Warning, Offer of Sale

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users h aving technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled “Offer of Sale”.

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

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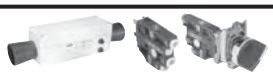
Accessories		Control Panel Products
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• Direct Acting Solenoid • 3-Way & 4-Way • Inline • IEM Bar Manifold • Subbase Valve Manifolds • .15 Cv	www.parker.com/pneu/xm	B Direct Acting
• Compact & Simplified Design • Subbase or Manifold Option • 3-Way • NO & NC on Same Manifold • Wide Range of Voltage • .033 to .05 Cv	www.parker.com/pneu/15mm	
• Stand Alone Valves • Valve Island • Collective Wiring or Fieldbus Configuration • 3-Way & 4-Way • Modular & Flexible Design • Multiple Pressure Option • Compact & Low Weight • .18 to .80 Cv	www.parker.com/pneu/moduflex	C Stacking
• Compact Composite Design • Modular with a Wide Range of Voltages • 3-Way & 4-Way • Fieldbus Available • .6 to 1.2 Cv	www.parker.com/pneu/pvl	
• Wear Compensating Dynamic Sealing System • Economical Solution • Optimized Design for Industrial Markets • Simplified Design • .8 to 2.4 Cv	www.parker.com/pneu/EZInline	D Inline
• Wide Range of Sizes & Flows • Multiple Options • IEM Bar Manifold • 3-Way & 4-Way • Wear Compensating Dynamic Sealing System • .75 to 7.0 Cv	www.parker.com/pneu/b	
• Extreme Temperature & Pressure Ranges • ATEX Options • 4-Way • Wide Range of Voltages for Mobile Industries • Unique Overmoulded Spool Technology • .7 to 2.7 Cv	www.parker.com/pneu/vikingx	
• 10mm 3-Way • 15mm & 20mm 4-Way • Low Power Consumption • Subbase & Inline Body • Individual & Collective Wiring Solutions • .01 to.47 Cv	www.parker.com/pneu/adex	
• Robust Poppet Design • Fast Response & High Flow • 2-Way & 3-Way • High Maximum Pressure Option • 3.6 to 29.9 Cv	www.parker.com/pneu/n	
• Compact Valves with High Flow • Innovative Back to Back Mounting Style with 4 Valves in a 42mm Width • Plug-in Design with Collective Wiring on Fieldbus or 25 Pin Cable • .35 Cv	www.parker.com/pneu/isysmicro	E Subbase & Manifold
• ISO Valve Platform, 18mm, 26mm, Size 1, Size 2, & Size 3 Plug-in • Collective Wiring on Fieldbus or 25-Pin or M23 Cable • Non Plug-in Valves with 3-Pin Din or Mini Connectors • .55 to 6.0 Cv	www.parker.com/pneu/isys	
• Isys Micro Fieldbus • Moduflex Fieldbus • Isysnet Fieldbus • Turck Fieldbus	www.parker.com/pneu/isysnet	
• ISO Valve Platform, 18mm, 26mm, Size 1, Size 2, & Size 3 • Non Plug-in Valves with 3-Pin Din or Mini Connectors • .55 to 4.15 Cv	www.parker.com/pneu/isomax	
• Robust Spool Design • Fast Response & High Flow • Plug-in & Direct Pipe Design • 4-Way • Hazardous Duty Option • 1.9 to 12.0 Cv	www.parker.com/pneu	
• Robust Poppet & Spool Designs • 3-Way & 4-Way • Manual & Mechanical • Plunger, Roller, One-Way Tripper, Button, Hand Lever, Togglel, Treadle • 1/8" & 1/4" NPT • .17 to .83 Cv	www.parker.com/pneu/directair	F Manual Mechanical
• Heavy Duty Design • 4-Way • Lever, Pedal Operated • 1/4" & 3/8" NPT • 1.3 to 2.8 Cv	www.parker.com/pneu/42ser	
• Heavy Duty Lever Operated • 4-Way • 1/8 to 1/2" NPT • .7 to 2.7 Cv	www.parker.com/pneu/vikingx	
• Heavy Duty Design • Bronze Body • 3-Way & 4-Way, Air Pilot Manual & Mechanical Valves • 1/4" to 1" NPTF Ports • 2.4 to 12.4 Cv	www.parker.com/pneu	
• Compliant with OSHA Standard 29 CFR 1910 • Lockout / Soft Start • 3.7 to 14.0 Cv	www.parker.com/pneu/lockout	
• Manual Valves • Lever & Button Operators • 1/8" thru 1/2" Ports • Wide Range of Sizes & Flows • .5 to 1.25 Cv	www.parker.com/pneu/ssv	
• Variety of Control Panel Options - Push Buttons - Indicators - Foot Pedals • Large Selection of Options • Two-Hand Control Conformance with EN 574	www.parker.com/pneu/cpp	G Accessories
• Large Variety of Limit & Pressure Switches • Limit Switches for Standard & Heavy Duty Service • Blocking Valves for Air, Gas & Liquid Service • Threshold Sensors for Monitoring Cylinder Exhaust	www.parker.com/pneu/limsen	
• Flow Controls • Check Valves • Needle Valves • Muffler & Silencers • Relief Valves • Quick Exhaust Valves • Ball Valves • Fittings • Tubing & Hose • Quick Couplings	www.parker.com/pneu/accessories	
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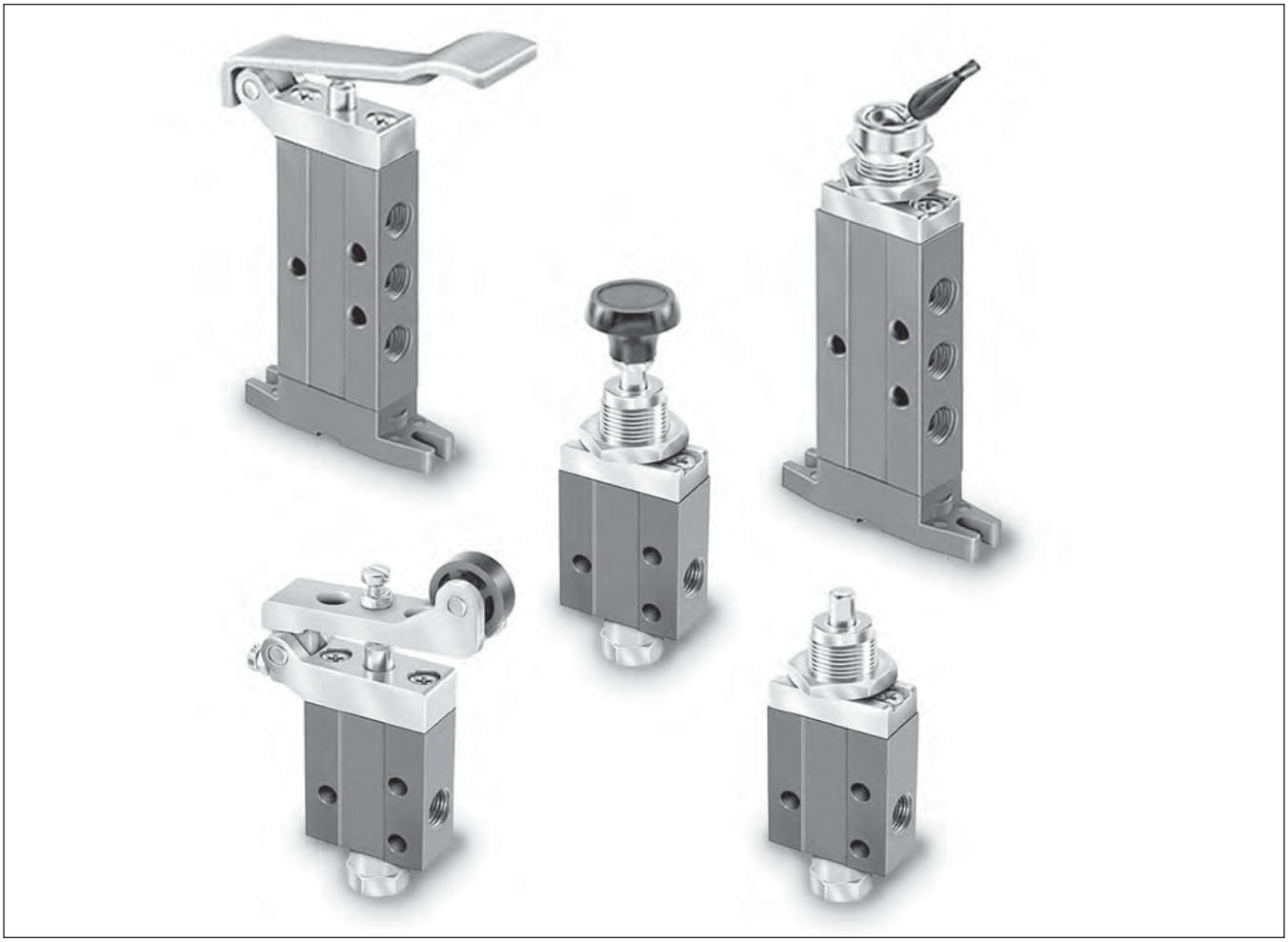
Directair 2 Series

Inline Valves
Manual / Mechanical
3 & 4-Way, 3 & 5-Port, 2-Position

Section F

www.parker.com/pneu/directair



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BOLD ITEMS ARE MOST POPULAR.

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Directair 2 Series

Specifications

Inline Valve
- 1/8" Port
- 4-Way, 2-Position
- 3-Way, 2-Position

Manual Operators
- Lever
- Toggle
- Button

Mechanical Operators
- Plunger
- Roller
- One-Way Tripper

Spool Style

Packed Bore Style – .20 Cv
- Stainless Steel Spool
- Fluorocarbon O-Rings
- 3-Way & 4-Way

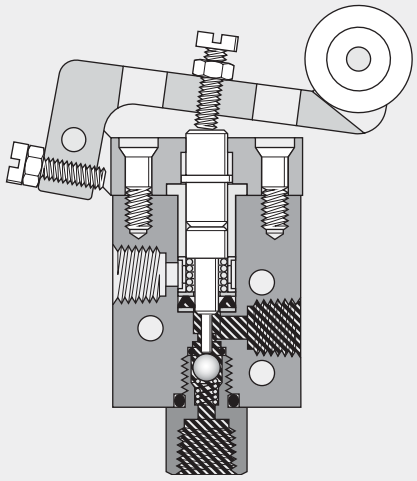
Poppet Style – .17 Cv
- Economical
- 3-Way Normally Closed Function

Operating Pressure

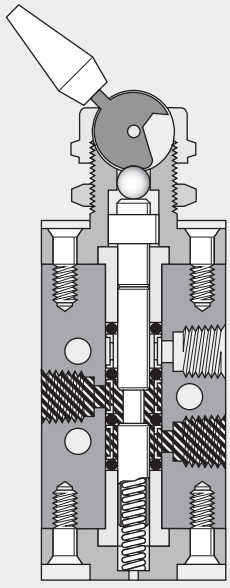
- Vacuum to 150 PSI (28" Hg to 1035 kPa) for spool style
- 0 to 150 PSI (0 to 1035 kPa) for poppet style

Operating Temperature

- 32°F to 175°F (0°C to 80°C)



Roller Operated



Toggle Operated

Pressure **Exhaust**

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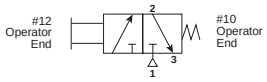
Plunger Operated

404111000 Plunger Operated, Spring Return



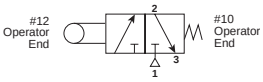
Spring Return

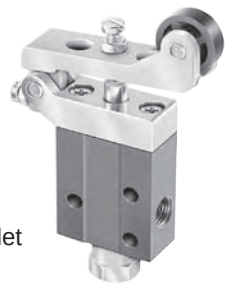
Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Roller Operated

404211000 Roller Operated, Spring Return





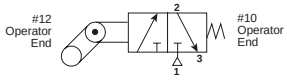
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Tripper Operated

404311000 One-Way Tripper Operated, Spring Return



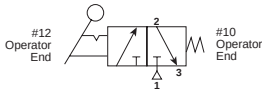
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Toggle Operated

404811000 Detented Toggle, Spring Return



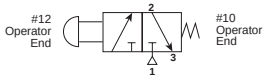
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated (Detented) Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Button Operated

404411000 Button Operated, Spring Return



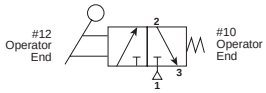
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2 Exhaust Port 3 is blocked.

Hand Lever Operated

404711000 Hand Lever Operated, Spring Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

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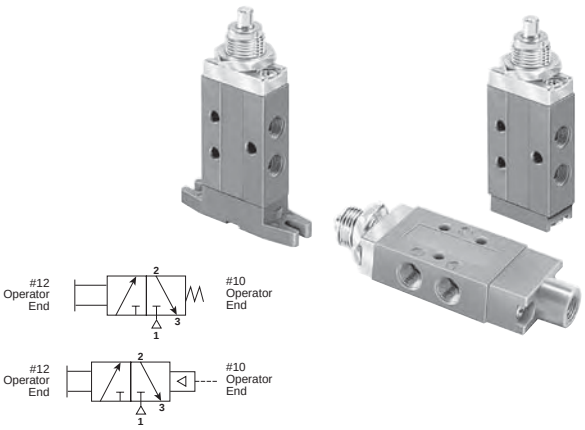
Plunger Operated

414111000 Plunger Operated, Spring Return

414121000 Plunger Operated, Spring Return, Foot Mounted

414151000 Plunger Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

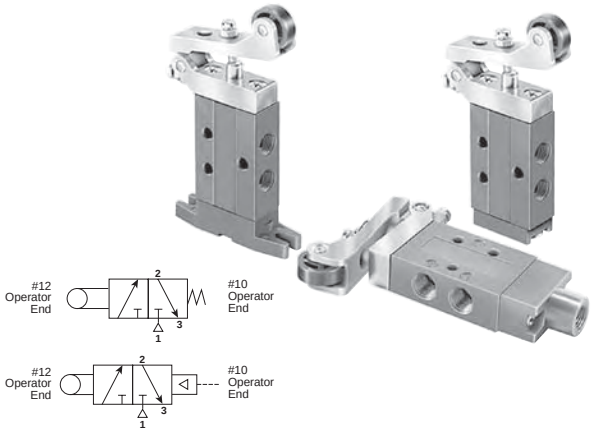
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2 Exhaust Port 3 is blocked.

Roller Operated

414211000 Roller Operated, Spring Return

414221000 Roller Operated, Spring Return, Foot Mounted

414251000 Roller Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

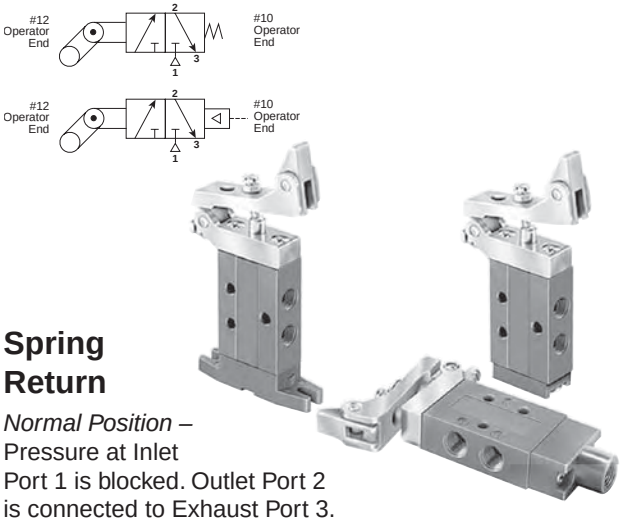
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

One-Way Tripper Operated

414311000 One-Way Tripper, Spring Return

414321000 One-Way Tripper, Spring Return, Foot Mounted

414351000 One-Way Tripper, Pilot Return



Spring Return

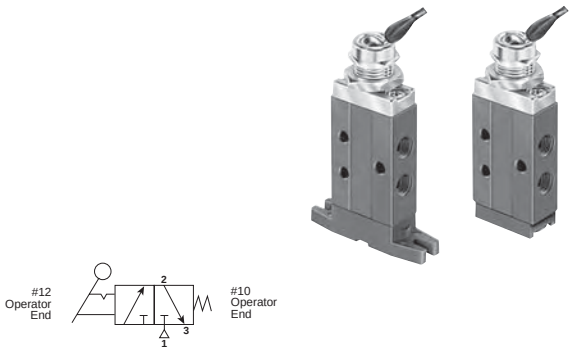
Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Toggle Operated

414811000 Detented Toggle, Spring Return

414821000 Detented Toggle, Spring Return, Foot Mounted



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked.

Outlet Port 2 is connected to Exhaust Port 3.

Actuated (Detented) Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

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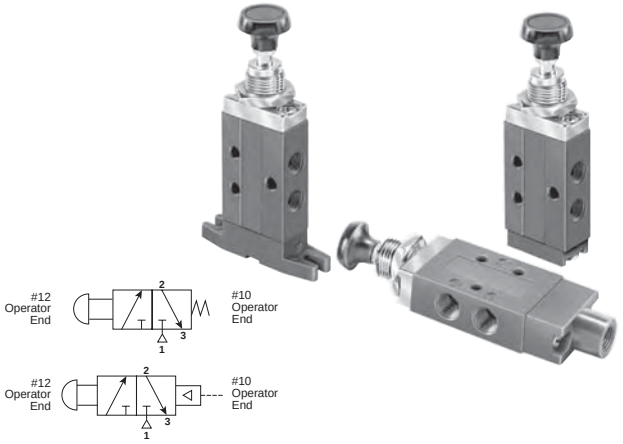
Button Operated

414411000 Button Operated, Spring Return

414421000 Button Operated, Spring Return, Foot Mounted

414451000 Button Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

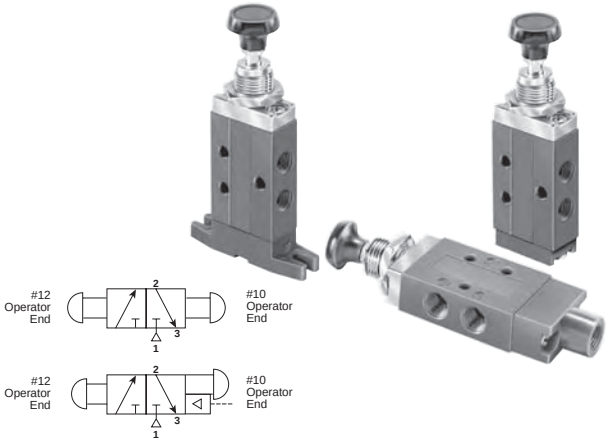
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Button Operated

414931000 Button Operated, Manual Return

414941000 Button Operated, Manual Return, Foot Mounted

414951000 Button Operated, Manual Return or Pilot Return



Manual Return

Operator pulled last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

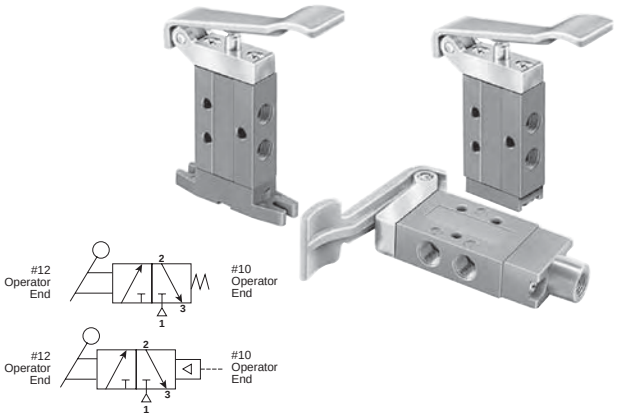
Operator pushed last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Hand Lever Operated

414711000 Hand Lever Operated, Spring Return

414721000 Hand Lever Operated, Spring Return, Foot Mounted

414751000 Hand Lever Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

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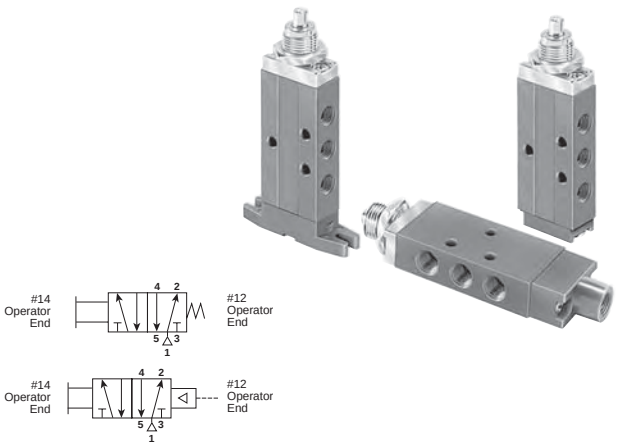
Plunger Operated

410111000 Plunger Operated, Spring Return

410121000 Plunger Operated, Spring Return, Foot Mounted

410151000 Plunger Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

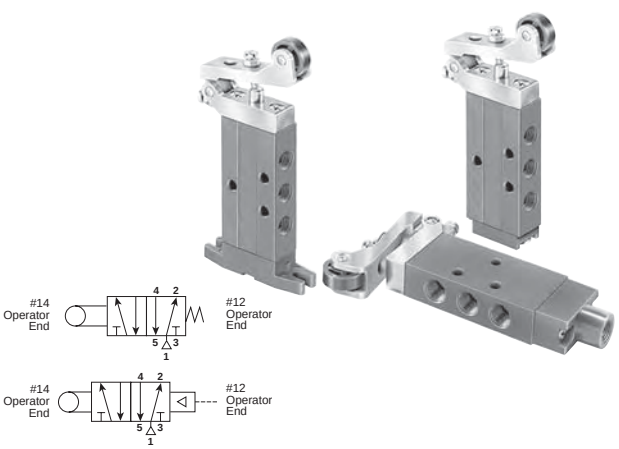
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Roller Operated

410211000 Roller Operated, Spring Return

410221000 Roller Operated, Spring Return, Foot Mounted

410251000 Roller Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

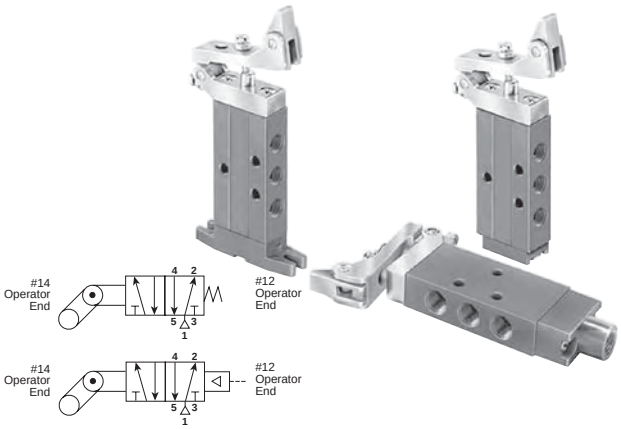
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

One-Way Tripper Operated

410311000 One-Way Tripper, Spring Return

410321000 One-Way Tripper, Spring Return, Foot Mounted

410351000 One-Way Tripper, Pilot Return



Spring Return

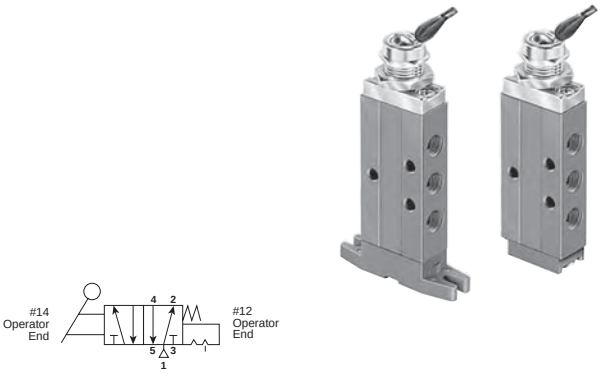
Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Toggle Operated

410811000 Detented Toggle, Spring Return

410821000 Detented Toggle, Spring Return, Foot Mounted



Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated (Detented) Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

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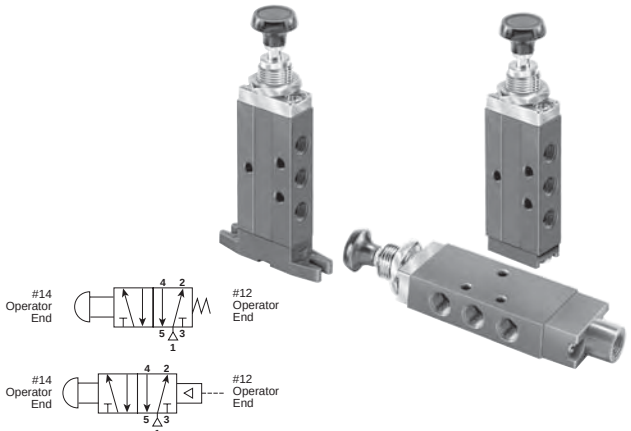
Button Operated

410411000 Button Operated, Spring Return

410421000 Button Operated, Spring Return, Foot Mounted

410451000 Button Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

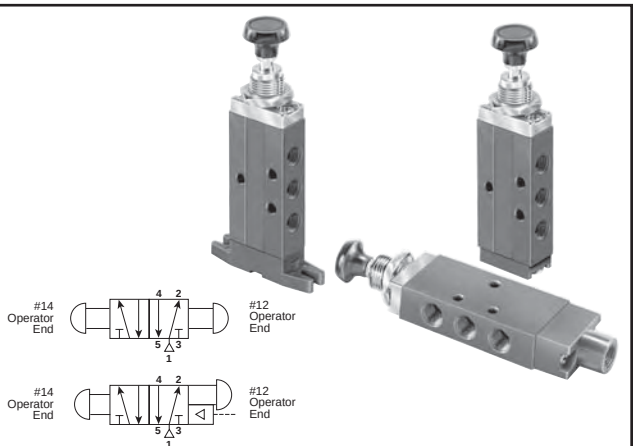
Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Button Operated

410931000 Button Operated, Manual Return

410941000 Button Operated, Manual Return, Foot Mounted

410951000 Button Operated, Manual Return or Pilot Return



Manual Return

Operator pulled last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

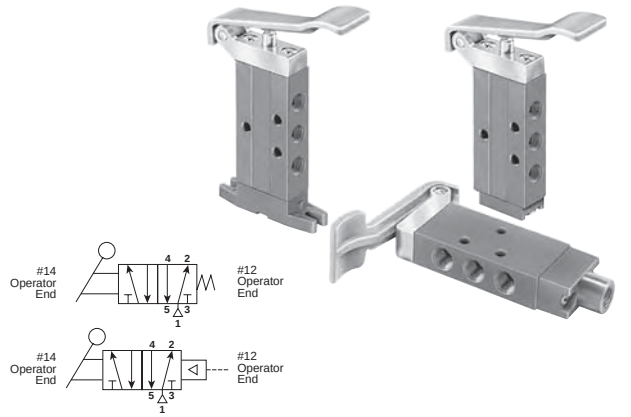
Operator pushed last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Hand Lever Operated

410711000 Hand Lever Operated, Spring Return

410721000 Hand Lever Operated, Spring Return, Foot Mounted

410751000 Hand Lever Operated, Pilot Return



Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

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Directair 2 Series

BOLD OPTIONS ARE MOST POPULAR.

Basic Series	
1/8" Port Poppet Valve	**40***
1/8" Port Spool Valve	**41**

* Only available in Spring Return.

Manual / Mechanical	
000	**Standard**

Type	
4-Way, 2-Position Valve	**0***
3-Way, 2-Position	**4**

* N/A with Basic Series 40.

Mounting	
1	**Direct Pipe Ported, NPT**
K	Direct Pipe Ported, BSPP

Actuation	
Plunger	**1**
Roller - Delrin	**2**
One-Way Tripper	**3**
Button - Spring Return	**4**
Hand Lever	**7**
Toggle	**8**
Button - Push-Pull	**9***

* N/A with Basic Series 40.

	Return
1†	**Spring**
2†	**Spring w/ Foot Mount**
3*	**None (Manual Return)**
4*	**None (Manual Return w/ Foot Mount)**
5†	Remote Pilot Return

* Available only with Actuation 9.

† N/A with Actuation 8.

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Operating Pressure

150 PSI (28" Hg to 1035 kPa)*

* Poppet valves cannot be used for vacuum.
Minimum operating pressure = 0 PSIG.

Temperature Range

32°F to 175°F (0°C to 80°C)

⚠ **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.

Materials

Body and Operator Housings.....Aluminum Extrusion
Spool .....Stainless Steel
Bushings.....Brass
Spacers ..... Zinc Die Cast
Dynamic O-Rings.....Fluorocarbon
Operator O-Rings.....Buna (Nitrile)
Operator U-Cups.....Buna (Nitrile)
Poppet Ball.....Nylon

Lubrication

For maximum service life use clean, lubricated air. Valves are shipped pre-lubricated and can be operated without additional lubrication with reduced service life.

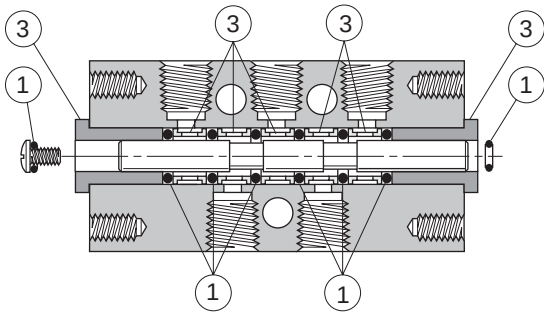
Suggested Lubricant

F442 Oil

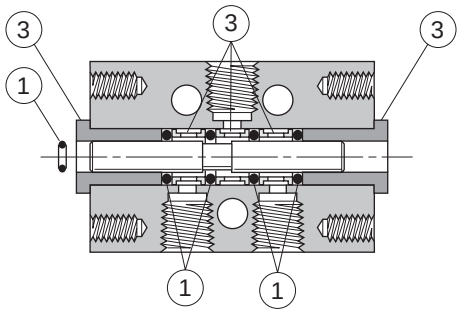
Flow Rating (Cv)

Flow Path	Direct Pipe Spool, 1/8" Ports	Direct Pipe Poppet, 1/8" Ports
1 → 2	.199	.125
1 → 4	.191	—
2 → 3	.192	.215
4 → 5	.212	—
Avg.	.199	N/A

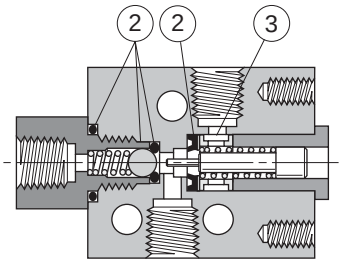
Service Kits



4-Way Spool



3-Way Spool



3-Way Poppet

(1) Spool Valve Seal Kit
(3 & 4-Way, Direct Pipe Ported) **41000 8000**
(2) Poppet Valve Seal Kit **40411 8000**
(3) Body Service Kit..... **41000 8005**

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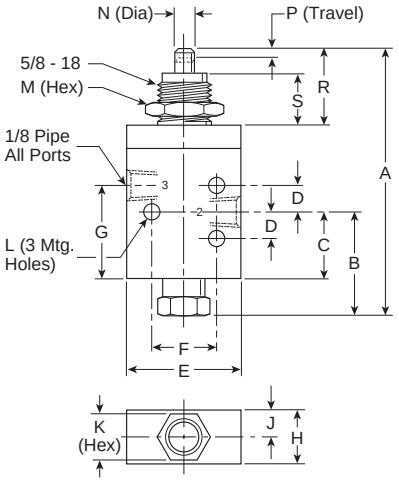
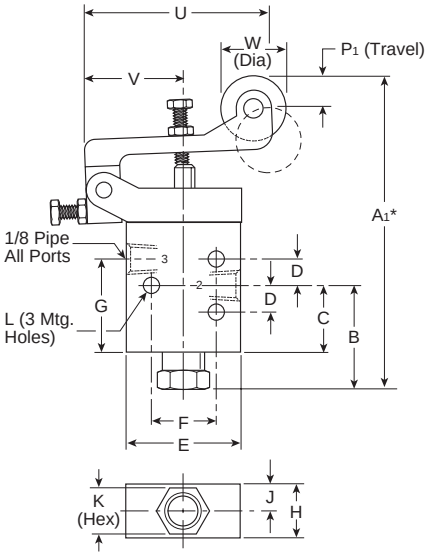
Plunger, Roller, One-Way Tripper & Toggle Operated

3-Way, 3-Port, 2-Position – 1/8" Ports

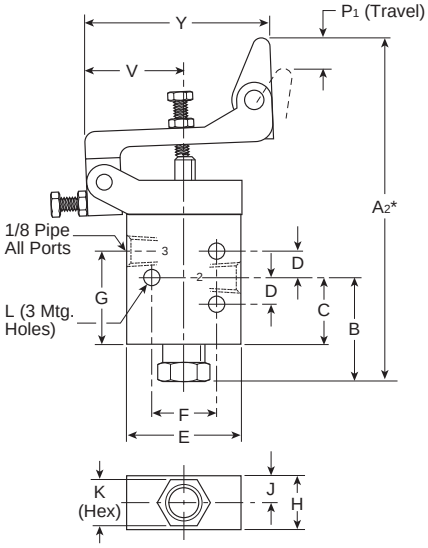
Plunger Operated



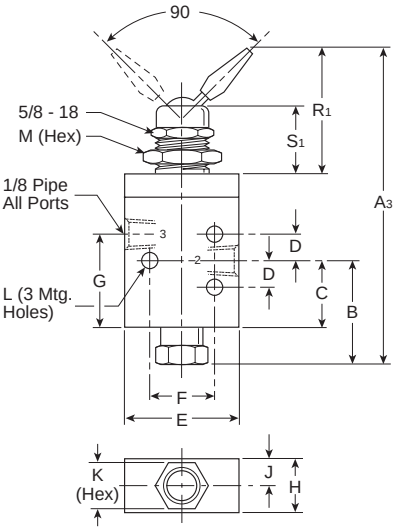
Roller Operated



One-Way Tripper Operated



Toggle Operated



3-Way, 3-Port, 2-Position

A 3.37 (86)	**A₁*** 4.21 (107)	**A₂*** 4.46 (113)	**A₃** 3.99 (101)	**B** 1.03 (26)
C .55 (14)	**D** .31 (8)	**E** 1.31 (33)	**F** .75 (19)	**G** .90 (23)
H .62 (16)	**J** .31 (8)	**K** .56 (14)	**L** .19 (5)	**M** .88 (22)
N .25 (6)	**P** .17 (4)	**P₁** .38 (10)	**R** .91 (23)	**R₁** 1.53 (39)
S .62 (16)	**S₁** .78 (20)	**U** 2.28 (58)	**V** 1.19 (30)	**W** .75 (19)
X .19 (5)	**Y** 2.19 (56)			

* Dimensions may be reduced .44" using adjusting screw.

