Warning, Offer of Sale

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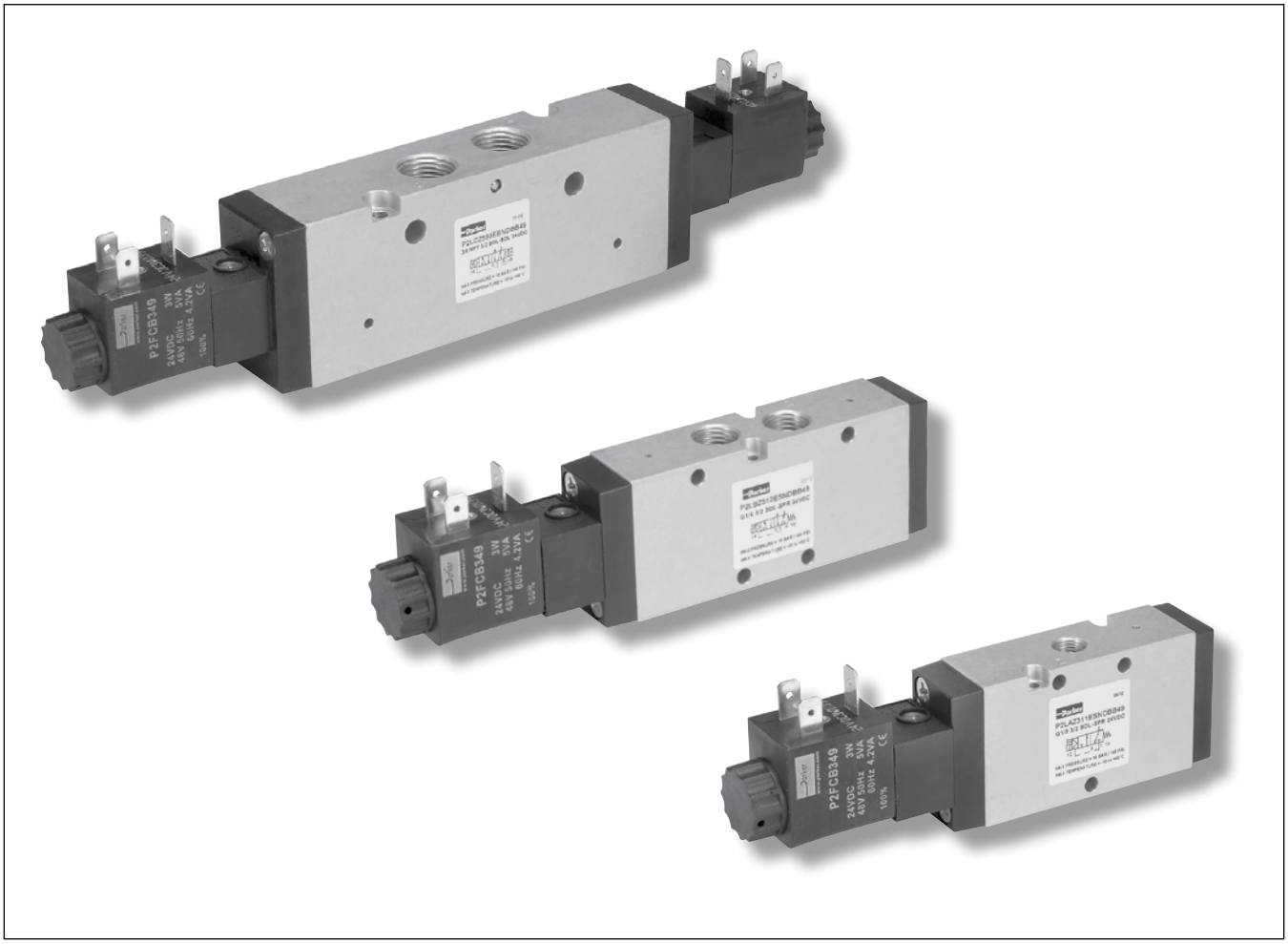
Viking Lite Inline Series

Air Control Valves

P2LAZ – 1/8"
P2LBZ – 1/4"
P2LCZ – 3/8"

Section D
www.parker.com/pneu/vikingx



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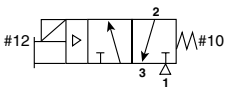
Single solenoid

3-Way, 2-Position NC (NNP)



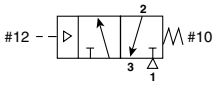
Normally Closed:

De-energized position – Solenoid #12 de-energized. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Energized position – Solenoid #12 energized. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Single remote pilot

3-Way, 2-Position NC (NNP)



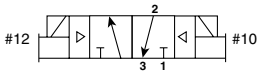
Normally Closed:

Normal position – Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Operated position – Maintained air signal at port 12. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Double solenoid

3-Way, 2-Position

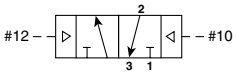


Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Solenoid operator #10 energized last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Double solenoid

3-Way, 2-Position

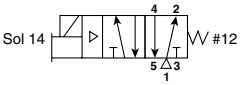


Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Momentary air signal at port 10 last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Single solenoid

Single pressure at inlet port 1:

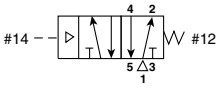


De-energized position – Solenoid operator #14 de-energized. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Energized position – Solenoid operator #14 energized. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Single remote pilot

Single pressure at inlet port 1:

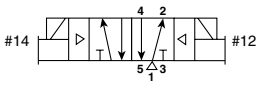


Normal position – Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Operated position – Maintained air signal at port 14. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Double solenoid

Single pressure at inlet port 1:

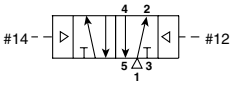


Solenoid operator #14 energized last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Double remote pilot

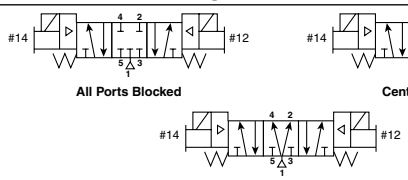
Single pressure at inlet port 1:



Momentary air signal at port 14 last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Double solenoid 3-position



With #12 operator energized – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

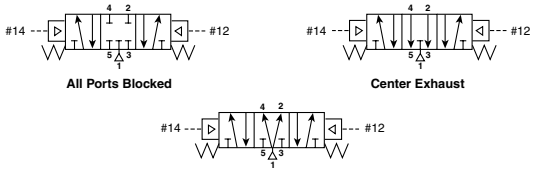
With #14 operator energized – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

All Ports Blocked
All ports blocked in the center position.

Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Double remote pilot 3-position



With #12 operator signaled – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With #14 operator signaled – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

All Ports Blocked
All ports blocked in the center position.

Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

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Specifications

P2LAZ P2LAZ: 0.6 Cv
P2LBZ P2LBZ: 1.5 Cv
P2LCZ P2LCZ: 2.5 Cv

Materials of Construction

- Valve Body: Anodized Aluminum
- Spool: Aluminum
- End Caps: Anodized Aluminum
- Piston: Acetal Plastic / Anodized Aluminum
- End Cover Sealings: Nitrile Rubber
- End Cover Screws: Stainless Steel
- Springs: Stainless Steel
- Spool Seals: Nitrile

Operating Temperature

- Normal: 14°F to 122°F (-10°C to 50°C)

Operating Pressure

- Normal: Vacuum to 145 PSIG (Vacuum to 10 bar)
- Minimum: Single solenoid - spring return 43.5 PSIG (3.0 bar)
  Double solenoid - 2-position 22 PSIG (1.5 bar)
  Double solenoid - 3-position 43.5 PSIG PSIG (3.0 bar)

Ports

P2LAZ P2LAX: 1/8" NPT & BSPP
P2LBZ P2LBX: 1/4" NPT & BSPP
P2LCZ P2LCX: 3/8" NPT & BSPP

Compliance / Approval

- IP65 Rated, RoHS, CE

Solenoids

- 2.5 Watts
  – 22mm, 3-Pin (DIN 43650),
- 24VDC to 120VAC

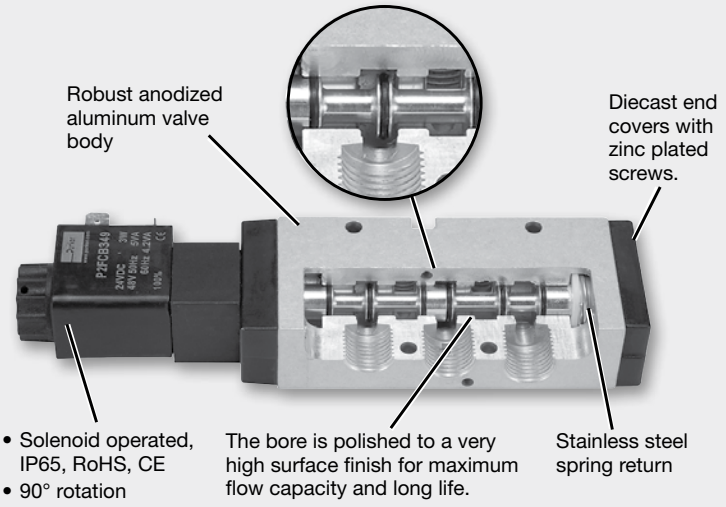
Mounting

- Inline
- IEM Aluminum Bar

WCS

- Maximum Performance
  – Low friction - fast response - less wear
- Long Cycle Life
  – Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore
- Non-Lube Service
  – No lubrication required for continuous valve shifting
- Bi-Directional Spool Seals
  – Common spool used for any pressure

WCS
***W**ear **C**ompensation **S**ystem*



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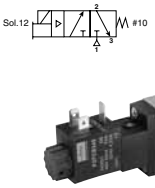
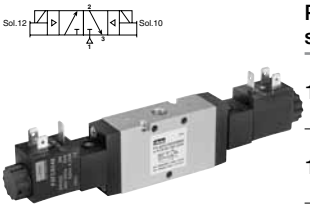
3/2 - 2 Position Single Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	15 / 35	0.35 (0.16)	24VDC	**P2LAZ391ESNDBB49**	P2LAZ311ESNDBB49
				120VAC	**P2LAZ391ESNDBB53**	P2LAZ311ESNDBB53
1/4	1.5	18 / 45	0.35 (0.16)	24VDC	**P2LBZ392ESNDBB49**	P2LBZ312ESNDBB49
				120VAC	**P2LBZ392ESNDBB53**	P2LBZ312ESNDBB53
3/8	2.5	27 / 45	0.77 (0.35)	24VDC	**P2LCZ393ESNDBB49**	P2LCZ313ESNDBB49
				120VAC	**P2LCZ393ESNDBB53**	P2LCZ313ESNDBB53

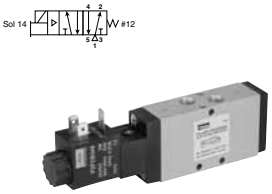
3/2 - 2 Position Double Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	10 / 10	0.40 (0.18)	24VDC	**P2LAZ391EENDBB49**	P2LAZ311EENDBB49
				120VAC	**P2LAZ391EENDBB53**	P2LAZ311EENDBB53
1/4	1.5	12 / 12	0.40 (0.18)	24VDC	**P2LBZ392EENDBB49**	P2LBZ312EENDBB49
				120VAC	**P2LBZ392EENDBB53**	P2LBZ312EENDBB53
3/8	2.5	17 / 17	0.80 (0.36)	24VDC	**P2LCZ393EENDBB49**	P2LCZ313EENDBB49
				120VAC	**P2LCZ393EENDBB53**	P2LCZ313EENDBB53

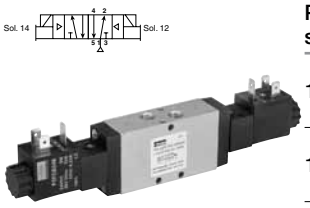
5/2 - 2 Position Single Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	15 / 35	.037 (0.17)	24VDC	**P2LAZ591ESNDBB49**	P2LAZ511ESNDBB49
				120VAC	**P2LAZ591ESNDBB53**	P2LAZ511ESNDBB53
1/4	1.5	18 / 45	0.44 (0.20)	24VDC	**P2LBZ592ESNDBB49**	P2LBZ512ESNDBB49
				120VAC	**P2LBZ592ESNDBB53**	P2LBZ512ESNDBB53
3/8	2.5	27 / 45	0.95 (0.43)	24VDC	**P2LCZ593ESNDBB49**	P2LCZ513ESNDBB49
				120VAC	**P2LCZ593ESNDBB53**	P2LCZ513ESNDBB53

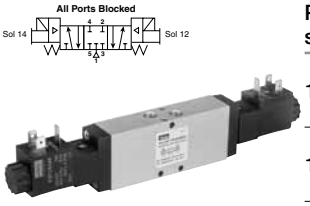
5/2 - 2 Position Double Solenoid



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	10 / 10	.042 (0.19)	24VDC	**P2LAZ591EENDBB49**	P2LAZ511EENDBB49
				120VAC	**P2LAZ591EENDBB53**	P2LAZ511EENDBB53
1/4	1.5	12 / 12	0.46 (0.21)	24VDC	**P2LBZ592EENDBB49**	P2LBZ512EENDBB49
				120VAC	**P2LBZ592EENDBB53**	P2LBZ512EENDBB53
3/8	2.5	17 / 17	0.97 (0.44)	24VDC	**P2LCZ593EENDBB49**	P2LCZ513EENDBB49
				120VAC	**P2LCZ593EENDBB53**	P2LCZ513EENDBB53

5/3 - 3 Position, All Ports Blocked



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	**P2LAZ691EENDBB49**	P2LAZ611EENDBB49
				120VAC	**P2LAZ691EENDBB53**	P2LAZ611EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	**P2LBZ692EENDBB49**	P2LBZ612EENDBB49
				120VAC	**P2LBZ692EENDBB53**	P2LBZ612EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	**P2LCZ693EENDBB49**	P2LCZ613EENDBB49
				120VAC	**P2LCZ693EENDBB53**	P2LCZ613EENDBB53

Notes: Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

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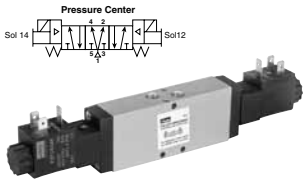
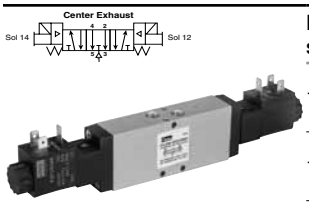
5/3 - 3 Position, Pressure Center



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	**P2LAZ791EENDBB49**	P2LAZ711EENDBB49
				120VAC	**P2LAZ791EENDBB53**	P2LAZ711EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	**P2LBZ792EENDBB49**	P2LBZ712EENDBB49
				120VAC	**P2LBZ792EENDBB53**	P2LBZ712EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	**P2LCZ793EENDBB49**	P2LCZ713EENDBB49
				120VAC	**P2LCZ793EENDCB53**	P2LCZ713EENDBB53

5/3 - 3 Position, Center Exhaust



P2LAZ Shown

Port size	Cv	Response time (msec)	Weight lb (kg)	Voltage	Part number (NPT)	Part number (BSPP)
1/8	0.6	18 / 40	0.57 (0.26)	24VDC	**P2LAZ891EENDBB49**	P2LAZ811EENDBB49
				120VAC	**P2LAZ891EENDBB53**	P2LAZ811EENDBB53
1/4	1.5	22 / 55	0.62 (0.28)	24VDC	**P2LBZ892EENDBB49**	P2LBZ812EENDBB49
				120VAC	**P2LBZ892EENDBB53**	P2LBZ812EENDBB53
3/8	2.5	30 / 90	1.32 (0.60)	24VDC	**P2LCZ893EENDBB49**	P2LCZ813EENDBB49
				120VAC	**P2LCZ893EENDBB53**	P2LCZ813EENDBB53

Notes: Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Single & Double Solenoid Operated Valves

P2L A Z 5 91 E S N D C B 49

Valve size

1/8"	A
1/4"	B
3/8"	C

Series

Viking Lite	Z

Valve type / function

Internal pilot supply to solenoid	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8

Main port thread

G1/8 (P2LA)	11
G1/4 (P2LB)	12
G3/8 (P2LC)	13
1/8" NPT (P2LA)	91
1/4" NPT (P2LB)	92
3/8" NPT (P2LC)	93

12 End operator

E	Double solenoid operated valve
S*	Single solenoid spring return

* Not available with 3-position valves.

Valve type

N	14°F to 122°F (-10°C to 50°C)

Solenoid pilot type

D	Pilot exhaust vented

Overrides

C	Extended - locking
B	Flush - non-locking

Enclosures / lead length

B	22mm rectangular 3-pin – type B industrial (male only)
N	Valve less coil

Voltage / frequency

49	24VDC
53	120VAC
Blank	Valve less coil

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IEM Bar Manifold, Inline Valve Only*

Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LAZ / P2LBZ	3-way	2	0.84 (0.38)	**91213202SXZN**	91213202SXZ
P2LAZ / P2LBZ	3-way	4	1.41 (0.64)	**91213204SXZN**	91213204SXZ
P2LAZ / P2LBZ	3-way	6	1.96 (0.89)	**91213206SXZN**	91213206SXZ
P2LAZ / P2LBZ	3-way	8	2.54 (1.15)	**91213208SXZN**	91213208SXZ
P2LAZ / P2LBZ	3-way	10	3.09 (1.40)	**91213210SXZN**	91213210SXZ

Kits include: Manifold, valve hold down bolts, gaskets.

Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LAZ	4-way	2	0.68 (0.31)	**9121658068N**	9121658068
P2LAZ	4-way	4	1.06 (0.48)	**9121658075N**	9121658075
P2LAZ	4-way	6	1.39 (0.63)	**9121658076N**	9121658076
P2LAZ	4-way	8	1.76 (0.80)	**9121658077N**	9121658077
P2LAZ	4-way	10	2.16 (0.98)	**9121658078N**	9121658078

Kits include: Manifold, valve hold down bolts, gaskets.

Valve series	Valve function	# of Stations	Weight lb (kg)	Manifold only (NPT)	Manifold only (BSPP)
P2LBZ	4-way	2	1.53 (0.69)	**9121594805XN**	9121594805X
P2LBZ	4-way	4	2.49 (1.13)	**9121594806XN**	9121594806X
P2LBZ	4-way	6	3.44 (1.56)	**9121594807XN**	9121594807X
P2LBZ	4-way	8	4.41 (2.00)	**9121594808XN**	9121594808X
P2LBZ	4-way	10	5.40 (2.45)	**9121594812XN**	9121594812X

Kits include: Manifold, valve hold down bolts, gaskets.
* For odd number of stations, consider Viking Xtreme bar manifold.

IEM Bar Manifold, Inline Valve Only

Valve series	Valve function	# of Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LCZ	4-way	Use Viking Xtreme IEM bar manifold		

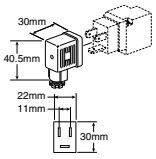
Note: P2LCZ 3-way has no IEM manifold

Manifold Accessories / Parts

Valve series	Description	Weight lb (kg)	Kit number
P2LAZ / P2LBZ *	3-way: Blanking kit with mounting screws (2)	0.22 (0.10)	**912132BPSXZ**
P2LAZ *	4-way: Blanking kit with mounting screws (2)	0.11 (0.05)	**9121658063**
P2LBZ *	4-way: Blanking kit with mounting screws (2)	0.04 (0.02)	**9121594809X**

***Note:** O-ring for blanking kit included with manifold. For replacement o-rings or fastener bolts, use Viking Xtreme Kits.

22mm Rectangular 3-Pin – Type B Industrial
(Use with Enclosure "B")



Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	**PS2429BP**
Light – 24VDC	PS2430J79BP*	**PS243079BP**
Light – 120V/60Hz	PS2430J83BP*	**PS243083BP**

* LED with surge suppression.
Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.
Engineering data:
conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm

Most popular.

Valve Less Coil

Remove the last 3 digits of the part number of the full valve and add "N" at the end for valve less coil.

Part number example :
P2LBZ592ESNDBBB49 valve with 24VDC solenoid
P2LBZ592ESNDBN valve less coil

Replacement Solenoid Coil

Description	Part number
24VDC coil kit	**P2FCB449**
110VAC coil kit	**P2FCB453**

Replacement Solenoid Nut

Description	Part number
Solenoid diffuser nut	**PS1556**

Description	Part number
Solenoid vented nut	**PS2892P**

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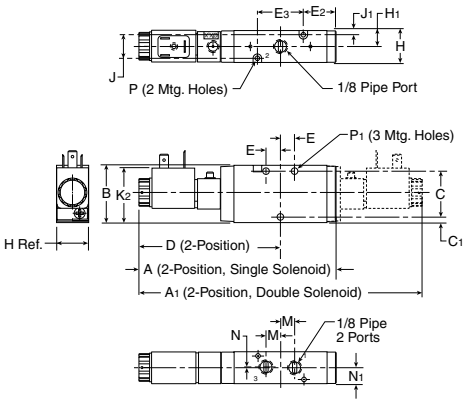
P2LAZ 3/2 Single & Double Operators – Solenoid

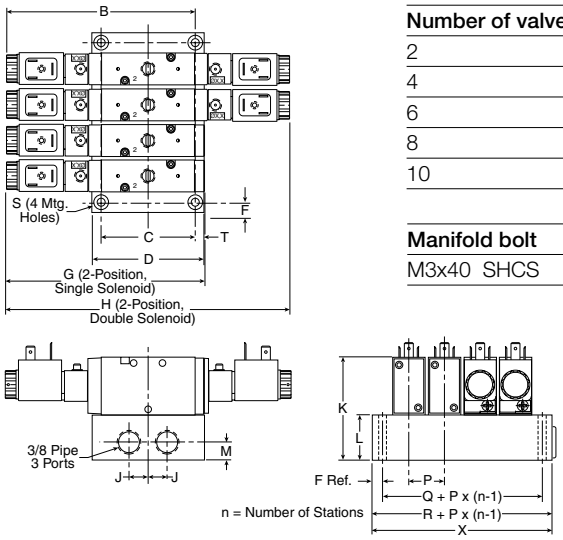


P2LAZ 3/2 (solenoid)

A	A1	B	C	C1
5.35	7.68	1.57	1.26	.16
(136)	(195)	(40)	(32)	(4)
D	**E**	**E2**	**E3**	**H**
3.84	.39	.91	1.26	.87
(97.5)	(10)	(23)	(32)	(22)
H1	**J**	**J1**	**K2**	**M**
.43	.65	.11	1.50	.39
(11)	(16.5)	(2.75)	(38)	(10)
N	**N1**	**P**	**P1**	
.02	.43	Ø .12	Ø .17	
(.5)	(11)	Ø (3.1)	Ø (4.3)	

Inches (mm)

P2LAZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	2.91 (74)
4	4.80 (122)
6	6.69 (170)
8	8.58 (218)
10	10.47 (266)

Inches (mm)

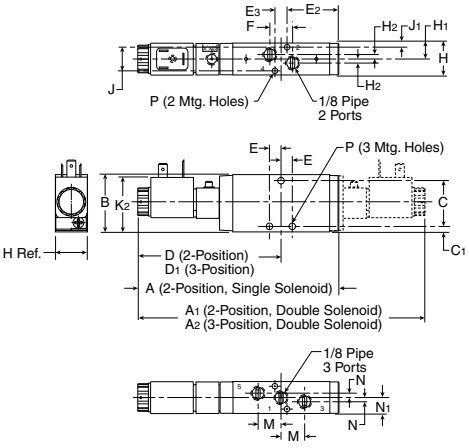
Manifold bolt	Torque value
M3x40 SHCS	4 in.lb (0.45 Nm)

P2LAZ 3/2
IEM Aluminum bar manifold

B	C	D	F	G
5.06	2.44	2.99	.28	5.35
(128.5)	(62)	(76)	(7)	(136)
H	**J**	**K**	**L**	**M**
7.68	.51	2.78	1.20	.47
(195)	(13)	(70.5)	(30.5)	(12)
P	**Q**	**R**	**S**	**T**
.94	1.42	1.97	Ø .22	.88
(24)	(36)	(50)	Ø (5.5)	(7)

Inches (mm)

P2LAZ 5/2 & 5/3 Single & Double Operators – Solenoid



P2LAZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
5.47	7.76	8.70	1.57	1.30
(139)	(197)	(221)	(40)	(33)
C1	**D**	**D1**	**E**	**E2**
.14	3.88	4.35	.31	1.86
(3.5)	(98.5)	(110.5)	(8)	(47.3)
E3	**F**	**H**	**H1**	**H2**
.33	.63	.87	.43	.12
(8.5)	(16)	(22)	(11)	(3)
J	**J1**	**K2**	**M**	**N**
.63	.12	1.50	.63	.12
(16)	(3)	(38)	(16)	(3)
N1	**P**			
.43	Ø .16			
(11)	Ø (4.1)			

Inches (mm)

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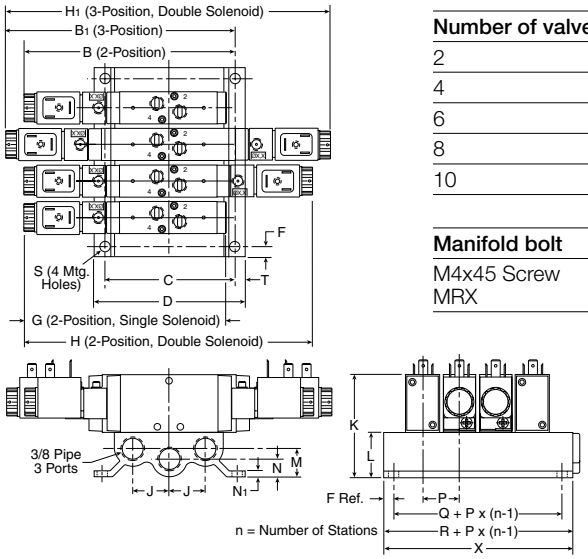
P2LAZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	3.07 (78)
4	4.96 (126)
6	6.85 (174)
8	8.74 (222)
10	10.63 (270)

Inches (mm)

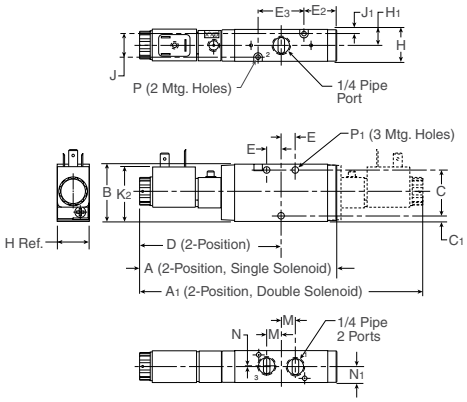
Manifold bolt	Torque value
M4x45 Screw MRX	9 in.lb (0.75 Nm)

P2LAZ 5/2 & 5/3
IEM Aluminum bar manifold

B	B1	C	D	F
5.10 (149.5)	6.36 (161.5)	3.46 (88)	4.02 (102)	.28 (7)
G	**H**	**H1**	**J**	**K**
5.47 (139)	7.76 (197)	8.70 (221)	.96 (24.5)	2.76 (70)
L	**M**	**N**	**N1**	**P**
1.18 (30)	.75 (19)	.47 (12)	.16 (4)	.94 (24)
Q	**R**	**S**	**T**	
1.57 (40)	2.13 (54)	Ø .28 Ø (7)	.28 (7)	

Inches (mm)

P2LBZ 3/2 Single & Double Operators – Solenoid

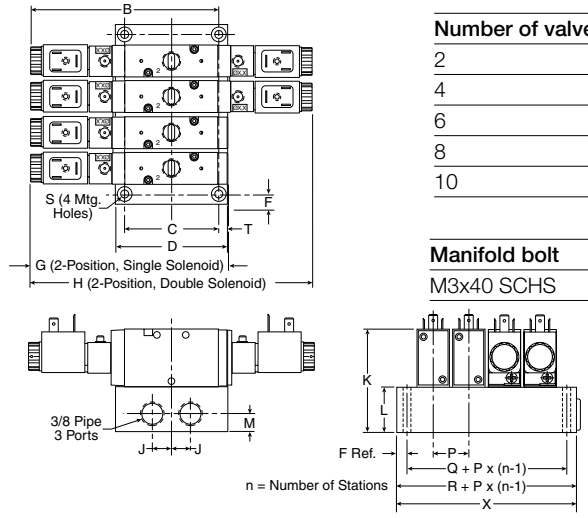


P2LBZ 3/2 (solenoid)

A	A1	B	C	C1
5.35 (136)	7.68 (195)	1.57 (40)	1.26 (32)	.16 (4)
D	**E**	**E2**	**E3**	**H**
3.84 (97.5)	.39 (10)	.91 (23)	1.26 (32)	.87 (22)
H1	**J**	**J1**	**K2**	**M**
.43 (11)	.65 (16.5)	.11 (2.75)	1.50 (38)	.39 (10)
N	**N1**	**P**	**P1**	
.02 (.5)	.43 (11)	Ø .12 Ø (3.1)	Ø .17 Ø (4.3)	

Inches (mm)

P2LBZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	2.91 (74)
4	4.80 (122)
6	6.69 (170)
8	8.58 (218)
10	10.47 (266)

Inches (mm)

Manifold bolt	Torque value
M3x40 SCHS	4 in.lb (0.45 Nm)

P2LBZ 3/2
IEM Aluminum bar manifold

B	C	D	F	G
5.06 (128.5)	2.44 (62)	2.99 (76)	.28 (7)	5.35 (136)
H	**J**	**K**	**L**	**M**
7.68 (195)	.51 (13)	2.78 (70.5)	1.20 (30.5)	.47 (12)
P	**Q**	**R**	**S**	**T**
.94 (24)	1.42 (36)	1.97 (50)	Ø .22 Ø (5.5)	.88 (7)

Inches (mm)

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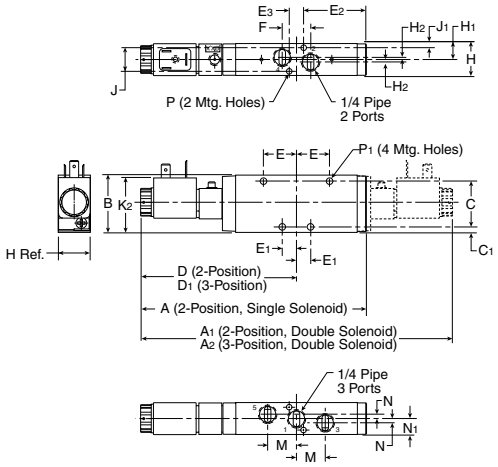
P2LBZ 5/2 & 5/3 Single & Double Operators – Solenoid

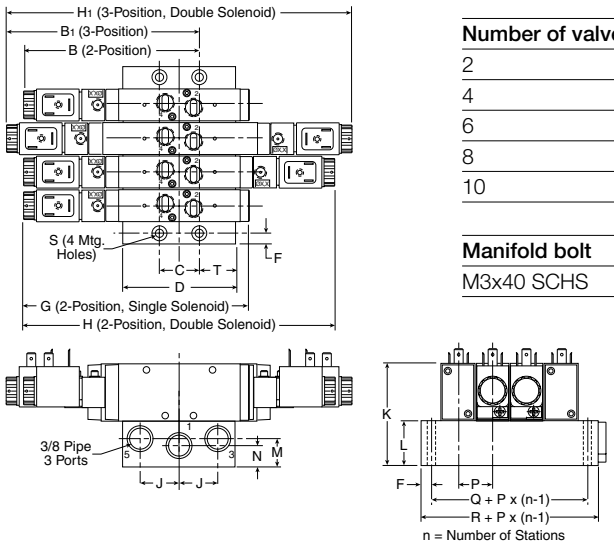


P2LBZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
6.14 (156)	8.46 (215)	9.29 (236)	1.57 (40)	1.26 (32)
C1	**D**	**D1**	**E**	**E1**
.16 (4)	4.23 (107.5)	4.65 (118)	.91 (23)	.39 (10)
E2	**E3**	**F**	**H**	**H1**
1.14 (29)	.39 (10)	.79 (20)	.87 (22)	.43 (11)
H2	**J**	**J1**	**K2**	**M**
.06 (1.5)	.65 (16.5)	.11 (2.8)	1.50 (38)	.79 (20)
N	**N1**	**P**	**P1**	
.08 (2)	.43 (11)	Ø .12 (Ø 3.1)	Ø .17 (Ø 4.3)	

Inches (mm)

P2LBZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	2.91 (74)
4	4.80 (122)
6	6.69 (170)
8	8.58 (218)
10	10.47 (266)

Inches (mm)

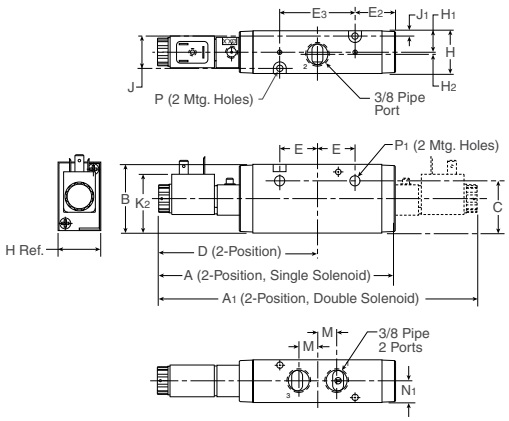
Manifold bolt	Torque value
M3x40 SCHS	9 in.lb (0.75 Nm)

P2LBZ 5/2 & 5/3
IEM Aluminum bar manifold

B	B1	C	D	F
4.43 (112.5)	4.84 (123)	1.04 (26.5)	2.99 (76)	.28 (7)
G	**H**	**H1**	**J**	**K**
6.14 (156)	8.46 (215)	9.29 (236)	1.02 (26)	2.781 (70.5)
L	**M**	**N**	**P**	**Q**
1.20 (30.5)	.75 (19)	.57 (14.5)	.94 (24)	1.57 (40)
R	**S**	**T**		
1.97 (50)	Ø .22 (Ø 5.5)	.97 (25)		

Inches (mm)

P2LCZ 3/2 Single & Double Operators – Solenoid



P2LCZ 3/2 (solenoid)

A	A1	B	C	D
6.50 (165)	8.66 (220)	1.89 (48)	1.46 (37)	4.33 (110)
E	**E2**	**E3**	**H**	**H1**
1.04 (26.5)	1.10 (28)	2.09 (53)	1.18 (30)	.59 (15)
H2	**J**	**J1**	**K2**	**M**
.06 (1.55)	.91 (23)	.14 (3.5)	1.50 (38)	.53 (13.5)
N1	**P**	**P1**		
.59 (15)	Ø .17 (Ø 4.4)	Ø .27 (Ø 6.9)		

Inches (mm)

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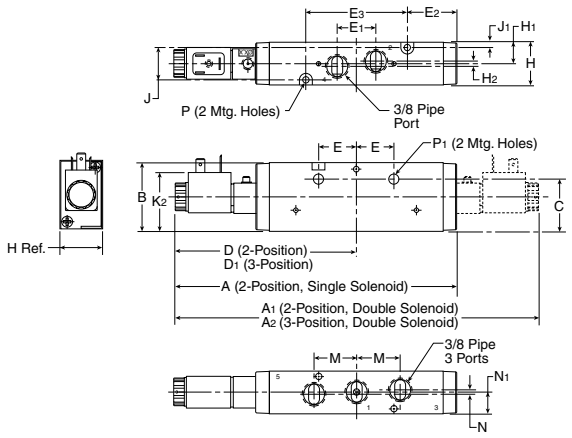
P2LCZ 5/2 & 5/3 Single & Double Operators – Solenoid

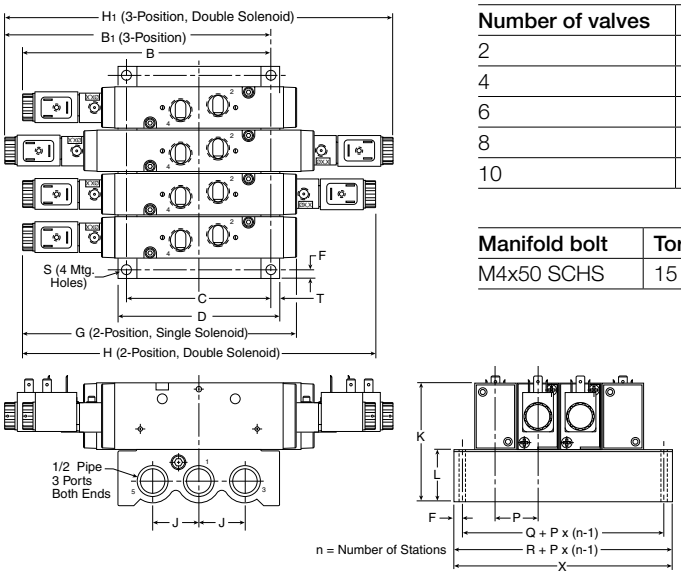


P2LBZ 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
7.68 (195)	9.88 (251)	10.70 (272)	1.89 (48)	1.46 (37)
D	**D1**	**E**	**E1**	**E2**
4.94 (125.5)	5.35 (136)	1.04 (26.5)	1.06 (27)	1.71 (43.5)
E3	**H**	**H1**	**H2**	**J**
2.80 (71)	1.18 (30)	.59 (15)	.12 (.3)	.91 (23)
J1	**K2**	**M**	**N**	**N1**
.14 (3.5)	1.50 (38)	1.18 (30)	.08 (2)	.59 (15)
P	**P1**			
Ø .17 (Ø 4.4)	Ø .27 (Ø 6.9)			

Inches (mm)

P2LCZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



Number of valves	X
2	3.29 (84)
4	5.96 (152)
6	8.44 (215)
8	10.93 (278)
10	13.41 (341)

Inches (mm)

Manifold bolt	Torque value
M4x50 SCHS	15 in.lb (2.0 Nm)

P2LCZ 5/2 & 5/3
IEM Aluminum bar manifold

C	D	F	G	H
3.97 (101)	4.41 (112)	.24 (6)	7.68 (195)	9.88 (251)
H1	**J**	**K**	**L**	**P**
10.70 (272)	1.26 (32)	3.43 (87)	1.54 (39)	1.24 (31.5)
Q	**R**	**S**	**T**	
1.77 (45)	2.24 (57)	Ø .26 (Ø 6.5)	.24 (6)	

Inches (mm)

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VIKING XTREME

Air Control Valves

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

Section D

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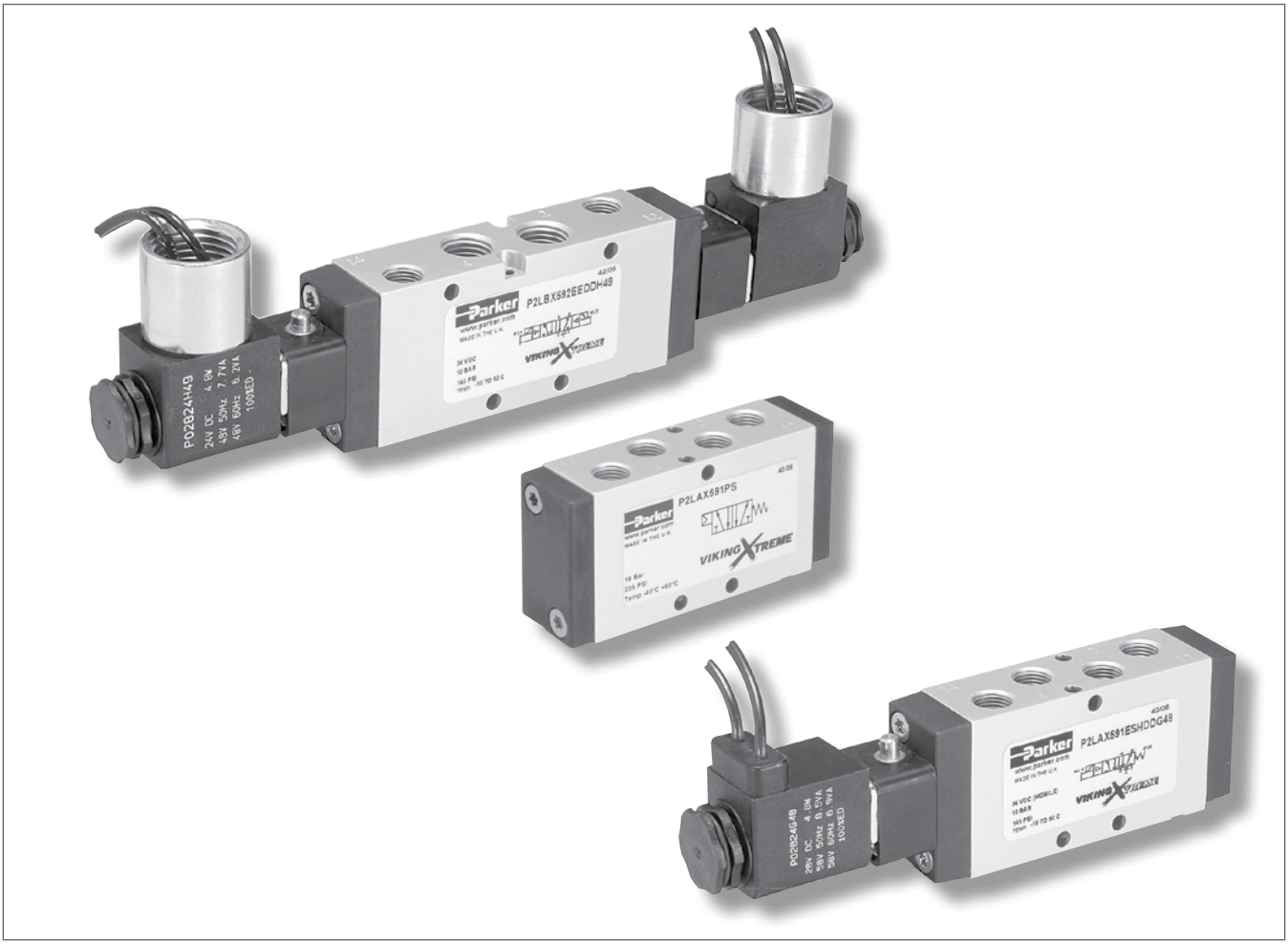

BOLD ITEMS ARE MOST POPULAR.

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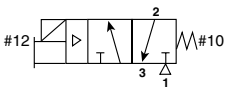
Single solenoid

3-Way, 2-Position NC (NNP)



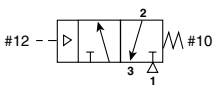
Normally Closed:

De-energized position – Solenoid #12 de-energized. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Energized position – Solenoid #12 energized. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Single remote pilot

3-Way, 2-Position NC (NNP)



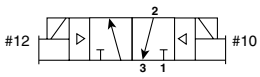
Normally Closed:

Normal position – Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Operated position – Maintained air signal at port 12. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Double solenoid

3-Way, 2-Position

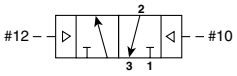


Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Solenoid operator #10 energized last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Double solenoid

3-Way, 2-Position

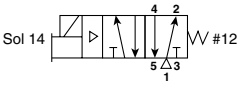


Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Momentary air signal at port 10 last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Single solenoid

Single pressure at inlet port 1:

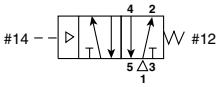


De-energized position – Solenoid operator #14 de-energized. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Energized position – Solenoid operator #14 energized. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Single remote pilot

Single pressure at inlet port 1:

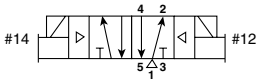


Normal position – Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Operated position – Maintained air signal at port 14. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Double solenoid

Single pressure at inlet port 1:

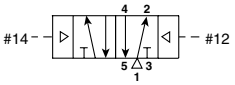


Solenoid operator #14 energized last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Double remote pilot

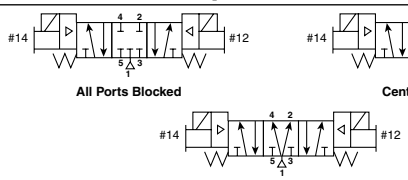
Single pressure at inlet port 1:



Momentary air signal at port 14 last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Double solenoid 3-position



With #12 operator energized – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

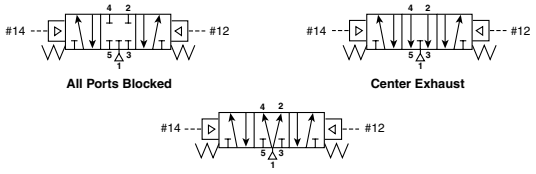
With #14 operator energized – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

All Ports Blocked
All ports blocked in the center position.

Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Double remote pilot 3-position



With #12 operator signaled – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With #14 operator signaled – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

All Ports Blocked
All ports blocked in the center position.

Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

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Specifications

P2LAX P2LAX: 0.7 Cv
P2LBX P2LBX: 1.3 Cv
P2LCX P2LCX: 2.5 Cv
P2LDX P2LDX: 2.7 Cv

Materials of Construction

- Valve Body: Anodized Aluminum
- Spool: Aluminum & Nitrile Rubber
- End Caps: Anodized Aluminum
- Coils: Thermoplastic
- Fasteners: Stainless Steel

Operating Temperature

- Normal: 14°F to 122°F (-10°C to 50°C)
- Xtreme: -40°F to 140°F (-40°C to 60°C)

Operating Pressure XTREME

- Normal: Vacuum to 145 PSIG (Vacuum to 10 bar)
- Xtreme:
  (P2LAX & P2LBX) Vacuum to 232 PSIG (Vacuum to 16 bar)
  (P2LCX & P2LDX) Vacuum to 174 PSIG (Vacuum to 12 bar)

Ports XTREME

P2LAX P2LAX: 1/8" NPT & BSPP
P2LBX P2LBX: 1/4" NPT & BSPP
P2LCX P2LCX: 3/8" NPT & BSPP
P2LDX P2LDX: 1/2" NPT & BSPP

Compliance / Approval

- IP65 Rated
- CSA Approved to 145 PSIG (10 bar)
- ATEX Option Available

Solenoids

- 2.5 to 7.3 Watt – Conduit, Grommet, 22mm & 30mm 3-Pin (DIN 43650), Hazardous Duty, Intrinsically Safe
- 12VDC to 240VAC

Mounting

- Inline
- IEM Aluminum Bar

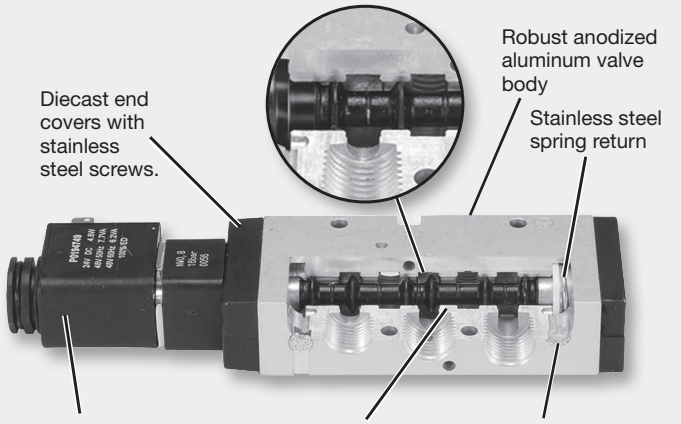
Mobile Applications XTREME

- Viking Xtreme Tested to +5g Shock and Vibration
- Solenoids Operate with Wide Voltage Tolerance Bands
- Corrosion Resistant Design

Over Molded Spool

- Aluminum spool with nitrile rubber coating ground to exact size for optimum performance
- Precision ground for maximum performance
- Wide operating temperature range
  – Low temperature to -40°

Over Molded Spool



- Solenoid operated, IP65, RoHS, CE
- Wide variety of electrical connections
- 90° rotation
- Air pilot available

The bore is polished to a very high surface finish for maximum flow capacity and long life.

Sintered bronze pilot chamber breathers provide increased protection against ingress of dust and dirt.

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Pneumatic Division
Richland, Michigan
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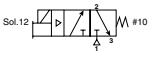
Single Solenoid, 3-way, 2-position, Normal Operating Pressure / Temperature

	Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
		1/8"	0.7	P2LAX	18 / 40	0.84 (0.38)	24VDC	**P2LAX391ESNDDB49**
							120VAC	**P2LAX391ESNDDB53**
	22mm DIN	1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	**P2LBX392ESNDDB49**
							120VAC	**P2LBX392ESNDDB53**
		3/8"	2.5	P2LCX	25 / 75	1.72 (0.78)	24VDC	**P2LCX393ESNDDB49**
							120VAC	**P2LCX393ESNDDB53**
		1/2"	2.7	P2LDX	25 / 75	1.72 (0.78)	24VDC	**P2LDX394ESNDDB49**
P2LAX 22mm DIN Shown							120VAC	**P2LDX394ESNDDB53**
		1/8"	0.7	P2LAX	18 / 40	0.84 (0.38)	24VDC	**P2LAX391ESNDDG49**
							120VAC	**P2LAX391ESNDDG53**
	18" Grommet	1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	**P2LBX392ESNDDG49**
							120VAC	**P2LBX392ESNDDG53**
		3/8"	2.5	P2LCX	25 / 75	1.72 (0.78)	24VDC	**P2LCX393ESNDDG49**
							120VAC	**P2LCX393ESNDDG53**
		1/2"	2.7	P2LDX	25 / 75	1.72 (0.78)	24VDC	**P2LDX394ESNDDG49**
P2LAX 18" Grommet Shown							120VAC	**P2LDX394ESNDDG53**

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Single Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature

	Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
		1/8"	0.7	P2LAX	15 / 35	0.49 (0.22)	24VDC	**P2LAX591ESNDDB49**
							120VAC	**P2LAX591ESNDDB53**
	22mm DIN	1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	**P2LBX592ESNDDB49**
							120VAC	**P2LBX592ESNDDB53**
		3/8"	2.5	P2LCX	27 / 75	1.68 (0.76)	24VDC	**P2LCX593ESNDDB49**
							120VAC	**P2LCX593ESNDDB53**
		1/2"	2.7	P2LDX	25 / 75	1.68 (0.76)	24VDC	**P2LDX594ESNDDB49**
P2LBX 22mm DIN Shown							120VAC	**P2LDX594ESNDDB53**
		1/8"	0.7	P2LAX	15 / 35	0.49 (0.22)	24VDC	**P2LAX591ESNDDG49**
							120VAC	**P2LAX591ESNDDG53**
	18" Grommet	1/4"	1.3	P2LBX	18 / 45	0.84 (0.38)	24VDC	**P2LBX592ESNDDG49**
							120VAC	**P2LBX592ESNDDG53**
		3/8"	2.5	P2LCX	27 / 75	1.68 (0.76)	24VDC	**P2LCX593ESNDDG49**
							120VAC	**P2LCX593ESNDDG53**
		1/2"	2.7	P2LDX	25 / 75	1.68 (0.76)	24VDC	**P2LDX594ESNDDG49**
P2LAX 18" Grommet Shown							120VAC	**P2LDX594ESNDDG53**

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

BOLD ITEMS ARE MOST POPULAR.

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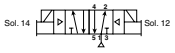
Double Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature



22mm DIN

P2LBX 22mm DIN Shown

18" Grommet

P2LAX 18" Grommet Shown

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
22mm DIN	1/8"	0.7	P2LAX	10 / 10	0.60 (0.27)	24VDC	**P2LAX591EENDDB49**
						120VAC	**P2LAX591EENDDB53**
	1/4"	1.3	P2LBX	12 / 12	0.93 (0.42)	24VDC	**P2LBX592EENDDB49**
						120VAC	**P2LBX592EENDDB53**
	3/8"	2.5	P2LCX	17 / 17	1.78 (0.81)	24VDC	**P2LCX593EENDDB49**
						120VAC	**P2LCX593EENDDB53**
	1/2"	2.7	P2LDX	17 / 17	1.78 (0.81)	24VDC	**P2LDX594EENDDB49**
						120VAC	**P2LDX594EENDDB53**
18" Grommet	1/8"	0.7	P2LAX	10 / 10	0.60 (0.27)	24VDC	**P2LAX591EENDDG49**
						120VAC	**P2LAX591EENDDG53**
	1/4"	1.3	P2LBX	12 / 12	0.93 (0.42)	24VDC	**P2LBX592EENDDG49**
						120VAC	**P2LBX592EENDDG53**
	3/8"	2.5	P2LCX	17 / 17	1.78 (0.81)	24VDC	**P2LCX593EENDDG49**
						120VAC	**P2LCX593EENDDG53**
	1/2"	2.7	P2LDX	17 / 17	1.78 (0.81)	24VDC	**P2LDX594EENDDG49**
						120VAC	**P2LDX594EENDDG53**

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

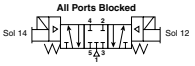
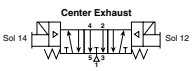
Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Normal Operating Pressure / Temperature

22mm DIN

P2LBX 22mm DIN Shown

18" Grommet

P2LBX 18" Grommet Shown

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number: All Ports Blocked 	Part number: Center Exhaust 
22mm DIN	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	24VDC 120VAC	**P2LAX691EENDDB49 P2LAX691EENDDB53**	**P2LAX891EENDDB49 P2LAX891EENDDB53**
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	24VDC 120VAC	**P2LBX692EENDDB49 P2LBX692EENDDB53**	**P2LBX892EENDDB49 P2LBX892EENDDB53**
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	24VDC 120VAC	**P2LCX693EENDDB49 P2LCX693EENDDB53**	**P2LCX893EENDDB49 P2LCX893EENDDB53**
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	24VDC 120VAC	**P2LDX694EENDDB49 P2LDX694EENDDB53**	**P2LDX894EENDDB49 P2LDX894EENDDB53**
18" Grommet	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	24VDC 120VAC	**P2LAX691EENDDG49 P2LAX691EENDDG53**	**P2LAX891EENDDG49 P2LAX891EENDDG53**
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	24VDC 120VAC	**P2LBX692EENDDG49 P2LBX692EENDDG53**	**P2LBX892EENDDG49 P2LBX892EENDDG53**
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	24VDC 120VAC	**P2LCX693EENDDG49 P2LCX693EENDDG53**	**P2LCX893EENDDG49 P2LCX893EENDDG53**
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	24VDC 120VAC	**P2LDX694EENDDG49 P2LDX694EENDDG53**	**P2LDX894EENDDG49 P2LDX894EENDDG53**

Notes: Above valves are rated for an operating temperature from 14°F to 122°F (-10°C to 50°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

BOLD ITEMS ARE MOST POPULAR.

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Pneumatic Division
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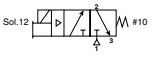
Single Solenoid, 3-way, 2-position, Xtreme Operating Pressure / Temperature



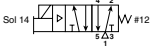
P2LBX 22mm DIN Shown

P2LBX 18" Grommet Shown

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
22mm DIN	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	**P2LAX391ESHDDB47**
						24VDC	**P2LAX391ESHDDB48**
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	**P2LBX392ESHDDB47**
						24VDC	**P2LBX392ESHDDB48**
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	**P2LCX393ESHDDB47**
						24VDC	**P2LCX393ESHDDB48**
	1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	**P2LDX394ESHDDB47**
						24VDC	**P2LDX394ESHDDB48**
18" Grommet	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	**P2LAX391ESHDDG47**
						24VDC	**P2LAX391ESHDDG48**
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	**P2LBX392ESHDDG47**
						24VDC	**P2LBX392ESHDDG48**
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	**P2LCX393ESHDDG47**
						24VDC	**P2LCX393ESHDDG48**
	1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	**P2LDX394ESHDDG47**
						24VDC	**P2LDX394ESHDDG48**

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Single Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature



P2LBX 22mm DIN Shown

P2LAX 18" Grommet Shown

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
22mm DIN	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	**P2LAX591ESHDDB47**
						24VDC	**P2LAX591ESHDDB48**
	1/4"	1.3	P2LBX	20 / 55	0.84 (0.38)	12VDC	**P2LBX592ESHDDB47**
						24VDC	**P2LBX592ESHDDB48**
	3/8"	2.5	P2LCX	25 / 85	1.01 (0.46)	12VDC	**P2LCX593ESHDDB47**
						24VDC	**P2LCX593ESHDDB48**
	1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	**P2LDX594ESHDDB47**
						24VDC	**P2LDX594ESHDDB48**
18" Grommet	1/8"	0.7	P2LAX	15 / 45	0.84 (0.38)	12VDC	**P2LAX591ESHDDG47**
						24VDC	**P2LAX591ESHDDG48**
	1/4"	1.3	P2LBX	25 / 65	0.84 (0.38)	12VDC	**P2LBX592ESHDDG47**
						24VDC	**P2LBX592ESHDDG48**
	3/8"	2.5	P2LCX	28 / 85	1.01 (0.46)	12VDC	**P2LCX593ESHDDG47**
						24VDC	**P2LCX593ESHDDG48**
	1/2"	2.7	P2LDX	25 / 85	1.01 (0.46)	12VDC	**P2LDX594ESHDDG47**
						24VDC	**P2LDX594ESHDDG48**

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

BOLD ITEMS ARE MOST POPULAR.

