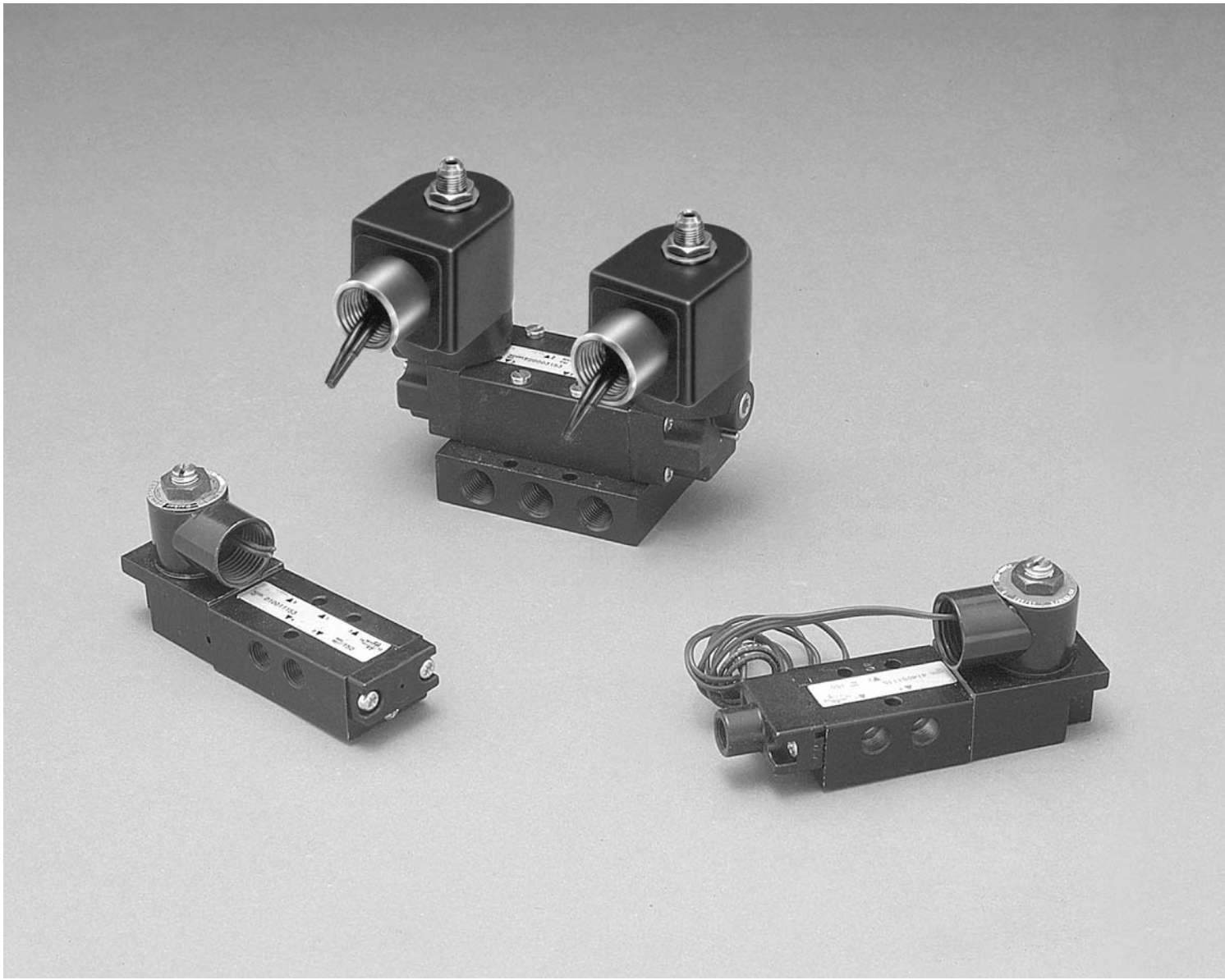
"Directair" Series

Air Control Valves

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

Catalog VAL-DA-E/USA
September 2004



Note: Shaded options have been discontinued. Refer to back of Catalog for Cross Reference Information.

