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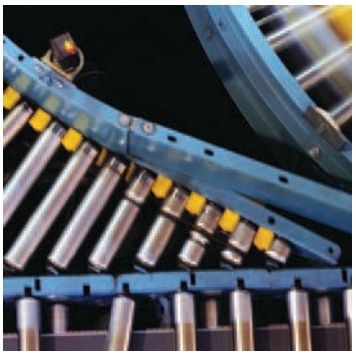
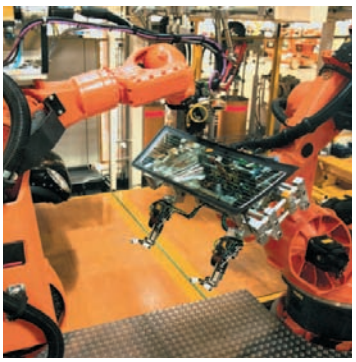
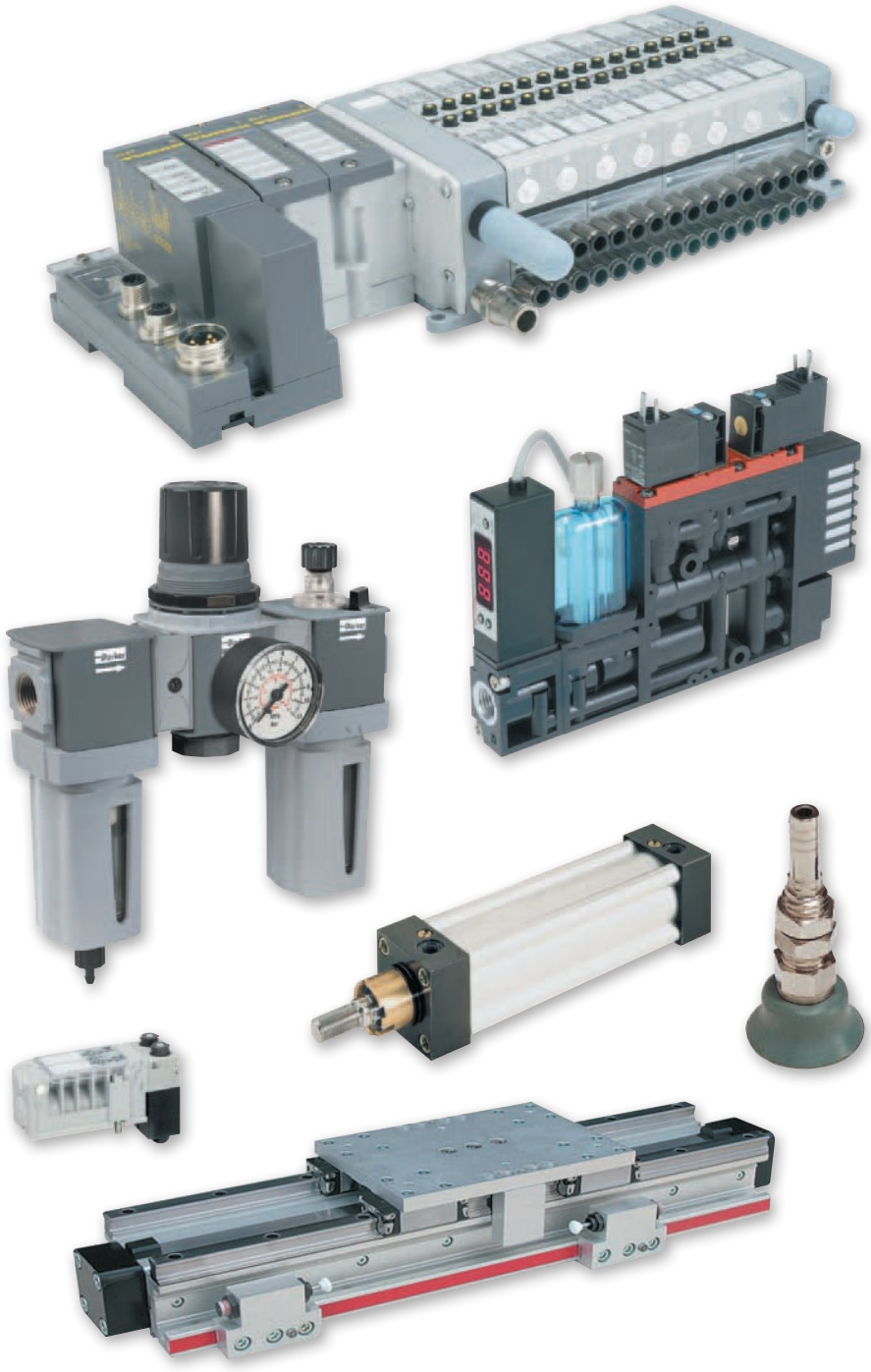
(Revised 08-24-2011)



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding





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A complete range of pneumatic system components

Catalog PDN1000US

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Parker Hannifin Corporation will extend its warranty on all pneumatic components to sixty (60) months providing they are correctly installed and protected by Parker pneumatic filters which are properly maintained. Components covered by this warranty include all cylinders, valves and pneumatic automation components manufactured by Parker in any of our global facilities. This warranty covers our components anywhere in the world you may ship your equipment.

Parker's obligation under this warranty is limited to the replacement or repair of any failed components. The buyer understands that the seller will not be liable for any other costs or damages.

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R. Sherrard

Roger Sherrard
President
Automation Group

Parker

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Tie Rod Cylinders

P1D Series - ISO 15552 / ISO 6431

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B62

3MA Series - Economy NFPA Cylinder

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B6

3MAJ / 4MAJ - Rodlock Cylinder

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B37

4MA Series - Flexible NFPA Cylinder

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

B16

4MNR Series - Non-Rotating Cylinder

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B55

Round Body Cylinders

P Series - Repairable

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B131

P1A Series - ISO Non-Repairable

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

B127

P1L Series - Repairable

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B113

SR Series - Non-Repairable

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

B79

SRX Series - Position Feedback

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

B105

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Compact Cylinders

LP / LPM Series - Compact Cylinder

- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B157

P1M Series - Compact Cylinder

- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B145

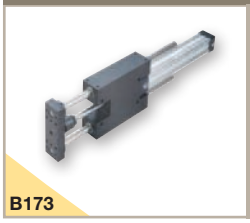
P1Q Series - Economy Compact Cylinder

- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B137

Guided Cylinders

HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B173

P5E Series - P1D ISO Guided

- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B177

P5L Series - Guided

- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B169

P5T Series - Compact Guided

- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B163

P5T2 Series - Compact Guided

- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

B166

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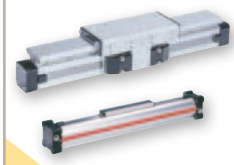
Rodless Cylinders

GDL Series - Rails & Cassettes

- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B265

OSP-P Series - Band Type Rodless



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

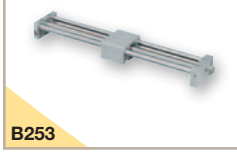
B179

P1X Series - Band Type Rodless

- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B241

P1Z Series - Magnetically Coupled Rodless

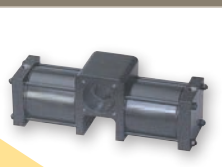


- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B253

Rotary Actuators

HP Series - Large Rack & Pinion Rotary



- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

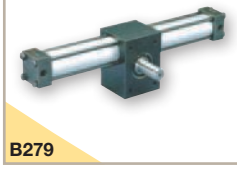
B281

PRN(A) Series - Vane Rotary

- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B273

PTR Series - Rack & Pinion Rotary



- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B279

PV Series - Vane Rotary

- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B270

P1V-S Series - Air Motors

- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B283

P5W Series - Rotary Table

- 7 bore sizes (10 to 63mm)
- Pressures 1 to 8 bar max.
- Temperatures 41°F to 140°F
- Theoretical torque (.28 to 39 Nm at 6 bar)

B277

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Grippers

Grippers

- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
  - Single acting
  - Double acting
  - Spring assist and spring return

B285

Electronic Sensors

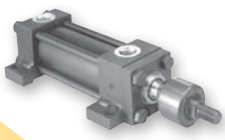
Sensors

- Solid state
- Reed
- NAMUR
- Proximity

B296

Actuator Accessories

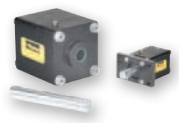
Linear Alignment Couplers



- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

B287

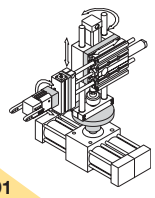
PRL Series - Stand Alone Rodlock



- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

B289

Transition Kits



- Plate kits – attach component to slide / guided cylinder
- Coupler kits – attach component to rotary actuator

B291

4TK Series - Air-Oil Tanks

- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B288

Shock Absorbers

Linear Alignment Couplers

- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

B320

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Vacuum Cups

PBG Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

PCG Multiple Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

PFG Flat Cups

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response
- Cup Sizes: 1.5mm to 200mm

C4

PJG Short Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

PUGB Flat Swivel Cups

- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

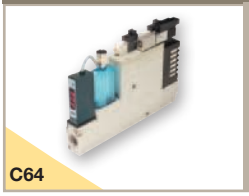
P5V-CFS Flat Cups

- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and looses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

Vacuum Generators

CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

CHF Inline Generators

- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

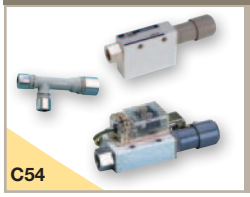
C56

CVCEK Integrated Generators

- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

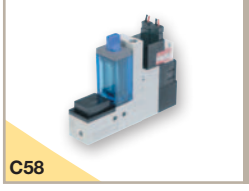
MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

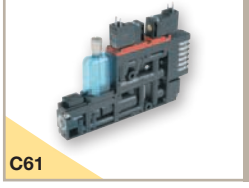
MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

MC72 Integrated Generators



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve,vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

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Vacuum Generator Accessories

CH01 One Way Check Valve

- Poppet design
- Low leakage
- Low cracking pressure

C74

Convum Vacuum Silencers

- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

C77

FSV Metered Flow Sensing Valve

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

C73

MPS-23 Integrated Generator Sensors

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C69

MVS-201 Integrated Generator Sensors

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

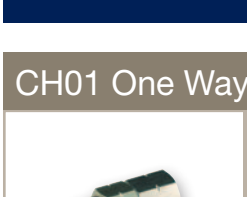
C71

VF & VL Vacuum Filters

- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

C75

VFP Vacuum Filters



- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

C76

Pressure Sensors

Cables

- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

C85

MPS-33 Pressure Sensors

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C78

MPS-34 Pressure Sensors

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C80

SCPSD Pressure Sensors

- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation

C83

SCP01 Pressure Sensor

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

C82

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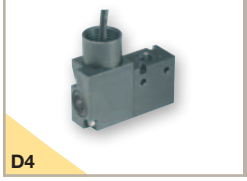
Direct Acting Valves

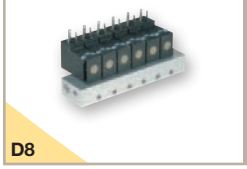
XM Series - Direct Acting



- Inline or stacking
- 1/8 inch ports
- Pressures 0 tp 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

D4

15mm Series - Direct Acting

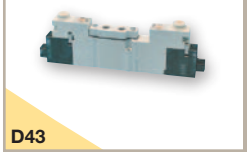


- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

D8

Inline Valves

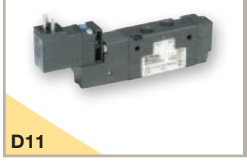
ADEX Series - Inline



- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

D43

B Series - Inline



- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

D11

N Series - Inline Poppet

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

D53

Inline – continued

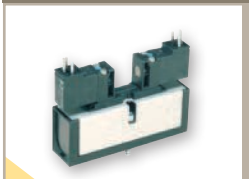
Viking Xtreme Series - Inline

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 158°F
- Flow - .7 to 2.7 Cv

D33

Subbase & Manifold Valves

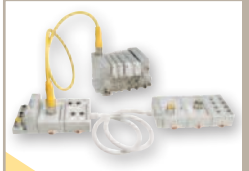
DX ISOMAX Series



- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

D147

Fieldbus Series



- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

D128

Isys ISO Series

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

D95

Isys Micro Series - Subbase

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

D84

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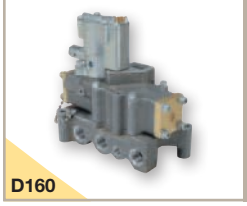
Subbase & Manifold – continued

Moduflex Series Valves

- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

D60

Valvair II Series - Plug-in



- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

D160

Manual / Mechanical Valves

Brass Poppet, Sliding Seal

- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

D189

Directair 2 & 4 Series - Inline

- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

D168

LV / EZ Lockout Valves

- Port sizes 3/8 through 1-1/4 inch
- Max.supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

D188

Manual / Mechanical – continued

M0 Series - Inline

- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

D184

Viking Xtreme Lever Series - Inline

- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
  Type A & B - VAC to 232 PSIG
  Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

D179

42 Series - Inline

- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

D177

Valve Accessories

Control Panel Products

- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

D192

Sensing / Limit Switches

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

D196

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Modular Air Preparation Products

Global FRL's

- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E3

General Industrial Air Preparation Products

Miniature, Compact, Standard, Hi-Flow

- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E27

Stainless Steel Air Preparation Products

Stainless Steel FRL's

- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E82

Precision / Proportional Regulator Products

Precision / Proportional Regulators

- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

E89

Dryer Products

Dryer Products

- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Zero loss & timer drains
- Environmentally friendly refrigerant

E101

Accessories

Ball Valves / Plug Valves

- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

F10

Flow Controls & Accessories

- Full range of flow controls, mufflers, silencers, drain valves, blow guns, relief, shuttle and quick exhaust valves
- Ports from M5 through 3/4 inch

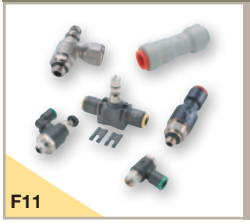
F5

Hose & Fittings

- 801 General purpose hose
- Push-on hose barb fittings

F16

Integrated Fittings



- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

F11

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Accessories – continued

Mufflers & Silencers

- Compact
- Lightweight
- Easy to install
- Excellent noise reduction
- Protects components from contamination
- NPT & BSPT threads available

F4

Quick Couplings

- Industrial interchange nipples –1/4" to 3/4" body size
- Sleevematic couplers –1/4" to 1/2" body size
- Saflomatic couplers –1/4" to 3/4" body size
- Economatic quick connect couplings –1/4" body size

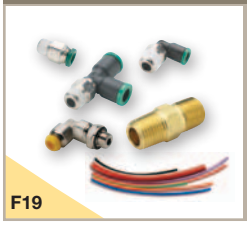
F7

Tank Valves & Air Chucks

- Maximum operating pressure 185 PSIG
- Temperature range -40°F to 220°F
- N/P finish
- Model No. 05499 0000 ball-foot air chuck, 1/4" female port
- Model No. 06739 0000 ball-foot air chuck with clip, 1/4" female port

F3

Tubing & Fittings



- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

F19

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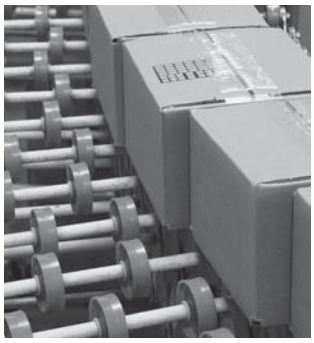

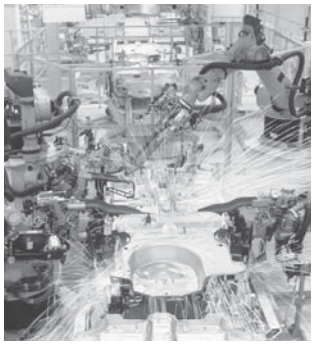

Actuator Products

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Tie Rod Cylinders

P1D Series - ISO 15552 / ISO 6431

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B62

3MA Series - Economy NFPA Cylinder

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

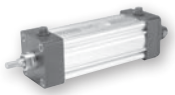
B6

3MAJ / 4MAJ - Rodlock Cylinder

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B37

4MA Series - Flexible NFPA Cylinder



- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

B16

4MNR Series - Non-Rotating Cylinder

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

B55

Round Body Cylinders

P Series - Repairable

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B131

P1A Series - ISO Non-Repairable

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

B127

P1L Series - Repairable

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

B113

SR Series - Non-Repairable

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

B79

SRX Series - Position Feedback

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

B105

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Compact Cylinders

LP / LPM Series - Compact Cylinder

- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B157

P1M Series - Compact Cylinder

- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B145

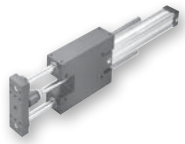
P1Q Series - Economy Compact Cylinder

- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B137

Guided Cylinders

HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B173

P5E Series - P1D ISO Guided

- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B177

P5L Series - Guided

- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B169

P5T Series - Compact Guided

- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B163

P5T2 Series - Compact Guided

- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

B166

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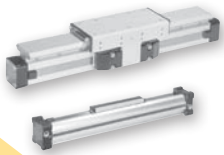
Rodless Cylinders

GDL Series - Rails & Cassettes

- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B265

OSP-P Series - Band Type Rodless



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

B179

P1X Series - Band Type Rodless

- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B241

P1Z Series - Magnetically Coupled Rodless

- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B253

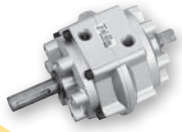
Rotary Actuators

HP Series - Large Rack & Pinion Rotary

- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

B281

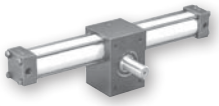
PRN(A) Series - Vane Rotary



- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B273

PTR Series - Rack & Pinion Rotary



- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B279

PV Series - Vane Rotary

- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B270

P1V-S Series - Air Motors

- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B283

P5W Series - Rotary Table

- 7 bore sizes (10 to 63mm)
- Pressures 1 to 8 bar max.
- Temperatures 41°F to 140°F
- Theoretical torque (.28 to 39 Nm at 6 bar)

B277

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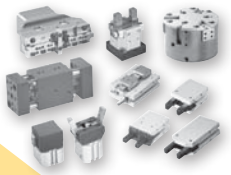
Grippers

Grippers



- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
  - Single acting
  - Double acting
  - Spring assist and spring return

B285

Electronic Sensors

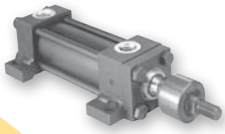
Sensors

- Solid state
- Reed
- NAMUR
- Proximity

B296

Actuator Accessories

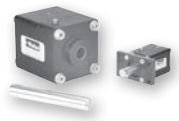
Linear Alignment Couplers



- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

B287

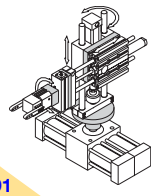
PRL Series - Stand Alone Rodlock



- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

B289

Transition Kits



- Plate kits – attach component to slide / guided cylinder
- Coupler kits – attach component to rotary actuator

B291

4TK Series - Air Oil Tanks

- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B288

Shock Absorbers

Linear Alignment Couplers

- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

B320

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- NFPA interchangeable economy series
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Available in any practical stroke length
- 18 standard modular mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod end options available
- Cushions – standard and adjustable at both ends, optional non-cushioned
- NPT porting standard
- RoHS compliant

Operating information

Operating pressure:	250 PSIG (17 bar)
Temperature range:	-10°F to 165°F (-23°C to 74°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

2.00	C		J		3MA		U			1	4		A	C	6.000

Bore size

1.50
2.00
2.50
3.25
4.00
5.00

Cushion head end

C	Standard (cushioned head end)
Blank	Non-cushioned head end

Double rod cylinder [5]

Specify "K" only if double rod cylinder is required.

Mounting style

Specify mounting style code (see table on following page).

Series

3MA

Cylinder construction

Blank*	Standard (extruded body, standard round lobe orientation)
A*	Extruded body, round lobe orientation rotated 90 degrees from standard
N*	Extruded body, round lobe orientation rotated 180 degrees from standard
Z*	Extruded body, round lobe orientation rotated 270 degrees from standard
T	Aluminum round tube and carbon steel tie rods and nuts

* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.

Piston type

Blank	Standard (lipseals and magnetic ring) [5]
1	Lipseals, no magnetic ring [5]
2	Lipseals, no magnetic ring (aluminum piston)
3	Lipseals and magnetic ring (aluminum piston)
4	Bumper seals, no magnetic ring
6	Bumper seals and magnetic ring
B	Lipseals, 1/4" thick bumpers both ends [1]
H	Lipseals, 1/4" thick bumper head end[1]
C	Lipseals, 1/4" thick bumper cap end [1]
D	Lipseals and magnetic ring, 1/4" thick bumpers both ends [1]
F	Lipseals and magnetic ring, 1/4" thick bumper head end [1]
R	Lipseals and magnetic ring, 1/4" thick bumper cap end [1]

Ports

Standard (NPTF)

Seals

Blank	Standard (nitrile seals)
E	Fluorocarbon rod wiper and rod seal only [2]

Special modification

Specify "S" only for special modification other than rod end, and then describe modification in item notes.

Piston rod number

Standard (rod code number 1) [3]

Piston rod thread style

4	Small male
8	Intermediate male
9	Short female
55	For use with split coupler [4]
3	Special (and specify all dimensions required)

Rod material code

Blank	Standard
Y	17-4 PH stainless steel
J	303 stainless steel
S	316 stainless steel

Piston rod thread type

A	Standard (UNF unified thread)
W	BSF British fine
M *	Metric

* Please reference catalog 0900P-E, page B106.

Cushion cap end

C	Standard (cushioned cap end)
Blank	Non-cushioned cap end

Stroke length

Specify stroke length required in inches.

[1] Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".

[2] Used for external chemical compatibility applications, not high temperature.

[3] Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter. (Note: 3MA has only one rod diameter per bore size, so proper piston rod diameter from chart result may lead to bore size change). For oversize rod within the same bore size, please see 4MA section.

[4] For additional information regarding this style, please reference catalog 0900P-E, page B105.
If non-standard Rod Material Code is required with this option, please place an "S" for special in Special Modification field and specify rod material in the item notes.

[5] Double rod cylinders not available with composite piston type.

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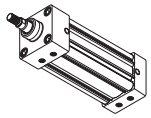
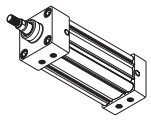
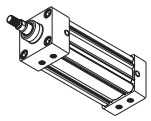
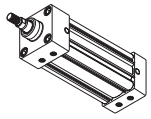
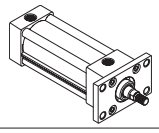
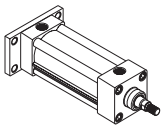
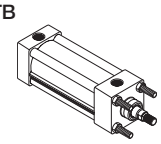
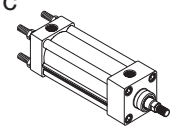
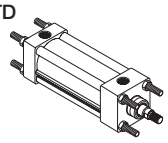
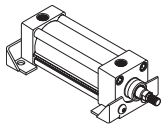
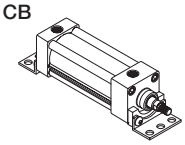
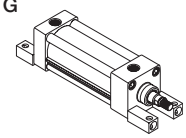
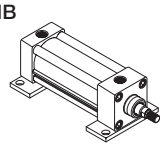
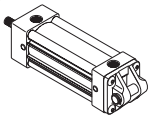
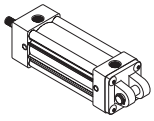
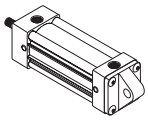
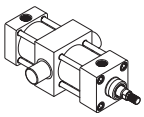
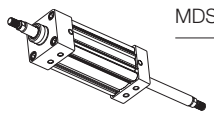
3MA Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5
T 	MX0	No Mount (same construction as TEF)	1-1/2 - 5
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5
F 	MS4	Side Tap (same construction as TEF)	1-1/2 - 5
J 	MF1	Head Rectangular Flange	1-1/2 - 5
H 	MF2	Cap Rectangular Flange	1-1/2 - 5
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 5
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 5

Mounting style	NFPA mounting	Description	Bore size
C 	MS2	Side Lug	1-1/2 - 5
CB 	MS1	Side End Angle	1-1/2 - 5
G 	MS7	Side End Lug	1-1/2 - 4
NB 	N/A	Base Bar	1-1/2 - 4
BB 	MP1	Cap Fixed Clevis	1-1/2 - 5
BC 	MP2	Cap Detachable Clevis	1-1/2 - 5
BE 	MP4	Cap Detachable Eye	1-1/2 - 4
DD 	MT4	Intermediate Trunnion	1-1/2 - 5
KTEF* 	MDX5/ MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Double rod end cylinders can be ordered with head mountings, i.e. KJ.

Sensors
For sensors see page B296.

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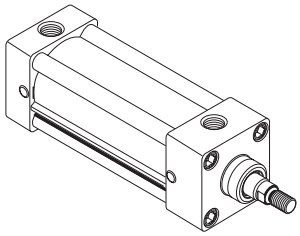
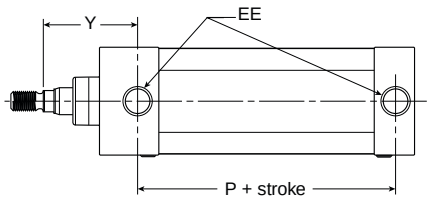
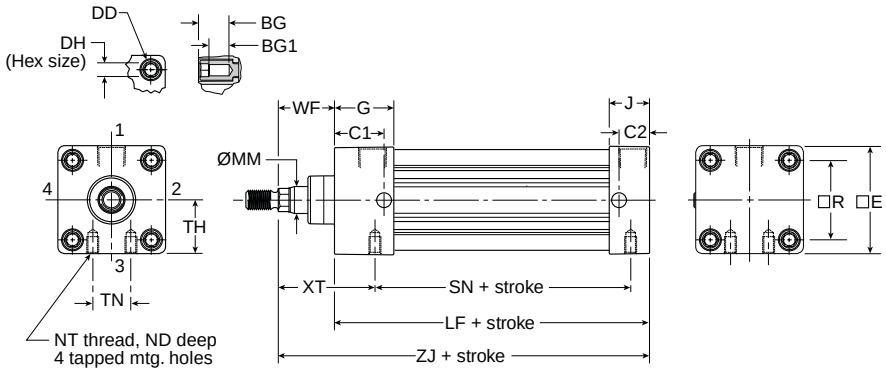
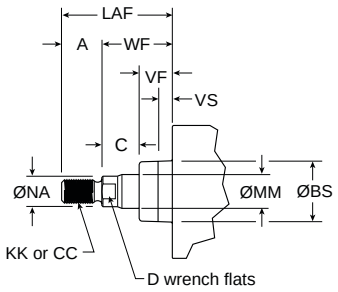
3MA Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)









For dimensions of all standard rod end styles, please see next page.

BS = pilot diameter

VS = length of pilot diameter

Styles TEF, T, TE and F

Bore size	Rod no.	Rod dia.	Thread						+.000 -.004								EE
size		MM	Style 8 CC	Style 4 & 9 KK	A	AA	BG	BG1	BS	C	C1	C2	D	DD	DH	E	(NPTF)	G
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	0.562	0.374	1.124	0.385	1.000	0.500	1/2	1/4-28	1/4	2.000	3/8	1.438
2	1	5/8	1/2-20	7/16-20	0.750	2.600	0.562	0.362	1.124	0.385	1.148	0.711	1/2	5/16-24	5/16	2.500	3/8	1.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	0.562	0.362	1.124	0.385	1.117	0.711	1/2	5/16-24	5/16	3.000	3/8	1.344
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	3.750	1/2	1.594
4	1	1	7/8-14	3/4-16	1.125	4.700	0.700	0.500	1.499	0.510	1.350	0.881	7/8	3/8-24	3/8	4.500	1/2	1.594
5	1	1	7/8-14	3/4-16	1.125	5.800	0.781	0.531	1.499	0.510	1.350	0.975	7/8	1/2-20	1/2	5.500	1/2	1.594

Bore size	Rod no.	Rod dia.							+.005 -.005							Add stroke			
size		MM	J	LAF	NA	ND	NT	R	TH	TN	VF	VS	WF	XT	Y	LF	P	SN	ZJ
1-1/2	1	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	-	1.000	1.938	1.875	3.625	2.313	2.250	4.625
2	1	5/8	0.938	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	0.250	1.000	1.938	1.875	3.625	2.313	2.250	4.625
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	0.250	1.000	1.938	1.938	3.750	2.375	2.375	4.750
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	0.250	1.375	2.438	2.438	4.250	2.625	2.625	5.625
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	0.250	1.375	2.438	2.438	4.500	2.875	2.875	5.875

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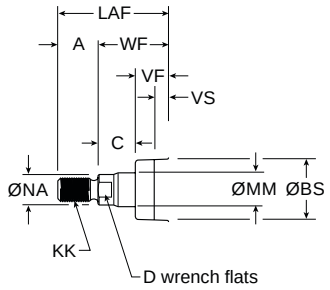
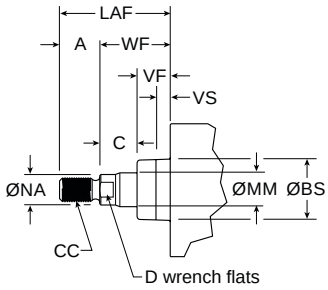
3MA Rod End Dimensions

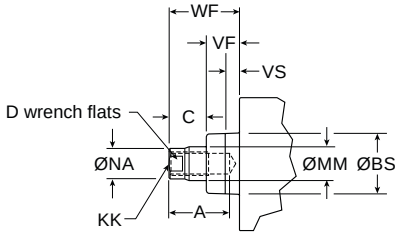
Thread Style 4
(NFPA Style SM)
Small Male



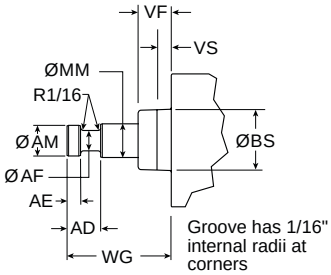
Thread Style 8
(NFPA Style IM)
Intermediate Male



Thread Style 9
(NFPA Style SF)
Short Female



Thread Style 55
For use with Split Coupler
(please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"
Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
If otherwise special, please supply dimensioned sketch.

Applies to all rod ends:
BS = pilot diameter
VS = length of pilot diameter

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AD	AE	AF	AM	+.000 -.004 BS	C	D	LAF	NA	VF	VS	WF	WG
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	-	1.000	1.750
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1.750	0.563	0.615	0.250	1.000	1.750
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	2.500	0.938	0.865	0.250	1.375	2.375

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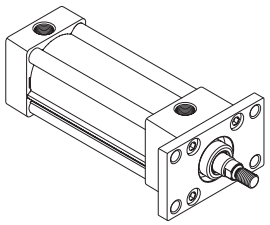
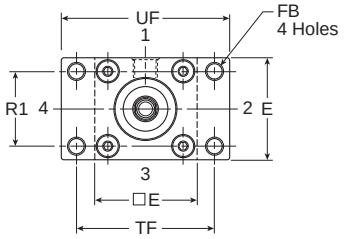
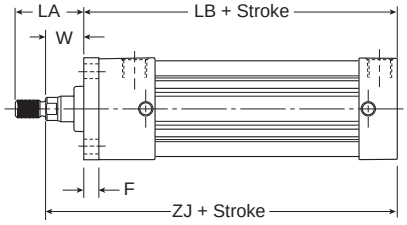
Head Rectangular Flange

Style J
(NFPA MF1)





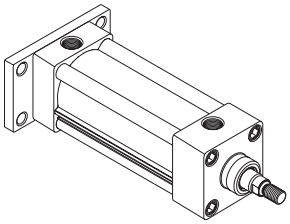


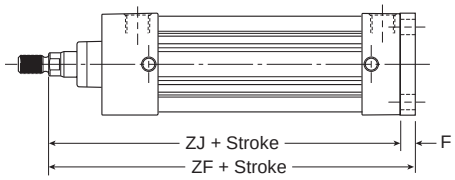
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

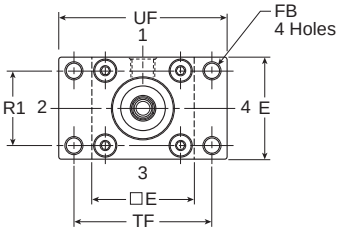
For reference, WF = W + F and LA = W + A.

Cap Rectangular Flange

Style H
(NFPA MF2)







Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke LB	Add stroke ZF	Add stroke ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
	2	1	1.125	2.000	0.375	0.313	2.125	1.430	2.750	3.375	1.000	4.000	5.375	5.000
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	4.000	5.375	5.000
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	4.125	5.500	5.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	4.875	6.500	5.875
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	4.875	6.500	5.875
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	5.125	6.750	6.125

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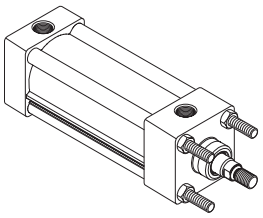
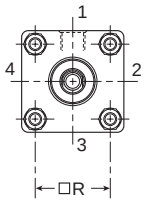
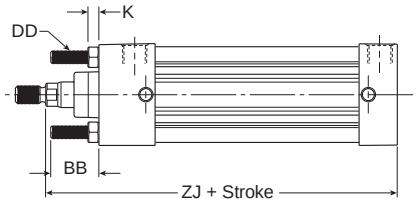
Tie Rods Ext. Head End

Style TB
(NFPA MX3)

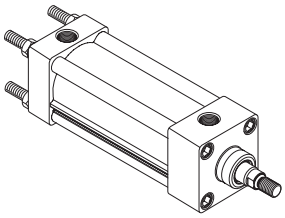


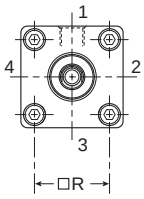


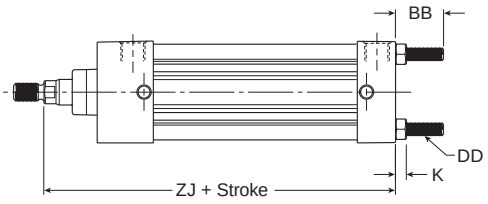


Tie Rods Ext. Cap End

Style TC
(NFPA MX2)

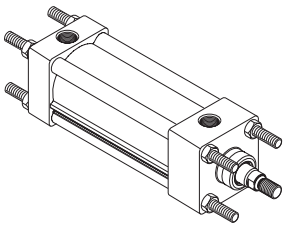


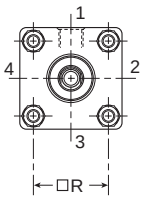


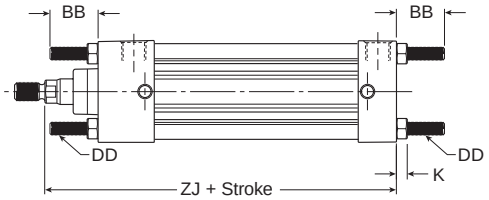


Tie Rods Ext. Both Ends

Style TD
(NFPA MX1)







Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke ZJ
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625
	2	1	1.000	1/4-28	2.000	0.250	1.430	5.000
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625
	3	1	1.125	5/16-24	2.500	0.313	1.840	5.000
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750
	3	1	1.125	5/16-24	3.000	0.313	2.190	5.125
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625
	3	1-3/8	1.375	3/8-24	3.750	0.375	2.760	5.875
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625
	3	1-3/8	1.375	3/8-24	4.500	0.375	3.320	5.875
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875
	3	1-3/8	1.813	1/2-20	5.500	0.438	4.100	6.125

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Side Lug

Style C
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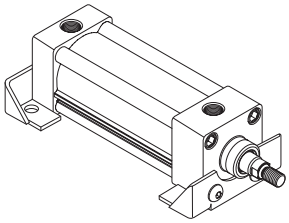
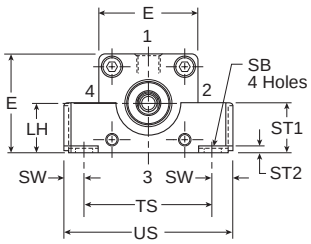
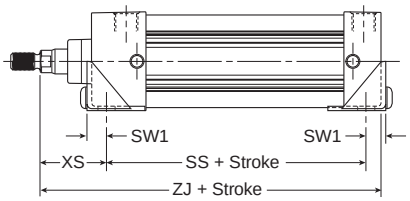




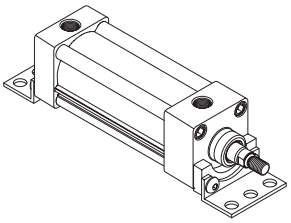


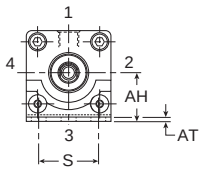
Style C

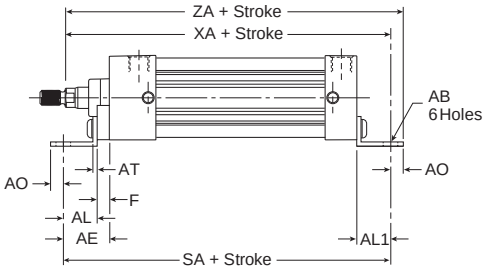
Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke SS	Add stroke ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
	2	1	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.750	2.875	5.000
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
	3	1	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
	3	1	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	2.125	3.250	5.875
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	2.125	3.250	5.875
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875
	3	1-3/8	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.313	3.125	6.125

Side End Angle*

Style CB
(NFPA MS1)







Note: Dimension "S" is for the holes in the mount (not the screw to screw dimension)

*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke SA	Add stroke XA	Add stroke ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
	2	1	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	6.000	6.375
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
	3	1	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	6.000	6.375
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
	3	1	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	6.125	6.500
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
	3	1-3/8	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	7.125	7.625
4	1	1	0.563	–	2.250	1.875	1.250	0.500	0.125	4.500	–	3.500	7.375	6.875	7.375
	3	1-3/8	0.563	–	2.250	1.875	1.250	0.500	0.125	4.500	–	3.500	7.375	7.125	7.625
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875
	3	1-3/8	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.500	8.125

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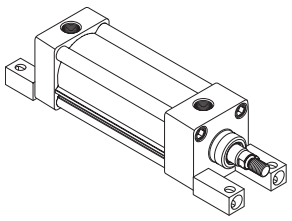
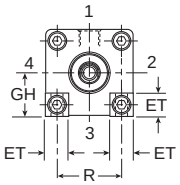
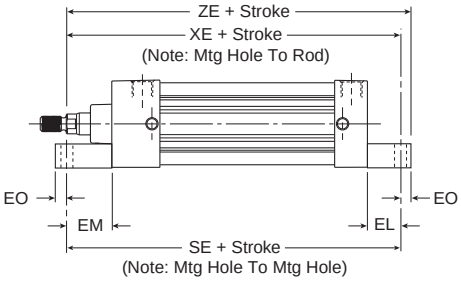
Side End Lug

Style G
(NFPA MS7)





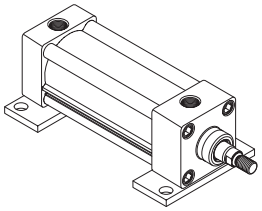


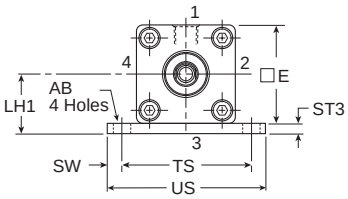
Style G

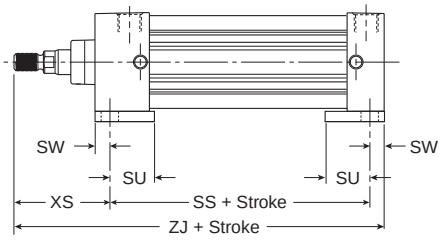
Bore Size	Rod No.	Rod Dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add stroke SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
	2	1	–	–	–	–	–	–	–	–	–	–	–
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.938	6.250
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	6.188	6.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.750	7.125
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.875	7.250

Base Bar Mount

Style NB







Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
	2	1	–	–	–	–	–	–	–	–	–	–	–
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
	3	1	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
	3	1	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.125	3.250	5.875
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.125	3.250	5.875

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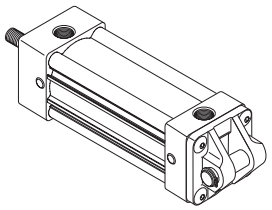
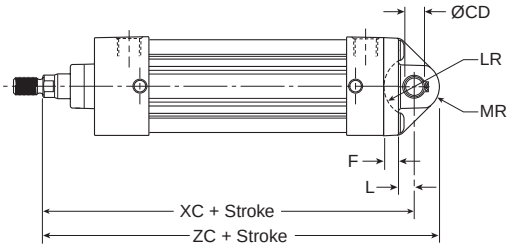
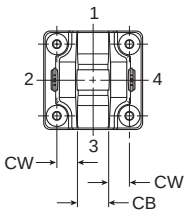
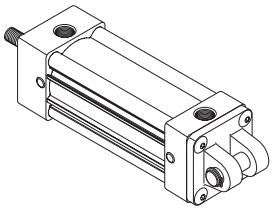
Cap Fixed Clevis
Style BB
(NFPA MP1)

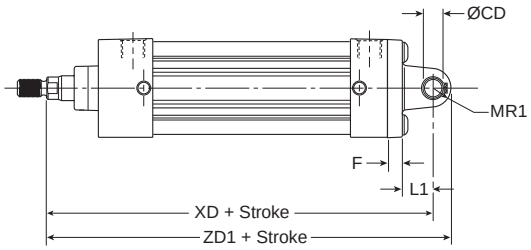


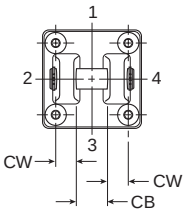




Cap Detachable Clevis
Style BC
(NFPA MP2)

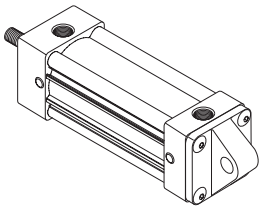


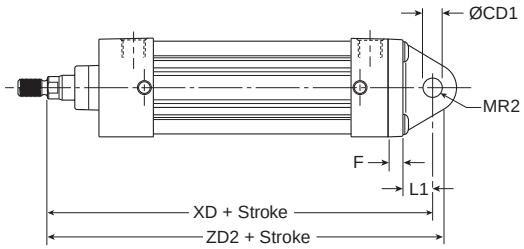


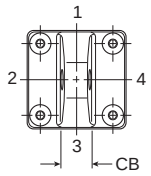


Cap Detachable Eye*
Style BE
(NFPA MP4)

Note: 5 inch bore not available on BE mount, see 4MA series.







Note: For maximum swivel angle of BB mount with rear mounting plate, please reference Catalog 0900P-E, cylinder accessories on page B108.

Styles BB, BC and BE

Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	+.002 +.004 CD1	CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	2	1	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	3	1	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
	3	1	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.875	6.250	6.500	6.750	6.313
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
5 *	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
	3	1-3/8	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.375	8.000	8.313	8.750	8.875

* 5 inch bore not available on BE mount, see 4MA series

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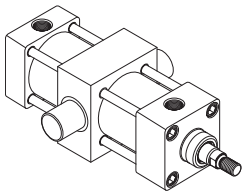
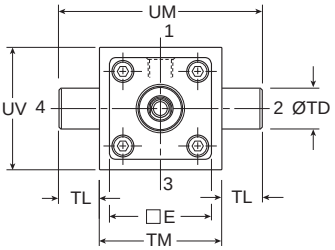
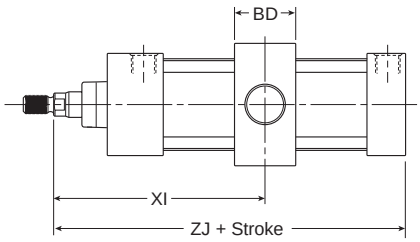
Intermediate Trunnion

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.







Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+.000 –.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke XJ	Add stroke ZJ
1–1/2	1	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
	2	1	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	–	3.437	4.250	5.000
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	2.125	3.500	4.500	5.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	2.125	3.469	4.625	5.125
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.500	4.219	5.250	5.875
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.500	4.219	5.250	5.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.500	4.219	5.500	6.125

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- Industry leading aluminum NFPA interchangeable cylinder with flexible construction
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- 20 standard mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod ends
- Cushions – standard and adjustable at both ends, optional non-cushioned
- RoHS compliant

Operating information

	4MA	4ML
Operating pressure:	250 PSIG (17 bar) maximum air service	400 PSIG (27 bar) maximum hydraulic service
Temperature range:		
Standard seals	-10°F to 165°F (-23°C to 74°C)	
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)	
Low temperature seals	-50°F to 150°F (-46°C to 66°C)	
Filtration requirements:	40 micron, dry filtered air	Filtered hydraulic oil

For technical information see CD

Ordering information

2.00			J		4MA		U			1	4		A		6.000

Bore size

1.50 [1]
2.00
2.50
3.25
4.00
5.00

Double rod cylinder [12]
Specify "K" only if double rod cylinder is required.

Mounting style
Specify mounting style code (see table on following page).

Series

4MA	Air service
4ML	Hydraulic service [2]

Ports

U	NPTF
R	BSPP
B	BSPT
T	SAE

Piston rod number
Specify rod code number for required diameter. [8, 2]

Stroke length
Specify stroke length required in inches. [11]

Cushion cap end

Blank	Non-cushioned cap end
C	Cushioned cap end (not available for 4ML)

Piston rod thread type

A	Standard (UNF unified thread)
W	BSF British fine
M *	Metric

* Please reference catalog 0900P-E, page B106.

Cushion head end

Blank	Non-cushioned head end
C	Cushioned head end (not available for 1.50" bore with 1" rod or 4ML)

Special modification
Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) [7]

Seals

Blank	Standard (nitrile seals)
V	Fluorocarbon seals [4]
E	Fluorocarbon rod wiper and rod seal only [5]
4	Low temperature seals [4]
M	Metallic rod wiper, nitrile seals [6]

Cylinder construction

Blank*	Standard (extruded body, standard round lobe orientation)
A*	Extruded body, round lobe orientation rotated 90 degrees from standard
N*	Extruded body, round lobe orientation rotated 180 degrees from standard
Z*	Extruded body, round lobe orientation rotated 270 degrees from standard
T	Aluminum round tube and carbon steel tie rods & nuts

* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.

Piston rod thread style

4	Small male
8	Intermediate male
9	Short female
55	For use with split coupler [9]
3	Special (and specify all dimensions required)

Rod material and gland code

Blank	Standard rod and gland
H	Standard rod and HI LOAD gland
Y	17-4 PH stainless steel rod and standard gland
Z	17-4 PH stainless steel rod and HI LOAD gland
J	303 stainless steel rod and standard gland [10]
K	303 stainless steel rod and HI LOAD gland [10]
S	316 stainless steel rod and standard gland [10]
T	316 stainless steel rod and HI LOAD gland [10]

Piston type [2]

Blank	Standard (lipseals and magnetic ring) [12]
1	Lipseals, no magnetic ring [12]
2	Lipseals, no magnetic ring (aluminum piston)
3	Lipseals and magnetic ring (aluminum piston) (standard for 4ML)
4	Bumper seals, no magnetic ring
6	Bumper seals and magnetic ring
B	Lipseals, 1/4" thick bumpers both ends [3]
H	Lipseals, 1/4" thick bumper head end [3]
C	Lipseals, 1/4" thick bumper cap end [3]
D	Lipseals and magnetic ring, 1/4" thick bumpers both ends [3]
F	Lipseals and magnetic ring, 1/4" thick bumper head end [3]
R	Lipseals and magnetic ring, 1/4" thick bumper cap end [3]

1 Not available with Linear Position Sensor Option (LPSO).
2 Piston Types (blank), 1, 4 and 6 not available for 4ML. Piston Types (blank) and 1 not available for oversize rod numbers 2 and 3. Seals option V only available with Piston Types 2 and 4. Seals option 4 only available with Piston Types 2 and 3.
3 Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".
4 Reed and solid-state sensors only available with standard seals or options E and M. See footnote 2.
5 Used for external chemical compatibility applications, not high temperature.
6 If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.
7 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
b. Sensor position
c. Port position (if other than position 1)
d. Length of stop tubing, gross stroke and net stroke (if required)
Also, Piston Type option (blank), 3, 6, D, F or R is required.
8 Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.
9 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.
10 Not available for 4ML.
11 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1.
12 Double rod cylinders not available with composite piston type.

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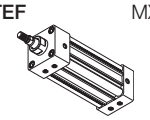
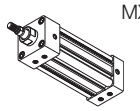
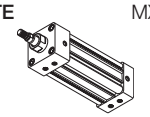
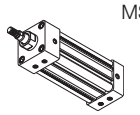
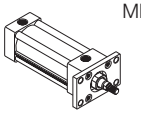
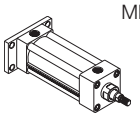
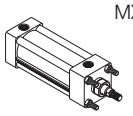
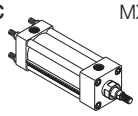
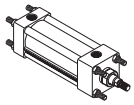
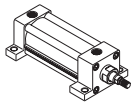
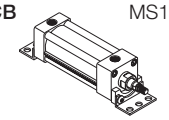
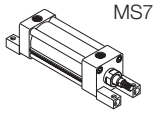
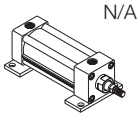
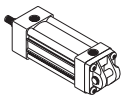
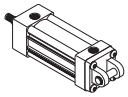
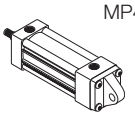
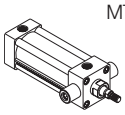
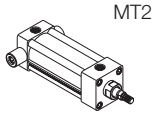
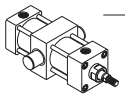
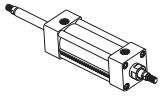
4MA/4ML Mounting Styles for 1-1/2" to 5" Bore

Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 5*
T 	MX0	No Mount (same construction as TEF)	1-1/2 - 5
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 5
F 	MS4	Side Tap (same construction as TEF)	1-1/2 - 5*
J 	MF1	Head Rectangular Flange	1-1/2 - 5
H 	MF2	Cap Rectangular Flange	1-1/2 - 5
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 5
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 5
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 5
C 	MS2	Side Lug	1-1/2 - 5

Mounting style	NFPA mounting	Description	Bore size
CB 	MS1	Side End Angle	1-1/2 - 5
G 	MS7	Side End Lug	1-1/2 - 4*
NB 	N/A	Base Bar	1-1/2 - 4*
BB 	MP1	Cap Fixed Clevis	1-1/2 - 5
BC 	MP2	Cap Detachable Clevis	1-1/2 - 5
BE 	MP4	Cap Detachable Eye	1-1/2 - 5
D 	MT1	Head Trunnion	1-1/2 - 5*
DB 	MT2	Cap Trunnion	1-1/2 - 5
DD 	MT4	Intermediate Trunnion	1-1/2 - 5
KTEF † 	MDX5/MDS4	Double Rod End, TEF Mount	1-1/2 - 5

* Not available for 1-1/2" bore with 1" rod.

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

Sensors

For sensors see page B296.

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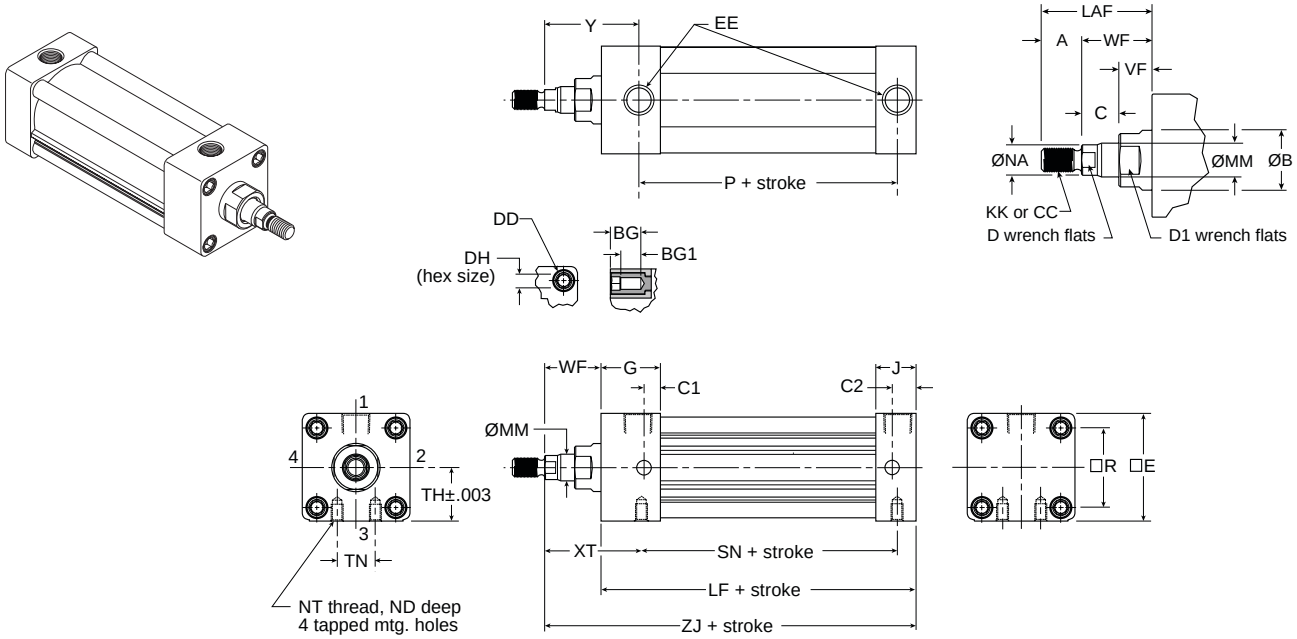
Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



Styles TEF, T, TE and F

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AA	+.000 -.002 B	BG	BG1	C	C1	C2	D	D1	DD	DH	E	EE (NPTF)	G
1-1/2	1 *	5/8	1/2-20	7/16-20	0.750	2.020	1.124	0.562	0.374	0.385	1.000	0.500	1/2	1	1/4-28	1/4	2.000	3/8	1.438
	2	1	7/8-14	3/4-16	1.125	2.020	1.499	0.562	0.374	0.510	–	0.500	7/8	1-3/8	1/4-28	1/4	2.000	3/8	1.438
2	1	5/8	1/2-20	7/16-20	0.750	2.600	1.124	0.562	0.362	0.385	1.000	0.562	1/2	1	5/16-24	5/16	2.500	3/8	1.375
	3	1	7/8-14	3/4-16	1.125	2.600	1.499	0.562	0.362	0.510	1.000	0.562	7/8	1-3/8	5/16-24	5/16	2.500	3/8	1.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	0.562	0.362	0.385	1.000	0.594	1/2	1	5/16-24	5/16	3.000	3/8	1.344
	3	1	7/8-14	3/4-16	1.125	3.100	1.499	0.562	0.362	0.510	1.000	0.594	7/8	1-3/8	5/16-24	5/16	3.000	3/8	1.344
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	3.750	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	3.750	1/2	1.594
4	1	1	7/8-14	3/4-16	1.125	4.700	1.499	0.700	0.500	0.510	1.188	0.719	7/8	1-3/8	3/8-24	3/8	4.500	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	0.700	0.500	0.635	1.188	0.719	1-1/8	1-7/8	3/8-24	3/8	4.500	1/2	1.594
5	1	1	7/8-14	3/4-16	1.125	5.800	1.499	0.781	0.531	0.510	1.188	0.813	7/8	1-3/8	1/2-20	1/2	5.500	1/2	1.594
	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	0.781	0.531	0.635	1.188	0.813	1-1/8	1-7/8	1/2-20	1/2	5.500	1/2	1.594

Bore size	Rod no.	Rod dia. MM	J	LAF	NA	ND	NT	R	+.003 -.003 TH	TN	VF	WF	XT	Y	Add stroke LF	P	SN	ZJ
1-1/2	1 *	5/8	0.938	1.750	0.563	0.375	1/4-20	1.430	0.993	0.625	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625
	2	1	0.938	2.500	0.938	-	-	1.430	0.993	-	0.865	1.375	-	2.250	3.625	2.313	-	5.000
2	1	5/8	0.937	1.750	0.563	0.438	5/16-18	1.840	1.243	0.875	0.615	1.000	1.938	1.875	3.625	2.313	2.250	4.625
	3	1	0.937	2.500	0.938	0.375	5/16-18	1.840	1.243	0.875	0.865	1.375	2.313	2.250	3.625	2.313	2.250	5.000
2-1/2	1	5/8	0.938	1.750	0.563	0.625	3/8-16	2.190	1.493	1.250	0.615	1.000	1.938	1.938	3.750	2.375	2.375	4.750
	3	1	0.938	2.500	0.938	0.625	3/8-16	2.190	1.493	1.250	0.865	1.375	2.313	2.313	3.750	2.375	2.375	5.125
3-1/4	1	1	1.125	2.500	0.938	0.750	1/2-13	2.760	1.868	1.500	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625
	3	1 3/8	1.125	3.250	1.313	0.750	1/2-13	2.760	1.868	1.500	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875
4	1	1	1.125	2.500	0.938	0.750	1/2-13	3.320	2.243	2.063	0.865	1.375	2.438	2.438	4.250	2.625	2.625	5.625
	3	1-3/8	1.125	3.250	1.313	0.750	1/2-13	3.320	2.243	2.063	0.990	1.625	2.688	2.688	4.250	2.625	2.625	5.875
5	1	1	1.219	2.500	0.938	0.938	5/8-11	4.100	2.743	2.688	0.865	1.375	2.438	2.438	4.500	2.875	2.875	5.875
	3	1-3/8	1.219	3.250	1.313	0.938	5/8-11	4.100	2.743	2.688	0.990	1.625	2.688	2.688	4.500	2.875	2.875	6.125

*** NOTE -** 1-1/2" bore with 1" rod is TE mount, F mount not available.
1-1/2" bore with 1" rod cannot have a cushion at head end.

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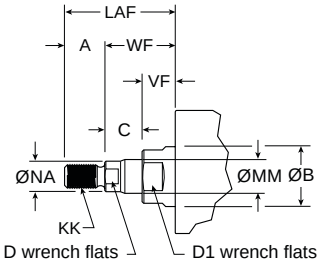
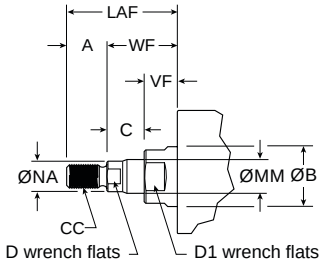
4MA Rod End Dimensions

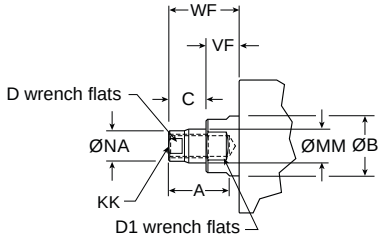
Thread Style 4
(NFPA Style SM)
Small Male



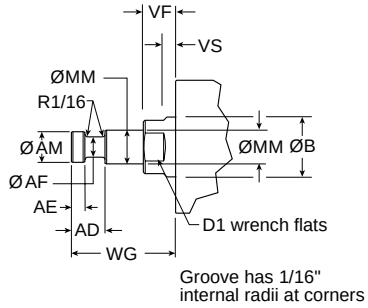
Thread Style 8
(NFPA Style IM)
Intermediate Male



Thread Style 9
(NFPA Style SF)
Short Female



Thread Style 55
For use with Split Coupler
(please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"
Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AD	AE	AF	AM	+.000 -.002 B	C	D	D1	LAF	NA	VF	WF	WG
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	2	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	0.385	1/2	1	1.750	0.563	0.615	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	0.510	7/8	1-3/8	2.500	0.938	0.865	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750

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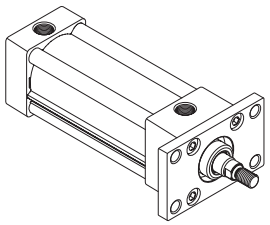
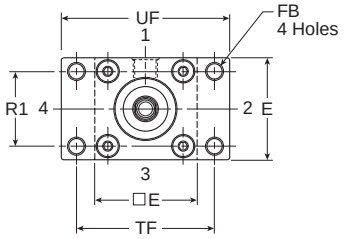
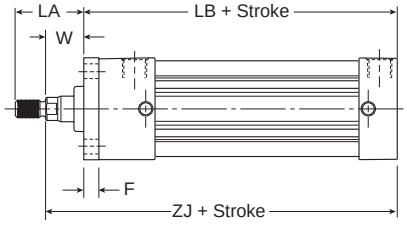
Head Rectangular Flange

Style J
(NFPA MF1)





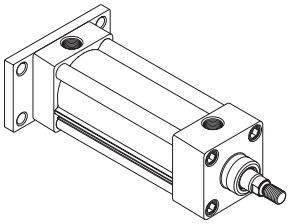


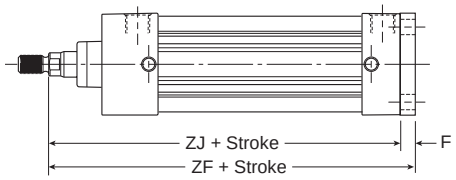
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

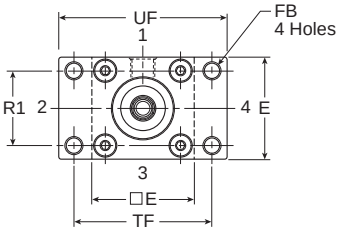
For reference, WF = W + F and LA = W + A.

Cap Rectangular Flange

Style H
(NFPA MF2)







Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke LB	Add stroke ZF	Add stroke ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	4.000	5.000	4.625
	2	1	1.125	2.000	0.375	0.313	2.125	1.430	2.750	3.375	1.000	4.000	5.375	5.000
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	4.000	5.000	4.625
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	4.000	5.375	5.000
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	4.125	5.125	4.750
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	4.125	5.500	5.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	4.875	6.500	5.875
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	4.875	6.250	5.625
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	4.875	6.500	5.875
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	5.125	6.500	5.875
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	5.125	6.750	6.125

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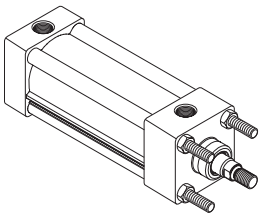
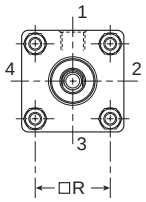
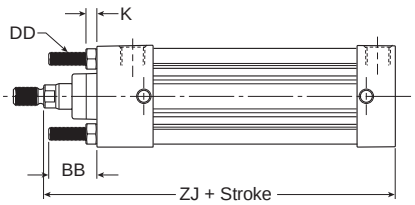
Tie Rods Ext. Head End

Style TB
(NFPA MX3)

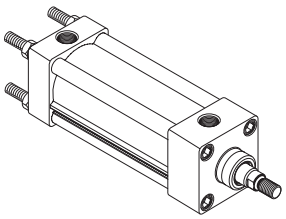


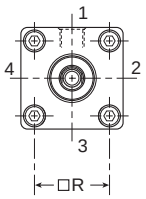


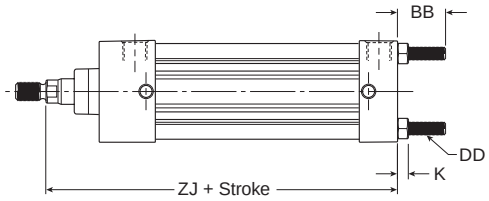


Tie Rods Ext. Cap End

Style TC
(NFPA MX2)

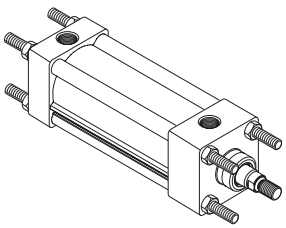


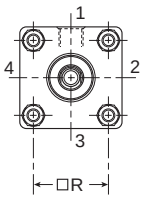


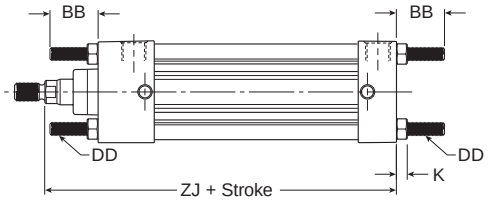


Tie Rods Ext. Both Ends

Style TD
(NFPA MX1)







Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	BB	DD	E	K	R	Add stroke ZJ
1-1/2	1	5/8	1.000	1/4-28	2.000	0.250	1.430	4.625
	2	1	1.000	1/4-28	2.000	0.250	1.430	5.000
2	1	5/8	1.125	5/16-24	2.500	0.313	1.840	4.625
	3	1	1.125	5/16-24	2.500	0.313	1.840	5.000
2-1/2	1	5/8	1.125	5/16-24	3.000	0.313	2.190	4.750
	3	1	1.125	5/16-24	3.000	0.313	2.190	5.125
3-1/4	1	1	1.375	3/8-24	3.750	0.375	2.760	5.625
	3	1-3/8	1.375	3/8-24	3.750	0.375	2.760	5.875
4	1	1	1.375	3/8-24	4.500	0.375	3.320	5.625
	3	1-3/8	1.375	3/8-24	4.500	0.375	3.320	5.875
5	1	1	1.813	1/2-20	5.500	0.438	4.100	5.875
	3	1-3/8	1.813	1/2-20	5.500	0.438	4.100	6.125

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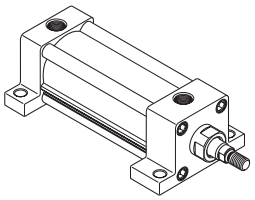
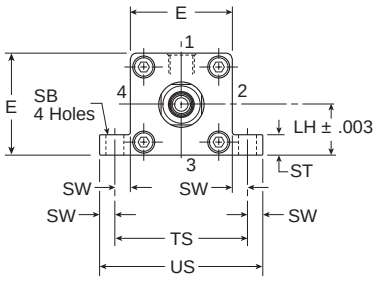
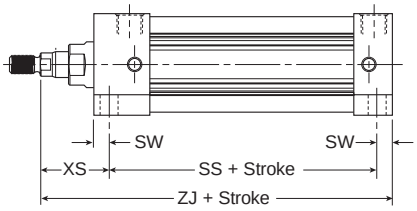
Side Lug

Style C for
(NFPA MS2)





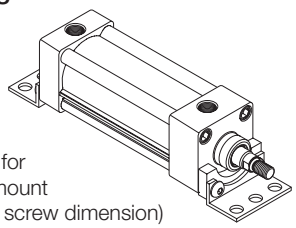


Styles C

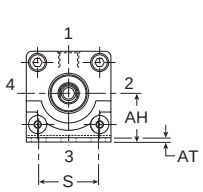
Bore size	Rod no.	Rod dia. MM	E	LH	SB	ST	ST1	ST2	SW	SW1	TS	US	XS	Add stroke SS	Add stroke ZJ
1-1/2	1	5/8	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.375	2.875	4.625
	2	1	2.000	0.993	0.438	0.500	1.000	0.120	0.375	0.495	2.750	3.500	1.750	2.875	5.000
2	1	5/8	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.375	2.875	4.625
	3	1	2.500	1.243	0.438	0.500	1.250	0.120	0.375	0.495	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.375	3.000	4.750
	3	1	3.000	1.493	0.438	0.500	1.343	0.120	0.375	0.495	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	3.750	1.868	0.563	0.750	1.500	0.188	0.500	0.688	4.750	5.750	2.125	3.250	5.875
4	1	1	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	4.500	2.243	0.563	0.750	1.500	0.188	0.500	0.688	5.500	6.500	2.125	3.250	5.875
5	1	1	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.063	3.125	5.875
	3	1-3/8	5.500	2.743	0.813	1.000	1.500	0.250	0.688	0.938	6.875	8.250	2.313	3.125	6.125

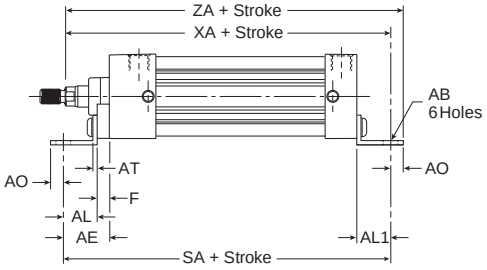
Side End Angle*

Style CB
(NFPA MS1)



Note:
Dimension "S" is for
the holes in the mount
(not the screw to screw dimension)





*Maximum recommended pressure for this mount is 150 PSIG

Style CB

Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AL1	AO	AT	E	F	S	Add stroke SA	Add stroke XA	Add stroke ZA
1-1/2	1	5/8	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	5.625	6.000
	2	1	0.438	1.375	1.188	1.000	1.000	0.375	0.125	2.000	0.375	1.250	6.000	6.000	6.375
2	1	5/8	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	5.625	6.000
	3	1	0.438	1.375	1.438	1.000	1.000	0.375	0.125	2.500	0.375	1.750	6.000	6.000	6.375
2-1/2	1	5/8	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	5.750	6.125
	3	1	0.438	1.375	1.625	1.000	1.000	0.375	0.125	3.000	0.375	2.250	6.125	6.125	6.500
3-1/4	1	1	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	6.875	7.375
	3	1-3/8	0.563	1.875	1.938	1.250	1.250	0.500	0.125	3.750	0.625	2.750	7.375	7.125	7.625
4	1	1	0.563	–	2.250	1.875	1.250	0.500	0.125	4.500	–	3.500	7.375	6.875	7.375
	3	1-3/8	0.563	–	2.250	1.875	1.250	0.500	0.125	4.500	–	3.500	7.375	7.125	7.625
5	1	1	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.250	7.875
	3	1-3/8	0.688	2.000	2.750	1.375	1.375	0.625	0.188	5.500	0.625	4.250	7.875	7.500	8.125

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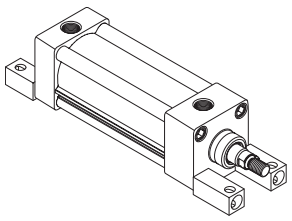
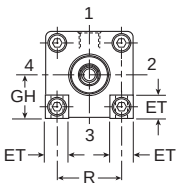
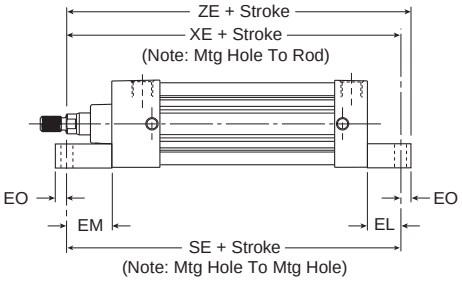
Side End Lug

Style G
(NFPA MS7)







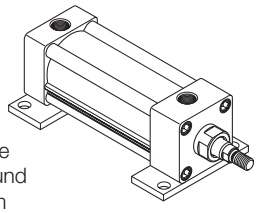
Style G

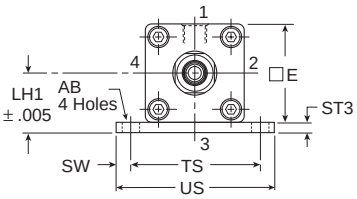
Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	GH	R	Add Stroke SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	5.500	5.375	5.625
	2	1	–	–	–	–	–	–	–	–	–	–	–
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.563	5.875
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	5.875	5.938	6.250
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	5.813	6.125
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	6.250	6.188	6.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.500	6.875
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	6.625	6.750	7.125
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.625	7.000
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	6.875	6.875	7.250

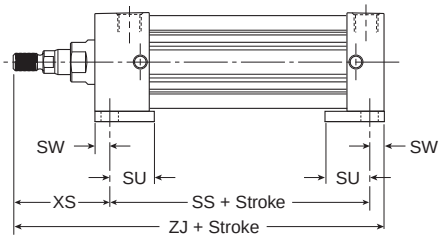
Base Bar Mount

Style NB for 4MA

Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.







Style NB

Bore size	Rod no.	Rod dia. MM	AB	E	LH1	ST3	SU	SW	TS	US	XS	Add stroke SS	ZJ
1-1/2	1	5/8	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	1.375	2.875	4.625
	2	1	–	–	–	–	–	–	–	–	–	–	–
2	1	5/8	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.375	2.875	4.625
	3	1	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	1.750	2.875	5.000
2-1/2	1	5/8	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.375	3.000	4.750
	3	1	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	1.750	3.000	5.125
3-1/4	1	1	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	1.875	3.250	5.625
	3	1-3/8	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.125	3.250	5.875
4	1	1	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	1.875	3.250	5.625
	3	1-3/8	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.125	3.250	5.875

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Cap Fixed Clevis

Style BB
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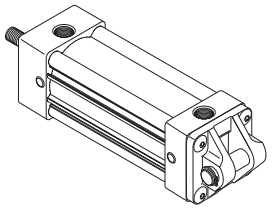
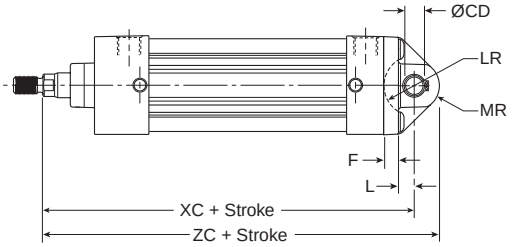
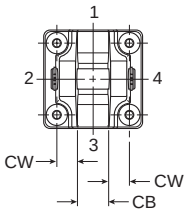
Note: For maximum swivel angle of BB mount with rear mounting plate, see cylinder accessories

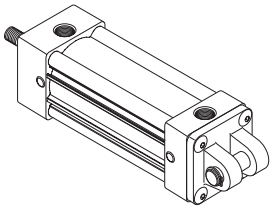


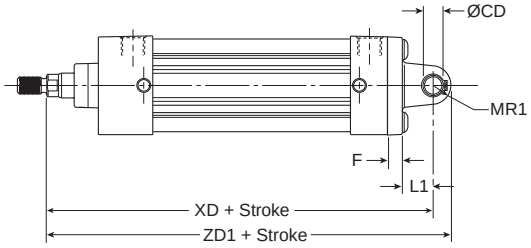


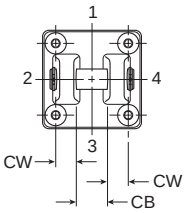


Cap Detachable Clevis

Style BC
(NFPA MP2)

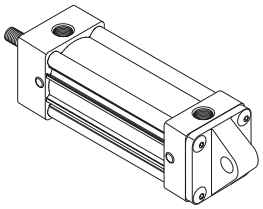


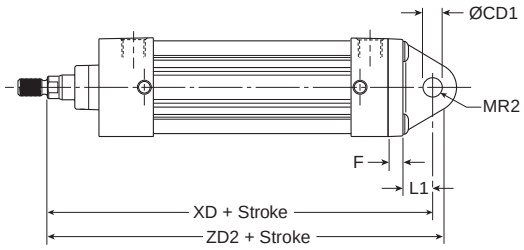


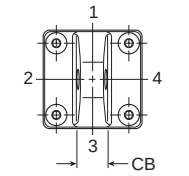


Cap Detachable Eye

Style BE
(NFPA MP4)







Styles BB, BC and BE

Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	+.002 +.004 CD1	CW	E	F	L	LR	L1	MR	MR1	MR2	Add stroke XC	XD	ZC	ZD1	ZD2
1-1/2	1	5/8	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	2	1	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2	1	5/8	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.375	5.750	6.000	6.250	6.375
	3	1	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	0.625	5.750	6.125	6.375	6.625	6.750
2-1/2	1	5/8	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.500	5.875	6.125	6.375	6.563
	3	1	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	0.688	5.875	6.250	6.500	6.750	6.313
3-1/4	1	1	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
4	1	1	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	6.875	7.500	7.813	8.250	8.375
	3	1-3/8	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
5	1	1	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.125	7.750	8.063	8.500	8.625
	3	1-3/8	1.250	0.751	0.750	0.625	5.500	0.625	0.625	1.000	1.250	0.938	0.750	0.875	7.375	8.000	8.313	8.750	8.875

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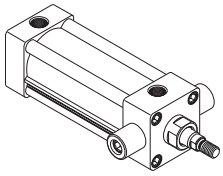
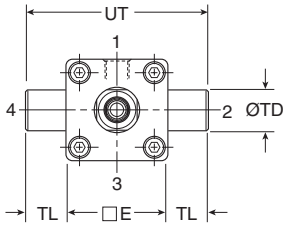
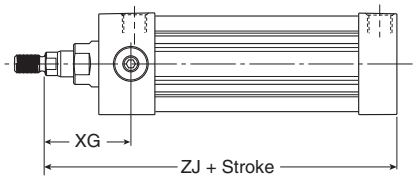
Head Trunnion*

Style D
(NFPA MT1)

Note: not available for 1-1/2" bore with 1" rod.

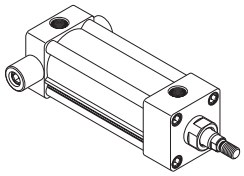


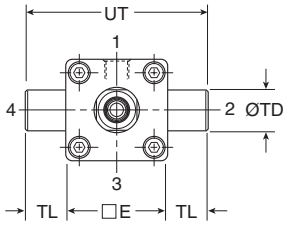


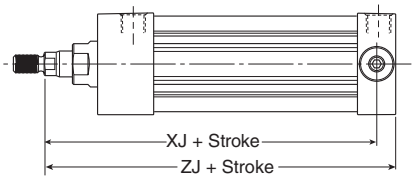


Cap Trunnion

Style DB
(NFPA MT2)



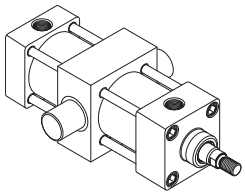


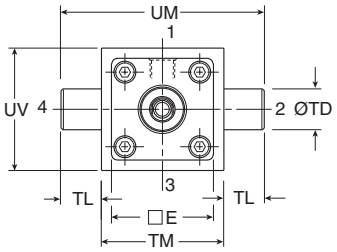


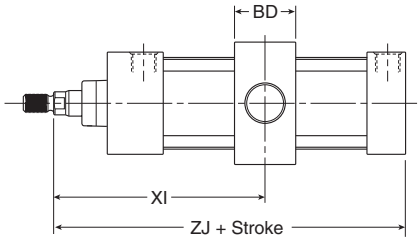
Intermediate Trunnion

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of internal hex.







Styles D, DB and DD

Bore size	Rod no.	Rod dia. MM	E	BD	+.000 –.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke XJ	Add stroke ZJ
1–1/2	1 *	5/8	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	1.750	3.036	4.125	4.625
	2	1	2.000	1.250	1.000	1.000	2.500	4.500	4.000	2.500	–	3.437	4.250	5.000
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	1.750	3.125	4.125	4.625
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	4.500	3.000	2.125	3.500	4.500	5.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	1.750	3.094	4.250	4.750
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	5.000	3.500	2.125	3.469	4.625	5.125
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.250	3.969	5.000	5.625
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	5.750	4.250	2.500	4.219	5.250	5.875
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.250	3.969	5.000	5.625
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	6.500	5.000	2.500	4.219	5.250	5.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.250	3.969	5.250	5.875
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	7.500	6.000	2.500	4.219	5.500	6.125

* Head trunnion style D not available for 1-1/2" bore with 1" rod

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- Industry leading NFPA interchangeable cylinder with flexible construction
- Bore sizes – 6" and 8"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- Tube and tie rod construction for heavy duty use
- Single rod end or double rod ends
- Cushions – optional and adjustable at either end or both ends (N/A for 4ML hydraulic version)
- 20 standard mounting styles available
- RoHS compliant

Operating information

	4MA	4ML
Operating pressure:	250 PSIG (17 bar) maximum air service	400 PSIG (27 bar) maximum hydraulic service
Temperature range:		
Standard seals	-10°F to 165°F (-23°C to 74°C)	
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)	
Low temperature seals	-50°F to 150°F (-46°C to 66°C)	
Filtration requirements:	40 micron, dry filtered air	Filtered hydraulic oil

For technical information see CD

Ordering information

6.00			J	4MA		U			1	4		A		12.000

Bore size

6.00
8.00

Double rod cylinder

Specify "K" only if double rod cylinder is required.

Series

4MA	Air service
4ML	Hydraulic service

Ports

U	NPTF
R	BSPP
B	BSPT
T	SAE

Piston rod number

Specify rod code number for required diameter. 8, 2

Stroke length

Specify stroke length required in inches. 8

Mounting style

Specify mounting style code (see table on following page).

Special modification

Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) 7

Cushion cap end

Blank	Non-cushioned cap end
C	Cushioned cap end (not available for 4ML)

Cushion head end

Blank	Non-cushioned head end
C	Cushioned head end (not available for 4ML)

Piston rod thread type

A	Standard (UNF unified thread)
W	BSF British fine
M *	Metric

* Please reference catalog 0900P-E, page B106.

Piston type

Blank	Standard (lipseals and magnetic ring)
3	Lipseals and magnetic ring

Seals

Blank	Standard (nitrile seals)
V	Fluorocarbon seals 1
E	Fluorocarbon rod wiper and rod seal only 2
4	Low temperature seals 1
M	Metallic rod wiper, nitrile seals 3

Rod material and gland code

Blank	Standard rod and gland
H	Standard rod and HI LOAD gland
Y	17-4 PH stainless steel rod and standard gland
Z	17-4 PH stainless steel rod and HI LOAD gland
J	303 stainless steel rod and standard gland 7
K	303 stainless steel rod and HI LOAD gland 7
S	316 stainless steel rod and standard gland 7
T	316 stainless steel rod and HI LOAD gland 7

Piston rod thread style

4	Small male
8	Intermediate male
9	Short female
55	For use with split coupler 6
3	Special (and specify all dimensions required)

1 Reed and solid-state sensors only available with standard seals or options E and M.
2 Used for external chemical compatibility applications, not high temperature.
3 If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.
4 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
  a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
  b. Sensor position
  c. Port position (if other than position 1)
  d. Length of stop tubing, gross stroke and net stroke (if required) Also, Piston Type 3 is required.
5 Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.
6 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.
7 Not available for 4ML.
8 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes.

Sensors

For sensors see page B296.

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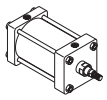
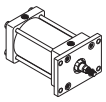
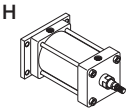
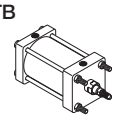
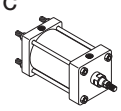
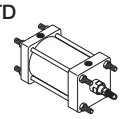
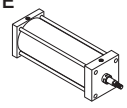
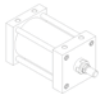
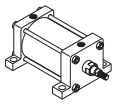
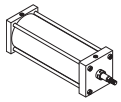
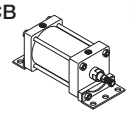
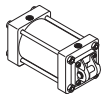
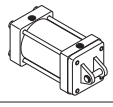
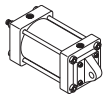
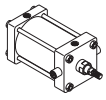
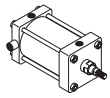
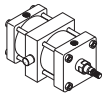
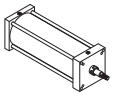
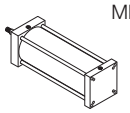
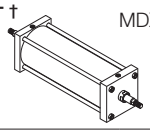
4MA/4ML Mounting Styles for 6" to 8" Bore

Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	6 - 8
J 	MF1	Head Rectangular Flange	6
H 	MF2	Cap Rectangular Flange	6
TB 	MX3	Tie Rods Extended Head End	6 - 8
TC 	MX2	Tie Rods Extended Cap End	6 - 8
TD 	MX1	Tie Rods Extended Both Ends	6 - 8
TE 	MX5	Sleeve Nut	6 - 8
TEF 	MX5/MS4	Sleeve Nut with Side Tap	6 - 8
C 	MS2	Side Lug	6 - 8
F 	MS4	Side Tap	6 - 8

Mounting style	NFPA mounting	Description	Bore size
CB 	MS1	Side End Angle	6 - 8
BB 	MP1	Cap Fixed Clevis	6 - 8
BC 	MP2	Cap Detachable Clevis	6 - 8
BE 	MP4	Cap Detachable Eye	6
D 	MT1	Head Trunnion	6 - 8
DB 	MT2	Cap Trunnion	6 - 8
DD 	MT4	Intermediate Trunnion	6 - 8
JB 	ME3	Head Square	8
HB 	ME4	Cap Square	8
KT † 	MDX0	Double Rod End, No Mount	6 - 8

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

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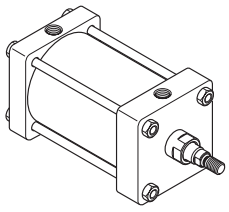
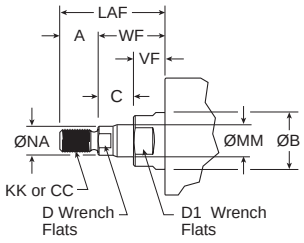
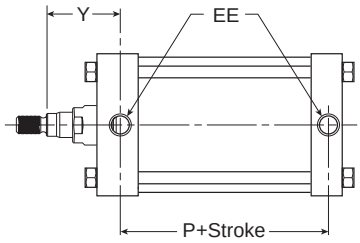
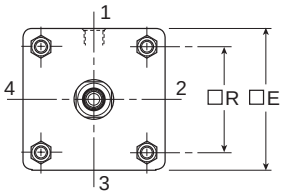
Single Rod Dimensioned Drawings – (Style T)

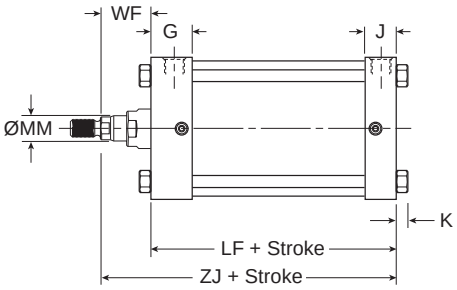






For dimensions of all standard rod end styles, please see next page.





Style T

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AA	+.000 -.002 B	C	D	D1	E	EE (NPTF)	G
6	1	1-3/8	1-1/4-12	1-14	1.625	6.900	1.999	0.635	1-1/8	1-7/8	6.500	3/4	1.910
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	6.900	2.374	0.760	1-1/2	2-3/16	6.500	3/4	1.910
8	1	1-3/8	1-1/4-12	1-14	1.625	9.100	1.999	0.635	1-1/8	1-7/8	8.500	3/4	1.810
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	9.100	2.374	0.760	1-1/2	2-3/16	8.500	3/4	1.810

Bore size	Rod no.	Rod dia. MM	J	K	LAF	NA	R	VF	WF	Y	Add stroke LF	P	ZJ
6	1	1-3/8	1.410	0.438	3.250	1.313	4.880	0.990	1.625	2.813	5.000	3.125	6.625
	3	1-3/4	1.410	0.438	3.875	1.688	4.880	1.115	1.875	3.063	5.000	3.125	6.875
8	1	1-3/8	1.440	0.563	3.250	1.313	6.440	0.990	1.625	2.750	5.125	3.250	6.750
	3	1-3/4	1.440	0.563	3.875	1.688	6.440	1.115	1.875	3.000	5.125	3.250	7.000

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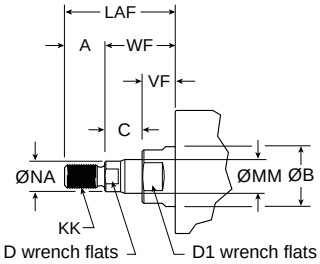
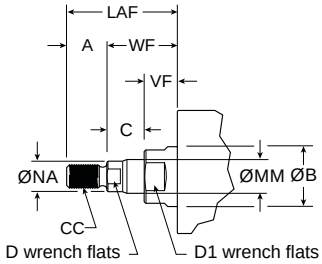
4MA Rod End Dimensions

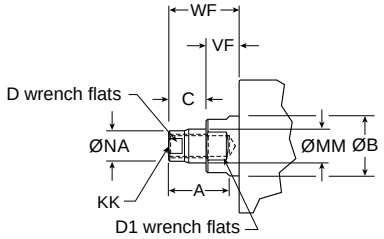
Thread Style 4
(NFPA Style SM)
Small Male



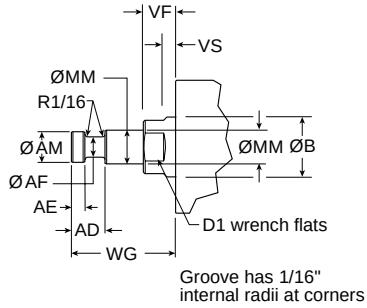
Thread Style 8
(NFPA Style IM)
Intermediate Male



Thread Style 9
(NFPA Style SF)
Short Female



Thread Style 55
For use with Split Coupler
(please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"
Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AD	AE	AF	AM	+.000 -.002 B	C	D	D1	LAF	NA	VF	WF	WG
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	0.635	1-1/8	1-7/8	3.250	1.313	0.990	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	0.760	1-1/2	2-3/16	3.875	1.688	1.115	1.875	3.125

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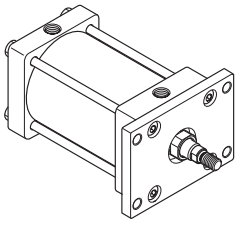
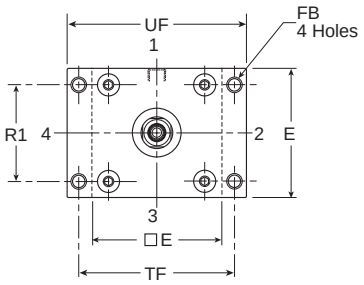
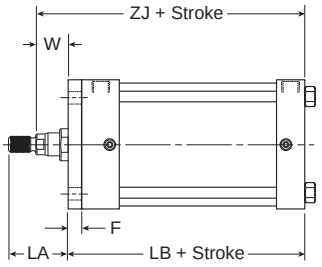
Head Rectangular Flange

Style J
(NFPA MF1)
(only 6" Bore)





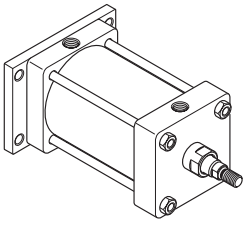


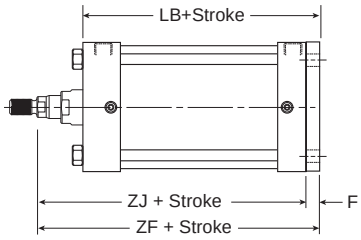
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

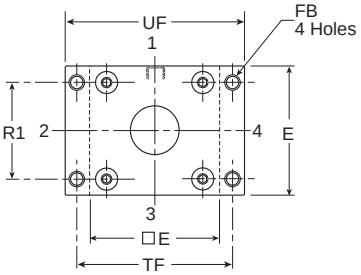
For reference, WF = W + F and LA = W + A.

Cap Rectangular Flange

Style H
(NFPA MF2)
(only 6" Bore)







Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke LB	Add stroke ZF	Add stroke ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	5.750	7.375	6.625
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	5.750	7.625	6.875

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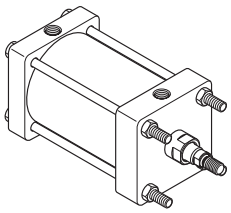
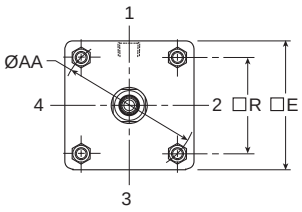
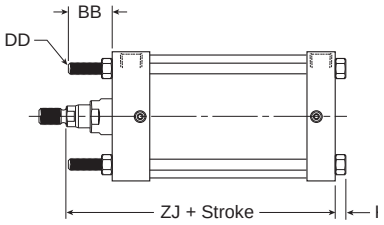
Tie Rods Ext. Head End

Style TB
(NFPA MX3)

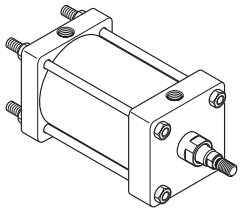


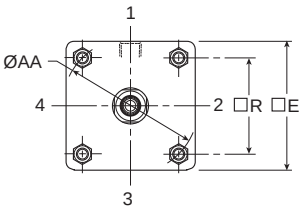


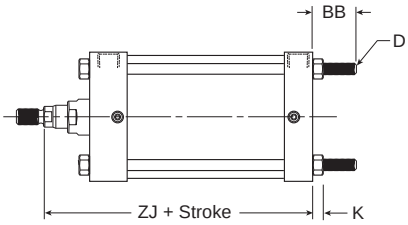


Tie Rods Ext. Cap End

Style TC
(NFPA MX2)

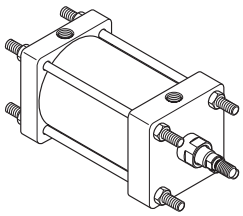


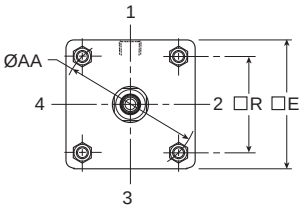


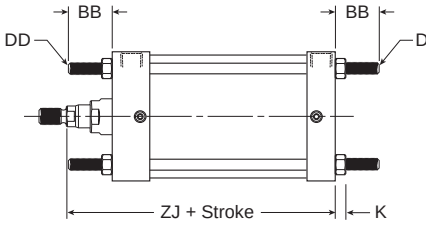


Tie Rods Ext. Both Ends

Style TD
(NFPA MX1)







Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R	Add stroke ZJ
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880	6.625
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880	6.875
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440	6.750
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440	7.000

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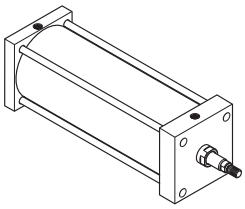
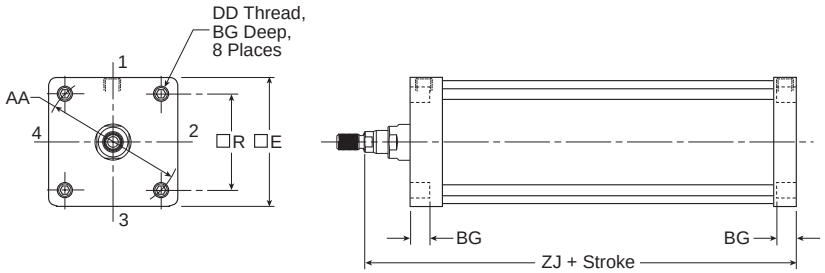
Sleeve Nut

Style TE
(NFPA MX5)



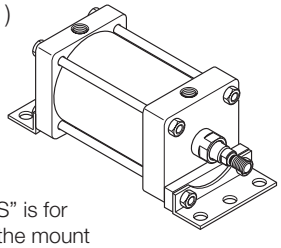


Style TE

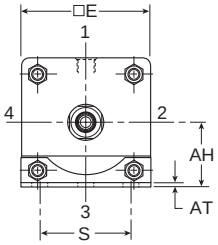
Bore size	Rod no.	Rod dia. MM	AA	BG	DD	E	R	Add stroke ZJ
6	1	1-3/8	6.900	0.500	1/2-20	6.500	4.880	6.625
	3	1-3/4	6.900	0.500	1/2-20	6.500	4.880	6.875
8	1	1-3/8	9.100	0.620	5/8-18	8.500	6.440	6.750
	3	1-3/4	9.100	0.620	5/8-18	8.500	6.440	7.000

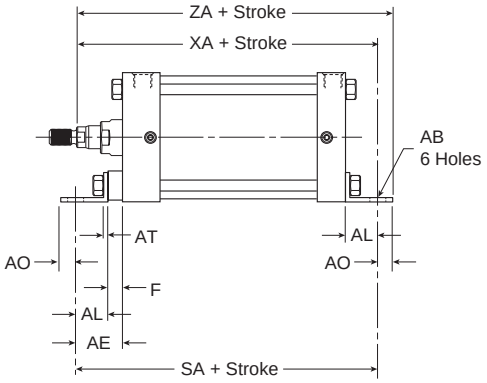
Side End Angle*

Style CB
(NFPA MS1)



Note:
Dimension "S" is for the holes in the mount (not the screw to screw dimension)





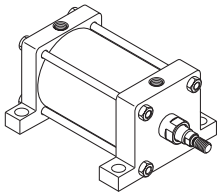
*Maximum recommended pressure for this mount is 150 PSIG

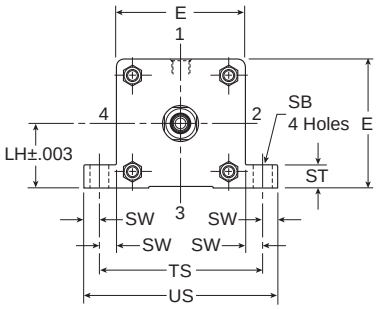
Style CB

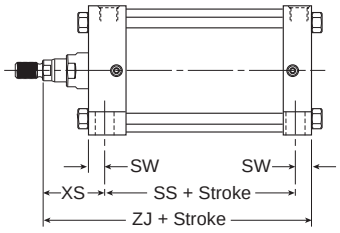
Bore size	Rod no.	Rod dia. MM	AB	AE	AH	AL	AO	AT	E	F	S	Add stroke SA	XA	ZA
6	1	1-3/8	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.000	8.625
	3	1-3/4	0.813	2.125	3.250	1.375	0.625	0.188	6.500	0.750	5.250	8.500	8.250	8.875
8	1	1-3/8	0.813	1.813	4.250	1.813	0.688	0.250	8.500	–	7.125	8.750	8.563	9.250
	3	1-3/4	0.813	1.813	4.250	1.813	0.688	0.250	8.500	–	7.125	8.750	8.813	9.500

Side Lug

Style C
(NFPA MS2)





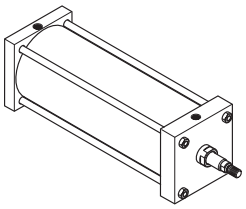


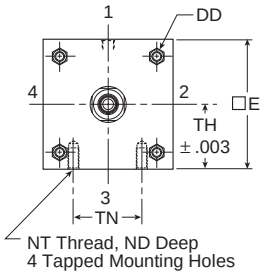
Style C

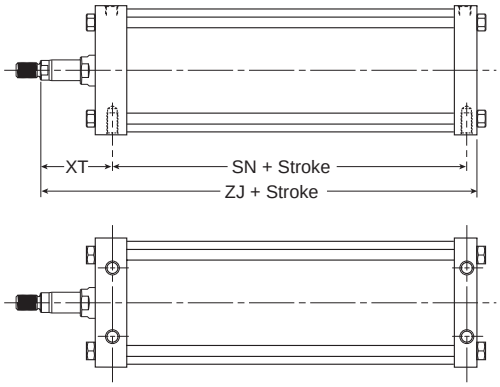
Bore size	Rod no.	Rod dia. MM	E	+/-.003 LH	SB	ST	SW	TS	US	XS	Add stroke SS	Add stroke ZJ
6	1	1-3/8	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.313	3.625	6.625
	3	1-3/4	6.500	3.243	0.813	1.000	0.688	7.875	9.250	2.563	3.625	6.875
8	1	1-3/8	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.313	3.750	6.750
	3	1-3/4	8.500	4.243	0.813	1.000	0.688	9.875	11.250	2.563	3.750	7.000

Side Tap

Style F
(NFPA MS4)







Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/-.003 TH	TN	XT	Add stroke SN	Add stroke ZJ
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	2.813	3.125	6.625
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	3.063	3.125	6.875
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	2.813	3.250	6.750
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	3.063	3.250	7.000

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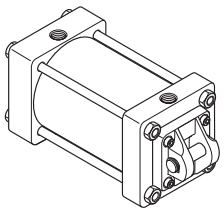
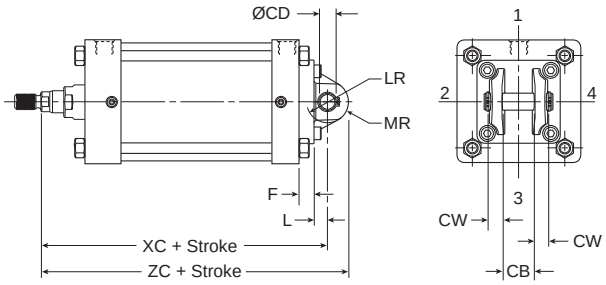
Cap Fixed Clevis

Style BB
(NFPA MP1)

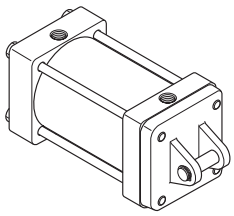
Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.

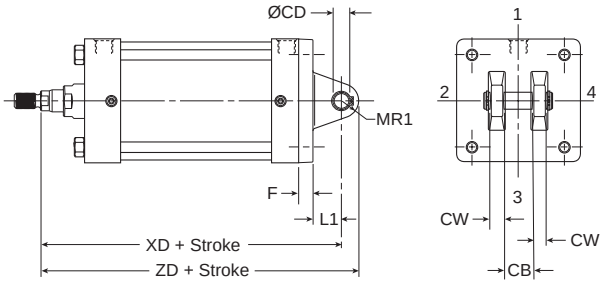




Cap Detachable Clevis

Style BC
(NFPA MP2)



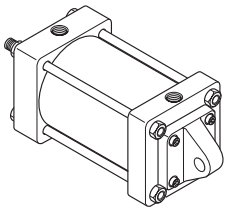


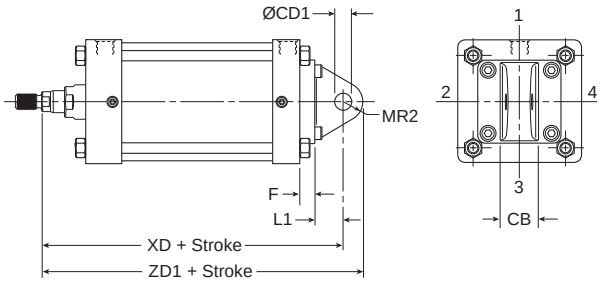
Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	CW	E	F	L	LR	L1	MR	MR1	Add stroke XC	XD	ZC	ZD
6	1	1- 3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.125	8.875	9.250	9.875
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.250	1.500	1.125	1.000	8.375	9.125	9.500	10.125
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.250	9.000	9.375	10.000
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.250	1.500	1.125	1.000	8.500	9.250	9.625	10.250

Cap Detachable Eye

Style BE
(NFPA MP4)
(only 6" Bore)





Style BE

Bore size	Rod no.	Rod dia. MM	CB	+.002 +.004 CD1	E	F	L1	MR2	Add stroke XD	ZD1
6	1	1-3/8	1.500	1.000	6.500	0.750	1.500	1.125	8.875	10.000
	3	1-3/4	1.500	1.000	6.500	0.750	1.500	1.125	9.125	10.250

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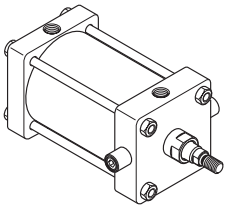
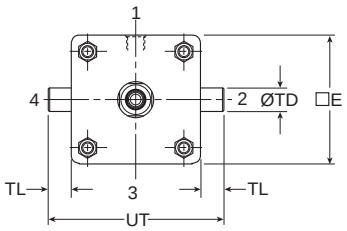
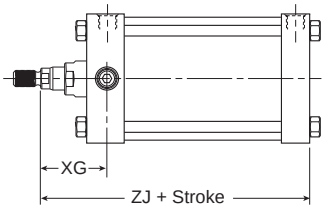
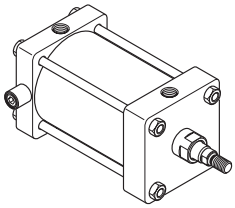
Head Trunnion
Style D
(NFPA MT1)

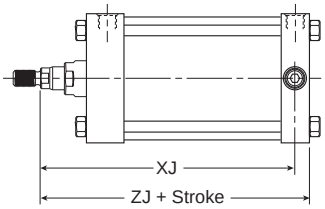


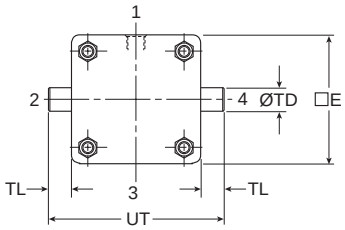




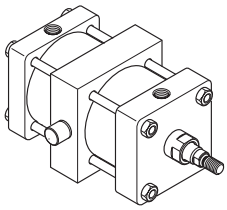
Cap Trunnion
Style DB
(NFPA MT2)

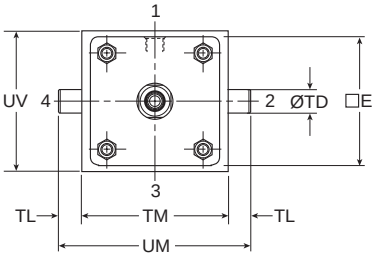


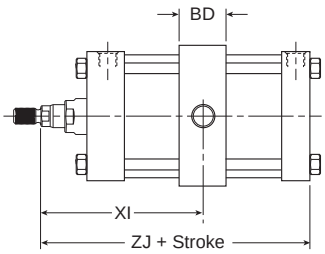




Intermediate Trunnion
Style DD
(NFPA MT4)







Styles D, DB and DD

Bore size	Rod no.	Rod dia. MM	E	BD	+.000 -.001 TD	TL	TM	UM	UT	UV	XG	Min. XI	Add stroke XJ	Add stroke ZJ
	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.625	4.813	5.875	6.625
6	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	9.250	7.000	2.875	5.063	6.125	6.875
	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.625	4.750	6.000	6.750
8	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	11.250	9.500	2.875	5.000	6.250	7.000

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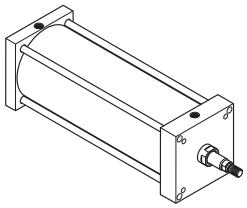
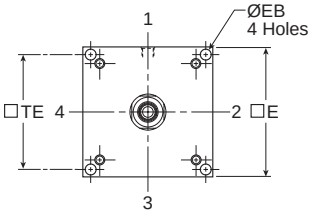
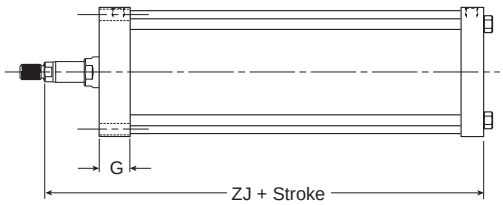
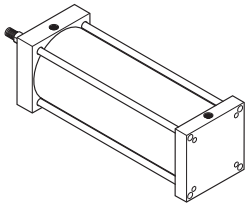
Head Square
Style JB
(NFPA ME3)

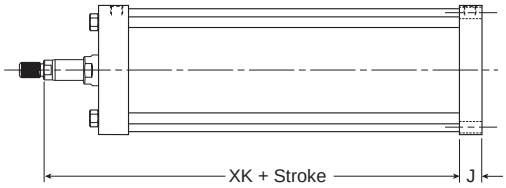


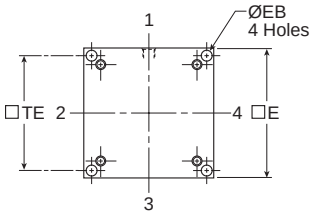




Cap Square
Style HB
(NFPA ME4)







Styles JB and HB

Bore size	Rod no.	Rod dia. MM	E	EB	G	J	TE	Add stroke XK	Add stroke ZJ
8	1	1-3/8	8.500	0.688	1.810	1.440	7.570	5.313	6.750
	3	1-3/4	8.500	0.688	1.810	1.440	7.570	5.563	7.000

- Industry leading NFPA interchangeable rod lock cylinder with flexible construction
- Rod lock holding force equivalent to cylinder output force at 100 PSIG
- Bore sizes – 1-1/2", 2', 2-1/2", 3-1/4", 4", 5", 6" and 8"
- 17 standard styles mounting styles available
- Available in any practical stroke length
- Rod diameters – 5/8", 1", 1-3/8" and 1-3/4"
- Single rod end or double rod ends
- Adjustable cushions are standard at both ends
- Manual override feature standard on all configurations

Operating information

Operating pressure:	100 PSIG (7 bar) maximum air pressure, except 2" bore with 1" rod rated at 80 PSIG)
	60 PSIG (4.1 bar) minimum air pressure to release rod lock
Temperature range:	
Standard seals	-10°F to 165°F (-23°C to 74°C)
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

2.00	C		J		4MAJ		U			1	4		A	C	6.000

Bore size

1.50 [1]
2.00
2.50
3.25
4.00
5.00
6.00 [2, 11]
8.00 [2, 11]

Cushion head end

C	Cushioned head end "C" is required

Double Rod Cylinder [12]

Specify "K" only if double rod cylinder is required.

Mounting style

Specify mounting style code (see table on following page).

Cylinder construction

Blank*	Standard (extruded body, standard round lobe orientation)
A*	Extruded body, round lobe orientation rotated 90 degrees from standard
N*	Extruded body, round lobe orientation rotated 180 degrees from standard
Z*	Extruded body, round lobe orientation rotated 270 degrees from standard
T	Aluminum round tube and carbon steel tie rods & nuts

* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore.

Piston type [11]

Blank	Standard (lipseals and magnetic ring) [12]
1	Lipseals, no magnetic ring [12]
2	Lipseals, no magnetic ring (aluminum piston)
3	Lipseals and magnetic ring (aluminum piston)
4	Bumper seals, no magnetic ring
6	Bumper seals and magnetic ring
B	Lipseals, 1/4" thick bumpers both ends [3]
H	Lipseals, 1/4" thick bumper head end [3]
C	Lipseals, 1/4" thick bumper cap end [3]
D	Lipseals and magnetic ring, 1/4" thick bumpers both ends [3]
F	Lipseals and magnetic ring, 1/4" thick bumper head end [3]
R	Lipseals and magnetic ring, 1/4" thick bumper cap end [3]

Series

4MAJ	4MA rod lock cylinder
3MAJ	3MA rod lock cylinder

Ports [4]

U	NPTF
R	BSPP
B	BSPT
T	SAE

Seals

Blank	Standard (nitrile seals)
V	Fluorocarbon seals [2, 5]
E	Fluorocarbon rod wiper and rod seal only [6]

Piston rod thread style

4	Small male
8	Intermediate male
9	Short female
55	For use with split coupler [9]
3	Special (and specify all dimensions required)

Special modification

Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MAJ with Linear Position Sensor Option) [7]

Piston rod number

Specify rod code number for required diameter. [8,]

Stroke length

Specify stroke length required in inches. [8]

Cushion cap end

C	Cushioned cap end "C" is required

Piston rod thread type

A	Standard (UNF unified thread)
W	BSF British fine
M *	Metric

* Please reference catalog 0900P-E, page B104.

Rod material and gland code

Blank	Standard rod and gland
H	Standard rod and HI LOAD gland
Y	17-4 PH stainless steel rod and standard gland
Z	17-4 PH stainless steel rod and HI LOAD gland

1 Not available with 1" rod diameter (rod number 2) for 1-1/2" bore. Not available with Linear Position Sensor Option (LPSO).

2 Not available for 3MAJ, please specify 4MAJ.

3 Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".

4 Port thread styles only for base cylinder. Rod lock port is always NPTF. If a different rod lock port thread style is required, place an "S" for special in the Special Modification field and indicate the desired rod lock port thread style in the item notes. NPTF cylinder ports are must be ordered for 3MAJ.

5 Fluorocarbon seals for 4MAJ are only for external chemical compatibility applications, not high temperature.

6 Used for external chemical compatibility applications, not high temperature.

7 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:
a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)
b. Sensor position
c. Port position (if other than position 1)
d. Length of stop tubing, gross stroke and net stroke (if required)
LPSO not available for 3MAJ, please specify 4MAJ. Cylinder dimensions will approximate dimensions for 4MAJ. Piston Type option (blank), 3, 6, D, F or R is required. Please consult the Actuator Division for additional information.

8 Review Piston Rod Selection Chart, please reference catalog 0900P-E, on page A14 to determine proper piston rod diameter.

9 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.

10 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1 for 1-1/2" - 5" bore cylinders. Stop tube not available for 3MAJ, please specify 4MAJ.

11 6"-8" bore 4MAJ can accept only Piston Types (blank) and 3. The (blank) piston for 6"-8" bores is aluminum, lipseals, no magnetic ring. Composite pistons not available with oversize rod number 3.

12 Double rod cylinders not available with composite piston type.

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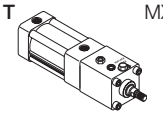
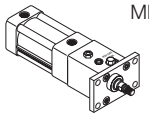
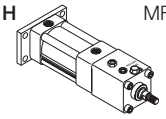
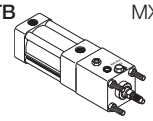
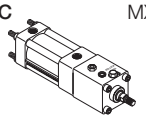
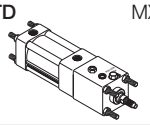
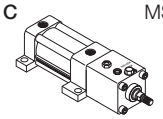
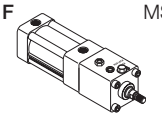
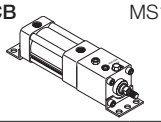
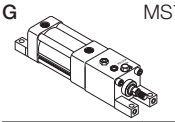
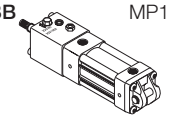
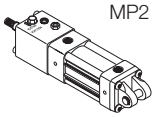
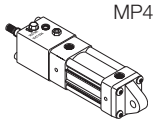
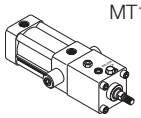
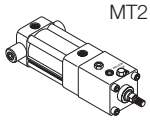
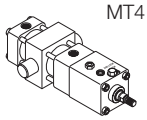
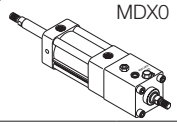
3MAJ*/4MAJ Mounting Styles for 6" to 8" Bore

Mounting style	NFPA mounting	Description	Bore size
T 	MX0	No Mount	1-1/2 - 8
J 	MF1	Head Rectangular Flange	1-1/2 - 6
H 	MF2	Cap Rectangular Flange	1-1/2 - 6
TB 	MX3	Tie Rods Extended Head End	1-1/2 - 8
TC 	MX2	Tie Rods Extended Cap End	1-1/2 - 8
TD 	MX1	Tie Rods Extended Both Ends	1-1/2 - 8
C 	MS2	Side Lug	1-1/2 - 8
F 	MS4	Side Tap	1-1/2 - 8
CB 	MS1	Side End Angle	1-1/2 - 8
G 	MS7	Side End Lug	1-1/2 - 4

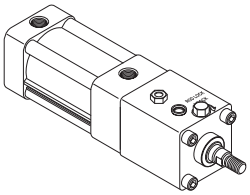
Mounting style	NFPA mounting	Description	Bore size
BB 	MP1	Cap Fixed Clevis	1-1/2 - 8
BC 	MP2	Cap Detachable Clevis	1-1/2 - 8
BE 	MP4	Cap Detachable Eye	1-1/2 - 6
D 	MT1	Head Trunnion	1-1/2 - 8
DB 	MT2	Cap Trunnion	1-1/2 - 8
DD 	MT4	Intermediate Trunnion	1-1/2 - 8
KT 	MDX0	Double Rod End, No Mount	1-1/2 - 8

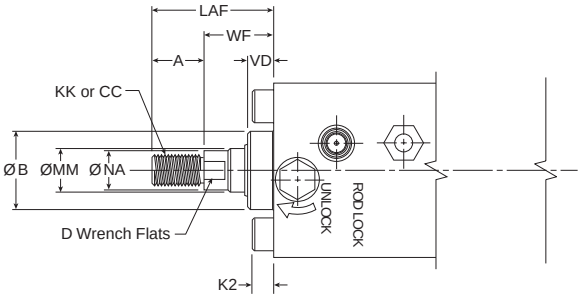
* 3MAJ utilizes base 3MA cylinder and is available in 1-1/2" to 5" bore sizes. Mounting style codes C, D and DB not available for 3MAJ

Sensors
For sensors see page B296.

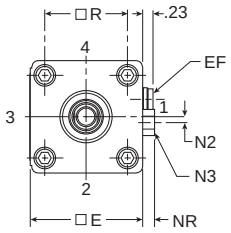
3MAJ/4MAJ Series Single Rod Dimensions

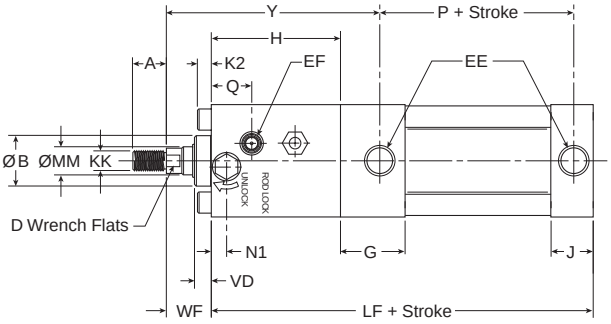
No Mount Basic
Style T
(NFPA MX0)





For dimensions of all standard rod end styles, see next page.





Style T

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AA	+.000 -.002 B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
1-1/2	1	5/8	1/2-20	7/16-20	0.750	2.020	1.124	1/2	2.000	3/8	1/8	1.438	2.625	0.938
2	1	5/8	1/2-20	7/16-20	0.750	2.600	1.124	1/2	2.500	3/8	1/8	1.375	2.875	0.937
	3	1	7/8-14	3/4-16	1.125	2.600	1.499	7/8	2.500	3/8	1/8	1.375	3.875	0.937
2-1/2	1	5/8	1/2-20	7/16-20	0.750	3.100	1.124	1/2	3.000	3/8	1/8	1.344	2.875	0.938
	3	1	7/8-14	3/4-16	1.125	3.100	1.499	7/8	3.000	3/8	1/8	1.344	4.000	0.938
3-1/4	1	1	7/8-14	3/4-16	1.125	3.900	1.499	7/8	3.750	1/2	1/4	1.594	4.500	1.125
	3	1-3/8	1-1/4-12	1-14	1.625	3.900	1.999	1-1/8	3.750	1/2	1/4	1.594	4.875	1.125
4	1	1	7/8-14	3/4-16	1.125	4.700	1.499	7/8	4.500	1/2	1/4	1.594	4.875	1.125
	3	1-3/8	1-1/4-12	1-14	1.625	4.700	1.999	1-1/8	4.500	1/2	1/4	1.594	5.125	1.125
5	1	1	7/8-14	3/4-16	1.125	5.800	1.499	7/8	5.500	1/2	1/4	1.594	5.375	1.219
	3	1-3/8	1-1/4-12	1-14	1.625	5.800	1.999	1-1/8	5.500	1/2	1/4	1.594	5.750	1.219

Bore size	Rod no.	Rod dia. MM	K2	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke LF	Add stroke P
1-1/2	1	5/8	0.250	1.750	0.220	0.140	5/16	0.563	0.190	0.715	1.430	0.375	1.000	4.500	6.250	2.313
2	1	5/8	0.313	1.750	0.340	0.130	1/2	0.563	0.265	0.895	1.840	0.375	1.000	4.750	6.500	2.313
	3	1	0.313	2.500	0.338	0.146	1/2	0.938	0.275	1.065	1.840	0.500	1.375	6.125	7.500	2.313
2-1/2	1	5/8	0.313	1.750	0.346	0.150	1/2	0.563	0.265	0.755	2.190	0.500	1.000	4.813	6.625	2.375
	3	1	0.313	2.500	0.346	0.148	1/2	0.938	0.265	1.120	2.190	0.500	1.375	6.313	7.750	2.375
3-1/4	1	1	0.375	2.500	0.631	0.180	5/8	0.938	0.340	1.510	2.760	0.500	1.375	6.938	8.750	2.625
	3	1-3/8	0.375	3.250	0.813	0.247	5/8	1.313	0.350	1.645	2.760	0.625	1.625	7.563	9.125	2.625
4	1	1	0.375	2.500	0.625	0.240	7/8	0.938	0.500	1.725	3.320	0.500	1.375	7.313	9.125	2.625
	3	1-3/8	0.375	3.250	0.771	0.276	7/8	1.313	0.490	1.679	3.320	0.750	1.625	7.813	9.375	2.625
5	1	1	0.500	2.500	0.720	0.220	7/8	0.938	0.500	1.995	4.100	0.500	1.375	7.813	9.875	2.875
	3	1-3/8	0.500	3.250	0.720	0.220	7/8	1.313	0.490	2.330	4.100	0.750	1.625	8.438	10.250	2.875

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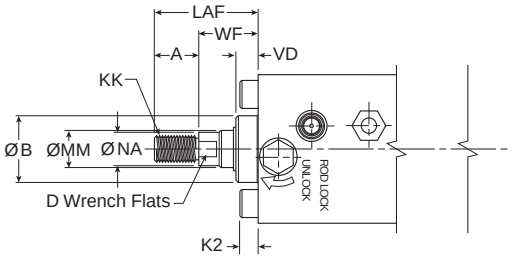
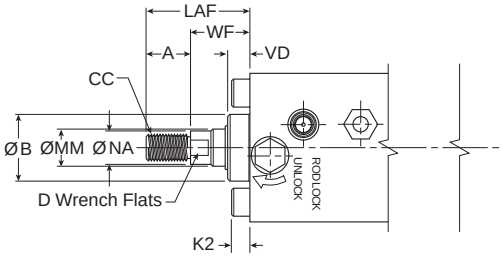
Rod End Dimensions

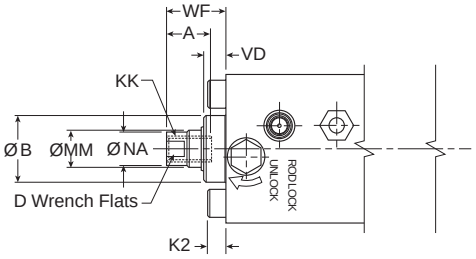
Thread Style 4
(NFPA Style SM)
Small Male



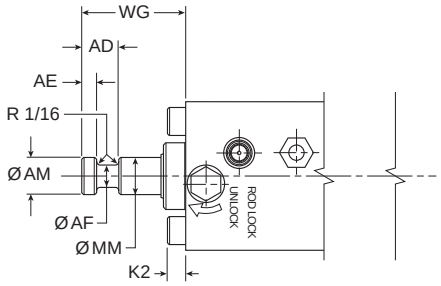
Thread Style 8
(NFPA Style IM)
Intermediate Male



Thread Style 9
(NFPA Style SF)
Short Female



Thread Style 55
For use with Split Coupler
(please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"
Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AD	AE	AF	AM	+.000 -.002 B	D	K2	LAF	NA	VD	WF	WG
1-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.250	1.750	0.563	0.375	1.000	1.750
2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.313	1.750	0.563	0.375	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
2-1/2	1	5/8	1/2-20	7/16-20	0.750	0.625	0.250	0.375	0.570	1.124	1/2	0.313	1.750	0.563	0.500	1.000	1.750
	3	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.313	2.500	0.938	0.500	1.375	2.375
3-1/4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.625	1.625	2.750
4	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.375	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.375	3.250	1.313	0.750	1.625	2.750
5	1	1	7/8-14	3/4-16	1.125	0.938	0.375	0.688	0.950	1.499	7/8	0.500	2.500	0.938	0.500	1.375	2.375
	3	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.500	3.250	1.313	0.750	1.625	2.750

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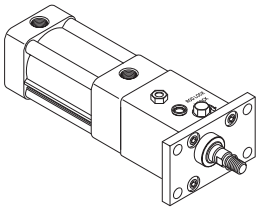
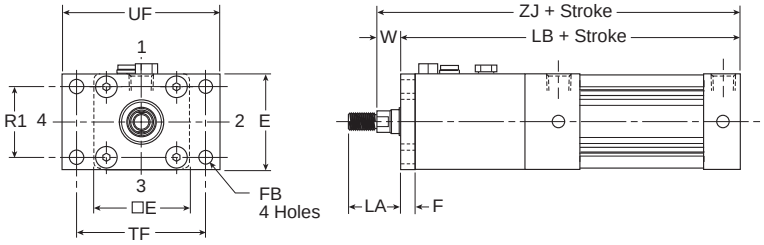
Head Rectangular Flange

Style J
(NFPA MF1)



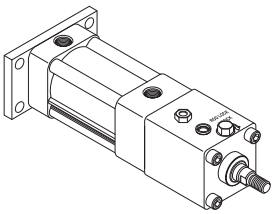


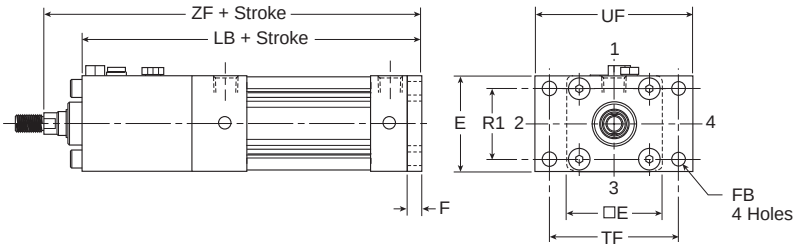
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

For reference, WF = W + F and LA = W + A.

Cap Rectangular Flange

Style H
(NFPA MF2)





Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R1	TF	UF	W	Add stroke LB	ZF	ZJ
1-1/2	1	5/8	0.750	2.000	0.375	0.313	1.375	1.430	2.750	3.375	0.625	6.625	7.625	7.250
2	1	5/8	0.750	2.500	0.375	0.375	1.375	1.840	3.375	4.125	0.625	6.875	7.875	7.500
	3	1	1.125	2.500	0.375	0.375	2.125	1.840	3.375	4.125	1.000	7.875	9.250	8.875
2-1/2	1	5/8	0.750	3.000	0.375	0.375	1.375	2.190	3.875	4.625	0.625	7.000	8.000	7.625
	3	1	1.125	3.000	0.375	0.375	2.125	2.190	3.875	4.625	1.000	8.125	9.500	9.125
3-1/4	1	1	1.125	3.750	0.625	0.438	1.875	2.760	4.688	5.500	0.750	9.375	10.750	10.125
	3	1-3/8	1.625	3.750	0.625	0.438	2.625	2.760	4.688	5.500	1.000	9.750	11.375	10.750
4	1	1	1.125	4.500	0.625	0.438	1.875	3.320	5.438	6.250	0.750	9.750	11.125	10.500
	3	1-3/8	1.625	4.500	0.625	0.438	2.625	3.320	5.438	6.250	1.000	10.000	11.625	11.000
5	1	1	1.125	5.500	0.625	0.563	1.875	4.100	6.625	7.625	0.750	10.500	11.875	11.250
	3	1-3/8	1.625	5.500	0.625	0.563	2.625	4.100	6.625	7.625	1.000	10.875	12.500	11.875

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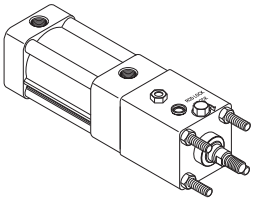
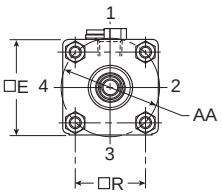
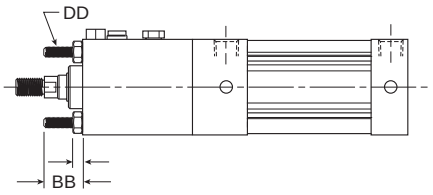
Tie Rods Extended Head End Mount

Style TB
(NFPA MX3)

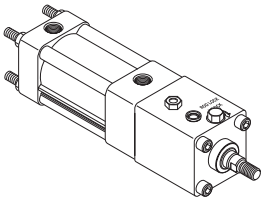


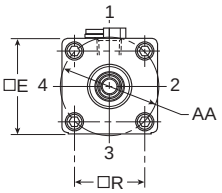


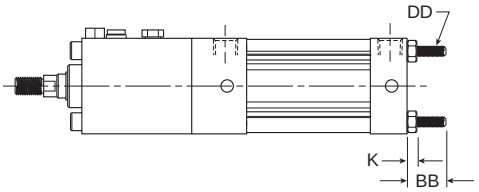


Tie Rods Extended Cap End Mount

Style TC
(NFPA MX2)

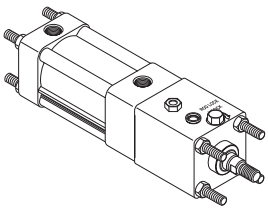


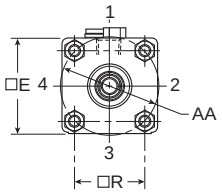


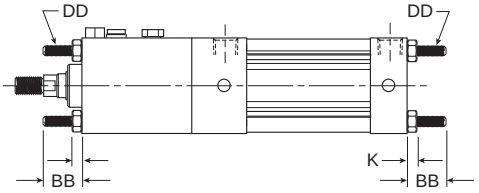


Tie Rods Extended Both Ends Mount

Style TD
(NFPA MX1)







Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
1-1/2	1	5/8	2.020	1.000	1/4-28	2.000	0.250	1.430
2	1	5/8	2.600	1.125	5/16-24	2.500	0.313	1.840
	3	1	2.600	1.125	5/16-24	2.500	0.313	1.840
2-1/2	1	5/8	3.100	1.125	5/16-24	3.000	0.313	2.190
	3	1	3.100	1.125	5/16-24	3.000	0.313	2.190
3-1/4	1	1	3.900	1.375	3/8-24	3.750	0.375	2.760
	3	1-3/8	3.900	1.375	3/8-24	3.750	0.375	2.760
4	1	1	4.700	1.375	3/8-24	4.500	0.375	3.320
	3	1-3/8	4.700	1.375	3/8-24	4.500	0.375	3.320
5	1	1	5.800	1.813	1/2-20	5.500	0.438	4.100
	3	1-3/8	5.800	1.813	1/2-20	5.500	0.438	4.100

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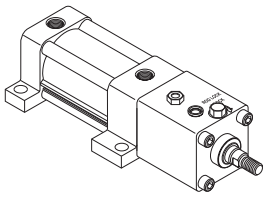
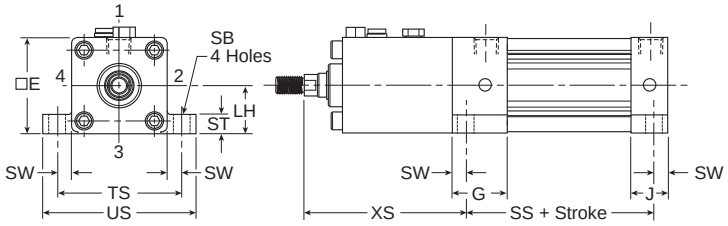
Side Lug Mount

Style C (only 4MAJ)
(NFPA MS2)



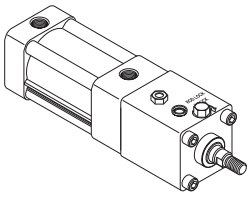


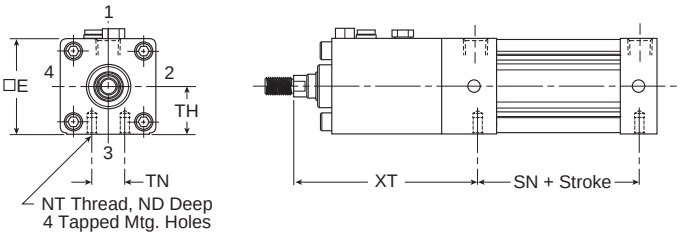
Style C

Bore size	Rod no.	Rod dia. MM	E	G	J	+/-.003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
1-1/2	1	5/8	2.000	1.438	0.938	0.993	0.438	0.500	0.375	2.750	3.500	4.000	2.875
2	1	5/8	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	4.250	2.875
	3	1	2.500	1.375	0.937	1.243	0.438	0.500	0.375	3.250	4.000	5.625	2.875
2-1/2	1	5/8	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	4.250	3.000
	3	1	3.000	1.344	0.938	1.493	0.438	0.500	0.375	3.750	4.500	5.750	3.000
3-1/4	1	1	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	6.375	3.250
	3	1-3/8	3.750	1.594	1.125	1.868	0.563	0.750	0.500	4.750	5.750	7.000	3.250
4	1	1	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	6.750	3.250
	3	1-3/8	4.500	1.594	1.125	2.243	0.563	0.750	0.500	5.500	6.500	7.250	3.250
5	1	1	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	7.438	3.125
	3	1-3/8	5.500	1.594	1.219	2.743	0.813	1.000	0.688	6.875	8.250	8.063	3.125

Side Tap Mount

Style F
(NFPA MS4)





Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/-.003 TH	TN	XT	Add stroke SN
1-1/2	1	5/8	2.000	0.375	1/4-20	0.993	0.625	4.563	2.250
2	1	5/8	2.500	0.438	5/16-18	1.243	0.875	4.813	2.250
	3	1	2.500	0.375	5/16-18	1.243	0.875	6.188	2.250
2-1/2	1	5/8	3.000	0.625	3/8-16	1.493	1.250	4.813	2.375
	3	1	3.000	0.625	3/8-16	1.493	1.250	6.313	2.375
3-1/4	1	1	3.750	0.750	1/2-13	1.868	1.500	6.938	2.625
	3	1-3/8	3.750	0.750	1/2-13	1.868	1.500	7.563	2.625
4	1	1	4.500	0.750	1/2-13	2.243	2.063	7.313	2.625
	3	1-3/8	4.500	0.750	1/2-13	2.243	2.063	7.813	2.625
5	1	1	5.500	0.938	5/8-11	2.743	2.688	7.813	2.875
	3	1-3/8	5.500	0.938	5/8-11	2.743	2.688	8.438	2.875

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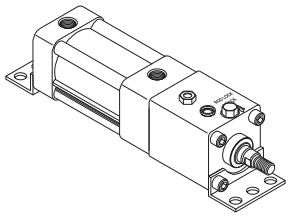
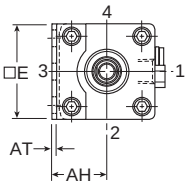
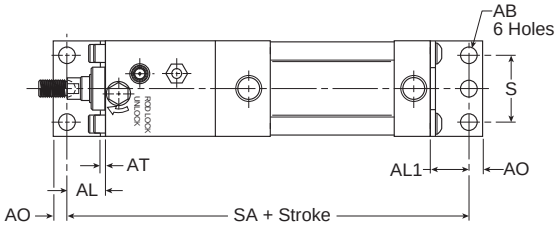
Side End Angle Mount

Style CB
(NFPA MS1)





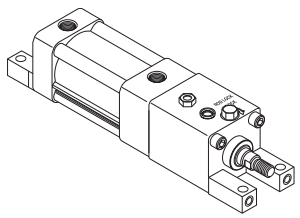


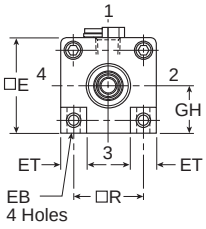
Style CB

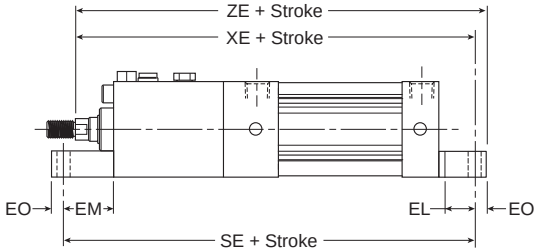
Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AL1	AO	AT	E	S	Add stroke SA
1-1/2	1	5/8	0.438	1.188	1.000	1.000	0.375	0.125	2.000	1.250	8.250
2	1	5/8	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	8.500
	3	1	0.438	1.438	1.000	1.000	0.375	0.125	2.500	1.750	9.500
2-1/2	1	5/8	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	8.625
	3	1	0.438	1.625	1.000	1.000	0.375	0.125	3.000	2.250	9.750
3-1/4	1	1	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.250
	3	1-3/8	0.563	1.938	1.250	1.250	0.500	0.125	3.750	2.750	11.625
4	1	1	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.250
	3	1-3/8	0.563	2.250	1.875	1.250	0.500	0.125	4.500	3.500	12.500
5	1	1	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	12.625
	3	1-3/8	0.688	2.750	1.375	1.375	0.625	0.188	5.500	4.250	13.000

Side End Lug Mount

Style G
(NFPA MS7)







Style G

Bore size	Rod no.	Rod dia. MM	E	EB	EL	EM	EO	ET	+/-.003 GH	R	Add stroke SE	XE	ZE
1-1/2	1	5/8	2.000	0.281	0.750	1.125	0.250	0.563	0.993	1.430	8.125	8.000	8.250
2	1	5/8	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	8.750	8.438	8.750
	3	1	2.500	0.344	0.938	1.313	0.313	0.688	1.243	1.840	9.750	9.813	10.125
2-1/2	1	5/8	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	9.125	8.688	9.000
	3	1	3.000	0.344	1.063	1.438	0.313	0.813	1.493	2.190	10.250	10.188	10.500
3-1/4	1	1	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	11.125	11.000	11.375
	3	1-3/8	3.750	0.406	0.875	1.500	0.375	1.000	1.868	2.760	11.500	11.625	12.000
4	1	1	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	11.750	11.500	11.875
	3	1-3/8	4.500	0.406	1.000	1.625	0.375	1.188	2.243	3.320	12.000	12.000	12.375

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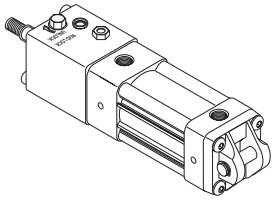
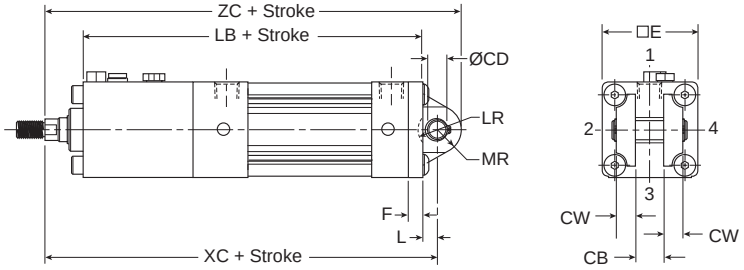
Cap Fixed Clevis Mount

Style BB
(NFPA MP1)

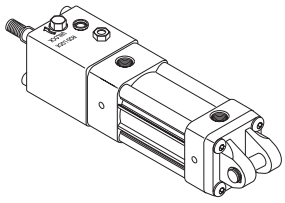
NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.

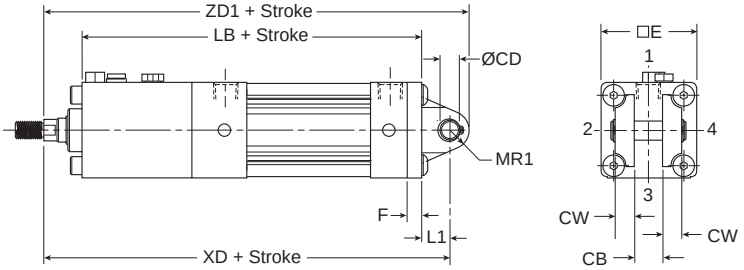




Cap Detachable Clevis Mount

Style BC
(NFPA MP2)





Styles BB and BC

Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	CW	E	F	L	L1	LR	MR	MR1	Add stroke LB	XC	XD	ZC	ZD1
1-1/2	1	5/8	0.750	0.501	0.500	2.000	0.375	0.375	0.750	0.750	0.625	0.500	6.625	8.000	8.375	8.625	8.875
2	1	5/8	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	6.875	8.250	8.625	8.875	9.125
	3	1	0.750	0.501	0.500	2.500	0.375	0.375	0.750	0.750	0.625	0.500	7.875	9.625	10.000	10.250	10.500
2-1/2	1	5/8	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	7.000	8.375	8.750	9.000	9.250
	3	1	0.750	0.501	0.500	3.000	0.375	0.375	0.750	0.750	0.625	0.500	8.125	9.875	10.250	10.500	10.750
3-1/4	1	1	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.375	11.375	12.000	12.313	12.750
	3	1-3/8	1.250	0.751	0.625	3.750	0.625	0.625	1.250	1.000	0.938	0.750	9.750	12.000	12.625	12.938	13.375
4	1	1	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	9.750	11.750	12.375	12.688	13.125
	3	1-3/8	1.250	0.751	0.625	4.500	0.625	0.625	1.250	1.000	0.938	0.750	10.000	12.250	12.875	13.188	13.625
5	1	1	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.500	12.500	13.125	13.438	13.875
	3	1-3/8	1.250	0.751	0.625	5.500	0.625	0.625	1.250	1.000	0.938	0.750	10.875	13.125	13.750	14.063	14.500

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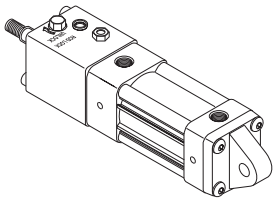
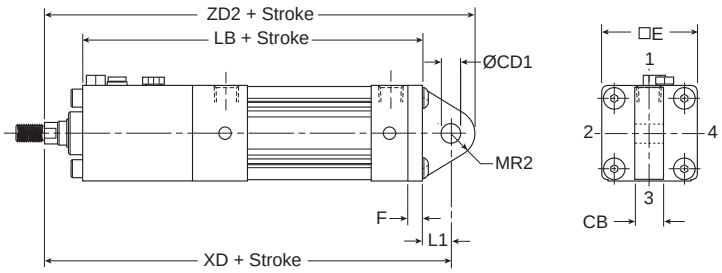
Cap Detachable Eye Mount*

Style BE
(NFPA MP4)

*Not available for 5" bore 3MAJ, please specify 4MAJ.





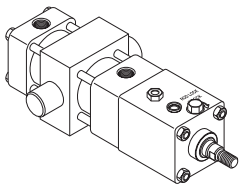
Style BE

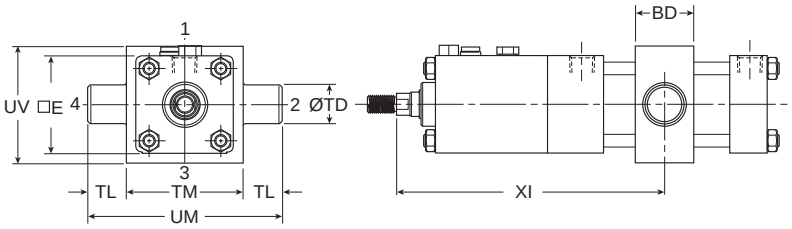
Bore size	Rod no.	Rod dia. MM	CB	+.002 +.004 CD1	E	F	L1	MR2	Add Stroke LB	XD	ZD2
1-1/2	1	5/8	0.750	0.500	2.000	0.375	0.750	0.625	6.625	8.375	9.000
2	1	5/8	0.750	0.500	2.500	0.375	0.750	0.625	6.875	8.625	9.250
	3	1	0.750	0.500	2.500	0.375	0.750	0.625	7.875	10.000	10.625
2-1/2	1	5/8	0.750	0.500	3.000	0.375	0.750	0.688	7.000	8.750	9.438
	3	1	0.750	0.500	3.000	0.375	0.750	0.688	8.125	10.250	10.938
3-1/4	1	1	1.250	0.750	3.750	0.625	1.250	0.875	9.375	12.000	12.875
	3	1-3/8	1.250	0.750	3.750	0.625	1.250	0.875	9.750	12.625	13.500
4	1	1	1.250	0.750	4.500	0.625	1.250	0.875	9.750	12.375	13.250
	3	1-3/8	1.250	0.750	4.500	0.625	1.250	0.875	10.000	12.875	13.750
5 *	1	1	1.250	0.750	5.500	0.625	1.250	0.875	10.500	13.125	14.000
	3	1-3/8	1.250	0.750	5.500	0.625	1.250	0.875	10.875	13.750	14.625

Intermediate Trunnion Mount

Style DD
(NFPA MT4)

Note: Tie rod nuts for Style DD have a slot instead of external hex.





Note: Style DD requires minimum stroke per table.

Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+.000 -.001 TD	TL	TM	UM	UV	Min. XI	Min. stroke
1-1/2	1	5/8	2.000	1.250	1.000	1.000	2.500	4.500	2.500	5.69	3.250
2	1	5/8	2.500	1.500	1.000	1.000	3.000	5.000	3.000	6.00	4.000
	3	1	2.500	1.500	1.000	1.000	3.000	5.000	3.000	7.38	4.000
2-1/2	1	5/8	3.000	1.500	1.000	1.000	3.500	5.500	3.500	5.97	3.875
	3	1	3.000	1.500	1.000	1.000	3.500	5.500	3.500	7.47	3.875
3-1/4	1	1	3.750	2.000	1.000	1.000	4.500	6.500	4.250	13.72	4.375
	3	1-3/8	3.750	2.000	1.000	1.000	4.500	6.500	4.250	14.34	4.375
4	1	1	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.09	4.875
	3	1-3/8	4.500	2.000	1.000	1.000	5.250	7.250	5.000	14.59	4.875
5	1	1	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.34	5.125
	3	1-3/8	5.500	2.000	1.000	1.000	6.250	8.250	6.000	16.97	5.125

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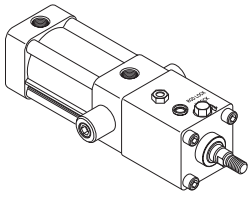
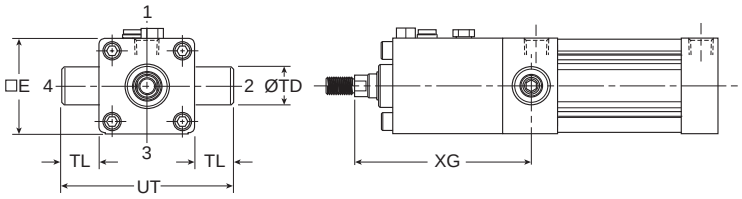
Head Trunnion Mount

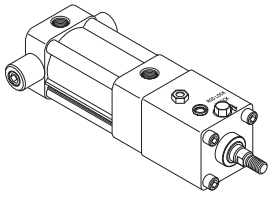
Style D (only 4MAJ)
(NFPA MT1)

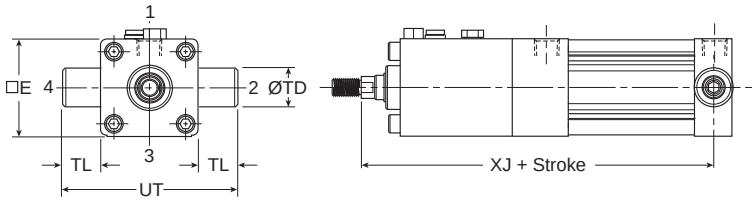




Cap Trunnion Mount

Style DB (only 4MAJ)
(NFPA MT2)





Styles D and DB

Bore size	Rod no.	Rod dia. MM	E	+.000 -.001 TD	TL	UT	XG	XJ
1-1/2	1	5/8	2.000	1.000	1.000	4.000	4.375	6.750
2	1	5/8	2.500	1.000	1.000	4.500	4.625	7.000
	3	1	2.500	1.000	1.000	4.500	6.000	8.375
2-1/2	1	5/8	3.000	1.000	1.000	5.000	4.625	7.125
	3	1	3.000	1.000	1.000	5.000	6.125	8.625
3-1/4	1	1	3.750	1.000	1.000	5.750	6.750	9.500
	3	1-3/8	3.750	1.000	1.000	5.750	7.375	10.125
4	1	1	4.500	1.000	1.000	6.500	7.125	9.875
	3	1-3/8	4.500	1.000	1.000	6.500	7.625	10.375
5	1	1	5.500	1.000	1.000	7.500	7.625	10.625
	3	1-3/8	5.500	1.000	1.000	7.500	8.250	11.250

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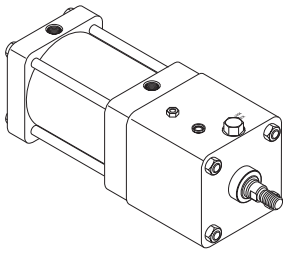
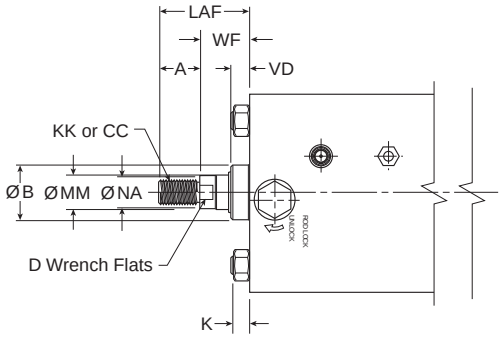
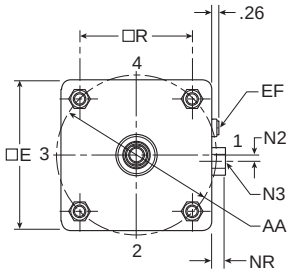
No Mount

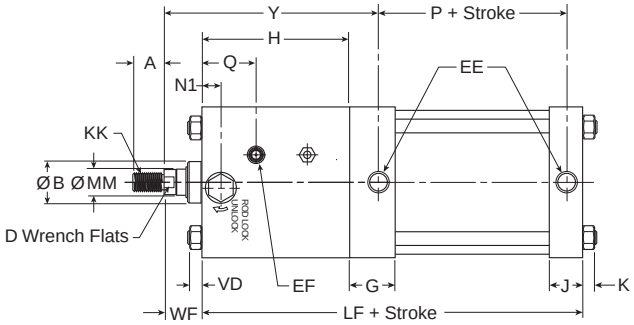
Style T
(NFPA MX0)





For dimensions of all standard rod end styles, see next page.





Style T

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AA	+.000 -.002 B	D	E	EE (NPTF)	EF (NPTF)	G	H	J
6	1	1-3/8	1-1/4 - 12	1-14	1.625	6.900	1.999	1-1/8	6.500	3/4	1/4	1.910	6.375	1.410
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	6.900	2.374	1-1/2	6.500	3/4	1/4	1.910	6.875	1.410
8	1	1-3/8	1-1/4 - 12	1-14	1.625	9.100	1.999	1-1/8	8.500	3/4	1/4	1.810	6.625	1.440
	3	1-3/4	1-1/2 - 12	1-1/4 - 12	2.000	9.100	2.374	1-1/2	8.500	3/4	1/4	1.810	7.125	1.440

Bore size	Rod no.	Rod dia. MM	K	LAF	N1	N2	Hex N3	NA	NR	Q	R	VD	WF	Y	Add stroke LF	Add stroke P
6	1	1-3/8	0.438	3.250	1.165	0.177	1-5/16	1.313	0.750	2.705	4.880	0.755	1.625	9.188	11.375	3.125
	3	1-3/4	0.438	3.875	1.495	0.177	1-5/16	1.688	0.740	3.055	4.880	0.875	1.875	9.938	11.875	3.125
8	1	1-3/8	0.563	3.250	1.305	0.177	1-5/16	1.313	0.740	2.885	6.440	0.755	1.625	9.375	11.750	3.250
	3	1-3/4	0.563	3.875	1.570	0.177	1-5/16	1.688	0.740	3.145	6.440	0.875	1.875	10.125	12.250	3.250

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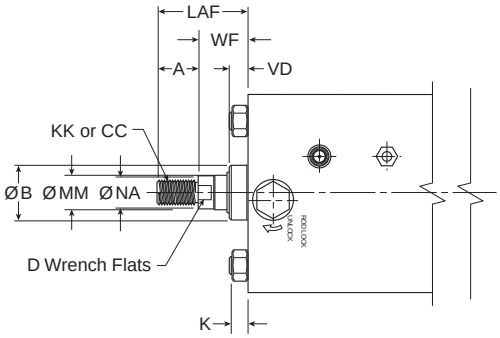
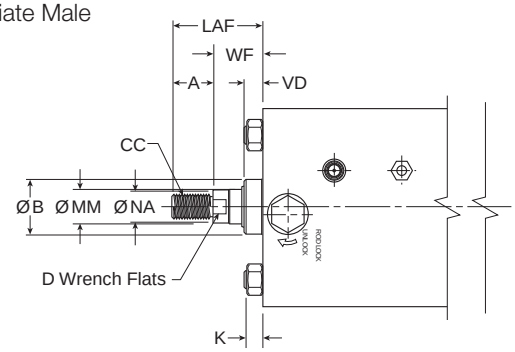
Rod End Dimensions – 6" to 8" Bore Sizes

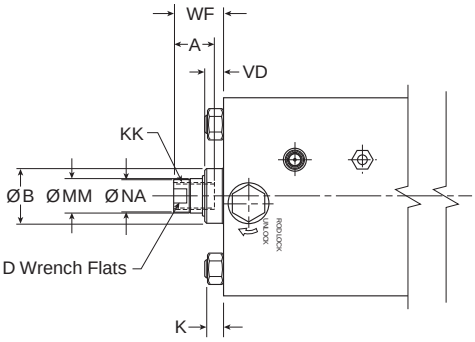
Thread Style 4
(NFPA Style SM)
Small Male



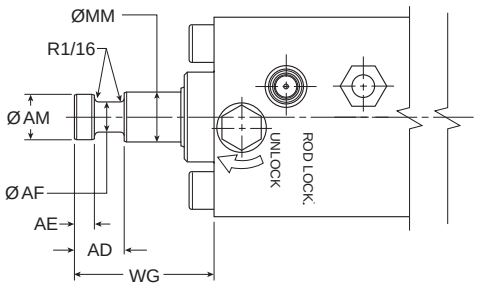
Thread Style 8
(NFPA Style IM)
Intermediate Male



Thread Style 9
(NFPA Style SF)
Short Female



Thread Style 55
For use with Split Coupler
(please reference catalog 0900P-E, page B105 for more information)



Thread Style 3 - "Special Thread"
Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.
If otherwise special, please supply dimensioned sketch.

Rod End Dimensions

Bore size	Rod no.	Rod dia. MM	Thread Style 8 CC	Thread Style 4 & 9 KK	A	AD	AE	AF	AM	+.000 -.002 B	D	K	LAF	NA	VD	WF	WG
6	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.438	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.438	3.875	1.688	0.875	1.875	3.125
8	1	1-3/8	1-1/4-12	1-14	1.625	1.063	0.375	0.875	1.320	1.999	1-1/8	0.563	3.250	1.313	0.755	1.625	2.750
	3	1-3/4	1-1/2-12	1-1/4-12	2.000	1.313	0.500	1.125	1.700	2.374	1-1/2	0.563	3.875	1.688	0.875	1.875	3.125

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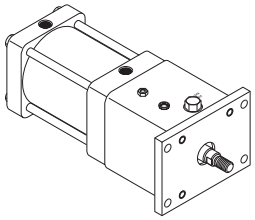
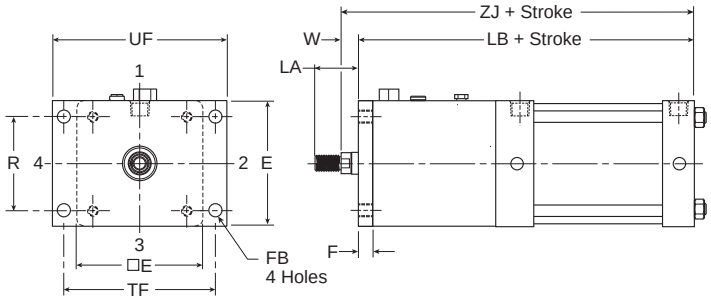
Head Rectangular Flange Mount

Style J
(NFPA MF1)
(only 6" Bore)



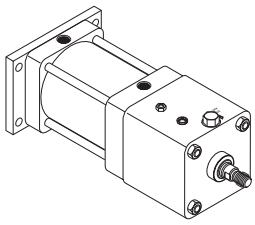


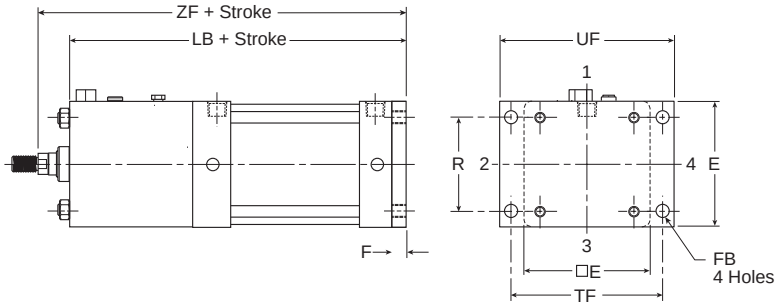
Note: Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

For reference, WF = W + F and LA = W + A.

Cap Rectangular Flange Mount

Style H
(NFPA MF2)
(only 6" Bore)





Styles J and H

Bore size	Rod no.	Rod dia. MM	A	E	F	FB	LA	R	TF	UF	W	Add stroke LB	Add stroke ZF	Add stroke ZJ
6	1	1-3/8	1.625	6.500	0.750	0.563	2.500	4.880	7.625	8.625	0.875	12.125	13.750	13.000
	3	1-3/4	2.000	6.500	0.750	0.563	3.125	4.880	7.625	8.625	1.125	12.625	14.500	13.750

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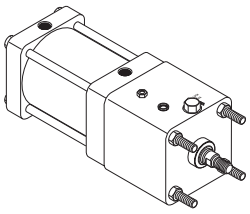
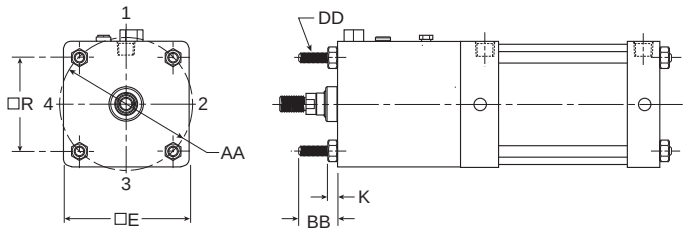
Tie Rods Extended Head End Mount

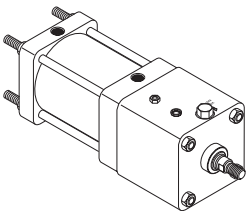
Style TB
(NFPA MX3)

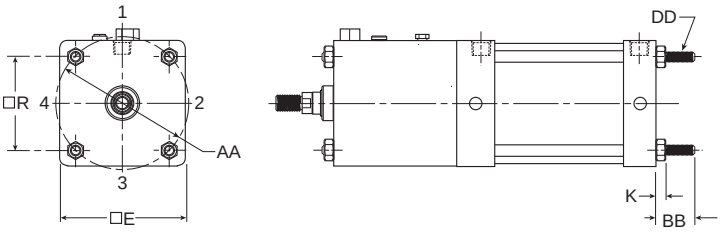




Tie Rods Extended Cap End Mount

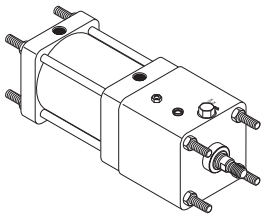
Style TC
(NFPA MX2)

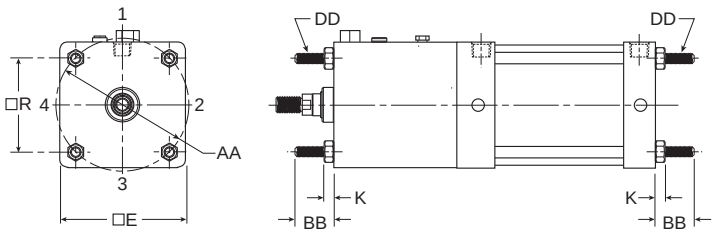




Tie Rods Extended Both Ends Mount

Style TD
(NFPA MX1)





Styles TB, TC and TD

Bore size	Rod no.	Rod dia. MM	AA	BB	DD	E	K	R
6	1	1-3/8	6.900	1.813	1/2-20	6.500	0.438	4.880
	3	1-3/4	6.900	1.813	1/2-20	6.500	0.438	4.880
8	1	1-3/8	9.100	2.313	5/8-18	8.500	0.563	6.440
	3	1-3/4	9.100	2.313	5/8-18	8.500	0.563	6.440

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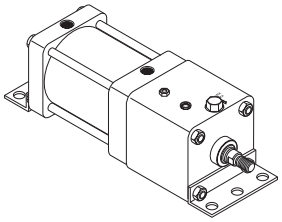
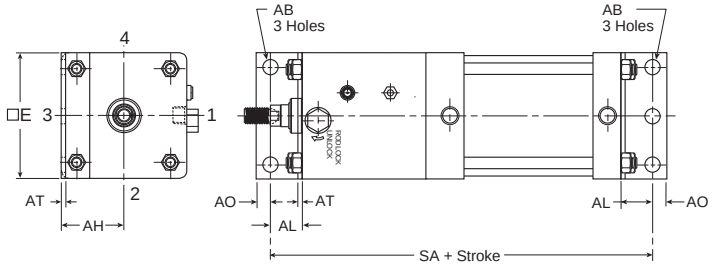
Side End Angle Mount

Style CB
(NFPA MS1)



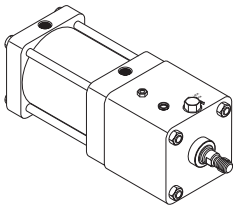


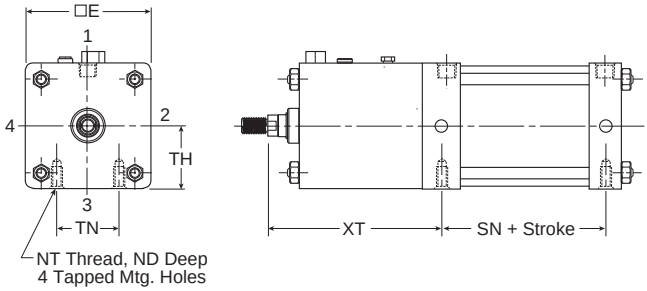
Style CB

Bore size	Rod no.	Rod dia. MM	AB	AH	AL	AO	AT	E	S	Add stroke SA
6	1	1-3/8	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.125
	3	1-3/4	0.813	3.250	1.375	0.625	0.188	6.500	5.250	14.625
8	1	1-3/8	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.375
	3	1-3/4	0.813	4.250	1.813	0.688	0.250	8.500	7.125	15.875

Side Tap Mount

Style F
(NFPA MS4)



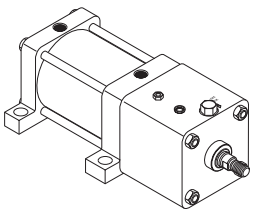


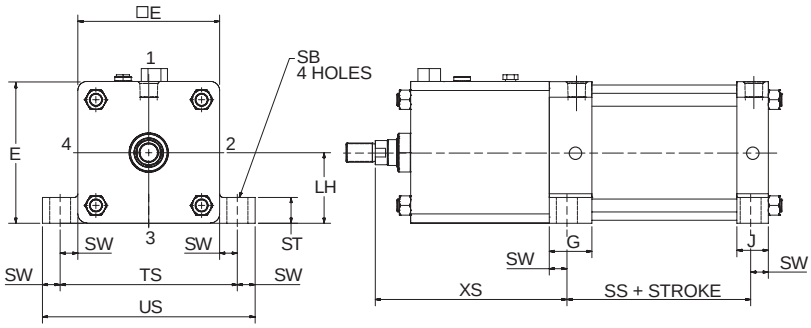
Style F

Bore size	Rod no.	Rod dia. MM	E	ND	NT	+/-.003 TH	TN	XT	Add stroke SN
6	1	1-3/8	6.500	1.125	3/4-10	3.243	3.250	9.188	3.125
	3	1-3/4	6.500	1.125	3/4-10	3.243	3.250	9.938	3.125
8	1	1-3/8	8.500	1.125	3/4-10	4.243	4.500	9.438	3.250
	3	1-3/4	8.500	1.125	3/4-10	4.243	4.500	10.188	3.250

Side Lug Mount

Style C
(NFPA MS2)





Style C

Bore size	Rod no.	Rod dia. MM	E	G	J	+/-.003 LH	SB	ST	SW	TS	US	XS	Add stroke SS
6	1	1-3/8	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	8.688	3.625
	3	1-3/4	6.500	1.910	1.410	3.243	0.813	1.000	0.688	7.875	9.250	9.438	3.625
8	1	1-3/8	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	8.938	3.750
	3	1-3/4	8.500	1.810	1.440	4.243	0.813	1.000	0.688	9.875	11.250	9.688	3.750

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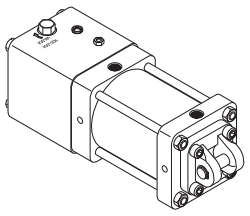
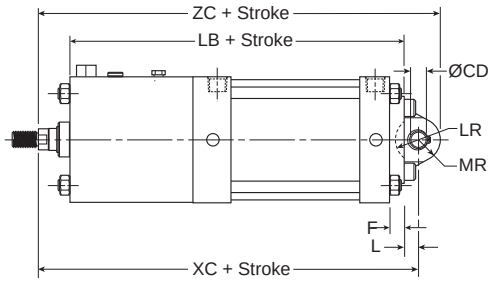
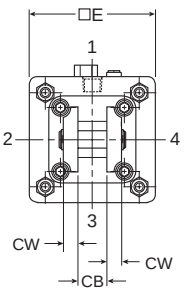
Cap Fixed Clevis

Style BB
(NFPA MP1)

NOTE: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.

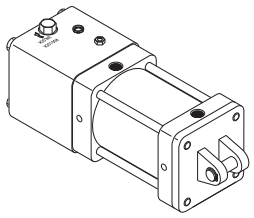


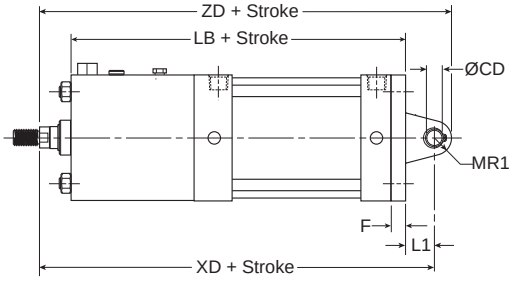


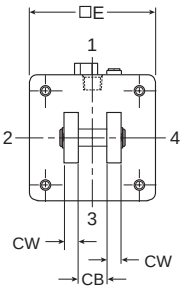


Cap Detachable Clevis

Style BC
(NFPA MP2)





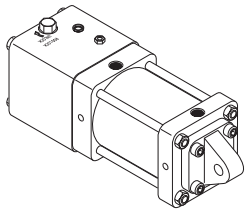


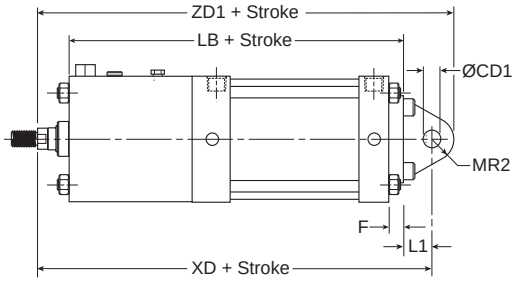
Styles BB and BC

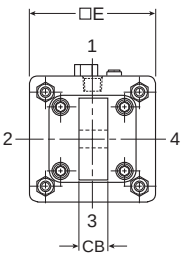
Bore size	Rod no.	Rod dia. MM	CB	+.000 -.002 CD	CW	E	F	L	L1	LR	MR	MR1	Add stroke LB	XC	XD	ZC	ZD
6	1	1-3/8	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.125	14.500	15.250	15.625	16.250
	3	1-3/4	1.500	1.001	0.750	6.500	0.750	0.750	1.500	1.250	1.125	1.000	12.625	15.250	16.000	16.375	17.000
8	1	1-3/8	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	12.500	14.875	15.625	16.000	16.625
	3	1-3/4	1.500	1.001	0.750	8.500	0.750	0.750	1.500	1.250	1.125	1.000	13.000	15.625	16.375	16.750	17.375

Cap Detachable Eye Mount

Style BE
(NFPA MP4)
(only 6" Bore)







Style BE

Bore size	Rod no.	Rod dia. MM	CB	+.002 +.004 CD1	E	F	L1	MR2	Add stroke LB	XD	ZD1
6	1	1-3/8	1.500	1.000	6.500	0.750	1.500	1.125	12.125	15.250	16.375
	3	1-3/4	1.500	1.000	6.500	0.750	1.500	1.125	12.625	16.000	17.125

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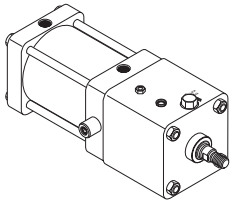
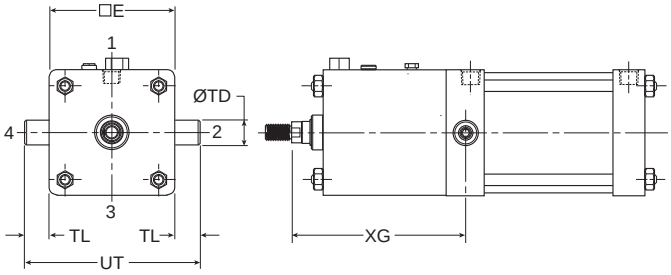
Head Trunnion Mount

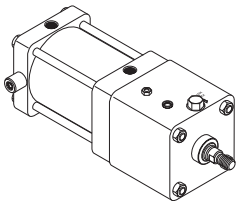
Style D
(NFPA MT1)

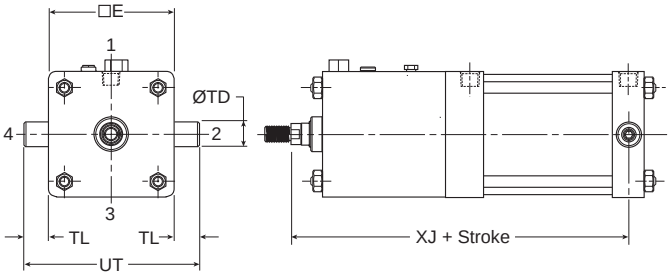




Cap Trunnion Mount

Style DB
(NFPA MT2)



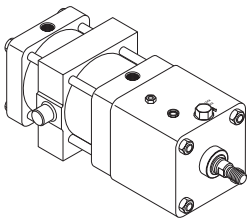


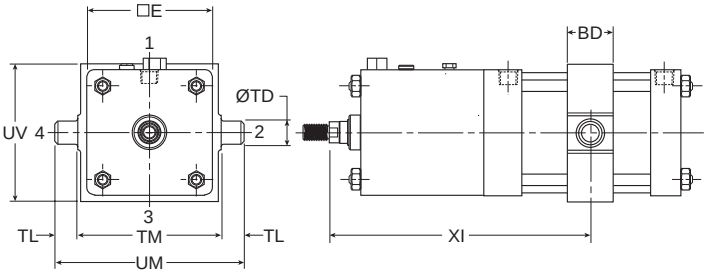
Styles D and DB

Bore size	Rod no.	Rod dia. MM	E	+.000 -.001 TD	TL	UT	XG	XJ
6	1	1-3/8	6.500	1.375	1.375	9.250	9.000	12.250
	3	1-3/4	6.500	1.375	1.375	9.250	9.750	13.000
8	1	1-3/8	8.500	1.375	1.375	11.250	9.250	12.625
	3	1-3/4	8.500	1.375	1.375	11.250	10.000	13.375

Intermediate Trunnion Mount

Style DD
(NFPA MT4)





Note: Style DD requires minimum stroke per table.

Style DD

Bore size	Rod no.	Rod dia. MM	E	BD	+.000 -.001 TD	TL	TM	UM	UV	Min. XI	Min. stroke
6	1	1-3/8	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.16	6.125
	3	1-3/4	6.500	2.500	1.375	1.375	7.625	10.375	7.000	20.19	6.125
8	1	1-3/8	8.500	2.500	1.375	1.375	9.750	12.500	9.500	26.31	6.500
	3	1-3/4	8.500	2.500	1.375	1.375	9.750	12.500	9.500	27.06	6.500

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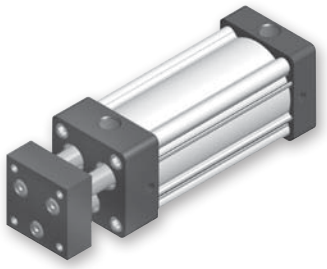
- Non-rotating cylinder, multiple piston rods
- Strokes available in any practical stroke length
- Steel tooling plate standard, specials available
- Single rod end or double rod ends
- Optional adjustable cushions available
- Mounting styles – 14 standard styles
- RoHS compliant



Operating information

Operating pressure:	250 PSIG (17 bar)
Temperature range:	
Standard seals	-10°F to 165°F (-23°C to 74°C)
Fluorocarbon seals	-10°F to 250°F (-23°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

2.00			J		4MNR	2	U			T	9		A		6.000

Bore size

1.12 [1]
1.50 [1]
2.00
2.50
3.25
4.00

Double rod cylinder

Specify "K" only if double rod cylinder is required.

Mounting style

Specify mounting style code (see table on following page).

Cushion head end

Blank	Non-cushioned head end
C	Cushioned head end

Cylinder construction

Blank*	Standard (extruded body, standard round lobe orientation)
A*	Extruded body, round lobe orientation rotated 90 degrees from standard
N*	Extruded body, round lobe orientation rotated 180 degrees from standard
Z*	Extruded body, round lobe orientation rotated 270 degrees from standard
T	Aluminum round tube and carbon steel tie rods & nuts

* Please reference table in catalog 0900P-E, page B10

Series

4MNR

Piston type [2]

2	Lipseals, no magnetic ring (aluminum piston)
3	Lipseals and magnetic ring (aluminum piston)

Ports

U	NPTF
R	BSPP

Seals

Blank	Standard (nitrile seals)
V	Fluorocarbon seals [3]
E	Fluorocarbon rod wiper and rod seal only [4]

Special modification

Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MNR with Linear Position Sensor Option) [5]

Tooling plate

T	Standard plate
M	Special plate (please specify details)

Piston rod thread style

9	Standard
3	Special (and specify all dimensions required)

Rod material and gland code

Blank	Standard rod and gland
H	Standard rod and HI LOAD gland
Y	17-4 PH stainless steel rod and standard gland

Piston rod thread type

A	Standard (UNF unified thread)

Cushion cap end

Blank	Non-cushioned cap end
C	Cushioned cap end

Stroke length

Specify stroke length required in inches.

[1] Not available with Linear Position Sensor Option (LPSO).
[2] Seals option V only available with Piston Type 2.
[3] Reed and solid-state sensors only available with standard seals or options E. See footnote 2.
[4] Used for external chemical compatibility applications, not high temperature.

Sensors

For sensors see page B296.

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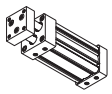
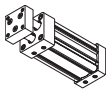
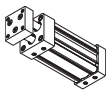
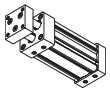
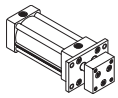
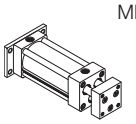
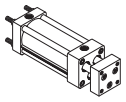
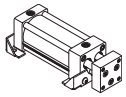
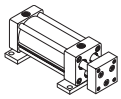
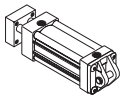
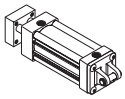
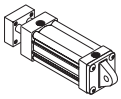
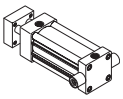
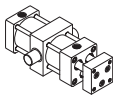
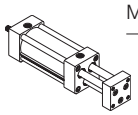
4MNR Mounting Styles

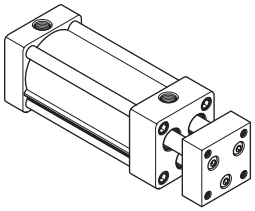
Mounting style	NFPA mounting	Description	Bore size
TEF 	MX5/MS4	Sleeve Nut with Side Tap (standard mount)	1-1/2 - 4
T 	MX0	No Mount (same construction as TEF)	1-1/8 - 4
TE 	MX5	Sleeve Nut (same construction as TEF)	1-1/2 - 4
F 	MS4	Side Tap (same construction as TEF)	1-1/8 - 4
J 	MF1	Head Rectangular Flange	1-1/8 - 4
H 	MF2	Cap Rectangular Flange	1-1/2 - 4
TC 	MX2	Tie Rods Extended Cap End	1-1/2 -5
C 	MS2	Side Lug	1-1/2 - 4

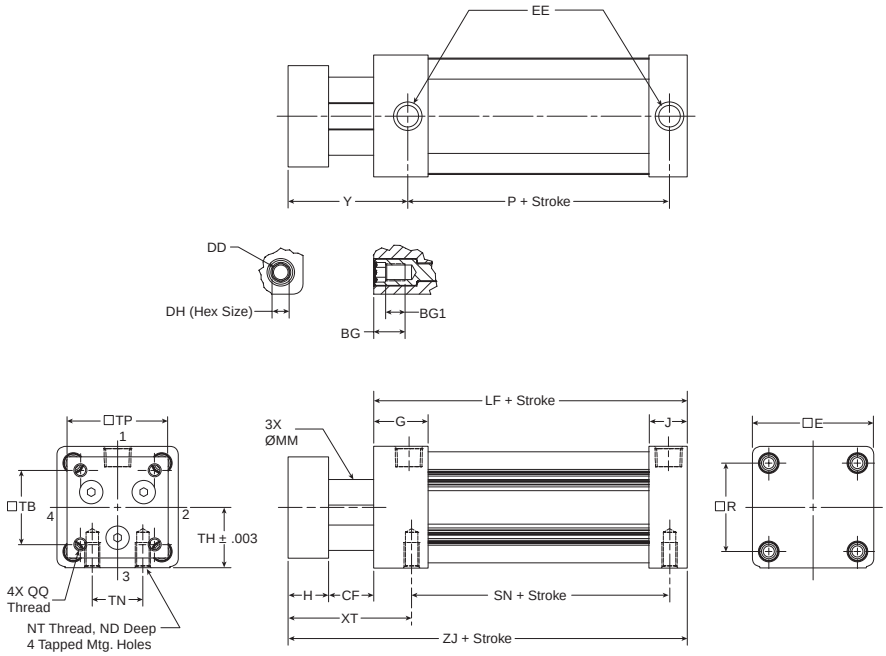
Mounting style	NFPA mounting	Description	Bore size
NB 	N/A	Base Bar	1-1/8 - 4
BB 	MP1	Cap Fixed Clevis	1-1/2 - 4
BC 	MP2	Cap Detachable Clevis	1-1/8 - 4
BE 	MP4	Cap Detachable Eye	1-1/8 - 4
DB 	MT2	Cap Trunnion	1-1/2 - 4
DD 	MT4	Intermediate Trunnion	1-1/2 - 4
KTEF / KT / KTE / KF * 	MDX0 / MDX5 / MDS4	Double Rod End	1-1/2 - 4

* Double rod end cylinders can be ordered with head mountings i.e. KJ.

4MNR Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)

(NFPA MX0, MX5, MS4)





Thread Style 3 - "Special Thread"

Special threads, rod extensions, rod eyes, blanks, etc. are also available.
To order, specify "Style 3" and give desired dimensions for KK (thread size), A (thread length) and W or WF.
If otherwise special, please supply dimensioned sketch.

Styles TEF, T, TE and F

Bore size	Rod dia. MM	BG	BG1	CF	DD	DH	E	EE (NPTF)	G	H	J	ND	NT
1-1/8 *	5/16	-	-	0.875	10-32	-	1.500	1/8	1.000	0.625	0.625	0.250	10-32
1-1/2	8mm	0.056	0.375	1.125	1/4-28	1/4	2.000	3/8	1.438	0.750	0.938	0.375	1/4-20
2	12mm	0.056	0.362	1.125	5/16-24	5/16	2.500	3/8	1.375	0.750	0.938	0.438	5/16-18
2-1/2	16mm	0.056	0.362	1.125	5/16-24	5/16	3.000	3/8	1.344	1.000	0.938	0.625	3/8-16
3-1/4	16mm	0.700	0.500	1.375	3/8-24	3/8	3.750	1/2	1.594	1.000	1.125	0.750	1/2-13
4	16mm	0.700	0.500	1.375	3/8-24	3/8	4.500	1/2	1.594	1.000	1.125	0.750	1/2-13

Bore size	Rod dia. MM	QQ	R	TB	TH	TP	TN	XT	Y	Add stroke LF	P	SN	ZJ
1-1/8 *	5/16	6-32	1.125	0.750	0.750	1.250	0.500	2.000	2.031	2.500	1.468	1.500	3.750
1-1/2	8mm	10-32	1.430	1.120	0.993	1.500	0.625	2.812	2.750	3.625	2.313	2.250	5.375
2	12mm	1/4-28	1.840	1.430	1.243	2.000	0.875	2.812	2.750	3.625	2.313	2.250	5.375
2-1/2	16mm	5/16-24	2.190	1.840	1.493	2.500	1.250	3.062	3.062	3.750	2.375	2.375	5.875
3-1/4	16mm	3/8-24	2.760	2.190	1.680	3.250	1.500	3.437	3.437	4.250	2.625	2.625	6.500
4	16mm	3/8-24	3.320	2.760	2.243	4.000	2.063	3.437	3.437	4.250	2.625	2.625	6.500

* Twin rod with flange construction (not shown)

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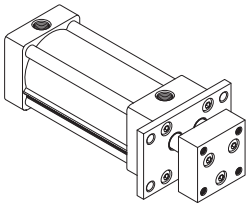
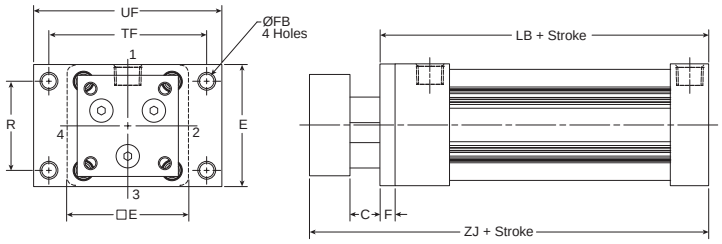
Head Rectangular Flange

Style J
(NFPA MF1)

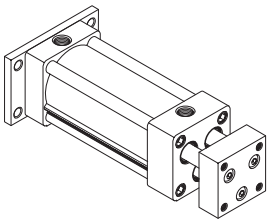


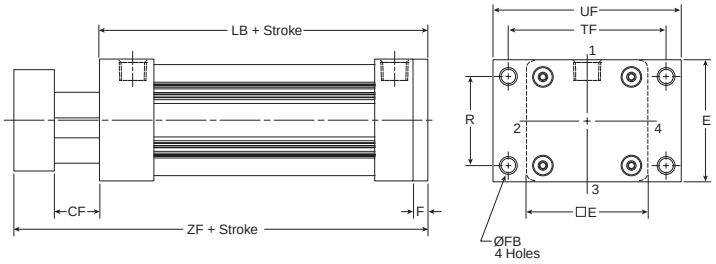


Note: Style J has a "C" dimension instead of "CF" because of the flange installation. For reference, CF = C + F

Cap Rectangular Flange

Style H
(NFPA MF2)





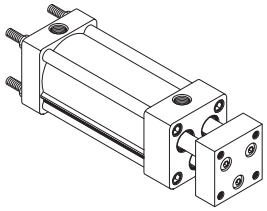
Styles J and H

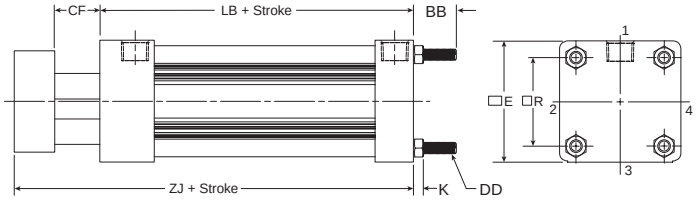
Bore size	Rod dia. MM	C	CF	E	F	FB	H	R	TF	UF	Add stroke LB	ZF	ZJ
1-1/8 *	5/16	0.625	0.875	1.500	0.250	0.219	0.625	1.000	2.000	2.500	2.750	4.250	4.000
1-1/2	8mm	0.750	1.125	2.000	0.375	0.313	0.750	1.430	2.750	3.375	4.000	5.875	5.500
2	12mm	0.750	1.125	2.500	0.375	0.375	0.750	1.840	3.375	4.125	4.000	5.875	5.500
2-1/2	16mm	0.750	1.125	3.000	0.375	0.375	1.000	2.190	3.875	4.625	4.125	6.250	5.875
3-1/4	16mm	0.750	1.375	3.750	0.625	0.438	1.000	2.760	4.688	5.500	4.875	7.250	6.625
4	16mm	0.750	1.375	4.500	0.625	0.438	1.000	3.320	5.438	6.250	4.875	7.250	6.625

* Twin rod with flange construction (not shown)

Tie Rods Ext. Cap End

Style TC
(NFPA MX2)





Style TC

Bore size	Rod dia. MM	BB	DD	CF	E	K	R	Add stroke LB	ZJ
1-1/2	8mm	1.000	1/4-28	1.125	2.000	0.250	1.430	4.000	5.500
2	12mm	1.125	5/16-24	1.125	2.500	0.313	1.840	4.000	5.500
2-1/2	16mm	1.125	5/16-24	1.125	3.000	0.313	2.190	4.125	5.875
3-1/4	16mm	1.375	3/8-24	1.375	3.750	0.375	2.760	4.875	6.625
4	16mm	1.375	3/8-24	1.375	4.500	0.375	3.320	4.875	6.625

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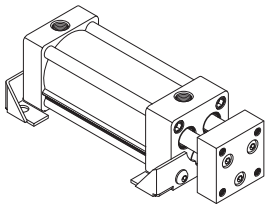
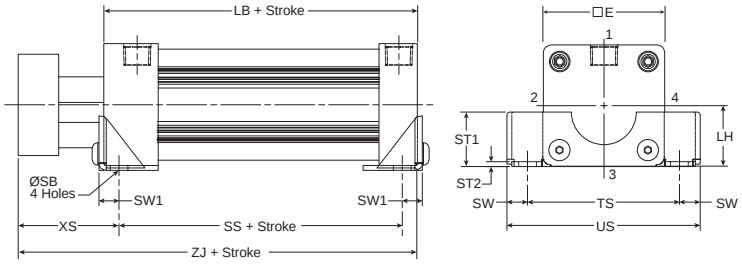
Side Lug

Style C
(NFPA MS2)



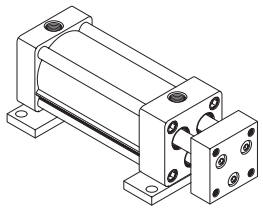


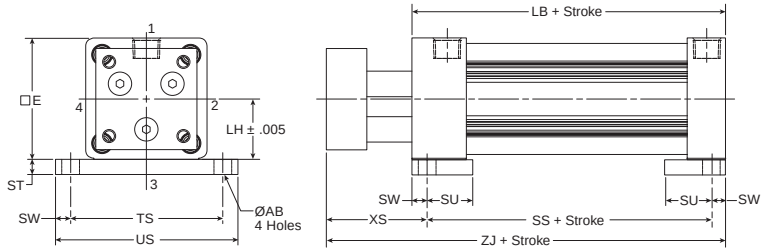
Style C

Bore size	Rod dia. MM	E	LH	SB	ST1	ST2	SW	SW1	TS	US	XS	Add stroke LB	SS	ZJ
1-1/2	8mm	2.000	0.993	0.438	1.000	0.120	0.375	0.495	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	2.500	1.243	0.438	1.250	0.120	0.375	0.495	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	3.000	1.493	0.438	1.343	0.120	0.375	0.495	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	3.750	1.868	0.563	1.500	0.188	0.500	0.688	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	4.500	2.243	0.563	1.500	0.188	0.500	0.688	5.500	6.500	2.875	4.875	3.250	6.625

Base Bar Mount

Style NB





Note: Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

Style NB

Bore size	Rod dia. MM	AB	E	LH	ST	SU	SW	TS	US	XS	Add stroke LB	SS	ZJ
1-1/8 *	5/16	0.203	1.500	1.000	0.250	0.750	0.250	1.875	2.375	1.750	2.750	1.750	3.750
1-1/2	8mm	0.438	2.000	1.243	0.250	1.125	0.375	2.750	3.500	2.250	4.000	2.875	5.500
2	12mm	0.438	2.500	1.493	0.250	1.125	0.375	3.250	4.000	2.250	4.000	2.875	5.500
2-1/2	16mm	0.438	3.000	1.868	0.375	1.125	0.375	3.750	4.500	2.500	4.125	3.000	5.875
3-1/4	16mm	0.563	3.750	2.368	0.500	1.250	0.500	4.750	5.750	2.875	4.875	3.250	6.625
4	16mm	0.563	4.500	2.743	0.500	1.250	0.500	5.500	6.500	2.875	4.875	3.250	6.625

* Twin rod with flange construction (not shown)

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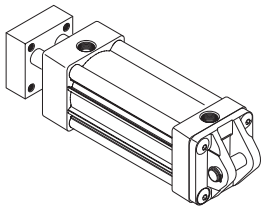
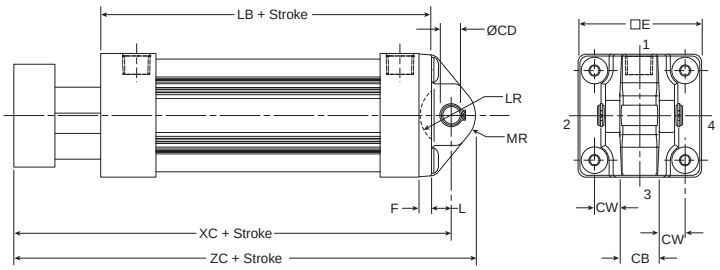
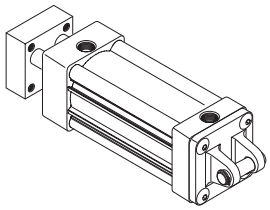
Cap Fixed Clevis
Style BB (NFPA MP1)

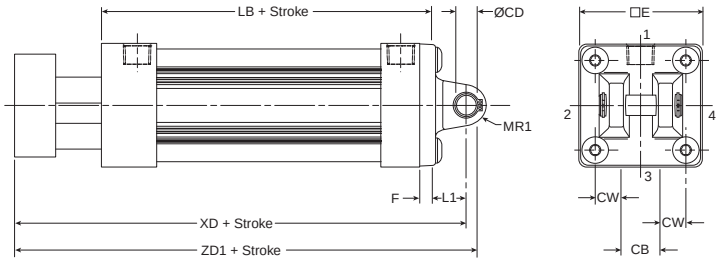
Note: For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, accessories page B141.



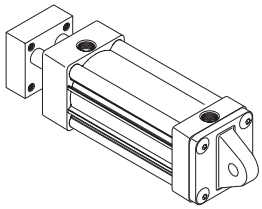


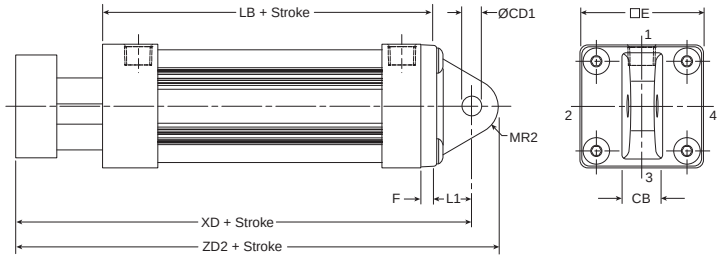
Cap Detachable Clevis
Style BC (NFPA MP2)





Cap Detachable Eye
Style BE (NFPA MP4)





Styles BB, BC and BE

Bore size	Rod dia. MM	CB	CD	CD1	CW	E	F	L	LR	L1
1-1/2	8mm	0.750	0.501	0.500	0.500	2.000	0.375	0.375	0.750	0.750
2	12mm	0.750	0.501	0.500	0.500	2.500	0.375	0.375	0.750	0.750
2-1/2	16mm	0.750	0.501	0.500	0.500	3.000	0.375	0.375	0.750	0.750
3-1/4	16mm	1.250	0.751	0.750	0.625	3.750	0.625	0.625	1.000	1.250
4	16mm	1.250	0.751	0.750	0.625	4.500	0.625	0.625	1.000	1.250

Bore size	Rod dia. MM	MR	MR1	MR2	Add stroke LB	XC	XD	ZC	ZD1	ZD2
1-1/2	8mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2	12mm	0.625	0.500	0.625	4.000	6.250	6.625	6.875	7.125	7.250
2-1/2	16mm	0.625	0.500	0.688	4.125	6.625	7.000	7.250	7.500	7.688
3-1/4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375
4	16mm	0.938	0.750	0.875	4.875	7.875	8.500	8.813	9.250	9.375

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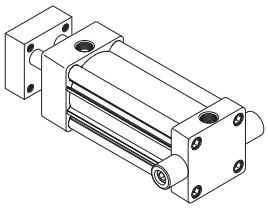
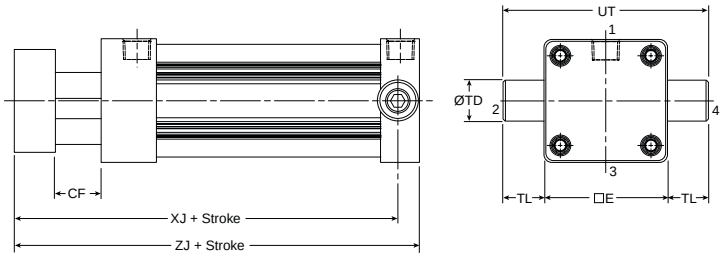
Cap Trunnion

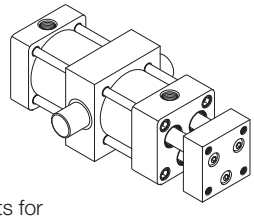
Style DB
(NFPA MT2)



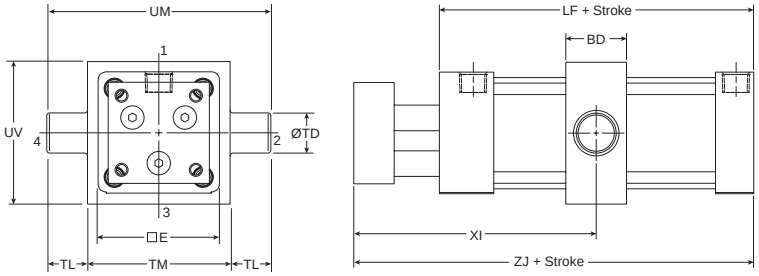


Intermediate Trunnion

Style DD
(NFPA MT4)



Note: Tie rod nuts for Style DD have a slot instead of internal hex.



Styles DD and DD

Bore size	Rod dia. MM	E	BD	CF	TD	TL	TM	UM	UT	UV	Min. XI	Add stroke LF	XJ	ZJ
1-1/2	8mm	2.000	1.250	1.125	1.000	1.000	2.500	4.500	4.000	2.500	4.000	4.000	5.000	5.875
2	12mm	2.500	1.500	1.125	1.000	1.000	3.000	5.000	4.500	3.000	4.125	4.000	5.000	5.875
2-1/2	16mm	3.000	1.500	1.125	1.000	1.000	3.500	5.500	5.000	3.500	4.375	4.125	5.375	6.250
3-1/4	16mm	3.750	2.000	1.375	1.000	1.000	4.500	6.500	5.750	4.250	5.125	4.875	6.000	7.250
4	16mm	4.500	2.000	1.375	1.000	1.000	5.250	7.250	6.500	5.000	5.125	4.875	6.000	7.250

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The innovative P1D is a future-proof generation of ISO/VDMA cylinders. The cylinders are double acting, with a new design of air cushioning.

The P1D complies with the current ISO 6431, ISO 15552, VDMA 24562 and AFNOR installation dimension standards

- Available in 32 to 200mm bores
- PUR seals for long service life
- Drop-in sensors
- Corrosion resistant design
- Magnetic piston as standard
- Lubricated with food grade grease

Operating information

Operating pressure:	145 PSIG (10 bar) maximum	
Temperature range:	Standard:	-4°F to 176°F (-20°C to 80°C)
	High temperature:	14°F to 250°F (-10°C to 121°C)
Cylinders for low pressure hydraulic operation:		Ø32 - 125mm
ATEX approval:	CE Ex IIGD c T4	248°F (120°C)
Filtration requirements:	40 micron, dry filtered air	

For technical information see CD

P1D Standard - Double acting

Ø32mm - (G1/8)

Stroke (mm)	Order Code
25	P1D-S032MC-0025NNNNN
40	P1D-S032MC-0040NNNNN
50	P1D-S032MC-0050NNNNN
80	P1D-S032MC-0080NNNNN
100	P1D-S032MC-0100NNNNN
125	P1D-S032MC-0125NNNNN
160	P1D-S032MC-0160NNNNN
200	P1D-S032MC-0200NNNNN
250	P1D-S032MC-0250NNNNN
320	P1D-S032MC-0320NNNNN
400	P1D-S032MC-0400NNNNN
500	P1D-S032MC-0500NNNNN

Ø40mm - (G1/4)

25	P1D-S040MC-0025NNNNN
40	P1D-S040MC-0040NNNNN
50	P1D-S040MC-0050NNNNN
80	P1D-S040MC-0080NNNNN
100	P1D-S040MC-0100NNNNN
125	P1D-S040MC-0125NNNNN
160	P1D-S040MC-0160NNNNN
200	P1D-S040MC-0200NNNNN
250	P1D-S040MC-0250NNNNN
320	P1D-S040MC-0320NNNNN
400	P1D-S040MC-0400NNNNN
500	P1D-S040MC-0500NNNNN

Ø50mm - (G1/4)

25	P1D-S050MC-0025NNNNN
40	P1D-S050MC-0040NNNNN
50	P1D-S050MC-0050NNNNN
80	P1D-S050MC-0080NNNNN
100	P1D-S050MC-0100NNNNN
125	P1D-S050MC-0125NNNNN
160	P1D-S050MC-0160NNNNN
200	P1D-S050MC-0200NNNNN
250	P1D-S050MC-0250NNNNN
320	P1D-S050MC-0320NNNNN
400	P1D-S050MC-0400NNNNN
500	P1D-S050MC-0500NNNNN

Ø63mm - (G3/8)

Stroke (mm)	Order Code
25	P1D-S063MC-0025NNNNN
40	P1D-S063MC-0040NNNNN
50	P1D-S063MC-0050NNNNN
80	P1D-S063MC-0080NNNNN
100	P1D-S063MC-0100NNNNN
125	P1D-S063MC-0125NNNNN
160	P1D-S063MC-0160NNNNN
200	P1D-S063MC-0200NNNNN
250	P1D-S063MC-0250NNNNN
320	P1D-S063MC-0320NNNNN
400	P1D-S063MC-0400NNNNN
500	P1D-S063MC-0500NNNNN

Ø80mm - (G3/8)

25	P1D-S080MC-0025NNNNN
40	P1D-S080MC-0040NNNNN
50	P1D-S080MC-0050NNNNN
80	P1D-S080MC-0080NNNNN
100	P1D-S080MC-0100NNNNN
125	P1D-S080MC-0125NNNNN
160	P1D-S080MC-0160NNNNN
200	P1D-S080MC-0200NNNNN
250	P1D-S080MC-0250NNNNN
320	P1D-S080MC-0320NNNNN
400	P1D-S080MC-0400NNNNN
500	P1D-S080MC-0500NNNNN

Ø100mm - (G1/2)

Stroke (mm)	Order Code
25	P1D-S100MC-0025NNNNN
40	P1D-S100MC-0040NNNNN
50	P1D-S100MC-0050NNNNN
80	P1D-S100MC-0080NNNNN
100	P1D-S100MC-0100NNNNN
125	P1D-S100MC-0125NNNNN
160	P1D-S100MC-0160NNNNN
200	P1D-S100MC-0200NNNNN
250	P1D-S100MC-0250NNNNN
320	P1D-S100MC-0320NNNNN
400	P1D-S100MC-0400NNNNN
500	P1D-S100MC-0500NNNNN

Ø125mm - (G1/2)

25	P1D-S125MC-0025NNNNN
40	P1D-S125MC-0040NNNNN
50	P1D-S125MC-0050NNNNN
80	P1D-S125MC-0080NNNNN
100	P1D-S125MC-0100NNNNN
125	P1D-S125MC-0125NNNNN
160	P1D-S125MC-0160NNNNN
200	P1D-S125MC-0200NNNNN
250	P1D-S125MC-0250NNNNN
320	P1D-S125MC-0320NNNNN
400	P1D-S125MC-0400NNNNN
500	P1D-S125MC-0500NNNNN

The cylinders are supplied complete with a zinc plated steel piston rod nut.

Sensors

For sensors see page B296.

☐ Most popular.

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Design Versions

P1D Standard Version

P1D Standard Version cylinders are available in 32-125mm bores and utilize internal composite technology to save weight, while assuring the high performance and functionality expected of ISO cylinders. Cushions and bumpers at both ends and a magnetic piston are included as standard. The Standard Version serves all markets where performance at an affordable price is desired.

P1D Removable Gland Version

P1D Removable Gland Version cylinders are available in 32-200mm bores and utilize bar stock endcaps and a removable high-strength bronze bearing for traditional and custom applications. The bronze bearing assembly is externally removable for quick and easy maintenance. No other ISO cylinder manufacturer in the world produces a Removable Gland Version and meets these demands. This version covers all applications which require performance and customization at all bore sizes.

P1D Series Rod Lock Cylinder

The P1D Series Rod Lock Cylinder incorporates a powerful piston rod locking device, which clamps the piston rod and locks it in position. The locking device is a spring lock with an air pressure release and is integrated into the front (head) cover of the cylinder.

P1D Clean Version

The P1D Clean Version is completely designed for the food industry. The stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Available with BSPP ports (ISO 1179-1 with ISO 228-1 threads).

P1D Tie-Rod Version

The P1D Tie-Rod Version cylinders are based on the same high level technology as the Standard Version. They accept either Standard Version or Removable Gland Version heads and caps. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.

Guided Cylinders

For guided versions of the P1D, see the P5E Series and HB Series.

P5E Series

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Ordering information

P1D	–	S	032	M	C	–	0500	N	N	N	N	N

Piston Style

Cushions	Piston material: Composite [1]	Piston material: Aluminum [2]
None	M	Y
Cush B/E	– [3]	4
Cush head	J	5
Cush cap	K	6

Bore size

032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm
125	125mm
160	160mm [8]
200	200mm [8]

Stroke [14]

Specify whole mm using 4 digits, i.e. 0500

Cylinder ports front & rear

–	BSPP Ports (G Threads)**
E	NPTF Ports*
Q	BSPT Ports (R^C Threads)*†

* Not available on clean version.
† Not available on die cast version.
** ISO 1179-1 with ISO 228-1 threads.

Rod end

N	Metric male
6	Metric female
3	Special*

* Please provide desired dimensions for KK, AM and WH or W. If otherwise, please provide dimensioned sketch.

Version

	Cylinder body profile	Rod lock: None	Rod lock: Fitted w/ standard rod lock [7]	Rod lock: Fitted w/ manual override rod lock [7]
Die cast end caps [4]	Standard	S	L	N/A
	Tie Rod [13]	T	M	N/A
	Clean	C	D	N/A
Removable gland [5] (machined end caps)	Standard	G	R	J
	Tie Rod [13]	E	7 [4]	Consult Factory
Special [6]	Any Special	/		

Function

Fastener type	Rod wiper style	Double acting	Double rod	Tandem [13]
Standard end cover screws	Std scraper	M	F	C
	Metal scraper	Q	R	J
Stainless steel end cover screws [9]	Std scraper	A	G	N/A
	Metal scraper	S	T	N/A

Piston rod & seal material

Piston rod material	Seal material: Standard	Seal material: Fluorocarbon [10]	Seal material: Hydraulic [11]
Chrome plated carbon steel [2]	C	G	J
Chrome plated stainless steel [2, 19]	R	D	Z
316 Stainless steel [13]	S	N/A	N/A
Acid-resistant stainless steel	M	N [2]	N/A

Rod mountings & plugs [15]

Rod mounting	No plugs [16]	With plugs [1]
Swivel rod eye	S	A
Swivel rod eye SS	T	1
Swivel rod eye with clevis bracket GA [19]	V	E
Swivel rod eye SS with clevis bracket GA	W	2
Clevis	C	B
Clevis SS	D	3
Flexco coupling	F	G
One additional piston rod nut	X	P
Stainless steel piston rod nut	Y	4
Acid-resistant nut	Z	5
None (piston rod nut only)	N	R

Sensors [17]

Prepared for factory-fitted sensors	Cable location: Front or left	Cable location: Rear or right	Cable location: Front & rear
P1D clean version	6	7	8
P1D all versions (except Clean) prepared for sensors or clean version without sensor capability [18]	N		

Mounting style

	Standard	Rotated 90°
Flange MF1 at head (front) end	1	3
Flange MF2 at cap (rear) end	B	4
Flanges MF1 and MF2 at both ends	2	K
Foot brackets MS1	F	R
Clevis bracket GA aluminum	C	U
Rear eye MP4 aluminum	E	V
Rear swivel eye MP6 aluminum	S	W
Clevis bracket MP2 aluminum	T	Y
Rear eye + clevis (MP4 + MP2) aluminum	L	Z
Clevis bracket MP2 + pivot hinge aluminum	X	5
Clevis bracket GA aluminum + steel swivel hinge	Q	0
Rear swivel eye + clevis bracket GA aluminum	M	A
Intermediate trunnion MT4 (requires XV dimension)	G	7
Trunnion flange at head (front) end [4]	H	P
Trunnion flange at cap (rear) end [4]	J	8
None (MX0)	N	9

Notes:

1 Not available for 160-200mm bores.
2 Not available on Clean Version.
3 Must be placed in model code.
4 Not available for 160-200mm bores or with fluorocarbon seals.
5 When Removable Gland Version is fitted with rod lock, gland cannot be replaced without disassembling cylinder.
6 If special cylinder is ordered (other than rod end), End Cap Style, Cylinder Body Profile and Rod Lock option must be given in addition to the special request.
7 Cylinders fitted with rod locks must be cushioned on both ends.
8 Tie Rod Version E must be specified for these bores.
9 Applies only to end cover screws for 32-125mm bores. For stainless steel tie rods and nuts (all bore sizes), change Version to special and request stainless steel tie rods and nuts.
10 If used for temperature above 80°C (176°F), aluminum piston required. Not available with die cast end caps.
11 Hydraulic seal option valid for Removable Gland Version only. Adjustable cushion options and Rod Lock Versions not available.
12 Only available on Clean Version.
13 Tie Rod Version is required for Tandem Function.
14 When specifying a stop tube, place a "/" in the version field. Then specify the version, amount of stop tube and amount of net stroke. The stroke used in the model code should be gross stroke (net stroke plus stop tube).
15 Please review Piston Rod Selection Chart in the Engineering Section to check for a rod buckling condition.
16 Clean Version comes standard with plugs. Use this column when ordering Clean Version.
17 For sensor part numbers and specifications, please refer to Electronic Sensors section.
18 P1D Clean Version ordered without sensors cannot be retrofitted with sensor capability.
19 Consult factory for this option.

Double Rod Cylinders

Double rod option is available with Mounting Styles MX0, MS1, MF1, MF2 and MT4.

For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

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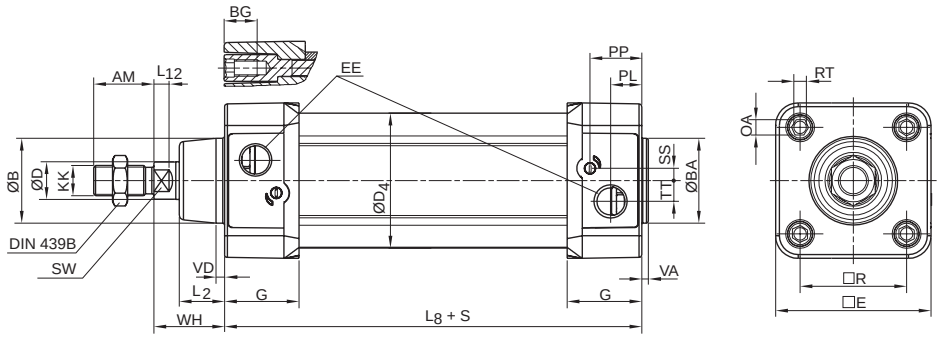
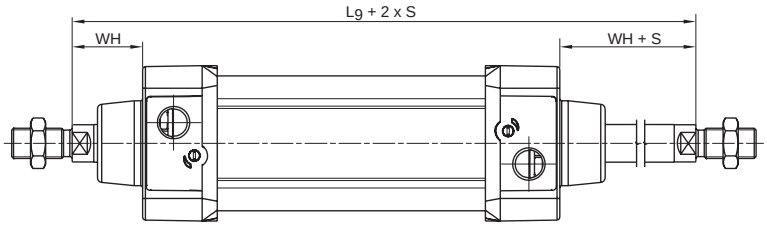
P1D Standard Version





S = Stroke

Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E	EE BSPP*	EE NPTF/ BSPT	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
32	22	30	30	16	12	45.0	50.0	G1/8	1/8	28.5	M10x1.25	16.0	94	146	6.0
40	24	35	35	16	16	52.0	57.4	G1/4	1/4	33.0	M12x1.25	19.0	105	165	6.5
50	32	40	40	16	20	60.7	69.4	G1/4	1/4	33.5	M16x1.5	24.0	106	180	8.0
63	32	45	45	16	20	71.5	82.4	G3/8	3/8	39.5	M16x1.5	24.0	121	195	8.0
80	40	45	45	17	25	86.7	99.4	G3/8	3/8	39.5	M20x1.5	30.0	128	220	10.0
100	40	55	55	17	25	106.7	116.0	G1/2	1/2	44.5	M20x1.5	32.4	138	240	10.0
125	54	60	60	20	32	134.0	139.0	G1/2	1/2	51.0	M27x2	45.0	160	290	13.0

Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21.8	32.5	M6	4.0	10	4.5	3.5	4.5	26
40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30
50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37
63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37
80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46
100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51
125	8	23	40.5	110.0	M12	0	27	17.5	3.5	6.5	65

* ISO 1179-1 with ISO 228-1 threads

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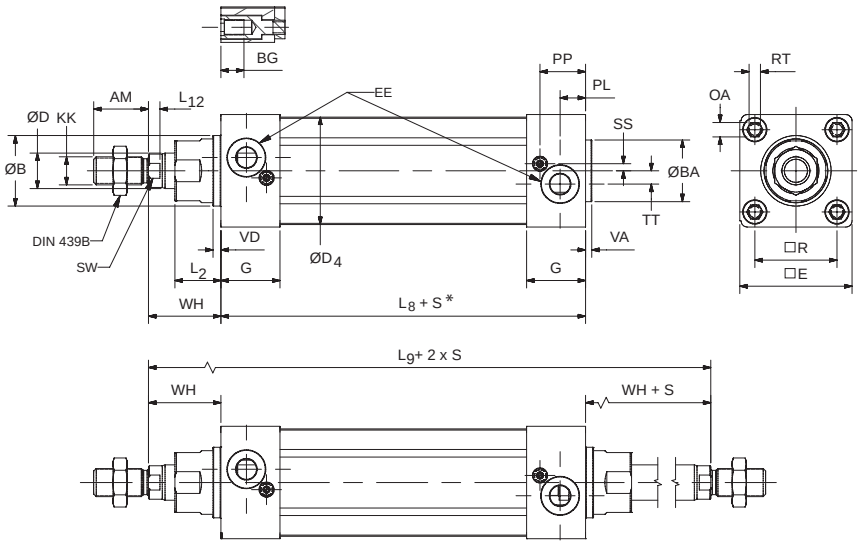
P1D Removable Gland Version



S = Stroke

Bore size	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE BSPP *	EE NPTF/ BSPT	G mm	KK	L2 mm	L8 mm	L9 mm	L12 mm
32	22	30	30	16	12	45.0	46.5	G1/8	1/8	28.5	M10x1.25	18	94	146	6.0
40	24	35	35	16	16	52.0	52.0	G1/4	1/4	33.0	M12x1.25	20	105	165	6.5
50	32	40	40	16	20	60.7	63.5	G1/4	1/4	33.5	M16x1.5	26	106	180	6.5
63	32	45	45	16	20	71.5	76.0	G3/8	3/8	39.5	M16x1.5	26	121	195	6.5
80	40	45	45	17	25	86.7	95.5	G3/8	3/8	39.5	M20x1.5	33	128	220	10.0
100	40	55	55	17	25	106.7	114.5	G1/2	1/2	44.5	M20x1.5	33	138	240	10.0
125	54	60	60	20	32	134.0	140.0	G1/2	1/2	51.0	M27x2	41	160	290	13.0

Bore size	OA mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm
32	6	13	21.8	32.5	M6	6.5	10	4.5	3.5	4.5	26
40	6	14	21.9	38.0	M6	8.0	13	5.5	3.5	4.5	30
50	8	14	25.9	46.5	M8	4.0	17	7.5	3.5	4.5	37
63	8	16	27.4	56.5	M8	6.5	17	11.0	3.5	4.5	37
80	6	16	30.5	72.0	M10	0	22	15.0	3.5	4.5	46
100	6	18	35.8	89.0	M10	0	22	20.0	3.5	4.5	51
125	8	23	40.5	110.0	M12	0	27	17.5	5.5	6.5	65

* ISO 1179-1 with ISO 228-1 threads

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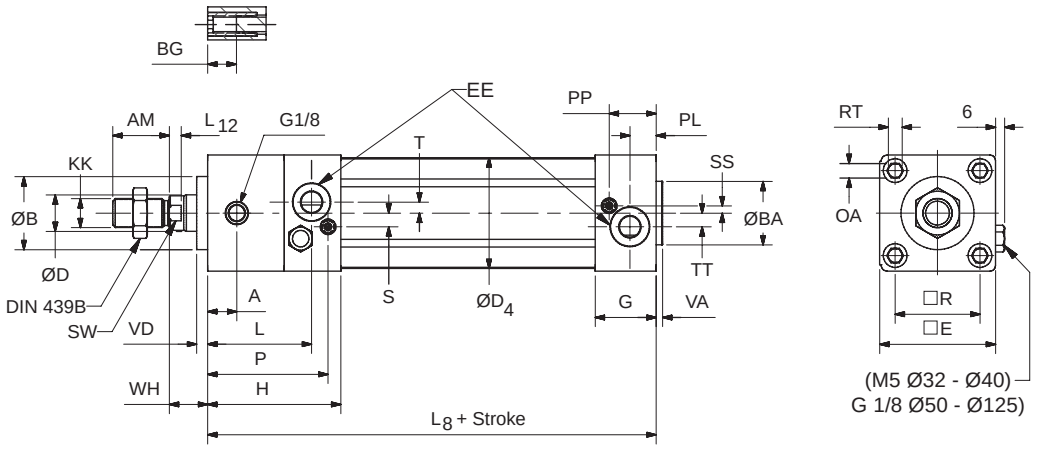
P1D Rod Lock Version
(Version R or L)



Bore size	A mm	AM mm	B mm	BA mm	BG mm	D mm	D4 mm	E mm	EE *	G mm	H mm	KK	L mm	L8 mm	L12 mm
32	16	22	30	30	16	12	45.0	46.5	G1/8	28.5	71.5	M10x1.25	56.0	137	6.0
40	16	24	35	35	16	16	52.0	52.0	G1/4	33.0	77.0	M12x1.25	56.0	149	6.5
50	18	32	40	40	16	20	60.7	63.5	G1/4	33.5	80.5	M16x1.5	62.5	153	6.5
63	26	32	45	45	16	20	71.5	76.0	G3/8	39.5	96.5	M16x1.5	74.5	178	6.5
80	35	40	45	45	17	25	86.7	95.5	G3/8	39.5	110.5	M20x1.5	87.0	199	10.0
100	50	40	55	55	17	25	106.7	114.5	G1/2	44.5	132.5	M20x1.5	106.0	226	10.0
125	60	54	60	60	20	32	134.0	140.0	G1/2	51.0	145.0	M27x2	117.0	254	13.0

Bore size	OA mm	P mm	PL mm	PP mm	R mm	RT mm	S mm	SS mm	SW mm	T mm	TT mm	VA mm	VD mm	WH mm
32	6	64.8	13	21.8	32.5	M6	7	6.5	10	2.5	4.5	3.5	4.5	15
40	6	68.0	14	21.9	38.0	M6	9	8.0	13	2.0	5.5	3.5	4.5	16
50	8	73.5	14	25.9	46.5	M8	8	4.0	17	4.0	7.5	3.5	5.0	17
63	8	89.5	16	27.4	56.5	M8	8	6.5	17	2.0	11.0	3.5	5.0	17
80	6	101.5	16	30.5	72.0	M10	9	0	22	5.0	15.0	3.5	4.0	20
100	6	123.5	18	35.8	89.0	M10	12	0	22	6.0	20.0	3.5	4.0	20
125	8	136.0	23	40.5	110.0	M12	12	0	27	6.0	17.5	5.5	6.0	27

* ISO 1179-1 with ISO 228-1 threads

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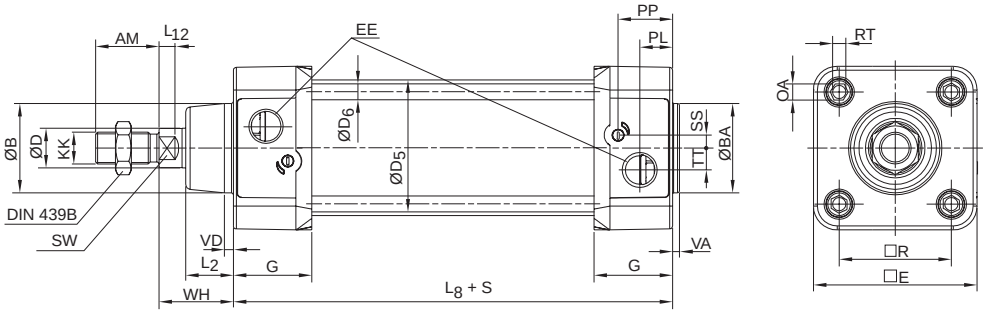
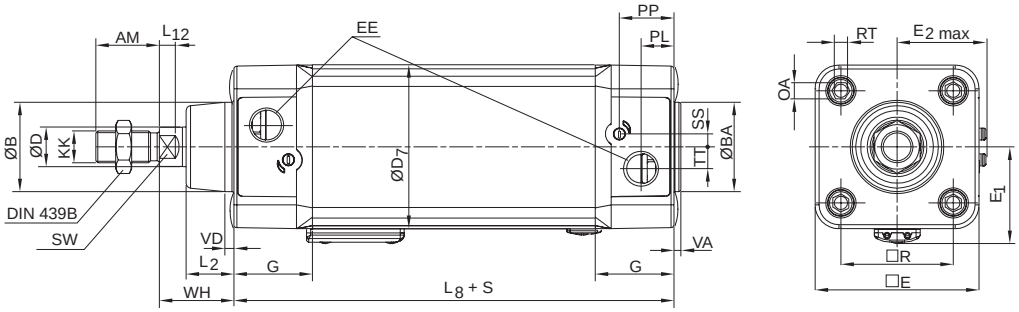
P1D Tie-Rod Version (32-125mm)



P1D Clean Version



Bore size	D5 mm	D6 mm	D7 mm	E1 mm	E2 max mm
32	36	5.3	49.6	32	5
40	45	5.3	57.3	36	6
50	55	7.1	69.3	42	6
63	68	7.1	82.3	49	5
80	85	8.9	99.3	57	5
100	105	8.9	117.6	68	6
125	132	10.7	142.8	81	6

Other dimensions, see P1D removable gland version.

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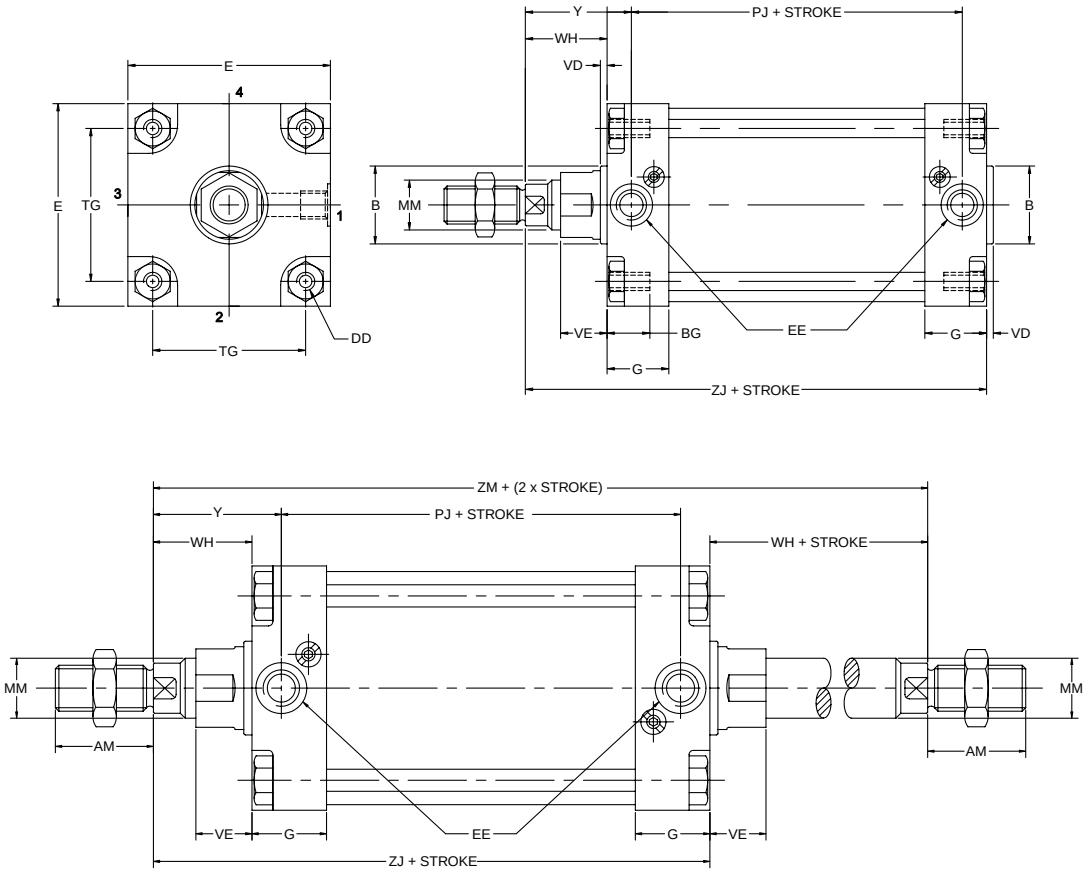
P1D Tie-Rod Version (160-200mm)



Rod End #1

Rod End #2

Bore size	AM mm	B d11 mm	BG mm	DD	E mm	EE BSPP [3]	EE NPTF/ BSPT	G mm	MM mm	TG mm	VD mm	VE mm	WH mm	Y mm	PJ [1] mm	ZJ [1] mm	ZM [2] mm
160	72	65	24	M16	177	G3/4	3/4	54	40	140	6	56	80	105	130	260	340
200	72	75	24	M16	214	G3/4	3/4	54	40	175	6	56	95	120	130	275	370

[1] Add stroke
[2] Add 2× stroke
[3] ISO 1179-1 with ISO 228-1 threads

Double Rod Cylinders

Double rod option is available on Mounting Styles MX0, MS1, MF1, MF2 and MT4.

For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

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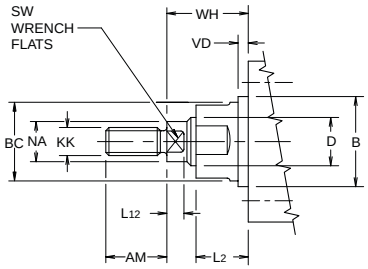
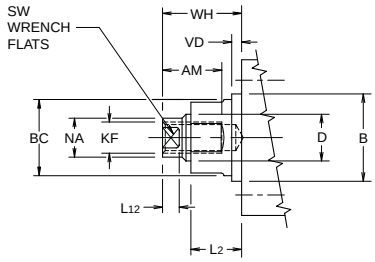
All Mountings Except MF1

Thread Style N



Thread Style 6



Thread Style 3 - "Special Thread"

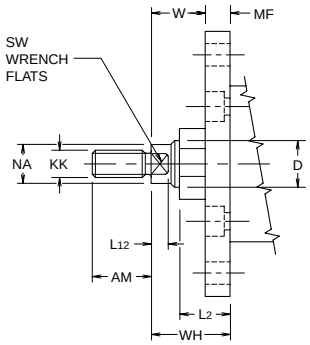
Special thread, extension, rod eye, blank, etc are also available. To order, specify "Style 3" and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore size	D	KK	KF	AM	B d11	BC	SW across flats	L12	NA	VD	L2	WH*
32	12	M10x1.25	M8x1	22	30	27	10	6	11	4.5	18	26
40	16	M12x1.25	M10x1.25	24	35	32	13	6.5	15	4.5	20	30
50	20	M16x1.5	M14x1.5	32	40	36	17	6.5	19	4.5	26	37
63	20	M16x1.5	M14x1.5	32	45	36	17	6.5	19	4.5	26	37
80	25	M20x1.5	M18x1.5	40	45	41	22	10	24	4.5	33	46
100	25	M20x1.5	M18x1.5	40	55	41	22	10	24	4.5	33	51
125	32	M27x2	M24x2	54	60	50	27	13	31	6.5	41	65
160	40	M36x2	M30x2	72	65	60	36	16	39	6	56	80
200	40	M36x2	M30x2	72	75	60	36	16	39	6	56	95

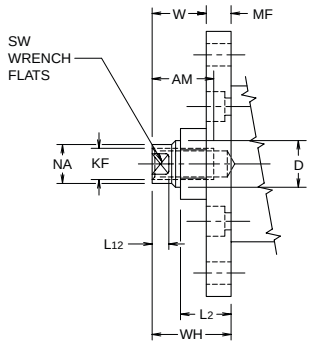
***NOTE:** Dimensions do not apply to Rod Lock Versions.

With MF1 Mounting

Thread Style N



Thread Style 6



"Special Thread" Style 3

Special thread, extension, rod eye, blank, etc are also available. To order, specify "Style 3" and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

Bore size	D	KK	KF	AM	SW across flats	L12	MF	NA	L2	W†	WH†
32	12	M10x1.25	M8x1	22	10	6	10	11	18	16	26
40	16	M12x1.25	M10x1.25	24	13	6.5	10	15	20	20	30
50	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
63	20	M16x1.5	M14x1.5	32	17	6.5	12	19	26	25	37
80	25	M20x1.5	M18x1.5	40	22	10	16	24	33	30	46
100	25	M20x1.5	M18x1.5	40	22	10	16	24	33	35	51
125	32	M27x2	M24x2	54	27	13	20	31	41	45	65
160	40	M36x2	M30x2	72	36	16	20	39	56	60	80
200	40	M36x2	M30x2	72	36	16	25	39	56	70	95

†**NOTE:** Dimensions do not apply to Rod Lock Versions.

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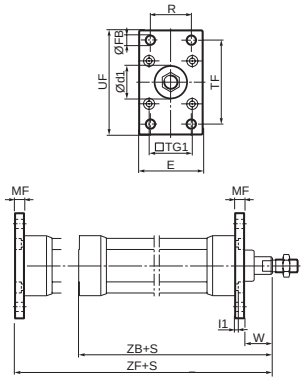
Flange – MF1, MF2

Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder.

Materials
32-100mm bore flange: Surface-treated aluminum, black
125-200mm bore flange: Steel, black
Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MF1/MF2, VDMA 24 562, AFNOR

Bore size mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF	l1 -0.5 mm	W mm	ZF mm	ZB mm	Weight kg	Part number
32	30	7	32.5	45	32	10	64	80	5.0	16	130	123.5	0.23	**P1C-4KMBA**
40	35	9	38.0	52	36	10	72	90	5.0	20	145	138.5	0.28	**P1C-4LMBA**
50	40	9	46.5	65	45	12	90	110	6.5	25	155	146.5	0.53	**P1C-4MMBA**
63	45	9	56.5	75	50	12	100	120	6.5	25	170	161.5	0.71	**P1C-4NMBA**
80	45	12	72.0	95	63	16	126	150	8.0	30	190	177.5	1.59	**P1C-4PMBA**
100	55	14	89.0	112	75	16	150	185	8.0	35	205	192.5	2.19	**P1C-4QMBA**
125	60	16	110.0	140	90	20	180	220	10.5	45	245	230.5	3.78	**P1C-4RMB**
160	65	18	140.0	180	115	20	230	260	9.5	60	280	266	C.F.	**L075370160**
200	75	22	175.0	220	135	25	270	300	12.5	70	300	281	C.F.	**L075370200**

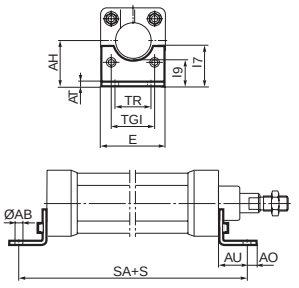
S = Stroke length C.F. = Consult Factory

Foot Bracket – MS1

Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder.

Materials
Foot bracket: Surface-treated steel, black
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.



According to ISO MS1, VDMA 24 562, AFNOR

Bore size mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	l7 mm	AT mm	l9 JS14 mm	SA mm	Weight* kg	Part number
32	7	32.5	45	32	10	24	32	30	4.5	17.0	142	0.06	**P1C-4KMF**
40	9	38.0	52	36	8	28	36	30	4.5	18.5	161	0.08	**P1C-4LMF**
50	9	46.5	65	45	13	32	45	36	5.5	25.0	170	0.16	**P1C-4MMF**
63	9	56.5	75	50	13	32	50	35	5.5	27.5	185	0.25	**P1C-4NMF**
80	12	72.0	95	63	14	41	63	49	6.5	40.5	210	0.50	**P1C-4PMF**
100	14	89.0	115	75	15	41	71	54	6.5	43.5	220	0.85	**P1C-4QMF**
125	16	110.0	140	90	22	45	90	71	8.0	60.0	250	1.48	**P1C-4RMF**
160	18	140.0	180	115	15	60	115	100	9.0	63.5	300	C.F.	**L075380160**
200	22	175.0	220	135	30	70	135	100	12.0	65.0	320	C.F.	**L075380200**

S = Stroke length C.F. = Consult Factory *Weight per item

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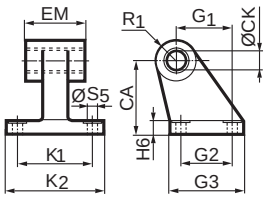
Pivot Bracket with Rigid Bearing

Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Materials
Pivot bracket: Surface-treated aluminium, black
Bearing: Sintered oil-bronze bushing



According to CETOP RP 107 P, VDMA 24 562, AFNOR

Bore size mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm	Weight kg	Part number
32	10	6.6	38	51	21	18	25.5	31	32	8	10.0	0.06	**P1C-4KMD**
40	12	6.6	41	54	24	22	27.0	35	36	10	11.0	0.08	**P1C-4LMD**
50	12	9.0	50	65	33	30	31.0	45	45	12	13.0	0.15	**P1C-4MMD**
63	16	9.0	52	67	37	35	39.0	50	50	12	15.0	0.20	**P1C-4NMD**
80	16	11.0	66	86	47	40	49.0	60	63	14	15.0	0.33	**P1C-4PMD**
100	20	11.0	76	96	55	50	59.0	70	71	15	19.0	0.49	**P1C-4QMD**
125	25	14.0	94	124	70	60	69.0	90	90	20	22.5	1.02	**P1C-4RMD**
160	30	14.0	118	156	97	89	88.5	126	115	25	31.0	C.F.	**L075480160**
200	30	16.0	122	162	105	89	88.5	130	135	30	31.0	C.F.	**L075480200**

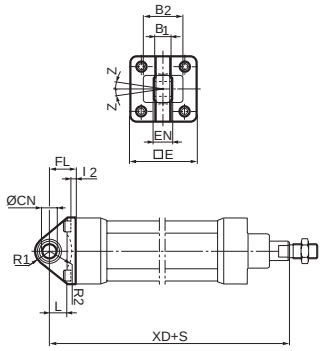
C.F. = Consult Factory

Swivel Eye Bracket – MP6

Intended for use together with clevis bracket GA

Material
Bracket: Surface-treated aluminium, black
(Cast iron for 160-200mm bores)
Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws for attachment to cylinder.



According to VDMA 24 562, AFNOR

Bore size mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	l2 mm	L mm	CN H7 mm	XD mm	Z	Weight kg	Part number
32	45	10.5	–	14	16	–	22	5.5	12	10	142	4°	0.08	**P1C-4KMSA**
40	52	12.0	–	16	18	–	25	5.5	15	12	160	4°	0.11	**P1C-4LMSA**
50	65	15.0	51	21	21	19	27	6.5	15	16	170	4°	0.20	**P1C-4MMSA**
63	75	15.0	–	21	23	–	32	6.5	20	16	190	4°	0.27	**P1C-4NMSA**
80	95	18.0	–	25	29	–	36	10.0	20	20	210	4°	0.52	**P1C-4PMSA**
100	115	18.0	–	25	31	–	41	10.0	25	20	230	4°	0.72	**P1C-4QMSA**
125	140	25.0	–	37	40	–	50	10.0	30	30	275	4°	1.53	**P1C-4RMSA**
160	177	30.0	–	43	44	41	55	4.0	41	35	315	16°	C.F.	**L075420160**
200	214	30.0	–	43	48	42	60	8.0	42	35	335	16°	C.F.	**L075420200**

S = Stroke length C.F. = Consult Factory

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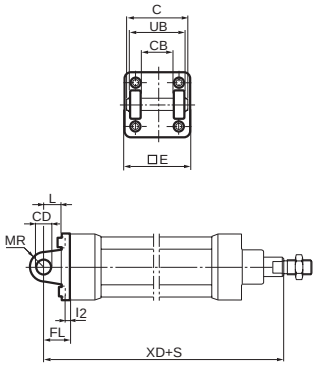
Clevis Bracket – MP2

Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

Materials
Clevis bracket: Surface-treated aluminium, black for 32-160mm bores; Cast iron for 200mm bore
Pin: Surface hardened steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

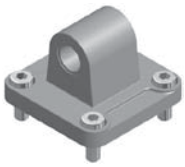


According to ISO MP2, VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0.2 mm	L mm	I2 mm	CD H9 mm	MR mm	XD mm	Weight kg	Part number
32	53	45	45	26	22	13	5.5	10	10	142	0.08	**P1C-4KMT**
40	60	52	52	28	25	16	5.5	12	12	160	0.11	**P1C-4LMT**
50	68	65	60	32	27	16	6.5	12	12	170	0.14	**P1C-4MMT**
63	78	75	70	40	32	21	6.5	16	16	190	0.29	**P1C-4NMT**
80	98	95	90	50	36	22	10.0	16	16	210	0.36	**P1C-4PMT**
100	118	115	110	60	41	27	10.0	20	20	230	0.64	**P1C-4QMT**
125	139	140	130	70	50	30	10.0	25	25	275	1.17	**P1C-4RMT**
160	178	180	170	90	55	35	10.0	30	25	315	C.F.	**L075390160**
200	178	200	170	90	60	35	14.0	30	25	335	C.F.	**L075390200**

S = Stroke length C.F. = Consult Factory

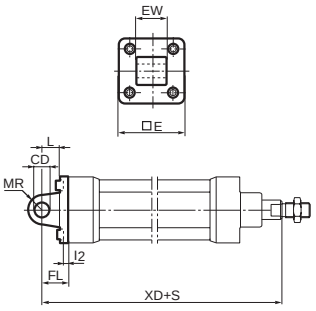
Clevis Bracket – MP4



Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

Materials
Clevis bracket: Surface-treated aluminium, black for 32-125mm bores; Cast iron for 160-200mm bores
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP4, VDMA 24 562, AFNOR

Bore size mm	E mm	EW mm	FL mm	L ±0.2 mm	I2 mm	CD mm	MR H9 mm	XD mm	Weight kg	Part number
32	45	26	22	13	5.5	10	10	142	0.09	**P1C-4KME**
40	52	28	25	16	5.5	12	12	160	0.13	**P1C-4LME**
50	65	32	27	16	6.5	12	12	170	0.17	**P1C-4MME**
63	75	40	32	21	6.5	16	16	190	0.36	**P1C-4NME**
80	95	50	36	22	10.0	16	16	210	0.46	**P1C-4PME**
100	115	60	41	27	10.0	20	20	230	0.83	**P1C-4QME**
125	140	70	50	30	10.0	25	25	275	1.53	**P1C-4RME**
160	180	90	55	35	10.0	30	25	315	C.F.	**L075410160**
200	220	90	60	35	14.0	30	25	335	C.F.	**L075410200**

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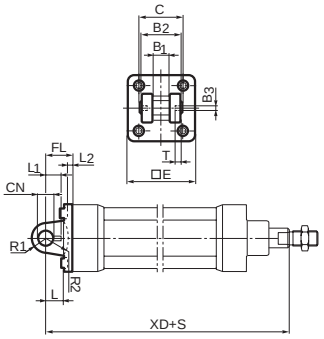
Clevis Bracket – GA

Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

Materials
Clevis bracket: Surface-treated aluminium
Pin: Surface hardened steel
Locking pin: Spring steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

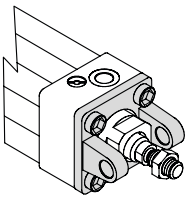


According to VDMA 24 562, AFNOR

Bore size mm	C mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0.2 mm	I2 mm	L mm	CN F7 mm	R1 mm	XD mm	Weight kg	Part number
32	41	45	34	14	3	3.3	17	11.5	22	5.5	12	10	11	142	0.09	**P1C-4KMCA**
40	48	52	40	16	4	4.3	20	12.0	25	5.5	15	12	13	160	0.13	**P1C-4LMCA**
50	54	65	45	21	4	4.3	22	14.0	27	6.5	17	16	18	170	0.17	**P1C-4MMCA**
63	60	75	51	21	4	4.3	25	14.0	32	6.5	20	16	18	190	0.36	**P1C-4NMCA**
80	75	95	65	25	4	4.3	30	16.0	36	10.0	20	20	22	210	0.58	**P1C-4PMCA**
100	85	115	75	25	4	4.3	32	16.0	41	10.0	25	20	22	230	0.89	**P1C-4QMCA**
125	110	140	97	37	6	6.3	42	24.0	50	10.0	30	30	30	275	1.75	**P1C-4RMCA**
160	140	178	122	43	6	6.3	46	26.5	55	10.0	37	35 h9	36	C.F.	C.F.	**L075510160**
200	175	218	122	43	6	6.3	49	26.5	60	11.5	40	35 h9	38	C.F.	C.F.	**L075510200**

S = Stroke length C.F. = Consult Factory

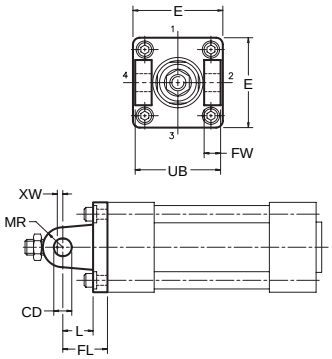
Head Detachable Clevis – MP7



Intended for flexible mounting of cylinder

Materials
Clevis bracket: Cast iron for 32-63mm bores;
Surface treated aluminum, black for 80-200mm bores
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP7, VDMA 24 562, AFNOR

Bore size	CD mm	E mm	FL mm	FW mm	L mm	MR mm	UB mm	XW mm	Part number
32	10	46.5	22	8	12	10	45	4	**L075400032**
40	12	52	25	9	15	12	52	5	**L075400040**
50	12	63.5	27	10	15	13	60	10	**L075400050**
63	16	76	32	15	20	16	70	5	**L075400063**
80	16	95.5	36	20	20	17	90	10	**L075400080**
100	20	114.5	41	25	25	21	110	10	**L075400100**
125	25	140	50	30	35	25	130	15	**L075400125**
160	30	177	55	40	36	30	170	25	**L075400160**
200	30	214	60	40	41	30	170	35	**L075400200**

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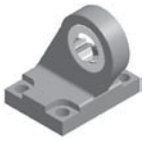
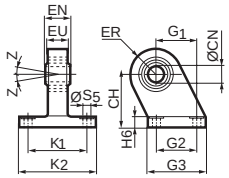
Pivot Bracket with Swivel Bearing



Intended for use together with clevis bracket GA.

Material
Pivot bracket: Surface-treated steel, black
Swivel bearing acc. to DIN 648K: Hardened steel



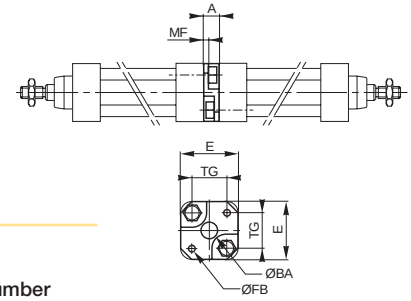
According to VDMA 24 562, AFNOR

Bore size mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z	Weight kg	Part number
32	10	6.6	38	51	10.5	21	18	14	31	32	10	16	4°	0.18	**P1C-4KMA**
40	12	6.6	41	54	12.0	24	22	16	35	36	10	18	4°	0.25	**P1C-4LMA**
50	16	9.0	50	65	15.0	33	30	21	45	45	12	21	4°	0.47	**P1C-4MMA**
63	16	9.0	52	67	15.0	37	35	21	50	50	12	23	4°	0.57	**P1C-4NMA**
80	20	11.0	66	86	18.0	47	40	25	60	63	14	28	4°	1.05	**P1C-4PMA**
100	20	11.0	76	96	18.0	55	50	25	70	71	15	30	4°	1.42	**P1C-4QMA**
125	30	14.0	94	124	25.0	70	60	37	90	90	20	40	4°	3.10	**P1C-4RMA**

Mounting kit

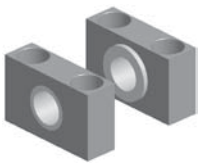
Mounting kit for back to back mounted cylinders, 3 and 4 position duplex cylinders.

Material
Mounting: Aluminium
Mounting screws: Zinc-plated steel 8.8



Bore size mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm	Weight kg	Part number
32	50	32.5	6.5	5	16	30	0.060	**P1E-6KB0**
40	60	38.0	6.5	5	16	35	0.078	**P1E-6LB0**
50	66	46.5	8.5	6	20	40	0.162	**P1E-6MB0**
63	80	56.5	8.5	6	20	45	0.194	**P1E-6NB0**
80	100	72.0	10.5	8	25	45	0.450	**P1E-6PB0**
100	118	89.0	10.5	8	25	55	0.672	**P1E-6QB0**

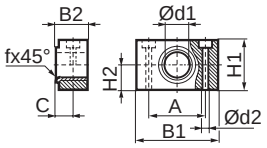
Pivot Bracket – MT4



Intended for use together with central trunnion MT4.

Material
Pivot bracket: Surface-treated aluminium
Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing

Supplied in pairs.



According to ISO, VDMA 24 562, AFNOR

Bore size mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm	Weight* kg	Part number
32	46	18.0	32	10.5	12	6.6	30	15	1.0	0.04	**9301054261**
40	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	**9301054262**
50	55	21.0	36	12.0	16	9.0	36	18	1.6	0.07	
63	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	**9301054264**
80	65	23.0	42	13.0	20	11.0	40	20	1.6	0.12	
100	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	**9301054266**
125	75	28.5	50	16.0	25	14.0	50	25	2.0	0.21	

* Weight per item

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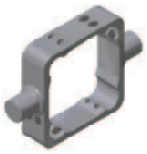
Intermediate Trunnion – MT4



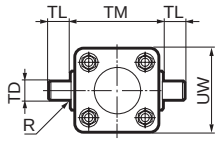
Standard*

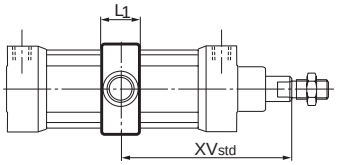
Tie Rod Version

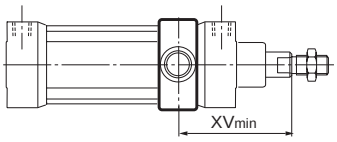
Intended for articulated mounting of cylinder. The trunnion is factory-fitted at an optional location. Order by specifying Mounting Style G or 7 and providing the desired XV dimension (3-digit measure in mm). See page B64 for ordering information. Combined with pivot bracket for MT4 for 32-125mm bores.

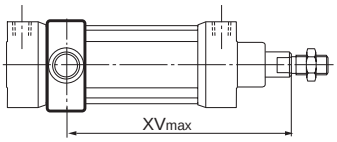
Material:
Trunnion: Zinc plated steel
(Cast iron for 160-200mm bores)

* Standard mounting is for the Standard cylinder body and is permanently affixed by the factory.







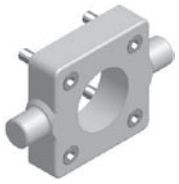


According to ISO MT4, VDMA 24 562, AFNOR

Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	X1 mm	XVmin mm	X2 mm	Weight kg
32	50	12	12	1.0	46	15	73.0	62.0	84.0	0.13
40	63	16	16	1.6	59	20	82.5	73.0	92.0	0.31
50	75	16	16	1.6	69	20	90.0	80.5	99.5	0.37
63	90	20	20	1.6	84	25	97.5	89.5	106.0	0.69
80	110	20	20	1.6	102	25	110.0	98.0	122.0	0.89
100	132	25	25	2.0	125	30	120.0	110.5	129.5	1.58
125	160	25	25	2.0	155	32	145.0	132.0	158.0	2.60
160	200	32	32	2.5	190	70	C.F.	169	C.F.	C.F.
200	250	32	32	2.5	242	70	C.F.	184	C.F.	C.F.

XVstd = X1 + Stroke length/2 XVmax = X2 + Stroke length C.F. = Consult Factory

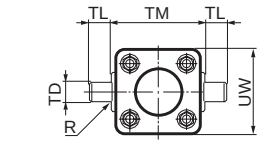
Flange Mounted Trunnion

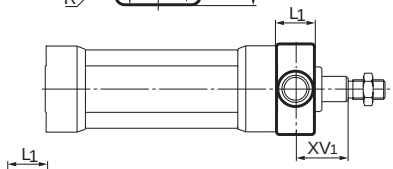


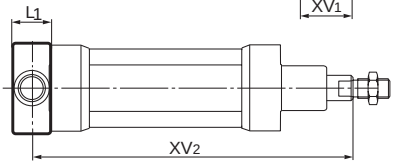
Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. If you choose, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the ordering information on page B64 Individual trunnions have part numbers as shown below.

Material
Trunnion: zinc plated steel
Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder







According to ISO MT4, VDMA 24 562, AFNOR

Bore size mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV_1 mm	X mm	Weight kg	Part number
32	50	12	12	1.0	46	14	19.0	127.0	0.17	**P1D-4KMYF**
40	63	16	16	1.6	59	19	20.5	144.5	0.43	**P1D-4LMYF**
50	75	16	16	1.6	69	19	27.5	152.5	0.55	**P1D-4MMYF**
63	90	20	20	1.6	84	24	25.0	170.0	1.10	**P1D-4NMYF**
80	110	20	20	1.6	102	24	34.0	186.0	1.66	**P1D-4PMYF**
100	132	25	25	2.0	155	29	36.5	203.5	3.00	**P1D-4QMYF**

XV_2 = X + Stroke length

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Swivel Rod Eye

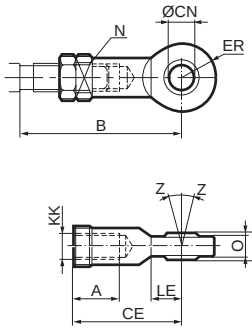
Stainless Steel
Swivel Rod Eye

Swivel rod eye for articulated mounting of cylinder.
Swivel rod eye can be combined with clevis bracket GA.
Maintenance-free.

Materials
Swivel rod eye: Zinc-plated steel
Swivel bearing according to DIN 648K: Hardened steel

Swivel rod eye: Stainless steel
Swivel bearing according to DIN 648K: Stainless steel

Use stainless steel nut (see next page) with stainless steel swivel rod eye.

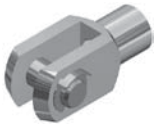


According to ISO 8139

Bore size mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z	Weight kg	Part number	Stainless steel part number
32	20	48.0	55	3	10	14	14	M10x1.25	15	17	10.5	12°	0.08	**P1C-4KRS**	**P1S-4JRT**
40	22	56.0	62	50	12	16	16	M12x1.25	17	19	12.0	12°	0.12	**P1C-4LRS**	**P1S-4LRT**
50	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25	**P1C-4MRS**	**P1S-4MRT**
63	28	72.0	80	64	16	21	21	M16x1.5	22	22	15.0	15°	0.25		
80	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46	**P1C-4PRS**	**P1S-4PRT**
100	33	87.0	97	77	20	25	25	M20x1.5	26	32	18.0	15°	0.46		
125	51	123.5	137	110	30	37	35	M27x2	36	41	25.0	15°	1.28	**P1C-4RRS**	**P1S-4RRT**
160/200	56	C.F.	C.F.	125	35*	43	40	M36x2	40	50	28.0	15°	C.F.	**L075470036**	**C.F.**

*H7 C.F. = Consult Factory

Clevis

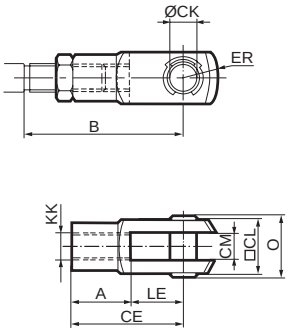


Stainless Steel
Clevis

Clevis for articulated mounting of cylinder.

Material
Clevis, clip: Galvanized steel
Pin: Hardened steel

Clevis: Stainless steel
Pin: Stainless steel
Circlips according to DIN 471: Stainless steel



According to ISO 8140

Bore size mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm	Weight kg	Part number	Stainless steel part number
32	20	45.0	52	40	10	20	10	16	M10x1.25	20	28.0	0.09	**P1C-4KRC**	**P1S-4JRD**
40	24	54.0	60	48	12	24	12	19	M12x1.25	24	32.0	0.15	**P1C-4LRC**	**P1S-4LRD**
50	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35	**P1C-4MRC**	**P1S-4MRD**
63	32	72.0	80	64	16	32	16	25	M16x1.5	32	41.5	0.35		
80	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75	**P1C-4PRC**	**P1S-4PRD**
100	40	90.0	100	80	20	40	20	32	M20x1.5	40	50.0	0.75		
125	56	123.5	137	110	30	55	30	45	M27x2	54	72.0	2.10	**P1C-4RRC**	**P1S-4RRD**
160/200	71	C.F.	C.F.	144	35	70	35	57	M36x2	72	95	C.F.	**L075490036**	**C.F.**

C.F. = Consult Factory

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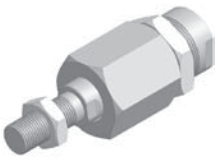
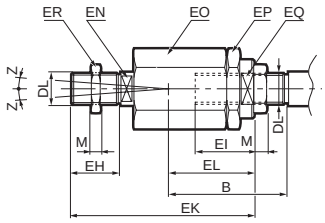
Flexo Coupling



Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of ±4°.

Material
Flexo coupling, nut: Zinc-plated steel
Socket: Hardened steel

Supplied complete with galvanized adjustment nut.



Bore size mm	B min mm	B max mm	DL	EH mm	EI mm	EK mm	EL mm	EN mm	EO mm	EP mm	EQ mm	ER mm	M mm	Z	Weight kg	Part number
32	36.0	43	M10x1.25	20	23	70	31	12	30	30	19	30	5.0	4°	0.21	**P1C-4KRF**
40	37.0	43	M12x1.25	23	23	67	31	12	30	30	19	30	6.0	4°	0.22	**P1C-4LRF**
50	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	**P1C-4MRF**
63	53.0	61	M16x1.5	40	32	112	45	19	41	41	30	41	8.0	4°	0.67	
80	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	**P1C-4PRF**
100	57.0	67	M20x1.5	39	42	122	56	19	41	41	30	41	10.0	4°	0.72	
125	75.5	89	M27x2	48	48	145	60	24	55	55	32	55	13.5	4°	1.80	**P1C-4RRF**
160/200	C.F.	C.F.	M36x2	72	78	251	C.F.	36	75	75	50	55	18.0	4°	C.F.	**L075530036**

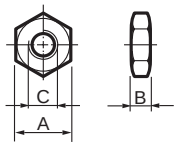
C.F. = Consult Factory

Nuts

Intended for fixed mounting of accessories to the piston rod.

Material: Zinc-plated steel

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.



Stainless Steel Nut

Material: Stainless steel A2

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.

Acid-proof nut

Material: Acid-proof steel A4

Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel

According to DIN 439 B

Bore size mm	A mm	B mm	C	Weight kg	Part numbers		
					Steel	Stainless steel	Acid-proof
32	17	5.0	M10x1.25	0.007	**9128985601**	**9126725404**	**0261109919**
40	19	6.0	M12x1.25	0.010	**0261109910**	**9126725405**	**0261109920**
50	24	8.0	M16x1.5	0.021	**9128985603**	**9126725406**	**0261109917**
63	24	8.0	M16x1.5	0.021			
80	30	10.0	M20x1.5	0.040	**0261109911**	**0261109921**	**0261109916**
100	30	10.0	M20x1.5	0.040			
125	41	13.5	M27x2	0.100	**0261109912**	**0261109922**	**0261109918**
160/200	55	18.0	M36x2	C.F.	**L075540036**	**C.F.**	**C.F.**

C.F. = Consult Factory

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- 304 stainless steel cylinder body, non repairable construction
- Aluminum heads and caps, Delrin heads and caps are optional
- 12 bore sizes — 5/16" through 3" (see dimensional tables for SRM and SRD/SRDM exclusions).
- Stainless steel piston rods are standard up to 1.50" bore
- 28 standard mounting styles (not all available on SRM and SRD/SRDM – see table on following page)
- Single and double acting
- Adjustable cushions optional on both ends

Operating information

Operating pressure:	250 PSIG for SR and SRM 100 PSIG for SRD/SRDM
Temperature range:	-10°F to 165°F for SR 14°F to 140°F for SRM 32°F to 160°F for SRD/SRDM
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

1.06	C		D	SR	B	V				C	2.00

Bore Size [1]

.31	5/16"
.44	7/16"
.56	9/16"
.75	3/4"
.88	7/8"
1.06	1-1/16"
1.25	1-1/4"
1.50	1-1/2"
1.75	1-3/4"
2.00	2"
2.50	2-1/2"
3.00	3"

Cushion Head [2]
Use "C" only when cushion head is required.

Double Rod
Use "K" only when double rod is required.
Available on DX and DXH mounting only.

Mounting [1]
N, NR, NRP, P, R, RP, D, DP, DXP, DX, DXH, A, RA, AP, AR, BRN, BRR, BFD, BRD, BFN, BFR, TRN, TRR, TFD, TRD, TFN or TFR.

Series

SR	Standard cylinder
SRM	With magnetic piston
SRD	With delrin caps
SRDM	With delrin caps and magnetic piston

Piston

Blank	No bumpers
B	With bumpers [3]

Seals

Blank	Standard seals
V	Fluorocarbon seals [4]
W	Rod wiper

Special
Use "S" only if special modifications are required, except piston rod end.

Non-Standard Rod
Specify Y for stainless steel piston rod.
Stainless steel is standard on all bore sizes up to and including 1.50" Bore.

Non-Standard Piston Rod
Use "3" only when special piston rod end is required.
Specify CC, LE and A Dimensions (See next page.)

Cushion Cap [2]
Use "C" only when cushion cap is required.

Stroke
Specify in inches.

[1] Bore sizes and mounting styles are limited by series. See table on next page for availability.
[2] Cushions not available on SRD/SRDM series.
[3] Bumpers may increase cylinder length. Please reference catalog 0900P-E, page D37 for adders.
[4] Fluorocarbon seals not available on SRM or SRDM series.

Sensors
For sensors see page B296.

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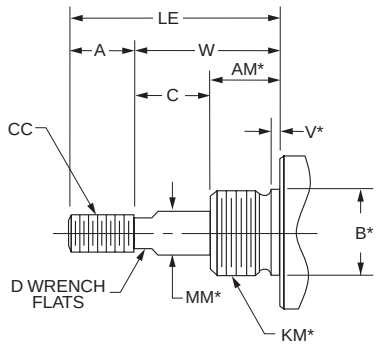
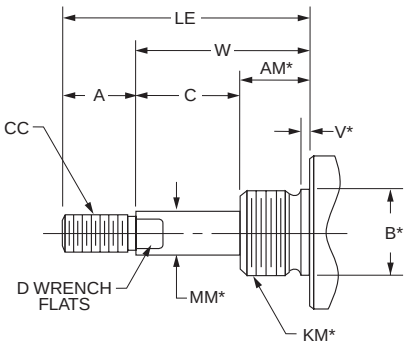
Non-Standard Rods

For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in the drawing. Specify CC, LE and A dimensions.

Full diameter rod end threads



Undersized rod end threads

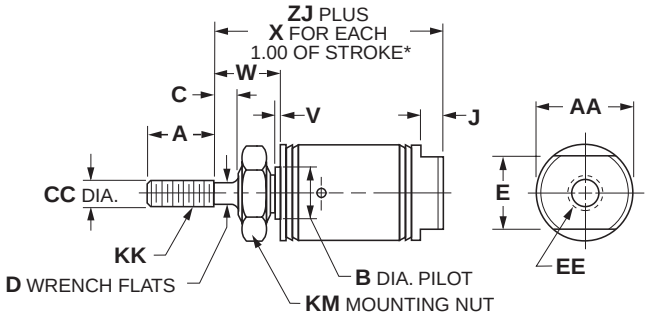


* Requires an S designation in model number.

Mounting Style N

Nose Mount, Spring Return

Bore size	SR	SRM	Std. strokes (in)	Max.. stroke (in)	SS rod std
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✔
7/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	✔
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
1-1/4"	•	•	1/2, 1, 2, 3, 4	6	✔
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✔
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	
2"	•	•	–	4	



Bore size	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	ZJ SR	ZJ SRM
5/16"	0.38	0.36	–	–	0.125	–	0.36	#10-32	–	#5-40 UNC	1/4-28	0	0.25	0.75**	1.12	–
7/16"	0.50	0.50	0.374	–	0.188	–	0.38	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.31	0.94**	1.31	–
9/16"	0.50	0.62	0.437	–	0.188	–	0.50	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.38	1.62	1.53	1.76
3/4"	0.50	0.81	0.499	–	0.250	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.44	1.69	1.50	1.75
7/8"	0.50	0.93	0.624	–	0.250	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.50	1.56	1.84	–
1-1/16"	0.50	1.12	0.624	0.12	0.312	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.62	1.56	2.06	2.31
1-1/4"	0.75	1.34	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.69	2.44	2.69
1-3/4"	0.88	1.84	1.031	0.38	0.500	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	0.75	2.0	2.97	3.09
2"	0.88	2.08	1.374	0.38	0.625	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-12	0.12	1.19	–	▲	▲

▲ 5.66" for 1" stroke; 7.66" for 2" stroke; 8.91" for 3" stroke; 11.84" for 4" stroke.

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

** For each 0.50" of stroke

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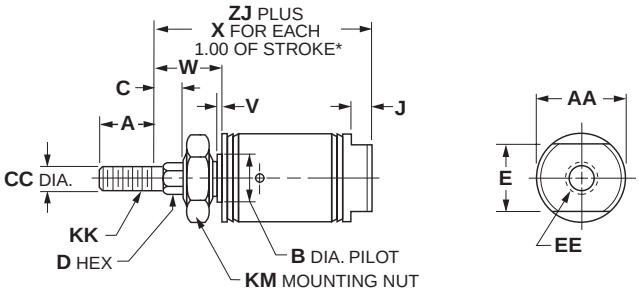
Mounting Style NR

Nose Mount, Spring Return, Hex Rod



Bore size	SR	SRM	Std. stroke (in)	Max.. stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔
1-1/4"	•	•	1, 2, 3, 4	6	✔
1-1/2"	•	•	1/2, 1, 2, 3, 4	6	✔
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6	

Bore size	A	AA	B	C	CC	D	E	EE	J	KK	KM	V	W	X	ZJ	
															SR	SRM
7/16"	0.50	–	0.374	0.25	0.188	3/16	–	#10-32	0.19	#10-32 UNF	3/8-24	0.05	0.56	0.94	1.56	–
9/16"	0.50	–	0.437	0.25	0.188	3/16	–	#10-32	0.19	#10-32 UNF	7/16-20	0.06	0.62	1.62	1.78	2.03
3/4"	0.50	–	0.499	0.25	0.250	1/4	–	1/8 NPTF	0.19	1/4-28 UNF	1/2-20	0.09	0.69	1.69	1.75	2.00
7/8"	0.50	–	0.624	0.25	0.250	1/4	–	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.09	0.75	1.56	2.09	–
1-1/16"	0.50	1.12	0.624	0.25	0.312	3/8	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	0.09	0.75	1.56	2.19	2.44
1-1/4"	0.88	1.34	0.749	0.25	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	0.88	1.81	2.66	2.78
1-1/2"	0.88	1.56	0.749	0.38	0.437	7/16	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	0.09	1.00	1.69	2.56	2.81
1-3/4"	0.88	1.84	1.031	0.38	0.500	1/2	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	0.09	1.12	2.0	3.03	3.15

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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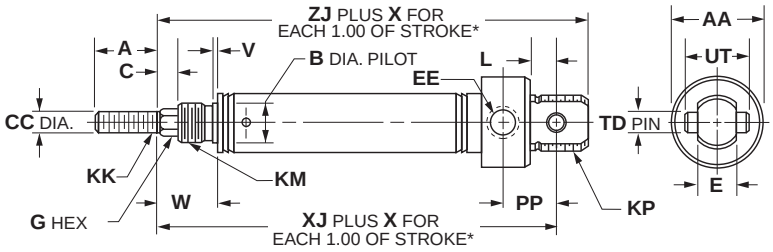
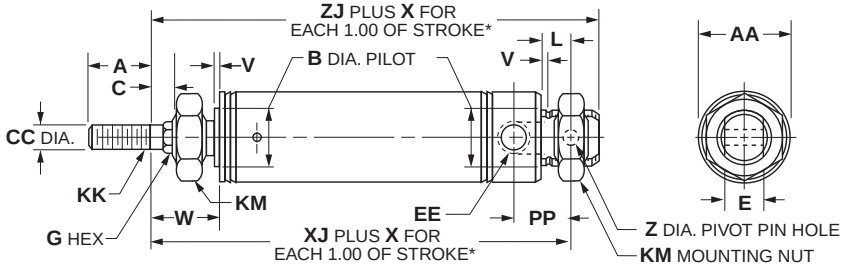
Mounting Style NRP

Pivot & Nose Mount, Spring Return, Hex Rod



Bore sizes
7/16" *
3/4"

* No mounting nuts



Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.74	0.374	0.25	0.188	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.62	0.437	0.25	0.188	0.31	#10-32
3/4"	•	•	1, 2, 3, 4	6	✔	0.50	0.86	0.499	0.25	0.250	0.38	1/8 NPTF
7/8"	•		1, 2, 3, 4	6	✔	0.50	0.93	0.624	0.25	0.250	0.38	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.50	1.12	0.624	0.25	0.312	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✔	0.88	1.34	0.749	0.25	0.437	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✔	0.88	1.56	0.749	0.38	0.437	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.38	0.500	0.62	1/4 NPTF

Bore size	G HEX	KK	KM	KP	L	PP	TD	UT	V	W	X	XJ		Z	ZJ	
												SR	SRM		SR	SRM
7/16"	3/16	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.56	0.94	2.00	–	–	2.25	–
9/16"	3/16	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	–	–	0.06	0.62	1.62	2.06	2.31	0.157	2.25	2.50
3/4"	1/4	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.69	1.69	2.53	2.78	–	2.81	3.06
7/8"	1/4	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.72	–	–	3.00	–
1-1/16"	3/8	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.75	1.56	2.78	3.03	–	3.06	3.31
1-1/4"	7/16	7/16-20 UNF	3/4-16	–	0.41	0.78	0.251	–	0.09	0.88	1.81	3.38	3.50	0.251	3.78	3.91
1-1/2"	7/16	7/16-20 UNF	3/4-16	–	0.50	0.81	0.375	1.00	0.09	1.00	1.69	3.25	3.50	–	3.62	3.87
1-3/4"	1/2	1/2-20 UNF	1-14	–	0.50	1.12	0.376	0.62	0.09	1.12	2.0	4.09	4.21	0.376	4.59	4.71

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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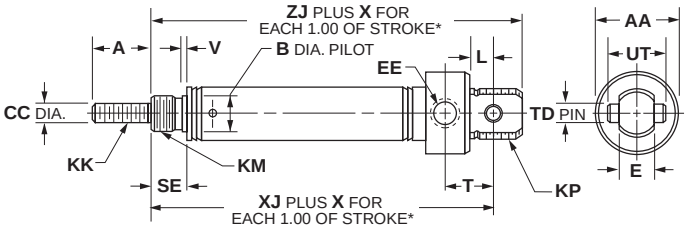
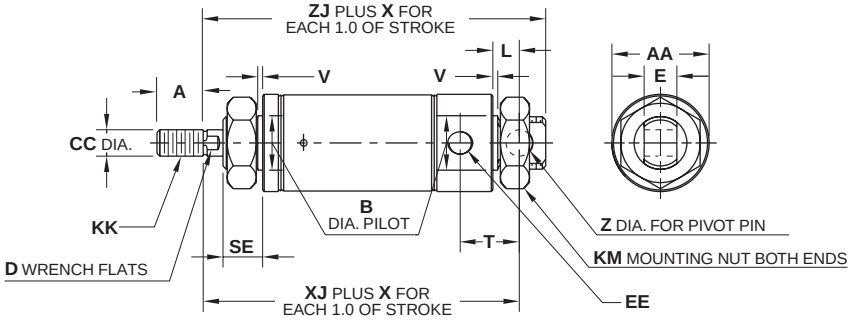
Mounting Style P

Pivot Mount, Spring Return



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts



Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
5/16"	•		1/2, 1, 1-1/2, 2, 3, 4	4	✔	0.38	0.39	–	0.125	–	0.25	#10-32
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.74	0.374	0.188	–	0.31	#10-32
9/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.62	0.437	0.188	–	0.31	#10-32
3/4"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.86	0.499	0.250	–	0.38	1/8 NPTF
7/8"	•		1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.93	0.624	0.250	–	0.38	1/8 NPTF
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF
1-1/4"	•	•	1, 2, 3, 4	6	✔	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✔	0.75	1.56	0.749	0.437	0.38	0.62	1/8 NPTF
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	0.62	1/4 NPTF
2"	•	•	–	4		0.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF

Bore size	KK	KM	KP	L	SE	T	TD	UT	V	X	XJ SR	XJ SRM	Z	ZJ SR	ZJ SRM
5/16"	#5-40 UNC	3/8-24	–	0.34	0.25	0.34	–	–	–	0.75	1.52	–	0.125	1.68	–
7/16"	#10-32 UNF	3/8-24	7/16-20 UNF	0.25	0.31	0.44	0.156	0.50	0.05	0.94	1.75	–	–	2.00	–
9/16"	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.38	0.38	–	–	0.06	1.62	1.81	2.06	0.157	2.00	2.25
3/4"	1/4-28 UNF	1/2-20	5/8-18 UNF	0.34	0.44	0.62	0.250	0.75	0.09	1.69	2.28	2.53	–	2.56	2.81
7/8"	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.47	–	–	2.75	–
1-1/16"	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.50	0.62	0.250	0.75	0.09	1.56	2.66	2.91	–	2.94	3.19
1-1/4"	7/16-20 UNF	3/4-16	–	0.41	0.63	0.78	–	–	0.09	1.81	3.38	3.91	0.251	3.78	3.50
1-1/2"	7/16-20 UNF	3/4-16	–	0.50	0.63	0.81	0.375	1.00	0.09	1.81	3.12	3.37	–	3.50	3.75
1-3/4"	1/2-20 UNF	1-14	–	0.50	0.75	1.12	–	–	0.09	2.0	4.03	4.15	0.376	4.53	4.65
2"	1/2-20 UNF	1-1/4-12	–	0.56	0.81	1.03	–	–	0.12	–	■	✷	–	▲	◆

■ 6.34" for 1" stroke, 8.34" for 2" stroke, 9.59" for 3" stroke, 12.53" for 4" stroke*

▲ 6.78" for 1" stroke, 8.78" for 2" stroke, 10.03" for 3" stroke, 12.97" for 4" stroke*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

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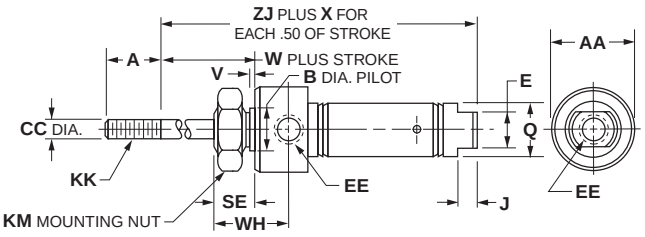
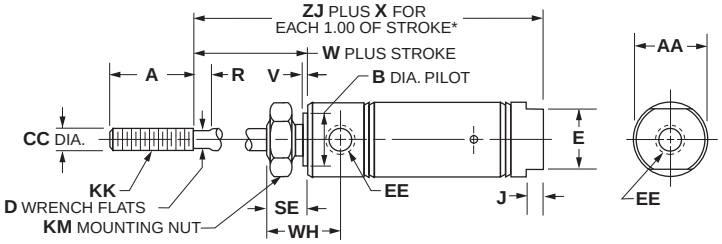
Mounting Style R

Nose Mount, Spring Extended



Bore sizes
5/16
7/16"
3/4"



Bore sizes
9/16"
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✔	0.38	0.50 SQ.	–	0.125	–	–
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✔	0.50	0.74	0.437	0.188	–	0.38
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✔	0.50	0.62	0.437	0.188	–	0.50
3/4"	•	•	1/2, 1, 2, 3, 4	6	✔	0.50	0.86	0.624	0.250	–	–
7/8"	•		1/2, 1, 2, 3, 4	6	✔	0.50	0.93	0.624	0.250	–	–
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	1.12	0.624	0.312	0.25	–
1-1/4"	•	•	1, 2, 3, 4	6	✔	0.75	1.34	0.749	0.437	0.38	–
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	0.749	0.437	0.38	0.88
1-3/4"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	6		0.88	1.84	1.031	0.500	7/16	–
2"	•	•	–	4		0.88	2.08	1.374	0.625	0.50	–

Bore size	EE	J	KK	KM	Q	R	SE	V	W	WH	X	ZJ SR	ZJ SM
5/16"	#10-32	–	#5-40 UNC	3/8-24	0.36	–	0.31	–	0.31	0.47	1.25	1.49	–
7/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.50	–	0.38	0.05	0.38	0.72	1.44	1.94	–
9/16"	#10-32	0.19	#10-32 UNF	7/16-20	0.62	–	0.38	0.05	0.38	0.78	2.62	2.00	2.25
3/4"	1/8 NPTF	–	1/4-28 UNF	5/8-18	0.81	–	0.50	0.09	0.50	0.97	2.69**	2.31	2.56
7/8"	1/8 NPTF	–	1/4-28 UNF	5/8-18	–	–	0.50	0.09	0.50	0.97	2.56	2.31	–
1-1/16"	1/8 NPTF	–	5/16-24 UNF	5/8-18	–	0.12	0.50	0.09	0.62	1.06	2.81	2.62	2.87
1-1/4"	1/8 NPTF	–	7/16-20 UNF	3/4-16	–	0.25	0.62	0.09	0.88	1.38	2.81	3.47	3.60
1-1/2"	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.25	0.62	0.09	0.88	1.25	3.00	3.19	3.44
1-3/4"	1/4 NPTF	–	1/2-20 UNF	1-14	–	–	0.75	0.09	1.06	1.63	3.0	4.03	4.15
2"	1/4 NPTF	–	1/2-20 UNF	1-1/4-12	–	0.38	0.81	0.12	1.19	1.47	–	▲	◆

▲ 7.11" for 1" stroke, 10.11" for 2" stroke, 12.34" for 3" stroke, 16.34" for 4" stroke.*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

** For each 1.00" of stroke.

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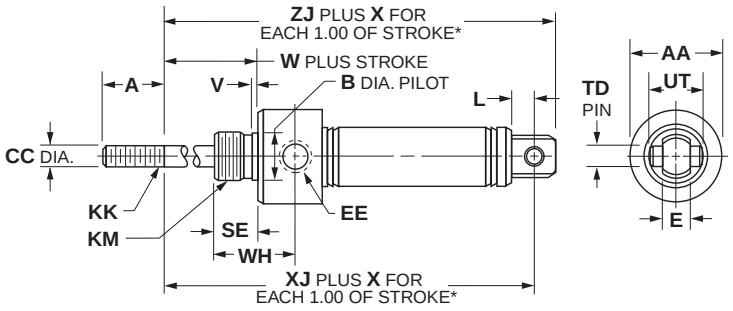
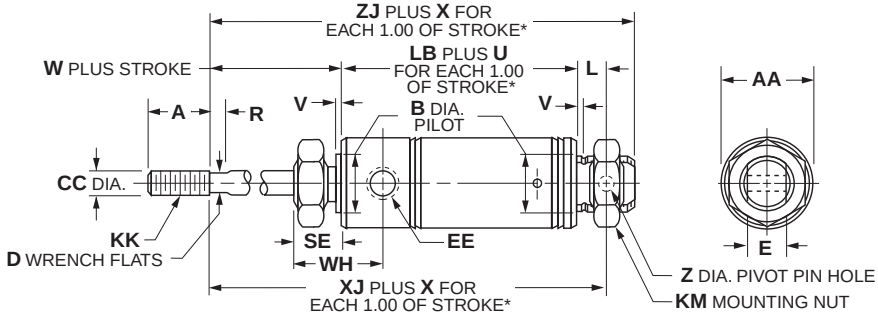
Mounting Style RP

Pivot and Nose Mount, Spring Extended



Bore sizes
5/16" *
7/16"
3/4"

* No mounting nuts



Bore sizes
9/16" *
7/8" *
1-1/16" *
1-1/4"
1-1/2" *
1-3/4"
2" *

* No mounting nuts

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE	KK
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3	4	✔	0.38	0.50 SQ.	–	0.125	–	0.25	#10-32	#5-40 UNC
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✔	0.50	0.74	0.437	0.188	–	0.31	#10-32	#10-32 UNF
9/16"	•	•	1/2, 1, 1-1/2, 2, 3	6	✔	0.50	0.62	0.437	0.188	–	0.31	#10-32	#10-32 UNF
3/4"	•	•	1/2, 1, 2, 3, 4	6	✔	0.50	0.86	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
7/8"	•		1/2, 1, 2, 3, 4	6	✔	0.50	0.93	0.624	0.250	–	0.38	1/8 NPTF	1/4-28 UNF
1-1/16"	•	•	1/2, 1, 1- 1/2, 2, 3, 4	6	✔	0.50	1.12	0.624	0.312	0.25	0.38	1/8 NPTF	5/16-24 UNF
1-1/4"	•	•	1, 2, 3, 4	6	✔	0.75	1.34	0.749	0.437	0.38	0.50	1/8 NPTF	7/16-20 UNF
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	7/16-20 UNF
2"	•	•	–	4		.88	2.08	1.374	0.625	0.50	0.75	1/4 NPTF	1/2-20 UNF

Bore size	KM	L	LB	R	SE	TD	U	UT	V	W	WH	X	XJ SR	XJ SRM	Z	ZJ SR	ZJ SRM
5/16"	3/8-24	0.19	–	–	0.31	–	–	–	–	0.31	0.47	1.25	1.88	–	–	2.04	–
7/16"	7/16-20	0.25	–	–	0.38	0.156	–	0.50	0.05	0.38	0.72	1.44	2.38	–	–	2.62	–
9/16"	7/16-20	0.25	–	–	0.38	–	–	–	0.06	0.38	0.78	2.62	2.28	2.53	0.157	2.47	2.72
3/4"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.69	2.44	2.69	–	2.72	2.97
7/8"	5/8-18	0.34	–	–	0.50	0.250	–	0.75	0.09	0.50	0.97	2.56	2.63	–	–	2.91	–
1-1/16"	5/8-18	0.34	–	0.12	0.50	0.250	–	0.75	0.09	0.62	1.06	2.81	2.78	3.03	–	3.06	3.31
1-1/4"	3/4-16	0.41	2.47	0.25	0.62	–	1.81	–	0.09	0.88	1.38	2.81	3.78	3.91	0.251	4.16	4.28
1-1/2"	3/4-16	0.50	–	0.25	0.62	0.375	–	1.00	0.09	0.88	1.25	3.00	3.88	4.13	–	4.25	4.50
2"	1-1/4 -12	0.56	–	0.38	0.81	–	–	–	0.12	1.19	1.47	–	■	✷	0.376	▲	◆

■ 8.05" for 1" stroke, 11.05" for 2" stroke, 13.28" for 3" stroke, 17.28" for 4" stroke*

▲ 8.50" for 1" stroke, 11.50" for 2" stroke, 13.72" for 3" stroke, 17.72" for 4" stroke*

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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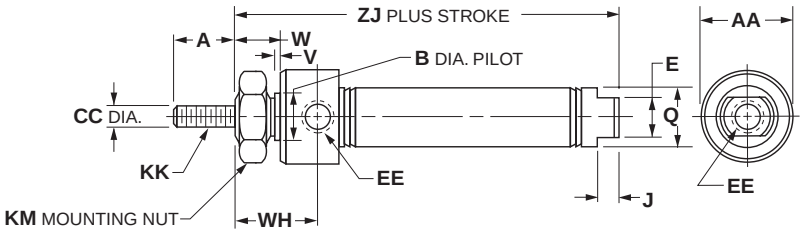
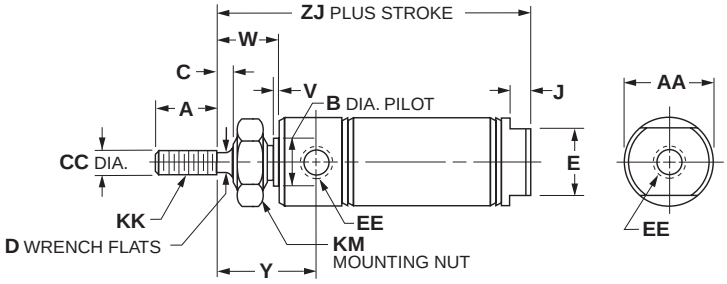
Mounting Style D

Nose Mount, Double Acting



Bore sizes
5/16"
7/16"
3/4"



Bore sizes
9/16"
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC
5/16"	•			1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✔	0.38	0.50 SQ.	–	–	0.125
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.74	0.437	–	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.62	0.437	–	0.188
3/4"	•	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✔	0.50	0.86	0.624	–	0.250
7/8"	•			1/2, 1, 2, 3, 4, 5, 6	12	✔	0.50	0.93	0.624	–	0.250
1-1/16"	•	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✔	0.50	1.12	0.624	0.12	0.312
1-1/4"	•	•		1, 2, 3, 4, 5, 6	12	✔	0.75	1.34	0.749	0.25	0.437
1-1/2"	•	•	•	1/2, 1, 2, 3, 4, 5, 6, 8, 10, 12	12	✔	0.75	1.56	0.749	0.25	0.437
1-3/4"	•	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6	12		0.88	1.84	1.031	0.31	0.500
2"	•	•	•	–	12		0.88	2.08	1.374	0.38	0.625
2-1/2"	•	•		–	12		0.88	2.62	1.500	0.38	0.625
3"	•			–	12		1.25	3.16	1.630	0.38	0.750

Bore size	D	E	EE	J	KK	KM	Q	V	W	WH	Y	ZJ SR	ZJ SRM
5/16"	–	–	#10-32	–	#5-40 UNC	3/8-24	0.36	–	0.31	0.47	–	1.64	–
7/16"	–	0.38	#10-32	0.19	#10-32 UNF	7/16-20	0.50	0.05	0.38	0.72	–	2.12	–
9/16"	–	0.50	#10-32	0.19	#10-32 UNF	7/16-20	–	0.06	0.38	0.78	–	2.28	2.53
3/4"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	0.81	0.09	0.50	0.97	–	2.97	2.97
7/8"	–	0.62	1/8 NPTF	0.19	1/4-28 UNF	5/8-18	–	0.09	0.50	0.97	–	2.94	–
1-1/16"	0.25	0.88	1/8 NPTF	0.19	5/16-24 UNF	5/8-18	–	0.09	0.62	–	1.19	3.25	3.41
1-1/4"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.62	4.00	4.03
1-1/2"	0.38	0.88	1/8 NPTF	0.25	7/16-20 UNF	3/4-16	–	0.09	0.88	–	1.50	3.69	3.94
1-3/4"	7/16	1.25	1/4 NPTF	0.25	1/2-20 UNF	1-14	–	0.09	1.06	1.63	–	4.69	4.69
2"	0.50	1.25	1/4 NPTF	0.31	1/2-20 UNF	1-1/4-12	–	0.12	1.19	–	1.84	4.69	4.97
2-1/2"	1/2	1.75	1/4 NPTF	0.31	1/2-20 UNF	1-3/8-12	–	0.13	1.19	–	1.84	4.69	4.69
3"	5/8	2.00	3/8 NPTF	0.31	5/8-18 UNF	1-1/2-12	–	0.19	1.38	–	2.09	5.25	–

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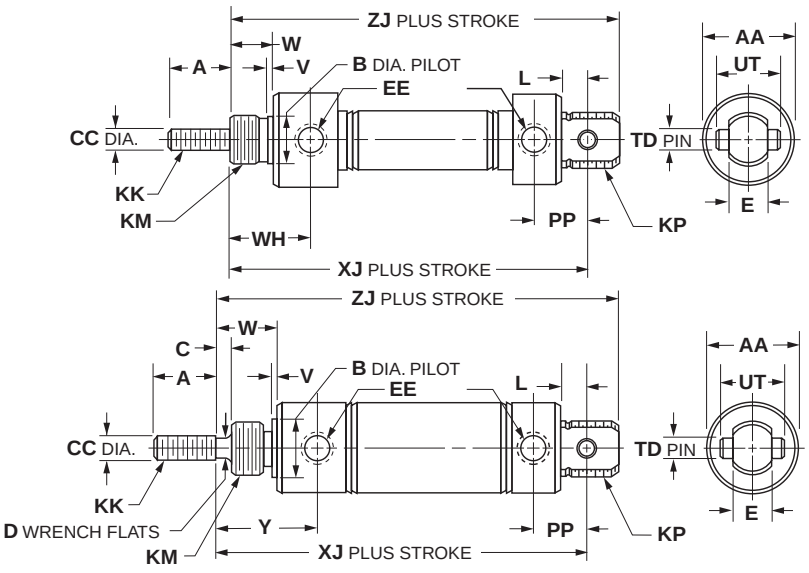
Mounting Style DP

Pivot and Nose Mount, Double Acting, Pivot Pin



Bore sizes
5/16"
7/16"
3/4"

Bore sizes
1-1/16"
1-1/2"

B

Round Body Cylinders
Actuator Products

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC	D	E
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.74	0.437	0.188	–	0.31
3/4"	•	•	1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10	12	✔	0.50	0.86	0.624	0.250	–	0.38
1-1/16"	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	12	✔	0.50	1.12	0.624	0.312	0.25	0.38
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	12	✔	0.75	1.56	0.749	0.437	0.38	0.62

Bore size	EE	KK	KM	KP	L	PP	TD	UT	V	W	WH	XJ		Y	ZJ	
												SR	SRM		SR	SRM
7/16"	#10-32	#10-32 UNF	7/16-20	7/16-20 UNF	0.25	0.44	0.156	0.50	0.05	0.38	0.72	2.56	–	–	2.81	–
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.50	0.97	3.75	3.75	–	4.03	4.03
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	5/8-18 UNF	0.34	0.62	0.250	0.75	0.09	0.62	–	3.84	4.00	1.19	4.12	4.28
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	–	0.50	0.81	0.375	1.00	0.09	0.87	–	4.38	4.63	1.50	4.75	5.00

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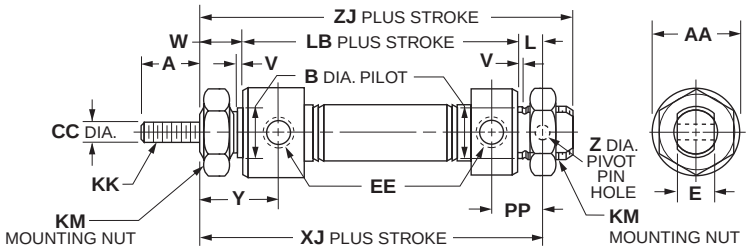
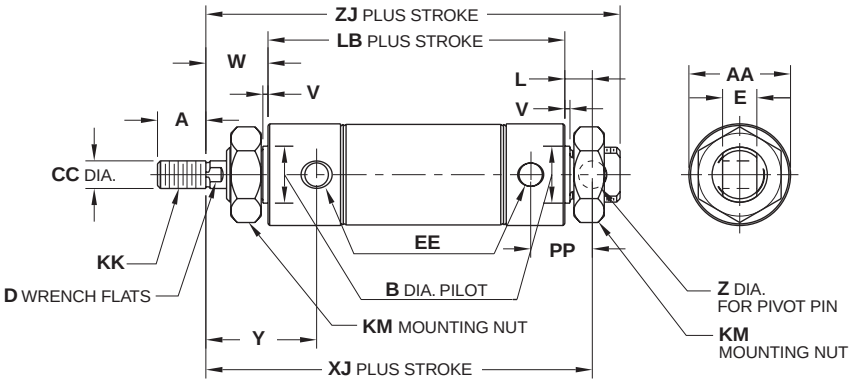
Mounting Style DXP

Pivot & Nose Mount, Double Acting, No Pivot Pin



Bore sizes
5/16"
7/16"
3/4"



Bore sizes
9/16" *
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E
5/16"	•			1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✔	0.38	0.50 SQ.	–	0.125	–	0.25
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.74	0.437	0.188	–	0.31
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.62	0.437	0.188	–	0.31
3/4"	•	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✔	0.50	0.86	0.624	0.250	–	0.38
7/8"	•			1, 2, 3, 4, 5, 6, 8, 10	32	✔	0.50	0.93	0.624	0.250	–	0.38
1-1/16"	•	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✔	0.50	1.12	0.624	0.312	0.25	0.38
1-1/4"	•	•		1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✔	0.75	1.34	0.749	0.437	0.38	0.50
1-1/2"	•	•	•	–	32	✔	0.75	1.56	0.749	0.437	0.38	0.62
1-3/4"	•	•		1, 2, 3, 4, 5, 6, 8, 10, 12	32		0.88	1.84	1.031	0.500	7/16	0.62
2"	•	•	•	–	32		0.88	2.08	1.374	0.625	0.50	0.75
2-1/2"	•	•		–	32		0.88	2.62	1.500	0.625	1/2	0.75
3"	•			–	32		1.25	3.16	1.630	0.750	5/8	0.88

Bore size	EE	KK	KM	L	LB	PP	V	W	XJ SR	XJ SRM	Y	Z	ZJ SR	ZJ SRM
5/16"	#10-32	#5-40 UNC	3/8-24	0.19	–	0.34	–	0.31	2.03	–	–	0.125	2.19	–
7/16"	#10-32	#10-32 UNF	7/16-20	0.25	1.94	0.44	0.05	0.38	2.56	–	0.72	0.157	2.81	–
9/16"	#10-32	#10-32 UNF	7/16-20	0.25	–	0.38	0.06	0.38	2.56	2.81	0.78	0.157	2.75	3.00
3/4"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	2.91	0.62	0.09	0.50	3.75	3.75	0.97	0.251	4.03	4.03
7/8"	1/8 NPTF	1/4-28 UNF	5/8-18	0.34	–	0.62	0.09	0.50	3.56	–	0.97	0.251	3.84	–
1-1/16"	1/8 NPTF	5/16-24 UNF	5/8-18	0.34	–	0.62	0.09	0.62	3.84	–	1.19	0.251	4.12	4.28
1-1/4"	1/8 NPTF	7/16-20 UNF	3/4-16	0.41	–	0.78	0.09	0.88	4.72	4.75	1.62	0.251	5.12	5.16
1-1/2"	1/8 NPTF	7/16-20 UNF	3/4-16	0.50	–	0.81	0.09	0.88	4.38	4.63	1.50	0.376	4.75	5.00
1-3/4"	1/4 NPTF	1/2-20 UNF	1-14	0.50	4.19	1.12	0.09	1.06	5.75	5.75	1.94	0.376	6.25	6.25
2"	1/4 NPTF	1/2-20 UNF	1-1/4-12	0.56	–	1.03	0.12	1.19	5.62	5.91	–	0.376	6.06	6.34
2-1/2"	1/4 NPTF	1/2-20 UNF	1-3/8-12	0.56	–	1.03	0.13	1.19	5.62	5.62	1.84	0.376	6.06	6.06
3"	3/8 NPTF	5/8-18 UNF	1-1/2-12	0.81	–	1.34	0.19	1.38	6.50	–	2.09	0.500	7.12	–

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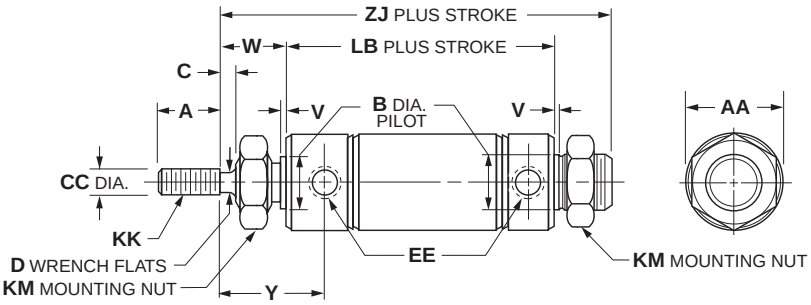
Mounting Style DX

Threaded Both Ends, Double Acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16" *	•		1/2, 1, 1-1/2, 2, 3, 4	12	✔
9/16" *	•	•	1/2, 1, 1-1/2, 2, 3, 4	12	✔
3/4" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✔
7/8" *	•	•	1, 2, 3, 4, 5, 6, 8, 10	32	✔
1-1/16" *	•	•	1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12	32	✔
1-1/4" *	•	•	1, 2, 3, 4, 5, 6, 7, 8, 10, 12	32	✔
1-1/2"	•	•	1, 2, 3, 4, 5, 6, 8, 10, 12	32	✔
2" *	•	•	–	32	

Bore size	A	AA	B	C	CC	D	EE	KK	KM	LB SR	LB SRM	V	W	Y	ZJ SR	ZJ SRM
7/16" *	0.50	0.74	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	1.94		0.05	0.38	0.72	2.81	
9/16" *	0.50	0.62	0.437	–	0.188	–	#10-32	#10-32 UNF	7/16-20	–		0.06	0.38	0.78	2.75	
3/4" *	0.50	0.86	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	2.91		0.09	0.50	0.97	4.03	
7/8" *	0.50	0.93	0.624	–	0.250	–	1/8 NPTF	1/4-28 UNF	5/8-18	–		0.09	0.50	0.97	3.84	
1-1/16" *	0.50	1.12	0.624	0.12	0.312	0.25	1/8 NPTF	5/16-24 UNF	5/8-18	–		0.09	0.62	1.19	4.12	
1-1/4" *	0.75	0.34	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	–		0.09	0.88	1.62	5.12	
1-1/2"	0.75	1.56	0.749	0.25	0.437	0.38	1/8 NPTF	7/16-20 UNF	3/4-16	3.00		0.09	0.88	1.50	4.50	
2" *	0.88	2.08	1.374	0.38	0.625	0.50	1/4 NPTF	1/2-20 UNF	1-1/4-12	–		0.12	1.19	–	6.06	

* Available upon request. Please consult factory.

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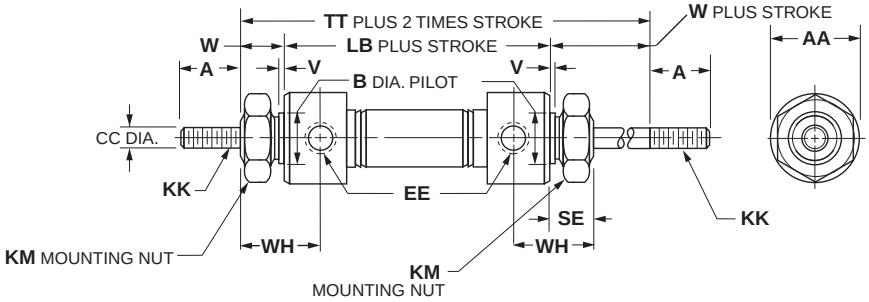
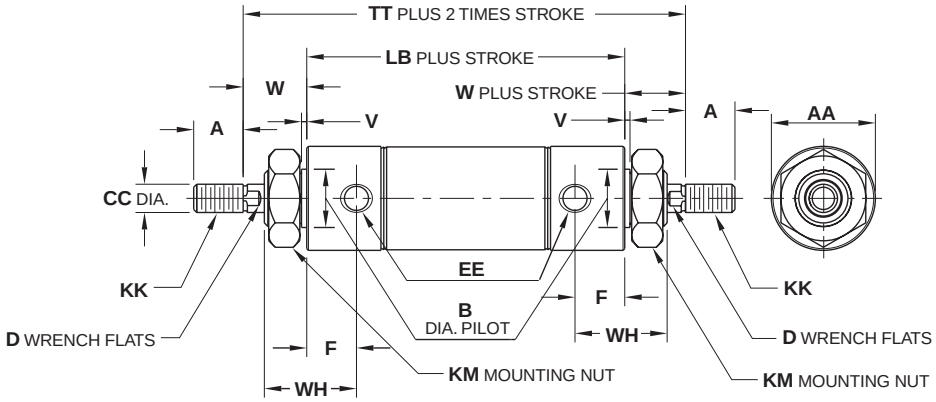
Mounting Style KDX

Threaded Both Ends, Double Acting, Double Rod



Bore sizes
7/16"
3/4"



Bore sizes
9/16" *
7/8"
1-1/16"
1-1/4"
1-1/2"
1-3/4"
2" *
2-1/2" *
3" *

* No mounting nuts

Bore size	SR	SRM	SRD SRDM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	B	CC
7/16"	•			1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.74	0.437	0.188
9/16"	•	•	•	1/2, 1, 1-1/2, 2, 3, 4	6	✔	0.50	0.62	0.437	0.188
3/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✔	0.50	0.86	0.624	0.250
7/8"	•			1, 2, 3, 4, 6	12	✔	0.50	0.93	0.624	0.250
1-1/16"	•	•	•	1, 2, 3, 4, 5, 6	12	✔	0.50	1.12	0.624	0.312
1-1/4"	•	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	1.34	0.749	0.437
1-1/2"	•	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	1.56	0.749	0.437
1-3/4"	•	•		1, 2, 3, 4, 5, 6	12	✔	0.88	1.84	1.031	0.500
2"	•	•	•	–	12	✔	0.88	2.08	1.374	0.625
2-1/2"	•	•		–	18	✔	0.88	2.62	1.500	0.625
3"	•			–	12	✔	1.25	3.16	1.630	0.750

Bore size	D	EE	F	KK	KM	LB SR	LB SRM	SE	TT SR	TT SRM	V	W	WH
7/16"	–	#10-32	0.34	#10-32 UNF	7/16-20	2.06	–	0.38	2.81	–	0.05	0.38	0.72
9/16"	–	#10-32	0.40	#10-32 UNF	7/16-20	2.19	2.44	0.38	2.94	3.19	0.06	0.38	0.78
3/4"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	3.00	3.00	0.50	4.00	4.00	0.09	0.50	0.97
7/8"	–	1/8 NPTF	0.47	1/4-28 UNF	5/8-18	2.91	–	0.50	3.91	–	0.09	0.50	0.97
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.50	4.00	4.53	0.09	0.62	1.19
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.63	5.56	5.59	0.09	0.88	1.62
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.63	5.12	5.38	0.09	0.88	1.50
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	0.75	6.56	6.56	0.09	1.06	1.63
2"	0.50	1/4 NPTF	0.65	1/2-20 UNF	1-1/4-12	4.19	4.47	–	6.56	6.84	0.12	1.19	1.84
2-1/2"	1/2	1/4 NPTF	0.65	1/2-20 UNF	1-3/8-12	4.19	4.19	–	6.56	6.56	0.13	1.19	1.84
3"	5/8	3/8 NPTF	0.71	5/8-18 UNF	1-1/2-12	4.56	–	–	7.31	–	0.19	1.38	1.72

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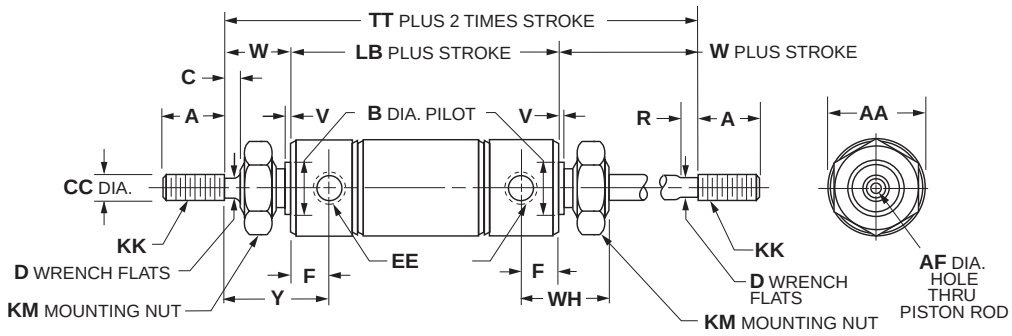
Mounting Style KDXH

Threaded Both Ends, Double Rod, Hollow Rod

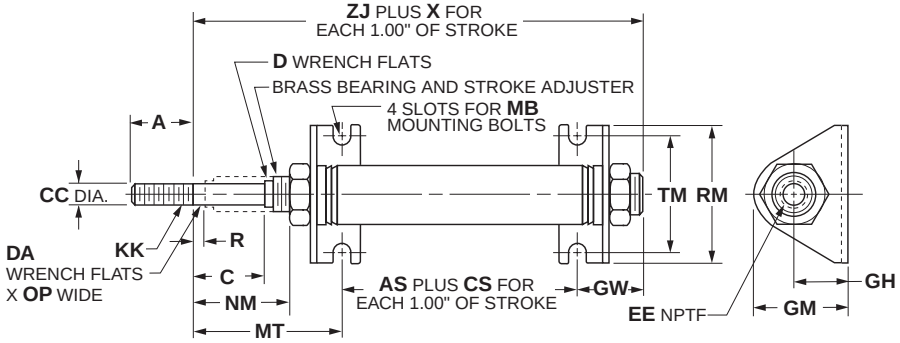


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod	A	AA	AF	B	C	CC
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.50	1.12	0.187	0.624	0.12	0.312
1-1/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.34	0.250	0.749	0.25	0.437
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.75	1.56	0.250	0.749	0.25	0.437
1-3/4"	•	•	1, 2, 3, 4, 5, 6	12	N/A	0.88	1.84	0.328	1.031	0.38	0.500

Bore size	D	EE	F	KK	KM	LB SR	LB SRM	R	TT SR	TT SRM	V	W	WH	Y
1-1/16"	0.25	1/8 NPTF	0.56	5/16-24 UNF	5/8-18	2.75	3.28	0.12	4.00	4.53	0.09	0.62	1.06	1.19
1-1/4"	0.38	1/8 NPTF	0.75	7/16-20 UNF	3/4-16	3.81	3.84	0.25	5.56	5.59	0.09	0.88	1.38	1.62
1-1/2"	0.38	1/8 NPTF	0.62	7/16-20 UNF	3/4-16	3.38	3.63	0.25	5.12	5.38	0.09	0.88	1.25	1.50
1-3/4"	7/16	1/4 NPTF	0.88	1/2-20 UNF	1-14	4.44	4.44	–	6.56	6.56	0.09	1.06	1.63	1.63

Mounting Style A

Nose Mount, Spring Return, Head Adjustable Stroke



Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std	A	AS	C	CC	CS	D
3/4"	•		Stroke adjustment in 1" increments to 3": 1" stroke adjusts 0-1" 2" stroke adjusts 1-2" 3" stroke adjusts 2-3"	6	✔	0.50	–	1.19	0.250	1.69	–
1-1/16"	•			6	✔	0.50	0.32	1.25	0.312	1.56	0.25
1-1/2"	•			6	✔	0.75	0.19	1.25	0.437	2.00	0.62

Bore size	EE	GH	GM	GW	KK	MB	MT	NM	OP	R	RM	TM	X	ZJ
3/4"	1/8 NPTF	0.81	1.38	0.88	1/4-28 UNF	0.250	2.38	1.44	–	0.19	1.88	1.50	1.69	3.12
1-1/16"	1/8 NPTF	0.81	1.38	0.93	5/16-24 UNF	0.250	2.38	1.44	0.12	0.25	1.88	1.50	1.56	3.63
1-1/2"	1/8 NPTF	1.00	1.78	1.25	7/16-20 UNF	0.250	2.56	1.50	–	0.25	2.50	1.88	2.00	4.00

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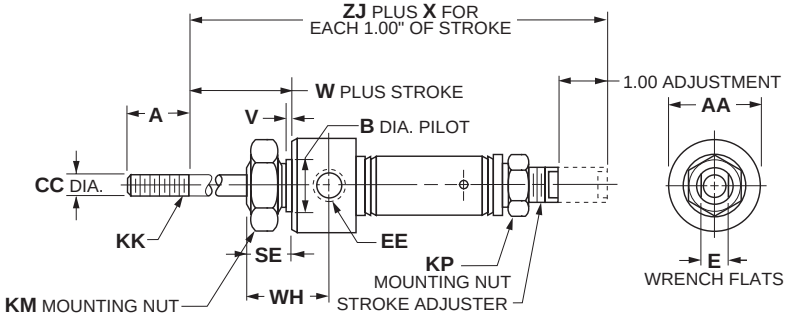
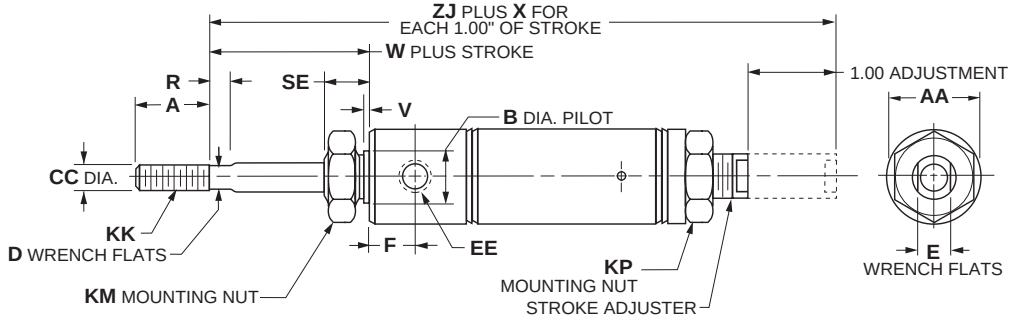
Mounting Style RA

Nose Mount, Spring Return, Cap Adjustable Stroke



Bore sizes
3/4"



Bore sizes
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3":	6	✔
1-1/16"	•		1" stroke adjusts 0-1"	6	✔
1-1/2"	•		2" stroke adjusts 1-2" 3" stroke adjusts 2-3"	6	✔

Bore size	A	AS	AA	B	CC	D	E	EE	F
3/4"	0.50	1.69	0.86	0.624	0.250	–	0.34	1/8 NPTF	–
1-1/16"	0.50	0.32	1.12	0.624	0.312	0.25	0.50	1/8 NPTF	0.56
1-1/2"	1.25	0.19	1.56	0.749	0.437	0.38	0.62	1/8 NPTF	0.62

3/4"	KK	KM	SE	R	V	W	WH	X	ZJ
1-1/16"	1/4-28 UNF	5/8-18	0.50	–	0.09	0.53	0.97	2.69	3.78
1-1/2"	5/16-24 UNF	5/8-18	0.50	0.12	0.09	0.50	–	2.56	4.03
1-1/2"	7/16-20 UNF	3/4-16	0.62	0.25	0.09	0.88	–	2.00	5.81

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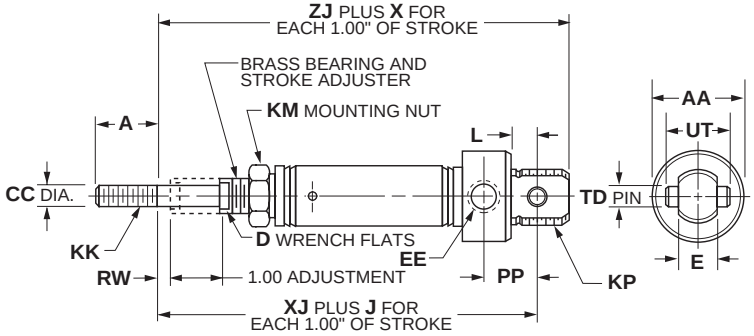
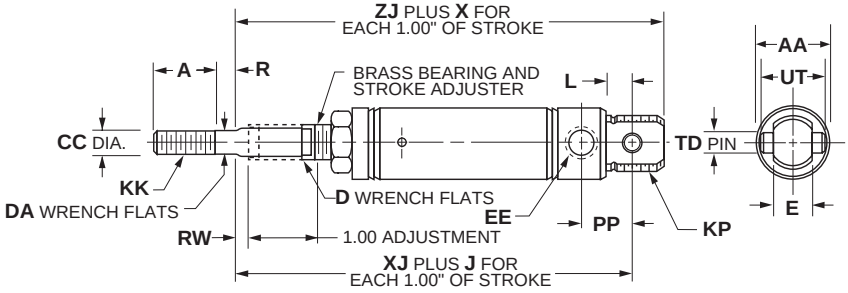
Mounting Style AP

Pivot Mount, Spring Return, Head Adjustable Stroke



Bore sizes
3/4"



Bore sizes
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke	Max. stroke (in)	SS rod std
3/4"	•		Stroke adjustment in 1" increments to 3":	6	✔
1-1/16"	•		1" stroke adjusts 0-1"	6	✔
			2" stroke adjusts 1-2"		
1-1/2"	•		3" stroke adjusts 2-3"	6	✔

Bore size	A	AA	CC	D	DA	E	EE	J	KK
3/4"	0.50	0.86	0.250	0.34	–	0.38	1/8 NPTF	1.69	1/4-28 UNF
1-1/16"	0.50	1.12	0.312	0.50	0.25	0.38	1/8 NPTF	1.56	5/16-24 UNF
1-1/2"	0.75	1.56	0.437	0.62	0.38	0.62	1/8 NPTF	2.00	7/16-20 UNF

Bore size	KM	KP	L	OP	PP	R	RW	TD	UT	X	XJ	ZJ
3/4"	7/16-20	5/8-18 UNF	0.34	–	0.62	0.19	0.19	0.250	0.75	1.69	3.65	3.93
1-1/16"	–	5/8-18 UNF	0.34	0.25	0.62	0.12	0.25	0.250	0.75	1.56	3.97	4.25
1-1/2"	3/4-16	–	0.50	–	0.81	0.25	0.25	0.375	1.00	2.00	4.31	4.69

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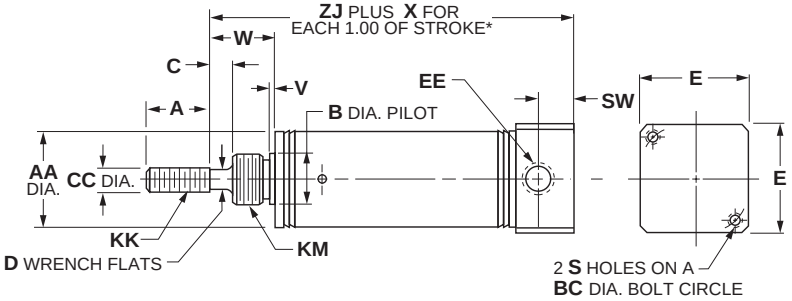
Mounting Style BRN

Rear Block Mount, Single Acting, Spring Return



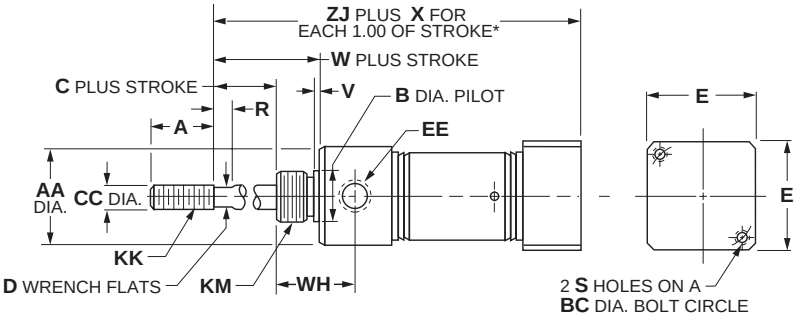
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D
7/16"	•		1/2, 1, 2, 3, 4	6	✔	0.50	0.5	0.374	–	0.188	–
3/4"	•	•	1, 2, 3, 4	6	✔	0.75	0.81	0.499	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.75	1.12	0.624	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	0.749	0.25	0.437	0.38

Bore size	E	EE	KK	KM	SW	V	W	X	ZJ SR	ZJ SRM
7/16"	0.75	#10-32	#10-32 UNF	3/8-24	0.38	0.05	0.31	0.94	1.62	–
3/4"	1.00	1/8 NPTF	1/4-28 UNF	1/2-20	0.44	0.09	0.62	1.69	2.31	2.56
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.44	0.09	0.88	1.81	2.81	3.06
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.62	0.09	0.88	2.00	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

Mounting Style BRR

Rear Block Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	C	CC	D
3/4"	•	•	1, 2, 3, 4	6	✔	0.75	0.86	0.624	1.00	0.25	0.250	0.22
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.75	1.12	0.624	1.25	0.38	0.312	0.25
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	0.749	1.75	0.25	0.437	0.38

Bore size	E	EE	KK	KM	R	S	V	W	WH	X	ZJ SR	ZJ SRM
3/4"	1.00	1/8 NPTF	1/4-28 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.75	0.97	2.69	3.22	3.47
1-1/16"	1.25	1/8 NPTF	5/16-24 UNF	5/8-18	0.25	#10-32 UNF	0.09	0.88	1.06	2.81	3.53	3.78
1-1/2"	1.75	1/4 NPTF	7/16-20 UNF	3/4-16	0.25	1/4-20 UNC	0.09	0.88	1.25	3.00	3.88	4.13

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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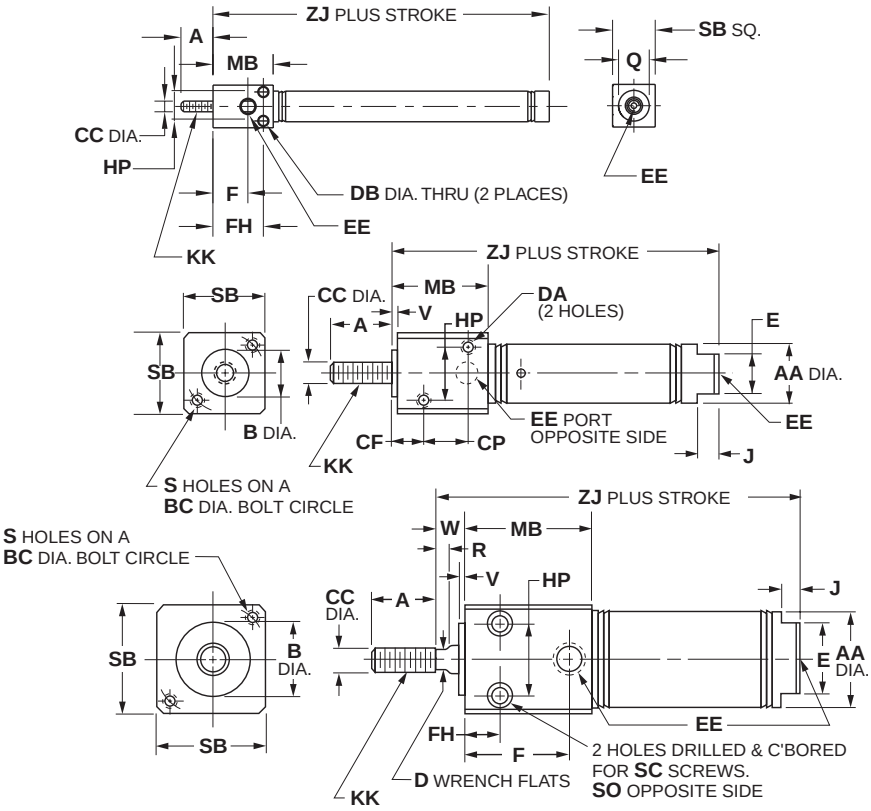
Mounting Style BFD

Front Block Mount, Double Acting



Bore sizes
5/16"

Bore sizes
7/16"

Bore sizes
3/4"
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	BC	CC
5/16"	•		1/2, 1, 1-1/2, 2, 2-1/2, 3, 4	4	✔	0.38	–	–	–	0.125
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.50	0.437	0.75	0.188
3/4"	•	•	1/2, 1, 2, 3, 4, 5, 6	12	✔	0.75	0.81	0.624	1.00	0.250
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	1.12	0.750	1.25	0.312
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✔	1.25	1.56	1.00	1.75	0.437

Bore size	CF	CP	D	DA	DB	E	EE	F	FH	HP	J
5/16"	–	–	–	–	0.11	–	#10-32	0.41	0.59	0.34	–
7/16"	0.31	0.44	–	#8-32	–	0.38	#10-32	–	0.31	0.44	0.19
3/4"	–	–	0.22	–	–	0.62	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	–	–	0.25	–	–	0.88	1/8 NPTF	1.16	0.62	0.81	0.19
1-1/2"	–	–	0.38	–	–	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	KK	MB	Q	R	S	SB	SC	SO	V	W	ZJ SR	ZJ SRM
5/16"	#5-40 UNC	0.71	0.36	–	–	0.50 SQ	–	–	–	–	1.72	–
7/16"	#10-32 UNF	0.88	–	–	#8-32 UNC	0.75	–	–	0.062	–	2.12	–
3/4"	1/4-28 UNF	1.12	–	–	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	3.22	3.22
1-1/16"	5/16-24 UNF	1.41	–	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	3.75	3.91
1-1/2"	7/16-20 UNF	1.88	–	–	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	4.19	4.44

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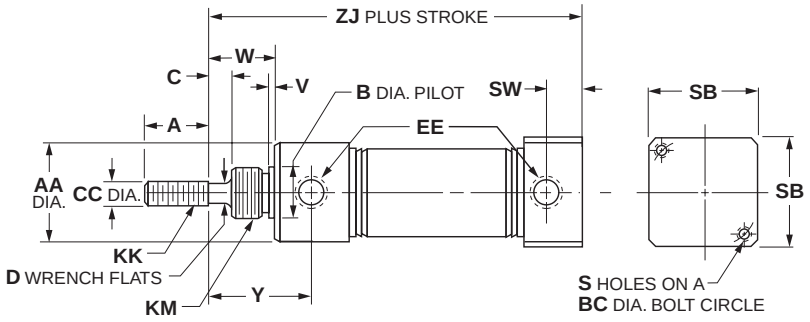
Mounting Style BRD

Rear Block Mount, Double Acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std
7/16"	•		1/2, 1, 2, 3, 4	12	✔
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✔
1-1/16"	•	•	1, 2, 3, 4	12	✔
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✔

Bore size	A	AA	B	BC	C	CC	D	EE	KK
7/16"	0.50	0.74	0.437	0.75	–	0.188	–	#10-32	#10-32 UNF
3/4"	0.75	0.86	0.624	1.00	0.25	0.250	0.22	1/8 NPTF	1/4-28 UNF
1-1/16"	0.75	1.12	0.624	1.25	0.38	0.312	0.25	1/8 NPTF	5/16-24 UNF
1-1/2"	1.25	1.56	0.749	1.75	0.25	0.437	0.38	1/4 NPTF	7/16-20 UNF

Bore size	KM	S	SB	SW	V	W	Y	ZJ	
								SR	SRM
7/16"	7/16-20 UNF	#8-32 UNC	0.75	0.38	0.05	0.43	0.72	2.44	–
3/4"	5/8-18 UNF	#10-32 UNF	1.00	0.44	0.09	0.75	1.22	3.78	3.78
1-1/16"	5/8-18 UNF	#10-32 UNF	1.25	0.44	0.09	0.88	1.44	4.00	4.16
1-1/2"	3/4-16 UNF	1/4-20 UNC	1.75	0.62	0.09	0.88	1.47	4.38	4.63

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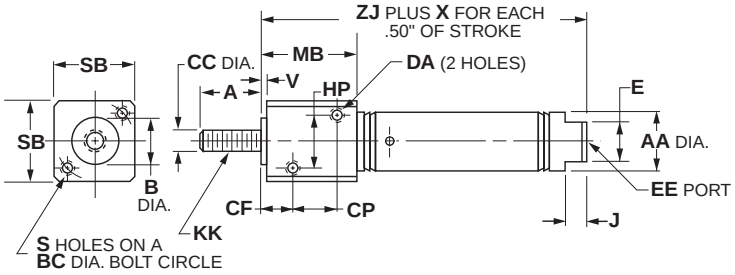
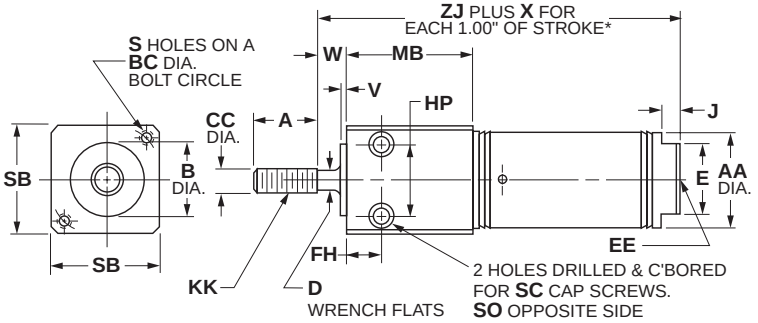
Mounting Style BFN

Front Block Mount, Single Acting, Spring Return



Bore sizes
7/16"



Bore sizes
3/4"
1-1/16"
1-1/2"

Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✔
3/4"	•	•	1/2, 1, 2, 3, 4	6	✔
1-1/16"	•	•	1, 2, 3, 4	6	✔
1-1/2"	•	•	1, 2, 3, 4	6	✔

Bore size	A	AA	B	BC	CC	CF	CP	D	DA	E	EE	FH
7/16"	0.50	0.50	0.437	0.75	0.188	0.31	0.44	–	#8-32 UNC	0.38	#10-32	0.31
3/4"	0.75	0.81	0.624	1.00	0.250	–	–	0.22	–	0.62	1/8 NPTF	0.38
1-1/16"	0.75	1.12	0.750	1.25	0.312	–	–	0.25	–	0.88	1/8 NPTF	0.62
1-1/2"	1.25	1.56	1.00	1.75	0.437	–	–	0.38	–	0.88	1/4 NPTF	0.88

Bore size	HP	J	KK	MB	S	SB	SC	SO	V	W	X	ZJ SR	ZJ SRM
7/16"	0.44	0.19	#10-32 UNF	0.88	#8-32 UNC	0.75	–	–	0.062	–	0.94	1.94	–
3/4"	0.62	0.19	1/4-28 UNF	1.12	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	1.69	2.66	2.91
1-1/16"	0.81	0.19	5/16-24 UNF	1.41	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	1.81	3.38	3.63
1-1/2"	1.12	0.25	7/16-20 UNF	1.88	1/4 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	2.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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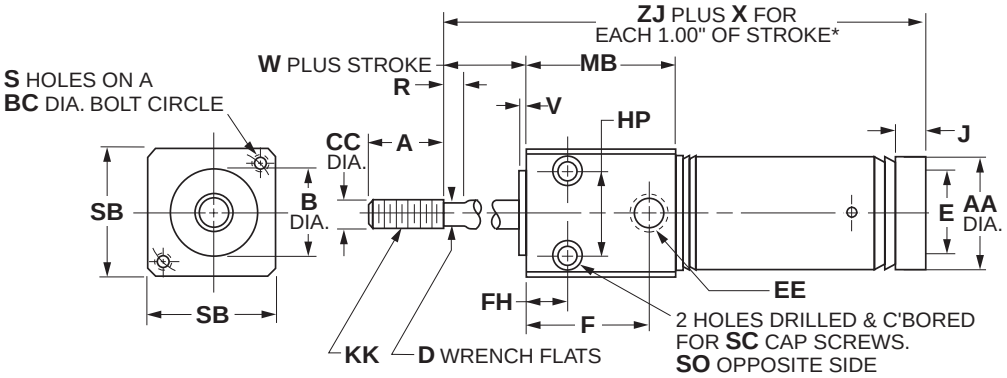
Mounting Style BFR

Front Block Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max stroke (in)	SS rod std
3/4"	•	•	1, 2, 3, 4	6	✔
1-1/16"	•	•	1, 2, 3, 4	6	✔
1-1/2"	•	•	1, 2, 3, 4	6	✔

Bore size	A	AA	B	BC	CC	D	E	EE	F	FH	HP	J
3/4"	0.75	0.81	0.624	1.00	0.250	0.22	–	1/8 NPTF	0.88	0.38	0.62	0.19
1-1/16"	0.75	1.12	0.750	1.25	0.312	0.25	–	1/8 NPTF	1.16	0.62	0.81	–
1-1/2"	1.25	1.56	1.00	1.75	0.437	0.38	0.88	1/4 NPTF	1.53	0.88	1.12	0.25

Bore size	KK	MB	R	S	SB	SC	SO	V	W	X	ZJ	
											SR	SRM
3/4"	1/4-28 UNF	1.12	0.25	#10-32 UNF	1.00	#10-32	1/4-20 UNC	0.093	0.34	2.69	2.56	2.81
1-1/16"	5/16-24 UNF	1.41	0.25	#10-32 UNF	1.25	#10-32	1/4-20 UNC	0.093	0.47	2.81	3.12	3.37
1-1/2"	7/16-20 UNF	1.88	0.25	1/4-20 UNC	1.75	1/4-20	5/16-18 UNC	0.125	0.38	3.00	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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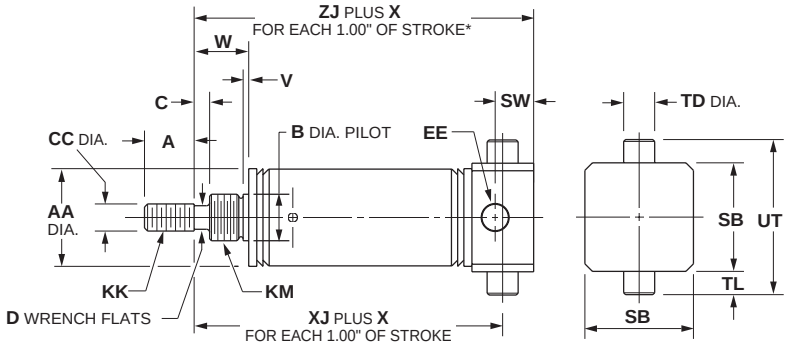
Mounting Style TRN

Rear Trunnion Mount, Single Acting, Spring Return



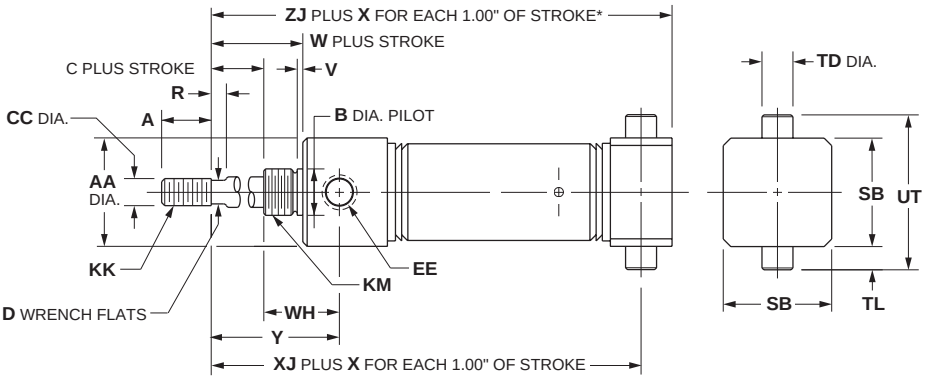
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
7/16"	•		1/2, 1, 2, 3, 4	6	✔	0.50	0.50	0.374	–	0.188	–	#10-32
3/4"	•	•	1, 2, 3, 4	6	✔	0.75	0.81	0.499	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

Bore size	KK	KM	SB	SW	TD	TL	UT	V	W	X	XJ SR	XJ SRM	ZJ SR	ZJ SRM
7/16"	#10-32 UNF	3/8-24 UNF	0.75	0.38	0.374	0.50	1.25	0.05	0.32	0.94**	1.38	–	1.62	–
3/4"	1/4-28 UNF	1/2-20 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.62	1.69	1.94	2.19	2.31	2.56
1-1/16"	5/16-24 UNF	5/8-18 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	1.81	2.44	2.69	2.81	3.06
1-1/2"	7/16-20 UNF	3/4-16 UNF	1.75	0.62	0.500	0.38	2.50	0.09	0.88	2.00	2.56	2.81	3.06	3.31

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.
** For each 0.50" of stroke.