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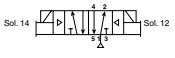
Double Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature



22mm DIN

P2LBX 22mm DIN Shown

18" Grommet

P2LAX 18" Grommet Shown

Solenoid	Port size (NPT)	Cv	Valve type	Response time (msec)	Weight lb (kg)	Voltage	Part number
	1/8"	0.7	P2LAX	11 / 11	0.60 (0.27)	12VDC	**P2LAX591EEHDDB47**
						24VDC	**P2LAX591EEHDDB48**
	1/4"	1.3	P2LBX	13 / 13	0.93 (0.42)	12VDC	**P2LBX592EEHDDB47**
						24VDC	**P2LBX592EEHDDB48**
	3/8"	2.5	P2LCX	18 / 18	1.06 (0.48)	12VDC	**P2LCX593EEHDDB47**
						24VDC	**P2LCX593EEHDDB48**
	1/2"	2.7	P2LDX	18 / 18	1.06 (0.48)	12VDC	**P2LDX594EEHDDB47**
						24VDC	**P2LDX594EEHDDB48**
	1/8"	0.7	P2LAX	11 / 11	0.60 (0.27)	12VDC	**P2LAX591EEHDDG47**
						24VDC	**P2LAX591EEHDDG48**
	1/4"	1.3	P2LBX	13 / 13	0.93 (0.42)	12VDC	**P2LBX592EEHDDG47**
						24VDC	**P2LBX592EEHDDG48**
	3/8"	2.5	P2LCX	18 / 18	1.06 (0.48)	12VDC	**P2LCX593EEHDDG47**
						24VDC	**P2LCX593EEHDDG48**
	1/2"	2.7	P2LDX	18 / 18	1.06 (0.48)	12VDC	**P2LDX594EEHDDG47**
						24VDC	**P2LDX594EEHDDG48**

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature

22mm DIN

P2LBX 22mm DIN Shown

18" Grommet

P2LBX 18" Grommet Shown

Solenoid	Port size	Cv	Valve type (NPT)	Response time (msec)	Weight lb (kg)	Voltage	Part number: All ports blocked	Part number: Center exhaust
	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	12VDC 24VDC	**P2LAX691EEHDDB47 P2LAX691EEHDDB48**	**P2LAX891EEHDDB47 P2LAX891EEHDDB48**
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	12VDC 24VDC	**P2LBX692EEHDDB47 P2LBX692EEHDDB48**	**P2LBX892EEHDDB47 P2LBX892EEHDDB48**
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	12VDC 24VDC	**P2LCX693EEHDDB47 P2LCX693EEHDDB48**	**P2LCX893EEHDDB47 P2LCX893EEHDDB48**
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	12VDC 24VDC	**P2LDX694EEHDDB47 P2LDX694EEHDDB48**	**P2LDX894EEHDDB47 P2LDX894EEHDDB48**
	1/8"	0.5	P2LAX	18 / 40	0.62 (0.28)	12VDC 24VDC	**P2LAX691EEHDDG47 P2LAX691EEHDDG48**	**P2LAX891EEHDDG47 P2LAX891EEHDDG48**
	1/4"	0.9	P2LBX	22 / 55	0.97 (0.44)	12VDC 24VDC	**P2LBX692EEHDDG47 P2LBX692EEHDDG48**	**P2LBX892EEHDDG47 P2LBX892EEHDDG48**
	3/8"	1.8	P2LCX	30 / 90	2.45 (1.11)	12VDC 24VDC	**P2LCX693EEHDDG47 P2LCX693EEHDDG48**	**P2LCX893EEHDDG47 P2LCX893EEHDDG48**
	1/2"	1.9	P2LDX	30 / 90	2.45 (1.11)	12VDC 24VDC	**P2LDX694EEHDDG47 P2LDX694EEHDDG48**	**P2LDX894EEHDDG47 P2LDX894EEHDDG48**

Notes: Above valves have Mobile Rate Coils and are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

BOLD ITEMS ARE MOST POPULAR.

Parker Hannifin Corporation
Pneumatic Division
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Single & Double Solenoid Operated Valves

P2L	A	X	5	91	E	S	H	D	D	G	49

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

Series	
Viking Xtreme	X

Valve type / function	
*Internal pilot supply to solenoid**	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8
External pilot supply to the solenoids through ports #12 & #14	
3/2 NC - 2-position	L
5/2 2-position	N
5/3 3-position, APB	P
5/3 3-position, PC	Q
5/3 3-position, CE	R

* Size A & B solenoid valves can be field converted from internal to external pilot. See page D48 for details.

Main port thread	
G1/8 (P2LA)	11
G1/4 (P2LB)	12
G1/4 (P2LB) NAMUR Mount	1N*
G3/8 (P2LC)	13
G1/2 (P2LD)	14
1/8" NPT (P2LA)	**91**
1/4" NPT (P2LB)	**92**
1/4" NPT (P2LB) NAMUR Mount	**9N***
3/8" NPT (P2LC)	**93**
1/2" NPT (P2LD)	**94**

* NAMUR mount available for 5/2, 2-position only.

12 End operator	
Double solenoid operated valve	E
Single solenoid spring return	S*

* Not available with 3-position valves.

	Valve type
N	Normal, vacuum to 145 PSIG (10 bar) 14°F to 122°F (-10°C to 50°C) CSA Approved
K	Xtreme, vacuum to 145 PSIG (10 bar) -40°F to 140° F (-40°C to 60°C) CSA Approved
H*	Xtreme, vacuum to 232 PSIG (16 bar) -40°F to 140° F (-40°C to 60°C)

* P2LC and P2LD solenoid operated valves have a maximum pressure rating of 175 PSIG (12 bar)

	Solenoid pilot type
D	Pilot exhaust vented
N	Tapped pilot exhaust (M5)

	Overrides
A	No override
C*	Flush - locking
D	Extended non-locking

* Overide for valve type N only.

	Enclosures / lead length
A	30mm square 3-pin – ISO 4400 Form A (male only)
B	22mm rectangular 3-pin – type B industrial (male only)
E*	Intrinsically safe, FM / CSA
F‡	Hazardous duty, FM / CSA
G	Grommet - 18" leads
H	1/2" NPT conduit - 18" leads
N	Solenoid pilot operator less coil

* Only available with voltage code "49" & override option "A", valve type "N" Only. Solenoid coil only CSA approved.

‡ Valve Type "N" Only. Solenoid coil only CSA approved.

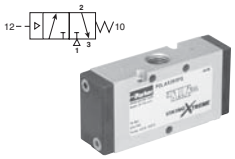
	Voltage / frequency
42	24VAC
45	12VDC
47*	**12 VDC mobile**
48*	**24 VDC mobile**
49	**24VDC**
53	**120VAC**
57	240VAC
Blank	Valve less coil

* Only available with enclosures "A", "B" & "G". Additional voltages are available upon request. Contact customer support for more information.

BOLD ITEMS ARE MOST POPULAR.

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

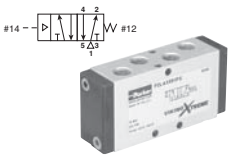
Single Remote Pilot, 3-way, 2-position, Xtreme Operating Pressure / Temperature



P2LAX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	15 / 45	0.68 (0.31)	P2LAX	**P2LAX391PS**
1/4"	1.3	25 / 65	0.68 (0.31)	P2LBX	**P2LBX392PS**
3/8"	2.5	25 / 65	0.88 (0.40)	P2LCX	**P2LCX393PS**
1/2"	2.7	25 / 65	0.88 (0.40)	P2LDX	**P2LDX394PS**

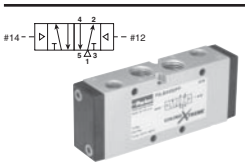
Single Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature



P2LAX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	15 / 45	0.33 (0.15)	P2LAX	**P2LAX591PS**
1/4"	1.3	20 / 55	0.68 (0.31)	P2LBX	**P2LBX592PS**
3/8"	2.5	25 / 85	0.90 (0.41)	P2LCX	**P2LCX593PS**
1/2"	2.7	25 / 85	0.90 (0.41)	P2LDX	**P2LDX594PS**

Double Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature



P2LBX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number
1/8"	0.7	11 / 11	0.33 (0.15)	P2LAX	**P2LAX591PP**
1/4"	1.3	13 / 13	0.68 (0.31)	P2LBX	**P2LBX592PP**
3/8"	2.5	18 / 18	0.90 (0.41)	P2LCX	**P2LCX593PP**
1/2"	2.7	18 / 18	0.90 (0.41)	P2LDX	**P2LDX594PP**

Double Remote Pilot, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature

P2LBX Shown

Port size (NPT)	Cv	Response time (msec)	Weight lb (kg)	Valve type	Part number: All ports blocked	Part number: Center exhaust
1/8"	0.5	18 / 50	0.31 (0.14)	P2LAX	**P2LAX691PP**	**P2LAX891PP**
1/4"	0.9	25 / 65	0.73 (0.33)	P2LBX	**P2LBX692PP**	**P2LBX892PP**
3/8"	1.8	30 / 90	0.93 (0.42)	P2LCX	**P2LCX693PP**	**P2LCX893PP**
1/2"	1.9	30 / 90	0.93 (0.42)	P2LDX	P2LDX694PP	**P2LDX894PP**

Notes: Above valves are rated for an operating temperature from -40°F to 140°F (-40°C to 60°C). See model code matrix for additional options.
Response time: Actuate to 90% pressure / return to exhaust to 10% of supply pressure. 93 PSIG (6.3 bar) / temperature 68°F (20°C).

Remote Air Pilot Operated Valves

P2L A X 5 91 PS

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

* P2LCX and P2LDX manual & remote air pilot valves have a maximum pressure rating of 175 PSIG (12 bar).

Valve type / function	
Internal pilot supply to solenoid	
3/2 NC - 2-position	3
5/2 2-position	5
5/3 3-position, APB	6
5/3 3-position, PC	7
5/3 3-position, CE	8

Operators / return	
PP	Double remote pilot
PS*	Single remote pilot, spring return

* 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)**

Note: NAMUR Mount for P2LBX is available upon request.

BOLD ITEMS ARE MOST POPULAR.

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

IEM Bar Manifold, Viking Xtreme Solenoid / Remote Pilot Valves

Valve series	Valve function	## -Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LAX*	3-way	02 - 12	**P2LAXGAXG##NP**	**P2LAXGAXG##NP**
P2LAX*	4-way	02 - 12	**P2LAXMAXN##NP**	**P2LAXMAXN##NP**
P2LBX*	3-way	02 - 12	**P2LBXGAXG##NP**	**P2LBXGAXG##NP**
P2LBX*	4-way	02 - 12	**P2LBXMAXN##NP**	**P2LBXMAXN##NP**
P2LCX	3-way / 4-way	02 - 12	**P2LCXMAXN##NP**	**P2LCXMAXN##NP**

Kits include: (1) manifold, valve hold down bolts and o-rings. Replace ## with number of valve stations.
* 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

IEM Bar Manifold Add-A-Fold Assembly (Viking Xtreme Solenoid / Remote Pilot Valves Only)

Valve series	Valve function	## -Stations	Manifold only (NPT)	Manifold only (BSPP)
P2LAX*	3-way	02 - 12	**AAPL2AXGAXG##NP**	**AAPL2AXGAXG##NP**
P2LAX*	4-way	02 - 12	**AAPL2AXMAXN##NP**	**AAPL2AXMAXG##NP**
P2LBX*	3-way	02 - 12	**AAPL2BXGAXG##NP**	**AAPL2BXGAXG##NP**
P2LBX*	4-way	02 - 12	**AAPL2BXMAXN##NP**	**AAPL2BXMAXG##NP**
P2LCX	3-way / 4-way	02 - 12	**AAPL2CXMAXN##NP**	**AAPL2CXMAXG##NP**

Kits include: (1) manifold, valve hold down bolts, o-rings and assembly. Replace ## with number of valve stations.
* 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

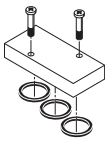
How to Order: 1. List Add-A-Fold assembly part number as line item 1

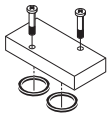
2. List the desired valves series part number in subsequent line items after the Add-A-Fold Assembly part number to complete the ordering code. Include all valves and blanking kits required. The left most station is station # 1 looking at the #12 end of the manifold.

Example: B3, 4-way manifold with station #1 blanked off with valves assembled

Line	Qty	Part number	Comment
1	1	AAPL2BXMAXN02NP	Add-A-Fold Assembly, 2-station IEM bar manifold
2	2	P2LBX591ESNNDDB49	4-way, Station 1, 2

Blanking Plate





Type		Kit number
P2LAX	4-way	**9121658063**
P2LBX	4-way	**9121594809X**
P2LCX	3 & 4 way	**P2LCXK20P**
P2LAX	3-way	**912132BPSXZ**
P2LBX	3-way	**912132BPSXZ**

Kit includes: plate, screws, o-rings

Manifold Bolts

Type	Qty.	Kit number
P2LAX	12	**P2LAXK87P**
P2LBX	12	**P2LBXK87P**
P2LCX	12	**P2LCXK87P**

Manifold O-rings

Type	Qty.	Kit number
P2LAX	30	**P2LAXK84P**
P2LBX	18	**P2LBXK84P**
P2LCX	12	**P2LCXK84P**

BOLD ITEMS ARE MOST POPULAR.

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

ATEX Certified Single & Double Solenoid Operated Valves

Vacuum to 145 PSIG (Vacuum to 10 bar)
14°F to 122°F 22mm Coils (Enclosure Option M)
-4°F to 122°F 30mm Coils (Enclosure Option S)

P2L A X 5 91 E S A D D M 49

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

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

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

12 End Operator	
E	Double Solenoid Operated Valve
S	Single Solenoid Spring Return

Solenoid Pilot Type	
D	Vented Pilot Exhaust
N	Tapped Pilot Exhaust (M5)

Overrides	
D	Extended Non-Locking

Enclosures	
M	ATEX 8-22T EExm T4 135°C

Voltage	
49	24VDC

NOTE: For ATEX Certified Manual and Remote Air Pilot Valves, build the valve part number from the model number index on page D81 and add "-EX" following the number.
Example: P2LAX591PS-EX

NOTE: All valves include a 3 Meter Sealed Cable with Assembly.

ATEX Certified Solenoid Pilot Assemblies

P2F S 1 3 A 3 D M 49

Voltage	
49	24VDC

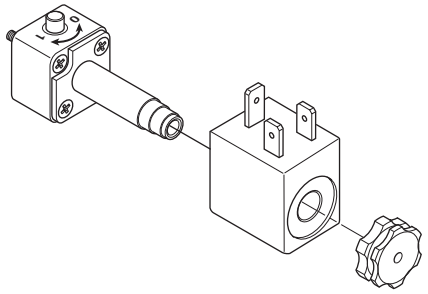
Enclosures	
M	ATEX 8-22T EExm T4 135°C

NOTE: All valves include a 3 Meter Sealed Cable with Assembly.

BOLD ITEMS ARE MOST POPULAR.

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

22mm Solenoid Pilot Operators & Coils



22mm Solenoid Pilot Options

The P2FP13*4* (NC) 3/2 solenoid pilot operators are designed for piloting pneumatic control valves with compressed air or other inert gases.

The P2FP operator is available for Normal operating pressures up to 10 bar or the Xtreme maximum operating pressure of 16 bar and wide band voltage tolerances required for mobile applications.

Corrosion Resistant Design

The pilot valve body is manufactured in thermoplastic PA6 material and the core tube brass / stainless steel. The plunger / core is made from stainless steel and the valve seats from FKM.

Solenoid Pilot Exhaust

These operators all exhaust out of the top of the core tube which is tapped M5. The standard solenoid nut fitted to the core tube is a diffuser nut which allows the exhaust to escape to atmosphere. This nut also minimizes ingress of dirt into the valve through this port. The alternative plastic knurled nut can be specified (refer to part number system) if the exhaust air needs captured and piped away using the M5 tapped port.

Mobile Applications

Viking Xtreme valves are tested to +5g shock and vibration. Solenoid operated valves are designed to operate with wide voltage tolerance bands within the ambient temperature ranges stated in the technical section.

Coils

Coils are wound with enameled copper wire, having a temperature index of 180°C with class F insulation (155°C) and are encapsulated in Thermoplastic resin. When fitted with suitable connector and correct gasket, they give protection to IP65.

Manual Override Options

The pilot operators can be supplied with locking or non-locking manual override. The standard manual override is the monostable (spring return) extended brass override. Alternatively the bistable (locking) override can be specified as an alternative for the Normal duty 10 bar option.

Spares

Solenoid operators are available as spares complete with mounting screws and seals. Coils and connectors should be ordered separately unless ATEX certified and intrinsically safe is needed. ATEX certified operators and coils must be ordered together.

Transients

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavorable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors / cable plugs with LEDs include this type of circuit protection.

Materials

Pilot Valve

Body ..... Polyamide

Armature Tube:
- Normal Pilot Operator ..... Brass
- Extreme Pilot Operator ..... Stainless Steel

Plunger & Core ..... Corrosion resistant Cr-Ni Steel

Seals ..... Fluorocarbon (FKM)

Screws ..... Stainless Steel

Coil

Encapsulation Material ..... Thermoplastic

ATEX

ATEX is a European Directive (94/9/EC) valid for products to be used within an explosive atmosphere.

Both ATEX certified solenoid, remote pilot and manual operated valves, as well as complete solenoid pilot assemblies are available. For specific information regarding ATEX certification please visit www.parker/pneumatics.

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

Pilot Operator Kits

P2F	P	1	3	N	4	C

Type	
Pilot operator kit	P

Pressure / temperature	
145 PSIG (10 bar) 14°F to 122°F (-10°C to 50°C)	N
232 PSIG (16 bar) -40°F to 158°F (-40°C to 70°C)	H

Overrides	
A	No override
C*	Locking (bistable) flush - plastic
D	Non-locking (monostable) extended - brass

* Only available with "N" Pressure / temperature option.

Solenoid Kits

P2F	C	A	4	49

Type	
Solenoid Kit	C

Enclosures / lead length	
30mm square 3-pin – ISO 4400 Form A (male only)	**A**
22mm rectangular 3-pin – Type B Industrial (male only)	**B**
Hazardous duty, FM / CSA	F*
Grommet - 18" leads	**G**
1/2" NPT conduit - 18" leads	**H**
Grommet 72" leads	Q
1/2" conduit 72" leads	R

* Only available with voltage codes "45", "49", "53" & "57". Not for use with the Xtreme version (-40°C to 70°C).

Voltage / frequency	
42	24VAC
45	12VDC
47*	**12 VDC mobile**
48*	**24 VDC mobile**
49	**24VDC**
53	**120VAC**
57	240VAC

* Only available with enclosures "A", "B" & "G". Additional voltages are available upon request. Contact customer support for more information.

Solenoid Enclosures

Option A
30mm Square,
3-Pin ISO 4400, DIN 43650A

Option B
22mm Rectangular,
3-Pin DIN, Type B Industrial

Option G & Q
Grommet, 18" or 72" Leads

Option H & R
1/2" Conduit, 18" or 72" Leads

Solenoid Information (Solenoids are rated for continuous duty.)

Voltage				Enclosure "A"		Enclosure "B" to "R"	
Code	AC 60Hz	AC 50Hz	DC	Power consumption	Holding (amps)	Power consumption	Holding (amps)
42	24	22		3.9VA	.14	7.3VA	.31
45	—	—	12	2.6W	.21	4.6W	.37
47*	—	—	12	6.2W	.52	5.5W	.46
48*	—	—	24	6.8W	.29	6.0W	.25
49	—	—	24	2.7W	.11	4.8W	.20
53	120	110	—	4.1VA	.04	6.3VA	.05
57	240	230	—	3.7VA	.02	6.4VA	.03

* Mobile voltages. Solenoid voltage characteristics for all coils located on page D49.

Replacement Solenoid Nut

	Description	Part number		Description	Part number
	Solenoid diffuser nut	**PS1556**		Solenoid vented nut	**PS2892P**

BOLD ITEMS ARE MOST POPULAR

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

Intrinsically safe solenoid valves ("E" option)

Hazardous location class:

Class I; Groups A, B, C & D

Class II; Groups E, F, & G

Class III; Div. I

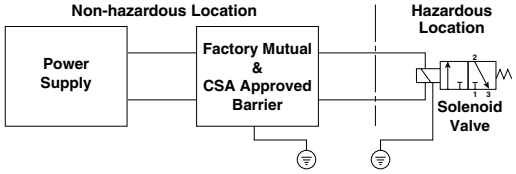
For use in low voltage (24VDC) Intrinsically Safe applications. NO OTHER VOLTAGE IS APPROVED.

Comes standard with non-lighted solenoid connector.

36mm Coil width.

Must be connected to an FM approved Barrier.

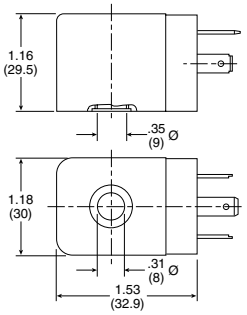
For dimensions, reference standard solenoid models. Maximum internally piloted valve pressure is 115 PSIG. Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.



Intrinsically safe solenoid pilot assembly kits

Description	Part number
24VDC	**P2FS13N1AE49**

Kit includes: coil, connector, o-ring & screws



Hazardous duty solenoid valves ("F" option)

Hazardous location class:

Class I; Zone I EX, M, II & T4

Class I; Div. I, Groups A, B, C, & D

Class II & III; Div. I, Groups E, F, & G

Comes standard with 1/2" conduit connection.

Voltage range = ±10%

Ambient temperature range = -20°C (-4°F) to 60°C (140°F)

Duty factor = 100%

IP65 Rated (with connected conduit connector)

Notes:

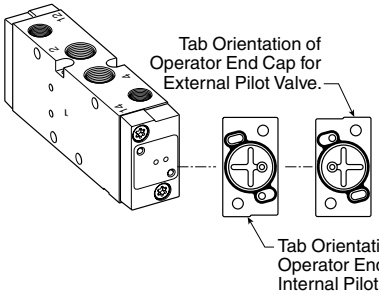
1. Maximum non-hazardous location voltage not to exceed 250V RMS.
2. Connect per Barrier Manufacturers instructions.
3. Factory Mutual requires connections per ISA RP 12.6 instructions.
4. CSA requires "Installation to be in accordance with the Canadian Electrical Code. Part I."
5. The hazardous duty coils are wider in size than size A, B, C & D valves.
   If mounted on a manifold, the valves need to be staggered to fit.

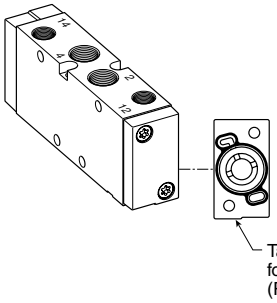
Option F
Hazardous Duty FM / CSA

Internal to external pilot conversion (size A & B only)

To convert from Internal to External Pilot Valve, simply remove the (2) fasteners that attach the end cap to the valve body. Rotate the end cap 180° and attach back to the valve body. For single solenoid valves, only the 14-End needs to be rotated. For double solenoid valves, both ends must be converted for proper function.

The 12 & 14-Ports are always tapped no matter what Valve Type / Function is selected. For Internal Pilot Function, ports do NOT need to be plugged.





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

Operating Temperature

- **Normal** ..... 14°F to 122°F (-10°C to 50°C)
- **Extreme** ..... -40°F to 158°F (-40°C to 70°C)

Flow Rating

Valve Size	Port Size	2-Position	3-Position
P2LAX	1/8"	0.7	0.5
P2LBX	1/4"	1.3	0.9
P2LCX	3/8"	2.5	1.8
P2LDX	1/2"	2.7	1.9

Operating Pressure

Maximum: Normal.....145 PSIG (10 bar)
Extreme.....232 PSIG (16 bar)
Minimum:

Valve Type - Internal Pilot	Minimum PSIG (bar)			
	P2LAX	P2LBX	P2LCX	P2LDX
Single Sol - Spring Return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Single Remote Pilot - Spring Return	46 (3.2)	51 (3.5)	51 (3.5)	51 (3.5)
Double Solenoid - 2-Position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double Remote Pilot - 2-Position	22 (1.5)	22 (1.5)	22 (1.5)	22 (1.5)
Double Solenoid - 3-Position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)
Double Remote Pilot - 3-Position (APB, PC, CE)	51 (3.5)	51 (3.5)	51 (3.5)	51 (3.5)

Valve Type - External Pilot	P2LAX	P2LBX	P2LCX	P2LDX
All Viking Series	Vacuum			

Solenoid Voltage Characteristics

Non-mobile Coils

+10% / -10% for all Coils with Normal and Extreme Operators

Mobile Coils - Normal Pilot Operator

22mm 12 & 24VDC - Mobile (47 & 48 Voltage Code)

Minimum Inlet Pressure (bar)		Operating Temperature		
		-10°C	+10°C	+50°C
	3	+30 / -25% VDC	+30 / -20% VDC	+25 / -15% VDC
	6	+30 / -30% VDC	+30 / -25% VDC	+25 / -20% VDC
	8	+30 / -30% VDC	+30 / -30% VDC	+25 / -25% VDC
	10	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC

30mm 12 & 24VDC - Mobile (47 & 48 Voltage Code)

Minimum Inlet Pressure (bar)		Operating Temperature		
		-10°C	+10°C	+50°C
	3	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
	6	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
	8	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC
	10	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC

Mobile Coils - Extreme Pilot Operator

22mm 12 & 24VDC - Mobile (47 & 48 Voltage Code)

Minimum Inlet Pressure (bar)		Operating Temperature			
		-40°C	+10°C	+50°C	+70°C
	4	+30 / -25% VDC	+30 / -25% VDC	+30 / -10% VDC	+20 / -10% VDC
	8	+30 / -30% VDC	+30 / -25% VDC	+30 / -15% VDC	+20 / -15% VDC
	12	+30 / -30% VDC	+30 / -30% VDC	+30 / -15% VDC	+20 / -15% VDC
	16	+30 / -30% VDC	+30 / -30% VDC	+30 / -20% VDC	+20 / -20% VDC

30mm 12 & 24VDC - Mobile (47 & 48 Voltage Code)

Minimum Inlet Pressure (bar)		Operating Temperature			
		-40°C	+10°C	+50°C	+70°C
	4	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC
	8	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC
	12	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC
	16	+30 / -30% VDC	+30 / -30% VDC	+25 / -30% VDC	+15 / -30% VDC

Note: All table ratings are based on 100% continuous duty and 5G shock vibration. At 50% continuous duty all ratings are +30% / -30% for all Temperatures and Pressures.

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Female Electrical Connectors / Accessories

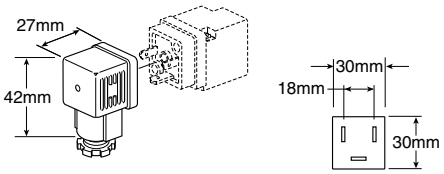
30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2028JCP	**PS2028BP**
Light – 6-48V, 50/60Hz, 6-48VDC	PS2032J79CP*	**PS203279BP**
Light – 120V/60Hz	PS2032J83CP*	**PS203283BP**
Light – 240V/60Hz	N/A	**PS203283BP**

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm.



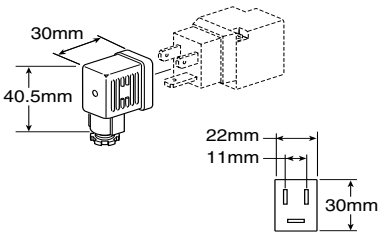
22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure "B")

Description	Connector with 6' (2m) cord	Connector
Unlighted	PS2429JBP	**PS2429BP**
Light – 24V60Hz, 24VDC	PS2430J79BP*	**PS243079BP**
Light – 120V/60Hz	PS2430J83BP*	**PS243083BP**
Light – 240V/60Hz	N/A	PS243087BP

* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering data:
Conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm.



Exhaust Mufflers

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

P6M - Plastic; EM - Sintered bronze

Plastic Silencers

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

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Exhaust Protector

Features

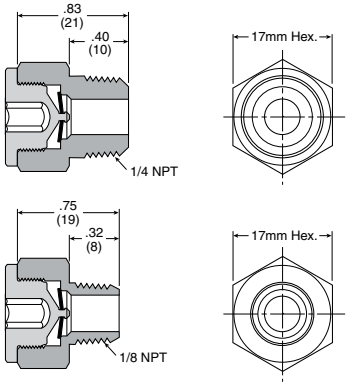
- 1/8 and 1/4 NPT male sizes
- Fitted with a brass pipe adapter and a fluorocarbon membrane
- Resistant to rust, clog, wash down and contamination

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.



Operating information

Operating pressure:	0 to 150 PSIG (0 to 10 bar)
Operating temperature:	-40°F to 140°F (-40°C to 60°C)

Flow data (SCFM)

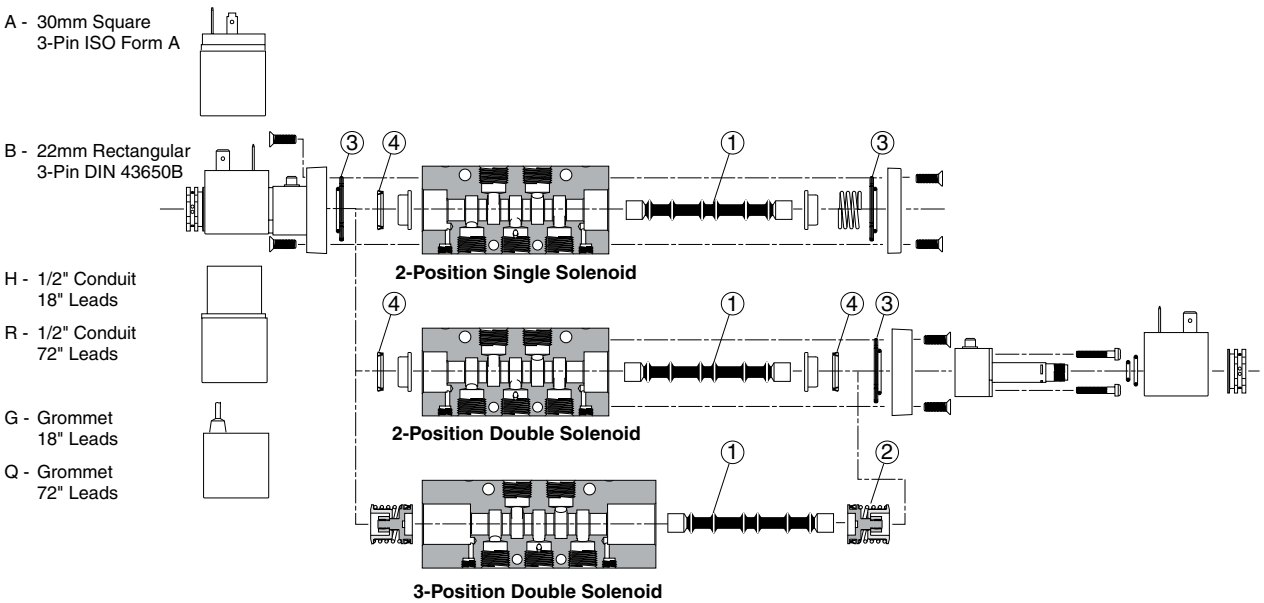
Size	60 PSIG Inlet	90 PSIG Inlet	125 PSIG Inlet	Part number
1/8"	40.1	56.5	75.5	**E90016**
1/4"	44.6	62.7	83.5	**E90017**

Material specifications

Body & pipe adapter	Brass
Membrane	Fluorocarbon

Spool Service Kits

Description	Includes items (qty.)	Part number
Size A, 4-way, 2-position, solenoid & air pilot valves	1 (1), 3 (2), 4 (2)	**P2LAXSK1**
Size A, 4-way, 3-position, solenoid & air pilot valves	1 (1), 2 (2), 3 (2), 4 (2)	**P2LAXSK2**
Size A, 4-way, 2-position, manual valves	Spool only (not shown)	**P2LAXSK3**
Size A, 4-way, 3-position, manual valves	Spool only (not shown)	**P2LAXSK4**
Size B, 4-way, 2 & 3-position valves	1 (1), 3 (2), 4 (2)	**P2LBXSK1**
Size C & Size D, 4-way, 2 & 3-position valves	1 (1), 3 (2), 4 (2)	**P2LCXDXSK1**



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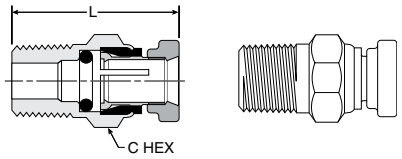
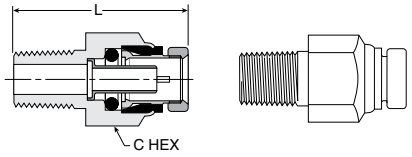
68PM Male Connector



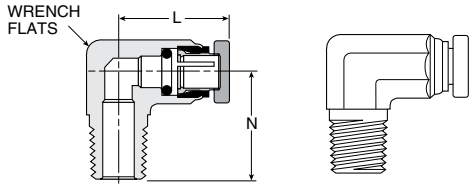
Part number	Tube size	Pipe thread (NPTF)	C hex	L
68PM-2-1	1/8	1/16	3/82	0.93
68PM-2-2	1/8	1/8	7/16	0.88
68PM-5/32-1	5/32	1/16	3/8	0.95
68PM-5/32-2	5/32	1/8	7/16	0.74
68PM-5/32-4	5/32	1/4	9/16	0.99
68PM-3-1	3/16	1/16	7/16	0.95
68PM-3-2	3/16	1/8	7/16	0.92
68PM-3-4	3/16	1/4	9/16	1.10

68PMT Male Connector



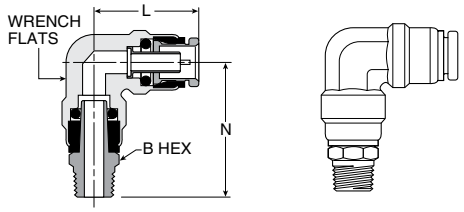
Part number	Tube size	Pipe thread (NPTF)	C hex	L
68PMT-4-2	1/4	1/8	1/2	1.06
68PMT-4-4	1/4	1/4	9/16	1.19
68PMT-4-6	1/4	3/8	3/4	1.27
68PMT-6-2	3/8	1/8	3/4	1.37
68PMT-6-4	3/8	1/4	3/4	1.43
68PMT-6-6	3/8	3/8	3/4	1.33
68PMT-6-8	3/8	1/2	7/8	1.38
68PMT-8-4	1/2	1/4	7/8	1.72
68PMT-8-6	1/2	3/8	7/8	1.52
68PMT-8-8	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°



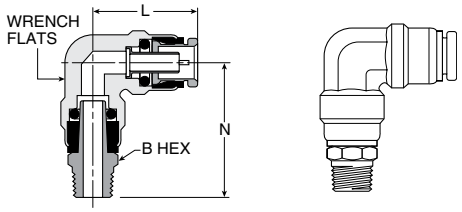
Part number	Tube size	Pipe thread (NPTF)	Wrench flats	L	N
169PMNS-2-2	1/8	1/8	3/8	0.86	0.68
169PMNS-5/32-2	5/32	1/8	3/8	0.88	0.68
169PMNS-3-2	3/16	1/8	3/8	0.75	0.67
169PMNS-3-4	3/16	1/4	1/2	0.74	0.93

169PMT Male Elbow Swivel 90°



Part number	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 number	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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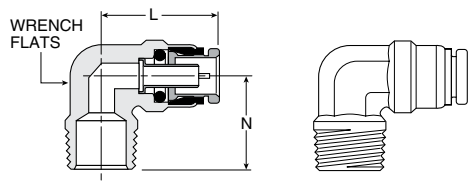
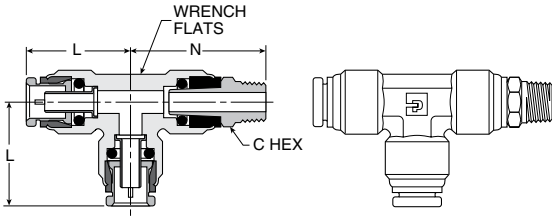
169PMTNS Male Elbow Non-Swivel 90°



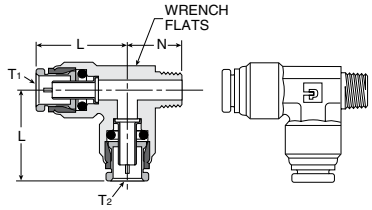
Part number	Tube size	Pipe thread (NPTF)	Wrench flats	L	N
169PMTNS-4-2	1/4	1/8	1/2	0.84	0.72
169PMTNS-4-4	1/4	1/4	1/2	0.84	0.90
169PMTNS-4-6	1/4	3/8	1/2	0.84	1.06
169PMTNS-6-2	3/8	1/8	9/16	1.05	0.75
169PMTNS-6-4	3/8	1/4	9/16	1.05	0.94
169PMTNS-6-6	3/8	3/8	3/4	1.05	0.94
169PMTNS-6-8	3/8	1/2	11/16	1.12	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



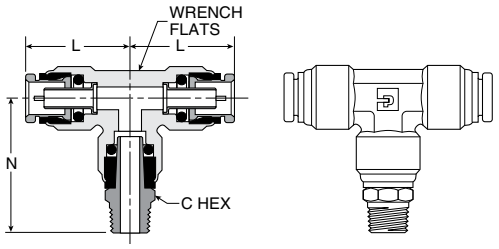
Part number	Tube size	Pipe thread (NPTF)	Wrench flats	L	N	N
171PMT-4-2	1/4	1/8	1/2	7/16	.85	1.25
171PMT-4-4	1/4	1/4	1/2	9/16	.85	1.48
171PMT-4-6	1/4	3/8	1/2	11/16	.85	1.43
171PMT-6-4	3/8	1/4	5/8	9/16	1.21	1.83
171PMT-6-6	3/8	3/8	5/8	11/16	1.21	1.83
171PMT-8-4	1/2	1/4	7/8	5/8	1.27	1.74
171PMT-8-6	1/2	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



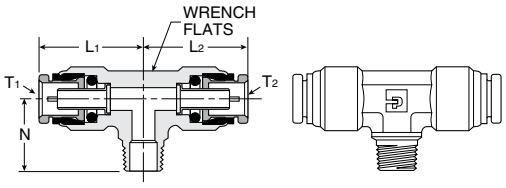
Part number	Tube 1 size	Tube 2 size	Pipe thread (NPTF)	Wrench flats	L1	L2	N
171PMTNS-4-4	1/4	1/4	1/4	15-32	0.91	0.91	0.94
171PMTNS-4-6-4	1/4	3/8	1/4	5/8	0.93	1.21	0.97
171PMTNS-6-4	3/8	3/8	1/4	5/8	1.21	1.21	0.97
171PMTNS-6-4-4	3/8	1/4	1/4	5/8	1.21	0.93	0.97
171PMTNS-6-4-6	3/8	1/4	3/8	5/8	1.22	0.97	0.93
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 number	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 number	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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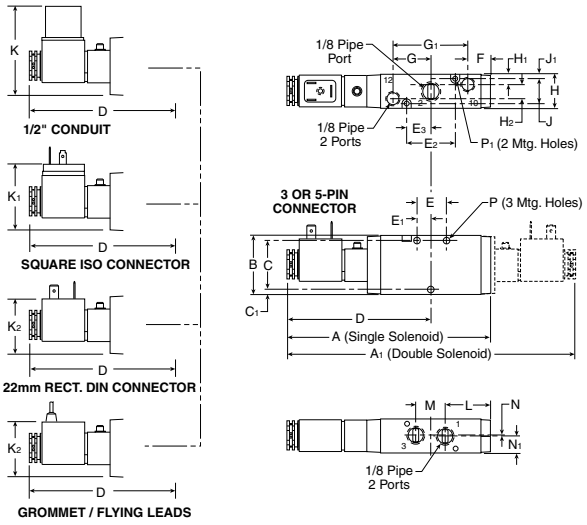
P2LAX 3/2 Single & Double Operators – Solenoid

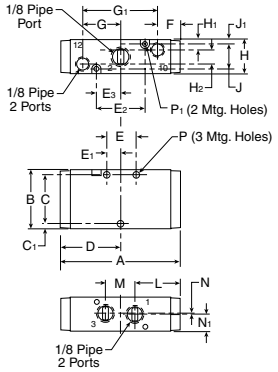


P2LAX 3/2 (solenoid)

A	A1	B	C	C1
5.35	7.60	1.57	1.26	.16
(136)	(193)	(40)	(32)	(4)
D	**E**	**E1**	**E2**	**E3**
3.80	.79	.39	1.26	.63
(97)	(20)	(10)	(32)	(16)
F	**G**	**G1**	**H**	**H1**
.55	.98	1.97	.87	.26
(14)	(25)	(50)	(22)	(6.6)
H2	**J**	**J1**	**K**	**K1**
.35	.65	.11	2.36	1.61
(9)	(16.5)	(2.9)	(60)	(41)
K2	**L**	**M**	**N**	**N1**
1.50	1.14	.79	.02	.42
(38)	(29)	(20)	(0.5)	(11)
P	**P1**			
Ø .17	Ø .12			
Ø (4.3)	Ø (3.1)			

Inches (mm)

P2LAX 3/2 Single & Double Operators – Remote Pilot

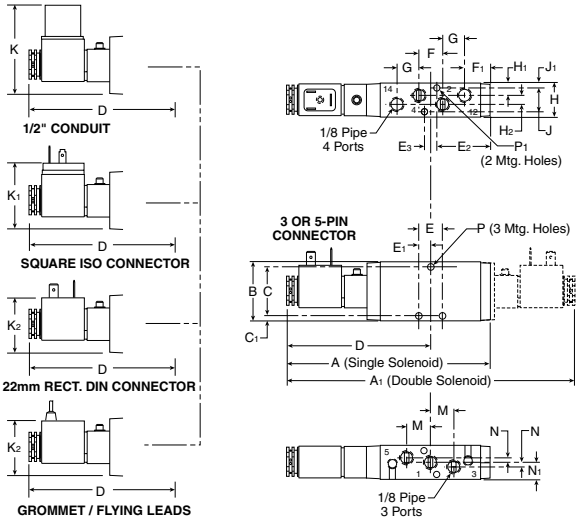


P2LAX 3/2 (remote)

A	B	C	C1	D
3.07	1.57	1.26	.16	1.54
(78)	(40)	(32)	(4)	(39)
E	**E1**	**E2**	**E3**	**F**
.79	.39	1.26	.63	.55
(20)	(10)	(32)	(16)	(14)
G	**G1**	**H**	**H1**	**H2**
.98	1.97	.87	.26	.35
(25)	(50)	(22)	(6.6)	(9)
J	**J1**	**L**	**M**	**N**
.65	.11	1.14	.79	.02
(16.5)	(2.9)	(29)	(20)	(0.5)
N1	**P**	**P1**		
.42	Ø .17	Ø .12		
(11)	Ø (4.3)	Ø (3.1)		

Inches (mm)

P2LAX 5/2 & 5/3 Single & Double Operators, 4-way



P2LAX 5/2 & 5/3 (solenoid)

A	A1	B	C	C1
5.47	7.72	1.57	1.30	.14
(139)	(196)	(40)	(33)	(3.5)
D	**E**	**E1**	**E2**	**E3**
3.86	.63	.31	1.42	.33
(98)	(16)	(8)	(36)	(8.5)
F	**F1**	**G**	**H**	**H1**
.63	.67	.59	.87	.31
(16)	(17)	(15)	(22)	(8)
H2	**J**	**J1**	**K**	**K1**
.24	.63	.12	2.36	1.61
(6)	(16)	(39)	(60)	(41)
K2	**M**	**N**	**N1**	**P**
1.50	.63	.12	.43	Ø .17
(38)	(16)	(3)	(11)	Ø (4.3)
P1				
Ø .12				
Ø (3.1)				

Inches (mm)

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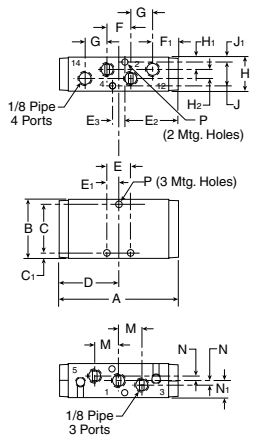
P2LAX 5/2 & 5/3 Single & Double Operators – Remote Pilot

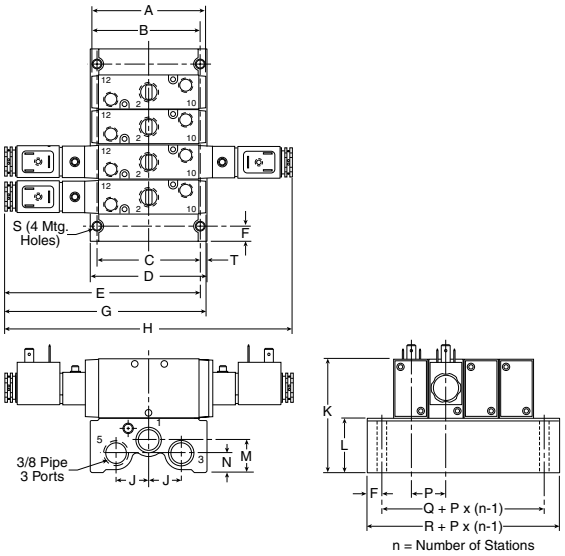


P2LAX 5/2 & 5/3 (remote)

A	B	C	C1	D
3.19	1.57	1.30	.14	1.59
(81)	(40)	(33)	(3.5)	(40.5)
E	**E1**	**E2**	**E3**	**F**
1.47	.31	1.42	.33	.63
(16)	(8)	(36)	(8.5)	(16)
F1	**G**	**H**	**H1**	**H2**
.67	.59	.87	.31	.24
(17)	(15)	(22)	(8)	(6)
J	**J1**	**M**	**N**	**N1**
.63	.12	.63	.12	.43
(16)	(3)	(16)	(3)	(11)
P	**P1**			
Ø .17	Ø .12			
Ø (4.3)	Ø (3.1)			

Inches (mm)

P2LAX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

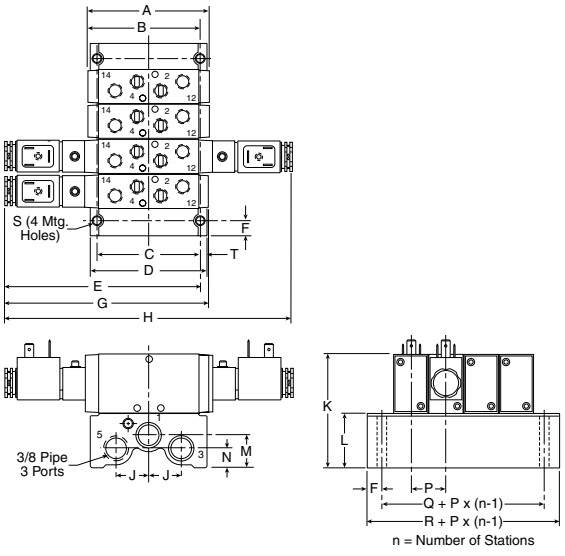


P2LAX 3/2
IEM Aluminum bar manifold

A	B	C	D	E
3.07	2.83	2.76	3.12	5.18
(78)	(72)	(70)	(79)	(132)
F	**G**	**H**	**J**	**K**
41	5.35	7.72	.87	3.11
(10.5)	(136)	(193)	(22)	(79)
L	**M**	**N**	**P**	**Q**
1.54	.87	.52	.93	1.56
(39)	(22)	(13.2)	(23.5)	(39.5)
R	**S**	**T**		
2.36	Ø .22	.18		
(60)	Ø (5.5)	(4.5)		

Inches (mm)

P2LAX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



P2LAX 5/2 & 5/3
IEM Aluminum bar manifold

A	B	C	D	E
3.19	2.97	2.76	3.12	5.26
(81)	(76)	(70)	(79)	(134)
F	**G**	**H**	**J**	**K**
41	5.47	7.72	.87	3.11
(10.5)	(139)	(196)	(22)	(79)
L	**M**	**N**	**P**	**Q**
1.54	**.87**	.52	.93	1.56
(39)	**(22)**	(13.2)	(23.5)	(39.5)
R	**S**	**T**		
2.36	Ø .22	.18		
(60)	Ø (5.5)	(4.5)		

Inches (mm)

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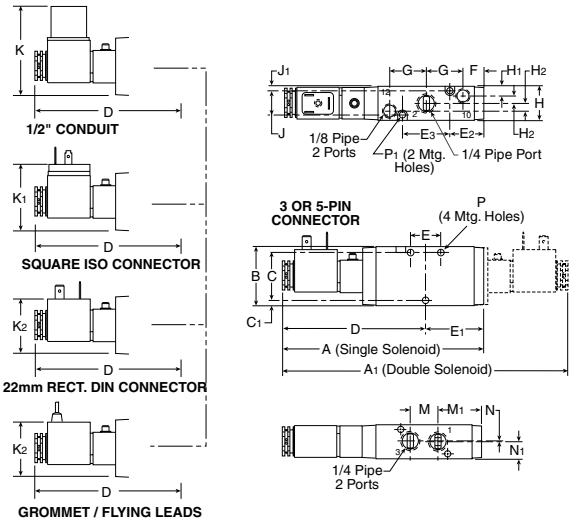
P2LBX 3/2 Single & Double Operators – Solenoid

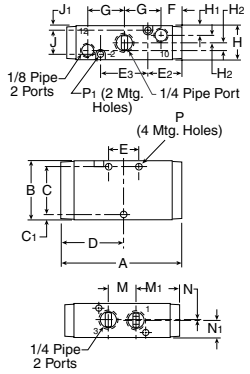


P2LBX 3/2 (solenoid)

A	A1	B	C	C1
5.35	7.60	1.57	1.26	.16
(136)	(193)	(40)	(32)	(4)
D	**E**	**E1**	**E2**	**E3**
3.80	.79	1.54	.51	1.26
(96.5)	(20)	(39)	(13)	(32)
F	**G**	**H**	**H1**	**H2**
.55	.98	.87	.26	.18
(14)	(25)	(22)	(6.6)	(4.5)
J	**J1**	**K**	**K1**	**K2**
.65	.11	2.36	1.61	1.50
(16.5)	(2.9)	(60)	(41)	(38)
M	**M1**	**N**	**N1**	**P**
.79	1.14	.02	.42	Ø .17
(20)	(29)	(0.5)	(11)	Ø (4.3)
P1				
Ø .12				
Ø (3.1)				

Inches (mm)

P2LBX 3/2 Single & Double Operators – Remote Pilot

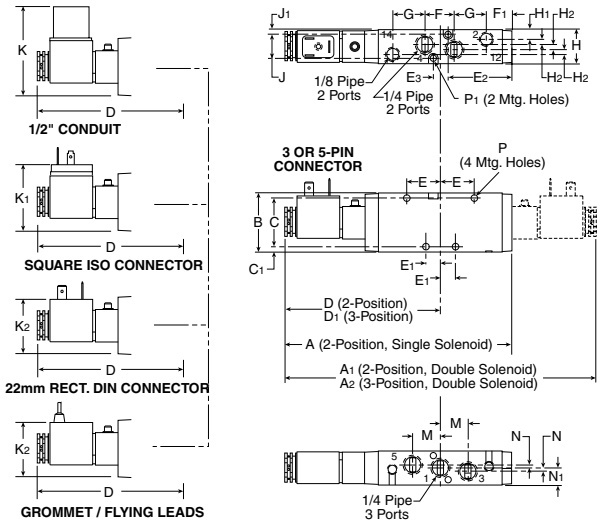


P2LBX 3/2 (remote)

A	B	C	C1	D
3.08	1.57	1.26	.16	1.54
(78)	(40)	(32)	(4)	(39)
E	**E2**	**E3**	**F**	**G**
.79	.51	1.26	.55	.98
(20)	(13)	(32)	(14)	(25)
H	**H1**	**H2**	**J**	**J1**
.87	.26	.18	.65	.11
(22)	(6.6)	(4.5)	(16.5)	(2.9)
M	**M1**	**N**	**N1**	**P**
.79	1.14	.02	.42	Ø .17
(20)	(29)	(0.5)	(11)	Ø (4.3)
P1				
Ø .12				
Ø (3.1)				

Inches (mm)

P2LBX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LBX 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
6.14	8.39	9.23	1.57	1.26
(156)	(213)	(235)	(40)	(32)
C1	**D**	**D1**	**E**	**E1**
.16	4.21	4.64	.91	.39
(4)	(107)	(118)	(23)	(10)
E2	**E3**	**F**	**F1**	**G**
1.73	.39	.79	.67	.87
(44)	(10)	(20)	(17)	(22)
H	**H1**	**H2**	**J**	**J1**
.87	.26	.12	.65	.12
(22)	(6.6)	(3)	(16.5)	(3)
K	**K1**	**K2**	**M**	**N**
2.36	1.61	1.50	.79	.08
(60)	(41)	(38)	(20)	(2)
N1	**P**	**P1**		
.43	Ø .17	Ø .12		
(11)	Ø (4.3)	Ø (3.1)		

Inches (mm)

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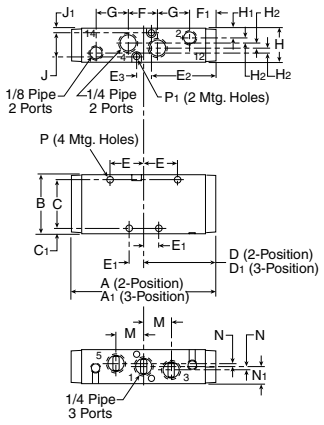
P2LBX 5/2 & 5/3 Single & Double Operators – Remote Pilot

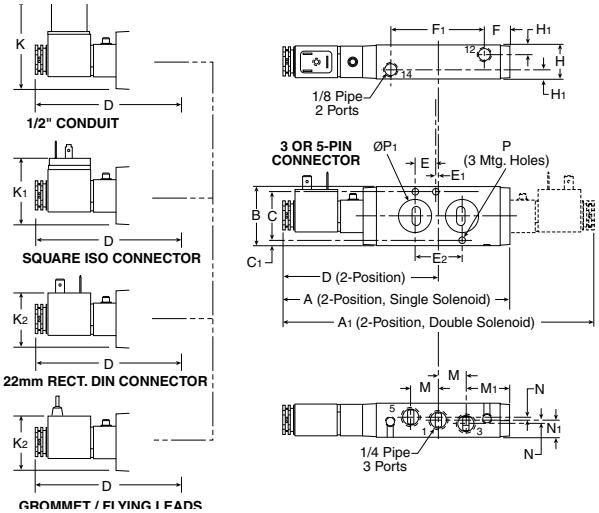


P2LBX 5/2 & 5/3 (remote)

A	A1	B	C	C1
3.95	4.61	1.57	1.26	.16
(100)	(117)	(40)	(32)	(4)
D	**D1**	**E**	**E1**	**E2**
1.93	2.28	91	.39	1.73
(49)	(58)	(23)	(10)	(44)
E3	**F**	**F1**	**G**	**H**
.39	.79	.67	.87	.8
(10)	(20)	(17)	(22)	(22)
H1	**H2**	**J**	**J1**	**K**
.26	.12	.65	.11	2.90
(6.6)	(3)	(16.5)	(2.8)	(74)
M	**N**	**N1**	**P**	**P1**
.79	.08	.43	Ø .17	Ø .12
(20)	(2)	(11)	Ø (4.3)	Ø (3.1)

Inches (mm)

P2LBX 5/2 Single & Double Operators – Solenoid _ NAMUR



P2LBX 5/2 (NAMUR)

A	A1	B	C	C1
6.15	8.39	1.57	1.26	.16
(156)	(213)	(40)	(32)	(4)
D	**E**	**E1**	**E2**	**F**
4.21	.47	.08	.94	.67
(107)	(12)	(2)	(24)	(17)
F1	**H**	**H1**	**M**	**M1**
2.52	.87	.26	.79	1.14
(64)	(22)	(6.6)	(20)	(29)
N	**N1**	**P**	**P1**	
.08	.43	Ø .22	Ø .76	
(2)	(11)	Ø (5.5)	Ø (19.4)	