Inches (mm)

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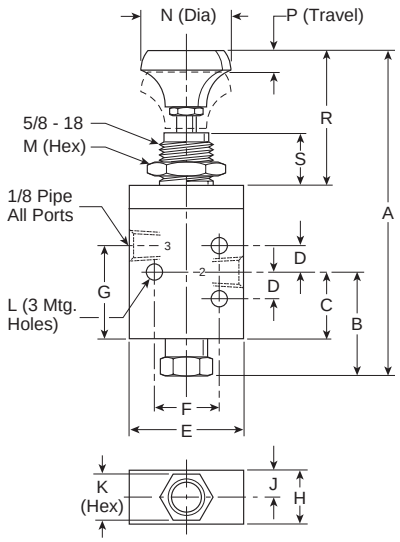
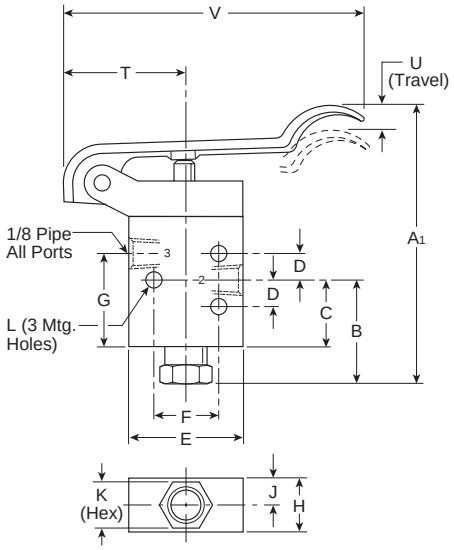
Button & Hand Lever Operated

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 (105)	3.34 (85)	1.03 (26)	.55 (14)	.31 (8)
E	**F**	**G**	**H**	**J**
1.31 (33)	.75 (19)	.90 (23)	.62 (16)	.31 (8)
K	**L**	**M**	**N**	**P**
.56 (14)	.19 (5)	.88 (22)	1.06 (27)	.17 (4)
R	**S**	**T**	**U**	**V**
1.67 (42)	.63 (16)	1.19 (30)	.53 (13)	3.38 (86)

Inches (mm)

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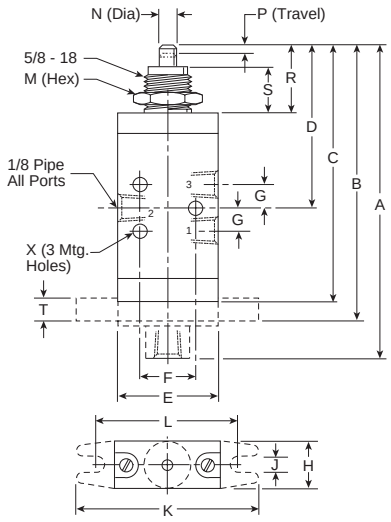
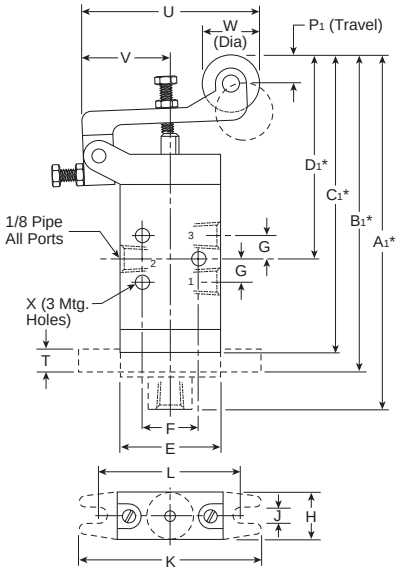
Plunger, Roller, One-Way Tripper & Toggle Operated

3-Way, 3-Port, 2-Position – 1/8" Ports

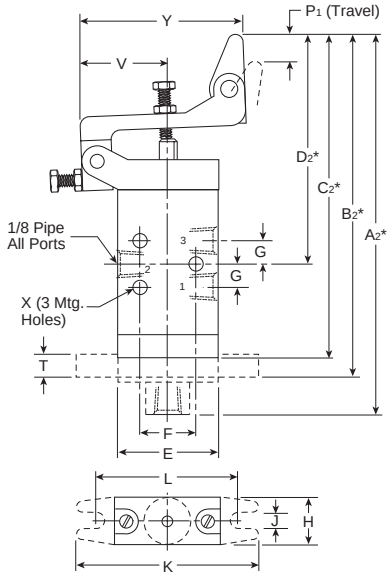
Plunger Operated



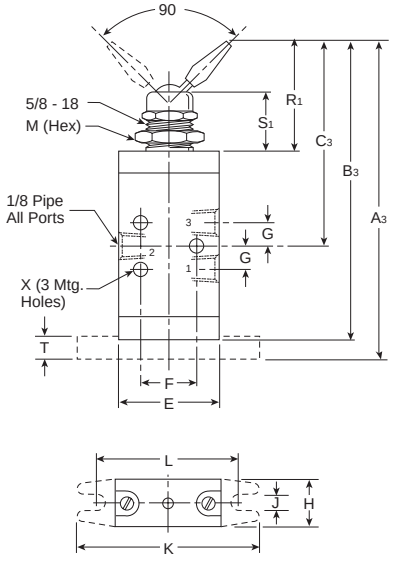
Roller Operated



One-Way Tripper Operated



Toggle Operated



3-Way, 3-Port, 2-Position

A	**A₁***	**A₂***	**A₃**	**B**
4.14 (105)	4.98 (126)	5.23 (133)	4.23 (107)	3.61 (92)
B₁	**B₂**	**B₃**	**C**	**C₁**
4.45 (113)	4.70 (119)	4.00 (102)	3.38 (86)	4.22 (107)
C₂	**C₃**	**D**	**D₁**	**D₂**
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)
P₁	**R**	**R₁**	**S**	**S₁**
.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)

Parker Hannifin Corporation
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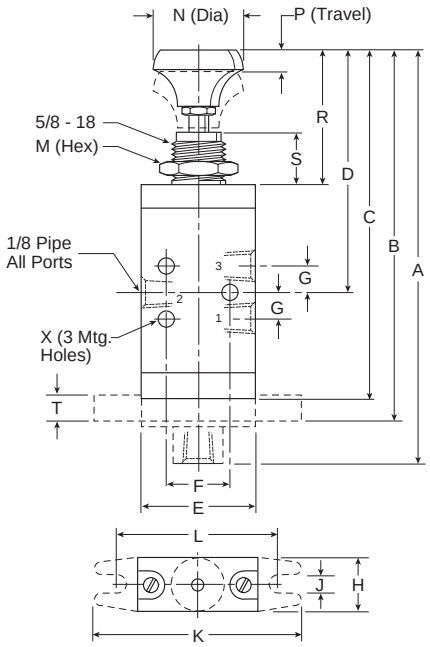
Richland, Michigan
www.parker.com/pneumatics

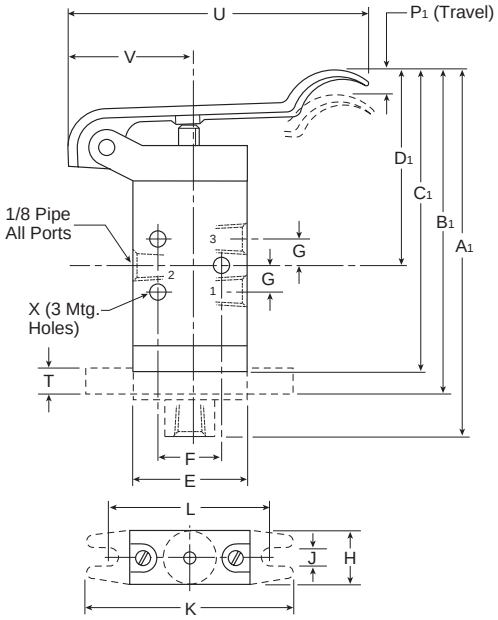
Button, Hand Lever Operated

3-Way, 3-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



3-Way, 3-Port, 2-Position

A	**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)

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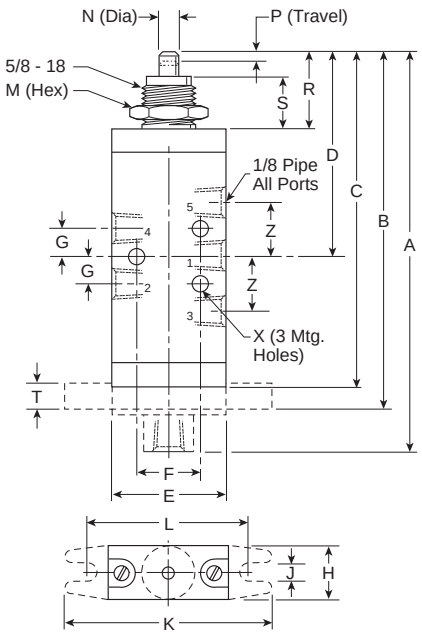
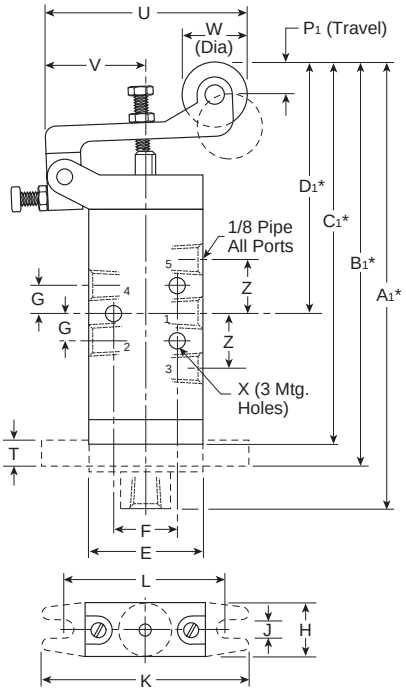
Plunger, Roller, One-Way Tripper & Toggle Operated

4-Way, 5-Port, 2-Position – 1/8" Ports

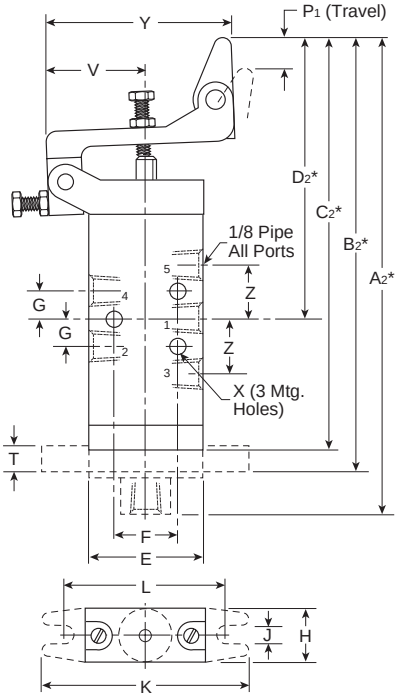
Plunger Operated



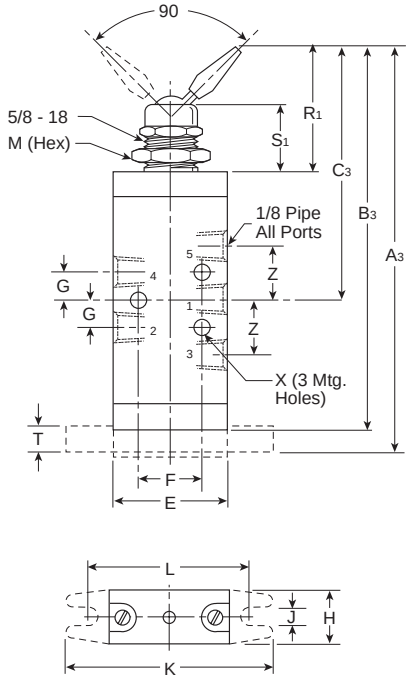
Roller Operated



One-Way Tripper Operated



Toggle Operated



4-Way, 5-Port, 2-Position

A	**A₁***	**A₂***	**A₃**	**B**
4.75 (121)	5.59 (142)	5.84 (148)	4.84 (123)	4.22 (107)
B₁*	**B₂***	**B₃**	**C**	**C₁***
5.06 (128)	5.31 (135)	4.61 (117)	3.99 (102)	4.83 (123)
C₂*	**C₃**	**D**	**D₁***	**D₂***
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)
P₁	**R**	**R₁**	**S**	**S₁**
.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)

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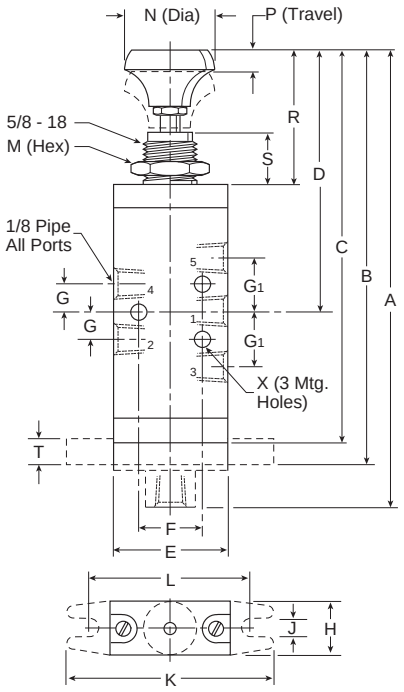
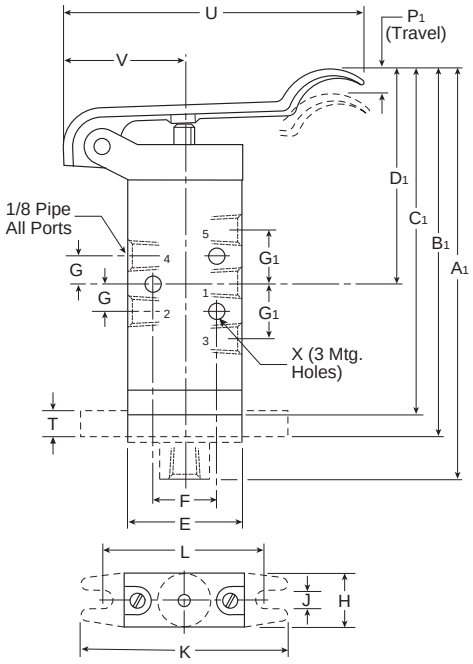
Button & Hand Lever Operated

4-Way, 5-Port, 2-Position – 1/8" Ports

Button Operated



Hand Lever Operated



4-Way, 5-Port, 2-Position

A	A1	B	B1	C
5.69 (144)	4.90 (124)	5.16 (131)	4.38 (111)	4.92 (125)
C1	**D**	**D1**	**E**	**F**
4.14 (105)	3.67 (93)	2.90 (74)	1.31 (33)	.75 (19)
G	**G1**	**H**	**J**	**K**
.31 (8)	.63 (16)	.62 (16)	.20 (5)	2.38 (60)
L	**M**	**N**	**P**	**P1**
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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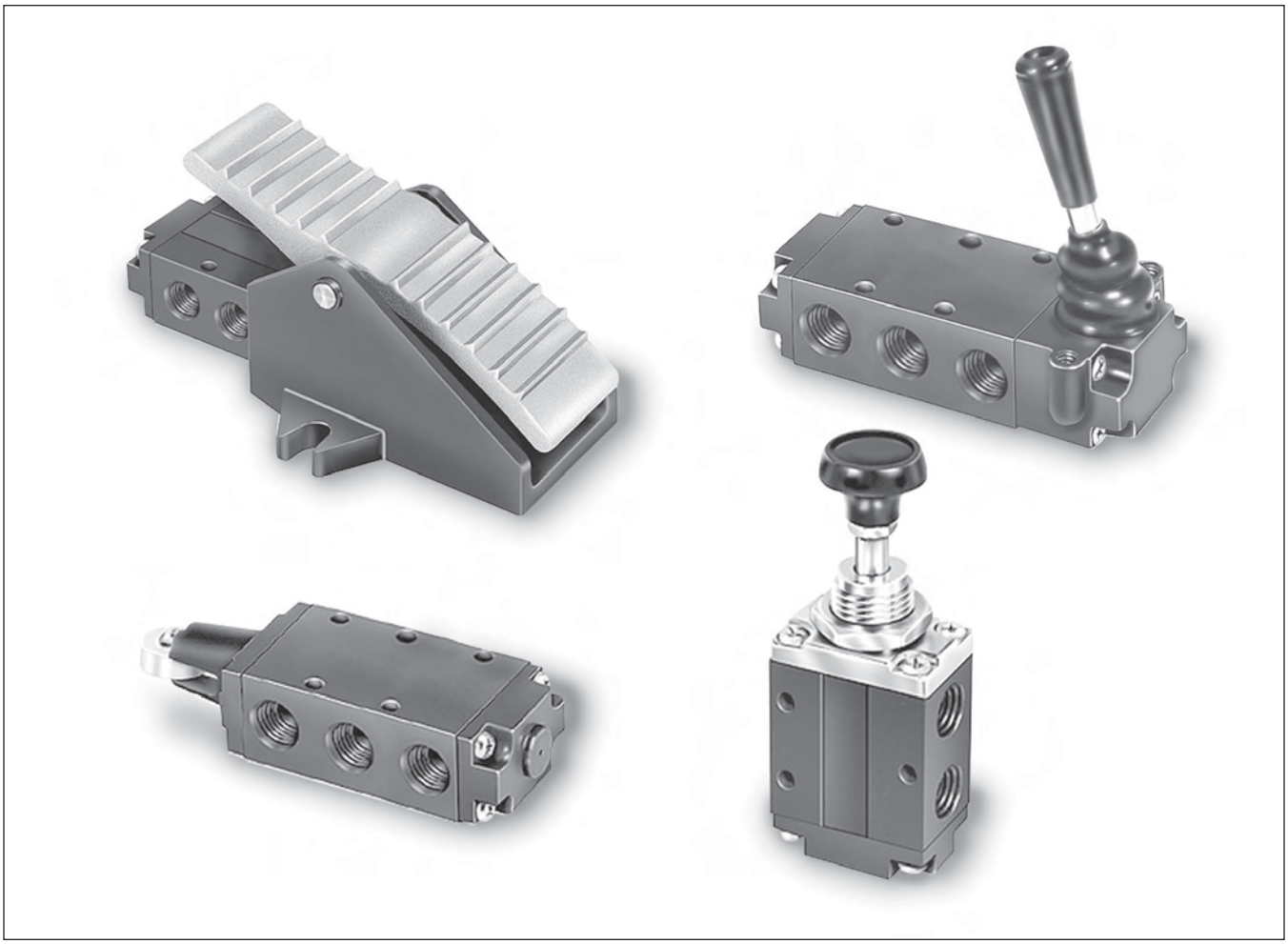
Directair 4 Series

Inline Valves
Manual / Mechanical
3 & 4-Way, 3 & 5-Port, 2 & 3-Position

Section F

www.parker.com/pneu/directair



Directair 4 Series Basic Features..... F19
3-Way Spool Valves.....F20-F21
4-Way Spool Valves.....F22-F23
Model Number Index..... F24
Accessories & Service Kits F25
Technical Information..... F26

Dimensions
3-Way – Button, Roller & Treadle..... F27
3-Way – Lever & Pedal F28
4-Way – Button, Roller, Pedal & Treadle..... F29
4-Way – Lever F30

BOLD ITEMS ARE MOST POPULAR.

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Directair 4 Series

Specifications

Inline Valve
- 1/4" Port
- 4-Way, 2 & 3-Position
- 3-Way, 2 & 3-Position

Manual Operators
- Lever
- Pedal
- Treadle
- Button

Mechanical Operators
- Roller

Packed Bore Style - .83 Cv
- Stainless Steel Spool
- Fluorocarbon O-rings

Operating Pressure

- Vacuum to 150 PSI (28" Hg to 1035 kPa)

Operating Temperature

- 32 to 175°F (0 to 80°C)

Button Operated

Lever Operated

Treadle Operated

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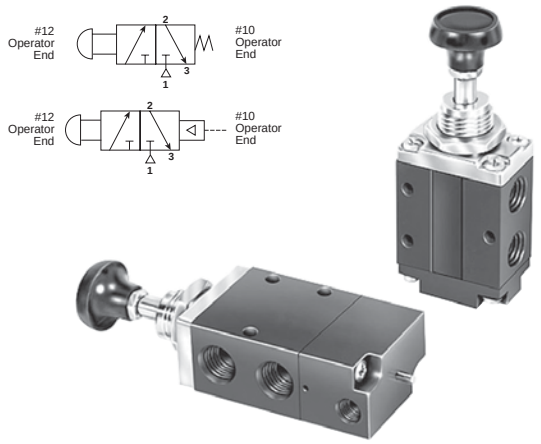
Button Operated

524411000 Button Operated, Spring Return
524451000 Button Operated, Pilot Return



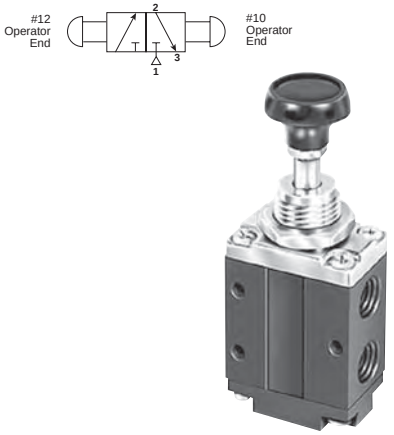
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Button Operated

524431000 Button Operated, Manual Return



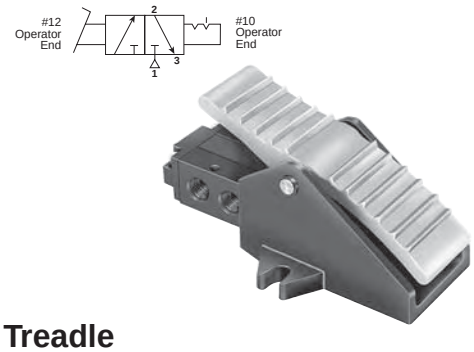
Manual Return

Operator pulled last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Operator pushed last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Treadle Operated

524931000 Treadle Operated



Treadle

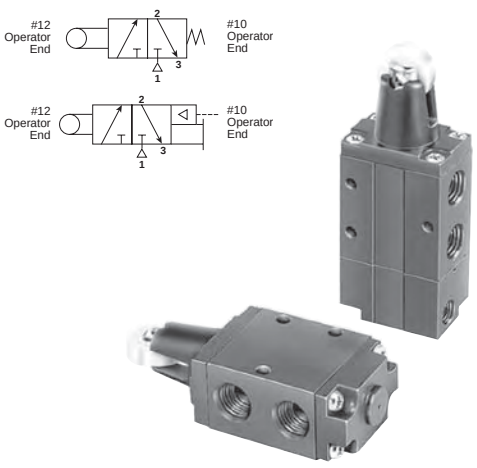
Toe pressed last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Heel pressed last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

⚠ ***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.
See Accessories page for Pedal Guard Kit.

Roller Operated

524211000 Delrin Roller Operated, Spring Return
524251000 Delrin Roller Operated, Pilot Return
524A11000 Steel Roller Operated, Spring Return
524A51000 Steel Roller Operated, Pilot Return



Roller

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

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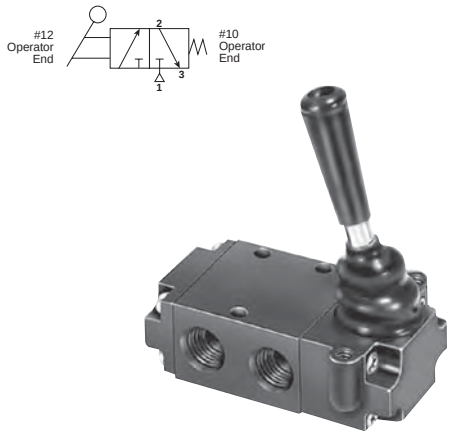
Lever Operated

524811000 Lever Operated, Spring Return



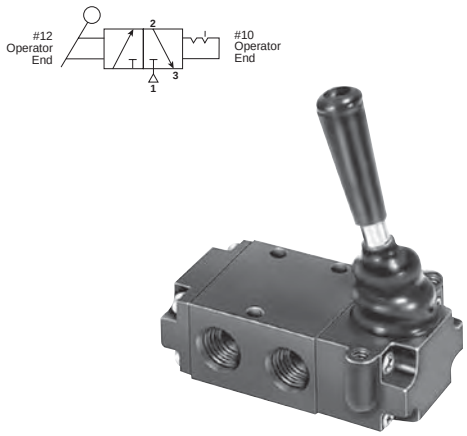
Spring Return

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Lever Operated

524831000 Lever Operated, Manual Return



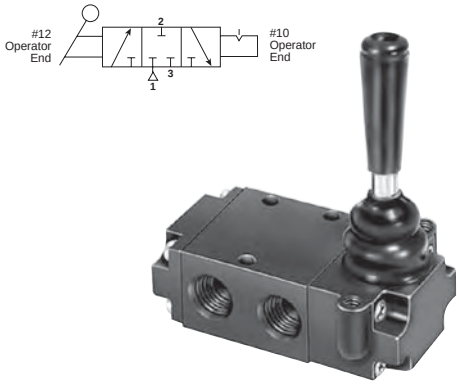
Manual Return

Operator pushed last (toward body) – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Operator pulled last (away from body) – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Lever Operated – 3-Position

523831000 Lever Operated, 3-Position Detented, All Ports Blocked



Lever

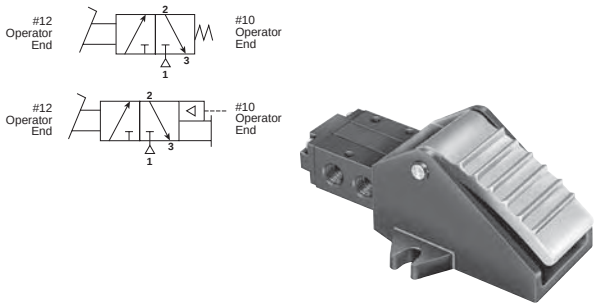
Operator pushed last (*toward body)* – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Operator pulled last (away from body) – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

Center Position – All Ports blocked.

Pedal Operated

524711000 Pedal Operated, Spring Return
524751000 Pedal Operated, Pilot Return



Pedal

Normal Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

⚠ ***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.
See Accessories page for Pedal Guard Kit.

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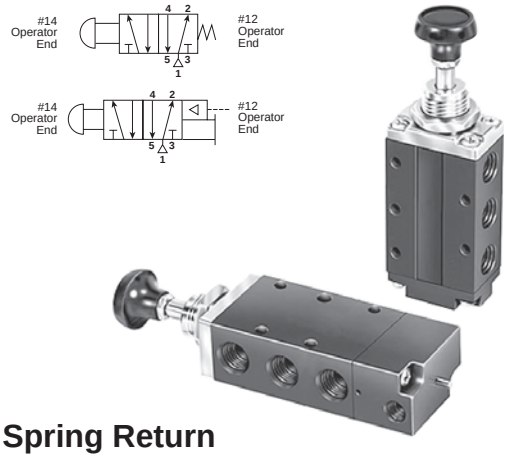
Button Operated

520411000 Button Operated, Spring Return
520451000 Button Operated, Pilot Return



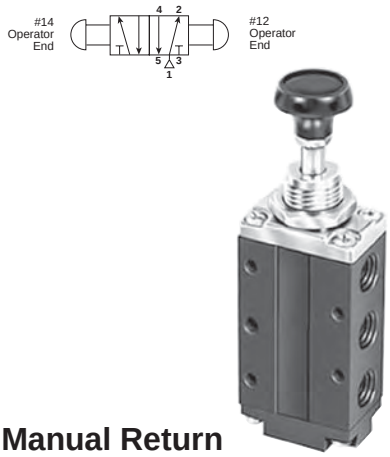
Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Button Operated

520431000 Button Operated, Manual Return



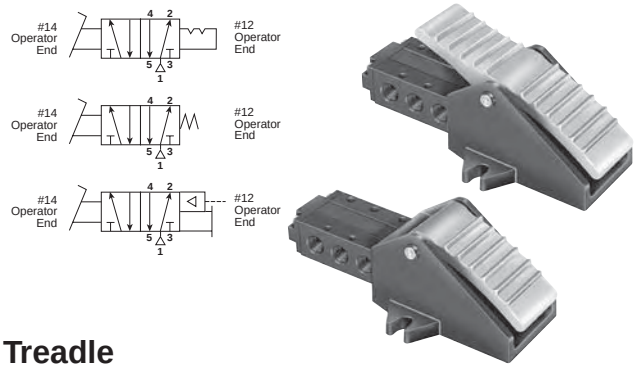
Manual Return

Operator pulled last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Operator pushed last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Pedal & Treadle Operated

520711000 Pedal Operated, Spring Return
520751000 Pedal Operated, Pilot Return
520931000 Treadle Operated



Treadle

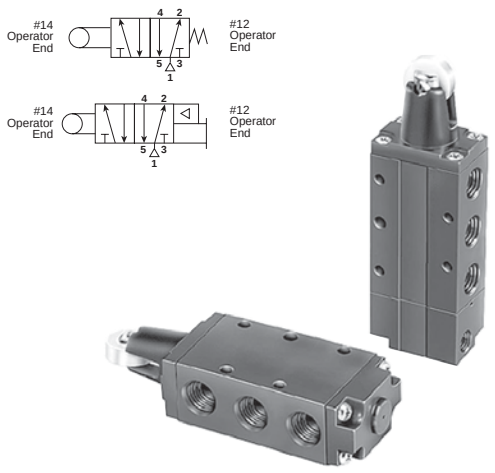
Toe pressed last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Heel pressed last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

⚠ ***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.
See Accessories page for Pedal Guard Kit.

Roller Operated

520211000 Delrin Roller Operated, Spring Return
520251000 Delrin Roller Operated, Pilot Return
520A11000 Steel Roller Operated, Spring Return
520A51000 Steel Roller Operated, Pilot Return



Roller

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

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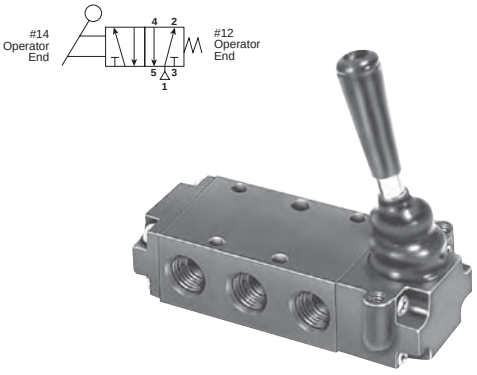
Lever Operated

520811000 Lever Operated, Spring Return



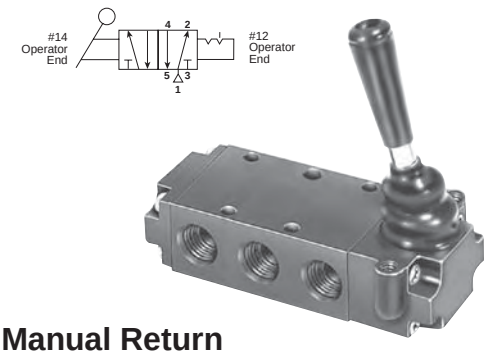
Spring Return

Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Actuated Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Lever Operated

520831000 Lever Operated, Manual Return



Manual Return

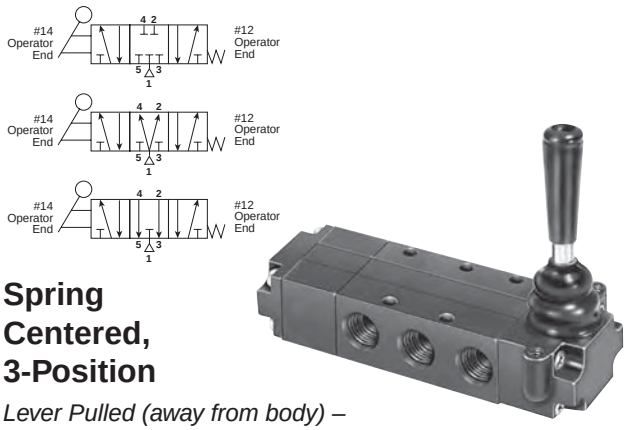
Operator pushed last (toward body) – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Operator pulled last (away from body) – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Lever Operated, 3-Position

Lever, Spring Centered

521811000 Type 1, Closed Center
522811000 Type 2, Pressure Center
529811000 Type 9, Exhaust Center



Spring Centered, 3-Position

Lever Pulled (away from body) –
Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Lever Pushed (toward body) –
Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Centered Position –
Type 1: All Ports blocked.

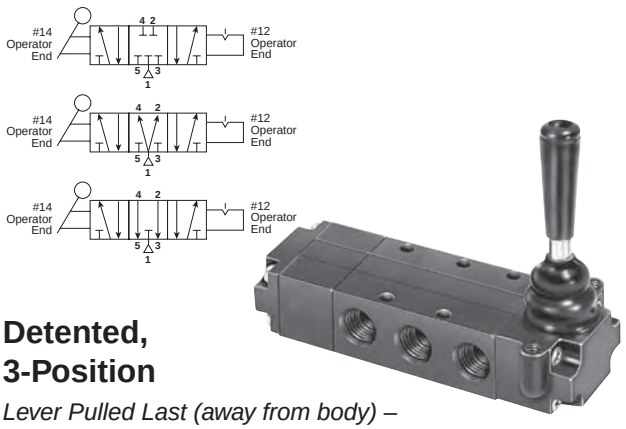
Type 2: Pressure at Inlet Port 1 is connected to Outlet Ports 2 & 4.

Type 9: Pressure at Inlet Port 1 is blocked. Outlet Ports 2 & 4 are connected to Exhaust Ports 3 & 5.

Lever Operated, 3-Position

Lever, Detented

521831000 Type 1, Closed Center
522831000 Type 2, Pressure Center
529831000 Type 9, Exhaust Center



Detented, 3-Position

Lever Pulled Last (away from body) –
Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Lever Pushed Last (toward body) –
Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Centered Position –
Type 1: All Ports blocked.

Type 2: Pressure at Inlet Port 1 is connected to Outlet Ports 2 & 4.

Type 9: Pressure at Inlet Port 1 is blocked. Outlet Ports 2 & 4 are connected to Exhaust Ports 3 & 5.

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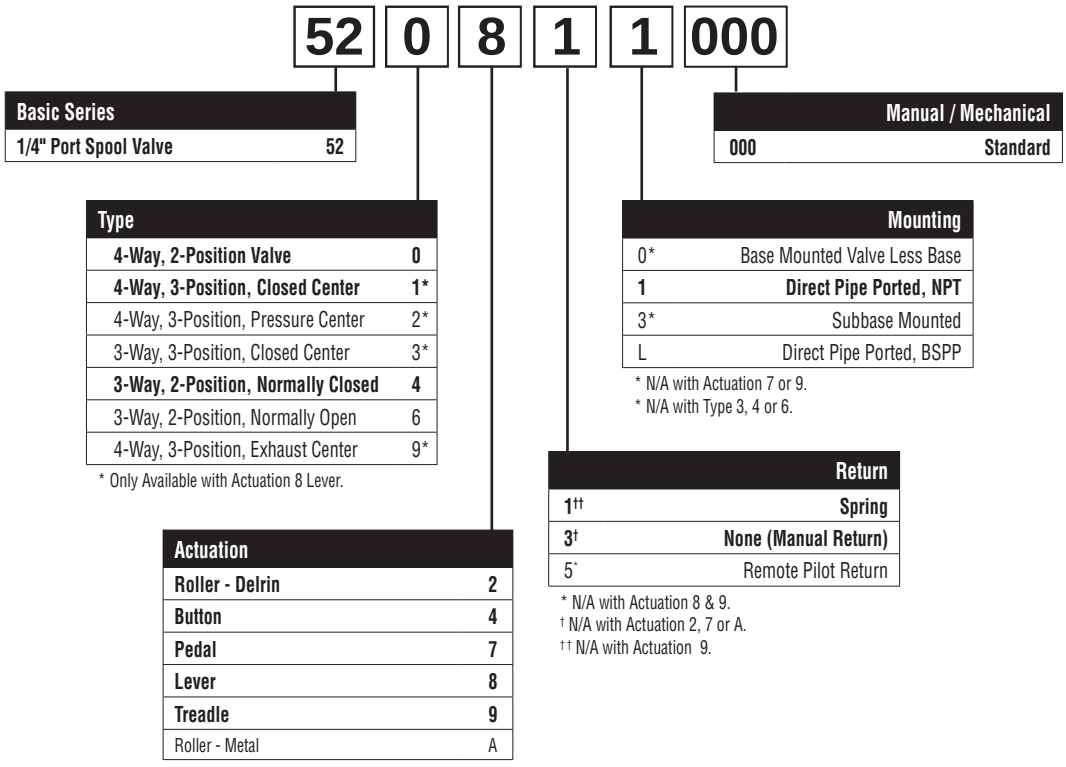
Directair 4 Series

BOLD OPTIONS ARE MOST POPULAR.



Basic Series	
1/4" Port Spool Valve	**52**

Type	
4-Way, 2-Position Valve	**0**
4-Way, 3-Position, Closed Center	**1***
4-Way, 3-Position, Pressure Center	2*
3-Way, 3-Position, Closed Center	3*
3-Way, 2-Position, Normally Closed	**4**
3-Way, 2-Position, Normally Open	6
4-Way, 3-Position, Exhaust Center	9*

* Only Available with Actuation 8 Lever.

Actuation	
Roller - Delrin	**2**
Button	**4**
Pedal	**7**
Lever	**8**
Treadle	**9**
Roller - Metal	A

	Mounting
0*	Base Mounted Valve Less Base
1	**Direct Pipe Ported, NPT**
3*	Subbase Mounted
L	Direct Pipe Ported, BSPP

* N/A with Actuation 7 or 9.
* N/A with Type 3, 4 or 6.

	Return
1††	**Spring**
3†	**None (Manual Return)**
5*	Remote Pilot Return

* N/A with Actuation 8 & 9.
† N/A with Actuation 2, 7 or A.
†† N/A with Actuation 9.