Mounting Style TRR

Rear Trunnion Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
3/4"	I	I	1, 2, 3, 4	6	3	0.75	0.86	0.624	0.25	0.250	0.22	1/8 NPTF
1-1/16"	I	I	1, 2, 3, 4	6	3	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	I	I	1, 2, 3, 4	6	3	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

Bore size	KK	KM	R	SB	TD	TL	UT	V	W	WH	X	XJ SR	XJ SRM	ZJ SR	ZJ SRM
3/4"	1/4-28 UNF	1/2-20 UNF	0.25	1.00	0.500	0.38	1.75	0.09	0.75	0.72	2.69	2.85	3.10	3.22	3.47
1-1/16"	5/16-24 UNF	5/8-18 UNF	0.25	1.25	0.500	0.38	2.00	0.09	0.88	0.68	2.81	3.15	3.40	3.53	3.78
1-1/2"	7/16-20 UNF	3/4-16 UNF	0.25	1.75	0.500	0.38	2.50	0.09	0.88	1.25	3.00	3.38	3.63	3.88	4.13

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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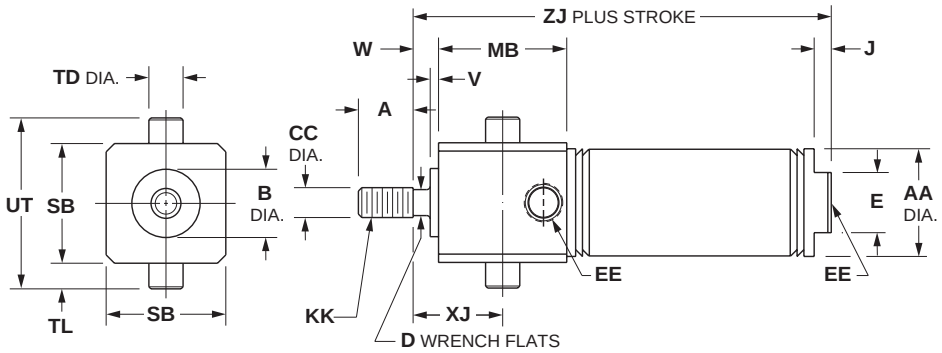
Mounting Style TFD

Front Trunnion Mount, Double Acting

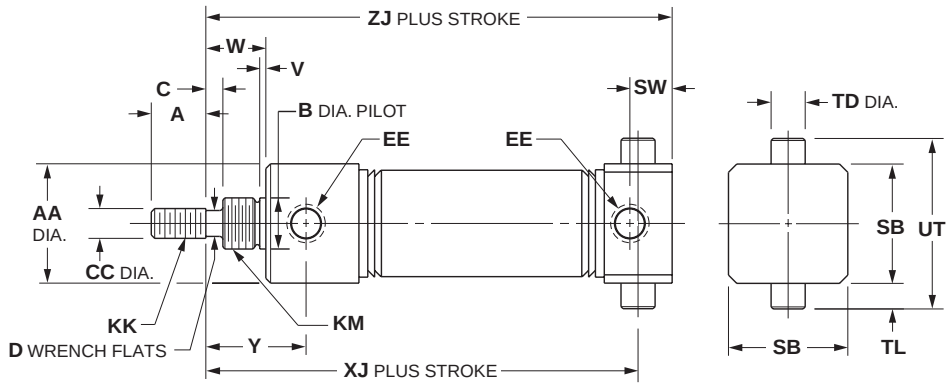


Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✔	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

Bore size	J	KK	MB	SB	TD	TL	UT	V	W	XJ	ZJ	
	0.19	#10-32 UNF									SR	SRM
7/16"	0.19	1/4-28 UNF	0.88	0.75	0.374	0.250	1.25	0.062	–	0.31	2.12	–
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	0.69	3.22	3.22
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.09	3.75	3.91
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	1.31	4.19	4.44

Mounting Style TRD

Rear Trunnion Mount, Double Acting



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3, 4	12	✔	0.50	0.74	0.437	–	0.188	–	#10-32
3/4"	•	•	1, 2, 3, 4, 5, 6	12	✔	0.75	0.86	0.624	0.25	0.250	0.22	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	12	✔	0.75	1.12	0.624	0.38	0.312	0.25	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4, 5, 6	12	✔	1.25	1.56	0.749	0.25	0.437	0.38	1/4 NPTF

Bore size	KK	KM	SB	SW	TD	TL	UT	V	W	XJ		Y	ZJ	
	#10-32 UNF	7/16-20 UNF								SR	SRM		SR	SRM
7/16"	1/4-28 UNF	5/8-18 UNF	0.75	0.38	0.374	0.25	1.25	0.05	0.38	2.19	–	0.72	2.44	–
3/4"	5/16-24 UNF	5/8-18 UNF	1.00	0.44	0.500	0.38	1.75	0.09	0.75	3.41	3.41	1.22	3.78	3.78
1-1/16"	7/16-20 UNF	3/4-16 UNF	1.25	0.44	0.500	0.38	2.00	0.09	0.88	3.62	3.62	1.44	4.00	4.16
1-1/2"			1.75	0.62	0.500	0.38	2.50	0.09	0.88	3.88	4.13	1.47	4.38	4.63

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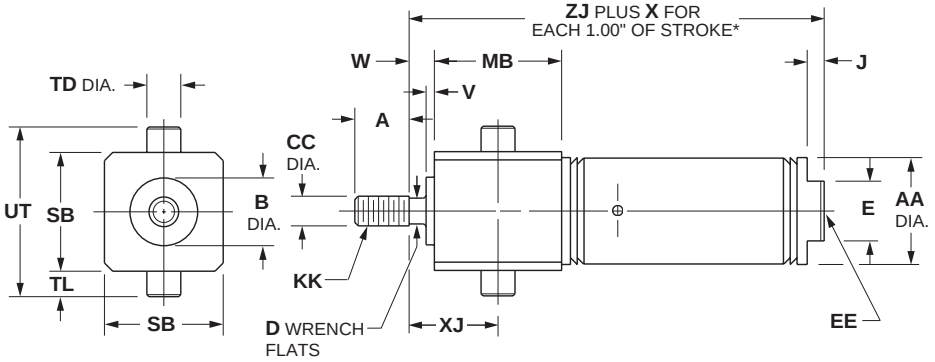
Mounting Style TFN

Front Trunnion Mount, Single Acting, Spring Return



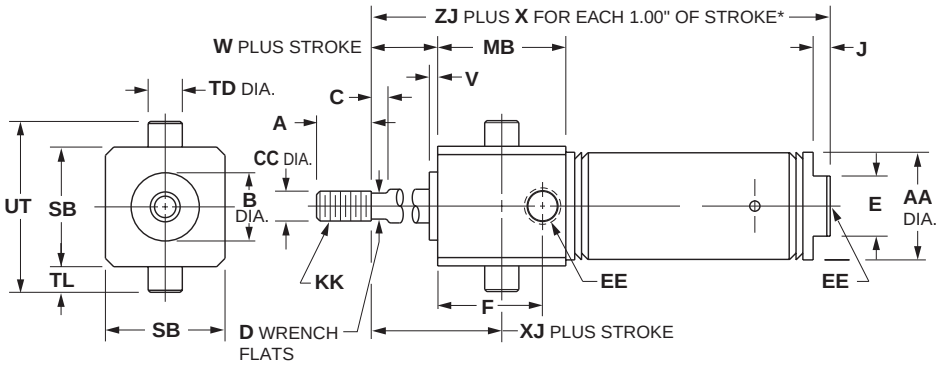
Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	CC	D	E	EE
7/16"	•		1/2, 1, 1-1/2, 2, 3	6	✔	0.50	0.50	0.437	0.188	–	0.38	#10-32
3/4"	•	•	1/2, 1, 2, 3, 4	6	✔	0.75	0.81	0.624	0.250	0.22	0.62	1/8 NPTF
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.75	1.12	0.750	0.312	0.25	0.88	1/8 NPTF
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	1.000	0.437	0.38	0.88	1/4 NPTF

Bore size	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
	0.19	#10-32 UNF											
7/16"	0.19	1/4-28 UNF	0.88	0.75	0.374	0.25	1.25	0.062	0	0.94**	0.31	1.94	–
3/4"	0.19	5/16-24 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	1.69	0.69	2.66	2.91
1-1/16"	0.25	7/16-20 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	1.81	1.09	3.38	3.63
1-1/2"			1.88	1.75	0.500	0.38	2.50	0.125	0.38	2.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.
** For each 0.50" of stroke

Mounting Style TFR

Front Trunnion Mount, Single Acting, Spring Extend



Bore size	SR	SRM	Std. stroke (in)	Max. stroke (in)	SS rod std	A	AA	B	C	CC	D	E
3/4"	•	•	1, 2, 3, 4	6	✔	0.75	0.81	0.624	0.25	0.250	0.22	0
1-1/16"	•	•	1, 2, 3, 4	6	✔	0.75	1.12	0.750	0.25	0.312	0.25	0
1-1/2"	•	•	1, 2, 3, 4	6	✔	1.25	1.56	1.000	0.25	0.437	0.38	0.88

Bore size	F	EE	J	KK	MB	SB	TD	TL	UT	V	W	X	XJ	ZJ SR	ZJ SRM
3/4"	0.88	1/8 NPTF	–	1/4-28 UNF	1.12	1.00	0.500	0.38	1.75	0.093	0.34	2.69	0.69	2.56	2.81
1-1/16"	1.16	1/8 NPTF	–	5/16-24 UNF	1.41	1.25	0.500	0.38	2.00	0.093	0.47	2.81	1.09	3.12	3.37
1-1/2"	–	1/4 NPTF	0.25	7/16-20 UNF	1.88	1.75	0.500	0.38	2.50	0.125	0.38	3.00	1.31	3.69	3.94

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

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Air Reservoirs

Air Reservoirs installed can significantly reduce the pulsation of a system. In addition air reservoirs can be used as a means to store energy. Caution should always be used when storing energy. Air reservoirs if installed in the correct location and sized correctly can temporarily increase the flow of an actuator or cylinder.
As always never exceed the rated pressure of the cylinder.

Ordering information

.75 — **Bore Size***

.75	3/4"
1.06	1-1/16"
1.50	1-1/2"
2.00	2"
2.50	2-1/2"
3.00	3"

AR — **Mounting**

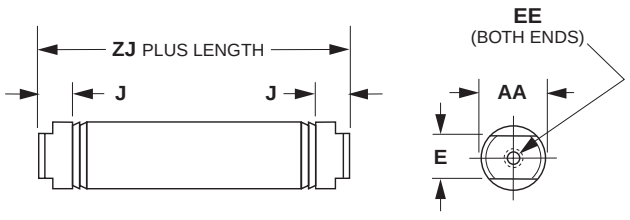
AR	Air Reservoir

SR

2.00 — **Length**

Specify in inches.
See table below.

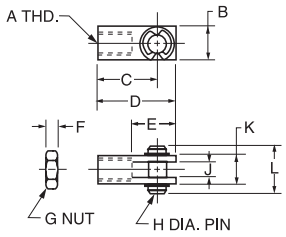
Bore size	Standard lengths	Max. length	Volume (in3)
3/4"	1" increments to 4"	32"	0.39 plus 0.44 per inch length
1-1/16"	1" increments to 8"	32"	0.99 plus 0.89 per inch length
1-1/2"	1" increments to 16"	32"	1.91 plus 1.77 per inch length
2"	1" increments to 16"	32"	4.22 plus 3.14 per inch length
2-1/2"	1" increments to 16"	32"	7.04 plus 4.91 per inch length
3"	1" increments to 16"	32"	9.90 plus 7.07 per inch length



Bore size	AA	E	EE	J	ZJ
3/4"	0.813	0.625	1/8" NPTF	0.19	1.938
1-1/16"	1.125	0.88	1/8" NPTF	0.19	2.375
1-1/2"	1.56	0.88	1/8" NPTF	0.250	2.250
2"	2.08	1.25	1/4" NPTF	0.312	2.875
2-1/2"	2.62	1.75	1/4" NPTF	0.312	2.875
3"	3.16	2.00	3/8" NPTF	0.312	3.190

Piston Rod Clevis

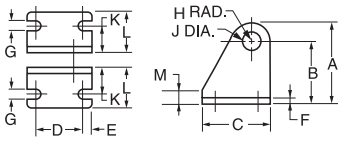
Assembly includes pin and (2) retainer rings and (1) jam nut.



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	#5-40	.31	.44	.56	.38	.11	#5-40	.12	.13	.31	.50	**L071300025**
7/16, 9/16	#10-32	.38	.75	.94	.56	.12	#10-32	.19	.19	.38	.56	**L071300100** **L077130100***
3/4, 7/8	1/4-28	.50	.94	1.19	.68	.16	1/4-28	.25	.25	.50	.69	**L071300200** **L077130200***
1-1/16	5/16-24	.50	.94	1.19	.68	.19	5/16-24	.25	.25	.50	.69	**L071300300** **L077130300***
1-1/4, 1-1/2	7/16-20	.75	1.31	1.69	.94	.25	7/16-20	.38	.38	.75	1.03	**L071300400** **L077130400***
1-3/4, 2, 2-1/2	1/2-20	.75	1.31	1.69	.94	.31	1/2-20	.38	.38	.75	1.03	**L071300500** **L077130500***
3	5/8-18	1.00	2.25	2.75	1.50	.38	5/8-18	.50	.50	1.00	1.38	**L071300600**

* Stainless Steel for use with SRD/SRDM cylinders.

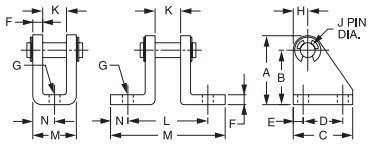
Pivot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	.76	.56	.75	.50	.12	.06	.19	.20	.160	.28	.50	.12	**L071310100**
3/4, 7/8, 1-1/16	1.19	.88	1.12	.75	.19	.12	.27	.31	.255	.44	.81	.25	**L071310200**
1-1/2	1.75	1.38	1.50	1.00	.25	.12	.27	.38	.380	.62	1.00	.25	**L071310300**

Pivot Bracket Assembly

Assembly includes pin and (2) retainer rings.



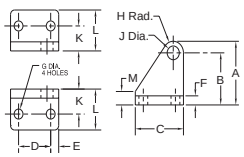
5/16" bore only

Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
5/16	.53	.40	.62	.38	.12	.04	16	.12	.12	.26	–	.36	.18	**L071320025**
7/16, 9/16	.76	.56	.75	.50	.12	.06	.19	.19	.156	.34	.91	1.34	.22	**L071320100** **L077150100***
3/4, 7/8, 1-1/16	1.18	.88	1.12	.75	.19	.12	.27	.30	.250	.38	1.25	2.00	.38	**L071320200** **L077150200***
1-1/4	1.18	.88	1.12	.75	.19	.12	27	.30	.250	.50	1.38	2.14	.38	**L071320300**
1-1/2, 1-3/4	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.62	2.00	2.88	.44	**L071320400** **L077150400***
2, 2-1/2	1.75	1.38	1.50	1.00	.25	.25	.27	.37	.375	.75	2.12	3.00	.44	**L071320500** **L077150500***
3	2.25	1.75	1.75	1.25	.25	.25	.27	50	.50	.88	2.62	3.88	.62	**L071320600**

* Stainless steel for use with SRD/SRDM cylinders.

SR Series Trunnion Brackets

Select brackets for SR series trunnion mount cylinders from the table below. (Note: trunnion brackets are ordered as a separate item from the cylinder.)



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
7/16	1.75	1.38	1.50	1	.25	.25	.27	.38	.375	.69	1.12	.37	**L076600100**
3/4, 11/16, 1-1/2	1.75	1.38	1.50	1	.25	.25	.27	.38	.500	.69	1.12	.37	**L076600200**

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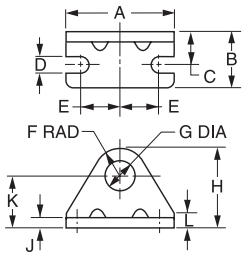
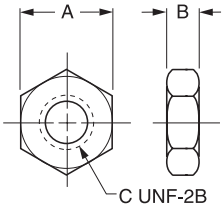
Foot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
5/16	1.00	.37	.25	.13	.37	.31	.25	.75	.06	.44	.12	**L073790016**
5/16	1.00	.37	.25	.13	.37	.31	.38	.75	.06	.44	.12	**L073790023**
7/16	1.38	.62	.31	.19	.50	.31	.38	.88	.07	.56	.12	**L073790024**
7/16, 9/16	1.38	.62	.38	.19	.50	.38	.44	.94	.09	.56	.12	**L073790028** **L077160028***
3/4	1.62	.75	.44	.19	.62	.41	.50	1.09	.10	.69	.19	**L073790032**
3/4, 7/8, 1-1/16	1.88	1.00	.56	.27	.75	.56	.63	1.38	.12	.81	.25	**L073790040** **L077160040***
1-1/4, 1-1/2	2.50	1.50	.75	.27	.94	.75	.75	1.75	.12	1.00	.38	**L073790048** **L077160048***
1-3/4	3.00	1.50	.87	.35	1.12	.91	1.03	2.16	.19	1.25	.50	**L073790102**
2	3.12	1.62	1.00	.34	1.12	1.00	1.38	2.50	.25	1.50	.62	**L073790124** **L077160124***
2-1/2	3.75	1.62	1.00	.35	1.44	1.25	1.51	3.00	.25	1.75	.75	**L073790132**
3	4.37	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	**L073790140**

* Stainless Steel for use with SRD/SRDM cylinders.

Mounting Nut



Bore size	A	B	C	Part number
5/16	.44	.16	1/4-28	**L073800200**
5/16, 7/16	.56	.22	3/8-24	**L073800400**
7/16, 9/16	.69	.25	7/16-20	**L073800500** **L077170500***
3/4	.75	.31	1/2-20	**L073800600**
3/4, 7/8, 1-1/16	.94	.38	5/8-18	**L073800800** **L077170800***
1-1/4, 1-1/2	1.12	.42	3/4-16	**L073800900** **L077170900***
1-3/4	1.50	.55	1-14	**L073801100**
2	1.88	.50	1-1/4-12	**L073801200** **L077171200***
2-1/2	2.06	.78	1-3/8-12	**L073801400**
3	2.25	.84	1-1/2-12	**L073801500**

* Stainless Steel for use with SRD/SRDM cylinders.

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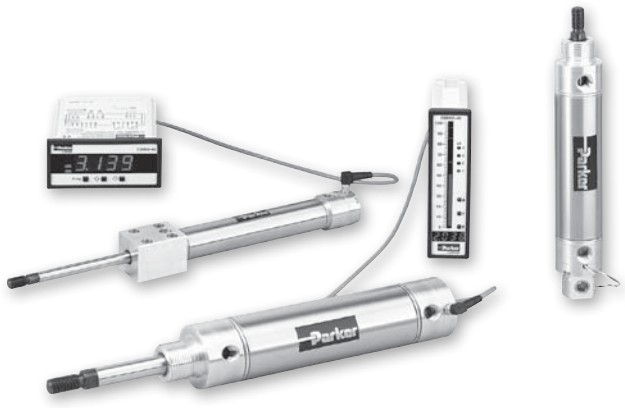
- Continuous position feedback
- Bore sizes: 1-1/16" to 3"
- Signal input: 5 to 24 VDC
- Signal output (w/o controls): DC ratiometric voltage*
- Signal output (w/controls): 0 to 10 VDC or 4 to 20 mA
- Strokes: Available in any practical stroke length up to 24"

* Mega Ohm impedence interface device suggested for limiting sensor current if controller is not used.



Operating information

Operating pressure:	150 PSIG air
Temperature range:	40°F to 160°F (4.4°C to 71°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering Information

1.50"	DXP	P	SRX	B	F	S	3	6.00"

Bore size

1.06"
1.50"
2.00"
2.50"
3.00"

Mounting s tyle

D	Nose mount
DXP	Nose and pivot mount
BFD	Front block mount

Connector style

P	Plug
F	Flying leads

Piston

B	Bumper*

Leave blank if not required.

Seals

F	Low friction

Leave blank if not required.

Special

S	Special

Leave blank if special modification is not required.

Non-standard rod dimension

3	Non-standard dimension

Leave blank if special rod end dimension is not required.

Stroke

Stroke in inches

* Incorporating bumpers adds 1/4" of overall length to the cylinder.

Sensors

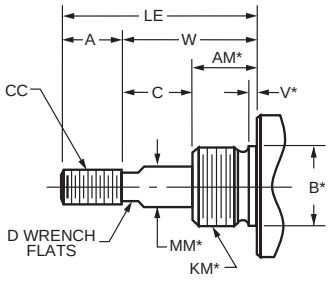
For sensors see page B296.

NOTE: For non-standard / special rod ends, see below.

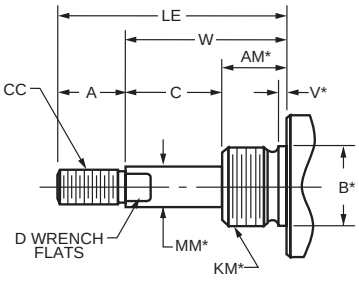
Non-standard rods

For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in the drawing. It is necessary to specify only those dimensions that are non-standard.

Full diameter rod end threads



Undersized rod end threads



* Requires an "S" designation in model number.

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Ordering Information for CDRO Panel Meter Controller

1	4	9	3	4	5				

Relay output

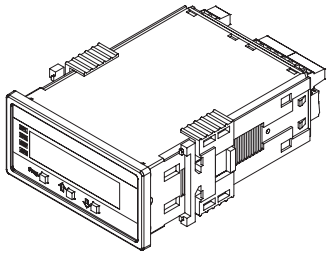
X	No relay output
R1	Single 5A form A relay
R2	Dual 5A form A relays
R4	Four 5A form A relays

Analog output

X	Noanalog output
C	Isolated 16-bit current output, 4-20 mA
V	Isolated 16-bit voltage output, 0-10 VDC

Power supply

1	85-265 VAC / 95-370 VDC
2	18-48 VAC / 10-72 VDC



Notes:
1) Input requires a 3-wire potentiometer 1 kOhm min. (0 to 100.0).
2) Please reference catalog 0900P-E, page D54 for complete electrical and dimensional specifications.

Ordering Information for CDBRO 101 Segment Bargraph Controller

1	4	9	3	4	6				

Display

R	Red LED vertical bargraph with 4-digit red DPM
T	Tri-color LED vertical bargraph with 4-digit red DPM

Power supply

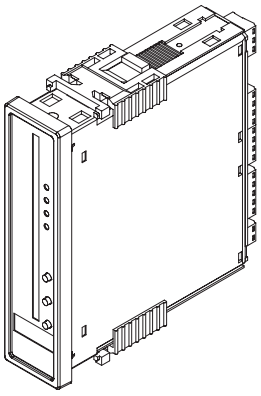
1	85-265 VAC / 95-370 VDC
2	18-48 VAC / 10-72 VDC

Analog output

X	No analog output
C	Isolated 16-bit current output, 4-20 mA
V	Isolated 16-bit voltage output, 0-10 VDC

Relay output

X	No relay output
1	Single 10A form C relay
2	Dual 10A form C relays
3	Dual 10A form C & single 5A form A relays
4	Dual 10A form C & dual 5A form A relays
5	Single 10A form C & dual 5A form A relays
6	Single 10A form C & single 5A form A relays



Notes:
1) Input requires a 3-wire potentiometer 1 kOhm min. (0 to 100.0).
2) Please reference catalog 0900P-E, page D55 for complete electrical and dimensional specifications.

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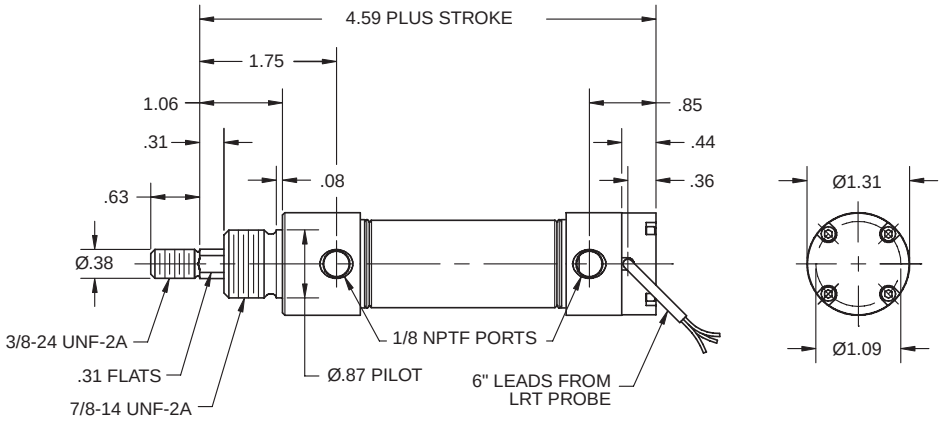
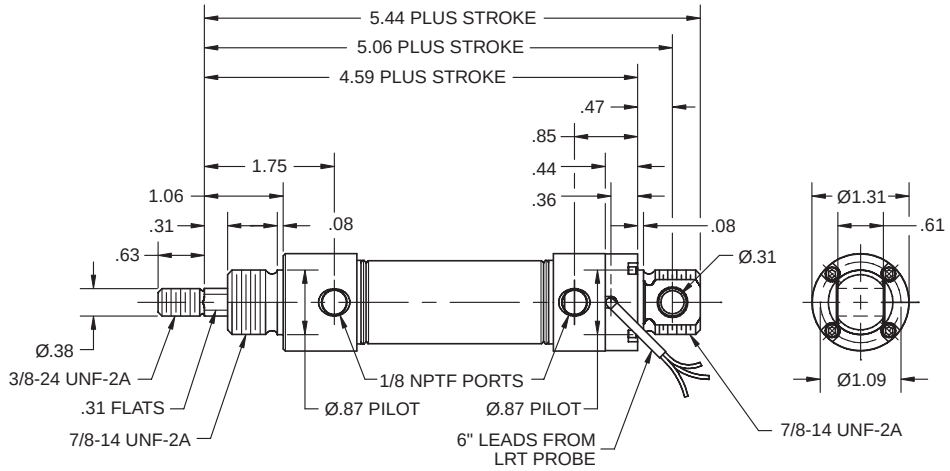
1-1/16" Bore Cylinders

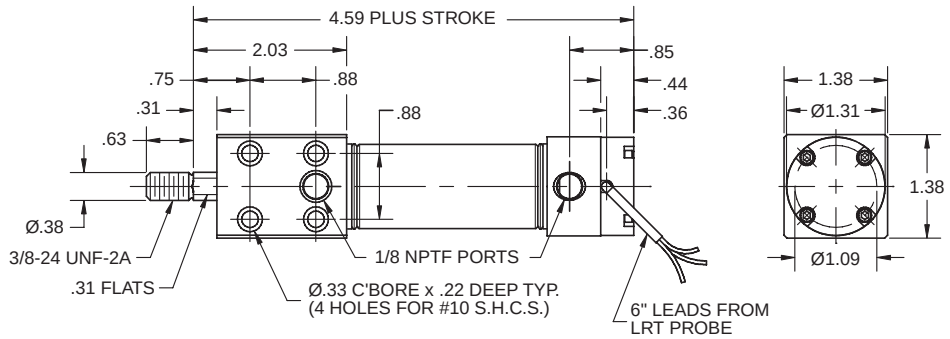
Style D



Style DXP



Style BFD



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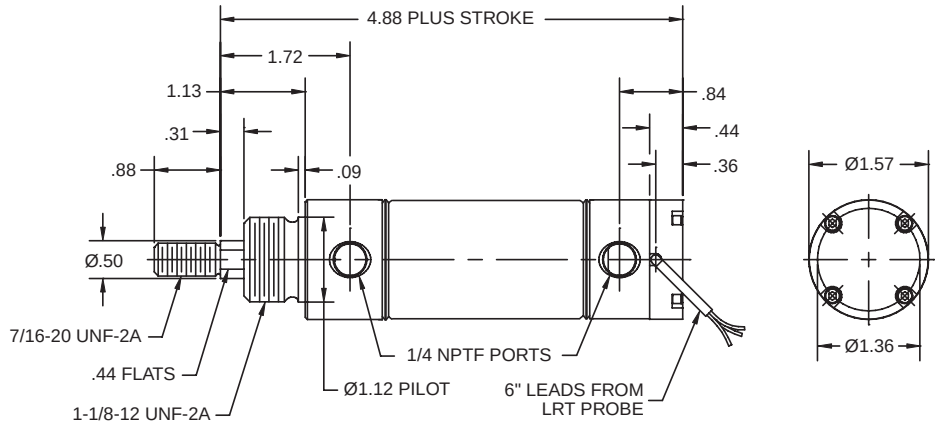
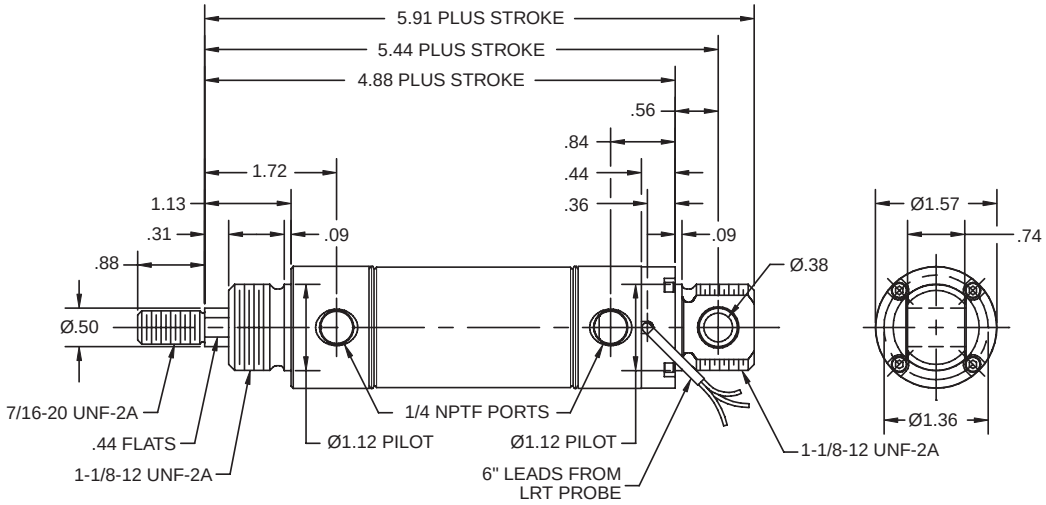
1-1/2" Bore Cylinders

Style D



Style DXP



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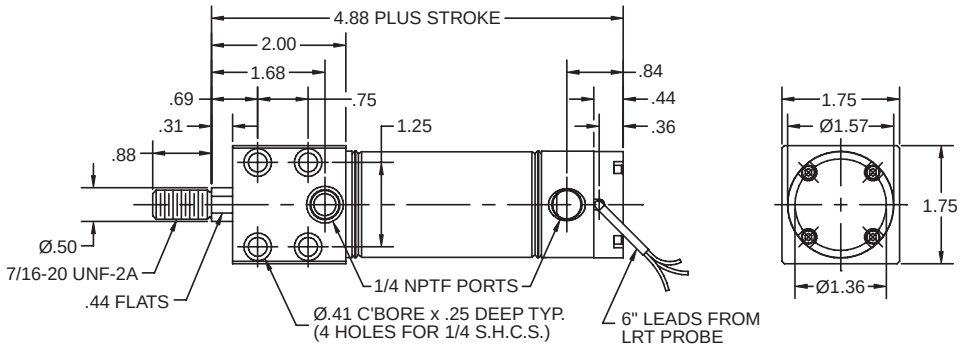
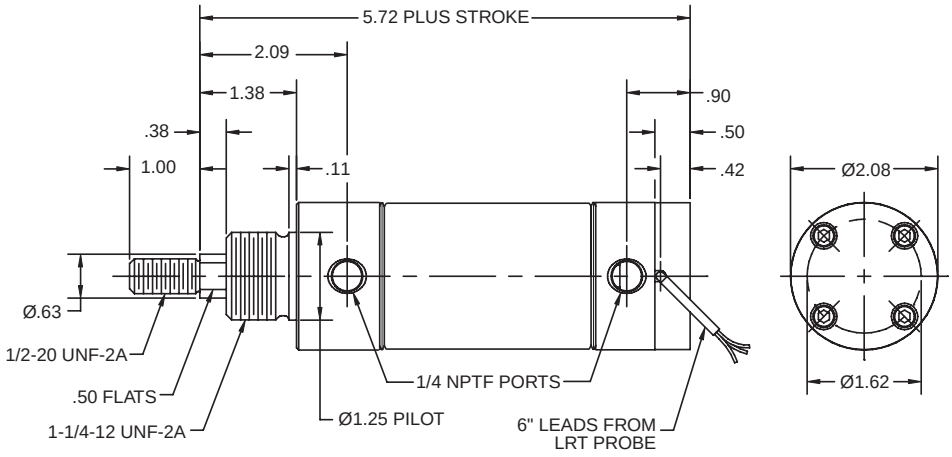


2" Bore Cylinders

Style D



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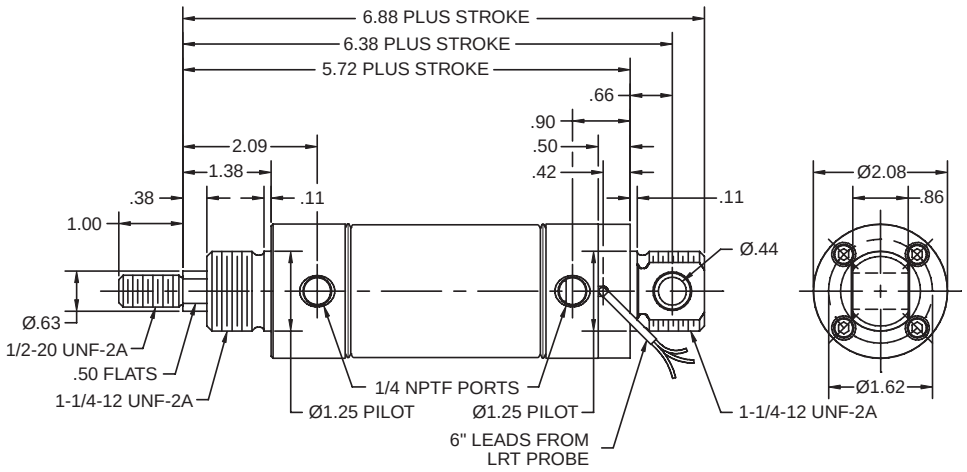

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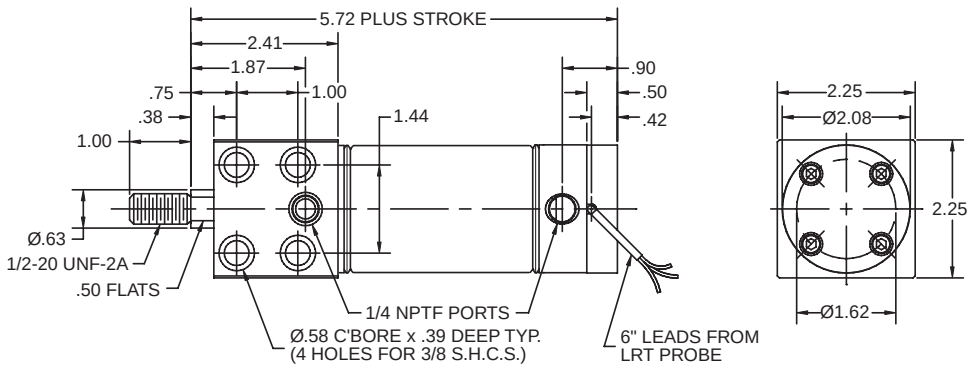

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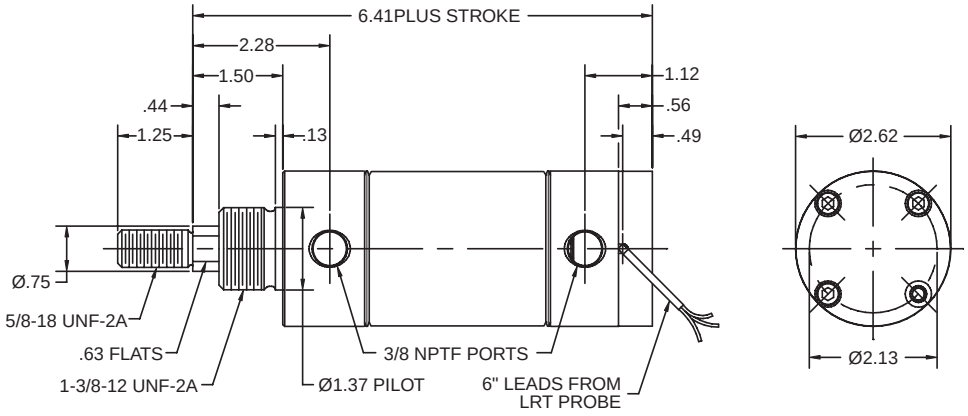
2-1/2" Bore Cylinders

Style D



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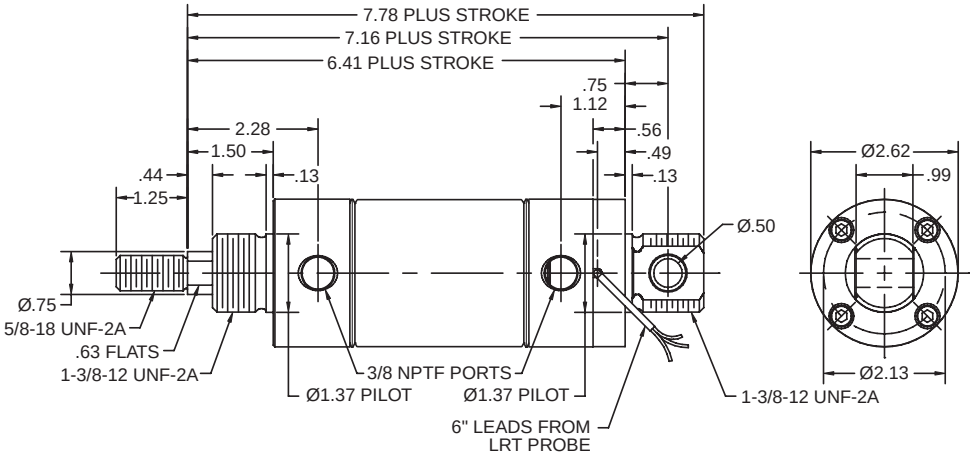

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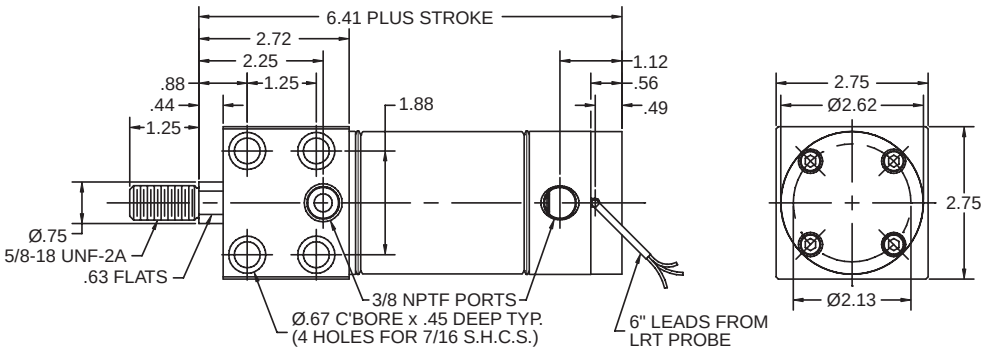

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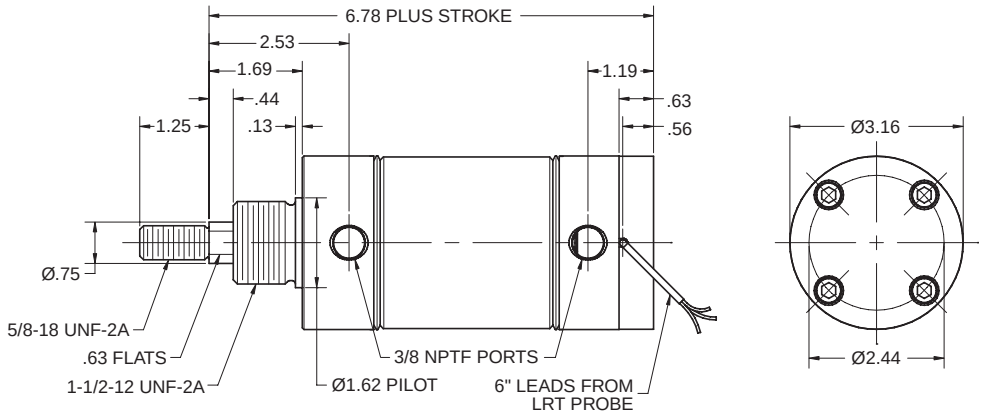
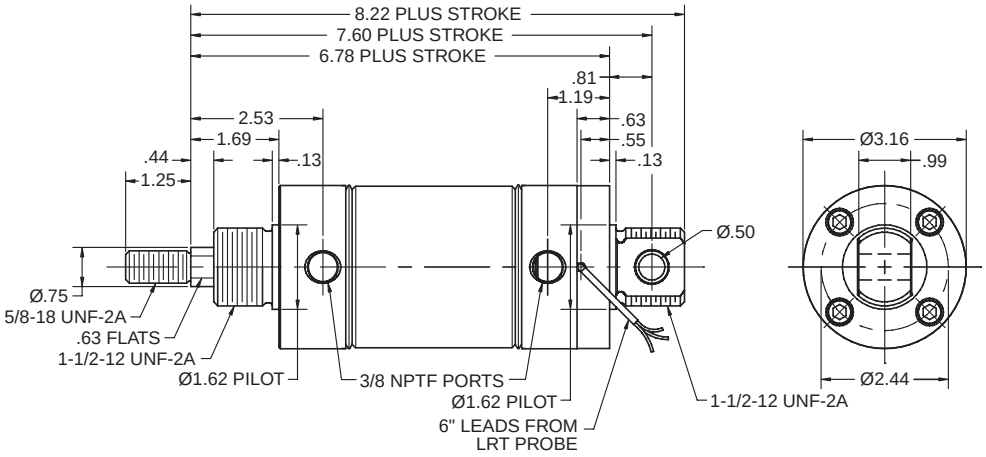
3" Bore Cylinders

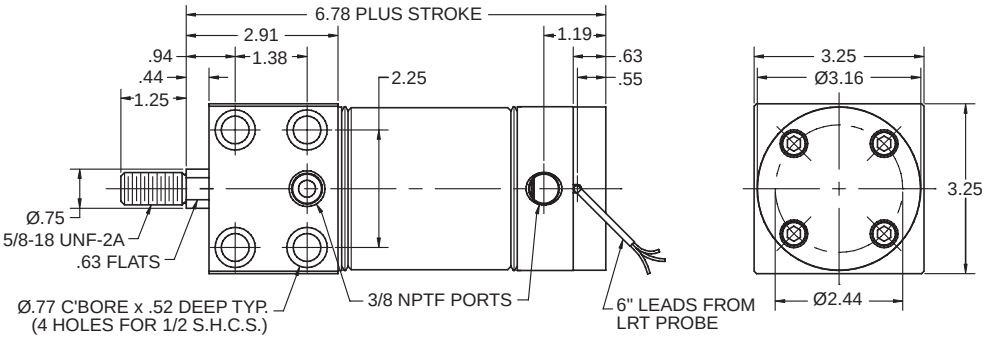
Style D



Style DXP



Style BFD



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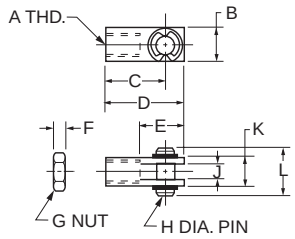
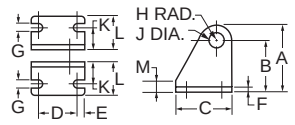
Piston Rod Clevis



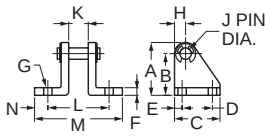
Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	3/8–24	.63	1.38	1.69	.94	.22	3/8–24	.31	.32	.63	.88	L071300350
1-1/2	7/16–20	.75	1.31	1.69	.94	.25	7/16–20	.38	.38	.75	1.03	L071300400
2	1/2–20	.88	1.88	2.31	1.31	.31	1/2–20	.44	.45	.88	1.14	L071300550
2-1/2, 3	5/8–18	1.00	2.25	2.75	1.50	.38	5/8–18	.50	.51	1.00	1.38	L071300600

Pivot Brackets



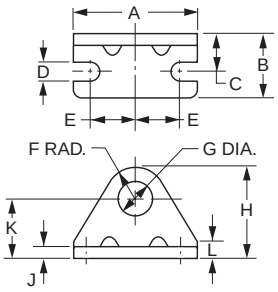
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.315	.56	.88	.28	L071310400
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.378	.69	1.13	.31	L071310500
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.440	.75	1.19	.38	L071310600
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.503	.88	1.38	.38	L071310700

Pivot Brackets



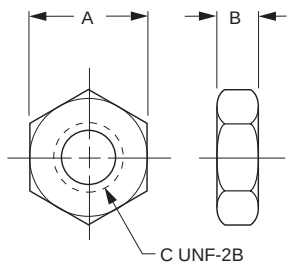
Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	Part number
1-1/16	1.31	1.00	1.31	.81	.25	.16	.28	.31	.312	.62	1.75	2.38	.31	L071320250
1-1/2	1.63	1.25	1.63	1.00	.31	.19	.34	.38	.375	.75	2.13	3.00	.44	L071320350
2	1.81	1.38	1.81	1.19	.31	.25	.34	.44	.437	.88	2.38	3.25	.44	L071320450
2-1/2, 3	2.13	1.63	2.13	1.38	.38	.25	.41	.50	.500	1.00	2.75	3.75	.50	L071320550

Foot Brackets



Bore size	A	B	C	D	E	F	G	H	J	K	L	Part number
1-1/16	2.13	1.16	.66	.28	.75	.75	.88	1.75	.16	1.00	.38	L073790056
1-1/2	2.75	1.44	.81	.35	1.00	.94	1.13	2.19	.19	1.25	.38	L073790108
2	3.00	1.59	.91	.35	1.19	1.06	1.26	2.44	.22	1.38	.44	L073790116
2-1/2	3.75	1.88	1.06	.41	1.50	1.19	1.38	2.81	.25	1.63	.50	L073790125
3	4.38	1.62	1.00	.35	1.75	1.25	1.64	3.14	.25	1.89	.89	L073790140

Mounting Nut



Bore size	A	B	C	Part number
1-1/16	1.31	.48	7/8–14	L073801000
1-1/2	1.69	.61	1-1/8–12	L073801300
2	1.88	.50	1-1/4–12	L073801200
2-1/2	2.06	.78	1-3/8–12	L073801400
3	2.25	.84	1-1/2–12	L073801500

☐ Most popular.

- Repairable aluminum cylinder, anodized body and end caps
- 8 bore sizes: 20mm to 100mm (3/4" to 4")
- 4 Standard rod ends: inch, metric, male, female
- Bumpers standard on both ends
- Adjustable cushions optional at both ends
- Mounting styles: 9 standard
- Strokes available in any practical length
- Available in metric or inch mounting threads

Operating information

Operating pressure:	10 bar (145 PSIG
Temperature range:	
Standard	-23°C to 74°C (-10°F to 250°F)
High temperature version*	-23°C to 121°C (-10°F to 250°F)

* Option intended for limited exposure to temperatures over 80°C or 176°F. This option is primarily for applications which subject the cylinder to fluids that have an adverse effect on external seals.

Filtration requirements: 40 micron, dry filtered air

For technical information see CD

Ordering information

P1L	N	032	D	M	N	0200	W	B	N	N	N

Construction [1]

N	Inch mounting threads
M	Metric mounting threads

Bores (mm)

020	032	050	080
025	040	063	100

Function

D	Double acting, single rod
K	Double acting, double rod

Cushions/magnetic piston

N	No cushion, no magnetic piston
M	No cushion, magnetic piston [2]
F	Cushioned both ends, no magnetic piston
Y	Cushioned both ends, magnetic piston [2]

Seal material

N	Standard seals
T	Fluorocarbon

Stroke

Specify in mm

Version [3]

B	Basic
W	With options
/	Special

Mounting style

N	No mountings fitted (std.)
J	Front flange
H	Rear flange
B	Single rear clevis
A	Double rear clevis
F	Foot, front & rear
G	Nose mount
E	Front trunnion
D	Rear trunnion

Port type [1]

N	NPT threads [4]
B	BSPT threads [5]

Rod end style [1]

N	Inch male [4]
6	Metric female
5	Metric male [5]
9	Inch female
3	Special

Rod material

N	Carbon steel (std on 32-100mm bores)
S	Stainless (std on 20-25mm bores)

Notes:

1 When selecting inch or metric construction, be advised that the piston rod end and porting thread will coincide with the mounting thread selected as the standard for the basic cylinder. For example, selecting "M" in the construction field will automatically provide a metric male piston rod end and BSPT ports as standard.

2 Not available with fluorocarbon seal option.

3 If cylinder contains no options, then use "B" as the last digit in the model code. The last 4 boxes are used only when "W" or "/" appears in this field.

4 Standard with Inch Construction

5 Standard with Metric Construction

6 Please consult factory for availability of stroke lengths longer than those listed.

Stroke length for standard cylinders

Bore	Min. stroke (mm)	Max. stroke (mm) [6]
20	2	1000
25	2	1000
32	2	1000
40	4	1000
50	5	1000
63	7	1000
80	4	1000
100	4	1000

Sensors

For sensors see page B296.

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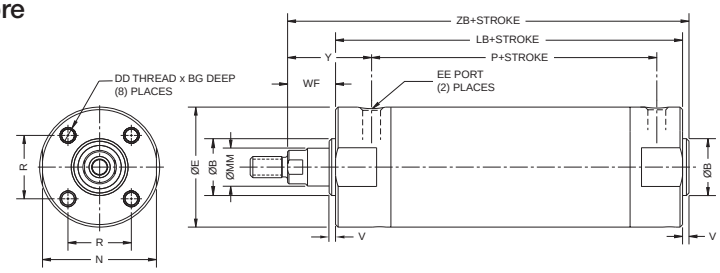
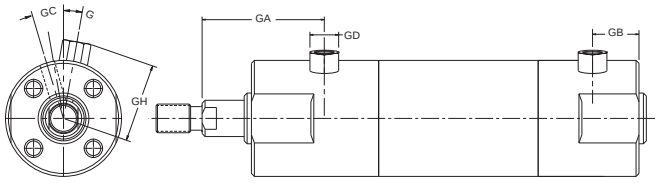
Style N - Basic No Mount

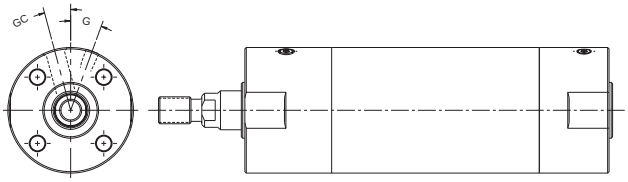
Typical 20 to 100 mm Bore
without air cushion



With adjustable air cushion - 20 to 25 mm bores



With adjustable air cushion - 32 to 100 mm bores
(feature a flush-fit cushion adjustment screw)



Style N, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02 (+0 -0.001)	DD (UNF)	BG depth	ØE	EE (NPTF)	Ø MM rod dia.	N	NA	R	V	WF	Y
20	12 (0.472)	M4x0.7 (8-32)	7 (0.28)	27 (1.06)	1/8* (1/8 †)	8 (0.315)	24 (0.94)	–	14 (0.55)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	M5x0.8 (10-32)	7.6 (0.30)	32 (1.26)	1/8* (1/8 †)	10 (0.394)	29 (1.14)	–	16.5 (0.65)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	M5x0.8 (10-32)	7.6 (0.30)	39 (1.53)	1/8 (1/8)	12 (0.472)	36 (1.42)	11 (0.43)	20 (0.79)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	M6x1 (1/4-28)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	16 (0.630)	44 (1.73)	14 (0.55)	26 (1.02)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	M8x1.25 (5/16-24)	16 (0.63)	59 (2.32)	1/4 (1/4)	20 (0.787)	55 (2.17)	18 (0.71)	32 (1.26)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	M10x1.5 (3/8-24)	16 (0.63)	72 (2.83)	1/4 (1/4)	20 (0.787)	69 (2.72)	18 (0.71)	38 (1.50)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	M10x1.5 (3/8-24)	22 (0.88)	90 (3.54)	3/8 (3/8)	25 (0.984)	86 (3.39)	23 (0.91)	50 (1.97)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	M12x1.75 (1/2-20)	22 (0.88)	110 (4.33)	1/2 (1/2)	32 (1.260)	106 (4.17)	30 (1.18)	60 (2.36)	3 (0.12)	31 (1.22)	57 (2.24)

	Add stroke		
Bore size	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

	Adjustable air cushion							
Bore size	GA	GB	GD Hex	GC°	G°	GH	EE	Cushion length
20	33 (1.30)	14 (0.55)	8 (0.31)	13-1/2	25-1/2	20.5 (0.81)	M5 x 0.8 (10-32 UNF)	9 (0.35)
25	35 (1.38)	14 (0.55)	8 (0.31)	15-1/2	20-1/2	23 (0.91)	M5 x 0.8 (10-32 UNF)	9 (0.35)
32	–	–	–	10-1/2	30-1/2	–	1/8 (1/8 NPTF)	10 (0.39)
40	–	–	–	10-1/2	22-1/2	–	1/8 (1/8 NPTF)	12 (0.47)
50	–	–	–	10-1/2	23-1/2	–	1/4 (1/4 NPTF)	15 (0.59)
63	–	–	–	15-1/2	20-1/2	–	1/4 (1/4 NPTF)	15 (0.59)
80	–	–	–	15-1/2	25-1/2	–	3/8 (3/8 NPTF)	15 (0.59)
100	–	–	–	15-1/2	25-1/2	–	1/2 (1/2 NPTF)	15 (0.59)

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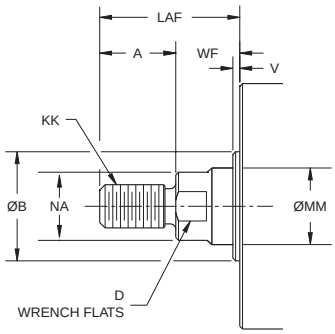
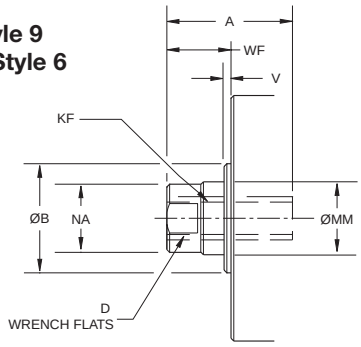
Rod End Details

Male threads
Inch male - Style N
Metric male - Style 5



Female threads
Inch female - Style 9
Metric female - Style 6



Special rod end threads
Thread Style 3
Special Metric or Inch threads, extension, blank, etc., are also available.
To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF.
If otherwise special, supply a dimensioned sketch.

Rod ends – mm (inch)

Bore size	A	ØB +0 -0.02 (+0 -0.001)	D	Thread KK Style 5 (Style N)	Thread KF Style 6 (Style 9)	LAF	Ø MM rod dia.	NA	V	WF
20	13 (0.50)	12 (0.472)	6 (0.24)	M8 x 1.25 (1/4-28)	M5 x 0.80 (#10-32)	26 (1.00)	8 (0.315)	–	2 (0.08)	13 (0.50)
25	13 (0.50)	14 (0.551)	8 (0.31)	M10 x 1.25 (5/16-24)	M6 x 1.00 (1/4-28)	29 (1.12)	10 (0.394)	–	2 (0.08)	16 (0.62)
32	19 (0.75)	18 (0.709)	10 (0.39)	M10 x 1.25 (7/16-20)	M8 x 1.25 (5/16-24)	41 (1.63)	12 (0.472)	11 (0.43)	2 (0.08)	22 (0.88)
40	19 (0.75)	25 (0.984)	12 (0.47)	M14 x 1.5 (7/16-20)	M8 x 1.25 (3/8-24)	41 (1.63)	16 (0.630)	14 (0.55)	2 (0.08)	22 (0.88)
50	22 (0.88)	30 (1.181)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
63	22 (0.88)	32 (1.260)	16 (0.63)	M18 x 1.5 (1/2-20)	M10 x 1.25 (1/2-20)	52 (2.07)	20 (0.787)	18 (0.71)	2 (0.08)	30 (1.19)
80	38 (1.50)	40 (1.575)	20 (0.79)	M22 x 1.5 (3/4-16)	M16 x 1.5 (5/8-18)	69 (2.72)	25 (0.984)	23 (0.91)	3 (0.12)	31 (1.22)
100	48 (1.88)	50 (1.968)	26 (1.02)	M26 x 1.5 (1-14)	M20 x 1.5 (3/4-16)	79 (3.11)	32 (1.260)	30 (1.18)	3 (0.12)	31 (1.22)

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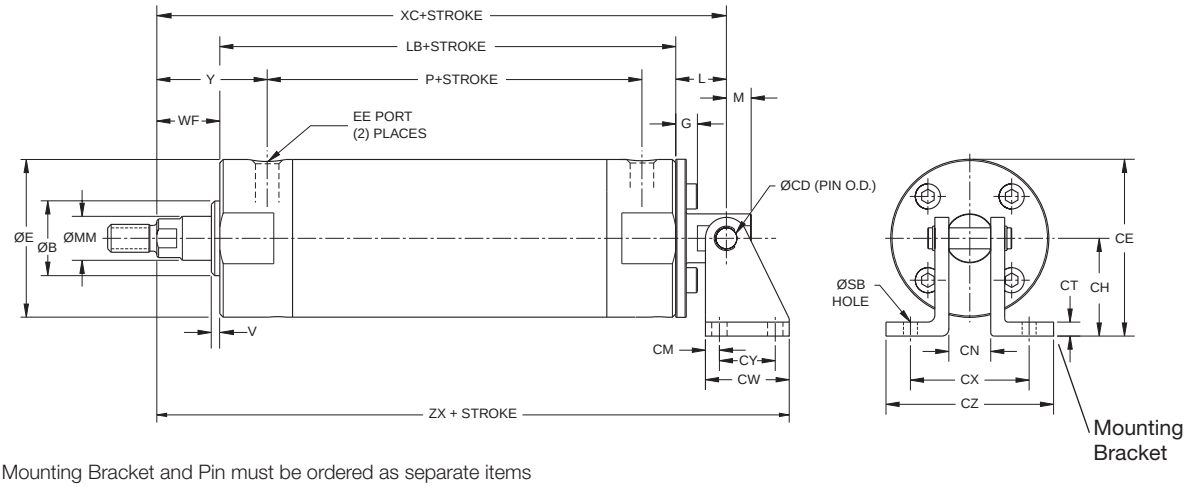
Style B - Single Rear Clevis

Typical 20 to 100 mm Bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items

Style B, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 - 0.02 (+0 - 0.001)	ØCD h9 (+0 - 0.002)	ØE	EE BSPT (NTPF)	G	L	M	ØMM rod dia.	V	WF	Y
20	12 (0.472)	6.35 (0.250)	27 (1.06)	1/8* (1/8 †)	7 (0.26)	18 (0.70)	7 (0.28)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	6.35 (0.250)	32 (1.26)	1/8* (1/8 †)	8 (0.27)	17 (0.68)	7 (0.28)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	6.35 (0.250)	39 (1.53)	1/8 (1/8)	15.5 (0.57)	27 (1.07)	10 (0.39)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	9.52 (0.375)	48.5 (1.91)	1/8 (1/8)	10 (0.36)	22 (0.88)	10 (0.39)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	9.52 (0.375)	59 (2.32)	1/4 (1/4)	12 (0.43)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	9.52 (0.375)	72 (2.83)	1/4 (1/4)	13 (0.46)	23 (0.91)	11 (0.44)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	19.07 (0.751)	90 (3.54)	3/8 (3/8)	15 (0.54)	35 (1.38)	19 (0.75)	25 (0.984)	3 (0.12)	31 (1.22)	59 ()2.32
100	50 (1.968)	19.07 (0.751)	110 (4.33)	1/2 (1/2)	17 (0.64)	43 (1.69)	19 (0.75)	32 (1.260)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size	CE	CH	CM	CN	CT	CW	CX	CY	CZ	ØSB	Add stroke LB	P	XC	ZX
20	35.5 (1.39)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	45 (1.77)	99 (3.91)	120 (4.74)
25	38 (1.49)	22 (0.87)	5 (0.19)	10 (0.38)	3 (0.12)	29 (1.13)	32 (1.25)	19 (0.75)	51 (2.00)	7 (0.27)	69 (2.70)	46 (1.81)	102 (4.00)	123 (4.83)
32	41.5 (1.63)	22 (0.87)	5 (0.19)	13 (0.50)	3 (0.12)	29 (1.13)	35 (1.38)	19 (0.75)	54 (2.12)	7 (0.27)	71 (2.78)	43 (1.69)	120 (4.72)	141 (5.55)
40	59 (2.31)	35 (1.38)	6 (0.25)	16 (0.62)	3 (0.12)	38 (1.50)	47 (1.86)	25 (1.00)	67 (2.62)	7 (0.27)	78 (3.06)	49 (1.93)	122 (4.81)	151 (5.94)
50	64.5 (2.52)	35 (1.38)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	53 (2.09)	143 (5.63)	172 (6.76)
63	80 (3.17)	44 (1.75)	6 (0.25)	19 (0.75)	6 (0.25)	38 (1.50)	54 (2.12)	25 (1.00)	76 (3.00)	7 (0.27)	90 (3.53)	52 (2.05)	143 (5.63)	172 (6.76)
80	96 (3.77)	51 (2.00)	13 (0.50)	28 (1.09)	6 (0.25)	64 (2.50)	72 (2.84)	38 (1.50)	104 (4.09)	11 (0.42)	108 (4.25)	64 (2.52)	173 (6.82)	218 (8.57)
100	115 (4.54)	60 (2.37)	13 (0.50)	32 (1.25)	6 (0.25)	70 (2.75)	76 (3.00)	44 (1.75)	108 (4.25)	14 (0.55)	108 (4.25)	66 (2.60)	189 (7.44)	240 (9.44)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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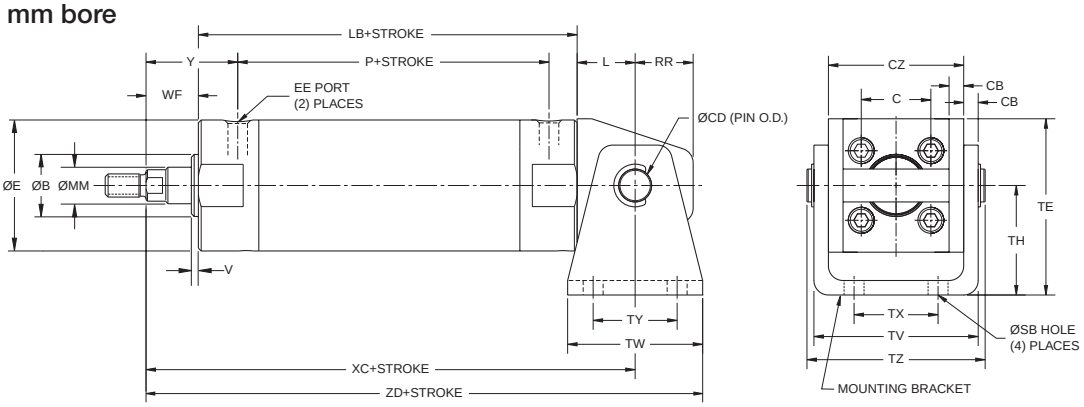
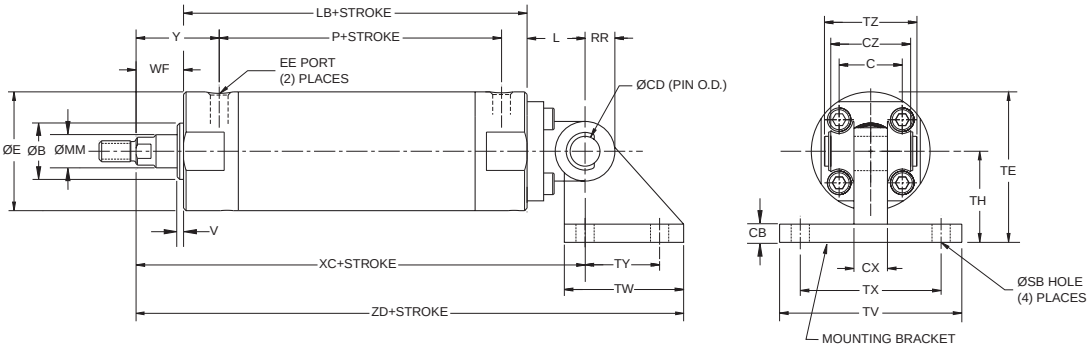
Style A - Double Rear Clevis

Typical 20 to 63 mm bore



Typical 80 to 100 mm bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items.

Style A, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02 (+0 -0.001)	C	CB	ØCD d 9 (-0.001 -0.003)	CZ	CX	ØE	EE BSPT (NPTF)	L	ØMM rod dia.	RR	V	WF
20	12 (0.472)	14 (0.55)	3 (0.12)	8 (0.315)	29 (1.14)	–	27 (1.06)	1/8* (1/8†)	14 (0.55)	8 (0.315)	11 (0.43)	2 (0.08)	13 (0.50)
25	14 (0.551)	16.5 (0.65)	3 (0.12)	10 (0.394)	33 (1.30)	–	32 (1.26)	1/8* (1/8†)	16 (0.63)	10 (0.394)	13 (0.51)	2 (0.08)	16 (0.62)
32	18 (0.709)	20 (0.79)	4.5 (0.18)	12 (0.472)	40 (1.57)	–	39 (1.53)	1/8 (1/8)	20 (0.79)	12 (0.472)	15 (0.59)	2 (0.08)	22 (0.88)
40	25 (0.984)	26 (1.02)	4.5 (0.18)	14 (0.551)	49 (1.93)	–	48.5 (1.91)	1/8 (1/8)	22 (0.87)	16 (0.630)	18 (0.71)	2 (0.08)	22 (0.88)
50	30 (1.181)	32 (1.26)	6 (0.25)	16 (0.630)	60 (2.36)	–	59 (2.32)	1/4 (1/4)	25 (0.98)	20 (0.787)	20 (0.79)	2 (0.08)	30 (1.19)
63	32 (1.260)	38 (1.50)	8 (0.31)	18 (0.709)	74 (2.91)	–	72 (2.83)	1/4 (1/4)	30 (1.18)	20 (0.787)	22 (0.87)	2 0.08)	30 (1.19)
80	40 (1.575)	50 (1.97)	11 (0.43)	18 (0.709)	56 (2.20)	28 (1.10)	90 (3.54)	3/8 (3/8)	35 (1.38)	25 (0.984)	18 (0.71)	3 (0.12)	31 (1.22)
100	50 (1.968)	60 (2.36)	12 (0.47)	22 (0.866)	64 (2.52)	32 (1.26)	110 (4.33)	1/2 (1/2)	43 (1.69)	32 (1.260)	22 (0.87)	3 (0.12)	31 (1.22)

Bore size	Ø SB	TY	TV	TE	TH	TX	TW	TZ	Y	Add Stroke LB	P	XC	ZD
20	5.5 (0.22)	28 (1.10)	35 (1.39)	38 (1.50)	25 (0.98)	16 (0.63)	42 (1.66)	43.4 (1.71)	28 (1.10)	69 (2.70)	45 (1.77)	95 (3.75)	116 (4.58)
25	5.5 (0.22)	28 (1.10)	39 (1.55)	45.5 (1.79)	30 (1.18)	20 (0.79)	42 (1.66)	48 (1.89)	30 (1.18)	69 (2.70)	46 (1.81)	100 (3.95)	121 (4.78)
32	7 (0.28)	28 (1.10)	49 (1.93)	54 (2.13)	35 (1.38)	22 (0.87)	48 (1.88)	59.4 (2.34)	40 (1.57)	71 (2.78)	43 (1.69)	113 (4.45)	137 (5.39)
40	7 (0.28)	30 (1.18)	58 (2.28)	63.5 (2.50)	40 (1.57)	30 (1.18)	56 (2.20)	71.4 (2.81)	42 (1.65)	78 (3.06)	49 (1.93)	122 (4.81)	150 (5.91)
50	9 (0.35)	36 (1.42)	72 (2.83)	79 (3.11)	50 (1.97)	36 (1.42)	64 (2.52)	86 (3.38)	53 (2.09)	90 (3.53)	53 (2.09)	145 (5.70)	177 (6.96)
63	11 (0.43)	46 (1.81)	90 (3.54)	96 (3.78)	60 (2.36)	46 (1.81)	74 (2.91)	105.4 (4.15)	53 (2.09)	90 (3.53)	52 (2.05)	150 (5.90)	187 (7.36)
80	11 (0.43)	45 (1.77)	110 (4.33)	100 (3.94)	55 (2.17)	85 (3.35)	72 (2.83)	64 (2.52)	59 (2.32)	108 (4.25)	64 (2.52)	174 (6.85)	232.5 (9.15)
100	13.5 (0.53)	60 (2.36)	130 (5.12)	120 (4.72)	65 (2.56)	100 (3.94)	93 (3.66)	72 (2.83)	57 (2.24)	108 (4.25)	66 (2.60)	182 (7.17)	258.5 (10.18)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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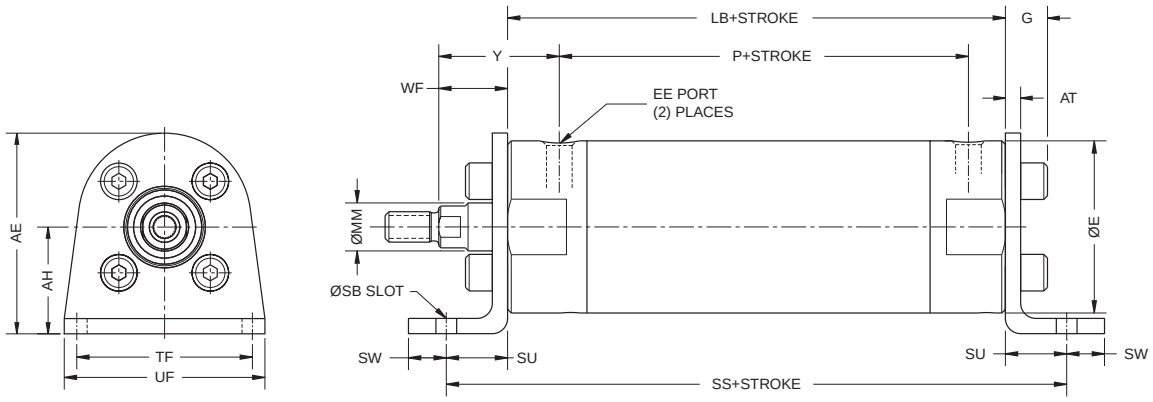
Style F - Foot Mount

Typical 20 to 100 mm bore



Style F, envelope and mounting dimensions – mm (inch)

Bore size	AE	AH	AT	ØE	EE (BSPT)	G	ØMM rod dia.	ØSB
20	36.5 1.44)	20.6 (0.81)	3 (0.12)	27 (1.06)	1/8* (1/8†)	6 (0.20)	8 (0.315)	7 (0.27)
25	38.5 (1.52)	20.6 (0.81)	3 (0.12)	32 (1.26)	1/8* (1/8†)	6.5 (0.22)	10 (0.394)	7 (0.27)
32	46.5 (1.83)	25.4 (1.00)	3 (0.12)	39 (1.53)	1/8 (1/8)	6.5 (0.22)	12 (0.472)	7 (0.28)
40	51 (2.02)	25.4 (1.00)	3 (0.12)	48.5 (1.91)	1/8 (1/8)	7 (0.25)	16 (0.630)	7 (0.28)
50	72 (2.84)	38.1 (1.50)	6 (0.25)	59 (2.32)	1/4 (1/4)	11 (0.41)	20 (0.787)	9 (0.34)
63	83.5 (3.29)	44.5 (1.75)	6 (0.25)	72 (2.83)	1/4 (1/4)	12 (0.44)	20 (0.787)	9 (0.34)
80	101 (3.98)	55 (2.17)	6 (0.25)	90 (3.54)	3/8 (3/8)	12 (0.44)	25 (0.984)	11 (0.43)
100	121 (4.76)	65 (2.56)	6 (0.25)	110 (4.33)	1/2 (1/2)	13 (0.50)	32 (1.260)	14 (0.55)

Bore size	SU	SW	TF	UF	WF	Y	Add stroke		
							LB	P	SS
20	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	13 (0.50)	28 (1.10)	69 (2.70)	45 (1.77)	97 3.82)
25	14 (0.56)	11 (0.44)	38 (1.50)	48 (1.88)	16 (0.62)	30 (1.18)	69 (2.70)	46 (1.81)	97 (3.82)
32	19 (0.75)	19 0.75)	48 (1.88)	63.5 (2.50)	22 (0.88)	40 (1.57)	71 (2.78)	43 (1.69)	109 (4.28)
40	18 (0.72)	20 (0.78)	48 (1.88)	63.5 (2.50)	22 (0.88)	42 (1.65)	78 (3.06)	49 (1.93)	114 (4.50)
50	25 (1.00)	16 (0.62)	57 (2.24)	79 (3.12)	30 (1.19)	53 (2.09)	90 (3.53)	53 (2.09)	140 (5.53)
63	25 (1.00)	16 (0.62)	73 (2.88)	95 (3.75)	30 (1.19)	53 (2.09)	90 (3.53)	52 (2.05)	140 (5.53)
80	28.5 (1.12)	14 (0.55)	100 (3.94)	125 (4.92)	31 (1.22)	59 (2.32)	108 (4.25)	64 (2.52)	165 (6.49)
100	30 (1.18)	16 0.63)	120 (4.72)	150 (5.91)	31 (1.22)	57 (2.24)	108 (4.25)	66 (2.60)	168 (6.61)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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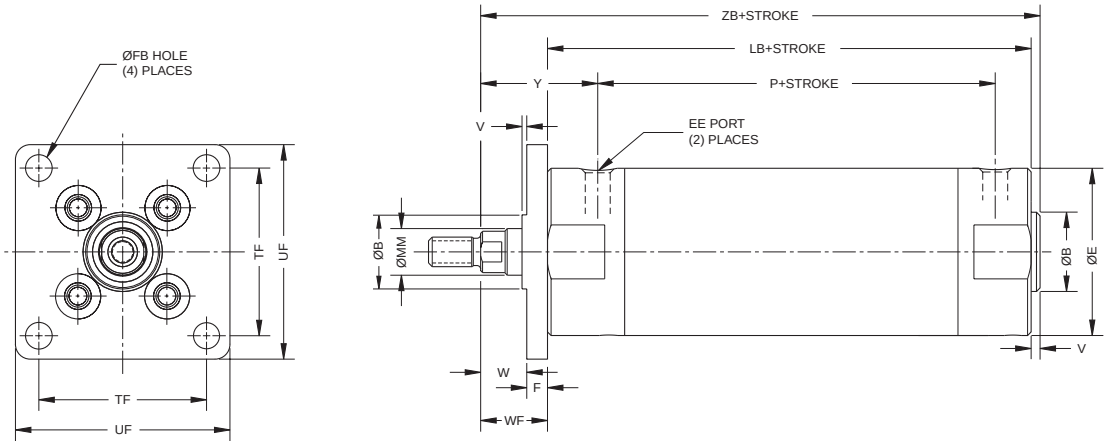
Style J - Front Flange

Typical 20 to 100 mm bore



Style J, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	W	Y
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	7 (0.26)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	9 (0.34)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	15 (0.60)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	14 (0.57)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	21 (0.84)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	20 (0.79)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	17 (0.67)	57 (2.24)

Bore size	Add stroke		
	LB	P	ZB
20	69 (2.70)	45 (1.77)	83 (3.28)
25	69 (2.70)	46 (1.81)	86 (3.40)
32	71 (2.78)	43 (1.69)	95 (3.74)
40	78 (3.06)	49 (1.93)	102 (4.02)
50	90 (3.53)	53 (2.09)	122 (4.80)
63	90 (3.53)	52 (2.05)	122 (4.80)
80	108 (4.25)	64 (2.52)	142 (5.59)
100	108 (4.25)	66 (2.60)	142 (5.59)

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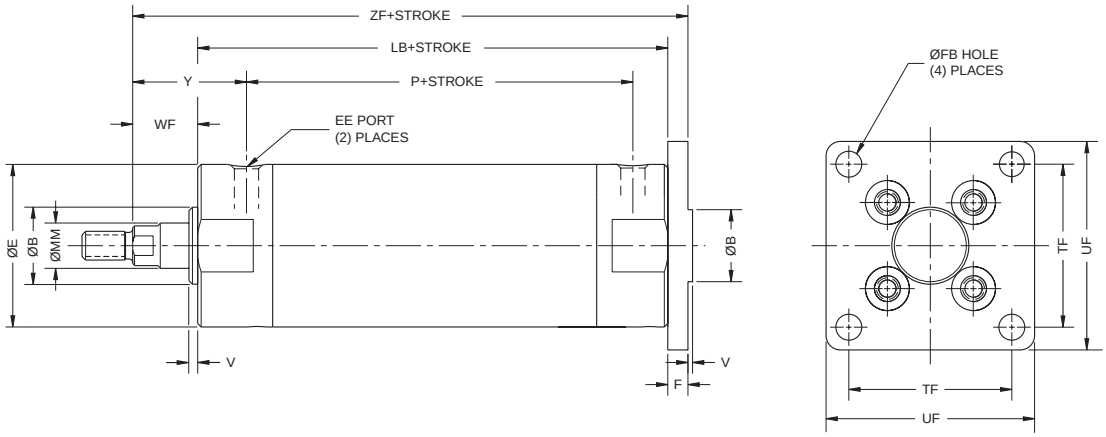
Style H - Rear Flange

Typical 20 to 100 mm bore



Style H, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	EE (BSPT)	F	ØFB	ØMM rod dia.	TF	UF	V	WF	Y
20	12 (0.472)	27 (1.06)	1/8* (1/8†)	6 (0.24)	5.5 (0.22)	8 (0.315)	28 (1.10)	40 (1.57)	2 (0.08)	13 (0.50)	28 (1.10)
25	14 (0.551)	32 (1.26)	1/8* (1/8†)	7 (0.28)	5.5 (0.22)	10 (0.394)	32 (1.26)	44 (1.73)	2 (0.08)	16 (0.62)	30 (1.18)
32	18 (0.709)	39 (1.53)	1/8 (1/8)	7 (0.28)	7 (0.28)	12 (0.472)	38 (1.50)	53 (2.09)	2 (0.08)	22 (0.88)	40 (1.57)
40	25 (0.984)	48.5 (1.91)	1/8 (1/8)	8 (0.31)	7 (0.28)	16 (0.630)	46 (1.81)	61 (2.40)	2 (0.08)	22 (0.88)	42 (1.65)
50	30 (1.181)	59 (2.32)	1/4 (1/4)	9 (0.35)	9 (0.35)	20 (0.787)	58 (2.28)	76 (3.00)	2 (0.08)	30 (1.19)	53 (2.09)
63	32 (1.260)	72 (2.83)	1/4 (1/4)	9 (0.35)	11 (0.43)	20 (0.787)	70 (2.76)	92 (3.62)	2 (0.08)	30 (1.19)	53 (2.09)
80	40 (1.575)	90 (3.54)	3/8 (3/8)	11 (0.43)	11 (0.43)	25 (0.984)	82 (3.23)	104 (4.09)	3 (0.12)	31 (1.22)	59 (2.32)
100	50 (1.968)	110 (4.33)	1/2 (1/2)	14 (0.55)	14 (0.55)	32 (1.260)	100 (3.94)	128 (5.04)	3 (0.12)	31 (1.22)	57 (2.24)

Bore size	Add stroke		
	LB	P	ZF
20	69 (2.70)	45 (1.77)	87 (3.44)
25	69 (2.70)	46 (1.81)	91 (3.60)
32	71 (2.78)	43 (1.69)	100 (3.94)
40	78 (3.06)	49 (1.93)	108 (4.25)
50	90 (3.53)	53 (2.09)	129 (5.07)
63	90 (3.53)	52 (2.05)	129 (5.07)
80	108 (4.25)	64 (2.52)	150 (5.91)
100	108 (4.25)	66 (2.60)	153 (6.02)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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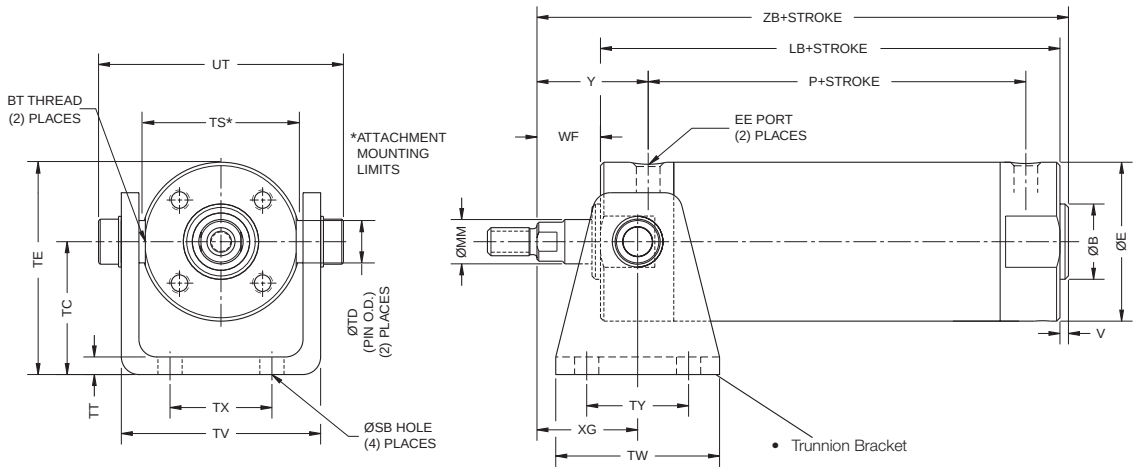
Style E - Front Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style E, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	BT	D	ØE	EE (BSPT)	ØMM rod dia.	V	WF	XG	Y	ØSB	TC
20	12 (0.472)	M5x0.80	6 (0.24)	27 (1.06)	1/8* (1/8†)	8 (0.315)	2 (0.08)	13 (0.50)	24 (0.93)	28 (1.10)	5.5 (0.22)	25 (0.98)
25	14 (0.551)	M6x0.75	8 (0.31)	32 (1.26)	1/8* (1/8†)	10 (0.394)	2 (0.08)	16 (0.62)	27 (1.05)	30 (1.18)	5.5 (0.22)	30 (1.18)
32	18 (0.709)	M8x1.00	10 (0.39)	39 (1.53)	1/8 (1/8)	12 (0.472)	2 (0.08)	22 (0.88)	33 (1.31)	40 (1.57)	7 (0.28)	35 (1.38)
40	25 (0.984)	M10x1.25	12 (0.47)	48.5 (1.91)	1/8 (1/8)	16 (0.630)	2 (0.08)	22 (0.88)	34 (1.35)	42 (1.65)	7 (0.28)	40 (1.57)
50	30 (1.181)	M12x1.25	16 (0.63)	59 (2.32)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	43 (1.70)	53 (2.09)	9 (0.35)	50 (1.97)
63	32 (1.260)	M14x1.50	16 (0.63)	72 (2.83)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	43 (1.70)	53 (2.09)	11 (0.43)	60 (2.36)

Bore size	ØTD e8	TE	TS	TT	TV	TW	TX	TY	UT	Add stroke LB	P	ZB
20	8 (0.315)	38.5 (1.51)	28 (1.10)	3 (0.12)	35 (1.39)	42 (1.66)	16 (0.63)	28 (1.10)	47.5 (1.87)	69 (2.70)	45 (1.77)	83 (3.28)
25	10 (0.394)	46 (1.81)	33 (1.30)	3 (0.12)	39 (1.55)	42 (1.66)	20 (0.79)	28 (1.10)	53 (2.09)	69 (2.70)	46 (1.81)	86 (3.40)
32	12 (0.472)	54.5 (2.15)	40 (1.58)	4.5 (0.18)	49 (1.93)	48 (1.88)	22 (0.87)	28 (1.10)	68 (2.67)	71 (2.78)	43 (1.69)	95 (3.74)
40	14 (0.551)	64 (2.53)	49 (1.93)	4.5 (0.18)	58 (2.28)	56 (2.20)	30 (1.18)	30 (1.18)	79 (3.10)	78 (3.06)	49 (1.93)	102 (4.02)
50	16 (0.630)	79.5 (3.13)	60 (2.36)	6 (0.25)	72 (2.83)	64 (2.52)	36 (1.42)	36 (1.42)	99 (3.88)	90 (3.53)	53 (2.09)	122 (4.80)
63	18 (0.709)	96 (3.78)	74 (2.91)	8 (0.31)	90 (3.54)	74 (2.91)	46 (1.81)	46 (1.81)	119 (4.69)	90 (3.53)	52 (2.05)	122 (4.80)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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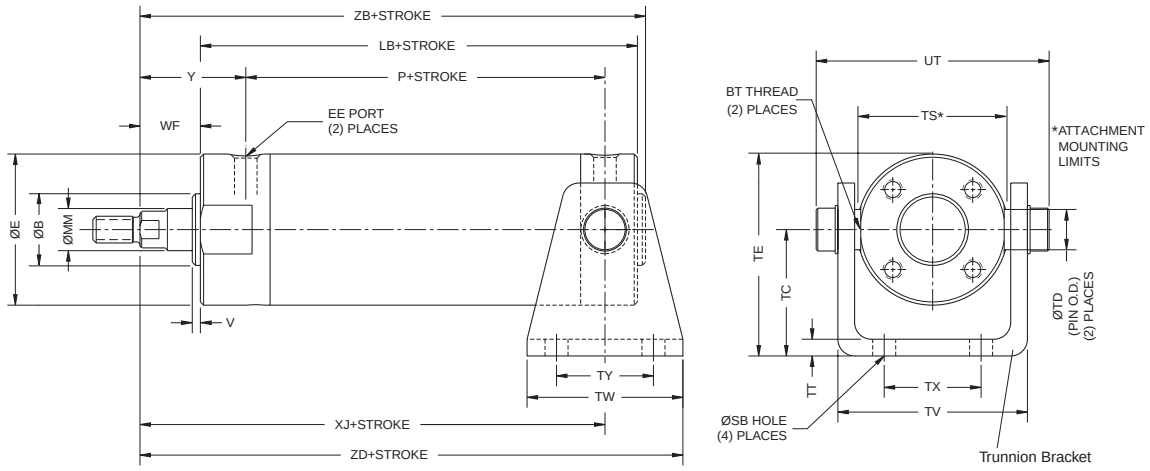
Style D - Rear Trunnion

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

Style D, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	BT	ØE	EE (BSPT)	ØMM rod dia.	V	WF	Y	ØSB	TC	ØTD e8	TE
20	12 (0.472)	M5x0.80	27 (1.06)	1/8* (1/8†)	8 (0.315)	2 (0.08)	13 (0.50)	28 (1.10)	5.5 (0.22)	25 (0.98)	8 (0.315)	38.5 (1.51)
25	14 (0.551)	M6x0.75	32 (1.26)	1/8* (1/8†)	10 (0.394)	2 (0.08)	16 (0.62)	30 (1.18)	5.5 (0.22)	30 (1.18)	10 (0.394)	46 (1.81)
32	18 (0.709)	M8x1.00	39 (1.53)	1/8 (1/8)	12 (0.472)	2 (0.08)	22 (0.88)	40 (1.57)	7 (0.28)	35 (1.38)	12 (0.472)	54.5 (2.15)
40	25 (0.984)	M10x1.25	48.5 (1.91)	1/8 (1/8)	16 (0.630)	2 (0.08)	22 (0.88)	42 (1.65)	7 (0.28)	40 (1.57)	14 (0.551)	64 (2.53)
50	30 (1.181)	M12x1.25	59 (2.32)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	9 (0.35)	50 (1.97)	16 (0.630)	79.5 (3.13)
63	32 (1.260)	M14x1.50	72 (2.83)	1/4 (1/4)	20 (0.787)	2 (0.08)	30 (1.19)	53 (2.09)	11 (0.43)	60 (2.36)	18 (0.709)	96 (3.78)

Bore size	TS	TT	TV	TW	TX	TY	UT	Add stroke LB	P	XJ	ZB	ZD
20	28 (1.10)	3 (0.12)	35 (1.39)	42 (1.66)	16 (0.63)	28 (1.10)	47.5 (1.87)	69 (2.70)	45 (1.77)	70 (2.77)	83 (3.28)	91 (3.60)
25	33 (1.30)	3 (0.12)	39 (1.55)	42 (1.66)	20 (0.79)	28 (1.10)	53 (2.09)	69 (2.70)	46 (1.81)	73 (2.89)	86 (3.40)	94 (3.72)
32	40 (1.58)	4.5 (0.18)	49 (1.93)	48 (1.88)	22 (0.87)	28 (1.10)	68 (2.67)	71 (2.78)	43 (1.69)	83 (3.27)	95 (3.74)	107 (4.21)
40	49 (1.93)	4.5 (0.18)	58 (2.28)	56 (2.20)	30 (1.18)	30 (1.18)	79 (3.10)	78 (3.06)	49 (1.93)	90 (3.54)	102 (4.02)	118 (4.64)
50	60 (2.36)	6 (0.25)	72 (2.83)	64 (2.52)	36 (1.42)	36 (1.42)	99 (3.88)	90 (3.53)	53 (2.09)	108 (4.25)	122 (4.80)	140 (5.51)
63	74 (2.91)	8 (0.31)	90 (3.54)	74 (2.91)	46 (1.81)	46 (1.81)	119 (4.69)	90 (3.53)	52 (2.05)	108 (4.25)	122 (4.80)	145 (5.71)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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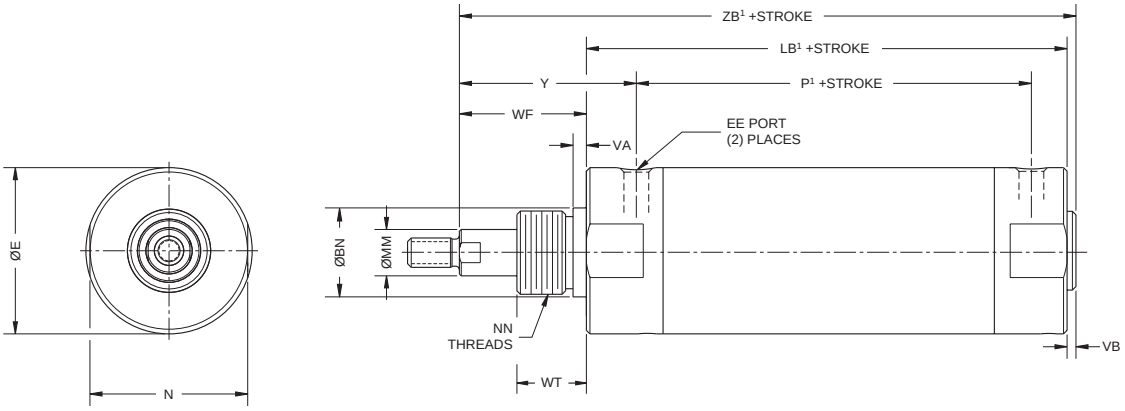
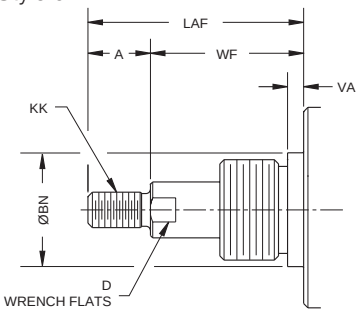
Style G - Nose Mount

Typical 20 to 25 mm bore

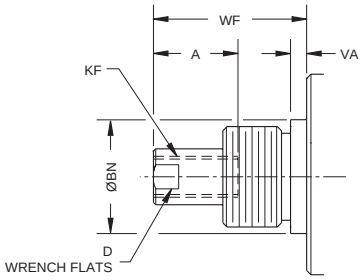


Rod end details – 20 and 25 mm bore

Male threads
Inch male - Style N
Metric male - Style 5



Female threads
Inch female - Style 9
Metric female - Style 6



Special rod end threads

Thread style 3
Special metric or inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF. If otherwise special, supply a dimensioned sketch.

Style G, envelope and mounting dimensions – mm (inch)

Bore size	A	BN +0 -0.08	D	ØE	EE (BSPT)	Thread KK Style 5	Thread KF Style 6	LAF	ØMM rod dia.	NN	N	VA	VB	WF	WT	Y	Add stroke LB¹	Add stroke P¹	Add stroke ZB¹
20	13 (0.50)	19.02 (0.749)	6 (0.24)	27 (1.06)	1/8* (1/8†)	M8x1.25 (1/4-28)	M5x0.80 (#10-32)	35 (1.38)	8 (0.315)	3/4-16 (3/4-16)	24 (0.94)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	32 (1.25)	66 (2.60)	47 (1.85)	90 (3.56)
25	13 (0.50)	19.02 (0.749)	8 (0.31)	32 (1.26)	1/8* (1/8†)	M10x1.25 5/16-24 ()	M6x1.00 (1/4-28)	35 (1.38)	10 (0.394)	3/4-16 (3/4-16)	29 (1.14)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	32 (1.25)	66 (2.60)	47 (1.85)	90 (3.56)

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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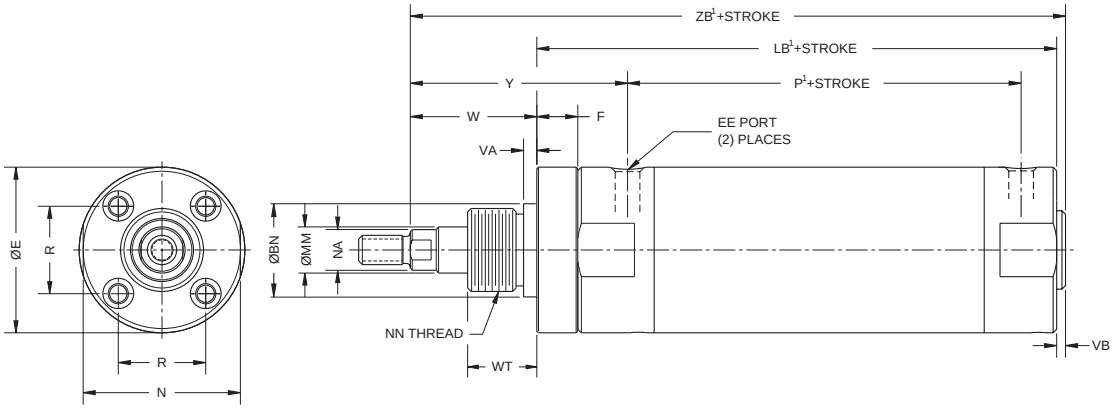
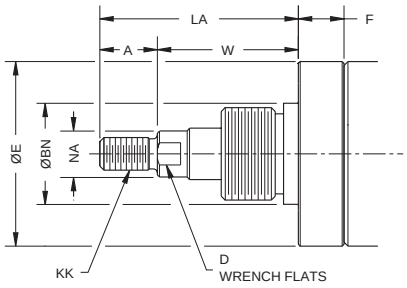
Style G - Nose Mount

Typical 32 to 63mm bore

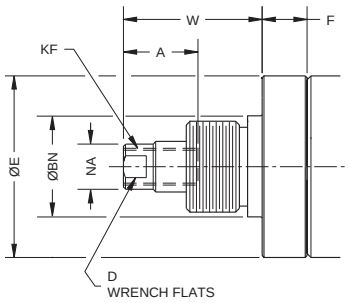


Rod end details – 32 to 63mm bore

Male threads
Inch male - Style N
Metric male - Style 5



Female threads
Inch female - Style 9
Metric female - Style 6



Special rod end threads

Thread style 3

Special metric or inch threads, extension, blank, etc., are also available. To order, specify “Style 3” and give desired dimensions for KK or KF, A and LAF or WF (Note: LAF = LA+F and WF = W+F). If otherwise special, supply a dimensioned sketch.

Style G, envelope and mounting dimensions – mm (inch)

Bore size	A	BN +0 -0.8	D	ØE	EE* (BSPT)	F	Thread KK Style 5	Thread KF Style 6	LA	ØMM rod dia.	NN	N	NA	R	VA	VB	W	WT	Y	Add stroke LB[1]	Add stroke P[1]	Add stroke ZB[1]
32	19 (0.75)	19.02 (0.749)	10 (0.39)	39 (1.53)	1/8 (1/8)	9 (0.37)	M10x1.25 (7/16-20)	M8x1.25 (5/16-24)	41 (1.63)	12 (0.472)	3/4-16 (3/4-16)	36 (1.42)	11 (0.43)	20 (0.79)	3 (0.12)	2 (0.08)	22 (0.88)	16 (0.63)	49 (1.93)	80 (3.15)	43 (1.69)	104 (4.11)
40	19 (0.75)	26.87 (1.058)	12 (0.47)	48.5 (1.91)	1/8 (1/8)	14 (0.56)	M14x1.5 (7/16-20)	M8x1.25 (3/8-24)	51 (2.00)	16 (0.630)	1-14 (1-14)	44 (1.73)	14 (0.55)	26 (1.02)	5 (0.19)	2 (0.08)	32 (1.25)	22 (0.88)	66 (2.60)	92 (3.62)	49 (1.93)	126 (4.95)
50	22 (0.88)	34.90 (1.374)	16 (0.63)	59 (2.32)	1/4 (1/4)	15 (0.59)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-1/4-12 (1-1/4-12)	55 (2.17)	18 (0.71)	32 (1.26)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	68 (2.68)	105 (4.12)	53 (2.09)	137 (5.39)
63	22 (0.88)	38.10 (1.500)	16 (0.63)	72 (2.83)	1/4 (1/4)	16 (0.63)	M18x1.5 (1/2-20)	M10x1.25 (1/2-20)	52 (2.07)	20 (0.787)	1-3/8-12 (1-3/8-12)	69 (2.72)	18 (0.71)	38 (1.50)	3 (0.12)	2 (0.08)	30 (1.19)	20.5 (0.81)	70 (2.76)	106 (4.19)	52 (2.05)	139 (5.46)

* See Metric Dimensions for BSPT Port Size.
See Inch Dimensions for NPTF Port Size.

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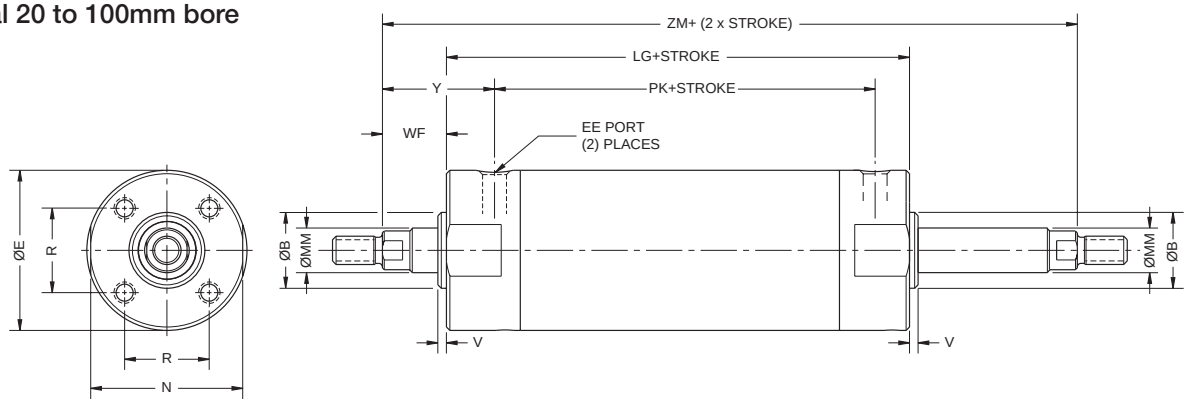
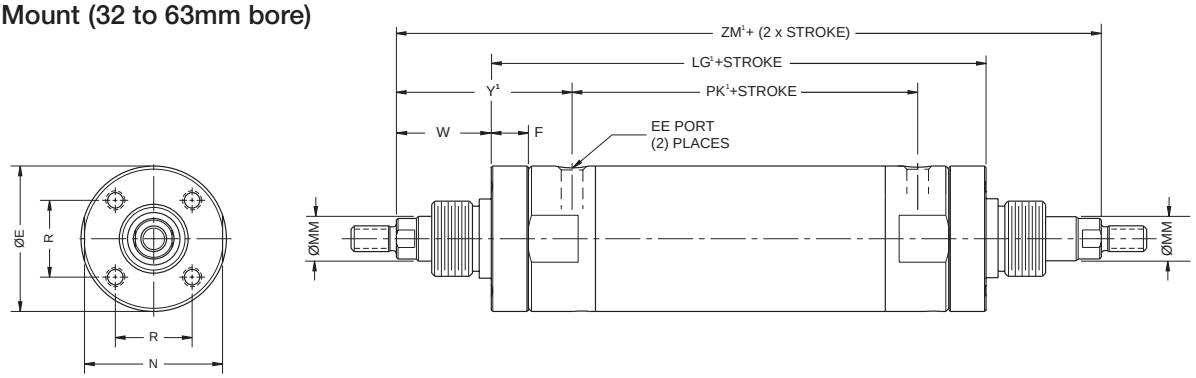
Double-Rod

Typical 20 to 100mm bore



Double-Rod

Nose Mount (32 to 63mm bore)



For detailed dimensions for the nose mount from 20 to 63 mm bore, please reference previous pages.

Double rod, envelope and mounting dimensions – mm (inch)

Bore size	ØB +0 -0.02	ØE	F	EE (BSPT)	ØMM rod dia.	N	R	V	W	WF	Y	Y[1]	Add stroke LG	LG[1]	PK	PK[1]	ZM	ZM[1]
20	12 (0.472)	27 (1.06)	–	1/8* (1/8†)	8 (0.315)	24 (0.94)	14 (0.55)	2 (0.08)	–	13 (0.50)	28 (1.10)	32 (1.25)	75 (2.97)	70 (2.74)	45 (1.77)	50 (1.97)	101 (3.97)	95 (3.74)
25	14 (0.551)	32 (1.26)	–	1/8* (1/8†)	10 (0.394)	29 (1.14)	16.5 (0.65)	2 (0.08)	–	16 (0.62)	30 (1.18)	32 (1.25)	75 (2.97)	70 (2.74)	47 (1.85)	50 (1.97)	107 (4.21)	101 (3.98)
32	18 (0.709)	39 (1.53)	9 (0.37)	1/8 (1/8)	12 (0.472)	36 (1.42)	20 (0.79)	2 (0.08)	22 (0.88)	22 (0.88)	40 (1.57)	49 (1.93)	78 (3.06)	97 (3.80)	42 (1.65)	42 () 1.65	122 (4.82)	141 (5.56)
40	25 (0.984)	48.5 (1.91)	14 (0.56)	1/8 (1/8)	16 (0.630)	44 (1.73)	26 (1.02)	2 (0.08)	32 (1.25)	22 (0.88)	42 (1.65)	66 (2.60)	87 (3.41)	115 (4.53)	47 (1.85)	47 (1.85)	131 (5.17)	179 (7.03)
50	30 (1.181)	59 (2.32)	15 (0.59)	1/4 (1/4)	20 (0.787)	55 (2.17)	32 (1.26)	2 (0.08)	30 (1.19)	30 (1.19)	53 (2.09)	68 (2.68)	100 (3.93)	130 (5.11)	54 (2.13)	54 (2.13)	160 (6.31)	190 (7.49)
63	32 (1.260)	72 (2.83)	17 (0.66)	1/4 (1/4)	20 (0.787)	69 (2.72)	38 (1.50)	2 (0.08)	30 (1.19)	30 (1.19)	53 (2.09)	70 (2.76)	100 (3.93)	133 (5.25)	54 (2.13)	54 (2.13)	160 (6.31)	194 (7.63)
80	40 (1.575)	90 (3.54)	–	3/8 (3/8)	25 (0.984)	86 (3.39)	50 (1.97)	3 (0.12)	–	31 (1.22)	59 (2.32)	–	119 (4.70)	–	61 (2.40)	–	181 (7.14)	–
100	50 (1.968)	110 (4.33)	–	1/2 (1/2)	32 (1.260)	106 (4.17)	60 (2.36)	3 (0.12)	–	31 (1.22)	57 (2.24)	–	119 (4.70)	–	65 (2.56)	–	181 (7.14)	–

* Ports are M5 for cushioned versions, metric
† Ports are 10-32 for cushioned versions, inch

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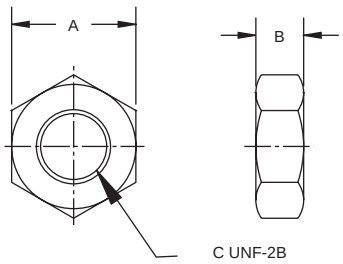
Rod Jam Nut



Rod jam nut should be ordered separately on all mounting styles.

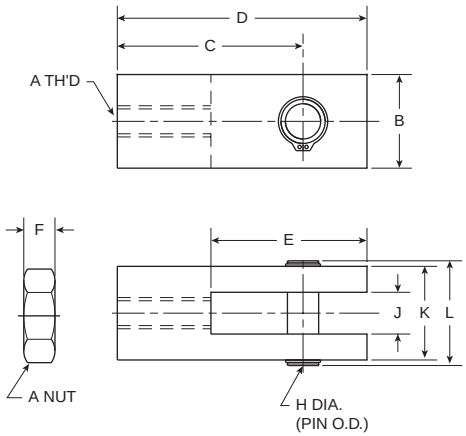
Rod Jam Nut Dimensions – mm

Bore size	A	B	C	Part number
20	13	4	M8 x 1.25	L075540008
25-32	17	5	M10 x 1.25	L075540010
40	22	7	M14 x 1.5	L075540014
50-63	27	8	M18 x 1.5	L075540018
80	32	11	M22 x 1.5	L075540022
100	41	16	M26 x 1.5	L075540026

Rod Jam Nut Dimensions – inch

Bore size	A	B	C	Part number
20	0.44	0.16	1/4-28	L077970025
25	0.50	0.19	5/16-24	L077970031
32-40	0.69	0.25	7/16-20	L077970044
50-63	0.75	0.31	1/2-20	L077970050
80	1.12	0.42	3/4 -16	L077970075
100	1.50	0.55	1-14	L077970100

Piston Rod Clevis



Piston Rod Clevis Dimensions – mm

Bore size	A	B	C	D	E	F	H h9	J	K	L	Part number
20	M8x1.25	13	24	30	18	4	6.35	6.5	13	17.5	L077590020
25	M10x1.25	19	24	30	18	5	6.35	6.5	19	24.5	L077590025
32	M10x1.25	19	34	43	24	5	9.52	10	19	26	L077590032
40	M14x1.5	19	34	43	24	7	9.52	10	19	26	L077590040
50	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
63	M18x1.5	28	34	43	24	8	9.52	10	28	36	L077590050
80	M22x1.5	38	50	71	48	11	18	28	56	64	PIM-4PRC
100	M26x1.5	44	55	79	55	16	22	32	63.5	72	L077590100

Piston Rod Clevis Dimensions – inch

Bore size	A	B	C	D	E	F	H	J	K +0 -0.02	L	Part number
20	1/4-28	0.50	0.94	1.19	0.69	0.16	0.250	0.26	0.50	0.69	L077960025
25	5/16-24	0.50	0.94	1.19	0.69	0.19	0.250	0.26	0.50	0.69	L077960031
32	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
40	7/16-20	0.75	1.32	1.69	0.94	0.25	0.375	0.38	0.75	1.03	L077960044
50	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
63	1/2-20	0.75	1.32	1.69	0.94	0.31	0.375	0.38	0.75	1.03	L077960050
80	3/4-16	1.25	1.81	2.38	1.31	0.42	0.437	0.52	1.25	1.66	L077960075
100	1-14	1.50	2.63	3.38	1.81	0.55	0.500	0.64	1.50	1.91	L077960100

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- Conforms to ISO 6432 and CETOP RP52P standards
- 5 bore sizes, 10mm to 25mm
- Stainless steel body with black anodized aluminum end caps
- Stainless steel piston rod
- Magnetic piston and bumpers standard

Operating information

Operating pressure:	10 bar (145 PSIG), air
Temperature range:	
Working	-20°C to 80°C (4°F to 176°F)
High temperature version	
20mm, 25mm	-10°C to 150°C (14°F to 302°F)
10mm, 12mm, 16mm	-10°C to 120°C (14°F to 248°F)
Low temperature version	-40°C to 60°C (-40°F to 140°F)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P1A – S **016** **M** **S** **–** **0025**

Bore size	
010	10mm
012	12mm
016	16mm
020	20mm
025	25mm

Cylinder type / function		
M		Double-acting, adjustable cushioning. Ø16-25 mm. Not for sealing material type F.
D		Double-acting, bumpers, Ø10 - Ø25
F		Double-acting, adjustable cushioning, double rod, Ø16-25 mm. Not for sealing material type F.
K		Double-acting, bumpers, double rod, Ø10 - Ø25
S		Single-acting, bumpers, spring return for retract stroke, Ø10-25 mm
T		Single-acting, bumpers, spring extend for advance stroke, Ø16-25 mm

Sealing material	
S	Standard -20°C to +80°C (-4°F to +176°F) Magnetic piston
F	High temperature: Ø12 mm, 16 mm, 20 mm and 25 mm -10°C to +150°C. (14°F to 302°F) Non magnetic piston
V	External seals of fluorinated rubber -20°C to +80°C (-4°F to +176°F) Magnetic piston

Stroke length, mm
E.g. 0025 = 25 mm
For standard stroke length and max length see table below.

Stroke Lengths

Cylinder model	Bore size	Stroke Length (• = standard, • = non-standard, blank = N/A)															
		10	15	20	25*	30	40	50*	80*	100*	125*	160*	200*	250*	320*	400*	500*
Double acting with fixed end-cushioning:																	
P1A-S 010 D	10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 012 D	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 016 D	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 020 D	20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 025 D	25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Double acting with adjustable end-cushioning:																	
P1A-S 016 M	16			•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 020 M	20			•	•	•	•	•	•	•	•	•	•	•	•	•	•
P1A-S 025 M	25			•	•	•	•	•	•	•	•	•	•	•	•	•	•
Single acting:																	
P1A-S 010 SS	10	•	•	•	•	•	•	•	•								
P1A-S 012 SS	12	•	•	•	•	•	•	•	•								
P1A-S 016 SS(TS)	16	•	•	•	•	•	•	•	•**								
P1A-S 020 SS(TS)	20	•	•	•	•	•	•	•	•								
P1A-S 025 SS(TS)	25	•	•	•	•	•	•	•	•								

* Standard stroke lengths in mm according to ISO 4393
** Not for the TS version

Sensors
For sensors see page B296.

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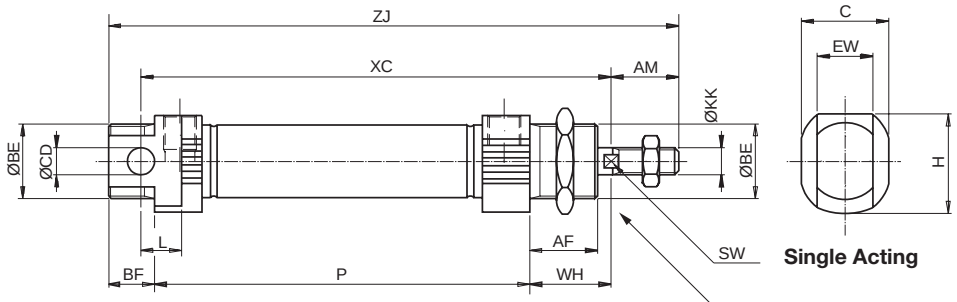
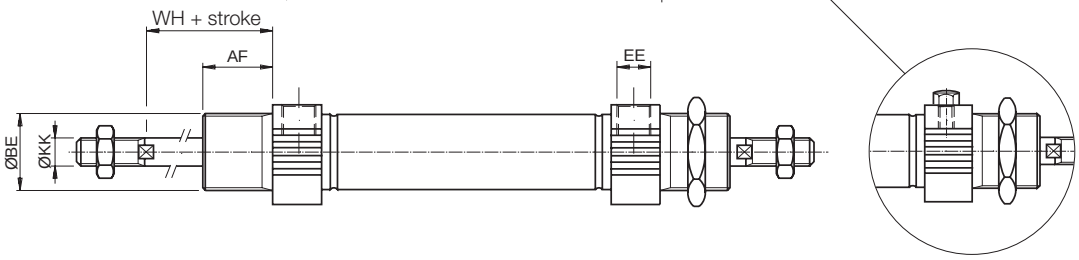
Double acting cylinders



Double piston rod



Bore size mm	AM 0/-2 mm	BE	AF mm	BF mm	C mm	CD h9 mm	EE	EW mm	H mm	KK	L mm	SW mm	WH±1.2 mm
10	12	M12x1.25	12	10	14.0	4	M5	8	16.7	M4	6	–	16
12	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16[1)]	16	M16x1.5	18	13	18.0	6	M5	12	19.1	M6	9	5	22
16[2)]	16	M16x1.5	18	13	25.0	6	M5	12	24.0	M6	9	5	22
20	20	M22x1.5	20	14	24.0	8	G1/8	16	27.0	M8	12	7	24
25	22	M22x1.5	22	14	27.5	8	G1/8	16	29.0	M10x1.25	12	9	28

1) P1A-S016DS/SS/TS 2) P1A-S016MS

Double acting cylinders

Bore size mm	XC mm	ZJ mm	P mm
10	64 + stroke	84 + stroke	46 + stroke
12	75 + stroke	99 + stroke	48 + stroke
16	82 + stroke	104 + stroke	53 + stroke
20	95 + stroke	125 + stroke	67 + stroke
25	104 + stroke	132 + stroke	68 + stroke

Single-acting, spring return, type SS

Bore size mm	XC (mm) at various strokes						ZJ (mm) at various strokes						P (mm) at various strokes					
	10	**15**	**25**	**40**	**50**	**80**	**10**	**15**	**25**	**40**	**50**	**80**	**10**	**15**	**25**	**40**	**50**	**80**
10	74	79	89	126	136	174	94	99	109	146	156	194	56	61	71	108	118	156
12	85	90	100	132	142	185	109	114	124	156	166	209	58	63	73	105	115	158
16	92	97	107	122	132	184	114	119	129	144	154	206	63	68	78	93	103	155
20	105	110	120	135	145	191	135	140	150	165	175	221	77	82	92	107	117	163
25	114	119	129	144	154	201	142	147	157	172	182	229	78	83	93	108	118	165

Single-acting, spring-extended, type TS

Bore size mm	ZC 3) (mm) at various strokes						ZJ 3) (mm) at various strokes						P (mm) at various strokes					
	10	**15**	**25**	**40**	**50**	**80**	**10**	**15**	**25**	**40**	**50**	**80**	**10**	**15**	**25**	**40**	**50**	**80**
16	107	112	122	137	147	–	134	139	149	164	174	–	78	83	93	108	118	–
20	120	125	135	150	160	195	156	161	171	186	196	231	92	97	107	122	132	167
25	129	134	144	159	169	205	165	170	180	195	205	241	93	98	108	123	133	169

3) With piston rod retracted, as shown in the dimension drawing
Length tolerances ±1 mm Stroke length tolerance +1.5/0 mm

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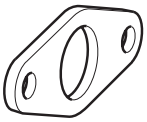
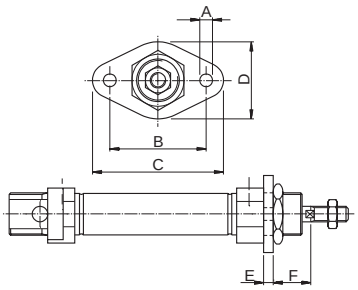
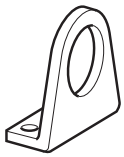
Flange - MF8

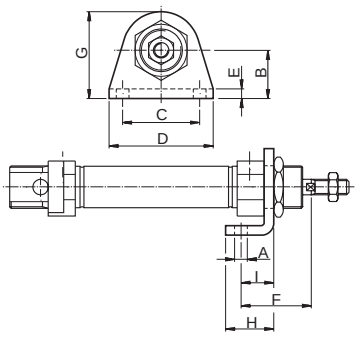




Cylinder Ø mm	A	B	C	D	E	F	Weight lbs	Part number
10	4.5	30	40	22	3	13	0.025	**P1A-4CMB**
12-16	5.5	40	52	30	4	18	0.055	**P1A-4DMB**
20	6.6	50	66	40	5	19	0.100	**P1A-4HMB**
25	6.6	50	66	40	5	23	0.100	

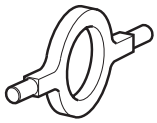
Foot - MS3

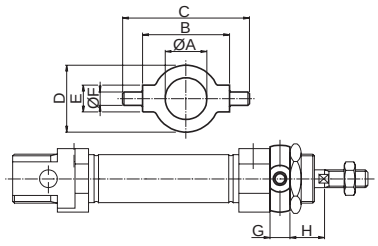




Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	Weight lbs	Part number
10	4.5	16	25	35	3	24	26.0	16	11	0.045	**P1A-4CMF**
12-16	5.5	20	32	42	4	32	32.5	20	14	0.08	**P1A-4DMF**
20	6.5	25	40	54	5	36	45.0	25	17	0.18	**P1A-4HMF**
25	6.5	25	40	54	5	40	45.0	25	17	0.18	

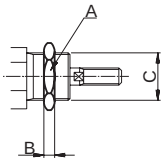
Cover Trunnion





Cylinder Ø mm	A mm	B h14 mm	C mm	D mm	E e9 mm	F mm	G mm	H mm	Weight lbs	Part number
10	12.5	26	38	20	8	4	6	10	0.03	**P1A-4CMJ**
12-16	16.5	38	58	25	10	6	8	14	0.07	**P1A-4DMJ**
20	22.5	46	66	30	10	6	8	16	0.08	**P1A-4HMJ**
25	22.5	46	66	30	10	6	8	20	0.08	

Mounting Nut



Cylinder Ø mm	A mm	B mm	C mm	Weight lbs	Part number
10	19	6	M12x1.25	0.02	**9127385101**
12-16	24	8	M16x1.50	0.04	**9127385102**
20-25	32	11	M22x1.50	0.09	**9127385103**

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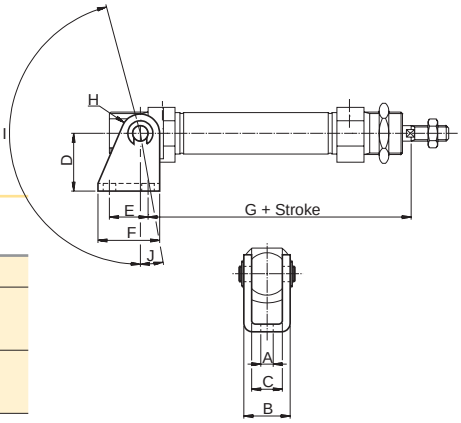
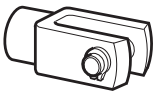
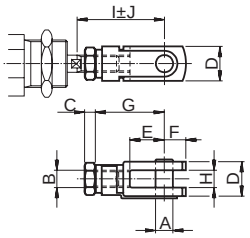
Clevis Bracket



Cylinder Ø mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I °	J °	Weight lbs	Part number
10	4.5	13	8	24	12.5	20	65.3	5	160	17	0.045	**P1A-4CMT**
12	5.5	18	12	27	15.0	25	73.0	7	170	15	0.08	**P1A-4DMT**
16	5.5	18	12	27	15.0	25	80.0	7	170	15	0.08	
20	6.5	24	16	30	20.0	32	91.0	10	165	10	0.18	**P1A-4HMT**
25	6.5	24	16	30	20.0	32	100.0	10	165	10	0.18	

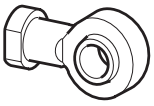
Rod clevis

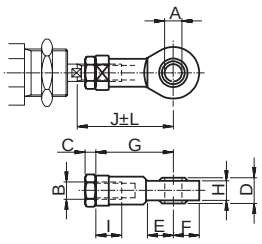




Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	Weight lbs	Part number
10	4	M4	2.2	8	8	5	16	4	22.0	2.0	0.015	**P1A-4CRC**
12-16	6	M6	3.2	12	12	7	24	6	31.0	3.0	0.05	**P1A-4DRC**
20	8	M8	4.0	16	16	10	32	8	40.5	3.5	0.10	**P1A-4HRC**
25	10	M10 x 1.25	5.0	20	20	12	40	10	49.0	3.0	0.21	**P1A-4JRC**

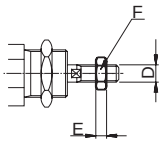
Swivel Rod Eye





Cylinder Ø mm	A mm	B	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	Weight lbs	Part number
10	5	M4	2.2	8	10	9	27	6.0	8	33.0	9	2.0	0.04	**P1A-4CRS**
12-16	6	M6	3.2	9	10	10	30	6.8	9	38.5	11	1.5	0.06	**P1A-4DRS**
20	8	M8	4.0	12	12	12	36	9.0	12	46.0	14	2.0	0.10	**P1A-4HRS**
25	10	M10 x 1.25	5.0	14	14	14	43	10.5	15	52.5	17	2.5	0.19	**P1A-4JRS**

Rod Nut



Cylinder Ø mm	D mm	F mm	E mm	Weight lbs	Part number
10	M4	7	2.2	0.002	**0261110600**
12-16	M6	10	3.2	0.004	**0261210800**
20	M8	13	4.0	0.010	**0261211000**
25	M10x1.25	17	5.0	0.015	**9128985601**

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- Repairable design, aluminum construction
- 6 bore sizes: 1-1/8" to 4"
- Double-acting, spring-return and spring-extend models
- Cushions optional at either or both ends
- Universal nose and tang mounts
- Standard stroke lengths to 20 inches in one inch increments, plus 1-1/2", 2-1/2" and 3-1/2" strokes. Fraction strokes and strokes over 20 inches are available upon request.

Operating information

Operating pressure:	150 PSIG
Temperature range:	
Standard seals	-10°F to 165°F
Fluorocarbon seals	-10°F to 250°F
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

2-1/2"	C	K		P	L	U				1	6		C	X6"

Bore size

1-1/8"
1-1/2"
2"
2-1/2"
3"
4"

Cushion head end

Blank	No cushion
C	Cushion head end

Double rod

Blank	Single rod
K	Double rod

Mounting style

Blank	Standard
N	No tang
A	Dual tang

Series

Piston

Blank	0-ring piston
L	Lipseal piston

Sensors available on lipseal pistons only.

Ports

U	N.P.T.F.

Seals / options

Blank	Buna-N
V	Fluorocarbon
M	Magnet with Buna-N seals[1]

Spring

E	Spring extend
R	Spring return

Special number

Use "S" symbol only if special feature is required (specify).

NOTE: Do not use symbol "S" for rod end modification.

Rod diameter style

1	Standard

For double rod cylinders specify rod code twice.

Rod thread

6	Standard
3	Special

(For special rod end specify "CC" thread Dia. A and LE or LE1 or Dim. or submit sketch.)

Rod material

Blank	Standard rod
D	416 Stainless steel [2]

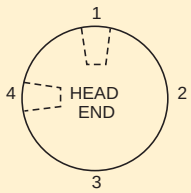
Cushion cap end

Blank	No cushion
C	Cushion cap end

Stroke

Specify in inches. Show times symbol "X" just ahead of stroke length.

Safety Cushion Adjustment Location



With port in position 1, cushion location will be position 4.

Notes:
[1] Must specify lipseal piston with magnet option.
[2] Standard on 1-1/8" bore. {D} not required.

Sensors

For sensors see page B296.

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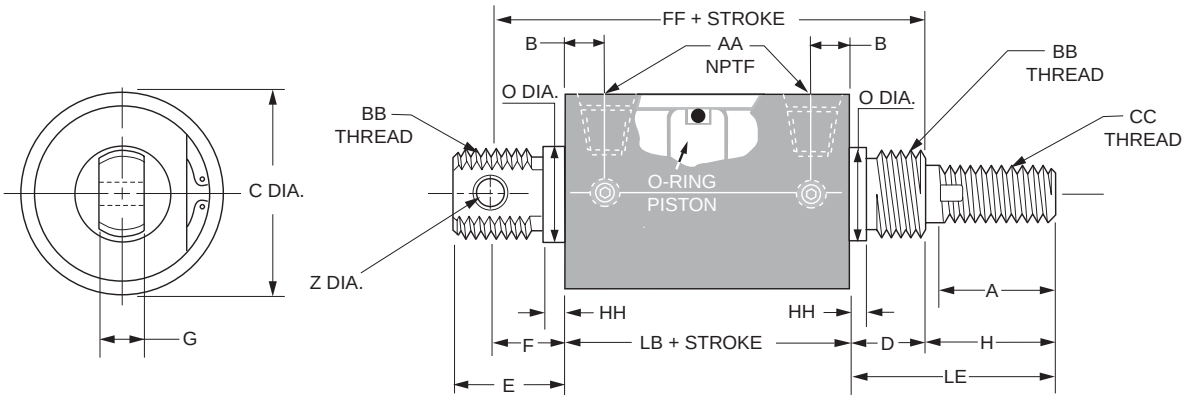
Model P

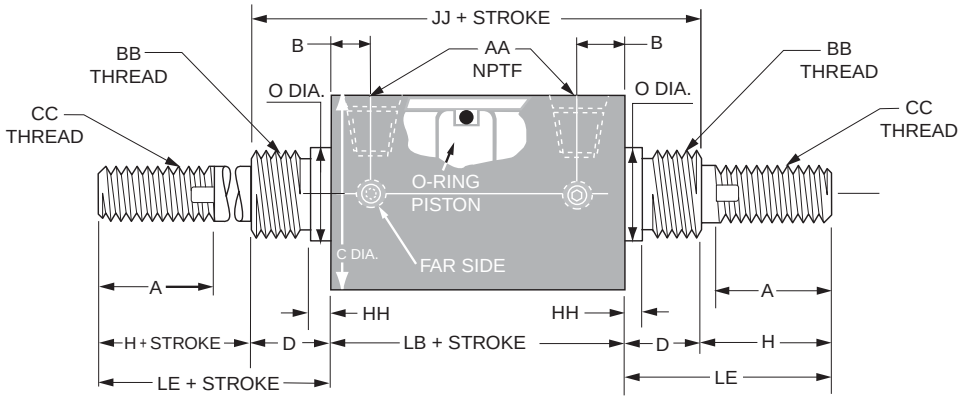
O-ring piston – single rod



Model P cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NP.

Model KP

O-ring piston – double rod



Mounting nuts not supplied with cylinder.

Model P and KP Single and Double Rod Cylinders

Bore Size	Rod Dia.	LB	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	FF	HH	JJ	LE
1-1/8	3/8	2-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3-3/8	3/32	3-5/16	1-5/8
1-1/2	1/2	2-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	4-3/8	1/8	4-3/8	2-5/16
2	5/8	2-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	4-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	3	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16
3	3/4	3	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	5-3/8	3/16	5	2-11/16

Note: 4" bore size offered only with Lipseal Piston.
FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PV or KPV.

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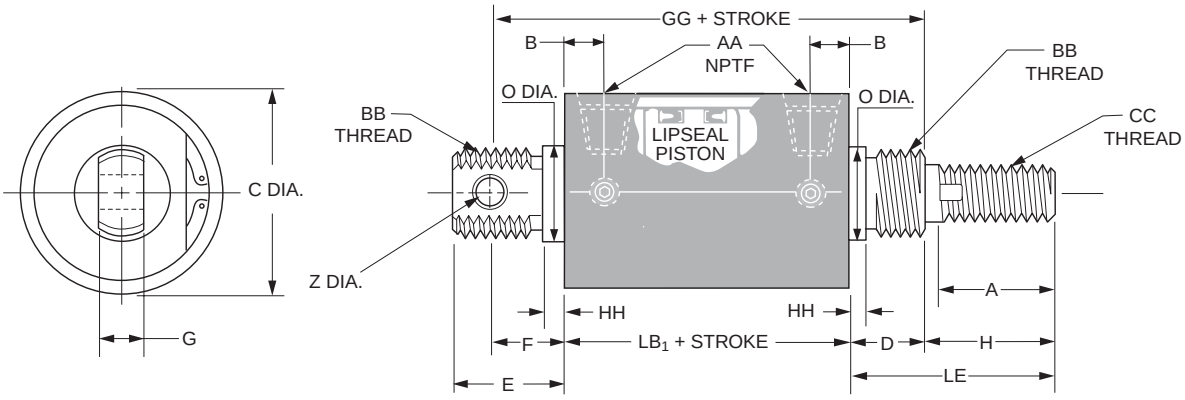
Model PL

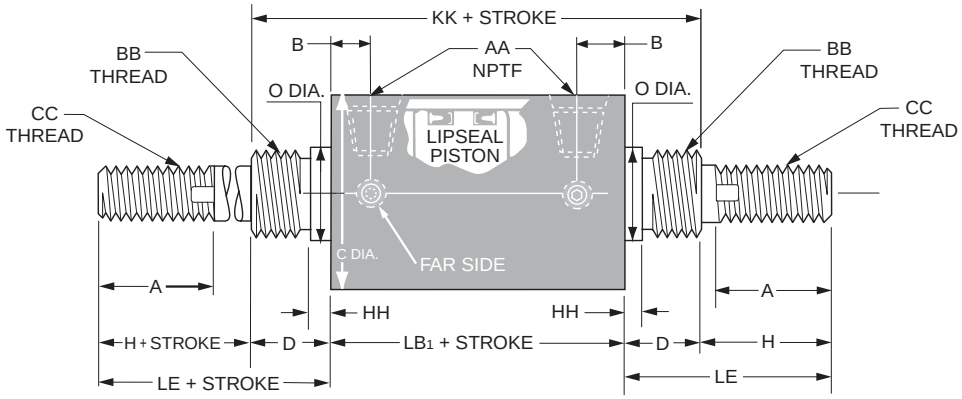
Lipseal piston – single rod



Model PL cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NPL.

Model KPL

Lipseal piston – double rod



Mounting nuts not supplied with cylinder.

Model PL and KPL Single and Double Rod Cylinders

Bore Size	Rod Dia.	LB1	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	GG	HH	KK	LE
1-1/8	3/8	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	4-3/8	3/32	4-5/16	1-5/8
1-1/2	1/2	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	5-3/8	1/8	5-3/8	2-5/16
2	5/8	3-5/8	1/2	2-1/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	5-3/8	1/8	4-3/8	2-5/16
2-1/2	3/4	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
3	3/4	4	5/8	3-1/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	6-3/8	3/16	6	2-11/16
4	1	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	8-1/16	3/16	7-1/4	3-3/8

FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PLV or KPLV.

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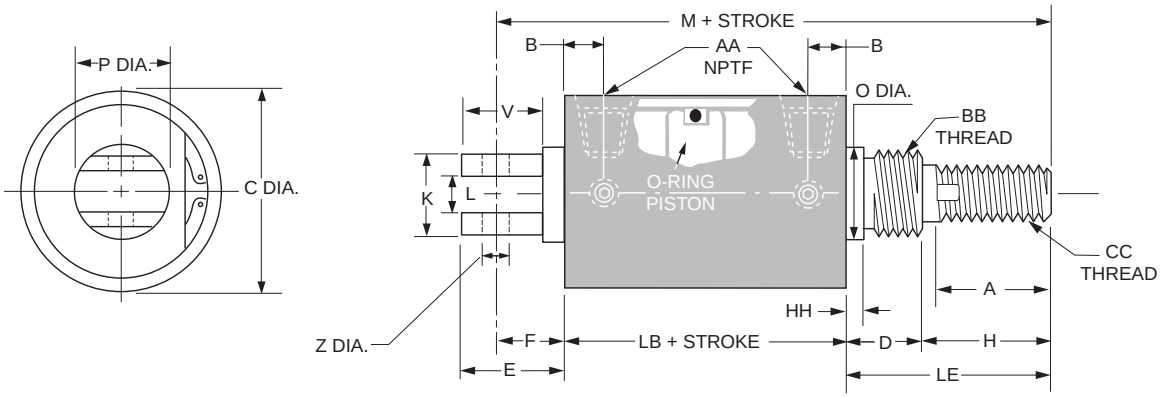
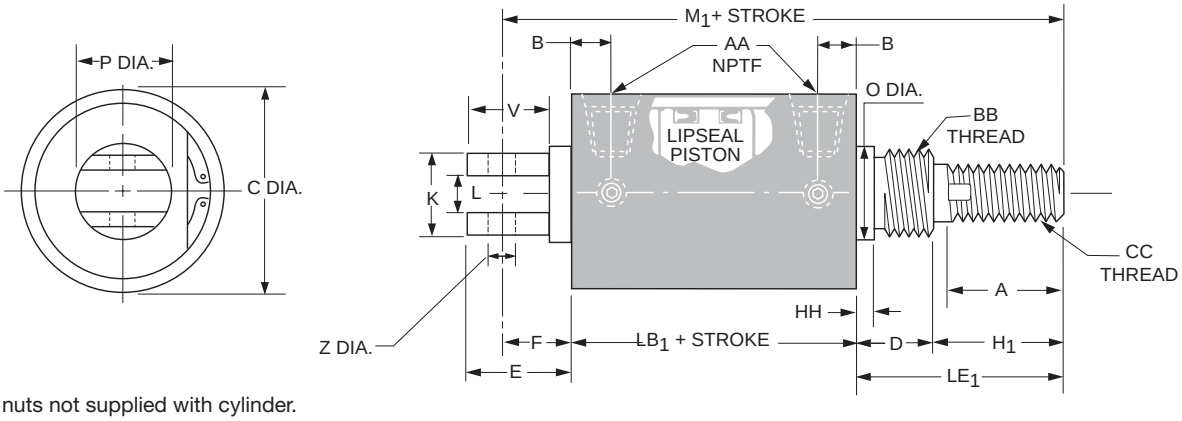
Model AP

O-ring piston – single rod
1-1/8" bore thru 3" bore



Model APL

Lipseal piston – single rod
1-1/8" bore thru 4" bore



Mounting nuts not supplied with cylinder.

Models AP and APL only

Bore Size	Rod Dia.	LB	LB1	B	C	D	E	F	H	H1	A	K	L	M	M1	O	P	V	Z	AA	BB	CC	HH	LE	LE1
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	1	1	7/8	15/16	3/8	4-3/8	5-3/8	3/4	15/16	7/8	3/8	1/8	3/4-16	3/8-16	3/32	1-5/8	1-5/8
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-5/8	15/16	2-7/16	1-7/16	1-1/4	1-1/4	1/2	6-7/8	6-7/8	1-1/16	1-1/4	1-1/2	3/8	1/4	1-14	1/2-13	1/8	3-5/16	2-5/16
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7/8	2-1/4	1-9/16	2-7/16	1-7/16	1-1/4	1-1/2	1/2	7-1/2	7-1/2	1-1/16	1-11/16	1-3/4	1/2	1/4	1-14	5/8-11	1/8	3-5/16	2-5/16
2-1/2	3/4	3	4	5/8	2-3/4	1	1-13/16	1-1/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	8-13/16	8-13/16	1-3/8	2-1/4	1-11/16	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16
3	3/4	3	4	5/8	3-1/4	1	2-5/16	1-5/8	3-11/16	2-11/16	1-1/2	1-1/2	1/2	9-5/16	9-5/16	1-3/8	2-1/4	1-3/4	1/2	3/8	1-3/8-12	3/4-10	3/16	4-11/16	3-11/16
4	1	–	5-1/2	15/16	4-3/8	1-1/8	2-7/8	1-7/8	–	2-1/4	1-7/8	2-1/4	3/4	–	10-3/4	1-3/4	3	2-1/2	3/4	1/2	1-3/4-12	1-14	3/16	–	3-3/8

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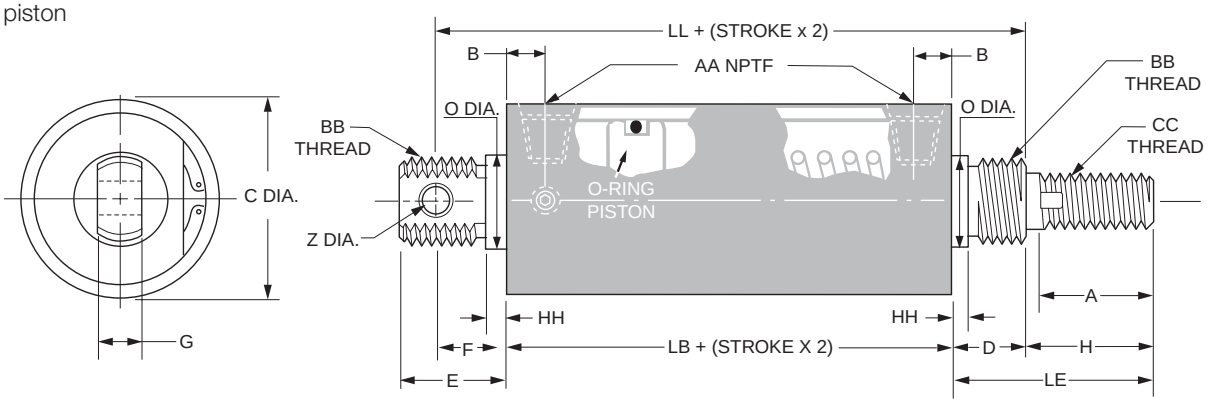
Model PR – Spring return
Model PE – Spring extend

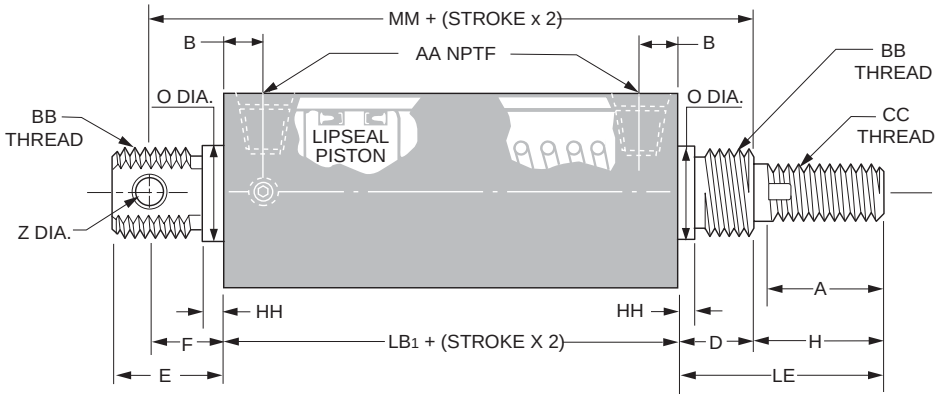
O-ring piston



Spring return cylinders are available without tail section covered by dimension E minus HH at no extra charge. To order, add letter "N" to model number.

Model PLR – Spring return
Model PLE – Spring extend

Lipseal piston



Mounting nuts not supplied with cylinder.

For Single Rod Spring Return Cylinders up to 6" Stroke (no load spring)

Bore Size	Rod Dia.	LB	LB1	B	C	D	E	F	G	H	A	O	Z	AA	BB	CC	HH	LL	MM	LE	Spring force Pre-load (lbs.)	Spring force Max. load (lbs.)
1-1/8	3/8	2-1/16	3-1/16	13/32	1-3/8	5/8	1	11/16	3/8	1	7/8	3/4	1/4	1/8	3/4-16	3/8-16	3/32	3-3/8	4-3/8	1-5/8	12	36
1-1/2	1/2	2-5/8	3-5/8	1/2	1-3/4	7/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	1/2-13	1/8	4-3/8	5-3/8	2-5/16	14	45
2	5/8	2-5/8	3-5/8	1/2	2-1/4	7-/8	1-1/4	7/8	1/2	1-7/16	1-1/4	1-1/16	5/16	1/4	1-14	5/8-11	1/8	4-3/8	5-3/8	2-5/16	18	48
2-1/2	3/4	3	4	5/8	2-3/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
3	3/4	3	4	5/8	31/4	1	2	1-3/8	5/8	1-11/16	1-1/2	1-3/8	7/16	3/8	1-3/8-12	3/4-10	3/16	5-3/8	6-3/8	2-11/16	30	64
4	1	▲	5-1/2	15/16	4-3/8	1-1/8	2-3/16	1-7/16	3/4	2-1/4	1-7/8	1-3/4	1/2	1/2	1-3/4-12	1-14	3/16	▲	8-1/16	3-3/8	50	148

▲ 4" bore spring return cylinders, available only with lipseal type piston.
** Net stroke plus stop tube = gross stroke.
FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PVR, PVE, PLVR or PLVE.
* Dimensions shown are for cylinder with no load spring. For heavier springs or double rod spring return cylinders, consult factory.

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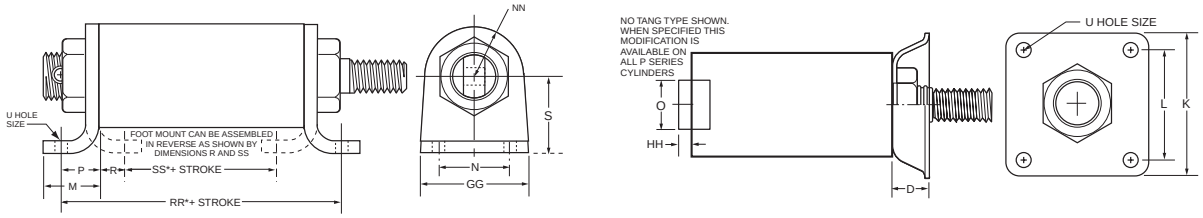
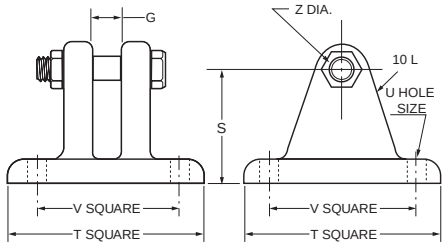
Foot and Flange Mounts



Bore size	D	K	L	M	N	O	P	R	S	U	GG	HH	NN	RR	SS	Foot mount*	Flange mount**
1-1/8	5/8	2-1/2	2	1-3/8	1-11/16	3/4	7/8	5/8	1-9/32	9/32	2-11/16	3/32	11/16	3-13/16	13/16	**L069190000**	**L069230000**
1-1/2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	**L069200000**	**L069240000**
2	7/8	3-1/4	2-1/2	1-9/32	1-5/8	1-1/16	7/8	9/16	1-3/4	9/32	2-7/16	1/8	1-1/8	4-3/8	1-1/2	**L069200000**	**L069240000**
2-1/2	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	**L069210000**	**L069250000**
3	1	4-1/2	3-3/8	1-29/32	2-1/4	1-3/8	1-1/4	7/8	2-3/8	13/32	3-9/16	3/16	1-5/8	5-1/2	1-1/4	**L069210000**	**L069250000**
4	1-1/8	5-1/4	4	2-17/32	3-1/4	1-3/4	1-3/4	1-5/16	3-3/16	15/32	4-13/16	3/16	2-3/16	9▲	2-7/8▲	**L069220000**	**L069260000**

▲ Dimension shown is for lipseal piston type.
* Part number includes one foot mounting and one mounting nut.
** Includes mounting nut.

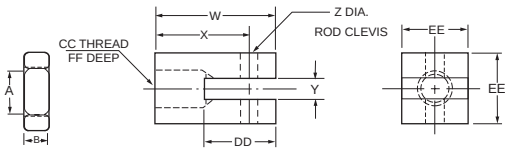
Clevis Bracket



Bore size	G	S	T	U	V	Z	Part number
1-1/8	3/8	1-9/32	2-1/4	9/32	1-3/4	1/4	**L06730 0000**
1-1/2	1/2	1-3/4	3	9/32	2-1/4	5/16	**L06731 0000**
2	1/2	1-3/4	3	9/32	2-1/4	5/16	**L06731 0000**
2-1/2	5/8	2-3/8	4	13/32	3	7/16	**L06732 0000**
3	5/8	2-3/8	4	13/32	3	7/16	**L06732 0000**
4	3/4	3-3/16	5	15/32	3-3/4	1/2	**L06733 0000**

Connecting pin and locknut furnished with clevis bracket.

Rod Clevis

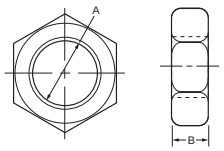


Cyl. bore	Rod dia.	A	B	CC	DD	EE	FF	W	X	Y	Z	Part number
1-1/8	3/8	3/8-16	7/32	3/8-16	1-1/8	3/4	5/8	1-3/4	1-3/8	5/16	1/4	**L06734 0000**
1-1/2	1/2	1/2-13	5/16	1/2-13	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	**L06735 0000**
2	5/8	5/8-11	3/8	5/8-11	1-5/16	1	15/16	2-1/4	1-3/4	3/8	5/16	**L06736 0000**
2-1/2	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	**L06737 0000**
3	3/4	3/4-10	27/64	3/4-10	1-5/16	1-1/4	1-1/16	2-3/8	1-13/16	1/2	7/16	**L06737 0000**
4	1	1-14	35/64	1-14	1-13/16	1-1/2	1-9/16	3-3/8	2-5/8	5/8	1/2	**L06738 0000**

Note: Rod end jam nut furnished with rod clevis.

☐ Most popular.

Mounting Nut for Cylinders**



Bore size	A	B	Part number
1-1/8	3/4-16	27/64	**083301 0048**
1-1/2 & 2	1-14	35/64	**083301 0100**
2-1/2 & 3	1-3/8-12	25/32	**083301 0124**
4	1-3/4-12	15/16	**083183 0000**

Sensors
For sensors see page B296.

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- Economical square body compact cylinder
- 10 bore sizes available 12mm - 100mm
- 4 flexible mounting options
- Female and male rod ends available
- Bumpers standard on all models
- Magnetic and non-magnetic contruction available

Operating information

Operating pressure:	10 bar (145 PSIG) maximum
Temperature range:	-5°C to 70°C (23°F to 158°F)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Metric Double Acting/Magnetic - Female Threaded Piston Rod

12mm

Stroke (mm)	Order Code
5	P1QS012DC7G0005
10	P1QS012DC7G0010
15	P1QS012DC7G0015
25	P1QS012DC7G0025
30	P1QS012DC7G0030

16mm

5	P1QS016DC7G0005
10	P1QS016DC7G0010
15	P1QS016DC7G0015
25	P1QS016DC7G0025
30	P1QS016DC7G0030

20mm

10	P1QS020DC7G0010
15	P1QS020DC7G0015
25	P1QS020DC7G0025
30	P1QS020DC7G0030
40	P1QS020DC7G0040
50	P1QS020DC7G0050

25mm

10	P1QS025DC7G0010
15	P1QS025DC7G0015
25	P1QS025DC7G0025
30	P1QS025DC7G0030
40	P1QS025DC7G0040
50	P1QS025DC7G0050

32mm

Stroke (mm)	Order Code
10	P1QS032DC7N0010
15	P1QS032DC7N0015
25	P1QS032DC7N0025
30	P1QS032DC7N0030
40	P1QS032DC7N0040
50	P1QS032DC7N0050
75	P1QS032DC7N0075
100	P1QS032DC7N0100

40mm

15	P1QS040DC7N0015
25	P1QS040DC7N0025
30	P1QS040DC7N0030
40	P1QS040DC7N0040
50	P1QS040DC7N0050
75	P1QS040DC7N0075
100	P1QS040DC7N0100

50mm

15	P1QS050DC7N0015
25	P1QS050DC7N0025
30	P1QS050DC7N0030
40	P1QS050DC7N0040
50	P1QS050DC7N0050
75	P1QS050DC7N0075
100	P1QS050DC7N0100

63mm

Stroke (mm)	Order Code
15	P1QS063DC7N0015
25	P1QS063DC7N0025
30	P1QS063DC7N0030
40	P1QS063DC7N0040
50	P1QS063DC7N0050
75	P1QS063DC7N0075

80mm

15	P1QS080DC7N0015
25	P1QS080DC7N0025
30	P1QS080DC7N0030
40	P1QS080DC7N0040
50	P1QS080DC7N0050
75	P1QS080DC7N0075

100mm

15	P1QS100DC7N0015
25	P1QS100DC7N0025
30	P1QS100DC7N0030
40	P1QS100DC7N0040
50	P1QS100DC7N0050
75	P1QS100DC7N0075

Sensors
For sensors see page B296.

☐ Most popular.

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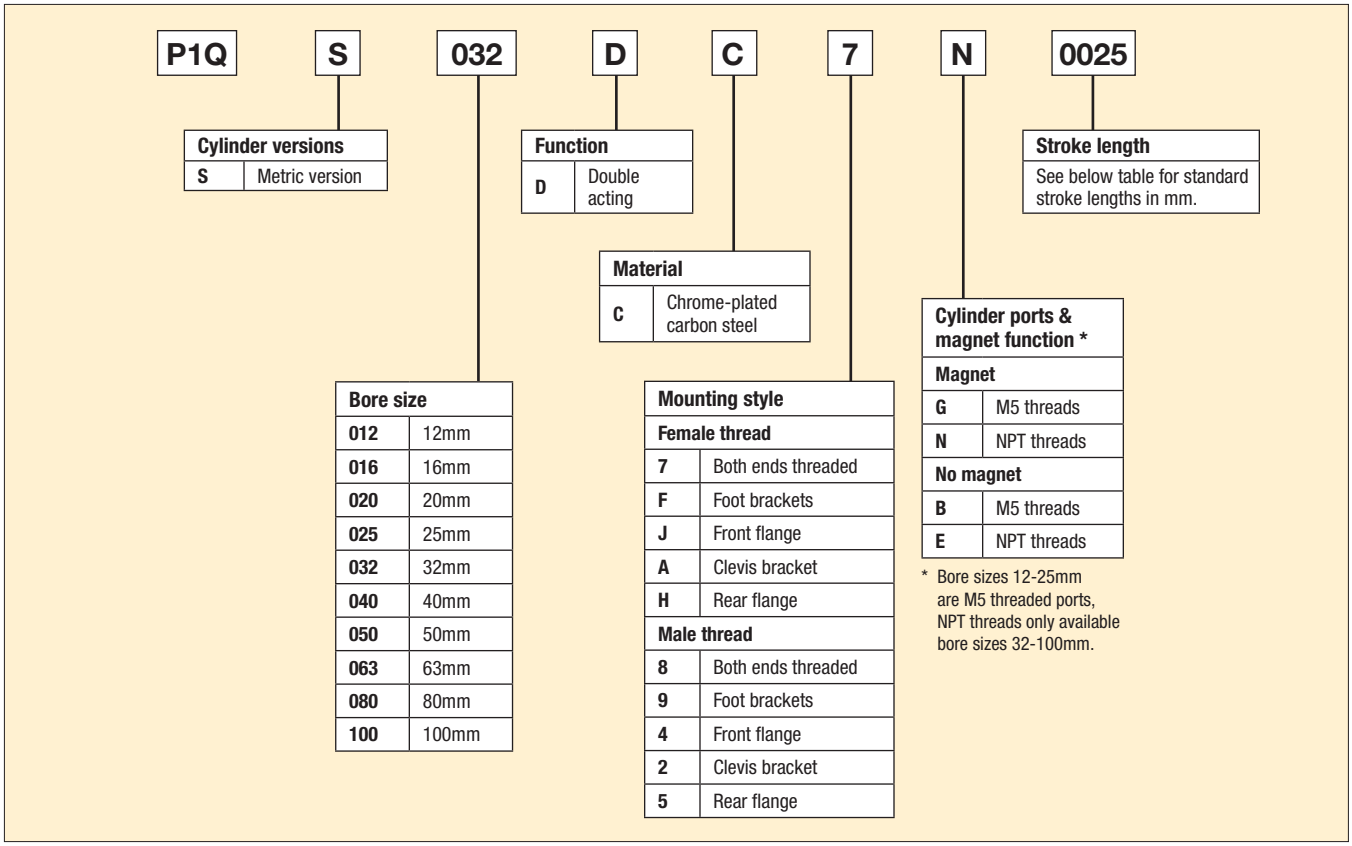
Ordering information



Standard strokes

Bore size	5	10	15	25	30	40	50	75	100
12 - 16	•	•	•	•	•				
20 - 25		•	•	•	•	•	•		
32		•	•	•	•	•	•	•	•
40 - 50			•	•	•	•	•	•	•
63 - 100			•	•	•	•	•	•	

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Cylinder forces, double acting variants

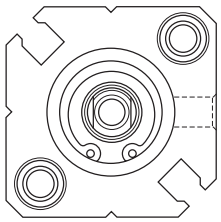
Bore size / pist. rod mm		Stroke piston area cm²	Max theoretical force in N (bar)								
			1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
12/6	+	1.1	11	23	34	45	57	**68**	79	90	102
	-	0.8	8	17	25	34	42	**51**	59	68	76
16/8	+	2.0	20	40	60	80	101	**121**	141	161	181
	-	1.5	15	30	45	60	75	**90**	106	121	136
20/10	+	3.1	31	63	94	126	157	**188**	220	251	283
	-	2.4	24	47	71	94	118	**141**	165	188	212
25/12	+	4.9	49	98	147	196	245	**295**	344	393	442
	-	3.8	38	76	113	151	189	**227**	264	302	340
32/16	+	8.0	80	161	241	322	402	**483**	563	643	724
	-	6.0	60	121	181	241	302	**362**	422	483	543
40/16	+	12.6	126	251	377	503	628	**754**	880	1005	1131
	-	10.6	106	211	317	422	528	**633**	739	844	950
50/20	+	19.6	196	393	589	785	982	**1178**	1374	1571	1767
	-	16.5	165	330	495	660	825	**990**	1155	1319	1484
63/20	+	31.2	312	623	935	1247	1559	**1870**	2182	2494	2806
	-	28.0	280	561	841	1121	1402	**1682**	1962	2242	2523
80/25	+	50.3	503	1005	1508	2011	2513	**3016**	3519	4021	4524
	-	45.4	454	907	1361	1814	2268	**2721**	3175	3629	4082
100/32	+	78.5	785	1571	2356	3142	3927	**4712**	5498	6283	7069
	-	70.5	705	1410	2115	2820	3525	**4230**	4936	5640	6345

\+ = Outward stroke
\- = Return stroke

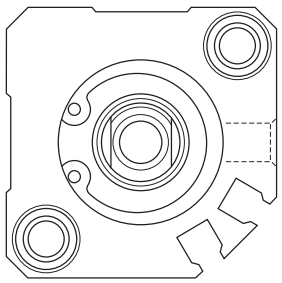
Note:
Select a theoretical force 50-100% larger than the force required

Front profiles by bore size

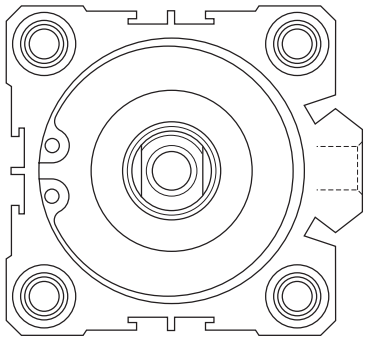
Magnetic version



Ø12 - Ø16

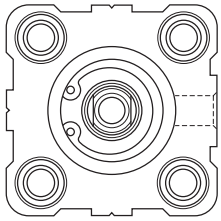


Ø20 - Ø25

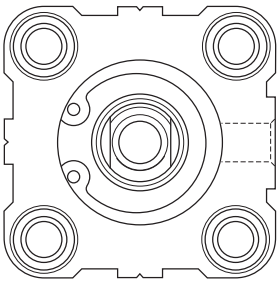


Ø32 - Ø100

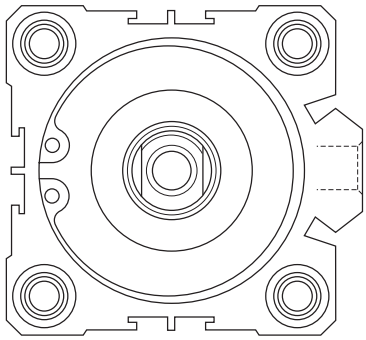
Non magnetic version



Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100

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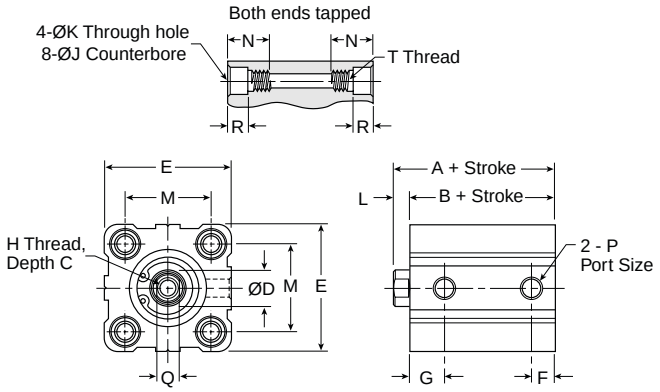
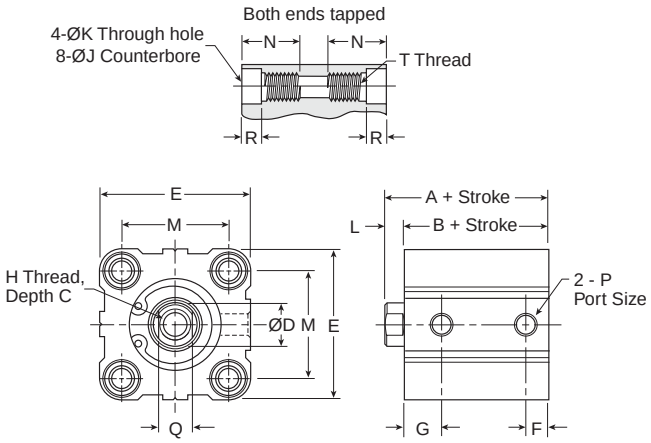
Non-magnet dimensions

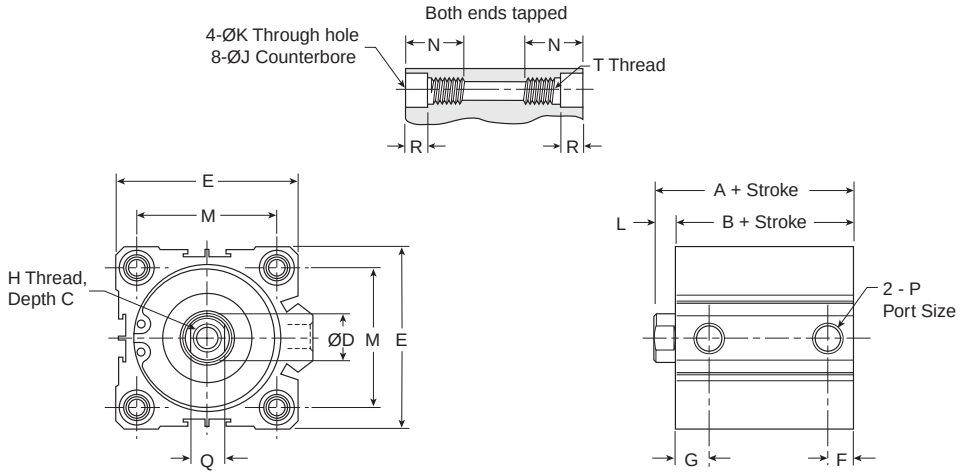
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



Bore size	A 5 to 50mm	A 75 to 100mm	B 5 to 50mm	B 75 to 100mm	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
12	20.5	–	17	–	6	6	25	5	7.5	M3x0.5	6.5	3.4	3.5	15.5	11	M5x0.8	5	3.5	M4x0.7
16	22	–	18.5	–	8	8	29	5.5	8	M4x0.7	6.5	3.4	3.5	20	11	M5x0.8	6	3.5	M4x0.7
20	24	34	19.5	–	7	10	36	5.5	9	M5x0.8	9	5.2	4.5	25.5	17	M5x0.8	8	7	M6x1.0
25	27.5	37.5	22.5	–	12	12	40	5.5	11	M6x1.0	9	5.2	5	28	17	M5x0.8	10	7	M6x1.0
32	30	40	23	33	13	16	45	7.5	10.5	M8x1.25	9	5.2	7	34	17	1/8"	14	7	M6x1.0
40	36.5	46.5	29.5	39.5	13	16	53	8	11	M8x1.25	9	5.2	7	40	17	1/8"	14	7	M6x1.0
50	38.5	48.5	30.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.5	8	50	22	1/4"	17	8	M8x1.25
63	44	54	36	46	15	20	77	10.5	15	M10x1.5	14	8.7	8	60	28.5	1/4"	17	10.5	M10x1.5
80	53.5	63.5	43.5	53.5	20	25	98	14	16	M16x2.0	17.5	10.7	10	77	35.5	3/8"	22	13.5	M12x1.75
100	65	75	53	63	26	32	117	17.5	20	M20x2.5	17.5	10.7	12	94	35.5	3/8"	27	13.5	M12x1.75

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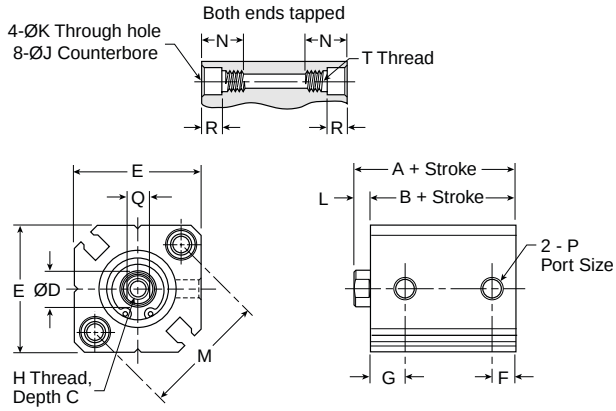
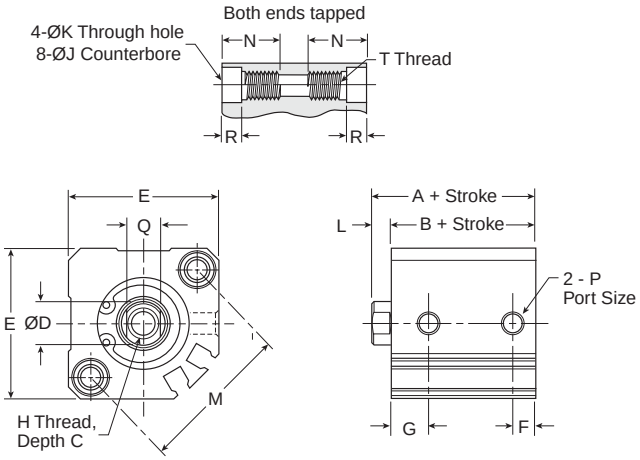
Magnet dimensions

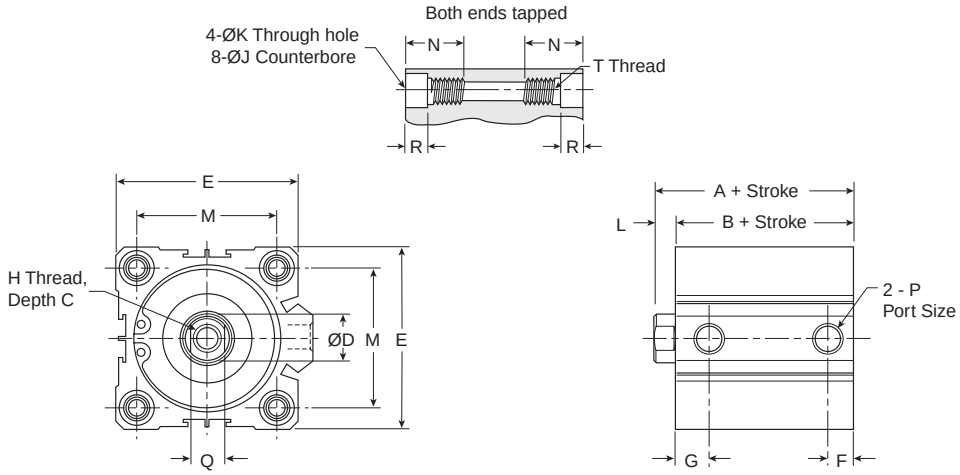
Ø12 - Ø16



Ø20 - Ø25



Ø32 - Ø100



Bore size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	T
12	31.5	28	6	6	25	7	9	M3x0.5	6.5	3.4	3.5	22	11	M5x0.8	5	3.5	M4x0.7
16	34	30.5	8	8	29	5.5	9.5	M4x0.7	6.5	3.4	3.5	28	11	M5x0.8	6	3.5	M4x0.7
20	36	31.5	7	10	36	5.5	9.5	M5x0.8	9	5.2	4.5	36	17	M5x0.8	8	7	M6x1.0
25	37.5	32.5	12	12	40	5.5	11	M6x1.0	9	5.2	5	40	17	M5x0.8	10	7	M6x1.0
32	40	33	13	16	45	7.5	10.5	M8x1.25	9	5.2	7	34	17	1/8"	14	7	M6x1.0
40	46.5	39.5	13	16	53	8	11	M8x1.25	9	5.2	7	40	17	1/8"	14	7	M6x1.0
50	48.5	40.5	15	20	64	10.5	10.5	M10x1.5	11	6.5	8	50	22	1/4"	17	8	M8x1.25
63	54	46	15	20	77	10.5	15	M10x1.5	14	8.7	8	60	28.5	1/4"	17	10.5	M10x1.5
80	63.5	53.5	20	25	98	14	16	M16x2.0	17.5	10.7	10	77	35.5	3/8"	22	13.5	M12x1.75
100	75	63	26	32	117	17.5	20	M20x2.5	17.5	10.7	12	94	35.5	3/8"	27	13.5	M12x1.75

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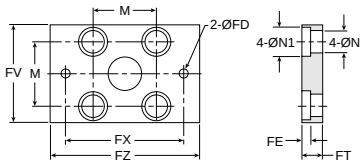
Flange Mounting – Style J, H, 4, 5

Intended for fixed mounting of cylinder. Flange can be fitted to front or rear of cylinder.

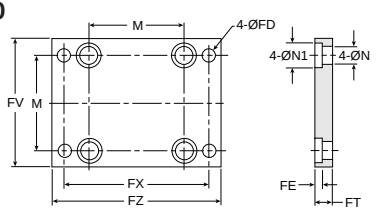
Material
Flange: surface treated steel, black

Supplied complete with mounting screws for attachment to cylinder.

Ø12 - Ø25



Ø32 - Ø100



Bore size	FD mm	FT mm	FV mm	FX mm	FZ mm	M mm	N mm	N1 mm	Mass kg	Part number
12	4.5	5.5	25	45	55	15.5	4.5	7.5	0.08	**P1Q-4DMB**
16	4.5	5.5	30	45	55	20	4.5	7.5	0.10	**P1Q-4FMB**
20	6.5	8	39	48	60	25.5	6.5	10.5	0.16	**P1Q-4HMB**
25	6.5	8	42	52	64	28	6.5	10.5	0.20	**P1Q-4JMB**
32	5.5	8	48	56	65	34	6.5	10.5	0.23	**P1Q-4KMB**
40	5.5	8	54	62	72	40	6.5	10.5	0.28	**P1Q-4LMB**
50	6.5	9	67	76	89	50	8.5	13.5	0.53	**P1Q-4MMB**
63	9	9	80	92	108	60	10.5	16.5	0.71	**P1Q-4NMB**
80	11	11	99	116	134	77	12.5	18.5	1.59	**P1Q-4PMB**
100	11	11	117	136	154	94	12.5	18.5	2.19	**P1Q-4QMB**

Foot Mounting – Style F, 9

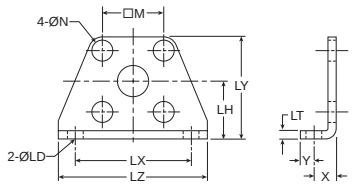
Intended for fixed mounting of cylinder. Angle bracket can be fitted to front and rear of cylinder.

Material
Angle bracket: surface treated steel, black

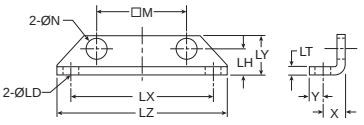
Supplied in pairs with mounting screws for attachment to cylinder.

* Weight per item

Ø12 - Ø25



Ø32 - Ø100



Bore size	LD mm	LH mm	LT mm	LX mm	LY mm	LZ mm	X mm	Y mm	M mm	N mm	Mass kg	Part number
12	4.5	17	2	34	29.5	44	8	4.5	15.5	4.5	0.02*	**P1Q-4DMF**
16	4.5	19	2	38	33.5	48	8	5	20	4.5	0.02*	**P1Q-4FMF**
20	6.5	24	3.2	48	42	62	9.2	5.8	25.5	6.5	0.04*	**P1Q-4HMF**
25	6.5	26	3.2	52	46	66	10.7	5.8	28	6.5	0.05*	**P1Q-4JMF**
32	6.5	13	3.2	57	20	71	11.2	5.8	34	6.5	0.06*	**P1Q-4KMF**
40	6.5	13	3.2	64	20	78	11.2	7	40	6.5	0.08*	**P1Q-4LMF**
50	8.5	14	3.2	79	22	95	12.2	8	50	8.5	0.16*	**P1Q-4MMF**
63	10.5	16	3.2	95	26	113	13.7	9	60	10.5	0.25*	**P1Q-4NMF**
80	13	20.5	4.5	118	32	140	16.5	11	77	13	0.50*	**P1Q-4PMF**
100	13	24	6	137	36	162	23	11.5	94	13	0.85*	**P1Q-4QMF**

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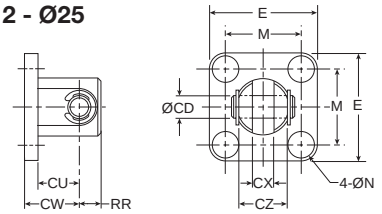
Clevis Mounting – Style A, 2

Intended for flexible mounting of cylinder. Clevis bracket can be fitted to the rear of cylinder.

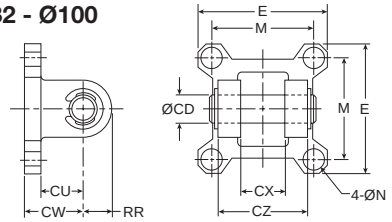
Material
Clevis bracket: surface treated steel, black

Supplied complete with mounting screws for attachment to cylinder.

Ø12 - Ø25



Ø32 - Ø100



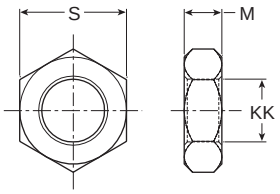
Bore size	CD mm	CU mm	CW mm	CX mm	CZ mm	N mm	RR mm	M mm	E mm	Mass kg	Part number
12	5	9.5	14	5.3	9.8	4.5	6	15.5	25	0.02	**P1Q-4DMT**
16	5	10.5	15	6.8	11.8	4.5	6	20	29	0.03	**P1Q-4FMT**
20	8	12.5	18	8.3	15.8	6.5	9	25.5	36	0.05	**P1Q-4HMT**
25	10	14.5	20	10.3	19.8	6.5	10	28	40	0.06	**P1Q-4JMT**
32	10	14.5	20	18.3	35.8	6.5	10	34	45.5	0.08	**P1Q-4KMT**
40	10	15	22	18.3	35.8	6.5	10	40	53.5	0.11	**P1Q-4LMT**
50	14	20	28	22.3	43.8	8.5	14	50	64.5	0.14	**P1Q-4MMT**
63	14	21	30	22.3	43.8	10.5	14	60	77.5	0.29	**P1Q-4NMT**
80	18	28	38	28.3	55.8	12.5	18	77	98.5	0.36	**P1Q-4PMT**
100	22	32	45	32.3	63.8	12.5	22	94	117.5	0.64	**P1Q-4QMT**

Jam Nut

Intended for fixed mounting of accessories to the piston rod.

Materials
Galvanized steel

Cylinders supplied with galvanized nut.



Bore size	KK	M	S	Mass kg	Part number
12	M5x0.8	2.7	18	0.002	**L075540005**
16	M6x1.0	3.2	10	0.002	**L075540006**
20	M8x1.25	4	13	0.005	**L075540008**
25	M10x1.25	5	17	0.007	**L075540010**
32	M14x1.5	7	22	0.010	**L075540014**
40	M14x1.5	7	22	0.010	**L075540014**
50	M18x1.5	8	27	0.021	**L075540018**
63	M18x1.5	8	27	0.021	**L075540018**
80	M22x1.5	11	32	0.040	**L075540022**
100	M26x1.5	16	41	0.040	**L075540026**

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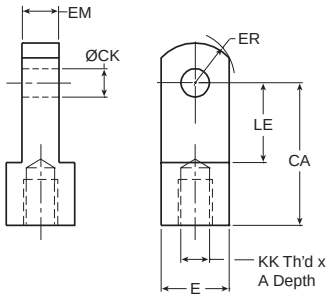
Rod Eye

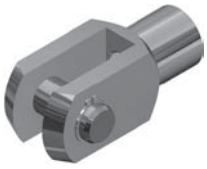
Rod eye for articulated mounting of cylinder.
Rod eye can be combined with clevis bracket.
Maintenance-free.

Material
Rod eye, nut: galvanized steel



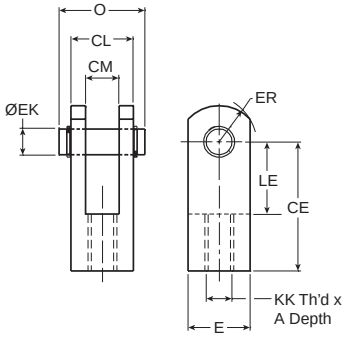
Bore size	A	E	CA	KK	ER	LE	CK	EM	Mass kg	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	0.03	**P1M-4DRE**
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	0.03	**P1M-4FRE**
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	0.05	**P1M-4HRE**
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	0.07	**P1M-4JRE**
32	14	22 Dia.	30	M14x1.5	12	14	10	18	0.08	**P1M-4LRE**
40	14	22 Dia.	30	M14x1.5	12	14	10	18	0.12	**P1M-4LRE**
50	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	**P1M-4MRE**
63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	0.25	**P1M-4MRE**
80	22	38 Dia.	50	M22x1.5	21	27	18	28	0.25	**P1M-4PRE**

Rod Clevis



Clevis for articulated mounting of cylinder.

Material
Clevis, clip, nut: galvanized steel
Pin: hardened steel



Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Mass kg	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	0.02	**P1M-4DRC**
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	0.02	**P1M-4FRC**
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	0.05	**P1M-4HRC**
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	0.09	**P1M-4JRC**
32	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.09	**P1M-4LRC**
40	16	22 Dia.	30	M14x1.25	12	14	10	18	36	41.5	0.15	**P1M-4LRC**
50	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	**P1M-4MRC**
63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	0.35	**P1M-4MRC**
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	0.75	**P1M-4PRC**

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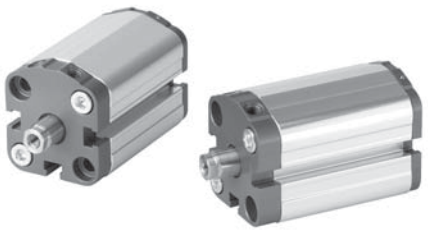
- Versatile range of square body style compact cylinder
- Available in Low Profile Version or Long Bearing Version for enhanced rod bearing support
- 10 bore sizes: 12mm through 100mm
- Single and double acting versions available
- Four flexible port configurations available
- Recessed, flush position piston sensing available



Operating information

Operating pressure:	145 PSIG (10 bar) maximum air
Temperature range:	Standard: -4°F to 176°F (-20°C to 80°C) High: 14°F to 250°F (-10°C to 121°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P1M	032	C	/	D	C	P	6	G	012

Bore size

012	12mm
016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Cylinder style

C	Basic no mtgs.
A	Double rear clevis [1,3]
B	Single rear clevis [1,3]
F	Foot mount [1,4]
J	Front flange [1]
H	Rear flange [1, 3]

Insert "/" to denote special

Function

D	Double acting
K	Double rod
R	Single acting spring return [6]
E	Single acting spring extend [4]

Piston/seal material

Without magnet [2]

C	No bumpers class 1 std. temp. seals
G	No bumpers class 5 fluorocarbon seals
B	With bumpers class 1 std. temp. seals [7]

With magnet [5]

(Not available on spring extend models)

N	No bumpers class 1 std. temp. seals
M	With bumpers class 1 std. temp. seals [7]

Piston rod & bearings

Extra low profile rod bearing

P	Chrome plated steel rod not available on 12-25mm bores
Y	Stainless steel rod standard on 12-25mm boresand spring extend models

Long rod bearing [2]

C	Chrome plated steel rod not available on 12-25mm bores
A	Stainless steel rod standard on 12-25mm bores and spring extend models

Rod threads

Inch	
4	Male
9	Female
Metric	
5	Male
6	Female
3	Special rod end

Stroke length

Specify stroke length required in mm.

Ports

Bspp	
G	Ported each end
H	Both ports head
J	Both ports cap
K	Both ports cap face [3]
NPTF (Not available on 12-25mm bores)	
N	Ported each end
M	Both ports head
L	Both ports cap
P	Both ports cap face [3]

Maximum stroke lengths

Bore	ELP bearing version		Long bearing version		Single acting version
	Min. stroke*	Max. stroke	Min. stroke*	Max. stroke	Standard stroke
12	3	50	4	200	5,10
16	3	50	4	200	5,10
20	3	50	8	200	5,10
25	3	50	8	200	5,10
32	3	100	9	320	5,10
40	3	100	7	320	5,10
50	3	100	13	320	10, 20, 25
63	3	100	18	500	10, 20, 25
80	3	150	23	500	10, 20, 25
100	3	150	18	500	10, 20, 25

* Minimum stroke for double rod cylinders: 12-63mm bores is 5mm; 80 &100mm bores is 10mm

NOTES:

1 Fitted with Mounting Accessory
2 Magnetic Piston Option must be specified along with Long Rod Bearing option to achieve Long Bearing Version
3 Porting Options 'K' and 'P' (Both ports cap face) not available with rear mountings
4 Single Acting Spring Extend available with stainless steel rod only.
5 For information regarding sensors, please refer to Electronic Sensors section.
6 Spring return is short bearing version only.
7 Bumper only available on head end for spring extend. Bumper only available on cap end for spring return.

Sensors

For sensors see page B296.

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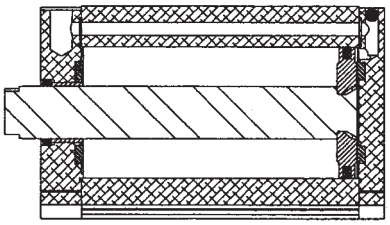
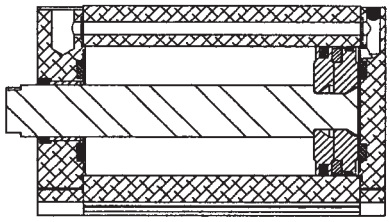
Extra Low Profile Version

The Extra Low Profile Bearing Version provides the most compact cylinder possible. This bearing version is recommended for applications that require shorter stroke lengths or that are light duty. It is available in stroke lengths up to 50mm in the smaller bore sizes and 150 mm in the larger bore sizes.

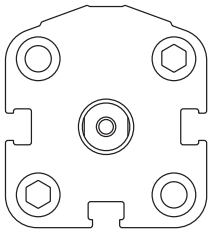


Long Bearing Version

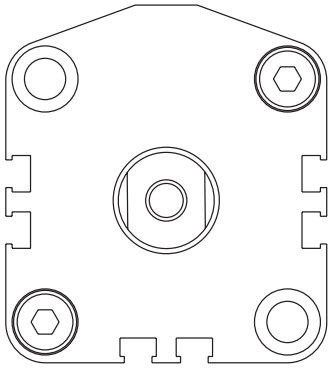
The Long Bearing Version provides additional rod bearing and piston bearing support and also includes a magnetic piston with bearing strip for greater piston bearing support. This Long Bearing version is required for stroke lengths beyond the Extra Low Profile maximum stroke length and is recommended for higher duty applications.



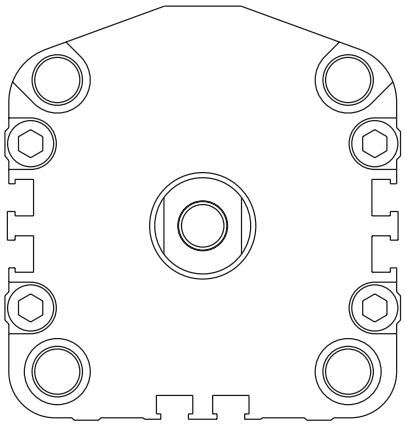
Front profiles by bore size



Bores 12-25mm



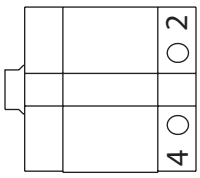
Bores 32-50mm



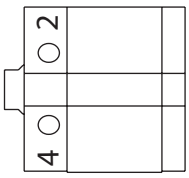
Bores 63-100mm

Porting configurations

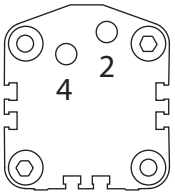
Both Ports Cap



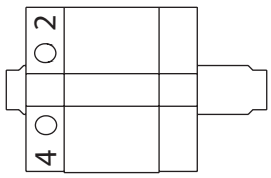
Both Ports Head*



Both Ports Cap Face



Double Rod Both Ports One End



To retract cylinder apply air to port #2

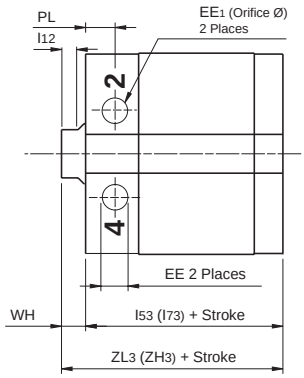
To extend cylinder apply air to port #4

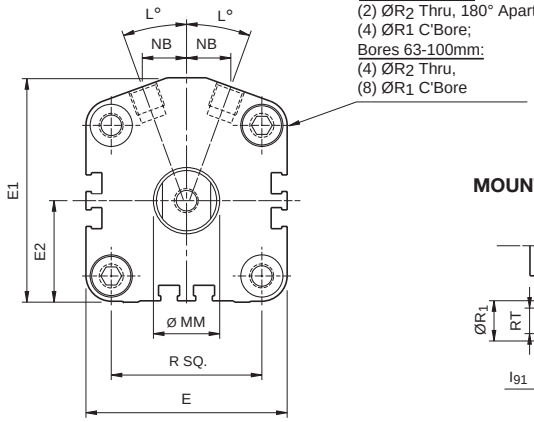
For a double rod cylinder, pressurize port #2 to retract the piston rod into the head containing the ports.

* For 12mm to 16mm bores, although the location of ports #2 and #4 are reversed, porting functions shown above apply.

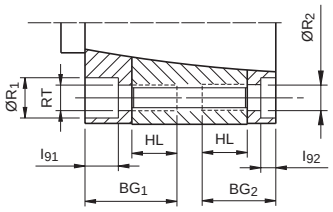
All porting configurations

BOTH PORTS HEAD



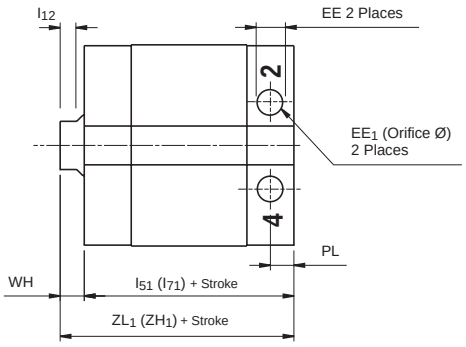


MOUNTING HOLE CONFIGURATION
BOTH PORTS HEAD

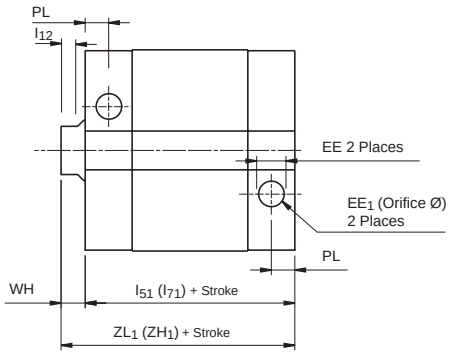


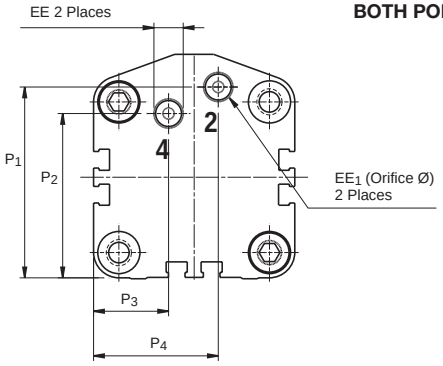
Optional porting configurations

BOTH PORTS CAP

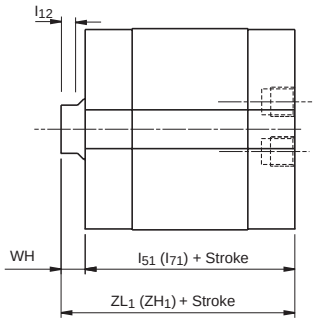


HEAD & CAP PORTED

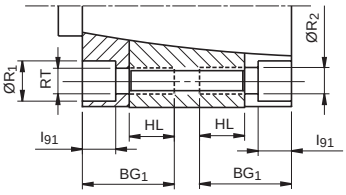




BOTH PORTS CAP FACE



MOUNTING HOLE CONFIGURATION
BOTH PORTS CAP OR CAP FACE, PORTS AT HEAD & CAP



Note: Magnetic Dimensions in Parentheses

B

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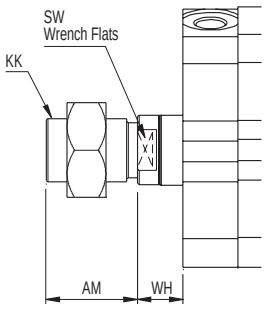
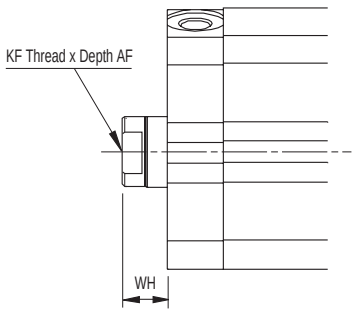
For special rod ends, specify "3" in model number and give desired WH, AM or AF and KK or KF.

Jam nut is supplied when cylinder is ordered with Style 4 or Style 5 rod end.



Style 5 / Style 4



Style 6 / Style 9

Bore size	Rod	AF Style 6	AF Style 9	AM Style 5	AM Style 4	KF Style 6	KF Style 9	KK Style 5	KK Style 4	WH Style 4, 9 & 6	WH Style 5	l_{12}	SW
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1,5	3/4-16	12	11	6	21

Bore size	BG_1	BG_2	E	E_1	E_2	EE BSPP	EE NPTF	EE_1	HL	l_{91}	l_{92}	L	NB	P_1	P_2
12	16.5	11.5	27	31	14	M5	–	1	8	3.5	3.5	26	5.5	25	9.5
16	17	12	31.5	35	16	M5	–	1.2	8	4	4	20	7	29.5	9.5
20	19	14,5	38.5	42.5	19.5	M5	–	1.3	10	4.5	4.5	20	8	35	13.5
25	21	15	41.5	45.5	21	M5	–	1.8	10	5	5	20	8.5	38.5	14
32	25	17	48	56	24	G1/8	1/8	2.7	10	4	4	25	9.5	45.5	16.5
40	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	4	4	20	11.5	51	12
50	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	5	5	20	14.5	63	54.5
63	34	28	82	86	40.5	G1/8	1/8	5	18	6.5	8	20	17.5	73.5	64
80	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	8.5	10	20	25.5	92	79.5
100	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	8.5	10	20	31.5	111.5	97.5

Bore size	P_3	P_4	PL	PM	R	R_1	R_{2*}	RT	Non-magnetic l_{51}	Non-magnetic l_{53}	Non-magnetic ZL_1	Non-magnetic ZL_3	Magnetic l_{71}	Magnetic l_{73}	Magnetic ZH_1	Magnetic ZH_3	ELP Max stroke
12	13.5	13.5	5	8.5	15.5	5.8	3.5	M4	22	17	25.5	20.5	33	28	36.5	31.5	50
16	15.5	18	5	9	20	7.4	3.5	M4	23.5	18.5	27	22	34.5	29.5	38	33	50
20	24.5	21.5	5	9	25.5	9	5.5	M6	24	19.5	28.5	24	34	29.5	38.5	34	50
25	27.5	24.5	7	9	28	9	5.5	M6	28.5	22.5	33.5	27.5	38.5	32.5	43.5	37.5	50
32	31.5	28.5	8	10.5	34	10.5	5.5	M6	36.5	28.5	43.5	35.5	46	37.5	53	44.5	100
40	23	33	7.5	9.5	40	10.5	5.5	M6	38.5	29.5	44.5	36.5	47.5	39.5	54.5	46.5	100
50	25	41.5	8	10	50	13.5	7.5	M8	38.5	32.5	46.5	40.5	47.5	41.5	55.5	49.5	100
63	30	53	8	11	60	13.5	9.5	M10	39.5	34	47.5	42	51.5	46	59.5	54	100
80	33	69.5	11.5	11.5	77	16.5	11	M12	52	43	62	53	62.5	53.5	72.5	63.5	150
100	36.5	87.5	12	12	94	17	11	M12	57	48.5	69	60.5	71.5	63	83.5	75	150

*"R2 thru" not available on 12mm and 16mm bores.

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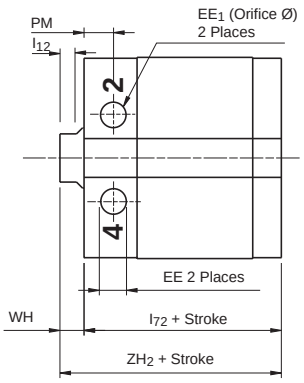
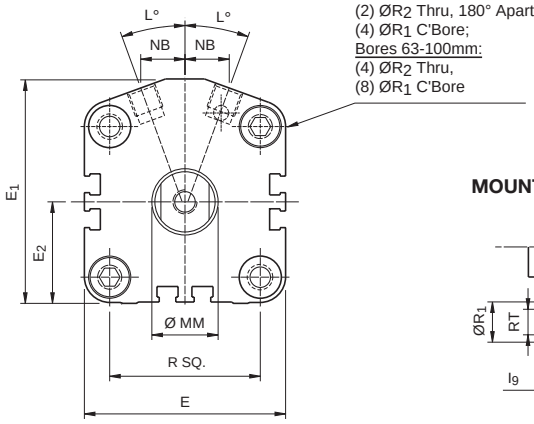
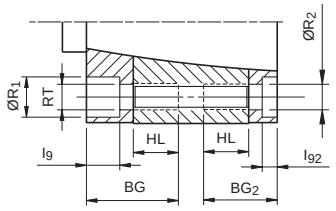
All porting configurations

BOTH PORTS HEAD



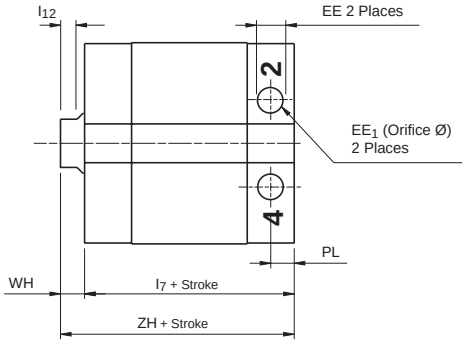


MOUNTING HOLE CONFIGURATION
BOTH PORTS HEAD

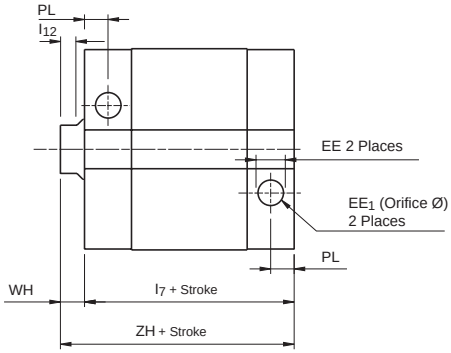


Optional porting configurations

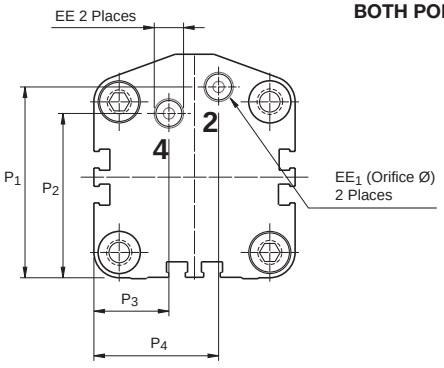
BOTH PORTS CAP

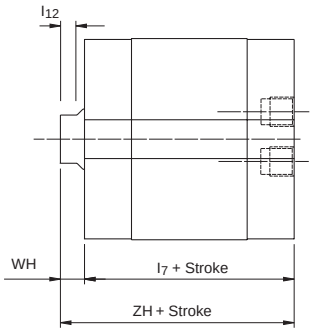


HEAD & CAP PORTED

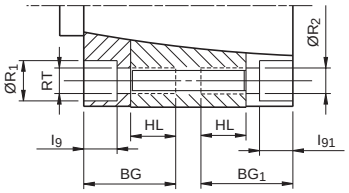


BOTH PORTS CAP FACE





MOUNTING HOLE CONFIGURATION
BOTH PORTS CAP OR CAP FACE, PORTS AT HEAD & CAP



Note: Magnetic Dimensions in Parentheses

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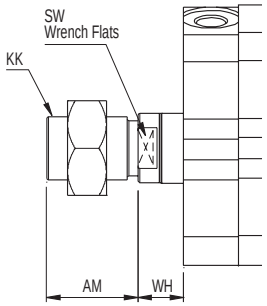
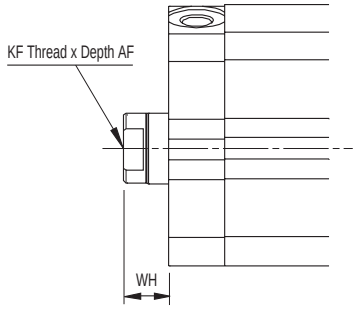
For special rod ends, specify "3" in model number and give desired WH, AM or AF and KK or KF.

Jam nut is supplied when Style 4 or Style 5 rod end is specified.

Note: Magnetic piston and longer rod bearing are standard with Long Bearing Version.



Style 5 / Style 4



Style 6 / Style 9

Bore size	Rod MM	AF Style 6	AF Style 9	AM Style 5	AM Style 4	KF Style 6	KF Style 9	KK Style 5	KK Style 4	WH Style 4, 9 & 6	WH Style 5	I_{12}	SW
12	6	6	5.4	9	8	M3x0.5	#8-32	M5x0.8	#8-32	3.5	5	3	5
16	8	8	5.4	10	8	M4x0.7	#8-32	M6x1.0	#8-32	3.5	5.5	3	7
20	10	7	7	12	8	M5x0.8	#10-32	M8x1.25	#10-32	4.5	6.5	4	9
25	10	12	10	15	9.5	M6x1.0	1/4-28	M10x1.25	1/4-28	5	7.5	4	9
32	12	13	13.3	20.5	12.7	M8x1.25	5/16-24	M12x1.25	5/16-24	7	8	5	10
40	16	13	18.3	20.5	16	M8x1.25	3/8-24	M14x1.5	3/8-24	7	8	5.5	13
50	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
63	20	15	17.6	26	19.5	M10x1.5	1/2-20	M18x1.5	1/2-20	8	7.5	5.5	16
80	25	21	24.3	32.5	25.5	M16x2.0	5/8-18	M22x1.5	5/8-18	10	11	6	21
100	25	27	27	32.5	28.5	M20x2.5	3/4-16	M22x1.5	3/4-16	12	11	6	21

Bore size	BG	BG_1	BG_2	E	E_1	E_2	EE BSPP	EE NPTF	EE_1	HL	I_7	I_{72}	I_9	I_{91}	I_{92}	L
12	21.5	16.5	11.5	27	31	14	M5	–	1	8	38.5	33.5	3.5	3.5	3.5	26
16	22	17	12	31.5	35	16	M5	–	1.2	8	40.5	35.5	5.5	4	4	20
20	24.5	19	14.5	38.5	42.5	19.5	M5	–	1.3	10	40	35.5	10.5	4.5	4.5	20
25	24.5	21	15	41.5	45.5	21	M5	–	1.8	10	42.5	36.5	10.5	5	5	20
32	27.5	25	17	48	56	24	G1/8	1 8	2.7	10	48	40	14	4	4	25
40	27.5	25.5	17.5	56	62.5	28	G1/8	1/8	3.4	10	49.5	41.5	14	4	4	20
50	31.5	29.5	23.5	67	74.5	33.5	G1/8	1/8	4	14	49.5	43.5	13	5	5	20
63	37	34	28	82	86	40.5	G1/8	1/8	5	18	54.5	49	6.5	6.5	8	20
80	43	43	34	98	106.5	48.5	G1/4	1/4	5.5	22	62.5	53.5	9.5	8.5	10	20
100	44	44	35.5	119	126.5	59.5	G1/4	1/4	6	22	71.5	63	9.5	8.5	10	20

Bore size	NB	P_1	P_2	P_3	P_4	PM	R	R_1	R_2*	RT	ZH	ZH_2	Min stroke	Max stroke
12	5.5	25	9.5	13.5	13.5	8.5	15.5	5.8	3.5	M4	42	37	4	200
16	7	29.5	9.5	15.5	18	9	20	7.4	3.5	M4	44	39	4	200
20	8	35	13.5	24.5	21.5	9	25.5	9	5.5	M6	44.5	40	8	200
25	8.5	38.5	14	27.5	24.5	9	28	9	5.5	M6	47.5	41.5	8	200
32	9.5	45.5	16.5	31.5	28.5	10.5	34	10.5	5.5	M6	55	47	9	320
40	11.5	51	12	23	33	9.5	40	10.5	5.5	M6	56.5	48.5	7	320
50	14.5	63	54.5	25	41.5	10	50	13.5	7.5	M8	57.5	51.5	13	320
63	17.5	73.5	64	30	53	11	60	13.5	9.5	M10	62.5	57	18	500
80	25.5	92	79.5	33	69.5	11.5	77	16.5	11	M12	72.5	62.5	23	500
100	31.5	111.5	97.5	36.5	87.5	12	94	17	11	M12	83.5	75	18	500

* "R2 thru" not available on 12mm and 16mm bores.

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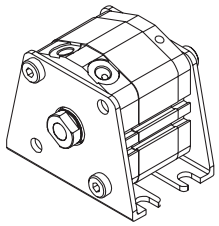
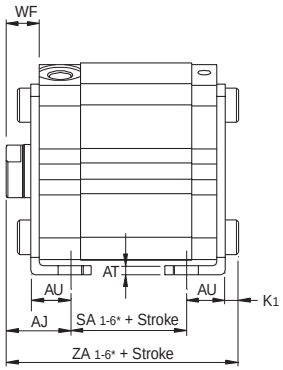
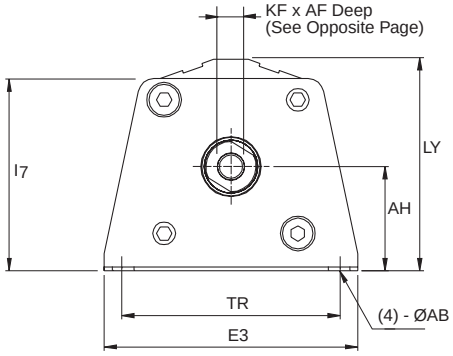
Foot Mounting – Style F







Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	AB	AH	AJ	AT	AU	E3	I7	K1	LY	TR	Part number
12	4.5	17	19.5	2	8	44	29.5	2.8	34	35	**P1M-4DMF**
16	4.5	19	19.5	2	8	48	33.5	2.8	38	39	**P1M-4FMF**
20	6.5	24	20.5	3.2	9.2	62	42	4	47	50	**P1M-4HMF**
25	6.5	26	22.5	3.2	10.7	66	46	4	50.5	52	**P1M-4JMF**
32	6.5	30	25	3.2	11.2	71	54	4	62	60	**P1M-4KMF**
40	6.5	33	25	3.2	11.2	78	61	4	67.5	67	**P1M-4LMF**
50	9	39	29.5	3.2	14.7	95	72.5	5	80	82	**P1M-4MMF**
63	11	46	31	3.2	16.2	113	32	5	91.5	100	**P1M-4NMF**
80	13	59	35	4.5	19.5	140	42	7	117	118	**P1M-4PMF**
100	13	71	39	6	23	162	53	7	138	139	**P1M-4QMF**

	ELP version non-magnetic					ELP version magnetic					Long bearing version					
	Both ports head		Optional porting		Min. **	Both ports head		Optional porting		Min.**	Both ports head		Optional porting		Min.**	Style 5
Bore size	SA1	ZA1*	SA2*	ZA2*	stroke	SA3	ZA3*	SA4	ZA4*	stroke	SA5	ZA5*	SA6	ZA6*	stroke	end length adjustment
12	5	35.3	10	40.3	15	16	46.3	21	51.3	4	21.5	51.8	26.5	56.8	4	1.5
16	6.5	36.8	11.5	41.8	14	17.5	47.8	22.5	52.8	4	23.5	53.8	28.5	58.8	4	2
20	7.5	41.2	12	45.7	18	17.5	51.2	22	55.7	8	23.5	57.2	28	61.9	8	2
25	7.5	44.7	13.5	50.7	18	17.5	54.7	23.5	60.7	8	21.5	58.7	27.5	64.7	8	2.5
32	12.5	52.5	20.5	60.7	18	21.5	61.7	29.5	69.9	9	24	64	32	72.2	9	1
40	13.5	53.7	21.5	61.9	17	23.5	63.7	31.5	71.9	7	25.5	65.7	33.5	73.9	7	1
50	9.5	58.7	15.5	64.9	22	18.5	67.7	24.5	73.9	13	20.5	69.7	26.5	75.9	13	-0.5
63	8	60.2	13.5	65.7	30	20	72.2	25.5	77.7	18	23	75.2	28.5	80.7	18	-0.5
80	13	74.5	22	83.5	33	23.5	85	32.5	94	23	23.5	85	32.5	94	23	1
100	14.5	83.5	23	92	33	29	98	37.5	106.5	18	29	98	37.5	106.5	18	-1

* For strokes less than 'min. stroke', only one bracket will be supplied at rod end.

** Dimensions shown apply only for rod end styles 4, 6 and 9. For rod end style 5, please include the above length adjustment.

Note: Foot bracket mounting is not available with cap face porting

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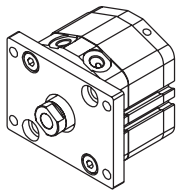
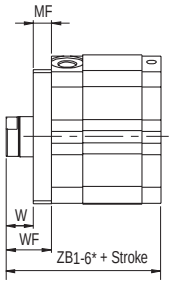
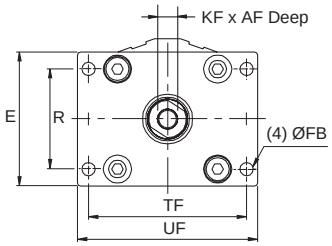
Front Flange Mounting – Style J



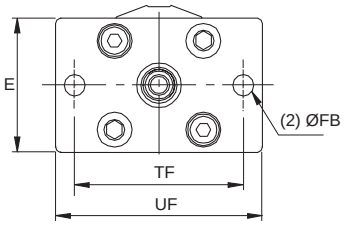
Please note bearing, piston and porting configuration for selecting proper dimensions.



Bores 32-100mm



Bores 12-25mm

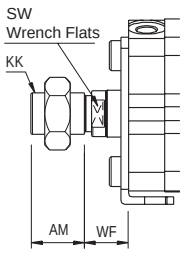


Bore size	E	FB	MF	R	TF	UF	ELP version Non-magnetic Both ports head ZB1*	ELP version Non-magnetic Optional Porting ZB2*	ELPversion Magnetic Both ports head ZB3*	ELPversion Magnetic Optional porting ZB4*	Long bearing Version Both ports head ZB5*	Long bearing Version Optional porting ZB6*	Style 5 rod end length adjustment	Part number
12	25	4.5	5.5	–	45	55	30.5	35.5	41.5	46.5	47	52	1.5	**P1M-4DMB**
16	30	4.5	5.5	–	45	55	32	37	43	48	49	54	2	**P1M-4FMB**
20	39	6.5	8	–	50.5	62	34	38.5	44	48.5	50	54.5	2	**P1M-4HMB**
25	42	6.5	8	–	53	65	37.5	43.5	47.5	53.5	51.5	57.5	2.5	**P1M-4JMB**
32	48	5.5	8	34	58	68	45.5	53.5	54.5	62.5	57	65	1	**P1M-4KMB**
40	54	5.5	8	40	66	76	46.5	54.5	56.5	64.5	58.5	66.5	1	**P1M-4LMB**
50	67	6.5	9	50	79	90	50.5	56.5	59.5	65.5	61.5	67.5	-0.5	**P1M-4MMB**
63	80	9	9	60	97	112	52	57.5	64	69.5	67	72.5	-0.5	**P1M-4NMB**
80	99	11	11	77	116	134	63	72	73.5	82.5	73.5	82.5	1	**P1M-4PMB**
100	117	11	11	94	137	154	70.5	79	85	93.5	85	93.5	-1	**P1M-4QMB**

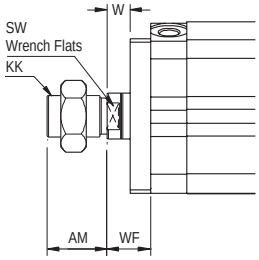
* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

Rod End Front Mounts F & J

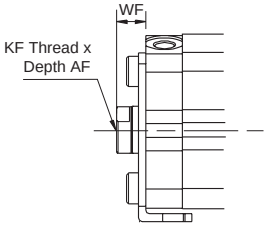
For special rod threads, specify "3" in model number and give desired AM or AF, WF and KK or KF.



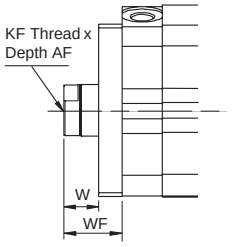
Foot Mounting - Style F



Foot Flange Mounting - Style J



Foot Mounting - Style F



Foot Flange Mounting - Style J

Bore size	AF Style 9	AF Style 6	AM Style 4	AM Style 5	KF Style 9	KF Style 6	KK Style 4	KK Style 5	W Styles 9, 6, 4	W Style 5	WF Styles 9, 6, 4	WF Style 5	SW
12	5.4	6	8	9	#8-32	M3X0.5	#8-32	M5X0.8	8	9.5	13.5	15	5
16	5.4	8	8	10	#8-32	M4x0.7	#8-32	M6x1.0	8	10	13.5	15.5	7
20	7	7	8	12	#10-32	M5x0.8	#10-32	M8x1.25	6.5	8.5	14.5	16.5	9
25	10	12	9.5	15	1/4-28	M6x1.0	1/4-28	M10x1.25	7	9.5	15	17.5	9
32	13.3	13	12.7	20.5	5/16-24	M8x1.25	5/16-24	M12x1.25	9	10	17	18	10
40	18.3	13	16	20.5	3/8-24	M8x1.25	3/8-24	M14x1.5	9	10	17	18	13
50	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
63	17.6	15	19.5	26	1/2-20	M10x1.5	1/2-20	M18x1.5	9	8.5	18	17.5	16
80	24.3	21	25.5	32.5	5/8-18	M16x2.0	5/8-18	M22x1.5	9	10	20	21	21
100	27	27	28.5	32.5	3/4-16	M20x2.5	3/4-16	M22x1.5	11	10	22	21	21

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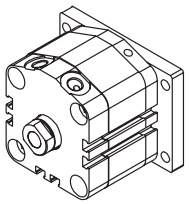
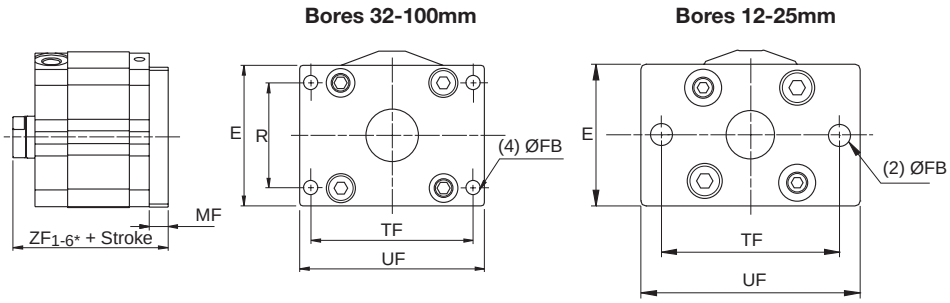
Rear Flange Mounting – Style H





Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	E	FB	MF	R	TF	UF	Part number
12	25	4.5	5.5	–	45	55	**P1M-4DMB**
16	30	4.5	5.5	–	45	55	**P1M-4FMB**
20	39	6.5	8	–	50.5	62	**P1M-4HMB**
25	42	6.5	8	–	53	65	**P1M-4JMB**
32	48	5.5	8	34	58	68	**P1M-4KMB**
40	54	5.5	8	40	66	76	**P1M-4LMB**
50	67	6.5	9	50	79	90	**P1M-4MMB**
63	80	9	9	60	97	112	**P1M-4NMB**
80	99	11	11	77	116	134	**P1M-4PMB**
100	117	11	11	94	137	154	**P1M-4QMB**

	ELP version non-magnetic		ELP version magnetic		Long bearing version		
Bore size	Both ports head ZF_{1*}	Optional porting ZF_{2*}	Both ports head ZF_{3*}	Optional porting ZF_{4*}	Both ports head ZF_{5*}	Optional porting ZF_{6*}	Style 5 rod end length adjustment
12	26	31	37	42	42.5	47.5	1.5
16	27.5	32.5	38.5	43.5	44.5	49.5	2
20	32	36.5	42	46.5	48	52.5	2
25	35.5	41.5	45.5	51.5	49.5	55.5	2.5
32	43.5	51.5	52.5	60.5	55	63	1
40	44.5	52.5	54.5	62.5	56.5	64.5	1
50	49.5	55.5	58.5	64.5	60.5	66.5	-0.5
63	51	57.5	63	68.5	66	71.5	-0.5
80	64	73	74.5	83.5	74.5	83.5	1
100	71.5	80	86	94.5	86	94.5	-1

Note: Rear Flange mounting is not available with cap face porting.

* Dimensions shown apply only for Rod End Styles 4, 6 and 9.

For Rod End Style 5, please include the above length adjustment.

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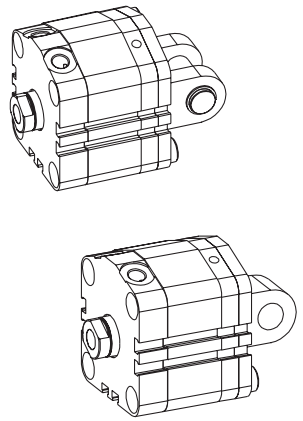
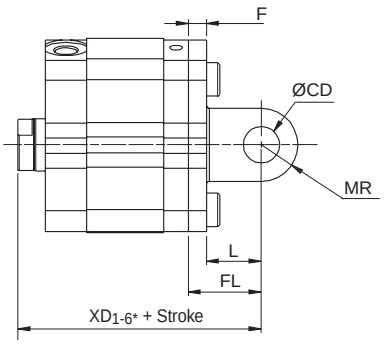
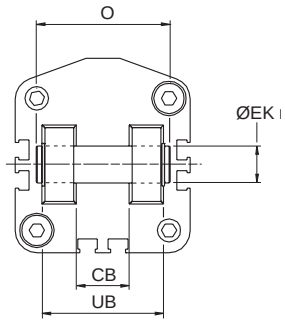
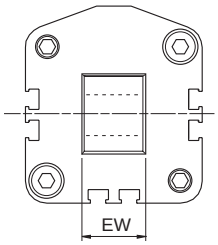
Rear Clevis Mounts – Styles A & B







Style A



Style B

Please note bearing, piston and porting configuration for selecting proper dimensions.

Bore size	CB	CD/EK	EW	F	FL	L	MR	O	UB	Double clevis kit part number	Single clevis kit part number**
12	5	5	5	4	14	10	6.5	14.5	10	**P1M-4DMT**	**P1M-4DME**
16	6.5	5	6.5	4	15	11	6.5	16.5	12	**P1M-4FMT**	**P1M-4FME**
20	8	8	8	5	18	13	10	21	16	**P1M-4HMT**	**P1M-4HME**
25	10	10	10	5	20	15	11	25.5	20	**P1M-4JMT**	**P1M-4JME**
32	18	10	18	5	20	15	10	41.5	36	**P1M-4KMT**	**P1M-4KME**
40	18	10	18	6	22	16	10	41.5	36	**P1M-4LMT**	**P1M-4LME**
50	22	14	22	7	28	21	14	50.5	44	**P1M-4MMT**	**P1M-4MME**
63	22	14	22	8	30	22	14	50.5	44	**P1M-4NMT**	**P1M-4NME**
80	28	18	28	10	38	28	18	64	56	**P1M-4PMT**	**P1M-4PME**
100	32	22	32	13	45	32	22	72	64	**P1M-4QMT**	**P1M-4QME**

	ELP version non-magnetic		ELP version magnetic		Long bearing version		
Bore size	Both ports head XD_{1*}	Optional porting XD_{2*}	Both ports head XD_{3*}	Optional porting XD_{4*}	Both ports head XD_{5*}	Optional porting XD_{6*}	Style 5 rod end length adjustment
12	34.5	39.5	45.5	50.5	51	56	1.5
16	37	42	48	53	54	59	2
20	42	46.5	52	56.5	58	62.5	2
25	47.5	53.5	57.5	63.5	61.5	67.5	2.5
32	55.5	63.5	64.5	72.5	67	75	1
40	59.5	66.5	68.5	76.5	70.5	78.5	1
50	68.5	74.5	77.5	83.5	79.5	85.5	-0.5
63	72	78.5	84	89.5	87	92.5	-0.5
80	91	100	101.5	110.5	101.5	110.5	1
100	105.5	114	120	128.5	120	128.5	-1

* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

** Single Clevis Kit can be used as mounting bracket for double clevis cylinders. Double Clevis Kit can be used as mounting kit for single clevis cylinders.

Note: Rear Clevis mounts are not available with cap face port.

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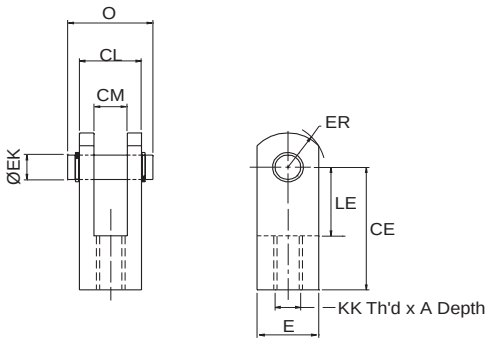
Rod Clevis



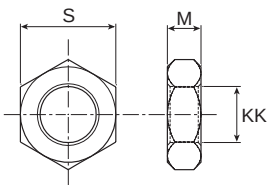
Metric

Bore size	A	E	CE	KK	ER	LE	EK (h9)	CM	CL	O	Part number
12	7	9.5	16	M5x0.8	6.5	7	5	5	9.5	14.5	**P1M-4DRC**
16	11	11	21	M6x1.0	8	10	5	6.5	11	16.5	**P1M-4FRC**
20	8.5	16	25	M8x1.25	10.5	11.5	8	8	16	21	**P1M-4HRC**
25	10.5	19	30	M10x1.25	13	14	10	10	19	25.5	**P1M-4JRC**
32	16	22 Dia.	30	M12x1.25	12	14	10	18	36	41.5	**P1M-4KRC**
40	16	22 Dia.	30	M14x1.5	12	14	10	18	36	41.5	**P1M-4LRC**
50/63	20	28 Dia.	40	M18x1.5	16	20	14	22	44	50.5	**P1M-4MRC**
80	23	38 Dia.	50	M22x1.5	21	27	18	28	56	64	**P1M-4PRC**
100	24	44 Dia.	55	M22x1.5	24	31	22	32	64	72	**P1M-4QRC**

Inch

Bore size	A	E	CE	KK	ER	LE	EK (inch) +0, -0.002	CM	CL (inch)	O (inch)	Part number
12	6	9.5	16	#8-32	6.5	7	3/16	5	0.375	0.563	**P1M-4DRC-T**
16	6	11	21	#8-32	8	10	3/16	6.5	0.437	0.625	**P1M-4FRC-T**
20	6	16	25	#10-32	10.5	11.5	5/16	8	0.625	0.875	**P1M-4HRC-T**
25	8	19	30	1/4-28	13	14	3/8	10	0.750	1.031	**P1M-4JRC-T**
32	16	22 Dia.	30	5/16-24	12	14	3/8	18	1.437	1.687	**P1M-4KRC-T**
40	16	22 Dia.	30	3/8-24	12	14	3/8	18	1.437	1.687	**P1M-4LRC-T**
50/63	20	28 Dia.	40	1/2-20	16	20	1/2	22	1.750	2.125	**P1M-4MRC-T**
80	23	38 Dia.	50	5/8-18	21	27	3/4	28	2.250	2.625	**P1M-4PRC-T**
100	24	44 Dia.	55	3/4-16	24	31	7/8	32	2.500	2.875	**P1M-4QRC-T**

Jam Nuts



Style 4

Bore size	KK	M	S	Part number
12	#8-32	1/8	11/32	**L073800080**
16	#8-32	1/8	11/32	**L073800080**
20	#10-32	1/8	3/8	**L073800100**
25	1/4-28	5/32	7/16	**L073800200**
32	5/16-24	3/16	1/2	**L073800300**
40	3/8-24	7/32	9/16	**L073800400**
50	1/2-20	5/16	3/4	**L073800600**
63	1/2-20	5/16	3/4	**L073800600**
80	5/8-18	3/8	15/16	**L073800800**
100	3/4-16	27/64	1-1/8	**L073800900**

Dimensions in inches

Style 5

Bore size	KK	M	S	Part number
12	M5x0.8	2.7	18	**L075540005**
16	M6x1.0	3.2	10	**L075540006**
20	M8x1.25	4	13	**L075540008**
25	M10x1.25	5	17	**L075540010**
32	M12x1.25	6	19	**L075540012**
40	M14x1.5	7	22	**L075540014**
50	M18x1.5	8	27	**L075540018**
63	M18x1.5	8	27	**L075540018**
80	M22x1.5	11	32	**L075540022**
100	M22x1.5	11	32	**L075540022**

Dimensions in mm

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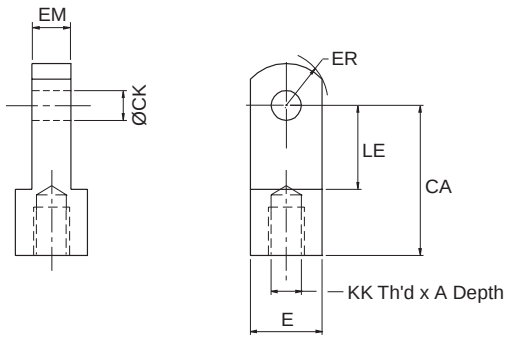
Rod Eye



Metric

Bore size	A	E	CA	KK	ER	LE	CK	EM	Part number
12	7	9.5 Sq.	16	M5x0.8	6.5	7	5	5	**P1M-4DRE**
16	8	11 Sq.	25	M6x1.0	8	14	5	6.5	**P1M-4FRE**
20	8.5	16 Sq.	25	M8x1.25	10.5	11.5	8	8	**P1M-4HRE**
25	10.5	19 Sq.	30	M10x1.25	13	14	10	10	**P1M-4JRE**
32	15	22 Dia.	30	M12x1.25	12	14	10	18	**P1M-4KRE**
40	14	22 Dia.	30	M14x1.5	12	14	10	18	**P1M-4LRE**
50/63	18.5	28 Dia.	40	M18x1.5	16	20	14	22	**P1M-4MRE**
80	22	38 Dia.	50	M22x1.5	21	27	18	28	**P1M-4PRE**
100	22	44 Dia.	55	M22x1.5	24	31	22	32	**P1M-4QRE**

Inch

Bore size	A	E	CA	KK	ER	LE	CK (inch)	EM	Part number
12	6	9.5 Sq.	16	#8-32	6.5	7	3/16	5	**P1M-4DRE-T**
16	6	11 Sq.	25	#8-32	8	14	3/16	6.5	**P1M-4FRE-T**
20	6	16 Sq.	25	#10-32	10.5	11.5	5/16	8	**P1M-4HRE-T**
25	8	19 Sq.	30	1/4-28	13	14	3/8	10	**P1M-4JRE-T**
32	12	22 Dia.	30	5/16-24	12	14	3/8	18	**P1M-4KRE-T**
40	11	22 Dia.	30	3/8-24	12	14	3/8	18	**P1M-4LRE-T**
50/63	18	28 Dia.	40	1/2-20	16	20	1/2	22	**P1M-4MRE-T**
80	21	38 Dia.	50	5/8-18	21	27	3/4	28	**P1M-4PRE-T**
100	21	44 Dia.	55	3/4-16	24	31	7/8	32	**P1M-4QRE-T**

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- Low profile design
- Flexible construction with special modification capability
- High density iron rod bearing provides maximum support for longer life
- Single and double acting versions available
- 6 mounting styles
- 8 bore sizes from 9/16" to 4"
- Strokes from 1/8" to 6"
- Permanent lubrication
- Non-lube service

Operating information

Operating pressure:		200 PSIG (17 bar)
Temperature range:	LP	-10°F to 200°F (-23°C to 93°C)
	LPM	-10°F to 140°F (-23°C to 60°C)
Filtration requirements:		40 micron, dry filtered air

For technical information see CD

Ordering information

1.50	K	N	LP	L	V	B	E	S	9	1.25"

Bore size

0.56"
0.75"
1.12"
1.50"
2.00"
2.50"
3.00"
4.00"

Double rod cylinder

Blank	Single rod
K	Double rod

Mounting style

N	Basic (Std.)
Single rod styles	
4F	Head bolt
4R	Cap bolt
2F	Head trunnion [1]
2R	Cap trunnion [1]
1	Cap pivot eye
Double rod styles	
N	Basic
4R	Cap bolt
2F	Head trunnion
Hollow rod styles [1,2,5]	
NH	Basic
4RH	Cap bolt
2FH	Head trunnion

Series

LP	Standard
LPM	Magnetic Piston [5]

Piston seal

Blank	Standard seal
L	Lipseal piston seal [3]

Seals

Blank	Standard
V	Class 5 seals

Bumpers*

Blank	No bumpers
B	Bumpers both ends
H	Head end only
C	Cap end only [4]

* Please reference catalog 0900P-E, page E60 for stroke reduction.

Spring

Blank	None
E	Spring extended
R	Spring return

Special features

Blank	No special feature
S	Special feature

Rod end thread style

9	Standard female rod end
4	Optional male rod end
3	Special rod end (specify dimensions or sketch)

Stroke length

Specify stroke length required in inches.

1 Not available on 9/16" bore.
2 Hollow rods are used on double rod cylinders. All hollow rod options require the double rod prefix "K".
3 Lipseal piston is not available on LPM Series.
4 Not available on spring extend.
5 LPM Series with hollow rod option are not available on the 9/16", 3/4" and 1-1/8" bore sizes.

Note: For sensor specifications and part numbers, please refer to the Electronic Sensors section.

Sensors

For sensors see page B296.

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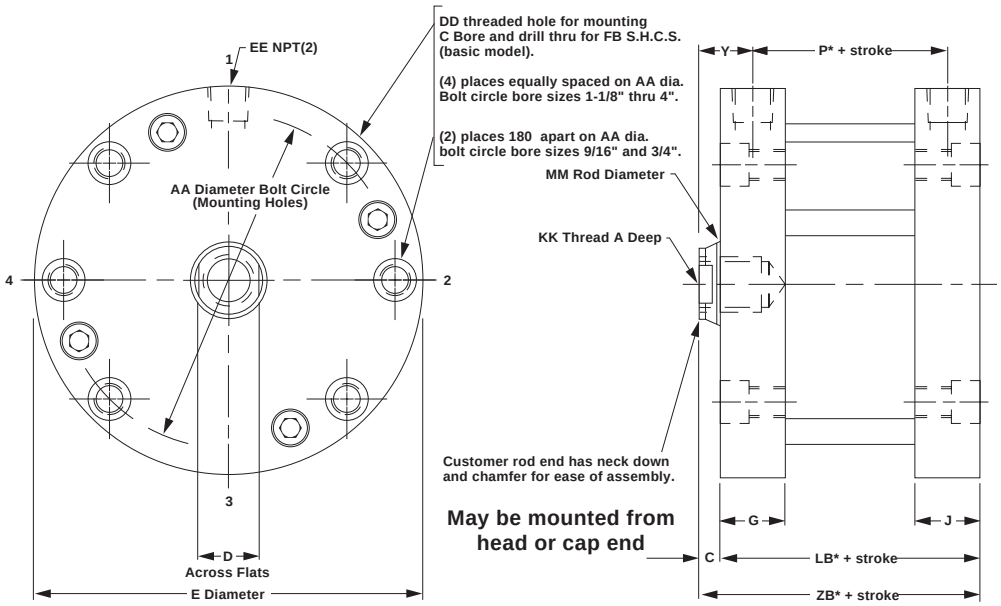
Mounting Style N

Cylinder Dimensions
Double Acting
Single Rod End,
Female Rod Style No. 9

Temperature: -10°F to 200°F (optional Fluorocarbon seals). All air cylinders are permanently lubricated. LPM Series maximum temperature 140°F.



Bore size	A	C	D	E	G	J	P*	Y	AA	DD	EE	FB	KK	LB*	MM	ZB*
9/16	0.40	1/8	7/32	1-1/8	23/64	23/64	11/32	17/64	0.875	#8-32	#10-32	#4	#8-32	5/8	1/4	3/4
3/4	0.44	1/8	1/4	1-1/2	23/64	23/64	3/8	17/64	1.219	#10-32	#10-32	#6	#10-32	21/32	5/16	25/32
1-1/8	0.62	1/8	7/16	2	1/2	1/2	27/64	3/8	1.687	#10-32	1/8	#6	5/16-24	59/64	1/2	1-3/64
1-1/2	0.62	1/8	1/2	2-5/8	1/2	1/2	1/2	3/8	2.187	1/4-28	1/8	#10	3/8-24	1	5/8	1-1/8
2	0.70†	1/8	5/8	3-1/8	1/2	1/2	9/16	3/8	2.687	1/4-28	1/8	#10	1/2-20	1-1/16	3/4	1-3/16
2-1/2	0.70†	1/8	5/8	3-3/4	5/8	5/8	5/8	7/16	3.250	5/16-24	1/4	1/4	1/2-20	1-1/4	3/4	1-3/8
3	0.75†	1/8	3/4	4-1/4	43/64	43/64	21/32	7/16	3.781	5/16-24	1/4	1/4	5/8-18	1-9/32	7/8	1-13/32
4	0.75†	1/8	7/8	5-1/2	27/32	27/32	49/64	17/32	4.937	3/8-24	3/8	5/16	3/4-16	1-5/8	1	1-3/4

* These dimensions are for the LP Series with standard piston.
† For strokes less than 0.25", A dimension = 0.66".

Added length table for LPM or lipseal piston options

Bore size	LPM option*						LP with lipseal piston option				
	P	LB	XD	XJ	ZB	Stroke	P	LB	XD	XJ	ZB
9/16†	15/16	1-7/32	2	–	1-11/32	1/2	5/8	29/32	1-11/16	–	1-1/32
3/4†	31/32	1-1/4	2-1/32	1-3/16	1-3/8	1/2	21/32	15/16	1-23/32	7/8	1-1/16
1-1/8†	63/64	1-31/64	2-3/8	1-23/64	1-39/64	9/16	43/64	1-11/64	2-1/16	1-3/64	1-19/64
1-1/2	1-1/8	1-5/8	2-13/16	1-1/2	1-3/4	7/16	13/16	1-5/16	2-1/2	1-3/16	1-7/16
2	1-9/32	1-25/32	3-1/32	1-21/32	1-29/32	7/16	61/64	1-29/64	2-45/64	1-21/64	1-37/64
2-1/2	1-21/64	1-61/64	3-21/64	1-3/4	2-5/64	1/2	1	1-5/8	3	1-27/64	1-3/4
3	1-27/64	2-3/64	3-53/64	1-53/64	2-11/64	1/2	1-3/32	1-23/32	3-1/2	1-1/2	1-27/32
4	1-1/2	2-23/64	4-11/64	2	2-31/64	1/2	1-11/64	2-1/32	3-27/32	1-43/64	2-5/32

Note minimum strokes for LPM option.
† These bore sizes not available for the LPM option with the hollow rod option.
* The LPM option is only available with the standard quad seal.

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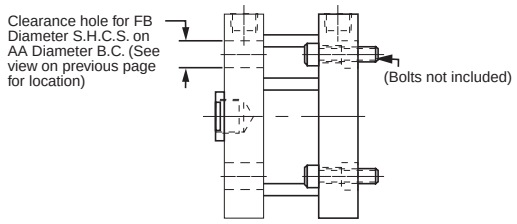
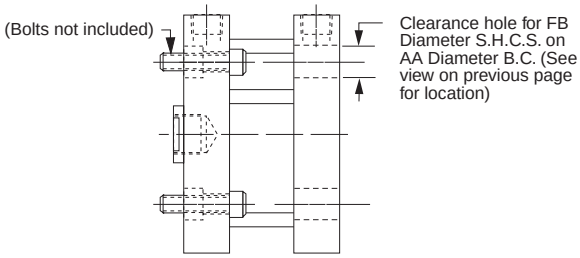
Head Bolt Clearance Holes

Mounting Style 4F
Available Head End



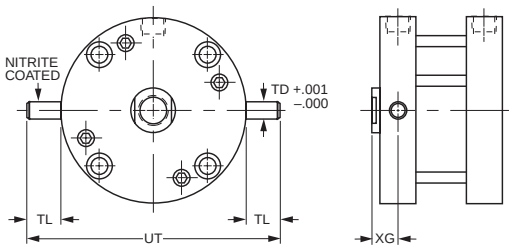
Cap Bolt Clearance Holes

Mounting Style 4R
Available Cap End



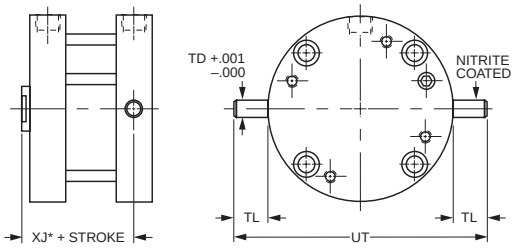
Head Trunnion

Mounting Style 2F (9/16" bore not available)



Cap Trunnion

Mounting Style 2R (9/16" bore not available)

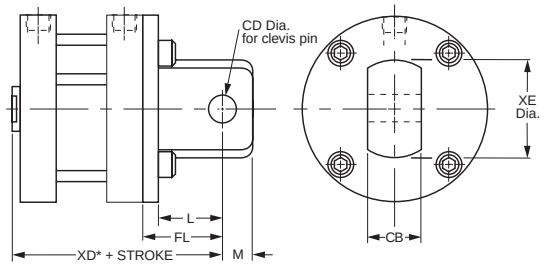


Bore size	TD	TL	UT	XG	XJ*
3/4	0.125	5/16	2-1/8	5/16	19/32
1-1/8	0.250	1/2	3	3/8	51/64
1-1/2	0.250	1/2	3-5/8	3/8	7/8
2	0.250	1/2	4-1/8	3/8	15/16
2-1/2	0.312	5/8	5	29/64	1-3/64
3	0.312	5/8	5-1/2	15/32	1-1/16
4	0.375	3/4	7	35/64	1-17/64

* These dimensions are for the LP Series with standard piston.

Cap Pivot Eye

Mounting Style 1



Bore size	L	M	CB	CD	FL	XD*	XE
9/16	1/2	1/4	3/8	3/16	21/32	1-13/32	19/32
3/4	1/2	1/4	3/8	3/16	21/32	1-7/16	3/4
1-1/8	1/2	1/4	3/8	3/16	49/64	1-13/16	3/4
1-1/2	13/16	7/16	3/4	3/8	1-1/16	2-3/16	1-3/8
2	13/16	7/16	3/4	3/8	1-1/8	2-5/16	1-3/8
2-1/2	13/16	7/16	3/4	3/8	1-1/4	2-5/8	1-3/8
3	1-9/32	9/16	1	5/8	1-21/32	3-1/16	1-7/8
4	1-9/32	9/16	1	5/8	1-11/16	3-7/16	1-7/8

Order clevis pin from accessories when required.
* These dimensions are for the LP Series with standard piston. See table on the previous page for dimensions for the lipseal piston or LPM options.

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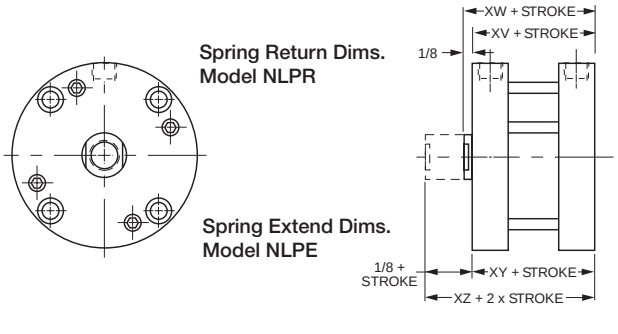
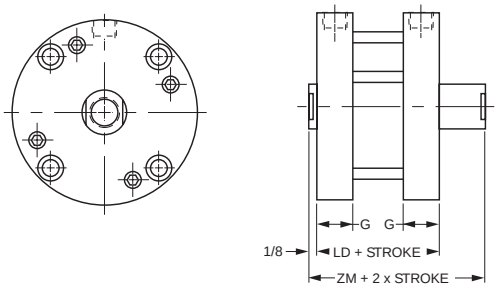
Spring Extend & Spring Return Cylinders
(Available through 2" stroke)



Double Rod Spring Extend & Spring Return Cylinders
(Available through 2" stroke)



Bore size	1/8" to 1" stroke XV	XW	XY	XZ	Over 1" to 2" stroke XV	XW	XY	XZ	Add this length to XV, XW, XY, XZ for Lipseal Piston
9/16	1	1-1/8	57/64	1-1/64	1-11/16	1-13/16	1-37/64	1-45/64	9/32
3/4	1-1/64	1-9/64	59/64	1-3/64	1-45/64	1-53/64	1-39/64	1-47/64	9/32
1-1/8	1-23/64	1-31/64	1-9/32	1-13/32	1-63/64	2-7/64	1-29/32	2-1/32	1/4
1-1/2	1-25/64	1-33/64	1-11/32	1-15/32	2-1/64	2-9/64	1-31/32	2-3/32	5/16
2	1-11/64	1-19/64	1-13/32	1-17/32	1-51/64	1-59/64	2-1/32	2-5/32	25/64
2-1/2	1-3/8	1-1/2	1-23/32	1-27/32	2	2-1/8	2-11/32	2-15/64	3/8
3	1-1/2	1-5/8	1-55/64	1-63/64	2-1/8	2-1/4	2-31/64	2-39/64	7/16
4	1-27/32	1-31/32	2-13/64	2-21/64	2-15/32	2-19/32	2-53/64	2-61/64	13/32

Bore size	G	Spring return/extend – LP ≥ 1/8", ≤ 1" LD	ZM	Min.* stroke	<1", ≤ 2" LD	ZM	Spring return/extend – LPM ≥ 1/8", >1" LD	ZM	Min.* stroke	>1", ≤ 2" LD	ZM
9/16	23/64	1-1/8	1-3/8	5/16	1-13/16	2-1/16	1-23/32	1-27/32	3/16	2-13/32	2-17/32
3/4	23/64	1-11/64	1-27/64	1/8	1-55/64	2-7/64	1-49/64	1-57/64	3/16	2-29/64	2-37/64
1-1/8	1/2	1-1/2	1-3/4	1/8	2-1/8	2-3/8	2-1/16	2-3/16	1/8	2-11/16	2-13/16
1-1/2	1/2	1-11/16	1-15/16	1/8	2-5/16	2-9/16	2-5/16	2-7/16	1/4	2-15/16	3-1/16
2	1/2	1-31/64	1-47/64	1/8	2-7/64	2-23/64	2-13/64	2-21/64	1/4	2-53/64	2-61/64
2-1/2	5/8	1-3/4	2	1/8	2-3/8	2-5/8	2-29/64	2-37/64	3/16	3-5/64	3-13/64
3	43/64	1-29/32	2-5/32	1/8	2-17/32	2-25/32	2-43/64	2-51/64	1/8	3-19/64	3-27/64
4	27/32	2-1/4	2-1/2	1/8	2-7/8	3-1/8	2-63/64	3-7/64	1/8	3-39/64	3- 47/64

* Note minimum strokes for LPM option.

Spring force data

1/8" to 1" Stroke Bore size	Max. Spring Force (lbs)	Spring Rate (lb/in)	Over 1" to 2" Stroke Bore dia.	Max. Spring Force (lbs)	Spring Rate (lb/in)
9/16	5.7	4.25	9/16	5.7	1.75
3/4	9	6	3/4	9	2.5
1-1/8	10	6	1-1/8	10	2.5
1-1/2	13	5.5	1-1/2	12	2.25
2	13	5.5	2	12	2.25
2-1/2	17.5	6	2-1/2	16	2.5
3 & 4	24	6.5	3 & 4	23	2.75

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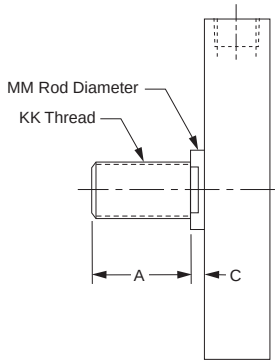
Optional Male Rod End

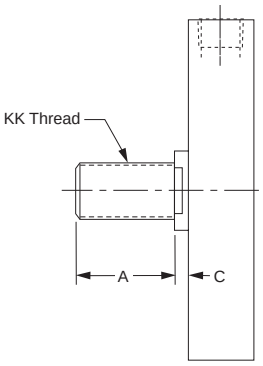
Specify #4



Bore size	A	C	KK	MM
9/16	0.38	1/8	#8-32	1/4
3/4	0.50	1/8	#10-32	5/16
1-1/8	0.50	1/8	5/16-24	1/2
1-1/2	0.50	1/8	3/8-24	5/8
2	0.62	1/8	1/2-20	3/4
2-1/2	0.62	1/8	1/2-20	3/4
3	0.75	1/8	5/8-18	7/8
4	0.75	1/8	3/4-16	1

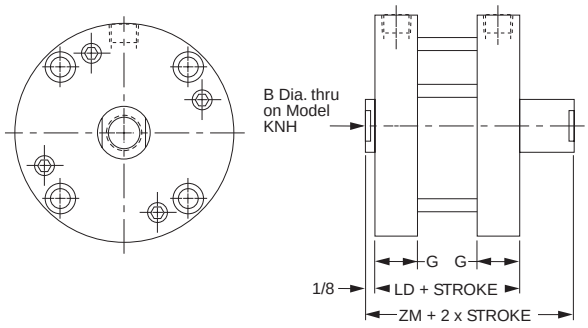
Non-standard Rods

For non-standard rod ends, please specify rod thread style 3 and provide the KK, A, and C dimensions as needed.



Double or Hollow Rod Cylinders

Note: Cylinders with hollow rod option should not be bottomed out during stroke.



LP double or hollow rod option, LPM, lipseal piston

Bore size	B	G	Standard double rod end or with hollow rod		LPM option		LP with lipseal piston option	
			LD	ZM	LD	ZM	LD	ZM
9/16	*	23/64	3/4	1	1-11/32	1-15/32	1-1/32	1-9/32
3/4	9/64	23/64	13/16	1-1/16	1-13/32	1-17/32	1-3/32	1-11/32
1-1/8	7/32	1/2	1-3/16	1-7/16	1-3/4	1-7/8	1-7/16	1-11/16
1-1/2	9/32	1/2	1-19/64	1-35/64	1-59/64	2-3/64	1-39/64	1-55/64
2	3/8	1/2	1-3/8	1-5/8	2-3/32	2-7/32	1-49/64	2-1/64
2-1/2	3/8	5/8	1-5/8	1-7/8	2-21/64	2-29/64	2	2-1/4
3	7/16	43/64	1-11/16	1-15/16	2-29/64	2-37/64	2-1/8	2-3/8
4	1/2	27/32	2-1/32	2-9/32	2-49/64	2-57/64	2-7/16	2-11/16

*Hollow rod not available on 9/16" bore.

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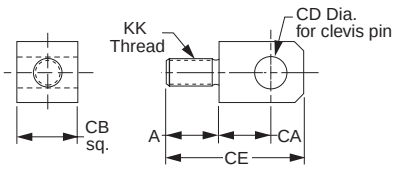
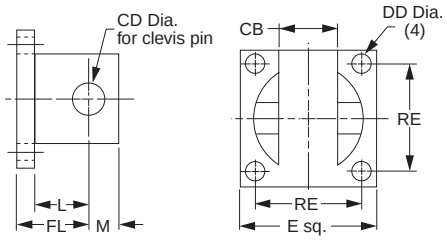
Rod Eye



Bore size	A	CA	CB	CD	CE	KK	Part number
9/16	3/8	15/32	3/8	3/16	1-3/32	#8-32	**L073810008**
3/4	3/8	15/32	3/8	3/16	1-3/32	#10-32	**L073810010**
1-1/8	9/16	15/32	3/8	3/16	1-9/32	5/16-24	**L073810020**
1-1/2	5/8	23/32	3/4	3/8	1-25/32	3/8-24	**L073810024**
2-2-1/2	21/32	23/32	3/4	3/8	1-27/32	1/2-20	**L073810032**
3	21/32	1	1	5/8	2-3/8	5/8-18	**L073810040**
4	21/32	1	1	5/8	2-3/8	3/4-16	**L073810048**

Clevis Bracket

(Supplied with Pin)

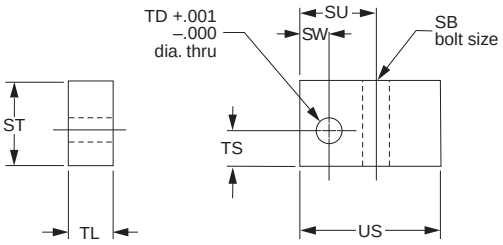


E	L	M	CB	CD	DD	FL	RE	Part number
1	13/32	7/32	25/64	3/16	9/64	9/16	3/4	**L073820012**
1-3/4	25/32	13/32	49/64	3/8	11/64	15/16	1-3/8	**L073820024**
2-1/2	1	9/16	1-1/64	5/8	17/64	1-1/4	2	**L073820040**

Use L073820012 on 9/16", 3/4" and 1-1/8" bore.
Use L073820024 on 1-1/2", 2" and 2-1/2" bore.
Use L073820040 on 3" and 4" bore.

Note: The Clevis Bracket is an accessory for the rod eye or the cap pivot eye and cannot be mounted directly to the cylinder.

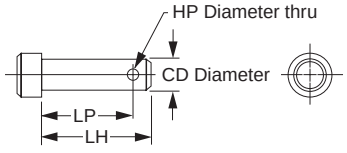
Trunnion Bracket



SB	ST	SU	SW	TD	TL	TS	US	Part number
1/4	7/8	13/16	5/16	.252	1/2	3/8	1-1/2	**L073840016**
5/16	1	15/16	3/8	.314	5/8	29/64	1-5/8	**L073840020**
3/8	1-1/4	1- 1/16	7/16	.377	3/4	35/64	1-7/8	**L073840024**

Use L073840016 on 1-1/8", 1-1/2" and 2" bore.
Use L073840020 on 2- 1/2" and 3" bore.
Use L073840024 on 4" bore.

Clevis Pin



CD	HP	LH	LP	Part number
3/16	3/32	1	29/32	**L073830012**
3/8	5/32	1-5/8	1-15/32	**L073830024**
5/8	5/32	2	1-27/32	**L073830040**

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- Compact guided cylinder for heavy duty short stroke applications
- 9 Bore sizes, 16mm to 200mm
- Strokes 10 to 200mm depending on model
- Standard dowel holes on body and tool plate
- High load bearing option
- Internal bumpers and magnetic piston are standard
- Flexible porting: top, rear, side

Operating information

Operating pressure:	1 MPa (145 PSIG / 10 bar)
Temperature range:	
Nitrile seals (standard)	0°F to 165°F (-18°C to 74°C)
Fluorocarbon seals*	0°F to 250°F (-18°C to 121°C)
* See fluorocarbon seal option for high temperature applications.	
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P5T – J 032 D H S N 100

Shaft / bearing type	
J	Composite bearing, chrome plated shaft (std)
H	Ball bearing, stainless steel shaft
C	Composite bearing, stainless steel shaft

Bore size	
016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Seals	
S	Nitrile (std)
F	Fluorocarbon (high temp)

Stroke length
See table below for standard stroke lengths. Consult factory for special stroke lengths.

Port location / mounting	
D	Dowel holes, top ports (std)
R	Dowel holes, rear ports, top plugged (std)
S	Dowel holes, side ports [1] and top ports

Options	
N	None (std)
B	High load bearings [2]
A	Bumpers, adjustable stop collars (extend only) and dual tool plate (side ports rec) [3, 4]
E	Bumpers and adjustable stop collars (extend only) [3]
G	High load bearings, bumpers and adjustable stop collars (extend only) [2, 3]
D	Dual tool plate [3, 4]
X	Special

Port style	
H	NPTF (std)
G	BSPP
P	Flow control, BSPP port, prestolok tube (mm) [1]
F	Flow control, NPTF port, prestolok tube (inch) [1]
B	Flow control, BSPP [1]
N	Flow control, NPTF [1]

Standard strokes (mm)*

Bore size (mm)	10	25	40	50	75	100	125	150	175	200
16	•	•	•	•	•	•				
20		•	•	•	•	•	•			
25		•		•	•	•	•	•		
32 -100		•		•	•	•	•	•	•	•

* Consult factory for special stroke lengths.

NOTES:

1 Cannot combine flow controls, side ports and 25mm stroke.
2 Not available with rear mounting and ports.
3 Not available with rear port location (R).
4 Includes high load bearings as standard.

Sensors
For sensors see page B296.

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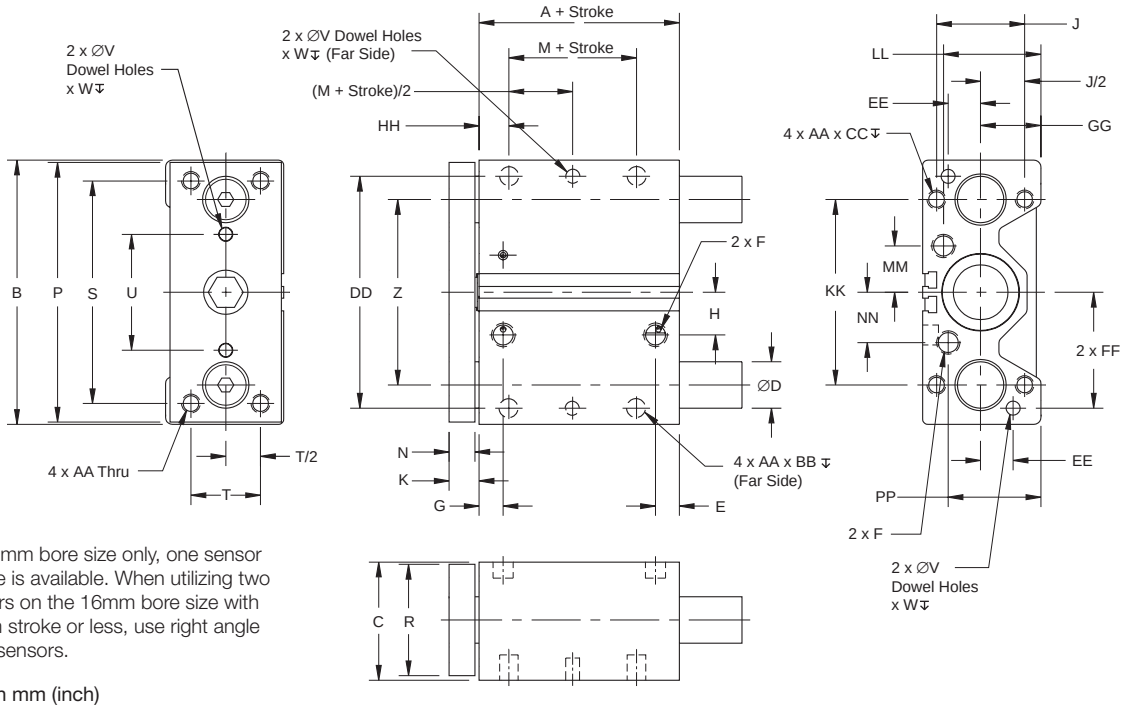

Note: On 16mm bore size only, one sensor groove is available. When utilizing two sensors on the 16mm bore size with 25mm stroke or less, use right angle short sensors.

Dimensions in mm (inch)

Model	A**	B	C	D	D²	E**	F	G	H	J	K
16	37.75 (1.49)	64 (2.52)	31 (1.22)	8 (0.315)	10 (0.394)	10.1 (0.40)	M5/10-32	10.1 (0.40)	6.95 (0.27)	22 (0.866)	9.94 (0.39)
20	36 (1.42)	74 (2.91)	36 (1.42)	10 (0.394)	12 (0.472)	19 (0.75)	1/8 NPTF or BSPP	10 (0.39)	15.8 (0.62)	26 (1.024)	9.94 (0.39)
25	38 (1.50)	88 (3.46	42 (1.65)	12 (0.472)	16 (0.630)	21 (0.83)	1/8 NPTF or BSPP	11.4 (0.45)	15.5 (0.61)	32 (1.260)	9.94 (0.39)
32	36 (1.42)	114 (4.49)	51 (2.00)	16 (0.630)	20 (0.787)	10.26 (0.40)	1/8 NPTF or BSPP	10.35 (0.41)	18.42 (0.73)	38 (1.496)	13.1 (0.52)
40	44 (1.73)	124 (4.88)	52 (2.05)	16 (0.630)	20 (0.787)	12.10 (0.48)	1/8 NPTF or BSPP	14.9 (0.59)	22.53 (0.89)	38 (1.496)	13.1 (.052)
50	44.9 (1.77)	140 (5.51)	62 (2.44)	20 (0.787)	25 (0.984)	14.5 (0.57)	1/4 NPTF or BSPP	16.1 (0.63)	27 (1.06)	44 (1.732)	14.7 (0.58)
63	50.05 (1.97)	150 (5.91)	75 (2.95)	20 (0.787)	25 (0.984)	16.4 (0.65)	1/4 NPTF or BSPP	14.5 (0.57)	33 (1.30)	44 (1.732)	14.7 (0.58)
80	60.3 (2.37)	188 (7.40)	95 (3.74)	25 (0.984)	30 (1.181)	17.5 (0.610)	3/8 NPTF or BSPP	19 (0.75)	37 (1.46)	56 (2.205)	18 (0.71)
100**	67.5 (2.60)	224 (8.82)	115 (4.53)	30 (1.181)	35 (1.38)	21.9 (0.862)	3/8 NPTF or BSPP	23 (0.91)	40 (1.57)	62 (2.441)	18 (0.71)

Model	M	N	P	R	S	T	U	V	W	Z	AA	BB
16	7 (0.276)	7.94 (0.31)	62 (2.44)	25.4 (1.00)	52 (2.047)	16 (.630)	20 (0.787)	3 (0.118)	6 (0.236)	42 (1.654)	M5x0.8	7.5 (0.30)
20	10 (0.394)	7.94 (0.31)	72 (2.83)	31.8 (1.25)	60 (2.362)	18 (.709)	30 (1.181	4 (0.157)	6 (0.236)	52 (2.047)	M5x0.8	7.5 (0.30)
25	10 (0.394)	7.94 (0.31)	86 (3.39)	38 (1.50)	70 (2.756)	26 (1.024)	34 (1.339)	4 (0.157)	6 (0.236)	62 (2.441)	M6x1.0	9 (0.35)
32	5 (0.197)	11.1 (0.44)	112 (4.41)	44.5 (1.75)	96 (3.780)	30 (1.181)	50 (1.969)	6 (0.236)	6 (0.236)	80 (3.150)	M8x1.25	11 (0.43)
40	10 (0.394)	11.1 (0.44)	122 (4.80)	44.5 (1.75)	106 (4.173)	30 (1.181)	60 (2.362)	6 (0.236)	6 (0.236)	90 (3.543)	M8x1.25	11 0.43)
50	10 (0.394)	12.7 (0.50)	138 (5.43)	57.2 (2.25)	120 (4.724)	40 (1.575)	60 (2.362)	8 (0.315)	8 (0.315)	100 (3.937)	M10x1.5	12 (0.47)
63	10 (0.394)	12.7 (0.50)	148 (5.83)	69.9 (2.75)	130 (5.118)	50 (1.969)	72 (2.835)	8 (0.315)	8 (0.315)	110 (4.331)	M10x1.5	15 (0.59)
80	15 (0.591)	16 (0.63)	185 (7.28)	89 (3.50)	160 (6.299)	60 (2.362)	92 (3.622)	10 (0.394)	10 (0.394)	140 (5.512)	M12x1.75	18 (0.71)
100	15 (0.591)	16 (0.63)	221 (8.70)	108 (4.25)	190 (7.480)	80 (3.150)	114 (4.488)	10 (0.394)	10 (0.394)	170 (6.693)	M14x2.0	21 (0.83)

Model	CC	DD	EE	FF	GG	HH	KK	LL	MM	NN	PP	Piston Rod
16	10 (0.39)	54 (2.126)	8 (0.315)	27 (1.063)	15 (0.591)	13.06 (0.514)	42 (1.654)	22.5 (0.88)	11.25 (0.44)	9.7 (0.38)	23.0 (0.91)	8 (0.315)
20	10 (0.39)	64 (2.520)	10 (0.394)	32 (1.260)	17 (0.669)	13.06 (0.514)	52 (2.126)	26.0 (1.02)	15.4 (0.61)	15.4 (0.61)	26.0 (1.0)	10 (0.394)
25	12 (0.47)	76 (2.992)	11 (0.433)	38 (1.496)	21 (0.827)	14.06 (0.553)	62 (2.441)	33.4 (1.31)	17 (0.67)	17 (0.67)	33.4 (1.31)	10 (0.394)
32	16 (0.63)	100 (3.937)	14 (0.551)	50 (1.969)	26 (1.024)	12.9 (0.508)	80 (3.150)	42 (1.65)	20 (0.79)	21.7 (0.85)	38 (1.50)	16 (0.630)
40	16 (0.63)	110 (4.33)	14 (0.551)	55 (2.165)	26 (1.024)	13.9 (0.547)	90 (3.543)	41 (1.61)	24 (0.95)	26.4 (1.04)	37.9 (1.49)	16 (0.630)
50	20 (0.79)	124 (4.882)	16 (0.630)	62 (2.441)	30 (1.181)	14.3 (0.563)	100 (3.937)	51 (2.01)	29 (1.14)	33 (1.30)	44 (1.73)	20 (0.787)
63	20 (0.79)	132 (5.197)	18 (0.709)	66 (2.598)	36.5 (1.437)	16.3 (0.642)	110 (4.331)	62 (2.44)	36 (1.42)	37.75 (1.49)	57.75 (2.27)	20 (0.787)
80	24 (0.94)	166 (6.535)	22 (0.866)	83 (3.268)	46.5 (1.831)	21 (0.83)	140 (5.512)	78 (3.07)	45 (1.77)	48 (1.89)	75.5 (2.97)	25 (0.984)
100	28 (1.10)	200 (7.874)	24 (0.945)	100 (3.937)	56.5 (2.224)	25 (0.98)	170 (6.693)	91.5 (3.60)	53 (2.09)	51 (2.01)	95.5 (3.76)	25 (0.984)

D¹ With linear ball bearing D² With composite bushing
** For Model 100 with 25mm stroke, A = 100.3 (3.95") and E = 28 (1.10")

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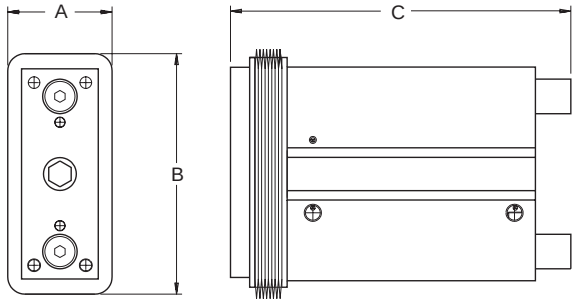
Contaminant & Weld Flash Covers

A contaminant cover protects the guide rods and bearings from particles and fluid that could cause premature failure.

A weld flash cover protects guide rods and bearings from weld spatter.

Cover option can be ordered on models having the bearings both ends option.

Consult factory to order.



Weld Flash Cover Specifications

Coating material (exposed side)		PVC (Black)
Base material		Nomex
Coating material (other side)		PVC (Black)
Material thickness range		.012" - .016" (.3-.4mm)
Temperature resistance (nomex)		
	Briefly	642°F (450°C)
	Continuously	-22° to 572°F (-30° to 300°C)
Temperature resistance (coating)		
	Briefly	392°F (200°C)
	Continuously	-22° to 302°F (-30° to 150°C)
Resistant to		Chemicals, coolants, solvents, oil
Characteristics		self-extinguishing, abrasion resistant
Material weight		400 grams/square meter

Dimensions in mm (inch)

Model	A	B	10	25	40	50	75	100	125	150	175	200
16	42 (1.65)	86 (3.39)	61.2 (2.41)	100.2 (3.94)	135.2 (5.32)	135.2 (5.32)	160.2 (6.31)	200.2 (7.88)	–	–	–	–
20	45 (1.77)	98 (3.86)	–	106.9 (4.21)	141.9 (5.59)	141.9 (5.59)	166.9 (6.57)	216.9 (8.54)	241.9 (9.52)	–	–	–
25	49 (1.93)	112 (4.41)	–	119.9 (4.72)	–	144.9 (5.70)	169.9 (6.69)	194.9 (7.67)	241.9 (9.52)	266.9 (10.51)	–	–
32	62 (2.44)	142 (5.59)	–	127.9 (5.04)	–	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
40	62 (2.44)	152 (5.98)	–	127.9 (5.04)	–	152.9 (6.02)	177.9 (7.00)	202.9 (7.99)	266 (10.47)	291 (11.46)	316 (12.44)	341 (13.43)
50	66 (2.60)	167 (6.57)	–	134 (5.28)	–	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
63	77 (3.03)	187 (7.36)	–	134 (5.28)	–	159 (6.26)	184 (7.24)	209 (8.23)	274.1 (10.79)	299.1 (11.78)	324.1 (12.76)	349.1 (13.74)
80	104 (4.09)	244 (9.61)	–	151.8 (5.98)	–	176.8 (6.96)	201.8 (7.94)	226.8 (8.93)	290 (11.42)	315 (12.40)	340 (13.39)	365 (14.37)
100	109 (4.29)	279 (10.98)	–	170.3 (6.70)	–	195.3 (7.69)	220.3 (8.67)	245.3 (9.66)	308.4 (12.14)	333.4 (13.13)	358.4 (14.11)	383.4 (15.09)

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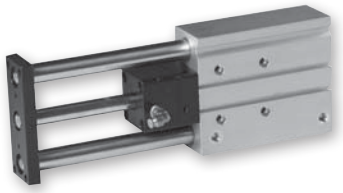
- Compact guided cylinder for heavy duty short stroke applications
- 10 bore sizes 12mm to 100mm
- Strokes 10 to 200mm depending on model
- Rod lock option to hold position upon loss of air pressure
- High load bearing option
- Optional stop collars for adjustable stroke



Operating information

Operating pressure:	1 MPa (145 PSIG / 10 bar)
Temperature range:	
Nitrile seals (standard)	-18°C to 74°C (0°F to 165°F)
Fluorocarbon seals	-18°C to 121°C (0°F to 250°F)
Operating characteristics:	Double acting
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P5T2	A	032	J1	K	N	1	B	G	J	025	A

Construction

A	Standard, metric mounting Threads
E	Cushions [6], metric mounting threads

Bore size

012	12mm
016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Bearings / shaft

J1	Composite bushings, chrome plated rod
J3	Composite bushings, stainless steel rod
K1	Composite high load bearings, chrome plated rod [7]
K3	Composite high load bearings, stainless steel rod [7]
H3	Linear ball bearings, stainless steel rod
L3	Linear ball high load bearings, stainless steel rod [7]

Extend options

A	Shock absorber [1, 9]
K	Bumpers and adjustable stop collars [2]
L	Bumpers and shock absorbers [3, 9]
N	None

Retract options

A	Shock absorber [4, 9]
K	Bumpers and adjustable stop collars [4]
L	Bumpers and shock absorber [4, 9]
R	Rod lock (sizes 32-100 only)
N	None

Port location

1	Top
2	Side
3	Rear

Ports / flow controls

Ports	Flow controls [5]		
	None	Prestolok	Threaded
NPTF	A	E	P
BSPP or M5	B	F	R

Other options

Tool Plate	Seals	
	Buna-N	Fluorocarbon
Front	G	L
Front & Rear [5]	H	M

Stroke length

Order standard stroke from tables below using 3 digits, i.e. 025 = 25mm

Type	Connection	Sensor option			
		Proximity sensor [8]			None
		Extend	Retract	Extend & retract	
PNP	Lead type	U	A	E	N
	Plug in	V	B	F	
NPN	Lead type	W	C	J	
	Plug in	Y	D	K	

Sensors

For sensors see page B296.

Standard strokes, basic units*

Bore size	10	20	25	30	40	50	75	100	125	150	175	200
12 - 16	•	•		•	•	•	•	•	•	•	•	•
20 - 25		•		•	•	•	•	•	•	•	•	•
32 - 100			•			•	•	•	•	•	•	•

Standard strokes, cushioned units*

Bore Size	10	20	25	30	40	50	75	100	125	150	175	200
20 - 63			•			•	•	•	•	•	•	•
80 - 100						•	•	•	•	•	•	•

*Consult factory for special stroke lengths.

Notes:

1. not available with rear or side port; not available with retract option l; not available on 100mm size with 25mm stroke.
2. Not available with rear ports.
3. Not available with rear or side ports; not available with retract option a.
4. Not available with rod lock.
5. Not available with rear ports.
6. Cushions not available on sizes 12 & 16. Cushions may not be effective in combination with shocks or bumpers/stop collars.
7. High load bearings option only available with 50mm and greater strokes.
8. Consult factory for retract proximity sensors on rodlock unit.
9. Shock absorbers not available on sizes 12 & 16.

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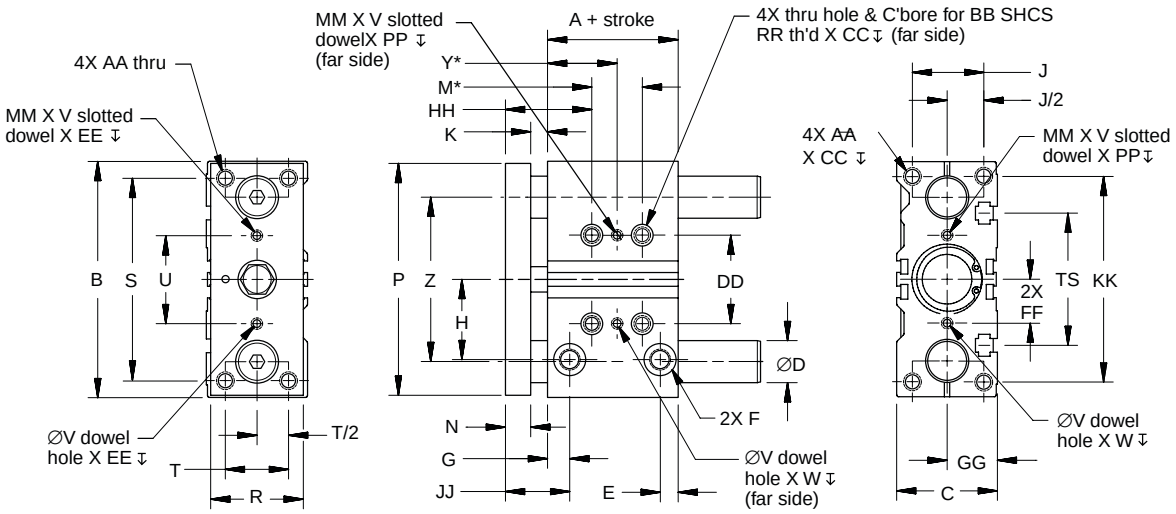

Dimensions in mm (inch)

Note: See next page for these stroke dependent dimensions.

Bore	A	B	C	D1	D2	E	F	G	H	J	K	N	P	R	S	T	U
12	29 (1.14)	58 (2.28)	26 (1.02)	6 (0.24)	8 (0.31)	6.75 (0.27)	M5x0.8*	10.5 (0.41)	7.5 (0.30)	18 (0.71)	6 (0.24)	7 (0.28)	56 (2.20)	22 (0.87)	48 (1.89)	14 (0.55)	23 (0.91)
16	33 (1.30)	64 (2.52)	30 (1.18)	8 (0.31)	10 (0.39)	6.2 (0.24)	M5x0.8*	12 (0.47)	16.5 (0.65)	22 (0.87)	5 (0.20)	8 (0.31)	62 (2.44)	25 (0.98)	54 (2.13)	16 (0.63)	24 (0.94)
20	37 (1.46)	83 (3.27)	36 (1.42)	10 (0.39)	12 (0.47)	10 (0.39)	1/8 BSPP 1/8 NPTF	11 (0.43)	25 (0.98)	24 (0.94)	8 (0.31)	8 (0.31)	81 (3.19)	30 (1.18)	70 (2.76)	18 (0.71)	28 (1.10)
25	37.5 (1.48)	93 (3.66)	42 (1.65)	12 (0.47)	16 (0.63)	10.5 (0.41)	1/8 BSPP 1/8 NPTF	10.5 (0.41)	30 (1.18)	30 (1.18)	8 (0.31)	8 (0.31)	91 (3.58)	38 (1.50)	78 (3.07)	26 (1.02)	34 (1.34)
32	37.5 (1.48)	112 (4.41)	48 (1.89)	16 (0.63)	20 (0.79)	10.75 (0.42)	1/8 BSPP 1/8 NPTF	11.75 (0.46)	37.5 (1.48)	34 (1.34)	10 (0.39)	12 (0.47)	110 (4.33)	44 (1.73)	96 (3.78)	30 (1.18)	42 (1.65)
40	44 (1.73)	120 (4.72)	54 (2.13)	16 (0.63)	20 (0.79)	11.5 (0.45)	1/8 BSPP 1/8 NPTF	16 (0.63)	42 (1.65)	40 (1.57)	10 (0.39)	12 (0.47)	118 (4.65)	44 (1.73)	104 (4.09)	30 (1.18)	50 (1.97)
50	44 (1.73)	148 (5.83)	64 (2.52)	20 (0.79)	25 (0.98)	12.5 (0.49)	1/4 BSPP 1/4 NPTF	16 (0.63)	49 (1.93)	46 (1.81)	15 (0.59)	13 (0.51)	146 (5.75)	60 (2.36)	130 (5.12)	40 (1.57)	66 (2.60)
63	49 (1.93)	162 (6.38)	78 (3.07)	20 (0.79)	25 (0.98)	13 (0.51)	1/4 BSPP 1/4 NPTF	16 (0.63)	57 (2.24)	58 (2.28)	15 (0.59)	13 (0.51)	158 (6.22)	70 (2.76)	130 (5.12)	50 (1.97)	80 (3.15)
80	56.5 (2.22)	202 (7.95)	91.5 (3.60)	25 (0.98)	30 (1.18)	17 (0.67)	3/8 BSPP 3/8 NPTF	18 (0.71)	74 (2.91)	54 (2.13)	18 (0.71)	22 (0.87)	198 (7.80)	75 (2.95)	174 (6.85)	52 (2.05)	100 (3.94)
100	66 (2.60)	240 (9.45)	112 (4.41)	30 (1.18)	35 (1.38)	20 (0.79)	3/8 BSPP 3/8 NPTF	23 (0.91)	94 (3.70)	48 (1.89)	25 (0.98)	25 (0.98)	236 (9.29)	89 (3.50)	210 (8.27)	64 (2.52)	124 (4.88)

Bore	V +0.01 -0.00	W	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	MM**	PP	RR	TS
12	3.06 (0.12)	6 (0.24)	41 (1.61)	M4 x 0.7	M4	10 (0.39)	23 (0.91)	4.5 (0.18)	11.5 (0.45)	13 (0.51)	18 (0.71)	23.5 (0.93)	50 (1.97)	3.5 (0.14)	3 (0.12)	M5 x 0.8	37 (1.46)
16	3.06 (0.12)	6 (0.24)	46 (1.81)	M5 x 0.8	M4	10 (0.39)	24 (0.94)	4.5 (0.18)	12 (0.47)	15 (0.59)	18 (0.71)	25 (0.98)	56 (2.20)	3.5 (0.14)	3 (0.12)	M5 x 0.8	38 (1.50)
20	3.06 (0.12)	6 (0.24)	54 (2.13)	M5 x 0.8	M5	12 (0.47)	28 (1.10)	4.5 (0.18)	14 (0.55)	18 (0.71)	33 (1.30)	27 (1.06)	72 (2.83)	3.5 (0.14)	3 (0.12)	M6 x 1.0	44 (1.73)
25	4.06 (0.16)	6 (0.24)	64 (2.52)	M6 x 1.0	M5	12 (0.47)	34 (1.34)	4.5 (0.18)	17 (0.67)	21 (0.83)	33 (1.30)	26.5 (1.04)	82 (3.23)	4.5 (0.18)	3 (0.12)	M6 x 1.0	50 (1.97)
32	4.06 (0.16)	6 (0.24)	78 (3.07)	M8 x 1.25	M6	16 (0.63)	42 (1.65)	5.5 (0.22)	21 (0.83)	24 (0.94)	43 (1.69)	33.75 (1.33)	98 (3.86)	4.5 (0.18)	3 (0.12)	M8 x 1.25	63 (2.48)
40	4.06 (0.16)	6 (0.24)	86 (3.39)	M8 x 1.25	M6	16 (0.63)	50 (1.97)	5.5 (0.22)	25 (0.98)	27 (1.06)	44 (1.73)	38 (1.50)	106 (4.17)	4.5 (0.18)	3 (0.12)	M8 x 1.25	72 (2.83)
50	5.04 (0.20)	8 (0.31)	110 (4.33)	M10 x 1.5	M8	20 (0.79)	66 (2.60)	5.5 (0.22)	33 (1.30)	32 (1.26)	52 (2.05)	44 (1.73)	130 (5.12)	6 (0.24)	4 (0.16)	M1 x 1.5	92 (3.62)
63	5.04 (0.20)	8 (0.31)	124 (4.88)	M10 x 1.5	M8	20 (0.79)	80 (3.15)	5.5 (0.22)	40 (1.57)	39 (1.54)	52 (2.05)	44 (1.73)	142 (5.59)	6 (0.24)	4 (0.16)	M10 x 1.5	110 (4.33)
80	6.04 (0.24)	10 (0.39)	156 (6.14)	M12 x 1.75	M10	24 (0.94)	100 (3.94)	7.0 (0.28)	50 (1.97)	46 (1.81)	68 (2.68)	58 (2.28)	180 (7.09)	7 (0.28)	5 (0.20)	M12 x 1.75	140 (5.51)
100	6.04 (0.24)	10 (0.39)	188 (7.40)	M14 x 2.0	M12	28 (1.10)	124 (4.88)	7.0 (0.28)	62 (2.44)	56 (2.20)	61 (2.40)	73 (2.87)	221 (8.70)	7 (0.28)	5 (0.20)	M14 x 2.0	166 (6.54)

D1 with linear ball bearing; D2 with composite bushing
* 10-32 fittings will fit into M5x0.8 ports.
** Slot length

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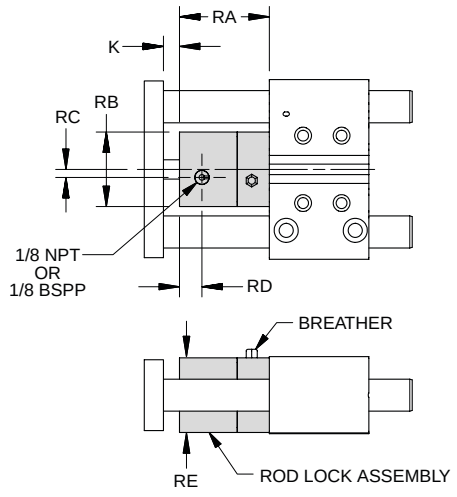
Stroke Dependent Dimensions

Bore size	Dim	Standard stroke length (mm) 10	20	25	30	40	50	75	100	125	150	175	200
12	M	20 (0.79)	20 (0.79)	N/A	20 (0.79)	40 (1.57)	40 (1.57)	40 (1.57)	40 (1.57)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
	Y	15 (0.59)	15 (0.59)	N/A	15 (0.59)	25 (0.98)	25 (0.98)	25 (0.98)	25 (0.98)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)
16	M	24 (0.94)	24 (0.94)	N/A	24 (0.94)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	110 (4.33)	110 (4.33)	110 (4.33)	110 (4.33)
	Y	17 (0.67)	17 (0.67)	N/A	17 (0.67)	27 (1.06)	27 (1.06)	27 (1.06)	27 (1.06)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)
20, 25	M	N/A	24 (0.94)	N/A	24 (0.94)	44 (1.73)	44 (1.73)	44 (1.73)	44 (1.73)	120 (4.72)	120 (4.72)	120 (4.72)	120 (4.72)
	Y	N/A	29 (1.14)	N/A	29 (1.14)	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)	77 (3.03)	77 (3.03)	77 (3.03)	77 (3.03)
32	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	33 (1.30)	N/A	N/A	45 (1.77)	45 (1.77)	45 (1.77)	83 (3.27)	83 (3.27)	83 (3.27)	83 (3.27)
40	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	34 (1.34)	N/A	N/A	46 (1.81)	46 (1.81)	46 (1.81)	84 (3.31)	84 (3.31)	84 (3.31)	84 (3.31)
50	M	N/A	N/A	24 (0.94)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	124 (4.88)	124 (4.88)	124 (4.88)	124 (4.88)
	Y	N/A	N/A	36 (1.42)	N/A	N/A	48 (1.89)	48 (1.89)	48 (1.89)	86 (3.39)	86 (3.39)	86 (3.39)	86 (3.39)
63	M	N/A	N/A	24 (0.94)	N/A	N/A	52 (2.05)	52 (2.05)	52 (2.05)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
	Y	N/A	N/A	38 (1.50)	N/A	N/A	50 (1.97)	50 (1.97)	50 (1.97)	88 (3.46)	88 (3.46)	88 (3.46)	88 (3.46)
80	M	N/A	N/A	28 (1.10)	N/A	N/A	52 (2.05)	52 (2.05)	52 (2.05)	128 (5.04)	128 (5.04)	128 (5.04)	128 (5.04)
	Y	N/A	N/A	42 (1.65)	N/A	N/A	54 (2.13)	54 (2.13)	54 (2.13)	92 (3.62)	92 (3.62)	92 (3.62)	92 (3.62)
100	M	N/A	N/A	48 (1.89)	N/A	N/A	72 (2.83)	72 (2.83)	72 (2.83)	148 (5.83)	148 (5.83)	148 (5.83)	148 (5.83)
	Y	N/A	N/A	35 (1.38)	N/A	N/A	47 (1.85)	47 (1.85)	47 (1.85)	85 (3.35)	85 (3.35)	85 (3.35)	85 (3.35)

Rod Lock (R)



Dimensions in mm (inch)

Bore size	RA	RB	RC	RD	RE	K
32	56 (2.20)	46.5 (1.83)	5 (0.20)	14 (0.55)	46.5 (1.83)	10 (0.39)
40	58 (2.28)	50.8 (2.00)	6 (0.24)	10 (0.39)	50.8 (2.00)	10 (0.39)
50	66 (2.60)	63.5 (2.50)	0 0.00	14 (0.55)	63.5 (2.50)	15 (0.59)
63	83 (3.27)	76.2 (3.00)	7.4 (0.29)	18 (0.71)	76.2 (3.00)	15 (0.59)
80	100 (3.94)	95.25 (3.75)	10 (0.39)	26 (1.02)	92.75 (3.65)	18 (0.71)
100	116 (4.57)	111 (4.37)	10 (0.39)	43 (1.69)	111 (4.37)	25 (0.98)

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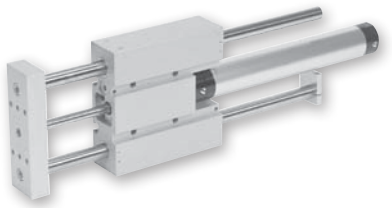
- 3 body styles (Thrust, Reach, Base)
- 8 bore sizes 20mm to 100mm
- Maximum strokes 400 to 1000mm depending on model
- 3 Bearing options: composite, ball bearing, self-aligning ball bearing
- Dowel holes standard on body and tool plate
- Available with adjustable stroke and shock absorbers
- Direct mount of thrust and reach to same size base
- Powered by P1L cylinder



Operating information

Operating pressure:	10 bar (145 PSIG)
Temperature range:	
Standard seals	-17°C to 74°C (0°F to 165°F)
Fluorocarbon seals*	-17°C to 121°C (0°F to 250°F) *
See fluorocarbon seal option for high temperature applications.	
Operating characteristics:	Double acting
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P5L	–	R	L	100	J1	A	A	N	F	N	–	0900	–	A

Series

T	Thrust slide
R	Reach slide
B	Base slide

Cylinder type

L	P1L cylinder

Bore size

020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Bushings

J1	Composite bushing, chrome plated shafts
J2	Composite bushing, oversized chrome plated shafts
J3	Composite bushing, stainless steel shafts
J4	Composite bushing, oversized stainless steel shafts
G1	Composite bushing, chrome plated shafts, contaminent tolerant seals
G3	Composite bushing, stainless steel shafts, contaminent tolerant seals
H3	Linear ball bearings, stainless steel shafts
H5	Linear ball bearings, carbon steel shafts
S3*	Self aligning linear ball bearings, stainless steel shafts
S5*	Self aligning linear ball bearings, carbon steel shafts

* Not avaialble 20mm bore models

Extend options

N	None
A	Shock/stroke adjusters
B	Bumpers (base slides only)
C	Cushions both ends
E	Micro-adjusters and cushions (both ends only)
H	Cushions and bumpers (includes options C & K)
K	Bumpers and adjustable stop collars
L	Shock absorbers and bumpers (N/A on base slides)

Retract options

N	None
A	Shock/stroke adjusters
B	Bumpers only
C	Cushions both ends
E	Micro-adjusters and cushions (both ends only)
H	Cushions and bumpers (includes options C & K)
K	Bumpers and adjustable stop collars
L	Shock absorbers and bumpers (N/A on base slides)

Cylinder seals

N	Nitrile (standard)
V	Fluorocarbon (high temperature)

Proximity sensor options

N	No Sensor
P	PNP, lead type
R	NPN, lead type
S	PNP, plug in type
T	NPN, plug in type
W	Prox ready, 8mm (no sensor supplied)
Z	Prox ready, 12mm (no sensor supplied)

** Note: Piston magnet is standard on all cylinders. Inductive proximity sensors are included with Options P, R, S & T.

Cylinder port style

G	BSPT ports
H	NPTF ports
P	BSPT ports w/ Presto-lok flow controls (mm)
F	NPTF ports w/ Presto-lok flow controls (inch)
B	BSPT ports w/ flow controls
N	NPTF ports w/ flow controls

T-slots

–	Standard (Extruded T-slots on sizes 20-40, no T-slots on sizes 50-100)
A **	Machined T-slots (Sizes 50-100)

** Not avaialble on sizes 20-40

Stroke length

Order in 1mm increments.

Design series

A	Current design

Order P8S Series reed and solid state sensors separately from Electronic Sensors Section.

Sensors

For sensors see page B296.

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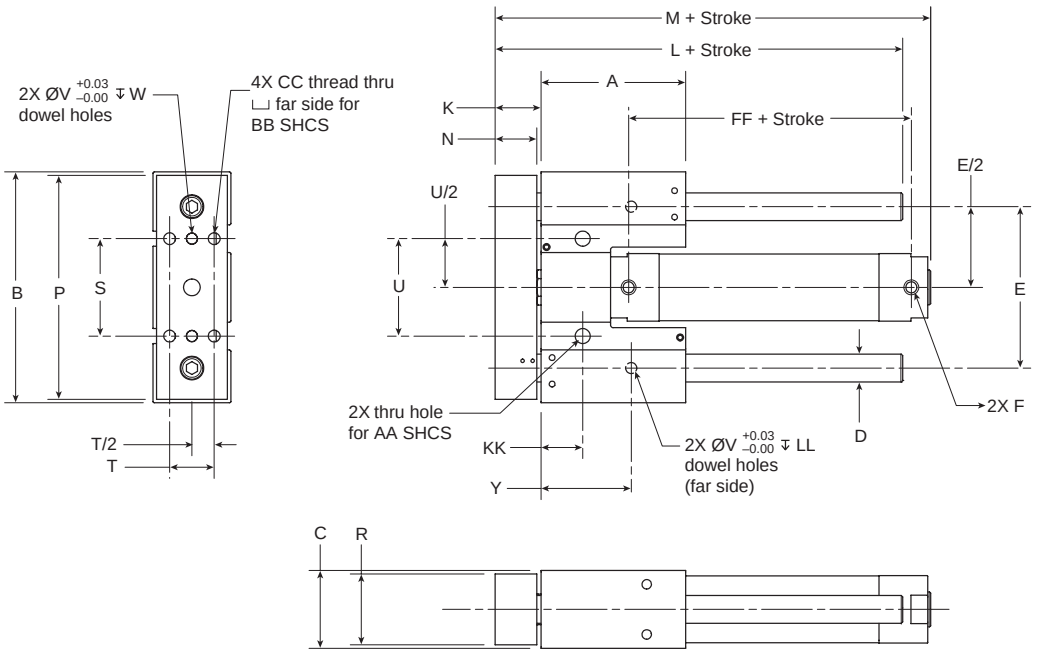
Thrust Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	60 (2.4)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	86 (3.4)	114 (4.5)	17 (0.7)	96 (3.8)	26 (1.0)
25	76 (3.0)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	107 (4.2)	126 (5.0)	22 (0.9)	119 (4.7)	33 (1.3)
32	84 (3.3)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	117 (4.6)	140 (5.5)	24 (0.9)	137 (5.4)	39 (1.5)
40	104 (4.1)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	143 (5.6)	163 (6.4)	30 (1.2)	161 (6.3)	51 (2.0)
50	130 (5.1)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	175 (6.9)	195 (7.7)	36 (1.4)	211 (8.3)	63 (2.5)
63	152 (6.0)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	203 (8.0)	219 (8.6)	40 (1.6)	255 (10.0)	77 (3.0)
80	180 (7.1)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	237 (9.3)	249 (9.8)	46 (1.8)	315 (12.4)	95 (3.7)
100	222 (8.7)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	289 (11.4)	306 (12.0)	56 (2.2)	383 (15.1)	111 (4.4)

Bore size	S	T	U	V	W	Y	AA	BB	CC	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	36 (1.4)	M5	M4	M5x0.8	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	46 (1.8)	M6	M5	M6x1.0	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	53 (2.1)	M8	M6	M8x1.25	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	65 (2.6)	M10	M8	M10x1.5	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	83 (3.3)	M10	M8	M10x1.5	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	101 (4.0)	M12	M10	M12x1.75	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	127 (5.0)	M16	M14	M16x1.5	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	154 (6.1)	M20	M16	M20x2.5	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32

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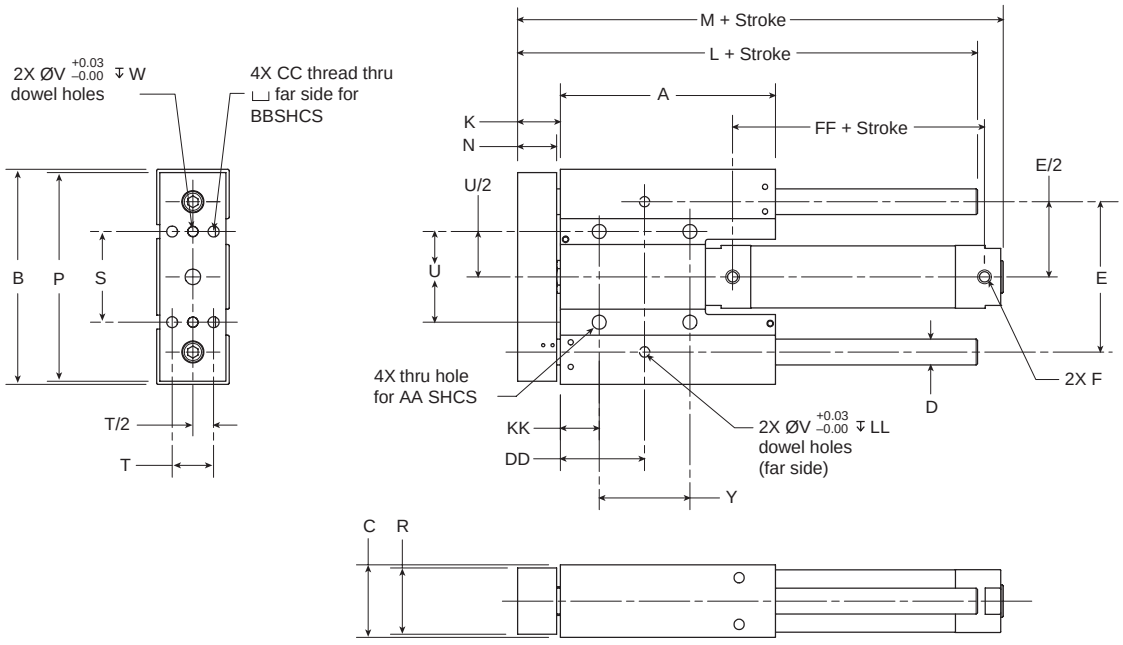
Reach Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	K	L	M	N	P	R
20	98 (3.9)	98 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	68 (2.7)	1/8†	20 (0.8)	124 (4.9)	152 (6.0)	17 (0.7)	96 (3.8)	26 (1.0)
25	122 (4.8)	122 (4.8)	38 (1.5)	12 (0.5)	16 (0.6)	84 (3.3)	1/8†	25 (1.0)	153 (6.0)	172 (6.8)	22 (0.9)	119 (4.7)	33 (1.3)
32	140 (5.5)	140 (5.5)	44 (1.7)	16 (0.6)	20 (0.8)	92 (3.6)	1/8	27 (1.1)	173 (6.8)	196 (7.7)	24 (0.9)	137 (5.4)	39 (1.5)
40	166 (6.5)	166 (6.5)	56 (2.2)	20 (0.8)	25 (1.0)	116 (4.6)	1/8	33 (1.3)	205 (8.1)	225 (8.9)	30 (1.2)	161 (6.3)	51 (2.0)
50	216 (8.5)	216 (8.5)	70 (2.8)	25 (1.0)	30 (1.2)	148 (5.8)	1/4	39 (1.5)	261 (10.3)	281 (11.1)	36 (1.4)	211 (8.3)	63 (2.5)
63	260 (10.2)	260 (10.2)	84 (3.3)	30 (1.2)	40 (1.6)	176 (6.9)	1/4	43 (1.7)	311 (12.2)	327 (12.9)	40 (1.6)	255 (10.0)	77 (3.0)
80	320 (12.6)	320 (12.6)	102 (4.0)	40 (1.6)	50 (2.0)	220 (8.7)	3/8	49 (1.9)	377 (14.8)	389 (15.3)	46 (1.8)	315 (12.4)	9 (3.7)
100	390 (15.4)	390 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	260 (10.2)	1/2	59 (2.3)	457 (18.0)	474 (18.7)	56 (2.2)	383 (15.1)	111 (4.4)

Bore size	S	T	U	V	W	Y	AA	BB	CC	DD	FF	KK	LL
20	40 (1.6)	16 (0.6)	40 (1.6)	4.03 (0.2)	4 (0.2)	40 (1.6)	M5	M4	M5X0.8	36 (1.4)	45 (1.8)	16 (0.6)	4 (0.2)
25	48 (1.9)	20 (0.8)	48 (1.9)	5.03 (0.2)	5 (0.2)	48 (1.9)	M6	M5	M6X1.0	46 (1.8)	46 (1.8)	22 (0.9)	5 (0.2)
32	50 (2.0)	24 (0.9)	50 (2.0)	6.03 (0.2)	6 (0.2)	50 (2.0)	M8	M6	M8X1.25	53 (2.1)	43 (1.7)	28 (1.1)	6 (0.2)
40	70 (2.8)	32 (1.3)	70 (2.8)	8.03 (0.3)	8 (0.3)	70 (2.8)	M10	M8	M10X1.5	65 (2.6)	49 (1.9)	30 (1.2)	8 (0.3)
50	80 (3.1)	42 (1.7)	80 (3.1)	8.03 (0.3)	8 (0.3)	80 (3.1)	M10	M8	M10X1.5	83 (3.3)	53 (2.1)	43 (1.7)	8 (0.3)
63	100 (3.9)	52 (2.0)	100 (3.9)	10.03 (0.4)	10 (0.4)	100 (3.9)	M12	M10	M12X1.75	101 (4.0)	52 (2.0)	51 (2.0)	10 (0.4)
80	124 (4.9)	62 (2.4)	124 (4.9)	12.03 (0.5)	12 (0.5)	124 (4.9)	M16	M14	M16X1.5	127 (5.0)	64 (2.5)	65 (2.6)	12 (0.5)
100	148 (5.8)	72 (2.8)	148 (5.8)	12.03 (0.5)	12 (0.5)	148 (5.8)	M20	M16	M20X2.5	154 (6.1)	66 (2.6)	80 (3.1)	12 (0.5)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32

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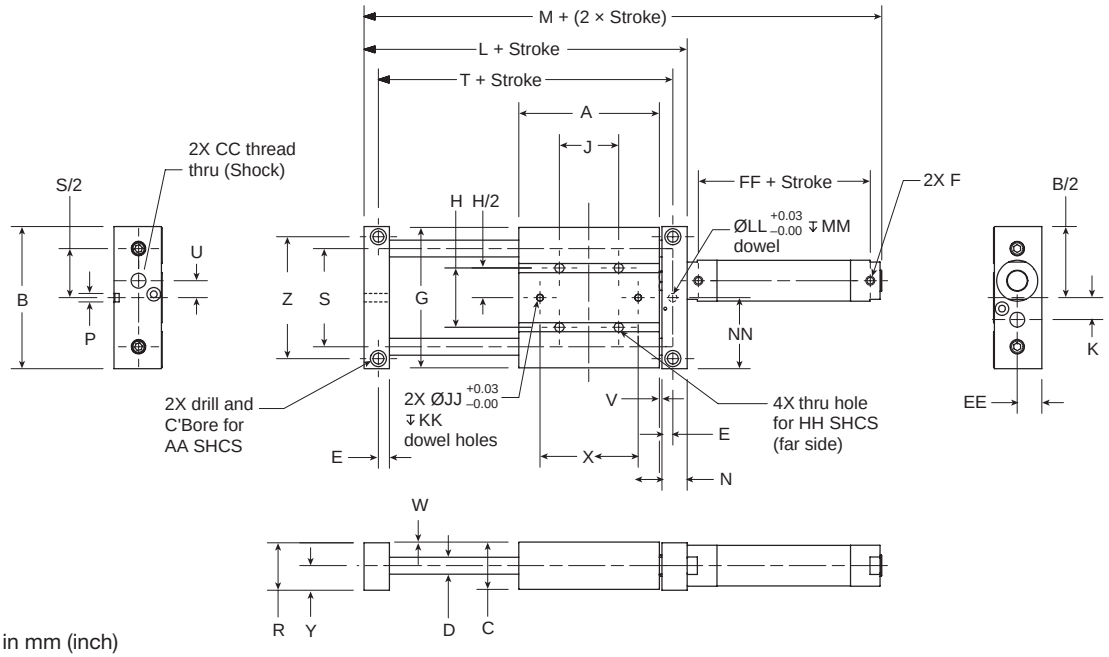
Base Slides



Dimensions in mm (inch)

Bore size	A	B	C	Ds*	Do*	E	F**	G	H	J	K	L	M	N	P+.03	R	S
20	98 (3.9)	100 (3.9)	30 (1.2)	10 (0.4)	12 (0.5)	8 (0.3)	1/8†	98 (3.9)	40 (1.6)	40 (1.6)	18 (0.7)	140 (5.5)	211 (8.3)	18 (0.7)	5.03 (0.2)	30 (1.2)	68 (2.7)
25	122 (4.8)	124 (4.9)	38 (1.5)	12 (0.5)	16 (0.6)	14 (0.6)	1/8†	122 (4.8)	48 (1.9)	48 (1.9)	22 (0.9)	176 (6.9)	247 (9.7)	24 (0.9)	6.03 (0.2)	38 (1.5)	84 (3.3)
32	140 (5.5)	142 (5.6)	44 (1.7)	16 (0.6)	20 (0.8)	12 (0.5)	1/8	140 (5.5)	50 (2.0)	50 (2.0)	22 (0.9)	198 (7.8)	271 (10.7)	26 (1.0)	6.03 (0.2)	44 (1.7)	92 (3.6)
40	166 (6.5)	168 (6.6)	56 (2.2)	20 (0.8)	25 (1.0)	13 (0.5)	1/8	166 (6.5)	70 (2.8)	70 (2.8)	26 (1.0)	232 (9.1)	312 (12.3)	30 (1.2)	10.03 (0.4)	56 (2.2)	116 (4.6)
50	216 (8.5)	218 (8.6)	70 (2.8)	25 (1.0)	30 (1.2)	16 (0.6)	1/4	216 (8.5)	80 (3.1)	80 (3.1)	28 (1.1)	292 (11.5)	384 (15.1)	35 (1.4)	10.03 (0.4)	70 (2.8)	148 (5.8)
63	260 (10.2)	262 (10.3)	84 (3.3)	30 (1.2)	40 (1.6)	19 (0.7)	1/4	260 (10.2)	100 (3.9)	100 (3.9)	42 (1.7)	350 (13.8)	442 (17.4)	42 (1.7)	12.03 (0.5)	84 (3.3)	176 (6.9)
80	320 (12.6)	322 (12.7)	102 (4.0)	40 (1.6)	50 (2.0)	24 (0.9)	3/8	320 (12.6)	124 (4.9)	124 (4.9)	42 (1.7)	434 (17.1)	545 (21.5)	54 (2.1)	16.03 (0.6)	102 (4.0)	220 (8.7)
100	390 (15.4)	392 (15.4)	120 (4.7)	50 (2.0)	60 (2.4)	28 (1.1)	1/2	390 (15.4)	148 (5.8)	148 (5.8)	62 (2.4)	528 (20.8)	639 (25.2)	66 (2.6)	16.03 (0.6)	120 (4.7)	260 (10.2)

Bore size	T	U	V***	W	X	Y	Z	AA	CC	EE	FF	HH	JJ	KK	LL	MM	NN
20	120 (4.7)	11 (0.4)	3 (0.1)	1 (0.0)	68 (2.7)	14 (0.6)	86 (3.4)	M6	M12	16 (0.6)	45 (1.8)	M5	4.03 (0.2)	4 (0.2)	5.03 (0.2)	5 (0.2)	50 (2.0)
25	156 (6.1)	12 (0.5)	3 (0.1)	1 (0.0)	84 (3.3)	18 (0.7)	104 (4.1)	M8	M14	20 (0.8)	46 (1.8)	M6	5.03 (0.2)	5 (0.2)	6.03 (0.2)	6 (0.2)	62 (2.4)
32	170 (6.7)	11 (0.4)	3 (0.1)	1 (0.0)	92 (3.6)	21 (0.8)	120 (4.7)	M10	M14	23 (0.9)	43 (1.7)	M8	6.03 (0.2)	6 (0.2)	6.03 (0.2)	6 (0.2)	71 (2.8)
40	198 (7.8)	20 (0.8)	3 (0.1)	1 (0.0)	116 (4.6)	27 (1.1)	144 (5.7)	M12	M20	29 (1.1)	49 (1.9)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	84 (3.3)
50	254 (10.0)	22 (0.9)	3 (0.1)	1 (0.0)	148 (5.8)	34 (1.3)	188 (7.4)	M16	M25	36 (1.4)	53 (2.1)	M10	8.03 (0.3)	8 (0.3)	10.03 (0.4)	10 (0.4)	109 (4.3)
63	304 (12.0)	30 (1.2)	3 (0.1)	1 (0.0)	176 (6.9)	41 (1.6)	224 (8.8)	M20	M25	43 (1.7)	52 (2.0)	M12	10.03 (0.4)	10 (0.4)	12.03 (0.5)	12 (0.5)	131 (5.2)
80	374 (4.7)	36 (1.4)	3 (0.1)	1 (0.0)	220 (8.7)	50 (2.0)	276 (10.9)	M24	M33	52 (2.0)	64 (2.5)	M16	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	161 (6.3)
100	452 (17.8)	36 (1.4)	3 (0.1)	1 (0.0)	260 (10.2)	59 (2.3)	336 (13.2)	M30	M36	61 (2.4)	66 (2.6)	M20	12.03 (0.5)	12 (0.5)	16.03 (0.6)	16 (0.6)	196 (7.7)

* s = standard, o = oversized ** NPTF or BSPT † w/cushions M5/10-32
*** Space between housing and end plate in both extend and retract positions.

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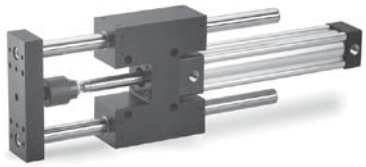
- Medium duty to extremely heavy duty linear motion
- Powered by the 3MA or 4MA NFPA cylinder, with ISO options available
- Bore sizes 1-1/2", 2", and 2-1/2"
- Thrust, reach, and compact versions available
- Shock absorber, bumpers/stop collars, and proximity sensor options available



Operating information

Operating pressure:	Maximum	100 PSIG (7 bar), air – 4MAJ cylinder 150 PSIG (10 bar), air – P1D cylinder 250 PSIG (17 bar), air – 3MA, 4MA and 2A cylinders 400 PSIG (28 bar), oil – 4ML cylinder only 750 PSIG (52 bar), oil – 3L cylinder only
Temperature range:	Cylinder	Standard seals 0°F to 165°F (-18°C to 74°C) Fluorocarbon seals* 0°F to 250°F (-18°C to 121°C)
		* See fluorocarbon seal option for high temperature applications. Not available for 3MA or rod lock cylinders.
Filtration requirements:		40 micron, dry filtered air

For technical information see CD

Ordering information for HBC, HBT and HBR

HBT	25	–	08	A	P1	T	F	4A		–	B	

Series

HBC	Compact slide
HBT	Thrust slide
HBR	Reach slide

Model

15	1-1/2" bore, 20mm shaft
20	2" bore, 25mm shaft
25	2-1/2" bore, 30mm shaft

Stroke length

Order in 1" increments. [4]

For 3-position units, specify intermediate and total stroke separated by a "/", i.e. 02/06.

Consult factory for strokes over 36".

Bushings

T	Composite (standard)
D	Linear ball bearing
T1	Composite with oversized support shafts
TC	Composite with contaminant-tolerant seals

Design Series

B	Current design level

Special Options

Blank	standard

(Two digit code assigned by factory and applies when any "X" appears in the model number or when special options or features are required.)

Slide Configuration Options

Blank	None
A	Shock absorber, both ends
A1	Shock absorber, extend only
A2	Shock absorber, retract only
A3	Shock ready, both ends
A4	Shock ready, extend
A5	Shock ready, retract
B	Bumpers both ends [1]
B1	Bumper & adjustable stop collar, extend only
B2	Bumper retract only
B3	Bumper & adjustable stop collar, retract only
B4	Bumper & adjustable stop collar, both ends
C	Cushions on cylinder, both ends [2]
C1	Cushion on cylinder, extend only [2]
C2	Cushion on cylinder, retract only [2]
X	Special slide configuration (please specify)

Proximity Sensor Options

Blank	None
P	PNP, flying lead type
N	NPN, flying lead type
P1	PNP, plug-in connector
N1	NPN, plug-in connector
J	8mm sensor mounting bracket, no sensor supplied
J1	12mm sensor mounting bracket, no sensor supplied

Note: 8mm inductive proximity sensors are included with Options P, N, P1, N1. Magnetic piston is standard for 3MA, 4MA, 4MAJ, 4ML and P1D cylinders. Order reed and solid state sensors separately for these cylinders from the Electronic Sensors section.

Other Options
(More than one selection is possible)

Blank	None
F	Flow controls (presto-lok)
G	Flow controls (NPT)
K	Stainless steel support shafting

Cylinder Options
(More than one selection is possible)

Blank	None
V	Fluorocarbon cylinder seals [3]
L1	Left hand assembly
L3	Cylinder ports at position [3]

Cylinder Type

3A	3MA NFPA air cylinder, NPTF ports [2]
4A	4MA NFPA air cylinder, NPTF ports
4J	4MAJ NFPA air cylinder with manual override rodlock, NPTF ports, 100 PSIG max.
D	P1D ISO cylinder w/ removable gland, BSPP ports
D1	P1D ISO cylinder w/ removable gland, Standard Rodlock, BSPP ports
D2	P1D ISO cylinder w/ removable gland, manual override rodlock, BSPP ports
E	P1D ISO cylinder w/ removable gland, NPTF ports
E1	P1D ISO cylinder w/ removable gland, standard rodlock, NPTF ports
E2	P1D ISO cylinder w/ removable gland, manual override rodlock, NPTF ports
4L	4ML NFPA hydraulic cylinder, NPTF ports, 400 PSIG max. [2]
S	2A NFPA steel air cylinder, 250 PSIG max.
S1	3L NFPA steel hydraulic cylinder, 750 PSIG max.
Q	No cylinder, NFPA cylinder mounting
Q1	No cylinder, ISO cylinder mounting
X	Special cylinder type (please specify)

NOTES

1 Option B includes options B1 and B2.
2 Cushions are not available with 4ML cylinders or 3MA cylinders on HB products.
3 Fluorocarbon seals not available with 3MA or rodlock cylinders.
4 P1D cylinders have strokes only in whole mm. The HB inch stroke will be changed (rounded up) to reflect this.

Sensors

For sensors see page B296.

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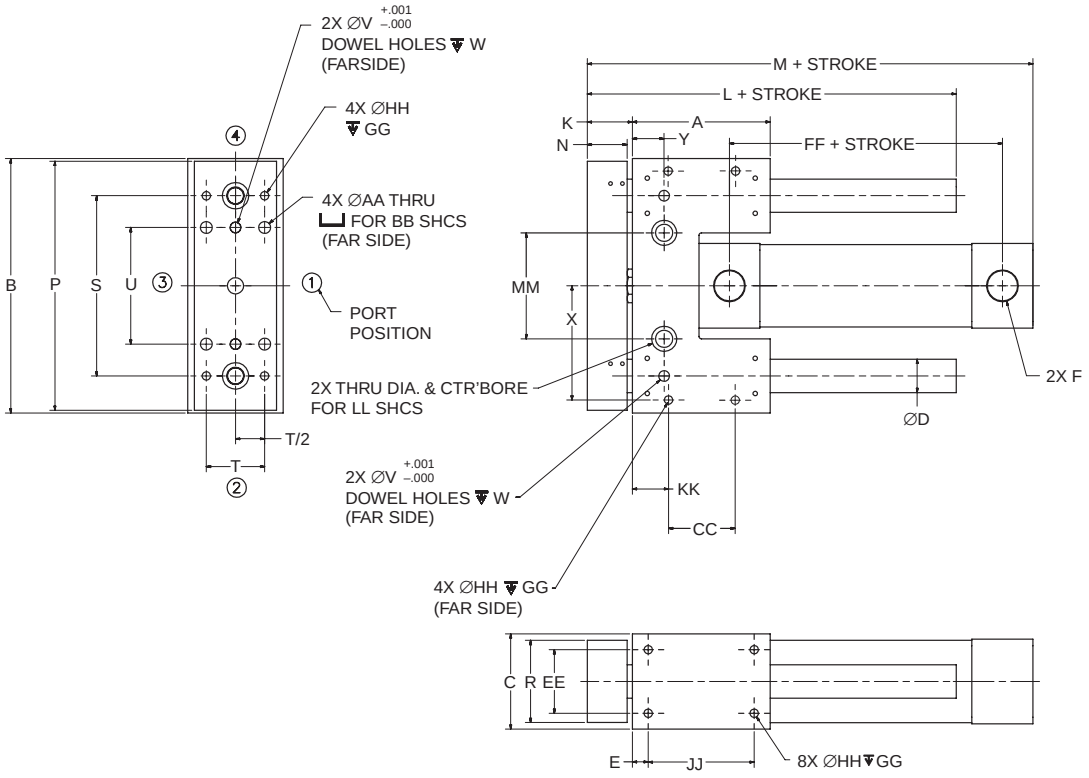
HBC Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T	U
15[1]	3.25	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4[1]	1/4	1.06	5.19	6.26	0.94	5.88	1.94	4.250	1.375	2.750
20	4.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	6.39	7.00	1.19	7.13	2.44	5.000	1.750	3.250
25	5.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	7.82	8.38	1.44	8.88	2.88	6.500	2.000	3.750

Model number	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK	LL	MM
15[1]	0.251	0.27	2.750	0.750	0.28	1/4	1.750	1.500	2.31	0.50	1/4-20	2.50	0.75	3/8	2.500
20	0.313	0.33	3.250	0.750	0.34	5/16	2.250	1.750	2.31	0.63	5/16-18	3.00	0.88	3/8	3.000
25	0.376	0.39	4.000	1.532	0.41	3/8	3.000	2.250	2.38	0.75	3/8-16	4.00	1.00	1/2	4.000

* Standard shafting
** Oversized shafting
1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

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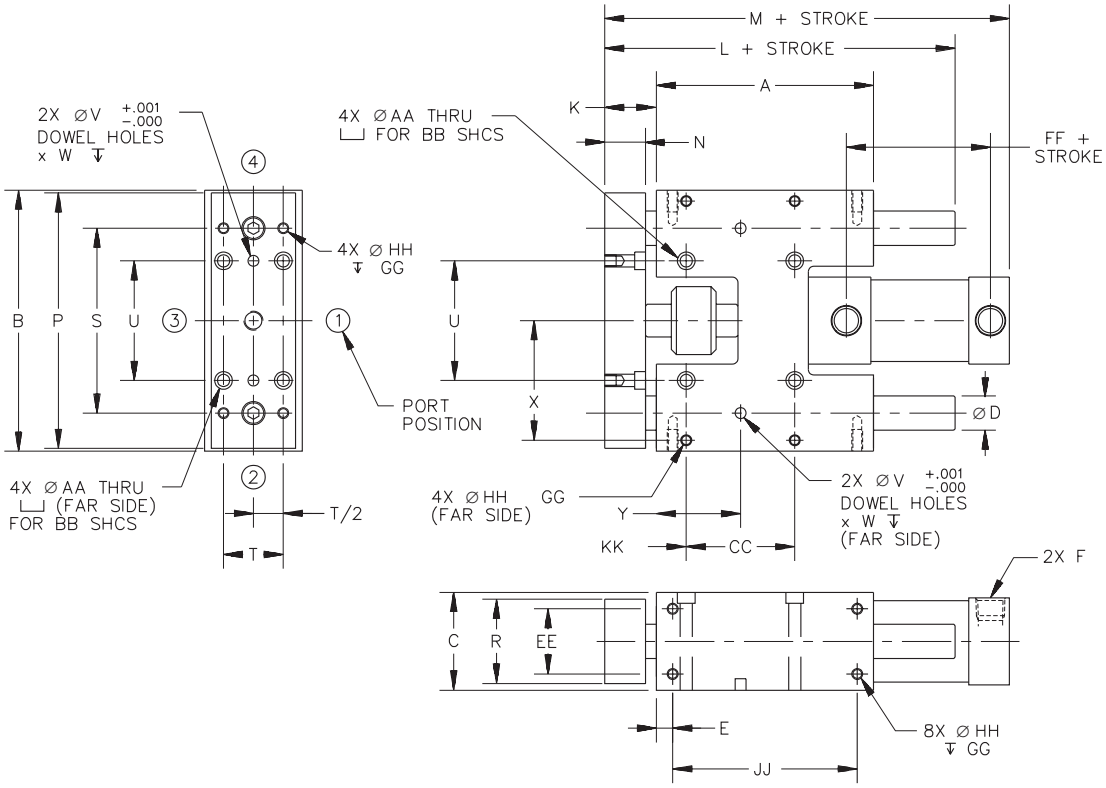
HBT Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	5.0	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	6.94	8.19	0.94	5.88	1.94	4.250	1.375
20	5.5	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	7.88	8.94	1.19	7.13	2.44	5.000	1.750
25	6.5	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	9.31	10.31	1.44	8.88	2.88	6.500	2.000

Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	2.500	1.500	2.31	0.50	1/4-20	4.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	2.750	1.750	2.31	0.63	5/16-18	4.50	0.88
25	3.750	0.376	0.39	4.000	2.750	0.41	3/8	3.500	2.250	2.38	0.75	3/8-16	5.50	1.00

* Standard shafting
** Oversized shafting
1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

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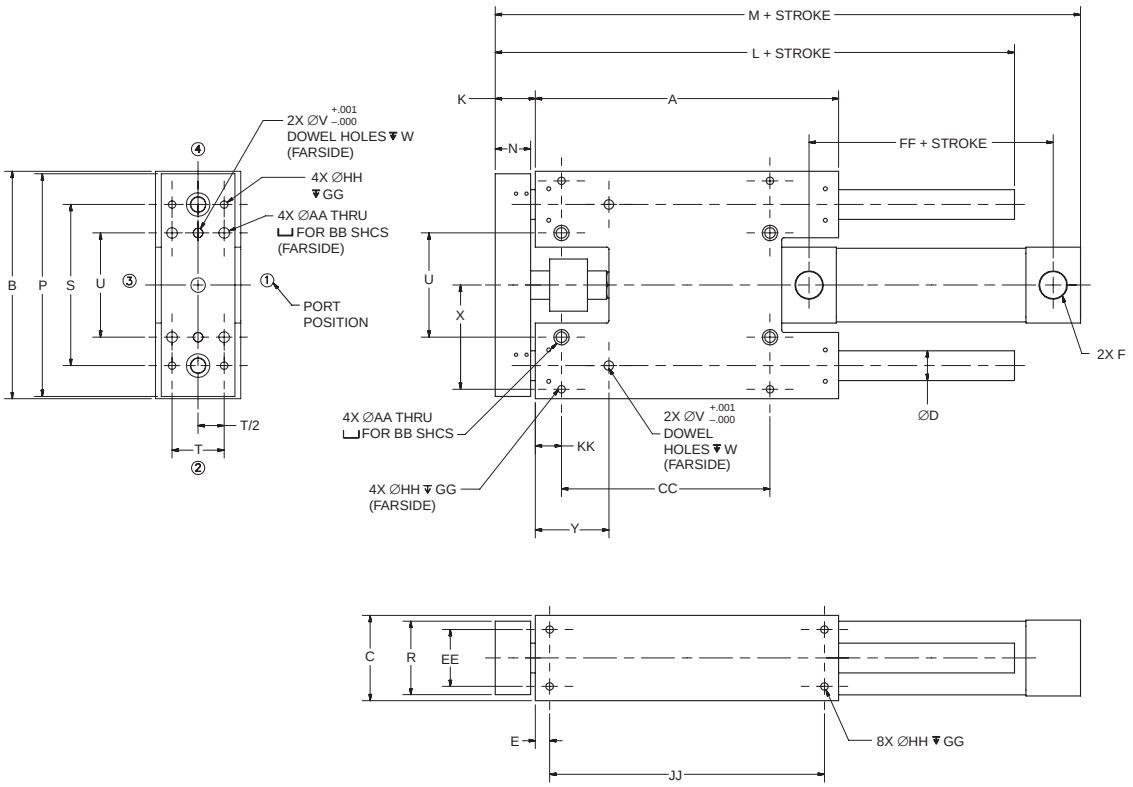
HBR Series



Model number	A	B	C	Ds*	Do**	E	F NPTF	F BSPP	K	L	M	N	P	R	S	T
15	8.00	6.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4 1	1/4	1.06	9.94	11.19	0.94	5.88	1.94	4.250	1.375
20	10.00	7.25	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	1/4	1.31	12.39	13.44	1.19	7.13	2.44	5.000	1.750
25	12.00	9.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	3/8	1.56	14.82	15.82	1.44	8.88	2.88	6.500	2.000

Model number	U	V	W	X	Y	AA	BB	CC	EE	FF	GG	HH	JJ	KK
15	2.750	0.251	0.27	2.750	1.938	0.28	1/4	5.500	1.500	2.31	0.50	1/4-20	7.25	0.69
20	3.250	0.313	0.33	3.250	2.250	0.34	5/16	7.250	1.750	2.31	0.63	5/16-18	9.00	0.88
25	3.750	0.376	0.39	4.000	2.760	0.41	3/8	9.000	2.250	2.38	0.75	3/8-16	11.00	1.00

* Standard shafting
** Oversized shafting
1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

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- Low profile guided assembly
- Powered by the P1D cylinder
- Bore sizes 32, 40, 50, 63, 80 and 100mm
- Strokes to any practical length
- Rod lock options available
- Composite and ball bearing options available

Operating information

Operating pressure:	145 PSIG (10 bar) maximum
Temperature range:	14°F to 165°F (-10°C to 74°C)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

P5E	–	J	032	F	G	N	0250

Shaft / bearing type

J	Composite bearing, chrome plated standard shaft
M	Composite bearing, chrome plated oversize shaft [1]
C	Composite bearing, stainless steel shaft
H	Ball bearing, stainless steel shaft

Bore size

032	32mm
040	40mm
050	50mm
063	63mm
080	80mm
100	100mm

Cylinder type [3]

F	P1D removable gland cylinder
G	P1D removable gland cylinder with cushions
K	P1D rod lock cylinder with cushions
S	P1D manual override rod lock cylinder with cushions
Q	No cylinder
X	Special – please specify

Port Style

H	NPTF (std)
G	BSPP
N	NPTF with flow controls (std. female ports)
B	BSPP with flow controls (ISO female ports)
F	Flow controls, NPTF port, prestolok tube (inch)
P	Flow controls, BSPP port, prestolok tube (mm)

Bumpers / Adjustable Stop Collars

N	None
B	Bumpers, retract only [2]
E	Bumpers and adjustable stop collars, extend only
T	Bumpers both ends, adjustable stop collars on extend [2]
R	Bumpers and adjustable stop collars on retract [2]
S	Bumpers and adjustable stop collars both ends [2]

Stroke length

Specify whole millimeters, i.e. 0250 = 250mm stroke

[1] Bumpers and adjustable stop collars are not available with oversize shaft option.