Inches (mm)

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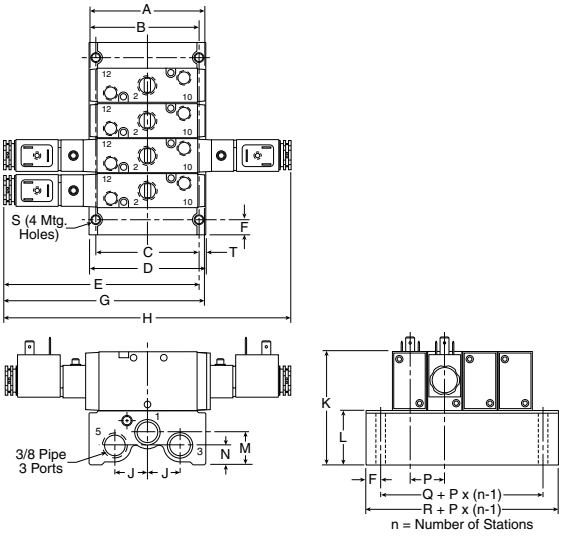
P2LBX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

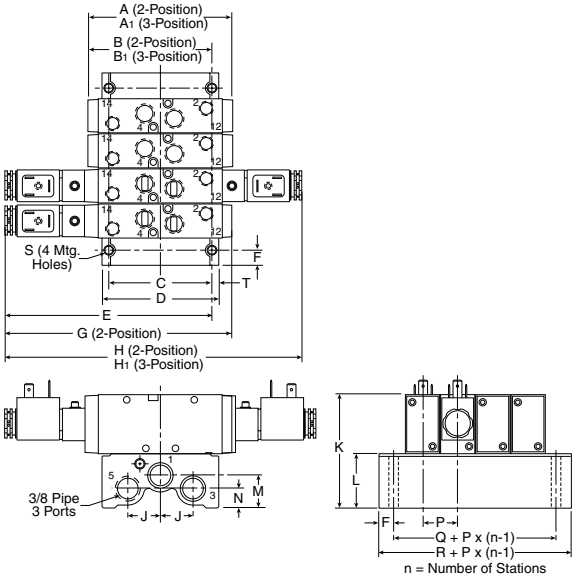


P2LBX 3/2
IEM Aluminum bar banifold

A	B	C	D	E
3.86	2.91	2.76	3.12	5.17
(78)	(74)	(70)	(79)	(131)
F	**G**	**H**	**J**	***K***
.40	5.33	7.6	.87	3.11
(10.2)	(136)	(193)	(22)	(79)
L	**M**	**N**	**P**	**Q**
1.47	.87	.52	.93	1.56
(37)	(22)	(13.2)	(23.5)	(39.6)
R	**S**	**T**		
2.36	Ø .22	.18		
(60)	Ø (5.5)	(4.6)		

Inches (mm)

P2LBX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



P2LBX 5/2 & 5/3
IEM Aluminum bar manifold

A	A_1	B	B_1	C
3.86	4.70	3.42	3.73	2.76
(98)	(120)	(84)	(95)	(70)
D	**E**	**F**	**G**	**H**
3.12	5.59	.40	6.14	8.39
(79)	(142)	(10.2)	(156)	(213)
H_1	**J**	**K**	**L**	**M**
9.23	.87	3.11	1.47	.87
(235)	(22)	(79)	(37)	(22)
N	**P**	**Q**	**R**	**S**
.52	.93	1.56	2.36	Ø .22
(13.2)	(23.5)	(39.6)	(60)	Ø (5.5)
T				
.18				
(4.6)				

Inches (mm)

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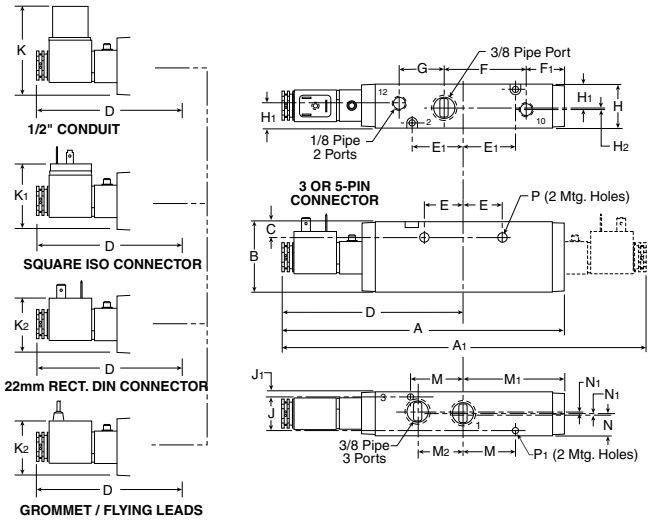
P2LCX 3/2 Single & Double Operators – Solenoid

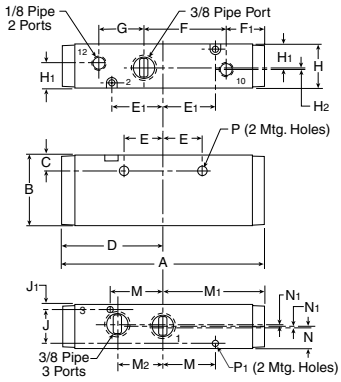


P2LCX 3/2 (solenoid)

A	A1	B	C	D
7.66 (194.5)	9.80 (249)	1.89 (48)	.43 (11)	4.90 (124.5)
E	**E1**	**F**	**F1**	**G**
1.04 (26.5)	1.40 (35.5)	2.24 (57)	1.02 (26)	1.22 (31)
H	**H1**	**H2**	**J**	**J1**
1.18 (30)	.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)
K	**K1**	**K2**	**M**	**M1**
2.52 (64)	1.77 (45)	1.65 (42)	1.40 (35.5)	2.76 (70)
M2	**N**	**N1**	**P**	**P1**
1.18 (30)	.55 (14)	.04 (1)	Ø .27 Ø (6.9)	Ø .17 Ø (4.4)

Inches (mm)

P2LCX 3/2 Single & Double Operators – Remote Pilot

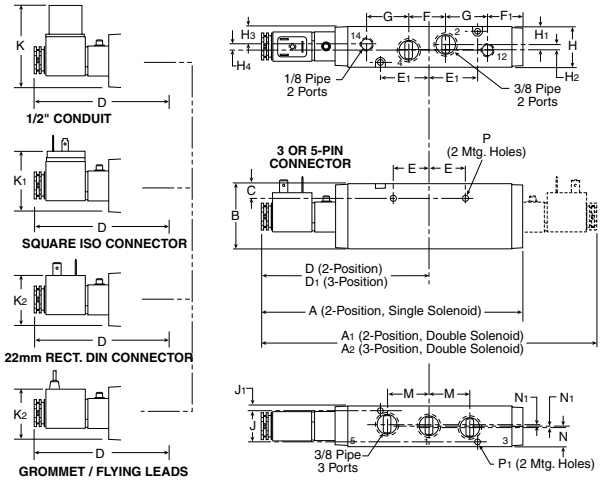


P2LCX 3/2 (remote)

A	B	C	D	E
5.51 (140)	1.89 (48)	.43 (11)	2.76 (70)	1.04 (26.5)
E1	**F**	**F1**	**G**	**H**
1.40 (35.5)	2.24 (57)	1.02 (26)	1.22 (31)	1.18 (30)
H1	**H2**	**J**	**J1**	**M**
.67 (17)	.02 (0.5)	.91 (23)	.14 (3.5)	1.40 (35.5)
M1	**M2**	**N**	**N1**	**P**
2.76 (70)	1.18 (30)	.55 (14)	.04 (1)	Ø .27 Ø (6.9)
P1				
Ø .17 Ø (4.4)				

Inches (mm)

P2LCX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LCX 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
7.68 (195)	9.84 (250)	10.71 (272)	1.89 (48)	.43 (11)
D	**D1**	**E**	**E1**	**F**
4.92 (125)	5.35 (136)	1.04 (26.5)	1.40 (35.5)	1.06 (27)
F1	**G**	**H**	**H1**	**H2**
1.02 (26)	1.22 (31)	1.18 (30)	.53 (13.5)	.12 (3)
H3	**H4**	**J**	**J1**	**K**
.51 (13)	.16 (4)	.91 (23)	.14 (3.5)	2.52 (64)
K1	**K2**	**M**	**N**	**N1**
1.77 (45)	1.65 (42)	1.18 (30)	.55 (14)	.04 (1)
P	**P1**			
Ø .27 Ø (6.9)	Ø .17 Ø (4.4)			

Inches (mm)

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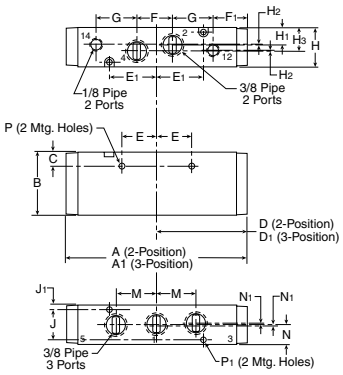
P2LCX 5/2 & 5/3 Single & Double Operators – Remote Pilot

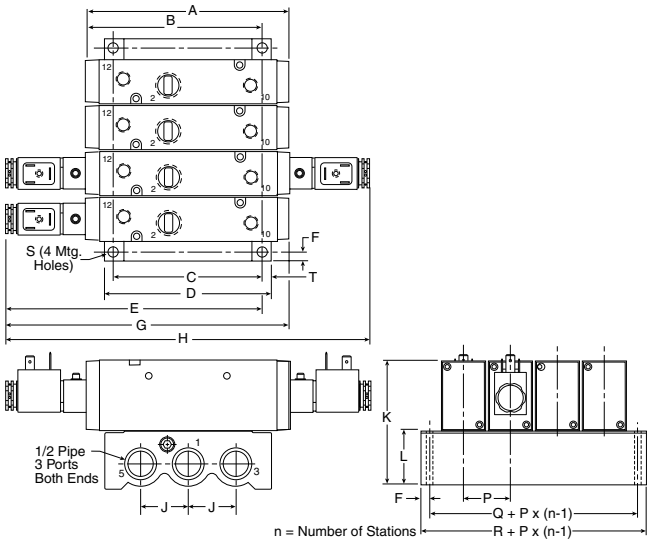


P2LCX 5/2 & 5/3 (remote)

A	A1	B	C	D
5.51	6.38	1.89	.43	2.76
(140)	(162)	(48)	(11)	(70)
D1	**E**	**E1**	**F**	**F1**
3.18	1.04	1.40	1.06	1.02
(81)	(26.5)	(35.5)	(27)	(26)
G	**H**	**H1**	**H2**	**H3**
1.22	1.18	.51	.02	.12
(31)	(30)	(13)	(0.5)	(3)
J	**J1**	**M**	**N**	**N1**
.91	.14	1.18	.55	.04
(23)	(3.5)	(30)	(14)	(1)
P	**P1**			
Ø .27	Ø .17			
Ø (6.9)	Ø (4.4)			

Inches (mm)

P2LCX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold

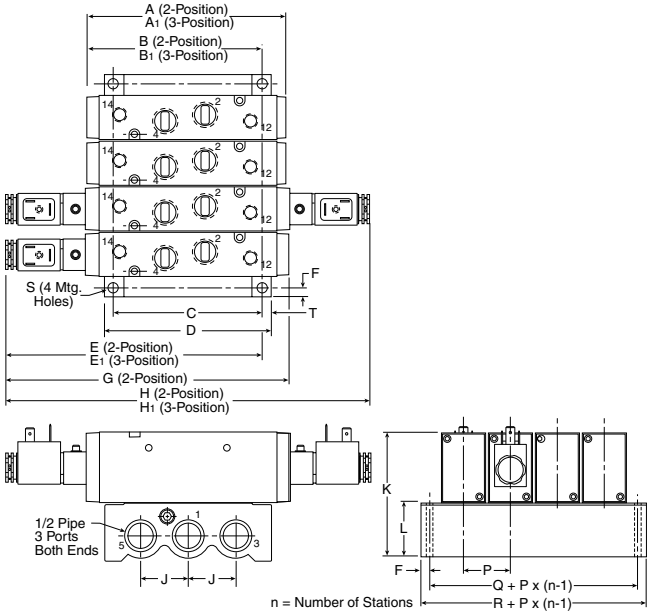


P2LCX 3/2
IEM Aluminum bar manifold

A	B	C	D	E
5.51	4.96	3.94	4.41	7.11
(140)	(126)	(100)	(112)	(180.5)
F	**G**	**H**	**J**	**K**
.24	7.66	9.80	1.26	3.43
(6)	(194.5)	(249)	(32)	(87)
L	**P**	**Q**	**R**	**S**
1.54	1.24	1.77	2.24	Ø .26
(39)	(31.5)	(45)	(57)	Ø (6.5)
T				
.24				
(6)				

Inches (mm)

P2LCX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold



P2PCX 5/2 & 5/3
IEM Aluminum bar manifold

A	A1	B	B1	C
5.51	6.38	4.72	5.16	3.94
(140)	(162)	(120)	(131)	(100)
D	**E**	**E1**	**F**	**G**
4.41	6.89	7.13	.24	7.68
(112)	(170)	(181)	(6)	(195)
H	**H1**	**J**	**K**	**L**
9.84	10.71	1.26	3.43	1.54
(250)	(272)	(32)	(87)	(39)
P	**Q**	**R**	**S**	**T**
1.24	1.77	2.24	Ø .26	.24
(31.5)	(45)	(57)	Ø (6.5)	(6)

Inches (mm)

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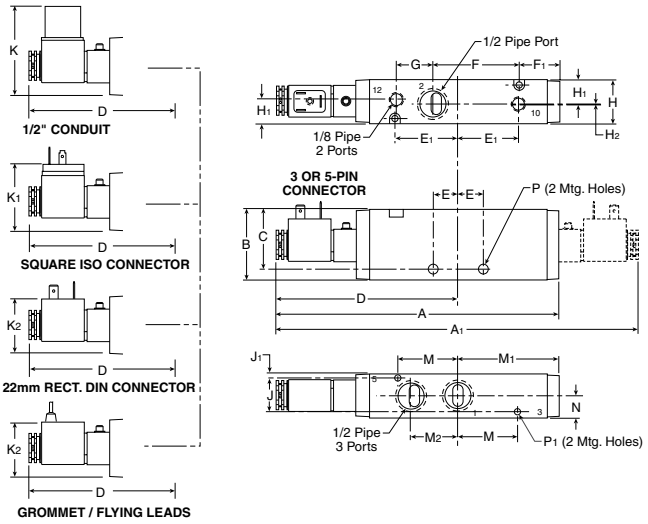
P2LDX 3/2 Single & Double Operators – Solenoid

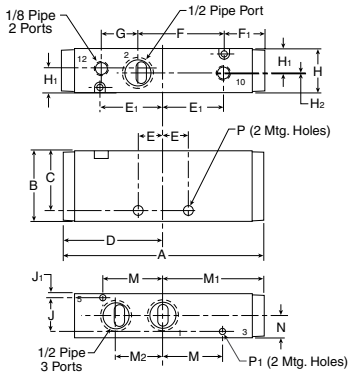


P2LDX 3/2 (solenoid)

A	A1	B	C	D
7.66	9.80	1.89	1.59	4.90
(194.5)	(249)	(48)	(40.5)	(124.5)
E	**E1**	**F**	**F1**	**G**
.67	1.65	2.36	1.08	.98
(17)	(42)	(60)	(27.5)	(25)
H	**H1**	**H2**	**J**	**J1**
1.18	.67	.02	.91	.14
(30)	(17)	(0.5)	(23)	(3.5)
K	**K1**	**K2**	**M**	**M1**
2.52	1.77	1.65	1.65	2.76
(64)	(45)	(42)	(42)	(70)
M2	**N**	**P**	**P1**	
1.30	.59	Ø .26	Ø .17	
(33)	(15)	Ø (6.6)	Ø (4.4)	

Inches (mm)

P2LDX 3/2 Single & Double Operators – Remote Pilot

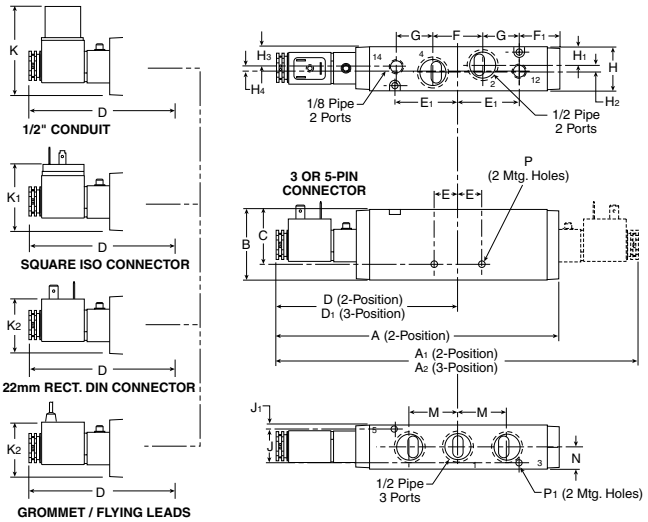


P2LDX 3/2 (remote)

A	B	C	D	E
5.51	1.89	1.59	2.76	.67
(140)	(48)	(40.5)	(70)	(17)
E1	**F**	**F1**	**G**	**H**
1.65	2.36	1.08	.98	1.18
(42)	(60)	(27.5)	(25)	(30)
H1	**H2**	**J**	**J1**	**M**
.67	.02	.91	.14	1.65
(17)	(0.5)	(23)	(3.5)	(42)
M1	**M2**	**N**	**P**	**P1**
2.76	1.30	.59	Ø .26	Ø .17
(70)	(33)	(15)	Ø (6.6)	Ø (4.4)

Inches (mm)

P2LDX 5/2 & 5/3 Single & Double Operators – Solenoid



P2LDX 5/2 & 5/3 (solenoid)

A	A1	A2	B	C
7.67	9.84	10.7	1.89	1.59
(195)	(250)	(272)	(48)	(40.5)
D	**D1**	**E**	**E1**	**F**
4.92	5.79	.67	1.65	1.34
(125)	(147)	(17)	(42)	(34)
F1	**G**	**H**	**H1**	**H2**
1.10	.98	1.18	.49	.20
(28)	(25)	(30)	(12.5)	(5)
H3	**H4**	**J**	**J1**	**K**
.51	.16	.91	.14	2.52
(13)	(4)	(23)	(3.5)	(64)
K1	**K2**	**M**	**N**	**P**
1.77	1.65	1.30	.59	Ø .26
(45)	(42)	(33)	(15)	Ø (6.6)

P1
Ø .17
Ø (4.4)

Inches (mm)

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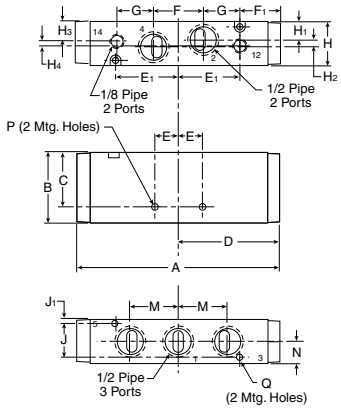
P2LDX 5/2 & 5/3 Single & Double Operators – Remote Pilot



P2LDX 5/2 & 5/3 (remote)

A	B	C	D	E
5.47	1.89	1.59	2.63	.67
(139)	(48)	(40.5)	(67)	(17)
E_1	**F**	**F_1**	**G**	**H**
1.65	1.34	1.08	.98	1.18
(42)	(34)	(27.5)	(25)	(30)
H_1	**H_2**	**H_3**	**H_4**	**J**
.49	.20	.51	.16	.91
(12.5)	(5)	(13)	(4)	(23)
J_1	**P**	**M**	**N**	**Q**
.14	Ø .26	1.29	.59	Ø .17
(3.5)	Ø (6.6)	(32.7)	(15)	Ø (4.4)

Inches (mm)

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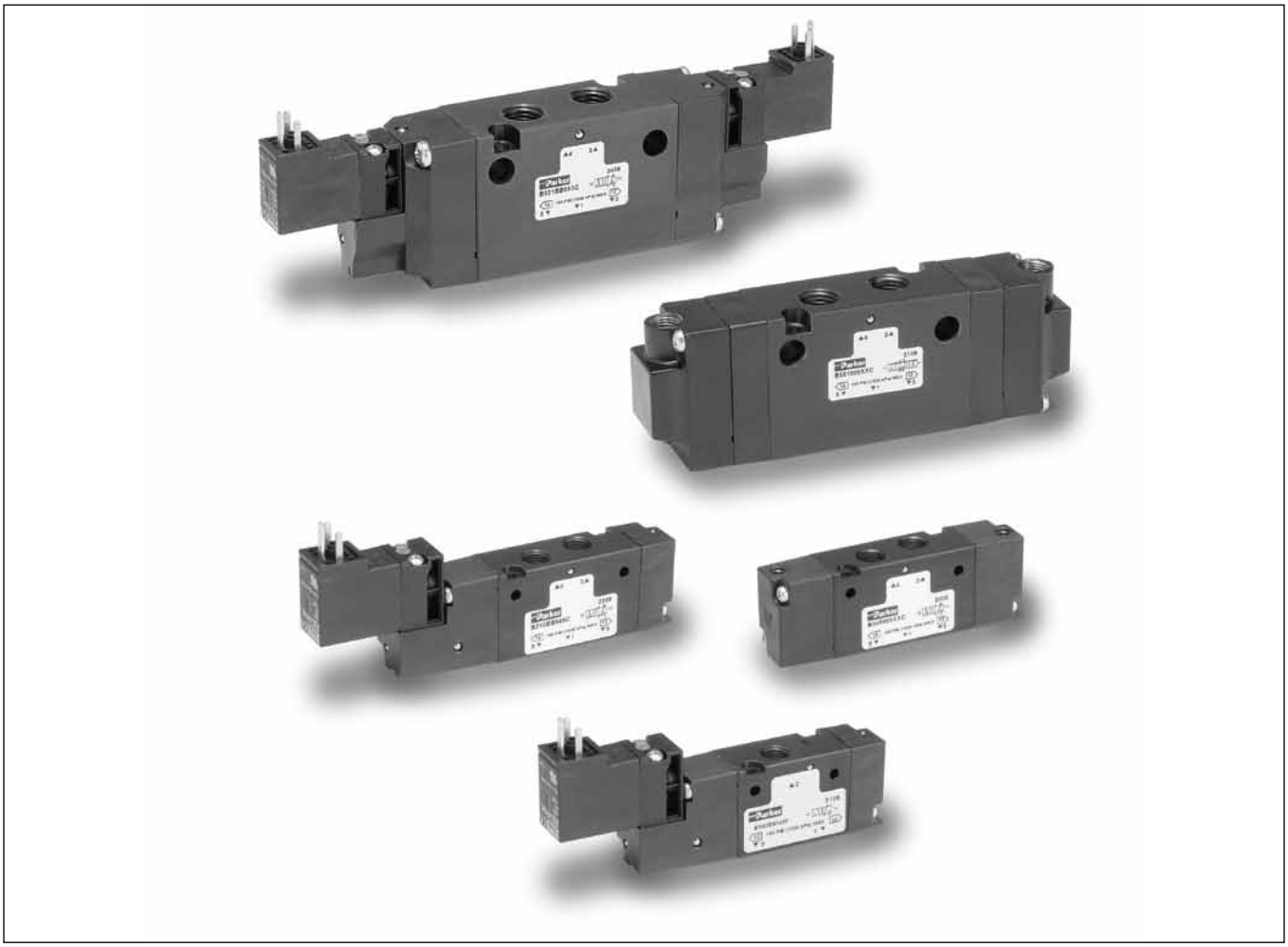
"B" Series

Air Control Valves

B3 – .75 Cv 1/8", 1/4" Port
B5 – 1.40 Cv 1/4", 3/8" Port
B6 – 2.70 Cv 3/8" Port
B7 – 5.90 Cv 1/2" Port
B8 – 7.00 Cv 3/4" Port

Section D
www.parker.com/pneu/b



BOLD ITEMS ARE MOST POPULAR.

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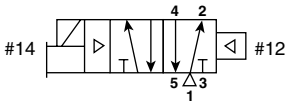
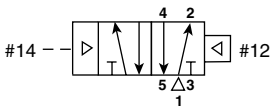
Single Solenoid
4-Way, 2-Position



De-energized position – Solenoid operator #14 de-energized. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Energized position – Solenoid operator #14 energized. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

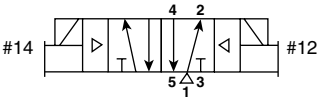
Single Remote Pilot
4-Way, 2-Position



Normal position – Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Operated position – Maintained air signal at port 14. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

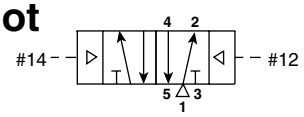
Double Solenoid
4-Way, 2-Position



Solenoid operator #14 energized last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

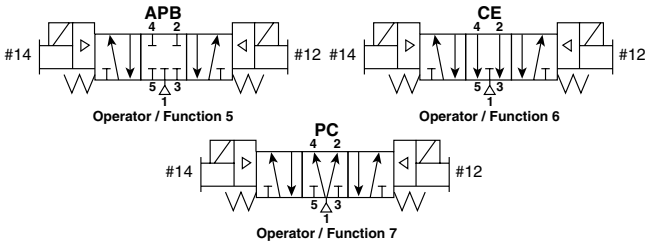
Double Remote Pilot
4-Way, 2-Position



Momentary air signal at port 14 last. Pressure at inlet port 1 connected to outlet port 4. Outlet port 2 connected to exhaust port 3.

Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2. Outlet port 4 connected to exhaust port 5.

Double Solenoid
4-Way, 3-Position



With #12 operator energized – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

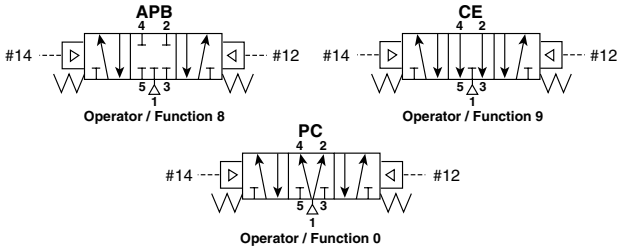
With #14 operator energized – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

Function 5: All Ports Blocked
All ports blocked in the center position.

Function 6: Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Function 7: Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Double Remote Pilot
4-Way, 3-Position



With #12 operator signaled – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With #14 operator signaled – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

Function 8: All Ports Blocked
All ports blocked in the center position.

Function 9: Center Exhaust
Cylinder ports 2 and 4 connected to exhaust ports 3 and 5 in center position. Port 1 is blocked.

Function 0: Pressure Center
Pressure port 1 connected to cylinder ports 2 and 4, and exhaust ports 3 and 5 blocked in center position.

Dual Pressure:
May be used for dual pressure service with pressure at ports 3 & 5. (Use either external pilot source option "K", "W" or "X", or dual pressure pilot source option "D" or "E".) If pilot source "D" or "E" is selected. the high pressure must be at port #3. If pilot source "K", "W" or "X" is selected, the external pilot must be plumbed to port #14 or "X" respectively. NOTE: The "B6" valve is also available with dual pressure using Port 5 for high pressure (Option "G" & "H"). This is only to be used if converting from a "42" ("CM") Series traditional valve.

In the 3-Position valve, the effect of dual pressure is extremely important when the valve is in the center position, as the CE and PC functions are reversed. Therefore, care should be used when selecting a 3-Position valve.

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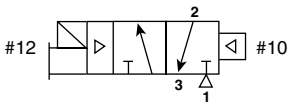
Single Solenoid
3-Way, 2-Position
NC (NNP)

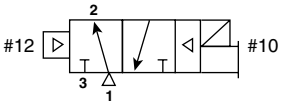


Normally Closed:

De-energized position – Solenoid #12 de-energized. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Energized position – Solenoid #12 energized. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Single Solenoid
3-Way, 2-Position
NO (NP)

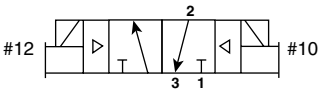


Normally Open:

De-energized position – Solenoid #10 de-energized. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Energized position – Solenoid #10 energized. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

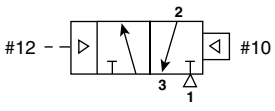
Double Solenoid
3-Way, 2-Position



Solenoid operator #12 energized last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Solenoid operator #10 energized last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Single Remote Pilot
3-Way, 2-Position
NC (NNP)

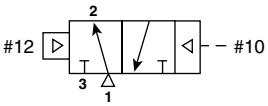


Normally Closed:

Normal position – Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Operated position – Maintained air signal at port 12. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Single Remote Pilot
3-Way, 2-Position
NO (NP)

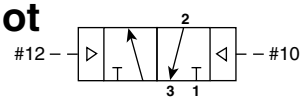


Normally Open:

Normal position – Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Operated position – Maintained air signal at port 10. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

Double Remote Pilot
3-Way, 2-Position



Momentary air signal at port 12 last. Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Momentary air signal at port 10 last. Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

3-Way Configuration

B6, B7, B8:
Looking at the #1 and #3 ports, the solenoid (or remote operator) is always on the #3 port end. Different spools are used for NO and NC functions.

B3, B5:
Looking at the #1 and #3 ports, the solenoid (or remote operator) is on the #3 port end for NC and the #1 port end for NO. The same spool is used for both.

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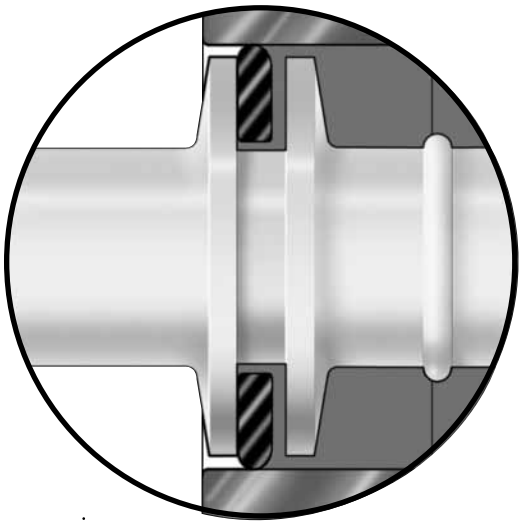
WCS

*W*ear *C*ompensation *S*ystem



- **Maximum Performance**
  - Low Friction - Lower Operating Pressures
  - Fast Response - Less Wear
- **Long Cycle Life** - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore.
- **Non-Lube Service** - No lubrication required for continuous valve shifting.
- **Bi-Directional Spool Seals** - Common spool used for any pressure, including vacuum.

Refer to www.parker.com/pneu/b
Click on Catalog B Series-E/USA

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"B" Series

Flow Characteristics

- B3: .75 Cv
- B5: 1.40 Cv
- B6: 2.50 Cv
- B7: 5.90 Cv
- B8: 7.00 Cv

Operating Pressure

- Vacuum to 145 PSIG

Ports

- B3: 1/8, 1/4 Inch
- B5: 1/4, 3/8 Inch
- B6: 3/8 Inch
- B7: 1/2 Inch
- B8: 3/4 Inch

Mounting

- Inline
- Subbase
- IEM Stackable Base
- IEM Aluminum Bar
- 5-Port Subbase Aluminum Bar

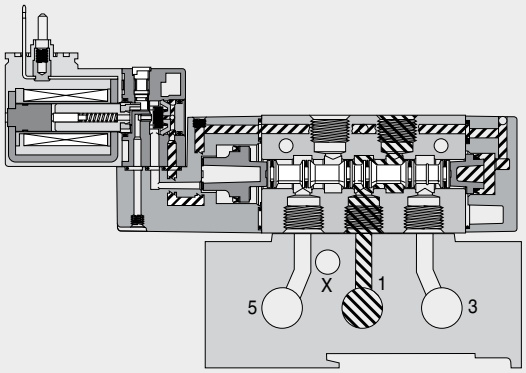
Solenoids

- 1.2 Watt – 15mm 3-Pin (EN 175301-803)
- 2.5 to 7.3 Watt – Conduit, Grommet, 22mm & 30mm 3-Pin DIN (43650)
- 12VDC to 240VAC
- Female DIN Electrical Connectors

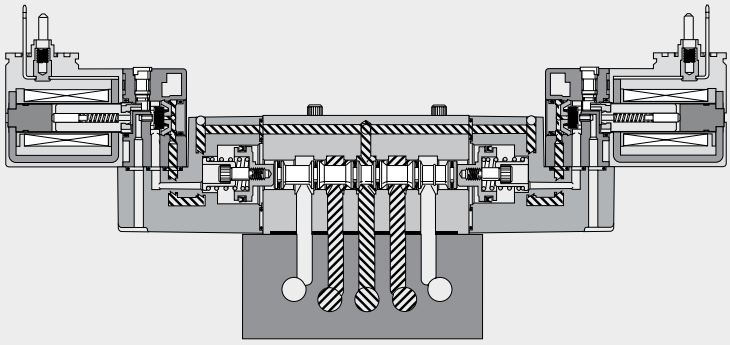
Certification / Approval

- Approved to be CE marked
- IP65 Rated
- CSA C/US*

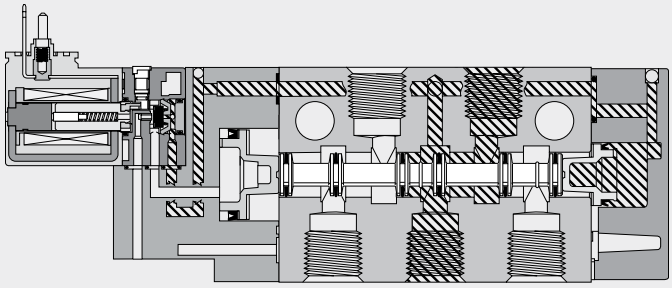
* See catalog technical section for more information.



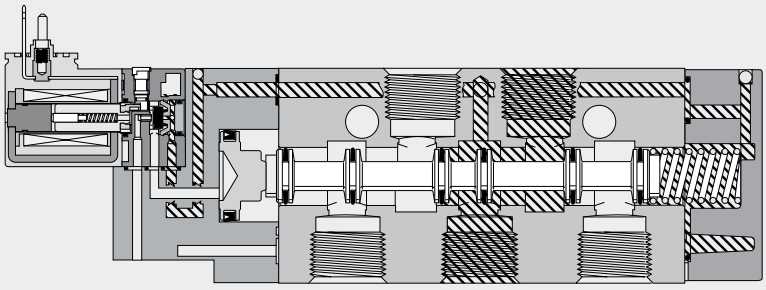
B3 Single Solenoid IEM Aluminum Bar Manifold
Shown De-Energized



B3 Double Solenoid 3-Position Subbase Mounted
Shown De-Energized



B5 Single Solenoid Inline - Air Return
Shown De-Energized



B6, B7 & B8 Single Solenoid Inline - Spring / Air Return
Shown De-Energized

Pressure **Exhaust**

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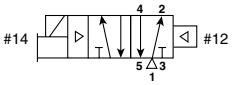
Single Solenoid
4-Way, 2-Position



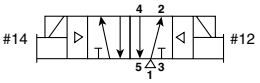
Inline

B3	**B310BB553C** **B310BB549C**	120VAC 24VDC	1/8"	0.75 Cv
B5	**B511BB553C** **B511BB549C**	120VAC 24VDC	1/4"	1.4 Cv
	B512BB553C **B512BB549C**	120VAC 24VDC	3/8"	
B6	**B612BB553A** **B612BB549A**	120VAC 24VDC	3/8"	2.7 Cv
B7	**B713BB553A** **B713BB549A**	120VAC 24VDC	1/2"	5.9 Cv
B8	**B814BB553A** **B814BB549A**	120VAC 24VDC	3/4"	7.0 Cv

Subbase

B3	**B31VBB553C** **B31VBB549C**	120VAC 24VDC	Less Base	0.65 Cv

Double Solenoid
4-Way, 2-Position



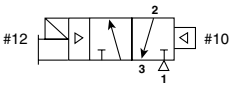
Inline

B3	**B320BB553C** **B320BB549C**	120VAC 24VDC	1/8"	0.75 Cv
B5	**B521BB553C** **B521BB549C**	120VAC 24VDC	1/4"	1.4 Cv
	B522BB553C **B522BB549C**	120VAC 24VDC	3/8"	
B6	**B622BB553A** **B622BB549A**	120VAC 24VDC	3/8"	2.7 Cv
B7	**B723BB553A** **B723BB549A**	120VAC 24VDC	1/2"	5.9 Cv
B8	**B824BB553A** **B824BB549A**	120VAC 24VDC	3/4"	7.0 Cv

Subbase

B3	**B32VBB553C** **B32VBB549C**	120VAC 24VDC	Less Base	0.65 Cv

Single Solenoid
3-Way, 2-Position, NC

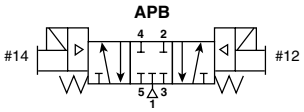


Inline

B3	**B3G0BB553C** **B3G0BB549C**	120VAC 24VDC	1/8"	0.75 Cv
B5	**B5G1BB553C** **B5G1BB549C**	120VAC 24VDC	1/4"	1.4 Cv
	B5G2BB553C **B5G2BB549C**	120VAC 24VDC	3/8"	
B6	**B6V2BB553A** **B6V2BB549A**	120VAC 24VDC	3/8"	2.7 Cv
B7	**B7V3BB553A** **B7V3BB549A**	120VAC 24VDC	1/2"	5.9 Cv
B8	**B8V4BB553A** **B8V4BB549A**	120VAC 24VDC	3/4"	7.0 Cv

3-Pin DIN 43650C Electrical Connection.
Non-Locking Flush Override.

Double Solenoid
4-Way, 3-Position, APB



Inline

B3	**B350BB553C** **B350BB549C**	120VAC 24VDC	1/8"	0.60 Cv
B5	**B551BB553C** **B551BB549C**	120VAC 24VDC	1/4"	1.1 Cv
	B552BB553C **B552BB549C**	120VAC 24VDC	3/8"	
B6	**B652BB553A** **B652BB549A**	120VAC 24VDC	3/8"	2.1 Cv
B7	**B753BB553A** **B753BB549A**	120VAC 24VDC	1/2"	5.7 Cv
B8	**B854BB553A** **B854BB549A**	120VAC 24VDC	3/4"	6.6 Cv

Subbase

B3	**B35VBB553C** **B35VBB549C**	120VAC 24VDC	Less Base	0.50 Cv

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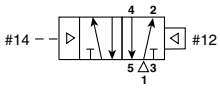
Single Remote Pilot
4-Way, 2-Position



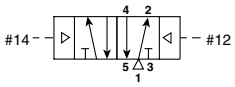
Inline

B3	**B330000XXC**	1/8"	0.75 Cv
B5	**B531000XXC**	1/4"	1.4 Cv
	B532000XXC	3/8"	
B6	**B632000XXA**	3/8"	2.7 Cv
B7	**B733000XXA**	1/2"	5.9 Cv
B8	**B834000XXA**	3/4"	7.0 Cv

Subbase

B3	**B33V000XXC**	Less Base	0.65 Cv

Double Remote Pilot
4-Way, 2-Position



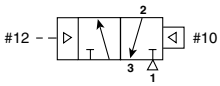
Inline

B3	**B340000XXC**	1/8"	0.75 Cv
B5	**B541000XXC**	1/4"	1.4 Cv
	B542000XXC	3/8"	
B6	**B642000XXA**	3/8"	2.7 Cv
B7	**B743000XXA**	1/2"	5.9 Cv
B8	**B844000XXA**	3/4"	7.0 Cv

Subbase

B3	**B34V000XXC**	Less Base	0.65 Cv

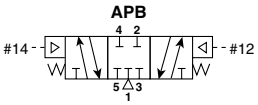
Single Remote Pilot
3-Way, 2-Position, NC



Inline

B3	**B3K0000XXC**	1/8"	0.75 Cv
B5	**B5K1000XXC**	1/4"	1.4 Cv
	B5K2000XXC	3/8"	
B6	**B6X2000XXA**	3/8"	2.7 Cv
B7	**B7X3000XXA**	1/2"	5.9 Cv
B8	**B8X4000XXA**	3/4"	7.0 Cv

Double Remote Pilot
4-Way, 3-Position, APB



Inline

B3	**B380000XXC**	1/8"	0.60 Cv
B5	**B581000XXC**	1/4"	1.1 Cv
	B582000XXC	3/8"	
B6	**B682000XXA**	3/8"	2.1 Cv
B7	**B783000XXA**	1/2"	5.7 Cv
B8	**B884000XXA**	3/4"	6.6 Cv

Subbase

B3	**B38V000XXC**	Less Base	0.50 Cv

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B3 Series

BOLD OPTIONS ARE MOST POPULAR.

B3 1 0 B B 5 49 – C

Basic Series	
B3 Series	B3

Engineering Level	
C	Current

Operator Function	
3-Way	
Single Solenoid, 2-Position NC - Air Return	**G**
Single Solenoid, 2-Position NO - Air Return	H
Double Solenoid, 2-Position	J
Single Remote Pilot, 2-Position NC - Air Return	**K**
Single Remote Pilot, 2-Position NO - Air Return	L
Double Remote Pilot, 2-Position	M
Single Solenoid, 2-Position NC - Air Return / Spring Assist	V
Single Solenoid, 2-Position NO - Air Return / Spring Assist	W
Single Remote Pilot, 2-Position NC - Air Return / Spring Assist	X
Single Remote Pilot, 2-Position NO - Air Return / Spring Assist	Y
4-Way	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	**3**
Double Remote Pilot, 2-Position	**4**
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	6
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	**8**
Double Remote Pilot, 3-Position - CE	9
Double Remote Pilot, 3-Position - PC	0
Single Solenoid, 2-Position - Air Return / Spring Assist	E
Single Remote Pilot, 2-Position - Air Return / Spring Assist	F

Options	
Blank	**None**
02	Solenoid Rotated 180° - Pins Down

Voltage§	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote Pilot - M5 or Valve Less 15mm Solenoid**		
YY	Remote Pilot - 5/32" (4mm) Tube		

Enclosure / Lead Length	
0	None, Remote Pilot Valve
5	**15mm 3-Pin DIN 43650C (Male Only)**
X	Valve Less 15mm Solenoid

Overrides§	
0	**None, Remote Pilot Valve**
B	**Flush - Non-Locking**
C	**Flush - Locking**
D	Extended - Non-Locking
E	Extended - Locking
X	Valve Less 15mm Solenoid

Port Size / Thread Type	
3-Way	
1/8" NPT Inline	**0***
1/8" BSPP "G" Inline	5*
4-Way	
1/8" NPT Inline	**0***
1/8" BSPP "G" Inline	5*
1/4" NPT Subbase	H‡
1/8" NPT Face Mount	T**
Subbase Valve Less Base	**V‡**

* Available for use on IEM Manifolds.
** 4-Way only.
‡ Subbase valves available for 4-Way valves only.

Pilot Source / Pilot Exhaust	
0	**None, Remote Pilot Valve**
B†	**Internal - Port #1 / Vented**
E*	Dual Pressure - Port #3 / Vented
K†	External - Body / Tapped M5
X‡	External - Manifold / Vented

* Not available for 3-Way Valves.
† Not available for Remote Pilot Valves.
‡ See Pilot Source Note below.

§ Enclosure '5' – Override / Voltage Availability
S - Standard
O - Option

Voltage Code	Override Code			
	Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage Code	"02" Option			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Pilot Source 'X'
External-Manifold / Vented

INLINE & SUBBASE Valves –
Only used IF an IEM or 5-Ported Subbase Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications OR when used with Sandwich Regulators.

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B5 Series

BOLD OPTIONS ARE MOST POPULAR.

B5 1 1 B B 5 49 – C

Basic Series	
B5 Series	**B5**

Engineering Level	
C	**Current**

Operator Function	
3-Way	
Single Solenoid, 2-Position NC - Air Return	**G**
Single Solenoid, 2-Position NO - Air Return	H
Double Solenoid, 2-Position	J
Single Remote Pilot, 2-Position NC - Air Return	**K***
Single Remote Pilot, 2-Position NO - Air Return	L*
Double Remote Pilot, 2-Position	M*
Single Solenoid, 2-Position NC - Air Return / Spring Assist	V
Single Solenoid, 2-Position NO - Air Return / Spring Assist	W
Single Remote Pilot, 2-Position NC - Air Return / Spring Assist	X*
Single Remote Pilot, 2-Position NO - Air Return / Spring Assist	Y*
4-Way	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	**3***
Double Remote Pilot, 2-Position	**4***
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	6
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	**8***
Double Remote Pilot, 3-Position - CE	9*
Double Remote Pilot, 3-Position - PC	0*
Single Solenoid, 2-Position - Air Return / Spring Assist	E
Single Remote Pilot, 2-Position - Air Return / Spring Assist	F*

* Pilot Source / Pilot Exhaust, Override, and Enclosure must be "0".

Options	
Blank	**None**
02	Solenoid Rotated 180° - Pins Down
MD††	Manual Detent
V0*	Fluorocarbon Seals

* Not available with Enclosure "0", "5", "X", "E" or "F".
†† Only Available with Operator Function 1 & 3 and Enclosure "N", "X" or Mobile Voltages upon Request.

Voltage§			
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote Pilot - M5 or Valve Less Solenoid**		
YY	Remote Pilot - 5/32" (4mm) Tube		

Enclosure / Lead Length	
0	None, Remote Pilot Valve
5	**15mm 3-Pin DIN 43650C (Male Only)**
A	30mm Square 3-Pin – ISO 4400 Form A (Male Only)
B	22mm Rectangular 3-Pin – Type B Industrial (Male Only)
C	3-Pin Automotive - Mini
D	5-Pin Automotive - Mini
E*	Intrinsically Safe - 30mm 3-Pin
F**	Hazardous Duty 1/2" NPT Conduit - 18" Leads
G	**Grommet - 18" Leads**
H	**1/2" NPT Conduit - 18" Leads**
N	Valve Less "A - R" Coil
Q	Grommet - 72" Leads
R	1/2" NPT Conduit - 72" Leads
X	Valve Less 15mm Solenoid

* 24 VDC & Override "A" Only.
** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Port Size / Thread Type	
3-Way	
1/4" NPT Inline	**1***
3/8" NPT Inline	**2***
1/4" BSPP "G" Inline	6*
3/8" BSPP "G" Inline	7*
4-Way	
1/4" NPT Inline	**1***
3/8" NPT Inline	**2***
1/4" BSPP "G" Inline	6*
3/8" BSPP "G" Inline	7*
3/8" NPT Subbase	J†
1/4" NPT NAMUR Mount	T‡†
Subbase Valve Less Base - NPT	V‡
1/4" BSPP "G" NAMUR Mount	W‡†

* Available for use on IEM Manifolds.
† 4-Way only.
‡ Available with pilot source "0", "A", and "B" only.

Pilot Source / Pilot Exhaust	
Enclosures "0, 5 & X"	
None, Remote Pilot Valve	0
Internal - Port #1 / Tapped M5	A†
Internal - Port #1 / Vented	**B†**
Dual Pressure - Port #3 / Vented	E*
External - Body / Tapped M5	K†
External - Manifold / Vented	X‡
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / Tapped M5	**A†**
Internal - Port #1 / Vented	**B†**
Dual Pressure - Port #3 / Tapped M5	D*†
External - Body / Tapped 1/8"	K†

* Not available for 3-Way Valves.
† Not available for Remote Pilot Valves.
‡ See Pilot Source Note below.

Overrides§	
None. Remote Pilot Valve	**0**
No Override	A†
Flush - Non-Locking	**B***
Flush - Locking	**C**
Extended - Non-Locking	D
Extended - Locking	E*
Valve Less 15mm Solenoid	X

* Only Available with Encl. "5".
† Only Available with Encl. "E".

Pilot Source 'X'
External-Manifold / Vented or Tapped M5

INLINE & SUBBASE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

Note: For Mobile Voltages, Contact the Application Team.

§ Enclosure '5' – Override / Voltage Availability
S - Standard
O - Option

Voltage Code	Override Code Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage Code	Override Code "02" Option			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

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B6 Series

BOLD OPTIONS ARE MOST POPULAR.

B6 1 2 B B 5 49 – A

Basic Series	
B6 Series	B6

Engineering Level	
A	Current

Operator Function	
3-Way	
Single Solenoid, 2-Position NC - Air Return / Spring Assist	V
Single Solenoid, 2-Position NO - Air Return / Spring Assist	W
Single Remote Pilot, 2-Position NC - Air Return / Spring Assist	X
Single Remote Pilot, 2-Position NO - Air Return / Spring Assist	Y
4-Way	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	**3**
Double Remote Pilot, 2-Position	**4**
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	6
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	**8**
Double Remote Pilot, 3-Position - CE	9
Double Remote Pilot, 3-Position - PC	0
Single Solenoid, 2-Position - Air Return / Spring Assist	E
Single Remote Pilot, 2-Position - Air Return / Spring Assist	F

Options	
Blank	**None**
02	Solenoid Rotated 180° - Pins Down
42*	Series Cylinder Mount Replacement

* Only Available with Port Size "T" and "0", "A" and "B" Pilot Source.

	Voltage§		
	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote Pilot - M5 or Valve Less 15mm Solenoid**		
YY	Remote Pilot - 5/32" (4mm) Tube		

Enclosure / Lead Length	
0	None, Remote Pilot Valve
5	**15mm 3-Pin DIN 43650C (Male Only)**
A	30mm Square 3-Pin – ISO 4400 Form A (Male Only)
B	22mm Rectangular 3-Pin – Type B Industrial (Male Only)
E*	Intrinsically Safe - 30mm 3-Pin
F**	Hazardous Duty 1/2" NPT Conduit - 18" Leads
G	**Grommet - 18" Leads**
H	**1/2" NPT Conduit - 18" Leads**
N	Valve Less "A - R" Coil
Q	Grommet - 72" Leads
R	1/2" NPT Conduit - 72" Leads
X	Valve Less 15mm Solenoid

* 24 VDC & Override "A" Only.
** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

Port Size / Thread Type	
3-Way / 4-Way	
3/8" NPT Inline	**2***
3/8" BSPP "G" Inline	7*
1/4" NPT NAMUR Mount	T†

* Available for use on IEM Manifolds.
† 4-Way only. Available with pilot source "0", "A" and "B" only.

Pilot Source / Pilot Exhaust	
Enclosures "0, 5 & X"	
None. Remote Pilot Valve	0
Internal - Port #1 / Tapped M5	A†
Internal - Port #1 / Vented	**B†**
Dual Pressure - Port #5 / Vented	H*
External - Body / Tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / Tapped M5	**A†**
Internal - Port #1 / Vented	**B†**
External - Body / Tapped 1/8"	K†

* Not available for 3-Way Valves.
† Not available for Remote Pilot Valves.

Overrides§	
None, Remote Pilot Valve	**0**
No Override	A†
Flush - Non-Locking	**B***
Flush - Locking	**C**
Extended - Non-Locking	D
Extended - Locking	E*
Valve Less 15mm Solenoid	X

* Only Available with Encl. "5".
† Only Available with Encl. "E".

INLINE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

§ Enclosure '5' – Override / Voltage Availability
S - Standard
O - Option

Voltage Code	Override Code Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

Voltage Code	Override Code "02" Option			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

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B7 & B8 Series

BOLD OPTIONS ARE MOST POPULAR.

B7 1 3 A B G 53 – A

Basic Series	
B7 Series	**B7**
B8 Series	**B8**

Engineering Level	
A	**Current**

Options	
Blank	**None**

Operator Function	
3-Way	
Single Solenoid, 2-Position NC - Air Return / Spring Assist	V
Single Solenoid, 2-Position NO - Air Return / Spring Assist	W
Single Remote Pilot, 2-Position NC - Air Return / Spring Assist	X
Single Remote Pilot, 2-Position NO - Air Return / Spring Assist	Y
4-Way	
Single Solenoid, 2-Position - Air Return	**1**
Double Solenoid, 2-Position	**2**
Single Remote Pilot, 2-Position - Air Return	**3**
Double Remote Pilot, 2-Position	**4**
Double Solenoid, 3-Position - APB	**5**
Double Solenoid, 3-Position - CE	6
Double Solenoid, 3-Position - PC	7
Double Remote Pilot, 3-Position - APB	**8**
Double Remote Pilot, 3-Position - CE	9
Double Remote Pilot, 3-Position - PC	0
Single Solenoid, 2-Position - Air Return / Spring Assist	E
Single Remote Pilot, 2-Position - Air Return / Spring Assist	F

Port Size / Thread Type	
B7 Series	
1/2" NPT Inline	**3***
1/2" BSPP "G" Inline	8*
B8 Series	
3/4" NPT Inline	**4***
3/4" BSPP "G" Inline	9*

* Available for use on IEM Manifolds.

Pilot Source / Pilot Exhaust	
Enclosures "0. 5 & X"	
None. Remote Pilot Valve	0
Internal - Port #1 / Tapped M5	A†
Internal - Port #1 / Vented	**B†**
External - Body / Tapped M5	K†
Enclosures "A, B, C, D, E, F, G, H, N, Q & R"	
Internal - Port #1 / Tapped M5	**A†**
Internal - Port #1 / Vented	**B†**
External - Body / Tapped 1/8"	K†

† Not available for Remote Pilot Valves.

Overrides§	
None, Remote Pilot Valve	**0**
No Override	A†
Flush - Non-Locking	**B***
Flush - Locking	**C**
Extended - Non-Locking	D
Extended - Locking	E*
Valve Less 15mm Solenoid	X

* Only Available with Encl. "5".
† Only Available with Encl. "E".

Voltage§	AC		DC
	60Hz	50Hz	
42	24	22	
45			12
49			**24**
53	**120**	**110**	
57	240	230	
XX	**Remote Pilot - M5 or Valve Less Solenoid**		
YY	Remote Pilot - 5/32" (4mm) Tube		

Enclosure / Lead Length	
0	None, Remote Pilot Valve
5	**15mm 3-Pin DIN 43650C (Male Only)**
A	30mm Square 3-Pin – ISO 4400 Form A (Male Only)
B	22mm Rectangular 3-Pin – Type B Industrial (Male Only)
E*	Intrinsically Safe - 30mm 3-Pin
F**	Hazardous Duty 1/2" NPT Conduit - 18" Leads
G	**Grommet - 18" Leads**
H	**1/2" NPT Conduit - 18" Leads**
N	Valve Less "A - R" Coil
R	1/2" NPT Conduit - 72" Leads
X	Valve Less 15mm Solenoid

* 24 VDC & Override "A" Only.
** 12 VDC, 24 VDC, 120 VAC or 240 VAC.

INLINE Valves –
Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal thru the manifold for low pressure / vacuum applications.

§ Enclosure '5' – Override / Voltage Availability
S - Standard
O - Option

Voltage Code	Override Code			
	Standard			
	B	C	D	E
42	O	O	–	–
45	O	O	–	–
49	S	S	O	O
53	S	S	O	O
57	O	O	–	–

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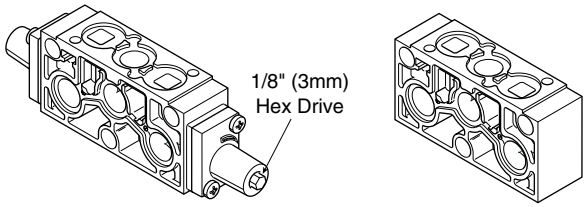
IEM Stackable Manifolds

Series	Type	Kit Number	
		Standard	Flow Control
B3	4-Way	**PS2917P**	**PS2918P**
B5	4-Way	**PS2817P**	**PS2818P**

- Individual Manifold Bases stack together to form lightweight custom length manifold system.
- Easy-to-connect male / female tie rods for modular assembly.
- Utilizes B3 and B5 4-Way Inline Valves.
- Low-cost built-in Flow Controls with heavy-duty brass adjusting needles to control meter-out exhaust flow.
- Accessories include Isolator Plugs for pressure isolation and Universal Blanking Plates for auxiliary inlet and exhaust supply and future valve additions.
- Kit includes: (1) Manifold Base, (2) Hold-down Bolts, Tie-rods, Gaskets and O-rings.