Schrader Bellows®

⚠ WARNING

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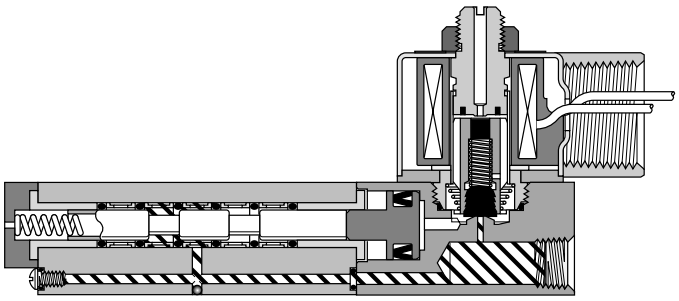
Parker Pneumatic

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

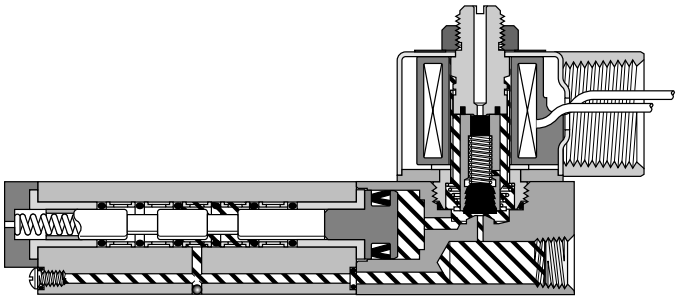
Table of Contents

- Cv = 0.13 to 0.20, 7 to 11 SCFM
- 1/8 Inch Ports (NPT or BSP)
- Direct Pipe Ported
- Solenoid, Air Pilot and Manual Actuators Available
- Stainless Steel Spool Withstands Wear and Corrosion
- Body: Precision Machined Aluminum Extrusion
- Conduit Solenoid Operators
- Compact for Neat Appearance

De-energized



Energized



Pressure **Exhaust**

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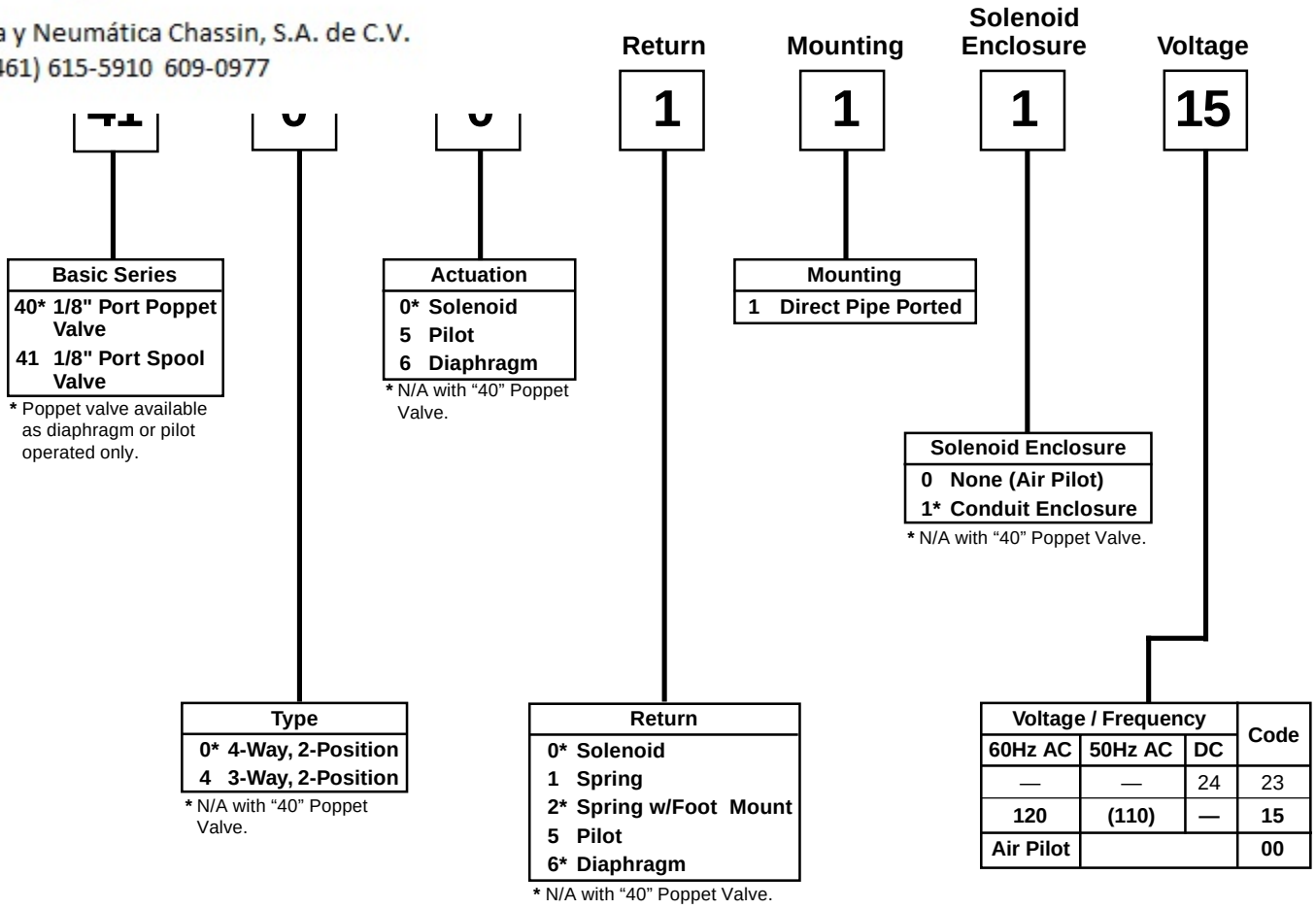