Manual / Mechanical	
000	**Standard**

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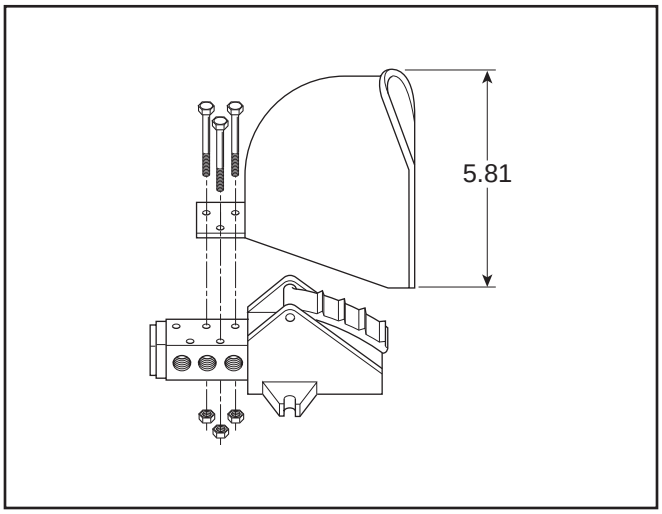
Pedal Guard Kit
No. 52071 8001

Pedal guard meets safety requirements for foot operated valves by protecting pedal from accidental tripping from all angles. Guard is constructed of lightweight aluminum casting for strength and durability. Bolts quickly into place with only three screws without special valve mounting. One modeL fits any pedal (not treadle) operated “Directair 4” Series valve.

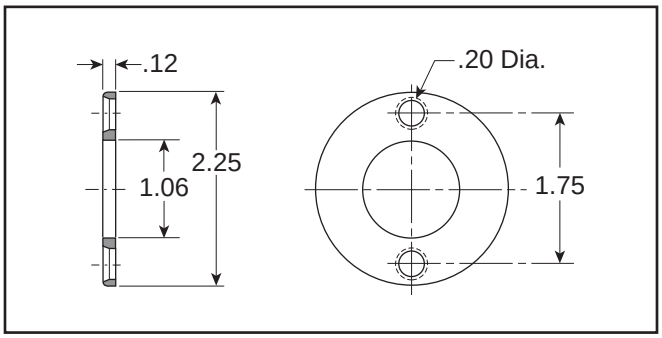
⚠ ***CAUTION:***

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.



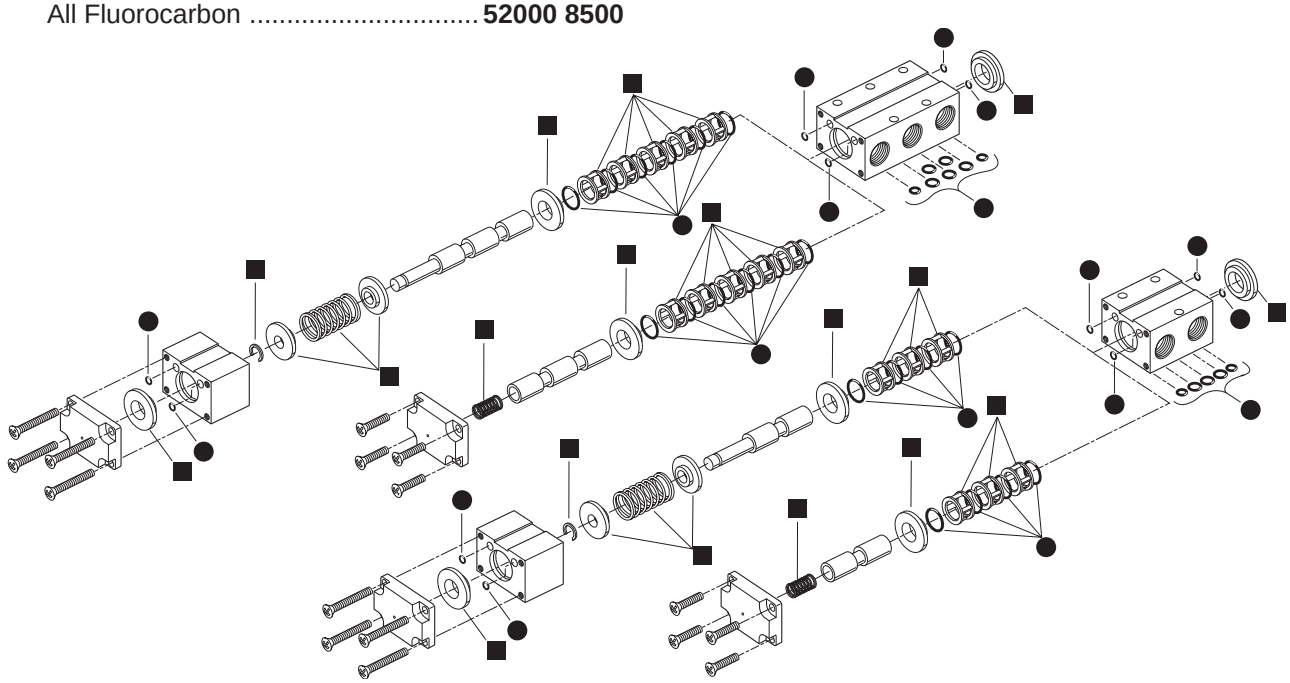
Panel Mounting Kit
No. 52083 8004

Available for panel mounting direct pipe ported, lever operated “Directair 4” Series valves only. Kit includes a flange and two screws.



Service Kits

- Valve Seal Kit **52000 8050**
  (Contains all soft seals found in 3 & 4-Way bodies and all actuator styles.)
  All Fluorocarbon **52000 8500**
- Body Service Kit **52001 8005**
  (Contains bushing, springs, retainers and shell from 2 & 3-Position, 3 & 4-Way bodies.)



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Operating Pressure

Vacuum to 150 PSI (28" Hg to 1035 kPa)

Temperature Range

32°F to 175°F (0°C to 80°C)

⚠ ***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.

Materials

Body and Operator Housings.....Aluminum Extrusion
Spool ..... Stainless Steel
Bushings and Pilot Piston .....Brass
Dynamic Seals .....Fluorocarbon
U-Cups .....Buna (Nitrile)
Spacers ..... Aluminum

Lubrication

For maximum service life use clean, lubricated air. Valves are shipped pre-lubricated and can be operated without additional lubrication with reduced service life.

Suggested Lubricant

F442 Oil

Flow Rating (Cv)

Flow Path	Direct Pipe Ported 1/4" Ports	Subbase Mounted 1/4" Side Ports
1 → 2	.82	.64
1 → 4	.84	.66
2 → 3	.84	.63
4 → 5	.83	.63
Avg.	.83	.64

Mechanically Operated Actuating Forces in Lbs.

	2-Position Spring Return	2-Position Manual Return	3-Position Spring Return	3-Position Manual Return
Button Actuator	13.0	2.0	13.0	N/A
Roller Actuator	13.0	N/A	N/A	N/A
Lever Actuator	4.0	2.0	4.0	2.5

Notes: N/A = Not Applicable
All valves are at 100 PSIG inlet pressure to the valve.

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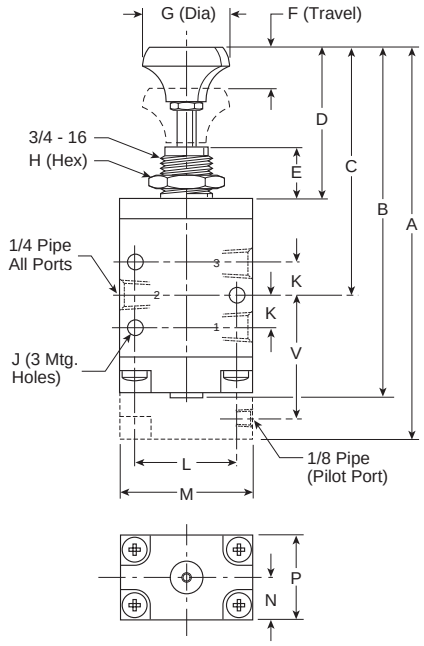
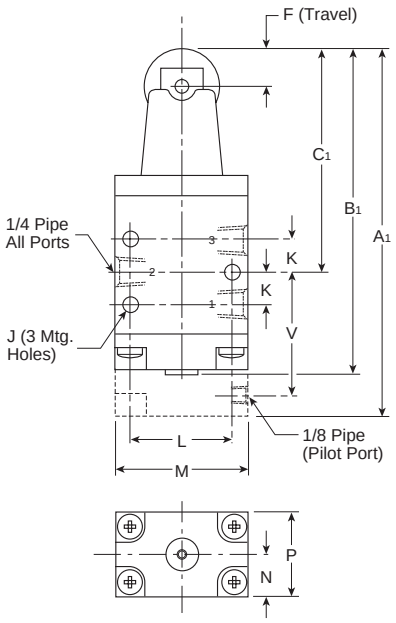
Button, Roller & Treadle Operated

3-Way, 3-Port, 2-Position

Button Operated



Roller Operated

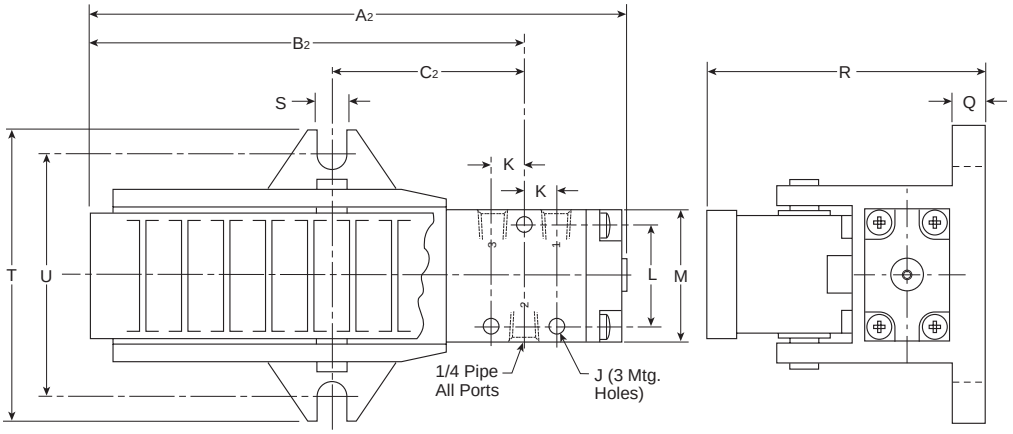


3-Way, 3-Port, 2-Position

A 4.91 (125)	**A1** 4.25 (108)	**A2** 6.55 (166)	**B** 4.44 (113)	**B1** 3.78 (96)
B2 5.20 (132)	**C** 3.10 (79)	**C1** 2.44 (62)	**C2** 2.19 (56)	**D** 2.00 (51)
E .63 (16)	**F** .32 (8)	**G** 1.05 (27)	**H** 1.00 (25)	**J** .19 (5)
K .41 (10)	**L** 1.25 (32)	**M** 1.63 (42)	**N** .53 (14)	**P** 1.06 (27)
Q .37 (10)	**R** 2.40 (61)	**S** .34 (9)	**T** 3.50 (89)	**U** 3.00 (76)
V 1.52 (39)				

Inches (mm)

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.
See Accessories page for Pedal Guard Kit.

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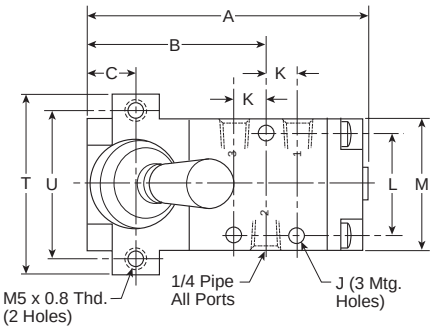
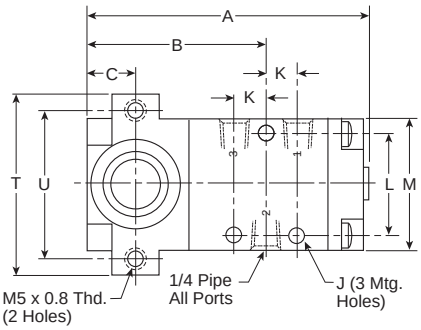
Lever & Pedal Operated

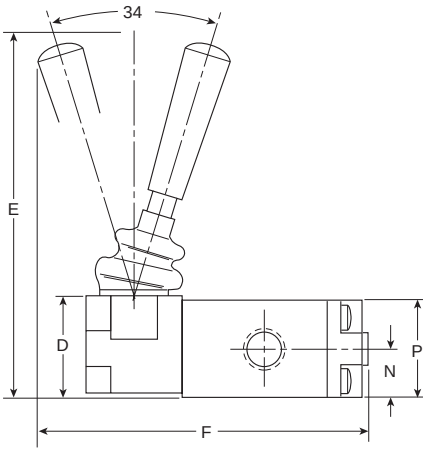
3-Way, 3-Port, 2 & 3-Position

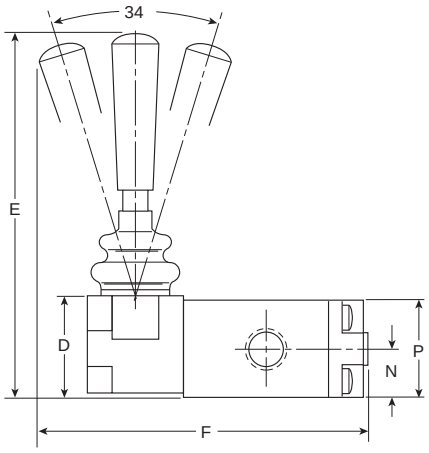
Lever Operated 2-Position



Lever Operated 3-Position





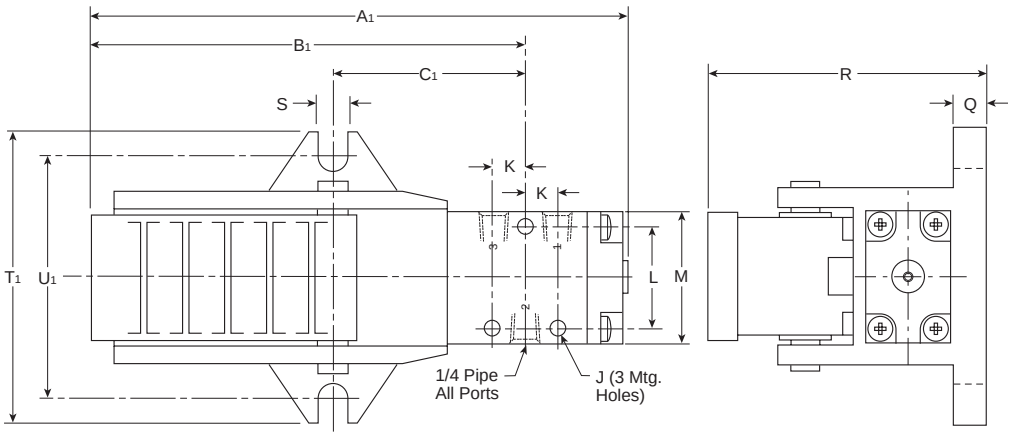


3-Way, 3-Port, 2 & 3-Position

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)	44 (76)			

Inches (mm)

Pedal 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.
See Accessories page for Pedal Guard Kit.

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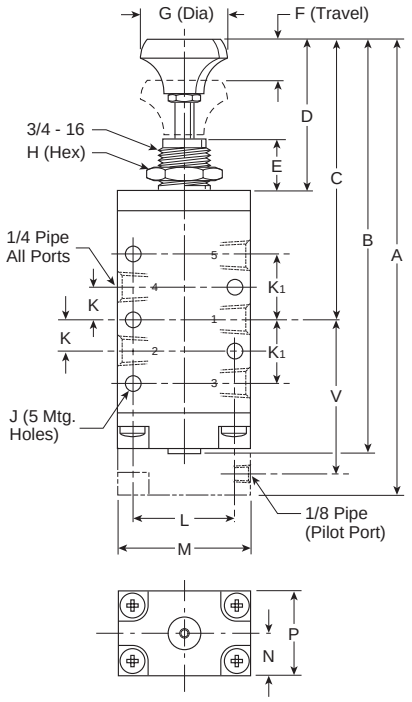
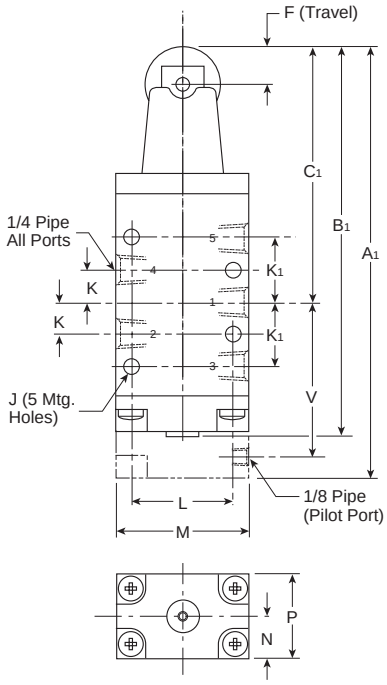
Button, Roller, Pedal & Treadle Operated

4-Way, 5-Port, 2-Position

Button Operated



Roller Operated

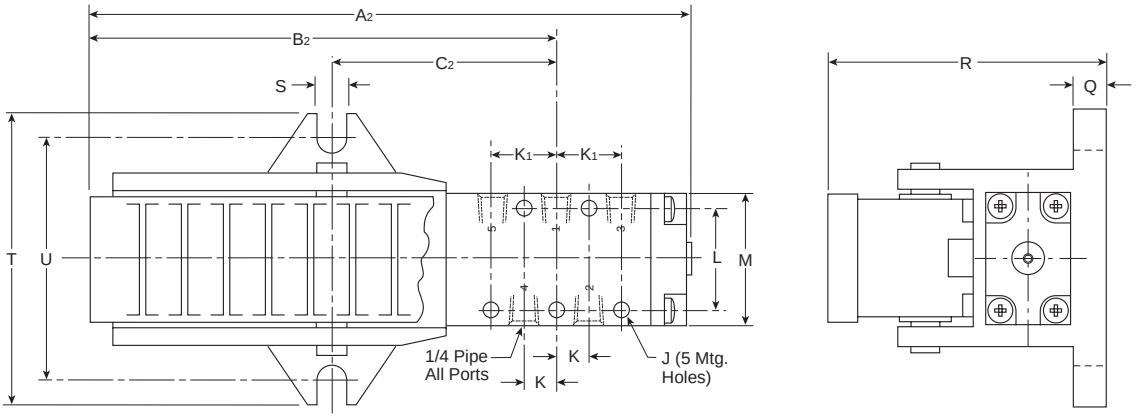


4-Way, 5-Port, 2-Position

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)

Pedal and 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.
See Accessories page for Pedal Guard Kit.

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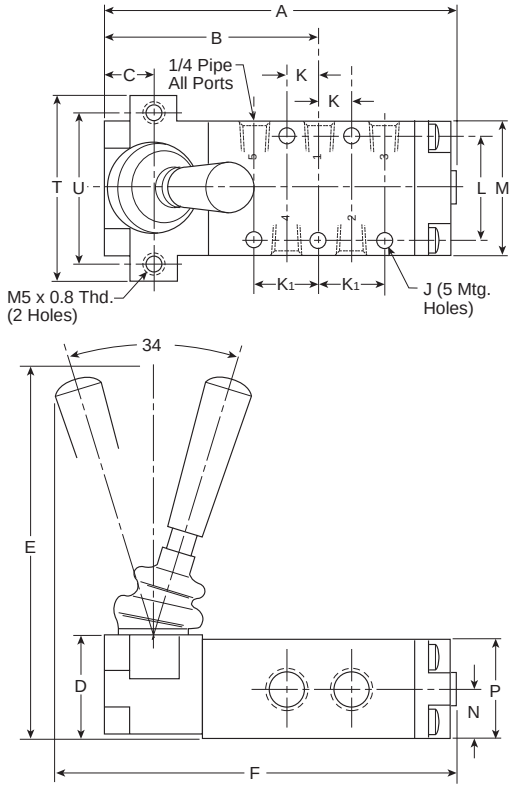
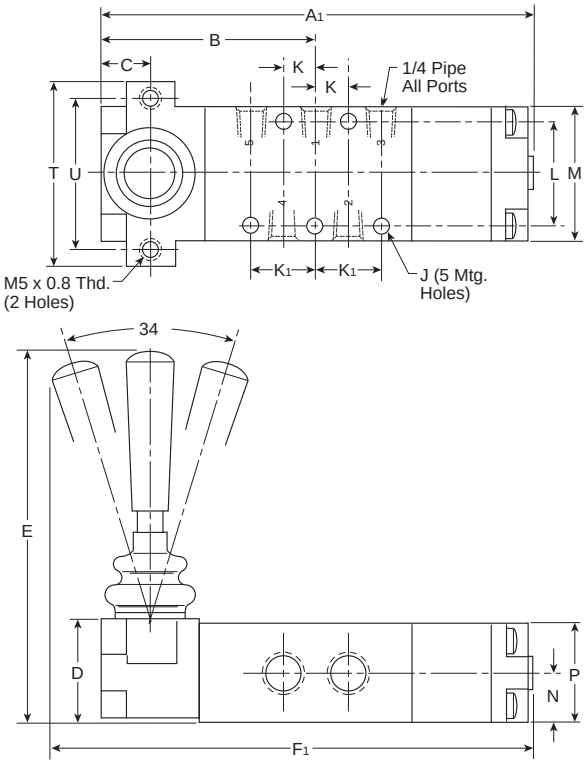
Lever Operated

4-Way, 5-Port, 2 & 3-Position

Lever Operated 2-Position



Lever Operated 3-Position



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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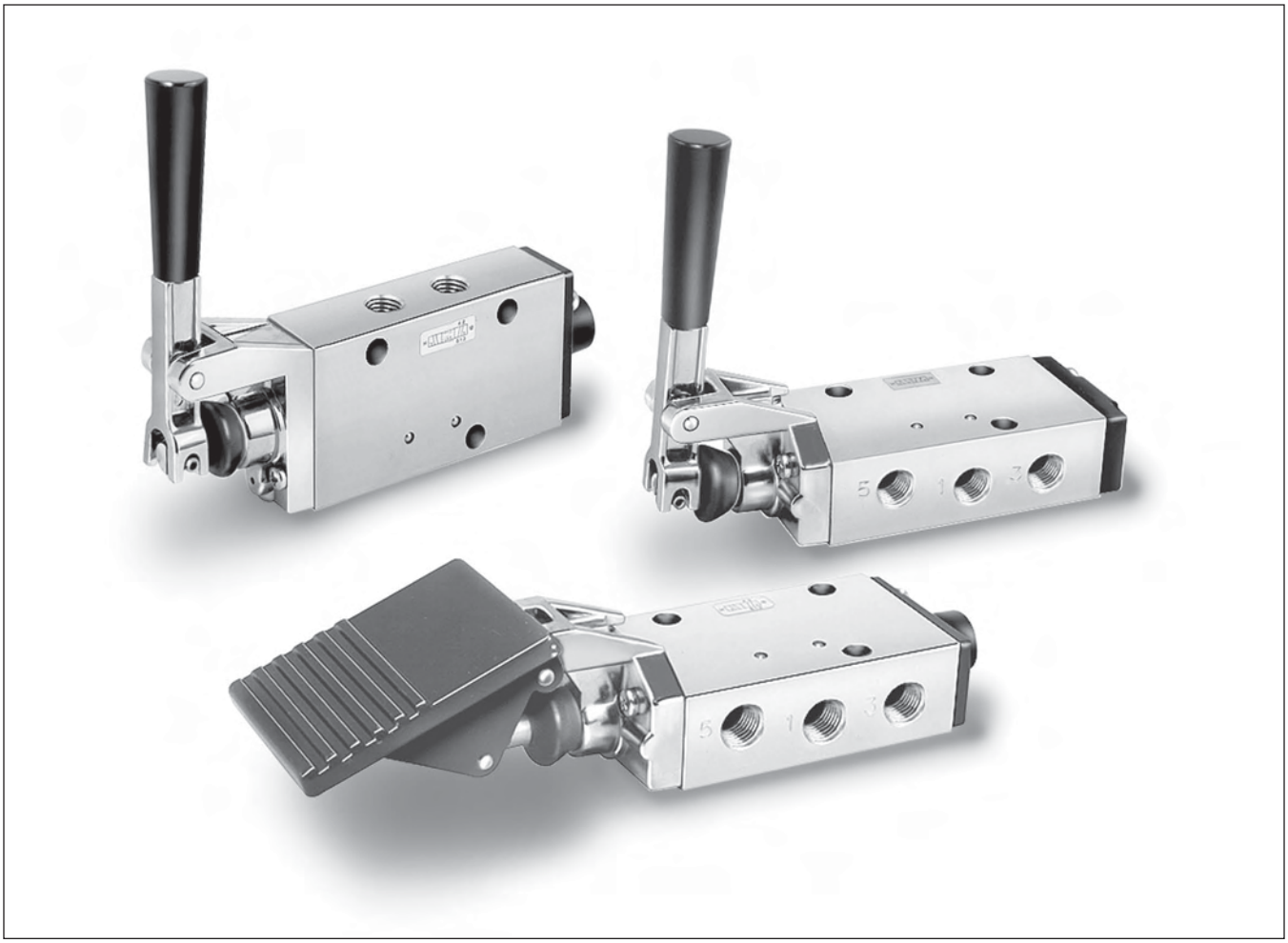
“42” Series

Lever / Pedal Valves

4-Way, 5-Port, 2 & 3-Position

Section F

www.parker.com/pneu/42ser



Basic Valve Functions F32
“42” Series Basic Valve Features F33
Common Part Numbers..... F34
Model Number Index & Accessories F35
Dimensions
Lever Valve F36
Foot Pedal Valve, Foot Pedal Guard F37

BOLD ITEMS ARE MOST POPULAR.

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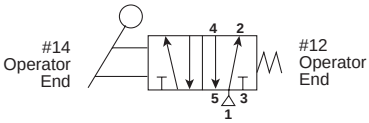
Lever Valves – Parallel & Perpendicular Operated

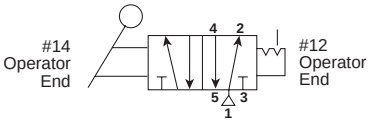
2-Position, Spring Return



Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When actuating Hand Lever, port 4 is pressurized; when releasing Hand Lever, spring returns the spool, pressurizing port 2.

Dual Pressure – Pressure at port 3 & 5 alternately pressurizes port 2 or 4 while exhausting at port 1. When actuating Hand Lever, port 2 is pressurized; when releasing Hand Lever, spring returns the spool, pressurizing port 4. (Must be ordered as dual pressure)

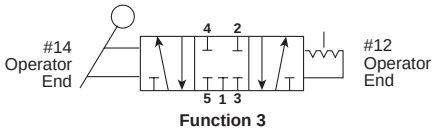
2-Position, Detent



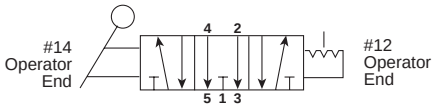
Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When pulling Hand Lever, port 4 is pressurized; when pushing Hand Lever, port 2 is pressurized. Spool stays in last actuated position.

Dual Pressure – Pressure at port 3 & 5 alternately pressurizes port 2 or 4 while exhausting at port 1. When pulling Hand Lever, port 2 is pressurized; when pushing Hand Lever, port 4 is pressurized. Spool stays in last actuated position. (Must be ordered as dual pressure.)

3-Position, Detent



Function 3



Function 4

Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When pulling Hand Lever, port 4 is pressurized; when pushing Hand Lever, port 2 is pressurized. When Hand Lever is vertical, it is in the center position - either APB or CE. Spool stays in last actuated position.

Center Functions

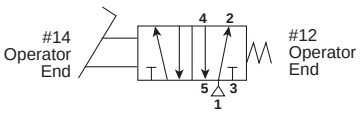
All Ports Blocked – Function 3

Center Exhaust – Function 4

⚠ ***CAUTION:***
For 3-Position lever function, do not restrict exhaust ports with speed controls.

Foot Pedal Operated

2-Position, Spring Return



⚠ ***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.

See Dimension page for Pedal Guard Kit.

Single Pressure at Port #1 – The Foot Pedal alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When pressing Foot Pedal down, port 4 is pressurized; when releasing Foot Pedal, spring returns the spool, pressurizing port 2.

Dual Pressure – Pressure at port 3 & 5 alternately pressurizes port 2 or 4 while exhausting at port 1. When pressing Foot Pedal down, port 2 is pressurized; when releasing Foot Pedal, spring returns the spool, pressurizing port 4. (Must be ordered as dual pressure)

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"42" Series

Specifications

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 Pressure

- Vacuum to 150 PSI (710mm HG to 1035 kPa)

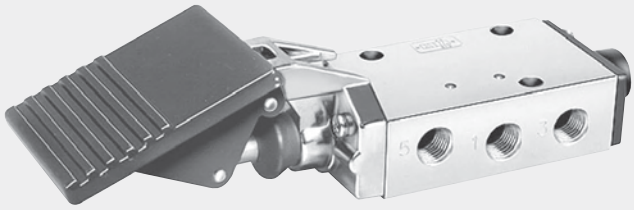
Operating Temperature

- 0°F to 140°F (-18°C to 60°C)

Flow Rating (Cv)

Port Size	Mounting Style	2-Position	3-Position
1/4" Ports	Inline	2.2	1.3
3/8" Ports	Inline	2.9	1.3

Lever Valve – Parallel



Foot Pedal Valve

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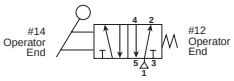
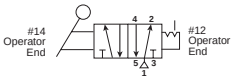
Lever Valve – 2-Position

(Parallel Shown)



Spring Return



Detented

Inline – Parallel

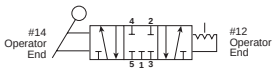
Single Pressure	Return	Port
422CS011K	Spring	1/4" NPT
422CS021K		3/8" NPT
422CS011W	Detent	1/4" NPT
422CS021W		3/8" NPT

Inline – Perpendicular

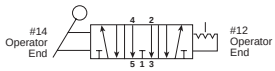
Single Pressure	Return	Port
422CR011K	Spring	1/4" NPT
422CR021K		3/8" NPT
422CR011W	Detent	1/4" NPT
422CR021W		3/8" NPT

Lever Valve – 3-Position

(Perpendicular Shown)



APB



CE

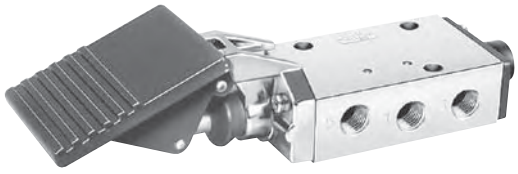
Inline – Parallel

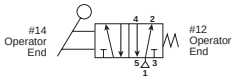
Single Pressure	Type	Port
422CS013W	3-Pos APB	1/4" NPT
422CS023W		3/8" NPT
422CS014W	3-Pos CE	1/4" NPT
422CS024W		3/8" NPT

Inline – Perpendicular

Single Pressure	Type	Port
422CR013W	3-Pos APB	1/4" NPT
422CR023W		3/8" NPT
422CR014W	3-Pos CE	1/4" NPT
422CR024W		3/8" NPT

Foot Pedal Valve – 2-Position





Spring Return

Inline

Single Pressure	Type	Return	Port
422CT011K	2-Pos	Spring	1/4" NPT
422CT021K			3/8" NPT

⚠ ***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.

See Dimensions page for Pedal Guard Kit.

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"42" Series

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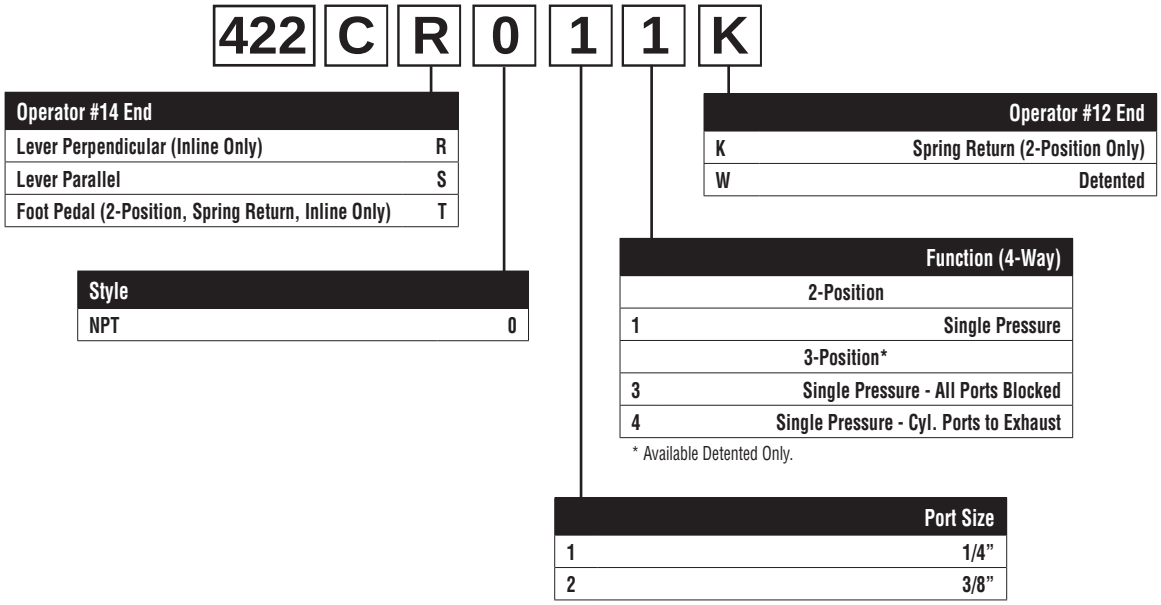

Valve Body Service Kits

Function / Operator	Single Pressure	Dual Pressure
2-Position / Manual	PS2038P	PS2039P
3-Position / Manual, Detented	PS2041P	

Kit includes: all soft seals and spool.