[2] These options will increase the cylinder length. To achieve a specific usable stroke length with these options, add the corresponding value(s) in the adder table, please reference catalog 0900P-E, page F156 to the desired stroke length. See Bumper Options for explanation.

Adders are not used when P1D Rod Lock (K) or P1D Manual Override Rod Lock (S) are specified with bumpers.

[3] Tie Rod Version or composite piston option must be specified as Special (X).

Sensors

For sensors see page B296.

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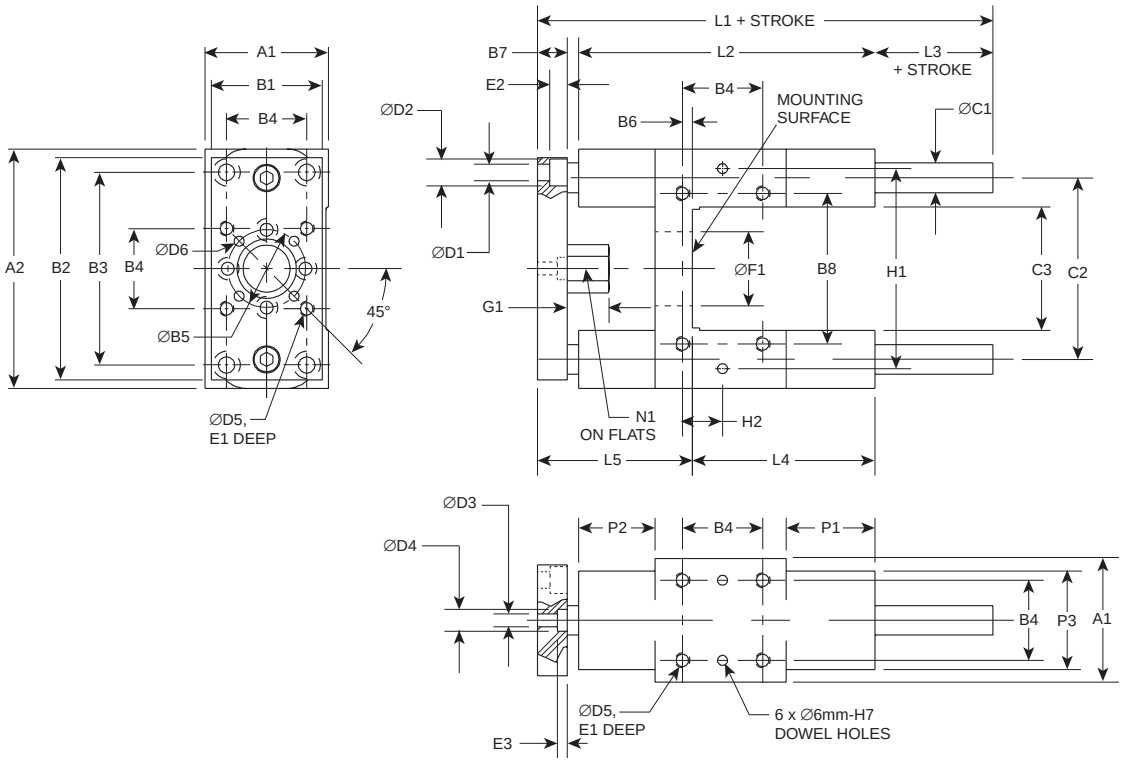

Metric (inch)

Bore size	A1	A2	B1	B2	B3	B4	ØB5	B6	B7	B8	ØC1 std.	ØC1 O.S.	C2	C3	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6
32	50 (1.97)	97 (3.82)	45 (1.77)	92 (3.62)	78 (3.07)	32.5 (1.28)	31.5 (1.24)	4 (0.16)	12.7 (0.50)	61 (2.40)	12 (0.47)	16 (0.63)	73.5 (2.89)	50 (1.97)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)
40	58 (2.28)	115 (4.53)	50.8 (2.00)	110 (4.33)	84 (3.31)	38 (1.50)	31.5 (1.24)	11 (0.43)	12.7 (0.50)	69 (2.72)	16 (0.63)	20 (0.79)	86.5 (3.41)	58 (2.28)	6.6 (0.26)	11 (0.43)	5.2 (0.20)	9 (0.35)	M6 x 1.00	4 (0.16)
50	70 (2.76)	137 (5.39)	63 (2.48)	132 (5.20)	100 (3.94)	46.5 (1.83)	50 (1.97)	19 (0.75)	16 (0.63)	85 (3.35)	20 (0.79)	25 (0.98)	103.5 (4.07)	70 (2.76)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)
63	85 (3.35)	152 (5.98)	82.5 (3.25)	145 (5.71)	105 (4.13)	56.5 (2.24)	50 (1.97)	15 (0.59)	16 (0.63)	100 (3.94)	20 (0.79)	25 (0.98)	118.5 (4.67)	85 (3.35)	9 (0.35)	14 (0.55)	6.4 (0.25)	11 (0.43)	M8 x 1.25	4 (0.16)
80	105 (4.13)	189 (7.44)	100 (3.94)	180 (7.09)	130 (5.12)	72 (2.83)	76 (2.99)	21 (0.83)	19 (0.75)	130 (5.12)	25 (0.98)	30 (1.18)	147 (5.79)	105 (4.13)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)
100	130 (5.12)	213 (8.39)	120 (4.72)	200 (7.87)	150 (5.91)	89 (3.50)	76 (2.99)	24.5 (0.97)	19 (0.75)	150 (5.91)	25 (0.98)	30 (1.18)	171.5 (6.75)	130 (5.12)	11 (0.43)	17 (0.67)	8.4 (0.33)	14 (0.55)	M10 x 1.50	6 (0.24)

Bore size	E1	E2	E3	ØF1	G1	H1	H2	L1	L2	L3	L4	L5	N1	P1	P2	P3	Port size	Piston rod thread
32	12 (0.47)	7 (0.28)	4 (0.16)	30 (1.18)	17 (0.67)	81 (3.19)	16 (0.63)	153 (6.02)	120 (4.72)	17 (0.67)	71 (2.80)	64.7 (2.55)	17 (0.67)	36 (1.42)	31 (1.22)	40 (1.57)	1/8	M10 x 1.25
40	12 (0.47)	7 (0.28)	4 (0.16)	35 (1.38)	24 (0.94)	99 (3.90)	19 (0.75)	166 (6.54)	130 (5.12)	20 (0.79)	71 (2.80)	74.7 (2.94)	17 (0.67)	36 (1.42)	36 (1.42)	44 (1.73)	1/4	M12 x 1.25
50	16 (0.63)	9 (0.35)	9 (0.35)	40 (1.57)	27 (1.06)	119 (4.69)	23 (0.91)	194 (7.64)	150 (5.90)	25 (0.98)	79 (3.11)	90 (3.54)	24 (0.94)	42 (1.65)	44 (1.73)	50 (1.97)	1/4	M16 x 1.5
63	16 (0.63)	9 (0.35)	9 (0.35)	45 (1.77)	27 (1.06)	132 (5.20)	28 (1.10)	224 (8.82)	180 (7.09)	25 (0.98)	109 (4.29)	90 (3.54)	24 (0.94)	58 (2.28)	44 (1.73)	60 (2.36)	3/8	M16 x 1.5
80	20 (0.79)	11 (0.43)	5 (0.19)	45 (1.77)	32 (1.26)	166 (6.54)	36 (1.42)	252 (9.92)	200 (7.87)	30 (1.18)	113 (4.45)	109 (4.29)	30 (1.18)	50 (1.97)	52 (2.05)	70 (2.76)	3/8	M20 x 1.5
100	20 (0.79)	11 (0.43)	5 (0.20)	55 (2.17)	32 (1.26)	190 (7.48)	45 (1.77)	272 (10.71)	220 (8.66)	30 (1.18)	128 (5.04)	114 (4.49)	30 (1.18)	49 (1.93)	51 (2.01)	70 (2.76)	1/2	M20 x 1.5

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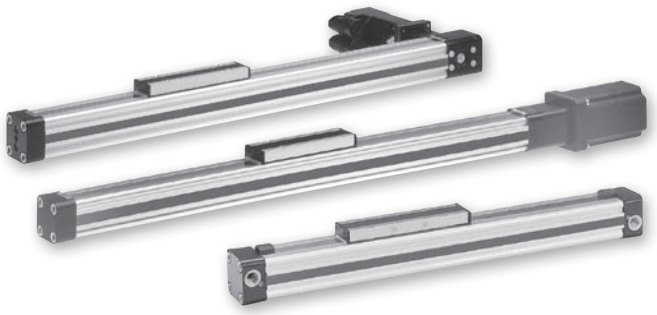
Based on the original ORIGA rodless cylinder, proven in world wide markets, PARKER-ORIGA now offers the complete solution for linear drive systems. Designed for absolute reliability, high performance, ease of use and optimized engineering the ORIGA SYSTEM PLUS satisfies even the most demanding applications.



ORIGA SYSTEM PLUS
is a totally modular concept which offers the choice of pneumatic or electric actuation, with guidance and control modules to suit the exact needs of individual installations.

The actuators at the core of the system all have a common aluminum extruded profile, with double dovetail mounting rails on three sides, these are the principle building blocks of the system to which all modular options are directly attached.

System modularity

- **Pneumatic drive**
  - For all round versatility and convenience, combining ease of control and broad performance capability. Ideally suited for point-to point operations, reciprocating movements and simple traverse / transfer applications.
- **Electric screw drive**
  - For high force capability and accurate path and position control.
- **Electric belt drive**
  - For high speed applications, accurate path and position control and longer strokes.

For additional information on electric linear actuators, please contact factory for OSP-E literature.

- Different guidance options provide the necessary level of precision, performance and duty for various applications.
- Compact solutions, which are simple to install and can be easily retrofitted.
- Valves and control options can be directly mounted to the actuator system.
- Diverse mounting options to provide total installation flexibility.

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ORIGA SYSTEM PLUS – innovation from a proven design

A completely new generation of linear drives which can be simply and neatly integrated into any machine layout.

A new modular linear drive system

With this second generation linear drive PARKER-ORIGA offers design engineers complete flexibility.

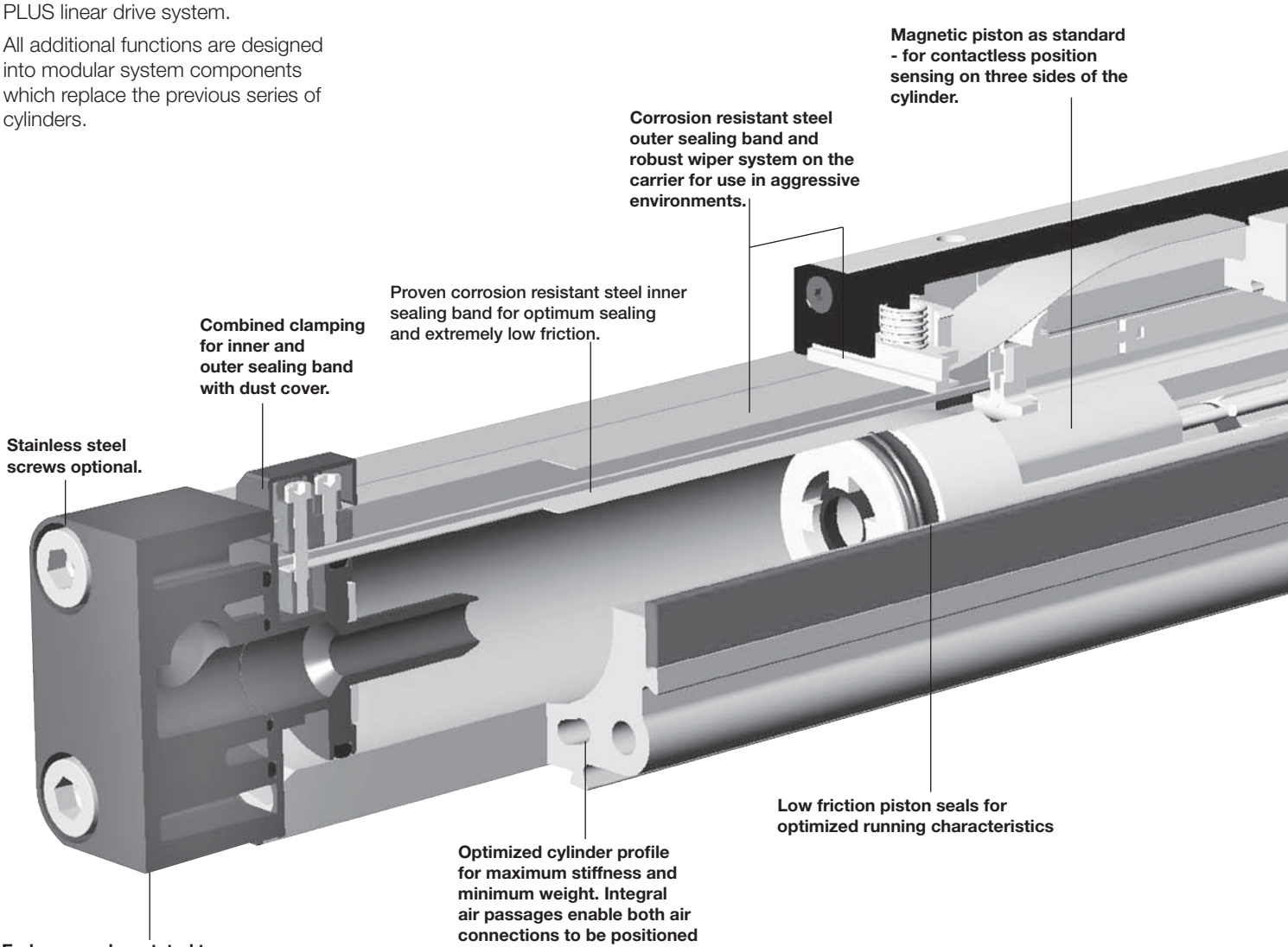
The well known ORIGA cylinder has been further developed into a combined linear actuator, guidance and control package. It forms the basis for the new, versatile ORIGA SYSTEM PLUS linear drive system.

All additional functions are designed into modular system components which replace the previous series of cylinders.

Mounting rails on 3 sides

Mounting rails on 3 sides of the cylinder enable modular components such as linear guides, brakes, valves, magnetic switches etc. to be fitted to the cylinder itself. This solves many installation problems, especially where space is limited.

The modular system concept forms an ideal basis for additional customer-specific functions.



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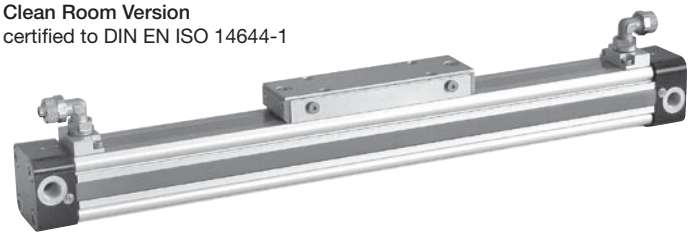
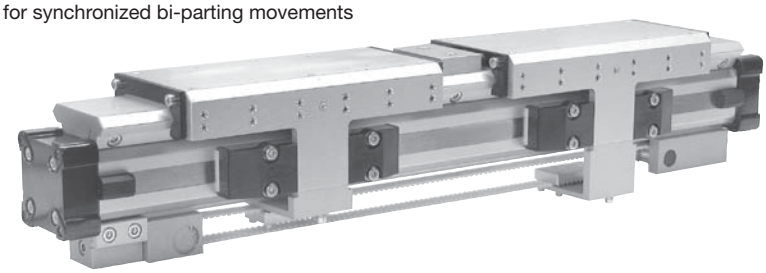
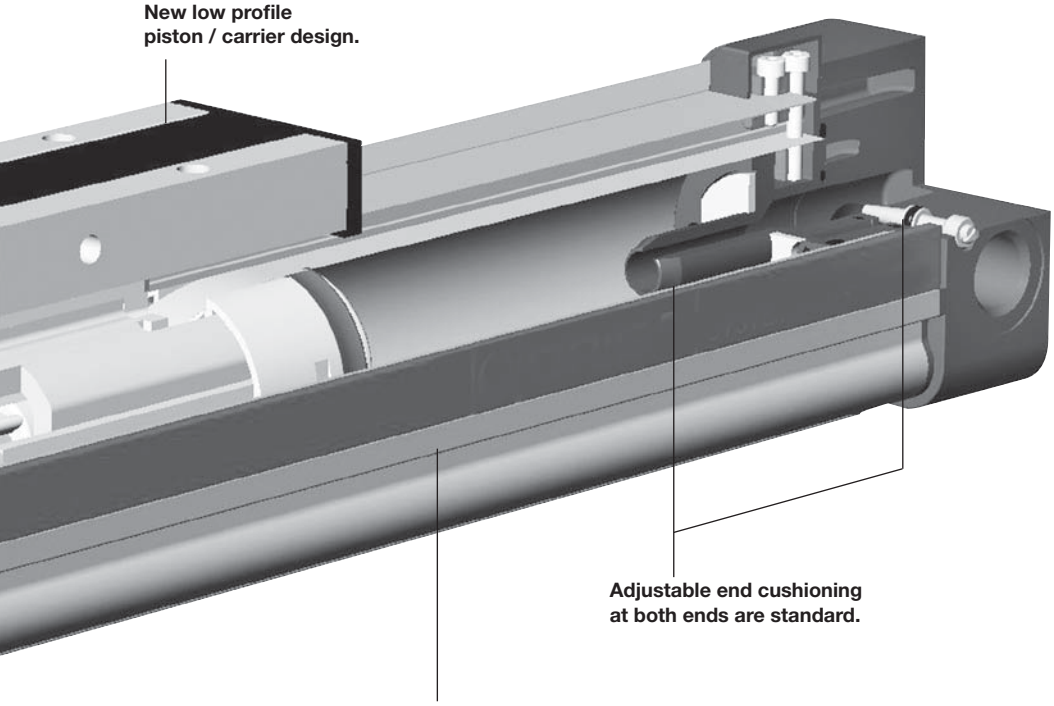
Clean Room Version
certified to DIN EN ISO 14644-1



Rodless Cylinder
for synchronized bi-parting movements



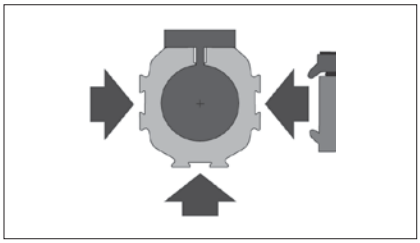
New low profile piston / carrier design.



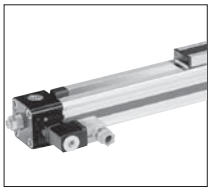
Adjustable end cushioning at both ends are standard.

Integral dovetail rails on three sides provide many adaptation possibilities (linear guides, magnetic switches, etc.).

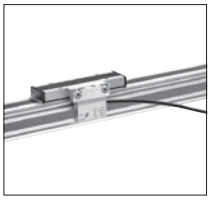
Modular system components are simply clamped on.



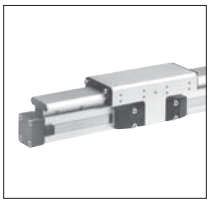
Integrated VOE Valves



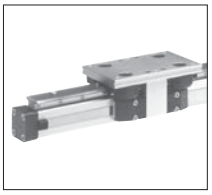
SENSOFLEX SFI-plus incremental measuring system with 0.1 (1.0) mm resolution



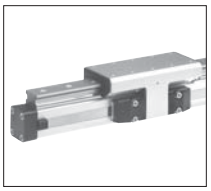
SLIDELINE
Combination with linear guides provides for heavier loads



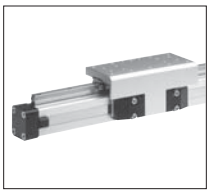
POWERSLIDE
Roller bearing precision guidance for smooth travel and high dynamic or static loads



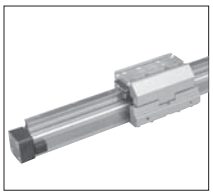
PROLINE
The compact aluminum roller guide for high loads and velocities



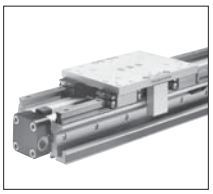
STARLINE
Recirculating ball bearing guide for very high loads and precision



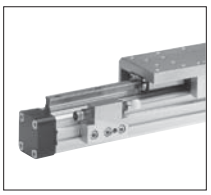
KF Guide
Recirculating ball bearing guide – the mounting dimensions correspond to FESTO Type: DGPL-KF



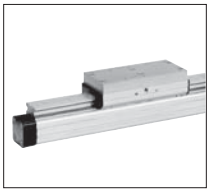
Heavy Duty Guide HD
for heavy duty applications



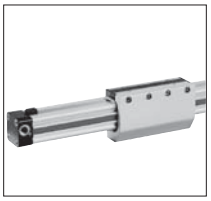
VARIABLE STOP VS
The variable stop provides simple stroke limitation



Passive pneumatic brake reacts automatically to pressure failure



Active pneumatic brake for secure, positive stopping at any position



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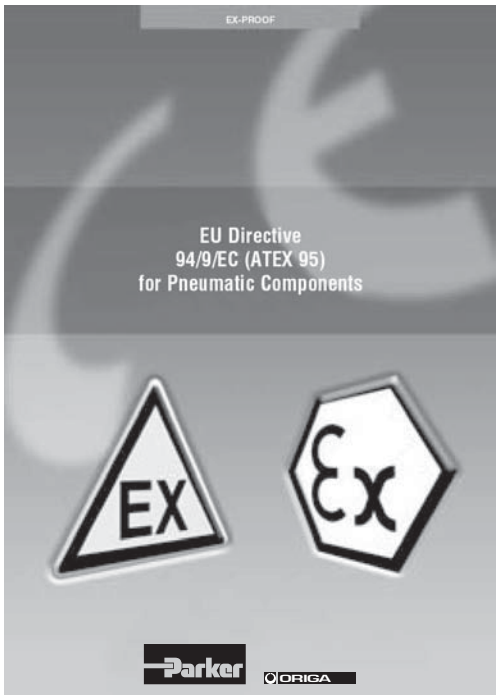
PARKER-ORIGA rodless pneumatic cylinders are the first rodless cylinders that have been approved for use in potentially explosive atmospheres in Equipment Group II, Category 2 GD

The cylinders are to the ATEX Certification 94/9/EG (ATEX 95) for Pneumatic Components.

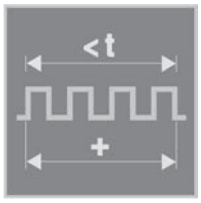
For ATEX Certification, consult factory for ordering assistance.



for use in Ex-Areas

for Clean Room Applications certified to DIN EN ISO 14644-1

Stainless Steel Version for special applications

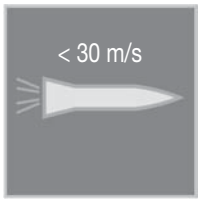


with special pneumatic cushioning system for cycle time optimization, for Ø 16 to 50 mm – on request

High Temperature Version for temperatures up to +120°C

Low Temperature Version for temperatures up to -40°C

Slow Speed Version v = 0.005 – 0.2 m/s



High Speed Version vmax. = 30 m/s

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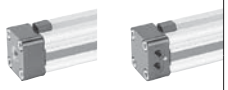
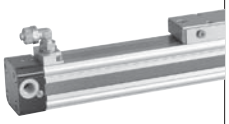
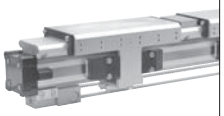
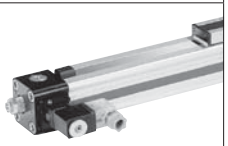
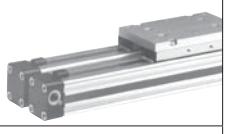
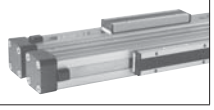
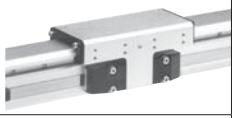
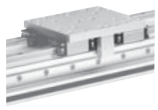
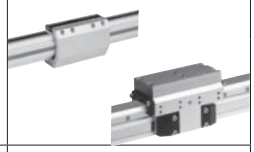
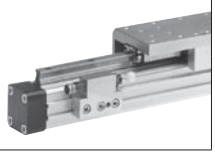
Basic linear drive **Standard version** • Series OSP-P • Series OSP-E* Belt drive Belt drive with integrated guides Vertical belt drive with recirculating ball bearing guide • Series OSP-E* Screw drive (Ball screw, trapezoidal screw)	
Air connection on the end-face or both at one end • Series OSP-P	
Clean room cylinder certified to DIN EN ISO 146644-1 • Series OSP-P • Series OSP-E..SB	
Bi-parting version • Series OSP-P	
Integrated 3/2 way valves • Series OSP-P	
Clevis mounting • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
End cap mounting • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
Mid-section support • Series OSP-Plt drive* • Series OSP-E screw drive • Series OSP-E be*	
Inversion mounting • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
Standard version • Series OSP-P	
Multiplex connection • Series OSP-P	

Linear guides **– SLIDELINE** • Series OSP-P • Series OSP-E screw drive*	
Linear guides **– POWERSLIDE** • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
Linear guides **– PROLINE** • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
Linear guides **– STARLINE** • Series OSP-P	
Linear guides **– KF** • Series OSP-P	
Heavy duty linear guides **– HD** • Series OSP-P • Series OSP-E screw drive*	
Intermediate stop module **– ZSM** • Series OSP-P	
Brakes • Active brake • Passive brakes	
Magnetic switches • Series OSP-P • Series OSP-E belt drive* • Series OSP-E screw drive*	
SENSOFLEX – Measuring system • Series SFI-plus	
Variable stop VS • Series OSP-P • with linear guide STL, KF, HD	

* For information on Electric Linear Drives, contact factory for literature

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Linear drives	OSP-P10	OSP-P16	OSP-P25	OSP-P32	OSP-P40	OSP-P50	OSP-P63	OSP-P80
Theoretical force at 6 bar (N)	47	120	295	483	754	1178	1870	3010
Effective force at 6 bar (N)	32	78	250	420	640	1000	1550	2600
Velocity v (m/s)	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005	> 0.005
Magnetic piston (three sides)	X	❑	❑	❑	❑	❑	❑	❑
Lubrication - prelubricated	❑	❑	❑	❑	❑	❑	❑	❑
Multiple air ports (4 x 90°)	X	❑	❑	❑	❑	❑	❑	❑
Both air connections at end-face	X	❍	❍	❍	❍	❍	❍	❍
Air connection on the end-face	X	❍	❍	❍	❍	❍	❍	❍
Cushioning	❑	❑	❑	❑	❑	❑	❑	❑
Cushioning length (mm)	2,50	11	17	20	27	30	32	39
Stroke length (mm) ▲	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000	1 - 6000
Pressure range pmax (bar)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Temperature range (°C) ✳	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80	-10 – + 80
Viton / chemical resistance	❍	❍	❍	❍	❍	❍	❍	❍
Stainless steel parts	❍	❍	❍	❍	❍	❍	❍	❍
Clevis mounting	❍	❍	❍	❍	❍	❍	❍	❍
Slow speed lubrication	❍	❍	❍	❍	❍	❍	❍	❍
Duplex connection / multiplex connection	X	on request	❍	❍	❍	❍	on request	on request
Tandem piston	❍	❍	❍	❍	❍	❍	❍	❍
Basic cylinder								
F (N)	20	120	300	450	750	1200	1650	2400
Mx (Nm)	0.2	0.45	1.5	3	6	10	12	24
My (Nm)	1	4	15	30	60	115	200	360
Mz (Nm)	0.3	0.5	3	5	8	15	24	48
Slideline								
F (N)	X	325	675	925	1500	2000	2500	2500
Mx (Nm)	X	6	14	29	50	77	120	120
My (Nm)	X	11	34	60	110	180	260	260
Mz (Nm)	X	11	34	60	110	180	260	260
Proline								
F (N)	X	542	857	1171	2074	3111	X	X
Mx (Nm)	X	8	16	29	57	111	X	X
My (Nm)	X	12	39	73	158	249	X	X
Mz (Nm)	X	12	39	73	158	249	X	X
Powerslide								
F (N)	X	1400	1400 - 3000	1400 - 3000	3000	3000 - 4000	X	X
Mx (Nm)	X	14	14 - 65	20 - 65	65 - 90	90 - 140	X	X
My (Nm)	X	45	63 - 175	70 - 175	175 - 250	250 - 350	X	X
Mz (Nm)	X	45	63 - 175	70 - 175	175 - 250	250 - 350	X	X
Starline								
F (N)	X	1000	3100	3100	4000-7500	4000-7500	X	X
Mx (Nm)	X	15	50	62	150	210	X	X
My (Nm)	X	30	110	160	400	580	X	X
Mz (Nm)	X	30	110	160	400	580	X	X
– Variable stop	X	❍	❍	❍	❍	❍	X	X
KF guide								
F (N)	X	1000	3100	3100	4000-7500	4000-7500	X	X
Mx (Nm)	X	12	35	44	119	170	X	X
My (Nm)	X	25	90	133	346	480	X	X
Mz (Nm)	X	25	90	133	346	480	X	X
– Variable stop	X	❍	❍	❍	❍	❍	X	X

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Linear drives	OSP-P10	OSP-P16	OSP-P25	OSP-P32	OSP-P40	OSP-P50	OSP-P63	OSP-P80
HD heavy duty guide								
F (N)	X	X	6000	6000	15000	18000	X	X
Mx (Nm)	X	X	260	285	800	1100	X	X
My (Nm)	X	X	320	475	1100	1400	X	X
Mz (Nm)	X	X	320	475	1100	1400	X	X
– Variable stop	X	X	❍	❍	❍	❍	X	X
– Intermediate stop module	X	X	❍	X	X	X	X	X
Active brake								
Braking force at 6 bar (brake surface dry) (N)	X	X	350	590	900	1400	2170	4000
Slideline SL / Proline PL with brakes								
Active brake								
SL braking force at 6 bar (brake surface dry) (N)	X	X	325	545	835	1200	X	X
PL braking force at 6 bar (brake surface dry) (N)	X	X	on request	on request	on request	on request	X	X
Passive brake multibrake								
SL braking force at 6 bar (brake surface dry) (N)	X	X	470	790	1200	1870	2900	2900
PL braking force at 6 bar (brake surface dry) N)	X	X	315	490	715	1100	–	–
Magnetic switches								
Standard version	❍	❍	❍	❍	❍	❍	❍	❍
T-nut version	❍	❍	❍	❍	❍	❍	❍	❍
Displacement measuring systems								
SFI-plus incremental	X	X	❍	❍	❍	❍	❍	❍
Integrated valves 3/2 WV NO VOE	X	X	❍	❍	❍	❍	on request	on request
Mountings								
End cap mounting / mid-section support	❍	❍	❍	❍	❍	❍	❍	❍
Inversion mounting	X	❍	❍	❍	❍	❍	❍	❍
Shock absorber for intermediate positioning	X	X	on request	on request	on request	on request	X	X
Adaptor profile / T-nut profile	X	❍	❍	❍	❍	❍	X	X
Special cylinders								
Special pneumatical cushioning system	X	on request	on request	on request	on request	on request	X	X
Clean room cylinders to DIN EN ISO 14644-1	X	❍	❍	❍	X	X	X	X
Bi-parting version	X	X	X	X	❍	X	X	X
High-speed up to 30 m/s	X	on request	on request	on request	X	X	X	X

❑ = Standard version
▲ = Longer strokes on request
❊ = Other temperature ranges on request
❍ = Option
X = Not applicable

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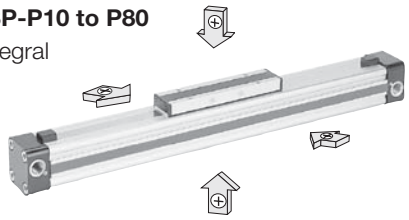
Options and Accessories for System Versatility

Series OSP-P

Standard versions OSP-P10 to P80



Standard carrier with integral guidance. End cap can be rotated 4 x 90° to position air connection on any side.
Magnetic piston as standard. Dovetail profile for mounting of accessories and the cylinder itself.

Basic cylinder options

Clean Room Cylinders

For use in clean room applications, certified with the IPA-Certificate (to DIN EN ISO 14644-1).
The special design of the linear drive enables all emissions to be led away.

Stainless version

For use in constantly damp or wet environments.
All screws are A2 quality stainless steel.

Slow speed options

Specially formulated grease lubrication facilitates slow, smooth and uniform piston travel in the speed range from 0.005 to 0.2 m/s.
Minimum achievable speeds are dependent on several factors. Please consult our technical department.
Slow speed lubrication in combination with Viton® on demand.
Oil free operation preferred.

Viton® version

For use in an environment with high temperatures or in chemically aggressive areas.
All seals are made of Viton®.
Sealing bands: Stainless steel

End-face air connection

To solve special installation problems.

Both air connections at one end

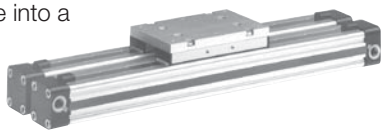
For simplified tubing connections and space saving.

Integrated VOE valves

The complete compact solution for optimal cylinder control.

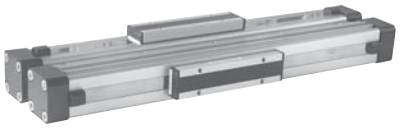
Joint clamp connection

The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.



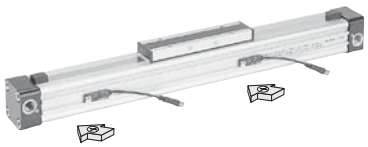
Multiplex connection

The multiplex connection combines two or more OSP-P cylinders of the same size into one unit.
The orientation of the carriers can be freely selected.



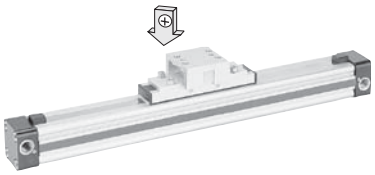
Accessories

Magnetic switches Type RS, ES, RST, EST



For electrical sensing of end and intermediate piston positions, also in EX-Areas.

Clevis mounting

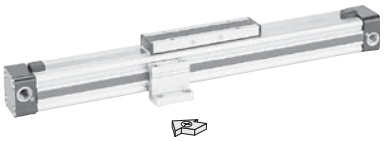


Carrier with tolerance and parallelism compensation for driving loads supported by external linear guides.

Inversion mounting

The inversion mounting transfers the driving force to the opposite side, e. g. for dirty environments.

End cap mounting



For end-mounting of the cylinder.

Mid-section support

For supporting long cylinders or mounting the cylinder by its dovetail rails.

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General features

Characteristics	Symbol	Unit	Description	
Type			Rodless cylinder	
Series			OSP-P	
System			Double-acting, with cushioning, position sensing capability	
Mounting			See drawings	
Air connection			Threaded	
Ambient	T_{min}	°C	-10	Other temperature ranges on request
Temperature range	T_{max}	°C	+80	
Weight (mass)		kg	See table below	
Installation			In any position	
Medium			Filtered, unlubricated compressed air (other media on request)	
Lubrication			Permanent grease lubrication (additional oil mist lubrication not required) Option: special slow speed grease	
Material	Cylinder profile		Anodized aluminum	
	Carrier (piston)		Anodized aluminum	
	End caps		Aluminum, lacquered / Plastic (P10)	
	Sealing bands		Corrosion resistant steel	
	Seals		NBR (Option: Viton®)	
	Screws		Galvanized steel Option: stainless steel	
	Dust covers, wipers		Plastic	
Max. operating pressure*	p_{max}	bar	8	

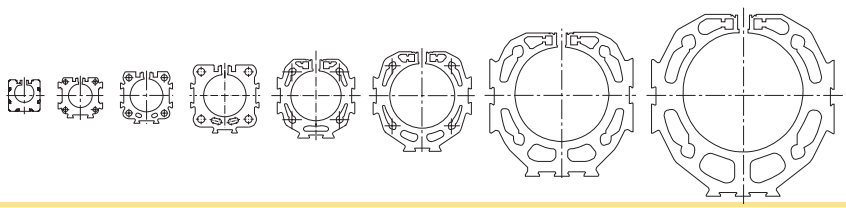
* Pressure quoted as gauge pressure

Weight (mass) kg

Cylinder series (Basic cylinder)	Weight (Mass) kg	
	At 0 mm stroke	per 100 mm stroke
OSP-P10	0.087	0.052
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354
OSP-P40	1.95	0.415
OSP-P50	3.53	0.566
OSP-P63	6.41	0.925
OSP-P80	12.46	1.262

Size Comparison

P10 P16 P25 P32 P40 P50 P63 P80

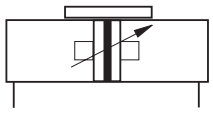


Rodless Pneumatic Cylinder

ø 10-80 mm

OSP
ORIGA SYSTEM PLUS

Series OSP-P..



Standard versions:

- Double-acting with adjustable end cushioning
- With magnetic piston for position sensing
- Long-Stroke Cylinders for stroke lengths up to 41m (consult factory)

Special versions:

- With special pneumatic cushioning system (on request)
- Clean room cylinders
- Stainless steel screws
- Slow speed lubrication
- Viton® seals
- Both air connections on one end
- Air connection on the end-face
- Integrated Valves
- End cap can be rotated 4 x 90° to position air connection as desired
- Free choice of stroke length up to 6000 mm,
- Long-Stroke version (Ø50-80mm) for stroke lengths up to 41m

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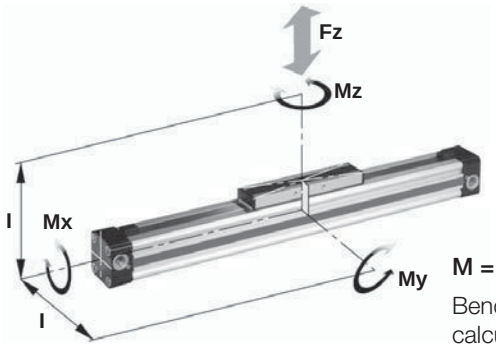
Loads, forces and moments

Choice of cylinder is decided by:

- Permissible loads, forces and moments
- Performance of the pneumatic end cushions. The main factors here are the mass to be cushioned and the piston speed at start of cushioning (unless external cushioning is used, e. g. hydraulic shock absorbers).



M = F ·l

Bending moments are calculated from the center of the linear actuator

The adjacent table shows the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

Load and moment data are based on speeds v ≤ 0.5 m/s.

When working out the action force required, it is essential to take into account the friction forces generated by the specific application or load.

Cylinder series (mm Ø)	Theoretical action force at 6 bar (N)	Effective action force F_A at 6 bar (N)	Max. moments Mx (Nm)	My (Nm)	Mz (Nm)	Max. load F (N)	Cushion length (mm)
OSP-P10	47	32	0.2	1	0.3	20	2.5 *
OSP-P16	120	78	0.45	4	0.5	120	11
OSP-P25	295	250	1.5	15	3	300	17
OSP-P32	483	420	3	30	5	450	20
OSP-P40	754	640	6	60	8	750	27
OSP-P50	1178	1000	10	115	15	1200	30
OSP-P63	1870	1550	12	200	24	1650	32
OSP-P80	3016	2600	24	360	48	2400	39

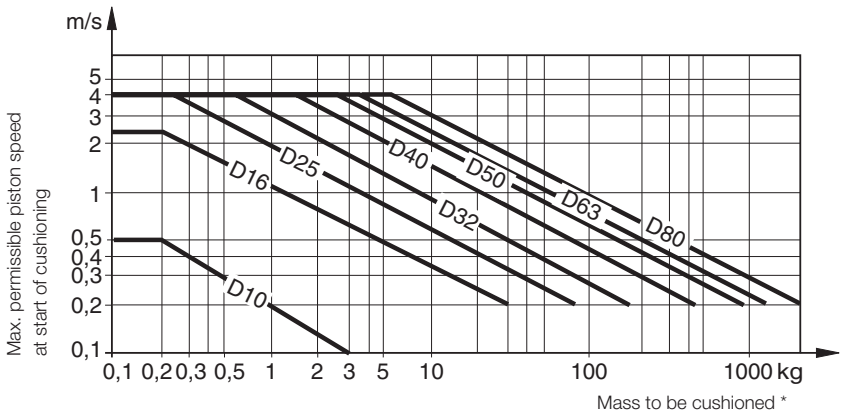
* A rubber element (non-adjustable) is used for end cushioning.
To deform the rubber element enough to reach the absolute end position would require a Dp of 4 bar!

Cushioning diagram

Work out your expected moving mass and read off the maximum permissible speed at start of cushioning.

Alternatively, take your desired speed and expected mass and find the cylinder size required.

Please note that piston speed at start of cushioning is typically ca. 50% higher than the average speed, and that it is this higher speed which determines the choice of cylinder. If these maximum permissible values are exceeded, additional shock absorbers must be used.



* For cylinders with linear guides or brakes, please be sure to take the mass of the carriage or the brake housing into account.

If the permitted limit values are exceeded, either additional shock absorbers should be fitted in the area of the center of gravity or you can consult us about our special cushioning system – we shall be happy to advise you on your specific application.

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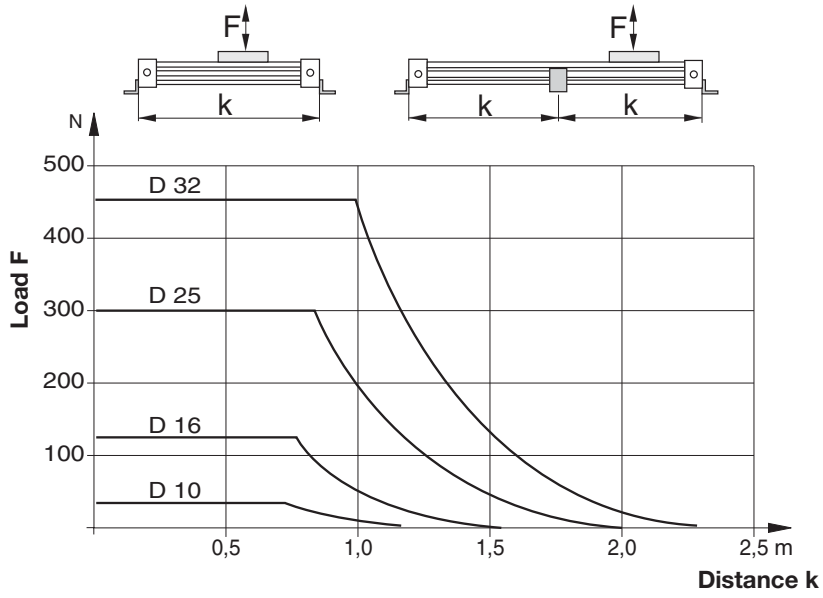
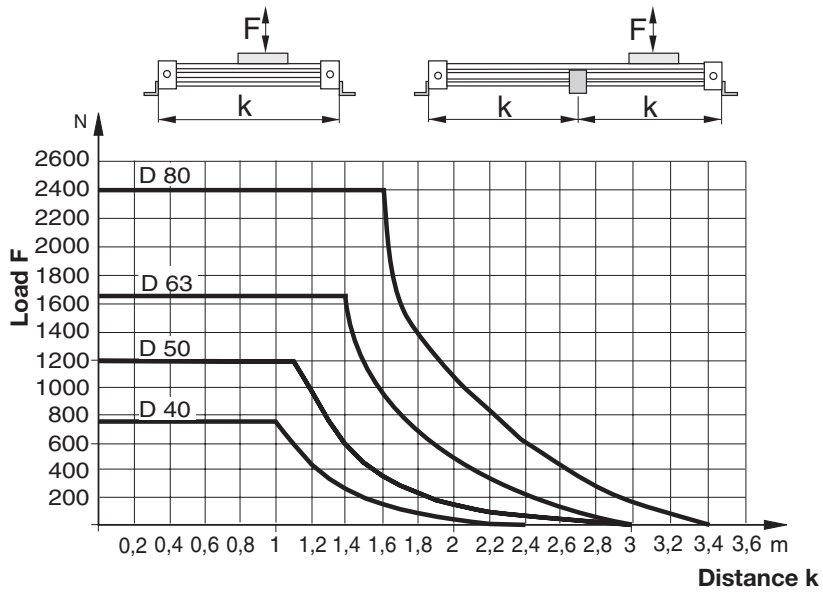
Permissible support spacings: OSP - P10 - P32



Permissible support spacings: OSP - P40 - P80



Mid-section supports

To avoid excessive bending and oscillation of the cylinder, mid-section supports are required dependent on specified stroke lengths and applied loads. The diagrams show the maximum possible support spacings depending on the load.

Bending up to max. 0.5 mm is permissible between supports. The mid-section supports are clamped on to the dovetail profile of the cylinder tube. They are also able to take the axial forces.

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Integrated 3/2 Way Valves VOE

For optimal control of the OSP-P cylinder, 3/2 way valves integrated into the cylinder's end caps can be used as a compact and complete solution.

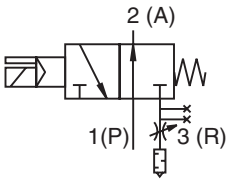
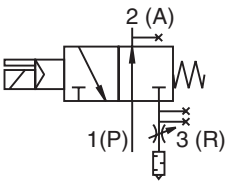
They allow for easy positioning of the cylinder, smooth operation at the lowest speeds and fast response, making them ideally suited for the direct control of production and automation processes.

Integrated 3/2 way valves VOE Series OSP-P25, P32, P40 and P50

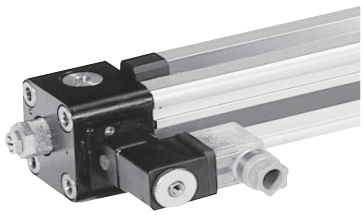
Characteristics:

- Complete compact solution
- Various connection possibilities: Free choice of air connection with rotating end caps with VOE valves, Air connection can be rotated 4 x 90°, Solenoid can be rotated 4 x 90°, Pilot Valve can be rotated 180°
- High piston velocities can be achieved with max. 3 exhaust ports
- Minimal installation requirements
- Requires just one air connection per valve
- Optimal control of the OSP-P cylinder
- Excellent positioning characteristics
- Integrated operation indicator
- Integrated exhaust throttle valve
- Manual override - indexed
- Adjustable end cushioning
- Easily retrofitted – please note the increase in the overall length of the cylinder!

Characteristics 3/2 way valves VOE

Characteristics	3/2 Way Valves with spring return			
Pneumatic diagram				
Type	**VOE-25**	**VOE-32**	**VOE-40**	**VOE-50**
Actuation	electrical			
Basic position	P → A open, R closed			
Type	Poppet valve, non overlapping			
Mounting	integrated in end cap			
Installation	in any position			
Port size	G 1/8	G 1/4	G 3/8	G 3/8
Temperature	-10°C to +50°C *			
Operating pressure	2-8 bar			
Nominal voltage	24 V DC / 230 V AC, 50 Hz			
Power consumption	2,5 W / 6 VA			
Duty cycle	100%			
Electrical Protection	IP 65 DIN 40050			

* other temperature ranges on request



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Active Brake

OSP
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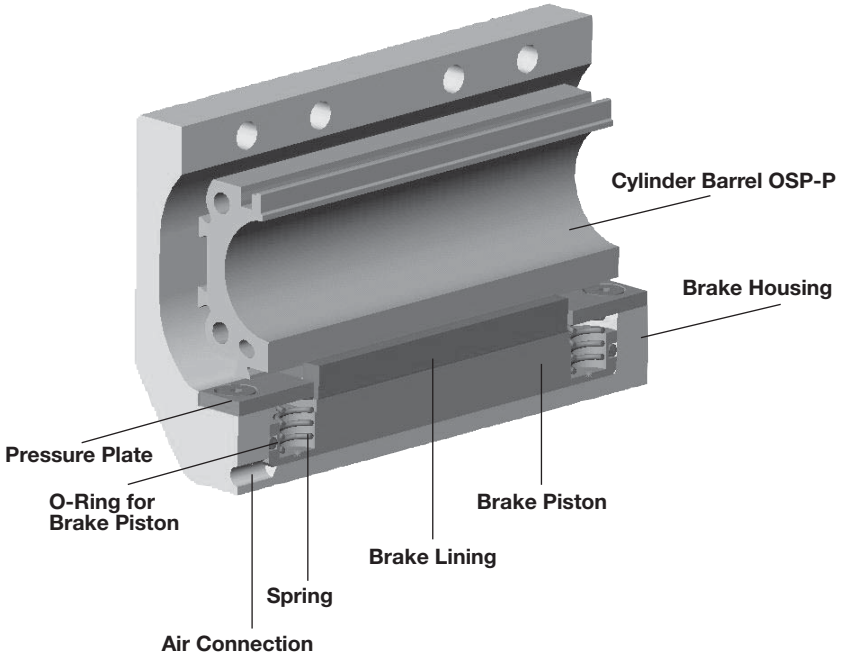
Function



Series AB 25 to 80 for linear drive

- Series OSP-P

Features:

- Actuated by pressurization
- Released by spring actuation
- Completely stainless version
- Holds position, even under changing load conditions

For further technical data, please refer to the data sheets for linear drives OSP-P.

Note:
For combinations Active Brake AB + SFI-plus + Magnetic Switch contact our technical department please.

Forces and Weights

Series	For linear drive	Max. braking force (N) (1	Brake pad way (mm)	Mass (kg) Linear drive with brake 0 mm stroke	Increase per 100mm stroke	brake*	Order no. active brake
AB 25	OSP-P25	350	2.5	1.0	0.197	0.35	**20806**
AB 32	OSP-P32	590	2.5	2.02	0.354	0.58	**20807**
AB 40	OSP-P40	900	2.5	2.83	0.415	0.88	**20808**
AB 50	OSP-P50	1400	2.5	5.03	0.566	1.50	**20809**
AB 63	OSP-P63	2170	3.0	9.45	0.925	3.04	**20810**
AB 80	OSP-P80	4000	3.0	18.28	1.262	5.82	**20811**

(1 – at 6 bar
both chambers pressurized with 6 bar
Braking surface dry
– oil on the braking surface will reduce the braking force

*** Please Note:**
The mass of the brake has to be added to the total moving mass when using the cushioning diagram.

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End cap mountings

On the end-face of each cylinder end cap there are four threaded holes for mounting the cylinder. The hole layout is square, so that the mounting can be fitted to the bottom, top or either side.

Material:
Series OSP-P25, P32: Galvanized steel

The mountings are supplied in pairs.

Material:
Series OSP-P40,P50, P63, P80: Anodized aluminum

The mountings are supplied in pairs.

Stainless steel version on request.

	Order number	
	Type A3	Type C3
Series		
AB 25	**2060**	–
AB 32	**3060**	–
AB 40	–	**20339**
AB 50	–	**20350**
AB 63	–	**20821**
AB 80	–	**20822**

Clevis mounting, ø 10 mm

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

		Order number	
	Series	Standard	Stainless
	OSP-P10	**20971**	–

Clevis mounting, ø 16-80 mm

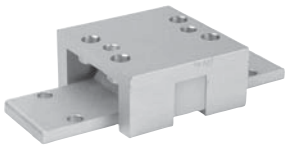
When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

A stainless steel version is also available.

		Order number	
	Series	Standard	Stainless
	OSP-P16	**20462**	**20463**
	OSP-P25	**20005**	**20092**
	OSP-P32	**20096**	**20094**
	OSP-P40	**20024**	**20093**
	OSP-P50	**20097**	**20095**
	OSP-P63	**20466**	**20467**
	OSP-P80	**20477**	**20478**

Inversion mounting, ø 16-80 mm

In dirty environments, or where there are special space problems, inversion of the cylinder is recommended.

The inversion bracket transfers the driving force to the opposite side of the cylinder. The size and position of the mounting holes are the same as on the standard cylinder.

Stainless steel version on demand.

Please note:

Other components of the OSP system such as **mid-section supports, magnetic switches** and the **external air passage for the P16**, can still be mounted on the free side of the cylinder.

When combining single end porting with inversion mountings, RS magnetic switches can only be mounted directly opposite to the external air-supply profile.

	Series	Order number
	OSP-P16	**20446**
	OSP-P25	**20037**
	OSP-P32	**20161**
	OSP-P40	**20039**
	OSP-P50	**20166**
	OSP-P63	**20459**
	OSP-P80	**20490**

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End cap mountings, ø 10-80 mm

On the end-face of each end cap there are four threaded holes for mounting the actuator.
The hole layout is square, so that the mounting can be fitted to the bottom, top or either side, regardless of the position chosen for the air connection.

Material:
Series OSP-P10 – P32: Galvanized steel.
Series OSP-P40 – P80: Anodized aluminum.

The mountings are supplied in pairs.

	Order number (*	
Series	Type A1	Type C1
OSP-P10	0 240	–
OSP-P16	20408	–
OSP-P25	2010	–
OSP-P32	3010	–
OSP-P40	–	4010
OSP-P50	–	5010
OSP-P63	–	6010
OSP-P80	–	8010

(*= Pair

Mid-section support, ø 10-80 mm

Note on types E1 and D1 (P16 – P80):

The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

Stainless steel version on demand.

	Order number	
Series	Type E1	Type D1
OSP-P10	0250	—
OSP-P16	20435	20434
OSP-P25	20009	20008
OSP-P32	20158	20157
OSP-P40	20028	20027
OSP-P50	20163	20162
OSP-P63	20452	20451
OSP-P80	20482	20480

Adaptor profile, ø 16-50 mm

Adaptor profile OSP
- A universal attachment for mounting of valves etc.
- Solid material

	Order number	
Series	Standard	Stainless
OSP-P16	20432	20438
OSP-P25	20006	20186
OSP-P32	20006	20186
OSP-P40	20025	20267
OSP-P50	20025	20267

T-Slot Profile ø 16-50 mm

T-slot profile OSP
- A universal attachment for mounting with standard T-Nuts

	Order number	
Series	Standard	Stainless
OSP-P16	20433	20439
OSP-P25	20007	20187
OSP-P32	20007	20187
OSP-P40	20026	20268
OSP-P50	20026	20268

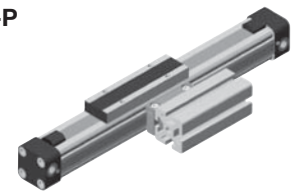
Connection profile, ø 16-50 mm

For combining
- Series OSP-P with system profiles
- Series OSP-P with Series OSP-P

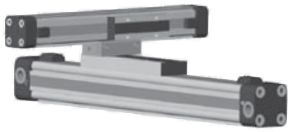
Series	For mounting on the carrier of	Order number
OSP-P16	OSP25	20849
OSP-P25	OSP32-50	20850
OSP-P32	OSP32-50	20850
OSP-P40	OSP32-50	20851
OSP-P50	OSP32-50	20851

Possible Combinations

Combination of Series OSP-P with system profiles



Combination of Series OSP-P with Series OSP-P



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Joint clamp connection ø 25-50 mm

For connection of cylinders of the Series OSP-P

The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.

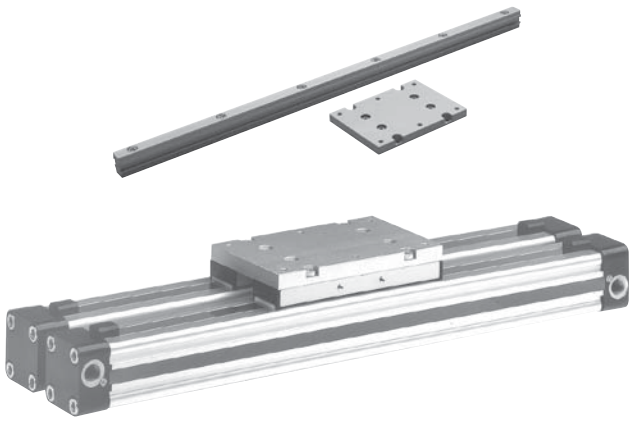
Features

- Increased load and torque capacity
- Higher driving forces

Included in delivery:

2 clamping profiles with screws

1 mounting plate with fixings



Multiplex connection ø 25-50 mm

For connection of cylinders of the Series OSP-P

The multiplex connection combines two or more OSP-P cylinders of the same size into on unit.

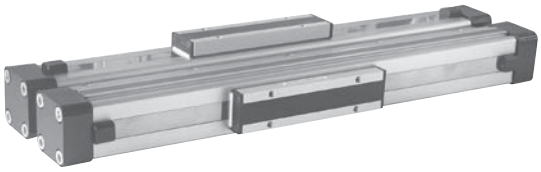
Features

- The orientation of the carriers can be freely selected

Included in delivery:

2 clamping profiles with clamping screws

		Order number	
	Series	Standard	Stainless
	OSP-P25	**20035**	**20193**
	OSP-P32	**20167**	**20265**
	OSP-P40	**20036**	**20275**
	OSP-P50	**20168**	**20283**



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Ordering Information / Part Numbering System for OSP-P Rodless Basic Pneumatic Series

6		7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	25	0	0	1	0	0	01100	0	0	1	0	0	0	0	0	0

Bore

10
16
25
32
40
50
63
80

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End Face (position #5)
2	Single End Porting
3	Left Stand (pos #2), Right End Face (pos #5)
4	Right Stand (pos #2), Left End Face (pos #5)
6	Single End Porting End Face
A	3/2 Way Valve VOE 24V = (25, 32, 40, 50)
B	3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 Way Valve VOE 48V = (25, 32, 40, 50)
E	3/2 Way Valve VOE 110V~ (25, 32, 40, 50)
S	Special

Notes: 10mm bore can only have standard port locations.

Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow Speed
4	Food
5	Clean Room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

xxxxx

End Cap Position

0	I+r 0° = In Front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the Back (pos # 4)
3	I+r 270° = Same Face as Outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In Front (pos #3, 2)
5	I 180° = At the Back; r 0° = In Front (pos #4, 2)
6	I 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)
7	I 0° = In Front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the Back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In Front; r 180° = At the Back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the Back (pos #3, 4)
C	I 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)
D	I 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)
F	I 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
S	Special

Piston Mountings

0	None
1	Floating Mount (NR25) Joint Clamp
8	Plate (NR24)
S	Special

Guides / Brakes / Inversion Mounts

0	None
A	AB Activebrake
M	Inversion (NR30)
N	Joint Clamp (25,32,40,50)
S	Special

add. Carriage

0	Without
S	Special

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

End Cap Mounts

0	Without
1	A1 (10, 16, 25, 32)
2	A2 (16, 25, 32)
3	A3 (25, 32)
4	B1 (25, 32)
6	B3 (16)
7	B4 (25, 32)
8	B5 (32)
9	C1 (40, 50, 63, 80)
A	C2 (40, 50)
B	C3 (40, 50, 63, 80)
C	C4 (40, 50)

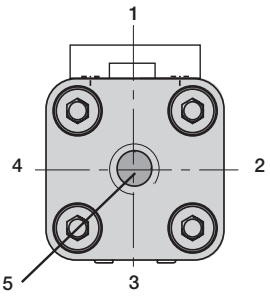
Note: Comes in pairs

Version

Switches / Measuring System

0	None
1	NO Reed - KL3045 (All except 10mm) Qty. 2
2	NC Reed - KL3048 (All except 10mm) Qty. 2
3	PNP KL3054+4041 (All except 10mm) Qty. 2
4	NPN KL3060+4041 (All except 10mm) Qty. 2
5	NO Reed - KL3045 (10mm only)
6	PNP 3049+4041 (10mm only) Qty. 2
7	PNP 3753+4041 (10mm only) Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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Clean Room Cylinder

ø 16 – 32 mm Rodless Cylinder certified to DIN EN ISO 14644-1

OSP
ORIGA SYSTEM PLUS

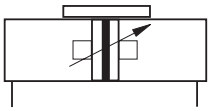
Standard versions:

- Double-acting with adjustable end cushioning
- With magnetic piston for position sensing
- Stainless steel screws

Special versions:

- Slow speed lubrication
- Viton® seals

Series OSP-P..



Features:

- Clean room classification
- ISO Class 4 at vm = 0.14 m/s
- ISO Class 5 at vm = 0.5 m/s
- Suitable for smooth slow speed operation up to vmin = 0.005 m/s
- Optional stroke length up to
- 1200 mm (longer strokes on request)
- Low maintenance
- Compact design with equal force and velocity in both directions
- Aluminum piston with bearing rings to support high direct and cantilever loads

General features

Characteristics	Symbol	Unit	Description	
Type			Rodless cylinder	
Series			OSP-P	
System			Double-acting, with cushioning, position sensing capability	
Mounting			See drawings	
Air connection			Threaded	
Ambient	T_{min}	°C	-10	Other temperature ranges on request
Medium temperature range	T_{max}	°C	+80	
Weight (mass)		kg	See table below	
Installation			In any position	
Medium			Filtered, unlubricated compressed air (other media on request)	
Lubrication			Permanent grease lubrication (additional oil mist lubrication not required) Option: special slow speed grease	
Material	Cylinder profile		Anodized aluminum	
	Carrier (piston)		Anodized aluminum	
	End caps		Aluminum, lacquered	
	Sealing bands		Corrosion resistant steel	
	Seals		NBR (Option: Viton®)	
	Screws		Stainless steel	
	Dust covers, wipers		Plastic	
Max. operating pressure*	p_{max}	bar	8	

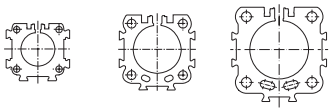
* Pressure quoted as gauge pressure

Weight (Mass) kg

Cylinder series (basic cylinder)	Weight (Mass) kg	
	at 0 mm stroke	per 100 mm stroke
OSP-P16	0.22	0.1
OSP-P25	0.65	0.197
OSP-P32	1.44	0.354

Size Comparison

P16 P25 P32



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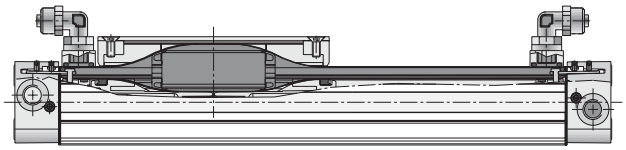
Certification

Based on the PARKER-ORIGA rodless cylinder, proven in world wide markets, PARKER-ORIGA now offers the only rodless cylinder on the market with a certification from IPA Institute for the cleanroom specification according to DIN EN ISO 14644-1.

Function:

The clean room cylinders of the ORIGA SYSTEM PLUS (OSP-P) combines the efficiency of the PARKER-ORIGA slot seal system with vacuum protection against progressive wear and contamination from the sliding components. A partial vacuum drawn between inner and outer sealing bands prevents emission into the clean room. To achieve the necessary vacuum a suction flow of ca. 4 m3/h is required.

Function diagram

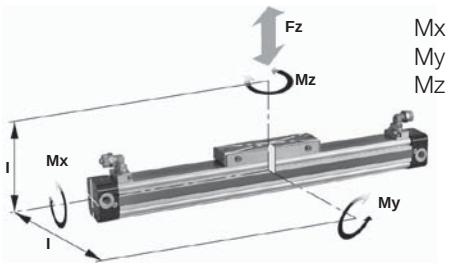


Loads, forces and moments

Cylinder series (mm Ø)	Effective force at 6 bar (N)	Max. moment Mx (Nm)	My (Nm)	Mz (Nm)	Max. load Fz (N)	Cushion length (mm)
OSP-P16	78	0.45	4	0.5	120	11
OSP-P25	250	1.5	15	3.0	300	17
OSP-P32	420	3.0	30	5.0	450	20

Load and moment data are based on speeds v ≤ 0.2 m/s.

The adjacent table shows the maximum values for light, shock-free operation which must not be exceeded even in dynamic operation.



Mx = F . l
My = F . l
Mz = F . l

Ordering Information / Part Numbering System for OSP-P Clean Room Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	0	0	0	S	02500	0	0	0	G	0	0	2	0	0

Bore
16
25
32

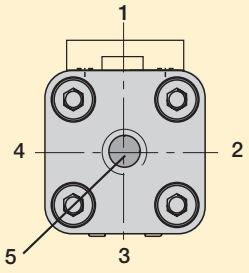
Piston Style
0 Standard

Air Connection / Porting
7 Clean Room

Seals
0 Standard
1 Viton
S Special

Lubrication
0 Standard
1 Slow Speed
4 Food
5 Clean Room
S Special

Corrosion Resist, Hardware
0 Standard
1 Stainless
2 Xylan Coated Aluminum
3 Xylan Coating & Stainless Steel Fasteners
S Special



Stroke
x x x x x

End Cap Position
0 l+r 0° = In Front (pos #2)

Cushioning / Stops
0 Standard

Piston Mountings
0 None

Guides / Brakes
0 None

add. Carriage
0 Without

Dovetail Cover
0 Standard
X Without Cover Rail
S Special

End Cap Mounts
0 Without
1 A1 (16, 25, 32)
2 A2 (16, 25, 32)
3 A3 (25, 32)
4 B1 (25, 32)
6 B3 (16)
7 B4 (25, 32)
8 B5 (32)

Note: Comes in pairs

Version

Switches / Measuring System
0 None
1 NO Reed - KL3045 Qty. 2
2 NC Reed - KL3048 Qty. 2
3 PNP KL3054+4041 Qty. 2
4 NPN KL3060+4041 Qty. 2

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.

Note: Position #2 is the standard location.

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Rodless Cylinder Ø 40 mm

for synchronized bi-parting movements

Type OSP-P40-SL-BP

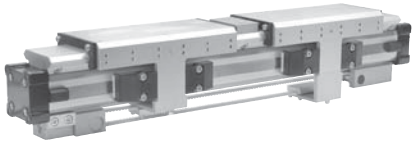
OSP
ORIGA SYSTEM PLUS

Features:

- Accurate bi-parting movement through toothed belt synchronization
- Optimum slow speed performance
- Increased action force
- Anodized aluminum guide rail with prism-form slideway arrangement
- Adjustable polymer slide units
- Combined sealing system with polymer and felt elements to remove dirt and lubricate the slideway
- Integrated grease nipples for guide lubrication

Applications:

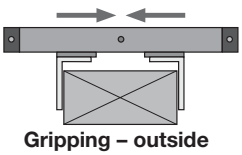
- Opening and closing operations
- Gripping of workpieces – outside
- Gripping of hollow workpieces – inside
- Gripping underneath larger objects
- Clamping force adjustable via pressure regulator



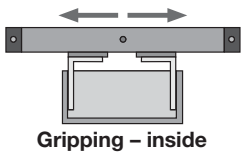
General features

Characteristics	Symbol	Unit	Description
Type			Rodless cylinder for synchronized bi-parting movements
Series			OSP-P
System			Double acting with end cushioning. For contactless position sensing
Guide			Slideline SL40
Synchronization			Toothed belt
Mounting			See drawings
Ambient temperature range	T_{min} T_{max}	°C °C	-10 +60
Weight (Mass)		kg	see table
Medium			Filtered, unlubricated compressed air (other media on request)
Lubrication			Special slow speed grease – additional oil mist lubrication not required
Material			
Toothed Belt			Steel-corded polyurethane
Belt wheel			Aluminum
Operating pressure range	p_{max}	bar	6
Cushioning middle position			Elastic buffer
Max. Speed	v_{max}	m/s	0.2
Max. stroke of each stroke		mm	500
Max. mass per guide carrier		kg	25
Max. moments on guide carrier			
lateral moment	M_{xmax}	Nm	25
axial moment	M_{ymax}	Nm	46
rotating moment	M_{zmax}	Nm	46

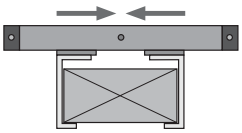
Applications



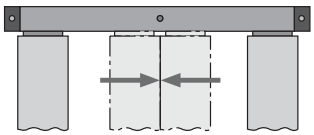
Gripping – outside



Gripping – inside



Gripping – underneath



Door opening and closing

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Ordering Information / Part Numbering System for OSP-P Bi-Parting Rodless Cylinders Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	40	N	7	0	5	0	01000	0	0	0	0	0	0	9	0	0

Bore

40

Piston Style

N	Bi-Parting

Air Connections / Porting

0	Standard (position #2)
1	End Face (position #5)
2	Single End Porting
3	Left Stand (pos #2), Right End Face (pos #5)
4	Right Stand (pos #2), Left End Face (pos #5)
6	Single End Porting End Face
S	Special

Seals

0	Standard

Lubrication

0	Standard

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

x x x x x

End Cap Position

0	I+r 0° = In Front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the Back (pos # 4)
3	I+r 270° = Same Face as Outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In Front (pos #3, 2)
5	I 180° = At the Back; r 0° = In Front (pos #4, 2)
6	I 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)
7	I 0° = In Front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the Back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In Front; r 180° = At the Back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the Back (pos #3, 4)
C	I 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)
D	I 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)
F	I 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard

Piston Mountings

0	None

Guides / Brakes

0	None

add. Carriage

0	Without

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

End Cap Mounts

0	Without
9	C1
A	C2
B	C3
C	C4

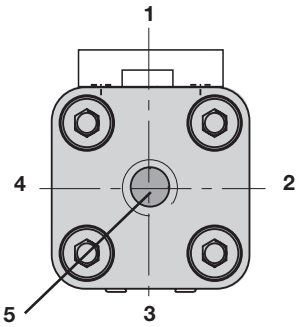
Note: Comes in pairs

Version

Switches / Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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OSP
ORIGA SYSTEM PLUS

Adaptive modular system

The Origa system plus – OSP – provides a comprehensive range of linear guides for the pneumatic and electric linear drives.

Advantages:

- Takes high loads and forces
- High precision
- Smooth operation
- Can be retrofitted
- Can be installed in any position

Rodless pneumatic cylinder

- Series OSP - P

Piston diameters 10 – 80 mm

Linear Guides

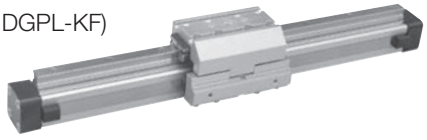
SLIDELINE
The cost-effective plain bearing guide for medium loads.
Active/ Passive Brake optional.
Piston diameters 16 – 80 mm

Powerslide
The roller guide for heavy loads and hard application conditions
Piston diameters 16 – 50 mm

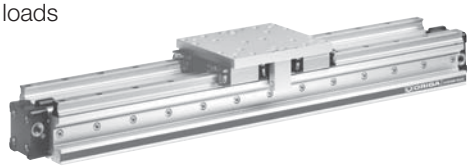
PROLINE
The compact aluminum roller guide for high loads and velocities.
Active/ Passive Brake optional.
Piston diameters 16 – 50 mm

STARLINE
Recirculating ball bearing guide for very high loads and precision
Piston diameters 16 – 50 mm

KF Guide
Recirculating ball bearing guide for highest loads and precision.
Correspond to FESTO dimensions (Type DGPL-KF)
Piston diameters 16 – 50 mm



HD Heavy Duty Guide
The ball bushing guide for the heavy loads and greatest accuracy.
Piston diameters 25 – 50 mm



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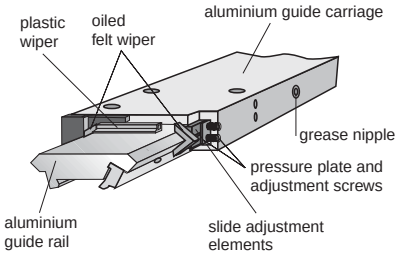
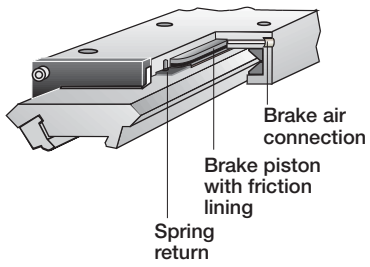
Versions

For pneumatic linear drive:
Series OSP-P



Option – Integrated brake

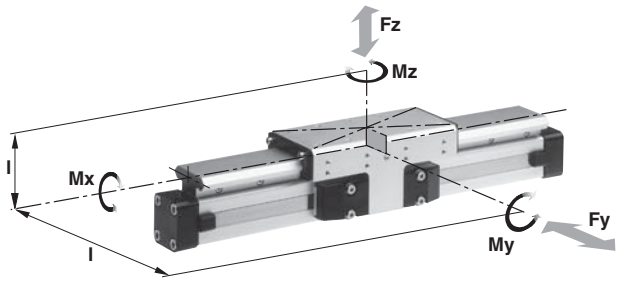


Integrated brake (optional) for series OSP-P25 to OSP-P50:

- Actuated by pressure
- Released by exhausting and spring return

For further technical data see also linear drives OSP-P.

Loads, forces and moments



Technical data:

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

The load and moment figures apply to speeds v < 0.2 m/s.

Plain Bearing Guide SLIDELINE

OSP
ORIGA SYSTEM PLUS

Series SL 16 to 80 for Linear-drive

- Series OSP-P

Features:

- Adjustable plastic slide elements – optional with integral brake
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideways.
- Corrosion resistant version available on request.
- Any length of stroke up to 5500 mm (longer strokes on request)

1) Only with integrated brake:
Braking force on dry oil-free surface
Values are decreased for lubricated slideways

2) Corrosion resistant fixtures available on request

*** Please note:**
In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Maximum braking force at 6 bar (N) 1)	Mass of linear drive with guide (kg)		Mass * of guide carriage (kg)
			Mx	My	Mz	Fy, Fz	With 0mm stroke	Increase per 100mm stroke	
SL16	OSP-P16	6	11	11	325	–	0.57	0.22	0.23
SL 25	OSP-P25	14	34	34	675	325	1.55	0.39	0.61
SL 32	OSP-P32	29	60	60	925	545	2.98	0.65	0.95
SL 40	OSP-P40	50	110	110	1500	835	4.05	0.78	1.22
SL50	OSP-P50	77	180	180	2000	1200	6.72	0.97	2.06
SL63	OSP-P63	120	260	260	2500	–	11.66	1.47	3.32
SL80	OSP-P80	120	260	260	2500	–	15.71	1.81	3.32

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Multi-Brake Passive Brake

OSP
ORIGA SYSTEM PLUS

Series MB-SL 25 to 80 for linear-drive

- Series OSP-P

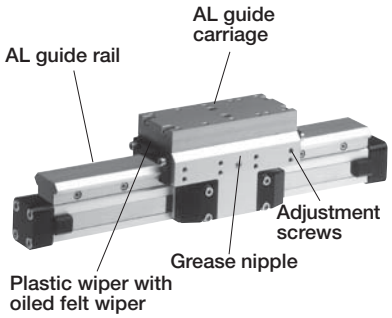
Features:

- Brake operated by spring actuation
- Brake release by pressurization
- Optional sensor to indicate brake lining wear
- Anodized aluminum rail, with prism shaped slide elements
- Adjustable plastic slide elements
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideway
- Replenishable guide lubrication by integrated grease nipples
- Blocking function in case of pressure loss
- Intermediate stops possible

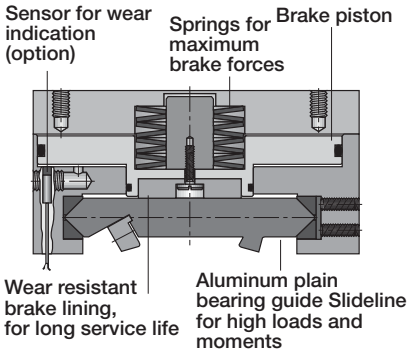
1) Braking surface dry – oil on the braking surface will reduce the braking force

* **Please note:**
In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

Versions



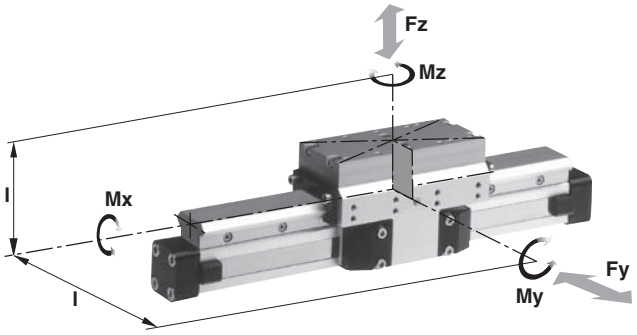
Function



Function:
The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used effectively in positioning applications.

Loads, forces and moments



Technical data:

The table shows the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

Load and moment data are based on speeds v < 0.2 m/s.

Operating pressure 4.5 - 8 bar
A pressure of 4.5 bar is required to release the brake.

For further technical information, please refer to the data sheets for linear drives OSP-P.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Max. brake force (N) 1	Mass of linear drive with guide (kg)		Mass* guide carriage (kg)
		Mx	My	Mz	Ly, Lz		With 0mm stroke	Increase per 100mm stroke	
MB-SL 25	OSP-P25	14	34	34	675	470	2.04	0.39	1.10
MB-SL 32	OSP-P32	29	60	60	925	790	3.82	0.65	1.79
MB-SL 40	OSP-P40	50	110	110	1500	1200	5.16	0.78	2.34
MB-SL 50	OSP-P50	77	180	180	2000	1870	8.29	0.97	3.63
MB-SL 63	OSP-P63	120	260	260	2500	2900	13.31	1.47	4.97
MB-SL 80	OSP-P80	120	260	260	2500	2900	17.36	1.81	4.97

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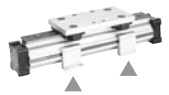
Overview

Mounting Type	Type	Type – OSP Guides															
		SLIDELINE PROLINE MULTIBRAKE							POWERSLIDE								
		16*	25	32	40	50	63*	80*	16/ 25	25/ 25	25/ 35	25/ 44	32/ 35	32/ 44	40/ 44	40/ 60	50/ 60	50/ 76
End cap mounting	Type A1	X							X									
	Type A2	O	O	O														
	Type A3									O	O		O					
End cap mounting, reinforced	Type B1		X	X						X	X	X	X	X				
	Type B3								O									
	Type B4											O		O				
	Type B5																	
End cap mounting	Type C1				X	X	X	X							X	X	X	X
	Type C2				O	O												
	Type C3						O	O							O		O	
	Type C4															O		O
Mid-Section support, small	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mid-Section support, wide 	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	O	O	O	O	O												
	Type E3						O	O	O	O	O		O		O		O	
	Type E4											O		O		O		O
	Type E5																	

X = carriage mounted in top (12 o'clock position)
O = carriage mounted in lateral (3 or 9 o'clock position)
= available components
* not available for all sizes

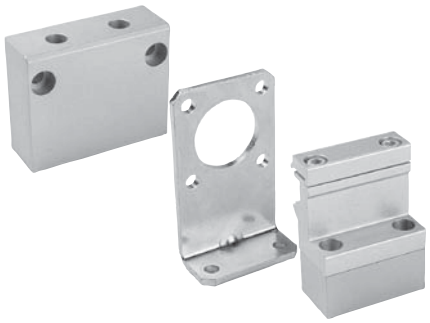
Linear Drive Accessories

Mountings for Linear Drives fitted with OSP-Guides

OSP
ORIGA SYSTEM PLUS

For linear-drives

- Series OSP-P



B

Rodless Cylinders Actuator Productd

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End cap mountings

Four internal screw threads are located in the end faces of all OSP actuators for mounting the drive unit. End cap mountings may be secured across any two adjacent screws.

Material: Series OSP-16, 25, 32:
Galvanized steel
Series OSP-40,50, 63, 80:
Anodized aluminum

The mountings are supplied in pairs.

Mid-section support

Information regarding type E1 and D1:

Mounting of the Mid-Section supports is also possible on the lower side of the drive. In this case, please note the new center line dimensions.

Stainless steel version on request.

Ordering Information For Mountings Type A – Type B – Type C – Type D – Type E

Mounting type (versions)	Size						
	16	25	32	40	50	63	80
A1 *)	20408	2010	3010	–	–	–	–
A2 *)	20464	2040	3040	–	–	–	–
A3 *)	–	2060	3060	–	–	–	–
B1 *)	–	20311	20313	–	–	–	–
B3 *)	20465	–	–	–	–	–	–
B4 *)	–	20312	20314	–	–	–	–
B5 *)	–	–	20976	–	–	–	–
C1 *)	–	–	–	4010	5010	6010	8010
C2 *)	–	–	–	20338	20349	–	–
C3 *)	–	–	–	20339	20350	20821	20822
C4 *)	–	–	–	20340	20351	–	–
D1	20434	20008	20157	20027	20162	20451	20480
E1	20435	20009	20158	20028	20163	20452	20482
E2	20436	20352	20355	20358	20361	–	–
E3	20437	20353	20356	20359	20362	20453	20819
E4	–	20354	20357	20360	20363	–	–
E5	–	–	20977	–	–	–	–

(* Pair

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Ordering Information / Part Numbering System for OSP-P SLIDELINE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	25	0	2	0	0	0	01500	0	0	0	2	0	0	0	0	0

Bore

16
25
32
40
50
63
80

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End Face (position #5)
2	Single End Porting
3	Left Stand (pos #2), Right End Face (pos #5)
4	Right Stand (pos #2), Left End Face (pos #5)
6	Single End Porting End Face
A	3/2 Way Valve VOE 24V = (25, 32, 40, 50)
B	3/2 Way Valve VOE 220V~/110V = (25 ,32, 40, 50)
C	3/2 Way Valve VOE 48V = (25, 32, 40, 50)
E	3/2 Way Valve VOE 110V~ (25, 32, 40, 50)
S	Special

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow Speed
4	Food
5	Clean Room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

x x x x x

End Cap Position

0	I+r 0° = In Front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the Back (pos # 4)
3	I+r 270° = Same Face as Outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In Front (pos #3, 2)
5	I 180° = At the Back; r 0° = In Front (pos #4, 2)
6	I 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)
7	I 0° = In Front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the Back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In Front; r 180° = At the Back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the Back (pos #3, 4)
C	I 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)
D	I 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)
F	I 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
S	Special

Piston Mountings

0	None

Guides / Brakes

2	SL Slideline
3	SL Slideline with Activebrake
4	SL Slideline with Multibrake (without sensors)

add. Carriage

0	Without
2	Guide Carriage Slideline SL
3	Guide Carriage SL-AB
4	Guide Carriage SL-MB
M	Guide Carriage SL-MB without Brake Function

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

End Cap Mounts

0	Without
1	A1 (16, 25, 32)
2	A2 (16, 25, 32)
3	A3 (25, 32)
4	B1 (25, 32)
6	B3 (16)
7	B4 (25, 32)
8	B5 (32)
9	C1 (40, 50, 63, 80)
A	C2 (40,50)
B	C3 (40, 50, 63, 80)
C	C4 (40, 50)

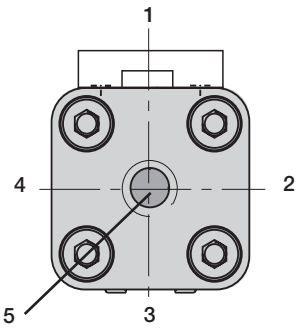
Note: Comes in pairs

Version

Switches/ Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0,1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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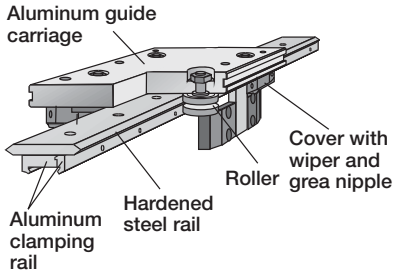
Roller Guide POWERSLIDE

OSP
ORIGA SYSTEM PLUS

Versions

For pneumatic linear drive:
Series OSP-P

Function

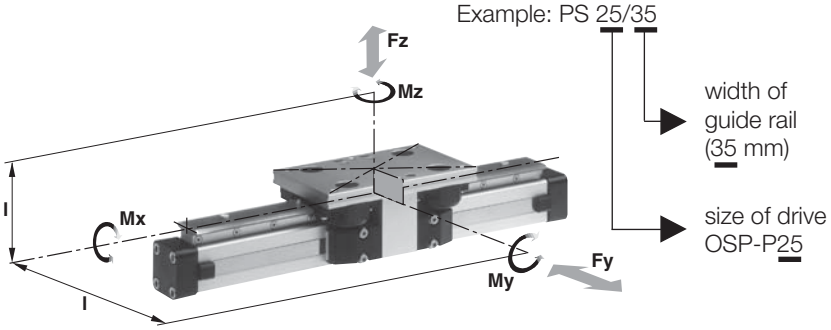


Series PS 16 to 50 for linear-drive

- Series OSP-P

Loads, forces and moments

Example: PS 25/35



Features:

- Anodized aluminum guide carriage with vee rollers having 2 rows of ball bearings
- Hardened steel guide rail
- Several guide sizes can be used on the same drive
- Corrosion resistance version available on request
- Max. Speed v = 3 m/s,
- Tough roller cover with wiper and grease nipple
- Any length of stroke up to 3500 mm, (longer strokes on request)

***Please note:**
In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

Technical Data

The Table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

For further information and technical data see linear drives OSP-P.

Series	For linear drive	Max. moments (Nm			Max. load (N)	Mass of linear drive with guide (kg)		
		Mx	My	Mz	Fy, Fz	With 0 mm stroke	Increase per 100 mm stroke	Mass * of guide carriage (kg)
PS 16/25	OSP-P16	14	45	45	1400	0.93	0.24	0.7
PS 25/25	OSP-P25	14	63	63	1400	1.5	0.4	0.7
PS 25/35	OSP-P25	20	70	70	1400	1.7	0.4	0.8
PS 25/44	OSP-P25	65	175	175	3000	2.6	0.5	1.5
PS 32/35	OSP-P32	20	70	70	1400	2.6	0.6	0.8
PS 32/44	OSP-P32	65	175	175	3000	3.4	0.7	1.5
PS 40/44	OSP-P40	65	175	175	3000	4.6	1.1	1.5
PS 40/60	OSP-P40	90	250	250	3000	6	1.3	2.2
PS 50/60	OSP-P50	90	250	250	3000	7.6	1.4	2.3
PS 50/76	OSP-P50	140	350	350	4000	11.5	1.8	4.9

1) corrosion resistance version available on request (max. loads and moments are 25% lower)

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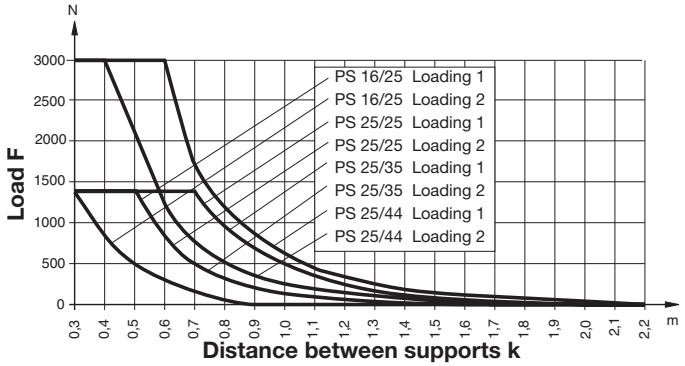
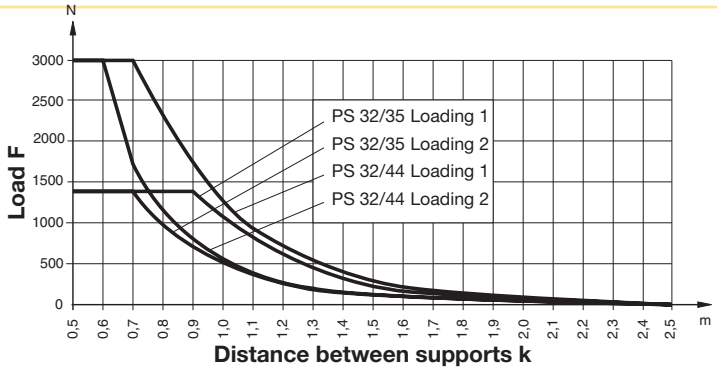
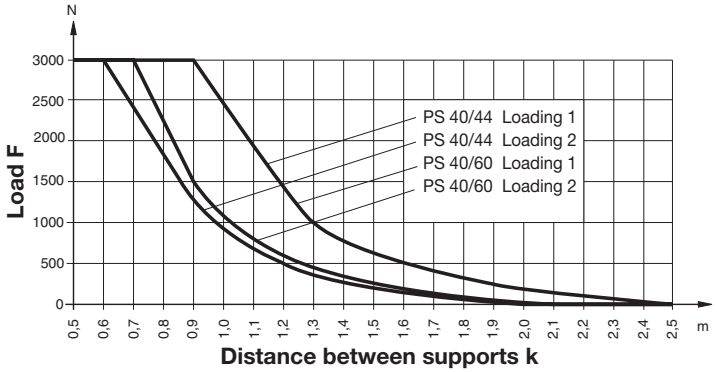
Permissable unsupported length: PS 16/25, PS 25/25, PS 25/35, PS 25/44



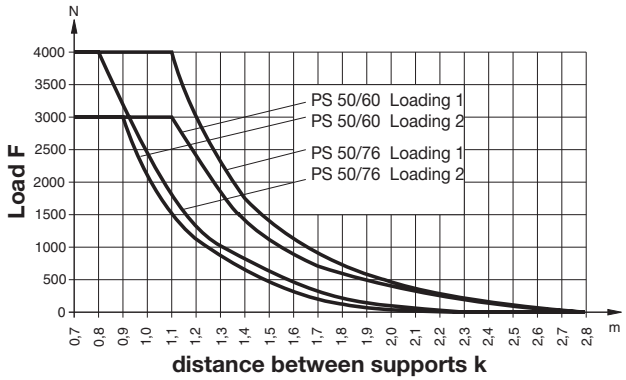
Permissable unsupported length: PS 32/35, PS 32/44



Permissable unsupported length: PS 40/44, PS 40/60



Permissable unsupported length: PS 50/60, PS 50/76

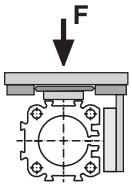


Mid-section support

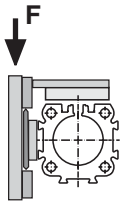
(for versions, see accessories)

Mid-Section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.
A distinction must be drawn between loading 1 and loading 2.
Deflection of 0.5 mm max. between supports is permissible.

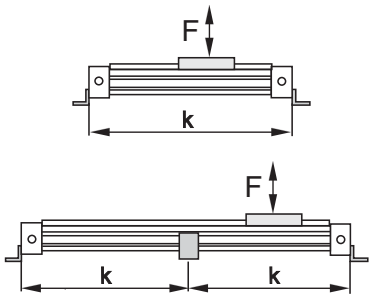
Note
For speeds v > 0.5 m/s the distance between supports should not exceed 1m.



Loading 1



Loading 2



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Service life

Calculation of service life is achieved in two stages:

- Determination of load factor LF from the loads to be carried
- Calculation of service life in km

1. Calculation of load factor L_F

$$LF = \frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}}$$

with combined loads, **LF** should not exceed the value 1.

2. Service life calculation

- **For PS 16/25, PS 25/25, PS 25/35, and PS 32/35** Service life (km) = $\frac{106}{(LF + 0{,}02)^3}$
- **For PS 25/44, PS 32/44, PS 40/44, PS 40/60 and PS 50/60:** Service life (km) = $\frac{314}{(LF + 0{,}015)^3}$
- **For PS 50/76:** Service life (km) = $\frac{680}{(LF + 0{,}015)^3}$

Lubrication

For maximum system life, lubrication of the rollers must be maintained at all times.

Only high quality Lithium based greases should be used.

Lubrication intervals are dependent on environmental conditions (temperature, running speed, grease quality etc.) therefore the installation should be regularly inspected.

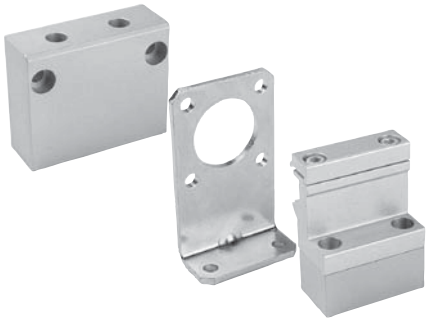
Linear Drive Accessories

Mountings for Linear Drives fitted with OSP-Guides

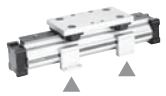
OSP
ORIGA SYSTEM PLUS

For linear-drives

- Series OSP-P



Overview

Mounting Type	Type	Type – OSP Guides: SLIDELINE PROLINE MULTIBRAKE 16*	25	32	40	50	63*	80*	POWERSLIDE 16/25	25/25	25/35	25/44	32/35	32/44	40/44	40/60	50/60	50/76
End cap mounting	Type A1	X							X									
	Type A2	O	O	O														
	Type A3									O	O		O					
End cap mounting, reinforced	Type B1		X	X						X	X	X	X	X				
	Type B3								O									
	Type B4											O		O				
	Type B5																	
End cap mounting	Type C1				X	X	X	X							X	X	X	X
	Type C2				O	O												
	Type C3						O	O							O		O	
	Type C4															O		O
Mid-Section support, small	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mid-Section support, wide 	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	O	O	O	O	O													
	Type E3						O	O	O	O	O		O		O		O	
	Type E4											O		O		O		O
	Type E5																	

X = carriage mounted in top (12 o'clock position)
O = carriage mounted in lateral (3 or 9 o'clock position)
= available components
* not available for all sizes

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Ordering Information / Part Numbering System for OSP-P POWERSLIDE Series

6		7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	2	0	0	0	02500	0	0	0	G	0	0	2	0	0

Bore

16
25
32
40
50

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End Face (position #5)
2	Single End Porting
3	Left Stand (pos #2), Right End Face (pos #5)
4	Right Stand (pos #2), Left End Face (pos #5)
6	Single End Porting End Face
A	3/2 Way Valve VOE 24V = (25, 32, 40, 50)
B	3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 Way Valve VOE 48V = (25, 32, 40, 50)
E	3/2 Way Valve VOE 110V~ (25, 32, 40, 50)
S	Special

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow Speed
4	Food
5	Clean Room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

xxxxx

End Cap Position

0	l+r 0° = In Front (pos #2)
1	l+r 90° = Underneath (pos #3)
2	l+r 180° = At the Back (pos # 4)
3	l+r 270° = Same Face as Outerband (pos #2, 1)
4	l 90° = Underneath; r 0° = In Front (pos #3, 2)
5	l 180° = At the Back; r 0° = In Front (pos #4, 2)
6	l 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)
7	l 0° = In Front; r 90° = Underneath (pos #2, 3)
8	l 180° = At the Back; r 90° = Underneath (pos #4, 3)
9	l 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)
A	l 0° = In Front; r 180° = At the Back (pos #2, 4)
B	l 90° = Underneath; r 180° = At the Back (pos #3, 4)
C	l 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)
D	l 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)
E	l 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)
F	l 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
S	Special

Piston Mountings

0	None

Guides / Brakes

E	PSXX/25 Powerslide (16, 25)
F	PSXX/35 Powerslide (25, 32)
G	PSXX/44 Powerslide (25, 32, 40)
H	PSXX/60 Powerslide (40, 50)
I	PSXX/76 Powerslide (50)

add. Carriage

0	Without
E	Guide Carriage Powerslide PSXX/25 (16, 25)
F	Guide Carriage Powerslide PSXX/35 (16, 25)
G	Guide Carriage Powerslide PSXX/44 (16, 25)
H	Guide Carriage Powerslide PSXX/60 (16, 25)

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

End Cap Mounts

0	Without
1	A1 (16, 25, 32)
2	A2 (16, 25, 32)
3	A3 (25, 32)
4	B1 (25, 32)
6	B3 (16)
7	B4 (25, 32)
8	B5 (32)
9	C1 (40, 50)
A	C2 (40, 50)
B	C3 (40, 50)
C	C4 (40, 50)

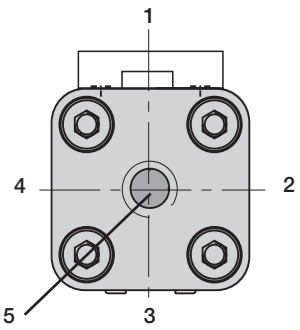
Note: Comes in pairs

Version

Switches/ Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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Aluminum Roller Guide PROLINE

OSP
ORIGA SYSTEM PLUS

Series PL 16 to 50 for linear-drive

- Series OSP-P

Features:

- High precision
- High velocities (10 m/s)
- Smooth operation - low noise
- Integated wiper system
- Long life lubrication
- Compact dimensions - compatible to Slideline plain bearing guide
- Any length of stroke up to 3750 mm

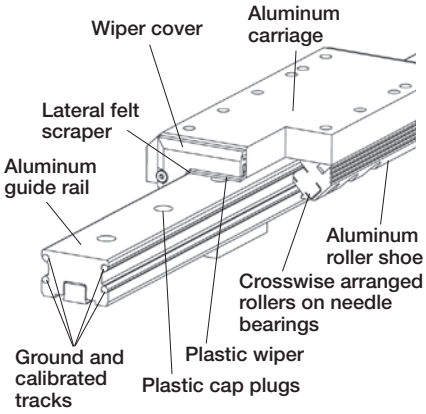
Integrated brake (optional) for Series OSP-P25 to OSP-P50:

- Actuated by pressurization
- Release by depressurization and spring actuation

*** Please note:**
The mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Versions

For pneumatic linear drive:
Series OSP-P



Technical data

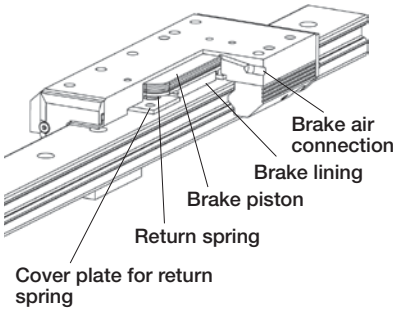
The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

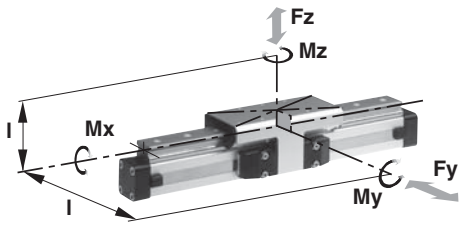
The sum of the loads should not exceed >1. With a load factor of less than 1, service life is 8000 km

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Option – Integrated Brake



Loads, forces and moments



Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Maximum braking force at 6 bar (N) 1)	Mass of linear drive with guide (kg)		Mass * guide carriage (kg)
		Mx	My	Mz	Fy, Fz		With 0 mm stroke	Increase per 100 mm stroke	
PL 16	OSP-P16	8	12	12	542	–	0.55	0.19	0.24
PL 25	OSP-P25	16	39	39	857	on request	1.65	0.40	0.75
PL 32	OSP-P32	29	73	73	1171	on request	3.24	0.62	1.18
PL 40	OSP-P40	57	158	158	2074	on request	4.35	0.70	1.70
PL 50	OSP-P50	111	249	249	3111	on request	7.03	0.95	2.50

1) Only for version with brake:
Braking surface dry – oiled surface reduces the effective braking force.

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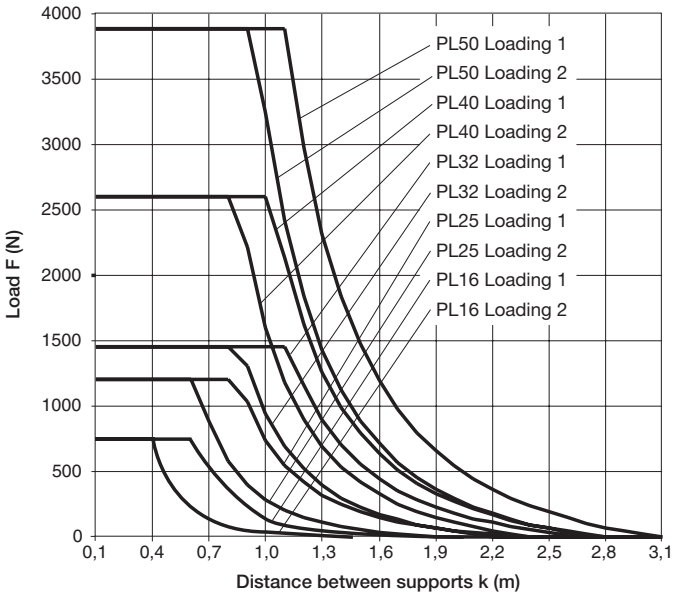
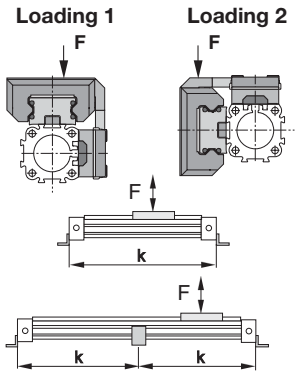
Note:
For speeds v > 0.5 m/s the distance between supports should not exceed 1 m.

Permissible unsupported length PL16, PL25, PL32, PL40 and PL50



Mid-section support

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



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Multi-Brake Passive Brake

with Aluminum Roller Guide Proline PL

OSP
ORIGA SYSTEM PLUS

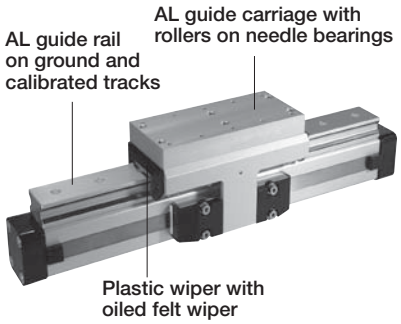
Series MB-PL 25 to 50 for linear-drive
- Series OSP-P

Features:
- Brake operated by spring actuation
- Brake release by pressurization
- Optional sensor to indicate brake lining wear
- Composite sealing system with plastic and felt wiper elements to remove dirt and lubricate the slideway
- Blocking function in case of pressure loss
- Intermediate stops possible

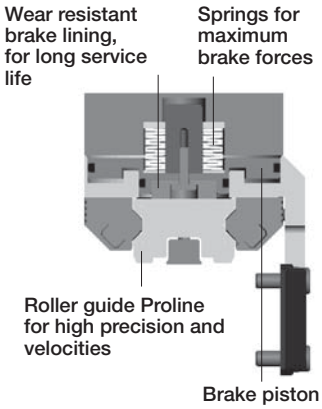
1) Braking surface dry – oil on the braking surface will reduce the braking force

*** Please note:**
In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

Versions



Function

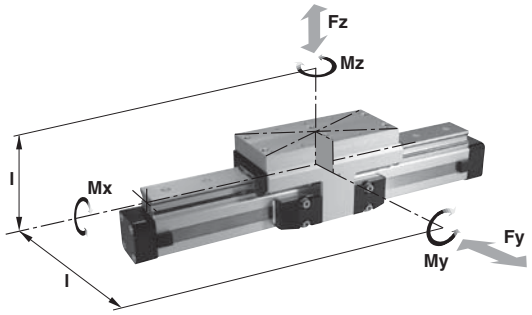


Function:

The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used effectively in positioning applications.

Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Ly}{Ly_{max}} + \frac{Lz}{Lz_{max}} \leq 1$$

The sum of the loads should not exceed >1. With a load factor of less than 1, service life is 8000 km

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Operating Pressure 4.5 - 8 bar.

A pressure of min. 4.5 bar release the brake.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)	Max. brake force (N) 1)	Mass of linear drive with guide (kg		Mass* guide carriage (kg)
		Mx	My	Mz	Fy, Fz		With 0 mm stroke	Increase per 100 mm stroke	
MB-PL25	OSP-P25	16	39	39	857	315	2.14	0.40	1.24
MB-PL32	OSP-P32	29	73	73	1171	490	4.08	0.62	2.02
MB-PL40	OSP-P40	57	158	158	2074	715	5.46	0.70	2.82
MB-PL50	OSP-P50	111	249	249	3111	1100	8.60	0.95	4.07

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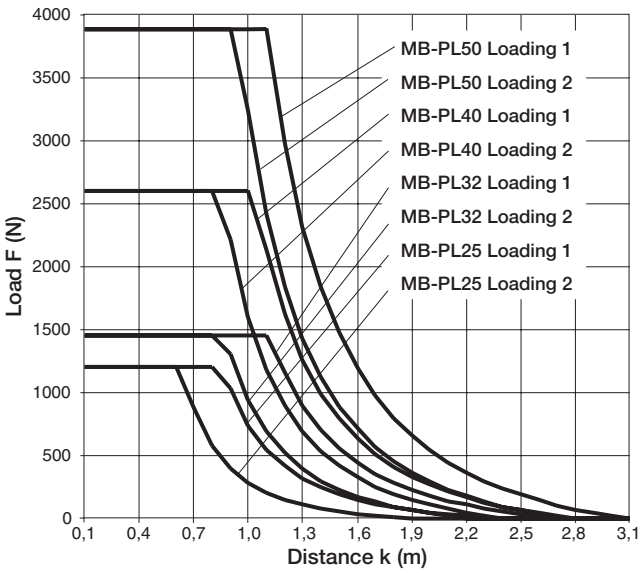
Note:
For speeds v > 0.5 m/s the distance between supports should not exceed 1 m.

Permissible Unsupported Length OSP-P MB-PL25, MB-PL32, MB-PL40, MB-PL50

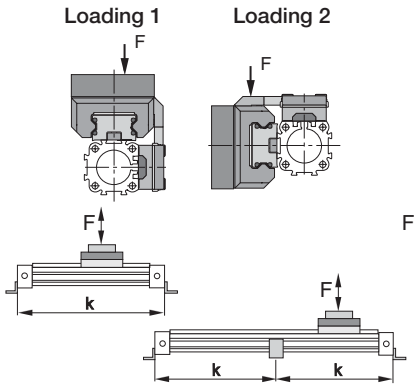


Mid-section support

Mid-Section supports are required from a certain stroke length to prevent

excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading.

A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



Overview

Mounting Type	Type	Type – OSP Guides: SLIDELINE PROLINE MULTIBRAKE 16*	25	32	40	50	63*	80*	POWERSLIDE 16/25	25/25	25/35	25/44	32/35	32/44	40/44	40/60	50/60	50/76
End cap mounting	Type A1	X							X									
	Type A2	O	O	O														
	Type A3									O	O		O					
End cap mounting, reinforced	Type B1		X	X						X	X	X	X	X				
	Type B3								O									
	Type B4											O		O				
	Type B5																	
End cap mounting	Type C1				X	X	X	X							X	X	X	X
	Type C2				O	O												
	Type C3						O	O							O		O	
	Type C4															O		O
Mid-section support, small	Type D1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mid-section support, wide	Type E1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Type E2	O	O	O	O	O												
	Type E3						O	O	O	O	O		O		O		O	
	Type E4											O		O		O		O
	Type E5																	

X = carriage mounted in top (12 o'clock position)
O = carriage mounted in lateral (3 or 9 o'clock position)
= available components
* not available for all sizes

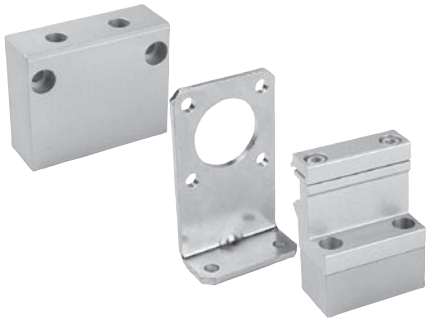
Linear Drive Accessories

Mountings for Linear Drives fitted with OSP-Guides

OSP
ORIGA SYSTEM PLUS

For linear-drives

- Series OSP-P



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Ordering Information / Part Numbering System for OSP-P PROLINE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	0	0	0	0	02500	0	0	0	6	0	0	0	0	0

Bore

16
25
32
40
50

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End Face (position #5)
2	Single End Porting
3	Left Stand (pos #2), Right End Face (pos #5)
4	Eight Stand (pos #2), Left End Face (pos #5)
6	Single End Porting End Face
A	3/2 Way Valve VOE 24V = (25, 32, 40, 50)
B	3/2 Way Valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 Way Valve VOE 48V = (25, 32, 40, 50)
E	3/2 Way Valve VOE 110V~ (25, 32, 40, 50)
S	Special

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow Speed
4	Food
5	Clean Room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

x x x x x

End Cap Position

0	I+r 0° = In Front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the Back (pos # 4)
3	I+r 270° = Same Face as Outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In Front (pos #3, 2)
5	I 180° = At the Back; r 0° = In Front (pos #4, 2)
6	I 270° = Same Face as Outerband; r 0° = In Front (pos #1, 2)
7	I 0° = In Front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the Back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same Face as Outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In Front; r 180° = At the Back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the Back (pos #3, 4)
C	I 270° = Same Face as Outerband; r 180° = At the Back (pos #1, 4)
D	I 0° = In Front; r 270° = Same Face as Outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same Face as Outerband (pos #3, 1)
F	I 180° = At the Back; r 270° = Same Face as Outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
S	Special

Piston Mountings

0	None

Guides / Brakes

6	PL Proline
7	PL Proline with Activebrake
8	PL Proline with Multibrake

add. Carriage

0	Without
2	Guide Carriage Proline PL
3	Guide Carriage PL-AB
4	Guide Carriage PL-MB
M	Guide Carriage PL-MB without Brake Function

Dovetail Cover

0	Standard
X	Without Cover Rail
S	Special

End Cap Mounts

0	Without
1	A1 (16, 25, 32)
2	A2 (16, 25, 32)
3	A3 (25, 32)
4	B1 (25, 32)
6	B3 (16)
7	B4 (25, 32)
8	B5 (32)
9	C1 (40, 50)
A	C2 (40, 50)
B	C3 (40, 50)
C	C4 (40, 50)

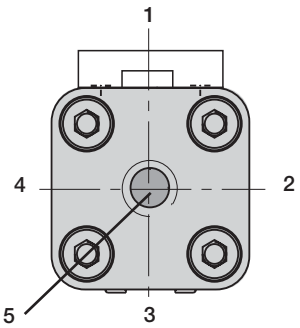
Note: Comes in pairs

Version

Switches Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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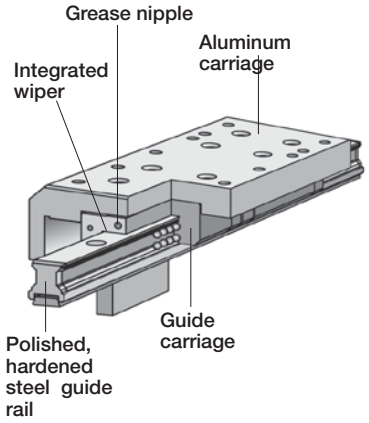
Recirculating Ball Bearing Guide STARLINE

OSP
ORIGA SYSTEM PLUS

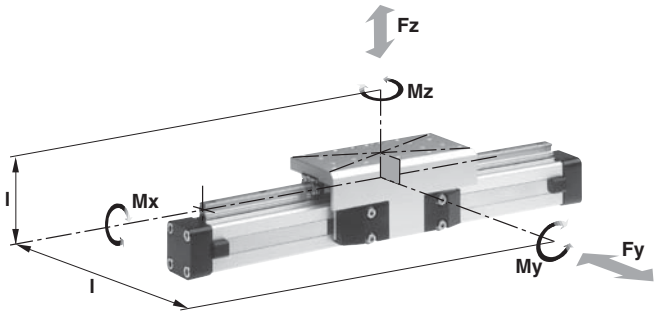
Series STL 16 to 50
For linear drive Series OSP-P

Versions

For pneumatic linear drive:
Series OSP-P



Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

Features:

- Polished and hardened steel guide rail
- For very high loads in all directions
- High precision
- Integrated wiper system
- Integrated grease nipples
- Any length of stroke up to 3700 mm
- Anodized aluminum guide carriage – dimensions compatible with OSP guides SLIDELINE and PROLINE
- Installation height (STL16 - 32) compatible with OSP guides SLIDELINE and PROLINE
- **Maximum speed**
  STL16: v = 3 m/s
  STL25 to 50: v = 5 m/s

**** Please note:**
The mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Mass of linear drive with guide (kg)		Mass ** guide carriage (kg)
		Mx	My	Mz	Fy	Fz	With 0 mm stroke	Increase per 100 mm stroke	
STL16	OSP-P16	15	30	30	1000	1000	0.598	0.210	0.268
STL25	OSP-P25	50	110	110	3100	3100	1.733	0.369	0.835
STL32	OSP-P32	62	160	160	3100	3100	2.934	0.526	1.181
STL40	OSP-P40	150	400	400	4000	7500	4.452	0.701	1.901
STL50	OSP-P50	210	580	580	4000	7500	7.361	0.936	2.880

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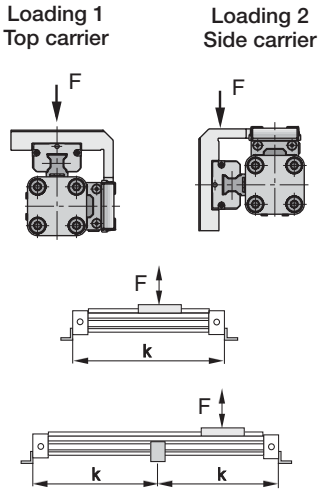
Mid-section support

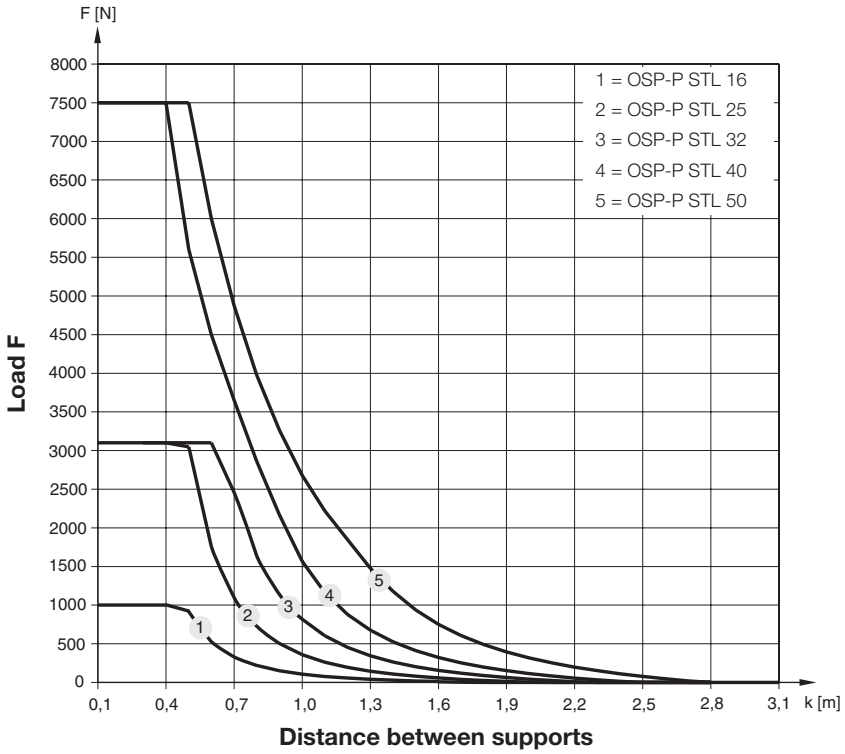
Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2. Deflection of 0.5 mm max. between supports is permissible.



Note:
For speeds v > 0.5 m/s the distance between supports should not exceed 1m.

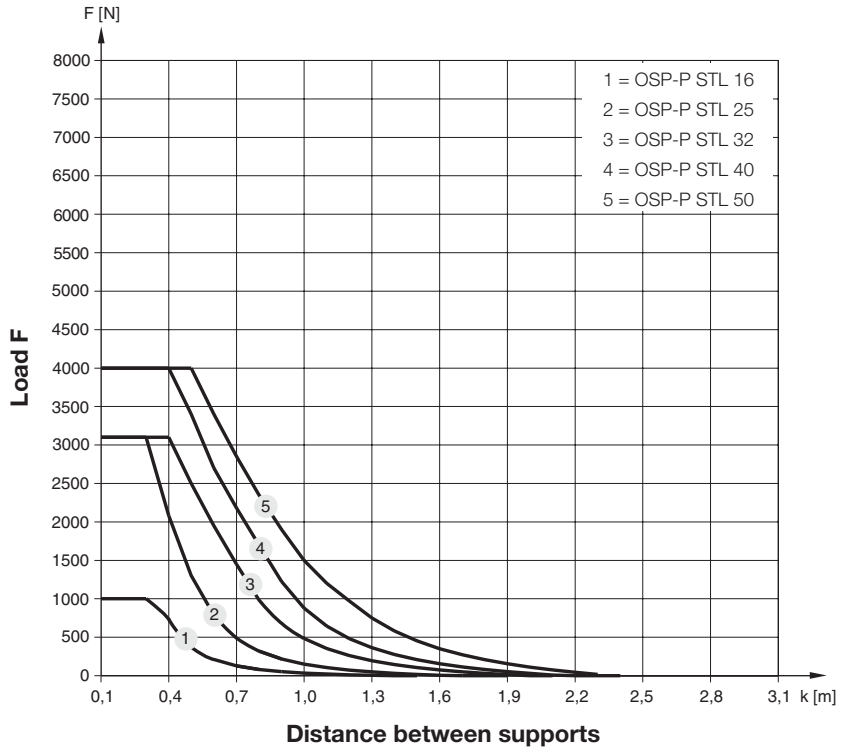
Permissible unsupported length STL16 to STL50

Loading 1 – Top carrier



Permissable unsupported length STL16 to STL50

Loading 2 – Side carrier



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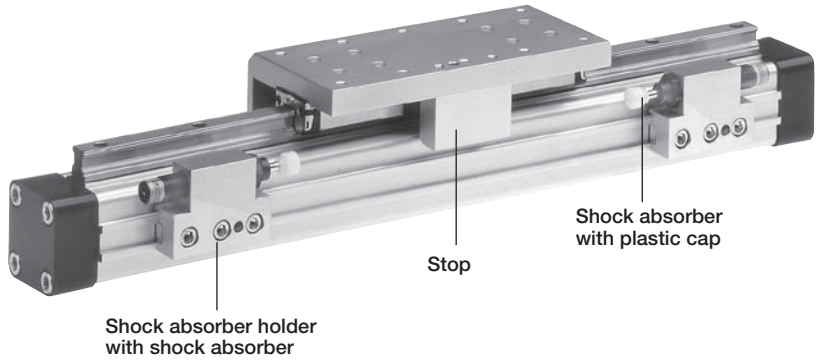
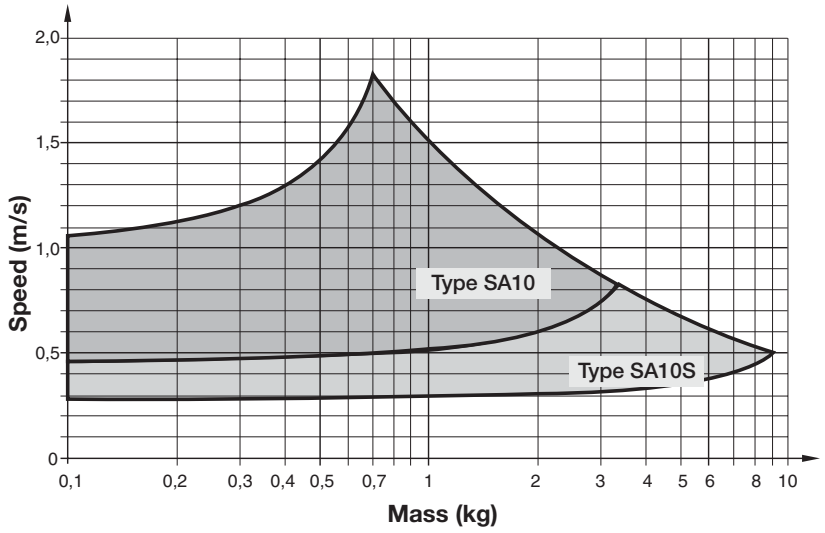
Variable Stop Type VS16 to VS50

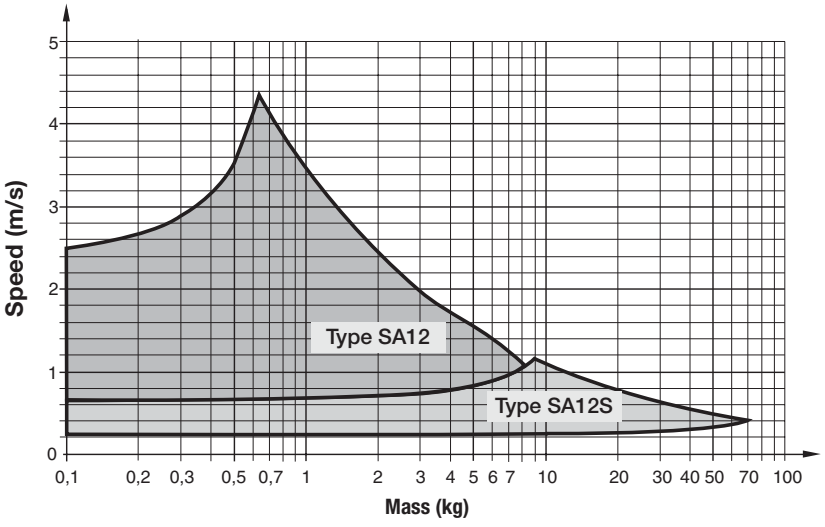
Arrangement with two variable stops



Shock absorber selection in dependence on mass and speed for Series OSP-STL16



Shock absorber selection in dependence on mass and speed for Series OSP-STL25



Variable stop

The variable stop Type VS provides simple stroke limitation.

It can be retrofitted and positioned anywhere along the stroke length.

For every cylinder diameter two types of shock absorber are available

– see “Shock Absorber Selection” below.

Mid-section supports and magnetic switches can still be fitted on the same side as the variable stop.

Depending on the application, two variable stops can be fitted if required.

Shock absorber selection

The shock absorber is selected in dependence on the mass and speed.

The mass of the carrier itself must be taken into account.

The values relate to an effective driving force of 78 N (6 bar)

The values relate to an effective driving force of 250 N (6 bar)

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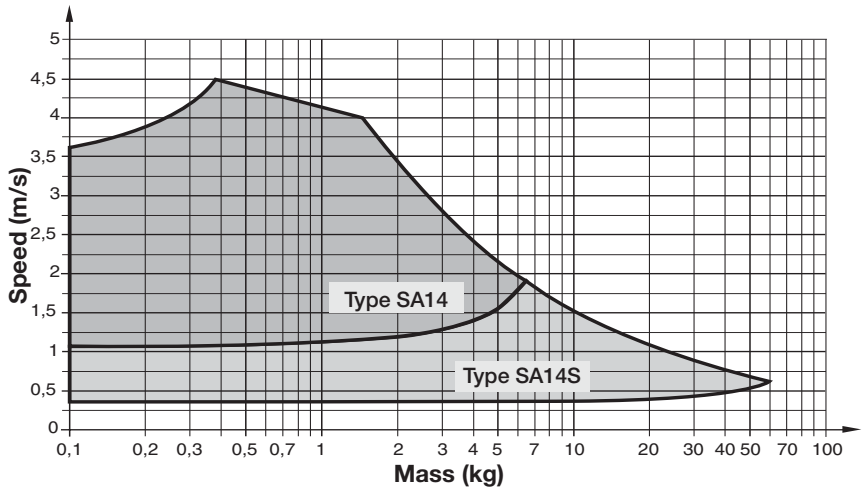
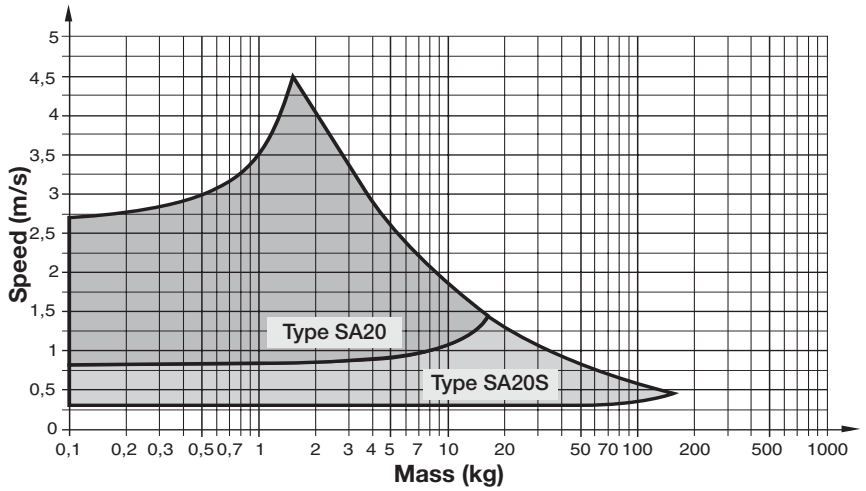
The values relate to an effective driving force of 420 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL32



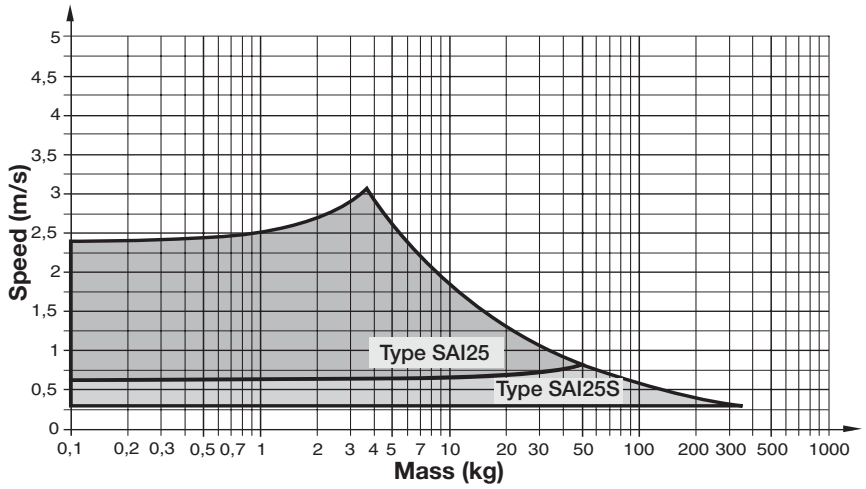
The values relate to an effective driving force of 640 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL40



The values relate to an effective driving force of 1000 N (6 bar)

Shock absorber selection in dependence on mass and speed for Series OSP-STL50



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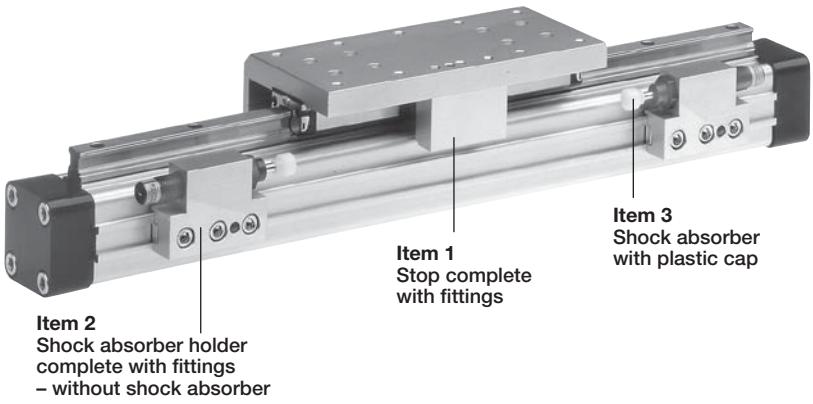
Order Information – Variable Stop, Type VS16 to VS50



Ordering Information – Variable Stop Type VS16 to VS50

		VS16		VS25		VS32		VS40		VS50	
Item	Description	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
1	Stop, complete	–	21196	–	21197	–	21198	–	21199	–	21200
2	Shock absorber holder, complete	–	21201	–	21202	–	21203	–	21204	–	21205
3 *	Shock absorber, standard	SA10	7718	SA12	7706	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA10S	7721	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

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End cap mounting, Type: B, Ø 16 to 32 mm

For Linear Drives with Recirculating Ball Bearing Guide

- Series OSP-P STL
- Series OSP-P KF

Material:
Galvanized steel
Anodized aluminum

The mountings are supplied in pairs.

Series	Mounting type	Order number (pair)
OSP-P STL16 OSP-P KF16	B1	**21135**
	B2	**21136**
	B3	**21137**
OSP-P STL25 OSP-P KF25	B1	**20311**
	B2	**21138**
	B3	**21139**
OSP-P STL32 OSP-P KF32	B1	**20313**
	B2	**21140**
	B5	**21141**

End cap mounting, Type: C, Ø 40 to 50 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:
Anodized aluminum

The mountings are supplied in pairs.

Series	Mounting type	Order number (pair)
OSP-P STL40 OSP-P KF40	C1	**4010**
	C2	**20338**
	C4	**20340**
OSP-P STL50 OSP-P KF50	C1	**5010**
	C2	**20349**
	C3	**20350**

Mid-section support, Type: D1ST, Ø 16 to 50

For Linear Drives with Recirculating Ball Bearing Guide

- Series OSP-P STL
- Series OSP-P KF

Note on Types D1ST:
The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

Series OSP-P	Mounting Type	Order number
STL/KF16	D1ST	**21125**
STL/KF25	D1ST	**21126**
STL/KF32	D1ST	**21127**
STL/KF40	D1ST	**21128**
STL/KF50	D1ST	**21129**

Mid-section support, Type: E1ST to E5ST

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Type EST1

Type EST2 to EST5

Series OSP-P	Mounting Type	Order number
STL/KF16	E1ST	**21130**
STL/KF16	E2ST	**21142**
STL/KF25	E1ST	**21131**
STL/KF25	E2ST	**21143**
STL/KF25	E3ST	**21148**
STL/KF32	E1ST	**21132**
STL/KF32	E2ST	**21144**
STL/KF32	E5ST	**21151**
STL/KF40	E1ST	**21133**
STL/KF40	E2ST	**21145**
STL/KF40	E4ST	**21150**
STL/KF50	E1ST	**21134**
STL/KF50	E2ST	**21146**
STL/KF50	E3ST	**21149**

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Ordering Information / Part Numbering System for OSP-P STARLINE Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	0	0	0	0	02500	0	0	0	6	0	0	0	0	0

Bore

16
25
32
40
50

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End face (position #5)
2	Single end porting
3	Left stand (pos #2), right end face (pos #5)
4	Eight stand (pos #2), left end face (pos #5)
6	Single end porting end face
A	3/2 way valve VOE 24V = (25, 32, 40, 50)
B	3/2 way valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 way valve VOE 48V = (25, 32, 40, 50)
E	3/2 way valve VOE 110V~ (25, 32, 40, 50)
S	Special

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow speed
4	Food
5	Clean room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan coated aluminum
3	Xylan coating & stainless steel fasteners
S	Special

Stroke

x x x x x

End Cap Position

0	l+r 0° = In front (pos #2)
1	l+r 90° = Underneath (pos #3)
2	l+r 180° = At the back (pos # 4)
3	l+r 270° = Same face as outerband (pos #2, 1)
4	l 90° = Underneath; r 0° = In front (pos #3, 2)
5	l 180° = At the back; r 0° = In front (pos #4, 2)
6	l 270° = Same face as outerband; r 0° = In front (pos #1, 2)
7	l 0° = In front; r 90° = Underneath (pos #2, 3)
8	l 180° = At the back; r 90° = Underneath (pos #4, 3)
9	l 270° = Same face as outerband; r 90° = Underneath (pos #1, 3)
A	l 0° = In front; r 180° = At the Back (pos #2, 4)
B	l 90° = Underneath; r 180° = At the back (pos #3, 4)
C	l 270° = Same face as outerband; r 180° = At the back (pos #1, 4)
D	l 0° = In front; r 270° = Same face as outerband (pos #2, 1)
E	l 90° = Underneath; r 270° = Same face as outerband (pos #3, 1)
F	l 180° = At the back; r 270° = Same face as outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
2	VS Soft left
3	VS Hard left
4	VS Soft right
5	VS Hard right
6	VS Soft both sides
7	VS Hard both sides
S	Special

Piston Mountings

0	None

Guides / Brakes

B	STL Starline

add. Carriage

0	Without
B	Guide Carriage Starline STL

Dovetail Cover

0	Standard
X	Without cover rail
S	Special

End Cap Mounts

0	Without
4	B1 (16, 25, 32)
5	B2 (16, 25, 32)
6	B3 (16, 25)
8	B5 (32)
9	C1 (40, 50)
A	C2 (40, 50)
B	C3 (50)
C	C4 (40)

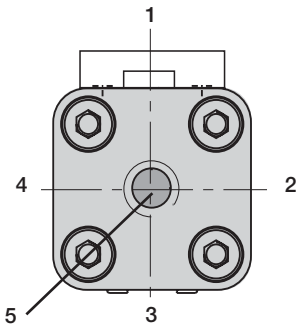
Note: Comes in pairs

Version

Switches Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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Recirculating Ball Bearing Guide KF

ORIGA SYSTEM PLUS

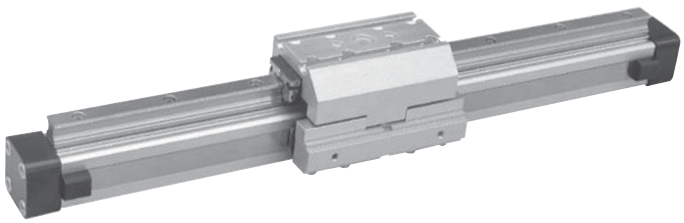
Series KF16 to KF50 For linear drives
Series OSP-P CLASSIC

Features:

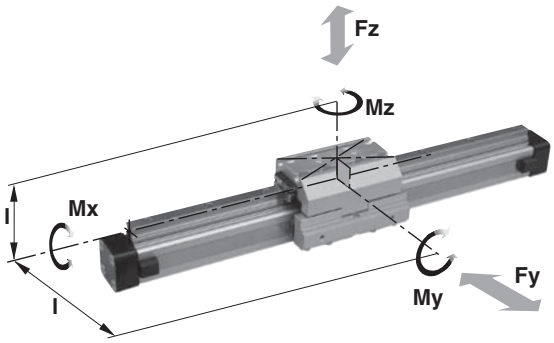
- Anodized aluminum guide carriage, the mounting dimensions correspond to FESTO Type: DGPL-KF
- Polished and hardened steel guide rail
- For high loads in all directions
- High precision
- Integrated wiper system
- Integrated grease nipples
- Any length of stroke up to 3700 mm
- Maximum speed
  KF16, KF40: v = 3 m/s
  KF25, KF32, KF50: v = 5 m/s

Versions

For Pneumatic Linear Drive:
Series OSP-P KF



Loads, forces and moments



Technical data

The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

***Please note:**
the mass of the carriage has to be added to the total moving mass when using the cushioning diagram.

Series	For linear drive	Max. moments (Nm)			Max. load (N)		Mass of drive with guide (kg)		Mass * guide carriage (kg)	Groove stone Thread Size
		Mx	My	Mz	Fy	Fz	With 0 mm stroke	Increase per 100 mm stroke		
KF16	OSP-P16	12	25	25	1000	1000	0.558	0.21	0.228	–
KF25	OSP-P25	35	90	90	3100	3100	1.522	0.369	0.607	M5
KF32	OSP-P32	44	133	133	3100	3100	2.673	0.526	0.896	M5
KF40	OSP-P40	119	346	346	4000	7100	4.167	0.701	1.531	M6
KF50	OSP-P50	170	480	480	4000	7500	7.328	0.936	2.760	M8

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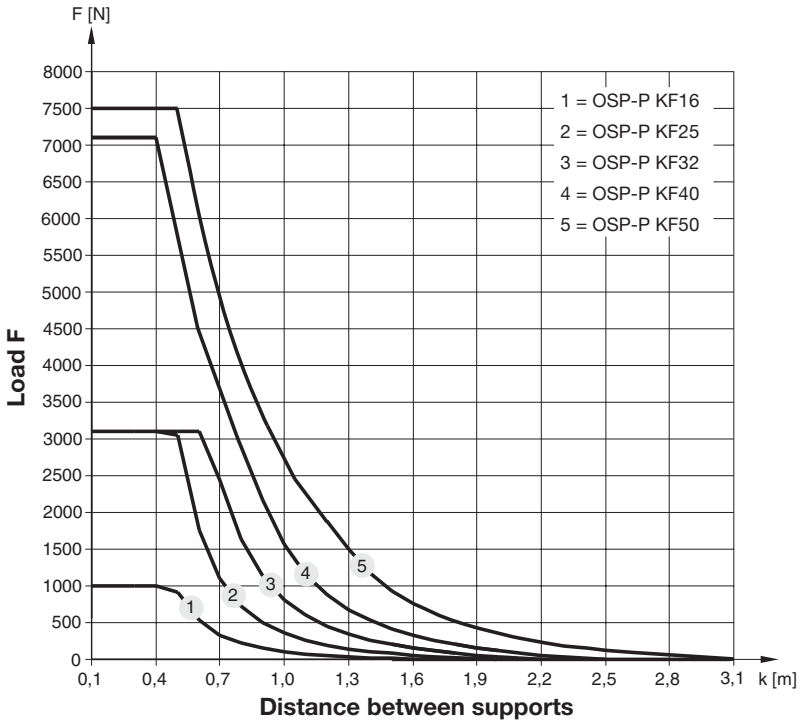
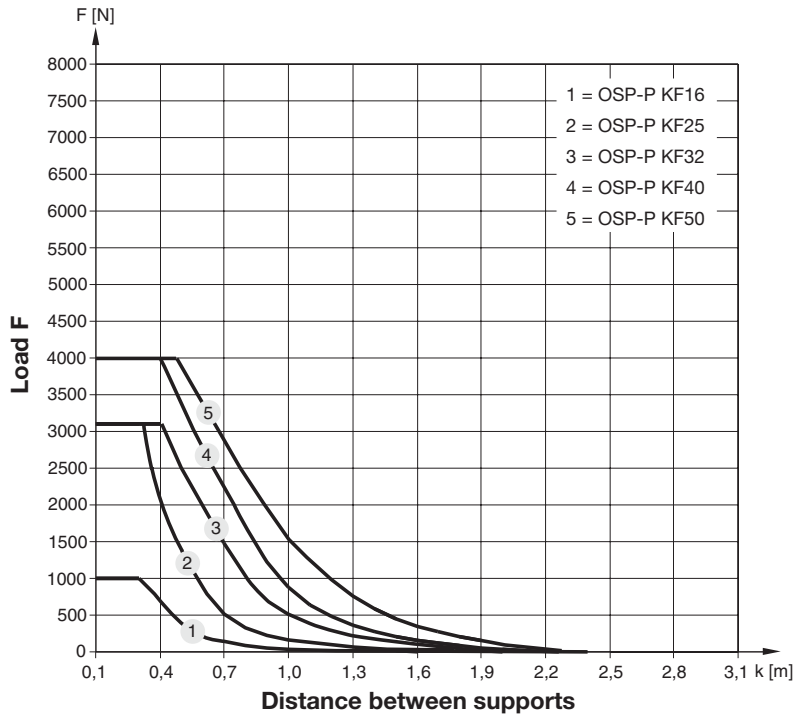
Permissible unsupported length OSP-P KF16 to KF50

Loading 1 – Top carrier



Permissible unsupported length OSP-P KF16 to KF50

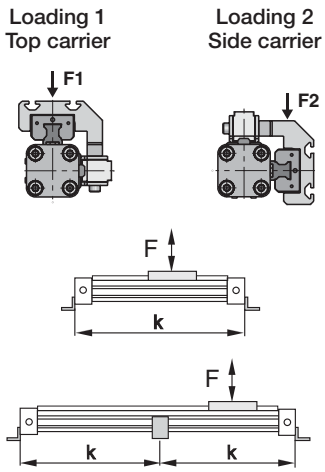
Loading 2 – Side carrier



Mid-section support

Mid-section supports are required from a certain stroke length to prevent excessive deflection and vibration of the linear drive. The diagrams show the maximum permissible unsupported length in relation to loading. A distinction must be drawn between loading 1 and loading 2.

Deflection of 0.5 mm max. between supports is permissible.



Note:

For speeds v > 0.5 m/s the distance between supports should not exceed 1m.

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Variable stop

The variable stop Type VS provides simple stroke limitation.

It can be retrofitted and positioned anywhere along the stroke length. For every cylinder diameter two types of shock absorber are available – see "Shock Absorber Selection" below.

Mid-section supports and magnetic switches can still be fitted on the same side as the variable stop.

Depending on the application, two variable stops can be fitted if required.

Shock absorber selection

The shock absorber is selected in dependence on the mass and speed.

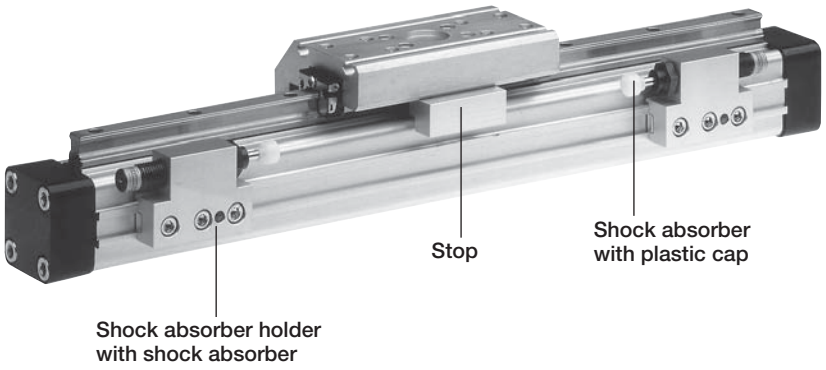
The mass of the carrier itself must be taken into account.

The values relate to an effective driving force of 78 N (6 bar)

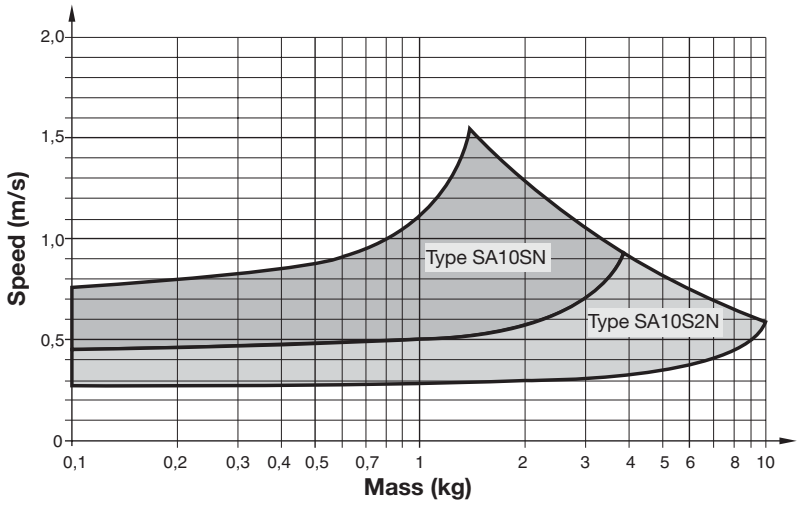
The values relate to an effective driving force of 250 N (6 bar)

Variable stop type VS16 to VS50

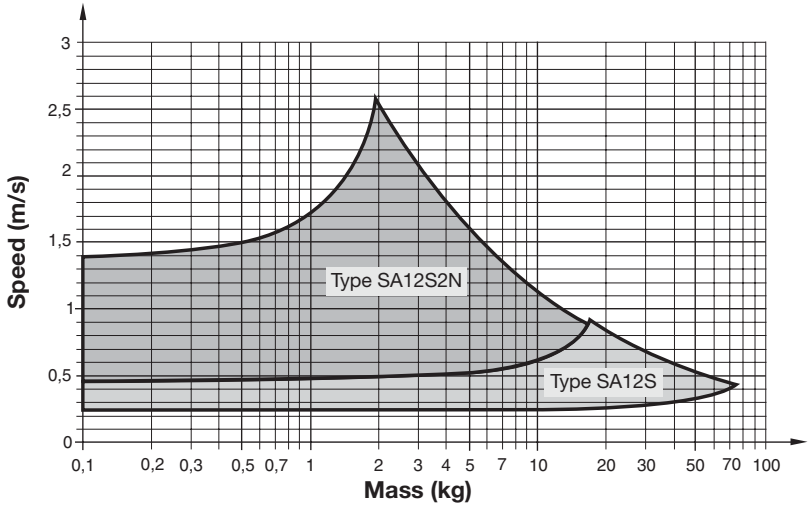
Arrangement with two variable stops



Shock absorber selection in dependence on mass and speed for Series OSP-KF16



Shock absorber selection in dependence on mass and speed for Series OSP-KF25



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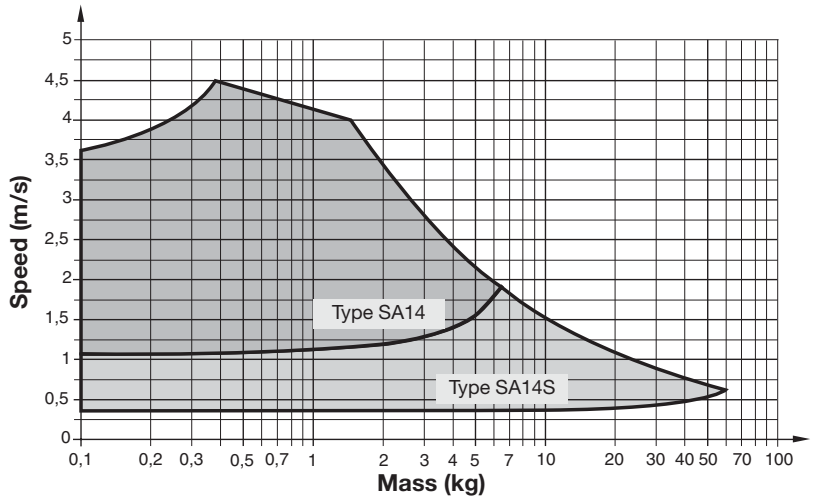
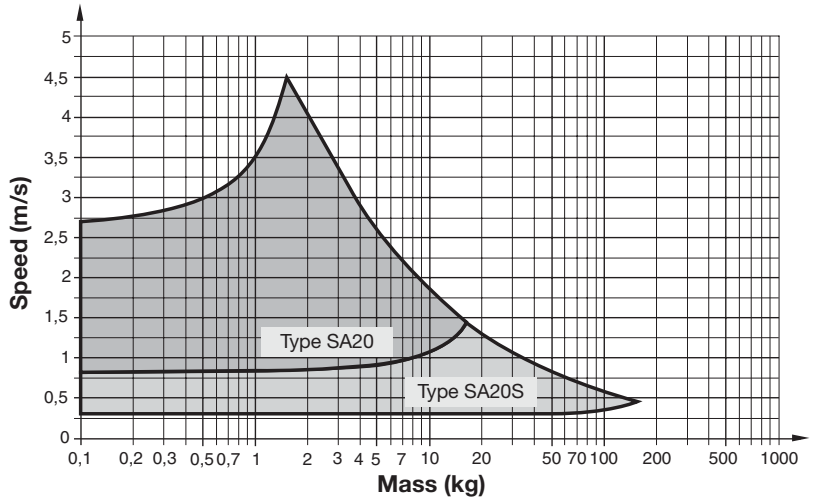
Shock absorber selection in dependence on mass and speed for Series OSP-KF32

The values relate to an effective driving force of 420 N (6 bar)



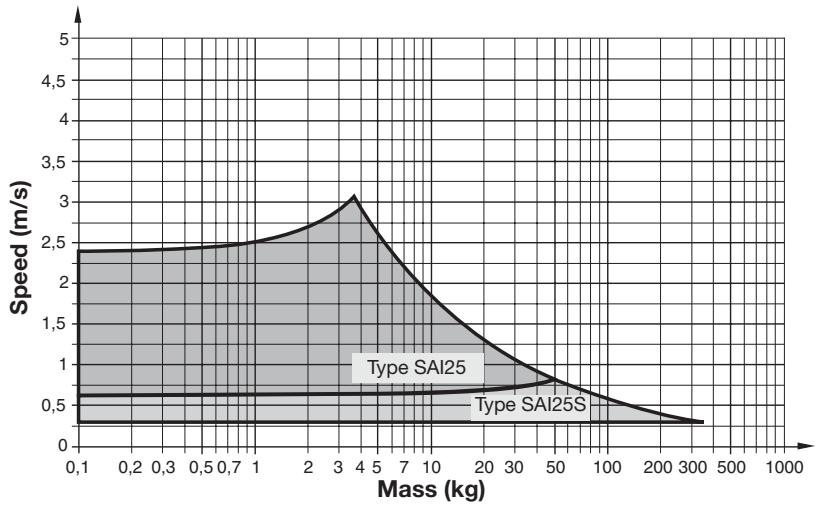
Shock absorber selection in dependence on mass and speed for Series OSP-KF40

The values relate to an effective driving force of 640 N (6 bar)



Shock absorber selection in dependence on mass and speed for Series OSP-KF50

The values relate to an effective driving force of 1000 N (6 bar)



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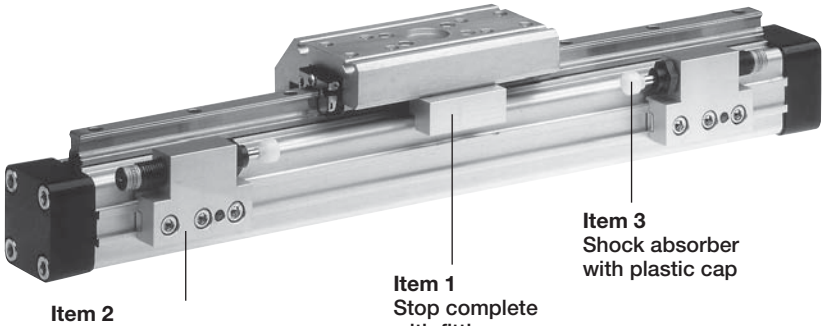
Order information – variable stop type VS16 to VS50



Ordering Information – Variable Stop Type VS16 to VS50

		VS16		VS25		VS32		VS40		VS50	
Item	Description	Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.
1	Stop, complete	–	21186	–	21187	–	21188	–	21189	–	21190
2	Shock absorber holder, complete	–	21201	–	21202	–	21203	–	21204	–	21205
3 *	Shock absorber, standard	SA10	7718	SA12S2N	7723	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA10S	7721	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

Linear Drive Accessories

End cap mounting, Type: B, Ø 16 to 32 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:
Galvanized steel
Anodized aluminum

The mountings are supplied in pairs.

Series	Mounting type	Order number (pair)
OSP-P STL16 OSP-P KF16	B1	21135
	B2	21136
	B3	21137
OSP-P STL25 OSP-P KF25	B1	20311
	B2	21138
	B3	21139
OSP-P STL32 OSP-P KF32	B1	20313
	B2	21140
	B5	21141

End cap mounting, Type: C, Ø 40 to 50 mm

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Material:
Anodized aluminum

The mountings are supplied in pairs.

Series	Mounting type	Order number (pair)
OSP-P STL40 OSP-P KF40	C1	4010
	C2	20338
	C4	20340
OSP-P STL50 OSP-P KF50	C1	5010
	C2	20349
	C3	20350

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Mid-section support, Type: D1ST, Ø 16 to 50

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Note on Types D1ST:
The mid-section support can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.

Series OSP-P	Mounting type	Order number
STL/KF16	D1ST	21125
STL/KF25	D1ST	21126
STL/KF32	D1ST	21127
STL/KF40	D1ST	21128
STL/KF50	D1ST	21129

Mid-section support, Type: E1ST to E5ST

For linear drives with recirculating ball bearing guide

- Series OSP-P STL
- Series OSP-P KF

Type EST1

Type EST2 to EST5

Series OSP-P	Mounting type	Order numbre
STL/KF16	E1ST	21130
STL/KF16	E2ST	21142
STL/KF25	E1ST	21131
STL/KF25	E2ST	21143
STL/KF25	E3ST	21148
STL/KF32	E1ST	21132
STL/KF32	E2ST	21144
STL/KF32	E5ST	21151
STL/KF40	E1ST	21133
STL/KF40	E2ST	21145
STL/KF40	E4ST	21150
STL/KF50	E1ST	21134
STL/KF50	E2ST	21146
STL/KF50	E3ST	21149

End cap mounting, Ø 25 to 50 mm

Correspond to FESTO dimensions HP25 – 50

For linear drives with recirculating ball bearing guide

- Series OSP-P KF

On the end-face of each end cap there are four threaded holes for mounting the actuator.

Material:
Series OSP-P KF25 – 50:
Anodized aluminum.

The mountings are supplied in pairs.

Series	Order number
HP25	21107
HP32	21108
HP40	21109
HP50	21110

Mid-section support, Ø 25-50 mm

Correspond to FESTO dimensions MUP25 – 50

For linear drives with recirculating ball bearing guide

- Series OSP-P KF

Note:

Correspond to FESTO DGPL-KF, when the Mid-Section Support MUP are mounted on the 90° side to the carriage.

Series	Order number
MUP25	21119
MUP32	21120
MUP40	21121
MUP50	21122

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Ordering Instructions / Part Numbering System for OSP-P KF Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	32	0	0	0	0	0	02500	0	0	0	6	0	0	0	0	0

Bore

16
25
32
40
50

Piston style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End face (position #5)
2	Single end porting
3	Left stand (pos #2), right end face (pos #5)
4	Eight stand (pos #2), left end face (pos #5)
6	Single end porting end face
A	3/2 way valve VOE 24V = (25, 32, 40, 50)
B	3/2 way valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 way valve VOE 48V = (25, 32, 40, 50)
E	3/2 way valve VOE 110V~ (25, 32, 40, 50)
S	Special

Note: Single End Porting on 16mm bore, then end caps cannot be rotated.

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow speed
4	Food
5	Clean room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan coated aluminum
3	Xylan coating & stainless steel fasteners
S	Special

Stroke

xxxxx

End Cap Position

0	I+r 0° = In front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the back (pos # 4)
3	I+r 270° = Same face as outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In front (pos #3, 2)
5	I 180° = At the back; r 0° = In front (pos #4, 2)
6	I 270° = Same face as outerband; r 0° = In front (pos #1, 2)
7	I 0° = In front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same face as outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In front; r 180° = At the back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the back (pos #3, 4)
C	I 270° = Same face as outerband; r 180° = At the back (pos #1, 4)
D	I 0° = In front; r 270° = Same face as outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same face as outerband (pos #3, 1)
F	I 180° = At the back; r 270° = Same face as outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
2	VS Soft left
3	VS Hard left
4	VS Soft right
5	VS Hard right
6	VS Soft both sides
7	VS Hard both sides
S	Special

Piston Mountings

0	None

Guides / Brakes

C	KF

add. Carriage

0	Without
C	Guide Carriage KF

Dovetail Cover

0	Standard
X	Without cover rail
S	Special

End Cap Mounts

0	Without
4	B1 (16, 25, 32)
5	B2 (16, 25, 32)
6	B3 (16, 25)
8	B5 (32)
9	C1 (40, 50)
A	C2 (40, 50)
B	C3 (50)
C	C4 (40)
D	HP (25, 32, 40, 50)

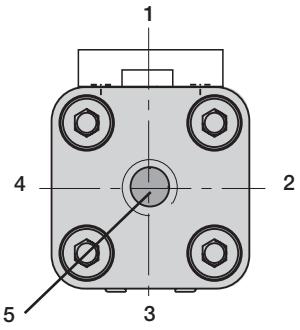
Note: Comes in pairs

Version

Switches Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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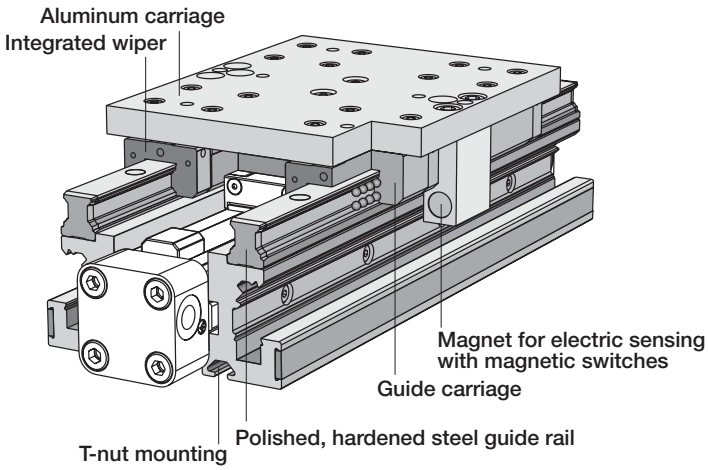
Version with pneumatic linear drive series OSP-P



Heavy Duty-Guide HD

OSP
ORIGA SYSTEM PLUS

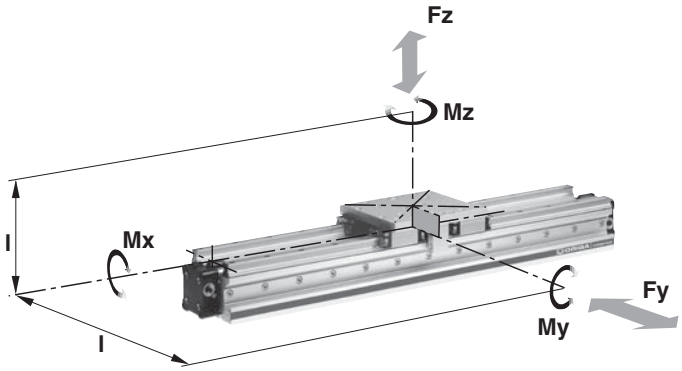
Series HD 25 to 50
for Linear Drive Series OSP-P

Features:

- Guide system: 4-row recirculating ball bearing guide
- Polished and hardened steel guide rail
- For highest loads in all directions
- Highest precision
- Integrated wiper system
- Integrated grease nipples
- Any lengths of stroke up to 3700 mm (longer strokes on request)
- Anodized aluminum guide carriage - dimensions compatible with OSP guide GUIDELINE
- Maximum speed v = 5 m/s

B
Rodless Cylinders Actuator Productd

Loads, forces and moments



Technical data

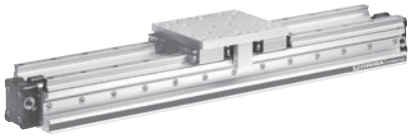
The table shows the maximum permissible loads. If multiple moments and forces act upon the cylinder simultaneously, the following equation applies:

$$\frac{Mx}{Mx_{max}} + \frac{My}{My_{max}} + \frac{Mz}{Mz_{max}} + \frac{Fy}{Fy_{max}} + \frac{Fz}{Fz_{max}} \leq 1$$

The sum of the loads should not exceed >1

The table shows the maximum permissible values for light, shock-free operation, which must not be exceeded even under dynamic conditions.

***Please note:**
the mass of the carriage does not have to be added to the total moving mass when using the cushioning diagram.



Series	For linear drive	Max. moments (Nm)			Max. loads (N)		Mass of the linear drive		
		Mx	My	Mz	Fy	Fz	With guide (kg) with 0 mm stroke	Increase per 100 mm stroke	Mass * guide carriage (kg)
HD 25	OSP-P25	260	320	320	6000	6000	3.065	0.924	1.289
HD 32	OSP-P32	285	475	475	6000	6000	4.308	1.112	1.367
HD 40	OSP-P40	800	1100	1100	15000	15000	7.901	1.748	2.712
HD 50	OSP-P50	1100	1400	1400	18000	18000	11.648	2.180	3.551

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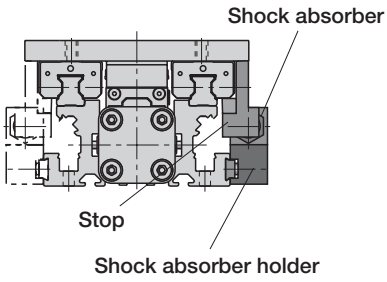
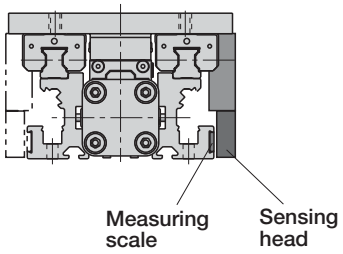
Variable stop Type VS25 to VS50

The variable stop provides simple stroke limitation and can be supplied mounted on the right or left, as required.



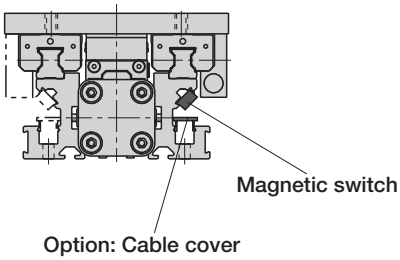
Incremental displacement measuring system ORIGA-Sensoflex

Series SFI-plus can be supplied mounted on the right or left, as required.

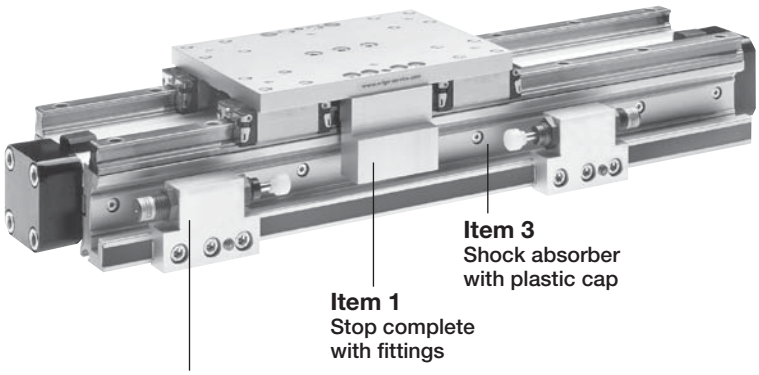


Arrangement of magnetic switches:

Magnetic switches can be fitted anywhere on either side.



Ordering Information – Variable Stop Type VS25 to VS50



Item 3
Shock absorber with plastic cap

Item 1
Stop complete with fittings

Item 2
Shock absorber holder complete with fittings – without shock absorber

Ordering Information

		VS25		VS32		VS40		VS50	
Item	Description	Type	Order no.	Type	Order no.	Type	Order no.	Type	Order no.
1	Stop, complete	–	21257	–	21258	–	21259	–	21260
2	Shock absorber holder, complete	–	21202	–	21203	–	21204	–	21205
3 *	Shock absorber, standard	SA12	7706	SA14	7708	SA20	7710	SAI25	7712
	Shock absorber, version S	SA12S	7707	SA14S	7709	SA20S	7711	SAI25S	7835

* Shock absorber with plastic cap

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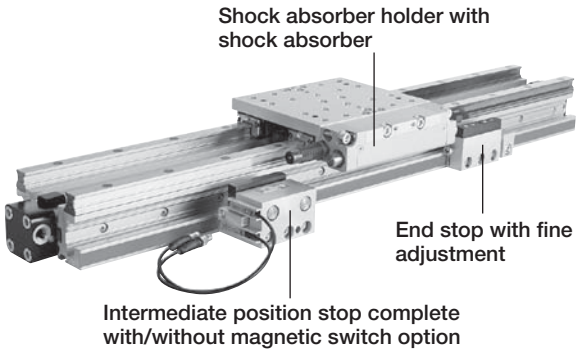
Intermediate stop module Type ZSM..HD

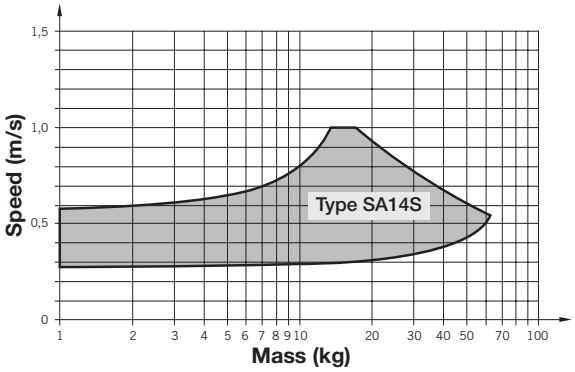


Technical data

Temperature range	-10°C to +70°C
Operating pressure range	4 – 8 bar
Intermediate position grid	85 mm

Shock absorber Type SA14S

The values relate to an effective driving force of 250 N (6 bar)



Intermediate stop module

The intermediate stop module ZSM allows the guide carriage to stop at any desired intermediate positions with high accuracy. It can be retrofitted. Depending on the application, i.e. the number of intermediate stops, one or more intermediate position stops can be used. The intermediate position stops can be retracted and extended without the need for the guide carriage to be moved back out of position.

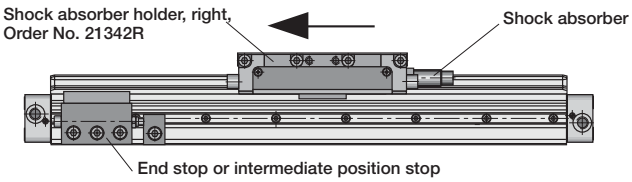
Therefore the guide carriage can be made to stop at the defined intermediate positions in any order.

ORIGA intermediate stop module ZSM:

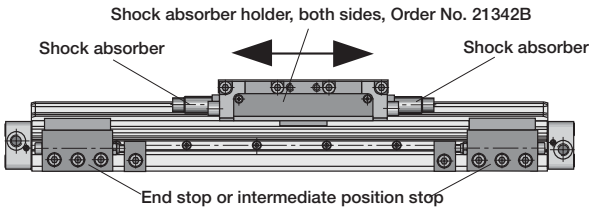
- Allows stopping at any intermediate positions
- Intermediate position stops can be located steplessly anywhere along the whole stroke length
- Movement to the next position without reverse stroke
- Compact unit
- Cost-effective positioning module without electrical or electronic components
- Option: end stop with fine adjustment

Shock absorber arrangement in dependence on direction of movement

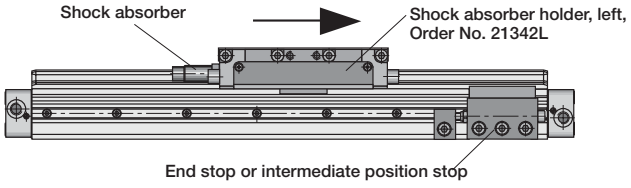
From right to left



In both directions



From left to right



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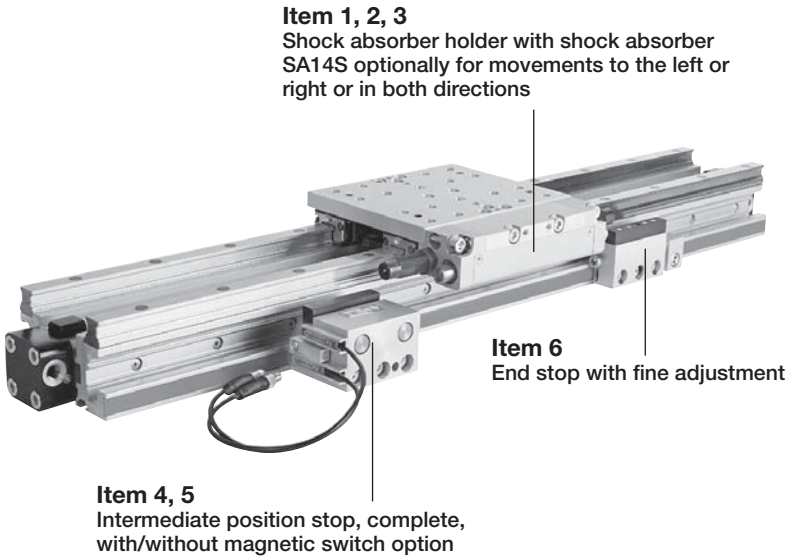

Illustration shows version with shock absorber holder for movement in both directions and magnetic switch option with T-slot switches.

Ordering Information – intermediate stop module Type ZSM..HD

Item	Description	For intermediate stop module	Order number
1*	Shock absorber holder with shock absorber SA14S, both sides	**ZSM25HD**	**21342B**
2*	Shock absorber holder with shock absorber SA14S, left	**ZSM25HD**	**21342L**
3*	Shock absorber holder with shock absorber SA14S, right	**ZSM25HD**	**21342R**
4	Intermediate position stop complete, without magnetic switch option	**ZSM25HD**	**21343**
5	Intermediate position stop complete, with magnetic switch option	**ZSM25HD**	**21344**
6	End stop with fine adjustment	**ZSM25HD**	**21346**

* The shock absorbers are installed in the shock absorber holder and adjusted in our workshop.

Note:
For movement onwards from the intermediate position, the intermediate position stop must advance.

The intermediate position stop can only advance if both cylinder chambers of the OSP-P cylinder are pressurized.

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Ordering Information / Part Numbering System for OSP-P HD Series

6	7	8	9	10	11	12-16	17	18	19	20	21	22	23	24	25
OSPP	50	0	0	0	0	0	02500	0	0	0	6	0	0	0	0	0

Bore

25
32
40
50

Piston Style

0	Standard
1	Tandem
S	Special

Air Connections / Porting

0	Standard (position #2)
1	End face (position #5)
2	Single end porting
3	Left stand (pos #2), right end face (pos #5)
4	Eight stand (pos #2), left end face (pos #5)
6	Single end porting end face
A	3/2 way valve VOE 24V = (25, 32, 40, 50)
B	3/2 way valve VOE 220V~/110V = (25, 32, 40, 50)
C	3/2 way valve VOE 48V = (25, 32, 40, 50)
E	3/2 way valve VOE 110V~ (25, 32, 40, 50)
S	Special

Seals

0	Standard
1	Viton
S	Special

Lubrication

0	Standard
1	Slow speed
4	Food
5	Clean room
S	Special

Corrosion Resist, Hardware

0	Standard
1	Stainless
2	Xylan Coated Aluminum
3	Xylan Coating & Stainless Steel Fasteners
S	Special

Stroke

x x x x x

End Cap Position

0	I+r 0° = In front (pos #2)
1	I+r 90° = Underneath (pos #3)
2	I+r 180° = At the back (pos # 4)
3	I+r 270° = Same face as outerband (pos #2, 1)
4	I 90° = Underneath; r 0° = In front (pos #3, 2)
5	I 180° = At the back; r 0° = In front (pos #4, 2)
6	I 270° = Same face as outerband; r 0° = In front (pos #1, 2)
7	I 0° = In front; r 90° = Underneath (pos #2, 3)
8	I 180° = At the back; r 90° = Underneath (pos #4, 3)
9	I 270° = Same face as outerband; r 90° = Underneath (pos #1, 3)
A	I 0° = In front; r 180° = At the back (pos #2, 4)
B	I 90° = Underneath; r 180° = At the back (pos #3, 4)
C	I 270° = Same face as outerband; r 180° = At the back (pos #1, 4)
D	I 0° = In front; r 270° = Same face as outerband (pos #2, 1)
E	I 90° = Underneath; r 270° = Same face as outerband (pos #3, 1)
F	I 180° = At the back; r 270° = Same face as outerband (pos #4, 1)
S	Special

Cushioning / Stops

0	Standard
2	VS Soft left
3	VS Hard left
4	VS Soft right
5	VS Hard right
6	VS Soft both sides
7	VS Hard both sides
S	Special

Piston Mountings

0	None

Guides / Brakes

C	HD Heavy Duty

add. Carriage

0	Without
C	Guide carriage heavy duty HD

Dovetail Cover

0	Standard
X	Without cover rail
S	Special

End Cap Mounts

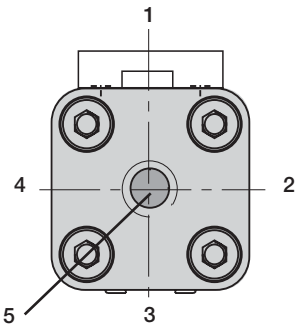
0	Without

Version

Switches Measuring System

0	None
1	NO Reed - KL3045 Qty. 2
2	NC Reed - KL3048 Qty. 2
3	PNP KL3054+4041 Qty. 2
4	NPN KL3060+4041 Qty. 2
X	21240 SFI 0.1mm
Y	21241 SFI 1mm
Z	4650 SFA
S	Special

Note: 2 switches will be supplied. For different quantity, please order as a separate line item.



Note: Position #2 is the standard location.

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Linear Drive Accessories

ø 10-80 mm Magnetic Switches

OSP
ORIGA SYSTEM PLUS

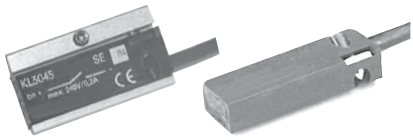
For electrical sensing of the carrier position, e.g. at the end positions, magnetic switches may be fitted.

Position sensing is contactless and is based on magnets fitted as standard to the carrier. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all PARKER-ORIGA OSP-Actuators and aluminum profile rod type cylinders.

Piston, speed and switching distance affect signal duration and should be considered in conjunction with the minimum reaction time of ancillary control equipment.

$$\text{Min. reaction time} = \frac{\text{Switching distance}}{\text{Piston speed}}$$



Characteristics

Characteristics	Unit	Description	
Electrical characteristics		**Type RS**	**Type ES**
Switching output		Reed	PNP, NPN
Operating voltage	V	10-240 AC/DC (NO) 10-150 AC/DC (NC)	10-30 DC
Residual voltage	V	< 3	< 3
Connection		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	200	200
Max. Switching capacity	VA (W)	10 VA	—
Power consumption without load	mA	—	< 20
Function indicator		LED, yellow	
Typical switching time	ms	On: < 2	On: < 2
Switch-off delay	ms	—	ca. 25
Pole reversal does not work		LED	—
Pole reversal protection		—	Built in
Short-circuit protection		—	Built in
Switchable capacity load		µF	0.1 at 100 W, 24 VDC
Switching point accuracy	mm	± 0,2	
Switching distance	mm	ca. 15	ca. 15
Hysteresis for OSP	mm	ca. 8	ca. 3
Lifetime		3 x 106, up to 6 x 106 cycles	Theoretically unlimited
Mechanical characteristics			
Housing		Makrolon, smoke color	
Cable cross section	mm2	2 x 0.14	3 x 0.14
Cable type*		PVC	PUR, black
Bending radius fixed	mm	≥ 20	
Moving	mm	≥ 70	
Weight (Mass)	kg	0.012	
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range*†	°C	-25°C Other temperature ranges +80°C on request	
Shock resistance	m/s2	100 (contact switches)	500

* Other versions on request

† For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.

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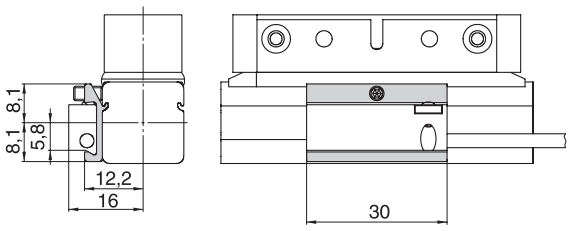
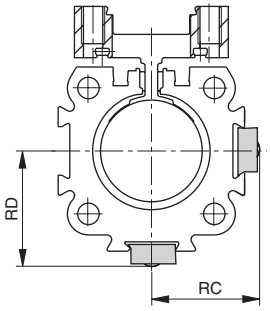
Dimensions series OSP-P10



Dimensions series OSP-P16 to P80



Note:
Sensors can not be mounted directly opposite of the carrier

Dimensions (mm) and Ordering Information

	Dimensions		Order number						
			RS closer	RS opener	ES		ES Complete with 5 m cable		Adapter
Series	RC	RD	Normally open	Normally closed	PNP	NPN	PNP	NPN	Only for OSP-P10
OSP-P10	–	–							
OSP-P16	20	20.5							
OSP-P25	25	27							
OSP-P32	31	34	**Type: RS-K KL3045**	**Type: RS-K KL 3048**	**Type: ES-S KL 3054**	**Type: ES-S KL 3060**	**Type: ES-S KL 3054 + 4041**	**Type: ES-S KL 3060 + 4041**	**20968** please order separately
OSP-P40	36	39							
OSP-P50	43	48							
OSP-P63	53	59							
OSP-P80	66	72							
Cable 5 m with connector and with open end for magnetic switches Type ES-S					**4041**				

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Linear Drive Accessories

ø 10-80 mm Magnetic Switches for T-Slot

OSP
ORIGA SYSTEM PLUS

Series **RST**
EST

Magnetic switches are used for electrical sensing of the position of the piston, e.g. at its end positions. They can also be used for sensing of intermediate positions.

Sensing is contactless, based on magnets which are built-in as standard. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all PARKER-ORIGA OSP-Actuators and aluminum profile rod type cylinders.

1) For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.

Characteristics

Characteristics	Unit	Description	
Electrical characteristics		**Type RST**	**Type EST**
Switching output		Reed	PNP
Operating voltage	V	10-30 AC/DC	10-30 DC
Ripple		—	≤ 10%
Voltage drop	V	≤ 3	≤ 2
Electrical configuration		Two wire	Three wire
Output function		normally open normally closed	normally open
Permanent current	mA	≤ 100	≤ 100
Breaking capacity	W	≤ 6 peak	—
Power consumption at UB = 24V, switched on, without load	mA	—	≤ 10
Function indicator		LED, yellow (not for normally closed)	
Response time	ms	≤ 2	≤ 0.5
Sensitivity	mT	2 – 4	2 – 4
Time delay before availability	ms	—	≤ 2
Reverse polarity protection		Yes	Yes
Short-circuit protection		No	Yes (pulsed)
Switchable capacity load	µF	0.1 at 100 W, 24 VDC	
Switching frequency	Hz	≤ 400	≤ 5k
Repeatability	mm	≤ 0.2	≤ 0.2
Hysteresis	mm	≤ 1.5	≤ 1.5
EMC	EN	60947-5-2	
Lifetime		≥ 35 Mio. cycles with PLC load	Unlimited
Power-up pulse suppression		—	Yes
Protection for inductive load		—	Yes
Mechanical characteristics			
Housing		Plastic / PA66 + PA6I red	
Cable cross section	mm2	2 x 0.14	3 x 0.14
Cable type*		PUR, black	PUR, black
Bending radius	mm	≥ 36	≥ 30
Weight (Mass)	kg	ca. 0.030 RST-K ca. 0.010 RST-S	ca. 0.030 EST-K ca. 0.010 EST-S
Degree of protection	IP	67 to DIN EN 60529	
Ambient temperature range*†	°C	-25°C to +80°C	-25°C to +75°C at UB=10 – 30 V -25°C to +80°C at UB=10 – 28 V
– with adapter	°C	-25°C to +60°C	
Adapter tightening torque	Nm	0.15 (tightening torque of screwing adapter onto magnetic switch)	
Shock resistance			
Vibration to EN 60068-2-6	G	15, 11 ms, 10 to 55 Hz, 1 mm	
Shock to EN 60068-2-27	G	50, 11 ms	
Bump to EN 60068-2-29	G	30, 11 ms, 1000 bumps each axis	

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Ordering Information

Version	Voltage	Type	Order number
Magnetic switch, reed contact, normally open, LED indicator, cable 2 m	10-30 V AC / DC	**RST-K**	**KL 3301**
Magnetic switch, reed contact, normally open, LED indicator, cable 5 m	10-30 V AC / DC	**RST-K**	**KL 3300**
Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	**RST-S**	**KL 3302**
Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24 m	10-30 V AC / DC	**RST-S**	**KL 3303**
Magnetic switch, reed contact, normally closed, cable 5 m	10-30 V AC / DC	**RST-K**	**KL 3305**
Magnetic switch, electronic, PNP LED indicator, cable 2 m	10-30 V DC	**EST-K**	**KL 3308**
Magnetic switch, electronic, PNP LED indicator, cable 5 m	10-30 V DC	**EST-K**	**KL 3309**
Magnetic switch, electronic, PNP snap connector M8, LED indicator	10-30 V DC	**EST-S**	**KL 3312**
Magnetic switch, electronic, PNP screw connector M8, LED indicator	10-30 V DC	**EST-S**	**KL 3306**

Included in delivery: 1 magnetic switch
1 adapter for dovetail groove mounting

Accessories

Description	Type	Order number
Cable M8, 2.5 m without lock nut	**KS 25**	**KY 3240**
Cable M8, 5.0 m without lock nut	**KS 50**	**KY 3241**
Cable M8, 10.0 m without lock nut	**KS 100**	**KY 3140**
Cable M8, 2.5 m with lock nut	**KSG 25**	**KC 3102**
Cable M8, 5.0 m with lock nut	**KSG 50**	**KC 3104**
Adapter for dovetail groove (pack of 10)		**KL 3333**

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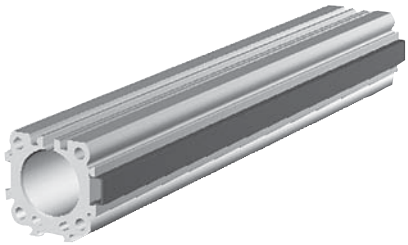
Linear Drive Accessories

ø 16-80 mm Dovetail Cover



For clean guidance of magnetic switch cables along the cylinder body.

Contains a maximum of 3 cables with diameter 3 mm.

Ordering Information

Series	Order number
OSP-P16	**13039** Minimal length: 1m Max. profile length: 2m Multiple profiles can be used.
OSP-P25	
OSP-P32	
OSP-P40	
OSP-P50	
OSP-P63	
OSP-P80	

Material .....Plastic
Color..... Red
Temperature range .....–10 to +80°C

Service Packs

		Bore sizes						
		16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA service pack - Single piston	Part number	**11111**	**11112**	**11113**	**11114**	**11115**	**11116**	**11118**
Viton service pack - Single piston	Part number	**11121**	**11122**	**11123**	**11124**	**11125**	**11126**	**11128**
BUNA service pack - Single piston - Slow speed grease	Part number	**11131**	**11132**	**11133**	**11134**	**11135**	**11136**	**11138**
Viton service pack - Single piston - Slow speed grease	Part number	**11141**	**11142**	**11143**	**11144**	**11145**	**11146**	**11148**

*Behind part number, please add stroke length in mm

Service pack information
Service Packs, containing all the components necessary to completely rebuild a Parker-Origa rodless cylinder, are available. Each pack contains a complete seal kit, inner and outer bands, Parker-Origa grease tube, cleaning tool and repair instructions. It's all packaged in an easy-to-ship, easy-to-store box clearly labeled to indicate the cylinder type, bore and stroke for which it is intended. Contact your local Parker-Origa distributor for more information.

Seal Kits

		Bore sizes						
		16mm	25mm	32mm	40mm	50mm	63mm	80mm
BUNA seal kit - Standard cylinder	Part number	**11052**	**11053**	**11054**	**11055**	**11056**	**11057**	**11058**
Viton seal kit - Standard cylinder	Part number	**11059**	**11060**	**11061**	**11062**	**11063**	**11064**	**11065**
Seal kit - Sideline carriage	Part number	**11066**	**11067**	**11068**	**11069**	**11070**	**–**	**–**
Seal kit active brake - Standard cylinder	Part number	**–**	**11822**	**11823**	**11824**	**11825**	**11826**	**11827**
Seal kit - Multibrake	Part Number	**–**	**11089**	**11090**	**11091**	**11092**	**11093**	**–**

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Characteristics

Characteristics	Unit	Description	
Type		21210	21211
Output function			
Resolution	mm	0.1	1
Pole lengths magnetic scale	mm	5	
Maximum speed	m/s	10	
Repeat accuracy		± 1 Increment	
Distance between sensor and scale	mm	≤ 4	
Tangential deviation		≤ 5°	
Lateral deviation	mm	≤ ± 1.5	
Switching output		PNP	
Electrical Characteristics			
Operating voltage Ub	V DC	18 – 30	
Voltage drop	V	≤ 2	
Continuous current for each output	mA	≤ 20	
Power consumption at Ub = 24V, switched on, without load	mA	≤ 50	
Short-circuit protection		yes	
Reverse polarity protection			yes
Protection from inductive load		yes	
Power-up pulse suppression		yes	
EMC			
Electrostatic discharge immunity	kV	6, B, to EN 61000-4-2	
Electromagnetic field immunity	V/m	10, A, to EN61000-4-3	
Electrical fast transient/burst immunity (for signal connections)	kV	1, B, to EN 61000-4-4	
Electrical fast transient/burst immunity (for DC connections)	kV	2, B, to EN 61000-4-4	
Surge immunity (for signal connections)	kV	1, B, to EN 61000-4-5	
Surge immunity (for DC connections)	kV	0,5, B, to EN 61000-4-5	
Immunity to conducted disturbances	V	10, A, to EN 61000-4-6	
Power frequency magnetic field immunity at 50 Hz	A/m	30, A, to EN 61000-4-8	
Emission standard for residential		to EN 61000-6-4	
Radio disturbance characteristics		to EN 55011, Group 1, A	
Mechanical characteristics			
Housing		Aluminum	
Cable length	m	5.0 – fixed, open end	
Cable cross section	mm^2	4 x 0.14	
Cable type		PUR, black	
Bending radius	mm	≥ 36	
Weigth (mass)	kg	ca. 0.165	
Environmental conditions / Shock resistance			
Degree of protection	IP	67 to EN60529	
Ambient temperature range	°C	-25 to +80	
Broad-band random vibration to EN 60068-2-64	g	5, 5 Hz to 2 kHz, 0.5 h each axis	
Vibration stress to EN 60068-2-6	g	12, 10 Hz to 2 kHz, 2 mm, 5 h each axis	
Shock to EN 60068-2-27	g	100, 6 ms, 50 bumps each axis	
Bump to EN 60068-2-29	g	5, 2 ms, 8000 bumps each axis	

Displacement Measuring System

Displacement measuring system for automated movement

ORIGA-Sensoflex

(Incremental displacement measuring system)

Series SFI-plus for cylinder series
- OSP-P...

Characteristics
- Contactless magnetic displacement measurement system
- Displacement length up to 32 m
- Resolution 0.1 mm (option: 1 mm)
- Displacement speed up to 10 m/s
- For linear and non-linear rotary motion

Suitable for almost any control or display unit with a counter input

Note
For combinations Active Brake AB + SFI-plus + Magnetic Switch contact our technical department please.

The SFI-plus magnetic displacement measuring system consists of 2 main components.

- **Measuring Scale**
  Self-adhesive magnetic measuring scale
- **Sensing Head**
  Converts the magnetic poles into electrical signals which are then processed by counter inputs downstream
  (e.g. PLC, PC, digital counter)

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Sensing head

The sensing head provides two pulsating, 90° out of phase counter signals (phase A/B) with a 0.4 mm resolution (option 4 mm).

External processing can improve the resolution to 0.1 mm (option 1 mm).

The counting direction can be determined automatically from the phase variance of the counter signals.

Electrical connection

Color	Description
bn = brown	+ DC
bu = blue	– DC
bl = black	Phase A
wt = white	Phase B

SFI-plus mounted on a rodless cylinder series OSP-P

The SFI-plus system can be mounted directly on a rodless OSP-P cylinder with the special mounting kit.

The position of the sensing head is generally 90° to the carrier.

Combinations consisting of SFI-plus and OSP-P Cylinders with guides are available on request.

Ordering Information

Description	Order number
Sensing head with measuring scale – Resolution 0.1 mm (scale length = required measuring distance + a minimum of – see table below)	**21240**
Option: Sensing head with measuring scale – Resolution 1 mm (scale length = required measuring distance + a minimum of – see table below)	**21241**
Sensing head – Resolution 0.1 mm (spare part)	**21210**
Option: Sensing head – Resolution 1 mm (spare part)	**21211**
Measuring scale per meter (spare part)	**21235**
Mounting kit for OSP-P25	**21213**
Mounting kit for OSP-P32	**21214**
Mounting kit for OSP-P40	**21215**
Mounting kit for OSP-P50	**21216**
Mounting kit for OSP-P63	**21217**
Mounting kit for OSP-P80	**21218**

* Overall length of the measuring scale results from stroke length of the cylinder + dead length
Dead length for linear drives series OSP-P see table.

Example:
Cylinder OSP-P, Ø25 mm, stroke length 1000 mm

Dead length	+ Stroke length	= Overall length of the measuring scale
154 mm	**+1000 mm**	**= 1154 mm**

Series	Dead length (mm)
OSP-P 25	154
OSP-P 32	196
OSP-P 40	240
OSP-P 50	280
OSP-P 63	350
OSP-P 80	422

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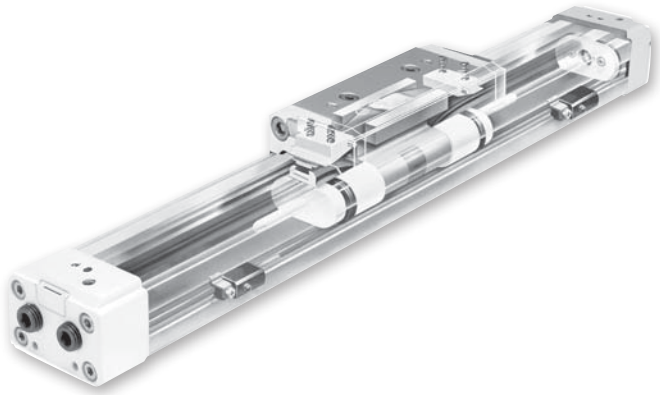
- 7 Bore Sizes – 16mm through 63mm
- Two Port Locations Standard
- Large Carriage for Stability
- Integral Sensor Mounting Rail
- Optional Adjustable Stroke and Shock Absorbers



Ordering Information

P1X	N	032	D	A	N	0500	W	D	N	N	N	-B

Series

P1X	Global Rodless

Construction

N	Inch
M	Metric

Bore Size

016	16mm
020	20mm
025	25mm
032	32mm
040	40mm
050	50mm
063	63mm

Carriage

D	Double acting

Piston / Shock Style

A	Cushions both ends (standard)
R	Cushion right end only*
L	Cushion left end only*
N	No cushions or shock absorbers
H	Shock absorber both ends**
B	Shock absorber right end only**
C	Shock absorber left end only**

* As viewed from port side of cylinder
** Cannot be combined with inverted carriage

Seal Material

N	Standard

Stroke Length*

Basic or Options

B†	Standard
W†	With options
/	Special (for factory use only)

Carriage Mounting Style

Standard	Inverted	Carriage Mounting
D (std)	J	Single, Basic Mount
A	G	Single, Swivel Mount

Porting Options

N	NPTF
G	BSPP
Q	BSPT*

* Not available with N construction

Mounting Options

No Foot Mount	End Mount Foot Bracket	Bottom Mount Foot Bracket	Intermediate Supports
N	F	A††	No support
H	M	B††	One support
K	P	C††	Two supports
T	R	D††	Three supports

Fastener Type

N	Standard - zinc-plated
S	Stainless steel

* Stroke is ALWAYS in mm.
† When "B" is specified, the remaining digits in the part number are not necessary. If "W" is used, the remaining digits in the part number must be filled out.
†† Not available on 40, 50 and 63mm bore sizes.

Essential Information
Optional Features

Sensors
For sensors see page B296.

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Specifications

Model	P1X (Standard w/switch)			
Operating medium	Compressed air			
Maximum pressure	100 PSI (7 bar)			
Minimum pressure	Ø16, Ø20 bores	29 PSI (2 bar)		
	Ø25, Ø32, Ø40 bores	14.5 PSI (1 bar)		
	Ø50, Ø63 bores	7 PSI (0.5 bar)		
Proof pressure	152 PSI (10.5 bar)			
Bore size mm (inch nominal)	16 (5/8)	20 (3/4), 25 (1)	32 (1-1/4), 40 (1-1/2)	50 (2), 63 (21/2)
Port size – N series	M5 (10-32)	1/8 NPT	1/4 NPT	3/8 NPT
Port size – M series	M5 (10-32)	1/8 Rc	1/4 Rc	3/8 Rc
Ambient temperature °F (°C)	40 to 140°F (5 to 60°C)			
Stroke tolerance in.	±0.080 to 39"	±0.100 to 118"	±0.120 to 196"	
Piston speed, *in./sec.	2-80 IPS with side ports on each end (Ø16 & Ø20 bores 2-40 IPS with single end porting with 39" stroke) (Ø25, Ø32, Ø40, Ø50 & Ø63 bores 2-40 IPS with single end porting with 78" stroke)			
Cushion	Air cushion standard			
Lubrication	Not required (if you choose to lubricate your system, continuing lubrication will be required.)			

*Actual piston speed with one end ports will vary depending on stroke length.

Weight & theoretical force characteristics

		Weights								Theoretical force (lbs)				
		Weight at zero stroke						Weight per 1" (25.4mm) stroke		At pressure (PSI)				
	Area	M00		MLB		MLB1								
Bore	in²	lbs	kg	lbs	kg	lbs	kg	lbs	kg	30	40	60	80	100
16	0.31	0.70	0.3	0.73	0.3	0.77	0.4	0.07	0.03	9	12	19	25	31
20	0.49	1.15	0.5	1.19	0.5	1.28	0.6	0.10	0.04	15	20	29	39	49
25	0.84	2.21	1.0	2.43	1.1	2.43	1.1	0.15	0.07	23	30	46	61	76
32	1.26	3.31	1.5	3.53	1.6	3.75	1.7	0.20	0.09	38	50	69	100	125
40	1.96	5.29	2.4	5.51	2.5	—	—	0.27	0.12	59	78	117	156	195
50	3.08	7.94	3.6	8.16	3.7	—	—	0.40	0.18	91	122	182	243	304
63	4.86	13.67	6.2	14.33	6.5	—	—	0.63	0.28	145	193	290	386	483

Moments

Figure 1 shows the maximum allowable moments for each of the three types of loading: pitch, roll and yaw.

The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable (Figure 2) and factored into the equation.

Horizontal mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Figure 1

Maximum allowable moments n-m (lb-in)

	[M]		[Ms]		[Mv]	
Bore	Pitch moment		Roll moment		Yaw moment	
size	Std.	Inverted	Std.	Inverted	Std.	Inverted
16	5 (44)	3.5 (31)	1 (9)	0.5 (4)	1 (9)	1 (9)
20	10 (89)	7 (62)	1.5 (13)	0.7 (6)	3 (27)	3 (27)
25	17 (150)	12 (106)	5 (44)	2.5 (22)	10 (89)	10 (89)
32	36 (319)	25 (221)	10 (89)	5 (44)	21 (186)	21 (186)
40	77 (682)	54 (478)	23 (204)	11.5 (102)	26 (230)	26 (230)
50	154 (1363)	108 (956)	32 (283)	16 (142)	42 (372)	42 (372)
63	275 (2434)	193 (1708)	52 (460)	26 (230)	76 (673)	76 (673)

Figure 2

Bore	Max. allowable load [L] N (lbs)		Max. unsupported length mm (in)
size	Std.	Inverted	at max. load
16	141 (32)	70 (16)	450 (17.7)
20	198 (45)	101 (23)	551 (21.7)
25	356 (81)	180 (41)	899 (35.4)
32	616 (140)	308 (70)	749 (29.5)
40	959 (218)	480 (109)	1000 (39.4)
50	1456 (331)	726 (165)	1300 (51.2)
63	2297 (522)	1148 (261)	1600 (63.0)

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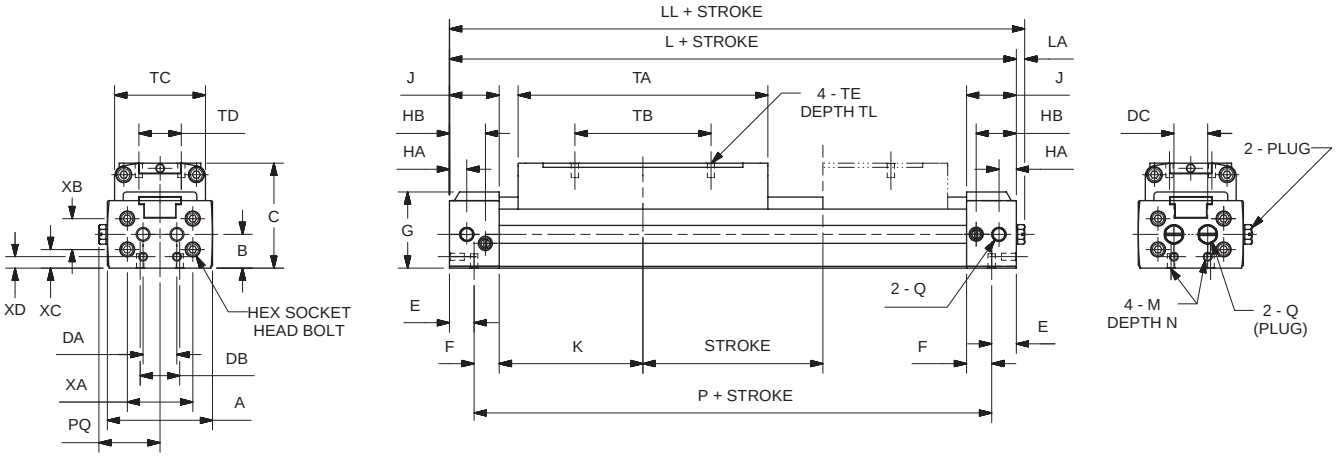
Basic cylinder



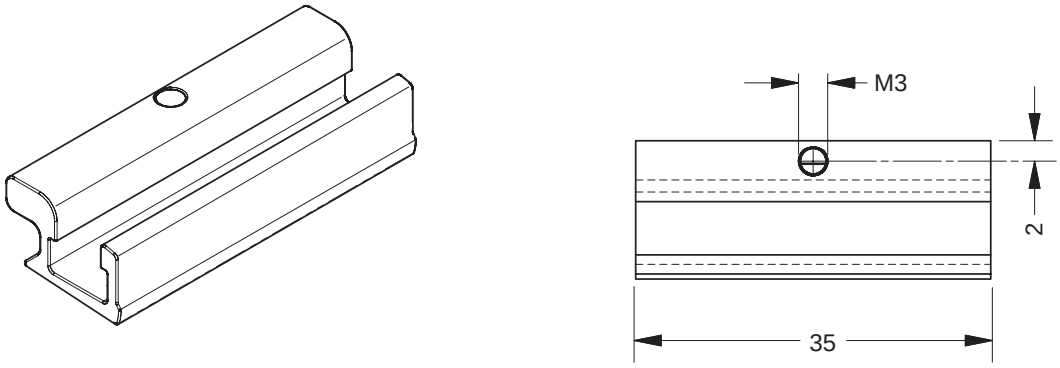
Bore (mm)	A	B	C	DA	DB	DC	E	F	G	HA	HB	J	K	L	LL	LA	M	N
16	1.46 (37)	0.47 (12)	1.46 (37)	0.47 (12)	0.55 (14)	0.47 (12)	0.34 (8.5)	0.35 (9)	1.06 (27)	0.24 (6)	0.55 (14)	0.69 (17.5)	2.24 (57)	5.87 (149)	5.98 (152)	0.12 (3)	5-40 (M3)	0.20 (5)
20	1.73 (44)	0.55 (14)	1.65 (42)	0.55 (14)	0.63 (16)	0.63 (16)	0.41 (10.5)	0.45 (11.5)	1.22 (31)	0.34 (8.5)	0.73 (18.5)	0.87 (22)	2.46 (62.5)	6.65 (169)	6.75 (171.5)	0.10 (2.5)	8-32 (M4)	0.26 (6.5)

Bore (mm)	P	PQ	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XD
16	5.20 (132)	0.83 (21)	10-32 NPT (M5)	3.47 (88)	1.89 (48)	1.26 (32)	0.59 (15)	5-40 (M3)	0.20 (5)	0.91 (23)	0.43 (11)	0.26 (6.5)	0.16 (4)
20	5.83 (148)	0.97 (24.5)	1/8 NPT (1/8 Rc)	3.94 (100)	2.36 (60)	1.50 (38)	0.71 (18)	8-32 (M4)	0.24 (6)	1.10 (28)	0.63 (16)	0.24 (6)	0.20 (5)

inches (mm)

Sensor adapter bracket

Part number P8S-TMA0Y
(Shown larger than actual size)



NOTE: Must be ordered separately when ordering sensors.

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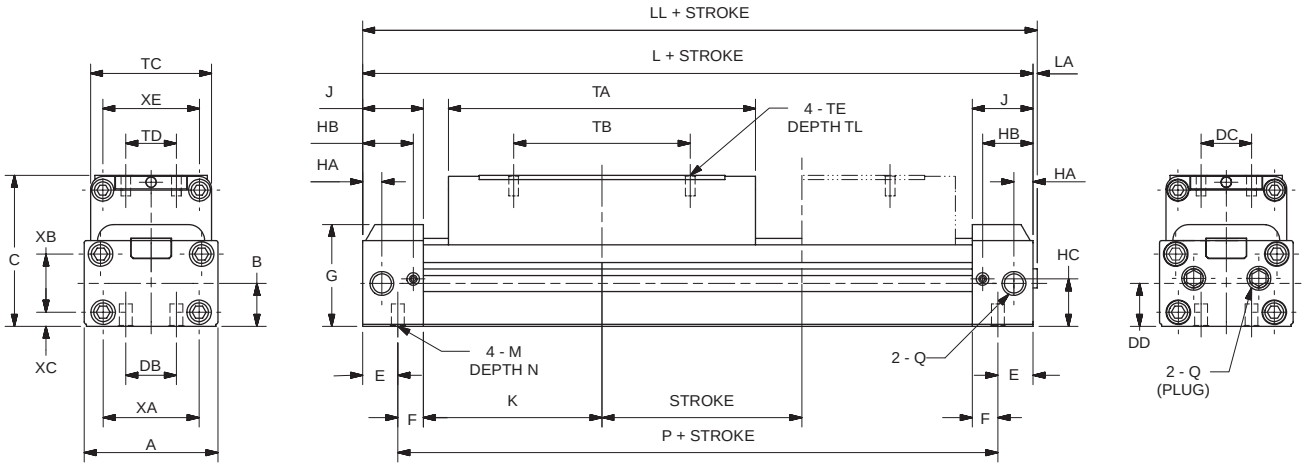
Basic cylinder



Bore (mm)	A	B	C	DB	DC	DD	E	F	G	HA	HB	HC	J	K	L	LL	LA	M	N
25	2.09 (53)	0.67 (17)	2.09 (53)	0.79 (20)	1.02 (26)	0.75 (19)	0.55 (14)	0.39 (10)	1.59 (40.5)	0.30 (7.5)	0.79 (20)	0.74 (18.9)	0.95 (24)	2.80 (71)	7.48 (190)	7.56 (192)	0.08 (2)	1/4-20 (M6)	0.35 (9)
32	2.60 (66)	0.73 (18.5)	2.24 (57)	1.26 (32)	1.06 (27)	0.83 (21)	0.59 (15)	0.51 (13)	1.71 (43.5)	0.39 (10)	0.93 (23.5)	0.85 (21.5)	1.10 (28)	3.35 (85)	8.90 (226)	9.00 (228.5)	0.10 (2.5)	1/4-20 (M6)	0.35 (9)
40	3.15 (80)	0.87 (22)	2.64 (67)	1.42 (36)	1.38 (35)	1.10 (28)	0.67 (17)	0.55 (14)	2.03 (51.5)	0.51 (13)	1.02 (26)	1.06 (27)	1.22 (31)	3.58 (91)	9.61 (244)	9.71 (246.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
50	3.78 (96)	1.10 (28)	3.23 (82)	1.77 (45)	1.38 (35)	1.38 (35)	0.91 (23)	0.63 (16)	2.40 (61)	0.59 (15)	1.30 (33)	1.39 (35.3)	1.54 (39)	3.54 (90)	10.16 (258)	10.26 (260.5)	0.10 (2.5)	5/16-18 (M8)	0.47 (12)
63	4.65 (118)	1.38 (35)	3.74 (95)	1.97 (50)	1.54 (39)	1.65 (42)	0.75 (19)	0.79 (20)	2.91 (74)	0.59 (15)	1.26 (32)	1.69 (43)	1.54 (39)	4.29 (109)	11.65 (296)	11.75 (298.5)	0.10 (2.5)	3/8-16 (M10)	0.59 (15)

Bore (mm)	P	Q	TA	TB	TC	TD	TE	TL	XA	XB	XC	XE
25	6.38 (162)	1/8 NPT (1/8 Rc)	4.80 (122)	2.76 (70)	1.89 (48)	0.79 (20)	10-24 (M5)	0.32 (8)	1.50 (38)	0.91 (23)	0.22 (5.5)	1.58 (40)
32	7.72 (196)	1/4 NPT (1/4 Rc)	5.28 (134)	3.15 (80)	2.21 (56)	0.79 (20)	1/4-20 (M6)	0.35 (9)	1.89 (48)	0.98 (25)	0.24 (6)	1.85 (47)
40	8.27 (210)	1/4 NPT (1/4 Rc)	5.83 (148)	3.54 (90)	2.68 (68)	1.18 (30)	1/4-20 (M6)	0.43 (11)	2.36 (60)	1.18 (30)	0.28 (7)	2.28 (58)
50	8.35 (212)	3/8 NPT (3/8 Rc)	5.98 (152)	3.94 (100)	3.15 (80)	1.18 (30)	5/16-18 (M8)	0.51 (13)	2.91 (74)	1.42 (36)	0.39 (10)	2.76 (70)
63	10.16 (258)	3/8 NPT (3/8 Rc)	6.61 (168)	4.33 (110)	4.02 (102)	1.58 (40)	5/16-18 (M8)	0.51 (13)	3.78 (96)	1.65 (42)	0.55 (14)	3.54 (90)

inches (mm)

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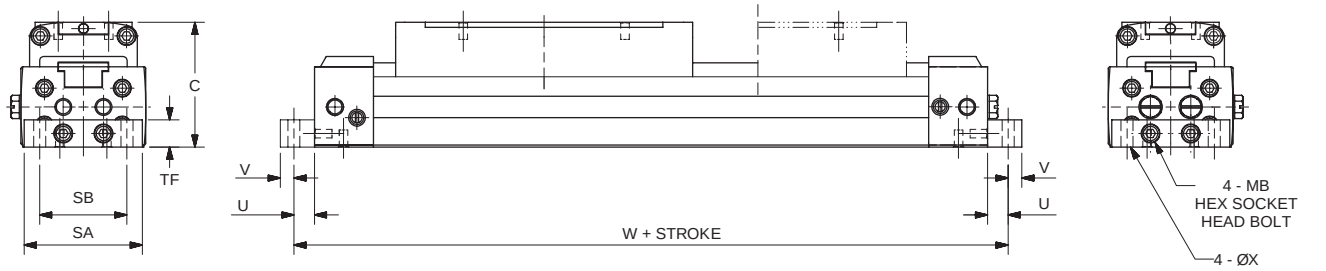
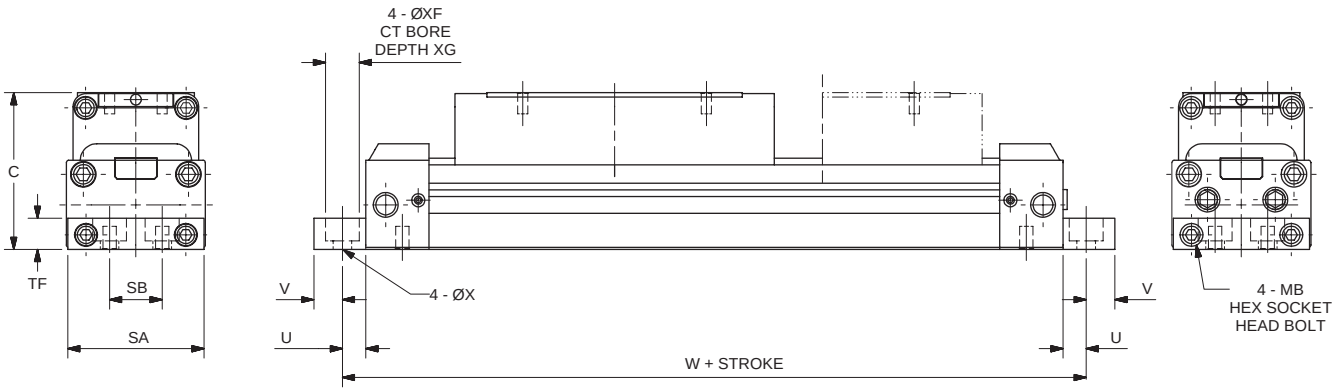
16 to 32 mm bore sizes



40 to 63 mm bore sizes



Bore (mm)	C	SA	SB	TF	U	V	W	X	XF	XG	MB
16	1.46 (37)	1.38 (35)	1.02 (26)	0.32 (8)	0.24 (6)	0.16 (4)	6.34 (161)	0.14 (3.6)	—	—	M3x10
20	1.65 (42)	1.69 (43)	1.30 (33)	0.39 (10)	0.24 (6)	0.24 (6)	7.13 (181)	0.19 (4.7)	—	—	M4x12
25	2.09 (53)	2.05 (52)	0.79 (20)	0.47 (12)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	—	—	M5x50
32	2.24 (57)	2.52 (64)	1.26 (32)	0.47 (12)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	—	—	M5x50
40	2.64 (67)	3.15 (80)	1.18 (30)	0.59 (15)	0.49 (12.5)	0.45 (11.5)	10.60 (269)	0.35 (9)	0.51 (13)	0.34 (8.7)	M6x55
50	3.23 (82)	3.70 (94)	1.57 (40)	0.79 (20)	0.49 (12.5)	0.45 (11.5)	11.10 (283)	0.35 (9)	0.51 (13)	0.34 (8.7_	M8x65
63	3.74 (95)	4.57 (116)	1.89 (48)	0.98 (25)	0.59 (15)	0.59 (15)	12.80 (326)	0.43 (11)	0.61 (15.5)	0.41 (10.5)	M8x70

inches (mm)

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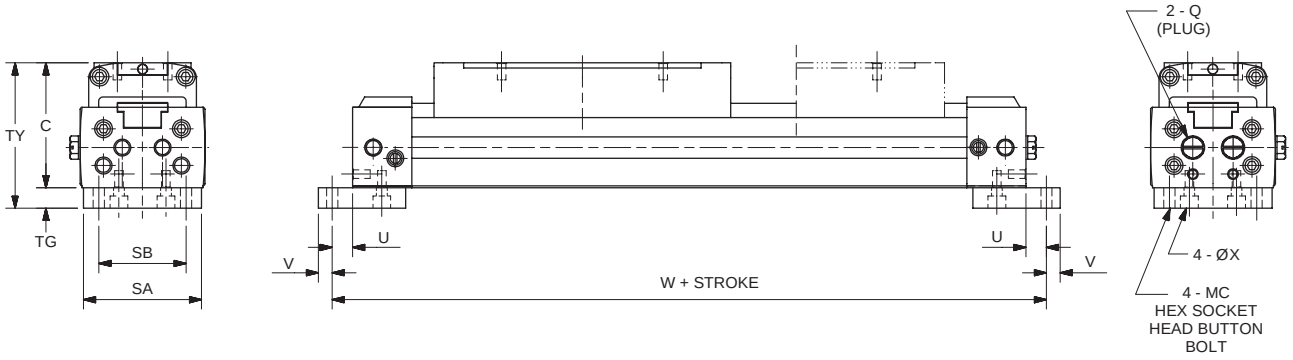
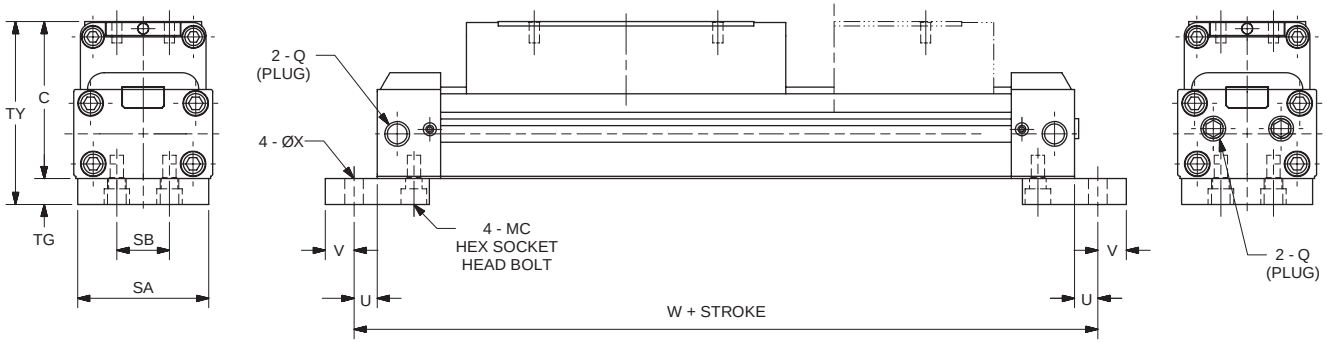
16 to 20 mm bore sizes



25 to 32 mm bore sizes



Bore (mm)	C	Q	SA	SB	TG	TY	U	V	W	X	MC
16	1.46 (37)	10-32 (M5)	1.38 (35)	1.02 (26)	0.24 (6)	1.69 (43)	0.24 (6)	0.16 (4)	6.34 (161)	0.13 (3.4)	5-40, 1/4 LG
20	1.65 (42)	1/8 NPT (1/8 Rc)	1.69 (43)	1.30 (33)	0.32 (8)	1.97 (50)	0.24 (6)	0.24 (6)	7.13 (181)	0.18 (4.5)	8-32, 3/8 LG
25	2.09 (53)	1/8 NPT (1/8 Rc)	1.97 (50)	0.79 (20)	0.39 (10)	2.48 (63)	0.35 (9)	0.43 (11)	8.19 (208)	0.28 (7)	1/4-20 x 1/2 LG
32	2.24 (57)	1/4 NPT (1/4 Rc)	2.52 (64)	1.26 (32)	0.39 (10)	2.64 (67)	0.35 (9)	0.43 (11)	9.61 (244)	0.28 (7)	1/4-20 x 1/2 LG
40	2.64 (67)	1/4 NPT (1/4 Rc)	—	—	—	—	—	—	—	—	—
50	3.23 (82)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—
63	3.74 (95)	3/8 NPT (3/8 Rc)	—	—	—	—	—	—	—	—	—

inches (mm)

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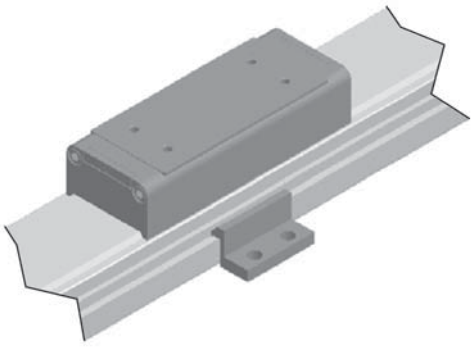
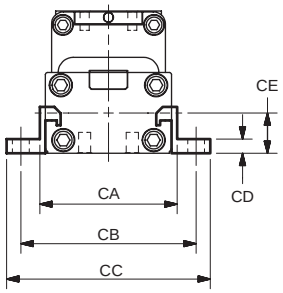
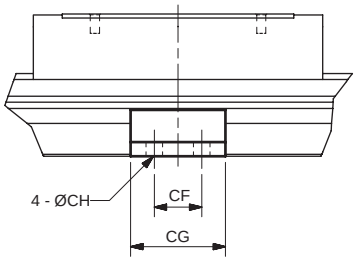
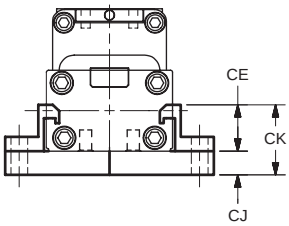
Intermediate support brackets

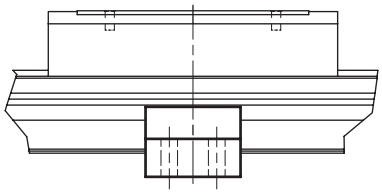
End mount











Intermediate support brackets (2 per kit)

Bore (mm)	CA	CB	CC	CD	CE	CF	CG	CH
16	1.654 (42)	2.205 (56)	2.52 (64)	0.118 (3)	0.472 (12)	0.787 (20)	1.378 (35)	0.157 (4)
20	1.929 (49)	2.52 (64)	2.953 (75)	0.157 (4)	0.551 (14)	0.787 (20)	1.496 (38)	0.197 (5)
25	2.362 (60)	2.992 (76)	3.465 (88)	0.236 (6)	0.768 (19.5)	0.787 (20)	1.575 (40)	0.276 (7)
32	2.913 (74)	3.465 (88)	3.937 (100)	0.236 (6)	0.846 (21.5)	0.787 (20)	1.575 (40)	0.276 (7)
40	3.543 (90)	4.252 (108)	4.882 (124)	0.236 (6)	0.965 (24.5)	1.181 (30)	2.362 (60)	0.354 (9)
50	4.173 (106)	4.882 (124)	5.512 (140)	0.315 (8)	1.201 (30.5)	1.181 (30)	2.362 (60)	0.354 (9)
63	5.118 (130)	5.984 (152)	6.772 (172)	0.394 (10)	1.516 (38.5)	1.969 (50)	3.543 (90)	0.433 (11)

Bore (mm)	CJ	CK	Kit part number	
			End mount or no mount	Bottom mount
16	0.236 (6)	0.709 (18)	**L080180016**	**L080190016**
20	0.315 (8)	0.866 (22)	**L080180020**	**L080190020**
25	0.394 (10)	1.161 (29.5)	**L080180025**	**L080190025**
32	0.394 (10)	1.24 (31.5)	**L080180032**	**L080190032**
40	—	—	**L080180040**	
50	—	—	**L080180050**	
63	—	—	**L080180063**	

inches (mm)

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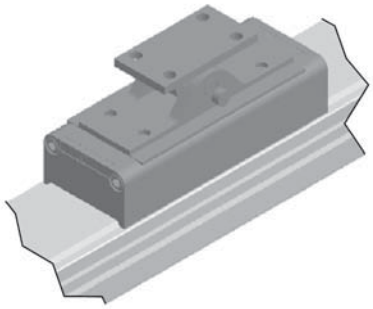
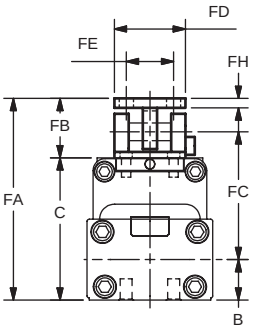
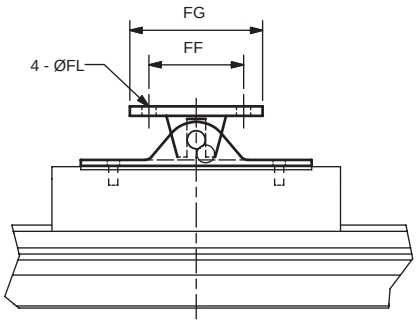
Swivel mount

Absorbs misalignment between cylinder and load





FJ dimension is the maximum horizontal float



FK dimension is the maximum vertical float

Swivel mounts

Bore (mm)	FA	FB	FC	FD	FE	FF	FG	FH
16	2.238 (58)	0.827 (21)	1.339 (34)	0.945 (24)	0.673 (16)	1.181 (30)	1.575 (40)	0.118 (3)
20	2.638 (67)	0.984 (25)	1.535 (39)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
25	3.071 (78)	0.984 (25)	1.85 (47)	1.181 (30)	0.787 (20)	1.575 (40)	2.205 (56)	0.157 (4)
32	3.74 (95)	1.496 (38)	2.185 (55.5)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
40	4.134 (105)	1.496 (38)	2.441 (62)	1.772 (45)	1.181 (30)	1.969 (50)	2.756 (70)	0.236 (6)
50	4.961 (126)	1.732 (44)	2.874 (73)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)
63	5.472 (139)	1.732 (44)	3.11 (79)	2.362 (60)	1.575 (40)	2.756 (70)	3.543 (90)	0.315 (8)

inches (mm)

Bore (mm)		FJ	FK	FL	B	C	Part number
16	inches	0.118	0.118	0.134	0.472	1.457	**L078930016**
	mm	3	3	3.4	12	37	
20	inches	0.118	0.118	0.177	0.551	1.654	**L080160020**
	mm	3	3	4.5	14	42	**L08016M020**
25	inches	0.118	0.118	0.236	0.669	2.087	**L080160025**
	mm	3	3	6	17	53	**L08016M025**
32	inches	0.197	0.197	0.276	0.728	2.244	**L080160032**
	mm	5	5	7	18.5	57	**L08016M032**
40	inches	0.197	0.197	0.276	0.866	2.638	**L080160040**
	mm	5	5	7	22	67	**L08016M040**
50	inches	0.197	0.197	0.354	1.102	3.228	**L080160050**
	mm	5	5	9	28	82	**L08016M050**
63	inches	0.197	0.197	0.354	1.378	3.74	**L080160063**
	mm	5	5	9	35	95	**L08016M063**

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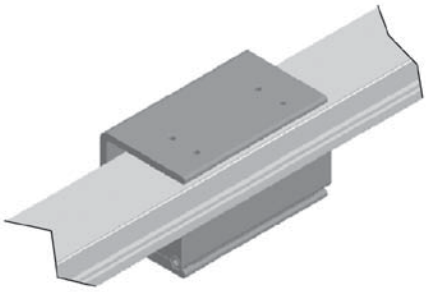
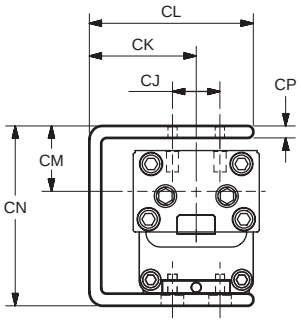
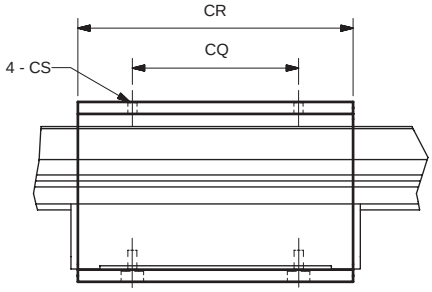
Inverted mount

Provides mounting surface 180° from carriage







Inverted mounts*

Bore (mm)		CJ	CK	CL	CM	CN	CP	CQ	CR	CS	Part number**
16	inches	0.591	1.398	1.969	1.142	2.362	0.236	1.89	3.465	5-40	**L080170016**
	mm	15	35.5	50	29	60	6	48	88		**L08017M016**
20	inches	0.709	1.28	1.969	1.024	2.362	0.236	2.362	3.937	8-32	**L080170020**
	mm	18	32.5	50	26	60	6	60	100		**L08017M020**
25	inches	0.787	1.772	2.717	1.102	2.795	0.197	2.756	4.567	10-24	**L080170025**
	mm	20	45	69	28	71	5	70	116		**L08017M025**
32	inches	0.787	2.126	3.209	1.319	3.15	0.276	3.15	5.039	1/4-20	**L080170032**
	mm	20	54	81.5	33.5	80	7	80	128		**L08017M032**
40	inches	1.181	2.48	3.76	1.496	3.602	0.315	3.543	5.433	1/4-20	**L080170040**
	mm	30	63	95.5	38	91.5	8	90	138		**L08017M040**
50	inches	1.181	2.913	4.449	1.89	4.429	0.394	3.937	5.591	5/16-18	**L080170050**
	mm	30	74	113	48	112.5	10	100	142		**L08017M050**
63	inches	1.575	3.465	5.433	2.283	5.157	0.512	4.331	6.22	5/16-18	**L080170063**
	mm	40	88	138	58	131	13	110	158		**L08017M063**

*Inverted mounts not available with adjustable stroke, shock absorber or tube center support bracket.

**Use this part number when ordering as a separate part. When ordering with cylinder, use “C” option as part of cylinder part number.

End port piping

Refer to Figure 3 to determine when end port piping can be used with various types of mountings relative to fitting clearance.

On all bore sizes with foot mounting, the end port pipe fittings will obstruct the mounting holes. To avoid this problem, mount the cylinder first and tighten the mounting bolts and then attach the pipe fittings to the cylinder ports.

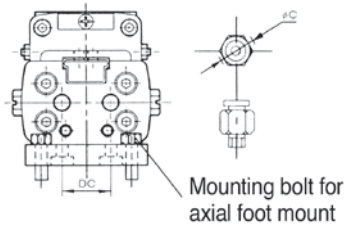


Figure 3

Bore (mm)	øC [O.D. of fittings - mm (in.)]		
	No mount	End mount	Bottom mount
16	12 (0.472)	End Port Piping Not Available	12 (0.472)
20	16 (0.630)		16 (0.630)
25	26 (1.024)		26 (1.024)
32	27 (1.065)		27 (1.063)
40	35 (1.378)	26 (1.024)	
50	35 (1.378)	30 (1.181)	
63	39 (1.535)	34 (1.339)	

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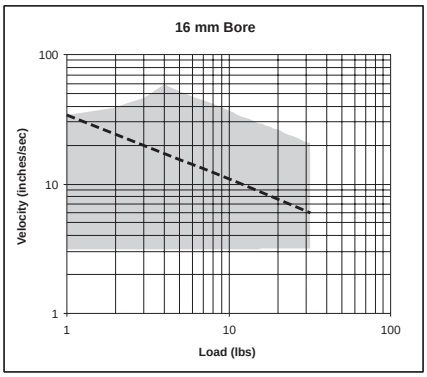
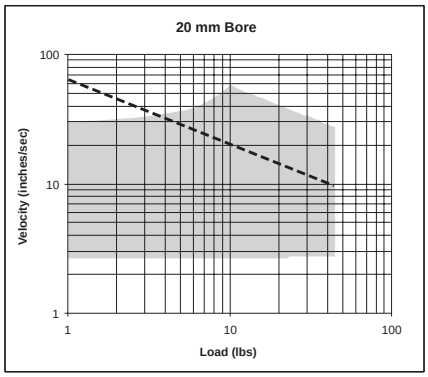
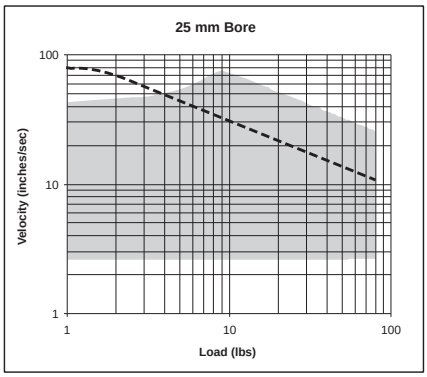
Shock absorber specifications

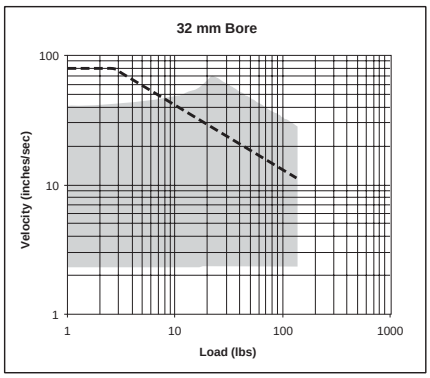
Cylinder	16mm	20mm	25mm	32mm	40mm	50, 63mm
Shock absorber number	**0887790016**	**0887790020**	**0887790025**	**0887790032**	**0887790040**	**0887790050**
Max. energy absorption - in-lbs (kgf·m)	26.0 (0.3)	60.8 (0.7)	104.2 (1.2)	226 (2.6)	608 (7.0)	1042 (12)
Stroke - inches	0.236	0.315	0.394	0.590	0.787	0.984
Energy absorption / hour - in.-lbs / hour	54,700	109,380	187,510	338,560	729,200	750,000
Max. impact velocity - in. / sec.	59	59	78.7	78.7	98.4	118.1
Max. cycle rate per hour	2100	1800	1800	1500	1200	720
Ambient temperature - °F (°C)	41-140 (5-60)					
Spring return force - lb. Extended Compressed	0.65 1.01	0.45 0.97	0.65 1.33	1.33 2.65	2.20 4.86	3.60 7.49
Return time - Sec.	0.3	0.3	0.3	0.3	0.4	0.4

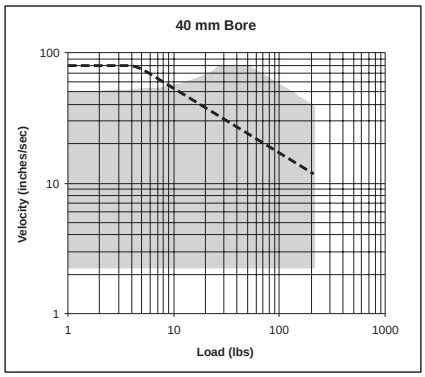
Performance data (16 to 32mm bores)

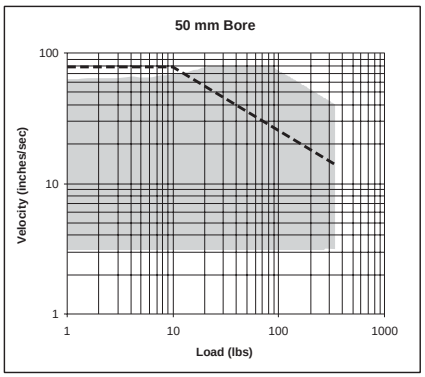


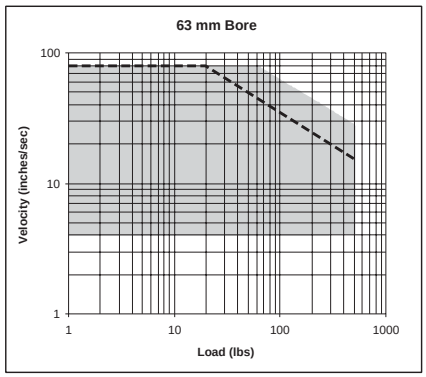












Air Cushion w/back pressure (flow controls or other meter out device)

Shock Absorber

Notes: 1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.
2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.
3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

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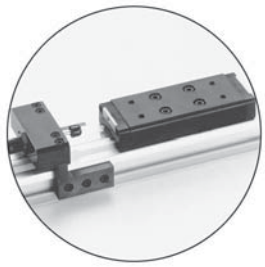
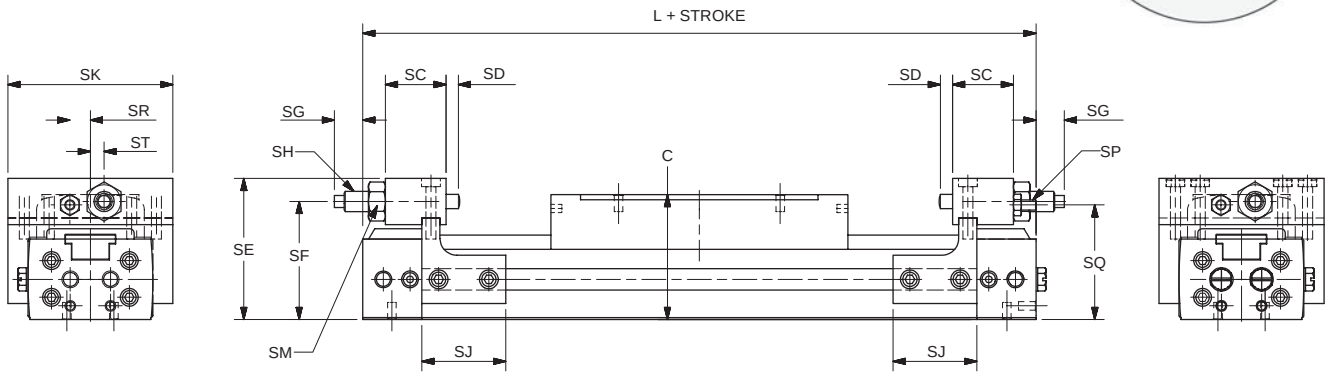
16 to 25 mm bore sizes

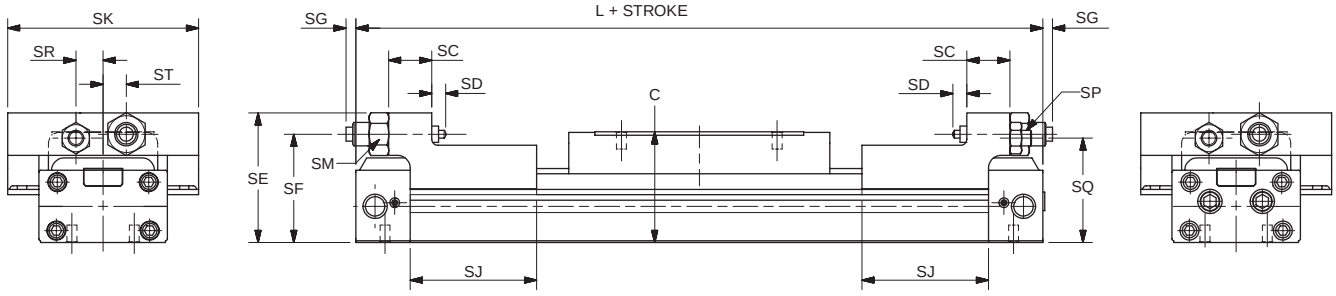




Bore (mm)	SC	SD	SE	SF	SG Max	SG Min	SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
16	0.71 (18)	0.16 (4)	1.65 (42)	1.38 (35)	0.57 (14.5)	0.18 (4.5)	26	0.98 (25)	1.93 (49)	M3	1.34 (34)	0.24 (6)	0.16 (4)	1.46 (37)	5.87 (149)
20	0.89 (22.5)	0.14 (3.5)	1.89 (48)	1.57 (40)	0.57 (14.5)	0.18 (4.5)	61	1.54 (39)	2.24 (57)	M4	1.50 (38)	0.32 (8)	0.20 (5)	1.65 (42)	6.65 (169)
25	0.79 (20)	0.10 (2.5)	2.46 (62.5)	2.03 (51.5)	0.57 (14.5)	0.18 (4.5)	104	1.97 (50)	3.03 (77)	M6	1.97 (50)	0.47 (12)	0.39 (10)	2.09 (53)	7.48 (190)

inches (mm)
SH = max. energy absorption

32 to 63 mm bore sizes



Bore (mm)	SC	SD	SE	SF	SG Max	SG Min	SH in-lbs	SJ	SK	SP	SQ	SR	ST	C	L
32	0.87 (22)	0.28 (7)	2.62 (66.5)	2.19 (55.5)	1.06 (27)	0.67 (17)	226	2.56 (65)	3.86 (98)	M8	2.11 (53.5)	0.55 (14)	0.47 (12)	2.24 (57)	8.90 (226)
40	1.26 (32)	0.28 (7)	3.09 (78.5)	2.58 (65.5)	1.34 (34)	0.94 (24)	608	2.56 (65)	4.41 (112)	M10	2.50 (63.5)	0.67 (17)	0.47 (12)	2.64 (67)	9.61 (244)
50	1.50 (38)	0.32 (8)	3.90 (99)	3.15 (80)	2.17 (55)	1.77 (45)	1042	2.76 (70)	5.35 (136)	M12	3.05 (77.5)	0.87 (22)	0.67 (17)	3.23 (82)	10.16 (258)
63	1.50 (38)	0.32 (8)	4.41 (112)	3.68 (93.5)	1.73 (44)	1.34 (34)	1042	2.76 (70)	6.22 (158)	M16	3.50 (89)	0.98 (25)	0.79 (20)	3.74 (95)	11.65 (296)

inches (mm)
SH = max. energy absorption

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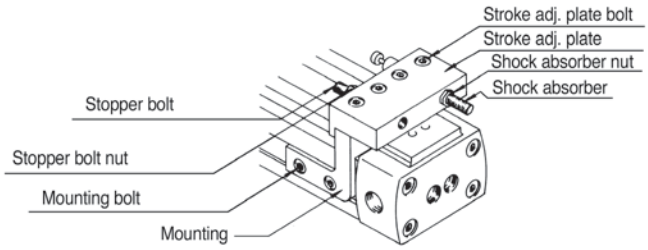
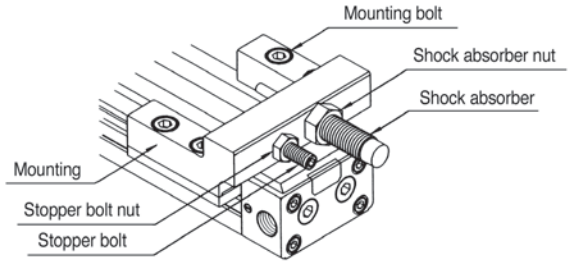
Positioning of stroke adjustment unit



ø16~ø25



ø32~ø63

(1) Moving the stroke adjustment unit.
The stroke adjustment unit can be moved by loosening the mounting bolts.

(2) Locking of stroke adjustment unit.
After moving the stroke adjustment unit to the appropriate position, lock it there by tightening the mounting bolts to the torque values shown in Figure 4. Insufficient torque may cause the stroke adjustment unit to slip out of position.

Figure 4
Torque values for tightening stroke adjustment unit.

	Tightening torque	
Bore size	Mounting bolt (lb-in)	Stroke adj. plate bolt (lb-in)
16mm	9-11	4-6
20mm	22-24	
25mm	46-50	22-24
32mm	195-213	–
40mm	390-415	–
50, 63mm	682-735	–

(3) Stroke adjustment using the stopper bolt.
Adjust the stroke by loosening the stopper bolt nut and turning the stopper bolt. After adjusting the stroke, tighten the stopper bolt nut to the torque values shown in Figure 5. When adjusting the 16-25 mm cylinders, due to the small amount of clearance between the table and the stroke adjustment plate, adjust the stroke by moving the complete stroke adjustment unit.

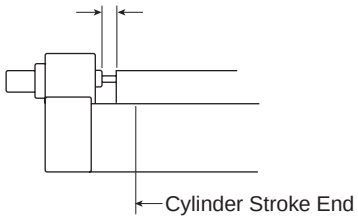
Figure 5
Torque values for tightening stopper bolt nut and shock absorber nut.

	Tightening torque	
Bore size	Stopper bolt nut (lb-in)	Shock absorber nut (lb-in)
16mm	10-11	12-16
20mm	22-24	26-35
25mm	73-84	40-53
32mm	195-213	66-89
40mm	390-425	195-266
50mm	682-735	487-620
63mm	1772-1914	487-620

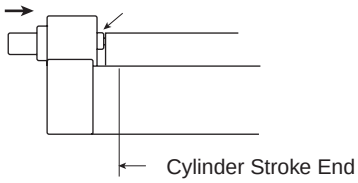
(4) Adjustment of shock absorber.
Adjust the absorption energy of the shock absorber by changing the operating stroke of the shock absorber. This is done by loosening the shock absorber nut and turning the unit. When adjustment is complete, tighten the shock absorber nut to the torque values shown in Figure 12a.

(5) Notes on usage.
The shock absorber absorbs rated energy with rated stroke. The factory setting allows a small amount of shock absorber stroke before it bottoms out. Readjust the location of the shock absorber so that the complete stroke of the absorber is utilized.

Absorption energy as set at factory:
Small margin with stroke of shock absorber.



Adjust the position of the shock absorber until the plunger of the shock absorber is fully depressed.



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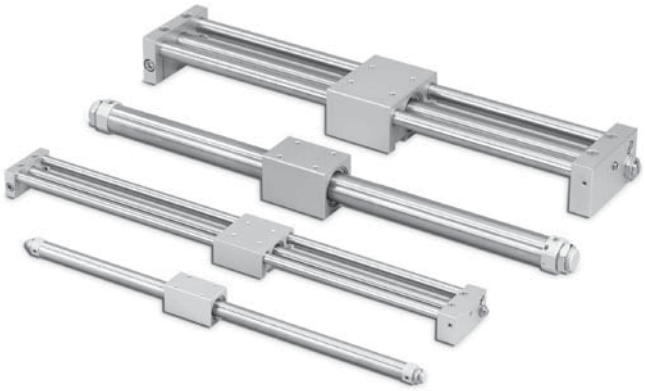
Basic version

The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston fitted with annular magnets.

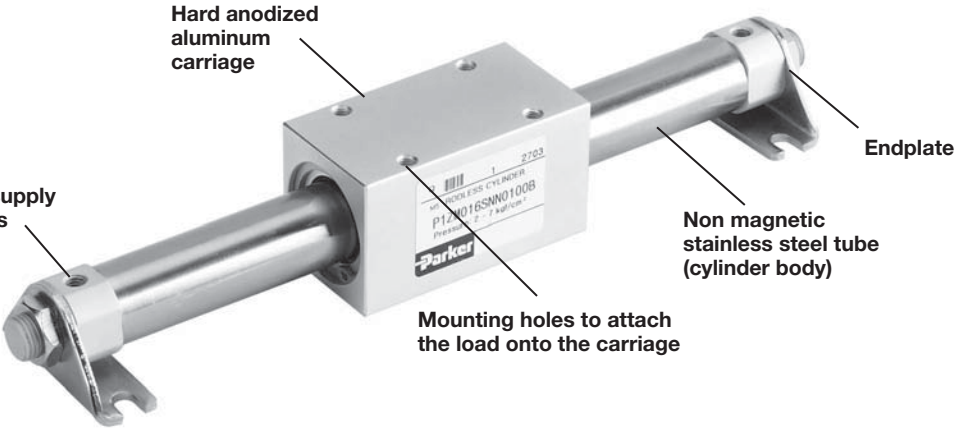
The mobile carriage is also equipped with magnets to provide magnetic coupling between the piston and carriage.

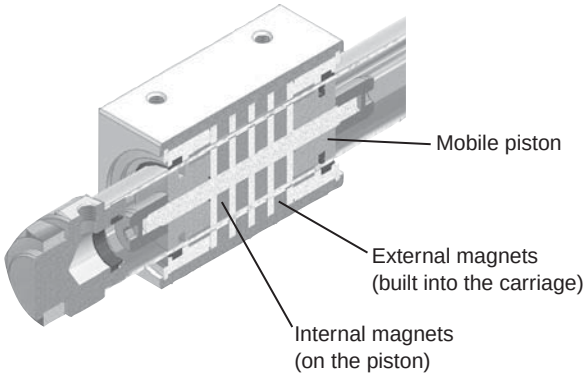
It incorporates the following features:

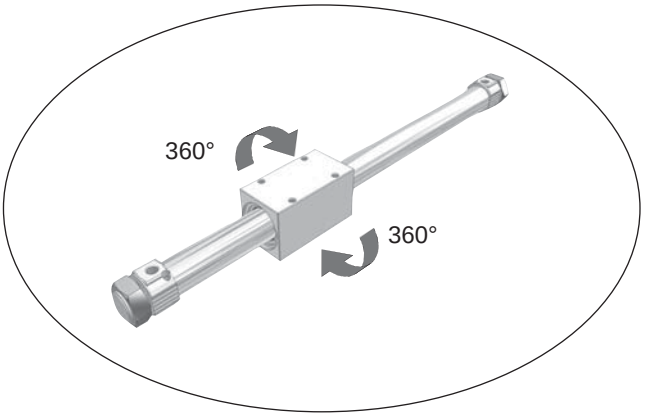
- end of stroke cushioning/bumpers
- mounting:
  – threaded endcaps
  – optional foot mount
  – optional flange mount



Sensors
For sensors see page B296.







Cushioning

Ø 16 mm: non-adjustable bumper or adjustable pneumatic cushioning

Ø 20 and 32 mm: adjustable pneumatic cushioning

Mounting

The mobile carriage is free to rotate 360° around the cylinder axis. This feature facilitates the adaptation of the cylinder to various mounting arrangements.

The load must be guided by an external device.

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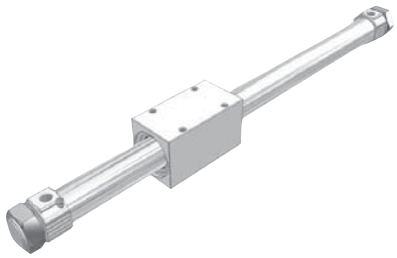
Magnetic Rodless cylinder, basic version

- Available in 3 bores with stroke lengths up to 2000 mm
- Adjustable air cushioning is available on all cylinderS
- The load is fixed onto the mobile carriage by 4 tapped holes
- The cylinder is attached by the ends with jam nuts, flanges or foot mounts



Specifications for P1Z series magnetically coupled rodless

Operating medium	Compressed air		
Maximum pressure - bar (PSI)	7 (100)		
Minimum pressure - bar (PSI)	2 (29)		
Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Ambient temperature °F (°C)	15 to 140°F (-10 to 160°C)		
Maximum stroke mm (inch)	1000 (39.4)	1500 (59.1)	2000 (78.7)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

Technical data

Bore size		Weights			
		Weight at zero stroke		Weight per 25mm of stroke	
mm	**inch**	**kg**	**lbs**	**kg**	**lbs**
16	5/8	0.28	0.62	0.01	0.02
20	3/4	0.46	1.01	0.02	0.05
32	1-1/4	1.35	2.98	0.04	0.08

Conditions of use

If external lubrication is added, this must always be continued.

Working medium, air quality

Working medium: Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

Standard cylinder (15 positions) | **Options (16 positions)**

P	1	Z	M	0	1	6	S	N	N	0	5	0	0	B	F	M	N

Bore

016	Ø 16 mm
020	Ø 20 mm
032	Ø 32 mm

Cushioning

N	None (Ø 16 only)
A	Adjustable Cushions

Strokes

0200	200 mm
1000	1000 mm

Mounting Kit*

F	Footmount
L	Flanges
N	None (std.)

Options *

B†	None
W	With options

† Standard when "B" option is used.

Cylinder Port Type

M†	Metric (Ø 16 only)
B†	BSPP (Ø 20 & 32)
R	BSPT (Ø 20 & 32)
N	NPTF (Ø 20 & 32)

* Cylinders are supplied with mounting nuts fitted on each endplate.

Ø	Stroke (mm)	(in)
16	0 to 1000	0 to 39.4
20	0 to 1500	0 to 59.1
32	0 to 2000	0 to 78.7

Order code examples:

- P1ZM016SNN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with mounting nut on each endplate
- P1ZM020SAN1000WFBN Ø 20 mm bore 1 m stroke cylinder with foot mount on each endplate

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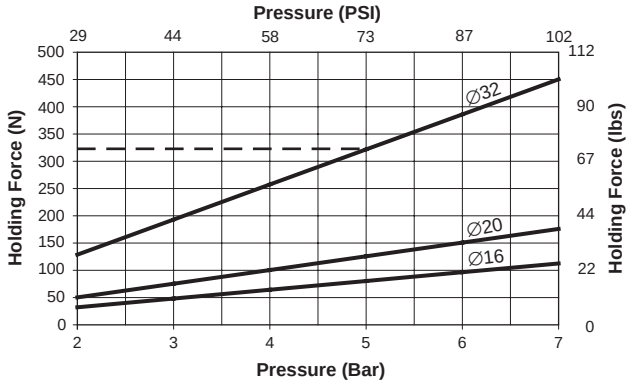
Technical data



Example:
Pressure: 5 bar

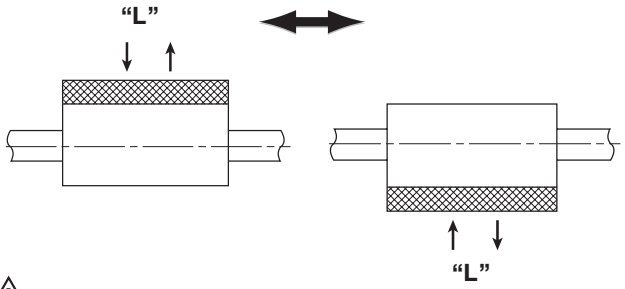
F_{max} = 322 N for Ø 32 mm cylinder

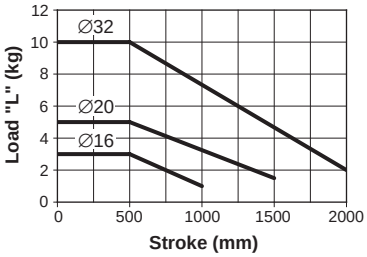
⚠ Calculate the kinetic energy due to the load moved

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder

Load diagrams

Permissible radial loads, horizontal mounting

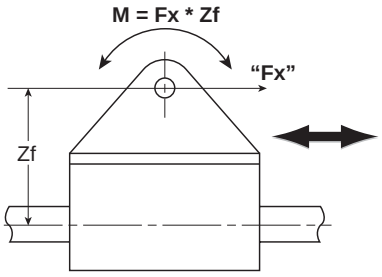


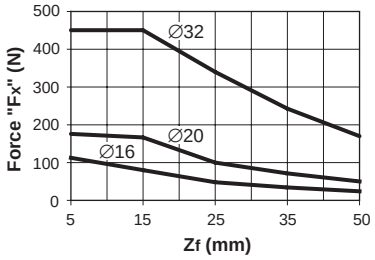


Ø	L Max. (kg)	(lbs.)
16	3	6.6
20	5	11.0
32	10	22.0

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, horizontal mounting



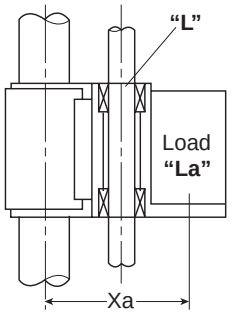


Ø	Max. Moment M (Nm)	(in-lbs.)	Max. Fx* (N	(lbs.)
16	1.2	11	112	25
20	2.5	22	175	39
32	8.5	75	450	101

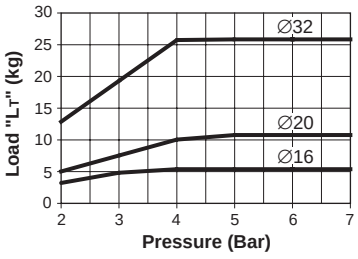
* at 7 bar

⚠ The load must be guided by a device from outside the cylinder

Permissible axial loads, vertical mounting



*If force due friction is unknown, use 0.1 × (L + La).



Ø	Max. load T (kg)	(lbs.)	Max. XA (mm)	(in.)
16	5	11	122	4.8
20	10	22	142	5.6
32	24	53	174	6.8

* at 6.5 bar

L = Load guided by external device
La = Direct mounting onto the cylinder
Ff = Force due to friction*

LT = Load weight + guiding device weight + force due to friction

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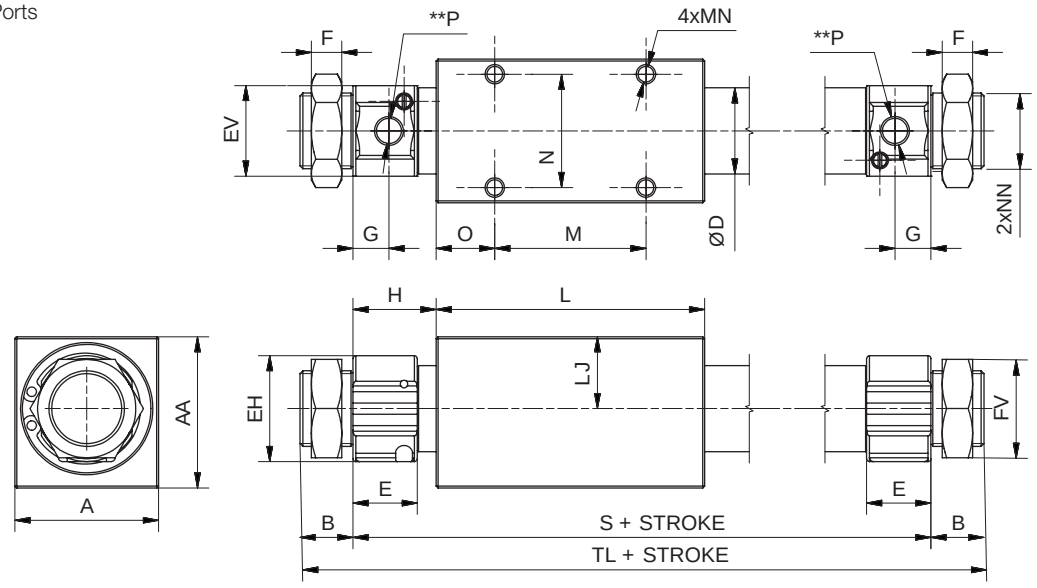
Dimensions

** = Air supply Ports



Ø	A	AA	B	ØD	E	Ø EH	Ø EV	F	FV	G	H	L	LJ	M	N	O
16	32 (1.26)	34 (1.34)	10 (0.39)	18 (0.71)	11 (0.43)	18 (0.71)	18 (0.71)	4 (0.16)	14 (0.55)	5.5 (0.22)	15.5 (0.61)	61 (2.40)	16 (0.63)	34 (1.34)	25 (0.98)	13.5 (0.53)
20	38 (1.50)	40 (1.57)	14 (0.55)	22.8 (0.90)	17 (0.67)	28 (1.10)	24 (0.94)	8 (0.31)	26 (1.02)	9.5 (0.37)	22 (0.87)	71 (2.80)	19 (0.75)	40 (1.57)	30 (1.18)	15.5 (0.61)
32	60 (2.36)	60 (2.36)	16 (0.63)	35 (1.38)	17 (0.67)	40 (1.57)	36 (1.42)	8 (0.31)	32 (1.26)	9.5 (0.37)	23 (0.91)	87 (3.43)	30 (1.18)	50 (1.97)	40 (1.57)	18.5 (0.73)

Ø	P	MN	NN	S	TL
16	M5 x 0.8 (10-32)	M4 x 0.7 x 6	M10 x 1 x 6	92 (3.62)	112 (4.41)
20	G 1/8 (1/8)	M5 x 0.8 x 8	M20 x 1.5 x 7	115 (4.53)	143 (5.63)
32	G 1/8 (1/8)	M6 x 1 x 10	M26 x 1.5 x 7	133 (5.24)	165 (6.50)

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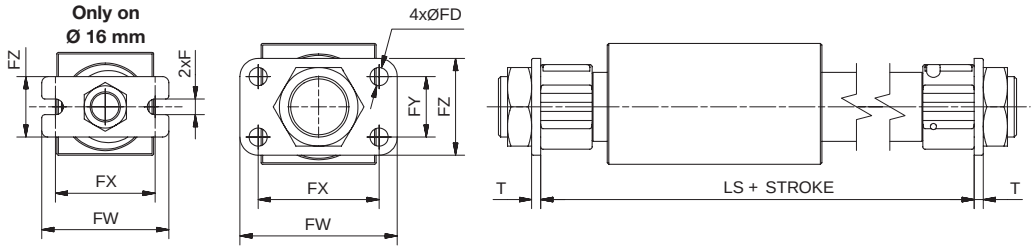
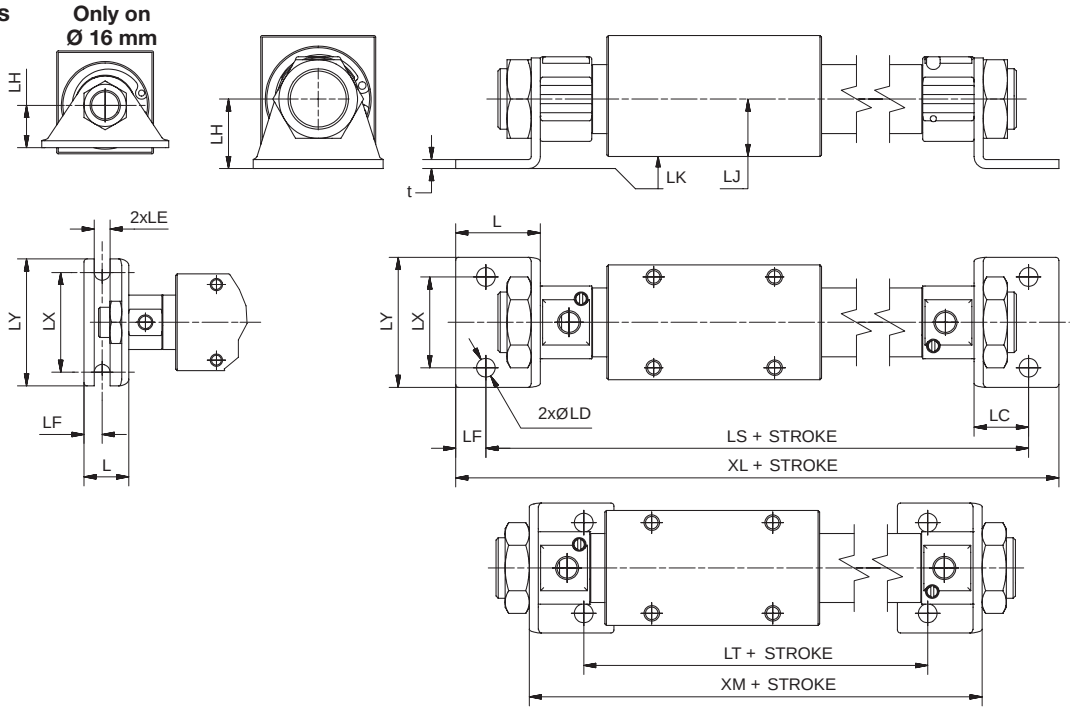
Mountings

Flanges



Ø	F	ØFD	FW	FX	FY	FZ	T	LS	Order code
16	5.2 (0.20)	–	42 (1.65)	33 (1.30)	–	20 (0.79)	2.3 (0.09)	92 (3.62)	**PDC15-FH**
20	–	6 (0.24)	52 (2.05)	40 (1.57)	20 (0.78)	32 (1.26)	3 (0.12)	115 (4.53)	**PK1A20-FH**
32	–	7 (0.28)	80 (3.15)	64 (2.52)	28 (1.10)	44 (1.73)	5 (0.20)	133 (5.24)	**PK1A25-FH**

Brackets



Ø	t	L	LC	ØLD	LE	LF	LH	LJ	LK	LX	LY	LS	LT	XL	XM	Order code
16	2.3 (0.09)	14.8 (0.58)	8.8 (0.35)	–	5.2 (0.20)	6 (0.24)	14 (0.55)	16 (0.63)	-2 (-0.08)	33 (1.30)	42 (1.65)	109.6 (4.32)	79 (3.11)	121.6 (4.79)	96.6 (3.80)	**PDC15-LB***
20	3 (0.12)	28 (1.10)	18 (0.71)	6.2 (0.24)	–	10 (0.39)	23 (0.91)	19 (0.75)	4 (0.16)	30 (1.18)	43 (1.69)	151 (5.94)	85 (3.35)	171 (6.73)	121 (4.76)	**PK1A20-LB***
32	3 (0.12)	35 (1.38)	23 (0.91)	7 (0.28)	–	12 (0.47)	30 (1.18)	30 (1.18)	0 (0)	46 (1.81)	62 (2.44)	179 (7.05)	**	203 (7.99)	**	**PK1A25-LB***

* Set of 2 pcs
** Impossible mounting

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The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston with annular magnets.

The mobile carriage is also equipped with magnets to give magnetic coupling between the piston and carriage. The carriage slides along the main tube and is guided by two guide rods.

It incorporates the following features:

- Built-in guide rods
- Adjustable end-of-stroke bumpers
- Optional magnetic piston sensing
- Optional transfer porting

Guidance

The guided version consists of a carriage fitted with 4 plain bearings, guided on 2 rods.

This design provides high rigidity, accurate guidance and smooth movement of the carriage.

End of stroke

Each endplate can be fitted with an adjustable bumper or self-compensating shock absorbers.

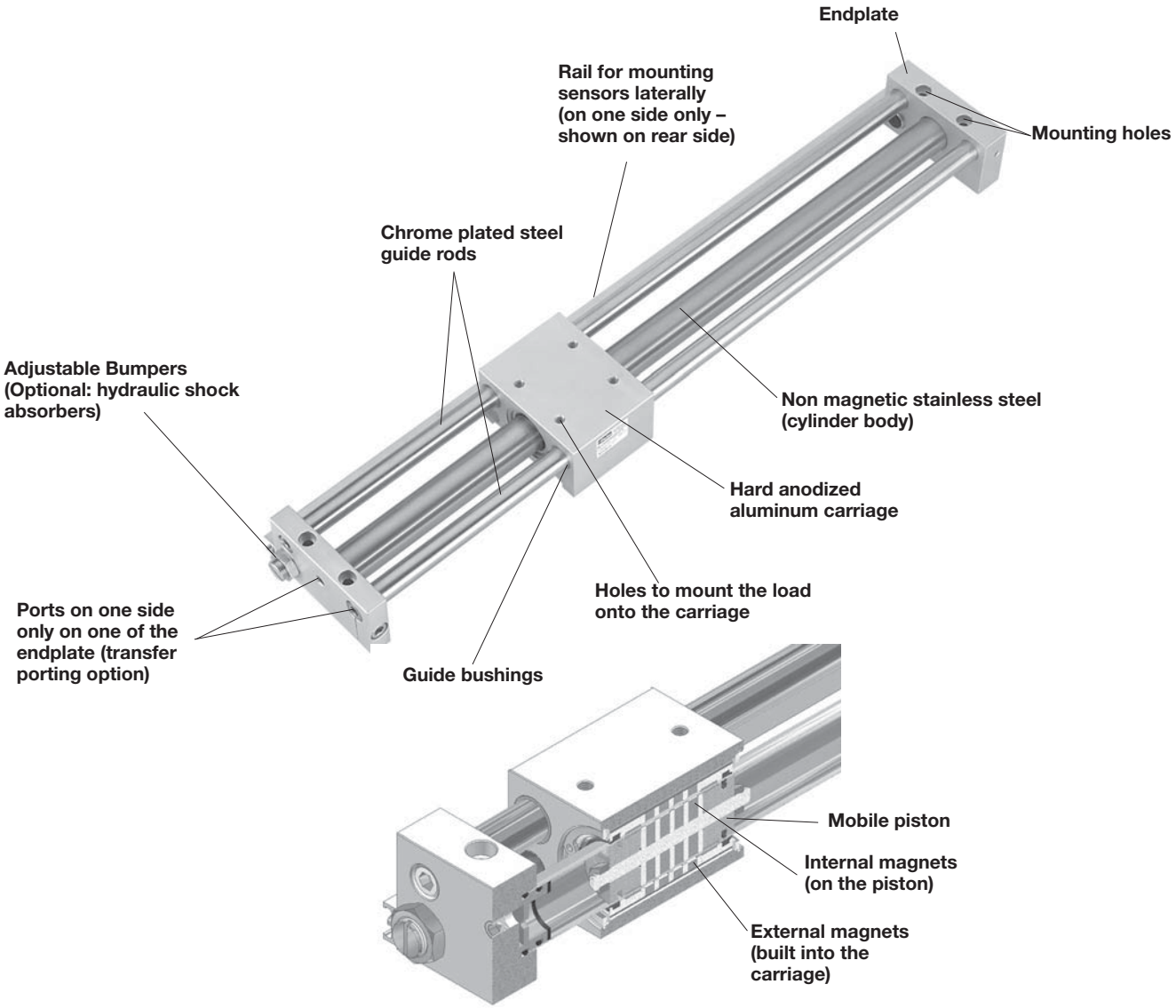
Optional transfer porting

Cylinder air supply is located on one end only to facilitate cylinder installation and avoid long tube lengths for longer strokes.

Options

The following options are available to enhance the Magnetic Rodless cylinder functions:

- External bumpers: when low operating pressure, light loads and short strokes.
- External hydraulic shock absorbers: recommended for arduous applications.
- Reed and solid state sensors: provide sensing at an adjustable position along the entire stroke of the cylinder.



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Standard cylinder (15 positions)															Options (16 positions)	
P	1	Z	M	0	1	6	T	N	N	0	5	0	0	B	N	M	L

Bore

016	Ø 16 mm
020	Ø 20 mm
032	Ø 32 mm

Cushioning

N	None stops*
C	Adjustable stop
H	Hydraulic shock absorber

Function

G	Guided
T	Guided with transfer porting

Strokes

0200	200 mm
1000	1000 mm

Options

B†	None
W	With options

Cylinder Port Type

M†	Metric (Ø 16 only)
B†	BSPP (Ø 20 & 32)
R	BSPT (Ø 20 & 32)
N	NPTF (Ø 20 & 32)

End of stroke sensing

NPN	PNP	Reed	Sensors type (Qty: 2)
L			With rail, no sensor
D	K	S	0.3 m with 8mm connector
A	H	C	3 m flying leads
F	U	B	10 m flying leads
G	W	E	0.3 m with M12 connector
N† (std.)			No sensor rail
P			Proximity sensor in end caps

* Do not exceed coupling force on deceleration.
†Standard when "B" option is used.

Ø	Stroke (mm)	(in)
16	0 to 750	0 to 29.5
20	0 to 1000	0 to 39.4
32	0 to 1000	0 to 59.1

Order code examples:

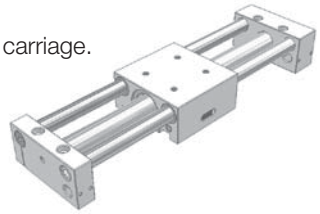
- P1ZM016GCN0100B Ø 16 mm bore 100 mm stroke cylinder supplied with adjustable stop
- P1ZM020GHN1000WNBL Ø 20 mm bore 1 m stroke cylinder with hydraulic shock absorbers and rail for sensors

Range

Magnetic rodless cylinder, guided version
Available in 3 diameters with possible strokes up to 1500 mm (59 in).

4 tapped mounting holes on the carriage.

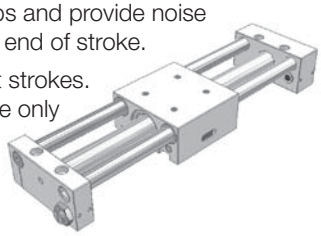
Endcap mounting provided by 4 tapped and counterbored holes.



Options

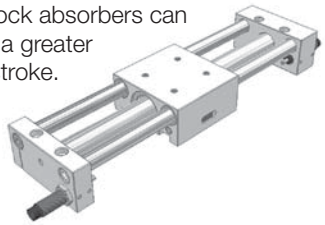
External adjustable bumpers
Can be fitted on cylinder endcaps and provide noise reduction and adjustment at the end of stroke.

Used when light loads and short strokes. Pneumatic air supply on one side only (transfer porting option).



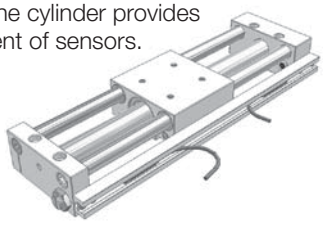
External hydraulic shock absorbers
Self-compensating hydraulic shock absorbers can be used instead of bumpers for a greater cushioning effect at the end of stroke.

They are recommended for arduous applications.



Reed or solid state sensors:
A rail fitted on one side only of the cylinder provides mounting and position adjustment of sensors.

The rail is located on same side as the end of stroke stops.



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General features

Specifications for P1Z series magnetically coupled rodless

Operating medium	Compressed Air		
Maximum pressure bar (PSI)	7 (100)		
Minimum pressure bar (IPS)	2 (29)		
Bore size mm (inch nominal)	16 (5/8)	20 (3/4)	32 (1 1/4)
Port size	M5 BSPP, 10-32 NPT	1/8 BSPP, 1/8 NPT	1/8 BSPP, 1/8 NPT
Ambient temperature °F (°C)	15 to 140°F (-10 to 160°C)		
Maximum stroke mm (inch)	750 (29.5)	1000 (39.4)	1500 (59.1)
Stroke tolerance mm	+1.5/-0	<=1000 +1.5/-0; >1000 +2/-0	
Piston speed m/s (inch/sec)	0.1 to 0.4 (4 to 15.75)		
Max. coupling force N (Lbs)	157 (35)	236 (53)	703 (158)
Cushion	Air cushion standard		
Lubrication	Not required (If you choose to lubricate your system, continuing lubrication will be required.)		

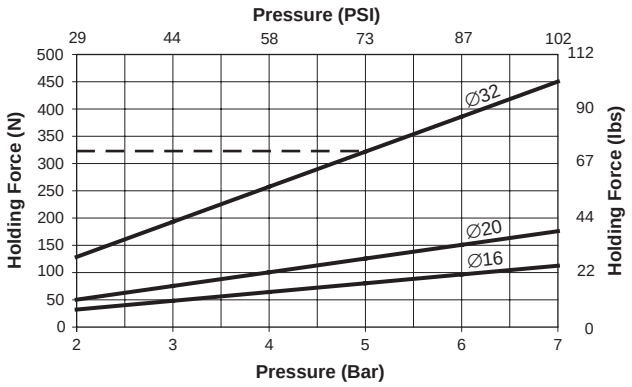
Weights

Bore size		Weight at zero stroke		Weight per 25mm of stroke	
mm	inch	kg	lbs	kg	lbs
16	5/8	0.9	1.98	0.05	0.11
20	3/4	1.52	3.35	0.08	0.17
32	1-1/4	3.63	8.00	0.13	0.29

Options

Function	Description
Detection	Sensors mounting in T-slot
	Reed or solid state sensors (PNP or NPN)
External rubber bumpers	Supplied pre-fitted in endplates if chosen
Hydraulic shock absorbers	Self-compensating shock absorbers supplied pre-fitted in endplates if chosen

Pressure in the cylinder / pneumatic holding force



Example:
Pressure: 5 bar (73 PSI)

F_{max} = 322 N (72 lbs.) for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved.

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder.

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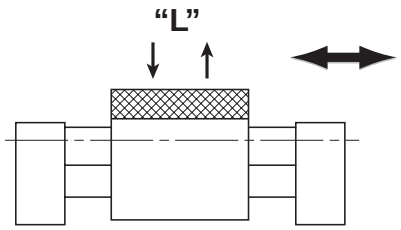
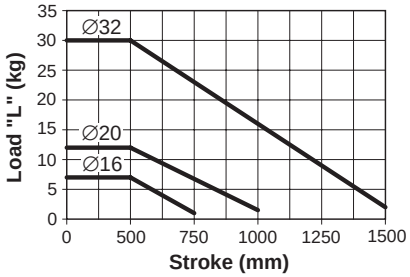
Load diagrams

Permissible radial loads, horizontal mounting

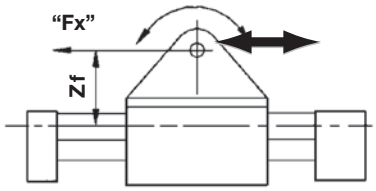




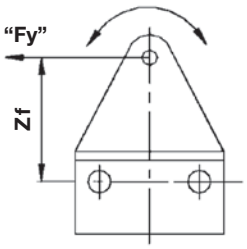
Ø	L Max. (kg)	(lbs.)
16	7	15
20	12	26
32	30	66

Permissible axial loads, horizontal mounting

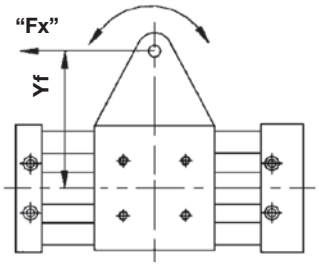
M = Fx * Zf



Ms = Fy * Zf

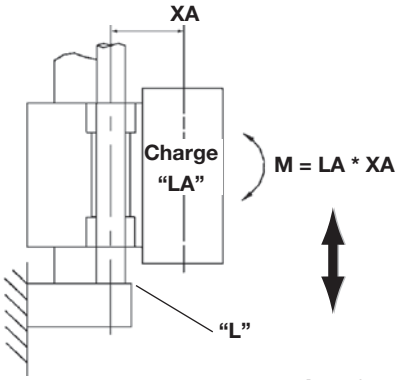


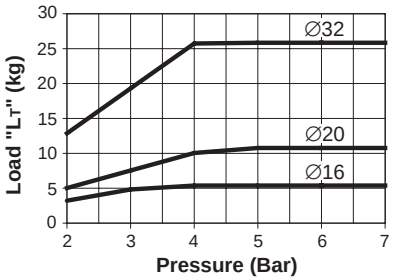
Mv = Fx * Yf



Ø	Max. moment M (Nm)	(in-lbs.)	Max. moment Ms (Nm)	(in-lbs.)	Max. moment Mv (Nm)	(in-lbs.)
16	2.4	21	0.5	4.4	2.4	21
20	5	44	1	8.9	5	44
32	15	133	3	26.6	15	133

Permissible axial loads, vertical mounting

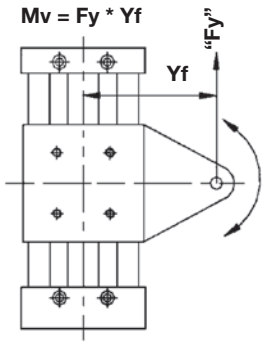




Ø	Max. load LT* (kg)	Max. XA (mm)
16	5	122
20	10	142
32	24	174

* at 6.5 bar

Mv = Fy * Yf



L = Load guided by external device

LA = Mounting direct onto cylinder

LT = Load weight + guiding device weight + force due to friction

Ff* = Force due to friction

*If force due to friction is unknown, use 0.1 * (L + LA)

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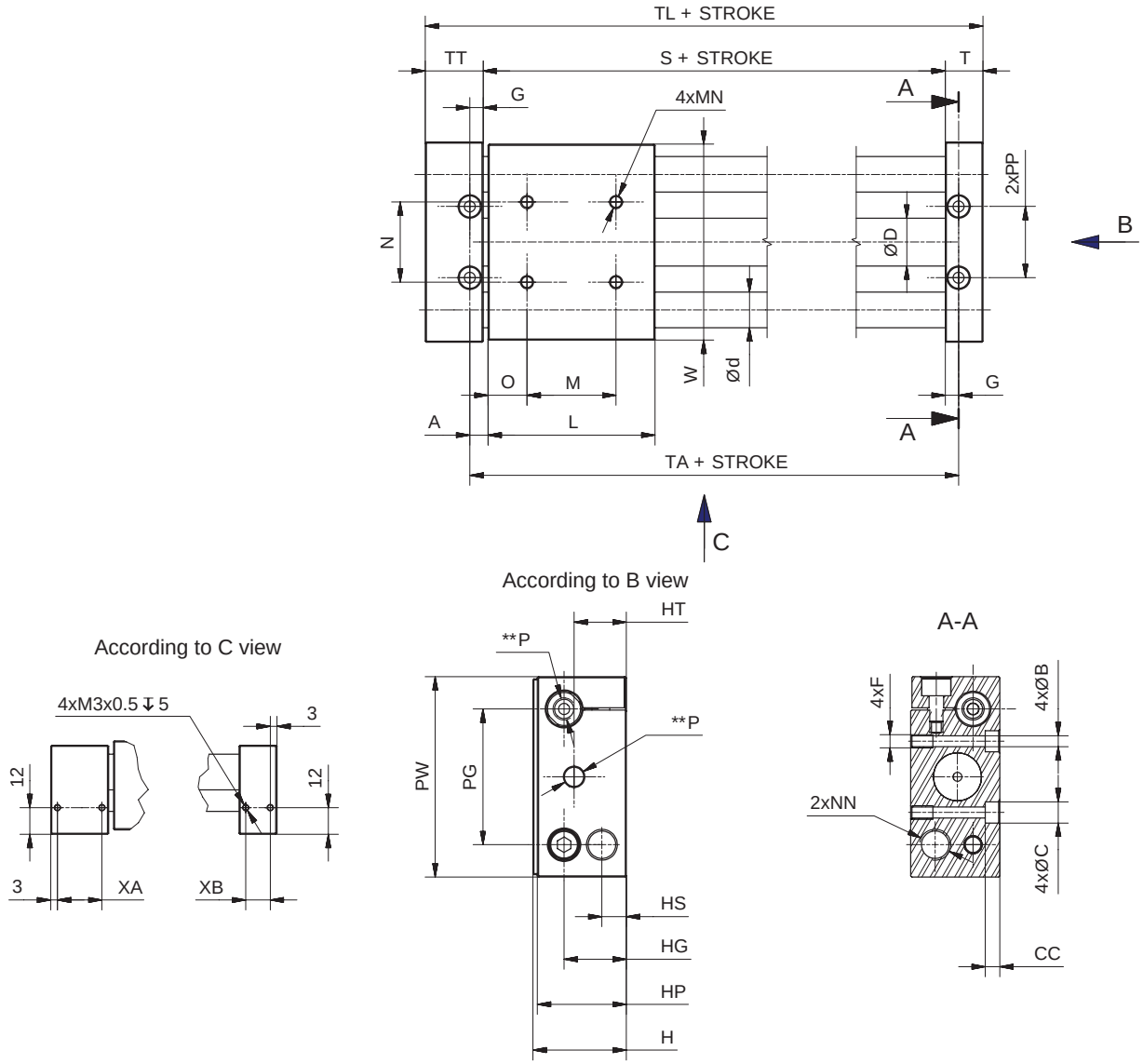
Dimensions

** = Air supply ports



Ø	A	ØB	ØC	CC	ØD	Ød	F	G	H	HP	HG	HS	HT	L	M	N	MN
16	8 (.31)	4.3 (.17)	8 (.31)	4.5 (.18)	17.4 (.69)	12 (.47)	M5x0.8 x 10	6 (.24)	34 (1.34)	33.5 (1.32)	25 (0.98)	12 (.47)	21.5 (0.85)	65 (2.56)	34 (1.34)	30 (1.18)	M5 x 0.8 x 8
20	8 (.31)	5.5 (.22)	9.5 (.37)	6.5 (.26)	21.4 (.84)	16 (.63)	M6x1 x 10	6 (.24)	42 (1.65)	40 (1.57)	28 (1.10)	12 (.47)	23.5 (.93)	75 (2.95)	40 (1.57)	36 (1.42)	M6 x 1 x 10
32	13.5 (.53)	8.7 (.34)	14 (.55)	8 (.31)	33.6 (1.32)	20 (.79)	M10x1.5 x 15	10 (.39)	66 (2.60)	64 (2.52)	46 (1.81)	20 (.79)	41 (1.61)	91 (3.58)	60 (2.36)	50 (1.97)	M8 x 1.25 x 12

Ø	NN	O	P	PG	PW	PP	T	TT	S	TA	TL	W	XA	XB
16	M10 x 1 x 6	15.5 (0.61)	M5 x 0.8	50 (1.97)	70 (2.76)	27 (1.06)	14 (0.55)	23 (0.91)	69 (2.76)	81 (3.19)	106 (4.17)	68 (2.68)	17 (0.67)	8 (0.31)
20	M14 x1.5 x 7	17.5 (0.69)	G1/8	61 (2.40)	90 (3.54)	32 (1.26)	17 (0.67)	26 (1.02)	79 (3.11)	91 (3.58)	122 (4.80)	88 (3.46)	20 (0.79)	11 (0.43
32	M20 x 1.5 x 7	15.5 (0.61)	G1/8	86 (3.39)	122 (4.80)	50 (1.97)	20 (0.79)	28 (1.10)	97 (3.82)	117 (4.61)	145 (5.71)	118 (4.65)	22 (0.87)	14 (0.55)

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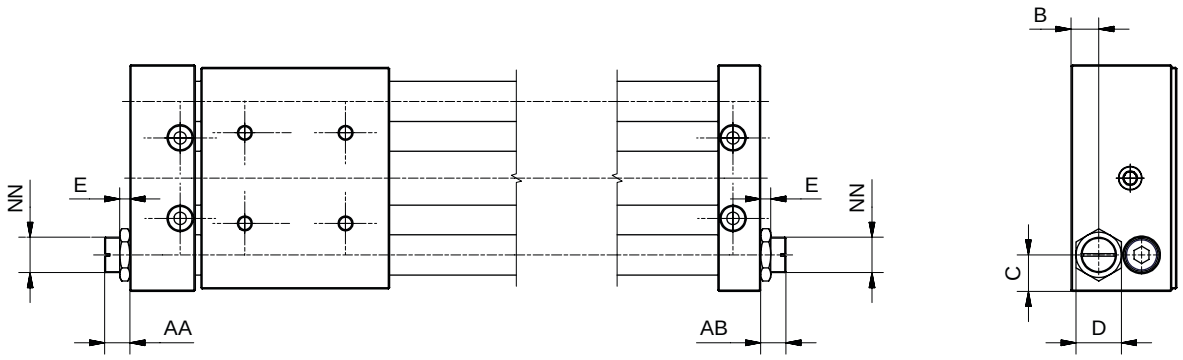
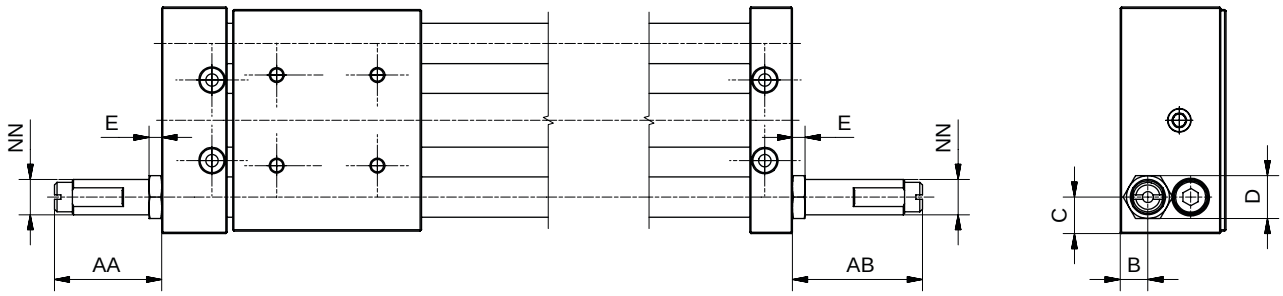
Optional external adjustable bumpers



Ø	AA	AB	B	C	D	E	NN
16	7.5 (0.30)	6.5 (0.26)	12 (0.47)	10 (0.39)	14 (0.55)	4 (0.16)	M10 x 1
20	10 (0.39)	10 (0.39)	11 (0.43)	14.5 (0.57)	18 (0.71)	4 (0.16)	M14 x 1.5
32	11 (0.43)	12 (0.47)	20 (0.79)	18 (0.71)	26 (1.02)	8 (0.31)	M20 x 1.5

External hydraulic shock absorbers



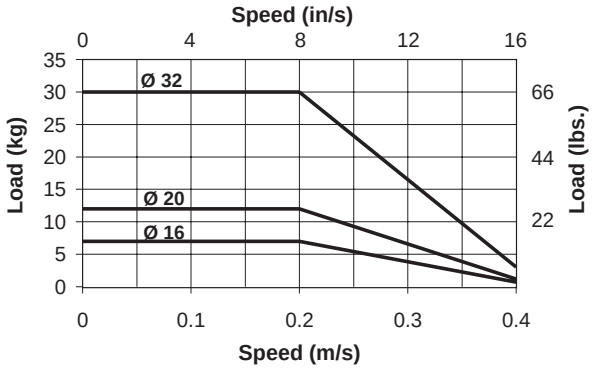
Ø	AA	AB	B	C	D	E	NN
16	18 (0.71)	27 (1.06)	12 (0.47)	10 (0.39)	13 (0.51)	3 (0.12)	M10 x 1
20	50 (1.97)	59 (2.32)	11 (0.43)	14.5 (0.57)	17 (0.67)	5 (0.20)	M14 x 1.5
32	56 (2.20)	66 (2.60)	20 (0.79)	18 (0.71)	24 (0.94)	6 (0.24)	M20 x 1.5

Loads / speeds diagram

The diagram to the right exhibits the P1Z cylinders maximum capacities with an adjustable bumper.

If the intersection exhibits between speed and load is above the curves, it is imperative to use hydraulic shock absorbers to prevent cylinder damage.

Example:
Ø 32 mm cylinder with a 0.3 m/s speed and 25 kg load
Choose the hydraulic shock absorber option
Ø 20mm cylinder with 0.2 m/s speed and 10 kg load
Choose the adjustable bumpers option



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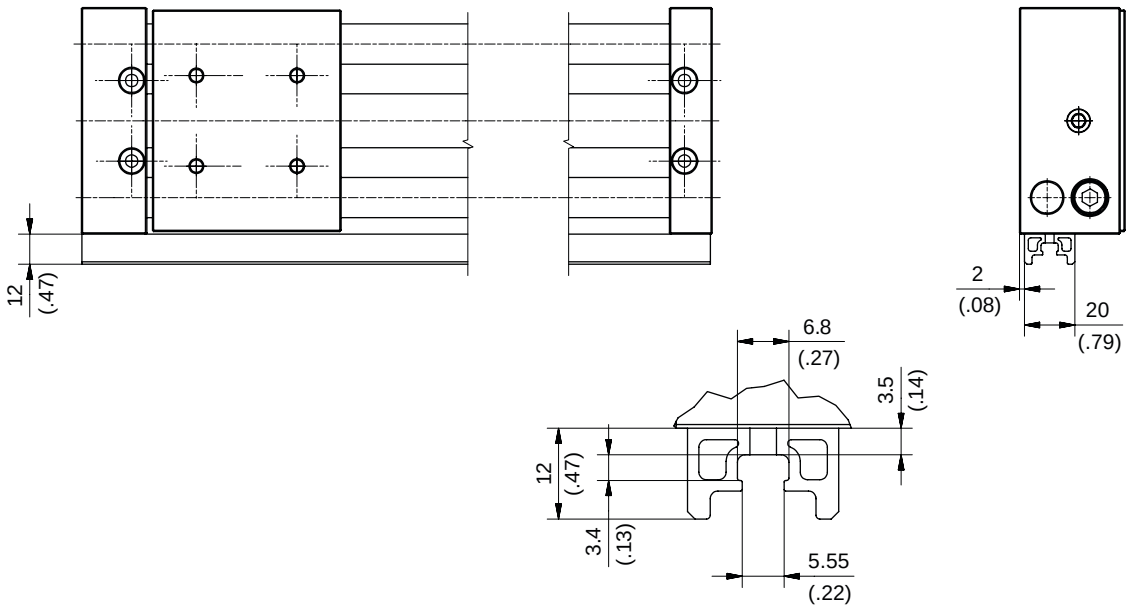
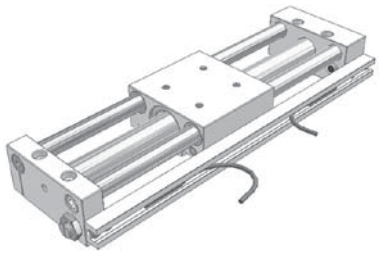
Optional sensor rail



Detection

Reed or solid state sensor mounting is possible on one cylinder side only.

External aluminum profile integrates 1 T-slot for sensor mounting.



Spare parts

End of stroke rubber bumpers *(2 pieces)*

ø	Order code
16	**9129609AS**
20	**9129610AS**
32	**9129611AS**

Flow controls *(1 piece)*

	Order code		
Ø	BSP ports	NPT ports	Metric ports
16	**–**	**–**	**0876300300**
20	**PTFL4PB6-1/8**	**0876300400**	**–**
32	**PTFL4PB6-1/8**	**0876300400**	**–**

End of stroke hydraulic shock absorber *(1 piece)*

Ø	Order code
16	**MC25MH-NB**
20	**MC150MH**
32	**SC300M-3 NB**

Repair kits

Ø	Basic version	Guided version
16 (Cushioned)	**P1ZM016SAN-R**	**–**
16 (Non-cushioned)	**P1ZM016SNN-R**	**P1ZM016GNN-R**
20	**P1ZM020SAN-R**	**P1ZM020GNN-R**
32	**P1ZM032SAN-R**	**P1ZM032GNN-R**

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GDL Product line overview

Characteristic	Unit	Description
Full profile wipers		Rollershoes and cassette are provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wipers kits.
Acceleration and deceleration	m/s^2 (ft/sec^2)	40 m/s^2 maximum (131 ft/s^2 maximum)
Guide installation		Possible in any position.
Drag adjustment set screw		Cassettes can be adjusted at the factory or by the customer.
		Rollershoes can be set-up by the customer to incorporate the drag adjustment set screw feature. The drag adjustment set screw components are supplied with each pair of rollershoes.
Standard lubrication		Lifetime lubrication with standard grease-packed roller bearings.
Speed	m/s (ft/s)	Up to 10 m/s (or up to 33 ft/s)
Materials for high performance or standard versions / corrosion resistant		Rail: Aluminum alloy
		Guideways: Hardened high alloy spring steel
		Cassettes / rollershoes / top plates: Aluminum alloy
		Rollers: Bearing steel / Stainless steel bearing steel
Bearing types		Steel axial needle, Specials on request (ex: anti-magnetic, grease free, high dynamics) - consult factory
Operating temperature	C (F)	-10° to 80°C (+14 to 176°F) temperature range
Specials available		Custom length cassettes and rollershoes for 100 piece lots minimum.
		Keyed butt-jointed rail sections up to 4000mm.
		Solid continuous length rails between 4000.
		Offset or non-standard “L11” dimensions on opposite ends of cut rails.
		Integrated metal scraper with standard full profile wiper currently available.
		Rail underside blind mounting holes.

Descriptions of the various GDL series available:

High Performance Series:
(Sizes FDC12HP-... thru FDC45HP-...)

The High Performance series is the basis for GDL's development, which is used in the majority of applications. High Performance guides consist of 8 axial needle roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and shielded, while offering the highest load and moment rating capacities within the GDL product line.

Standard Performance Series:
(Sizes FDC12SP-... thru FDC45SP-...)

The Standard Performance series is intended for minor loads and moments for particularly economical guidance solutions. Standard Performance guides consist of 8 radial ball roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and sealed, while offering the lowest load and moment ratings available within the GDL product line, with the exception of the Grease-Free and the Anti-Friction / Corrosion Resistant series. Standard Performance series is the second most commonly used GDL guides for various applications and also provides excellent running behavior.

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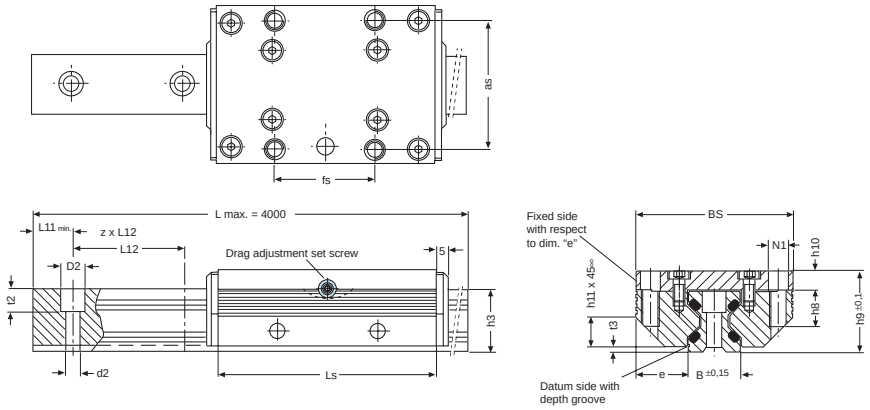
Cassette with double sided rail



Dimensions for both standard FDC version guides

Size	Length Ls	B	BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
12	64	12.0	37	14.7	19	30	3.4	6	12.50	25	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	30	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	80	24	13.5	22	16	105	14.5	4.0	M12

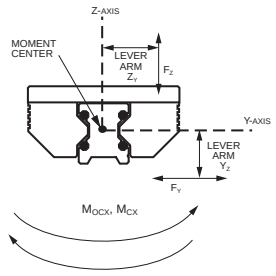
Dimensions (mm)

Dimensions for both underside mounting hole FDC version guides (Ref. ordering instructions)

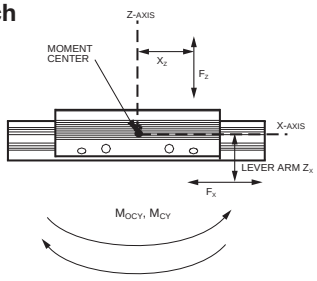
Size	Length Ls	B	BS	h3	h9	as	d2	D2	e	fs	h8	h10	h11	L11 min.	L12	t2	t3	N1
12	64	12.0	37	14.7	19	30	3.4	6	12.50	29	8	4.0	6	10	40	5.5	1.4	M4
15	78	15.5	47	18.7	24	38	4.5	8	15.75	34	10	5.0	8	10	60	6.0	2.0	M5
20	92	21.0	63	22.6	30	53	5.5	10	21.00	40	12	7.0	11	10	60	7.0	2.0	M6
25	98	23.0	70	27.0	36	57	6.6	11	23.50	45	16	8.5	13	10	60	10.0	2.5	M8
35	135	32.0	100	37.0	48	82	9.0	15	34.00	62	20	10.5	20	12	80	11.5	3.5	M10
45	165	45.0	120	46.0	60	100	11.0	18	37.50	90	24	13.5	22	16	105	14.5	4.0	M12

Dimensions (mm)

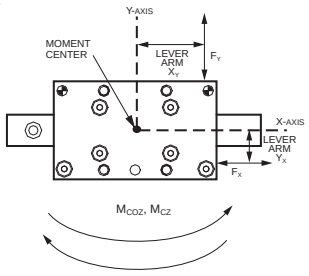
Roll



Pitch



Yaw



Load & moment rating capacities (for cassettes on double sided rail)

Dynamic load rating C (N)	Static load rating Co (N)	Static moment rating capacities: Roll Mocx (Nm)	Pitch Mocy (Nm)	Yaw Mocz (Nm)	Dynamic moment rating capacities: Roll Mcx (Nm)	Pitch Mcy (Nm)	Yaw Mcz (Nm)	Cassette weight (kg)	Rail weight (kg)	Cassette series
High performance series										
2800	3000	27	43	43	25	40	40	0.1	0.4	**FDC12HP-...**
4200	3400	37	58	58	45	72	72	0.3	0.8	**FDC15HP-...**
5400	5400	76	111	111	76	111	111	0.4	0.9	**FDC20HP-...**
9000	10100	158	222	222	142	198	198	0.6	1.8	**FDC25HP-...**
12500	18000	423	559	559	294	388	388	1.5	3.2	**FDC35HP-...**
21200	25900	827	983	983	678	806	806	2.9	5.5	**FDC45HP-...**

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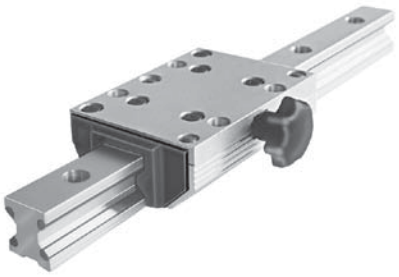
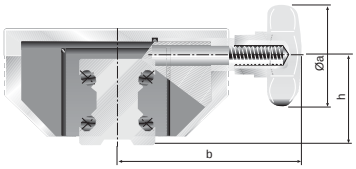
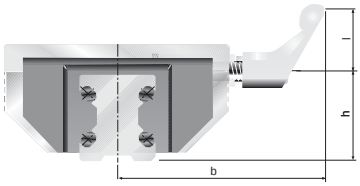
GDL Aluminum roller guides

High performance cassettes with lock device



Special cassette types





The locking cassette with star grip handle can be stopped at any desired location on the rail. The clamping device does not exert forces on the rail guideways.

The clamping device is used in fixtures which are movable manually, clamping and stop ledgers, feeding of tools and work pieces. Also available with L-ratchet handle.

Star grip handle dimensions

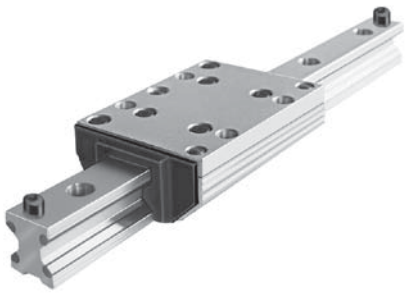
Size	Øa	b	h	Clamp force	Part numbers star grip knob
12	N/A				
15	25	41	19.0	200	**FDC15HP-00020000**
20	25	49	23.0	250	**FDC20HP-00020000**
25	32	56	28.0	250	**FDC25HP-00020000**
35	50	83	38.5	350	**FDC35HP-00020000**
45	63	101	48.0	750	**FDC45HP-00020000**

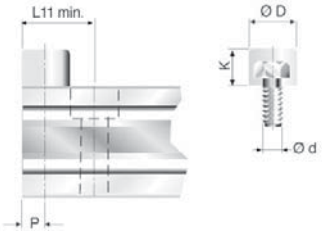
Dimensions (mm), Force (N) with normal manual tightening.

L-ratchet handle dimensions

Size	l	b	h	Clamp force	Part numbers L-ratchet handle
12	N/A				
15	45	59.5	19.0	200	**FDC15HP-00010000**
20	45	67.5	23.0	250	**FDC20HP-00010000**
25	45	71	28.0	250	**FDC25HP-00010000**
35	63	96	38.5	350	**FDC35HP-00010000**
45	78	116	48.0	750	**FDC45HP-00010000**

End of stroke stop screws





The stop screws are screwed into threads (option) on the guide rails. The end of stroke stopping energy is reduced by a rubber cap. With guide rails where the L11 is less than the standard minimum, we offset the mounting hole by half of its diameter.

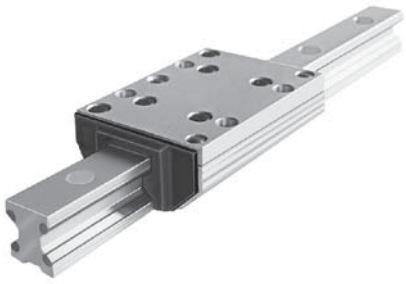
Note: Customer must drill and tap the holes for the stop screws.

Size	Ød	ØD	K	L11 min.	P	Order number
12	M5	12	8	15.0	6.0	**63504A**
15	M5	12	8	16.0	6.0	**63504A**
20	M5	12	8	17.0	6.0	**63504A**
25	M6	15	10	20.5	7.5	**63505A**
35	M8	19	13	26.5	9.5	**63506A**
45	M10	24	16	33.0	12.0	**63507A**

Dimensions (mm)

GDL accessories

Rail mounting screw covers



Material: Wear resistant plastic, resistant to oil and aging.

Mounting: Put a plastic plate on top and pound in uniformly. Remove residual burrs with a soft brush or fingernail.

Note: Use respective order numbers for ordering separately or include in rail part number.

Size	Cylindrical screw DIN912	Ø D	Order number
12	M3	6	**87752A**
15	M4	8	**87753A**
20	M5	10	**87754A**
25	M6	11	**87755A**
35	M8	15	**87756A**
45	M10	18	**87757A**

Dimensions (mm)

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GDL Aluminum roller guides

Version with wipers
Integrated into an additional cover, a felt wiper is saturated with oil. Although dependent on the degree of contaminants, these wipers last for some 6000km, after which the felt wipers can either be washed or replaced.

For optimal cassette rolling performance, all holes in the guide rails should be filled with the plastic rail mounting screw covers.

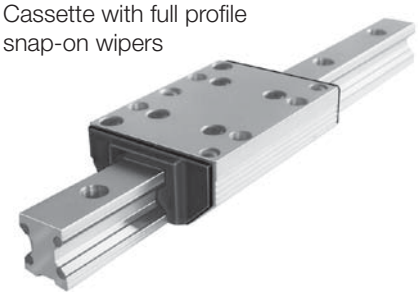
Order numbers for replacement wiper kits

FDC series and size	Respective order number
12	**84457B**
15	**84480B**
20	**84481B**
25	**84482B**
35	**84483B**
45	**84484B**

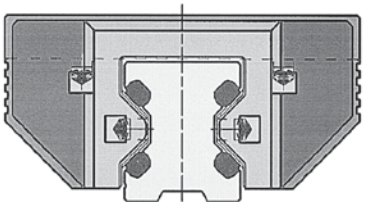
*wiper kits are sold in pairs

NOTE: Use respective order numbers for ordering separately as replacements, or specify in cassette part number.

Cassette with full profile snap-on wipers



Full profile snap-on wiper



GDL's keyed butt-jointed rail option

GUIDELINE rails can be precisely fastened together using a factory offered keyed butt-joint option for continuous rail lengths, as shown in Figures 1 & 2.

Two rail sections are clamped together with mating round bar stock pieces that seat tangent to both rail section guideways on each side of the rail. While the rail sections are clamped together, a keyway slot is machined in the top and bottom sides of the rail, across the butt- joint. Screw holes are then drilled through the rail inside the keyway slot, so the opposing keyways can be drawn together tightly with screws. The round bar stock clamp is then removed, providing a rigid and well aligned keyed butt-joint.

The keyed butt-joint option provides optimum alignment of all guideways from one rail section to the next. This allows for optimum "smooth" guidance of the cassette bearings, while crossing rail butt-joints.

The keyed butt-jointed rail option is currently available in the FDR version 25, 35, & 45 mm rail sizes. For a keyed butt-joint on rail sizes 25, 35 or 45 mm, specify P/N:# GDL-BJK

Consult factory for other size possibilities.

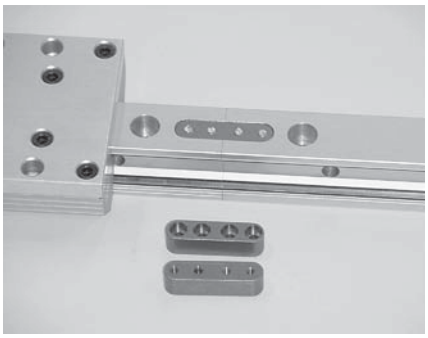


Figure 1

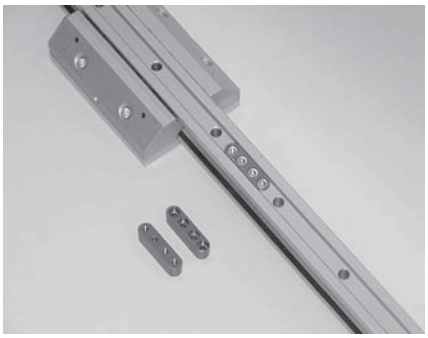


Figure 2

GDL coupled with structural aluminum extrusion material and OSP-E actuator

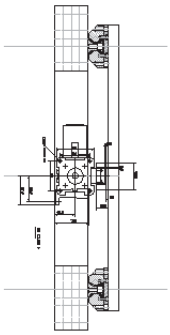


Figure 3

GDL linear guides couple well with various structural aluminum extrusions and Parker-Origa OSP-P and OSP-E actuators. Mounting can be easily accomplished using standard fasteners and mounting brackets. See Figure 3 above.

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Ordering Information / Part Numbering System for GDL Rails

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	D	R	1	2	H	0	0	0	0	0	0	–	0	0	0	0	0

Series

FD	Double sided rail guide* (standard)

Rail

R	Standard

Rail Size

1	2*
1	5*
2	0*
2	5*
3	5*
4	5*

Guideway Material

H	High performance alloy steel* (standard)
S	Stainless steel

Coatings

0	Anodized aluminum* (standard)
Z	Custom (consult factory)

Mounting Holes

0	Topside thru hole* (standard)
1	Underside blind thread
Z	Custom (consult factory)

"L11" Dimension

00	Equal on both sides* (standard)
??	Actual dimension (mm)**

** As measured from left side while viewing the depth groove line.

Long Rail Joining Option

0	None* (standard)
1	Keyed butt joint (size 25-45 only)
2	Unkeyed butt joint

Screw Covers

0	None* (standard)
1	Yes*

Note: Quantity supplied to cover all rail holes.

Length (mm)

–	0	0	0	0	0

Note: Maximum length is 4 meters on Size 12.

*Stocked Item

Ordering Information / Part Numbering System for GDL Cassettes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
F	D	C	1	2	H	P	–	0	0	0	0	0	0	0	0

Series

FD	Double sided rail cassette* (standard

Cassette

C	Standard

Rail Size

1	2*
1	5*
2	0*
2	5*
3	5*
4	5*

Bearing Options

HP	Axial needle - high performance alloy steel* (standard)
SP	Single row radial ball - standard performance - alloy steel* (standard)
ZZ	Factory** (consult factory

Grease

0	High performance* (standard)
Z	Custom (consult factory)

Lubrication Options

0	None* (standard)
z	Custom (consult factory)**

Coatings

0	Anodized and standard hardware* (standard)
1	Anodized and stainless steel hardware*
Z	Custom (consult factory)

Locking Mechanism

0	None* (standard)
1	"L" ratchet handle*
2	Star grip handle*

* Locking mechanism only available on FD Series size 15 thru 45 with Axial Needle Bearing - High Performance - Alloy Steel.

Mounting Holes

0	Topside threaded thru* (standard)
1	Underside hole thru (unthreaded)
2	Underside hole thru (threaded)

Wiper Options

0	With felt wipers* (standard)
1	Without*
2	With felt wipers and scrapers*

Cassette Length

0	Normal length* (standard)
Z	Custom (consult factory)**

Adjustment

0	None* (standard)
1	Adjusted to specific rail*

*Stocked Item
**Minimum Order Quantity Required

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- Single or double vane rotary actuator
- 8 model sizes
- Output torque @ 100 PSIG: 8 to 1800 lb-in
- Standard rotations:
  Single vane units: 280° ± 1°
  (except size 10 & 11: 275° ± 2.5°)
  Double vane units: 100° ± 1°
  (except size 10 & 11: 95° ± 2.5°)
  Available with stroke adjusters and internal stops to provide 90° and 180° rotation
- Stainless steel shaft
- Optional radial ball bushing shaft bearing

Operating information

Operating pressure:	150 PSIG air
Temperature range: †	
Nitrile seals	30°F to 180°F
Fluorocarbon seals*	30°F to 250°F

* See fluorocarbon seal option for high temperature applications.
† Fow low temperature version, please consult factory.

Filtration requirements: 40 micron, dry filtered air

For technical information see CD

Ordering information

PV	22	D	–	090BS	–	B	B	2	V	–	B	

Model

10	22	33	42
11		36	44
			46

Vanes / maximum rotation

Omit	Single Vane, 280° Rotation (275° on PV10, PV11)
D	Double Vane, 100° Rotation (95° on PV10, PV11)

Rotation Options
(may order more than one)

Omit	Standard Units (no stroke adjusters, bumpers or switches)
090A	Stroke Adjusters adjustable from 60° to maximum unit rotation (preadjusted to 90°)
180A	Stroke Adjusters (single vane only) adjustable from 60° to 190° (preadjusted to 180°)
090B	Internal bumpers, 90° rotation [4]
180B	Internal bumpers, 180° rotation (single vane only)
090S	Magnets[1] added, 90° setting
180S	Magnets[1] added, 180° setting (single vane only)

Mounting

B	Base / Front (Std)
R	Rear Flange [2, 3]
F	Front Flange
S	Base / Rear Face [2]

Shaft

B	Single male keyed (Std)
C	Double end male keyed [2]

Ports

2	NPTF Top (Std) (10-32 on PV10 & PV11)
7	NPTF Rear [2] (10-32 on PV10 & PV11)

Options

Omit	None
L	Radial ball bushings
V	Fluorocarbon seals

Design series

B	Current design series

Special options

Omit	Standard

Two digit code assigned by factory when any "X" appears in the model number or when special options or features are required.

1. Switches can be used with stroke adjusters or bumpers (example: PV22D-090BS-BB2-B).
2. Not available with switches or stroke adjusters.
3. No tapped mounting holes in face opposite the flange.
4. 90° bumpers (090B) not available on PV10/11 sizes.

Note:
Order Hall effect sensors and reed switches separately from the Electronic Sensors section.

Sensors

For sensors see page B296.

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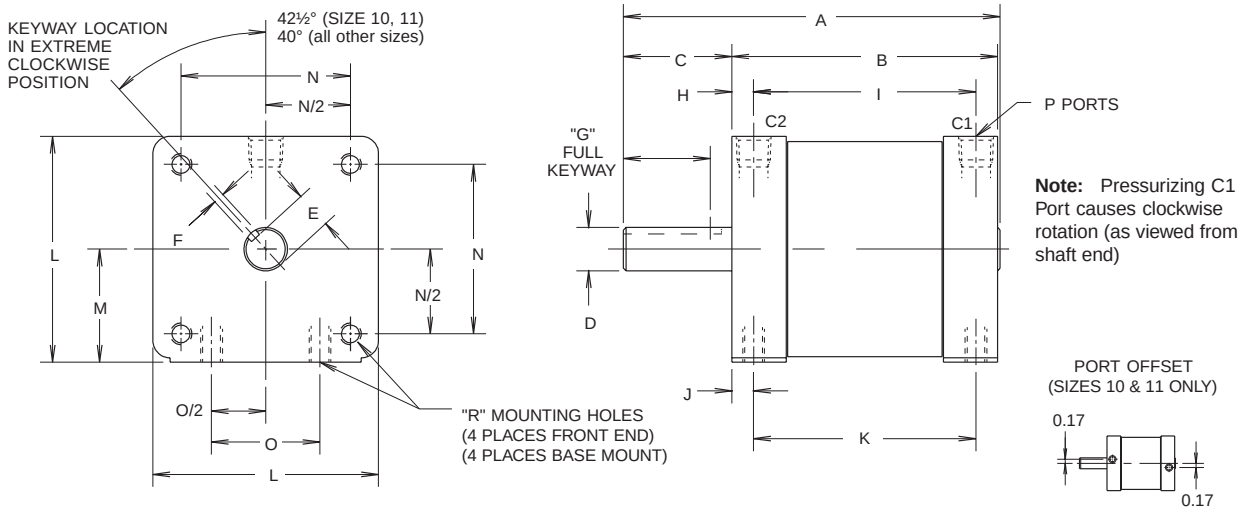
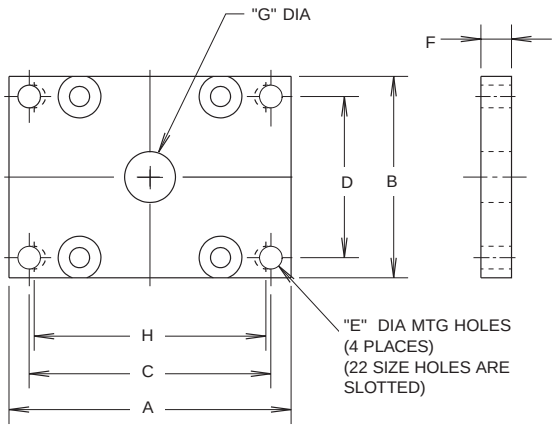
Standard Face/Base Mount (B) and Male Keyed Shaft (B)



Model number	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R
10	2.280	1.38	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.00	0.19	1.000	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
11	2.905	2.00	0.88	0.312 0.311	0.258 0.253	0.094 0.095	0.63	0.19	1.63	0.19	1.625	1.62	0.810	1.220	0.750	10-32	8-32 x 0.25 DP
22	4.340	3.06	1.25	0.500 0.499	0.423 0.418	0.125 0.126	0.94	0.25	2.56	0.25	2.560	2.50	1.250	2.000	1.250	1/8 NPTF	1/4-20NC x 0.38 DP
33	6.180	4.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	3.70	0.26	3.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
36	9.180	7.40	1.75	0.749 0.748	0.644 0.639	0.188 0.189	1.38	0.35	6.70	0.26	6.875	3.00	1.500	2.436	1.500	1/4 NPTF	5/16-18NC x 0.47 DP
42	6.280	4.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	3.00	0.50	3.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
44	8.280	6.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	5.00	0.50	5.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP
46	10.280	8.00	2.25	0.999 0.998	0.859 0.854	0.250 0.251	2.00	0.50	7.00	0.50	7.000	4.50	2.250	3.500	2.375	1/4 NPTF	3/8-16NC x 0.75 DP

Flange Mount (F, R)*



Model number	A	B	C	D	E	F	G	H
10	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
11	2.50	1.62	2.000	1.250	0.203	0.19	0.41	N/A
22	3.50	2.50	3.000	2.000	0.281	0.25	0.66	2.875
33	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
36	4.50	3.00	3.750	2.000	0.344	0.38	0.84	N/A
42	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
44	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A
46	7.32	4.51	5.905	2.953	0.551	0.63	1.61	N/A

Note: The face opposite the flange mount does not contain tapped mounting holes. Consult factory if needed.