Note: Standard Items in Bold.

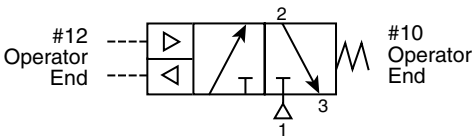
Diaphragm Operated

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "maintained" vacuum or low-pressure signal shifts the valve. When the signal is removed, the valve returns to its normally closed position.

Mounting
These valves may be oriented in any position and are designed to be mounted inline or bracket mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" vacuum or low-pressure signal on the diaphragm. Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked. (See Technical Data page for signal pressure range.)



Model Selection Information

Function	Model Number
Single Diaphragm, Spring Return	**40461 1000**

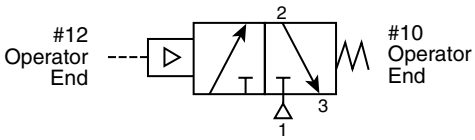
Pilot Operated

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normally closed position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" pressure signal at #12 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information

Function	Model Number
Single Remote Pilot, Spring Return	**40451 1000**

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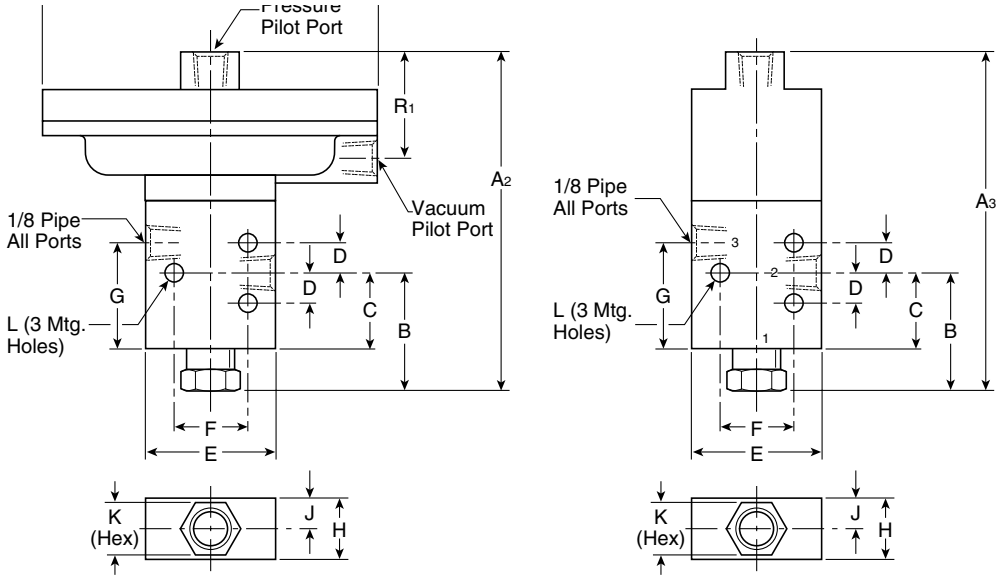
ed Single Remote Pilot Operated