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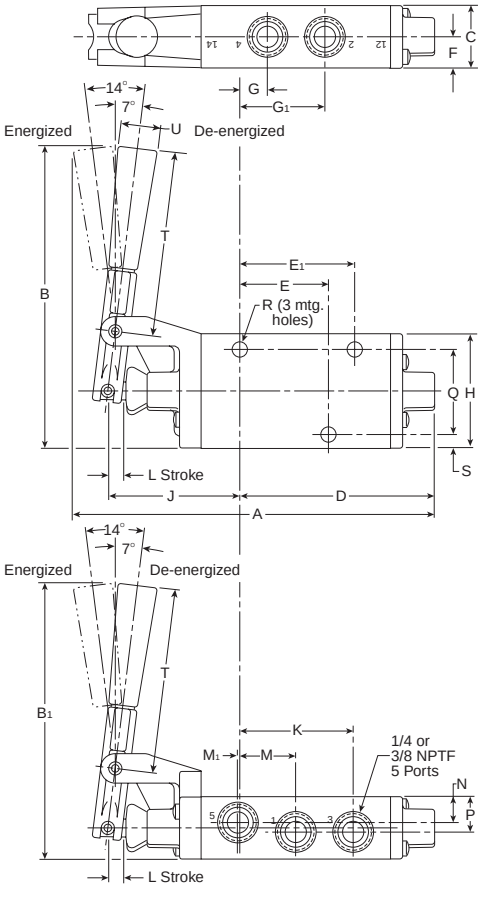
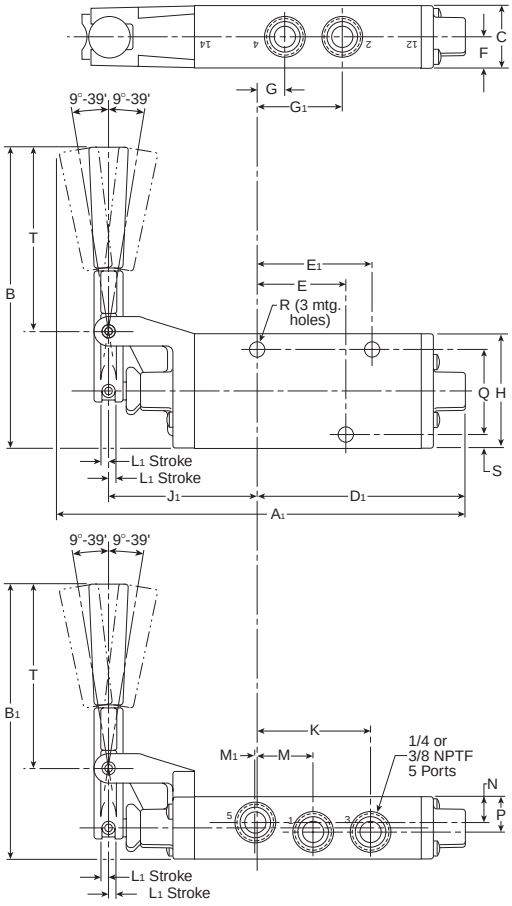
Lever Valve

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)

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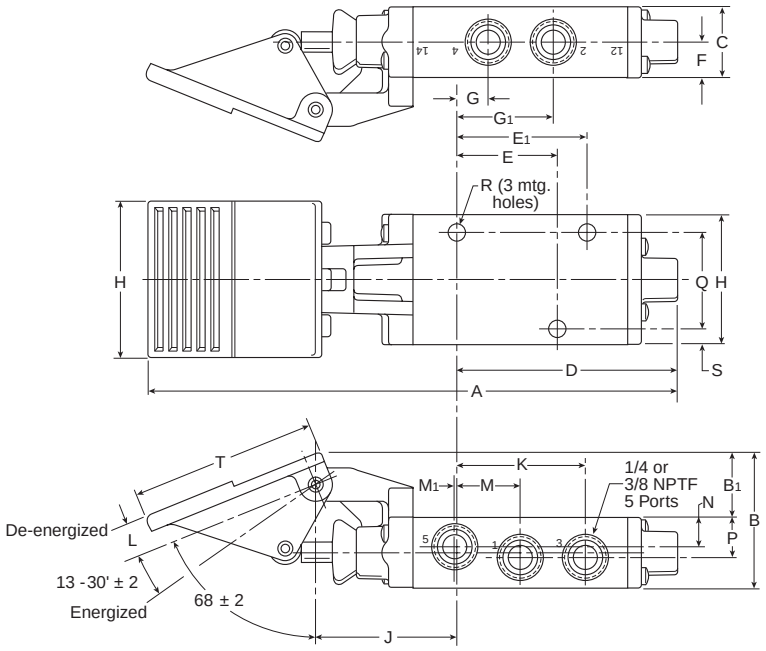
Foot Pedal Valve



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)	

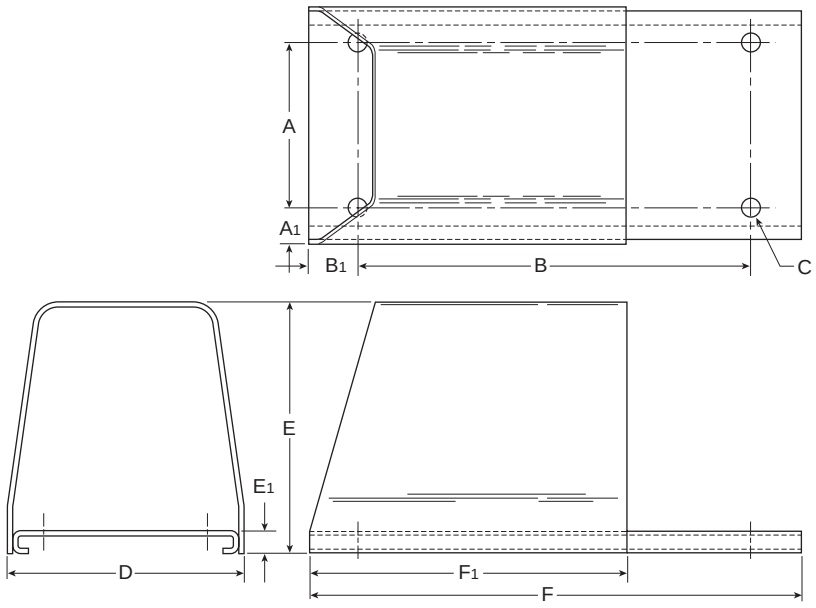
Inches (mm)

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 Pedal Valve Guard

To order Foot Pedal Valve Guard, specify part number PS2043P.

This kit contains the valve mounting hardware.



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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Lever Operated Air Control Valves

P2LAX – 1/8"
P2LBX – 1/4"
P2LCX – 3/8"
P2LDX – 1/2"

Section F

www.parker.com/pneu/vikingx

Basic Valve Functions F40
Basic Valve Features F41
P2LAX Common Part Numbers F42-F43
P2LBX Common Part Numbers F43
P2LCX Common Part Numbers F43
P2LDX Common Part Numbers F43
Electrical Connectors & Accessories F44
DOT Fittings F45-F46
Dimensions F47-F50

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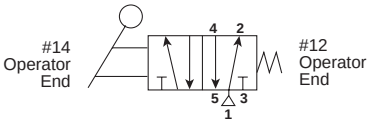
Lever Valves

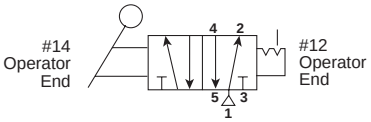
2-Position, Spring Return



Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When actuating Hand Lever, port 4 is pressurized; when releasing Hand Lever, spring returns the spool, pressurizing port 2.

Dual Pressure – Pressure at port 3 & 5 alternately pressurizes port 2 or 4 while exhausting at port 1. When actuating Hand Lever, port 2 is pressurized; when releasing Hand Lever, spring returns the spool, pressurizing port 4. (Must be ordered as dual pressure)

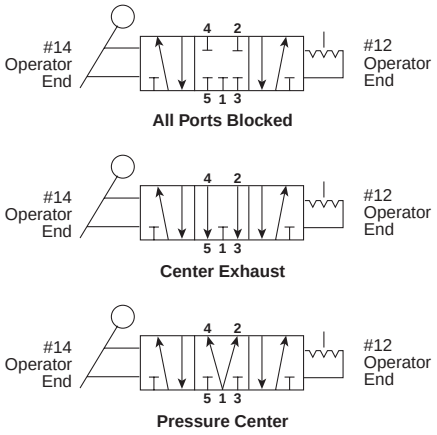
2-Position, Detent



Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When pulling Hand Lever, port 4 is pressurized; when pushing Hand Lever, port 2 is pressurized. Spool stays in last actuated position.

Dual Pressure – Pressure at port 3 & 5 alternately pressurizes port 2 or 4 while exhausting at port 1. When pulling Hand Lever, port 2 is pressurized; when pushing Hand Lever, port 4 is pressurized. Spool stays in last actuated position. (Must be ordered as dual pressure.)

3-Position, Detent



Single Pressure at Port #1 – The Hand Lever alternately pressurizes port 2 or 4 while exhausting at port 3 or 5. When pulling Hand Lever, port 4 is pressurized; when pushing Hand Lever, port 2 is pressurized. When Hand Lever is vertical, it is in the center position - either APB or CE. Spool stays in last actuated position.

Center Functions

All Ports Blocked

Center Exhaust

Pressure Center

⚠ ***CAUTION:***
For 3-Position lever function, do not restrict exhaust ports with speed controls.

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Specifications

- 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 Temperature

- Extreme: -40°F to 140°F (-40°C to 60°C)

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.)

Material Specifications

- 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

Size A

P2LAX
2-Position, Detent

Size B

P2LBX
2-Position, Spring

Size C

P2LCX
2-Position, Lever

Size D

P2LDX
3-Position APB

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Lever Operated Valves

Vacuum to 232 PSIG (Vacuum to 16 bar)
-40°F to 158°F (-40°C to 70°C)

P2L A X 5 91 VS

Valve Size	
1/8"	A
1/4"	B
3/8"	C*
1/2"	D*

*See Note Below for Pressure rating.

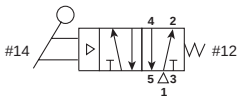
Valve Type / Function	
Internal Pilot Supply	
2-Position Valve	**5**
3-Position Valve APB	**6**
3-Position Valve PC	7
3-Position Valve CE	**8**
External Pilot Supply through Ports #12 & #14	
NC 2-Position	L
2-Position Valve	N
3-Position Valve APB	P
3-Position Valve PC	Q
3-Position Valve CE	R

Actuator / Return	
S	**Spring (Return Only)**
V	**Lever 2-Position**
1	**Lever 3-Position Self Centered**
2	**Lever 3-Position**
VS*	**Spring Return Lever, 2-Position, 90° to Ports, P2LA Only**
VV*	**Lever, Detent, 2-Position, 90° to Ports, P2LA Only**
11	Spring Centered Lever, 3-Position, 90° to Ports, P2LA Only
22	Lever, Detent, 3-Position, 90° to Ports, P2LA Only

* Not Available with 3-Position Valves.

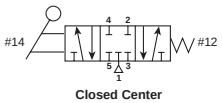
Main Port Thread	
11	G1/8 (P2LA)
12	G1/4 (P2LB)
13	G3/8 (P2LC)
14	G1/2 (P2LD)
91	**1/8" NPT (P2LA)**
92	**1/4" NPT (P2LB)**
93	**3/8" NPT (P2LC)**
94	**1/2" NPT (P2LD)**

Lever Operated
2-Position

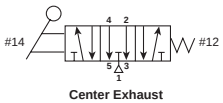


P2LAX			
	P2LAX591VS	Spring Return	0.7 Cv
	P2LAX591VV	Detent	

Lever Operated
3-Position



Closed Center



Center Exhaust

All Ports Blocked			
P2LAX	**P2LAX69111**	Spring-Centered	0.5 Cv
	P2LAX69122	Detent	

Center Exhaust			
P2LAX	**P2LAX89111**	Spring-Centered	0.5 Cv
	P2LAX89122	Detent	

NOTE: P2LCX and P2LDX Manual & Remote Air Pilot Valves have a maximum pressure rating of 175 PSIG (12 bar).

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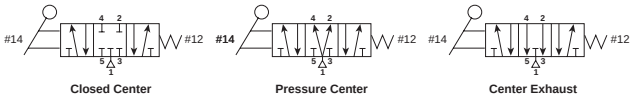
Lever Operated
3-Position



All Ports Blocked			
P2LBX	**P2LBX69222**	Lever - APB	1.3 Cv
	P2LBX69211	Spring - APB	
P2LCX	**P2LCX69322**	Lever - APB	2.5 Cv
	P2LCX69311	Spring - APB	
P2LDX	**P2LDX69422**	Lever - APB	2.7 Cv
	P2LDX69411	Spring - APB	

Pressure Center			
P2LBX	**P2LBX79222**	Lever - PC	1.3 Cv
	P2LBX79211	Spring - PC	
P2LCX	**P2LCX79322**	Lever - PC	2.5 Cv
	P2LCX79311	Spring - PC	
P2LDX	**P2LDX79422**	Lever - PC	2.7 Cv
	P2LDX79411	Spring - PC	

Center Exhaust			
P2LBX	**P2LBX89222**	Lever - CE	1.3 Cv
	P2LBX89211	Spring - CE	
P2LCX	**P2LCX89322**	Lever - CE	2.5 Cv
	P2LCX89311	Spring - CE	
P2LDX	**P2LDX89422**	Lever - CE	2.7 Cv
	P2LDX89411	Spring - CE	

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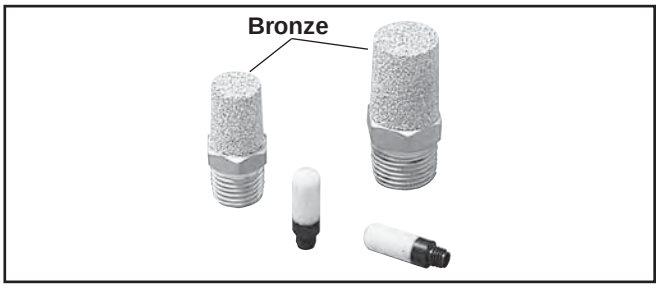
Exhaust Mufflers

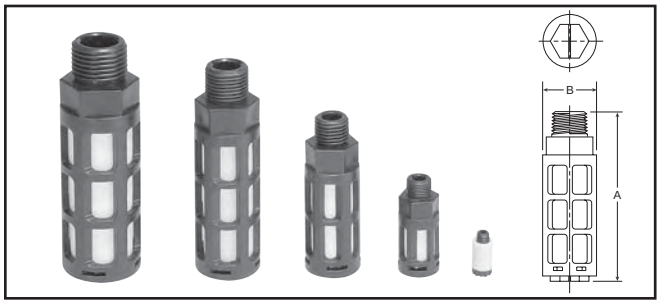
Pipe Thread	Part Number
M5	**P6M-PAC5**
1/8" NPT	**EM12**
1/4" NPT	**EM25**
3/8" NPT	**EM37**
1/2" NPT	**EM50**

P6M - Plastic; EM - Sintered Bronze

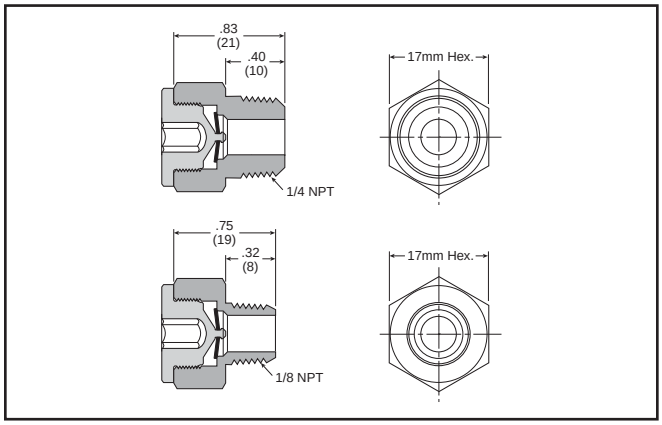


Plastic Silencers

Thread Size	Part Number		A (mm)	B (mm)
	NPT	BSPT		
M5	**AS-5**		.43 (11)	.32 (8)
1/8"	**ASN-6**	**AS-6**	1.57 (40)	.63 (16)
1/4"	**ASN-8**	**AS-8**	2.56 (65)	.83 (21)
3/8"	**ASN-10**	**AS-10**	3.35 (85)	.98 (25)
1/2"	**ASN-15**	**AS-15**	3.74 (95)	1.18 (30)



Exhaust Protector



Specifications

Operating Pressure ..... 0 – 150 PSIG
(0 to 10 bar, 0 to 1034 kPa)

Operating Temperature .....-40°F to 158°F (-40°C to 70°C)

Material:

Body and Pipe Adapter ..... Brass
Membrane .....Fluorocarbon

Flow Data (SCFM)

Part Number	Size	60 PSIG Inlet	90 PSIG Inlet	125 PSIG Inlet
E90016	1/8"	40.1	56.5	75.5
E90017	1/4"	44.6	62.7	83.5

Features

- 1/8 and 1/4 NPT male sizes
- Fitted with a Brass Pipe Adapter and a Fluorocarbon Membrane
- Resistant to Rust, Clog, Wash Down and Contamination

Applications

These protectors are intended for mobile applications, quick venting applications and alternative exhaust port breathers that require protection against clogging.

Ideal for valves exposed to harsh environmental conditions (which can cause a “caking up” in the exhaust pipe ports where the bronze mufflers or breather vents are installed).

Particularly suitable for time-sensitive applications such as axle-lift suspensions or pushers or tag axles.

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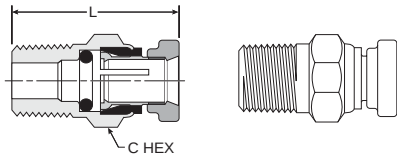
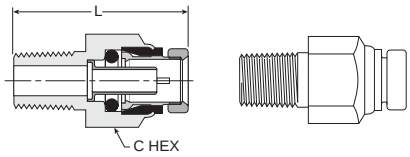
68PM Male Connector



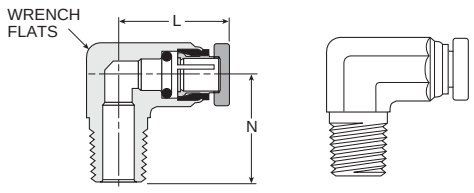
Part No.	Tube Size	Pipe Thread (NPTF)	C Hex	L
68PM-2-1	1/8	1/16	3/82	0.93
68PM-2-2	1/8	1/8	7/16	0.88
68PM-5/32-1	5/32	1/16	3/8	0.95
68PM-5/32-2	5/32	1/8	7/16	0.74
68PM-5/32-4	5/32	1/4	9/16	0.99
68PM-3-1	3/16	1/16	7/16	0.95
68PM-3-2	3/16	1/8	7/16	0.92
68PM-3-4	3/16	1/4	9/16	1.10

68PMT Male Connector



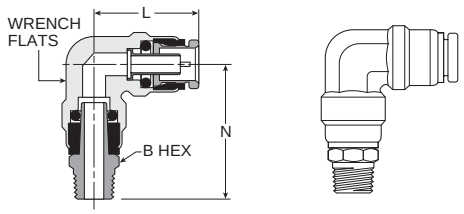
Part No.	Tube Size	Pipe Thread (NPTF)	C Hex	L
68PMT-4-2	1/4	1/8	1/2	1.06
68PMT-4-4	1/4	1/4	9/16	1.19
68PMT-4-6	1/4	3/8	3/4	1.27
68PMT-6-2	3/8	1/8	3/4	1.37
68PMT-6-4	3/8	1/4	3/4	1.43
68PMT-6-6	3/8	3/8	3/4	1.33
68PMT-6-8	3/8	1/2	7/8	1.38
68PMT-8-4	1/2	1/4	7/8	1.72
68PMT-8-6	1/2	3/8	7/8	1.52
68PMT-8-8	1/2	1/2	7/8	1.44
68PMT-10-6	5/8	3/8	1	1.88
68PMT-10-8	5/8	1/2	1	1.88
68PMT-12-8	3/4	1/2	1-3/16	2.03

169PMNS Male Elbow Non-Swivel 90°



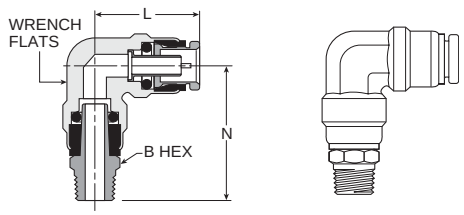
Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	L	N
169PMNS-2-2	1/8	1/8	3/8	0.86	0.68
169PMNS-5/32-2	5/32	1/8	3/8	0.88	0.68
169PMNS-3-2	3/16	1/8	3/8	0.75	0.67
169PMNS-3-4	3/16	1/4	1/2	0.74	0.93

169PMT Male Elbow Swivel 90°



Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	B Hex	L	N
169PMT-4-2	1/4	1/8	13/32	7/16	0.84	1.21
169PMT-4-4	1/4	1/4	13/32	9/16	0.84	1.43
169PMT-4-6	1/4	3/8	13/32	11/16	0.84	1.43
169PMT-6-2	3/8	1/8	9/16	9/16	1.11	1.41
169PMT-6-4	3/8	1/4	9/16	9/16	1.11	1.58
169PMT-6-6	3/8	3/8	9/16	11/16	1.11	1.58
169PMT-6-8	3/8	1/2	9/16	7/8	1.11	1.79
169PMT-8-4	1/2	1/4	11/16	5/8	1.27	1.73
169PMT-8-6	1/2	3/8	11/16	3/4	1.27	1.81
169PMT-8-8	1/2	1/2	11/16	7/8	1.27	1.96
169PMT-10-6	5/8	3/8	7/8	3/4	1.53	2.03
169PMT-10-8	5/8	1/2	7/8	7/8	1.53	2.18

169PMTL Male Elbow Long Non-Swivel 90°



Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	B Hex	L	N
169PMTL-6-4	3/8	1/4	9/16	9/16	1.06	1.63
169PMTL-6-6	3/8	3/8	9/16	7/8	1.19	2.50
169PMTL-6-8	3/8	1/2	9/16	7/8	1.19	2.50
169PMTL-8-8	1/2	1/2	11/16	7/8	1.22	2.50
169PMTL-10-8	5/8	1/2	7/8	7/8	1.46	2.50

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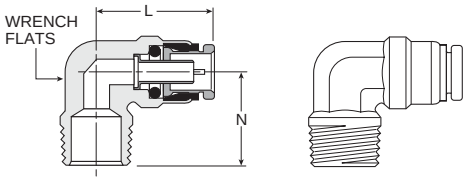
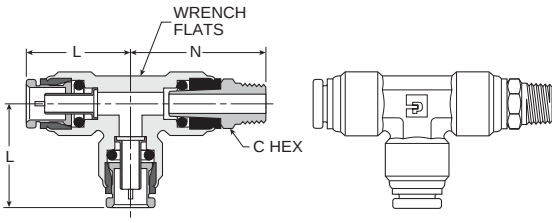
169PMTNS Male Elbow Non-Swivel 90°



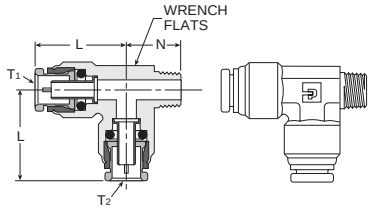
Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	L	N
169PMTNS-4-2	1/4	1/8	1/2	0.84	0.72
169PMTNS-4-4	1/4	1/4	1/2	0.84	0.90
169PMTNS-4-6	1/4	3/8	1/2	0.84	1.06
169PMTNS-6-2	3/8	1/8	9/16	1.05	0.75
169PMTNS-6-4	3/8	1/4	9/16	1.05	0.94
169PMTNS-6-6	3/8	3/8	3/4	1.05	0.94
169PMTNS-6-8	3/8	1/2	11/16	1.12	1.26
169PMTNS-8-4	1/2	1/4	11/16	1.17	1.06
169PMTNS-8-6	1/2	3/8	11/16	1.22	1.06
169PMTNS-8-8	1/2	1/2	11/16	1.22	1.26
169PMTNS-10-6	5/8	3/8	7/8	1.46	1.11
169PMTNS-10-8	5/8	1/2	7/8	1.46	1.32
169PMTNS-12-8	3/4	1/2	1	1.81	1.44

171PMT Male Run Tee Swivel



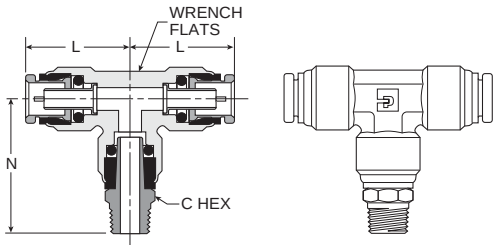
Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	C Hex	L	N
171PMT-4-2	1/4	1/8	1/2	7/16	.85	1.25
171PMT-4-4	1/4	1/4	1/2	9/16	.85	1.48
171PMT-4-6	1/4	3/8	1/2	11/16	.85	1.43
171PMT-6-4	3/8	1/4	5/8	9/16	1.21	1.83
171PMT-6-6	3/8	3/8	5/8	11/16	1.21	1.83
171PMT-8-4	1/2	1/4	7/8	5/8	1.27	1.74
171PMT-8-6	1/2	3/8	7/8	3/4	1.27	1.83
171PMT-8-8	1/2	1/2	7/8	7/8	1.27	1.99

171PMTNS Male Run Tee Non-Swivel



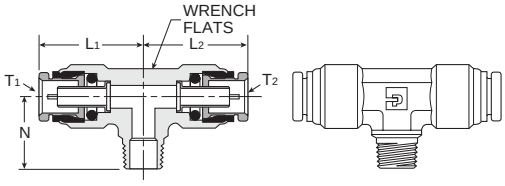
Part No.	Tube 1 Size	Tube 2 Size	Pipe Thread (NPTF)	Wrench Flats	L1	L2	N
171PMTNS-4-4	1/4	1/4	1/4	15-32	0.91	0.91	0.94
171PMTNS-4-6-4	1/4	3/8	1/4	5/8	0.93	1.21	0.97
171PMTNS-6-4	3/8	3/8	1/4	5/8	1.21	1.21	0.97
171PMTNS-6-4-4	3/8	1/4	1/4	5/8	1.21	0.93	0.97
171PMTNS-6-4-6	3/8	1/4	3/8	5/8	1.22	0.97	0.93
171PMTNS-6-6	1/2	3/8	3/8	5/8	1.21	1.27	0.97
171PMTNS-6-8	1/2	3/8	1/2	5/8	1.17	1.27	1.26
171PMTNS-8-4	1/2	1/2	1/4	7/8	1.28	1.27	1.06

172PMT Male Branch Tee Swivel



Part No.	Tube Size	Pipe Thread (NPTF)	Wrench Flats	C Hex	L	N
172PMT-4-2	1/4	1/8	1/2	7/16	0.85	1.25
172PMT-4-4	1/4	1/4	1/2	9/16	0.85	1.43
172PMT-6-2	3/8	1/8	5/8	9/16	1.22	1.66
172PMT-6-4	3/8	1/4	5/8	5/8	1.22	1.83
172PMT-6-6	3/8	3/8	5/8	3/4	1.22	1.83
172PMT-8-4	1/2	1/4	7/8	5/8	1.27	1.73
172PMT-8-6	1/2	3/8	7/8	3/4	1.27	1.79
172PMT-8-8	1/2	1/2	7/8	7/8	1.27	1.97

172PMTNS Male Branch Tee Non-Swivel



Part No.	Tube 1 Size	Tube 2 Size	Pipe Thread (NPTF)	Wrench Flats	L1	L2	N
172PMTNS-4-2	1/4	1/4	1/8	1/2	0.91	0.91	0.78
172PMTNS-6-4	3/8	3/8	1/4	5/8	1.21	1.21	0.97
172PMTNS-6-4-4	3/8	1/4	1/4	5/8	1.21	.93	0.97
172PMTNS-6-6	3/8	3/8	3/8	5/8	1.21	1.21	0.97
172PMTNS-6-8	3/8	3/8	1/2	7/8	1.17	1.17	1.26
172PMTNS-8-6	1/2	1/2	3/8	7/8	1.28	1.28	1.06
172PMTNS-8-6-8	1/2	3/8	1/2	7/8	1.25	1.25	1.25
172PMTNS-8-8	1/2	1/2	1/2	7/8	1.34	1.25	1.25

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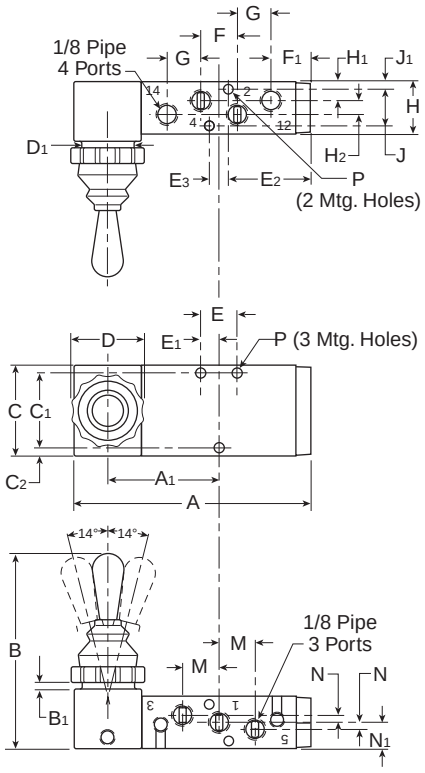
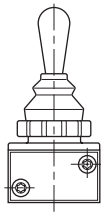
Hand Lever Operated





P2LAX Hand Lever

A 4.02 (102)	**A1** 1.89 (48)	**B** 3.23 (82)	**B1** .12 (3)
C 1.57 (40)	**C1** 1.30 (33)	**C2** .14 (3.5)	**D** 1.18 (30)
D1 .89 (22.5)	**E** .63 (16)	**E1** .31 (8)	**E2** 1.42 (36)
E3 .33 (8.5)	**F** .63 (16)	**F1** .67 (17)	**G** .59 (15)
H .87 (22)	**H1** .31 (8)	**H2** .24 (6)	**J** .63 (16)
J1 .12 (3)	**M** .63 (16)	**N** .12 (3)	**N1** .43 (11)
P Ø .16 Ø (4.1)			

Inches (mm)

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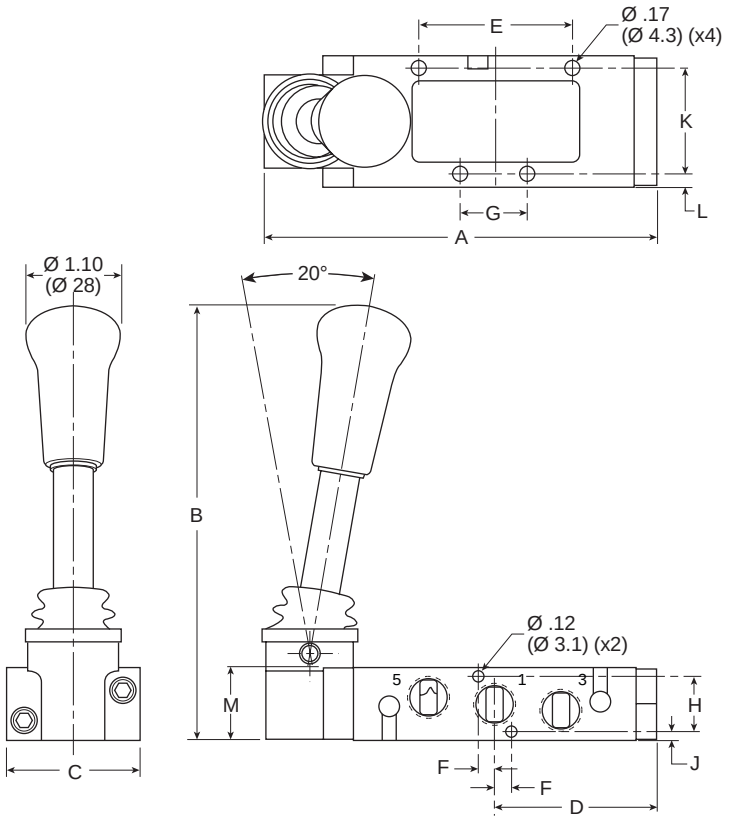
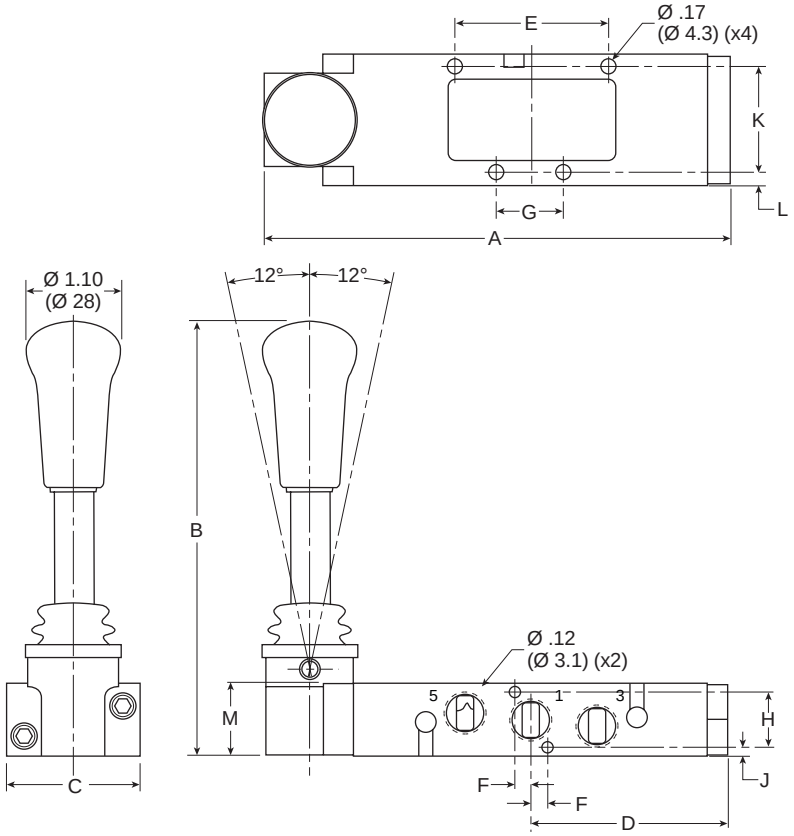


P2LBX 2-Position Hand Lever

A	B	C	D
4.67 (118.5)	5.19 (131.8)	1.57 (40)	1.93 (49)
E	**F**	**G**	**H**
1.81 (46)	.20 (5)	.79 (20)	.65 (16.5)
J	**K**	**L**	**M**
.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)



P2LBX 3-Position Hand Lever

A	B	C	D
5.51 (140)	5.19 (131.8)	1.57 (40)	2.35 (59.8)
E	**F**	**G**	**H**
1.81 (46)	.20 (5)	.79 (20)	.65 (16.5)
J	**K**	**L**	**M**
.11 (2.85)	1.26 (32)	.16 (4)	.87 (22.2)

Inches (mm)

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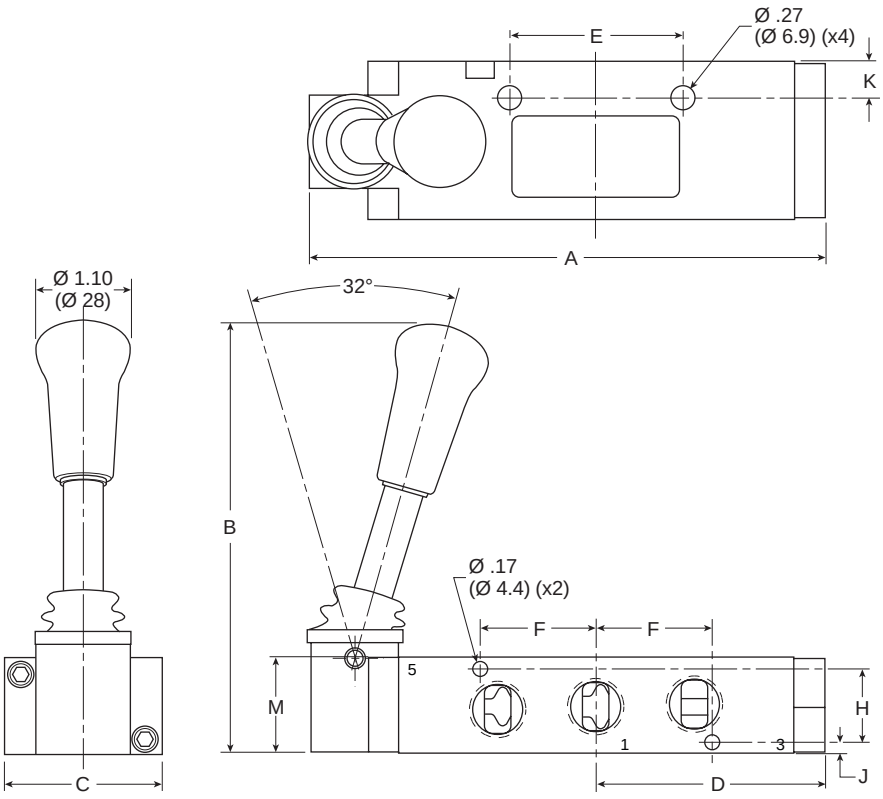
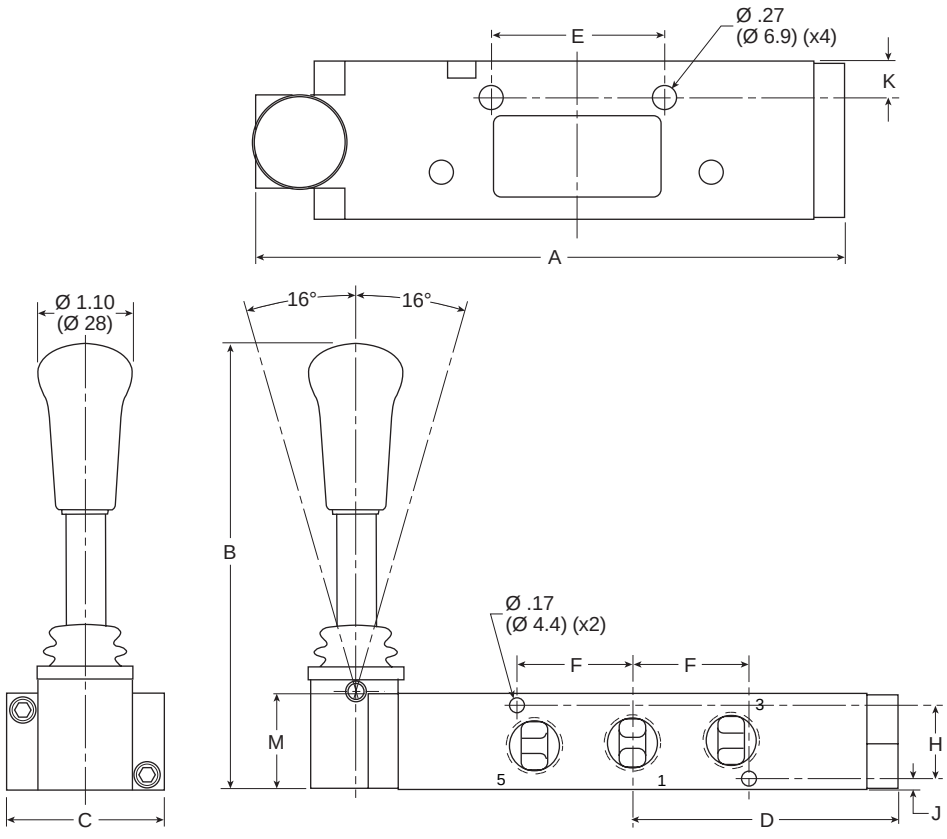