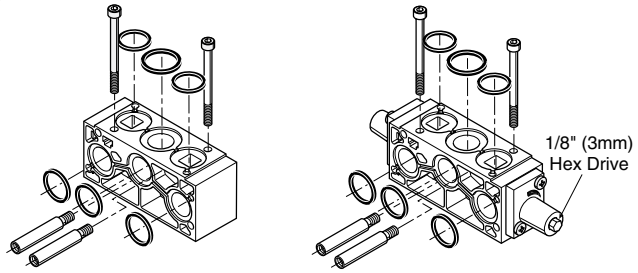
B3



4-Way Manifold with Flow Control

4-Way Manifold

B5



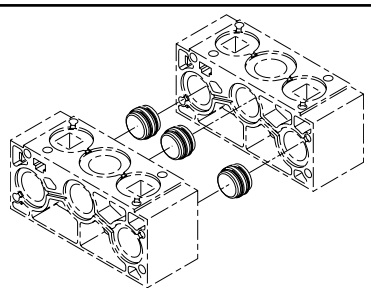
4-Way

4-Way w/ Flow Control

Isolator Plugs

Series	Kit Number
	4-Way
B3	**PS2919P**
B5	**PS2819P**

- Used to isolate the #1, #3 or #5 gallery between two Manifold Bases. (IEM STACKABLE ONLY)
- **Kit includes:** (3) plugs and (6) o-rings



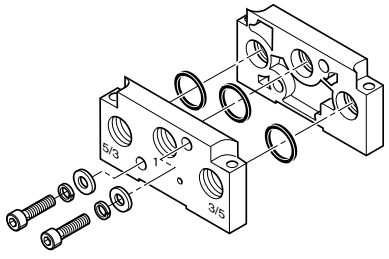
4-Way Isolator Plugs
IEM Stackable

End Plate Kits

Series	Type	Kit Number
		NPT
B3	4-Way	**PS2915P**
B5	4-Way	**PS2815P***

Kit includes: Right and Left End Plate, O-rings, Socket Head Cap Screws, Flat Washers and Lockwashers.

* B5 4-Way use the same Kit.



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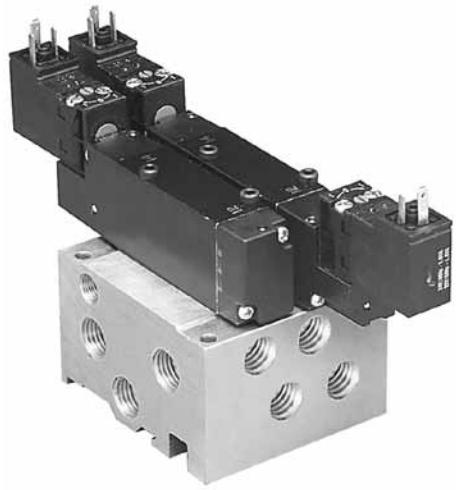
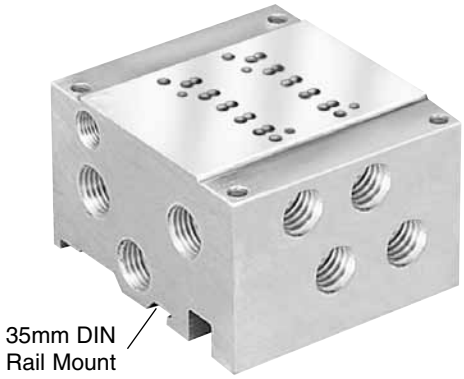
B3 Series



4-Way, 1/8" NPT	**AAPSJ3B1N##NP**	## – stations 02 to 12

B3 Series



4-Way, 1/8" NPT	**PSJ3B1N##NP**	## – stations 02 to 12

- Utilizes Subbase mount B3 valves.
- Available for 4-Way valves. If 3-Way function is required, plug a cylinder port.
- Common External Pilot galley is standard.
- Standard Internal Pilot valves need not use this galley, and the galley does not need to be plugged.
- External Pilot Valves – "X" or "W", must have Common External Galley pressurized.

Kit includes:
Subbase – (1) Manifold (bolts & gasket come with subbase valve).

Assembly Model Number

	PS	J	3	B	1	N	04	N	P

Manifold

Manifold Only	Blank
Manifold with Valves Mounted	AA

Type

4-Way	
Subbase Bottom Port	K
Subbase End Port	J

Series

B3 Series	3

Pilot

External (B3)	B

Cylinder Ports

1	1/8"

Port Type

G	BSPP "G"
N	NPT

Stations

02
•
•
•
12

Options

N	None

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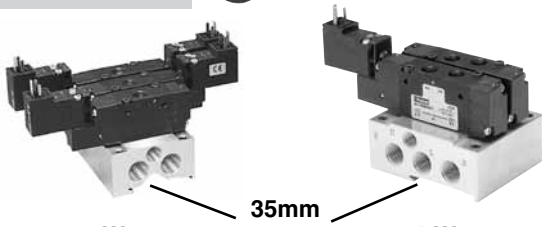
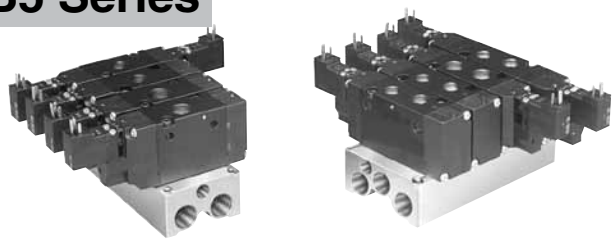
B3 Series



3-Way | 4-Way

3-Way, NPT	**AAPSG3BXN##NP**	## – stations 02 to 12
4-Way, NPT	**AAPSM3BXN##NP**	

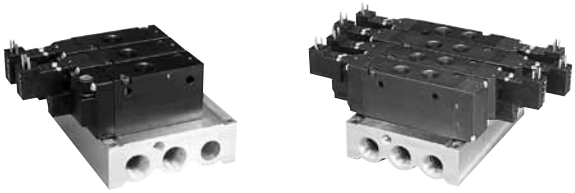
B5 Series



3-Way | 4-Way

3-Way, NPT	**AAPSG5BXN##NP**	## – stations 02 to 12
4-Way, NPT	**AAPSM5BXN##NP**	

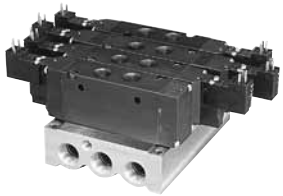
B6 Series



3-Way | 4-Way

3-Way, NPT	**AAPSG6BXN##NP**	## – stations 02 to 12
4-Way, NPT	**AAPSM6BXN##NP**	

B7 & B8 Series



4-Way

4-Way, NPT	**AAPSM7BXN##NP**	## – stations 02 to 12

- Utilizes Inline mount "B" Series valves.
- Different manifold for 3-Way & 4-Way valves (B7 and B8 use common manifolds).
- Common External Pilot galley is standard. Standard Internal Pilot valves need not use this galley. This galley does not require a plug for internally piloted valves.
- External Pilot Valves – "X" or "W", must have Common External Galley pressurized.
- **Kits (PS....) include:** (1) Manifold, Valve Hold Down Bolts, Gaskets.

IEM Bar Manifold Model Number

	PS	M	5	B	X	N	04	N	P

Manifold

Manifold Only	Blank
Manifold with Valves Mounted	AA

Type

IEM 3-Way	G*
IEM 4-Way	M

* Not available with B7 or B8.

Series

B3 Series	3
B5 Series	5
B6 Series	6
B7 / B8 Series	7

Pilot

External	B

Cylinder Ports

X	IEM Manifold

Port Type

G	BSPP "G"
N	NPT

Stations

02
•
•
•
12

Options

N	None

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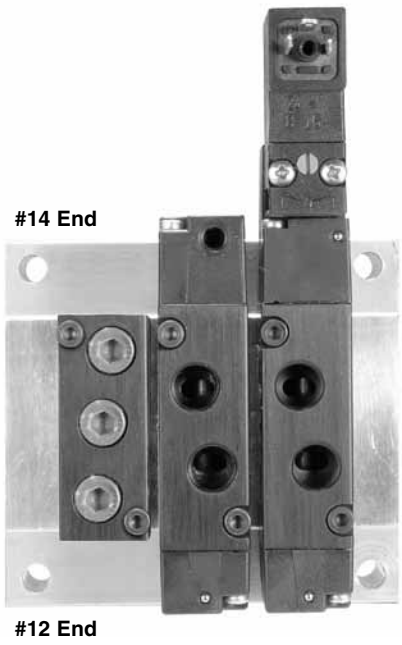

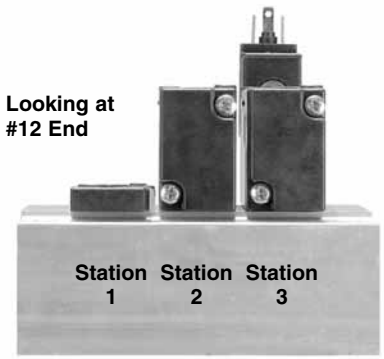

How To Order Aluminum Bar Manifold Assemblies

1. List Manifold Assembly call out. Use AA + the part number of the aluminum bar manifold. This automatically includes the aluminum bar manifold and assembly.

2. List complete valve model number, listing left to right, LOOKING AT THE #12 END of the manifold. The left most station is station 1.

(If a blank station is needed, list the blanking plate part number at the desired station.)

AA PS***##NP**

Use Aluminum Bar Manifold Kit Numbers from previous pages.

AA Manifold Assembly

Example: Application requires a 3-station "B3" 4-Way manifold with station #1 blanked off with valves assembled.

Qty.	Part No.	Comment
1	AAPSM3BXN03NP	
1	PS2920P	Station 1
1	B330000XXC	Station 2
1	B310BB549C	Station 3

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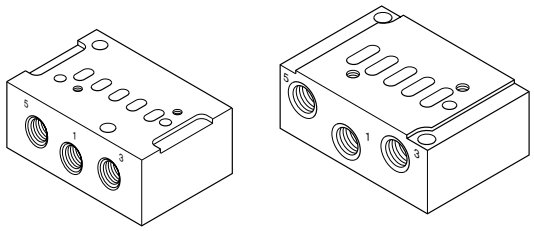
Subbase

Type		Size	Kit Number
			NPT
B3	4-Way	1/4"	PS2934P
B5	4-Way	3/8"	PS2834P

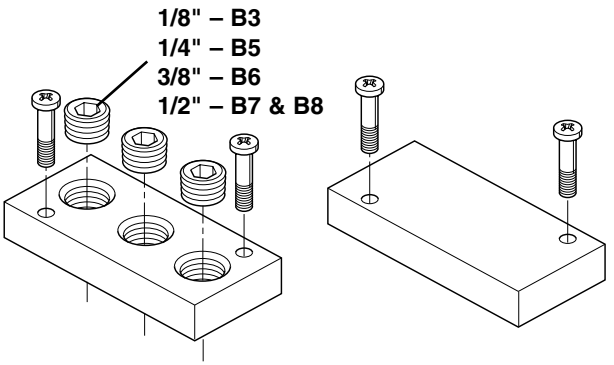
Kit includes: (1) subbase.
(Hold down bolts & gasket are included with valve.)



Blanking Plate

Type		Kit Number			
		IEM Universal		IEM	Subbase
		NPT	BSPP "G"	Blank	Blank
B3	3-Way	PS2966P	PS2967P	PS2968P	—
	4-Way	PS2920P	PS2921P	PS2969P	PS2994P
B5	3-Way	PS2866P	PS2867P	PS2868P	—
	4-Way	PS2820P	—	PS2869P	—
B6	3-Way 4-Way	PS2620P	—	—	—
B7 B8	4-Way	PS2520P	—	PS2569P	—

Kit includes:
(1) Plate, (2) Screws, Seal / Gaskets

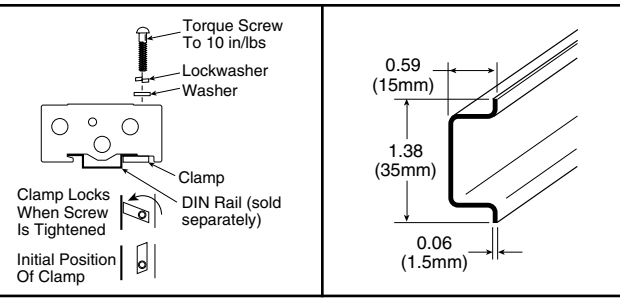


DIN Rail Hardware Kits

Series	Length	Part Number
B3	6 Feet	AM1DE200

Series	IEM Bar	5-Port Subbase Bar
B3	PS2990P	PS2991P

Kit includes: (2) Screws, (2) Nuts, (2) Clamps



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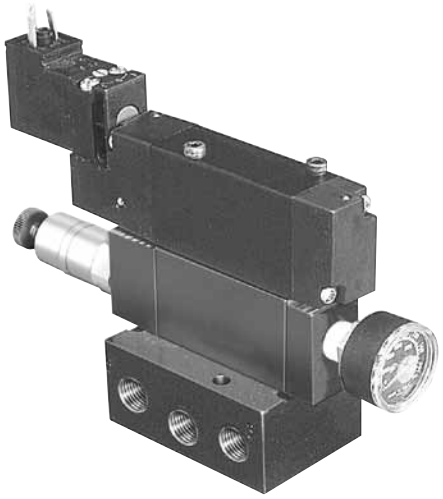
B3 Series



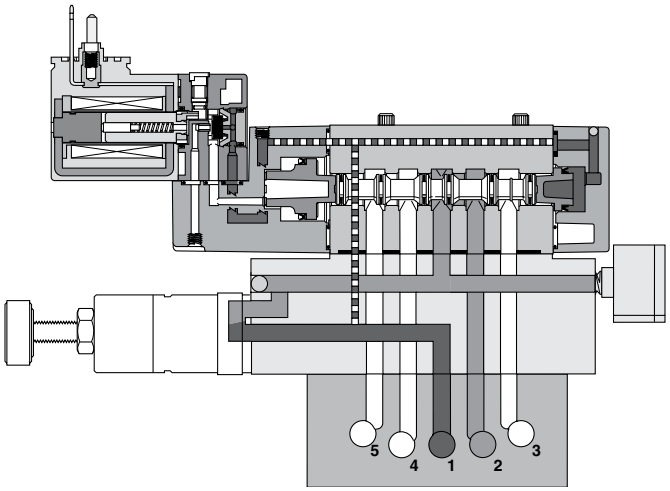
Sandwich Regulators

- Use with B3 Subbase Valves on 5-Ported Subbase Bar Manifolds.
- Common Port or Dual Port regulation control.
- Unregulated Pressure Supplied to Valve Pilot - Use Pilot Source - 'X'.
- Easy adjust knob control.

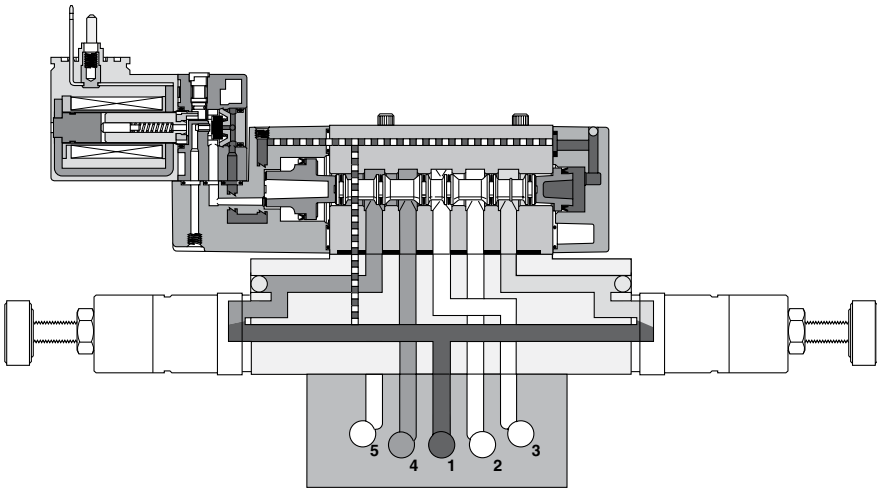
	Common Port with Gauge *	Dual Port without Gauge	Cv
B3 5-125 PSI	PS2930166P	PS2930233P	.33

* Gauge is 160 PSI. Gauge shipped unassembled. For different gauge mounting configuration, use brass adapters listed at bottom of page.

Common Port



Dual Port



Brass Adapters for Gauge –

1/8" to 1/8" Female Coupling..... 207P-2
1/8" Male Pipe Nippled 1.5"..... 215PNL-2-15
1/8" Male to Female Adapter..... 222P-2-2
1/8" to 1/8" 45° Female Elbow..... 2201P-2-2
1/8" to 1/8" 90° Female Elbow..... 2200P-2-2

Gauge 1" Face –

0-160 PSI..... PS4051160BP

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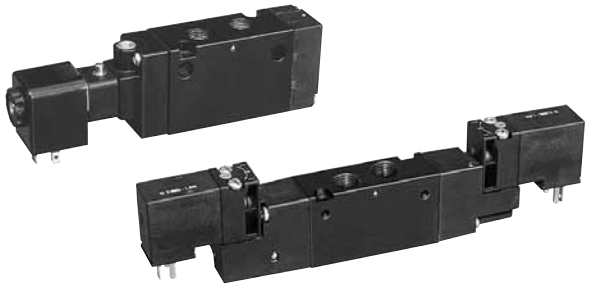
Solenoid Rotated 180° - Pins Down

B3 **B5** **B6** **B7** **B8**

- 1.8W (2.4VA) solenoids – Enclosure "5".
- Override on top for easy access.
- "02" in the Options code.



Valve Less Solenoid

B3 **B5** **B6** **B7** **B8**

- Valve ordered & shipped without solenoid.
- Efficient method in place of valve repair, fully tested at factory.

Alternate Solenoid Enclosures

B5 **B6** **B7** **B8**

- Enclosure "A": 2.6W - 4.1VA (Coil rotates in 45° increments)
- Enclosure "B" – "R": 4.6W - 7.3VA (Coil rotates in 90° increments)

"A" 30mm 3-Pin

"C" 3-Pin Mini

"G". "Q" Grommet

"B" 22mm 3-Pin

"D" 5-Pin Mini

"F". "H". "R" 1/2" Conduit

Tube Fitting Remote Pilot

B3 **B5** **B6** **B7** **B8**

- "YY" Option
- 5/32" (4mm) Tube Fitting

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Intrinsically Safe Solenoid Valves ("E" Option)

Hazardous Location Class:

Class I; Groups A, B, C & D

Class II; Groups E, F, & G

Class III; Div. I

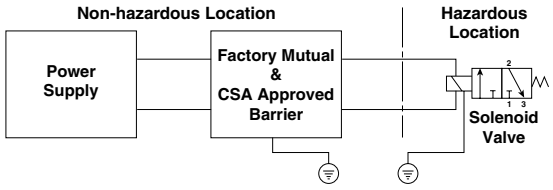
For use in low voltage (24VDC) Intrinsically Safe applications. NO OTHER VOLTAGE IS APPROVED.

36mm Coil width.

Comes standard with non-lighted solenoid connector.

Must be connected to an FM approved Barrier.

For dimensions. reference standard solenoid models. Maximum internally piloted valve pressure is 115 PSIG. Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.



Intrinsically Safe Solenoid Pilot Assembly Kits

Part Number	Description
P2FS13N1AE49	24VDC

Hazardous Duty Solenoid Valves ("F" Option)

Hazardous Location Class:

Class I; Zone I EX, M, II & T4

Class I; Div. I. Groups A, B, C, & D

Class II & III; Div. I. Groups E, F, & G

Comes standard with 1/2" conduit connection.

Voltage Range = ± 10%

Ambient Temp. Range = -20°C (-4°F) to 60°C (140°F)

Duty Factor = 100%

IP65 Rated (with Connected Conduit Connector)

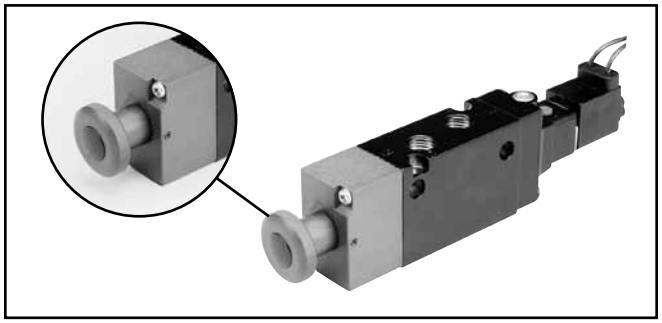
Notes:

1. Maximum non-hazardous location voltage not to exceed 250V RMS.
2. Connect per Barrier Manufacturers instructions.
3. Factory Mutual requires connections per ISA RP 12.6 instructions.
4. CSA requires "Installation to be in accordance with the Canadian Electrical Code. Part I."
5. The hazardous duty coils are wider in size than both the B5 and the B6 valve. If mounted on a manifold, the valves need to be staggered to fit.

Option F
Hazardous Duty FM / CSA

B5 With Manual Detent

- Positive mechanical contact of the override knob assures actuation of valve, however, knob does not move during normal cycling.
- Hard coated override to resist harsh environments.
- Override return spring is stainless steel, for harsh environments.
- Heavy duty locking mechanism to maintain position.
- Use in combination with mobile voltages or valve less solenoid.



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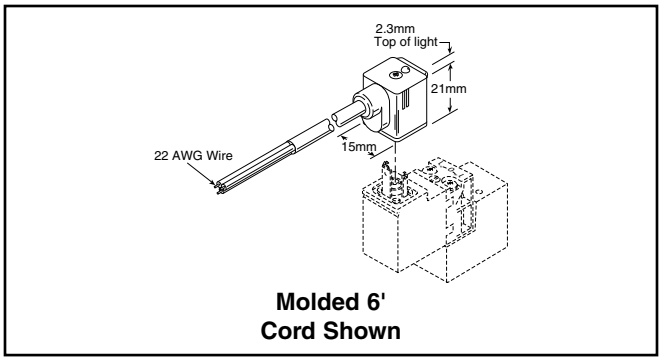
Female Electrical Connectors

15mm 3-Pin DIN 43650C (Use with Enclosure "5")

Connector	Connector with Cord	Description
PS2932BP	PS2932HBP 18 Inches	Unlighted
PS2932BP	PS2932JBP 6 Feet	Unlighted
PS294675BP	PS2946J75BP* 6 Feet	Light – 12VAC or DC
PS294679BP	PS2946J79BP* 6 Feet	Light – 24VAC or DC
PS294683BP	PS2946J83BP* 6 Feet	Light – 110/120VAC
PS294687BP	N/A	Light – 240/230VAC



**Molded 6'
Cord Shown**

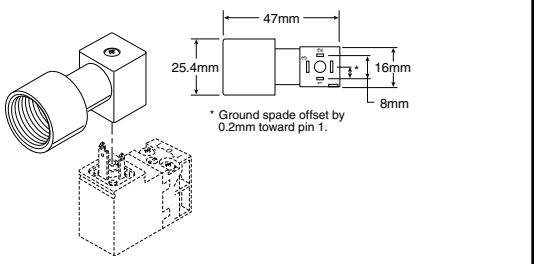
* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord.
IP65 rated when properly installed.

Engineering Data:
Conductors: 2 Poles Plus Ground
Cable Range (Connector Only): 4 to 6mm (0.16 to 0.24 Inch)
Contact Spacing: 8mm

15mm 3-Pin DIN 43650C to 1/2" Conduit (Use with Enclosure "5")

Connector	Description
PS2998P	1/2" NPTF Conduit – Unlighted with 3' (1m) Leads 20 AWG Wire



Note: Rated up to 250VAC or VDC; 6 Amps
IP65 rated when properly installed.

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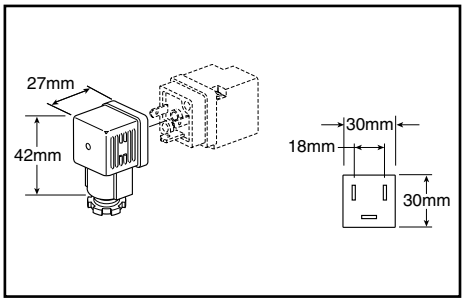
Female Electrical Connectors / Accessories

30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")

Connector	Connector with 6' (2m) Cord	Description
PS2028BP	PS2028JCP	Unlighted
PS203279BP	PS2032J79CP*	Light – 6-48V. 50/60Hz. 6-48VDC
PS203283BP	PS2032J83CP*	Light – 120V/60Hz
PS203283BP	N/A	Light – 240V/60Hz



* LED with surge suppression.

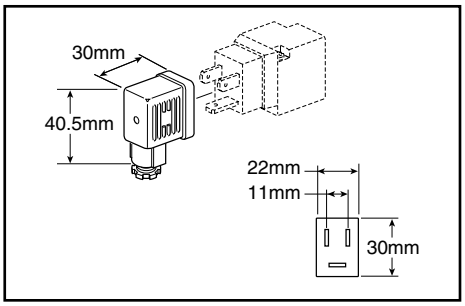
Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

Engineering Data:

Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 8 to 10mm (0.31 to 0.39 Inch); Contact Spacing: 18mm

22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure "B")

Connector	Connector with 6' (2m) Cord	Description
PS2429BP	PS2429JBP	Unlighted
PS243079BP	PS2430J79BP*	Light – 24V60Hz. 24VDC
PS243083BP	PS2430J83BP*	Light – 120V/60Hz
PS243087BP	N/A	Light – 240V/60Hz



* LED with surge suppression.

Note: Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

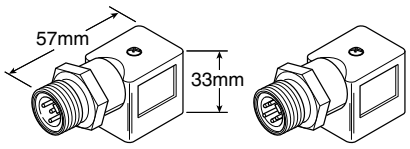
Engineering Data:

Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

3-Pin / 5-Pin Male Automotive Connectors (Use on 22mm Rectangular 3-Pin Solenoid)

3-Pin	5-Pin	Description
PS2893CP	PS2893DP	Unlighted
PS2893C##P	PS2893D##P	Lighted - Voltage

— 79 = 6 to 48VAC/VDC
83 = 100 to 240VAC/48 to 120 VDC



3-Pin **5-Pin**

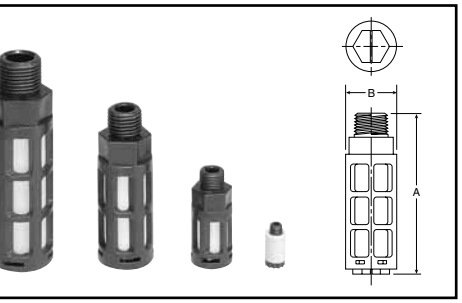
Exhaust Mufflers

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)



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Flow Rating (Cv)

Size	Port Size	Mounting Style	2-Position	3-Position
B3	1/8" Ports	Inline	.75	.60
	1/4" Tube	Inline	.45	.45
	1/8" Ports	Subbase	.65	.45
	1/4" Ports	Subbase	.65	.50
B5	1/4" Ports	Inline	1.4	1.1
	3/8" Ports	Inline	1.4	1.1
	1/4" Ports	Subbase	1.4	1.1
	3/8" Ports	Subbase	1.4	1.1
B6	3/8" Ports	Inline	2.7	2.1
B7	1/2" Ports	Inline	5.9	5.7
B8	3/4" Ports	Inline	7.0	6.6

ANSI / (NFPA) T3.21.3-1990 standard for Cv measurement.

Temperature Rating

5°F to 120°F (-15°C to 49°C) ambient.
(Buna-N and Fluorocarbon)

Operating Pressure

Maximum: 145 PSIG (1000 kPa)
Minimum:

Operator / Function	Internal Pilot	Minimum PSIG (kPa)				
		B3	B5	B6	B7	B8
1. G. H	Single Solenoid - Air Return	20 (138)	20 (138)	20 (138)	35 (241)	35 (241)
2. A. J. S	Double Solenoid					
3. K. L	Single Remote Pilot - Air Return					
4. M	Double Remote Pilot	Vacuum				
5. 6. 7	Double Solenoid - APB, CE, PC	30 (207)	30 (207)	30 (207)	45 (310)	45 (310)
8. 9. 0	Double Remote Pilot - APB, CE, PC			Vacuum		
E. V. W	Single Solenoid - Air Return / Spring Assist	35 (241)	35 (241)	35 (241)	35 (241)	35 (241)
F. X. Y	Single Remote Pilot - Air Return / Spring Assist					
External Pilot*						
All	"B" Series	Vacuum				

* External Pilot Pressure / Remote Pilot Signal 35-145 PSIG (241-1000 kPa).

Note: For CSA-NRTL/C approved solenoid valves –
insert an 'L' at the end of the valve part number.
B3: Maximum pressure - 120 PSI
B5: Maximum pressure - 145 PSI*§
B6: Maximum pressure - 145 PSI*§
B7: Maximum pressure - 145 PSI*†
B8: Maximum pressure - 145 PSI*†

* Enclosure Option E is CSA / FM approved at source. For certification of valve / solenoid assembly, consult factory.
† Not Available with Enclosure 5
§ Not available with Enclosures 0. 5 & X

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Solenoid Information (Solenoids are rated for continuous duty.)

Voltage				Enclosure "5"		Voltage				B5 B6 B7 B8 Enclosure "A"		B5 B6 B7 B8 Enclosure "B" to "R"	
Code	AC 60Hz	AC 50Hz	DC	Power Consumption	Holding (Amps)	Code	AC 60Hz	AC 50Hz	DC	Power Consumption	Holding (Amps)	Power Consumption	Holding (Amps)
42	24	22		1.6VA	.065	42	24	22		3.9VA	.136	7.3VA	.309
45			12	1.2W	.098	45			12	2.6W	.208	4.6W	.365
47*			12	0.91W	.074	47*			12	—	—	4.9W	.298
48*			24	0.91W	.033	48*			24	—	—	4.8W	.142
49			24	1.2W	.049	49			24	2.7W	.112	4.8W	.200
53	120	110		1.6W	.013	53	120	110		4.1VA	.033	6.3VA	.047
57	240	230		1.6W	.007	57	240	230		3.7VA	.017	6.4VA	.026

Note: For enclosure "5" with "02" Option, solenoid wattage is 1.8W (2.4VA). Response time is 10% faster.
Voltage rated +10 / -15%.

***** 47 and 48 code are mobile voltages. voltage +25 / -30%.

Response Time

Valve Size	Port Size	Enclosure "5" 0 Cu. In. Test Chamber Fill	Enclosure "5" 0 Cu. In. Test Chamber Exhaust	Enclosure "5" 25* Cu. In. Test Chamber Fill	Enclosure "5" 25* Cu. In. Test Chamber Exhaust	Enclosure "A, B, C, D, G, H, Q & R" 0 Cu. In. Test Chamber Fill	Enclosure "A, B, C, D, G, H, Q & R" 0 Cu. In. Test Chamber Exhaust	Enclosure "A, B, C, D, G, H, Q & R" 25* Cu. In. Test Chamber Fill	Enclosure "A, B, C, D, G, H, Q & R" 25* Cu. In. Test Chamber Exhaust
2-Position Single Solenoid / Internal Air Return									
B3	1/8"	.024	.026	.149	.242	—	—	—	—
B5	1/4"	.038	.040	.106	.156	.025	.026	.090	.142
B5*	3/8"	.039	.041	.150	.245	.025	.027	.141	.241
B6*	3/8"	.037	.038	.096	.132	.016	.018	.084	.119
B7	1/2"	.073	.075	.195	.275	.049	.051	.167	.249
B8	3/4"	.072	.074	.166	.226	.049	.051	.142	.206
2-Position Single Solenoid Spring / Air Return									
B3	1/8"	.019	.022	.128	.217	—	—	—	—
B5	1/4"	.039	.041	.108	.162	.024	.026	.091	.143
B5*	3/8"	.040	.042	.169	.261	.024	.026	.143	.240
B6*	3/8"	.035	.036	.096	.133	.023	.024	.083	.120
B7	1/2"	.071	.074	.194	.275	.049	.051	.167	.249
B8	3/4"	.072	.074	.176	.239	.046	.048	.142	.204
2-Position Double Solenoid									
B3	1/8"	.013	.015	.122	.213	—	—	—	—
B5	1/4"	.016	.018	.082	.132	.012	.014	.077	.128
B5*	3/8"	.016	.018	.129	.222	.016	.018	.128	.225
B6*	3/8"	.016	.017	.074	.110	.012	.013	.071	.107
B7	1/2"	.026	.028	.145	.228	.022	.024	.138	.225
B8	3/4"	.026	.028	.123	.185	.022	.024	.115	.178
3-Position Double Solenoid									
B3	1/8"	.021	.023	.091	.141	—	—	—	—
B5	1/4"	.022	.023	.091	.141	.011	.011	.079	.135
B5*	3/8"	.022	.024	.135	.229	.016	.019	.135	.234
B6*	3/8"	.024	.026	.094	.139	.016	.018	.084	.132
B7	1/2"	.049	.051	.167	.257	.028	.030	.148	.238
B8	3/4"	.035	.037	.136	.206	.028	.030	.130	.195

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing 120V/60Hz solenoid. Times shown are average.

***** For 3/8" ported, 50 cu. in. test chamber is used. For 1/2" & 3/4", a 200 cu. in. test chamber is used.

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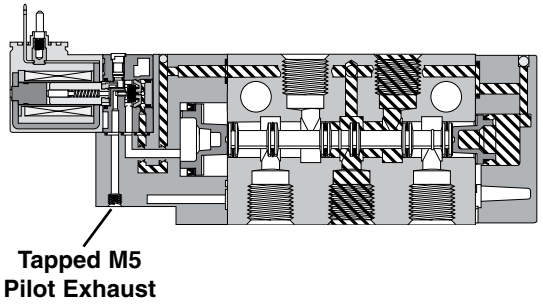
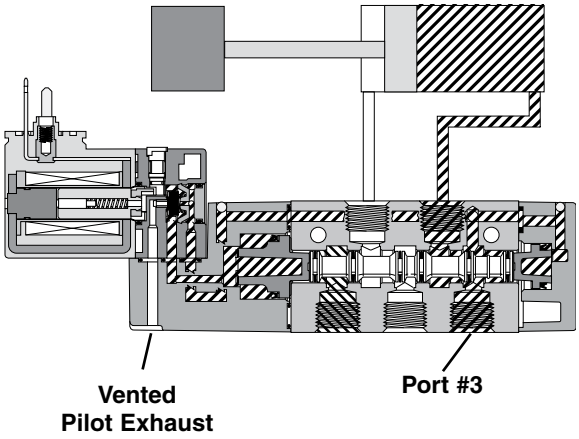
A - Internal - Port #1 / Tapped M5



B5 Shown

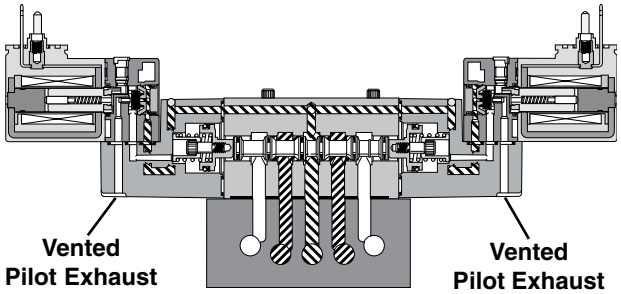
E - Dual Pressure - Port #3 / Vented

H - Dual Pressure - Port #5 / Vented (Similar)



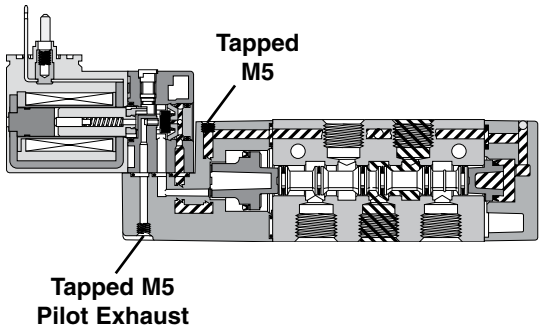
B3 Shown

B - Internal - Port #1 / Vented



B3 Shown

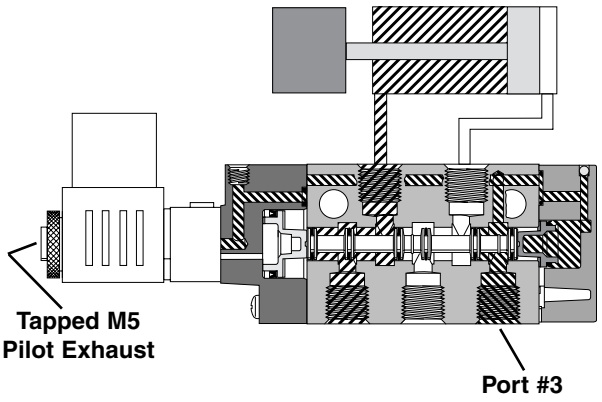
K - External - Body / Tapped M5



B3 Shown

D - Dual Pressure - Port #3 / Tapped M5

G - Dual Pressure - Port #5 / Tapped M5 (Similar)



B5 Shown

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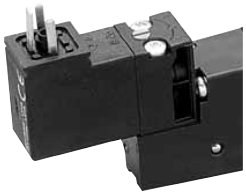
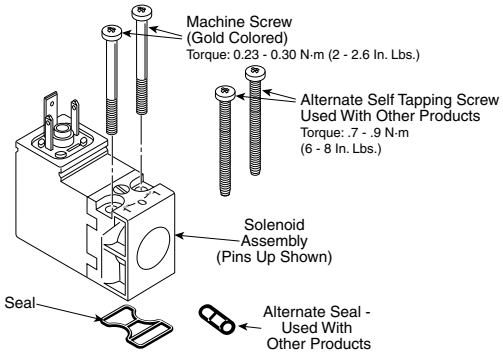
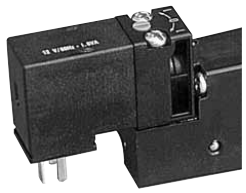
Solenoid Kits – B3 'C', B5 'C', B6 'A', B7 'A', B8 'A'

3-Pin, EN175301-803 (Former DIN 43650C), 15mm



STANDARD





"02" OPTION

PS2982*##P –
Enclosure '5'

Override	## Voltage						
	42	45	47*	48*	49	53	57
B	O	O	–	–	S	S	O
C	O	O	–	–	S	S	O
D	–	–	O	O	O	O	–
E	–	–	O	O	O	O	–

PS3541 *##P –
Enclosure '5 with "02" Option

Override	## Voltage				
	42	45	49	53	57
B	O	O	S	S	O
C	O	O	S	S	O
D	–	–	O	O	–
E	–	–	O	O	–

S - Standard; O - Option

* Mobile Voltage

Kit Includes: Solenoid, (2) Machine Screws, (2) Self Threading Screws, (1) Gasket, (1) 3-cell Gasket.

Solenoid Kits Alternate Enclosures

P2F C A 4 49

Type	
Solenoid Kit	C

Enclosures / Lead Length	
30mm Square 3-Pin – ISO 4400 Form A (Male Only)	**A**
22mm Rectangular 3-Pin – Type B Industrial (Male Only)	**B**
Hazardous Duty, FM / CSA	F*
Grommet - 18" Leads	**G**
1/2" NPT Conduit - 18" Leads	**H**
Grommet 72" Leads	Q
1/2" Conduit 72" Leads	R

* Only Available with Voltage Codes "45", "49", "53" & "57".

Voltage / Frequency	
42	24VAC
45	12VDC
47*	**12 VDC Mobile**
48*	**24 VDC Mobile**
49	**24VDC**
53	**120VAC**
57	240VAC

* Only Available with Enclosures "A", "B" & "G".

Option A & E
30mm Square
3-Pin ISO 4400, DIN 43650A

Option B
22mm Rectangular
3-Pin DIN, Type B Industrial

Option G & Q
Grommet, 18" or 72" Leads

Option F, H & R
1/2" Conduit, 18" or 72" Leads

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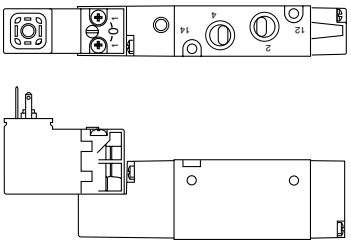
B3 Series

Spool / Body Service Kits

		Kit Includes:
PS2901CP	4-Way, 2-Pos	Item 15, 21 (2), 24, 25, 31 (2), grease packet
PS2902CP	4-Way, 3-Pos APB	Item 16, 21 (2), 31 (2), grease packet
PS2903CP	4-Way, 3-Pos CE	Item 16, 21 (2), 31 (2), grease packet
PS2904CP	4-Way, 3-Pos PC	Item 16, 21 (2), 31 (2), grease packet
PS2971CP	3-Way, 2-Pos	Item 15, 21 (2), 24, 25, 31 (2), grease packet



Valve to Manifold Kits

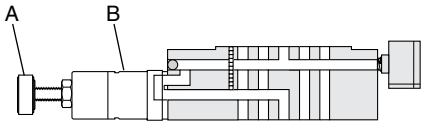
PS2980P	Gasket (10) - Inline 3-Way Valve to Segmented Manifold
PS2981P	Gasket (10) - Inline 4-Way Valve to Segmented Manifold
PS2984P	O-ring (10) - Inline Valve to IEM Bar Manifold
PS2986P	Gasket - Subbase Valve to Subbase Bar Manifold; Item 4 (10), 39 (10)
PS2987P	Mounting Bolts (10) - Inline Valve / Subbase Valve

Manifold to Manifold Kit

PS2995P	O-ring (10), Sleeves (10), Tie Rods (10) - 3-Way Manifold
PS2996P	Gasket (10), Tie Rods (10) - 4-Way Manifold

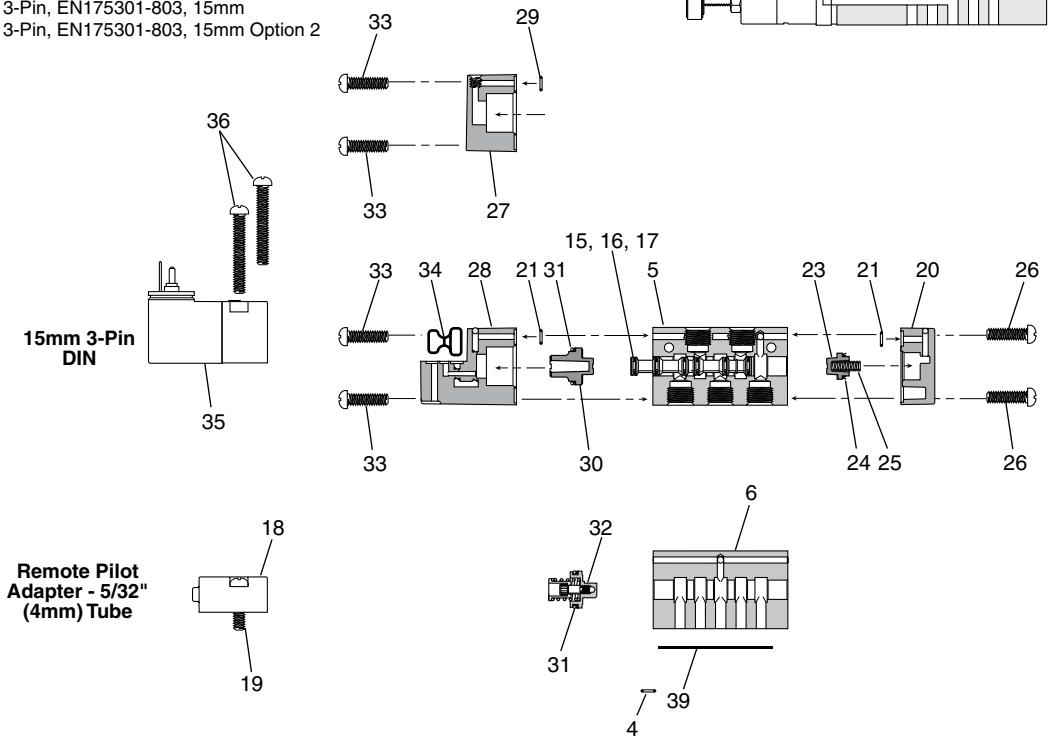
Sandwich Regulator Cartridge Kit

PS299922P	2-60 PSI Cartridge (Item A, B)
PS299933P	5-125 PSI Cartridge (Item A, B)



Solenoid Kit *Kit Includes: 35, 36, 34*

PS2982*##P	3-Pin, EN175301-803, 15mm
PS3541*##P	3-Pin, EN175301-803, 15mm Option 2



Item List – Parts not sold separately.

Item	Description	Item	Description	Item	Description
4*	O-ring - Ext Pilot Valve to Manifold	23	Return Piston	31*	Lip Seal - Operator Piston
5	Inline Body - Tapped Ports	24*	Lip Seal - Return Piston	32	Operator Piston Mechanism - 3-Position
6	Subbase Body	25*	Spring, Return Assist	33	Screws - Operator Adapter
7	Inline Body - Tube Ports	26	Screws - Return Operator	34*	Gasket - Solenoid to Adapter
15*	Spool - 2-Position (Seals Assembled)	27	Remote Pilot Operator	35*	15mm Solenoid
16*	Spool - 3-Position (Seals Assembled)	28a	Solenoid Adapter - Vent Exhaust	36*	Self Tapping Screw - Solenoid (Effective May 99)
17*	Spool Seal	28b	Solenoid Adapter - Ext Pilot. Vent Exhaust		
18	Remote Pilot Adapter (PVAP111)	28c	Solenoid Adapter - Ext Pilot. Tapped Exhaust	36*	Machine Screw - Solenoid (Jan 96 - May 99)
19	Screw - Remote Pilot Adapter	28d	Solenoid Adapter - Tapped Exhaust	39*	Gasket - Subbase Valve to Base
20	Return Operator	29	O-ring - Remote Pilot	40*	Mounting Screws - Subbase Valve
21*	Gasket - Body to Operator	30	Operator Piston - 2-Position		

Note: * Parts are available in kits shown. For kit components, order VALVE LESS SOLENOID for assembled and tested repair valve.

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B5 Series

Spool / Body Service Kits

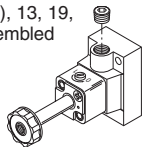
		Kit Includes:
PS2801*P	4-Way, 2-Pos	Item 2, 10 (2), 14, 15, 116, 6 (2), grease packet
PS2802*P	4-Way, 3-Pos APB	Item 3, 6 (2), 10 (2), 13 (2), grease packet
PS2803*P	4-Way, 3-Pos CE	Item 3, 6 (2), 10 (2), 13 (2), grease packet
PS2804*P	4-Way, 3-Pos PC	Item 3, 6 (2), 10 (2), 13 (2), grease packet
PS2871*P	3-Way, 2-Pos NC	Item 2, 10 (2), 14, 15, 116, 6 (2), grease packet

* Fluorocarbon Seal Kit (i.e. PS2801VP)

Pilot Replacement Kit – Alternate Enclosure

Kit Includes: Item 6, 9, 10, 11, 17 (2), 18 (2), 13, 19, 20, 22, 23, 24 (2), 57, 58 Assembled

PS2897GBP	Non-Locking, BSPP
PS2897GCP	Locking, BSPP
PS2897NBP	Non-Locking, NPT
PS2897NCP	Locking, NPT

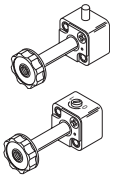


Armature / Override Kit

Kit Includes: Item 22, 23, 24 (2), 57, 58 Assembled

P2FP13N4D* Non-Locking

P2FP13N4C* Locking



* Comes with a Thru Nut and A Diffuser Nut.

Valve to Manifold Kits

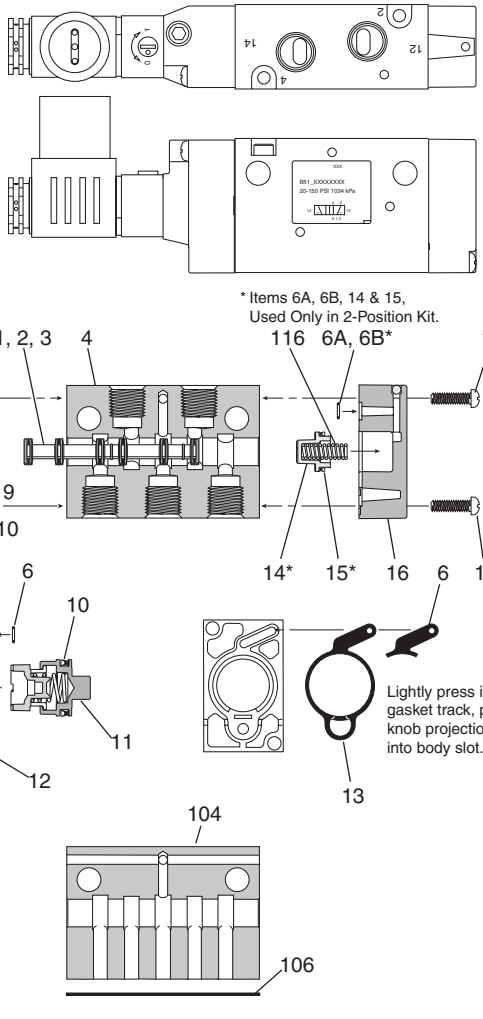
PS2884P	O-ring (10) - Inline Valve to IEM Manifold (All)
PS2886P	Gasket (10) - Subbase Valve to Subbase
PS2887P	Mounting Bolts (10) - Inline & Subbase Valve

Manifold to Manifold Kit

PS2896P	Gasket (10), Tie Rods (10) - 4-Way Manifold

Solenoid Kit *Kit Includes: 25, 122, 123*

PS2982*##P	3-Pin, EN175301-803, 15mm
PS3541*##P	3-Pin, EN175301-803, 15mm Option 2



Item List – Parts not sold separately.

Item	Description	Item	Description	Item	Description
1*	Spool Seal	15*	Lip Seal - Return Piston	57*	Solenoid Nut
2*	Spool - 2-Position (Seals Assembled)	16	Return Operator	58a*	Solenoid Base Assembly - Locking
3*	Spool - 3-Position (Seals Assembled)	17*	Screws - Operator Adapter - 2-Position	58b*	Solenoid Base Assembly - Non Locking
4	Inline Body	18*	Screws - Operator Adapter - 3-Position	59*	Coil - Alternate Enclosure (see Page D87)
6A*	Gasket - Body to Operator	19*	Operator Adapter - Alt Enclosure	104	Subbase Body
6B	O-ring - Body to Operator (Effective July 2007)	20*	1/8" NPT Pipe Plug	106*	Gasket - Subbase Valve to Base
7	Remote Pilot Operator	22*	O-ring - Small - Solenoid Base	116*	Spring, Return Assist
9	Operator Piston - 2-Position	23*	O-ring - Large - Solenoid Base	120a	Solenoid Adapter - Vent Exhaust
10*	Lip Seal - Operator Piston	24*	Bolts - Solenoid Base	120b	Solenoid Adapter - Tapped Exhaust
11	Operator Piston Mechanism - 3-Position	25a*	Self Tapping Screw - Solenoid (Effective May 99)	120d	Solenoid Adapter - Ext Pilot. Vent Exhaust
12	Adapter - 3-Position	25b*	Machine Screw - Solenoid (Jan 96 - May 99)	120e	Solenoid Adapter - Ext Pilot. Tapped Exhaust
13*	Gasket - 3-Position Adapter to Body	26	Remote Pilot Adapter - 5/32" Tube (PVAP111)	122*	Gasket - Solenoid to Adapter
14	Return Piston	27	Screws - Remote Pilot Adapter	123*	15mm Solenoid

Note: * Parts are available in kits shown. For kit components, order VALVE LESS SOLENOID for assembled and tested repair valve.

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B6 Series

Spool / Body Service Kits

		Kit Includes:
PS2601P	4-Way, 2-Pos	Item 2, 6 (2), 9 (2), 11, 14, grease packet
PS2602P	4-Way, 3-Pos APB	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS2603P	4-Way, 3-Pos CE	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS2604P	4-Way, 3-Pos PC	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS267101P	3-Way, 2-Pos. NC	Item 2, 6, 9, 14, grease packet
PS267102P	3-Way, 2-Pos. NO	Item 2, 6, 9, 14, grease packet

Valve to Manifold Kits

PS2684P	O-ring (10) - Inline Valve to IEM Manifold
PS2887P	Mounting Bolts (10) - Inline Valve

Pilot Replacement Kit – Alternate Enclosure

Kit Includes: Item 6, 8, 9, 10, 16 (2), 17 (2), 18, 13, 20, 22, 23, 24 (2), 57, 58 Assembled

PS2897GBP	Non-Locking, BSPP
PS2897GCP	Locking, BSPP
PS2897NBP	Non-Locking, NPT
PS2897NCP	Locking, NPT

Armature / Override Kit –

Kit Includes: Item 22, 23, 24 (2), 57, 58 Assembled

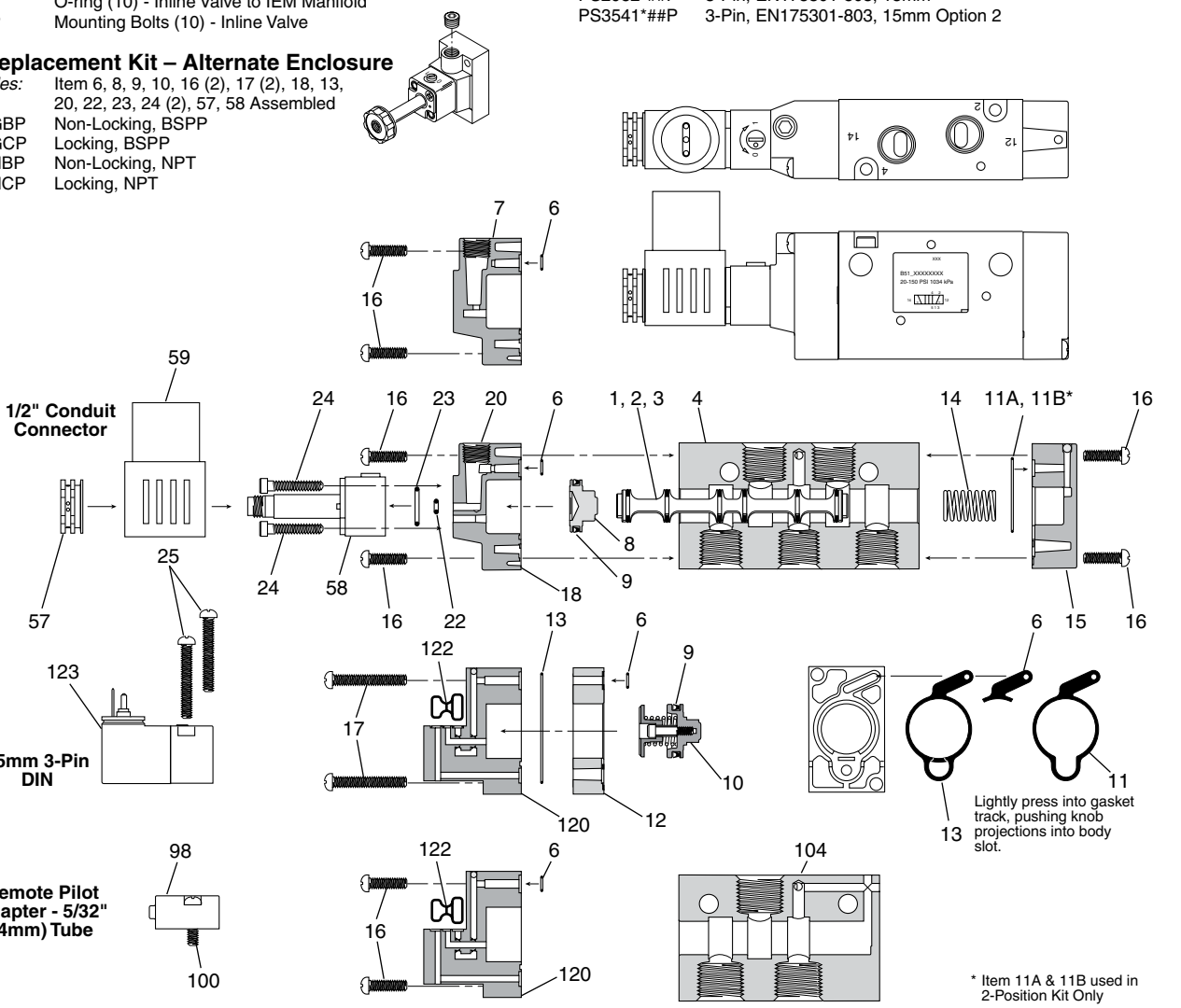
P2FP13N4D* Non-Locking

P2FP13N4C* Locking

* Comes with a Thru Nut and A Diffuser Nut.