Dimensions:

	inches	mm
A_2	3.61	92
A_3	3.06	78
B	1.03	26
C	0.55	14
D	0.31	8
E	1.31	33
F	0.75	19
G	0.90	23
H	0.62	16
J	0.31	8
K	0.56	14
L	.19	5
N_1	3.50	89
R_1	1.14	29

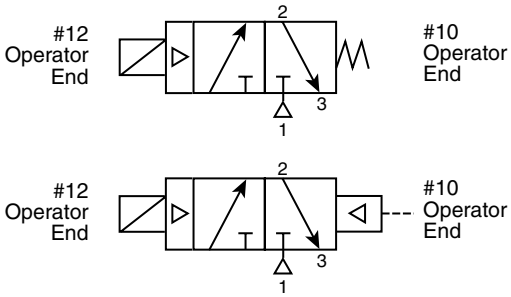
Single Solenoid

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
De-Energized Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

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



Model Selection Information
Listed for 120V/60Hz.*

Function	Model Number
Single Solenoid, Spring Return, Conduit Housing	**41401 1115**
Single Solenoid, Pilot Return, Conduit Housing	**41405 1115**

* See Valve Model Number System for other voltages.

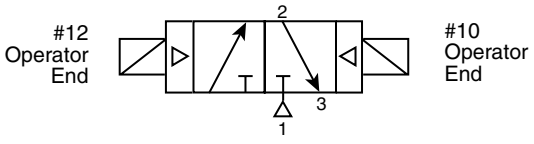
Double Solenoid

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a "momentary" signal is applied to the other solenoid.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

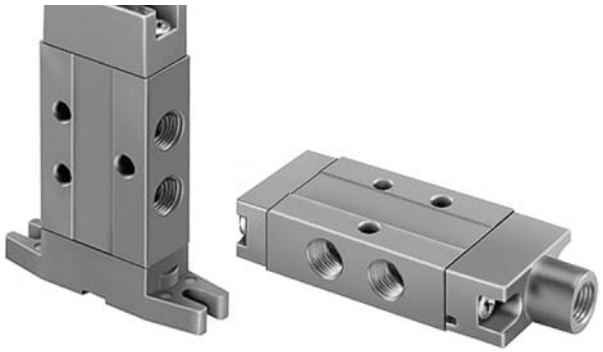
Operation
Solenoid Operator #10 energized last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Solenoid Operator #12 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information
Listed for 120V/60Hz.*

Function	Model Number
Double Solenoid, Conduit Housing	**41400 1115**



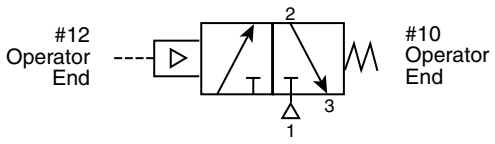
Single Remote Pilot

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" pressure signal at #12 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information

Function	Model Number
Single Remote Pilot, Spring Return	**41451 1000**
Single Remote Pilot, Spring Return, Foot Mounted	**41452 1000**

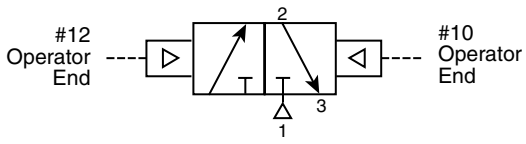
Double Remote Pilot

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "momentary" pressure signal applied to one of the pilot sections shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other pilot section.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Momentary air signal applied to #10 Pilot Port last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Momentary air signal applied to #12 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information

Function	Model Number
Double Remote Pilot	**41455 1000**

Single Diaphragm

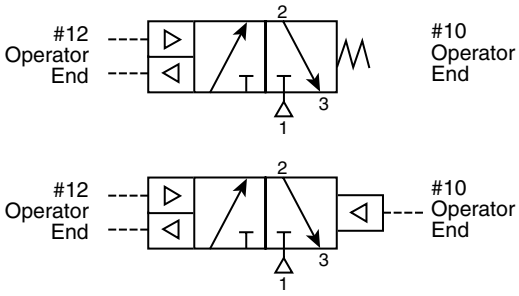
Double Diaphragm

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "maintained" vacuum or low-pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted, foot mounted, or bracket mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" vacuum or low-pressure signal on the diaphragm. Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked. (See Technical Data page for signal pressure range.)