P2LCX 2-Position Hand Lever

A	B	C	D
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)
E	**F**	**H**	**J**
2.09 (53)	1.40 (35.5)	.91 (23)	.14 (3.5)
K	**M**		
.43 (11)	1.18 (30)		

Inches (mm)



P2LCX 3-Position Hand Lever

A	B	C	D
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)
E	**F**	**H**	**J**
2.09 (53)	1.40 (35.5)	.91 (23)	.14 (3.5)
K	**M**		
.43 (11)	1.18 (30)		

Inches (mm)

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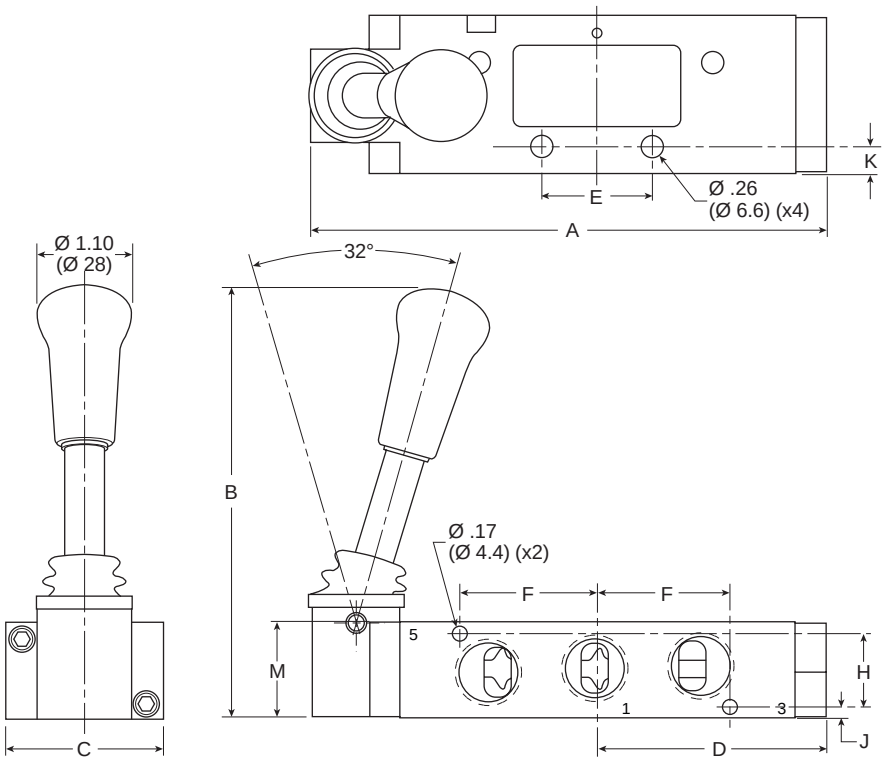
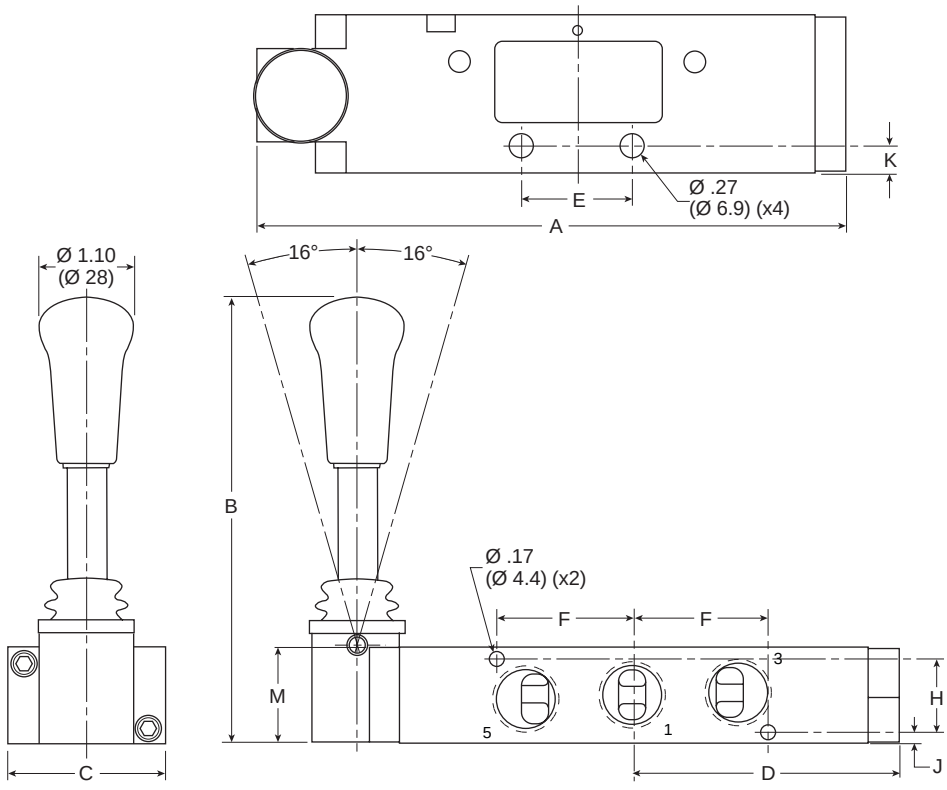


P2LDX 2-Position Hand Lever

A	B	C	D
6.20 (157.5)	5.24 (133)	1.89 (48)	2.76 (70)
E	**F**	**H**	**J**
1.34 (34)	1.65 (42)	.91 (23)	.14 (3.5)
K	**M**		
.30 (7.5)	1.18 (30)		

Inches (mm)



P2LDX 3-Position Hand Lever

A	B	C	D
7.07 (179.5)	5.36 (136.3)	1.89 (48)	3.19 (81)
E	**F**	**H**	**J**
1.34 (34)	1.65 (42)	.91 (23)	.14 (3.5)
K	**M**		
.30 (7.5)	1.18 (30)		

Inches (mm)

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Valvair Manual Spool Valves

Air Pilot, Manual & Mechanically Actuated

Section F

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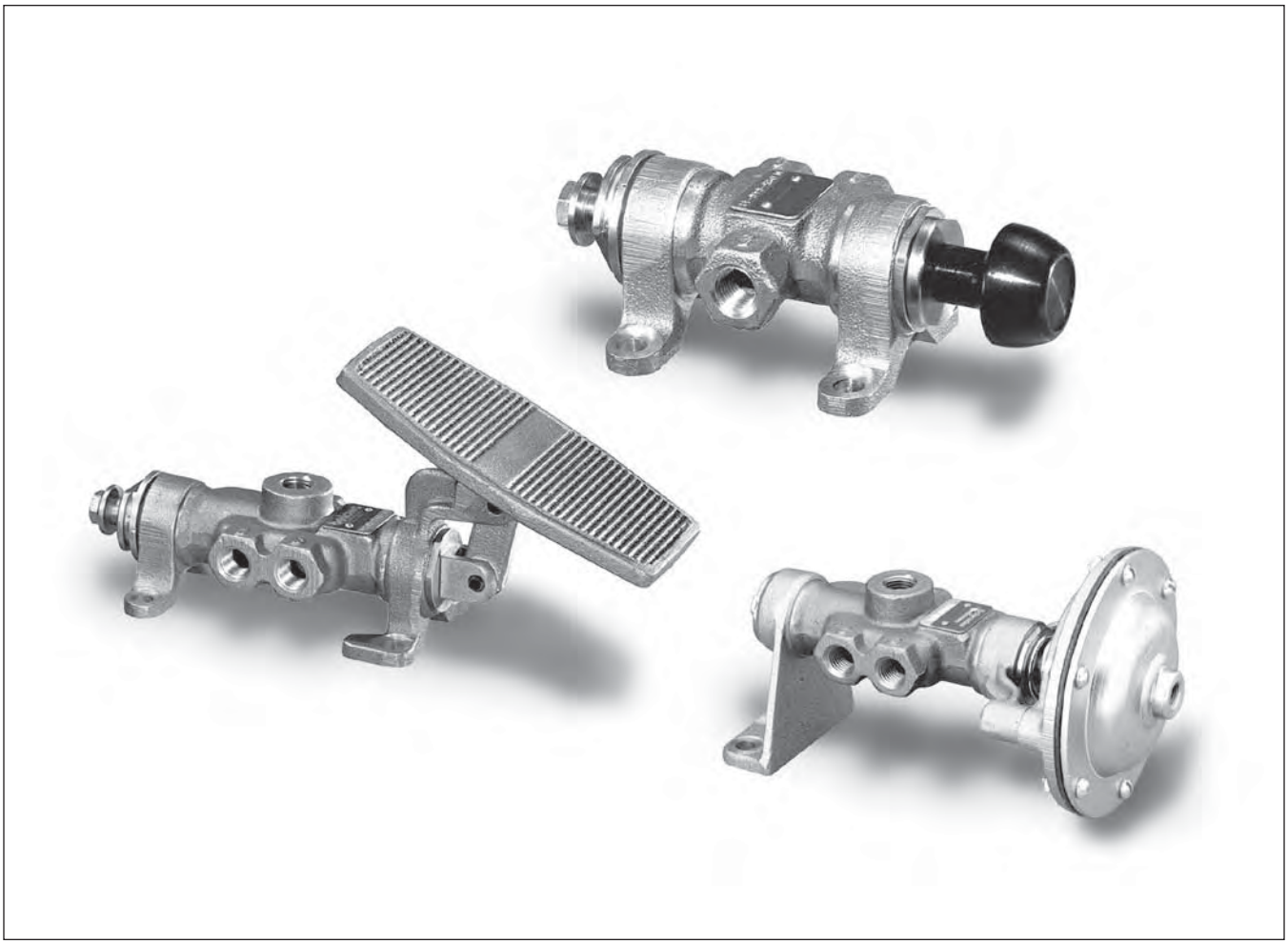

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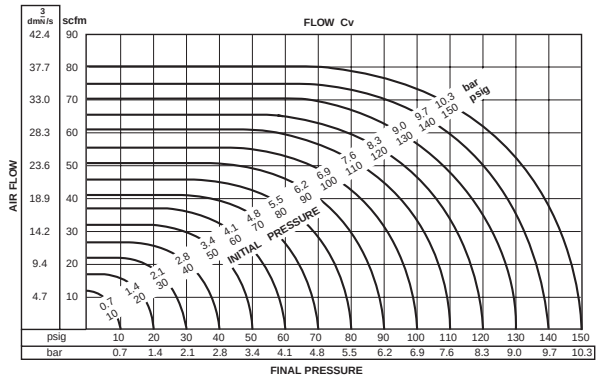
Features

- 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

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.

Operating Information

Pressure limitations
knob (manual and spring return) and palm operators (manual and spring return)

Media	Port Size	PSI (kPa) 3-Way	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	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

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**

BOLD ITEMS ARE MOST POPULAR.

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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					
	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					
	3-way, m anual, 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					
	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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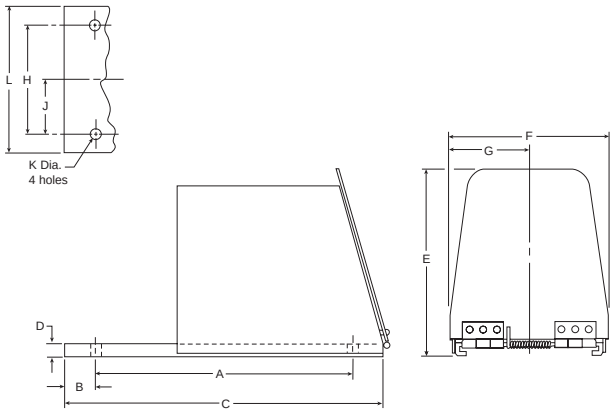
Pedal Guard
(Fits all pedal operated valves)

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

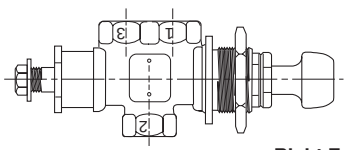
A 10.50 266.7	**B** 1.25 31.8	**C** 13.00 330.2	**D** .50 12.7	**E** 7.38 187.4	**F** 6.36 161.5	**G** 3.18 80.8
H 4.50 114.3	**J** 2.25 57.2	**K** .44 11.2	**L** 6.00 152.4			

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

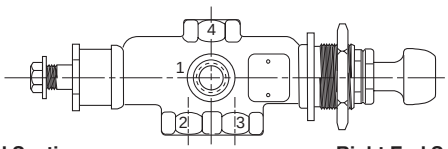
Series name	Left end	Port size	Body function	Right end
M0	XX	X	XX	XX



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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M0 Valve: 1/4", 3/8", 1/2" Port Size

M0 | 85 | 3 | 18 | 48

Valve Series	
Basic Series	M0

Left End Section	
Double Cylinder	19
Double Air Diaphragm	33
Ball Detent, Small Bracket	54
Ball Detent, Panel Mounted	58
Direct Acting Spring Return, Less Bracket (Push Lever)	62
Reverse Acting Spring Return, Less Bracket (Pull Lever)	63
Light Spring Return Direct Acting, Less Bracket (Pull Knob)	64
Light Spring Return Reverse Acting, Less Bracket (Push Knob)	65
Stem Stop, Large Bracket	84
Stem Stop, Small Bracket	85
Direct Acting Spring Return, Small Bracket (Push Lever)	95
Reverse Acting Spring Return, Small Bracket (Pull Lever)	96
Light Spring Return Direct Acting, Small Bracket (Pull Knob)	97
Light Spring Return Reverse Acting, Small Bracket (Push Knob)	98

Pipe Size	
NPT	Port Size
1/4	2
3/8	3
1/2	4

Body / Function	
18	3-Way
24*	3-Way, 2-Position Detent
46	4-Way
54*	4-Way, 2-Position Detent

* At least one end section must be coded 54.

Operating End Section: Right End	
03	Cam Follower
05	Clevis, Small Bracket
19	Double Cylinder
26	Single Cylinder
30	Single Diaphragm, Std. Spring
32	Single Diaphragm, Light Spring
33	Double Diaphragm
40	Pedal
43	Lever, Mounting Feet
48	Knob, Small Bracket
51	Knob, Panel Mounted
59	Palm Button, Panel Mounted
88	Treadle
99	Palm Button

M0 Valve: 3/4" Port Size

M0 | 85 | 6 | 18 | 48

Valve Series	
Basic Series	M0

Left End Section	
Double Cylinder	19
Ball Detent, Small Bracket	54
Ball Detent, Panel Mounted	58
Direct Acting Spring Return, Less Bracket (Push Lever)	62
Reverse Acting Spring Return, Less Bracket (Pull Lever)	63
Light Spring Return Direct Acting, Less Bracket (Pull Knob)	64
Light Spring Return Reverse Acting, Less Bracket (Push Knob)	65
Stem Stop, Small Bracket	85
Direct Acting Spring Return, Small Bracket (Push Lever)	95
Reverse Acting Spring Return, Small Bracket (Pull Lever)	96
Light Spring Return Direct Acting, Small Bracket (Pull Knob)	97
Light Spring Return Reverse Acting, Small Bracket (Push Knob)	98

Pipe Size	
NPT	Port Size
3/4	6

Body / Function	
18	3-Way
24*	3-Way, 2-Position Detent
46	4-Way
54*	4-Way, 2-Position Detent

* At least one end section must be coded 54.

Operating End Section: Right End	
03	Cam Follower
05	Clevis, Small Bracket
19	Double Cylinder
26	Single Cylinder
43	Lever, Mounting Feet
48	Knob, Small Bracket
51	Knob, Panel Mounted
59	Palm Button, Panel Mounted
99	Palm Button

⚠ ***CAUTION:***
Be sure to order end sections that are functionally effective with each other and with the body section selected. Model number combinations are possible which may not operate.

NOTE: Bold items are standard body and end sections.

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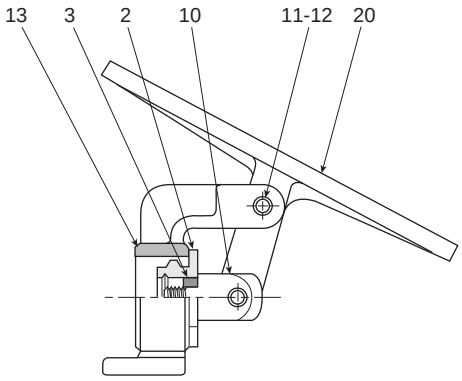
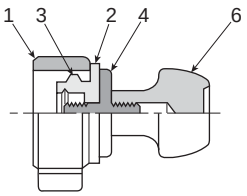
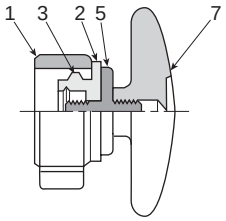


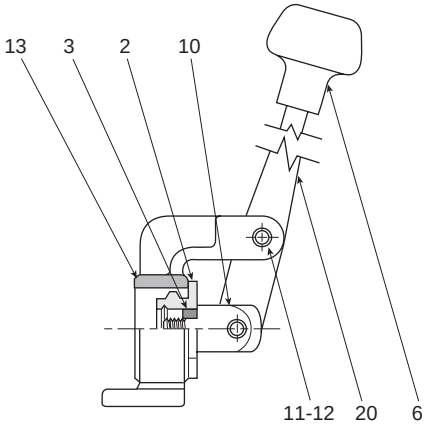
Treadle
M062 *88



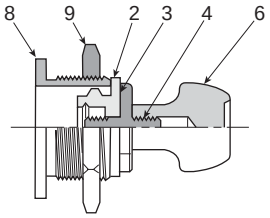
Knob
M062 *48



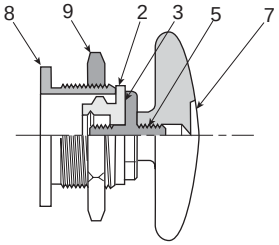
Palm Button
M062 *99



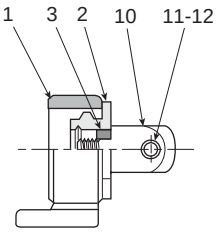
Lever
M062 *43



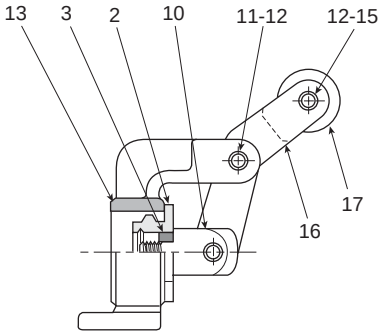
Panel Mounted Knob
M062 *51



Panel Mounted Palm Button
M062 *59

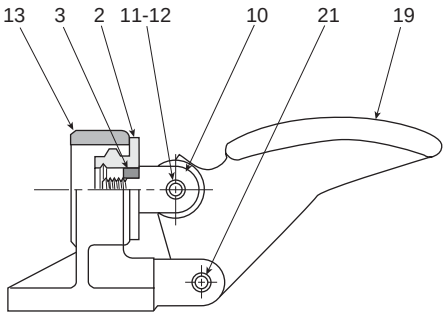


Clevis
M062 *05



Cam
M062 *03

Port Size	Use No. *
1/4	2
3/8	3
1/2	4
3/4	6



Pedal
M062 *40

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Item No.	Part Number				Description
	1/4"	3/8"	1/2"	3/4"	
1	M073 016	M073 026	M073 037	M073 046	Bracket
2	M103 012	M103 047	M103 066	M103 108	End Bearing
3	H177 05	H177 05	H177 06	H174 08	Lockwasher
4	M013 011	M013 011	M013 012	M013 013	Knob Adapter
5	M013 011	M013 011	M013 012	M013 013	Palm Knob Adapter
6	H050 28	H050 28	H050 28	H050 28	Knob
7	H050 29	H050 29	H050 29	H050 29	Palm Button
8	M013 014	M013 015	M013 016	M013 017	Panel Adapter
9	M303 005	M303 006	M303 007	M303 008	Jam Nut
10	M133 003	M133 003	M133 012	M133 018	Clevis
11	H072 29	H072 29	M333 013	M333 013	Pivot Pin (2)
12	—	—	H089 03	H089 03	Retaining Ring (4)
13	M073 009	M073 022	M073 033	M073 042	Bracket
14	M273 022	M273 022	M273 023	M273 024	Lever
15	H072 30	H072 30	M333 016	M333 016	Roller Trunnion
16	M273 002	M273 002	M273 006	M273 007	Cam Arm
17	M443 003	M443 003	M443 002	M443 002	Roller
18	M073 003	M073 019	M073 030	—	Bracket
19	M323 005	M323 005	M323 006	M323 007	Pedal
20	M553 004	M553 004	M553 005	—	Treadle
21	H072 29	H072 29	M333 013	M333 014	Pivot Pin

NOTE: ( ) denotes quantity required when more than one.

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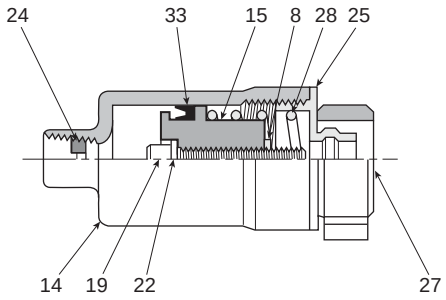
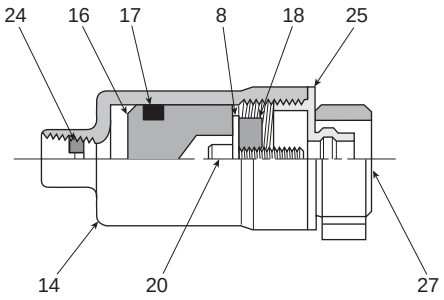
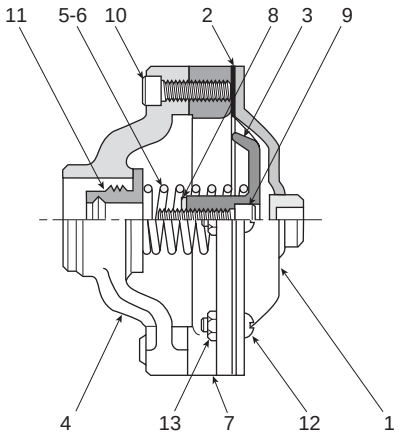


Single Cylinder
M062 *26

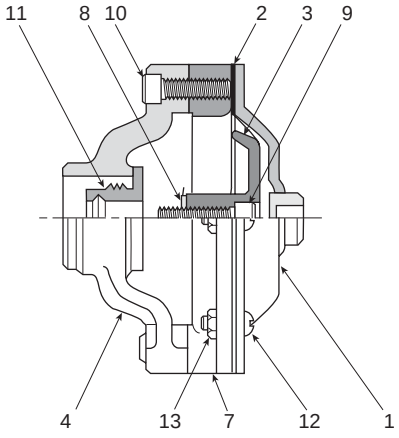


Double Cylinder
M062 *19



Single Diaphragm
M062 *30

Inst. Air Single Diaphragm
M062 *32



Double Diaphragm
M062 *33

Port Size	Use No. *
1/4	2
3/8	3
1/2	4
3/4	6

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Item No.	Part Number				Description
	1/4"	3/8"	1/2"	3/4"	
1	M163 005	M163 005	M163 005	M163 012	Cover
2	M193 002	M193 002	M193 002	M193 005	Diaphragm
3	M343 038	M343 038	M343 032	M343 039	Piston
4	M573 004	M573 003	M573 001	M573 011	Yoke
5	M493 024	M493 024	M493 010	M493 023	Spring
6	M493 022	M493 022	M493 009	M493 028	Spring (Inst. Air)
7	M423 002	M423 002	M423 002	M423 004	Ring
8	H177 05	H177 05	H177 06	H174 08	Lockwasher
9	H101 19	H101 19	H101 45	H102 17	Screw
10	H101 15	H101 15	H101 15	H101 15	Screw (2)
11	M103 012	M103 047	M103 066	M103 108	End Bearing
12	H113 33	H113 33	H113 33	H113 33	Screw (6)
13	H064 16	H064 16	H064 16	H064 16	Nut (6)
14	M243 028	M243 028	M243 028	M243 036	Housing
15	M343 019	M343 019	M343 018	M343 027	Piston – Single Act.
16	M343 022	M343 022	M343 022	M343 028	Piston – Double Cyl.
17	H145 15	H145 15	H145 15	H145 20	Packer
18	M013 005	M013 005	M013 007	M013 009	Adapter
19	H101 21	H101 21	H101 47	H102 19	Screw – Single Act.
20	H101 17	H101 17	H101 45	H102 15	Screw – Double Act.
22	H175 14	H175 14	H175 19	H175 24	Lockwasher
24	M363 002	M363 002	M363 002	M363 002	Restrictor
25	M383 007	M383 011	M383 018	M383 029	Retainer
27	M073 016	M073 026	M073 037	M073 046	Bracket
28	M493 015	M493 015	M493 015	M493 020	Spring
33	H222 32	H222 32	H222 32	H145 20	Packer

NOTE: ( ) denotes quantity required when more than one.

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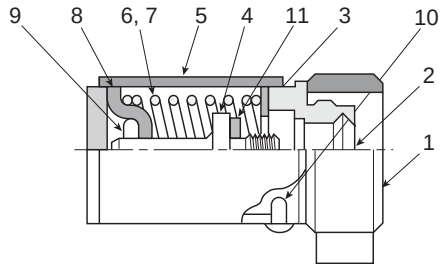
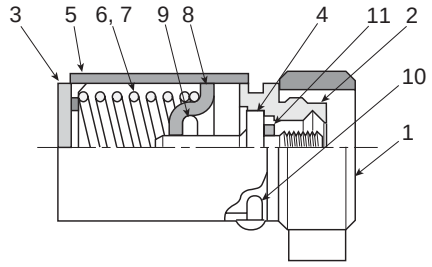
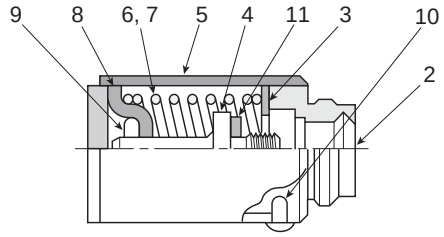


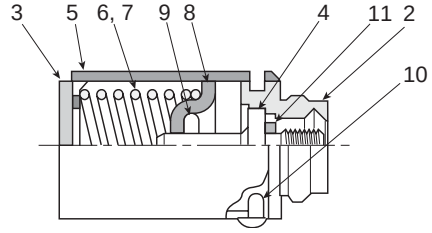
Direct Acting Spring Return with Bracket
M062 *95 Push Lever
M062 *97 Pull Knob



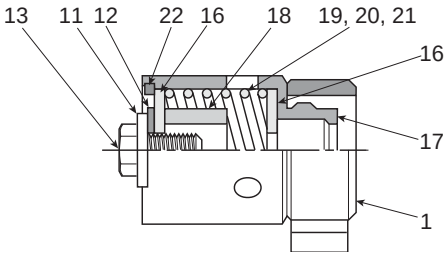
Reverse Acting Spring Return with Bracket
M062 *96 Pull Lever
M062 *98 Push Knob



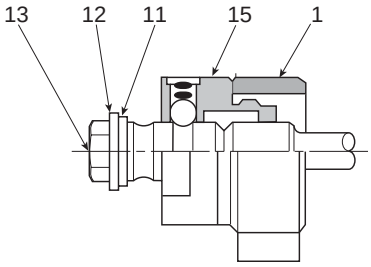
Direct Acting Spring Return less Bracket
M062 *62 Push Lever
M062 *64 Pull Knob



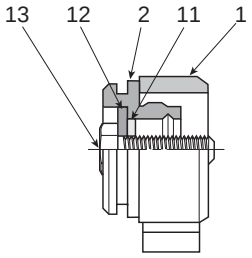
Reverse Acting Spring Return less Bracket
M062 *63 Pull Lever
M062 *65 Push Knob



Spring Centered Neutral
M062 *74 Standard Spring
M062 *76 Light Spring
M062 *78 Heavy Spring

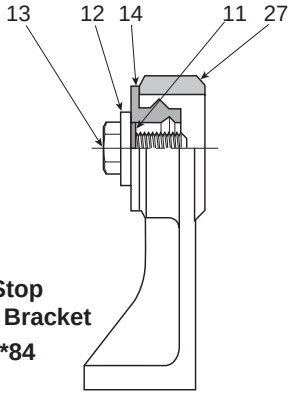


Ball Detent, 3-Position
M062 *54



Stem Stop
with Small Bracket
M062 *85

Port Size	Use No. *
1/4	2
3/8	3
1/2	4
3/4	6



Stem Stop
with Large Bracket
M062 *84

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Item No.	Part Number				Description
	1/4"	3/8"	1/2"	3/4"	
1	M073 016	M073 026	M073 037	M073 046	Bracket
2	M103 111	M103 112	M103 113	M103 114	End Bearing
3	M413 015	M413 015	M413 016	M413 017	Spring Retainer Washer
4	M523 009	M523 009	M523 010	M523 011	Stem Stop – Guide
5	M243 043	M243 043	M243 044	M243 045	Spring Housing
6	M493 037	M493 037	M493 027	M493 026	Spring – Knob Oper.
7	M493 038	M493 038	M493 011	M493 012	Spring – Other Oper.
8	M383 032	M383 032	M383 033	M383 034	Spring Retainer
9	H072 54	H072 54	H072 70	H072 71	Roll Pin
10	H11215	H11215	H11216	H11217	Screw
11	H177 05	H177 05	H177 06	H174 08	Lockwasher
12	M563 002	M563 002	M563 006	M563 014	Stem Stop
13	H096 26	H096 26	H096 45	H097 06	Stem Stop Screw
14	M103 012	M103 047	M103 066	M103 108	End Bearing – Plain
15	M012 001	M012 002	M012 003	M012 005	Ball Detent Assembly
16	M563 007	M563 009	M563 008	M563 016	Washer
17	M243 008	M243 019	M243 027	M243 032	Spring Housing
18	M083 003	M083 004	M083 005	M083 008	Spacer
19	M493 008	M493 008	M493 008	M493 014	Spring
20	M493 019	M493 019	M493 019	—	Spring – Knob Oper.
21	M493 006	M493 006	M493 006	M493 007	Spring – Dbl. Act. Cyl.
22	H090 25	H090 25	H090 25	H090 12	Retainer Ring
24	—	—	—	M353 036	Lock Plate
27	M073 006	M073 017	M073 028	—	Large Bracket

NOTE: ( ) denotes quantity required when more than one.

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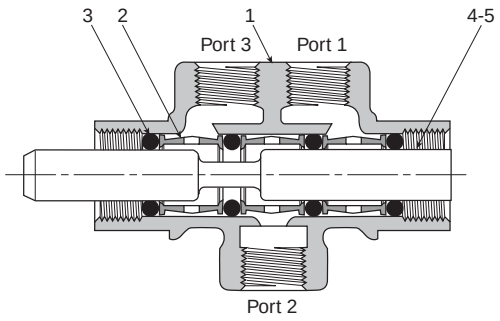
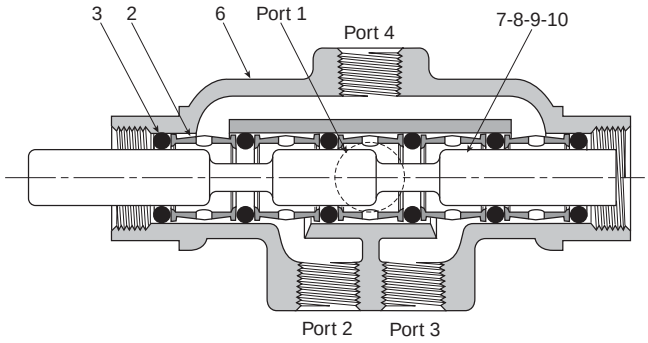


M032 *18
Standard 3-Way
M032 *24
2-Position Detent 3-Way



M032 *46
Standard 4-Way
M032 *54
2-Position Detent 4-Way

Port Size	Use No. *
1/4	2
3/8	3
1/2	4
3/4	6

Item No.	Part Number				Description
	1/4"	3/8"	1/2"	3/4"	
1	M053 007	M053 019	M053 030	M053 038	Body – 3-Way
2	M313 004	M313 011	M313 013	M313 017	Spacer (2-3-5)
3	H134 66	H135 88	H135 80	H135 84	O-Ring (3-4-6)
4	M373 014	M373 060	M373 102	M373 142	Stem – 3-Way
5	M373 020	M373 064	M373 103	M373 146	Stem – 3-Way 2-Pos. Detent
6	M053 003	M053 020	M053 033	M053 039	Body – 4-Way
7	M373 033	M373 074	M373 116	M373 156	Stem – 4-Way
8	M373 039	M373 076	M373 118	—	Stem – 4-Way 2-Pos. Detent

NOTE: ( ) denotes quantity required when more than one.