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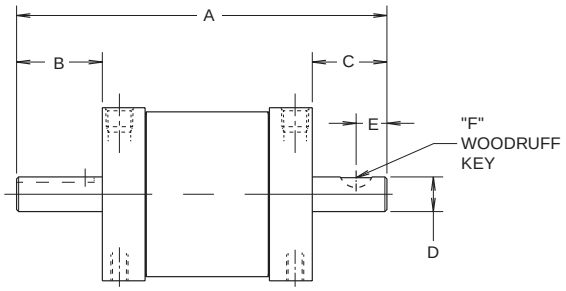
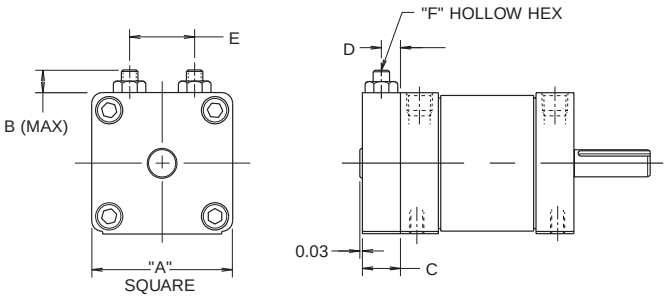
Double End Male Keyed Shaft (C)



Note: Not available with switches or stroke adjustment. Consult factory for rear port option.

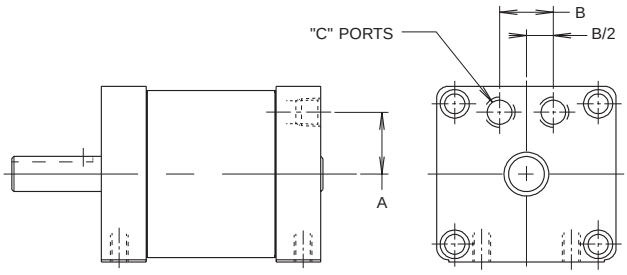
Model number	A	B	C	D	E	F
10	2.75	0.88	0.50	0.312 0.311	0.28	#302.5
11	3.38	0.88	0.50	0.312 0.311	0.28	#302.5
22	5.06	1.25	0.75	0.500 0.499	0.44	#404
33	7.15	1.75	1.00	0.749 0.748	0.56	#606
36	10.15	1.75	1.00	0.749 0.748	0.56	#606
42	7.53	2.25	1.28	0.999 0.998	0.72	#808
44	9.53	2.25	1.28	0.999 0.998	0.72	#808
46	11.53	2.25	1.28	0.999 0.998	0.72	#808

Adjustable Rotation Stop (090A, 180A)



Model number	A	B	C	D	E	F
10	1.62	0.63	0.47	0.24	0.75	3/32
11	1.62	0.63	0.47	0.24	0.75	3/32
22	2.50	1.00	0.72	0.36	1.25	5/32
33	3.00	1.16	0.97	0.48	1.56	3/16
36	3.00	1.16	0.97	0.48	1.56	3/16
42	4.50	1.38	1.25	0.56	2.25	7/32
44	4.50	1.38	1.25	0.56	2.25	7/32
46	4.50	1.38	1.25	0.56	2.25	7/32

Rear Port (7)



Model number	A	B	C
10	0.54	0.50	10-32
11	0.54	0.50	10-32
22	0.88	0.75	1/8 NPTF
33	1.09	0.90	1/8 NPTF
36	1.09	0.90	1/8 NPTF
42	1.68	1.00	1/4 NPTF
44	1.68	1.00	1/4 NPTF
46	1.68	1.00	1/4 NPTF

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- Single or double vane rotary actuator
- 3 standard rotations: 90°, 180°, or 270°
- Output torque @ 0.7 MPa:
  16 to 1120 N•cm (1.4 to 99 in-lb)
- Internal bumpers are standard
- Shock absorbers are available for high inertia loads

Operating information

Operating pressure:	100 PSIG
Temperature range:	-5°C to 80°C (-23°F to 176°F)
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

PRNA – **20** – **S** – **90** – **90** – **S**

Type	
PRNA	Sizes 1-20
PRN	Sizes 30-800

Size
1
3
10
20
30
50
150
300
800

Type	
S	Single vane
D	Double vane

Rotation angle	
90	90° (all sizes, single and double vane)
100	100° (sizes 50 through 800, double vane only)
180	180° (all sizes, single vane only)
270	270° (single vane only, not available on size 1)
280	280° (sizes 50 through 800, single vane only)

Oscillating reference point*	
40	40°
45	45°
90	90°

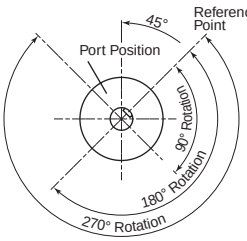
* See specification tables for availability of rotation angle /reference point combinations for the selected model.

Porting	
Omit	Standard porting
S	Rear porting (sizes 3-20 only)

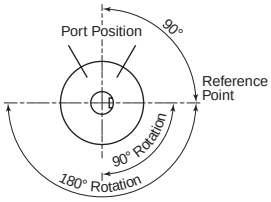
Sensors
For sensors see page B296.

Reference Point and Rotation Orientations

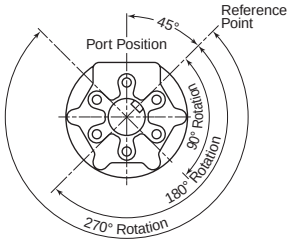
PRNA1S/D, PRNA3S/D, PRNA10S/D PRNA20S/D, PRN30S/D
Reference point at 45°



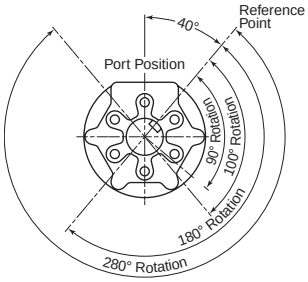
PRN1AS, PRNA3S PRNA10S, PRNA20S
Reference point at 90°



PRN50, 150, 300, 800
Reference point at 45°



PRN50, 150, 300, 800
Reference point at 40°



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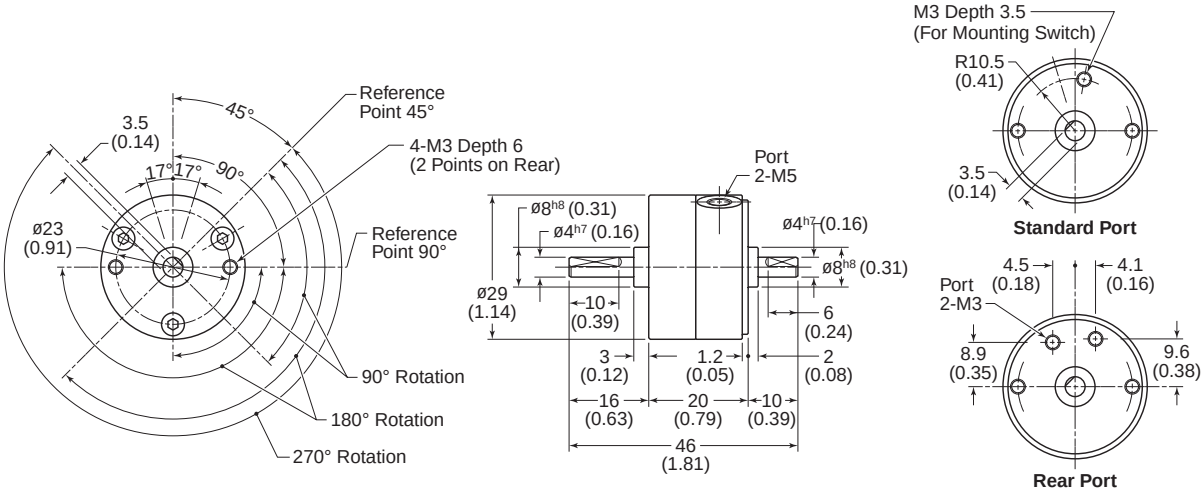
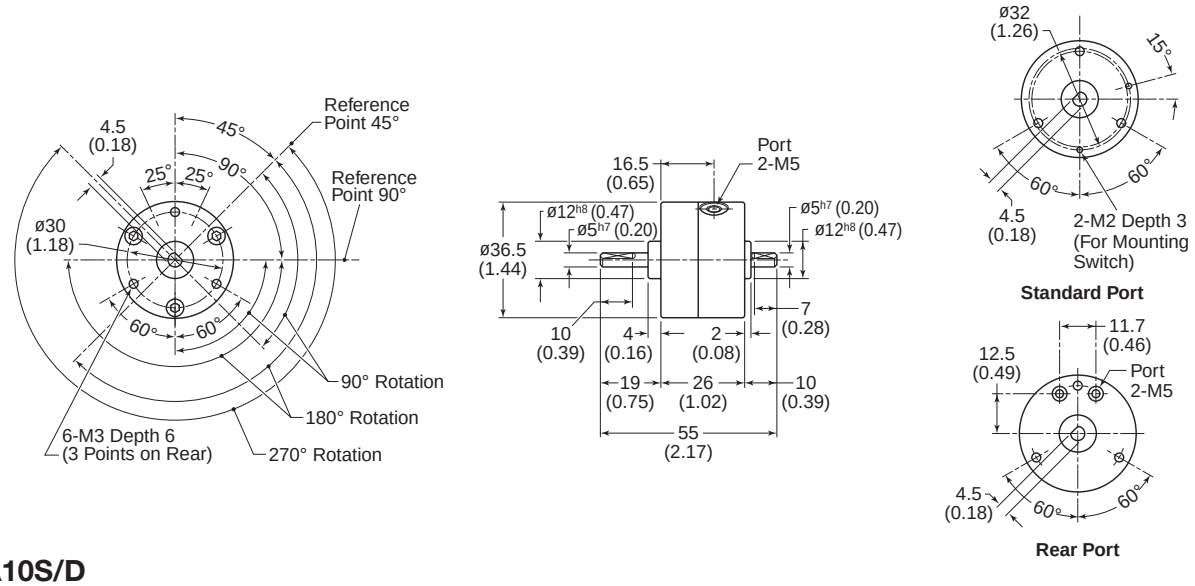
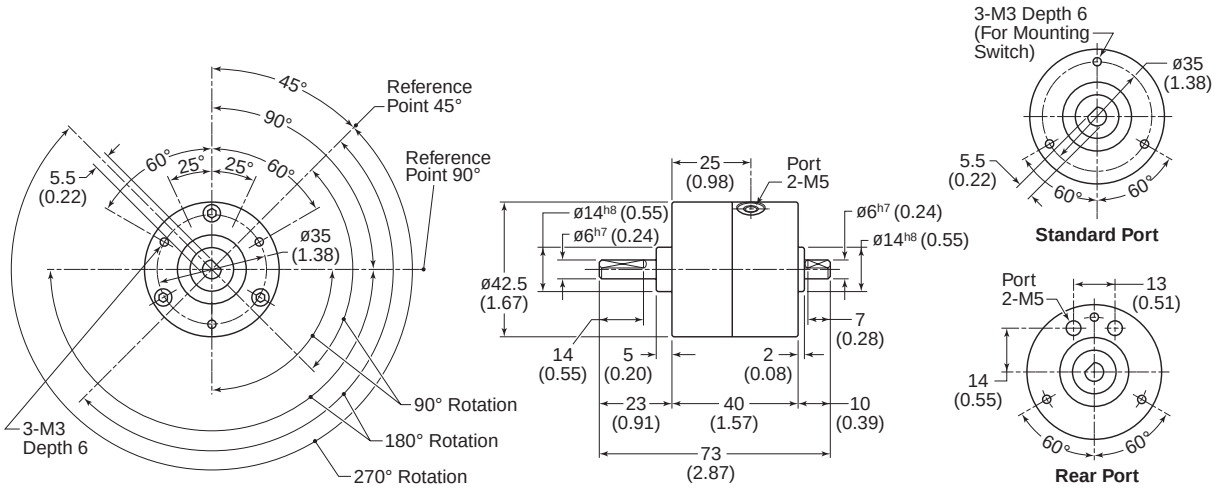
PRNA1S



PRNA3S/D



PRNA10S/D



Dimensions in mm (inch)

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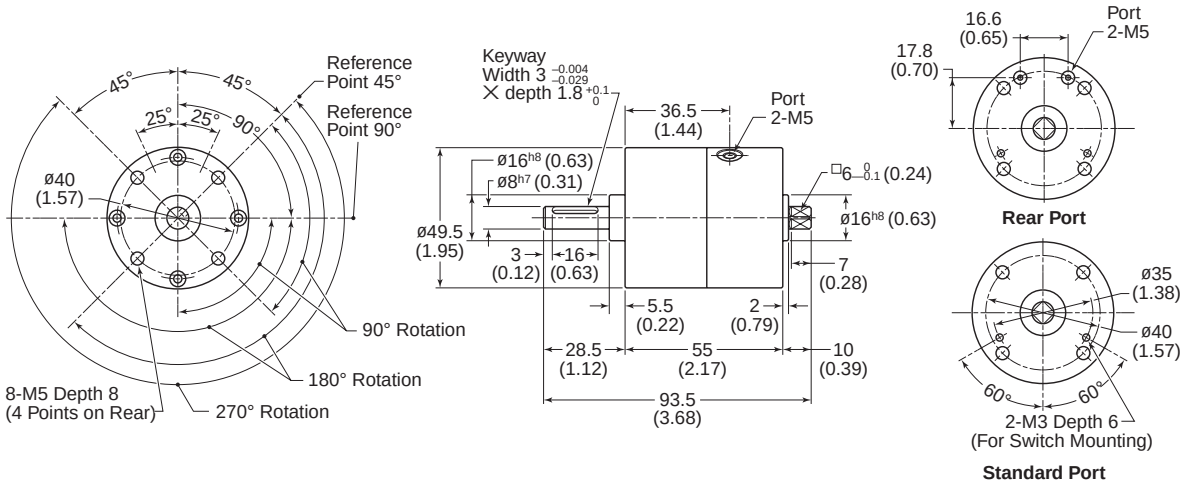
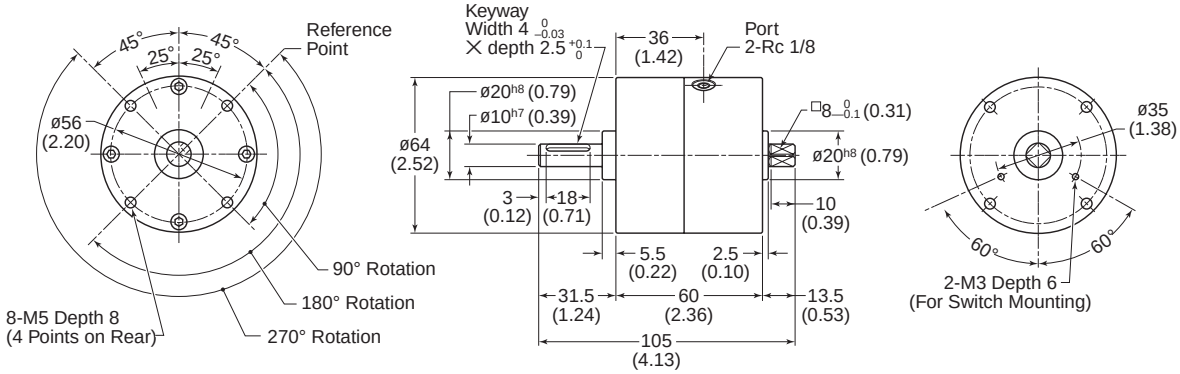
PRNA20S/D



PRN30S/D



Dimensions in mm (inch)

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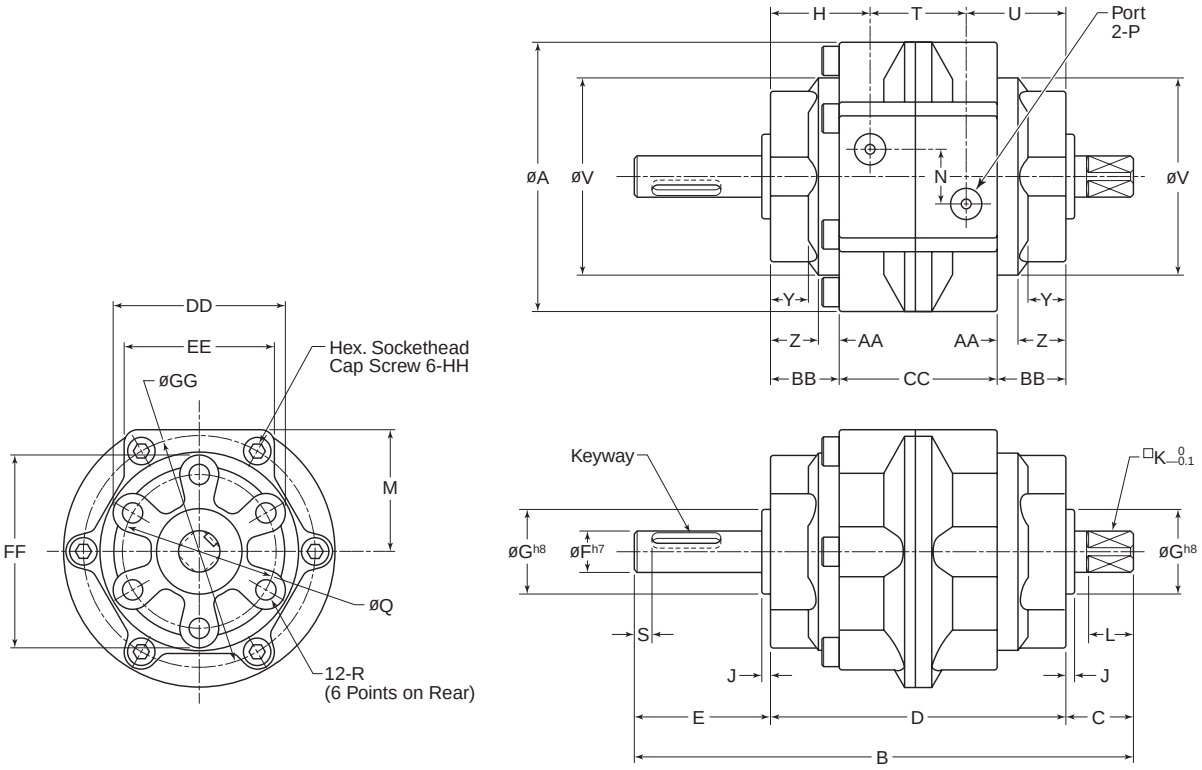
PRN Sizes 50 to 800



Dimensions in mm (inch)

Model number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
PRN50	79 (3.11)	145 (5.71)	19.5 (0.77)	86 (3.39)	39.5 (1.56)	12 (0.47)	25 (0.98)	29 (1.14)	2.5 (0.10)	10 (0.39)	13 (0.51)	36 (1.42)	16 (0.63)	Rc1/8	45 (1.77)	M6 x 1, Depth 9	5 (0.20)
PRN150	110 (4.33)	180 (7.09)	23.5 (0.93)	103 (4.06)	53.5 (2.11)	17 (0.67)	30 (1.18)	34.5 (1.36)	3 (0.12)	13 (0.51)	16 (0.63)	51 (2.01)	24 (0.94)	Rc1/4	70 (2.76)	M8 x 1.25, Depth 12	5 (0.20)
PRN300	141.5 (5.57)	220 (8.66)	30 (1.18)	125 (4.92)	65 (2.56)	25 (0.98)	45 (1.77)	41.5 (1.63)	3.5 (0.14)	19 (0.75)	22 (0.87)	66 (2.60)	32 (1.26)	Rc3/8	80 (3.15)	M10 x 1.5, Depth 15	5 (0.20)
PRN800	196 (7.72)	285 (11.22)	44.5 (1.75)	171 (6.73)	69.5 (2.74)	40 (1.57)	70 (2.76)	53.5 (2.11)	4.5 (0.18)	32 (1.26)	35 (1.38)	90 (3.54)	44 (1.73)	Rc1/2	120 (4.72)	M12 x 1.75, Depth 18	10 (0.39)

Model number	T	U	V	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	Keyway width x depth x length
PRN50	28 (1.10)	29 (1.14)	58 (2.28)	11 (0.43)	14 (0.55)	6 (0.24)	20 (0.79)	46 (1.81)	51 (2.01)	44 (1.73)	57 (2.24)	68 (2.68)	M5 x 30	4 $^{0}_{-0.03}$ x 2.5 $^{+0.1}_{0}$ x 20
PRN150	34 (1.34)	34.5 (1.36)	85.2 (3.35)	10.5 (0.41)	15.5 (0.61)	8 (0.31)	23.5 (0.93)	56 (2.20)	75 (2.95)	61 (2.40)	85 (3.35)	97 (3.82)	M6 x 35	5 $^{0}_{-0.03}$ x 3 $^{+0.1}_{0}$ x 36
PRN300	42 (1.65)	41.5 (1.63)	110 (4.33)	13 (0.51)	17.5 (0.69)	10 (0.39)	27.5 (1.08)	70 (2.76)	88.5 (3.48)	78 (3.07)	98.5 (3.88)	125 (4.92)	M8 x 45	7 $^{0}_{-0.03}$ x 4 $^{+0.2}_{0}$ x 40
PRN800	64 (2.52)	53.5 (2.11)	152 (5.98)	14.5 (0.57)	21.1 (0.83)	11.4 (0.45)	32.5 (1.28)	106 (4.17)	130 (5.12)	110 (4.33)	145 (5.71)	173 (6.81)	M12 x 70	12 $^{0}_{-0.043}$ x 5 $^{+0.2}_{0}$ x 40

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- Rack and pinion patented movement.
- Adjustable rotation 0 to 190°
- 7 bore sizes (10 to 63mm)
- Theoretical torque (.28 to 39 Nm at 6 bar)
- Ball bearing supported shaft
- Through hole in the pinion.
- Optional rubber dampers or hydraulic shock-absorbers.
- Mid position stop (MPS)

Operating information

Temperature range:	41°F to 140°F (5°C to 60°C)
Operating pressure:	1 to 8 bar maximum
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Rotary Table

Must be fitted with either external cushioning or other cushioning (MPS Units)

Size Ø mm	Connection	Weight kg	Rotary table order code	Weight kg	Intermediate stop order code
10	M5	0.234	**P5WCM10NMN0190B**	0.055	**P5WCM10M**
12	M5	0.557	**P5WCM12NMN0190B**	0.100	**P5WCM12M**
20	M5	0.966	**P5WCM20NMN0190B**	0.190	**P5WCM20M**
25	G1/8	1.682	**P5WCM25NMN0190B**	0.300	**P5WCM25M**
35	G1/8	2.473	**P5WCM35NMN0190B**	0.450	**P5WCM35M**
45	G1/4	5.252	**P5WCM45NMN0190B**	1.000	**P5WCM45M**
63	G1/4	8.184	**P5WCM63NMN0190B**	1.675	**P5WCM63M**

External Cushioning

Size Ø mm	Thread	Weight kg	Hydraulic shock absorbers order code	Weight kg	Rubber dampers order code
10	M8x1	0.008	**MC10MH**	0.009	**P5WCM10B**
12	M10x1	0.014	**MC25ML-NB**	0.016	**P5WCM12B**
20	M12x1	0.030	**MC75M-3-NB-111**	0.028	**P5WCM20B**
25	M12x1	0.030	**MC75M-3-NB-111**	0.028	**P5WCM20B**
35	M14x1.5	0.008	**MC150MH2**		
45	M20x1.5	0.15	**MC225MH2**		
63	M25x1.5	0.26	**MC600MH2**		

Sensors
For sensors see page B296.

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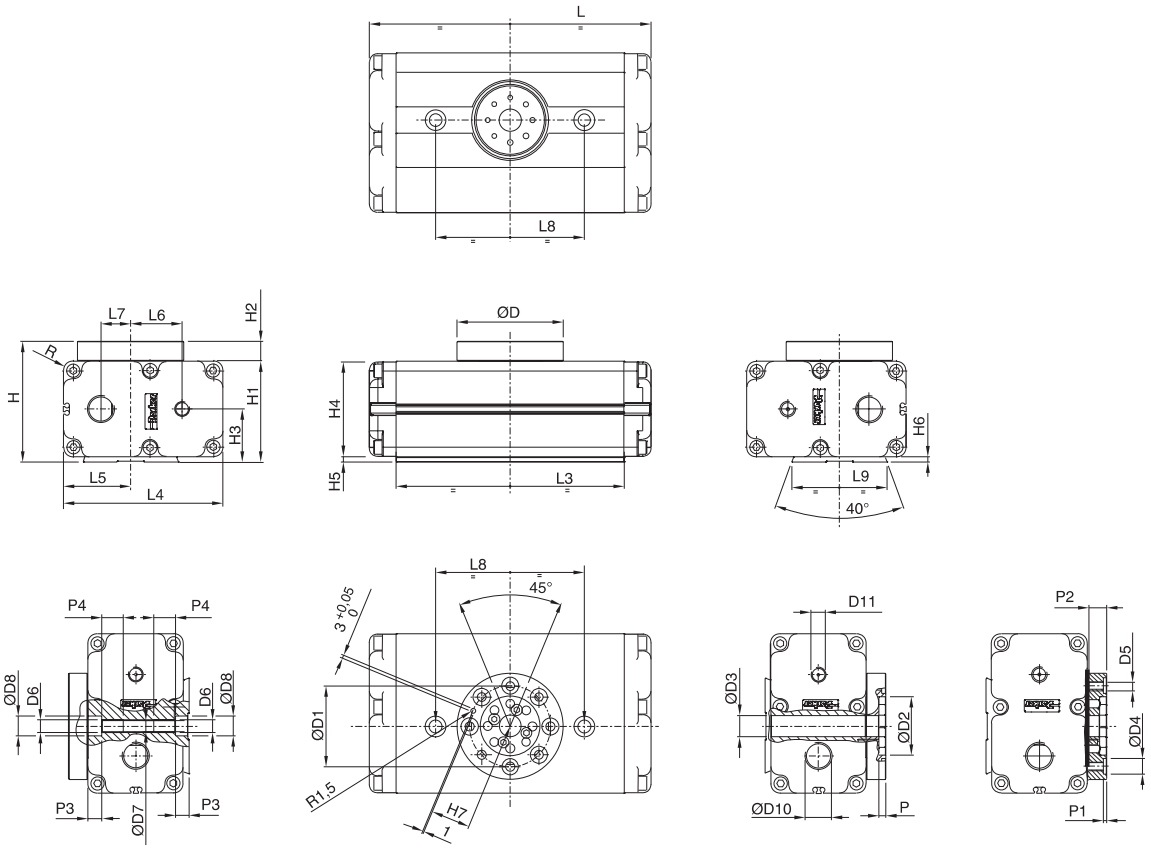

Size Ø mm	L mm	L3 mm	L4 mm	L5 mm	L6 mm	L7 mm	L8 ± 0.02 mm	L9 mm	D mm	D1 ±0.02 mm	D2 mm	D3 mm	D4 H8 mm	D5	D6	D7 mm	D8 H8 mm	D10	D11
10	81	65	38	19	10	9	50	40	32	23	–	5	7	M4	M5	4.3	9	M8x1	M5
12	108	88	50	25	13	13	59	40	45	31.5	22	6	7	M4	M6	5.2	11	M10x1	M5
20	130	110	65	32.5	16	13.5	72	56	45	31.5	22	8	7	M4	M6	5.2	11	M12x1	M5
25	162	136	80	40.5	24	18	86	70	65	50	37	10	9	M5	M8	6.8	15	M12x1	G1/8
35	170	140	100	47	28.5	17.5	86	70	65	50	37	12	9	M5	M8	6.8	15	M14x1.5	G1/8
45	230	180	120	56	37	26	140	90	100	76	55	18	15	M8	M12	10.5	19	M20x1.5	G1/4
63	265	215	150	63	48.5	28	140	90	100	76	55	20	15	M8	M12	10.5	19	M25x1.5	G1/4

Size Ø mm	H mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	H6 mm	H7 mm	P mm	P1 mm	P2 mm	P3 mm	P4 mm	R mm
10	35	27	8	16	21.5	5.25	5	–	–	2.5	6.5	6	10	2.75
12	47	37	10	21	31	5.5	5	15.25	4	2.5	8	6	12	3.5
20	54	44	10	24.5	38	5.5	5	15.25	4	2.5	8	6	12	4.5
25	64	50	14	27.5	44	5.5	5	24,5	5	3	12	10	18	5
35	76	62	14	33.5	55	5.5	5	24.5	5	3	12	10	18	7
45	95.5	77	18.5	41	70	5.5	5	37.5	7	3.5	16	13	24	7
63	113.5	95	18.5	50	88	5.5	5	37.5	7	3.5	16	13	24	9

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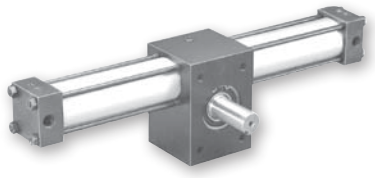
- Rack and pinion rotary actuator
- 5 bore sizes from 1" to 3-1/4"
- Output torque @ 100 PSIG: 39 lb-in to 2281 lb-in
- Standard rotations: 90°, 180°, 270°, 360°
- Available as single or double rack, 3 position, air/oil, anitbacklash
- Optional bumpers, cushions, stroke adjusters, shock absorbers



Operating information

Operating pressure:	250 PSIG
Temperature range:	
Nitrile seals	0°F to 180°F
Fluorocarbon seals	0°F to 250°F
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Sensors
For sensors see page B296.

Ordering information

PTR	25	1	–	090	3	F	P	–	A	B	2	1	M	V	–	C	

Model [1]

10	1" Bore
15	1-1/2" Bore
20	2" Bore
25	2-1/2" Bore
32	3-1/4" Bore

Rotation [2]

090	90°
180	180°
270	270°
360	360°
Or specify any other rotation.	

Configuration

1	Single Rack
2	Double Rack
3	Three Position Actuator
6	Air/Oil Operation
7	Antibacklash

Cushion / Bumpers

Omit	None
1	Cushioned CW rotation [3]
2	Cushioned CCW rotation [3]
3	Cushioned both rotations
4	Four cushions [4]
5	Bumper CW rotation [3]
6	Bumper CCW rotation [3]
7	Bumper both rotations
9	Special

Stroke adjusters

Omit	None
D	0-30° CW rotation [3, 5]
E	0-30° CCW rotation [3, 5]
F	0-30° both rotations [5]
H	Shock/stroke adj. CW rotation [3, 7]
K	Shock/stroke adj. CCW rotation [3, 7]
L	Shock/stroke adj. both rotations [7]
X	Special

Mounting

A	Face/base (standard)
F	Front flange
G	Foot flange
P	Pilot ring
R	Rear flange
X	Special

Port flow controls

Omit	None
P	Flow control both rotations
R	Flow control CW rotation [3]
S	Flow control CCW rotation [3]

Shaft

A	Female keyed
B	Single male keyed (standard)
C	Double male keyed
R	Preload keyway
X	Special

Port type

1	SAE straight thread
2	NPTF
4	BSPP (ISO 1179-1 with ISO 228-1 threads)
9	Special

Standard options

Omit	None
M	Magnetic piston ring
S	Shaft seal cover
Q	Prepped for external air/oil tank
L	Air/oil cushion & flow control adj. at location 1 (opposite standard)

Port location

1	Position 1 (standard)
2	Position 2
3	Position 3
4	Position 4
5	Position 5 [6]
9	Special

Seals

Omit	Nitrile
V	Fluorocarbon
X	Special

Special Options

Omit	Standard

(Two-digit code assigned by factory and applies when any "X" or "9" appears in the model number or when special options or features are required.)

Design Series

C	Current

Other options

Detail in clear text:
- Proximity Sensors
- Feedback Potentiometer

Notes:

1 Cylinder bore size. See appropriate tables for torque output.

2 For 3-position units, specify middle and total rotation separated by a "/", ie 090/180. To obtain equal rotation both sides of midstroke (theoretical 12:00), order unit with 5° longer rotation than standard with stroke adjusters.

3 Viewed from shaft end.

4 Double rack models only.

5 Reduces to 10° with cushions.

6 Not available with cushions or stroke adjusters.

7 Refer to Catalog 0900-E page H45 for option configuration compatibility.

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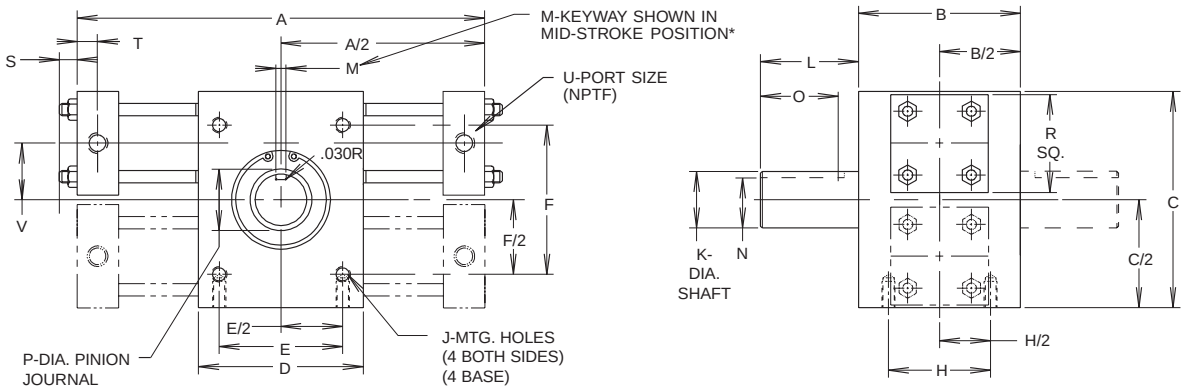
Standard Face Base Mount (A) and Male Keyed Shaft (B)

Double Male Keyed Shaft (C) shown in phantom



Model number	Rotation Degrees	A	B	C	D	E	F	H	J	K	L	M	N
	90	6-11/16											
10	180	8-1/4	2	3	2	1.500	2.000	1.500	1/4-20 x 3/8 DP	0.500 0.499	7/8	0.125 0.127	0.430 0.425
	360	11-7/16											
	90	9-1/8											
15	180	11-3/16	3	4-1/4	3	2.000	3.000	2.000	5/16-18 x 1/2 DP	0.875 0.874	1-7/8	0.188 0.190	0.771 0.761
	360	15-3/8											
	90	11-3/16											
20	180	14-1/16	3	5	4	2.500	3.500	2.000	3/8-16 x 1/2 DP	1.125 1.124	1-7/8	0.250 0.252	0.986
	360	19-11/16											
	90	12-9/16											
25	180	15-1/2	3-1/2	6	4	2.500	4.500	2.000	1/2-13 x 3/4 DP	1.375 1.374	2-1/4	0.313 0.315	1.201 1.191
	360	20-5/8											
	90	16-5/8											
32	180	21-1/8	5	8	5	3.000	5.000	2. 500	3/4-10 x 1 DP	1.750 1.749	3-1/2	0.375 0.377	1.542 1.532
	360	29-3/8											

Model number	O	P	R	S	T	U	V
10	5/8	0.59	1-1/2	1/4	0.31	1/8	3/4
15	1-1/2	0.98	2	5/16	0.41	1/4	1-1/16
20	1-1/2	1.18	2-1/2	3/8	0.41	1/4	1-1/4
25	1-3/4	1.38	3	3/8	0.41	1/4	1-1/2
32	3	1.77	3-3/4	7/16	0.56	3/8	1-15/16

*To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

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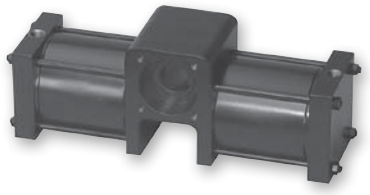
- Rack & pinion rotary actuator
- 2 large bore models
- 3 standard rotations: 90°, 180°, 360°
- Standard output torque at 100 PSIG: 4,500 and 10,000 lb-in
- Large female pinion
- Available with adjustable cushions and stroke adjusters



Operating information

Operating pressure:	100 PSIG
Temperature range:	
Nitrile seals	0°F to 180°F
Fluorocarbon seals	0°F to 250°F
Filtration requirements:	40 micron, dry filtered air

For technical information see CD

Ordering information

HP	10	–	090	3	C	–	A	A	2	V	–	

Model

4.5	4,500 lb-in output torque
10	10,000 lb-in output torque

Rotation [1]

090	90°
180	180°
360	360°

Specify other rotations.

Cushions

Omit	None
1	CW rotation [2]
2	CCW rotation [2]
3	Both rotation
9	Special

Stroke adjusters

Omit	None
A	0-5° CW rotation [2]
B	0-5° CCW rotation [2]
C	0-5° both rotation
D	0-30° CW rotation [2, 3]
E	0-30° CCW rotation [2, 3]
F	0-30° both rotation [3]
X	Special

Mounting style

A	Face (standard)
X	Special

Shaft configuration

A	Female keyed shaft
B	Male keyed shaft
D	Female SAE 10B spline
E	Male SAE 10B spline
X	Special

Port type

2	NPTF (standard)
9	Special

Seals

Omit	Nitrile (standard)
V	Fluorocarbon
X	Special

Special options

Omit	Standard

Two digit code assigned by factory when any "X" or "9" appears in the model number or when special options or features are required.

Notes:

1 To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

2 Viewed from shaft end.

3 Cannot combine with cushions.

Sensors

For sensors see page B296.

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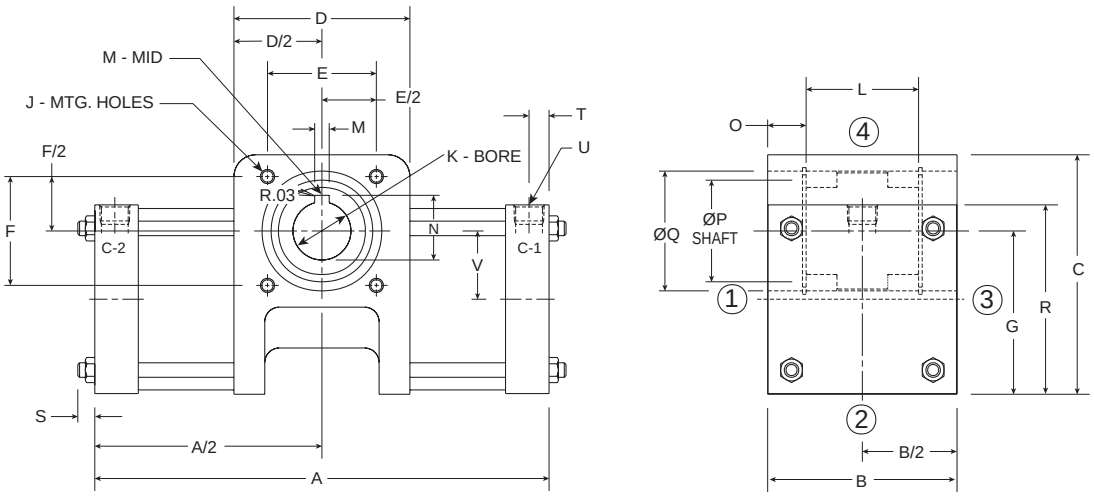
Standard face mount (A) and female keyed shaft (A) shown



Numbers above represent possible mounting and port positions.

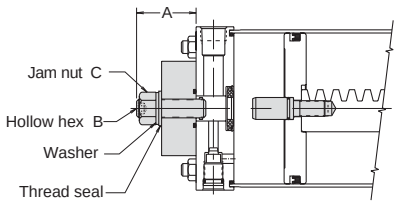
Notes: Pressure on C-1 port gives clockwise rotation.
Pressure on C-2 port gives counterclockwise rotation.

Model number	Rotation	A	B	C	D	E	F	G	J	K
4.5	90°	15-5/8	6.525	8-1/4	6.063	3.750	3.750	5.615	7/16-14 x 21/32 DP	2.000 2.003
	180°	22-1/4								
	360°	33								
10	90°	18	8.525	10-1/2	7.813	5.000	5.000	7.265	5/8-11 x 15/16 DP	2.250 2.253
	180°	26-3/4								
	360°	39-5/8								

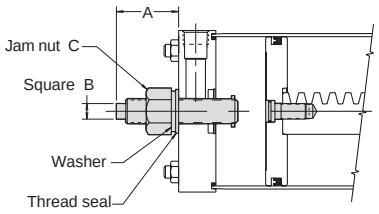
Model number	L	M	N	O	P	Q	R	S	T	U	V
4.5	3-7/8	0.500 0.502	2.223 2.233	1-5/16	3-1/2	4-1/8	6-1/2	5/8	0.69	3/4 NPTF	2.35
10	5	0.625 0.628	2.525 2.535	1-3/4	4-1/2	5-1/4	8-1/2	3/4	0.69	3/4 NPTF	3.00

Stroke Adjusters (A - F)

5° stroke adjust option
with cushion option

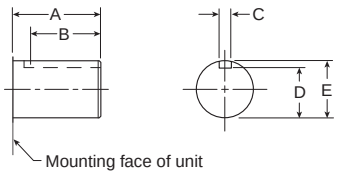


5° or 30° stroke adjust option
without cushion option



Model number	Cushioned end cap (1) Turn Adjust	A	B	C	Non-cushioned end cap (1) Turn Adjust	A 5°	A 30°	B	C
4.5	2.5°	2.50	5/8	1.00-14	2.0°	2.00	2.81	3/8	3/4-16
10	2.0°	2.50	15/16	1.50-12	1.5°	2.56	3.50	15/16	1-/2-12

Male Shaft (B)



Model number	A	B
4.5	2.61	2.38
10	4.38	3.38

Model number	C	D	E
4.5	0.561	1.928	2.249
	0.562	1.933	2.250
10	0.625	1.888	2.249
	0.627	1.893	2.250

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- Stainless steel air motor
- Approved for use in food grade applications
- Seven different sizes
- Powers ranging from 20 to 1,200 watts
- Speeds from 5 to 24,000 rpm
- Fluor rubber seals

Operating information

Operating pressure:	Max. 7 bar (Max. 6 bar in explosive atmospheres)
Temperature range:	-30 °C to 100 °C
Ambient temperature:	-20 °C to 40 °C in explosive atmospheres
Filtration requirements:	40 µm filtered, oil mist or dry unlubricated compressed air

For technical information see CD

Ordering Information

P 1 V - S | 0 2 0 | A | 0 | E 5 0

Air Motor Range	
P1V-S	Stainless Vane Motor

Motor Size	
002	20 W
008	80 W
012	120 W
020	200 W
030	300 W
060	600 W
120	1200 W

Function	
A	Keyed Shaft, Reversible
D	Threaded Shaft, Reversible

Optional Functions	
0	Standard
C*	Continuous Lubrication - Free Operation
Z*	Spring Loaded Vanes
M*	Multi: Combination of C+Z
D**	Standard with Brake
E**	Option C with Brake
F**	Option Z with Brake
G**	Option M with Brake

* Not for P1V-S002 and P1V-S008
** Only for P1V-S020 and P1V-S030

Free Speed per min	
0005	5
001 … 999	10 … 9990
A00 … E00	10000 … 14000
E50 … N00	14500 … 22000
Q00	24000

Important!
Before carrying out service activities, make sure the air motor is vented. Before disassembling the motor, disconnect the primary air hose to ensure that the air supply is interrupted.

NOTE!
All technical data in the catalog are typical values.

The air quality is a major factor in the service life of the motor, see ISO 8573-1.

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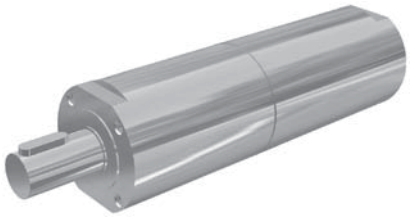
Series		Watts	Part number
P1V-S002A		20	P1V-S002A0130
			P1V-S002A0095
P1V-S008A		80	P1V-S008A0Q00
			P1V-S008A0700
			P1V-S008A0190
			P1V-S008A0130
P1V-S012A		120	P1V-S012A0N00, P1V-S012D0N00
P1V-S012D			P1V-S012A0550, P1V-S012D0550
			P1V-S012A0360, P1V-S012D0360
			P1V-S012A0140, P1V-S012D1400
			P1V-S012A0090, P1V-S012D0090
			P1V-S012A0060, P1V-S012D0060
			P1V-S012A0010, P1V-S012D0010
P1V-S020A		200	
P1V-S020D			P1V-S020A0E50, P1V-S020D0E50
			P1V-S020A0460, P1V-S020D0460
			P1V-S020A0240, P1V-S020D0240
			P1V-S020A0140, P1V-S020D0140
			P1V-S020A0070, P1V-S020D0070
			P1V-S020A0035, P1V-S020D0035
			P1V-S020A0018, P1V-S020D0018
			P1V-S020A0011
			P1V-S020A0006
			P1V-S020A0005, P1V-S020D0005
			P1V-S020A0002
			P1V-S020A0001
			P1V-S020A00005
P1V-S030A		300	P1V-S030A0E50, P1V-S030D0E50
P1V-S030D			P1V-S030A0460, P1V-S030D0460
			P1V-S030A0240, P1V-S030D0240
			P1V-S030A0140, P1V-S030D0140
			P1V-S030A0060, P1V-S030D0060
			P1V-S030A0028, P1V-S030D0028
			P1V-S030A0023
			P1V-S030A0018, P1V-S030D0018
			P1V-S030A0010
			P1V-S030A0005, P1V-S030D0005
P1V-S060A		600	P1V-S060A0E00
			P1V-S060A0400
			P1V-S060A0270
			P1V-S060A0170
			P1V-S060A0072
			P1V-S060A0048
			P1V-S060A0030
			P1V-S060A0010
P1V-S120A		1200	P1V-S120A0800
			P1V-S120A0270
			P1V-S120A0110
			P1V-S120A0078
			P1V-S120A0032
			P1V-S120A0012

☐ Most popular.

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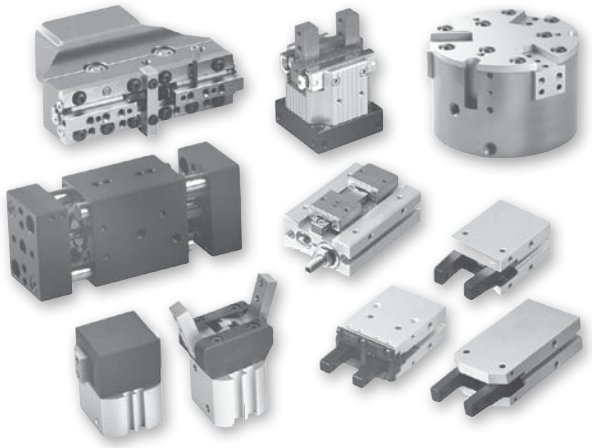
Parallel and Angular Grippers

- Miniature
- Precision
- High force
- Long stroke
- Heavy duty
- Compact
- Clean room
- Locking



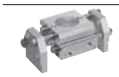
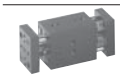
Common Options

- Sensors
- Dust covers
- Stroke adjuster
- Alternate seals
- Clean room

Specifications

- Stroke Ranges: to 6.0 inches
- Grip Forces: to 2800 lbs
- Operating Characteristics:
  - Single acting
  - Double acting
  - Spring open or closed

Parallel Grippers

	Series	Max. Strokes	Total grip force (lb)	Clean room	Spring open	Spring close	Synch	Non-synch	Reed hall	Prox	High temp seals
	GPR	10-20 mm	11-46							S	
	GPCR	4-14 mm	6-51		O					S	
	P5G-HPM	0.13-0.25 in	22-43	O	O			X			O
	P5G-HP (mini)	0.16-0.25 in	25-35				X				
	P5G-HP	0.25-1.50 in	35-694				X			S	
	GPT	0.625 in	46-86				X		S	S	O
	P5G-AP	5.3-17.9 mm	31-208		O	O	X		O	O	O
	GPEL	16-22 mm	10-27					X		S	
	GPDL	16-80 mm	10-65				X			S	
	P5G-HPL	0.25-1 in	25-33	O			X	O	S		O
	P5G-HP-P	0.5-3.0 in	23-498				X			S	O
	**GPK**	24-50 mm	20-90				X			S	
	**P5G-HPW**	0.75-4.50 in	45-450				X	O		S	O

X = standard
O = optional
S = order separately

Please reference CD for ordering and specification information.

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Three Jaw Grippers

	Series	Strokes	Total grip force (lb)	Dust cover	Spring open	Spring close	Synch	Non-synch	Reed hall	Prox	High temp seals
	P5G-HPC	0.3-1.38 in	80-2800					X	S		O

Angular Grippers

	Series	Max. Stroke	Total grip force (lb)	Dust cover	Spring open	Spring close	Synch	Reed hall	Prox	High temp seals
	GVC	30°	1.25 - 36		O		X		S	
	GAA	30°	2.7 - 6.3				X	S	S	O
	P5G-HA	30°	11 - 134				X	S		O
	P5G-AA	30°	17.4 - 198				X	S	O	O
	P5G-HA	12°	62 - 220				X		S	O
	GVH	180°	5 - 54				X		S	
	GAW	180°	2.7 - 6.3				X	S	S	O
	P5G-AW	180°	14 - 65				X	S	O	O

X = standard
O = optional
S = order separately

Sensors
For sensors see Catalog 1900-2/US.

Please reference CD for ordering and specification information.

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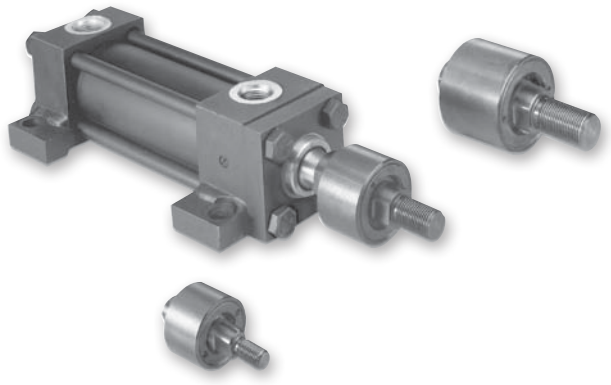
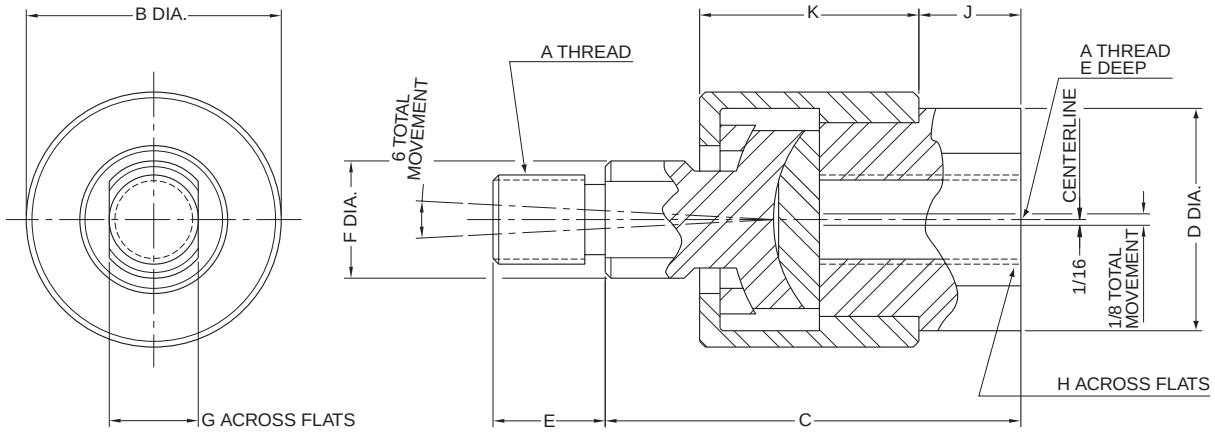
Linear Alignment Couplers are available in 12 standard thread sizes...

Cost Saving Features and Benefits Include...

- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available. Please consult factory.
- Simplifying cylinder installation and reducing assembly costs
- Increase rod bearing and rod seal life for lower maintenance costs



Alignment coupler



See table 1 for part numbers and dimensions

Table 1 — Part numbers and dimensions

A	B	C	D	E	F	G	H	J	K	Max. pull load (lbs.)	Approx. weight (Lbs.)	Part no.
5/16 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	1200	0.35	**1347570031**
3/8 -24	1-1/8	1-3/4	15/16	1/2	1/2	3/8	3/4	3/8	15/16	2425	0.35	**1347570038**
7/16 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	3250	0.55	**1347570044**
1/2 -20	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	4450	0.55	**1347570050**
5/8 -18	1-3/8	2	1-1/8	3/4	5/8	1/2	7/8	3/8	1-3/32	6800	0.55	**1347570063**
3/4 -16	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	9050	1.4	**1347570075**
7/8 -14	2	2-5/16	1-5/8	1-1/8	1-5/16	3/4	1-5/16	7/16	1-9/32	14450	1.4	**1347570088**
1-14	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	19425	4.8	**1347570100**
1-1/4 -12	3-1/8	3	2-3/8	1-5/8	1-7/16	1-1/4	1-7/8	3/4	1-25/32	30500	4.8	**1347570125**
1-1/4 -12	3-1/2	4	2	2	1-1/2	1-1/4	1-11/16	3/4	2-1/2	30500	6.9	**1337390125**
1-1/2 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	45750	9.8	**1337390150**
1-3/4 -12	4	4-3/8	2-1/4	2-1/4	1-3/4	1-1/2	1-15/16	7/8	2-3/4	58350	9.8	**1337390175**
1-7/8 -12	5	5-5/8	3	3	2-1/4	1-15/16	2-5/8	1-3/8	3-3/8	67550	19.8	**1337390188**

How to order linear alignment couplers

When ordering a cylinder with a threaded male rod end, specify the coupler of equal thread size by part number as listed in Table 1, i.e.; Piston Rod “KK” or “CC” dimension is 3/4" - 16", specify coupler part number 1347570075.

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4TK Air-Oil Tanks – For Smoother Hydraulic Flow

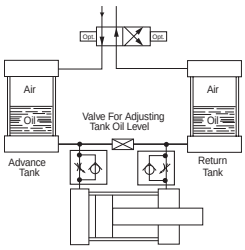
Parker Air-Oil tanks provide a means to convert shop air pressure into hydraulic pressure. Compressed air is applied directly to the oil in the air-oil tank to convert it into hydraulic pressure. The hydraulic pressure is at a 1-to-1 ratio, i.e. 80 PSIG air produces 80 PSIG hydraulic pressure.

All Parker Air-Oil tanks have a fiberglass tube which shows the proper oil level. They also contain two fluid flow baffles. The top baffle disperses the incoming air over the surface of the oil in such a way to avoid agitation and aeration. The bottom baffle insures a smooth flow pattern that minimizes oil turbulence and eliminates swirling, funneling or splashing which in turn could cause oil aeration or the oil to be blown from the tank into the exhaust air.

Air-Oil tanks are used to smooth out the cylinder piston rod travel and to prevent chatter. They are mainly used in slow speed circuits. Since each tank is designed for a specific port size, increasing the port size in a tank to lower the fluid velocity is not recommended. A tank with a larger port size should be selected.

Fluid velocity in or out of the tank through standard ports should be less than 6 feet per second to prevent aeration of the oil. To limit the fluid velocity, flow controls should be applied to the air side of the tank to restrict the exhaust. Metered-in flow controls on the air side may aid in the reduction of aeration. Additional flow controls on the oil side may aid in controlling the actuator motion.

In a basic air-oil circuit the advance tank is connected to the cap end port of a hydraulic cylinder and the return tank to the head end port. Shop air is applied alternately to the two tanks



through a 4-way air control valve. The oil in the advance tank is forced into the cap end of the cylinder to cause the piston rod to extend. At the same time, oil from the head end port is forced into the return tank, the air side of which is open to exhaust. To return the cylinder to retract position, air pressure is applied to the oil in the return tank.

Operating information

Operating pressure	17 bar (250 PSIG) maximum
Operating temperature	74°C (165°F) maximum
Filtration requirements	40 micron, dry filtered air

For technical information see CD

Table A – Rated capacities - cubic inches (in^3)

Bore size	Usable tank volume (Cu. In.) per internal height of tank											
	4	6	8	10	12	14	16	18	20	24	28	32
2-1/2	9	17	27	35	44	52	62	70	79	97	115	132
3-1/4	16	30	46	60	76	91	107	121	137	167	198	228
4	18	33	58	73	98	120	144	166	191	237	283	330
5	29	53	92	116	155	189	228	261	300	373	446	519
6	42	77	133	168	224	273	329	378	434	539	645	750
8	75	137	237	300	400	487	587	675	775	963	1150	1338

Ordering information

Example: 4.00CB4TKU 6.000

4.00			U	6.000

Tank Diameter (inches)

2.50
3.25
4.00
5.00
6.00
8.00

Tank Mounting Style

TEF	Sleeve nut with side tap
TE	Sleeve nut
TB	Tie rods extended, air end
TC	Tie rods extended, oil end
TD	Tie rods extended, both ends
C	Side lug (3MA style)
CB	Side end angles
NB	Base bar

Ports

U	NPTF

Tank Height*

Internal height in inches

* Less than 4 Inches, Consult Factory

Note: Standard air-oil tanks are designed for use with petroleum base hydraulic oil. If other fluids will be used, please consult the factory. For larger than 8" Bore Sizes consult factory.

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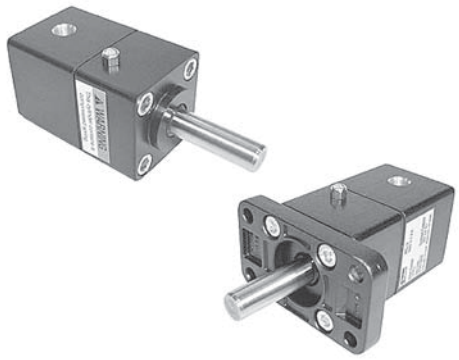
The PRL Series rod lock is used in applications where the locking of linear travel is required. It is commonly used in workholding applications and for locking tools and fixtures in the event of air pressure or electrical control failure.



Application

- Clamping: Without an appropriate air signal to the rod lock pressure port, the rod lock clamps to the precision metric rod and prevents rod movement in the axial direction.
- Delatching: When 4 Bar (58 PSIG) of air pressure is applied to the port, the rod lock releases and allows free movement of the rod. This will be required for installation.
- Locking Direction: The rod lock is designed specifically to prevent rod movement in the axial direction only. It is not recommended for locking rotary rod motion.
- Rod Material: The Series PRL rod lock is a precision locking device, therefore strict rod tolerances and rod material specifications are required to ensure safe and proper operation. Minimum requirements for the rod material include a chrome plated surface finish of 10 microinches or less and a surface hardness of 52 Rc. Rod material may be ordered separately in custom lengths. See next page for how to order.
- Environment: The rod lock is recommended for use in dry, clean conditions. Please take precautions to prevent moisture from entering the pressure port or the exhaust port of the locking device.

Operating information

Working pressure	Max. 10 bar (145 PSIG)
Working temperature	-20° to 80°C (-4°F to 176°F)
Locking pressure	4 bar (58 PSIG) ±10%
Filtration requirements	40 micron, dry filtered air

For technical information see CD

There should be no relative motion between the rod and the Rod Lock Device when the locking device is activated. The locking device is not intended to brake a movement in repeated sequences.

Considerations for Rod Sizing

When applying a rod lock device, it is important to consider the loading forces which will be imposed on the rod in the axial direction.

For applications where the rod lock and its associated load impose a compressive force on the rod, please consider the axial compression force and rod length to select the appropriate rod diameter for preventing rod buckling.

In situations where the rod lock and its associated load place the rod in tension, please take care to securely fasten the rod ends to the machine member.

Holding Forces

Model number	Holding force	
	Pounds (lbs.)	Newtons (N)
12PRL*	123	550
16PRL*	193	860
20PRL*	481	2140
25PRL*	1211	5390
32PRL*	1894	8425

* Character reserved for port style

Ordering information

Example: 25PRLU

25	PRL	U	
Rod Diameter Specify 12, 16, 20, 25 or 32 (mm)		**Ports** **U** NPTF **R** BSPP	**Ports** S Specials Leave blank if no specials

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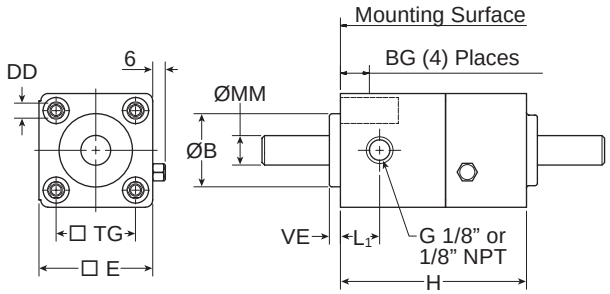
Basic rod lock



Rod lock with flange mount

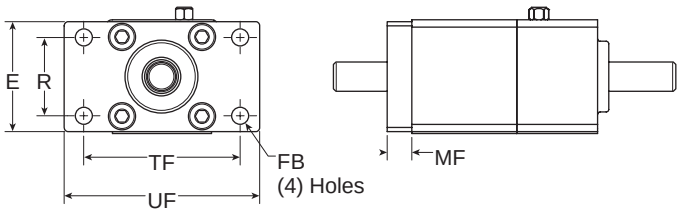


Table 1 – Mounting dimensions

Part	Rod dia. MM	B D11	BG	DD	E	FB	H	L1	MF	R	TF	TG	UF	VE
12PRL*	12.00 (-.04)	30	16	M6	46.5	7	76	16	10	32	64	32.5	80	4.5
16PRL*	16.00 (-.04)	35	16	M6	51	9	81.1	16	10	36	72	38	92	4.5
20PRL*	20.00 (-.04)	45	16	M8	76	9	100.8	26	12	50	100	56.5	129	5
25PRL*	25.00 (-.04)	55	16	M10	114.5	14	146	50	16	75	150	89	186	4
32PRL*	32.00 (-.04)	60	20	M12	140	16	165.2	60	20	90	180	110	220	6

* Character reserved for port style

Flange mounting kit

Mounting kits are available separately from the rod lock device. Please use the following part numbers to order. Mounting fasteners are included with the kits.

Model number	Flange mount
12PRL*	L075370032
16PRL*	L075370040
20PRL*	L075370063
25PRL*	L075370100
32PRL*	L075370125

* Character reserved for port style

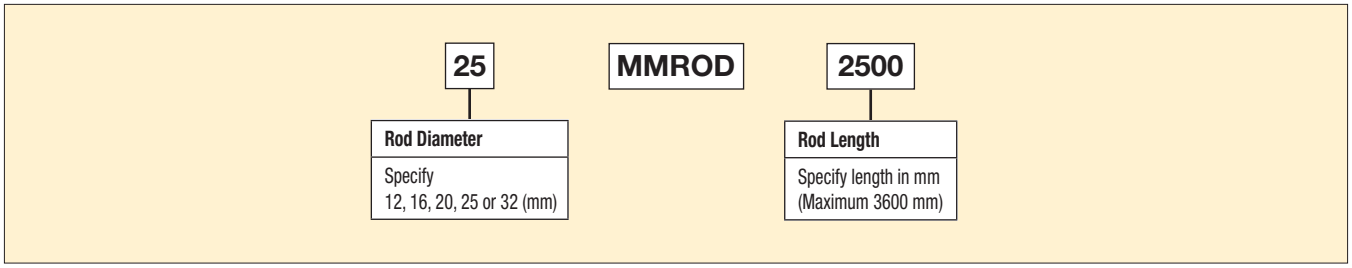
Metric rod material

Rods will be supplied in the specified length with chamfered ends. Please note, the rod material is case hardened and requires annealing prior to machining. Parker is pleased to quote custom machined rods per customer supplied drawings.

⚠ **Caution:** Using piston rod material which does not meet the tolerance and finished conditions as listed on the previous page may prevent the locking device from properly holding the intended load.

How to order

Example: 25MMROD2500



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Transition Kits for Automation Components

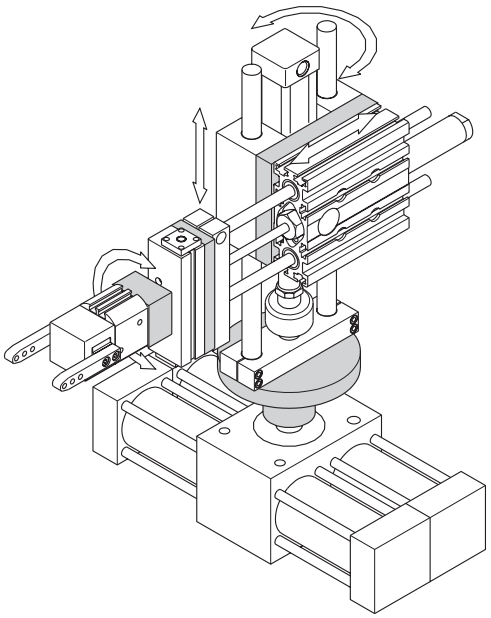
Step 1
Establish the primary and secondary units
The Primary Unit is established when the transition plate is mounted to the dynamic portion of the unit, i.e. tool plate, saddle on slides or shaft on rotary actuators.

The Secondary Unit is established when the transition plate is mounted to the stationary portion of the unit, i.e. body mounts.

Step 2
Properly size all components
For sizing of components, refer to the appropriate individual product section in this catalog. Remember to add the entire weight (component + tooling + transition plate + part, etc.) of the secondary unit when determining the size of the primary unit.

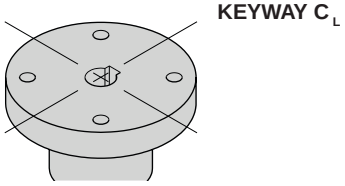
Step 3
Determine the orientation desired
Secondary units can be mounted in various orientations. From the orientation tables on the following pages, select the one that best illustrates your application.

Step 4
Determine the keyhole orientation (rotary components only)
A hole pattern centerline the same as the keyway is standard. The hole pattern centerline can be rotated clockwise to keyway in increments of 5°. Square hole patterns may be rotated up to 85°. Rectangular hole patterns may be rotated up to 175°. See examples below.

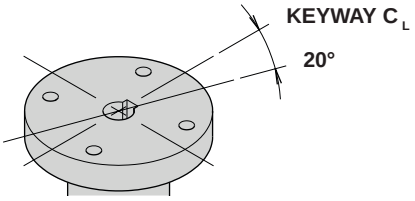


Examples:

Hole pattern centerline
Same as keyway



Hole pattern centerline



Step 5
Consult applications department to design your kit
Based on the information gathered above, the Applications Department will select the transition kit to fit your requirements.

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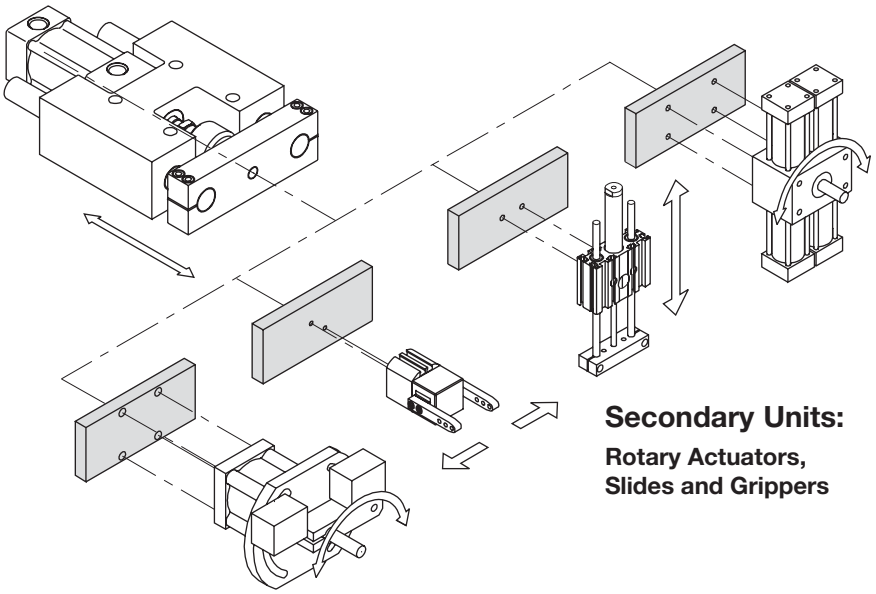
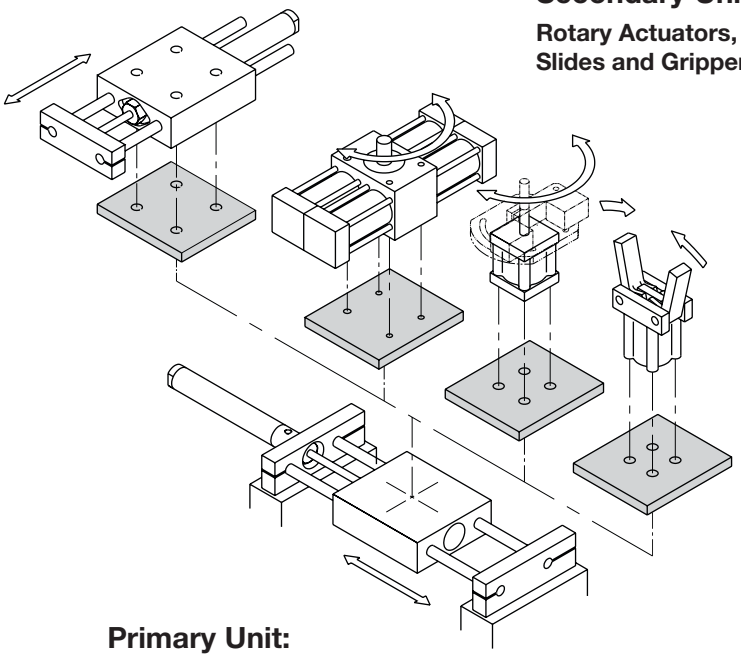
Transition Plate Kits
Connect Components to Thrust, Reach or Base Slides

Primary Unit:
Thrust and Reach Slides



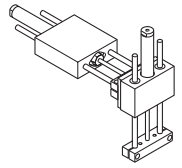
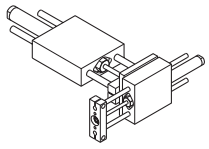
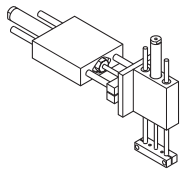
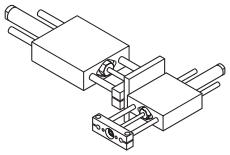
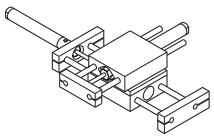
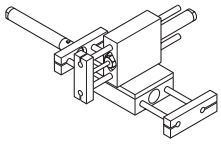
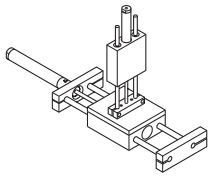
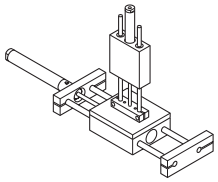
Secondary Units:
Rotary Actuators, Slides and Grippers

Secondary Units:
Rotary Actuators, Slides and Grippers



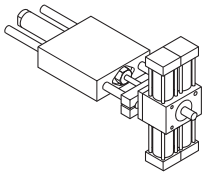
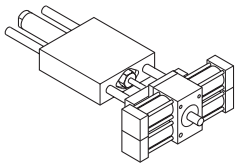
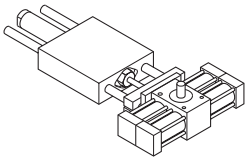
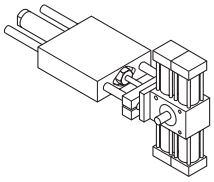
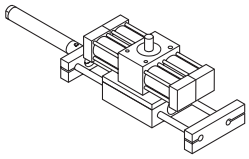
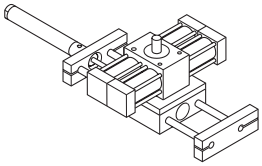
Primary Unit:
Base Slides

Mounting Slide to Slide

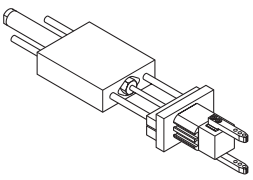
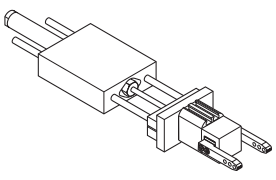
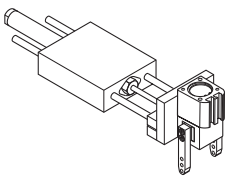
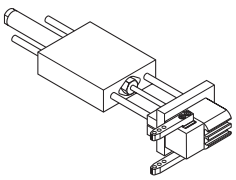
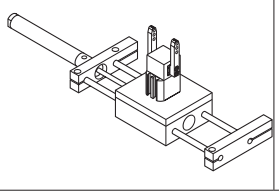
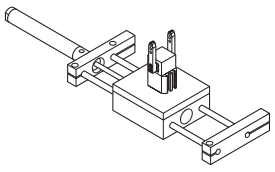
Primary series	Orientation			
	1	2	3	4
P5L P5E HBT/HBR XLT/XLR				
P5L* HBB XLB				

*** Note:** P5L Series units connect without transition plates in Orientation 1, where the thrust or reach version is mounted to a base slide version.

Mounting Rotary Actuator to Slide

Primary series	Orientation			
	1	2	3	4
P5L P5E HBT/HBR XLT/XLR				
P5L HBB XLB				

Mounting Gripper to Slide

Primary series	Orientation			
	1	2	3	4
P5L HBC HBT/HBR P5E XLT/XLR				
P5L HBB XLB				

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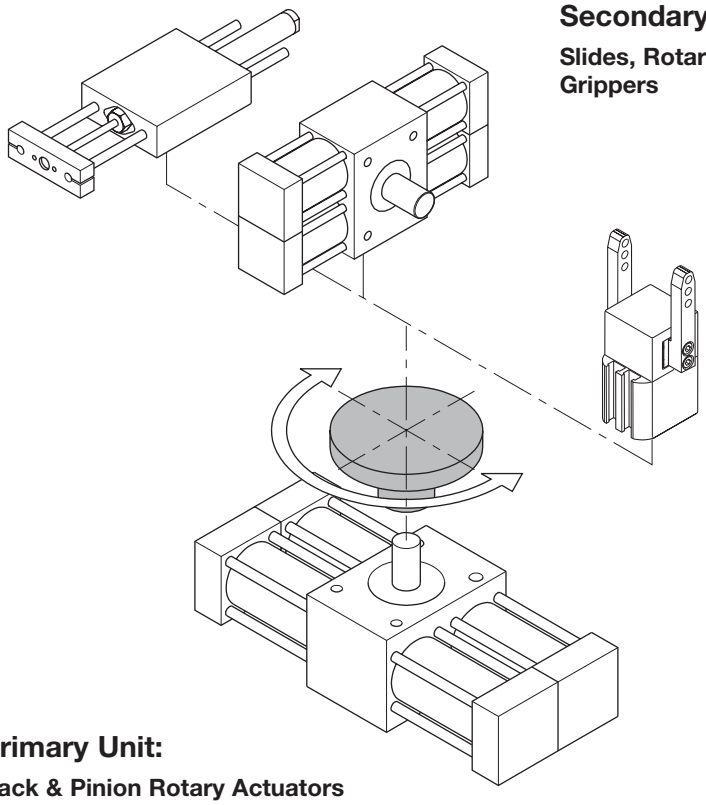
Transition Couplers – Connect Components to Rotary Actuators



Secondary Units:

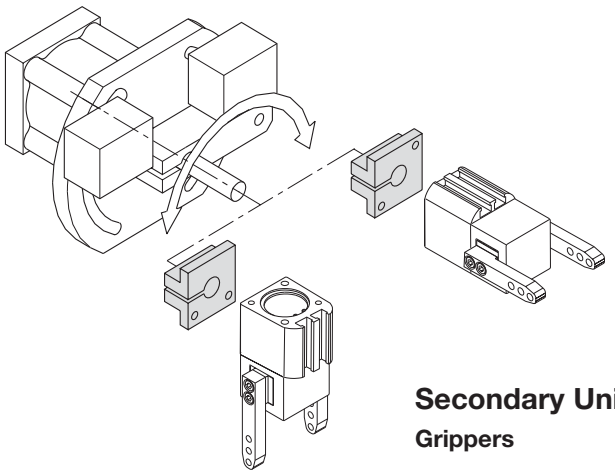
Slides, Rotary Actuators and Grippers

Primary Unit:

Rack & Pinion Rotary Actuators

Primary Unit:

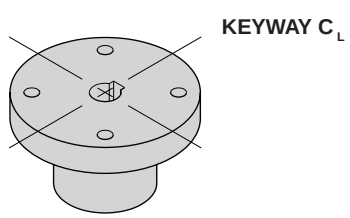
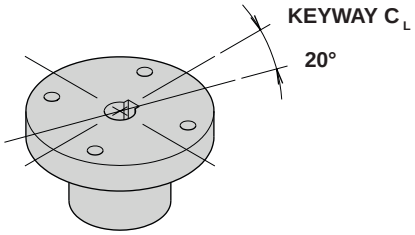
Vane Actuators

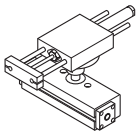
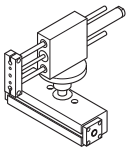
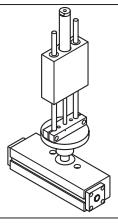
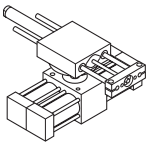
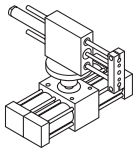
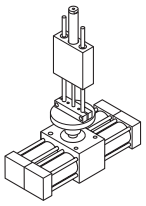


Secondary Units:

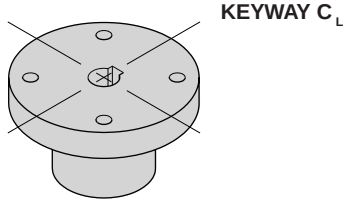
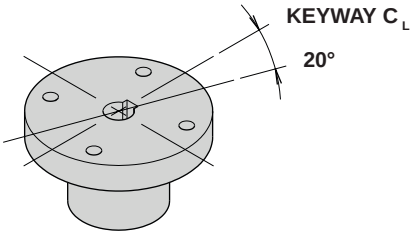
Grippers

Mounting Slide to Rotary Actuator

Hole pattern centerline Same as keyway	Hole pattern centerline 20° Clockwise to keyway
	

Primary series 1	Orientation		
	1	2	3
XR			
PTR			

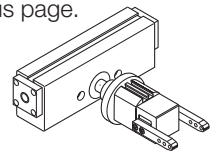
Mounting Gripper to Rotary Actuator

Hole pattern centerline Same as keyway	Hole pattern centerline 20° Clockwise to keyway
	

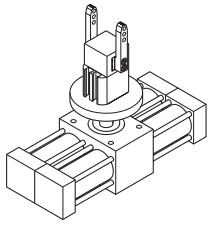
Standard Orientation

Standard orientation for each series is shown below. PV & WR Series coupler can accommodate two positions of the gripper.

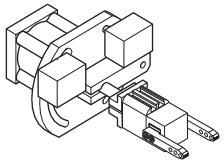
See drawing on previous page.



XR Series



PTR Series



PV & WR Series

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Electronic Sensors
Solid State, Reed and Proximity Sensors

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PNP Solid State Sensor Selection Guide

Series		Bore size or type	3M flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #
Compact cylinders	P1Q	12mm - 25mm	P8S-CPFLS	N/A	P8S-CPSHS	N/A	P8S-CPMHS	N/A	N/A	N/A
		32mm - 100mm	P8S-CPFLR	N/A	P8S-CPSHR	N/A	P8S-CPMHR	N/A	N/A	N/A
	P1M standard sensor	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	P1M right angle sensor	All	P8S-SPELXD	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B303	—
	LPM	9/16"	L076990000 [2]	N/A	L07699000C	N/A	N/A	N/A	B305	—
		3/4" - 1-1/8"	L077000000 [2]	N/A	L07700000C	N/A	N/A	N/A	B305	—
		1-1/2" - 2"	L077010000 [2]	N/A	L07701000C	N/A	N/A	N/A	B305	—
		2-1/2" - 4"	L077020000 [2]	N/A	L07702000C	N/A	N/A	N/A	B305	—
Round body cylinders	P1L	20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300	B303
		32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300	B303
		80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300	B303
	SRM/SRDM	9/16" - 3/4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300	B303
		1-1/16" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300	B303
	P	1-1/8" - 2-1/2"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300	B303
		3" - 4"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300	B303
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	B303
	3MA/4MA	6" - 8"						P8S-TMA0X	B300	B303
	3MA/4MA mini global sensor	1-1/8" - 5"	P8S-MPFLX	P8S-MPFTX	P8S-MPSHX	N/A	N/A	P8S-TMA0Z	B302	B303
Iso cylinders	P1A standard sensor	10-25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300	B303
	P1A right angle sensors	10mm	P1A-2XMK [1]	N/A	N/A	N/A	N/A	P1A-2CCC	B304	B304
		12mm	P1A-2XMK [1]	N/A	N/A	N/A	N/A	P1A-2DCC	B304	B304
		16mm	P1A-2XMK [1]	N/A	N/A	N/A	N/A	P1A-2FCC	B304	B304
		20mm	P1A-2XMK [1]	N/A	N/A	N/A	N/A	P1A-2HCC	B304	B304
		25mm	P1A-2XMK [1]	N/A	N/A	N/A	N/A	P1A-2JCC	B304	B304
	P1D standard & clean profiles	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	P1D standard profile mini sensors	All	P8S-MPFLX	P8S-MPFTX	P8S-MPSHX	N/A	N/A	N/A	B302	—
	P1D tie rod version	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0X	B300	B303
Rodless cylinders	P1X	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMA0Y	B300	—
	P1Z	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	RC	All	L074820000 [3]	N/A	L07482000C	N/A	N/A	N/A	—	—
Guided cylinders	P5T	Flush mount	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
		Right angle	P8S-SPELXD	P8S-SPETXD	P8S-SPTHXD	N/A	N/A	N/A	B303	—
	P5T2	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	P5E	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	HB	All	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	N/A	B300	—
	P5L	20 - 25mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC01	B300	B303
		32 - 63mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC02	B300	B303
		80 - 100mm	P8S-GPFLX	P8S-GPFTX	P8S-GPSHX	P8S-GPSCX	P8S-GPMHX	P8S-TMC03	B300	B303
Rotary actuators	P5W	All	P8S-SPFL3* 2.5m flying leads	N/A	P8S-SPSH3* .3m lead	N/A	N/A	N/A	N/A	N/A
	PV WR XR	Normally open	SMH-1P [2]	N/A	SMH-1PC	N/A	N/A	N/A	B307	—
		Normally closed	SMC-1P [2]	N/A	SMC-1PC	N/A	N/A	N/A	B307	—
	PRN(A)	All	N/A	N/A	N/A	N/A	N/A	N/A		
	PTR	10, 15	SWH-1P [3]	N/A	SWH-1PC	N/A	N/A	Included	B308	—
		20, 25, 32	SWH-2P [3]	N/A	SWH-2PC	N/A	N/A	Included	B308	—

1 Flying leads are 2 meters in length
2 Flying Leads are 1.5 meters in length
3 Flying leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.
* See page B311 for cord sets.

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NPN Solid State Sensor Selection Guide

Series		Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8mm quick connect w/ 1m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #
Compact cylinders	P1Q	12mm - 25mm	P8S-CNFLS	N/A	P8S-CNSHS	N/A	P8S-CNMHS	N/A	N/A	N/A
		32mm - 100mm	P8S-CNFLR	N/A	P8S-CNSHR	N/A	P8S-CNMHR	N/A	N/A	N/A
	P1M standard sensor	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	P1M right angle sensor	All	P8S-SNELX	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B303	—
	LPM	9/16"	L076950000 [2]	N/A	L07695000C	N/A	N/A	N/A	B305	—
		3/4" - 1-1/8"	L076960000 [2]	N/A	L07696000C	N/A	N/A	N/A	B305	—
		1-1/2" - 2"	L076970000 [2]	N/A	L07697000C	N/A	N/A	N/A	B305	—
		2-1/2" - 4"	L076980000 [2]	N/A	L07698000C	N/A	N/A	N/A	B305	—
Round body cylinders	P1L	20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303
		32 - 63mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303
		80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303
	SRM/SRDM	9/16" - 3/4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303
		1-1/16" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303
	P	1-1/8" - 2-1/2"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303
		3" - 4"	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GNFLX	P8S-GPNFTX	P8S-GNSHX	P8S-GPNSCX	P8S-GNMHX	N/A	B300	B303
	3MA/4MA	6" - 8"						P8S-TMA0X	B300	B303
	3MA/4MA mini-global sensor	1-1/8" - 5"	P8S-MNFLX	P8S-MNFTX	P8S-MNSHX	N/A	N/A	P8S-TMA0Z	B302	B303
ISO cylinders	P1A standard sensor	10-25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303
	P1A right angle sensors	10mm bore	P1A-2XLK [1]	N/A	N/A	N/A	N/A	P1A-2CCC	B304	B304
		12mm bore	P1A-2XLK [1]	N/A	N/A	N/A	N/A	P1A-2DCC	B304	B304
		16mm bore	P1A-2XLK [1]	N/A	N/A	N/A	N/A	P1A-2FCC	B304	B304
		20mm bore	P1A-2XLK [1]	N/A	N/A	N/A	N/A	P1A-2HCC	B304	B304
		25mm bore	P1A-2XLK [1]	N/A	N/A	N/A	N/A	P1A-2JCC	B304	B304
	P1D standard & clean profiles	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	P1D standard profile mini Sensors	All	P8S-MNFLX	P8S-MNFTX	P8S-MNSHX	N/A	N/A	N/A	B302	—
	P1D tie rod version	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0X	B300	B303
Rodless Cylinders	P1X	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMA0Y	B300	—
	P1Z	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	RC	All	L074810000 [3]	N/A	L07481000C	N/A	N/A	N/A	—	—
Guided cylinders	P5T	Flush mount	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
		Right angle	P8S-SNELX	P8S-SNETX	P8S-SNTHX	N/A	N/A	N/A	B303	—
	P5T2	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	P5E	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	HB	All	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	N/A	B300	—
	P5L	20 - 25mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC01	B300	B303
		32 - 63mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC02	B300	B303
		80 - 100mm	P8S-GNFLX	P8S-GNFTX	P8S-GNSHX	P8S-GNSCX	P8S-GNMHX	P8S-TMC03	B300	B303
Rotary actuators	P5W	All	P8S-SNFL3* 2.5m flying leads	N/A	P8S-SNSH3* .3m lead	N/A	N/A	N/A	N/A	N/A
	PV WR XR	Normally open	SMH-1N [2]	N/A	SMC-1NC	N/A	N/A	N/A	B307	—
		Normally closed	SMC-1N [2]	N/A	SMC-1NC	N/A	N/A	N/A	B307	—
	PRN(A)	All	See page B306							
	PTR	10, 15	SWH-1N [3]	N/A	SWH-1NC	N/A	N/A	Included	B308	—
		20, 25, 32	SWH-2N [3]	N/A	SWH-2NC	N/A	N/A	Included	B308	—

1 Flying leads are 2 meters in length
2 Flying Leads are 1.5 meters in length
3 Flying leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.
* See page B311 for cord sets.

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Reed Sensor Selection Guide

Series		Bore size or type	3m flying leads	10m flying leads	8mm quick connect*	8 mm quick connect w/ 1 m lead*	12mm quick connect*	Bracket	Sensor page #	Bracket page #
Compact cylinders	P1Q	12mm - 25mm	P8S-CRFLS	N/A	P8S-CRSHS	N/A	P8S-CRMHS	N/A	N/A	N/A
		32mm - 100mm	P8S-CRFLR	N/A	P8S-CRSHR	N/A	P8S-CRMHR	N/A	N/A	N/A
	P1M standard sensor	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	P1M right angle sensor	All	P8S-SRELX	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B303	—
	LPM	9/16"	L077030000 [1]	N/A	L07703000C	N/A	N/A	N/A	B305	—
		3/4" - 1-1/8"	L077040000 [1]	N/A	L07704000C	N/A	N/A	N/A	B305	—
		1-1/2" - 2"	L077050000 [1]	N/A	L07705000C	N/A	N/A	N/A	B305	—
		2-1/2" - 4"	L077060000 [1]	N/A	L07706000C	N/A	N/A	N/A	B305	—
Round body cylinders	P1L	20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303
		32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303
		80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303
	SRM/SRDM	9/16" - 3/4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303
		1-1/16" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303
	P	1-1/8" - 2-1/2"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303
		3" - 4"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303
Tie rod cylinders	3MA/4MA standard sensor	1-1/2" - 5"	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	B303
	3MA/4MA	6" - 8"						P8S-TMA0X	B301	B303
	3MA/4MA mini global sensor	1-1/8" - 5"	P8S-MRFLX	P8S-MRFTX	P8S-MRSHX	N/A	N/A	P8S-TMA0Z	B302	B303
ISO cylinders	P1A standard sensor	10-25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303
	P1A alternate sensors	10mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2CCB	B304	B304
		12mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2DCB	B304	B304
		16mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2FCB	B304	B304
		20mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2HCB	B304	B304
		25mm bore	P1A-2XRL	N/A	P1A-2XSH	N/A	N/A	P1A-2JCB	B304	B304
	P1D standard & clean profiles	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	P1D standard profile mini sensors	All	P8S-MRFLX	P8S-MRFTX	P8S-MRSHX	N/A	N/A	N/A	B302	—
	P1D tie rod version	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0X	B301	B303
Rodless cylinders	P1X	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMA0Y	B301	—
	P1Z	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	RC	All	L074800000 [2]	N/A	L07480000C	N/A	N/A	N/A	—	—
Guided cylinders	P5T	Flush mount	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
		Right angle	P8S-SRELX	P8S-SRETX	P8S-SRTHX	N/A	N/A	N/A	B303	—
	P5T2	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	P5E	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	HB	All	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	N/A	B301	—
	P5L	20 - 25mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC01	B301	B303
		32 - 63mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC02	B301	B303
		80 - 100mm	P8S-GRFLX	P8S-GRFTX	P8S-GRSHX	P8S-GRSCX	P8S-GRMHX	P8S-TMC03	B301	B303
Rotary actuators	P5W	All	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PV WR XR	N.O. high amp	SMR-1 [1]	N/A	SMR-1C	N/A	N/A	N/A	B307	—
		N.O. low amp	SMR-1L [1]	N/A	SMR-1LC	N/A	N/A	N/A	B307	—
		N.C.	SMD-1L [1]	N/A	SMD-1LC	N/A	N/A	N/A	B307	—
	PRN	50 - 800	See model code						B306	—
	PTR	10, 15	SWR-1 [2]	N/A	SWR-1C	N/A	N/A	Included	B308	—
		20, 25, 32	SWR-2 [2]	N/A	SWR-2C	N/A	N/A	Included	B308	—

1 Flying leads are 1.5 meters in length
2 Flying Leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B312-B314 for NAMUR Intrinsically Safe Sensors.
* See page B311 for cord sets.

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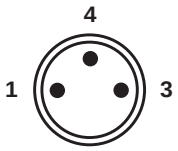
P8S Global Drop-In Solid State Sensors

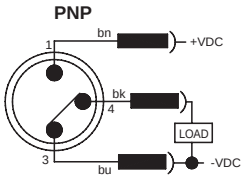
Wiring	PNP sensor	NPN sensor	PNP sensor ATEX certified
3m flying leads	**P8S-GPFLX**	**P8S-GNFLX**	**P8S-GPFLX/EX**
10m flying leads	**P8S-GPFTX**	**P8S-GNFTX**	N/A
0.3m lead with 8mm connector	**P8S-GPSHX**	**P8S-GNSHX**	
0.3m lead with 12mm connector	**P8S-GPMHX**	**P8S-GNMHX**	
1m lead with 8mm connector	**P8S-GPSCX**	**P8S-GNSCX**	

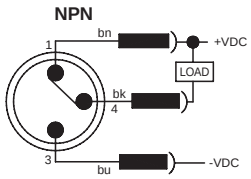
Wiring connection

Flying lead or 8 mm connector (shown)

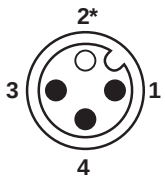


Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
3	Blue	-VDC



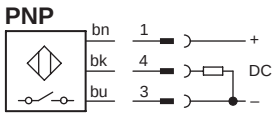


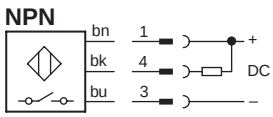
12 mm connector



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Black	Output signal (N.O.)
2*	White	Not used
3	Blue	-VDC

* Pin 2 not present.





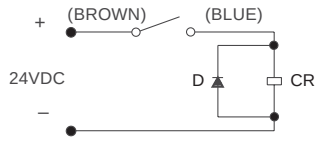
P8S Global Drop-in Reed Sensors

Wiring	Reed sensor
3m flying leads	**P8S-GRFLX**
10m flying leads	**P8S-GRFTX**
0.3m lead with 8mm connector	**P8S-GRSHX**
0.3m lead with 12mm connector	**P8S-GRMHX**
1m lead with 8mm connector	**P8S-GRSCX**

Circuit for switching contact protection (for inductive loads, e.g. solenoids, relays)

(Required for proper operation 24VDC)

Put diode parallel to load (CR) following polarity as shown below.

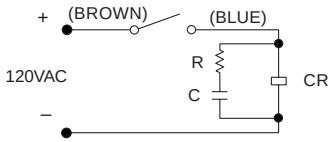


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 volt, 1 amp diode
CR: Relay coil (under 0.5W coil rating)

(Recommended for longer life 120 VAC)

Put a resistor and capacitor in parallel with the load (CR). Select the
resistor and capacitor according to the load.



Typical Example:
CR: Relay coil (under 2W coil rating)
R: Resistor 1 KΩ - 5 KΩ, 1/4 W
C: Capacitor 0.1 ΩF, 600 V

⚠ Caution

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high
in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) >E/0.3.

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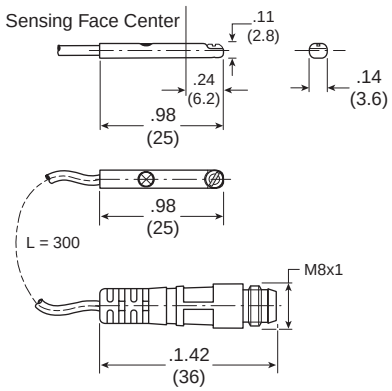
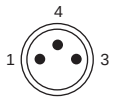
P8S Mini-Global Drop-In Solid State Sensors

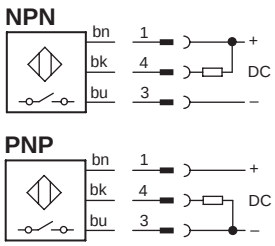
Wiring	PNP sensor	NPN sensor
3m flying leads	**P8S-MPFLX**	**P8S-MNFLX**
10m flying leads	**P8S-MPFTX**	**P8S-MNFTX**
0.3m lead with 8mm connector	**P8S-MPSHX**	**P8S-MNSHX**



Wiring connection



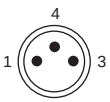
Pin	Wire	Function
1	Brown	+VDC
4	Black	NO
3	Blue	- VDC



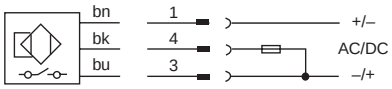
P8S Mini-Global Drop-In Reed Sensors

Wiring	Reed sensor
3m flying leads	**P8S-MRFLX**
10m flying leads	**P8S-MRFTX**
0.3m lead with 8mm connector	**P8S-MRSHX**

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
4	Black	Output signal
3	Blue	Ground (-V)



⚠ Caution

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) >E/0.3.

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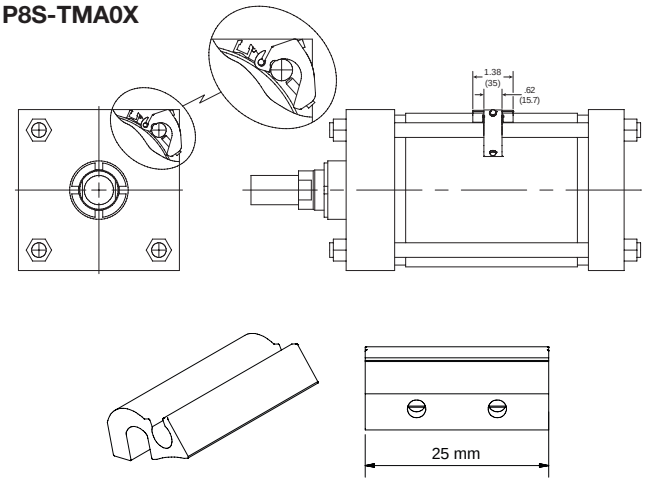
Tie Rod Bracket Assembly Part Number and Dimensions

Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); some 1-1/8" bore 3MA Series mounts; and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

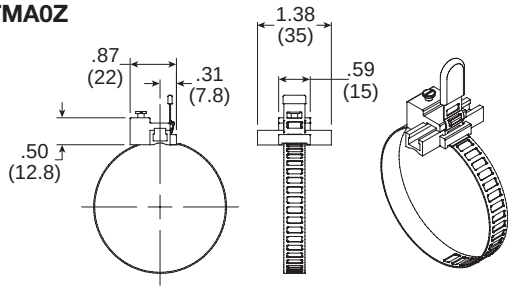
Part number P8S-TMA0X fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors

Part number P8S-TMA0Z fits 1-1/8" bore for Mini-Global Sensors

P8S-TMA0X



P8S-TMA0Z



Round body bracket assembly part numbers

Sensors and brackets must be ordered separately

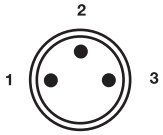
Bore size	Round body bracket
9/16" - 1-1/16"	**P8S-TMC01**
20 - 25mm	**P8S-TMC01**
1-1/8" - 2-1/2"	**P8S-TMC02**
32 - 63mm	**P8S-TMC02**
3" - 4"	**P8S-TMC03**
80 - 100mm	**P8S-TMC03**

P8S Right Angle Solid State Sensors

CE

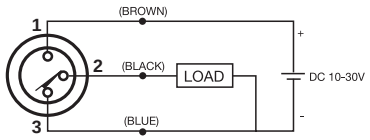
Wiring	PNP sensors	NPN sensors
0.2m lead with 8mm connector	**P8S-SPTHXD**	**P8S-SNTHX**
3m flying leads	**P8S-SPELXD**	**P8S-SNELX**
10m flying leads	**P8S-SPETXD**	**P8S-SNETX**

Wiring connection

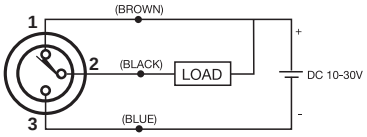


Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
2	Black	Output signal (N.O.)
3	Blue	-VDC

PNP



NPN

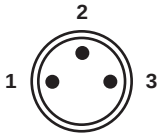


P8S Right Angle Reed Sensors

CE

Wiring	Reed sensors
0.2m lead with 8mm connector	**P8S-SRTHX**
3m flying leads	**P8S-SRELX**
10m flying leads	**P8S-SRETX**

Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+V)
3	Black	Not used
2	Blue	Output signal (-V or Ground)

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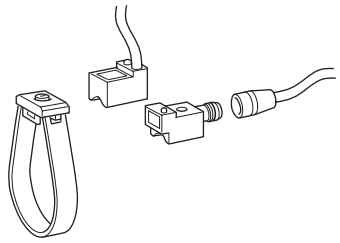
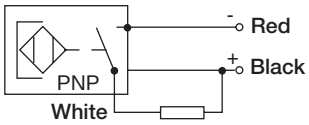
P1A Series Solid State Sensors

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

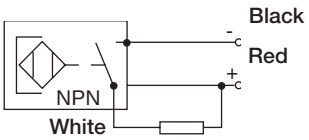


Wiring connection

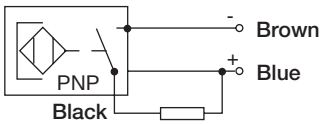
P1A-2XMK



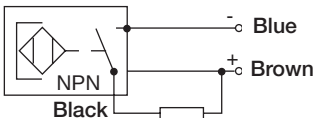
P1A-2XLK



P1A-2XHK,P1A-2XJH



P1A-2XEK, P1A-2XFH



Electronic Sensors

Output	Cable length	Weight (lb)	Part number
PNP, N.O.	2 m	0.09	**P1A-2XMK, Rt. angle**
NPN, N.O.	2 m	0.09	**P1A-2XLK, Rt. angle**
PNP, N.O.	2 m	0.022	**P1A-2XHK**
NPN, N.O.	2 m	0.022	**P1A-2XEK**
PNP, N.O.	*	0.033	**P1A-2XJH**
NPN, N.O.	*	0.033	**P1A-2XFH**

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.01	**P1A-2CCC**
12mm	0.01	**P1A-2DCC**
16mm	0.0176	**P1A-2FCC**
20mm	0.0176	**P1A-2HCC**
25mm	0.022	**P1A-2JCC**

Cable for Sensors

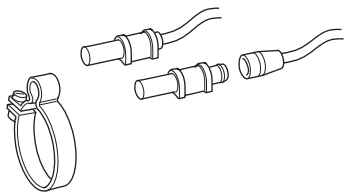
Cable length	Weight (lb)	Part number
3 m	0.12	**9126344341****
10 m	0.4	**9126344342****

* Cable ordered separately

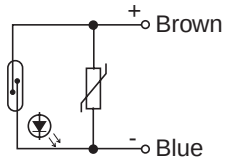
** Cable includes female part connector for sensor

P1A Series Reed Sensors

The reed sensors incorporate a well-proven, universal-voltage, compact reed switch element; making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems.



Wiring connection



Electronic Sensors

Output	Cable length	Weight (lb)	Part number
Making (N.O.)	3m	0.12	**P1A-2XRL**
Making (N.O.)	*	0.004	**P1A-2XSH**

Mounting Brackets

Fits cylinder bore size	Weight (lb)	Part number
10mm	0.004	**P1A-2CCB**
12mm	0.005	**P1A-2DCB**
16mm	0.006	**P1A-2FCB**
20mm	0.009	**P1A-2HCB**
25mm	0.010	**P1A-2JCB**

Cable for Sensors

Cable length	Weight (lb)	Part number
3 m	0.12	**9126344341****
10 m	0.4	**9126344342****

* Cable ordered separately

** Cable includes female part connector for sensor

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LP/LPM Series Sensors

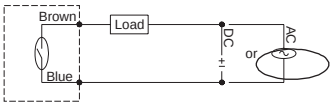
Bore size	Reed (Low AMP)	NPN sinking	PNP sourcing
9/16"	L077030000	L076950000	L076990000
3/4", 1-1/8"	L077040000	L076960000	L077000000
1-1/2", 2"	L077050000	L076970000	L077010000
2-1/2", 3", 4"	L077060000	L076980000	L077020000

Note: For sensors with an 8mm connector, replace the last digit with a 'C'. For example: L07696000C.

Circuits

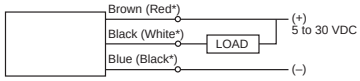
Reed Sensor

NOTE: Polarity must be observed for DC operation only.



NPN Sensor – Sinking Output

Color of Cable .....Black
"On" State Voltage Drop ..... 1.5V Maximum



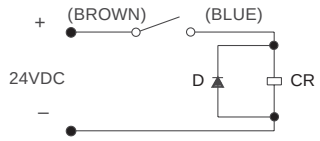
PNP Sensor – Sourcing Output

Color of Cable ..... Black
"On" State Voltage Drop .....1.5V Maximum

*Number in parentheses pertains to inductive loads.

Circuit for Switching Contact Protection (Inductive Loads) – for Reed Sensor Only
(Required for proper operation 24V DC)

Put Diode parallel to load (CR) following polarity as shown below.

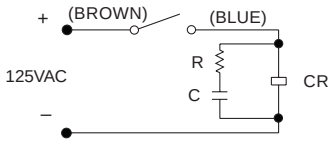


D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 Volt, 1 Amp Diode
CR: Relay coil (under 0.5W coil rating)
(Recommended for longer life 125 VAC)

*Wire colors in parentheses pertain to sensors manufactured before 10/15/93.

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



Typical Example:
CR: Relay coil (under 2W coil rating)
R: Resistor 1 KΩ – 5 KΩ, 1/4 W
C: Capacitor 0.1 µF, 600 V

⚠ Caution

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- NOTE: When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.
- Current capabilities are relative to operational temperatures.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) >E/0.3.

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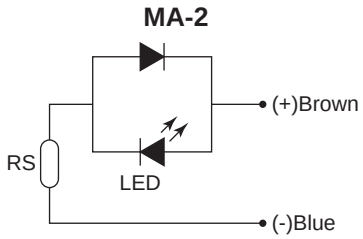
PRNA Sizes 3 to 30 Sensors

Fixed position sensor



Variable position sensor

Size	Part number
1	FR-1PRN
3	FR-3PRN
10	FR-10PRN
20	FR-20PRN
30	FR-30PRN

Model code and ordering information

Example: SR20 - 180 - 90

SR **20** – **180** – **90**

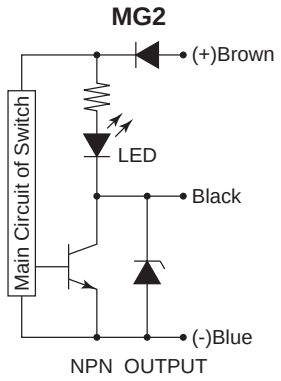
Size
3
10
20
30

Rotation	
090	90°
100	100°
180	180°
270	270°

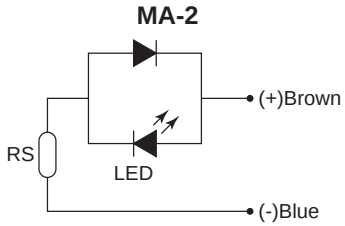
Reference Point	
45	45°
90	90°

PRN Sizes 50 to 800 Sensors

Solid state sensors



Reed sensors



Model code and ordering information

Example: FM50 - 90 - 45 - MA2

FM **50** – **90** – **45** – **MA** **2**

Size
50
150
300
800

Rotation	
090	90°
180	180°
270	270°

Reference Point	
45	45°
90	90°

Sensor Type	
MA	Reed
MG	Solid State

Number Sensors	
2	Standard

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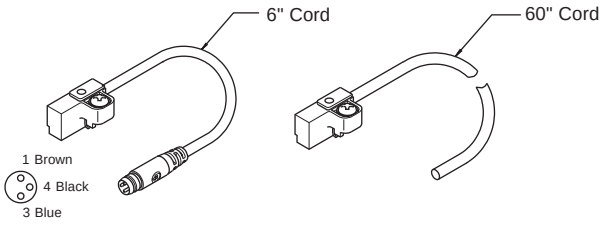
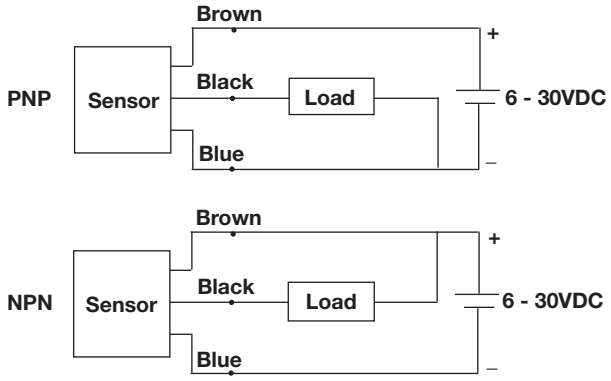
Solid State (Hall Effect) Sensors

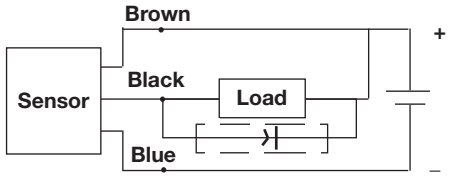
Type	LED color	Logic	Cable/Connector	Part number
N.O.	Green	PNP	1.5m black with leads	**SMH-1P**
N.O.	Red	NPN		**SMH-1N**
N.C.	Yellow	PNP		**SMC-1P**
N.C.	White/Red	NPN		**SMC-1N**
N.O.	Green	PNP	0.15m black with connector	**SMH-1PC**
N.O.	Red	NPN		**SMH-1NC**
N.C.	Yellow	PNP		**SMC-1PC**
N.C.	White/Red	NPN		**SMC-1NC**



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

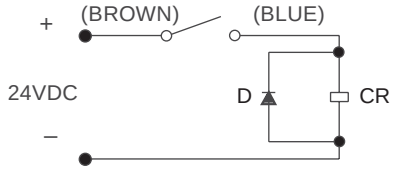
Reed Sensors

Reed sensors are available in a normally open or normally closed configuration. The low amp sensor is suitable for connection to PLCs or other low current devices. The high amp sensor can be used to drive sequencers, relays, coils, or other devices directly.

Type	LED color	Rating	Cable/Connector	Part number
N.O.	Green	High Amp	1.5m Gray with Leads	**SMR-1**
N.O.	Red	Low Amp		**SMR-1L**
N.C.	Yellow	Low Amp		**SMD-1L**
N.O.	Green	High Amp	0.15m Gray with Connector	**SMR-1C**
N.O.	Red	Low Amp		**SMR-1LC**
N.C.	Yellow	Low Amp		**SMD-1LD**

Integral circuit for switching contact protection

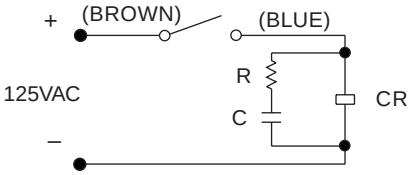
(Required for proper operation 24V DC)
Put Diode parallel to load (CR) with polarity as shown below.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

CR: Relay coil (under 0.5 W coil rating)

(Recommended for longer sensor life 125V AC)
Put resistor and capacitor parallel to load (CR).



CR: Relay coil (under 2 W coil ratings)

R: Resistor under 1 K ohm

C: Capacitor 0.1 µF

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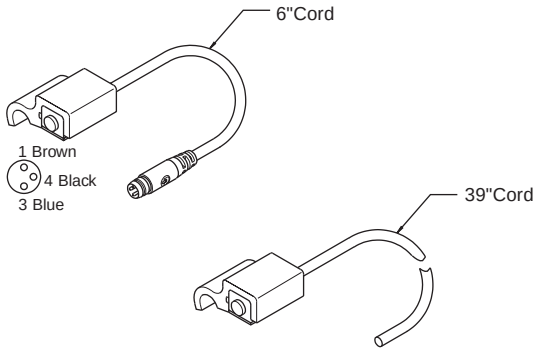
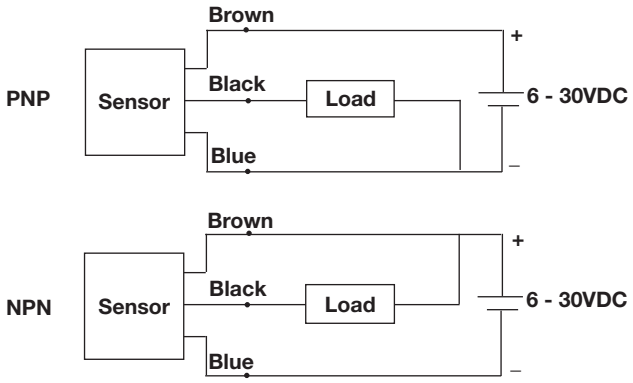
Solid State (Hall Effect) Sensors

PTR model	PNP		NPN	
	With 6" male quick connect	With 39" potted-in leads	With 6" male quick connect	With 39" potted-in leads
10	**SWH-1PC**	**SWH-1P**	**SWH-1NC**	**SWH-1N**
15	**SWH-1PC**	**SWH-1P**	**SWH-1NC**	**SWH-1N**
20	**SWH-2PC**	**SWH-2P**	**SWH-2NC**	**SWH-2N**
25	**SWH-2PC**	**SWH-2P**	**SWH-2NC**	**SWH-2N**
32	**SWH-2PC**	**SWH-2P**	**SWH-2NC**	**SWH-2N**

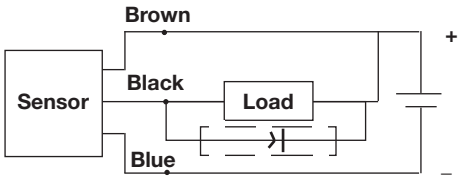
Note: Sensors with male quick connect option require female cordsets to be ordered separately. Please reference catalog 0900P-5, page M22.



Wiring connection



Protection circuit*



* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

Reed Sensors

PTR model	With 6" male quick connect	With 39" potted-in leads
10	**SWR-1C**	**SWR-1**
15	**SWR-1C**	**SWR-1**
20	**SWR-2C**	**SWR-2**
25	**SWR-2C**	**SWR-2**
32	**SWR-2C**	**SWR-2**

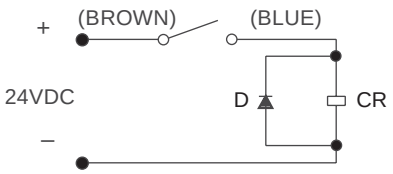
Sensors with male quick connect option require female cordsets to be ordered separately.

Note: Please reference catalog 0900P-5, page M22

Protection circuit (Inductive loads)

(Required for proper operation 24VDC)

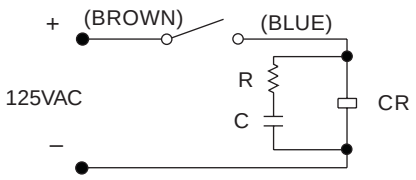
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



CR: Relay coil (under 0.5W coil rating)

(Recommended for longer sensor life 125VAC)

Select a resistor and capacitor according to the load (CR). Place a resistor and capacitor in parallel to the load:



CR: Relay coil (under 2W coil rating)

R: Resistor under 1 K ohm

C: Capacitor 0.1 µF

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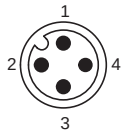
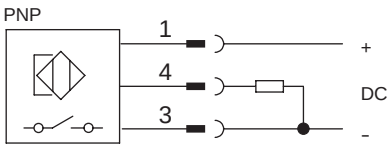
Weld Immune Sensors

CE

- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.
- NOTE: Tie rod construction of the P1D Series can be ordered directly in the model code.

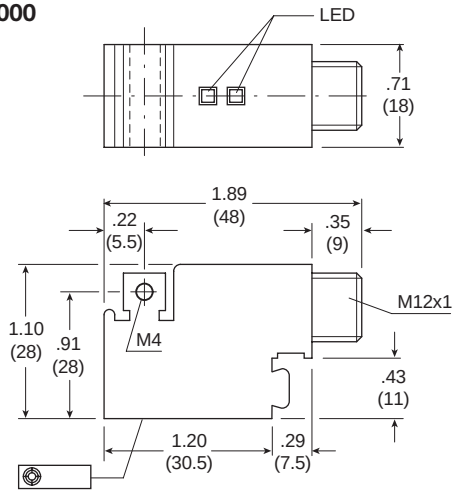


Pin	Function
1	Operating voltage (+VDC)
4	Output signal (N.O.)
3	-VDC
2	Not used

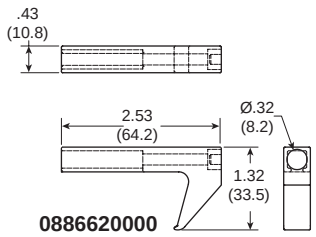


Description	Part number
Weld immune sensor	**0886600000**
Tie rod bracket kit	**0886620000**

0886600000



0886620000



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8mm Cordset with Female Quick Connect

A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

Cable length	Threaded connector	Snap on connector
5 meters	**086620T005**	**086620S005**
2 meters	**086620T002**	**086620S002**

Cordset Specifications

Connector ..... Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)

Contacts .....Gold plated beryllium copper, machined from solid stock

Coupling Method..... Snap-Lock or chrome plated brass nut

Cord Construction ..... Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V.

Cable end is stripped and tinned.

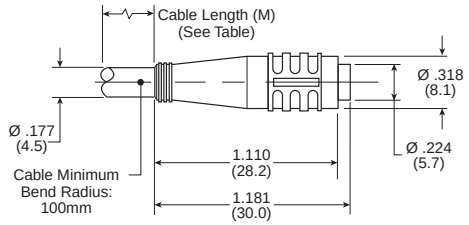
Conductors .....Extra high flex stranding, PVC insulation

Temperature ..... -40 to 194°F (-40 to 90°C)

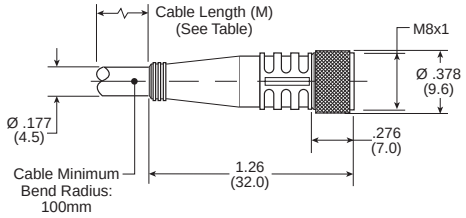
Protection..... NEMA 1, 3, 4, 6P and IEC 1P67

Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

Snap-On Straight Connector



Threaded Straight Connector



12mm Cordset with Female Quick Connect

M12 Straight connector

Cable length	Part number
5 meters	**9126487205**
2 meters	**9126487202**

M12 Right angle Connector

Cable length	Part number
5 meters	**9126487205**
2 meters	**9126487202**

A female connector is available for all sensors with the male 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed above.

Cordset Specifications

Connector ..... Polyvinylchloride (PVC) body material, PVC contact carrier, spacing to VDE 0110 Group C, (250VAC / 300VDC)

Contacts ..... Gold Plated Copper Tin (CuSn), stamped from stock.

Coupling Method.....Threaded nut: Chrome plated brass.

Cord Construction ..... PVC non-wicking, non-hygroscopic, 250VAC / 300VDC. Cable end is stripped.

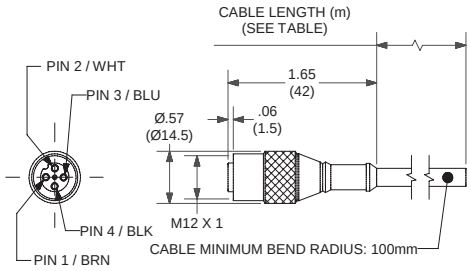
Conductors ..... Extra high flex stranding with PVC insulation

Temperature ..... -13°F to 158°F (-25°C to 70°C)

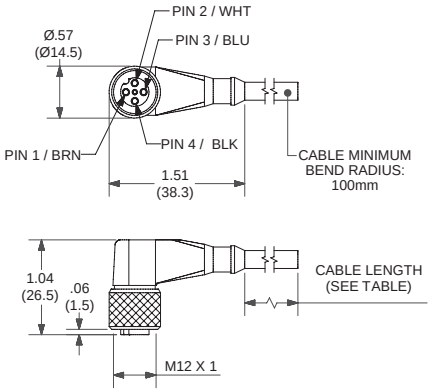
Protection..... NEMA 1, 3, 4, 6P and IEC 1P67

Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

Straight Connector



Right Angle Connector



Connection Block Valvetronic 110

The Valvetronic 110 is a connection block that can be used for collecting signals from sensors at various points on a machine and connecting them to the control system via a multicore cable. Valvetronic 110 can also be used for central connection of the multi-core cable to the outputs of a control system, and can be laid to a machine where the output signals can be connected. The connection block has ten 8 mm snap-in connectors and a multi-core cable which is available in lengths of 3 or 10 m. The connections on the block are numbered from 1 to 10. Blanking plugs are available for unused connections, as labels for marking the connections of each block.

Technical data

Connections

Ten 3-pole numbered 8 mm round snap-in female contacts

Input block

Pin 1	Common, +24 VDC
Pin 2	Input signal
Pin 3	Common, 0V

Output block

Pin 1	Common, GND
Pin 2	Output signal
Pin 3	Common, 0V

Electrical data

Voltage ..... 24 VDC (max. 60 V AC/75 V DC)
Insulation group..... according to DIN 0110 class C
Load..... max. 1 A per connection total max. 3 A

Cable

Length.....3 m or 10 m
Type of cable LifYY11Y
Conductor 12
Area 0.34 mm2
Color marking..... According to DIN 47 100

Mechanical data

Enclosure .....IP 67, DIN 40050 with fitted contacts and/or blanking plugs.
Temperature .....–20 °C to +70 °C

Material

Body ..... PA 6,6 VD according to UL 94
Contact holder.....
PBTP.....
Snap-in ring.....LDPE
Moulding mass..... Epoxy
Seal.....NBR
Screws .....Plated steel

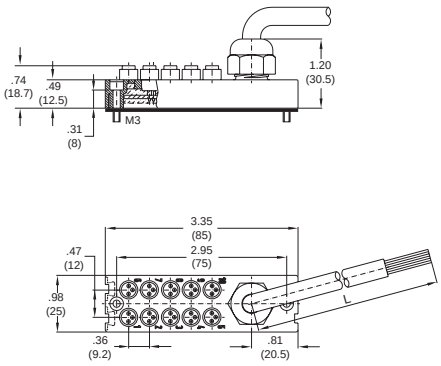
Industrial durability

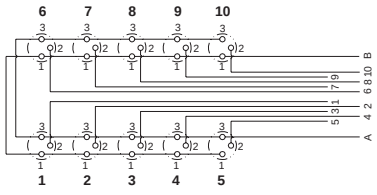
Good chemical and oil resistance. Tests should be performed in aggressive environments.

Ordering information

Designation	Weight kg	Part number
Connection block Valvetronic 110 with 3 m cable	0.32	**9121719001**
Connection block Valvetronic 110 with 10 m cable	0.95	**9121719002**
Blanking plugs (pack of 10) Use blanking plugs to close unused connections	0.02	**9121719003**
Labels (pack of 10) White labels to insert in grooves on the side of the connection	0.02	**9121719004**

Dimensions and wiring diagrams





Conductor	Color	Input	Output
1	Pink	Signal 1	Signal 1
2	Grey	Signal 2	Signal 2
3	Yellow	Signal 3	Signal 3
4	Green	Signal 4	Signal 4
5	White	Signal 5	Signal 5
6	Red	Signal 6	Signal 6
7	Black	Signal 7	Signal 7
8	Violet	Signal 8	Signal 8
9	Grey-Pink	Signal 9	Signal 9
10	Red-Blue	Signal 10	Signal 10
A	Blue	0 V	0 V
B	Brown	+24 V	PE

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NAMUR Intrinsically Safe Sensors

CE Ex

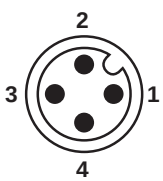
For Tie Rod Style Cylinders

Sensor description	Part number
Fits 1-1/8" to 4" bore and 32-100mm bore (2m flying lead)	**089779001**
Fits 1-1/8" to 4" bore and 32-100mm bore (12mm connector)	**089779002**
Fits 5" to 6" bore and 125-160mm bore (2m flying lead)	**089779003**
Fits 5" to 6" bore and 125-160mm bore (12mm connector)	**089779004**
Fits 8" bore and 200mm bore (2m flying lead)	**089779005**
Fits 8" bore and 200mm bore (12mm connector)	**089779006**

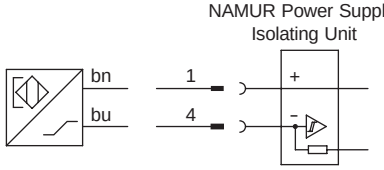
Specifications

Electrical configuration.....NAMUR 2-wire
Output function ..... NAMUR
Supply voltage.....5-25 VDC
Response sensitivity ..... ≤ 30 Gauss
Switching frequency ..... 5 kHz
Switching output .....Control current dependent on switching
Residual ripple.....≤ 5% of supply voltage
Power consumption, attenuated.....≥ 2.5mA
Power consumption, unattenuated.....≤ 1mA
Internal capacitance ..... ≤ 15nF
Internal inductance .....≤ 25 µH
Cable resistance..... ≤ 50 Ohm
Hysteresis.....≤ 1mm
Repeatability.....≤ 0.1mm
EMC.....EN 60 947-5-6
Short circuit protected .....Yes
Reverse polarity protected .....Yes
Enclosure rating.....IP67
Shock/vibration stress .....30 g, 11ms, 10-55 Hz, 1mm
Operating temperature ..... -25ºC to +70ºC (-13ºF to +158ºF)
Housing material.....Aluminum, plastic
Connector cable.....PVC with flying leads (shown)
Connector (option)..... M12 connector
Classification ..... TÜV 99 ATEX 1398 II 2G EEx ib IIC T6

Wiring connection



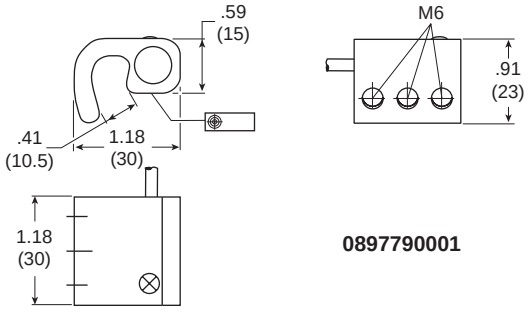
Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
4	Blue	-VDC
2		Not used
3		Not used



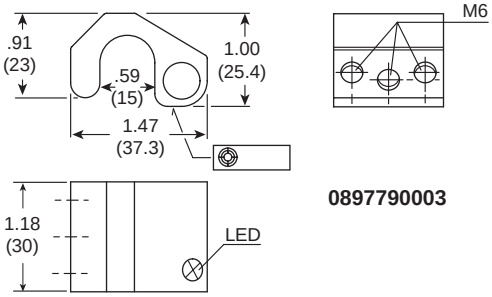
Data for connecting power supplies or other approved isolating amplifiers:

Short circuit current 1Kmax .....≤ 30mA
No load voltage .....≤ 16VDC
Power loss .....≤ 75mW

Note: Intrinsically safe solutions must include a NAMUR Power Supply



0897790001



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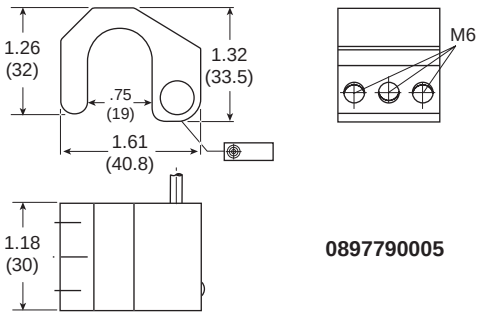

0897790005

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NAMUR Intrinsically Safe Sensors

CE Ex

For Round Body Cylinders

Description	Part number
NAMUR Sensor for round body cylinder	**0897790007**
Bracket for 18-29mm (0.71"-1.14") outer diameter	**0897800001**
Bracket for 28-39mm (1.10"-1.54") outer diameter	**0897800002**
Bracket for 38-49mm (1.50"-1.93") outer diameter	**0897800003**
Bracket for 48-59mm (1.89"-2.32") outer diameter	**0897800004**
Bracket for 58-69mm (2.28"-2.72") outer diameter	**0897800005**
Bracket for 68-79mm (2.68"-3.11") outer diameter	**0897800006**
Bracket for 88-99mm (3.46"-3.90") outer diameter	**0897800007**
Bracket for 98-109mm (3.86"-4.29") outer diameter	**0897800008**

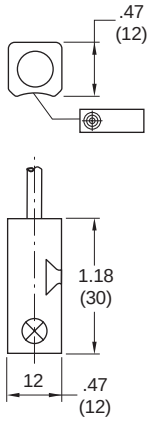
Specifications

Electrical configuration ..... NAMUR 2-wire
Output function ..... NAMUR
Supply voltage ..... 5-25 VDC
Response sensitivity ..... ≤ 30 Gauss
Switching frequency ..... 5 kHz
Switching output ..... Control current dependent on switching
Residual ripple ..... ≤ 5% of supply voltage
Power consumption, attenuated ..... ≥ 2.5mA
Power consumption, unattenuated ..... ≤ 1mA
Internal capacitance ..... ≤ 15nF
Internal inductance ..... ≤ 25 µH
Cable resistance ..... ≤ 50 Ohm
Hysteresis ..... ≤ 1mm
Repeatability ..... ≤ 0.1mm
EMC ..... EN 60 947-5-6
Short circuit protected ..... Yes
Reverse polarity protected ..... Yes
Enclosure rating IP67
Shock/vibration stress ..... 30 g, 11ms, 10-55 Hz, 1mm
Operating temperature ..... -25ºC to +70ºC (-13ºF to +158ºF)
Housing material ..... Aluminum, plastic
Connector cable ..... PVC with flying leads (shown)
Classification ..... TÜV 99 ATEX 1398 II 2G EEx ib IIC T6

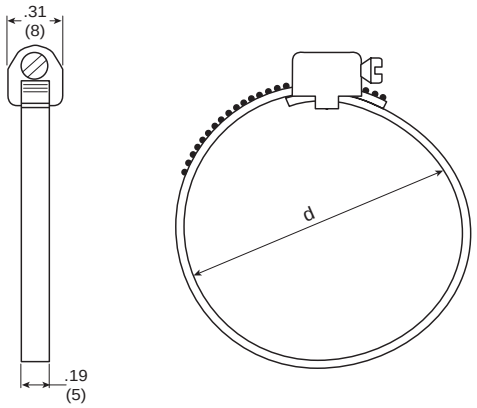
Data for connecting power supplies or other approved isolating amplifiers:

Short circuit current 1Kmax ..... ≤ 30mA
No load voltage ..... ≤ 16VDC
Power loss ..... ≤ 75mW
Note: Intrinsically safe solutions must include a NAMUR Power Supply

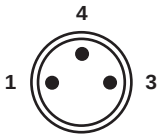
0897790007



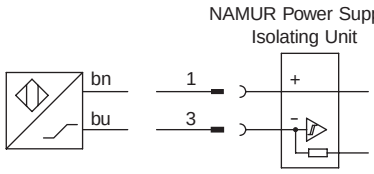
Round Body Brackets



Wiring connection



Pin	Wire	Function
1	Brown	Operating voltage (+VDC)
3	Blue	-VDC
4		Not used



B
Electronic Sensors
Actuator Products

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NAMUR Sensor Power Supply

CE

For All NAMUR Sensors

Supply voltage	Part number
115VAC	**0897810001**
230VAC	**0897810002**
24VDC	**0897810003**

- Reliable DC-decoupling between input, output and supply voltage in accordance with VDE 0100 Part 410
- 2-channel with one relay output SPDT respectively
- Intrinsically safe inputs complying with [EEx 1a] IIC
- Housing with snap fastening for support rail DIN 46277

Specifications

Supply voltage..... 115 VAC (p/n 0897810001)
230 VAC (p/n 0897810002)
24 VDC (p/n 0897810003)

Mains frequency .....48-62 Hz

Switching frequency .....≤ 20 Hz

Power consumption per channel .....Approximately 1.5 VA
Approximately 0.7 W only for p/n 0897810003

Inputs .....2 sensors

No load voltage .....8.5 VDC

Short circuit current .....≥ 6mA

Permissible external capacitance..... ≤ 567nF

Permissible external inductance..... ≤ 5 mH

Switching outputs..... 1 relay per input: SPDT

Switching voltage ..... ≤ 250 VAC

Switching current.....≤ 5 A

Switching output .....≤ 100 VA

Permit.....PTB no. Ex-95.C.2003X

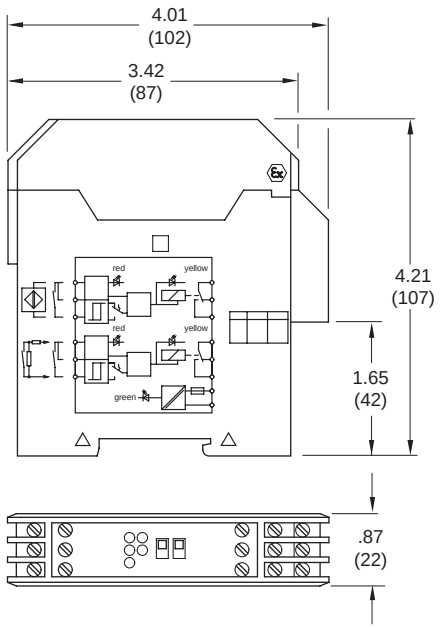
VDE protection class I

Enclosure rating.....IP20

Operating temperature ..... -25ºC to +60ºC (-13ºF to +140ºF)

Approximate weight.....250g (8.8 oz.)

Housing material.....Plastic



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End-of-Stroke Proximinity Sensors

Ordering information

Sensor type	Inductive proximity			Non-contacting magnetically actuated	
Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Sensor part number	**148897******	**146617******	**148896******	**148275******	**149109******
6' Cable	**0853550006**	**0853550006**	**0859170006**	**0853550006**	—
12' Cable	**0853550012**	**0853550012**	**0859170012**	**0853550012**	—
6' Cable, right angle	**0875470006**	**0875470006**	**—**	**0875470006**	—

**** Part number suffix: **** 4-digit suffix indicates probe length: 0125=1.25", 0206=2.06", 0288=2.875", 0456=4.562"

Specifications

Style	EPS-7	EPS-5	EPS-6	CLS-1	CLS-4
Code designator	H	R	D	F	B
Sensor type	Inductive proximity	Inductive proximity	Inductive Proximity	Non-contacting magnetically actuated	Non-contacting magnetically actuated
Description	Economical, General Purpose, 2 wire device, primarily for AC applications, not suitable for 24 VDC applications. Use EPS-5 only for automotive industry customers who specify them.		Economical, General Purpose, 3 wire, DC sensor, dual output: sinking and sourcing	Functional replacement for AB (Mechanical) Limit Switches in many applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.	Functional replacement for AB (Mechanical) Limit Switches in many High Temperature applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style.
Supply voltage	20 to 250 VAC/DC	20 to 230 VAC/DC	10 to 30 VDC	24 to 240 VAC/DC	24 to 240 VAC/DC
Load current, min	8 mA	5 mA	NA	NA	NA
Load current, max	300 mA	500 mA	200 mA	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC	4 AMPS @ 120 VAC 3 AMPS @ 24 VDC
Leakage current:	1.7 mA, max.	1.7 mA, max.	10 micro amps max.	—	—
Voltage drop	7 V, max.	10 V, max	2 VDC max.	NA	NA
Operating temperature	-14° to 158° F	-4° to 158° F	-14° to 158° F	-40°F to 221° F	-40° F to 400° F
Connection	3-pin mini	3-pin mini	5-pin mini	3-pin mini	144" PTFE coated flying leads with 1/2" conduit hub
Enclosure rating	IEC IP67	NEMA 4, 6, 12, 13	IEC IP67	NEMA 1, 2, 3, 4, 4x, 5, 6, 6P, 11, 12, 12K, 13	NEMA 1, 2, 3, 4, 4x, 5
Led indication	Yes	Yes	Yes	No	No
Short circuit protection	Yes	Yes	Yes	No	No
Weld field immunity	Yes	Yes	Yes	Yes	Yes
Output	2 wire, Normally Open with leakage current	2 wire, Normally Open with leakage current	Dual output: DC Sinking and DC Sourcing, user selectable via wiring	SPDT (Single pole double throw), Normally Open/Normally Closed, Form C	SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C
Approvals/marks	CE, UL, CSA	UL	CE, UL, CSA	UL or CSA	UL or CSA
Make / break location	0.125" from end of stroke, typical. Tolerance is 0/-0.125"				
Wiring instructions	Pin 1: AC ground (Green)	Pin 1: AC ground (Green)	Pin 1: +10 to 30 VDC (White)	Pin 1: Common (Green)	Common: (Black)
	Pin 2: Output (Black)	Pin 2: Output (Black)	Pin 2: Sourcing output (Red)	Pin 2: Normally Closed (Black)	Normally Open: (Blue)
	Pin 3: AC line (White)	Pin 3: AC line (White)	Pin 3: Grounded (not connected or required)	Pin 3: Normally Open (White)	Normally Closed: (Red)
			Pin 4: Sinking output (Orange)		
			Pin 5: DC common (Black)		

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Series and Parallel Wiring

When Parker EPS-5, 6 or 7 proximity sensors are used as inputs to programmable controllers, the preferred practice is to connect each sensor to a separate input channel of the PC. Series or parallel operations may then be accomplished by the internal PC programming.

Parker EPS-5, 6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

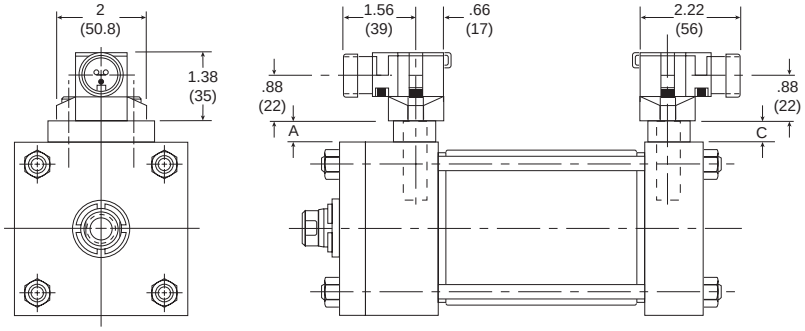
Parker EPS-5, 6 or 7 sensors may also be hard wired for parallel operation. However, the leakage current of each sensor will pass through the load. The total of all leakage currents must not exceed the current required to actuate the load. In most cases, the use of two or more EPS-5, 6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

EPS-5
Automotive Applications

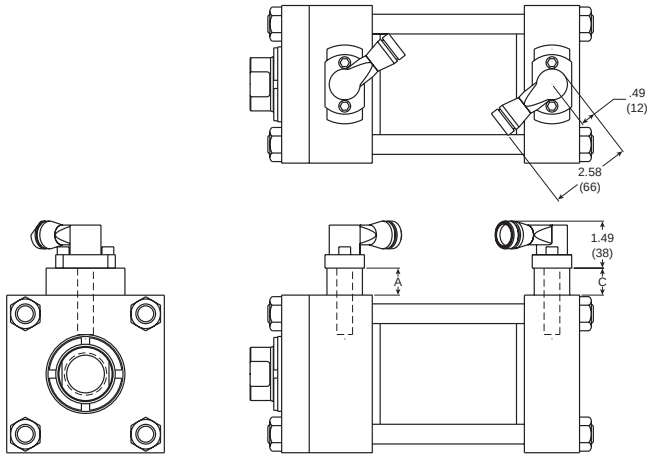
(Meets some Automotive Manufacturer's Specifications)

Series	A max.	C max.
2A, 4MA, 4MAJ	1.55"	1.30"

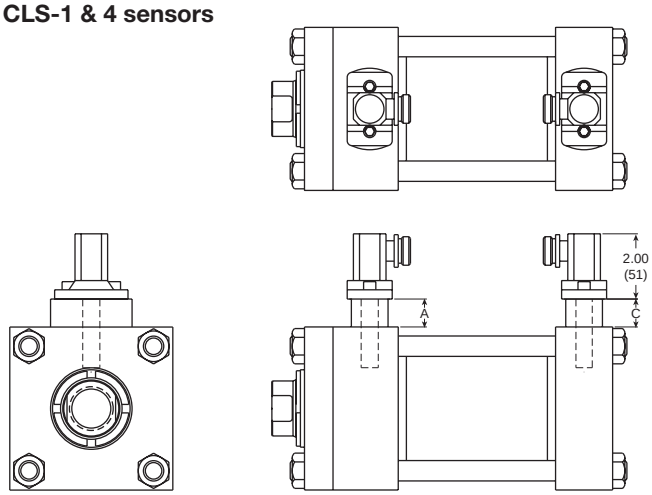
For exact dimensions, see Bulletin 0840-G-E1



EPS-7 & EPS-6 sensors

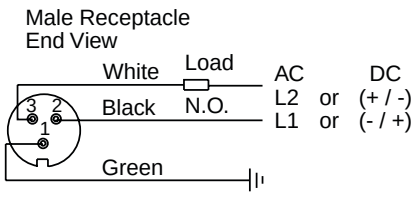


CLS-1 & 4 sensors

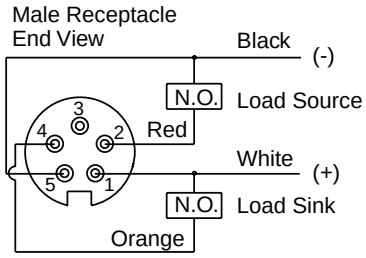


Connector pin numbering

3-pin mini



5-pin mini



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How to Specify EPS Sensors

Parker EPS proximity sensors may be ordered on 2A, 2AN, 4MA and 4MAJ Series cylinders as follows:

1) Complete the basic cylinder model number.
2) Place an "S" in the model number to denote sensors and/or special features.
3) Mounting styles D, DB, JB, or HB should be used with caution because of possible mounting interferences. Consult bulletin 0840-G-E1 for additional information.
4) Special modifications to cylinders other than sensors must have a written description.
5) Specify letter prefix "H" for EPS-7, "D" for EPS-6, "R" for EPS-5, "F" for CLS-1, or "B" for CLS-4, then fill in the four fields specifying port location, sensor orientation and actuation point for both head and cap. If only one sensor is used, place "XXXX" in the unused fields.

   Example = H13CGG-XXXX denotes a sensor on the head end only, EPS-7

   Example = BXXXX-42BGG denotes a sensor on the cap end only, CLS-4

Head end

R	1	3	A	GG
Specify: R = EPS-5 H = EPS-7 D = EPS-6 F = CLS-1 B = CLS-4 |N = Prep for sensors only	Port Location See Figure 1.	Sensor Location See Figure 1.	Sensor Orientation See Figure 2 for EPS-7 and EPS-6 only.	Actuation Point GG = End of Stroke See Bulletin 0840-G-E1 for stroke remaining.

Cap end

4	2	B	GG
Port Location See Figure 1.	Sensor Location See Figure 1.	Sensor Orientation See Figure 2 for EPS-7 and EPS-6 only.	Actuation Point GG = End of Stroke See Bulletin 0840-G-E1 for stroke remaining.

Note: All specified sensor and port locations are as seen from rod end of cylinder.
*EPS-5 sensors will be oriented so that the connectors face each other.
**Consult the Wadsworth, Ohio facility for this option with 4MA and 4MAJ Series cylinders.

Figure 1

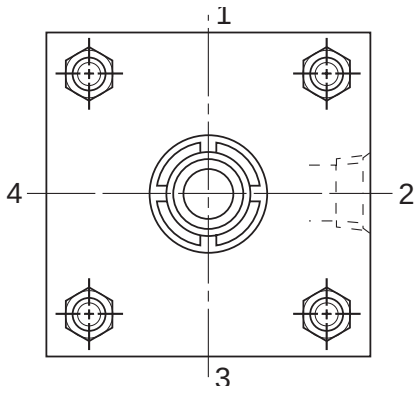
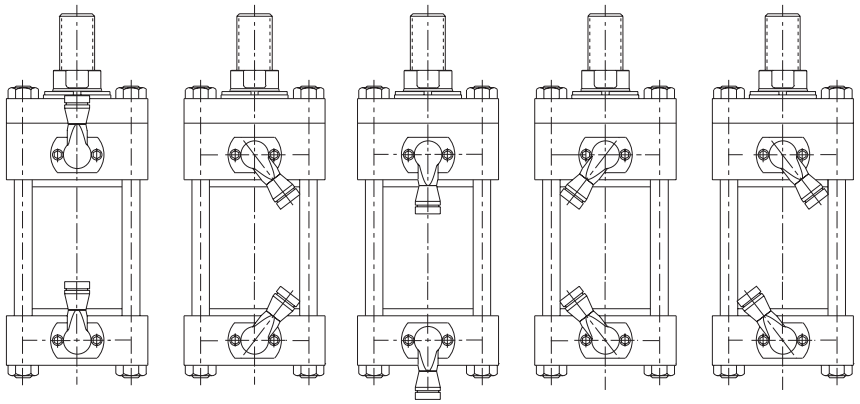


Figure 2



Example:
4.00 CJ4MAUS14AC 12.000
S = H13CGG-13CGG

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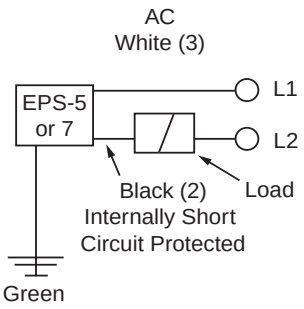
EPS-5 & EPS-7

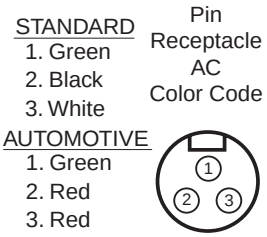
Connectors

The male quick disconnect on the Parker EPS-5 or 7 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number	
	Automotive	Standard
3'	085356003	0853550003
6'	085356006	0853550006
9'	085356009	—
12'	0853560012	0853550012





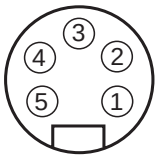
EPS-6

Connectors

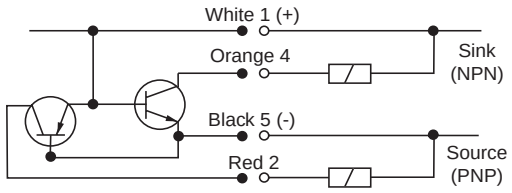
The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

Plug Pin and Cable Identification

1) +10 to 30 VDC (White)
2) Source (Red)
3) Grounded not connected nor required
4) Sink (Orange)
5) Common (Black)



Cable length	Part number
3	0859170003
6	0859170006
12	0859170012



LED Function	"Ready"	"Target"
Power Applied (No Target)	ON	OFF
Target Present	OFF	ON
Short Circuit Condition	FLASH	FLASH

CLS

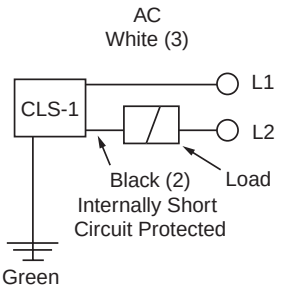
Connectors

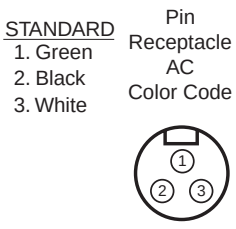
The male quick disconnect on the Parker CLS-1 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

Cable length	Part number
3'	0853550003
6'	0853550006
9'	—
12'	0853550012

The connection for the CLS-4 are 144" PTFE insulated flying leads with 1/2" conduit hub. 3-wire: Common (black), Normally open (blue), and Normally closed (red).





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PTR and HP Series Proximity Sensors

The inductive type proximity sensor provides end of rotation indication. The non-contact probe senses the presence of the ferrous cushion spear and has no springs, plungers, cams or dynamic seals that can wear out or go out of adjustment. The sensor is solid state and meets NEMA 3, 4, & 13 specifications. For ease of wiring, the connector housing is rotatable through 360°. To rotate, lift the cover latch, position, and release.

A standard proximity sensor controls 20-230 VAC/DC loads from 5 to 500 mA. The low 1.7 mA off-state leakage current can allow use for direct PLC input. The standard short circuit protection (SCP) protects the sensor from a short in the load or line upon sensing such a condition (5 amp or greater current) by assuming a non-conductive mode. The fault condition must be corrected and the power removed to reset the sensor preventing automatic restarts.

The low voltage DC sensor is also available for use with 10-30 VDC. This sensor is in a non-rotatable housing, but does incorporate the short circuit protection.

Both sensors are equipped with two LEDs, “Ready” and “Target”. The “Ready” LED is lit when power is applied and the cushion spear is not present. The “Target” LED will light and the “Ready” LED will go out when the sensor is closed, indicating the presence of the cushion spear. Both LEDs flashing indicates a short circuit condition.

Notes:

1. Available with or without cushions.
2. Not available with stroke adjusters.
3. Pressure rating: 3000 PSIG
4. Operating temperature: -4°F to 150°F
5. Specify sensor type, orientation and voltage when ordering.
6. The low voltage DC sensor is available in non-rotatable style only, consult representative for further information.

Inductive Proximity Sensors – 8mm Barrel Type

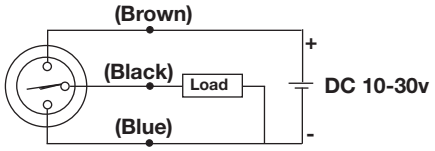
Proximity sensors are normally ordered with the unit as part of the model number. Use these part numbers for replacement parts only.

Ordering information

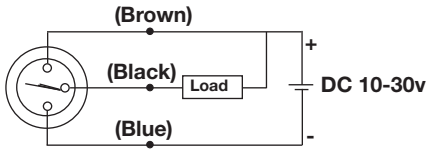
Series	PNP		NPN	
	Quick* connect	Flying leads	Quick ** connect	Flying leads
HB	B8830-P	913090000	B8830-N	913090100
P5L	B8830-P	913090000	B8830-N	913090100
WR	B8830-P	913090000	B8830-N	913090100

* Order cordset B8757-P separately.
** Order cordset B8757-N separately.

PNP wiring connection



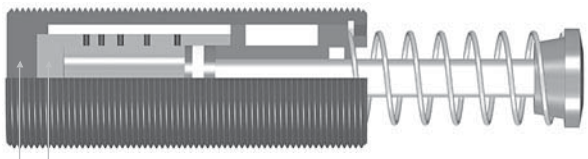
NPN wiring connection



Parker Shock Absorber

The use of one piece / closed end bodies and inner pressure chambers provides an extremely strong construction, which can withstand much higher internal pressures and overload forces without mechanical damage.

Parker builds its shock absorbers with closed end / one piece bodies and inner pressure chambers, which greatly reduces the chance of sudden failure, or machine damage in the event of an overload.



Outer body and pressure chamber with closed rear end (one-piece)

Specifications

	Oil Type	Materials	Mechanical Stop	Lock Nut
MC 9 - MC 75	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.		Included
MC 150 - MC 600	Silicone	Steel body: Black oxide finish. Piston rod: Hardened stainless steel. Rolling seal: EPDM*	Must be provided 0.02 to 0.04 inch (0.5 to 1 mm) before end of stroke.	Included
SC 190 - SC 925	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
SC 300 - SC 650	#5	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Integral mechanical stop built into front of units.	Included
MA 35 - MA 900	MA 35: #5 MA 150: Silicone MA 225, 600, 900: ATF	Steel body: Black oxide finish. Piston rod: Hardened stainless steel.	Adjustment screw for optimum deceleration.	Included
MC 33 - MC 64 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated. Rod end button: Hardened steel with black oxide finish. Return spring: Zinc plated		Included
MC 33 - MC 64 Adjustable	ATF		Turn front stop collar or rear adjuster against the scale marked 0 to 9 for optimum deceleration	Included
1-1/2" Bore Series	American 46	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated. Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	
CA 2 - CA 4 Self-Compensating	ATF	Steel body: Black oxide finish. Piston rod: Hardened, high tensile steel, chrome plated. Return spring: Zinc plated	Must be provided .09 inch (2.3 mm) before end of stroke.	
A 2 - A 3 Adjustable	ATF		Must be provided .09 inch (2.3 mm) before end of stroke.	

* Seal not compatible with petroleum based fluids) If unit to be used in contact with such fluids specify neoprene rolling seal. Consider the SC2 Series as an alternative.

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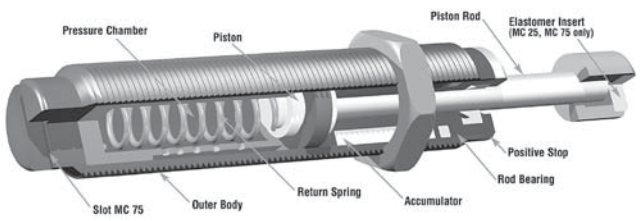
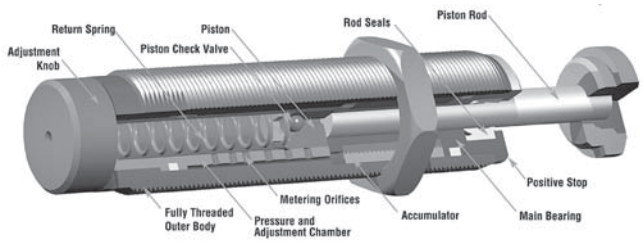
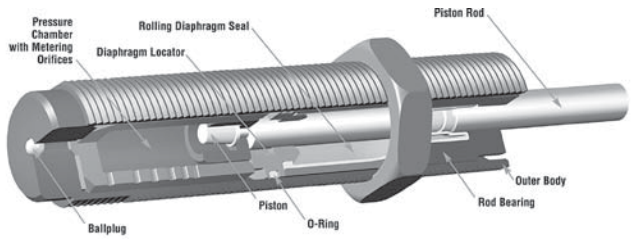
Miniature shock absorbers
MC 9 to MC 75
Self-compensating



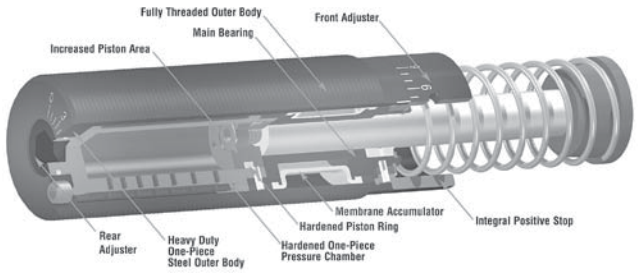
MA series 225-900 shock absorbers
(Miniature adjustable)
Adjustable



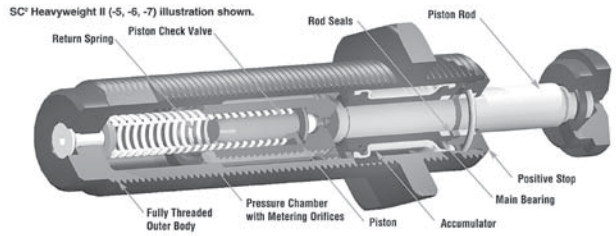
Miniature shock absorbers
MC 150, MC 225 and MC 600
Self-Compensating



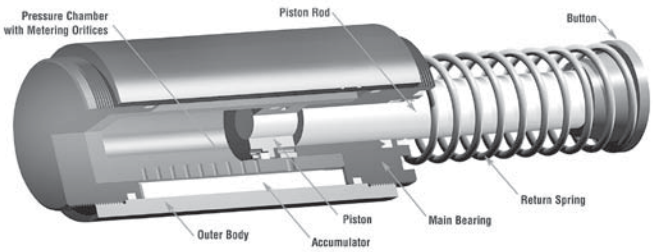
Magnum series MA and ML 33 to 64
Adjustable



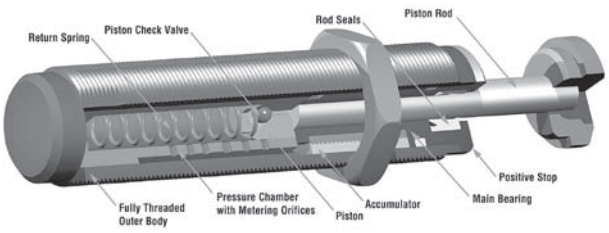
Heavyweight shock absorbers
SC 300 and SC 650
Soft Contact and Self-Compensating



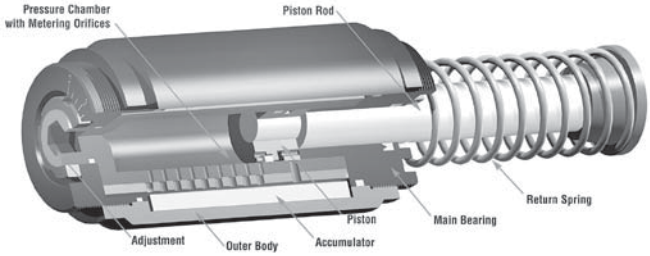
Heavy Industrial Shock Absorbers
CA to CA 4
Self-Compensating



Miniature shock absorbers
SC 190 to SC 925
Soft Contact and Self-Compensating



Heavy Industrial Shock Absorbers
A2 to A3
Adjustable



Industrial Shock Absorbers are rated by capacity for the purpose of selecting the proper unit for an application's energy requirements. Ratings are determined by the effective weight that the shock absorber can stop and the energy it can absorb per cycle and per hour. These ratings relate to the mechanical and thermal capacity of a shock absorber because the mechanical energy is converted to heat and dissipated.

Self-Compensating Models

Model number	Stroke inches 1 inch = 25.4 mm	E3 max. energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max. energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour		
				Self-contained	A/O tank	A/O Re-circulating
MC 9-1	0.20	9	1.35-7.0	18,000	N/A	N/A
MC 9-2	0.20	9	1.75-9.0	18,000		
MC 10L	0.20	4	0.75-6.0	35,000	N/A	N/A
MC 10H	0.20	7	1.5-11	35,000		
MC 25L	0.25	20	1.5-5	120,000	N/A	N/A
MC 25	0.25	20	4-12	120,000		
MC 25H	0.25	20	10-30	120,000		
MC 75-1	0.40	75	0.5-2.5	250,000	N/A	N/A
MC 75-2	0.40	75	2-14	250,000		
MC 75-3	0.40	75	6-80	250,000		
MC 150	0.50	150	2-22	300,000	N/A	N/A
MC 150H	0.50	150	20-200	300,000		
MC 150H2	0.50	150	150-450	300,000		
MC 225	0.50	225	5-55	400,000	N/A	N/A
MC 225H	0.50	225	50-500	400,000		
MC 225H2	0.50	225	400-2,000	400,000		
MC 600	1.00	600	20-300	600,000	N/A	N/A
MC 600H	1.00	600	250-2,500	600,000		
MC 600H2	1.00	600	880-5,000	600,000		
SC 190-1	0.63	225	3-15	300,000	N/A	N/A
SC 190-2	0.63	225	8-40	300,000		
SC 190-3	0.63	225	20-100	300,000		
SC 190-4	0.63	225	50-225	300,000		
SC 300-1	0.75	300	3-18	400,000	N/A	N/A
SC 300-2	0.75	300	10-60	400,000		
SC 300-3	0.75	300	30-180	400,000		
SC 300-4	0.75	300	70-450	400,000		
SC 300-5	0.59	650	25-100	400,000		
SC 300-6	0.59	650	75-300	400,000		
SC 300-7	0.59	650	200-400	400,000		
SC 300-8	0.59	620	300-1,500	400,000		
SC 300-9	0.59	620	700-4,300	400,000		
SC 650-1	1.00	650	17-100	600,000	N/A	N/A
SC 650-2	1.00	650	50-300	600,000		
SC 650-3	1.00	650	150-900	600,000		
SC 650-4	1.00	650	450-2,600	600,000		
SC 650-5	0.91	1,860	50-250	600,000		
SC 650-6	0.91	1,860	200-800	600,000		
SC 650-7	0.91	1,860	700-2,400	600,000		
SC 650-8	0.91	1,860	1,700-5,800	600,000		
SC 650-9	0.91	1,860	4,000-14,000	600,000		
SC 925-1	1.58	975	30-200	800,000	N/A	N/A
SC 925-2	1.58	975	90-600	800,000		
SC 925-3	1.58	975	250-1,600	800,000		
SC 925-4	1.58	975	750-4,600	800,000		
MC 3325-1	0.91	1,350	20-80	670,000	1,100,000	1,500,000
MC 3325-2			68-272			
MC 3325-3			230-920			
MC 3325-4			780-3,120			
MC 3350-1	1.91	2,700	40-160	760,000	1,200,000	1,600,000
MC 3350-2			136-544			
MC 3350-3			460-1,840			
MC 3350-4			1,560-6,240			
MC 3625-1	0.91	1,350	20-80	670,000	1,100,000	1,500,000
MC 3625-2			68-272			
MC 3625-3			230-920			
MC 3625-4			780-3,120			
MC 3650-1	1.91	2,700	40-160	760,000	1,200,000	1,600,000
MC 3650-2			136-544			
MC 3650-3			460-1,840			
MC 3650-4			1,560-6,240			
MC 4525-1	0.91	3,000	50-200	950,000	1,400,000	1,700,000
MC 4525-2			170-680			
MC 4525-3			575-2,300			
MC 4525-4			1,950-7,800			
MC 4550-1	1.91	6,000	100-400	1,000,000	1,700,000	2,200,000
MC 4550-2			340-1,360			
MC 4550-3			1,150-4,600			
MC 4550-4			3,900-15,600			
MC 4575-1	2.91	9,000	150-600	1,300,000	2,000,000	2,500,000
MC 4575-2	1.91		510-2,040			
MC 4575-3			1,730-6,920			
MC 4575-4			5,850-23,400			
MC 6450-1		15,000	300-1,200	1,300,000	2,600,000	3,400,000
MC 6450-2			1,020-4,080			
MC 6450-3			3,460-13,840			
MC 6450-4			11,700-46,800			
MC 64100-1	3.91	30,000	600-2,400	1,700,000	3,400,000	4,400,000
MC 64100-2			2,040-8,160			
MC 64100-3			6,920-27,680			
MC 64100-4			23,400-93,600			
MC 64150-1	5.91	45,000	900-3,600	2,200,000	4,400,000	5,700,000
MC 64150-2			3,060-12,240			
MC 64150-3			10,380-41,520			
MC 64150-4			35,100-140,400			

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Self-Compensating Models Continued

Model number	Stroke inches 1 inch = 25.4 mm	E3 max energy per cycle, inch lbs 1 in lb = .11 Nm	We effective weight lbs, 1 lb = .45 kg	E4 max energy per hour, in lbs/hour 1 in lb/hour = .11 Nm/hour		
				Self-contained	A/O tank	A/O Re-circulating
CA 2x2-1	2.00	32,000	1,600-4,800	9,600,000	12,000,000	15,600,000
CA 2x2-2			4,000-12,000			
CA 2x2-3			10,000-30,000			
CA 2x2-4			25,000-75,000			
CA 2x4-1	4.00	64,000	3.200-9.600	12,000,000	15,000,000	19,500,000
CA 2x4-2			8,000-24,000			
CA 2x4-3			20,000-60,000			
CA 2x4-4			50,000-150,000			
CA 2x6-1	6.00	96,000	4.800-14,400	14,400,000	18,000,000	23,500,000
CA 2x6-2			12,000-36,000			
CA 2x6-3			30,000-90,000			
CA 2x6-4			75,000-225,000			
CA 2x8-1	8.00	128,000	6,400-19,200	16,800,000	21,000,000	27,000,000
CA 2x8-2			16,000-48,000			
CA 2x8-3			40,000-120,000			
CA 2x8-4			100,000-300,000			
CA 2x10-1	10.00	160,000	8,000-24,000	19,200,000	24,000,000	31,000,000
CA 2x10-2			20,000-60,000			
CA 2x10-3			50,000-150,000			
CA 2x10-4			125,000-375,000			
CA 3x5-1	5.00	125,000	6,400-19,200	20,000,000	25,000,000	32,500,000
CA 3x5-2			16,000-48,000			
CA 3x5-3			40,000-120,000			
CA 3x5-4			100,000-300,000			
CA 3x8-1	8.00	200,000	10,240-30,720	32,000,000	40,000,000	52,000,000
CA 3x8-2			25,600-76,800			
CA 3x8-3			64,000-192,000			
CA 3x8-4			160,000-480,000			
CA 3x12-1	12.00	300,000	15,360-46,080	48,000,000	60,000,000	78,000,000
CA 3x12-2			38,400-115,200			
CA 3x12-3			96,000-288,000			
CA 3x12-4			240,000-720,000			
CA 4x6-3	6.00	420,000	8,000-19,000	27,000,000	45,000,000	58,000,000
CA 4x6-5	6.00	420,000	19,000-41,000	27,000,000	45,000,000	58,000,000
CA 4x6-7	6.00	420,000	41,000-94,000	27,000,000	45,000,000	58,000,000
CA 4x8-3	8.00	560,000	11,000-25,000	30,000,000	50,000,000	65,000,000
CA 4x8-5	8.00	560,000	25,000-55,000	30,000,000	50,000,000	65,000,000
CA 4x8-7	8.00	560,000	55,000-125,000	30,000,000	50,000,000	65,000,000
CA 4x16-3	16.00	1,120,000	22,000-50,000	50,000,000	85,000,000	110,000,000
CA 4x16-5	16.00	1,120,000	50,000-110,000	50,000,000	85,000,000	110,000,000
CA 4x16-7	16.00	1,120,000	110,000-250,000	50,000,000	85,000,000	110,000,000

Adjustable Models

MA 35	0.40	35	13-125	53,000	N/A	N/A
MA 150	0.50	150	2-200	300,000		
MA 225	0.75	225	5-500	400,000		
MA 600	1.00	600	20-3,000	600,000		
MA 900	1.58	900	30-4,500	800,000	1,100,000	1,500,000
MA 3325	0.91	1,500	20-3,800	670,000	1,200,000	1,600,000
MA 3350	1.91	3,000	28-5,400	760,000		
MA 3625	0.91	1,500	20-3,800	670,000	1,100,000	1,500,000
MA 3650	1.91	3,000	28-5,400	760,000	1,200,000	1,600,000
MA 4525	0.91	3,450	95-22,000	950,000	1,400,000	1,700,000
MA 4550	1.91	6,900	150-32,000	1,000,000	1,700,000	2,200,000
MA 4575	2.91	10,350	155-33,000	1,300,000	2,000,000	2,500,000
MA 6450	1.91	18,000	480-110,000	1,300,000	2,600,000	3,400,000
MA 64100	3.91	36,000	600-115,000	1,700,000	3,400,000	4,400,000
MA 64150	5.91	54,000	730-175,000	2,200,000	4,400,000	5,700,000
1-1/2x2	2.00	16,000	430-70,000	3,200,000	4,000,000	5,200,000
1-1/2x3-1/2	3.50	28,000	480-80,000	5,600,000	7,000,000	9,100,000
1-1/2x5	5.00	40,000	500-90,000	8,000,000	10,000,000	13,000,000
1-1/2x6-1/2	6.50	52,000	680-100,000	10,400,000	13,000,000	17,000,000
A 2x2	2.00	32,000	560-170,000	9,600,000	12,000,000	15,600,000
A 2x4	4.00	80,000	510-160,000	12,000,000	15,000,000	19,500,000
A 2x6	6.00	120,000	570-190,000	14,400,000	18,000,000	23,500,000
A 2x8	8.00	170,000	580-200,000	16,800,000	21,000,000	27,000,000
A 2x10	10.00	210,000	720-250,000	19,200,000	24,000,000	31,000,000
A 3x5	5.00	140,000	1,050-340,000	20,000,000	25,000,000	32,500,000
A 3x8	8.00	250,000	1,200-400,000	32,000,000	40,000,000	52,000,000
A 3x12	12.00	390,000	1,350-450,000	48,000,000	60,000,000	78,000,000

Low Velocity Adjustable Models

ML 3325	0.91	1,500	.05-1.5	670,000	1,100,000	1,500,000
ML 3350	1.91	3,000	.05-1.5	760,000	1,200,000	1,600,000
ML 3625	0.91	1,500	.05-1.5	670,000	1,100,000	1,500,000
ML 3650	1.91	3,000	.05-1.5	760,000	1,200,000	1,600,000
ML 4525	0.91	3,450	.05-1.5	950,000	1,400,000	1,700,000
ML 4550	1.91	6,900	.05-1.5	1,000,000	1,700,000	2,200,000
ML 6425	0.91	9,000	.05-1.5	1,100,000	2,200,000	2,900,000
ML 6450	1.91	18,000	.05-1.5	1,300,000	2,600,000	3,400,000

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Miniature Shock Absorbers MC 9 to MC 75 - *Self-Compensating*

Miniature Shock Absorbers are self-contained hydraulic units. The MC 9 to MC 75 model range has a very short overall length and low return force. Its small size allows for high energy absorption in confined spaces, while the wide effective weight ranges accommodate a variety of load conditions. With threaded outer bodies and multiple accessories, MC models can be mounted in numerous configurations.

Applications include: small linear slides, material handling and packaging equipment, small robotics, office and medical equipment, as well as instrumentation.

Technical data

Impact velocity range:
MC 9: 0.5 to 6 ft/sec (0.15 to 1.8 m/sec)
MC 10: 0.5 to 5 ft/sec (0.15 to 1.5 m/sec)
MC 25: 0.5 to 8 ft/sec (0.15 to 2.4 m/sec)
MC 75: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)

Operating temperature:
MC 9 and MC 10: 14° to 158°F (-10° to 70°C)
MC 25: 32° to 150°F (0° to 66°C)
MC 75: 32° to 150°F (0° to 66°C)

Ordering information – Miniature MC Series, Self Compensating

MC	75		-1	
MC Series	Model Number	Mounting Thread	Effective Weight	Button Options
	9	**MC9**	**MC9**	**MC9 & MC10**
	10	M M6 x 1.0 metric	-1 Light	Standard, no button
	25	**MC10**	-2 Medium	-B Delrin button
	75	M M8 x 1.0 metric	**MC10**	**MC25 & MC75**
		E M8 x 0.75 metric	L Light range	Standard, with button
		MC25 Standard (UNEF)	H Heavy range	-NB *No button, short rod
		M Metric	**MC25**	-880 No button, standard rod
		MC75 Standard (UNEF)	L Light range	
		M Metric	Standard range	
			H Heavy range	
			MC75	
			-1 Light	
			-2 Medium	
			-3 Heavy	

* Consult factory for dimensional details.

Miniature Shock Absorbers MC 150 to MC 600 - *Self-Compensating*

Miniature Shock Absorbers
MC 150 to MC 600 model range, feature a hermetically sealed rolling diaphragm seal system that provides the highest possible cycle lifetime and an extremely low rod return force. These models can be directly mounted into the end cover of pneumatic cylinders to provide superior damping compared to normal cylinder cushions. Use of the optional stop collar is recommended to provide a positive mechanical stop. By adding the optional side load adapter (metric threaded models only), it is possible to accept side loads up to 25° from the axis.

Applications for the durable MC Series include: material handling, medium robotics, machine tools, pick and place systems, as well as packaging equipment.

Technical data

Impact velocity range: 0.26 to 19.7 ft/sec (0.08 to 6 m/sec)
Operating temperature: 32° to 150°F (0° to 66°C)

Note: MC 150 to MC 600 models may be mounted into pressure chambers of pneumatic actuators.

Ordering information – Miniature MC Series, Self Compensating

MC	225		-1	
MC Series	Model Number	Mounting Thread	Effective Weight	Button Options
	150	– Standard (UNF)	**MC150, MC255. MC600**	Standard, no button
	255	M Metric	Standard range	-B Delrin button
	600	ME* Fine metric	H Heavy range	-BS Steel button
		ML** Course metric	H2 Extra heavy range	

*MC 150 only **MC 600 only

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SC² Series SC 190 to SC 925- *Soft Contact and Self-Compensating*

SC² Series Miniature Shock Absorbers provide dual performance benefits. They offer **soft contact deceleration** where initial impact reaction forces are very low, with the advantages of **self-compensation** to react to changing energy conditions, without adjustment. They have long stroke lengths, **SC² 925 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces.

With the addition of the **optional side load adapter** (SC² 190M, 300M, and 650M models only), SC² Series shock absorbers can handle side loads up to 25°. SC² Series shock absorbers are fully interchangeable with the adjustable MA range.

Applications include: material handling, medium robotics, machine tools, pick and place systems, rodless cylinders and packaging equipment.

Technical data

Impact velocity range:	0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
Operating temperature:	32° to 150°F (0° to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – Miniature SC² Series, Soft Contact and Self Compensating

SC	300		-1	
SC² Series	**Model Number**	**Mounting Thread**	**Effective Weight**	**Button Options**
Soft Contact Self Compensating	**190** **300** **650** **925**	**–** Standard (UNF) **M** Metric	**-1** Ultra light **-2** Light **-3** Medium **-4** Heavy	Standard with button **-NB** No button, short rod **-BS** No button, standard rod

SC² Heavyweight Series SC 300 to SC 650 - *Soft Contact and Self-Compensating*

SC² 300 and SC² 650 Heavyweight Series Shock Absorbers deliver up to 950% of the effective weight capacity and 280% of the energy absorption capability of standard models. These durable units are ideal for decelerating heavy weights moving at low velocities. The Heavyweight Series design combines the piston and the inner tube into a single component, the piston tube. It acts as both the pressure creating and pressure controlling device.

SC² 300 and SC² 650 Heavyweight II Series Shock Absorbers offer effective weight ranges and dramatic increases in energy absorption capability, for handling a wider range of applications.

These revolutionary shock absorbers provide dual performance benefits. They offer **soft contact** deceleration where initial impact reaction forces are very low with the advantages of **self-compensation** to cope with changing input energy conditions without adjustment.

Applications include: rotary actuators, rodless cylinders, conveyors, pick and place operations, slides as well as operations turning heavy weights at slow speeds.

Technical data

Impact velocity range:	0.3 to 12 ft/sec (0.9 to 3.66 m/sec)
Operating temperature:	32° to 150°F (0° to 66°C)

Note: Integral mechanical stop built into front of units.

Ordering information – SC² Series, Soft Contact and Self Compensating

SC	300		-1	
SC² Series	**Model Number**	**Mounting Thread**	**Effective Weight**	**Button Options**
Soft Contact Self Compensating	**300** **650**	**–** Standard (UNF) **M** Metric	**-5** Heavy **-6** Heavy plus **-7** Heavy duty **-8** Extra heavy **-9** Ultra heavy	Standard with button **-NB** No button, short rod **-880** No button, standard rod

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Miniature Shock Absorbers MA 35 to MA 900 - *Adjustable*

MA Series miniature shock absorbers offer a compact design with true linear deceleration, and are adjustable over a wide range of conditions.
If your preference is a fully adjustable shock absorber rather than a self-compensating model on your application, then the MA Series provides a directly interchangeable alternative.

These adjustable models feature long stroke lengths, **MA 900 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces. The MA 150 incorporates the proven rolling diaphragm seal (used on the MC 150 to MC 600 range) and shares all the advantages of that technology.

Applications include: material handling, medium robotics, pick and place systems, machine tool and packaging equipment.

Technical data

Impact velocity range:	
MA35	3.3 ft/sec (1.0 m/sec)
MA150, 225, 600, 900	0.5 to 12 ft/sec (0.15 to 3.66 m/sec)
Operating temperature:	32° to 150°F (0° to 66°C)

Ordering information – MA Series, Adjustable

MA

MA Series
MA – Miniature Adjustable

225

Model Number
35
150
225
600
900

–

Mounting Thread	
–	Standard (UNF)
M	Metric
ME	Fine metric (MA 150 Only)

[ ]

Button Options	
MA35	
	Standard with button
-NB	No button, short rod
MA150	
	Standard, no button
-B	Nylon button
-BS	Steel button
MA 225-900	
	Standard steel button
-NB	No button, short rod
-880	No button, standard rod

Magnum Series MC 33 to MC 64 - *Self-Compensating*

Parker presents the ultimate in industrial shock absorber design...the Magnum Series. These versatile performers offer you the capability to mount shock absorbers that contain the highest energy capacity ratings in the industry. **Up to 150% of the energy per cycle** of previous models in the same package size, means increased safety factors in a wider range of applications.

Up to 390% of the effective weight capacity of previous models, may allow a smaller, lower priced shock absorber to be mounted, to meet your application requirements.

All Magnum Series shock absorbers are **fully threaded** for ease of installation. **Incorporation of high strength materials** along with an **integral stop collar** translates to extended shock absorber life and cost savings for you.

Applications include: automotive manufacturing and production equipment, large robotics, heavy conveyors, packaging and glass bottling equipment, rotary actuators, theme park rides, and lumber industry equipment.

Technical data

Impact velocity range:	
MC Models:	0.5 to 16.5 ft/sec (0.15 to 5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – MC Series, Self Compensating

MC

Return Method and Accumulator Style	
MC	Self-contained spring return, internal accumulator
MCA	Air return, external accumulator
MCS	Spring return, external accumulator
MCN	Self return (clevis), internal accumulator

3325

Model Number		
3325	4525	6450
3350	4550	64100
3625	4575	64150
3650		

–

Mounting Thread	
–	Standard (UNF)
M	Metric

1

Effective Weight	
-1	Light range
-2	Medium range
-3	Heavy range
-4	Heavier range

* Welded versions available upon request.
** Not available on MC 3625 and 3650 models.

C

Mounting Options	
	Standard mount
	Flanged stop collar
	Rectangular flange*
	Square flange*
-C	Clevis mount**
-S	Side-foot mount**
-P	Side port
-Z	Within air cylinder

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Magnum Series MA and ML 33 to 64
Adjustable

Magnum Series adjustable shock absorbers feature the latest seal technology, a hardened piston ring, pressure chamber and outer body for increased operating life. Additionally, these rugged units offer the unique feature of front or rear adjustment along with a fully threaded outer body for ease o f installation.

Magnum Series adjustable shock absorbers are directly interchangeable with obsolete primary series and competitor models.

Along with the self-compensating models, the adjustable range offers unprecedented increases in energy and effective weight capacity.

Applications are the same as self-compensating models.

Technical data

Impact velocity range:	
MA Models	0.5 to 16.5 ft/sec (0.15 to 5 m/sec)
ML Models	0.06 to 1.5 ft/sec (0.02 to 0.46 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – MA and ML Series, Adjustable

MA

Return Method and Accumulator Style	
MA	Self-contained spring return, internal accumulator
MAA	Air return, external accumulator
MAS	Spring return, external accumulator
MAN	Self return (clevis), internal accumulator

3325

Model Number		
3325	**4525**	**6450**
3350	**4550**	**64100**
3625	**4575**	**64150**
3650		

[ ]

Mounting Thread	
–	Standard (UNF)
M	Metric

1

Effective Weight	
-1	Light range
-2	Medium range
-3	Heavy range
-4	Heavier range

C

Mounting Options	
	Standard mount
	Flanged stop collar
	Rectangular flange*
	Square flange*
-C	Clevis mount**
-S	Side-foot mount**
-P	Side port
-Z	Within air cylinder

* Welded versions available upon request.
** Not available on ML 3625 and 3650 models.

Ordering information – ML Series, Low Velocity, Adjustable

ML

Return Method and Accumulator Style	
ML	Self-contained spring return, internal accumulator
MLA	Air return, external accumulator
MLS	Spring return, external accumulator
MLN	Self return (clevis), internal accumulator

3325

Model Number		
3325	**4525**	**6425**
3350	**4550**	**6450**
3625		
3650		

[ ]

Mounting Thread	
–	Standard (UNF)
M	Metric

C

Mounting Options	
	Standard mount
	Flanged stop collar
	Rectangular flange*
	Square flange*
-C	Clevis mount**
-S	Side-foot mount**
-P	Side port
-Z	Within air cylinder

* Welded versions available upon request.
** Not available on ML 3625 and 3650 models.

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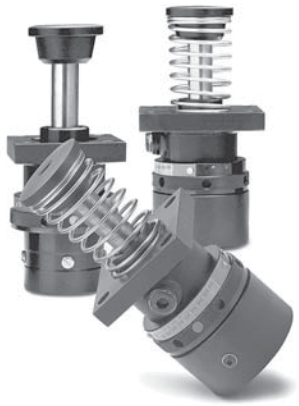
1-1/2" Bore Series
Adjustable

1-1/2" bore series shock absorbers are designed for the toughest environments. These durable adjustable models provide outstanding deceleration over a wide range of effective weight conditions. Large energy capacities stop heavy loads set into motion by high propelling forces, without damage.

Applications include: Automotive manufacturing and production equipment, large robotics, heavy conveyors, foundries and steel industry equipment.



Technical data

Impact velocity range:	0.5 to 15 ft/sec (0.15 to 4.5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – 1-1/2" Bore Series, Adjustable

MC

Return Method and Accumulator Style	
A	Spring return, internal accumulator
AA	Air return, external accumulator
SA	Spring return, external accumulator
NA	Self return (clevis), internal accumulator

1-1/2

Bore Size
1-1/2

6-1/2

Stroke Length
2
3-1/2
5
6-1/2

F

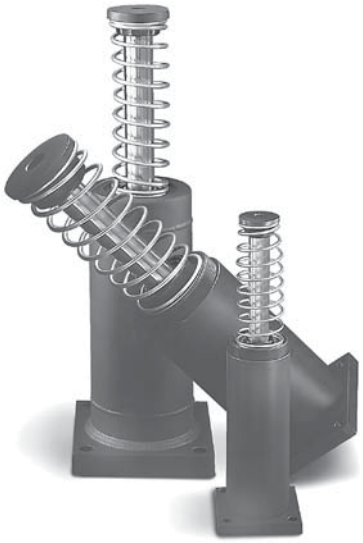
Mounting Style	
-F	Front flange
-R	Rear flange
-RF	Front rectangular flange
-RR	Rear rectangular flange
-S	Side foot mount
-C	Clevis mount

Heavy Industrial Shock Absorbers CA 2 to CA 4
Self-Compensating

CA 2, CA 3 and 4" Bore Series of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.

The new CA 2 offers up to 170% of the energy per cycle capacity of former models. The rugged new **CA 3 offers up to 125% of the energy capacity** of former models. You can select the correct model for your application by utilizing the PARKERSIZE INDUSTRIAL SHOCK ABSORBER SIZING PROGRAM or the capacity charts. Replacing existing shock absorbers with the new CA Series is easy-just provide us the type and adjustment setting of your existing units and we will, do the rest. These dependable units are available self-contained or for use with an external air/oil tank.

Applications include: foundry, steel, marine, lumber and other heavy equipment industries.



Technical data

Impact velocity range:	1 to 16.5 ft/sec (0.30 to 5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – CA 2 & CA 3 Series, Self-compensating

CA | **2** x **8** | **R** – **3**

Return Method and Accumulator Style	
CA	Spring return, internal accumulator
CAA	Air return, external accumulator
CSA	Spring return, external accumulator
CNA	Self return (clevis), internal accumulator

Bore Size
2
3

Stroke Length	
2	8
4	10
5	12
6	

Mounting Style	
-F	Front flange
-R	Rear flange
-RF	Front rectangular flange
-RR	Rear rectangular flange
-S	Side foot mount
-C	Clevis mount

Effective Weight	
-1	Light
-2	Medium light
-3	Medium heavy
-4	Heavy

Ordering information – CA 4 Series, Self-compensating

CA | **4** x **8** | **R** – **5**

Return Method and Accumulator Style	
CA	Spring return, internal accumulator
CAA	Air return, external accumulator
CSA	Spring return, external accumulator
CNA	Self return (clevis), internal accumulator

Bore Size
4

Stroke Length
6
8
16

Mounting Style	
-F	Front flange
-R	Rear flange
-RP	Rear standard
-FP	Front standard
-FRP	Front and rear standard
-S	Side foot mount
-C	Clevis mount

Effective Weight	
-3	Light
-5	Medium
-7	Heavy

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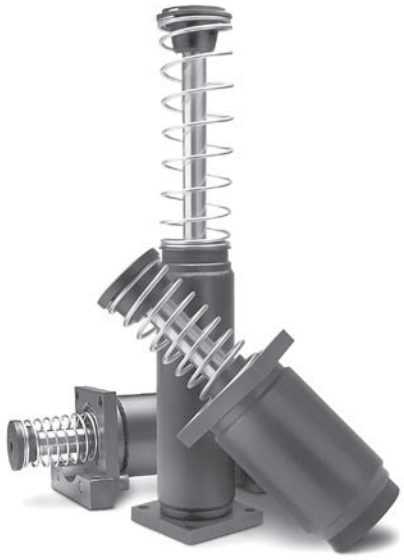
Heavy Industrial Shock Absorbers A 2 and A 3
Adjustable

A2 and A3 Series adjustable shock absorbers are capable of decelerating heavy duty loads. These reliable units replace the former 2" and 3" large bore adjustable shock absorbers.

Energy capacity ratings are 228% of former models. In addition, effective weight ranges have increased dramatically, resulting in the capability of handling a wider range of applications and increases in velocity. The units are easily adjusted by means of a 5/16 inch (8 mm) hex socket adjuster located at the bottom of the outer body. These dependable shock absorbers are maintenance free and are available self-contained or for use with an external air/oil tank.

Features include a considerably reduced outer diameter, internal accumulator and threaded mounting brackets, easily adaptable to the front or rear of the outer body.

Applications include: foundry, steel, marine, lumber, and other heavy equipment industries.



Technical data

Impact velocity range:	0.33 to 16.5 ft/sec (0.1 to 5 m/sec)
Operating temperature:	10° to 150°F (-12° to 66°C)

Ordering information – A 2 & A3 Series, Adjustable

A **2** x **8** – **R**

Return Method and Accumulator Style	
A	Spring return, internal accumulator
AA	Air return, external accumulator
SA	Spring return, external accumulator
NA	Self return (clevis), internal accumulator

Bore Size
2
3

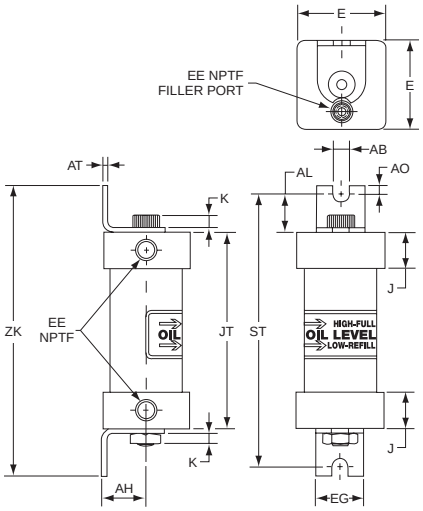
Stroke Length
2
4
5
6

Mounting Style	
-F	Front flange
-R	Rear flange
-RF	Front rectangular flange
-RR	Rear rectangular flange
-S	Side foot mount
-C	Clevis mount

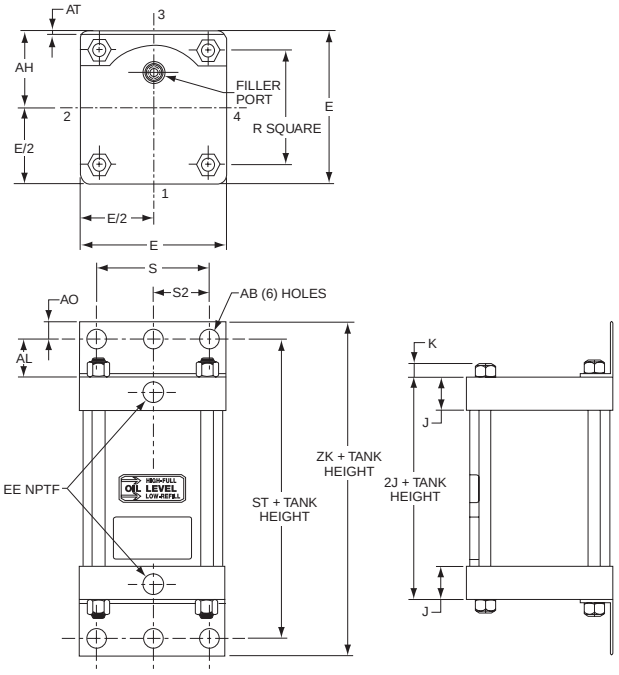
Note: A no button option is available on the 3" Bore only as a special.

Air-Oil tanks

1-1/4" Bore



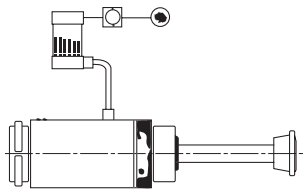
3-1/4" to 8" Bores



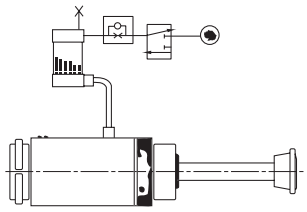
Dimensions Inches

Bore size	E	J	K	R	S	AB	AH	AL	AO	AT	EE	ST	ZK	EG	JT
1-1/4	1-27/32	3/4	1/4	–	–	11/32	29/32	25.32	3/16	31/32	1/8	5-5/8	6	1	4-1/16
3-1/4	3-3/4	1-3/16	3/16	2.76	2-3/4	9/16	1-15/16	1-1/4	1/2	1/8	1/2	5	6	–	–
6	6-1/2	1.41	7/16	4.88	5-1/4	13/16	3-1/4	1-3/8	5/8	3/16	3/4	5-3/4	7	–	–
8	8-1/2	1.44	9/16	6.44	7-1/8	13/16	4-1/4	1-13/16	11/16	1/4	3/4	6-5/8	8	–	–

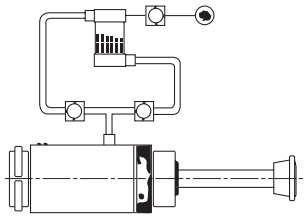
Mounting and circuits



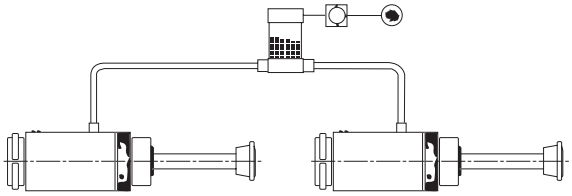
1. The piston rod is immediately returned to its extended position after completing the stroke.



2. The piston rod remains it its retracted position until it is signaled to return. Special bleed-down type check valve is required for this circuit.



3. A recirculating cooling circuit allows warm oil to return to the tank while cool oil refills the shock absorber. A recirculating cooling circuit substantially increases the shock absorber's hourly energy capacity.



4. When connecting more than one shock absorber to an Air-Oil Tank, use caution in selecting the proper reservoir capacity. For two shock absorbers, the next largest Air-Oil Tank Size is usually adequate.

Capacity (maximum)

Model	Oil temp (°F)	Max. pressure (PSIG)	Capacity (cubic inches)	Recommended shock absorber size
1.25CB3TKU x 2.00	200	100	2.4	MC 3325 MC 3350
3.25CB3TKU x 5.00	200	100	41.4	MC 4525 MC 64150
6.00CB3TKU x 9.00	200	100	254.5	1-1/2 x 5 - 3 x 12
8.00CB3TKU x 15.00	200	100	754	4 x 6 - 4 x 16
8.00 CB3TKUS x 15.00	200	100	754	4 x 6 - 4 x 16

S = 1 1/2 NPTF ports in cap face

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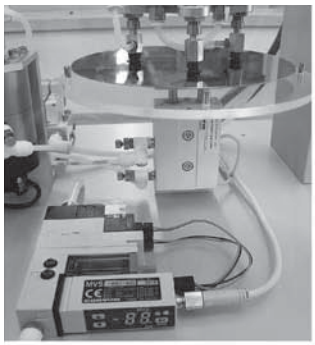
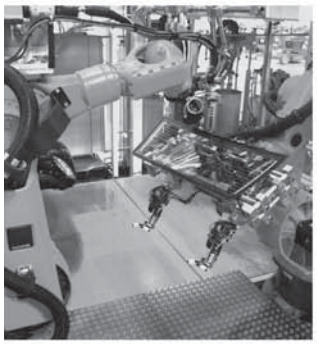
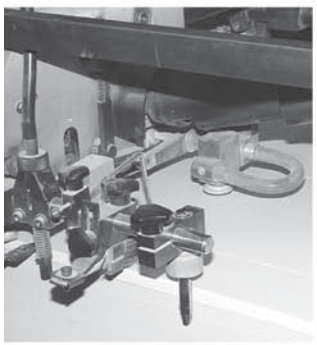
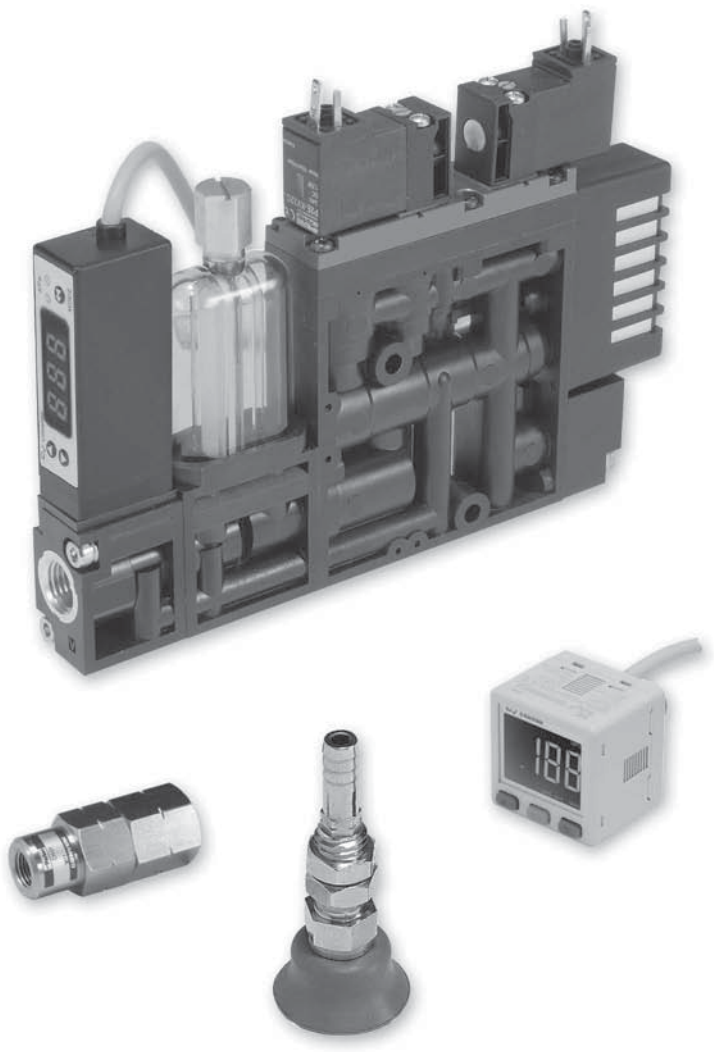








Vacuum Products

Click here to view bookmarks.

Vacuum Cups

PBG Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

PCG Multiple Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

PFG Flat Cups

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response.
- Cup Sizes: 1.5mm to 200mm

C4

PJG Short Bellows Cups

- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

PUGB Flat Swivel Cups

- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

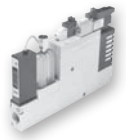
P5V-CFS Flat Cups

- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and looses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

Vacuum Generators

CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

CHF Inline Generators

- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

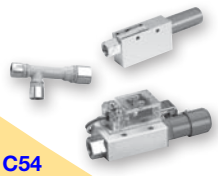
C56

CVCEK Integrated Generators

- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

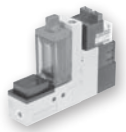
MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechical switch for part present confirmation

C54

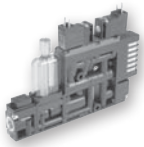
MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

MC72 Integrated Generators



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve,vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

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Vacuum Generator Accessories

CH01 One Way Check Valve

- Poppet design
- Low leakage
- Low cracking pressure

C74

Convum Vacuum Silencers

- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

C77

FSV Metered Flow Sensing Valve

- Pick and place rendomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

C73

MPS-23 Integrated Generator Sensors

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C69

MVS-201 Integrated Generator Sensors

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C71

VF & VL Vacuum Filters

- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

C75

VFP Vacuum Filters

- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

C76

Pressure Sensors

Cables

- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

C85

MPS-33 Pressure Sensors

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C78

MPS-34 Pressure Sensors

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

C80

SCPSD Pressure Sensors

- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation.

C83

SCP01 Pressure Sensor

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

C82

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Exceptional for any smooth flat or surface that will benefit from stability and fast response of the cup design.
This is a multi-versatile and multi-industry cup. Typical applications could be chip mounting, electrical components, semiconductor chips, glass, injection mold, sheet metal, press transfer, fixtures, woodworking.

Features

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Universal flat design for most smooth surface applications
- Stable vertical / horizontal lift
- Strong low profile design for fast response needed for short cycles
- 5mm to 200mm diameters
- Bottom cleats on 60 to 200mm diameters

Styles

- PFTM series male thread connector
- PFTF series female thread connector
- PFTK series barbed bulkhead
- PFYK series 90° barbed adapter
- PFTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	**NBR**	**NBRE**	**SI**	**SIE**	**U**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

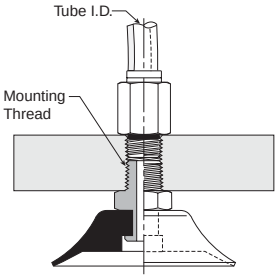
Application guide

Flat - Smooth surface

Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Metal sheet handling	Corrugated sheet handling	High lifting force **Ø 120/200 only**	Vertical lift

PFTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
Fitting material: aluminum.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	**PFTM-5A-NBR-M5**	**PFG-5A-NBR**	**PFTM-5A-SI-M5**	**PFG-5A-SI**	**FTM-5A-M5H**
5	1/8 BSPP	**PFTM-5A-NBR-G1**	**PFG-5A-NBR**	**PFTM-5A-SI-G1**	**PFG-5A-SI**	**FTM-5A-G1**
6	M5	**PFTM-6A-NBR-M5**	**PFG-6A-NBR**	**PFTM-6A-SI-M5**	**PFG-6A-SI**	**FTM-5A-M5H**
6	1/8 BSPP	**PFTM-6A-NBR-G1**	**PFG-6A-NBR**	**PFTM-6A-SI-G1**	**PFG-6A-SI**	**FTM-5A-G1**
8	M5	**PFTM-8A-NBR-M5**	**PFG-8A-NBR**	**PFTM-8A-SI-M5**	**PFG-8A-SI**	**FTM-5A-M5H**
8	1/8 BSPP	**PFTM-8A-NBR-G1**	**PFG-8A-NBR**	**PFTM-8A-SI-G1**	**PFG-8A-SI**	**FTM-5A-G1**
10	M5	**PFTM-10A-NBR-M5**	**PFG-10A-NBR**	**PFTM-10A-SI-M5**	**PFG-10A-SI**	**FTM-5A-M5H**
10	1/8 BSPP	**PFTM-10A-NBR-G1**	**PFG-10A-NBR**	**PFTM-10A-SI-G1**	**PFG-10A-SI**	**FTM-5A-G1**
15	M5	**PFTM-15A-NBR-M5**	**PFG-15A-NBR**	**PFTM-15A-SI-M5**	**PFG-15A-SI**	**FTM-5A-M5H**
15	1/8 BSPP	**PFTM-15A-NBR-G1**	**PFG-15A-NBR**	**PFTM-15A-SI-G1**	**PFG-15A-SI**	**FTM-5A-G1**
20	1/8 BSPP	**PFTM-20B-NBR-G1**	**PFG-20B-NBR**	**PFTM-20B-SI-G1**	**PFG-20B-SI**	**FTM-20B-G1H**
20	1/4 BSPP	**PFTM-20B-NBR-G2**	**PFG-20B-NBR**	**PFTM-20B-SI-G2**	**PFG-20B-SI**	**FTM-20B-G2**
20	M10	**PFTM-20B-NBR-M10**	**PFG-20B-NBR**	**PFTM-20B-SI-M10**	**PFG-20B-SI**	**FTM-20B-M10**
20	1/8 NPT	**PFTM-20B-NBR-N1**	**PFG-20B-NBR**	**PFTM-20B-SI-N1**	**PFG-20B-SI**	**FTM-20B-N1**
30	1/8 BSPP	**PFTM-30-NBR-G1**	**PFG-30-NBR**	**PFTM-30-SI-G1**	**PFG-30-SI**	**FTM-20B-G1H**
30	1/4 BSPP	**PFTM-30-NBR-G2**	**PFG-30-NBR**	**PFTM-30-SI-G2**	**PFG-30-SI**	**FTM-20B-G2**
30	M10	**PFTM-30-NBR-M10**	**PFG-30-NBR**	**PFTM-30-SI-M10**	**PFG-30-SI**	**FTM-20B-M10**
30	1/8 NPT	**PFTM-30-NBR-N1**	**PFG-30-NBR**	**PFTM-30-SI-N1**	**PFG-30-SI**	**FTM-20B-N1**
40	1/8 BSPP	**PFTM-40-NBR-G1**	**PFG-40-NBR**	**PFTM-40-SI-G1**	**PFG-40-SI**	**FTM-20B-G1H**
40	1/4 BSPP	**PFTM-40-NBR-G2**	**PFG-40-NBR**	**PFTM-40-SI-G2**	**PFG-40-SI**	**FTM-20B-G2**
40	M10	**PFTM-40-NBR-M10**	**PFG-40-NBR**	**PFTM-40-SI-M10**	**PFG-40-SI**	**FTM-20B-M10**
40	1/8 NPT	**PFTM-40-NBR-N1**	**PFG-40-NBR**	**PFTM-40-SI-N1**	**PFG-40-SI**	**FTM-20B-N1**
50	1/8 BSPP	**PFTM-50-NBR-G1**	**PFG-50-NBR**	**PFTM-50-SI-G1**	**PFG-50-SI**	**FTM-50-G1H**
50	1/4 BSPP	**PFTM-50-NBR-G2**	**PFG-50-NBR**	**PFTM-50-SI-G2**	**PFG-50-SI**	**FTM-50-G2**
50	1/8 NPT	**PFTM-50-NBR-N1**	**PFG-50-NBR**	**PFTM-50-SI-N1**	**PFG-50-SI**	**FTM-50-N1**
60	1/4 BSPP	**PFTM-60-NBR-G2**	**PFG-60-NBR**	**PFTM-60-SI-G2**	**PFG-60-SI**	**FTM-60-G2**
60	M10	**PFTM-60-NBR-M10**	**PFG-60-NBR**	**PFTM-60-SI-M10**	**PFG-60-SI**	**FTM-60-M10**
60	1/4 NPT	**PFTM-60-NBR-N2**	**PFG-60-NBR**	**PFTM-60-SI-N2**	**PFG-60-SI**	**FTM-60-N2**
80	1/4 BSPP	**PFTM-80-NBR-G2**	**PFG-80-NBR**	**PFTM-80-SI-G2**	**PFG-80-SI**	**FTM-60-G2**
80	M10	**PFTM-80-NBR-M10**	**PFG-80-NBR**	**PFTM-80-SI-M10**	**PFG-80-SI**	**FTM-60-M10**
80	1/4 NPT	**PFTM-80-NBR-N2**	**PFG-80-NBR**	**PFTM-80-SI-N2**	**PFG-80-SI**	**FTM-60-N2**
95	1/4 BSPP	**PFTM-95-NBR-G2**	**PFG-95-NBR**	**PFTM-95-SI-G2**	**PFG-95-SI**	**FTM-60-G2**
95	M10	**PFTM-95-NBR-M10**	**PFG-95-NBR**	**PFTM-95-SI-M10**	**PFG-95-SI**	**FTM-60-M10**
95	1/4 NPT	**PFTM-95-NBR-N2**	**PFG-95-NBR**	**PFTM-95-SI-N2**	**PFG-95-SI**	**FTM-60-N2**

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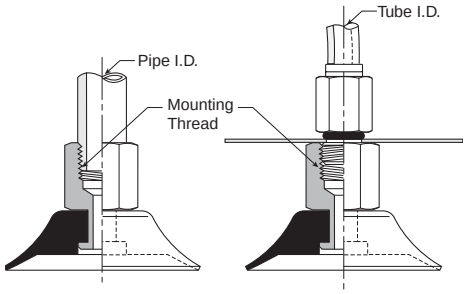
PFTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads. Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	**PFTF-5A-NBR-M5**	**PFG-5A-NBR**	**PFTF-5A-SI-M5**	**PFG-5A-SI**	**FTF-5A-M5**
5	1/8 BSPP	**PFTF-5A-NBR-G1**	**PFG-5A-NBR**	**PFTF-5A-SI-G1**	**PFG-5A-SI**	**FTF-5A-G1**
6	M5	**PFTF-6A-NBR-M5**	**PFG-6A-NBR**	**PFTF-6A-SI-M5**	**PFG-6A-SI**	**FTF-5A-M5**
6	1/8 BSPP	**PFTF-6A-NBR-G1**	**PFG-6A-NBR**	**PFTF-6A-SI-G1**	**PFG-6A-SI**	**FTF-5A-G1**
8	M5	**PFTF-8A-NBR-M5**	**PFG-8A-NBR**	**PFTF-8A-SI-M5**	**PFG-8A-SI**	**FTF-5A-M5**
8	1/8 BSPP	**PFTF-8A-NBR-G1**	**PFG-8A-NBR**	**PFTF-8A-SI-G1**	**PFG-8A-SI**	**FTF-5A-G1**
10	1/8 BSPP	**PFTF-10A-NBR-G1**	**PFG-10A-NBR**	**PFTF-10A-SI-G1**	**PFG-10A-SI**	**FTF-5A-G1**
10	M5	**PFTF-10A-NBR-M5**	**PFG-10A-NBR**	**PFTF-10A-SI-M5**	**PFG-10A-SI**	**FTF-5A-M5**
15	1/8 BSPP	**PFTF-15A-NBR-G1**	**PFG-15A-NBR**	**PFTF-15A-SI-G1**	**PFG-15A-SI**	**FTF-5A-G1**
15	M5	**PFTF-15A-NBR-M5**	**PFG-15A-NBR**	**PFTF-15A-SI-M5**	**PFG-15A-SI**	**FTF-5A-M5**
20	1/8 BSPP	**PFTF-20B-NBR-G1**	**PFG-20B-NBR**	**PFTF-20B-SI-G1**	**PFG-20B-SI**	**FTF-20B-G1**
30	1/8 BSPP	**PFTF-30-NBR-G1**	**PFG-30-NBR**	**PFTF-30-SI-G1**	**PFG-30-SI**	**FTF-20B-G1**
30	1/4 BSPP	**PFTF-30-NBR-G2**	**PFG-30-NBR**	**PFTF-30-SI-G2**	**PFG-30-SI**	**FTF-20B-G2**
40	1/8 BSPP	**PFTF-40-NBR-G1**	**PFG-40-NBR**	**PFTF-40-SI-G1**	**PFG-40-SI**	**FTF-20B-G1**
40	1/4 BSPP	**PFTF-40-NBR-G2**	**PFG-40-NBR**	**PFTF-40-SI-G2**	**PFG-40-SI**	**FTF-20B-G2**
50	1/8 BSPP	**PFTF-50-NBR-G1**	**PFG-50-NBR**	**PFTF-50-SI-G1**	**PFG-50-SI**	**FTF-50-G1**
50	1/4 BSPP	**PFTF-50-NBR-G2**	**PFG-50-NBR**	**PFTF-50-SI-G2**	**PFG-50-SI**	**FTF-50-G2**
60	1/4 BSPP	**PFTF-60-NBR-G2**	**PFG-60-NBR**	**PFTF-60-SI-G2**	**PFG-60-SI**	**FTF-60-G2**
60	1/4 NPT	**PFTF-60-NBR-N2**	**PFG-60-NBR**	**PFTF-60-SI-N2**	**PFG-60-SI**	**FTF-60-N2**
80	1/4 BSPP	**PFTF-80-NBR-G2**	**PFG-80-NBR**	**PFTF-80-SI-G2**	**PFG-80-SI**	**FTF-60-G2**
80	1/4 NPT	**PFTF-80-NBR-N2**	**PFG-80-NBR**	**PFTF-80-SI-N2**	**PFG-80-SI**	**FTF-60-N2**
95	1/4 NPT	**PFTF-95-NBR-N2**	**PFG-95-NBR**	**PFTF-95-SI-N2**	**PFG-95-SI**	**FTF-60-N2**
95	1/4 BSPP	**PFTF-95-NBR-G2**	**PFG-95-NBR**	**PFTF-95-SI-G2**	**PFG-95-SI**	**FTF-60-G2**
120	1/2 BSPP	**PFTF-120-NBR-G4**	**PFG-120-NBR**	**PFTF-120-SI-G4**	**PFG-120-SI**	**FTF-120-G4**
120	1/2 NPT	**PFTF-120-NBR-N4**	**PFG-120-NBR**	**PFTF-120-SI-N4**	**PFG-120-SI**	**FTF-120-N4**
150	1/2 NPT	**PFTF-150-NBR-G4**	**PFG-150-NBR**	**PFTF-150-SI-G4**	**PFG-150-SI**	**FTF-120-G4**
150	1/2 NPT	**PFTF-150-NBR-N4**	**PFG-150-NBR**	**PFTF-150-SI-N4**	**PFG-150-SI**	**FTF-120-N4**
200	1/2 BSPP	**PFTF-200-NBR-G4**	**PFG-200-NBR**	**PFTF-200-SI-G4**	**PFG-200-SI**	**FTF-120-G4**
200	1/2 NPT	**PFTF-200-NBR-N4**	**PFG-200-NBR**	**PFTF-200-SI-N4**	**PFG-200-SI**	**FTF-120-N4**

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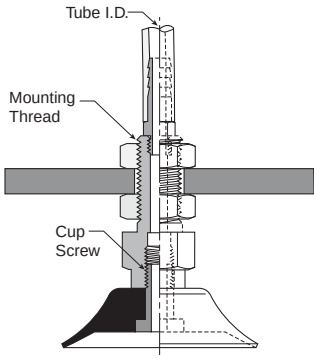
PFTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	**PFTK-5A-NBR**	**PFG-5A-NBR**	**PFTK-5A-SI**	**PFG-5A-SI**	**FTK-5A**
6	Barb	**PFTK-6A-NBR**	**PFG-6A-NBR**	**PFTK-6A-SI**	**PFG-6A-SI**	**FTK-5A**
8	Barb	**PFTK-8A-NBR**	**PFG-8A-NBR**	**PFTK-8A-SI**	**PFG-8A-SI**	**FTK-5A**
10	Barb	**PFTK-10A-NBR**	**PFG-10A-NBR**	**PFTK-10A-SI**	**PFG-10A-SI**	**FTK-5A**
15	Barb	**PFTK-15-NBR**	**PFG-15-NBR**	**PFTK-15-SI**	**PFG-15-SI**	**FTK-15**
20	Barb	**PFTK-20-NBR**	**PFG-20-NBR**	**PFTK-20-SI**	**PFG-20-SI**	**FTK-20**
30	Barb	**PFTK-30-NBR**	**PFG-30-NBR**	**PFTK-30-SI**	**PFG-30-SI**	**FTK-25**
40	Barb	**PFTK-40-NBR**	**PFG-40-NBR**	**PFTK-40-SI**	**PFG-40-SI**	**FTK-25**
50	Barb	**PFTK-50-NBR**	**PFG-50-NBR**	**PFTK-50-SI**	**PFG-50-SI**	**FTK-50**
60	1/8 BSPP	**PFTK-60-NBR-G1**	**PFG-60-NBR**	**PFTK-60-SI-G1**	**PFG-60-SI**	**FTK-60-G1**
60	1/8 NPT	**PFTK-60-NBR-N1**	**PFG-60-NBR**	**PFTK-60-SI-N1**	**PFG-60-SI**	**FTK-60-N1**
80	1/8 BSPP	**PFTK-80-NBR-G1**	**PFG-80-NBR**	**PFTK-80-SI-G1**	**PFG-80-SI**	**FTK-60-G1**
80	1/8 NPT	**PFTK-80-NBR-N1**	**PFG-80-NBR**	**PFTK-80-SI-N1**	**PFG-80-SI**	**FTK-60-N1**
95	1/8 BSPP	**PFTK-95-NBR-G1**	**PFG-95-NBR**	**PFTK-95-SI-G1**	**PFG-95-SI**	**FTK-60-G1**
95	1/8 NPT	**PFTK-95-NBR-N1**	**PFG-95-NBR**	**PFTK-95-SI-N1**	**PFG-95-SI**	**FTK-60-N1**

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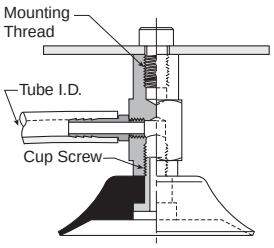
PFYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt thru a plate or "L" bracket to allow the tube connection from the side port. Fitting material: plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	**PFYK-5A-NBR**	**PFG-5A-NBR**	**PFYK-5A-SI**	**PFG-5A-SI**	**FYK-5A**
6	Barb	**PFYK-6A-NBR**	**PFG-6A-NBR**	**PFYK-6A-SI**	**PFG-6A-SI**	**FYK-5A**
8	Barb	**PFYK-8A-NBR**	**PFG-8A-NBR**	**PFYK-8A-SI-M5**	**PFG-8A-SI**	**FYK-5A**
10	Barb	**PFYK-10A-NBR**	**PFG-10A-NBR**	**PFYK-10A-SI**	**PFG-10A-SI**	**FYK-5A**
15	Barb	**PFYK-15-NBR**	**PFG-15-NBR**	**PFYK-15-SI**	**PFG-15-SI**	**FYK-15**
20	Barb	**PFYK-20-NBR**	**PFG-20-NBR**	**PFYK-20-SI**	**PFG-20-SI**	**FYK-20**
30	Barb	**PFYK-30-NBR**	**PFG-30-NBR**	**PFYK-30-SI**	**PFG-30-SI**	**FYK-25**
40	Barb	**PFYK-40-NBR**	**PFG-40-NBR**	**PFYK-40-SI**	**PFG-40-SI**	**FYK-25**
50	Barb	**PFYK-50-NBR**	**PFG-50-NBR**	**PFYK-50-SI**	**PFG-50-SI**	**FYK-50**
60	1/8 BSPP	**PFYK-60-NBR-G1**	**PFG-60-NBR**	**PFYK-60-SI-G1**	**PFG-60-SI**	**FYK-60-G1**
60	1/8 NPT	**PFYK-60-NBR-N1**	**PFG-60-NBR**	**PFYK-60-SI-N1**	**PFG-60-SI**	**FYK-60-N1**
80	1/8 BSPP	**PFYK-80-NBR-G1**	**PFG-80-NBR**	**PFYK-80-SI-G1**	**PFG-80-SI**	**FYK-60-G1**
80	1/8 NPT	**PFYK-80-NBR-N1**	**PFG-80-NBR**	**PFYK-80-SI-N1**	**PFG-80-SI**	**FYK-60-N1**
95	1/8 BSPP	**PFYK-95-NBR-G1**	**PFG-95-NBR**	**PFYK-95-SI-G1**	**PFG-95-SI**	**FYK-60-G1**
95	1/8 NPT	**PFYK-95-NBR-N1**	**PFG-95-NBR**	**PFYK-95-SI-N1**	**PFG-95-SI**	**FYK-60-N1**
120	1/8 BSPP	**PFYK-120-NBR-G1**	**PFG-120-NBR**	**PFYK-120-SI-G1**	**PFG-120-SI**	**FYK-120-G1**
120	1/8 NPT	**PFYK-120-NBR-N1**	**PFG-120-NBR**	**PFYK-120-SI-N1**	**PFG-120-SI**	**FYK-120-N1**
150	1/8 BSPP	**PFYK-150-NBR-G1**	**PFG-150-NBR**	**PFYK-150-SI-G1**	**PFG-150-SI**	**FYK-120-G1**
150	1/8 NPT	**PFYK-150-NBR-N1**	**PFG-150-NBR**	**PFYK-150-SI-N1**	**PFG-150-SI**	**FYK-120-N1**
200	1/8 BSPP	**PFYK-200-NBR-G1**	**PFG-200-NBR**	**PFYK-200-SI-G1**	**PFG-200-SI**	**FYK-120-G1**
200	1/8 NPT	**PFYK-200-NBR-N1**	**PFG-200-NBR**	**PFYK-200-SI-N1**	**PFG-200-SI**	**FYK-120-N1**

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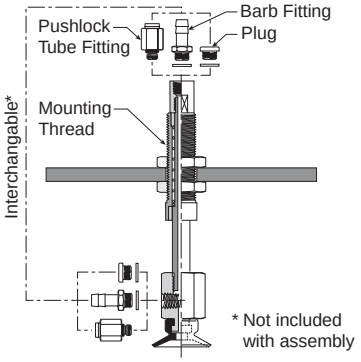
PFTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.

Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assemlby (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
5	M5	10	.14 (.61)	.26 (1.17)	**PFTYS5A10NBRM5**	**PFG-5A-NBR**	**PFTYS5A10SIM5**	**PFG-5A-SI**	**TYS-5A-10**
5	M5	15	.15 (.64)	.26 (1.17)	**PFTYS5A15NBRM5**	**PFG-5A-NBR**	**PFTYS5A15SIM5**	**PFG-5A-SI**	**TYS-5A-15**
6	M5	10	.14 (.61)	.26 (1.17)	**PFTYS6A10NBRM5**	**PFG-6A-NBR**	**PFTYS6A10SIM5**	**PFG-6A-SI**	**TYS-5A-10**
6	M5	15	.15 (.64)	.26 (1.17)	**PFTYS6A15NBRM5**	**PFG-6A-NBR**	**PFTYS6A15SIM5**	**PFG-6A-SI**	**TYS-5A-15**
8	M5	10	.14 (.61)	.26 (1.17)	**PFTYS8A10NBRM5**	**PFG-8A-NBR**	**PFTYS8A10SIM5**	**PFG-8A-SI**	**TYS-5A-10**
8	M5	15	.15 (.64)	.26 (1.17)	**PFTYS8A15NBRM5**	**PFG-8A-NBR**	**PFTYS8A15SIM5**	**PFG-8A-SI**	**TYS-5A-15**
10	M5	10	.11 (.49)	.13 (.59)	**PFTYS10A10NBRM5**	**PFG-10A-NBR**	**PFTYS10A10SIM5**	**PFG-10A-SI**	**TYS-5A-10**
10	M5	15	.11 (.49)	.13 (.59)	**PFTYS10A15NBRM5**	**PFG-10A-NBR**	**PFTYS10A15SIM5**	**PFG-10A-SI**	**TYS-5A-15**
15	M5	10	.11 (.49)	.13 (.59)	**PFTYS15A10NBRM5**	**PFG-15A-NBR**	**PFTYS15A10SIM5**	**PFG-15A-SI**	**TYS-5A-10**
15	M5	15	.11 (.49)	.13 (.59)	**PFTYS15A15NBRM5**	**PFG-15A-NBR**	**PFTYS15A15SIM5**	**PFG-15A-SI**	**TYS-5A-15**
20	M5	15	.56 (2.5)	.79 (3.4)	**PFTYS20B15NBRM5**	**PFG-20B-NBR**	**PFTYS20B15SIM5**	**PFG-20B-SI**	**TYS-20B-15**
20	M5	30	.56 (2.5)	1.2 (4.9)	**PFTYS20B30NBRM5**	**PFG-20B-NBR**	**PFTYS20B30SIM5**	**PFG-20B-SI**	**TYS-20B-30**
30	M5	15	.56 (2.5)	.79 (3.4)	**PFTYS3015NBRM5**	**PFG-30-NBR**	**PFTYS3015SIM5**	**PFG-30-SI**	**TYS-20B-15**
30	M5	30	.56 (2.5)	1.2 (4.9)	**PFTYS3030NBRM5**	**PFG-30-NBR**	**PFTYS3030SIM5**	**PFG-30-SI**	**TYS-20B-30**
40	M5	15	.56 (2.5)	.79 (3.4)	**PFTYS4015NBRM5**	**PFG-40-NBR**	**PFTYS4015SIM5**	**PFG-40-SI**	**TYS-20B-15**
40	M5	30	.56 (2.5)	1.2 (4.9)	**PFTYS4030NBRM5**	**PFG-40-NBR**	**PFTYS4030SIM5**	**PFG-40-SI**	**TYS-20B-30**
50	M5	15	.56 (2.5)	1.2 (4.9)	**PFTYS5015NBRM5**	**PFG-50-NBR**	**PFTYS5015SIM5**	**PFG-50-SI**	**TYS-50-15**
50	M5	30	.67 (2.9)	1.4 (5.9)	**PFTYS5030NBRM5**	**PFG-50-NBR**	**PFTYS5030SIM5**	**PFG-50-SI**	**TYS-50-30**
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PFTYS6030NBRN1**	**PFG-60-NBR**	**PFTYS6030SIN1**	**PFG-60-SI**	**TYS-60-30**
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PFTYS6050NBRN1**	**PFG-60-NBR**	**PFTYS6050SIN1**	**PFG-60-SI**	**TYS-60-50**
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PFTYS8030NBRN1**	**PFG-80-NBR**	**PFTYS8030SIN1**	**PFG-80-SI**	**TYS-60-30**
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PFTYS8050NBRN1**	**PFG-80-NBR**	**PFTYS8050SIN1**	**PFG-80-SI**	**TYS-60-50**
95	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PFTYS9530NBRN1**	**PFG-95-NBR**	**PFTYS9530SIN1**	**PFG-95-SI**	**TYS-60-30**
95	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PFTYS9550NBRN1**	**PFG-95-NBR**	**PFTYS9550SIN1**	**PFG-95-SI**	**TYS-60-50**
120	1/4 NPT	20	3.6 (15.6)	6.8 (29)	**PFTYS12020NBRN2**	**PFG-120-NBR**	**PFTYS12020SIN2**	**PFG-120-SI**	**TYS-120-20**
120	1/4 NPT	70	3.4 (14.7)	6.8 (29)	**PFTYS12070NBRN2**	**PFG-120-NBR**	**PFTYS12070SIN2**	**PFG-120-SI**	**TYS-120-70**
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	**PFTYS15020NBRN2**	**PFG-150-NBR**	**PFTYS15020SIN2**	**PFG-150-SI**	**TYS-120-20**
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	**PFTYS15070NBRN2**	**PFG-150-NBR**	**PFTYS15070SIN2**	**PFG-150-SI**	**TYS-120-70**
200	1/4 NPT	20	3.6 (15.6)	6.8 (29)	**PFTYS20020NBRN2**	**PFG-200-NBR**	**PFTYS20020SIN2**	**PFG-200-SI**	**TYS-120-20**
200	1/4 NPT	70	3.4 (14.7)	6.8 (29)	**PFTYS20070NBRN2**	**PFG-200-NBR**	**PFTYS20070SIN2**	**PFG-200-SI**	**TYS-120-70**

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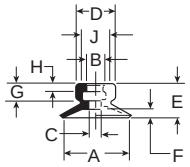
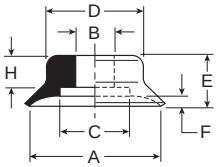
PFG Series Replacement Cup Dimensions

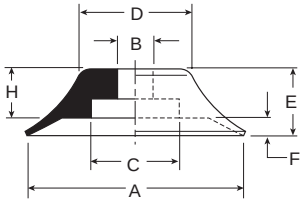
PFG-5A
PFG-15A



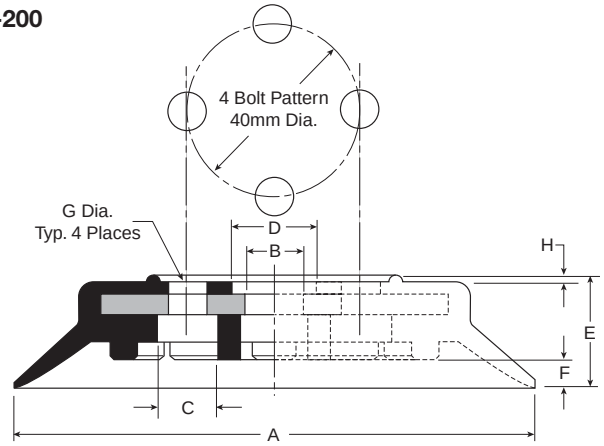
PFG-15 thru
PFG-40



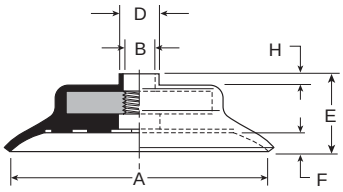
PFG-50



PFG-120 thru
PFG-200



PFG-60 thru
PFG-95



Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PFG-5A-*	.20 (5)	.16 (4)	.06 (1.4)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-6A-*	.24 (6)	.16 (4)	.08 (2)	.30 (7.5)	.26 (6.5)	.03 (.8)	.16 (4)	.08 (2)	.24 (6)
PFG-8A-*	.31 (8)	.16 (4)	.08 (2)	.31 (8)	.28 (7)	.05 (1.2)	.16 (4)	.08 (2)	.24 (6)
PFG-10A-*	.39 (10)	.16 (4)	.08 (2)	.33 (8.5)	.30 (7.5)	.06 (1.5)	.16 (4)	.08 (2)	.24 (6)
PFG-15-*	.59 (15)	—	.31 (7.8)	.47 (12)	.31 (8)	.07 (1.9)	—	—	—
PFG-15A-*	.59 (15)	.16 (4)	.08 (2)	.35 (9)	.31 (8)	.08 (2)	.16 (4)	.08 (2)	.24 (6)
PFG-20-*	.79 (20)	.18 (4.6)	.43 (11)	.59 (15)	.39 (10)	.09 (2.3)	—	.18 (4.5)	—
PFG-20B-*	.79 (20)	.24 (6)	.43 (11)	.59 (15)	.49 (12.5)	.09 (2.3)	—	.28 (7)	—
PFG-30-*	1.18 (30)	.24 (6)	.43 (11)	.55 (14)	.47 (12)	.08 (2)	—	.28 (7)	—
PFG-40-*	1.57 (40)	.24 (6)	.43 (11)	.94 (24)	.55 (14)	.16 (4)	—	.28 (7)	—
PFG-50-*	1.97(50)	.31 (8)	.79 (20)	1.06 (27)	.59 (15)	.14 (3.5)	—	.28 (7)	—
PFG-60-*	2.36 (60)	M10x1.25	—	.79 (12.5)	.73 (18.5)	.20 (5)	—	.10 (2.5)	—
PFG-80-*	3.15 (80)	M10x1.25	—	.79 (12.5)	.81 (20.5)	.24 (6)	—	.10 (2.5)	—
PFG-95-*	3.74 (95)	M10x1.25	—	.79 (12.5)	.83 (21)	.24 (6)	—	.10 (2.5)	—
PFG-120-*	4.72 (120)	.55 (14)	.55 (14)	.79 (20)	1.00 (25.5)	.24 (6)	4xØ8.7xØ40	.059 (1.5)	—
PFG-150-*	5.91 (150)	.51(13)	.55 (14)	.79 (20)	1.28 (32.5)	.35 (9)	4xØ8.7xØ40	.059 (1.5)	—
PFG-200-*	7.87 (200)	.51 (13)	.47 (12)	.79 (20)	1.48 (37.5)	.51 (13)	4xØ8.7xØ40	.059 (1.5)	—

Inches (mm)
* Cup material

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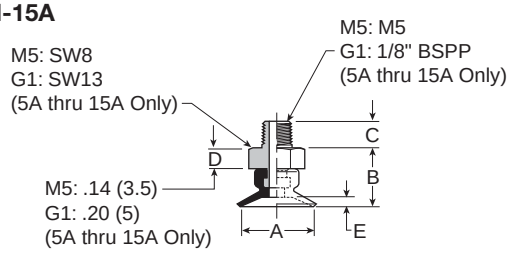
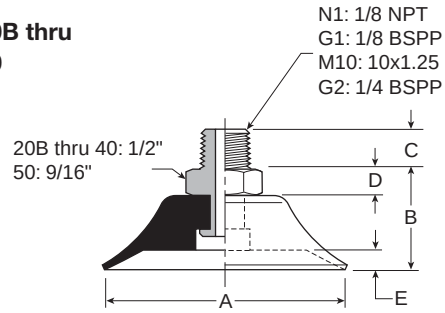
Dimensions

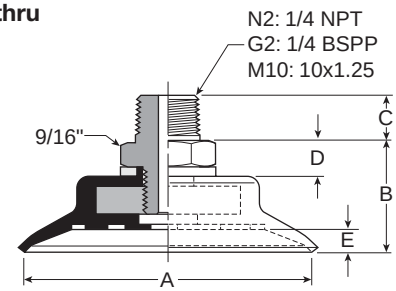
PFTM-5A thru PFTM-15A



PFTM-20B thru PFTM-50



PFTM-60 thru PFTM-95

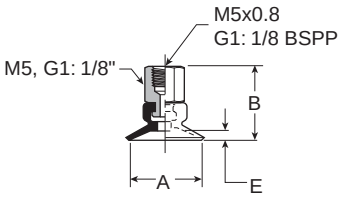


Model number	ØA	B	C (M3)	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PFTM-5A-*-†	.20 (5)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-6A-*-†	.24 (6)	.39 (10)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.31 (8)
PFTM-8A-*-†	.31 (8)	.41 (10.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.05 (1.2)
PFTM-10A-*-†	.39 (10)	.43 (11)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.06 (1.5)
PFTM-15A-*-†	.59 (15)	.45 (11.5)	—	.18 (4.5)	.31 (8)	—	—	See Dwg.	.08 (2)
PFTM-20B-*-†	.79 (20)	.69 (17.5)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.10 (2.5)
PFTM-30-*-†	1.18 (30)	.67 (17)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.08 (2)
PFTM-40-*-†	1.57 (40)	.75 (19)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.14 (3.5)
PFTM-50-*-†	1.97 (50)	.79 (20)	—	—	.31 (8)	.39 (10)	—	.20 (5)	.16 (4)
PFTM-60-*-†	2.36 (60)	.90 (23)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.20 (5)
PFTM-80-*-†	3.15 (80)	.98 (25)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)
PFTM-95-*-†	3.74 (95)	1.00 (25.5)	—	—	—	.39 (10)	.59 (15)	.28 (7)	.24 (6)

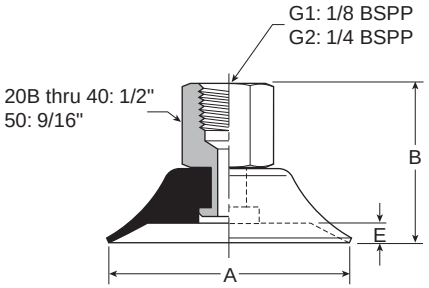
Inches (mm)
* Cup material
† Thread size

Dimensions

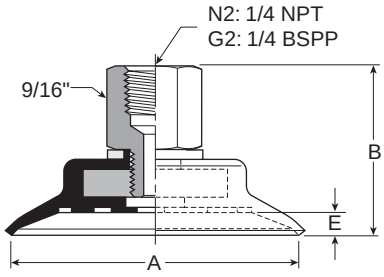
PFTF-5A thru PFTF-15A



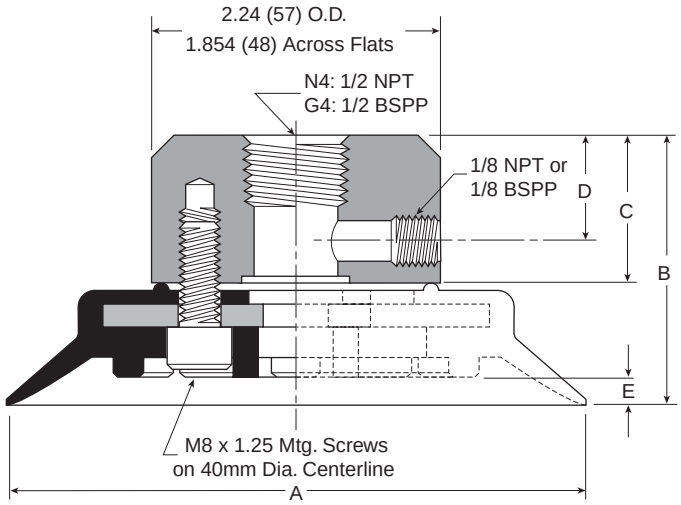
PFTF-20B thru PFTF-50



PFTF-60 thru PFTF-95



PFTF-120 thru PFTF-200

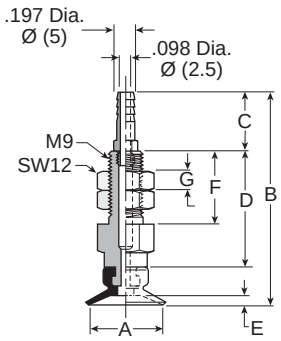


Model number	ØA	B	B (M5)	C	D	E
PFTF-5A-*-†	.20 (5)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-6A-*-†	.24 (6)	.57 (14.5)	.81 (20.5)	—	—	.03 (.8)
PFTF-8A-*-†	.31 (8)	.59 (15)	.83 (21)	—	—	.05 (1.2)
PFTF-10A-*-†	.39 (10)	.57 (14.5)	.81 (20.5)	—	—	.06 (1.5)
PFTF-15A-*-†	.59 (15)	.63 (16)	.87 (22)	—	—	.08 (2)
PFTF-20B-*-†	.79 (20)	1.04 (26.5)	—	—	—	.10 (2.5)
PFTF-30-*-†	1.18 (30)	1.02 (26)	—	—	—	.08 (2)
PFTF-40-*-†	1.57 (40)	1.10 (28)	—	—	—	.16 (4)
PFTF-50-*-†	1.97 (50)	1.14 (29)	—	—	—	.16 (4)
PFTF-60-*-†	2.36 (60)	1.40 (35.5)	—	—	—	.20 (5)
PFTF-80-*-†	3.15 (80)	1.48 (37.5)	—	—	—	.24 (6)
PFTF-95-*-†	3.74 (95)	1.50 (38)	—	—	—	.24 (6)
PFTF-120-*-†	4.72 (120)	1.83 (46.5)	—	.94 (24)	.51 (13)	.24 (6)
PFTF-150-*-†	5.91 (150)	2.11 (53.5)	—	.94 (24)	.51 (13)	.35 (9)
PFTF-200-*-†	7.87 (200)	2.30 (58.5)	—	.94 (24)	.51 (13)	.51 (13)

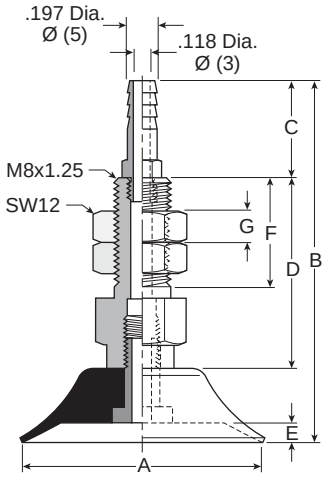
Inches (mm)
* Cup material
† Thread size

Dimensions

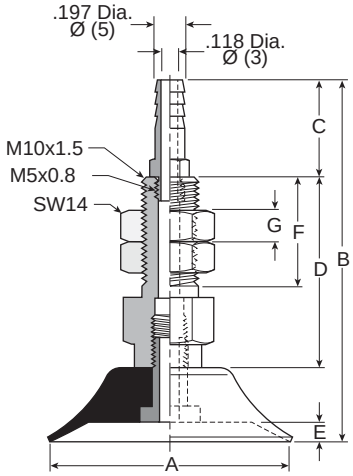
PFTK-5A thru PFTK-10A



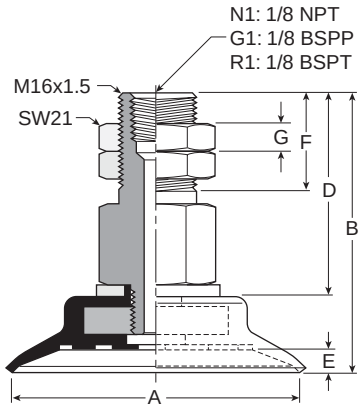
PFTK-15 thru PFTK-20



PFTK-30 thru PFTK-50



PFTK-60 thru PFTK-95



Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PFTK-5A-*	.20 (5)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-6A-*	.24 (6)	1.20 (30.5)	.39 (10)	.55 (14)	.03 (.8)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-8A-*	.31 (8)	1.22 (31)	.39 (10)	.55 (14)	.05 (1.2)	.61 (15.5)	.12 (3)	.39 (11)
PFTK-10A-*	.39 (10)	1.81 (46)	.63 (16)	.88 (22.5)	.06 (1.5)	.61 (15.5)	.12 (3)	.53 (15)
PFTK-15-*	.59 (15)	1.81 (46)	.63 (16)	.86 (22)	.07(1.9)	.59 (15)	.12 (3)	.71 (20)
PFTK-20-*	.79 (20)	1.89 (48)	.63 (16)	.86 (22)	.09 (2.3)	.59 (15)	.20 (5)	.71 (20)
PFTK-30-*	1.18 (30)	2.36 (60)	.63 (16)	1.26 (32)	.08 (2)	.71 (20)	.20 (5)	1.41 (40)
PFTK-40-*	1.57 (40)	2.44 (62)	.63 (16)	1.26 (32)	.14 (3.5)	.71 (20)	.20 (5)	1.41 (40)
PFTK-50-*	1.97 (50)	2.48 (63)	.63 (16)	1.26 (32)	.16 (4)	.71 (20)	.20 (5)	1.77 (50)
PFTK-60-*-†	2.36 (60)	2.30 (58.5)	—	1.67 (42.5)	.20 (5)	.79 (20)	.24 (6)	4.59 (130)
PFTK-80-*-†	3.15 (80)	2.38 (60.5)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	6.00 (170)
PFTK-95-*-†	3.74 (95)	2.40 (61)	—	1.67 (42.5)	.24 (6)	.79 (20)	.24 (6)	7.77 (220)

Inches (mm)
* Cup material
† Vacuum port

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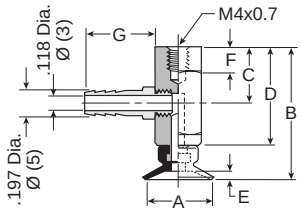
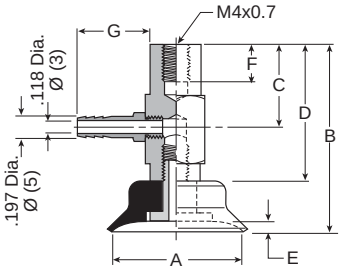
Dimensions

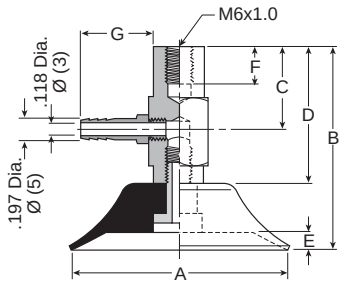
PFYK-5A thru PFYK-10A



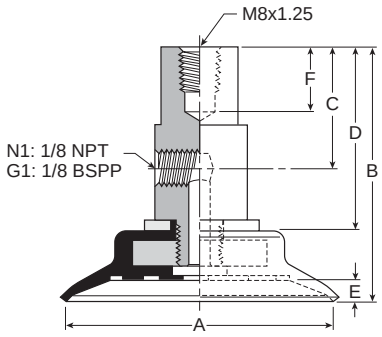
PFYK-15 thru PFYK-20



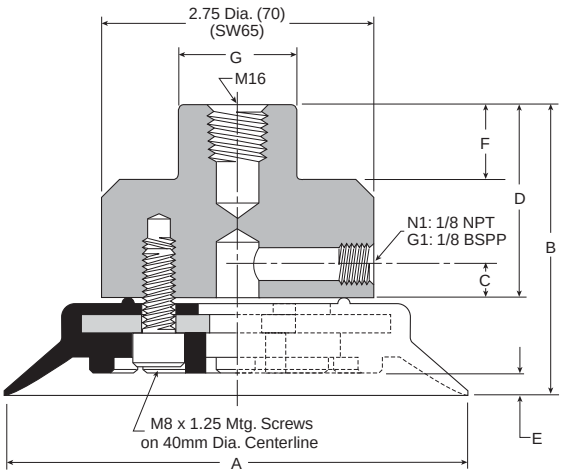
PFYK-30 thru PFYK-50



PFYK-60 thru PFYK-95



PFYK-120 thru PFYK-200

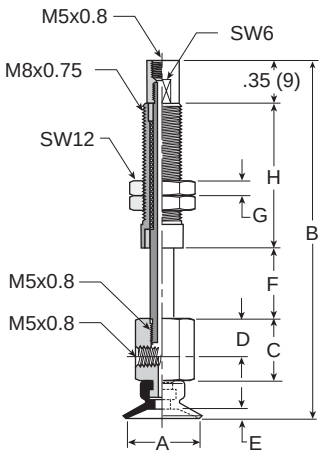


Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PFYK-5A-*	.20 (5)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-6A-*	.24 (6)	1.14 (29)	.51 (13)	.89 (22.5)	.03 (.8)	.24 (6)	.63 (16)	.56 (16)
PFYK-8A-*	.31 (8)	1.16 (29.5)	.51 (13)	.89 (22.5)	.05 (1.2)	.24 (6)	.63 (16)	.56 (16)
PFYK-10A-*	.39 (10)	1.18 (30)	.51 (13)	.89 (22.5)	.06 (1.5)	.24 (6)	.63 (16)	.56 (16)
PFYK-15-*	.59 (15)	1.18 (30)	.55 (14)	.87 (22)	.07 (1.9)	.24 (6)	.63 (16)	.71 (20)
PFYK-20-*	.79 (20)	1.26 (32)	.55 (14)	.87 (22)	.09 (2.3)	.24 (6)	.63 (16)	.71 (20)
PFYK-30-*	1.18 (30)	1.73 (44)	.79 (20)	1.26 (32)	.08 (2)	.31 (8)	.63 (16)	1.41 (40)
PFYK-40-*	1.57 (40)	1.81 (46)	.79 (20)	1.26 (32)	.14 (3.5)	.31 (8)	.63 (16)	1.77 (50)
PFYK-50-*	1.97 (50)	1.85 (47)	.79 (20)	1.26 (32)	.16 (4)	.31 (8)	.63 (16)	1.94 (55)
PFYK-60-*-†	2.36 (60)	2.30 (58.5)	1.10 (28)	1.57 (40)	.20 (5)	.43 (11)	—	4.24 (120)
PFYK-80-*-†	3.15 (80)	2.38 (60.5)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	5.65 (160)
PFYK-95-*-†	3.74 (95)	2.40 (61)	1.10 (28)	1.57 (40)	.24 (6)	.43 (11)	—	7.42 (210)
PFYK-120-*-†	4.72 (120)	2.94 (75.5)	.47 (12)	1.97 (50)	.24 (6)	.79 (20)	1.18 Dia. (30)	22.6 (640)
PFYK-150-*-†	5.91 (150)	3.25 (82.5)	.47 (12)	1.97 (50)	.35 (9)	.79 (20)	1.18 Dia. (30)	32.1 (910)
PFYK-200-*-†	7.87 (200)	3.44 (87.5)	.47 (12)	1.97 (50)	.51 (13)	.79 (20)	1.18 Dia. (30)	42.4 (1200)

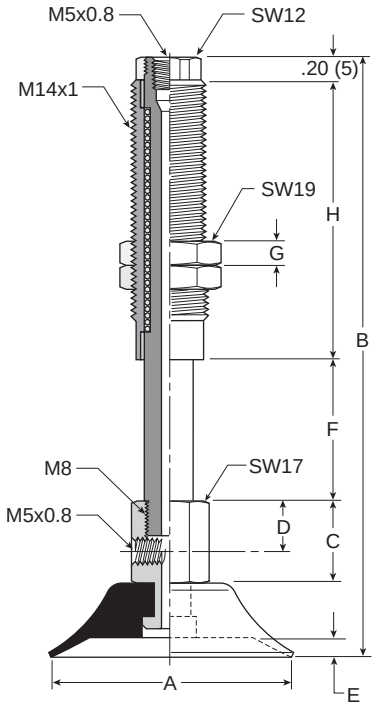
Inches (mm)
* Cup material
† Vacuum port

Dimensions

PFTYS5A thru PFTYS15A



PFTYS20B thru PFTYS50

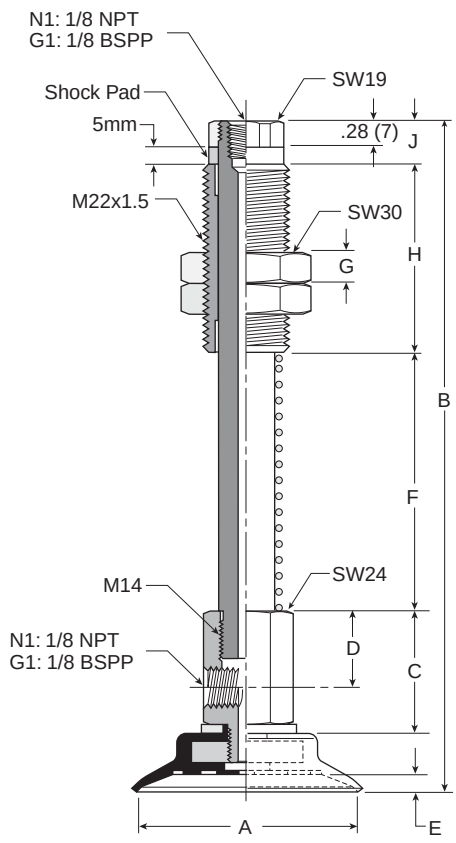


Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PFTYS5A10*†	.20 (5)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS5A15*†	.20 (5)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS6A10*†	.24 (6)	2.42 (61.5)	.51 (13)	.31 (8)	.03 (.8)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS6A15*†	.24 (6)	2.91 (74)	.51 (13)	.31 (8)	.03 (.8)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS8A10*†	.31 (8)	2.44 (62)	.51 (13)	.31 (8)	.05 (1.2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS8A15*†	.31 (8)	2.93 (74.5)	.51 (13)	.31 (8)	.05 (1.2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS10A10*†	.39 (10)	2.48 (63)	.51 (13)	.31 (8)	.06 (1.5)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS10A15*†	.39 (10)	2.95 (75)	.51 (13)	.31 (8)	.06 (1.5)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS15A10*†	.59 (15)	2.50 (63.5)	.51 (13)	.31 (8)	.08 (2)	.39 (10)	.12 (3)	.91 (23)	.65 (18.5)
PFTYS15A15*†	.59 (15)	2.97 (75.5)	.51 (13)	.31 (8)	.08 (2)	.59 (15)	.12 (3)	1.20 (30.5)	.74 (21)
PFTYS20B15*†	.79 (20)	3.37 (85.5)	.67 (17)	.39 (10)	.09 (2.3)	.59 (15)	.20 (5)	1.42 (36)	2.5 (71)
PFTYS20B30*†	.79 (20)	4.82 (122.5)	.67 (17)	.39 (10)	.09 (2.3)	1.18 (30)	.20 (5)	2.28 (58)	3.4 (96)
PFTYS3015*†	1.18 (30)	3.35 (85)	.67 (17)	.39 (10)	.08 (2)	.59 (15)	.20 (5)	1.42 (36)	2.5 (72)
PFTYS3030*†	1.18 (30)	4.80 (122)	.67 (17)	.39 (10)	.08 (2)	1.18 (30)	.20 (5)	2.28 (58	3.5 (97)
PFTYS4015*†	1.57 (40)	3.43 (87)	.67 (17)	.39 (10)	.14 (3.5)	.59 (15)	.20 (5)	1.42 (36)	2.7 (76)
PFTYS4030*†	1.57 (40)	4.88 (124)	.67 (17)	.39 (10)	.14 (3.5)	1.18 (30)	.20 (5)	2.28 (58	3.6 (101)
PFTYS5015*†	1.97 (50)	3.46 (88)	.67 (17)	.39 (10)	.16 (4)	.59 (15)	.20 (5)	1.42 (36)	3.0 (85)
PFTYS5030*†	1.97 (50)	4.92 (125)	.67 (17)	.39 (10)	.16 (4)	1.18 (30)	.20 (5)	2.28 (58)	3.9 (110)

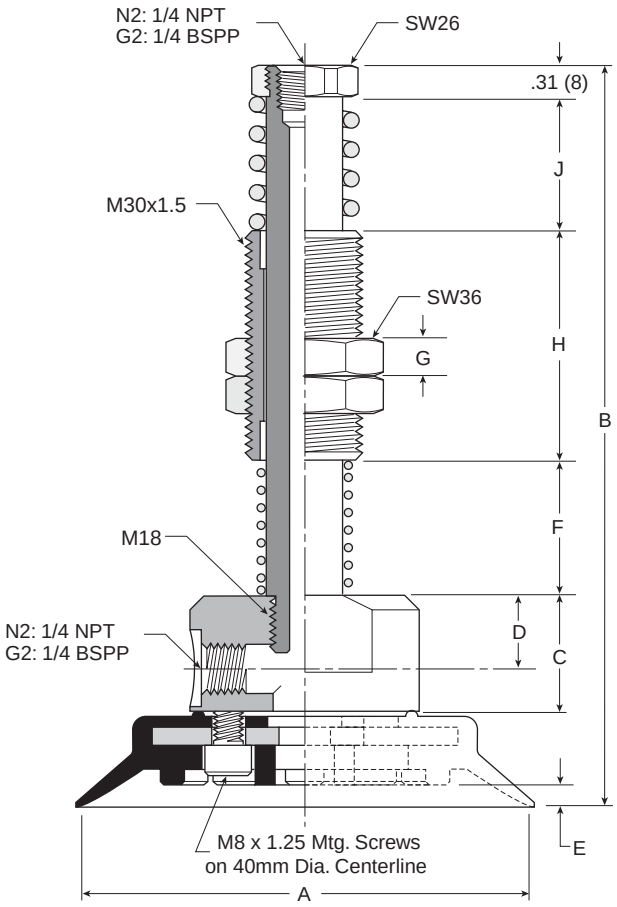
Inches (mm)
* Cup material
† Vacuum port

Dimensions

PFTYS60 thru PFTYS95



PFTYS120 thru PFTYS200



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PFTYS6030*†	2.36 (60)	6.02 (153)	1.28 (32.5)	.78 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	9.7 (282)
PFTYS6050*†	2.36 (60)	7.01 (178)	1.28 (32.5)	.78 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.2 (316)
PFTYS8030*†	3.15 (80)	6.10 (155)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	11 (310)
PFTYS8050*†	3.15 (80)	7.09 (180)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	12.2 (344)
PFTYS9530*†	3.74 (95)	6.12 (156)	1.28 (32.5)	.78 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12.4 (350)
PFTYS9550*†	3.74 (95)	7.11 (181)	1.28 (32.5)	.78 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.6 (384)
PFTYS12020*†	4.72 (120)	7.56 (192)	1.28 (32.5)	.71 (18)	.24 (6)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	41.2 (1165)
PFTYS12070*†	4.72 (120)	10.12 (257)	1.28 (32.5)	.71 (18)	.24 (6)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	44 (1246)
PFTYS15020*†	5.91 (150)	7.83 (199)	1.28 (32.5)	.71 (18)	.35 (9)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	49 (1389)
PFTYS15070*†	5.91 (150)	10.39 (264)	1.28 (32.5)	.71 (18)	.35 (9)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	52 (1471)
PFTYS20020*†	7.87 (200)	8.03 (204)	1.28 (32.5)	.71 (18)	.51 (13)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	62 (1755)
PFTYS20070*†	7.87 (200)	10.59 (269)	1.28 (32.5)	.71 (18)	.51 (13)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	64.9 (1836)

Inches (mm)
* Cup material
† Vacuum port

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These cups are for curved, corrugated, lightly textured surfaces and flexible product. Under vacuum, the bellow cup will collapse on contact and lift the product for a short distance. This inherent performance facilitates lifting and destack operations by breaking the vacuum between stacked product. The bellow style adds level compensation for applications that have inconsistent stack heights or uneven surfaces. The inclusive 30-degree rotation of the bellow helps maintain the vacuum seal when lifting sheet products that flex. Because of it's shape however the bellows suction cup is not very well suitable for applications involving lifting vertical surfaces.

Features

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 150mm diameters

Styles

- PBTM series male thread connector
- PBTF series female thread connector
- PBTK series barbed bulkhead
- PBYK series 90° barbed adapter
- PBTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Silicon	Urethane
Material code	**NBR**	**SI**	**U**
Operating temperature (°C)	-20° to +120°	-60° to +250°	-30° to +120°
Color	Black	White	Blue
Hardness, shore A (°Sh)	55 ±5	55 ±5	55 ±5

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PBTM-20B-NBR-G1 becomes PBTM-20B-U-G1. Inquire with factory for availability.

Application guide

Bellows

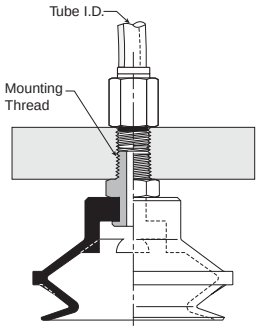
Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Bowed surface, any section	Soft porous material, any section	Differences in heights and levels	Corrugated sheet handling	Not for vertical lift	Metal sheet handling

PBTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	M5	**PBTM-10A-NBR-M5**	**PBG-10A-NBR**	**PBTM-10A-SI-M5**	**PBG-10A-SI**	**FTM-5A-M5H**
10	1/8 BSPP	**PBTM-10A-NBR-G1**	**PBG-10A-NBR**	**PBTM-10A-SI-G1**	**PBG-10A-SI**	**FTM-5A-G1**
15	M5	**PBTM-15A-NBR-M5**	**PBG-15A-NBR**	**PBTM-15A-SI-M5**	**PBG-15A-SI**	**FTM-5A-M5H**
15	1/8 BSPP	**PBTM-15A-NBR-G1**	**PBG-15A-NBR**	**PBTM-15A-SI-G1**	**PBG-15A-SI**	**FTM-5A-G1**
20	1/8 BSPP	**PBTM-20B-NBR-G1**	**PBG-20B-NBR**	**PBTM-20B-SI-G1**	**PBG-20B-SI**	**FTM-20B-G1H**
20	1/4 BSPP	**PBTM-20B-NBR-G2**	**PBG-20B-NBR**	**PBTM-20B-SI-G2**	**PBG-20B-SI**	**FTM-20B-G2**
20	M10	**PBTM-20B-NBR-M10**	**PBG-20B-NBR**	**PBTM-20B-SI-M10**	**PBG-20B-SI**	**FTM-20B-M10**
20	1/8 NPT	**PBTM-20B-NBR-N1**	**PBG-20B-NBR**	**PBTM-20B-SI-N1**	**PBG-20B-SI**	**FTM-20B-N1**
30	1/8 BSPP	**PBTM-30-NBR-G1**	**PBG-30-NBR**	**PBTM-30-SI-G1**	**PBG-30-SI**	**FTM-20B-G1H**
30	1/4 BSPP	**PBTM-30-NBR-G2**	**PBG-30-NBR**	**PBTM-30-SI-G2**	**PBG-30-SI**	**FTM-20B-G2**
30	M10	**PBTM-30-NBR-M10**	**PBG-30-NBR**	**PBTM-30-SI-M10**	**PBG-30-SI**	**FTM-20B-M10**
30	1/8 NPT	**PBTM-30-NBR-N1**	**PBG-30-NBR**	**PBTM-30-SI-N1**	**PBG-30-SI**	**FTM-20B-N1**
40	1/8 BSPP	**PBTM-40-NBR-G1**	**PBG-40-NBR**	**PBTM-40-SI-G1**	**PBG-40-SI**	**FTM-20B-G1H**
40	1/4 BSPP	**PBTM-40-NBR-G2**	**PBG-40-NBR**	**PBTM-40-SI-G2**	**PBG-40-SI**	**FTM-20B-G2**
40	M10	**PBTM-40-NBR-M10**	**PBG-40-NBR**	**PBTM-40-SI-M10**	**PBG-40-SI**	**FTM-20B-M10**
40	1/8 NPT	**PBTM-40-NBR-N1**	**PBG-40-NBR**	**PBTM-40-SI-N1**	**PBG-40-SI**	**FTM-20B-N1**
50	1/8 BSPP	**PBTM-50-NBR-G1**	**PBG-50-NBR**	**PBTM-50-SI-G1**	**PBG-50-SI**	**FTM-50-G1H**
50	1/4 BSPP	**PBTM-50-NBR-G2**	**PBG-50-NBR**	**PBTM-50-SI-G2**	**PBG-50-SI**	**FTM-50-G2**
50	1/8 NPT	**PBTM-50-NBR-N1**	**PBG-50-NBR**	**PBTM-50-SI-N1**	**PBG-50-SI**	**FTM-50-N1**
75	1/4 BSPP	**PBTM-75-NBR-G2**	**PBG-75-NBR**	**PBTM-75-SI-G2**	**PBG-75-SI**	**FTM-60-G2**
75	M10	**PBTM-75-NBR-M10**	**PBG-75-NBR**	**PBTM-75-SI-M10**	**PBG-75-SI**	**FTM-60-M10**
75	1/4 NPT	**PBTM-75-NBR-N2**	**PBG-75-NBR**	**PBTM-75-SI-N2**	**PBG-75-SI**	**FTM-60-N2**

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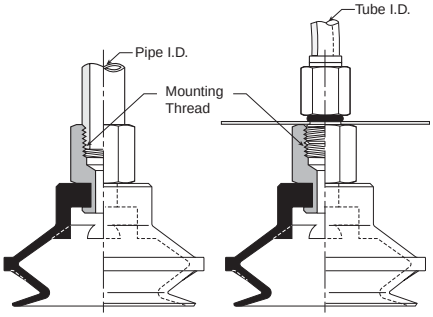
PBTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Replacement cup Silicon (SI)	Replacement cup fitting
10	1/8 BSPP	**PBTF-10A-NBR-G1**	**PBG-10A-NBR**	**PBG-10A-SI**	**FTF-5A-G1**
10	M5	**PBTF-10A-NBR-M5**	**PBG-10A-NBR**	**PBG-10A-SI**	**FTF-5A-M5**
15	1/8 BSPP	**PBTF-15A-NBR-G1**	**PBG-15A-NBR**	**PBG-15A-SI**	**FTF-5A-G1**
15	M5	**PBTF-15A-NBR-M5**	**PBG-15A-NBR**	**PBG-15A-SI**	**FTF-5A-M5**
20	1/8 BSPP	**PBTF-20B-NBR-G1**	**PBG-20B-NBR**	**PBG-20B-SI**	**FTF-20B-G1**
30	1/8 BSPP	**PBTF-30-NBR-G1**	**PBG-30-NBR**	**PBG-30-SI**	**FTF-20B-G1**
30	1/4 BSPP	**PBTF-30-NBR-G2**	**PBG-30-NBR**	**PBG-30-SI**	**FTF-20B-G2**
40	1/8 BSPP	**PBTF-40-NBR-G1**	**PBG-40-NBR**	**PBG-40-SI**	**FTF-20B-G1**
40	1/4 BSPP	**PBTF-40-NBR-G2**	**PBG-40-NBR**	**PBG-40-SI**	**FTF-20B-G2**
50	1/8 BSPP	**PBTF-50-NBR-G1**	**PBG-50-NBR**	**PBG-50-SI**	**FTF-50-G1**
50	1/4 BSPP	**PBTF-50-NBR-G2**	**PBG-50-NBR**	**PBG-50-SI**	**FTF-50-G2**
75	1/4 BSPP	**PBTF-75-NBR-G2**	**PBG-75-NBR**	**PBG-75-SI**	**FTF-60-G2**
75	1/4 NPT	**PBTF-75-NBR-N2**	**PBG-75-NBR**	**PBG-75-SI**	**FTF-60-N2**
110	1/2 BSPP	**PBTF-110-NBR-G4**	**PBG-110-NBR**	**PBG-110-SI**	**FTF-120-G4**
110	1/2 NPT	**PBTF-110-NBR-N4**	**PBG-110-NBR**	**PBG-110-SI**	**FTF-120-N4**
150	1/2 BSPP	**PBTF-150-NBR-G4**	**PBG-150-NBR**	**PBG-150-SI**	**FTF-120-G4**
150	1/2 NPT	**PBTF-150-NBR-N4**	**PBG-150-NBR**	**PBG-150-SI**	**FTF-120-N4**

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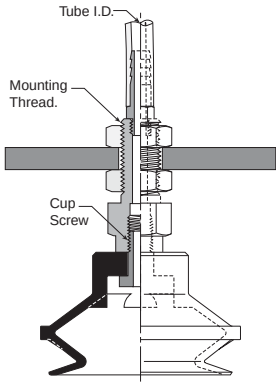
PBTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	**PBTK-10A-NBR**	**PBG-10A-NBR**	**PBTK-10A-SI**	**PBG-10A-SI**	**FTK-5A**
15	Barb	**PBTK-15A-NBR**	**PBG-15A-NBR**	**PBTK-15A-SI**	**PBG-15-SI**	**FTK-5A**
20	Barb	**PBTK-20-NBR**	**PBG-20-NBR**	**PBTK-20-SI**	**PBG-20-SI**	**FTK-20**
30	Barb	**PBTK-30-NBR**	**PBG-30-NBR**	**PBTK-30-SI**	**PBG-30-SI**	**FTK-25**
40	Barb	**PBTK-40-NBR**	**PBG-40-NBR**	**PBTK-40-SI**	**PBG-40-SI**	**FTK-25**
50	Barb	**PBTK-50-NBR**	**PBG-50-NBR**	**PBTK-50-SI**	**PBG-50-SI**	**FTK-50**
75	1/8 BSPP	**PBTK-75-NBR-G1**	**PBG-75-NBR**	**PBTK-75-SI-G1**	**PBG-75-SI**	**FTK-60-G1**
75	1/8 NPT	**PBTK-75-NBR-N1**	**PBG-75-NBR**	**PBTK-75-SI-N1**	**PBG-75-SI**	**FTK-60-N1**

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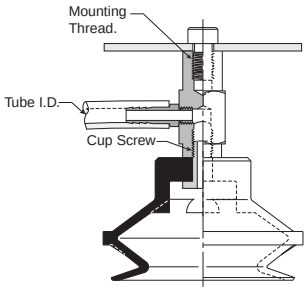
PBYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
10	Barb	**PBYK-10A-NBR**	**PBG-10A-NBR**	**PBYK-10A-SI**	**PBG-10A-SI**	**FYK-5A**
15	Barb	**PBYK-15A-NBR**	**PBG-15A-NBR**	**PBYK-15A-SI**	**PBG-15A-SI**	**FYK-15**
20	Barb	**PBYK-20-NBR**	**PBG-20-NBR**	**PBYK-20-SI**	**PBG-20-SI**	**FYK-20**
30	Barb	**PBYK-30-NBR**	**PBG-30-NBR**	**PBYK-30-SI**	**PBG-30-SI**	**FYK-25**
40	Barb	**PBYK-40-NBR**	**PBG-40-NBR**	**PBYK-40-SI**	**PBG-40-SI**	**FYK-25**
50	Barb	**PBYK-50-NBR**	**PBG-50-NBR**	**PBYK-50-SI**	**PBG-50-SI**	**FYK-50**
75	1/8 BSPP	**PBYK-75-NBR-G1**	**PBG-75-NBR**	**PBYK-75-SI-G1**	**PBG-75-SI**	**FYK-60-G1**
75	1/8 NPT	**PBYK-75-NBR-N1**	**PBG-75-NBR**	**PBYK-75-SI-N1**	**PBG-75-SI**	**FYK-60-N1**
110	1/8 BSPP	**PBYK-110-NBR-G1**	**PBG-110-NBR**	**PBYK-110-SI-G1**	**PBG-110-SI**	**FYK-120-G1**
110	1/8 NPT	**PBYK-110-NBR-N1**	**PBG-110-NBR**	**PBYK-110-SI-N1**	**PBG-110-SI**	**FYK-120-N1**
150	1/8 BSPP	**PBYK-150-NBR-G1**	**PBG-150-NBR**	**PBYK-150-SI-G1**	**PBG-150-SI**	**FYK-120-G1**
150	1/8 NPT	**PBYK-150-NBR-N1**	**PBG-150-NBR**	**PBYK-150-SI-N1**	**PBG-150-SI**	**FYK-120-N1**

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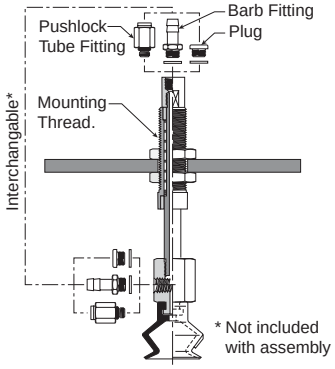
PBTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.



Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assembly (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
10	M5	10	.11 (.49)	.13 (.59)	**PBTYS10A10NBRM5**	**PBG-10A-NBR**	**PBTYS10A10SIM5**	**PBG-10A-SI**	**TYS-5A-10**
10	M5	15	.11 (.49)	.13 (.59)	**PBTYS10A15NBRM5**	**PBG-10A-NBR**	**PBTYS10A15SIM5**	**PBG-10A-SI**	**TYS-5A-15**
15	M5	10	.11 (.49)	.13 (.59)	**PBTYS15A10NBRM5**	**PBG-15A-NBR**	**PBTYS15A10SIM5**	**PBG-15A-SI**	**TYS-5A-10**
15	M5	15	.11 (.49)	.13 (.59)	**PBTYS15A15NBRM5**	**PBG-15A-NBR**	**PBTYS15A15SIM5**	**PBG-15A-SI**	**TYS-5A-15**
20	M5	15	.56 (2.5)	.79 (3.4)	**PBTYS20B15NBRM5**	**PBG-20B-NBR**	**PBTYS20B15SIM5**	**PBG-20B-SI**	**TYS-20B-15**
20	M5	30	.56 (2.5)	1.2 (4.9)	**PBTYS20B30NBRM5**	**PBG-20B-NBR**	**PBTYS20B30SIM5**	**PBG-20B-SI**	**TYS-20B-30**
30	M5	15	.56 (2.5)	.79 (3.4)	**PBTYS3015NBRM5**	**PBG-30-NBR**	**PBTYS3015SIM5**	**PBG-30-SI**	**TYS-20B-15**
30	M5	30	.56 (2.5)	1.2 (4.9)	**PBTYS3030NBRM5**	**PBG-30-NBR**	**PBTYS3030SIM5**	**PBG-30-SI**	**TYS-20B-30**
40	M5	15	.56 (2.5)	.79 (3.4)	**PBTYS4015NBRM5**	**PBG-40-NBR**	**PBTYS4015SIM5**	**PBG-40-SI**	**TYS-20B-15**
40	M5	30	.56 (2.5)	1.2 (4.9)	**PBTYS4030NBRM5**	**PBG-40-NBR**	**PBTYS4030SIM5**	**PBG-40-SI**	**TYS-20B-30**
50	M5	15	.56 (2.5)	1.2 (4.9)	**PBTYS5015NBRM5**	**PBG-50-NBR**	**PBTYS5015SIM5**	**PBG-50-SI**	**TYS-50-15**
50	M5	30	.67 (2.9)	1.4 (5.9)	**PBTYS5030NBRM5**	**PBG-50-NBR**	**PBTYS5030SIM5**	**PBG-50-SI**	**TYS-50-30**
75	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PBTYS7530NBRN1**	**PBG-75-NBR**	**PBTYS7530SIN1**	**PBG-75-SI**	**TYS-60-30**
75	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PBTYS7550NBRN1**	**PBG-75-NBR**	**PBTYS7550SIN1**	**PBG-75-SI**	**TYS-60-50**
110	1/4 NPT	20	3.6 (15.6)	6.8 (29)	**PBTYS12020NBRN2**	**PBG-110-NBR**	**PBTYS11020SIN2**	**PBG-110-SI**	**TYS-120-20**
110	1/4 NPT	70	3.4 (14.7)	6.8 (29)	**PBTYS12070NBRN2**	**PBG-110-NBR**	**PBTYS11070SIN2**	**PBG-110-SI**	**TYS-120-70**
150	1/4 NPT	20	3.6 (15.6)	6.8 (29)	**PBTYS15020NBRN2**	**PBG-150-NBR**	**PBTYS15020SIN2**	**PBG-150-SI**	**TYS-120-20**
150	1/4 NPT	70	3.4 (14.7)	6.8 (29)	**PBTYS15070NBRN2**	**PBG-150-NBR**	**PBTYS15070SIN2**	**PBG-150-SI**	**TYS-120-70**

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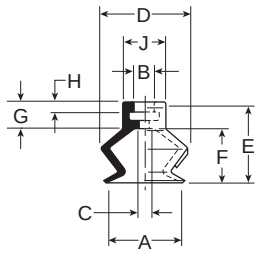
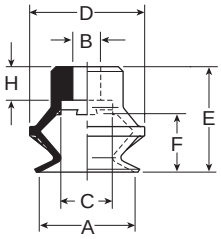
PBG Series Replacement Cup Dimensions

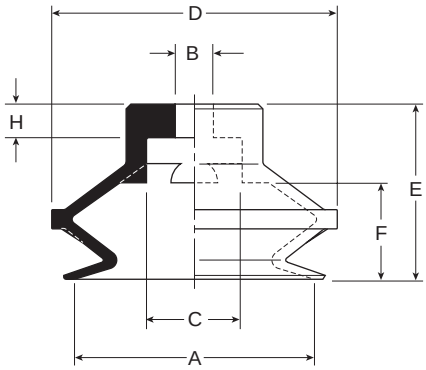
PBG-10A and PBG-20B



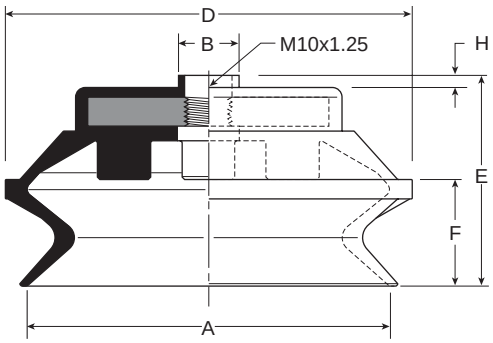
PBG-20 thru PBG-40



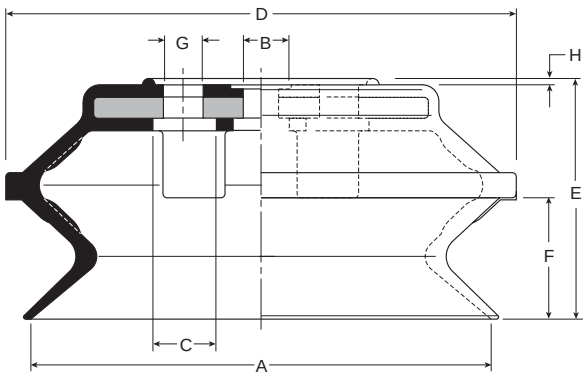
PBG-50



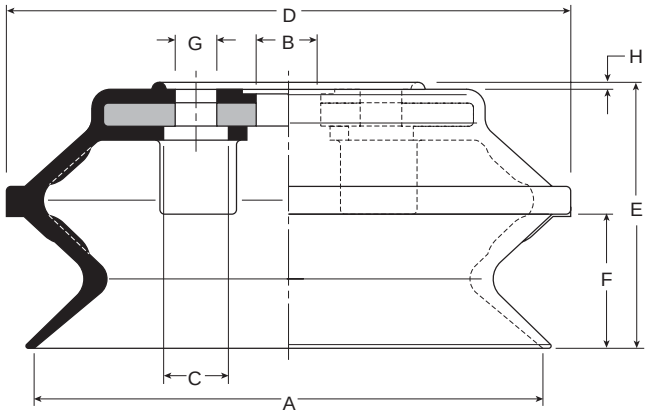
PBG-75



PBG-110



PBG-150

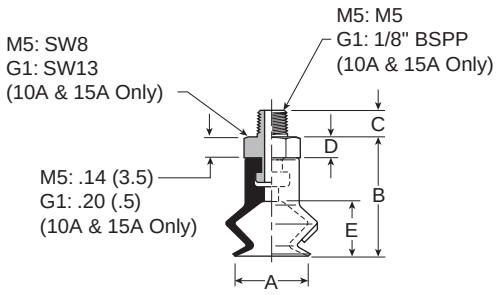


Model number	ØA	ØB	ØC	ØD	E	F	G	H	ØJ
PBG-10A-*	.42 (10.6)	.16 (4)	.08 (2)	.49 (12.4)	.53 (13.5)	.30 (7.5)	.24 (6)	.08 (2)	.24 (6)
PBG-15A-*	.59 (15)	.16 (4)	.16 (4)	.67 (17)	.63 (16)	.39 (10)	.24 (6)	.08 (2)	.24 (6)
PBG-20B-*	.79 (20)	.24 (6)	.43 (10.8)	.94 (24)	.87 (22)	.47 (12)	—	.28 (7)	—
PBG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.94 (24)	.77 (19.5)	.47 (12)	—	.18 (4.5)	—
PBG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	1.42 (36)	1.20 (30.5)	.67 (17)	—	.28 (7)	—
PBG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.81 (46)	1.20 (30.5)	.61 (15.5)	—	.28 (7)	—
PBG-50-*	1.97(50)	.31 (7.8)	.78 (19.8)	2.34 (59.5)	1.44 (36.5)	.79 (20)	—	.28 (7)	—
PBG-75-*	2.95 (75)	.49 (12.5)	—	3.31 (84)	1.71 (43.5)	.87 (22)	—	.10 (2.5)	—
PBG-110-*	4.33 (110)	.55 (14)	.55 (14)	4.80 (122)	2.26 (57.5)	1.14 (29)	—	.059 (1.5)	—
PBG-150-*	5.91 (150)	.79 (20)	.55 (14)	6.57 (167)	3.01 (76.5)	1.50 (38)	4xØ9xØ40	.059 (1.5)	—

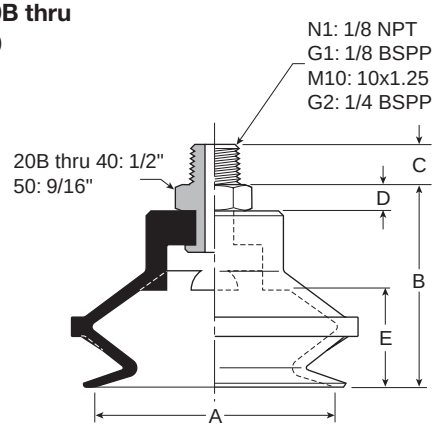
Inches (mm)
* Cup material

Dimensions

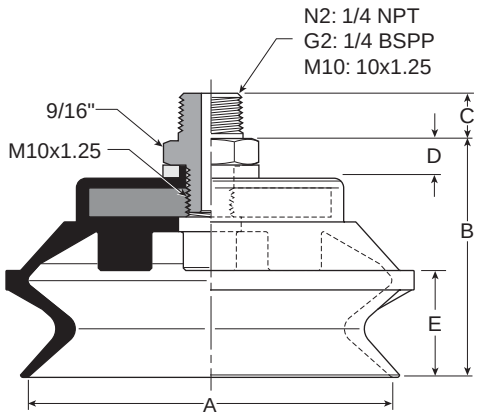
PBTM-10A thru PBTM-15



PBTM-20B thru PBTM-50



PBTM-75

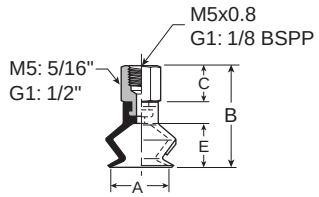


Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PBTM-10A-*-†	.39 (10)	.67 (17)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.30 (7.5)
PBTM-15A-*-†	.59 (15)	.77 (19.5)	.18 (4.5)	.31 (8)	—	—	See Dwg.	.39 (10)
PBTM-20B-*-†	.79 (20)	1.06 (27)	—	.31 (8)	.39 (10)	—	.20 (5)	.47 (12)
PBTM-30-*-†	1.18 (30)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.67 (17)
PBTM-40-*-†	1.57 (40)	1.40 (35.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.61 (15.5)
PBTM-50-*-†	1.97 (50)	1.63 (41.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.79 (20)
PBTM-75-*-†	3.74 (95)	1.99 (50.5)	—	—	.39 (10)	.59 (15)	.28 (7)	.87 (22)

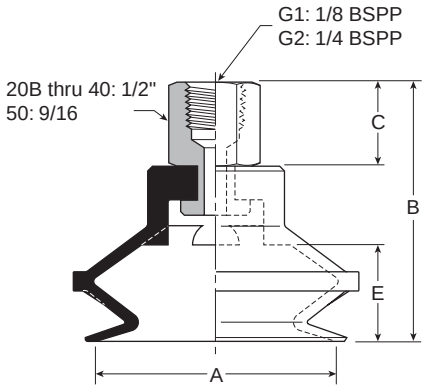
Inches (mm)
* Cup material
† Thread size

Dimensions

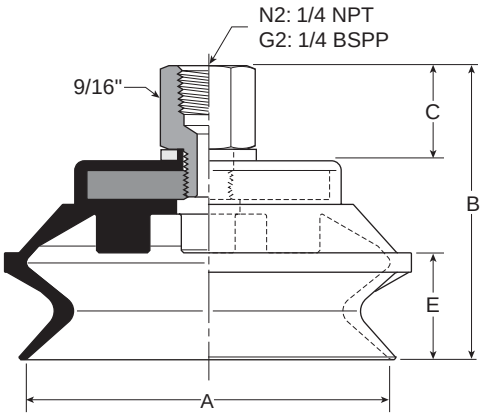
PBTF-10A thru
PBTF-15A



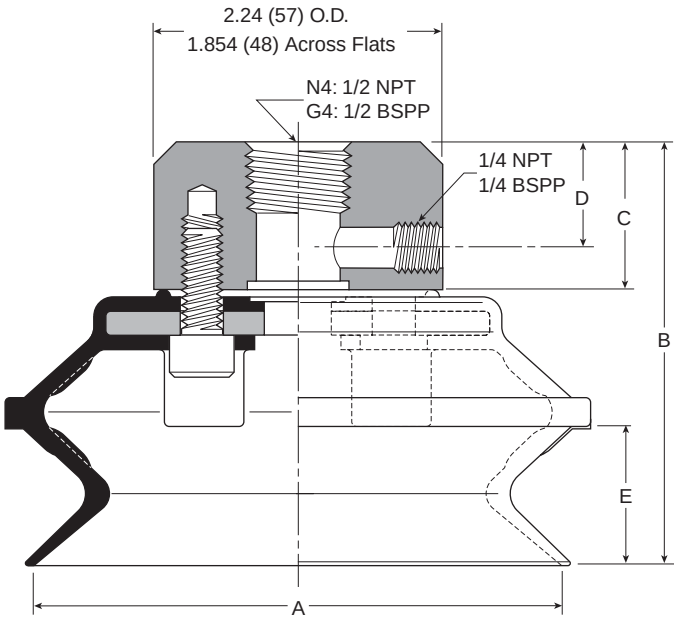
PBTF-20B thru
PBTF 50



PBTF-75



PBTF-110 thru
PBTF-150

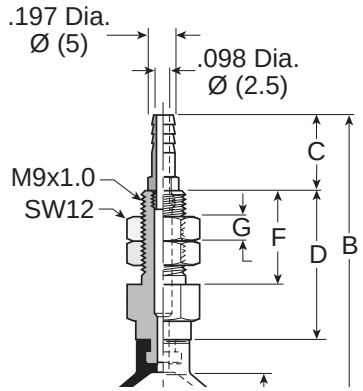


Model number	ØA	B	B (M5)	C	C (M5)	D	E
PBTF-10A-*-†	.39 (10)	.85 (21.5)	1.08 (27.5)	.31 (8)	.55 (14)	—	.30 (7.5)
PBTF-15A-*-†	.59 (15)	.94 (24)	1.18 (30)	.31 (8)	.55 (14)	—	.39 (10)
PBTF-20B-*-†	.79 (20)	1.42 (36)	—	.55 (14)	—	—	.47 (12)
PBTF-30-*-†	1.18 (30)	1.75 (44.5)	—	.55 (14)	—	—	.70 (17)
PBTF-40-*-†	1.57 (40)	1.75 (44.5)	—	.55 (14)	—	—	.61 (15.5)
PBTF-50-*-†	1.97 (50)	1.99 (50.5)	—	.55 (14)	—	—	.79 (20)
PBTF-75-*-†	3.74 (95)	2.38 (60.5)	—	.77 (19.5)	—	—	.87 (22)
PBTF-110-*-†	4.72 (120)	3.07 (78)	—	.94 (24)	—	.51 (13)	1.14 (29)
PBTF-150-*-†	5.91 (150)	3.82 (97)	—	.94 (24)	—	.51 (13)	1.50 (38)

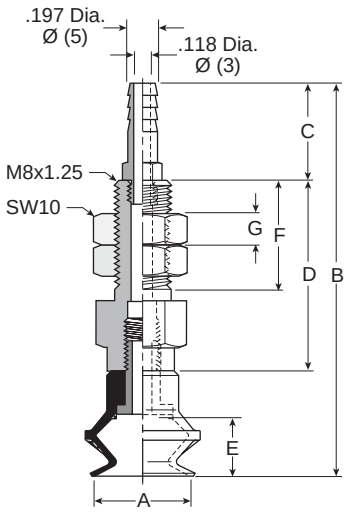
Inches (mm)
* Cup material
† Thread size

Dimensions

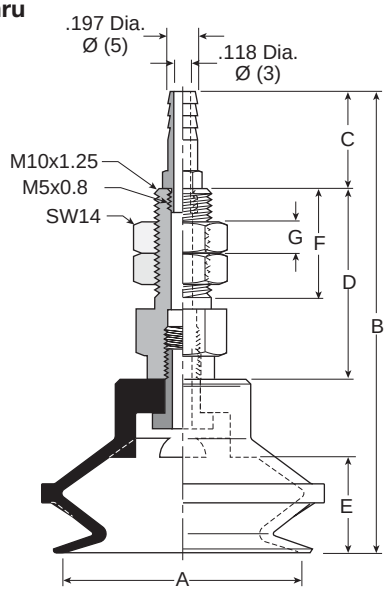
PBTK-10A thru PBTK-15A



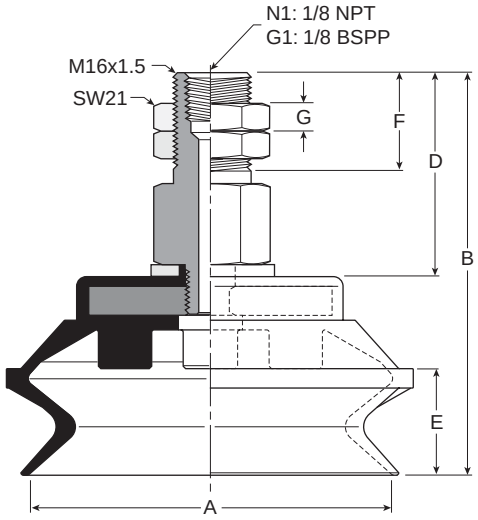
PBTK-20



PBTK-30 thru PBTK-50



PBTK-75



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBTK-10A-*	.39 (10)	2.05 (52)	.39 (10)	.89 (22.5)	.30 (7.5)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-15A-*	.59 (15)	2.15 (54.5)	.39 (10)	.89 (22.5)	.39 (10)	.24 (6)	.61 (15.5)	.5 (15)
PBTK-20-*	.79 (20)	2.26 (57.5)	.63 (16)	.87 (22)	.47 (12)	.24 (6)	.59 (15)	.7 (21)
PBTK-30-*	1.18 (30)	3.09 (78.5)	.63 (16)	1.26 (32)	.67 (17)	.24 (6)	.79 (20)	1.6 (45)
PBTK-40-*	1.57 (40)	3.09 (78.5)	.63 (16)	1.26 (32)	.61 (15.5)	.24 (6)	.79 (20)	1.7 (48)
PBTK-50-*	1.97 (50)	3.33 (84.5)	.63 (16)	1.26 (32)	.79 (20)	.24 (6)	.79 (20)	2.2 (62)
PBTK-75-*-†	3.74 (95)	3.29 (83.5)	—	1.67 (42.5)	.87 (22)	.43 (11)	—	6.5 (186)

Inches (mm)
* Cup material
† Vacuum port

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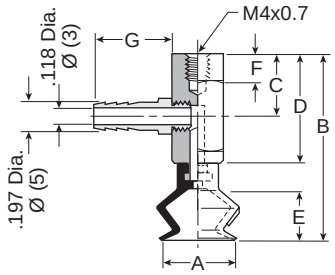
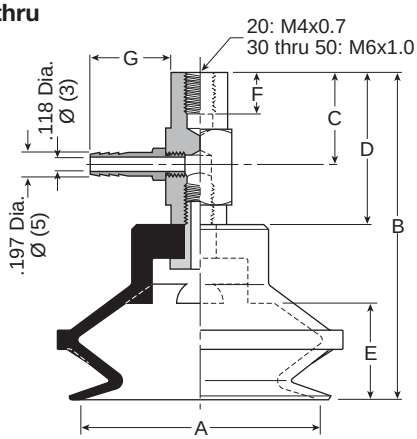
Dimensions

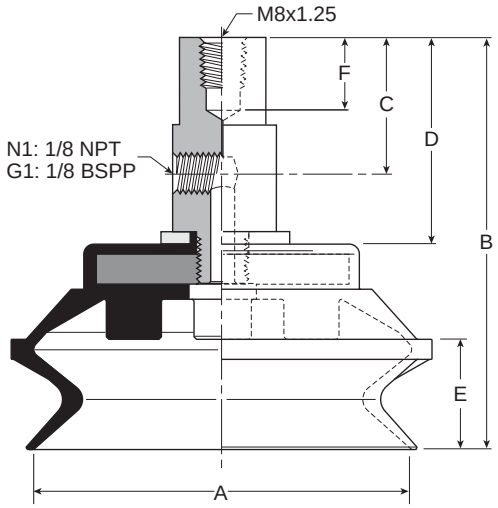
PBYK-10A thru PBYK-15A



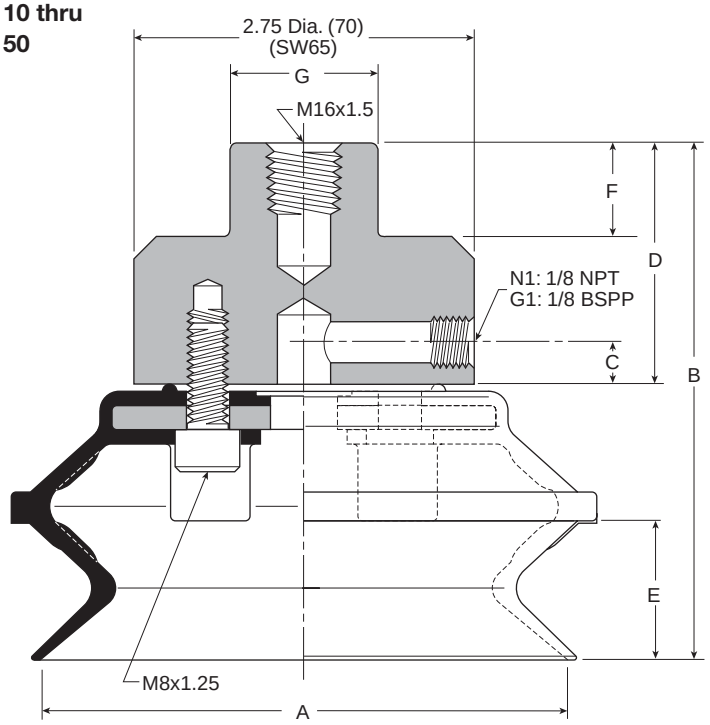
PBYK-20 thru PBYK-50



PBYK-75



PBYK-110 thru PBYK-150



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PBYK-10A-*	.39 (10)	1.42 (36)	.51 (13)	.89 (22.5)	.29 (7.5)	.24 (6)	.63 (16)	.6 (16)
PBYK-15A-*	.59 (15)	1.52 (38.5)	.51 (13)	.89 (22.5)	.39 (10)	.24 (6)	.63 (16)	.6 (16)
PBYK-20-*	.79 (20)	1.63 (41.5)	.55 (14)	.87 (22)	.47 (12)	.24 (6)	.63 (16)	.7 (21)
PBYK-30-*	1.18 (30)	2.46 (62.5)	.79 (20)	1.26 (32)	.67 (17)	.24 (6)	.63 (16)	1.6 (45)
PBYK-40-*	1.57 (40)	2.46 (62.5)	.79 (20)	1.26 (32)	.61 (15.5)	.24 (6)	.63 (16)	2.0 (58)
PBYK-50-*	1.97 (50)	2.70 (68.5)	.79 (20)	1.26 (32)	.78 (20)	.24 (6)	.63 (16)	2.4 (67)
PBYK-75-*-†	3.74 (95)	3.29 (83.5)	1.10 (28)	1.67 (42.5)	.86 (22)	.43 (11)	—	6.9 (176)
PBYK-110-*-†	4.72 (120)	4.17 (106)	.47 (12)	1.97 (50)	1.14 (29)	.79 (20)	1.18 Dia. (30)	26.4 (670)
PBYK-150-*-†	5.91 (150)	4.92 (125)	.47 (12)	1.97 (50)	1.50 (38)	.79 (20)	1.18 Dia. (30)	46.5 (1180)

Inches (mm)
* Cup material
† Vacuum port

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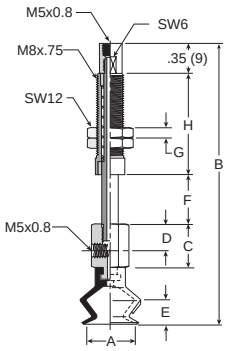
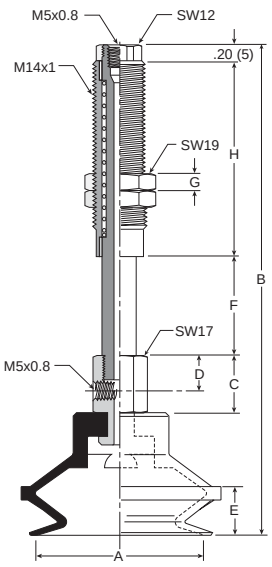
Dimensions

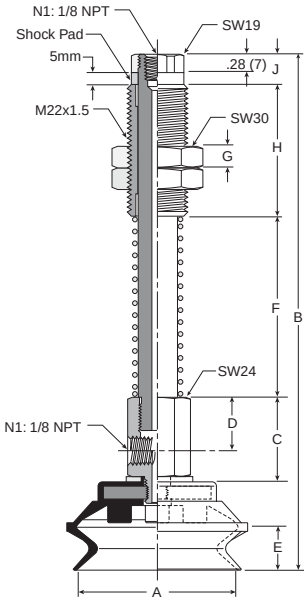
PBTYS10A thru PBTYS15A1



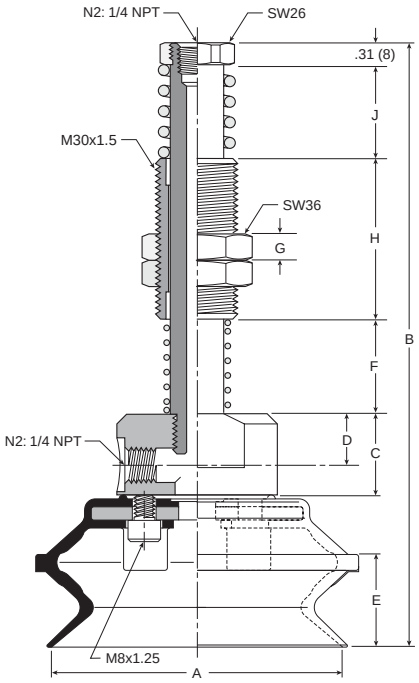
PBTYS20B thru PBTYS50



PBTYS75



PBTYS110 thru PBTYS150



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PBTYS10A10*	.39 (10)	2.70 (68.5)	.51 (13)	.31 (8)	.30 (7.5)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS10A15*	.39 (10)	3.19 (81)	.51 (13)	.31 (8)	.30 (7.5)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS15A10*	.59 (15)	2.80 (71)	.51 (13)	.31 (8)	.39 (10)	.39 (10)	.12 (3)	.91 (23)	—	.65 (18.5)
PBTYS15A15*	.59 (15)	3.29 (83.5)	.51 (13)	.31 (8)	.39 (10)	.59 (15)	.12 (3)	1.20 (30.5)	—	.7 (21)
PBTYS20B15*	.79 (20)	3.90 (99)	.67 (17)	.39 (10)	.47 (12	.59 (15)	.20 (5)	1.42 (36)	—	2.5 (72)
PBTYS20B30*	.79 (20)	5.36 (136)	.67 (17)	.39 (10)	.47 (12	1.18 (30)	.20 (5)	2.28 (58)	—	3.4 (97)
PBTYS3015*†	1.18 (30)	4.07 (103.5)	.67 (17)	.39 (10)	.67 (17)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS3030*†	1.18 (30)	5.53 (140.5)	.67 (17)	.39 (10)	.67 (17)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (102)
PBTYS4015*†	1.57 (40)	4.07 (103.5)	.67 (17)	.39 (10)	.61 (15.5)	.59 (15)	.20 (5)	1.42 (36)	—	2.9 (83)
PBTYS4030*†	1.57 (40)	5.53 (140.5)	.67 (17)	.39 (10)	.61 (15.5)	1.18 (30)	.20 (5)	2.28 (58)	—	3.8 (108)
PBTYS5015*†	1.97 (50)	4.31 (109.5)	.67 (17)	.39 (10)	.78 (20)	.59 (15)	.20 (5)	1.42 (36)	—	3.4 (97)
PBTYS5030*†	1.97 (50)	5.77 (146.5)	.67 (17)	.39 (10)	.78 (20)	1.18 (30)	.20 (5)	2.28 (58)	—	4.3 (122)
PBTYS7530*†	2.95 (75)	7.01 (178)	1.28 (32.5)	.78 (20)	.87 (22)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	12 (339)
PBTYS7550*†	2.95 (75)	7.99 (203)	1.28 (32.5)	.78 (20)	.87 (22)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13 (373)
PBTYS11020*†	4.33 (110)	8.82 (224)	1.18 (30)	.71 (18)	1.14 (29)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	42 (1194)
PBTYS11070*†	4.33 (110)	11.38 (289)	1.18 (30)	.71 (18)	1.14 (29)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	45 (1276)
PBTYS15020*†	5.91 (150)	9.57 (243)	1.18 (30)	.71 (18)	1.50 (38)	1.38 (35)	.39 (10)	2.36 (60)	1.38 (35)	60 (1704)
PBTYS15070*†	5.91 (150)	12.13 (308)	1.18 (30)	.71 (18)	1.50 (38)	3.94 (100)	.39 (10)	2.36 (60)	1.38 (35)	63 (1786)

Inches (mm)
* Cup material
† Vacuum port

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Features

- Double sealing lips for flexible sheet handling
- Vacuum cup grooves on underside increase holding area
- Resists acceleration and deceleration shear forces
- Strong low profile for fast response
- Metal insert fitting for stable vertical and horizontal lifts

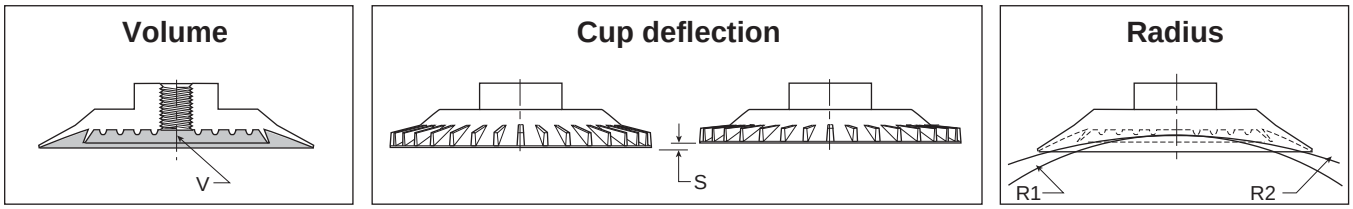
Applications

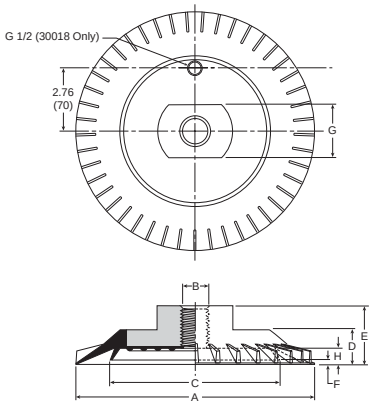
These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity.
The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

Dual sealing lips provide 2 seals for vacuum. As the product flexes, the outer lip seal may break, but the inner lip seal will hold the degree of vacuum for continued lifting capacity. In these types of applications, sizing should be done on the inner diameter cup dimension.

Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Area*** cm^2	Cup volume (V) liters	Deflection (S) (mm)	Radius R (mm)	
						R1*	R2**
50	1/8 BSPP	**P5V-CFS05011N**	19.6	.001	.16 (4)	3.86 (98)	3.15 (80)
100	3/8 BSPP	**P5V-CFS10013N**	78.5	.0667	.30 (8)	10.00 (254)	6.34 (161)
150	1/2 BSPP	**P5V-CFS15014N**	176.7	.2083	.43 (11)	12.17 (309)	9.92 (252)

* Minimum permissible radius for lifting using inner lip.
** Minimum permissible radius for lifting using outer lip.
*** Area based on Outer Cup Diameter





Dimensions

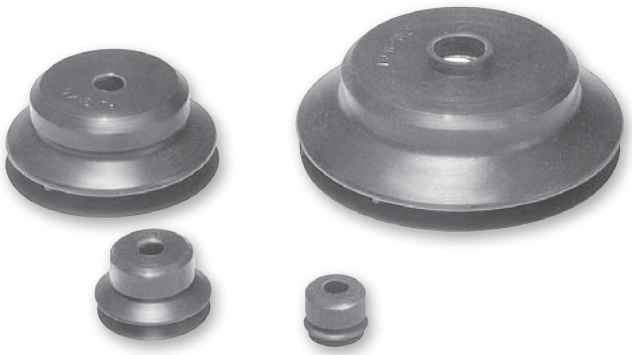
Model number	ØA	B	ØC	D	E	F	G	H
P5V-CFS50*	1.97 (50)	G1/8	1.38 (35)	0.43 (11)	0.71 (18)	0.087 (2.2)	0.51 (13)	0.146 (3.7)
P5V-CFS100*	3.94 (100)	G3/8	2.83 (72)	0.71 (18)	1.10 (28)	0.197 (5)	0.87 (22)	0.295 (7.5)
P5V-CFS150*	5.91 (150)	G1/2	4.17 (106)	1.02 (26)	1.65 (42)	0.276 (7)	1.06 (27)	0.43 (11)

Inches (mm)
* Cup material

☐ **Most popular.**

Versatile bellow cup design provides increased sealing lip and level compensation for products with irregular, smooth, curved surfaces, or flexible sheets.

The short stroke bellow suction cup has an extra thin sealing edge and shorter stroke versus the traditional bellows for faster response. The cups are good for corrugated and smooth surfaces.



Features

- Short bellows for fast response
- More lip seal contact for corrugated, textured surfaces
- Soft sealing lip
- 6mm to 80mm

Styles

- PJTM series male thread connector
- PJTF series female thread connector
- PJTK series barbed bulkhead
- PJYK series 90° barbed adapter
- PJTYS series bulkhead level compensator

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*
Material code	**NBR**	**NBRE**	**SI**	**SIE**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°
Color	Black	Black / Blue Dot	White	Black / Red Dot
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000

* ESD: Electric Static Dissipative Material

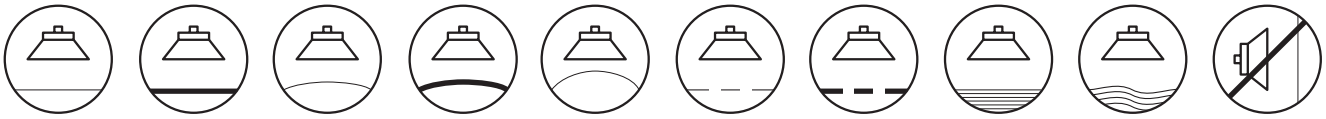
How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with silicon ESD (SIE), replace (NBR) with (SIE) in the part number. PJTM-20B-NBR-G1 becomes PJTM-20B-SIE-G1. Inquire with factory for availability.

Application guide

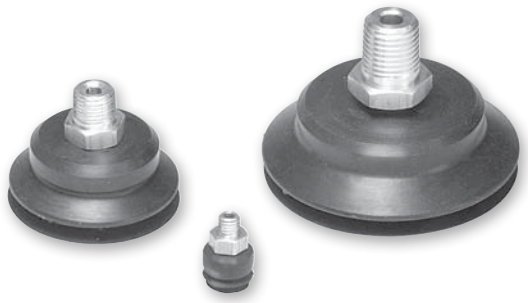
Short Bellows



Flat surface, thin section	Flat surface, any section	Slightly bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, thin section	Soft porous material, thin section	Soft porous material, any section	Metal sheet handling	Corrugated sheet handling	Not for vertical lift

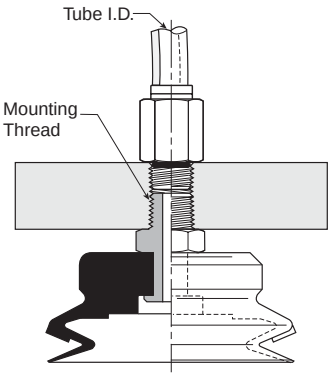
PJTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
Fitting material: aluminum.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	**PJTM-6-NBR-M5**	**PJG-6-NBR**	**PJTM-6-SI-M5**	**PJG-6-SI**	**FTM-5A-M5H**
6	1/8 BSPP	**PJTM-6-NBR-G1**	**PJG-6-NBR**	**PJTM-6-SI-G1**	**PJG-6-SI**	**FTM-5A-G1**
8	M5	**PJTM-8-NBR-M5**	**PJG-8-NBR**	**PJTM-8-SI-M5**	**PJG-8-SI**	**FTM-5A-M5H**
8	1/8 BSPP	**PJTM-8-NBR-G1**	**PJG-8-NBR**	**PJTM-8-SI-G1**	**PJG-8-SI**	**FTM-5A-G1**
10	M5	**PJTM-10-NBR-M5**	**PJG-10-NBR**	**PJTM-10-SI-M5**	**PJG-10-SI**	**TN-PF-15-M5**
15	M5	**PJTM-15-NBR-M5**	**PJG-15-NBR**	**PJTM-15-SI-M5**	**PJG-15-SI**	**TN-PF-15-M5**
20	M5	**PJTM-20-NBR-M5**	**PJG-20-NBR**	**PJTM-20-SI-M5**	**PJG-20-SI**	**TN-PF-20-M5**
30	1/8 BSPP	**PJTM-30-NBR-G1**	**PJG-30-NBR**	**PJTM-30-SI-G1**	**PJG-30-SI**	**FTM-20B-G1H**
30	1/4 BSPP	**PJTM-30-NBR-G2**	**PJG-30-NBR**	**PJTM-30-SI-G2**	**PJG-30-SI**	**FTM-20B-G2**
30	M10	**PJTM-30-NBR-M10**	**PJG-30-NBR**	**PJTM-30-SI-M10**	**PJG-30-SI**	**FTM-20B-M10**
30	1/8 NPT	**PJTM-30-NBR-N1**	**PJG-30-NBR**	**PJTM-30-SI-N1**	**PJG-30-SI**	**FTM-20B-N1**
40	1/8 BSPP	**PJTM-40-NBR-G1**	**PJG-40-NBR**	**PJTM-40-SI-G1**	**PJG-40-SI**	**FTM-20B-G1H**
40	1/4 BSPP	**PJTM-40-NBR-G2**	**PJG-40-NBR**	**PJTM-40-SI-G2**	**PJG-40-SI**	**FTM-20B-G2**
40	M10	**PJTM-40-NBR-M10**	**PJG-40-NBR**	**PJTM-40-SI-M10**	**PJG-40-SI**	**FTM-20B-M10**
40	1/8 NPT	**PJTM-40-NBR-N1**	**PJG-40-NBR**	**PJTM-40-SI-N1**	**PJG-40-SI**	**FTM-20B-N1**
50	1/8 BSPP	**PJTM-50-NBR-G1**	**PJG-50-NBR**	**PJTM-50-SI-G1**	**PJG-50-SI**	**FTM-50-G1H**
50	1/4 BSPP	**PJTM-50-NBR-G2**	**PJG-50-NBR**	**PJTM-50-SI-G2**	**PJG-50-SI**	**FTM-50-G2**
50	1/8 NPT	**PJTM-50-NBR-N1**	**PJG-50-NBR**	**PJTM-50-SI-N1**	**PJG-50-SI**	**FTM-50-N1**
60	1/4 BSPP	**PJTM-60-NBR-G2**	**PJG-60-NBR**	**PJTM-60-SI-G2**	**PJG-60-SI**	**FTM-60-G2**
60	M10	**PJTM-60-NBR-M10**	**PJG-60-NBR**	**PJTM-60-SI-M10**	**PJG-60-SI**	**FTM-60-M10**
60	1/4 NPT	**PJTM-60-NBR-N2**	**PJG-60-NBR**	**PJTM-60-SI-N2**	**PJG-60-SI**	**FTM-60-N2**
80	1/4 BSPP	**PJTM-80-NBR-G2**	**PJG-80-NBR**	**PJTM-80-SI-G2**	**PJG-80-SI**	**FTM-60-G2**
80	M10	**PJTM-80-NBR-M10**	**PJG-80-NBR**	**PJTM-80-SI-M10**	**PJG-80-SI**	**FTM-60-M10**
80	1/4 NPT	**PJTM-80-NBR-N2**	**PJG-80-NBR**	**PJTM-80-SI-N2**	**PJG-80-SI**	**FTM-60-N2**

☐ Most popular.

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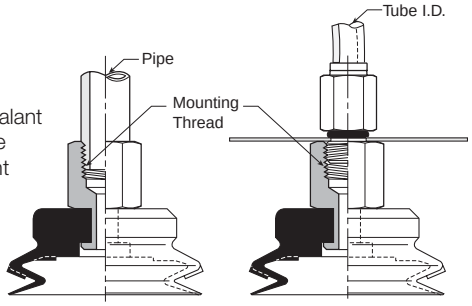
PJTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	M5	**PJTF-6-NBR-M5**	**PJG-6-NBR**	**PJTF-6-SI-M5**	**PJG-6-SI**	**FTF-5A-M5**
6	1/8 BSPP	**PJTF-6-NBR-G1**	**PJG-6-NBR**	**PJTF-6-SI-G1**	**PJG-6-SI**	**FTF-5A-G1**
8	M5	**PJTF-8-NBR-M5**	**PJG-8-NBR**	**PJTF--8-SI-M5**	**PJG-8-SI**	**FTF-5A-M5**
8	1/8 BSPP	**PJTF-8-NBR-G1**	**PJG-8-NBR**	**PJTF--8-SI-G1**	**PJG-8-SI**	**FTF-5A-G1**
10	M5	**PJTF-10-NBR-M5**	**PJG-10-NBR**	**PJTF-10-SI-M5**	**PJG-10-SI**	**FTF-5A-M5**
10	1/8 BSPP	**PJTF-10-NBR-G1**	**PJG-10-NBR**	**PJTF-10-SI-G1**	**PJG-10-SI**	**FTF-5A-G1**
15	M5	**PJTF-15-NBR-M5**	**PJG-15-NBR**	**PJTF-15-SI-M5**	**PJG-15-SI**	**FTF-5A-M5**
15	1/8 BSPP	**PJTF-15-NBR-G1**	**PJG-15-NBR**	**PJTF-15-SI-G1**	**PJG-15-SI**	**FTF-5A-G1**
30	1/8 BSPP	**PJTF-30-NBR-G1**	**PJG-30-NBR**	**PJTF-30-SI-G1**	**PJG-30-SI**	**FTF-20B-G1**
30	1/4 BSPP	**PJTF-30-NBR-G2**	**PJG-30-NBR**	**PJTF-30-SI-G2**	**PJG-30-SI**	**FTF-20B-G2**
40	1/8 BSPP	**PJTF-40-NBR-G1**	**PJG-40-NBR**	**PJTF-40-SI-G1**	**PJG-40-SI**	**FTF-20B-G1**
40	1/4 BSPP	**PJTF-40-NBR-G2**	**PJG-40-NBR**	**PJTF-40-SI-G2**	**PJG-40-SI**	**FTF-20B-G2**
50	1/8 BSPP	**PJTF-50-NBR-G1**	**PJG-50-NBR**	**PJTF-50-SI-G1**	**PJG-50-SI**	**FTF-50-G1**
50	1/4 BSPP	**PJTF-50-NBR-G2**	**PJG-50-NBR**	**PJTF-50-SI-G2**	**PJG-50-SI**	**FTF-50-G2**
60	1/4 BSPP	**PJTF-60-NBR-G2**	**PJG-60-NBR**	**PJTF-60-SI-G2**	**PJG-60-SI**	**FTF-60-G2**
60	1/4 NPT	**PJTF-60-NBR-N2**	**PJG-60-NBR**	**PJTF-60-SI-N2**	**PJG-60-SI**	**FTF-60-N2**
80	1/4 BSPP	**PJTF-80-NBR-G2**	**PJG-80-NBR**	**PJTF-80-SI-G2**	**PJG-80-SI**	**FTF-60-G2**
80	1/4 NPT	**PJTF-80-NBR-N2**	**PJG-80-NBR**	**PJTF-80-SI-N2**	**PJG-80-SI**	**FTF-60-N2**

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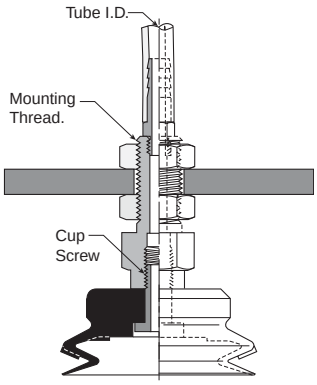
PJTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting materials: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	**PJTK-6-NBR**	**PJG-6-NBR**	**PJTK-6-SI**	**PJG-6-SI**	**FTK-5A**
8	Barb	**PJTK-8-NBR**	**PJG-8-NBR**	**PJTK-8-SI**	**PJG-8-SI**	**FTK-5A**
10	Barb	**PJTK-10-NBR**	**PJG-10-NBR**	**PJTK-10-SI**	**PJG-10-SI**	**FTK-15**
15	Barb	**PJTK-15-NBR**	**PJG-15-NBR**	**PJTK-15-SI**	**PJG-15-SI**	**FTK-15**
20	Barb	**PJTK-20-NBR**	**PJG-20-NBR**	**PJTK-20-SI**	**PJG-20-SI**	**FTK-20**
30	Barb	**PJTK-30-NBR**	**PJG-30-NBR**	**PJTK-30-SI**	**PJG-30-SI**	**FTK-25**
40	Barb	**PJTK-40-NBR**	**PJG-40-NBR**	**PJTK-40-SI**	**PJG-40-SI**	**FTK-25**
50	Barb	**PJTK-50-NBR**	**PJG-50-NBR**	**PJTK-50-SI**	**PJG-50-SI**	**FTK-50**
60	1/8 BSPP	**PJTK-60-NBR-G1**	**PJG-60-NBR**	**PJTK-60-SI-G1**	**PJG-60-SI**	**FTK-60-G1**
60	1/8 NPT	**PJTK-60-NBR-N1**	**PJG-60-NBR**	**PJTK-60-SI-N1**	**PJG-60-SI**	**FTK-60-N1**
80	1/8 BSPP	**PJTK-80-NBR-G1**	**PJG-80-NBR**	**PJTK-80-SI-G1**	**PJG-80-SI**	**FTK-60-G1**
80	1/8 NPT	**PJTK-80-NBR-N1**	**PJG-80-NBR**	**PJTK-80-SI-N1**	**PJG-80-SI**	**FTK-60-N1**

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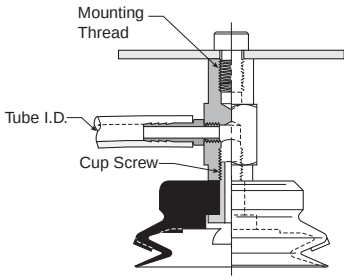
PJYK Series 90° Barbed Adapter

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting materials: nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
6	Barb	**PJYK-6-NBR**	**PJG-6-NBR**	**PJYK-6-SI**	**PJG-6-SI**	**FYK-5A**
8	Barb	**PJYK-8-NBR**	**PJG-8-NBR**	**PJYK-8-SI**	**PJG-8-SI**	**FYK-5A**
10	Barb	**PJYK-10-NBR**	**PJG-10-NBR**	**PJYK-10-SI**	**PJG-10-SI**	**FYK-15**
15	Barb	**PJYK-15-NBR**	**PJG-15-NBR**	**PJYK-15-SI**	**PJG-15-SI**	**FYK-15**
20	Barb	**PJYK-20-NBR**	**PJG-20-NBR**	**PJYK-20-SI**	**PJG-20-SI**	**FYK-20**
30	Barb	**PJYK-30-NBR**	**PJG-30-NBR**	**PJYK-30-SI**	**PJG-30-SI**	**FYK-25**
40	Barb	**PJYK-40-NBR**	**PJG-40-NBR**	**PJYK-40-SI**	**PJG-40-SI**	**FYK-25**
50	Barb	**PJYK-50-NBR**	**PJG-50-NBR**	**PJYK-50-SI**	**PJG-50-SI**	**FYK-50**
60	1/8 BSPP	**PJYK-60-NBR-G1**	**PJG-60-NBR**	**PJYK-60-SI-G1**	**PJG-60-SI**	**FYK-60-G1**
60	1/8 NPT	**PJYK-60-NBR-N1**	**PJG-60-NBR**	**PJYK-60-SI-N1**	**PJG-60-SI**	**FYK-60-N1**
80	1/8 BSPP	**PJYK-80-NBR-G1**	**PJG-80-NBR**	**PJYK-80-SI-G1**	**PJG-80-SI**	**FYK-60-G1**
80	1/8 NPT	**PJYK-80-NBR-N1**	**PJG-80-NBR**	**PJYK-80-SI-N1**	**PJG-80-SI**	**FYK-60-N1**

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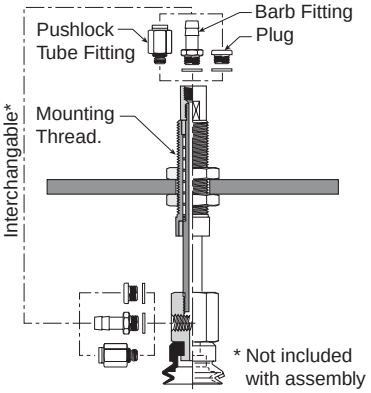
PJTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.