Model Selection Information

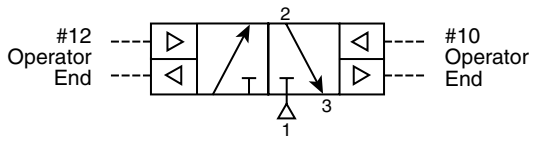
Function	Model Number
Single Diaphragm, Spring Return, Foot Mounted	**41462 1000**
Single Diaphragm, Pilot Return	**41465 1000**

Application
These valves are used to operate single-acting cylinders or to provide pilot signals for larger valves. A "momentary" vacuum or low-pressure signal applied to one diaphragm shifts the valve. The valve remains in this position until a "momentary" vacuum or low-pressure signal is applied to the other diaphragm.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane and are designed to be mounted inline or bracket mounted using the through holes provided in the valve body.

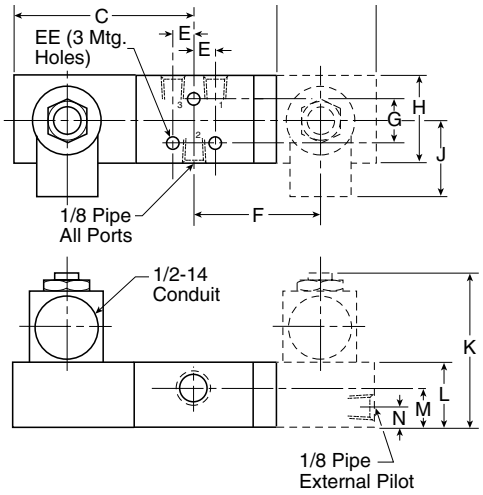
Operation
Momentary signal applied to diaphragm #10 last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Momentary signal applied to diaphragm #12 last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked. (See Technical Data page for signal pressure range.)

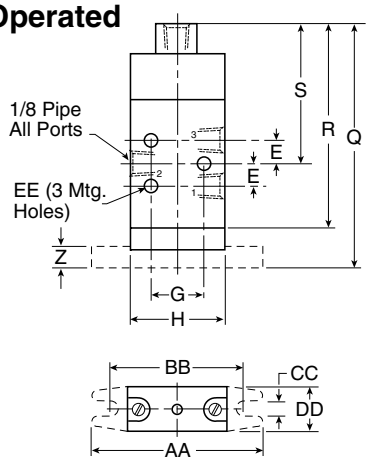


Model Selection Information

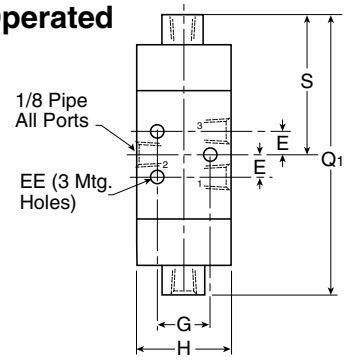
Function	Model Number
Double Diaphragm	**41466 1000**