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Replacement Knobs & Palm Buttons

Description	1/4" & 3/8"	1/2"	3/4"
Knob & Adapter Kit	M122001	M122002	M122003
Palm Button & Adapter Kit	M122004	M122005	M122006

Knob & Adapter Kit

Palm Button & Adapter Kit

Hex Drive Pipe Plugs

Port Size	1/4"	3/8"	1/2"	3/4"
Part Number	K21R02025L	K21R02037L	K21R02050L	K21R02075L

Service Kits

(Field Service Instructions)

Description (For all 3 & 4-Way Valves)	1/4	3/8	1/2	3/4
Manual & Mechanical Operators	M242 001	M242 002	M242 003	M242 004
Cylinder (Single, Double & Double-Acting)	M242 006	M242 007	M242 008	M242 009
Diaphragm (Single & Double)	M242 011	M242 012	M242 013	M242 014

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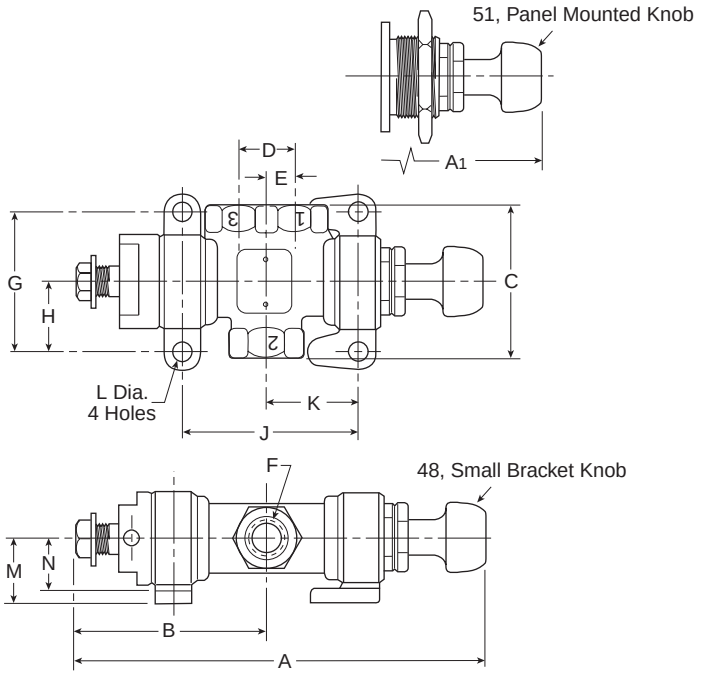
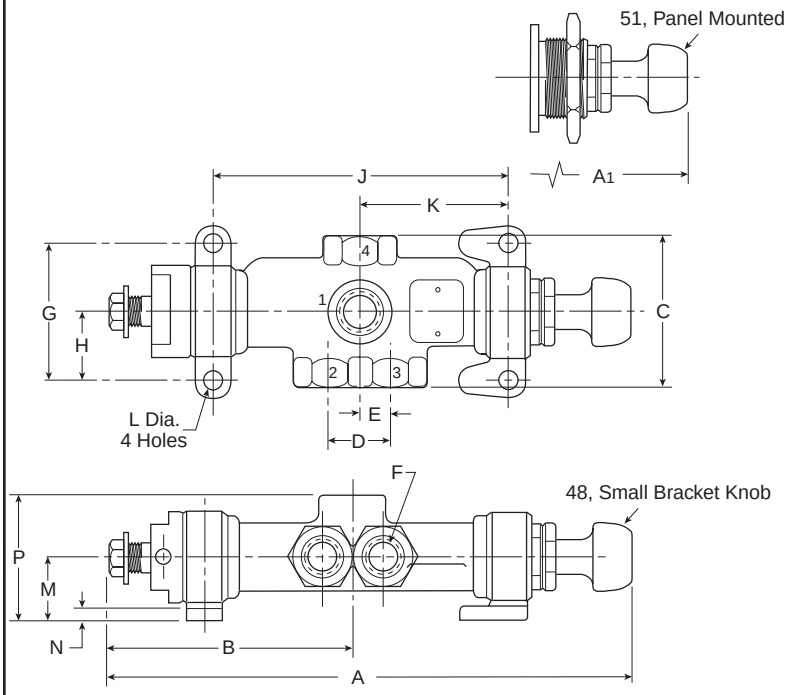
M054 Ball Detent, Small Bracket & M058 Ball Detent, Panel Mounted 3-Way



	1/4	3/8	1/2	3/4
A	6.57 (166.9)	7.30 (185.4)	8.56 (217.4)	10.40 (264.2)
A1	6.57 (166.9)	7.30 (185.4)	8.56 (217.4)	10.40 (264.2)
B	3.25 (82.6)	3.66 (93.0)	4.39 (111.5)	5.41 (137.4)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)

Inches (mm)

M054 Ball Detent, Small Bracket & M058 Ball Detent, Panel Mounted 4-Way



	1/4	3/8	1/2	3/4
A	8.02 (203.7)	9.13 (231.9)	11.17 (283.7)	13.10 (332.7)
A1	8.02 (203.7)	9.13 (231.9)	11.17 (283.7)	13.10 (332.7)
B	4.00 (101.6)	4.57 (116.1)	5.44 (138.2)	6.76 (171.7)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)

Inches (mm)

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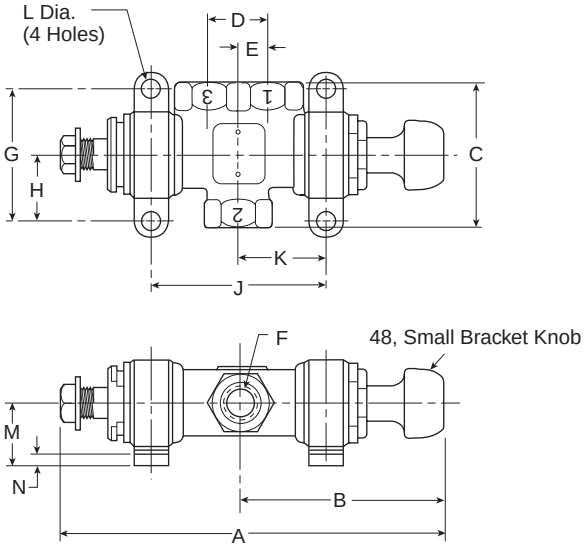
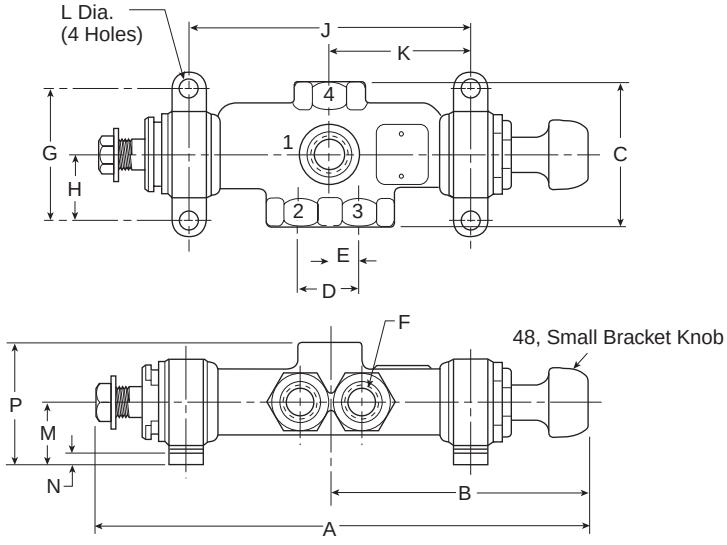
M085 Stem Stop, Small Bracket 3-Way



	1/4	3/8	1/2	3/4
A	5.99 (152.2)	6.69 (169.9)	7.90 (200.7)	9.60 (243.8)
B	3.32 (84.3)	3.64 (92.5)	4.17 (105.9)	4.99 (126.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.64 (67.1)	3.14 (79.8)	3.73 (94.7)	4.67 (118.6)
K	1.32 (33.5)	1.57 (39.9)	1.87 (47.5)	2.33 (59.2)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M085 Stem Stop, Small Bracket 4-Way



	1/4	3/8	1/2	3/4
A	7.49 (190.2)	8.53 (216.7)	10.01 (254.2)	12.31 (312.7)
B	4.02 (102.1)	4.56 (115.8)	5.73 (145.5)	6.34 (161.0)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.93 (74.4)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

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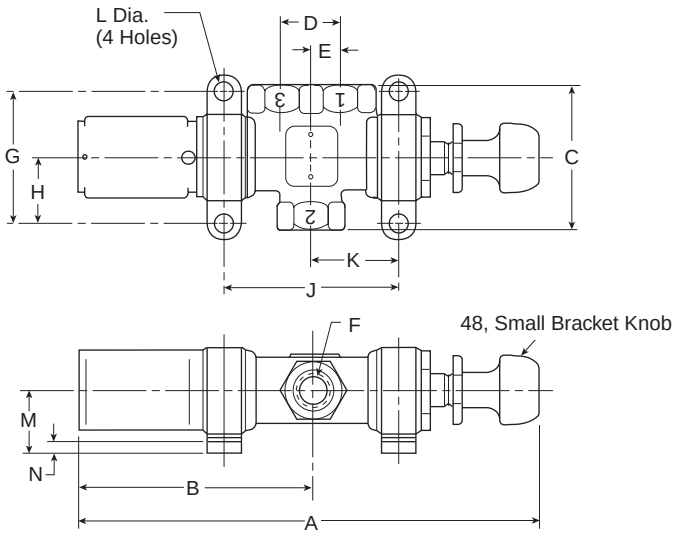
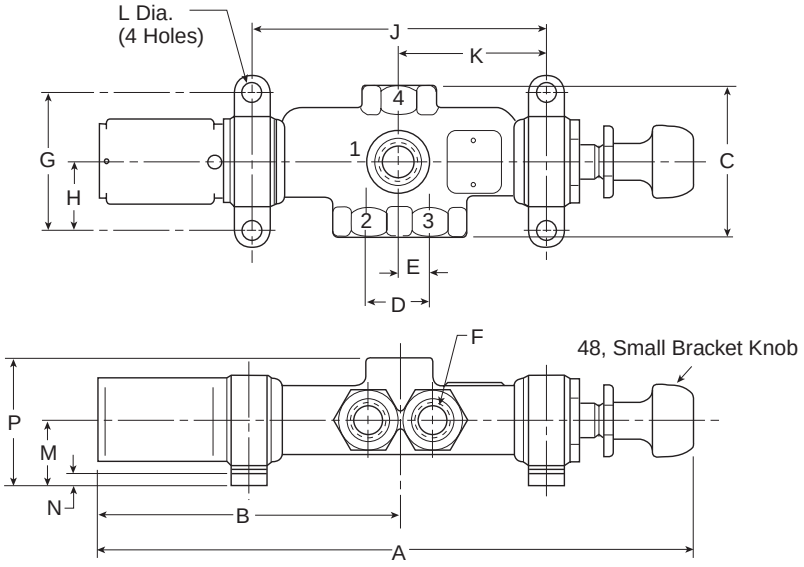
M097 Light Spring Return Direct Acting, Small Bracket (Pull Knob) 3-Way



	1/4	3/8	1/2	3/4
A	7.86 (199.8)	8.55 (217.2)	10.36 (263.1)	13.01 (330.4)
B	3.92 (99.6)	4.24 (107.7)	5.32 (135.2)	6.92 (175.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.64 (67.1)	3.14 (79.8)	3.73 (94.7)	4.67 (118.6)
K	1.32 (33.5)	1.57 (39.9)	1.87 (47.5)	2.33 (59.2)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M097 Light Spring Return Direct Acting, Small Bracket (Pull Knob) 4-Way



	1/4	3/8	1/2	3/4
A	9.36 (237.9)	10.39 (263.9)	12.48 (317.0)	15.73 (399.5)
B	4.67 (118.5)	5.15 (130.8)	6.37 (161.8)	8.27 (210.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.93 (74.4)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
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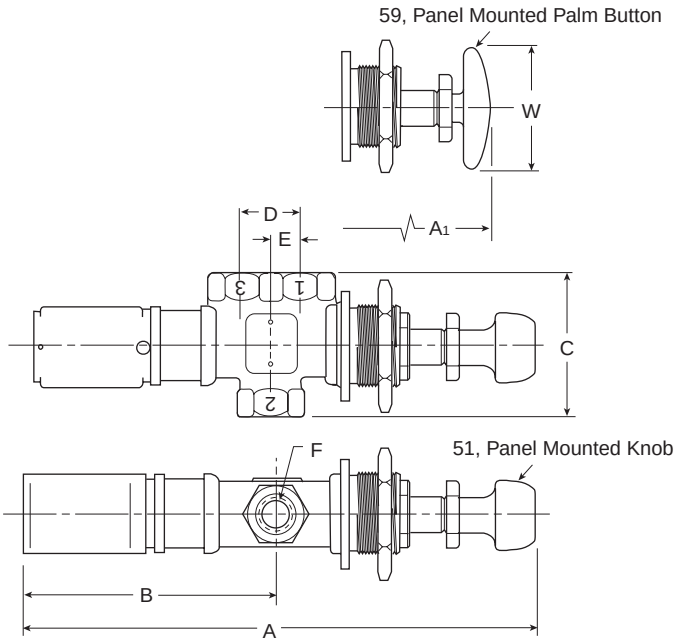
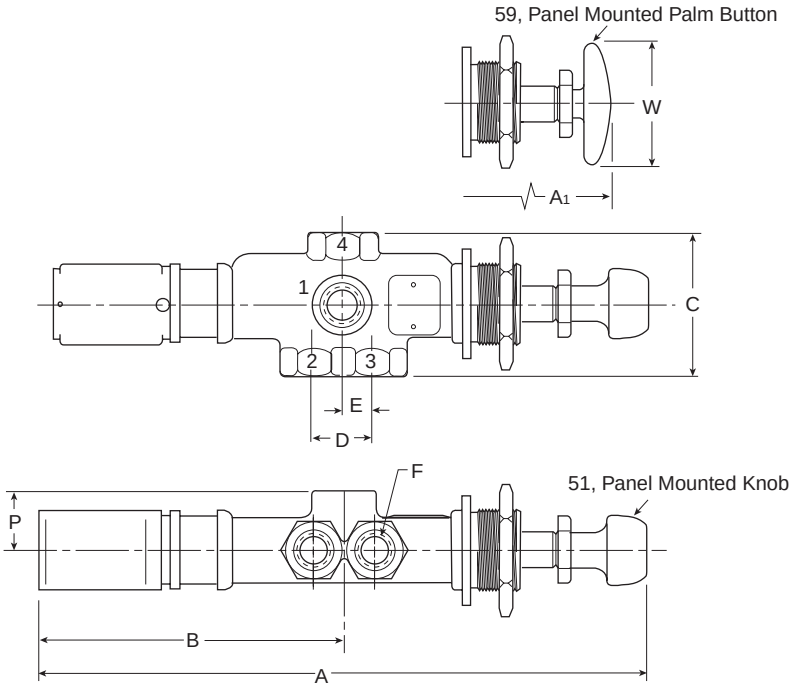
M064 Light Spring Return Direct Acting, Less Bracket (Pull Knob) & M065 Light Spring Return Reverse Acting, Less Bracket (Push Knob) 3-Way



	1/4	3/8	1/2	3/4
A	7.86 (199.6)	8.55 (217.1)	10.36 (263.1)	13.01 (330.4)
A1	7.55 (191.8)	8.24 (209.3)	10.05 (255.3)	12.70 (322.6)
B	3.96 (99.5)	4.23 (107.4)	5.31 (134.9)	6.91 (175.5)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
W	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M064 Light Spring Return Direct Acting, Less Bracket (Pull Knob) & M065 Light Spring Return Reverse Acting, Less Bracket (Push Knob) 4-Way



	1/4	3/8	1/2	3/4
A	9.36 (237.7)	10.39 (263.9)	12.48 (317.0)	15.73 (399.5)
A1	9.05 (229.9)	10.08 (256.0)	12.17 (309.1)	15.42 (391.7)
B	4.67 (118.5)	5.15 (130.8)	6.37 (161.8)	8.27 (210.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
W	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)	2.25 (57.2)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
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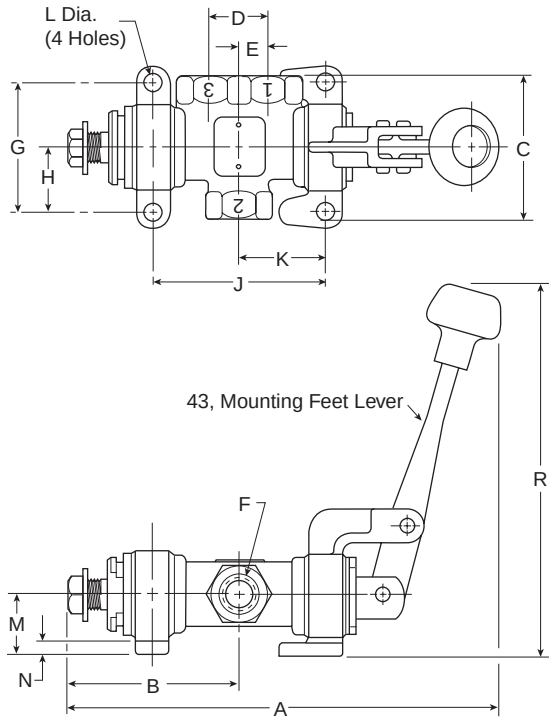
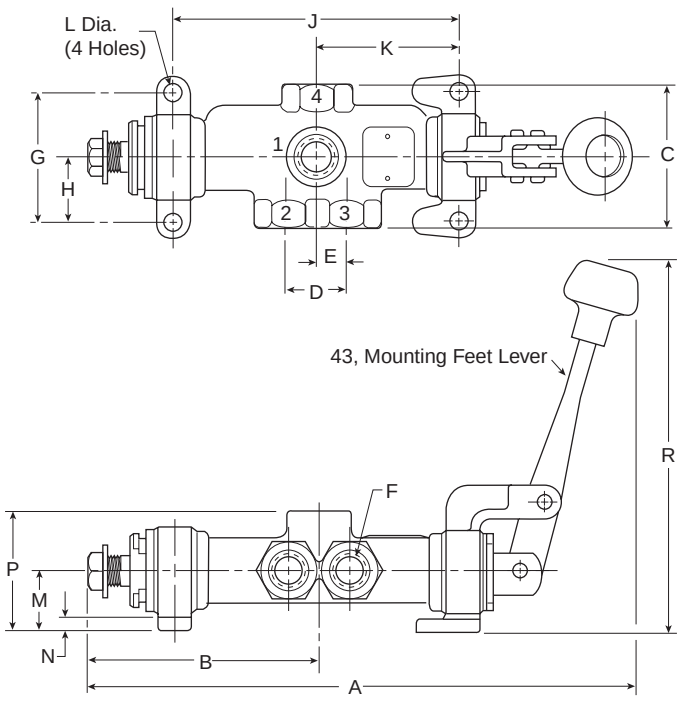
M085 Stem Stop, Small Bracket 3-Way



	1/4	3/8	1/2	3/4
A	6.77 (172.0)	7.76 (197.1)	9.29 (236.0)	11.46 (291.1)
B	2.67 (67.8)	3.05 (77.5)	3.72 (94.5)	4.61 (117.1)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
R	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M085 Stem Stop, Small Bracket 4-Way

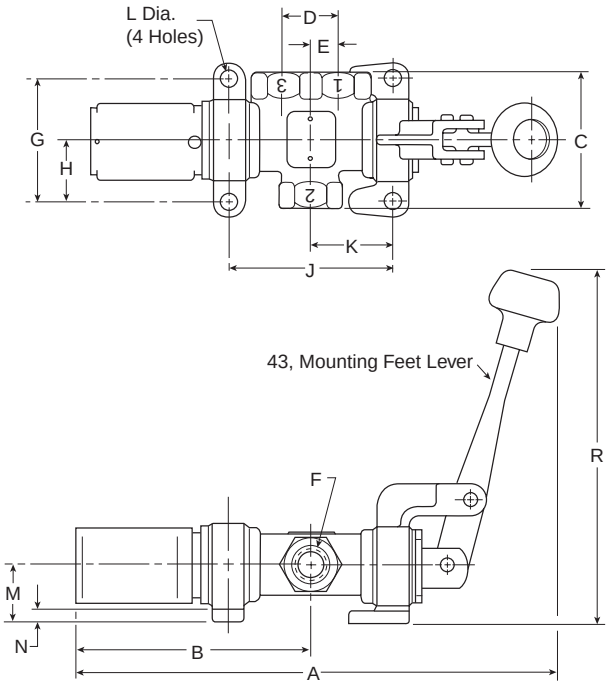


	1/4	3/8	1/2	3/4
A	8.28 (210.3)	9.60 (243.8)	11.08 (281.4)	14.17 (359.9)
B	3.42 (86.9)	3.97 (100.8)	4.78 (121.4)	5.97 (151.6)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

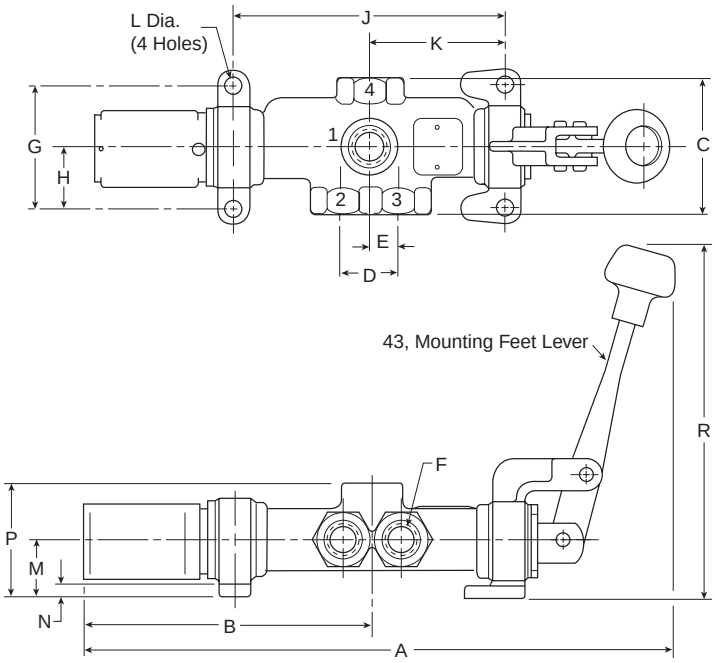
M095 Direct Acting Spring Return, Small Bracket (Push Lever) & M096 Reverse Acting Spring Return, Small Bracket (Pull Lever) 3-Way



	1/4	3/8	1/2	3/4
A	7.99 (202.8)	8.94 (227.0)	10.88 (276.4)	13.76 (349.5)
B	3.92 (99.5)	4.24 (107.6)	5.31 (134.9)	6.92 (175.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
R	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M095 Direct Acting Spring Return, Small Bracket (Push Lever) & M096 Reverse Acting Spring Return, Small Bracket (Pull Lever) 3-Way



	1/4	3/8	1/2	3/4
A	9.53 (242.1)	10.78 (273.8)	12.67 (321.8)	16.47 (418.3)
B	4.67 (118.6)	5.15 (130.8)	5.68 (144.3)	8.27 (210.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" PIpe	3/8" PIpe	1/2" PIpe	3/4" PIpe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
Travel	0.62 (15.7)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
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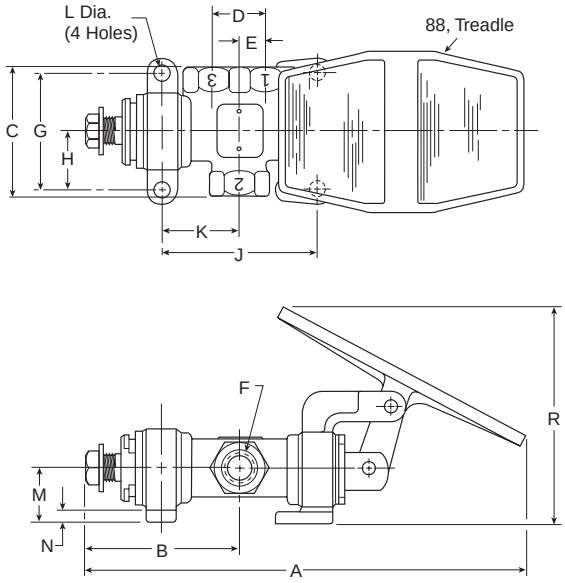
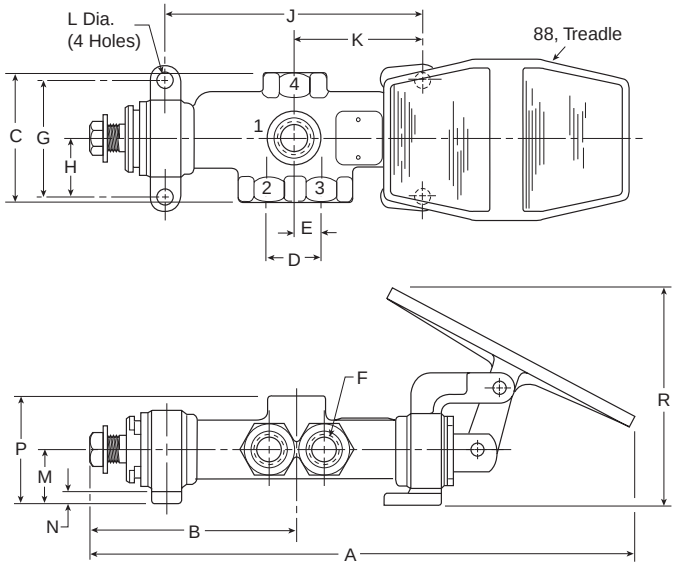
M085 Stem Stop, Small Bracket 3-Way



	1/4	3/8	1/2
A	8.01 (203.4)	8.73 (221.7)	10.32 (262.1)
B	2.67 (68.8)	3.06 (77.7)	4.06 (103.1)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)
R	4.51 (114.6)	4.65 (118.1)	4.85 (123.2)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)

Inches (mm)

M085 Stem Stop, Small Bracket 4-Way

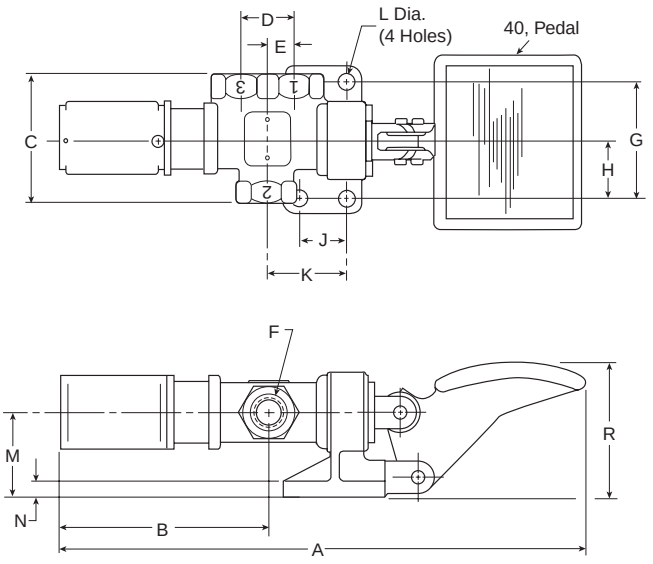


	1/4	3/8	1/2
A	9.52 (241.8)	10.57 (268.5)	12.11 (307.6)
B	3.42 (86.9)	3.97 (100.8)	4.78 (121.4)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)
R	4.51 (114.6)	4.65 (118.1)	4.85 (123.2)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

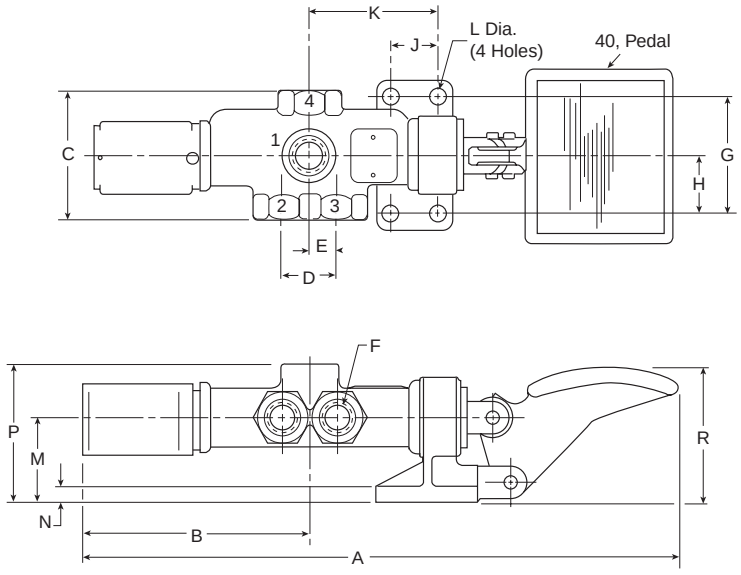
M062 Direct Acting Spring Return, Less Bracket (Push Lever) 3-Way



	1/4	3/8	1/2
A	9.99 (253.8)	10.50 (269.2)	12.66 (321.6)
B	3.92 (99.5)	4.23 (107.4)	5.31 (134.9)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)
J	0.97 (24.6)	0.97 (24.6)	1.12 (28.4)
K	1.44 (36.6)	1.56 (39.6)	1.83 (46.5)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)
M	1.72 (43.7)	1.72 (43.7)	2.00 (50.8)
N	0.31 (7.9)	0.31 (7.9)	0.38 (9.6)
R	2.66 (67.6)	2.71 (68.8)	2.74 (69.6)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)

Inches (mm)

M062 Direct Acting Spring Return, Less Bracket (Push Lever) 4-Way

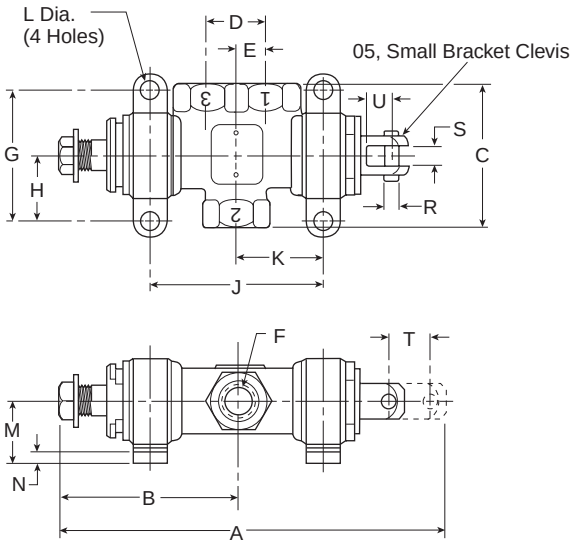


	1/4	3/8	1/2
A	11.50 (292.1)	12.44 (315.9)	14.45 (367.0)
B	4.67 (118.5)	5.15 (130.8)	5.68 (144.3)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)
J	0 .97 (24.6)	0.97 (24.6)	1.12 (28.4)
K	2.19 (55.6)	2.48 (63.0)	2.89 (73.4)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)
M	1.72 (43.7)	1.72 (43.7)	2.00 (50.8)
N	0.31 (7.9)	0.31 (7.9)	0.38 (9.6)
P	2.72 (69.1)	2.78 (70.6)	3.38 (85.8)
R	2.66 (67.6)	2.71 (68.8)	2.74 (69.6)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

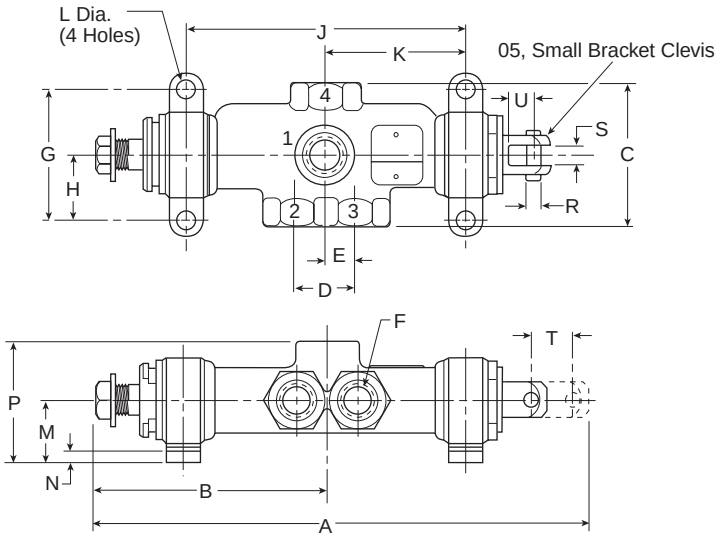
M085 Stem Stop, Small Bracket 3-Way



	1/4	3/8	1/2	3/4
A	5.31 (134.9)	6.01 (152.6)	7.36 (186.9)	8.92 (226.6)
B	2.68 (68.1)	3.06 (77.7)	4.85 (123.2)	4.62 (117.3)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.64 (67.1)	3.14 (79.8)	3.73 (94.7)	4.67 (118.6)
K	1.32 (33.5)	1.57 (39.9)	1.87 (47.5)	2.33 (59.2)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
R	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
S	0.38 (9.6)	0.38 (9.6)	0.44 (11.2)	0.44 (11.2)
U	0.47 (11.9)	0.47 (11.9)	0.56 (14.2)	0.62 (15.8)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M085 Stem Stop, Small Bracket 4-Way

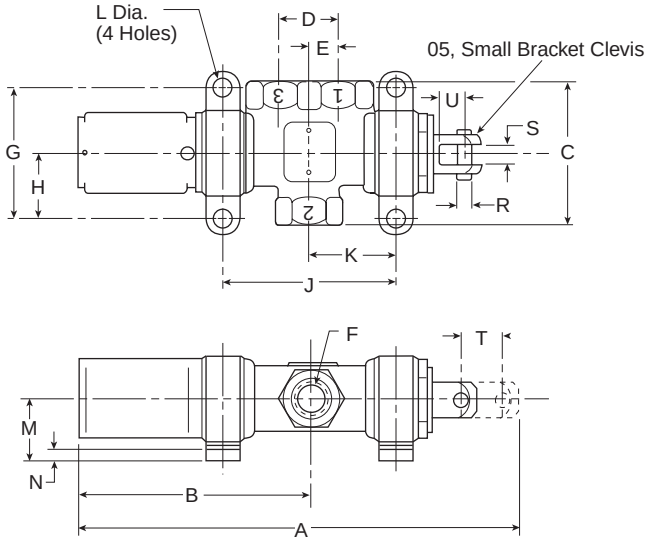


	1/4	3/8	1/2	3/4
A	6.81 (173.0)	7.85 (199.4)	9.48 (240.8)	11.64 (295.7)
B	3.42 (86.9)	3.97 (100.8)	5.91 (150.1)	5.97 (151.6)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
S	0.38 (9.6)	0.38 (9.6)	0.44 (11.2)	0.44 (11.2)
U	0.47 (11.9)	0.47 (11.9)	0.56 (14.2)	0.62 (15.8)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

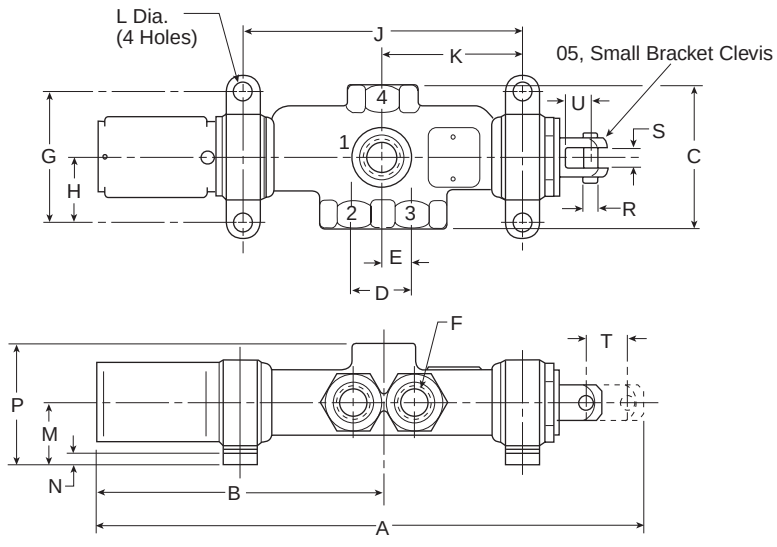
M095 Direct Acting Spring Return, Small Bracket (Push Lever) & M096 Reverse Acting Spring Return, Small Bracket (Pull Lever) 3-Way



	1/4	3/8	1/2	3/4
A	6.56 (166.5)	7.19 (182.6)	8.95 (227.3)	11.22 (285.0)
B	3.92 (99.5)	4.24 (107.6)	5.31 (134.9)	6.92 (175.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
R	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
S	0.38 (9.6)	0.38 (9.6)	0.44 (11.2)	0.44 (11.2)
U	0.47 (11.9)	0.47 (11.9)	0.56 (14.2)	0.62 (15.8)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M095 Direct Acting Spring Return, Small Bracket (Push Lever) & M096 Reverse Acting Spring Return, Small Bracket (Pull Lever) 4-Way

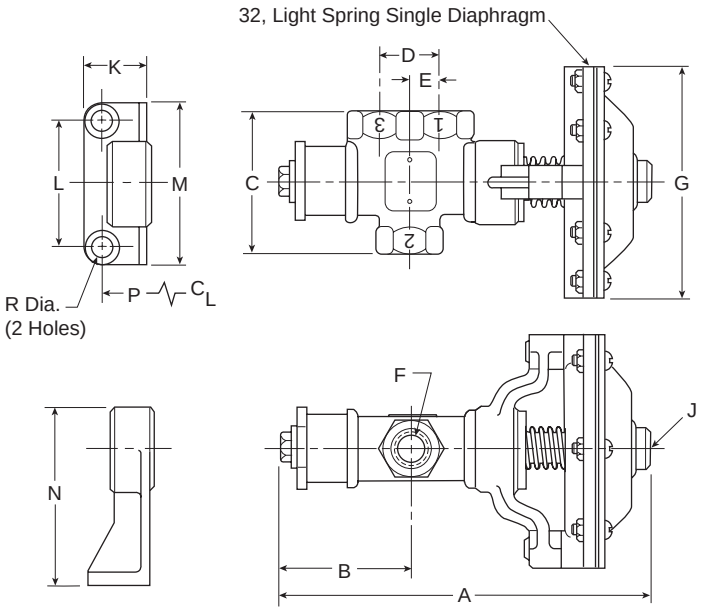


	1/4	3/8	1/2	3/4
A	8.06 (204.6)	9.03 (229.3)	11.07 (281.2)	13.94 (354.1)
B	4.67 (118.6)	5.15 (130.8)	5.68 (144.3)	8.27 (210.1)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.9 (74.2)	3.69 (93.7)
L	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	0.25 (6.4)	0.25 (6.4)	0.31 (7.9)	0.31 (7.9)
S	0.38 (9.6)	0.38 (9.6)	0.44 (11.2)	0.44 (11.2)
U	0.47 (11.9)	0.47 (11.9)	0.56 (14.2)	0.62 (15.8)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