Cup dia. (mm)	Vacuum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	Cup material Nitrile assemlby (NBR)	Replacement cup Nitrile (NBR)	Cup material Silicon assembly (SI)	Replacement cup Silicon (SI)	Level Compensator P/N
10	M5	10	.56 (2.5)	1.2 (4.9)	**PJTYS1010NBRM5**	**PJG-10-NBR**	**PJTYS1010SIM5**	**PJG-10-SI**	**JTYS-10-10**
10	M5	15	.67 (2.5)	1.4 (5.9)	**PJTYS1015NBRM5**	**PJG-10-NBR**	**PJTYS1015SIM5**	**PJG-10-SI**	**JTYS-10-15**
15	M5	10	.56 (2.5)	1.2 (4.9)	**PJTYS15A10NBRM5**	**PJG-15A-NBR**	**PJTYS15A10SIM5**	**PJG-15A-SI**	**JTYS-10-10**
15	M5	15	.67 (2.5)	1.4 (5.9)	**PJTYS15A15NBRM5**	**PJG-15A-NBR**	**PJTYS15A15SIM5**	**PJG-15A-SI**	**JTYS-10-15**
30	M5	15	.56 (2.5)	.79 (3.4)	**PJTYS3015NBRM5**	**PJG-30-NBR**	**PJTYS3015SIM5**	**PJG-30-SI**	**TYS-20B-15**
30	M5	30	.67 (2.9)	1.4 (5.9)	**PJTYS3030NBRM5**	**PJG-30-NBR**	**PJTYS3030SIM5**	**PJG-30-SI**	**TYS-20B-30**
40	M5	15	.56 (2.5)	.79 (3.4)	**PJTYS4015NBRM5**	**PJG-40-NBR**	**PJTYS4015SIM5**	**PJG-40-SI**	**TYS-20B-15**
40	M5	30	.67 (2.9)	1.4 (5.9)	**PJTYS4030NBRM5**	**PJG-40-NBR**	**PJTYS4030SIM5**	**PJG-40-SI**	**TYS-20B-30**
50	M5	15	.56 (.25)	1.2 (4.9)	**PJTYS5015NBRM5**	**PJG-50-NBR**	**PJTYS5015SIM5**	**PJG-50-SI**	**TYS-50-15**
50	M5	30	.67 (2.9)	1.4 (5.9)	**PJTYS5030NBRM5**	**PJG-50-NBR**	**PJTYS5030SIM5**	**PJG-50-SI**	**TYS-50-30**
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PJTYS6030NBRN1**	**PJG-60-NBR**	**PJTYS6030SIN1**	**PJG-60-SI**	**TYS-60-30**
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PJTYS6050NBRN1**	**PJG-60-NBR**	**PJTYS6050SIN1**	**PJG-60-SI**	**TYS-60-50**
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PJTYS8030NBRN1**	**PJG-80-NBR**	**PJTYS8030SIN1**	**PJG-80-SI**	**TYS-60-30**
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PJTYS8050NBRN1**	**PJG-80-NBR**	**PJTYS8050SIN1**	**PJG-80-SI**	**TYS-60-50**

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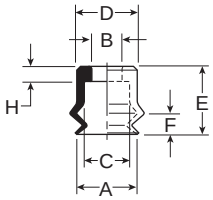
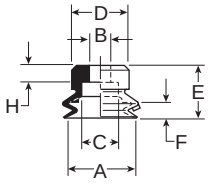
PJG Series Replacement Cup Dimensions

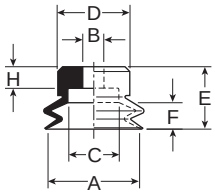
PJG-6 and PJG-8



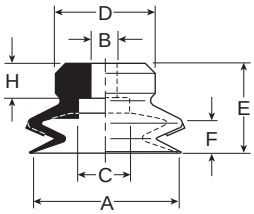
PJG-10 and PJG-15



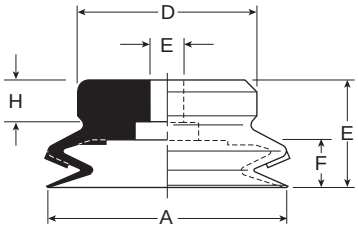
PJG-20



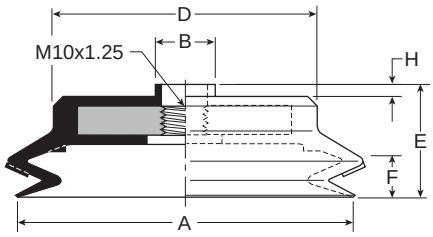
PJG-30 thru PJG-40



PJG-50



PJG-60 thru PJG-80



Model number	ØA	ØB	ØC	ØD	E	F	H
PJG-6-*	.24 (6)	.16 (4)	.24 (6)	.30 (7.5)	.35 (9)	.17 (4.2)	.08 (2)
PJG-8-*	.31 (8)	.16 (4)	.24 (6)	.31 (8)	.35 (9)	.16 (4)	.08 (2)
PJG-10-*	.39 (10)	.18 (4.6)	.31 (7.8)	.43 (11)	.37 (9.5)	.12 (3)	.14 (3.5)
PJG-15-*	.59 (15)	.18 (4.6)	.31 (7.8)	.47 (12)	.43 (11)	.13 (3.3)	.14 (3.5)
PJG-20-*	.79 (20)	.18 (4.6)	.43 (10.8)	.59 (15)	.51 (13)	.22 (5.5)	.18 (4.5)
PJG-30-*	1.18 (30)	.23 (5.8)	.43 (10.8)	.78 (20)	.71 (18)	.28 (7)	.28 (7)
PJG-35-*	1.38 (35)	.23 (5.8)	.43 (10.8)	.98 (25)	.71 (18)	.28 (7)	.28 (7)
PJG-40-*	1.57 (40)	.23 (5.8)	.43 (10.8)	1.18 (30)	.71 (18)	.28 (7.2)	.28 (7)
PJG-50-*	1.97 (50)	.31 (7.8)	.78 (19.8)	1.57 (40)	.79 (20)	.35 (9)	.28 (7)
PJG-60-*	2.36 (60)	.49 (12.5)	—	1.77 (45)	.89 (22.5)	.31 (8)	.10 (2.5)
PJG-70-*	2.75 (70)	.49 (12.5)	—	2.17 (55)	.93 (23.5)	.37 (9.5)	.10 (2.5)
PJG-80-*	3.15 (80)	.49 (12.5)	—	2.68 (68)	.93 (23.5)	.37 (9.5)	.10 (2.5)

Inches (mm)

* Cup material

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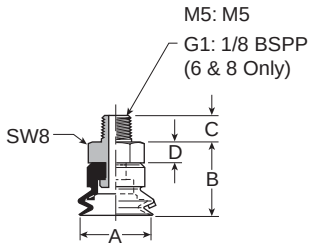
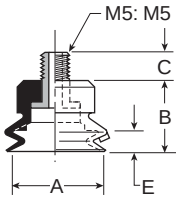
Dimensions

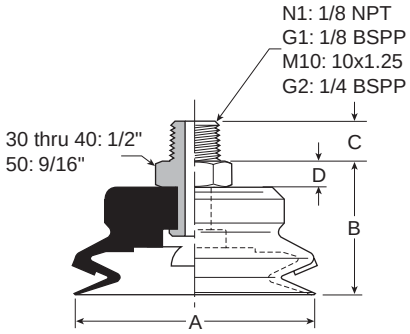
PJTM-6 and PJTM-8



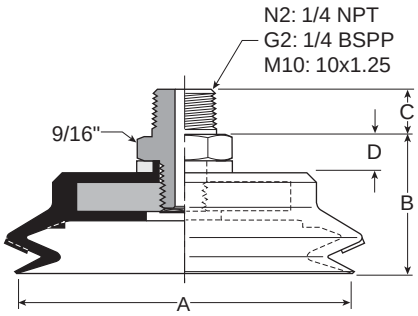
PJTM-10 thru PJTM-20



PJTM-30 thru PJTM-50



PJTM-60 thru PJTM-80



Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D
PJTM-6-*-†	.24 (6)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-8-*-†	.31 (8)	.49 (12.5)	.18 (4.5)	.31 (8)	—	—	.14 (3.5)
PJTM-10-*-†	.39 (10)	.37 (9.5)	.20 (5)	—	—	—	—
PJTM-15-*-†	.59 (15)	.43 (11)	.20 (5)	—	—	—	—
PJTM-20-*-†	.79 (20)	.51 (13)	.20 (5)	—	—	—	—
PJTM-30-*-†	1.18 (30)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-40-*-†	1.57 (40)	.91 (23)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-50-*-†	1.97 (50)	.98 (25)	—	.31 (8)	.39 (10)	—	.20 (5)
PJTM-60-*-†	2.36 (60)	1.06 (27)	—	—	.39 (10)	.59 (15)	.28 (7)
PJTM-80-*-†	3.15 (80)	1.10 (28)	—	—	.39 (10)	.59 (15)	.28 (7)

Inches (mm)
* Cup material
† Thread size

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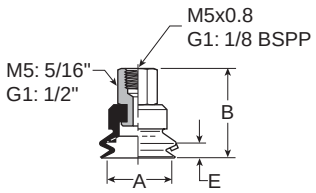
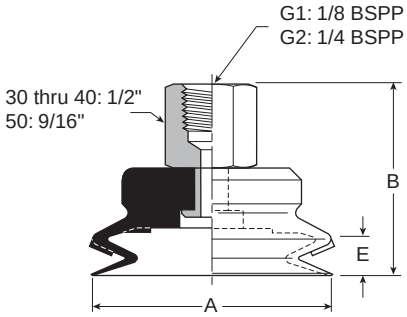
Dimensions

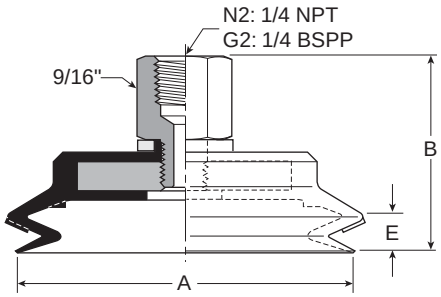
PJTF-6 and PJTF-8



PJTF-30 thru PJTF-50



PJTF-60 thru PJTF-80

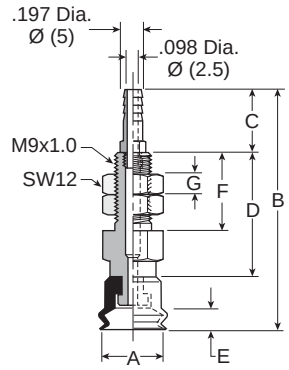


Model number	ØA	B	B (M5)	E
PJTF-6-*-†	.24 (6)	.79 (20)	.55 (14)	.16 (4)
PJTF-8-*-†	.31 (8)	.79 (20)	.55 (14)	.16 (4)
PJTF-10-*-†	.39 (10)	.79 (20)	.55 (14)	.12 (3)
PJTF-15-*-†	.59 (15)	.79 (20)	.55 (14)	.13 (3.3)
PJTF-30-*-†	1.18 (30)	1.25 (32)	—	.28 (7)
PJTF-40-*-†	1.57 (40)	1.25(32)	—	.28 (7.2)
PJTF-50-*-†	1.97 (50)	1.34 (34)	—	.35 (9)
PJTF-60-*-†	2.36 (60)	1.56 (39.5)	—	.31 (8)
PJTF-80-*-†	3.15 (80)	1.59 (40.5)	—	.37 (9.5)

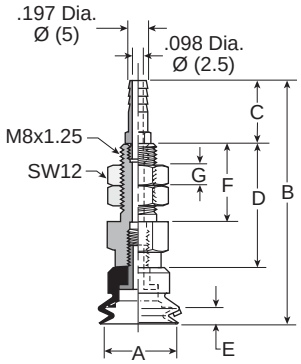
Inches (mm)
* Cup material
† Thread size

Dimensions

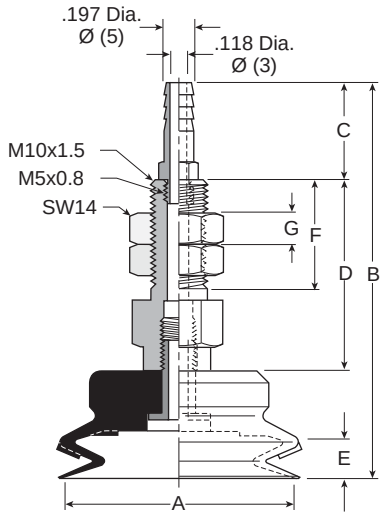
PJTK-6 and PJTK-8



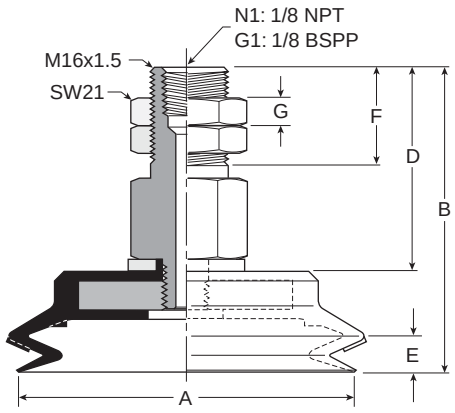
PJTK-10 thru PJTK-20



PJTK-30 thru PJTK-50



PJTK-60 thru PJTK-80



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJTK-6-*	.24 (6)	1.30 (33)	.39 (10)	.55 (14)	.17 (4.2)	.47 (12)	.12 (3)	.4 (11)
PJTK-8-*	.31 (8)	1.30 (33)	.39 (10)	.55 (14)	.16 (4)	.47 (12)	.12 (3)	.4 (11)
PJTK-10-*	.39 (10)	1.87 (47.5)	.63 (16)	.87 (22)	.12 (3)	.59 (15)	.12 (3)	.5 (14)
PJTK-15-*	.59 (15)	1.93 (49)	.63 (16)	.87 (22)	.13 (3.3)	.59 (15)	.12 (3)	.5 (15)
PJTK-20-*	.79 (20)	2.01 (51)	.63 (16)	.87 (22)	.22 (5.5)	.59 (15)	.20 (5)	.6 (17)
PJTK-30-*	1.18 (30)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7)	.79 (20)	.20 (5)	1.5 (42)
PJTK-40-*	1.57 (40)	2.60 (66)	.63 (16)	1.26 (32)	.28 (7.2)	.79 (20)	.20 (5)	1.6 (44)
PJTK-50-*	1.97 (50)	2.68 (68)	.63 (16)	1.26 (32)	.35 (9)	.79 (20)	.20 (5)	25.0 (58)
PJTK-60-*-†	2.36 (60)	2.46 (62.5)	—	1.67 (42.5)	.31 (8)	.79 (20)	.24 (6)	5.1 (144)
PJTK-80-*-†	3.15 (80)	2.50 (63.5)	—	1.67 (42.5)	.37 (9.5)	.79 (20)	.24 (6)	6.7 (190)

Inches (mm)
* Cup material
† Vacuum port

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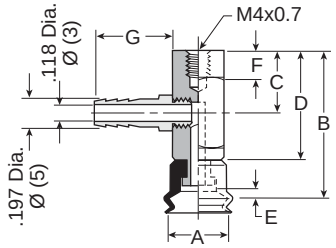
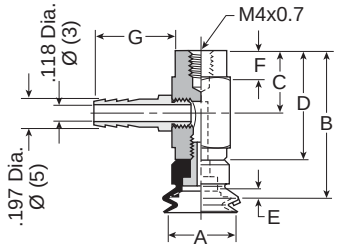
Dimensions

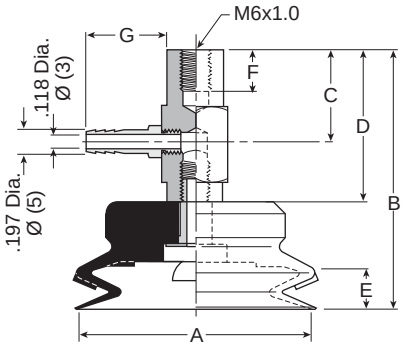
PJYK-6 and PJYK-8



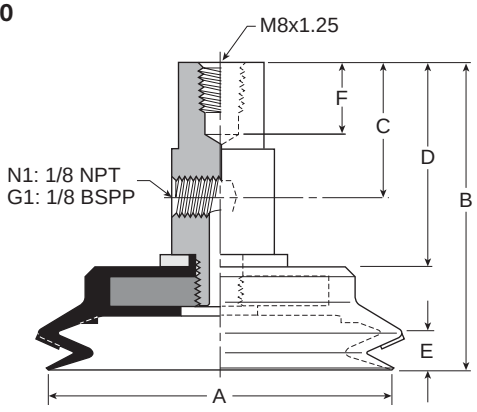
PJYK-10 thru PJYK-20



PJYK-25 thru PJYK-50



PJYK-60 thru PJYK-80



Model number	ØA	B	C	D	E	F	G	Wt oz (g)
PJYK-6-*	.24 (6)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJYK-8-*	.31 (8)	1.24 (31.5)	.51 (13)	.89 (22.5)	.17 (4.2)	.24 (6)	.63 (16)	.56 (16)
PJYK-10-*	.39 (10)	1.24 (31.5)	.55 (14)	.87 (22)	.12 (3)	.24 (6)	.63 (16)	.59 (17)
PJYK-15-*	.59 (15)	1.30 (33)	.55 (14)	.87 (22)	.13 (3.3)	.24 (6)	.63 (16)	.63 (18)
PJYK-20-*	.79 (20)	1.38 (35)	.55 (14)	.87 (22)	.22 (5.5)	.24 (6)	.63 (16)	.7 (20)
PJYK-30-*	1.18 (30)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7)	.31 (8)	.63 (16)	1.6 (46)
PJYK-40-*	1.57 (40)	1.97 (50)	.79 (20)	1.26 (32)	.28 (7.2)	.31 (8)	.63 (16)	1.7 (48)
PJYK-50-*	1.97 (50)	2.05 (52)	.79 (20)	1.26 (32)	.35 (9)	.31 (8)	.63 (16)	2.2 (62)
PJYK-60-*-†	2.36 (60)	2.46 (62.5)	1.10 (28)	1.67 (42.5)	.31 (8)	.43 (11)	—	4.9 (139)
PJYK-80-*-†	3.15 (80)	2.50 (63.5)	1.10 (28)	1.67 (42.5)	.37 (9.5)	.43 (11)	—	6.5 (185)

Inches (mm)
* Cup material
† Vacuum port

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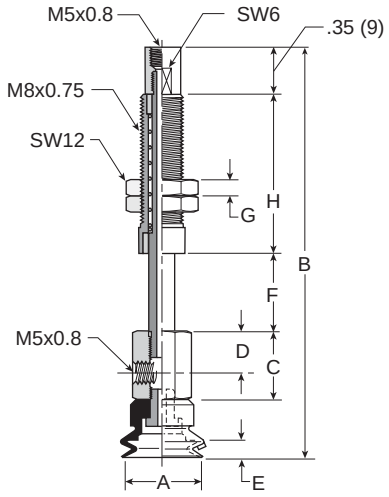
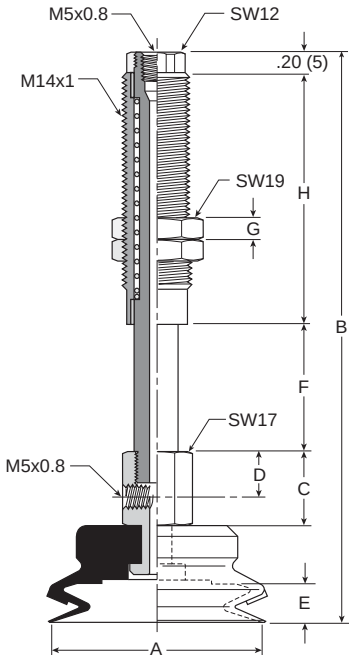
Dimensions

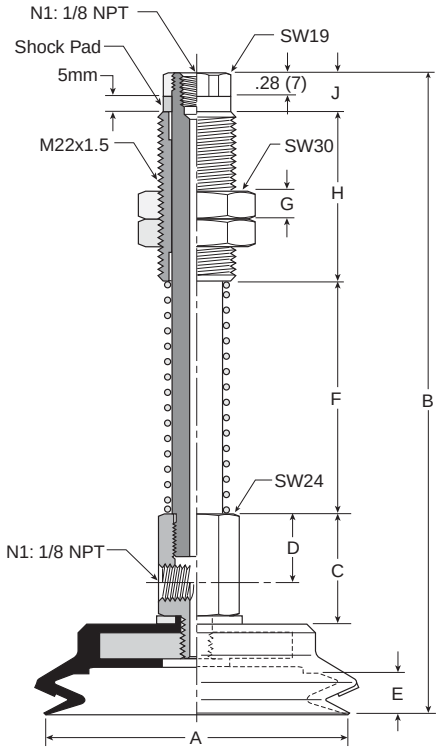
PJTYS10 thru PJTYS20



PJTYS30 thru PJTYS50



PJTYS60 thru PJTYS80



Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PJTYS1010*†	.39 (10)	2.52 (64)	.51 (13)	.31 (8)	.12 (3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (31)
PJTYS1015*†	.39 (10)	3.01 (76.5)	.51 (13)	.31 (8)	.12 (3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.2 (33.5)
PJTYS1510*†	.59 (15)	2.60 (66)	.51 (13)	.31 (8)	.13 (3.3)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS1515*†	.59 (15)	3.07 (78)	.51 (13)	.31 (8)	.13 (3.3)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS2010*†	.79 (20)	2.83 (72)	.51 (13)	.31 (8)	.22 (5.5)	.39 (10)	.20 (5)	.91 (23)	—	1.1 (32)
PJTYS2015*†	.79 (20)	4.29 (109)	.51 (13)	.31 (8)	.22 (5.5)	.59 (15)	.20 (5)	1.20 (30.5)	—	1.3 (34.5)
PJTYS3015*†	1.18 (30)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.6 (74)
PJTYS3030*†	1.18 (30)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.5 (99)
PJTYS3515*†	1.38 (35)	3.58 (91)	.67 (17)	.39 (10)	.28 (7)	.59 (15)	.20 (5)	1.42 (36)	—	2.7 (76.5)
PJTYS3530*†	1.38 (35)	5.04 (128)	.67 (17)	.39 (10)	.28 (7)	1.18 (30)	.20 (5)	2.28 (58)	—	3.6 (101.5)
PJTYS4015*†	1.57 (40)	3.58 (91)	.67 (17)	.39 (10)	.28 (7.2)	.59 (15)	.20 (5)	1.42 (36)	—	2.8 (78.5)
PJTYS4030*†	1.57 (40)	5.04 (128)	.67 (17)	.39 (10)	.28 (7.2)	1.18 (30)	.20 (5)	2.28 (58)	—	3.7 (103.5)
PJTYS5015*†	1.97 (50)	3.66 (93)	.67 (17)	.39 (10)	.35 (9)	.59 (15)	.20 (5)	1.42 (36)	—	3.3 (94)
PJTYS5030*†	1.97 (50)	5.12 (130)	.67 (17)	.39 (10)	.35 (9)	1.18 (30)	.20 (5)	2.28 (58)	—	4.2 (119)
PJTYS6030*†	2.36 (60)	6.18 (157)	1.18 (30)	.79 (20)	.31 (8)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	10.4 (294)
PJTYS6050*†	2.36 (60)	7.17 (182)	1.18 (30)	.79 (20)	.31 (8)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	11.6 (328)
PJTYS8030*†	3.15 (80)	6.22 (158)	1.18 (30)	.79 (20)	.37 (9.5)	1.18 (45)	.39 (10)	1.97 (50)	.47 (12)	11.9 (338)
PJTYS8050*†	3.15 (80)	7.20 (183)	1.18 (30)	.79 (20)	.37 (9.5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	13.1 (372)

Inches (mm)
** Cup material
† Vacuum port

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2-1/2 bellows design minimizes contact pressure applied to the product. The soft seal lip and touch allows the cup to conform to the product's surface to make a vacuum seal.

These multiple bellow cups are designed for applications that require additional level compensation, more flexibility, or minimum back pressure for a "soft touch". The multiple bellow has a soft sealing edge good for a variety of sensitive applications; such as food packaging, CD / DVD, medical packaging, and highly irregular curved surfaces. Cups can also be used to assist with sheet separation in destack operations.

Features

- Soft touch
- Extra level compensation
- Flexible sealing lip for irregular curved surfaces
- 5mm to 90mm in diameter

Styles

- PCTM series male thread connector
- PCTF series female thread Connector
- PCTK series barbed bulkhead

Specifications

Cup material	Nitrile	Nitrile ESD*	Silicon	Silicon ESD*	Urethane
Material code	**NBR**	**NBRE**	**SI**	**SIE**	**U**
Operating temperature (°C)	-20° to +120°	-30° to +120°	-60° to +250°	-60° to +250°	-30° to +120°
Color	Black	Black / Blue Dot	White	Black / Red Dot	Blue
Hardness, shore A (°Sh)	55 ±5	70 ±5	55 ±5	55 ±5	55 ±5
Electrical resistance (Ωm)	—	800 to 1000	—	800 to 1000	—

* ESD: Electric Static Dissipative Material

How to order

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

Example: To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PCTM-20B-NBR-G1 becomes PCTM-20B-U-G1. Inquire with factory for availability.

Application guide

2-1/2 Bellows

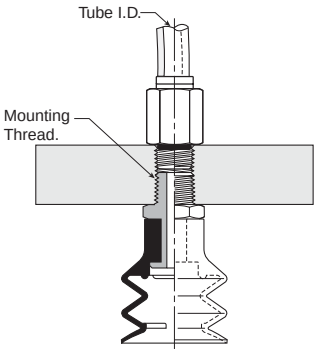
Flat surface, any section	Bowed surface, thin section	Slightly bowed surface, any section	Bowed surface, any section	Soft material	Metal sheet handling	Corrugated sheet handling	Differences in heights and levels	Not for vertical lift

PCTM Series Male Thread Connector

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	**PCTM-5-NBR-M5**	**PCG-5-NBR**	**PCTM-5-SI-M5**	**PCG-5-SI**	**FTM-5A-M5H**
7	M5	**PCTM-7-NBR-M5**	**PCG-7-NBR**	**PCTM-7-SI-M5**	**PCG-7-SI**	**FTM-5A-M5H**
10	M5	**PCTM-10-NBR-M5**	**PCG-10-NBR**	**PCTM-10-SI-M5**	**PCG-10-SI**	**CTM-10-M5H**
10	G1	**PCTM-10-NBR-G1**	**PCG-10-NBR**	**PCTM-10-SI-G1**	**PCG-10-SI**	**CTM-10-G1H**
15	M5	**PCTM-15-NBR-M5**	**PCG-15-NBR**	**PCTM-15-SI-M5**	**PCG-15-SI**	**CTM-10-M5H**
15	G1	**PCTM-15-NBR-G1**	**PCG-15-NBR**	**PCTM-15-SI-G1**	**PCG-15-SI**	**CTM-10-G1H**
20	M5	**PCTM-20-NBR-M5**	**PCG-20-NBR**	**PCTM-20-SI-M5**	**PCG-20-SI**	**CTM-10-M5H**
20	G1	**PCTM-20-NBR-G1**	**PCG-20-NBR**	**PCTM-20-SI-G1**	**PCG-20-SI**	**CTM-10-G1H**
30	G1	**PCTM-30-NBR-G1**	**PCG-30-NBR**	**PCTM-30-SI-G1**	**PCG-30-SI**	**CTM-30-G1H**
30	G2	**PCTM-30-NBR-G2**	**PCG-30-NBR**	**PCTM-30-SI-G2**	**PCG-30-SI**	**CTM-30-G2**
30	N1	**PCTM-30-NBR-N1**	**PCG-30-NBR**	**PCTM-30-SI-N1**	**PCG-30-SI**	**CTM-30-N1**
40	G1	**PCTM-40-NBR-G1**	**PCG-40-NBR**	**PCTM-40-SI-G1**	**PCG-40-SI**	**CTM-30-G1H**
40	G2	**PCTM-40-NBR-G2**	**PCG-40-NBR**	**PCTM-40-SI-G2**	**PCG-40-SI**	**CTM-30-G2**
40	N1	**PCTM-40-NBR-N1**	**PCG-40-NBR**	**PCTM-40-SI-N1**	**PCG-40-SI**	**CTM-30-N1**
60	G1	**PCTM-60-NBR-G1**	**PCG-60-NBR**	**PCTM-60-SI-G1**	**PCG-60-SI**	**CTM-30-G1H**
60	N1	**PCTM-60-NBR-N1**	**PCG-60-NBR**	**PCTM-60-SI-N1**	**PCG-60-SI**	**CTM-30-N1**
90	G2	**PCTM-90-NBR-G2**	**PCG-90-NBR**	**PCTM-90-SI-G2**	**PCG-90-SI**	**CTM-90-G2**
90	N2	**PCTM-90-NBR-N2**	**PCG-90-NBR**	**PCTM-90-SI-N2**	**PCG-90-SI**	**CTM-90-N2**

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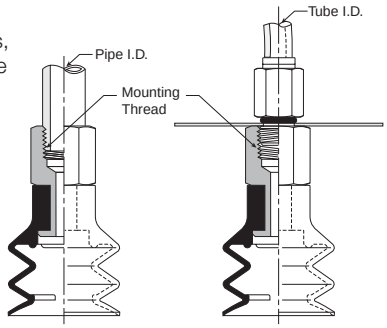
PCTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.
Fitting material: aluminum.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	M5	**PCTF-5-NBR-M5**	**PCG-5-NBR**	**PCTF-5-SI-M5**	**PCG-5-SI**	**FTF-5A-M5**
7	M5	**PCTF-7-NBR-M5**	**PCG-7-NBR**	**PCTF-7-SI-M5**	**PCG-7-SI**	**FTF-5A-M5**
10	1/8 BSPP	**PCTF-10-NBR-G1**	**PCG-10-NBR**	**PCTF-10-SI-G1**	**PCG-10-SI**	**CTF-10-G1**
15	1/8 BSPP	**PCTF-15-NBR-G1**	**PCG-15-NBR**	**PCTF-15-SI-G1**	**PCG-15-SI**	**CTF-10-G1**
20	1/8 BSPP	**PCTF-20-NBR-G1**	**PCG-20-NBR**	**PCTF-20-SI-G1**	**PCG-20-SI**	**CTF-10-G1**
30	1/8 BSPP	**PCTF-30-NBR-G1**	**PCG-30-NBR**	**PCTF-30-SI-G1**	**PCG-30-SI**	**CTF-30-G1**
30	1/8 NPT	**PCTF-30-NBR-N1**	**PCG-30-NBR**	**PCTF-30-SI-N1**	**PCG-30-SI**	**CTF-30-N1**
40	1/8 BSPP	**PCTF-40-NBR-G1**	**PCG-40-NBR**	**PCTF-40-SI-G1**	**PCG-40-SI**	**CTF-30-G1**
40	1/8 NPT	**PCTF-40-NBR-N1**	**PCG-40-NBR**	**PCTF-40-SI-N1**	**PCG-40-SI**	**CTF-30-N1**
60	1/8 NPT	**PCTF-60-NBR-N1**	**PCG-60-NBR**	**PCTF-60-SI-N1**	**PCG-60-SI**	**CTF-30-G1**
60	1/4 NPT	**PCTF-60-NBR-N1**	**PCG-60-NBR**	**PCTF-60-SI-N1**	**PCG-60-SI**	**CTF-30-N1**
90	1/4 BSPP	**PCTF-90-NBR-G2**	**PCG-90-NBR**	**PCTF-90-SI-G2**	**PCG-90-SI**	**CTF-90-G2**
90	1/4 NPT	**PCTF-90-NBR-N2**	**PCG-90-NBR**	**PCTF-90-SI-N2**	**PCG-90-SI**	**CTF-90-N2**

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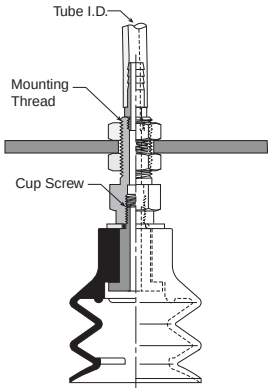
PCTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: Nickel plated brass.

Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup diameter (mm)	Vacuum port	Complete assembly Nitrile (NBR)	Replacement cup Nitrile (NBR)	Complete assembly Silicon (SI)	Replacement cup Silicon (SI)	Replacement cup fitting
5	Barb	**PCTK-5-NBR**	**PCG-5-NBR**	**PCTK-5-SI**	**PCG-5-SI**	**FTK-5A**
7	Barb	**PCTK-7-NBR**	**PCG-7-NBR**	**PCTK-7-SI**	**PCG-7-SI**	**FTK-5A**
10	Barb	**PCTK-10-NBR**	**PCG-10-NBR**	**PCTK-10-SI**	**PCG-10-SI**	**CTK-10**
15	Barb	**PCTK-15-NBR**	**PCG-15-NBR**	**PCTK-15-SI**	**PCG-15-SI**	**CTK-10**
20	Barb	**PCTK-20-NBR**	**PCG-20-NBR**	**PCTK-20-SI**	**PCG-20-SI**	**CTK-10**
30	Barb	**PCTK-30-NBR**	**PCG-30-NBR**	**PCTK-30-SI**	**PCG-30-SI**	**CTK-30**
40	Barb	**PCTK-40-NBR**	**PCG-40-NBR**	**PCTK-40-SI**	**PCG-40-SI**	**CTK-30**
60	Barb	**PCTK-60-NBR**	**PCG-60-NBR**	**PCTK-60-SI**	**PCG-60-SI**	**CTK-30**
90	NPT	**PCTK-90-NBR-N1**	**PCG-90-NBR**	**PCTK-90-SI-N1**	**PCG-90-SI**	**CTK-90-N1**
90	BSPP	**PCTK-90-NBR-G1**	**PCG-90-NBR**	**PCTK-90-SI-G1**	**PCG-90-SI**	**CTK-90-G1**

☐ Most popular.

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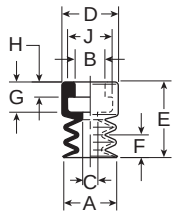
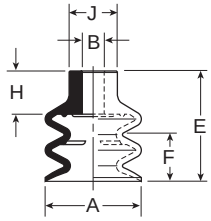
PCG Series Replacement Cup Dimensions

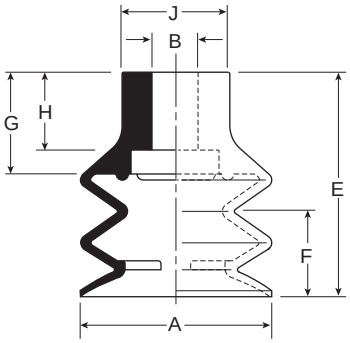
PCG-5 and PCG-7



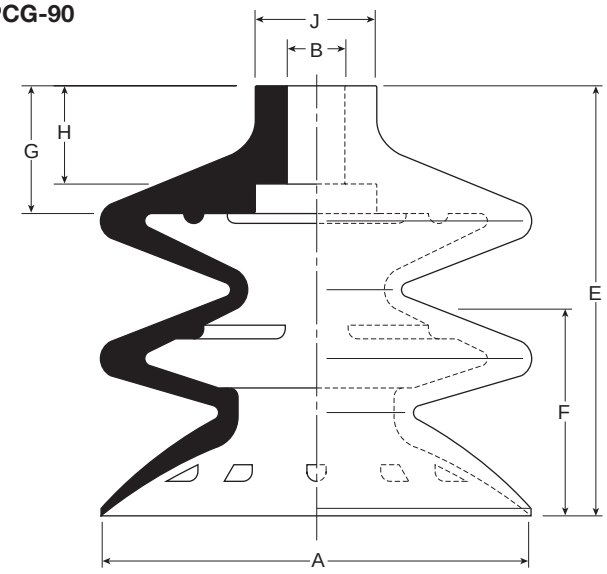
PCG-10 thru PCG-20



PCG-30 thru PCG-60



PCG-90



Model number	ØA	ØB	ØC	ØD	E	F	G	H	J
PCG-5-*	.20 (5)	.16 (4)	.08 (2)	.30 (7.5)	.37 (9.5)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-7-*	.28 (7)	.16 (4)	.08 (2)	.30 (7.5)	.39 (10)	.12 (3)	.16 (4)	.08 (2)	.24 (6)
PCG-10-*	.35 (9)	.20 (5)	—	—	.59 (15)	.12 (3)	.28 (7)	—	.35 (9)
PCG-15-*	.60 (15.2)	.20 (5)	—	—	.90 (22)	.39 (10)	.35 (9)	—	.39 (10)
PCG-20-*	.79 (20)	.20 (5)	—	—	.91 (23)	.39 (10)	.35 (9)	—	.39 (10)
PCG-30-*	1.26 (32)	.31 (8)	—	—	1.48 (37.5)	.57 (14.5)	.67 (17)	.51 (13)	.71 (18)
PCG-40-*	1.65 (42)	.31 (8)	—	—	1.81 (46)	.87 (22)	.67 (17)	.51 (13)	.79 (20)
PCG-60-*	2.44 (62)	.31 (8)	—	—	2.17 (55)	1.06 (27)	.71 (18)	.51 (13)	.85 (21.5)
PCG-90-*	3.46 (88)	.47 (12)	—	—	3.44 (87.5)	1.65 (42)	1.02 (26)	.79 (20)	.98 (25)

Inches (mm)
* Cup material

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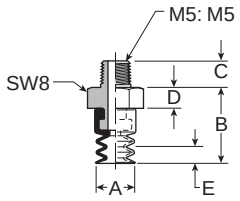
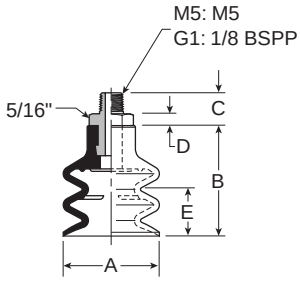
Dimensions

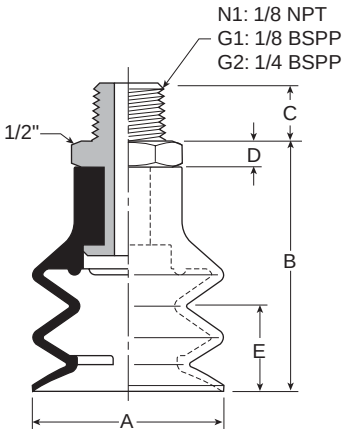
PCTM-5 and PCTM-7



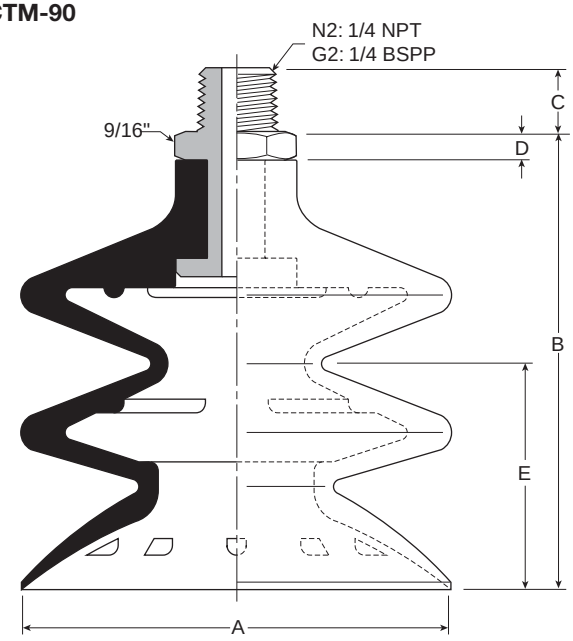
PCTM-10 thru PCTM-20



PCTM-30 thru PCTM-60



PCTM-90



Model number	ØA	B	C (M5)	C (N1 / G1)	C (M10 / G2)	C (N2)	D	E
PCTM-5-*-†	.20 (5)	.51 (13)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-7-*-†	.28 (7)	.53 (13.5)	.18 (4.5)	—	—	—	.14 (3.5)	.12 (3)
PCTM-10-*-†	.35 (9)	.69 (17.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.12 (3)
PCTM-15-*-†	.60 (15.2)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-20-*-†	.79 (20)	1.04 (25.5)	.18 (4.5)	.31 (8)	—	—	.10 (2.5)	.39 (10)
PCTM-30-*-†	1.26 (32)	1.67 (42.5)	—	.31 (8)	.39 (10)	—	.20 (5)	.57 (14.5)
PCTM-40-*-†	1.65 (42)	2.01 (51)	—	.31 (8)	.39 (10)	—	.20 (5)	.87 (22)
PCTM-60-*-†	2.44 (62)	2.36 (60)	—	.31 (8)	.39 (10)	—	.20 (5)	1.06 (27)
PCTM-90-*-†	3.46 (88)	3.64 (92.5)	—	—	.39 (10)	.59 (15)	.20 (5)	1.65 (42)

Inches (mm)
* Cup material
† Thread size

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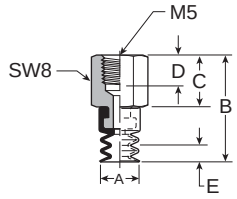
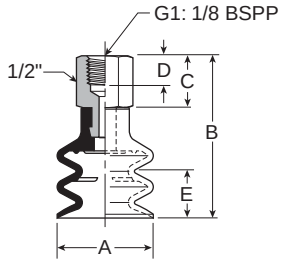
Dimensions

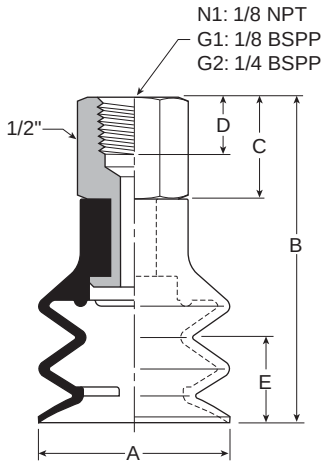
PCTF-5 and PCTF-7



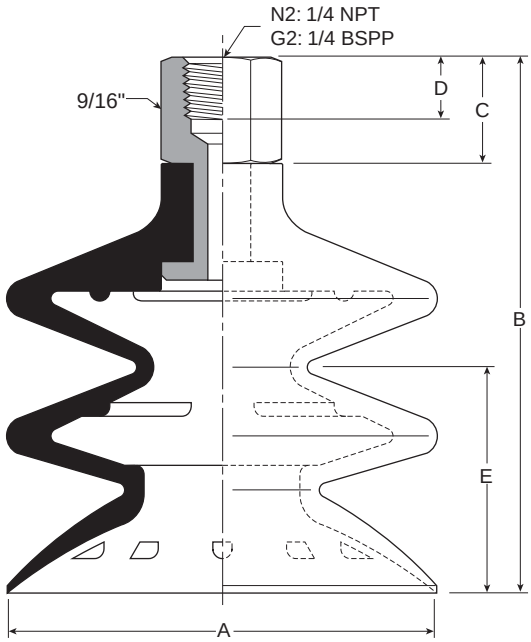
PCTF-10 thru PCTF-20



PCTF-30 thru PCTF-60



PCTF-90

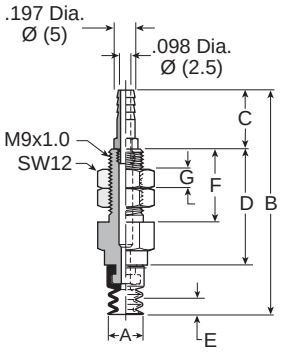


Model number	ØA	B	C	D	E
PCTF-5*†	.20 (5)	.85 (21.5)	.47 (12)	.31 (8)	.12 (3)
PCTF-7*†	.28 (7)	.87 (22)	.47 (12)	.31 (8)	.12 (3)
PCTF-10*†	.35 (9)	1.06 (27)	.47 (12)	.31 (8)	.12 (3)
PCTF-15*†	.60 (15.2)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-20*†	.79 (20)	1.38 (35)	.47 (12)	.31 (8)	.39 (10)
PCTF-30*†	1.26 (32)	2.03 (51.5)	.55 (14)	.31 (8)	.57 (14.5)
PCTF-40*†	1.65 (42)	2.36 (60)	.55 (14)	.31 (8)	.87 (22)
PCTF-60*†	2.44 (62)	2.72 (69)	.55 (14)	.31 (8)	1.06 (27)
PCTF-90*†	3.46 (88)	4.13 (105)	.69 (17.5)	.39 (10)	1.65 (42)

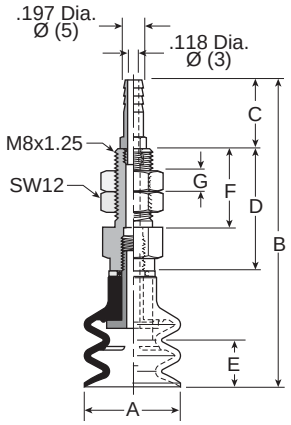
Inches (mm)
* Cup material
† Thread size

Dimensions

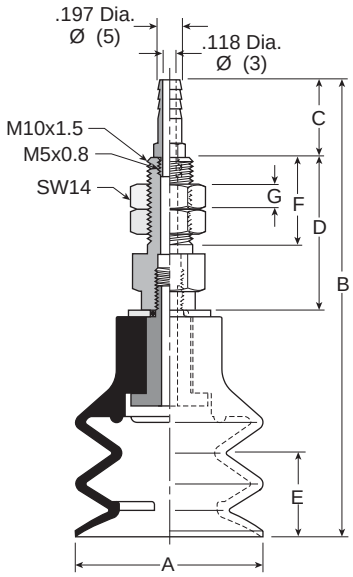
PCTK-5 and PCTK-7



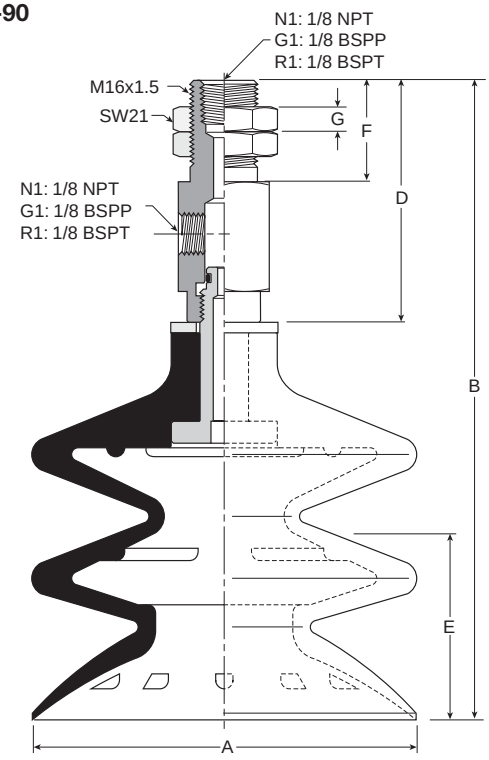
PCTK-10 thru PCTK-20



PCTK-30 thru PCTK-60



PCTK-90



Model number	ØA	B	C	D	E	F	G	Wt oz. (g)
PCTK-5-*	.20 (5)	1.32 (33.5)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-7-*	.28 (7)	1.34 (34)	.39 (10)	.55 (14)	.12 (3)	.47 (12)	.12 (3)	.56 (11)
PCTK-10-*	.35 (9)	2.21 (56.2)	.63 (16)	.88 (22.5)	.12 (3)	.59 (15)	.16 (4)	.78 (22)
PCTK-15-*	.60 (15.2)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-20-*	.79 (20)	2.53 (64.2)	.63 (16)	.86 (22)	.39 (10)	.59 (15)	.16 (4)	.78 (22)
PCTK-30-*	1.26 (32)	3.42 (86.8)	.63 (16)	1.26 (32)	.57 (14.5)	.79 (20)	.20 (5)	1.62 (46)
PCTK-40-*	1.65 (42)	3.75 (95.3)	.63 (16)	1.26 (32)	.86 (22)	.79 (20)	.20 (5)	1.94 (55)
PCTK-60-*	2.44 (62)	4.11 (104.3)	.63 (16)	1.26 (32)	1.06 (27)	.79 (20)	.20 (5)	3.00 (85)
PCYK-90-*	3.46 (88)	5.70 (144.8)	.91 (23)	2.17 (55)	1.65 (42)	.43 (11)	—	10.58 (300)

Inches (mm)
* Cup material
† Vacuum port

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30° inclusive swivel, single lip cup for smooth, slightly curved surfaces and flexible products. Rigid construction provides good stability against acceleration and deceleration forces during product transfer.

The single edge swivel cup is for smooth surfaces with slightly curved surfaces or flexible sheets with substantial weights. Typically, lift capacities and break away forces are higher for flat cups which may be necessary for good stability during lift and transfer. The position of the internal swivel joint minimizes moments during lift and transfer. The swivel joint compensates for load and angular misalignment instead of the cup material, prolonging cup life. Maintenance costs are minimized by replacing only the cup portion of the assembly.

Features

- Internal swivel joint design
- 30° Inclusive angle for flexible products
- Increased stability for horizontal lifts
- Lower maintenance costs
- 60mm to 100mm diameters

Styles

- PUTK series barbed bulkhead
- PUTYS series bulkhead level compensator

Specifications

Suction cup material	Nitrile (NBR)	Silicon (SI)
Operating temperature (°C)	-20° to +120°	-60° to +250°
Color	Black	White
Hardness, shore A (°Sh)	55 ±5	55 ±5

Application guide

Swivel Bellows

Flat surface, thin section

Flat surface, any section

Slightly bowed surface, thin section

Slightly bowed surface, any section

Metal sheet handling

Not for vertical lift

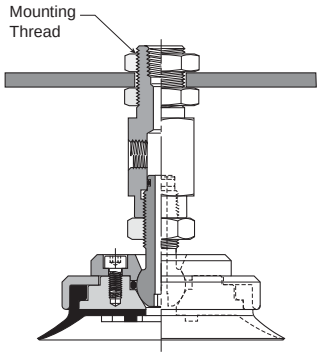
PUTK Series Barbed Bulkhead

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

Installation

Note:

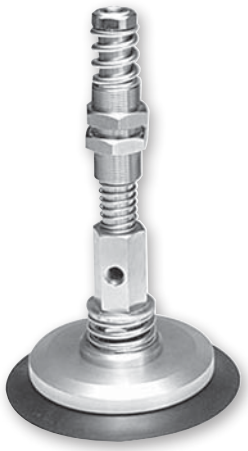
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



Cup size	Vacum port	Cup material Nitrile assembly (NBR)	Replacement PUGB swivel with cup only	Replacement cup only (NBR)	Cup fitting
60	1/8 NPT	**PUTK-60-NBR-N1**	**PUGB-60-NBR**	**PUG-60-NBR**	**UTK-60-N1**
80	1/8 NPT	**PUTK-80-NBR-N1**	**PUGB-80-NBR**	**PUG-80-NBR**	**UTK-60-N1**
100	1/8 NPT	**PUTK-100-NBR-N1**	**PUGB-100-NBR**	**PUG-100-NBR**	**UTK-60-N1**

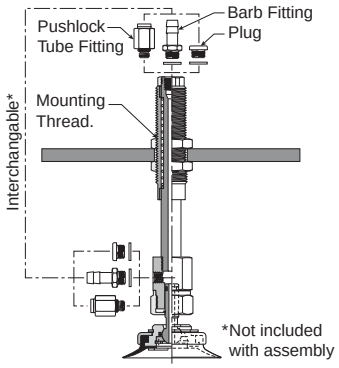
PUTYS Series Bulkhead Level Compensator

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.



Installation

Note:
When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.
Shown are interchangable connectors & plugs for port connections.

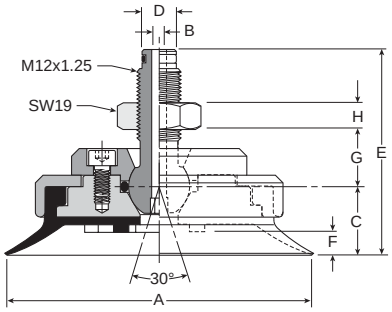


Cup diameter (mm)	Vacum port	Stroke (mm)	Spring compression Force lbf (N) 0%	100%	PUTYS assemlby (NBR)	Replacement PUGB swivel with cup only	Replacement cup only NBR	Level compensator P/N
60	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PUTYS6030NBRN1**	**PUGB-60-NBR**	**PUG-60-NBR**	**UTYS-60-30**
60	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PUTYS6050NBRN1**	**PUGB-60-NBR**	**PUG-60-NBR**	**UTYS-60-50**
80	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PUTYS8030NBRN1**	**PUGB-80-NBR**	**PUG-80-NBR**	**UTYS-60-30**
80	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PUTYS8050NBRN1**	**PUGB-80-NBR**	**PUG-80-NBR**	**UTYS-60-50**
100	1/8 NPT	30	1.6 (6.8)	3.6 (15.6)	**PUTYS10030NBRN1**	**PUGB-100-NBR**	**PUG-100-NBR**	**UTYS-60-30**
100	1/8 NPT	50	1.9 (8.3)	4.5 (19.6)	**PUTYS10050NBRN1**	**PUGB-100-NBR**	**PUG-100-NBR**	**UTYS-60-50**

☐ **Most popular.**

PUGB Series Barbed Bulkhead Dimensions

PUGB-60 thru
PUGB-100



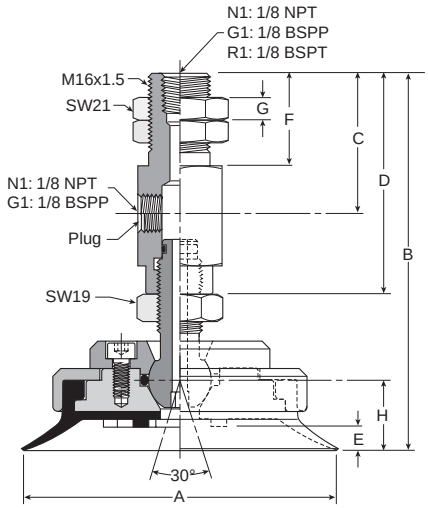
Model number	ØA	ØB	C	ØD	E	F	G	H
PUGB-60-*	2.36 (60)	.15 (3.9)	.63 (16)	.35 (9)	2.05 (52)	.20 (5)	.59 (15)	.28 (7)
PUGB-80-*	3.15 (80)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)
PUGB-100-*	3.94 (100)	.15 (3.9)	.71 (18)	.35 (9)	2.13 (54)	.24 (6)	.59 (15)	.28 (7)

Inches (mm)
* Cup material

C
Vacuum Cups
Vacuum Products

PUTK Series Barbed Bulkhead Dimensions

PUTK-60 thru
PUTK-100

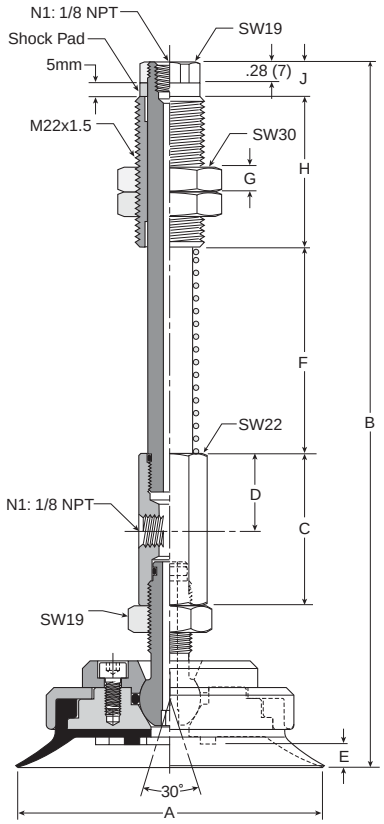


Model number	ØA	B	C	D	E	F	G	H	Wt oz (g)
PUTK-60-*	2.36 (60)	3.66 (93)	.63 (16)	1.89 (48)	.20 (5)	.91 (23)	.24 (6)	.63 (16)	12.4 (352)
PUTK-80-*	3.15 (80)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	15.7 (444)
PUTK-100-*	3.94 (100)	3.74 (95)	1.38 (35)	2.16 (55)	.24 (6)	.91 (23)	.24 (6)	.71 (18)	20.0 (568)

Inches (mm)
* Cup material

Dimensions

PUTYS60 thru PUTYS100

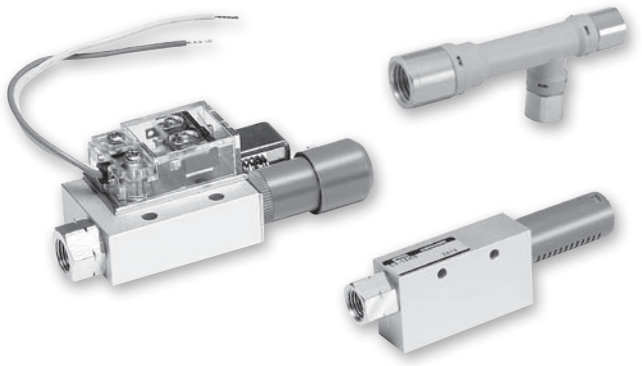


Model number	ØA	B	C	D	E	F	G	H	J	Wt oz (g)
PUTYS6030*	2.36 (60)	7.28 (185)	1.57 (40)	.79 (20)	.20 (5)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	17.2 (487)
PUTYS6050*	2.36 (60)	8.27 (210)	1.57 (40)	.79 (20)	.20 (5)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	18.4 (521)
PUTYS8030*	3.15 (80)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	19.7 (559)
PUTYS8050*	3.15 (80)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	20.1 (595)
PUTYS10030*	1.18 (30)	7.36 (187)	1.57 (40)	.79 (20)	.24 (6)	1.77 (45)	.39 (10)	1.97 (50)	.47 (12)	25.7 (729)
PUTYS10050*	1.18 (30)	8.35 (212)	1.57 (40)	.79 (20)	.24 (6)	2.76 (70)	.39 (10)	1.97 (50)	.47 (12)	26.7 (756)

Inches (mm)
* Cup material

Vacuum Generators
MCA, CV, CV-CK

Parker Inline Single Stage Vacuum Generators is a compact design offering multiple vacuum flow ranges in 3 styles. These Generators are meant to be mounted near the vacuum application for improved vacuum response time. A Normally Open or Normally Closed 3 way valve can be used to control the supply pressure to obtain up to a 27 Inhg degree of vacuum.



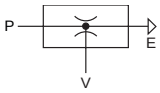
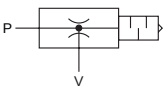
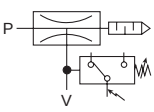
Features

- **MCA:**
  - light weight vacuum generator
  - vacuum flow rates to 1.26 SCFM
- **CV:**
  - basic aluminum body generator with exhaust muffler
  - vacuum flow rates to 12.36 SCFM
  - degree of vacuum to 27 inHg
- **CV-CK**
  - basic aluminum body generator with mechanical vacuum switch
  - vacuum flow rates to 5.85 SCFM
  - degree of vacuum to 27 inHg

Specifications

Media	Non-lubricated air, non-corrosive gases
Operating pressure	14 to 114 PSI
Operating temperature	32° to 120°F (MCA, CV); 32 to 140°F (CV-CK)
Material	Polycarbonate, Aluminum fittings (MCA)
	Body: Aluminum (CV, CV-CK)
	Nozzle: Nickel plated brass (CV, CV-CK)
CV-CK Switch	Setting range: 5.9 to 15.7 inHg, accuracy ± 1.57 inHg
	Hysteresis: 1.1 to 3.9 inHg
	Switch output: N.O., AC125V; 5A, AC250V: 3A, DC250V: 0.2A

MCA, CV, CV-CK Vacuum Generators

Symbol	Port size Pressure	Vacuum	Exhaust	Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number NPT	BSPP
MCA Series 	1/8	1/8	1/4	1.68	1.68	24	**MCA10HSN1N1N2**	**MCA10HSG1G1N2**
	1/4	1/4	1/4	2.81	2.81	24	**MCA13HSN1N1N2**	**MCA13HSG1G1G2**
CV Series	1/8	1/8	Muffler	0.21	0.46	27	**CV05HSN**	**CV05HSG**
	1/8	1/8	Muffler	0.32	0.46	17	**CV05LSN**	**CV05LSG**
	1/8	1/8	Muffler	0.95	1.55	27	**CV10HSN**	**CV10HSG**
	1/8	1/8	Muffler	1.27	1.55	17	**CV10LSN**	**CV10LSG**
	1/4	3/8	Muffler	2.22	3.53	27	**CV15HSN**	**CV15HSG**
	1/4	3/8	Muffler	3.35	3.53	17	**CV15LSN**	**CV15LSG**
	1/4	3/8	Muffler	3.88	6.36	27	**CV20HSN**	**CV20HSG**
	1/4	1/2	Muffler	5.85	6.36	17	**CV20LSN**	**CV20LSG**
	3/8	1/2	Muffler	5.65	9.36	27	**CV25HSN**	**CV25HSG**
	3/8	1/2	Muffler	8.83	9.36	17	**CV25LSN**	**CV25LSG**
	1/2	3/4	Muffler	7.94	13.60	27	**CV30AHSN**	**CV30AHSG**
	1/2	3/4	Muffler	12.36	13.60	17	**CV30ALSN**	**CV30ALSG**
CV-CK Series	1/8	1/8	—	0.95	1.55	27	**CV10HSCKN**	**CV10HSCKG**
	1/4	1/4	—	2.22	3.53	27	**CV15HSCKN**	**CV15HSCKG**
	1/4	3/8	—	3.88	6.36	27	**CV20HSCKN**	**CV20HSCKG**

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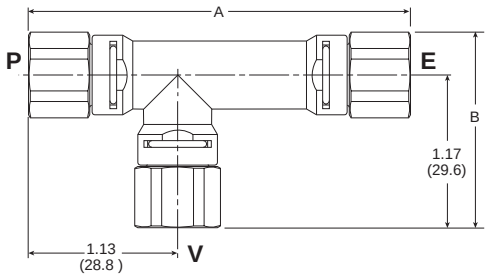
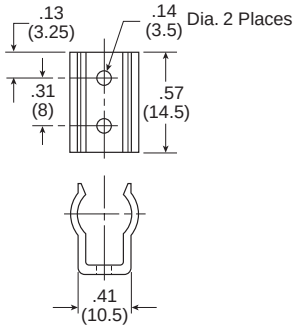
Dimensions

MCA



MCA Mounting bracket: MCA-B

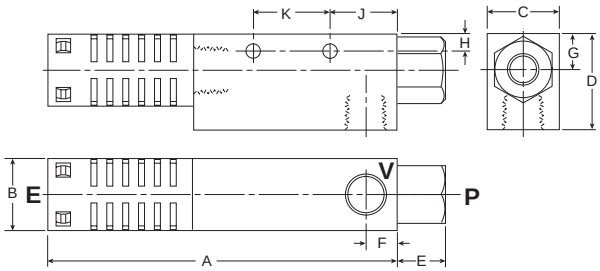


MCA****N1N1N2

Part number	A	B
MCA10HS******	2.76 (70)	1.16 (29.5)
MCA13HS******	2.76 (70)	1.16 (29.5)

Inches (mm)

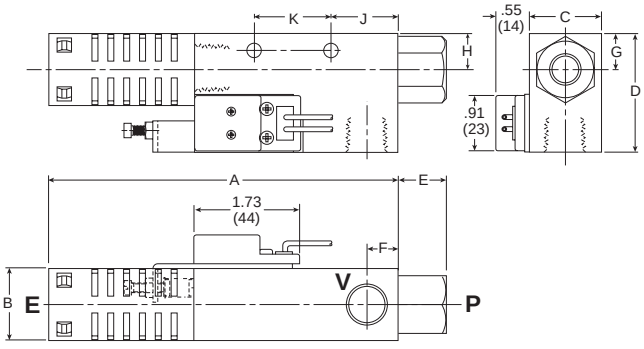
CV



Part number	A	B	C	D	E	F	G	H	J	K
CV05HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV10HS/LS	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	.55 (14)	.79 (20)
CV15HS/LS	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.79 (20)	.98 (25)
CV20HS/LS	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	1.10 (28)	1.26 (32)
CV25HS/LS	7.72 (196)	1.57 (40)	1.57 (40)	2.36 (60)	.67 (17)	.63 (16)	.79 (20)	.22 (5.5)	.79 (20)	1.97 (50)
CV30AHS/ALS	8.43 (214)	1.57 (40)	1.57 (40)	2.36 (60)	.79 (20)	.79 (20)	.79 (20)	.22 (5.5)	1.30 (33)	1.97 (50)

Inches (mm)

CV-CK



Part number	A	B	C	D	E	F	G	H	J	K
CV10HS/LSCK	3.19 (81)	.73 (18.5)	.63 (16)	1.30 (33)	.39 (10)	.31 (8)	.39 (10)	.18 (4.5)	17 (4.2)	.79 (20)
CV15HS/LSCK	4.27 (108.5)	.79 (20)	.79 (20)	1.38 (35)	.59 (15)	.39 (10)	.43 (11)	.20 (5)	.18 (4.5)	.98 (25)
CV20HS/LSCK	5.73 (145.5)	1.18 (30)	1.18 (30)	1.57 (40)	.79 (20)	.51 (13)	.59 (15)	.28 (7)	.24 (6)	1.26 (32)

Inches (mm)

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CHF- High Flow Series is a multistage vacuum generator. CHF unit is ideal for porous applications.

4 bolt mounting pattern with gauge opposite of vacuum and pressure inlet ports enables this generator to be panel mounted.

CHF Series comes standard with flow thru exhaust mufflers to reduce clogging in dirty environments. Additional Pneumatic Control Valve is required to create vacuum flow.

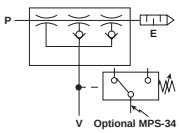
Features

- Classic multi-stage venturi
- Anodized aluminum body
- Aluminum body includes exhaust muffler
- Maximum vacuum level, 27.3 inHg
- Vacuum flow rates from 12.5 to 31.8 SCFM
- Mounting brackets included

Specifications

Media	Non-lubricated air, non-corrosive gases
Operating pressure	80 PSI
Operating temperature	32°F to 120°F
Material	Body: Aluminum Nozzle & Diffuser: Polymer Seals: BUNA N

CHF High Flow Vacuum Generators

	Port size			Max. vacuum flow SCFM	Air consumption SCFM	Max. degree of vacuum inHg	Part number NPT
	Pressure	Vacuum	Exhaust				
Symbol 	1/4	3/8	Muffler	20.9	6.5	27	**CHF-20ZNE**
	1/4	3/8	Muffler	26.3	9.6	27	**CHF-30ZNE**
	1/4	3/8	Muffler	31.8	14.0	27	**CHF-40ZNE**

Accessories

Port size	Description	Part number
3/8	Filter with 10 micron element	**VFP2CFC01**
1/2		**VFP3CFC01**
3/8	Filter with 10 micron element and 2 replacement elements	**VFP2CFC03**
1/2		**VFP3CFC03**

See Accessories Section for more options

VFP Series filter

Replacement components

Description	Part number
CHF- Repair kit	**SFCHF90NN**
0 to 30 inHg gauge	**266298A**
Bracket kit (Includes 4 brackets & 4 M5 x 15 screws	**SFBW15**
Silencer (flow thru)	**SIS-001**

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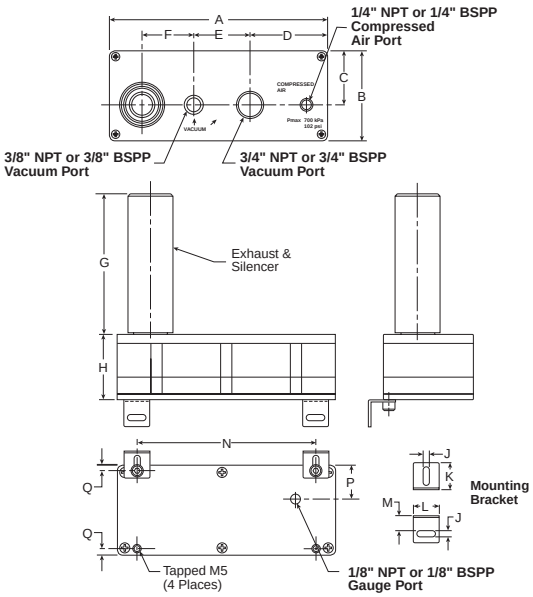
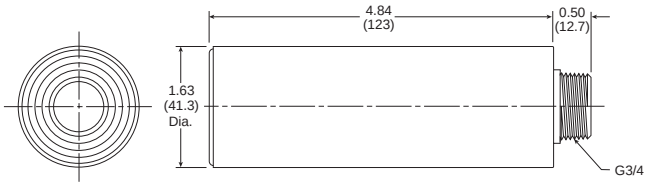
Dimensions



Part number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	Weight (grams)
CHF-20	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	875
CHF-30	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	1.69 (43)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	885
CHF-40	7.64 (194)	3.15 (80)	1.89 (48)	2.72 (69)	1.97 (50)	1.81 (46)	4.84 (123)	2.28 (58)	.22 (5.5)	.94 (24)	.91 (23)	.51 (13)	6.26 (159)	1.26 (32)	.20 (5)	965

Inches (mm)

SIS-001 silencer dimensions



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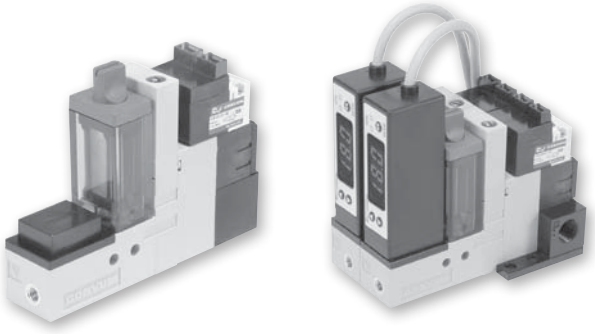
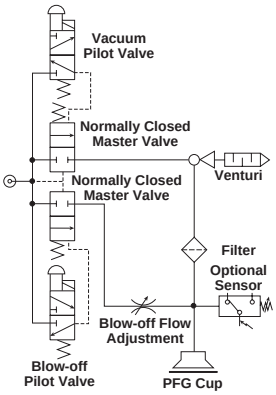
The MC22 is a complete package for factory automation. The MC22 has integrated vacuum generating and blow-off release pilot valves to minimize the response time to achieve vacuum. The small foot print and lightweight body allows the unit to be located close to the suction cup for maximum performance. The MC22 has additional features; regulating blow-off needle, 37 micron mesh filter, and a sensor platform for vacuum confirmation. The MC22 can be assembled into a maximum 8 station manifold. The unit can be ordered normally open or normally closed, with or without MPS-23 or MVS-201 pressure sensors.



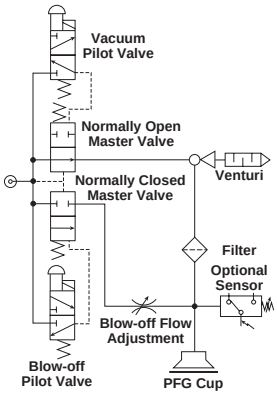
Add-A-Fold Manifold

Features

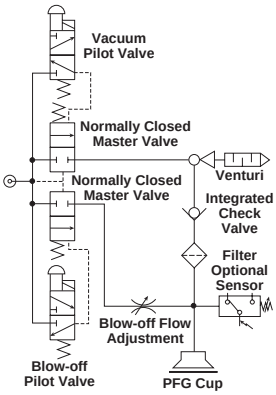
- Vacuum generating pilot valve
- Vacuum blow-off pilot valve
- Vacuum sensor - filter - silencer available
- Regulating blow-off adjustment
- Manifold system
- Short cycle times for high speed pick and place
- Vacuum flow rates to 1.55 SCFM



MC2, Normally Closed Vacuum Valve



MC2, Normally Open Vacuum Valve



MC2, Normally Closed Vacuum Valve with Integrated Check Valve

Specifications

Media	Non-lubricated compressed air, non-corrosive gases
Operating pressure	21 to 84 PSI (1.5 to 6 kgf/cm^2)
Optimum operating pressure	70 PSI (5 kgf/cm^2)
Humidity	35 to 85%
Pressure port	N: 1/8 NPT female, G: 1/8 BSPP female
Vacuum port	M5 female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Aluminum, Polyamide, NBR
Vacuum generating and blow-off release pilot	
Type of control valve	Pilot valve, includes 300mm clip wire connector
Manual operation	Non-locking manual override
Electrical connection	Clip type connector with LED and surge protection
Power supply	24VDC ± 10%
Power consumption	1W
Pressure range	21 to 84 PSI (1.5 to 6 kgf/cm^2)
Pilot valve air supply	Normally closed
Generator weight	4.1 oz. (117G) without sensor
Manifold weight	2-Station: 1.4 oz. (40g), 3-Station: 2 oz. (54g), 4-Station: 2.4 oz. (68g), 5-Station: 2.8 oz. (82g) 6-Station: 3.4 oz. (96g), 7-Station: 3.8 oz. (110g), 8-Station: 4.4 oz. (124g)

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MC2 Unit Without Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow	Max. degree of vacuum		Part number	
Pressure	Vacuum	Exhaust	SCFM	inHg	Sensor option	NPT	BSPP
1/8	M5	Muffler	1.55	24	None	**MC22S10HSZL4BLN**	**MC22S10HSZL4BLG**
1/8	M5	Muffler	1.55	24	MPS-V23C-PC. PNP	**MC22S10HS42L4BLN**	**MC22S10HS42L4BLG**
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	**MC22S10HS06L4BLN**	**MC22S10HS06L4BLG**
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	**MC22S10HS41L4BLN**	**MC22S10HS41L4BLG**
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	**MC22S10HS01L4BLN**	**MC22S10HS01L4BLG**

MC2 Unit Without Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow	Max. degree of vacuum		Part number	
Pressure	Vacuum	Exhaust	SCFM	inHg	Sensor option	NPT	BSPP
1/8	M5	Muffler	1.55	24	None	**MC22S10HSZL4ALN**	**MC22S10HSZL4ALG**
1/8	M5	Muffler	1.55	24	MPS-V23C-PC. PNP	**MC22S10HS42L4ALN**	**MC22S10HS42L4ALG**
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	**MC22S10HS41L4ALN**	**MC22S10HS41L4ALG**

MC2 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow	Max. degree of vacuum		Part number	
Pressure	Vacuum	Exhaust	SCFM	inHg	Sensor option	NPT	BSPP
1/8	M5	Muffler	1.55	24	None	**MC22S10HSZLC4BLN**	**MC22S10HSZLC4BLG**
1/8	M5	Muffler	1.55	24	MPS-V23C-PC. PNP	**MC22S10HS42LC4BLN**	**MC22S10HS42LC4BLG**
1/8	M5	Muffler	1.55	24	MVS-201-PCP, PNP	**MC22S10HS06LC4BLN**	**MC22S10HS06LC4BLG**
1/8	M5	Muffler	1.55	24	MPS-V23C-NC, NPN	**MC22S10HS41LC4BLN**	**MC22S10HS41LC4BLG**
1/8	M5	Muffler	1.55	24	MVS-201-NC, NPN	**MC22S10HS01LC4BLN**	**MC22S10HS01LC4BLG**

Station 1 Station 2

Example 1: Application requires a 2-Station MC22 manifold with NPT supply ports.

Qty.	Part number	Comment
1	AAMC2-M02N	Add-A-Fold
1	MC22S10HS42L4BLN	Station #1
1	MC22S10HS42L4BLN	Station #2
	Alternative Method	
1	AAMC2-M02N	Add-A-Fold
2	MC22S10HS42L4BLN	Station #1-2

☐ Most popular.

How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the MC22 Generator or a blank plate for each station of the manifold.
6. See model number index code for MC22 Generator number and MC22 accessories for blank plate part numbers.

AAMC2-M08N

Manifold port type
N NPT
G BSPP

Number of stations
M02 2
M03 3
M04 4
M05 5
M06 6
M07 7
M08 8*
* Maximum number of stations

Add-A-Fold assembly
AAMC2

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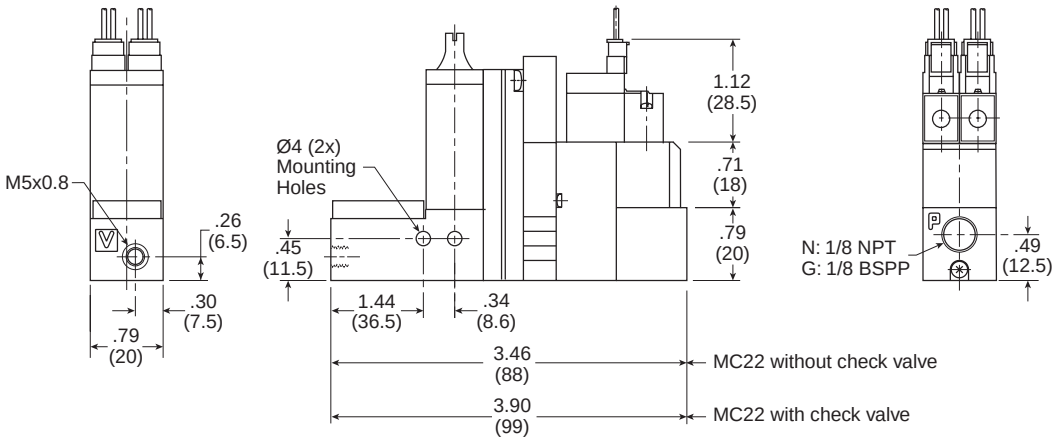
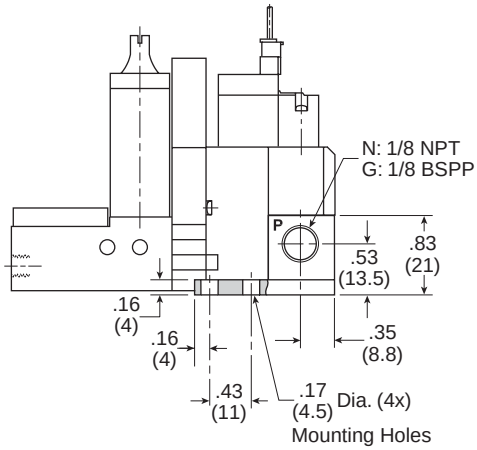
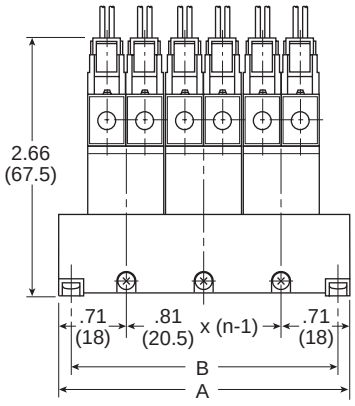
Dimensions



Manifold

3-Station manifold without check valve shown





n	2	3	4	5	6	7	8
A	2.22 (56.5)	3.03 (77)	3.84 (97.5)	4.65 (118)	5.45 (138.5)	6.26 (159)	7.07 (179.5)
B	1.91 (48.5)	2.72 (69.0)	3.52 (89.5)	4.33 (110)	5.14 (130.5)	5.95 (151)	6.75 (171.5)

Inches (mm)
n = Number of stations

Manifold part number

MC2 - M 08 N

Manifold	Stations	Port Size
	02	**N 1/8 NPT**
	03	G 1/8 BSPP
	04	R 1/8 BSPT
	05	
	06	
	07	
	08	

Bold Items are Most Popular.

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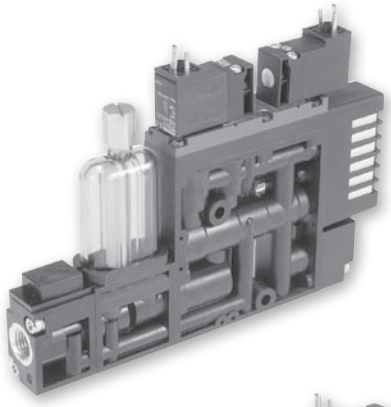
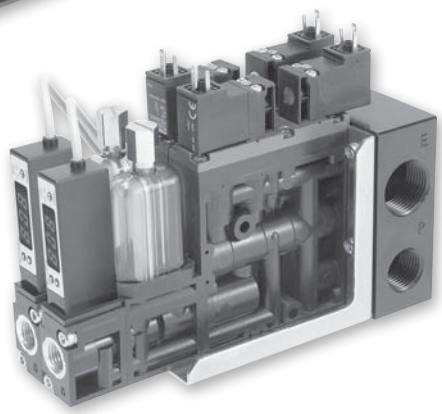
The MC72 Series vacuum generator provides a complete solution for factory automation. The MC72 is perfect for non-porous applications such as material handling, critical applications involving glass, or general transfer applications. The MC72 has integrated vacuum pilot and blow-off release pilot valves to minimize response times. The MC72 has additional features; regulating blow-off needle, 130 micron filter, optional check valve, and a sensor platform for vacuum confirmation. The MC72 can be assembled into a maximum 5 station manifold. The unit can be ordered normally open or normally closed.

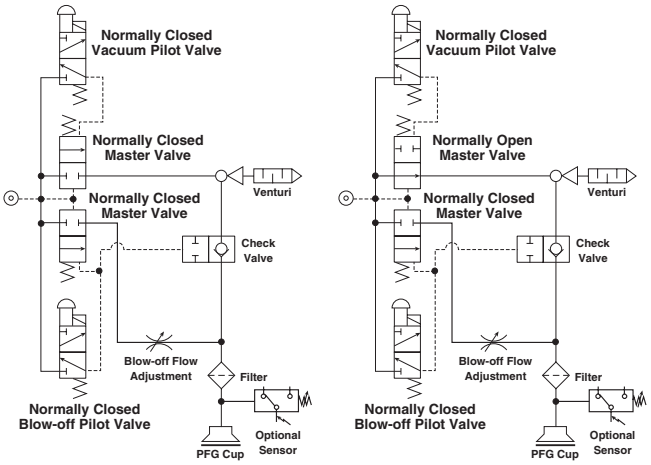




Add-A-Fold assembly (Silencer included)

Features

- Vacuum generating pilot valve
- Vacuum release pilot valve option
- Vacuum sensor - filter - silencer available
- Regulating blow-off
- Check valve option
- Air-economizing controls
- Manifold system
- Vacuum flow rates from 2.1 to 5.5 SCFM
- 3-Pin, EN175301-803, 15mm, 8mm 3-Pin



Specifications

Media	Non-lubricated compressed air, non-corrosive gases
Optimum operating pressure	70 PSI (5 kgf/cm^2)
Humidity	35 to 85%
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female
Vacuum port	N: 1/4 NPT female, G: 1/4 BSPP female
Operating temperature	41 to 132°F (5 to 50°C)
Material	Body (PA and PBT) with other internal components (Brass, AI.NBR, SUS, FKM), filter elements (PVF)
Manual operation	Non-locking manual override
Electrical connection	DIN connector with LED and surge protection, connectors included
Power supply	24VDC ± 10%
Power consumption	1.8W
Operating pressure	70 PSI (5 kgf/cm^2)
Pilot valve air supply	Normally closed
Generator weight	12.0 oz. (340g)
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)

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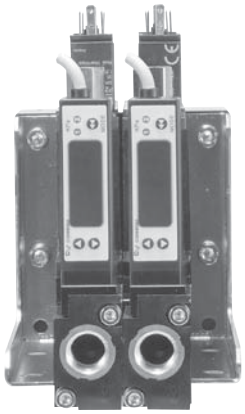
MC72 Unit With Integrated Check Valve, Normally Closed Vacuum Valve

Port size			Max. vacuum flow	Max. degree of vacuum		Part number	
Pressure	Vacuum	Exhaust	SCFM	inHg	Sensor option	NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	**MC72S15HSZSC4BPN**	**MC72S15HSZSC4BPG**
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	**MC72S15HS42C4BPN**	**MC72S15HS42C4BPG**
1/4	1/4	Muffler	2.20	24	MVS-201-PCP, PNP	**MC72S15HS06C4BPN**	**MC72S15HS06C4BPG**
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	**MC72S15HS41C4BPN**	**MC72S15HS41C4BPG**
1/4	1/4	Muffler	2.20	24	MVS-201-NC, NPN	**MC72S15HS01C4BPN**	**MC72S15HS01C4BPG**
1/4	1/4	Muffler	3.67	24	No sensor	**MC72S20HSZSC4BPN**	**MC72S20HSZSC4BPG**
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	**MC72S20HS42C4BPN**	**MC72S20HS42C4BPG**
1/4	1/4	Muffler	3.67	24	MVS-201-PCP, PNP	**MC72S20HS06C4BPN**	**MC72S20HS06C4BPG**
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	**MC72S20HS41C4BPN**	**MC72S20HS41C4BPG**
1/4	1/4	Muffler	3.67	24	MVS-201-NC, NPN	**MC72S20HS01C4BPN**	**MC72S20HS01C4BPG**
1/4	1/4	Muffler	5.20	24	No sensor	**MC72S25HSZSC4BPN**	**MC72S25HSZSC4BPG**
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	**MC72S25HS42C4BPN**	**MC72S25HS42C4BPG**
1/4	1/4	Muffler	5.20	24	MVS-201-PCP, PNP	**MC72S25HS06C4BPN**	**MC72S25HS06C4BPG**
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	**MC72S25HS41C4BPN**	**MC72S25HS41C4BPG**
1/4	1/4	Muffler	5.20	24	MVS-201-NC, NPN	**MC72S25HS01C4BPN**	**MC72S25HS01C4BPG**

MC72 Unit With Integrated Check Valve, Normally Open Vacuum Valve

Port size			Max. vacuum flow	Max. degree of vacuum		Part number	
Pressure	Vacuum	Exhaust	SCFM	inHg	Sensor option	NPT	BSPP
1/4	1/4	Muffler	2.20	24	No sensor	**MC72S15HSZSC4APN**	**MC72S15HSZSC4APG**
1/4	1/4	Muffler	2.20	24	MPS-V23C-PC, PNP	**MC72S15HS42C4APN**	**MC72S15HS42C4APG**
1/4	1/4	Muffler	2.20	24	MPS-V23C-NC, NPN	**MC72S15HS41C4APN**	**MC72S15HS41C4APG**
1/4	1/4	Muffler	3.67	24	No sensor	**MC72S20HSZSC4APN**	**MC72S20HSZSC4APG**
1/4	1/4	Muffler	3.67	24	MPS-V23C-PC, PNP	**MC72S20HS42C4APN**	**MC72S20HS42C4APG**
1/4	1/4	Muffler	3.67	24	MPS-V23C-NC, NPN	**MC72S20HS41C4APN**	**MC72S20HS41C4APG**
1/4	1/4	Muffler	5.20	24	No sensor	**MC72S25HSZSC4APN**	**MC72S25HSZSC4APG**
1/4	1/4	Muffler	5.20	24	MPS-V23C-PC, PNP	**MC72S25HS42C4APN**	**MC72S25HS42C4APG**
1/4	1/4	Muffler	5.20	24	MPS-V23C-NC, NPN	**MC72S25HS41C4APN**	**MC72S25HS41C4APG**

Add-A-Fold assembly ordering information



Station 1 Station 2

☐ Most popular.

How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for MC72 Generator number and accessories for blank plate part numbers.

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Example 1: Shown above is a 2-Station MC72 manifold with sensors and NPT Ports.

Qty.	Part number	Comment
1	AAMC72-M02N	Add-A-Fold
1	MC72SHS42C4BPN	Station #1
1	MC72SHS42C4BPN	Station #1
	Alternative Method	
1	AAMC72-M02N	Add-A-Fold
2	MC72SHS42C4BPN	Station #1-2

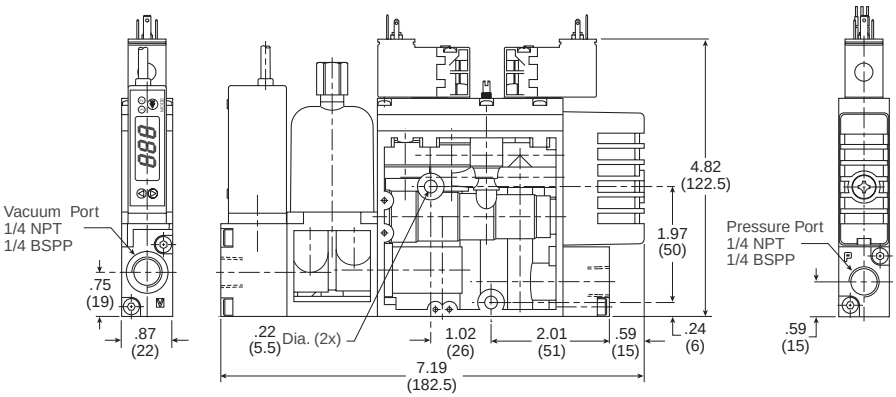
AAMC72-M02N

Port type
N NPT
G BSPP

Number of stations
M02 2
M03 3
M04 4
M05 5*
* Maximum number of stations

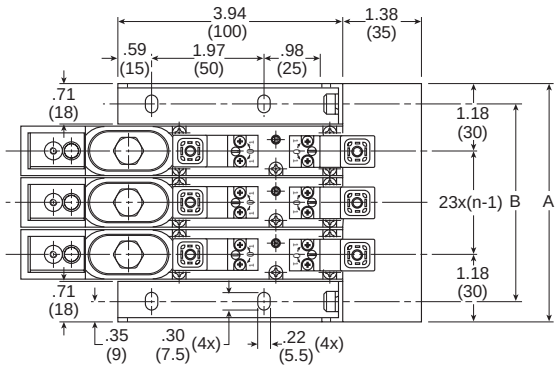
Add-A-Fold assembly
AAMC72

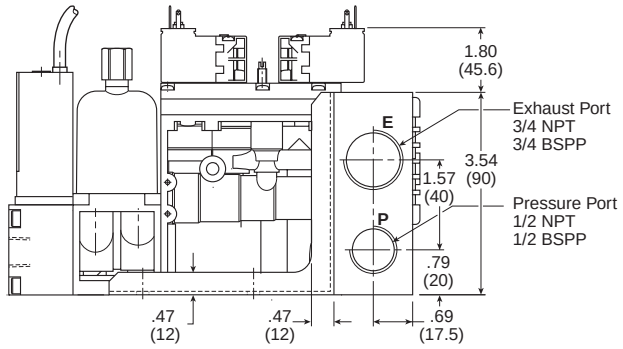
Dimensions



Manifold

3-Station manifold shown





Manifold part number

MC72 - M 05 N

Manifold

Stations
02
03
04
05

Port Size
N 1/8 NPT
G 1/8 BSPP
R 1/8 BSPT

Bold Items are Most Popular.

n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

Inches (mm)
n = Number of Stations

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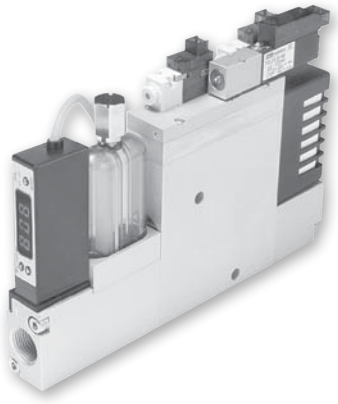
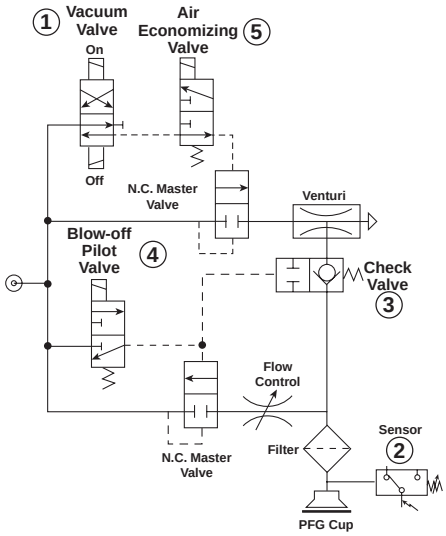
The CEK is a Normally Closed Vacuum On / Off valve that maintains the last state of air during an emergency stop or power loss. In addition to this, an air-economizing valve has been added to interrupt the air supply by connecting the output signal from the sensor to minimize air consumption.

This unit is ideal for non-porous applications that require fast response of large vacuum and blow-off release flow.

Typically, with a normally closed air circuit, the user controls vacuum with a command signal. During an Emergency Stop Event or power failure event, the vacuum command signal is lost, but, the Vacuum valve (1) remains in the current operating position due to the construction of the valve. The air-economizing valve (5), in a Normally Open configuration, passes the air supply from the Vacuum On / Off valve (1). The Sensor (2) output activates the air-economizing valve (5) closing the air supply to the Normally Closed master valve. The Check Valve (3) maintains the achieved vacuum level until the hysteresis value of the Sensor (2) is reached or when the Vacuum valve (1) has been returned to the closed position to stop the vacuum operation.



Valve controlled emergency stop circuit



Features

- Integrated double solenoid for last state
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units

CEK Emergency Stop Vacuum Generators

Nozzle size	Maximum degree of vacuum	Sensor option	Valve option	Part number
1.5mm	27 inHg	No Sensor	24 VDC, PNP	**CEK15HSZC24PBLN**
		MPS-V23 (NPN)	24 VDC, NPN	**CEK15HS41C24NBLN**
		MPS-V23 (PNP)	24 VDC, PNP	**CEK15HS42C24PBLN**
2.0mm	27 inHg	No Sensor	24 VDC, PNP	**CEK20HSZC24PBLN**
		MPS-V23 (NPN)	24 VDC, NPN	**CEK20HS41C24NBLN**
		MPS-V23 (PNP)	24 VDC, PNP	**CEK20HS42C24PBLN**
2.7mm	27 inHg	No Sensor	24 VDC, PNP	**CEK27HSZC24PBLN**
		MPS-V23 (NPN)	24 VDC, NPN	**CEK27HS41C24NBLN**
		MPS-V23 (PNP)	24 VDC, PNP	**CEK27HS42C24PBLN**

☐ **Most popular.**

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Specifications

Media	Non-lubricated compressed air, non-corrosive gases	
Operating pressure	70 PSI (5 kgf/cm²)	
Humidity	35 to 85%	
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female	
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female	
Operating temperature	41 to 132°F (5 to 50°C)	
Material	Aluminum, Brass, NBR	
Air-economizing valve and blow-off release pilot		**Emergency stop valve**
Type of control valve	Pilot valve	Double solenoid
Manual operation	Manual override	Manual overrides
Electrical connection	Clip connector with LED and surge	Clip connector with LED and surge
Power supply	24VDC ± 10%	24VDC ± 10%
Power consumption	0.9W	0.9W
Operating pressure	70 PSI (5 kgf/cm²)	70 PSI (5 kgf/cm²)
Air supply	Normally closed	Normally closed
Generator weight	26.3 oz. (750g)	
Manifold weight	2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g)	

Add-A-Fold assembly ordering information

Station 1 Station 2 Station 3 Station 4 Station 5

Example 1: Shown above is a 5-Station CVK manifold with sensors and NPT Ports.

Qty.	Part number	Comment
1	AACEK-M04N	Add-A-Fold
1	CEK15HS21C24NBLN	Station #1
1	CEK15HS21C24NBLN	Station #2
1	CEK20HS21C24NBLN	Station #3
1	CEK20HS21C24NBLN	Station #4
1	CEK27HS21C24NBLN	Station #5
	Alternative Method	
1	AACEK-M04N	Add-A-Fold
2	CEK15HS21C24NBLN	Station #1-2
2	CEK20HS21C24NBLN	Station #3-4
1	CEK27HS21C24NBLN	Station #5

How to order Add-A-Fold assemblies

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for CEK Generator number and accessories for blank plate part numbers.

AACEK-M05N

Port Type
N NPT
R BSP
G BSPP

Number of Stations
M02 2
M03 3
M04 4
M05 5*
* Maximum Number of Stations

Add-A-Fold Assembly
AACEK

Manifold part number

CVK - M 05 N

Manifold

Stations
02
03
04
05

Port Size
N 1/8 NPT
G 1/8 BSPP
R 1/8 BSPT

Bold Items are Most Popular.

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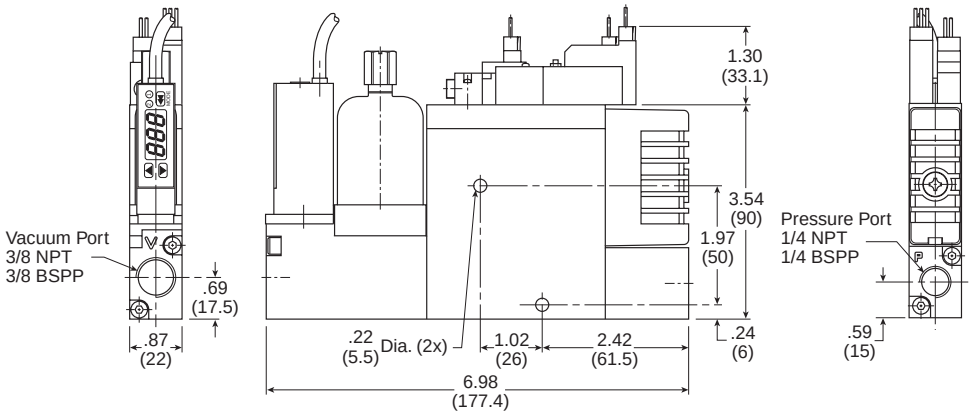
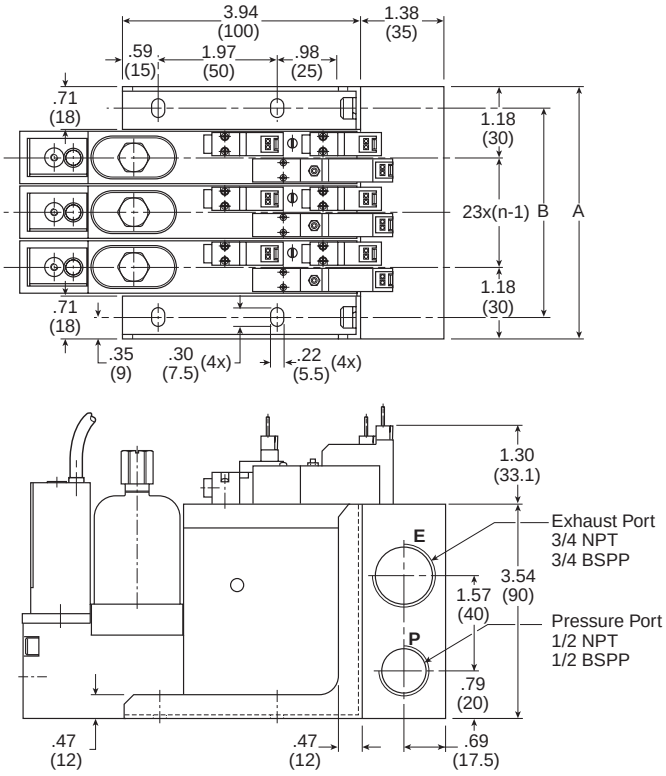
Dimensions



Manifold

3-Station manifold shown



n	2	3	4	5
A	3.27 (83)	4.17 (106)	5.08 (129)	5.98 (152)
B	2.56 (65)	3.46 (88)	4.37 (111)	5.28 (134)

Inches (mm)
n = Number of stations

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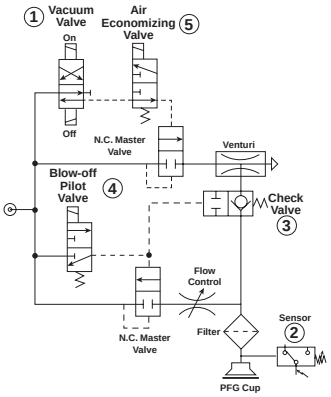
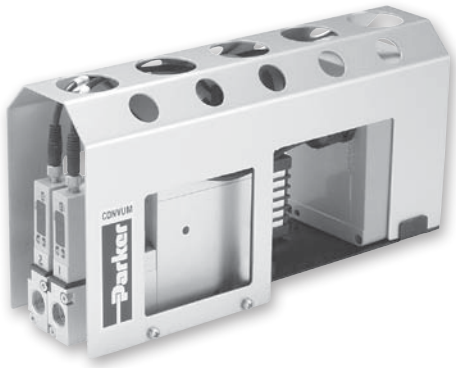
The CVXCEK vacuum generator creates vacuum and blow-off pressure in a vacuum system and has additional Air-economizing and emergency operating system functions.

Each CVXCEK unit consists of 2 independent vacuum generators labeled channel 1 and channel 2. Each vacuum generator has a vacuum ON / OFF solenoid pilot valve, blow-off solenoid pilot valve, Air-Economizing valve, blow-off needle control valve, pressure sensor, vacuum check valve, vacuum filter, and exhaust filter. Each Vacuum Generator is mounted to a 2-Station bar manifold with an optional electrical mounting kit. The pressure provided to inlet port of the bar manifold is common to both vacuum generators.





Features

- Integrated double solenoid for hold last state conditions
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units

General operation of CVXCEK vacuum units

A vacuum generator is a single stage Venturi that creates vacuum pressure using compressed air. In principle, compressed air is throttled as the air exits the nozzle and is discharged into the diffuser. This increased velocity of air lowers the pressure in the diffusion chamber. The volume of air within the closed vacuum system flows into the low-pressure area of the diffusion chamber and is exhausted thru the diffuser. This effect increases the vacuum level and evacuates most of the air within the closed vacuum. The vacuum generator will produce the specified degrees of vacuum as cataloged if the vacuum system is closed, inlet pressure is to design pressure, and there are no major restrictions in the exhaust flow.

Vacuum is created when the unit receives a momentary or maintained command vacuum “ON” signal, (high signal is sent to Vacuum Pilot Valve (1). Once a preset vacuum degree (H-1) of the pressure sensor (2) is achieved, the Air-Economizing Valve is enabled to conserve compressed air. The vacuum level will be maintained by the Check Valve (3) until the hysteresis switch point (H-1 minus h-1) of Sensor (2). At this point vacuum is turned back “ON” until the switch point (H-1) is achieved again. This cycle, which is called Air-economizing, will repeat until a blow-off signal is sent to the unit. When the Blow-off Pilot Valve (4) is activated to decay the vacuum pressure, the unit will release the part. Command vacuum “ON” should be turned “OFF” when command blow-off is turned “ON”. The Emergency Stop operating system provides Air-Economizing or maximum degree of vacuum at the time of disruption of Input and Output Power.

Model Number Index

CVXCEK | **27** | **D3** | **2** | **49** | **N** | **A**

Nozzle Diameter
- **27 27HS 2.7mm**

Electrical Enclosure
- D1 M12, 110VAC
- **D3 M12, 24VDC, PNP**
- D4 M12, 110VAC, w/ Mtg. Plate
- D6 M12, 24VDC, PNP w/ Mtg. Plate
- N1 M18, 110VAC
- **N3 M18, 24VDC, PNP**
- N4 M18, 110VAC, w/ Mtg. Plate
- N6 M18, 24VDC, PNP w/ Mtg. Plate

Number of Channels
- 1 Generator w/ Blanking Plate
- **2 Generators**

Voltage
- **49 24VDC**
- 53 110VAC

Port Threads
- **N NPT**
- G BSPP

Engineering Level
- **A Current**

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Vacuum Generators
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Specifications

Media	Non-lubricated compressed air, non-corrosive gases		
Operating pressure	70 PSI		
Humidity	35 to 85%		
Pressure port	N: 1/4 NPT female, G: 1/4 BSPP female, R: 1/4 BSPT female		
Vacuum port	N: 3/8 NPT female, G: 3/8 BSPP female, R: 3/8 BSPT female		
Operating temperature	41 to 132°F (5 to 50°C)		
Material	Aluminum, Brass, NBR		
Air-economizing valve and blow-off release pilot		**Vacuum pilot valve**	**Sensors**
Type of control	Single solenoid	Double solenoid	MPS-2 Pressure Sensor
Manual operation	Manual override	Manual overrides	N/A
Electrical connection	Clip connector	Clip connector	M8, 4-pin
Power supply*	24VDC ± 10%	24VDC ± 10%	10.8 to 30VDC
Solenoid power consumption	0.6W with LED and surge	2.0W with LED and surge	125mA
Operating pressure	70 PSI	70 PSI	-14.7 PSI to 72.5 PSI
Air supply	Normally closed	Normally closed	N/A
Manifold weight	1-Station: 62 oz. (1758g), 2-Station: 88 oz. (2495g)		

* 110VAC units use 24VDC solenoids and sensors.

Performance

Series / nozzle diameter	Nozzle diameter (mm)	Vacuum degree at 70 PSI (inHg)	Vacuum flow per channel (SCFM)	Air consumption per channel (SCFM)
CVXCEK27	2.7	27	5.75	10.41

Evacuation time

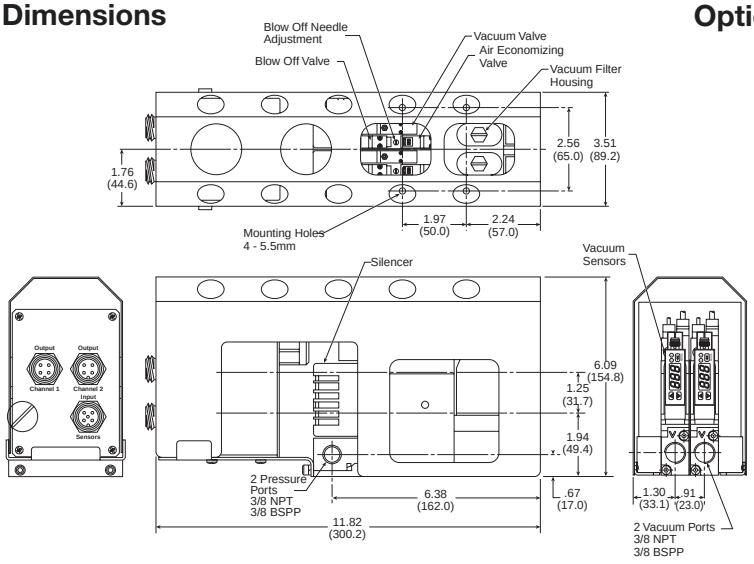
Series / nozzle diameter	Air supply pressure PSI	Air consumption per channel SCFM	Evacuation time per channel in sec / ft³ * to reach different vacuum levels (inHg)								
			3	**6**	**9**	**12**	**15**	**18**	**21**	**24**	**27**
CVXCEK27	70	10.42	0.6	2.0	3.0	5.6	8.5	13.3	21.2	42.1	—

* 1 ft³ = 28.31 liters

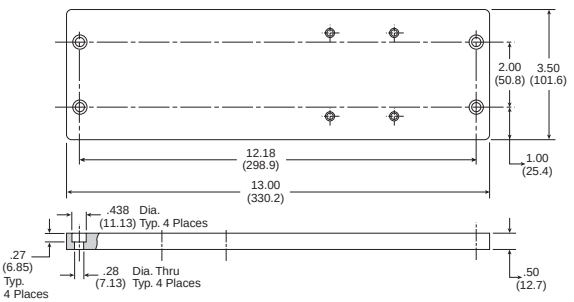
Vacuum flow (SCFM)

	inHg										
Nozzle Dia.	**0**	**3**	**6**	**9**	**12**	**15**	**18**	**21**	**24**	**27**	**30**
27HS	5.75	5.09	4.43	3.77	3.11	2.45	1.80	1.15	.50	—	—

Dimensions



Optional mounting plate



C

Vacuum Generators
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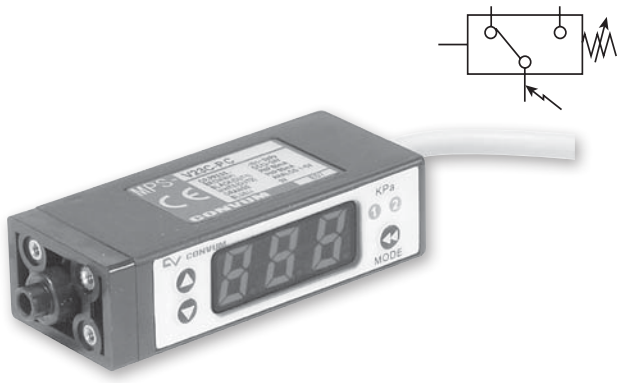
Features

- Pressure range:
  Vacuum pressure: 0 to -30 inHg
- Sensor output:
  2 NPN or PNP open collector
  Transistor output, 30VDC, 125mA
- Switch Point and Window Comparator Mode
- Selectable units of measure
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Error message



MPS-23 Sensor Only Ordering Numbers

Pressure range	Port thread	Electrical output	Electrical connection	Part number
0-30 inHg	Ejector mount	(2) PNP	M8 on 1M cable, 4-Pin	**MPS-V23C-PC**
0-30 inHg	Ejector mount	(2) NPN	M8 on 1M cable, 4-Pin	**MPS-V23C-NC**

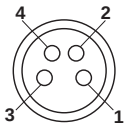
MPS-23 Accessories

M8, 4-Pin, 2 meter cable	**CB-M8-4P-2M-PUR**
M8, 4-Pin, 5 meter cable	**CB-M8-4P-5M-PUR**

Sensor pin out

Pin #

1 Brown: 24VDC
2 White: PNP/NPN Open Collector Output 2
3 Blue: 0VDC
4 Black: PNP/NPN Open Collector Output 1

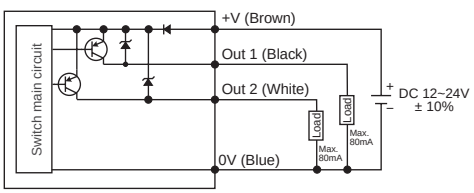


Programming options

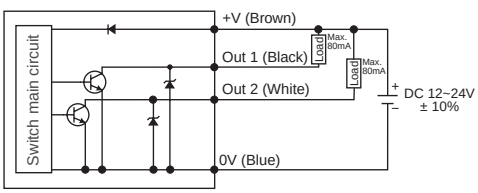
Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	✔
Output response time	✔
Lockout option	✔
Password lockout	–
Max. value display	✔
Min. value display	✔
Zero reset	✔
Error output mode	✔

Internal circuit for open collector and analog output wiring

PNP Output



NPN Output



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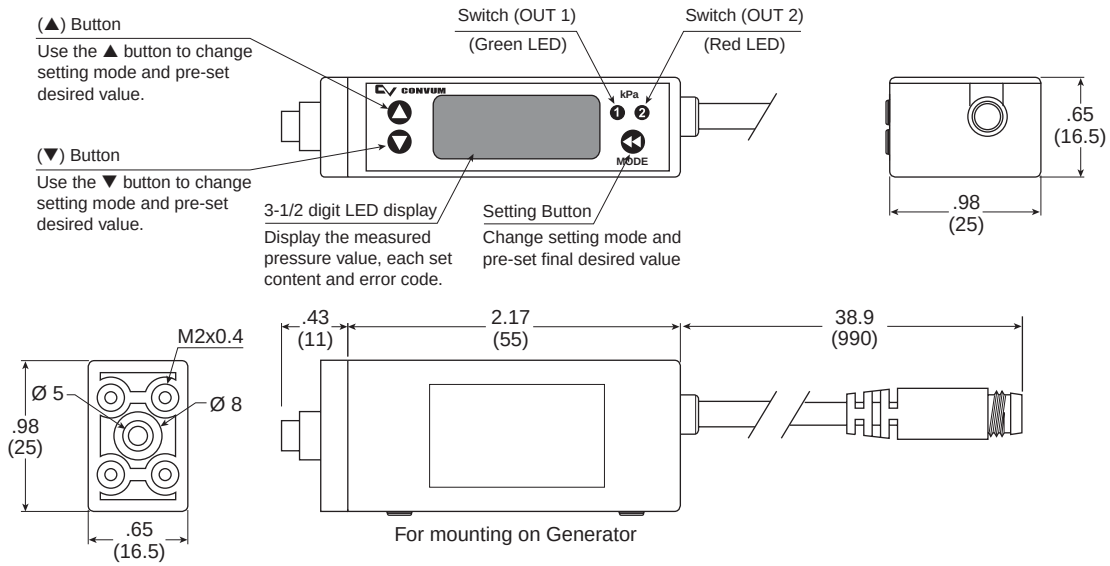
Specifications

Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)
Proof pressure	0.3 Mpa (44 PSI)
Display resolution, Units of measure	0.1, kPa 0.001, kgf/cm^2 0.001, bar 0.01, PSI 0.1, inHg 1, mmHg 0.1, mmH_2O
Media	Air & non-corrosive gases, incombustible gases
Pressure port	Generator mount only
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	-4 to 140°F (-20 to 60°C)
Humidity	40 - 85% RH (no condensation)
Electrical connection	**(C)** 4-pin, M8 connector on 1M lead wire
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less
Display	3 + 1/2 digit, 1 color, 7-segment RED LED
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator
Output indicator	Green LED (OUT1), Red LED (OUT2)
Output modes	Hysteresis or Window Comparator
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)
Repeatability	± 0.2% of F.S. ± 1 digit or less
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001
Current consumption	<55mA
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.
Shock resistance	980 m/s^2 (about 10G), 3 times/each directions X, Y, Z
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator
Material	Housing: ABS (black) , Pressure port: Zinc die-cast, Diaphragm: Silicon
Mass	2 oz. (65g) (including 1m cable)

Dimensions

Generator mount

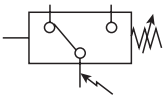


For mounting on Generator

C

Generator Sensors
Vacuum Products

The MVS-201 is a winning combination with the MC2, CVR-2, and CVK vacuum generators. The MVS-201 automatically provides an output signal for the blow-off function without the need of an additional output from the PLC. Begin the vacuum cycle with an output signal from the PLC to the "201" sensor. The "201" sensor has one NPN or PNP output for vacuum confirmation and a control output that interfaces directly with the blow-off release pilot valve. With programmable time control features and a special chip driver, the sensor automatically activates the blow-off release when the NPN or PNP vacuum signal from the PLC is discontinued. This eliminates, THE PREVIOUSLY REQUIRED, PLC output to activate the blow-off release This technology eliminates PLC output requirements by 50% and reduces installation to a simple 4 wire system by wiring the sensor only. There are 3 modes of operation for various applications. The output response time of the sensor is less than 2.5 msec. Peak limit prevention maintenance feature is automatically recorded internally.

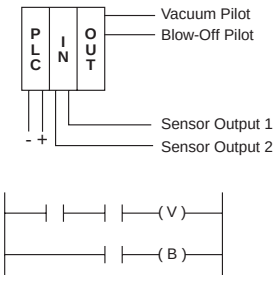


For use with MC22 / MC72 generators

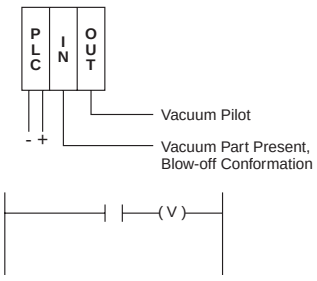
Features

- Time controlled sensor
- Intelligent simple 4-wire system
- Eliminate I/O for release valve
- 2 functions with one rung of code
- Automatic timer (0-9.9 Sec.) function by sensor control driver for vacuum generating and release valves
- Peak value preventative maintenance confirmation
- Response time less than 2 milliseconds

Basic PLC System



PLC System with 201 Sensor



Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Lockout option	✔
Zero reset	✔
Energy savings mode	✔
Air conservation / blow-off timer	✔
Vacuum timer option	✔
Signal controlled vacuum	✔
Blow-off activation timer	✔
Blow-off timer	✔
Vacuum confirmation signal	✔
Blow-off confirmation signal	✔
Peak vacuum error message	✔
Vacuum response error message	✔
Blow-off time error message	✔

MVS-201 Ordering Numbers

Pressure range	Output circuit	Input circuit	Electrical connector *	Part number
-14.7 to 72.5 PSI	PNP sourcing	PNP sourcing	4 Pin, M8	**MVS-201-PCP**
	NPN sinking	NPN sinking		**MVS-201-NC**

* Requires sensor to valve electrical connector

Note:
Output Circuit provides vacuum and blow-off confirmation signal (Input Signal to PLC).
Input Circuit controls vacuum solenoid valve (Output Signal from PLC).

Sensor to valve electrical connector

Generator series	Sensor connection	Valve connection	Part number
MC22	5 Pin Clip Type	2 with clip type	**MC22-C201G**
MC72		2 wire leads	**CVK-D201G**

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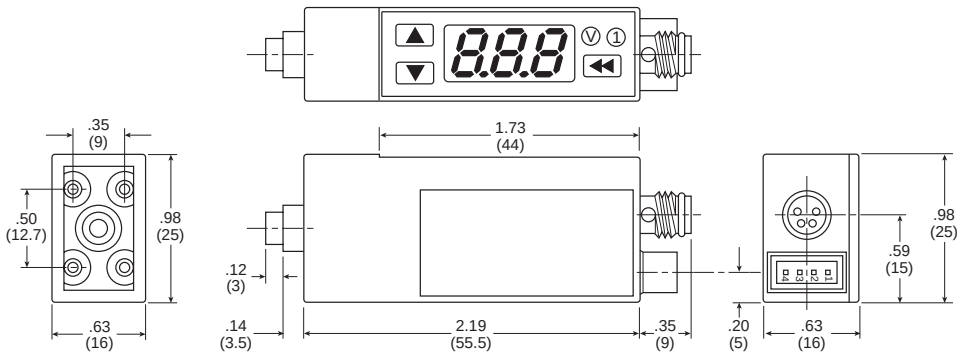
Specifications

Pressure range	Compound pressure: -14.7 to 72.5 PSI
Units of measure **Display resolution**	bar: 0.01 kPa: 1 kgf/cm²: 0.01 PSI: 0.1
Media	Non-lubricated air and non-corrosive gases
Proof pressure	116.0 PSI
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical connection	4-Pin, M8 connector
Power supply	10.8 to 30VDC, Ripple Vp-p 10% Max., Reverse voltage protection
Display	3-Digit, 7-Segment LED
Display frequency	5Hz
Circuit	NPN (Sinking), PNP (Sourcing) open collector transistor
Digital output	Individually selectable N.O. or N.C., max 125mA, 30V, with overcurrent protection
Mode	OP1, OP2, OP3 hysteresis: 0 to 100% of switch point
Response time	< 2ms
Repeatability	± 0.3% F.S.
Thermal error	±0.2% F.S. in temperature range: 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN55011 Class B, EN50082-1
Current consumption	< 45mA, < 25mA when utilizing screen saver option
Spike protection	350 Vp, 1, µs
Dielectric strength	1000 VAC 1 min.
Insulation resistance	> 100M ohms at 500VDC
Vibration resistance	10 to 55Hz, 1.5mm, XYZ, 2 hrs.
Shock resistance	10 G, XYZ
Material	Body: Polycarbonate
Mass	1.7 oz. (45g)

Dimensions

M8, 4-Pin



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Maintaining an acceptable level of vacuum is critical to the performance of vacuum systems that have a single source vacuum generator with multiple cups. The Parker Flow Sensing Valve assists in maintaining an acceptable vacuum level if the vacuum cup does not make a proper seal. The valve will automatically close if the cup loses the seal with the product during a pick and place motion.

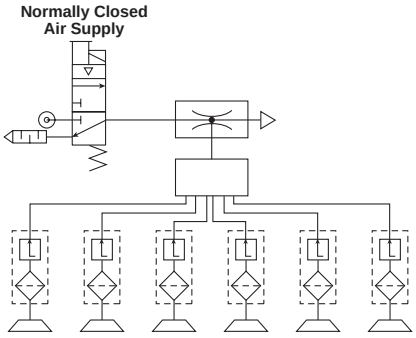
The Parker Flow Sensing Valve is a normally open valve that switches to a closed metered state when the vacuum flow rate from the cup side to the generator side is greater than the switching flow rate of the flow sensing valve. The Flow Sensing Valve "Checks" the vacuum flow. The vacuum flow rate of the generator must be more than the switching flow rate of the Flow Sensing Valve or it will not switch to a "Checked" position.

When using multiple Flow Sensing Valves per generator, the flow rate of the generator must be more than the combined switching flow rates of the flow valves and any other leak path. For example, a CV20-HSN has a maximum flow rate of 3.88 SCFM and a 1/8 Flow Sensing Valve has a switching flow rate of 0.28 SCFM. Therefore 13 Flow Sensing Valves can be connected in parallel to a CV20-HSN.

Once a Flow Sensing Valve is "Checked", a small amount of by-pass flow occurs. This leakage allows a generator to be turned on prior to the cup being in place on a product and is the flow path used to evacuate the cup volume. The by-pass flow will decrease the maximum degree of vacuum in a system, and is considered a leak path when the cup is not sealed on a product. Blow off functions will still operate by forcing the Flow Sensing Valve to a full open position, allowing the part to be blown off.

Features

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter



FSV Series Ordering Information

Description	Part number
1/8" BSPP	**FSV-G1**
1/4" BSPP	**FSV-G2**
3/8" BSPP	**FSV-G3**

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Operation

When the flow of air from the cup side to the generator side is greater than the switching flow rate of the valve, the float is drawn back against the spring and seals on the housing. In this state, flow passes through an orifice on the float. Vacuum flow is "Checked". (See Figure 1).

When the cup comes in contact and seals on a product, flow is reduced and the spring forces the float towards the cup side inlet. This breaks the seal at the float and the full open state is restored. (See Figure 2).

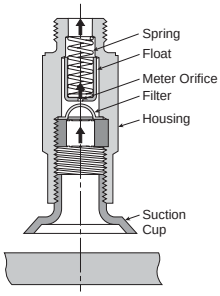


Figure 1
(Closed, Metered Flow)

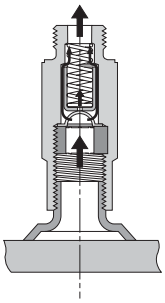
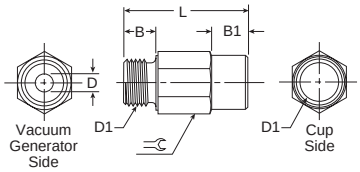


Figure 2
(Open, Full Flow)

Specifications

Description	FSV-G1	FSV-G2	FSV-G3
Switching flow rate	0.28 SCFM		0.875 SCFM
Nominal size	4mm		
Housing material	Anodized aluminum		
Filter material	Al-Niro mesh		
Temperature range	14°F to 140°F (-10°C to 60°C)		
Maximum pressure	145 PSI		115 PSI
Media	Atmospheric air		
Weight (grams)	0.009	0.016	0.029



Dimensions

	B	B1	D	D1	L	⌭
FSV-G1	0.26 (6.5)	0.43 (11)	0.16 (4)	G	1.42 (36)	0.51 (13)
FSV-G2	0.33 (8.5)	0.43 (11)	0.16 (4)	G1/4	1.50 (38)	0.67 (17)
FSV-G3	0.47 (12)	0.51 (13)	0.16 (4)	G3/8	1.65 (42)	0.87 (22)

inches (mm)

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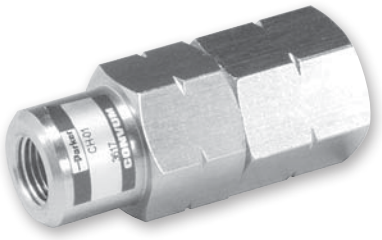
The CH Check valve is used to hold a degree of vacuum downstream from the check valve when the vacuum generator upstream from the check valve is turned off. A separate blow-off connection downstream from the CH check valve is required to destroy the vacuum pressure and blow off the part.

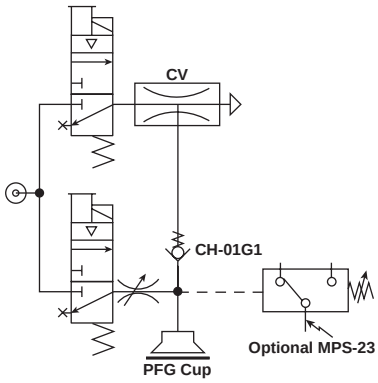
This check valve is an open or passing flow path when there is a differential pressure from the pad side to the generator side.



Features

- Poppet design
- Low leakage
- Low cracking pressure

Normally Closed Air Supply with Blow-off & Optional Sensor



Specifications

Temperature range	32°F to 140°F (0° to 60°C)
Operating vacuum	-4.25 to -13.89 PSIG (-8.7 to -28.3 inHg)
Port size	Pad side = 1/4", Generator side = 1/8"
Leakage rate	0.2 PSI / minute (0.4 inHg / minute)
Cracking pressure	2.9 PSIG (5.9 inHg)

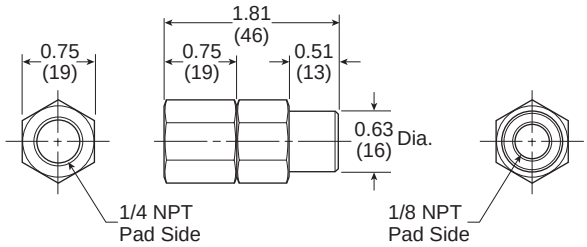
Materials

Valve body / Fittings	Brass / Aluminum
Seals	BUNA
Spring	SUS

CH01 Series Ordering Information

Description	Part number
BSPP Ports	**CH-01G1**
NPT Ports	**CH-01N1**

Dimensions



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Always filtrate the vacuum system to protect the components from damaging particles absorbed from the environment. Elements should be replaced periodically to prevent slower response and overall performance of the system.

Specifications

Media	Non-corrosive air
Operating vacuum	0 to 28 inHg
Maximum pressure	60 PSI
Operating temperature	32 to 140°F
Filtration	120 µm (VF-2), 130 µm (VF-3, VF-5, VF-6, VFL-44, 66, 88)

VF & VL Series Ordering Information

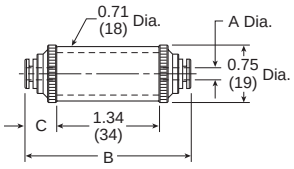
Application	Male connection	Replacement elements	Replacement cover, o-ring	Part number
CV-05, CV-10	G1/8"	**VF-2E**	**—**	**VF-2G**
CV-05, CV-10	G1/8"	**VF-3E**	**VF-3K**	**VF-3G**
CV-15, MCA-10/13	G1/4"	**VF-5E**	**VF-3K**	**VF-5G**
CV-20/25/30	G3/8"	**VF-6E**	**VF-3K**	**VF-6G**
General use	4mm - Tube	**VFL-E**	**VFL-44K**	**VFL-44**
General use	6mm - Tube	**VFL-E**	**VFL-66K**	**VFL-66**
General use	8mm - Tube	**VFL-88E**	**VFL-88K**	**VFL-88**

Materials

Part number	Material housing	Material element	Weight (oz.)
VF-2G	Aluminum	Acrylic, Stainless steel	1.54
VF-3G	Aluminum	PC, Polyvinyl	3.10
VF-5G	Aluminum	PC, Polyvinyl	5.15
VF-6G	Aluminum	PC, Polyvinyl	8.25
VFL-44	Poly-carbonate	PC, Polyvinyl	0.67
VFL-66	Poly-carbonate	PC, Polyvinyl	0.74
VFL-88	Poly-carbonate	PC, Polyvinyl	0.81

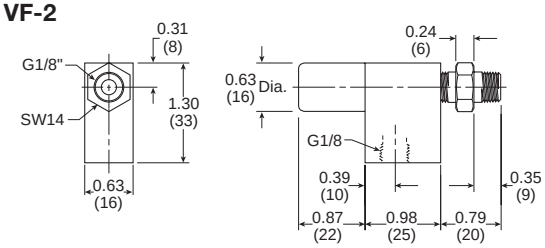
Dimensions

VFL Series

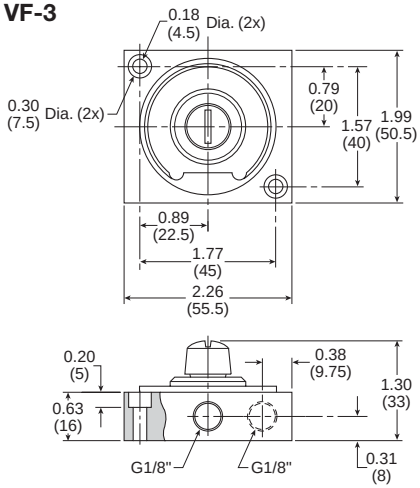


Part number	A	B	C
VFL-44	0.16 (4)	2.17 (55)	0.41 (10.5)
VFL-66	0.24 (6)	2.28 (58)	0.47 (12)
VFL-88	0.31 (8)	2.44 (62)	0.55 (14)

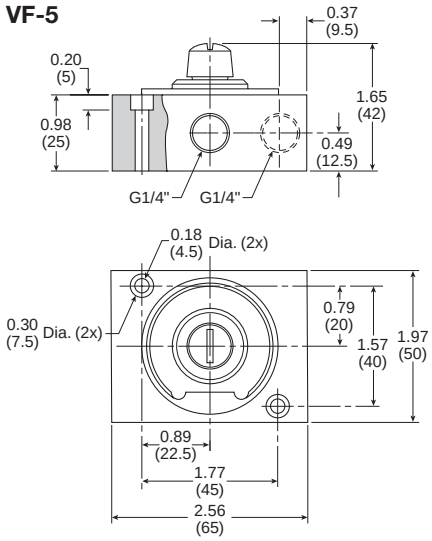
VF-2



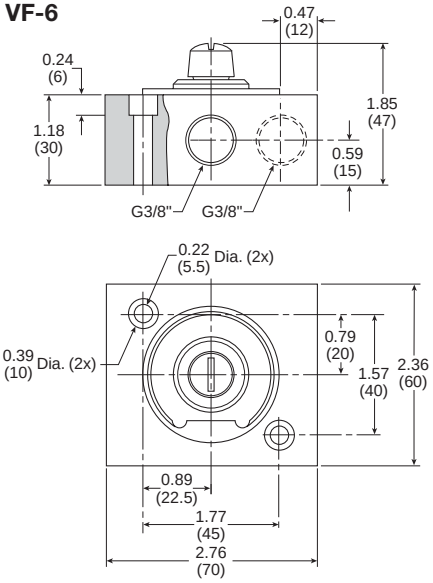
VF-3



VF-5



VF-6



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Parker plastic in-line filters provide easy monitoring, economy and safety. These shatterproof filters are airtight and can withstand high pressures.

A 10 micron porous plastic element prolongs element life under the most adverse environmental conditions.

Features

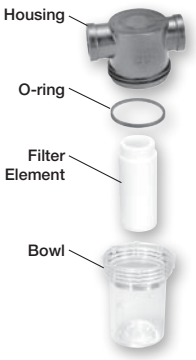
- To filter dust and other small particles from the vacuum flow
- Reduces the risk of operation breakdown or stoppage in the vacuum pump
- Replaceable filter element
- Made in the U.S.A.

Specifications

Media		Non-corrosive air
Operating vacuum range		-14.5 to 0 PSI (0 to 28 inHg)
Material	**Housing**	Polypropylene (PP)
	Bowl	Polyamide nylon (PA)
	Filter element	Polyethylene (PE)
Temperature range		-4°F to 176°F (-20°C to 80°C)
Removal efficiency		10 µm
Maximum pressure		150 PSI

Replacement components

Part number	Size	Part number
Clear Bowl Kit (Includes O-ring)	1/8, 1/4, 3/8	**PS577601**
	1/2, 3/4	**PS577602**
	1, 1-1/2	**PS577603**
BUNA O-ring	1/8, 1/4, 3/8	**PS577701**
	1/2, 3/4	**PS577702**
	1, 1-1/2	**PS577703**
Filter Element Kit*	1/8, 1/4	**PS577801**
	3/8	**PS577801**
	1/2, 3/4	**PS577802**
	1	**PS577803**
	1-1/2	**PS577804**



***** All Filter Elements are sold as a 3-pack.

VFP Series Ordering information

Port size	Flow SCFM*	Weight (oz)	Internal Volume in^3	Filter area in^3	Basic filter with element		Basic filter with 2 spare elements	
					NPT	BSPP	NPT	BSPP
1/8	25	1.7	2.10	4.9	**VFP0CFC01**	**VFP0CFC11**	**VFP0CFC03**	**VFP0CFC13**
1/4	35	1.98	2.4	4.9	**VFP1CFC01**	**VFP1CFC11**	**VFP1CFC03**	**VFP1CFC13**
3/8	45	2.47	2.7	4.9	**VFP2CFC01**	**VFP2CFC11**	**VFP2CFC03**	**VFP2CFC13**
1/2	130	6.61	11.9	16.0	**VFP3CFC01**	**VFP3CFC11**	**VFP3CFC03**	**VFP3CFC13**
3/4	175	6.42	12.5	16.0	**VFP4CFC01**	**VFP4CFC11**	**VFP4CFC03**	**VFP4CFC13**
1	290	15	30.2	29.5	**VFP5CFC01**	**VFP5CFC11**	**VFP5CFC03**	**VFP5CFC13**
1-1/2	430	18.80	41.2	35.0	**VFP6CFC01**	**VFP6CFC11**	**VFP6CFC03**	**VFP6CFC13**

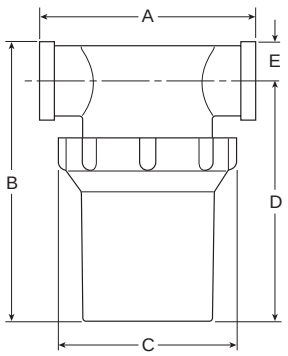
* 90 PSIG inlet and 5 PSIG pressure drop

Dimensions

Part number	A	B	C	D	E
VFP0CFC*1, VFP1CFC*1, VFP2CFC*1	3.1 (78.7)	2.4 (61)	1.9 (48.3)	2.0 (50.8)	0.4 (10.2)
VFP3CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.4 (111.6)	0.7 (17.8)
VFP4CFC*1	3.6 (91.4)	5.1 (129.5)	2.9 (73.6)	4.6 (116.9)	0.5 (12.7)
VFP5CFC*1	4.9 (124.5)	6.4 (162.6)	4.0 (101.6)	5.6 (142.2)	0.8 (20.3)
VFP6CFC*1	5.2 (132.1)	8.1 (209.9)	4.0 (101.6)	6.9 (175.3)	1.2 (30.5)

inches (mm)

* 0 (NPT), 1 (BSPP)



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Protect the environment against harmful noise levels with quality silencers.

Silencer Ordering Information

For generator series	Male connection	Part number
CV-05, CV-10	G1/8"	**MSS-01**
CV-05, CV-10	G1/8"	**MSS-02**
CV-15, MCA-10/13	G1/4"	**MSM-01**
CV-20	G1/2"	**MSL-02**
CV-25, CV-30	G3/4"	**MS6-01**

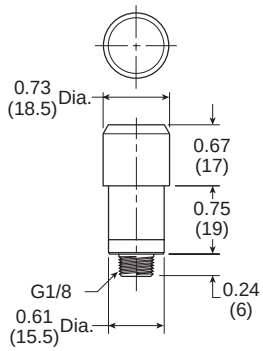
Specifications

Media	Non-corrosive air
Maximum pressure	128 PSI
Operating temperature	41°F to 132°F (5°C to 55.5°C)
Silencing effect	20 dB

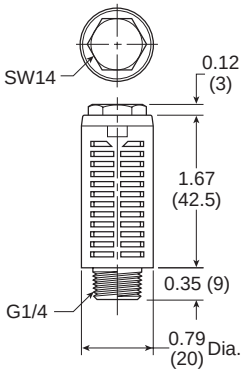
Materials

Part number	Material housing	Material element	Media	Weight (oz.)
MSS-01	Polyacetal	Felt, Urethane	Air	0.17
MSS-02	Polyacetal	Stainless steel	Oil	0.17
MSM-01	Polyurethane	Felt	Air	0.24
MSL-02	Nylon	Vinyl	Air	0.88
MS6-01	Nylon	Polyvinyl Forma	Air	2.01

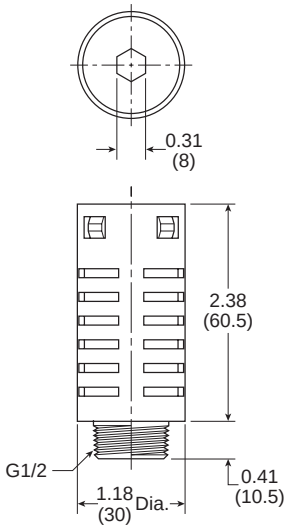
Dimensions



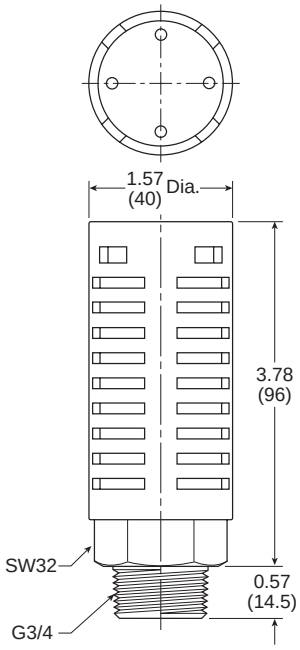
MSS-01



MSM-01



MSL-02



MS6-01

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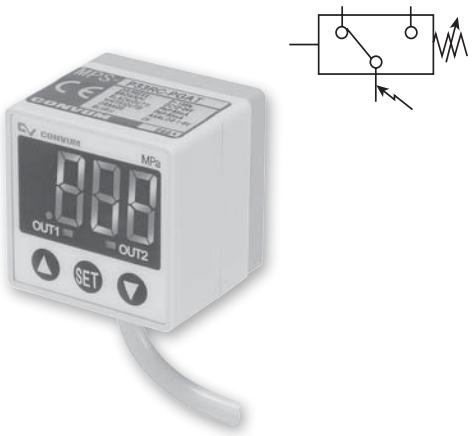
Features

- Sensor output:
  2 NPN or PNP open collector
  Transistor output, 30VDC, 125mA with
  Analog output, 1 to 5VDC
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases



Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	✔
Output response time	✔
Lockout option	✔
Password lockout	—
Max. value display	✔
Min. value display	✔
Zero reset	✔
Red / Green LED display options	—
Error output mode	✔

MPS-33 Sensor Only Ordering Numbers

Pressure range	Electrical output	Electrical connection	Part number 1/8 NPSF Female	Part number 1/8 BSPP Female
0-30 inHg	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-V33N-PGAT**	**MPS-V33G-PGAT**
0-30 inHg	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-V33N-NGAT**	**MPS-V33G-NGAT**
-14.5 to 72 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-R33N-PGAT**	**MPS-R33G-PGAT**
-14.5 to 72 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-R33N-NGAT**	**MPS-R33G-NGAT**
0-145 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-P33N-PGAT**	**MPS-P33G-PGAT**
0-145 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-P33N-NGAT**	**MPS-P33G-NGAT**

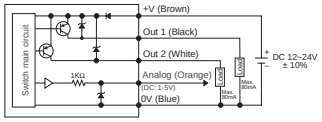
MPS-33 Accessories

Description	Part Number
Panel mounting bracket Note : Add “H” in suffix of Sensor Only Part Number to include with sensor	**MPS-ACCH8**
Surface mounting bracket Note : Add “K” in suffix of Sensor Only Part Number to include with sensor	**MPS-ACCK8**

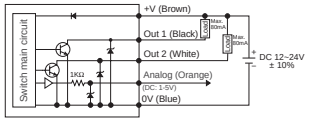
Example: MPS-P33N-PGAT**K**, *includes sensor MPS-P33N-PGA with bracket MPS-ACCK8*

Internal circuit for open collector and analog output wiring

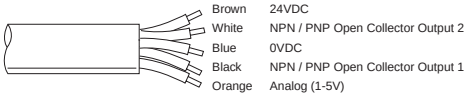
PNP Output (Analog (1-5V)



NPN Output (Analog: 1-5V)



Lead Wiring



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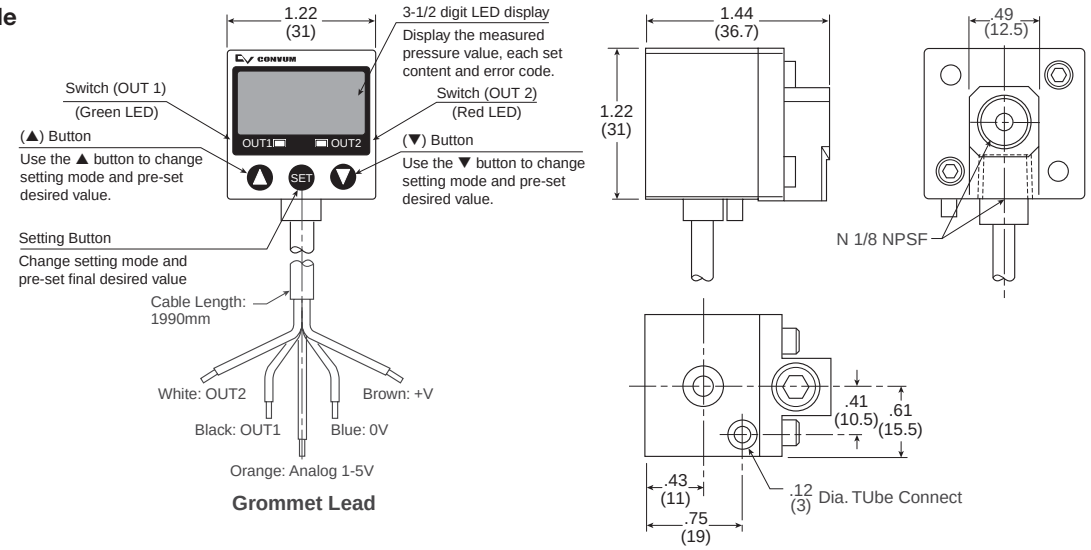
Specifications

	Vacuum (V)	Compound (R)	Positive (P)
Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)	0 - 500 kPa (0 to 72 PSI)	-0.1 - 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44 PSI)	0.8 Mpa (116 PSI)	1.5 Mpa (218 PSI)
Display resolution, Units of measure	0.1, kPa 0.001, kgf/cm^2 0.001, bar 0.01, PSI 0.1, inHg 1, mmHg 0.1, mmH$_2$O	1, kPa 0.01, kgf/cm^2 0.01, bar 0.1, PSI — — —	0.001, Mpa 0.01, kgf/cm^2 0.01, bar 0.1, PSI — — —
Media	Air & non-corrosive gases, incombustible gases		
Pressure port	**(N)** 1/8" NPSF, **(G)** 1/8" BSPP female		
Operating temperature	32 to 122°F (0 to 50°C)		
Storage temperature	-4 to 140°F (-20 to 60°C)		
Humidity	40 - 85% RH (no condensation)		
Electrical connection	**(G)** Grommet open lead, 5 wire (0.15mm^2)		
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less		
Display	3 + 1/2 digit, 1 color, 7-segment RED LED		
Display refresh	.1 to 3.0 Seconds, Variable (factory set at 0.1)		
Control output	NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output		
Analog output	1 to 5VDC ≤ ±2.5% F.S. Linearity ≤1% of F.S.;		
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator		
Output indicator	Green LED (OUT1), Red LED (OUT2)		
Output modes	Hysteresis or Window Comparator		
Response time	≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)		
Repeatability	± 0.2% of F.S. ± 1 digit or less		
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)		
General protection	IP65, CE marked, EMC-EN61000-6-2: 2001, with dust tube connection		
Current consumption	<55mA		
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.		
Shock resistance	980 m/s^2 (about 10G), 3 times/each directions X, Y, Z		
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator		
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon		
Mass	3.3 oz. (105g) (including cable)		

Dimensions

1/8" Female



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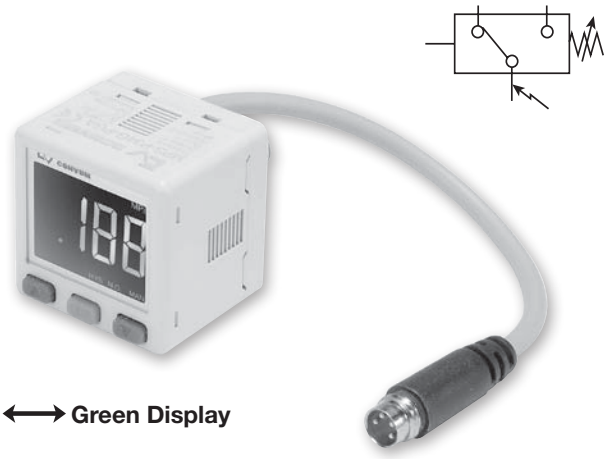
Features

- Sensor output:
  PNP Open collector
  Transistor output, 30VDC, 125mA with
  Analog output, 4 to 20mA
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Sensor face includes icons to show sensor programming status



Red ⟷ Green Display

Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	✔
Output response time	✔
Lockout option	✔
Password lockout	—
Max. value display	✔
Min. value display	✔
Zero reset	✔
Red / Green LED display options	✔
Error output mode	✔

MPS-34 Sensor Only Ordering Numbers

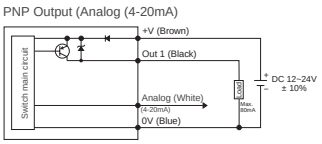
Pressure range	Electrical output	Electrical connection	Part number 1/8 NPSF male	Part number 1/8 BSPP male
0-30 inHg	(1) PNP with (1) 4-20ma	M8, 4 Pin	**MPS-V34N-PCI**	**MPS-V34G-PCI**
0-145 PSI	(1) PNP with (1) 4-20ma	M8, 4 Pin	**MPS-P34N-PCI**	**MPS-P34G-PCI**

MPS-34 Accessories

Description	Part number
Panel mounting bracket Note : Add "H" in suffix of Sensor Only Part Number to include with sensor	**MPS-ACCH9**
Surface mounting bracket Note : Add "K" in suffix of Sensor Only Part Number to include with sensor	**MPS-ACCK10**
Example: MPS-P34N-PCI**K**, *includes sensor MPS-P34N-PCI with bracket MPS-ACCK10*	

M8, 4-Pin, 2 meter cable	**CB-M8-4P-2M-PUR**
M8, 4-Pin, 5 meter cable	**CB-M8-4P-5M-PUR**

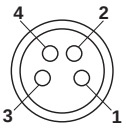
Internal circuit for open collector and analog output wiring



Sensor pin out with analog output

Pin #

1 Brown: 24VDC
2 White: 4 to 20mA
3 Blue: 0VDC
4 Black: PNP Open Collector Output 1



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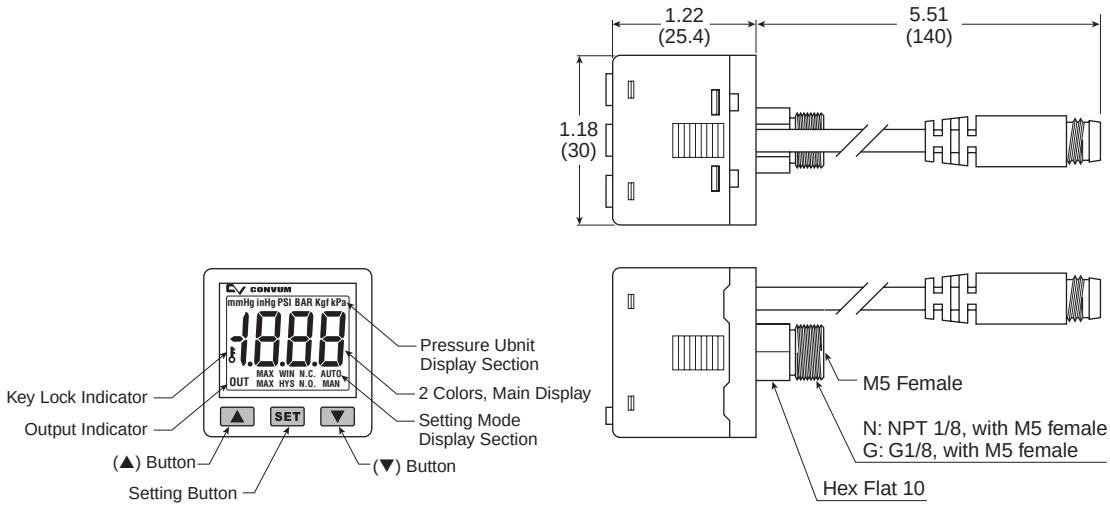
Specifications

	Vacuum (V)	Positive (P)
Pressure range	-101.3 to 0 kPa (-14.5 to 0 PSI)	-0.1 to 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44PSI)	1.5 Mpa (218 PSI)
Display resolution , Units of measure	0.1, kPa 0.001, kgf/cm² 0.001, bar 0.01, PSI 0.01, inHg 1, mmHg	1, kPa 0.01, kgf/cm² 0.01, bar 0.1, PSI - -
Media	Air & non-corrosive gases	
Pressure port	**(N)** 1/8" NPT male, **(G)** 1/8 BSPP male both with M5 female port	
Operating temperature	32 to 122°F (0 to 50°C)	
Storage temperature	-4 to 140°F (-20 to 60°C)	
Humidity	35 to 85% RH (no condensation)	
Electrical connection	**(C)** 4-pin, M8 connector on 150mm lead wire	
Power supply	12 to 24VDC ±10%, Ripple (P-P) 10% or less	
Display	3 + 1/2 digit, 2 color, 7-segment RED / GREEN LED	
Display refresh	Timing update : 0.1 ~ 3 sec. (Factory Set Unit: 0.1 sec.)	

Switch output	Output signal, PNP, Normally open or closed, LED indicator, 125 mA max. output load
Output modes	Hysteresis or Window Comparator
Response time	≤ 2.5ms (chattering-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)
Repeatability	± 0.2% of F.S. ± 1 digit
Output current	Output current 4 to 20mA; Linearity ±1.0% of F.S.; Maximum load impedance 300Ω at power supply of 12V; 600Ω at power supply of 12V; Minimum load impedance 50Ω
Thermal error	32 to 122°F (0 to 50°C) 25°C (77°C) + 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001
Current consumption	45mA (with no load)
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.
Shock resistance	980 m/s² (about 10G), 3 times/each directions X, Y, Z
Noise Resistance	Vp-p400V, 10 ms, 0.5μs noise simulator
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon
Mass	1.45 oz. (45g) with M8 connector

Dimensions

1/8" Male



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Pressure Sensors
SCP01 High Pressure 316 Stainless Steel

SCP01 Pressure Sensors are industrial pressure sensors offering long-term stability, resistance to interference and rugged construction. They are available in a wide range of standard and configured to order versions to meet your application needs.

These sensors are manufactured with the highest quality standards for reliable and repeatable measurements.

Features:

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

Applications include:

- Test and measurement
- Hydraulic power units
- Power generation
- Mobile hydraulics

SCP01 Ordering Numbers

Pressure range (psi)	Electrical output	Electrical connection	Part number 1/4 NPT male	Part number 7/16-20UNF-2A, male SAE-4 with o-ring
-14.5 to 250	4 - 20 mA, 3 wire	M12 X 1, 4 pin	**SCP01-0250P-25-07**	**SCP01-0250P-27-07**
0 to 1000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	**SCP01-1000P-25-07**	**SCP01-1000P-27-07**
0 to 3000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	**SCP01-3000P-25-07**	**SCP01-3000P-27-07**
0 to 5000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	**SCP01-5000P-25-07**	**SCP01-5000P-27-07**
0 to 9000	4 - 20 mA, 3 wire	M12 X 1, 4 pin	**SCP01-9000P-25-07**	**N/A**

Specifications

Overload pressure	200% FS
Burst pressure	250% FS
Accuracy	+/- 0.5% FS
Protection class	IP67
Response time	< 1ms
Long term stability	< 0.1% FS/a
Load reversals	> 20 M
Electrical protection	Short circuit, reverse polarity, overload production
Supply voltage	9-30VDC
Temperature range:	
Environmental	-40°F to 185°F
Media, storage	-40°F to 257°F
Compensated	-4°F to 185°F
Temperature coefficient	< +/- 0.3% FS/10K
Vibration resistance	Meets IEC 60068-2-29
Shock resistance	Meets IEC 60068 2-32
EMI compatibility	DIN EN 61000-6-3, DIN EN 61000-6-2
Material - housing	304 SS
Material - fitting	630 SS
Material - seal	Fluorocarbon
Sensing element	Thin film (poly Si on SiO_2)
Pressure bore	0.024 in.
Long term stability	< 0.1% FS/a
Load reversals	> 20 M

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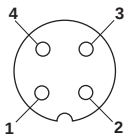
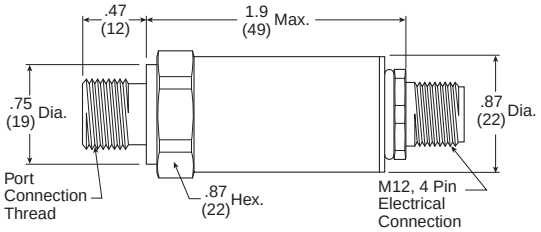
Sensor pin out with analog output

Pin #

1 Supply
2 Signal output
3 Ground
4 —



Dimensions



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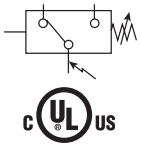
Features

- Stainless steel or ceramic diaphragms
- UL listed and CE marked
- Sensor outputs
  2 PNP Open collector transistor Output, 30 VDC, 100mA
- Optional additional current, 4 to 20mA
- Output response time less than 5.0ms
- Polarity protected
- Short circuit protected
- 4 digit LED
- Display head swivels 290°



SCPSD-1000P-1727

SCPSD-600-14-15

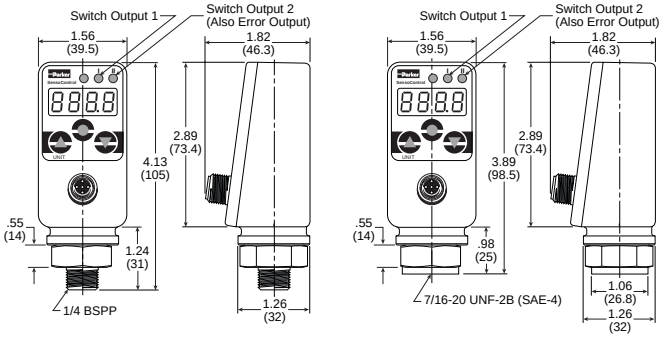
SCPSD Ordering Numbers

Pressure range	Port size	Electrical output	Electrical connection	Part number
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	**SCPSD-0250P-0727**
-14.7 to 250 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	**SCPSD-0250P-1727**
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	**SCPSD-1000P-1725**
0 to 1000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	**SCPSD-1000P-1727**
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	**SCPSD-3000P-0727**
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	**SCPSD-3000P-1727**
0 to 3000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	**SCPSD-3000P-1725**
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(1) PNP with 4-20MA	M12, 4 Pin	**SCPSD-5000P-1727**
0 to 5000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 5 Pin	**SCPSD-5000P-1725**
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP	M12, 4 Pin	**SCPSD-9000P-0727**
0 to 9000 PSI	7/16-20 UNF-2b (SAE-4)	(2) PNP with 4-20MA	M12, 4 Pin	**SCPSD-9000P-1725**
-1 to 16 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	**SCPSD-016-04-17**
-1 to 16 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	**SCPSD-016-14-15**
0 to 250 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	**SCPSD-250-04-17**
0 to 250 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	**SCPSD-250-14-15**
0 to 600 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	**SCPSD-600-04-17**
0 to 600 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	**SCPSD-600-14-15**

Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	—
Output response time	✔
Lockout option	—
Password lockout	✔
Max. value display	—
Min. value display	—
Zero reset	✔
Red / Green LED display options	—
Error output mode	✔
Setting of decimal point	✔

Dimensions



Most popular.

C

Vacuum Sensors
Vacuum Products

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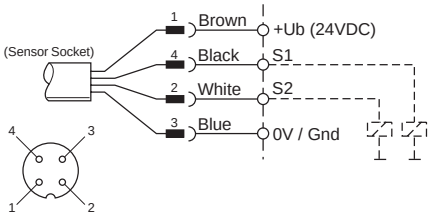
Specifications

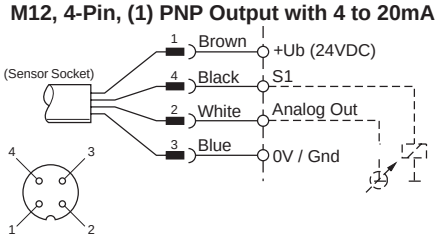
Pressure code	0250	016	1000	3000	5000	9000	250	600
Measure range PSI, (bar)	-14.7 to 250	(-1 to 16)	0 to 1000	0 to 3000	0 to 5000	0 to 9000	(0 to 250)	(0 to 600)
Overload pressure PSI, (bar)	725	(40)	2900	7250	11600	21750	(500)	(1200)
Burst pressure PSI, (bar)	725	(50)	11600	17400	24650	31900	(1200)	(2200)
Sensing element	Ceramic			Stainless steel				
Parts in contact with media	Stainless steel 1.4404 Ceramic AL203, NBR*			Stainless steel 1.4404, 1.4542, NBR*				
	*FPDM, EPDM special request							
Units of measure	PSI, bar, MPA							
Switch cycles	>100 million							
Output response time	< 10ms							
Power supply	15 to 30VDC, Class 2 power supply							
Short circuit protection	Yes, 2.4 amp / open collector output							
Reverse polarity protection	Yes							
Overload protection	Yes							
Current consumption	< 100mA							
Output circuit	2 PNP (Sourcing) open collector transistor							
Analog output	0/4…20mA, Programmable, freely scaleable							
Output functions	Hysteresis, Window comparator							
Switching voltage	-1.5VDC							
Maximum current output	1A with 2 open collector outputs, .5A per output							
Accuracy	± 0.5% F.S. Typ., ± 1% Max.							
Repeatability	± 0.25% F.S.							
Display accuracy	± 0.5% F.S. Typ., ± 1 Digit							
Thermal error max.	±0.03% F.S. at -4 to 185°F (-20 to 85°C)							
Material	Pressure Die-cast zinc Z 410: Surface-finishing							
Display material	Polyester							
General protection	IP 67, EN60529, UL, CE Marked, EMC-EN50082-2 Class B, EN 50081-2							
Temperature range of media	-4 to 185°F (-20 to 85°C)							
Ambient temperature range	-4 to 185°F (-20 to 85°C)							
Storage temperature	-40 to 212°F (-40 to 100°C)							
Display	4-Digit, 7-Segment LED, Red, 9mm height							
Tightening torque	35Nm							
Vibration resistance	20G, 10 to 500Hz, IEC60068-2-6							
Shock resistance	50 G, XYZ, 11ms, IEC60068-2-29							
Mass	10.6 oz. (300g)							

Internal circuit

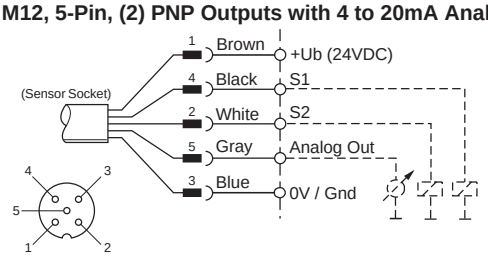
M12, 4-Pin, (2) PNP Outputs



M12, 4-Pin, (1) PNP Output with 4 to 20mA Analog



M12, 5-Pin, (2) PNP Outputs with 4 to 20mA Analog



Note: M12, 5-Pin Female Cable Connector will fit on both M12, 4-Pin and 5-Pin Male Sensor Connector.

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Features

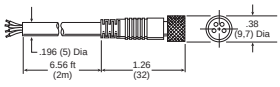
- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: Swivel straight or angled
- IP67 swivel connector

Common Part Numbers

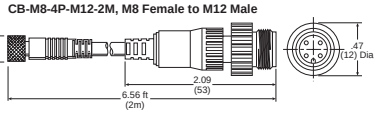
Connector	Contacts	Length	Cover	Part number
M8 female	4	2m	PUR	**CB-M8-4P-2M-PUR**
M8 female	4	5m	PUR	**CB-M8-4P-5M-PUR**
M8 angled female	4	5m	PUR	**CB-M8-4P-5M-90-PUR**
M8 female to M12 male	4	2m	PVC	**CB-M8-4P-M12-2M**
M12 female	4	2m	PVC	**CB-M12-4P-2M**
M12 female	5	2m	PVC	**CB-M12-5P-2M**
M12 female to M12 male	4	2m	PVC	**CB-M12-4P-M12-2M**
M12 female to M12 male	5	2m	PVC	**CB-M12-5P-M12-2M**

Dimensions

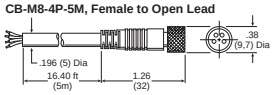
CB-M8-4P-2M, Female to Open Lead



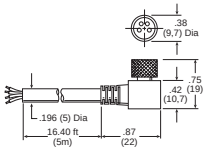
CB-M8-4P-M12-2M, M8 Female to M12 Male



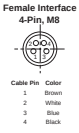
CB-M8-4P-5M, Female to Open Lead



CB-M8-4P-5M-90, Female to Open Lead



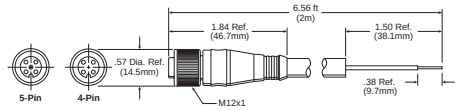
Female Interface 4-Pin, M8



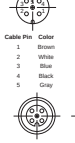
Male Interface 4-Pin, M8

Male Interface 4-Pin, M12

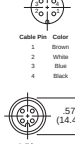
CB-M12-4P-2M, Female to Open Lead
CB-M12-5P-2M, Female to Open Lead



Female Interface 5-Pin, M12



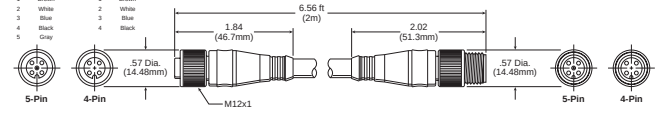
Female Interface 4-Pin, M12



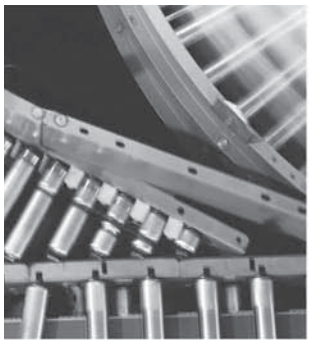
Male Interface 5-Pin, M12

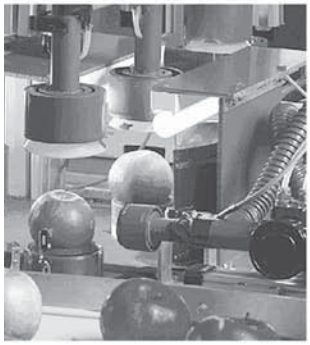
Male Interface 4-Pin, M12

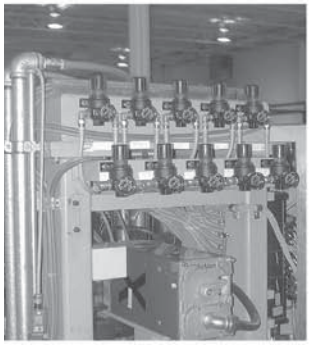
CB-M12-4P-M12-2M, Female to Male
CB-M12-5P-M12-2M, Female to Male

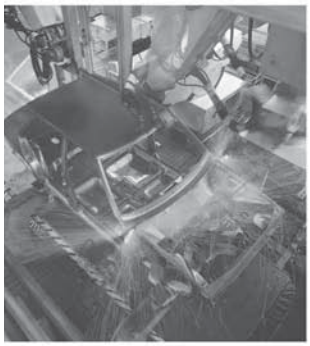


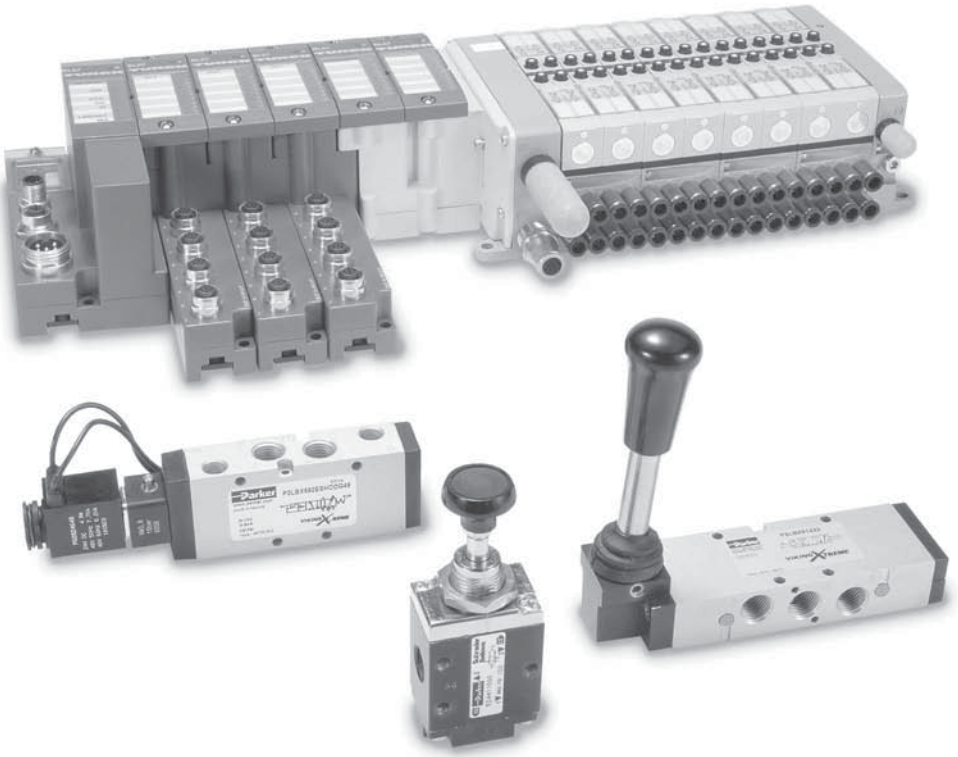
Most popular.











Valve Products

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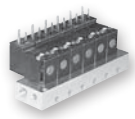
Direct Acting Valves

XM Series - Direct Acting

- Inline or stacking
- 1/8 inch ports
- Pressures 0 tp 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

D4

15mm Series - Direct Acting



- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

D8

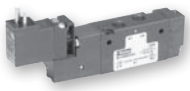
Inline Valves

ADEX Series - Inline

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

D43

B Series - Inline



- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

D11

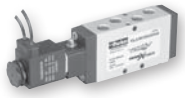
N Series - Inline Poppet

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

D53

Inline – continued

Viking Xtreme Series - Inline

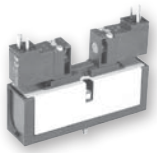


- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 158°F
- Flow - .7 to 2.7 Cv

D33

Subbase & Manifold Valves

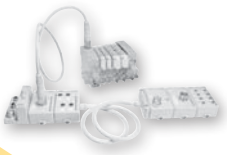
DX ISOMAX Series



- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

D147

Fieldbus Series



- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

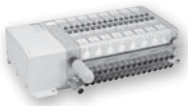
D128

Isys ISO Series

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

D95

Isys Micro Series - Subbase



- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

D84

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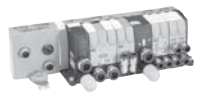
Subbase & Manifold – continued

Moduflex Series Valves



- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

D60

Valvair II Series - Plug-in

- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

D160

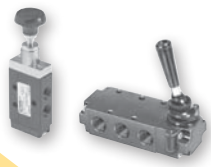
Manual / Mechanical Valves

Brass Poppet, Sliding Seal

- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

D189

Directair 2 & 4 Series - Inline



- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

D168

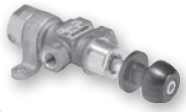
LV / EZ Lockout Valves

- Port sizes 3/8 through 1-1/4 inch
- Max.supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

D188

Manual / Mechanical – continued

M0 Series - Inline



- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

D184

Viking Xtreme Lever Series - Inline

- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:
  Type A & B - VAC to 232 PSIG
  Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

D179

42 Series - Inline

- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

D177

Valve Accessories

Control Panel Products

- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

D192

Sensing / Limit Switches

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

D196

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XM series is a 1/8 inch ported, 3-way and 4-way, 2-position, spring return, normally open or normally closed, general purpose air valve.

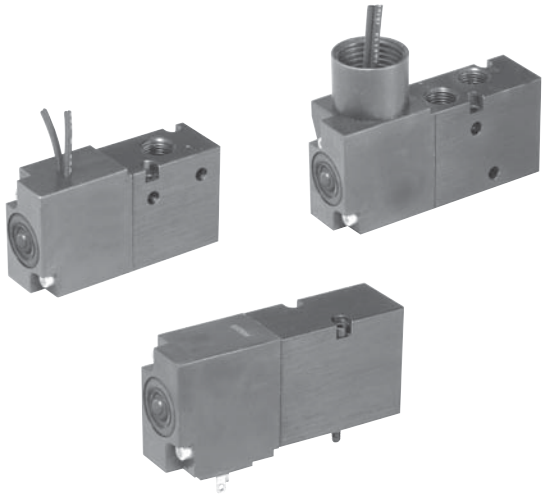
Ports
- 1/8" NPT

Mounting
- Inline
- IEM bar manifold
- Subbase valve manifold

Solenoids
- Continuous duty rated
- 24" grommet
- 15mm 3-pin (9.4mm pin spacing)
- 1/2" conduit
- 12VDC to 240VAC

Balanced Poppet
- 3-way N.O. & N.C.
- Diverter
- Selector
- Vacuum option

ROHS Compliant



Operating information

3-way, N operating pressure:	0 to 125 PSIG
3-way, V* operating pressure:	0.28" Hg to 125 PSIG
4-way, N operating pressure:	0.28" Hg to 125 PSIG
Temperature range:	32°F to 125°F (0°C to 50°C)

* For vacuum service

Materials

Body	Aluminum
Center post and armature	Stainless steel
Stem	Brass
Spring	Stainless steel
Seals	Buna N
Center post sleeve	Acetal
Coil	General purpose Class B, encapsulated

Performance Information

Electrical						Flow	
	Voltage			Power consumption	Holding current	Cv chart	
Code	AC		DC				
	60Hz	50Hz		(W / VA)	(Amps)	3-way	4-way
42	24	22	—	4.8VA	.200	.15	.15
45*	—	—	12	4.5W	.375	.15	.15
49*	—	—	24	4.5W	.188	.15	.15
53	120	110	—	4.32VA	.036	.15	.15
57	240	220	—	4.32VA	.018	.15	.15

* Mobile voltage, +25/-30%
Note: Voltage tolerance: +10 / -15%
Cv tested per ANSI / (NFPA) T3.21.3

Response Time

		0 Cu. in. test chamber		12 Cu. in. test chamber	
Code	Voltage	Fill	Exhaust	Fill	Exhaust
49	24VDC	.011	.007	.240	.384
53	120VAC	.011	.020	.240	.384

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing solenoid. Times shown are average.
Tested per ANSI / (NFPA) T3.21.8.

☐ Most popular.

For technical information see CD

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3-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4 oz (.11 Kg)	**XM30NBG49A**
		1/8"	.15	24" Grommet, 120VAC	Inline		**XM30NBG53A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4 oz (.11 Kg)	**XM30NB549A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline		**XM30NB553A**
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5 oz (.14 Kg)	**XM30NBH549A**
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline		**XM30NBH53A**

Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Inline Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Inline	4.3 oz (.12 Kg)	**XM40NBG49A**
		1/8"	.15	24" Grommet, 120VAC	Inline		**XM40NBG53A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Inline	4.3 oz (.12 Kg)	**XM40NB549A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Inline		**XM40NB553A**
		1/8"	.15	1/2" Conduit / 24" leads, 24VDC	Inline	5.3 oz (.15 Kg)	**XM40NBH549A**
		1/8"	.15	1/2" Conduit / 24" leads, 120VAC	Inline		**XM40NBH53A**

Note: All units with non-locking flush override.

3-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4 oz (.11 Kg)	**XM3VNBG49A**
		1/8"	.15	24" Grommet, 120VAC	Subbase mount		**XM3VNBG53A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4 oz (.11 Kg)	**XM3VNB549A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount		**XM3VNB553A**

Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

4-way Subbase Mount Valves

	Symbol	Port size	Cv	Voltage	Valve type	Weight	Part number
		1/8"	.15	24" Grommet, 24VDC	Subbase mount	4.3 oz (.12 Kg)	**XM4VNBG49A**
		1/8"	.15	24" Grommet, 120VAC	Subbase mount		**XM4VNBG53A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 24VDC	Subbase mount	4.3 oz (.12 Kg)	**XM4VNB549A**
		1/8"	.15	3-Pin, 15mm, DIN 9.4mm, 120VAC	Subbase mount		**XM4VNB553A**

Note: All units with non-locking flush override.

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Manifold

Description	Part number
IEM bar manifold (NPT)	**PSMXN##NP**

– stations 02 to 12 (04 Shown)

Subbase

Description	Part number
Manifold subbase kit (NPT)	**PSXM530CP**

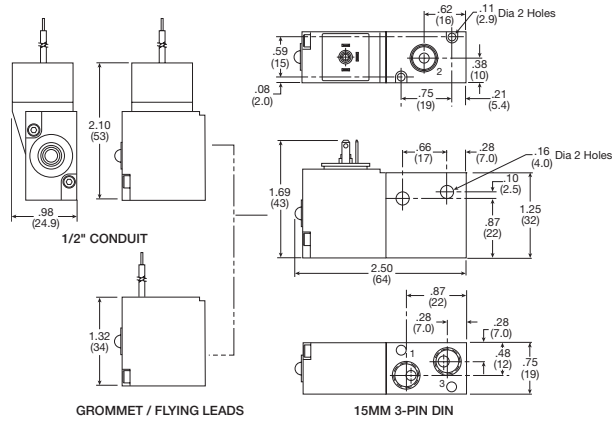
Plug-in Electrical Connectors - 9.4mm

	Description	Indication	Voltage	Part number
	Unwired Plug	None	N/A	**PESC10**
		LED & Suppression	12/24V	**PESC2020B**
			120VAC	**PESC2001F**
	Plug with 6" lead	None	N/A	**PESC12**
		LED & Suppression	12/24V	**PESC2220B**
			120VAC	**PESC2201F**

Accessories

	Description	Part number
	End plate kit (NPT)	**PSXM1010P**
	Blanking plate kit Subbase Kit includes: (1) Plate, (3) Screws, (4) Gaskets Fits subbase or IEM type manifold.	**PSXM8310P**
	Mounting Bracket - Inline valve	**PSXM8288P**
	Isolator plugs - Subbase manifold	**PSXM40900P**
	IEM valve / manifold o-ring kit	**PSXM2186P**
	Subbase valve / manifold bolt kit	**PSXM8100P**

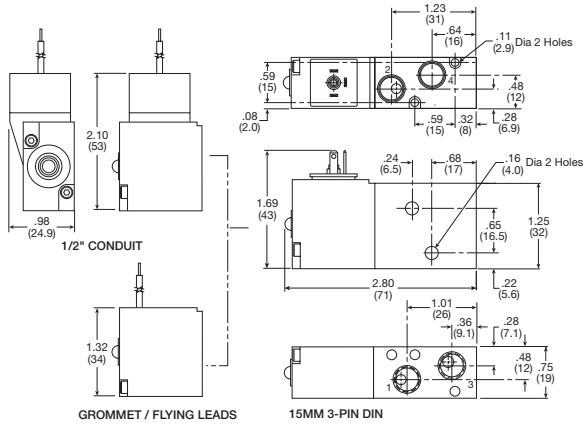
XM 3-way Inline



Inches (mm)

Note: 22 AWG black cross linked polyethylene insulated lead wire.

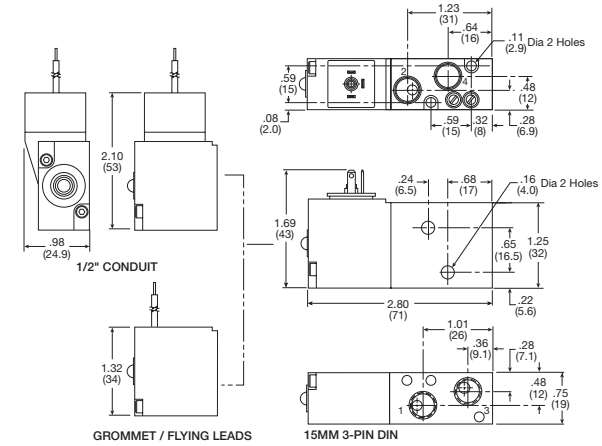
XM 4-way Inline



Inches (mm)

Note: 22 AWG black cross linked polyethylene insulated lead wire.

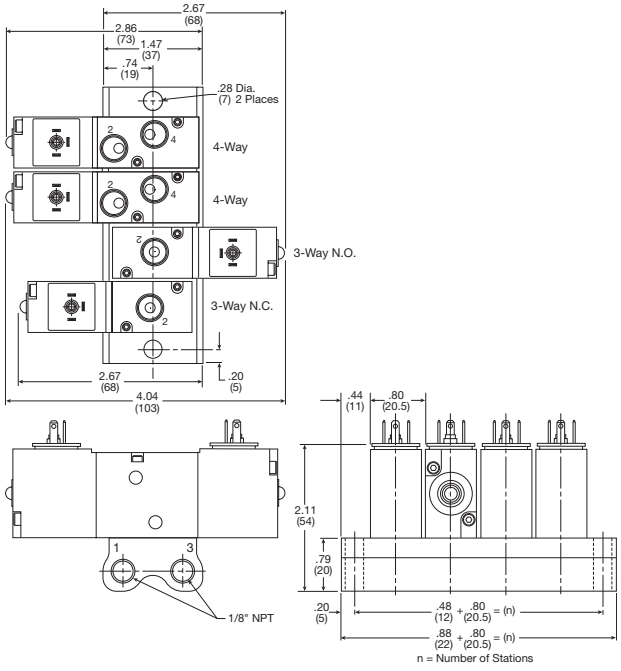
XM 4-way Inline with Flow Controls



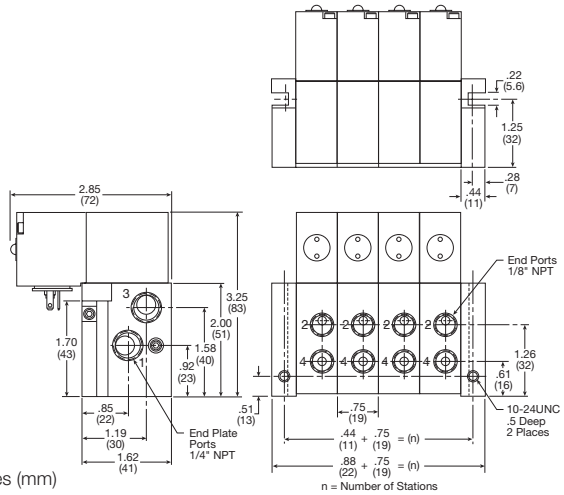
Inches (mm)

Note: 22 AWG black cross linked polyethylene insulated lead wire.

XM IEM Manifold



XM IEM Subbase



Inches (mm)

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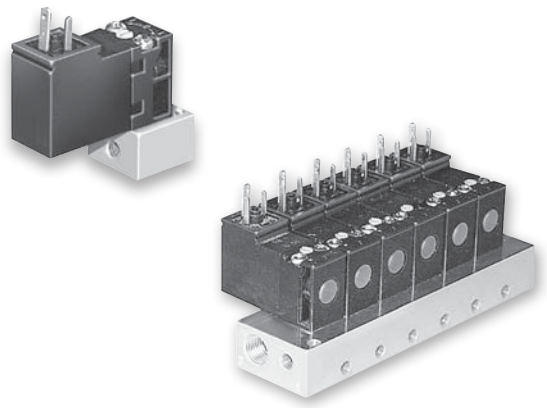
A compact 15mm, 3-way subbase or manifold mounted valve. Ideally suited for use in stationary or mobile equipment applications, where flow rates and low temperatures are a key consideration.



Features

- Compact and simple design
- Utilizes 15mm solenoid operators
- Manifold allows mounting of normally open and normally closed operators simultaneously
- Up to 20 stations available

Solenoids

- 15mm low watt solenoids are UL certified and approved to be CE marked
- Wide range of voltages available

Applications

- Piloting for process control valves
  - pharmaceutical equipment
  - waste water treatment systems
  - food processing
  - chemical batching
- Industrial laundry equipment
- Paint spray & dyeing equipment
- Textile winding applications
- Vacuum and conveyor applications

Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Operating temperature:	
Standard Flow:	5°F to 140°F (-15°C to 60°C)
High Flow:	5°F to 122°F (-15°C to 50°C)
Mobile Applications (47 & 48 Voltage Options):	-40°F to 158°F (-40°C to 70°C)
Storage temperature:	
All applications:	-40°F to 158°F (-40°C to 70°C)

Materials

Body	Glass filled polyamide
Internal metal parts	Steel
Screws	Steel
Bottom plug	Thermoplastic
Poppet seals	Nitrile for standard, fluorocarbon for mobile

Technical Data

Electrical interface per:	Din 43650 Form C (EN175301-803C)
Pneumatic interface per:	Afnor E 0652 110 N
Protection:	IP65 (Washdown)
Air flow:	Standard flow 0.033 Cv (33 Lpm) (1.2W) (1.6VA)
Voltage tolerance:	All voltages except 47 & 48: Rated voltage +10% / -15% options 47 & 48: Rated voltage +25% / -30%

☐ Most popular.

For technical information see CD

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NC (NNP) Solenoids / Kits

	## Voltage (S = Standard, O = Optional, — = N/A)					
* Override	42 (24VAC)	45 (12VDC)	49 (24VDC)	53 (120VAC)	57 (230VAC)	Kit No.
B (Non-lock, Flush)	O	O	S	S	O	**PS2982*##P Pins: UP NC / NNP 1.2W / 1.6VA**
C (Lock, Flush)	O	O	S	S	O	
D (Non-lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	S	S	—	**PS3541*##P Pins: DOWN NC / NNP 1.8W / 2.4VA**
C (Lock, Flush)	O	O	S	S	—	
D (Non-lock, Ext)	—	—	O	O	—	
E (Lock, Ext)	—	—	O	O	—	
B (Non-lock, Flush)	O	O	O	O	O	**PS3441*##P Pins: DOWN NC / NNP 1.2W / 1.6VA**
C (Lock, Flush)	O	O	O	O	O	
B (Non-lock, Flush)	O	O	S	S	—	**PS3202*##P Pins: UP NO / NP 1.2W / 1.6VA**

* Override
Voltage

Model Number Index

PSF T N 0 N 02 N P

Basic series

Subbase 3/2 bottom port	PSE
Subbase 3/2 end port	**PSF**

Manifold type

15mm solenoid valve manifold (machined to accept NC/ NO on same bar)	S
15mm solenoid valve manifold (machined to accept all NC or all NO)	**T**
15mm solenoid valve subbase	R

* Pins up only.
** End ported only.

Pilot source

Direct	**N**

Cylinder port size

M5	**0**

Port type

0*	M5
N**	**NPT**

* Use for valve manifold R only - single subbase
** Use for valve manifold S & T only - manifold

Number of stations

02	**2 Stations**
03	**3 Stations**
20	**20 Stations**
XX	**Single***

* Use for "R" manifold type only

Options

N**	**Standard - cylinder port on non-electrical side (port 1 side)**
E*	Cylinder port on electrical side (port 3 side)

* N/A with valve series "S"
* N/A with manifold "PSE"
** Use for bottom ported manifold type

Brand label

P	**Parker**

Examples:
PSFTN0N16EP - End port manifold - Cyl ports and electrical on same side
PSESN0N10NP - Bottom port manifold - N/C and N/O can be interchanged
PSFTN0N10NP - End port manifold - Cyl ports and electrical are opposite

BOLD OPTIONS ARE MOST POPULAR.

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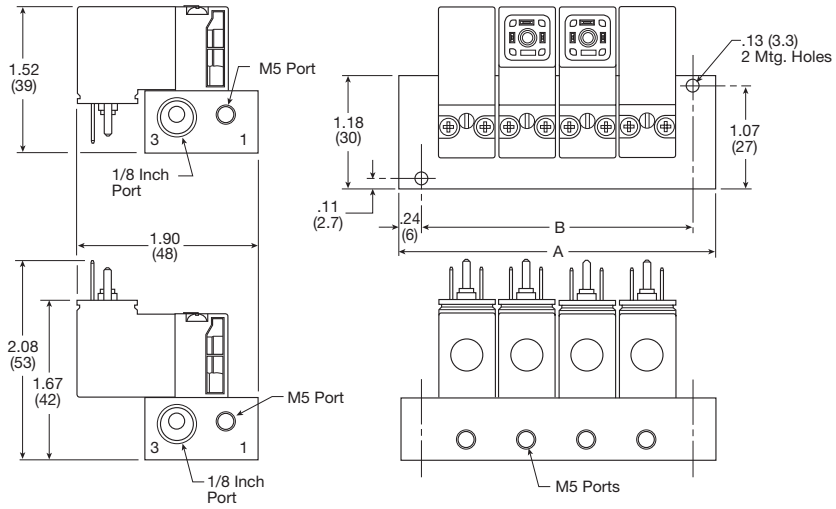
Manifold Dimensions

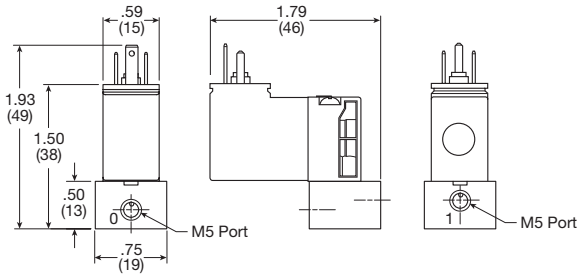
Special mounting considerations must be made for connector assembly clearance when mounting solenoid valves with pins down.



Number of stations	Dim. A	Dim.B
2	2.04 (52)	1.57 (40)
3	2.68 (68)	2.20 (56)
4	3.31 (84)	2.83 (72)
5	3.94 (100)	3.46 (88)
6	4.57 (116)	4.09 (104)
7	5.20 (132)	4.72 (120)
8	5.83 (148)	5.35 (136)
9	6.46 (164)	5.98 (152)
10	7.09 (180)	6.61 (168)
11	7.72 (196)	7.24 (184)
12	8.35 (212)	7.87 (200)
13	8.98 (228)	8.50 (216)
14	9.61 (244)	9.13 (232)
15	10.23 (260)	9.76 (248)
16	10.87 (276)	10.39 (264)
17	11.50 (292)	11.02 (280)
18	12.13 (308)	11.65 (296)
19	12.76 (324)	12.28 (312)
20	13.39 (340)	12.91 (328)

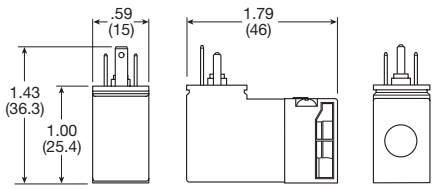
Subbase Dimensions

Pins up only.



15mm Solenoid Dimensions

Pins up only.



Female Electrical Connectors

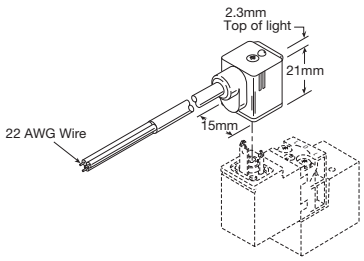
15mm 3-Pin DIN 43650C (Use with enclosure "5")

Description		Connector	Connector with Cord
Unlighted	18 Inches	**PS2932BP**	**PS2932HBP**
Unlighted	6 Feet	**PS2932BP**	**PS2932JBP**
Light – 12VAC or DC	6 Feet	**PS294675BP**	**PS2946J75BP***
Light – 24VAC or DC	6 Feet	**PS294679BP**	**PS2946J79BP***
Light – 110/120VAC	6 Feet	**PS294683BP**	**PS2946J83BP***
Light – 240/230VAC		**PS294687BP**	**N/A**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord.
IP65 rated when properly installed.

Engineering Data:
Conductors: 2 poles plus ground
Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)
Contact spacing: 8mm



Molded 6'
Cord Shown

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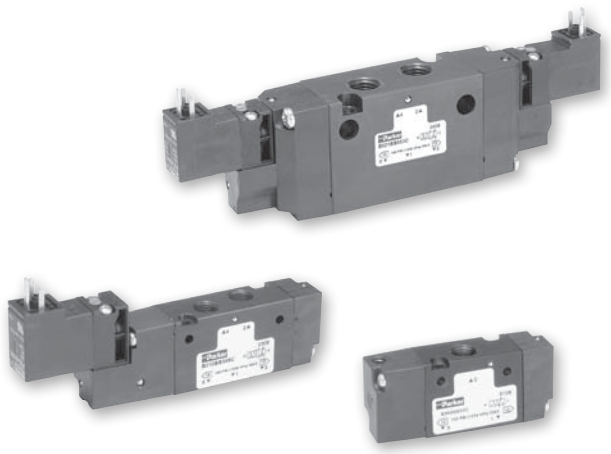
B Series, an exceptional performing industrial valve in a compact size with an enhanced flow range.

Available in solenoid pilot operated and remote air pilot models. The B series features Parker's proven WCS (Wear Compensating Seal) system ensuring long life and fast response, making it ideally suited for OEM applications.



Ports
- B3: 1/8, 1/4 inch
- B5: 1/4, 3/8 inch
- B6: 3/8 inch
- B7: 1/2 inch
- B8: 3/4 inch

Mounting
- Inline
- Subbase
- IEM stackable base
- IEM aluminum bar
- 5-port subbase alumionum bar

Solenoids
- 1.2 W – 15mm, 3-pin EN175301-803
- 2.5 to 7.3 watt - conduit, grommet, 22mm & 30mm, 3-pin DIN (433650)
- 12VDC to 240VAC
- Female DIN electrical connectors

Certification / Approval
- Approved to be CE marked
- IP65 rated
- CSA, C/US

Operating information

Operating pressure: Minimum:	Vacuum to 145 PSIG (Vacuum to 10 bar) See chart
Operating temperature:	5°F to 120°F (-15°C to 49°C)

Materials

Body	Anodized aluminum
End caps	Nylon polymer - 33% glass filled
Seals	Nitrile
Solenoid	Polyamide
Spool	Aluminum

Minimum Operating Pressure

Operator / function	Internal pilot	Minimum PSIG (kPa)				
		B3	B5	B6	B7	B8
1. G. H	Single solenoid - air return	20 (138)	20 (138)	20 (138)	35 (241)	35 (241)
2. A. J. S	Double solenoid					
3. K. L	Single remote pilot - air return					
4. M	Double remote pilot	Vacuum				
N. P. Q	Double solenoid - dual 3/2	40 (275)	—	—	—	—
5. 6. 7	Double solenoid - APB, CE, PC	30 (207)	30 (207)	30 (207)	45 (310)	45 (310)
8. 9. 0	Double remote pilot - APB, CE, PC	Vacuum				
E. V. W	Single solenoid - air return / spring assist	35 (241)	35 (241)	35 (241)	35 (241)	35 (241)
F. X. Y	Single remote pilot - air return / spring assist					
	External pilot*†					
All	"B" series	Vacuum				

* External Pilot Pressure / Remote Pilot Signal 35-145 PSIG (241-1000 kPa).
† External Pilot Not Available with B3 Dual 3/2.
Note: For CSA-NRTL/C approved solenoid valves – insert an 'L' at the end of the valve part number.
B3: Maximum pressure - 120 PSI
B5: Maximum pressure - 145 PSI*§
B6: Maximum pressure - 145 PSI*§
B7: Maximum pressure - 145 PSI*†
B8: Maximum pressure - 145 PSI*†

Most popular. For technical information see CD

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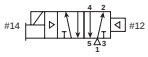
Single Solenoid, 4-way, 2-Position

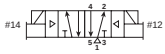
B3 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	**B310BB553C B310BB549C**
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	**B511BB553C B511BB549C**
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	**B512BB553C B512BB549C**
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	**B612BB553A B612BB549A**
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	**B713BB553A B713BB549A**
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	**B814BB553A B814BB549A**
	Less Base	0.65 Cv	120VAC 24VDC	B3 Subbase	**B31VBB553C B31VBB549C**

Double Solenoid, 4-way, 2-Position

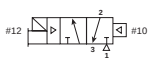
B5 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	**B320BB553C B320BB549C**
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	**B521BB553C B521BB549C**
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	**B522BB553C B522BB549C**
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	**B622BB553A B622BB549A**
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	**B723BB553A B723BB549A**
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	**B824BB553A B824BB549A**
	Less Base	0.65 Cv	120VAC 24VDC	B3 Subbase	**B32VBB553C B32VBB549C**

Single Solenoid, 3-way, 2-Position, NC

B5 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.75 Cv	120VAC 24VDC	B3 Inline	**B3G0BB553C B3G0BB549C**
	1/4"	1.4 Cv	120VAC 24VDC	B5 Inline	**B5G1BB553C B5G1BB549C**
	3/8"	1.4 Cv	120VAC 24VDC	B5 Inline	**B5G2BB553C B5G2BB549C**
	3/8"	2.7 Cv	120VAC 24VDC	B6 Inline	**B6V2BB553A B6V2BB549A**
	1/2"	5.9 Cv	120VAC 24VDC	B7 Inline	**B7V3BB553A B7V3BB549A**
	3/4"	7.0 Cv	120VAC 24VDC	B8 Inline	**B8V4BB553A B8V4BB549A**

3-Pin DIN 43650C Electrical Connection.
Non-Locking Flush Override.

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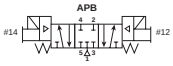
Double Solenoid, 4-way, 3-Position, APB

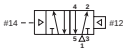
B5 Shown



Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.60 Cv	120VAC 24VDC	B3 Inline	**B350BB553C B350BB549C**
	1/4"	1.1 Cv	120VAC 24VDC	B5 Inline	**B551BB553C B551BB549C**
	3/8"	1.1 Cv	120VAC 24VDC	B5 Inline	**B552BB553C B552BB549C**
	3/8"	2.1 Cv	120VAC 24VDC	B6 Inline	**B652BB553A B652BB549A**
	1/2"	5.7 Cv	120VAC 24VDC	B7 Inline	**B753BB553A B753BB549A**
	3/4"	6.6 Cv	120VAC 24VDC	B8 Inline	**B854BB553A B854BB549A**
	Less Base	0.50 Cv	120VAC 24VDC	B3 Subbase	**B35VBB553C B35VBB549C**

Single Remote Pilot, 4-way, 2-Position

B5 Shown



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	**B330000XXC**
	1/4"	1.4 Cv	B5 Inline, remote pilot	**B531000XXC**
	3/8"	1.4 Cv	B5 Inline, remote pilot	**B532000XXC**
	3/8"	2.7 Cv	B6 Inline, remote pilot	**B632000XXA**
	1/2"	5.9 Cv	B7 Inline, remote pilot	**B733000XXA**
	3/4"	7.0 Cv	B8 Inline, remote pilot	**B834000XXA**
	Less Base	0.65 Cv	B3 Subbase, remote pilot	**B33V000XXC**

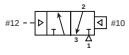
Double Remote Pilot, 4-way, 2-Position

B5 Shown

Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	**B340000XXC**
	1/4"	1.4 Cv	B5 Inline, remote pilot	**B541000XXC**
	3/8"	1.4 Cv	B5 Inline, remote pilot	**B542000XXC**
	3/8"	2.7 Cv	B6 Inline, remote pilot	**B642000XXA**
	1/2"	5.9 Cv	B7 Inline, remote pilot	**B743000XXA**
	3/4"	7.0 Cv	B8 Inline, remote pilot	**B844000XXA**
	Less Base	0.65 Cv	B3 Subbase, remote pilot	**B34V000XXC**

Single Remote Pilot, 2-way, 2-Position, NC

B3 Shown



Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.75 Cv	B3 Inline, remote pilot	**B3K0000XXC**
	1/4"	1.4 Cv	B5 Inline, remote pilot	**B5K1000XXC**
	3/8"	1.4 Cv	B5 Inline, remote pilot	**B5K2000XXC**
	3/8"	2.7 Cv	B6 Inline, remote pilot	**B6X2000XXA**
	1/2"	5.9 Cv	B7 Inline, remote pilot	**B7X3000XXA**
	3/4"	7.0 Cv	B8 Inline, remote pilot	**B8X4000XXA**

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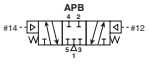
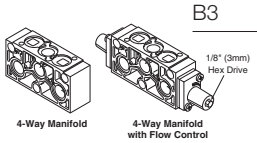
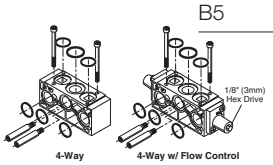
Double Remote Pilot, 4-way, 3-Position, APB

B5 Shown



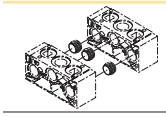
Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.60 Cv	B3 Inline, remote pilot	**B380000XXC**
	1/4"	1.1 Cv	B5 Inline, remote pilot	**B581000XXC**
	3/8"	1.1 Cv	B5 Inline, remote pilot	**B582000XXC**
	3/8"	2.1 Cv	B6 Inline, remote pilot	**B682000XXA**
	1/2"	5.7 Cv	B7 Inline, remote pilot	**B783000XXA**
	3/4"	6.6 Cv	B8 Inline, remote pilot	**B884000XXA**
	Less Base	0.50 Cv	B3 Subbase, remote pilot	**B38V000XXC**

IEM Stackable Manifolds

	Series	Type	Kit number Standard	Kit number Flow control
	B3	4-way	**PS2917P**	**PS2918P**
	B5	4-way	**PS2817P**	**PS2818P**

- Individual Manifold Bases stack together to form lightweight custom length manifold system.
- Easy-to-connect male / female tie rods for modular assembly.
- Utilizes B3 and B5 4-way Inline Valves.
- Low-cost built-in Flow Controls with heavy-duty brass adjusting needles to control meter-out exhaust flow.
- Accessories include Isolator Plugs for pressure isolation and Universal Blanking Plates for auxiliary inlet and exhaust supply and future valve additions.
- Kit includes: (1) Manifold Base, (2) Hold-down Bolts, Tie-rods, Gaskets and O-rings.

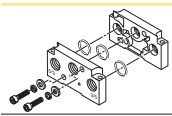
Isolator Plugs



Series	Description	Kit number
B3	4-way, IEM stackable	**PS2919P**
B5	4-way, IEM stackable	**PS2819P**

Used to isolate the #1, #3 or #5 gallery between two manifold bases.
(IEM stackable only)
Kit includes: (3) plugs and (6) o-rings

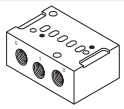
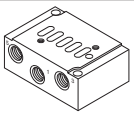
End Plate Kits



Series	Type	Kit number
B3	4-way, NPT	**PS2915P**
B5	4-way, NPT	**PS2815P***

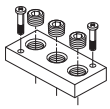
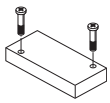
Kit includes: right and left end plate, o-rings, socket head cap screws, flat washers and lockwashers.
* B5 4-way use the same kit.

Subbase

	Series	Type	Kit number
	B3	4-way, 1/4" NPT	**PS2934P**
	B5	4-way, 3/8" NPT	**PS2834P**

Kit includes: (1) subbase.
(Hold down bolts & gasket are included with valve.).

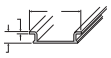
Blanking Plate

		IEM universal NPT	IEM universal BSPP "G"	IEM Blank	Subbase Blank
B3	3-way	**PS2966P**	**PS2967P**	**PS2968P**	—
	4-way	**PS2920P**	**PS2921P**	**PS2969P**	**PS2994P**
B5	3-way	**PS2866P**	**PS2867P**	**PS2868P**	—
	4-way	**PS2820P**	—	**PS2869P**	—
B6	3-way 4-way	**PS2620P**	—	—	—
B7-B8	4-way	**PS2520P**	—	**PS2569P**	—

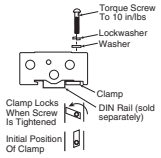
Kit includes: (1) plate, (2) screws, seal / gaskets

DIN Rail



Valve type	Length	Part number
B3	6 Feet	**AM1DE200**

DIN Rail Hardware Kit



Valve type	IEM bar	Part number
B3	(2) Screws, (2) Nuts, (2) Clamps	**PS2991P**

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B3 Series

B3 1 0 B B 5 49 – C

Basic series	
B3 series	B3

Engineering level	
C	Current

Operator Function	
3-way	
Single solenoid, 2-position NC - air return	**G**
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	**K**
Single remote pilot, 2-position NO - air return	L
Double remote pilot, 2-position	M
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	**1**
Double solenoid, 2-position	**2**
Single remote pilot, 2-position - air return	**3**
Double remote pilot, 2-position	**4**
Double solenoid, 3-position - APB	**5**
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	**8**
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Options	
Blank	**None**
02	Solenoid rotated 180° - pins down

Voltage§	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote pilot - M5 or valve less 15mm solenoid**		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	**15mm 3-pin DIN 43650C (male only)**
X	Valve less 15mm solenoid

Overrides§	
0	**None, remote pilot valve**
B	**Flush - non-locking**
C	**Flush - locking**
D	Extended - non-locking
E	Extended - locking
X	Valve less 15mm solenoid

Port size / thread type	
3-way	
1/8" NPT inline	0*
1/8" BSPP "G" inline	5*
Dual 3-way & 4-way	
1/8" NPT inline	**0***
1/8" BSPP "G" inline	5*
1/4" NPT subbase	H‡
1/8" NPT face mount	T**
Subbase valve less base	**V‡**

* Available for use on IEM Manifolds.

** 4-way only.

‡ Subbase valves available for 4-way valves only.

Pilot source / pilot exhaust	
0	**None, remote pilot valve**
B†	**Internal - port #1 / vented**
E*	Dual pressure - port #3 / vented
K†	External - body / tapped M5
X‡	External - manifold / vented

* Not available for 3-way Valves.

† Not available for Remote Pilot Valves.

‡ See Pilot Source Note below.

§ Enclosure '5' – Override / Voltage Availability

S - Standard
O - Option

Voltage code	Override code Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage code	"02" Option			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Pilot Source 'X'
External-Manifold / Vented

INLINE & SUBBASE Valves –
Only used IF an IEM or 5-Ported Subbase Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications OR when used with Sandwich Regulators.

☐ Most popular.

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B5 Series

B5 | 1 | 1 | B | B | 5 | 49 | – | C

Basic series	
B5 series	B5

Engineering level	
C	Current

Operator function	
3-way	
Single solenoid, 2-position NC - air return	**G**
Single solenoid, 2-position NO - air return	H
Double solenoid, 2-position	J
Single remote pilot, 2-position NC - air return	**K***
Single remote pilot, 2-position NO - air return	L*
Double remote pilot, 2-position	M*
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X*
Single remote pilot, 2-position NO - air return / spring assist	Y*
4-way	
Single solenoid, 2-position - air return	**1**
Double solenoid, 2-position	**2**
Single remote pilot, 2-position - air return	**3***
Double remote pilot, 2-position	**4***
Double solenoid, 3-position - APB	**5**
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	**8***
Double remote pilot, 3-position - CE	9*
Double remote pilot, 3-position - PC	0*
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F*

* Pilot source/pilot exhaust, override, and enclosure must be "0".

Options	
Blank	**None**
02	Solenoid rotated 180° - pins down
MD††	Manual detent
V0*	Fluorocarbon seals

* Not available with enclosure "0", "5", "X", "E" or "F".

†† Only available with operator function 1 & 3 and eEnclosure "N", "X" or mobile voltages upon request.

Voltage§	AC 60Hz	AC 50Hz	DC
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote pilot - M5 or valve less solenoid**		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	**15mm 3-pin DIN 43650C (male only)**
A	30mm square 3-pin – ISO 4400 form A (male only)
B	22mm rectangular 3-pin – type B industrial (male only)
C	3-pin automotive - mini
D	5-pin automotive - mini
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	**Grommet - 18" leads**
H	**1/2" NPT conduit - 18" leads**
N	Valve less "A -R" coil
Q	Grommet - 72" leads
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" oOnly.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Port Size / Thread Type	
3-way	
1/4" NPT inline	1*
3/8" NPT inline	**2***
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
4-way	
1/4" NPT inline	**1***
3/8" NPT inline	**2***
1/4" BSPP "G" inline	6*
3/8" BSPP "G" inline	7*
3/8" NPT subbase	J†
1/4" NPT NAMUR mount	T†‡
Subbase valve less base - NPT	V‡
1/4" BSPP "G" NAMUR mount	W†‡

* Available for use on IEM manifolds.

† 4-way only.

‡ Available with pilot source "0", "A", and "B" only.

Pilot Source / Pilot Exhaust	
Enclosures "0, 5 & X"	
None, remote pilot valve	0
Internal - port #1 / tapped M5	A†
Internal - port #1 / vented	**B†**
Dual pressure - port #3 / vented	E*
External - body / tapped M5	K†
External - manifold / vented	X‡
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - port #1 / tapped M5	**A†**
Internal - port #1 / vented	**B†**
Dual pressure - port #3 / tapped M5	D*†
External - body / tapped 1/8"	K†

* Not available for 3-way valves.

† Not available for remote pilot valves.

‡ See pilot source note below.

Overrides§	
None. Remote pilot valve	**0**
No override	A†
Flush - non-locking	**B***
Flush - locking	**C**
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

Pilot Source 'X'
External-Manifold / Vented or Tapped M5

INLINE & SUBBASE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

Note: for mobile voltages, contact the application team.

§ Enclosure '5' – Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code Standard B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage code	Override code "02" Option B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

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B6 Series

B6 | 1 | 2 | B | B | 5 | 49 | – | A

Basic series	
B6 series	B6

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	**1**
Double solenoid, 2-position	**2**
Single remote pilot, 2-position - air return	**3**
Double remote pilot, 2-position	**4**
Double solenoid, 3-position - APB	**5**
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	**8**
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PC	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Port size / thread type	
3-way / 4-way	
3/8" NPT inline	**2***
3/8" BSPP "G" inline	7*
3/8" NPT NAMUR mount	T†

*Available for use on IEM manifolds.

†4-way only. Available with pilot source "0", "A", "B" and "L" only.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	**B†**
Dual pressure - port #5 / vented	H
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	**A†**
Internal - Port #1 / vented	**B†**
External - Body / tapped 1/8"	K†

* Not available for 3-way valves.

† Not available for remote pilot valves.

Overrides§	
None, remote pilot valve	**0**
No override	A†
Flush - non-locking	**B***
Flush - locking	**C**
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

Voltage§	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote pilot - M5 or valve less 15mm solenoid**		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	**15mm 3-pin DIN 43650C (male only)**
A	30mm square 3-pin – ISO 4400 form A (male only)
B	22mm rectangular 3-pin – Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	**Grommet - 18" leads**
H	**1/2" NPT conduit - 18" leads**
N	Valve less "A - R" coil
Q	Grommet - 72" leads
R	1/2" NPT conduit - 72"leads
X	Valve less 15mm solenoid

* 24 VDC & override "A" only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Options	
Blank	**None**
02	Solenoid rotated 180° - pins down
42*	Series cylinder mount replacement

* Only available with port size "T" and "0", "A". "B", and "L" pilot source.

Engineering level	
A	**Current**

INLINE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

§ Enclosure '5' – Override / Voltage Availability

S - Standard
O - Option

Voltage code	Override code Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage code	Override code "02" Option			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

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B7 & B8 Series

B7 1 3 A B G 53 – A

Basic series	
B7 series	B7
B8 series	B8

Engineering level	
A	Current

Options	
Blank	None

Operator function	
3-way	
Single solenoid, 2-position NC - air return / spring assist	V
Single solenoid, 2-position NO - air return / spring assist	W
Single remote pilot, 2-position NC - air return / spring assist	X
Single remote pilot, 2-position NO - air return / spring assist	Y
4-way	
Single solenoid, 2-position - air return	**1**
Double solenoid, 2-position	**2**
Single remote pilot, 2-position - air return	**3**
Double remote pilot, 2-position	**4**
Double solenoid, 3-position - APB	**5**
Double solenoid, 3-position - CE	6
Double solenoid, 3-position - PC	7
Double remote pilot, 3-position - APB	**8**
Double remote pilot, 3-position - CE	9
Double remote pilot, 3-position - PCc	0
Single solenoid, 2-position - air return / spring assist	E
Single remote pilot, 2-position - air return / spring assist	F

Voltage§			
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote pilot - M5 or valve less solenoid**		
YY	Remote pilot - 5/32" (4mm) tube		

Enclosure / lead length	
0	None, remote pilot valve
5	**15mm 3-pin DIN 43650C (male only)**
A	30mm square 3-pin – ISO 4400 form A (male only)
B	22mm rectangular 3-pin – Type B industrial (male only)
E*	Intrinsically safe - 30mm 3-pin
F**	Hazardous duty 1/2" NPT conduit - 18" leads
G	**Grommet - 18" leads**
H	**1/2" NPT conduit - 18" leads**
N	Valve less "A - R" coil
R	1/2" NPT conduit - 72" leads
X	Valve less 15mm solenoid

* 24 VDC & Override "A" Only.

** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Port size / thread type	
B7 series	
1/2" NPT inline	**3***
1/2" BSPP "G" inline	8*
B8 series	
3/4" NPT inline	**4***
3/4" BSPP "G" inline	9*

* Available for use on IEM manifolds.

Pilot source / pilot exhaust	
Enclosures "0, 5 & X"	
None. Remote pilot valve	0
Internal - Port #1 / tapped M5	A†
Internal - Port #1 / vented	**B†**
External - Body / tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / tapped M5	**A†**
Internal - Port #1 / vented	**B†**
External - Body / tapped 1/8"	K†

† Not available for remote pilot valves.

Overrides§	
None, remote pilot valve	**0**
No override	A†
Flush - non-locking	**B***
Flush - locking	**C**
Extended - non-locking	D
Extended - locking	E*
Valve less 15mm solenoid	X

* Only available with encl. "5".

† Only available with encl. "E".

§ Enclosure '5' – Override / Voltage Availability

S - Standard

O - Option

Voltage code	Override code			
	Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

INLINE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

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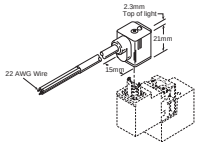
Voltage				Enclosure "5"		Voltage				B5, B6, B7, B8 Enclosure "A"		B5, B6, B7, B8 Enclosure "B" to "R"	
	AC						AC						
Code	60Hz	50Hz	DC	Power consumption	Holding (Amps)	Code	60Hz	50Hz	DC	Power consumption	Holding (Amps)	Power consumption	Holding (Amps)
42	24	22		1.6VA	.065	42	24	22		3.9VA	.136	7.3VA	.309
45			12	1.2W	.098	45			12	2.6W	.208	4.6W	.365
47*			12	0.91W	.074	47*			12	—	—	4.9W	.298
48*			24	0.91W	.033	48*			24	—	—	4.8W	.142
49			24	1.2W	.049	49			24	2.7W	.112	4.8W	.200
53	120	110		1.6W	.013	53	120	110		4.1VA	.033	6.3VA	.047
57	240	230		1.6W	.007	57	240	230		3.7VA	.017	6.4VA	.026

Note: For enclosure "5" with "02" Option, solenoid wattage is 1.8W (2.4VA). Response time is 10% faster.
Voltage rated +10 / -15%.

* 47 and 48 code are mobile voltages. voltage +25 / -30%.

15mm 3-Pin DIN 43650C



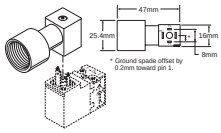
	Cord length	Connector	Connector with cord
Unlighted	18 Inches	**PS2932BP**	**PS2932HBP**
Unlighted	6 Feet	**PS2932BP**	**PS2932JBP**
Light – 12VAC or DC	6 Feet	**PS294675BP**	**PS2946J75BP***
Light – 24VAC or DC	6 Feet	**PS294679BP**	**PS2946J79BP***
Light – 110/120VAC	6 Feet	**PS294683BP**	**PS2946J83BP***
Light – 240/230VAC		**PS294687BP**	**N/A**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:
Conductors: 2 poles plus ground
Cable range (connector only): 4 to 6mm (0.16 To 0.24 Inch)
Contact spacing: 8mm

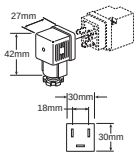
15mm 3-Pin DIN 43650C to 1/2" Conduit



Description	Connector
1/2" NPTF conduit – Unlighted with 3' (1m) leads 20 AWG wire	**PS2998P**

Note: Rated up to 250VAC or VDC; 6 amps
IP65 rated when properly installed.

30mm Square 3-Pin – ISO 4400, DIN 43650A
(Use with Enclosure "A")



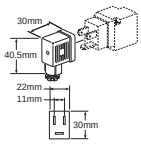
Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	**PS2028BP**
Light – 6-48V. 50/60Hz. 6-48VDC	PS2032J79CP*	**PS203279BP**
Light – 120V/60Hz	PS2032J83CP*	**PS203283BP**
Light – 240V/60Hz	N/A	**PS203283BP**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

22mm Rectangular 3-Pin – Type B Industrial
(Use with Enclosure "B")



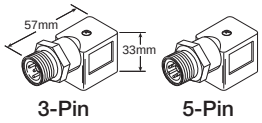
Description	Connector with 6' (2m) cord	Connector
Unlighted	**PS2429JBP**	**PS2429BP**
Light – 24V60Hz. 24VDC	**PS2430J79BP***	**PS243079BP**
Light – 120V/60Hz	**PS2430J83BP***	**PS243083BP**
Light – 240V/60Hz	**N/A**	**PS243087BP**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:
Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

3-Pin / 5-Pin Male Automotive Connectors
(Use on 22mm Rectangular 3-Pin Solenoid)



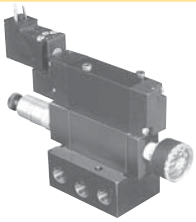
3-Pin 5-Pin

Description	3-Pin	5-Pin
Unlighted	**PS2893CP**	**PS2893DP**
Lighted - Voltage	**PS2893C##P**	**PS2893D##P**

= 79 = 6 to 48VAC/VDC
83 = 100 to 240VAC/48 to 120 VDC

Sandwich Regulators

- Use with B3 subbase valves on 5-ported subbase bar manifolds.
- Common port or dual port regulation control.
- Unregulated pressure supplied to valve pilot - use pilot source - 'X'.
- Easy adjust knob control.



Pressure range	Cv	Common port with gauge *	Dual port without gauge
5-125 PSI	.33	**PS2930166P**	**PS2930233P**

* Gauge is 160 PSI. Gauge shipped unassembled. For different gauge mounting configuration, use brass adapters listed at bottom of page.

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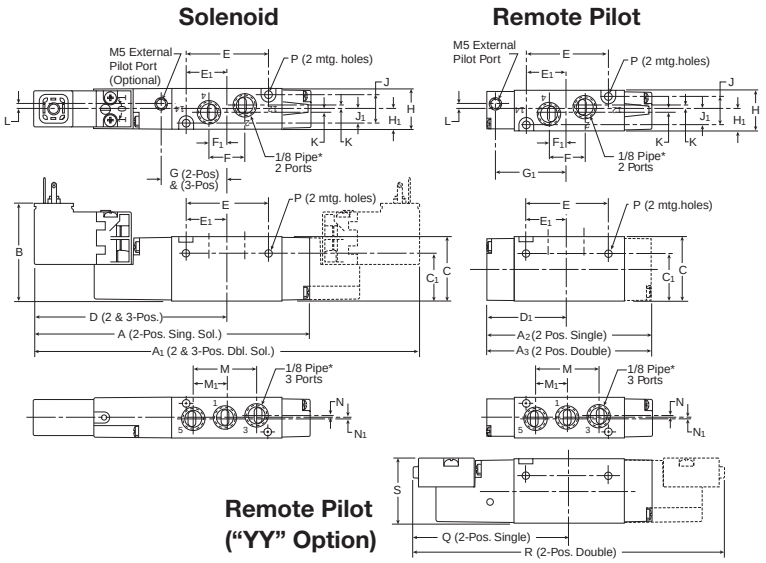
B3 Single & Double Operators – 4-way Inline

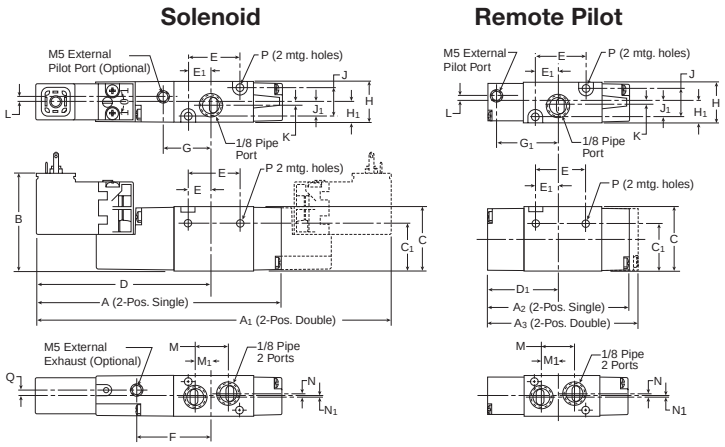


B3 4-way Inline

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
C	**C1**	**D**	**D1**	**E**
1.13 (39)	.84 (21)	3.22 (82)	1.66 (42)	1.47 (37)
E1	**F**	**F1**	**G**	**G1**
.74 (19)	.63 (16)	.32 (8)	1.13 (29)	1.50 (38)
H	**H1**	**J**	**J1**	**K**
.71 (18)	.36 (9)	.51 (13)	.26 (7)	.06 (2)
L	**M**	**M1**	**N**	**N1**
.11 (3)	1.12 (28)	.56 (14)	.05 (1)	.05 (1)
P	**Q**	**R**	**S**	
Ø .13 Ø (3.3)	2.69 (68)	5.37 (136)	1.16 (29)	

Inches (mm)

B3 Single & Double Operators – 3-way Inline

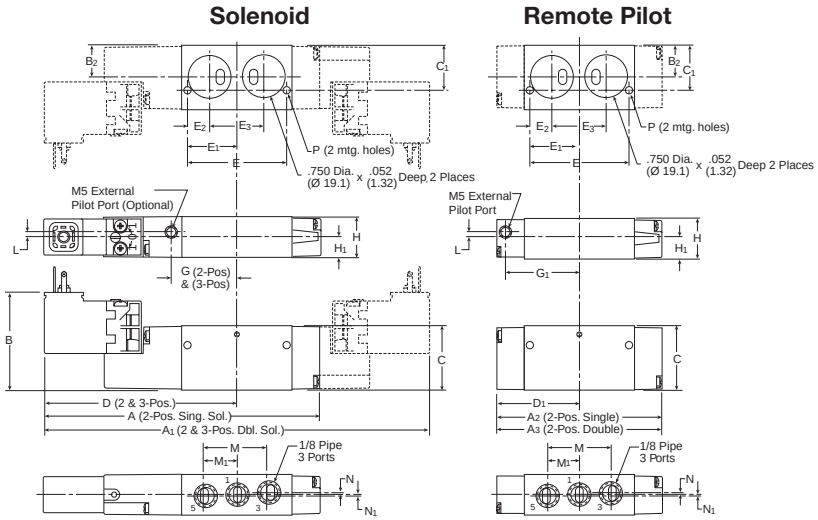


B3 3-way Inline

A	A1	A2	A3	B
4.20 (107)	5.96 (151)	2.65 (67)	2.86 (73)	1.66 (42)
C	**C1**	**D**	**D1**	**E**
1.13 (39)	.84 (21)	2.93 (74)	1.38 (35)	.98 (25)
E1	**F**	**G**	**G1**	**H**
.44 (11)	1.32 (34)	.85 (22)	1.22 (31)	.71 (18)
H1	**J**	**J1**	**K**	**L**
.36 (9)	.51 (13)	.26 (7)	.06 (2)	.11 (3)
M	**M1**	**N**	**N1**	**P**
.63 (16)	.27 (7)	.12 (3)	.06 (2)	Ø .13 Ø (3.3)
Q				
.08 (2)				

Inches (mm)

B3 Single & Double Operators – 4-way Face Mount



B3 4-way Face Mount

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
B2	**C**	**C1**	**D**	**D1**
.58 (15)	1.13 (29)	.81 (21)	3.22 (82)	1.66 (42)
E	**E1**	**E2**	**E3**	**G**
1.74 (44)	.87 (22)	.39 (10)	.95 (24)	1.13 (29)
G1	**H**	**H1**	**L**	**M**
1.50 (38)	.71 (18)	.36 (9)	.11 (3)	1.12 (28)
M1	**N**	**N1**	**P**	
.56 (14)	.05 (1)	.05 (1)	Ø .13 Ø (3.3)	

Inches (mm)

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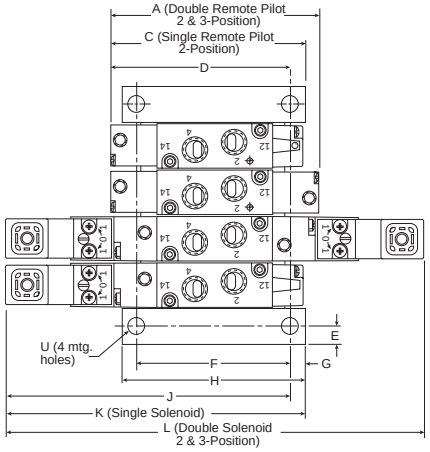
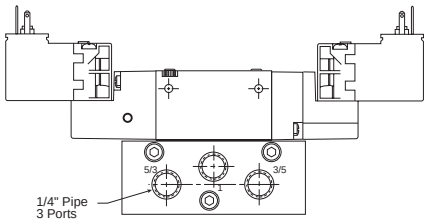
B3 Single & Double Operators – 4-way IEM Stackable

B3 4-way IEM Stackable

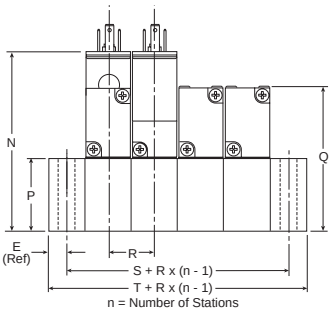
A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.91 (73.9)	.30 (7.6)	2.49 (63.3)
G	**H**	**J**	**K**	**L**
.25 (6.4)	3.00 (76.2)	4.46 (113.3)	4.67 (118.6)	6.43 (163.3)
N	**P**	**Q**	**R**	
2.91 (73.9)	1.25 (31.8)	2.38 (60.5)	.74 ±.01 (18.8) ± .3	
S	**T**	**U**		
1.34 (34.0)	1.94 (49.3)	Ø .28 Ø (7.1)		

Inches (mm)





Max. Hex Size (Across Flats)
For Inlet / Exhaust Ports = 11/16" (17mm)



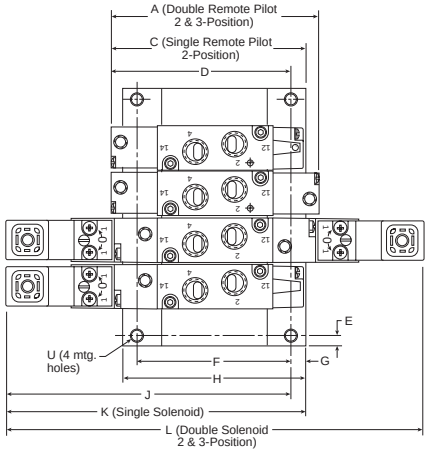
n = Number of Stations

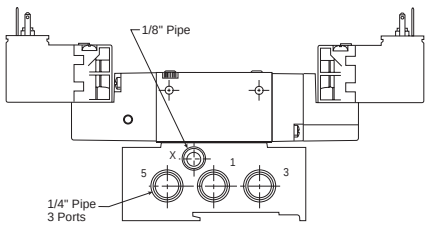
B3 Single & Double Operators – 4-way IEM Aluminum Bar

B3 4-way IEM Aluminum Bar Manifold

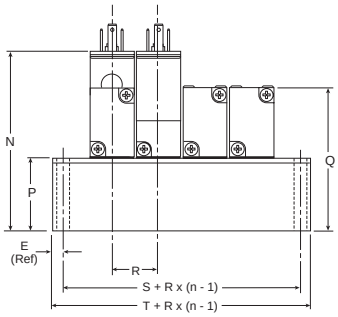
A	C	D	E	F
3.33 (84.6)	3.17 (80.5)	2.94 (74.7)	.25 (6.4)	2.54 (64.5)
G	**H**	**J**	**K**	**L**
.23 (5.9)	3.00 (76.2)	4.50 (114.2)	4.73 (120.1)	6.43 (163.3)
N	**P**	**Q**	**R**	**S**
2.94 (74.7)	1.28 (32.5)	2.41 (61.2)	.81 (20.5)	1.13 (28.8)
T	**U**			
1.64 (41.6)	Ø .23 Ø (5.8)			

Inches (mm)





Max. Hex Size (Across Flats)
For Inlet / Exhaust Ports = 5/8" (16mm)



n = Number of Stations

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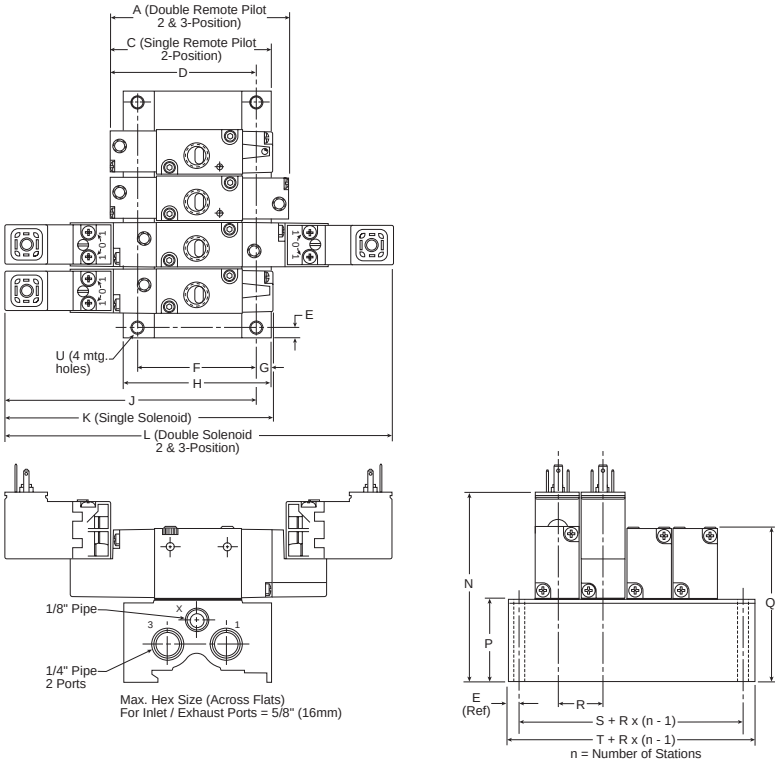
B3 Single & Double Operators – 3-way IEM Aluminum Bar



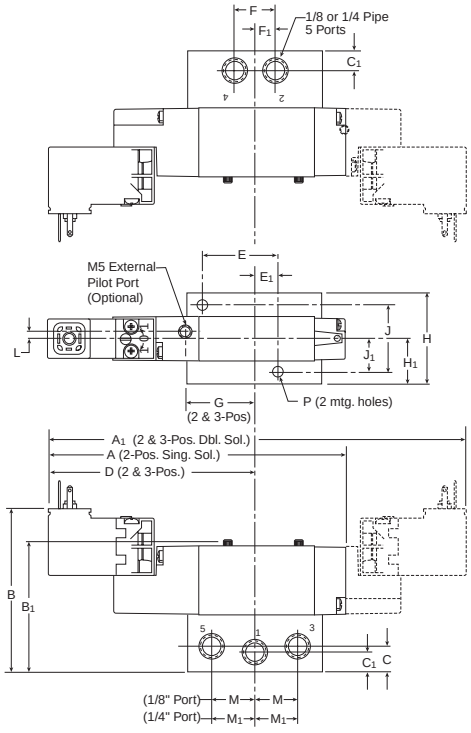
B3 4-way IEM Aluminum Bar Manifold

A	C	D	E	F
2.86 (72.6)	2.65 (67.3)	2.33 (59.2)	.25 (6.4)	1.80 (45.7)
G	**H**	**J**	**K**	**L**
.23 (5.9)	2.25 (57.2)	3.88 (98.6)	4.20 (106.7)	5.96 (151.4)
N	**P**	**Q**	**R**	**S**
2.93 (74.5)	1.27 (32.4)	2.40 (61.1)	.81 (20.5)	1.13 (28.8)
T	**U**			
1.64 (41.6)	Ø .23 Ø (5.8)			

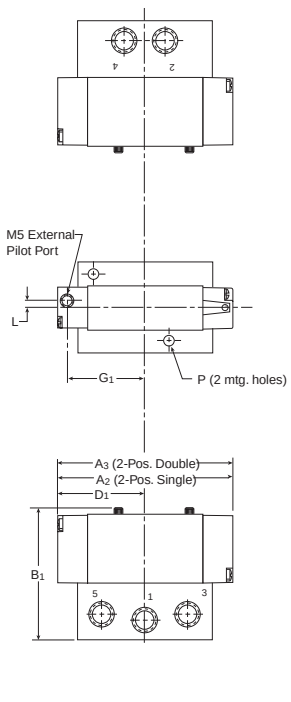
Inches (mm)

B3 Single & Double Operators – 4-way Single Subbase

Solenoid



Remote Pilot



B3 4-way Single Subbase

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	2.63 (67)
B1	**C**	**C1**	**D**	**D1**
2.21 (56)	.47 (12)	.37 (9)	3.22 (82)	1.66 (42)
E	**E1**	**F**	**F1**	**G**
1.25 (32)	.38 (10)	.69 (18)	.34 (9)	1.13 (29)
G1	**H**	**H1**	**J**	**J1**
1.50 (38)	1.50 (38)	.75 (19)	1.12 (28)	.56 (14)
L	**M**	**M1**	**P**	
.11 (3)	.71 (18)	.76 (19)	Ø .18 Ø (4)	

Inches (mm)

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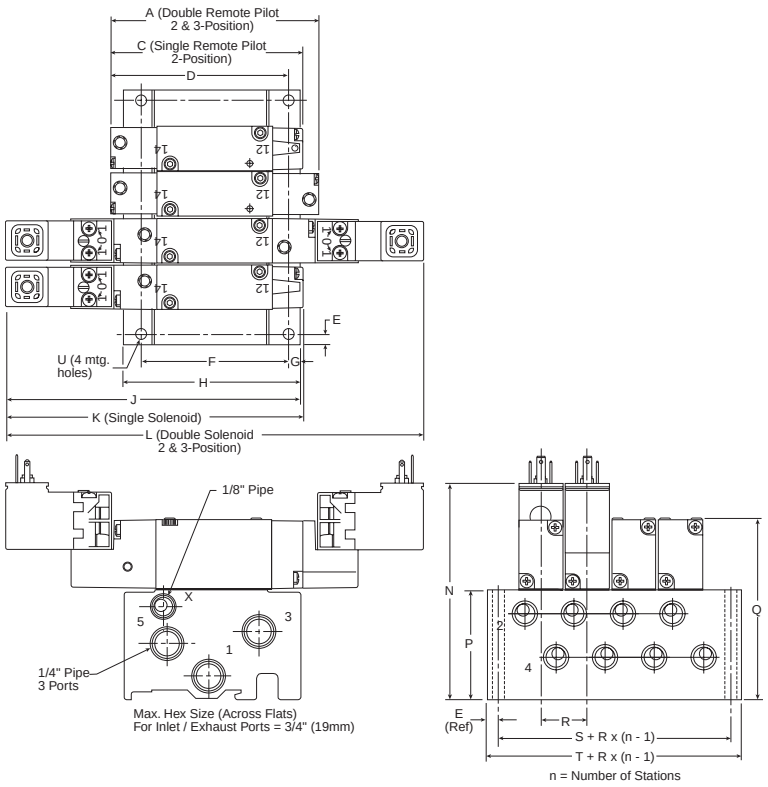
B3 Single & Double Operators – 5-Port Subbase Bar Manifold

B3 5-Port Subbase Bar Manifold

A	C	D	E	F
3.33	3.12	2.88	.25	2.43
(84.6)	(79.2)	(73.2)	(6.3)	(61.7)
G	**H**	**J**	**K**	**L**
.22	2.93	4.66	4.67	6.43
(5.5)	(74.5)	(118.3)	(118.6)	(166.3)
N	**P**	**Q**	**R**	**S**
3.47	1.81	2.94	.81	1.39
(88.2)	(46.0)	(74.7)	(20.5)	(35.4)
T	**U**			
1.89	Ø .22			
(48.0)	Ø (5.6)			

Inches (mm)



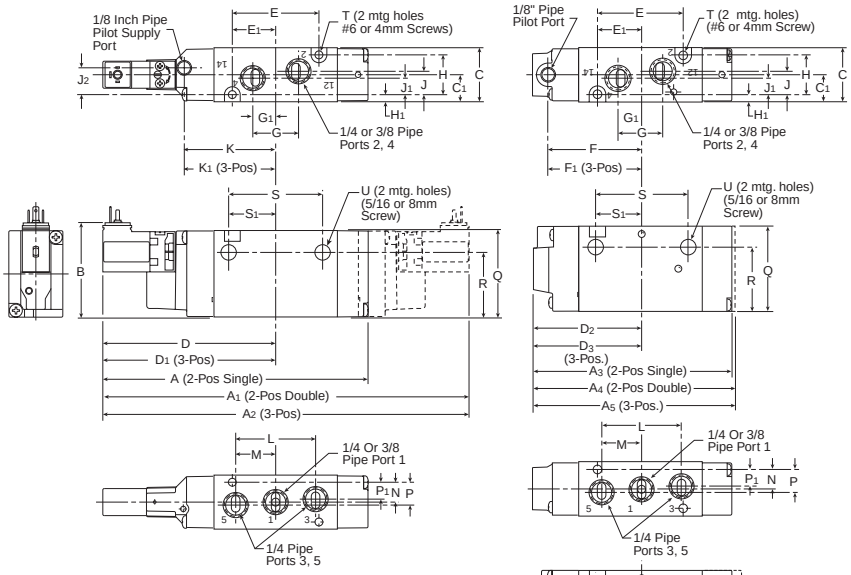
B5 Single & Double Operators – 4-way Inline

B5 4-way Inline

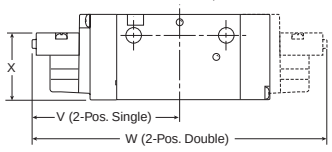
A	A_1	A_2	A_3	A_4
5.78	7.51	8.45	4.37	4.70
(147)	(191)	(215)	(110)	(119)
A_5	**B**	**C**	**C_1**	**D**
5.64	2.06	1.18	.59	3.76
(143)	(52)	(30)	(15)	(96)
D_1	**D_2**	**D_3**	**E**	**E_1**
4.23	2.35	2.82	1.89	.95
(107)	(60)	(72)	(48)	(24)
F	**F_1**	**G**	**G_1**	**H**
2.01	2.47	1.00	.50	.87
(51)	(63)	(25)	(13)	(22)
H_1	**J**	**J_1**	**J**	**K**
.16	.51	.36	.58	2.00
(4)	(13)	(9)	(15)	(51)
K_1	**L**	**M**	**N**	**P**
2.47	1.75	.88	.43	.50
(63)	(44)	(22)	(48)	(13)
P_1	**Q**	**R**	**S**	**S_1**
.37	1.89	1.41	2.05	1.03
(92)	(48)	(36)	(52)	(26)
T	**U**	**V**	**W**	**X**
Ø .177	Ø .34	3.24	6.48	1.50
Ø (4.5)	Ø (9)	(82)	(165)	(383)

Inches (mm)

Solenoid **Remote Pilot**



Remote Pilot ("YY" Option)



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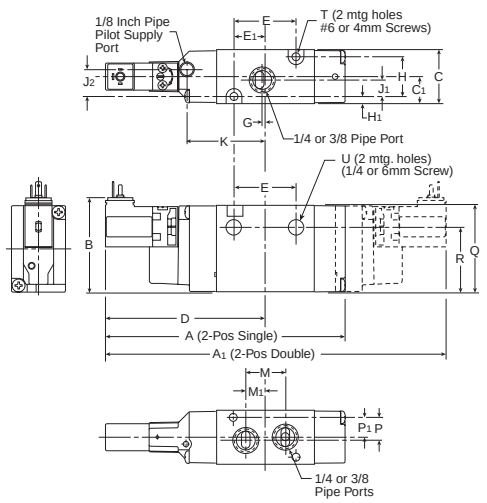
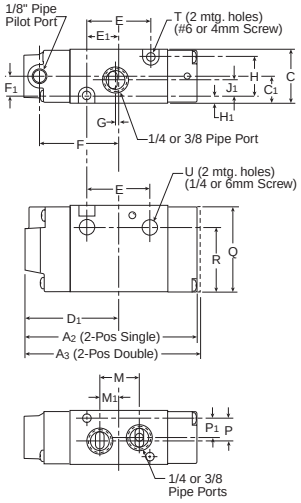
B5 Single & Double Operators – 3-way Inline

Solenoid



Remote Pilot



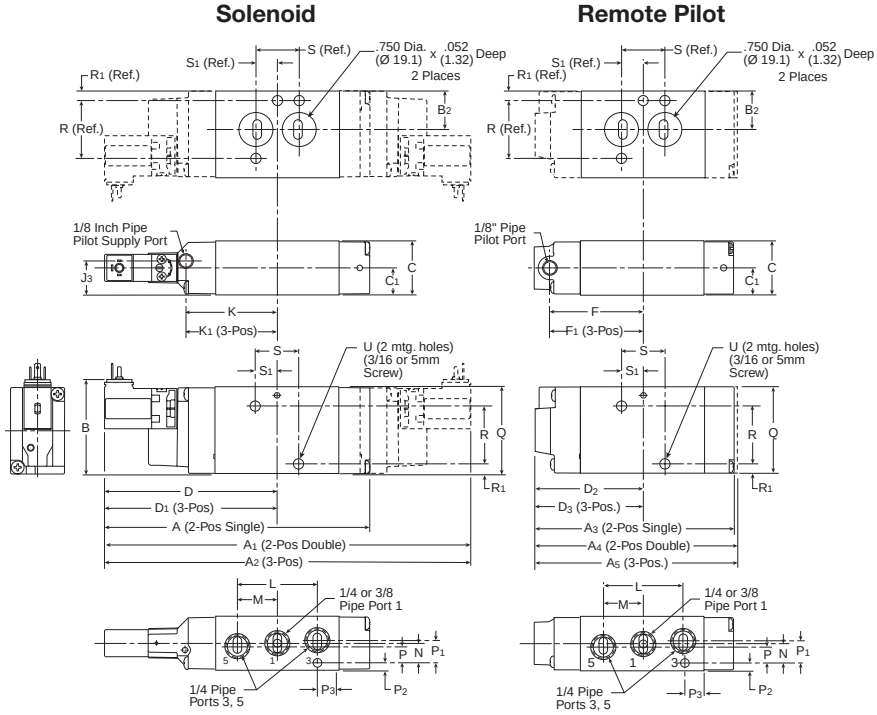
B5 3-way Inline

A	A1	A2	A3	B
5.29 (134)	7.03 (179)	3.88 (99)	4.21 (107)	2.06 (52)
C	**C1**	**D**	**D1**	**E**
1.18 (30)	.59 (15)	3.43 (87)	2.11 (54)	1.40 (36)
E1	**F**	**F1**	**G**	**H**
.70 (18)	1.77 (45)	.43 (11)	.06 (2)	.87 (22)
H1	**J1**	**J2**	**K**	**M**
.16 (4)	.36 (9)	.58 (15)	1.67 (42)	.88 (22)
M1	**P**	**P1**	**Q**	**R**
.44 (11)	.50 (13)	.37 (9)	1.89 (48)	1.41 (36)
T	**U**			
Ø .177 Ø (4.5)	Ø .26 Ø (6.6)			

Inches (mm)

B5 Single & Double Operators – 4-way NAMUR Mount

Solenoid



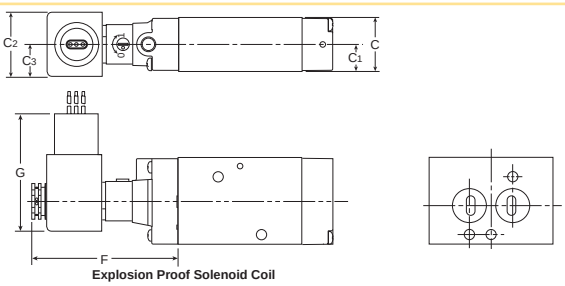
Remote Pilot

B5 4-way NAMUR Mount

A	A1	A2	A3	A4
5.78 (147)	7.51 (191)	8.45 (215)	4.37 (110)	4.70 (119)
A5	**B**	**B2**	**C**	**C1**
5.64 (143)	2.06 (52)	.84 (21)	1.18 (30)	.59 (15)
D	**D1**	**D2**	**D3**	**F**
3.76 (96)	4.23 (107)	2.35 (60)	2.82 (72)	2.01 (51)
F1	**J3**	**K**	**K1**	**L**
2.47 (63)	.74 (19)	2.00 (51)	2.47 (63)	1.75 (44)
M	**N**	**P**	**P1**	**P2**
.88 (22)	.44 (11)	.37 (9.4)	.50 (13)	.16 (4)
P3	**Q**	**R**	**R1**	**S**
.40 (10)	1.89 (48)	1.26 (32)	.21 (5)	.94 (24)
S1	**U**			
.47 (12)	Ø .224 Ø (5.7)			

Inches (mm)

B5 Alternative Electrical Enclosure Option F



Explosion Proof Solenoid Coil

B5 4-way NAMUR Mount with Option F Enclosure

C	C1	C2	C3	F
1.18 (30)	.59 (15)	1.42 (36)	.71 (18)	3.15 (80)
G				
2.60 (66)				

Inches (mm)

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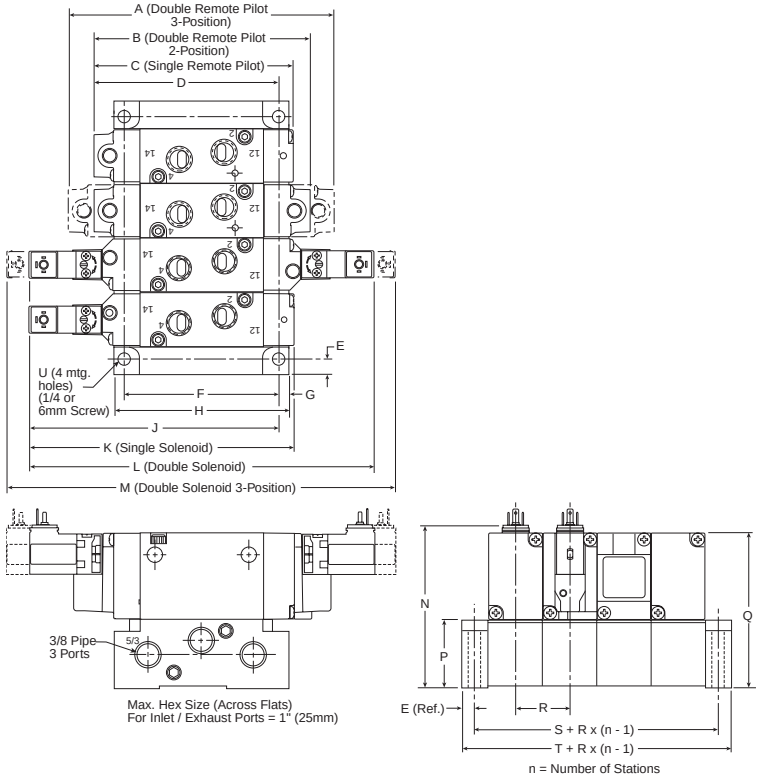
B5 Single & Double Operators – 4-way IEM Stackable

B5 4-way IEM Stackable

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	4.29 (109.0)	.29 (7.4)
F	**G**	**H**	**J**	**K**
3.44 (87.4)	.24 (6.1)	3.92 (99.6)	5.48 (139.2)	5.78 (146.8)
L	**M**	**N**	**P**	**Q**
7.52 (191.0)	8.46 (214.9)	3.56 (90.4)	1.50 (38.1)	3.42 (86.9)
R		**S**	**T**	**U**
1.21 ± .01 (30.7) ± (.3)		1.79 (45.5)	2.37 (60.2)	Ø .28 Ø (7.1)

Inches (mm)



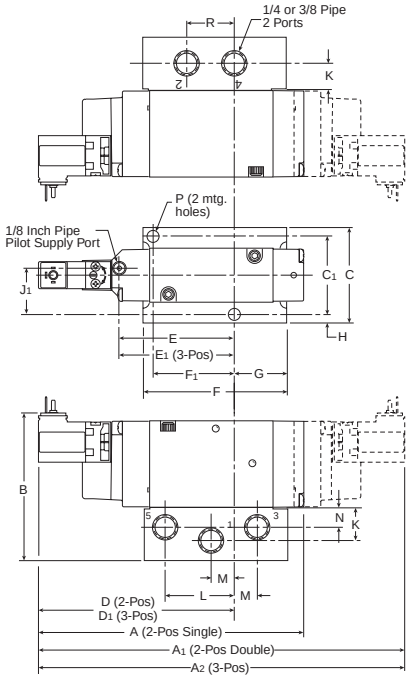
B5 Single & Double Operators – 4-way Single Subbase

B5 4-way Subbase

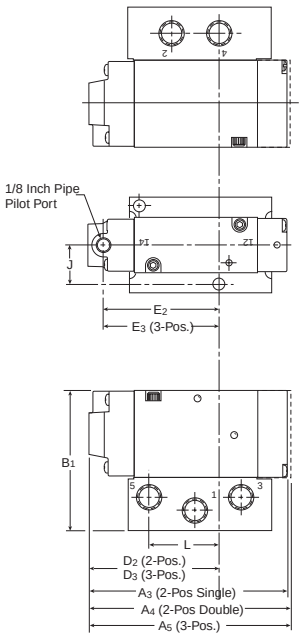
A	A_1	A_2	A_3	A_4
5.78 (147)	7.52 (191)	8.46 (215)	4.37 (110)	4.70 (119)
A_5	B	B_1	C	C_1
5.64 (143)	3.21 (82)	3.03 (77)	2.12 (54)	1.69 (43)
D	D_1	D_2	D_3	E
4.26 (108)	4.73 (120)	2.85 (72)	3.32 (40)	2.51 (65)
E_1	E_2	E_3	F	F_1
2.98 (76)	2.60 (66)	3.07 (80)	2.90 (74)	1.69 (43)
G	H	J	J_1	K
.95 (24)	.22 (5)	.84 (21)	.99 (25)	.71 (18)
L	M	N	P	R
1.50 (38)	.50 (13)	.46 (12)	Ø .27 Ø (7)	1.00 (25)

Inches (mm)

Solenoid



Remote Pilot



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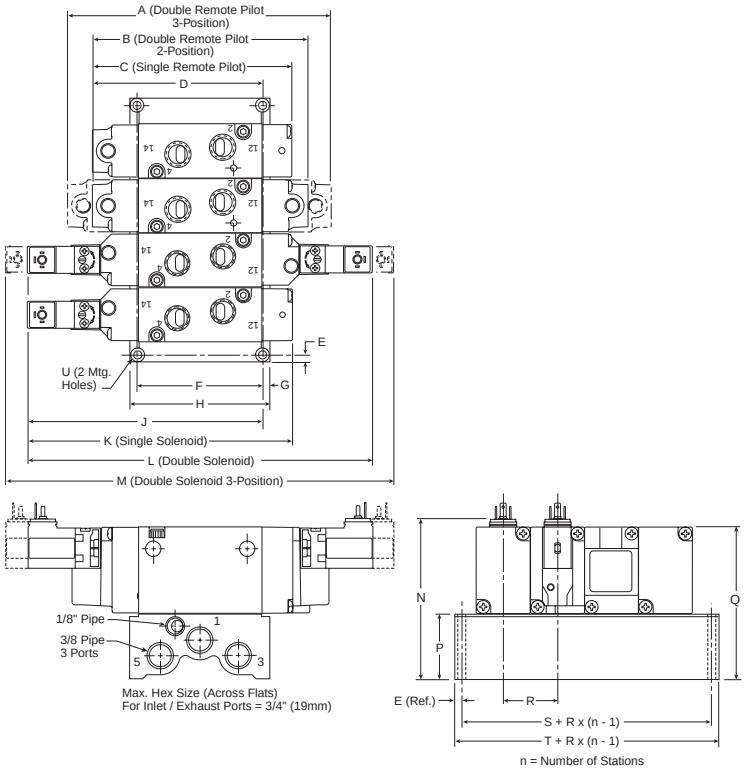
B5 Single & Double Operators – 4-way IEM Aluminum Bar

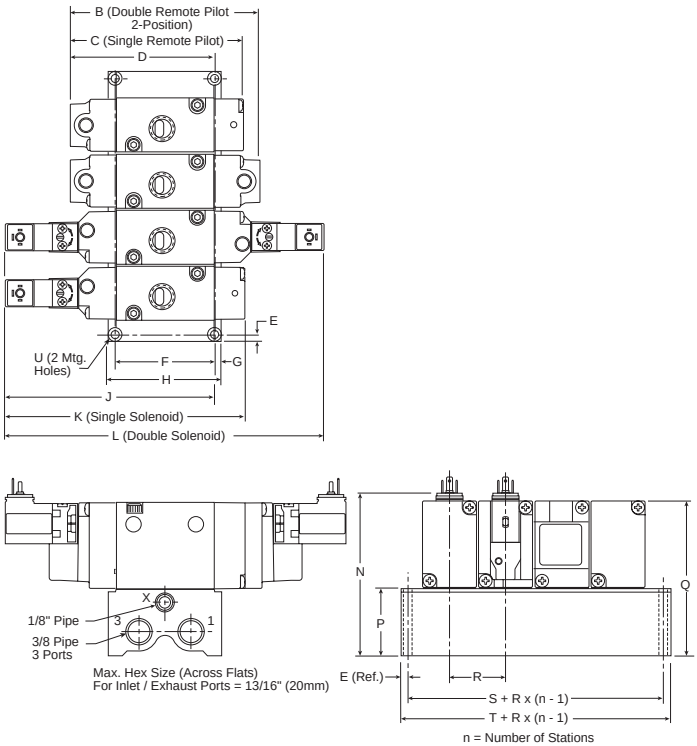


B5 4-way IEM Aluminum Bar Manifold

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	3.74 (95.0)	.18 (4.6)
F	**G**	**H**	**J**	**K**
2.78 (70.6)	.17 (4.3)	3.12 (79.2)	5.15 (130.8)	5.78 (146.8)
L	**M**	**N**	**P**	**Q**
7.52 (191.0)	8.46 (214.9)	3.50 (89.0)	1.44 (36.6)	3.36 (85.3)
R	**S**	**T**	**U**	
1.26 (32.0)	1.78 (45.2)	2.14 (54.4)	Ø .22 Ø (5.5)	

Inches (mm)

B5 Single & Double Operators – 3-way IEM Aluminum Bar



B5 3-way IEM Aluminum Bar Manifold

B	C	D	E	F
4.21 (106.9)	3.88 (98.6)	3.41 (86.6)	.18 (4.6)	2.12 (53.8)
G	**H**	**J**	**K**	**L**
.17 (4.3)	2.46 (62.5)	4.82 (122.4)	5.29 (134.4)	7.03 (178.6)
N	**P**	**Q**	**R**	**S**
3.50 (89.0)	1.44 (36.6)	3.36 (85.3)	1.26 (32.0)	1.76 (44.7)
T	**U**			
2.12 (53.8)	Ø .18 Ø (4.6)			

Inches (mm)

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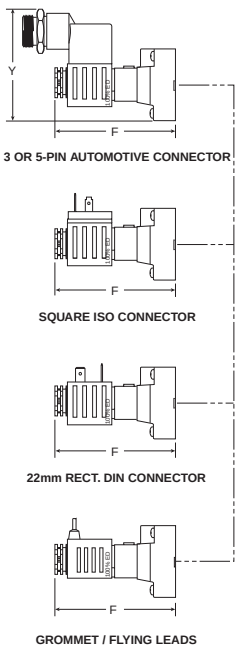
B5 3 & 4-way Alternative Electrical Enclosures

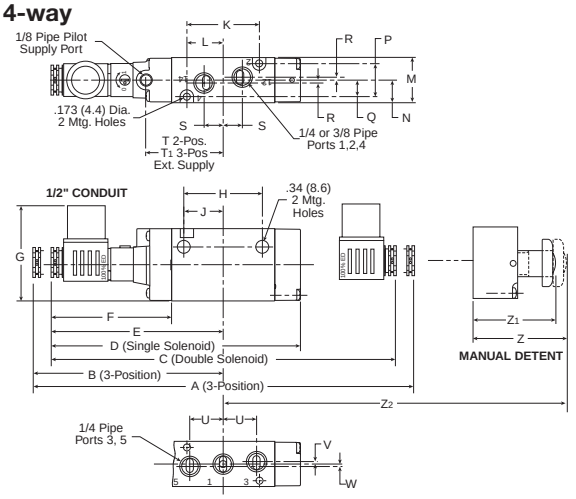
B5 Alternative – Electrical Enclosures

A	A1	B	C	D
9.94 (252.5)	.872 (221.4)	4.97 (126.2)	9.00 (228.6)	6.52 (165.6)
D1	**E**	**E1**	**F**	**G**
6.02 (152.9)	4.50 (114.3)	4.26 (108.1)	3.15 (80.0)	2.47 (62.8)
H	**J**	**K**	**K1**	**L**
2.05 (52.1)	1.03 (26.2)	1.89 (48.0)	1.40 (35.5)	.95 (24.1)
L1	**M**	**N**	**P**	**Q**
.70 (17.8)	1.18 (30.0)	.59 (15.0)	.87 (22.1)	.43 (10.9)
R	**S**	**S1**	**T**	**T1**
.08 (2.0)	.50 (12.7)	.06 (1.5)	2.01 (51.1)	2.47 (62.7)
T2	**U**	**U1**	**U2**	**V**
1.76 (44.8)	.87 (22.1)	.43 (10.9)	.45 (11.3)	.06 (1.5)
V1	**W**	**W1**	**Y**	**Z**
.37 (9.3)	.07 (1.8)	.50 (13)	2.90 (73.6)	2.40 (60.9)
Z1	**Z2**	**Z3**		
2.12 (53.8)	3.75 (95.2)	4.17 (105.8)		

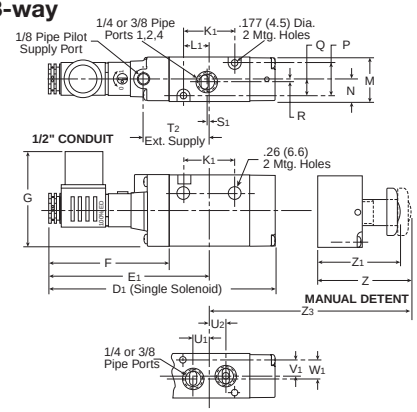
Inches (mm)



4-way



3-way



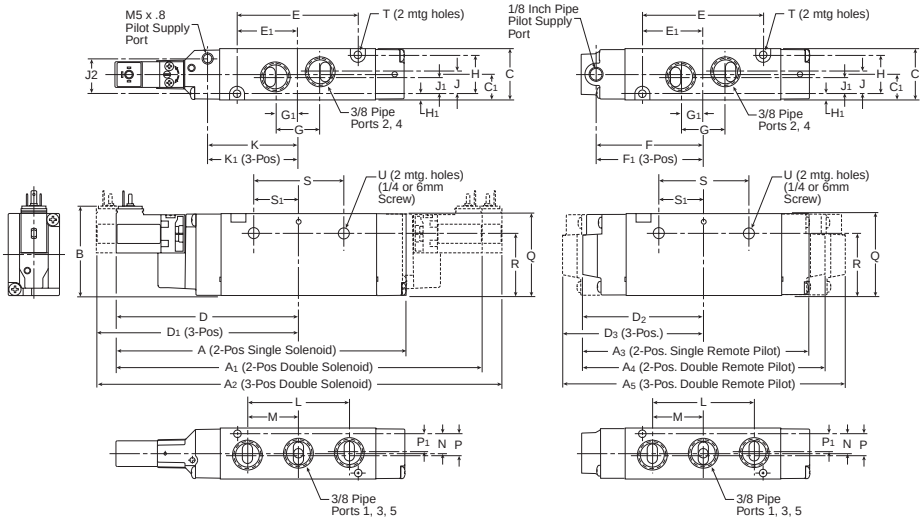
B6 Single & Double Operators – 4-way Inline

B6 4-way Inline

A	A1	A2	A3	A4
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	**B**	**C**	**C1**	**D**
6.54 (166)	2.06 (52)	1.18 (30.0)	.59 (15)	4.21 (106.8)
D1	**D2**	**D3**	**E**	**E1**
4.68 (118.8)	2.80 (71)	3.27 (83.0)	2.79 (70.8)	1.39 (35.4)
F	**F1**	**G**	**G1**	**H**
2.45 (62.3)	2.92 (74.3)	1.03 (26.1)	.51 (13.1)	.91 (23)
H1	**J**	**J1**	**J2**	**K**
.14 (3.5)	.51 (13.1)	.39 (10)	.81 (20.6)	2.09 (53)
K1	**L**	**M**	**N**	**P**
2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.45 (11.5)	.49 (12.5)
P1	**Q**	**R**	**S**	**S1**
.41 (10.5)	1.89 (48)	1.45 (36.8)	2.09 (53)	1.04 (26.5)
T	**U**			
Ø .17 Ø (4.4)	Ø .27 Ø (6.9)			

Inches (mm)

Solenoid **Remote Pilot**



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B6 Single Operators – 3-way Inline

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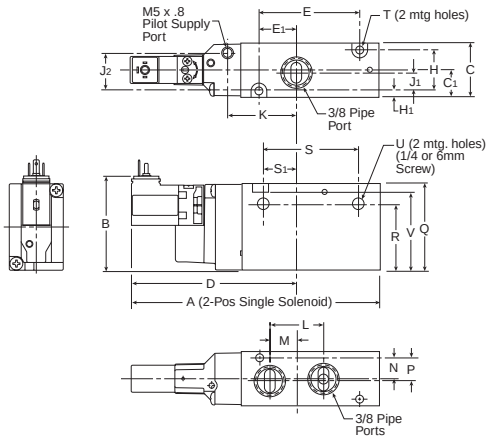
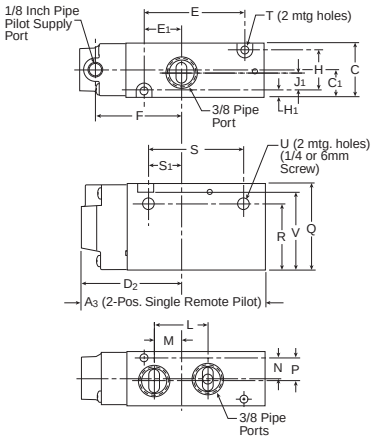


Remote Pilot



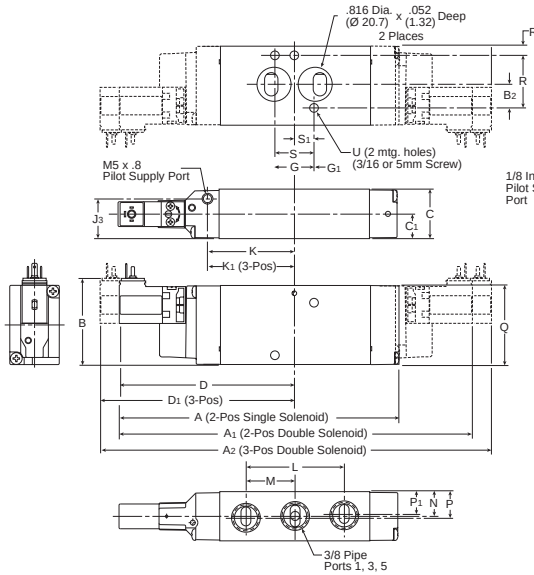
B6 3-way Inline

A	A3	B	C	C1
5.42 (137.7)	4.01 (101.9)	2.06 (52)	1.18 (30.0)	.59 (15.0)
D	**D2**	**E**	**E1**	**F**
3.63 (92.1)	2.22 (56.3)	2.19 (55.6)	0.82 (20.7)	1.87 (47.6)
H	**H1**	**J1**	**J2**	**K**
.91 (23.0)	.14 (3.5)	.39 (10.0)	.81 (20.6)	1.51 (38.3)
L	**M**	**N**	**P**	**Q**
1.17 (29.7)	.59 (15.0)	.45 (11.5)	.49 (12.5)	1.89 (48.0)
R	**S**	**S1**	**T**	**U**
1.45 (36.8)	2.09 (53.0)	0.76 (19.4)	Ø .17 Ø (4.4)	Ø .27 Ø (6.9)
V				
1.69 (43.0)				

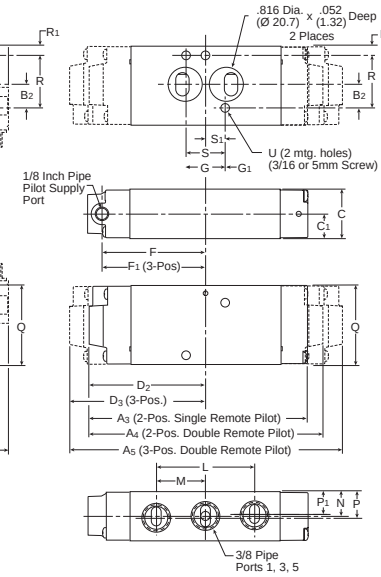
Inches (mm)

B6 Single & Double Operators – 4-way NAMUR Mount

Solenoid



Remote Pilot

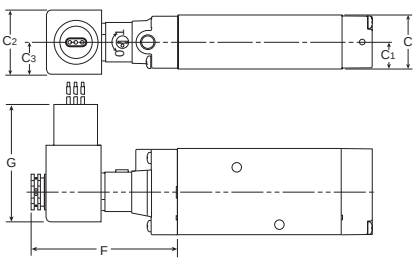


B6 4-way NAMUR Mount

A	A1	A2	A3	A4
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	**B**	**B2**	**C**	**C1**
6.54 (166.0)	2.06 (52)	.57 (14.4)	1.18 (30.0)	.59 (15)
D	**D1**	**D2**	**D3**	**F**
4.21 (106.8)	4.68 (118.8)	2.80 (71.0)	3.27 (83.0)	2.45 (62.3)
F1	**G**	**G1**	**J3**	**K**
2.92 (74.3)	.95 (24.2)	.02 (0.53)	.95 24.1)	2.09 (53.0)
K1	**L**	**M**	**N**	**P**
2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.59 (15)	.63 (16)
P1	**Q**	**R**	**R1**	**S**
.55 (14)	1.89 (48.0)	1.26 (32)	.22 (5.5)	.94 (24)
S1	**T**	**U**		
.47 (12)	Ø .17 Ø (4.4)	Ø .27 Ø (6.9)		

Inches (mm)

B6 Alternative Electrical Enclosure Option F



Hazardous Duty Solenoid Coil

B6 4-way NAMUR Mount with Option F Enclosure

C	C1	C2	C3	F
1.18 (30)	.59 (15)	1.42 (36)	.71 (18)	3.15 (80)
G				
2.60 (66)				

Inches (mm)

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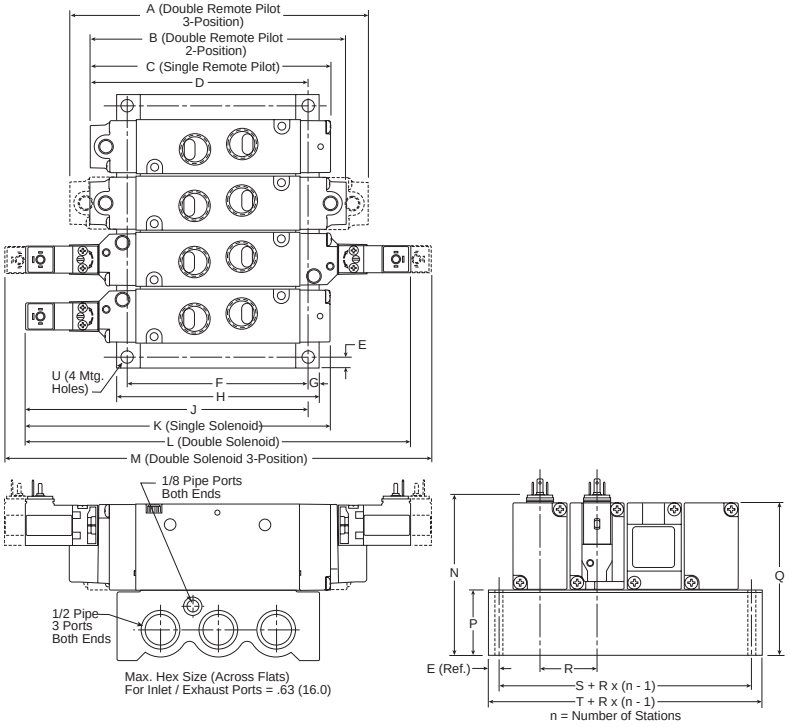
B6 Single & Double Operators – 4-way IEM Aluminum Bar

B6 4-way IEM Aluminum Bar Manifold

A	B	C	D	E
6.54 (166.0)	5.59 (142.1)	5.26 (133.7)	4.76 (121.0)	.24 (6.0)
F	**G**	**H**	**J**	**K**
3.94 (100.0)	.24 (6.0)	4.41 (112.0)	6.17 (156.8)	6.67 (169.5)
L	**M**	**N**	**P**	**Q**
8.41 (213.7)	9.35 (237.6)	3.60 (91.3)	1.54 (39.0)	3.43 (87.0)
R	**S**	**T**	**U**	
1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	ø .26 ø (6.5)	

Inches (mm)

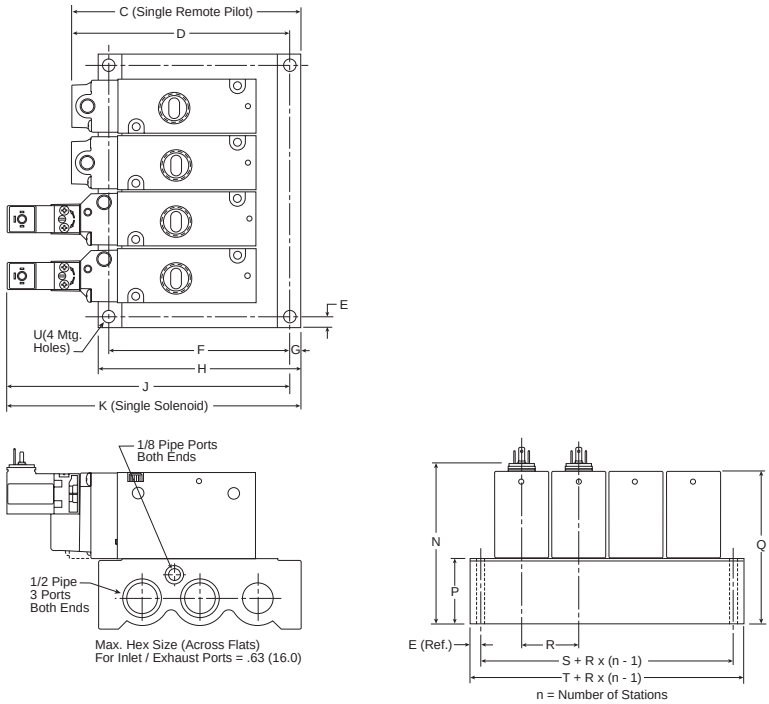


B6 Single Operators – 3-way IEM Aluminum Bar

B6 3-way IEM Aluminum Bar Manifold

C	D	E	F	G
5.00 (127.0)	4.76 (121.0)	.24 (6.0)	3.94 (100.0)	.24 (6.0)
H	**J**	**K**	**N**	**P**
4.41 (112.0)	6.17 (156.8)	6.41 (162.8)	3.60 (91.3)	1.54 (39.0)
Q	**R**	**S**	**T**	**U**
3.43 (87.0)	1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	Ø .26 Ø (6.5)

Inches (mm)



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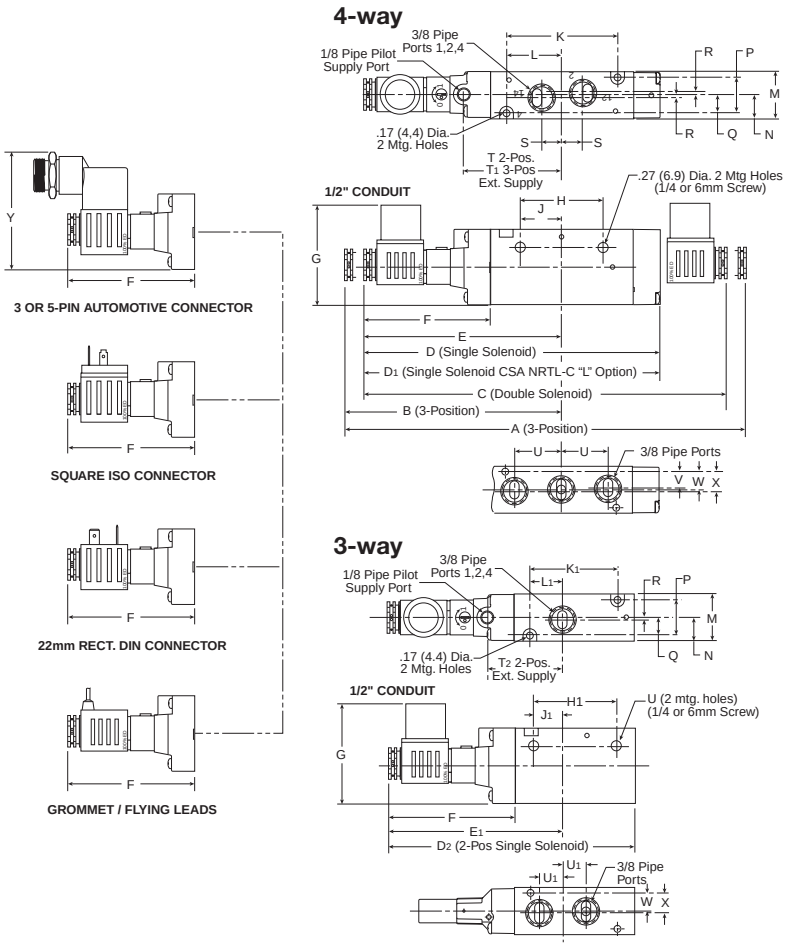
B6 3 & 4-way Alternative Electrical Enclosures

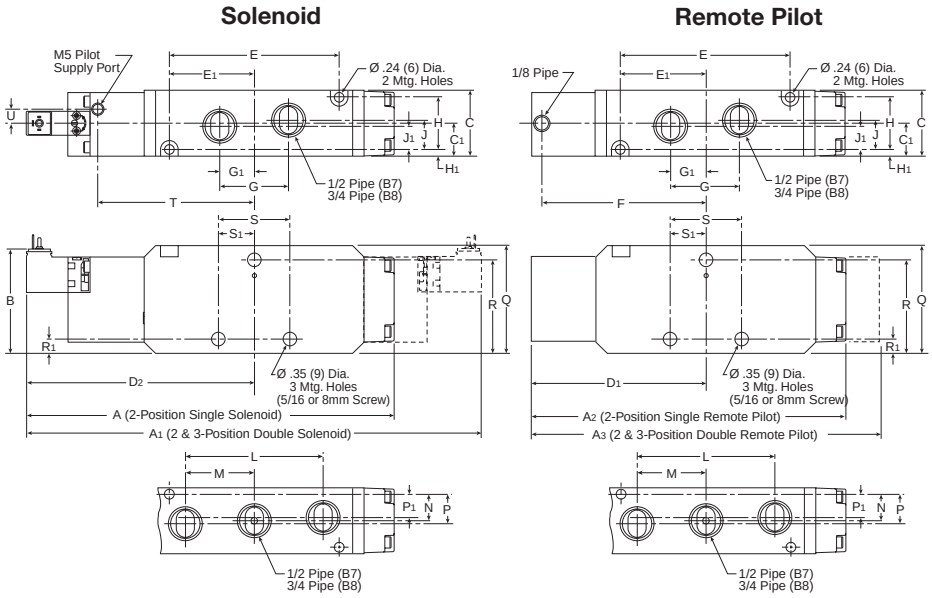


B6 Alternative – Electrical Enclosures

A	B	C	D	D1
10.84 (275.3)	5.41 (137.5)	9.89 (251.3)	7.41 (188.2)	7.74 (196.6)
D2	**E**	**E2**	**F**	**G**
6.17 (156.6)	4.94 (125.6)	4.37 (111.0)	3.15 (80.0)	2.47 (62.8)
H	**H1**	**J**	**J1**	**K**
2.09 (53.0)	2.09 (53.0)	1.04 (26.5)	0.76 (19.4)	2.79 (70.8)
K1	**L**	**L1**	**M**	**N**
2.19 (55.6)	1.39 (35.4)	.82 (20.7)	1.18 (30.0)	.59 (15.0)
P	**Q**	**R**	**S**	**T**
.91 (23.0)	.45 (11.5)	.06 (1.6)	.51 (13.1)	2.45 (62.3)
T1	**T2**	**U**	**U1**	**V**
2.93 (29.7)	1.89 (48.0)	.59 (15.0)	.59 (15.0)	.41 (10.5)
W	**X**	**Y**		
.45 (11.5)	.49 (12.5)	2.90 (73.6)		

Inches (mm)

B7& B8 Single & Double Operators – 4-way Inline



B7 & B8 4-way Inline

A	A1	A2	A3	B
9.13 (232)	11.29 (287)	7.79 (198)	8.62 (219)	2.59 (66)
C	**C1**	**D1**	**D2**	**E**
1.65 (42)	.83 (21)	4.29 (109)	5.63 (143)	4.21 (107)
E1	**F**	**G**	**G1**	**H**
2.13 (54)	4.06 (103)	1.73 (44)	.87 (22)	1.29 (33)
H1	**J**	**J1**	**L**	**M**
.16 (4)	.75 (19)	.59 (15)	3.39 (86)	1.69 (43)
N	**P**	**P1**	**Q**	**R**
.67 (17)	.75 (19)	.59 (15)	2.68 (68)	2.32 (59)
R1	**S**	**S1**	**T**	**U**
.35 (9)	1.81 (46)	.90 (23)	3.94 (100)	.35 (9)

Inches (mm)

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B7 & B8 Single Operators – 3-way Inline

B7 & B8 3-way Inline

A	A_2	B	C	C_1
7.99 (203)	6.65 (169)	2.59 (66)	1.65 (42)	.83 (21)

D_1	D_2	E	E_1	F
4.29 (109)	5.63 (143)	4.21 (107)	2.13 (54)	4.06 (103)

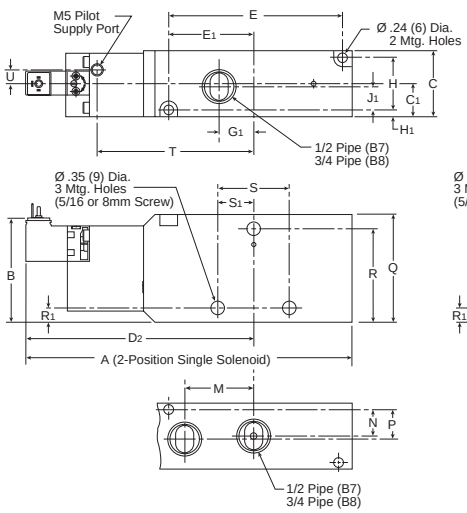
G_1	H	H_1	J_1	M
.86 (22)	1.29 (33)	.16 (4)	.59 (15)	1.69 (43)

N	P	Q	R	R_1
.67 (17)	.75 (19)	2.68 (68)	2.32 (59)	.35 (9)

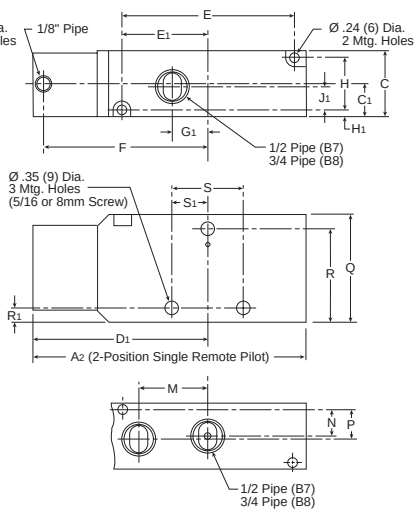
S	S_1	T	U
1.81 (46)	.90 (23)	3.94 (100)	.35 (9)

Inches (mm)

Solenoid



Remote Pilot



B7 & B8 Single & Double Operators – 4-way IEM Aluminum Bar

B7 & B8 4-way IEM Aluminum Bar Manifold

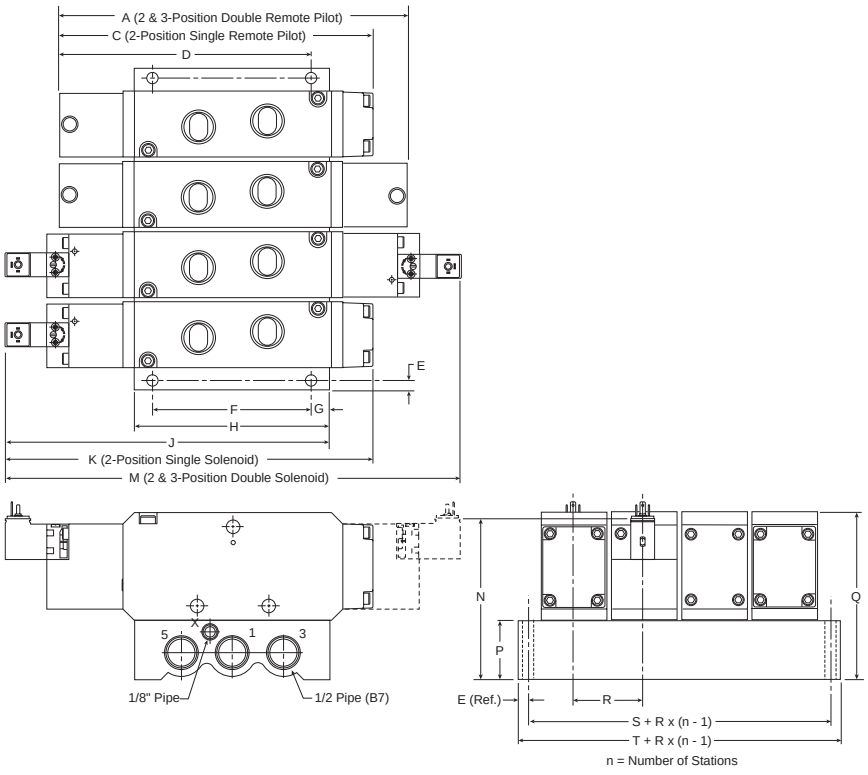
A	C	D	E	F
7.79 (198)	8.62 (219)	6.26 (159)	.24 (6)	3.94 (100)

G	H	J	K	M
.45 (11.5)	4.84 (123)	8.07 (205)	9.13 (232)	11.29 (287)

N	P	Q	R	S
4.00 (101.5)	1.48 (37.5)	4.15 (105.5)	1.77 (45)	2.24 (57)

T
2.72 (69)

Inches (mm)



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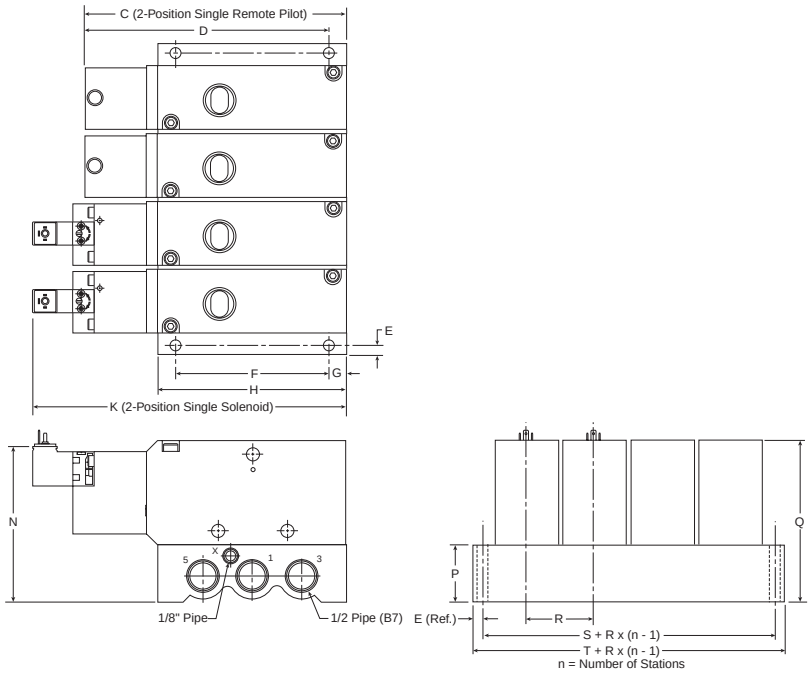
B7 & B8 Single Operators – 3-way IEM Aluminum Bar



B7 & B8 3-way IEM Aluminum Bar Manifold

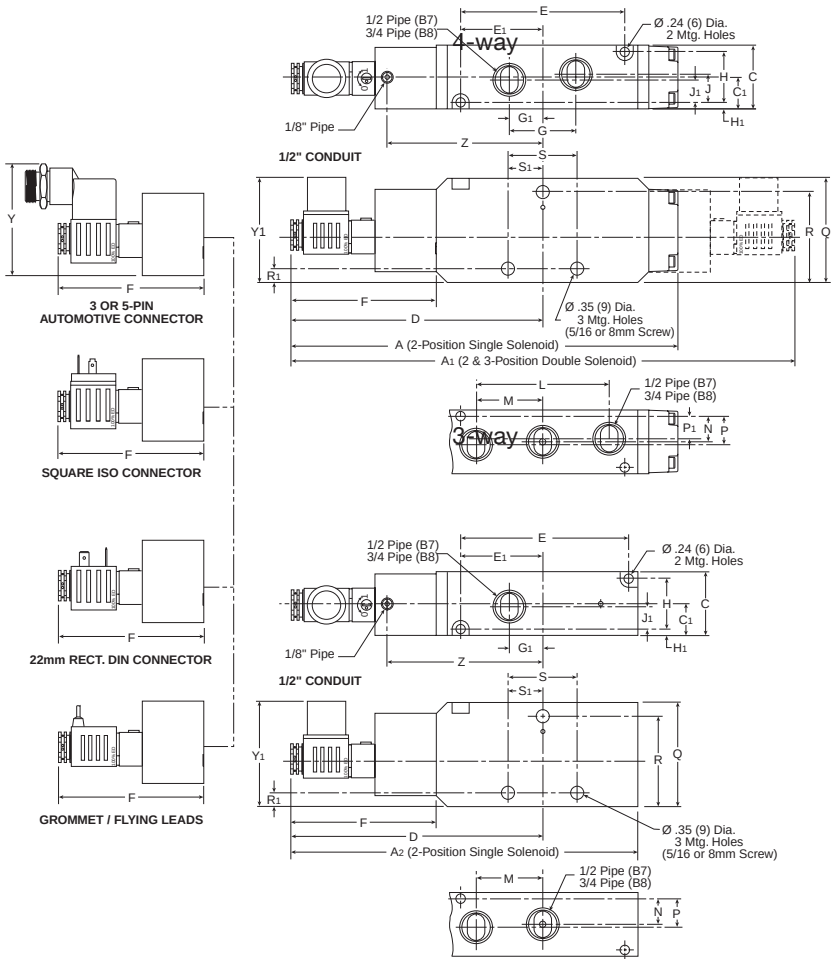
C	D	E	F	G
6.65 (169)	4.92 (124.9)	.24 (6)	3.94 (100)	.45 (11.5)

H	K	N	P	Q
4.84 (123)	7.99 (203)	4.00 (101.5)	1.48 (37.5)	4.15 (105.5)

R	S	T
1.77 (45)	2.24 (57)	2.72 (69)

Inches (mm)

B7 & B8 3 & 4-way Alternative Electrical Enclosures



B7 & B8 3 & 4-way Alternative Electrical Enclosures

A	A1	A2	C	C1
9.92 (252)	12.91 (328)	8.78 (223)	1.65 (42)	.83 (21)

D	E	E1	F	G
6.46 (164)	4.21 (107)	2.13 (54)	3.74 (95)	1.73 (44)

G1	H	H1	J	J1
.86 (22)	1.29 (33)	.16 (4)	.75 (19)	.59 (15)

L	M	N	P	P1
3.39 (86)	1.69 (43)	.67 (17)	.75 (19)	.59 (15)

Q	R	R1	S	S1
2.68 (68)	2.32 (59)	.35 (9)	1.81 (46)	.90 (23)

Y	Y1	Z
2.87 (73)	2.71 (69)	3.98 (101)

Inches (mm)

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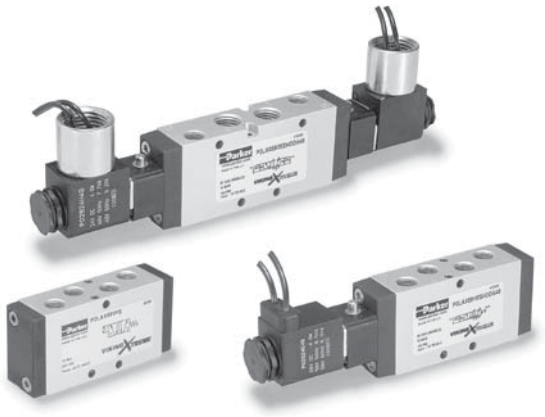
The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.



Ports
- P2LAX: 1/8 inch NPT & BSPP
- P2LBX: 1/4 inch NPT & BSPP
- P2LCX: 3/8 inch NPT & BSPP
- P2LDX: 1/2 inch & BSPP

Mounting
- Inline
- IEM aluminum bar

Solenoids
- 2.5 W to 7.3 watts
  - Conduit
  - Grommet
  - 22mm & 30mm 3-pin (DIN 43650)
- 12VDC to 240VAC W Option Available

Certification / Approval
- IP65 Rated
- ATEX option available

Mobile Applications
- Viking Xtreme tested to +5g shock and vibration
- Solenoids operate with wide voltage tolerance bands
- Corrosion resistant design

Operating information

Operating pressure:	
Normal	Vacuum to 145 PSIG (Vacuum to 10 bar)
Xtreme	Vacuum to 232 PSIG (Vacuum to 16 bar)
	Minimum: See chart
Operating temperature:	
Normal	14°F to 122°F (-10°C to 50°C)
Xtreme	-40°F to 158°F (-40°C to 70°C)

Materials

Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless Steel
Spool	Aluminum and nitrile rubber

Minimum Operating Pressure

	Minimum PSIG (bar)			
Valve type - Internal pilot	**P2LAX**	**P2LBX**	**P2LCX**	**P2LDX**
Single solenoid - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Single remote pilot - spring return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Double solenoid - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double remote pilot - 2-position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double solenoid - 3-position (APB, PC, CE)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)
Double remote pilot - 3-position (APB, PC, CE)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)

Most popular. For technical information see CD

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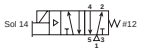
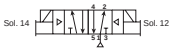
Single Solenoid, 2-Position, Extreme Operating Pressure / Temperature



P2LAX Shown

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	12VDC	P2LAX	**P2LAX591ESHDDB47** **P2LAX591ESHDDG47**
	1/8"	0.7 Cv	24VDC	P2LAX	**P2LAX591ESHDDB48** **P2LAX591ESHDDG48**
	1/4"	1.3 Cv	12VDC	P2LBX	**P2LBX592ESHDDB47** **P2LBX592ESHDDG47**
	1/4"	1.3 Cv	24VDC	P2LBX	**P2LBX592ESHDDB48** **P2LBX592ESHDDG48**
	3/8"	2.5 Cv	12VDC	P2LCX	**P2LCX593ESHDDB47** **P2LCX593ESHDDG47**
	3/8"	2.5 Cv	24VDC	P2LCX	**P2LCX593ESHDDB48** **P2LCX593ESHDDG48**
	1/2"	2.7 Cv	12VDC	P2LDX	**P2LDX594ESHDDB47** **P2LDX594ESHDDG47**
	1/2"	2.7 Cv	24VDC	P2LDX	**P2LDX594ESHDDB48** **P2LDX594ESHDDG48**

Double Solenoid, 2-Position, Extreme Operating Pressure / Temperature

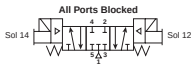


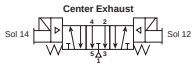
P2LBX Shown

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	12VDC	P2LAX	**P2LAX591EEHDDB47** **P2LAX591EEHDDG47**
	1/8"	0.7 Cv	24VDC	P2LAX	**P2LAX591EEHDDB48** **P2LAX591EEHDDG48**
	1/4"	1.3 Cv	12VDC	P2LBX	**P2LBX592EEHDDB47** **P2LBX592EEHDDG47**
	1/4"	1.3 Cv	24VDC	P2LBX	**P2LBX592EEHDDB48** **P2LBX592EEHDDG48**
	3/8"	2.5 Cv	12VDC	P2LCX	**P2LCX593EEHDDB47** **P2LCX593EEHDDG47**
	3/8"	2.5 Cv	24VDC	P2LCX	**P2LCX593EEHDDB48** **P2LCX593EEHDDG48**
	1/2"	2.7 Cv	12VDC	P2LDX	**P2LDX594EEHDDB47** **P2LDX594EEHDDG47**
	1/2"	2.7 Cv	24VDC	P2LDX	**P2LDX594EEHDDB48** **P2LDX594EEHDDG48**

Double Solenoid, 3-Position All Ports Blocked, 3-Position Center Exhaust, Extreme Operating Pressure / Temperature

P2LBX Shown





Port size	Cv	Voltage	Valve type	Part number: All ports blocked	Part number: Center exhaust
1/8"	0.5 Cv	12VDC	P2LAX	**P2LAX691EEHDDG47** **P2LAX691EEHDDG48**	**P2LAX891EEHDDG47** **P2LAX891EEHDDG48**
1/4"	0.9 Cv	12VDC	P2LBX	**P2LBX692EEHDDG47** **P2LBX692EEHDDG48**	**P2LBX892EEHDDG47** **P2LBX892EEHDDG48**
3/8"	1.8 Cv	12VDC	P2LCX	**P2LCX693EEHDDG47** **P2LCX693EEHDDG48**	**P2LCX893EEHDDG47** **P2LCX893EEHDDG48**
1/2"	1.9 Cv	24VDC	P2LDX	**P2LDX694EEHDDG47** **P2LDX694EEHDDG48**	**P2LDX894EEHDDG47** **P2LDX894EEHDDG48**

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Single Remote Pilot, 2-Position, Extreme Operating Pressure / Temperature

P2LAX Shown

Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.7 Cv	P2LAX	**P2LAX591PS**
	1/4"	1.3 Cv	P2LBX	**P2LBX592PS**
	3/8"	2.5 Cv	P2LCX	**P2LCX593PS**
	1/2"	2.7 Cv	P2LDX	**P2LDX594PS**

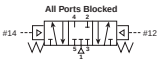
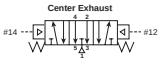
Double Remote Pilot, 2-Position, Extreme Operating Pressure / Temperature

P2LBX Shown

Symbol	Port size	Cv	Valve type	Part number
	1/8"	0.7 Cv	P2LAX	**P2LAX591PP**
	1/4"	1.3 Cv	P2LBX	**P2LBX592PP**
	3/8"	2.5 Cv	P2LCX	**P2LCX593PP**
	1/2"	2.7 Cv	P2LDX	**P2LDX594PP**

Double Remote Pilot, 3-Position All Ports Blocked, 3-Position Center Exhaust, Extreme Operating Pressure / Temperature

P2LBX Shown

			Part number	
				
Port size	Cv	Valve type	All ports blocked	Center exhaust
1/8"	0.5 Cv	P2LAX	**P2LAX691PP**	**P2LAX891PP**
1/4"	0.9 Cv	P2LBX	**P2LBX692PP**	**P2LBX892PP**
3/8"	1.8 Cv	P2LCX	**P2LCX693PP**	**P2LCX893PP**
1/2"	1.9 Cv	P2LDX	**P2LDX694PP**	**P2LDX894PP**

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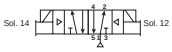
Single Solenoid, 2-Position, Normal Operating Pressure / Temperature

P2LAX Shown

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	24VDC	P2LAX	**P2LAX591ESNDDB49** **P2LAX591ESNDDG49**
	1/8"	0.7 Cv	120VAC	P2LAX	**P2LAX591ESNDDB53** **P2LAX591ESNDDG53**
	1/4"	1.3 Cv	24VDC	P2LBX	**P2LBX592ESNDDB49** **P2LBX592ESNDDG49**
	1/4"	1.3 Cv	120VAC	P2LBX	**P2LBX592ESNDDB53** **P2LBX592ESNDDG53**
	3/8"	2.5 Cv	24VDC	P2LCX	**P2LCX593ESNDDB49** **P2LCX593ESNDDG49**
	3/8"	2.5 Cv	120VAC	P2LCX	**P2LCX593ESNDDB53** **P2LCX593ESNDDG53**
	1/2"	2.7 Cv	24VDC	P2LDX	**P2LDX594ESNDDB49** **P2LDX594ESNDDG49**
	1/2"	2.7 Cv	120VAC	P2LDX	**P2LDX594ESNDDB53** **P2LDX594ESNDDG53**

Double Solenoid, 2-Position, Normal Operating Pressure / Temperature



P2LBX Shown

Symbol	Port size	Cv	Voltage	Valve type	Part number
	1/8"	0.7 Cv	24VDC	P2LAX	**P2LAX591EENDDB49** **P2LAX591EENDDG49**
	1/8"	0.7 Cv	120VAC	P2LAX	**P2LAX591EENDDB53** **P2LAX591EENDDG53**
	1/4"	1.3 Cv	24VDC	P2LBX	**P2LBX592EENDDB49** **P2LBX592EENDDG49**
	1/4"	1.3 Cv	120VAC	P2LBX	**P2LBX592EENDDB53** **P2LBX592EENDDG53**
	3/8"	2.5 Cv	24VDC	P2LCX	**P2LCX593EENDDB49** **P2LCX593EENDDG49**
	3/8"	2.5 Cv	120VAC	P2LCX	**P2LCX593EENDDB53** **P2LCX593EENDDG53**
	1/2"	2.7 Cv	24VDC	P2LDX	**P2LDX594EENDDB49** **P2LDX594EENDDG49**
	1/2"	2.7 Cv	120VAC	P2LDX	**P2LDX594EENDDB53** **P2LDX594EENDDG53**

Double Solenoid, 3-Position All Ports Blocked, 3-Position Center Exhaust, Normal Operating Pressure / Temperature

P2LBX Shown

Port size	Cv	Voltage	Valve type	Part number: All ports blocked (Sol 14 / Sol 12)	Part number: Center exhaust (Sol 14 / Sol 12)
1/8"	0.5 Cv	24VDC 120VAC	P2LAX	**P2LAX691EENDDG49** **P2LAX691EENDDG53**	**P2LAX891EENDDG49** **P2LAX891EENDDG53**
1/4"	0.9 Cv	24VDC 120VAC	P2LBX	**P2LBX692EENDDG49** **P2LBX692EENDDG53**	**P2LBX892EENDDG49** **P2LBX892EENDDG53**
3/8"	1.8 Cv	24VDC 120VAC	P2LCX	**P2LCX693EENDDG49** **P2LCX693EENDDG53**	**P2LCX893EENDDG49** **P2LCX893EENDDG53**
1/2"	1.9 Cv	24VDC 120VAC	P2LDX	**P2LDX694EENDDG49** **P2LDX694EENDDG53**	**P2LDX894EENDDG49** **P2LDX894EENDDG53**

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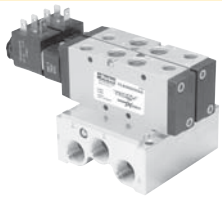
IEM Bar Manifolds

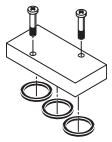


Valve type	## – Stations	Manifold only	Manifold assembly
P2LAX	02 to 12	**P2LAXMAXN##NP**	**AAP2LAXMAXN##NP**
P2LBX	02 to 12	**P2LBXMAXN##NP**	**AAP2LBXMAXN##NP**
P2LCX	02 to 12	**P2LCXMAXN##NP**	**AAP2LCXMAXN##NP**

- Utilizes Inline mount Viking Xtreme Series valves.
- **Kits include:** (1) Manifold, (2) Valve Hold Down Bolts per Station, (3) O-rings per Station.

Note: All IEM bar manifolds are 4-way only with internal pilot air supply. External pilot supply thru a common "X" port not available.

Blanking Plate



Type	Kit number
P2LAX	**P2LAXK20P**
P2LBX	**P2LBXK20P**
P2LCX	**P2LCXK20P**

Kit includes: (1) Plate, (2) Screws, (3) O-rings

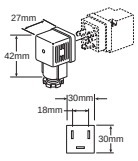
Manifold Bolts

Type	Qty.	Kit number
P2LAX	12	**P2LAXK87P**
P2LBX	12	**P2LBXK87P**
P2LCX	12	**P2LCXK87P**

Manifold O-rings

Type	Qty.	Kit number
P2LAX	30	**P2LAXK84P**
P2LBX	18	**P2LBXK84P**
P2LCX	12	**P2LCXK84P**

30mm Square 3-Pin – ISO 4400, DIN 43650A
(Use with Enclosure "A")



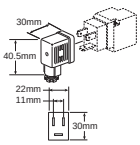
Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	**PS2028BP**
Light – 6-48V. 50/60Hz. 6-48VDC	PS2032J79CP*	**PS203279BP**
Light – 120V/60Hz	PS2032J83CP*	**PS203283BP**
Light – 240V/60Hz	N/A	**PS203283BP**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

22mm Rectangular 3-Pin – Type B Industrial
(Use with Enclosure "B")



Description	Connector with 6' (2m) cord	Connector
Unlighted	**PS2429JBP**	**PS2429BP**
Light – 24V60Hz. 24VDC	**PS2430J79BP***	**PS243079BP**
Light – 120V/60Hz	**PS2430J83BP***	**PS243083BP**
Light – 240V/60Hz	**N/A**	**PS243087BP**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:
Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

Exhaust Mufflers

Pipe thread	Part number
M5	**P6M-PAC5**
1/8" NPT	**EM12**
1/4" NPT	**EM25**
3/8" NPT	**EM37**
1/2" NPT	**EM50**

P6M - Plastic; EM - Sintered Bronze

Plastic Silencers

Thread size	Part number	
	NPT	BSPT
M5	**AS-5**	
1/8"	**ASN-6**	**AS-6**
1/4"	**ASN-8**	**AS-8**
3/8"	**ASN-10**	**AS-10**
1/2"	**ASN-15**	**AS-15**

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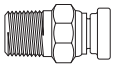
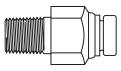
68PM Male Connector



Tube Size	Pipe thread (NPTF)	Part number
1/8	1/16	68PM-2-1
1/8	1/8	68PM-2-2
5/32	1/16	68PM-5/32-1
5/32	1/8	68PM-5/32-2
5/32	1/4	68PM-5/32-4
3/16	1/16	68PM-3-1
3/16	1/8	68PM-3-2
3/16	1/4	68PM-3-4

68PMT Male Connector

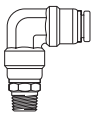


Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	68PMT-4-2
1/4	1/4	68PMT-4-4
1/4	3/8	68PMT-4-6
3/8	1/8	68PMT-6-2
3/8	1/4	68PMT-6-4
3/8	3/8	68PMT-6-6
3/8	1/2	68PMT-6-8
1/2	1/4	68PMT-8-4
1/2	3/8	68PMT-8-6
1/2	1/2	68PMT-8-8
5/8	3/8	68PMT-10-6
5/8	1/2	68PMT-10-8
3/4	1/2	68PMT-12-8

169PMNS Male Elbow Non-Swivel 90°

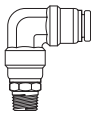
Tube size	Pipe thread (NPTF)	Part number
1/8	1/8	169PMNS-2-2
5/32	1/8	169PMNS-5/32-2
3/16	1/8	169PMNS-3-2
3/16	1/4	169PMNS-3-4

169PMT Male Elbow Swivel 90°



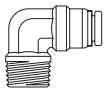
Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMT-4-2
1/4	1/4	169PMT-4-4
1/4	3/8	169PMT-4-6
3/8	1/8	169PMT-6-2
3/8	1/4	169PMT-6-4
3/8	3/8	169PMT-6-6
3/8	1/2	169PMT-6-8
1/2	1/4	169PMT-8-4
1/2	3/8	169PMT-8-6
1/2	1/2	169PMT-8-8
5/8	3/8	169PMT-10-6
5/8	1/2	169PMT-10-8

169PMTL Male Elbow Long Non-Swivel 90°



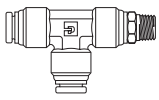
Tube Size	Pipe thread (NPTF)	Part number
3/8	1/4	169PMTL-6-4
3/8	3/8	169PMTL-6-6
3/8	1/2	169PMTL-6-8
1/2	1/2	169PMTL-8-8
5/8	1/2	169PMTL-10-8

169PMTNS Male Elbow Non-Swivel 90°



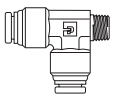
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMTNS-4-2
1/4	1/4	169PMTNS-4-4
1/4	3/8	169PMTNS-4-6
3/8	1/8	169PMTNS-6-2
3/8	1/4	169PMTNS-6-4
3/8	3/8	169PMTNS-6-6
3/8	1/2	169PMTNS-6-8
1/2	1/4	169PMTNS-8-4
1/2	3/8	169PMTNS-8-6
1/2	1/2	169PMTNS-8-8
5/8	3/8	169PMTNS-10-6
5/8	1/2	169PMTNS-10-8
3/4	1/2	169PMTNS-12-8

171PMT Male Run Tee Swivel



Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	171PMT-4-2
1/4	1/4	171PMT-4-4
1/4	3/8	171PMT-4-6
3/8	1/4	171PMT-6-4
3/8	3/8	171PMT-6-6
1/2	1/4	171PMT-8-4
1/2	3/8	171PMT-8-6
1/2	1/2	171PMT-8-8

171PMTNS Male Run Tee Non-Swivel



Tube 1 Size	Tube 2 Size	Part number
1/4	1/4	171PMTNS-4-4
1/4	3/8	171PMTNS-4-6-4
3/8	3/8	171PMTNS-6-4
3/8	1/4	171PMTNS-6-4-4
3/8	1/4	171PMTNS-6-4-6
1/2	3/8	171PMTNS-6-6
1/2	3/8	171PMTNS-6-8
1/2	1/2	171PMTNS-8-4

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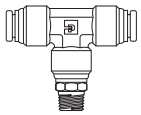
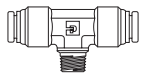
172PMT Male Branch Tee Swivel



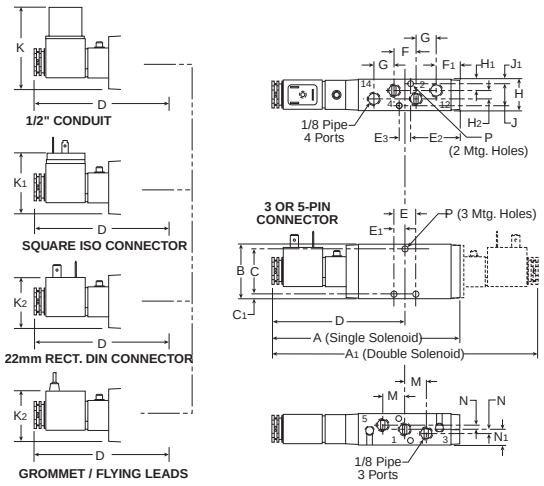
Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	**172PMT-4-2**
1/4	1/4	**172PMT-4-4**
3/8	1/8	**172PMT-6-2**
3/8	1/4	**172PMT-6-4**
3/8	3/8	**172PMT-6-6**
1/2	1/4	**172PMT-8-4**
1/2	3/8	**172PMT-8-6**
1/2	1/2	**172PMT-8-8**

172PMTNS Male Branch Tee Non-Swivel



Tube 1 Size	Tube 2 Size	Pipe thread (NPTF)	Part number
1/4	1/4	1/8	**172PMTNS-4-2**
3/8	3/8	1/4	**172PMTNS-6-4**
3/8	1/4	1/4	**172PMTNS-6-4-4**
3/8	3/8	3/8	**172PMTNS-6-6**
3/8	3/8	1/2	**172PMTNS-6-8**
1/2	1/2	3/8	**172PMTNS-8-6**
1/2	3/8	1/2	**172PMTNS-8-6-8**
1/2	1/2	1/2	**172PMTNS-8-8**

P2LAX Single & Double Operators – Solenoid

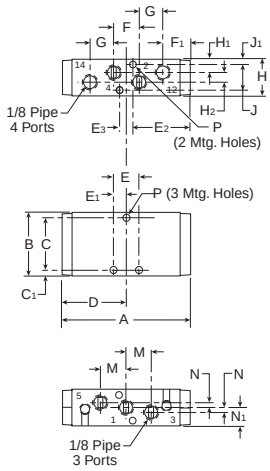


P2LAX (Solenoid)

A	A1	B	C	C1
5.31 (135)	7.72 (196)	1.57 (40)	1.30 (33)	.14 (3.5)
D	**E**	**E1**	**E2**	**E3**
3.86 (98)	.63 (16)	.31 (8)	1.42 (36)	.33 (8.5)
F	**G**	**H**	**H1**	**H2**
.63 (16)	.59 (15)	.87 (22)	.31 (8)	.24 (6)
J	**J1**	**K**	**K1**	**K2**
.63 (16)	.12 (3)	2.36 (60)	1.61 (41)	1.50 (38)
M	**N**	**N1**	**P**	
.63 (16)	.12 (3)	.43 (11)	Ø .16 Ø (4.1)	

Inches (mm)

P2LAX Single & Double Operators – Remote Pilot



P2LAX (Remote)

A	B	C	C1	D
3.19 (81)	1.57 (40)	1.30 (33)	.14 (3.5)	1.57 (40)
E	**E1**	**E2**	**E3**	**E3**
1.47 (16)	.31 (8)	1.42 (36)	.33 (8.5)	.33 (8.5)
F	**F1**	**G**	**H**	**H1**
.63 (16)	.67 (17)	.59 (15)	.87 (22)	.31 (8)
H2	**J**	**J1**	**M**	**N**
.24 (6)	.63 (16)	.12 (3)	.63 (16)	.12 (3)
N1	**P**			
.43 (11)	Ø .16 Ø (4.1)			

Inches (mm)

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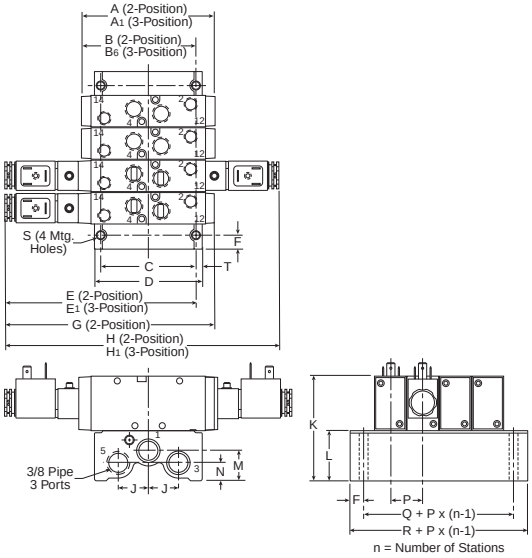
P2LAX Single & Double Operators – IEM Aluminum Bar Manifold

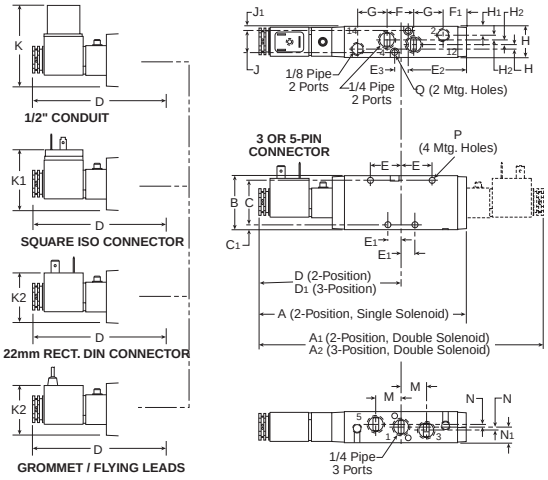


IEM Aluminum Bar Manifold

A	B	C	D	E
3.19 (81)	2.95 (75)	2.76 (70)	3.12 (79)	5.24 (133)
F	**G**	**H**	**J**	**K**
41 (10.5)	5.31 (135)	7.72 (196)	.87 (22)	3.11 (79)
L	**N**	**P**	**Q**	**R**
1.54 (39)	.52 (13.2)	.93 (23.5)	1.56 (39.5)	2.36 (60)
S	**T**			
Ø .22 (Ø 5.5)	.18 (4.6)			

Inches (mm)

P2LBX Single & Double Operators – Solenoid

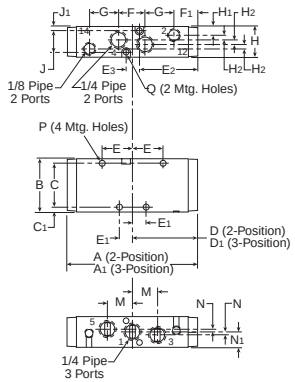


P2LBX (Solenoid)

A	A1	A2	B	C
6.14 (156)	8.39 (213)	9.06 (230)	1.57 (40)	1.26 (32)
C1	**D**	**D1**	**E**	**E1**
.16 (4)	4.21 (107)	4.55 (116)	91 (23)	.39 (10)
E2	**E3**	**F**	**F1**	**G**
1.73 (44)	.39 (10)	.79 (20)	.67 (17)	.87 (22)
H	**H1**	**H2**	**J**	**J1**
.87 (22)	.26 (6.6)	.12 (3)	.65 (16.5)	.11 (2.8)
K	**K1**	**K2**	**M**	**N**
2.36 (60)	1.61 (41)	1.50 (38)	.79 (20)	.08 (2)
N1	**P**	**Q**		
.43 (11)	Ø .17 (Ø 4.3)	Ø .12 (Ø 3.1)		

Inches (mm)

P2LBX Single & Double Operators – Remote Pilot



P2LBX (Remote)

A	A1	B	C	C1
3.95 (100)	4.61 (117)	1.57 (40)	1.26 (32)	.16 (4)
D	**D1**	**E**	**E1**	**E2**
1.93 (49)	2.28 (58)	91 (23)	.39 (10)	1.73 (44)
E3	**F**	**F1**	**G**	**H**
.39 (10)	.79 (20)	.67 (17)	.87 (22)	.87 (22)
H1	**H2**	**J**	**J1**	**K**
.26 (6.6)	.12 (3)	.65 (16.5)	.11 (2.8)	2.90 (74)
M	**N**	**N1**	**P**	
.79 (20)	.08 (2)	.43 (11)	Ø .17 (Ø 4.3)	

Inches (mm)

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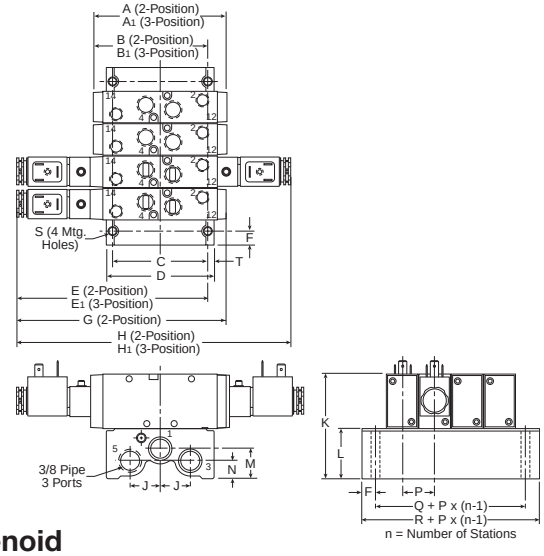
P2LBX Single & Double Operators – IEM Aluminum Bar Manifold

IEM Aluminum Bar Manifold

A	A1	B	B1	C
3.95	4.61	3.42	3.76	2.76
(100)	(117)	(87)	(96)	(70)
D	**E**	**E1**	**F**	**G**
3.12	5.47	5.81	.40	6.10
(79)	(139)	(148)	(10.2)	(155)
H	**H1**	**J**	**K**	**L**
8.39	9.06	.87	3.11	1.47
(213)	(230)	(22)	(79)	(37)
M	**N**	**P**	**Q**	**R**
.87	.52	.93	1.56	2.36
(22)	(13.2)	(23.5)	(39.5)	(60)
S	**T**			
Ø .22	.18			
Ø (5.5)	(4.6)			

Inches (mm)

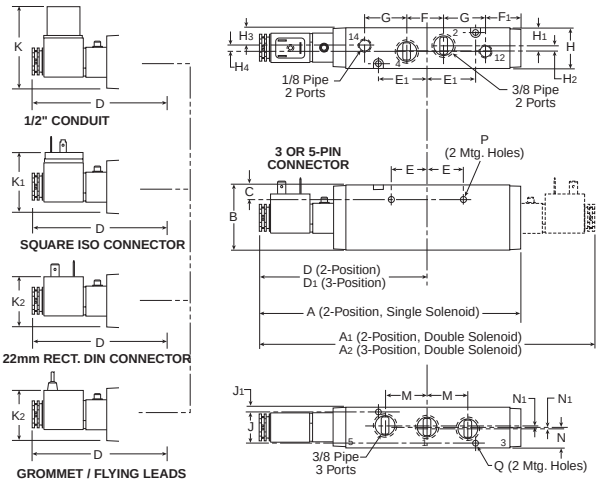


P2LCX Single & Double Operators – Solenoid

P2LCX (Solenoid)

A	A1	A2	B	C
7.64	9.84	10.71	1.89	.44
(194)	(250)	(272)	(48)	(11.2)
D	**D1**	**E**	**E1**	**F**
4.92	5.35	1.04	1.39	1.06
(125)	(136)	(26.5)	(35.4)	(27)
F1	**G**	**H**	**H1**	**H2**
1.02	1.22	1.18	.53	.12
(26)	(31)	(30)	(13.5)	(3)
H3	**H4**	**J**	**J1**	**K**
.51	.16	.91	.14	2.52
(13)	(4)	(23)	(3.5)	(64)
K1	**K2**	**M**	**N**	**N1**
1.77	1.65	1.18	.59	.04
(45)	(42)	(30)	(15)	(1)
P	**Q**			
Ø .27	Ø .17			
Ø (6.9)	Ø (4.4)			

Inches (mm)

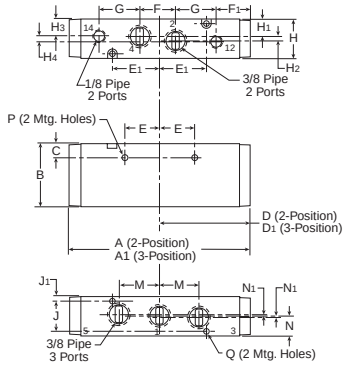


Single & Double Operators – Remote Pilot

P2LCX (Remote)

A	A1	B	C	D
5.51	6.38	1.89	.44	2.76
(140)	(162)	(48)	(11.2)	(70)
D1	**E**	**E1**	**F**	**F1**
3.18	1.04	1.39	1.06	1.02
(81)	(26.5)	(35.4)	(27)	(26)
G	**H**	**H1**	**H2**	**H3**
1.22	1.18	.53	.12	.51
(31)	(30)	(13.5)	(3)	(13)
H4	**J**	**J1**	**K**	**M**
.16	.91	.14	2.47	1.18
(4)	(23)	(3.5)	(62.8)	(30)
N	**N1**	**P**	**Q**	
.59	.04	Ø .27	Ø .17	
(15)	(1)	Ø (6.9)	Ø (4.4)	

Inches (mm)



D
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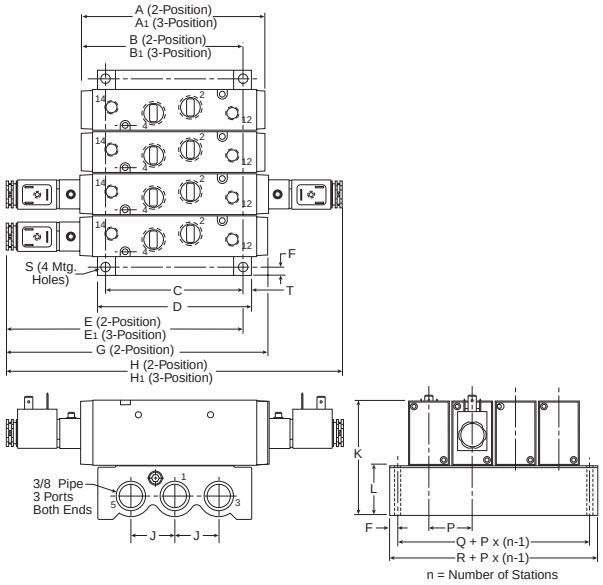
P2LCX Single & Double Operators – IEM Aluminum Bar Manifold

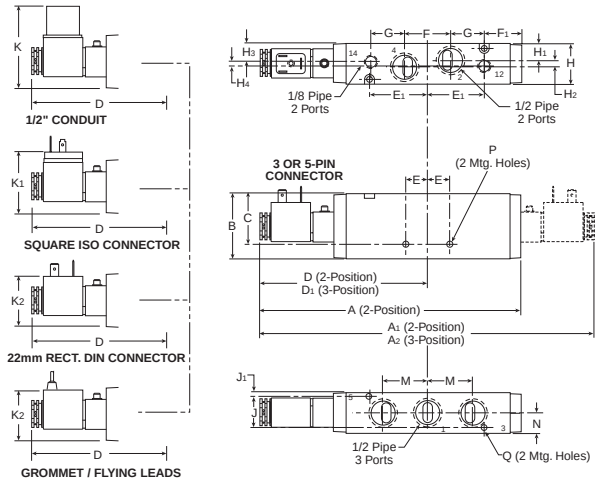


IEM Aluminum Bar Manifold

A	A1	B	B1	C
5.51 (140)	6.38 (162)	4.72 (120)	5.16 (131)	3.94 (100)
D	**E**	**E1**	**F**	**G**
4.41 (112)	6.89 (170)	7.13 (181)	.24 (6)	7.68 (195)
H	**H1**	**J**	**K**	**L**
9.84 (250)	10.71 (272)	1.26 (32)	3.43 (87)	1.54 (39)
P	**R**	**S**		
1.24 (31.5)	2.24 (57)	Ø .26 Ø (6.5)		

Inches (mm)

P2LDX Single & Double Operators – Solenoid

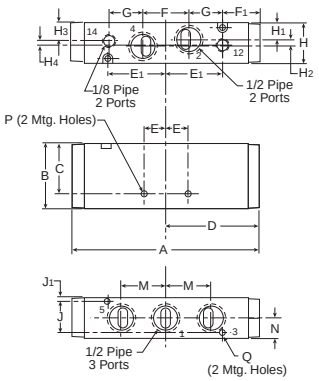


P2LDX (Solenoid)

A	A1	A2	B	C
7.64 (194)	9.84 (250)	10.70 (273)	1.89 (48)	1.59 (40.5)
D	**D1**	**E**	**E1**	**F**
4.92 (125)	5.83 (148)	.67 (17)	1.65 (42)	1.34 (34)
F1	**G**	**H**	**H1**	**H2**
1.08 (27.5)	.98 (25)	1.18 (30)	.49 (12.5)	.20 (5)
H3	**H4**	**J**	**J1**	**K**
.51 (13)	.16 (4)	.91 (23)	.14 (3.5)	2.52 (64)
K1	**K2**	**M**	**N**	**P**
1.77 (45)	1.65 (42)	1.29 (32.7)	.59 (15)	Ø .26 Ø (6.6)
Q				
Ø .17 Ø (4.4)				

Inches (mm)

P2LDX Single & Double Operators – Remote Pilot



P2LDX (Remote)

A	B	C	D	E
5.47 (139)	1.89 (48)	1.59 (40.5)	2.63 (67)	.67 (17)
E1	**F**	**F1**	**G**	**H**
1.65 (42)	1.34 (34)	1.08 (27.5)	.98 (25)	1.18 (30)
H1	**H2**	**H3**	**H4**	**J**
.49 (12.5)	.20 (5)	.51 (13)	.16 (4)	.91 (23)
J1	**P**	**M**	**N**	**Q**
.14 (3.5)	Ø .26 (6.6)	1.29 (32.7)	.59 (15)	Ø .17 (4.4)

Inches (mm)

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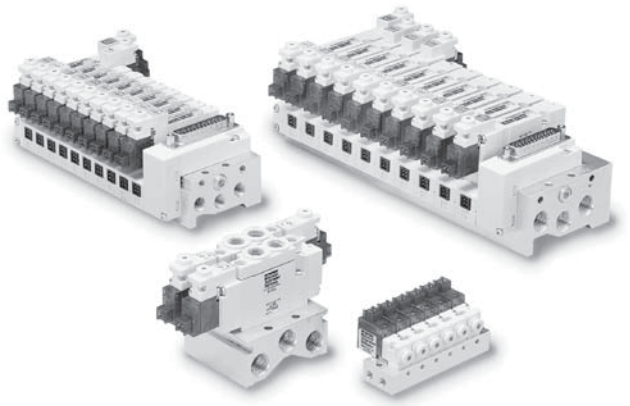
The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.