Solenoid Kit *Kit Includes: 25, 122, 123*

PS2982*##P	3-Pin, EN175301-803, 15mm
PS3541*##P	3-Pin, EN175301-803, 15mm Option 2



Item List – Parts not sold separately.

Item	Description	Item	Description	Item	Description
1*	Spool Seal	14*	Spring, Return Assist	58a*	Solenoid Base Assembly - Locking
2*	Spool - 2-Position (Seals Assembled)	15a	Return Operator	58b*	Solenoid Base Assembly - Non Locking
3*	Spool - 3-Position (Seals Assembled)	15b	Return Operator - CSA Option	59*	Coil - Alternate Enclosure (see Page D87)
4	Inline Body - 4-Way	16*	Screws - Operator Adapter - 2-Position	98*	Remote Pilot Adapter - 5/32" Tube (PVAP111)
6*	Gasket - Body to Operator	17*	Screws - Operator Adapter - 3-Position	100	Screws - Remote Pilot Adapter
7	Remote Pilot Operator	18*	Operator Adapter - Alt Enclosure	104	Inline Body - 3-Way
8	Operator Piston - 2-Position	20*	1/8" NPT Pipe Plug	120a	Solenoid Adapter - Vent Exhaust
9*	Lip Seal - Operator Piston	22*	O-ring - Small - Solenoid Base	120b	Solenoid Adapter - Tapped Exhaust
10	Operator Piston Mechanism - 3-Position	23*	O-ring - Large - Solenoid Base	120c	Solenoid Adapter - Ext Pilot. Vent Exhaust
11A*	Gasket - Body to Return Cap	24*	Bolts - Solenoid Base	120d	Solenoid Adapter - Ext Pilot. Tapped Exhaust
11B*	O-ring - Body to Operator (Effective Feb. 2008)	25*	Self Tapping Screw - Solenoid (Effective Jan 00)	122*	Gasket - Solenoid to Adapter
12	Adapter - 3-Position	57*	Solenoid Nut	123*	15mm Solenoid
13	Gasket - 3-Position Adapter to Body				

Note: * Parts are available in kits shown. For kit components, order VALVE LESS SOLENOID for assembled and tested repair valve.

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B7 & B8 Series

Spool / Body Service Kits

		Kit Includes:
PS2501P	4-Way, 2-Pos	Item 2, 6 (2), 9 (2), 11, grease packet
PS2502P	4-Way, 3-Pos APB	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS2503P	4-Way, 3-Pos CE	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS2504P	4-Way, 3-Pos PC	Item 3, 6 (2), 9 (2), 13 (2), grease packet
PS257101P	3-Way, 2-Pos. NC	Item 2, 6, 9, grease packet
PS257102P	3-Way, 2-Pos. NO	Item 2, 6, 9, grease packet

Valve to Manifold Kits

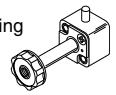
PS2584P	O-ring (10) - Inline Valve to IEM Manifold
PS2587P	Mounting Bolts (10) - Inline Valve

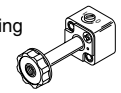
Pilot Replacement Kit – Alternate Enclosure

Kit Includes:	Item 6, 8, 9, 10, 16 (4), 18, 20, 22, 23, 24 (2), 57, 58 Assembled
PS2597GBP	Non-Locking, BSPP
PS2597GCP	Locking, BSPP
PS2597NBP	Non-Locking, NPT
PS2597NCP	Locking, NPT

Armature / Override Kit –

Kit Includes: Item 22, 23, 24 (2), 57, 58 Assembled

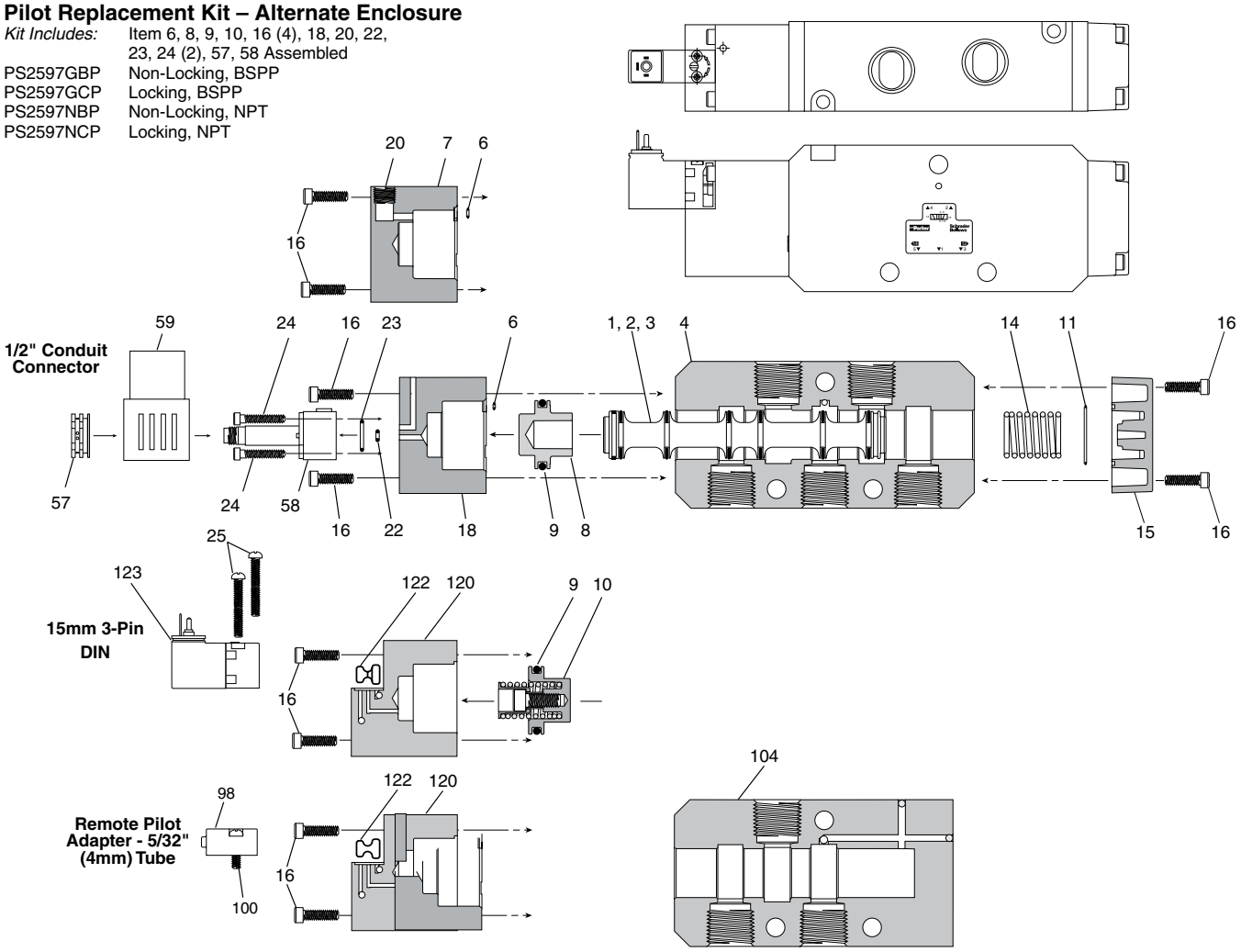
P2FP13N4D* Non-Locking 

P2FP13N4C* Locking 

* Comes with a Thru Nut and A Diffuser Nut.

Solenoid Kit *Kit Includes: 25, 122, 123*

PS2982*##P	3-Pin, EN175301-803, 15mm
PS3541*##P	3-Pin, EN175301-803, 15mm Option 2



Item List – Parts not sold separately.

Item	Description	Item	Description	Item	Description
1*	Spool Seal	16*	Screws - Operator Adapter	98*	Remote Pilot Adapter - 5/32" Tube (PVAP111)
2*	Spool - 2-Position (Seals Assembled)	8*	Operator Adapter - Alt Enclosure	100	Screws - Remote Pilot Adapter
3*	Spool - 3-Position (Seals Assembled)	20*	1/8" NPT Pipe Plug	104	Inline Body - 3-Way
4	Inline Body - 4-Way	22*	O-ring - Small - Solenoid Base	120a	Solenoid Adapter - Vent Exhaust
6*	Gasket - Body to Operator	23*	O-ring - Large - Solenoid Base	120b	Solenoid Adapter - Tapped Exhaust
7	Remote Pilot Operator	24*	Bolts - Solenoid Base	120c	Solenoid Adapter - Ext Pilot. Vent Exhaust
8	Operator Piston - 2-Position	25*	Self Tapping Screw - Solenoid (Effective Jan 00)	120d	Solenoid Adapter - Ext Pilot. Tapped Exhaust
9*	Lip Seal - Operator Piston	57*	Solenoid Nut	122*	Gasket - Solenoid to Adapter
10	Operator Piston Mechanism - 3-Position	58a*	Solenoid Base Assembly - Locking	123*	15mm Solenoid
11*	Gasket - Body to Return Cap	58b*	Solenoid Base Assembly - Non Locking		
14*	Spring, Return Assist	59*	Coil - Alternate Enclosure (see Page D87)		
15a	Return Operator				

Note: * Parts are available in kits shown. For kit components, order VALVE LESS SOLENOID for assembled and tested repair valve.

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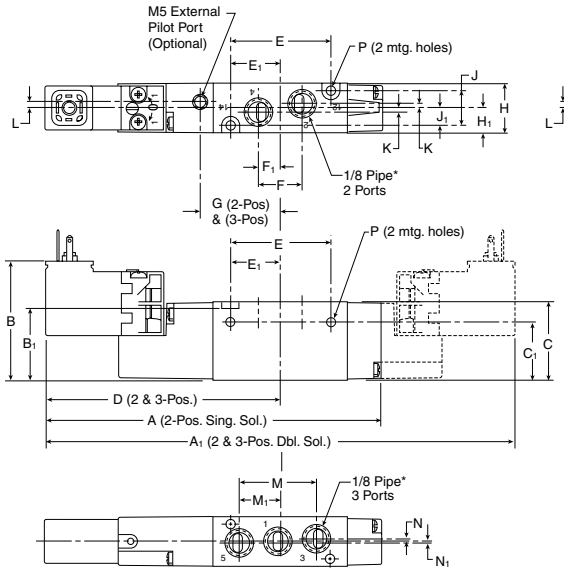
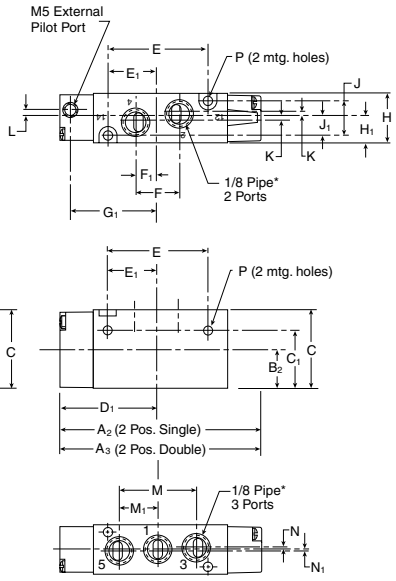
B3 Single & Double Operators – 4-Way Inline

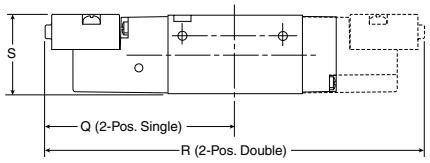
Solenoid



Remote Pilot



Remote Pilot ("YY" Option)



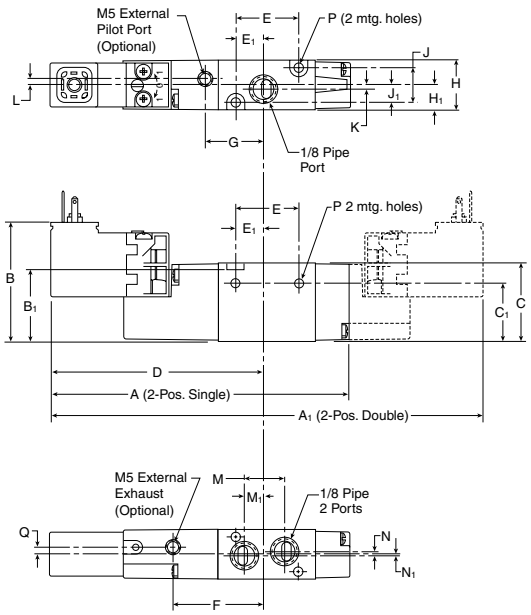
B3 4-Way Inline

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
B1	**B2**	**C**	**C1**	**D**
1.05 (27)	.57 (14)	1.13 (39)	.84 (21)	3.22 (82)
D1	**E**	**E1**	**F**	**F1**
1.66 (42)	1.47 (37)	.732 (19)	.63 (16)	.32 (8)
G	**G1**	**H**	**H1**	**J**
1.13 (29)	1.50 (38)	.71 (18)	.36 (9)	.51 (13)
J1	**K**	**L**	**M**	**M1**
.26 (7)	.06 (2)	.11 (3)	1.12 (28)	.56 (14)
N	**N1**	**P**	**Q**	**R**
.05 (1)	.05 (1)	Ø .13 Ø (3.3)	2.69 (68)	5.37 (136)
S				
1.16 (29)				

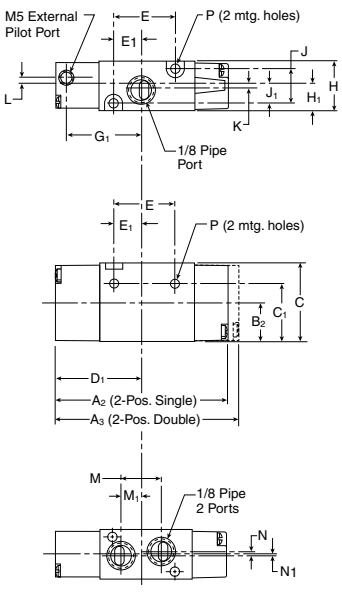
Inches (mm)

B3 Single & Double Operators – 3-Way Inline

Solenoid



Remote Pilot



B3 3-Way Inline

A	A1	A2	A3	B
4.20 (107)	5.96 (151)	2.65 (67)	2.86 (73)	1.66 (42)
B1	**B2**	**C**	**C1**	**D**
1.05 (27)	.57 (14)	1.13 (29)	.84 (21)	2.93 (74)
D1	**E**	**E1**	**F**	**G**
1.38 (35)	.98 (25)	.44 (11)	1.32 (34)	.85 (22)
G1	**H**	**H1**	**J**	**J1**
1.22 (31)	.71 (18)	.36 (9)	.51 (13)	.26 (7)
K	**L**	**M**	**M1**	**N**
.06 (2)	.11 (3)	.63 (16)	.27 (7)	.12 (3)
N1	**P**	**Q**		
.06 (2)	Ø .13 Ø (3.3)	.08 (2)		

Inches (mm)

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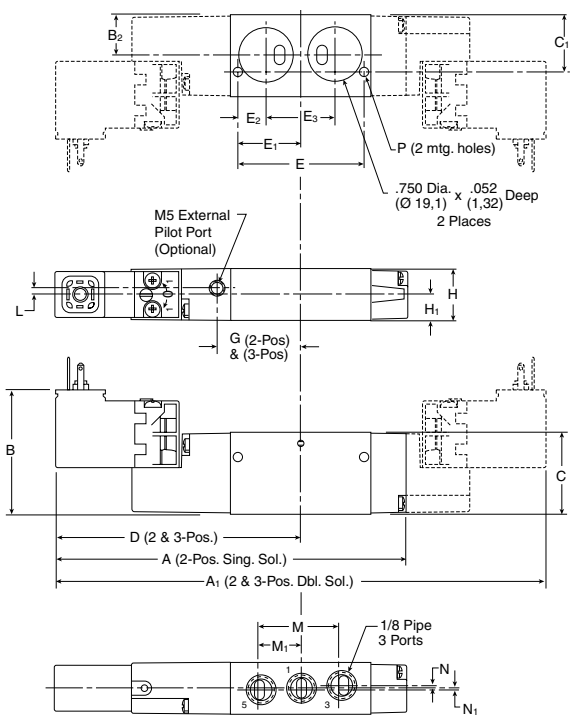
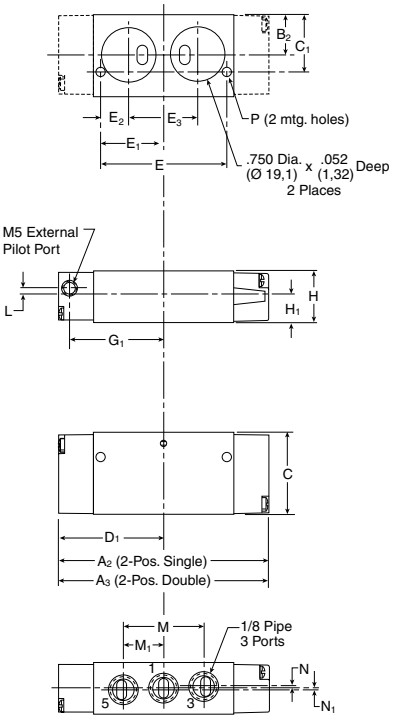
B3 Single & Double Operators – 4-Way Face Mount

Solenoid



Remote Pilot



B3 4-Way Face Mount

A	**A1**	**A2**	**A3**	**B**
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	1.66 (42)
B2	**C**	**C1**	**D**	**D1**
.58 (15)	1.13 (29)	.81 (21)	3.22 (82)	1.66 (42)
E	**E1**	**E2**	**E3**	**G**
1.74 (44)	.87 (22)	.39 (10)	.95 (24)	1.13 (29)
G1	**H**	**H1**	**L**	**M**
1.50 (38)	.71 (18)	.36 (9)	.11 (3)	1.12 (28)
M1	**N**	**N1**	**P**	
.56 (14)	.05 (1)	.05 (1)	Ø .13 Ø (3.3)	

Inches (mm)

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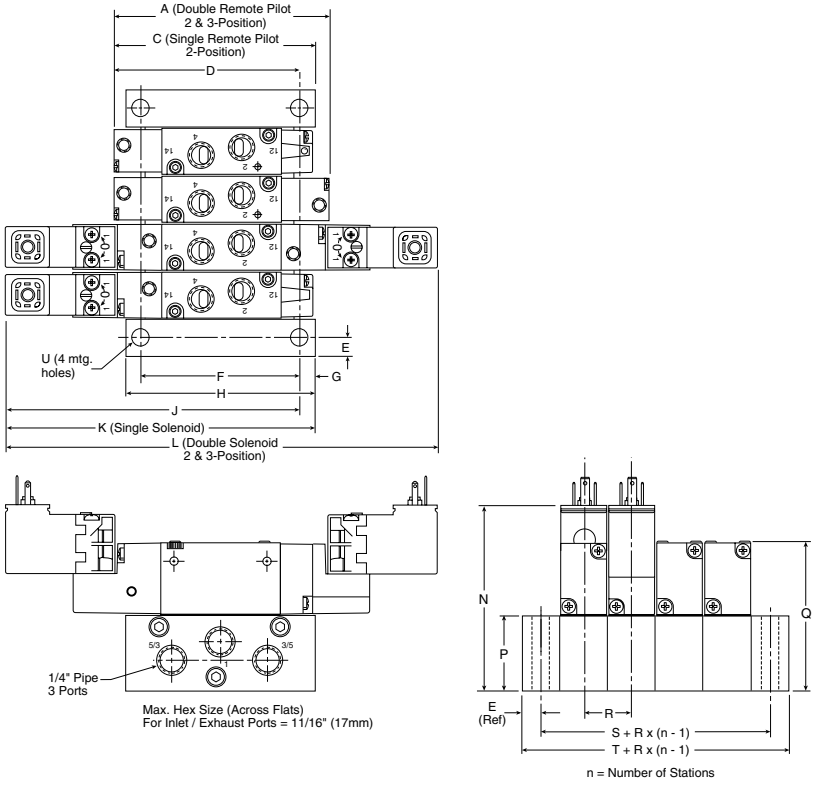
B3 Single & Double Operators – 4-Way IEM Stackable



B3 4-Way IEM Stackable

A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.91 (73.9)	.30 (7.6)	2.49 (63.3)
G	**H**	**J**	**K**	**L**
.25 (6.4)	3.00 (76.2)	4.46 (113.3)	4.67 (118.6)	6.43 (163.3)
N	**P**	**Q**	**R**	
2.91 (73.9)	1.25 (31.8)	2.38 (60.5)	.74 ±.01 (18.8) ± .3	
S	**T**	**U**		
1.34 (34.0)	1.94 (49.3)	Ø .28 Ø (7.1)		

Inches (mm)

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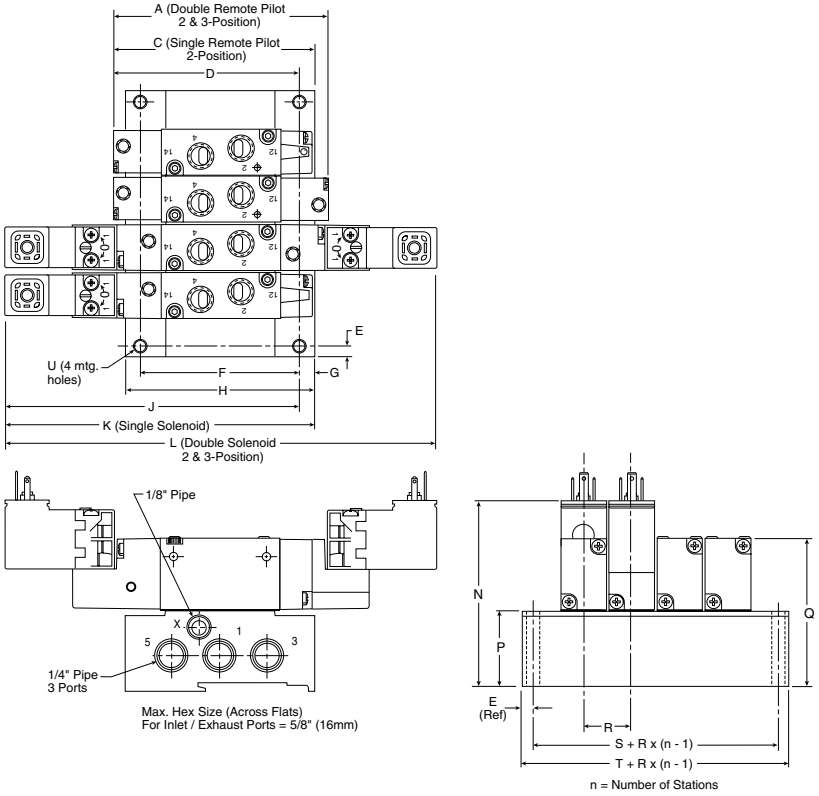
B3 Single & Double Operators – 4-Way IEM Aluminum Bar

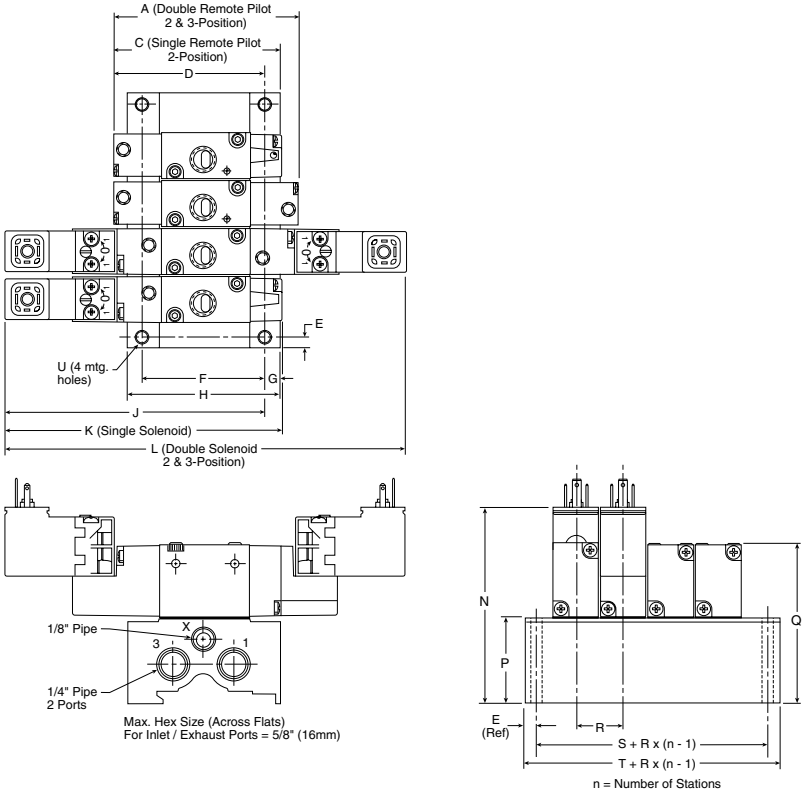


B3 4-Way IEM Aluminum Bar Manifold

A	C	D	E	F
3.33 (84.6)	3.17 (80.5)	2.94 (74.7)	.25 (6.4)	2.54 (64.5)
G	**H**	**J**	**K**	**L**
.23 (5.9)	3.00 (76.2)	4.50 (114.2)	4.73 (120.1)	6.43 (163.3)
N	**P**	**Q**	**R**	**S**
2.94 (74.7)	1.28 (32.5)	2.41 (61.2)	.81 (20.5)	1.13 (28.8)
T	**U**			
1.64 (41.6)	Ø .23 Ø (5.8)			

Inches (mm)

B3 Single & Double Operators – 3-Way IEM Aluminum Bar



B3 4-Way IEM Aluminum Bar Manifold

A	C	D	E	F
2.86 (72.6)	2.65 (67.3)	2.33 (59.2)	.25 (6.4)	1.80 (45.7)
G	**H**	**J**	**K**	**L**
.23 (5.9)	2.25 (57.2)	3.88 (98.6)	4.20 (106.7)	5.96 (151.4)
N	**P**	**Q**	**R**	**S**
2.93 (74.5)	1.27 (32.4)	2.40 (61.1)	.81 (20.5)	1.13 (28.8)
T	**U**			
1.64 (41.6)	Ø .23 Ø (5.8)			

Inches (mm)

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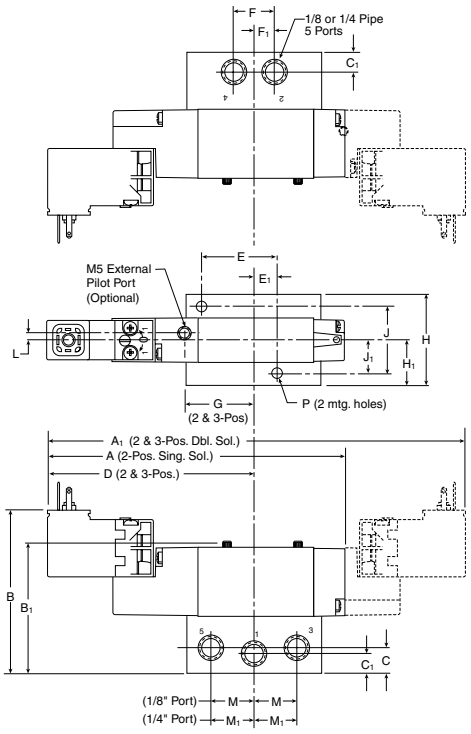
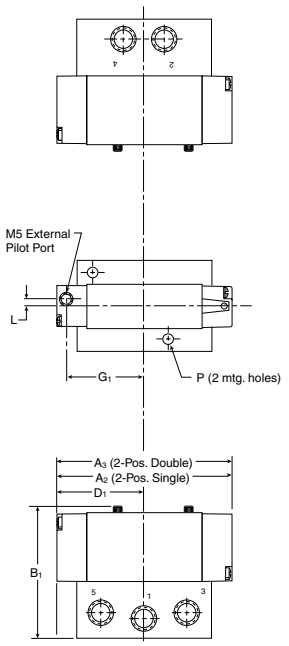
B3 Single & Double Operators – 4-Way Single Subbase

Solenoid



Remote Pilot

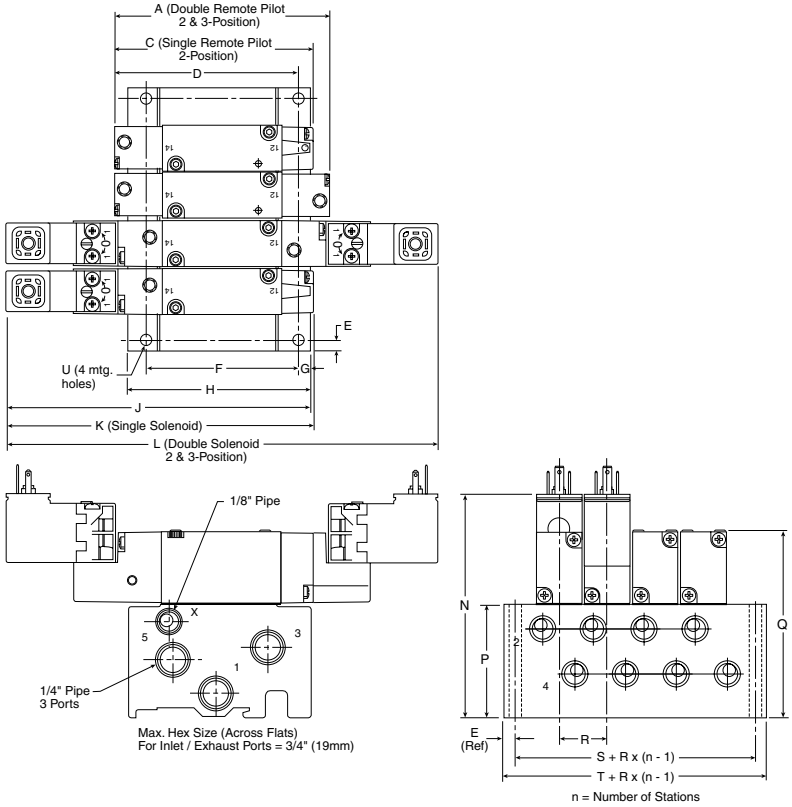


B3 4-Way Single Subbase

A	A1	A2	A3	B
4.67 (119)	6.44 (164)	3.12 (79)	3.33 (85)	2.63 (67)
B1	**C**	**C1**	**D**	**D1**
2.21 (56)	.47 (12)	.37 (9)	3.22 (82)	1.66 (42)
E	**E1**	**F**	**F1**	**G**
1.25 (32)	.38 (10)	.69 (18)	.34 (9)	1.13 (29)
G1	**H**	**H1**	**J**	**J1**
1.50 (38)	1.50 (38)	.75 (19)	1.12 (28)	.56 (14)
M	**M1**	**P**		
.71 (18)	.76 (19)	Ø .18 Ø (4)		

Inches (mm)

B3 Single & Double Operators – 5-Port Subbase Bar Manifold



B3 5-Port Subbase Bar Manifold

A	C	D	E	F
3.33 (84.6)	3.12 (79.2)	2.88 (73.2)	.25 (6.3)	2.43 (61.7)
G	**H**	**J**	**K**	**L**
.22 (5.5)	2.93 (74.5)	4.66 (118.3)	4.67 (118.6)	6.43 (166.3)
N	**P**	**Q**	**R**	**S**
3.47 (88.2)	1.81 (46.0)	2.94 (74.7)	.81 (20.5)	1.39 (35.4)
T	**U**			
1.89 (48.0)	Ø .22 Ø (5.6)			

Inches (mm)

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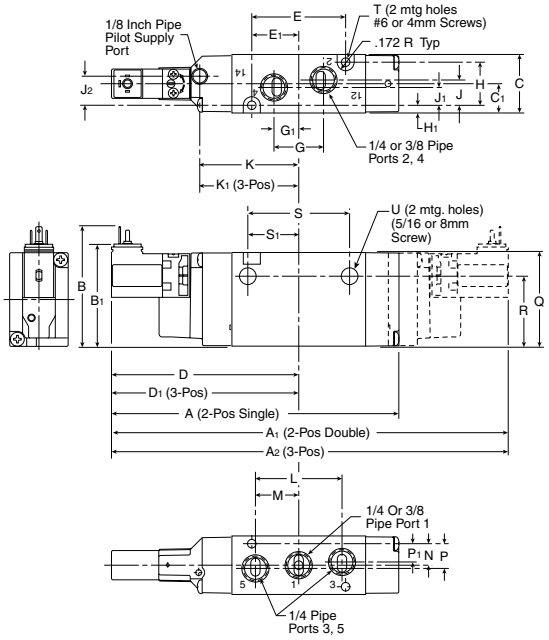
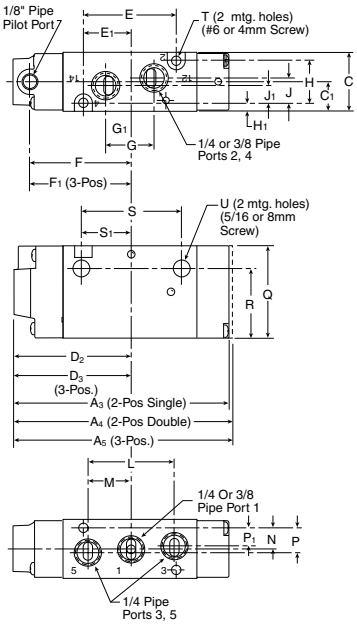
B5 Single & Double Operators – 4-Way Inline

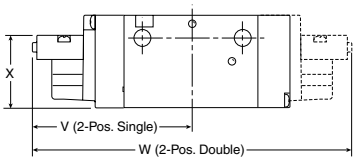
Solenoid



Remote Pilot



Remote Pilot ("YY" Option)



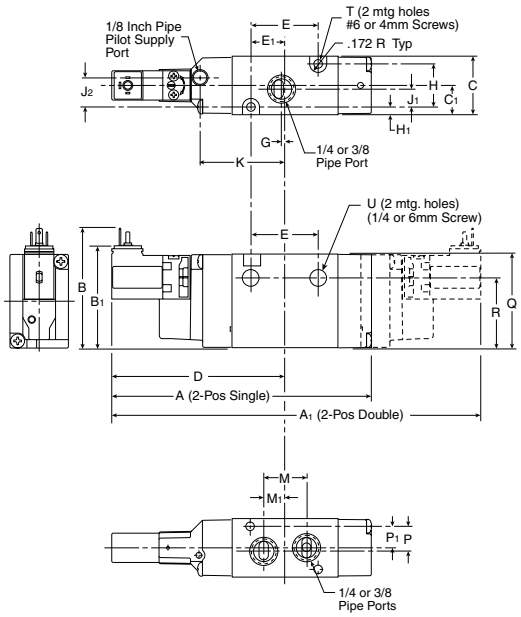
B5 4-Way Inline

A	A1	A2	A3	A4
5.78 (147)	7.51 (191)	8.45 (215)	4.37 (110)	4.70 (119)
A5	**B**	**B1**	**C**	**C1**
5.64 (143)	2.41 (61)	2.06 (52)	1.18 (30)	.59 (15)
D	**D1**	**D2**	**D3**	**E**
3.76 (96)	4.23 (107)	2.35 (60)	2.82 (72)	1.89 (48)
E1	**F**	**F1**	**G**	**G1**
.95 (24)	2.01 (51)	2.47 (63)	1.00 (25)	.50 (13)
H	**H1**	**J**	**J1**	**J**
.87 (22)	.16 (4)	.51 (13)	.36 (9)	.58 (15)
K	**K1**	**L**	**M**	**N**
2.00 (51)	2.47 (63)	1.75 (44)	.88 (22)	.43 (48)
P	**P1**	**Q**	**R**	**S**
.50 (13)	.37 (92)	1.89 (48)	1.41 (36)	2.05 (52)
S1	**T**	**U**	**V**	**W**
1.03 (26)	Ø .177 Ø (4.5)	Ø .34 Ø (9)	3.24 (82)	6.48 (165)
X				
1.50 (383)				

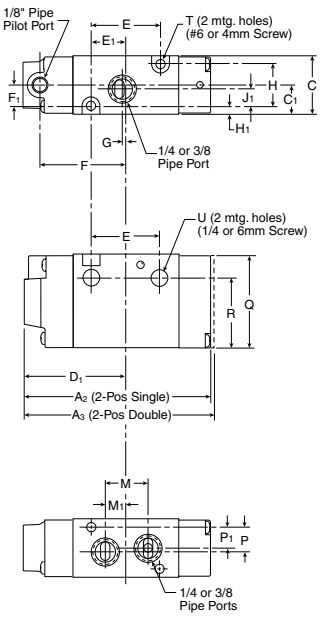
Inches (mm)

B5 Single & Double Operators – 3-Way Inline

Solenoid



Remote Pilot



B5 3-Way Inline

A	A1	A2	A3	B
5.29 (134)	7.03 (179)	3.88 (99)	4.21 (107)	2.41 (61)
B1	**C**	**C1**	**D**	**D1**
2.06 (52)	1.18 (30)	.59 (15)	3.43 (87)	2.11 (54)
E	**E1**	**F**	**F1**	**G**
1.40 (36)	.70 (18)	1.77 (45)	.43 (11)	.06 (2)
H	**H1**	**J1**	**J2**	**K**
.87 (22)	.16 (4)	.36 (9)	.58 (15)	1.67 (42)
M	**M1**	**P**	**P1**	**Q**
.88 (22)	.44 (11)	.50 (13)	.37 (9)	1.89 (48)
R	**T**	**U**		
1.41 (36)	Ø .177 Ø (4.5)	Ø .26 Ø (6.6)		

Inches (mm)

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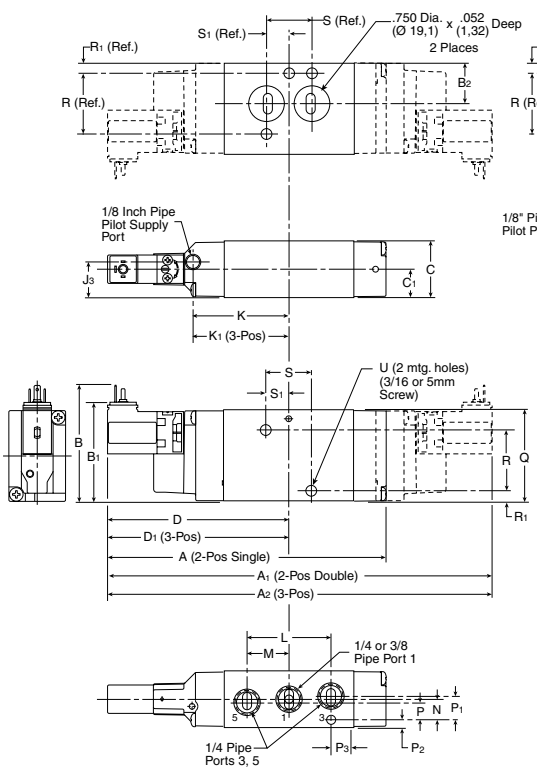
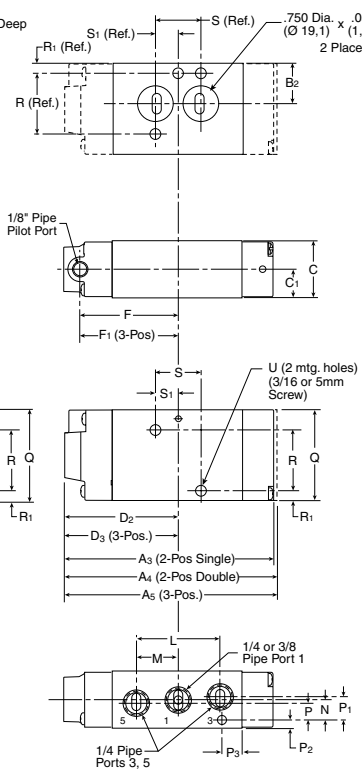
B5 Single & Double Operators – 4-Way NAMUR Mount

Solenoid



Remote Pilot

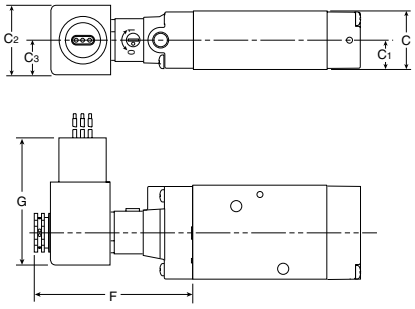


B5 4-Way NAMUR Mount

A	A1	A2	A3	A4
5.78 (147)	7.51 (191)	8.45 (215)	4.37 (110)	4.70 (119)
A5	**B**	**B1**	**B2**	**C**
5.64 (143)	2.41 (61)	2.06 (52)	.84 (21)	1.18 (30)
C1	**D**	**D1**	**D2**	**D3**
.59 (15)	3.76 (96)	4.23 (107)	2.35 (60)	2.82 (72)
F	**F1**	**J3**	**K**	**K1**
2.01 (51)	2.47 (63)	.74 (19)	2.00 (51)	2.47 (63)
L	**M**	**N**	**P**	**P1**
1.75 (44)	.88 (22)	.44 (11)	.37 (9.4)	.50 (13)
P2	**P3**	**Q**	**R**	**R1**
.16 (4)	.40 (10)	1.89 (48)	1.26 (32)	.21 (5)
S	**S1**	**U**		
.94 (24)	.47 (12)	Ø .224 Ø (5.7)		

Inches (mm)

B5 Alternative Electrical Enclosure Option F



Explosion Proof Solenoid Coil

B5 4-Way NAMUR Mount with Option F Enclosure

C	C1	C2	C3	F
1.18 (30)	.59 (15)	1.42 (36)	.71 (18)	3.15 (80)
G				
2.60 (66)				

Inches (mm)

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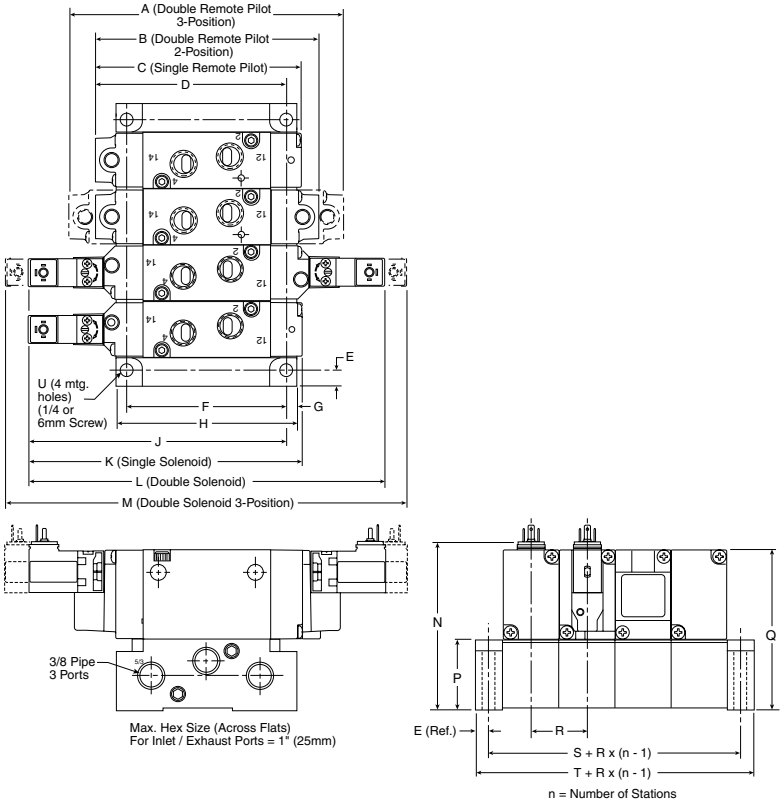
B5 Single & Double Operators – 4-Way IEM Stackable



B5 4-Way IEM Stackable

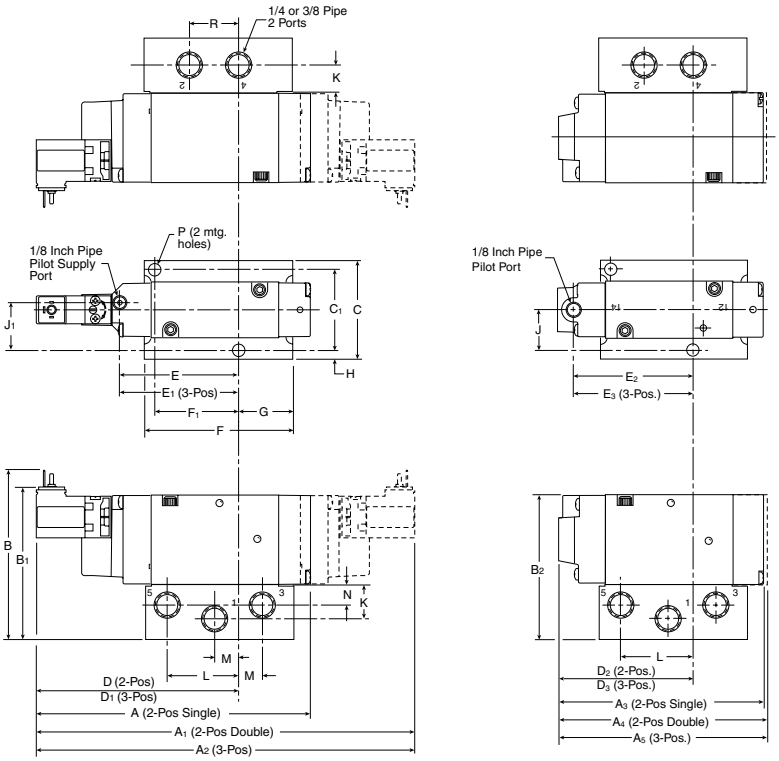
A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	4.29 (109.0)	.29 (7.4)
F	**G**	**H**	**J**	**K**
3.44 (87.4)	.24 (6.1)	3.92 (99.6)	5.48 (139.2)	5.78 (146.8)
L	**M**	**N**	**P**	**Q**
7.52 (191.0)	8.46 (214.9)	3.56 (90.4)	1.50 (38.1)	3.42 (86.9)
R		**S**	**T**	**U**
1.21 ± .01 (30.7) ± (.3)		1.79 (45.5)	2.37 (60.2)	Ø .28 Ø (7.1)

Inches (mm)

B5 Single & Double Operators – 4-Way Single Subbase

Solenoid

Remote Pilot



B5 4-Way Subbase

A	A_1	A_2	A_3	A_4
5.78 (147)	7.52 (191)	8.46 (215)	4.37 (110)	4.70 (119)
A_5	**B**	B_1	B_2	**C**
5.64 (143)	3.56 (90)	3.21 (82)	3.03 (77)	2.12 (54)
C_1	**D**	D_1	D_2	D_3
1.69 (43)	4.26 (108)	4.73 (120)	2.85 (72)	3.32 (40)
E	E_1	E_2	E_3	**F**
2.51 (65)	2.98 (76)	2.60 (66)	3.07 (80)	2.90 (74)
F_1	**G**	**H**	**J**	J_1
1.69 (43)	.95 (24)	.22 (5)	.84 (21)	.99 (25)
K	**L**	**M**	**N**	**P**
.71 (18)	1.50 (38)	.50 (13)	.46 (12)	Ø .27 Ø (7)
R				
1.00 (25)				

Inches (mm)

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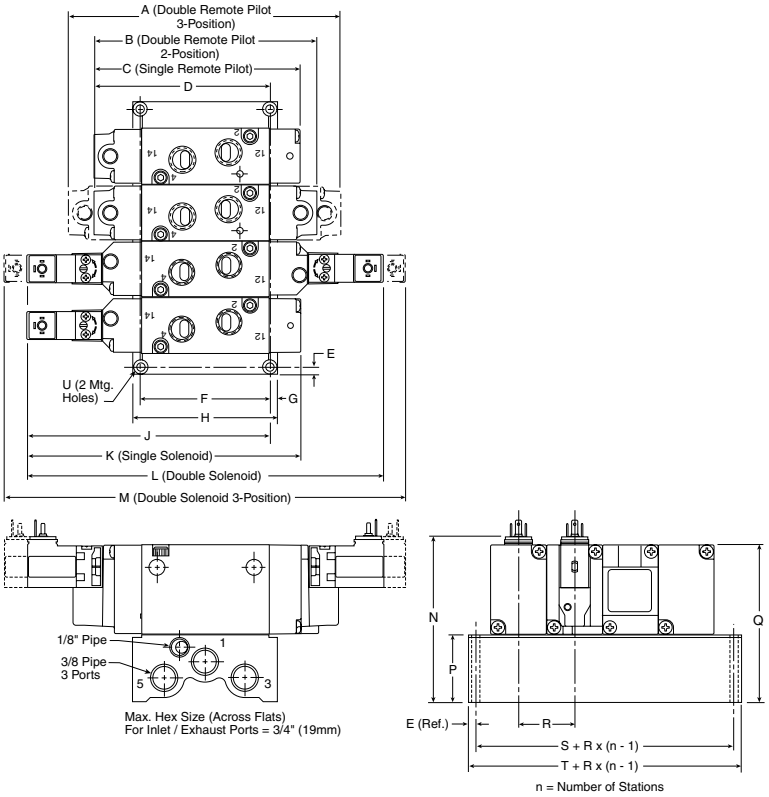
B5 Single & Double Operators – 4-Way IEM Aluminum Bar

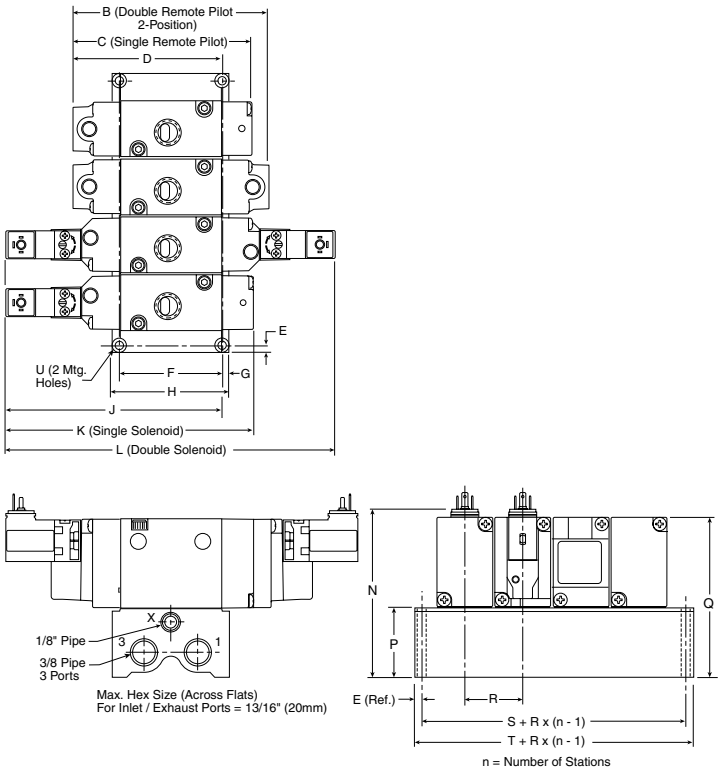


B5 4-Way IEM Aluminum Bar Manifold

A	B	C	D	E
5.64 (143.3)	4.70 (119.4)	4.37 (110.0)	3.74 (95.0)	.18 (4.6)
F	**G**	**H**	**J**	**K**
2.78 (70.6)	.17 (4.3)	3.12 (79.2)	5.15 (130.8)	5.78 (146.8)
L	**M**	**N**	**P**	**Q**
7.52 (191.0)	8.46 (214.9)	3.50 (89.0)	1.44 (36.6)	3.36 (85.3)
R	**S**	**T**	**U**	
1.26 (32.0)	1.78 (45.2)	2.14 (54.4)	Ø .22 Ø (5.5)	

Inches (mm)

B5 Single & Double Operators – 3-Way IEM Aluminum Bar



B5 3-Way IEM Aluminum Bar Manifold

B	C	D	E	F
4.21 (106.9)	3.88 (98.6)	3.41 (86.6)	.18 (4.6)	2.12 (53.8)
G	**H**	**J**	**K**	**L**
.17 (4.3)	2.46 (62.5)	4.82 (122.4)	5.29 (134.4)	7.03 (178.6)
N	**P**	**Q**	**R**	**S**
3.50 (89.0)	1.44 (36.6)	3.36 (85.3)	1.26 (32.0)	1.76 (44.7)
T	**U**			
2.12 (53.8)	Ø .18 Ø (4.6)			

Inches (mm)

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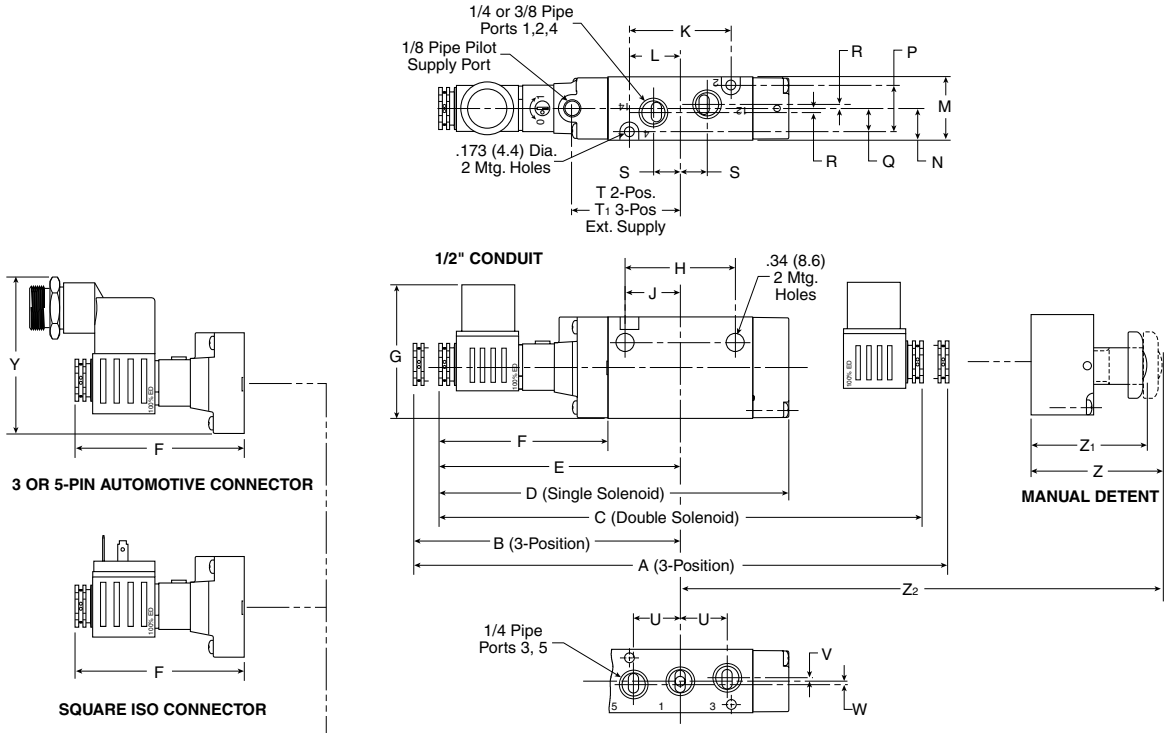
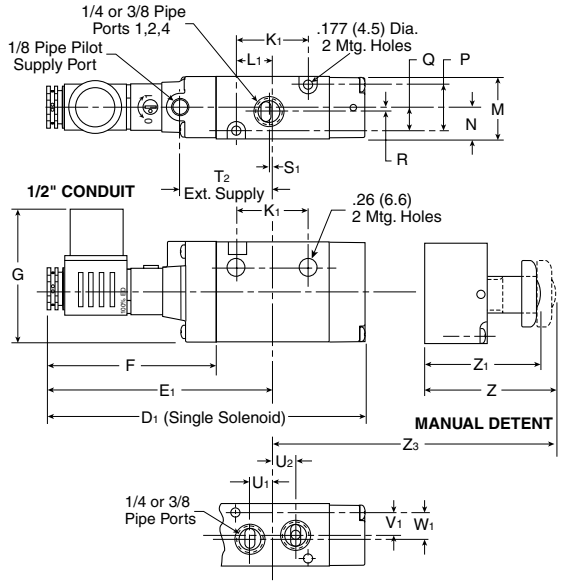
B5

4-Way Alternative Electrical Enclosures



3-Way Alternative Electrical Enclosures



B5 Alternative – Electrical Enclosures Inches (mm)