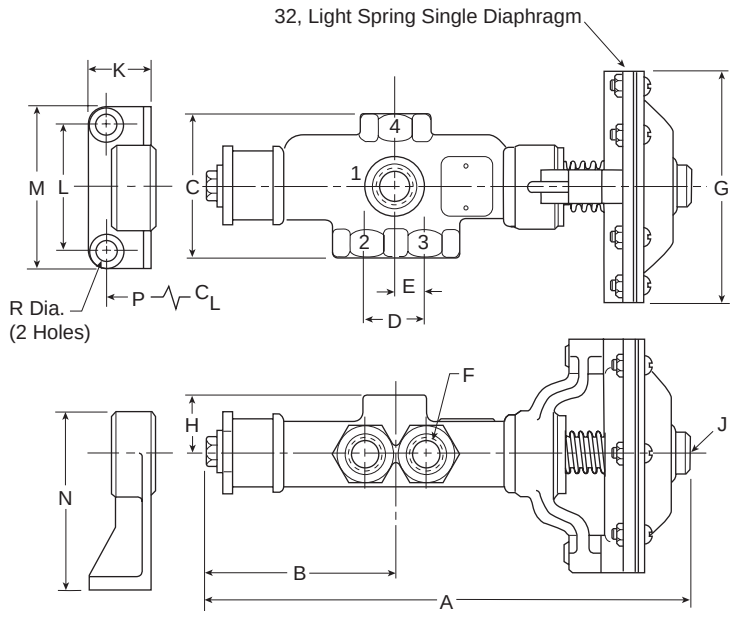
M084 Stem Stop, Large Bracket
3-Way



	1/4	3/8	1/2	3/4
A	6.14 (156.0)	6.85 (174.0)	8.03 (204.0)	9.89 (251.2)
B	2.03 (51.6)	2.36 (59.9)	2.83 (71.9)	3.48 (88.4)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	4.34 (110.2)	4.34 (110.2)	4.34 (110.2)	5.27 (133.9)
J	1/8" Pipe	1/8" Pipe	1/8" Pipe	1/8" Pipe
K	1.12 (28.4)	1.12 (28.4)	1.75 (44.4)	2.00 (50.8)
L	2.00 (50.8)	2.38 (60.4)	2.00 (50.8)	3.25 (82.6)
M	2.75 (69.8)	3.00 (76.2)	3.00 (76.2)	4.19 (106.4)
N	3.22 (81.8)	3.28 (83.3)	3.40 (86.4)	4.00 (101.6)
P	1.81 (46.0)	2.03 (51.6)	2.74 (69.6)	3.18 (80.8)
R	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

M084 Stem Stop, Large Bracket
4-Way

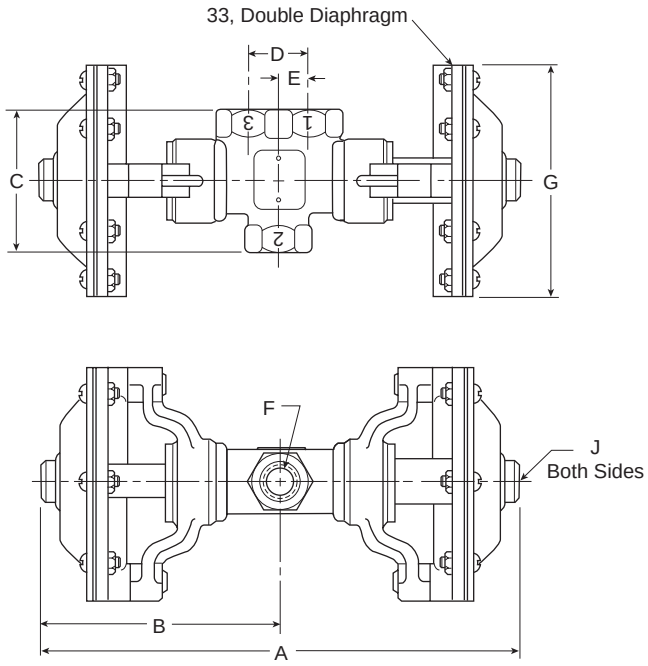


	1/4	3/8	1/2	3/4
A	7.65 (194.3)	8.69 (220.7)	9.82 (249.4)	12.60 (320.0)
B	2.79 (70.9)	3.28 (83.3)	3.89 (98.8)	4.84 (122.9)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	0.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	0.47 (11.9)	0.53 (13.5)	0.62 (15.8)	0.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	4.34 (110.2)	4.34 (110.2)	4.34 (110.2)	5.27 (133.9)
H	1.00 (25.4)	1.06 (26.9)	1.38 (30.0)	1.50 (38.1)
J	1/8 Pipe	1/8 Pipe	1/8 Pipe	1/8 Pipe
K	1.12 (28.4)	1.12 (28.4)	1.75 (44.4)	2.00 (50.8)
L	2.00 (50.8)	2.38 (60.4)	2.00 (50.8)	3.25 (82.6)
M	2.75 (69.8)	3.00 (76.2)	3.00 (76.2)	4.19 (106.4)
N	3.22 (81.8)	3.28 (83.3)	3.40 (86.4)	4.00 (101.6)
P	2.57 (65.3)	2.95 (74.9)	3.80 (96.5)	4.54 (115.3)
R	0.34 (8.6)	0.34 (8.6)	0.41 (10.4)	0.41 (10.4)
Travel	0.62 (15.8)	0.69 (17.5)	0.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

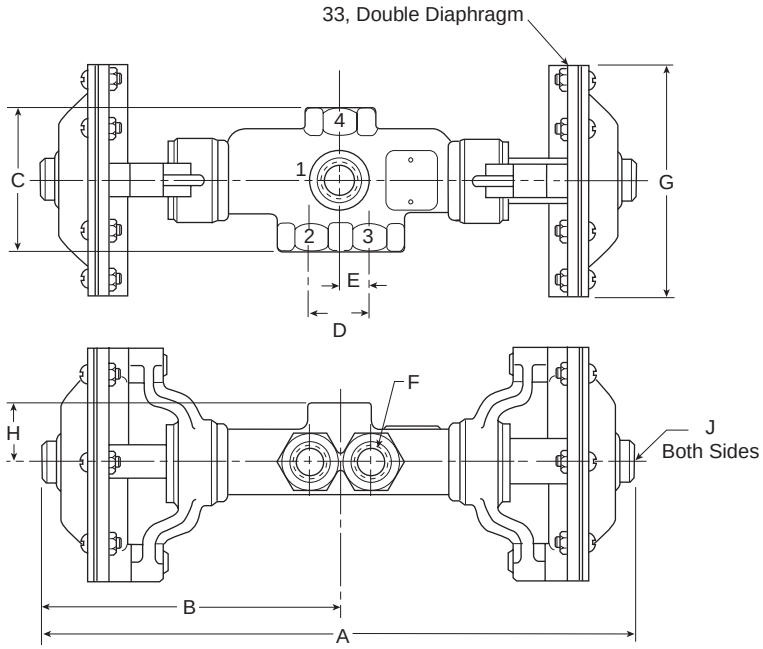
M033 Double Diaphragm 3-Way



	1/4	3/8	1/2	3/4
A	8.22 (208.8)	8.98 (228.1)	10.40 (264.2)	12.82 (325.6)
B	4.11 (104.4)	4.49 (114.0)	5.20 (132.1)	6.41 (162.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	4.34 (110.2)	4.34 (110.2)	4.34 (110.2)	5.27 (133.9)
J	1/8" Pipe	1/8" Pipe	1/8" Pipe	1/8" Pipe

Inches (mm)

M033 Double Diaphragm 4-Way

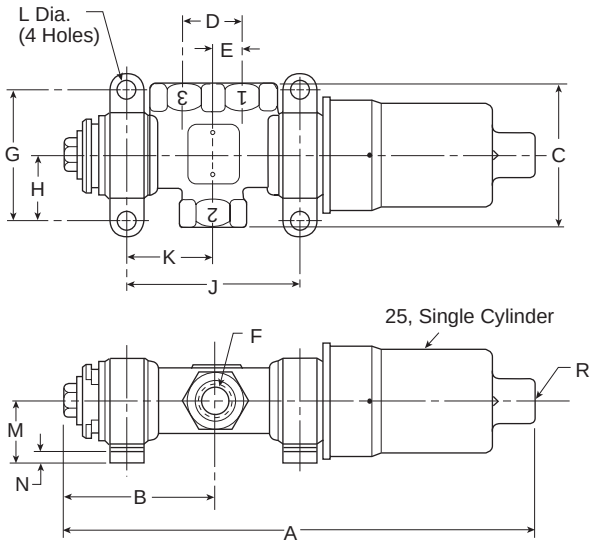


	1/4	3/8	1/2	3/4
A	9.72 (246.9)	10.82 (274.8)	11.86 (301.2)	15.52 (394.2)
B	4.86 (123.4)	5.41 (137.4)	5.93 (150.6)	7.76 (197.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	4.34 (110.2)	4.34 (110.2)	4.34 (110.2)	5.27 (133.9)
H	1.00 (25.4)	1.06 (26.9)	1.38 (30.0)	1.50 (38.1)
J	1/8" Pipe	1/8" Pipe	1/8" Pipe	1/8" Pipe

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

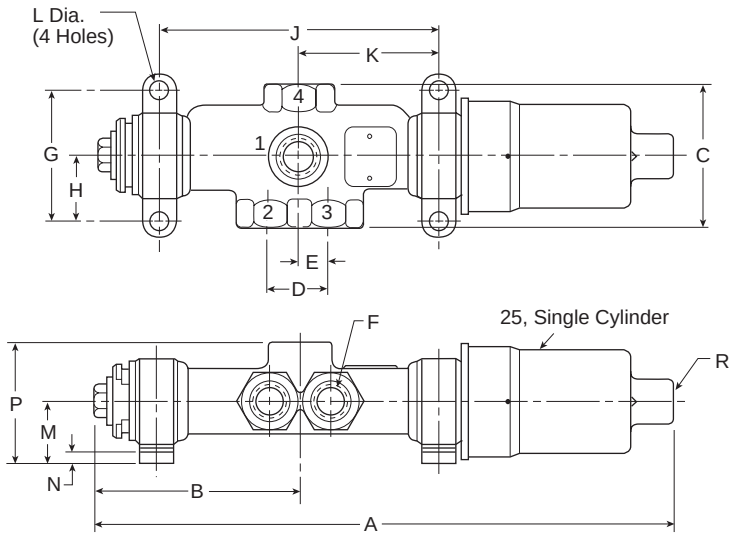
M085 Stem Stop, Small Bracket
3-Way



	1/4	3/8	1/2	3/4
A	7.50 (190.5)	8.14 (206.8)	9.03 (229.4)	11.18 (284.0)
B	2.03 (51.6)	2.36 (59.9)	2.83 (71.9)	3.48 (88.4)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.64 (67.1)	3.14 (79.8)	3.73 (94.7)	4.67 (118.6)
K	1.32 (33.5)	1.57 (39.9)	1.87 (47.5)	2.33 (59.2)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
R	1/4" Pipe	1/4" Pipe	1/4" Pipe	1/4" Pipe
Travel	.62 (15.7)	.69 (17.5)	.88 (22.4)	1.12 (28.4)

Inches (mm)

M085 Stem Stop, Small Bracket
4-Way

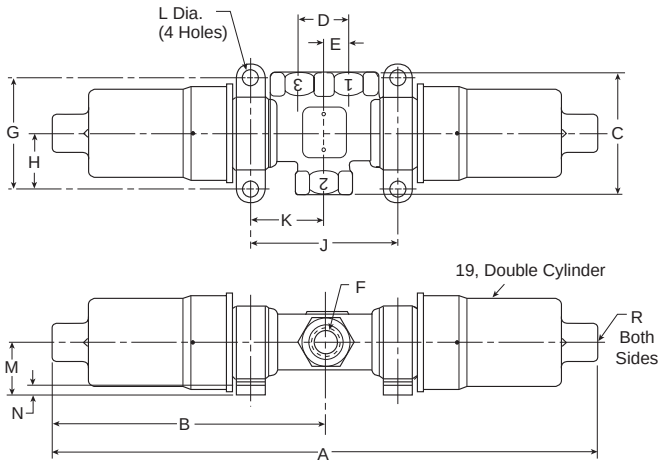


	1/4	3/8	1/2	3/4
A	9.00 (228.6)	9.98 (253.5)	11.15 (283.2)	13.90 (353.1)
B	2.79 (70.9)	3.28 (83.3)	3.89 (98.8)	4.84 (122.9)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	1/4" Pipe	1/4" PIpe	1/4" Pipe	1/4" Pipe
Travel	.62 (15.8)	.69 (17.5)	.88 (22.4)	1.12 (28.4)

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

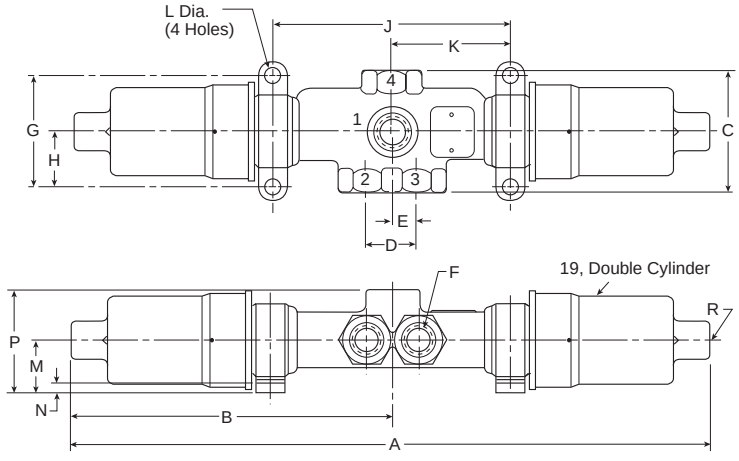
M019 Double Cylinder 3-Way



	1/4	3/8	1/2	3/4
A	10.94 (277.9)	11.56 (293.6)	12.40 (315.0)	15.40 (391.2)
B	5.47 (138.9)	5.78 (146.8)	6.20 (157.5)	7.70 (195.6)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.64 (67.1)	3.14 (79.8)	3.73 (94.7)	4.67 (118.6)
K	1.32 (33.5)	1.57 (39.9)	1.87 (47.5)	2.33 (59.2)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
R	1/4" Pipe	1/4" Pipe	1/4" Pipe	1/4" Pipe

Inches (mm)

M019 Double Cylinder 4-Way

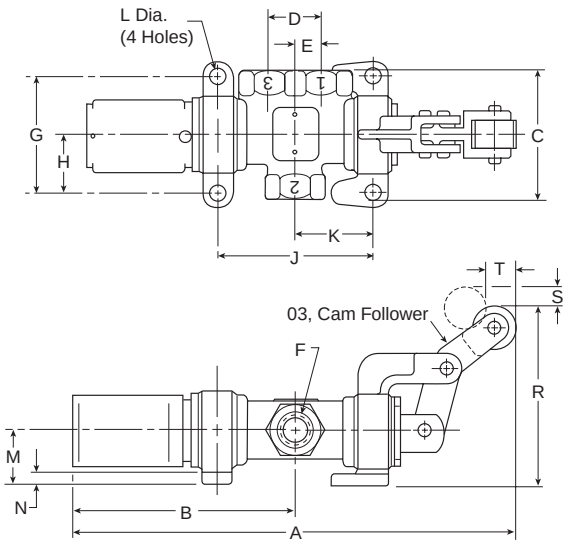


	1/4	3/8	1/2	3/4
A	12.42 (315.5)	13.40 (340.4)	14.52 (368.8)	18.12 (460.2)
B	6.21 (157.7)	6.70 (170.2)	7.26 (184.4)	9.06 (230.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	1/4" Pipe	1/4" Pipe	1/4" Pipe	1/4" Pipe

Inches (mm)

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

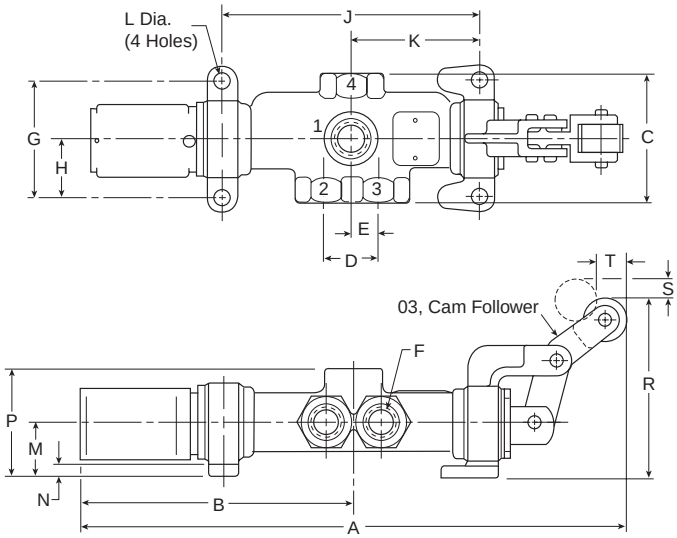
M095 Direct Acting Spring Return, Small Bracket (Push Lever) 3-Way



	1/4	3/8	1/2	3/4
A	7.98 (202.6)	8.72 (221.5)	10.77 (273.6)	13.54 (343.9)
B	3.92 (99.6)	4.24 (107.7)	5.31 (134.9)	6.92 (175.8)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (38.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
R	3.88 (98.6)	3.88 (98.6)	4.23 (107.4)	4.88 (124.0)
S	.43 (10.9)	.47 (11.9)	.70 (17.8)	.67 (17.0)
Travel	.53 (13.5)	.59 (15.0)	.75 (19.0)	.81 (20.6)

Inches (mm)

M095 Direct Acting Spring Return, Small Bracket (Push Lever) 4-Way



	1/4	3/8	1/2	3/4
A	9.48 (204.7)	10.56 (268.2)	12.89 (327.4)	16.26 (413.0)
B	4.67 (118.6)	5.15 (130.8)	5.68 (144.3)	8.27 (210.1)
C	2.38 (60.4)	2.62 (66.6)	3.12 (79.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R	3.88 (98.6)	3.88 (98.6)	4.23 (107.4)	4.88 (124.0)
S	.43 (10.9)	.47 (11.9)	.70 (17.8)	.67 (17.0)
Travel	.53 (13.5)	.59 (15.0)	.75 (19.0)	.81 (20.6)

Inches (mm)

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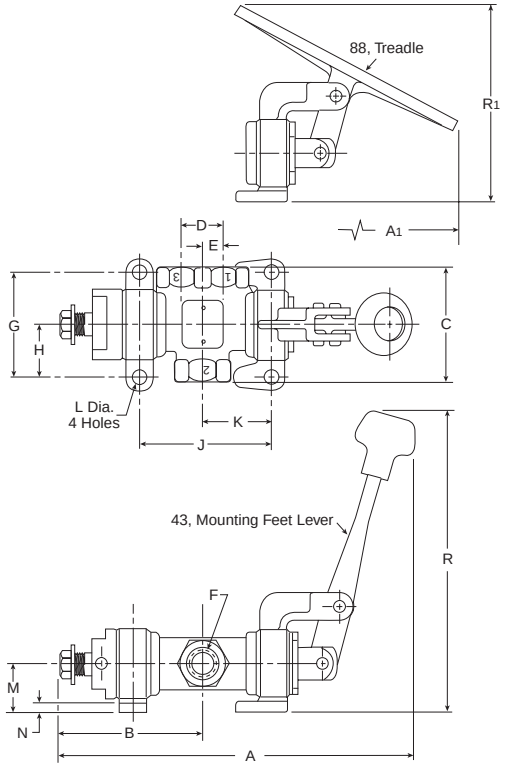
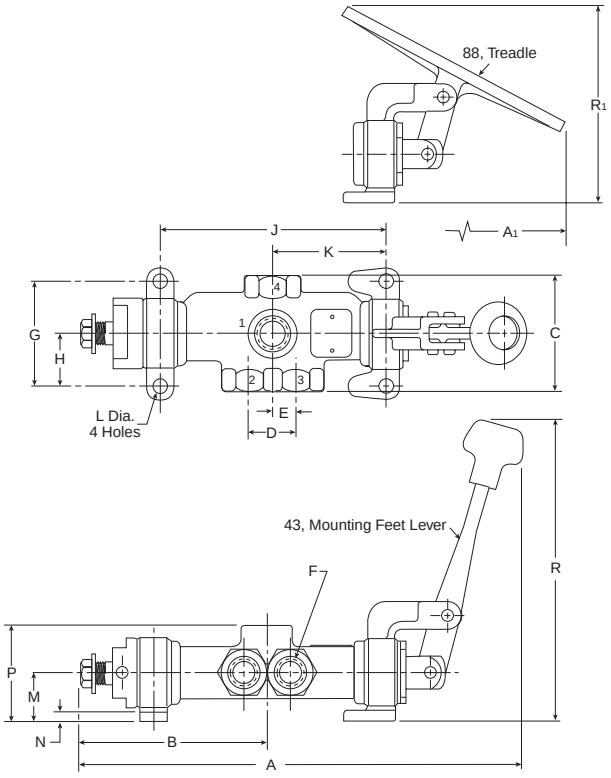
M054 Ball Detent, Small Bracket
3-Way



	1/4	3/8	1/2	3/4
A	7.35 (186.7)	8.36 (212.3)	9.95 (252.7)	12.25 (311.2)
A1	8.59 (218.2)	9.33 (237.0)	10.65 (270.5)	12.90 (327.7)
B	3.25 (82.6)	3.66 (93.0)	4.39 (11.5)	5.41 (137.4)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	2.63 (66.8)	3.13 (79.5)	3.72 (94.5)	4.56 (115.8)
K	1.31 (33.3)	1.56 (39.6)	1.86 (47.2)	2.28 (57.9)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
R1	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
R2	4.51 (114.6)	4.65 (18.1)	4.85 (123.2)	6.03 (153.2)

Inches (mm)

M054 Ball Detent, Small Bracket
4-Way



	1/4	3/8	1/2	3/4
A	8.86 (225.0)	10.20 (259.1)	11/74 (298.2)	14/96 (380.0)
A1	10.01 (254.2)	11.17 (283.7)	12.77 (324.4)	15.62 (396.8)
B	4.00 (101.6)	4.57 (116.1)	5.44 (138.2)	6.76 (171.7)
C	2.38 (60.4)	2.62 (66.6)	3.00 (76.2)	3.62 (92.0)
D	.94 (23.9)	1.06 (26.9)	1.25 (31.8)	1.62 (41.2)
E	.47 (11.9)	.53 (13.5)	.62 (15.8)	.81 (20.6)
F	1/4" Pipe	3/8" Pipe	1/2" Pipe	3/4" Pipe
G	2.25 (57.2)	2.38 (60.4)	2.62 (66.6)	3.25 (82.6)
H	1.12 (28.4)	1.19 (30.2)	1.31 (33.3)	1.62 (41.2)
J	4.14 (105.2)	4.98 (126.5)	5.85 (148.6)	7.39 (187.7)
K	2.07 (52.6)	2.49 (63.2)	2.92 (74.2)	3.69 (93.7)
L	.34 (8.6)	.34 (8.6)	.41 (10.4)	.41 (10.4)
M	1.12 (28.4)	1.12 (28.4)	1.25 (31.8)	1.56 (39.6)
N	.25 (6.4)	.25 (6.4)	.31 (7.9)	.31 (7.9)
P	2.12 (53.8)	2.18 (55.4)	2.63 (66.8)	3.06 (77.7)
R1	6.78 (172.2)	6.78 (172.2)	8.10 (205.7)	10.73 (272.5)
R2	4.51 (114.6)	4.65 (18.1)	4.85 (123.2)	6.03 (153.2)

Inches (mm)

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Pneumatic Division
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"LV" & "EZ" Series

Lockout Valves, 3-Way, 3-Port, 2-Position

Section F

www.parker.com/pneu/lv

"LV" Series

- Basic Features F82
- Applications F82
- Mounting F82
- Dimensions F82
- Technical Information
  - Operation F83
  - Specifications F83
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"EZ" Series

- Basic Features F84
- Applications F84
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- Technical Information
  - Operation F85
  - Specifications F85
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Flow & Safety Standards F86

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"LV" Series

Features

- Used in systems for compliance with OSHA Standard 29 CFR Part 1910
- 3/8 inch to 1-1/4 inch Pipe Sizes
- Cv's from 6.0 to 14
- 3/4 and 1-1/4 inch Exhaust Ports available
- Rugged Cast Aluminum Alloy Body
- Inline or Surface Mountable
- Safety Yellow and Red for High Visibility
- Detented Spool
- Exhaust Port Threaded for Installation of Silencer or Line for Remote Exhausting

1-1/4" Exhaust Shown

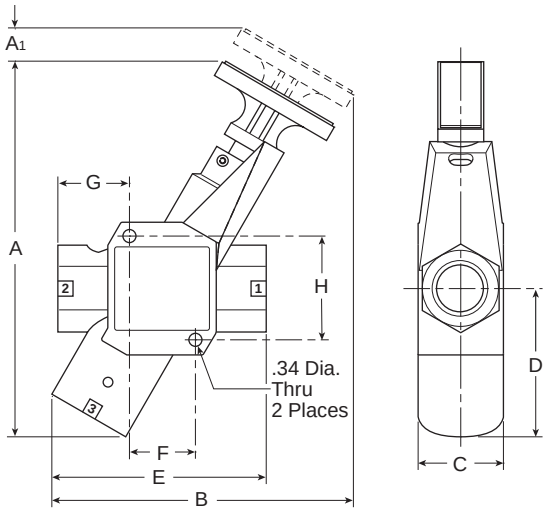
Applications

Lockout valves are installed in pneumatic drop legs, or individual pneumatic control lines (see Figure 1). In accordance with OSHA procedures, lockout valves are used during maintenance and service procedures of pneumatically (air) operated equipment. Prior to servicing, the red handle is pressed inward, blocking pressure and relieving all downstream air pressure. A padlock is installed through the locking hasp, Preventing accidental actuation during the maintenance procedure. Following maintenance, the padlock is removed and the red handle is pulled outward, returning air pressure to the system.
(For complete Lockout / Tagout procedures, consult OSHA Standard 29 CFR Part 1910 in U.S. Federal Register/Vol. 54 No. 169, Friday, September 1, 1989 / Page 36644.)

Mounting

Valves can be inline mounted or surface mounted using the two 11/32" mounting holes provided in the valve body. Mount valves in plain view with the handle oriented for accessibility.

Dimensions



LV Series, 3/4" Exhaust Port Inches (mm)

A	A1	B	C	D
8.32 (211)	0.64 (16)	6.60 (168)	2.00 (51)	3.06 (78)
E	**F**	**G**	**H**	
4.24 (108)	1.32 (111)	1.56 (40)	2.21 (56)	

LV Series, 1-1/4" Exhaust Port Inches (mm)

A	A1	B	C	D
9.91 (252)	0.85 (22)	7.95 (202)	2.25 (57)	3.91 (99)
E	**F**	**G**	**H**	
5.65 (144)	1.74 (44)	1.89 (48)	2.74 (70)	

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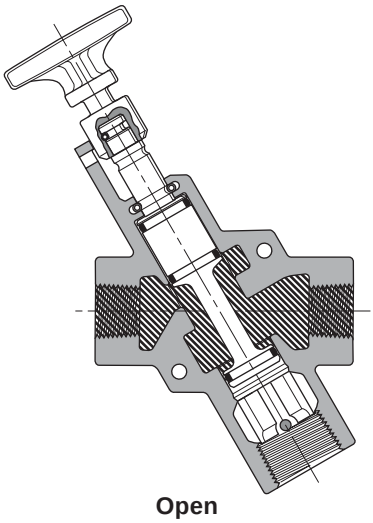
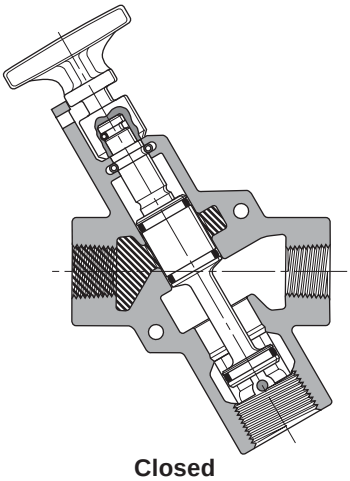
Operation

Normal Machine Operation – Valve Open
With the handle pulled outward. Inlet Port 1 is open to outlet Port 2. Exhaust Port 3 is blocked.



Open

Lockout Operation – Valve Closed
With the handle pushed inward. Inlet Port 1 is blocked. Outlet Port 2 is open to Exhaust Port 3.



Closed

Specifications

Operating Pressure Range:
0 to 250 PSIG (0 to 1725 kPa)

Operating Temperature Range (Ambient):
32°F to 160°F (0°C to 71°C)

Lubrication:
For best results and service life, use clean, moisture free, lubricated air.

Recommended Lubricant:
F442 Oil

Materials of Construction

Body ..... Cast Aluminum Alloy
Handle .....3/4" Exhaust Port - Cast Aluminum Alloy
1-1/4" Exhaust Port - Plastic
Spool ..... Aluminum
Seals .....Carboxylated Nitrile
Detent Spring.....Stainless Steel
Grease .....Magnalube G†

LV Series Model Number Index

LV 6 N A B

Port Size (Inlet & Outlet Ports 1 & 2)	
3/8"*	3
1/2"*	4
3/4"* ‡	6
1" ‡	8
1-1/4" ‡	A

* Available with 3/4" Exhaust Port.
‡ Available with 1-1/4" Exhaust Port.

Thread Type (Ports 1, 2 & 3)	
NPT	N
BSPP (G)	B

Port Size (Exhaust Port 3)	
6	3/4"
A	1-1/4"

Design Level	
B	Current

† Trademark Magnalube

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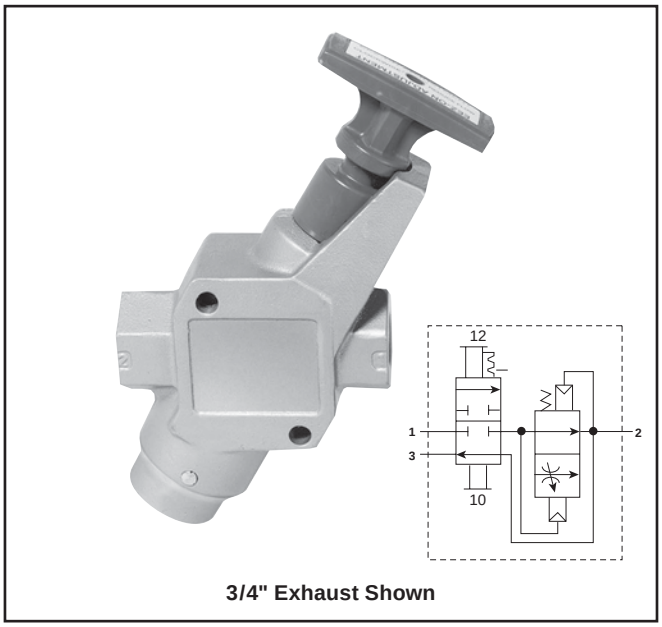
"EZ" Series

Features

- Combines Lockout and Soft-Start Functions in a Single Unit
- Used in systems for compliance with OSHA Standard 29 CFR Part 1910
- 3/8 inch to 1-1/4 inch Pipe Sizes
- Cv's from 3.7 to 13.7
- 3/4 and 1-1/4 inch: Exhaust Ports available
- Rugged Cast Aluminum Alloy Body
- Exhaust Port Threaded for Installation of Silencer or Line for Remote Exhausting
- Inline or Surface Mountable



3/4" Exhaust Shown

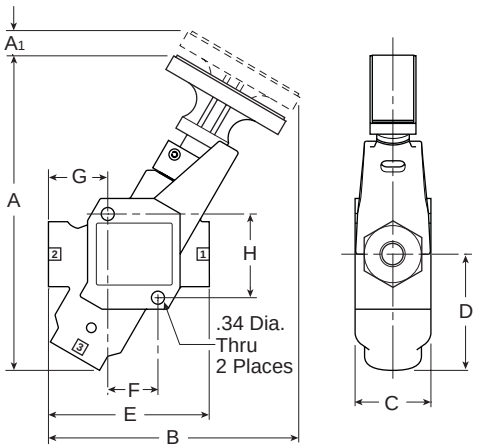
Applications

EZ valves are installed in pneumatic drop legs, or individual pneumatic control lines (see Figure 1). In accordance with OSHA procedures, EZ valves are used during maintenance and service procedures of pneumatically (air) operated equipment. Prior to servicing, the blue handle is pressed inward, blocking pressure and relieving all downstream air pressure. A padlock is installed through the locking hasp, preventing accidental actuation during the maintenance procedure. Following maintenance, the padlock is removed and the blue handle is pulled outward, gradually returning air pressure to the system. (For complete Lockout / Tagout procedures, consult OSHA Standard 29 CFR Part 1910 in U.S. Federal Register/Vol. 54 No. 169, Friday, September 1, 1989 / Page 36644.)

Mounting

Valves can be inline mounted or surface mounted using the two 11/32" mounting holes provided in the valve body. Mount valves in plain view with the handle oriented for accessibility.

Dimensions



EZ Series, 3/4" Exhaust Port **Inches (mm)**

A	A1	B	C	D
8.32 (211)	0.64 (16)	6.60 (168)	2.00 (51)	3.06 (78)
E	**F**	**G**	**H**	
4.24 (108)	1.32 (111)	1.56 (40)	2.21 (56)	

EZ Series, 1-1/4" Exhaust Port **Inches (mm)**

A	A1	B	C	D
9.91 (252)	0.85 (22)	7.95 (202)	2.25 (57)	3.91 (99)
E	**F**	**G**	**H**	
5.65 (144)	1.74 (44)	1.89 (48)	2.74 (70)	

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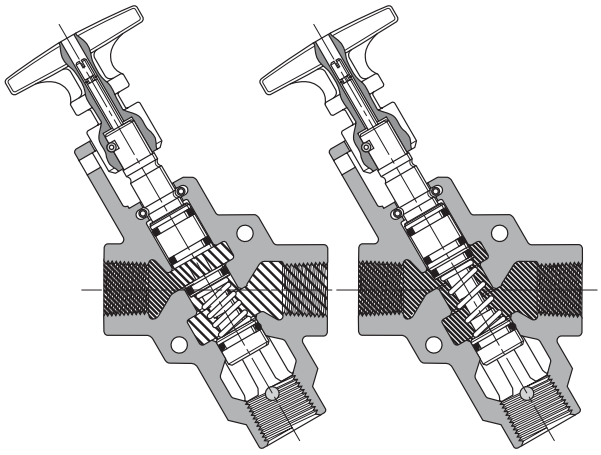
Operation

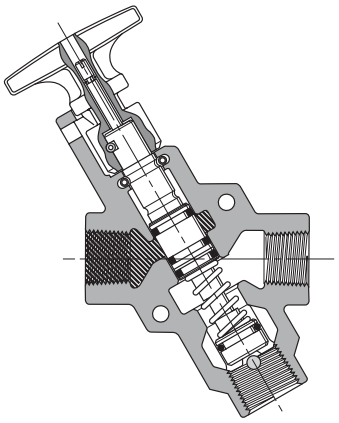
Normal Machine Operation – Valve Open
When the blue handle is pulled outward, the adjustable needle valve (accessed through the top of the handle) setting determines the rate of pressure buildup. When downstream pressure reaches the full flow described in the specifications below, Inlet Port 1 is open to outlet Port 2. Exhaust Port 3 is blocked.

Lockout Operation – Valve Closed
When the blue handle is pushed inward, the Inlet Port 1 is blocked. Downstream air is exhausted through Exhaust Port 3.



Open
Pressure Building Up

Open
Full Flow



Closed

Specifications

Operating Pressure Range:
30 to 150 PSIG (2 to 10 bar)
Open to Full Flow: Inlet Pressure - 25 PSIG (1.7 bar)

Operating Temperature Range (Ambient):
40°F to 175°F (4°C to 80°C)

Lubrication:
For best results and service life, use clean, moisture free, lubricated air.