ADEX Series is a miniature low power consumtion solenoid valves, ideal for powering small to mid-sized pneumatic actuators used in automation and process applications. ADEX's versatility is further enhanced through its three mounting styles and electronic connectivity options.



Features
- Two Sizes: M5, 1/8"
- Compact body size
- Fast response < 10ms

Ports
- A00: M3
- A05: M5
- A12: 1/8 inch

Mounting
- Inline
- Subbase mount

Solenoids
- 0.6 W
- 5VDC, 12VDC, 24VDC and 110/220VAC
- LED and surge suppression

Operating information

Operating pressure:	Vacuum to 100 PSIG (Vacuum to 6.8 bar)
A00S (NO)	Vacuum to 70 PSIG (Vacuum to 4.8 bar)
	Minimum: See chart
Operating temperature:	
Intermittent Duty (AC & DC Voltage):	32°F to 122°F (0°C to 50°C)
	Voltage Rated +10 / –10%
Continuous Duty (DC Voltage Only):	32°F to 104°F (0°C to 40°C)
	Voltage Rated +0 / –10%

Minimum Operating Pressure

Description		Internal pilot		External pilot	
		PSIG	kPa	PSIG	kPa
4-way	Single Solenoid	22	152	Vacuum	
				36	248
	Double Solenoid – 2-Position	15	104	Vacuum	
				36	248
	Double Solenoid – 3-Position	30	207	Vacuum	
				36	248
3-way	A00 Series	Vacuum			

* When using vacuum and pressure on ports 1 & 3 – 85 PSIG (586 kPa) NC; 58 PSIG (400 kPa) NO (see page D100).

Materials

Body	Anodized aluminum
End caps	Anodized aluminum
Coils	Thermoplastic
Fasteners	Stainless Steel
Spool	Aluminum and nitrile rubber

Most popular. For technical information see CD

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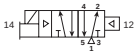
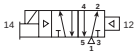
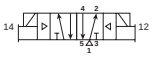
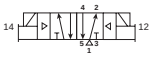
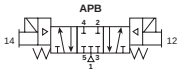
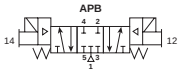
Single Solenoid, 4-way, 2-Position

	Symbol	Port size	Cv	Voltage	Valve type	Part number
		M5	.17 Cv	24VDC	A05 inline	**A05RS251PM5MF**
		M5	.17 Cv	12VDC	A05 inline	**A05RS252PM5MF**
		1/8"	.47 Cv	24VDC	A12 inline	**A12RS251PN1MF**
		1/8"	.47 Cv	12VDC	A12 inline	**A12RS252PN1MF**
		Less base	.18 Cv	24VDC	A06 subbase	**A05PS251P**
		Less base	.18 Cv	12VDC	A06 subbase	**A05PS252P**
		Less base	.44 Cv	24VDC	A12 subbase	**A12PS251P**
		Less base	.44 Cv	12VDC	A12 subbase	**A12PS252P**

Double Solenoid, 4-way, 2-Position

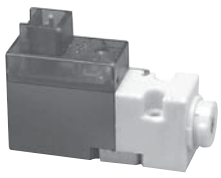
	Symbol	Port size	Cv	Voltage	Valve type	Part number
		M5	.17 Cv	24VDC	A05 inline	**A05RD251PM5MF**
		M5	.17 Cv	12VDC	A05 inline	**A05RD252PM5MF**
		1/8"	.47 Cv	24VDC	A12 inline	**A12RD251PN1MF**
		1/8"	.47 Cv	12VDC	A12 inline	**A12RD252PN1MF**
		Less base	.18 Cv	24VDC	A06 subbase	**A05PD251P**
		Less base	.18 Cv	12VDC	A06 subbase	**A05PD252P**
		Less base	.44 Cv	24VDC	A12 subbase	**A12PD251P**
		Less base	.44 Cv	12VDC	A12 subbase	**A12PD252P**

Double Solenoid, 4-way, 3-Position, APB

	Symbol	Port size	Cv	Voltage	Valve type	Part number
		M5	.16 Cv	24VDC	A05 inline	**A05RD351PM5MF**
		M5	.16 Cv	12VDC	A05 inline	**A05RD352PM5MF**
		1/8"	.43 Cv	24VDC	A12 inline	**A12RD351PN1MF**
		1/8"	.43 Cv	12VDC	A12 inline	**A12RD352PN1MF**
		Less base	.16 Cv	24VDC	A06 subbase	**A05PD351P**
		Less base	.16 Cv	12VDC	A06 subbase	**A05PD352P**
		Less base	.40 Cv	24VDC	A12 subbase	**A12PD351P**
		Less base	.40 Cv	12VDC	A12 subbase	**A12PD352P**

Locking flush override. Mounting screws and gaskets included with valve.

A00 Valve Only – Single Solenoid, 3-way, 2-Position*



A00SC231P Shown

* Screwdriver-Operated, Locking Manual Override (LMOR).

A00S | C23 | — | 1 | P

Function	
Single solenoid normally open	023
Single solenoid normally closed	**C23**

Flow	
Standard type	**Blank**
Large flow type	J

Voltage	
1	**24VDC**
2	12VDC
4*	5VDC
8*	110/50 VAC
9	120/60 VAC

* Special Order

Connector Position	
P	**With indicator light & surge suppression**

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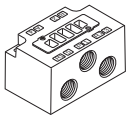
A00 Valve Subbase

Valve type	All Ports	Part number
A00	M3	**A00SBM3**

Mounting screws and gaskets included with valve.

A05 & A12 Subbases



A05PB

Size	Port size	Part number
A05	1/8" NPT	**A05PBN1**
	1/8" BSPP "G"	**A05PBG1**
A12	1/4" NPT	**A12PBN2**
	1/4" BSPP "G"	**A12PBG2**

Kit Includes: (1) Subbase (Holddown bolts and gasket are included with valve)

A00 Valve Manifold*

MMFS6A00M3 Shown

* Normally closed valves (A00SC23•P) and Normally open valves (A00S023•P) cannot be mounted on the same manifold simultaneously.

MMFS | **2** | **A00** | **M5**

Number of stations	
2 Stations	2
3 Stations	3
4 Stations	4
•	•
•	•
20 Stations	20

Port size
M3
M5

A05 Valve IEM Bar Manifold

MMFU10A05F Shown

4-way, NPTF (Individual wiring type)	**MMFU##A05F**
4-way, NPTF (Collective wiring type)	**MMCU‡‡A05F**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

A12 Valve IEM Bar Manifold

MMFU10A12F Shown

4-way, NPTF (Individual wiring type)	**MMFU##A12F**
4-way, NPTF (Collective wiring type)	**MMCU‡‡A12F**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

A05 Valve Subbase Bar Manifold (5-Ported)

4-way, M5 (Individual Wiring Type)	**MMFS##A05FM5**
4-way, M5 (Collective Wiring Type)	**MMCS‡‡A05FM5**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

A12 Valve Subbase Bar Manifold (5-Ported)

4-way, 1/8" NPTF (Individual Wiring Type)	**MMFS##A12FF1**
4-way, 1/8" NPTF (Collective Wiring Type)	**MMCS‡‡A12FF1**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

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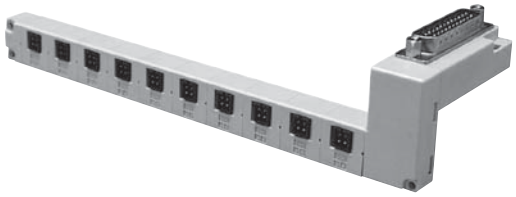
Collective Wiring



MCS10A05PDL Shown

MCS | 2 | A05 | P | DL

Type	
Manifold collective wiring system	MCS

Number of stations*	
2 Stations	2
4 Stations	4
6 Stations	6
8 Stations	8
10 Stations	10
12 Stations	12

* Even Number of Stations Only.

Valve size	
A05	10mm
A12	15mm

Options	
DL	D-sub 25
ML	26-pin ribbon

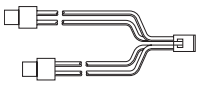
Individual Wired Connectors P / R Type

A05PDCCL##

Size	Voltage	Length	Part number
A00, A05, A12	DC	.5 meter	**A05PDCCL5**
		1 meter	**A05PDCCL10**
		3 meter	**A05PDCCL30**
	AC	.5 meter	**A05PACCL5**
		1 meter	**A05PACCL10**

DC Voltage: Positive "+" (Red Wire)
Negative "–" (Black Wire)
AC Voltage: Both Wires are Blue (Polarity Neutral)

Collective Wired Connectors P / R Type



A05PDCC

Size		Part number PNP	Part number NPN
A05	Single	**A05PSCCM**	**A05PSCC**
A12	Double	**A05PDCCM**	**A05PDCC**

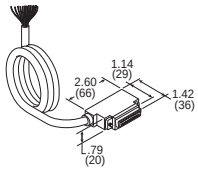
PNP = SOURCING = "Negative Common" = Yellow Wires
NPN = SINKING = "Positive Common" = Red Wires

Wired Connectors with Protective Cover - P / R Type

Size	Length	Part number
A00, A05, A12	1 meter	**A05PDCCB10**

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.

Cable with Female D-Sub, 25-Pin Connector



Description	Part number
25-Pin, D-Sub cable, 1 meter (3.3 ft.)	**DSS25FB1K**

Note: For use with ADEX MCS system only.
Connection to control system is through 25 colored wires AWG 24. Includes (2) M2.5 mm screws.

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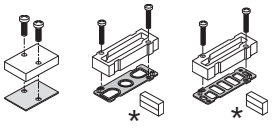
Blanking Plate

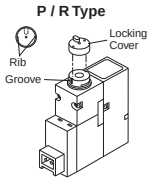


A00SBP A05RGBP A05PGBP

Size	Type	Part number
A00	Subbase	**A00SBP**
A05	Body ported	**A05RGBP**
	Subbase	**A05PGBP**
A12	Body ported	**A12RGBP**
	Subbase	**A12PGBP**

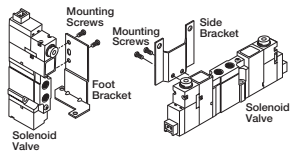
* Outlet pin cover used with collective wiring system only.

Extended Override Cover



Size	Orange: for 14 side solenoid	Green: for 12 side solenoid
	A05PLA	**A05PLB**
A00		
A05		
A12		

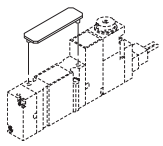
Mounting Bracket



Size	Type	Part number
A05	Side	**A05RBS**
	Foot	**A05RBF**
A12	Side	**A12RBS**
	Foot	**A12RBF**

Kit Includes: (1) Bracket, (2) Screws

Labeling Tag



Size	Description	Part number
	White Label Tag	**A05PN**
A05		
A12		

Exhaust Mufflers

Pipe thread	Part number
M5	**P6M-PAC5**
1/8" NPT	**EM12**
1/4" NPT	**EM25**

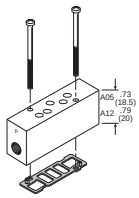
P6M - Plastic; EM - Sintered Bronze

Plastic Silencers

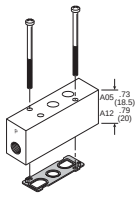
Thread size	Part number NPT	BSPT
M5	**AS-5**	**N/A**
1/8"	**ASN-6**	**AS-6**
1/4"	**ASN-8**	**AS-8**

Individual Air Supply Spacer

Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.



A05PAISM5



A05RAISM5

Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	**A05RAISM5**	**A05RAXISM5**
	Subbase	M5	**A05PAISM5**	**A05PAXISM5**
A12	Inline	1/8" NPT	**A12RAISN1**	**A12RAXISN1**
	Subbase	1/8" NPT	**A12PAISN1**	**A12PAXISN1**

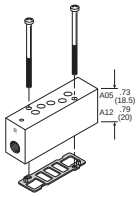
Can only be used on Collective wiring type manifolds.

*** Can only be used with External Piloted valve.** External pilot is located on the X Port of the manifold

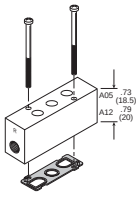
Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

Individual Air Exhaust Spacer

Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.



A05PAIEM5



A05RAIEM5

Size	Type	Port size	Internal pilot part number	External pilot* part number
A05	Inline	M5	**A05RAIEM5**	**A05RAXIEM5**
	Subbase	M5	**A05PAIEM5**	**A05PAXIEM5**
A12	Inline	1/8" NPT	**A12RAIEN1**	**A12RAXIEN1**
	Subbase	1/8" NPT	**A12PAIEN1**	**A12PAXIEN1**

Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

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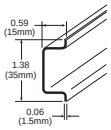
M3 & M5 Fittings

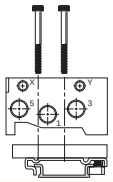
	Description	Part number
	M5 Plug Fitting	**N220-1900J**
	M3 to 3mm Barb	**BC03M3**
	M3 to 4mm Barb	**BC04M3**
	M5 to 3mm Barb	**BC03M5**

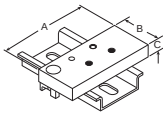
DIN Rail



Length	Part number
6 Feet	**AM1DE200**

DIN Rail Hardware Kit

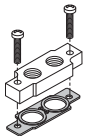




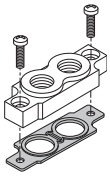
		Dimensions			
Size	Type	A	B	C	Part number
A05	IEM	2.24	1.00	.31	**MFUA05DB**
	Subbase	(57)	(25)	(8)	**MFSA05DB**
A12	IEM	2.91	1.00	.39	**MFUA12DB**
	Subbase	(74)	(25)	(10)	**MFSA12DB**

Kit includes: (2) Screws, (2) Clamps

Replacement Cylinder Port Plate Kits



A05RABM5



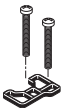
A12RABN1

Size	Fitting	Part number
A05	M5	**A05RABM5**
A12	1/8" NPT	**A12RABN1**
	1/8" BSPP "G"	**A12RABG1**

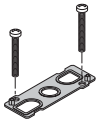
Replacement Base Gasket Kits

Screws

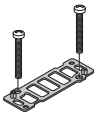
A00SS



A05RS



A05PS



Gaskets

A00SG

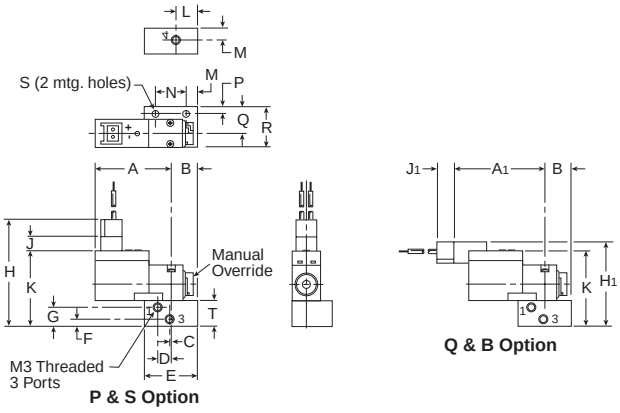
A05RG

A05PXG

Size	Type	Gasket only	Screw
A00	Subbase	**A00SG**	**A00SS**
A05	Body Ported	**A05RG**	**A05RS**
	Subbase Int.	**A05PG**	**A05PS**
	Subbase Ext.	**A05PXG**	**A05PS**
A12	Body Ported	**A12RG**	**A12RS**
	Subbase Int.	**A12PG**	**A12PS**
	Subbase Ext.	**A12PXG**	**A12PS**

These are spare parts, mounting screws and gaskets included with valves.

A00 Subbase

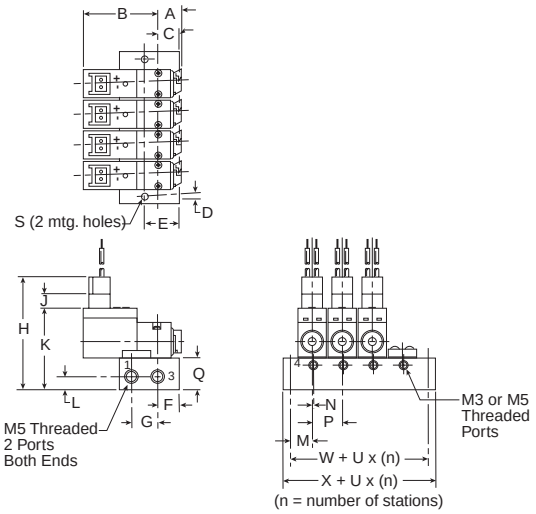


A00 - Subbase

A	A1	B	C	D
1.00 (25)	1.18 (30)	.41 (11)	.015 (.4)	.17 (4)
E	**F**	**G**	**H**	**H1**
.79 (20)	.12 (3)	.28 (7)	1.54 (39)	1.38 (34)
J	**J1**	**K**	**L**	**M**
.24 (6)	.20 (5)	1.11 (28)	.32 (8)	.18 (5)
N	**P**	**Q**	**R**	**S**
.47 (12)	.10 (3)	.39 (10)	.59 (15)	.106 (2.7)
T				
.38 (10)				

Inches (mm)

A00 Manifold

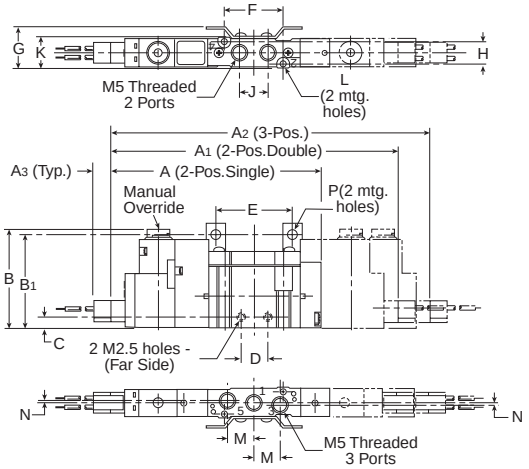


A00 - Manifold

A	B	C	D	E
.36 (9)	1.00 (25)	.31 (8)	.10 (3)	.51 (13)
F	**G**	**H**	**J**	**K**
.31 (8)	.39 (10)	1.63 (42)	.20 (5)	1.22 (31)
L	**M**	**N**	**P**	**Q**
.20 (5)	.33 (9)	.02 (.6)	.41 (10.5)	.47 (12)
S	**U**	**X**	**W**	
.125 (3.2)	.41 (10.5)	.45 (11.5)	.26 (6.5)	

Inches (mm)

A05R Single & Double Operators – Inline



A05R – Inline

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	1.38 (35)
B1	**C**	**D**	**E**	**F**
1.30 (33)	.16 (4)	.38 (10)	1.06 (27)	.83 (21)
G	**H**	**J**	**K**	**L**
.57 (15)	.33 (9)	.40 (10)	.45 (11.4)	Ø .08 Ø (2.1)
M	**N**	**P**		
.37 (10)	.04 (1)	Ø .14 Ø (3.5)		

Inches (mm)

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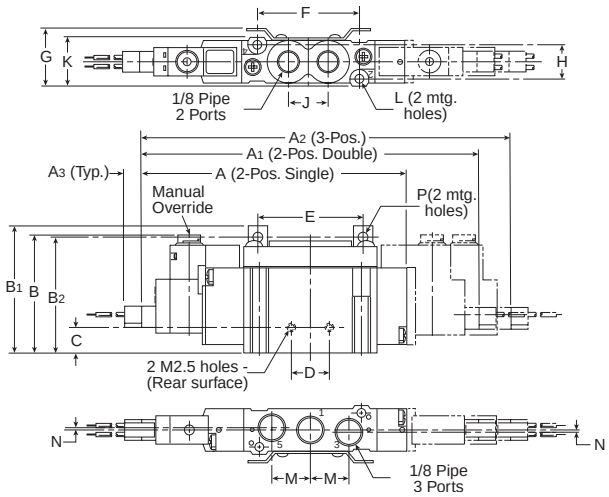
A12R Single & Double Operators – Inline

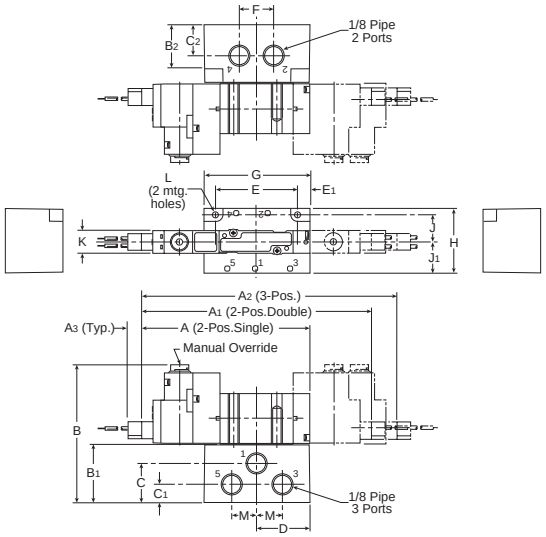


A12R – Inline

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	1.64 (42)
B1	**B2**	**C**	**D**	**E**
1.77 (45)	1.70 (43)	.35 (9)	.51 (13)	1.46 (37
F	**G**	**H**	**J**	**K**
1.42 (36)	.80 (20)	.47 (12)	.55 (14)	.68 (17)
L	**M**	**N**	**P**	
Ø .12 Ø (3.1)	.55 (14)	.03 (0.8)	Ø .14 Ø (3.5)	

Inches (mm)

A05P Single & Double Operators – Subbase

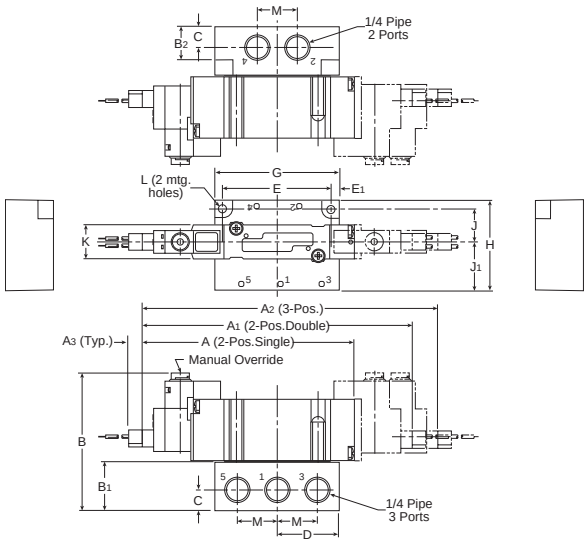


A05P – Subbase

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	2.35 (60)
B1	**B2**	**C**	**C1**	**C2**
.96 (25)	.75 (19)	.65 (17)	.30 (8)	.53 (14)
D	**E**	**E1**	**F**	**G**
.89 (23)	1.38 (35)	.20 (5)	.57 (15)	1.77 (45)
H	**J**	**J1**	**K**	**L**
.08 (28)	.45 (11.5)	.51 (13)	.39 (10)	Ø .13 Ø (3.2)
M				
.45 (12)				

Inches (mm)

A12P Single & Double Operators – Subbase



A12P – Subbase

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	2.41 (61)
B1	**B2**	**C**	**D**	**E**
.87 (22)	.75 (19)	.37 (10)	1.10 (28)	1.89 (48)
E1	**G**	**H**	**J**	**J1**
.16 (4)	2.20 (56)	1.59 (41)	.57 (14.5)	.87 (22)
K	**L**	**M**		
.59 (15)	Ø .17 Ø (4.3)	.71 (18)		

Inches (mm)

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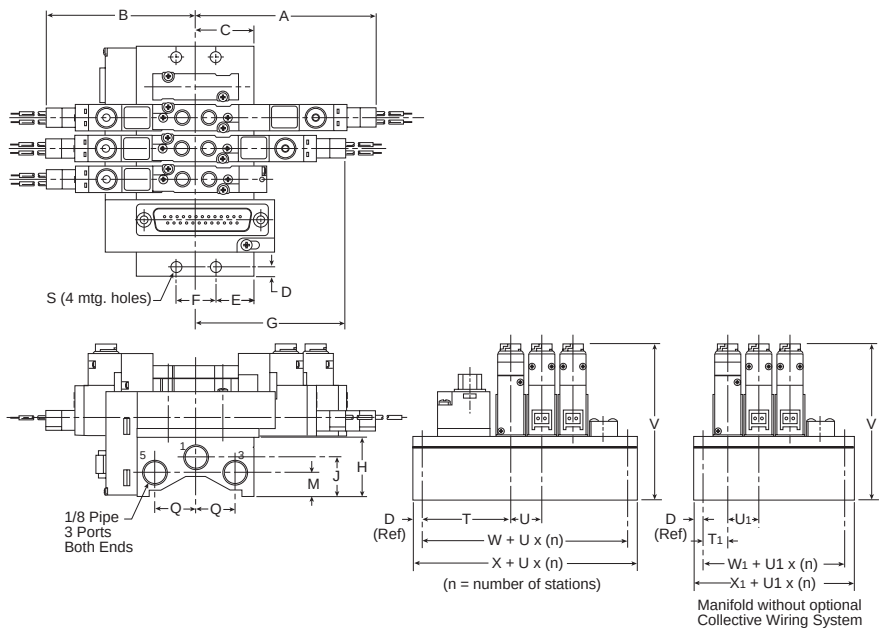
A05R Manifold – Valve Inline

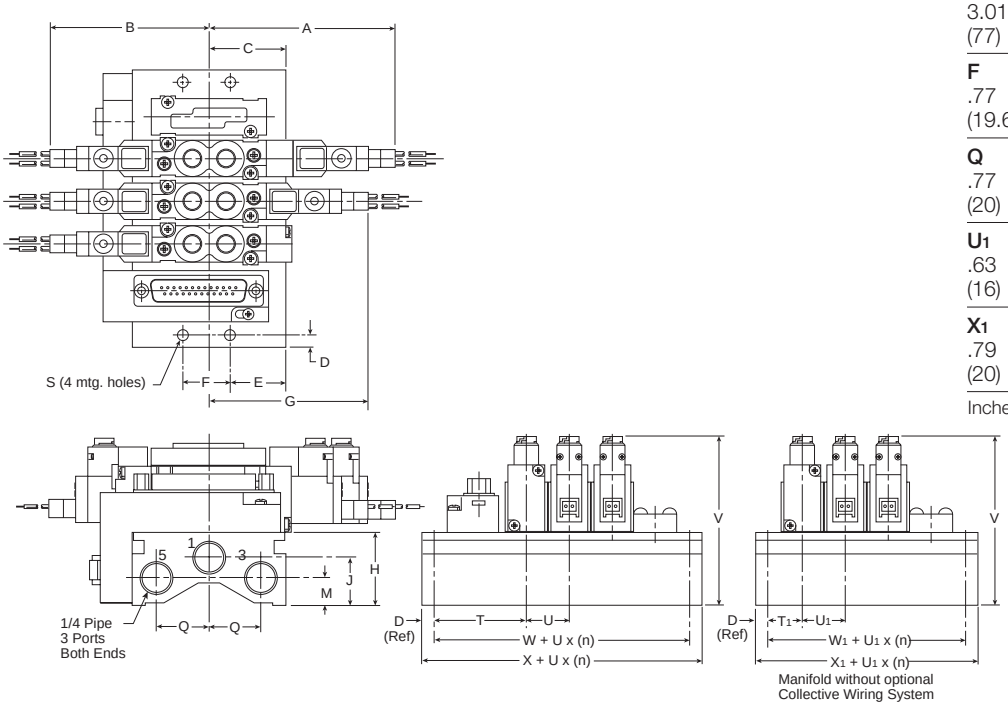


A05R - Manifold, Valve Inline

A	B	C	D	E
2.52 (64)	2.21 (56)	.94 (24)	.16 (4)	.61 (16)
F	**G**	**H**	**J**	**M**
.63 (16)	2.21 (56)	.94 (24)	.61 (16)	.37 (10)
Q	**S**	**T**	**T1**	**U**
.63 (16)	Ø .18 Ø (4.5)	1.34 (34)	.51 (13)	.49 (12.5)
U1	**V**	**W**	**W1**	**X**
.41 (10.5)	2.32 (59)	1.36 (35)	.37 (9.5)	167 (43)
X1				
.68 (17.5)				

Inches (mm)

A12R Manifold – Valve Inline



A12R - Manifold, Valve Inline

A	B	C	D	E
3.01 (77)	2.58 (66)	1.14 (29)	.20 (5)	.76 (19)
F	**G**	**H**	**J**	**M**
.77 (19.6)	2.58 (66)	1.08 (28)	.71 (18)	.41 (11)
Q	**S**	**T**	**T1**	**U**
.77 (20)	Ø .18 Ø (4.5)	1.48 (38)	.51 (13)	.69 (17.5)
U1	**V**	**W**	**W1**	**X**
.63 (16)	2.74 (70)	1.34 (34)	.39 (10)	1.73 (44)
X1				
.79 (20)				

Inches (mm)

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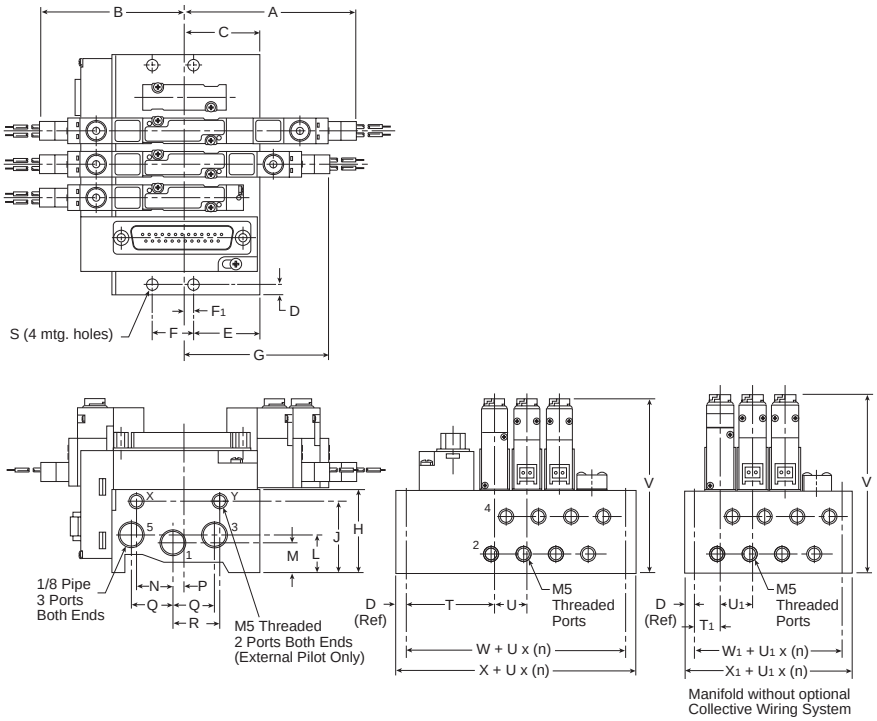
A05P Manifold – Side Ports

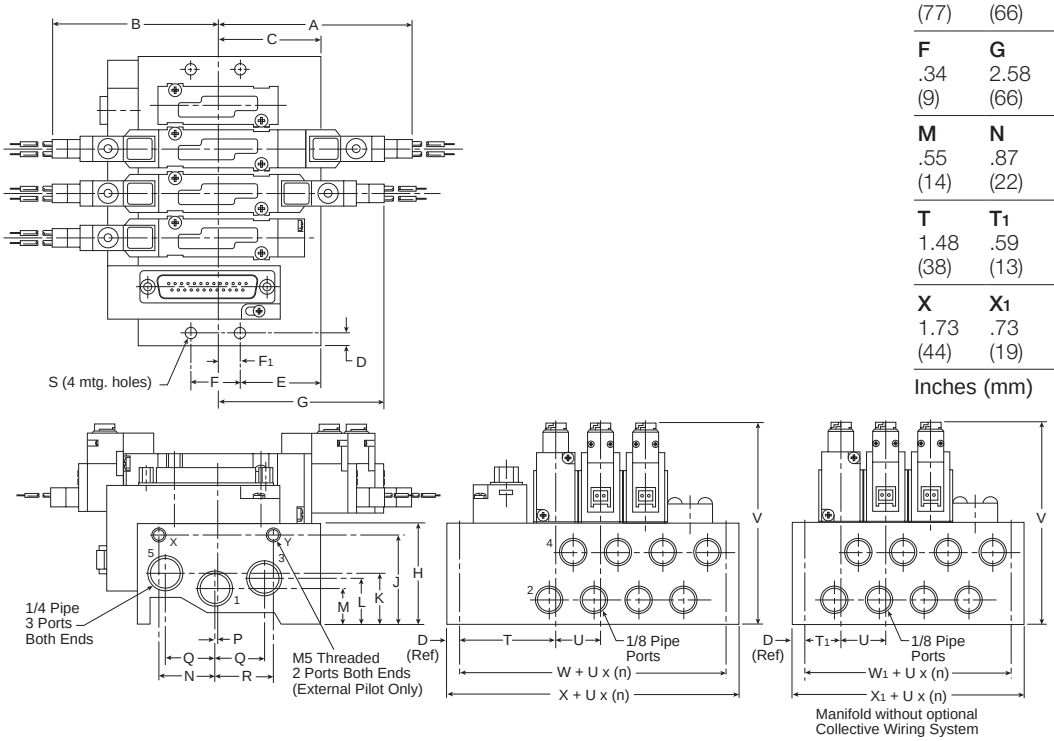


A05P – Manifold, Side Ports

A	B	C	D	E
2.52 (64)	2.21 (56)	1.12 (29)	.16 (4)	1.00 (26)
F	**F1**	**G**	**H**	**J**
.63 (16)	.19 (5)	2.21 (56)	1.26 (32)	1.08 (28)
L	**M**	**N**	**P**	**Q**
.59 (15)	.45 (11.5)	.55 (14)	.13 (3)	.63 (16)
R	**S**	**T**	**T1**	**U**
.71 (18)	Ø .18 Ø (4.5)	1.34 (34)	.39 (10)	.49 (12.5)
U1	**V**	**W**	**W1**	**X**
.41 (10.5)	2.64 (67)	1.32 (34)	.37 (10)	1.65 (42)
X1				
.67 (18)				

Inches (mm)

A12P Manifold – Side Ports



A12P – Manifold, Side Ports

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.59 (40)	.20 (5)	1.25 (32)	.77 (20)
F	**G**	**H**	**J**	**K**	**L**
.34 (9)	2.58 (66)	1.57 (40)	1.38 (35)	.79 (20)	.71 (18)
M	**N**	**P**	**Q**	**R**	**S**
.55 (14)	.87 (22)	.04 (1)	.77 (20)	.91 (23)	Ø .18 Ø (4.5)
T	**T1**	**U**	**V**	**W**	**W1**	**X**	**X1**
1.48 (38)	.59 (13)	.69 (17.5)	3.09 (79)	1.34 (34)	.33 (9)	1.73 (44)	.73 (19)

Inches (mm)

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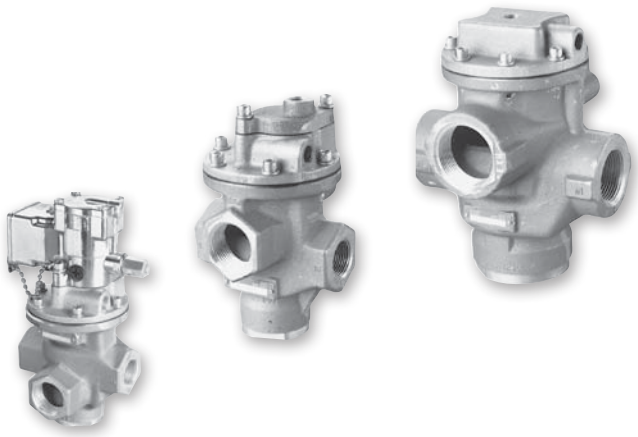
For decades Parker Pneumatics and Heavy Industrial have been synonymous with durability and long life. High flow-speed N Series poppet valves have been operating in foundries, steel mills, and automotive casting & stamping plants without fail.



Features
- Continuous Duty Rated Option
- Non-Lube Service
- Hi-Flow, Short Stroke Poppet
- Indicator Lights Available

Specifications
- 2-way NC
- 3-way NO & NC
- Selector Function

Ports
- 3/8" Body – 3/8", 1/2" NPT
- 3/4" Body – 1/2", 3/4", 1" NPT
- 1-1/4" Body – 1", 1-1/4", 1-1/2" NPT
- BSPP "G" Threads Available

Certification / Approval
- Approved to be CE Marked (Standard L-Pilot & P-Pilot)
- NEMA 4 Option
- Hazardous Duty Option IP 65 Rating / NEMA 4

Materials

Body	Cast Aluminum
Poppet assembly	Aluminum and Stainless Steel
Pilot Valve	Zinc, Stainless Steel, Brass, Copper, Zinc Plated Steel
Seals	Nitrile

Operating information

Operating pressure:

Solenoid valves - internal pilot

3/8" Basic	3/4" Basic
20 to 140 PSIG (standard	25 to 140 PSIG (200 PSIG option available)

Solenoid valves - external supply

Air pressure thru valve (PSI)	External pilot pressure required (PSI)*	
	3/8" Basic	3/4" Basic
25 PSI	35-200	35-200
50 PSI	45-200	40-200
75 PSI	55-200	50-200
100 PSI	65-200	65-200

Vacuum up to 1" HG, less than a perfect vacuum.
* With 200 PSI option. Do not exceed 140 PSI with standard pilots.

Internal pilot - remote pilot valve

Air pressure thru valve (PSI)	Remote pilot pressure (PSI)		
	3/8" Basic	3/4" Basic	1-1/4" Basic
25 PSI	30-250	30-250	30-250
50 PSI	50-250	50-250	50-250
75 PSI	70-250	75-250	70-250
100 PSI	95-250	95-250	90-250
150 PSI	140-250	145-250	130-250
200 PSI	175-250	185-250	175-250
250 PSI	215-250	230-250	205-250

Operating temperature:

Operator type	Duty cycle*	Minimum ambient temperature	Maximum ambient temperature
Standard service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	100°F (38°C)
Special service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	125°F (52°C)
Remote pilot	Not applicable	0°F (-18°C)	200°F (93°C)

* Applications with pilot valves energized for ten (10) minutes or longer with a duty cycle greater than 70% are considered to be continuously energized.

$$\text{Duty cycle} = \frac{\text{Time energized}}{\text{Time energized + time off}} \times 100\% = \%\ \text{Duty Cycle}$$

☐ Most popular. For technical information see CD

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Single Solenoid

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
		3/8"	3.0 to 4.4	3/8"	1/2"	**N315 39 045 53**	**N355 39 045 53**	**N375 39 045 53**
				1/2"	1/2"	**N315 49 045 53**	**N355 49 045 53**	**N375 49 045 53**
		3/4"	9.0 to 11.0	1/2"	3/4"	**N315 59 045 53**	**N355 59 045 53**	**N375 59 045 53**
				3/4"	1"	**N315 69 045 53**	**N355 69 045 53**	**N375 69 045 53**
Normally Closed	Normally Open			1"	1"	**N315 79 045 53**	**N355 79 045 53**	**N375 79 045 53**

Locking Manual Override, Internal "P" Pilot 140 PSI, Standard Service, Junction Box w/ Light, 120VAC.

Single Solenoid

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
		1-1/4"	20.0 to 30.0	1"	1-1/4"	**N325 79 047 53**	**N365 79 047 53**	**N385 79 047 53**
				1-1/4"	1-1/2"	**N325 89 047 53**	**N365 89 047 53**	**N385 89 047 53**
				1-1/2"	1-1/2"	**N325 99 047 53**	**N365 99 047 53**	**N385 99 047 53**
Normally Closed	Normally Open							

Locking Manual Override, Internal "P" Pilot 125 PSI, Standard Service, P-Pilot Junction Box w/ Light, 120VAC.

Single Remote Pilot

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
		3/8"	3.0 to 4.4	3/8"	1/2"	**N314 31 091**	**N354 31 091**	**N374 31 091**
				1/2"	1/2"	**N314 41 091**	**N354 41 091**	**N374 41 091**
		3/4"	9.0 to 11.0	1/2"	3/4"	**N314 51 091**	**N354 51 091**	**N374 51 091**
				3/4"	1"	**N314 61 091**	**N354 61 091**	**N374 61 091**
Normally Closed	Normally Open			1"	1"	**N314 71 091**	**N354 71 091**	**N374 71 091**

1/4" NPT Remote Pilot Port with Internal Pilot Return.

Single Remote Pilot

		Body Size	Cv	In / Cyl Ports	Exh. Port	2-way, 2-Position Normally Closed	3-way, 2-Position Normally Closed	3-way, 2-Position Normally Open
		1-1/4"	20.0 to 30.0	1"	1-1/4"	**N324 71 091**	**N364 71 091**	**N384 71 091**
				1-1/4"	1-1/2"	**N324 81 091**	**N364 81 091**	**N384 81 091**
				1-1/2"	1-1/2"	**N324 91 091**	**N364 91 091**	**N384 91 091**
Normally Closed	Normally Open							

1/4" NPT Remote Pilot Port with Internal Pilot Return.

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"N" Series 3/8", 3/4" & 1-1/4" Body Sizes - Solenoid 'L' Pilot

N	315	3	9	0	45	53

Valve function - solenoid

3/8" & 3/4" Body	
2-way, normally closed	315
3-way, normally closed	355
3-way, normally open	375
1-1/4" Body	
2-way, normally closed	325
3-way, normally closed	365
3-way, normally open	385

Port size / thread type

3/8" Body size	
3/8" Inlet & cyl - 1/2" exhaust - NPT	3
1/2" inlet & cyl - 1/2" exhaust - NPT	4
1/2" inlet & cyl - 1/2" exhaust - BSPP	N
3/4" body size	
1/2" inlet & cyl - 3/4" exhaust - NPT	5
3/4" inlet & cyl - 1" exhaust - NPT	**6**
3/4" inlet & cyl - 1" exhaust - BSPP	Q
1" inlet & cyl - 1" exhaust - NPT	7
1-1/4"body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	**7**
1-1/4" inlet & cyl – 1-1/2" exhaust - NPT	**8**
1-1/4" inlet & cyl – 1-1/2" exhaust - BSPP	S*
1-1/2" inlet & cyl – 1-1/2" exhaust - NPT	**9**
1-1/2" inlet & cyl – 1-1/2" exhaust - BSPP	T*

* Not available with valve function 325.

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

Solenoid enclosure

1	**Basic pilot**
2	Basic pilot NLMO
3	Basic pilot LMO
5	Junction box NLMO
6	Junction box LMO
8	**Junction box NLMO w/ light**
9	**Junction box LMO w/ light**
W	Basic pilot ext. LMO

Solenoid type

0	**Standard**

"L" pilot configuration

01*	External pilot, std service, 140 PSI
04*	External pilot, cont duty, 140 PSI
45	**Internal pilot, std service, 140 PSI**
48	**Internal pilot, cont duty, 140 PSI**

* Not available with valve function 325, 365, and 385 (1-1/4" body).

"L" pilot code

Code	Voltage: AC 60hz	Voltage: AC 50hz	Voltage: DC	Solenoid enclosure options: Standard duty (01, 45)	Solenoid enclosure options: Cont. duty (04, 48)	Solenoid enclosure options: 200 PSI (46)
49			**24**	**1, 2, 3, 5, 6, 8, 9, W**	**6, 8, 9**	**9**
53	**120**	**110**		**1, 2, 3, 5, 6, 8, 9, E, N, W**	**1, 6, 8, 9, N**	**8, 9, E**
57	240	220		1, 3, W		

"N" Series 1-1/4" Body Sizes - Solenoid Hi-Flow 'P' Pilot

N	365	8	9	0	47	53

Valve function - solenoid

1-1/4" body	
2-Way, normally closed	325
3-Way, normally closed	365
3-Way, normally open	385

Port size / thread type

1-1/4" body size	
1" inlet & cyl - 1 1/4" exhaust - NPT	**7**
1-1/4" inlet & cyl – 1-1/2" exhaust - NPT	**8**
1-1/4" inlet & cyl – 1-1/2" exhaust - BSPP	S
1-1/2" inlet & cyl – 1-1/2" exhaust - NPT	**9**
1-1/2" inlet & cyl – 1-1/2" exhaust - BSPP	T

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

Solenoid enclosure

5	Junction box NLMO
6	Junction box LMO
8	**Junction box NLMO w/ light**
9	**Junction box LMO w/ light**

Solenoid type

0	**Standard**

"P" pilot configuration

02	External pilot, std service, 125 PSI
47	**Internal pilot, std service, 125 PSI**

"P" pilot code

Code	Voltage: AC 60hz	Voltage: AC 50hz	Voltage: DC	Enclosure options: Standard duty
49			24	5, 6
53	**120**	**110**		**5, 6, 8, 9**

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Replacement Pilots

Description	Standard L-pilot		Continuous duty L-pilot	
Override type	Locking	Non-locking	Locking	Non-locking
Basic with override	**K065 3035****	**K065 2035****	**K085 3025****	**K085 2025****
JIC with junction box & override	**K065 6035****	**K065 5035****	**K085 6025****	**K085 5025****
JIC pilot with junction box & override & indicator lights (120VAC only)	**K065 9035****	**K065 8035****	**K085 9025****	**K085 8025****

** Voltage code - (reference model index for availability)

Replacement Pilots

Description	Hazardous duty L-pilot		NEMA 4 L-pilot	
Hazardous duty L-pilot - UL & CSA	**K045 1025****	**—**		
Override type	**Locking**	**Non-Locking**		
Hazardous duty with override	**K045 3025****	**K045 2025****		
NEMA 4 with override			**K255 3025****	**K255 202549**

** Voltage code - 49 & 53

Replacement Pilots

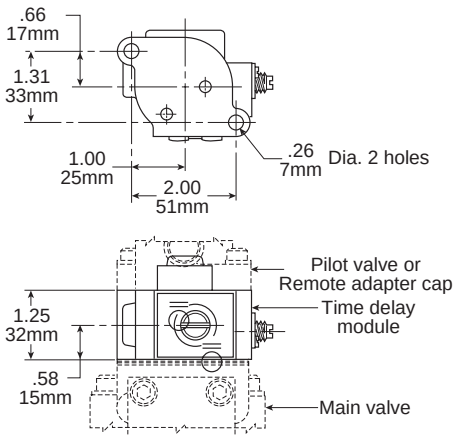
Description	Heavy duty P-Pilot		
Override type	**No override**	**Non-locking**	**Locking**
Basic with Override	**K135 1045****	**N/A**	**N/A**
JIC with Junction Box & Override	**N/A**	**K135 5045****	**K135 6045****
JIC Pilot with Junction Box & Override & Indicator Lights (120VAC Only)	**N/A**	**K135 804553**	**K135 904553**

** Voltage code - 49 & 53

Time Delay Modules

- Delay of valve action upon application of control signal, removal of control signal or both application and removal of control signal.
- Delay intervals from 0-6, 5-12 or 10-30 seconds . . . up to several minutes with the addition of a small external reservoir.
- Repeatability within 10%, using clean filtered air.
- Change of function without disassembly . . . with line pressure on the valve.

Delay interval	Module kit number
0-6 Seconds	**K705 1001**
5-12 Seconds	**K705 1002**
10-30 Seconds	**K705 1003**



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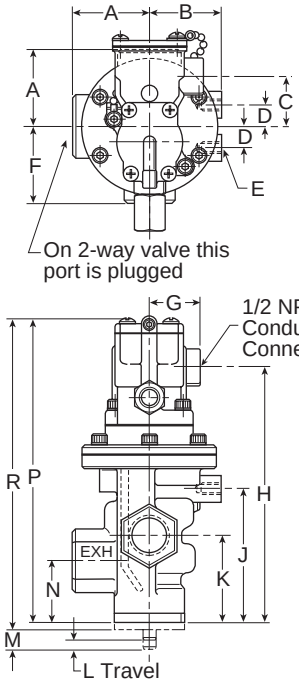
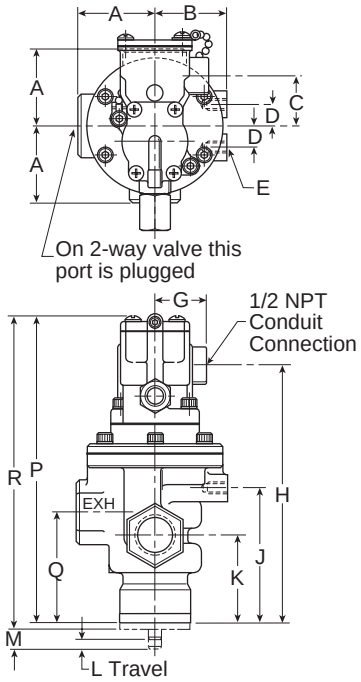
Internal Pilot - 3/8" & 3/4" Basic Body



Normally Closed

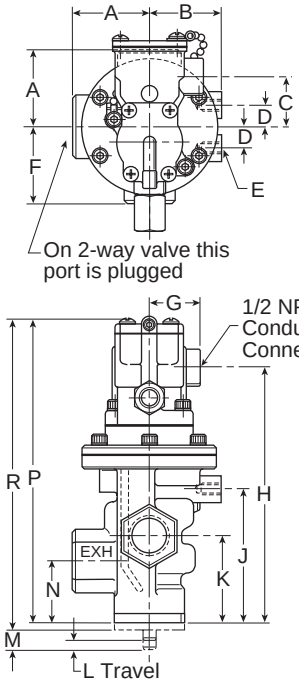


Normally Open

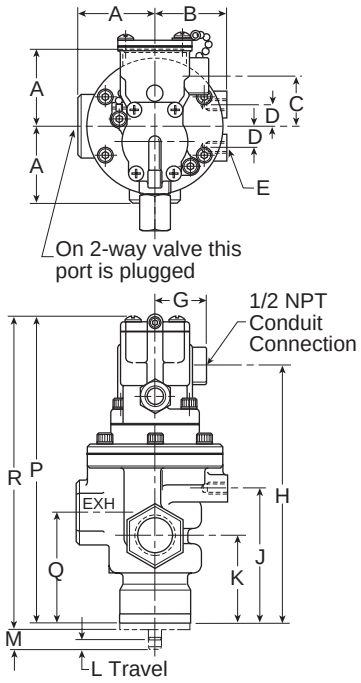
Internal Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body Inch	3/8" Body mm	3/4" Body Inch	3/4" Body mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	5.92	150	7.14	181
J	3.19	81	3.75	95
K	1.88	47	2.44	62
L	.11	3	.16	4
M	.50	13	.50	13
N	1.44	37	1.78	45
P	7.36	196	8.58	218
Q	2.31	59	3.09	84
R	7.92	201	8.83	224

External Pilot - 3/8" & 3/4" Basic Body



Normally Closed



Normally Open

External Pilot - 3/8" & 3/4" Basic Body

Key	3/8" Body Inch	3/8" Body mm	3/4" Body Inch	3/4" Body mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	6.42	163	7.45	189
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.86	200	8.89	226
Q	2.31	59	3.09	84
R	4.34	110	5.38	137

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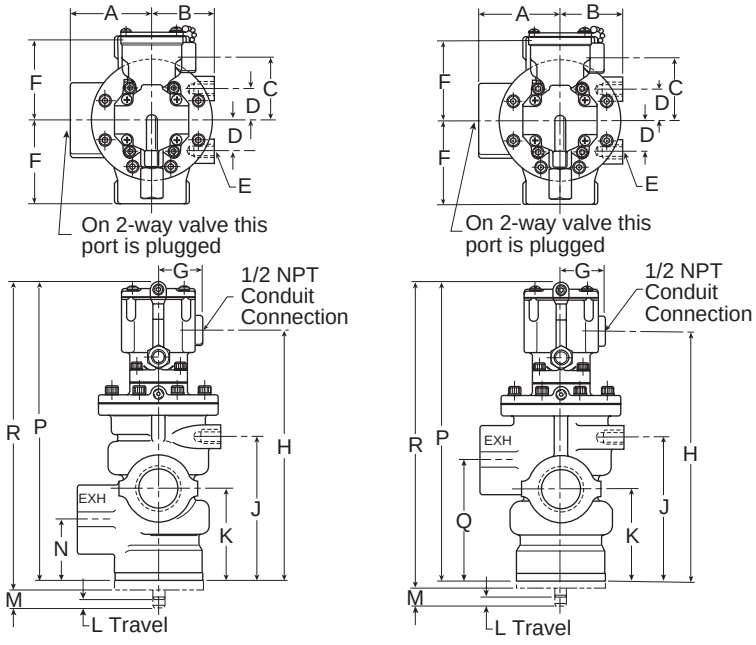
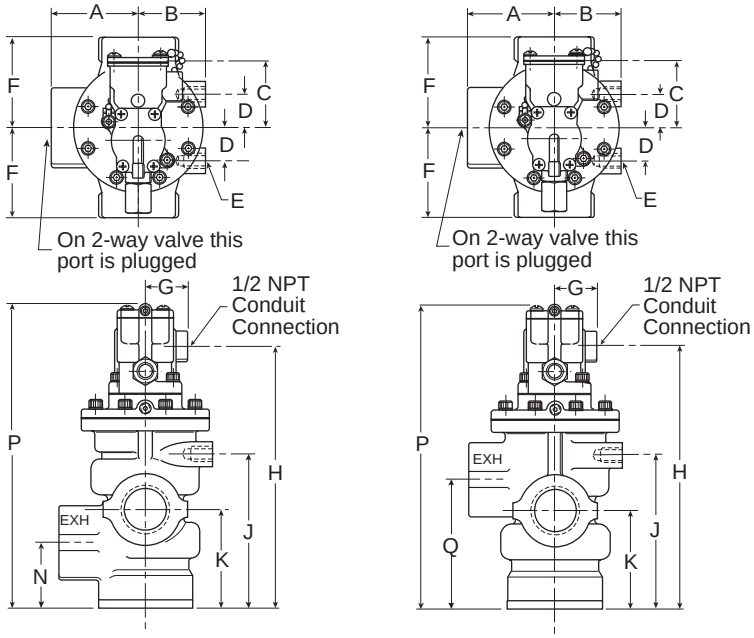
Internal Pilot - 1-1/4" Basic Body



Internal Pilot - 1-1/4" Basic Body

	1-14" Body	
Key	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC 3/4 Deep	
F	3.13	80
G	1.50	38
H	9.30	236
J	5.34	136
K	3.44	87
L	.25	6
M	.50	13
N	2.31	59
P	11.14	283
Q	4.56	116
R	11.48	292

Continuous Duty Pilot - 1-1/4" Basic Body



Continuous Duty Pilot - 1-1/4" Basic Body

	1-1/4" Body	
Key	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC 3/4 Deep	
F	3.13	80
G	1.50	38
H	9.02	229
J	5.34	136
K	3.44	87
N	2.31	59
P	10.45	265
Q	4.56	116

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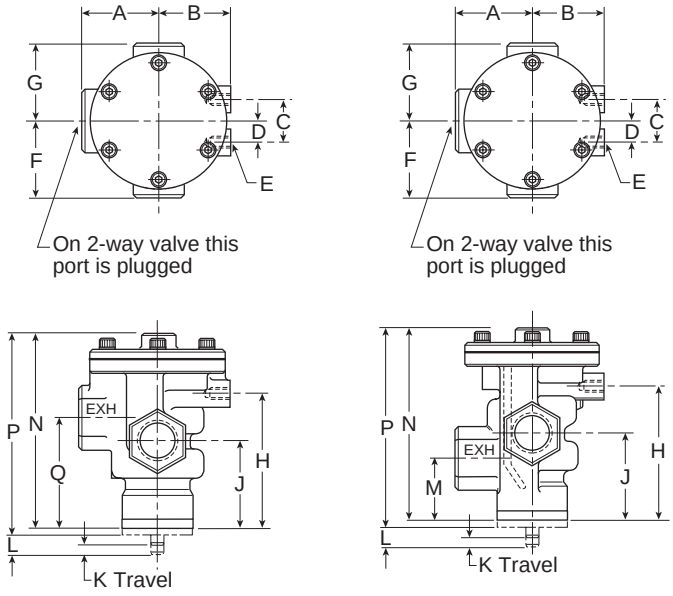
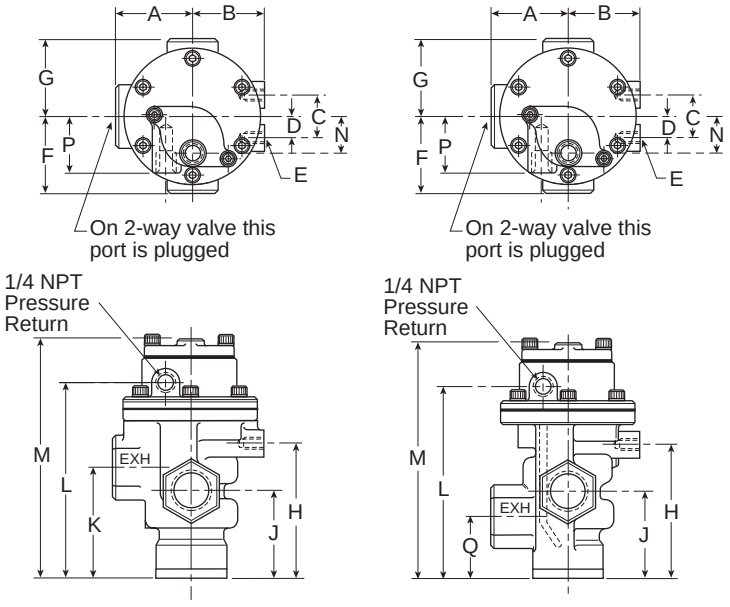
Internal Return - 3/8" & 3/4" Basic Body



Internal Return - 3/8" & 3/4" Basic Body

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8–16UNC 7/16" deep		3/8–16UNC 9/16" deep		1/2–13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	.50	13	.50	13	.50	13
L	.11	3	.16	4	.25	6
M	1.44	37	1.78	45	2.66	67
N	4.22	107	5.31	135	7.19	183
P	4.78	121	5.56	141	7.53	191
Q	2.31	59	3.09	78	4.56	116

External Return - 3/8" & 3/4" Basic Body



Internal Return - 3/8" & 3/4" Basic Body

	3/8" Body		3/4" Body		1-1/4" Body	
Key	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8–16UNC 7/16" deep		3/8–16UNC 9/16" deep		1/2–13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	2.31	59	3.09	78	4.56	116
L	4.34	110	5.38	137	7.31	186
M	5.31	135	6.34	161	7.88	200
N	Left of center				On center	
	.53	13	1.00	25		
Q	1.44	37	1.78	45	2.31	59

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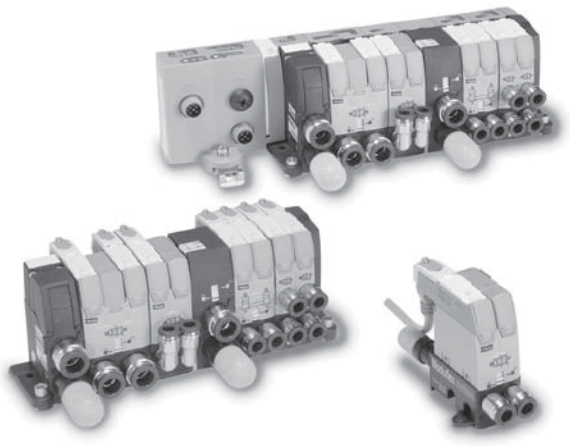
The Moduflex Valve System redefines flexibility for pneumatic users. Whether configured from basic components or ordered as a pre-assembled and tested valve manifold, Moduflex flexibility is unmatched in the market place.



Ports
- Size 1: Push-in connectors for 5/32, 1/4 inch, 4, 6mm OD tube
- Size 2: Push-in connectors for 1/4, 3/8, 1/2 inch, 6, 8, 10, 12 mm OD tube

Mounting
- S Series – Individual subbase
- T Series – Manifold Mount with individual connectors
- V Series – Manifold Mount with collective wiring or fieldbus

Fieldbus Options
- DeviceNet, Profibus, CANopen, AS-i, Interbus-S

Solenoids
- 1.0 Watt
- 24 VDC
- Compatible with PNP or NPN outputs

Certification / Approval
- IP65 rated
- CE, as marked

Operating information

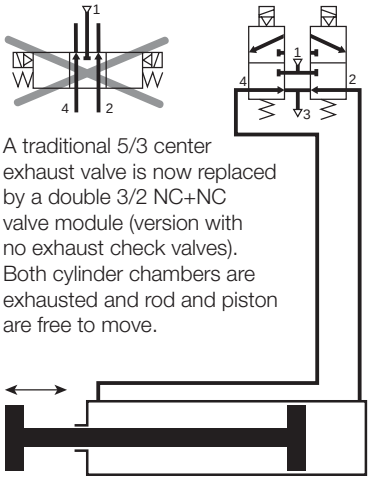
Operating pressure:	Vacuum to 123 PSIG (Vacuum to 8.3 bar)
Operating temperature:	5°F to 140°F (-15°C to 60°C)
Fieldbus operating temperature:	32°F to 130°F (0°C to 55°C)

Materials

Valve body	Plastic
Spool	Aluminum and nitrile rubber or ceramic plate
Subbase or manifold	Plastic
End plates (T and V series)	Plastic
Fasteners	Nickel plated steel

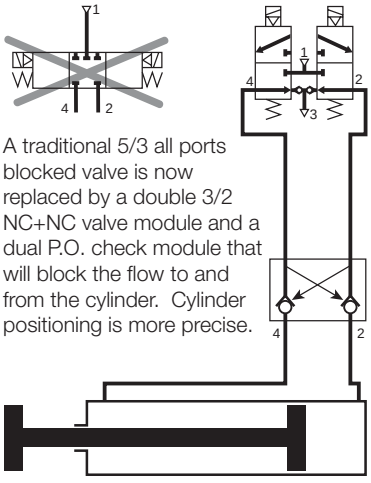
Dual 3/2 Valves Replace All 3-Position Valves for a Better Performance

3-Position Center Exhaust



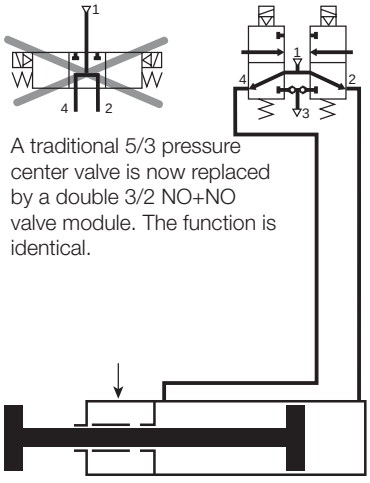
A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module (version with no exhaust check valves). Both cylinder chambers are exhausted and rod and piston are free to move.

3-Position All Ports Blocked



A traditional 5/3 all ports blocked valve is now replaced by a double 3/2 NC+NC valve module and a dual P.O. check module that will block the flow to and from the cylinder. Cylinder positioning is more precise.

3-Position Pressure Center



A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.

Most popular.

For technical information see CD

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"S" Series Individual Subbase Valves Size 1 (Valve & Base without Pneumatic Connectors)

	Symbol	Type	Cv	Operator	Part number
Single Solenoid Single Air Pilot		4-way, 2-position	0.32	Single solenoid	**P2M1S4ES2C**
				Single air pilot	**P2M1S4PS**
		4-way, 2-position	0.32	Double solenoid	**P2M1S4EE2C**
				Double air pilot	**P2M1S4PP**
		3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	**P2M1SDEE2C**
				Double air pilot	**P2M1SDPP**
		3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	**P2M1SCEE2C**
				Double air pilot	**P2M1SCPP**
Double Solenoid Double Air Pilot		3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	**P2M1SEEE2C**
		3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	**P2M1S3ES2C**
				Single air pilot	**P2M1S3PS**
		3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	**P2M1SGEE2C**

"S" Series Size 1 Accessories

	Description	Tube Size	Option	Part number
	Size 1 push to connect fitting	5/32"	Elbow	**CMD04-1**
			Straight	**FMD04-1**
	Size 1 push to connect fitting	1/4"	Elbow	**CMD07-1B**
			Straight	**FMD07-1B**
	Size 1 push to connect fitting	6mm	Elbow	**CMD06-1**
			Straight	**FMD06-1**
	Muffler for exhaust port			**MMDVA1**
	Plug			**PMDYY1**
	Double male union		Connecting peripheral modules	**HMDXX1**
	M8 female connector to flying lead - IP67 LED and surge protection		2m Cable	**P8LS08L226C**
			5m Cable	**P8LS08L526C**
			9m Cable	**P8LS08L926C**
	Field wireable connector		M8 Connector	**P8CS0803J**
			M12 Connector	**P8CS1204J**

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"S" Series Individual Subbase Valves Size 2 (Valve & Base without Pneumatic Connectors)

Symbol	Type	Cv	Operator	Part number
	4-way, 2-position	0.8	Single solenoid	**P2M2S4ES2C**
			Single air pilot	**P2M2S4PS**
	4-way, 2-position	0.8	Double solenoid	**P2M2S4EE2C**
			Double air pilot	**P2M2S4PP**
	3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	**P2M2SDEE2C**
			Double air pilot	**P2M2SDPP**
	3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	**P2M2SCEE2C**
			Double air pilot	**P2M2SCPP**
	3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	**P2M2SEEE2C**
	3-way, 2-position, NC w/ exhaust check	0.44	Single solenoid	**P2M2S3ES2C**
			Single air pilot	**P2M2S3PS**
	3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	**P2M2SGEE2C**

"S" Series Size 2 Accessories

	Description	Tube Size	Option	Part number
	Size 2 push to connect fitting	1/4" OD tube	Elbow	**CMD07-2B**
			Straight	**FMD07-2B**
	Size 2 push to connect fitting	3/8" OD tube	Elbow	**CMD09-2B**
			Straight	**FMD09-2B**
	Size 2 push to connect fitting	1/2" OD tube	Straight	**FMD13-2B**
	Size 2 push to connect fitting	6mm OD tube	Elbow	**CMD06-2**
			Straight	**FMD06-2**
	Size 2 push to connect fitting	8mm OD tube	Elbow	**CMD08-2**
			Straight	**FMD08-2**
	Size 2 push to connect fitting	10mm OD tube	Elbow	**CMD10-2**
			Straight	**FMD10-2**
	Size 2 push to connect fitting	12mm OD tube	Elbow	**CMD12-2**
			Straight	**FMD12-2**
	Muffler for exhaust port			**MMDVA2**
	Plug			**PMDYY2**
	Double male union		Connecting peripheral modules	**HMDXX2**
	M8 female connector to flying lead - IP67 LED and surge protection		2m Cable	**P8LS08L226C**
			5m Cable	**P8LS08L526C**
			9m Cable	**P8LS08L926C**
	Field wireable connector		M8 Connector	**P8CS0803J**
			M12 Connector	**P8CS1204J**

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"S" Series Individual Subbase Valve
(Complete with Pneumatic and Electrical Connectors)

P2M 1 S 4ES 2C 00 A F4

Basic Series	
Moduflex	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Individual subbase	S

Valve type / function	
3-Way / 2-position	
Single solenoid, NC spring return	**3ES**
Single air pilot, NC spring return	3PS
4-Way / 2-position	
Single solenoid, spring return	**4ES**
Single air pilot, spring return	4PS
Double solenoid	4EE
Double air pilot	4PP
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	BEE*
Air pilot, NC / NC + PO check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with exhaust eheck	**DEE**
Air pilot, NC / NC with exhaust check	DPP
Solenoid, NO / NC with exhaust check	EEE
Solenoid, NC / NC without Ccheck (4/3 Exh. Ctr.)	GEE

* Valve includes peripheral P. O. Check Valve and union fittings.

Operator voltage	
24VDC	**2C**
Remote pilot - 5/32" (4mm) Tube	00

LED / Cable	
00	**No cable, no LED, no surge suppression**
V2	**2 Meter cable with LED and surge suppression**
V5	5 Meter cable with LED and surge suppression
V9	9 Meter cable with LED and surge suppression

Fitting Configuration	
A*	**Straight fittings**
B*	**Elbow fittings**
C*†	**Straight fitting & muffler**
D*†	**Elbow fitting & muffler**

* Ports 1 & 3 fittings sizes are same as ports 2 & 4 (see example at left.)
† Fitting in port 1, muffler in port 3.

Ports (all ports)	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	**5/32" (4mm) elbow fitting**
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8*	8mm elbow fitting
C9*	**3/8" Elbow fitting**
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	**1/2" Straight fitting**
F4	**5/32" (4mm) straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8*	8mm straight fitting
F9*	**3/8" Straight fitting**

* Only available with size 2 valves.

Example for fitting configuration:

Size 1

CF7 Ports 1 & 3
1/4" straight fitting & muffler
Ports 2 & 4
1/4" straight fittings

Size 2

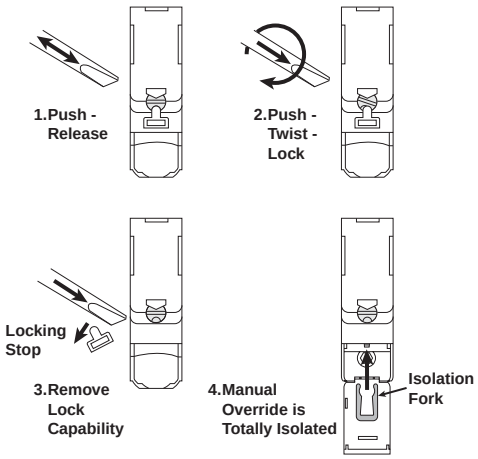
AC0 Ports 1 & 3
10mm elbow fittings
Ports 2 & 4
10mm elbow fittings

With only one universal solenoid pilot for all configurations

24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override



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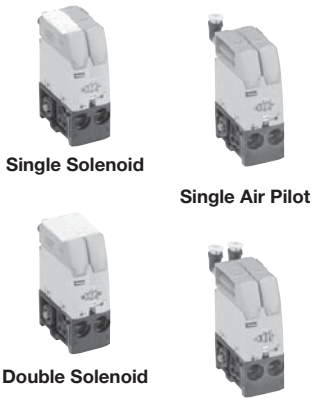
"T" Series Manifold Valves with Individual Connectors Size 1



Symbol	Type	Cv	Operator	Part number
	4-way, 2-position	0.32	Single solenoid	**P2M1T4ES2C**
			Single air pilot	**P2M1T4PS**
	4-way, 2-position	0.32	Double solenoid	**P2M1T4EE2C**
			Double air pilot	**P2M1T4PP**
	4-way, 2-position, dual valve w/ exhaust check	0.18	Double solenoid	**P2M1TJEE2C**
			Double air pilot	**P2M1TJPP**
	3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	**P2M1TDEE2C**
			Double air pilot	**P2M1TDPP**
	3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	**P2M1TCEE2C**
			Double air pilot	**P2M1TCPP**
	3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	**P2M1TEEE2C**
	3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	**P2M1T3ES2C**
			Single air pilot	**P2M1T3PS**
	3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	**P2M1TGEE2C**

"T" Series Size 1 Accessories

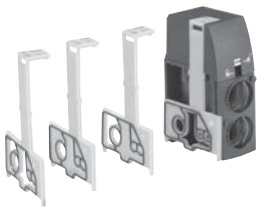
	Description	Tube Size	Option	Part number
	Size 1 push to connect fitting	5/32" or 4mm	Elbow	**CMD04-1**
			Straight	**FMD04-1**
	Size 1 push to connect fitting	1/4"	Elbow	**CMD07-1B**
			Straight	**FMD07-1B**
	Size 1 push to connect fitting	6mm	Elbow	**CMD06-1**
			Straight	**FMD06-1**
	Muffler for exhaust port			**MMDVA1**
	Plug			**PMDYY1**
	Double male union		Connecting peripheral modules	**HMDXX1**
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	**P8LS08L226C**
			5M cable	**P8LS08L526C**
			9M cable	**P8LS08L926C**
	Field wireable connector		M8 connector	**P8CS0803J**
			M12 connector	**P8CS1204J**
	Torx screwdriver			**P2M1K0TASD**

Manifold Options

Module	Part number
Pneumatic end plate kit	**P2M2HXT01***
Pneumatic end plate kit with torx screwdriver	**P2M2HXT0T***
Intermediate supply module (Includes 4 configuration plates)	**P2M2BXT0A***

* Use Fittings for Size 2 Modules Only

P2M2HXT01


P2M2BXT0A

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"T" Series Manifold Valves with Individual Connectors Size 2

Single Solenoid

Single Air Pilot

Double Solenoid

Double Air Pilot

Symbol	Type	Cv	Operator	Part number
	4-way, 2-position	0.8	Single solenoid	**P2M2T4ES2C**
			Single air pilot	**P2M2T4PS**
	4-way, 2-position	0.8	Double solenoid	**P2M2T4EE2C**
			Double air pilot	**P2M2T4PP**
	3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	**P2M2TDEE2C**
			Double air pilot	**P2M2TDPP**
	3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	**P2M2TCEE2C**
			Double air pilot	**P2M2TCPP**
	3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	**P2M2TEEE2C**
	3-way, 2-position, NC w/ exhaust check	0.44	Single solenoid	**P2M2T3ES2C**
			Single air pilot	**P2M2T3PS**
	3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	**P2M2TGEE2C**

"T" Series Size 2 Accessories

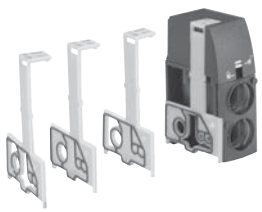
	Description	Tube size	Option	Part number
	Size 2 push to connect fitting	1/4"	Elbow	**CMD07-2B**
			Straight	**FMD07-2B**
	Size 2 push to connect fitting	3/8"	Elbow	**CMD09-2B**
			Straight	**FMD09-2B**
	Size 2 push to connect fitting	1/2"	Straight	**FMD13-2B**
	Size 2 push to connect fitting	6mm	Elbow	**CMD06-2**
			Straight	**FMD06-2**
	Size 2 push to connect fitting	8mm	Elbow	**CMD08-2**
			Straight	**FMD08-2**
	Size 2 push to connect fitting	10mm	Elbow	**CMD10-2**
			Straight	**FMD10-2**
	Size 2 Push to connect fitting	12mm	Elbow	**CMD12-2**
			Straight	**FMD12-2**
	Muffler for exhaust port			**MMDVA2**
	Plug			**PMDYY2**
	Double male union		Connecting peripheral modules	**HMDXX2**
	M8 female connector to flying lead - IP67 LED and surge protection		2M cable	**P8LS08L226C**
			5M cable	**P8LS08L526C**
			9M cable	**P8LS08L926C**
	Field wireable connector		M8 connector	**P8CS0803J**
			M12 connector	**P8CS1204J**
	Torx screwdriver			**P2M1K0TASD**

Manifold Options

Module	Part number
Pneumatic end plate kit	**P2M2HXT01***
Pneumatic end plate kit with torx screwdriver	**P2M2HXT0T***
Intermediate supply module (Includes 4 configuration plates)	**P2M2BXT0A***

* Use Fittings for Size 2 Modules Only

P2M2HXT01


P2M2BXT0A

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"T" Series Valve Manifold with Individual Connectors
(Complete with Pneumatic and Electrical Connectors)

P2M 1 T 4ES 2C 00 0 F4

Basic series	
Valvetronic modules	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Individual wire	T

Valve type / function	
3-Way / 2-position	
Single solenoid, NC spring return	**3ES**
Single air pilot, NC spring return	**3PS**
4-Way / 2-position	
Single solenoid, spring return	**4ES**
Single air pilot, spring return	**4PS**
Double solenoid	**4EE**
Double air pilot	**4PP**
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	**BEE***
Air pilot, NC / NC + PO check (4/3 APB)	BPP*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Air pilot NO / NO (4/3 Pressure Ctr.)	CPP
Solenoid, NC / NC with exhaust check	DEE
Air pilot, NC / NC with exhaust check	DPP
Solenoid, NO / NC with exhaust check	**EEE**
Solenoid, NC / NC without check (4/3 Exh. Ctr.)	**GEE**
Dual 4-Way, 2-Position, Spring Return	
Solenoid	**JEE****
Air pilot	**JPP****

* Valve includes peripheral P. O. check valve and union fittings.
** Size 1 only.

Operator Voltage	
2C	**24VDC**
00	Remote pilot - 5/32" (4mm) tube

Led / cable	
00	**No cable, no led, no surge suppression**
V2	**2 Meter cable with led and surge suppression**
V5	5 Meter cable with led and surge suppression
V9	9 Meter cable with led and surge suppression

Ports 1 & 3	
0	**None**

Ports 2 & 4	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	**5/32" (4mm) elbow fitting**
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8*	8mm elbow fitting
C9*	**3/8" Elbow fitting**
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	**1/2" Straight fitting**
F4	**5/32" (4mm) straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8*	8mm straight fitting
F9*	**3/8" Straight fitting**

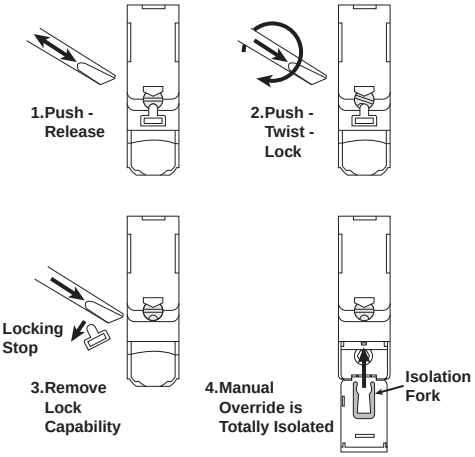
* Only available with size 2 valves.

With only one universal solenoid pilot for all configurations

24VDC is now a global standard for all machines.

The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override



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"V" Series Manifold Valves with Collective Wiring Size 1

Single Solenoid

Double Solenoid

Symbol	Type	Cv	Operator	Part number
	4-way, 2-position	0.32	Single solenoid	**P2M1V4ES2CV**
	4-way, 2-position	0.32	Double solenoid	**P2M1V4EE2CV**
	4-way, 2-position, dual valve, w/ exhaust check	0.18		**P2M1VJEE2CV**
	3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.22	Double solenoid	**P2M1VDEE2CV**
	3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.22	Double solenoid	**P2M1VCEE2CV**
	3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.22	Double solenoid	**P2M1VEEE2CV**
	3-way, 2-position, NC w/ exhaust check	0.22	Single solenoid	**P2M1V3ES2CV**
	3-way, 2-position, dual valve, NC/NC	0.22	Double solenoid	**P2M1VGEE2CV**

"V" Series Size 1 Accessories

	Description	Tube size	Option	Part number
	Size 1 push to connect fitting	5/32"	Elbow	**CMD04-1**
			Straight	**FMD04-1**
	Size 1 push to connect fitting	1/4"	Elbow	**CMD07-1B**
			Straight	**FMD07-1B**
	Size 1 push to connect fitting	6mm	Elbow	**CMD06-1**
			Straight	**FMD06-1**
	Muffler for exhaust port			**MMDVA1**
	Plug			**PMDYY1**
	Double male union		Connecting peripheral modules	**HMDXX1**
	Electrical 20-Pin multi-connector cable with flying leads	IP65 rated	2M cable	**P8LMH20M2A**
			5M cable	**P8LMH20M5A**
			9M cable	**P8LMH20M9A**
	Electrical 25-Pin D-sub cable	IP20 rated	3M cable	**P8LMH25M3A**
			9M cable	**SCD259D**
		IP65 rated	3M cable	**SCD253W**
			9M cable	**SCD259WE**
	Field wireable connector for power supply	Female	M12 - A code	**P8CS1205AA**
	Line termination resistor	Profibus DP	M12 type B	**P8BPA00MB**
		Devicenet or Canopen	M12 type A	**P8BPA00MA**
	AS-i M12 cable with jack for addressing		1M cable	**P8LS12JACK**
	Torx screwdriver			**P2M1K0TASD**

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Electrical Connections

Description	Part number
20-Pin, Multi-connector electrical head module	**P2M2HEV0A**
25-Pin, D-sub, electrical head module	**P2M2HEV0D**

Fieldbus Connections

Description		Part number
Profibus DP		**P2M2HBVP21600**
DeviceNet		**P2M2HBVD21600**
CANopen		**P2M2HBVC21600**
Interbus S		**P2M2HBVS11600**
AS-i	0 inputs and 8 solenoid outputs	**P2M2HBVA10800**
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	**P2M2HBVA10808A**
AS-i	8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	**P2M2HBVA10808B**
AS-i Version 2.1 ProtocolAS-i	0 inputs and 6 solenoid outputs	**P2M2HBVA20600**
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	**P2M2HBVA20608A**
AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	**P2M2HBVA20608B**

Manifold Options

Module	Part number
Pneumatic end plate kit	**P2M2HXT01***
Pneumatic end plate kit with torx screwdriver	**P2M2HXT0T***
Intermediate supply module (Includes 4 configuration plates)	**P2M2BXV0A***

* Use Fittings for Size 2 Modules Only

P2M2HXT01

P2M2BXV0A

"V" Series Manifold Valves with Collective Wiring Size 2

Single Solenoid

Double Solenoid

Symbol	Type	Cv	Operator	Part number
	4-way, 2-position	0.8	Single solenoid	**P2M2V4ES2CV**
	4-way, 2-position	0.8	Double solenoid	**P2M2V4EE2CV**
	3-way, 2-position, dual valve, NC/NC w/ exhaust check	0.44	Double solenoid	**P2M2VDEE2CV**
	3-way, 2-position, dual valve, NO/NO w/ exhaust check	0.44	Double solenoid	**P2M2VCEE2CV**
	3-way, 2-position, dual valve, NC/NO w/ exhaust check	0.44	Double solenoid	**P2M2VEEE2CV**
	3-way, 2-position, NC w/ exhaust check	0.44	Single solenoid	**P2M2V3ES2CV**
	3-way, 2-position, dual valve, NC/NC	0.44	Double solenoid	**P2M2VGEE2CV**

"V" Series Size 2 Accessories

	Description	Tube size	Option	Part number
	Size 2 push to connect fitting	1/4" OD tube	Elbow	**CMD07-2B**
			Straight	**FMD07-2B**
	Size 2 push to connect fitting	3/8" OD tube	Elbow	**CMD09-2B**
			Straight	**FMD09-2B**
	Size 2 push to connect fitting	1/2" OD tube	Straight	**FMD13-2B**
	Size 2 push to connect fitting	6mm OD tube	Elbow	**CMD06-2**
			Straight	**FMD06-2**
	Size 2 push to connect fitting	8mm OD tube	Elbow	**CMD08-2**
			Straight	**FMD08-2**
	Size 2 push to connect fitting	10mm OD tube	Elbow	**CMD10-2**
			Straight	**FMD10-2**
	Size 2 push to connect fitting	12mm OD tube	Elbow	**CMD12-2**
			Straight	**FMD12-2**
	Muffler for exhaust port			**MMDVA2**
	Plug			**PMDYY2**
	Double Male Union		Connecting peripheral modules	**HMDXX2**
	Electrical 20-Pin multi-connector cable with flying leads	IP65 rated	2M cable	**P8LMH20M2A**
			5M cable	**P8LMH20M5A**
			9M cable	**P8LMH20M9A**
	Electrical 25-Pin D-sub cable	IP20 rated	3M cable	**P8LMH25M3A**
			9M cable	**SCD259D**
		IP65 rated	3M cable	**SCD253W**
			9M cable	**SCD259WE**
	Torx screwdriver			**P2M1K0TASD**

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Electrical Connections

Description	Part number
20-Pin, Multi-connector electrical head module	**P2M2HEV0A**
25-Pin, D-sub, electrical head module	**P2M2HEV0D**

Fieldbus Connections

Description		Part number
Profibus DP		**P2M2HBVP21600**
DeviceNet		**P2M2HBVD21600**
CANopen		**P2M2HBVC21600**
Interbus S		**P2M2HBVS11600**
AS-i	0 inputs and 8 solenoid outputs	**P2M2HBVA10800**
AS-i	8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	**P2M2HBVA10808A**
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AS-i Version 2.1 ProtocolAS-i	8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	**P2M2HBVA20608B**

Manifold Options

Module	Part number
Pneumatic end plate kit	**P2M2HXT01***
Pneumatic end plate kit with torx screwdriver	**P2M2HXT0T***
Intermediate supply module (Includes 4 configuration plates)	**P2M2BXV0A***

* Use Fittings for Size 2 Modules Only

P2M2HXT01

P2M2BXV0A

"V" Series Valve Manifold with Collective Wiring
(Complete with Pneumatic Connectors)

P2M 1 V 4ES 2C V0 0 F4

Basic series	
Valvetronic modules	P2M

Size	
Size 1	1
Size 2	2

Valve series	
Collective wiring	V

Valve Type / Function	
3-Way / 2-position	
Single solenoid, NC spring return	3ES
4-Way / 2-position	
Single solenoid, spring return	4ES
Double solenoid	4EE
Dual 3-way, 2-position, spring return	
Solenoid, NC / NC + PO check (4/3 APB)	BEE*
Solenoid, NO / NO (4/3 Pressure Ctr.)	CEE
Solenoid, NC / NC with exhaust check	DEE
Solenoid, NO / NC with exhaust check	EEE
Solenoid, NC / NC without check (4/3 Exh. Ctr.)	GEE
Dual 4-way, 2-position, spring return	
Solenoid	JEE**

* Valve includes peripheral P. O. Check Valve and union fittings.
** Size 1 Only.

Operator voltage	
2C	24VDC

LED / Cable	
V0	No cable with LED and surge suppression

Ports 1 & 3	
0	None

Ports 2 & 4	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	**5/32" (4mm) elbow fitting**
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8*	8mm elbow fitting
C9*	**3/8" Elbow fitting**
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	**1/2" Straight fitting**
F4	**5/32" (4mm) straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8*	8mm straight fitting
F9*	**3/8" Straight fitting**

* Only available with size 2 valves.

With only one universal solenoid pilot for all configurations

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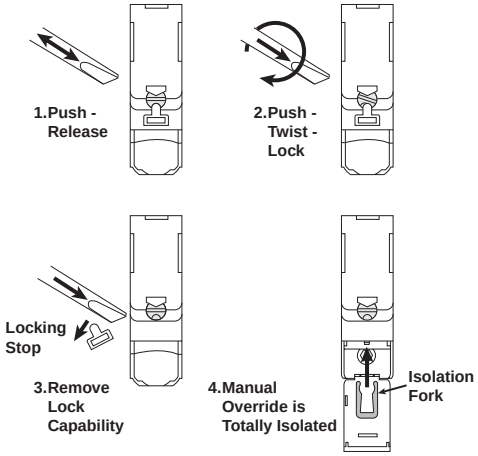
The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

Multi-function adaptable manual override



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Peripheral Modules Size 1

	Acessories	Description	Option	Part number
	Pressure regulator without gauge		0 to 30 PSI	**P2M1PXST**
			0 to 60 PSI	**P2M1PXSL**
			0 to 120 PSI	**P2M1PXSN**
	Pressure regulator with gauge		0 to 30 PSI	**P2M1PXSR**
			0 to 60 PSI	**P2M1PXSM**
			0 to 120 PSI	**P2M1PXSG**
	Gauge		0 to 30 PSI	**P2M1K0GT**
			0 to 60 PSI	**P2M1K0GL**
			0 to 120 PSI	**P2M1K0GN**
	Dual P.O. Check valve			**P2M1PXCA**
	Dual flow control			**P2M1PXFA**
	Vacuum generator			**P2M1PXVA**
	Size 1 push to connect fitting	5/32" or 4mm OD tube	Elbow	**CMD04-1**
			Straight	**FMD04-1**
	Size 1 push to connect fitting	1/4" OD tube	Elbow	**CMD07-1B**
			Straight	**FMD07-1B**
	Size 1 push to connect fitting	6mm OD tube	Elbow	**CMD06-1**
			Straight	**FMD06-1**
	Double male union	Connecting peripheral modules		**HMDXX1**
	Muffler for vacuum exhaust port			**MMDVA1**
	Plug			**PMDYY1**

Vacuum Generator Model Number Index

P2M1PXVA **F7** **A** **F7** **C** **MA**

Basic configuration	
Basic unit	P2M1PXVA

#1 Pressure port	
5/32" (4mm) elbow	C4
6mm elbow	C6
1/4" Elbow	C7
Joint fitting	JJ
5/32" (4mm) straight	F4
6mm straight	F6
1/4" Straight	F7

Port #1 configuration	
Fitting in pressure port and blow-off port	A
Fitting in pressure port and blow-off port plugged*	B

* Can not be directly mounting to valve.

#2 Vacuum port	
C4	5/32" (4mm) Elbow
C6	6mm Elbow
C7	1/4" Elbow
F4	5/32" (4mm) Straight
F6	6mm Straight
F7	1/4" Straight

#2 Sensor port	
A	6mm Plug
B	Plug
C	Sensor, PNP, M8
D	Sensor, NPN, M8
K	1/4" Straight
L	1/4" Elbow
M	6mm Elbow

#3 Exhaust port	
C4	5/32" (4mm) Elbow
C6	6mm Elbow
C7	1/4" Elbow
F4	5/32" (4mm) Straight
F6	6mm Straight
F7	1/4" Straight
MA	Muffler

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Peripheral Modules Size 2

	Acessories	Description	Option	Part number
	Pressure regulator without gauge		0 to 30 PSI	**P2M1PXST**
			0 to 60 PSI	**P2M1PXSL**
			0 to 120 PSI	**P2M1PXSN**
	Pressure regulator with gauge		0 to 30 PSI	**P2M1PXSR**
			0 to 60 PSI	**P2M1PXSM**
			0 to 120 PSI	**P2M1PXSG**
	Gauge		0 to 30 PSI	**P2M1K0GT**
			0 to 60 PSI	**P2M1K0GL**
			0 to 120 PSI	**P2M1K0GN**
	Dual P.O. Check valve			**P2M1PXCA**
	Dual flow control			**P2M1PXFA**
	Size 2 push to connect fitting	1/4" OD tube	Elbow	**CMD07-2B**
			Straight	**FMD07-2B**
	Size 2 push to connect fitting	3/8" OD tube	Elbow	**CMD09-2B**
			Straight	**FMD09-2B**
	Size 2 push to connect fitting	1/2" OD tube	Straight	**FMD13-2B**
	Size 2 push to connect fitting	6mm OD tube	Elbow	**CMD06-2**
			Straight	**FMD06-2**
	Size 2 push to connect fitting	8mm OD tube	Elbow	**CMD08-2**
			Straight	**FMD08-2**
	Size 2 push to connect fitting	10mm OD tube	Elbow	**CMD10-2**
			Straight	**FMD10-2**
	Size 2 push to connect fitting	12mm OD tube	Elbow	**CMD12-2**
			Straight	**FMD12-2**
	Muffler for exhaust port			**MMDVA2**
	Plug			**PMDYY2**
	Double Male Union		Connecting peripheral modules	**HMDXX2**

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"P" Series Peripheral Modules Model Number Index
(Complete with Pneumatic Connectors)

P2M 1 PX S L F4 F4

Basic series	
Electro-pneumatic valve modules	P2M

Size	
Size 1	1
Size 2	2

Style / Function	
Peripheral	PX

Accessory type	
Dual pilot operated check	C
Dual flow control	F
Single pressure regulator	S

Accessory option	
Flow control or pilot operated check	A*
0 - 120 PSI - Gauge	G
0 - 60 PSI - No gauge	L
0 - 60 PSI - Gauge	M
0 - 120 PSI - No gauge	N
0 - 30 PSI - Gauge	R
0 - 30 PSI - No gauge	T

* Must be used with accessory type "C" or "F".

Ports 1 & 3 (Supply / Exhaust)	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	**5/32" (4mm) elbow fitting**
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8*	8mm elbow fitting
C9*	**3/8" Elbow fitting**
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	**1/2" Straight fitting**
F4	**5/32" (4mm) straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8*	8mm straight fitting
F9*	**3/8" Straight fitting**
JJ	**Double male union**

* Only available with size 2 valves.

Ports 2 & 4 (S, T & V Series)	
C0*	10mm elbow fitting
C2*	12mm elbow fitting
C4	**5/32" (4mm) elbow fitting**
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8*	8mm elbow fitting
C9*	**3/8" Elbow fitting**
F0*	10mm elbow fitting
F2*	12mm elbow fitting
F3*	**1/2" Straight fitting**
F4	**5/32" (4mm) straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8*	8mm straight fitting
F9*	**3/8" Straight fitting**
JJ	**Double male union**
PP	**Clip-in plug**

* Only available with size 2 valves.

Intermediate Supply Module Model Number Index

P2M2BX V 0 4 F9 MM

Intermediate supply module	
Basic unit	P2M2BX

Valve type	
Individually wired	T
Collective wiring	V

Wiring style	
No cable	0

Plate configuration	
#1 & #3 Blocked	1
#1 Open & #3 blocked	2
#1 Blocked & #3 open	3
#1 & #3 Open	4

Inlet port type (#1 pressure)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8	8mm elbow fitting
C9	**3/8" Elbow fitting**
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	**1/2" Straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8	8mm straight fitting
F9	**3/8" Straight fitting**
MM	**Clip-in muffler**
PP	**Clip-in plug**

* Elbow fittings face up.

Exhaust port type (#3 exhaust)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8	8mm elbow fitting
C9	**3/8" Elbow fitting**
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	**1/2" Straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8	8mm straight fitting
F9	**3/8" Straight fitting**
MM	**Clip-in muffler**
PP	**Clip-in plug**

* Elbow fittings face up.

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Moduflex Add-A-Fold Assembly Model Number Index
(Complete with Pneumatic and Electrical Connectors)

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List valves and manifolds. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

P2MA V 0 1 C9 C9 ##

Moduflex island assembly	
Add-A-Fold	**P2MA***

*Includes pneumatic H & T end plate kit.

Style	
Individually wired	**T**
Collective wiring	**V***

* Includes 20-pin multi-connector or 25-pin, D-sub electrical head module.

Wiring / bus protocol	
No cable (20-pin multi-connector T series)	**0**
2 Meter cable (20-pin)	**2**
5 Meter cable (20-pin)	5
9 Meter cable (20-pin)	9
Bus	**B***
No cable (25-pin, D-sub)	**D**
3 Meter cable (25-pin, D-sub)	**F**

* Order bus module as a separate line item.
† Default to option "0" for T series.

Pilot source	
Internal supply / internal exhaust	**1**
Internal supply / external exhaust	2
External supply / internal exhaust	3
External supply / external exhaust	4

Number of stations†	
01 - 19*	**V-Type**
01 - 30	**T-Type**

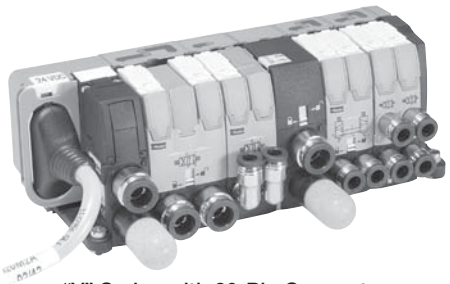
* Max. Number of Addresses for V type is 19. Single Solenoid Valves equal one address. Double Solenoid Valves equal two addresses. Maximum address may depend upon choice of bus protocol.
† Intermediate Modules are considered Stations, but do not count against maximum number of addresses for manifold.

Exhaust Port Type (#3 Exhaust)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8	8mm elbow fitting
C9	**3/8" Elbow fitting**
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	**1/2" Straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8	8mm straight fitting
F9	**3/8" Straight fitting**
MM	**Clip-in muffler**
PP	**Clip-in plug**

* Elbow fittings face up.

Inlet port type (#1 pressure)*	
C0	10mm elbow fitting
C2	12mm elbow fitting
C6	6mm elbow fitting
C7	**1/4" Elbow fitting**
C8	8mm elbow fitting
C9	**3/8" Elbow fitting**
F0	10mm elbow fitting
F2	12mm elbow fitting
F3	**1/2" Straight fitting**
F6	6mm straight fitting
F7	**1/4" Straight fitting**
F8	8mm straight fitting
F9	**3/8" Straight fitting**
MM	**Clip-in muffler**
PP	**Clip-in plug**

* Elbow fittings face up.



"V" Series with 20-Pin Connector

"V" Series with Field Bus Connection

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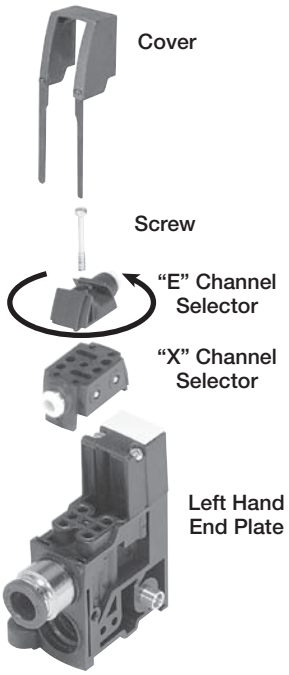
Internal and External Pilot Supply Options

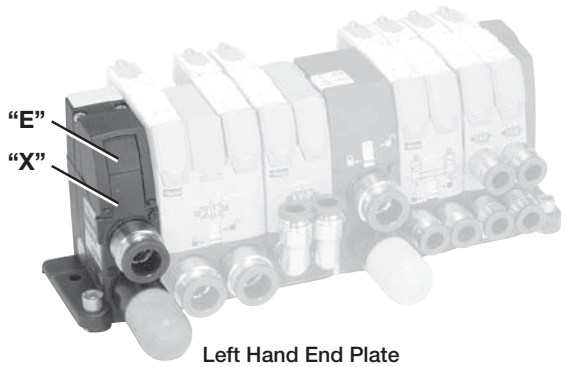
All T and V Series Valve bases incorporate an auxiliary channel **"X"** to supply pressure to the solenoid pilots. The **"X"** galley is pressurized from the left hand end plate. Depending on the configuration of the left hand end plate, this pressure is either supplied from the #1 port in the left hand end plate or supplied externally through a 4mm OD tube fitting in the left hand end plate This fitting is supplied in all left hand end plates and can be converted in the field.

Internal and External Solenoid Pilot Exhaust Options

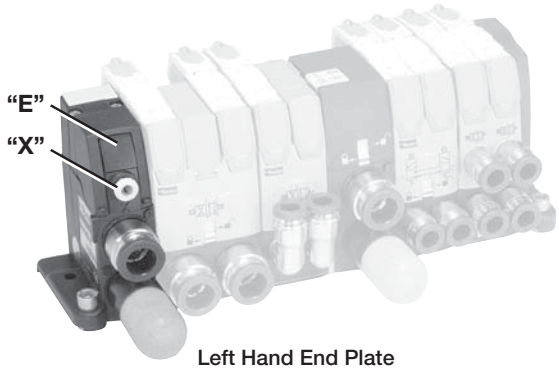
All T and V Series Valve bases incorporate an auxiliary channel **"E"** which is used to exhaust the solenoid pilot pressure from each solenoid valve. The **"E"** galley is connected to the left hand end plate. Depending on the configuration of the left hand end plate, this exhaust is either connected to the #3 exhaust port or is connected to a 4mm OD Tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

To configure the left hand end plate, with pressure off, remove head cover to expose the selector section. Loosen selector section and rotate **"X"** or **"E"** channel selector to desired position. Tighten selector section and assemble cover.

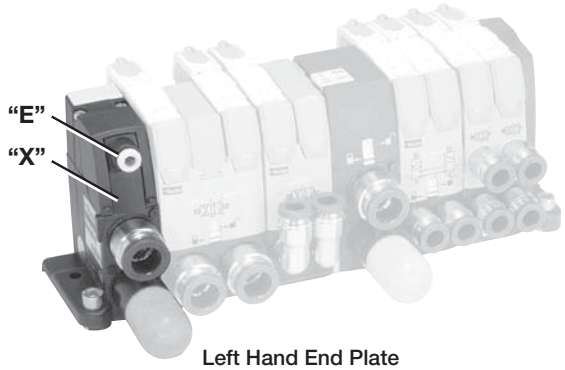




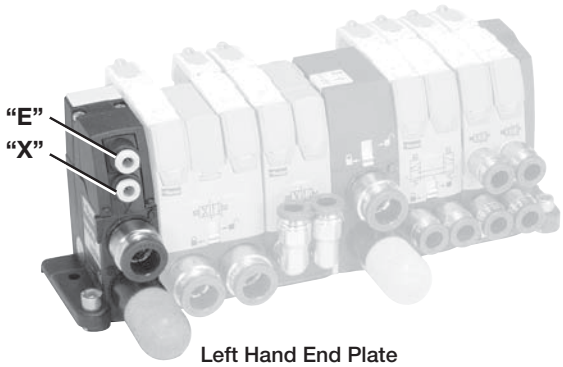
Left Hand End Plate
"E" Channel Internal Exhaust
"X" Channel Internal Pilot



Left Hand End Plate
"E" Channel Internal Exhaust
"X" Channel External Pilot



Left Hand End Plate
"E" Channel External Exhaust
"X" Channel Internal Pilot



Left Hand End Plate
"E" Channel External Exhaust
"X" Channel External Pilot

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Solenoid Pilot 24VDC

Description	Part number
Solenoid Pilot (Without Plug-in Electrical Connector)	**P2D8V32C5**
Air Pilot with 5/32" (4mm) Tube Fitting	**P2M2K0PA**

P2D8V32C5

P2M2K0PA

Size 1 Valve Without Solenoid Pilot and Without Subbase

P2M1X4EE

4-Way / 2-Position / Single Valve

	Solenoid	Part number
	Single solenoid (Monostable)	**P2M1X4ES**
	Double solenoid (Bistable)	**P2M1X4EE**

4-Way / 2-Position / Dual Valve

	Solenoid	Part number
	Solenoid spring with exhaust check	**P2M1XJEE**

3-Way / 2-Position / Dual Valve

	Solenoid	Part number
	Double solenoid NC + NC with exhaust check	**P2M1XDEE**
	Double solenoid NO + NO with exhaust check	**P2M1XCEE**
	Double solenoid NC + NO with exhaust check	**P2M1XEEE**
	Single solenoid NC with exhaust check	**P2M1X3ES**

Size 2 Valve Without Solenoid Pilot and Without Subbase

P2M2X4EE

4-Way / 2-Position / Dual Valve

	Solenoid	Part number
	Single solenoid (Monostable)	**P2M2X4ES**
	Double solenoid (Bistable)	**P2M2X4EE**

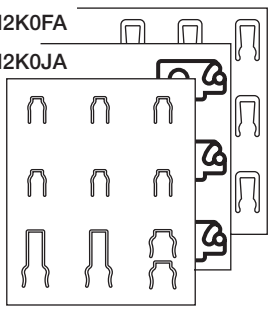
3-Way / 2-Position / Dual Valve

	Solenoid	Part number
	Double solenoid NC + NC with exhaust check	**P2M2XDEE**
	Double solenoid NO + NO with exhaust check	**P2M2XCEE**
	Double solenoid NC + NO with exhaust check	**P2M2XEEE**
	Single solenoid NC with exhaust check	**P2M2X3ES**

Set of Maintenance Parts

Description		Part number
Clips	Set of 10 clips: 6 for size 1 valves, 2 for size 2 valves, 2 for end plate and intermediate modules	**P2M2K0CA**
Seals	Set of 10 seals: 3 for manifold to manifold seals, 3 under solenoid pilot seals, 4 under valve seals (two size 1 seals, two size 2 seals)	**P2M2K0JA**
Forks	Set of 10 isolation forks for solenoid pilot manual override	**P2M2K0FA**

P2M2K0FA
P2M2K0JA



P2M2K0CA

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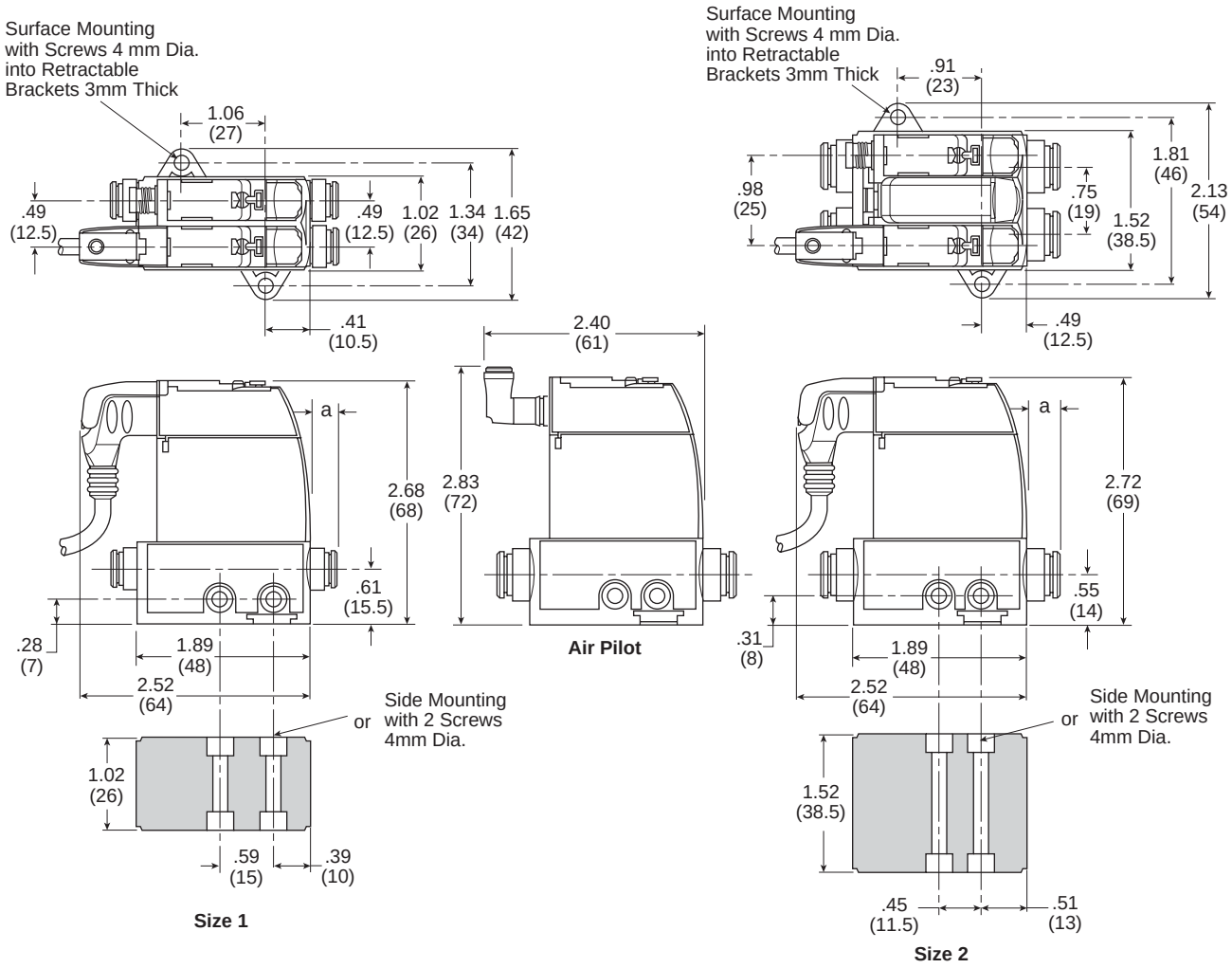
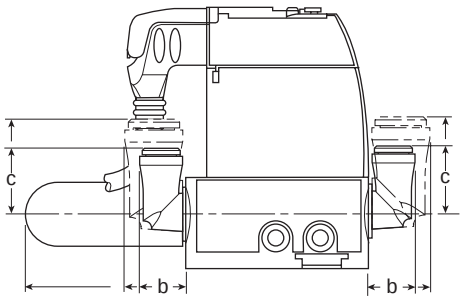
"S" Series Individual Subbase Valve Dimensions and Mounting

Subbase Valve Size 1

Subbase Valve Size 2

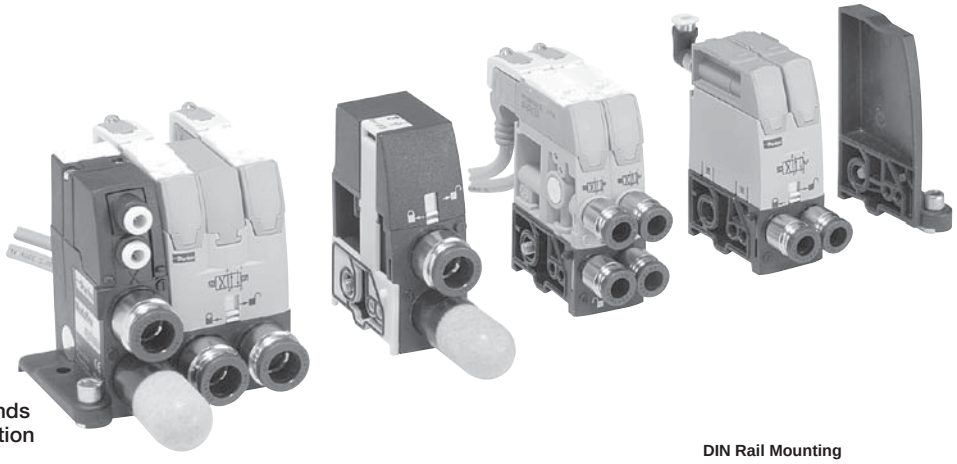


OD Tube Ext.		a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
	Muffler		31	
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22
	Muffler		40	

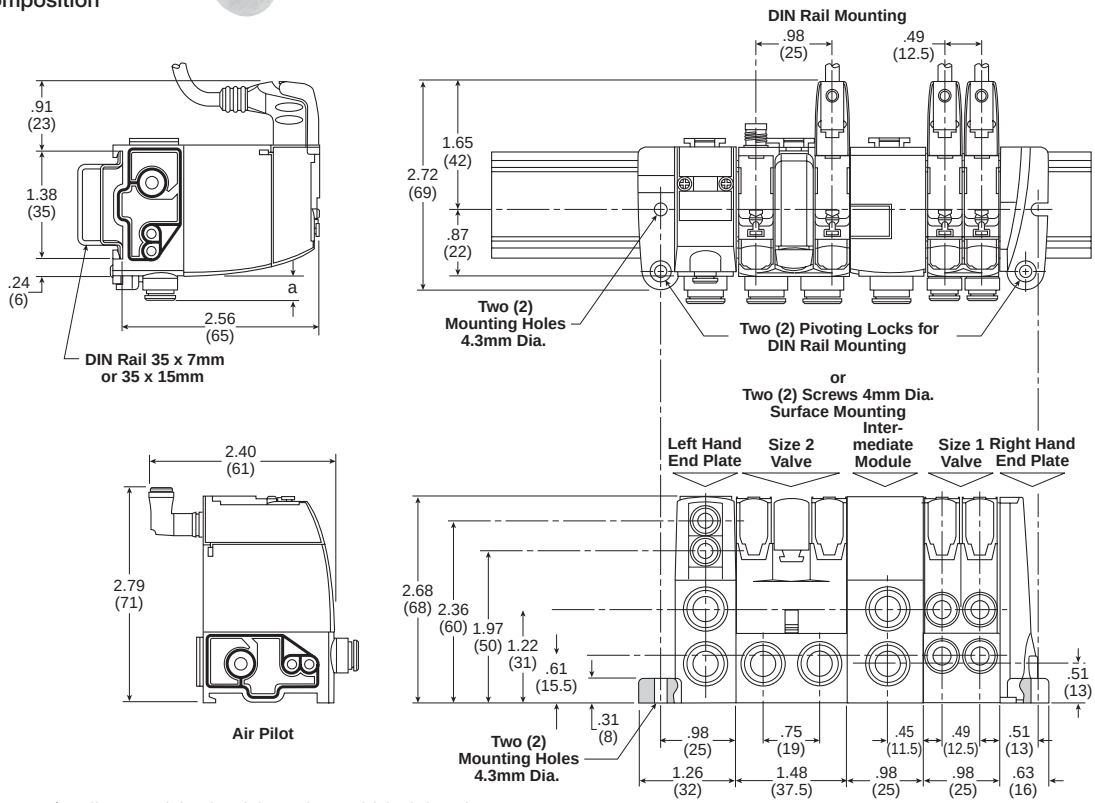


Special Case: 4/3 all ports blocked. Add the dual P.O. check valve that has been plugged in the basic valve.

"T" Series Manifold Dimensions and Mounting



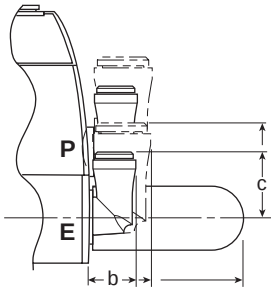
Total Width Depends on Valve Composition



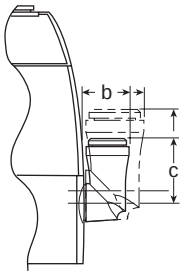
Special Case: 4/3 all ports blocked function within island version, add the dimensions of the dual P.O. check valve plugged into the island.

End Plate and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler		40	



OD Tube	Ext.	a	b	c
Size 1 Valves	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Valves	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22



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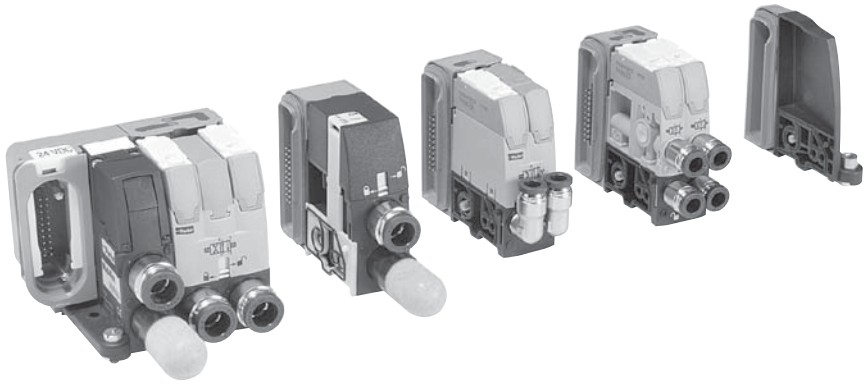
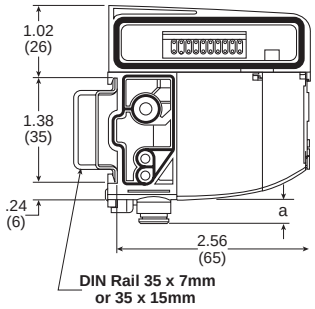
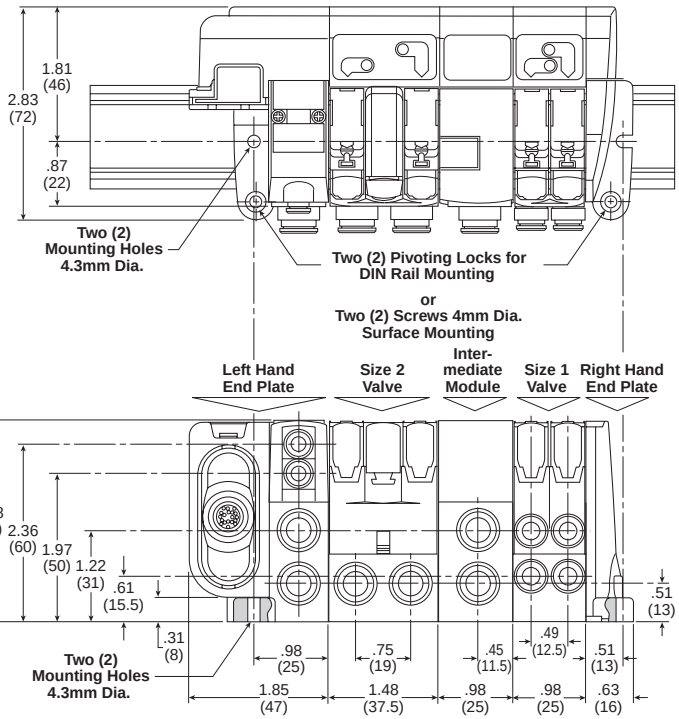
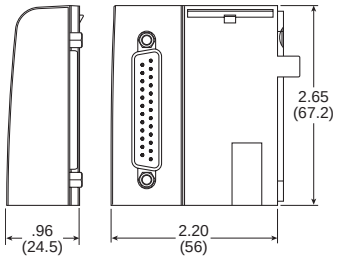
"V" Series Manifold Dimensions and Mounting
20-Pin, Multi-Connector Valve Manifold



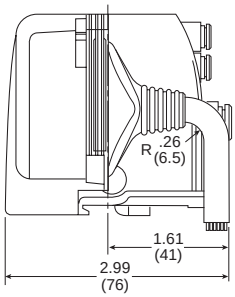
Total Width Depends on Valve Composition







25-Pin,
D-Sub



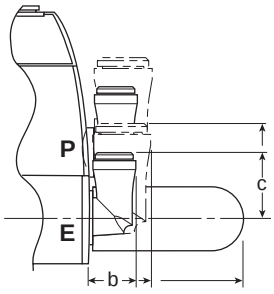
20-Pin,
Multi-Connector

D

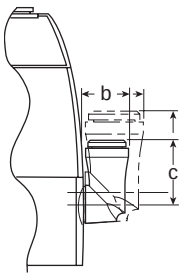
Subbase & Manifold Valve Products

End Plate and Intermediate Modules

	a	b	c
6 mm Tube OD	8	13	16
1/4" Tube OD	12	18	22
8 mm Tube OD	9	16	19
3/8" Tube OD	16	23	26
10 mm Tube OD	13	18	25
12 mm Tube OD	13	19	25
1/2" Tube OD	13		
Muffler		40	



OD Tube	Ext.	a	b	c
Size 1 Modules	5/32" (4 mm)	8	10	12
	6 mm	8	13	16
	1/4"	15	18	22
Size 2 Modules	1/4"	12	18	22
	8 mm	9	16	19
	3/8"	16	23	26
	10 mm	13	18	22



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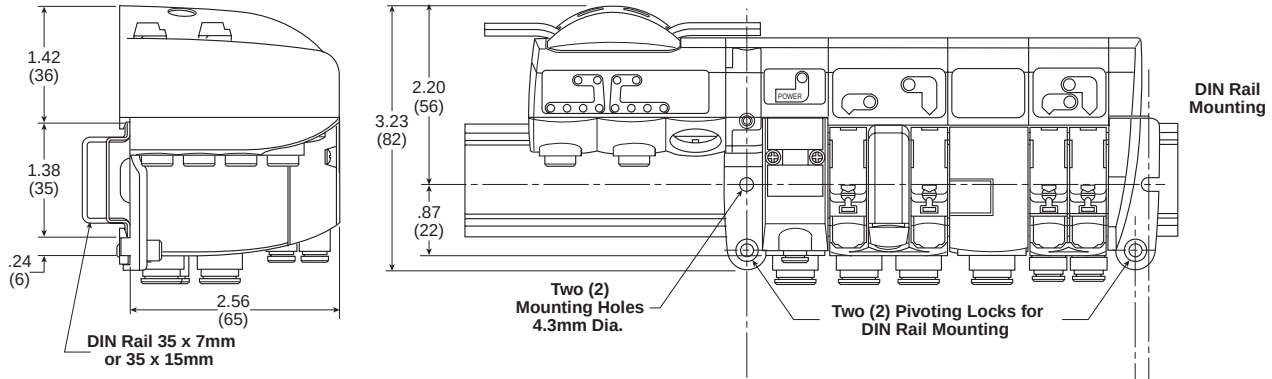
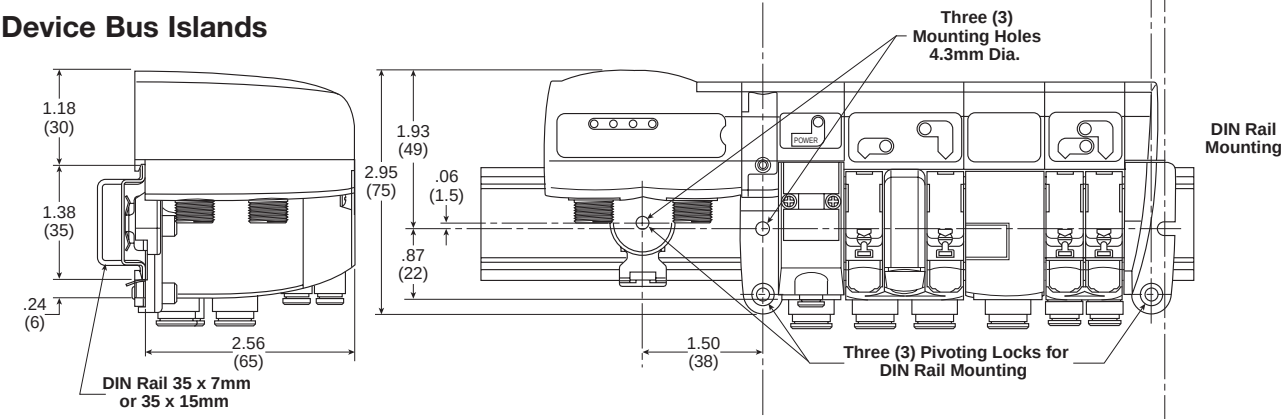
"V" Series Manifold Dimensions and Mounting
Fieldbus Connected Manifolds

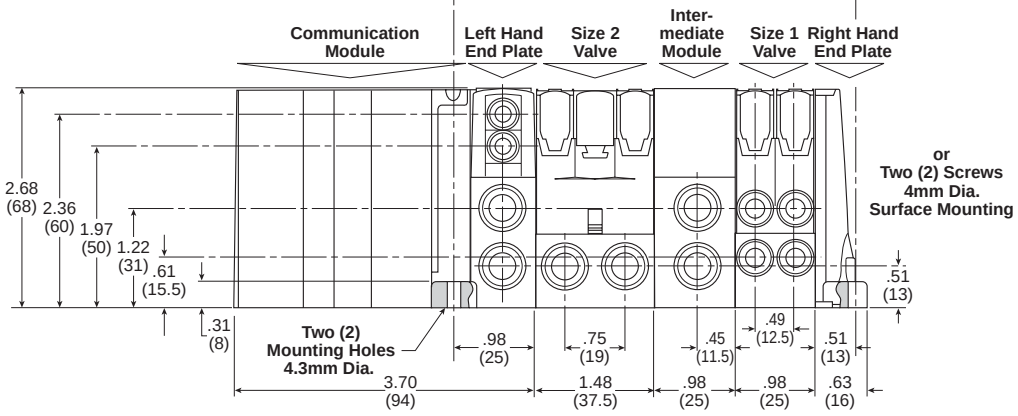
Total Width Depends on Valve Composition

AS-i Bus Islands



Device Bus Islands





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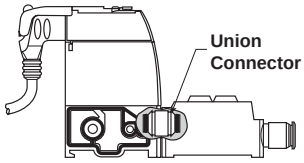
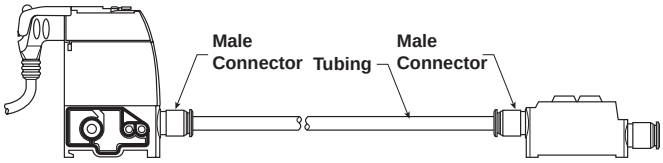
"P" Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

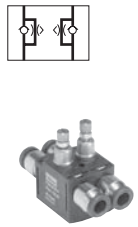
Peripheral Module
Plugged in a Valve

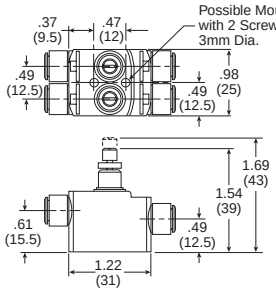


In-Line Peripheral Modules:
Mounting is Required



Dual Flow Control Size 1





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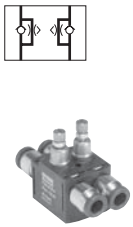
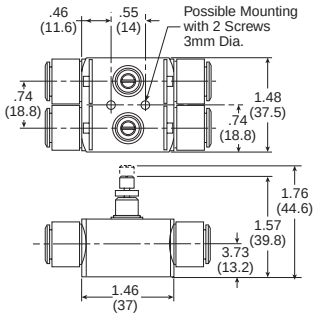
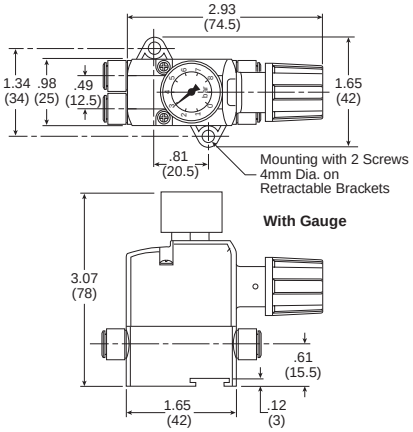


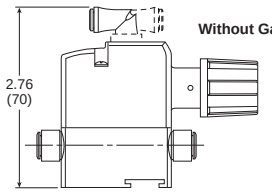


Pressure Regulator Size 1

With Gauge

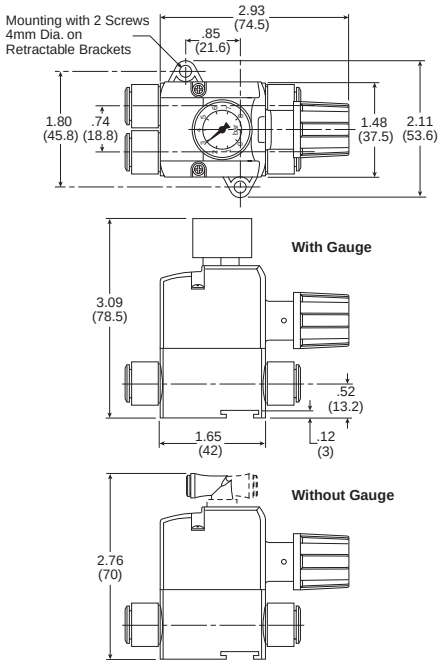


Without Gauge



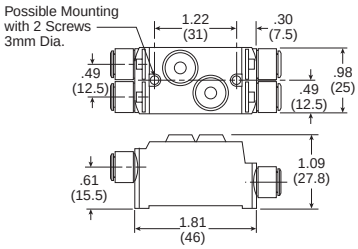
Pressure Regulator Size 2

With Gauge

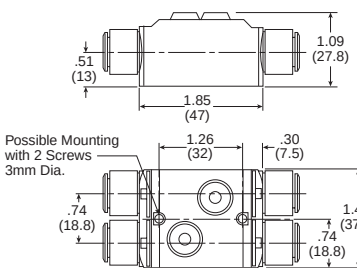


Without Gauge

Dual P.O. Check Valve Size 1



Dual P.O. Check Valve Size 2



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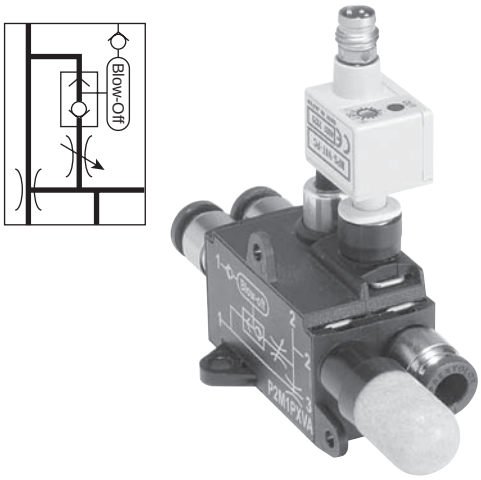
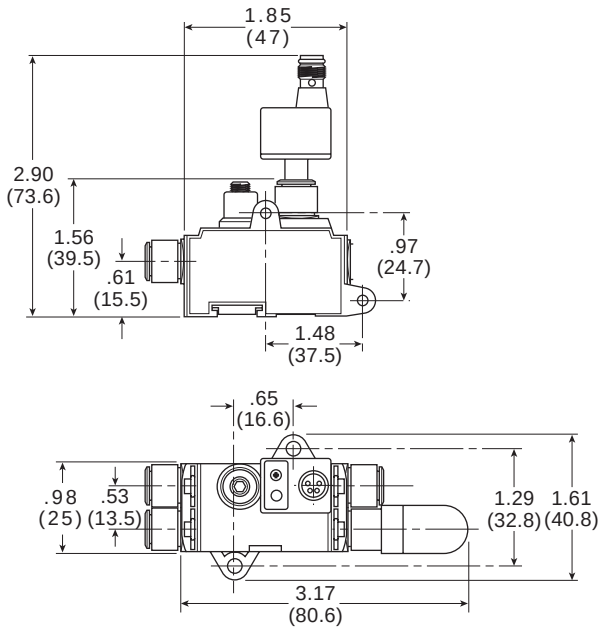
"P" Series Peripheral Modules Dimensions and Mounting

Reminder: Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

Vacuum Generator Size 1

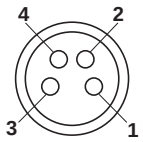




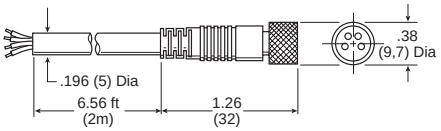
Sensor Pin Out

Pin #

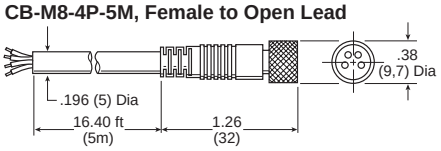
1 Brown: 24VDC
2 White: NPN / PNP Open Collector Output
3 Blue: 0VDC
4 Black: NPN / PNP Open Collector Output



CB-M8-4P-2M, Female to Open Lead



CB-M8-4P-5M, Female to Open Lead



Sensor Specifications

Media	Air and Non-Corrosives Gases
Proof Pressure	(V) 72.5 PSI
Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	14 to 140°F (-10 to 60°C)
Humidity	35 to 85% RH
Electrical Connection	(C) 4-Pin, M8 Connector
Power Supply	10.8 to 30 VDC, Ripple Vp-p 10% max., Reverse Voltage Protection
Switch Output	1 Output Signal Open and Closed, NPN or PNP, 30VDC, 125mA
Linear Output	Analog Output 1 to 5 VDC
Switch Point Setting	2/3 Turn Trimmer
Hysteresis Setting	< 2% of F.S.
Output Response Time	<1ms
Repeatability	<0.2% F.S.
Shock Resistance	100 G, XYZ
Material	Housing: Polycarbonate, Pressure Port: Zinc Die-cast
Mass	T Port: 0.25 oz. (7g)

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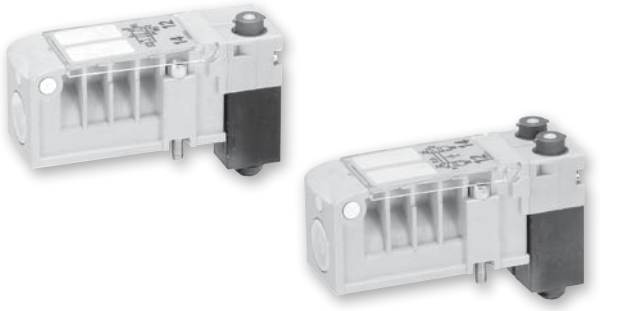
The Isys Micro Valve System incorporates a space saving back to back valve mounting design, and achieves flow rates of 0.35 Cv per valve with 4 valves having a combined width of 42mm. This plug-in valve solution simplifies wiring with the use of 25 pin connectors or fieldbus systems.

Ports
- M7 on manifolds
- 3/8 Inch on end plates

Mounting
- Manifold

Solenoids
- 24 VDC, 1.0 watt

Certification / Approval
- IP65 rated
- EMC / CE Mark: According to EN 61 000-6-2



Materials

Body	Polyamide reinforced fiberglass
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Spool	Brass and nitrile rubber
Spool enclosure	Brass

Operating information

Operating pressure: Vacuum to 145 PSIG (Vacuum to 10 bar)

Pilot pressure requirements:

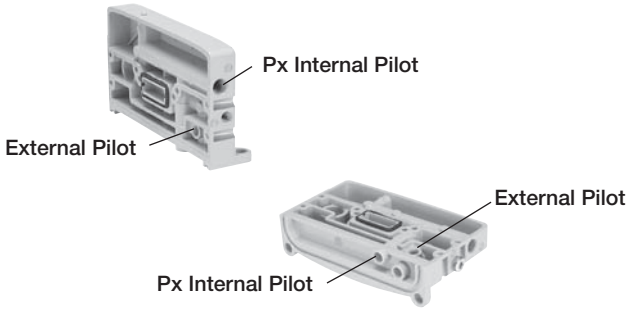
Valve number	Minimum pilot pressure	Maximum pilot pressure
HMEVX2049A	40 PSI	120 PSI
HM2VX2049A	25 PSI	120 PSI
HM5VX2049A	45 PSI	120 PSI
HMNVX2049A	40 PSI	120 PSI
HMPVX2049A	40 PSI	120 PSI
HMQVX2049A	40 PSI	120 PSI

Temperature range: 5°F to 120°F (-15°C to 49°C)

Pilot Configuration

Manifolds can be configured for either internal or external pilot in the field. Side ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the front of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.

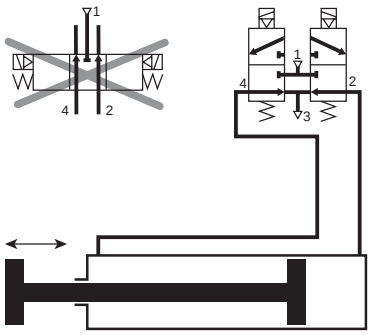
Bottom ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the bottom of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.



Dual 3/2 Valves Replace 3-Position Valves for Better Performance

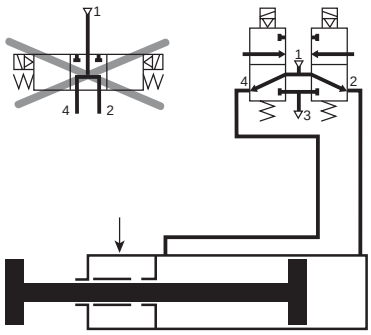
3-Position Center Exhaust

A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module. Both cylinder chambers are exhausted and rod and piston are free to move.



3-Position Pressure Center

A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.



☐ Most popular. For technical information see CD

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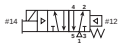
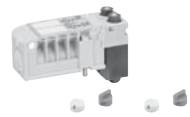
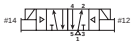
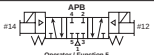
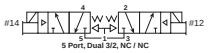
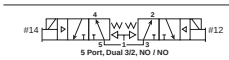
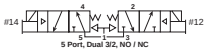
Isys Micro Valves

	Symbol	Type	Cv	Operator	Part number
		4-way, 2-position	0.35	Single solenoid	**HMEVX2049A**
		4-way, 2-position	0.35	Double solenoid	**HM2VX2049A**
		4-way, 3-position, all ports blocked	0.3	Double solenoid	**HM5VX2049A**
		3-way, 2-position, dual valve, NC/NC	0.35	Double solenoid	**HMNVX2049A**
		3-way, 2-position, dual valve, NO/NO	0.35	Double solenoid	**HMPVX2049A**
		3-way, 2-position, dual valve, NO/NC	0.35	Double solenoid	**HMQVX2049A**

Manifold Bases

		Part numbers		
Plug-in valve manifolds		**Side port**		**Bottom port**
Single solenoid outputs only		**PSM21JAP**		**PSM22JAP**
Double or single solenoid outputs		**PSM21MAP**		**PSM22MAP**

Internal Pilot End Plate Kits

	Electrical option	Porting	Side port	Bottom port
	25-pin, D-sub	NPT	**PSML25AP**	**PSML26AP**
		BSPP	**PSML21AP**	**PSML22AP**
	Turck fieldbus with valve driver module - 16 outputs	NPT	**PSMT15AP**	**PSMT16AP**
		BSPP	**PSMT11AP**	**PSMT12AP**
	Turck fieldbus with valve driver module - 32 outputs	NPT	**PSMT25AP**	**PSMT26AP**
		BSPP	**PSMT21AP**	**PSMT22AP**
	Moduflex 16 outputs	NPT	**PSMM45AP**	**PSMM46AP**
		BSPP	**PSMM41AP**	**PSMM42AP**
	Isysnet with valve driver module	NPT	**PSML65AP**	**PSML66AP**
		BSPP	**PSML61AP**	**PSML62AP**
	Isysnet with valve driver module and bus extension connector	NPT	**PSMM55AP**	**PSMM56AP**
		BSPP	**PSMM51AP**	**PSMM52AP**
	Isysnet with valve driver module and 24VDC connector	NPT	**PSMM65AP**	**PSMM66AP**
		BSPP	**PSMM61AP**	**PSMM62AP**
	Isysnet with valve driver module, bus extension connector and 24VDC connector	NPT	**PSMM75AP**	**PSMM76AP**
		BSPP	**PSMM71AP**	**PSMM72AP**

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Simple Manifold Assemblies

Includes a valve manifold with 4 valves and fittings installed.
End Plates must be ordered separately.

					A		B		C		D	
					9	10	11	12	13	14	15	16
PSM3	1	M	A	P	N	7	N	7	N	7	N	7

Base style	
4-Station manifold with valve and / or fitting	PSM3

Mounting style	
Side ported	1
Bottom ported	2

Enclosure / lead length	
Single address circuit board	J
Double address circuit board	M

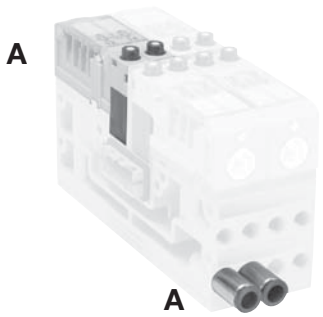
Engineering level	
Current	A

10, 12, 14, 16	Fitting
0	Without fitting
4	Straight fitting for 5/32 inch or 4mm OD tube
6	Straight fitting for 6mm OD tube
7	Straight fitting for 1/4 inch OD tube
P	Plug for blanking module

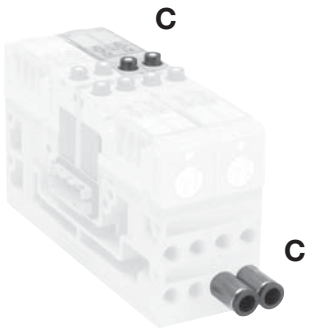
9, 11, 13, 15	Valve Type
N*	Double solenoid, dual 3/2, NC/NC
P*	Double solenoid, dual 3/2, NO/NO
Q*	Double solenoid, dual 3/2, 14 end NO - 12 end NC
E	Single solenoid, 2-position - air return, spring assist
2*	Double solenoid, 2-position
5*	Double solenoid, 3-position - APB
B**	Blanking module
C	Intermediate air supply module

* Requires double address circuit board, enclosure "M".
** Requires fitting "P".

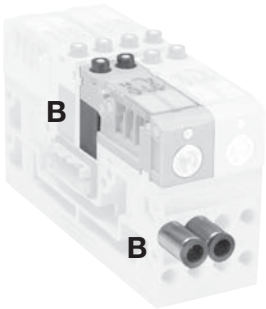
BOLD OPTIONS ARE MOST POPULAR.



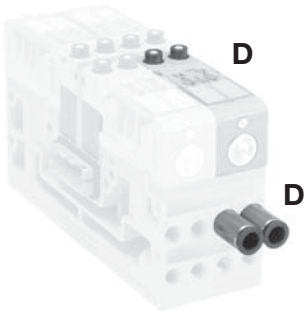
Valve Position A - Character 9
Fitting Position A - Character 10



Valve Position C - Character 13
Fitting Position C - Character 14



Valve Position B - Character 11
Fitting Position B - Character 12



Valve Position D - Character 15
Fitting Position D - Character 16

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How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List Simple Manifold Assemblies. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

Maximum Number of Solenoids
(Maximum Energized Simultaneously)

	25-pin D-sub	Moduflex	Isysnet*	Turck 16 Outputs	Turck 32 Outputs
24VDC	24 (24)	16 (16)	32 (32)	16 (16)	32 (32)

* Maximum of 32 solenoids per manifold. With Bus Extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same network.

Add-A-Fold Assembly Model Number

AAHM D 3 24 0 0 0 0

Valve series	
Isys micro add-a-fold	AAHM

End plate option	
Turck fieldbus with valve driver module - 16 outputs	A
Turck fieldbus with valve driver module - 32 outputs	B
25-pin, D-sub - 24 outputs	D
Isysnet with valve drive module - 32 outputs	Y
Isysnet with valve drive module and bus extension connector - 32 outputs	W
Isysnet with valve drive module and 24VDC connector - 32 outputs	X
Isysnet with valve drive module and bus extension and 24VDC connector - 32 outputs	Z
Moduflex - 16 outputs	T

Isysnet and Moduflex communication modules must be ordered separately.

	End plate type	
BSPP Threads	BSPP side port, internal pilot	1
	BSPP bottom port, internal pilot	2
	BSPP side port, external pilot	3
	BSPP bottom port, external pilot	4
NPT Threads	NPT side port, internal pilot	5
	NPT bottom port, internal pilot	6
	NPT side port, external pilot	7
	NPT bottom port, external pilot	8

Number of stations	
4 Valve manifold	04
8 Valve manifold	08
12 Valve manifold	12
16 Valve manifold	16
20 Valve manifold	20
24 Valve manifold	24
28 Valve manifold	28
32 Valve manifold	32

3/8" Inlet Port on End Plate		
0	Without fitting	
8	Straight fitting for 8mm OD tube	*BSPP Threads*
A	Straight fitting for 10mm OD tube	
7	Straight fitting for 1/4 inch OD tube	*NPT Threads*
9	Straight fitting for 3/8 inch OD tube	

3/8" Exhaust on End Plate		
0	Without fitting	
M	Muffler	
8	Straight fitting for 8mm OD tube	*BSPP Threads*
A	Straight fitting for 10mm OD tube	
7	Straight fitting for 1/4 inch OD tube	*NPT Threads*
9	Straight fitting for 3/8 inch OD tube	

M7 pilot port on end plate		
	Internal pilot end plate	
0	With standard plug	
	External pilot end plate	
0	Without fitting	
4	Straight fitting for 4mm OD tube	*BSPP Threads*
6	Straight fitting for 6mm OD tube	
4	Straight fitting for 5/32 inch OD tube	*NPT Threads*
7	Straight fitting for 1/4 inch OD tube	

Pilot exhaust on end plate		
0	Without fitting	
M	Muffler	
4	Straight fitting for 4mm OD tube	*BSPP Threads*
6	Straight fitting for 6mm OD tube	
4	Straight fitting for 5/32 inch OD tube	*NPT Threads*
7	Straight fitting for 1/4 inch OD tube	

Note:
BSPP fittings can only be used with BSPP Manifolds.
NPT fittings can only be used with NPT Manifolds.

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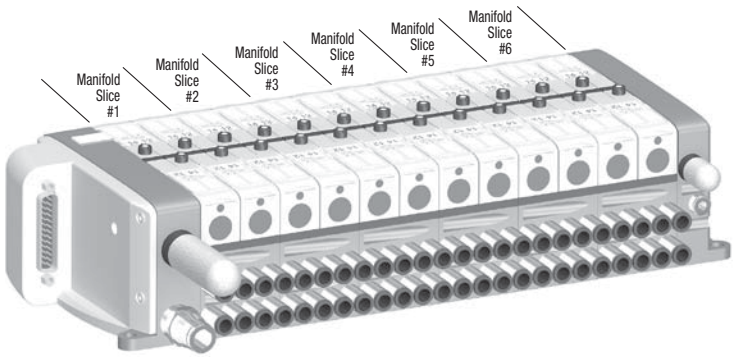
25-Pin, D-Sub Manifolds

24 Single Solenoid Valves



Add-A-Fold

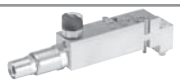
Manifold is factory assembled and tested for pneumatic leaks and electrical continuity.

Item	Qty	Description	Part number
01	1	24 valve Add-A-Fold with end plates	**AAHMD5249M0M**
02	6	4 valve simple manifold slices #1-6	**PSM31JAPE7E7E7E7**

Component Level

Item	Qty	Description	Part number
01	1	25-pin, D-sub, end plate	**PSML25AP**
02	24	Single solenoid valve	**HMEVX2049A**
03	6	Manifold, side ported, single address	**PSM21JAP**
04	50	1/4" Tube fittings (in box quantity)	**PS567925**
05	10	3/8" Tube fittings (in box quantity)	**PS568338**
06	1	3/8" Exhaust muffler	**P6M-PAB3**
07	1	1/8" Exhaust muffler	**P6M-PAB1**

Sandwich Regulator

	Description	Kit number
	Common port regulator, 5 to 125 PSI with gauge	**PSMRAX6AP**

Note: Cv values are reduced when using a sandwich regulator to 0.20 for 2-Position and Dual 3/2 valves, and 0.17 for 3-Position APB valves.

Note: The sandwich regulator passes full pilot pressure from the manifold, allowing the regulated pressure to adjusted down to 5 PSI without affecting valve functionality.

Mufflers

	Description	Part number
	1/8" pilot exhaust – BSPP or NPT	**P6M-PAB1**
	3/8" main exhaust – BSPP or NPT	**P6M-PAB3**
	M7 bottom port pilot exhaust (must be ordered in multiples of 10)	**PS568800**

Flow Controls

	Description	Kit number
	4mm to 4mm or 5/32" to 5/32" OD tube	**FC800-5/32**
	1/4" to 1/4" O.D. tube	**FC800-4**

25-Pin, D-Sub Cable (Female)

	Description	Length	Part number
	25-pin, D-sub cable, IP20	3 meters	**P8LMH25M3A**
	25-pin, D-sub cable, IP20	9 meters	**SCD259D**
	25-pin, D-sub cable, IP65	3 meters	**SCD253W**
	25-pin, D-sub cable, IP65	9 meters	**SCD259WE**

Fittings – Must be ordered in multiples of 10

	Thread	Tube O.D.	Part number
Manifold or pilot supply ports – straight			
	M7	4mm or 5/32"	**PS567904**
	M7	6mm	**PS567906**
	M7	1/4"	**PS567925**
Main inlet or exhaust ports			
	3/8" NPT	1/4"	**PS568325**
	3/8" NPT	3/8"	**PS568338**
	3/8" BSPP	8mm	**PS568308**
	3/8" BSPP	10mm	**PS568310**
Pilot exhaust ports			
	1/8" NPT	5/32"	**PS568215**
	1/8" NPT	1/4"	**PS568225**
	1/8" BSPP	4mm	**PS568204**
	1/8" BSPP	6mm	**PS568206**

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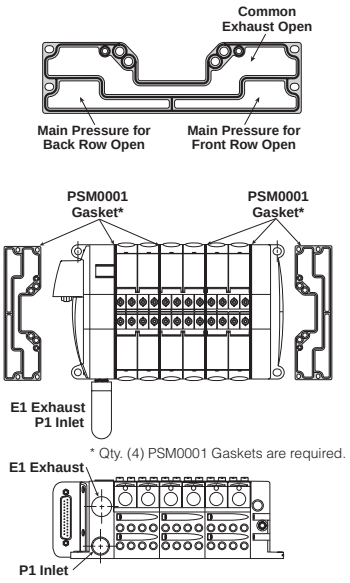
Multiple Pressure Zones

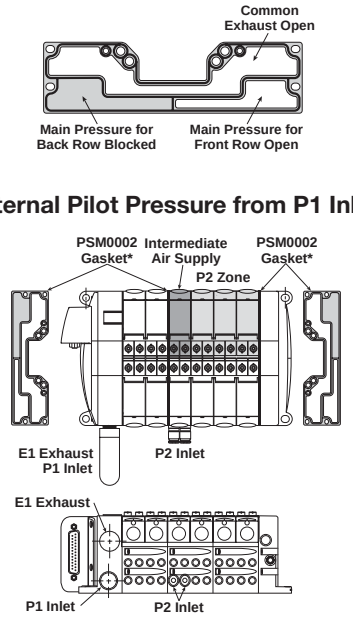
PSM0001 –

All ports open. Common pressure for front and rear manifold.
Common exhausts.
Standard gasket included with each manifold and end plate.



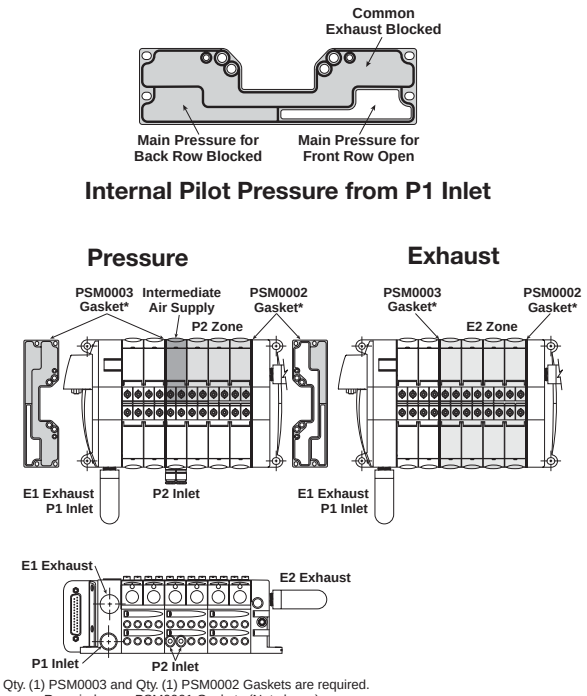
PSM0002 –

Rear manifold blocked for separate pressure supply.
Common exhausts.
Flip gasket to block front of manifold.



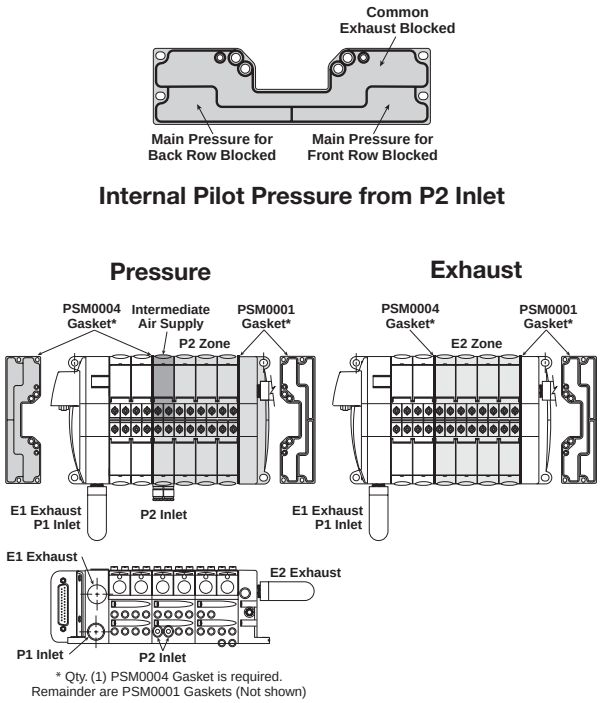
PSM0003 –

Rear manifold blocked for separate pressure supply.
Exhaust blocked also.
Flip gasket to block front of manifold.
If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



PSM0004 –

All galleys blocked.
Two pressure zones and two exhaust zones.
If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



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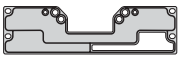
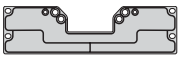
Manifold to Manifold Gaskets*

	Description	Part number
	All galleys passing	**PSM0001**
	Main pressure to rear or front valves blocked, exhaust passing	**PSM0002**
	Main pressure to rear or front valves blocked, exhaust blocked	**PSM0003**
	All galleys blocked	**PSM0004**

* Includes 1 Gasket

Valve Labels*

Description	Part number
Single solenoid diagram	**PSM002E**
Double solenoid diagram	**PSM0022**
Double solenoid diagram – APB	**PSM0025**
Double solenoid diagram – Dual 3/2 NC/NC	**PSM002N**
Double solenoid diagram – Dual 3/2 NO/NO	**PSM002P**
Double solenoid diagram – Dual 3/2, 14 end NO, 12 end NC	**PSM002Q**

*Includes 10 Labels.

Replacement Solenoid Kit

	Description	Part number
	24VDC solenoid kit with screws	**PSM0010**

Replacement Screws

	Description	Part number
	Set of 10 manifold to manifold M3 screws	**PSM0014**

Replacement Override Caps

	Description	Part number
	Set of 10 manual override caps	**PSM0011**

Replacement Regulator Gauge

	Description	Part number
	5 to 125 PSI Gauge	**P0566202**

Replacement Gaskets and Valve Screws

	Description	Part number
	Set of 5 valve to manifold gaskets and 10 screws	**PSM0012**

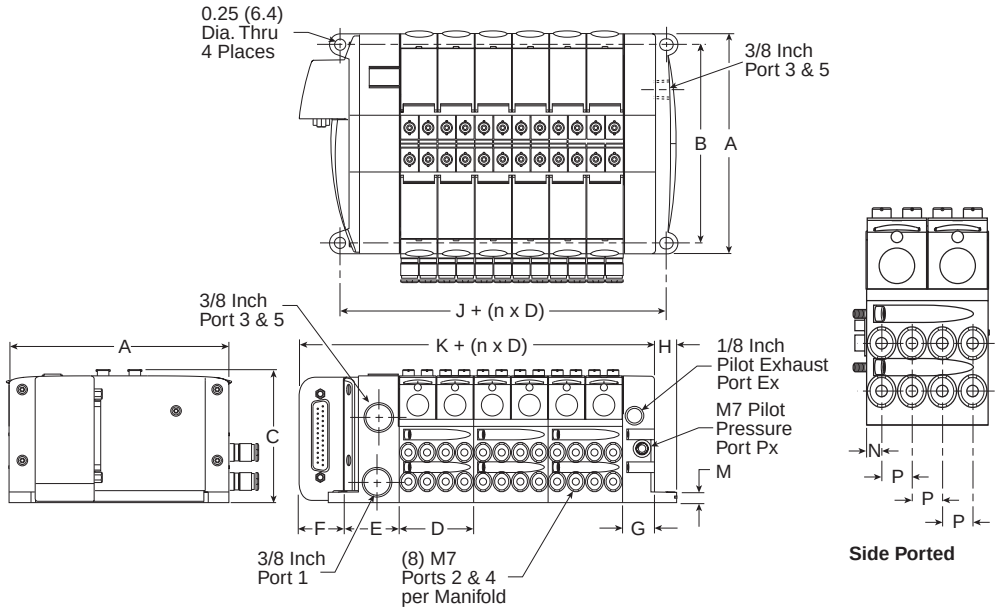
Replacement Protective Cover

	Description	Part number
	Protective Polyester Cover Set of 10	**PS5706**

Replacement Plugs

	Description	Part number
	Set of 10 M7 plugs (Part No. PS567900) for auxiliary and pilot pressure ports	**PSM0013**

25-Pin, D-Sub with Isys Micro Valves, Side Ported



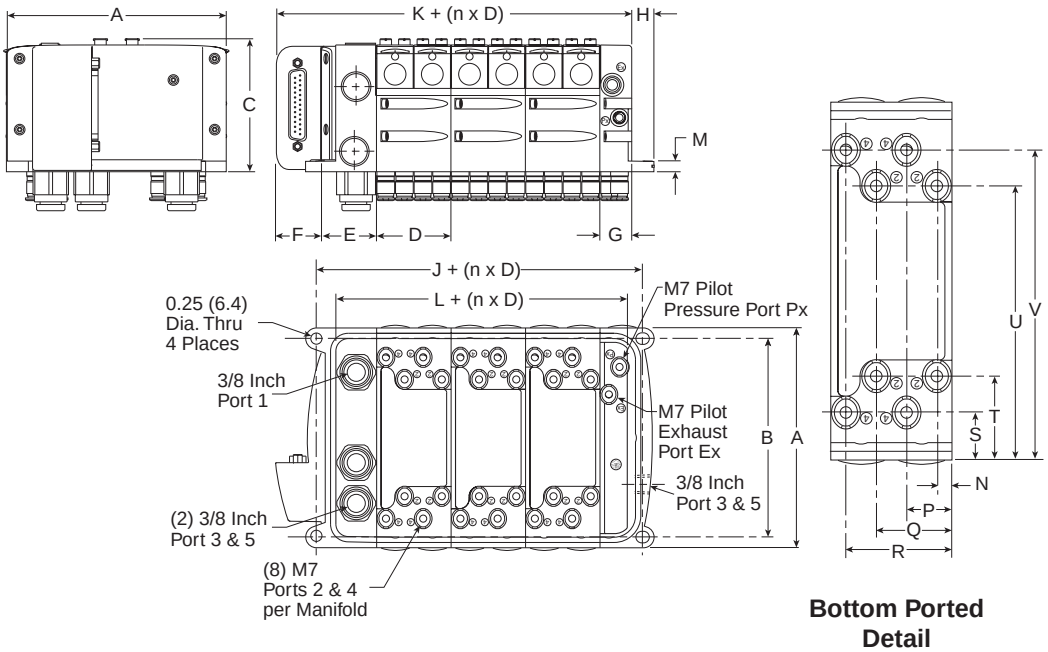
Side Ported

Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	**F**	**G**	**H**
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)
J	**K**	**M**	**N**
2.28 (58.0)	3.44 (87.5)	0.24 (6.1)	0.21 (5.2)
P			
0.41 (10.5)			

Inches (mm)
n = Number of manifolds

25-Pin, D-Sub with Isys Micro Valves, Bottom Ported



Bottom Ported Detail

Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	**F**	**G**	**H**
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)
J	**K**	**L**	**M**
2.28 (58.0)	3.44 (87.5)	1.69 (43.0)	0.24 (6.1)
N	**P**	**Q**	**R**
0.21 (5.3)	0.62 (15.8)	1.03 (26.3)	1.45 (36.8)
S	**T**	**U**	**V**
0.64 (16.40)	1.14 (29.0)	3.73 (94.9)	4.23 (107.4)

Inches (mm)
n = Number of manifolds

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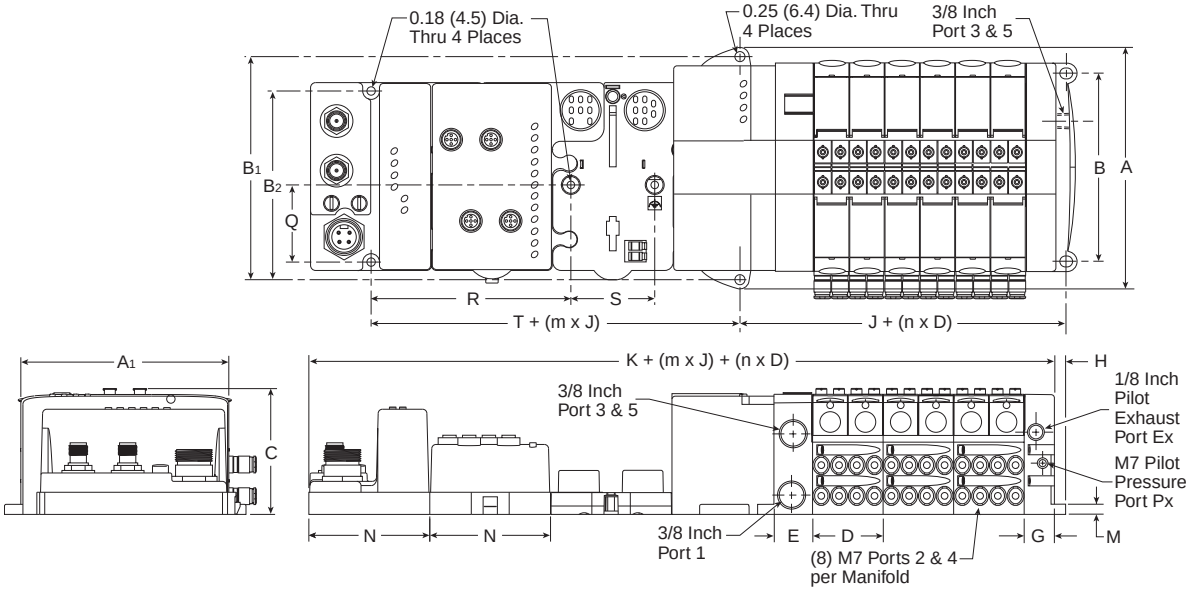
Isysnet with Isys Micro Valves, Side Ported



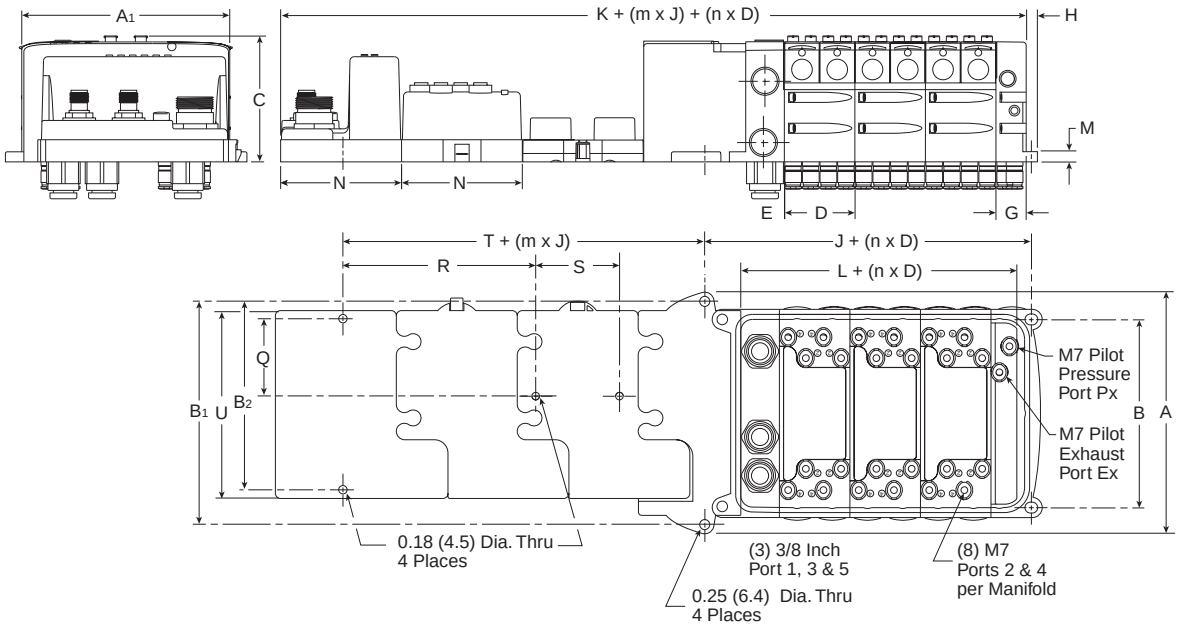
Dimensions

A	A1	B	B1	B2	C	D	E	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)

H	J	K	M	N	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)
n = Number of Manifolds
m = Number of Modules

Isysnet with Isys Micro Valves, Bottom Ported



Dimensions

A	A1	B	B1	B2	C	D	E	G	H
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	0.71 (18.0)	0.49 (12.5)

J	K	L	M	N	Q	R	S	T	U
2.72 (69.0)	7.32 (186.0)	1.69 (43.0)	0.24 (6.1)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)	4.41 (112)

Inches (mm)
n = Number of Manifolds
m = Number of Modules

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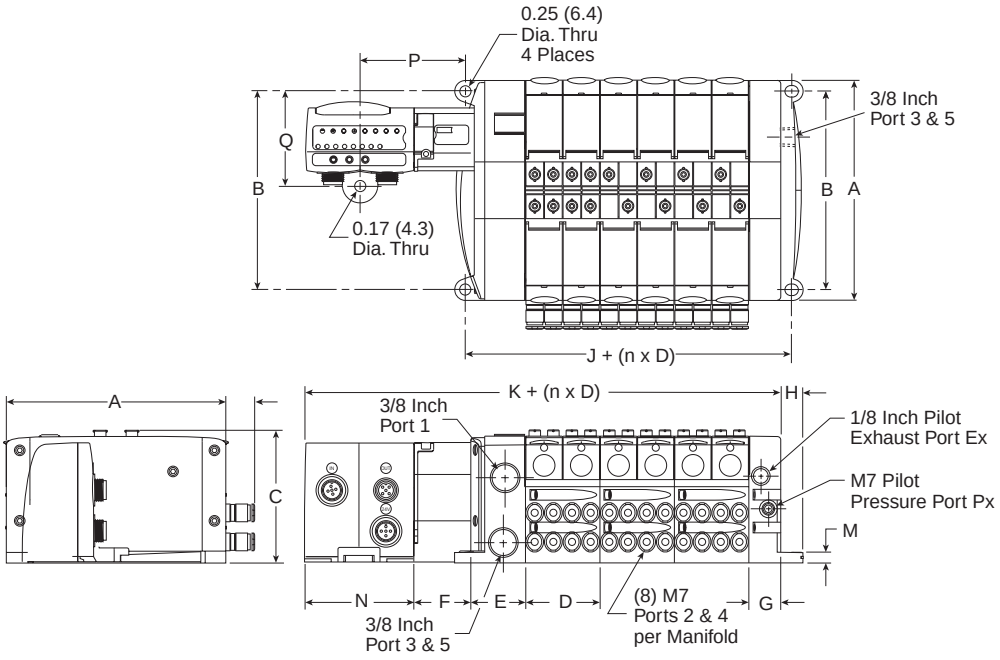
Moduflex with Isys Micro Valves, Side Ported

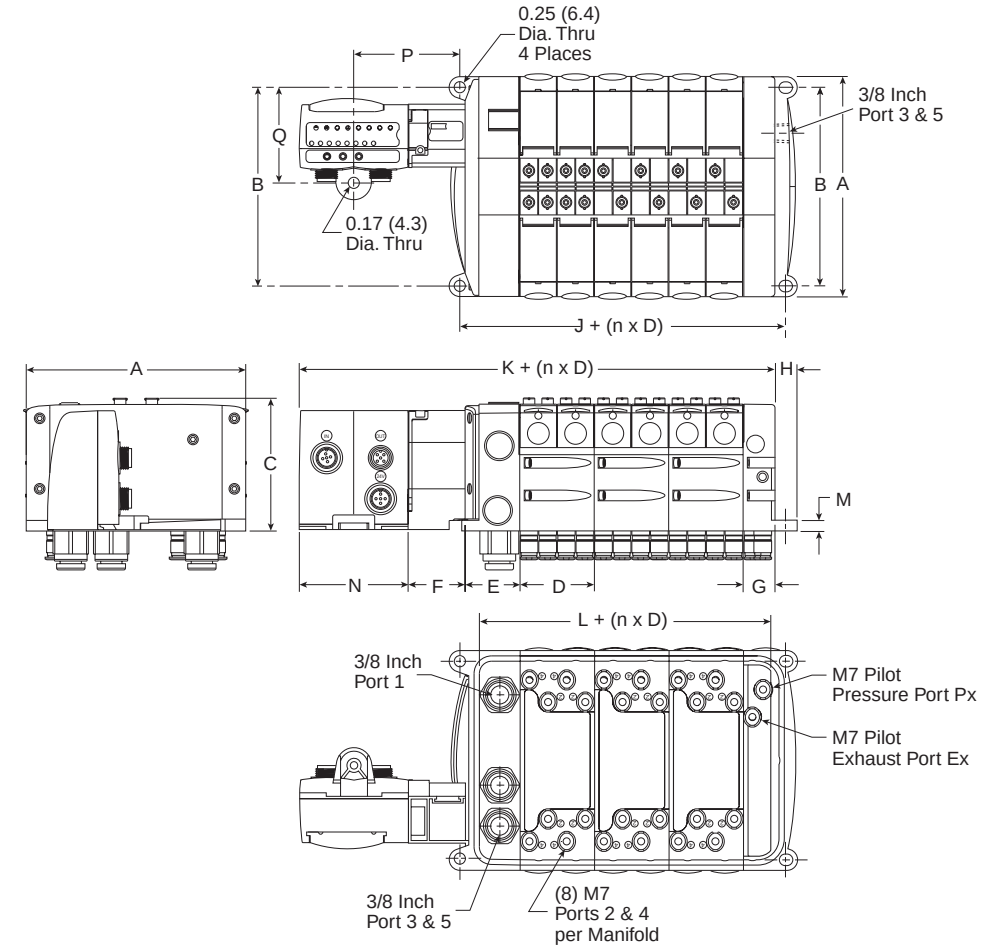


Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	**F**	**G**	**H**
1.22 (31.0)	1.28 (32.5)	0.71 (18.0)	0.49 (12.5)
J	**K**	**M**	**N**
2.28 (58.0)	6.10 (155.0)	0.24 (6.1)	2.40 (61.0)
P	**Q**		
2.36 (60.0)	2.07 (52.55)		

Inches (mm)
n = Number of manifolds

Moduflex with Isys Micro Valves, Bottom Ported



Dimensions

A	B	C	D
4.88 (124.0)	4.41 (112.0)	2.95 (75.0)	1.65 (42.0)
E	**F**	**G**	**H**
1.22 (31.0)	1.02 (26.0)	0.71 (18.0)	0.49 (12.5)
J	**K**	**L**	**M**
2.28 (58.0)	6.10 (155.0)	1.69 (43.0)	0.24 (6.1)
N	**P**	**Q**	
2.40 (61.0)	2.36 (60.0)	2.07 (52.55)	

Inches (mm)
n = Number of manifolds

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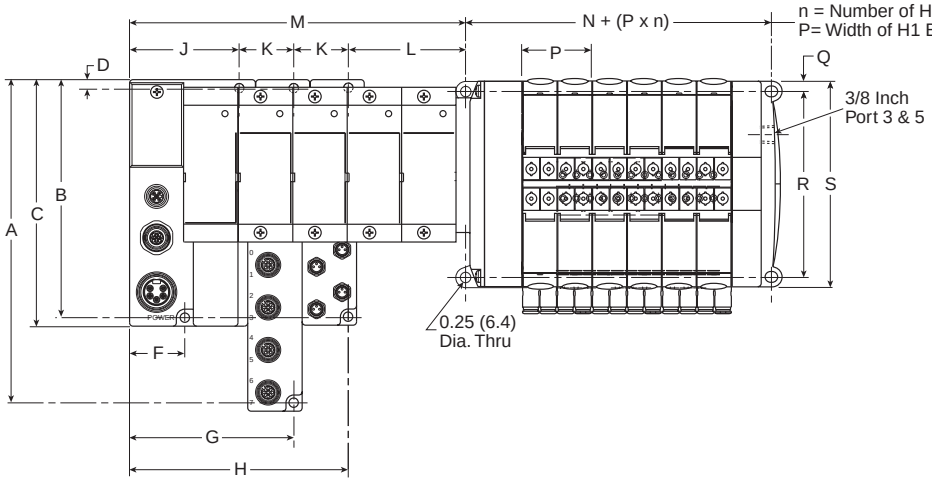
Turck with Isys Micro Valves, Side Ported

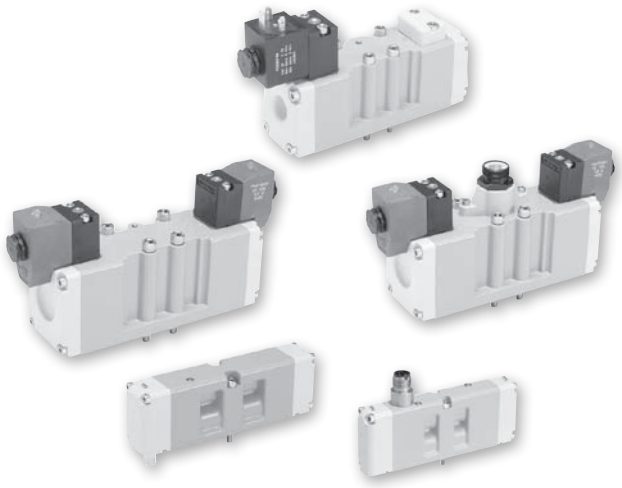


Dimensions

A	B	C	D
7.48 (190)	5.51 (140)	5.71 (145)	0.20 (5)
F	**G**	**H**	**J**
1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)
K	**L**	**M**	**N**
1.26 (32)	2.54 (64)	See note 1	2.28 (58)
P	**Q**	**R**	**S**
1.65 (42)	.19 (4.9)	4.41 (112)	4.88 (124)

Note 1: M =J+L+n_2xK, where n_2 = Number of Turck input / output modules
Inches (mm)

The Isys ISO valve conforms to international standards 15407 and 5599, providing maximum flexibility for end users. As Parker's premier manifold mount product offering, Isys ISO offers machine builds a complete offering with a wide variety of accessories and options in a valve family with flow ranges from 0.55 Cv up to 6.0 Cv. Individual wiring is available with DIN or central connectors, and collective solutions offer installation time savings with either multi-pin connectors or fieldbus solutions.



Ports
- HB: 1/8 inch
- HA: 1/4 inch
- H1: 3/8 inch
- H2: 1/2 inch
- H3: 3/4 inch

Mounting
- Manifold or Subbase

Solenoids
- HB and HA 24 VDC, 1.0 Watt, and 120 VAC, 1.0 VA
- H1, H2, and H3 24 VDC, 3.2 Watt, and 120VAC, 4.5 VA

Certification / Approval
- IP65 rated
- CSA / C-US Approved

Materials

Body	Aluminum
End caps	PBT
End plates	Aluminum
Fasteners	Zinc plated steel
Manifolds	Aluminum
Seals	Nitrile
Spool	Aluminum

Operating information

Operating pressure:	Vacuum to 145 PSIG (Vacuum to 10 bar)
Pilot pressure:	See chart
Temperature range:	5°F to 120°F (-15°C to 49°C)

Operating Pressure

Maximum: 145 PSIG (1000 kPa)

Minimum:

Operator / function	Internal pilot	PSIG (Min. kPa) HB	PSIG (Min. kPa) HA	PSIG (Min. kPa) H1	PSIG (Min. kPa) H2	PSIG (Min. kPa) H3
1	Single solenoid - 2-position	30 (207)	25 (173)	25 (173)	25 (173)	35 (241)
2	Double solenoid- 2-position					
3	Single remote pilot - 2-position **	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
4	Double remote pilot - 2-position**	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
5, 6, 7	Double solenoid - 3-position APB, CE, PC	35 (241)	35 (241)	35 (241)	50 (345)	50 (345)
8, 9, 0	Double remote pilot - 3-position** APB, CE, PC	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum
E	Single solenoid pilot - 2-position	30 (207)	30 (207)	35 (241)	45 (310)	45 (310)
	Air return / spring assist					
F	Single remote pilot - 2-position**					
	Air return / spring assist					
N, P, Q	Double solenoid - dual 3/2	30 (207)	N/A	N/A	N/A	N/A
	External pilot*	*	*	*	*	*
All	Isys	Vacuum	Vacuum	Vacuum	Vacuum	Vacuum

* External Pilot Pressure / Remote Pilot Supply - Must meet or exceed minimum pilot pressure for internal pilot option. Not available on Operator / Function N, P, or Q.

** Must be equal to or greater than operating pressure.

Most popular. For technical information see CD

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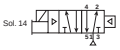
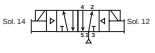
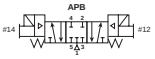
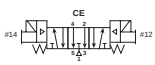
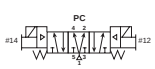
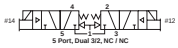
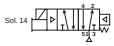
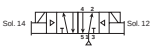
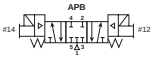
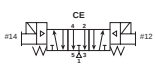
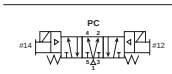
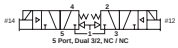
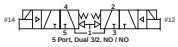
15407-2, Plug-in, Size 18mm (HB)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	**HBEVXBG0G9A**	**HBEVXBH0G9A**
						External	**HBEVXLG0G9A**	**HBEVXLH0G9A**
		4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	**HB1VXBG0G9A**	**HB1VXBH0G9A**
						External	**HB1VXLG0G9A**	**HB1VXLH0G9A**
		4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	**HB2VXBG0G9A**	**HB2VXBH0G9A**
						External	**HB2VXLG0G9A**	**HB2VXLH0G9A**
		4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	**HB5VXBG0G9A**	**HB5VXBH0G9A**
						External	**HB5VXLG0G9A**	**HB5VXLH0G9A**
		4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	**HB6VXBG0G9A**	**HB6VXBH0G9A**
						External	**HB6VXLG0G9A**	**HB6VXLH0G9A**
		4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	**HB7VXBG0G9A**	**HB7VXBH0G9A**
						External	**HB7VXLG0G9A**	**HB7VXLH0G9A**
		3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	**HBNVXBG0G9A**	**HBNVXBH0G9A**
		3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	**HBPVXBG0G9A**	**HBPVXBH0G9A**

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	0.55	Single solenoid	120 VAC	Internal	**HBEVXBG023A**	**HBEVXBH023A**
						External	**HBEVXLG023A**	**HBEVXLH023A**
		4-way, 2-position, air return	0.55	Single solenoid	120 VAC	Internal	**HB1VXBG023A**	**HB1VXBH023A**
						External	**HB1VXLG023A**	**HB1VXLH023A**
		4-way, 2-position	0.55	Double solenoid	120 VAC	Internal	**HB2VXBG023A**	**HB2VXBH023A**
						External	**HB2VXLG023A**	**HB2VXLH023A**
		4-way, 3-position, all ports blocked	0.5	Double solenoid	120 VAC	Internal	**HB5VXBG023A**	**HB5VXBH023A**
						External	**HB5VXLG023A**	**HB5VXLH023A**
		4-way, 3-position, center exhaust	0.5	Double solenoid	120 VAC	Internal	**HB6VXBG023A**	**HB6VXBH023A**
						External	**HB6VXLG023A**	**HB6VXLH023A**
		4-way, 3-position, pressure center	0.5	Double solenoid	120 VAC	Internal	**HB7VXBG023A**	**HB7VXBH023A**
						External	**HB7VXLG023A**	**HB7VXLH023A**
		3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	120 VAC	Internal	**HBNVXBG023A**	**HBNVXBH023A**
		3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	120 VAC	Internal	**HBPVXBG023A**	**HBPVXBH023A**

15407-2, Plug-in, Size 18mm (HB), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/8" NPT	1/8" BSPP
	Circuit board	Single solenoid - 1 address	**PS561151JP**	**PS561152JP**
	Circuit board	Double solenoid - 2 addresses	**PS561151MP**	**PS561152MP**
	Circuit board with 32 output expansion	Single solenoid - 1 address	**PS561151NP**	**PS561152NP**
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	**PS561151PP**	**PS561152PP**
Bottom / end ported bases				
	Circuit board	Single solenoid - 1 address	**PS561161JP**	**PS561162JP**
	Circuit board	Double solenoid - 2 addresses	**PS561161MP**	**PS561162MP**
	Circuit board with 32 output expansion	Single solenoid - 1 address	**PS561161NP**	**PS561162NP**
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	**PS561161PP**	**PS561162PP**

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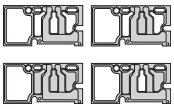
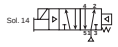
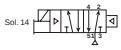
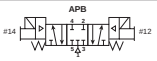
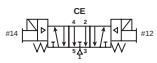
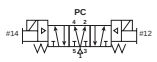
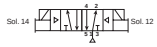
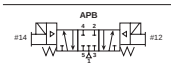
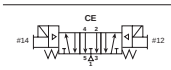
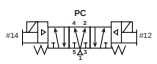
15407-2, Plug-in, Size 26mm (HB) Accessories

	Acessories	Description		Part number
	Sandwich regulator	Common pressure	2-60 PSIG w/ gauge	**PS5638155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5638166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5638255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5638266P**
	Gauge adapter kit	Includes 1/8" coupling and long nipple		**PS5651160P**
	Blanking plate kit			**PS5634P**
	Sandwich supply module	1/8" NPT		**PS561600P**
		1/8" BSPP		**PS561601P**
	Sandwich exhaust module	1/8" NPT		**PS561700P**
		1/8" BSPP		**PS561701P**
	Intermediate air supply module	1/8" NPT		**D02P-01-80**
	Sandwich flow control			**PS5635P**
	Manifold to manifold gasket kits	Standard		**PS561AP**
		Blocked #1 port		**PS561BP**
		Blocked #1, 3, 5, ports		**PS561CP**
		Blocked #3, 5 ports		**PS561DP**

15407-2, Plug-in, Size 26mm (HA)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	**HAEVXBG0G9A**	**HAEVXBH0G9A**
						External	**HAEVXLG0G9A**	**HAEVXLH0G9A**
		4-way, 2-position, air return	1.1	Single solenoid	24 VDC	Internal	**HA1VXBG0G9A**	**HA1VXBH0G9A**
						External	**HA1VXLG0G9A**	**HA1VXLH0G9A**
		4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	**HA2VXBG0G9A**	**HA2VXBH0G9A**
						External	**HA2VXLG0G9A**	**HA2VXLH0G9A**
		4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	**HA5VXBG0G9A**	**HA5VXBH0G9A**
						External	**HA5VXLG0G9A**	**HA5VXLH0G9A**
		4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	**HA6VXBG0G9A**	**HA6VXBH0G9A**
						External	**HA6VXLG0G9A**	**HA6VXLH0G9A**
		4-way, 3-position, pressure center	1.0	Double solenoid	24 VDC	Internal	**HA7VXBG0G9A**	**HA7VXBH0G9A**
						External	**HA7VXLG0G9A**	**HA7VXLH0G9A**

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.1	Single solenoid	120 VAC	Internal	**HAEVXBG023A**	**HAEVXBH023A**
						External	**HAEVXLG023A**	**HAEVXLH023A**
		4-way, 2-position, air return	1.1	Single solenoid	120 VAC	Internal	**HA1VXBG023A**	**HA1VXBH023A**
						External	**HA1VXLG023A**	**HA1VXLH023A**
		4-way, 2-position	1.1	Double solenoid	120 VAC	Internal	**HA2VXBG023A**	**HA2VXBH023A**
						External	**HA2VXLG023A**	**HA2VXLH023A**
		4-way, 3-position, all ports blocked	1.0	Double solenoid	120 VAC	Internal	**HA5VXBG023A**	**HA5VXBH023A**
						External	**HA5VXLG023A**	**HA5VXLH023A**
		4-way, 3-position, center exhaust	1.0	Double solenoid	120 VAC	Internal	**HA6VXBG023A**	**HA6VXBH023A**
						External	**HA6VXLG023A**	**HA6VXLH023A**
		4-way, 3-position, pressure center	1.0	Double solenoid	120 VAC	Internal	**HA7VXBG023A**	**HA7VXBH023A**
						External	**HA7VXLG023A**	**HA7VXLH023A**

15407-2, Plug-in, Size 26mm (HA), Single Subbase

	Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
	Terminal strip in the base	Double solenoid - 2 addresses	**PS551113CP**	**PS551114CP**

15407-2, Plug-in, Size 26mm (HA), 2-Station Manifold Bases

End ported bases	Enclosure / Lead length	Solenoid addresses	1/4" NPT	1/4" BSPP
	Circuit board	Single solenoid - 1 address	**PS551153JP**	**PS551154JP**
	Circuit board	Double solenoid - 2 addresses	**PS551153MP**	**PS551154MP**
	Circuit board with 32 output expansion	Single solenoid - 1 address	**PS551153NP**	**PS551154NP**
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	**PS551153PP**	**PS551154PP**
	Terminal strip in the base	Double solenoid - 2 addresses	**PS551153CP**	**PS551154CP**
Bottom / end ported bases				
	Circuit board	Single solenoid - 1 address	**PS551163JP**	**PS551164JP**
	Circuit board	Double solenoid - 2 addresses	**PS551163MP**	**PS551164MP**
	Circuit board with 32 output expansion	Single solenoid - 1 address	**PS551163NP**	**PS551164NP**
	Circuit board with 32 output expansion	Double solenoid - 2 addresses	**PS551163PP**	**PS551164PP**
	Terminal strip in the base	Double solenoid - 2 addresses	**PS551163CP**	**PS551164CP**

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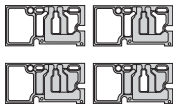
15407-2, Plug-in, Size 18mm (HA) Accessories

	Acessories	Description		Part number
	Sandwich regulator	Common pressure	2-60 PSIG w/ gauge	**PS5538155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5538166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5538255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5538266P**
	Gauge adapter kit	Includes 1/8" coupling and long nipple		**PS5551160P**
	Blanking plate kit			**PS5534P**
	Sandwich supply module	1/4" NPT		**PS551600P**
		1/4" BSPP		**PS551601P**
	Sandwich exhaust module	1/4" NPT		**PS551700P**
		1/4" BSPP		**PS551701P**
	Intermediate air supply module	1/4" NPT		**D01P-02-80**
	Sandwich flow control			**PS5535P**
	Manifold to manifold gasket kits	Standard		**PS561AP**
		Blocked #1 port		**PS561BP**
		Blocked #1, 3, 5, ports		**PS561CP**
		Blocked #3, 5 ports		**PS561DP**

15407-2, Plug-in, Size 18mm & 26mm End Plate Kits

	Electrical option	NPT port	BSPP port
	No connector - use with terminal strip in base	**PS5631010P**	**PS5631011P**
	25-pin, D-Sub	**PS5620L20P**	**PS5620L21P**
	19-pin, round, Brad Harrison	**PS5620L30P**	**PS5620L31P**
	12-pin, M23	**PS5620L40P**	**PS5620L41P**
	16-point terminal strip	**PS5620L50P**	**PS5620L51P**
	19-pin, M23	**PS5620M20P**	**PS5620M21P**
	Moduflex fieldbus	**PS5620M40P**	**PS5620M41P**
	Isysnet, with valve driver module	**PS5620L60P**	**PS5620L61P**
	Turck fieldbus with valve driver module - 16 outputs	**PS5620T10P**	**PS5620T11P**
	Turck fieldbus with valve driver module - 32 outputs	**PS5620T20P**	**PS5620T21P**

15407-2 End Plate Kits with Transition to H2

	Electrical option	NPT port	BSPP port
	25-pin, D-sub	**PS5624L20P**	**PS5624L21P**
	19-pin, round, Brad Harrison	**PS5624L30P**	**PS5624L31P**
	12-pin, M23	**PS5624L40P**	**PS5624L41P**
	16-point terminal strip	**PS5624L50P**	**PS5624L51P**
	19-pin, M23	**PS5624M20P**	**PS5624M21P**
	Moduflex fieldbus	**PS5624M40P**	**PS5624M41P**
	Isysnet, with valve driver module	**PS5624L60P**	**PS5624L61P**
	Turck fieldbus with valve driver module - 16 outputs	**PS5624T10P**	**PS5624T11P**
	Turck fieldbus with valve driver module - 32 outputs	**PS5624T20P**	**PS5624T21P**

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

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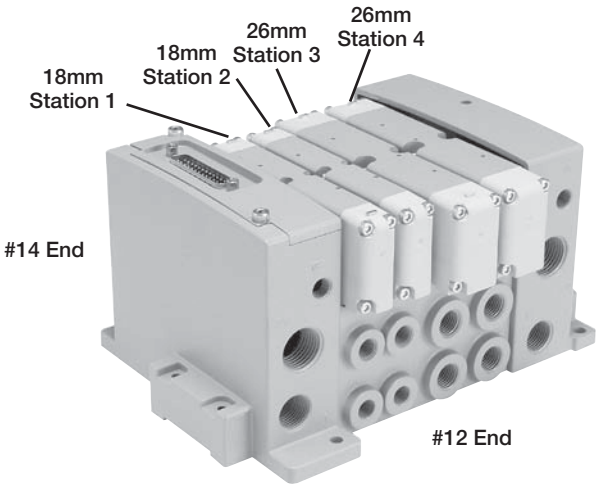
How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids
(Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison	12-pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	32 (32)	16 (16)	32 (32)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.



Example:
4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases

Add-A-Fold Assembly Model Number

AA HB D 0 04

Valve series

Right & left end plate 15407-2 (plug-in, HB 18mm & HA 26mm)	HB*

* Common end plates for HA & HB.

End plate type

Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*
25-pin, D-sub	D
19-pin, Brad Harrison	E
16 Point terminal strip	F
12-pin, M23	G
19-pin, M23	H
Moduflex fieldbus	T*
Isysnet, with valve driver module	Y*

*Must order communication modules separately.

Number of stations*

02
04
•
24
•
32

* Must be ordered in multiples of (2) unless using the HB / HA to H2 Transition Plate.

Thread type

0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 with 228-1 threads.

Example

Application requires a 4-Station manifold.
(Two 18mm + Two 26mm Stations)

Item	Qty.	Part No.	Location
01	1	AAHBD004	
02	1	HB1VXBG0G9A	Station 1
03	1	HB2VXLG0G9A	Station 2
04	1	PS561151MP	Station 1 & 2
05	2	HA1VXBG0G9A	Station 3 & 4
06	1	PS551151MP	Station 3 & 4

NOTE: Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

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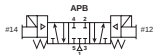
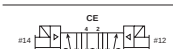
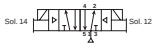
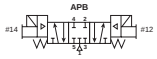
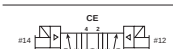
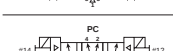
5599-2, Plug-in, Size 1 (H1)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	Internal	**H1EVXBG0B9C**	**H1EVXBH0B9C**
						External	**H1EVXXG0B9C**	**H1EVXXH0B9C**
		4-way, 2-position, air return	1.5	Single solenoid	24 VDC	Internal	**H11VXBG0B9C**	**H11VXBH0B9C**
						External	**H11VXXG0B9C**	**H11VXXH0B9C**
		4-way, 2-position	1.5	Double solenoid	24 VDC	Internal	**H12VXBG0B9C**	**H12VXBH0B9C**
						External	**H12VXXG0B9C**	**H12VXXH0B9C**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	Internal	**H15VXBG0B9C**	**H15VXBH0B9C**
						External	**H15VXXG0B9C**	**H15VXXH0B9C**
		4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	Internal	**H16VXBG0B9C**	**H16VXBH0B9C**
						External	**H16VXXG0B9C**	**H16VXXH0B9C**
		4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	Internal	**H17VXBG0B9C**	**H17VXBH0B9C**
						External	**H17VXXG0B9C**	**H17VXXH0B9C**

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	Internal	**H1EVXBG023C**	**H1EVXBH023C**
						External	**H1EVXXG023C**	**H1EVXXH023C**
		4-way, 2-position, air return	1.5	Single solenoid	120 VAC	Internal	**H11VXBG023C**	**H11VXBH023C**
						External	**H11VXXG023C**	**H11VXXH023C**
		4-way, 2-position	1.5	Double solenoid	120 VAC	Internal	**H12VXBG023C**	**H12VXBH023C**
						External	**H12VXXG023C**	**H12VXXH023C**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	Internal	**H15VXBG023C**	**H15VXBH023C**
						External	**H15VXXG023C**	**H15VXXH023C**
		4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	Internal	**H16VXBG023C**	**H16VXBH023C**
						External	**H16VXXG023C**	**H16VXXH023C**
		4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	Internal	**H17VXBG023C**	**H17VXBH023C**
						External	**H17VXXG023C**	**H17VXXH023C**

5599-2, Plug-in Single Subbase, Size 1 (H1)

Side ported	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Terminal strip in base	Double solenoid - 2 address	**PS401115CCP**	**PS401116CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS401115ACP**	**PS401116ACP**
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	**PS4011158FCP**	**PS4011168FCP**

5599-2, Plug-in Manifold Bases, Size 1 (H1)

End ported	Enclosure / Lead length	Solenoid addresses	3/8" NPT	3/8" BSPP
	Circuit board	Single solenoid - 1 address	**PS401155JCP**	**PS401156JCP**
	Circuit board	Double solenoid - 2 addresses	**PS401155MCP**	**PS401156MCP**
	Terminal strip in base	Double solenoid - 2 address	**PS401155CCP**	**PS401156CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS401155ACP**	**PS401156ACP**
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	**PS4011558FCP**	**PS4011568FCP**
Bottom / End	**Enclosure / Lead length**	**Solenoid addresses**	**3/8" NPT**	**3/8" BSPP**
	Circuit board	Single solenoid - 1 address	**PS401165JCP**	**PS401166JCP**
	Circuit board	Double solenoid - 2 addresses	**PS401165MCP**	**PS401166MCP**
	Terminal strip in base	Double solenoid - 2 address	**PS401165CCP**	**PS401166CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS401165ACP**	**PS401166ACP**
	4-pin, M12 micro connector in base, SAE / Ford wiring	Double solenoid - 2 addresses	**PS4011658FCP**	**PS4011668FCP**

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5599-2, Size 1 (H1) Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4038166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4038266CP**
Blanking plate kit				**PS4034CP**
Sandwich flow control				**PS4035CP**
Manifold to manifold gasket kits				**PS4013P**
Manifold port isolation kit		Main galley (1, 3, 5)		**PS4032CP**
		Pilot galley		**PS4033CP**
Auxiliary access plate kit		1/4" & 3/8"	NPT	**PS403000CP**
			BSPP	**PS403001CP**

Plug-in, 5599-2 End Plate Kits, Size 1 (H1)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	**PS4031010CP**	**PS4031011CP**
25-pin, D-sub	**PS4020L20CP**	**PS4020L21CP**
19-pin, round, Brad Harrison	**PS4020L30CP**	**PS4020L31CP**
12-pin, M23	**PS4020L40CP**	**PS4020L41CP**
19-pin, M23	**PS4020M20CP**	**PS4020M21CP**
Moduflex fieldbus	**PS4020M40CP**	**PS4020M41CP**
Isysnet, with valve driver module	**PS4020L60CP**	**PS4020L61CP**
Turck fieldbus with valve driver module - 16 outputs	**PS4020T10CP**	**PS4020T11CP**
Turck fieldbus with valve driver module - 32 outputs	**PS4020T20CP**	**PS4020T21CP**

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids
(Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison	12-pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

AA **H1** **D** **0** **03**

Valve series	
Right & left end plate	H1

End plate type	
Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*
25-pin, D-sub	D
19-pin, brad harrison	E
12-pin, M23	G
19-pin, M23	H
Moduflex fieldbus	T*
Isysnet, with valve driver module	X*

* Must order communication modules separately.

Thread type	
0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 w 228-1 theads.

Number of stations
01
02
03
04
•
•
24

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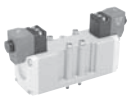
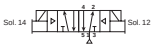
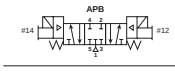
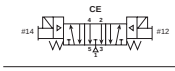
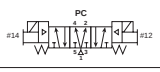
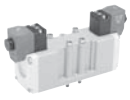
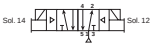
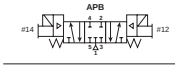
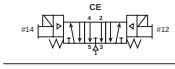
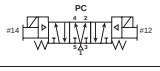
5599-2, Plug-in, Size 2 (H2)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	Internal	**H2EVXBG0B9C**	**H2EVXBH0B9C**
						External	**H2EVXXG0B9C**	**H2EVXXH0B9C**
		4-way, 2-position, air return	3.0	Single solenoid	24 VDC	Internal	**H21VXBG0B9C**	**H21VXBH0B9C**
						External	**H21VXXG0B9C**	**H21VXXH0B9C**
		4-way, 2-position	3.0	Double solenoid	24 VDC	Internal	**H22VXBG0B9C**	**H22VXBH0B9C**
						External	**H22VXXG0B9C**	**H22VXXH0B9C**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	Internal	**H25VXBG0B9C**	**H25VXBH0B9C**
						External	**H25VXXG0B9C**	**H25VXXH0B9C**
		4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	Internal	**H26VXBG0B9C**	**H26VXBH0B9C**
						External	**H26VXXG0B9C**	**H26VXXH0B9C**
		4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	Internal	**H27VXBG0B9C**	**H27VXBH0B9C**
						External	**H27VXXG0B9C**	**H27VXXH0B9C**

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	Internal	**H2EVXBG023C**	**H2EVXBH023C**
						External	**H2EVXXG023C**	**H2EVXXH023C**
		4-way, 2-position, air return	3.0	Single solenoid	120 VAC	Internal	**H21VXBG023C**	**H21VXBH023C**
						External	**H21VXXG023C**	**H21VXXH023C**
		4-way, 2-position	3.0	Double solenoid	120 VAC	Internal	**H22VXBG023C**	**H22VXBH023C**
						External	**H22VXXG023C**	**H22VXXH023C**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	Internal	**H25VXBG023C**	**H25VXBH023C**
						External	**H25VXXG023C**	**H25VXXH023C**
		4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	Internal	**H26VXBG023C**	**H26VXBH023C**
						External	**H26VXXG023C**	**H26VXXH023C**
		4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	Internal	**H27VXBG023C**	**H27VXBH023C**
						External	**H27VXXG023C**	**H27VXXH023C**

5599-2, Plug-in Single Subbase, Size 2 (H2)

Side ported base	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Terminal strip in base	Double solenoid - 2 address	**PS411117CCP**	**PS411118CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS411117ACP**	**PS411118ACP**

5599-2, Plug-in Manifold Bases, Size 2 (H2)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	1/2" NPT	1/2" BSPP
	Circuit board	Single solenoid - 1 address	**PS411167JCP**	**PS411168JCP**
	Circuit board	Double solenoid - 2 addresses	**PS411167MCP**	**PS411168MCP**
	Terminal strip in base	Double solenoid - 2 address	**PS411167CCP**	**PS411168CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS411167ACP**	**PS411168ACP**

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5599-2, Size 2 (H2) Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4138166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4138266CP**
Blanking plate kit				**PS4134CP**
Sandwich flow control				**PS4135CP**
Manifold to manifold gasket kits				**PS4113P**
Manifold port isolation kit		Main galley (1, 3, 5)		**PS4132CP**
		Pilot galley		**PS4033CP**

Plug-in, 5599-2 End Plate Kits, Size 2 (H2)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	**PS4131010CP**	**PS4131011CP**
25-pin, D-sub	**PS4120L20CP**	**PS4120L21CP**
19-pin, round, Brad Harrison	**PS4120L30CP**	**PS4120L31CP**
12-pin, M23	**PS4120L40CP**	**PS4120L41CP**
19-pin, M23	**PS4120M20CP**	**PS4120M21CP**
Moduflex fieldbus	**PS4120M40CP**	**PS4120M41CP**
Isysnet, with valve driver module	**PS4120L60CP**	**PS4120L61CP**
Turck fieldbus with valve driver module - 16 outputs	**PS4120T10CP**	**PS4120T11CP**
Turck fieldbus with valve driver module - 32 outputs	**PS4120T20CP**	**PS4120T21CP**

Turck, Isysnet, and Moduflex communication modules must be ordered separately.
See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids
(Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison	12-pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

AA H2 D 0 03

Valve series

Right & left end plate	H2

End plate type

Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*
25-pin, D-sub	D†
19-pin, brad harrison	E†
12-pin, M23	G†
19-pin, M23	H†
Moduflex fieldbus	T*
Isysnet, with valve driver module	Y*

* Must order communication modules separately.
† Collective wiring module included.

Thread type

0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 w 228-1 theads.

Number of stations

01
02
03
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24

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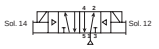
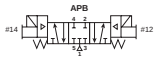
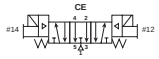
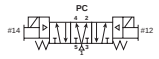
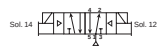
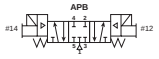
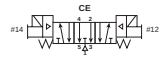
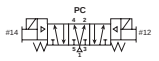
5599-2, Plug-in, Size 3 (H3)

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	Internal	**H3EVXBG0B9C**	**H3EVXBH0B9C**
					External	**H3EVXXG0B9C**	**H3EVXXH0B9C**
	4-way, 2-position, air return	6.0	Single solenoid	24 VDC	Internal	**H31VXBG0B9C**	**H31VXBH0B9C**
					External	**H31VXXG0B9C**	**H31VXXH0B9C**
	4-way, 2-position	6.0	Double solenoid	24 VDC	Internal	**H32VXBG0B9C**	**H32VXBH0B9C**
					External	**H32VXXG0B9C**	**H32VXXH0B9C**
	4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	Internal	**H35VXBG0B9C**	**H35VXBH0B9C**
					External	**H35VXXG0B9C**	**H35VXXH0B9C**
	4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	Internal	**H36VXBG0B9C**	**H36VXBH0B9C**
					External	**H36VXXG0B9C**	**H36VXXH0B9C**
	4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	Internal	**H37VXBG0B9C**	**H37VXBH0B9C**
					External	**H37VXXG0B9C**	**H37VXXH0B9C**

Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
	4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	Internal	**H3EVXBG023C**	**H3EVXBH023C**
					External	**H3EVXXG023C**	**H3EVXXH023C**
	4-way, 2-position, air return	6.0	Single solenoid	120 VAC	Internal	**H31VXBG023C**	**H31VXBH023C**
					External	**H31VXXG023C**	**H31VXXH023C**
	4-way, 2-position	6.0	Double solenoid	120 VAC	Internal	**H32VXBG023C**	**H32VXBH023C**
					External	**H32VXXG023C**	**H32VXXH023C**
	4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	Internal	**H35VXBG023C**	**H35VXBH023C**
					External	**H35VXXG023C**	**H35VXXH023C**
	4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	Internal	**H36VXBG023C**	**H36VXBH023C**
					External	**H36VXXG023C**	**H36VXXH023C**
	4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	Internal	**H37VXBG023C**	**H37VXBH023C**
					External	**H37VXXG023C**	**H37VXXH023C**

5599-2, Plug-in Single Subbase, Size 3 (H3)

Side ported base	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Terminal strip in base	Double solenoid - 2 address	**PS421119CCP**	**PS401110CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS421119ACP**	**PS421110ACP**

5599-2, Plug-in Manifold Bases, Size 3 (H3)

Bottom / End ported bases	Enclosure / Lead length	Solenoid addresses	3/4" NPT	3/4" BSPP
	Circuit board	Single solenoid - 1 address	**PS421169JCP**	**PS421160JCP**
	Circuit board	Double solenoid - 2 addresses	**PS421169MCP**	**PS421160MCP**
	Terminal strip in base	Double solenoid - 2 address	**PS421169CCP**	**PS421160CCP**
	6" flying leads	Double solenoid - 2 addresses	**PS421169ACP**	**PS421160ACP**

5599-2, Size 3 (H3) Accessories

Accessory	Description		Part number
Sandwich regulator	Common pressure	5-125 PSIG w/ gauge	**PS4238166CP**
	Independent pressure	5-125 PSIG w/ gauge	**PS4238266CP**
Blanking plate kit			**PS4234CP**
Sandwich flow control			**PS4235CP**
Manifold to manifold gasket kits			**PS4213P**
Manifold port isolation kit	Main galley (1, 3, 5)		**PS4232CP**
	Pilot galley		**PS4033CP**

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Plug-in, 5599-2 End Plate Kits, Size 3 (H3)

Electrical option	NPT port	BSPP port
No connector - use with individually wired base	**PS4231010CP**	**PS4231011CP**
25-pin, D-sub	**PS4220L20CP**	**PS4220L21CP**
19-pin, round, Brad Harrison	**PS4220L30CP**	**PS4220L31CP**
12-pin, M23	**PS4220L40CP**	**PS4220L41CP**
19-pin, M23	**PS4220M20CP**	**PS4220M21CP**
Moduflex fieldbus	**PS4220M40CP**	**PS4220M41CP**
Isysnet, with valve driver module	**PS4220L60CP**	**PS4220L61CP**
Turck fieldbus with valve driver module - 16 outputs	**PS4220T10CP**	**PS4220T11CP**
Turck fieldbus with valve driver module - 32 outputs	**PS4220T20CP**	**PS4220T21CP**

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Maximum Number of Solenoids
(Maximum Energized Simultaneously)

Voltage	Voltage code	25-pin D-sub	19-pin M23 or Brad Harrison	12-pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-Sub option.

Add-A-Fold Assembly Model Numbers

AA H3 D 0 03

Valve series	
Right & left end plate	H3

End plate type	
Turck fieldbus with valve driver module - 16 outputs	A*
Turck fieldbus with valve driver module - 32 outputs	B*
25-pin, D-sub	D†
19-pin, brad harrison	E†
12-pin, M23	G†
19-pin, M23	H†
Moduflex fieldbus	T*
Isysnet, with valve driver module	Y*

* Must order communication modules separately.
† Collective wiring module included.

Number of stations
01
02
03
04
•
•
24

Thread type	
0	NPT
1*	BSPP "G"

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Plug-in, 5599-2 Transition Plate Kits

PS4026 L2 0 C P

Transition plate type*	
H1 to H2 to H3	PS4025
H1 to H3	PS4026
H1 to H2	PS4027
H2 to H3	PS4028

* Includes Left Hand and Right Hand End Plates

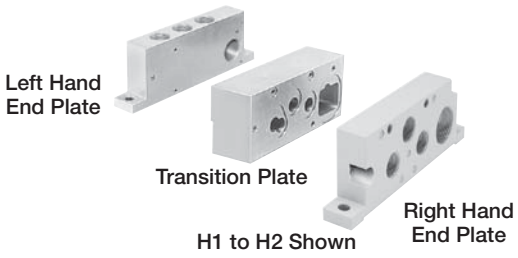
Engineering level	
C	Basic series PS40

Thread type	
0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 w 228-1 threads.

Options	
25-pin, D-sub	L2
19-pin, round, brad harrison	L3
12-pin, M23	L4
19-pin, M23	M2
Moduflex fieldbus	M4*
Isysnet, with valve driver module	L6*
Turck fieldbus with valve driver module - 16 outputs	T1
Turck fieldbus with valve driver module - 32 outputs	T2

* Must order communication miodule seperately
turck, isysnet, and moduflex communication modules must be ordered separately.
See fieldbus section for more information.



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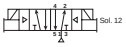
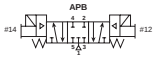
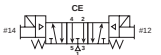
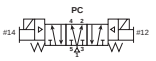
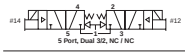
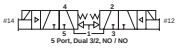
15407-1, Non Plug-in, Size 18mm (HB)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	0.55	Single solenoid	24 VDC	Internal	**HBEWXBG2G9000FA**	**HBEWXBH2G9000FA**
						External	**HBEWXLG2G9000FA**	**HBEWXLH2G9000FA**
		4-way, 2-position, air return	0.55	Single solenoid	24 VDC	Internal	**HB1WXBG2G9000FA**	**HB1WXBH2G9000FA**
						External	**HB1WXLG2G9000FA**	**HB1WXLH2G9000FA**
		4-way, 2-position	0.55	Double solenoid	24 VDC	Internal	**HB2WXBG2G9000FA**	**HB2WXBH2G9000FA**
						External	**HB2WXLG2G9000FA**	**HB2WXLH2G9000FA**
		4-way, 3-position, all ports blocked	0.5	Double solenoid	24 VDC	Internal	**HB5WXBG2G9000FA**	**HB5WXBH2G9000FA**
						External	**HB5WXLG2G9000FA**	**HB5WXLH2G9000FA**
		4-way, 3-position, center exhaust	0.5	Double solenoid	24 VDC	Internal	**HB6WXBG2G9000FA**	**HB6WXBH2G9000FA**
						External	**HB6WXLG2G9000FA**	**HB6WXLH2G9000FA**
		4-way, 3-position, pressure center	0.5	Double solenoid	24 VDC	Internal	**HB7WXBG2G9000FA**	**HB7WXBH2G9000FA**
						External	**HB7WXLG2G9000FA**	**HB7WXLH2G9000FA**
		3-way, 2-position, dual valve, NC/NC	0.45	Double solenoid	24 VDC	Internal	**HBNWXBG2G9000FA**	**HBNWXBH2G9000FA**
		3-way, 2-position, dual valve, NO/NO	0.45	Double solenoid	24 VDC	Internal	**HBPWXBG2G9000FA**	**HBPWXBH2G9000FA**

15407-1, Non Plug-in, Size 18mm (HB)

Single subbase	Description	1/8" NPT	1/8" BSPP
	Side ported base	**PL02-01-80**	**PL02-01-70**
2 Station manifold bases			
	End ported bases	1/8" NPT	1/8" BSPP
		PS5611510P	**PS5611520P**
End plate kit		3/8" NPT Port	3/8" BSPP Port
		PS5631010P	**PS5631011P**

15407-1, Non Plug-in, Size 18mm (HB) Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	2-60 PSIG w/ gauge	**PS5637155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5637166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5637255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5637266P**
Gauge adapter kit		Includes 1/8" coupling and long nipple		**PS5651160P**
Blanking plate kit				**PS5634P**
Sandwich supply module		1/8" NPT		**PS562600P**
		1/8" BSPP		**PS562601P**
Sandwich exhaust module		1/8" NPT		**PS562700P**
		1/8" BSPP		**PS562701P**
Intermediate air supply module		1/8" NPT		**D02P-01-80**
Sandwich flow control				**PS5642P**
Manifold to manifold gasket kits		Standard		**PS561AP**
		Blocked #1 port		**PS561BP**
		Blocked #1, 3, 5, ports		**PS561CP**
		Blocked #3, 5 ports		**PS561DP**

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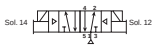
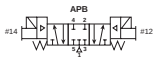
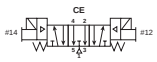
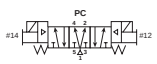
15407-1, Non Plug-in, Size 26mm (HA)

	Symbol	Type	Cv	Operator	Voltage	Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.1	Single solenoid	24 VDC	Internal	**HAEWXBG2G9000FA**	**HAEWXBH2G9000FA**
						External	**HAEWXLG2G9000FA**	**HAEWXLH2G9000FA**
		4-way, 2-position, air return	1.1	Single solenoid	24 VDC	Internal	**HA1WXBG2G9000FA**	**HA1WXBH2G9000FA**
						External	**HA1WXLG2G9000FA**	**HA1WXLH2G9000FA**
		4-way, 2-position	1.1	Double solenoid	24 VDC	Internal	**HA2WXBG2G9000FA**	**HA2WXBH2G9000FA**
						External	**HA2WXLG2G9000FA**	**HA2WXLH2G9000FA**
		4-way, 3-position, all ports blocked	1.0	Double solenoid	24 VDC	Internal	**HA5WXBG2G9000FA**	**HA5WXBH2G9000FA**
						External	**HA5WXLG2G9000FA**	**HA5WXLH2G9000FA**
		4-way, 3-position, center exhaust	1.0	Double solenoid	24 VDC	Internal	**HA6WXBG2G9000FA**	**HA6WXBH2G9000FA**
						External	**HA6WXLG2G9000FA**	**HA6WXLH2G9000FA**
		4-way, 3-position, pressure center	1.0	Double solenoid	24 VDC	Internal	**HA7WXBG2G9000FA**	**HA7WXBH2G9000FA**
						External	**HA7WXLG2G9000FA**	**HA7WXLH2G9000FA**

15407-1, Non Plug-in, Size 26mm (HA)

Single subbase	Description	1/4" NPT	1/4" BSPP
	Side ported base	**PL01-02-80**	**PL01-02-70**
2 Station manifold bases			
	End ported bases	1/4" NPT	1/4" BSPP
		PS5511530P	**PS5511540P**
End plate kit		3/8" NPT port	3/8" BSPP port
		PS5631010P	**PS5631011P**

15407-1, Non Plug-in, Size 26mm (HA) Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	2-60 PSIG w/ gauge	**PS5637155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5637166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5637255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5637266P**
Gauge adapter kit		Includes 1/8" coupling and long nipple		**PS5651160P**
Blanking plate kit				**PS5634P**
Sandwich supply module		1/8" NPT		**PS562600P**
		1/8" BSPP		**PS562601P**
Sandwich exhaust module		1/8" NPT		**PS562700P**
		1/8" BSPP		**PS562701P**
Intermediate air supply module		1/8" NPT		**D02P-01-80**
Sandwich flow control				**PS5642P**
Manifold to manifold gasket kits		Standard		**PS561AP**
		Blocked #1 port		**PS561BP**
		Blocked #1, 3, 5, ports		**PS561CP**
		Blocked #3, 5 ports		**PS561DP**

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How To Order 15407-1 Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Add-A-Fold Assembly Model Number

AA HBS 0 04

Valve series	
Right & left end plate 15407-1 (HB 18mm & HA 26mm)	HBS†

† For use with PS5511 and PS5611 manifolds.

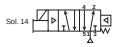
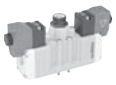
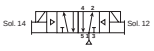
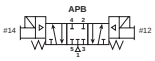
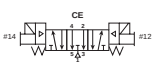
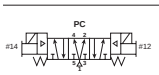
Thread type	
NPT	0
BSPP "G"	1*

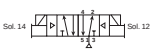
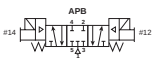
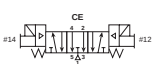
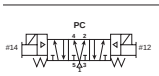
* BSPP conforms to ISO 1179-1 w 228-1 threads for end plate Type "S".

Number of stations*
02
04
•
24
•
32

* Must be ordered in multiples of (2) unless using the HB/HA to H2 transition plate.

5599-1, Non Plug-in, Size 1 with Central Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H1EWXBG2B9000FC**	**H1EWXBH2B9000FC**
							External	**H1EWXXG2B9000FC**	**H1EWXXH2B9000FC**
		4-way, 2-position, air return	1.5	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H11WXBG2B9000FC**	**H11WXBH2B9000FC**
							External	**H11WXXG2B9000FC**	**H11WXXH2B9000FC**
		4-way, 2-position	1.5	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H12WXBG2B9000FC**	**H12WXBH2B9000FC**
							External	**H12WXXG2B9000FC**	**H12WXXH2B9000FC**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H15WXBG2B9000FC**	**H15WXBH2B9000FC**
							External	**H15WXXG2B9000FC**	**H15WXXH2B9000FC**
		4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H16WXBG2B9000FC**	**H16WXBH2B9000FC**
							External	**H16WXXG2B9000FC**	**H16WXXH2B9000FC**
		4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H17WXBG2B9000FC**	**H17WXBH2B9000FC**
							External	**H17WXXG2B9000FC**	**H17WXXH2B9000FC**

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H1EWXBG323000FC**	**H1EWXBH323000FC**
							External	**H1EWXXG323000FC**	**H1EWXXH323000FC**
		4-way, 2-position, air return	1.5	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H11WXBG323000FC**	**H11WXBH323000FC**
							External	**H11WXXG323000FC**	**H11WXXH323000FC**
		4-way, 2-position	1.5	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H12WXBG323000FC**	**H12WXBH323000FC**
							External	**H12WXXG323000FC**	**H12WXXH323000FC**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H15WXBG323000FC**	**H15WXBH323000FC**
							External	**H15WXXG323000FC**	**H15WXXH323000FC**
		4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H16WXBG323000FC**	**H16WXBH323000FC**
							External	**H16WXXG323000FC**	**H16WXXH323000FC**
		4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H17WXBG323000FC**	**H17WXBH323000FC**
							External	**H17WXXG323000FC**	**H17WXXH323000FC**

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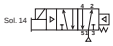
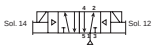
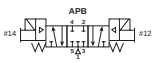
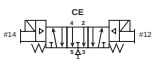
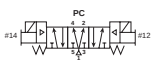
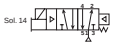
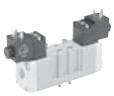
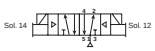
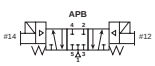
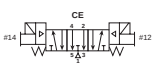
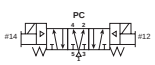
5599-1, Non Plug-in, Size 1 with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H1EWXBBL49C**	**H1EWXBCL49C**
							External	**H1EWXXBL49C**	**H1EWXXCL49C**
		4-way, 2-position, air return	1.5	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H11WXBBL49C**	**H11WXBCL49C**
							External	**H11WXXBL49C**	**H11WXXCL49C**
		4-way, 2-position	1.5	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H12WXBBL49C**	**H12WXBCL49C**
							External	**H12WXXBL49C**	**H12WXXCL49C**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H15WXBBL49C**	**H15WXBCL49C**
							External	**H15WXXBL49C**	**H15WXXCL49C**
		4-way, 3-position, center exhaust	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H16WXBBL49C**	**H16WXBCL49C**
							External	**H16WXXBL49C**	**H16WXXCL49C**
		4-way, 3-position, pressure center	1.2	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H17WXBBL49C**	**H17WXBCL49C**
							External	**H17WXXBL49C**	**H17WXXCL49C**

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	1.5	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H1EWXBBL53C**	**H1EWXBCL53C**
							External	**H1EWXXBL53C**	**H1EWXXCL53C**
		4-way, 2-position, air return	1.5	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H11WXBBL53C**	**H11WXBCL53C**
							External	**H11WXXBL53C**	**H11WXXCL53C**
		4-way, 2-position	1.5	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H12WXBBL53C**	**H12WXBCL53C**
							External	**H12WXXBL53C**	**H12WXXCL53C**
		4-way, 3-position, all ports blocked	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H15WXBBL53C**	**H15WXBCL53C**
							External	**H15WXXBL53C**	**H15WXXCL53C**
		4-way, 3-position, center exhaust	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H16WXBBL53C**	**H16WXBCL53C**
							External	**H16WXXBL53C**	**H16WXXCL53C**
		4-way, 3-position, pressure center	1.2	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H17WXBBL53C**	**H17WXBCL53C**
							External	**H17WXXBL53C**	**H17WXXCL53C**

5599-1, Non Plug-in, Size 1

Single subbase	Description	3/8" NPT	3/8" BSPP
	Side ported base	**PS4011150CP**	**PS4011160CP**

Manifold bases		3/8" NPT	3/8" BSPP
	End ported bases	**PS4011550CP**	**PS4011560CP**
	Bottom / End ported bases	**PS4011650CP**	**PS4011660CP**

End plate kits		NPT port	BSPP port
	H1 Non-collective wiring end plates	**PS4031010CP**	**PS4031011CP**

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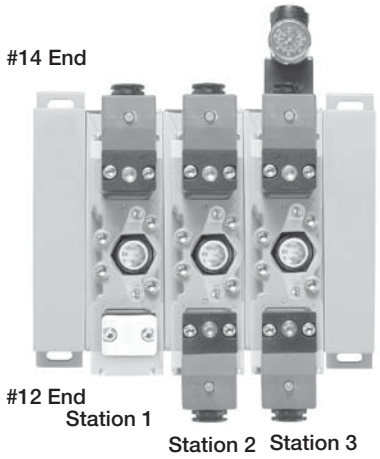
5599-1, Non Plug-in, Size 1 Accessories

Accessories	Description		Part number
Sandwich regulator	Common pressure	5-125 PSIG w/ gauge	**PS4037166CP**
	Independent pressure	5-125 PSIG w/ gauge	**PS4037266CP**
Blanking plate kit			**PS4034CP**
Sandwich flow control			**PS4042CP**
Manifold to manifold gasket kit			**PS4013P**
Manifold port isolation kits	Main galley (1, 3, 5)		**PS4032CP**
Manifold port isolation kits	Pilot galley		**PS4033CP**
Auxiliary access plate kit	1/4" & 3/8"	NPT	**PS403000CP**
		BSPP	**PS403001CP**

How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
3-Station Manifold with (3) H1 Valves
On Manifold Bases
and Regulator at Station 3

Add-A-Fold Assembly Model Number

AA	H1	S	0	03	

Valve Series

Right & Left End Plate	H1

End Plate Type

Standard - Non-Collective Wiring	S

Thread Type

NPT	0
BSPP "G"	1*

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Number of Stations

01
02
03
04
•
•
24

Transition Plate

Blank	No Transition Plate
C	H1 to H2
D	H1 to H3

Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH1S003	
02	1	H11WXBG3B9000FC	Station 1
03	1	PS4011550CP	Station 1
04	1	H12WXBG3B9000FC	Station 2
05	1	PS4011550CP	Station 2
06	1	H12WXXG3B9000FC	Station 3
07	1	PS4037166CP	Station 3
08	1	PS4011550CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.

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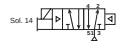
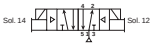
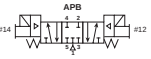
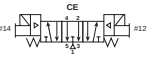
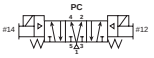
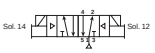
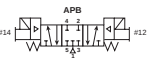
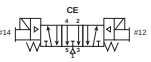
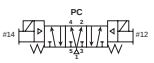
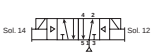
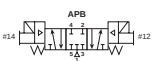
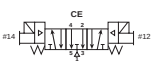
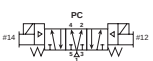
5599-1, Non Plug-in, Size 2 with Central Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H2EWXBG2B9000FC**	**H2EWXBH2B9000FC**
							External	**H2EWXXG2B9000FC**	**H2EWXXH2B9000FC**
		4-way, 2-position, air return	3.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H21WXBG2B9000FC**	**H21WXBH2B9000FC**
							External	**H21WXXG2B9000FC**	**H21WXXH2B9000FC**
		4-way, 2-position	3.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H22WXBG2B9000FC**	**H22WXBH2B9000FC**
							External	**H22WXXG2B9000FC**	**H22WXXH2B9000FC**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H25WXBG2B9000FC**	**H25WXBH2B9000FC**
							External	**H25WXXG2B9000FC**	**H25WXXH2B9000FC**
		4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H26WXBG2B9000FC**	**H26WXBH2B9000FC**
							External	**H26WXXG2B9000FC**	**H26WXXH2B9000FC**
		4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H27WXBG2B9000FC**	**H27WXBH2B9000FC**
							External	**H27WXXG2B9000FC**	**H27WXXH2B9000FC**

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H2EWXBG323000FC**	**H2EWXBH323000FC**
							External	**H2EWXXG323000FC**	**H2EWXXH323000FC**
		4-way, 2-position, air return	3.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H21WXBG323000FC**	**H21WXBH323000FC**
							External	**H21WXXG323000FC**	**H21WXXH323000FC**
		4-way, 2-position	3.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H22WXBG323000FC**	**H22WXBH323000FC**
							External	**H22WXXG323000FC**	**H22WXXH323000FC**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H25WXBG323000FC**	**H25WXBH323000FC**
							External	**H25WXXG323000FC**	**H25WXXH323000FC**
		4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H26WXBG323000FC**	**H26WXBH323000FC**
							External	**H26WXXG323000FC**	**H26WXXH323000FC**
		4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H27WXBG323000FC**	**H27WXBH323000FC**
							External	**H27WXXG323000FC**	**H27WXXH323000FC**

5599-1, Non Plug-in, Size 2 with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H2EWXBBL49C**	**H2EWXBCL49C**
							External	**H2EWXXBL49C**	**H2EWXXCL49C**
		4-way, 2-position, air return	3.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H21WXBBL49C**	**H21WXBCL49C**
							External	**H21WXXBL49C**	**H21WXXCL49C**
		4-way, 2-position	3.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H22WXBBL49C**	**H22WXBCL49C**
							External	**H22WXXBL49C**	**H22WXXCL49C**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H25WXBBL49C**	**H25WXBCL49C**
							External	**H25WXXBL49C**	**H25WXXCL49C**
		4-way, 3-position, center exhaust	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H26WXBBL49C**	**H26WXBCL49C**
							External	**H26WXXBL49C**	**H26WXXCL49C**
		4-way, 3-position, pressure center	2.8	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H27WXBBL49C**	**H27WXBCL49C**
							External	**H27WXXBL49C**	**H27WXXCL49C**

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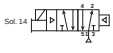
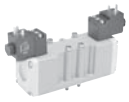
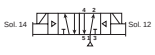
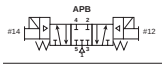
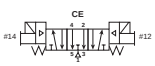
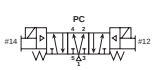
5599-1, Non Plug-in, Size 2 with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H2EWXBBL53C**	**H2EWXBCL53C**
							External	**H2EWXXBL53C**	**H2EWXXCL53C**
		4-way, 2-position, air return	3.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H21WXBBL53C**	**H21WXBCL53C**
							External	**H21WXXBL53C**	**H21WXXCL53C**
		4-way, 2-position	3.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H22WXBBL53C**	**H22WXBCL53C**
							External	**H22WXXBL53C**	**H22WXXCL53C**
		4-way, 3-position, all ports blocked	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H25WXBBL53C**	**H25WXBCL53C**
							External	**H25WXXBL53C**	**H25WXXCL53C**
		4-way, 3-position, center exhaust	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H26WXBBL53C**	**H26WXBCL53C**
							External	**H26WXXBL53C**	**H26WXXCL53C**
		4-way, 3-position, pressure center	2.8	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H27WXBBL53C**	**H27WXBCL53C**
							External	**H27WXXBL53C**	**H27WXXCL53C**

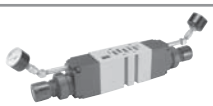
5599-1, Non Plug-in, Size 2

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	**PS4111170CP**	**PS4111180CP**

Manifold bases		1/2" NPT	1/2" BSPP
	Bottom / End ported bases	**PS4111670CP**	**PS4111680CP**
	Note: Manifolds include 2 pipe plugs		

End plate kits		NPT port	BSPP port
	H2 Non-collective wiring end plates	**PS4131010CP**	**PS4131011CP**

5599-1, Non Plug-in, Size 2 Accessories

Accessories		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4137166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4137266CP**
Blanking plate kit				**PS4134CP**
Sandwich flow control				**PS4142CP**
Manifold to manifold gasket kit				**PS4113P**
Manifold port isolation kits		Main galley (1, 3, 5)		**PS4132CP**
Manifold port isolation kits		Pilot galley		**PS4033CP**

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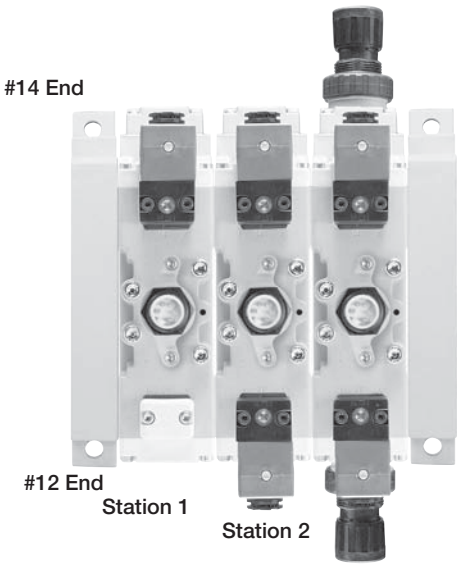
How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
3-Station Manifold with (3) H2 Valves
On Manifold Bases
and Regulator at Station 3

Add-A-Fold Assembly Model Number

AA H2 S 0 03

Valve Series	
Right & Left End Plate	H2

End Plate Type	
Standard - Non-Collective Wiring	S

Thread Type	
NPT	0
BSPP "G"	1*

* BSPP Conforms to ISO 1179-1 w 228-1 Theads.

Number of Stations
01
02
03
04
•
•
24

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH2S003	
02	1	H21WXBG3B9000C	Station 1
03	1	PS4111570CP	Station 1
04	1	H22WXBG3B9000C	Station 2
05	1	PS4111570CP	Station 2
06	1	H22WXXG3B9000C	Station 3
07	1	PS4137166CP	Station 3
08	1	PS4111570CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.

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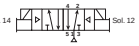
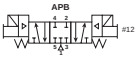
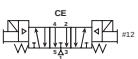
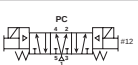
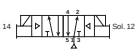
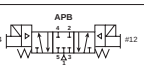
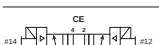
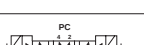
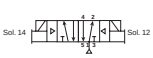
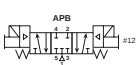
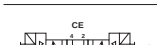
5599-1, Non Plug-in, Size 3 with Central Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H3EWXBG2B9000FC**	**H3EWXBH2B9000FC**
							External	**H3EWXXG2B9000FC**	**H3EWXXH2B9000FC**
		4-way, 2-position, air return	6.0	Single solenoid	24 VDC	4-pin, central M12 connector	Internal	**H31WXBG2B9000FC**	**H31WXBH2B9000FC**
							External	**H31WXXG2B9000FC**	**H31WXXH2B9000FC**
		4-way, 2-position	6.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H32WXBG2B9000FC**	**H32WXBH2B9000FC**
							External	**H32WXXG2B9000FC**	**H32WXXH2B9000FC**
		4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H35WXBG2B9000FC**	**H35WXBH2B9000FC**
							External	**H35WXXG2B9000FC**	**H35WXXH2B9000FC**
		4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H36WXBG2B9000FC**	**H36WXBH2B9000FC**
							External	**H36WXXG2B9000FC**	**H36WXXH2B9000FC**
		4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	4-pin, central M12 connector	Internal	**H37WXBG2B9000FC**	**H37WXBH2B9000FC**
							External	**H37WXXG2B9000FC**	**H37WXXH2B9000FC**

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H3EWXBG323000FC**	**H3EWXBH323000FC**
							External	**H3EWXXG323000FC**	**H3EWXXH323000FC**
		4-way, 2-position, air return	6.0	Single solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H31WXBG323000FC**	**H31WXBH323000FC**
							External	**H31WXXG323000FC**	**H31WXXH323000FC**
		4-way, 2-position	6.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H32WXBG323000FC**	**H32WXBH323000FC**
							External	**H32WXXG323000FC**	**H32WXXH323000FC**
		4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H35WXBG323000FC**	**H35WXBH323000FC**
							External	**H35WXXG323000FC**	**H35WXXH323000FC**
		4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H36WXBG323000FC**	**H36WXBH323000FC**
							External	**H36WXXG323000FC**	**H36WXXH323000FC**
		4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	5-Pin, central 7/8" mini connector	Internal	**H37WXBG323000FC**	**H37WXBH323000FC**
							External	**H37WXXG323000FC**	**H37WXXH323000FC**

5599-1, Non Plug-in, Size 3 with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage	Enclosure	Pilot	Internal pilot	External pilot
		4-way, 2-position, spring return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H3EWXBBL49C**	**H3EWXBCL49C**
							External	**H3EWXXBL49C**	**H3EWXXCL49C**
		4-way, 2-position, air return	6.0	Single solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H31WXBBL49C**	**H31WXBCL49C**
							External	**H31WXXBL49C**	**H31WXXCL49C**
		4-way, 2-position	6.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H32WXBBL49C**	**H32WXBCL49C**
							External	**H32WXXBL49C**	**H32WXXCL49C**
		4-way, 3-position, all ports blocked	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H35WXBBL49C**	**H35WXBCL49C**
							External	**H35WXXBL49C**	**H35WXXCL49C**
		4-way, 3-position, center exhaust	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H36WXBBL49C**	**H36WXBCL49C**
							External	**H36WXXBL49C**	**H36WXXCL49C**
		4-way, 3-position, pressure center	5.0	Double solenoid	24 VDC	3-pin DIN connector on coil	Internal	**H37WXBBL49C**	**H37WXBCL49C**
							External	**H37WXXBL49C**	**H37WXXCL49C**

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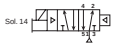
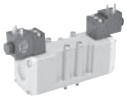
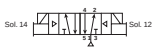
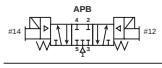
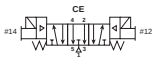
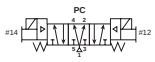
5599-1, Non Plug-in, Size 3 with 3-Pin DIN Connectors

	Symbol	Type	Cv	Operator	Voltage		Pilot	Non-locking	Locking
		4-way, 2-position, spring return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H3EWXBBL53C**	**H3EWXBCL53C**
							External	**H3EWXXBL53C**	**H3EWXXCL53C**
		4-way, 2-position, air return	6.0	Single solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H31WXBBL53C**	**H31WXBCL53C**
							External	**H31WXXBL53C**	**H31WXXCL53C**
		4-way, 2-position	6.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H32WXBBL53C**	**H32WXBCL53C**
							External	**H32WXXBL53C**	**H32WXXCL53C**
		4-way, 3-position, all ports blocked	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H35WXBBL53C**	**H35WXBCL53C**
							External	**H35WXXBL53C**	**H35WXXCL53C**
		4-way, 3-position, center exhaust	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H36WXBBL53C**	**H36WXBCL53C**
							External	**H36WXXBL53C**	**H36WXXCL53C**
		4-way, 3-position, pressure center	5.0	Double solenoid	120 VAC	3-pin DIN connector on coil	Internal	**H37WXBBL53C**	**H37WXBCL53C**
							External	**H37WXXBL53C**	**H37WXXCL53C**

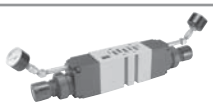
5599-1, Non Plug-in, Size 3

Single subbase	Description	3/4" NPT	3/4" BSPP
	Side ported base	**PS4211170CP**	**PS4211180CP**

Manifold bases		3/4" NPT	3/4" BSPP
	Bottom / End ported bases	**PS4211690CP**	**PS4211600CP**
	Note: Manifolds include 2 pipe plugs		

End plate kits		NPT port	BSPP port
	H3 Non-collective wiring end plates	**PS4231010CP**	**PS4231011CP**

5599-1, Non Plug-in, Size 3 Accessories

Accessories		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4237166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4237266CP**
Blanking plate kit				**PS4234CP**
Sandwich flow control				**PS4242CP**
Manifold to manifold gasket kit				**PS4213P**
Manifold port isolation kits		Main galley (1, 3, 5)		**PS4232CP**
Manifold port isolation kits		Pilot galley		**PS4033CP**

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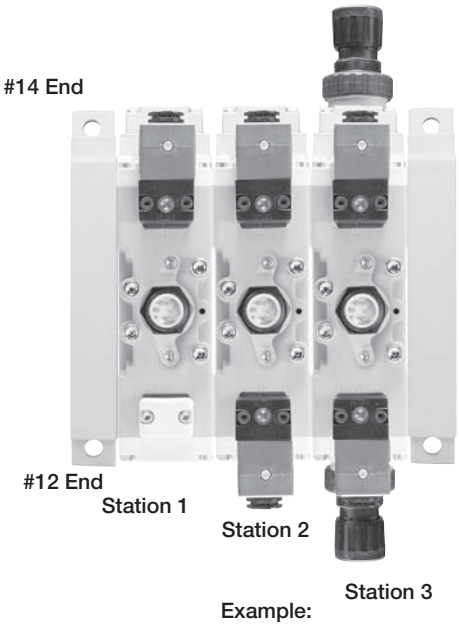
How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:
3-Station Manifold with (3) H3 Valves
On Manifold Bases and Regulator at Station 3

Add-A-Fold Assembly Model Number

AA	H3	S	0	03	

Valve series

Right & left end plate	H3

End plate type

Standard - non-collective wiring	S

Thread type

NPT	0

Number of stations

01
02
03
04
•
•
24

Transition plate

Blank	No transition plate
E	H2 to H3

Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

Item	Qty.	Part No.	Location
01	1	AAH3S003	
02	1	H31WXBG3B9000C	Station 1
03	1	PS4211590CP	Station 1
04	1	H32WXBG3B9000C	Station 2
05	1	PS4211590CP	Station 2
06	1	H32WXXG3B9000C	Station 3
07	1	PS4237166CP	Station 3
08	1	PS4211590CP	Station 3

NOTE: Construct manifold assemblies from left to right while looking at the cylinder ports.
Valves must be ordered as External Pilot when using Sandwich Regulator.

5599-1 Non Plug-in Transition Plate Kits

PS402601	0	C	P

Transition plate Type*

H1 to H2 to H3	PS402501
H1 to H3	PS402601
H1 to H2	PS402701
H2 to H3	PS402801

* Includes left hand and right hand end plates.
Use with PS4... series manifolds only.

Thread type

0	NPT
1*	BSPP "G"

* BSPP conforms to ISO 1179-1 w 228-1 threads.

Engineering level

C	Current

H1 to H2 Shown

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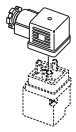
Maximum Number of Solenoids
(Maximum Energized Simultaneously)

HA & HB	Voltage code	25-Pin D-sub	19-Pin Brad Harrison	12-Pin M23	19-Pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
24VDC	G9	24 (24)	16 (16)	8 (8)	16 (16)	16 (16)	32 (32)	16 (16)	32 (32)
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A

H1, H2 & H3	Voltage code	25-Pin D-sub	19-Pin Brad Harrison	12-Pin M23	19-Pin M23	Moduflex	Isysnet	Turck 16 Outputs	Turck 32 Outputs
12VDC	45	24 (13)	16 (13)	8 (8)	16 (13)	N/A	N/A	N/A	N/A
24VAC*	42	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A
24VDC	B9	24 (20)	16 (16)	8 (8)	16 (16)	16 (16)	24 (21)	16 (16)	24 (21)
120VAC*	23	24 (24)	16 (16)	8 (8)	16 (16)	N/A	N/A	N/A	N/A

* Not CSA certified for 25-Pin, D-sub option.

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



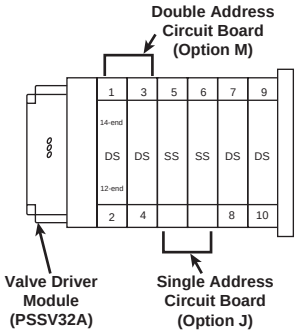
Description	Connector with 6' (2m) cord	Connector
Unlighted	**PS2028JCP**	**PS2028BP**
Light – 6-48V, 50/60Hz; 6-48VDC	**PS2032J79CP***	**PS203279BP**
Light – 120V/60Hz	**PS2032J83CP***	**PS203283BP**
Light – 240V/60Hz	**N/A**	**PS203283BP**

* With surge suppression.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

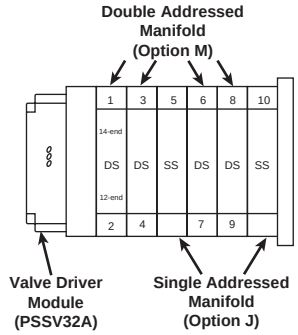
I/O Addressing Examples

HB & HA Example
Two Station Manifold Bases



Notes: SS = Single Solenoid Valve
DS = Double Solenoid Valve
First output address the #14 end of the valve closest to the valve driver module.

H1, H2 & H3 Example:
Single Station Manifold Bases



5599-2 & 5599-1 AUTO Solenoid Kits

Valve size	Voltage code	Coil kit number
H1, H2 & H3	42 (24VAC)	**PS404142P**
	45 (12VDC)	**PS404145P**
	B9 (24VDC)	**PS4041B9P**
	23 (120VAC)	**PS404123P**
	57 (240VAC)	**PS404157P**

Quantity 1

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	**PS2828619P**
42	**P2FCA442**	—
45	**P2FCA445**	—
49	**P2FCA449**	—
53	**P2FCA453**	—
57	**P2FCA457**	—

Quantity 1

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Pilot Operator - CNOMO

Valve size		Kit number
H1, H2 & H3	Locking	**PS4052CP**
	Non-locking	**PS4053CP**

Manifold Hardware Kits – PS Series

Valve size	Kit number
HA & HB	**PS5612P**
	PS5512P
H1, H2 & H3	**PS4012P**
	PS4112P
	PS4212P

Quantity 12

Valve Bolt Kits

Valve size	Kit number
HA & HB	**PS5687P**
	PS5587P
H1, H2 & H3	**PS4087CP**
	PS4187CP
	PS4287CP

Quantity 12

Valve to Base Gasket Kits

Valve size	Standard	Remote pilot	Dual pressure #3	Dual pressure #5
HA & HB	**PS5605P***	—	—	—
	PS5505P*	—	—	—
H1, H2 & H3	**PS4005CP**	**PS4006CP**	**PS40D3CP**	—
	PS4105CP	**PS4106CP**	**PS41D3CP**	**PS41D5CP**
	PS4205CP	**PS4206CP**	**PS42D3CP**	**PS42D5CP**

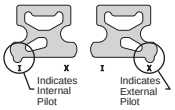
Quantity 1
* Quantity 10

Body Service Kits

Valve size	2-position	3-position		
		APB	CE	PC
HA & HB	**PS5601P**	**PS5602P**	**PS5603P**	**PS5604P**
	PS5501P	**PS5502P**	**PS5503P**	**PS5504P**
H1, H2 & H3	**PS4001CP**	**PS4002CP**	**PS4003CP**	**PS4004CP**
	PS4101CP	**PS4102CP**	**PS4103CP**	**PS4104CP**
	PS4201CP	**PS4202CP**	**PS4203CP**	**PS4204CP**

HB / HA Kit Includes: Spool assembly with seals.
H1, H2, H3 Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.
Quantity 1

Pilot Select Gasket Kits

	Valve size	Kit number
HB shown	HB	**PS5605P**
	HA	**PS5505P**
	H1, H2 & H3	**PS4007P**

Quantity 10

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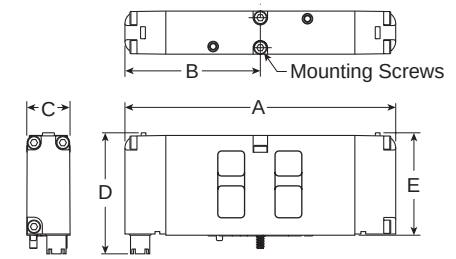
Isys ISO 15407-2, Plug-in, Size 18mm (HB)



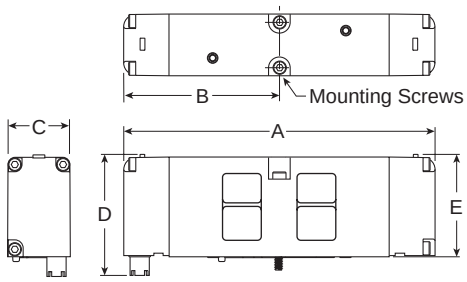
18mm Dimensions

A	B	C	D
4.43 (113)	2.22 (56)	.72 (18)	1.98 (50)

E
1.68 (43)

Inches (mm)

Isys ISO 15407-2, Plug-in, Size 26mm (HA)



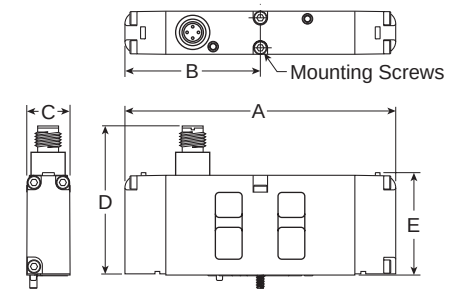
26mm Dimensions

A	B	C	D
5.10 (130)	2.55 (65)	1.02 (26)	1.98 (50)

E
1.66 (42)

Inches (mm)

Isys ISO 15407-1, Plug-in, Size 18mm (HB)



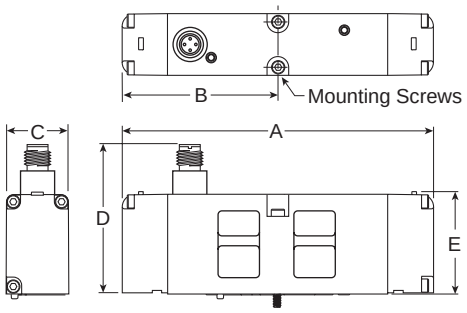
18mm Dimensions

A	B	C	D
4.43 (113)	2.22 (56)	.72 (18)	2.40 (61)

E
1.68 (43)

Inches (mm)

Isys ISO 15407-1, Plug-in, Size 26mm (HA)



26mm Dimensions

A	B	C	D
5.10 (130)	2.55 (65)	1.02 (26)	2.40 (61)

E
1.66 (42)

Inches (mm)

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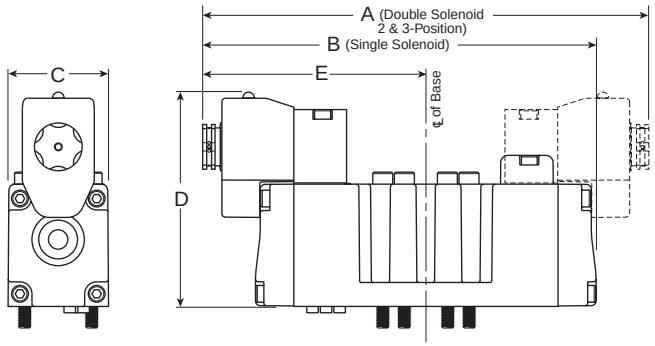
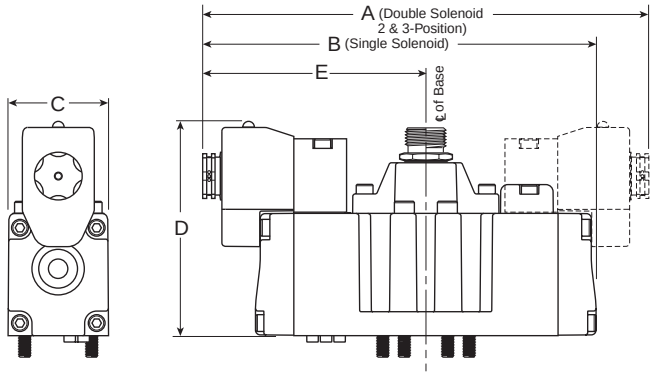
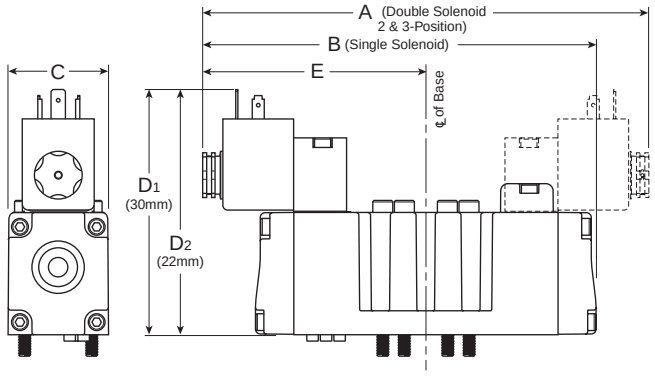
Isys ISO 5599-2



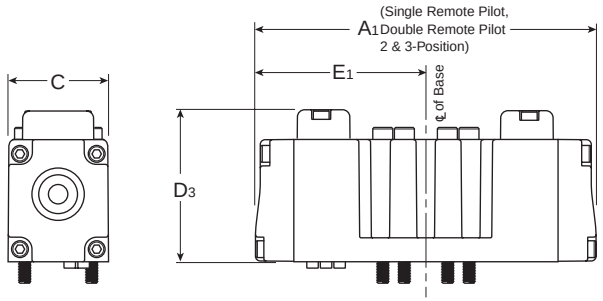
Isys ISO 5599-1 Auto



Isys ISO 5599-1 CNOMO



Isys ISO 5599-2 / 5599-1 Remote Pilot



H1 Valve Dimensions Shown

H1 Dimensions

A	A1	B	C
7.32 (186)	5.59 (142)	6.46 (164)	1.65 (42)
D	**D1**	**D2**	**D3**
3.54 (90)	4.29 (109)	4.29 (109)	2.50 (63.5)
D4	**E**	**E1**	
2.48 (63)	3.66 (93)	2.80 (71)	

Inches (mm)

H2 Dimensions

A	A1	B	C
8.35 (212)	6.62 (168)	7.48 (190)	2.17 (55)
D	**D1**	**D2**	**D3**
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	**E1**		
4.17 (106)	3.31 (84)		

Inches (mm)

H3 Dimensions

A	A1	B	C
9.49 (241)	6.98 (177)	8.23 (209)	2.17 (55)
D	**D1**	**D2**	**D3**
4.05 (103)	4.80 (122)	4.57 (116)	2.99 (76)
E	**E1**		
4.74 (121)	3.49 (89)		

Inches (mm)

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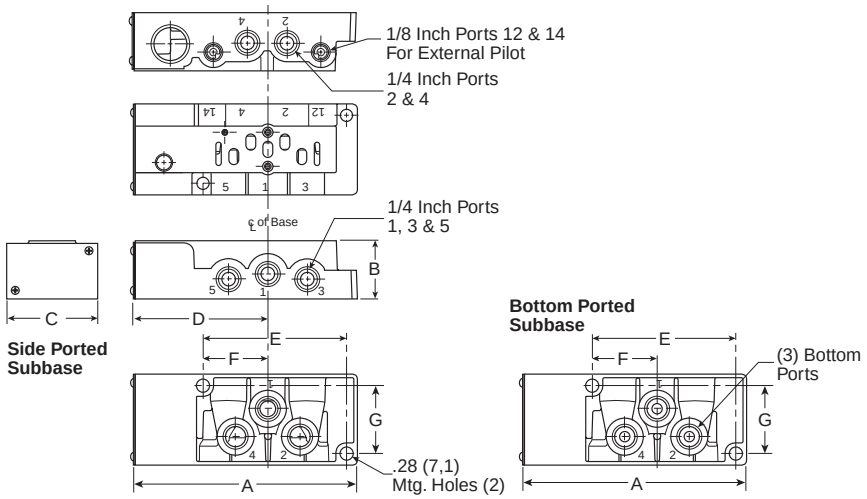
Isys ISO 15407-2 & 15407-1 Size 18mm (HA), PS511 Subbases

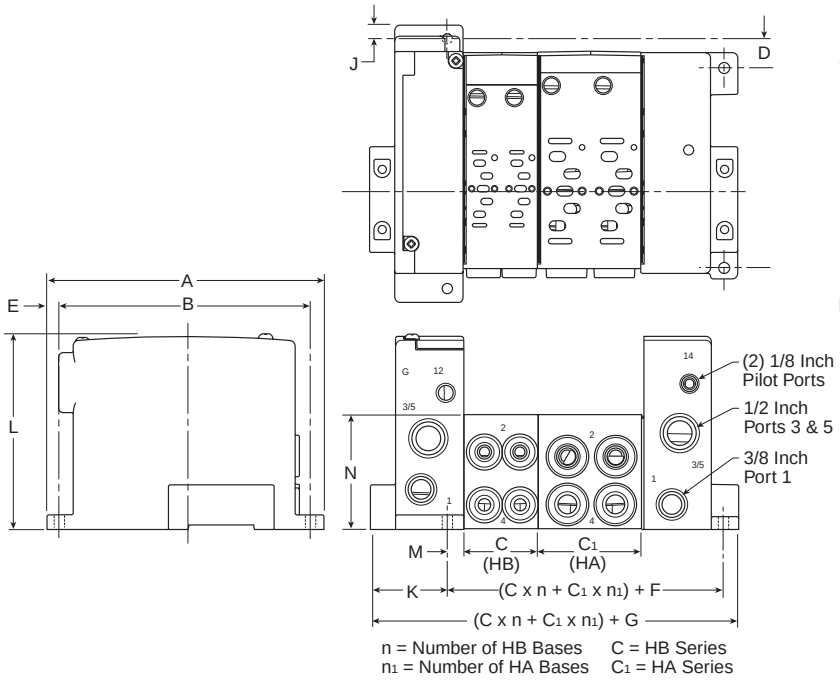


HA Dimensions

A	B	C	D
4.88 (124)	1.28 (32.5)	2.00 (50.8)	2.91 (74)
E	**F**	**G**	
1.43 (36.2)	3.16 (80.2)	1.49 (37.9)	

Inches (mm)

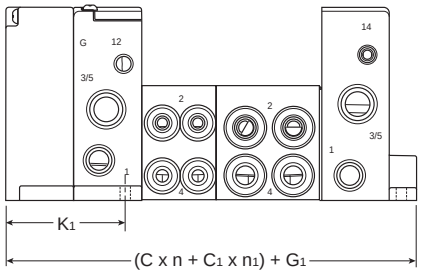
Isys ISO 15407-2 & 15407-1 Size 26mm (HB) & 18mm (HA), PS5611 & PS5511 Manifolds



HB & HA Dimensions

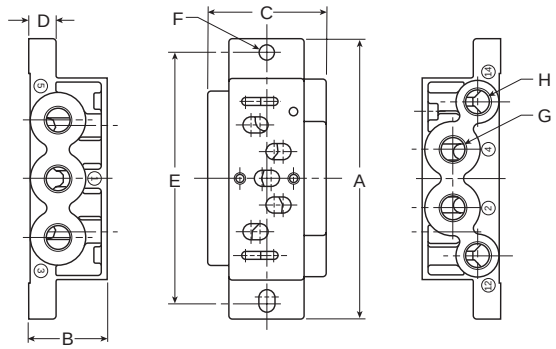
A	B	C	C_1	D	E
5.98 (152)	5.39 (137)	1.61 (40.8)	2.24 (56.8)	.63 (16)	.30 (7.5)
F	**G**	**G_1**	**H**	**J**	**K**
2.14 (54.4)	4.12 (104.6)	5.11 (130)	4.32 (109.8)	.15 (4)	1.68 (42.7)
K_1	**L**	**M**	**N**		
2.70 (68)	4.17 (106)	.33 (8.4)	2.48 (63)		

Inches (mm)



Manifold Assembly with Valve Driver Module

Isys ISO Size 26mm (HB) & 18mm (HA), Individual Subbase



Series	Part number	A	B	C	D	E	F	G	H
HB	**PL02**	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
HA	**PL01**	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

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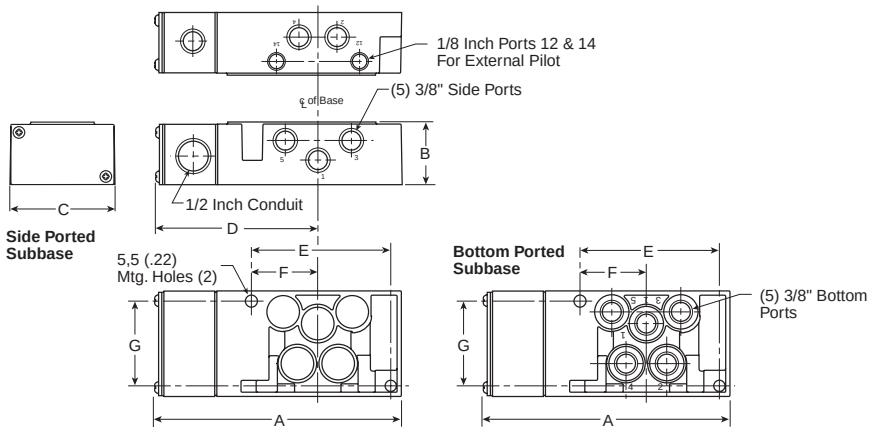
Isys ISO 5599-1 Size H1, PS4011 Subbase



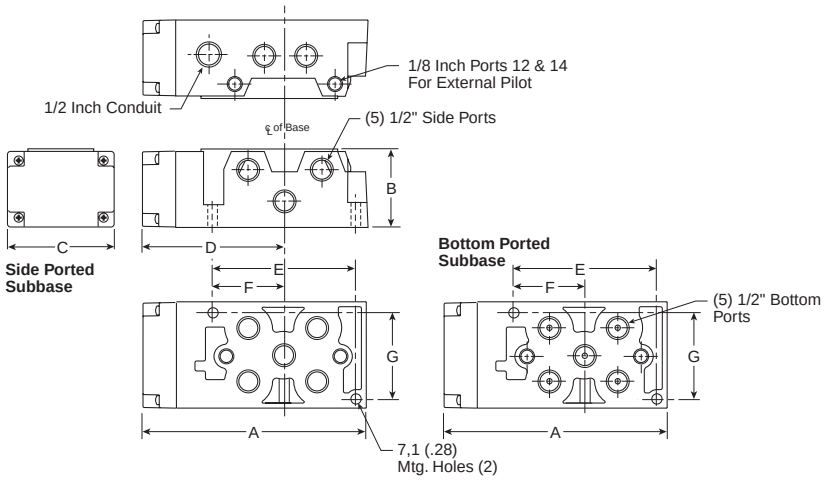
PS4011 Subbase Dimensions

A	B	C	D
5.83 (148)	1.48 (38)	2.50 (64)	3.86 (98)

E	F	G
3.29 (84)	1.57 (40)	2.00 (51)

Inches (mm)

Isys ISO 5599-1 Size H2, PS4111 Subbase



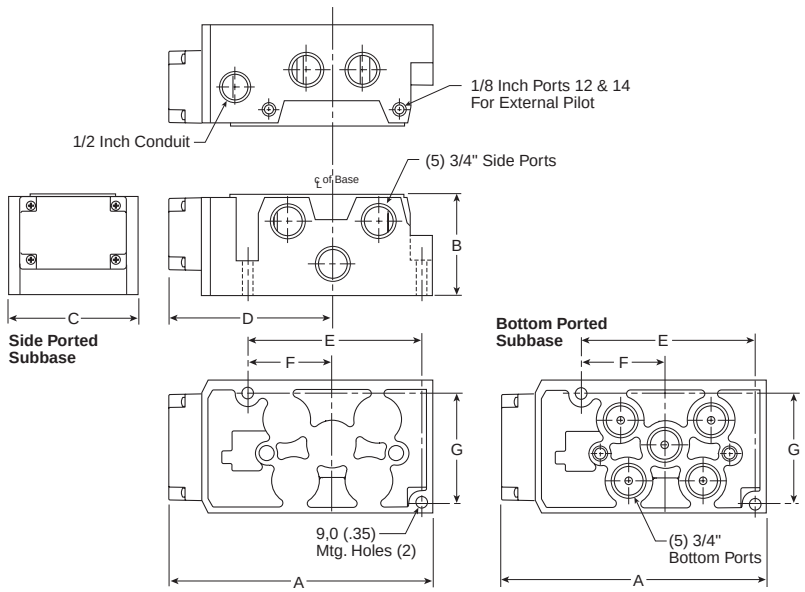
PS4111 Subbase Dimensions

A	B	C	D
6.69 (170)	2.33 (59)	3.15 (80)	4.25 (108)

E	F	G
4.21 (107)	2.07 (52)	2.56 (65)

Inches (mm)

Isys ISO 5599-1 Size H3, PS4211 Subbase



PS4211 Subbase Dimensions

A	B	C	D
7.90 (201)	2.96 (75)	3.90 (99)	4.92 (125)

E	F	G
5.14 (131)	2.50 (64)	3.24 (82)

Inches (mm)

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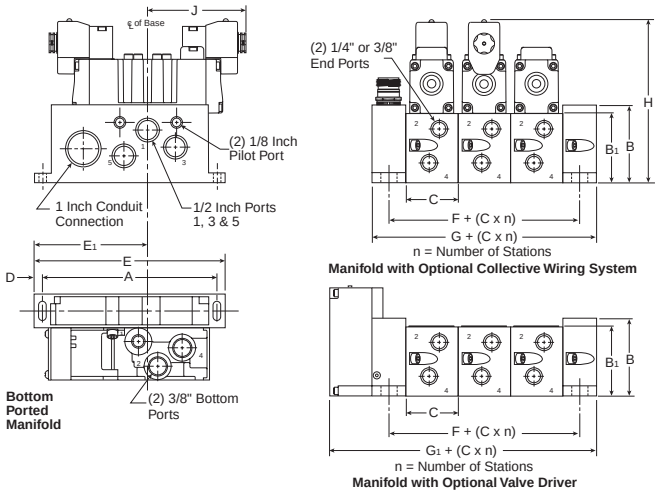
Isys ISO 5599 Size H1, PS4011 Manifold

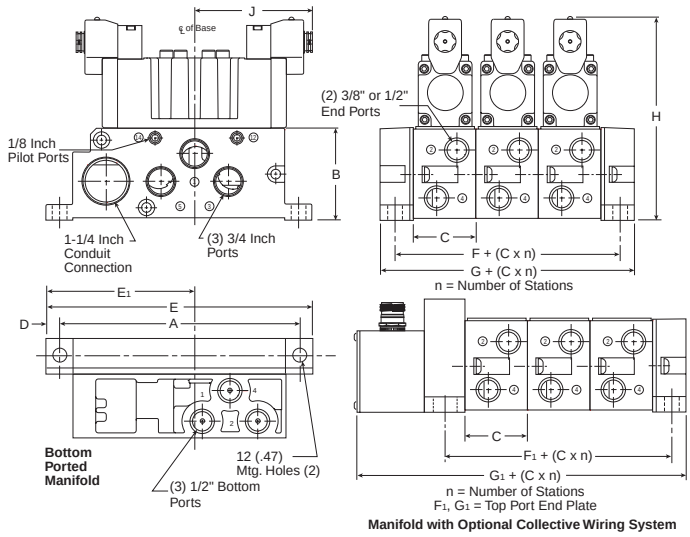


PS4011 Manifold Dimensions

A	B	B1	C	D
6.50 (165)	2.87 (73)	2.64 (67)	1.96 (50)	.33 (8)
E	**E1**	**F**	**G**	**G1**
7.15 (182)	4.25 (108)	1.25 (32)	2.50 (63.5)	4.06 (86)
H	**J**			
6.18 (157)	3.66 (93)			

Inches (mm)

Isys ISO 5599 Size H2, PS4111 Manifold



PS4111 Manifold Dimensions

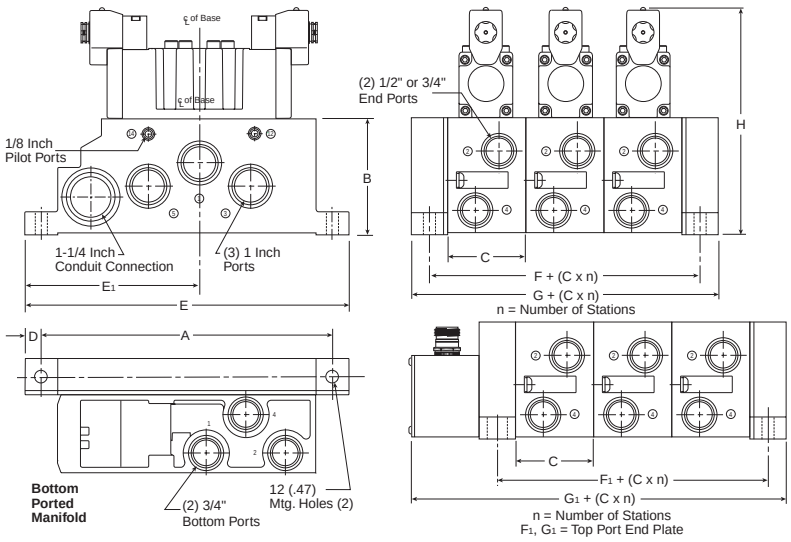
A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.47 (12)	9.41 (239)
E1	**F**	**F1**	**G**	**G1***
5.28 (134)	1.18 (30)	1.30 (33)	2.36 (60)	3.78 (96)
H	**J**			
7.40 (188)	4.17 (106)			

Inches (mm)

* For Isysnet End Plate, add 0.39" (10mm) to the G1 dimensions.

For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G1 dimensions.

Isys ISO 5599 Size H3, PS4211 Manifold



PS4211 Manifold Dimensions

A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.59 (15)	11.61 (295)
E1	**F**	**F1**	**G**	**G1***
6.26 (159)	1.30 (33)	1.60 (41)	2.60 (63)	4.37 (111)
H				
8.19 (208)				

Inches (mm)

* For Isysnet End Plate, add 0.39" (10mm) to the G1 dimensions.

For 19-Pin Round Connector Module, add 1.08" (27.5mm) to the G1 dimensions.

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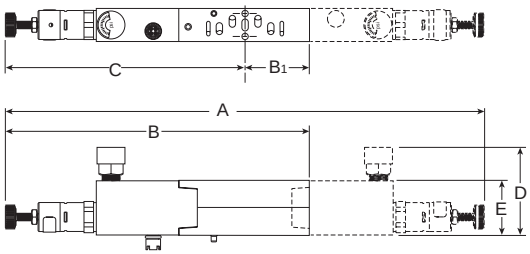
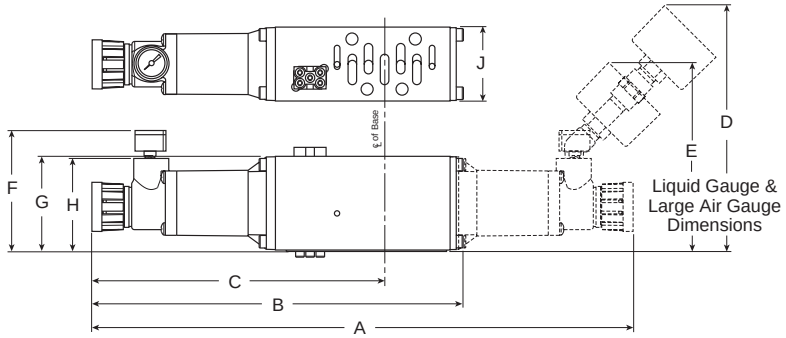
Isys ISO 15407 Sandwich Regulator



Series	Part number	A	B	B1	C	D	E
HB	PS5637	10.28 (261)	6.14 (156)	1.02 (26)	5.13 (130)	2.60 (66)	1.18 (30)
HA	PS5537	10.00 (254)	6.42 (163)	1.42 (36)	5.00 (127)	2.72 (69)	1.18 (30)

Inches (mm)

Isys ISO 5599, Size H1 Sandwich Regulator

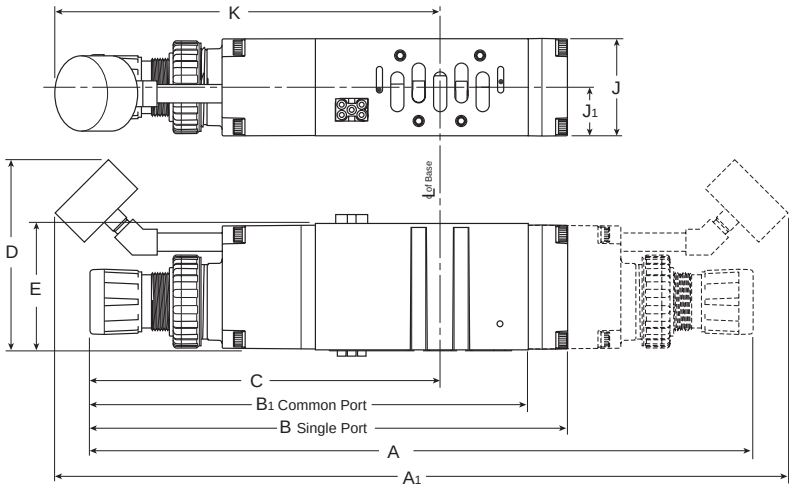


Series	Part number	A	B	C	D	E	F	G	H	J
H1	PS4037	11.84 (301)	8.13 (207)	6.40 (163)	5.45 (138	4.25 (108)	2.85 (72)	2.09 (53)	2.05 (52)	1.63 (41)
	PS4038									

Inches (mm)

Isys ISO 5599, Size H2 & H3 Sandwich Regulator

H2 Sandwich Regulator Shown



Series	Part number	A	A1	B	B1	C	D	E	J	J1	K
H2	PS4137	14.65 (372	16.18 (411)	10.56 (268)	9.84 (250	7.71 (196)	4.20 (107)	2.80 (71)	2.15 (55)	1.07 (27)	8.50 (216)
	PS4138										
H3	PS4237	15.67 (398)	17.15 (436)	11.53 (293)	10.67 (271)	8.37 (213)	4.20 (107)	2.93 (75)	2.50 (64)	1.25 (32)	9.10 (231)
	PS4238										

Inches (mm)

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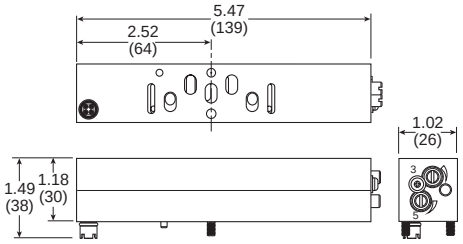
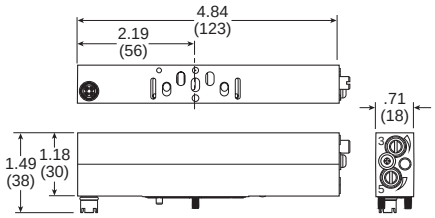
Isys ISO 15407, Size 26mm (HB) & 18mm (HA), Flow Control

HA Flow Control

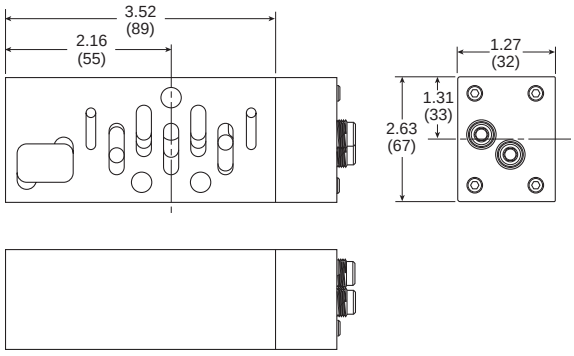


HB Flow Control

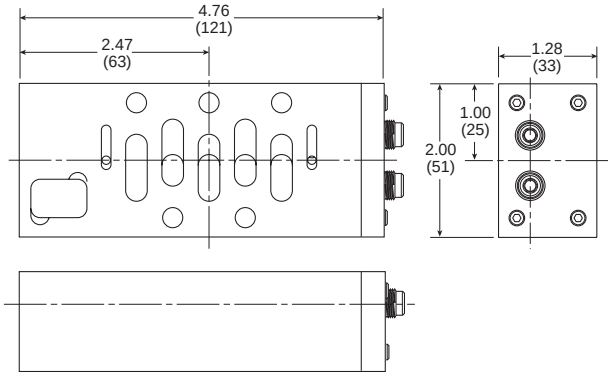


Isys ISO 5599, Size H1, H2 & H3, Flow Control

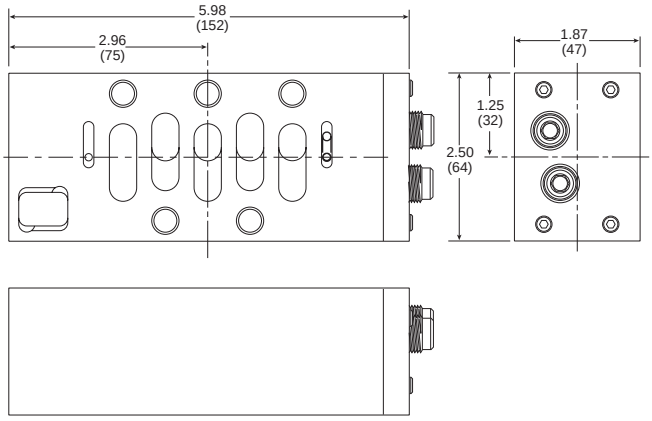
H1 Flow Control



H2 Flow Control



H3 Flow Control



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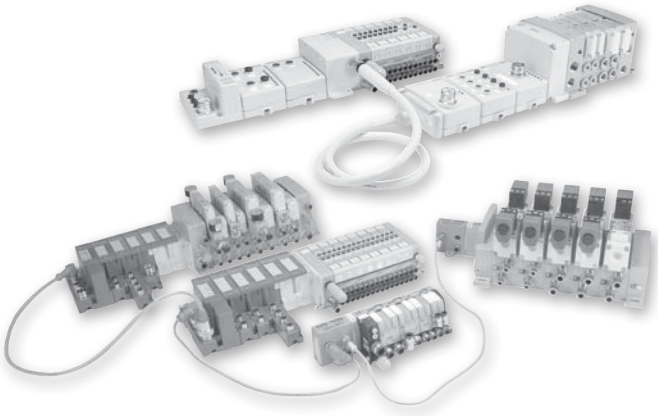
Fieldbus Offering

Valve series	Moduflex	Isysnet	Turck
Moduflex	X		
Isys Micro	X	X	X
Isys ISO	X	X	X

Protocol	Moduflex	Isysnet	Turck
DeviceNet	X	X	X
Ethernet/IP		X	X
Profibus-DP	X	X	X
Profinet			X
Modbus/TCP			X
AS-i	X		
CANopen	X		X
Interbus-S	X		
ControlNet		X	

Options	Moduflex	Isysnet	Turck
Digital inputs / outputs*		X	X
Analog inputs / outputs		X	X
16 Solenoid control*	X		X
32 Solenoid control		X	X
Short circuit protection on inputs			X
Current sensing outputs			X
Bus expansion		X	
DeviceNet subnet			X
Programmable comm modules			X
Power over DeviceNet / CANopen			X
Preferred connectivity		X	
CANopen expansion			X

* Modulfex AS-i modules are available with 6 or 8 inputs and 6 or 8 solenoid outputs



	Turck fieldbus	Isysnet	Moduflex
Solenoid control	Up to 32 solenoids on main valve manifold. Devicenet Subnet Allows an additional 32 solenoids per node 63 nodes maximum. CANopen expansion Allows an additional 64 solenoids per expansion 5 expansions maximum.	Up to 32 solenoids on main valve manifold Isys Micro Bus Expansion Allows an additional 32 solenoids per expansion 3 expansions maximum 1 meter fixed cable length per expansion	Up to 16 solenoids on main valve manifold
I/O capabilities	256 maximum inputs and outputs directly connected to communication module. Devicenet Subnet Allows an additional 256 I/O per node 63 nodes maximum Third party DeviceNet modules can be used CANopen expansion Allows an additional 64 I/O per expansion 5 expansions maximum Third party CANopen modules can be used	Maximum of 256 inputs and 256 outputs directly connected to the communication module, including Isys Micro Bus Expansion.	8 Inputs available on AS-i communication only.
Short circuit protection	SXG and diagnostic electronic modules have each point isolated. All other electronic modules are isolated from the backplane.	Devices must be fused between input / output and electronic module.	

Most popular. For technical information see CD

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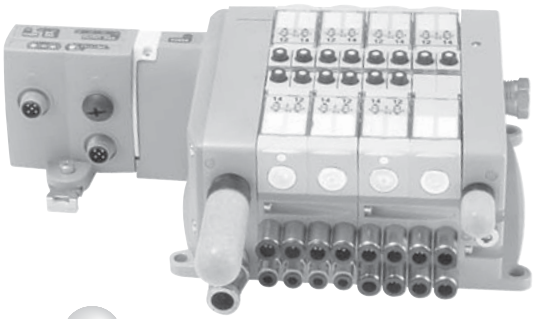
The Moduflex Fieldbus System

Moduflex communication modules directly attach to the end plate. It offers a compact and low cost fieldbus solution.



DeviceNet™ PROFIBUS PROCESS FIELD BUS CANopen INTERBUS-S

Moduflex Features

- Small, compact product design
- Broad protocol offering, including DeviceNet, Profibus, AS-i, CANopen, and Interbus
- Channel-level diagnostics (LED and Electronic)
- Inputs available with AS-i modules
- Horizontal and vertical mounting without derating
- 5g vibration
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- CE certification

Protocol	Part number
Profibus DP	**P2M2HBVP21600**
DeviceNet	**P2M2HBVD21600**
CANopen	**P2M2HBVC21600**
InterBus-S	**P2M2HBVS11600**

Fieldbus Accessories

	Protocol	Connector type	Part number
Power Supply Field Wireable Connector	Profibus DP / InterBus-S / DeviceNet / CANopen	M12 type A Female	**P8CS1205AA**
Line Termination Resistor	Profibus DP	M12 type B	**P8BPA00MB**
	DeviceNet / CANopen	M12 type A	**P8BPA00MA**

AS-i INTERFACE

P2M2HBVA10808A

P2M2HBVA10808B

Standard AS-i Protocol (up to 31 nodes)

Communication module for 8 solenoids max.
(2 nodes per module, 4 inputs, 4 solenoids per node)

Input / Output capability	Weight (oz)	Part number
0 inputs and 8 solenoid outputs	5.29	**P2M2HBVA10800**
8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs	7.05	**P2M2HBVA10808A**
8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs	7.05	**P2M2HBVA10808B**

AS-i Version 2.1 Protocol (up to 62 nodes)

Communication module for 6 solenoids max.
(2 nodes per module, 4 inputs, 3 solenoids per node)

Input / Output capability	Weight (oz)	Part number
0 inputs and 6 solenoid outputs	5.29	**P2M2HBVA20600**
8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs	7.05	**P2M2HBVA20608A**
8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs	7.05	**P2M2HBVA20608B**

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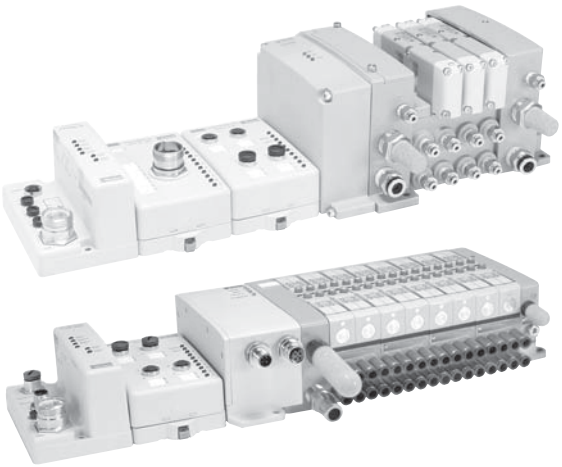
The Isysnet System

Isysnet has four major components:

- Valve driver module provide control for 32 solenoids on a manifold, with bus extension providing connectivity to 3 more manifolds
- I/O modules provide the field interface, system-interface circuitry, and bases for mounting
- Communication modules provide the network-interface circuitry
- Power distribution module provide 5 additional power inputs to the Isysnet system



Isysnet Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Parameter-level explicit messaging
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Communications Module

	Protocol	Part number
PSSCENA	DeviceNet™	**PSSCDM18PA (7/8" Mini) or PSSCDM12A (M12)**
	ControlNet™	**PSSCCNA**
	EtherNet I/P™	**PSSCENA**
	Profibus-DP®	**PSSCPBA**

All Modules IP67 Certified
EDS and GSD files located at www.parker.com/pneu/Isysnet

Digital Inputs

	I/O modules	Voltage	Part number
PSSN16M12A	16 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	**PSSN16M12A**
	8 digital inputs M12, 5-pin used with PNP sourcing input device	10 to 28.8VDC	**PSSN8M12A**
	8 digital inputs M12, 5-pin used with NPN sinking input device	10 to 28.8VDC	**PSSP8M12A**
	8 digital inputs M8, 3-pin used with PNP sourcing input device	10 to 28.8VDC	**PSSN8M8A**
PSSN8M8A	8 digital inputs M8, 3-pin used with NPN sinking input device	10 to 28.8VDC	**PSSP8M8A**
	8 digital inputs M23, 12-pin used with NPN sinking input device	10 to 28.8VDC	**PSSP8M23A**
	8 digital inputs M23, 12-pin used with PNP sourcing input device	10 to 28.8VDC	**PSSN8M23A**

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Digital Outputs

	I/O modules	Voltage	Part number
PSST16D25A	16 digital outputs M23, 19-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST16M23A**
	16 digital outputs D-sub, 25-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST16D25A**
PSST16M12A	16 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST16M12A**
	8 digital outputs M12, 5-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST8M12A**
	8 digital outputs M8, 3-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST8M8A**
	4 digital output, high watt relay M12, 5-pin used with PNP sourcing outputs (2 Amp)	24VDC	**PSSTR4M12A**
PSST8M12A	8 digital outputs M23, 12-pin used with PNP sourcing outputs	10 to 28.8VDC	**PSST8M23A**

All modules IP67 certified
See www.parker.com/pneu/Isysnet

Analog Inputs

	I/O modules	Voltage	Part number
PSSNACM12A	2 Analog inputs voltage M12, 5-pin	-10 to 10VDC or 0 to 10VDC	**PSSNAVM12A**
	2 Analog inputs current M12, 5-pin	4 to 20mA or 0 to 20mA	**PSSNACM12A**

All modules IP67 certified
See www.parker.com/pneu/Isysnet

Analog Outputs

	I/O modules	Voltage	Part number
PSSTACM12A	2 Analog outputs voltage M12, 5-pin	0 to 10V ± 10V	**PSSTAVM12A**
	2 Analog outputs current M12, 5-pin	4 to 20mA or 0 to 20mA	**PSSTACM12A**

All modules IP67 certified
See www.parker.com/pneu/Isysnet

Terminating Base Module

	Base module	Part number
	Termination base for stand alone units	**PSSTERM**

Used as the last terminating module for a stand alone isysnet assembly.

Power Extender Module

	Extender module	Part number
	24VDC field power module	**PSSSE24A**

A Power Extender Module must be used on every 14th Module in an Isysnet assembly. See www.parker.com/pneu/Isysnet

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Bus Extender Cable

	Description	Voltage	Part number
	1 Meter Cable*	24VDC	**PSSEXT1**
	3 Meter Cable*	24VDC	**PSSEXT3**

* Requires a PSSSE24 Power Extender Module
IP67 certified
See www.parker.com/pneu/Isysnet

Isys Micro Bus Extender Cable

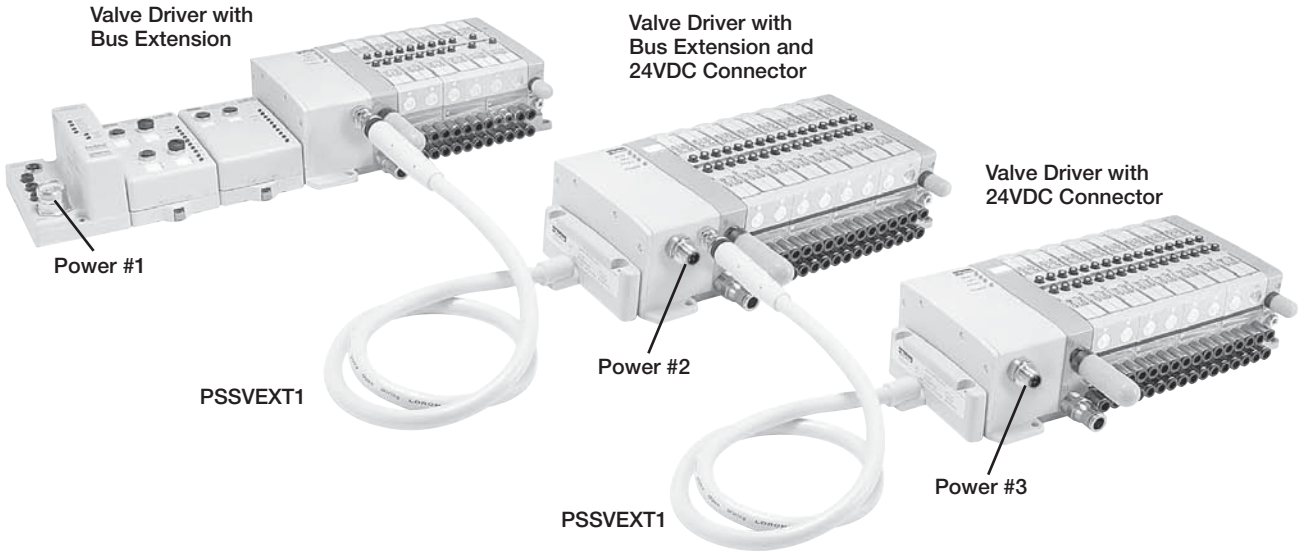
	Description	Voltage	Part number
	1 Meter Cable*	24VDC	**PSSVEXT1**

* IP67 certified.

Example

Isys Micro with Bus Extension on Valve Driver Module – No additional I/O at the Extension

- Add up to three additional valve manifolds without adding another communication module.
- No PSSSE24A is needed on the Extension when the Valve Driver Module with 24VDC Connector is used.
- Commonly used when many valves are required.
- Bus expansion only available with Isys Micro valves.



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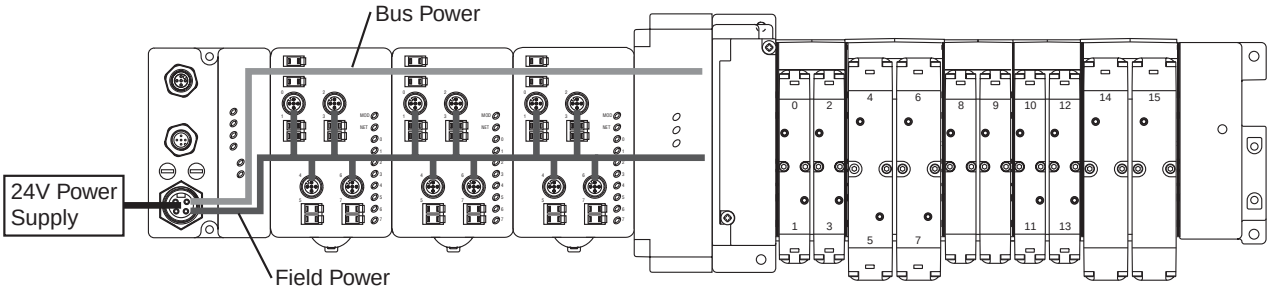
Power Distribution Options for Isys ISO

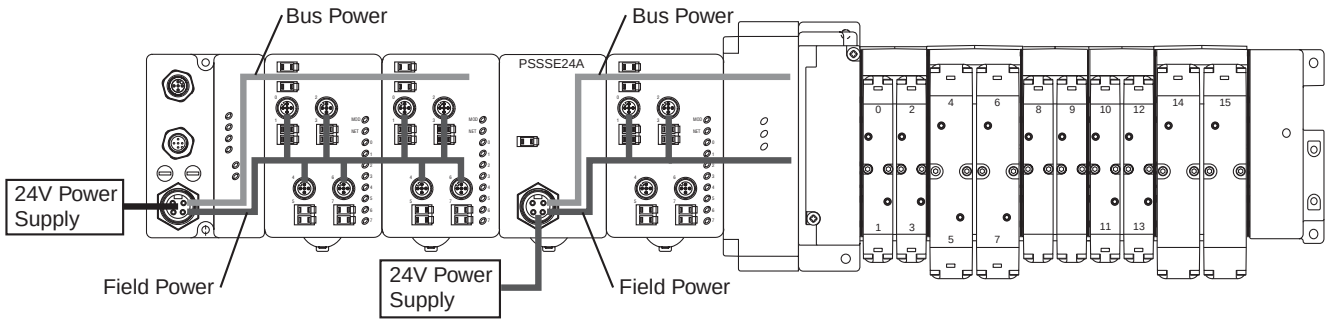
Isysnet Communication and I/O Modules

An auxiliary 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 I/O modules with a maximum of 10 A field power, using the auxiliary power.



Isysnet System with 24VDC Expansion Power Unit (PSSSE24A)

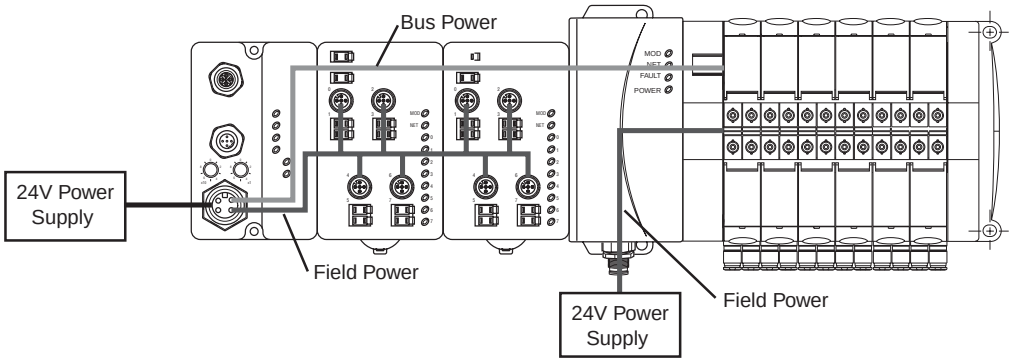
The auxiliary power from the communication module supports up to 13 I/O modules with a maximum of 10 A field power. The 24VDC Power Extender Module (PSSSE24A) extends the backplane bus power and I/O Module field power to support up to 13 more I/O modules. Connect additional Power Extender Modules to expand the I/O assembly up to the maximum of 63 I/O modules. This secondary 24VDC connector on the PSSSE24A can be wired into an Emergency Stop circuit.



Additional Power Distribution Options for Isys Micro

Isysnet Communication Module and Valve Driver Module with 24VDC Connector

The 24VDC power supply from the Communication Adaptor provides power to the backplane bus power and I/O module field power for up to 13 modules and an adapter with a maximum of 10 A Field Power. In this configuration, backplane bus power and I/O module field power are supplied to the input and output modules. The communication module only supplies backplane bus power to the Valve Driver Module, as the Isys Micro with 24VDC Connector separates the field power from the rest of the network. This secondary 24VDC Connector on the Valve Driver Module supplies Field Power to the valves, and can be wired into an Emergency Stop Circuit.



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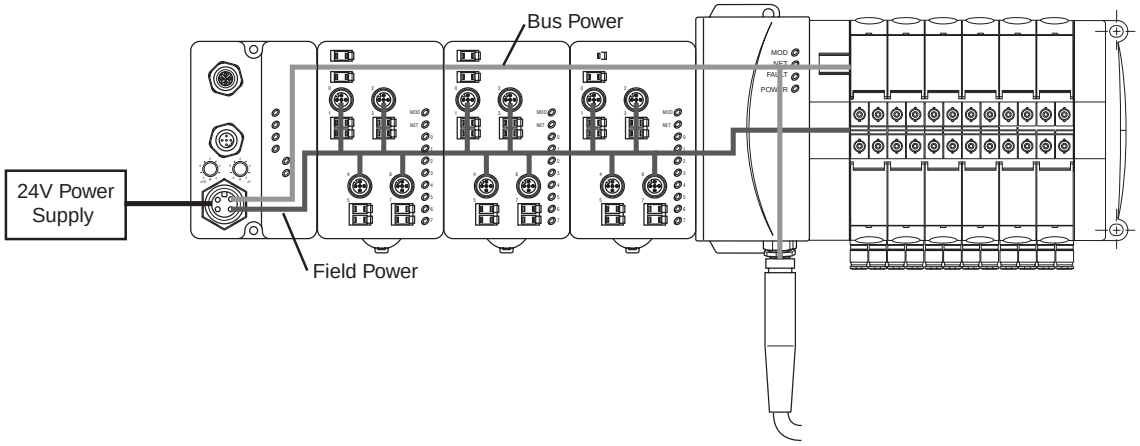
Power Distribution Options for Isys Micro (Continued)

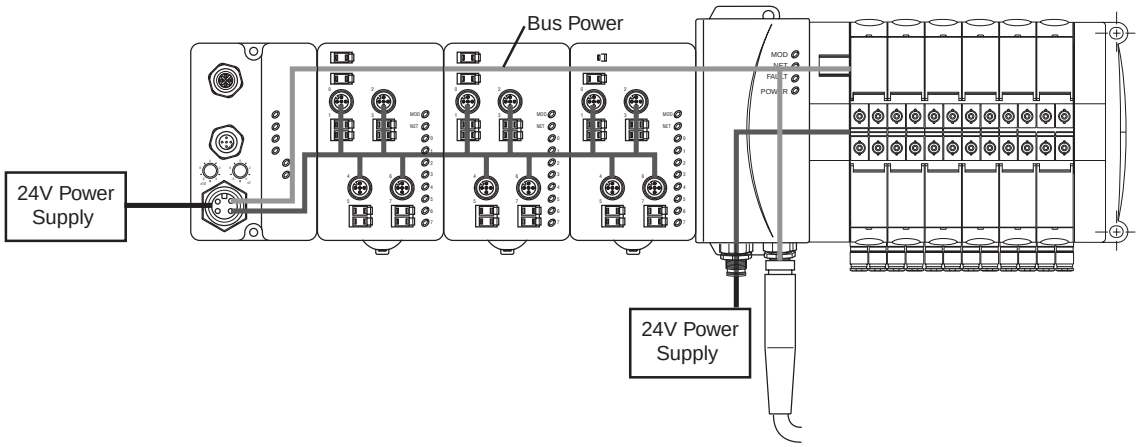
Isysnet Communication Module with Bus Extension Connector and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10 A field power, using this power source. The Isys Micro with Bus Extension Connector carries backplane bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet Input and Output Modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide Field Power. If the extension is attached directly to an Isys Micro Manifold, Field Power can be supplied directly by using the 24VDC Connector option.



Isysnet Communication Module with 24VDC and Bus Extension Connectors and I/O Modules

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. In this configuration, bus power and field power are supplied to the input and output modules. The communication module only supplies bus power to the Valve Driver Module, as the 24VDC Connector separates the Field Power from the rest of the network. This secondary 24VDC connector on the Valve Driver Module supplies field power to the valves, and can be wired into an Emergency Stop Circuit. The Bus Extension Connector carries bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet input and output modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide field power. If the extension is attached directly to an Isys Micro Manifold with 24VDC Connector, field power can be supplied directly by using the 24VDC Connector option.



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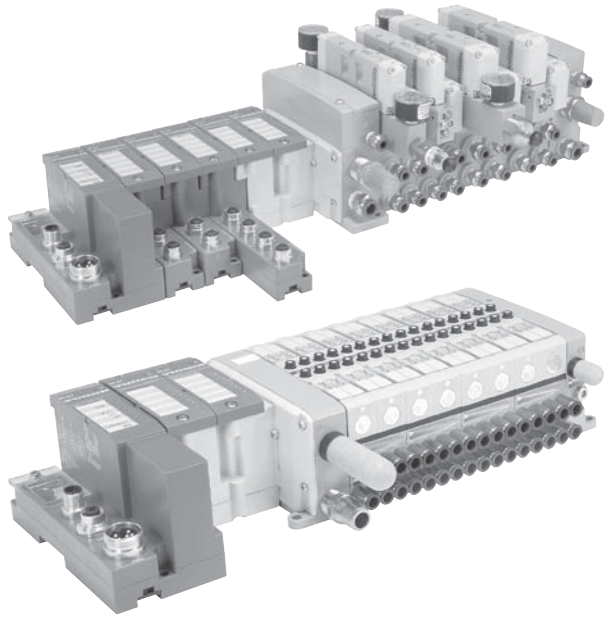
The Turck Fieldbus System

Isysnet has four major components:

- **Valve driver module** provide control for either 16 or 32 solenoids on a manifold
- **I/O modules** provide the field interface and system-interface circuitry
- **Communication modules** provide the network-interface circuitry
- **Power distribution module** provide 5 additional power inputs to the Turck system



Turck Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED and electronic)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Channel-level short-circuit detection with electronic feedback
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Communication Modules

CANopen	**BL67-GW-CO**
CANopen with power over network	**BL67-GW-CO-T**
DeviceNet with power over network	**BL67-GW-DN**
Profibus DP	**BL67-GW-DPV1**
Modbus / TCP communication module	**BL67-GW-EN**
Ethernet / IP communication module	**BL67-GW-EN-IP**
Profinet communication module	**BL67-GW-EN-PN**
Modbus / TCP communication module with DeviceNet subnet	**BL67-GW-EN-DN**
Ethernet / IP communication module with DeviceNet subnet	**BL67-GW-EN-IP-DN**

Programmable Communication Modules

Profibus DP	**BL67-PG-DP**
Modbus / TCP communication module	**BL67-PG-EN**
Ethernet / IP communication module	**BL67-PG-EN-IP**
Modbus / TCP communication module with DeviceNet subnet	**BL67-PG-EN-DN**
Ethernet / IP communication module with DeviceNet subnet	**BL67-PG-EN-IP-DN**

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Digital Input Modules

	I/O modules	Voltage	Part number
	8 PNP input module	7 to 30 VDC	**BL67-8DI-P**
	8 PNP input module, with diagnostics	7 to 30 VDC	**BL67-8DI-PD**
	8 NPN input module	24 VDC	**BL67-8DI-N**

	Base module	Part number
	8 x M8, 3 pole, female	**BL67-B-8M8**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12-P**
	1 x M23, 12 pole, female	**BL67-B-1M23**

I/O modules	Voltage	Part number
4 PNP input module	7 to 30 VDC	**BL67-4DI-P**
4 PNP input module, with diagnostics	7 to 30 VDC	**BL67-4DI-PD**
4 NPN input module	24 VDC	**BL67-4DI-N**

	Base module	Part number
	4 x M8, 3 pole, female	**BL67-B-4M8**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12-P**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	1 x M23, 12 pole, female	**BL67-B-1M23**

Digital Output Modules

	I/O modules	Output current	Part number
	8 PNP output module	0.5 amps per channel	**BL67-8DO-0.5A-P**
	8 NPN output module	0.5 amps per channel	**BL67-8DO-0.5A-N**

	Base module	Part number
	8 x M8, 3 pole, female	**BL67-B-8M8**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12-P**
	1 x M23, 12 pole, female	**BL67-B-1M23**

I/O modules	Output Current	Part number
4 PNP output module	0.5 amps per channel	**BL67-4DO-0.5A-P**
4 PNP output module	2 amps per channel	**BL67-4DO-2A-P**
4 PNP output module	4 amps per channel	**BL67-4DO-4A-P**
4 NPN output module	2 amps per channel	**BL67-4DO-2A-N**

	Base module	Part number
	4 x M8, 3 pole, female	**BL67-B-4M8**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12-P**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	1 x M23, 12 pole, female	**BL67-B-1M23**

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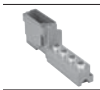
Digital Output Modules

I/O modules	Output current	Part number
16 PNP output module	0.14 amps per channel	**BL67-16DO-0.1A-P**

	Base module	Part number
	1 x M23, 19 pole, female	**BL67-B-1M23-19**

Relay Output Modules

I/O modules	Output current	Part number
8 normally open relays	0.14 amps per channel	**BL67-8DO-R-NO**

	Base module	Part number
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12-P**

Analog Input Modules

I/O modules	Input type	Part number
4 configurable current or voltage analog input module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	**BL67-4AI-V/I**

	Base module	Part number
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**

I/O modules	Input type	Part number
2 Current analog input module	4 to 20 mA or 0 to 20 mA	**BL67-2AI-I**
2 Voltage analog input module	-10 to +10 VDC or 0 to +10 VDC	**BL67-2AI-V**
2 Temperature analog input module	PT100, PT200, PT500, PT1000, Ni100, Ni1000	**BL67-2AI-PT**
2 Temperature analog input module	Type B, E, J, K, N R, S, T	**BL67-2AI-TC**

	Base module	Part number
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12**

Combination Input / Output Modules

I/O modules	Input voltage & output current	Part number
4 PNP output 4 PNP input module, with diagnostics	7 to 30 VDC 0.5 Amps	**BL67-4DI4DO-PD**
8 PNP configurable input or output module, with diagnostics	7 to 30 VDC 0.5 Amps	**BL67-8XSG-PD**

	Base module	Part number
	8 x M8, 3 pole, female	**BL67-B-8M8**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12P**

Analog Output Modules

I/O modules	Input type	Part number
4 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	**BL67-4AO-V**

	Base module	Part number
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**

I/O modules	Input type	Part number
2 Current analog output module	4 to 20 mA or 0 to 20 mA	**BL67-2AO-I**
2 Voltage analog output module	-10 to +10 VDC or 0 to +10 VDC	**BL67-2AO-V**

	Base module	Part number
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12**

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Combination Analog Input / Output Modules

I/O modules	Output current	Part number
4 configurable input and 4 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	**BL67-4AI4AO-V/I**

	Base module	Part number
	8 x M8, 3 pole, female	**BL67-B-8M8**
	4 x M12, 5 pole, female, A-code	**BL67-B-4M12**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12-8-P**

I/O modules	Output current	Part number
2 onfigurable input and 2 configurable output current or voltage analog module	4 to 20 mA or 0 to 20 mA -10 to +10 VDC or 0 to +10 VDC	**BL67-2AI2AO-V/I**

	Base module	Part number
	8 x M8, 3 pole, female	**BL67-B-8M8**
	2 x M12, 8 pole, female, A-code	**BL67-B-2M12-8**
	2 x M12, 5 pole, female, A-code	**BL67-B-2M12-8-P**

CANopen Subnet Module

Extender module	Capacity	Part number
1 CANopen connection	64 bits of inputs or outputs	**BL67-1CVI**

	Base module	Part number
	1 x M12, 5 pole, female, A-code	**BL67-B-1M12**

Serial Interface Module

Extender module	Capacity	Part number
1 RS232 serial interface	300 to 115200 bps	**BL67-1RS232**
1 RS485 or 422 serial interface	300 to 115200 bps	**BL67-1RS485/422**

	Base module	Part number
	1 x M12, 5 pole, female, A-code	**BL67-B-1M12**
	1 x M12, 8 pole, female, A-code	**BL67-B-1M12-8**
	1 x M23, 12 pole, female	**BL67-B-1M23**

Power Extender Module

Extender module	Current capacity	Part number
24 VDC field power module	10 amps input	**BL67-PF-24VDC**

	Base module	Part number
	5 Pole mini connector to supply bus power and field power	**BL67-B-1RSM**
	5 Pole mini connector to field power only	**BL67-B-1RSM-VO**
	4 Pole mini connector to supply bus power and field power	**BL67-B-1RSM-4**

SSI and Counting Modules

Extender module	Capacity	Part number
1 SSI sensor interface	65 kbps up to 1 Mbps	**BL67-1SSI**
1 counter interface	Up to 250 kHz	**BL67-1CNT/ENC**

	Base module	Part number
	1 x M12, 8 pole, female, A-code	**BL67-B-1M12-8**
	1 x M23, 12 pole, female	**BL67-B-1M23**

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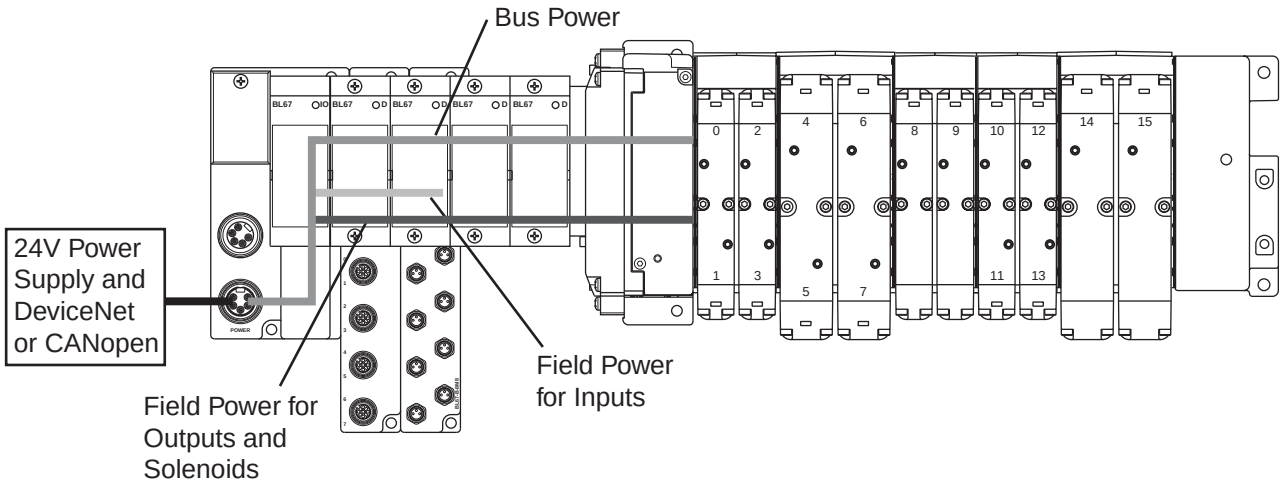
Power Distribution Options for Turck Fieldbus

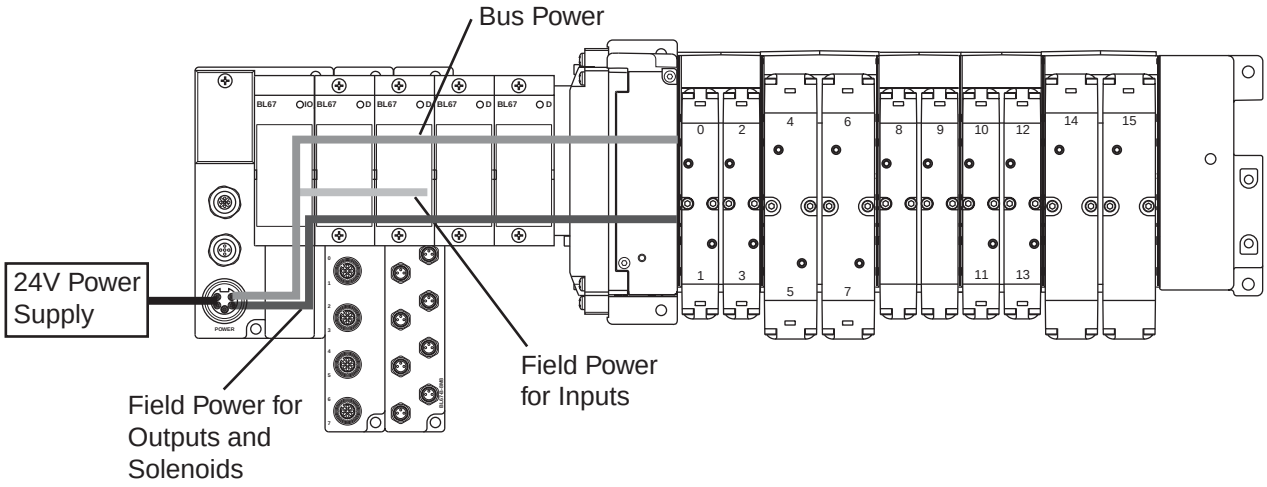
Turck Communication and I/O Modules - DeviceNet and CANopen, Power over Network

The 24VDC power supply pins from the DeviceNet or CANopen network connection on the communication module provides a single power circuit. This circuit provides 1.5 A bus power, 4 A field power for inputs and 8A field power for outputs.



Turck Communication and I/O Modules - Ethernet/IP, Modbus/TCP, Profinet, Profibus, and CANopen

An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5 A bus power and 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.



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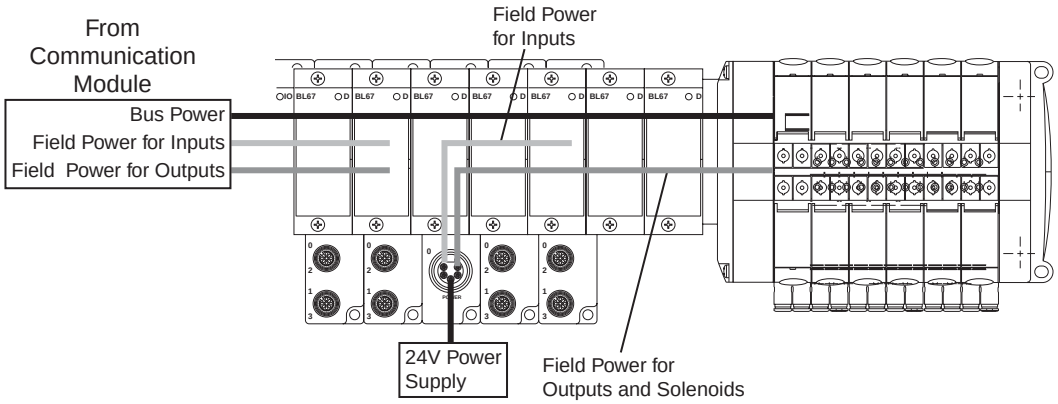
Power Distribution Options for Turck Fieldbus

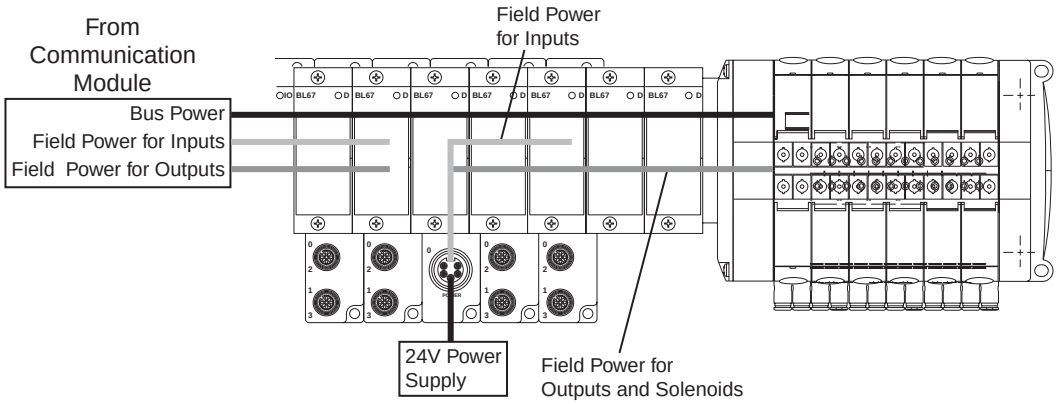
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM

This configuration creates an auxiliary 24VDC power supply and provides power across two separate circuits, regardless of the communication module used. The first circuit provides 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



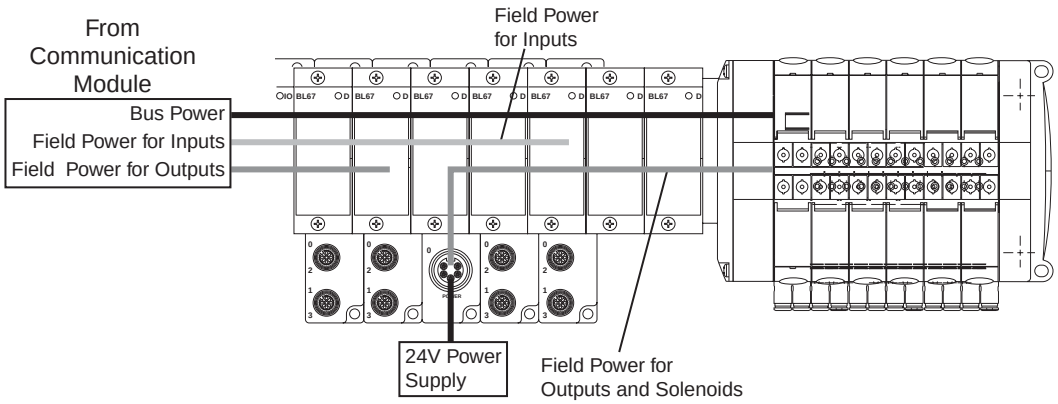
24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 4 A field power for inputs and 10A field power for outputs. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power and 4 A field power for inputs are uninterrupted, and are still supplied from the communication module.