A	A1	B	C	D	D1	E	E1	F	G	H	J	K
9.94 (252.5)	.872 (221.4)	4.97 (126.2)	9.00 (228.6)	6.52 (165.6)	6.02 (152.9)	4.50 (114.3)	4.26 (108.1)	3.15 (80.0)	2.47 (62.8)	2.05 (52.1)	1.03 (26.2)	1.89 (48.0)
K1	**L**	**L1**	**M**	**N**	**P**	**Q**	**R**	**S**	**S1**	**T**	**T1**	**T2**
1.40 (35.5)	.95 (24.1)	.70 (17.8)	1.18 (30.0)	.59 (15.0)	.87 (22.1)	.43 (10.9)	.08 (2.0)	.50 (12.7)	.06 (1.5)	2.01 (51.1)	2.47 (62.7)	1.76 (44.8)
U	**U1**	**U2**	**V**	**V1**	**W**	**W1**	**Y**	**Z**	**Z1**	**Z2**	**Z3**	
.87 (22.1)	.43 (10.9)	.45 (11.3)	.06 (1.5)	.37 (9.3)	.07 (1.8)	.50 (13)	2.90 (73.6)	2.40 (60.9)	2.12 (53.8)	3.75 (95.2)	4.17 (105.8)	

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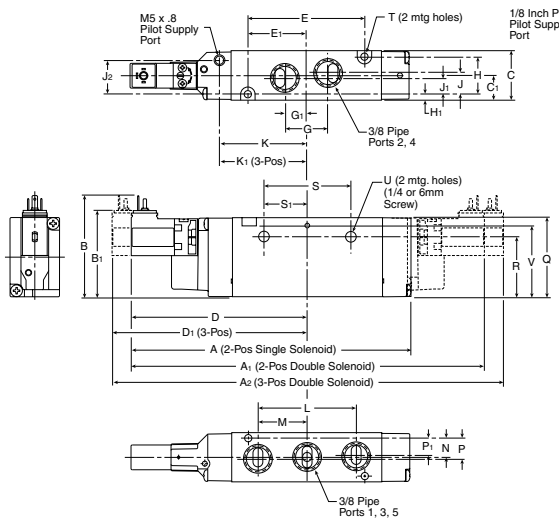
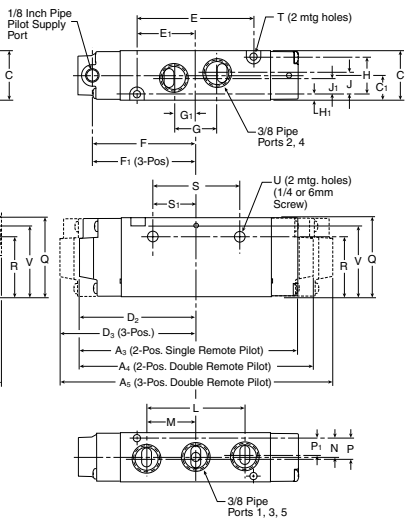
B6 Single & Double Operators – 4-Way Inline

Solenoid



Remote Pilot



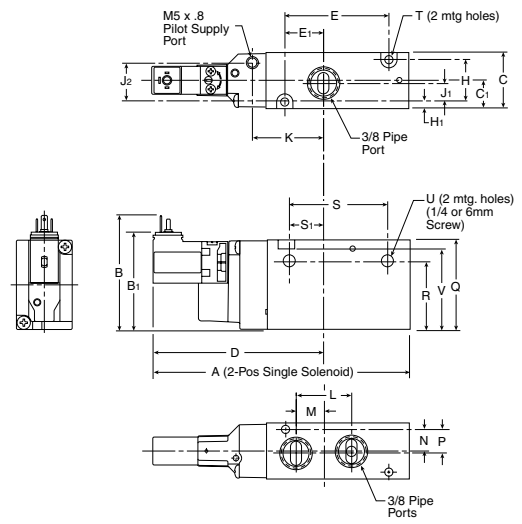
B6 4-Way Inline

A	A1	A2	A3	A4
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	**B**	**B1**	**C**	**C1**
6.54 (166.0)	2.41 (61.3)	2.06 (52.3)	1.18 (30.0)	.59 (15.0)
D	**D1**	**D2**	**D3**	**E**
4.21 (106.8)	4.68 (118.8)	2.80 (71.0)	3.27 (83.0)	2.79 (70.8)
E1	**F**	**F1**	**G**	**G1**
1.39 (35.4)	2.45 (62.3)	2.92 (74.3)	1.03 (26.1)	.51 (13.1)
H	**H1**	**J**	**J1**	**J2**
.91 (23.0)	.14 (3.5)	.51 (13.1)	.39 (10.0)	.81 (20.6)
K	**K1**	**L**	**M**	**N**
2.09 (53.0)	2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.45 (11.5)
P	**P1**	**Q**	**R**	**S**
.49 (12.5)	.41 (10.5)	1.89 (48.0)	1.45 (36.8)	2.09 (53.0)
S1	**T**	**U**	**V**	
1.04 (26.5)	Ø .17 Ø (4.4)	Ø .27 Ø (6.9)	1.69 (43.0)	

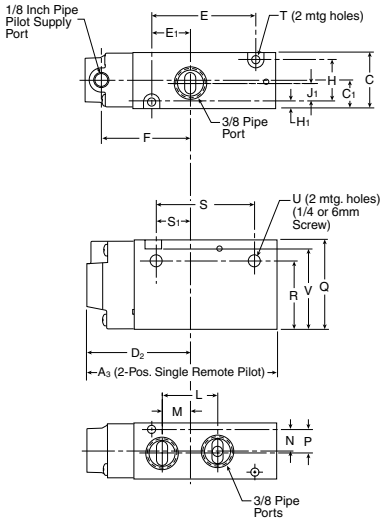
Inches (mm)

B6 Single Operators – 3-Way Inline

Solenoid



Remote Pilot



B6 3-Way Inline

A	A3	B	B1	C
5.42 (137.7)	4.01 (101.9)	2.41 (61.3)	2.06 (52.3)	1.18 (30.0)
C1	**D**	**D2**	**E**	**E1**
.59 (15.0)	3.63 (92.1)	2.22 (56.3)	2.19 (55.6)	0.82 (20.7)
F	**H**	**H1**	**J1**	**J2**
1.87 (47.6)	.91 (23.0)	.14 (3.5)	.39 (10.0)	.81 (20.6)
K	**L**	**M**	**N**	**P**
1.51 (38.3)	1.17 (29.7)	.59 (15.0)	.45 (11.5)	.49 (12.5)
Q	**R**	**S**	**S1**	**T**
1.89 (48.0)	1.45 (36.8)	2.09 (53.0)	0.76 (19.4)	Ø .17 Ø (4.4)
U	**V**			
Ø .27 Ø (6.9)	1.69 (43.0)			

Inches (mm)

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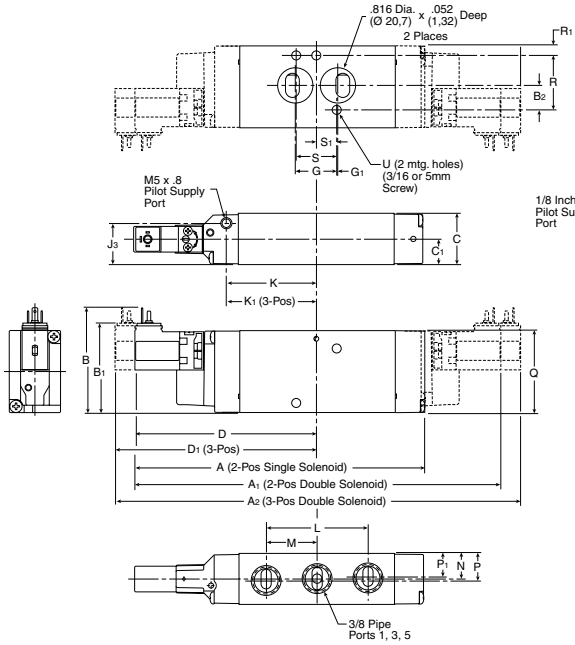
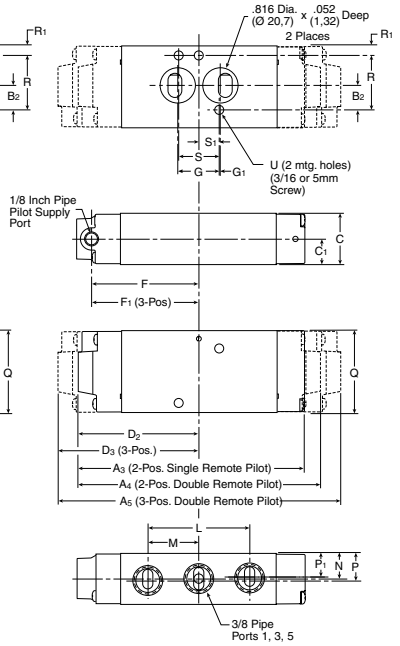
B6 Single & Double Operators – 4-Way NAMUR Mount

Solenoid



Remote Pilot

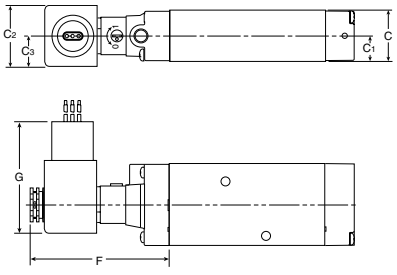


B6 4-Way NAMUR Mount

A	**A1**	**A2**	**A3**	**A4**
6.67 (169.5)	8.41 (213.7)	9.35 (237.6)	5.26 (133.7)	5.59 (142.1)
A5	**B**	**B1**	**B2**	**C**
6.54 (166.0)	2.41 (61.3)	2.06 (52.3)	.57 (14.4)	1.18 (30.0)
C1	**D**	**D1**	**D2**	**D3**
.59 (15)	4.21 (106.8)	4.68 (118.8)	2.80 (71.0)	3.27 (83.0)
F	**F1**	**G**	**G1**	**J3**
2.45 (62.3)	2.92 (74.3)	.95 (24.2)	.02 (0.53)	.95 24.1)
K	**K1**	**L**	**M**	**N**
2.09 (53.0)	2.56 (64.9)	2.34 (59.4)	1.17 (29.7)	.59 (15)
P	**P1**	**Q**	**R**	**R1**
.63 (16)	.55 (14)	1.89 (48.0)	1.26 (32)	.22 (5.5)
S	**S1**	**T**	**U**	
.94 (24)	.47 (12)	Ø .17 Ø (4.4)	Ø .27 Ø (6.9)	

Inches (mm)

B6 Alternative Electrical Enclosure Option F



Hazardous Duty Solenoid Coil

B6 4-Way NAMUR Mount with Option F Enclosure

C	**C1**	**C2**	**C3**	**F**
1.18 (30)	.59 (15)	1.42 (36)	.71 (18)	3.15 (80)
G				
2.60 (66)				

Inches (mm)

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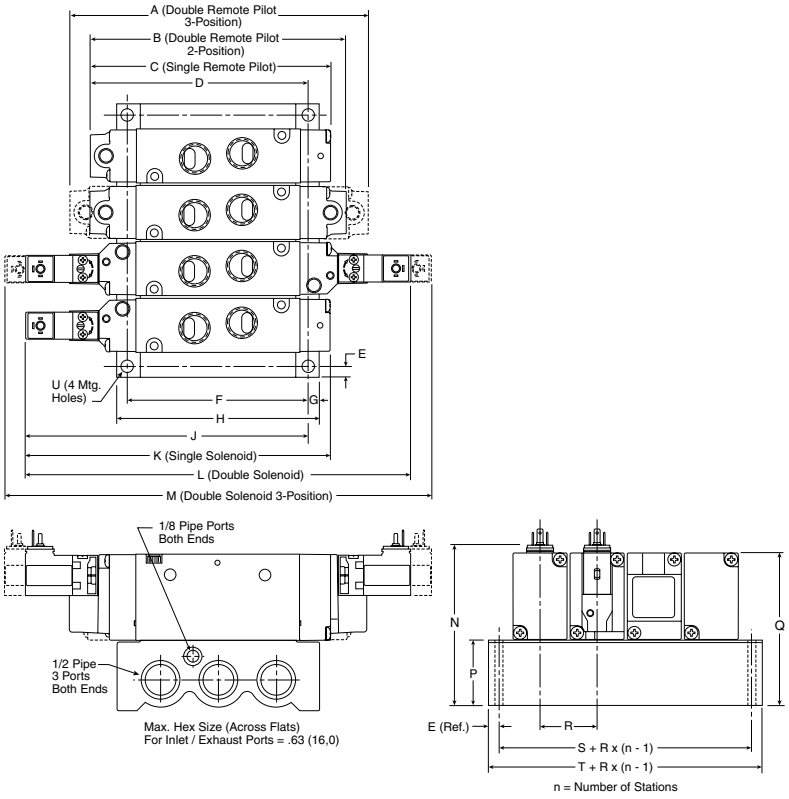
B6 Single & Double Operators – 4-Way IEM Aluminum Bar

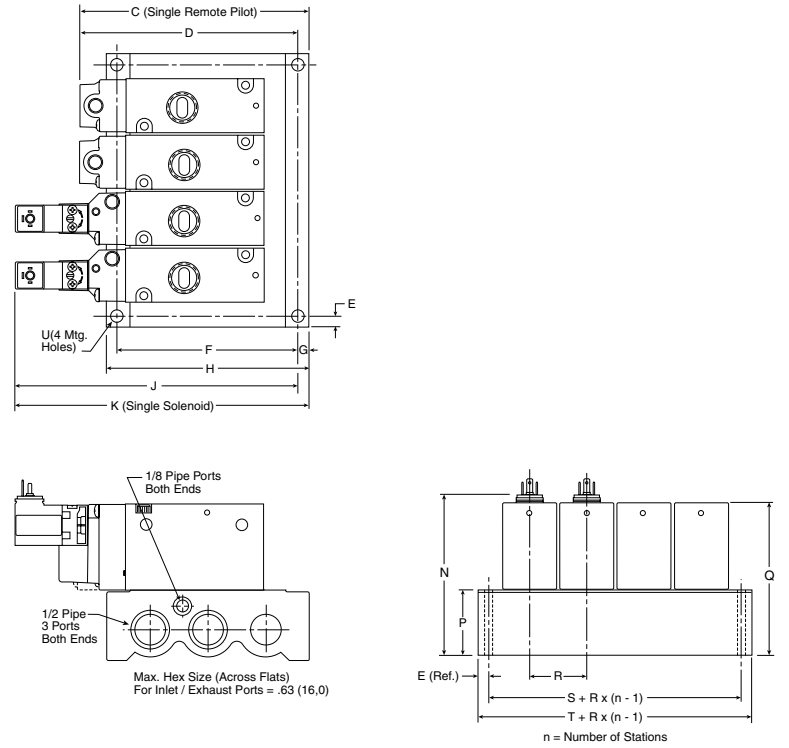


B6 4-Way IEM Aluminum Bar Manifold

A	B	C	D	E
6.54 (166.0)	5.59 (142.1)	5.26 (133.7)	4.76 (121.0)	.24 (6.0)
F	**G**	**H**	**J**	**K**
3.94 (100.0)	.24 (6.0)	4.41 (112.0)	6.17 (156.8)	6.67 (169.5)
L	**M**	**N**	**P**	**Q**
8.41 (213.7)	9.35 (237.6)	3.60 (91.3)	1.54 (39.0)	3.43 (87.0)
R	**S**	**T**	**U**	
1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	ø .26 ø (6.5)	

Inches (mm)

B6 Single Operators – 3-Way IEM Aluminum Bar



B6 3-Way IEM Aluminum Bar Manifold

C	D	E	F	G
5.00 (127.0)	4.76 (121.0)	.24 (6.0)	3.94 (100.0)	.24 (6.0)
H	**J**	**K**	**N**	**P**
4.41 (112.0)	6.17 (156.8)	6.41 (162.8)	3.60 (91.3)	1.54 (39.0)
Q	**R**	**S**	**T**	**U**
3.43 (87.0)	1.24 (31.5)	1.77 (45.0)	2.24 (57.0)	Ø .26 Ø (6.5)

Inches (mm)

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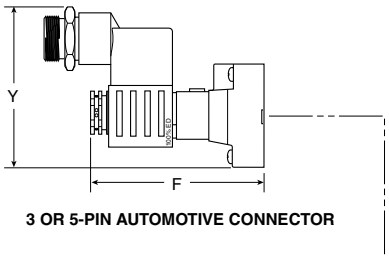
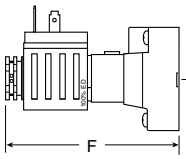
B6

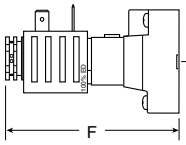
4-Way Alternative Electrical Enclosures



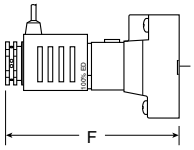
3 OR 5-PIN AUTOMOTIVE CONNECTOR



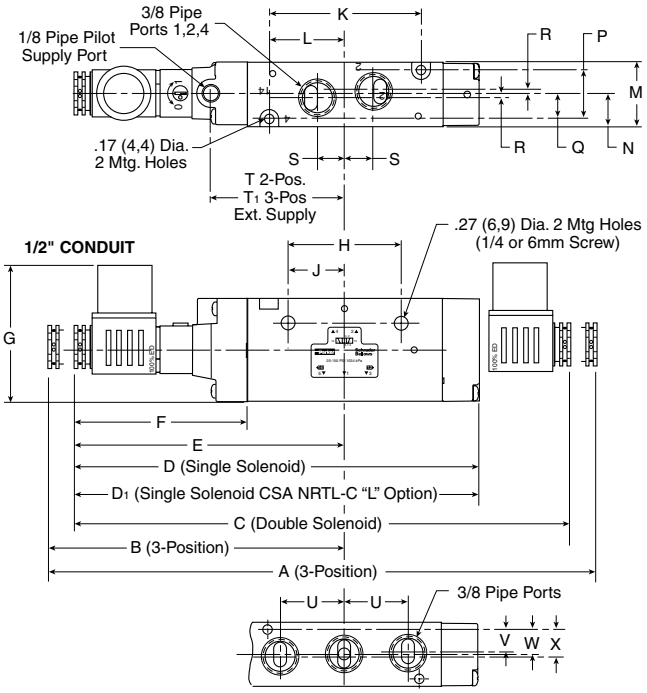
SQUARE ISO CONNECTOR



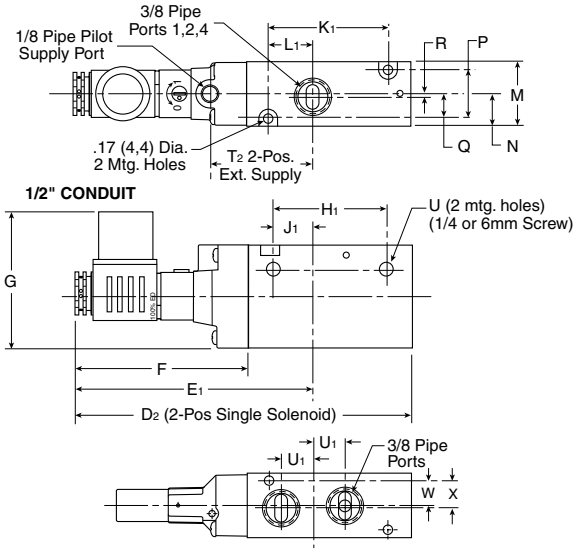
22mm RECT. DIN CONNECTOR



GROMMET/FLYING LEADS



3-Way Alternative Electrical Enclosures



B6 Alternative – Electrical Enclosures Inches (mm)

A	B	C	D	D_1	D_2	E	E_2	F	G	H	H_1	J
10.84 (275.3)	5.41 (137.5)	9.89 (251.3)	7.41 (188.2)	7.74 (196.6)	6.17 (156.6)	4.94 (125.6)	4.37 (111.0)	3.15 (80.0)	2.47 (62.8)	2.09 (53.0)	2.09 (53.0)	1.04 (26.5)
J_1	K	K_1	L	L_1	M	N	P	Q	R	S	T	T_1
0.76 (19.4)	2.79 (70.8)	2.19 (55.6)	1.39 (35.4)	.82 (20.7)	1.18 (30.0)	.59 (15.0)	.91 (23.0)	.45 (11.5)	.06 (1.6)	.51 (13.1)	2.45 (62.3)	2.93 (29.7)
T_2	U	U_1	V	W	X	Y						
1.89 (48.0)	.59 (15.0)	.59 (15.0)	.41 (10.5)	.45 (11.5)	.49 (12.5)	2.90 (73.6)						

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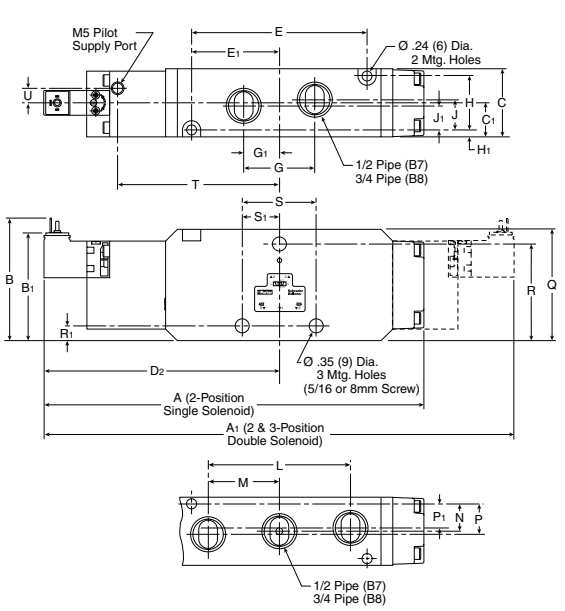
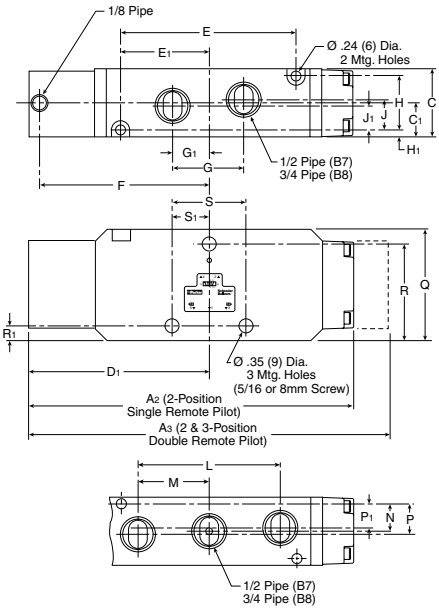
B7 / B8 Single & Double Operators – 4-Way Inline

Solenoid



Remote Pilot



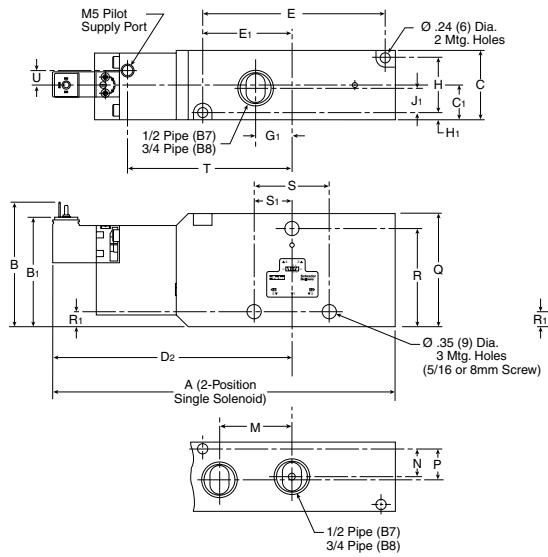
B7 & B8 4-Way Inline

A	A1	A2	A3
9.13 (232)	11.29 (287)	7.79 (198)	8.62 (219)
B	**B1**	**C**	**C1**
2.95 (75)	2.59 (66)	1.65 (42)	.83 (21)
D1	**D2**	**E**	**E1**
4.29 (109)	5.63 (143)	4.21 (107)	2.13 (54)
F	**G**	**G1**	**H**
4.06 (103)	1.73 (44)	.87 (22)	1.29 (33)
H1	**J**	**J1**	**L**
.16 (4)	.75 (19)	.59 (15)	3.39 (86)
M	**N**	**P**	**P1**
1.69 (43)	.67 (17)	.75 (19)	.59 (15)
Q	**R**	**R1**	**S**
2.68 (68)	2.32 (59)	.35 (9)	1.81 (46)
S1	**T**	**U**	
.90 (23)	3.94 (100)	.35 (9)	

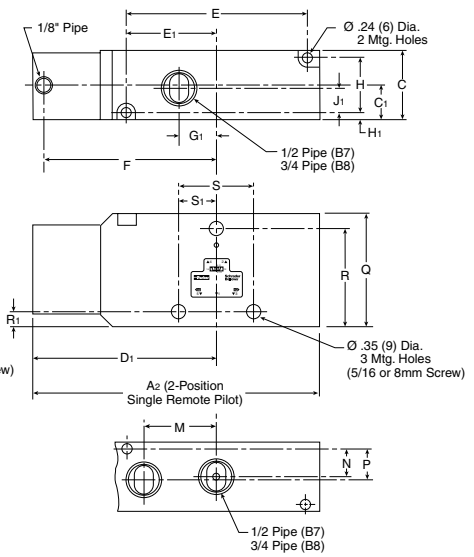
Inches (mm)

B7 / B8 Single Operators – 3-Way Inline

Solenoid



Remote Pilot



B7 & B8 3-Way Inline

A	A2	B	B1
7.99 (203)	6.65 (169)	2.95 (75)	2.59 (66)
C	**C1**	**D1**	**D2**
1.65 (42)	.83 (21)	4.29 (109)	5.63 (143)
E	**E1**	**F**	**G1**
4.21 (107)	2.13 (54)	4.06 (103)	.86 (22)
H	**H1**	**J1**	**M**
1.29 (33)	.16 (4)	.59 (15)	1.69 (43)
N	**P**	**Q**	**R**
.67 (17)	.75 (19)	2.68 (68)	2.32 (59)
R1	**S**	**S1**	**T**
.35 (9)	1.81 (46)	.90 (23)	3.94 (100)
U			
.35 (9)			

Inches (mm)

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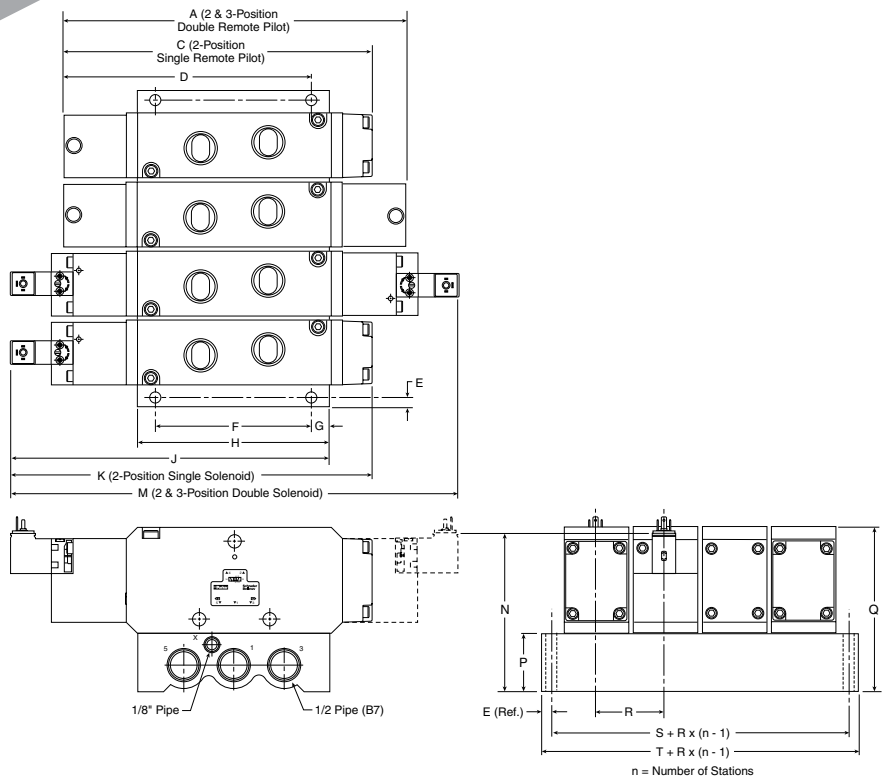
B7 Single & Double Operators – 4-Way IEM Aluminum Bar

B8



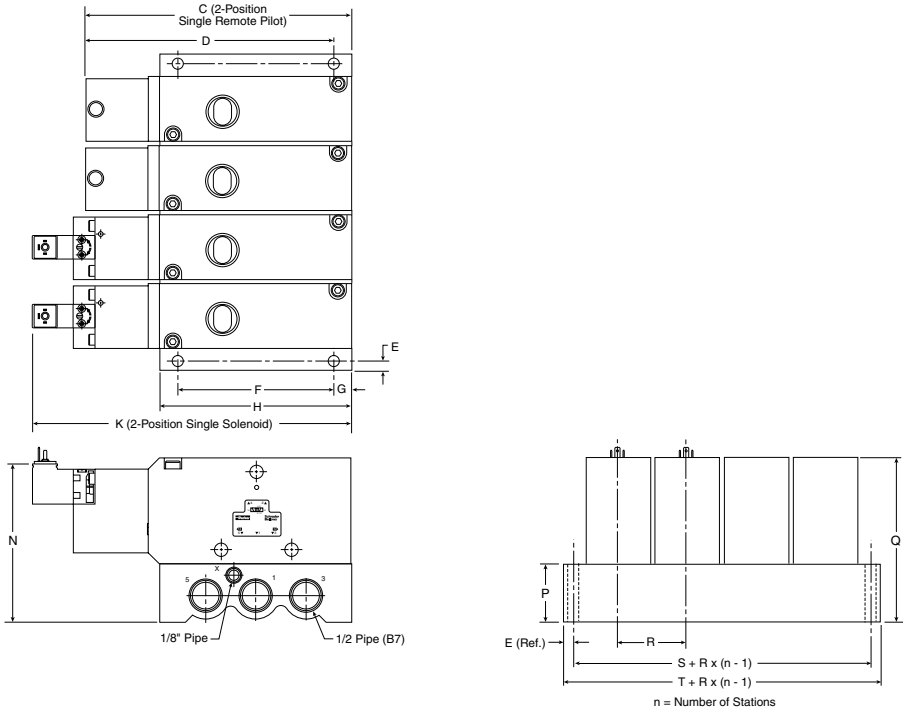
B7 & B8 4-Way IEM Aluminum Bar Manifold

A	C	D	E
7.79 (198)	8.62 (219)	6.26 (159)	.24 (6)
F	**G**	**H**	**J**
3.94 (100)	.45 (11.5)	4.84 (123)	8.07 (205)
K	**M**	**N**	**P**
9.13 (232)	11.29 (287)	4.00 (101.5)	1.48 (37.5)
Q	**R**	**S**	**T**
4.15 (105.5)	1.77 (45)	2.24 (57)	2.72 (69)

Inches (mm)

B7 Single Operators – 3-Way IEM Aluminum Bar

B8



B7 & B8 3-Way IEM Aluminum Bar Manifold

C	D	E	F
6.65 (169)	4.92 (124.9)	.24 (6)	3.94 (100)
G	**H**	**K**	**N**
.45 (11.5)	4.84 (123)	7.99 (203)	4.00 (101.5)
P	**Q**	**R**	**S**
1.48 (37.5)	4.15 (105.5)	1.77 (45)	2.24 (57)
T			
2.72 (69)			

Inches (mm)

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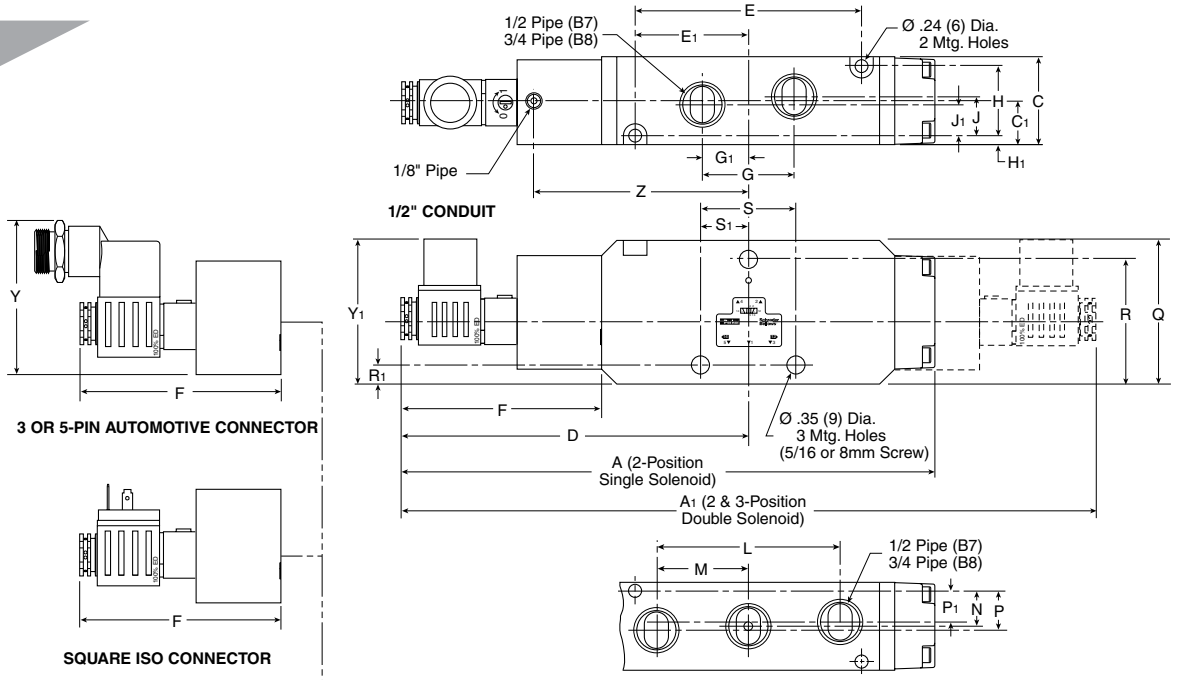
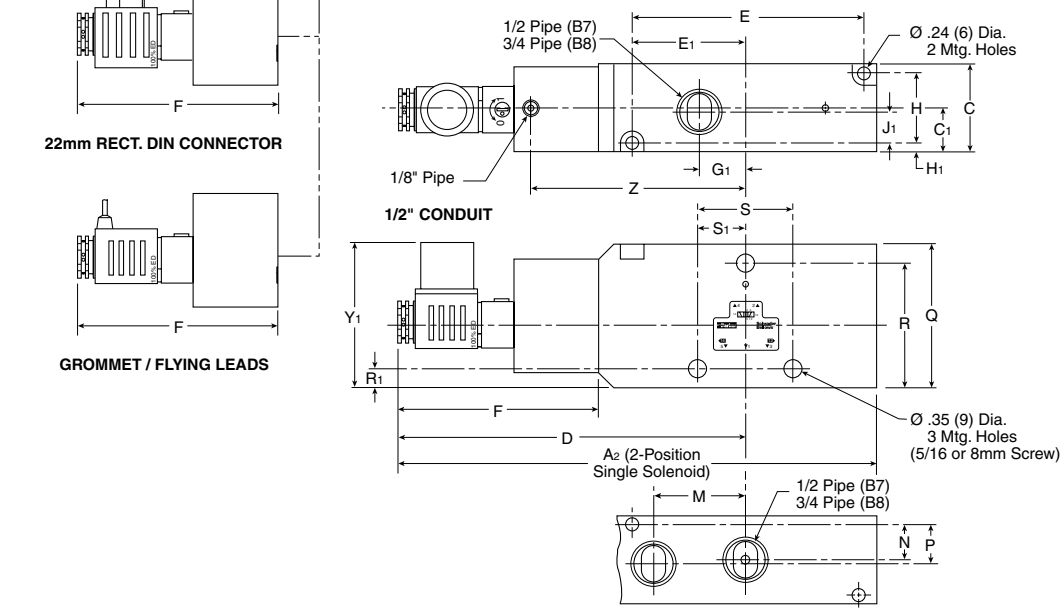
B7

B8

4-Way Alternative Electrical Enclosures



3-Way Alternative Electrical Enclosures



B7 & B8 3 & 4-Way Alternative – Electrical Enclosures Inches (mm)

A 9.92 (252)	**A1** 12.91 (328)	**A2** 8.78 (223)	**C** 1.65 (42)	**C1** .83 (21)	**D** 6.46 (164)	**E** 4.21 (107)	**E1** 2.13 (54)	**F** 3.74 (95)	**G** 1.73 (44)	**G1** .86 (22)	**H** 1.29 (33)	**H1** .16 (4)
J .75 (19)	**J1** .59 (15)	**L** 3.39 (86)	**M** 1.69 (43)	**N** .67 (17)	**P** .75 (19)	**P1** .59 (15)	**Q** 2.68 (68)	**R** 2.32 (59)	**R1** .35 (9)	**S** 1.81 (46)	**S1** .90 (23)	**Y** 2.87 (73)
Y1 2.71 (69)	**Z** 3.98 (101)											

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Definitions

CSA C/US ..... Canadian Standards Association and UL Applicable.

IP65 ..... International classification system for sealing effectiveness for enclosures of electrical equipment. IP stands for "Ingress Protection" and the two digits XY stand for: X - protection from solid objects and Y - protection from moisture. IP 65 is protection from dust and water washdown.

NEMA 4 ..... National standard for electrical enclosure protection. NEMA 4 provides protection against dirt, dust, water hosedown and rain. (Similar to IP 65)

DIN 43650C ..... International standard for the 15mm 3-Pin connector. The pin spacing is 8mm.

3-WAY ..... Valve has three ways for air to flow. Also designated as 3/2.

4-WAY ..... Valve has four ways for air to flow. Also designated as 5/2 for 2-Position and 5/3 for 3-Position.

NC ..... Normally Closed. Pressure is blocked when in neutral position. (Normally Non-Passing)

NO ..... Normally Open. Pressure passes thru when in neutral position. (Normally Passing)

IEM ..... Inlet / Exhaust manifold. The inlet and exhaust ports are located in the manifold. The cylinder ports are accessed in the valve.

5-Port Subbase Bar Manifold
Manifold that includes the inlet and outlet ports as well as the #2 & #4 cylinder ports. Utilizes a subbase valve less base.

NLMOR ..... Non-Locking Manual Override. A constant actuation must be maintained for the valve to remain shifted.

LMOR ..... Locking Manual Override. Valve remains shifted without constant end user override actuation.

Surge Suppression
Nullifies reverse EMF generated when a solenoid is de-energized.

SCFM ..... Measure of air flow. Standard Cubic Feet per Minute at 68°F and 36% humidity at sea level.

PSIG ..... Pounds per Square Inch measured with a gage. (Catalog pressure reflects PSIG)

PSIA ..... Pounds per Square Inch atmospheric.

kPa ..... Kilopascals. International measure of pressure. 145 PSIG = 1000 kPa

PSIG = 0 → PSIA = 14.7 → In. of Hg = 0 → kPa = 0

Product Shipping Weights

Series	Single Solenoid	3-Position Solenoid	Manifold Stackable	Subbase	End Plate
B3	.25	.35	.20	.60	.50
B5	.70	.80	.20	.80	.70
B6	1.8	2.4	—	—	—
B7	2.5	2.9	—	—	—
B8	2.5	2.9	—	—	—

Weights are in pounds and are approximate.

Cv Calculations

Cv ..... Measure of calculating flow of a valve (or other pneumatic device) that takes into effect the temperature, pressure, pressure drop, and flow. As a rule of thumb. a Cv of 1.0 is 25 SCFM with a 5 PSIG pressure drop.

$$Cv = \frac{\text{Cylinder Area (Sq. In.) (See Table 2)} \times \text{Cylinder Stroke (In.)} \times \text{Compression Factor (Table 1)} \times \text{"A" (Table 1)}}{\text{Stroke Time (sec.)} \times 28.8}$$

Table 1
Compression Factors and "A" Constants

Inlet Pressure (PSIG)	Compression Factor	"A" Constants for Various Pressure Drop*		
		2 PSI △ P	5 PSI △ P	10 PSI △ P
10	1.6	.152	.103	
20	2.3	.126	.084	.065
30	3.0	.111	.073	.055
40	3.7	.100	.065	.048
50	4.4	.091	.059	.044
60	5.1	.085	.055	.040
70	5.7	.079	.051	.037
80	6.4	.075	.048	.035
90	7.1	.071	.046	.033
100	7.8	.068	.044	.032
110	8.5	.065	.042	.030
120	9.2	.063	.040	.029
130	9.9	.061	.039	.028
140	10.6	.058	.037	.027
150	11.2	.057	.036	.026
160	11.9	.055	.035	.025
170	12.6	.053	.034	.024
180	13.3	.052	.033	.024
190	14.0	.051	.032	.023
200	14.7	.050	.032	.023

Note: Use "A" constant at 5 PSI △ P for most applications. On very critical applications. use "A" at 2 PSI △ P. You will find in many cases, a 10 PSI △ P is not detrimental, and can save money and mounting space.

* Tabulated values are the solution of $\frac{1}{22.48}\sqrt{\frac{GT}{(P_1 - P_2)\,P_2}}$ where T is for 68°F and G =1 for Air.

Table 2
Effective Square-Inch Areas for Standard-Bore-Size Cylinders

Bore Size	Cylinder Area (Sq. In.)	Bore Size	Cylinder Area (Sq. In.)
3/4"	.44	4"	12.57
1"	.79	4-1/2"	15.90
1-1/8"	.99	5"	19.64
1-1/4"	1.23	6"	28.27
1-1/2"	1.77	7"	38.48
1-3/4"	2.41	8"	50.27
2"	3.14	10"	78.54
2-1/2"	4.91	12"	113.10
3-1/4"	8.30	14"	153.94
3-5/8"	10.32		

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Notes

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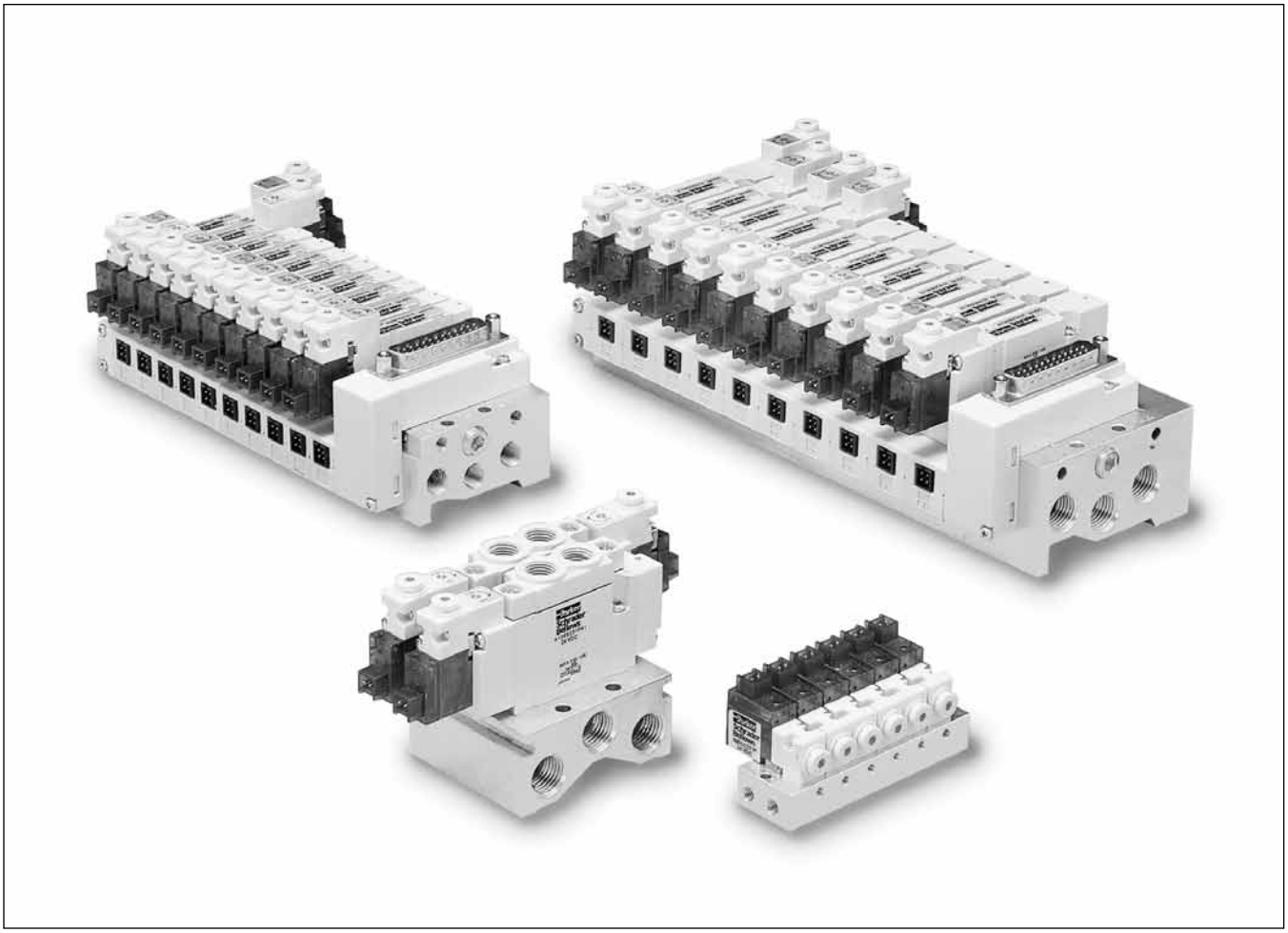
"ADEX" Series

Air Control Valves

A00 – .01 Cv M3 Port
A05 – .18 Cv M5 Port
A12 – .47 Cv 1/8" Port

Section D

www.parker.com/pneu/adex



BOLD ITEMS ARE MOST POPULAR.

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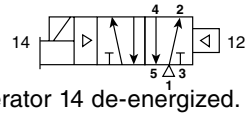
Single Solenoid

4-Way, 2-Position

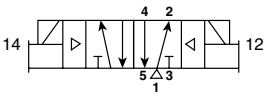


De-energized position – Solenoid operator 14 de-energized.
Pressure at inlet port 1 connected to outlet port 2.
Outlet port 4 connected to exhaust port 5.

Energized position – Solenoid operator 14 energized.
Pressure at inlet port 1 connected to outlet port 4.
Outlet port 2 connected to exhaust port 3.

Double Solenoid

4-Way, 2-Position

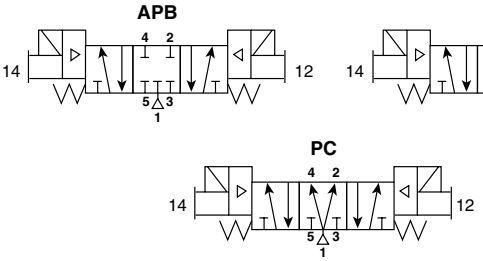


Solenoid operator 14 energized last.
Pressure at inlet port 1 connected to outlet port 4.
Outlet port 2 connected to exhaust port 3.

Solenoid operator 12 energized last.
Pressure at inlet port 1 connected to outlet port 2.
Outlet port 4 connected to exhaust port 5.

Double Solenoid

4-Way, 3-Position



With 12 operator energized – inlet port 1 connected to cylinder port 2, cylinder port 4 connected to exhaust port 5.

With 14 operator energized – inlet port 1 connected to cylinder port 4, cylinder port 2 connected to exhaust port 3.

Function 1: All Ports Blocked (APB)
All ports blocked in the center position.

Function 2: Center Exhaust (CE)
Cylinder ports 4 and 2 connected to exhaust ports 5 and 3 in center position. Port 1 is blocked.

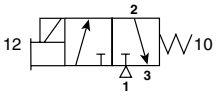
Function 3: Pressure Center (PC)
Pressure port 1 connected to cylinder ports 4 and 2, and exhaust ports 5 and 3 blocked in center position.

Dual Pressure (Subbase valves only):

May be used for dual pressure service with pressure at ports 3 & 5. **Specify External Pilot option "X" on Valve AND Manifold.** In the 3-Position valve, the effect of dual pressure is extremely important when the valve is in the center position, as the CE and PC functions are reversed. Therefore, care should be used when selecting a 3-Position valve.

Single Solenoid

3-Way, 2-Position NC



Normally Closed:

De-energized position – Solenoid 12 de-energized.
Pressure at inlet port 1 blocked, outlet port 2 connected to exhaust port 3.

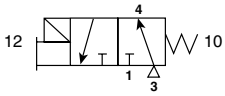
Energized position – Solenoid 12 energized.
Pressure at inlet port 1 connected to outlet port 2, exhaust port 3 is blocked.

Vacuum Applications (Device becomes NO):
'1' port is connected to atmosphere or compressed air † when required.
'2' port is outlet
'3' port is connected to vacuum

† When both vacuum and compressed air are required, maximum pressure is 85 PSIG (586 kPa).

Single Solenoid

3-Way, 2-Position NO*



Normally Open:

De-energized position – Solenoid 12 de-energized.
Pressure at inlet port 3 connected to outlet port 2, exhaust port 1 is blocked.

Energized position – Solenoid 12 energized. Pressure at inlet
port 3 blocked, outlet port 2 connected to exhaust port 1.

* To obtain NO function, ports 1 & 3 are reversed (1 becomes exhaust and 3 becomes supply).

Vacuum Applications (Device becomes NC):
'1' port is connected to vacuum
'2' port is outlet
'3' port is connected to atmosphere or compressed air † when required.

† When both vacuum and compressed air are required, maximum pressure is 58 PSIG (400 kPa).

***Caution:** Normally Open and Normally Closed 3-Way valve cannot be mixed on the same manifold.*

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"A00" Valve
"A05" Valve
"A12" Valve

Flow Ratings*

- A00: .02 Cv
- A05: .18 Cv
- A12: .47 Cv

Operating Pressure

- Vacuum to 100 PSIG*
- A00S (NO) vacuum to 70 PSIG

Ports

- A00: M3
- A05: M5
- A12: 1/8 Inch

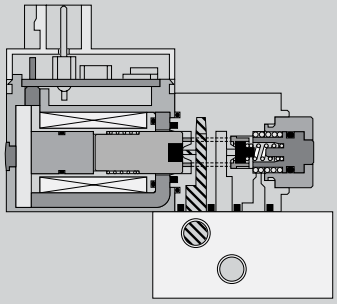
Mounting

- Inline
- Subbase Mount

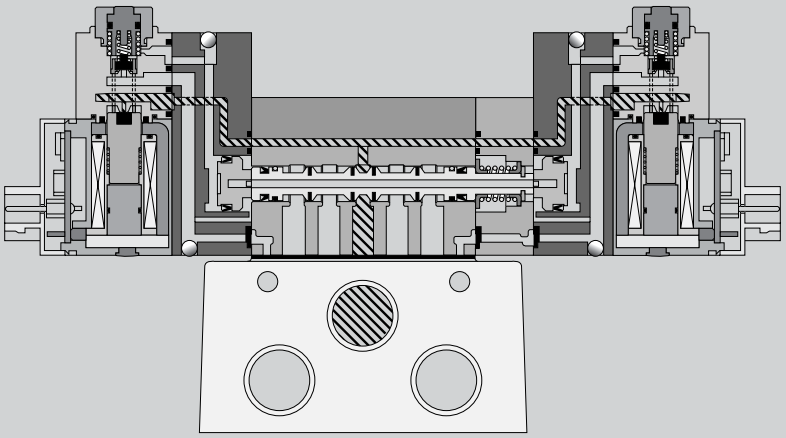
Solenoids

- 0.6 Watt
- 5VDC, 12VDC, 24VDC and 110/120VAC
- LED and Surge Suppression

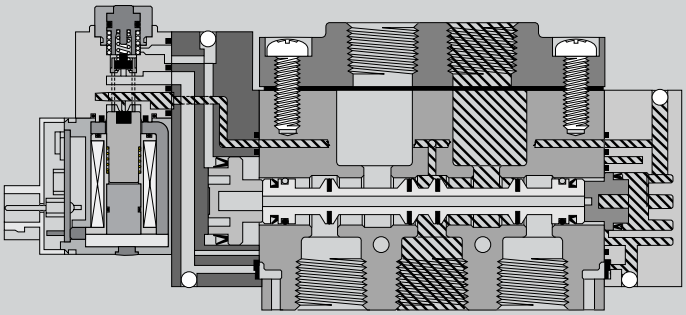
* See catalog technical section for more information.



A00S Single Solenoid Normally Closed (NC)



A05P Double Solenoid 3-Position Subbase Mounted



A12R Single Solenoid Inline

Pressure **Exhaust**

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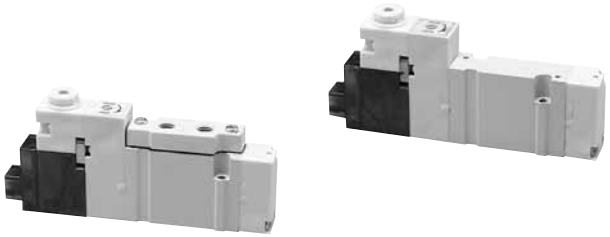
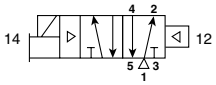
Single Solenoid
4-Way, 2-Position





Inline

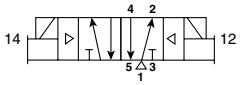
A05	**A05RS251PM5MF**	24VDC	M5	.17 Cv
	A05RS252PM5MF	12VDC		
A12	**A12RS251PN1MF**	24VDC	1/8"	.47 Cv
	A12RS252PN1MF	12VDC		

Subbase

A05	**A05PS251P**	24VDC	Less Base	.18 Cv
	A05PS252P	12VDC		
A12	**A12PS251P**	24VDC	Less Base	.44 Cv
	A12PS252P	12VDC		

Note: Wired electrical connectors sold separately. See Accessory Section.

Double Solenoid
4-Way, 2-Position



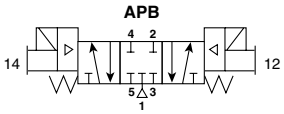
Inline

A05	**A05RD251PM5MF**	24VDC	M5	.17 Cv
	A05RD252PM5MF	12VDC		
A12	**A12RD251PN1MF**	24VDC	1/8"	.47 Cv
	A12RD252PN1MF	12VDC		

Subbase

A05	**A05PD251P**	24VDC	M5	.18 Cv
	A05PD252P	12VDC		
A12	**A12PD251P**	24VDC	1/8"	.44 Cv
	A12PD252P	12VDC		

Double Solenoid
4-Way, 3-Position, APB



Inline

A05	A05RD351PM5MF	24VDC	M5	.16 Cv
	A05RD352PM5MF	12VDC		
A12	A12RD351PN1MF	24VDC	1/8"	.43 Cv
	A12RD352PN1MF	12VDC		

Subbase

A05	A05PD351P	24VDC	Less Base	.16 Cv
	A05PD352P	12VDC		
A12	A12PD351P	24VDC	Less Base	.40 Cv
	A12PD352P	12VDC		

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 manufactures 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.*

Locking Flush Override. Mounting screws and gaskets included with valve.

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"ADEX" Series

BOLD OPTIONS ARE MOST POPULAR.

A05 R S25 — 1 P M5 MF

Basic Series	
Series	**A05**
Series	**A12**

Body Type	
Subbase	**P**
Inline	**R**

Operator / Function	
4-Way	
Single Solenoid, 2-Position, Air Return	**S25**
Double Solenoid, 2-Position	**D25**
Double Solenoid, 3-Position, APB	D35
Double Solenoid, 3-Position,CE	E35
Double Solenoid, 3Position, PC	035

Pilot Source / Exhaust	
Internal	**Blank**
External	X*

Voltage	
1	**24VDC**
2	**12VDC**
9	120/60 VAC

Options	
P	**Lights / Surge Suppression**

Port Size / Thread Type†	
Blank	**None (Subbase)**
M5	**M5 (A05R Only)**
N1	**1/8" NPT (A12R Only)**
G1	1/8" BSPP "G" (A12R Only)

† Required for inline models only, port size code not used for subbase versions.

Valve Type	
Blank	**None (Subbase)**
MF	**Inline**

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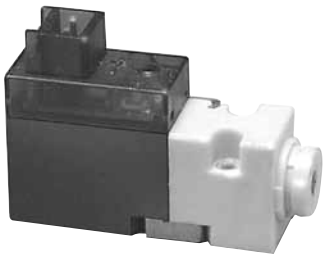
Valve Only – Single Solenoid
3-Way, 2-Position*



A00SC231P Shown

* Screwdriver-Operated, Locking Manual Override (LMOR).