Recommended Lubricant:
F442 Oil

Materials of Construction

Body ..... Cast Aluminum Alloy
Handle ..... Plastic
Spool ..... Aluminum
Seals ..... Carboxylated Nitrile
Detent Spring ..... Stainless Steel
Grease ..... Magnalube G†

EZ Combination EEZ-On Series Model Number Index

EZ 03 N B A

Port Size (Inlet & Outlet Ports 1 & 2)	
3/8"*	03
1/2"*	04
3/4"* ‡	06
1" ‡	08
1-1/4" ‡	0A

* Available with 3/4" Exhaust Port.
‡ Available with 1-1/4" Exhaust Port.

Port Size (Exhaust Port 3)	
6	3/4"
A	1-1/4"

Design Level	
B	Current

Thread Type (Ports 1, 2 & 3)	
NPT	N
BSPP (G)	B
BSPT (R)	R

† Trademark Magnalube

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Flow

Model	1 to 2 Cv	2 to 3 Cv
LV3N6B	6.00	8.00
LV4N6B	7.10	8.30
LV6N6B	8.60	9.50
LV6NAB	13.00	12.00
LV8NAB	13.00	14.00
LVANAB	20.00	14.00

Model	1 to 2 Cv	2 to 3 Cv
EZ03NB6	3.79	3.78
EZ04NB6	5.31	3.77
EZ06NBA	6.01	9.25
EZ08NBA	11.18	8.13
EZ0ANBA	13.74	8.03

Schematic

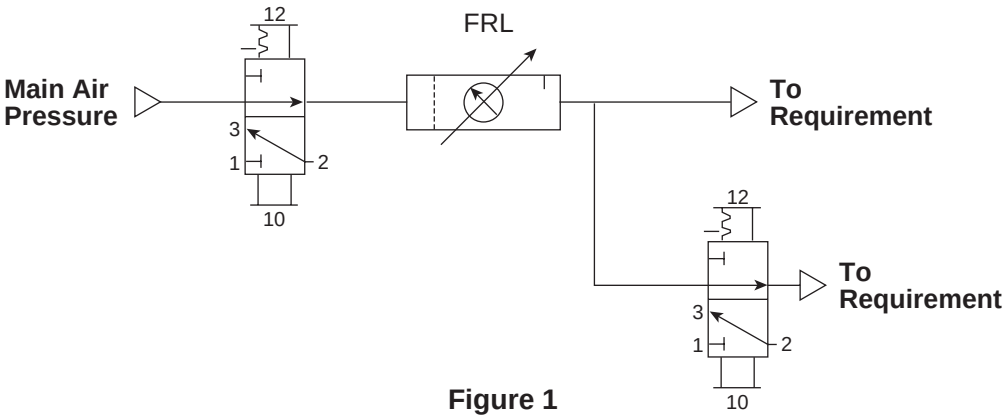

Figure 1
Lockout Valves Shown In The Passing Condition

Friday, September 1, 1989 the Occupational Safety and Health Administration (OSHA) passed a standard, 29CFR Part 1910, requiring certain lockout and / or tagout procedures for the control of a hazardous energy source. This standard addresses practices and procedures that are necessary to disable the release of potentially hazardous energy while maintenance and servicing activities are being performed. Tagout refers to the use of tags to warn workers when equipment using potentially hazardous energy is being serviced. Lockout is the procedure which ensures that all power to a piece of equipment is isolated, locked or blocked and dissipated using a method that cannot be readily removed to bypassed. Dissipation means stored energy at the equipment is brought to a neutral state. This standard is expected to save 120 lives and prevent 60,000 accidents a year. This OSHA Standard became effective October 31, 1989.

A typical application (Figure 1) shows a main lockout valve mounted in the main drop leg, before the split to machine functions. Additional lockout valves can be used to isolate individual control lines. Before servicing, the valve can be actuated and locked to isolate downstream from pressure, and exhaust downstream to atmosphere thus making equipment safe for maintenance.

To reference this standard see the U.S. Federal Register / Vol. 54, No. 169 / Friday, September 1, 1989 / Page 36644. For copies of this standard, contact U.S. Department of Labor, Occupational Safety and Health Administration, Office of Publication, Room N3101, Washington, DC 20210, (202) 523-9667.

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Sliding Seal & Brass Poppet Valves

Manually Operated

Section F

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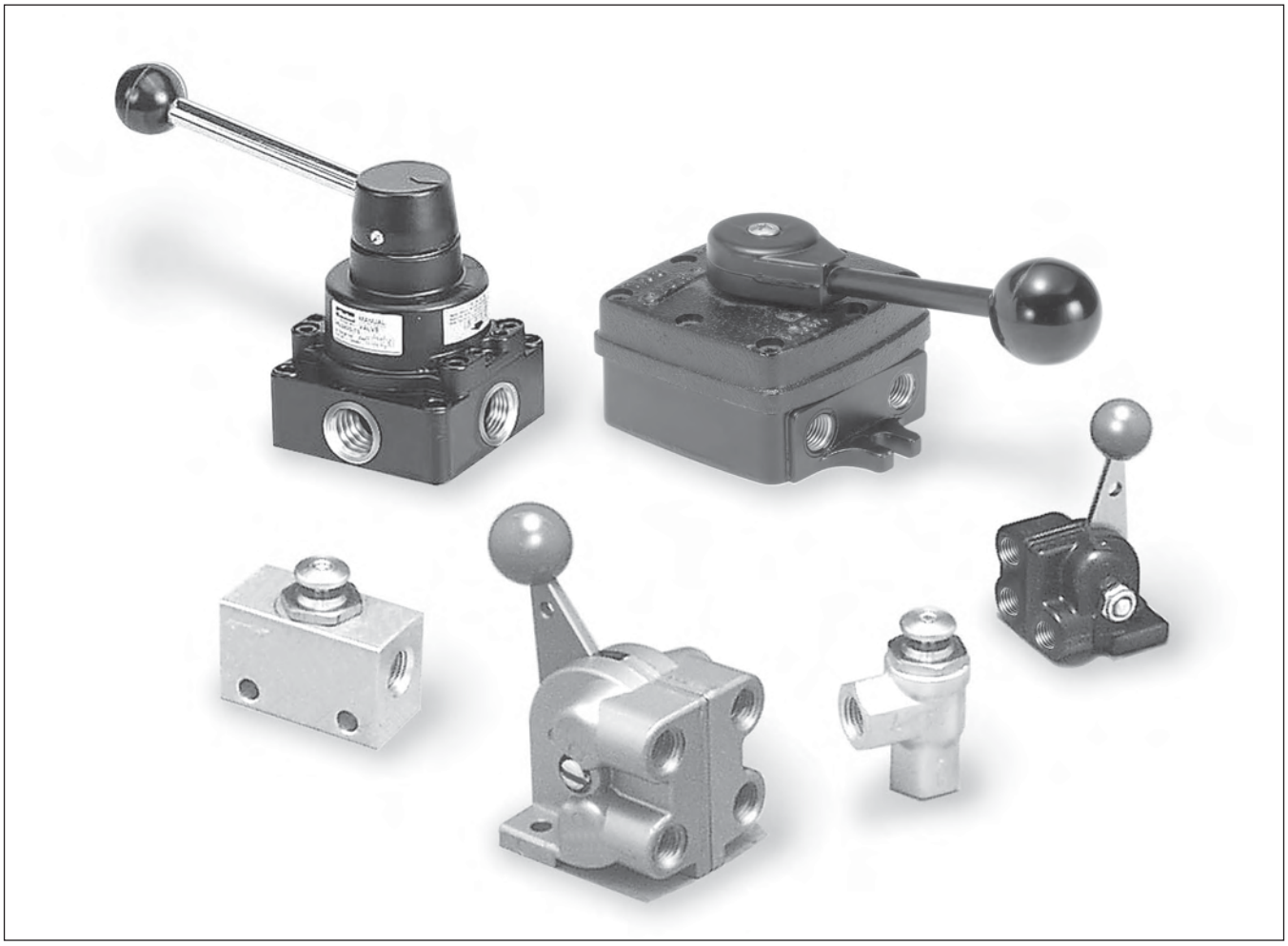

PL / VL Series F88-F89
HV Valve F90-F91
Hand Operated Valves, Dimensions F92-F93
Button Operated Valves F94
Hand / Cam Button Valves F95
Bleed Valve F96

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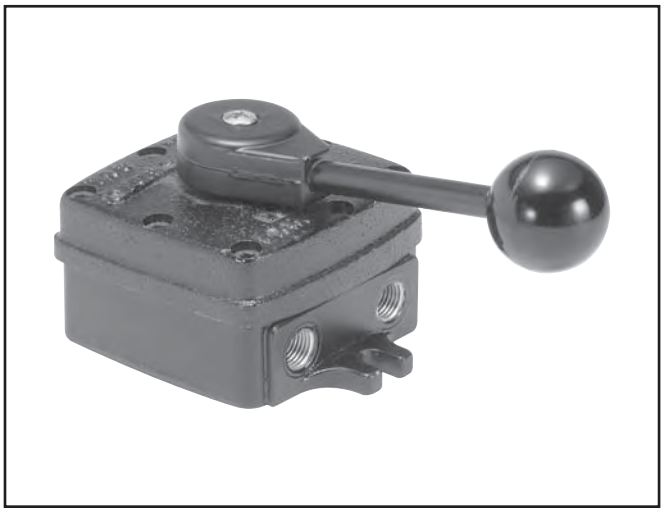


Application

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.

Flow Ratings (Cv)

Standard Side Port	Optional Bottom Port Adapter	Optional Bottom Manifold	Cv	Port Size
PL 25 **VL 25**	PLD 25 VLD 25	PLA 25 VLA 25	2.5	1/4" NPT
PL 37 **VL 37**	PLD 37 VLD 37	PLA 37 VLA 37	3.0	3/8" NPT
PL 50 **VL 50**	PLD 50 VLD 50	PLA 50 VLA 50	6.2	1/2" NPT

Optional Items and Accessories

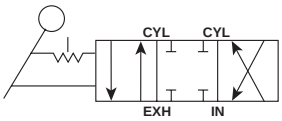
Bottom Porting for gasket mounting to customer's manifold. Four holes are drilled (see following page for dimensions) through the base into the four port chambers. Side ports are plugged. Customer provides suitable means of gasketing. Specify Series PLA or VLA.

Bottom Ported Adaptor Plate, o-ring gasketed to base (four o-rings furnished). Adaptor plate has four drilled and tapped ports. Side ports are plugged. Specify Series PLD or VLD.

Operation

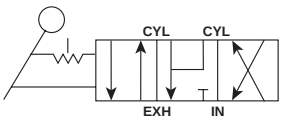
Series PL

This type has a 90° lever movement. In neutral position, inlet is closed to pressure – outlets closed to exhaust. With clockwise (CW), inlet is connected to cylinder port directly opposite. Other cylinder port is connected to exhaust. With counterclockwise (CCW), inlet is connected to cylinder port diagonally opposite. Other cylinder port is connected to exhaust. Recommended for stationary air cylinders, arbor presses, and as a throttling valve for positioning air cylinders.



Series VL

This type has a 90° lever movement. In neutral position, inlet is closed to pressure – outlets open to exhaust. With clockwise (CW), inlet is connected to cylinder port directly opposite. Other cylinder port is connected to exhaust. With counterclockwise (CCW), inlet is connected to cylinder port diagonally opposite. Other cylinder port is connected to exhaust. This valve is particularly suited for pneumatic chuck operation.



Operating Pressure

0 to 150 PSI (0 to 1035 kPa)

Operating Temperature

18°F to 200°F (-8°C to 93°C)

Lubrication

Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

Service Kit and Parts Available

Lever Assembly Service Kits:

PL25, PL25HP, PL37, PL37HP, VL25, & VL37 ..... PL2425BP

PL50, PL50HP & VL50 ..... PL2424BP

Body Gasket:

PL25, PL25HP, PL37, PL37HP, VL25, & VL37 ..... P66837

PL50, PL50HP & VL50 ..... P66829

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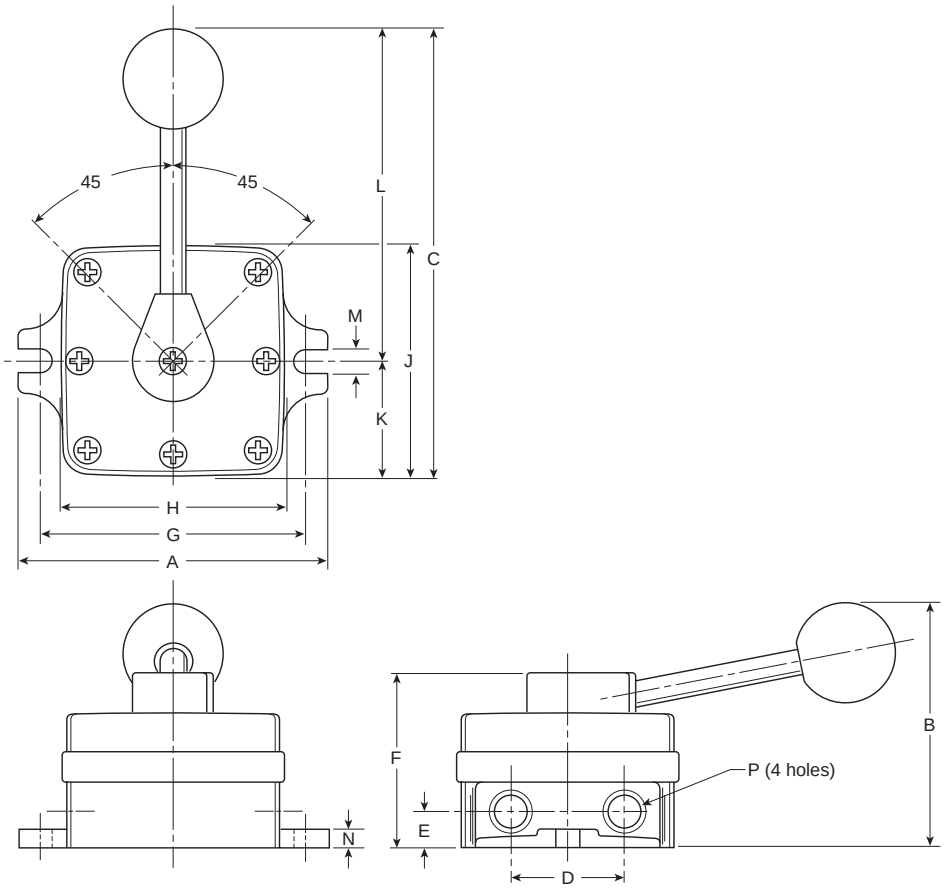
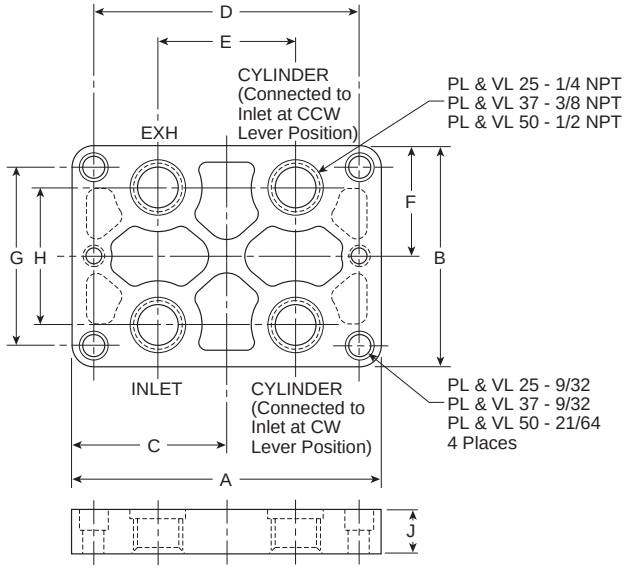


Dimensions

	PL-25 VL-25	PL-37 VL-37	PL-50 VL-50
A	4.75 (121)	4.75 (121)	5.62 (143)
B	3.81 (97)	3.81 (97)	4.44 (113)
C	6.81 (173)	6.81 (173)	8.94 (227)
D	1.69 (43)	1.69 (43)	2.12 (54)
E	.56 (14)	.56 (14)	.66 (17)
F	2.75 (70)	2.56 (65)	3.25 (83)
G	4.12 (105)	4.12 (105)	5.00 (127)
H	3.50 (89)	3.50 (89)	4.38 (111)
J	3.50 (89)	3.50 (89)	4.38 (111)
K	1.69 (43)	1.69 (43)	2.12 (54)
L	5.06 (129)	5.06 (129)	6.75 (171)
M	.34 (9)	.34 (9)	.34 (9)
N	.28 (7)	.28 (7)	.34 (9)
P	1/4 NPT	3/8 NPT	1/2 NPT



Adapter Plate for Series PLD and VLD

Dimensions

	PLD-25, PLD-37 VLD-25, VLD-37	PLD-50 VLD-50
A	4.75 (121)	5.62 (143)
B	3.38 (86)	4.25 (108)
C	2.38 (60)	2.81 (71)
D	4.12 (105)	5.00 (127)
E	2.19 (56)	2.59 (66)
F	1.69 (43)	2.12 (54)
G	2.75 (70)	3.62 (92)
H	2.06 (52)	2.81 (71)
J	.58 (15)	.70 (18)

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Features

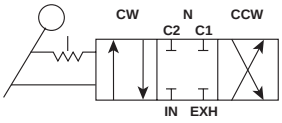
- Compact and Simple Design
- 4-Way, 3-Position
- Rotary Disc, Direct Operated Valves
- Side Porting
- Detent Action
  Smooth Lever Actuation
- General Pneumatic Applications

Flow Rating

Port Size	Cv (ANSI)	Cv (JIS)
1/4"	0.5	0.4
3/8"	1.4	2.72
1/2"	1.5	3.26

Operation

These closed center valves have a 90° lever movement. In neutral position, the inlet is closed to pressure and outlets are closed to exhaust. With clockwise (CW) rotation, inlet (IN) is connected to C2, C1 is connected to exhaust (EXH). With counter-clockwise (CCW) rotation, inlet (IN) is connected to C1, C2 is connected to exhaust (EXH). These valves are recommended for stationary air cylinders, and as throttling valves for positioning air cylinders. They are not to be used on punch presses or press brakes.



Operating Pressure

0 - 150 PSIG (0 - 10 bar)

Operating Temperature

32° - 166°F (0° - 60°C)

Lubrication

Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

Materials

Cover ..... Zinc
Body ..... Aluminum
Seals ..... Polyurethane

Service Kit & Parts Available

Disk and Seal Service Kit:

HV4200	**HVRK420001**
HV4400	**HVRK440001**

ANSI Cv vs. JIS Cv

*For Pneumatic Valve flow, the measurement **Cv** – Coefficient of Flow – is used to convey to the user how much air can flow through a given valve. Most valve manufacturers publish this information in their catalogs to assist the user in choosing the proper valve for their application. In publishing this data however, there are discrepancies in how the **Cv** is calculated, resulting in some **Cv**'s being OVERSTATED by **20 to 40**%. This can adversely affect the user's application because the valve flows LESS than the published **Cv**.*

*The reason for the large discrepancy is in the method of calculation - the ANSI (NFPA) or the JIS standard. Parker's **Cv** valve is calculated using the ANSI (NFPA)*

T3.21.3-1990 standard. The ANSI (NFPA) method is a structured test using very specific tube sizes and lengths, inlet pressures and pressure drops, and volume chambers.

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HV Model Number Index

H	V	N	42	0	0	–	8

Port Type	
BSPT "Rc"	Blank
NPT	**N**
BSPP "G"	G

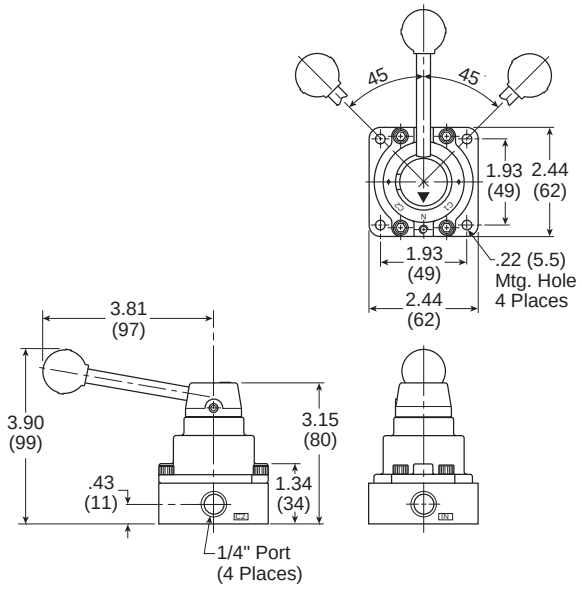
Body Type	
4-Port, 3-Position Mini	42
4-Port, 3-Position Medium	44

Valve Type	
0	Closed Center

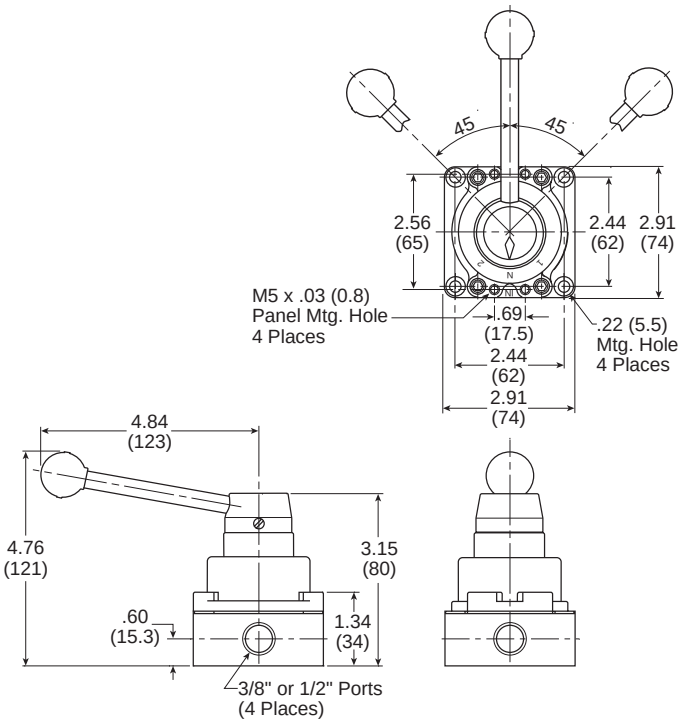
Port Option	
0	Side Port

Port Size	
8	1/4" (42 Type Only)
10	3/8" (44 Type Only)
15	1/2" (44 Type Only)

Dimensions



HVN4200-8



HVN4400-10, 15

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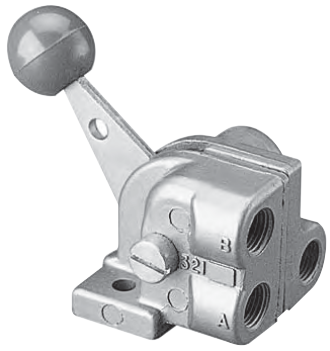
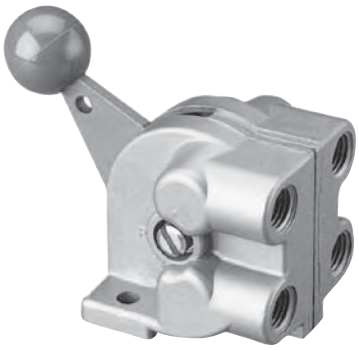


1/8" 3-Way



1/4" 4-Way

Application

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.

Operating Temperature

-40°F to 212°F (-40°C to 100°C)

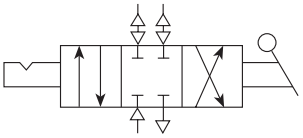
If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

Operating Pressure

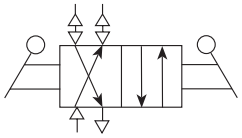
Maximum.....200 PSIG air only
Minimum.....26" Hg vacuum

Materials

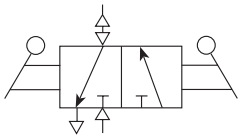
Seals ..... Buna N
Internal Components.....Brass, Stainless Steel
Body ..... Die Cast Zinc



4-Way 3-Position



4-Way 2-Position



3-Way 2-Position

Note: 3-Way exhaust passage is through an untapped hole in bottom side of valve.

Model Selection and Performance Data

Port Size	Function	Model Number	Old Number	Cv (Avg)	Service Kit*
1/8"	3-Way, 2-Position	032130599	3213H	0.54	032130899
1/8"	4-Way, 2-Position	032140299	3214H	0.54	032130899
1/4"	3-Way, 2-Position	008230109	823H	1.25	008230299
1/4"	4-Way, 3-Position	008240109	824H	1.25	008230299

* Contains asterisk items from next page.

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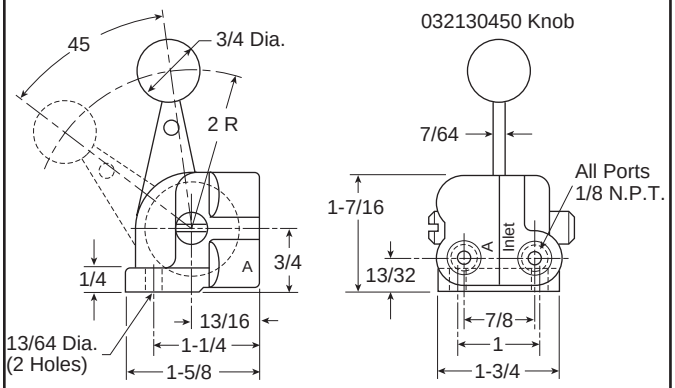
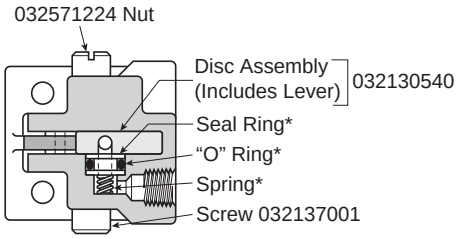
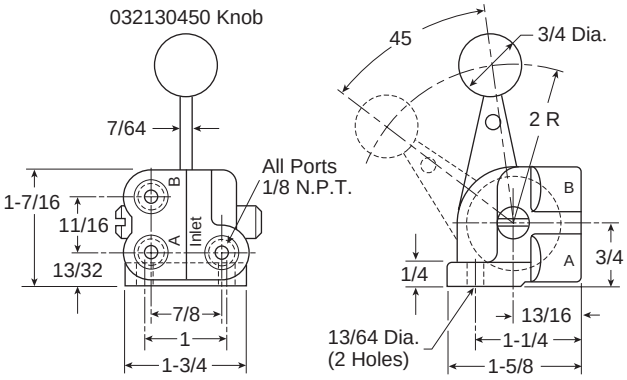
1/8" 3-Way
(Model No. 032130599)

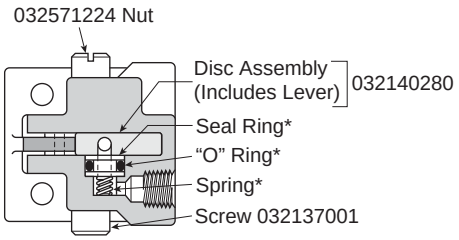




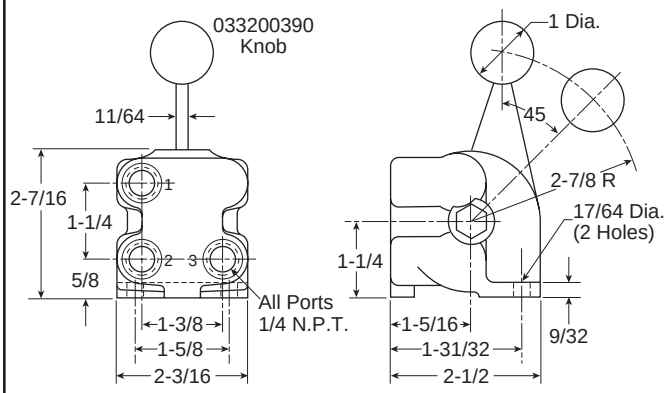
1/8" 4-Way
(Model No. 032140299)

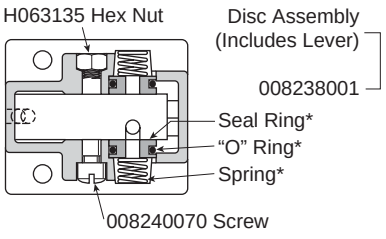


NOTE: With lever in position shown, inlet pressure is connected to port A.

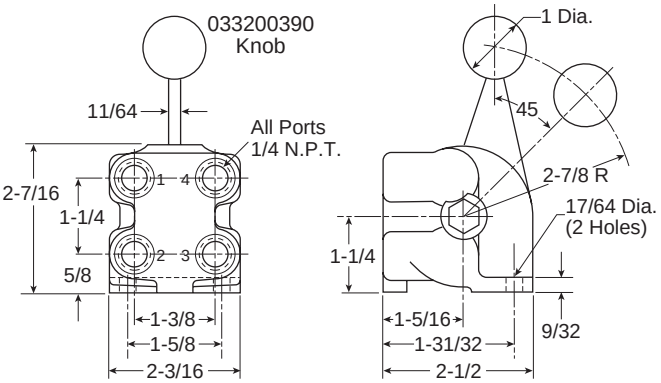


1/4" 3-Way
(Model No. 008230109)

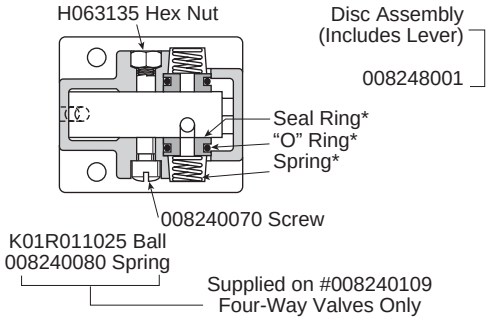




1/4" 4-Way
(Model No. 008240109)



NOTE: With lever in position shown, inlet port 3 is connected to port 4 and exhaust is through port 1.



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Application

Normally-closed poppet valve operates at the press of a button and may be installed in a pipe line or used as a portable blow gun attached to a length of hose.

⚠ ***CAUTION:***
Install guards on all hand operated valves.
Accidental operation can cause personal injury.

Operating Temperatures:

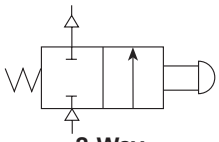
-20°F to 180°F (-28°C to 82°C)

Operating Pressures:

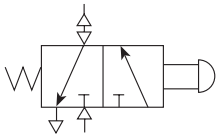
Maximum..... 150 PSIG air only
Minimum.....0 PSIG

Materials:

Seals ..... Buna N
Internal Components..... Brass, Stainless and Plated Steel
Body ..... Brass

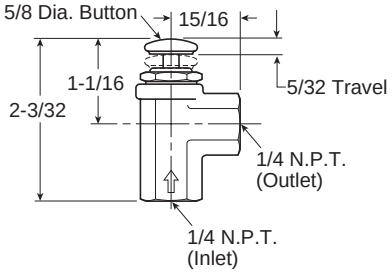


2-Way

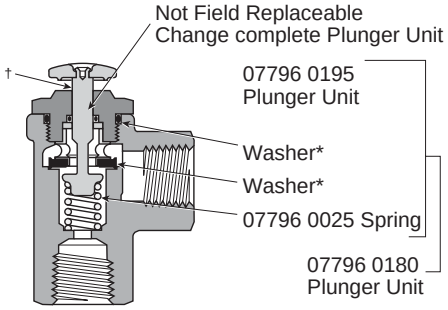


3-Way

Dimensions



Replacement Parts



† 07796 0199 2-Way valve shown.
Plunger unit for 08187 0199 3-Way valve shown on page V9.

* Included in service kits listed below.

Model Selection and Performance Data

Port Size	Function	Model Number	Old Number	Cv (Avg)	Service Kit
1/4"	2-Way	07796 0199	7796SP1	0.94	07796 0105
1/4"	3-Way	08187 0129	8187	0.94	07796 0105

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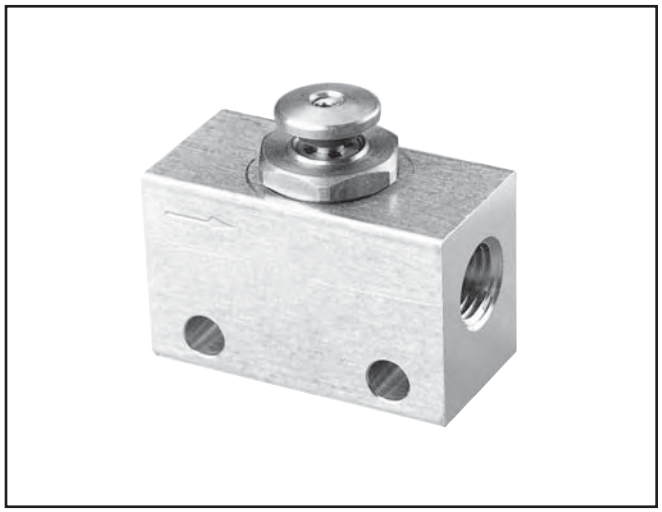


Application

Inline, button-operated, normally closed poppet valve has mounting holes for single or gang mounting. Actuation by hand, cam or mechanical fingers.
Valves should be used with filtered and lubricated air.

⚠ ***CAUTION:***
Install guards on all hand operated valves.
Accidental operation can cause personal injury.

Operating Temperatures:

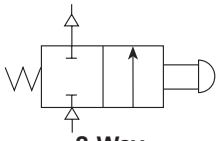
-20°F to 180°F (-28°C to 82°C)

Operating Pressures:

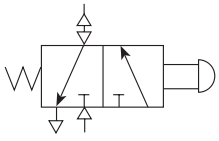
Maximum.....150 PSIG air only
Minimum.....0 PSIG

Materials:

Seals ..... Buna N
Internal Components..... Brass, Stainless and Plated Steel
Body ..... Aluminum bar stock

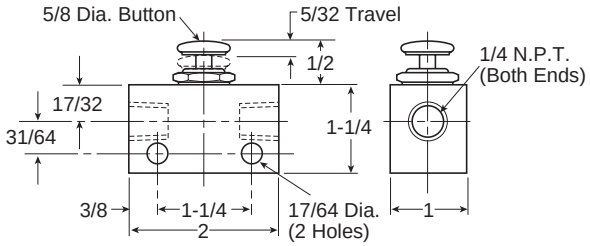


2-Way

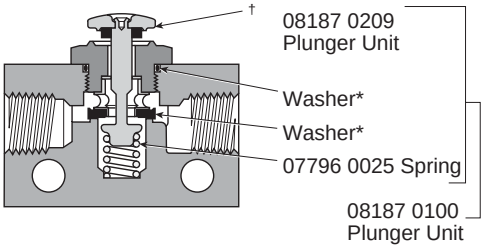


3-Way

Dimensions



Replacement Parts



† 08187 0139 3-Way valve shown.
Plunger unit for 07796 0319 2-Way valve shown on page V8.
* Included in service kits listed below.

Model Selection and Performance Data

Port Size	Function	Model Number	Old Number	Cv (Avg)	Service Kit
1/4"	2-Way	07796 0319	7796SP5	0.94	07796 0105
1/4"	3-Way	08187 0139	8187SP1	0.94	07796 0105

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Application

This 2-Way normally closed bleeder valve is an accessory that may be used with any double pilot-operated valve (bleed type). It provides manual or cam-operated control. A 1/4" pipe thread fits either the pilot valve port or the feeder airline. Opposite end has standard 1/2-20 thread for easy mounting on machine or panel. Valves should be used with filtered and lubricated air.

Operating Temperatures:

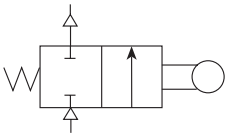
-40°F to 450°F (-40°C to 232°C)

Operating Pressures:

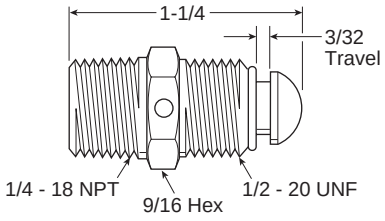
Maximum..... 150 PSIG air only
Minimum..... 0 PSIG

Materials:

Seals ..... Fluorocarbon
Internal Components..... Brass, Stainless Steel
Body ..... Brass



Dimensions



Model Selection

Pipe Size	Function	Model Number
1/4"	2-Way	31513 9000

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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.

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.

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics

Offer of Sale

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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