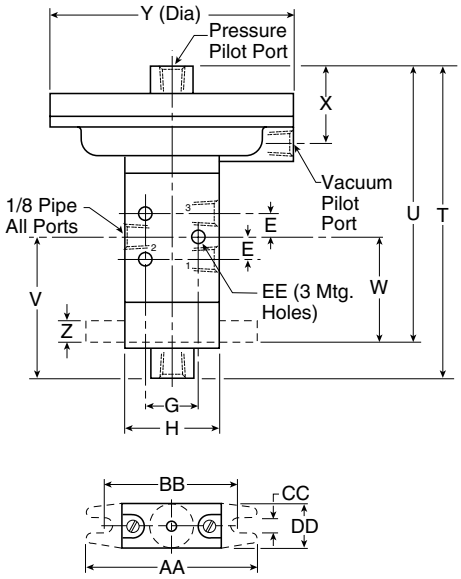
Single Remote Pilot Operated



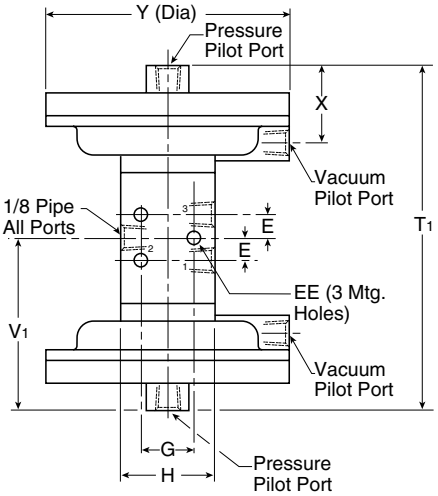
Double Remote Pilot Operated



Single Diaphragm Operated



Double Diaphragm Operated



Dimensions:

	inches	mm
A	5.14	146
B	3.81	97
C	2.56	65
E	0.31	8
F	2.25	57
G	0.75	19
H	1.25	32
J	1.25	32
K	2.44	62
L	0.91	23
M	0.59	15
N	0.34	9
Q	3.48	88
Q_1	4.00	102
R	3.25	82
S	2.00	51
T	4.56	116
T_1	5.11	130
U	4.03	102
V	2.00	51
V_1	2.56	65
W	1.48	38
X	1.14	29
Y	3.50	89
Z	0.25	6
AA	2.38	60
BB	1.88	48
CC	0.20	5
DD	0.62	16
EE	0.19	5

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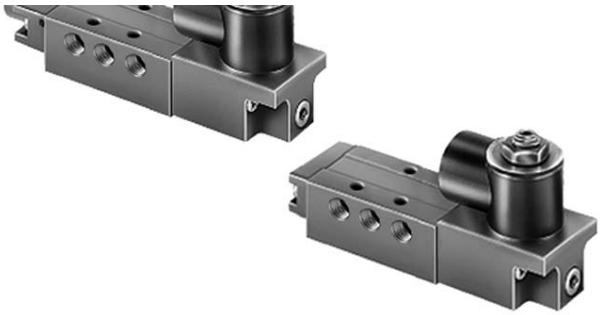


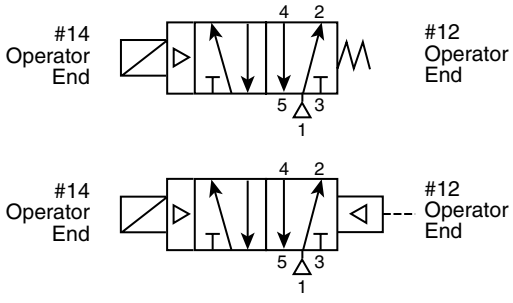
Single Solenoid

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
De-Energized Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

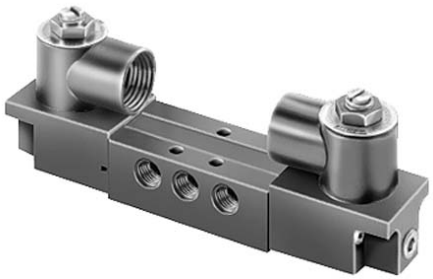
Energized Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information
Listed for 120V/60Hz.*

Function	Model Number
Single Solenoid, Conduit Housing, Spring Return	**41001 1115**
Single Solenoid, Conduit Housing, Pilot Return	**41005 1115**

* See Valve Model Number System for other voltages.