A00S C23 — 1 P

Function	
Single Solenoid Normally Open	023
Single Solenoid Normally Closed	**C23**

Flow	
Standard Type	**Blank**
Large Flow Type	J

Voltage	
1	**24VDC**
2	12VDC
4*	5VDC
8*	110/50 VAC
9	120/60 VAC

* Special Order

Connector Position	
P	**With Indicator Light & Surge Suppression**

Subbase

A00SBM3 Shown

Model Number	All Ports
A00 **A00SBM3**	M3

Mounting screws and gaskets included with valve.

Manifold*

MMFS6A00M3 Shown

* Normally Closed valves (A00SC23•P) and Normally Open valves (A00S023•P) cannot be mounted on the same manifold simultaneously.

Mounting screws and gaskets included with valve.

MMFS 2 A00 M5

Number of Stations	
2 Stations	2
3 Stations	3
4 Stations	4
•	•
•	•
20 Stations	20

Port Size
M3
M5

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"A05" Valve

MMFU10A05F Shown

4-Way, NPTF (Individual Wiring Type)	**MMFU##A05F**
4-Way, NPTF (Collective Wiring Type)	**MMCU‡‡A05F**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

"A12" Valve

MMFU10A12F Shown

4-Way, NPTF (Individual Wiring Type)	**MMFU##A12F**
4-Way, NPTF (Collective Wiring Type)	**MMCU‡‡A12F**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

- Utilizes Inline mount ADEX valves.
- Bolts and Gaskets are included with valve.
- A05 Collective Wiring Type Manifold Kits also include an Adapter Plate for use with the MCS Module.

Pilot Exhaust for IEM Manifold –
is captured through the "3" and "5" galley.

Model Number

BOLD OPTIONS ARE MOST POPULAR.

M MF U 2 A05 F

Type	
Bar Manifold	M

Port Type	
F	NPTF
G	BSPP "G"

Wiring	
Manifold, Individual	MF
Manifold Collective	MC

Valve Size	
A05	10mm
A12	15mm

Type / Pilot	
IEM	U

Number of Stations	
MF (Individual)	MC (Collective)
2	2
3	4
4	6
•	8
•	10
20	12 †

† Maximum of 12 stations available for "MC" Type. (Even # stations only.)

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"A05" Valve

4-Way, M5 (Individual Wiring Type)	**MMFS##A05FM5**
4-Way, M5 (Collective Wiring Type)	**MMCS‡‡A05FM5**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

"A12" Valve

4-Way, 1/8" NPTF (Individual Wiring Type)	**MMFS##A12FF1**
4-Way, 1/8" NPTF (Collective Wiring Type)	**MMCS‡‡A12FF1**

– stations 2 to 20
‡‡ – stations 2 to 12
(Even numbers only)

- Utilizes Subbase mount ADEX valves.
- Bolts and Gaskets are included with valve.

Internally Piloted Manifolds –
Pilot exhaust is captured through the "3" and "5" galley.

Externally Pilot Manifold –
Pilot exhaust is captured through the "Y" galley.

Model Number

BOLD OPTIONS ARE MOST POPULAR.

M MF S 2 A05 F M5

Type	
Bar Manifold	**M**

Wiring	
Manifold, Individual	**MF**
Manifold Collective	**MC**

Type/Pilot	
Subbase, Internally Piloted	**S**
Subbase, Externally Piloted	X

Number of Stations	
MF (Individual)	**MC (Collective)**
2	**2**
3	**4**
4	**6**
•	**8**
•	**10**
20	**12 †**

† Maximum of 12 stations available for "MC" Type. (Even # stations only.)

	Valve Size
A05	**10mm**
A12	**15mm**

	Port Type
A05 Manifolds	
M5	**M5**
A12 Manifolds	
F1	1/8" NPTF
G1	1/8" BSPP "G"

	Port Type
F	**NPTF**
G	BSPP "G"

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Collective Wiring

MCS10A05PDL Shown

MCS 2 A05 P DL

Type	
Manifold Collective Wiring System	MCS

Number of Stations*	
2 Stations	2
4 Stations	4
6 Stations	6
8 Stations	8
10 Stations	10
12 Stations	12

* Even Number of Stations Only.

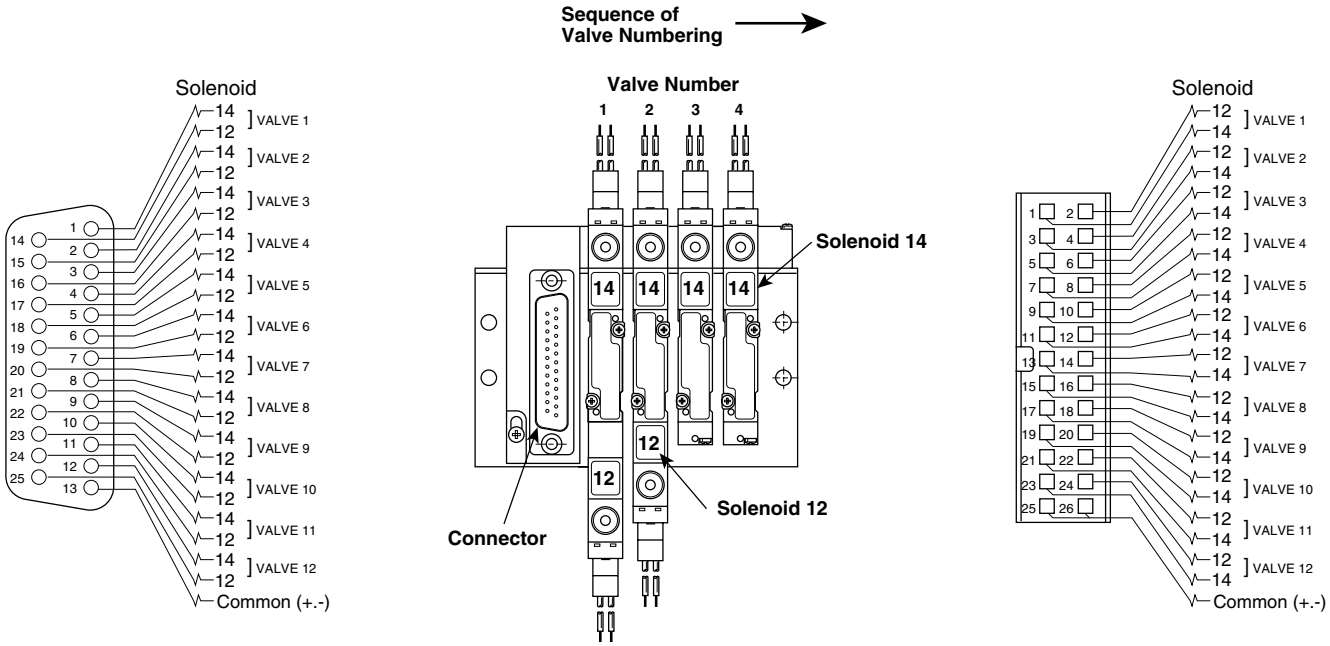
Valve Size	
A05	10mm
A12	15mm

Options	
DL	D-Sub 25
ML	26-Pin Ribbon

BOLD OPTIONS ARE MOST POPULAR.

Collective Wiring Pin Mapping

(Not Available for AC Voltages)



Pin Map for D-Sub 25 Connector | **Valve and Solenoid Addresses** | **Pin Map for 26-Pin Ribbon Connector**

Notes:

1. The MCS Collective Wiring System is "Polarity Neutral". Polarity is addressed with the Collective Wired Connectors (page D120).
   Example: When 'positive' common is used, an A05 single solenoid valve uses an A05PSCC. When 'negative' common is used, use A05PSCCM.
2. The MCS Collective Wiring System provides for both the "14" and "12" addresses at each valve location. When single solenoid valves are used, skip the "12" address for both wiring and controller programming.
3. Be sure that the leakage current of the controller outputs is less than 1.5 ma.

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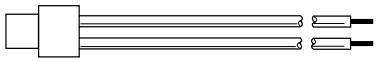
Individual Wired Connectors

P / R Type

Size	Voltage	Length	Part Number
A00	DC	.5 meter	A05PDCCL5
A05		1 meter	A05PDCCL10
A12		3 meter	A05PDCCL30
	AC	.5 meter	A05PACCL5
		1 meter	A05PACCL10

DC Voltage: Positive "+" (Red Wire)
Negative "–" (Black Wire)
AC Voltage: Both Wires are Blue (Polarity Neutral)



A05PDCCL##

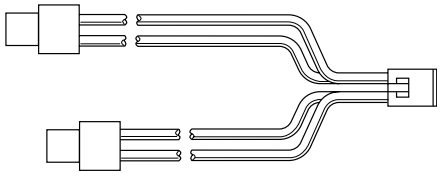
Collective Wired Connectors

P / R Type

Size		Part Number	
		PNP	NPN
A05	Single	A05PSCCM	A05PSCC
A12	Double	A05PDCCM	A05PDCC

PNP = SOURCING = "Negative Common" = Yellow Wires

NPN = SINKING = "Positive Common" = Red Wires

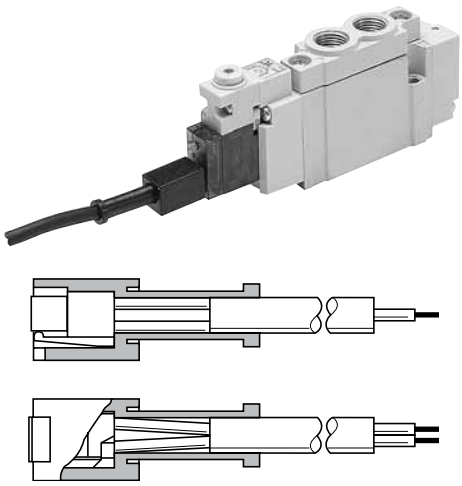


A05PDCC

Wired Connectors with Protective Cover - P / R Type

Size	Length	Part Number
A00	1 meter	A05PDCCB10
A05		
A12		

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.



A05PDCCB10

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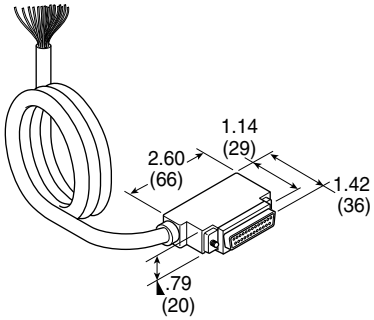
Cable with Female D-Sub, 25-Pin Connector

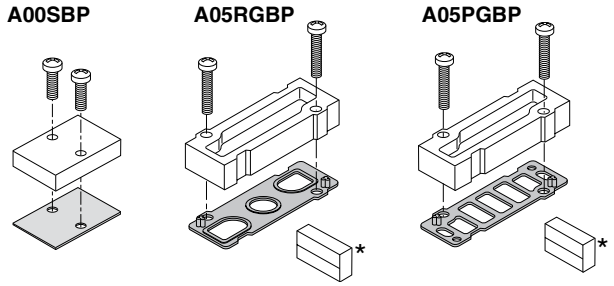
Part Number	Description
DSS25FB1K	25-Pin, D-Sub Cable, 1 meter (3.3 ft.)

Note: For use with ADEX MCS system only.
Connection to control system is through 25 colored wires AWG 24. Includes (2) M2.5 mm screws.



Blanking Plate

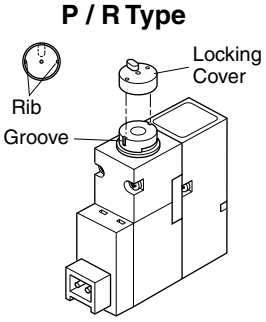
Size	Type	Part Number
A00	Subbase	**A00SBP**
A05	Body Ported	**A05RGBP**
	Subbase	**A05PGBP**
A12	Body Ported	**A12RGBP**
	Subbase	**A12PGBP**



* Outlet Pin Cover used with Collective Wiring System only.

Extended Override Cover

Size	Orange: For 14 Side Solenoid	Green: For 12 Side Solenoid
A00	**A05PLA**	**A05PLB**
A05		
A12		



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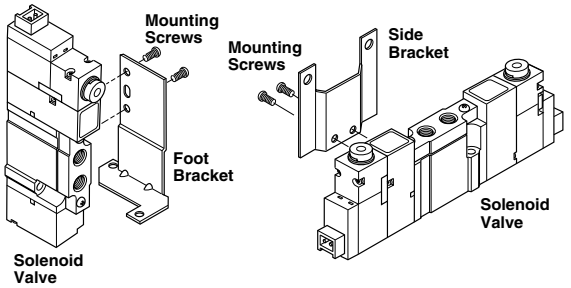
Mounting Bracket

Size	Type	Part Number
A05	Side	**A05RBS**
	Foot	A05RBF
A12	Side	**A12RBS**
	Foot	A12RBF

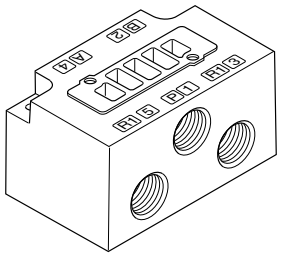
Kit Includes: (1) Bracket, (2) Screws



Subbases

Size	Port Size	Part Number
A05	1/8" NPT	**A05PBN1**
	1/8" BSPP "G"	A05PBG1
A12	1/4" NPT	**A12PBN2**
	1/4" BSPP "G"	A12PBG2

Kit Includes: (1) Subbase (Holddown Bolts and Gasket are included with valve)



A05PB

Individual Air Supply Spacer

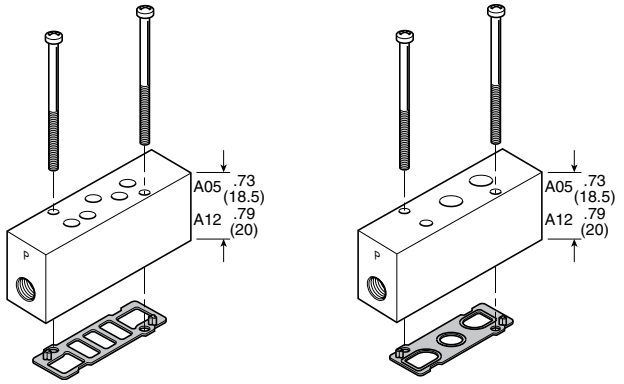
Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.

Size	Type	Port Size	Internal Pilot Part Number	External Pilot* Part Number
A05	Inline	M5	A05RAISM5	A05RAXISM5
	Subbase	M5	A05PAISM5	A05PAXISM5
A12	Inline	1/8" NPT	A12RAISN1	A12RAXISN1
	Subbase	1/8" NPT	A12PAISN1	A12PAXISN1

Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket



A05PAISM5 **A05RAISM5**

Individual Air Exhaust Spacer

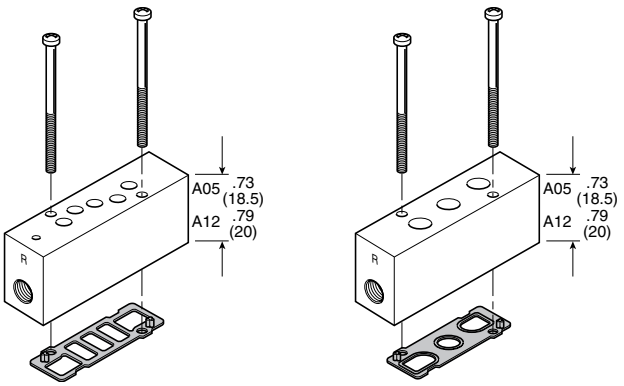
Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.

Size	Type	Port Size	Internal Pilot Part Number	External Pilot* Part Number
A05	Inline	M5	A05RAIEM5	A05RAXIEM5
	Subbase	M5	A05PAIEM5	A05PAXIEM5
A12	Inline	1/8" NPT	A12RAIEN1	A12RAXIEN1
	Subbase	1/8" NPT	A12PAIE N1	A12PAXIEN1

Can only be used on Collective wiring type manifolds.

* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket



A05PAIEM5 **A05RAIEM5**

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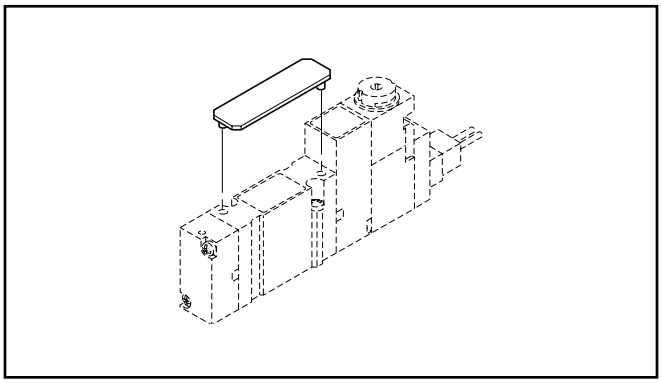
Labeling Tag

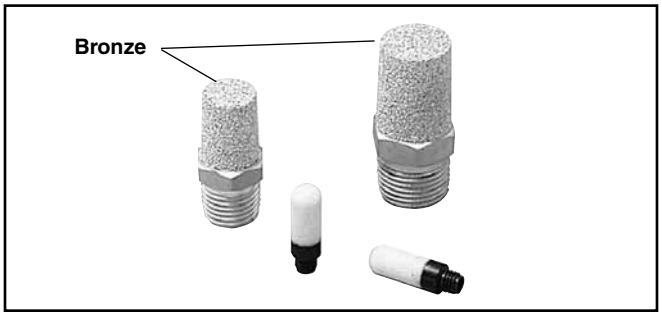
Size	Description	Part Number
A05 A12	White Label Tag	**A05PN**



Exhaust Mufflers

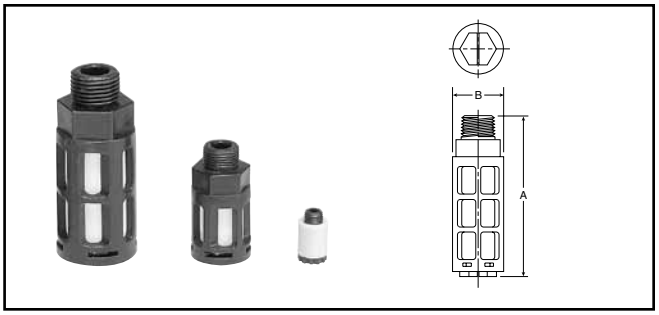
Male Thread	Model Number
M5	**P6M-PAC5**
1/8" NPT	**EM12**
1/4" NPT	**EM25**

P6M - Plastic; EM - Sintered Bronze



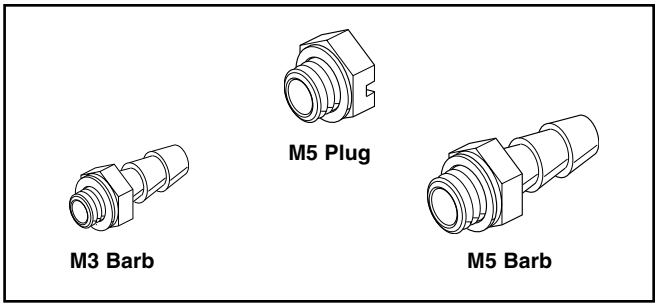
Plastic Silencers

Thread Size	Part Number		A (mm)	B (mm)
	NPT	BSPT "R"		
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)



M3 & M5 Fittings

Description	Part Number
M5 Plug Fitting	**N220-1900J**
M3 to 3mm Barb	**BC03M3**
M3 to 4mm Barb	**BC04M3**
M5 to 3mm Barb	**BC03M5**



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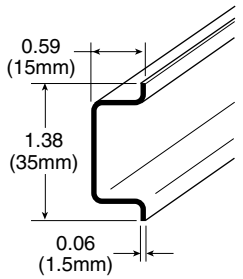
DIN Rail

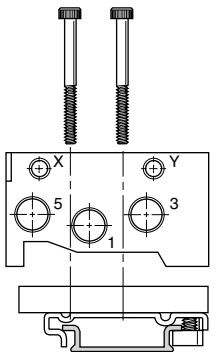
Part Number	Description
AM1DE200	6 Foot Rail Length

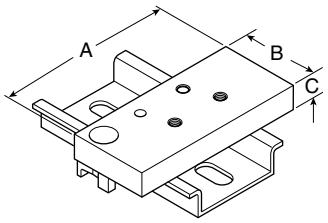


DIN Rail Hardware Kit

Size	Type	Part Number	Dimensions		
			A	B	C
A05	IEM	**MFUA05DB**	2.24	1.00	.31
	Subbase	**MFSA05DB**	(57)	(25)	(8)
A12	IEM	**MFUA12DB**	2.91	1.00	.39
	Subbase	**MFSA12DB**	(74)	(25)	(10)

Kit includes: (2) Screws, (2) Clamps

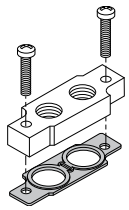




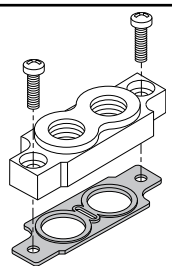
Replacement Kits

Cylinder Port Plate Kits

Size	Fitting	Part Number
A05	M5	**A05RABM5**
A12	1/8" NPT	A12RABN1
	1/8" BSPP "G"	A12RABG1



A05RABM5



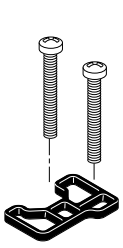
A12RABN1

Base Gasket Kits

Size	Type	Gasket Only	Screw
A00	Subbase	**A00SG**	**A00SS**
A05	Body Ported	**A05RG**	**A05RS**
	Subbase Int.	**A05PG**	**A05PS**
	Subbase Ext.	**A05PXG**	**A05PS**
A12	Body Ported	**A12RG**	**A12RS**
	Subase Int.	**A12PG**	**A12PS**
	Subbase Ext.	**A12PXG**	**A12PS**

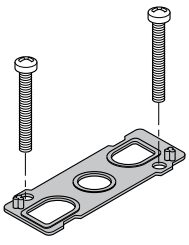
These are spare parts, mounting screws and gaskets included with valves.

A00SS



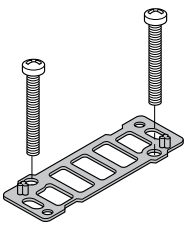
A00SG

Screws
A05RS



Gaskets
A05RG

A05PS



A05PXG

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Flow Rating (Cv)

Size	Port Size	Mounting Style	ANSI / (NFPA)		JIS Method	
			2-Position	3-Position	2-Position	3-Position
A00	M3	Subbase	.010	—	—	—
	M5	Subbase	.017	—	—	—
A00****J	M5	Subbase	.020	—	—	—
A05	M5	Inline	.18	.16	.22	.20
	M5	Subbase	.17	.16	.32	.32
A12	1/8" Ports	Inline	.47	.43	.48	.46
	1/8" Ports	Subbase	.44	.40	.61	.42

ANSI / (NFPA) T3.21.3-1990 standard for Cv measurement.

Response Time

Valve Size	Port Size	0 Cu. In. Test Chamber	
		Fill	Exhaust
2-Position Single Solenoid / Air Return			
A00	M3	.004	.006
A05	M5	.014	.025
A12	1/8"	.016	.030
2-Position Double Solenoid			
A00	M3	—	—
A05	M5	.011	.015
A12	1/8"	.010	.012
3-Position Double Solenoid			
A00	M3	—	—
A05	M5	.013	.017
A12	1/8"	.013	.014

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing 24VDC solenoid. Times shown are average.

Tested per ANSI / (NFPA) T3.21.8.

Temperature Rating

Intermittent Duty (AC & DC Voltage):

32°F to 122°F (0°C to 50°C)
Voltage Rated +10 / –10%

Continuous Duty (DC Voltage Only):

32°F to 104°F (0°C to 40°C)
Voltage Rated +0 / –10%

Operating Pressure

Maximum: **4-Way:** 100 PSIG (690 kPa)
3-Way: 100 PSIG (690 kPa) NC*
70 PSIG (483 kPa) NO*

Minimum:

Description		Internal Pilot		External Pilot	
		PSIG	kPa	PSIG	kPa
4-Way	Single Solenoid	22	152	Vacuum	
				36	248
	Double Solenoid – 2-Position	15	104	Vacuum	
				36	248
	Double Solenoid – 3-Position	30	207	Vacuum	
				36	248
3-Way	A00 Series	Vacuum			

* When using vacuum and pressure on ports 1 & 3 – 85 PSIG (586 kPa) NC; 58 PSIG (400 kPa) NO (see page D112).

Solenoid Information

Power Consumption	**Standard**			
				With Indicator Light & Surge Suppressor
	DC		W	**0.6**
	AC	100V	VA	**1.2**
		110V	VA	**1.4**
	High Flow			
				With Indicator Light & Surge Suppressor
	DC		W	**0.91**
	AC	100V	VA	—
		110V	VA	—

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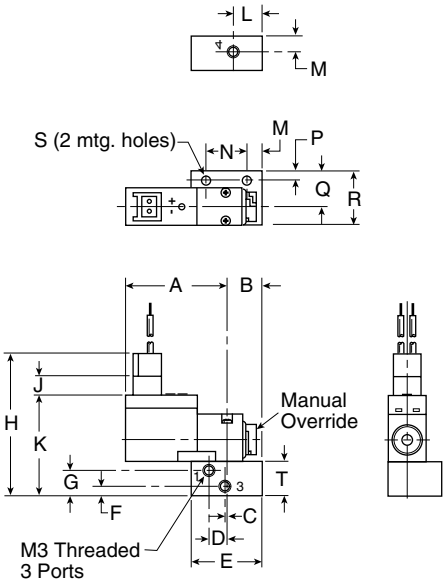
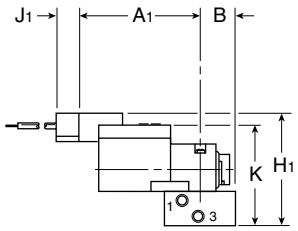
A00 Subbase



P & S Option



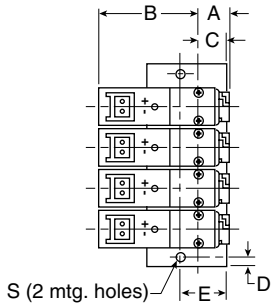
Q & B Option

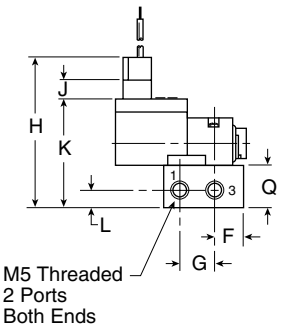
A00 - Subbase

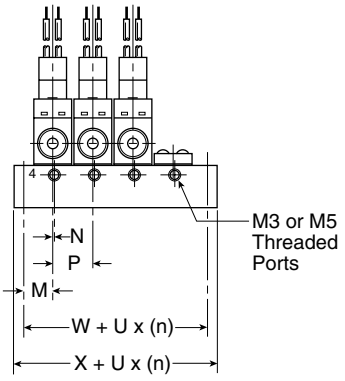
A	A1	B	C	D
1.00 (25)	1.18 (30)	.41 (11)	.015 (.4)	.17 (4)
E	**F**	**G**	**H**	**H1**
.79 (20)	.12 (3)	.28 (7)	1.54 (39)	1.38 (34)
J	**J1**	**K**	**L**	**M**
.24 (6)	.20 (5)	1.11 (28)	.32 (8)	.18 (5)
N	**P**	**Q**	**R**	**S**
.47 (12)	.10 (3)	.39 (10)	.59 (15)	.106 (2.7)
T				
.38 (10)				

Inches (mm)

A00 Manifold







A00 - Manifold

A	B	C	D	E
.36 (9)	1.00 (25)	.31 (8)	.10 (3)	.51 (13)
F	**G**	**H**	**J**	**K**
.31 (8)	.39 (10)	1.63 (42)	.20 (5)	1.22 (31)
L	**M**	**N**	**P**	**Q**
.20 (5)	.33 (9)	.02 (.6)	.41 (10.5)	.47 (12)
S	**U**	**X**	**W**	
.125 (3.2)	.41 (10.5)	.45 (11.5)	.26 (6.5)	

Inches (mm)

n = Number of stations.

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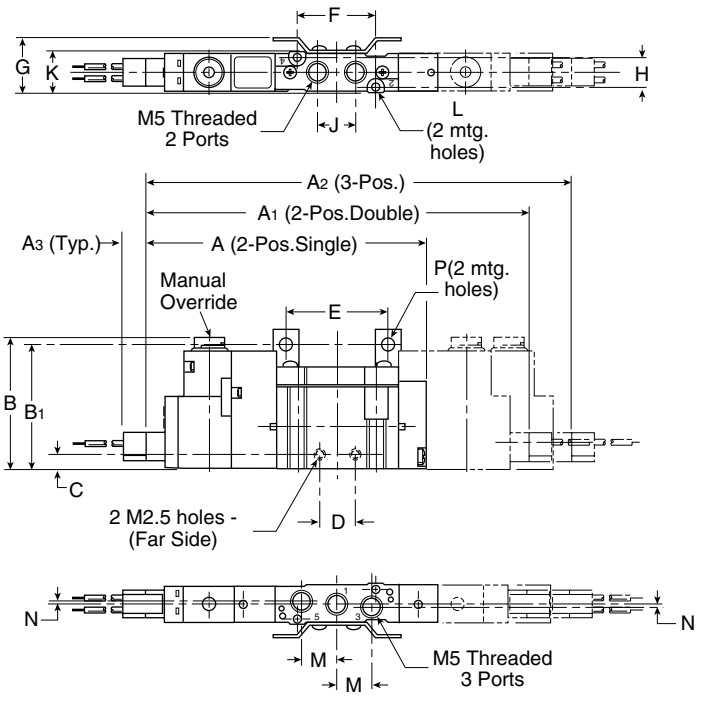
A05

Single & Double Operators – Inline



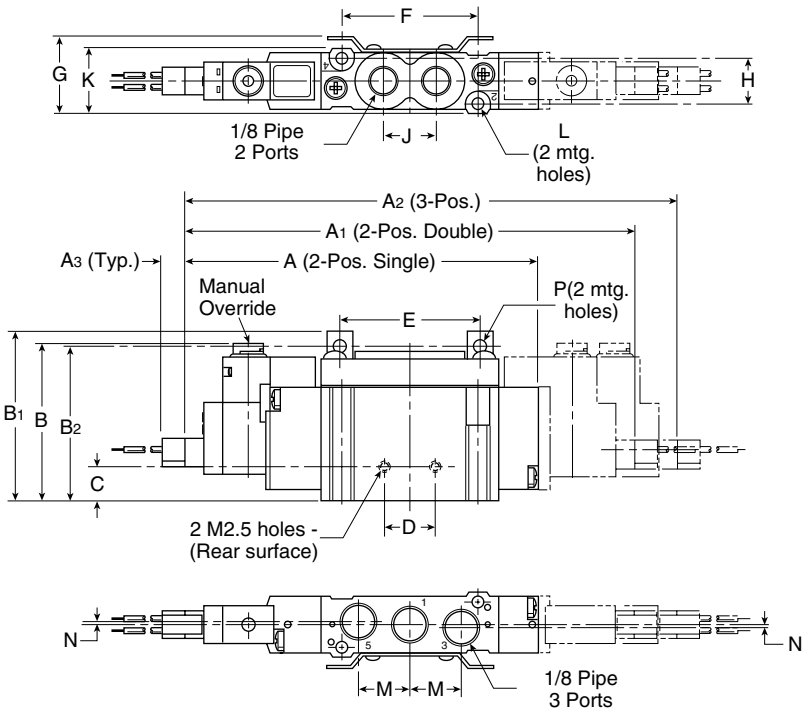
A05R – Inline

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	1.38 (35)
B1	**C**	**D**	**E**	**F**
1.30 (33)	.16 (4)	.38 (10)	1.06 (27)	.83 (21)
G	**H**	**J**	**K**	**L**
.57 (15)	.33 (9)	.40 (10)	.45 (11.4)	Ø .08 Ø (2.1)
M	**N**	**P**		
.37 (10)	.04 (1)	Ø .14 Ø (3.5)		

Inches (mm)

A12

Single & Double Operators – Inline



A12R – Inline

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	1.64 (42)
B1	**B2**	**C**	**D**	**E**
1.77 (45)	1.70 (43)	.35 (9)	.51 (13)	1.46 (37
F	**G**	**H**	**J**	**K**
1.42 (36)	.80 (20)	.47 (12)	.55 (14)	.68 (17)
L	**M**	**N**	**P**	
Ø .12 Ø (3.1)	.55 (14)	.03 (0.8)	Ø .14 Ø (3.5)	

Inches (mm)

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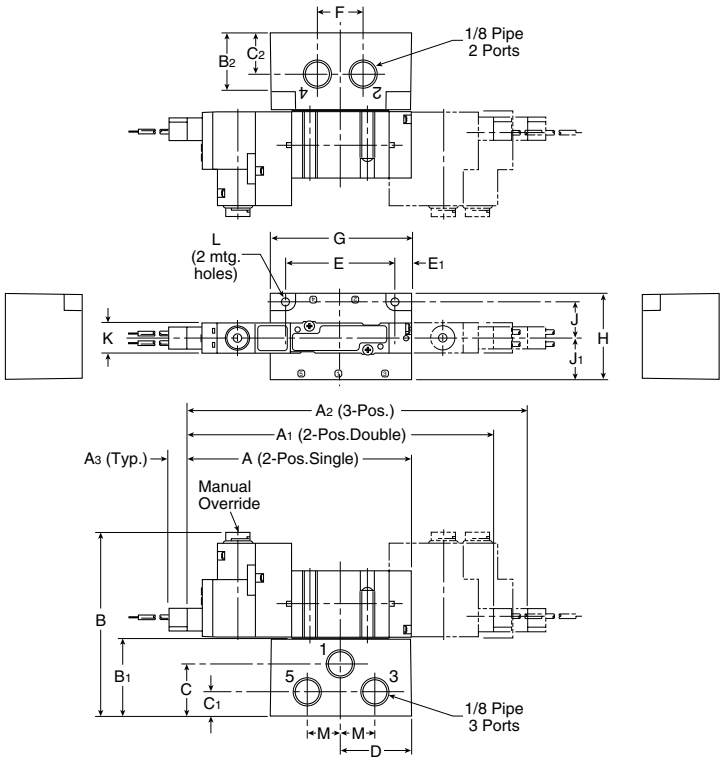
A05

Single & Double Operators – Subbase



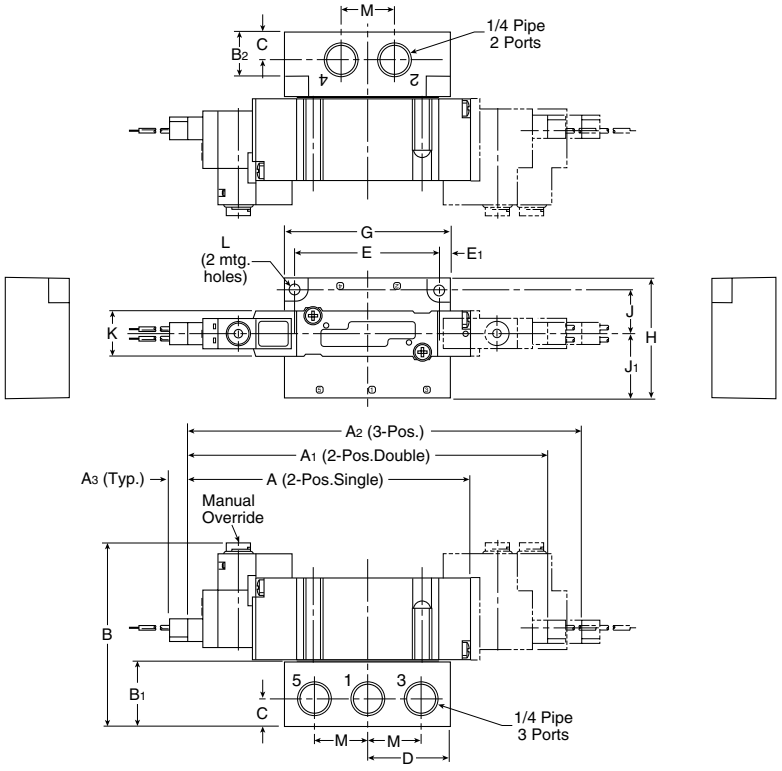
A05P – Subbase

A	A1	A2	A3	B
2.91 (74)	3.94 (100)	4.25 (108)	.24 (6)	2.35 (60)
B1	**B2**	**C**	**C1**	**C2**
.96 (25)	.75 (19)	.65 (17)	.30 (8)	.53 (14)
D	**E**	**E1**	**F**	**G**
.89 (23)	1.38 (35)	.20 (5)	.57 (15)	1.77 (45)
H	**J**	**J1**	**K**	**L**
.08 (28)	.45 (11.5)	.51 (13)	.39 (10)	Ø .13 Ø (3.2)
M				
.45 (12)				

Inches (mm)

A12

Single & Double Operators – Subbase



A12P – Subbase

A	A1	A2	A3	B
3.68 (94)	4.69 (119)	5.12 (130)	.24 (6)	2.41 (61)
B1	**B2**	**C**	**D**	**E**
.87 (22)	.75 (19)	.37 (10)	1.10 (28)	1.89 (48)
E1	**G**	**H**	**J**	**J1**
.16 (4)	2.20 (56)	1.59 (41)	.57 (14.5)	.87 (22)
K	**L**	**M**		
.59 (15)	Ø .17 Ø (4.3)	.71 (18)		

Inches (mm)

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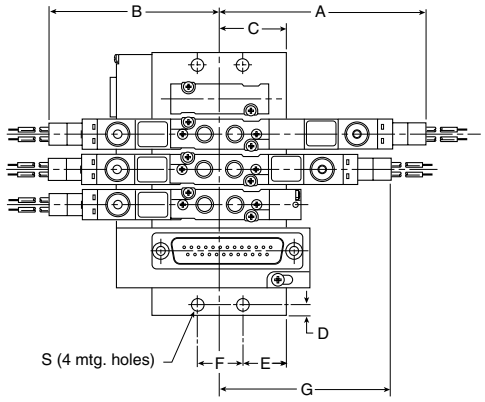
A05

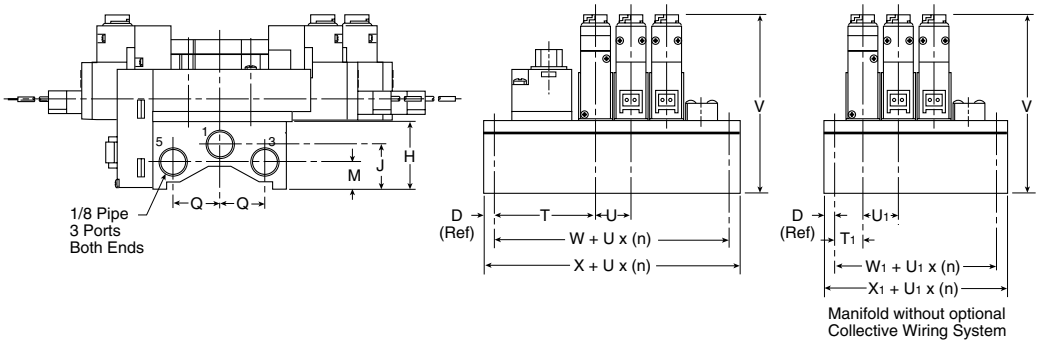
Manifold – Valve Inline



A05R - Manifold, Valve Inline

A	B	C	D	E	F
2.52 (64)	2.21 (56)	.94 (24)	.16 (4)	.61 (16)	.63 (16)
G	**H**	**J**	**M**	**Q**	**S**
2.21 (56)	.94 (24)	.61 (16)	.37 (10)	.63 (16)	Ø .18 Ø (4.5)
T	**T_1**	**U**	**U_1**	**V**	**W**
1.34 (34)	.51 (13)	.49 (12.5)	.41 (10.5)	2.32 (59)	1.36 (35)
W_1	**X**	**X_1**			
.37 (9.5)	167 (43)	.68 (17.5)			

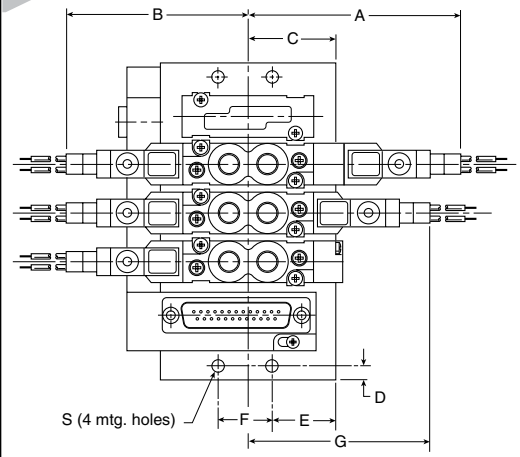
Inches (mm)



n = Number of stations.

A12

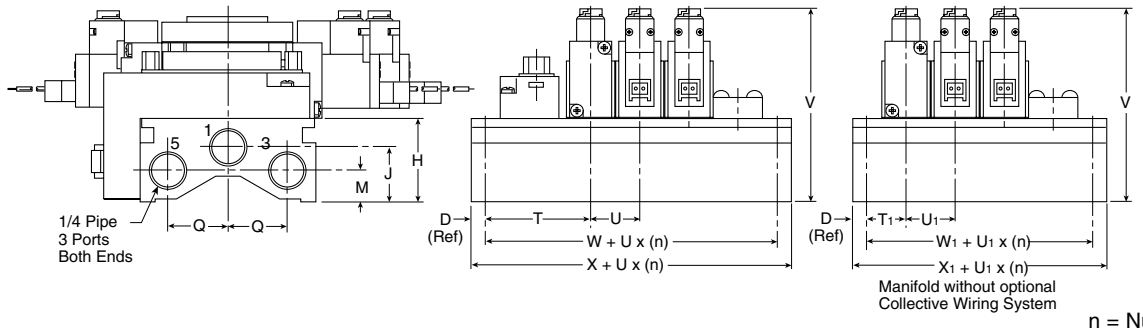
Manifold – Valve Inline



A12R - Manifold, Valve Inline

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.14 (29)	.20 (5)	.76 (19)	.77 (19.6)
G	**H**	**J**	**M**	**Q**	**S**
2.58 (66)	1.08 (28)	.71 (18)	.41 (11)	.77 (20)	Ø .18 Ø (4.5)
T	**T_1**	**U**	**U_1**	**V**	**W**
1.48 (38)	.51 (13)	.69 (17.5)	.63 (16)	2.74 (70)	1.34 (34)
W_1	**X**	**X_1**			
.39 (10)	1.73 (44)	.79 (20)			

Inches (mm)



n = Number of stations.

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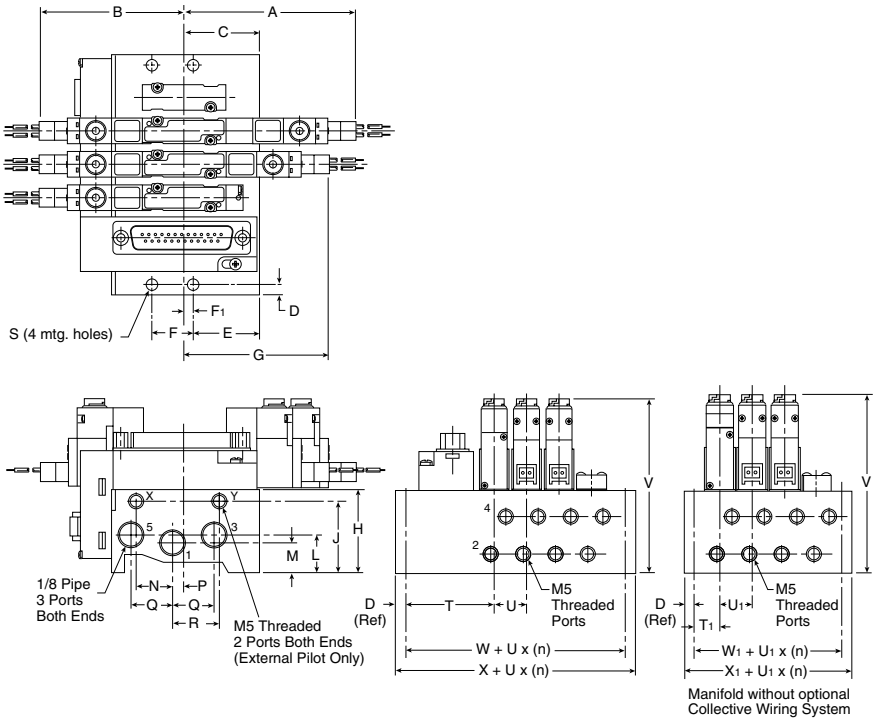
A05

Manifold – Side Ports



A05P – Manifold, Side Ports

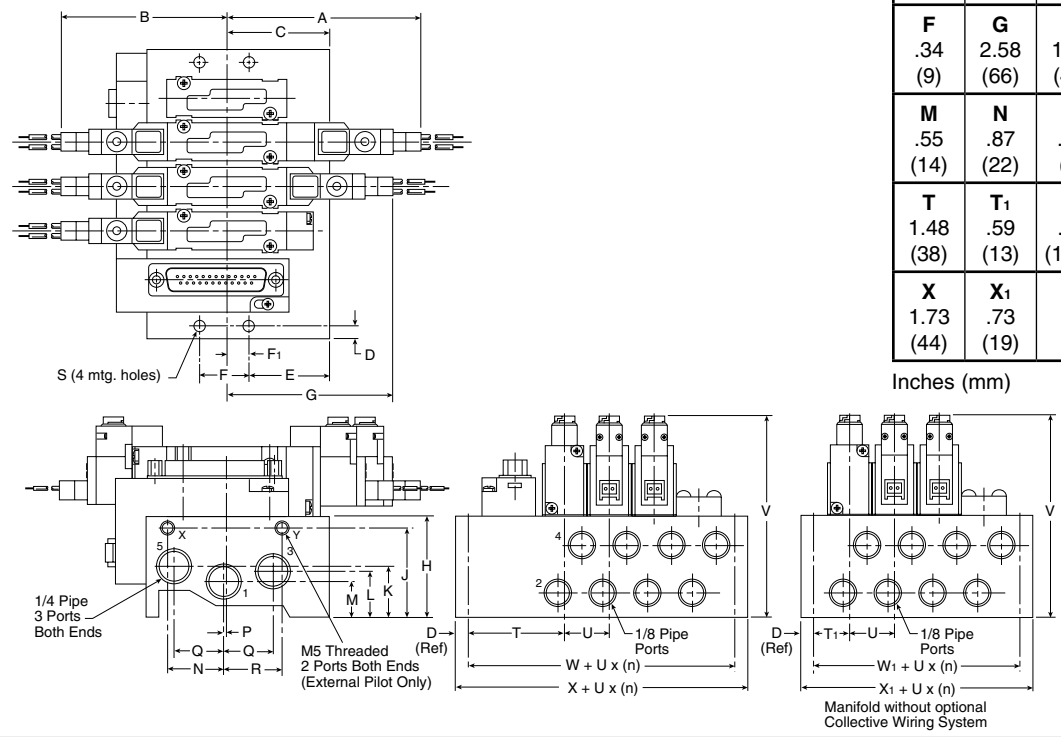
A	B	C	D	E	F
2.52 (64)	2.21 (56)	1.12 (29)	.16 (4)	1.00 (26)	.63 (16)
F_1	**G**	**H**	**J**	**L**	**M**
.19 (5)	2.21 (56)	1.26 (32)	1.08 (28)	.59 (15)	.45 (11.5)
N	**P**	**Q**	**R**	**S**	**T**
.55 (14)	.13 (3)	.63 (16)	.71 (18)	Ø .18 Ø (4.5)	1.34 (34)
T_1	**U**	**U_1**	**V**	**W**	**W_1**
.39 (10)	.49 (12.5)	.41 (10.5)	2.64 (67)	1.32 (34)	.37 (10)
X	**X_1**				
1.65 (42)	.67 (18)				

Inches (mm)

n = Number of stations.

A12

Manifold – Side Ports



A12P – Manifold, Side Ports

A	B	C	D	E	F
3.01 (77)	2.58 (66)	1.59 (40)	.20 (5)	1.25 (32)	.77 (20)
F	**G**	**H**	**J**	**K**	**L**
.34 (9)	2.58 (66)	1.57 (40)	1.38 (35)	.79 (20)	.71 (18)
M	**N**	**P**	**Q**	**R**	**S**
.55 (14)	.87 (22)	.04 (1)	.77 (20)	.91 (23)	Ø .18 Ø (4.5)
T	**T_1**	**U**	**V**	**W**	**W_1**
1.48 (38)	.59 (13)	.69 (17.5)	3.09 (79)	1.34 (34)	.33 (9)
X	**X_1**				
1.73 (44)	.73 (19)				

Inches (mm)

n = Number of stations.

Parker Hannifin Corporation
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"N" Series

High Speed Inline Poppet Valves 2 & 3-Way

Section D

www.parker.com/pneu/n

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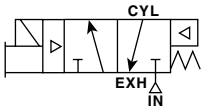
Single Solenoid 3-Way, 2-Position NC (NNP)



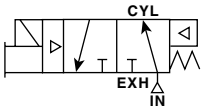
Normal position – Pressure at inlet port marked "IN" blocked. Cylinder port connected to exhaust port (3-Way).

Energized position – Solenoid operator energized, pressurized "IN" port connects to cylinder port. Exhaust port is blocked (3-Way).

⚠ **CAUTION:**
These are poppet valves, ***Do Not*** restrict the inlet.

Note: For 2-Way, Normally Closed, Exhaust Port is Plugged.

Single Solenoid 3-Way, 2-Position NO (NP)



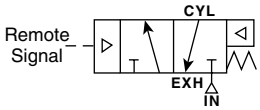
Normal position – Pressure at inlet port marked "IN" open to cylinder. Exhaust port is blocked (3-Way).

Energized position – Solenoid operator energized. Pressure at inlet port marked "IN" is blocked. Cylinder open to exhaust (3-Way).

⚠ **CAUTION:**
These are poppet valves, ***Do Not*** restrict the inlet.

Note: For 2-Way, Normally Open, Exhaust Port is Plugged.

Single Remote Pilot 3-Way, 2-Position, NC (NNP)



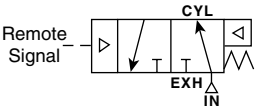
Normal position –
Pressure at inlet port marked "IN" blocked. Cylinder port connected to exhaust port (3-Way).

Operated position – With maintained air signal at pilot port, pressurized "IN" port connects to cylinder port. Exhaust port is blocked (3-Way).

⚠ **CAUTION:**
These are poppet valves, ***Do Not*** restrict the inlet.

Note: For 2-Way, Normally Closed, Exhaust Port is Plugged.

Single Remote Pilot 3-Way, 2-Position, NO (NP)



Normal position –
Pressure at inlet port marked "IN" open to cylinder. Exhaust port is blocked (3-Way).

Operated position – With maintained air signal at pilot port, pressure at inlet port marked "IN" is blocked. Cylinder open to exhaust (3-Way).

⚠ **CAUTION:**
These are poppet valves, ***Do Not*** restrict the inlet.

Note: For 2-Way, Normally Open, Exhaust Port is Plugged.

For Information on Options that are no longer available and the Suggested Cross Reference or Kit Info, refer to www.parker.com/pneumatic/classicvalves & Catalog N Series-E/USA

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www.parker.com/pneumatics

"N" Series

Specifications

- 2-Way NC
- 3-Way NO & NC
- Selector Function

Flow

- 3/8" Body – 3.0 to 4.4 Cv
- 3/4" Body – 9.0 to 11.0 Cv
- 1-1/4" Body – 20.0 to 30.0 Cv

Port Sizes

- 3/8" Body – 3/8", 1/2" NPT
- 3/4" Body – 1/2", 3/4", 1" NPT
- 1-1/4" Body – 1", 1-1/4", 1-1/2" NPT
- BSPP "G" Threads Available

Operating Pressure

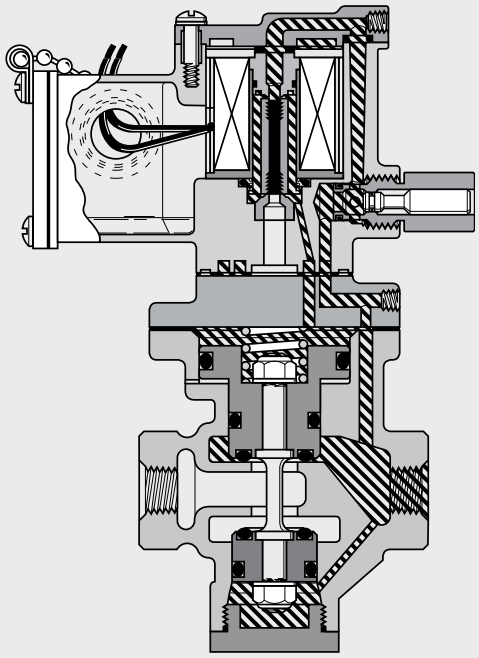
- 30 to 250 PSI (0 to 1000 kPa)
- Vacuum with External Pilot

Features

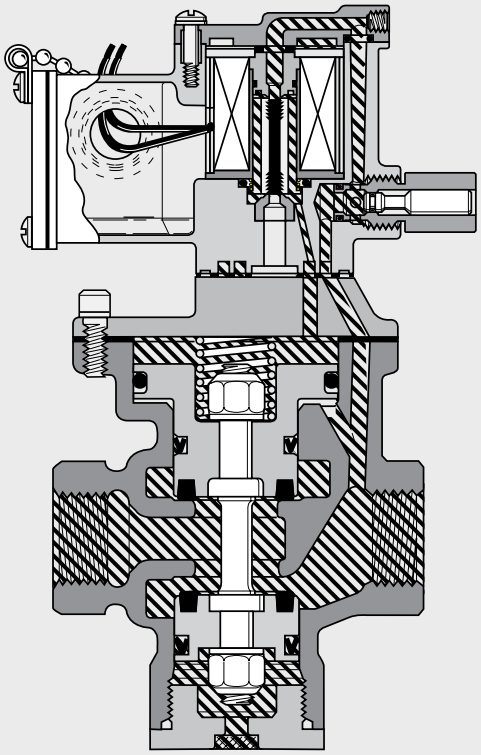
- Continuous Duty Rated Option
- Non-Lube Service
- Hi-Flow, Short Stroke Poppet
- Indicator Lights Available

Certification / Approval

- Approved to be CE Marked (Standard L-Pilot & P-Pilot)
- NEMA 4 Option
- Hazardous Duty Option



3/8" Solenoid Pilot De-Energized
Normally Closed



1-1/4" Solenoid Pilot De-Energized
Normally Open

Pressure **Exhaust**

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Single Solenoid Normally Closed

2-Way, 2-Position
3-Way, 2-Position

3/8" & 3/4" Body Size

	2-Way Normally Closed	3-Way Normally Closed	In/Cyl Ports	Exh. Port
3/8"	N3153904553	N3553904553	3/8"	1/2"
	N3154904553	N3554904553	1/2"	1/2"
3/4"	N3155904553	N3555904553	1/2"	3/4"
	N3156904553	N3556904553	3/4"	1"
	N3157904553	N3557904553	1"	1"

Locking Manual Override, Internal "P" Pilot 140 PSI, Standard Service, Junction Box w/ Light, 120VAC.

Single Solenoid Normally Open

3-Way, 2-Position

3/8" & 3/4" Body Size

	3-Way Normally Open	In/Cyl Ports	Exh Port
3/8"	N3753904553	3/8"	1/2"
	N3754904553	1/2"	1/2"
3/4"	N3755904553	1/2"	3/4"
	N3756904553	3/4"	1"
	N3757904553	1"	1"

Locking Manual Override, Internal "P" Pilot 140 PSI, Standard Service, Junction Box w/ Light, 120VAC.

1-1/4" Body Size

	2-Way Normally Closed	3-Way Normally Closed	In/Cyl Ports	Exh. Port
1-1/4"	N3257904753	N3657904753	1"	1-1/4"
	N3258904753	N3658904753	1-1/4"	1-1/2"
	N3259904753	N3659904753	1-1/2"	1-1/2"

Locking Manual Override, Internal "P" Pilot 125 PSI, Standard Service, P-Pilot Junction Box w/ Light, 120VAC.