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7/8" Mini Power Cables

Description	Part number
4 pin female to flying lead cable, TPE	**RKM 46-xM/S1587**
5 pin female to flying lead cable, TPE	**RKM 56-xM/S1587**
4 pin male to female cable, TPE	**RSM RKM 46-x/S1587**
5 pin male to female cable, TPE	**RSM RKM 56-x/S1587**
4 pin right angle female to flying lead cable, TPE	**WKM 46-xM/S1587**
5 pin right angle female to flying lead cable, TPE	**WKM 56-xM/S1587**

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Power Tee

Description	Part number
4 pin Male to 2 female sockets	**RSM-2RKM 40**
5 pin Male to 2 female sockets	**RSM-2RKM 50**

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	**RKC 4.4T-***
4 pin male to flying lead cable, PVC	**RSC 4.4T-***
4 pin male to female cable, PVC	**RKC 4.4T-*-RSC 4.4T**
5 pin female to flying lead cable, TPE	**RKC 4.5T-*/S1587**
5 pin male to flying lead cable, TPE	**RSC 4.5T-*/S1587**
5 pin male to female cable, TPE	**RKC 4.5T-*-RSC 4.5T/S1587**

Where * = 1, 2, 3, 4 meter standard lengths

M8 Cables

Description	Part number
3 pin female to flying lead cable, PUR	**PKG 3M-*M/S90**
3 pin male to flying lead cable, PUR	**PSG 3M-*M/S90**
3 pin male to female cable, PUR	**PKG 3M-*M-PSG 3M/S90**

Where * = 1, 2, 3, 4 meter standard lengths

M23 Cables

Description	Part number
12 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	**CSCM CKCM 12-11-x/S90**
19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus.	**CSM CKM 19-19-x/S90**
19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for turck fieldbus.	**CSWM CKWM 19-19-x/CS12852**

Where x = 1, 2, 3, 4 meter standard lengths

Profibus Cables

Description	Part number
M12 Male to M12 Female, PUR	**RSSW RKSW 455-xM**

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

M12 A-code Cables

Description	Part number
4 pin female to flying lead cable, PVC	**RKC 4.4T-***
4 pin male to flying lead cable, PVC	**RSC 4.4T-***
4 pin male to female cable, PVC	**RKC 4.4T-*-RSC 4.4T**
5 pin female to flying lead cable, TPE	**RKC 4.5T-*/S1587**
5 pin male to flying lead cable, TPE	**RSC 4.5T-*/S1587**
5 pin male to female cable, TPE	**RKC 4.5T-*-RSC 4.5T/S1587**

Where * = 1, 2, 3, 4 meter standard lengths

Profibus Terminating Resistor

Description	Part number
M12 male pin terminating resistor	**P8BPA00MB**

Ethernet Cables

Description	Part number
M12 female to M12 male, PUR	**RSSD RKSD 443-xM**
RJ45 to M12 male, PUR	**RSSD RJ45S 443-xM**

Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

DeviceNet and CANopen Cables

Description	Part number
7/8" mini male to 7/8" mini female, PUR	**RSM RKM 5711-xM**
7/8" mini male to M12 female, PUR	**RSM RKC 5711-xM**
M12 male to M12 female, PUR	**RSC RKC 5711-xM**
M12 male to 7/8" mini female, PUR	**RSC RKM 5711-xM**

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

Bus Power Tee

Description	Part number
Bus power tee	**RSM RKM 57 WSM 40 PST**

For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

DeviceNet and CANopen Terminating Resistor

Description	Part number
7/8" Mini Male Pin Terminating Resistor	**RSM 57-TR2**
M12 Male Pin Terminating Resistor	**P8BPA00MA**

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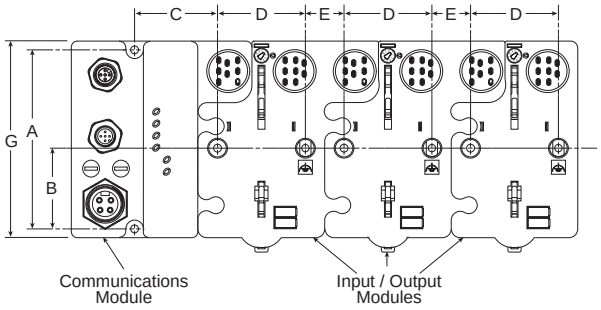
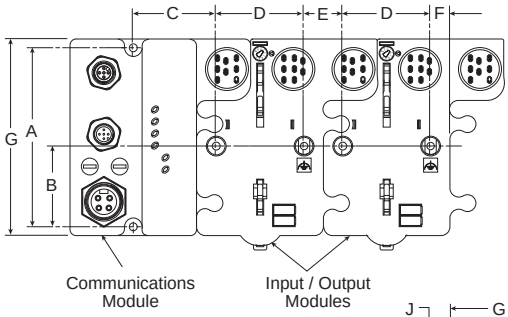
Isysnet with Isys ISO Valves





Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)

E	F	G
.87 (22)	.43 (11)	4.41 (112)

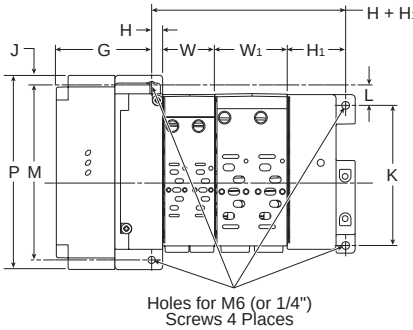
Inches (mm)

HB - HA Dimensions

G	H	H1	J	K
2.68 (68)	.33 (8.4)	1.80 (45.8)	.15 (4)	4.32 (110)

L	M	P	W	W1
.63 (16)	5.39 (137)	5.98 (152)	1.61 (40.8)	2.24 (56.8)

Inches (mm)



n = Number of 18mm HB Bases
n1 = Number of 26mm HA Bases
W= Width of 18mm HB Bases
W1 = Width of 26mm HA Bases

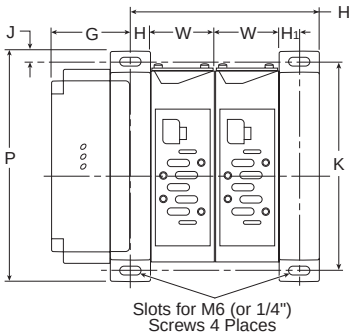
HB - HA Manifold Assembly

H1 Dimensions

G	H	H1	J	K
2.20 (56)	.63 (15.9)	.63 (15.9)	.33 (8.5)	6.50 (165)

P	W
7.17 (182)	1.93 (49)

Inches (mm)



n = Number of H1 Bases
W= Width of H1 Bases

H1 Manifold Assembly

H2 Dimensions

G	H	H1	J	K
2.28 (58)	.71 (18)	.59 (15)	.47 (12)	8.46 (215)

P	W
9.41 (239)	2.20 (56)

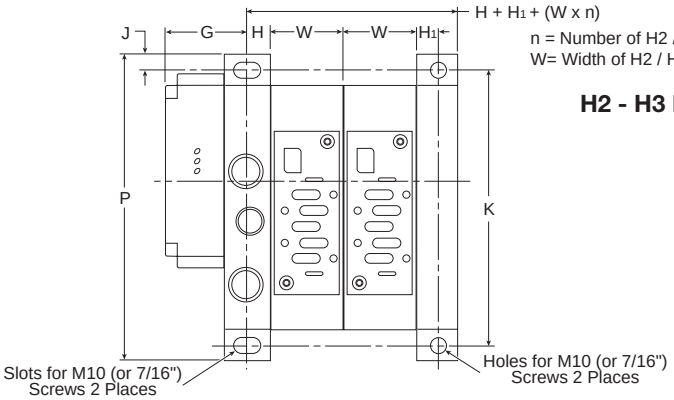
Inches (mm)

H3 Dimensions

G	H	H1	J	K
2.52 (64)	.94 (24)	.65 (16.5)	.59 (15)	10.43 (265)

P	W
11.61 (295)	2.80 (71)

Inches (mm)



n = Number of H2 / H3 Bases
W= Width of H2 / H3 Bases

H2 - H3 Manifold Assembly

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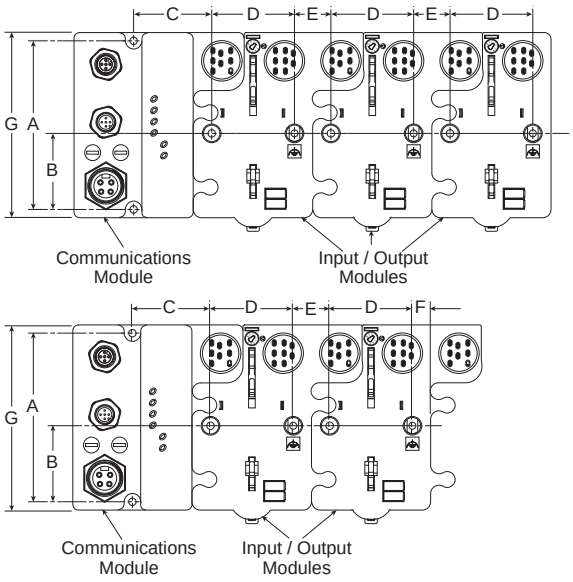
Isysnet with Isys Micro Valves



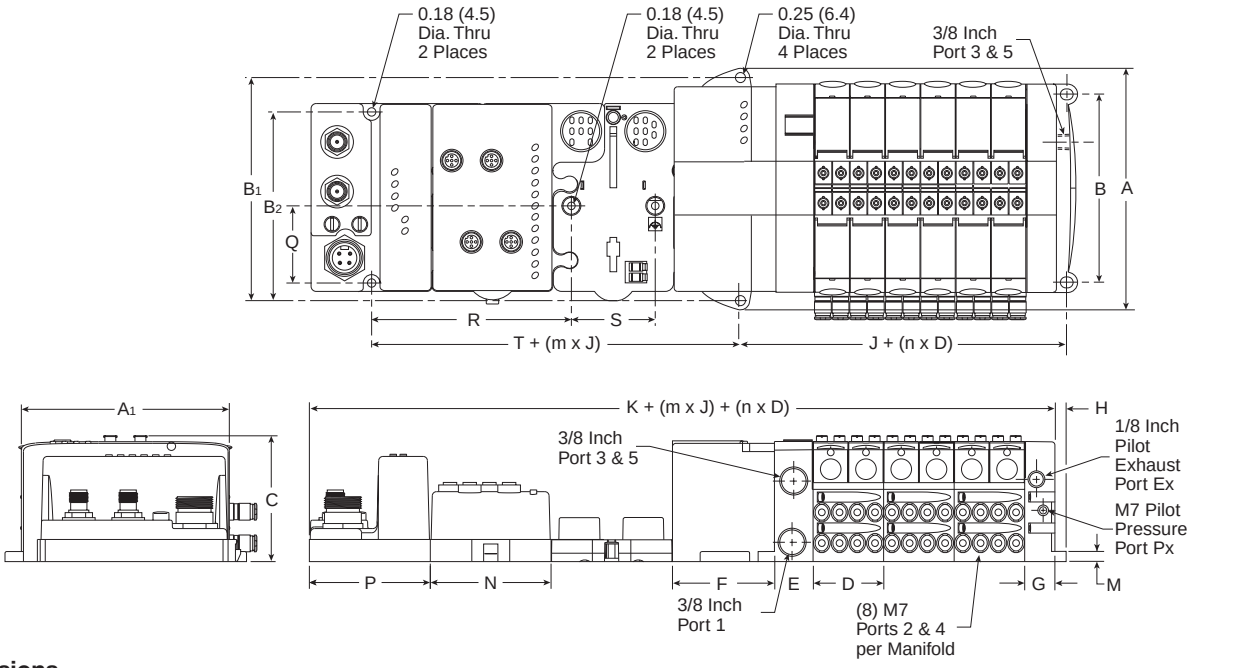
Dimensions

A	B	C	D
4.00 (102)	1.80 (46)	1.90 (48)	2.00 (50)

E	F	G
.87 (22)	.43 (11)	4.41 (112)

Inches (mm)

Isys Micro Manifold Assembly



Dimensions

A	A1	B	B1	B2	C	D	E	F	G
5.67 (144.0)	4.88 (124.0)	4.41 (112.0)	5.24 (133.0)	4.02 (102.0)	2.95 (75.0)	1.65 (42.0)	0.91 (23.0)	2.40 (61.0)	0.71 (18.0)

H	J	K	M	N	P	Q	R	S	T
0.49 (12.5)	2.72 (69.0)	7.32 (186.0)	0.24 (6.1)	2.83 (72.0)	2.83 (72.0)	1.81 (46.0)	4.72 (120.0)	2.01 (51.0)	2.01 (51.0)

Inches (mm)

n = Number of Manifolds
m = Number of Modules

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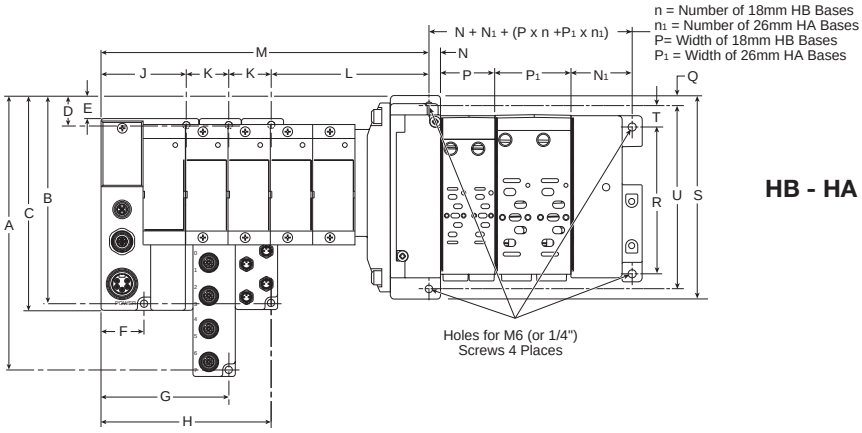
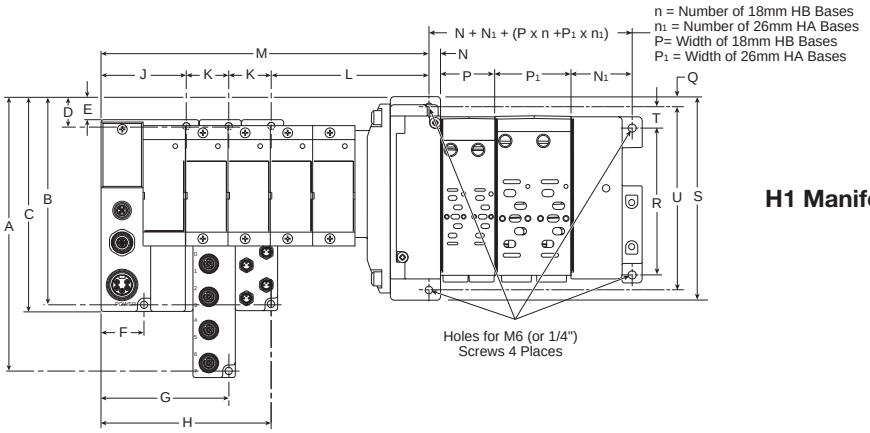
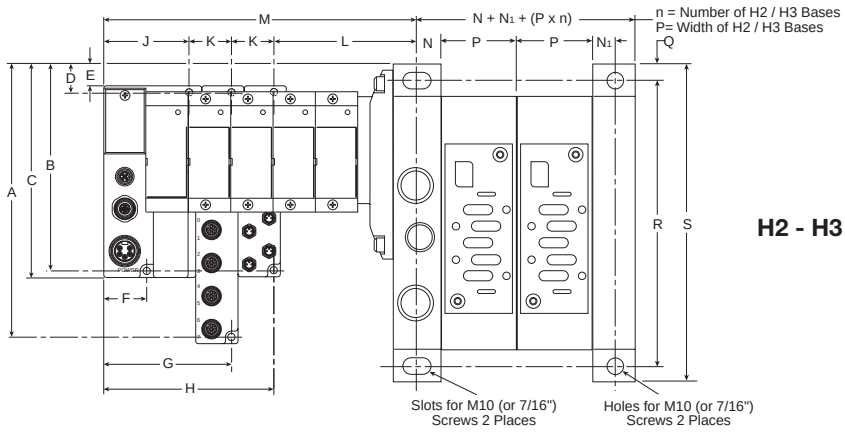
Turck with Isys ISO Valves



HB - HA Manifold Assembly



H1 Manifold Assembly



H2 - H3 Manifold Assembly

Dimensions

	A	B	C	D	E	F	G	H	J	K	L	M	N	N1	P	P1	Q	R	S	T	U
HA / HB	8.05 (204.5)	6.08 (154.5)	6.28 (159.5)	0.75 (19.5)	0.57 (14.5)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.75 (120.8)	See note 1	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	8.53 (216.7)	6.56 (166.7)	6.76 (171.7)	1.25 (31.7)	1.05 (26.7)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.27 (108.5)	See note 1	.63 (15.9)	.63 (15.9)	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	8.38 (212.9)	6.41 (162.9)	6.61 (167.9)	1.10 (27.9)	.90 (22.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.26 (108.6)	See note 1	.71 (18)	.59 (15)	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	8.62 (218.9)	6.65 (168.9)	6.85 (173.9)	1.33 (33.9)	1.14 (28.9)	1.28 (32.5)	3.79 (96.5)	5.06 (128.5)	2.53 (64.5)	1.26 (32)	4.59 (116.6)	See note 1	.94 (24)	.65 (16.5)	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Note 1: M =J+L+n_2xK, where n_2 = Number of Turck input / output modules
Inches (mm)

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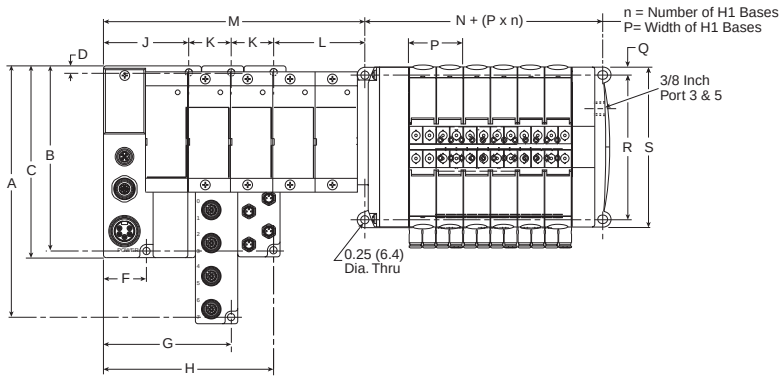
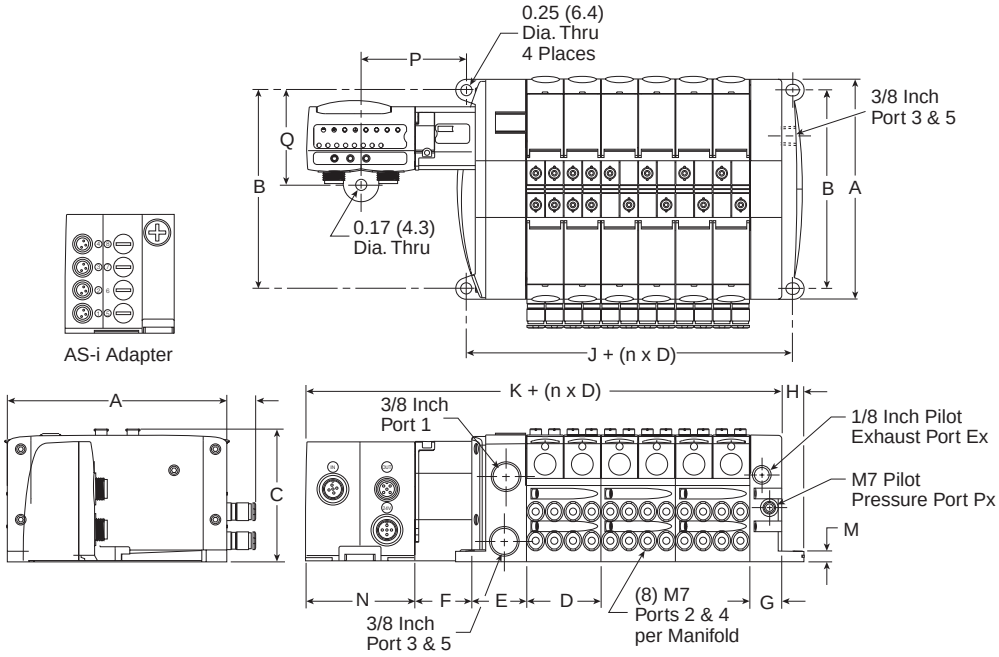


Dimensions

A	B	C	D	F	G	H	J	K	L	M	N	P	Q	R	S
7.48	5.51	5.71	0.20	1.28	3.79	5.06	2.53	1.26	2.54	See	2.28	1.65	.19	4.41	4.88
(190)	(140)	(145)	(5)	(32.5)	(96.5)	(128.5)	(64.5)	(32)	(64)	note 1	(58)	(42)	(4.9)	(112)	(124)

Note 1: M =J+L+n_2xK, where n_2 = Number of Turck input / output modules
Inches (mm)

Moduflex Adapter, Side Ported



n = Number of Manifolds

Dimensions

A	B	C	D	E	F	G	H	J	K	M	N	P	Q
4.88	4.41	2.95	1.65	1.22	1.28	0.71	0.49	2.28	6.10	0.24	2.40	2.36	2.07
(124.0)	(112.0)	(75.0)	(42.0)	(31.0)	(32.5)	(18.0)	(12.5)	(58.0)	(155.0)	(6.1)	(61.0)	(60.0)	(52.5)

Inches (mm)

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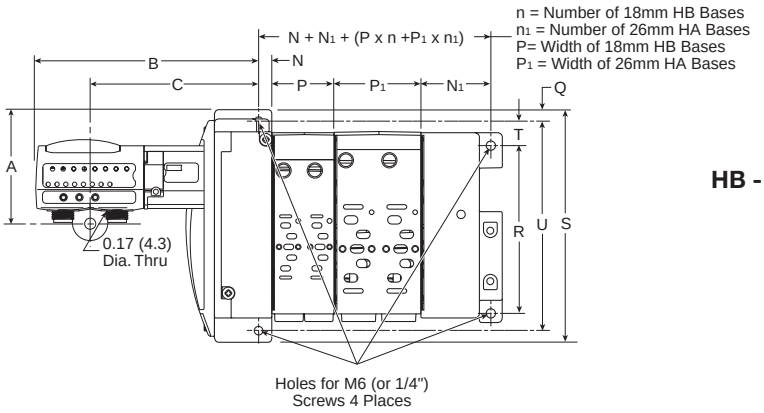
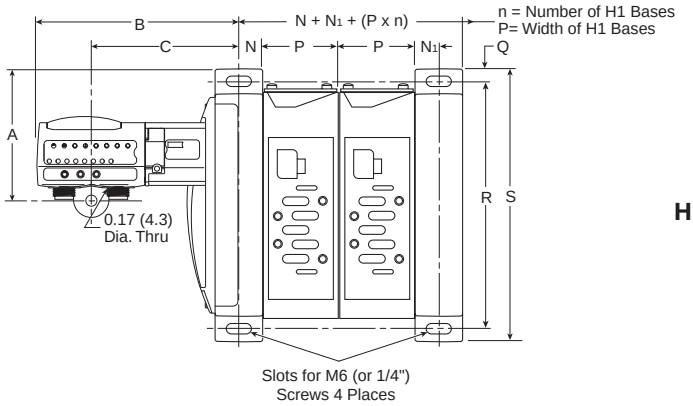
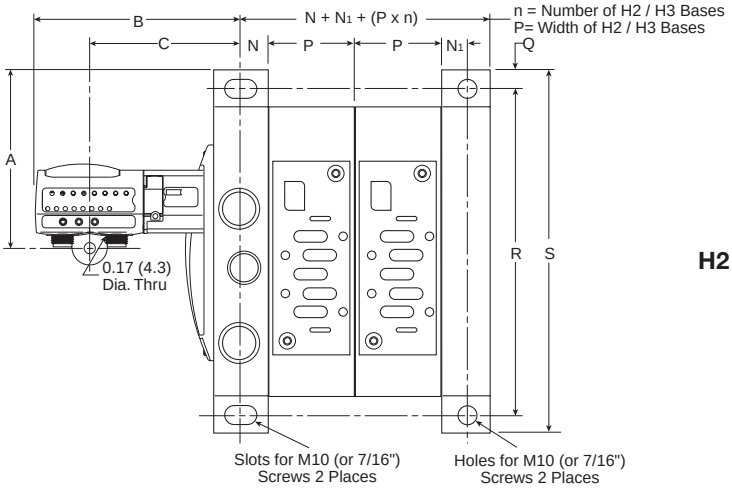
Moduflex with Isys ISO Valves



HB - HA Manifold Assembly



H1 Manifold Assembly



H2 - H3 Manifold Assembly

Dimensions

	A	B	C	N	N1	P	P1	Q	R	S	T	U
HA / HB	2.75 (69.8)	5.61 (142.5)	4.40 (111.8)	.33 (8.4)	1.80 (45.8)	1.61 (40.8)	2.24 (56.8)	.15 (4)	4.32 (110)	5.98 (152)	.63 (16)	5.39 (137)
H1	3.23 (82)	5.13 (130.2)	6.33 (160.9)	.63 (15.9)	.63 (15.9)	1.93 (49)	—	.33 (8.5)	6.50 (165)	7.17 (182)	—	—
H2	3.08 (78.2)	5.13 (130.3)	6.34 (161)	.71 (18)	.59 (15)	2.20 (56)	—	.47 (12)	8.46 (215)	9.41 (239)	—	—
H3	3.31 (84.2)	5.44 (138.2)	6.65 (168.9)	.94 (24)	.65 (16.5)	2.80 (71)	—	.59 (15)	10.43 (265)	11.61 (295)	—	—

Inches (mm)

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The ISOMAX range of directional control valves complies with ISO 15407-1 and VDMA 24563 for sizes 02 and 01 and ISO 5599-1 for sizes 1, 2 and 3. ISOMAX provides flows from 0.55 Cv to 4.15 Cv.

The ISOMAX range includes valves for pneumatic and electrical actuation with a wide choice of subbases and manifolds to suit different application needs.

All ISOMAX products use high-tech ceramic switching technology providing:

Excellent reliability
- Long life in excess of 100 million operations*
- Operates with lubricated or non-lubricated air
- Low sensitivity to air quality changes

High performance
- Slide valve concept allows high flow / size ratio and short response time due to short slide stroke and low friction

Stable long lasting performances
- Low friction switching: minimum wear of the valve member / seal assembly

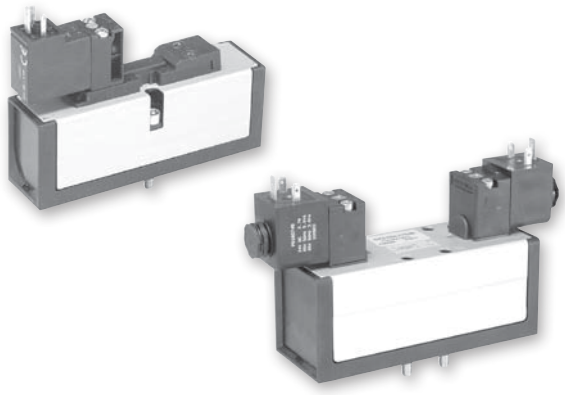
Valves fitted with switchable selector to give internal or external pilot supply

Corrosion free and modern design

Vacuum operation

Dual pressure

* Refer to our warranty conditions.



Operating information

Operating Pressure: Vacuum to 145 PSIG (10 bar)

Function		M.O.P (PSIG)
20, 21, 22, 23	2-Position, spring return	36
50, 51, 53, 54	2-Position, air return	30
04, 05, 06, 08	2-Position	15
09, 11, 12, 27	3-Position, CE	45
16, 18, 19, 25	3-Position, APB	45

Working temperatures: -10°C to 60°C (14°F to 140°F)
Storage temperatures: -20°C to 70°C (-4°F to 158°F)

Materials

Valve members	Self lubricating acetal
Seat	Ceramic
Body	Polyamide reinforced fiberglass
Casing	Anodized aluminum
End plates	Painted zinc plated steel
Valve plate	Zinc
Seals	Nitrile
Springs	Stainless steel
Screws	Zinc plated steel
Function selector	Polyamide reinforced fiberglass
Top cover seals	Polyester

Most popular. For technical information see CD

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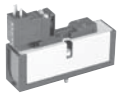
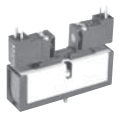
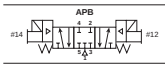
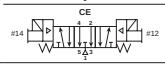
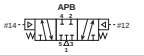
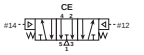
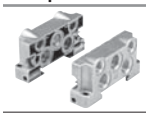
DX02 ISO Valves

	Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
		4-way, 2-position, spring return	0.55	Single solenoid	Internal	Non-locking	**DX02-621-951M**	**DX02-621-951J**
		4-way, 2-position, air return	0.55	Single solenoid	Internal	Non-locking	**DX02-651-951M**	**DX02-651-951J**
		4-way, 2-position	0.55	Double solenoid	Internal	Non-locking	**DX02-606-951M**	**DX02-606-951J**
		4-way, 3-position, all ports blocked	0.4	Double solenoid	Internal	Non-locking	**DX02-611-951M**	**DX02-611-951J**
		4-way, 3-position, center exhaust	0.4	Double solenoid	Internal	Non-locking	**DX02-616-951M**	**DX02-616-951J**

	Symbol	Type	Cv	Operator	Pilot	Part number
		4-way, 2-position, spring return	0.55	Single remote pilot	Remote	**DX02-421-60**
		4-way, 2-position, air return	0.55	Single remote pilot	Remote	**DX02-451-60**
		4-way, 2-position	0.55	Double remote pilot	Remote	**DX02-406-60**
		4-way, 3-position, all ports blocked	0.4	Double remote pilot	Remote	**DX02-411-60**
		4-way, 3-position, center exhaust	0.4	Double remote pilot	Remote	**DX02-416-60**

DX02 Series Subbase & Manifolds

Single subbase		1/8" NPT	1/8" BSPP
	Side ported base	**PL02-01-80**	**PL02-01-70**
2 Station manifold bases			
	End ported bases	1/8" NPT	1/8" BSPP
		PJLP02-201-80	**PJLP02-201-70**
End plate kit		1/8" NPT port	1/8" BSPP port
		**PEJ02-02-80**	**PEJ02-02-70**

Add-A-Fold Assembly Model Number

AA **02U** **0** **04**

Valve series	
Right & left end plate DX02	02U*

* For use with PJLP02 Manifolds.

Thread type	
NPT	0
BSPP "G"	1

Number of stations*
02
04
•
24
•
32

* Must be ordered in multiples of (2)

DX02 Series Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	2-60 PSIG w/ gauge	**PS5637155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5637166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5637255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5637266P**
Gauge adapter kit		Includes 1/8" coupling and long nipple		**PS5651160P**
Blanking plate kit				**PS5634P**
Sandwich supply module		1/8" NPT		**PS562600P**
		1/8" BSPP		**PS562601P**
Sandwich exhaust module		1/8" NPT		**PS562700P**
		1/8" BSPP		**PS562701P**
Intermediate air supply module		1/8" NPT		**D02P-01-80**
Sandwich flow control				**PS5642P**
Manifold to manifold gasket kits		Used with manifold PJLP02		**DX02M2MGSKT**
Manifold port isolation kits (main galley 1, 3, & 5)		For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.		**D02BD0**
Manifold hardware kit		Includes 10 bolts, 10 washers, 10 nuts		**Dx02m2mb**

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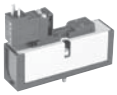
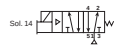
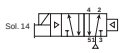
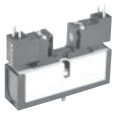
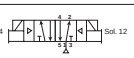
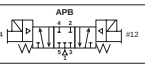
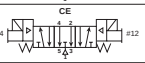
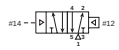
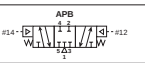
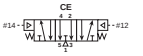
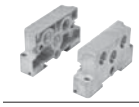
DX01 ISO Valves

	Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
		4-way, 2-position, spring return	0.75	Single solenoid	Internal	Non-locking	**DX01-621-951M**	**DX01-621-951J**
		4-way, 2-position, air return	0.75	Single solenoid	Internal	Non-locking	**DX01-651-951M**	**DX01-651-951J**
		4-way, 2-position	0.75	Double solenoid	Internal	Non-locking	**DX01-606-951M**	**DX01-606-951J**
		4-way, 3-position, all ports blocked	0.5	Double solenoid	Internal	Non-locking	**DX01-611-951M**	**DX01-611-951J**
		4-way, 3-position, center exhaust	0.5	Double solenoid	Internal	Non-locking	**DX01-616-951M**	**DX01-616-951J**

	Symbol	Type	Cv	Operator	Pilot	Part number
		4-way, 2-position, spring return	0.75	Single remote pilot	Remote	**DX01-421-60**
		4-way, 2-position, air return	0.75	Single remote pilot	Remote	**DX01-451-60**
		4-way, 2-position	0.75	Double remote pilot	Remote	**DX01-406-60**
		4-way, 3-position, all ports blocked	0.5	Double remote pilot	Remote	**DX01-411-60**
		4-way, 3-position, center exhaust	0.5	Double remote pilot	Remote	**DX01-416-60**

DX01 Series Subbase & Manifolds

		1/4" NPT	1/4" BSPP
Single subbase			
	Side ported base	**PL01-02-80**	**PL01-02-70**
2 Station manifold bases			
	End ported bases	1/4" NPT	1/4" BSPP
		PJLP01-202-80	**PJLP01-202-70**
End plate kit		1/4" NPT port	1/4" BSPP port
		**PEJ01-03-80**	**PEJ01-03-70**

Add-A-Fold Assembly Model Number

AA **01U** **0** **04**

Valve series	
Right & left end plate DX01	01U*

* For use with PJLP01 or PJL01 Manifolds.

Thread type	
NPT	0
BSPP "G"	1

Number of stations*
02
04
•
24
•
32

* Must be ordered in multiples of (2)

DX01 Series Accessories

Accessory		Description		Part number
Sandwich regulator		Common pressure	2-60 PSIG w/ gauge	**PS5537155P**
		Common pressure	5-125 PSIG w/ gauge	**PS5537166P**
		Independent pressure	2-60 PSIG w/ gauge	**PS5537255P**
		Independent pressure	5-125 PSIG w/ gauge	**PS5537266P**
Gauge adapter kit		Includes 1/8" coupling and long nipple		**PS5651160P**
Remote pilot access plate kit		1/4" NPT		**PS551500P**
		1/4" BSPP		**PS551501P**
Blanking plate kit				**PS5534P**
Sandwich supply module		1/4" NPT		**PS552600P**
		1/4" BSPP		**PS552601P**
Sandwich exhaust module		1/4" NPT		**PS552700P**
		1/4" BSPP		**PS552701P**
Intermediate air supply module		1/4" NPT		**D01P-02-80**
Sandwich flow control				**PS5542P**
Manifold to manifold gasket kits		Used with manifold PJLP02		**DX01M2MGSKT**
Manifold port isolation kits (main galley 1, 3, & 5)		For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings.		**D01BD0**
Manifold hardware kit		Includes 10 bolts, 10 washers, 10 nuts		**DX02M2MB**

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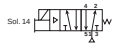
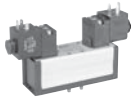
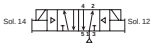
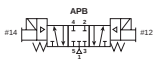
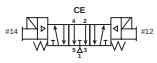
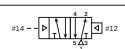
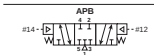
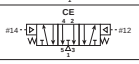
DX1 ISO Valves

	Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
		4-way, 2-position, spring return	1.15	Single solenoid	Internal	Non-locking	**DX1-621-BL49**	**DX1-621-BL53**
						Locking	**DX1-621-CL49**	**DX1-621-CL53**
		4-way, 2-position, air return	1.15	Single solenoid	Internal	Non-locking	**DX1-651-BL49**	**DX1-651-BL53**
						Locking	**DX1-651-CL49**	**DX1-651-CL53**
		4-way, 2-position	1.15	Double solenoid	Internal	Non-locking	**DX1-606-BL49**	**DX1-606-BL53**
						Locking	**DX1-606-CL49**	**DX1-606-CL53**
		4-way, 3-position, all ports blocked	0.75	Double solenoid	Internal	Non-locking	**DX1-611-BL49**	**DX1-611-BL53**
						Locking	**DX1-611-CL49**	**DX1-611-CL53**
		4-way, 3-position, center exhaust	0.75	Double solenoid	Internal	Non-locking	**DX1-616-BL49**	**DX1-616-BL53**
						Locking	**DX1-616-CL49**	**DX1-616-CL53**

	Symbol	Type	Cv	Operator	Pilot	Part number
		4-way, 2-position, spring return	1.15	Single remote pilot	Remote	**DX1-421-60**
		4-way, 2-position, air return	1.15	Single remote pilot	Remote	**DX1-451-60**
		4-way, 2-position	1.15	Double remote pilot	Remote	**DX1-406-60**
		4-way, 3-position, all ports blocked	0.75	Double remote pilot	Remote	**DX1-411-60**
		4-way, 3-position, center exhaust	0.75	Double remote pilot	Remote	**DX1-416-60**

DX1 Series Subbase & Manifolds

Single subbase	Description	3/8" NPT	3/8" BSPP
	Side ported base	**PS4011150CP**	**PS4011160CP**

Manifold bases		3/8" NPT	3/8" BSPP
	End ported bases	**PS4011550CP**	**PS4011560CP**
	Bottom / End ported bases	**PS4011650CP**	**PS4011660CP**

End plate kits		NPT port	BSPP port
	DX1 non-collective wiring end plates	**PS4031010CP**	**PS4031011CP**

5599-1, DX1 Accessories

Accessories		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4037166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4037266CP**
Remote pilot access plate kit		1/8" NPT		**PS401500CP**
		1/8" BSPP		**PS401501CP**
Blanking plate kit				**PS4034CP**
Sandwich flow control				**PS4042CP**
Manifold to manifold gasket kit				**PS4013P**
Manifold port isolation kits		Main galley (1, 3, 5)		**PS4032CP**
Manifold port isolation kits		Pilot galley		**PS4033CP**
Auxiliary access plate kit		1/4" & 3/8"	NPT	**PS403000CP**
			BSPP	**PS403001CP**

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How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.

   (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

Example: Application requires a 3-Station manifold.

Qty.	Part No.
1	AAH1S003
1	DX1-621-BL49..... Valve Station 1
1	PS4011550CP.....Base Station 1
1	DX1-616-BL49 ..... Valve Station 2
1	PS4011550CP.....Base Station 2
1	DX1-611-BL49 ..... Valve Station 3
1	PS4011550CP.....Base Station 3

AA H1 S 0 03 —

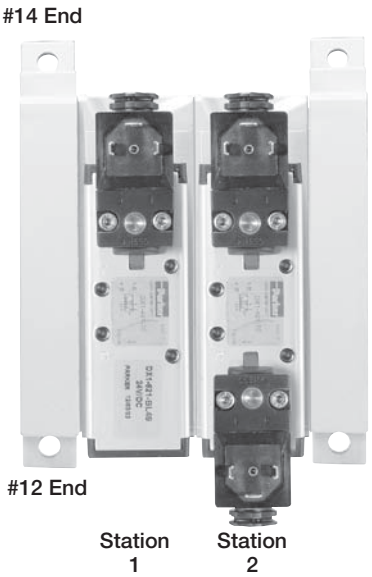
Valve series	
DX1, ISO Size 1	H1

End plate type	
Standard non-collective wiring	S

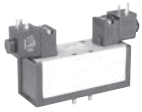
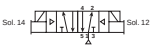
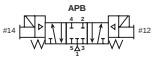
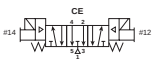
Port type	
NPT	0
BSPP "G"	1

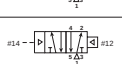
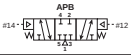
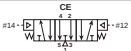
Number of stations*
01
•
•
•
24

Transition plate	
Blank	No transition plate
C	DX1 to DX2
D	DX1 to DX3



DX2 ISO Valves

	Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
		4-way, 2-position, spring return	2.5	Single solenoid	Internal	Non-locking	**DX2-621-BL49**	**DX2-621-BL53**
						Locking	**DX2-621-CL49**	**DX2-621-CL53**
		4-way, 2-position, air return	2.5	Single solenoid	Internal	Non-locking	**DX2-651-BL49**	**DX2-651-BL53**
						Locking	**DX2-651-CL49**	**DX2-651-CL53**
		4-way, 2-position	2.5	Double solenoid	Internal	Non-locking	**DX2-606-BL49**	**DX2-606-BL53**
						Locking	**DX2-606-CL49**	**DX2-606-CL53**
		4-way, 3-position, all ports blocked	2.4	Double solenoid	Internal	Non-locking	**DX2-611-BL49**	**DX2-611-BL53**
						Locking	**DX2-611-CL49**	**DX2-611-CL53**
		4-way, 3-position, center exhaust	2.4	Double solenoid	Internal	Non-locking	**DX2-616-BL49**	**DX2-616-BL53**
						Locking	**DX2-616-CL49**	**DX2-616-CL53**

	Symbol	Type	Cv	Operator	Pilot	Part number
		4-way, 2-position, spring return	2.5	Single remote pilot	Remote	**DX2-421-60**
		4-way, 2-position, air return	2.5	Single remote pilot	Remote	**DX2-451-60**
		4-way, 2-position	2.5	Double remote pilot	Remote	**DX2-406-60**
		4-way, 3-position, all ports blocked	2.4	Double remote pilot	Remote	**DX2-411-60**
		4-way, 3-position, center exhaust	2.4	Double remote pilot	Remote	**DX2-416-60**

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DX2 Series Subbase & Manifolds

Single subbase	Description	1/2" NPT	1/2" BSPP
	Side ported base	**PS4111170CP**	**PS4111180CP**

Manifold bases		1/2" NPT	1/2" BSPP
	Bottom / End ported bases	**PS4111670CP**	**PS4111680CP**
	Note: Manifolds include 2 pipe plugs		

End plate kits		NPT port	BSPP port
	H2 Non-collective wiring end plates	**PS4131010CP**	**PS4131011CP**

5599-1, DX2 Accessories

Accessories	Description		Part number
Sandwich regulator	Common pressure	5-125 PSIG w/ gauge	**PS4137166CP**
	Independent pressure	5-125 PSIG w/ gauge	**PS4137266CP**
Remote pilot access plate kit	1/8" NPT		**PS411500CP**
	1/8" BSPP		**PS411501CP**
Blanking plate kit			**PS4134CP**
Sandwich flow control			**PS4142CP**
Manifold to manifold gasket kit			**PS4113P**
Manifold port isolation kits	Main galley (1, 3, 5)		**PS4132CP**
Manifold port isolation kits	Pilot galley		**PS4033CP**

How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.

   (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

AA **H2** **S** **0** **03** **—**

Valve series	
DX2, ISO Size 2	H2

End plate type	
Standard non-collective wiring	S

Port type	
NPT	0
BSPP "G"	1

Number of stations
01
•
•
•
21

Transition plate	
Blank	No transition plate
C	DX1 to DX2
D	DX1 to DX3

Example: Application requires a 3-Station manifold.

Qty.	Part No.
1	AAH2S003
1	DX2-621-BL49 ..... Valve Station 1
1	PS4111570CP .....Base Station 1
1	DX2-616-BL49 ..... Valve Station 2
1	PS4111570CP .....Base Station 2
1	DX2-611-BL49 ..... Valve Station 3
1	PS4111570CP .....Base Station 3

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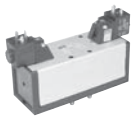
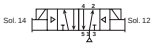
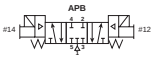
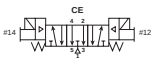
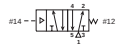
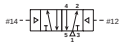
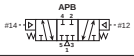
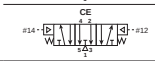
DX3 ISO Valves

	Symbol	Type	Cv	Operator	Pilot	Override	24 VDC	120 VAC
		4-way, 2-position, spring return	4.15	Single solenoid	Internal	Non-locking	**DX3-621-BL49**	**DX3-621-BL53**
						Locking	**DX3-621-CL49**	**DX3-621-CL53**
		4-way, 2-position, air return	4.15	Single solenoid	Internal	Non-locking	**DX3-651-BL49**	**DX3-651-BL53**
						Locking	**DX3-651-CL49**	**DX3-651-CL53**
		4-way, 2-position	4.15	Double solenoid	Internal	Non-locking	**DX3-606-BL49**	**DX3-606-BL53**
						Locking	**DX3-606-CL49**	**DX3-606-CL53**
		4-way, 3-position, all ports blocked	4.0	Double solenoid	Internal	Non-locking	**DX3-611-BL49**	**DX3-611-BL53**
						Locking	**DX3-611-CL49**	**DX3-611-CL53**
		4-way, 3-position, center exhaust	4.0	Double solenoid	Internal	Non-locking	**DX3-616-BL49**	**DX3-616-BL53**
						Locking	**DX3-616-CL49**	**DX3-616-CL53**

	Symbol	Type	Cv	Operator	Pilot	Part number
		4-way, 2-position, spring return	4.15	Single remote pilot	Remote	**DX3-421-60**
		4-way, 2-position, air return	4.15	Single remote pilot	Remote	**DX3-451-60**
		4-way, 2-position	4.15	Double remote pilot	Remote	**DX3-406-60**
		4-way, 3-position, all ports blocked	4.0	Double remote pilot	Remote	**DX3-411-60**
		4-way, 3-position, center exhaust	4.0	Double remote pilot	Remote	**DX3-416-60**

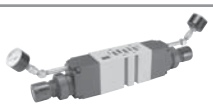
DX3 Series Subbase & Manifolds

Single subbase	Description	3/4" NPT	3/4" BSPP
	Side ported base	**PS4211170CP**	**PS4211180CP**

Manifold bases		3/4" NPT	3/4" BSPP
	Bottom / End ported bases	**PS4211690CP**	**PS4211600CP**
	Note: Manifolds include 2 pipe plugs		

End plate kits		NPT port	BSPP port
	H3 Non-collective wiring end plates	**PS4231010CP**	**PS4231011CP**

5599-1, DX3 Accessories

Accessories		Description		Part number
Sandwich regulator		Common pressure	5-125 PSIG w/ gauge	**PS4237166CP**
		Independent pressure	5-125 PSIG w/ gauge	**PS4237266CP**
Remote pilot access plate kit		1/8" NPT		**PS421500CP**
		1/8" BSPP		**PS421501CP**
Blanking plate kit				**PS4134CP**
Sandwich flow control				**PS4242CP**
Manifold to manifold gasket kit				**PS4213P**
Manifold port isolation kits		Main galley (1, 3, 5)		**PS4232CP**
Manifold port isolation kits		Pilot galley		**PS4033CP**

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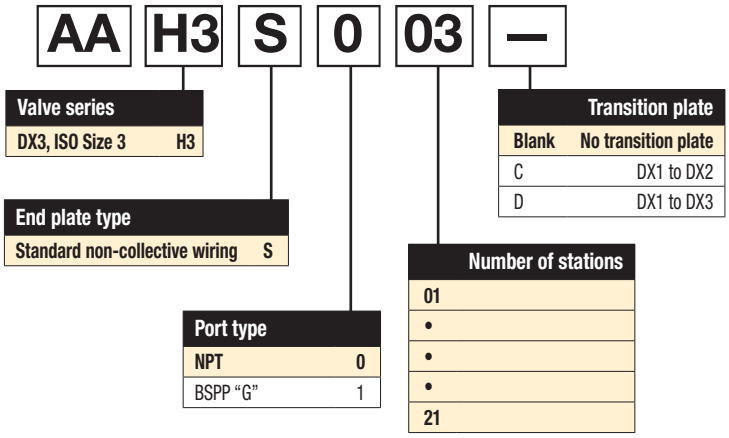
How To Order Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.

   (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example: Application requires a 3-Station manifold.

Qty.	Part No.	
1	AAH3S003	
1	DX3-621-BL49	Valve Station 1
1	PS4111590CP	Base Station 1
1	DX3-616-BL49	Valve Station 2
1	PS4111590CP	Base Station 2
1	DX3-611-BL49	Valve Station 3
1	PS4111590CP	Base Station 3

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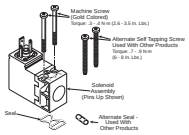
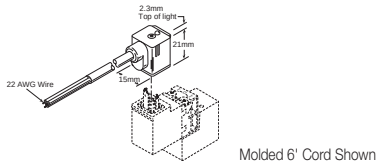
15mm 3-Pin DIN 43650C Replacement Solenoid Kits



Voltage	Non-locking	Locking
24VDC	**PS2982B49P**	**PS2982C49P**
110/50, 120/60	**PS2982B53P**	**PS2982C53P**

15mm 3-Pin DIN 43650C Connectors



Molded 6' Cord Shown

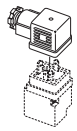
Description	Connector with 6' (2m) Cord	Connector
No Circuit Board	**PS2932JBP**	**PS2932BP**
Light – 24DC	**PS2946J79BP***	**PS294679BP**
Light – 110/120VAC	**PS2946J83BP***	**PS294683BP**

* LED with surge suppression.

Note: Max. ø6.5mm cable size required for connector without 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:
Conductors: 2 Poles Plus Ground
Cable Range (Connector Only): 4 to 6mm (0.16 to 0.24 Inch)
Contact Spacing: 8mm

Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



Description	Connector with 6' (2m) cord	Connector
Unlighted	**PS2028JCP**	**PS2028BP**
Light – 6-48V, 50/60Hz; 6-48VDC	**PS2032J79CP***	**PS203279BP**
Light – 120V/60Hz	**PS2032J83CP***	**PS203283BP**
Light – 240V/60Hz	**N/A**	**PS203283BP**

* With surge suppression.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

5599-1 CNOMO Solenoid Kits

Voltage code	3-pin, 30mm 'L' coil kit	2-pin, M12 Euro '6' coil kit
19	—	**PS2828619P**
42	**P2FCA442**	—
45	**P2FCA445**	—
49	**P2FCA449**	—
53	**P2FCA453**	—
57	**P2FCA457**	—

Quantity 1

CNOMO Operator Adapter

Description	Kit number
Operator Adapter	**PS2855P**

Manifold to Manifold Gasket Kits

	Size	Part number
	DX02*	**DX02M2MGSKT (PJLP02)**
	DX01*	**DX01M2MGSKT (PJLP01)**

* Gaskets used with PS5611 & PS5511 Manifolds.

Pilot Operator - CNOMO

Valve size		Kit number
DX1, DX2 & DX3	Locking	**PS4052CP**
	Non-locking	**PS4053CP**

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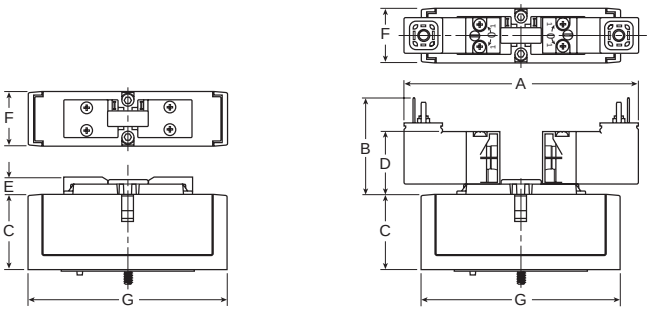
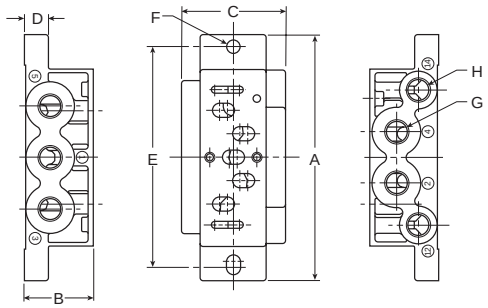
DX01 & DX02 Valve Dimensions



Series	A	B	C	D	E	F	G
DX02	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	.71 (18)	3.15 (80)
DX01	4.06 (103)	1.61 (41)	1.41 (36)	1.06 (27)	.31 (8)	1.02 (26)	3.94 (100)

Inches (mm)

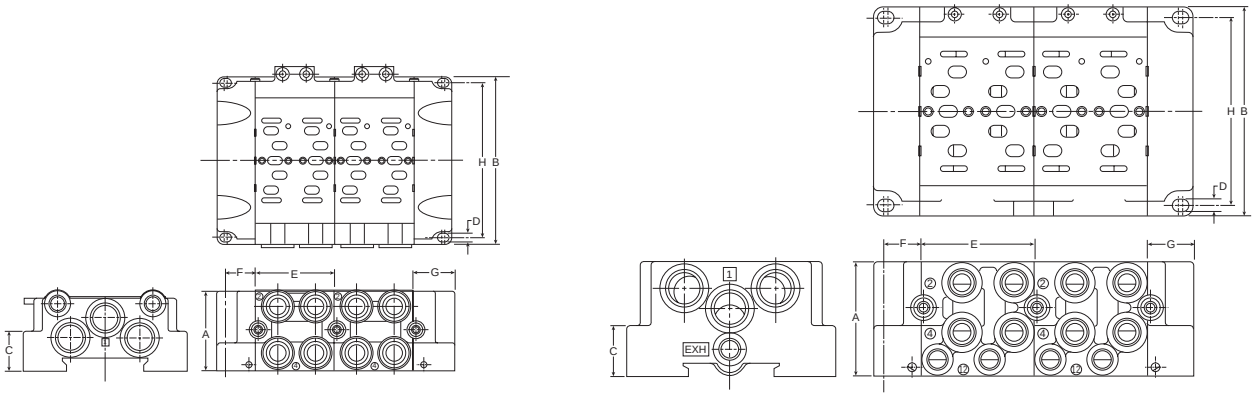
DX01 & DX02 Individual Subbase Dimensions



Series	Part number	A	B	C	D	E	F	G	H
DX02	**PL02**	3.15 (80)	.87 (22)	1.06 (27)	.31 (8)	2.76 (70)	.216 Dia. (Ø 5.5)	1/8	M5
DX01	**PL01**	3.94 (100)	1.10 (28)	1.65 (42)	.39 (10)	3.54 (90)	.216 Dia. (Ø 5.5)	1/4	1/8

Inches (mm)

DX01 & DX02 2-Station Manifold Base Dimensions



Series	Part number	A	B	C	D	E	F	G	H
DX02	**PJLP02 / PEJ02**	1.52 (38.5)	3.15 (80)	.47 (12)	.165 Dia. (Ø 4.2)	1.50 (38)	.55 (14)	.71 (18)	2.83 (72)
DX01	**PJL01 / PJLP01 / PEJ01**	2.17 (55)	3.94 (100)	.94 (24)	.216 Dia. (Ø 5.5)	2.13 (54)	.67 (17)	.87 (22)	3.54 (90)

Inches (mm)

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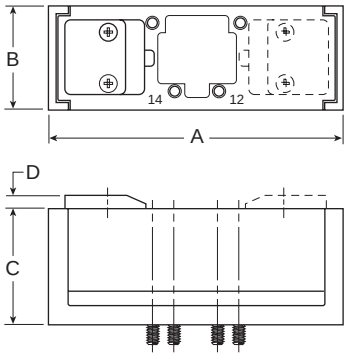
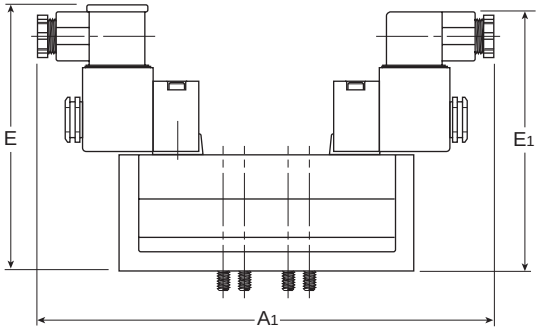
DX1, DX2 & DX3 Air Operated Valve Dimensions



Series	A	B	C	D
DX1	4.72 (120)	1.65 (42)	1.85 (47)	.20 (5)
DX2	5.51 (140)	2.13 (54)	2.30 (58.5)	.20 (5)
DX3	6.69 (170)	2.68 (68)	2.80 (71)	.20 (5)

Inches (mm)

DX1, DX2 & DX3 Solenoid Operated Valve Dimensions



Series	A_1	E	E_1	E_2
DX1	7.97 (202.5)	4.43 (112.5)	4.69 (119)	4.53 (115)
DX2	8.58 (218)	4.86 (123.5)	5.12 (130)	4.98 (126.5)
DX3	9.27 (235.5)	5.35 (136)	5.61 (142.5)	5.47 (139)

Inches (mm)

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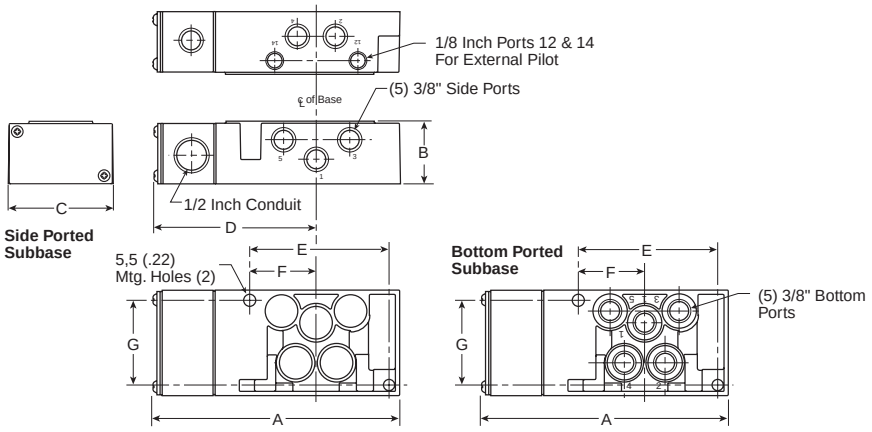
DX1 Subbase Dimensions

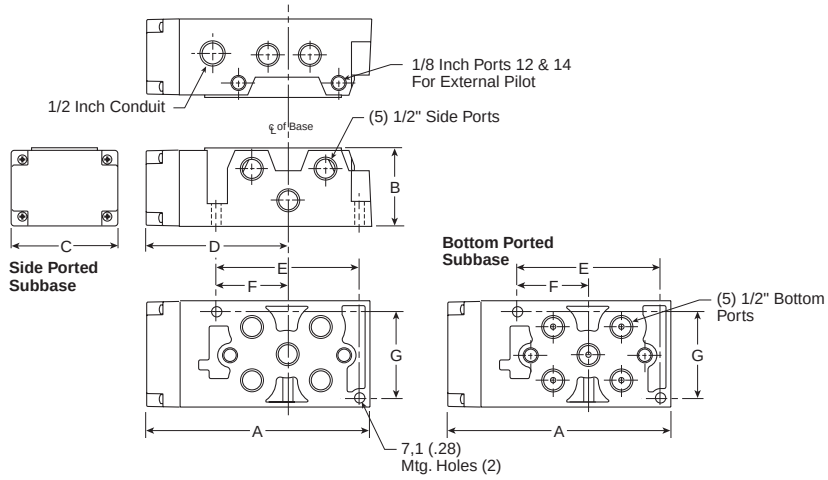


PS4011 Subbase

A	B	C	D
5.83 (148)	1.48 (38)	2.50 (64)	3.86 (98)
E	**F**	**G**	
3.29 (84)	1.57 (40)	2.00 (51)	

Inches (mm)

DX2 Subbase Dimensions

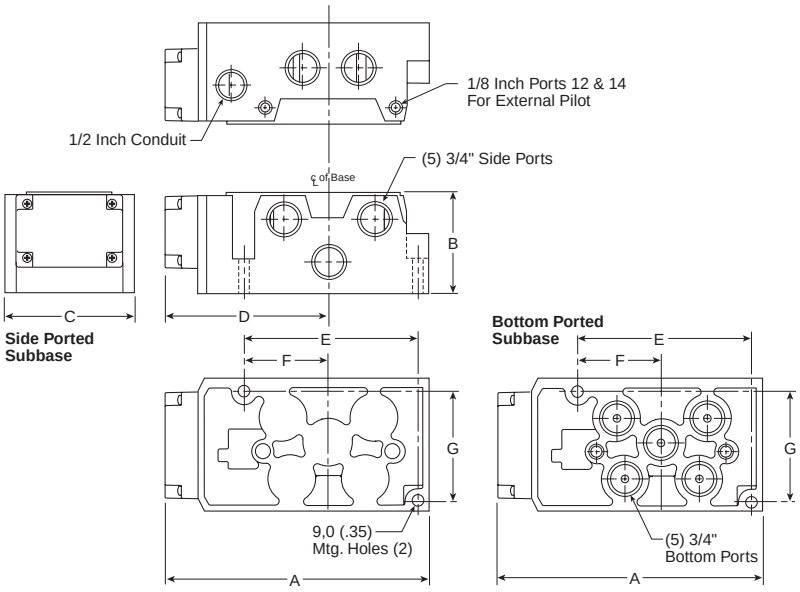


PS4111 Subbase

A	B	C	D
6.69 (170)	2.33 (59)	3.15 (80)	4.25 (108)
E	**F**	**G**	
4.21 (107)	2.07 (52)	2.56 (65)	

Inches (mm)

DX3 Subbase Dimensions



PS4211 Subbase

A	B	C	D
7.90 (201)	2.96 (75)	3.90 (990)	4.92 (125)
E	**F**	**G**	
5.14 (131)	2.50 (64)	3.24 (82)	

Inches (mm)

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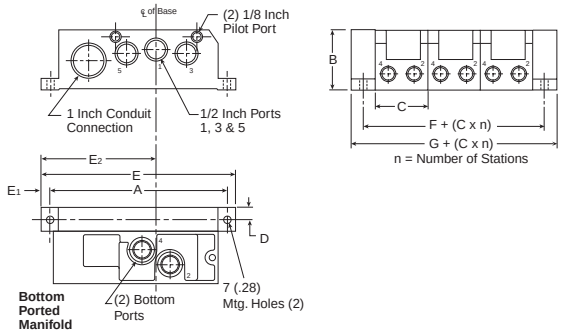
DX1 Manifold Dimensions



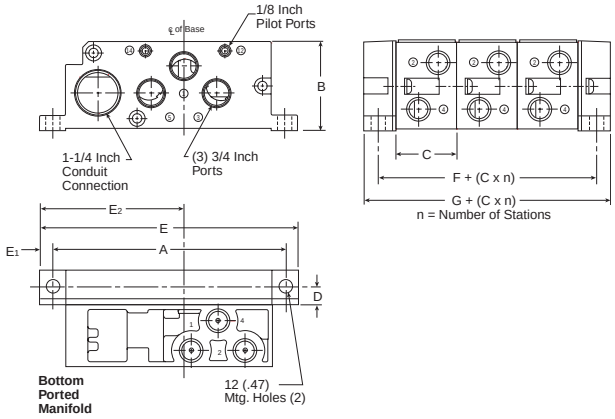
PS4011 Manifold

A	B	C	D	E
6.50 (165)	2.20 (56)	1.93 (49)	.44 (11)	7.15 (182)

E1	E2	F	G
.33 (8)	4.25 (108)	.87 (22)	1.80 (46)

Inches (mm)

DX2 Manifold Dimensions



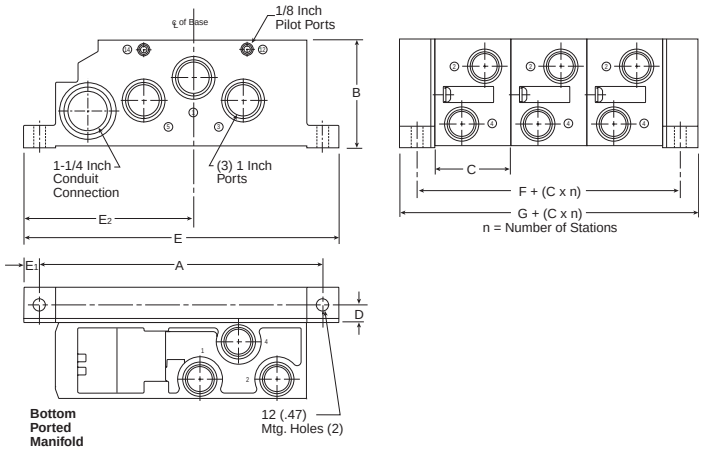
PS4111 Manifold

A	B	C	D	E
8.46 (215)	3.35 (85)	2.20 (56)	.59 (15)	9.41 (239)

E1	E2	F	G
.47 (12)	5.28 (134)	1.18 (30)	2.36 (60)

Inches (mm)

DX3 Manifold Dimensions



PS4211 Manifold

A	B	C	D	E
10.41 (265)	4.13 (105)	2.80 (71)	.65 (175)	11.61 (295)

E1	E2	F	G
.59 (15)	6.26 (159)	1.30 (33)	2.60 (63)

Inches (mm)

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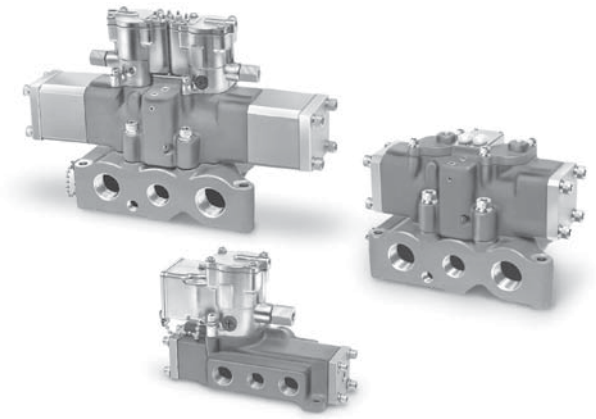
- Full air operation for fastest response.
- "Plug-In" option simplifies maintenance and installation. Reduces downtime. No wiring or plumbing to disturb.
- "Direct pipe" design for economy and performance.
- Variety of operators available; direct conduit, (JIC) junction box, NEMA 4, hazardous duty, (UL, CSA), and remote air pilot.
- Synthetic rubber o-ring seals are specially compounded for minimum compression and friction for superior wear and abrasion resistance.
- Precision ground spool "floats" on o-ring seals. Closed center cross-over design saves air.
- General Purpose Approvals
  - CSA - Canadian Standards Association File number 42024
- Hazardous Duty Approvals
  - UL - Underwriters Laboratories, Inc. File number E42542 Category Y107
  - CSA - Canadian Standards Association File number 24349



Materials

Valve bodies	Aluminum alloy	
Valve spool	Aluminum alloy with special coating on 3/8" basic valves	
	Hard chrome plated AISI type 416 stainless steel on 1/4" & 1/2" basic valves.	
Resilient seals: in valve body		
Dynamic	Polyurethane base on 3/8" basic valves*	
Static / dynamic	Nitrile base w / 12% Molybdenum Disulphide on 1/4" & 1/2" basic valves	
Other seals	Nitrile	
Shock pads	Polyurethane	
Valve spacers	Brass	
Manifolds & subbases	Aluminum alloy	
Solenoid bodies	Plated zinc alloy	
Internal components	Corrosion resistant steel	
Resilient seals	Standard Service	Nitrile
	Special Service (continuous duty)	Fluorocarbon & Silicone
Other seals	Nitrile	
Coil	Class "B" epoxy encapsulated (Class "H" also available on some models, consult supplier)	

* These materials are specially designed for valves used on non-lubricated service

Operating information

Pressure range for solenoid operated valves

Media	Internal pilot supply			External pilot supply			
	1/4"	3/8"	1/2"	1/4"	3/8"	1/2"	1"
Air	35-140* PSIG			N.A.	Main	0-250 PSIG	
					Pilot	35-140* PSIG	
Vacuum	do not use			N.A.	Main	within 1 Hg of perfect	
					Pilot	35-140* PSIG	
Other	Consult cupplier						

* 200 PSIG Solenoid Is Optional (consult supplier).

Pressure range for remote pilot operated valves

Media		Valve type	
		Single	Double & 3-position
Air	Main	35-250 PSIG	0-250 PSIG
	Pilot	35-200 PSIG	35-200 PSIG
Vacuum	Main	Do not use	Within 1" Hg of perfect
	Pilot	Do not use	35-200 PSIG
Other	Consult supplier		

Ambient temperature – standard service solenoid operator

Minimum	Maximum	
	Intermittent duty	Continuous duty
0°F	125°F	100°F

Special service (continuous duty) solenoid operator

0°F	125°F	125°F

Ambient temperature – remote pilot operated valves

0°F	200°F

As the above chart indicates, Standard Duty Solenoids may be used on continuous duty but ambient temperature is de-rated.

In some cases, Special Service Solenoids may be rated for higher ambient temperatures (consult supplier).

⚠ **Caution:**
If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage and unpredictable behavior.

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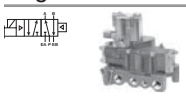
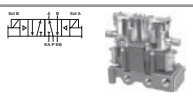
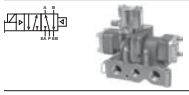
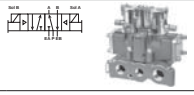
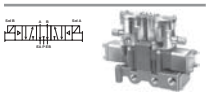
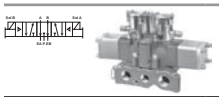
4-Way, 5-Port, 2-Position, Plug-in

L675 (3/8" basic valve) Single solenoid	L655 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Manifold† (End & bottom ports)	Voltage	Valve only	
							Single solenoid	Double solenoid
		4.8	3/8"	**K022 090**	**K142 230**	120V 60Hz	**L675 39 102 53**	**L655 39 102 53**
		4.8	1/2"	**K022 091**	**K142 231**	110V 50Hz		
		4.8	3/4"	**K022 101**	**K142 270**	24VDC	**L675 33 102 49**	**L655 33 102 49**

L675 (1" basic valve) Single solenoid	L655 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (Side ports)	Voltage	Valve only	
						Single solenoid	Double solenoid
					120V 60Hz	**L675 89 102 53**	**L655 89 102 53**
		11.3	1"	**K022 095**	110V 50Hz		
					24VDC	**L675 83 102 49**	**L655 83 102 49**

4-Way, 5-Port, 3-Position, Plug-in

L665 (3/8" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Manifold† (end & bottom ports)	Voltage	Valve only
						Double solenoid
	4.8	3/8"	**K022 090**	**K142 230**	120V 60Hz	**L665 39 211 53**
		1/2"	**K022 091**	**K142 231**	110V 50Hz	
		3/4"	**K022 101**	**K142 270**	24VDC	**L665 33 211 49**

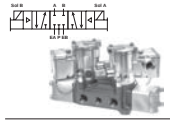
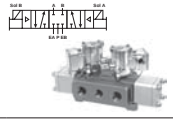
L665 (1" basic valve) Double solenoid	Nominal Cv	Port size (NPT)	Subbase (side ports)	Voltage	Valve only
					Double solenoid
				120V 60Hz	**L665 89 211 53**
	11.3	1"	**K022 095**	110V 50Hz	
				24VDC	**L665 83 211 49**

4-Way, 5-Port, 2-Position, Direct Pipe Ported

L705 (3/8" basic valve) single solenoid	L685 (3/8" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		3/8"	1/2"	4.8	120V 60Hz	Junction box	**L705 39 102 53**	**L685 39 102 53**
		1/2"	1/2"		110V 50Hz		**L705 49 102 53**	**L685 49 102 53**
		3/8"	1/2"	4.8	24VDC	Junction box	**L705 36 102 49**	**L685 36 102 49**
		1/2"	1/2"				**L705 46 102 49**	**L685 46 102 49**
		3/8"	1/2"	4.8	120V 60Hz	Basic	**L705 33 102 53**	**L685 33 102 53**
		1/2"	1/2"		110V 50Hz		**L705 43 102 53**	**L685 43 102 53**

L705 (1" basic valve) single solenoid	L685 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				Single solenoid	Double solenoid
		1"	1-1/4"	12.0	120V 60Hz	Junction box	**L705 89 102 53**	**L685 89 102 53**
		1-1/4"	1-1/4"		110V 50Hz		**L705 99 102 53**	**L685 99 102 53**
		1"	1-1/4"	12.0	24VDC	Junction box	**L705 86 102 49**	**L685 86 102 49**
		1-1/4"	1-1/4"				**L705 96 102 49**	**L685 96 102 49**

4-Way, 5-Port, 3-Position, Direct Pipe Ported

L695 (3/8" basic valve) double solenoid	L695 (1" basic valve) double solenoid	Port size (NPT)		Nominal Cv	Voltage	Operator type	Valve	
		P, A & B	EA & EB				3/8" basic size	1" basic size
		3/8"	1/2"	4.5	120V 60Hz 110V 50Hz	Junction box	**L695 39 211 53**	—
		1/2"	1/2"				**L695 49 211 53**	—
		1"	1-1/4"	12.0			—	**L695 89 211 53**
		1-1/4"	1-1/4"				—	**L695 99 211 53**

† Manifolds include mounting hardware, except for port adapters.

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Plug-in Pilot

With indicator light

Description	Standard service		Special service	
Override type	Locking	Non-locking	Locking	Non-locking
With override (120VAC)	**K175 9035 53**	**K175 8035 53**	**K185 9025 53**	**K185 8025 53**
With override (Other than 120VAC)	**K175 3035****	**—**	**K185 3025****	**—**

** Voltage code - (reference model index for availability)

NEMA 1 & 12

Basic Pilot

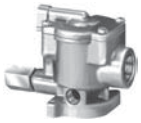
JIC Pilot

Description	Standard service		Special service	
Override type	Locking	Non-locking	Locking	Non-locking
Basic with override	**K065 3035****	**—**	**K085 3025****	**—**
JIC with junction box & override	**K065 6035****	**K065 5035****	**K085 6025****	**K085 5025****
JIC pilot with junction box & override & indicator lights (120VAC Only)	**K065 9035****	**K065 8035****	**K085 9025****	**K085 8025****

** Voltage code - (reference model index for availability)

NEMA 4, 7 & 9

Hazardous Duty



NEMA 4 Pilot

Description	Standard service		Special service	
Hazardous duty pilot - UL & CSA	**K025 1035** †**		**K045 1025** †**	
NEMA 4 pilot	**K235 1035** †**		**—**	
Override type	Locking	Non-locking	Locking	Non-locking
Hazardous duty with override	**K025 3035** †**	**K025 2035** †**	**K045 3025** †**	**K045 2025** †**
NEMA 4 with override	**—**	**K235 3035** †**	**K235 2035** †**	**—**

† 49 / 53 only ** Voltage code - (reference model index for availability)

Blank Station Covers

Manifold assembly	Blank cover kit
—	**K060 20007**
K142 230	
K142 231	**K060 20003**
K142 270	
K142 233	**K060 20009**
K142 236	**K060 20004**

Flush Type Hex Drive Pipe Plugs for Port Isolation

Size (NPTF)	Part number
1/8"	**K21R02012L**
1/4"	**K21R02025L**
3/8"	**K21R02037L**
1/2"	**K21R02050L**
3/4"	**K21R02075L**

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Service Kits

Basic valve		Solenoid operated *					
		Standard service (intermittent duty)		Special service ** (continuous duty)		Remote pilot operated	
Size	Series (prefix)	Single	Double 2 & 3-position	Single	Double 2 & 3-position	Single	Double 2 & 3-position
3/8"	L65	–	**K352 126**	–	**K352 127**	–	**K352 355**
	L66	–	**K352 126**	–	**K352 127**	–	**K352 355**
	L67	**K352 124**	–	**K352 125**	–	**K352 362**	–
	L68	–	**K352 126**	–	**K352 127**	–	**K352 355**
	L69	–	**K352 126**	–	**K352 127**	–	**K352 355**
	L70	**K352 124**	–	**K352 125**	–	**K352 362**	–
1"	L65	–	**K352 130**	–	**K352 131**	–	**K352 360**
	L66	–	**K352 130**	–	**K352 131**	–	**K352 360**
	L67	**K352 128**	–	**K352 129**	–	**K352 359**	–
	L68	–	**K352 130**	–	**K352 131**	–	**K352 360**
	L69	–	**K352 130**	–	**K352 131**	–	**K352 360**
	L70	**K352 128**	–	**K352 129**	–	**K352 359**	–

Notes:

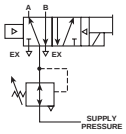
* Kits for solenoid operated valves include solenoid service kits.

** Special service (continuous duty) solenoids may be identified as having gold colored solenoid tops.

Common Port Regulator

Pressure Adjustment	Pressure Range PSIG	Part number Assembly "A"	Assembly "B"
Manual	1 - 60	**L554 02 308C**	**L554 08 302C**
	2 - 125	**L554 03 308C**	**L554 08 303C**
Remote	0 - 140	**L554 11 308C**	**L554 08 311C**

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.

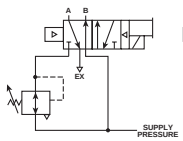


Regulated Pressure at Both "A" & "B"

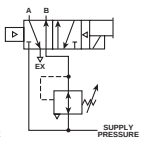
Single Port Regulator

Pressure adjustment	Pressure range PSIG	Part number Reduced pressure Cyl. port "A"	Cyl. port "B"
Manual	1 - 60	**L554 05 307C**	**L554 07 305C**
	2 - 125	**L554 06 307C**	**L554 07 306C**
Remote	0 - 140	**L554 14 307C**	**L554 07 314C**

* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.



Supply Pressure at "B" & Regulated at "A"

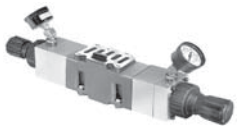


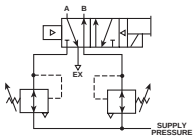
Supply Pressure at "A" & Regulated at "B"

Independent Port Regulator

Pressure adjustment	Cylinder port "A" PSIG	Part number Cylinder port "B" 5 - 60	10 - 125†
Manual	1 - 60	**L554 05 305C**	—
Remote	0 - 140	—	**L554 14 314C†**

† Remote operator units 0-140 PSIG





Independently Regulated Pressure at Both "A" & "B"

Interchangeable Manual Override Assemblies for Solenoid Operators

Non-locking type	Locking type
K162 001	**K152 003**

Conversion Kits: Lubricated to Non-Lubricated Operation

Basic size	Operators (solenoid or remote pilot) Single	Double (2-position)
3/8"	K322 012	K322 013

Electrical Connectors Single or Double Solenoid Valves

Basic size	Valve body Single solenoid	Double solenoid	Subbase / manifold 19" leads	72" leads
3/8" 1"	**H027 23**	**H027 22**	**H027 13**	**H027 89**

D

Subbase & Manifold Valve Products

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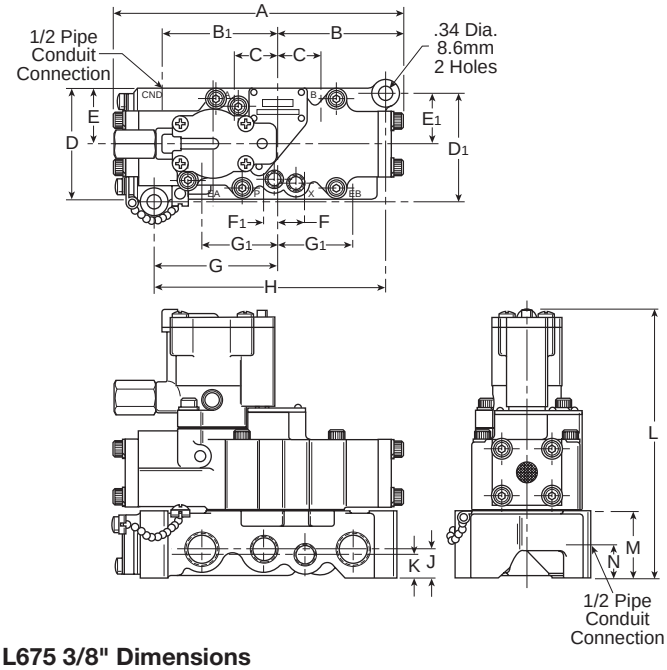
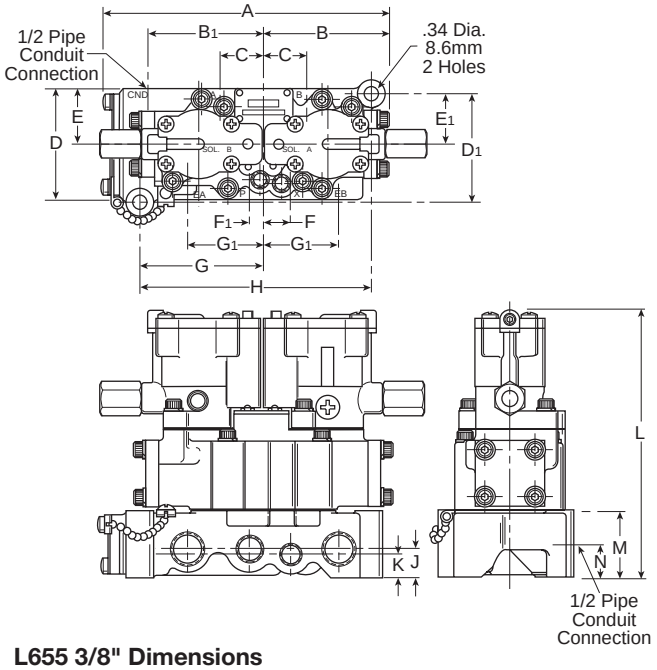


L675 3/8" Dimensions

A	B	B1	C	D	D1	E	E1	F
7.56 (192)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)

F1	G	G1	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

Inches (mm)

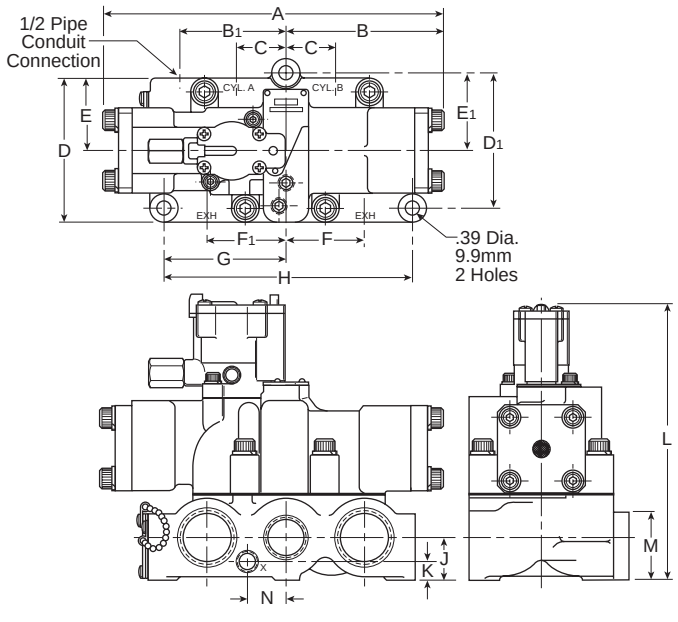


L655 3/8" Dimensions

A	B	B1	C	D	D1	E	E1	F
7.38 (187.5)	3.32 (84.3)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)

F1	G	G1	H	J	K	L	M	N
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.75 (44.5)	1.00 (25.4)

Inches (mm)

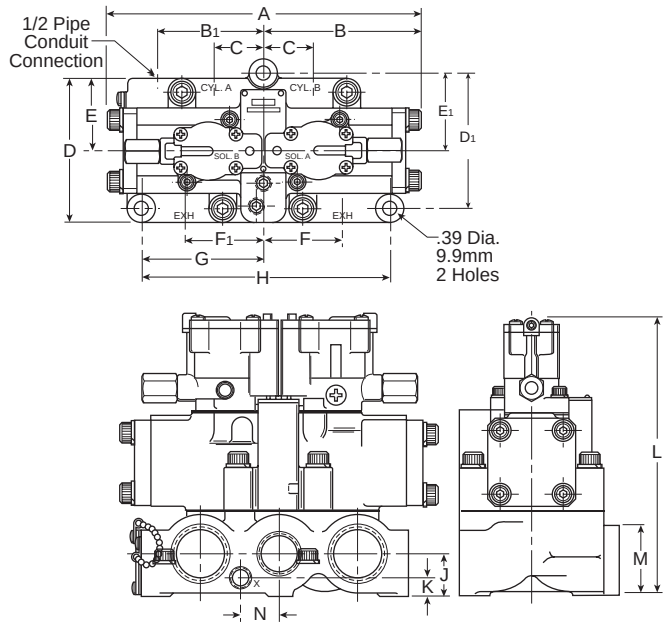


L675 1" Dimensions

A	B	B1	C	D	D1	E	E1	F
10.46 (265.7)	4.75 (120.6)	2.94 (74.7)	3.38 (85.8)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)

F1	G	H	J	K	L	M	N
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)

Inches (mm)



L655 1" Dimensions

A	B	B1	C	D	D1	E	E1	F
9.50 (241.3)	4.75 (120.6)	3.38 (85.8)	1.53 (38.9)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)

F1	G	H	J	K	L	M	N
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)

Inches (mm)

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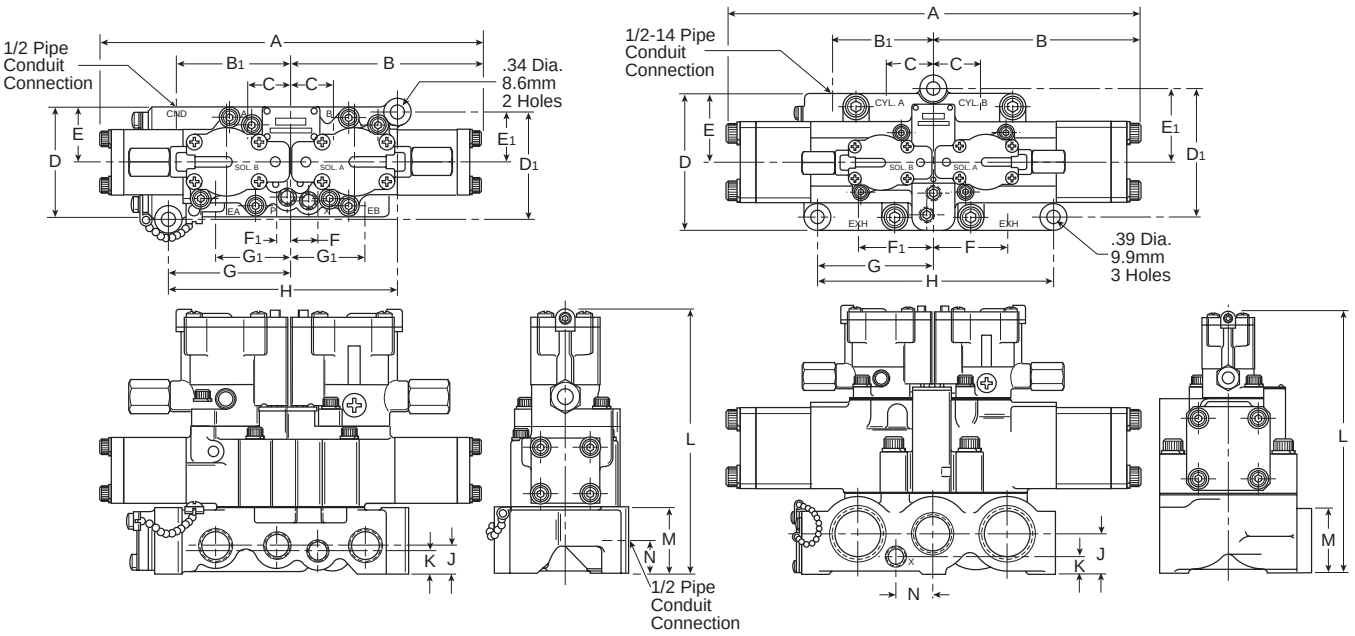


L665 3/8" Dimensions

A	B	B1	C	D	D1	E	E1	F
9.64 (244.8)	4.82 (122.4)	2.94 (74.7)	1.12 (28.4)	2.88 (73.2)	2.84 (72.1)	1.44 (36.6)	1.34 (34)	.75 (19.1)

F1	G	G1	H	J	K	L	M
.38 (9.7)	3.16 (80.3)	2.00 (50.8)	6.03 (153.2)	.75 (19.1)	.62 (15.7)	6.93 (176)	1.00 (25.4)

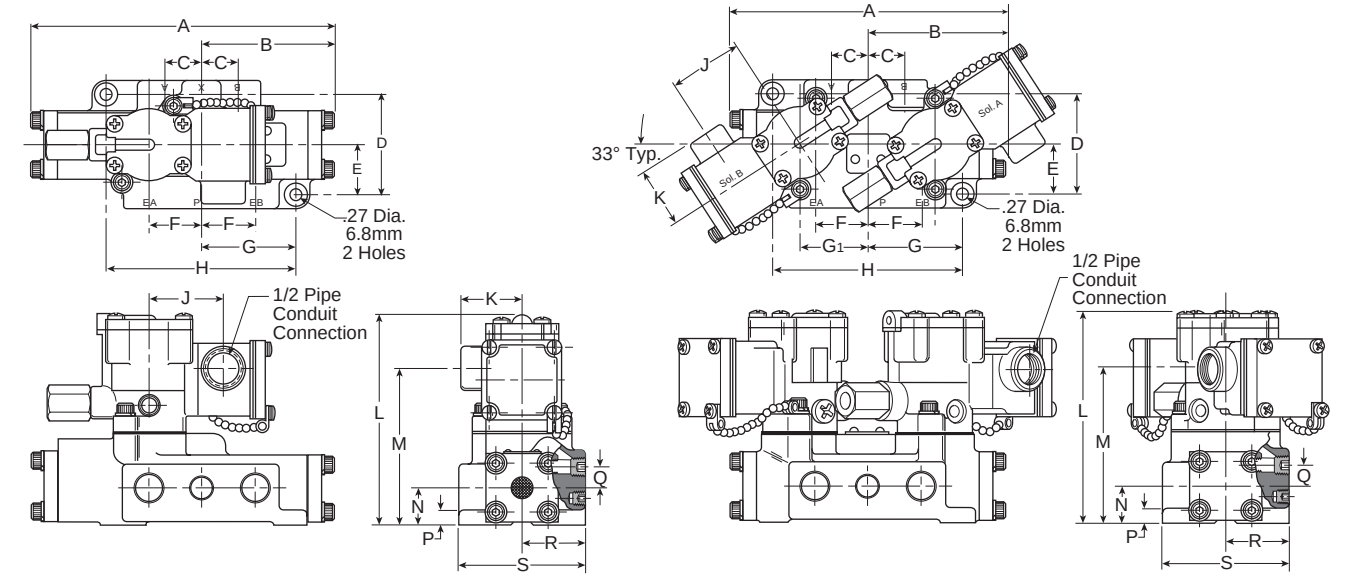
Inches (mm)

L665 1" Dimensions

A	B	B1	C	D	D1	E	E1	F
13.62 (345.9)	6.81 (173)	3.38 (85.8)	1.53 (38.9)	4.56 (115.8)	4.28 (108.7)	2.28 (57.9)	2.44 (62)	2.45 (62.2)

F1	G	H	J	K	L	M	N
2.46 (62.5)	3.81 (96.8)	7.62 (193.5)	1.31 (33.3)	.59 (15)	8.74 (222)	2.09 (53.1)	1.22 (31)

Inches (mm)



L705 3/8" Dimensions

A	B	C	D	E	F	G	H	J
7.56 (192)	3.32 (84.3)	.90 (22.9)	2.56 (65)	1.28 (32.5)	1.33 (33.8)	2.34 (59.4)	4.69 (119.1)	1.82 (46.2)

K	L	M	N	P	Q	R	S
1.50 (38.1)	5.35 (135.9)	3.91 (99.3)	.94 (23.9)	.38 (9.7)	.53 (13.5)	1.62 (41.1)	3.25 (82.6)

Inches (mm)

L685 3/8" Dimensions

A	B	C	D	E	F	G	G1	H
7.56 (192)	3.32 (84.3)	.90 (22.9)	2.56 (65)	1.28 (32.5)	1.33 (33.8)	2.34 (59.4)	1.66 (42.4)	4.69 (119.1)

J	K	L	M	N	P	Q	R	S
1.82 (46.2)	1.50 (38.1)	5.35 (135.9)	3.91 (99.3)	.94 (23.9)	.38 (9.7)	.53 (13.5)	1.62 (41.1)	3.25 (82.6)

Inches (mm)

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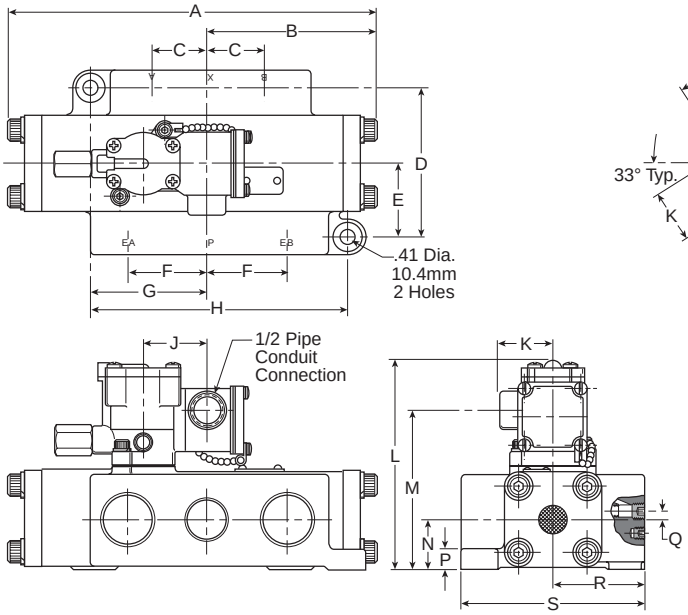
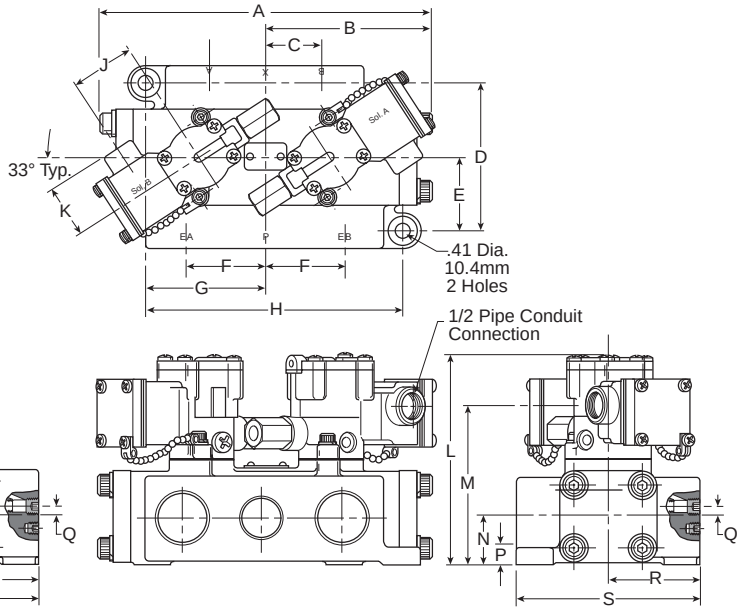


L705 1" Dimensions

A	B	C	D	E	F	G	H	J
10.46 (265.7)	4.75 (120.6)	1.62 (41.1)	4.25 (108)	2.12 (53.8)	2.19 (55.6)	3.44 (87.4)	7.44 (189)	1.82 (46.2)

K	L	M	N	P	Q	R	S
1.50 (38.1)	6.44 (163.6)	4.95 (125.7)	1.50 (38.1)	.69 (17.5)	.20 (5.1)	2.62 (66.5)	5.25 (133.4)

Inches (mm)

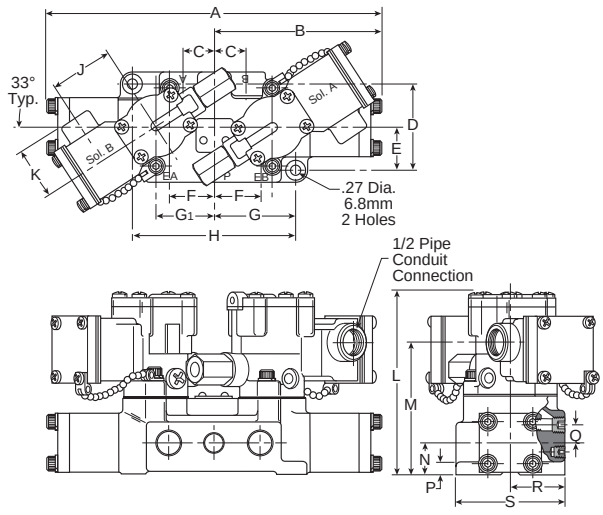


L685 1" Dimensions

A	B	C	D	E	F	G	H	J
9.50 (241.3)	4.75 (120.6)	1.62 (41.1)	4.25 (108)	2.12 (53.8)	2.19 (55.6)	3.44 (87.4)	7.44 (189)	1.82 (46.2)

K	L	M	N	P	Q	R	S
1.50 (38.1)	6.44 (163.6)	4.95 (125.7)	1.50 (38.1)	.69 (17.5)	.20 (5.1)	2.62 (66.5)	5.25 (133.4)

Inches (mm)

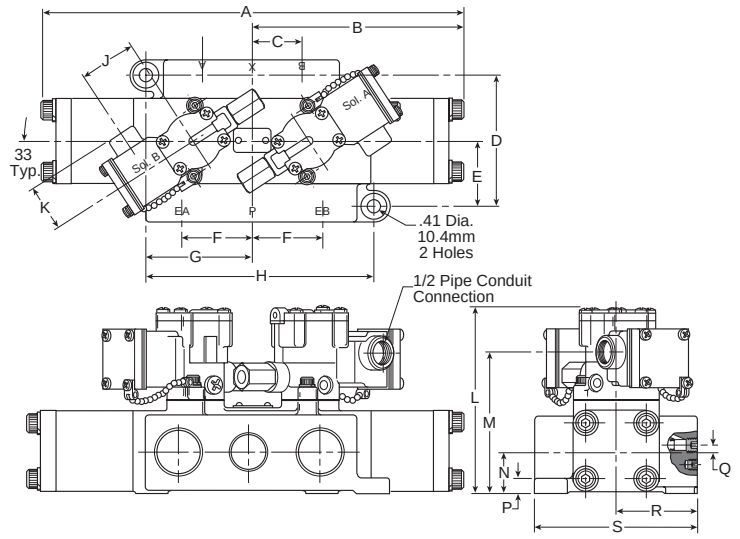


L695 3/8" Dimensions

A	B	C	D	E	F	G	G1	H
9.64 (244.8)	4.82 (122.4)	.90 (22.9)	2.56 (65)	1.28 (32.5)	1.33 (33.8)	2.34 (59.4)	1.66 (42.4)	4.69 (119.1)

J	K	L	M	N	P	Q	R	S
1.82 (46.2)	1.50 (38.1)	5.35 (135.9)	3.91 (99.3)	.94 (23.9)	.38 (9.7)	.53 (13.5)	1.62 (41.1)	3.25 (82.6)

Inches (mm)



L695 1" Dimensions

A	B	C	D	E	F	G	H	J
13.63 (346.2)	6.81 (173)	1.62 (41.1)	4.25 (108)	2.12 (53.8)	2.19 (55.6)	3.44 (87.4)	7.44 (189)	1.82 (46.2)

K	L	M	N	P	Q	R	S
1.50 (38.1)	6.44 (163.6)	4.95 (125.7)	1.50 (38.1)	.69 (17.5)	.20 (5.1)	2.62 (66.5)	5.25 (133.4)

Inches (mm)

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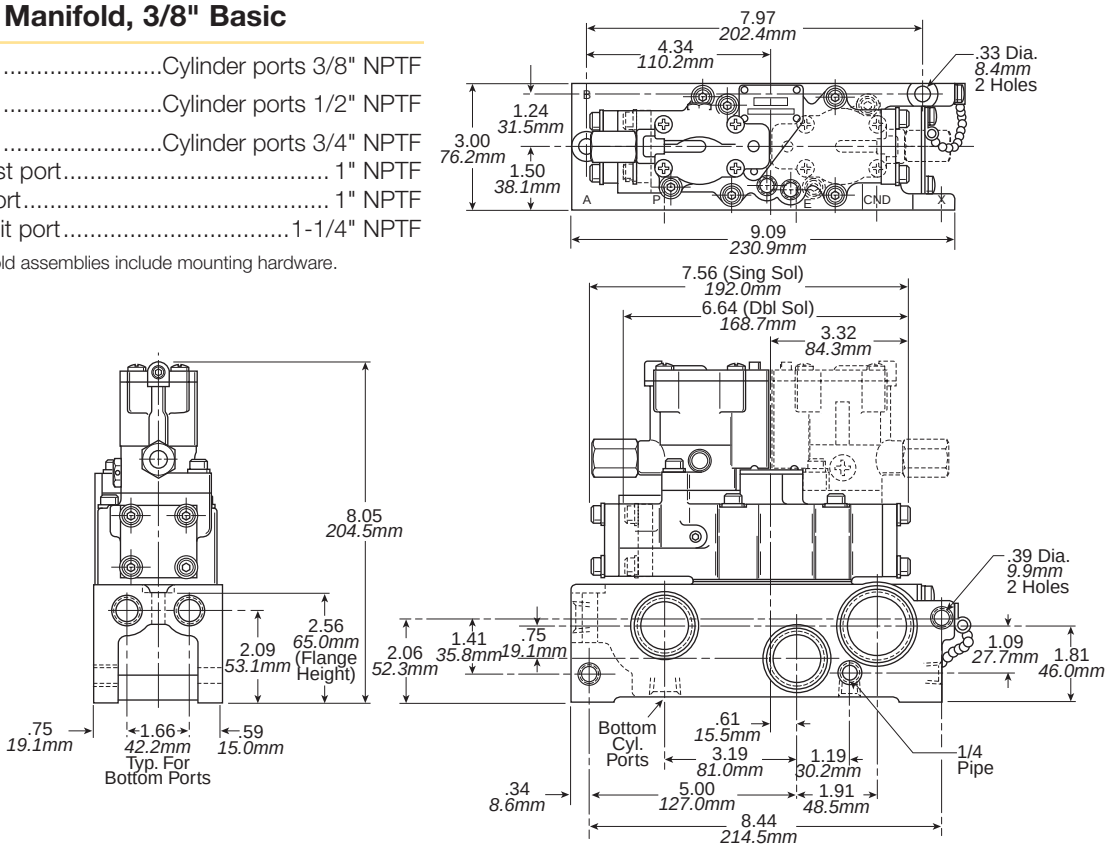
Plug-in Manifold, 3/8" Basic

K142 230 .....Cylinder ports 3/8" NPTF
K142 231 .....Cylinder ports 1/2" NPTF
K142 270 .....Cylinder ports 3/4" NPTF
Exhaust port..... 1" NPTF
Inlet port..... 1" NPTF
Conduit port.....1-1/4" NPTF

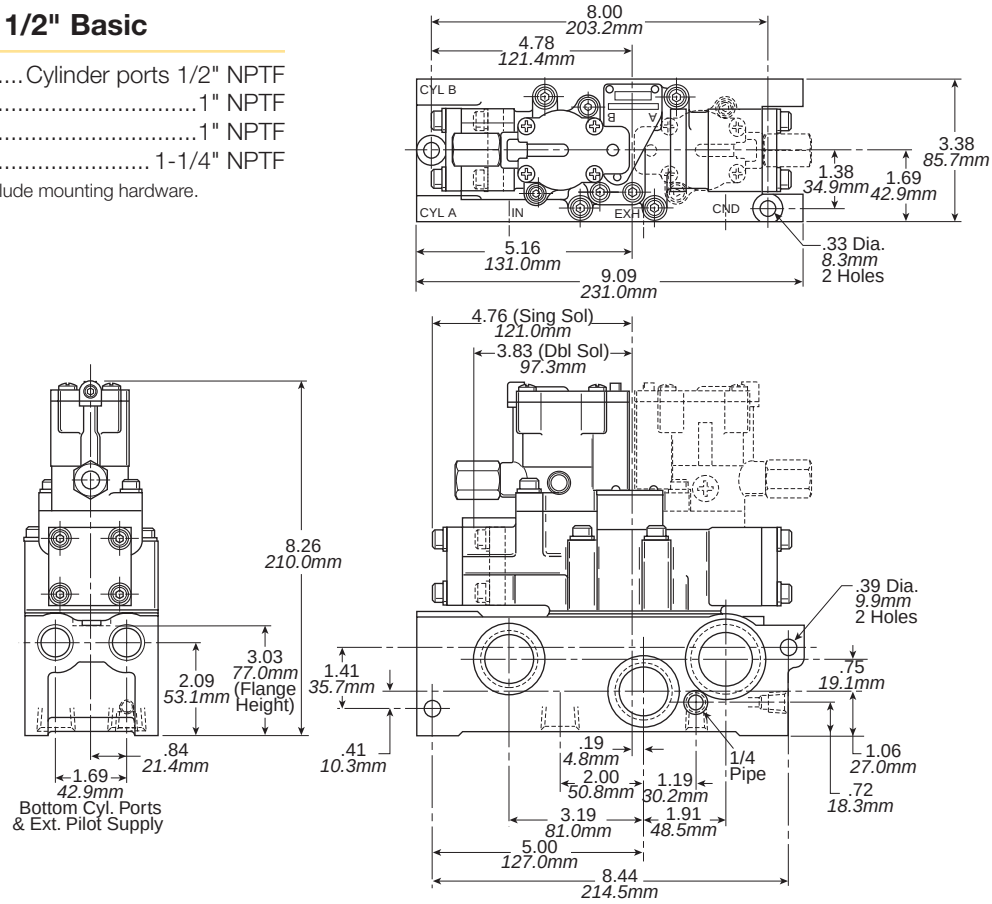
Note: Manifold assemblies include mounting hardware.



Plug-in Manifold, 1/2" Basic

K142 233 .....Cylinder ports 1/2" NPTF
Exhaust port.....1" NPTF
Inlet port.....1" NPTF
Conduit port..... 1-1/4" NPTF

Note: Manifold assemblies include mounting hardware.



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Features

Direct Air 2, 1/8" valves
Poppet style – .17 Cv

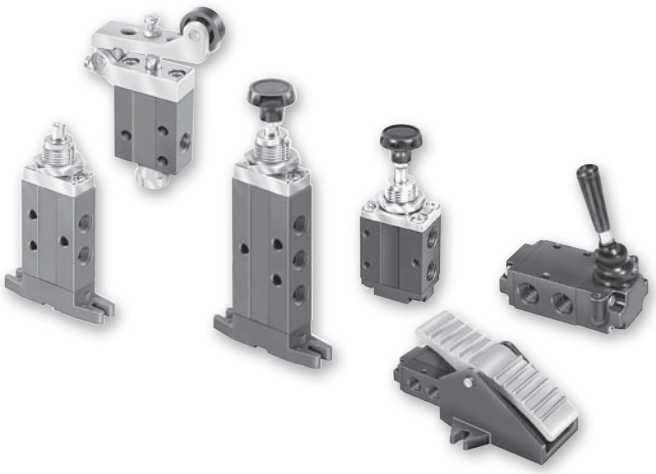
- Economical
- 3-way normally closed function

Direct Air 2, 1/8" valves
Packed bore style – .20 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way

Direct Air 4, 1/4" valves
Packed bore style – .83 Cv

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way



Operating information

Operating pressure	150 PSI (28 inHg to 1035 kPa)*
Temperature range	32°F to 175°F (0°C to 80°C)

Materials

Body and operator housings	Aluminum extrusion
Spool	Stainless steel
Bushings and pilot piston	Brass
Spacers - Direct Air 2	Aluminum
Spacers - Direct Air 4	Zinc die cast
Dynamic seals	Fluorocarbon
O-rings	Buna (nitrile)
Poppet ball	Nylon

Most popular. For technical information see CD

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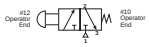
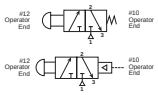
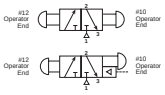
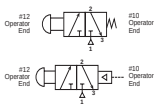
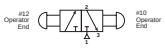
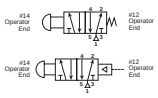
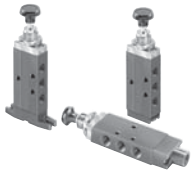
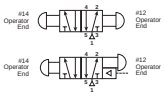
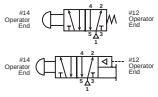
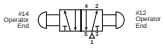
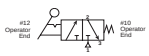
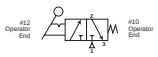
3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Button operated		1/8"	.17	3-way, spring return	Poppet	**404411000**
		1/8"	.20	3-way, spring return	Spool	**414411000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414421000**
		1/8"	.20	3-way, pilot return	Spool	**414451000**
		1/8"	.20	3-way, manual return	Spool	**414931000**
		1/8"	.20	3-way, manual return, foot mounted	Spool	**414941000**
		1/8"	.20	3-way, manual or pilot return	Spool	**414951000**
		1/4"	.83	3-way, spring return	Spool	**524411000**
		1/4"	.83	3-way, pilot return	Spool	**524451000**
		1/4"	.83	3-way, Manual return	Spool	**524431000**
		1/8"	.20	4-way, spring return	Spool	**410411000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**410421000**
		1/8"	.20	4-way, pilot return	Spool	**410451000**
		1/8"	.20	4-way, manual return	Spool	**410931000**
		1/8"	.20	4-way, manual return, foot mounted	Spool	**410941000**
		1/8"	.20	4-way, manual or pilot return	Spool	**410951000**
		1/4"	.83	4-way, spring return	Spool	**520411000**
		1/4"	.83	4-way, pilot return	Spool	**520451000**
		1/4"	.83	4-way, manual return	Spool	**520431000**
Toggle operated, detented		1/8"	.17	3-way, spring return	Poppet	**404811000**
		1/8"	.20	3-way, spring return	Spool	**414811000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414821000**
		1/8"	.20	4-way, spring return	Spool	**410811000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**410821000**

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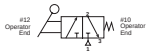
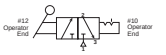
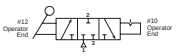
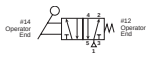
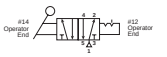
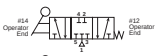
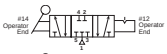
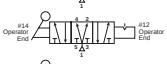
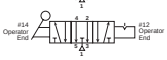
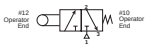
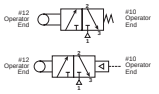
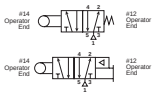
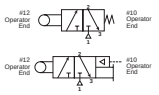
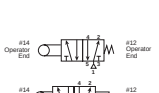
3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Lever operated		1/4"	.83	3-way, spring return	Spool	**524811000**
		1/4"	.83	3-way, manual return	Spool	**524831000**
		1/4"	.83	3-way, 3-Position detented, all ports blocked	Spool	**523831000**
		1/4"	.83	4-way, spring return	Spool	**520811000**
		1/4"	.83	4-way, manual return	Spool	**520831000**
		1/4"	.83	4-way, spring centered, closed center	Spool	**521811000**
		1/4"	.83	4-way, spring centered, pressure center	Spool	**522811000**
		1/4"	.83	4-way, spring centered, exhaust center	Spool	**529811000**
		1/4"	.83	4-way, detented, closed center	Spool	**521831000**
		1/4"	.83	4-way, detented, pressure center	Spool	**522831000**
		1/4"	.83	4-way, detented, exhaust center	Spool	**529831000**
Roller operated		1/8"	.20	3-way, spring return	Poppet	**404211000**
		1/8"	.20	3-way, spring return	Spool	**414211000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414221000**
		1/8"	.20	3-way, pilot return	Spool	**414251000**
		1/8"	.20	4-way, spring return	Spool	**410211000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**410221000**
		1/8"	.20	4-way, pilot return	Spool	**410251000**
		1/4"	.83	3-way, spring return, delrin roller	Spool	**524211000**
		1/4"	.83	3-way, pilot return, delrin roller	Spool	**524251000**
		1/4"	.83	3-way, spring return, steel roller	Spool	**524A11000**
		1/4"	.83	3-way, pilot return, steel roller	Spool	**524A51000**
		1/4"	.83	4-way, spring return, delrin roller	Spool	**520211000**
		1/4"	.83	4-way pilot return, delrin roller	Spool	**520251000**
		1/4"	.83	4-way, spring return, steel roller	Spool	**520A11000**
		1/4"	.83	4-way, pilot return, steel roller	Spool	**520A51000**

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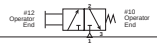
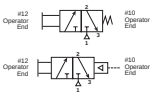
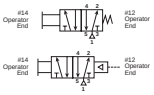
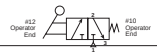
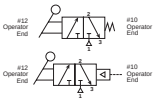
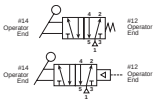
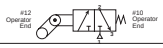
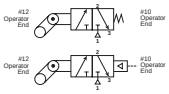
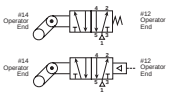
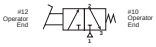
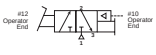
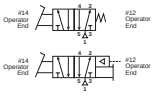
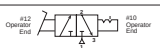
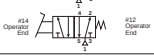
3-way & 4-way Valves

	Symbol	Port size	Cv	Description	Valve type	Part number
Plunger operated		1/8"	.17	3-way, spring return	Poppet	**404111000**
		1/8"	.20	3-way, spring return	Spool	**414111000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414121000**
		1/8"	.20	3-way, pilot return	Spool	**414151000**
		1/8"	.17	4-way, spring return	Spool	**410111000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**410121000**
		1/8"	.20	4-way, pilot return	Spool	**410151000**
Hand lever operated		1/8"	.17	3-way, spring return	Poppet	**404711000**
		1/8"	.20	3-way, spring return	Spool	**414711000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414721000**
		1/8"	.20	3-way, pilot return	Spool	**414751000**
		1/8"	.20	4-way, spring return	Spool	**410711000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**410721000**
		1/8"	.20	4-way, pilot return	Spool	**410751000**
One way tripper operated		1/8"	.17	3-way, spring return	Poppet	**404311000**
		1/8"	.20	3-way, spring return	Spool	**414311000**
		1/8"	.20	3-way, spring return, foot mounted	Spool	**414321000**
		1/8"	.20	3-way, pilot return	Spool	**414351000**
		1/8"	.20	4-way, spring return	Spool	**414311000**
		1/8"	.20	4-way, spring return, foot mounted	Spool	**414321000**
		1/8"	.20	4-way, pilot return	Spool	**414351000**
Pedal operated		1/4"	.83	3-way, spring return	Spool	**524711000**
		1/4"	.83	3-way, pilot return	Spool	**524751000**
		1/4"	.83	4-way, spring return	Spool	**520711000**
		1/4"	.83	4-way, pilot return	Spool	**520751000**
		⚠ **CAUTION:** This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.				
Treadle operated		1/4"	.83	3-way, treadle operated, detented	Spool	**524931000**
		1/4"	.83	4-way, treadle operated, detented	Spool	**520931000**
		⚠ **CAUTION:** This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.				

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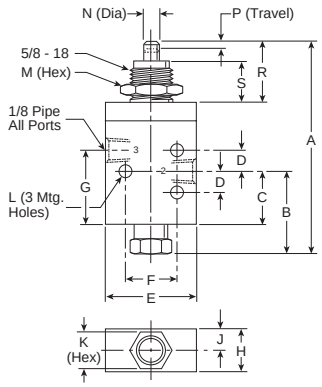
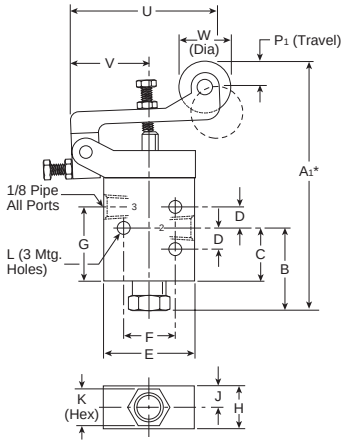
Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

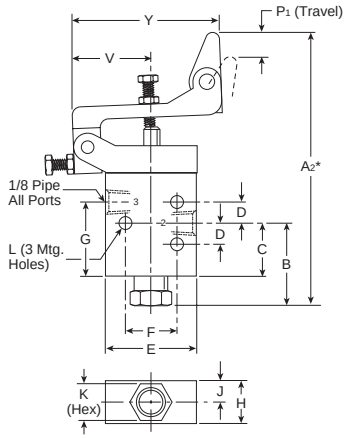
Plunger Operated



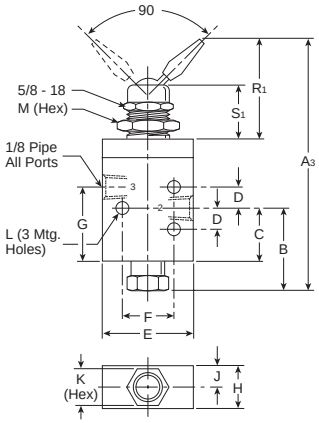
Roller Operated



One-Way Tripper Operated



Toggle Operated



3-Way, 3-Port, 2-Position

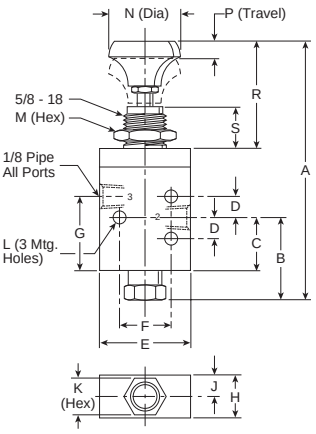
A	A1*	A2*	A3	B
3.37	4.21	4.46	3.99	1.03
(86)	(107)	(113)	(101)	(26)
C	**D**	**E**	**F**	**G**
.55	.31	1.31	.75	.90
(14)	(8)	(33)	(19)	(23)
H	**J**	**K**	**L**	**M**
.62	.31	.56	.19	.88
(16)	(8)	(14)	(5)	(22)
N	**P**	**P1**	**R**	**R1**
.25	.17	.38	.91	1.53
(6)	(4)	(10)	(23)	(39)
S	**S1**	**U**	**V**	**W**
.62	.78	2.28	1.19	.75
(16)	(20)	(58)	(30)	(19)
X	**Y**			
.19	2.19			
(5)	(56)			

* Dimensions may be reduced .44" using adjusting screw.

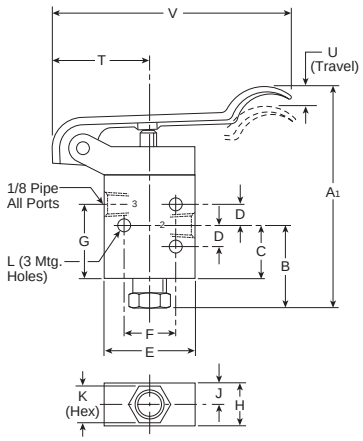
Inches (mm)

Button & Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



3-Way, 3-Port, 2-Position

A	A1	B	C	D
4.13	3.34	1.03	.55	.31
(105)	(85)	(26)	(14)	(8)
E	**F**	**G**	**H**	**J**
1.31	.75	.90	.62	.31
(33)	(19)	(23)	(16)	(8)
K	**L**	**M**	**N**	**P**
.56	.19	.88	1.06	.17
(14)	(5)	(22)	(27)	(4)
R	**S**	**T**	**U**	**V**
1.67	.63	1.19	.53	3.38
(42)	(16)	(30)	(13)	(86)

Inches (mm)

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Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

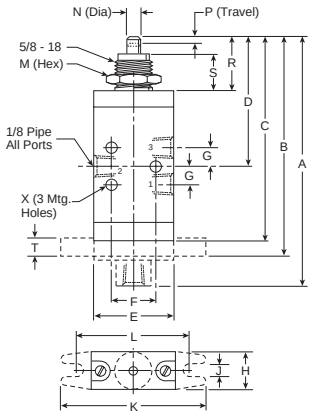
3-Way, 3-Port, 2-Position

A	A_1*	A_2*	A_3	B
4.14 (105)	4.98 (126)	5.23 (133)	4.23 (107)	3.61 (92)
B_1	**B_2**	**B_3**	**C**	**C_1**
4.45 (113)	4.70 (119)	4.00 (102)	3.38 (86)	4.22 (107)
C_2	**C_3**	**D**	**D_1**	**D_2**
4.47 (113)	2.75 (70)	2.05 (52)	2.98 (76)	3.22 (82)
E	**F**	**G**	**H**	**J**
1.31 (33)	.75 (19)	.31 (8)	.62 (16)	.20 (5)
K	**L**	**M**	**N**	**P**
2.38 (60)	1.88 (48)	.88 (22)	.25 (6)	.17 (4)
P_1	**R**	**R_1**	**S**	**S_1**
.38 (10)	.91 (23)	1.53 (39)	.62 (16)	.78 (20)
T	**U**	**V**	**W**	**X**
.25 (6)	2.28 (58)	1.19 (30)	.75 (19)	.19 (5)
Y				
2.19 (56)				

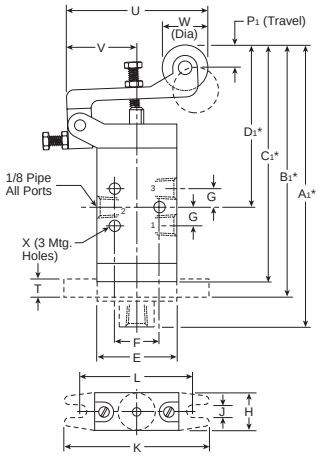
* Dimensions may be reduced .44" using adjusting screw.

Inches (mm)

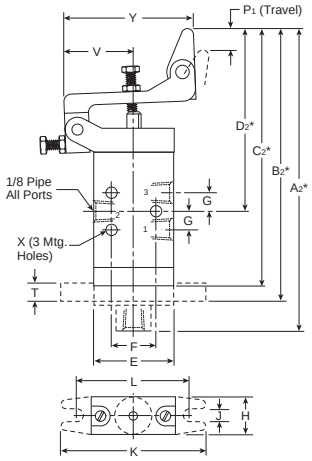
Plunger Operated



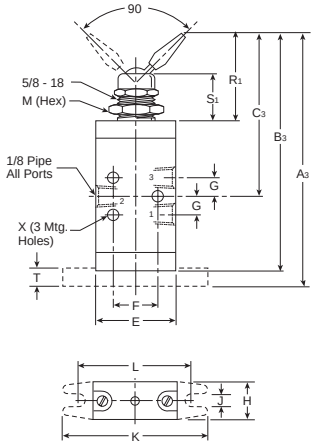
Roller Operated



One-Way Tripper Operated



Toggle Operated



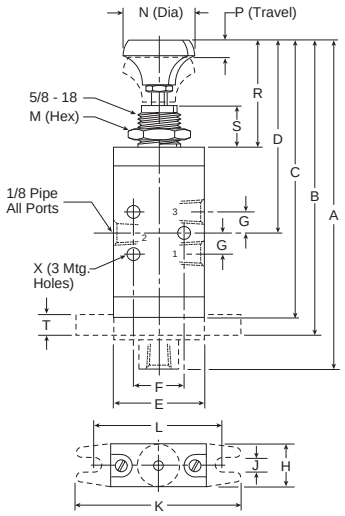
Button, Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports

3-Way, 3-Port, 2-Position

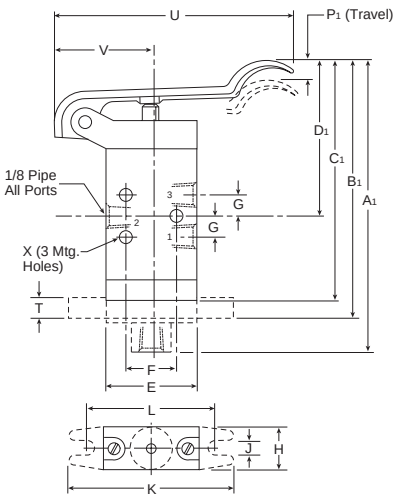
A	A_1	B	B_1	C
5.08 (129)	4.29 (109)	4.55 (115)	3.77 (96)	4.31 (109)
C_1	**D**	**D_1**	**E**	**F**
3.53 (90)	3.08 (78)	2.29 (58)	1.31 (33)	.75 (19)
G	**H**	**J**	**K**	**L**
.31 (8)	.62 (16)	.20 (5)	2.38 (60)	1.88 (48)
M	**N**	**P**	**P_1**	**R**
.88 (22)	1.06 (27)	.17 (4)	.53 (13)	1.67 (42)
S	**T**	**U**	**V**	**X**
.63 (16)	.25 (6)	3.38 (86)	1.19 (30)	.19 (5)
Y				
.59 (15)				

Inches (mm)

Button Operated



Hand Lever Operated



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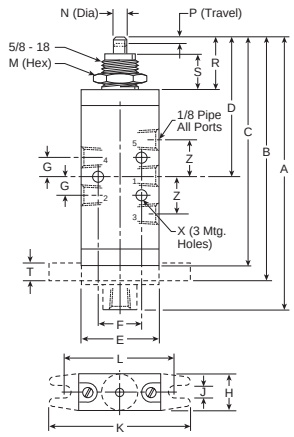
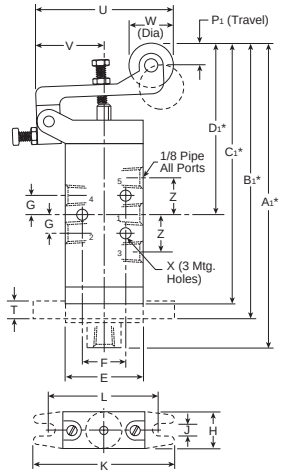
Plunger, Roller, One-way Tripper & Toggle Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports

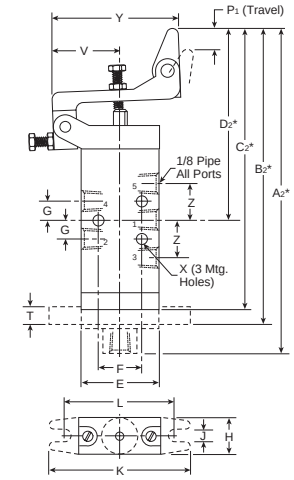
Plunger Operated



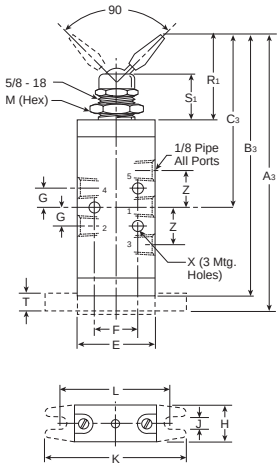
Roller Operated



One-Way Tripper Operated



Toggle Operated



4-Way, 5-Port, 2-Position

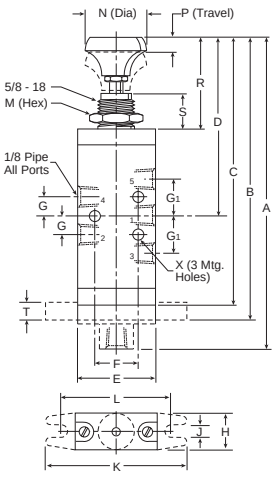
A	A_1*	A_2*	A_3	B
4.75 (121)	5.59 (142)	5.84 (148)	4.84 (123)	4.22 (107)
B_1*	**B_2***	**B_3**	**C**	**C_1***
5.06 (128)	5.31 (135)	4.61 (117)	3.99 (102)	4.83 (123)
C_2*	**C_3**	**D**	**D_1***	**D_2***
5.08 (129)	3.06 (78)	2.44 (62)	3.28 (83)	3.53 (90)
E	**F**	**G**	**H**	**J**
1.31 (33)	.75 (19)	.31 (8)	.62 (16)	.20 (5)
K	**L**	**M**	**N**	**P**
2.38 (60)	1.88 (48)	.88 (22)	.25 (6)	.17 (4)
P_1	**R**	**R_1**	**S**	**S_1**
.38 (10)	.91 (23)	1.53 (39)	.62 (16)	.78 (20)
T	**U**	**V**	**W**	**X**
.25 (6)	2.28 (58)	1.19 (30)	.75 (19)	.19 (5)
Y	**Z**			
2.19 (56)	.62 (16)			

* Dimensions may be reduced .44" using adjusting screw.

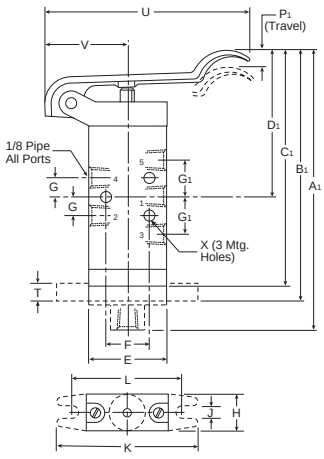
Inches (mm)

Button & Hand Lever Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



4-Way, 5-Port, 2-Position

A	A_1	B	B_1	C
5.69 (144)	4.90 (124)	5.16 (131)	4.38 (111)	4.92 (125)
C_1	**D**	**D_1**	**E**	**F**
4.14 (105)	3.67 (93)	2.90 (74)	1.31 (33)	.75 (19)
G	**G_1**	**H**	**J**	**K**
.31 (8)	.63 (16)	.62 (16)	.20 (5)	2.38 (60)
L	**M**	**N**	**P**	**P_1**
1.88 (48)	.88 (22)	1.06 (27)	.17 (4)	.53 (13)
R	**S**	**T**	**U**	**V**
1.67 (42)	.63 (16)	.25 (6)	3.38 (86)	1.19 (30)
X	**Y**			
.19 (5)	.59 (15)			

Inches (mm)

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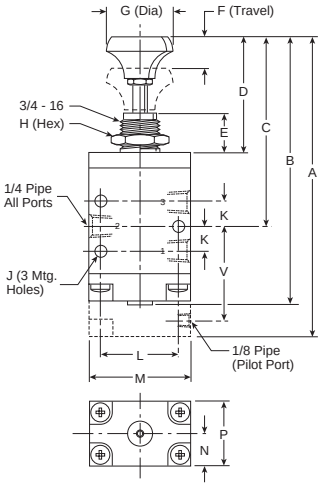
Button & Roller Operated — 3-Way, 3-Port, 2-Position

3-Way, 3-Port, 2-Position

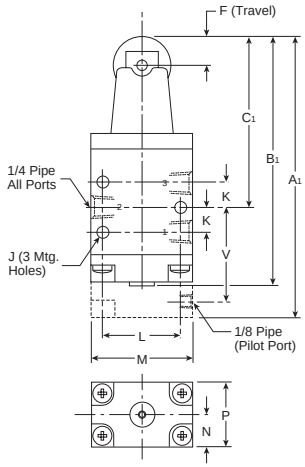
A	A_1	B	B_1	C
4.91 (125)	4.25 (108)	4.44 (113)	3.78 (96)	3.10 (79)
C_1	**D**	**E**	**F**	**G**
2.44 (62)	2.00 (51)	.63 (16)	.32 (8)	1.05 (27)
H	**J**	**K**	**L**	**M**
1.00 (25)	.19 (5)	.41 (10)	1.25 (32)	1.63 (42)
N	**P**	**V**		
.53 (14)	1.06 (27)	1.52 (39)		

Inches (mm)

Button Operated



Roller Operated



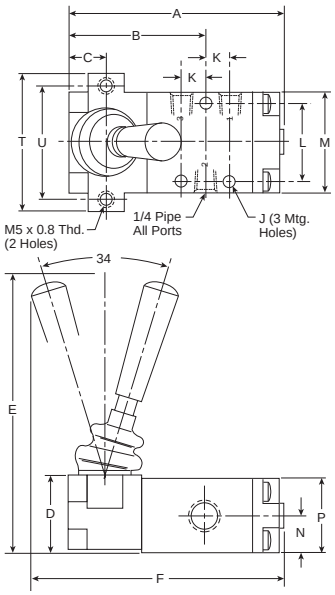
Lever & Pedal Operated — 3-Way, 3-Port, 2 & 3-Position

3-Way, 3-Port, 2 & 3-Position

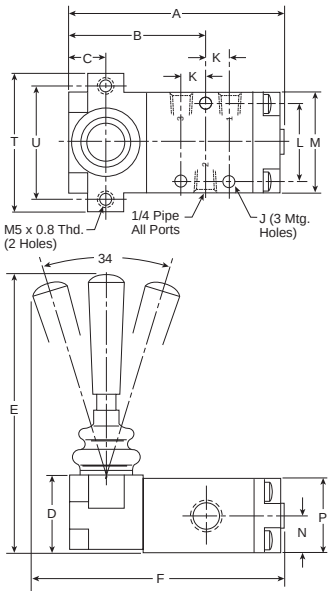
A	A_1	B	B_1	C
3.31 (84)	6.55 (166)	1.97 (50)	5.20 (132)	.53 (14)
C_1	**D**	**E**	**F**	**J**
2.19 (56)	1.12 (28)	4.06 (103)	3.90 (99)	.19 (5)
K	**L**	**M**	**N**	**P**
.41 (10)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
Q	**R**	**S**	**T**	**T_1**
.37 (10)	2.40 (61)	.34 (9)	2.13 (54)	3.50 (89)
U	**U_1**			
1.75 (44)	3.00 (76)			

Inches (mm)

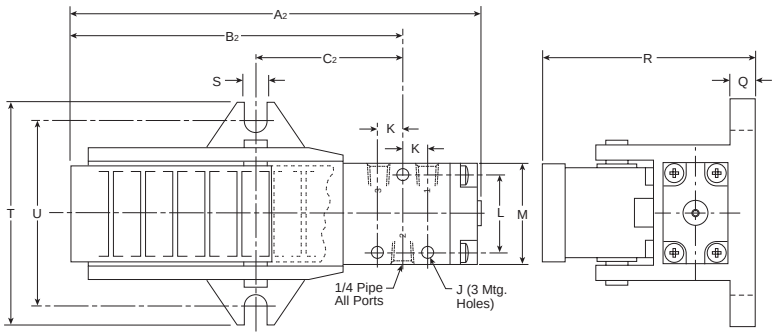
Lever Operated 2-Position



Lever Operated 3-Position



Pedal / Treadle Operated



⚠ CAUTION:

This valve shall not be used to actuate a punch press.
Do not use this valve on punch presses or press brakes.
See OSHA 1910.217.

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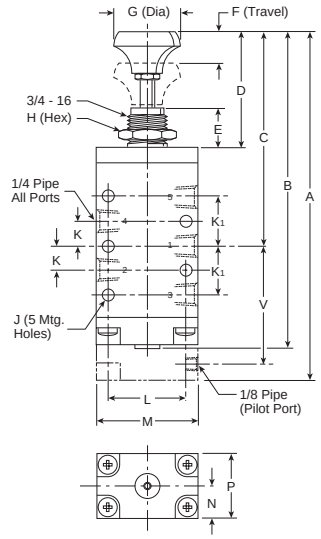
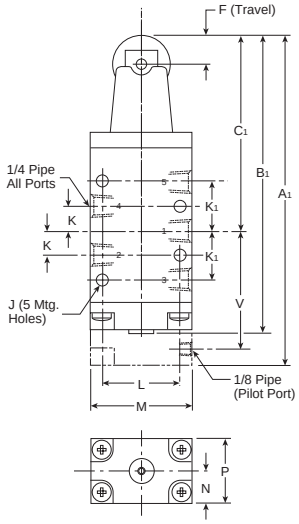
Button, Roller, Pedal & Treadle, Lever Operated — 4-Way, 5-Port, 2-Position

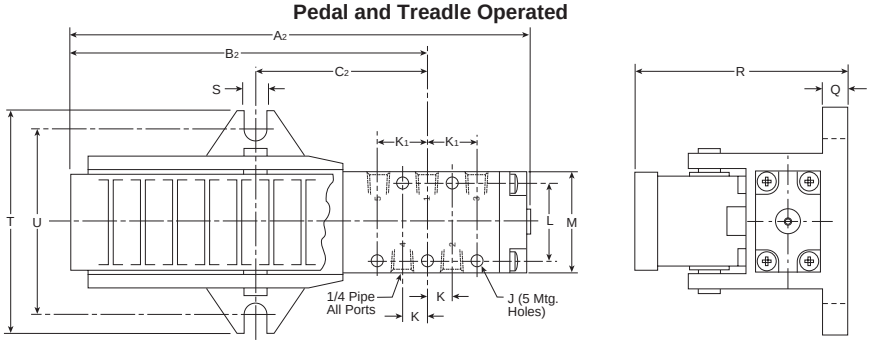
Button Operated



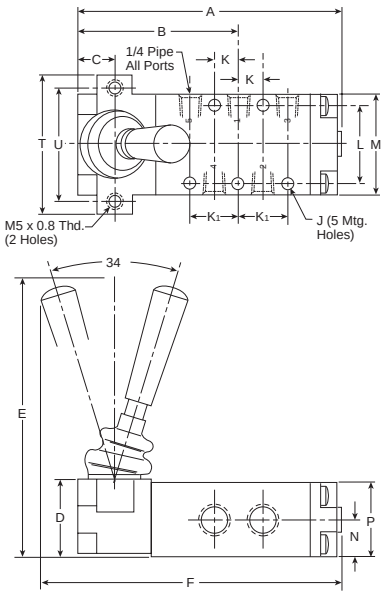
Roller Operated



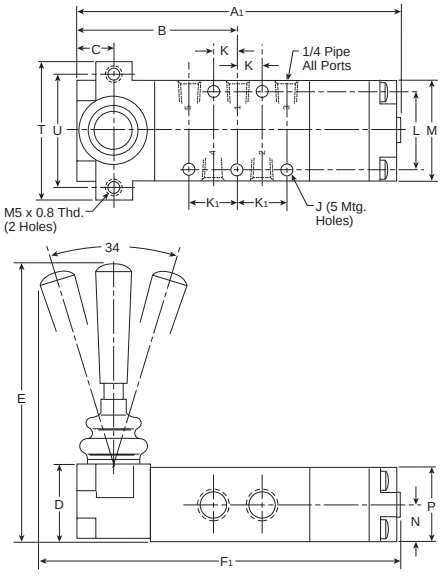
Pedal and Treadle Operated



Lever Operated 2-Position



Lever Operated 3-Position



4-Way, 5-Port, 2-Position

A	A1	A2	B	B1
5.75 (146)	5.13 (130)	7.41 (189)	5.28 (134)	4.66 (118)
B2	**C**	**C1**	**C2**	**D**
5.63 (143)	3.50 (89)	2.88 (73)	2.64 (67)	2.00 (51)
E	**F**	**G**	**H**	**J**
.63 (16)	.32 (8)	1.05 (27)	1.00 (25)	.19 (5)
K	**K1**	**L**	**M**	**N**
.44 (11)	.84 (21)	1.25 (32)	1.63 (41)	.53 (14)
P	**Q**	**R**	**S**	**T**
1.06 (27)	.37 (10)	2.40 (61)	.34 (9)	3.50 (89)
U	**V**			
3.00 (76)	1.96 (50)			

Inches (mm)

⚠ CAUTION:

This valve shall not be used to actuate a punch press.
Do not use this valve on punch presses or press brakes.
See OSHA 1910.217.

4-Way, 5-Port, 2 & 3-Position

A	A1	B	C	D
4.19 (106)	5.09 (129)	2.41 (61)	.53 (14)	1.12 (28)
E	**F**	**F1**	**J**	**K**
4.06 (103)	4.78 (121)	5.78 (147)	.19 (5)	.44 (11)
K1	**L**	**M**	**N**	**P**
.84 (21)	1.25 (32)	1.63 (42)	.53 (14)	1.06 (27)
T	**U**			
2.13 (54)	1.75 (44)			

Inches (mm)

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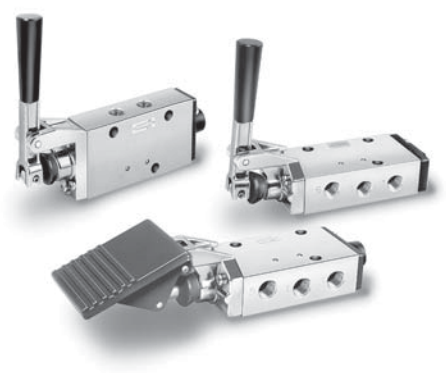
Features

Heavy Duty Lever
- Parallel Mount
- Perpendicular Mount

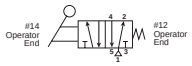
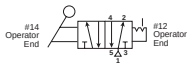
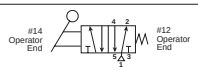
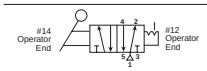
Heavy Duty Foot Pedal
- Inline Valve
  - 1/4" Port – 1.3 to 2.2 Cv
  - 3/8" Port – 1.3 to 2.9 Cv
- 2-Position
- 3-Position
  - All Ports Blocked
  - Center Exhaust



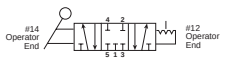
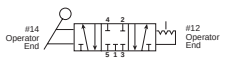
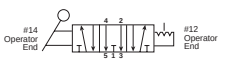
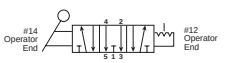
Operating information

Operating pressure: Vacuum to 150 PSI (710 mmHg to 1035 kPa)
Temperature range: 0°F to 140°F (-18°C to 60°C)

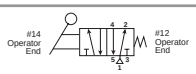
Lever Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Inline, parallel	2-Position, Spring return	**422CS011K**
		3/8"	2.9	Inline, parallel	2-Position, Spring return	**422CS021K**
		1/4"	2.2	Inline, parallel	2-Position, Detent	**422CS011W**
		3/8"	2.9	Inline, parallel	2-Position, Detent	**422CS021W**
		1/4"	2.2	Inline, perpendicular	2-Position, Spring return	**422CR011K**
		3/8"	2.9	Inline, perpendicular	2-Position, Spring return	**422CR021K**
		1/4"	2.2	Inline, perpendicular	2-Position, Detent	**422CR011W**
		3/8"	2.9	Inline, perpendicular	2-Position, Detent	**422CR021W**

Lever Valve - 3-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	1.3	Inline, parallel	3-Position APB	**422CS013W**
		3/8"	1.3	Inline, parallel	3-Position, APB	**422CS023W**
		1/4"	1.3	Inline, parallel	3-Position, CE	**422CS014W**
		3/8"	1.3	Inline, parallel	3-Position, CE	**422CS024W**
		1/4"	1.3	Inline, perpendicular	3-Position, APB	**422CR013W**
		3/8"	1.3	Inline, perpendicular	3-Position, APB	**422CR023W**
		1/4"	1.3	Inline, perpendicular	3-Position, CE	**422CR014W**
		3/8"	1.3	Inline, perpendicular	3-Position, CE	**422CR024W**

Foot Pedal Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/4"	2.2	Foot pedal	2-Position, Spring return	**422CT011K**
		3/8"	2.9	Foot pedal	2-Position, Spring return	**422CT021K**
				Foot pedal guard		**FS043P**

⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

Most popular. For technical information see CD

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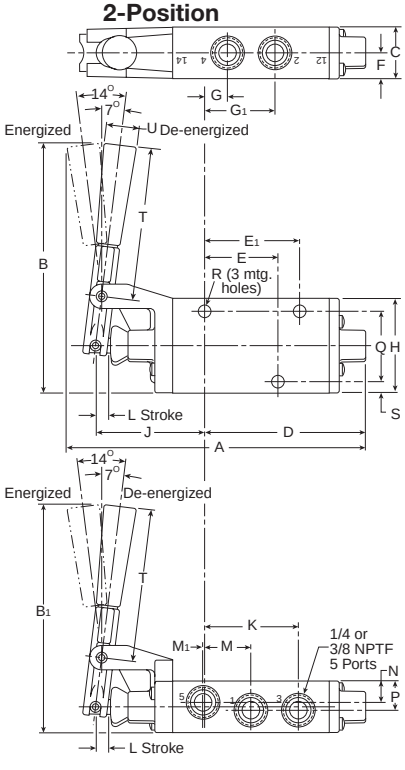
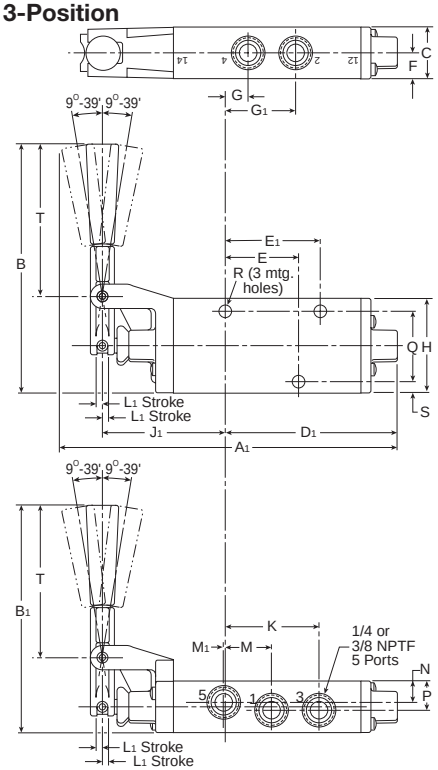
2-Position



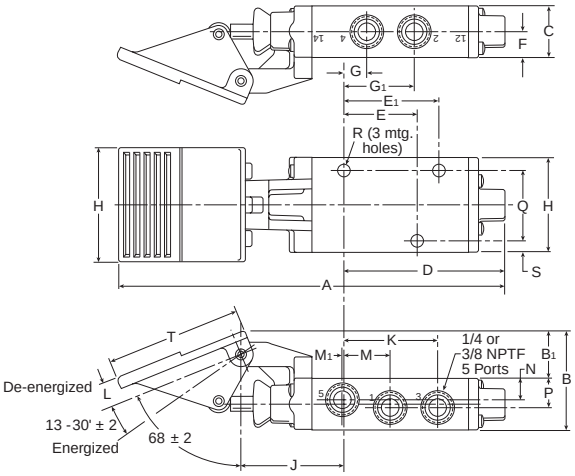
3-Position



Lever Valve

A	A1	B	B1	C
6.70 (170)	7.58 (193)	5.55 (141)	5.05 (128)	1.15 (29)
D	**D1**	**E**	**E1**	**F**
3.59 (91)	3.83 (97)	1.58 (40)	2.06 (52)	.57 (14)
G NPT		**G1 NPT**		**H**
1/4" .51 (13) 3/8" .55 (14)		1/4" 1.56 (40) 3/8" 1.51 (38)		2.13 (54)
J	**J1**	**K NPT**		**L**
2.44 (62)	2.80 (71)	1/4" 2.08 (53) 3/8" 2.13 (54)		.25 (6)
L1	**M**	**M1 NPT**		**N**
.18 (5)	1.03 (36)	1/4" .02 (.5) 3/8" .06 (2)		.50 (13)
P	**Q**	**R**	**S**	**T**
.65 (17)	1.58 (40)	.33 (8)	.27 (7)	3.42 (87)
U Dia				
.75 (19)				

Inches (mm)

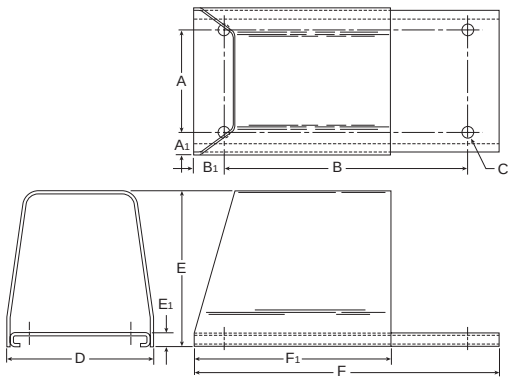


Foot Pedal Valve

A	B	B1	C	D
8.64 (220)	2.18 (55)	1.03 (26)	1.15 (29)	3.59 (91)
E	**E1**	**F**	**G NPT**	
1.58 (40)	2.06 (52)	.57 (14)	1/4" .51 (13) 3/8" .55 (14)	
G1 NPT		**H**	**H1**	**J**
1/4" 1.56 (40) 3/8" 1.51 (38)		2.13 (54)	2.50 (64)	2.32 (59)
K NPT		**L**	**M**	
1/4" 2.08 (53) 3/8" 2.13 (54)		.60 (15)	1.03 (26)	
M1 NPT		**N**	**P**	**Q**
1/4" .02 (.5) 3/8" .06 (2)		.50 (13)	.65 (17)	1.58 (40)
R	**S**	**T**	**U**	
.33 (8)	.27 (7)	3.00 (76)	.48 (11)	

Inches (mm)

CAUTION:
This valve shall not be used to actuate a punch press.
Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



Foot Valve Guard

A	A1	B	B1	C
4.50 (114)	.75 (19)	10.50 (267)	1.25 (32)	.48 (11)
D	**E**	**E1**	**F**	**F1**
6.00 (152)	7.13 (181)	.50 (13)	13.00 (330)	8.38 (213)

Inches (mm)

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Features

- Heavy duty lever
- Inline valve
  – 1/8", 1/4", 3/8", 1/2" NPT
- 2-Position models
- 3-Position models
  – all ports blocked
  – pressure center
  – center exhaust

Operating information

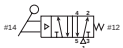
Operating pressure: Type A & B: Vacuum to 232 PSIG (Vacuum to 16 bar Max.)
Type C & D: Vacuum to 174 PSIG (Vacuum to 12 bar Max.)
Temperature range: Extreme: -40°F to 140°F (-40°C to 60°C)

NOTE: P2LCX and P2LDX Manual & Remote Air Pilot Valves have a maximum pressure rating of 175 PSIG (12 bar).

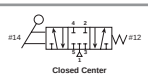
Materials

Valve body	Anodized aluminum
End covers	Anodized aluminum
Lever housing	Acetal plastic
Spool	Aluminum & nitrile rubber
Piston	Acetal plastic / anodized aluminum
Seals	Nitrile rubber
Screws	Stainless steel
Springs	Dacromet - processed steel, stainless steel
Lever	Reinforced polyamide plastic

Lever Valve - 2-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
		1/8"	0.7	P2LAX Inline	2-Position, Spring return	**P2LAX591VS**
		1/8"	0.7	P2LAX Inline	2-Position, Detent	**P2LAX591VV**

Lever Valve - 3-Position

	Symbol	Port size	Cv	Description	Valve type	Part number
	 Closed Center	1/8"	0.5	P2LAX Inline	APB, Spring centered	**P2LAX69111**
		1/8"	0.5	P2LAX Inline	APB, Detent	**P2LAX69122**
	Center Exhaust	1/8"	0.5	P2LAX Inline	CE, Spring centered	**P2LAX89111**
		1/8"	0.5	P2LAX Inline	CE, Detent	**P2LAX89122**

☐ Most popular. For technical information see CD

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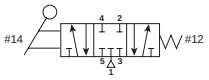
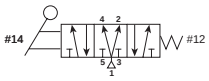
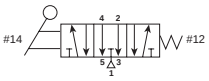
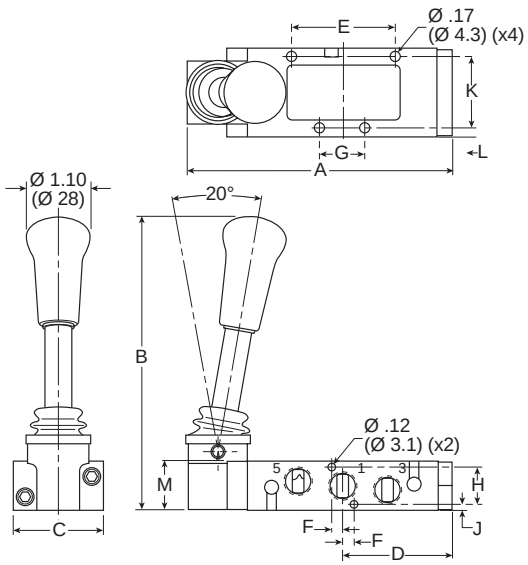
Lever Valve - 3-Position

Symbol	Port size	Cv	Description	Valve type	Part number
 Closed Center	1/4"	1.3	P2LBX Inline	Lever - APB	**P2LBX69222**
	1/4"	1.3	P2LBX Inline	Spring - APB	**P2LBX69211**
	3/8"	2.5	P2LCX Inline	Lever - APB	**P2LCX69322**
	3/8"	2.5	P2LCX Inline	Spring - APB	**P2LCX69311**
	1/2"	2.7	P2LDX Inline	Lever - APB	**P2LDX69422**
	1/2"	2.7	P2LDX Inline	Spring - APB	**P2LDX69411**
 Pressure Center	1/4"	1.3	P2LBX Inline	Lever - PC	**P2LBX79222**
	1/4"	1.3	P2LBX Inline	Spring - PC	**P2LBX79211**
	3/8"	2.5	P2LCX Inline	Lever - PC	**P2LCX79322**
	3/8"	2.5	P2LCX Inline	Spring - PC	**P2LCX79311**
	1/2"	2.7	P2LDX Inline	Lever - PC	**P2LDX79422**
	1/2"	2.7	P2LDX Inline	Spring - PC	**P2LDX79411**
 Center Exhaust	1/4"	1.3	P2LBX Inline	Lever - CE	**P2LBX89222**
	1/4"	1.3	P2LBX Inline	Spring - CE	**P2LBX89211**
	3/8"	2.5	P2LCX Inline	Lever - CE	**P2LCX89322**
	3/8"	2.5	P2LCX Inline	Spring - CE	**P2LCX89311**
	1/2"	2.7	P2LDX Inline	Lever - CE	**P2LDX89422**
	1/2"	2.7	P2LDX Inline	Spring - CE	**P2LDX89411**

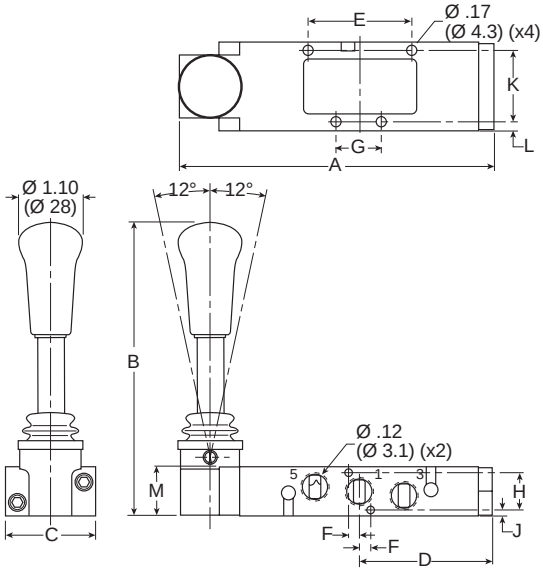


P2LBX 2-Position Hand Lever

A	B	C	D	E	F
4.67 (118.5)	5.19 (131.8)	1.57 (40)	1.93 (49)	1.81 (46)	.20 (5)

G	H	J	K	L	M
.79 (20)	.65 (16.5)	.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)



P2LBX 3-Position Hand Lever

A	B	C	D	E	F
5.51 (140)	5.19 (131.8)	1.57 (40)	2.35 (59.8)	1.81 (46)	.20 (5)

G	H	J	K	L	M
.79 (20)	.65 (16.5)	.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)

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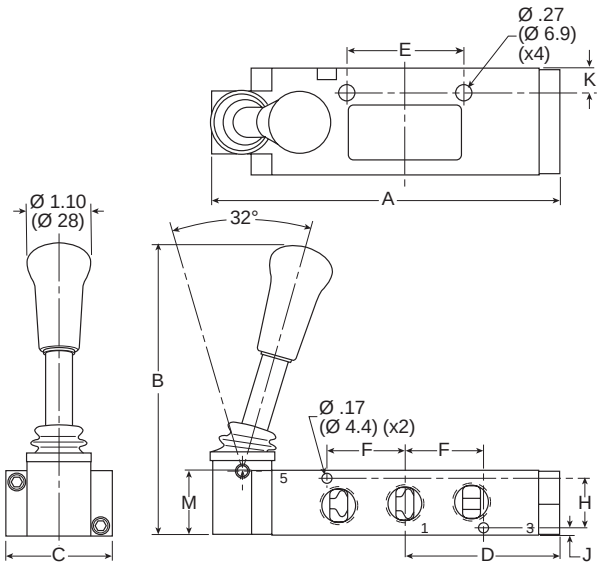
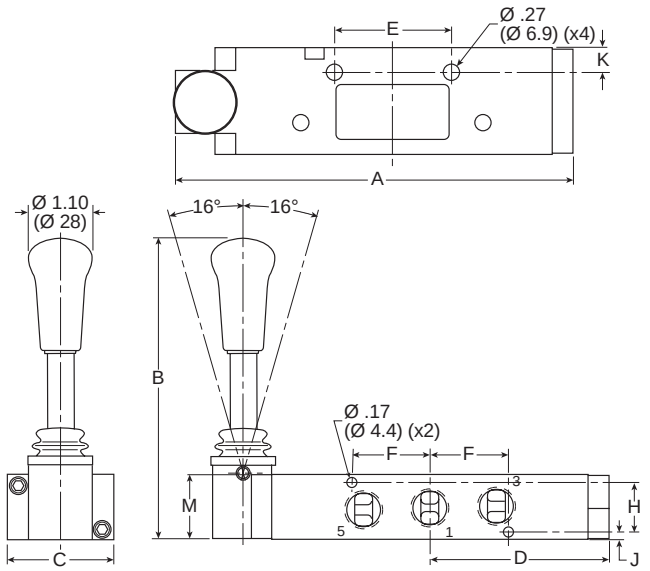


P2LCX 2-Position Hand Lever

A	B	C	D	E	F
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)	2.09 (53)	1.40 (35.5)

H	J	K	M
.91 (23)	.14 (3.5)	.43 (11)	1.18 (30)

Inches (mm)

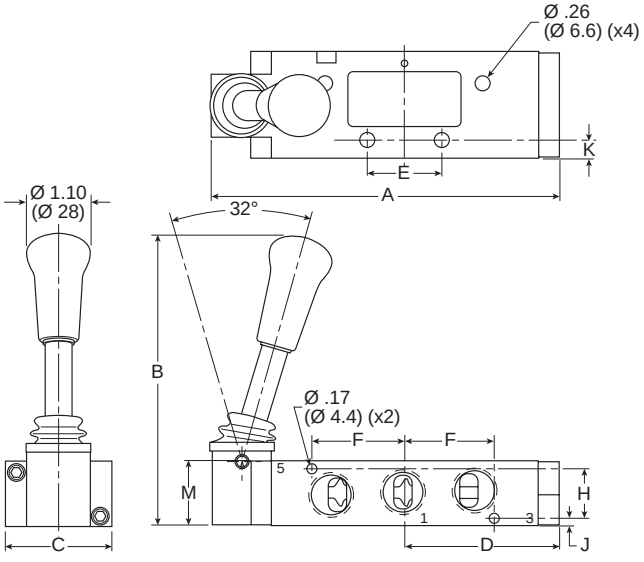


P2LCX 3-Position Hand Lever

A	B	C	D	E	F
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)	2.09 (53)	1.40 (35.5)

H	J	K	M
.91 (23)	.14 (3.5)	.43 (11)	1.18 (30)

Inches (mm)

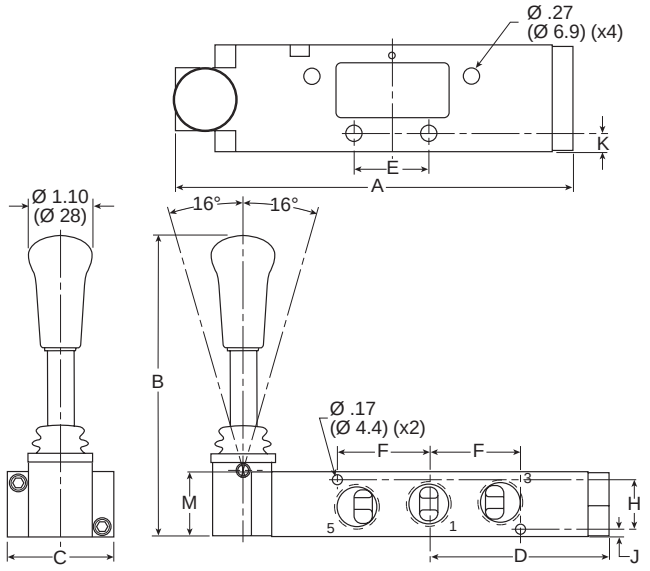


P2LDX 2-Position Hand Lever

A	B	C	D	E	F
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)	1.34 (34)	1.65 (42)

H	J	K	M
.91 (23)	.14 (3.5)	.30 (7.5	1.18 (30)

Inches (mm)



P2LDX 3-Position Hand Lever

A	B	C	D	E	F
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)	1.34 (34)	1.65 (42)

H	J	K	M
.91 (23)	.14 (3.5)	.30 (7.5	1.18 (30)

Inches (mm)

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Exhaust Mufflers

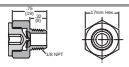
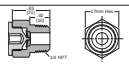
Pipe thread	Part number
M5	**P6M-PAC5**
1/8" NPT	**EM12**
1/4" NPT	**EM25**
3/8" NPT	**EM37**
1/2" NPT	**EM50**

P6M - Plastic; EM - Sintered Bronze

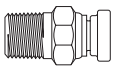
Plastic Silencers

Thread size	Part number NPT	BSPT
M5	**AS-5**	**AS-5**
1/8"	**ASN-6**	**AS-6**
1/4"	**ASN-8**	**AS-8**
3/8"	**ASN-10**	**AS-10**
1/2"	**ASN-15**	**AS-15**

Exhaust Protector

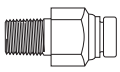
	Size	Part number
	1/8"	**E90016**
	1/4"	**E90017**

68PM Male Connector



Tube size	Pipe thread (NPTF)	Part number
1/8	1/16	**68PM-2-1**
1/8	1/8	**68PM-2-2**
5/32	1/16	**68PM-5/32-1**
5/32	1/8	**68PM-5/32-2**
5/32	1/4	**68PM-5/32-4**
3/16	1/16	**68PM-3-1**
3/16	1/8	**68PM-3-2**
3/16	1/4	**68PM-3-4**

68PMT Male Connector

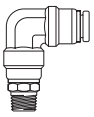


Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	**68PMT-4-2**
1/4	1/4	**68PMT-4-4**
1/4	3/8	**68PMT-4-6**
3/8	1/8	**68PMT-6-2**
3/8	1/4	**68PMT-6-4**
3/8	3/8	**68PMT-6-6**
3/8	1/2	**68PMT-6-8**
1/2	1/4	**68PMT-8-4**
1/2	3/8	**68PMT-8-6**
1/2	1/2	**68PMT-8-8**
5/8	3/8	**68PMT-10-6**
5/8	1/2	**68PMT-10-8**
3/4	1/2	**68PMT-12-8**

169PMNS Male Elbow Non-Swivel 90°

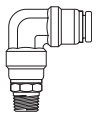
Tube size	Pipe thread (NPTF)	Part number
1/8	1/8	**169PMNS-2-2**
5/32	1/8	**169PMNS-5/32-2**
3/16	1/8	**169PMNS-3-2**
3/16	1/4	**169PMNS-3-4**

169PMT Male Elbow Swivel 90°



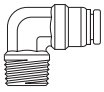
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	**169PMT-4-2**
1/4	1/4	**169PMT-4-4**
1/4	3/8	**169PMT-4-6**
3/8	1/8	**169PMT-6-2**
3/8	1/4	**169PMT-6-4**
3/8	3/8	**169PMT-6-6**
3/8	1/2	**169PMT-6-8**
1/2	1/4	**169PMT-8-4**
1/2	3/8	**169PMT-8-6**
1/2	1/2	**169PMT-8-8**
5/8	3/8	**169PMT-10-6**
5/8	1/2	**169PMT-10-8**

169PMTL Male Elbow Long Non-Swivel 90°



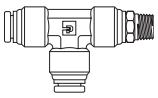
Tube size	Pipe thread (NPTF)	Part number
3/8	1/4	**169PMTL-6-4**
3/8	3/8	**169PMTL-6-6**
3/8	1/2	**169PMTL-6-8**
1/2	1/2	**169PMTL-8-8**
5/8	1/2	**169PMTL-10-8**

169PMTNS Male Elbow Non-Swivel 90°



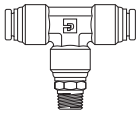
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	**169PMTNS-4-2**
1/4	1/4	**169PMTNS-4-4**
1/4	3/8	**169PMTNS-4-6**
3/8	1/8	**169PMTNS-6-2**
3/8	1/4	**169PMTNS-6-4**
3/8	3/8	**169PMTNS-6-6**
3/8	1/2	**169PMTNS-6-8**
1/2	1/4	**169PMTNS-8-4**
1/2	3/8	**169PMTNS-8-6**
1/2	1/2	**169PMTNS-8-8**
5/8	3/8	**169PMTNS-10-6**
5/8	1/2	**169PMTNS-10-8**
3/4	1/2	**169PMTNS-12-8**

171PMT Male Run Tee Swivel



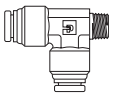
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	**171PMT-4-2**
1/4	1/4	**171PMT-4-4**
1/4	3/8	**171PMT-4-6**
3/8	1/4	**171PMT-6-4**
3/8	3/8	**171PMT-6-6**
1/2	1/4	**171PMT-8-4**
1/2	3/8	**171PMT-8-6**
1/2	1/2	**171PMT-8-8**

172PMT Male Branch Tee Swivel



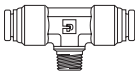
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	**172PMT-4-2**
1/4	1/4	**172PMT-4-4**
3/8	1/8	**172PMT-6-2**
3/8	1/4	**172PMT-6-4**
3/8	3/8	**172PMT-6-6**
1/2	1/4	**172PMT-8-4**
1/2	3/8	**172PMT-8-6**
1/2	1/2	**172PMT-8-8**

171PMTNS Male Run Tee Non-Swivel



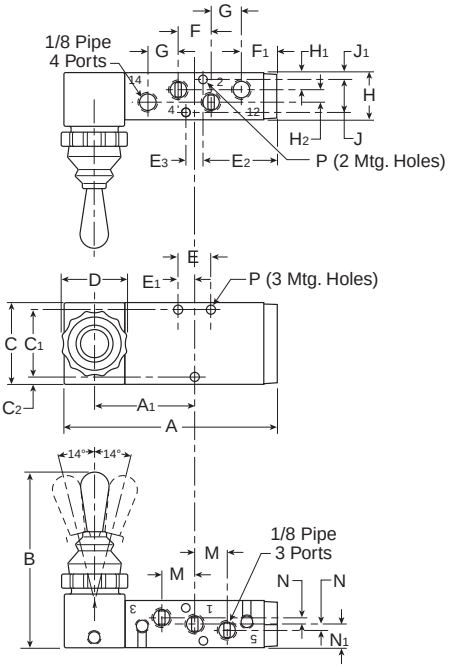
Tube size	Pipe thread (NPTF)	Part number
1/4	1/4	**171PMTNS-4-4**
1/4	3/8	**171PMTNS-4-6-4**
3/8	3/8	**171PMTNS-6-4**
3/8	1/4	**171PMTNS-6-4-4**
3/8	1/4	**171PMTNS-6-4-6**
1/2	3/8	**171PMTNS-6-6**
1/2	3/8	**171PMTNS-6-8**
1/2	1/2	**171PMTNS-8-4**

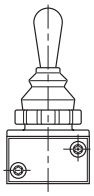
172PMTNS Male Branch Tee Non-Swivel



Tube size	Pipe thread (NPTF)	Part number
1/4	1/4	**172PMTNS-4-2**
3/8	3/8	**172PMTNS-6-4**
3/8	1/4	**172PMTNS-6-4-4**
3/8	3/8	**172PMTNS-6-6**
3/8	3/8	**172PMTNS-6-8**
1/2	1/2	**172PMTNS-8-6**
1/2	3/8	**172PMTNS-8-6-8**
1/2	1/2	**172PMTNS-8-8**

P2LAX Hand Lever Operated





P2LAX Hand Lever

A	A1	B	C	C1
4.02 (102)	1.89 (48)	3.23 (82)	1.57 (40)	1.30 (33)

C2	D	E2	E3	F
.14 (3.5)	1.18 (30)	1.42 (36)	.33 (8.5)	.63 (16)

F1	G	H	H1	H2
.67 (17)	.59 (15)	.87 (22)	.31 (8)	.24 (6)

J	J1	M	N	N1
.63 (16)	.12 (3)	.63 (16)	.12 (3)	.43 (11)

P
Ø .16 Ø (4.1)

Inches (mm)

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Features

- 1/4" to 3/4" NPTF ports
- Standard operators listed. Consult factor for variations in orientation
- Standard 2 position 3-way and 4-way valves listed. Consult factory for 2-way and 3 position valves
- Corrosion resistant bronze body
- High flow brass spacers position o-ring, permit reverse piping and vacuum service
- Specially compounded o-rings suitable for non-lube air service and low pressure oil service
- Floating stem of hard chrome plated stainless steel; no metal to metal contact
- Closed at crossover design for air savings
- Piped exhaust convenient for muffling
- Interchangeable operators
- Interchangeable end sections
- Service without disturbing plumbing
- Dual mounting brackets on most models

Operating information

Pressure limitations
knob (manual and spring return) and palm operators (manual and spring return)

Media	Port size	PSI (kPa) 3-way	PSI (kPa) 4-way
Air and Hydraulic ‡	1/4	200 (1380)	180 (1240)
	3/8	175 (1210)	170 (1170)
	1/2	160 (1100)	150 (1030)
	3/4	150 (1030)	150 (1030)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Pressure limitations
knob (detent), lever, pedal, treadle, clevis, cam air operated diaphragm and cylinder

Media	Port size	PSI (kPa) 3-way	PSI (kPa) 4-way
Air and Hydraulic ‡	1/4	225 (1550)	225 (1550)
	3/8	225 (1550)	225 (1550)
	1/2	215 (1480)	215 (1480)
	3/4	200 (1380)	200 (1380)
Vacuum	All	Within 1" Hg of perfect	
Other	Consult factory		

Temperature range: -15°F to 200°F (-26° to 93°C)

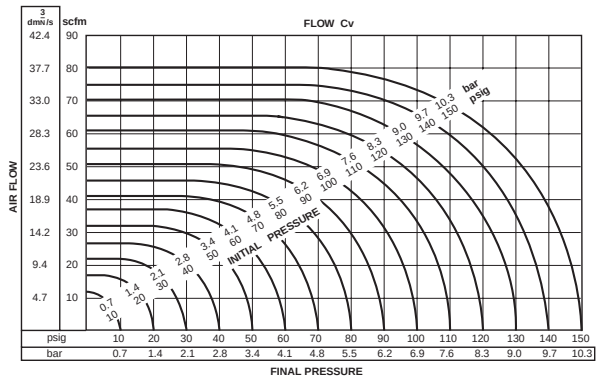
Lubrication: For best results and service life use clean, moisture free lubricated air.

‡ For technical information see CD

Flow Cv ratings

Valve type	Port size	Port 1 to 2	Port 1 to 3	Port 2 to 3	Port 2 to 4	Port 3 to 4
3-way 2-position	1/4	2.4	—	2.4	—	—
	3/8	3.2	—	3.4	—	—
	1/2	5.0	—	5.1	—	—
	3/4	9.5	—	9.8	—	—
4-way 2-position	1/4	2.4	2.4	—	2.0	2.2
	3/8	3.4	3.2	—	3.0	3.1
	1/2	5.2	5.3	—	4.7	4.7
	3/4	8.7	9.2	—	7.9	8.0

Flow Cv



Flow capacities

The capacity curves shown in the chart are for a theoretical valve having a Cv = 1.0 for air at standard conditions.

Flow rating determined in accordance with NFPA recommended standard NFPA/T3.21.3 - 1974.

Materials

Body	High pressure valve bronze
Knobs and palm buttons	Anodized aluminum
Operators	Iron castings; steel rod, bar and tube, and plated for corrosion resistance
O-rings	Buna-N and impregnated with Molybdenum Disulfide
Spacers and end bearings	Brass bar stock
Springs	high quality steel and plated for corrosion resistance
Stem	Stainless steel and hard chrome plated

Warnings

⚠ Install guards on all hand operated valves if accidental operation can cause personal injury.

⚠ Foot operated valves must be protected against inadvertent operation that can cause serious bodily injury. Use of a guard is strongly recommended as it will reduce the likelihood of inadvertent operation.

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M0 Series Air Pilot, Manual & Mechanically Actuated Valves

3-way and 4-way knob operated		Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
		3-way, detent ball, foot bracket	**M05422448**	**M05432448**	**M05442448**	**M05462448**
		3-way, detent ball, panel mount with nut	**M05822451**	**M05832451**	**M05842451**	**M05862451**
		3-way, N.C., manual, foot bracket	**M08521848**	**M08531848**	**M08541848**	**M08561848**
		3-way, N.C., manual, panel nut	**M08521851**	**M08531851**	**M08541851**	**M08561851**
		3-way, N.C., pull to operate, spring return, foot bracket	**M09721848**	**M09731848**	**M09741848**	**M09761848**
		3-way, N.C., pull to operate, spring return, panel mount with nut	**M06421851**	**M06431851**	**M06441851**	**M06461851**
		3-way, N.C., push to operate, spring return, foot bracket	**M09821848**	**M09831848**	**M09841848**	**M09861848**
		3-way, N.C., push to operate, spring return, panel mount with nut	**M06521851**	**M06531851**	**M06541851**	**M06561851**
		4-way, detent ball, foot bracket	**M05425448**	**M05435448**	**M05445448**	**M05465448**
		4-way, detent ball, panel mount with nut	**M05825451**	**M05835451**	**M05845451**	**M05865451**
		4-way, manual, foot bracket	**M08524648**	**M08534648**	**M08544648**	**M08564648**
		4-way, manual, panel nut	**M08524651**	**M08534651**	**M08544651**	**M08564651**
		4-way, pull to operate, spring return, foot bracket	**M09724648**	**M09734648**	**M09744648**	**M09764648**
		4-way, pull to operate, spring return, |panel mount with nut	**M06424651**	**M06434651**	**M06444651**	**M06464651**
		4-way, push to operate, spring return, foot bracket	**M09824648**	**M09834648**	**M09844648**	**M09864648**
		4-way, push to operate, spring return, panel mount with nut	**M06524651**	**M06534651**	**M06544651**	**M06564651**
3-way and 4-way palm button operated						
		3-way, N.C., pull palm button to operate, spring return, panel mount with nut	**M06421859**	**M06431859**	**M06441859**	**M06461859**
		3-way, N.C., push palm button to operate, spring return, panel mount with nut	**M06521859**	**M06531859**	**M06541859**	**M06561859**
		4-way, pull palm button to operate, spring return panel mount with nut	**M06424659**	**M06434659**	**M06444659**	**M06464659**
		4-way, push palm button to operate, spring return, panel mount with nut	**M06524659**	**M06534659**	**M06544659**	**M06564659**
3-way and 4-way lever operated						
		3-way, detent ball, foot bracket	**M05422443**	**M05432443**	**M05442443**	**M05462443**
		3-way, manual, foot bracket	**M08521843**	**M08531843**	**M08541843**	**M08561843**
		3-way, N.C., pull lever to operate, spring return, foot bracket	**M09621843**	**M09631843**	**M09641843**	**M09661843**
		3-way, N.C., push lever to operate, spring return, foot bracket	**M09521843**	**M09531843**	**M09541843**	**M09561843**
		4-way, detent ball, foot bracket	**M05425443**	**M05435443**	**M05445443**	**M05465443**
		4-way, manual, foot bracket	**M08524643**	**M08534643**	**M08544643**	**M08564643**
		4-way, pull lever to operate, spring return, foot bracket	**M09624643**	**M09634643**	**M09644643**	**M09664643**
		4-way, push lever to operate, spring return, foot bracket	**M09524643**	**M09534643**	**M09544643**	**M09564643**

Most popular. For technical information see CD

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M0 Series Air Pilot, Manual & Mechanically Actuated Valves

3-way and 4-way, foot operated: treadle / pedel type	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	3-way, treadle operated, detent ball, foot bracket	M05422488	M05432488	M05442488	–
	3-way, treadle operated, manual return, foot bracket	M08521888	M08531888	M08541888	–
	3-way, N.C., spring return, pedel operated, foot bracket	M06221840	M06231840	M06241840	–
	4-way, treadle operated, denent ball, foot bracket	M05425488	M05435488	M05445488	–
	4-way, treadle operated, manual return, foot bracket	M08524688	M08534688	M08544688	–
	4-way, spring return, pedel operated, foot bracket	M06224640	M06234640	M06244640	–

CAUTION:
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

3-way and 4-way air operated : diaphram or cylinder	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	3-way, N.C., single air diaphram, air signal to actuate, spring return foot bracket	M08421830	M08431830	M08441830	–
	3-way, single air cylinder signal to actuate, spring return foot bracket	M08521826	M08531826	M08541826	M08561826
	3-way, double air diaphram	M03321833	M03331833	M03341833	–
	3-way, double air cylinder foot bracket	M01921819	M01931819	M01941819	M01961819
	4-way, single air diaphram, air signal to actuate, spring return foot bracket	M08424630	M08434630	M08444630	–
	4-way, single air cylinder signal to actuate, spring return foot bracket	M08524626	M08534626	M08544626	M08564626
	4-way, double air diaphram	M03324633	M03334633	M03344633	–
	4-way, double air cylinder foot bracket	M01924619	M01934619	M01944619	M01964619

Note: diaphragm operators : pilot signal pressures from 20 to 60 psi. Cylinder operators : pilot signal pressures from 20 to 250 psi.

3-way and 4-way clevis operated	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	3-way, manual, foot bracket	M08521805	M08531805	M08541805	M08561805
	3-way, N.C., pull to operate, spring return foot bracket	M09621805	M09631805	M09641805	M09661805
	3-way, N.C., push to operate, spring return, foot bracket	M09521805	M09531805	M09541805	M09561805
	4-way, manual, foot bracket	M08524605	M08534605	M08544605	M08564605
	4-way, pull clevis to operate, spring return, foot bracket	M09624605	M09634605	M09644605	M09664605
	4-way, push clevis to operate, spring return, foot bracket	M09524605	M09534605	M09544605	M09564605

3-way and 4-way cam operated	Description	Part number 1/4 NPT	Part number 3/8 NPT	Part number 1/2 NPT	Part number 3/4 NPT
	3-way, N.C., spring return, cam operated, foot bracket	M09521803	M09531803	M09541803	M09561803
	4-way, spring return, cam operatred, foot bracket	M09524603	M09534603	M09544603	M09564603

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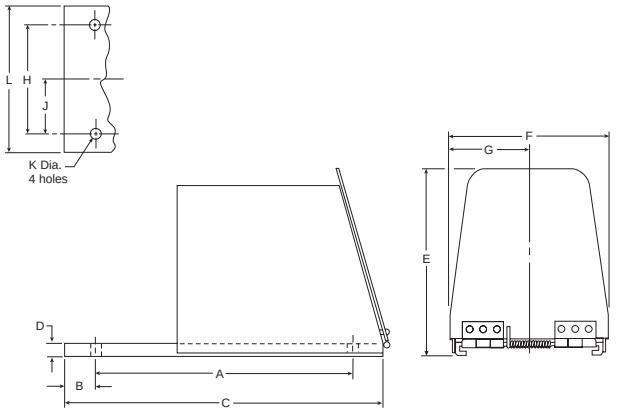
Pedal Guard
(Fits all pedal operated valves)

Description	Model number
Guard with door	**M232 001**
Guard without door	**M232 002**
Guard with door for 1/4 and 3/8 valve	**M232 003***
Guard without door for 1/4 and 3/8 valve	**M232 004***
Guard with door for 1/2 and 3/4	**M232 005***
Guard without door for 1/2 and 3/4	**M232 006***

* Includes mounting hardware.

CAUTION:

Foot valves utilizing this guard shall not be used to actuate a punch presse. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



Dimensions

A	B	C	D	E	F	G
10.50	1.25	13.00	.50	7.38	6.36	3.18
266.7	31.8	330.2	12.7	187.4	161.5	80.8

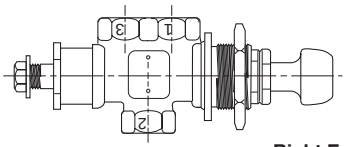
H	J	K	L
4.50	2.25	.44	6.00
114.3	57.2	11.2	152.4

M0 valve 9 digit part number dissection

The M0 Valve Series has with wide variety of operating and return ends which can be ordered either on the left or right hand side of the valve body. Common part numbers on the previous pages can be ordered with the left and right hand ends swapped. Swapping operator and return end sections does not change the spool function, but can reverse the expected function of the valve. For example, a 3-way, normally closed, “NC”, spring return valve will become a 3-way normally open, “NO”, valve when the operator and return secton is swapped. There are other non-cataloged options available and this part number dissection will enable you to discuss your valve part number with the factory for options.

3-way

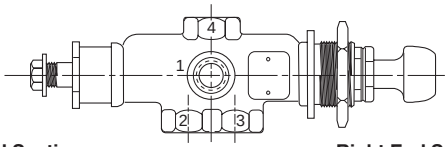
Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #2

4-way

Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



Left End Section in relation to port #2 ← → Right End Section in relation to port #3

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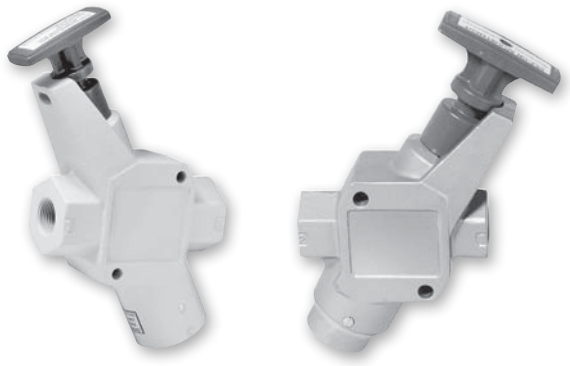
Lockout valves are installed in pneumatic drop legs, or individual pneumatic control lines. In accordance with OSHA procedures, lockout valves are used during maintenance and service procedures of pneumatically (air) operated equipment.

- Used in systems for compliance with OSHA standard 29 CFR part 1910
- 3/8 Inch to 1-1/4 inch pipe sizes
- 3/4 and 1-1/4 inch exhaust ports available
- Rugged cast aluminum alloy body
- Inline or surface mountable
- Exhaust port threaded for installation of silencer or line for remote exhausting



Material specification

Description	
Body:	Cast Aluminum Alloy
Handle:	Plastic
Spool:	Aluminum
Seals:	Carboxylated Nitrile
Detent Spring:	Stainless Steel
Grease:	Magnalube G †

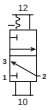
† Trademark Magnalube

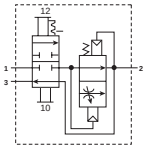
Operating information

	LV	EZ
Max operating pressure	300 PSIG	150 PSIG
Max operating temperature	175°F	175°F
Cv	6 to 14	3.7 to 13.7

For technical information see CD

Lockout Valves

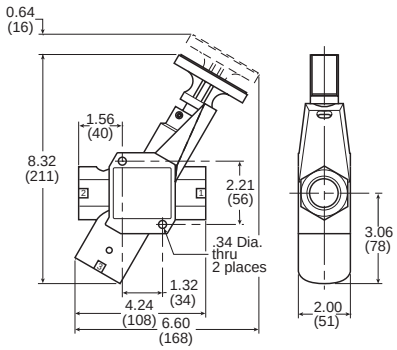




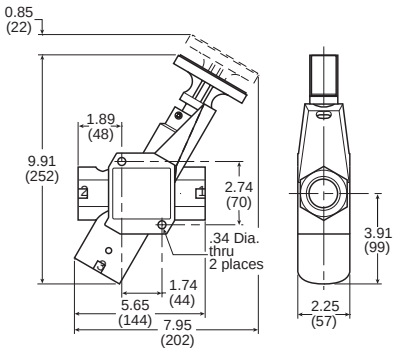
Port size inlet & outlet (port 1 & 2)	Port size exhaust (port 3)	Part number 0 to 125 PSIG
LV Series		
3/8	3/4	**LV3N6B**
1/2	3/4	**LV4N6B**
3/4	3/4	**LV6N6B**
3/4	1-1/4	**LV6NAB**
1	1-1/4	**LV8NAB**
1-1/4	1-1/4	**LVANAB**
EZ Series		
3/8	3/4	**EZ03NB6**
1/2	3/4	**EZ04NB6**
3/4	1-1/4	**EZ06NBA**
1	1-1/4	**EZ08NBA**
1-1/4	1-1/4	**EZ0ANBA**

Dimensions

3/4 Exhaust port



1-1/4 Exhaust port



☐ Most popular.

For technical information see CD

D

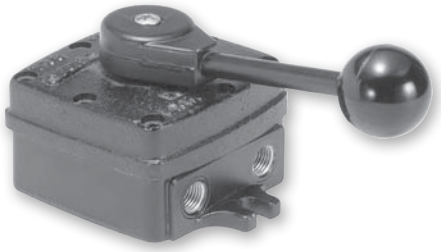
Manual / Mechanical Valve Products

These are 4-Way, 3-Position, rotary disc, direct-operated air valves. Two different types of control are offered. The forged bronze disc and the cast iron surface upon which the disc works are ground and lapped to provide a leak-proof seal. Air pressure from the inlet port is confined beneath the disc, making the seal tighter as the pressure increases, yet friction between the lapped surfaces is so low that only 15 pounds of force is required to move the lever at 100 PSI line pressure. The need for packing to seal around the stem is eliminated.

Valve can be furnished for gasketing to a manifold on customer's machine or with an adaptor for tapped bottom porting.

Valves are detented.

Operating handles may be installed in any of four positions.



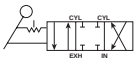
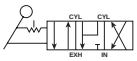
Operating information

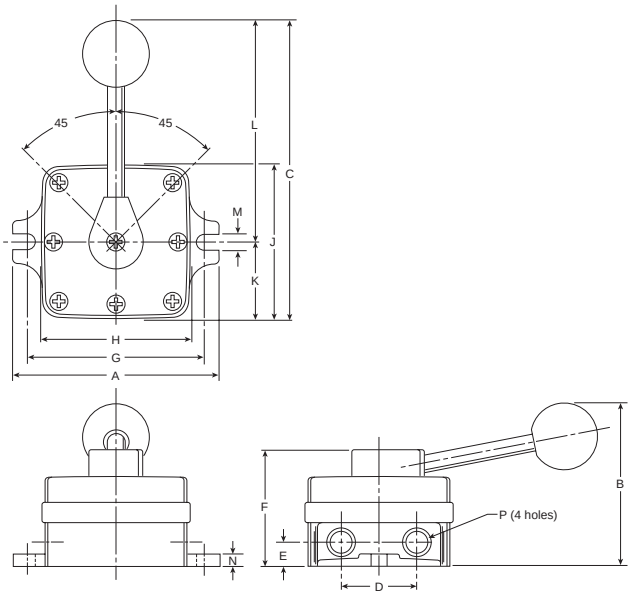
Operating pressure: 0 to 150 PSI (0 to 1035 kPa)

Temperature range: 18°F to 200°F (-8°C to 93°C)

Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

PL-VL Series Valves

Symbol	Port Size	Description	Cv	Part number
	1/4" NPT	4-way, 3-position, detent, closed center	2.5	**PL25**
	3/8" NPT	4-way, 3-position, detent, closed center	3.0	**PL37**
	1/2" NPT	4-way, 3-position, detent, closed center	6.2	**PL50**
	1/4" NPT	4-way, 3-position, detent, exhaust center	2.5	**VL25**
	3/8" NPT	4-way, 3-position, detent, exhaust center	3.0	**VL37**
	1/2" NPT	4-way, 3-position, detent, exhaust center	6.2	**VL50**



PL-VL Dimensions

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
PL-25 **VL-25**	4.75 (121)	3.81 (97)	6.81 (173)	1.69 (43)	.56 (14)	2.75 (70)	4.12 (105)	3.50 (89)	3.50 (89)	1.69 (43)	5.06 (129)	.34 (9)	.28 (7)	1/4 NPT
PL-37 **VL-37**	4.75 (121)	3.81 (97)	6.81 (173)	1.69 (43)	.56 (14)	.56 (14)	4.12 (105)	3.50 (89)	3.50 (89)	1.69 (43)	5.06 (129)	.34 (9)	.28 (7)	3/8 NPT
PL-50 **VL-50**	5.62 (143)	4.44 (113)	8.94 (227)	2.12 (54)	.66 (17)	3.25 (83)	5.00 (127)	4.38 (111)	4.38 (111)	2.12 (54)	6.75 (171)	.34 (9)	.34 (9)	1/2 NPT

inches (mm)

Most popular. For technical information see CD

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Features

- Compact and simple design
- Rotary disc, direct operated valves
- Side porting
- Detent action smooth lever actuation
- General pneumatic applications

Operating information

Operating pressure: 0 to 150 PSI (0 to 10 bar)

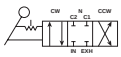
Temperature range: 32°F to 166°F (0°C to 60°C)

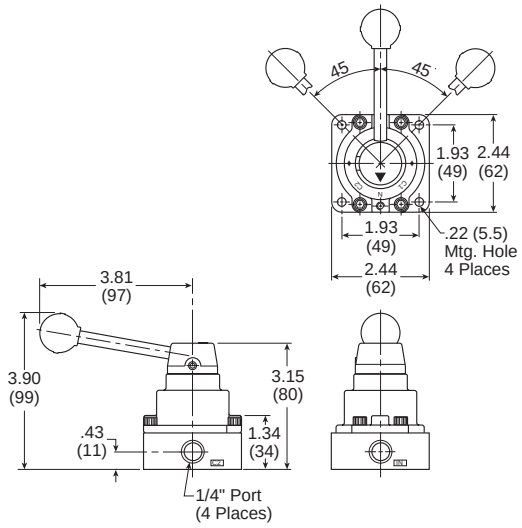
Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

Materials

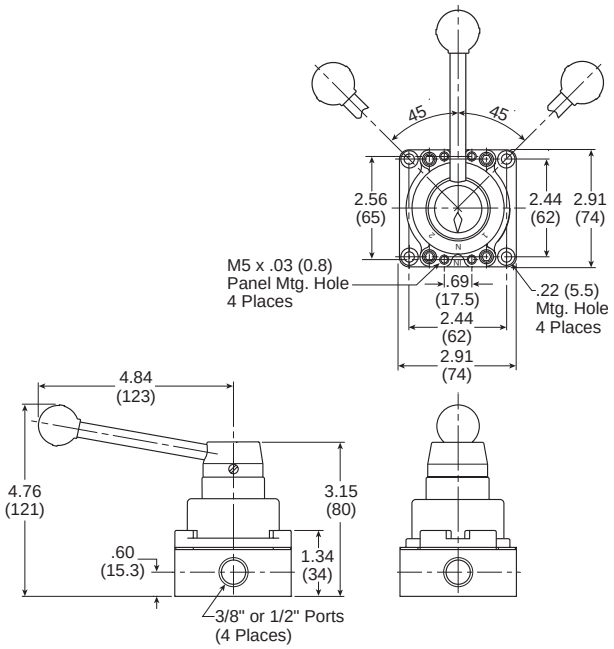
Cover	Zinc
Body	Aluminum
Seals	Polyurethane

HV Valve Series

Symbol	Port size	Description	Cv (ANSI)	Cv (JIS)	Part number
	1/4" NPT	4-way, 3-position	0.5	0.4	**HVN4200-8**
	3/8" NPT	4-way, 3-position	1.4	2.72	**HVN4400-10**
	1/2" NPT	4-way, 3-position	1.5	3.26	**HVN4400-15**



HVN4200-8



HVN4400-10, 15

Most popular. For technical information see CD

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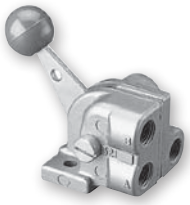
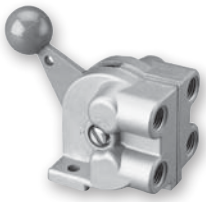
Sliding seal valves provide 3 or 4-Way directional control in a compact body size. Comfortable hand lever is easy to operate and maintains set position. Disc type valve has minimum number of moving parts. Valves should be used with filtered and lubricated air.

⚠ CAUTION:
Install guards on all hand operated valves.
Accidental operation can cause personal injury.



1/8" 3-Way



1/4" 4-Way

Materials

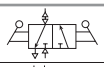
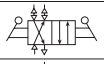
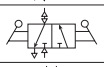
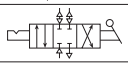
Internal components	Brass, stainless steel
Body	Die cast zinc
Seals	Buna N

Operating information

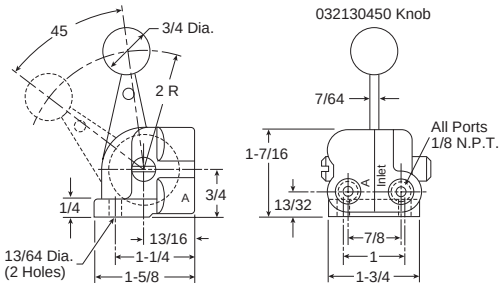
Operating pressure: Max. 200 PSIG air only
Min. 26" Hg vacuum

Temperature range: -40°F to 212°F (-40°C to 100°C)
If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

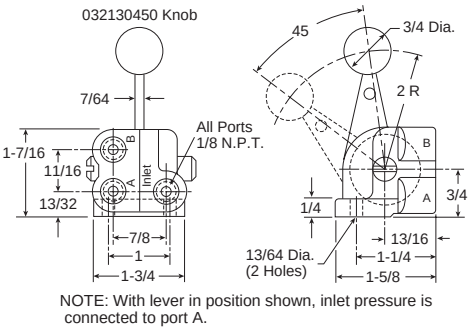
Hand Operated Sliding Seal Valve

Symbol	Port size	Function	Cv (Avg)	Part number
	1/8"	3-way, 2-position, detented	0.54	**032130599**
	1/8"	4-way, 2-position, detented	0.54	**032140299**
	1/4"	3-way, 2-position, detented	1.25	**008230109**
	1/4"	4-way, 3-position, detented, center blocked	1.25	**008240109**

Note: 3-Way exhaust passage is through an untapped hole in bottom side of valve.

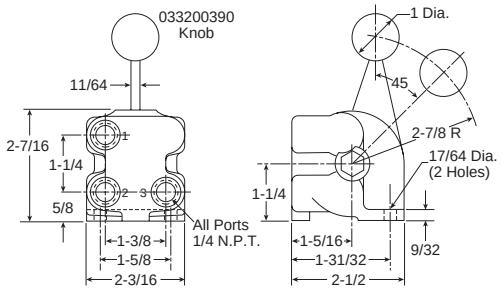


1/8" 3-Way (model no. 032130599)

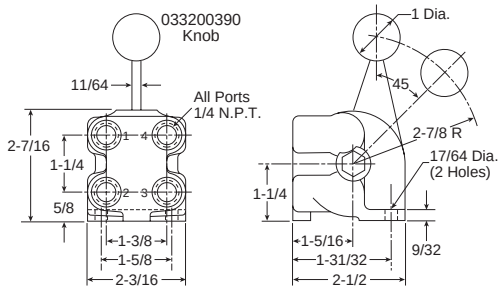


NOTE: With lever in position shown, inlet pressure is connected to port A.

1/8" 4-Way (model no. 032140299)



1/4" 3-Way (model no. 008230109)



NOTE: With lever in position shown, inlet port 3 is connected to port 4 and exhaust is through port 1.

1/4" 4-Way (model no. 008240109)

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HUMAN-MACHINE DIALOG requires devices such as push buttons and selector switches to provide command inputs. A wide variety of these devices are available to meet most application needs; in both pneumatic and electrical switch bodies. All of these devices use the 22 mm (7/8") mounting standard.

Complete Assemblies– 3/2 Valve Bodies with 5/32" Instant Straight Connections

Flush Push Buttons

	Color	Function	Type of switching*	Part number
	Black	Spring return	NNP	**PXBB3111BA2**
	Green			**PXBB3111BA3**
	Red			**PXBB3111BA4**
	Black	Spring return	NNP+NP	**PXBB3251BA2**
	Black	Spring return	Single universal 3-way	**PXBB4131BA2**
	Green			**PXBB4131BA3**
	Red			**PXBB4131BA4**
	Black	Spring return	Dual universal 3-way	**PXBB4231BA2**

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

Note: Mount up to three valves on mounting ring.

Mushroom Head Push Buttons (40mm Diameter)

	Color	Function	Type of switching*	Part number
	Black	Spring return	NNP	**PXBB3111BC2**
	Red	Push-pull		**PXBB3111BT4**
	Red	Push-pull	NP	**PXBB3121BT4**
	Black	Spring return	Single universal 3-way	**PXBB4131BC2**
	Red	Push-pull		**PXBB4131BT4**

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

Note: Mount up to three valves on mounting ring.

Selector Switches

	Color	Function	Type of switching*	Part number
	Black	2 maintained positions with std. handle	NNP	**PXBB3111BD2**
	Black		NNP+NNP	**PXBB3211BD2**
	Black		NNP+NP	**PXBB3251BD2**
	Black	3 maintained positions with std. handle	NNP+NNP	**PXBB3211BD3**
	Black		NNP+NP	**PXBB3251BD3**
	Black	3 positions, spring return to center with long handle	NNP+NNP	**PXBB3211BJ5**
	Black	2 maintained positions with std. Handle	Single universal 3-way	**PXBB4131BD2**
	Black	2 maintained positions with std. handle	Dual universal 3-way	**PXBB4231BD2**
	Black	3 maintained positions with std. handle	Dual universal 3-way	**PXBB4231BD3**
	Black	3 maintained positions with long handle	Dual universal 3-way	**PXBB4231BJ5**

* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.

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For Use With PXBB Valve Bodies and ZBE Electrical Switch Bodies

Push Buttons

	Color	Function	Type	Plastic head**	Metal head*
	Black	Spring return	Flush	**ZB5AA2**	**ZB4BA2**
	Green			**ZB5AA3**	**ZB4BA3**
	Red			**ZB5AA4**	**ZB4BA4**
	Yellow			—	**ZB4BA5**
	Blue			—	**ZB4BA6**
	Black	Spring return	Extended	**ZB5AL2**	**ZB4BL2**
	Green			**ZB5AL3**	**ZB4BL3**
	Red			**ZB5AL4**	**ZB4BL4**
	Yellow			—	**ZB4BL5**
	Black	Spring return	Booted	—	**ZB4BP2**
	Green			—	**ZB4BP3**
	Red			—	**ZB4BP4**
	Black	Detent 2 position	Flush	—	**ZB4BH02**
	Green			—	**ZB4BH03**
	Red			—	**ZB4BH04**

* ZB4*** model numbers are metal head operators
** ZB5*** model numbers are plastic head operators

Mushroom Head Push Buttons

	Color	Function	Description	Part number*
	Black	Spring return	Ø 40mm head	**ZB4BC2**
	Green			**ZB4BC3**
	Red			**ZB4BC4**
	Black	Latching push-pull		**ZB4BT2**
	Green			**ZB4BT3**
	Red			**ZB4BT4**
	Black	Spring return	Ø 60mm head	**ZB4BR2**
	Green			**ZB4BR3**
	Red			**ZB4BR4**

* ZB4*** model numbers are metal head operators

For Push Buttons and Visual Indicators

Mounting Ring for Valve Bodies, Switch Bodies and Operating Heads

Description		Part number
	Metal mounting ring	**ZB4BZ009**
	Plastic mounting ring	**ZB5AZ009**

Note: To release push button from mounting ring, pull lever on top of mounting ring up and remove push button operator. To assemble push button operator to mounting ring, align arrows and snap into place.

Selector Switches

Standard black handle

	Description	Function	Part number*
	Maintained	2 positions	**ZB4BD2**
	Spring return from right to left		**ZB4BD4**
	Maintained	3 positions	**ZB4BD3**
	Spring return to center from left and right		**ZB4BD5**
	Maintained right spring return from left to center	3 positions	**ZB4BD7**
	Maintained left spring return from right to center	3 positions	**ZB4BD8**

Long Black Handle

	Maintained	2 positions	**ZB4BJ2**
	Spring return from right to left		**ZB4BJ4**
	Maintained	3 positions	**ZB4BJ3**
	Spring return to center from left and right		**ZB4BJ5**

* ZB4*** model numbers are metal head operators

Key Operated Selectors

	Key withdrawal	Function	Part number*
	Left	2 maintained positions	**ZB4BG2**
	Left and right		**ZB4BG4**
	Center	3 maintained positions	**ZB4BG3**
	Left and right		**ZB4BG5**
	Center	3 positions 2 spring return to center	**ZB4BG7**

* ZB4*** Model numbers are metal head operators

Mushroom Head Push Buttons with Key Select

	Color	Function	Description	Part number*
	Red	Latching turn to release	Ø 40mm head	**ZB4BS54**
	Red	Key latching		**ZB4BS14**
	Red	Latching turn to release	Ø 60mm head	**ZB4BS64**
	Red	Key latching		**ZB4BS24**

* ZB4**** model numbers are metal head operators

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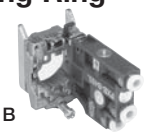
For Use With 2B4*** Metal Operating Heads

3/2 Valve Bodies with Mounting Ring

PXBB3111B


PXBB4131B

Connections	Function	Type of switching*	Part number
5/32" Instant	3/2	NNP	**PXBB3111B**
5/32" Instant	3/2	NP	**PXBB3121B**
5/32" Instant	3/2	Universal 3 way	**PXBB4131B**

* NNP: Normally non-passing.

Note: Mount up to 3 valves on mounting ring for push buttons.
Mount up to 2 valves on mounting ring for selector switches, valves cannot be mounted in center position.

Additional Valve Bodies

PXBB3911

PXBB4932

PXBB4931

Connections	Function	Type of switching*	Part number
5/32" instant straight	3/2	NNP	**PXBB3911**
5/32" instant swivel			**PXBB3912**
5/32" instant straight	3/2	NP	**PXBB3921**
5/32" instant swivel			**PXBB3922**
5/32" instant straight	3/2	Universal	**PXBB4931**
5/32" instant swivel		3 way	**PXBB4932**

* NNP: Normally non-passing.

For Push Buttons and Visual Indicators

Legend Plates for PXBB Devices (22mm)

	Description			Part number
Without text for customer engraving				
	Black / red background (white letters)			**ZBY2101**
	Yellow / white background (black letters)			**ZBY4101**
With text for push buttons				
	Start			**ZBY2303**
	Stop			**ZBY2304**
	Forward			**ZBY2305**
	Reverse			**ZBY2306**
	Up			**ZBY2307**
	Down			**ZBY2308**
	Right			**ZBY2309**
	Left			**ZBY2310**
	On			**ZBY2311**
	Off			**ZBY2312**
	Open			**ZBY2313**
	Close			**ZBY2314**
	Inch			**ZBY2321**
	Reset			**ZBY2323**
	Power On			**ZBY2326**
	Slow			**ZBY2327**
	Fast			**ZBY2328**
	Emergency stop			**ZBY2330**
	Run			**ZBY2334**
With text for 2 position selectors				
		Off	On	**ZBY2367**
With text for 3 position selectors				
	Hand	Off	Auto	**ZBY2387**

Blank Legend Plates for Inscription

For PXBB devices (2 lines of 11 characters maximum)

Please indicate the required text when ordering.
(Allow 3 weeks for delivery)

Description	Part number
Black background / White letters	**ZBY2002**

For 22mm Visual Indicators Only

2 lines of 11 characters maximum

Please indicate the required text when ordering.
(Allow 3 weeks for delivery)

Description	Part number
Black background / white letters	**ZB2BY2002**

Electrical Switch Bodies

When combined with pneumatic valves ,these contact blocks allow different forms of power to be provided from a single push button. Can be mounted with both types of valves PXBB3 / PXBB4.

Type of contact	Part number
Normally open (NO)	**ZBE101**
Normally closed (NC)	**ZBE102**

Note: Plastic mounting ring ZB5AZ009 to be used with ZB5 plastic operating heads. Metal mounting ring ZB4BZ009 to be used with ZB4 metal operating heads.

Electrical specification: 240V, 10Amp

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With 5/32" Instant Connections

22mm Visual Indicators

Black Plastic Bezel	Color	Part number "ON" indicator	Part number "OFF" indicator
	Green	**PXVF131**	**PXVF1213**
	Red	**PXVF141**	**PXVF1214**
	Yellow	**PXVF151**	**PXVF1215**
	Blue	**PXVF161**	**PXVF1216**
	White	**PXVF111**	**PXVF1211**

Notes: The Pneumatic Indicators are black in one position and colored in the other. The colored position corresponds either to the presence of a pressure ("ON" Indicator) or the absence of pressure ("OFF" Indicator).

With 5/32" Instant Connections, 1/16" I.D. Internal Orifice

Rotary Selector Switches, 22mm (7/8")

Without mechanical stop, 4-positions, 4-outputs 3/2

	Operating head	Type of switching*	Part number
	Black handle with 2.5" X 2.5" (64 X 64 mm) legend plate, red or black background	NNP	**PXBDD104**

* NNP: Normally non-passing.

Rotary Selector Switches, 22mm (7/8")

Without mechanical stop, 8-positions, 8-outputs 3/2

	Operating head	Type of switching*	Part number
	Black handle with 2.5" X 2.5" (64 X 64 mm) legend plate, red or black background	NNP	**PXBDD508**

* NNP: Normally non-passing.

With 5/32" Instant Connections, 1/16" I.D. Internal Orifice

Joystick Operators, 22mm (7/8")

2-Position Unit

PXBGA8211

4-Position Unit

PXBGA8411

Position	Function	Type of switching*	Operating head	Part number
2	Maintained position in each direction	NNP	Chrome plated lever with protective bellows 1.6" X 2.5"	**PXBGA8211**
4				**PXBGA8411**
2	Spring return in each direction	NNP	(40 X 64 mm) legend plate red or black background	**PXBGA8221**
4				**PXBGA8421**

* NNP: Normally non-passing.

Note: These joystick operators come assembled with switch type PXBB1911, but will accept all switch bodies shown later in this Section.

Standard Duty 1/6" I.D. Valves with 5/32" Instant Connections

Protective Guard

	Function	Material	Part number
	High resistance protective guard, with interlock mechanism to prevent accidental operation by a falling object.	Metal	**PXPEM510**

Foot Switches Without Protective Guard

	Function	Material	Type of switching*	Part number
	Spring Return	Plastic	NNP	**PXPEA110**
	Spring Return	Metal	NNP	**PXPEM110**

* NNP: Normally non-passing.

Two-Hand Controls

	Connections	Part number
	5/32" Instant	**PXPC111**

Mounting Accessories

	Color	Description	Part number
	—	Plastic head (ZB5) mounting nut tightening tool	**ZB5AZ905**
	Black plastic	Guard for 40mm	**ZBZ1602**

Two-Hand Control Module

	Connections	Part number
	5/32" Instant	**PXPA11**

Two-Hand Control Module Guard

	Base component	Part number
	PXPC111	**PPRL15**

D

Accessories
Valve Products

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To achieve the sensing or feedback function, pneumatic sensors can be:

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleed or blocking for detection.

A wide variety of pneumatic sensors are available to suit any application requirement.

Materials

Body	Zinc Alloy
Poppets	Polyurethane
Seals	Nitrile (Buna N)

Operating information

Operating pressure:	40 to 115 PSIG (3 to 8 bar)
Operating temperature:	
Operating	32°F to 122°F (0°C to 50°C)
Storage	-22°F to 140°F (-30°C to 60°C)

3/2 Miniature Direct Acting Limit Switches

1/16" I.D. Internal Orifice

	Actuator	Type of switching*	Flow SCFM (Nl/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available	NNP	2.2 (60)	1/16" (1.5mm)	5/32" instant	**PXCM111**
					10-32 UNF	**PXCM115**
	Plastic roller	NNP	3.0 (85)		5/32" instant	**PXCM121**
					10-32 UNF	**PXCM125**

7/64" I.D. Internal Orifice

	Plastic roller	NNP			5/32" instant	**PXCM521**

Actuators For Steel Plunger (Use with PXCM11*)

	Plastic roller lever	**PXCZ11**
	Plastic roller lever, one way trip	**PXCZ12**

3/2 Compact Pilot Operated Limit Switches

7/64" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port

	Actuator	Type of switching*	Flow SCFM (Nl/min)	Nominal bore	Connection	Part number
	Steel plunger operating levers available	NNP	8.8 (250)	7/64" (2.5mm)	5/32" instant	**PXCM601A110**
	Steel roller plunger					**PXCM601A102**
	90° Steel roller plunger					**PXCM601A103**

* NNP: Normally non-passing.

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Standard Duty Limit Switches – "K" Series

Plunger Operated Limit Switches
1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port

	Actuator	Type of switching*	Flow SCFM (Nl/min)	Nominal bore	Connection	Part number
	Steel plunger	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	**PXCK21101**
		NP				**PXCK22101**
	Steel roller plunger	NNP				**PXCK21102**
		NP				**PXCK22102**
	Plastic roller plunger	NNP				**PXCK21121**
		NP				**PXCK22121**
	Cats whisker	NNP				**PXCK21106**
		NP				**PXCK22106**

Roller Operated Limit Switches
1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port

	Actuator	Type of switching*	Flow SCFM (Nl/min)	Nominal bore	Connection	Part number
	Fixed delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP	7.4 (210)	1/8" (3mm)	5/32" instant	**PXCK2110031**
		NP				**PXCK2210031**
	Adjustable delrin roller lever multi-function head actuates: - from right and left - from right - from left	NNP				**PXCK2110041**
		NP				**PXCK2210041**

Separate Pneumatic Switch Bodies

	Actuator	Type of switching*	Part number
	For use with ZCK series operating heads	NNP	**PXCK211**
		NP	**PXCK221**

Pneumatic Switch Bodies with Rotary Heads

	Actuator	Type of switching*	Part number
	Multi-function head actuates: - from right and left - from right - from left	NNP	**PXCK21100**
		NP	**PXCK22100**

* NNP: Normally non-passing.
NNP: Normally passing.

D
Accessories
Valve Products

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Standard Duty Limit Switches – "K" Series

Operating Heads
For Use With PXCK Switch Bodies

	Actuator	Description	Part number
Rotary operated			
	—	Die cast zinc	**ZCKG00**
Plunger operated			
	Roller plunger	Plunger operated	**ZCKD02**
	Whisker		**ZCKD06**
	Rod plunger		**ZCKD10**
	Delrin roller lever on plunger		**ZCKD21**
	Steel roller lever on plunger		**ZCKD23**

Operating Levers for Rotary Heads
For Use With Rotary Head ZCKG00

	Actuator	Description	Part number
ZCKY81 ZCKY91	Steel 1/8" square	Rod levers	**ZCKY51**
	Fiberglas 1/8" dia. round		**ZCKY52**
	Plastic spring rod lever		**ZCKY81**
	Metal spring rod lever		**ZCKY91**
	Delrin roller lever	Roller levers	**ZCKY11**
	Steel roller lever		**ZCKY13**
	Adjust. delrin roller lever		**ZCKY41**
	Adjust. steel roller lever		**ZCKY43**

Heavy Duty Limit Switches – "J" Series

Switch Bodies Only

	Type of switching*	Part number
PXCJ117	NNP	**PXCJ117**
	NP	**PXCJ127**

Operating Levers for Rotary Heads
Die Cast Zinc. For Use With PXCJ Switch Bodies

	Operator	Description	Part number
ZC2JY11	Delrin roller	Spring return	**ZC2JY11**
ZC2JY31	Steel roller		**ZC2JY13**
	Offset delrin roller		**ZC2JY21**
	Plastic spring rod		**ZC2JY81**
	Metal spring rod		**ZC2JY91**
ZC2JY81	Delrin roller	Adjustable roller	**ZC2JY31**
ZC2JY91	Offset delrin roller		**ZC2JY41**
		Rod lever	**ZC2JY51**
	Single track, delrin roller	Fork lever	**ZC2JY71**
	Double track, delrin rollers		**ZC2JY61**

* NNP: Normally non-passing.
NNP: Normally passing.

Separate Pneumatic Switch Bodies

	Direction of actuator	Type of switching*	Part number
PXCJ11701	Right & left, spring return	NNP	**PXCJ11701**
	Right or left, spring return		**PXCJ11705**
	Right & left, spring return	NP	**PXCJ12701**
	Right or left, spring return		**PXCJ12705**

Top Plunger & Rotary Operating Heads
Die Cast Zinc. For Use With PXCJ Switch Bodies

	Operation	Description	Part number
Top Plunger Type			
ZC2JE70	Top push	Spring return	**ZC2JE61**
	Top roller push		**ZC2JE62**
	Side push		**ZC2JE63**
	Cat's whisker		**ZC2JE70**
Rotary Type			
ZC2JE01	From left & right	Spring return	**ZC2JE01**
	Counterclockwise from right		**ZC2JE02**
	Clockwise from left		**ZC2JE03**
	From left or right		**ZC2JE05**
	Maintained positions		**ZC2JE09**

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The blocking valve is a single acting spring return 2/2 valve in a fitting format. The device requires a pneumatic pilot signal to open, which allows free flow of air, gas or liquid to pass. As long as a pilot signal is present, the device will remain open. When the pilot signal is removed, the internal spring will close the blocking valve, bubble tight. The blocking valve is oil serviceable and rated to 150 PSI.

These devices have two primary design uses: (1) to prevent unwanted gravity induced motion in cylinders during shut down procedures or during periods of lost supply pressure and (2) freezing the cylinder position by using a blocking valve at each end of the cylinder. Application needs such as tool or work piece protection, horizontal indexing or inspection stops are often satisfied by these devices.

Materials

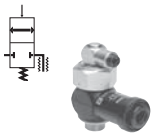
Body	Zinc alloy

Operating information

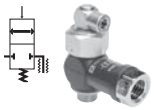
Operating pressure:	0 to 150 PSIG (0 to 10.3 bar)
Operating temperature:	
Operating	5°F to 140°F (-15°C to 60°C)
Storage	-40°F to 160°F (-40°C to 70°C)

For Cylinder Mounting
(Can also be mounted in Threshold Sensor Banjo)

With Instant Tube Fittings

BSPP					NPT			
Symbol	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number	Connection for pilot	Cylinder port thread (male)	Connection for tube	Part number
 **PWBA3469**	4mm Tube	1/8"	6mm	**PWBA1468**	5/32" Tube	1/8"	1/4"	**PWBA3468**
		1/4"	6mm	**PWBA1469**		1/4"	1/4"	**PWBA3469**
		1/4"	8mm	**PWBA1489**		3/8"	3/8"	**PWBA3493**
		3/8"	8mm	**PWBA1483**		1/2"	1/2"	**PWBA3412**
		3/8"	10mm	**PWBA1493**				
		1/2"	12mm	**PWBA1412**				

With Threaded Connections and Tube Pilot Port

BSPP					NPT			
Symbol	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number	Connection for pilot	Cylinder port thread (male)	Connection from valve (female)	Part number
 **PWBA3833**	4mm Tube	1/8"	1/4"	**PWBA1898**	5/32" * Tube	1/8"	1/8"	**PWBA3888**
		1/4"	1/4"	**PWBA1899**		1/4"	1/4"	**PWBA3899**
	M5 Female	3/8"	3/8"	**PWBA1833**		3/8"	3/8"	**PWBA3833**
		1/2"	1/2"	**PWBA1822**		1/2"	1/2"	**PWBA3822**

* Instant fitting

With Threaded Connections and Threaded Pilot Port

NPT			
Connection for pilot	Cylinder port thread (male)	Connection from valve	Part number
1/8" pipe	1/8"	1/8"	**PWBA38887**
	1/4"	1/4"	**PWBA38997**
	3/8"	3/8"	**PWBA38337**
	1/2"	1/2"	**PWBA38227**

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The plug-in threshold sensors provide feedback information on pneumatic cylinder status in either pneumatic or electrical outputs. Mounted into the cylinder port, these devices monitor the back pressure of the cylinder's exhaust. When the cylinder's piston stops, the back pressure rapidly drops and the threshold sensor provides the desired output. Ideal for variable stroke applications such as robotics where other sensor type devices such as limit switches are impractical, these devices provide a signal whenever the cylinder stops motion.

The threshold sensor consists of two complementary sub assemblies (1) the banjo fitting and (2) the plug-in sensor element. In all cases, the sensor is easily plugged into the banjo fitting and locked in place with a spring clip. The banjo fitting is designed to accept (piggy backed) other functional fittings such as flow controls or blocking valves. Simply select the sensor based on the type feedback signal that best fits the application.

Materials

Body	Thermoplastic
Mounting screw	Brass

Operating information

Operating pressure:	0 to 150 PSIG (0 to 10.3 bar)
Operating temperature:	
Operating	5°F to 140°F (-15°C to 60°C)
Storage	-40°F to 160°F (-40°C to 70°C)

Banjo Sockets (with Sensor Clip)

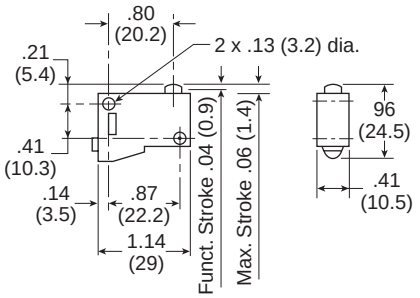
	Port size	Wrench	Part number
	10-32	5/16" Hex	**PWSB1557**
	1/8"	3/16" Allen	**PWSB1887**
	1/4"	5/16" Allen	**PWSB1997**
	3/8"	3/8" Allen	**PWSB1337**
	1/2"	1/2" Allen	**PWSB1227**

Plug-in Sensors

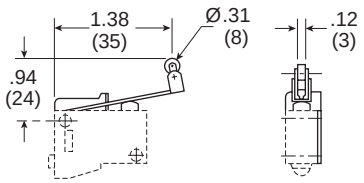
	Output	Connection	Part number
	Pneumatic	5/32" push-in	**PWSP111**
	Electrical	3-wire cable (6 ft)	**PWSM1012**

Miniature Limit Switches

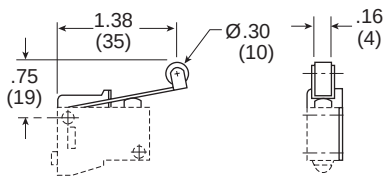
PXCM111



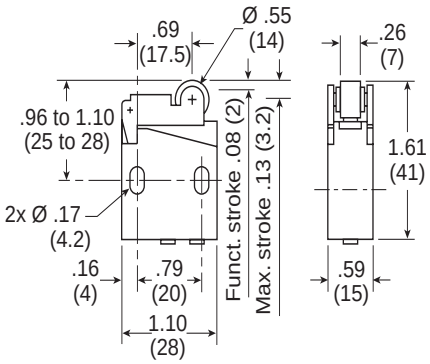
PXCZ12



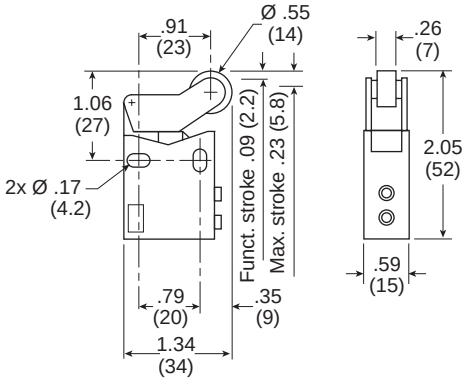
PXCZ11



PXCM121, PXCM131

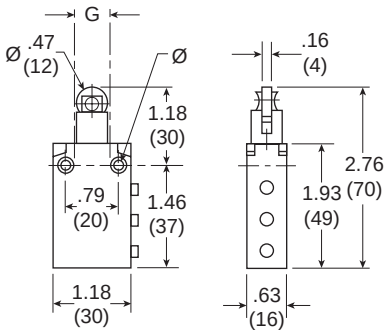


PXCM521



Compact Limit Switches

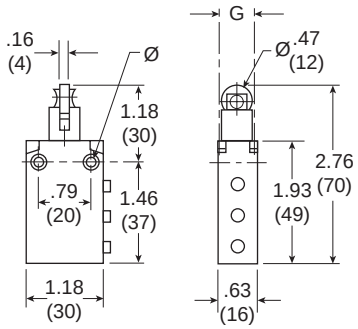
PXCM601A102



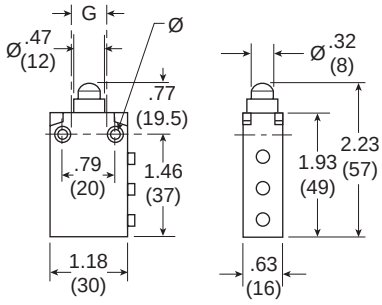
Ø:
2 mounting holes Ø .17" (4.3)
2 countersunk Ø .32" (8.2)
depth 4 mm

G:
top mounting holes, 2 x M5
.71" (18 mm) centers

PXCM601A103

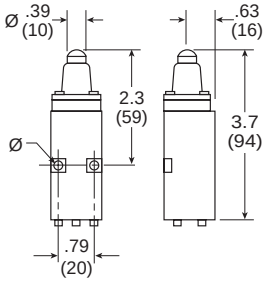


PXCM601A110

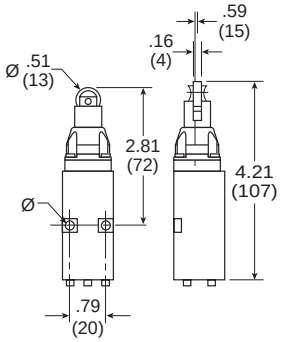


K Series

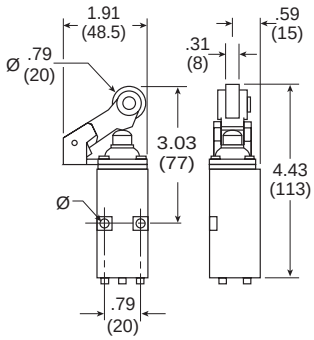
PXCK21101, PXCK22101



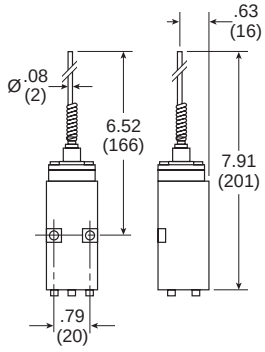
PXCK21102, PXCK22102



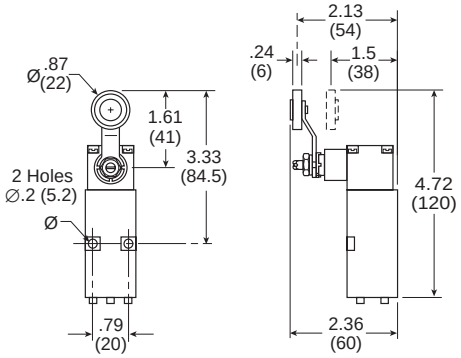
PXCK21121, PXCK22121



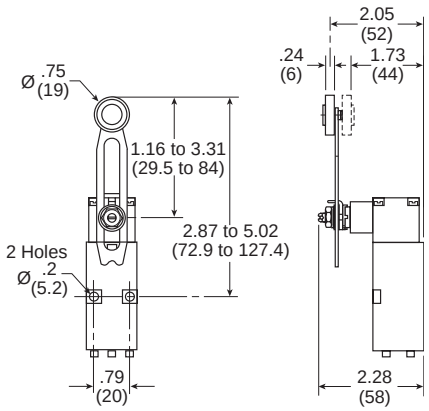
PXCK21106, PXCK22106



PXCK2110031, PXCK2210031

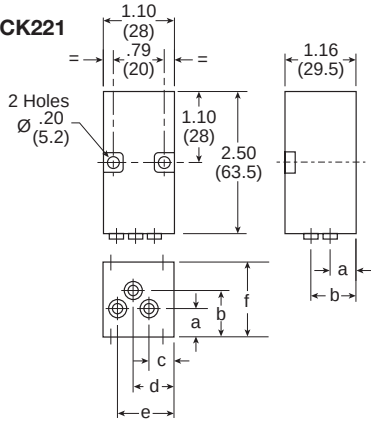


PXCK2110041, PXCK2210041



Pneumatic Switch Bodies

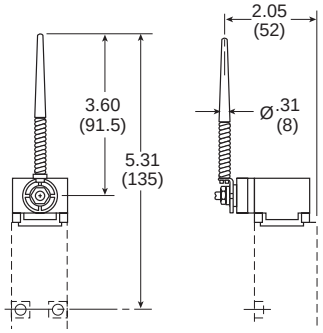
PXCK211, PXCK221



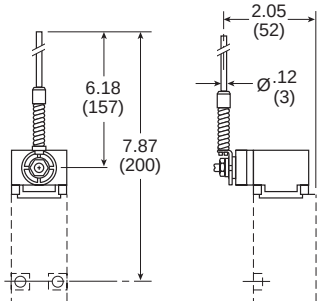
	inch	mm
a	.39	10
b	.77	19.5
c	.35	9
d	.61	15.5
e	.87	22
r	1.66	29.5

Rotary Heads with Operating Levers

ZCKY81



ZCKY91



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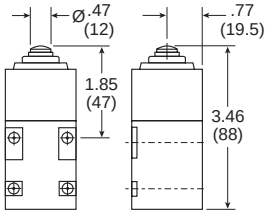
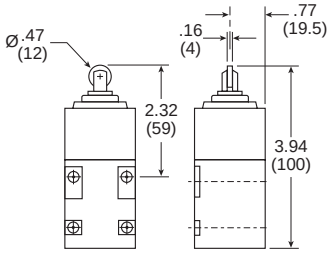
J Series

Switch Body With Plunger Heads

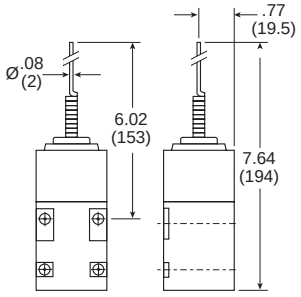
With ZC2JE61



With ZC2JE62

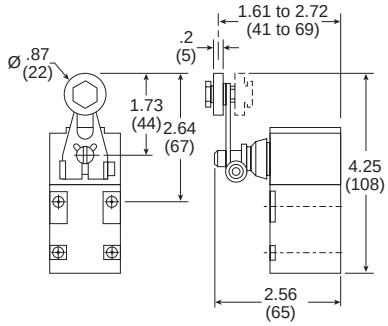


With ZC2JE70

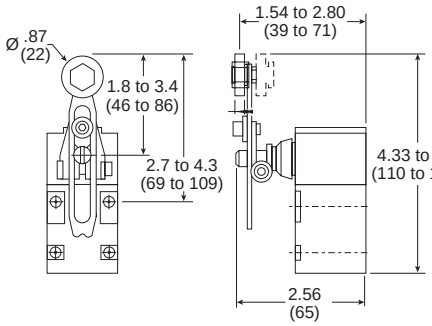


Switch Body With Rotary Heads and Operating Levers

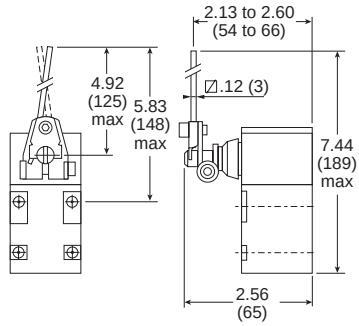
With ZC2JY11



With ZC2JY31

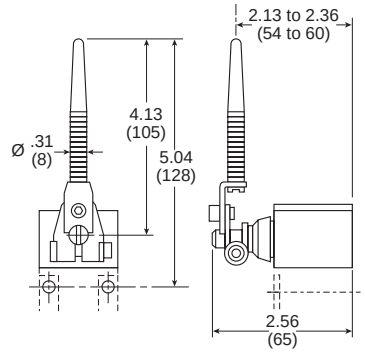


With ZC2JY51

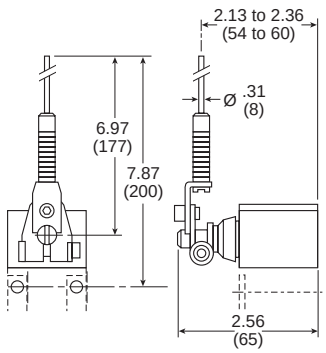


Rotary Heads With Operating Levers

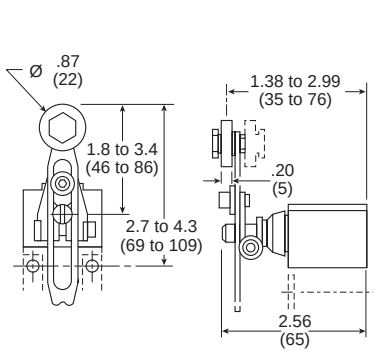
ZC2JY81



ZC2JY91

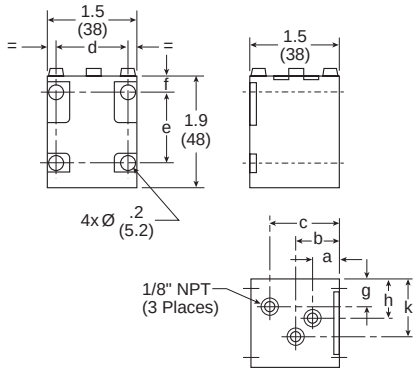


ZC2JY41



Pneumatic Switch Bodies

PXCJ117, PXCJ127



	inch	mm
a	.47	12
b	.75	19
c	1.16	29.5
d	1.14 to 1.18	29 to 30
e	1.18	30
f	.28	7
g	.43	11
h	.51	13
k	.94	24

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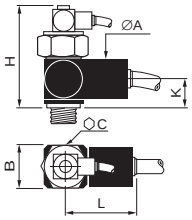
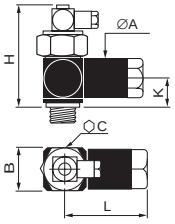
Blocking Valves

PWBA14/34



PWBA18/38



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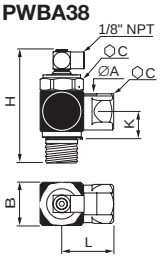
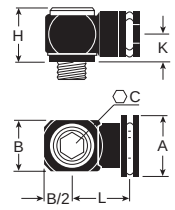


ØA	B	C	K	H	L	Flow*	Part number
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.54" (39)	14.8	**PWBA1468/3468**
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.54" (39)	19.4	**PWBA1469/3469 PWBA1489**
1.06""(27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	1.98" (50)	45.9	**PWBA1483 PWBA1493/3493**
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.59" (66)	81.2	**PWBA1412/3412**
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.32" (59)	1.71" (43.5)	14.8	**PWBA1898/3888**
0.86" (22)	0.82" (21)	0.94" (24)	0.53" (13.5)	2.09" (53)	1.71" (43.5)	19.4	**PWBA1899/3899**
1.06" (27)	1.10" (28)	0.94" (24)	0.55" (14)	2.09" (53)	2.18" (55)	45.9	**PWBA1833/3833**
1.22" (31)	1.30" (33)	1.30" (33)	0.94" (24)	2.59" (66)	2.47" (63)	81.2	**PWBA1822/3822**
0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	14.8	**PWBA38887**
0.75" (19)	0.87" (22)	0.83" (21)	0.67" (17)	2.20" (56)	1.73" (44)	19.4	**PWBA38997**
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	45.9	**PWBA38337**
1.06" (27)	1.18" (30)	1.06" (27)	0.91" (23)	2.64" (67)	1.42" (36)	81.2	**PWBA38227**

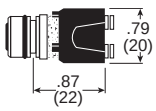
Threshold Sensors

Banjo Socket



A	B	C	H	K	L	Part number
.98 (25)	.43 (11)	5/16" Hex	.79 (20)	.40 (10)	.67 (17)	**PWSB1557**
.98 (25)	.63 (16)	3/16" Allen	.71 (18)	.40 (10)	.79 (20)	**PWSB1887**
.98 (25)	.83 (21)	5/16" Allen	.71 (18)	.40 (10)	.87 (22)	**PWSB1997**
.98 (25)	1.10 (28)	3/8" Allen	.79 (20)	.47 (12)	.98 (25)	**PWSB1337**
.98 (25)	1.30 (33)	1/2" Allen	.93 (24)	.55 (14)	1.02 (26)	**PWSB1227**

PWSP111



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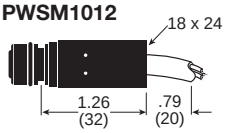

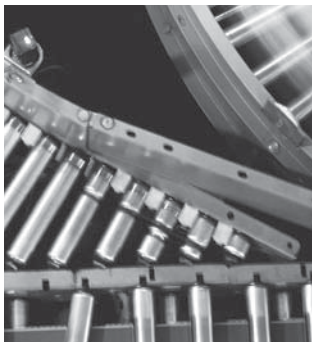

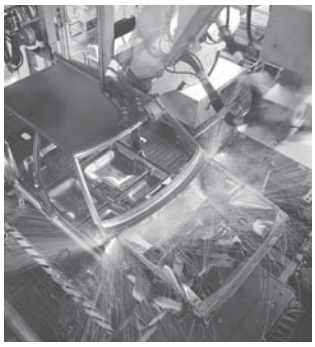

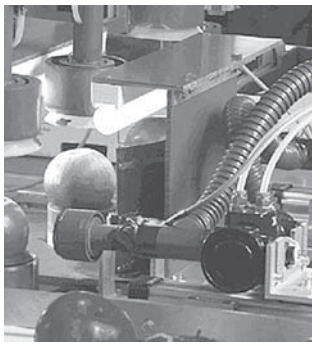

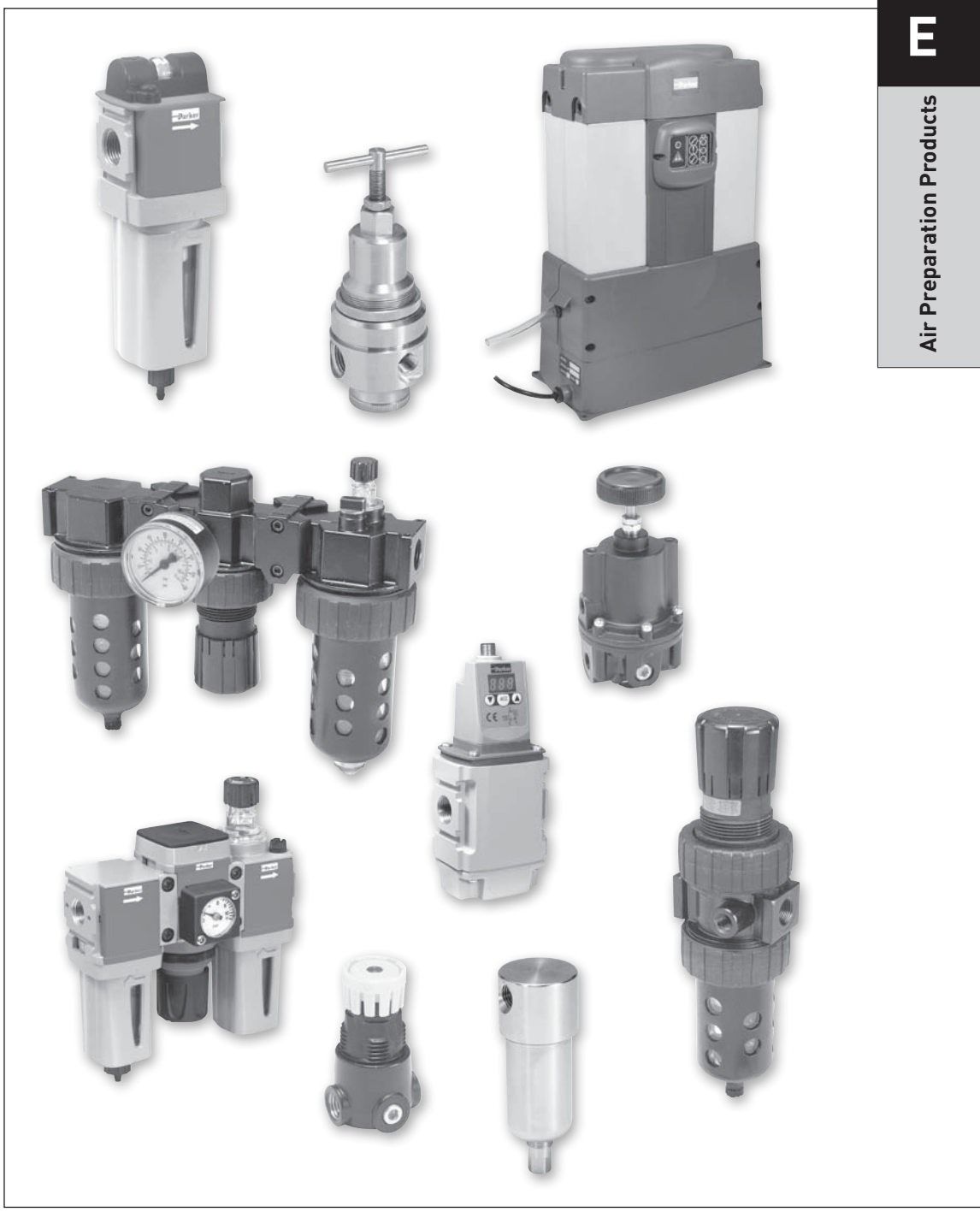

Air Preparation Products

Click here to view bookmarks.

Modular Air Preparation Products

Global FRL's

- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E3

General Industrial Air Preparation Products

Miniature, Compact, Standard, Hi-Flow

- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E27

Stainless Steel Air Preparation Products

Stainless Steel FRL's

- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E82

Precision / Proportional Regulator Products

Precision / Proportional Regulators

- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

E89

Dryer Products

Dryer Products

- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Zero loss & timer drains
- Environmentally friendly refrigerant

E101

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- Integral 1/4", 3/8", 1/2", or 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting

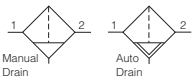
Operating information

		P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)				
Plastic Bowl		10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl		17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature				
Plastic Bowl		-10°C to 52°C (14°F to 25°F)	-25°C to 52°C (-13°F to 25°F)	-25°C to 52°C (-13°F to 25°F)
Metal Bowl		-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration		5 micron	5 micron	5 micron
Flow Capacity*	1/4	12 dm^3/s (25 SCFM)	18 dm^3/s (38 SCFM)	—
	3/8	—	30 dm^3/s (64 SCFM)	—
	1/2	—	38 dm^3/s (80 SCFM)	40 dm^3/s (85 SCFM)
	3/4	—	—	48 dm^3/s (102 SCFM)

*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD

Particulate Filters



Port size	Bowl type	Drain type	Element type	Part number P31	P32	P33
1/4"	Poly	Manual	5 micron	**P31F*92EGMN**	**P32F*92EGMN**	
1/4"	Poly	Pulse	5 micron	**P31F*92EGBN**		
1/4"	Poly	Auto	5 micron		**P32F*92EGAN**	
1/4"	Metal	Manual	5 micron	**P31F*92EMMN**	**P32F*92ESMN**	
1/4"	Metal	Pulse	5 micron	**P31F*92EMBN**		
1/4"	Metal	Auto	5 micron		**P32F*92ESAN**	
3/8"	Poly	Manual	5 micron		**P32F*93EGMN**	
3/8"	Poly	Auto	5 micron		**P32F*93EGAN**	
3/8"	Metal	Manual	5 micron		**P32F*93ESMN**	
3/8"	Metal	Auto	5 micron		**P32F*93ESAN**	
1/2"	Poly	Manual	5 micron		**P32F*94EGMN**	**P33F*94EGMN**
1/2"	Poly	Auto	5 micron		**P32F*94EGAN**	**P33F*94EGAN**
1/2"	Metal	Manual	5 micron		**P32F*94ESMN**	**P33F*94ESMN**
1/2"	Metal	Auto	5 micron		**P32F*94ESAN**	**P33F*94ESAN**
3/4"	Poly	Manual	5 micron			**P33F*96EGMN**
3/4"	Poly	Auto	5 micron			**P33F*96EGAN**
3/4"	Metal	Manual	5 micron			**P33F*96ESMN**
3/4"	Metal	Auto	5 micron			**P33F*96ESAN**

☐ Most popular.

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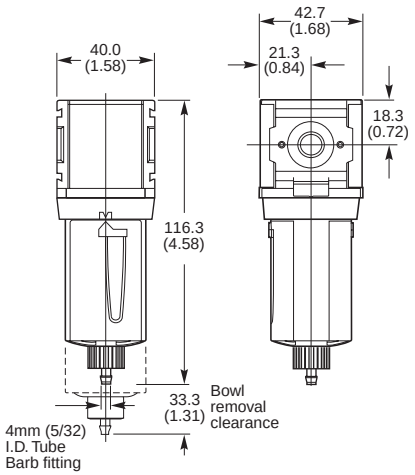
P31



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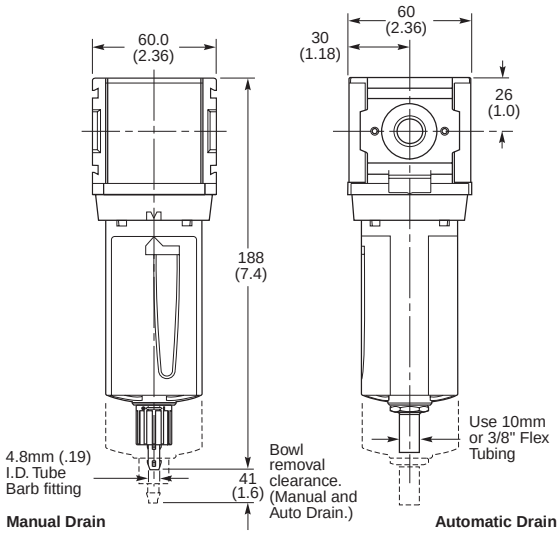

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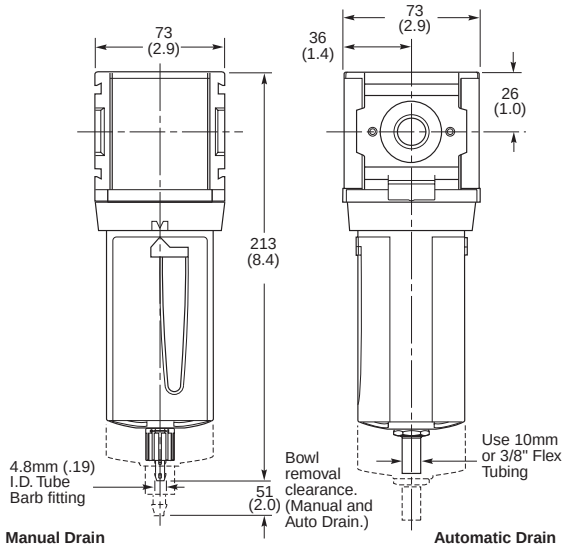

Material specification

Body		Aluminum
Body cap		ABS
Bowls	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard		Nylon
Deflector		**(P32 and P33)** Polypropylene
Element retainer/baffle		Acetal
Filter element		Sintered polyethylene
Adsorber		Activated carbon
Seals		Nitrile
Sight gauge		**(P32 and P33)** Polycarbonate

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	**P31KA00BGM**	**P32KA00BGM**	**P33KA00BGM**
	Pulse drain	**P31KA00BGB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl w/o sight gauge	Manual drain	**P31KA00BMM**		
	Pulse drain	**P31KA00BMB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl / sight gauge	Manual drain		**P32KA00BSM**	**P33KA00BSM**
	Auto drain		**P32KA00DA**	**P32KA00DA**
Filter element	5µ partculate	**P31KA00ESE**	**P32KA00ESE**	**P33KA00ESE**
C-bracket	Fits to body	**P31KA00MW**		
L-bracket	Fits to body		**P32KA00ML**	**P33KA00ML**
T-bracket	Fits to body connector		**P32KA00MB**	**P32KA00MB**
	With body connector	**P31KA00MT**	**P32KA00MT**	**P33KA00MT**
Body connector		**P31KA00CB**	**P32KA00CB**	**P32KA00CB**
Differential pressure indicator (replacement)			**P32KA00DM**	**P32KA00DM**

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- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Removes liquid aerosols and sub micron particles
- Oil free air for critical applications, such as air gauging, pneumatic instrumentation and control
- Positive bayonet latch to ensure correct & safe fitting
- Adsorbing activated carbon element removes oil vapors and most hydrocarbons

Note: To optimize the life of coalescing element, it is advisable to install a pre-filter with a 5 micron element upstream of the coalescing filter. To optimize the life of an Adsorber it is advisable to install a Coalescing Filter upstream of the Adsorber. Adsorber element should be replaced approximately every 1000 hours of service.

Operating information

	P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)			
Plastic Bowl	10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl	17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature			
Plastic Bowl	-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl	-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Standard filtration	1.0 and 0.01 micron	1.0 and 0.01 micron	1.0 and 0.01 micron
Flow Capacity			
1.0 Micron Coalescing			
Energy Efficient Flow*	3.8 dm^3/s (8 SCFM)	17 dm^3/s (36 SCFM)	32 dm^3/s (68 SCFM)
Maximum Flow**	6 dm^3/s (13 SCFM)	27 dm^3/s (57 SCFM)	44 dm^3/s (93 SCFM)
0.01 Micron Coalescing			
Energy Efficient Flow*	2 dm^3/s (4.2 SCFM)	11 dm^3/s (23 SCFM)	20 dm^3/s (42 SCFM)
Maximum Flow**	3.8 dm^3/s (8 SCFM)	28 dm^3/s (38 SCFM)	34 dm^3/s (72 SCFM)
Activated Carbon Adsorber			
Rated Flow*	6 dm^3/s (13 SCFM)	27 dm^3/s (57 SCFM)	44 dm^3/s (93 SCFM)

* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.2 bar (3 PSIG) saturated element.
** Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.4 bar (6 PSIG) saturated element.

For technical information see CD

Coalescing and Adsorber Filters, (1 micron and absorber elements available)

Port size	Bowl type	Drain type	Element type	Part number P31	P32	P33
1/4"	Poly	Manual	0.01 micron	**P31F*92CGMN**	**P32F*92DGMN**	
1/4"	Poly	Pulse	0.01 micron	**P31F*92CGBN**		
1/4"	Poly	Auto	0.01 micron		**P32F*92DGAN**	
1/4"	Metal	Manual	0.01 micron	**P31F*92CMMN**	**P32F*92DSMN**	
1/4"	Metal	Pulse	0.01 micron	**P31F*92CMBN**		
1/4"	Metal	Auto	0.01 micron		**P32F*92DSAN**	
3/8"	Poly	Manual	0.01 micron		**P32F*93DGMN**	
3/8"	Poly	Auto	0.01 micron		**P32F*93DGAN**	
3/8"	Metal	Manual	0.01 micron		**P32F*93DSMN**	
3/8"	Metal	Auto	0.01 micron		**P32F*93DSAN**	
1/2"	Poly	Manual	0.01 micron		**P32F*94DGMN**	**P33F*94DGMN**
1/2"	Poly	Auto	0.01 micron		**P32F*94DGAN**	**P33F*94DGAN**
1/2"	Metal	Manual	0.01 micron		**P32F*94DSMN**	**P33F*94DSMN**
1/2"	Metal	Auto	0.01 micron		**P32F*94DSAN**	**P33F*94DSAN**
3/4"	Poly	Manual	0.01 micron			**P33F*96DGMN**
3/4"	Poly	Auto	0.01 micron			**P33F*96DGAN**
3/4"	Metal	Manual	0.01 micron			**P33F*96DSMN**
3/4"	Metal	Auto	0.01 micron			**P33F*96DSAN**

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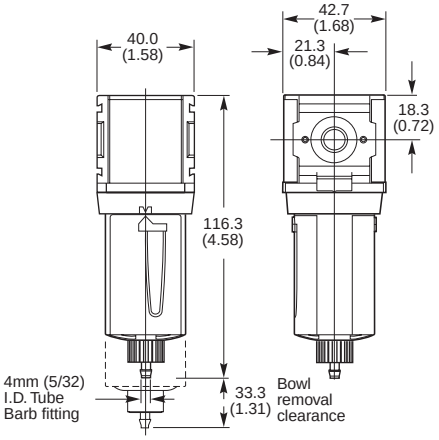
P31



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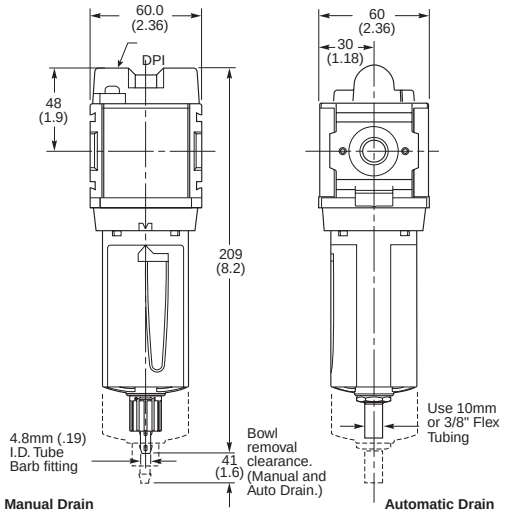

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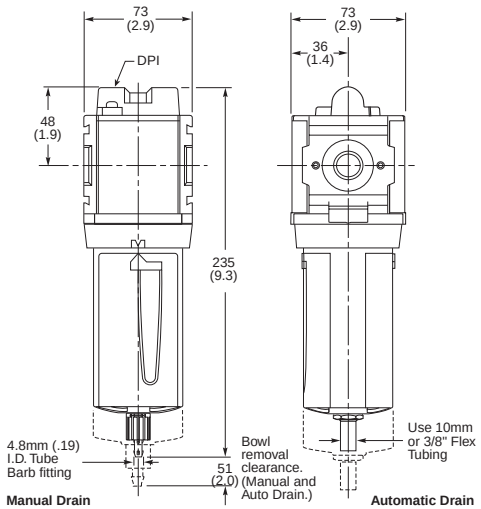

Material specification

Body		Aluminum
Body cap		ABS
Bowls	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard		Nylon
Filter element		Borosilicate cloth, 1.0 and .01 micron
Adsorber		Activated carbon
Seals		Nitrile
Sight gauge		Polycarbonate

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	**P31KA00BGM**	**P32KA00BGM**	**P33KA00BGM**
	Pulse drain	**P31KA00BGB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl w/o sight gauge	Manual drain	**P31KA00BMM**		
	Pulse drain	**P31KA00BMB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl / sight gauge	Manual drain		**P32KA00BSM**	**P33KA00BSM**
	Auto drain		**P32KA00DA**	**P32KA00DA**
Filter element	1µ coalescing	**P31KA00ES9**	**P32KA00ES9**	**P33KA00ES9**
	0.01µ coalescing	**P31KA00ESC**	**P32KA00ESC**	**P33KA00ESC**
	Activated carbon adsorber	**P31KA00ESA**	**P32KA00ESA**	**P33KA00ESA**
C-bracket	Fits to body	**P31KA00MW**		
L-bracket	Fits to body		**P32KA00ML**	**P33KA00ML**
T-bracket	Fits to body connector		**P32KA00MB**	**P32KA00MB**
	With body connector	**P31KA00MT**	**P32KA00MT**	**P32KA00MT**
Body connector		**P31KA00CB**	**P32KA00CB**	**P32KA00CB**
Differential pressure indicator (replacement)			**P32KA00RQ**	**P32KA00RQ**

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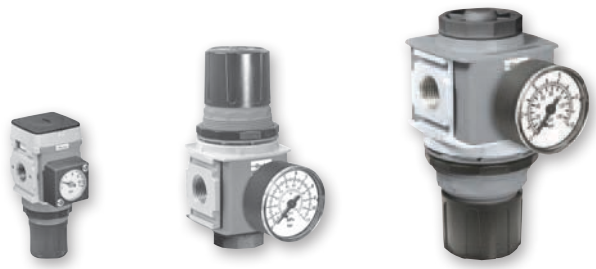
- Robust but lightweight aluminum construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation.
- Relieving & Non-relieving types
- Non-rising knob



⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

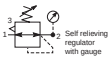
Operating information

		P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)		20 bar (300 PSIG)	20 bar (300 PSIG)	20 bar (300 PSIG)
Operating temperature		-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Units with square gauges		-15°C to 65.5°C (5°F to 150°F)		
Flow Capacity*	1/4	30 dm^3/s (64 SCFM)	41 dm^3/s (81 SCFM)	—
	3/8	—	65 dm^3/s (138 SCFM)	—
	1/2	—	67 dm^3/s (142 SCFM)	100 dm^3/s (212 SCFM)
	3/4	—	—	100 dm^3/s (212 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).

For technical information see CD

Regulators



Port size	Pressure (relieving)	Gauge	Part number P31	P32	P33
1/4"	8 bar (125 PSIG)	—	**P31R*92BNNP**	**P32R*92BNNP**	
1/4"	8 bar (125 PSIG)	Round	**P31R*92BN5P**	**P32R*92BNGP**	
3/8"	8 bar (125 PSIG)	—		**P32R*93BNNP**	
3/8"	8 bar (125 PSIG)	Round		**P32R*93BNGP**	
1/2"	8 bar (125 PSIG)	—		**P32R*94BNNP**	**P33R*94BNNP**
1/2"	8 bar (125 PSIG)	Round		**P32R*94BNGP**	**P33R*94BNGP**
3/4"	8 bar (125 PSIG)	—			**P33R*96BNNP**
3/4"	8 bar (125 PSIG)	Round			**P33R*96BNGP**

*** Engineering Level will be entered at factory.**

Material specifications

Description	P31	P32	P33
Body	Aluminum	Aluminum	Aluminum
Adjustment knob	Acetal	Acetal	Acetal
Body cap	ABS	ABS	ABS
Bonnet	PBT	33% glass-filled nylon	33% glass-filled nylon
Diaphragm assembly	Brass/nitrile	Nitrile/zinc	Nitrile/zinc
Bottom plug	33% glass-filled nylon	33% glass-filled nylon	—
Valve assembly	Brass/nitrile	Brass/nitrile	Brass/nitrile/acetal
Springs	Steel	Steel S.S. (main regulating valve)	Steel S.S. (main regulating valve)
Seals	Nitrile	Nitrile	Nitrile
Panel nut	Acetal	Acetal	Acetal

☐ Most popular.

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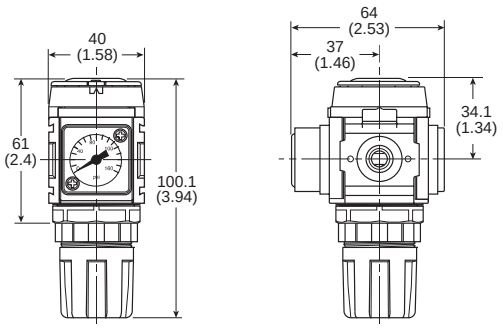
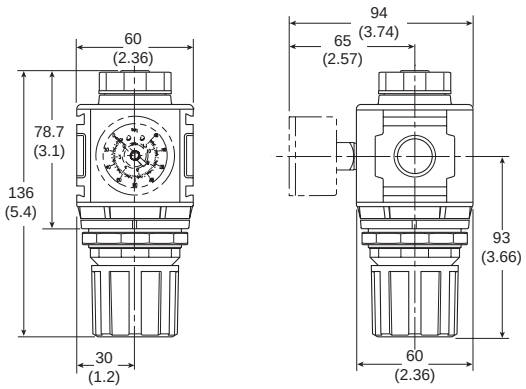
P31



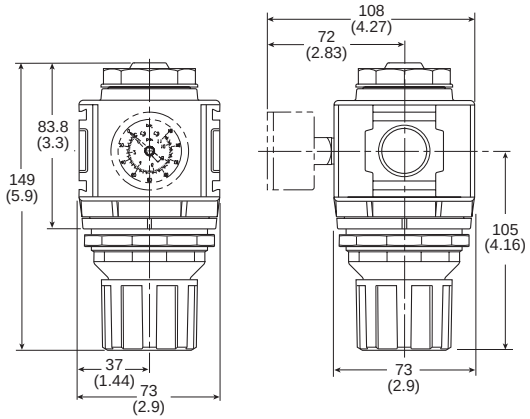
NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

P32



NOTE: 51 mm (2.00 in.) hole required for panel nut mounting.

P33



NOTE: 61 mm (2.40 in.) hole required for panel nut mounting.

Service kits

Description			P31	P32	P33
Regulator repair kit		Relieving	**P31KA00RC**	**P32KA00RC**	**P33KA00RC**
		Non-relieving	**P31KA00RH**	**P32KA00RH**	**P33KA00RH**
Panel mount nut		Aluminum	**P31KA00MM**	**P32KA00MM**	**P33KA00MM**
		Plastic	**P31KA00MP**	**P32KA00MP**	**P33KA00MP**
Angle bracket		Uses panel mount threads	**P31KA00MR**	**P32KA00MR**	**P33KA00MR**
C-bracket		Fits to body	**P31KA00MW**		
T-Bracket		With body connector	**P31KA00MT**	**P32KA00MT**	**P32KA00MT**
T-Bracket					**P32KA00MB**
Body connector			**P31KA00CB**	**P32KA00CB**	**P32KA00CB**
Gauges -	square flush mount gauge	0-4 bar	**K4511SCR04B**		
		0-10 bar	**K4511SCR11B**		
		0-60 PSIG	**K4511SCR060**		
		0-150 PSIG	**K4511SCR150**		
	1.00" round 1/8" center back mount	0-60 PSIG/0-4 bar	**K4510N18060**		
		0-160 PSIG/0-11 bar	**K4510N18160**		
	40mm round 1/8" center back mount	0-30 PSIG/0-2 bar	**K4515N18030**		
		0-60 PSIG/0-4 bar	**K4515N18060**		
		0-160 PSIG/0-11 bar	**K4515N18160**		
	50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		**K4520N14030**	**K4520N14030**
		0-60 PSIG/0-4 bar/0-0.4 MPa		**K4520N14060**	**K4520N14060**
		0-160 PSIG/0-11 bar/0-1.1 MPa		**K4520N14160**	**K4520N14160**
		0-300 PSIG/0-20 bar/0-2 MPa		**K4520N14300**	**K4520N14300**

- Manifold style regulator with line pressure on both sides.
- Pressure output is at front or rear.
- Integral 1/4", 3/8" or 1/2" ports (NPT, BSPP & BSPT)
- Robust construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Relieving & Non-relieving types
- Non-rising knob

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

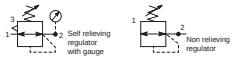
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

		P31 (Mini)	P32 (Compact)
Supply pressure (max)		20 bar (300 PSIG)	20 bar (300 PSIG)
Operating temperature		-20°C to 65.5°C (-4°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Flow Capacity*	1/4	18 dm^3/s (38 SCFM)	28 dm^3/s (59 SCFM)
	3/8	—	28 dm^3/s (59 SCFM)
	1/2	—	28 dm^3/s (59 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).
For technical information see CD

Regulators



Port size	Pressure	Part number P31	Part number P32
1/4"	8 bar (125 PSIG) relieving	**P31H*92BNNP**	**P32H*92BNNP**
3/8"	8 bar (125 PSIG) relieving		**P32H*93BNNP**
1/2"	8 bar (125 PSIG) relieving		**P32H*94BNNP**

*** Engineering Level will be entered at factory.**

Material specifications

Description	P31	P32
Body	Zinc	Zinc
Adjustment knob	Acetal	Acetal
Body cap	ABS	ABS
Bonnet	33% Glass-filled PBT	33% Glass-Filled Nylon
Diaphragm assembly	Brass/Nitrile	Nitrile/Zinc
Bottom plug	33% Glass-Filled Nylon	33% Glass-Filled Nylon
Valve assembly	Brass/nitrile	Brass/nitrile
Springs		Steel S.S. (main regulating valve)
Seals		Nitrile
Panel nut		Acetal

☐ Most popular.

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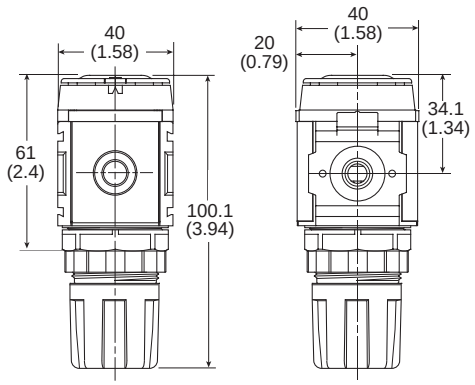
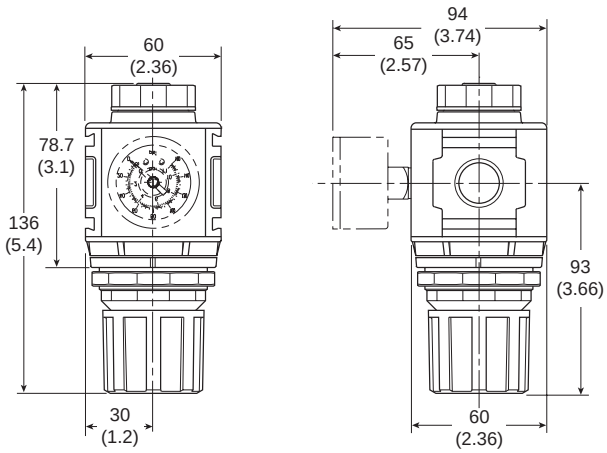
P31



NOTE: 31.7 mm (1.25 in.) hole required for panel nut mounting.

P32



NOTE: 51 mm (2.00 in.)hole required for panel nut mounting.

Service kits

Description			P31	P32
Regulator repair kit	Relieving		**P31KA00RC**	**P32KA00RC**
	Non-relieving		**P31KA00RH**	**P32KA00RH**
Panel mount nut	Aluminum		**P31KA00MM**	**P32KA00MM**
	Plastic		**P31KA00MP**	**P32KA00MP**
Angle Bracket (uses panel mount threads)			**P31KA00MR**	**P32KA00MR**
T-bracket	With body connector		**P31KA00MT**	**P32KA00MT**
	Fits to body connector		**P31KA00MB**	**P32KA00MB**
Body connector			**P31KA00CB**	**P32KA00CB**
Gauges	1.00" round 1/8" center back mount	0-60 PSIG/0-4 bar	**K4510N18060**	
		0-160 PSIG/0-11 bar	**K4510N18160**	
	50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		**K4520N14030**
		0-60 PSIG/0-4 bar/0-0.4 MPa		**K4520N14060**
		0-160 PSIG/0-11 bar/0-1.1 MPa		**K4520N14160**
		0-300 PSIG/0-20 bar/0-2 MPa		**K4520N14300**

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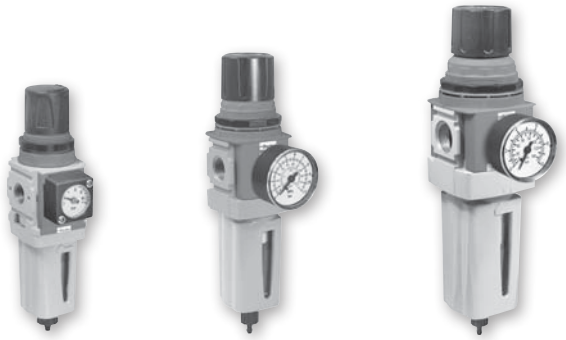
- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation



⚠ WARNING

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CAUTION:

REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

		P31 (Mini)	P32 (Compact)	P33 (Standard)
Supply pressure (max)				
Plastic Bowl		10 bar (150 PSIG)	10 bar (150 PSIG)	10 bar (150 PSIG)
Metal Bowl		17 bar (250 PSIG)	17 bar (250 PSIG)	17 bar (250 PSIG)
Operating temperature				
Plastic Bowl		-10°C to 52°C (14°F to 125°F)	-25°C to 52°C (-13°F to 125°F)	-25°C to 52°C (-13°F to 125°F)
Metal Bowl		-10°C to 65.5°C (14°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)	-25°C to 65.5°C (-13°F to 150°F)
Units with square gauges		-15°C to 65.5°C (5°F to 150°F)		
Standard filtration		5 micron	5 micron	5 micron
Flow Capacity*	1/4	14 dm^3/s (30 SCFM)	42 dm^3/s (89 SCFM)	–
	3/8	–	58 dm^3/s (123 SCFM)	–
	1/2	–	64 dm^3/s (136 SCFM)	90 (191 SCFM)
	3/4	–	–	98 dm^3/s (208 SCFM)

*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).
For technical information see CD

Filter / Regulator

Port size	Pressure (relieving)	Bowl type	Drain type	Part number P31	P32	P33
1/4"	8 bar (125 PSIG)	Poly	Manual	**P31E*92EGMBN5P**	**P32E*92EGMBNGP**	
1/4"	8 bar (125 PSIG)	Poly	Pulse	**P31E*92EGBBN5P**		
1/4"	8 bar (125 PSIG)	Poly	Auto		**P32E*92EGMBNGP**	
1/4"	8 bar (125 PSIG)	Metal	Manual	**P31E*92EMMBN5P**	**P32E*92ESMBNGP**	
1/4"	8 bar (125 PSIG)	Metal	Pulse	**P31E*92EMBBN5P**		
1/4"	8 bar (125 PSIG)	Metal	Auto		**P32E*92ESABNGP**	
3/8"	8 bar (125 PSIG)	Poly	Manual		**P32E*93EGMBNGP**	
3/8"	8 bar (125 PSIG)	Poly	Auto		**P32E*93EGABNGP**	
3/8"	8 bar (125 PSIG)	Metal	Manual		**P32E*93ESMBNGP**	
3/8"	8 bar (125 PSIG)	Metal	Auto		**P32E*93ESABNGP**	
1/2"	8 bar (125 PSIG)	Poly	Manual		**P32E*94EGMBNGP**	**P33E*94EGMBNGP**
1/2"	8 bar (125 PSIG)	Poly	Auto		**P32E*94EGABNGP**	**P33E*94EGABNGP**
1/2"	8 bar (125 PSIG)	Metal	Manual		**P32E*94ESMBNGP**	**P33E*94ESMBNGP**
1/2"	8 bar (125 PSIG)	Metal	Auto		**P32E*94ESABNGP**	**P33E*94ESABNGP**
3/4"	8 bar (125 PSIG)	Poly	Manual			**P33E*96EGMBNGP**
3/4"	8 bar (125 PSIG)	Poly	Auto			**P33E*96EGABNGP**
3/4"	8 bar (125 PSIG)	Metal	Manual			**P33E*96ESMBNGP**
3/4"	8 bar (125 PSIG)	Metal	Auto			**P33E*96ESABNGP**

☐ Most popular.

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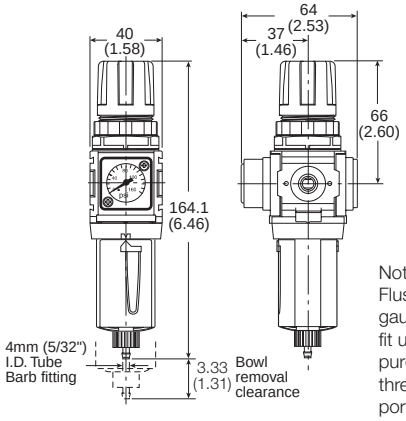
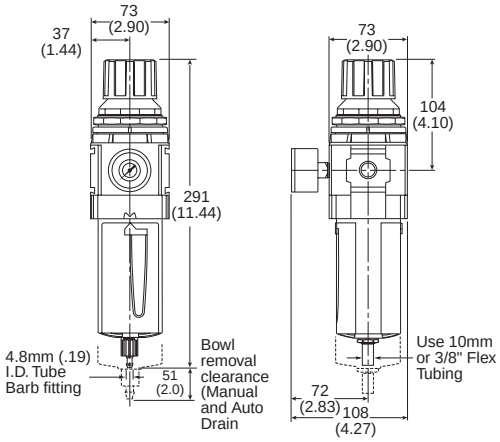
P31



Note:
Flush-mounted gauge kits will not fit units originally purchased with threaded gauge ports.

P33



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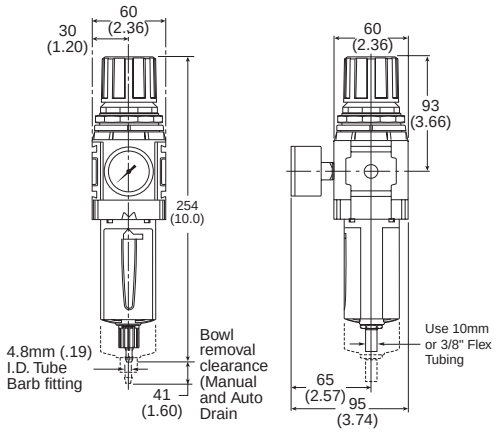

Material Specifications

Body		Aluminum
Adjustment knob		Acetal
Body cap		ABS
Bonnet		**(P31)** PBT
Element retainer/baffle		Acetal
Bowl	Plastic	Polycarbonate
	Metal	**(P31 and P33)** Aluminum, **(P32)** Zinc
Bowl guard		Nylon
Filter element		Polyethylene
Seals		Nitrile
Springs		Steel
Valve assembly		Brass/nitrile
Diaphragm assembly		**(P31)** Brass/nitrile **(P32 and P33)** Nitrile/zinc
Panel nut		Acetal
Sight gauge		Polycarbonate

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard	Manual drain	**P31KA00BGM**	**P32KA00BGM**	**P33KA00BGM**
	Pulse drain	**P31KA00BGB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl w/o sight gauge	Manual drain	**P31KA00BMM**		
	Pulse drain	**P31KA00BMB**		
	Auto drain		**P32KA00DA**	**P32KA00DA**
Metal bowl / sight gauge	Manual drain		**P32KA00BSM**	**P33KA00BSM**
	Auto drain		**P32KA00DA**	**P32KA00DA**
Filter element	5µ paticulate	**P31KA00ESE**	**P32KA00ESE**	**P33KA00ESE**
Regulator repair kit	Relieving	**P31KA00RC**	**P32KA00RC**	**P33KA00RC**
	Non-relieving	**P31KA00RH**	**P32KA00RH**	**P33KA00RH**
Panel mount nut	Aluminum	**P31KA00MM**	**P32KA00MM**	**P331KA00MM**
	Plastic	**P31KA00MP**	**P32KA00MP**	**P33KA00MP**
Angle bracket (uses panel mount threads)		**P31KA00MR**	**P32KA00MR**	**P33KA00MR**
C-bracket	Fits to body	**P31KA00MW**		
T-bracket	Fits to body connector		**P32KA00MB**	**P32KA00MB**
	With body connector	**P31KA00MT**	**P32KA00MT**	**P32KA00MT**
Body connector		**P31KA00CB**	**P32KA00CB**	**P32KA00CB**
Gauges - square flush mount gauge	0-4 bar	**K4511SCR04B**		
	0-10 bar	**K4511SCR11B**		
	0-60 PSIG	**K4511SCR060**		
	0-150 PSIG	**K4511SCR150**		
50mm (2") round 1/4" center back mount	0-30 PSIG/0-2 bar/0-0.2 MPa		**K4520N14030**	**K4520N14030**
	0-60 PSIG/0-4 bar/0-0.4 MPa		**K4520N14060**	**K4520N14060**
	0-160 PSIG/0-11 bar/0-1.1 MPa		**K4520N14160**	**K4520N14160**
	0-300 PSIG/0-20 bar/0-2 MPa		**K4520N14300**	**K4520N14300**

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- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Proportional oil delivery over a wide range of air flows
- Finger tip ratchet control for precise oil drip rate adjustment

Operating information

Supply pressure (max)	Plastic Bowl Metal Bowl	10 bar (150 PSIG) 17 bar (250 PSIG)		
Operating temperature	Plastic Bowl Metal Bowl	-10°C to 52°C (14°F to 125°F) -10°C to 65.5°C (14°F to 150°F)		
Standard filtration	5 micron			
		P31 (Mini)	**P32 (Compact)**	**P33 (Standard)**
Flow Capacity*	1/4	13 dm^3/s (28 SCFM)	18 dm^3/s (38 SCFM)	–
	3/8	–	32 dm^3/s (68 SCFM)	–
	1/2	–	47 dm^3/s (100 SCFM)	48 (102 SCFM)
	3/4	–	–	68 dm^3/s (144 SCFM)

* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD

Lubricators

Lubricator with drain

Port size	Bowl type	Type	Part number P31	P32	P33
1/4"	Poly / no drain	Mist	**P31L*92LGNN**	**P32L*92LGNN**	
1/4"	Metal / no drain	Mist / sight gauge	**P31L*92LMNN**	**P32L*92LSNN**	
3/8"	Poly / no drain	Mist		**P32L*93LGNN**	
3/8"	Metal / no drain	Mist / sight gauge		**P32L*93LSNN**	
1/2"	Poly / no drain	Mist		**P32L*94LGNN**	**P33L*94LGNN**
1/2"	Metal / no drain	Mist / sight gauge		**P32L*94LSNN**	**P33L*94LSNN**
3/4"	Poly / no drain	Mist			**P33L*96LGNN**
3/4"	Metal / no drain	Mist / sight gauge			**P33L*96LSNN**

*** Engineering Level will be entered at factory.**

Material specifications

Body		Aluminum
Body cap		ABS
Bowl	Plastic	Polycarbonate
	Metal	Aluminum
Bowl guard		Nylon
Seals		Nitrile
Sight dome		Polycarbonate
Sight gauge		**(P32 and P33)** Polycarbonate
Suggested lubricant		ISO/ASTM VG 32
Pick-up filter		Sintered Bronze

☐ Most popular.

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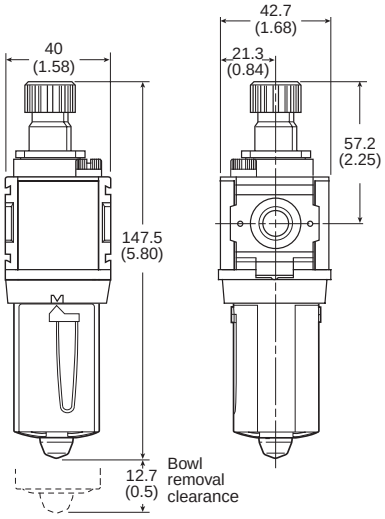
P31



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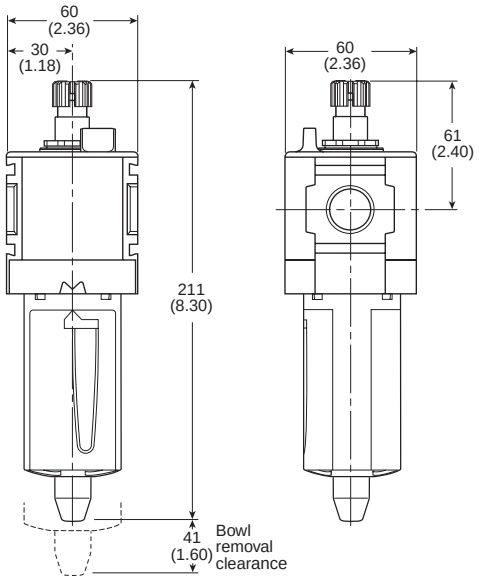

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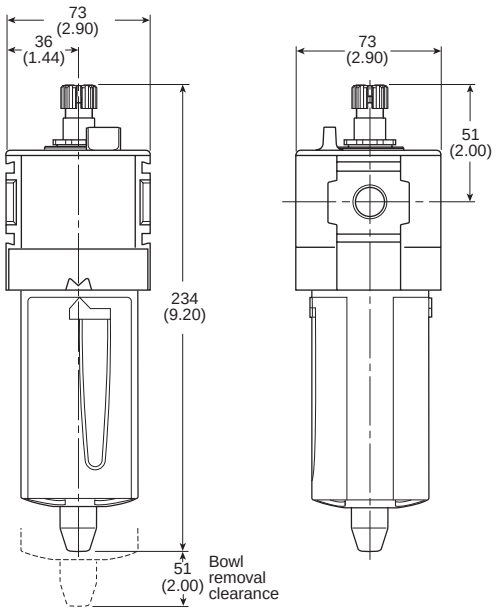

Service kits

Description		P31	P32	P33
Plastic bowl / bowl guard / no drain		**P31KA00BGN**	**P32KA00BGN**	**P33KA00BGN**
Drip control assembly		**P32KA00PG**	**P32KA00PG**	**P32KA00PG**
Fill plug		**P31KA00PL**	**P32KA00PL**	**P32KA00PL**
C-bracket	Fits to body	**P31KA00MW**		
L-bracket			**P32KA00ML**	**P33KA00ML**
T-bracket	Fits to body connector		**P32KA00MB**	**P32KA00MB**
	With body connector	**P31KA00MT**	**P32KA00MT**	**P32KA00MT**
Body connector		**P31KA00CB**	**P32KA00CB**	**P32KA00CB**
Lubricant*		**F442**	**F442**	**F442**

* Petroleum based oil of 100 to 200 SUS viscosity at 38°C (100°F) and an aniline point greater than 93°C (200°F). DO NOT USE OILS WITH ADDITIVES,COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

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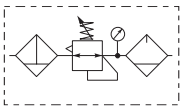
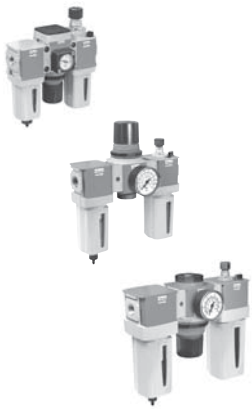
Filter + Regulator + Lubricator Combinations + Poly Bowl

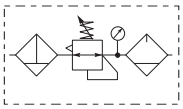


5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
1 bar (14.5 PSIG) pressure drop.



Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	**P31CB92GEMN5LNW**	**P32CB92GEMNGLNW**	
1/4"	Pulse	**P31CB92GEBN5LNW**		
1/4"	Auto		**P32CB92GEANGLNW**	
3/8"	Manual		**P32CB93GEMNGLNW**	
3/8"	Auto		**P32CB93GEANGLNW**	
1/2"	Manual		**P32CB94GEMNGLNW**	**P33CB94GEMNGLNW**
1/2"	Auto		**P32CB94GEANGLNW**	**P33CB94GEANGLNW**
3/4"	Manual			**P33CB96GEMNGLNW**
3/4"	Auto			**P33CB96GEANGLNW**

Filter / Regulator + Lubricator Combinations + Poly Bowl



5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets
Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),
1 bar (14.5 PSIG) pressure drop.

Port size	Drain type	Part number		
		P31 Series	P32 Series	P33 Series
1/4"	Manual	**P31CA92GEMN5LNW**	**P32CA92GEMNGLNW**	
1/4"	Pulse	**P31CA92GEBN5LNW**		
1/4"	Auto		**P32CA92GEANGLNW**	
3/8"	Manual		**P32CA93GEMNGLNW**	
3/8"	Auto		**P32CA93GEANGLNW**	
1/2"	Manual		**P32CA94GEMNGLNW**	**P33CA94GEMNGLNW**
1/2"	Auto		**P32CA94GEANGLNW**	**P33CA94GEANGLNW**
3/4"	Manual			**P33CA96GEMNGLNW**
3/4"	Auto			**P33CA96GEANGLNW**

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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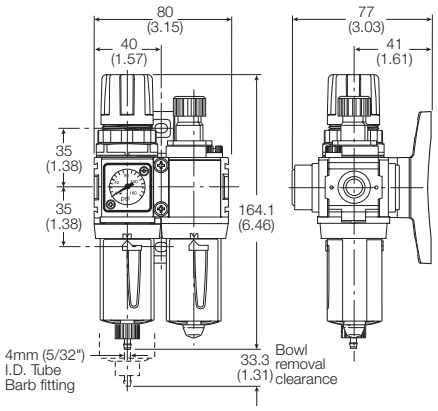
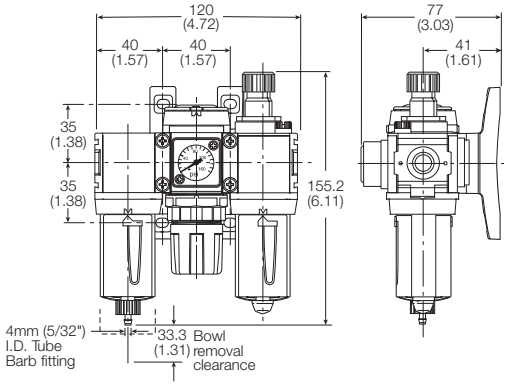
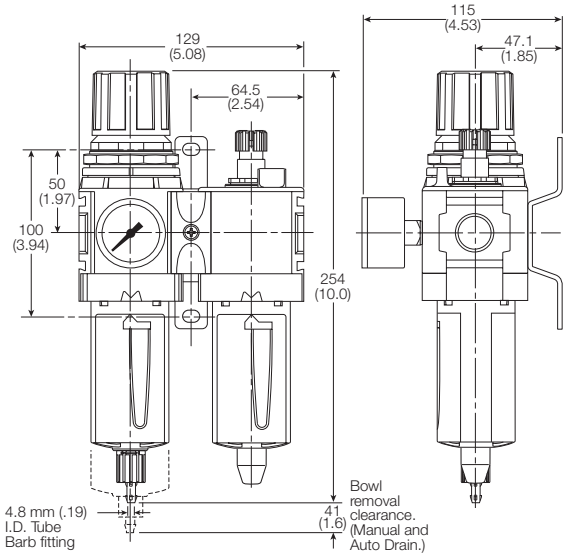
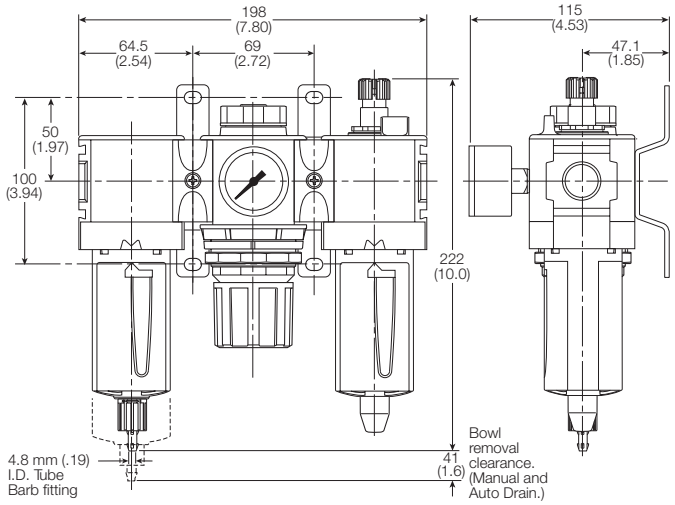
P31C



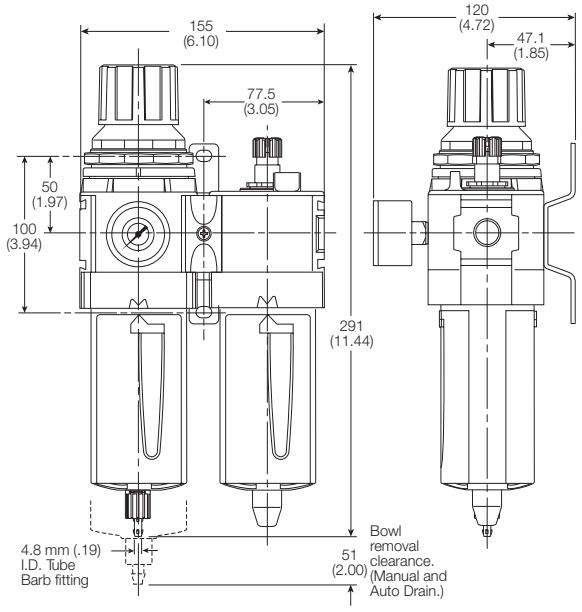


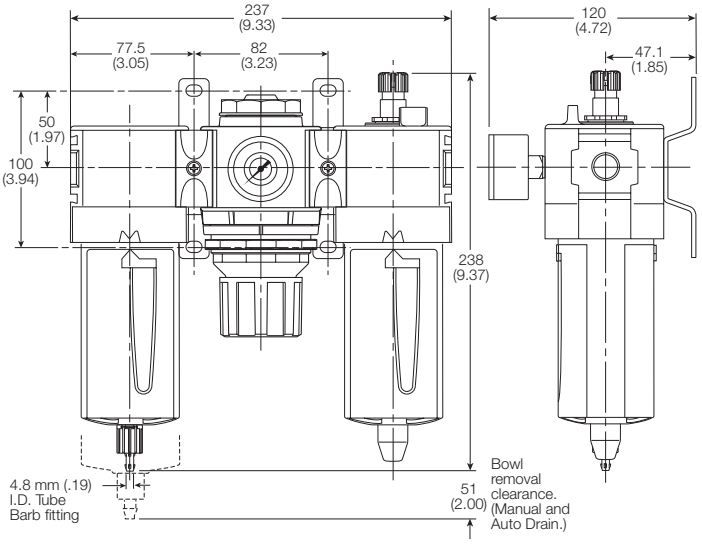
P32C





P33C





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- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm3/s (40 scfm)
- P32P flows to 57 dm3/s (120 scfm)

P31P Series
Bottom exhaust

P32P Series
Bottom exhaust

Ordering information

P 3 [ ] P * 1 [ ] A [ ] 2 [ ] [ ] 1 A

Body size

Modular mini (1/4")	1
Modular compact (1/2")	2

Thread type

BSPP	1
BSPT	2
NPT	9

Port size

Modular mini (1/4")	2
Modular compact (1/2")	4

Version

Bottom ported exhaust (NC)	A
Bottom ported forced exhaust (NO)†	E

† When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

Pressure range

0 - 2 bar (0-29 PSIG)	Z
0 - 10 bar (0-145 PSIG)	D

Power supply

24 Volts	2

Control signal

0-10 V‡s	V

‡ Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

Output signal

Digital, PNP	D
PNP or 0-10V	P
NPN or 0-10V	N
4-20mA fixed	M

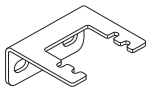
D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analog 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8

Input connector

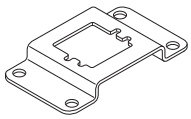
M12 (4-pin)	1

* Engineering Level will be entered at factory.

P31P mounting brackets



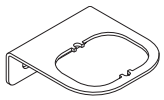
L-bracket



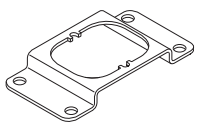
Foot bracket

Part number	Description
P3HKA00ML	L-bracket mounting kit
P3HKA00MC	Foot bracket mounting kit

P32P mounting brackets



L-bracket



Foot bracket

Part number	Description
P3KKA00ML	L-bracket mounting kit
P3KKA00MC	Foot bracket mounting kit

Note: These brackets fit both Proportional Regulators and Combined Soft Start & Dump Valves.

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

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Technical information

Working medium
Compressed air or inert gasses, filtered to 40µ.

Supply pressure

	Max. Operating Pressure:
2 bar unit:	3 bar (43.5 PSIG)
10 bar unit:	10.5 bar (152 PSIG)
Min. Operating Pressure	P2 Pressure + 0.5 bar (7.3 PSIG)

Pressure control range
Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range
0°C up to +50°C (32°F up to122°F)

Weights:
P31P = 0.291 kg (0.64 lbs)
P32P = 0.645 kg (1.42 lbs)

Air consumption
No consumption in stable regulated situation.

Display
The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.
The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

Supply voltage
24 VDC +/- 10%

Power consumption
Max. 1.1W with unloaded signal outputs

Control signals
The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

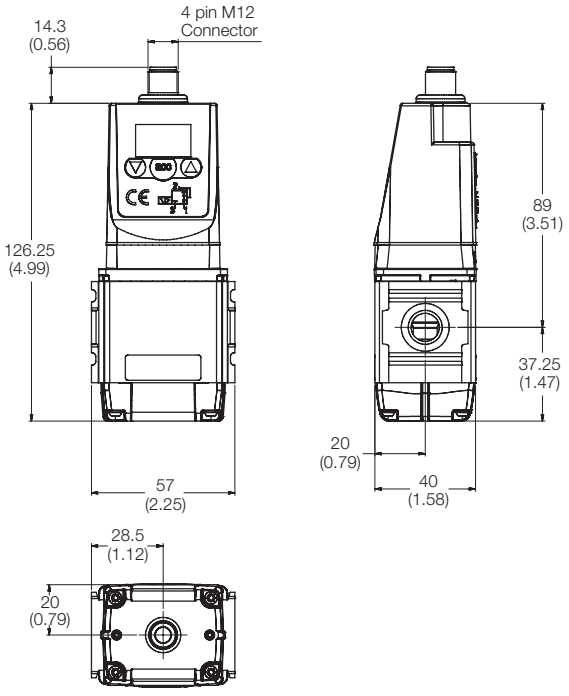
Output signals
As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
Outside the signal band this connection is 0V.

Connections
(In case of output signal (Option D)
Central M12 connector 4-pole

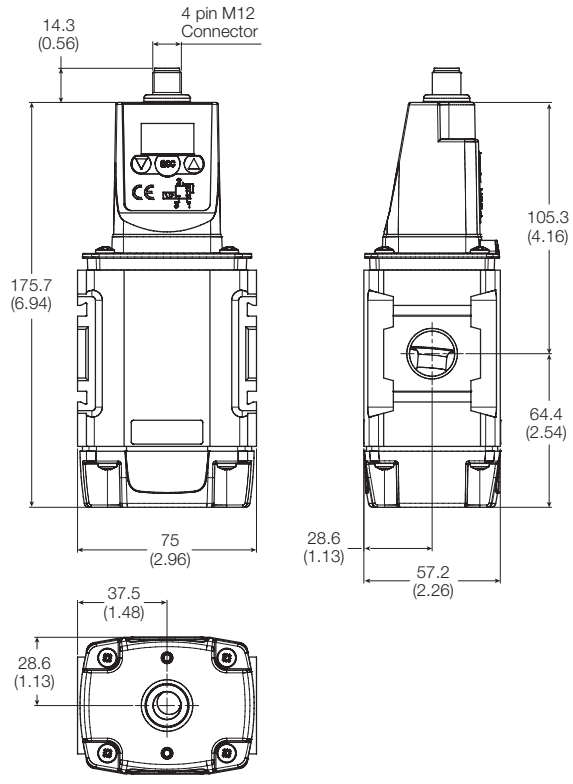
The electrical connections are as follows:

Pin number		Function	Color
1	24 V	Supply	Brown
2	0 to 10 V	Control signal Ri = 100k W	White
	4 to 20mA	Control signal Ri = 500k W	
3	0 V (GND)	Supply	Blue
4	24 V	Alarm output signal	Black

P31P



P32P



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- Modular design with 1/4" or 1/2" integral ports (NPT, BSPP & BSPT)
- The 3-way, 2-position function automatically dumps downstream pressure on the loss of pilot signal
- Adjustable slow start
- Solenoid or air pilot options
- High flow & exhaust capability
- Silencer included

Operating information

Operating pressure (max)	Solenoid Air pilot	10 bar (150 PSIG) 17 bar (250 PSIG)
Operating pressure (min)		3 bar (44 PSIG)
Operating temperature (max)	Solenoid Air pilot	50°C (122°F) 80°C (176°F)
Flow Capacity*	P31 Series P32 Series	17 dm^3/s (36 SCFM) 48 dm^3/s (97 SCFM)

*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.5 PSIG).

For technical information see CD

Combined Soft Start / Dump Valves (P31T / P32T)

Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	**P31T*92SGNC1FN**
1/4"	24VDC Solenoid & cable plug	**P31T*92SGNC2CN**
1/4"	External air pilot operated	**P31T*92PPN**
1/2"	120VAC 30mm coil & cable plug included	**P32T*94SCNA3GN**
1/2"	24VDC 30mm coil & cable plug included	**P32T*94SCNA2CN**
1/2"	External air pilot operated	**P32T*94PPN**

* Includes exhaust silencer. Flow with 6.3 bar (91.3) PSIG) inlet and 1 bar (14.5 PSIG) pressure drop.

Dump Valves (P31D / P32D)

Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	**P31D*92SGNC1FN**
1/4"	24VDC Solenoid & cable plug	**P31D*92SGNC2CN**
1/4"	External air pilot operated	**P31D*92PPN**
1/2"	120VAC 30mm coil & cable plug included	**P32D*94SCNA3GN**
1/2"	24VDC 30mm coil & cable plug included	**P32D*94SCNA2CN**
1/2"	External air pilot operated	**P32D*94PPN**

* Includes exhaust silencer.

Soft Starts (P31S / P32S)

Port size	Description	Part number
1/4"	120VAC Solenoid & cable plug	**P31S*92SGNC1FN**
1/4"	24VDC Solenoid & cable plug	**P31S*92SGNC2CN**
1/4"	Internal air pilot operated	**P31S*92Y0N**
1/4"	External air pilot operated	**P31S*92PPN**
1/2"	120VAC 30mm coil & cable plug included	**P32S*94SCNA3GN**
1/2"	Internal air pilot operated	**P32S*92Y0N**
1/2"	24VDC 30mm coil & cable plug included	**P32S*94SCNA2CN**
1/2"	External air pilot operated	**P32S*94PPN**

Material specifications

Body	Aluminum
Body cover	Polyester
Seals	Nitrile NBR

☐ Most popular.

Mounting brackets

Description	P31 Series	P32 Series
L-bracket mounting kit	**P3HKA00ML**	**P3KKA00ML**
Foot bracket mounting kit	**P3HKA00MC**	**P3KKA00MC**

Note:
For solenoid operators and cable plugs (connectors) see pages E21 to E22.

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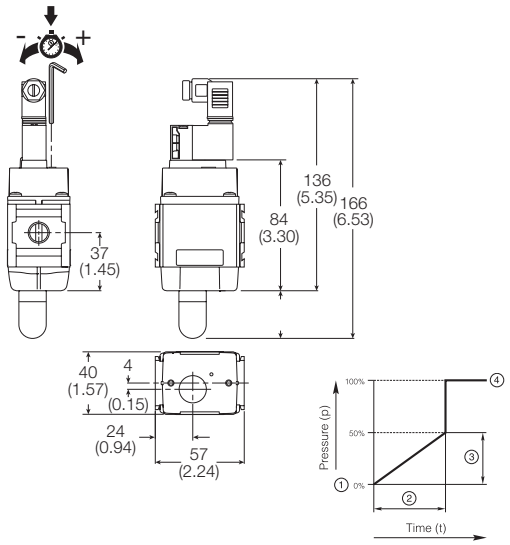
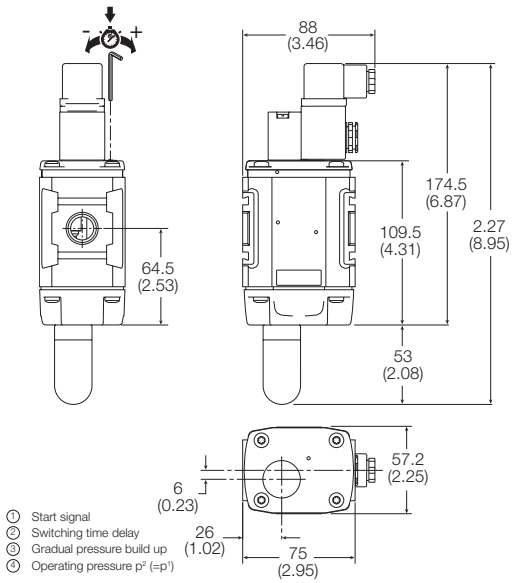
P31T

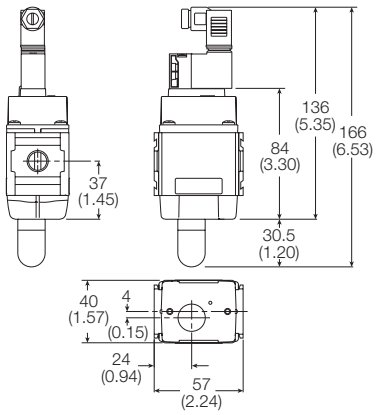


P32T

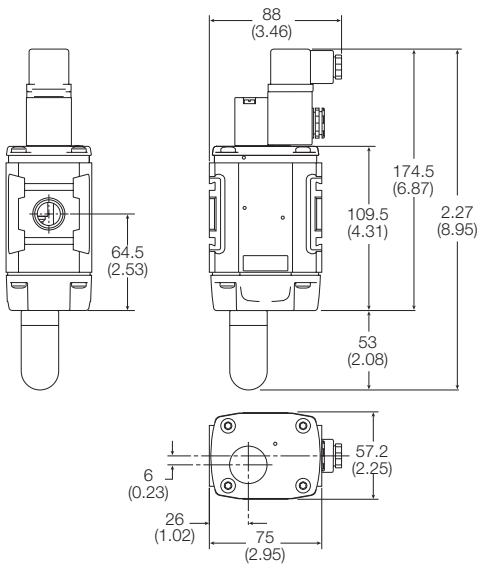


① Start signal
② Switching time delay
③ Gradual pressure build up
④ Operating pressure p^2 (=p^1)

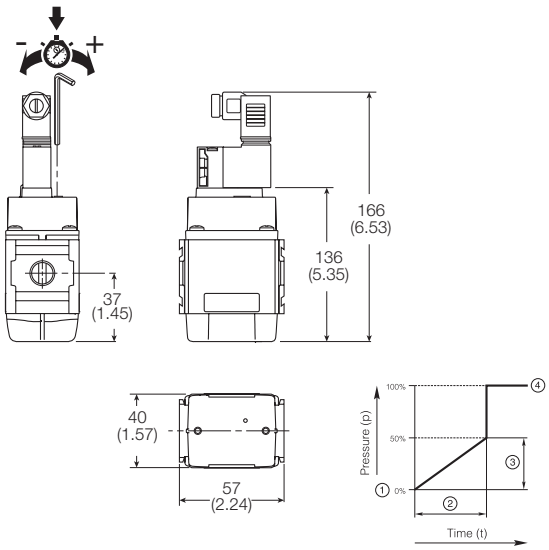
P31D



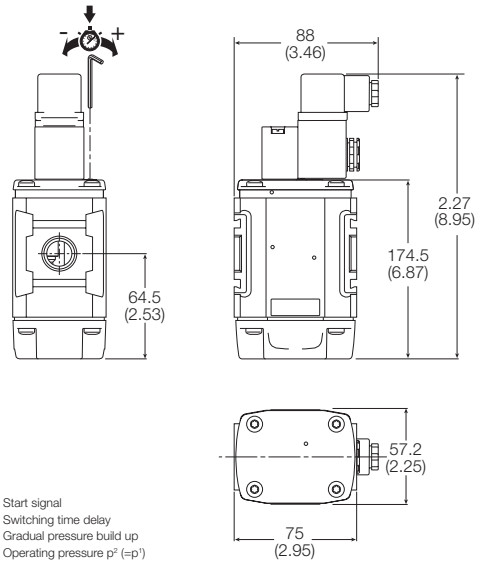
P32D



P31S



P32S



① Start signal
② Switching time delay
③ Gradual pressure build up
④ Operating pressure p^2 (=p^1)

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Solenoid Operators - CNOMO

Technical data - Solenoid operators, coil combinations

	NC Normal Operator with 15mm standard coil	NC Normal Operator with 22 x 30 standard coil	NC Normal Operator with 30 x 30 standard coil
Working pressure	0 to 10 bar	0 to 10 bar	0 to 10 bar
Ambient temperature	-15°C to 60°C *	-10°C to 60°C *	-10°C to 60°C *
Power (DC)	1.2W	4.8W	2.7W
Power (AC)	1.6VA	8.5VA	4.9VA
Voltage tolerance	+10%/-15%	+/-10%	+/-10%
Duty cycle	100%	100%	100%
Insulation class	F	F	F
Electric connection	ISO 15217	B Industrial	DIN 43650A
Protection	IP65	IP65	IP65
Approval	UL/CSA		UL/CSA
Working media	All neutral media such as compressed air and inert gases.		

* Limited to 50°C if use with 100% duty cycle

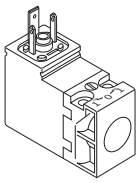
Transients

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavourable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the Maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors/cable plugs EN175301-803 with LED's include this type of circuit protection.

Materials

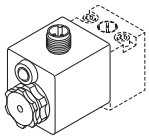
Pilot Valve	
Body:	Polyamide
Armature tube:	Brass
Plunger & core:	Corrosion resistant Cr-Ni steel
Seals:	Fluorocarbon
Screws:	Stainless steel
Coil	
Encapsualtion material:	Thermoplastic as standard Duroplast for M12 connection

P31 Series only - Solenoid coils 15mm NC



Voltage	Order code Override, blue, non-locking flush	Weight (Kg)
24VDC	**PS2982B49P**	0.038
115VAC 50Hz / 120VAC 60Hz	**PS2982B53P**	0.038

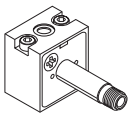
Solenoid coils with M12 connection



Voltage	Order code	Weight (Kg)
Direct current		
24VDC	**P2FC6449**	0.065

Spare solenoid operators

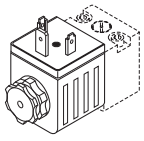
Base Solenoid pilot operator CNOMO NC



Description	Order code non-lock manual override	Weight (Kg)
Standard Duty	**P2FP23N4B**	0.065
No Override	**P2FP23N4A**	0.065

Note: Solenoid pilot operators are fitted to the Global range. Order the above part numbers for spares. The operators are supplied with mounting screws and interface 'O' rings. Coils and connectors must be ordered separately.

Solenoid coils with Din A or Industrial B connection



Voltage	22mm x 30mm Order code B industrial standard	Weight (Kg)	30mm x 30mm Order code DIN 43650A standard	Weight (Kg)
Direct current				
24VDC	**P2FCB449**	0.093	**P2FCA449**	0.105
Alternative current				
110V 50Hz, 120V 60Hz	**P2FCB453**	0.093	**P2FCA453**	0.105

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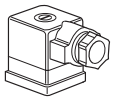
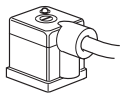
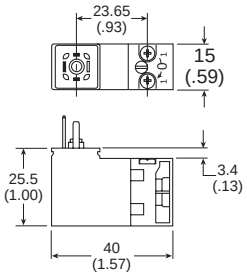
Solenoid connectors / Cable plugs EN175301-803

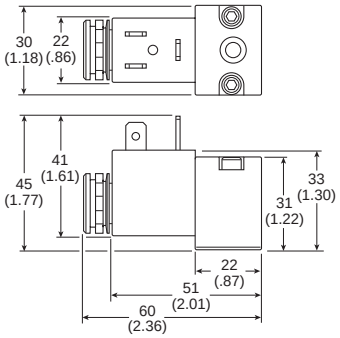
	Description	Order code 15mm Form C ISO15217	Order code 22mm Form B Industrial	Order code 30mm Form A DIN 43650A
With standard screw 	Standard IP65 without flying lead	**PS2932BP**	**PS2429BP**	**PS2028BP**
	With LED and protection 24VAC/DC	**PS294679BP**	**PS243079BP**	**PS203279BP**
	With LED and protection 110VAC	**PS294683BP**	**PS243083BP**	**PS203283BP**
With cable 	Standard with 2m cable IP65	**PS2932JBP**	**PS2429JBP**	**PS2028JBP**
	24VAC/DC, 2m cable LED and protection IP65	**PS2946J79BP**	**PS2430J79BP**	**PS2032J79BP**
	110VAC/DC, 2m cable LED and protection IP65	**PS2946J83BP**	**PS2430J83BP**	**PS2032J83BP**

Solenoid coil Dimensions mm (inches)

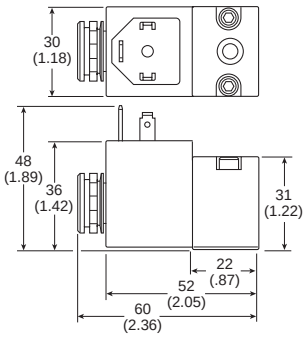
15mm



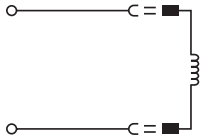
22 x 30mm

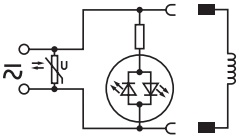


30 x 30mm



Electrical schematics





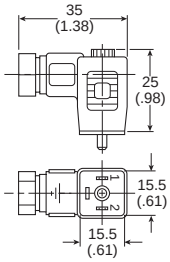
PS2028BP	**PS243079BP**	**PS203279BP**
PS2028JBP	**PS2430J79BP**	**PS2032J79BP**
PS2429BP	**PS243083BP**	**PS293283BP**
PS2429JBP	**PS2430J83BP**	**PS2932J83BP**
PS2932BP	**PS294679BP**	**PS294683BP**
PS2932JBP	**PS2946J79BP**	**PS2946J83BP**

Cable plug dimensions mm (inches)

15mm ISO 15217 Cable plugs

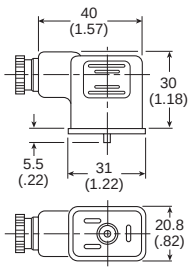
PS2932BP

PS294679BP



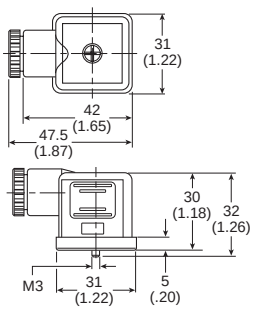
22mm Form B Industrial Cable plugs

PS2429BP



30mm DIN 43650A Cable plugs

PS2028BP



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Safety Lockout Valves

	Model type	Port size	Thread type	Flow dm^3/s (scfm)	Part number Flow from *left to right*	Part number Flow from *right to left*
	P31	1/4"	NPT	47.2 (100)	**P31V*92LSAN**	
	P32	1/4"	NPT	66.5 (141)	**P32V*92LSAN**	**P32V*92LSBN**
		3/8"	NPT	101.9 (216)	**P32V*93LSAN**	**P32V*93LSBN**
		1/2"	NPT	128.4 (272)	**P32V*94LSAN**	**P32V*94LSBN**
	P33	1/2"	NPT	136.9 (290)	**P33V*94LSAN**	**P33V*94LSBN**
		3/4"	NPT	141.6 (300)	**P33V*96LSAN**	**P33V*96LSBN**

For thread type: BSPP 1, BSPT 2, NPT 9

Modular Ball Valve

	Model type	Port size	Thread type	Flow dm^3/s (scfm)	Part number Flow from *left to right*
	P31	1/4"	NPT	20 (42.4)	**P31V*92LBNN**
	P32	3/8"	NPT	90 (190.7)	**P32V*93LBNN**
		1/2"	NPT	122 (258.5)	**P32V*94LBNN**
	P33	1/2"	NPT	265 (561.5)	**P33V*94LBNN**
		3/4"	NPT	320 (678)	**P33V*96LBNN**

For thread type: BSPP 1, BSPT 2, NPT 9

Manifold Blocks

	Model type	In / Out port size	Auxiliary port size top	Auxiliary port size bottom	Thread type	Part number
	P31	1/4"	1/4"	1/4"	NPT	**P31M*92022N**
	P32	1/2"	1/4"	1/2"	NPT	**P32M*94024N**
	P33	3/4"	1/4"	1/2"	NPT	**P33M*96024N**

For thread type: BSPP 1, BSPT 2, NPT 9

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P31 Series Accessories

	Description	Port size	Part number
	C-bracket (Fits to filter and lubricator body)	—	**P31KA00MW**
	T-bracket w/ body connector	—	**P31KA00MT**
	Body connector	—	**P31KA00CB**
	Port block kit	1/8 NPT	**P31KA91CP**
		1/4 NPT	**P31KA92CP**
		3/8 NPT	**P31KA93CP**
		1/8 BSPP	**P31KA11CP**
		1/4 BSPP	**P31KA12CP**
		3/8 BSPP	**P31KA13CP**
		1/8 BSPT	**P31KA21CP**
		1/4 BSPT	**P31KA22CP**
		3/8 BSPT	**P31KA23CP**
	Port block kit with T-bracket	1/8 NPT	**P31KA91CN**
		1/4 NPT	**P31KA92CN**
		3/8 NPT	**P31KA93CN**
		1/8 BSPP	**P31KA11CN**
		1/4 BSPP	**P31KA12CN**
		3/8 BSPP	**P31KA13CN**
		1/8 BSPT	**P31KA21CN**
		1/4 BSPT	**P31KA22CN**
		3/8 BSPT	**P31KA23CN**
	Angle bracket (Fits to regulator and filter / regulator body)	—	**P31KA00MR**

P32 Series Accessories

	Description	Part number
	Angle bracket (Fits to regulator and filter / regulator body)	**P32KA00MR**
	L-bracket (Fits to filter and lubricator body)	**P32KA00ML**

P32 & P33 Series Accessories

	Description	Port size	Part number
	T-bracket with body connector	—	**P32KA00MT**
	Body connector	—	**P32KA00CB**
	Port block kit	1/4 NPT	**P32KA92CP**
		3/8 NPT	**P32KA93CP**
		1/2 NPT	**P32KA94CP**
		3/4 NPT	**P32KA96CP**
		1/4 BSPP	**P32KA12CP**
		3/8 BSPP	**P32KA13CP**
		1/2 BSPP	**P32KA14CP**
		3/4 BSPP	**P32KA16CP**
		1/4 BSPT	**P32KA22CP**
		3/8 BSPT	**P32KA23CP**
		1/2 BSPT	**P32KA24CP**
		3/4 BSPT	**P32KA26CP**
	T-bracket (fits to body connector or port block)	—	**P32KA00MB**

P33 Series Accessories

	Description	Part number
	Angle bracket (Fits to regulator and filter / regulator body)	**P33KA00MR**
	L-bracket (Fits to filter and lubricator body)	**P33KA00ML**

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Kits

	Description		P31	P32	P33
	Panel mount (plastic)		**P31KA00MP**	**P32KA00MP**	**P33KA00MP**
	Panel mount nut (aluminum)		**P31KA00MM**	**P32KA00MM**	**P33KA00MM**
	5µ element kit		**P31KA00ESE**	**P32KA00ESE**	**P33KA00ESE**
	1µ element kit		**P31KA00ES9**	**P32KA00ES9**	**P33KA00ES9**
	0.01µ element kit		**P31KA00ESC**	**P32KA00ESC**	**P33KA00ESC**
	Adsorber element kit		**P31KA00ESA**	**P32KA00ESA**	**P33KA00ESA**
	Auto drain kit			**P32KA00DA**	**P32KA00DA**
	Differential pressure indicator kit			**P32KA00RQ**	**P32KA00RQ**
	Fill plug kit		**P31KA00PL**	**P32KA00PL**	**P32KA00PL**
	Drip control assembly kit		**P32KA00PG**	**P32KA00PG**	**P32KA00PG**
	Plastic bowl w/ bowl guard &	manual drain	**P31KA00BGM**	**P32KA00BGM**	**P33KA00BGM**
		pulse drain	**P31KA00BGB**		
		auto drain		**P32KA00BGA**	**P33KA00BGA**
	Lubricator	no drain	**P31KA00BGN**	**P32KA00BGN**	**P33KA00BGN**
	Metal bowl w/o sight gauge &	manual drain	**P31KA00BMM**	**P32KA00BMM**	**P33KA00BMM**
		pulse drain	**P31KA00BMB**		
		auto drain		**P32KA00BMA**	**P33KA00BMA**
	Lubricator	no drain	**P31KA00BMN**		
	Metal bowl w/ sight gauge &	manual drain		**P32KA00BSM**	**P33KA00BSM**
		auto drain		**P32KA00BSA**	**P33KA00BSA**
	Lubricator	no drain		**P32KA00BSN**	**P33KA00BSN**

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Kits

	Port size	Description		P31	P32	P33
		Regulator - relieving repair kit		**P31KA00RB**	**P32KA00RB**	**P33KA00RB**
		Regulator - non relieving repair kit		**P31KA00RC**	**P32KA00RC**	**P33KA00RC**
		Regulator - main adjusting spring 0-2 bar (0-30 PSIG) kit		**P31KA00PR**	**P32KA00PR**	**P33KA00PR**
		Regulator - main adjusting spring 0-4.1 bar (0-60 PSIG) kit		**P31KA00PS**	**P32KA00PS**	**P33KA00PS**
		Regulator - main adjusting spring 0-8.6 bar (0-125 PSIG) kit		**P31KA00PT**	**P32KA00PT**	**P33KA00PT**
		Regulator - main adjusting spring 0-17 bar (0-250 PSIG) kit			**P32KA00PV**	**P33KA00PV**
	1/8"	Square flush mount gauge kit	0-4 bar	**K4511SCR04B**		
	1/8"		0-10 bar	**K4511SCR11B**		
	1/8"		0-60 PSIG	**K4511SCR060**		
	1/8"		0-150 PSIG	**K4511SCR150**		
	1/8"	1.00" round gauge	0-60 PSIG / 0-4.1 bar	**K4510N18060**		
	1/8"		0-160 PSIG / 0-10 bar	**K4510N18160**		
	1/8"	40mm round gauge (Not for use with common port regulators)	0-30 PSIG / 0-2 bar	**K4515N18030**		
	1/8"		0-60 PSIG / 0-4.1 bar	**K4515N18060**		
	1/8"		0-160 PSIG / 0-10 bar	**K4515N18160**		
	1/4	50mm round gauge	0-30 PSIG / 0-2 bar		**K4520N14030**	**K4520N14030**
	1/4"		0-60 PSIG / 0-4.1 bar		**K4520N14060**	**K4520N14060**
	1/4"		0-160 PSIG / 0-10 bar		**K4520N14160**	**K4520N14160**
	1/4"		0-300 PSIG / 0-20 bar		**K4520N14300**	**K4520N14300**
		Body connector o-ring (spares kit) (pack of 4)		**P31KA02CY**	**P32KA04CY**	**P32KA04CY**

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- Tested in accordance with ISO 8573.9
- High liquid removal efficiencies at all flow conditions
- Low pressure losses for low operational costs
- Multiple port sizes for a given flow rate provides increased flexibility during installation
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- Low maintenance
- Lightweight cast aluminum housing with 1/4" to 3" ports
- External surface epoxy painted for maximum corrosion resistance

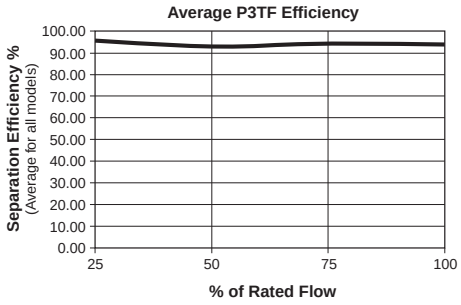
Applications

- Bulk liquid removal at any point in a compressed air system
- Protection of refrigeration and heatless regenerative desiccant dryers
- Liquid removal from compressor Inter-coolers / after-coolers
- Liquid separation within refrigeration dryers
- Pre-filtration

Operating information

	P3TF (Bulk Liquid Separator)
Operating pressure	232 PSIG (16 bar) Max
Operating temperature	35°F to 176°F (1.5°C to 80°C)

For technical information see CD



Material specifications

Description	P3TF (Bulk Liquid Separator)
Auto float drain	Plastic
Housing / bowl	Aluminum
Seals	Fluorocarbon

Service kits

Drain	**EFI**

P3TF Bulk Liquid Separator

	Pipe size	Flow SCFM (L/s)	Weight lb. (kg)	Part number (NPT)
P3TF	1/4"	21 (10)	0.9 (0.4)	**P3TFA92WAAN**
	3/8"	85 (40)	2.2 (1.0)	**P3TFA93WBAN**
	1/2"	85 (40)	2.2 (1.0)	**P3TFA94WCAN**
	3/4"	233 (110)	4.8 (2.2)	**P3TFA96WDAN**
	1"	233 (110)	2.6 (5.7)	**P3TFA98WEAN**
	1-1/2"	742 (350)	5.3 (11.6)	**P3TFA9BWGAN**
	2"	742 (350)	5.3 (11.6)	**P3TFA9CWHAN**
	3"	1695 (800)	12.0 (26.4)	**P3TFA9EWKAN**

Pressure Differential at Rated Flow ... 1.0 PSID (0.07 bar)
Stated flows are for operation at 102 PSIG (7 bar) with reference to 20°C, 1 bar (a), 0% relative water vapor pressure.

Note: BSPT threads available upon request.

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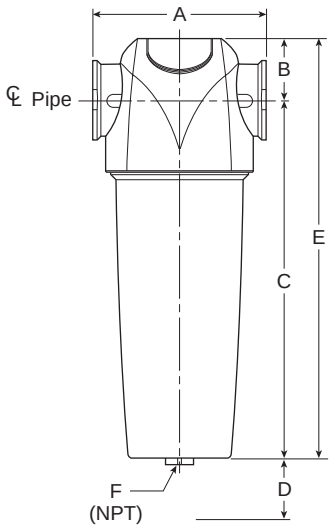
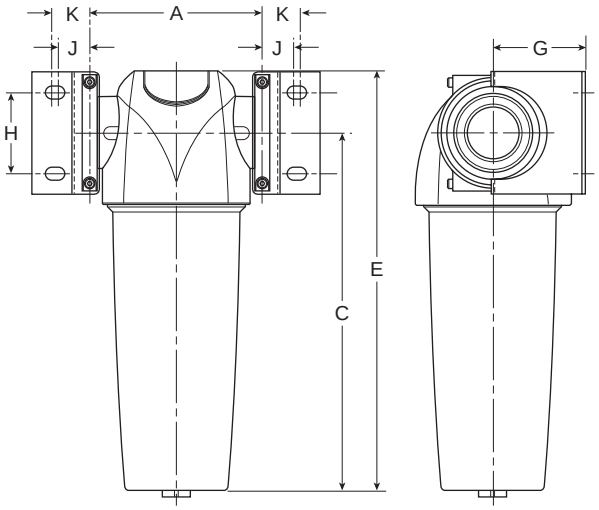
P3TF (Bulk Liquid Separator)





Dimensions

Part number	Pipe size	A	B	C	D	E	NPT F	G	H	J	K	Wall mounting bracket kit
P3TFA92WAAN	1/4"	3.00 (76)	1.12 (28.5)	6.02 (153)	1.58 (40)	7.15 (181.5)	1/2	2.05 (50)	1.18 (30)	0.71 (18)	0.96 (24.5)	**P3TKA00MWA**
P3TFA93WBAN	3/8"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	**P3TKA00MWB**
P3TFA94WCAN	1/2"	3.83 (97.5)	1.34 (34)	7.91 (201)	1.97 (50)	9.25 (235)	1/2	2.36 (60)	1.57 (40)	0.81 (20.5)	1.00 (25.5)	**P3TKA00MWB**
P3TFA96WDAN	3/4"	5.07 (129)	1.67 (42.5)	13.09 (232.5)	2.76 (70)	10.80 (275)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	**P3TKA00MWD**
P3TFA98WEAN	1	5.07 (129)	1.67 (42.5)	12.68 (322)	2.76 (70)	14.35 (364.5)	1/2	2.68 (68)	2.36 (60)	0.91 (23)	1.10 (28)	**P3TKA00MWD**
P3TFA9BWGAN	1-1/2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	**P3TKA00MWF**
P3TFA9CWHAN	2"	6.70 (170)	1.97 (50)	18.68 (474.5)	3.94 (100)	20.64 (524.5)	1/2	3.62 (92)	3.31 (84)	1.26 (32)	1.54 (39)	**P3TKA00MWF**
P3TFA9EWKAN	3"	8.07 (205)	2.36 (60)	30.39 (772)	4.72 (120)	32.76 (832)	1/2	5.31 (135)	3.94 (100)	1.40 (35.5)	1.67 (42.5)	**P3TKA00MWJ**

Inches (mm)

Wall Mounting Bracket Kit
Mounting brackets provide additional support to filters installed in flexible piping systems or OEM equipment.

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- Excellent water removal efficiency
- 5 micron element standard on 14F
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

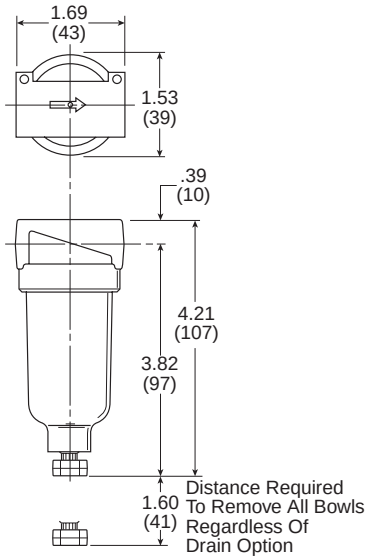
Description		14F (Mini)
Body		Zinc
Bowl		Polycarbonate
Deflector, element holder, baffle		Plastic
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Filter element –	5 micron (Standard)	Plastic
	40 micron (Optional)	Plastic
	Adsorber (Optional)	Activated charcoal
Seals		Nitrile

Operating information

		14F
Operating pressure	Poly bowl Metal bowl	0 to 150 PSIG (0 to 10.3 bar) 0 to 250 PSIG (0 to 17.2 bar)
	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
Operating temperature	Poly bowl Metal bowl Auto pulse drain	32°F to 125°F (0°C to 52°C) 32°F to 175°F (0°C to 80°C) 125°F (52°C) or less

For technical information see CD

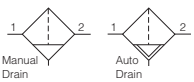
14F



Service kits

Description			14F (Mini)
Bowl Kits	Poly bowl –	Auto pulse drain	**PS408BP**
		Twist drain	**PS404P**
	Metal bowl –	Auto drain	**PS451BP**
		Twist drain	**PS447BP**
Filter element kit –		40 micron	**PS401P**
		5 micron	**PS403P**
		Adsorber	**PS452P**
Mounting bracket kit			**PS417BP**

14F Particulate Filters



		Port size	Bowl type	Sight gauge	Flow SCFM	Part number (NPT)	
						Twist drain	Automatic pulse drain
14F		1/8"	Poly	No	22	**14F01B***	**14F05B***
		1/8"	Metal	No	22	**14F03B***	**14F07B***
		1/4"	Poly	No	24	**14F11B***	**14F15B***
		1/4"	Metal	No	24	**14F13B***	**14F17B***

* Enginering level will be added at factory.