1-1/4" Body Size

	3-Way Normally Open	In/Cyl Ports	Exh. Port
1-1/4"	N3857904753	1"	1-1/4"
	N3858904753	1-1/4"	1-1/2"
	N3859904753	1-1/2"	1-1/2"

Locking Manual Override, Internal "P" Pilot 125 PSI, Standard Service, P-Pilot Junction Box w/ Light, 120VAC.

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Single Remote Pilot Normally Closed

2-Way, 2-Position
3-Way, 2-Position

3/8" & 3/4" Body Size

	2-Way Normally Closed	3-Way Normally Closed	In/Cyl Ports	Exh. Port
3/8"	N31431091	N35431091	3/8"	1/2"
	N31441091	N35441091	1/2"	1/2"
3/4"	N31451091	N35451091	1/2"	3/4"
	N31461091	N35461091	3/4"	1"
	N31471091	N35471091	1"	1"

1/4" NPT Remote Pilot Port with Internal Pilot Return.

Single Remote Pilot Normally Open

3-Way, 2-Position

3/8" & 3/4" Body Size

	3-Way Normally Open	In/Cyl Ports	Exh. Port
3/8"	N37431091	3/8"	1/2"
	N37441091	1/2"	1/2"
3/4"	N37451091	1/2"	3/4"
	N37461091	3/4"	1"
	N37471091	1"	1"

1/4" NPT Remote Pilot Port with Internal Pilot Return.

1-1/4" Body Size

	2-Way Normally Closed	3-Way Normally Closed	In/Cyl Ports	Exh. Port
1-1/4"	N32471091	N36471091	1"	1-1/4"
	N32481091	N36481091	1-1/4"	1-1/2"
	N32491091	N36491091	1-1/2"	1-1/2"

1/4" NPT Remote Pilot Port with Internal Pilot Return.

1-1/4" Body Size

	3-Way Normally Open	In/Cyl Ports	Exh. Port
1-1/4"	N38471091	1"	1-1/4"
	N38481091	1-1/4"	1-1/2"
	N38491091	1-1/2"	1-1/2"

1/4" NPT Remote Pilot Port with Internal Pilot Return.

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"N" Series 3/8", 3/4" & 1-1/4" Body Sizes - Solenoid 'L' Pilot

N	315	3	9	0	45	53	—

Valve Function - Solenoid	
3/8" & 3/4" Body	
2-Way, Normally Closed	**315**
3-Way, Normally Closed	**355**
3-Way, Normally Open	**375**
1-1/4" Body	
2-Way, Normally Closed	**325**
3-Way, Normally Closed	**365**
3-Way, Normally Open	**385**

Port Size / Thread Type	
3/8" Body Size	
3/8" Inlet & Cyl - 1/2" Exhaust - NPT	3
1/2" Inlet & Cyl - 1/2" Exhaust - NPT	4
1/2" Inlet & Cyl - 1/2" Exhaust - BSPP	N
3/4" Body Size	
1/2" Inlet & Cyl - 3/4" Exhaust - NPT	5
3/4" Inlet & Cyl - 1" Exhaust - NPT	**6**
3/4" Inlet & Cyl - 1" Exhaust - BSPP	Q
1" Inlet & Cyl - 1" Exhaust - NPT	7
1-1/4" Body Size	
1" Inlet & Cyl - 1 1/4"Exhaust - NPT	**7**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - NPT	**8**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - BSPP	S*
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - NPT	**9**
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - BSPP	T*

* Not available with Valve Function 325.

Note: BSPP is to the ISO 228 Standard, and requires an R-BSPT male fitting.

Solenoid Enclosure	
Basic Pilot	**1**
Basic Pilot NLMO	2
Basic Pilot LMO	3
Junction Box NLMO	**5**
Junction Box LMO	6
Junction Box NLMO w/ Light	**8**
Junction Box LMO w/ Light	**9**
Basic Pilot Ext. LMO	W
JIC NLMO w/Light - 3-Pin Automotive	E
JIC NLMO w/ Light - 4-Pin M12	J
JIC NLMO w/ Light - 5-Pin Automotive	N

Options	
Blank	**None**
L	72" Leads - '51' Voltage Code Only
C	Chrysler Wiring - Enclosure 'J' & 'N'
F	Ford Wiring - Enclosure 'E', 'J', & 'N'
G	GM wiring - Enclosure 'J' & 'N'

"L" Pilot Code						
Code	Voltage			Solenoid Enclosure Options		
	AC 60hz	AC 50hz	DC	Standard Duty (01, 45)	Cont. Duty (04, 48)	200 PSI (46)
42	24	24	6	5, 6	6	
45			12	1, 5, 6		
49			**24**	**1, 2, 3, 5, 6, 8, 9, W**	**6, 8, 9**	**9**
51			48	1		
53	**120**	**110**		**1, 2, 3, 5, 6, 8, 9, E, N, W**	**1, 6, 8, 9, N**	**8, 9, E**
57	240	220		1, 3, W		
61			120	5, 6		
79			24	E, J	E, J	E, J

"L" Pilot Configuration	
01*	External Pilot, Std Service, 140 PSI
04*	External Pilot, Cont Duty, 140 PSI
45	**Internal Pilot, Std Service, 140 PSI**
46	Internal Pilot, Std Service, 200 PSI
48	**Internal Pilot, Cont Duty, 140 PSI**

* Not available with Valve Function 325, 365, and 385 (1-1/4" Body).

Solenoid Type	
0	**Standard**
5*	Hazardous Duty
8*	NEMA 4 Solenoid

* Available with Solenoid Enclosure 2 & 3, 'L' Pilot Configuration 04 & 48, and Voltage 49 & 53 ONLY.

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"N" Series 1-1/4" Body Sizes - Solenoid Hi-Flow 'P' Pilot

N	365	8	9	0	47	53

Valve Function - Solenoid	
1-1/4" Body	
2-Way, Normally Closed	**325**
3-Way, Normally Closed	**365**
3-Way, Normally Open	**385**

Port Size / Thread Type	
1-1/4" Body Size	
1" Inlet & Cyl - 1 1/4"Exhaust - NPT	**7**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - NPT	**8**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - BSPP	S
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - NPT	**9**
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - BSPP	T

Note: BSPP is to the ISO 228 Standard, and requires an R-BSPT male fitting.

Solenoid Enclosure	
Junction Box NLMO	5
Junction Box LMO	6
Junction Box NLMO w/ Light	**8**
Junction Box LMO w/ Light	**9**

Solenoid Type	
0	**Standard**

"P" Pilot Configuration	
02	External Pilot, Std Service, 125 PSI
47	**Internal Pilot, Std Service, 125 PSI**

"P" Pilot Code				
Code	Voltage			Enclosure Options
	AC 60hz	AC 50hz	DC	Standard Duty
49			24	5, 6
53	**120**	**110**		**5, 6, 8, 9**

"N" Series 3/8", 3/4" & 1-1/4" Body Sizes - Remote Pilot

N	314	3	0	91

Valve Function - Solenoid	
3/8" & 3/4" Body	
2-Way, Normally Closed	**314**
3-Way, Normally Closed	**354**
3-Way, Normally Open	**374**
1-1/4" Body	
2-Way, Normally Closed	**324**
3-Way, Normally Closed	**364**
3-Way, Normally Open	**384**

Port Size / Thread Type	
3/8" Body Size	
3/8" Inlet & Cyl - 1/2" Exhaust - NPT	**3**
1/2" Inlet & Cyl - 1/2" Exhaust - NPT	**4**
1/2" Inlet & Cyl - 1/2" Exhaust - BSPP	N
3/4" Body Size	
1/2" Inlet & Cyl - 3/4" Exhaust - NPT	5
1/2" Inlet & Cyl - 3/4" Exhaust - BSPP	P
3/4" Inlet & Cyl - 1" Exhaust - NPT	**6**
3/4" Inlet & Cyl - 1" Exhaust - BSPP	Q
1" Inlet & Cyl - 1" Exhaust - NPT	7
1-1/4" Body Size	
1" Inlet & Cyl - 1 1/4"Exhaust - NPT	**7**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - NPT	**8**
1-1/4" Inlet & Cyl – 1-1/2" Exhaust - BSPP	S*
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - NPT	**9**
1-1/2" Inlet & Cyl – 1-1/2" Exhaust - BSPP	T*

* Not available with Valve Function 325.

Note: BSPP is to the ISO 228 Standard, and requires an R-BSPT male fitting.

Pilot Configuration	
089	External Pilot Return
091	**Internal Pilot Return**

BOLD OPTIONS ARE MOST POPULAR.

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Operating Pressure

Internal Pilot – Solenoid Valves

3/8" & 3/4" Body

- 20 to 140 PSIG (standard)

1-1/4" Body

- 25 to 140 PSIG (200 PSIG option available)

Internal Pilot – Remote Pilot Valve

Operating Pressure Limitations			
Air Pressure Thru Valve	Remote Pilot Pressure (PSI)		
	3/8" Basic	3/4" Basic	1-1/4" Basic
25 PSI	30-250	30-250	30-250
50 PSI	50-250	50-250	50-250
75 PSI	70-250	75-250	70-250
100 PSI	95-250	95-250	90-250
150 PSI	140-250	145-250	130-250
200 PSI	175-250	185-250	175-250
250 PSI	215-250	230-250	205-250

Solenoid Valves: External Supply

3/8" & 3/4" Basic

Air Pressure Thru Valve (PSI)	External Pilot Pressure Required (PSI)*	
	3/8" Basic	3/4" Basic
25 PSI	35-200	35-200
50 PSI	45-200	40-200
75 PSI	55-200	50-200
100 PSI	65-200	65-200

Vacuum up to 1" HG, less than a perfect vacuum.

* With 200 PSI option.

Do not exceed 140 PSI with standard pilots.

3/8" & 3/4" Body
Single Solenoid External Pilot
Normally Closed

3/8" & 3/4" Body
Single Solenoid External Pilot
Normally Open

3/8" & 3/4" Body

1-1/4" Body

Remote Operated External Return
Normally Closed

3/8" & 3/4" Body

1-1/4" Body

Remote Operated External Return
Normally Open

External Pilot supply should be used when the main valve needs to operate below the Minimum Operating Pressure or at Vacuum. A Selector function can also be achieved (pressurizing the IN and EXHAUST ports) with an External Pilot Supply. Refer to charts for required external pilot pressure.

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Flow

Basic Valve Size	Inlet Port Size	Exhaust Port Size	Cv Inlet to Cylinder	Cv Cylinder to Exhaust
3/8" 3-Way Normally Closed	3/8" Pipe	1/2" Pipe	3.6	4.2
	1/2" Pipe	1/2" Pipe	3.8	4.3
3/8" 3-Way Normally Open	3/8" Pipe	1/2" Pipe	3.6	4.1
	1/2" Pipe	1/2" Pipe	3.9	4.5
3/4" 3-Way Normally Closed	1/2" Pipe	3/4" Pipe	8.2	9.2
	3/4" Pipe	1" Pipe	9.3	10.8
3/4" 3-Way Normally Open	1/2" Pipe	3/4" Pipe	7.7	6.6
	3/4" Pipe	1" Pipe	9.6	11.4
1-1/4" 3-Way Normally Closed	1" Pipe	1-1/4" Pipe	19.5	23.5
	1-1/4" Pipe	1-1/2" Pipe	23.3	26.9
	1-1/2" Pipe	1-1/2" Pipe	23.3	26.9
1-1/4" 3-Way Normally Open	1" Pipe	1-1/4" Pipe	20.4	24.8
	1-1/4" Pipe	1-1/2" Pipe	25.0	29.1
	1-1/2" Pipe	1-1/2" Pipe	26.7	29.9

Temperature Rating

Operating Temperature Range:

Operator Type	Duty Cycle*	Minimum Ambient Temperature	Maximum Ambient Temperature
Standard Service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	100°F (38°C)
Special Service	Intermittent	0°F (-18°C)	125°F (52°C)
Solenoid	Continuous	0°F (-18°C)	125°F (52°C)
Remote Pilot	Not Applicable	0°F (-18°C)	200°F (93°C

* Applications with pilot valves energized for ten (10) minutes or longer with a duty cycle greater than 70% are considered to be continuously energized.

$$\text{Duty cycle} = \frac{\text{Time energized}}{\text{Time energized + time off}} \times 100\% = \%\ \text{Duty Cycle}$$

Materials of Construction

Valve Body .....Cast Aluminum

Poppet Assembly..... Aluminum and Stainless Steel

Pilot Valve.....Zinc, Stainless Steel, Brass, Copper, Zinc Plated Steel

Seals .....Nitrile

Selection

Although reasonable safety factors are designed into each speed poppet valve, it is important that application requirements do not exceed the rated limitation of the valve. This precaution insures a sufficient safety factor.

Life Expectancy

Normal multimillion cycle life expectancy of high speed poppet series valves is based on the use of properly filtered and lubricated air at room temperature. In actual laboratory tests, the high speed poppet valves provide maintenance-free service life in excess of 20,000,000 cycles.

Lubrication

The high speed poppet valves are pre-lubricated to permit use with non-lubricated air. However, air should be lubricated to assure maximum seal life.

F442 lubricating oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from air-operated equipment.

Other good air line lubricating oils may be used provided they atomize readily and are of the medium aniline type. Aniline point range must be between 180°F - 220°F. Viscosity SUS @ 100°F of 140-170. High aniline oils will shrink seals; low aniline oils will swell seals, reducing operating life and expectancy.

Installation

Valves should be installed with reasonable accessibility for service whenever possible. Care should be taken to hold piping length to a minimum and to protect valves from exposure to extreme heat, dirt and moisture. Piping should be clean and clear of dirt and chips. Threads should be the correct size and undamaged. Pipe joint compound should be used sparingly and only on pipe threads, never in the valve body. Care should be taken in installation to avoid undue strain on valve.

For the small port size options, it is recommended that an air reservoir is located close to the valve inlet as to not starve the valve of air pressure.

⚠ ***CAUTION:*** **DO NOT RESTRICT THE INLET TO POPPET VALVES**

Restriction of the inlet can starve the air supply to the pilot section of internally piloted poppet valves and result in slow shifting or failure of the valve to shift properly. Always connect the supply line directly to the inlet of the valve using the full pipe size of the valve inlet. Never use a quick coupling to connect a poppet valve to the air supply. On valves with a small inlet port, use of an upstream surge tank may be required at lower operating pressures to insure an adequate air supply and proper operation.

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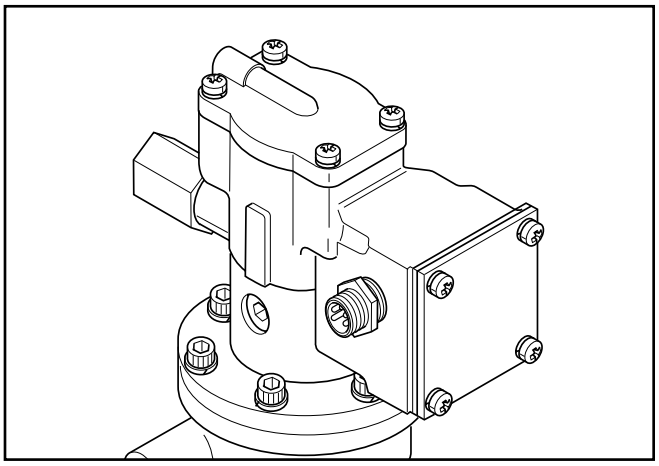


Automotive Connections

- 3-Pin & 5-Pin "Mini" (7/8 UNF Thread)
- 4-Pin "Micro" (M12 Thread)

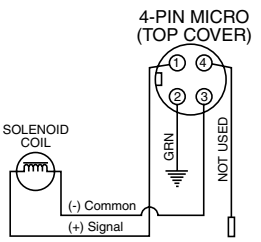
Solenoid Configurations

"E", "J", "N"

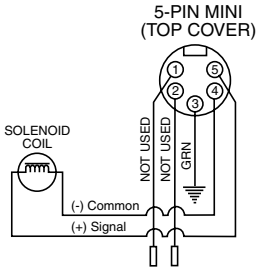
Wiring Connections

Chrysler Connection

4-Pin Male/Single Solenoid
(Encl. Option J, Wiring Option C)

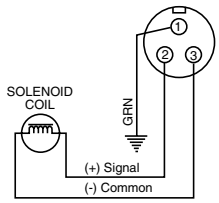


5-Pin Male/Single Solenoid
(Encl. Option N, Wiring Option C)

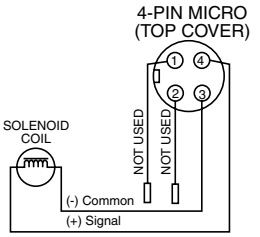


Ford Connection

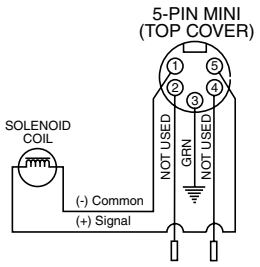
3-Pin Male/Single Solenoid
(Encl. Option E, Wiring Option F)



4-Pin Male/Single Solenoid
(Encl. Option J, Wiring Option F)

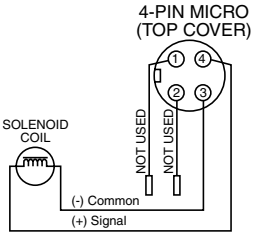


5-Pin Male/Single Solenoid
(Encl. Option N, Wiring Option F)

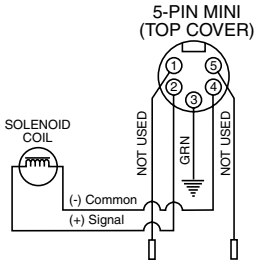


GM Connection

4-Pin Male/Single Solenoid
(Encl. Option J, Wiring Option G)



5-Pin Male/Single Solenoid
(Encl. Option N, Wiring Option G)



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Solenoid Characteristics Chart

Voltage Range +10/-15% of Nominal

3/8" & 3/4" Basic – L-Pilot					
Voltage/ Cycles	**Amps Inrush**	**Amps Holding**	**Resistance Ohms**	**Watts**	**Insulation Class**
120/60VAC	.29	.18	122	12	B
110/50VAC	.21	.14	122	12	B
240/60VAC	.18	.12	610	12	B
24/60VAC	1.6	1.0	4.5	9.5	B
24/50VAC	1.2	.75	6.4	9.5	B
6VDC	–	1.4	4.5	7.6	B
12VDC	–	.66	17.7	9	B
24VDC	–	.32	71	9	B
48VDC	–	.22	216	11	B

1-1/4" Basic – P-Pilot					
Voltage/ Cycles	**Amps Inrush**	**Amps Holding**	**Resistance Ohms**	**Watts**	**Insulation Class**
120/60VAC	.46	.25	35	18.5	B
110/50VAC	.36	.19	48	12	B
230/60VAC	.26	.15	125	19.5	B
220/50VAC	.20	.11	191	15	B
24/60VAC	2.3	1.4	1.3	20	B
24/50VAC	1.6	.9	2.1	12	B
12VDC	–	.7	17	8	B
24VDC	–	.33	68	8	B
48VDC	–	.16	275	7.5	B

NOTE: Continuous duty type service is for applications where pilot valve is energized more than ten (10) minutes.

Hazardous Duty Solenoid Listing

Valves with solenoid operators designed for hazardous locations are UL & CSA Approved as follows:

National Electric Code	Ambient Conditions	NEMA Classification
Class I Div. 1 Group C	Ethyl, Ether, Etc. Gases & Vapors	VII (7)
Class I Div. 1 Group D	Gasoline, Etc. Gases & Vapors	VII (7)
Class I Div. 2 Group B	Butadiene, Etc., Liquid, Fluid or Vapor Normally Contained, or Atmosphere Ventilated	VII (7)
Class II Div. 1 Group E	Metal Dust	IX (9)
Class II Div. 1 Group F	Coal, Coke, Carbon Black Dust	IX (9)
Class II Div. 1 Group G	Flour, Starch, Grain Dust	IX (9)

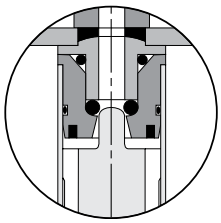
See Article 500 – Hazardous (Classified) Locations, National Electric Code.

Continuous Duty Pilots

Continuous duty pilots are designed for applications where cycling is infrequent and the pilot is to be energized for indefinite periods of time . . . hours, days or weeks. Typical uses include fail-safe or emergency shutdown circuits where the pilot is to be energized and the valve open as long as the main control is "live" in order to shut off air to equipment in the event of power failure.

The Continuous duty pilot operates satisfactorily in ambient temperatures up to 125°F, even when continuously energized and without the benefit of the cooling air which normally flows through the pilot during frequent cycling. Under certain conditions, satisfactory operation may be obtained at ambient temperatures above 125°F. CONSULT FACTORY.

Incorporating the performance-proven design features of the standard L-Pilot, the continuous duty pilot utilizes a bullet-shaped stem on the upper end of the plunger. This bullet-shaped stem, seating in a high-temperature rubber o-ring, provides both a bubble-tight seal and positive release.



Continuous Duty Pilot

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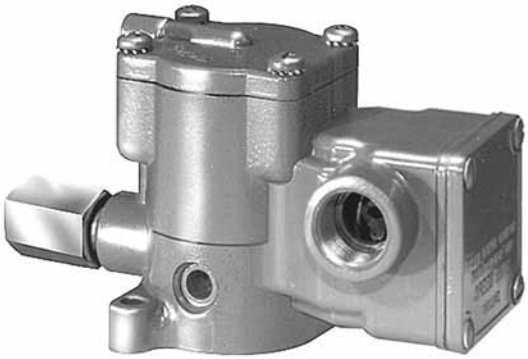
Basic L-Pilot

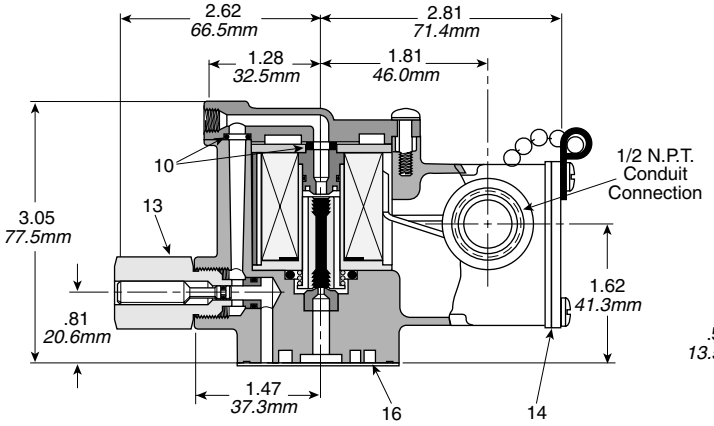


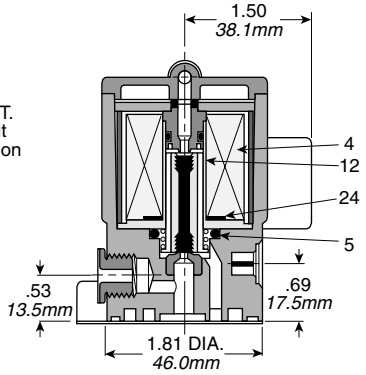
Junction Box L-Pilot

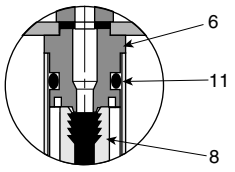
Replacement Pilots

Description	Standard L-Pilot		Continuous Duty L-Pilot	
Override Type	**Locking**	**Non-Locking**	**Locking**	**Non-Locking**
Basic with Override	K0653035**	K0652035**	K0853025**	K0852025**
JIC with Junction Box & Override	K0656035**	K0655035**	K0856025**	K0855025**
JIC Pilot with Junction Box & Override & Indicator Lights (120VAC Only)	K0659035**	K0658035**	K0859025**	K0858025**

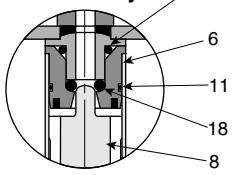
** Voltage Code - (Reference Model Index for Availability)







Standard Duty Pilot Only



Continuous Duty Pilot Only

Parts List

Item No.	Part Number	Description
4	**K593025**	**Coil 120V 60Hz / 110V 50Hz**
	K593035	**Coil 240V 60Hz / 220V 50Hz**
	K593003	Coil 6VDC / 24V 60Hz
	K593010	Coil 12VDC
	K593014	**Coil 24VDC**
	K593041	**Coil 120VDC**
5	H14213	Seal
6	K423006	Top Seat
	K423010	Top Seat (Continuous Duty)
8	**K343002**	**Plunger (STD. Service)**
	K343001	**Plunger (Continuous Duty)**
10*	H14201	Seal
11*	K41RB72011	O-Ring (STD. Service)
	H24969	O-Ring (Continuous Duty)

Item No.	Part Number	Description
12	K272004	Plunger Guide
13	K152003	Override Assembly
14	K183047	Cover Gasket
16*	K183001	Gasket
18*	H13473	O-Ring
20*	H13413	O-Ring
22	H19102	120 AC Only – Indicator Light
24	K183108	Gasket

Coil leads are 19" long.

* Parts included in Service Kit.
Continuous Duty Kit K352 366
Standard Service Kit K352 166

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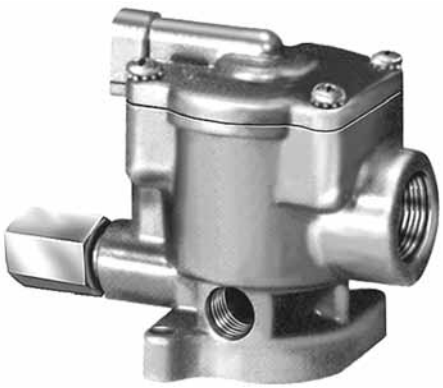
Hazardous Duty L-Pilot

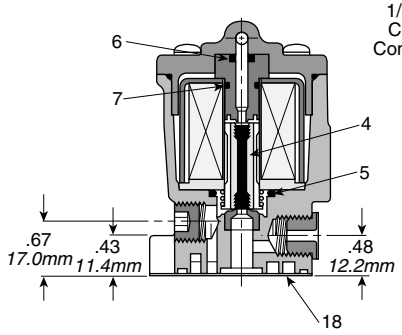


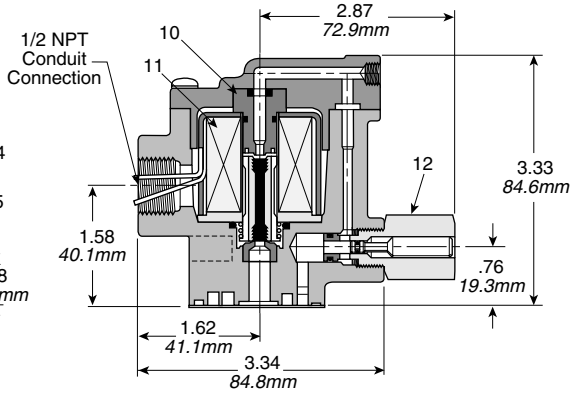
NEMA 4 L-Pilot

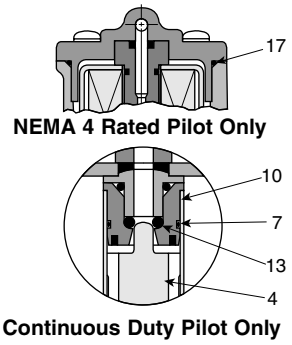
Replacement Pilots

Description	Continuous Duty L-Pilot	
Hazardous Duty L-Pilot - UL & CSA	K0451025**	—
Override Type	**Locking**	**Non-Locking**
Hazardous Duty with Override	K0453025**	K0452025**
NEMA 4 with Override	K2553025**	K255202549

** Voltage Code - 49 & 53







Parts List

Item No.	Part Number	Description
4*	**K343002**	**Plunger (STD. Service)**
	K343001	**Plunger (Continuous Duty)**
5*	K14213	Seal
6*	K41RB72009	O-Ring
	K41RB72008	O-Ring (STD. Service)
7*	K41RB72011	O-Ring (STD. Service)
	H24969	O-Ring (Continuous Duty)
10	K423001	Top Seat
	K423002	Top Seat (Continuous Duty)
11	**K593025**	**Coil 120V 60Hz / 110V 50Hz**
	K593035	**Coil 240V 60Hz / 220V 50Hz**
	K593003	Coil 6VDC / 24V 60Hz
	K593010	Coil 12VDC
	K593014	**Coil 24VDC**
	K593041	**Coil 120VDC**

Item No.	Part Number	Description
12	K152003	Override Assembly
13*	H13473	O-Ring
17*	H13716	Gasket (NEMA 4 Rated Pilot Only)
18*	K183001	Gasket

Coil leads are 19" long.

* Parts included in Service Kit.
Continuous Duty Kit K352 366
Standard Service Kit K352 166

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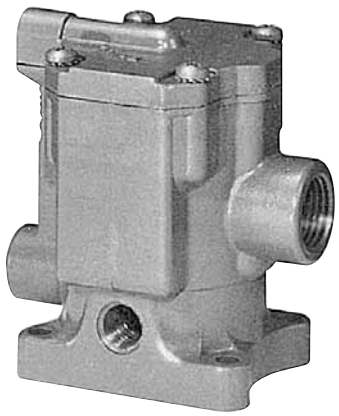
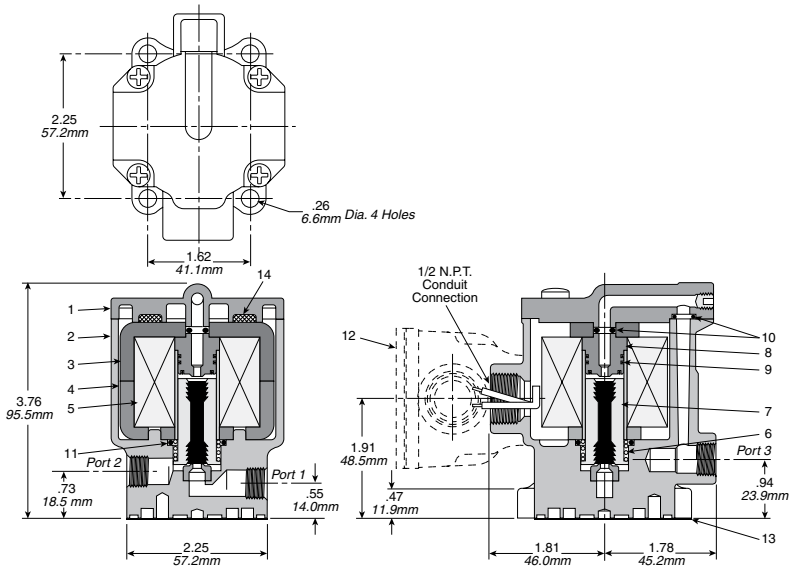


Heavy Duty P-Pilot

Replacement Pilots

Description	Standard P-Pilot		
Override Type	**No Override**	**Non-Locking**	**Locking**
Basic with Override	K1351045**	N/A	N/A
JIC with Junction Box & Override	N/A	K1355045**	K1356045**
JIC Pilot with Junction Box & Override & Indicator Lights (120VAC Only)	N/A	K135804553	K135904553

** Voltage Code - 49 & 53



Parts List

Item No.	Part Number	Description
1	K062005	Cover Assy
2	K112045	Body, Man. Mtd. (1/8" Bottom Seal)
	K112046	Body, Man. Mtd. (3/16" Bottom Seal)
3	K013001	Magnet Bar
4	K272002	Sleeve Sub Assy
5*	K593108	Coil (115V 60Hz)
	K593112	Coil (230V 60Hz)
	K593097	Coil 24VDC
	K593107	Coil 115VDC

Item No.	Part Number	Description
6	K473010	Spring N.O. Valve
	K473011	Spring N.C. Valve
• 7	K343042	Plunger
8	K423020	Top Seat (1/8" Orifice)
	K423022	Top Seat (3/16" Orifice)
• 9	H13436	Seal
• 10	H14202	Seal
• 11	H14215	Seal
12	K322004	Junction Box Kit
• 13	K183012	Gasket

* Coil leads are 19" long.

• Parts included in Seal Kit K352 064.

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Coils for L-Pilot Operated Valves

Voltage Code **	Voltage			Coil	
	60Hz	50Hz	DC	19" Leads	72" Leads
40	12	—	—	K593007	—
41,42	24	—	6	K593003	—
45*	**—**	**—**	**12**	**K593010**	**—**
49*	**—**	**—**	**24 (Standard)**	**K593014**	**—**
79	—	—	24 (Arc Suppressed)	K593271	—
51*	—	—	48	—	K593185
53*	**120**	**110**	**—**	**K593025**	**—**
57*	**240**	**240**	**—**	**K593035**	**—**
60	**240**	**220**	**—**	**K593035**	**—**
61	**—**	**—**	**120**	**K593041**	**—**

* Indicates voltages approved for solenoid operators designed for use in hazardous locations.

Coils for P-Pilot Operated Valves

Voltage Code **	Voltage			Coil	
	60Hz	50Hz	DC	19" Leads	72" Leads
42	24	—	—	K593099	—
43	—	24	—	K593098	—
45	**—**	**—**	**12**	**K593094**	**—**
49	**—**	**—**	**24**	**K593097**	**—**
51	—	—	48	—	K593254
53	**115**	**—**	**—**	**K593108**	**—**
58	**—**	**230**	**—**	**K593111**	**—**

N □□□ □□ □□□ * *
Voltage Code

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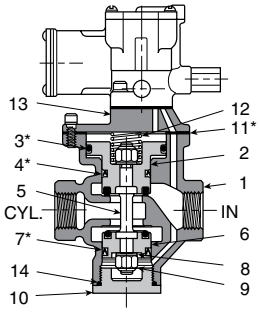
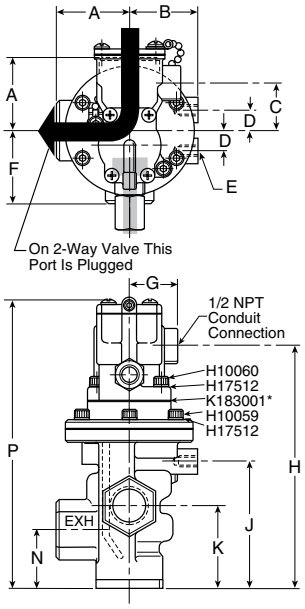
Normally Closed





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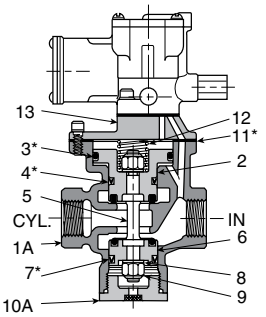

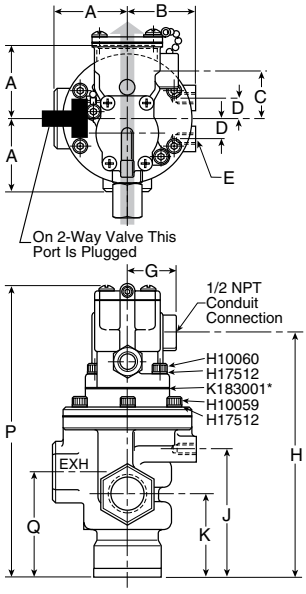

Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Dimensions

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	5.92	150	7.14	181
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.36	196	8.58	218
Q	2.31	59	3.09	84

Service Kits

Include all parts normally required for in-service maintenance:

3/8" Basic Valve with standard service L-Pilots.....**K352076**

3/8" Basic Valve with continuous duty L-Pilots **K352276**

3/4" Basic Valve with standard service L-Pilots.....**K352077**

3/4" Basic Valve with continuous duty L-Pilots **K352277**

Key	3/8" Valve	3/4" Valve	Description
1	—	1/2" Tap K053075	Body (N.C.)
	3/8" Tap K053022	3/4" Tap K053076	
	1/2" Tap K053023	1" Tap K053220	
1A	—	3/4" Tap K053077	Body (N.O.)
	3/8" Tap K053025	3/4" Tap K053078	
	1/2" Tap K053026	1" Tap K053218	
2	K212001	K212002	Upper Piston Assy
3*	H13648	H13728	Seal
4*	H14510	H13676	U-Cup (3/8), O-Ring (3/4)

Key	3/8" Valve	3/4" Valve	Description
5	K493002	K493009	Stem
6	K202001	K202002	Lower Piston Assy.
7*	H14509	H13676	U-Cup (3/8), O-Ring (3/4)
8	H17811	H17813	Washer (2)
9	H06326	H06332	Stop Nut (2)
10	K103035	K103053	Bottom Cap (N.C.)
10A	K092020	K092034	Bottom Cap Assy. (N.O.)
11*	K183049	K183057	Gasket
12	K473014	K473015	Spring
13	K563015	K563017	Adapter
14*	K41RB72121	K41RB72221	O-Ring

*** Parts included in seal kit**

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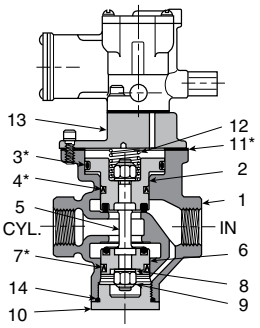
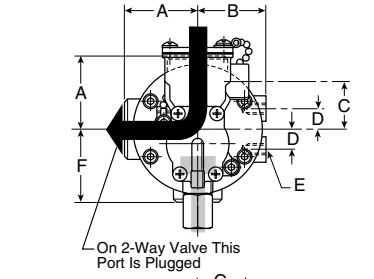
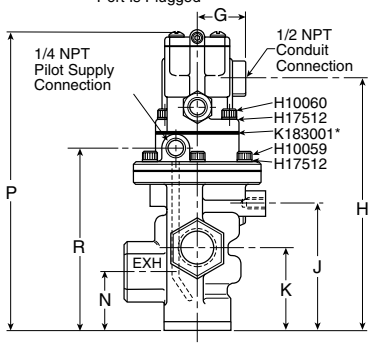
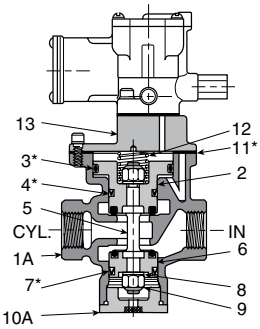
Normally Closed

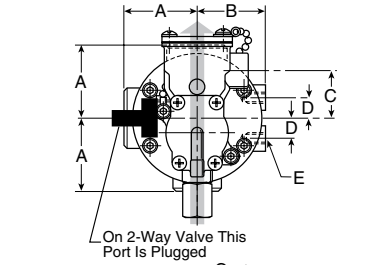


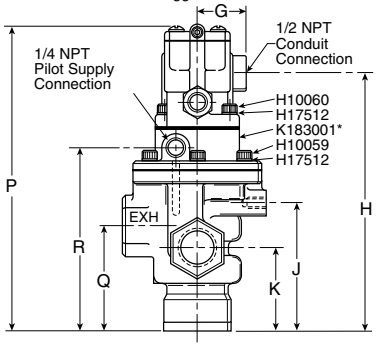




Normally Open







Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Dimensions

Key	3/8" Body		3/4" Body	
	Inch	mm	Inch	mm
A	1.56	40	2.13	54
B	1.50	38	1.94	49
C	1.81	46	1.34	34
D	.56	14	.56	14
E	3/8-16UNC 7/16" deep		3/8-16UNC 9/16" deep	
F	1.75	44	2.25	57
G	1.50	38	1.50	38
H	6.42	163	7.45	189
J	3.19	81	3.75	95
K	1.88	47	2.44	62
N	1.44	37	1.78	45
P	7.86	200	8.89	226
Q	2.31	59	3.09	84
R	4.34	110	5.38	137

Service Kits

Include all parts normally required for in-service maintenance:

3/8" Basic Valve with standard service L-Pilots.....**K352076**

3/8" Basic Valve with continuous duty L-Pilots **K352276**

3/4" Basic Valve with standard service L-Pilots.....**K352077**

3/4" Basic Valve with continuous duty L-Pilots **K352277**

Key	3/8" Valve	3/4" Valve	Description
1	—	1/2" Tap K053067	Body (N.C.)
	3/8" Tap K053019	3/4" Tap K053069	
	1/2" Tap K053157	1" Tap K053221	
1A	—	3/4" Tap K053065	Body (N.O.)
	3/8" Tap K053018	3/4" Tap K053070	
	1/2" Tap K053064	1" Tap K053219	
2	K212001	K212002	Upper Piston Assy
3*	H13648	H13728	Seal
4*	K41RB72211	H13676	O-Ring

Key	3/8" Valve	3/4" Valve	Description
5	K493002	K493009	Stem
6	K202001	K202002	Lower Piston Assy.
7*	K41RB72210	H13676	O-Ring
8	H17811	H17813	Washer (2)
9	H06326	H06332	Stop Nut (2)
10	K103035	K103053	Bottom Cap (N.C.)
10A	K092020	K092034	Bottom Cap Assy. (N.O.)
11	K473014	K473015	Spring
12*	K183049	K183057	Gasket
13	K563016	K563021	Adapter
14*	K41RB72121	K41RB72221	O-Ring

*** Parts included in seal kit**

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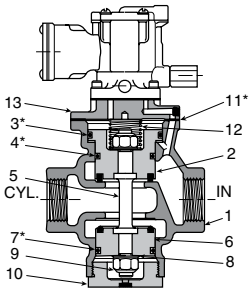
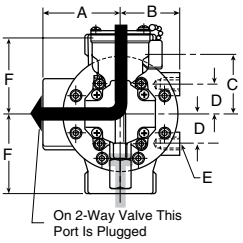
Exhaust
Pressure

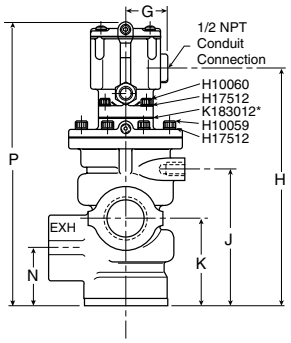
Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Normally Closed







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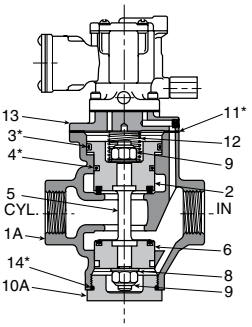

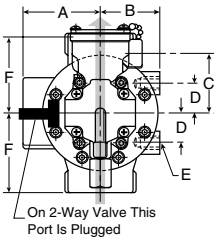

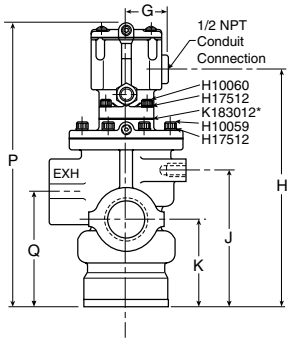

Dimensions

Key	1-14" Body	
	Inch	mm
H	9.30	236
J	5.34	136
K	3.44	87
N	2.31	59
P	11.14	283
Q	4.56	116

Service Kits

Includ e all parts normally required for in-service maintenance:

1-1/4" Basic Valve with standard service P-Pilot **K352078**

Key	1-1/4" Valve	Description
1	1" Tap K053111	Body (N.C.)
	1-1/4" Tap K053112	
	1-1/2" Tap K053113	
1A	1" Tap K053114	Body (N.O.)
	1-1/4" Tap K053115	
	1-1/2" Tap K053116	
2	K313029	Upper Piston Assy
3*	H13752	O-Ring
4*	H13728	Seal

Key	1-1/4" Valve	Description
5	K493016	Stem
6	K313028	Lower Piston
7*	H13728	Seal
8	H17817	Washer
9	H06338	Stop Nut
10	K092046	Bottom Cap (N.C.)
10A	K103061	Bottom Cap (N.O.)
11*	K183058	Gasket
12	K473016	Spring
13	K012003	Adapter
14*	K41RB72143	O-Ring

*** Parts included in seal kit**

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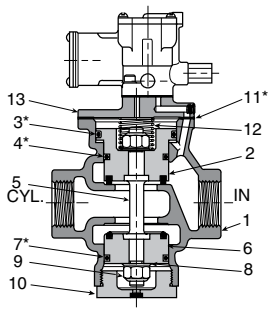
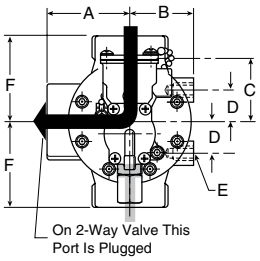
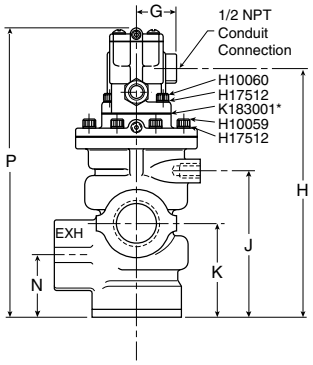
Normally Closed







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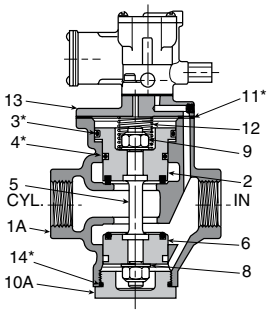

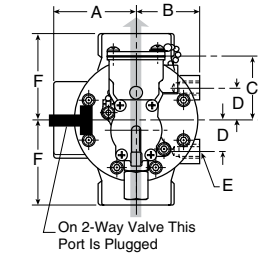

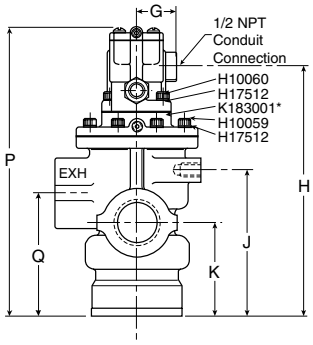

Exhaust
Pressure

Top view indicates flow through 3-Way valve with coil de-energized.

NOTE: For normal valve operation, override must be in "out" position.

Dimensions

Key	1-1/4" Body	
	Inch	mm
A	3.00	76
B	2.25	57
C	1.34	34
D	1.19	30
E	1/2-13 UNC 3/4 Deep	
F	3.13	80
G	1.50	38
H	9.02	229
J	5.34	136
K	3.44	87
N	2.31	59
P	10.45	265
Q	4.56	116

Service Kits

Include all parts normally required for in-service maintenance:

1-1/4" Basic Valve with continuous duty L-Pilot.....**K352080**

Key	1-1/4" Valve	Description
1	1" Tap K053111	Body (N.C.)
	1-1/4" Tap K053112	
	1-1/2" Tap K053113	
1A	1" Tap K053114	Body (N.O.)
	1-1/4" Tap K053115	
	1-1/2" Tap K053116	
2	K313029	Upper Piston Assy
3*	H13752	O-Ring
4*	H13728	Seal

Key	1-1/4" Valve	Description
5	K493016	Stem
6	K313028	Lower Piston
7*	H13728	Seal
8	H17817	Washer
9	H06338	Stop Nut
10	K092046	Bottom Cap (N.C.)
10A	K103061	Bottom Cap (N.O.)
11*	K183058	Gasket
12	K473016	Spring
13	K012003	Adapter
14*	K41RB72143	O-Ring

*** Parts included in seal kit**

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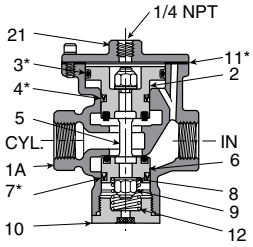
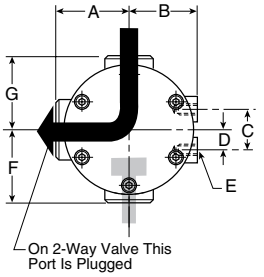
Exhaust
Pressure

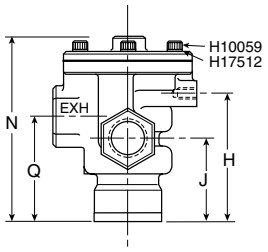
Top view indicates flow through 3-Way valve.

NOTE: For normal valve operation, override must be in "out" position.

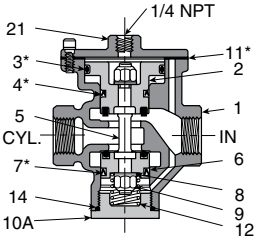
Normally Closed

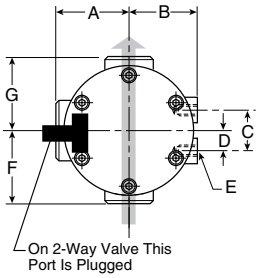


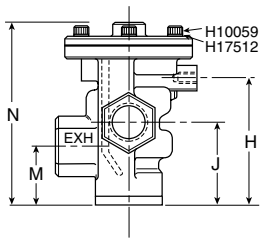




Normally Open







Dimensions

Key	3/8" Body		3/4" Body		1-1/4" Body	
	Inch	mm	Inch	mm	Inch	mm
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
M	1.44	37	1.78	45	2.66	67
N	4.22	107	5.31	135	7.19	183
Q	2.31	59	3.09	78	4.56	116

Service Kits

Include all parts normally required for in-service maintenance:

3/8" Basic Valve.....**K352073**
3/4" Basic Valve.....**K352074**
1-1/4" Basic Valve.....**K352075**

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
1	—	1/2" Tap K053075	1" Tap K053111	Body (N.O.)
	3/8" Tap K053022	3/4" Tap K053076	1-1/4" Tap K053112	
	1/2" Tap K053023	1" Tap K053220	1-1/2" Tap K053113	
1A	—	1/2" Tap K053077	1" Tap K053114	Body (N.C.)
	3/8" Tap K053025	3/4" Tap K053078	1-1/4" Tap K053115	
	1/2" Tap K053026	1" Tap K053218	1-1/2" Tap K053116	
2	K212001	K212002	K313029	Upper Piston Assy
3*	H13648	H13728	H13752	Seal
4*	H14510	H13676	H13728	Seal

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
5	K493002	K493009	K493016	Stem
6	K202001	K202002	K313028	Lower Piston Assy.
7*	H13499	H13676	H13728	Seal
8	H17811	H17813	H17817	Washer (2)
9	H06326	H06332	H06338	Stop Nut (2)
10	K092020	K092034	K092046	Bottom Cap (N.C.)
10A	K103035	K103053	K103061	Bottom Cap (N.O.)
11*	K183049	K183057	K183058	Gasket
12	K473014	K473015	K473016	Spring
14*	K41RB72121	K41RB72221	K41RB72143	O-Ring
21	K123018	K123021	K123024	Cover

*** Parts included in seal kit**

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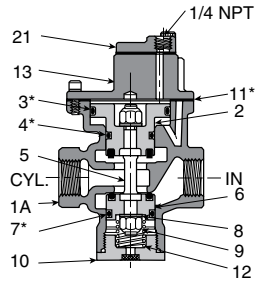
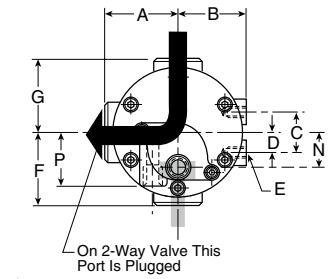
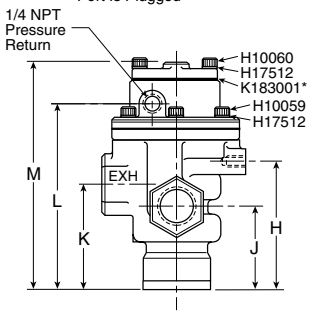
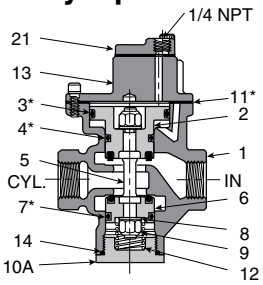
Normally Closed

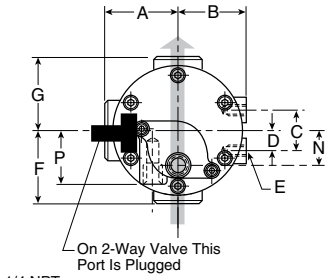


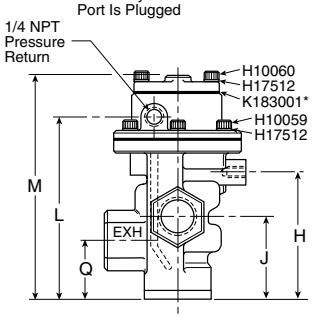




Normally Open







Exhaust
Pressure

Top view indicates flow through 3-Way valve.

NOTE: For normal valve operation, override must be in "out" position.

Dimensions

	3/8" Body		3/4" Body		1-1/4" Body	
Key	Inch	mm	Inch	mm	Inch	mm
A	1.56	40	2.13	54	3.00	76
B	1.50	38	1.94	49	2.25	57
C	1.13	29	1.13	29	2.38	60
D	.56	14	.56	14	1.19	30
E	3/8–16UNC 7/16" deep		3/8–16UNC 9/16" deep		1/2–13UNC 3/4" deep	
F	1.75	44	2.25	57	3.13	79
G	1.56	40	2.13	54	3.13	79
H	3.19	81	3.75	95	5.34	136
J	1.88	48	2.44	62	3.44	87
K	2.31	59	3.09	78	4.56	116
L	4.34	110	5.38	137	7.31	186
M	5.31	135	6.34	161	7.88	200
N	Left of center				On center	
	.53	13	1.00	25		
Q	1.44	37	1.78	45	2.31	59

Service Kits

Include all parts normally required for in-service maintenance:

3/8" Basic Valve.....**K352031**
3/4" Basic Valve.....**K352056**
1-1/4" Basic Valve.....**K352083**

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Description
1	1/4" Tap K053011	1/2" Tap K053067	1" Tap K053143	Body (N.O.)
	—	3/4" Tap K053069	1-1/4" Tap K053110	
	1/2" Tap K053157	1" Tap K053221	1-1/2" Tap K053146	
1A	1/4" Tap K053010	1/2" Tap K053065	1" Tap K053159	Body (N.C.)
	—	3/4" Tap K053070	1-1/4" Tap K053144	
	1/2" Tap K053064	1" Tap K053219	1-1/2" Tap K053145	
2	K212001	K212002	K313029	Upper Piston Assy
3*	H13648	H13728	H13752	Seal
4*	H13529	H13676	H13728	Seal

Key	3/8" Valve	3/4" Valve	1-1/4" Valve	Part
5	K493002	K493009	K493016	Stem
6	K202001	K202002	K313028	Lower Piston Assy.
7*	H13499	H13676	H13728	Seal
8	H17811	H17813	H17817	Washer (2)
9	H06326	H06332	H06338	Stop Nut (2)
10	K092020	K092034	K092046	Bottom Cap Assy. (N.C.)
10A	K103035	K103053	K103061	Bottom Cap (N.O.)
11*	K183049	K183057	K183058	Gasket
12	K473014	K473015	K473016	Spring
13	K563016	K563021	K563027	Adapter
14*	K41RB72121	K41RB72221	K41RB72143	O-Ring
21	K323027	K323027	Not used	Cover

*** Parts included in seal kit**

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Notes

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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.

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Offer of Sale

The goods, services or work (referred to as the "Products") offered by **Parker-Hannifin Corporation**, its subsidiaries, groups, divisions, and authorized distributors ("Seller") are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller's offer by any customer ("Buyer") is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer's order for any Products specified in Buyer's purchase document or Seller's offer, proposal or quote ("Quote") attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions. Seller's willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document or other communication issued by Buyer.

2. Price; Payment. Prices stated on Seller's Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller's Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller's facility. 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 acts or omissions.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

6. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. **IN NO EVENT IS SELLER LIABLE 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, WHETHER BASED 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. 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 based upon data or specifications provided by the user, 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.

8. 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, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items 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.

9. 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 has the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

10. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller retains a security interest in all Products delivered to Buyer and this agreement is deemed to be 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.

11. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), 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, application, design, specification 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 Products; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Buyer may not cancel or modify or cancel any order 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.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller's obligations by reason of events or circumstances beyond its reasonable control (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not invalidate 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.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

17. Governing Law. This agreement and the sale and delivery of all Products are 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.

18. Indemnity for Infringement of Intellectual Property Rights. Seller is not liable 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 refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable 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 constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. 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 sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

20. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act") and the U.S. Food Drug and Cosmetic Act ("FDCA"),each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

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