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- Excellent water removal efficiency
- Unique deflector plate and shroud creates a swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- Optional automatic float drain available
- 06F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07F: 1/2" & 3/4" ports (NPT & BSPP)

06F

07F

Material specifications

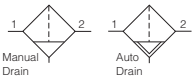
Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Deflector, shroud & baffle	Plastic
Drains –	
Twist drain – body & nut	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter elements –	
40 Micron (standard)	Plastic
5 Micron (optional)	Plastic
Seals	Nitrile
Sight gauge	Polyamide

Operating information

		06F & 07F
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Auto float drain	Poly bowl Metal bowl	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

06F, 07F Particulate Filters



			Flow SCFM		Part number (NPT)	
	Port size	Bowl type	Grade 6 element	Grade 10 element	Twist drain	Automatic float drain
06F	1/4"	Poly bowl / Metal guard	53	60	**06F12A***	**06F16A***
	1/4"	Metal bowl / Sight gauge	53	60	**06F14A***	**06F18A***
	3/8"	Poly bowl / Metal guard	80	72	**06F22A***	**06F26A***
	3/8"	Metal bowl / Sight gauge	80	72	**06F24A***	**06F28A***
	1/2"	Poly bowl / Metal guard	85	95	**06F32A***	**06F36A***
	1/2"	Metal bowl / Sight gauge	85	95	**06F34A***	**06F38A***
07F	1/2"	Poly bowl / Metal guard	75	125	**07F32A***	**07F36A***
	1/2"	Metal bowl / Sight gauge	75	125	**07F34A***	**07F38A***
	3/4"	Poly bowl / Metal guard	80	160	**07F42A***	**07F46A***
	3/4"	Metal bowl / Sight gauge	80	160	**07F44A***	**07F48A***

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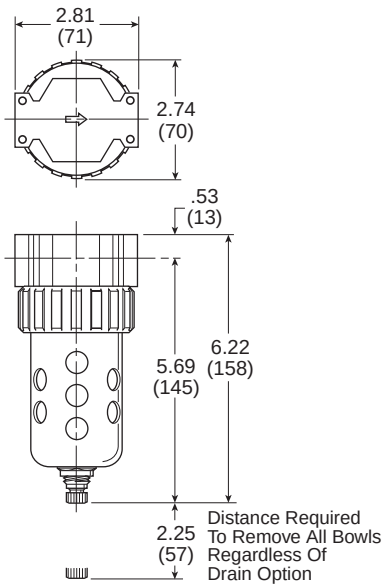
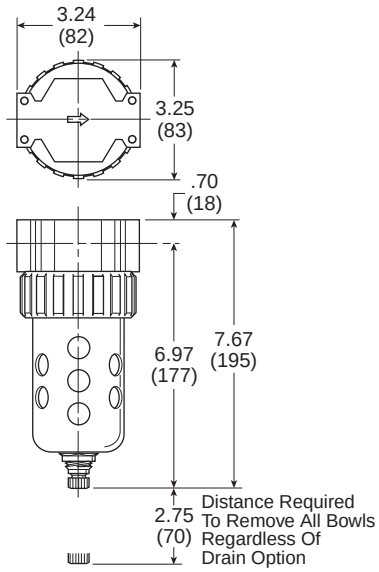
06F (Compact)



07F (Standard)



Service kits

Description		06F (Compact)	07F (Standard)
Bowl guard kit		**PS705P**	**PS805P**
Bowl Kits –			
Poly bowl –	Auto float drain	**PS722P**	**PS822P**
	Twist drain	**PS732P**	**PS832P**
Metal bowl –	Auto float drain	**PS726P**	**PS826P**
	Twist drain	**PS734P**	**PS834P**
	Sight gauge / automatic float drain	**PS723P**	**PS823P**
	Sight gauge / twist drain	**PS735P**	**PS835P**
DPI replacement kit		**PS781P**	**PS781P**
Drain kits –	Auto float drain	**PS506P**	**PS506P**
	Semi-auto drain	**PS511P**	**PS511P**
	Twist drain	**PS512P**	**PS512P**
	Push 'N' Drain	**PS513P**	**PS513P**
Filter element kit –	40 micron	**PS701P**	**PS801P**
	5 micron	**PS702P**	**PS802P**
	Adsorber	**PS731P**	**PS831P**
Mounting bracket kit		**PS743P**	**PS843P**
Sight gauge kit		**PS914P**	**PS914P**

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- Excellent water removal efficiency
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 40 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)

Material specifications

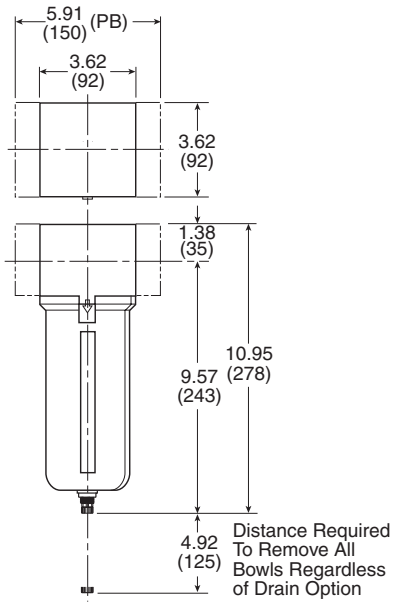
Description		P3NF (Hi-Flow)
Body		Aluminum
Bowl		Aluminum
Deflector		Plastic
Drain		Plastic
Filter element	5 micron	Plastic
	40 micron	Plastic
	Adsorber	Activated charcoal
Seals		Nitrile
Sight gauge		Polyamide (Nylon)

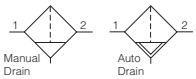
Operating information

		P3NF (Hi-Flow)
Operating pressure	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

P3NF (Hi-Flow)





Service kits

Description		P3NF (Hi-Flow)
Bowl Kits –	Sight gauge / auto float	**P3NKA00BSA**
	Sight gauge / twist drain	**P3NKA00BSM**
	Sight gauge / push 'n' drain	**P3NKA00BSP**
Bowl latch kit		**C11A33**
DPI replacement kit		**PS781P**
Drain kit –	Auto drain	**PS506P**
	Twist drain	**PS512P**
Filter element kit –	40 micron	**P3NKA00ESG**
	5 micron	**P3NKA00ESE**
	Adsorber	**P3NKA00ESA**
Mounting bracket kit		**P3NKA00MW**
Sight gauge kit		**P3NKA00PE**

P3NF Particulate Filters

	Port size	Bowl type	Sight gauge	Flow	Part number (NPT) Twist drain	Part number (NPT) Automatic float drain
P3NF	3/4"	Metal	Yes	270 SCFM	**P3NFA96GSM**	**P3NFA96GSA**
	1"	Metal	Yes	300 SCFM	**P3NFA98GSM**	**P3NFA98GSA**
	1-1/2" #	Metal	Yes	310 SCFM	**P3NFA9PGSM**	**P3NFA9PGSA**

1" port body with 1-1/2" port block

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- Excellent water removal efficiency
- For heavy duty applications with minimum pressure drop requirement
- Unique deflector plate that creates swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- 40 micron filter element standard, 5 micron available
- Metal bowl with sight gauge standard
- Twist drain as standard, optional auto drain
- Large bowl capacity
- Optional high capacity bowl(s) available

3/4" & 1"

1-1/4" & 1-1/2"

Material specifications

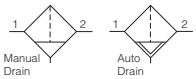
Description		(Hi-Flow) F602-06W F602-08W F602-06E F602-08E	(Hi-Flow) F602-10W F602-12W F602-10E F602-12E
Body		Zinc	Zinc
Bowl	(E) 32 oz	Aluminum	Aluminum
	(W) 16 oz	Zinc	Zinc
Drains	Housing R	Acetal	Acetal
	Housing Q	Bronze	Bronze
Drains - Twist	Body & stem	Brass	Brass
Filter element	5 micron	Polypropylene	Polypropylene
	40 micron	Polypropylene	Polypropylene
Seals		Nitrile	Nitrile
Sight gauge		Nylon	Nylon

Operating information

		F602 (Hi-Flow)
Operating pressure	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
	With internal auto drain (R)	20 to 175 PSIG (1.4 to 11.9 bar)
	With external auto drain (Q)	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
	With internal auto drain (R)	40°F to 125°F (4.4°C to 52°C)
	With external auto drain (Q)	40°F to 150°F (4.4°C to 65.6°C)

For technical information see CD

Particulate Filters



		Port size	Bowl type	Bowl size	Flow SCFM	Part number (NPT) Twist drain	Part number (NPT) Automatic float drain
F602		3/4"	Metal / Sight gauge	16 oz	270	**F602-06WJ**	**F602-06WJR**
		3/4"	Metal / Without sight gauge	32 oz	270	**F602-06EJ**	**F602-06EJR**
		1"	Metal / Sight gauge	16 oz	300	**F602-08WJ**	**F602-08WJR**
		1"	Metal / Without sight gauge	32 oz	300	**F602-08EJ**	**F602-08EJR**
F602		1-1/4"	Metal / Sight gauge	16 oz	380	**F602-10WJ**	**F602-10WJR**
		1-1/4"	Metal / Without sight gauge	32 oz	380	**F602-10EJ**	**F602-10EJR**
		1-1/2"	Metal / Sight gauge	16 oz	450	**F602-12WJ**	**F602-12WJR**
		1-1/2"	Metal / Without sight gauge	32 oz	450	**F602-12EJ**	**F602-12EJR**

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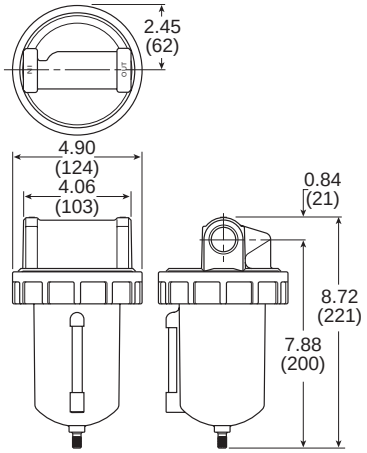
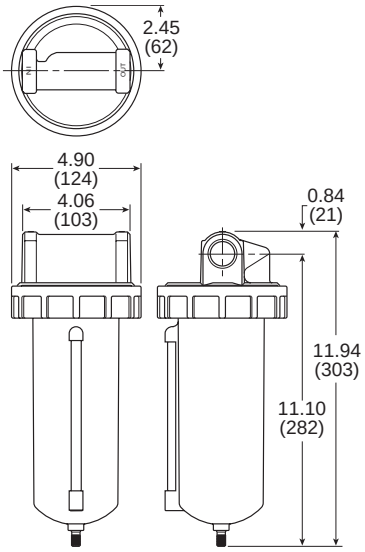
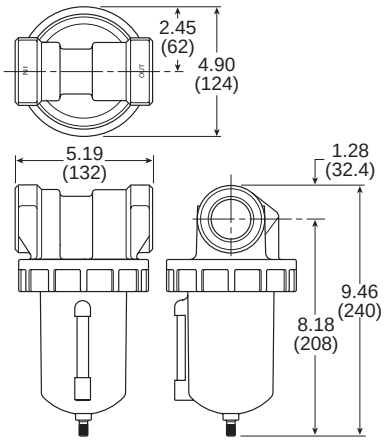
F602-06W, F602-08W (Hi-Flow)



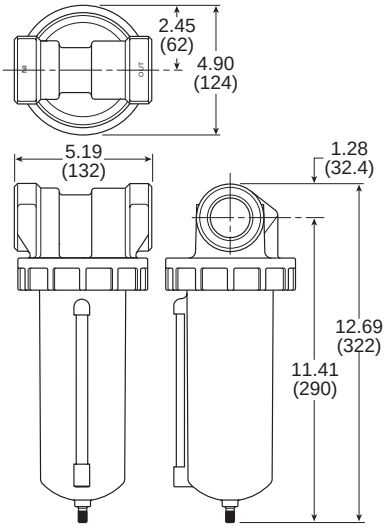
F602-06E, F602-08E (Hi-Flow)



F602-10W, F602-12W (Hi-Flow)



F602-10E, F602-12E (Hi-Flow)



Service kits

Description		(Hi-Flow) F602-06W, F602-08W, F602-06E, F602-08E	(Hi-Flow) F602-10W, F602-12W, F602-10E, F602-12E
Bowl kits –	Aluminum (E) 32 oz	**BK603B**	**BK603B**
	Zinc / sight gauge (W) 16 oz	**BK605WB**	**BK605WB**
Drain kits –	Internal auto	**SA602MD**	**SA602MD**
	Manual	**SA600Y7-1**	**SA600Y7-1**
Filter element kits –	40 micron	**EK602B**	**EK602B**
	5 micron	**EK602VB**	**EK602VB**
Mounting bracket kits –	3/4" unit	**SA200AW57**	
	1" unit	**SA200CW57**	
Repair kits –	Deflector, baffle assy, & retaining rod	**RK602B**	**RK602B**
	External auto drain	**RK602D**	**RK602D**
	Internal auto drain	**RK602MD**	**RK602MD**
	Metal bowl / sight gauge	**RKB605WB**	**RKB605WB**

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- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains

35F

43F

Material specifications

Description	35F, 43F (Hi-Flow)
Baffle	Plated steel
Body	Aluminum
Bowl	Aluminum
Deflector	Plated steel
Filter element	Polyethylene
Seals	Fluorocarbon
Stud	Plated steel

Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)

For technical information see CD

Particulate Filters

	Port size	Bowl type	Flow SCFM	Element type	Part number (NPT) Automatic drain
35F	1-1/2	Metal	1280	5 micron	**35F77BAP**
	2	Metal	1400	5 micron	**35F87BAP**
43F	3	Metal	2900	5 micron	**43FN7BAP**

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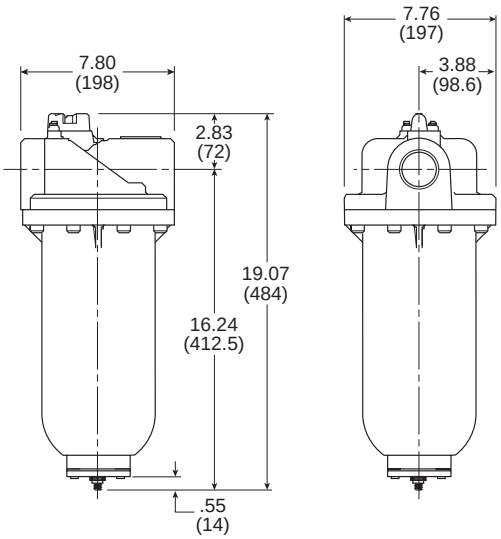
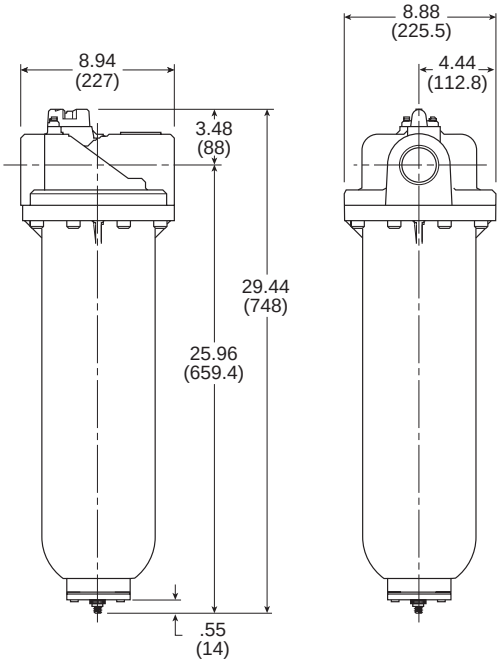
35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description		35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit		**DP2-02-001**	**DP2-02-001**
DPI cap	Pressures over 150 PSIG	**GRP-95-022**	**GRP-95-022**
DP gauge		**DP3-01-000**	**DP3-01-000**
Automatic float drain kit	Auto internal drain 1/8"	**P32KA00DA**	**P32KA00DA**
Manual drain kit	with 1/2" drain plate	**GRP-95-392**	**GRP-95-392**
Drain plate kit	1/2 NPT tapped port	**GRP-95-393**	**GRP-95-393**
Filter element kit	5 micron	**FRP-95-505**	**FRP-95-508**

- Removes liquid aerosols and sub-micron particles
- 0.01 micron element standard
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

Material specifications

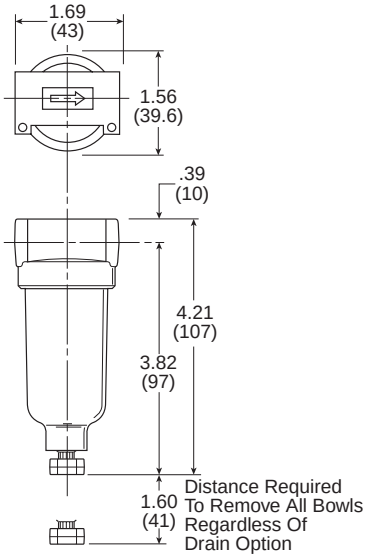
Description		10F (Mini)
Body		Zinc
Bowl		Polycarbonate
Drains – Twist	Body & stem	Plastic
	Seals	Nitrile
Drains – Auto Pulse	Piston & seals	Nitrile
	Stem, seat, adapter & washers	Aluminum
Element holder		Plastic
Filter element	1.0 micron	Borosilicate & felt glass fibers
	0.01 micron	
Seals		Nitrile

Operating information

		10F
Operating pressure	Poly bowl Metal bowl	0 to 150 PSIG (0 to 10.3 bar) 0 to 250 PSIG (0 to 17.2 bar)
	Auto pulse drain	10 to 250 PSIG (0.7 to 17.2 bar)
Operating temperature	Poly bowl Metal bowl Auto pulse drain	32°F to 125°F (0°C to 52°C) 32°F to 175°F (0°C to 80°C) 125°F (52°C) or less

For technical information see CD

10F



Service kits

Description			10F (Mini)
Bowl Kits	Poly bowl –	Auto pulse drain	**PS408BP**
		Twist drain	**PS404P**
	Metal bowl	Auto drain	**PS451BP**
		Twist drain	**PS447BP**
Filter element kit –		Grade 6 (standard)	**PS446P**
		Grade 10 (optional	**PS456P**
Mounting bracket kit			**PS417BP**

Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT) Twist drain	Part number (NPT) Automatic pulse drain
10F	1/8"	Poly	No	17	0.01 micron	**10F01E***	**10F05E***
	1/8"	Poly	No	19	1.0 micron	**10F01H***	**10F05H***
	1/8"	Metal	No	17	0.01 micron	**10F03E***	**10F07E***
	1/8"	Metal	No	19	1.0 micron	**10F03H***	**10F07H***
	1/4"	Poly	No	20	0.01 micron	**10F11E***	**10F15E***
	1/4"	Poly	No	24	1.0 micron	**10F11H***	**10F15H***
	1/4"	Metal	No	20	0.01 micron	**10F13E***	**10F17E***
	1/4"	Metal	No	24	1.0 micron	**10F13H***	**10F17H***

* Enginering level will be added at factory.

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- Removes liquid aerosols and sub-micron particles
- Liquids gravitate to the bottom of the element and will not re-enter the airstream
- Oil free air for critical applications, such as air gauging and pneumatic instrumentation and controls
- Interchangeable twist and automatic float drains
- Differential pressure indicator standard
- 11F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 12F: 1/2" & 3/4" ports (NPT & BSPP)

11F

12F

Material specifications

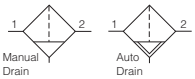
Body	Zinc
Bowls	Transparent polycarbonate or Metal (zinc) with or without sight gauge
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drains –	
Twist drain – body & nut	Plastic
Automatic float drain –	
Housing, float	Plastic
Seals	Nitrile
Springs, push rod	Stainless steel
Filter element –	
Borosilicate & felt glass fibers 99.97% DOP efficiency Largest Aerosol Particle Passed (Grade 6)	0.01 Micron
Largest Solid Particle Passed (Grade 6)	0.30 Micron
Seals	Nitrile
Sight gauge	Polyamide

Operating information

		11F & 12F
Operating pressure	Poly bowl	0 to 150 PSIG (0 to 10.3 bar)
	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Auto float drain	Poly bowl	15 to 250 PSIG (1.0 to 17.2 bar)
	Metal bowl	
Operating temperature	Poly bowl	32°F to 125°F (0°C to 52°C)
	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

Coalescing Filters



	Port size	Bowl type	Flow SCFM Grade 6 element	Flow SCFM Grade 10 element	Part number (NPT) Twist drain	Part number (NPT) Automatic float drain
11F	1/4"	Poly bowl / Metal guard	45	60	**11F12E***	**11F16E***
	1/4"	Metal bowl / Sight gauge	45	60	**11F14E***	**11F18E***
	3/8"	Poly bowl / Metal guard	48	72	**11F22E***	**11F26E***
	3/8"	Metal bowl / Sight gauge	48	72	**11F24E***	**11F28E***
	1/2"	Poly bowl / Metal guard	65	95	**11F32E***	**11F36E***
	1/2"	Metal bowl / Sight gauge	65	95	**11F34E***	**11F38E***
12F	1/2"	Poly bowl / Metal guard	75	125	**12F32E***	**12F36E***
	1/2"	Metal bowl / Sight gauge	75	125	**12F34E***	**12F38E***
	3/4"	Poly bowl / Metal guard	80	160	**12F42E***	**12F46E***
	3/4"	Metal bowl / Sight gauge	80	160	**12F44E***	**12F48E***

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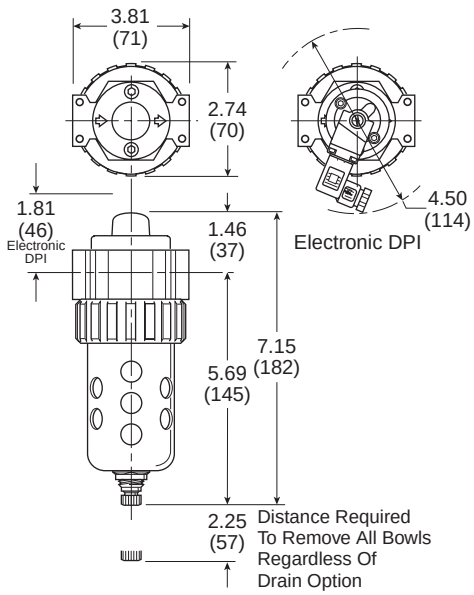
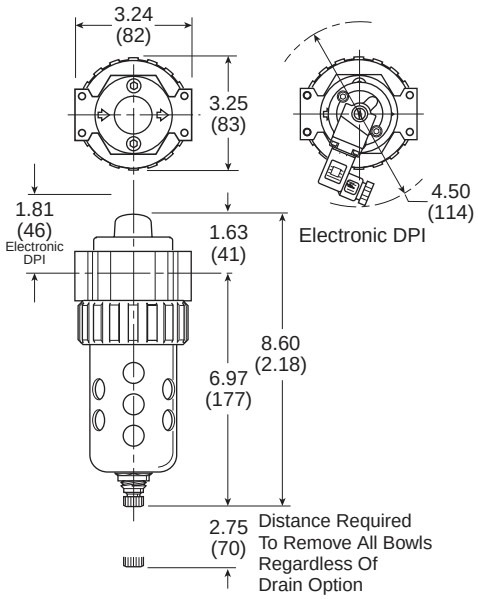
11F (Compact)



12F (Standard)



Service kits

Description		11F (Compact)	12F (Standard)
Bowl guard kit		**PS705P**	**PS805P**
Bowl Kits –			
Poly bowl –	Auto float drain	**PS722P**	**PS822P**
	Twist drain	**PS732P**	**PS832P**
Metal bowl –	Auto float drain	**PS726P**	**PS826P**
	Twist drain	**PS734P**	**PS834P**
	Sight gauge / automatic float drain	**PS723P**	**PS823P**
	Sight gauge / twist drain	**PS735P**	**PS835P**
DPI replacement kit		**PS781P**	**PS781P**
Drain kits –	Auto float drain	**PS506P**	**PS506P**
	Semi-auto drain	**PS511P**	**PS511P**
	Twist drain	**PS512P**	**PS512P**
	Push 'N' Drain	**PS513P**	**PS513P**
Electronic DPI replacement kit		**PS764**	**PS764**
Electrical connector -	15mm, 3-pin DIN, 6 Ft. Cord	**PS2932JBP**	**PS2932JBP**
Filter element kit –	Grade 6 (Standard)	**PS701P**	**PS824P**
	Grade 10 (Optional)	**PS702P**	**PS830P**
Mounting bracket kit		**PS743P**	**PS843P**
Sight gauge kit		**PS914P**	**PS914P**

Most popular.

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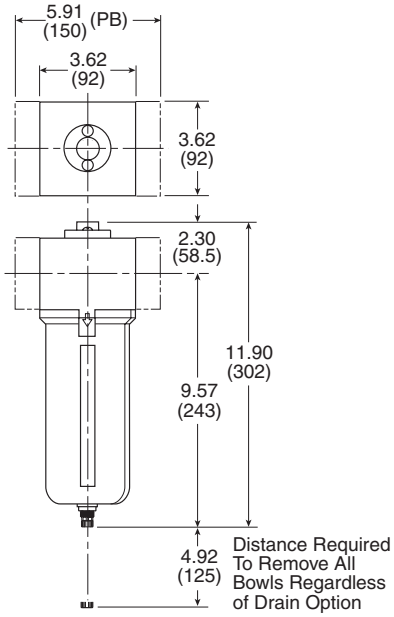
- Removes liquid aerosols and sub-micron particles
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 0.01 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)

Material specifications

Description		P3NF (Hi-Flow)
Body		Aluminum
Bowl		Aluminum
Deflector		Plastic
Drain		Plastic
Filter element –	1.0 micron	Borosilicate & felt glass fibers
	0.01 micron	
Seals		Nitrile
Sight gauge		Polyamide (Nylon)

P3NF (Hi-Flow)



Operating information

		P3NF (Hi-Flow)
Operating pressure	Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
	Auto float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Operating temperature	Metal bowl	32°F to 175°F (0°C to 80°C)

For technical information see CD

Service kits

Description		P3NF (Hi-Flow)
Bowl Kits –	Sight gauge / auto float	**P3NKA00BSA**
	Sight gauge / twist drain	**P3NKA00BSM**
	Sight gauge / push 'n' drain	**P3NKA00BSP**
Bowl latch kit		**C11A33**
DPI replacement kit		**PS781P**
Drain kit –	Auto drain	**PS506P**
	Twist drain	**PS512P**
Filter element kit –	Grade 6 (standard)	**P3NKA00ESCB**
	Grade 10 (optional	**P3NKA00ES9**
Mounting bracket kit		**P3NKA00MW**
Sight gauge kit		**P3NKA00PE**

Coalescing Filters

	Port size	Bowl type	Sight gauge	Flow SCFM	Element type	Part number (NPT) Twist drain	Part number (NPT) Automatic float drain
P3NF	3/4"	Metal	Yes	130	0.01 micron	**P3NFA96DSM**	**P3NFA96DSA**
	3/4"	Metal	Yes	195	1.0 micron	**P3NFA96QSM**	**P3NFA96QSA**
	1"	Metal	Yes	140	0.01 micron	**P3NFA98DSM**	**P3NFA98DSA**
	1"	Metal	Yes	215	1.0 micron	**P3NFA98QSM**	**P3NFA98QSA**
	1-1/2"#	Metal	Yes	225	0.01 micron	**P3NFA9PDSM**	**P3NFA9PDSA**
	1-1/2"#	Metal	Yes	150	1.0 micron	**P3NFA9PQSM**	**P3NFA9PQSA**

1" port body with 1-1/2" port block

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- Removes liquid aerosols and sub-micron particles
- Protects pneumatic systems from contamination that standard particulate filters will not catch
- Two different grade elements available
- Differential pressure indicator (pop-up) standard
- Differential pressure gauge optional
- High flow design

Material specifications

Description		F701 (Hi-Flow)
Body & flange ring		Zinc
Bowl	(E) 32 oz	Aluminum
	(L) 100 oz	Aluminum
Drains	Housing R	Acetal
	Housing Q	Bronze
	Manual	Brass
Element end cap		Urethane
Filter element	0.01 micron	Borosilicate fibers & felt
	1.0 micron	
Seals & float		Buna N
Springs		Stainless steel

Operating information

	F701 (Hi-Flow)	
Maximum pressure	"R" drain	175 PSIG (12.4 bar)
	"T" drain	250 PSIG (17.2 bar)
	"Q" drain	250 PSIG (17.2 bar)
Maximum temperature		32°F to 150°F (0°C to 65.6°C)
Maximum temperature with "T", "R" or "Q" drains		125°F (52°C)
Minimum rated flow		20% or rated flow

For technical information see CD

Coalescing Filters

	Port size	Bowl type	Bowl size	Flow SCFM	Element type	Part number
F701	3/4"	Metal	32 oz	95	0.01 micron	**F701-06E3P**
	3/4"	Metal	32 oz	158	1.0 micron	**F701-06E7P**
	3/4"	Metal	100 oz	170	0.01 micron	**F701-06L3P**
	3/4"	Metal	100 oz	285	1.0 micron	**F701-06L7P**
	1"	Metal	32 oz	95	0.01 micron	**F701-08E3P**
	1"	Metal	32 oz	158	1.0 micron	**F701-08E7P**
	1"	Metal	100 oz	170	0.01 micron	**F701-08L3P**
	1"	Metal	100 oz	285	1.0 micron	**F701-08L7P**

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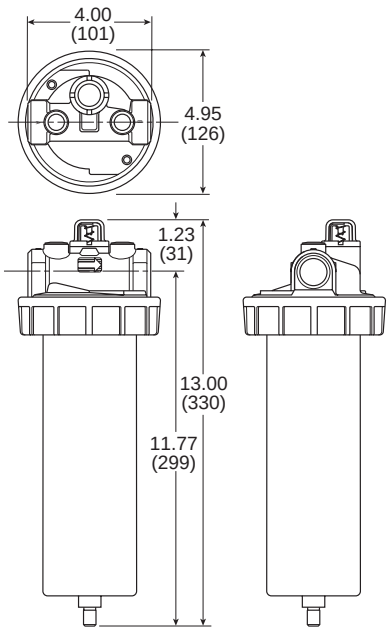
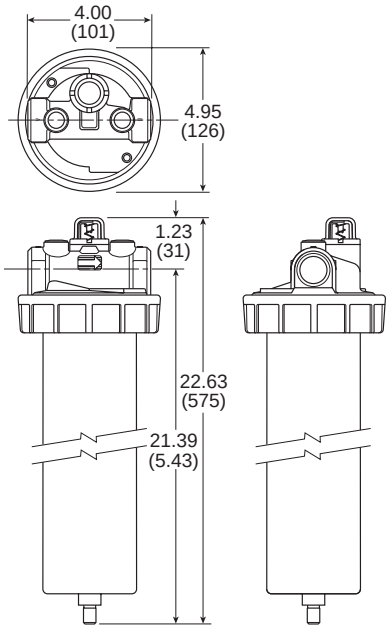
F701 - 32 oz. bowl (Hi-Flow)



F701 - 100 oz. bowl (Hi-Flow)



Service kits

Description		F701 (Hi-Flow)
Bowl kits	3/4, 1 inch (E) 32 oz	**BK603B**
	3/4, 1 inch (L) 100 oz	**BK603C**
DPI repair kit		**RK701P**
Drain kits –	Internal auto	**SA702MD**
	Manual	**SA600Y7-1**
Filter element kits –	0.01 micron, 3/4, 1 inch (E) 32 oz	**F701-C3-0773**
	0.01 micron, 3/4, 1 inch (E) 100 oz	**F701-C3-0774**
	1.0 micron, 3/4, 1 inch (E) 32 oz	**F701-C7-0773**
	1.0 micron, 3/4, 1 inch (E) 100 oz	**F701-C7-0773**
Mounting bracket kits –	3/4" unit	**SA200AW57**
	1" unit	**SA200CW57**

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- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains
- 35F: 1-1/2" & 2" ports (NPT & BSPP)
- 43F: 3" ports (NPT & BSPP)

35F

43F

Material specifications

Description		35F, 43F (Hi-Flow)
Baffle		Plated steel
Body		Aluminum
Bowl		Aluminum
Deflector		Plated steel
Filter element	0.01 & 1.0 micron	Borosilicate cloth
	Adsorber	Activated carbon
Seals		Fluorocarbon
Stud		Plated steel

Operating information

		35F (Hi-Flow)	43F (Hi-Flow)
Operating pressure	With DP gauge & without DPI	250 PSIG (17.2 bar)	250 PSIG (17.2 bar)
	With DPI	150 PSIG (10.3 bar)	150 PSIG (10.3 bar)
Operating temperature		32°F to 150°F (0°C to 65.5°C)	32°F to 150°F (0°C to 65.5°C)

For technical information see CD

Coalescing Filters

		Port size	Bowl type	Flow SCFM	Element type	Part number (NPT) Automatic drain
35F		1-1/2	Metal	710	0.01 micron	**35F77EAP**
		1-1/2	Metal	710	1.0 micron	**35F77HAP**
		1-1/2	Metal	710	Adsorber	**35F77ZAP**
		2	Metal	710	0.01 micron	**35F87EAP**
		2	Metal	710	1.0 micron	**35F87HAP**
		2	Metal	710	Adsorber	**35F87ZAP**
43F		3	Metal	1770	0.01 micron	**43FN7EAP**
		3	Metal	1770	1.0 micron	**43FN7HAP**
		3	Metal	1770	Adsorber	**43FN7ZAP**

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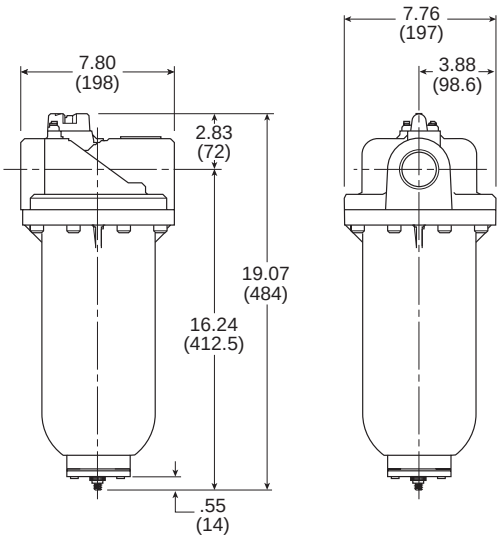
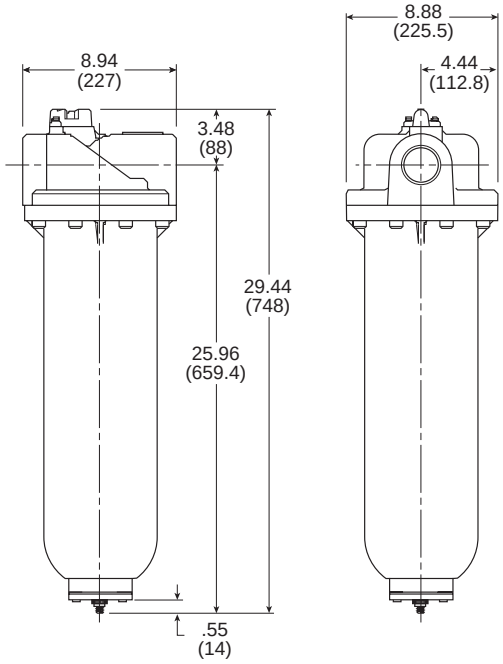
35F (Hi-Flow)



43F (Hi-Flow)



Service kits

Description		35F (Hi-Flow)	43F (Hi-Flow)
DPI replacement kit		**DP2-02-001**	**DP2-02-001**
DPI cap	Pressures over 150 PSIG	**GRP-95-022**	**GRP-95-022**
DP gauge		**DP3-01-000**	**DP3-01-000**
Automatic float drain kit	Auto internal drain 1/8"	**P32KA00DA**	**P32KA00DA**
Manual drain kit	with 1/2" drain plate	**GRP-95-392**	**GRP-95-392**
Drain plate kit	1/2 NPT tapped port	**GRP-95-393**	**GRP-95-393**
Filter element kit –	0.01 micron	**MTP-95-502**	**MTP-95-562**
	1.0 micron	**MSP-95-502**	**MSP-95-876**
	Adsorber	**MXP-95-502**	**MXP-95-565**

- Unbalanced poppet standard
- Solid control piston with lip seal for extended life
- Non-rising adjusting knob
- Compact, 2.88 inch (73,2mm) high by 1.65 inch (42mm) wide
- Easily serviced
- 14R: 1/8" & 1/4" ports (NPT, BSPP & BSPT)
- 15R: 1/4" & 3/8" ports (NPT, BSPP & BSPT)

14R

15R

Material specifications

Adjusting nut	Brass
Adjusting stem & spring	Steel
Body	Zinc
Bonnet, seat, piston & valve poppet	Plastic
Seals	Nitrile

Operating information

	14R (Mini), 15R (Economy)
Pressure rating	0 to 300 PSIG (0 to 20.4 bar)
Temperature rating	32°F to 125°F (0°C to 52°C)
Low temperature	-4°F to 125°F (-20°C to 52°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
Medium pressure	1 to 30 PSIG (0 to 2.1 bar)
Low pressure	1 to 15 PSIG (0 to 1 bar)
For technical information see CD	

Regulators

	Port size	Pressure range	Flow SCFM	Part number (NPT) Without gauge	With gauge
14R	1/8"	30 PSIG	13	**14R010F***	**14R015F***
	1/8"	60 PSIG	13	**14R011F***	**14R016F***
	1/8"	125 PSIG	13	**14R013F***	**14R018F***
	1/4"	30 PSIG	15	**14R110F***	**14R115F***
	1/4"	60 PSIG	15	**14R111F***	**14R116F***
	1/4"	125 PSIG	15	**14R113F***	**14R118F***
15R	1/4"	30 PSIG	21	**15R110F***	**15R115F***
	1/4"	60 PSIG	21	**15R111F***	**15R116F***
	1/4"	125 PSIG	21	**15R113F***	**15R118F***
	3/8"	30 PSIG	28	**15R210F***	**15R216F***
	3/8"	60 PSIG	28	**15R211F***	**15R215F***
	3/8"	125 PSIG	28	**15R213F***	**15R218F***

* Enginering level will be added at factory.

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Most popular.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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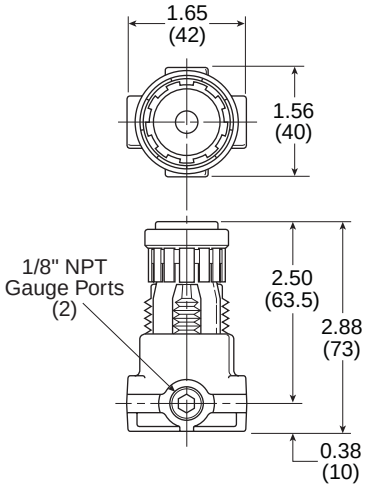
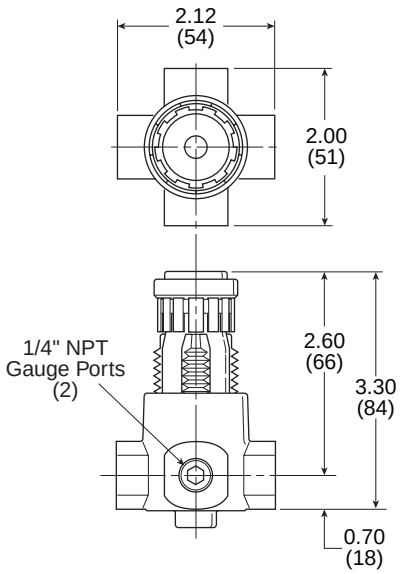
14R (Mini)



15R (Economy)



Service kits

Description		14R (Mini)	15R (Economy)
Body service kit – unbalanced			**PS424BP**
Bonnet assembly kit		**L01369**	**L01369**
Bonnet tamperproof kit		**P01265**	
Gauges –	30 PSIG, 1/8" NPT (0 to 2.1 bar)	**K4515N18030**	**K4515N18030**
	60 PSIG, 1/8" NPT (0 to 4.1 bar)	**K4515N18060**	**K4515N18060**
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	**K4515N18160**	**K4515N18160**
	60 PSIG, 1/4" NPT (0 to 4.1 bar)	**K4520N14060**	**K4520N14060**
	160 PSIG, 1/4" NPT (0 to 11.0 bar)	**K4520N14160**	**K4520N14160**
Mounting bracket kit (includes panel mount nut)		**PS417BP**	**PS417BP**
Panel mount nuts –	Plastic	**P78652**	**P78652**
	Metal	**P01531**	**P01531**
Poppet / piston kits –	Unbalanced, non-relieving	**PS428P**	
	Unbalanced, relieving	**PS426P**	
Seal kit	Unbalanced		**PS454B**
Springs –	1-15 PSIG range (Yellow)	**P01176**	**P01176**
	1-30 PSIG range (Black)	**P01175**	**P01175**
	1-60 PSIG range (White)	**P01174**	**P01174**
	2-125 PSIG range (Gold)	**P01173**	**P01173**

- Diaphragm operated for fast operation
- Large Diaphragm to valve area ratio for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Available in 2 or 4 port design
- Available with a manifold mount to minimize plumbing
- Suitable for low temperature applications
- Non-rising adjusting knob
- 1/8" & 1/4" ports (NPT & BSPP)

R342/R344

R342-0MC

Material specifications

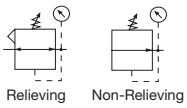
Description	R34 (Mini)
Body	Aluminum
Bonnet	Acetal
Diaphragm & seals	Nitrile
Springs	Steel
Panel nut	Acetal
Valve assembly	Brass

Operating information

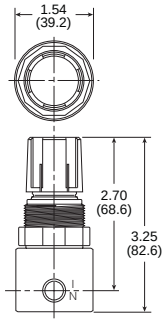
	R34 (Mini)
Supply pressure	300 PSIG (20.4 bar) max
Temperature rating	-40°F to 150°F (-40°C to 65.5°C)

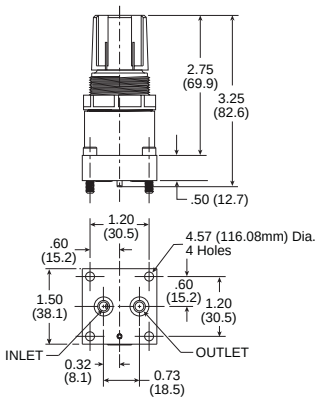
For technical information see CD

R34 Regulator, relieving



Port size	Pressure range	Flow SCFM	Part number	
			Without gauge	With gauge
1/8"	0 to 30 PSIG (0 to 2.1 bar)	17	**R344-01A**	**R344-01AG**
1/8"	0 to 60 PSIG (0 to 4.1 bar)	17	**R344-01B**	**R344-01BG**
1/8"	0 to 125 PSIG (0 to 8.6 bar)	17	**R344-01C**	**R344-01CG**
1/4"	0 to 30 PSIG (0 to 2.1 bar)	19	**R344-02A**	**R344-02AG**
1/4"	0 to 60 PSIG (0 to 4.1 bar)	19	**R344-02B**	**R344-02BG**
1/4"	0 to 125 PSIG (0 to 8.6 bar)	19	**R344-02C**	**R344-02CG**
Manifold Mount			**R342-0MA**	
Manifold Mount			**R342-0MB**	
Manifold Mount			**R342-0MC**	





Service kits

Diagram assembly	Non-relieving	**GRP-96-726**
	Relieving	**GRP-96-725**
Gauges –	60 PSIG, 1/8" NPT (0 to 4.1 bar)	**K4515N18060**
	160 PSIG, 1/8" NPT (0 to 11.0 bar)	**K4515N18160**
Mounting bracket kit (includes panel mount nut)		**SA161x57**
Panel mount nuts	Plastic	**R05x51-P**
	Aluminum	**R05x51-A**
Springs –	0 to 30 PSIG (0 to 2.1 bar)	**GRP-95-111**
	0 to 60 PSIG (0 to 4.1 bar)	**GRP-96-718**
	0 to 125 PSIG (0 to 8.6 bar)	**GRP-96-717**

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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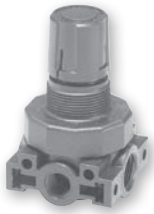
- 20R: Rugged brass body for water service
- R24/R25, R45/R46: Constructed with a combination of N.S.F. and F.D.A. Approved materials
- Unbalanced poppet standard
- Non-rising, push-to-lock adjusting knob
- Diaphragm operated
- 20R: 1/8" & 1/4" ports (NPT & BSPP)
- R24/R25: 1/8" & 1/4" ports (NPT & BSPP)
- R45/R46: 1/4" & 3/8" ports (NPT & BSPP)

20R

R24/R25



R45/R46

Material specifications

	20R	R25/R45	R24/R46
Adjusting screw	Steel	Steel	Steel
Body		Acetal	Acetal
Body, bottom plug, diaphragm button	Brass		
Bonnet & seat	Plastic	Acetal	Acetal
Diaphragm		Buna N	EPDM
Seals	Buna N	Buna N	EPDM
Springs	Steel	Stainless	Stainless
Valve poppet	Brass	Buna N	EPDM

Operating information

	20R	
Pressure rating	0 to 300 PSIG (0 to 20.4 bar)	
Secondary pressure ranges		
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)	
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)	
Medium pressure	1 to 25 PSIG (0 to 2.1 bar)	
Temperature rating	32°F to 125°F (0°C to 52°C)	
	R24/R25	**R45/R46**
Pressure rating	0 to 150 PSIG (0 to 10 bar)	
Temperature rating	40°F to 125°F (4°C to 52°C)	

For technical information see CD

Regulators

	Port size	Pressure range	Flow SCFM	Part number (NPT) Air service, relieving	Water service, non-relieving
R24/R25	1/8"	25 PSIG		**R25-01A**	**R24-01AK**
	1/8"	60 PSIG		**R25-01B**	**R24-01BK**
	1/8"	125 PSIG		**R25-01C**	**R24-01CK**
	1/4"	25 PSIG		**R25-02A**	**R24-02AK**
	1/4"	60 PSIG		**R25-02B**	**R24-02BK**
	1/4"	125 PSIG		**R25-02C**	**R24-02CK**
R45/R46	1/4"	25 PSIG		**R45-02A**	**R46-02AK**
	1/4"	60 PSIG		**R45-02B**	**R46-02BK**
	1/4"	125 PSIG		**R45-02C**	**R46-02CK**
	3/8"	25 PSIG		**R45-03A**	**R46-03AK**
	3/8"	60 PSIG		**R45-03B**	**R46-03BK**
	3/8"	125 PSIG		**R45-03C**	**R46-03CK**
				Water service, relieving	**Water service, non-relieving**
20R	1/8"	25 PSIG	1.25	**20R011F***	**20R011G***
	1/8"	60 PSIG	1.25	**20R061F***	**20R061G***
	1/8"	125 PSIG	1.25	**20R013F***	**20R013G***
	1/4"	25 PSIG	1.25	**20R111F***	**20R111G***
	1/4"	60 PSIG	1.25	**20R161F***	**20R161G***
	1/4"	125 PSIG	1.25	**20R113F***	**20R113G***

NOTE: 1.25 Dia. (32mm) hole required for panel mounting.
* Enginering level will be added at factory.

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Most popular.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
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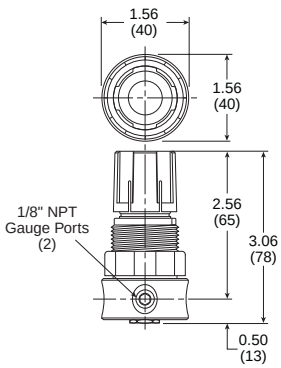
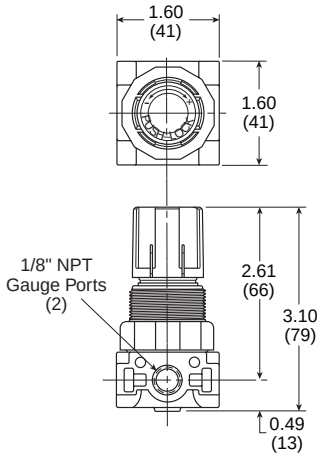
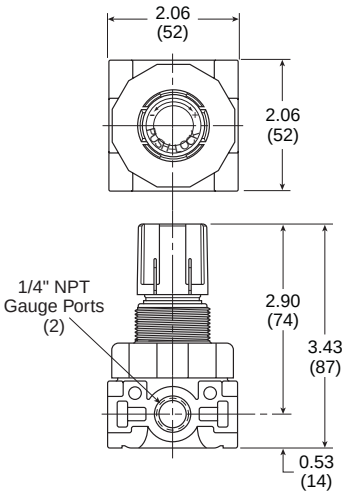
20R



R24/R25



R45/R46

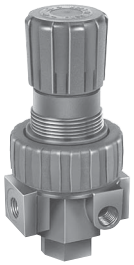


Service kits

Description		20R	R24	R25	R45	R46
Bonnet kit		**PCKR364Y**				
Bonnet tamperproof kit		**PCKR364T**				
Mounting bracket kit (includes panel mount nut)		**SA161x57**	**SA161X57**	**SA161X57**	**SA161X57**	**SA161X57**
Panel mount nuts –	Plastic	**R05x51-P**	**R05X51-P**	**R05X51-P**	**R05X51-P**	**R05X51-P**
	Aluminum	**R05x51-A**	**R05X51-A**	**R05X51-A**	**R05X51-A**	**R05X51-A**
Repair kits –	Non-relieving	**PRKR163Y**	**RKR24KY**	**RKR25KY**	**RKR45KY**	**RKR45KY**
	Relieving	**PRKR164Y**	**RKR24Y**	**RKR25Y**	**RKR45Y**	**RKR45Y**
Springs –	0 to 25 PSIG (0 to 1.7 bar)		**SPR-375-1**	**SPR-375-1**	**SPR-46**	**SPR-46**
	0 to 60 PSIG (0 to 4.1 bar)		**SPR-376**	**SPR-376**	**SPR-47**	**SPR-47**
	0 to 125 PSIG (0 to 8.6 bar)		**SPR-377**	**SPR-377**	**SPR-48**	**SPR-48**

Most popular.

- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Rolling diaphragm for extended life
- Two high flow 1/4" gauge ports can be used as additional outlets
- Easily serviced
- Removable non-rising knob for panel mounting and tamper resistance
- 06R: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07R: 1/2" & 3/4" ports (NPT & BSPP)



06R

07R

Material specifications

Adjusting Stem	Steel
Body	Zinc
Bonnet, piston stem, valve poppet & cap	Plastic
Collar, knob	Plastic
Diaphragm	Nitrile
Seals	Nitrile
Springs – Poppet Control	Stainless Steel

Operating information

	06R (Compact), 07R (Standard)
Pressure rating	250 PSIG (17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)
For technical information see CD	

Regulators

		Port size	Pressure range	Flow SCFM	Part number (NPT) Without gauge	With 160 PSI gauge
06R		1/4"	125 PSIG	53	**06R113A***	**06R118A***
		3/8"	125 PSIG	60	**06R213A***	**06R218A***
		1/2"	125 PSIG	75	**06R313A***	**06R318A***
07R		1/2"	125 PSIG	90	**07R313A***	**07R318A***
		3/4"	125 PSIG	90	**07R413A***	**07R418A***

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

☐ Most popular.

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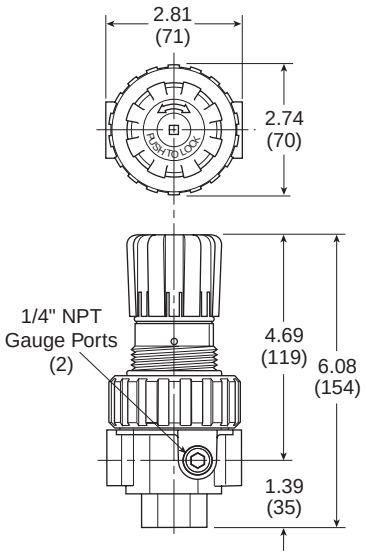
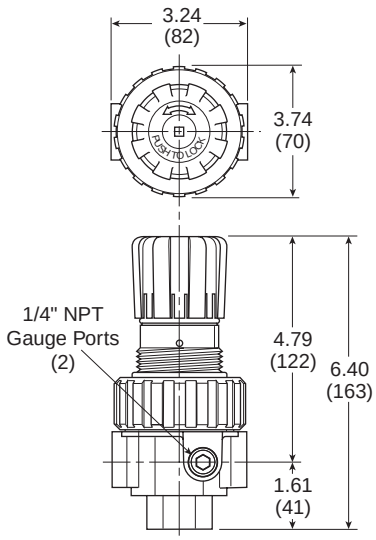
06R (Compact)



07R (Standard)



Service kits

Description		06R (Compact)	07R (Standard)
Bonnet assembly		**PS715P**	**PS715P**
Control knob		**P04069B**	**P04069B**
Gauges –	60 PSIG (0 to 4.1 bar)	**K4520N14060**	**K4520N14060**
	160 PSIG (0 to 11.0 bar)	**K4520N14160**	**K4520N14160**
	300 PSIG (0 to 20.0 bar)	**K4520N14300**	**K4520N14300**
Mounting bracket kit (Includes panel mount nut)		**PS707P**	**PS807P**
Panel mount nut –	Plastic	**P04082**	**P04079B**
	Metal	**P04082**	**P04079B**
Reverse Flow Service Conversion Kit – Relieving		**PS708RP**	**PS808RP**
Springs –	1-30 PSIG range	**P01698**	**P01698**
	1-60 PSIG range	**P04062**	**P04062**
	2-125 PSIG range	**P04063**	**P04063**
	5-250 PSIG range	**P04064**	**P04064**
Tamperproof kit		**PS737P**	**PS7373P**

☐ Most popular.

P3N
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

R119
- High flow performance featuring rugged design for the most demanding applications
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Heavy duty tee handle adjustment
- Reverse flow version available

09R
- Piston design for reduced downtime
- High flow
- Balanced poppet for quick and accurate regulation
- Self relieving piston standard

P3N

R119

09R

Operating information

	P3NR	R119	09R
Pressure rating, maximum	250 PSIG (17.2 bar)	300 PSIG (20.4 bar)	300 PSIG (20.4 bar)
Secondary pressure range			10 to 125 PSIG (0.7 to 8.6 bar) 10 to 180 PSIG (0.7 to 12.4 bar)
Reduced pressure range		2 to 125 PSIG 0.15 to 8.5 bar)	
Temperature rating	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)	32°F to 150°F (0°C to 66°C)

For technical information see CD

P3NR, R119, 09R Hi-Flow Regulators

Port size	Gauge	Flow (SCFM) P3NR	R119	09R	Part number (NPT), Relieving P3NR	R119	09R
3/4"	No	200	300		**P3NRA96BNN**	**R119-06C**	
1"	No	300	400		**P3NRA98BNN**	**R119-08C**	
1-1/4"	No		500			**R119-10C**	
1-1/2"	No	300	500		**P3NRA9PBNN**	**R119-12C**	
2"	No			1000			**09R813B***
3/4"	125 PSI	200	300		**P3NRA96BNG**	**R119-06CG**	
1"	125 PSI	300	400		**P3NRA98BNG**	**R119-08CG**	
1-1/4"	125 PSI		500			**R119-10CG**	
1-1/2"	125 PSI	300	500		**P3NRA9PBNG**	**R119-12CG**	

* Enginering level will be added at factory.

Material specifications

	P3NR	R119	09R
Adjusting screw	Steel	Steel	Steel
Body	Aluminum	Zinc	Zinc
Bonnet	Aluminum		Aluminum
Bottom plug, inner valve		Brass	
Knob	Plastic		
Piston	Plastic		Plastic
Piston stem			Aluminum
Poppet assembly	Brass		Aluminum
Seals	Nitrile	Buna N	Nitrile
Springs – poppet & control	Steel	Steels	Stainless

Most popular.

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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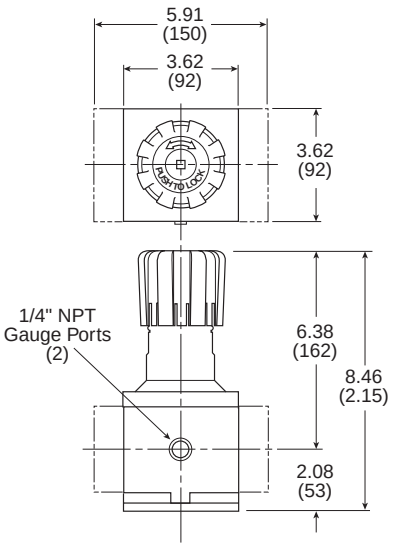
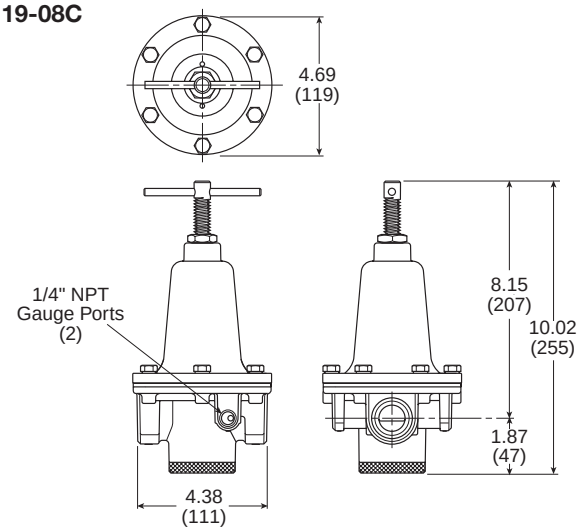
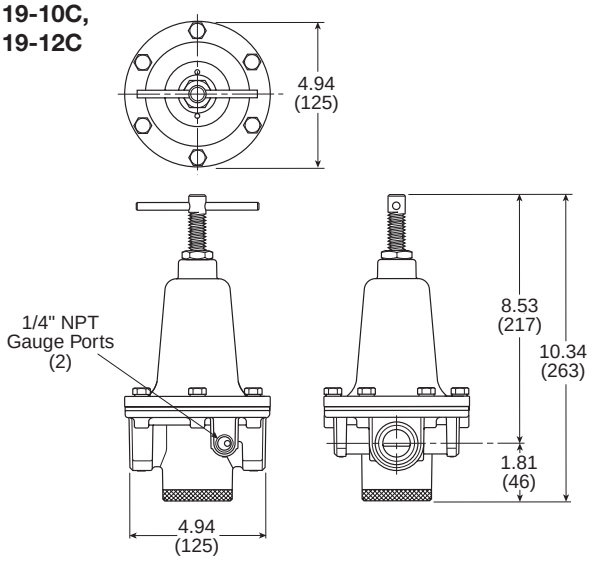
P3NR



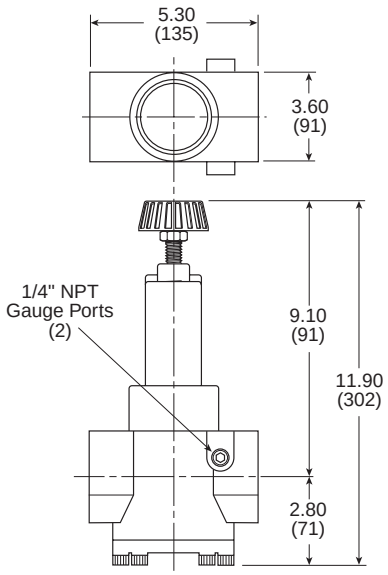
R119-06C,
R119-08C



R119-10C,
R119-12C



09R



Service kits

		P3NR	R119	09R
Body service kit				**PS603P**
Control knob		**P3NKA00PN**		
Gauges –	60 PSIG (0 to 4.1 bar)	**K4520N14060**	**K4520N14060**	
	160 PSIG (0 to 11.0 bar)	**K4520N14160**	**K4520N14160**	**K4520N14160**
	300 PSIG (0 to 20.0 bar)	**K4520N14300**	**K4520N14300**	**K4520N14300**
Mounting bracket kit		**P3NKA00MW**	**18B57**	**PS605P**
Repair kits –	Non-relieving	**P3NKA00RN**		**PS604P**
	Non-relieving (1-1/4", 1-1/2")		**RK118B**	
	Relieving	**P3NKA00RR**		**PS626P**
	Relieving (3/4", 1")		**RK119B**	
	Relieving (1-1/4", 1-1/2")		**RK119D**	
Springs –	1-60 PSIG	**C10A1304**		
	0 to 125 PSIG			**PS602P**
	2 to 125 PSIG	**SPR-47**		
	0 to 180 PSIG			**PS627**
	5 to 250 PSIG	**SPR-48**		

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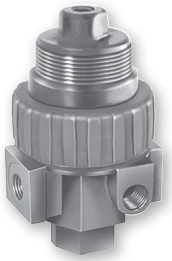
- Balanced poppet provides quick response and accurate pressure regulation
- Pilot controlled regulators can be mounted "out of reach" with pilot regulator installed in a convenient location
- Solid control piston for extended life

11R



12R

Operating information

	11R	12R
Pressure rating	0 to 250 PSIG (0 to 17.2 bar)	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)	32°F to 175°F (0°C to 80°C)
Flow capacity SCFM	1/4": 85 3/8": 95 1/2": 95	1/2": 140 3/4": 140

For technical information see CD

11R, 12R Pilot Controlled Regulators

Port size	Gauge	Part number (NPT), Relieving 11R	12R
1/4"	No	**11R115P***	
3/8"	No	**11R215P***	
1/2"	No	**11R315P***	**12R315P***
3/4"	No		**12R415P***
1/4"	160 PSI	**11R121P***	
3/8"	160 PSI	**11R221P***	
1/2"	160 PSI	**11R321P***	**12R321P***
3/4"	160 PSI		**12R421P***

* Enginering level will be added at factory.

Material specifications

	11R	12R
Body	Zinc	Zinc
Bottom plug	–	–
Innervalve	–	–
Pilot cap	Zinc	Zinc
Piston & poppet	Plastic	Plastic
Seals	Nitrile	Nitrile
Springs – poppet	Steel	Steel

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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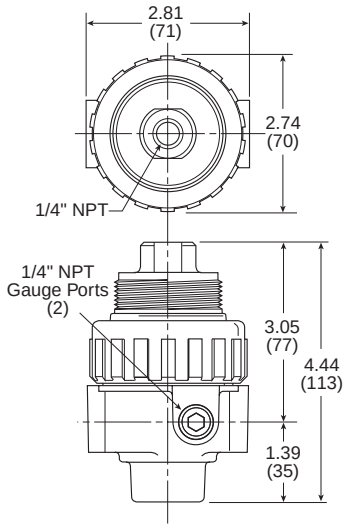
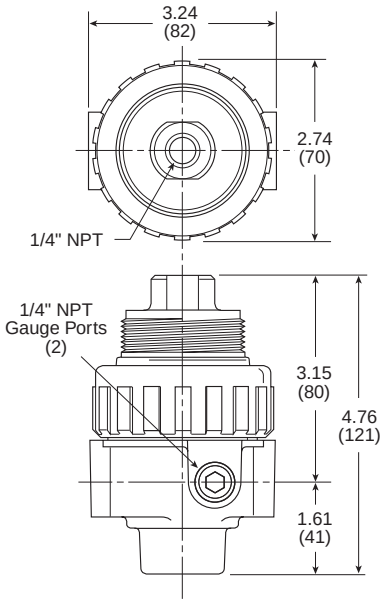
11R



12R



Service kits

			11R	12R
Body service kit			**PS713P**	**PS813P**
Gauges	1-1/2" Dial face –	30 PSIG (0 to 2.1 bar)		
		60 PSIG (0 to 4.1 bar)	**K4520N14060**	**K4520N14060**
		160 PSIG (0 to 11.0 bar)	**K4520N14160**	**K4520N14160**
		300 PSIG (0 to 20.0 bar)	**K4520N14300**	**K4520N14300**
	2" Dial face –	60 PSIG (0 to 4.1 bar)		
		160 PSIG (0 to 11.0 bar)		
		300 PSIG (0 to 20.0 bar)		
Mounting bracket kit			**PS707P**	**PS807P**
Panel mount nut –		Metal	**P04079B**	**P04079B**
		Plastic	**P04082**	**P04082**
Pilot conversion kit			**PS745P**	**PS745P**
Repair kits –		Non-relieving	**PS747P**	**PS847P**
		Relieving	**PS749P**	**PS849P**

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P3NR
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

R119
- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow

P3NR

R119 (06-12)

R119 (16-20)

Operating information

	P3NR	R119-06J R119-08J R119-10J R119-12J	R119-16J R119-20J
Pressure rating, maximum	250 PSIG (17.2 bar)	300 PSIG (17.2 bar)	300 PSIG (17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)	40°F to 120°F (4.4°C to 48.9°C)
Flow capacity SCFM	3/4"; 300 1"; 300 1-1/2"; 350	3/4"; 300 1"; 300 1-1/4"; 500 1-1/2"; 500	2"; 1800 2-1/2"; 1800

For technical information see CD

P3NR, R119 Pilot Operated Regulators

Port size	Gauge	Part number (NPT), relieving P3NR	R119-06J, R119-08J, R119-10J, R119-12J 0-125 PSIG reduced pressure	R119-16J, R119-20J
3/4"	No	**P3NRA96BPP**	**R119-06J**	
1"	No	**P3NRA98BPP**	**R119-08J**	
1-1/4"	No		**R119-10J**	
1-1/2"	No	**P3NRA9PBPP**	**R119-12J**	
2"	No			**R119-16J**
2-1/2"	No			**R119-20J**
3/4"	160 PSI	**P3NRA96BPG**		
1"	160 PSI	**P3NRA98BPG**		
1-1/2"	160 PSI	**P3NRA9PBPG**		

Material specifications

	P3NR	R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Adjusting stem	Steel		
Body	Aluminum		Aluminum
Body, ring, top plate		Zinc	
Bonnet	Aluminum		
Bottom plug, inner valve		Brass	Brass & Stainless
Piston	Plastic		Aluminum
Poppet assembly	Brass		
Seals	Nitrile	Buna N	Buna N
Springs – poppet	Steel		

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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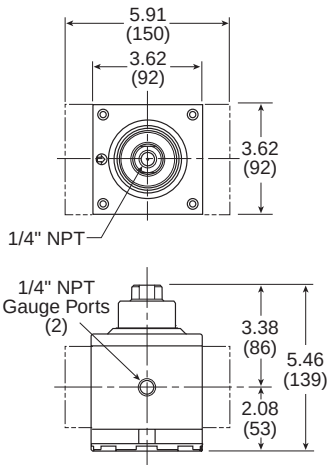
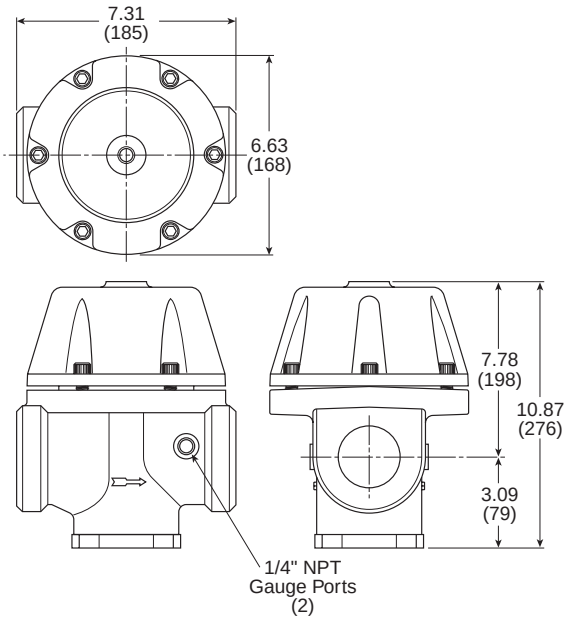
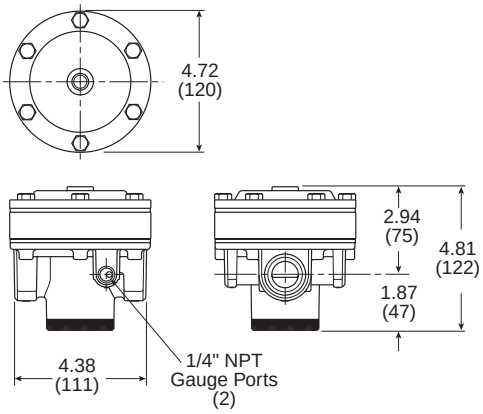
P3NR



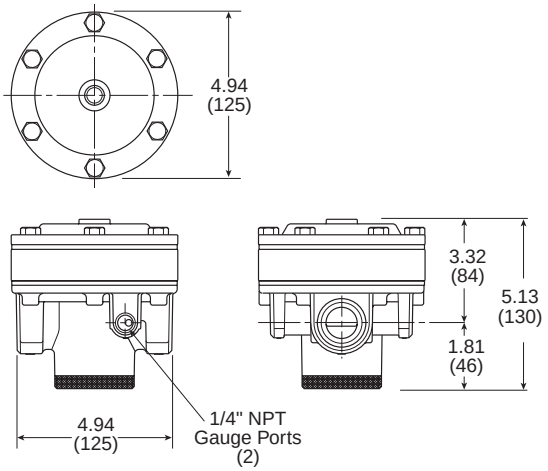
R119-16J, R119-20J



R119-06J, R119-08J



R119-10J, R119-12J



Service kits

		P3NR	R119-06J, R119-08J, R119-10J, R119-12J	R119-16J, R119-20J
Gauges 2" Dial face –	60 PSIG (0 to 4.1 bar)	**K4520N14060**	**K4520N14060**	**K4520N14060**
	160 PSIG (0 to 11.0 bar)	**K4520N14160**	**K4520N14160**	**K4520N14160**
	300 PSIG (0 to 20.0 bar)	**K4520N14300**	**K4520N14300**	**K4520N14300**
Mounting bracket kit		**P3NKA00MW**		
Repair kits	Piston type regulation (2", 2-1/2")			**RK119G**
Non-relieving diaphragm –	Valve assembly (3/4", 1")		**RK118X20B**	
	Valve assembly (1-1/4", 1-1/2")		**RK118X20D**	
Relieving diaphragm –	Valve assembly (3/4", 1")		**RK119X20B**	
	Valve assembly (1-1/4", 1-1/2")		**RK119X20D**	
Repair kits	Relieving	**P3NKA00PD**		

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14E
- Excellent water removal efficiency
- Unbalanced poppet standard
- Solid control piston for extended life
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob
- Two full flow 1/8" gauge ports

B34
- Excellent water removal efficiency diaphragm operated for fast operation
- Large diaphragm to valve area for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob

14E

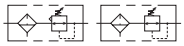
B34

Operating information

	14E	B34
Pressure rating		
Polycarbonate bowl	0 to 150 PSIG (0 to 10.3 bar)	0 to 150 PSIG (0 to 10.3 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)	0 to 300 PSIG (0 to 17.2 bar)
Secondary pressure ranges	Standard pressure 2 to 125 PSIG (0 to 8.6 bar) Medium pressure 1 to 30 PSIG (0 to 2.1 bar) Medium pressure 1 to 60 PSIG (0 to 4.1 bar) Low pressure 1 to 15 PSIG (0 to 1 bar)	Reduced pressure ranges 0 to 25 PSIG (0 to 1.7 bar) 1 to 60 PSIG (0 to 4.1 bar) 2 to 125 PSIG (0.15 to 8.5 bar)
Temperature rating		
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)	40°F to 125°F (4.4°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)	40°F to 125°F (4.4°C to 52°C)

For technical information see CD

Miniature Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT) Pressure range 30 PSIG	60 PSIG	125 PSIG
14E	1/8"	Poly	Twist	16	5 micron	**14E01B10F***	**14E01B11F***	**14E01B13F***
	1/8"	Poly	Auto pulse	16	5 micron	**14E05B10F***	**14E05B11F***	**14E05B13F***
	1/8"	Metal	Twist	16	5 micron	**14E03B10F***	**14E03B11F***	**14E03B13F***
	1/8"	Metal	Auto pulse	16	5 micron	**14E07B10F***	**14E07B11F***	**14E07B13F***
	1/4"	Poly	Twist	18	5 micron	**14E11B10F***	**14E11B11F***	**14E11B13F***
	1/4"	Poly	Auto pulse	18	5 micron	**14E15B10F***	**14E15B11F***	**14E15B13F***
	1/4"	Metal	Twist	18	5 micron	**14E13B10F***	**14E13B11F***	**14E13B13F***
	1/4"	Metal	Auto pulse	18	5 micron	**14E17B10F***	**14E17B11F***	**14E17B13F***
B34	1/8"	Poly	Twist		5 micron			**B344-01AGC**
	1/8"	Metal	Twist		5 micron			**B344-01DGC**
	1/4"	Poly	Twist		5 micron			**B344-02AGC**
	1/4"	Metal	Twist		5 micron			**B344-02DGC**

* Enginering level will be added at factory.

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

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CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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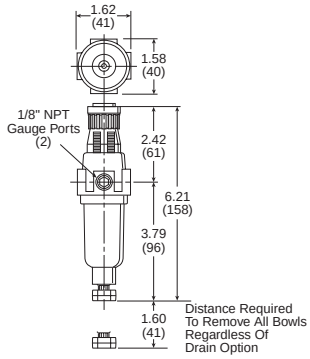
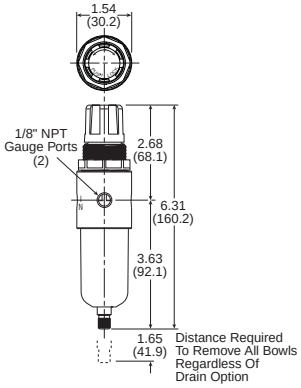
14E



B34



Material specifications

Description			14E (Mini)	B34
Adjusting nut			Brass	
Adjusting stem & spring			Steel	
Body			Zinc	Aluminum
Bonnet, knob, seat, piston, holder & deflector			Plastic	
Bowls		Transparent	Polycarbonate	Polycarbonate
		Metal	Zinc	Zinc
Drains	Manual – twist	Body & stem	Plastic	
		Seals	Nitrile	
	Automatic – pulse	Piston & seals	Nitrile	
		Stem, seat, adapter & washers	Aluminum	
Elastomers				Buna N
Filter elements		5 Micron (standard)	Plastic	Sintered polyethylene
		40 Micron (optional)	Plastic	
		Adsorber (optional)	Activated charcoal	
Filter retainer, vane plate				Acetal
Innervalve, diaphragm, button, drain				Brass
Seals			Nitrile	

Service kits

Adjusting knob				**RRP-16-005-000**
Bonnet tamperproof kit			**P01265**	
Bowl kits	Poly bowl –	Automatic pulse drain	**PS408BP**	**BK504SY**
		Twist drain	**PS404P**	**BK504Y**
	Metal bowl –	Automatic drain	**PS451BP**	**BK505SY**
		Twist drain	**PS447BP**	**BK505Y**
Drain kits		Automatic pulse drain		**RK504SY**
Filter element kits –		5 Micron	**PS403P**	**FRP-96-729**
		40 Micron	**PS401P**	
		Adsorber	**PS452P**	
Gauges –		30 PSIG (0 to 2.1 bar)	**K4515N18030**	
		60 PSIG (0 to 4.1 bar)	**K4515N18060**	**K4515N18060**
		160 PSIG (0 to 11.0 bar)	**K4515N18160**	**K4515N18160**
Mounting bracket kit* (includes panel mount nut)			**PS417BP**	**SA161X57**
Panel mount nuts –		Plastic	**P78652**	**R05X51-P**
		Aluminum		**R05X51-A**
Poppet / piston kits –		Unbalanced, non-relieving	**PS428P**	
		Unbalanced, relieving	**PS426P**	
Repair kits –		Non-relieving, diapphragm, valve assembly		**GRP-96-726**
		Relieving, diapphragm, valve assembly		**GRP-96-725**
Springs –		15 PSIG	**P01176** (yellow)	**GRP-95-111**
		30 PSIG	**P01175** (black)	
		60 PSIG	**P01174** (white)	**GRP-96-718 (black)**
		125 PSIG	**P01173** (gold)	**GRP-96-717**

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- Excellent water removal efficiency.
- Rolling diaphragm for extended life.
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure.
- Two high flow 1/4" gauge ports can be used as additional outlets.

Material specifications

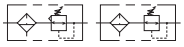
Adjusting stem			Steel
Body			Zinc
Bonnet, internal parts			Plastic
Bowls		Transparent	Polycarbonate
		Metal	Zinc
Bowl guard			Steel
Collar			Plastic
Diaphragm			Nitrile
Drains	Manual twist drain standard	Body & nut	Plastic
	Automatic float drain optional	Float housing	Plastic
		Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements		40 Micron (standard)	Plastic
		5 Micron (optional)	Plastic
Knob			Plastic
Seals			Nitrile
Sight gauge			Polyamide
Springs –		Poppet	Stainless
		Control	Steel

Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)

For technical information see CD

06E Compact Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT) Pressure range (Without gauge) 60 PSIG	125 PSIG
06E	1/4"	Poly / Metal guard	Twist	46	5 micron	**06E12A11A***	**06E12A13A***
	1/4"	Poly / Metal guard	Auto float	46	5 micron	**06E16A11A***	**06E16A13A***
	3/8"	Poly / Metal guard	Twist	55	5 micron	**06E22A11A***	**06E22A13A***
	3/8"	Poly / Metal guard	Auto float	55	5 micron	**06E26A11A***	**06E26A13A***
	1/2"	Poly / Metal guard	Twist	61	5 micron	**06E32A11A***	**06E32A13A***
	1/2"	Poly / Metal guard	Auto float	61	5 micron	**06E36A11A***	**06E36A13A***
	1/4"	Metal / Sight gauge	Twist	46	5 micron	**06E14A11A***	**06E14A13A***
	1/4"	Metal / Sight gauge	Auto float	46	5 micron	**06E18A11A***	**06E18A13A***
	3/8"	Metal / Sight gauge	Twist	55	5 micron	**06E24A11A***	**06E24A13A***
	3/8"	Metal / Sight gauge	Auto float	55	5 micron	**06E28A11A***	**06E28A13A***
	1/2"	Metal / Sight gauge	Twist	61	5 micron	**06E34A11A***	**06E34A13A***
	1/2"	Metal / Sight gauge	Auto float	61	5 micron	**06E38A11A***	**06E38A13A***

* Enginering level will be added at factory.

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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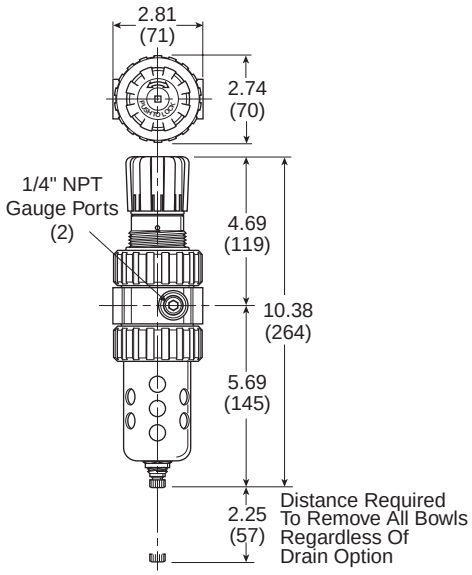
06E



Service kits

Description			06E
Bonnet assembly kit			**PS715P**
Bowl guard kit			**PS705P**
Bowl kits	Poly bowl –	Automatic float drain	**PS722P**
		Twist drain	**PS732P**
	Metal bowl –	Automatic float drain	**PS726P**
		Semi-auto drain	**PS794P**
		Twist drain	**PS734P**
		Sight gauge / Automatic drain	**PS723P**
		Sight gauge / Twist drain	**PS735P**
Control knob			**P04069B**
Drain kits –		Automatic float drain	**PS506P**
		Semi-auto drain	**PS511P**
		Twist drain	**PS512P**
		Push 'N' Drain	**PS513P**
Filter element kits –		40 Micron	**PS701P**
		5 Micron	**PS702P**
		Adsorber	**PS731P**
Gauges –		60 PSIG (0 to 4.1 bar)	**K4520N14060**
		160 PSIG (0 to 11.0 bar)	**K4520N14160**
		300 PSIG (0 to 20.0 bar)	**K4520N14300**
Mounting bracket kit (includes panel mount nut)			**PS707P**
Panel mount nut			**P04082**
Service kits –		Non-relieving (includes poppet)	**PS711P**
		Relieving (includes poppet	**PS710P**
Seat insert kit			**PS713P**
Springs –		1- 30 PSIG range	**P01698**
		1- 60 PSIG range	**P04062**
		2- 125 PSIG range	**P04063**
		5- 250 PSIG range	**P04064**
Tamperproof kit (key lock)			**PS737P**

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- Rolling diaphragm for extended life.
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure.
- Two high flow 1/4" gauge ports can be used as additional outlets.

Material specifications

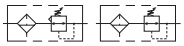
Adjusting stem			Steel
Body			Zinc
Bonnet, internal parts			Plastic
Bowls		Transparent	Polycarbonate
		Metal	Zinc
Bowl guard			Steel
Collar			Plastic or metal
Diaphragm			Nitrile
Drains	Manual twist drain standard	Body & nut	Plastic
	Automatic float drain optional	Float housing	Plastic
		Seals	Nitrile
		Springs, push rod	Stainless steel
Filter elements		40 Micron (standard)	Plastic
		5 Micron (optional)	Plastic
Knob			Plastic
Seals			Nitrile
Sight gauge			Polyamide
Springs –		Poppet	Stainless
		Control	Steel

Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Automatic float drain	15 to 250 PSIG (1.0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Secondary pressure ranges –	
Standard pressure	2 to 125 PSIG (0 to 8.6 bar)
Medium pressure	1 to 60 PSIG (0 to 4.1 bar)
High pressure	5 to 250 PSIG (0.4 to 17.2 bar)

For technical information see CD

07E Standard Filter / Regulators



	Port size	Bowl type	Drain type	Flow SCFM	Element type	Part number (NPT) Pressure range (Without gauge) 60 PSIG	125 PSIG
07E	1/2"	Poly / Metal guard	Twist	90	5 micron	**07E32A11A***	**07E32A13A***
	1/2"	Poly / Metal guard	Auto float	90	5 micron	**07E36A11A***	**07E36A13A***
	3/4"	Poly / Metal guard	Twist	90	5 micron	**07E42A11A***	**07E42A13A***
	3/4"	Poly / Metal guard	Auto float	90	5 micron	**07E46A11A***	**07E46A13A***
	1/2"	Metal / Sight gauge	Twist	90	5 micron	**07E34A11A***	**07E34A13A***
	1/2"	Metal / Sight gauge	Auto float	90	5 micron	**07E38A11A***	**07E38A13A***
	3/4"	Metal / Sight gauge	Twist	90	5 micron	**07E44A11A***	**07E44A13A***
	3/4"	Metal / Sight gauge	Auto float	90	5 micron	**07E48A11A***	**07E48A13A***

* Enginering level will be added at factory.

⚠ WARNING
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CAUTION:
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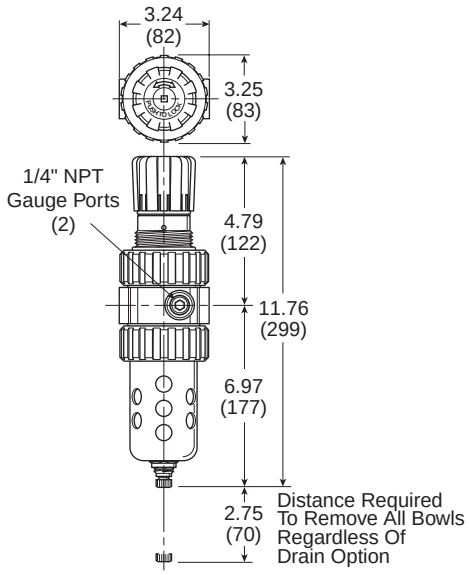
07E



Service kits

Description			07E
Bonnet assembly kit			**PS715P**
Bowl guard kit			**PS805P**
Bowl kits	Poly bowl –	Automatic float drain	**PS822P**
		Twist drain	**PS832P**
	Metal bowl –	Automatic float drain	**PS826P**
		Semi-auto drain	**PS894P**
		Twist drain	**PS834P**
		Sight gauge / Automatic drain	**PS823P**
		Sight gauge / Twist drain	**PS835P**
Control knob			**P04069B**
Drain kits –		Automatic float drain	**PS506P**
		Semi-auto drain	**PS511P**
		Twist drain	**PS512P**
		Push 'N' Drain	**PS513P**
Filter element kits –		40 Micron	**PS801P**
		5 Micron	**PS802P**
		Adsorber	**PS831P**
Gauges –		60 PSIG (0 to 4.1 bar)	**K4520N14060**
		160 PSIG (0 to 11.0 bar)	**K4520N14160**
		300 PSIG (0 to 20.0 bar)	**K4520N14300**
Mounting bracket kit (includes panel mount nut)			**PS807P**
Panel mount nut			**P04082**
Service kits –		Non-relieving (includes poppet)	**PS811P**
		Relieving (includes poppet	**PS810P**
Seat insert kit			**PS813P**
Springs –		1- 30 PSIG range	**P01698**
		1- 60 PSIG range	**P04062**
		2- 125 PSIG range	**P04063**
		5- 250 PSIG range	**P04064**
Tamperproof kit (key lock)			**PS737P**

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- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
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- Metal bowl with sight gauge
- Large filter element surface guarantees low pressure drop and increased element life
- Twist drain as standard, optional auto drain
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

Material specifications

Adjusting stem		Steel
Body, bonnet, bowl		Aluminum
Drain		Plastic
Filter elements	5 micron (standard)	Plastic
	40 micron (optional)	Plastic
	Adsorber (optional)	Activated charcoal
Knob		Plastic
Piston		Plastic
Polyamide (Nylon)		Polyamide (nylon)
Springs – poppet & control		Steel

Operating information

Pressure ratings	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)

For technical information see CD

P3NE Hi-Flow Filter / Regulators

Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
3/4"	Metal / Sight gauge	Twist	250	**P3NEA96GSMBNN**
3/4"	Metal / Sight gauge	Auto float	250	**P3NEA96GSABNN**
1"	Metal / Sight gauge	Twist	250	**P3NEA98GSMBNN**
1"	Metal / Sight gauge	Auto float	250	**P3NEA98GSABNN**
1-1/2" #	Metal / Sight gauge	Twist	250	**P3NEA9PGSMBNN**
1-1/2" #	Metal / Sight gauge	Auto float	250	**P3NEA9PGSABNN**

1" port body with 1-1/2" port block

⚠ WARNING
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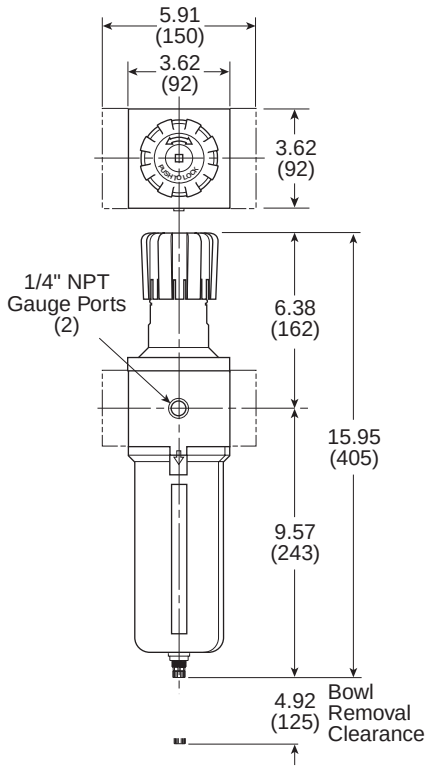
Most popular.

P3NE



Service kits

Description		P3NE
Bowl kits: Metal bowl –	Automatic drain	**P3NKA00BSA**
	Twist drain	**P3NKA00BSM**
	Push 'N' Drain	**P3NKA00BSP**
Bowl latch kit		**C11A33**
Control knob		**P3NKA00PN**
Drain kits –	Automatic float drain	**PS506P**
	Semi-auto drain	**PS511P**
	Twist drain	**PS512P**
	Push 'N' Drain	**PS513P**
Filter element kits –	40 Micron	**P3NKA00ESG**
	5 Micron	**P3NKA00ESE**
	Adsorber	**P3NKA00ESA**
Gauges –	60 PSIG (0 to 4.1 bar)	**K4520N14060**
	160 PSIG (0 to 11.0 bar)	**K4520N14160**
	300 PSIG (0 to 17.2 bar)	**K4520N14300**
Mounting bracket kit* (includes panel mount nut)		**P3NKA00MW**
Service kits –	Non-relieving	**P3NKA00RN**
	Relieving	**P3NKA00RR**
Sight gauge kit		**P3NKA00PE**
Springs –	1- 60 PSIG rang)	**C10A1304**
	2- 125 PSIG range	**C10A1308**
	5-250 PSIG range (white)	**C10A1317**

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- Generates oil particles of 5 micron or smaller downstream to lubricate systems having complex piping arrangements
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility
- Yellow fill cap identifies Micro-Mist Lubricator
- 16L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 17L: 1/2" & 3/4" ports (NPT & BSPP)

16L

17L

Material specifications

Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (16, 17) or metal (17)
Drains –	
Twist drain – body & nut	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	1 SCFM at 100 PSIG
Suggested lubricant	F442 oil

Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)

(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

Compact & Standard Lubricators

	Port size	Bowl type	Flow SCFM	Part number (NPT) Twist drain	Part number (NPT) No drain
16L	1/4"	Poly / Metal guard	40	—	**16L12B***
	1/4"	Metal / Sight gauge	40	**16L14B***	—
	3/8"	Poly / Metal guard	60	—	**16L22B***
	3/8"	Metal / Sight gauge	60	**16L24B***	—
	1/2"	Poly / Metal guard	90	—	**16L32B***
	1/2"	Metal / Sight gauge	90	**16L34B***	—
17L	1/2"	Poly / Metal guard	90	—	**17L32B***
	1/2"	Metal / Sight gauge	90	**17L34B***	—
	3/4"	Poly / Metal guard	90	—	**17L42B***
	3/4"	Metal / Sight gauge	90	**17L44B***	—

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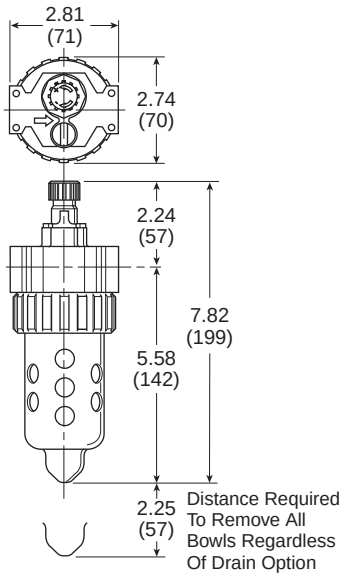
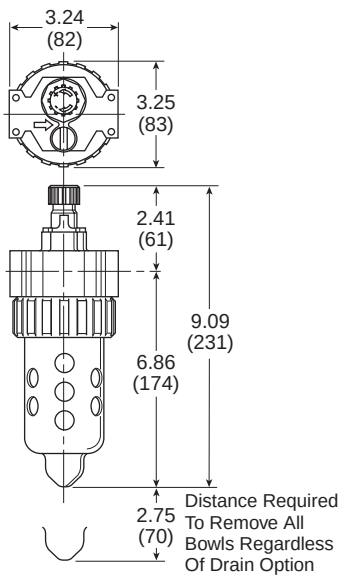
16L



17L



Service kits

Description			16L (Compact)	17L (Standard)
Adjustment knob			**P04121**	**P04121**
Bowl guard kit			**PS705P**	**PS805P**
Bowl Kits:	Poly bowl –	No drain	**PS746P**	**PS846P**
		Twist drain	**PS717P**	**PS817P**
		Pressure fill	**PS719P**	**PS819P**
		Remote fill	**PS728P**	**PS828P**
	Metal bowl –	Sight gauge / Twist drain	**PS729P**	**PS829P**
		Sight gauge / Pressure fill	**PS720P**	**PS820P**
Drain kit		Twist drain	**PS512P**	**PS512P**
Fill cap kit			**PS742P**	**PS742P**
Lubricator service kit			**PS748P**	**PS748P**
Mounting bracket kit			**PS743P**	**PS843P**
Oil –		1 Gal	**F442002**	**F442002**
		12 Quart case	**F442003**	**F442003**
		4 Gal case	**F442005**	**F442005**
Pressure fill adapter kit			**PS716P**	**PS716P**
Pressure fill button			**P11912**	**P11912**
Remote auto-fill device			**PS505CP**	**PS505CP**
Sight dome / Fill cap kit			**PS739P**	**PS739P**
Sight dome kit			**PS740P**	**PS740P**
Nylon sight dome kit			**PS740N**	**PS740N**

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility

Material specifications

Body		Zinc
Bowls	Transparent	Polycarbonate
	Metal	Zinc
Drains, twist / body & nut		Plastic
Seals		Nitrile
Sight Dome		Polycarbonate

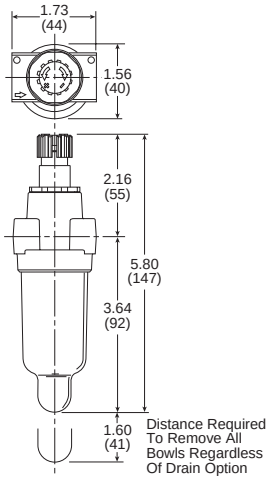
Operating information

Pressure ratings	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.3 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	0.5 SCFM at 100 PSIG
For technical information see CD	

04L Miniature Lubricators

Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
1/8"	Poly	None	20	**04L00G***
1/8"	Metal without sight gauge	Twist	20	**04L03G***
1/4"	Poly	None	20	**04L10G***
1/4"	Metal without sight gauge	Twist	20	**04L13G***

* Enginering level will be added at factory.



Service kits

			04L (Mini)
Bowl kits	Poly bowl	No drain	**PS421P**
		Twist drain	**PS420P**
	Metal bowl	Twist drain	**PS447BP**
Mounting bracket kit			**PS4197**
Oil		1 Quart	**F442001**
		12 Quart case	**F442003**
		4 Gallon case	**F442005**

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 06L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07L: 1/2" & 3/4" ports (NPT & BSPP)

06L

07L

Material specifications

Body	Zinc
Bowls –	
Transparent	Polycarbonate
Metal	Zinc
Bowl guards	Steel
Collar	Plastic (06, 07) or metal (07)
Drains –	
Twist drain – body & nut	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure rating	
Polycarbonate bowl	0 to 150 PSIG (0 to 10.4 bar)
Metal bowl	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	
Polycarbonate bowl	32°F to 125°F (0°C to 52°C)
Metal bowl	32°F to 175°F (0°C to 80°C)
Minimum flow for lubrication	.5 SCFM at 100 PSIG
Suggested lubricant	F442 oil

Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)

(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

Compact & Standard Lubricators

		Port size	Bowl type	Flow SCFM	Part number (NPT)	
					Twist drain	No drain
06L		1/4"	Poly / Metal guard	40		**06L12B***
		1/4"	Metal / Sight gauge	40	**06L14B***	
		3/8"	Poly / Metal guard	60		**06L22B***
		3/8"	Metal / Sight gauge	60	**06L24B***	
		1/2"	Poly / Metal guard	90		**06L32B***
		1/2"	Metal / Sight gauge	90	**06L34B***	
07L		1/2"	Poly / Metal guard	90		**07L32B***
		1/2"	Metal / Sight gauge	90	**07L34B***	
		3/4"	Poly / Metal guard	90		**07L42B***
		3/4"	Metal / Sight gauge	90	**07L44B***	

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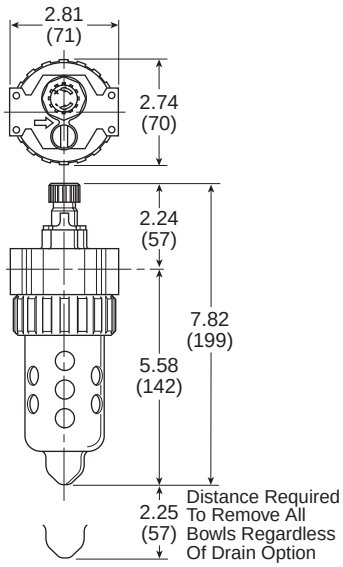
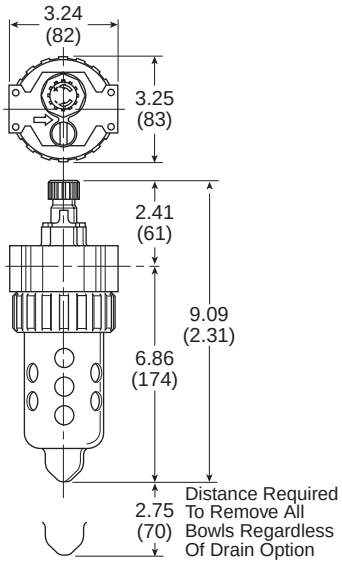
06L



07L



Service kits

Description			06L (Compact)	07L (Standard)
Adjustment knob			**P04121**	**P04121**
Bowl guard kit			**PS705P**	**PS805P**
Bowl Kits –	Poly bowl –	No drain	**PS746P**	**PS846P**
		Twist drain	**PS717P**	**PS817P**
		Pressure fill	**PS719P**	**PS819P**
		Remote fill	**PS728P**	**PS828P**
	Metal bowl –	Sight gauge / Twist drain	**PS729P**	**PS829P**
		Sight gauge / Pressure fill	**PS720P**	**PS820P**
Drain kit		Twist drain	**PS512P**	**PS512P**
Fill cap kit			**PS741P**	**PS741P**
Lubricator service kit			**PS718P**	**PS718P**
Mounting bracket kit			**PS743P**	**PS843P**
Oil –		1 Gal	**F442002**	**F442002**
		12 Quart case	**F442003**	**F442003**
		4 Gal case	**F442005**	**F442005**
Pressure fill adapter kit			**PS716P**	**PS716P**
Pressure fill button			**P11912**	**P11912**
Remote auto-fill device			**PS505CP**	**PS505CP**
Sight dome / fill cap kit			**PS738P**	**PS738P**
Sight dome kit			**PS740P**	**PS740P**
Nylon sight dome kit			**PS740N**	**PS740N**

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Proportional oil delivery over a wide range of air flows
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 3/4", 1" & 1-1/2" ports (NPT, BSPP & BSPT)

Material specifications

Body	Aluminum
Bowls	Aluminum
Drains – twist (optional)	Plastic
Injector meter block & base assembly	Plastic
Seals	Nitrile
Sight dome	Polycarbonate
Sight gauge	Polyamide (Nylon)

Operating information

Pressure ratings	0 to 250 PSIG (0 to 17.2 bar)
Temperature rating	32°F to 175°F (0°C to 80°C)
Flow capacity	3/4" — 240 SCFM 1" — 250 SCFM 1-1/2" — 260 SCFM
Minimum Flow for Lubrication	6.6 SCFM at 100 PSIG
Suggested lubricant	F442 oil

Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)

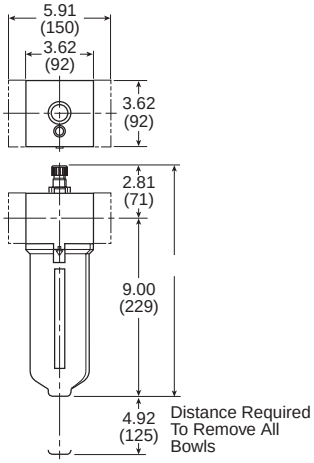
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

P3NL Hi-Flow Lubricators

Port size	Bowl type	Drain type	Flow SCFM	Part number (NPT)
3/4"	Metal / Sight gauge	None	240	**P3NLA96LSN**
1"	Metal / Sight gauge	None	250	**P3NLA98LSN**
1-1/2" #	Metal / Sight gauge	None	260	**P3NLA9PLSN**

1" port body with 1-1/2" port block



Service kits

		P3NL
Adjustment knob		**P04121**
Bowl kits: Metal bowl –	No drain	**P3NKA00BSN**
	Twist drain	**P3NKA00BSM**
Bowl latch kit		**C11A33**
Drain kit	Twist drain	**PS512P**
Fill cap kit		**P3NKA00PL**
Mounting bracket kit		**P3NKA00MW**
Oil –	1 Quart	**F442001**
	12 Quart case	**F442003**
	4 Gallon case	**F442005**
Pressure fill adapter kit		**P3NKA00PK**
Service kit		**P3NKA00RL**
Sight dome kits –	Polycarbonate	**PS740P**
	Nylon	**PS740N**
Sight gauge kit		**P3NKA00PE**

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- Metal bowl with sight gauge - standard
- Polycarbonate sight dome
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows
- Large capacity bowl
- Optional high capacity bowl(s) available
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- 3/4", 1", 1-1/4" & 1-1/2" ports (NPT & BSPP)

L606 3/4" & 1"

L606 1-1/4" & 1-1/2"

Material specifications

Body		Zinc
Bowl	(E) 32 oz	Aluminum
	(G) 64 oz.	Aluminum with polycarbonate sight gauge
	(W) 16 oz	Zinc with nylon sight gauge
Seals		Buna N

Operating information

Operating pressure	Aluminum bowl (E) 32 oz.	0 to 300 PSIG (0 to 20.4 bar)
	Aluminum (G) 64 oz.	0 to 150 PSIG (0 to 10.2 bar)
	Zinc (W) 16 oz.	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	Aluminum bowl (E) 32 oz.	40°F to 150°F (4.4°C to 65.6°C)
	Aluminum (G) 64 oz.	40°F to 125°F (4.4°C to 52°C)
	Zinc (W) 16 oz.	40°F to 150°F (4.4°C to 65.6°C)
Suggested lubricant		F442 oil

Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)

(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

L606 Lubricators

Port size	Bowl type	Bowl capacity	Drain	Flow SCFM	Part number NPT	Part number BSPP
3/4"	Zinc / Sight gauge	16 oz	Yes	325	**L606-06W**	**L606G06W**
3/4"	Aluminum	32 oz	Yes	325	**L606-06E**	**L606G06E**
3/4"	Aluminum / Sight gauge	64 oz	None	325	**L606-06G**	**L606G06G**
1"	Zinc / Sight gauge	16 oz	Yes	350	**L606-08W**	**L606G08W**
1"	Aluminum	32 oz	Yes	350	**L606-08E**	**L606G08E**
1"	Aluminum / Sight gauge	64 oz	None	350	**L606-08G**	**L606G08G**
1-1/4"	Zinc / Sight gauge	16 oz	Yes	325	**L606-10W**	**L606G10W**
1-1/4"	Aluminum	32 oz	Yes	325	**L606-10E**	**L606G10E**
1-1/4"	Aluminum / Sight gauge	64 oz	None	325	**L606-10G**	**L606G10G**
1-1/2"	Zinc / Sight gauge	16 oz	Yes	400	**L606-12W**	**L606G12W**
1-1/2"	Aluminum	32 oz	Yes	400	**L606-12E**	**L606G12E**
1-1/2"	Aluminum / Sight gauge	64 oz	None	400	**L606-12G**	**L606G12G**

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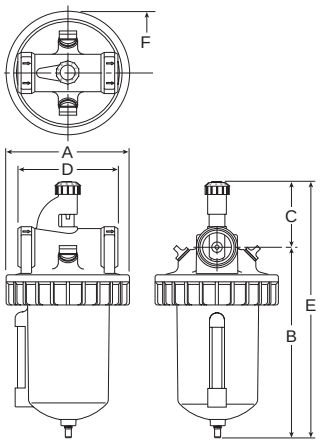
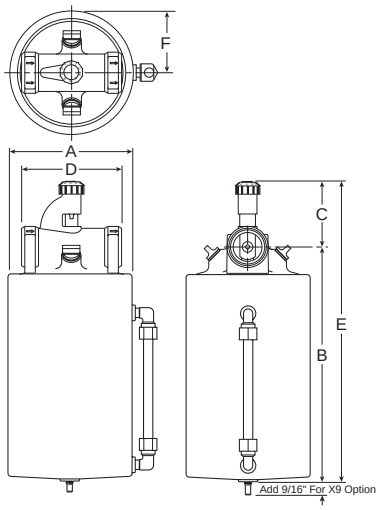
L606 - 3/4" and 1"



W & E size bowl

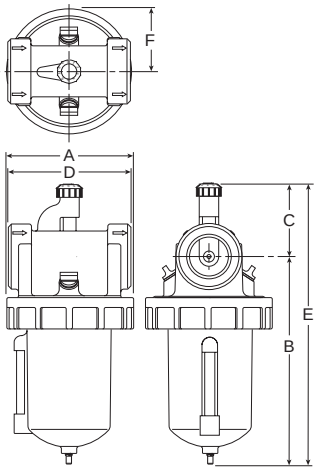


G size bowl

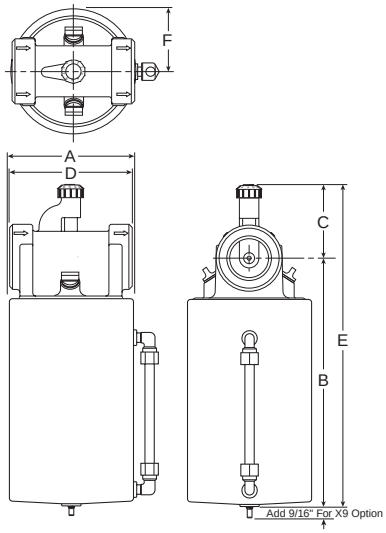
A	B	C	D	E	F
L606-06W, L606-08W					
4.97 (126)	7.25 (184)	2.63 (66.7)	4.06 (103)	9.88 (251)	2.48 (63.1)
L606-06E, L606-08E					
4.97 (126)	10.75 (273)	2.63 (66.7)	4.06 (103)	13.38 (340)	2.48 (63.1)
L606-06G, L606-08G					
5.00 (127)	9.40 (239)	2.62 (66)	4.06 (103)	12.02 (305)	2.50 (64)

inches (mm)

L606 - 1-1/4" and 1-1/2"



W & E size bowl



G size bowl

A	B	C	D	E	F
L606-10W, L606-12W					
4.97 (126)	7.63 (194)	2.84 (72.2)	4.81 (122)	10.47 (266)	2.48 (63.1)
L606-10E, L606-12E					
4.97 (126)	11.13 (283)	2.84 (72.2)	4.81 (122)	13.97 (255)	2.48 (63.1)
L606-10G, L606-12G					
5.00 (127)	7.99 (203)	2.84 (72.2)	4.81 (122)	12.80 (325)	2.50 (64)

inches (mm)

Service kits

Description		L606
Adjusting knob		**606Y72**
Bowl kits –	Aluminum (e) 32 oz	**BK603B**
	Aluminum (g) 64 oz	**BK606X30B**
	Zinc / sight gauge (w) 16 oz	**BK609WB**
Button head fill fitting (m14 male thread)		**L606C14**
Dip tube kit		**DTK606**
Drip spout kit		**RK606SY**
Mounting brackets –	3/4 Inch units (2 required per unit)	**SA200AW57**
	1 Inch units (2 required per unit)	**SA200CW57**
Oil –	1 Quart	**F442001**
	2 Quart case	**F442003**
	4 Gallon case	**F442005**
Repair kits –	Needle valve assembly (all)	**RK606Y**
	Sight gauge bowl repair kit (w)	**RKB605WB**
	Sight gauge bowl repair kit (g)	**RKB606X30B**

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- Metal bowl with sight gauge and manual drain – standard
- Transparent sight dome for 360° visibility
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows

Material specifications

Body	Zinc alloy, die cast

Operating information

Pressure rating	0 to 150 PSIG (0 to 10.3 bar)
Temperature rating	32°F to 150°F (0°C to 66°C)
Suggested lubricant	F442 oil

Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)

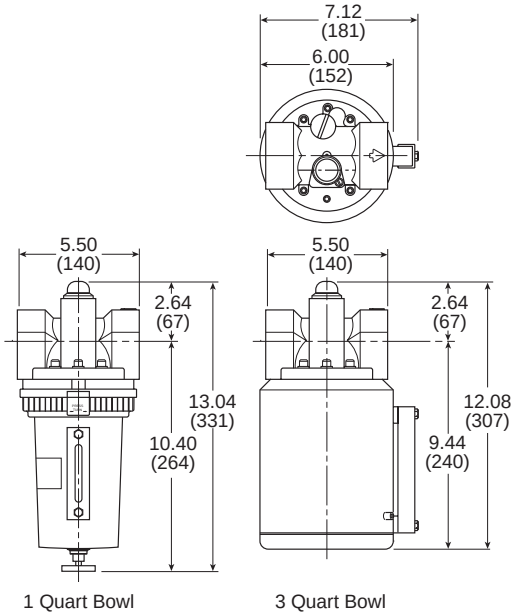
(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

09L Lubricator

Port size	Bowl type	Bowl capacity	Flow SCFM	Part number (NPT)
2"	Metal / Sight gauge	1 quart	1000	**09L84B***
2"	Metal / Sight gauge	3 quart	1000	**09L8PB***

* Enginering level will be added at factory.



1 Quart Bowl 3 Quart Bowl

Service kits

Bowl kit	Metal bowl, sight gauge / twist drain	**PS612P***
Fill cap kit		**PS610P**
Lubricator service kit		**PS607P**
Oil	1 Quart	**F442001**
	12 Quart case	**F442003**
	4 Gallon case	**F442005**
Sight dome kit		**PS613P**

* 1 quart bowl.

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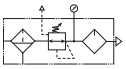
Close Nippled Combinations – 14 Miniature Series

- Regulator can be mounted with knob in up or down position
- 5 micron filter element standard, 40 micron optional
- Manual twist drain
- Relieving regulator

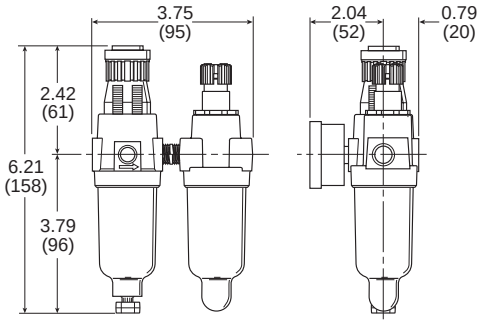


Close Nippled Combinations

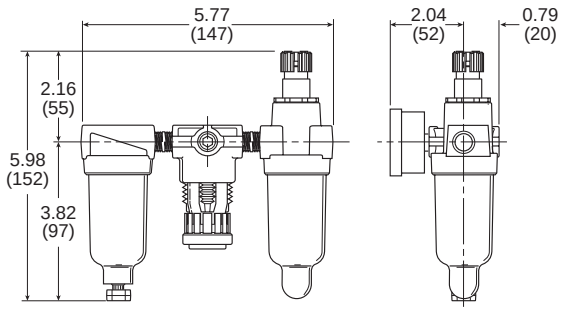
		Port size	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Part number (NPT)
14G		1/8"	Poly	5 micron	Twist	Relieving	None	**14G01B13F0G***
		1/4"	Poly	5 micron	Twist	Relieving	None	**14G11B13F0G***
14A		1/8"	Poly	5 micron	Twist	Relieving	None	**14A01B13F0G***
		1/4"	Poly	5 micron	Twist	Relieving	None	**14A11B13F0G***

* Enginering level will be added at factory.

14G (Close nippled 2-unit)



14A (Close nippled 3-unit)



Service kits

Mounting bracket kits –	14E, 14F, 14R	**PS417BP**
	04L	**PS419**

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular. For technical information see CD

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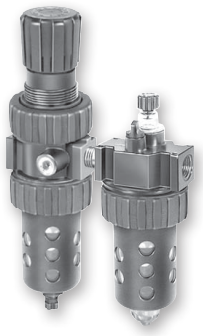
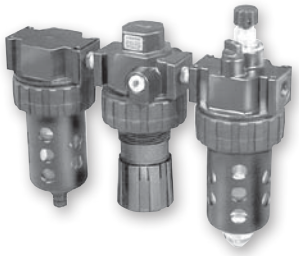
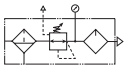
Close Nipped Combinations – 06 Compact & 07 Standard Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



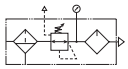


06G, 16G, 07G, 17G 2-Unit Close Nipped Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06G Shown	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06G	**06G12A13A2B***	16G	**16G12A13A2B***
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		**06G22A13A2B***		**16G22A13A2B***
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		**06G32A13A2B***		**16G32A13A2B***
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07G	**07G32A13A2B***	17G	**17G32A13A2B***
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		**07G42A13A2B***		**17G42A13A2B***

06A, 16A, 07A, 17A 3-Unit Close Nipped Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06A Shown	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06A	**06A12A13A2B***	16A	**16A12A13A2B***
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		**06A22A13A2B***		**16A22A13A2B***
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None		**06A32A13A2B***		**16A32A13A2B***
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07A	**07A32A13A2B***	17A	**17A32A13A2B***
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		**07A42A13A2B***		**17A42A13A2B***

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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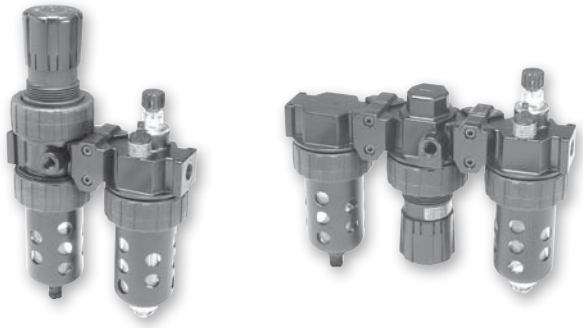
Modular Combinations – 06 Compact & 07 Standard Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



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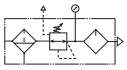
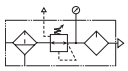
06H, 16H, 07H, 17H 2-Unit Modular Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06H Shown	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06H	06H12A13A2B*	16H	16H12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06H22A13A2B*		16H22A13A2B*
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06H32A13A2B*G		16H32A13A2B*G
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07H	07H32A13A2B*	17H	17H32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07H42A13A2B*		17H42A13A2B*

* 06 / 16 Available with port blocks only.

06B, 16B, 07B, 17B 3-Unit Modular Combinations



	Port	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Series	Model numbers	Series	Model numbers
06B Shown	1/4"	Poly / Metal guard	40 micron	Twist	Relieving	None	06B	06B12A13A2B*	16B	16B12A13A2B*
	3/8"	Poly / Metal guard	40 micron	Twist	Relieving	None		06B22A13A2B*		16B22A13A2B*
	1/2" *	Poly / Metal guard	40 micron	Twist	Relieving	None		06B32A13A2B*G		16B32A13A2B*G
	1/2"	Poly / Metal guard	40 micron	Twist	Relieving	None	07B	07B32A13A2B*	17B	17B32A13A2B*
	3/4"	Poly / Metal guard	40 micron	Twist	Relieving	None		07B42A13A2B*		17B42A13A2B*

* 06 / 16 available with port blocks only.

Modular service kits

Description	06 Series	07 Series
Body connectors	PS754P	PS854P
Lockout valves	PS756P	PS856P
Modular manifold block	PS757P	PS857P
Wall mounting kit	PS755P	PS755P

Description	Series	Size	NPT	BSPP	BSPT
Port block connector kits	06 Series –	1/4"	PS750P	PS765P†	PS761P
		3/8"	PS751P	PS766P†	PS762P
		1/2"	PS752P*	PS767P*†	PS799P*
	07 Series –	1/4"	PS850P	PS865P	PS861P
		3/8"	PS851P	PS866P	PS862P
		1/2"	PS852P	PS867P‡	PS863P
		3/4"	PS853P	PS860P	PS864P

Use 1/4 or 3/8 ported bodies. † 1/4, 3/8 & 1/2 inch meet ISO 1179-1 Standard. ‡ 1/2 inch meets ISO 1179-1 Standard.

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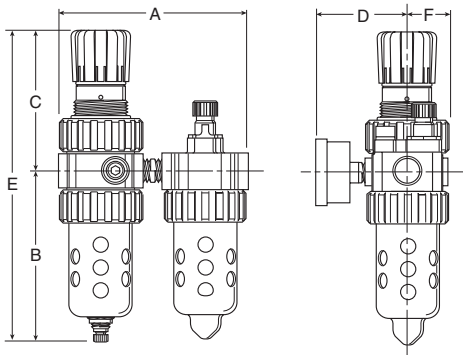
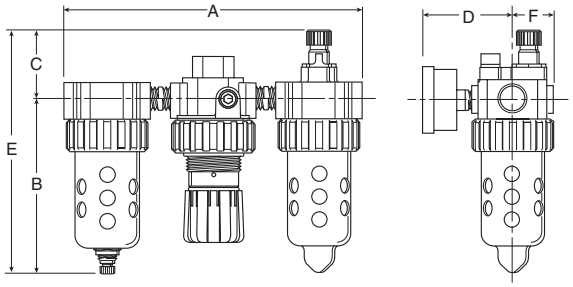
Combination Dimensions – 06 Compact & 07 Standard Series





06G, 16G Series

A	B	C	D	E	F
6.13 (156)	5.69 (145)	4.69 (119)	3.18 (81)	10.38 (264)	1.37 (35)

07G, 17G Series

A	B	C	D	E	F
6.99 (178)	6.97 (177)	4.79 (122)	3.44 (87)	11.76 (299)	1.63 (41)

Inches (mm)
• All dimensions nominal.

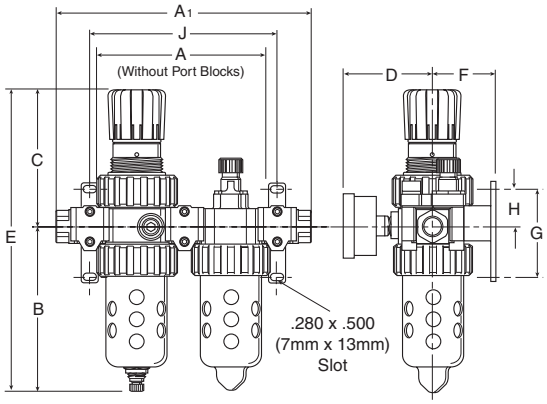
06A, 16A Series

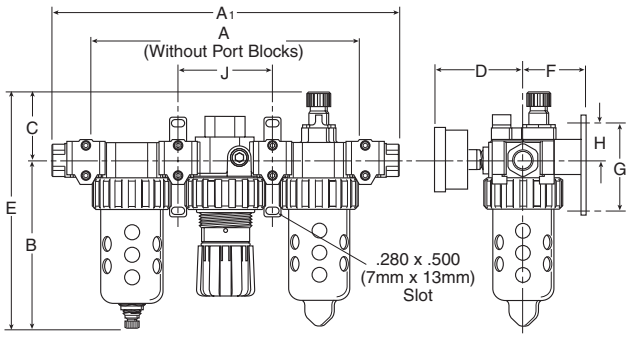
A	B	C	D	E	F
9.45 (240)	5.69 (145)	2.24 (57)	3.18 (81)	7.93 (201)	1.37 (35)

07A, 17A Series

A	B	C	D	E	F
10.74 (2738)	6.97 (177)	2.41 (61)	3.44 (87)	9.38 (238)	1.63 (41)

Inches (mm)
• All dimensions nominal.





06H, 16H Series

A	A1	B	C	D	E
6.10 (155)	9.04 (230)	5.69 (145)	4.69 (119)	3.18 (81)	10.38 (264)

F	G	H	J
2.00 (51)	3.58 (91)	1.40 (36)	6.65 (169)

07H, 17H Series

A	A1	B	C	D	E
7.00 (178)	10.28 (261)	6.97 (177)	4.79 (122)	3.44 (87)	11.76 (299)

F	G	H	J
2.09 (53)	3.58 (91)	1.40 (36)	7.51 (191)

Inches (mm)
• All dimensions nominal.

06B, 16B Series

A	A1	B	C	D	E
9.46 (240)	12.39 (315)	5.69 (145)	2.24 (57)	3.18 (81)	7.93 (202)

F	G	H	J
2.00 (51)	3.58 (91)	1.40 (36)	3.33 (85)

07B, 17B Series

A	A1	B	C	D	E
10.75 (273)	14.03 (356)	6.97 (177)	2.41 (61)	3.44 (87)	9.38 (238)

F	G	H	J
2.18 (55)	3.58 (91)	1.40 (36)	3.76 (95)

Inches (mm)
• All dimensions nominal.

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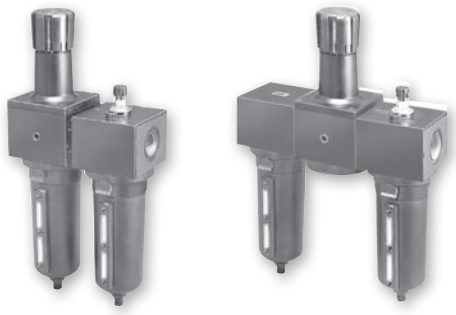
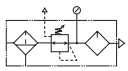
Combinations – P3N Hi-Flow Series

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



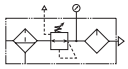
Close Nippled Combinations



		Port size	Bowl type	Element type	Filter drain type	Relief type	Lubricator drain type	Part number (NPT)
P3N3A		3/4"	Metal	40 micron	Twist	Relieving	None	**P3N3A96SGMNNLNA**
		1"	Metal	40 micron	Twist	Relieving	None	**P3N3A98SGMNNLNA**
		1-1/2" #	Metal	40 micron	Twist	Relieving	None	**P3N3A9PSGMNNLNA**
P3N3B		3/4"	Metal	40 micron	Twist	Relieving	None	**P3N3B96SGMNNLNA**
		1"	Metal	40 micron	Twist	Relieving	None	**P3N3B98SGMNNLNA**
		1-1/2" #	Metal	40 micron	Twist	Relieving	None	**P3N3B9PSGMNNLNA**

Notes: All combo part numbers are with regulator knob in up position.
1" Port body with 1-1/2" port block.

Modular Combinations



		Port size	Bowl type	Element type	Filter drain type	Pressure range	Relief type	Lubricator drain type	Part number (NPT)
P3NCA		3/4"	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCA96SGMNNLNA**
		1"	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCA98SGMNNLNA**
		1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCA9PSGMNNLNA**
P3NCB		3/4"	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCB96SGMNNLNA**
		1"	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCB98SGMNNLNA**
		1-1/2" #	Metal	40 micron	Twist	0-125	Relieving	None	**P3NCB9PSGMNNLNA**

Notes: All combo part numbers are with regulator knob in up position.
1" Port body with 1-1/2" port block.

⚠ WARNING
Product rupture can cause serious injury.
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Do not exceed maximum primary pressure rating.

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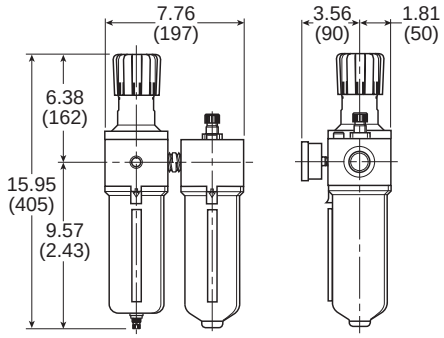
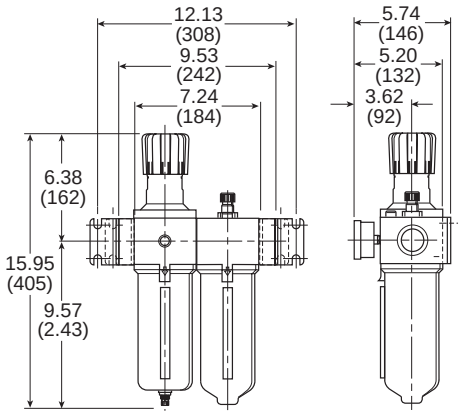
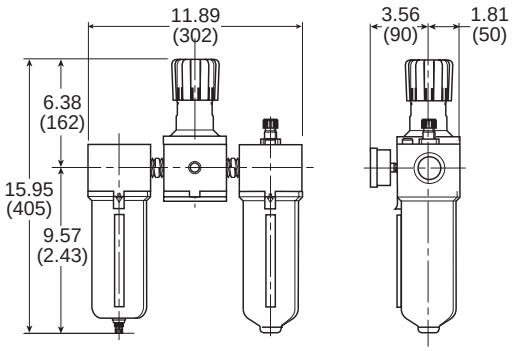
P3N3A (Close nippled 2-unit)



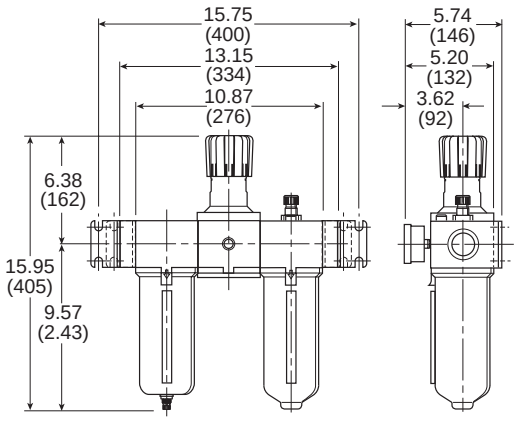
P3NCA (Modular 2-unit)



P3N3B (Close nippled 3-unit)



P3NCB (Modular 3-unit)



Service kits

Mounting bracket kit			**P3NKA00MW**
Replacement body cover			**P3NKA00PM**

Port block kits	**3/4"**	**1"**	**1-1/2"**
Individual filters, individual regulators and 2-piece filter and regulator assemblies:			
NPT	**P3NKB96CP**	**P3NKB98CP**	**P3NKB9BCP**
BSPP	**P3NKB16CP**	**P3NKB18CP**	**P3NKB1BCP**
2 and 3 piece combinations including a lubricator (FR/L & FRL), individual lubricators, individual coalescing filters and 2-piece filter and coalescer assemblies:			
NPT	**P3NKB96CL**	**P3NKB98CL**	**P3NKB9BCL**
BSPP	**P3NKB16CL**	**P3NKB18CL**	**P3NKB1BCL**

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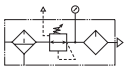
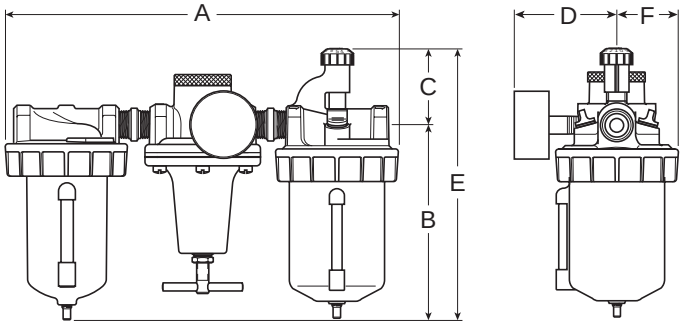
- Regulator can be mounted with knob in up or down position
- 40 micron filter element
- Gauges included on combinations
- Manual twist drain
- Relieving regulator

C628 Standard Combinations



Port size	Bowl type	Bowl capacity	Element type	Part number
3/4"	Metal / Sight gauge	16 oz	40 micron	**C628-06FRLWJCW**
3/4"	Metal / Without sight gauge	32 oz	40 micron	**C628-06FRLEJCE**
1"	Metal / Sight gauge	16 oz	40 micron	**C628-08FRLWJCW**
1"	Metal / Without sight gauge	32 oz	40 micron	**C628-08FRLEJCE**
1-1/4"	Metal / Sight gauge	16 oz	40 micron	**C628-10FRLWJCW**
1-1/4"	Metal / Without sight gauge	32 oz	40 micron	**C628-10FRLEJCE**
1-1/2"	Metal / Sight gauge	16 oz	40 micron	**C628-12FRLWJCW**
1-1/2"	Metal / Without sight gauge	32 oz	40 micron	**C628-12FRLEJCE**



A	B	C	D	E	F
C628-06FRL, C628-08FRL					
15.75 (400)	7.75 (197)	5.25 (133)	3.52 (89)	13.00 (330)	2.48 (63)
C628-10FRL, C628-12FRL					
16.50 (419)	8.13 (206)	6.00 (152)	3.86 (98)	14.13 (359)	2.64 (67)

Inches (mm)
• All dimensions nominal.

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Do not exceed maximum primary pressure rating.

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The range of Stainless Steel FRLs are ideal for use in the food industry, the petrochemical or process industries or any application in a particularly harsh or aggressive environment.

- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain

Operating information

		PF504	PF10	PF501	PF11
Operating pressure	Twist drain	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)	0 to 300 PSIG (0 to 20.7 bar)
	Auto drain	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)	10 to 175 PSIG (0 to 12 bar)
Operating temperature	Twist drain	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)	0°F to 180°F (-18°C to 82°C)
	Auto drain	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)	32°F to 150°F (0°C to 66°C)
Flow / SCFM (dm^3/s)		23 (10.85)	70 (33.04)	16 (7.55)	45 (21.24)

For technical information see CD

Particulate Filters

Port Size	Flow SCFM (dm^3/s)	Standard filtration	Part number manual drain	Part number auto drain
1/4	23 (10.85)	20 µ	**PF504-02DHSS**	**PF504-02DHRSS**
1/2	70 (33.04)	40 µ	**PF10-04WJSS**	**PF10-04WJRSS**

Coalescing Filters

1/4	16 (7.55)	.3 µ	**PF501-02DHSS**	**PF501-02DHRSS**
1/2	45 (21.24)	.01 µ	**PF11-04WJSS**	**PF11-04WJRSS**

Service kits

Description		PF504	PF10	PF501	PF11
Drain kit -	automatic pulse	**RK504SY-SS**		**RK504SY-SS**	
	automatic float		**SA10MDSS**		**SA10MDSS**
	manual twist, small (old)	**SA600Y7-1SS**	**SA600Y7-1SS**	**SA600Y7-1SS**	
	manual twist, large (new)	**SAP05481**	**SAP05481**	**SAP05481**	
Filter element -	5 micron (particulate)	**EK504VY**	**EK55J**		
	20 micron (particulate)	**EK504Y**			
	40 micron (particulate)		**EK55G**		
	0.3 micron (coalescing)			**EK501H**	
	0.01 micron (coalescing)				**EKF71**
Pipe nipple		**616Y28-SS**	**616A28-SS**	**616Y28-SS**	**616A28-SS**

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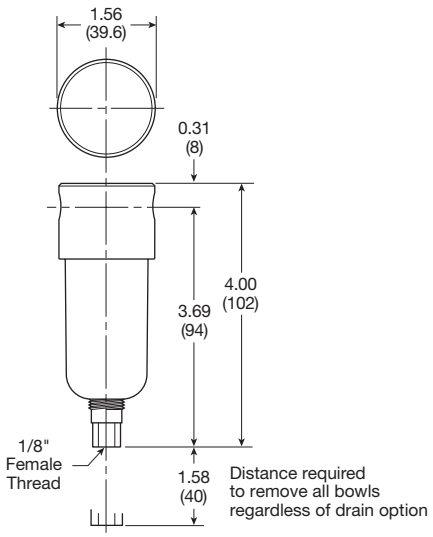
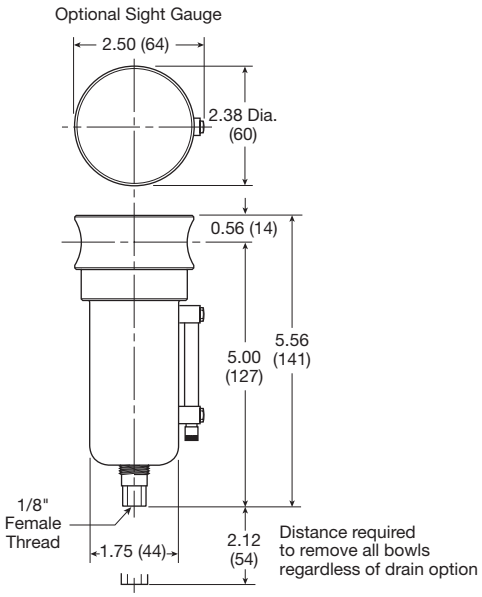
PF504 / PF501



PF10 / PF11



Specifications

Description	PF504	PF10	PF501	PF11
Filter rating	20 micron	40 micron	0.3 micron	0.01 micron
Port threads	1/4	1/2	1/4	1/2
Weight	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)	0.6 lb. (0.27 kg)	1.9 lb. (0.85 kg)

Material specification

Description	PF504	PF10	PF501	PF11
Body	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bowls	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Deflector	Acetal	Acetal		
Drain	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Element holder	Acetal	Acetal	Acetal	Acetal
Filter element	Polyethylene	Polyethylene	Borosilicate fiber	Borosilicate fiber
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge		Isoplast		Isoplast

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- Stainless steel construction handles most corrosive environments
- Large diaphragm to valve area ratio for precise regulation and high flow capacity
- Meets NACE specifications MR-01-75/ISO 15156

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	PR354 & PR11	PR364 & PR10
Operating pressure	300 PSIG Max (20.7 bar)	300 PSIG Max (20.7 bar)
Operating temperature	0°F to 180°F (-18°C to 82°C)	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm^3/s)	12 (5.66)	80 (37.76)

For technical information see CD

Regulators

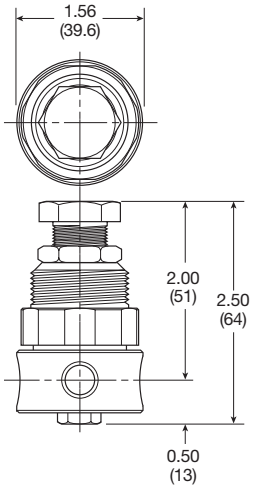
Port size	Adjustment type	Flow SCFM (dm^3/s)	Part number 0 to 125 PSIG
1/4	Knob version	12 (5.66)	**PR364-02CSS**
1/4	All metal version	12 (5.66)	**PR354-02CSS**
1/2	Knob version	80 (37.76)	**PR10-04CSS**
1/2	T-handle version	80 (37.76)	**PR11-04CSS**

Service kits

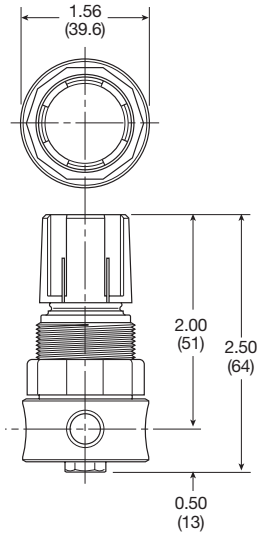
Description		PR354	PR364	PR10	PR11
Bonnet Kit		**CKR354YSS**	**CKR364YSS**	**CKR10YSS**	**CKR11YSS**
Gauge, stainless – 160 PSIG (0 to 1100 kPa)	1-1/2" Face	**K4515N14160SS**	**K4515N14160SS**		
	2" Face			**K4520N14160SS**	**K4520N14160SS**
Panel mount bracket (stainless)		**161X57-SS**	**161X57-SS**	**R10Y57-SS**	**R10Y57-SS**
Panel mount nut –	stainless	**R05X51-SS**	**R05X51-SS**	**R10X51-SS**	**R10X51-SS**
	plastic	**R05X51-P**	**R05X51-P**	**R10X51-P**	**R10X51-P**
Pipe nipple, 316 stainless steel		**616Y28-SS**	**616Y28-SS**	**616A28-SS**	**616A28-SS**
Service Kit –	relieving	**RKR364YSS**	**RKR364YSS**	**RKR10YSS**	**RKR10YSS**
	non-relieving	**RKR364KYSS**	**RKR364KYSS**	**RKR10KYSS**	**RKR10KYSS**
Springs –	0-25 PSIG range	**SPR-375-2-SS**	**SPR-375-2-SS**	**SPR-388-1-SS**	**SPR-388-1-SS**
	0-60 PSIG range	**SPR-376-1-SS**	**SPR-376-1-SS**	**SPR-389-1-SS**	**SPR-389-1-SS**
	0-125 PSIG range	**SPR-377-1-SS**	**SPR-377-1-SS**	**SPR-390-1-SS**	**SPR-390-1-SS**

☐ Most popular.

PR354



PR364



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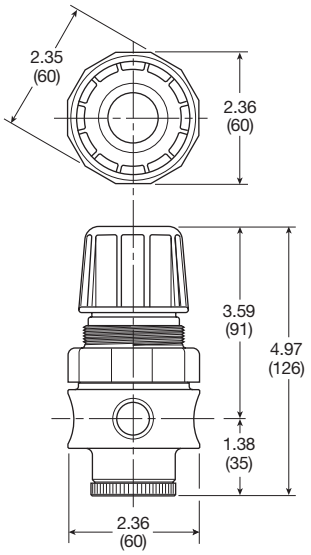
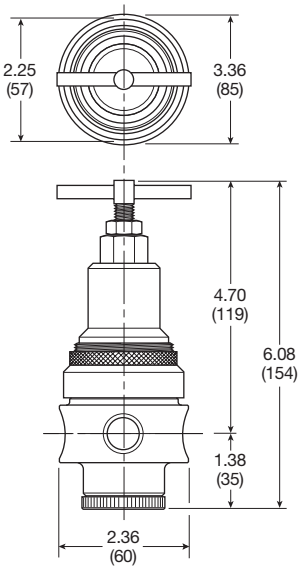


PR11



Specifications

Description	PR354	PR364	PR10	PR11
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.5 lb. (0.23 kg)	0.5 lb. (0.23 kg)	1.79 lb. (0.81 kg)	1.79 lb. (0.81 kg)

Material specification

Description	PR354	PR364	PR10	PR11
Adjustment mechanism / springs:	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	316 stainless steel	Polypropylene		
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	316 stainless steel	Acetal	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon

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CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
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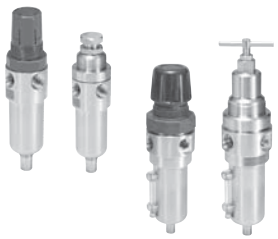
For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Operating information

	PB548 & PB558	PB11 & PB12
Operating pressure	300 PSIG max (20.7 bar)	300 PSIG max (20.7 bar)
Operating temperature	**PB548:** 0°F to 150°F (-18°C to 66°C) **PB558:** 0°F to 180°F (-18°C to 82°C)	**PB11:** 0°F to 150°F (-18°C to 66°C) **PB12:** 0°F to 180°F (-18°C to 82°C)
Flow / SCFM (dm^3/s)	12 (5.66)	72 (33.98)

For technical information see CD

Filter / Regulators



Port size	Adjustment type	Drain type	Flow SCFM (dm^3/s) ft/min@100 PSI	Part number 0 to 125 PSIG
1/4	Knob version	Manual twist	12 (5.66)	**PB548-02DHCSS**
1/4	All metal version	Manual twist	12 (5.66)	**PB558-02DHCSS**
1/2	Knob version	Manual twist	72 (33.98)	**PB11-04WJCSS**
1/2	Knob version	Auto float	72 (33.98)	**PB11-04WJCRSS**
1/2	T-handle version	Manual twist	72 (33.98)	**PB12-04WJCSS**
1/2	T-handle version	Auto float	72 (33.98)	**PB12-04WJCRSS**

Service kits

Description		PB548	PB558	PB11	PB12
Bonnet kit		**CKR364YSS**	**CKR354YSS**	**CKR10YSS**	**CKR11YSS**
Drain kit -	automatic pulse	**RK504SY-SS**	**RK504SY-SS**		
	automatic float			**SA10MDSS**	**SA10MDSS**
	manual twist, small (old)	**SA600Y7-1SS**	**SA600Y7-1SS**	**SA600Y7-1SS**	**SA600Y7-1SS**
	manual twist, large (new)	**SAP05481**	**SAP05481**	**SAP05481**	**SAP05481**
Filter element kits particulate	5 micron	**EK504VY**	**EK504VY**	**EKF10VY**	**EKF10VY**
	20 micron	**EK504Y**	**EK504Y**		
	40 micron			**EKF10Y**	**EKF10Y**
Gauge, stainless 160 PSIG (0 to 1100 kPa)	1-1/2" Face	**K4515N14160SS**	**K4515N14160SS**		
	2" Face			**K4520N14160SS**	**K4520N14160SS**
Panel mount bracket (stainless)		**161X57-SS**	**161X57-SS**	**R10Y57-SS**	**R10Y57-SS**
Panel mount nut –	stainless	**R05X51-SS**	**R05X51-SS**	**R10X51-SS**	**R10X51-SS**
	plastic	**R05X51-P**	**R05X51-P**	**R10X51-P**	**R10X51-P**
Pipe nipple, 316 stainless steel		**616Y28-SS**	**616Y28-SS**	**616A28-SS**	**616A28-SS**
Service kit –	relieving	**RK549YSS**	**RK549YSS**	**RKR10YSS**	**RKR10YSS**
	non-relieving	**RK548YSS**	**RK548YSS**	**RKR10KYSS**	**RKR10KYSS**
Springs –	0-25 PSIG range	**SPR-375-2-SS**	**SPR-375-2-SS**		
	0-60 PSIG range	**SPR-376-1-SS**	**SPR-376-1-SS**	**SPR-388-1-SS**	**SPR-388-1-SS**
	0-125 PSIG range	**SPR-377-1-SS**	**SPR-377-1-SS**	**SPR-389-1-SS**	**SPR-389-1-SS**
	0-250 PSIG range			**SPR-390-1-SS**	**SPR-390-1-SS**

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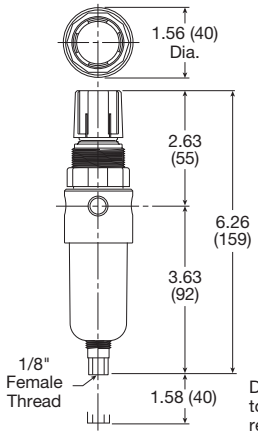
PB548



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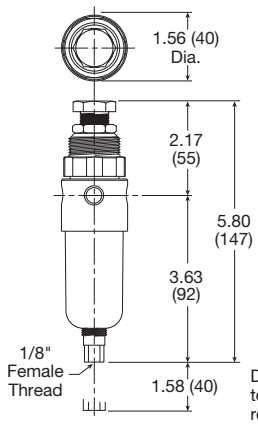

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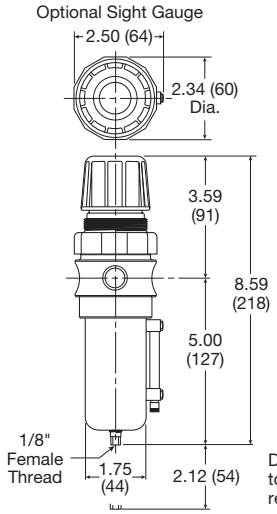
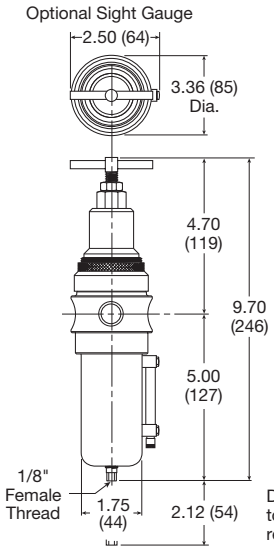


PB12



Specifications

Description	PB548	PB558	PB11	PB12
Filter rating	20 micron	20 micron	40 micron	40 micron
Gauge port	1/4	1/4	1/4	1/4
Operation	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm	Fluorocarbon diaphragm
Port threads	1/4	1/4	1/2	1/2
Weight	0.6 lb. (0.27 kg)	0.6 lb. (0.27 kg)	2.42 lb. (1.09 kg)	2.42 lb. (1.09 kg)

Material specification

Description	PB548	PB558	PB11	PB12
Adjustment mechanism / springs	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Adjusting knob	Polypropylene	316 stainless steel	Acetal	316 stainless steel
Body / poppet	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Bonnet	Acetal	316 stainless steel	Acetal	316 stainless steel
Bottom plug	316 stainless steel	316 stainless steel	316 stainless steel	316 stainless steel
Seals	Fluorocarbon	Fluorocarbon	Fluorocarbon	Fluorocarbon
Sight gauge			Isoplast	Isoplast

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- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain
- Fillable under pressure

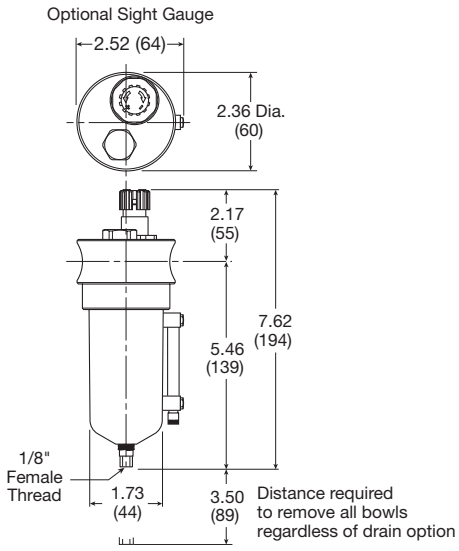
Operating information

Operating pressure	
no sight gauge	0 to 300 PSIG (0 to 20.7 bar)
with sight gauge	0 to 250 PSIG (0 to 17.2 bar)
Operating temperature	0°F to 150°F (-18°C to 66°C)
Flow / SCFM (dm^3/s)	100 (47.19)

For technical information see CD

Lubricators

Port size	Flow SCFM (dm^3/s)	Part number metal bowl with sight gauge
1/2	100 (47.19)	**PL10-04WSS**



Service kits

Description	Part number
Drain kit - manual twist drain, small (old)	**SA600Y7-1SS**
large (new)	**SAP05481**
Pipe nipple, 316 Stainless Steel	**616A28-SS**
Sight dome kit - old	**RKL10SS**
new	**PS740N**

Specifications

Description	PL10
Bowl capacity	4.0 ounces
Port threads	1/2
Weight	1.9 lb. (0.85 kg)

Material specification

Description	PL10
Body	316 stainless steel
Bowls	316 stainless steel
Dip tube / drain / fill plug	316 stainless steel
Seals	Fluorocarbon
Sight dome	Nylon
Sight gauge	Isoplast

Most popular.

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Highly accurate units, suitable for applications such as instrumentation where precision regulations is required.

- Fine adjustment sensitivity
- Good repeatability and minimal pressure drop
- High flow capacity
- Two 1/4" gauge ports
- Brass Poppet for long life
- Modular with 05 Series FRL
- Non-rising, removable knob

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:

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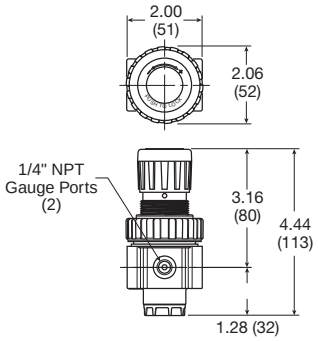
Operating information

Inlet pressure	250 PSIG (17.2 bar) maximum
Temperature rating	32°F to 175°F (0°C to 80°C)
Relief capacity	0.5 SCFM (0.24 dm^2/s) @ 5 PSIG (0.4) increase in P^2
Flow capacity	25 SCFM (13.2 dm^2/s) @ 100 PSIG (6.9) P^1 and 20 PSIG (1.4 bar) P^2
Bleed Rate	2.0 SCFH
Effect of supply pressure variation	0.5 PSIG (0.04 bar) for 25 PSIG (1.7 bar) change in P^1
Relief Flow	5.0 SCFM
Repeatability	± .5 PSIG (± 0.034 bar)
Response	Valve will open to full flow and fill a volume of 100 in^3

For technical information see CD

Precision Regulator

Port size	Pressure	Weight	Part number
1/4	15 PSIG	1.0 lb. (0.45 kg)	**27R112A**
1/4	30 PSIG	1.0 lb. (0.45 kg)	**27R110A**
1/4	60 PSIG	1.0 lb. (0.45 kg)	**27R114A**
1/4	125 PSIG	1.0 lb. (0.45 kg)	**27R113A**



NOTE: 1.53 dia. (39mm) hole required for panel mounting. Maximum panel thickness 1/4".

Material specification

Description	
Poppet	Brass
Bonnet	Plastic
Body	Zinc
Collar, knob	Plastic
Diaphragm	Nitrile
Bottom cap	Plastic
Seals	Nitrile
Springs – poppet & control	Steel

Most popular.

Service kits

Description		Part number
Bonnet Assembly Kit		**PS910P**
Control Knob		**P0442001**
Gauges –	1-1/2" dial face	
	30 PSIG (0 to 2.1 bar)	**K4515N14030**
	60 PSIG (0 to 4.1 bar)	**K4515N14060**
	160 PSIG (0 to 11.0 bar)	**K4515N14160**
	300 PSIG (0 to 20.0 bar)	**K4515N14300**
	2" Dial Face	
	60 PSIG (0 to 4.1 bar)	**K4520N14060**
	160 PSIG (0 to 11.0 bar)	**K4520N14160**
	300 PSIG (0 to 20.0 bar)	**K4520N14300**
Mounting bracket kit		**PS963P**
Panel mount nut – Metal		**PS964P**
Pressure sensor – MPS-32		
Service kit		**PS907P**
Springs –	1-30 PSIG range	**P04427**
	1-15 PSIG range	**P04428**
	0-60 PSIG range	**P04426**
	2-125 PSIG range	**P04425**

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51R
- Pressure reference indicating dial face
- Non-rising, pressure-adjustment dial
- Self-relieving
- Full pressure adjustment in less than one full turn
- Recommended for pilot-air applications

52R, 53R, 54R
- Balanced poppet design
- Non-rising, pressure-adjusting dial
- High-relief flow (3/16" relief orifice)
- Two 1/4" gauge ports
- Piston operated

Operating information

Adjusting range pressure	2 to 40 PSIG (0 to 2.8 bar) 5 to 160 PSIG (0 to 11.0 bar)
Max supply pressure	300 PSIG (20.7 bar)
Max operating temperature	150°F (65.5°C)

For technical information see CD

Dial Regulators, relieving

Port size	Flow capacity* SCFM (dm^3/s)	Part number Low pressure 2 to 40 PSIG (0.14 to 3 bar)	Part number Standard pressure 5 to 160 PSIG (0.34 to 11 bar)
1/4	0.7 (.3)	**51R125R**	**51R126R**
1/4	117 (55)	**52R125R**	**52R126R**
3/8	180 (85)	**52R225R**	**52R226R**
1/2	195 (92)	**52R325R**	**52R326R**
3/4	220 (104)	**52R425R**	**52R426R**
3/4	400 (189)	**53R425R**	**53R426R**
1	650 (307)	**53R525R**	**53R526R**
1-1/4	700 (330)	**53R625R**	**53R626R**
1-1/2	1,600 (755)	**54R725R**	**54R726R**
2	1,600 (755)	**54R825R**	**54R826R**

* SCFM = Standard cubic feet per minute at 100 PSIG (6.9 bar) inlet, 90 PSIG (6.2 bar) no-flow secondary setting and 25 PSIG pressure drop.

Service kits

Description		51R	52R	53R	54R
Adjustment dial knob		**RRP-16-024**	**RRP-16-024**	**RRP-16-024**	**RRP-16-024**
O-ring, repair kit		**GRP-95-260**	**GRP-95-260**	**GRP-95-261**	**GRP-95-262**
Piston and bonnet repair kit		**RRP-95-765**	**RRP-95-766**	**RRP-95-766**	**RRP-95-766**
Piston bottom and o-ring seal			**RRP-95-192**	**RRP-95-192**	**RRP-95-192**
Spring, regulation, belleville washer –					
	2 to 40 PSIG (2.8 bar)	**RRP-95-906**	**RRP-95-906**	**RRP-95-906**	**RRP-95-906**
	5 to 160 PSIG (11.0 bar)	**RRP-95-905**	**RRP-95-905**	**RRP-95-905**	**RRP-95-905**
Spring, main valve					**RRP-95-024**
Tamper resistant kit		**RRP-95-585**	**RRP-95-585**	**RRP-95-585**	**RRP-95-585**
Valve, main with u-cup seal & bottom plug			**RRP-95-914**		
Valve, main with u-cup seal			**RRP-95-151**		
Valve, main with o-ring seal				**RRP-95-152**	**RRP-95-153**
Valve, pilot with o-ring and valve spring		**RRP-96-934**	**RRP-96-934**	**RRP-96-935**	**RRP-96-935**

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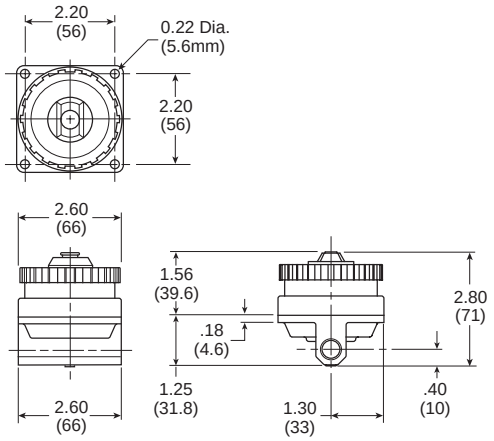
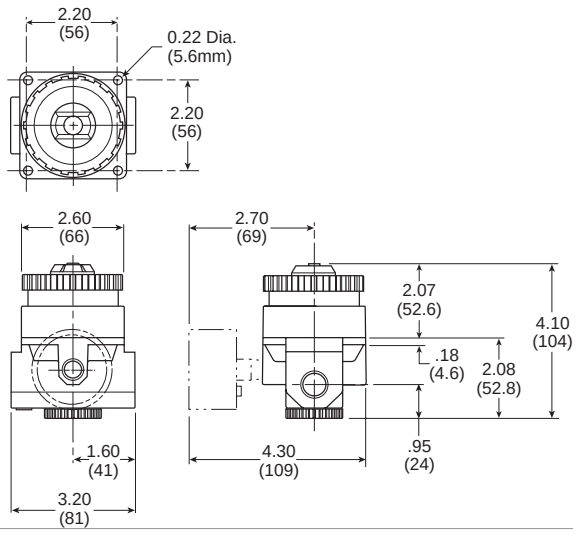
51R



52R



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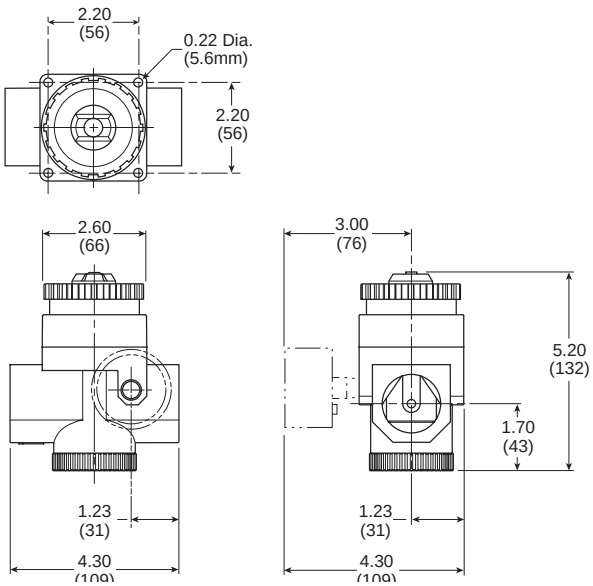
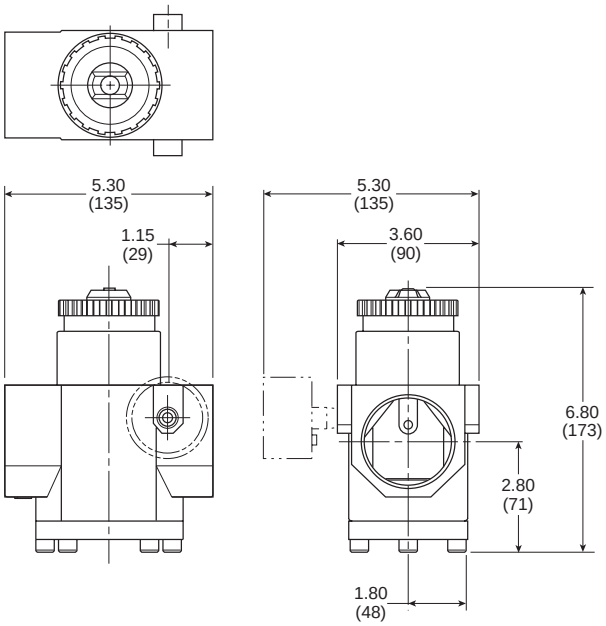


54R



Specifications

Description	51R	52R	53R	54R
Bleed rate	0.05 SCFM	0.05 SCFM	0.05 SCFM	0.05 SCFM
Gauge port	—	Two ports 1/4	Two ports 1/4	Two ports 1/4
Port threads	1/4	1/4, 3/8, 1/2, 3/4	3/4, 1, 1-1/4	1-1/2, 2
Weight	1.3 lb. (0.5 kg)	2.3 lb. (1.04 kg)	4.0 lb. (1.8 kg)	9 lb. (4.1 kg)

Material specification

Description	
Body	Zinc
Bonnet	Zinc / brass
Piston	Acetal
Seals	Nitrile
Springs	Steel
Valve assembly	Brass / nitrile / acetal

⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

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- The no-brass construction is well suited to harsh environments
- Internal and external epoxy finish for superior corrosion resistance
- Non-bleed design to reduce consumption
- Integral relief valve
- A gauge port provides convenient pressure gauge mounting
- The standard 5-micron filter minimizes internal contamination
- The filter dripwell contains a drain plug to easily drain trapped liquids
- Standard tapped exhaust
- Soft relief seat minimizes air loss

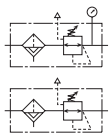
P3EA632 Series

Operating information

Supply pressure	250 PSIG (17.2 bar), (1700 kPa) max
Temperature range	-40°F to 160°F (-40°C to 71°C)
Sensitivity	1.0" (.036 PSIG) (2.54 cm) water column
Flow capacity	25 SCFM (42.5 m^3/HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity	0.8 (1.36 m^3/HR) where downstream pressure is 5 PSIG, (.35 bar) (35 kPa) above 20 PSIG (1.5 bar), (150 kPa) setpoint (0.8 SCFM for 120 # unit)
Consumption	Undetectable
Supply pressure effect	Less than 1.25 PSIG, (.09 bar), (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure (1.90 PSIG for 120 # unit)

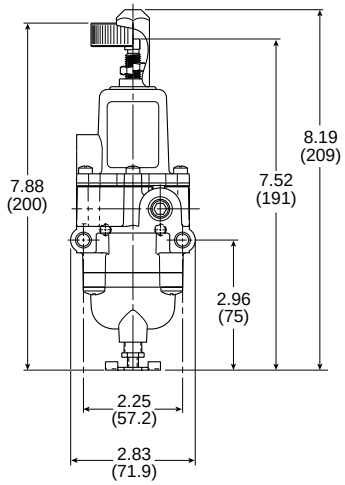
For technical information see CD

P3EA632
Precision Filter / Regulator



Port size	Spring	Part number
1/4"	1 to 60 PSIG	**P3EA63242NS**
1/4"	2 to 120 PSIG	**P3EA63252NS**

Note: Other spring ranges, port sizes, and options available. Please consult factory.



Service kits

Service kit	1 to 60, 2 to 120 PSIG	**PS19968-NR**
Tamper resistant kit		**PS12165**

Material specification

Body and housing	Epoxy coated aluminum
Elastomers	Nitrile
Trim	Stainless steel, nickel plated steel

⚠ WARNING
Product rupture can cause serious injury.
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Do not exceed maximum primary pressure rating.

CAUTION:
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- The P3BA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio
- A balanced supply valve minimizes the effects of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flowing conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction allows servicing without removal

P3BA208 Series
1/4" port size

Operating information

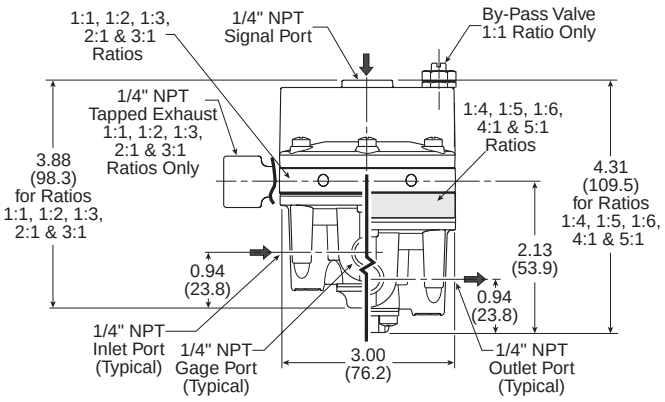
Signal : Output	1:1	1:2	1:3
Output pressure, maximum	150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum	250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity 100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output	45 SCFM (76.5 m^3/HR)	45 SCFM (76.5 m^3/HR)	45 SCFM (76.5 m^3/HR)
Exhaust capacity Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint	11 SCFM (18.7 m^3/HR)	11 SCFM (18.7 m^3/HR)	11 SCFM (18.7 m^3/HR)
Sensitivity, water column	.250" (.64 cm)	.500" (1.27 cm)	.750" (1.9 cm)
Ratio accuracy % of 100 PSIG (7 bar) output span % of output span with 100 PSIG (7 bar) input span	1.0 —	1.0 —	1.0 —
Supply pressure effect for change of 100 PSIG (7 bar)	0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)

For technical information see CD

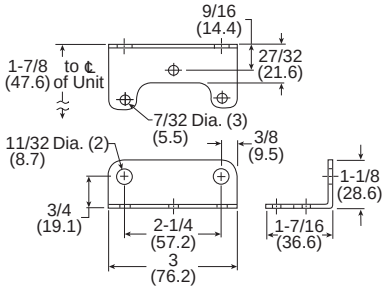
P3BA208
Precision Pneumatic Input Signal Amplifier

Port size	Pilot ratio	Part number
1/4"	1:1	**P3BA20812**
1/4"	1:2	**P3BA20822**
1/4"	1:3	**P3BA20823**

Note: Other spring ranges, port sizes, and options available. Please consult factory.



Mounting bracket



Service kits

1:1 ratio	**PS19513-11**
1:1 ratio w/ by-pass valve	**PS19513-11I**
1:2 ratio	**PS19513-12**
1:3 ration	**PS19513-13**
Mounting bracket	**PS09921**

Material specification

Body and housing	Aluminum
Elastomers	Nitrile on dacron fabric
Trim	Zinc plated steel, brass

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- Five signal to output ratios meet most control element requirements
- Control sensitivity of water column allows use in precision applications
- Large supply and exhaust Valves provide high forward and exhaust flows
- Soft supply and exhaust Valve seats minimize air consumption
- A balanced supply valve minimizes the effect of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the P3BA45 without removing it from the line

P3BA45 Series
1/2" & 3/4" port size

Operating information

Signal : Output	1:1	1:2	1:3
Output pressure, maximum	150 PSIG (10 bar)	150 PSIG (10 bar)	150 PSIG (10 bar)
Supply pressure, maximum	250 PSIG (17 bar)	250 PSIG (17 bar)	250 PSIG (17 bar)
Flow capacity 100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output	150 SCFM (255 m^3/HR)	150 SCFM (255 m^3/HR)	150 SCFM (255 m^3/HR)
Exhaust capacity Downstream pressure 5 PSIG (.35 bar) above 20 PSIG (1.5 bar) setpoint	40 SCFM (62.5 m^3/HR)	40 SCFM (62.5 m^3/HR)	40 SCFM (62.5 m^3/HR)
Sensitivity, water column	1.0" (2.54 cm)	2.0" (5.08 cm)	3.0" (7.62 cm)
Ratio Accuracy % of 100 PSIG (7 bar) output span % of output span with 100 PSIG (7 bar) input span	3.0 —	3.0 —	3.0 —
Supply pressure effect for change of 100 PSIG (7 bar)	0.10 PSIG (.007 bar)	0.20 PSIG (.014 bar)	0.30 PSIG (.021 bar)
Ambient temperature	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)	-40°F to 200°F (-40°C to 93°C)
Hazardous locations	Acceptable for use in zones 1 and 2 for gas atmospheres; Groups IIA and IIB and zones 21 and 22 for dust atmospheres.		
For technical information see CD			

P3BA45
Precision Pneumatic Input Signal Amplifier

Port size	Pilot ratio	Part number
1/2"	1:1	**P3BA4514A**
1/2"	1:2	**P3BA4524A**
1/2"	1:3	**P3BA4534A**
3/4"	1:1	**P3BA4516A**
3/4"	1:2	**P3BA4526A**
3/4"	1:3	**P3BA4536A**

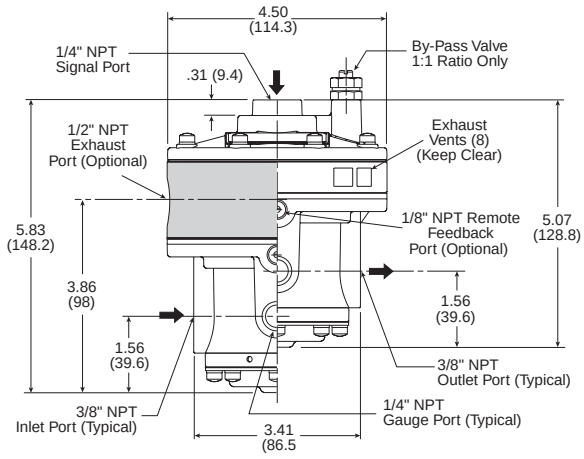
Note: Other spring ranges, port sizes, and options available. Please consult factory.

Service kits

1:1 ratio	**PS19549-1**
1:1 ratio w/ tapped exhaust	**PS19549-1E**
1:2 ratio	**PS19549-2**
1:3 ratio	**PS19549-3**
1:1 w/ tapped exhaust, I option	**PS19549-20E**

Material specification

Body and housing	Aluminum
Diaphragm	Nitrile on dacron fabric
Trim	Zinc plated steel, brass



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- Control sensitivity of .250" (.010 PSIG) (.64 cm) water column variation allows use in precision applications
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes
- Flow of up to 40 SCFM with 100 PSIG supply allows use in applications with high flow requirements
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the regulator without removing it from the line

P3RA302 Series

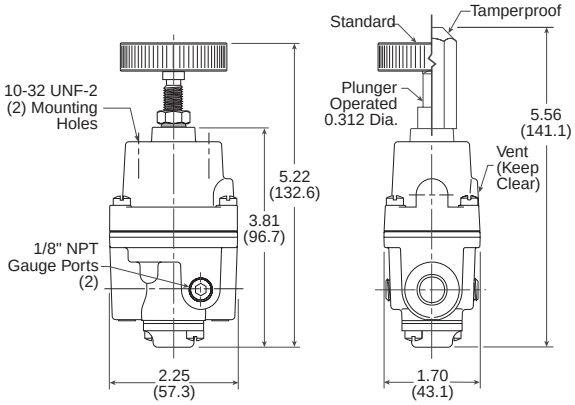
Operating information

Supply pressure	250 PSIG (17.2 bar), (1700 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.250" (.010 PSIG) (.64 cm) water column
Flow capacity	40 SCFM (68 m^3/HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust capacity	2.0 SCFM (3.4 m3/HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply pressure effect	Less than 0.2 PSIG, (.014 bar), (.14 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous locations	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres

For technical information see CD

P3RA302
Compact High Precision Regulator

Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	**P3RA30232**
1/4"	1 to 60 PSIG	**P3RA30242**
1/4"	2 to 100 PSIG	**P3RA30252**



⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Most popular.

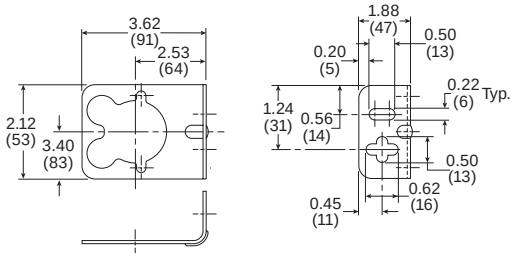
Service kits

Service kit	Nitrile, standard	**PS16116-13**
	Nitrile, non-relieving	**PS16116-14**
Tamper resistant kit		**PS12163**
Mounting bracket kit		**PS417BP**

Material specification

Body and housing	Aluminum
Diaphragms	Nitrile on dacron
Trim	Brass

Mounting bracket



CAUTION:
REGULATOR PRESSURE ADJUSTMENT –
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- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision processes
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions

P3RA102 Series

Operating information

Supply pressure	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	40 SCFM (68 m³/HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint
Exhaust Capacity	5.5 SCFM (9.35 m3/HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint
Supply Pressure Effect	Less than 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure
Hazardous Locations	Acceptable for use in zones 1 and 2 for gas atmosphere: Groups IIA and IIB and zones 21 and 22 for dust atmospheres

For technical information see CD

P3RA102
Standard High Precision Regulator

Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	**P3RA10232**
1/4"	1 to 60 PSIG	**P3RA10242**
1/4"	2 to 150 PSIG	**P3RA10262**

Service kits

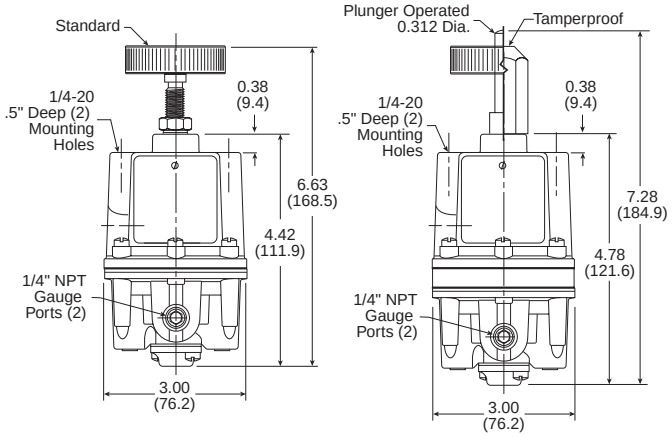
Service kit	0 to 200 PSIG, relieving	**PS12125-1**
	0 to 200 PSIG, non-relieving	**PS12125-4**
Tamper resistant kit		**PS12165**
Mounting bracket kit, zinc plated steel		**PS09921**

Material specification

Body and housing		Aluminum
Diaphragms	(standard unit only)	Buna N on dacron
Trim		Brass, zinc plated steel

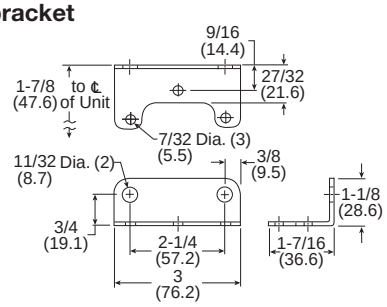
⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

☐ Most popular.



2 thru 200 PSIG Range | **300 & 400 PSIG Range**

Mounting bracket



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- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- A separate control chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service without removing it from the line
- Mounting bracket is available

P3RA102BP Series

Operating information

Setpoint range	System pressure (maximum)
2 to 200 PSIG (0.15 to 14 bar) (15 to 1400 kPa)	300 PSIG (21 bar), (2100 kPa) max
300 to 400 PSIG (21 to 28 bar) (2100 to 2800 kPa)	500 PSIG (35 bar), (3500 kPa) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	40 SCFM (68 m3/HR) @ 100 PSIG, (7.0 bar), (700 kPa) system pressure
For technical information see CD	

P3RA102BP
High Precision Relief Valve

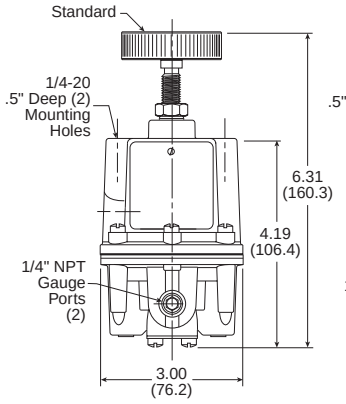
Port size	Spring	Part number
1/4"	0.5 to 30 PSIG	**P3RA10232BP**
1/4"	1 to 60 PSIG	**P3RA10242BP**
1/4"	2 to 150 PSIG	**P3RA10262BP**

Service kits

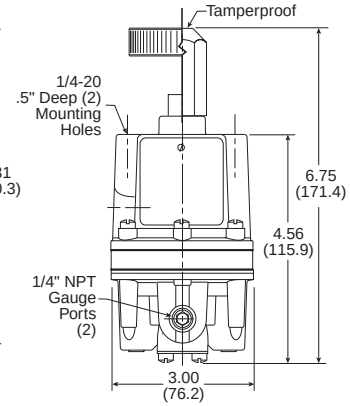
Service kit	0 to 200 PSIG, standard	**PS12127-1**
Tamper resistant kit		**PS12165**
Mounting bracket kit, zinc plated steel		**PS09921**

Material specification

Body and housing	Aluminum
Nozzle	Nitrile on dacron
Trim	Zinc plated steel, brass

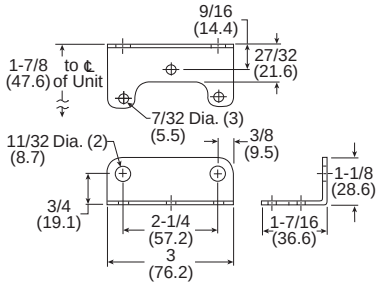


2 thru 200 PSIG Range



300 & 400 PSIG Range

Mounting bracket



⚠ WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Most popular.

CAUTION:
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- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- Balanced supply valve minimizes effects of vacuum variation
- Aspirator tube compensates for downstream pressure droop under flow conditions
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Construction allows servicing without removing from the line

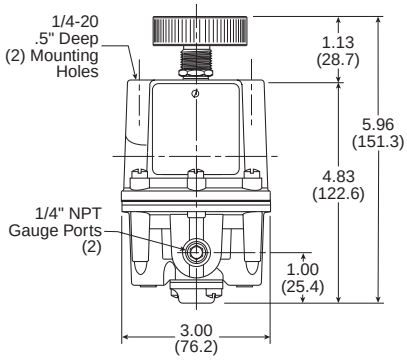
P3RA171 Series

Operating information

Vacuum supply	29.92 Hg (760 torr) max
Ambient temperature	-40°F to 200°F (-40°C to 93°C)
Sensitivity	.125" (.005 PSIG) (.32 cm) water column
Flow capacity	3 SCFM @ 650 torr supply, 250 torr setpoint
Vacuum supply effect	Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) change in vacuum supply
For technical information see CD	

P3RA171
High Precision Vacuum Regulator

Port size	Spring	Part number
1/4"	0 to 30 Hg	**P3RA17132NNKN**



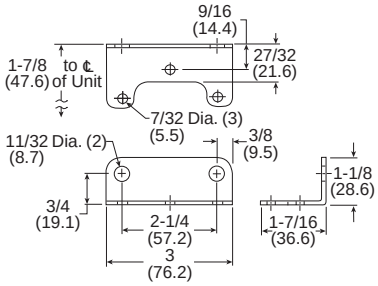
Service kits

Service kit	Includes diaphragm, valve, seat assemblies and gasket	**PS20966-9**
Tamper resistant kit		**PS20967-1**
Mounting bracket kit, zinc plated steel		**PS09921**

Material specification

Body and housing	Aluminum
Elastomers	Nitrile
Trim	Zinc plated steel, brass

Mounting bracket



⚠ WARNING
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Do not exceed maximum primary pressure rating.

CAUTION:
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- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm3/s (40 scfm)
- P32P flows to 57 dm3/s (120 scfm)

P31P Series
Bottom exhaust

P32P Series
Bottom exhaust

Ordering information

P 3 [ ] P A 1 [ ] A [ ] 2 [ ] [ ] 1 A

Body size	
Modular mini (1/4")	1
Modular compact (1/2")	2

Thread type	
BSPP	1
BSPT	2
NPT	9

Port size	
Modular mini (1/4")	2
Modular compact (1/2")	4

Version	
Bottom ported exhaust (NC)	A
Bottom ported forced exhaust (NO)*	E

* When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

Pressure range	
0 - 2 bar (0-29 PSIG)	Z
0 - 10 bar (0-145 PSIG)	D

Power supply	
24 volts	2

Control signal	
0-10 V†	V

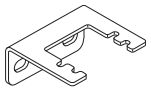
† Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

Output signal	
Digital, PNP	D
PNP or 0-10V	P
NPN or 0-10V	N
4-20mA fixed	M

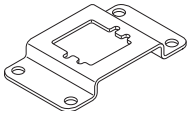
D) Digital PNP output only, no analog output selectable
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)
N) Digital NPN and analog 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)
M) Analog 4-20mA output only.
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8

Input connector	
M12 (4 pin)	1

P31P mounting brackets



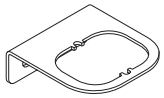
L-bracket



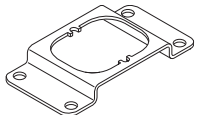
Foot bracket

Part number	Description
P3HKA00ML	L-bracket mounting kit
P3HKA00MC	Foot bracket mounting kit

P32P mounting brackets



L-bracket



Foot bracket

Part number	Description
P3KKA00ML	L-bracket mounting kit
P3KKA00MC	Foot bracket mounting kit

Note: These brackets fit both proportional regulators and combined soft start & dump valves.

Cables

Part number	Description
CB-M12-4P-2M	2 mtr. cable with moulded straight M12x1 connector

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Technical information

Working medium
Compressed air or inert gasses, filtered to 40µ.

Supply pressure
	Max. operating pressure:
2 bar unit:	3 bar (43.5 PSIG)
10 bar unit:	10.5 bar (152 PSIG)
Min. Operating Pressure	P2 pressure + 0.5 bar (7.3 PSIG)

Pressure control range
Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

Temperature range
0°C up to +50°C (32°F up to 122°F)

Weights:
P31P = 0.291 kg (0.64 lbs)
P32P = 0.645 kg (1.42 lbs)

Air consumption
No consumption in stable regulated situation.

Display
The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.
The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Supply voltage
24 VDC +/- 10%

Power consumption
Max. 1.1W with unloaded signal outputs

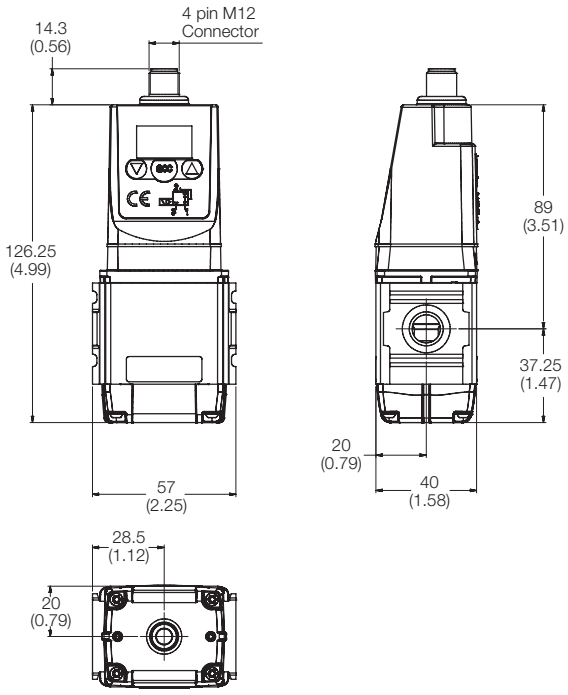
Control signals
The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

Output signals
As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm
Outside the signal band this connection is 0V.

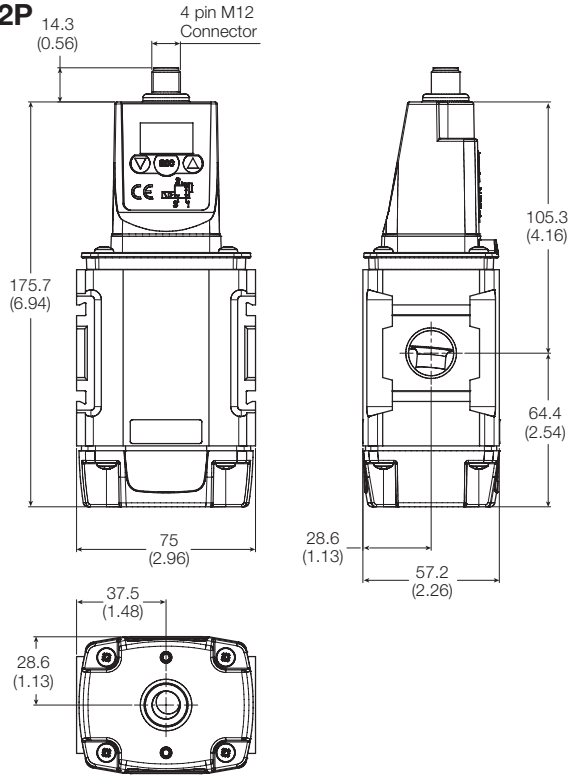
Connections
(In case of output signal (Option D)
Central M12 connector 4-pole
The electrical connections are as follows:

Pin No.		Function	Color
1	24 V	Supply	Brown
2	0 to 10 V	Control Signal Ri = 100k W	White
	4 to 20mA	Control Signal Ri = 500k W	
3	0 V (GND)	Supply	Blue
4	24 V	Alarm Output Signal	Black

P31P



P32P



PDRD10 - PDRD250

- "Plug & Play" design for easy installation and operation (PDRD10 - PDRD125)
- Small space saving design
- Oversized demister separator resulting in excellent liquid removal over all operating conditions
- Low pressure differential across the dryer (1.45 PSIG average)
- Environmentally friendly refrigerant
- Oversized condenser to operate in ambients to 122°F (50°C)
- All models incorporate a dewpoint indicator

PDRD325 - PDRD2400

- Optimum dewpoint levels for highest system performance
- Advanced patented design solutions
- Environmentally friendly refrigerant
- High reliability, easy to use and maintain
- Unique 4-in-1 SmartPack heat exchanger
- Integral drain
- Extremely low pressure drop design
- SmartControl energy saving function
- Excellent dewpoint performances
- Advanced compliant scroll compressor

PDRD Series

Nominal flow					Recommended filtration		
SCFM	Nm³/hr	Primary voltage	Part number	Pipe size	Bulk separator	Pre-filter (5µ particulate)*	Post-filter (.01µ coalescing)
10	17	115V/1ph/60Hz	**PDRD10-115160**	1/2" NPT-F	**P3TFA94WCAN**	**P32FA94FSAN**	**P32FA94DSAN**
15	26	115V/1ph/60Hz	**PDRD15-115160**	1/2" NPT-F	**P3TFA94WCAN**	**P32FA94FSAN**	**P32FA94DSAN**
25	43	115V/1ph/60Hz	**PDRD25-115160**	1/2" NPT-F	**P3TFA94WCAN**	**P32FA94FSAN**	**P32FA94DSAN**
35	60	115V/1ph/60Hz	**PDRD35-115160**	1/2" NPT-F	**P3TFA94WCAN**	**P32FA94FSAN**	**P32FA94DSAN**
50	85	115V/1ph/60Hz	**PDRD50-115160**	3/4" NPT-F	**P3TFA96WDAN**	**P33FA96FSAN**	**P33FA96DSAN**
75	127	115V/1ph/60Hz	**PDRD75-115160**	3/4" NPT-F	**P3TFA96WDAN**	**P33FA96FSAN**	**P33FA96DSAN**
100	170	115V/1ph/60Hz	**PDRD100-115160**	3/4" NPT-F	**P3TFA96WDAN**	**P3NFA96FSA**	**P3NFA96DSA**
125	212	115V/1ph/60Hz& 230V/1ph/60Hz	**PDRD125-115160 PDRD125-230160**	1-1/2" NPT-F	**P3TFA9BWGAN**	**P3NFA9PFSA**	**P3NFA9DFSA**
150	255	115V/1ph/60Hz & 230V/1ph/60Hz	**PDRD150-115160 PDRD150-230160**	1-1/2" NPT-F	**P3TFA9BWGAN**	**P3NFA9PFSA**	**P3NFA9DFSA**
175	297	115V/1ph/60Hz	**PDRD175-230160**	1-1/2" NPT-F	**P3TFA9BWGAN**	**35F77BAP**	**35F77EAP**
200	425	230V/1ph/60Hz	**PDRD200-230160**	1-1/2" NPT-F	**P3TFA9BWGAN**	**35F77BAP**	**35F77EAP**
250	425	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD250-230360 PDRD250-460360**	1-1/2" NPT-F	**P3TFA9BWGAN**	**35F77BAP**	**35F77EAP**
325	552	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD325-230360 PDRD325-460360**	2" NPT-F	**P3TFA9CWHAN**	**35F87BAP**	**35F87EAP**
400	680	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD400-230360 PDRD400-460360**	2" NPT-F	**P3TFA9CWHAN**	**35F87BAP**	**35F87EAP**
500	849	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD500-230360 PDRD500-460360**	2" NPT-F	**P3TFA9CWHAN**	**35F87BAP**	**35F87EAP**
700	1189	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD700-230360 PDRD700-460360**	3" NPT-M	**P3TFA9EWKAN**	**43FN7BAP**	**43FN7EAP**
800	1359	230V/3ph/60Hz & 460V/3ph/60Hz	**PDRD800-230360 PDRD800-460360**	3" NPT-M	**P3TFA9EWKAN**	**43FN7BAP**	**43FN7EAP**
1000	1700	460V/3ph/60Hz	**PDRD1000-460360**	3" NPT-M	**P3TFA9EWKAN**	**43FN7BAP**	**43FN7EAP**
1200	2039	460V/3ph/60Hz	**PDRD1200-460360**	3" NPT-M	**P3TFA9EWKAN**	**43FN7BAP**	**43FN7EAP**
1600	2718	460V/3ph/60Hz	**PDRD1600-460360**	4" Flg.	**P3TFAFFW2AN**	**P3TFAFFQ2AN***	**P3TFAFFD2AN**
2000	3400	460V/3ph/60Hz	**PDRD2000-460360**	6" Flg.	**P3TFAFGW3AN**	**P3TFAFGQ3AN***	**P3TFAFGD3AN**
2400	4078	460V/3ph/60Hz	**PDRD2400-460360**	6" Flg.	**P3TFAFGW3AN**	**P3TFAFGQ3AN***	**P3TFAFGD3AN**

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* 1µ coalescing

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Operating information

		PDRD10-PDRD175	PDRD200-PDRD250	PDRD325-PDRD2400
Temperature	Ambient (maximum) Ambient (minimum)	122°F (50°C) 41°F (5°C)	122°F (50°C) 41°F (5°C)	122°F (50°C) 41°F (5°C)
	Inlet (maximum)	149°F (65°C)	140°F (60°C)	140°F (60°C)
Pressure (maximum)		232 PSIG (16 bar)	203 PSIG (14 bar)	203 PSIG (14 bar)
Refrigerant		R134a	R407C	R407C

For technical information see CD

Flow correction factors

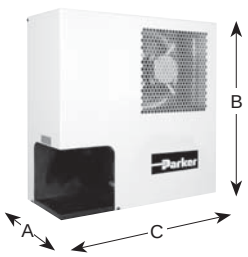
Capacities are based upon:
Ambient temperature - 100°F (38°C); Inlet temperature - 100°F (38°C);
and Working pressure - 100 PSIG (7 bar g).

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

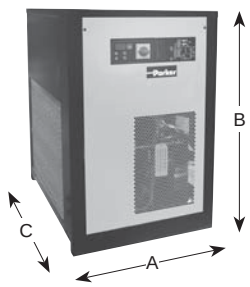
	PDRD10 - PDRD175								PDRD200 - PDRD250							PDRD325 - PDRD2400						
Ambient temperature (C1)																						
°F	60	70	80	89	100	110	120		70	80	90	100	110	120	122	90	100	110	120	122		
°C	16	21	27	32	38	43	49		21	27	32	38	43	49	50	32	38	43	49	50		
Factor	1.34	1.26	1.17	1.09	1.00	0.91	0.82		1.22	1.15	1.05	1.00	0.94	0.79	0.71	1.05	1.00	0.94	0.79	0.71		
Inlet temperature (C2)																						
°F	90	100	110	120	140	149			90	100	110	120	130	140		90	100	110	120	130	140	
°C	32	38	43	49	60	65			32	38	43	49	54	60		32	38	43	49	54	60	
Factor	1.24	1.00	0.81	0.67	0.45	0.43			1.24	1.00	0.82	0.68	0.56	0.40		1.22	1.00	0.82	0.68	0.56	0.46	
Inlet pressure (C3)																						
PSIG	60	80	100	125	150	175	200	230	50	80	100	125	150	174	203	50	80	100	125	150	174	203
bar	4	6	7	9	10	12	14	16	3	6	7	9	10	12	14	3	6	7	9	10	12	14
Factor	0.83	0.93	1.00	1.07	1.12	1.16	1.19	1.22	0.77	0.93	1.00	1.07	1.12	1.15	1.18	0.77	0.93	1.00	1.07	1.12	1.15	1.18

Dimensions

PDRD10-PDRD250



PDRD325-PDRD2400



Model number	A	B	C	Weight (kg)
PDRD10	8.3 (210)	17 (430)	17.7 (450)	42 (19)
PDRD15	8.3 (210)	17 (430)	17.7 (450)	42 (19)
PDRD25	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
PDRD35	8.3 (210)	19.9 (505)	19.7 (500)	52 (24)
PDRD50	8.9 (225)	22.3 (565)	20.5 (520)	58 (27)
PDRD75	8.9 (225)	22.3 (565)	20.5 (520)	68 (31)
PDRD100	8.9 (225)	22.3 (565)	20.5 (520)	77 (35)
PDRD125	16.7 (425)	23.8 (605)	21.8 (555)	115 (52)
PDRD150	16.7 (425)	23.8 (605)	21.8 (555)	128 (58)
PDRD175	16.7 (425)	23.8 (605)	21.8 (555)	132 (60)
PDRD200	28.0 (711)	37.0 (940)	22.0 (559)	183 (83)
PDRD250	28.0 (711)	42.0 (1067)	41.0 (1041)	287 (130)
PDRD325	28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)
PDRD400	28.0 (711)	42.0 (1067)	41.0 (1041)	320 (145)
PDRD500	28.0 (711)	42.0 (1067)	41.0 (1041)	342 (155)
PDRD700	32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PDRD800	32.0 (813)	52.0 (1321)	46.0 (1168)	529 (240)
PDRD1000	32.0 (813)	52.0 (1321)	46.0 (1168)	551 (250)
PDRD1200	40.0 (1016)	67.0 (1702)	43.0 (1092)	816 (370)
PDRD1600	40.0 (1016)	68.0 (1727)	71.0 (1803)	1279 (580)
PDRD2000	40.0 (1016)	68.0 (1727)	71.0 (1803)	1477 (670)
PDRD2400	40.0 (1016)	68.0 (1727)	71.0 (1803)	1521 (690)

Inches (mm)

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Inline Desiccant Dryer – DD15, DD30, DD60

- Inline desiccant dryers are a convenient and cost effective means of ensuring your sensitive intermittent pneumatic applications are never exposed to damaging moisture
- Compact size for point-of-use applications
- Drying efficiency down to -40°F pressure dew point
- Easily and quickly serviced
- Sightglass in bowl to monitor desiccant
- Built-in particulate after filter prevents downstream dust
- No electricity needed
- Low pressure drop
- No purge air lost as with other dryer types
- Check valve required on inlet
- Desiccant must be ordered separately

Operating information

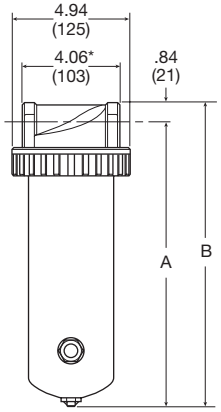
Optimum working temperature	Below 100°F
Operating temperature	32°F to 180°F (0°C to 82°C)
Operating pressure	0 to 300 PSIG Max (21 bar)

For technical information see CD

Inline Desiccant Dryers

	Part number SCFM / Desiccant Capacity[1]		
Port size	15 SCFM / 2.5 lb.	30 SCFM / 5 lbs.	60 SCFM / 10 lbs.
1/4[2]	**DD15-02**		
3/8[2]	**DD15-03**		
1/2[2]	**DD15-04**	**DD30-04**	**DD60-04**
3/4	**DD15-06**	**DD30-06**	**DD60-06**
1		**DD30-08**	**DD60-08**

Notes:
1. Desiccant must be ordered separately.
2. These units supplied with reducer bushings.



	A	B
DD15	12.69 (322)	13.5 (343)
DD30	22.44 (570)	23.25 (591)
DD60	29.44 (748)	30.25 (768)

* Dimension does not include reducer bushings for 1/4", 3/8", 1/2" versions.

Inches (mm)

Service kits

Description		Part number
Desiccant - environmentally friendly silica gel		
	DD15	**DRP-14-447/003**
	DD30	**DRP-14-447/006**
	DD60	**DRP-14-447/012**
Mounting brackets (pair of pipe mounted brackets)		
	1 inch Pipe Size	**SA200CW57**

Materials

Description		
Bowl	DD15	Aluminum
	DD30	Aluminum
	DD60	Steel
Flow tube		CPVC
Filter element		Sintered bronze
Head & flange ring		Zinc
Other hardware		Brass
Seals		Buna-N
Sight glass		Glass & steel

Specifications

Description	
Desiccant Capacity (Desiccant must be ordered separately)	
DD15	2.5 lb. (1.1 kg)
DD30	5 lb. (2.3 kg)
DD60	10 lb. (4.5 kg)

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Regenerative Desiccant Dryer – P3TJA

- Point of use application
  bringing clean dry air just where you need it.
- Approved to international standards designed in accordance with ASME VIII Div.1, approved to CSA/UL/CRN and fully CE Marked (PED, EMC, LVD) as standard.
- Simple to install - flexible installation utilising the multiple in-line inlet & outlet connection ports.
- Compact and lightweight - can be floor, bench or wall / canopy mounted.
- Very quiet operation - noise level less than 70dB(A).
- Can be installed almost anywhere, IP66 / NEMA 4 protection as standard.
- Audible alarm - indicating service interval for optimal performance.
- Simple & easy to maintain - due to the quick release top cap arrangement, which does NOT require the inlet / outlet ports to be disconnected as with traditional systems, maintenance can be achieved in under 15 minutes.

The P3TJA is the reliable, cost effective and flexible way to provide clean dry air exactly where needed.

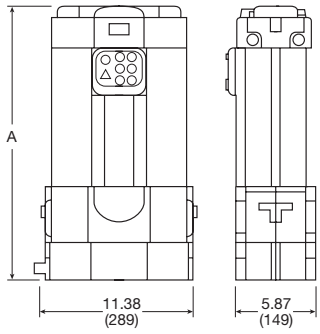
Operating information

Operating temperature	35°F (1.5°C) max.
Inlet temperature	122°F (50°C) max.
Operating pressure	58 to 175 PSIG (4 to 21 bar)
Flow range	3 SCFM to 20 SCFM @ 100 PSIG (85 L/min to 567 L/min @ 7 bar)
Noise level (Average)	70dB(A)
Pressure dewpoint – Standard	-40°F (-40°C) pdp
Standard electrical supply	115/1ph/60Hz (Tolerance +/- 10%)
Controls	Electronic control timer
Connections	3/8 NPT

For technical information see CD

Regenerative Desiccant Dryer

P3TJA



A	Weight (kg)	SCFM	Part number	Maintenance kit
16.6 (422)	24.2 (11)	3	**P3TJA93A1JN**	**P3TKA00JA1**
19.7 (500)	28.7 (13)	5	**P3TJA93A2JN**	**P3TKA00JA2**
24.2 (616)	35.3 (16)	8	**P3TJA93A3JN**	**P3TKA00JA3**
27.2 (692)	39.7 (18)	10	**P3TJA93A4JN**	**P3TKA00JA4**
33.3 (847)	44.1 (20)	13	**P3TJA93A5JN**	**P3TKA00JA5**
35.7 (906)	50.7 (23)	15	**P3TJA93A6JN**	**P3TKA00JA6**
43.2 (1098)	61.7 (28)	20	**P3TJA93A7JN**	**P3TKA00JA7**

Inches (mm)

Service kits

Description	Part number
Mounting Bracket	
Fixed Wall	**P3TKA00MJ**
45° Tilt Wall	**P3TKA00MK**

Sizing Chart (correction)

Minimum inlet pressure									
PSIG	58	73	87	100	116	135	145	160	175
bar g	4	5	6	7	8	9	10	11	12
Maximum inlet temperature									
95°F (35°C)	0.63	0.75	0.88	1.00	0.97	1.08	1.18	1.29	1.40
104°F (40°C)	0.61	0.73	0.85	0.97	0.94	1.05	1.14	1.25	1.36
113°F (45°C)	0.55	0.66	0.77	0.88	0.85	0.95	1.04	1.14	1.23
122°F (50°C)	0.46	0.55	0.64	0.73	0.71	0.79	0.86	0.94	1.02

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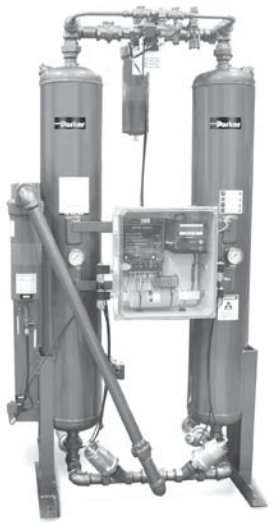
Heatless Desiccant Air Dryer – PTW Series

Parker PTW Series Heatless Desiccant Air Dryers remove water vapor from compresses air through a process known as pressure swing adsorption. Pressure dewpoints ranging from -40°F (-40°C) to -100°F (-70°C) are attained by directing the flow of saturated compressed air over a bed of desiccant.

- **Features**
- Pre-filter and after filters included with dryers
- Solid state controller
- CycleLoc™ demand control
- Variable cyle control (models PTW75 - PTW800 SCFM)
- Purge Flow indicator
- Purge flow regulator (models PTW75 - PTW800 SCFM)
- Repressurization circuit (models PTW75 - PTW800 SCFM)
- Control air filter (models PTW75 - PTW800 SCFM)
- Safety valves
- Pressure equalization
- 150 PSIG design standard
- Moisture indicator (models PTW75 - PTW800 SCFM)

- **Options**
- DDS Light / DDS (dewpoint dependent switching)



Operating information

Inlet or ambient air temperature	120°F (49°C) maximum
Operating pressure	50 PSIG (3.5 bar) minimum
Working pressure	150 PSIG (10.5 bar) maximum
Pressure drop at rated flow	less than 5 PSI (0.34 bar)

For technical information see CD

Heatless Desiccant Air Dryers

Capacity SCFM @ 100 PSIG (Nm³/min @ 6.9 bar)	Approximate purge SCFM (Nm³/min)	Primary voltage	Part number	Port size	Filtration package included with dryer		
					Pre-filter (5µ)	Pre-filter (.01µ)	After-filter (1µ)
25 (.70)	4 (.11)	• 120V/1ph/60Hz	**PTW25***	1/2	**P32FA94FSAN**	**P32FA94DSAN**	**P32FA94QSAN**
42 (1.19)	6 (.19)	• 120V/1ph/60Hz	**PTW40***	1/2	**P33FA94FSAN**	**P33FA94DSAN**	**P33FA94QSAN**
60 (1.70)	9 (.25)	• 120V/1ph/60Hz	**PTW55***	3/4	**P33FA94FSAN**	**P33FA94DSAN**	**P33FA94QSAN**
75 (2.13)	11 (.31)	• 120V/1ph/60Hz	**PTW75***	3/4	**P3NFA96FSA**	**P3NFA96DSA**	**P3NFA96QSA**
107 (3.03)	16 (.45)	• 120V/1ph/60Hz	**PTW100***	1	**P3NFA98FSA**	**P3NFA98DSA**	**P3NFA98QSA**
135 (3.82)	20 (.56)	• 120V/1ph/60Hz	**PTW130***	1	**P3NFA98FSA**	**P3NFA98DSA**	**P3NFA98QSA**
200 (5.66)	30 (.84)	• 120V/1ph/60Hz	**PTW200***	1-1/2	**35F77BAP**	**35F77EAP**	**35F77HAP**
250 (7.07)	38 (1.07)	• 120V/1ph/60Hz	**PTW250***	1/1/2	**35F77BAP**	**35F77EAP**	**35F77HAP**
300 (8.49)	45 (1.27)	• 120V/1ph/60Hz	**PTW300***	1-1/2	**35F77BAP**	**35F77EAP**	**35F77HAP**
400 (11.32)	60 (1.69)	• 120V/1ph/60Hz	**PTW400***	2	**35F87BAP**	**35F87EAP**	**35F87HAP**
500 (14.44)	77 (2.18)	• 120V/1ph/60Hz	**PTW500***	2	**35F87BAP**	**35F87EAP**	**35F87HAP**
600 (18.40)	98 (2.77)	• 120V/1ph/60Hz	**PTW600***	2	**35F87BAP**	**35F87EAP**	**35F87HAP**
800 (22.65)	120 (3.39)	• 120V/1ph/60Hz	**PTW800***	2	**35F87BAP**	**35F87EAP**	**35F87HAP**

* Options: Dewpoint dependent switching (DDS).
DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.
DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix

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Flow Correction Factors

Capacities are based upon:

- Pressure drop at rated flow less than 5 PSI (0.34 bar)
- Maxium inlet air or ambient air temperature 120°F (49°C)
- Maximum working pressure: 150 PSIG (10.5 bar g) standard units for high maximum working pressure are available
- Minimum operating pressure: 50 PSIG (3.5 bar g)

Inlet air pressure correction

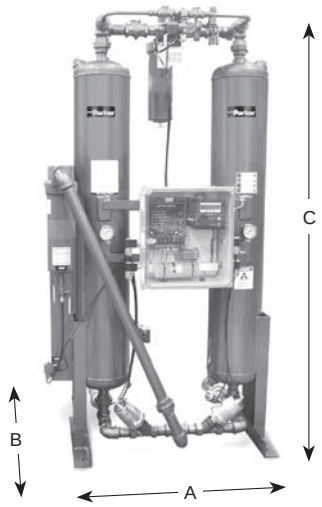
PSI	50	60	70	80	90	100	110	120	130	140	150
BAR	3.5	4.1	4.9	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.3
Factor	.56	.65	.74	.83	.91	1.00	1.09	1.18	1.27	1.37	1.43

Inlet air temperature correction

°F	90	95	100	105	110	115	120
°C	32	35	38	41	43	46	49
Factor	1.35	1.16	1.00	.85	.74	.64	.56

Heatless Desiccant Air Dryers

PTW series



Part number	A (length)	B (width)	C (height)	Weight lbs. (kg)
PTW25	19 (483)	16 (406)	64 (1626)	156 (71)
PTW40	21 (533)	17 (432)	48 (1219)	190 (86)
PTW55	21 (533)	20 (508)	67 (1702)	230 (104)
PTW75	35 (889)	27 (686)	80 (2032)	384 (174)
PTW100	35 (889)	27 (686)	80 (2032)	468 (212)
PTW130	35 (899)	21 (533)	70 (1778)	496 (225)
PTW200	44 (1118)	28 (711)	78 (1981)	692 (314)
PTW250	44 (1118)	30 (762)	78 (1981)	776 (352)
PTW300	44 (1118)	30 (762)	78 (1981)	796 (361)
PTW400	74 (1880)	41 (1041)	84 (2134)	1626 (738)
PTW500	74 (1880)	41 (1041)	85 (2159)	1735 (787)
PTW600	74 (1880)	41 (1041)	86 (2184)	1740 (789)
PTW800	74 (1880)	41 (1041)	91 (2311)	2120 (962)

Inch (mm)

Service kits

Element kits

	5µ	0.01µ	1.0µ
P32	**P32KA00ESE**	**P32KA00ESC**	**P32KA00ES9**
P33	**P33KA00ESE**	**P33KA00ESC**	**P33KA00ES9**
P3NF	**P3NKA00ESE**	**P3NKA00ESCB**	**P3KNA00ES9**
35F	**FRP-95-505**	**MTP-95-502**	**MSP-95-502**

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Zero Air Loss Condensate Drains

Zero air loss condensate drains are designed for economical removal of unwanted water, oil emulsions, and other liquids. These drains will only open when liquid is present and will not allow any compressed air to escape from the system.

Operating information

Maximum pressure		232 PSIG (16 bar)
Ambient operating temperature		35°F to 140°F (1.6°C to 60°C)
Voltages	NPT	115/50-60Hz, standard
Optional:	BSPP ports	230/50-60Hz & 24VDC

For technical information see CD

Zero Air Loss Condensate Drains

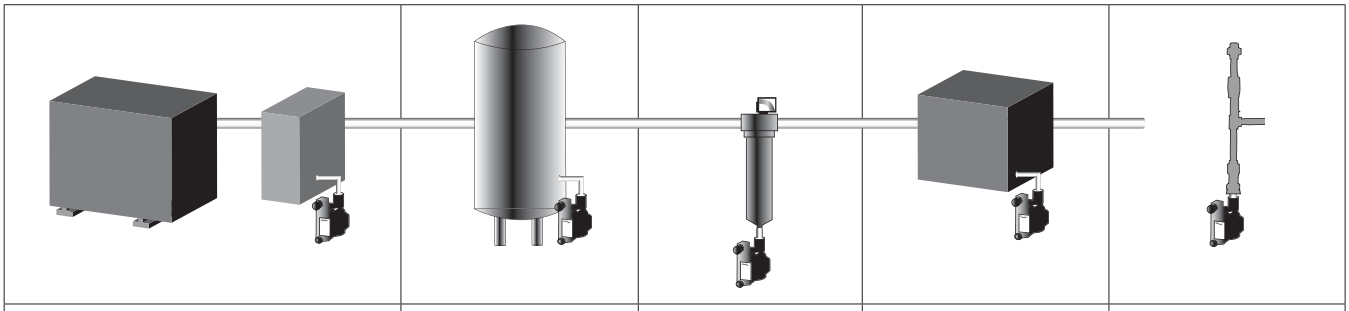
Port size (NPT)	Compressor aftercooler (SCFM)*	Capacity refrigeration dryer (SCFM)**	Filter (SCFM)	Drain capacity per day (gal/liter)	Model number	Service kit
1 @ 3/8 (in), 1 @ 3/8 (out)	—	—	424	6 (22.7)	**ED3002N115-K**	**SKED3000N115**
1 @ 1/2 (in), 1 @ 3/8 (out)	141	282	1,413	13 (49.2)	**ED3004N115-K**	**SKED3000N115**
2 @ 1/2 (in), 1 @ 3/8 (out)	247	494	2,472	23 (87.1)	**ED3007N115-K**	**SKED3000N115**
2 @ 1/2 (in), 1 @ 3/8 (out)	1,059	2,119	10,594	100 (378.5)	**ED3030N115-K**	**SKED3000N115**
2 @ 1/2 (in), 1 @ 3/8 (out)	3,532	7,063	35,315	330 (1,249.2)	**ED3100N115-K**	**SKED3000N115**

* Based on 100 PSI working pressure, air compressor inlet at 77°F (25°C) at 60% RH, air discharge temperature od 95°F (35°C) following the aftercooler, pressure dewpoint of 37°F (2.8°C) after the refrigerated dryer.

** Condensate from aftercooler or refrigerated dryer to be drained upstream – only for residual oil content or small quantities of condensate.

Note: A 6 ft. line cord will be included with each drain.

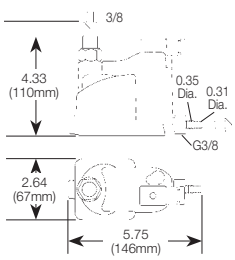
Where Are Condensate Drains Used?



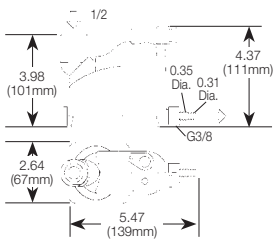
Compressor with Aftercooler	Receiver Tank	Filter	Air Dryer	Drip Leg
Removes the condensate that is collected after the air cools in the aftercooler	Removes the condensate that is collected when the air cools inside of the receiver tank	Removes the condensate that is collected in the filter bowl	Removes the condensate that is collected in the air dryer	Point-of-use applications: removes the condensate from compressed air pipes in a plant

Dimensions

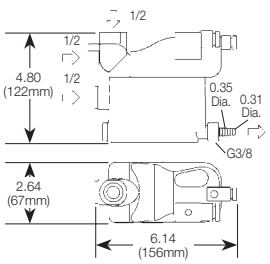
ED3002N115-K



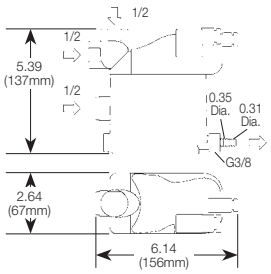
ED3004N115-K



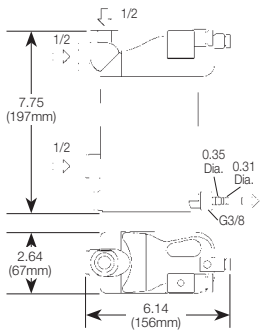
ED3007N115-K



ED3030N115-K



ED3100N115-K



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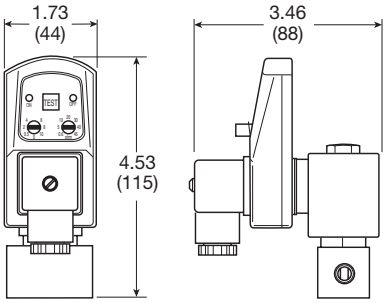
Automatic Electrical Drain Valve – WDV3-G

The WDV3 Electrical Drain is designed to remove condensate from compressors, compressed air dryers and receivers up to any size, type or manufacturer.

Benefits

- Does not air-lock during operation
- Compressed air systems up to any size
- The direct acting valve is serviceable
- Suitable for all types of compressors
- Test (micro-switch) feature
- High time cycle accuracy
- Large (4.5mm) valve orifice



Operating information

Operating pressure		230 PSIG (16 bar)
Ambient operating temperature		34°F to 130°F (1.1°C to 54°C)
Voltages		115VAC, 230/50-60Hz, 24VDC
Coil Insulation		Class H, 340°F (171.1°C)
Current Rating		4mA maximum
Timer	open time	.5 to 10 sec., adjustable
	cycle time	.5 to 45 min., adjustable

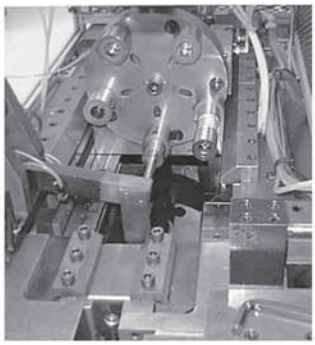
For technical information see CD

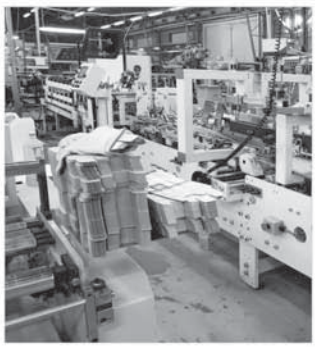
Materials

Description	
Valve Body	Brass / Stainless Steel
Enclosure (IP65 / NEMA 4)	ABS Plastic
Internal Parts	Brass / Stainless Steel
Valve Seals	FPM (Fluorocarbon)

Automatic Electrical Drain Valve

Port size	Primary voltage	Weight (kg)	Model number
1/4	120VAC	1.8 (0.8 kg)	**WDV3-G12BL**
1/4	230VAC	1.8 (0.8 kg)	**WDV3-G22BL**
3/8	120VAC	1.8 (0.8 kg)	**WDV3-G13BL**
3/8	230VAC	1.8 (0.8 kg)	**WDV3-G23BL**
1/2	120VAC	1.8 (0.8 kg)	**WDV3-G14BL**
1/2	230VAC	1.8 (0.8 kg)	**WDV3-G24BL**
1/2	24VDC	1.8 (0.8 kg)	**WDV3-G34BL**





Accessories

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Accessories

Ball Valves / Plug Valves

- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

F10

Flow Controls & Accessories

- Full range of flow controls, mufflers, silencers, drain valves, blow guns, relief, shuttle and quick exhaust valves
- Ports from M5 through 3/4 inch

F5

Hose & Fittings

- 801 General purpose hose
- Push-on hose barb fittings

F16

Integrated Fittings

- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

F11

Mufflers & Silencers

- Compact
- Lightweight
- Easy to install
- Excellent noise reduction
- Protects components from contamination
- NPT & BSPT threads available

F4

Accessories – continued

Quick Couplings

- Industrial interchange nipples –1/4" to 3/4" body size
- Sleevematic couplers –1/4" to 1/2" body size
- Saflomatic couplers –1/4" to 3/4" body size
- Economatic quick connect couplings –1/4" body size

F7

Tank Valves & Air Chucks

- Maximum operating pressure 185 PSIG
- Temperature range -40°F to 220°F
- N/P finish
- Model No. 05499 0000 ball-foot air chuck, 1/4" female port
- Model No. 06739 0000 ball-foot air chuck with clip, 1/4" female port

F3

Tubing & Fittings

- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- DOT Fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

F19

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09166 0060
1/8" pipe thread, dome shaped cap

Pipe thread	Part number
1/8	**09166 0060**

00645 0060
1/8" pipe thread at bottom, screwdriver type cap

Pipe thread	Part number
1/8	**00645 0060**

01468 0006
1/8" pipe thread part way up the stem, screwdriver type cap

Pipe thread	Part number
1/8	**01468 0006**

05499 0000
1/4" female port, ball-foot air chuck

Port size	Part number
1/4	**05499 0000**

06739 0000
1/4" port, ball-foot air chuck with clip

Port size	Part number
1/4	**00645 0000**

☐ Most popular. For technical information see CD

Mufflers / Silencers

EM Sintered Bronze Muffler / Filters

Port size	Part number
1/8	**EM12**
1/4	**EM25**
3/8	**EM37**
1/2	**EM50**
3/4	**EM75**
1	**EM100**
1-1/4	**EM125**
1-1/2	**EM150**

Muffler / Flow Controls

Port size	Part number
1/8	**04502 0002**
1/4	**04504 0004**
3/8	**04506 0060**
1/2	**04508 0080**
3/4	**04512 0012**
1	**04516 0016**

Breather Vents

NOTE: Breather vents should not be used as exhaust mufflers.

Pipe thread	Part number
1/8	**04702 0002**
1/4	**04704 0004**
3/8	**04706 0006**
1/2	**04708 0008**
3/4	**04712 0012**
1	**04716 0016**
1-1/4	**04720 0020**
1-1/2	**04724 0024**

ES Silencer

Pipe thread	Part number
1/8	**ES12MC**
1/4	**ES25MC**
3/8	**ES37MC**
1/2	**ES50MC**
3/4	**ES75MC**
1	**ES100MC**
1-1/4	**ES125MC**
1-1/2	**ES150MC**

ASN Air Line Silencer, Plastic

Thread size	Part number
M5	**AS-5**
1/8	**ASN-6**
1/4	**ASN-8**
3/8	**ASN-10**
1/2	**ASN-15**

P6M G Thread, Air Line Silencer, Plastic

Port thread	Part number
M5	**P6M-PAC5**
G1/8	**P6M-PAB1**
G1/4	**P6M-PAB2**
G3/8	**P6M-PAB3**
G1/2	**P6M-PAB4**
G3/4	**P6M-PAB6**
G1	**P6M-PAB8**

ECS Reclassifier, Air Line Muffler

Port thread	Part number
1/2	**ECS3**
1	**ECS5**

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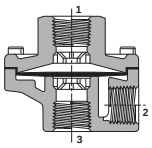
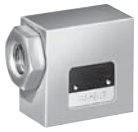
Quick Exhaust & Shuttle Valve



Port 1	Port 2	Port 3	Flow (SCFM)	Part number with panel nut
Standard version				
1/4	1/4	3/8	150	**0R25NB**
1/4	3/8	3/8	240	**0R25PB**
3/8	3/8	3/8	240	**0R37B**
1/2	1/2	1/2	450	**0R50B**
3/4	3/4	3/4	550	**0R75B**
Nitrile diaphragms				
1/8	1/8	1/8	70	**0R12B**
1/8	1/8	1/4	70	**0R12NB**
1/4	1/4	1/4	90	**0R25B**
1/4	1/4	3/8	90	**0R25NFB**
3/8	3/8	3/8	240	**0R37FB**
3/4	3/4	3/4	550	**0R75FB**
Fluorocarbon diaphragms				
1/8	1/8	1/8	70	**0R12VB**
1/8	1/8	1/4	70	**0R12NVB**
1/4	1/4	1/4	90	**0R25VB**
3/8	3/8	3/8	240	**0R37VB**
1/2	1/2	1/2	450	**0R50VB**
3/4	3/4	3/4	550	**0R75VB**
PTFE diaphragms				
3/8	3/8	3/8	240	**0R37TB**

Shuttle Valve



Port size	Part number
1/8	**N164 1001**
1/4	**N164 2003**
3/8	**N164 3003**

Relief Valve

Pressure (PSI)	Part number
***	**RV01AN*** **

***** 010 through 200 psi**

130 Relief Valve

Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	**130-02AA**	**130-02AAP**
0-25 PSIG	**130-02A**	**130-02AP**
0-50 PSIG	**130-02B**	**130-02BP**
0-100 PSIG	**130-02C**	**130-02CP**

134 Relief Valve

Spring range	Part number no panel nut	Part number with panel nut
0-15 PSIG	**134-02AA**	**134-02AAP**
0-25 PSIG	**134-02A**	**134-02AP**
0-50 PSIG	**134-02B**	**134-02BP**
0-100 PSIG	**134-02C**	**134-02CP**

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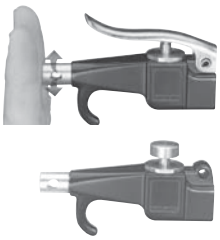
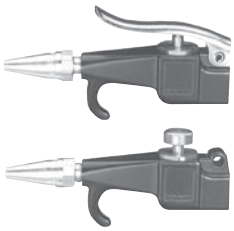
Brass Nozzle Blow Gun



Inlet port	Part number
Lever Operated	
1/4	**00475 0010**
Button Operated	
1/4	**00470 0010**

Brass Nozzle Blow Gun



Inlet port	Part number
Lever Operated	
1/4	**00475 0900**
Button Operated	
1/4	**00470 0900**

Self-Regulating Blow Gun

Inlet port	Part number
Lever Operated	
1/4	**00475 2900**

Pistol Grip Blow Gun

Inlet port	Part number
1/4	**BG441-NBL**

Brass Nozzle

Part number
00470 7020

FLO-GAIN Nozzle

Part number
W1110 0900

Automatic Drip Leg Drain

Port thread	Part number
1/4	**06D1NA**
1/2	**06D3NA**

F

Flow Controls & Accessories

☐ Most popular. For technical information see CD

Industrial Interchange Nipples

Hardened wear points and solid barstock construction provide long service life. Precision machined surfaces and hardened load-bearing areas resist the effects of mechanical shock in the most rugged applications. Industrial interchange nipples conform to MIL-C4109 and are for use with either Sleevmatic or Saflomatic couplers.

Female Pipe Thread

Body size (inches)	Thread size	Part number Steel
1/4	1/8-27	**H1C**
1/4	1/4-18	**H3C**
1/4	3/8-18	**H3C-E**
3/8	1/4-18	**H1E**
3/8	3/8-18	**H3E**
3/8	1/2-14	**H3E-F**
1/2	3/8-18	**H1F**
1/2	1/2-14	**H3F**
1/2	3/4-14	**H3F-G**
3/4	1/2-14	**H3G-F**
3/4	3/4-14	**H3G**
3/4	1-11½	**H3G-J**

Male Pipe Thread

1/4	1/8-27	**H0C**
1/4	1/4-18	**H2C**
1/4	3/8-18	**H2C-E**
3/8	1/8-27	**H00E**
3/8	1/4-18	**H0E**
3/8	3/8-18	**H2E**
3/8	1/2-14	**H2E-F**
1/2	3/8-18	**H0F**
1/2	1/2-14	**H2F**
1/2	3/4-14	**H2F-G**
3/4	1/2-14	**H2G-F**
3/4	3/4-14	**H2G**
3/4	1-11½	**H2G-J**

Standard Hose Barb

Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	**H8C**
1/4	5/16	**H8C-D**
1/4	3/8	**H9C**
3/8	3/8	**H5E**
3/8	1/2	**H6E**
1/2	3/8	**H4F**
1/2	1/2	**H5F**
1/2	3/4	**H5F-G**
3/4	1/2	**H5G-F**
3/4	3/4	**H5G**
3/4	1	**H5G-J**

Push-Lok Hose Barb*

1/4	1/4	**H8CP**
1/4	3/8	**H9CP**
3/8	1/4	**H4EP**
3/8	3/8	**H5EP**
3/8	1/2	**H6EP**
1/2	3/8	**H4FP**
1/2	1/2	**H5FP**
1/2	1/2	**H6FP**

* Push-Lok hose barbs are designed for use with a push-lok hose and do not require clamps.

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F
Quick Connect Couplers Accessories

Sleevmatic Couplers

Female Pipe Thread

Body size (inches)	Thread size	Part number Brass	Steel
1/4	1/8-27	**B23A**	—
1/4	1/4-18	**B23**	—
1/4	3/8-18	**B23E**	—
3/8	1/4-18	—	**25C**
3/8	3/8-18	—	**25**
3/8	1/2-14	—	**25F**
1/2	3/8-18	—	**17E**
1/2	1/2-14	—	**17**
1/2	3/4-14	—	**17G**

Male Pipe Thread

Body size (inches)	Thread size	Part number Brass	Steel
1/4	1/4-18	**B22**	—
1/4	3/8-18	**B22E**	—
3/8	1/4-18	—	**24C**
3/8	3/8-18	—	**24**
3/8	1/2-14	—	**24F**
1/2	3/8-18	—	**16E**
1/2	1/2-14	—	**16**
1/2	3/4-14	—	**16G**

Standard Hose Barb

Body size (inches)	Hose I.D.	Part number Brass	Steel
1/4	1/4	**B20-3B**	—
1/4	5/16	**B20-4B**	—
1/4	3/8	**B20-5B**	—
3/8	3/8	—	**24-5B**
3/8	1/2	—	**24-6B**
1/2	3/8	—	**16-5B**
1/2	1/2	—	**16-6B**
1/2	3/4	—	**16-7B**

Push-Lok Hose Barb*

Body size (inches)	Hose I.D.	Part number Brass	Steel
1/4	3/8	**B20-5BP**	—
3/8	3/8	—	**24-5BP**
1/2	3/8	—	**16-5BP**
1/2	1/2	—	**16-6BP**

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Saflomatic Couplers

Female Pipe Thread

Body size (inches)	Thread size	Part number Brass
1/4	1/8-27	**B33A**
1/4	1/4-18	**B33**
1/4	3/8-18	**B33E**
3/8	1/4-18	**B35C**
3/8	3/8-18	**B35**
3/8	1/2-14	**B35F**
1/2	3/8-18	**B37E**
1/2	1/2-14	**B37**
1/2	3/4-14	**B37G**
3/4	1/2-14	**B39F**
3/4	3/4-14	**B39**
3/4	1-11½	**B39J**

Male Pipe Thread

Body size (inches)	Thread size	Part number Brass
1/4	1/8-27	**B32A**
1/4	1/4-18	**B32**
1/4	3/8-18	**B32E**
3/8	1/4-18	**B34C**
3/8	3/8-18	**B34**
3/8	1/2-14	**B34F**
1/2	3/8-18	**B36E**
1/2	1/2-14	**B36**
1/2	3/4-14	**B36G**
3/4	3/4-14	**B38**
3/4	1-11½	**B38J**

Standard Hose Barb

Body size (inches)	Hose I.D.	Part number Brass
1/4	1/4	**B30-3B**
1/4	5/16	**B30-4B**
1/4	3/8	**B30-5B**
3/8	3/8	**B34-5B**
3/8	1/2	**B34-6B**
1/2	1/2	**B36-6B**
1/2	3/4	**B36-7B**
3/4	3/4	**B38-7B**
3/4	1	**B38-8B**

Push-Lok Hose Barb*

Body size (inches)	Thread size	Part number Brass
1/4	1/4	**B30-3BP**
1/4	3/8	**B30-5BP**
3/8	3/8	**B34-5BP**
1/2	1/2	**B36-6BP**

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

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Couplers Female Pipe Thread

Body size (inches)	Thread size	Part number Brass
1/4	1/4-18 NPTF	**B53**
1/4	3/8-18 NPTF	**B53E**

Couplers Male Pipe Thread

Body size (inches)	Thread size	Part number Brass
1/4	1/4-18	**B52**
1/4	3/8-18	**B52E**

Couplers Push-Lok Hose Barb*

Body size (inches)	Hose I.D.	Part number Brass
1/4	1/4	**B50-03BP**
1/4	3/8	**B50-05BP**

* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Nipples Female Pipe Thread

Body size (inches)	Thread size	Part number Steel
1/4	1/4-18	**A3C**

Nipples Male Pipe Thread

Body size (inches)	Thread size	Part number Steel
1/4	1/4-18	**A2C**

Nipples Standard Hose Barb

Body size (inches)	Hose I.D.	Part number Steel
1/4	1/4	**A8C**

Nipples Push-Lok Hose Barb*

Body size (inches)	Thread size	Part number Steel
1/4	1/4	**A8CP**

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Female-Female Pipe Ends XV500P

Pipe thread	Flow dia.	Part number
1/4	.375	**XV500P-4**
3/8	.375	**XV500P-6**
1/2*	.500	**XV500P-8**
3/4**	.685	**XV500P-12**
1**	.875	**XV500P-16**

Female Pipe Ends, Lever Handle, Mini Ball Valve MV200

Pipe thread	Flow dia.	Part number
1/8	.31	**MV200-2**
1/4	.31	**MV200-4**
3/8	.31	**MV200-6**
1/2	.39	**MV200-8**

Male-Female Pipe Ends, Compact Handle, Mini Ball Valve MV608

Pipe thread	Flow dia.	Part number
1/8	.20	**MV608-2**
1/4	.31	**MV608-4**
3/8	.31	**MV608-6**
1/2	.39	**MV608-8**

Female Pipe Ends, Compact Handle, Mini Ball Valve MV609

Pipe thread	Flow dia.	Part number
1/8	.24	**MV609-2**
1/4	.31	**MV609-4**
3/8	.31	**MV609-6**
1/2	.39	**MV609-8**
3/8x1/4	.31	**MV609-6-4**

Female Pipe Ends, Panel Mount XV502SS

Pipe thread	Flow dia.	Part number
1/4	.380	**XV502SS-4**
3/8	.380	**XV502SS-6**
1/2	.500	**XV502SS-8**
3/4	.790	**XV502SS-12**
1	1.000	**XV502SS-16**
1-1/4	1.250	**XV502SS-20**
1-1/2	1.500	**XV502SS-24**
2	2.000	**XV502SS-32**

Male Pipe to Male Pipe Plug Valve PV607

Pipe thread	Flow dia.	Part number
1/8	.200	**PV607-2**
1/4	.200	**PV607-4**

Female Pipe to Male Pipe Plug Valve PV608

Pipe thread	Flow dia.	Part number
1/8	.200	**PV608-2**
1/4	.200	**PV608-4**

Female Pipe to Female Pipe Plug Valve PV609

Pipe thread	Flow dia.	Part number
1/8	.200	**PV609-2**
1/4	.200	**PV609-4**

Internal Seal Drain Cock DC602

Temperature Range: -65° to 250°F

Pipe thread	Part number
1/8	**DC602-2**
1/4	**DC602-4**

External Seal Drain Cock DC604

Temperature Range: -25° to 250°F

Pipe thread	Part number
1/8	**DC604-2***
1/4	**DC604-4**
3/8	**DC604-6***

* When assembled handle wings are down facing

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FCC731 Compact Meter Out

Tube size (in)	NPT	Part number
5/32	1/8	**FCC731-5/32-2**
5/32	1/4	**FCC731-5/32-4**
1/4	1/8	**FCC731-4-2**
1/4	1/4	**FCC731-4-4**
3/8	1/4	**FCC731-6-4**
3/8	3/8	**FCC731-6-6**

FC731 Compact Meter Out - BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**FC731-4M-2G**
6	1/8	**FC731-6M-2G**
6	1/4	**FC731-6M-4G**
8	1/8	**FC731-8M-2G**
8	1/4	**FC731-8M-4G**
8	3/8	**FC731-8M-6G**
10	1/4	**FC731-10M-4G**
10	3/8	**FC731-10M-6G**
12	3/8	**FC731-12M-6G**
12	1/2	**FC731-12M-8G**

FCCB731 Compact Bi-Directional Flow Control

Tube size (in)	NPT	Part number
5/32	1/8	**FCCB731-5/32-2**
1/4	1/8	**FCCB731-4-2**
1/4	1/4	**FCCB731-4-4**

FCCB731 Compact Bi-directional Flow Control - BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**FCCB731-4M-2G**
6	1/8	**FCCB731-6M-2G**
6	1/4	**FCCB731-6M-4G**
8	1/8	**FCCB731-8M-2G**
8	1/4	**FCCB731-8M-4G**
8	3/8	**FCCB731-8M-6G**

FCKC731 Knobless Meter Out Flow Control

Tube size (in)	NPT / UNF	Part number
1/8	10-32	**FCKC731-2-0**
1/8	1/8	**FCKC731-2-2**
5/32	10-32	**FCKC731-5/32-0**
5/32	1/8	**FCKC731-5/32-2**
1/4	10-32	**FCKC731-4-0**
1/4	1/8	**FCKC731-4-2**
1/4	1/4	**FCKC731-4-4**
5/16	1/8	**FCKC731-5-2**
5/16	1/4	**FCKC731-5-4**
3/8	1/4	**FCKC731-6-4**
3/8	3/8	**FCKC731-6-6**

FCKC731 Knobless Compact Flow Control - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**FCKC731-4M-M5**
4	1/8	**FCKC731-4M-2G**
6	M5x0.8	**FCKC731-6M-M5**
6	1/8	**FCKC731-6M-2G**
6	1/4	**FCKC731-6M-4G**
8	1/8	**FCKC731-8M-2G**
8	1/4	**FCKC731-8M-4G**
8	3/8	**FCKC731-8M-6G**
10	1/4	**FCKC731-10M-4G**
10	3/8	**FCKC731-10M-6G**
10	1/2	**FCKC731-10M-8G**
12	3/8	**FCKC731-12M-6G**
12	1/2	**FCKC731-12M-8G**

FCKCB731 Knobless Bi-directional Flow Control - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	**FCKCB731-4M-M5**
4	1/8	**FCKCB731 -4M-2G**
6	M5x0.8	**FCKCB731 -6M-M5**
6	1/8	**FCKCB731 -6M-2G**
6	1/4	**FCKCB731 -6M-4G**
8	1/8	**FCKCB731 -8M-2G**
8	1/4	**FCKCB731 -8M-4G**
8	3/8	**FCKCB731 -8M-6G**

FCM731 Miniature Meter Out Flow Control

Tube size (in)	NPT	Part number
1/8	10-32	**FCM731-2-0**
1/8	1/8	**FCM731-2-2**
5/32	10-32	**FCM731-5/32-0**
5/32	1/8	**FCM731-5/32-2**
1/4	10-32	**FCM731-4-0**
1/4	1/8	**FCM731-4-2**
1/4	1/4	**FCM731-4-4**

FCM731 Miniature Flow Control - BSPP

Tube size (mm)	BSPP	Part number
3	M3x0.5	**FCM731-3M-M3**
3	M5x0.8	**FCM731-3M-M5**
4	M3x0.5	**FCM731-4M-M3**
4	M5x0.8	**FCM731-4M-M5**
4	1/8	**FCM731-4M-2G**
6	M5x0.8	**FCM731-6M-M5**
6	1/8	**FCM731-6M-2G**
6	1/4	**FCM731-6M-4G**
8	1/8	**FCM731-8M-2G**
8	1/4	**FCM731-8M-4G**
8	3/8	**FCM731-8M-6G**

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FCMB731 Miniature Bi-directional Flow Control - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**FCMB731-4M-M5**
4	1/8	**FCMB731-4M-2G**
6	M5x0.8	**FCMB731-6M-M5**
6	1/8	**FCMB731-6M-2G**
6	1/4	**FCMB731-6M-4G**

FCMK731 Knobless Mini Meter Out Flow Control

Tube size (in)	NPT	Part number
1/8	10-32	**FCMK731-2-0**
1/8	1/8	**FCMK731-2-2**
5/32	10-32	**FCMK731-5/32-0**
5/32	1/8	**FCMK731-5/32-2**
1/4	10-32	**FCMK731-4-0**
1/4	1/8	**FCMK731-4-2**
1/4	1/4	**FCMK731-4-4**

FCCS731 Compact Swivel Outlet Flow Control

Tube size (in)	NPT	Part number
1/4	1/8	**FCCS731-4-2**
1/4	1/4	**FCCS731-4-4**
3/8	1/4	**FCCS731-6-4**
3/8	3/8	**FCCS731-6-6**

FCMS731 Mini Swivel Outlet Flow Control

Tube size (in)	NPT	Part number
5/32	10-32	**FCMS731-5/32-0**
5/32	1/8	**FCMS731-5/32-2**

FCMS731 Miniature Swivel Outlet - BSPP

Tube size (mm)	NPT	Part number
4	M5x0.8	**FCMS731-4M-M5**
4	1/8	**FCMS731-4M-2G**
6	M5x0.8	**FCMS731-6M-M5**
6	1/8	**FCMS731-6M-2G**

FCCS731 Compact Swivel Outlet - BSPP

Tube size (mm)	BSPP	Part number
6	1/8	**FCCS731-6M-2G**
6	1/4	**FCCS731-6M-4G**
8	1/8	**FCCS731-8M-2G**
8	1/4	**FCCS731-8M-4G**
10	3/8	**FCCS731-8M-6G**
10	1/4	**FCCS731-10M-4G**
10	3/8	**FCCS731-10M-6G**
12	3/8	**FCCS731-12M-6G**
12	1/2	**FCCS731-12M-8G**

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FCMSP731 Plug-In Mini Flow Control

Tube size (in)	Part number
1/8	**FCMSP731-2**
5/32	**FCMSP731-5/32**
1/4	**FCMSP731-4**

FCMSP701 Plug-In Miniature Flow Control

Tube size (mm)	Part number
4	**FCMSP701-4M**
6	**FCMSP701-6M**

FCCSP731 Plug-In Compact Flow Control

Tube size (mm)	Part number
6	**FCCSP731-6M**
8	**FCCSP731-8M**
10	**FCCSP731-10M**
12	**FCCSP731-12M**

FC832 In-Line Flow Control

Tube size (in)	Part number
5/32	**FC832-5/32**
1/4	**FC832-4**
5/16	**FC832-5**
3/8	**FC832-6**
1/2	**FC832-8**

FC832 In-Line Flow Control

Tube size (mm)	Part number
4	**FC832-4M**
6	**FC832-6M**
8	**FC832-8M**
10	**FC832-10M**
12	**FC832-12M**

FCB832 In-Line Bi-directional Flow Control

Tube size (in)	Part number
5/32	**FCB832-5/32**
1/4	**FCB832-4**
5/16	**FCB832-5**

FCB832 In-Line Bi-directional Flow Control

Tube size (mm)	Part number
4	**FCB832-4M**
6	**FCB832-6M**
8	**FCB832-8M**

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FCPM832 In-Line Panel Mountable Flow Control

Tube size (mm)	Part number
4	FCPM832-4M
6	FCPM832-6M
8	FCPM832-8M
10	FCPM832-10M
12	FCPM832-12M

FC836 Threaded In-Line Flow Control

NPT	Part number
1/8	FC836-2
1/4	FC836-4
3/8	FC836-6
1/2	FC836-8

FC836 Threaded In-Line Flow Control - BSPP

BSPP	Part number
1/8	FC836-2G
1/4	FC836-4G
3/8	FC836-6G
1/2	FC836-8G

337 Micrometer Flow Control Valves

Port size	Part number.
1/8"	00337 1000
1/4"	00337 1001
3/8"	00337 1002
1/2"	00337 1003
3/4"	00337 1004

337 Micrometer Flow Control Valves - BSPP

Port size	Part number
1/8"	00337G1000
1/4"	00337G1001

338 Bi-directional Flow Control Valves

Port size	Part number
1/8"	00338 1100
1/4"	00338 1101
3/8"	00338 1102
1/2"	00338 1103
3/4"	00338 1104

338 Bi-directional Flow Control Valves - BSPP

Port size	Part number
1/8"	00338G1100
1/4"	00338G1101

3250 Flow Control Valves

Port size	Part number
1/8"	03250 0119
1/4"	03250 0219
3/8"	03250 0319
1/2"	03250 0419
3/4"	03250 0519

3250 Flow Control Valves - BSPP

Port size	Part number
1/8"	3250G0119
1/4"	3250G0219
3/8"	3250G0319
1/2"	3250G0419
3/4"	3250G0519

3250 Flow Control Valves

Port size	Part number
1"	3250G1000
1-1/4"	3250G1250
1-1/2"	3250G1500

3250 Flow Control Valves - BSPP

Port size	Part number
1"	03250 1000
1-1/4"	03250 1250
1-1/2"	03250 1500

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3251 Series Flow Control Valves

Thread (NPT) Male	Thread (NPT) Female	Right angle flow control valves
1/8	1/8	**03251 0125**
1/4	1/4	**03251 0250**
3/8	3/8	**03251 0375**
1/2	1/2	**03251 0500**

		With Prestolok Fittings
1/8	5/32	**03251 1215**
1/8	1/4	**03251 1225**
1/4	1/4	**03251 2525**
1/4	3/8	**03251 2538**
3/8	3/8	**03251 3838**

CAUTION: If it is possible that the ambient temperature may fall below freezing, the medium must be moisture-free to prevent internal damage or unpredictable behavior.

FC705 Push-to-Connect Metal Flow Control

Tube size (in)	NPT	Part number
5/32	1/8	**FC705-5/32-2**
1/4	1/8	**FC705-4-2**
1/4	1/4	**FC705-4-4**
3/8	1/4	**FC705-6-4**
3/8	3/8	**FC705-6-6**

FC701 Push-to-Connect Metal Flow Control - BSPP

Tube Size (mm)	BSPP	Part number
4	1/8	**FC701-4M-2G**
6	1/8	**FC701-6M-2G**
6	1/4	**FC701-6M-4G**
8	1/8	**FC701-8M-2G**
8	1/4	**FC701-8M-4G**
8	3/8	**FC701-8M-6G**
10	1/4	**FC701-10M-4G**
10	3/8	**FC701-10M-6G**
12	3/8	**FC701-12M-6G**
12	1/2	**FC701-12M-8G**
14	1/2	**FC701-14M-8G**

FC708 Threaded Port Meter Out Flow Control

NPT	Part number
1/8	**FC708-2**
1/4	**FC708-4**
3/8	**FC708-6**
1/2	**FC708-8**

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FC702 Threaded Port Metal Flow Control - BSPP

BSPP	Part number
1/8	**FC702-2G**
1/4	**FC702-4G**
3/8	**FC702-6G**
1/2	**FC702-8G**

32PLCK In-Line Check Valve

Tube size (in)	Part number
5/32	**32PLCK-5/32**
1/4	**32PLCK-4**
5/16	**32PLCK-5**
3/8	**32PLCK-6**

32PLCK In-Line Check Valve

Tube size (mm)	Part number
4	**32PLCK-4M**
6	**32PLCK-6M**
8	**32PLCK-8M**
10	**32PLCK-10M**
12	**32PLCK-12M**

W68PLCK Male Check Valve

Tube size (in)	NPT / UNF	Part number
5/32	10-32	**68PLCK-5/32-0**
5/32	1/8	**W68PLCK-5/32-2**
1/4	1/8	**W68PLCK-4-2**
1/4	1/4	**W68PLCK-4-4**
3/8	1/4	**W68PLCK-6-4**
3/8	3/8	**W68PLCK-6-6**

W68PLCKI Male Check Valve - Meter In

Tube size (in)	NPT / UNF	Part number
5/32	10-32	**68PLCKI-5/32-0**
5/32	1/8	**W68PLCKI-5/32-2**
1/4	1/8	**W68PLCKI-4-2**
1/4	1/4	**W68PLCKI-4-4**
3/8	1/4	**W68PLCKI-6-4**
3/8	3/8	**W68PLCKI-6-6**

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68PLCK Male Check Valve Meter Out - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**68PLCK-4M-M5**
4	1/8	**68PLCK-4M-2G**
6	1/8	**68PLCK-6M-2G**
6	1/4	**68PLCK-6M-4G**
8	1/8	**68PLCK-8M-2G**
8	1/4	**68PLCK-8M-4G**

68PLCKI Male Check Valve Meter In - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**68PLCKI-4M-M5**
6	1/8	**68PLCKI-6M-2G**
8	1/8	**68PLCKI-8M-2G**
8	1/4	**68PLCKI-8M-4G**
10	3/8	**68PLCKI-10M-6G**
12	3/8	**68PLCKI-12M-6G**
12	1/2	**68PLCKI-12M-8G**

VC – Check Valve

Tube size (in)	O.D.	Part number
1/4	.66	**A4VC4-MG**
5/16	.70	**A5VC5-MG**
3/8	.80	**A6VC6-MG**

339 Check Valve

Port size	Part number
1/8"	**00339 3000**
1/4"	**00339 3001**
3/8"	**00339 3002**
1/2"	**00339 3003**
3/4"	**00339 3004**

339 Check Valve - BSPP

Port size	Part number
1/8"	**00339G3000**
1/4"	**00339G3001**

3047 Check Valve

Pipe thread	Part number
1/4"	**03047 0099**

FC601 Push-to-Connect Lock Out Valves

Tube size (in)	NPT	Part number
1/4	1/8	**FC601-4-2**
1/4	1/4	**FC601-4-4**
3/8	3/8	**FC601-6-6**
1/2	1/2	**FC601-8-8**

FC601 Push-to-Connect Lock-Out Valve - BSPP

Tube size (mm)	BSPP	Part number
6	1/8	**FC601-6M-2G**
6	1/4	**FC601-6M-4G**
8	1/4	**FC601-8M-4G**
8	3/8	**FC601-8M-6G**
10	3/8	**FC601-10M-6G**
12	1/2	**FC601-12M-8G**

FC602 Threaded Port Lock Out Valves

NPT 1	NPT 2	Part number
1/4	1/8	**FC602-2**
1/4	1/4	**FC602-4**
3/8	3/8	**FC602-6**
1/2	1/2	**FC602-8**

FC608 Threaded Port Lock-Out Valve - BSPP

BSPP 1	BSPP 2	Part number
1/8	1/4	**FC608-4G-2G**
1/4	1/4	**FC608-4G-4G**
3/8	3/8	**FC608-6G-6G**
1/2	1/2	**FC608-8G-8G**

PSBJ731 Pneumatic Threshold Sensor - 5/32 Pilot

NPT / UNF	Part number
10-32	**PSBJ731-0**
1/8	**PSBJ731-2**
1/4	**PSBJ731-4**
3/8	**PSBJ731-6**
1/2	**PSBJ731-8**

PSBJ731 Pneumatic Threshold Sensor - 4mm Pilot

BSPP	Part number
M5x0.8	**PSBJ731-M5**
1/8	**PSBJ731-2G**
1/4	**PSBJ731-4G**
3/8	**PSBJ731-6G**
1/2	**PSBJ731-8G**

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PSPJ731 Pneumatic Threshold Sensor - 10-32 Pilot

NPT	Part number
1/8	**PSPJ731-2**
1/4	**PSPJ731-4**
3/8	**PSPJ731-6**

PSBJ708 Pneumatic Threshold Sensor - M5 Pilot

BSPP	Part number
1/8	**PSBJ708-2G**
1/4	**PSBJ708-4G**

PSPE701 Pneumatic / Electric Threshold Sensor - BSPP

BSPP	Part number
M5x0.8	**PSPE701-M5**
1/8	**PSPE701-2G**
1/4	**PSPE701-4G**
3/8	**PSPE701-6G**
1/2	**PSPE701-8G**

Hose & Fittings

801 General Purpose Hose

Hose I.D. Inch	Hose I.D. mm	Hose O.D. Inch	Hose O.D. mm	Reel Length	Part number
1/4	6.3	0.50	12.7	600 feet	**801-4-***-RL**
3/8	10	0.63	15.9	450 feet	**801-6-***-RL**
1/2	12,5	0.78	19.8	300 feet	**801-8-***-RL**
5/8	16	0.91	23.0	250 feet	**801-10-***-RL**
3/4	19	1.03	26.2	200 feet	**801-12-***-RL**
1	25	1.28	32.6	200 feet	**801-16-***-RL**

***** Available Colors**

GRA = gray
RED = red
YEL = yellow
BLU = blue
GRN = green
BLK = black

30182 Push-on Hose Barb to Male Pipe

Thread (in)	Hose size (in)	Part number
1/8 x 27	1/4	**30182-2-4B**
1/4 x 18	1/4	**30182-4-4B**
1/4 x 18	3/8	**30182-4-6B**
3/8 x 18	3/8	**30182-6-6B**
1/2 x 14	3/8	**30182-8-6B**
3/8 x 18	1/2	**30182-6-8B**
1/2 x 14	1/2	**30182-8-8B**
1/2 x 14	5/8	**30182-8-10B**
3/4 x 14	1/2	**30182-12-8B**
3/4 x 14	3/4	**30182-12-12B**

30282 Push-on Hose Barb to Female Pipe

Thread (in)	Hose Size (in)	Part number
1/4 x 18	1/4	**30282-4-4B**
3/8 x 18	3/8	**30282-6-6B**
1/2 x 14	1/2	**30282-8-8B**

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30482 Push-on Hose Barb to Male SAE 45°

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	**30482-4-4B**
1/2 x 20	1/4	**30482-5-4B**
5/8 x 18	3/8	**30482-6-6B**
3/4 x 16	1/2	**30482-8-8B**

30682 Push-on Hose Barb to Female SAE JIC 37° Swivel

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	**30682-4-4B**
1/2 x 12	1/4	**30682-5-4B**
9/16 x 18	1/4	**30682-6-6B**
3/4 x 16	3/8	**30682-8-6B**
3/4 x 16	1/2	**30682-8-8B**
7/8 x 14	1/2	**30682-10-8B**
7/8 x 14	5/8	**30682-10-10B**
1-1/16 x 12	3/4	**30682-12-12B**

30882 Push-on Hose Barb to Female SAE 45° Swivel

Thread (in)	Hose Size (in)	Part number
7/16 x 20	1/4	**30882-4-4B**
1/2 x 20	1/4	**30882-5-4B**
5/8 x 18	3/8	**30882-6-6B**
3/4 x 16	3/8	**30882-8-6B**
3/4 x 16	1/2	**30882-8-8B**
7/8 x 14	1/2	**30882-10-8B**
7/8 x 14	5/8	**30882-10-10B**
1-1/16 x 14	3/4	**30882-12-12B**

31382 Push-on Hose Barb to Male Pipe Swivel

Thread (in)	Hose Size (in)	Part number
1/4 x 18	1/4	**31382-4-4**
3/8 x 18	3/8	**31382-6-6**
1/2 x 14	1/2	**31382-8-8***

* Steel

38282 Push-on Hose Barb Union

Hose size (in)	Part number
1/4	**38282-4-4B**
3/8	**38282-6-6B**
1/2	**38282-8-8B**

37G82 Push-on Hose Barb to Female Pipe (NPSM) Swivel with Gasket

Thread (in)	Hose size (in)	Gasket	Part number
1/4- 18	1/4	07G-4	**37G82-4-4**
1/4- 18	3/8	07G-4	**37G82-4-6**
3/8- 18	3/8	07G-6	**37G82-6-6**
1/2- 14	1/2	07G-8	**37G82-8-8**
1/2- 14	5/8	07G-8	**37G82-8-10**
3/4- 14	3/4	07G-12	**37G82-12-12**

Tubing

E Instrument Grade Tubing

O.D.	I.D.	Reel length (feet)	Part number
1/4	.170	100	**E-43-0100**
1/4	.170	500	**E-43-0500**
1/4	.170	1000	**E-43-1000**
1/4	.170	100	**EB-43-0100**
1/4	.170	500	**EB-43-0500**
1/4	.170	1000	**EB-43-1000**
1/4	.170	100	**E-43-R-0100**
1/4	.170	500	**E-43-R-0500**
1/4	.170	100	**E-43-B-0100**
1/4	.170	500	**E-43-B-0500**
1/4	.170	500	**E-43-O-0500**
1/4	.170	500	**E-43-Y-0500**
1/4	.170	500	**E-43-P-0500**
1/4	.170	500	**E-43-G-0500**
5/16	.187	500	**E-53-0500**
5/16	.187	500	**EB-53-0500**
3/8	.250	100	**E-64-0100**
3/8	.250	500	**E-64-0500**
3/8	.250	100	**EB-64-0100**
3/8	.250	500	**EB-64-0500**
3/8	.250	500	**E-64-R-0500**
3/8	.250	500	**E-64-B-0500**
3/8	.250	500	**E-64-O-0500**
3/8	.250	500	**E-64-Y-0500**
3/8	.250	500	**E-64-P-0500**
3/8	.250	500	**E-64-G-0500**
1/2	.375	100	**E-86-0100**
1/2	.375	100	**EB-86-0100**
5/8	.500	100	**E-108-0100**
5/8	.500	Coil	**EB-108-0100**

N Flexible Tubing

O.D.	I.D.	Reel length (feet)	Part number
1/8	.093	250	**NN-2-016**
1/8	.093	250	**NB-2-016**
1/8	.064	250	**NN-2-031**
1/8	.064	250	**NB-2-031**
5/32	.106	250	**NN-2.5-025**
5/32	.106	250	**NB-2.5-025**
3/16	.138	250	**NN-3-025**
3/16	.138	250	**NB-3-025**
3/16	.096	250	**NN-3-046**
3/16	.096	250	**NB-3-046**
1/4	.180	250	**NN-4-035**
1/4	.180	250	**NB-4-035**
1/4	.170	250	**NN-4-040**
1/4	.170	250	**NB-4-040**
1/4	.127	250	**NN-4-062**
1/4	.127	250	**NB-4-062**
5/16	.233	250	**NN-5-040**
5/16	.233	250	**NB-5-040**
3/8	.275	250	**NN-6-050**
3/8	.275	250	**NB-6-050**
3/8	.190	250	**NN-6-093**
3/8	.190	250	**NB-6-093**
1/2	.375	250	**NN-8-062**
1/2	.375	250	**NB-8-062**
1/2	.253	250	**NN-8-124**
1/2	.253	250	**NB-8-124**

*Suggested working pressure is 1/4 of burst pressure.

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PEFR Flame Resistant Tubing

O.D.	I.D.	Reel length (feet)	Part number
5/32	.096	500	**PEFR-2.5-0500**
1/4	.170	500	**PEFR-4-0500**
1/4	.170	1000	**PEFR-4-1000**
3/8	.250	500	**PEFR-6-0500**
1/2	.375	250	**PEFR-8-0250**

NR Semi-rigid High Strength Tubing

O.D.	I.D.	Reel length (feet)	Part number
1/8	.091	500	**NNR-2-017**
1/8	.091	500	**NBR-2-017**
1/8	.073	500	**NNR-2-026**
1/8	.073	500	**NBR-2-026**
3/16	.140	500	**NNR-3-024**
3/16	.140	500	**NBR-3-024**
3/16	.110	500	**NNR-3-039**
3/16	.110	500	**NBR-3-039**
1/4	.180	250	**NNR-4-035**
1/4	.180	250	**NBR-4-035**
1/4	.150	250	**NNR-4-050**
1/4	.150	250	**NBR-4-050**
5/16	.233	250	**NNR-5-040**
5/16	.233	250	**NBR-5-040**
3/8	.279	250	**NNR-6-048**
3/8	.279	250	**NBR-6-048**
3/8	.225	250	**NNR-6-075**
3/8	.225	250	**NBR-6-075**
1/2	.376	250	**NNR-8-062**
1/2	.376	250	**NBR-8-062**
1/2	.350	250	**NNR-8-075**
1/2	.350	250	**NBR-8-075**

*Suggested working pressure is 1/4 of burst pressure.

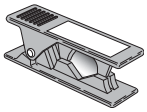
U Polyether Base Tubing

O.D.	I.D.	Reel length (feet)	Part number
1/8	1/16	500	**U-21-0500**
		250	**U-21-0250**
1/4	1/8	500	**U-42-0500**
		250	**U-42-0250**
3/8	1/4	250	**U-64-0250**
		100 (coil)	**U-64-0100**
1/2	3/8	250	**U-86-0250**
		100 (coil)	**U-86-0100**

* Colors: Clear-Blank, Black-BLK, Green-GRN, Red-RED, Yellow-YEL, Blue-BLU, Orange-ORG, Gray-GRA

** Based on a full 4:1 safety factor.

Plastic Tube Cutter



Part number
PTC-001

Replacement Blades

Part number
PTC-001RB

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W369PLP Male Elbow Swivel 90°

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**369PLP-2-0**
1/8	1/16	**W369PLP-2-1**
1/8	1/8	**W369PLP-2-2**
1/8	1/4	**W369PLP-2-4**
5/32	10-32	**369PLP-5/32-0**
5/32	1/8	**W369PLP-5/32-2**
5/32	1/4	**W369PLP-5/32-4**
3/16	1/8	**W369PLP-3-2**
1/4	10-32	**369PLP-4-0**
1/4	1/8	**W369PLP-4-2**
1/4	1/4	**W369PLP-4-4**
1/4	3/8	**W369PLP-4-6**
5/16	1/8	**W369PLP-5-2**
5/16	1/4	**W369PLP-5-4**
5/16	3/8	**W369PLP-5-6**
3/8	1/8	**W369PLP-6-2**
3/8	1/4	**W369PLP-6-4**
3/8	3/8	**W369PLP-6-6**
3/8	1/2	**W369PLP-6-8**
1/2	1/4	**W369PLP-8-4**
1/2	3/8	**W369PLP-8-6**
1/2	1/2	**W369PLP-8-8**

W369PLPX Extended Male Elbow

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**369PLPX-2-0**
1/8	1/8	**W369PLPX-2-2**
1/8	1/4	**W369PLPX-2-4**
5/32	10-32	**369PLPX-5/32-0**
5/32	1/8	**W369PLPX-5/32-2**
5/32	1/4	**W369PLPX-5/32-4**
1/4	10-32	**369PLPX-4-0**
1/4	M7	**369PLPX-4-M7**
1/4	1/8	**W369PLPX-4-2**
1/4	1/4	**W369PLPX-4-4**
1/4	3/8	**W369PLPX-4-6**
5/16	1/8	**W369PLPX-5-2**
5/16	1/4	**W369PLPX-5-4**
3/8	1/8	**W369PLPX-6-2**
3/8	1/4	**W369PLPX-6-4**
3/8	3/8	**W369PLPX-6-6**

W379PLP Male Elbow 45°

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**379PLP-2-0**
1/8	1/8	**W379PLP-2-2**
1/4	1/8	**W379PLP-4-2**
1/4	1/4	**W379PLP-4-4**
1/4	M7	**W379PLP-4-M7**
3/8	1/4	**W379PLP-6-4**
3/8	3/8	**W379PLP-6-6**

W372PLP Male Branch Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**372PLP-2-0**
1/8	1/16	**W372PLP-2-1**
1/8	1/8	**W372PLP-2-2**
1/8	1/4	**W372PLP-2-4**
5/32	10-32	**372PLP-5/32-0**
5/32	1/8	**W372PLP-5/32-2**
5/32	1/4	**W372PLP-5/32-4**
3/16	1/8	**W372PLP-3-2**
1/4	1/8	**W372PLP-4-2**
1/4	1/4	**W372PLP-4-4**
1/4	3/8	**W372PLP-4-6**
5/16	1/8	**W372PLP-5-2**
5/16	1/4	**W372PLP-5-4**
5/16	3/8	**W372PLP-5-6**
3/8	1/8	**W372PLP-6-2**
3/8	1/4	**W372PLP-6-4**
3/8	3/8	**W372PLP-6-6**
3/8	1/2	**W372PLP-6-8**
1/2	1/4	**W372PLP-8-4**
1/2	3/8	**W372PLP-8-6**
1/2	1/2	**W372PLP-8-8**

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W371PLP Male Run Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**371PLP-2-0**
1/8	1/16	**W371PLP-2-1**
1/8	1/8	**W371PLP-2-2**
5/32	10-32	**371PLP-5/32-0**
5/32	1/8	**W371PLP-5/32-2**
5/32	1/4	**W371PLP-5/32-4**
3/16	1/8	**W371PLP-3-2**
1/4	1/8	**W371PLP-4-2**
1/4	1/4	**W371PLP-4-4**
1/4	3/8	**W371PLP-4-6**
5/16	1/8	**W371PLP-5-2**
5/16	1/4	**W371PLP-5-4**
5/16	3/8	**W371PLP-5-6**
3/8	1/8	**W371PLP-6-2**
3/8	1/4	**W371PLP-6-4**
3/8	3/8	**W371PLP-6-6**
3/8	1/2	**W371PLP-6-8**
1/2	1/4	**W371PLP-8-4**
1/2	3/8	**W371PLP-8-6**
1/2	1/2	**W371PLP-8-8**

W68PLPSP Male Standpipe

Tube size (in.)	Thread NPT / UNF	Part number
5/32	10-32	**68PLPSP-5/32-0**
5/32	1/8	**W68PLPSP-5/32-2**
5/32	1/4	**W68PLPSP-5/32-4**
1/4	1/8	**W68PLPSP-4-2**
1/4	1/4	**W68PLPSP-4-4**
5/16	1/8	**W68PLPSP-5-2**
5/16	1/4	**W68PLPSP-5-4**
3/8	1/8	**W68PLPSP-6-2**
3/8	1/4	**W68PLPSP-6-4**
3/8	3/8	**W68PLPSP-6-6**
1/2	3/8	**W68PLPSP-8-6**
1/2	1/2	**W68PLPSP-8-8**

W368PLP Male Y Connector

Tube size (in.)	Thread NPT / UNF	Part number
5/32	**1/8**	**W368PLP-5/32-2**
5/32	**1/4**	**W368PLP-5/32-4**
1/4	**1/8**	**W368PLP-4-2**
1/4	**1/4**	**W368PLP-4-4**
3/8	**1/4**	**W368PLP-6-4**
3/8	**3/8**	**W368PLP-6-6**

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32PLP Equal Union

Tube Size (in.)	Part number
1/8	**32PLP-2**
5/32	**32PLP-5/32**
3/16	**32PLP-3**
1/4	**32PLP-4**
5/16	**32PLP-5**
3/8	**32PLP-6**
1/2	**32PLP-8**

365PLP Union Elbow

Tube Size (in.)	Part number
1/8	**365PLP-2**
5/32	**365PLP-5/32**
3/16	**365PLP-3**
1/4	**365PLP-4**
5/16	**365PLP-5**
3/8	**365PLP-6**
1/2	**365PLP-8**

364PLP Union Tee

Tube Size (in.)	Part number
1/8	**364PLP-2**
5/32	**364PLP-5/32**
3/16	**364PLP-3**
1/4	**364PLP-4**
5/16	**364PLP-5**
3/8	**364PLP-6**
1/2	**364PLP-8**

362PLP Union Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**362PLP-2**
1/8	1/4	**362PLP-2-4**
5/32	5/32	**362PLP-5/32**
5/32	1/4	**362PLP-5/32-4**
1/4	1/4	**362PLP-4**
1/4	3/8	**362PLP-4-6**
5/16	5/16	**362PLP-5**
3/8	3/8	**362PLP-6**

362PLPD Double Y Connector

1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	**362PLPD-5/32**
5/32	1/4	**362PLPD-5/32-4**

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24PLP Multiple Tee

1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	**24PLP-4-5/32**
1/4	1/4	**24PLP-4-4**
5/16	5/32	**24PLP-5-5/32**
3/8	1/4	**24PLP-6-4**

24PLPD Double Multiple Tee

1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	5/32	**24PLPD-4-5/32**
1/4	1/4	**24PLPD-4-4**
5/16	5/32	**24PLPD-5-5/32**
3/8	1/4	**24PLPD-6-4**

347PLP Equal Cross

Tube Size (in.)	Part number
5/32	**347PLP-5/32**
1/4	**347PLP-4**
5/16	**347PLP-5**

32PLPRC Connector for 2 Tubes

Tube Size (in.)	Part number
5/32	**32PLPRC-5/32**
1/4	**32PLPRC-4**
5/16	**32PLPRC-5**

32PLPDRC Connector for 3 Tubes

Tube Size (in.)	Part number
5/32	**32PLPDRC-5/32**
5/16	**32PLPDRC-5**

377PLP Female Branch Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	1/8	**377PLP-2-2**
5/32	1/8	**377PLP-5/32-2**
5/32	1/4	**377PLP-5/32-4**
1/4	1/8	**377PLP-4-2**
1/4	1/4	**377PLP-4-4**
5/16	1/8	**377PLP-5-2**
5/16	1/4	**377PLP-5-4**
3/8	1/4	**377PLP-6-4**
1/2	3/8	**377PLP-8-6**

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370PLP Female Elbow Swivel

Tube size (in.)	Thread NPT	Part number
1/8	1/8	**370PLP-2-2**
5/32	1/8	**370PLP-5/32-2**
5/32	1/4	**370PLP-5/32-4**
1/4	1/8	**370PLP-4-2**
1/4	1/4	**370PLP-4-4**
5/16	1/8	**370PLP-5-2**
5/16	1/4	**370PLP-5-4**
3/8	1/4	**370PLP-6-4**
1/2	3/8	**370PLP-8-6**

32PLPBH Bulkhead Union

Tube Size (in.)	Part number
1/8	**32PLPBH-2**
5/32	**32PLPBH-5/32**
1/4	**32PLPBH-4**
5/16	**32PLPBH-5**
3/8	**32PLPBH-6**
1/2	**32PLPBH-8**

365PLPBH Equal Bulkhead Elbow

Tube size (in.)	Thread NPT / UNF	Part number
1/8	13	**365PLPBH-2**
5/32		**365PLPBH-5/32**
1/4	18	**365PLPBH-4**
5/16		**365PLPBH-5**
3/8	22	**365PLPBH-6**
1/2	29	**365PLPBH-8**

369PLPSP Plug-In Elbow

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**369PLPSP-2**
5/32	5/32	**369PLPSP-5/32**
5/32	1/4	**369PLPSP-5/32-4**
1/4	1/4	**369PLPSP-4**
1/4	3/8	**369PLPSP-4-6**
5/16	5/16	**369PLPSP-5**
3/8	3/8	**369PLPSP-6**
1/2	1/2	**369PLPSP-8**

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369PLPSPX Extended Plug-In Elbow

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**369PLPSPX-2**
5/32	5/32	**369PLPSPX-5/32**
1/4	1/4	**369PLPSPX-4**
5/16	5/16	**369PLPSPX-5**
3/8	3/8	**369PLPSPX-6**

379PLPSP 45° Plug-In Elbow

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**379PLPSP-2**
5/32	5/32	**379PLPSP-5/32**
1/4	1/4	**379PLPSP-4**
5/16	5/16	**379PLPSP-5**
3/8	3/8	**379PLPSP-6**

372PLPSP Plug-In Branch Tee

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**372PLPSP-2**
5/32	5/32	**372PLPSP-5/32**
1/4	1/4	**372PLPSP-4**
5/16	5/16	**372PLPSP-5**
3/8	3/8	**372PLPSP-6**
1/2	1/2	**372PLPSP-8**

371PLPSP Plug-In Run Tee

1 Tube size (in.)	2 Tube size (in.)	Part number
5/32	5/32	**371PLPSP-5/32**
1/4	1/4	**371PLPSP-4**
5/16	5/16	**371PLPSP-5**
3/8	3/8	**371PLPSP-6**
1/2	1/2	**371PLPSP-8**

362PLPSP Plug-In Y

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	1/8	**362PLPSP-2**
5/32	5/32	**362PLPSP-5/32**
1/4	1/4	**362PLPSP-4**
5/16	5/16	**362PLPSP-5**
3/8	3/8	**362PLPSP-6**

67PLP Tube End Reducer

1 Tube size (in.)	2 Tube size (in.)	Part number
1/8	5/32	**67PLP-2-5/32**
1/8	3/16	**67PLP-2-3**
1/8	1/4	**67PLP-2-4**
5/32	3/16	**67PLP-5/32-3**
5/32	1/4	**67PLP-5/32-4**
5/32	5/16	**67PLP-5/32-5**
5/32	3/8	**67PLP-5/32-6**
3/16	5/16	**67PLP-3-5**
3/16	1/4	**67PLP-3-4**
1/4	5/16	**67PLP-4-5**
1/4	3/8	**67PLP-4-6**
1/4	1/2	**67PLP-4-8**
5/16	3/8	**67PLP-5-6**
5/16	1/2	**67PLP-5-8**
3/8	1/2	**67PLP-6-8**

32PLPSP Tube Expander

1 Tube size (in.)	2 Tube size (in.)	Part number
1/4	1/8	**32PLPSP-4-2**
1/4	6M	**32PLPSP-4-6M**
1/4	5/32	**32PLPSP-4-5/32**
1/4	3/16	**32PLPSP-4-3**
3/8	1/4	**32PLPSP-6-4**

322PLPSP Barbed Connector

OD 1	OD 2	OD 3	Part No.
5/32	0.12	0.20	**322PLPSP-2-5/32**
5/32	0.20	0.28	**322PLPSP-5M-5/32**
1/4	3/16		**322PLPSP-3-4**
5/16	0.25	0.34	**322PLPSP-4-5**
3/8	0.32	0.39	**322PLPSP-5-5**
3/8	0.32	0.39	**322PLPSP-5-6**

63PLP Double Male Union

Tube size (in.)	Part number
5/32	**63PLP-5/32**
1/4	**63PLP-4**
5/16	**63PLP-5**
3/8	**63PLP-6**
1/2	**63PLP-8**

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639PLP Plug

Tube size (in.)	Part number
1/8	**639PLP-2**
5/32	**639PLP-5/32**
3/16	**639PLP-3**
1/4	**639PLP-4**
5/16	**639PLP-5**
3/8	**639PLP-6**
1/2	**639PLP-8**

W369PLP Male Elbow

Tube size (mm)	Thread NPT	Part number
4	1/8	**W369PLP-4M-2**
4	1/4	**W369PLP-4M-4**
6	1/8	**W369PLP-6M-2**
6	1/4	**W369PLP-6M-4**
8	1/8	**W369PLP-8M-2**
8	1/4	**W369PLP-8M-4**
8	3/8	**W369PLP-8M-6**
10	1/4	**W369PLP-10M-4**
10	3/8	**W369PLP-10M-6**
10	1/2	**W369PLP-10M-8**
12	3/8	**W369PLP-12M-6**
12	1/2	**W369PLP-12M-8**

W372PLP Male Branch Tee Swivel

Tube size (in.)	Thread NPT / UNF	Part number
1/8	10-32	**372PLP-2-0**
1/8	1/16	**W372PLP-2-1**
1/8	1/8	**W372PLP-2-2**
1/8	1/4	**W372PLP-2-4**
5/32	10-32	**372PLP-5/32-0**
5/32	1/8	**W372PLP-5/32-2**
5/32	1/4	**W372PLP-5/32-4**
3/16	1/8	**W372PLP-3-2**
1/4	1/8	**W372PLP-4-2**
1/4	1/4	**W372PLP-4-4**
1/4	3/8	**W372PLP-4-6**
5/16	1/8	**W372PLP-5-2**
5/16	1/4	**W372PLP-5-4**
5/16	3/8	**W372PLP-5-6**
3/8	1/8	**W372PLP-6-2**
3/8	1/4	**W372PLP-6-4**
3/8	3/8	**W372PLP-6-6**
3/8	1/2	**W372PLP-6-8**
1/2	1/4	**W372PLP-8-4**
1/2	3/8	**W372PLP-8-6**
1/2	1/2	**W372PLP-8-8**

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32PLP Union

Tube size (mm)	Part number
3	**32PLP-3M**
4	**32PLP-4M**
6	**32PLP-6M**
8	**32PLP-8M**
10	**32PLP-10M**
12	**32PLP-12M**
14	**32PLP-14M**

365PLP Union Elbow

Tube size (mm)	Part number
4	**365PLP-4M**
6	**365PLP-6M**
8	**365PLP-8M**
10	**365PLP-10M**
12	**365PLP-12M**
14	**365PLP-14M**

364PLP Union Tee

Tube size (mm)	Part number
3	**364PLP-3M**
4	**364PLP-4M**
6	**364PLP-6M**
8	**364PLP-8M**
10	**364PLP-10M**
12	**364PLP-12M**
14	**364PLP-14M**

362PLP Union Y Connector

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**362PLP-4M**
6	6	**362PLP-6M**
8	8	**362PLP-8M**
10	10	**362PLP-10M**
12	12	**362PLP-12M**
4	6	**362PLP-4M-6M**
6	8	**362PLP-6M-8M**
8	10	**362PLP-8M-10M**
10	12	**362PLP-10M-12M**

362PLPD Double Y Connector

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**362PLPD-4M**
6	6	**362PLPD-6M**
4	6	**362PLPD-4M-6M**
6	8	**362PLPD-6M-8M**

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24PLP Multiple Tee

1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	**24PLP-6M-4M**
8	4	**24PLP-8M-4M**
8	6	**24PLP-8M-6M**
10	6	**24PLP-10M-6M**
10	8	**24PLP-10M-8M**

24PLPD Double Multiple Tee

1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	**24PLPD-6M-4M**
8	4	**24PLPD-8M-4M**
8	6	**24PLPD-8M-6M**
10	6	**24PLPD-10M-6M**
10	8	**24PLPD-10M-8M**

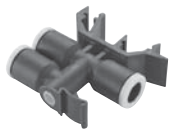
347PLP Equal Cross

Tube size (mm)	Part number
4	**347PLP-4M**
6	**347PLP-6M**
8	**347PLP-8M**

32PLPRC Connector for 2 Tubes

Tube size (mm)	Part number
4	**32PLPRC-4M**
6	**32PLPRC-6M**
8	**32PLPRC-8M**

32PLPDRC Connector for 3 Tubes



Tube size (mm)	Part number
4	**32PLPDRC-4M**
6	**32PLPDRC-6M**
8	**32PLPDRC-8M**

32PLPBH Bulkhead Union

Tube size (mm)	Part number
4	**32PLPBH-4M**
6	**32PLPBH-6M**
8	**32PLPBH-8M**
10	**32PLPBH-10M**
12	**32PLPBH-12M**
14	**32PLPBH-14M**

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365PLPBH Equal Bulkhead Elbow

Tube size (mm)	Part number
4	**365PLPBH-4M**
6	**365PLPBH-6M**
8	**365PLPBH-8M**
10	**365PLPBH-10M**
12	**365PLPBH-12M**

370PLP Female Elbow - BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**370PLP-4M-2G**
4	1/4	**370PLP-4M-4G**
6	1/8	**370PLP-6M-2G**
6	1/4	**370PLP-6M-4G**
8	1/8	**370PLP-8M-2G**
8	1/4	**370PLP-8M-4G**
8	3/8	**370PLP-8M-6G**
10	1/4	**370PLP-10M-4G**
10	3/8	**370PLP-10M-6G**
10	1/2	**370PLP-10M-8G**
12	1/4	**370PLP-12M-4G**
12	3/8	**370PLP-12M-6G**
12	1/2	**370PLP-12M-8G**

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369PLP Male Elbow - BSPP

Tube size (mm)	BSPP	Part number
3	M3x0.5	**369PLP-3M-M3**
3	M5x0.8	**369PLP-3M-M5**
4	M3x0.5	**369PLP-4M-M3**
4	M5x0.8	**369PLP-4M-M5**
4	M7x1	**369PLP-4M-M7**
4	1/8	**369PLP-4M-2G**
4	1/4	**369PLP-4M-4G**
6	M5x0.8	**369PLP-6M-M5**
6	M7x1	**369PLP-6M-M7**
6	M10x1	**369PLP-6M-M10**
6	M12x1.5	**369PLP-6M-M12**
6	1/8	**369PLP-6M-2G**
6	1/4	**369PLP-6M-4G**
6	3/8	**369PLP-6M-6G**
6	1/2	**369PLP-6M-8G**
8	M10x1	**369PLP-8M-M10**
8	M12x1.5	**369PLP-8M-M12**
8	1/8	**369PLP-8M-2G**
8	1/4	**369PLP-8M-4G**
8	3/8	**369PLP-8M-6G**
8	1/2	**369PLP-8M-8G**
10	1/4	**369PLP-10M-4G**
10	3/8	**369PLP-10M-6G**
10	1/2	**369PLP-10M-8G**
12	1/4	**369PLP-12M-4G**
12	3/8	**369PLP-12M-6G**
12	1/2	**369PLP-12M-8G**
14	3/8	**369PLP-14M-6G**
14	1/2	**369PLP-14M-8G**

379PLP 45° Male Elbow - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	**379PLP-4M-M5**
4	1/8	**379PLP-4M-2G**
6	M5x0.8	**379PLP-6M-M5**
6	1/8	**379PLP-6M-2G**
6	1/4	**379PLP-6M-4G**
8	1/8	**379PLP-8M-2G**
8	1/4	**379PLP-8M-4G**
8	3/8	**379PLP-8M-6G**
10	1/4	**379PLP-10M-4G**
10	3/8	**379PLP-10M-6G**
10	1/2	**379PLP-10M-8G**
12	1/4	**379PLP-12M-4G**
12	3/8	**379PLP-12M-6G**
12	1/2	**379PLP-12M-8G**

369PLPX Male Elbow - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**369PLPX-4M-M5**
4	M7x1	**369PLPX-4M-M7**
4	1/8	**369PLPX-4M-2G**
4	1/4	**369PLPX-4M-4G**
6	M5x0.8	**369PLPX-6M-M5**
6	M7x1	**369PLPX-6M-M7**
6	1/8	**369PLPX-6M-2G**
6	1/4	**369PLPX-6M-4G**
8	1/8	**369PLPX-8M-2G**
8	1/4	**369PLPX-8M-4G**
8	3/8	**369PLPX-8M-6G**
10	1/4	**369PLPX-10M-4G**
10	3/8	**369PLPX-10M-6G**
10	1/2	**369PLPX-10M-8G**
12	1/4	**369PLPX-12M-4G**
12	3/8	**369PLPX-12M-6G**
12	1/2	**369PLPX-12M-8G**
14	3/8	**369PLPX-14M-6G**
14	1/2	**369PLPX-14M-8G**

372PLP Male Branch Tee - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	**372PLP-4M-M5**
4	1/8	**372PLP-4M-2G**
4	1/4	**372PLP-4M-4G**
6	M5x0.8	**372PLP-6M-M5**
6	1/8	**372PLP-6M-2G**
6	1/4	**372PLP-6M-4G**
8	1/8	**372PLP-8M-2G**
8	1/4	**372PLP-8M-4G**
8	3/8	**372PLP-8M-6G**
10	1/4	**372PLP-10M-4G**
10	3/8	**372PLP-10M-6G**
10	1/2	**372PLP-10M-8G**
12	1/4	**372PLP-12M-4G**
12	3/8	**372PLP-12M-6G**
12	1/2	**372PLP-12M-8G**
14	3/8	**372PLP-14M-6G**
14	1/2	**372PLP-14M-8G**

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371PLP Male Run Tee - BSPP

Tube size (mm)	BSPP	Part number
4	M5x0.8	**371PLP-4M-M5**
4	1/8	**371PLP-4M-2G**
4	1/4	**371PLP-4M-4G**
6	M5x0.8	**371PLP-6M-M5**
6	1/8	**371PLP-6M-2G**
6	1/4	**371PLP-6M-4G**
8	1/8	**371PLP-8M-2G**
8	1/4	**371PLP-8M-4G**
8	3/8	**371PLP-8M-6G**
10	1/4	**371PLP-10M-4G**
10	3/8	**371PLP-10M-6G**
10	1/2	**371PLP-10M-8G**
12	1/4	**371PLP-12M-4G**
12	3/8	**371PLP-12M-6G**
12	1/2	**371PLP-12M-8G**
14	3/8	**371PLP-14M-6G**
14	1/2	**371PLP-14M-8G**

68PLPSP Male Standpipe - BSPP

Tube size (mm)	BSPT	Part number
4	M5x0.8	**68PLPSP-4M-M5**
4	1/8	**68PLPSP-4M-2G**
4	1/4	**68PLPSP-4M-4G**
6	1/8	**68PLPSP-6M-2G**
6	1/4	**68PLPSP-6M-4G**
8	1/8	**68PLPSP-8M-2G**
8	1/4	**68PLPSP-8M-4G**
8	3/8	**68PLPSP-8M-6G**
10	1/4	**68PLPSP-10M-4G**
10	3/8	**68PLPSP-10M-6G**
10	1/2	**68PLPSP-10M-8G**
12	3/8	**68PLPSP-12M-6G**
12	1/2	**68PLPSP-12M-8G**
14	3/8	**68PLPSP-14M-6G**
14	1/2	**68PLPSP-14M-8G**

368PLP Male Y Connector - BSPP

Tube size (mm)	BSPP / M5	Part number
4	M5x0.8	**368PLP-4M-M5**
4	1/8	**368PLP-4M-2G**
4	1/4	**368PLP-4M-4G**
6	M5x0.8	**368PLP-6M-M5**
6	1/8	**368PLP-6M-2G**
6	1/4	**368PLP-6M-4G**
8	1/8	**368PLP-8M-2G**
8	1/4	**368PLP-8M-4G**
8	3/8	**368PLP-8M-6G**
10	1/4	**368PLP-10M-4G**
10	3/8	**368PLP-10M-6G**
10	1/2	**368PLP-10M-8G**
12	3/8	**368PLP-12M-6G**
12	1/2	**368PLP-12M-8G**

368PLPD Double Y Male Connector - BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**368PLPD-4M-2G**
4	1/4	**368PLPD-4M-4G**
6	1/8	**368PLPD-6M-2G**
6	1/4	**368PLPD-6M-4G**

369PLPSP Plug-In Elbow

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**369PLPSP-4M**
6	6	**369PLPSP-6M**
8	8	**369PLPSP-8M**
10	10	**369PLPSP-10M**
12	12	**369PLPSP-12M**
4	6	**369PLPSP-4M-6M**
6	4	**369PLPSP-6M-4M**
6	8	**369PLPSP-6M-8M**
8	10	**369PLPSP-8M-10M**
10	12	**369PLPSP-10M-12M**

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369PLPXSP Extended Plug-In Elbow

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**369PLPXSP-4M**
6	6	**369PLPXSP-6M**
8	8	**369PLPXSP-8M**
10	10	**369PLPXSP-10M**
12	12	**369PLPXSP-12M**
4	6	**369PLPXSP-4M-6M**
6	8	**369PLPXSP-6M-8M**
8	10	**369PLPXSP-8M-10M**
10	12	**369PLPXSP-10M-12M**

379PLPSP 45° Plug-In Elbow

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**379PLPSP-4M**
6	6	**379PLPSP-6M**
8	8	**379PLPSP-8M**
10	10	**379PLPSP-10M**
12	12	**379PLPSP-12M**

372PLPSP Plug-In Branch Tee

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**372PLPSP-4M**
6	6	**372PLPSP-6M**
8	8	**372PLPSP-8M**
10	10	**372PLPSP-10M**
12	12	**372PLPSP-12M**
4	6	**372PLPSP-4M-6M**
6	8	**372PLPSP-6M-8M**
8	10	**372PLPSP-8M-10M**
10	12	**372PLPSP-10M-12M**

371PLPSP Plug-In Run Tee

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**371PLPSP-4M**
6	6	**371PLPSP-6M**
8	8	**371PLPSP-8M**
10	10	**371PLPSP-10M**
12	12	**371PLPSP-12M**
4	6	**371PLPSP-4M-6M**
6	8	**371PLPSP-6M-8M**
8	10	**371PLPSP-8M-10M**
10	12	**371PLPSP-10m-12M**

362PLPSP Plug-In Y

1 Tube size (mm)	2 Tube size (mm)	Part number
4	4	**362PLPSP-4M**
6	6	**362PLPSP-6M**
8	8	**362PLPSP-8M**
10	10	**362PLPSP-10M**
12	12	**362PLPSP-12M**
4	6	**362PLPSP-4M-6M**
6	8	**362PLPSP-6M-8M**
8	10	**362PLPSP-8M-10M**
10	12	**362PLPSP-10M-12M**

362PLPDSP Plug-In Multiple Y

1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	**362PLPDSP-6M-4M**
8	4	**362PLPDSP-8M-4M**
8	6	**362PLPDSP-8M-6M**

67PLP Tube Reducer

1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	**67PLP-6M-4M**
8	4	**67PLP-8M-4M**
8	6	**67PLP-8M-6M**
10	4	**67PLP-10M-4M**
10	6	**67PLP-10M-6M**
10	8	**67PLP-10M-8M**
12	10	**67PLP-12M-10M**
12	6	**67PLP-12M-6M**
12	8	**67PLP-12M-8M**
14	10	**67PLP-14M-10M**
14	12	**67PLP-14M-12M**
14	6	**67PLP-14M-6M**
14	8	**67PLP-14M-8M**

32PLPSP Tube Expander

1 Tube size (mm)	2 Tube size (mm)	Part number
6	4	**32PLPSP-6M-4M**
8	6	**32PLPSP-8M-6M**
10	8	**32PLPSP-10M-8M**
12	10	**32PLPSP-12M-10M**

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322PLPSP Barbed Connector

OD 1	OD 2	OD 3	Part number
4	3.2	5.0	**322PLPSP-3M-4M**
4	5.0	7.0	**322PLPSP-5M-4M**
6	5.0	7.0	**322PLPSP-5M-6M**
8	6.3	8.5	**322PLPSP-6M-8M**
8	8.0	10.0	**322PLPSP-8M-8M**
10	6.3	8.0	**322PLPSP-6M-10M**
10	8.0	10.0	**322PLPSP-8M-10M**
12	8.0	10.0	**322PLPSP-8M-12M**
12	10.0	12.0	**322PLPSP-1012M**
12	12.5	14.5	**322PLPSP-1212M**
14	12.5	14.5	**322PLPSP-1214M**
14	14.0	16.0	**322PLPSP-1414M**

Push-to-Connect, Prestolok Metal

W68PLP Male Connector

Tube size (in.)	Pipe thd (NPTF)	Part number
1/8	1/16	**W68PLP-2-1**
1/8	1/8	**W68PLP-2-2**
1/8	1/4	**W68PLP-2-4**
3/16	1/8	**W68PLP-3-2**
3/16	1/4	**W68PLP-3-4**
5/32	1/16	**W68PLP-5/32-1**
5/32	1/8	**W68PLP-5/32-2**
5/32	1/4	**W68PLP-5/32-4**
1/4	1/16	**W68PLP-4-1**
1/4	1/8	**W68PLP-4-2**
1/4	1/4	**W68PLP-4-4**
1/4	3/8	**W68PLP-4-6**
5/16	1/8	**W68PLP-5-2**
5/16	1/4	**W68PLP-5-4**
5/16	3/8	**W68PLP-5-6**
3/8	1/8	**W68PLP-6-2**
3/8	1/4	**W68PLP-6-4**
3/8	3/8	**W68PLP-6-6**
3/8	1/2	**W68PLP-6-8**
1/2	1/4	**W68PLP-8-4**
1/2	3/8	**W68PLP-8-6**
1/2	1/2	**W68PLP-8-8**
5/32	1/4-28	**68PLP-5/32-4LT***

*SAE-LT Threads

W68PLPR Round Body Male Connector

Tube size (in.)	Thread size NPTF	Part number
5/32	1/16	**W68PLPR-5/32-1**
5/32	1/8	**W68PLPR-5/32-2**
1/4	1/16	**W68PLPR-4-1**
1/4	1/8	**W68PLPR-4-2**
1/4	1/4	**W68PLPR-4-4**

*10-32 seal is neoprene

W68PW Male Connector (Nickel Plated)

Tube size (in.)	Thread size NPTF	Part number
1/4	1/8	**W68PW-4-2**
1/4	1/4	**W68PW-4-4**
1/4	3/8	**W68PW-4-6**
5/16	1/8	**W68PW-5-2**
5/16	1/4	**W68PW-5-4**
5/16	3/8	**W68PW-5-6**
3/8	1/8	**W68PW-6-2**
3/8	1/4	**W68PW-6-4**
3/8	3/8	**W68PW-6-6**
3/8	1/2	**W68PW-6-8**
1/2	1/4	**W68PW-8-4**
1/2	3/8	**W68PW-8-6**
1/2	1/2	**W68PW-8-8**

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W169PLP Male Elbow Swivel 90°

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/16	**W169PLP-2-1**
1/8	1/8	**W169PLP-2-2**
1/8	10-32	**169PLP-2-0***
1/8	1/4	**W169PLP-2-4**
3/16	1/8	**W169PLP-3-2**
5/32	1/16	**W169PLP-5/32-1**
5/32	1/8	**W169PLP-5/32-2**
5/32	1/4	**W169PLP-5/32-4**
5/32	10-32	**169PLP-5/32-0***
1/4	1/16	**W169PLP-4-1**
1/4	1/8	**W169PLP-4-2**
1/4	1/4	**W169PLP-4-4**
1/4	3/8	**W169PLP-4-6**
1/4	10-32	**169PLP-4-0***
5/16	1/8	**W169PLP-5-2**
5/16	1/4	**W169PLP-5-4**
3/8	1/8	**W169PLP-6-2**
3/8	1/4	**W169PLP-6-4**
3/8	3/8	**W169PLP-6-6**
3/8	1/2	**W169PLP-6-8**
1/2	1/4	**W169PLP-8-4**
1/2	3/8	**W169PLP-8-6**
1/2	1/2	**W169PLP-8-8**

*10-32 seal is neoprene

W169PLPNS Male Elbow 90°

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	**W169PLPNS-2-2**
5/32	1/8	**W169PLPNS5/32-2**
5/32	1/4	**W169PLPNS5/32-4**
1/4	1/8	**W169PLPNS-4-2**
1/4	1/4	**W169PLPNS-4-4**
5/16	1/8	**W169PLPNS-5-2**
5/16	1/4	**W169PLPNS-5-4**
3/8	1/4	**W169PLPNS-6-4**
3/8	3/8	**W169PLPNS-6-6**
3/8	1/2	**W169PLPNS-6-8**
1/2	3/8	**W169PLPNS-8-6**
1/2	1/2	**W169PLPNS-8-8**
5/32	1/4-28	**169PLPNS532-4LT***

* SAE-LT Threads

W169PW Male Elbow Swivel 90° (Nickel Plated)

Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	**W169PW-4-2**
1/4	1/4	**W169PW-4-4**
1/4	3/8	**W169PW-4-6**
5/16	1/8	**W169PW-5-2**
5/16	1/4	**W169PW-5-4**
3/8	1/8	**W169PW-6-2**
3/8	1/4	**W169PW-6-4**
3/8	3/8	**W169PW-6-6**
3/8	1/2	**W169PW-6-8**
1/2	1/4	**W169PW-8-4**
1/2	3/8	**W169PW-8-6**
1/2	1/2	**W169PW-8-8**

W171PLP Male Run Tee Swivel

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	**W171PLP-2-2**
5/32	1/8	**W171PLP-5/32-2**
1/4	1/8	**W171PLP-4-2**
1/4	1/4	**W171PLP-4-4**
1/4	3/8	**W171PLP-4-6**
5/16	1/8	**W171PLP-5-2**
5/16	1/4	**W171PLP-5-4**
3/8	1/4	**W171PLP-6-4**
3/8	3/8	**W171PLP-6-6**
1/2	3/8	**W171PLP-8-6**
1/2	1/2	**W171PLP-8-8**

W171PW Male Run Tee Swivel (Nickel Plated)

Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	**W171PW-4-2**
1/4	1/4	**W171PW-4-4**
1/4	3/8	**W171PW-4-6**
5/16	1/8	**W171PW-5-2**
5/16	1/4	**W171PW-5-4**
3/8	1/4	**W171PW-6-4**
3/8	3/8	**W171PW-6-6**
1/2	3/8	**W171PW-8-6**
1/2	1/2	**W171PW-8-8**

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W172PLP Male Branch Tee Swivel

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	**W172PLP-2-2**
3/16	1/8	**W172PLP-3-2**
5/32	1/8	**W172PLP-5/32-2**
1/4	1/8	**W172PLP-4-2**
1/4	1/4	**W172PLP-4-4**
1/4	3/8	**W172PLP-4-6**
5/16	1/8	**W172PLP-5-2**
5/16	1/4	**W172PLP-5-4**
3/8	1/4	**W172PLP-6-4**
3/8	3/8	**W172PLP-6-6**
1/2	1/4	**W172PLP-8-4**
1/2	3/8	**W172PLP-8-6**
1/2	1/2	**W172PLP-8-8**

W172PW Male Branch Tee Swivel (Nickel Plated)

Tube size (in.)	Thread (NPTF)	Part number
1/4	1/8	**W172PW-4-2**
1/4	1/4	**W172PW-4-4**
1/4	3/8	**W172PW-4-6**
5/16	1/8	**W172PW-5-2**
5/16	1/4	**W172PW-5-4**
3/8	1/4	**W172PW-6-4**
3/8	3/8	**W172PW-6-6**
1/2	1/4	**W172PW-8-4**
1/2	3/8	**W172PW-8-6**
1/2	1/2	**W172PW-8-8**

62PLP Union

Tube size (in.)	Part number
1/8	**62PLP-2**
3/16	**62PLP-3**
5/32	**62PLP-5/32**
1/4	**62PLP-4**
5/16	**62PLP-5**
3/8	**62PLP-6**
1/2	**62PLP-8**

62PW Union (Nickel Plated)

Tube size (in.)	Part number
1/4	**62PW-4**
5/16	**62PW-5**
3/8	**62PW-6**
1/2	**62PW-8**

164PLP Union Tee

Tube size (in.)	Part number
1/8	**164PLP-2**
3/16	**164PLP-3**
5/32	**164PLP-5/32**
1/4	**164PLP-4**
5/16	**164PLP-5**
3/8	**164PLP-6**
1/2	**164PLP-8**

164PW Union Tee (Nickel Plated)

Tube size (in.)	Part number
1/4	**164PW-4**
5/16	**164PW-5**
3/8	**164PW-6**
1/2	**164PW-8**

165PLP Union Elbow

Tube size (in.)	Part number
1/8	**165PLP-2**
5/32	**165PLP-5/32**
3/16	**165PLP-3**
1/4	**165PLP-4**
5/16	**165PLP-5**
3/8	**165PLP-6**
1/2	**165PLP-8**

165PW Union Elbow (Nickel Plated)

Tube size (in.)	Part number
1/4	**165PW-4**
5/16	**165PW-5**
3/8	**165PW-6**
1/2	**165PW-8**

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66PLP Female Connector

Tube size (in.)	Pipe thread (NPTF)	Part number
1/8	1/8	**66PLP-2-2**
1/8	1/4	**66PLP-2-4**
3/16	1/8	**66PLP-3-2**
5/32	1/8	**66PLP-5/32-2**
5/32	1/4	**66PLP-5/32-4**
1/4	1/8	**66PLP-4-2**
1/4	1/4	**66PLP-4-4**
5/16	1/8	**66PLP-5-2**
5/16	1/4	**66PLP-5-4**
3/8	1/4	**66PLP-6-4**
3/8	3/8	**66PLP-6-6**

66PW Female Connector (Nickel Plated)

Tube size (in.)	Pipe thread (NPTF)	Part number
1/4	1/8	**66PW-4-2**
1/4	1/4	**66PW-4-4**
5/16	1/8	**66PW-5-2**
5/16	1/4	**66PW-5-4**
3/8	1/4	**66PW-6-4**
3/8	3/8	**66PW-6-6**

62PLPBH Bulkhead Union

Tube size (in.)	Part number
1/8	**62PLPBH-2**
5/32	**62PLPBH-5/32**
1/4	**62PLPBH-4**
5/16	**62PLPBH-5**
3/8	**62PLPBH-6**
1/2	**62PLPBH-8**

66PLPBH Female Bulkhead

Tube size (in.)	Pipe thd (NPTF)	Part number
5/32	1/4	**66PLPBH-5/32-4**
1/4	1/4	**66PLPBH-4-4**
3/8	3/8	**66PLPBH-6-6**
1/2	3/8	**66PLPBH-8-6**

62PWBH Bulkhead Union (Nickel Plated)

Tube Size (in.)	Bulkhead Hole Dia. B	Part No.
1/4	9/16	**62PWBH-4**
5/16	5/8	**62PWBH-5**
3/8	3/4	**62PWBH-6**
1/2	7/8	**62PWBH-8**

66PWBH Female Bulkhead (Nickel Plated)

Tube size (in.)	Thread (NPTF)	Bulkhead hole dia.	Part number
1/4	1/4	9/16	**66PWBH-4-4**
3/8	3/8	7/8	**66PWBH-6-6**
1/2	3/8	1	**66PWBH-8-6**

PLPHBF4-B Male Connector BSPP

Tube size (in.)	Pipe thd BSPP	Part number
3/16	1/8-28	**3-1/8PLPHBF4-B**
3/16	1/4-19	**3-1/4PLPHBF4-B**
1/4	1/8-28	**4-1/8PLPHBF4-B**
1/4	1/4-19	**4-1/4PLPHBF4-B**
1/4	3/8-19	**4-3/8PLPHBF4-B**
3/8	1/4-19	**6-1/4PLPHBF4-B**
3/8	3/8-19	**6-3/8PLPHBF4-B**
3/8	1/2-14	**6-1/2PLPHBF4-B**
1/2	3/8-19	**8-3/8PLPHBF4-B**
1/2	1/2-14	**8-1/2PLPHBF4-B**

DB Dust / Weld Spatter Boot

Tube size (in.)	Part number
1/4	**DB-4**
3/8	**DB-6**
1/2	**DB-8**

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FPB Male Connector NPT

Tube size (mm)	NPT	Part number
4	1/8-27	**W68PLP-5/32-2**
4	1/4-18	**W68PLP-5/32-4**
6	1/8-27	**FPB6-1/8**
6	1/4-18	**FPB6-1/4**
10	1/4-18	**FPB10-1/4**
10	3/8-18	**FPB10-3/8**
12	3/8-18	**FPB12-3/8**

C6PB Adjustable Male Elbow NPT

Tube size (mm)	NPT	Part number
6	1/4-18	**C6PB6-1/4**
6	3/8-18	**C6PB6-3/8**
10	1/4-18	**C6PB10-1/4**
10	3/8-18	**C6PB10-3/8**
12	1/2-14	**C6PB12-1/2**

HPB Equal Union

Tube size (mm)	Part number
4	**HPB4**
5	**HPB5**
6	**HPB6**
8	**HPB8**
10	**HPB10**
12	**HPB12**
14	**HPB14**

JPB Union Tee

Tube size (mm)	Part number
4	**JPB4**
5	**JPB5**
6	**JPB6**
8	**JPB8**
10	**JPB10**
12	**JPB12**
14	**JPB14**

EPB 90° Union Elbow

Tube size (mm)	Part number
4	**EPB4**
5	**EPB5**
6	**EPB6**
8	**EPB8**
10	**EPB10**
12	**EPB12**
14	**EPB14**

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WBMPB Mixed Bulkhead Union

Tube 1 size (mm)	Tube 2 size (mm)	Bulkhead hole dia.	Part number
4	4	8mm	**WBMPB4**
6	6	10mm	**WBMPB6**
8	8	12mm	**WBMPB8**
10	10	14mm	**WBMPB10**
12	12	16mm	**WBMPB12**
14	14	18mm	**WBMPB14**

WPB Bulkhead Union

Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	**WPB4**
6	13mm	**WPB6**
8	16mm	**WPB8**
10	18mm	**WPB10**
12	23mm	**WPB12**
14	24mm	**WPB14**

Jam nut is supplied loose in box

WE6PB Adjustable Bulkhead Union Elbow

Tube Size (mm)	Bulkhead hole dia.	Part number
4	11mm	**WE6PB4**
6	13mm	**WE6PB6**
8	15mm	**WE6PB8**
10	18mm	**WE6PB10**
12	23mm	**WE6PB12**

G4PB Female Connector BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**G4PB4-1/8**
6	1/8	**G4PB6-1/8**
6	1/4	**G4PB6-1/4**
8	1/8	**G4PB8-1/8**
8	1/4	**G4PB8-1/4**

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WG4PB Bulkhead Union Female BSPP

Tube size (mm)	BSPP	Part number
4	G1/8	**WG4PB4-1/8**
6	G1/8	**WG4PB6-1/8**
6	G1/4	**WG4PB6-1/4**
8	G1/8	**WG4PB8-1/8**
8	G1/4	**WG4PB8-1/4**
10	G3/8	**WG4PB10-3/8**
12	G3/8	**WG4PB12-3/8**
12	G1/2	**WG4PB12-1/2**

C64PB Adjustable Male Elbow BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**C64PB4-1/8**
4	1/4	**C64PB4-1/4**
6	1/8	**C64PB6-1/8**
6	1/4	**C64PB6-1/4**
8	1/8	**C64PB8-1/8**
8	1/4	**C64PB8-1/4**
8	3/8	**C64PB8-3/8**
10	1/4	**C64PB10-1/4**
10	3/8	**C64PB10-3/8**
12	1/4	**C64PB12-1/4**
12	3/8	**C64PB12-3/8**
12	1/2	**C64PB12-1/2**
14	3/8	**C64PB14-3/8**
14	1/2	**C64PB14-1/2**

C64SPB Compact Adjustable Male Elbow BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**C64SPB4-1/8**
6	1/8	**C64SPB6-1/8**
6	1/4	**C64SPB6-1/4**
8	1/8	**C64SPB8-1/8**
8	1/4	**C64SPB8-1/4**
8	3/8	**C64SPB8-3/8**
10	1/4	**C64SPB10-1/4**
10	3/8	**C64SPB10-3/8**
12	1/8	**C64SPB12-1/4**
12	3/8	**C64SPB12-3/8**
12	1/2	**C64SPB12-1/2**

☐ Most popular. For technical information see CD

F4PB Compact Male Connector BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**F4PB4-1/8**
4	1/4	**F4PB4-1/4**
6	1/8	**F4PB6-1/8**
6	1/4	**F4PB6-1/4**
8	1/4	**F4PB8-1/4**
8	1/8	**F4PB8-1/8**
8	3/8	**F4PB8-3/8**
10	1/4	**F4PB10-1/4**
10	3/8	**F4PB10-3/8**
10	1/2	**F4PB10-1/2**
12	1/4	**F4PB12-1/4**
12	3/8	**F4PB12-3/8**
12	1/2	**F4PB12-1/2**
14	3/8	**F4PB14-3/8**
14	1/2	**F4PB14-1/2**

R64PB Swivel Male Branch Run Tee BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**R64PB4-1/8**
4	1/4	**R64PB4-1/4**
6	1/8	**R64PB6-1/8**
6	1/4	**R64PB6-1/4**
8	1/8	**R64PB8-1/8**
8	1/4	**R64PB8-1/4**
8	3/8	**R64PB8-3/8**
10	1/4	**R64PB10-1/4**
10	3/8	**R64PB10-3/8**
12	1/4	**R64PB12-1/4**
12	3/8	**R64PB12-3/8**
14	3/8	**R64PB14-3/8**
14	1/2	**R64PB14-1/2**

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S64PB Swivel Male Branch Tee BSPP

Tube size (mm)	BSPP	Part number
4	1/8	**S64PB4-1/8**
4	1/4	**S64PB4-1/4**
6	1/8	**S64PB6-1/8**
6	1/4	**S64PB6-1/4**
8	1/8	**S64PB8-1/8**
8	1/4	**S64PB8-1/4**
8	3/8	**S64PB8-3/8**
10	1/4	**S64PB10-1/4**
10	3/8	**S64PB10-3/8**
12	1/4	**S64PB12-1/4**
12	3/8	**S64PB12-3/8**
14	3/8	**S64PB14-3/8**
14	1/2	**S64PB14-1/2**

C68PB Adjustable Male Elbow Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	**C68PB4M5**
6	M5x0.8	**C68PB6M5**

C68SPB Compact Adjustable Male Elbow Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	**C68SPB4M5**
6	M5x0.8	**C68SPB6M5**

F28PB Male Connector Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	**F28PB4M3**
4	M5x0.8	**F28PB4M5**
6	M5x0.8	**F28PB6M5**

This fitting has been designed for use where space is at a premium. It is assembled using the internal hexagon and an allen key.

F8PB Male Connector Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M5x0.8	**F8PB4M5**
4	M10x1	**F8PB4M10**
6	M5x0.8	**F8PB6M5**
6	M10x1	**F8PB6M10**
6	M12x1.5	**F8PB6M12**
8	M12x1.5	**F8PB8M12**
8	M16x1.5	**F8PB8M16**
8	M22x1.5	**F8PB8M22**

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R68PB Adjustable Male Run Tee Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	**R68PB4M3**
4	M5x0.8	**R68PB4M5**
6	M5x0.8	**R68PB6M5**

S68PB Adjustable Male Branch Tee Metric Straight Thread

Tube size (mm)	Thread (mm)	Part number
4	M3x0.5	**S68PB4M3**
4	M5x0.8	**S68PB4M5**
6	M5x0.8	**S68PB6M5**

FNPB Plug

Tube size (mm)	Part number
4	**FNPB4**
6	**FNPB6**
8	**FNPB8**
10	**FNPB10**
12	**FNPB12**
14	**FNPB14**

TEPB Tube End Expander

Tube 1 Size (mm)	Tube 2 Size (mm)	Part number
4	6	**TEPB4-6**

TRPB Tube End Reducer

Tube 1 size (mm)	Tube 2 size (mm)	Part number
6	4	**TRPB6-4**
8	4	**TRPB8-4**
8	6	**TRPB8-6**
10	4	**TRPB10-4**
10	6	**TRPB10-6**
10	8	**TRPB10-8**
12	6	**TRPB12-6**
12	8	**TRPB12-8**
12	10	**TRPB12-10**
14	8	**TRPB14-8**
14	10	**TRPB14-10**
14	12	**TRPB14-12**

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207ACBH Anchor Coupling

Female pipe thread	Straight thread	Max. bulkhead	Part number
1/8	5/8-18	.89	**207ACBH-2**
1/8	5/8-18	.35	**207ACBHS-2**
1/4	3/4-16	.81	**207ACBH-4**
1/4	3/4-16	.26	**207ACBHS-4**
3/8	1-14	.62	**207ACBH-6**
1/2	1-1/8-14	.75	**207ACBH-8**
3/4	1-5/16-12	.65	**207ACBH-12**
1	1-5/8-14	1.00	**207ACBH-16***

*Lock Washer not Available

207P Coupling

Pipe thread	C Hex	Part number
1/8	9/16	**207P-2**
1/4	3/4	**207P-4**
3/8	7/8	**207P-6**
1/2	1-1/16	**207P-8**
3/4	1-3/8	**207P-12**

208P Reducer Coupling

1 Pipe thread	2 Pipe thread	C Hex	Part number
1/4	1/8	3/4	**208P-4-2**
3/8	1/4	7/8	**208P-6-4**
1/2	1/4	1-1/16	**208P-8-4**
1/2	3/8	1-1/16	**208P-8-6**
3/4	3/8	1-3/8	**208P-12-6**
3/4	1/2	1-3/8	**208P-12-8**

209P Bushing

1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/4	9/16	**209P-4-2**
1/8	3/8	11/16	**209P-6-2**
1/4	3/8	3/4	**209P-6-4**
1/8	1/2	7/8	**209P-8-2**
1/4	1/2	7/8	**209P-8-4**
3/8	1/2	7/8	**209P-8-6**
1/8	3/4	1-1/8	**209P-12-2**
1/4	3/4	1-1/8	**209P-12-4**
3/8	3/4	1-1/8	**209P-12-6**
1/2	3/4	1-1/8	**209P-12-8**
1/2	1	1-3/8	**209P-16-8**
3/4	1	1-3/8	**209P-16-12**

210P Lock Nut

Pipe thread	C Hex	Part number
1/8 NPSL	11/16	**210P-2**
1/4 NPSL	7/8	**210P-4**
3/8 NPSL	1	**210P-6**
1/2 NPSL	1-1/8	**210P-8**

211P Square-Head Plug

Pipe thread	Part number
1/8	**211P-2**
1/4	**211P-4**
3/8	**211P-6**
1/2	**211P-8**
3/4	**211P-12**

212P Union

Pipe thread	C Hex	Part number
1/4	1-3/16	**212P-4**
3/8	1-1/4	**212P-6**

213P Cap

Pipe thread	C Hex	Part number
1/8	9/16	**213P-2**
1/4	11/16	**213P-4**
3/8	13/16	**213P-6**
1/2	1-1/16	**213P-8**
3/4	1-1/4	**213P-12**

215PN Close Nipple

Pipe thread	Part number
1/8	**215PN-2**
1/4	**215PN-4**
3/8	**215PN-6**
1/2	**215PN-8**
3/4	**215PN-12**

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215PNL Long Nipple

Pipe thread	Part number
1/8	**215PNL-2-15**
1/4	**215PNL-4-15**
3/8	**215PNL-6-15**
1/2	**215PNL-8-15**
1/8	**215PNL-2-20**
1/4	**215PNL-4-20**
3/8	**215PNL-6-20**
1/2	**215PNL-8-20**
1/8	**215PNL-2-25**
1/4	**215PNL-4-25**
3/8	**215PNL-6-25**
1/2	**215PNL-8-25**
1/8	**215PNL-2-30**
1/4	**215PNL-4-30**
3/8	**215PNL-6-30**
1/2	**215PNL-8-30**
1/8	**215PNL-2-35**
1/4	**215PNL-4-35**
3/8	**215PNL-6-35**
1/2	**215PNL-8-35**

216P Hex Nipple

Pipe thread	C Hex	Part number
1/8	7/16	**216P-2**
1/4	9/16	**216P-4**
3/8	11/16	**216P-6**
1/2	7/8	**216P-8**
3/4	1-1/16	**216P-12**

218P Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	7/16	**218P-2**
1/4	9/16	**218P-4**
3/8	11/16	**218P-6**
1/2	7/8	**218P-8**
3/4	1-1/16	**218P-12**

219P Countersunk Hex-Head Plug

Pipe thread	C Hex	Part number
1/8	3/16	**219P-2**
1/4	1/4	**219P-4**
3/8	5/16	**219P-6**
1/2	3/8	**219P-8**
3/4	9/16	**219P-12**

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220P Slotted-Head Plug

Pipe thread	Part number
1/8	**220P-2**
1/4	**220P-4**
3/8	**220P-6**

222P Adapter

1 Pipe thread	2 Pipe thread	C Hex	Part number
1/8	1/8	9/16	**222P-2-2**
1/4	1/8	3/4	**222P-4-2**
1/4	1/4	3/4	**222P-4-4**
3/8	1/8	7/8	**222P-6-2**
3/8	1/4	7/8	**222P-6-4**
3/8	3/8	7/8	**222P-6-6**
1/2	1/4	1	**222P-8-4**
1/2	3/8	1-1/16	**222P-8-6**
1/2	1/2	1-1/16	**222P-8-8**
3/4	3/8	1-3/8	**222P-12-6**
3/4	1/2	1-3/8	**222P-12-8**
3/4	3/4	1-3/8	**222P-12-12**

1200P-2200P 90° Union Elbow

Pipe thread	Part number
1/8	**1200P-2-2**
1/8	**2200P-2-2**
1/4	**1200P-4-4**
1/4	**2200P-4-4**
3/8	**1200P-6-6**
3/8	**2200P-6-6**
1/2	**2200P-8-8**

1202P-2202P 90° Street Elbow

1 Pipe thread	2 Pipe thread	Part number
1/8	1/8	**1202P-2-2**
1/8	1/8	**2202P-2-2**
1/8	1/8	**2202PA-2-2***
1/4	1/8	**2202P-4-2**
1/4	1/4	**1202P-4-4**
1/4	1/4	**2202P-4-4**
1/4	1/4	**2202PA-4-4***
1/4	3/8	**2202P-4-6**
3/8	1/4	**1202P-6-4**
3/8	3/8	**1202P-6-6**
3/8	3/8	**2202P-6-6**
3/8	3/8	**2202PA-6-6***

*Meets SAE Dimensions

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1203P-2203P Union Tee

Pipe thread	Part number
1/8	**1203P-2**
1/8	**2203P-2**
1/4	**1203P-4**
1/4	**2203P-4**
3/8	**2203P-6**
1/2	**1203P-8**
1/2	**2203P-8**
3/4	**2203P-12**

1204P Male Elbow

Pipe thread	Part number
1/8	**1204P-2**
1/4	**1204P-4**
3/8	**1204P-6**
1/2	**1204P-8**

2224P Male Branch Tee

Pipe thread	Part number
1/8	**2224P-2**
1/4	**2224P-4**
3/8	**2224P-6**
1/2	**2224P-8**
3/4	**2224P-12**

2225P Street Tee

Pipe thread	Part number
1/8	**2225P-2**
1/4	**2225P-4**
3/8	**2225P-6**
1/2	**2225P-8**
3/4	**2225P-12**

1201P-2201P 45° Female Elbow

1201P

2201P

Pipe thread	Part number
1/8	**2201P-2-2**
1/2	**1201P-8-8**

2205P Cross

Pipe thread	Part number
1/8	**2205P-2**
1/4	**2205P-4**
3/8	**2205P-6**
1/2	**2205P-8**
3/4	**2205P-12**

2214P 45° Street Elbow

Pipe thread	Part number
1/8	**2214P-2-2**
1/4	**2214P-4-4**
3/8	**2214P-6-6**
1/2	**2214P-8-8**

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DD44 Pipe 90° Elbow BSPP

BSPP	C Hex	Part number
1/8	14	**1/8DD44B**
1/4	17	**1/4DD44B**
3/8	22	**3/8DD44B**
1/2	27	**1/2DD44B**

FF44 Pipe Nipples BSPP

BSPP	C Hex	Part number
1/8	14	**1/8FF44B**
1/4	17	**1/4FF44B**
3/8	22	**3/8FF44B**
1/2	27	**1/2FF44B**

FHG4 Adapter Male NPTF BSPP

BSPP 1	NPTF 2	C Hex	Part No.
1/8	1/8	0.562	**1/8FHG4-B**
1/4	1/4	0.750	**1/4FHG4-B**
3/8	3/8	0.875	**3/8FHG4-B**
1/2	1/2	1.062	**1/2FHG4-B**

GG44 Pipe Connector BSPP

BSPP	C Hex	Part number
1/8	14	**1/8GG44B**
1/4	17	**1/4GG44B**
3/8	22	**3/8GG44B**
1/2	27	**1/2GG44B**
3/4	32	**3/4GG44B**
1	41	**1GG44B**

KMMOO4 Pipe Cross BSPP

BSPP	C Hex	Part number
1/8	14	**1/8KMMOO4B**
1/4	17	**1/4KMMOO4B**
3/8	22	**3/8KMMOO4B**
1/2	27	**1/2KMMOO4B**

MMO444 Pipe Tee BSPP

BSPP	C Hex	Part number
1/8	14	**1/8MMO444B**
1/4	17	**1/4MMO444B**
3/8	22	**3/8MMO444B**
1/2	27	**1/2MMO444B**
3/4	32	**3/4MMO444B**
1	40	**1MMO444B**

WGG44 Bulkhead Female Union BSPP

BSPP	Straight thread	C Hex	Part number
1/8	M16x1.5	19	**1/8WGG44B**
1/4	M20x1.5	24	**1/4WGG44B**
3/8	M23x1.5	27	**3/8WGG44B**
1/2	M27x1.5	32	**1/2WGG44B**
3/4	M34x1.5	41	**3/4WGG44B**
1	M45x2	55	**1WGG44B**

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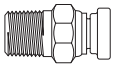
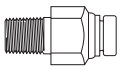
68PM Male Connector



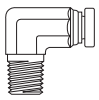
Tube Size	Pipe thread (NPTF)	Part number
1/8	1/16	68PM-2-1
1/8	1/8	68PM-2-2
5/32	1/16	68PM-5/32-1
5/32	1/8	68PM-5/32-2
5/32	1/4	68PM-5/32-4
3/16	1/16	68PM-3-1
3/16	1/8	68PM-3-2
3/16	1/4	68PM-3-4

68PMT Male Connector



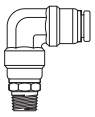
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	68PMT-4-2
1/4	1/4	68PMT-4-4
1/4	3/8	68PMT-4-6
3/8	1/8	68PMT-6-2
3/8	1/4	68PMT-6-4
3/8	3/8	68PMT-6-6
3/8	1/2	68PMT-6-8
1/2	1/4	68PMT-8-4
1/2	3/8	68PMT-8-6
1/2	1/2	68PMT-8-8
5/8	3/8	68PMT-10-6
5/8	1/2	68PMT-10-8
3/4	1/2	68PMT-12-8

169PMNS Male Elbow Non-Swivel 90°



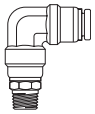
Tube size	Pipe thread (NPTF)	Part number
1/8	1/8	169PMNS-2-2
5/32	1/8	169PMNS-5/32-2
3/16	1/8	169PMNS-3-2
3/16	1/4	169PMNS-3-4

169PMT Male Elbow Swivel 90°



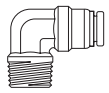
Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMT-4-2
1/4	1/4	169PMT-4-4
1/4	3/8	169PMT-4-6
3/8	1/8	169PMT-6-2
3/8	1/4	169PMT-6-4
3/8	3/8	169PMT-6-6
3/8	1/2	169PMT-6-8
1/2	1/4	169PMT-8-4
1/2	3/8	169PMT-8-6
1/2	1/2	169PMT-8-8
5/8	3/8	169PMT-10-6
5/8	1/2	169PMT-10-8

169PMTL Male Elbow Long Non-Swivel 90°



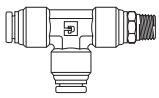
Tube Size	Pipe thread (NPTF)	Part number
3/8	1/4	169PMTL-6-4
3/8	3/8	169PMTL-6-6
3/8	1/2	169PMTL-6-8
1/2	1/2	169PMTL-8-8
5/8	1/2	169PMTL-10-8

169PMTNS Male Elbow Non-Swivel 90°



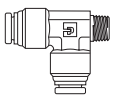
Tube size	Pipe thread (NPTF)	Part number
1/4	1/8	169PMTNS-4-2
1/4	1/4	169PMTNS-4-4
1/4	3/8	169PMTNS-4-6
3/8	1/8	169PMTNS-6-2
3/8	1/4	169PMTNS-6-4
3/8	3/8	169PMTNS-6-6
3/8	1/2	169PMTNS-6-8
1/2	1/4	169PMTNS-8-4
1/2	3/8	169PMTNS-8-6
1/2	1/2	169PMTNS-8-8
5/8	3/8	169PMTNS-10-6
5/8	1/2	169PMTNS-10-8
3/4	1/2	169PMTNS-12-8

171PMT Male Run Tee Swivel



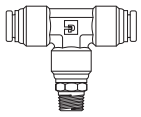
Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	171PMT-4-2
1/4	1/4	171PMT-4-4
1/4	3/8	171PMT-4-6
3/8	1/4	171PMT-6-4
3/8	3/8	171PMT-6-6
1/2	1/4	171PMT-8-4
1/2	3/8	171PMT-8-6
1/2	1/2	171PMT-8-8

171PMTNS Male Run Tee Non-Swivel



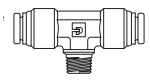
Tube 1 Size	Tube 2 Size	Part number
1/4	1/4	171PMTNS-4-4
1/4	3/8	171PMTNS-4-6-4
3/8	3/8	171PMTNS-6-4
3/8	1/4	171PMTNS-6-4-4
3/8	1/4	171PMTNS-6-4-6
1/2	3/8	171PMTNS-6-6
1/2	3/8	171PMTNS-6-8
1/2	1/2	171PMTNS-8-4

172PMT Male Branch Tee Swivel



Tube Size	Pipe thread (NPTF)	Part number
1/4	1/8	172PMT-4-2
1/4	1/4	172PMT-4-4
3/8	1/8	172PMT-6-2
3/8	1/4	172PMT-6-4
3/8	3/8	172PMT-6-6
1/2	1/4	172PMT-8-4
1/2	3/8	172PMT-8-6
1/2	1/2	172PMT-8-8

172PMTNS Male Branch Tee Non-Swivel



Tube 1 Size	Tube 2 Size	Pipe thread (NPTF)	Part number
1/4	1/4	1/8	172PMTNS-4-2
3/8	3/8	1/4	172PMTNS-6-4
3/8	1/4	1/4	172PMTNS-6-4-4
3/8	3/8	3/8	172PMTNS-6-6
3/8	3/8	1/2	172PMTNS-6-8
1/2	1/2	3/8	172PMTNS-8-6
1/2	3/8	1/2	172PMTNS-8-6-8
1/2	1/2	1/2	172PMTNS-8-8

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Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- **Unanticipated or uncontrolled movement of the cylinder or objects connected to it.**
- **Falling of the cylinder or objects held up by it.**
- **Fluid escaping from the cylinder, potentially at high velocity.**

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure x effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

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3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.

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Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

⚠ WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

1.2. Fail-Safe: Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.

1.3 Relevant International Standards: For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.

1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
- Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
- Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Flow Rate: The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

2.2. Pressure Rating: Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

2.3. Temperature Rating: Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

2.4. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.5. Lubrication and Compressor Carryover: Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

2.6. Polycarbonate Bowls and Sight Glasses: To avoid potential polycarbonate bowl failures:

- Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
- Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
- Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

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2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

2.8. Product Rupture: Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
- Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
- Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.

4.3. Lockout / Tagout Procedures: Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:
- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

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The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

1. Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. **IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**

7. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed $10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

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Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:

- **Unanticipated or uncontrolled movement of the cylinder or objects connected to it.**
- **Falling of the cylinder or objects held up by it.**
- **Fluid escaping from the cylinder, potentially at high velocity.**

THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

1.0 General Instructions

1.1 Scope – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

1.2 Fail Safe – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

1.3 Distribution – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

1.4 User Responsibility – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

1.5 Additional Questions – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 Cylinder and Accessories Selection

2.1 Seals – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest.

The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

2.2 Piston Rods – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

2.3 Cushions – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be review by our engineering department.

2.4 Cylinder Mountings – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

2.5 Port Fittings – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure x effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

3.0 Cylinder and Accessories Installation and Mounting

3.1 Installation

3.1.1 – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

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3.1.2 – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

3.1.3 – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

3.1.4 – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

3.2 Mounting Recommendations

3.2.1 – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

3.2.2 – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

3.2.3 – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

3.2.4 – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

3.2.5 – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

3.2.6 – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

4.1 Storage – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

4.1.1 – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

4.1.2 – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

4.1.3 – Port protector plugs should be left in the cylinder until the time of installation.

4.1.4 – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

4.1.5 – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

4.2 Cylinder Trouble Shooting

4.2.1 – External Leakage

4.2.1.1 – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

4.2.1.2 – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorque tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorque as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

4.2.2 – Internal Leakage

4.2.2.1 – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

4.2.2.2 – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

4.2.2.3 – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

4.2.3 – Cylinder Fails to Move the Load

4.2.3.1 – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

4.2.3.2 – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

4.2.3.3 – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

4.3 Erratic or Chatter Operation

4.3.1 – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

4.3.2 – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

4.3.3 – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

4.4 Cylinder Modifications, Repairs, or Failed Component – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.

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Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

⚠ WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

1.2. Fail-Safe: Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.

1.3 Relevant International Standards: For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.

1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
- Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
- Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Flow Rate: The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

2.2. Pressure Rating: Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

2.3. Temperature Rating: Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

2.4. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.5. Lubrication and Compressor Carryover: Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

2.6. Polycarbonate Bowls and Sight Glasses: To avoid potential polycarbonate bowl failures:

- Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
- Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
- Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

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2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

2.8. Product Rupture: Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
- Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
- Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.

4.3. Lockout / Tagout Procedures: Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:
- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

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4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. **IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**

7. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (b) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (c) an assignment for the benefit of creditors, or (d) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed $10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

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