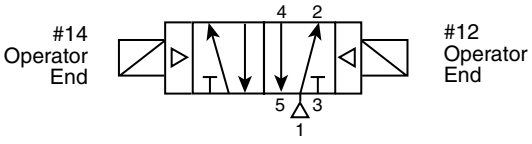
Double Solenoid

Application
These valves are used to operate double-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a momentary signal is applied to the other solenoid.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

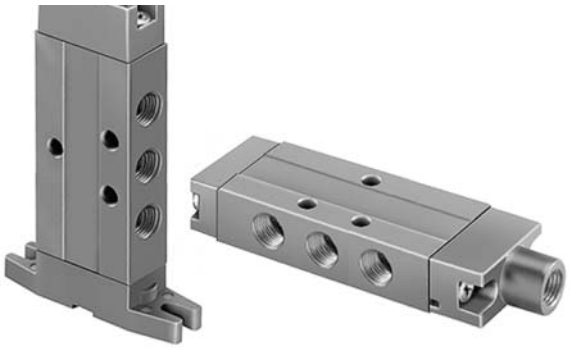
Operation
Solenoid Operator #12 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Solenoid Operator #14 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information
Listed for 120V/60Hz.*

Function	Model Number
Double Solenoid, Conduit Housing	**41000 1115**



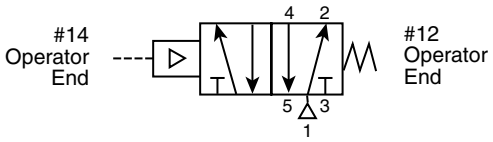
Single Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" pressure signal at #14 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information

Function	Model Number
Single Remote Pilot, Spring Return	**41051 1000**
Single Remote Pilot, Spring Return, Foot Mounted	**41052 1000**

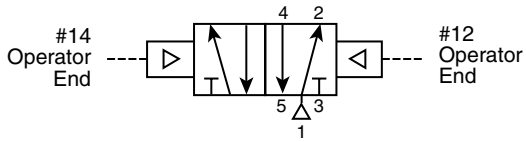
Double Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "momentary" pressure signal applied to one of the pilot sections shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other pilot section.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Momentary air signal applied to #12 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Momentary air signal applied to #14 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information

Function	Model Number
Double Remote Pilot	**41055 1000**

Single Diaphragm

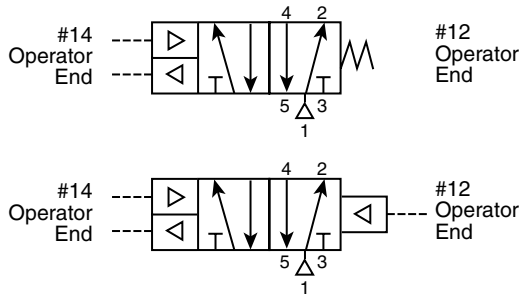
Double Diaphragm

Application
These valves are used to actuate double-acting cylinders. A "maintained" vacuum or low-pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted, foot mounted, or bracket mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" vacuum or low-pressure signal on the diaphragm. Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3. (See Technical Data page for signal pressure range.)



Model Selection Information

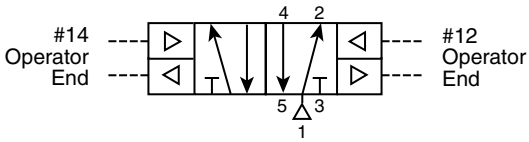
Function	Model Number
Single Diaphragm, Spring Return, Foot Mounted	**41062 1000**
Single Diaphragm, Pilot Return	**41065 1000**

Application
These valves are used to actuate double-acting cylinders. A "momentary" vacuum or low-pressure signal applied to one diaphragm shifts the valve. The valve remains in this position until a "momentary" vacuum or low-pressure signal is applied to the other diaphragm.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane and are designed to be mounted inline or bracket mounted using the through holes provided in the valve body.

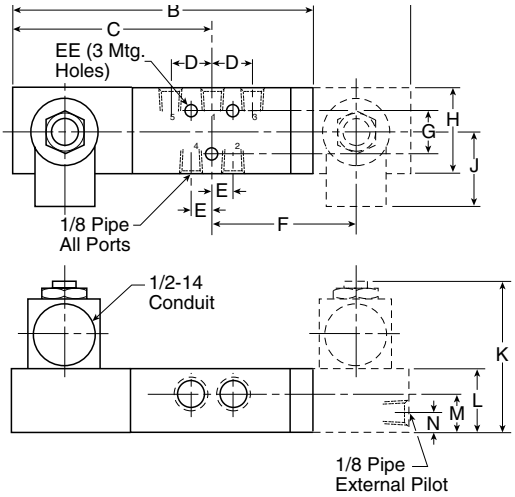
Operation
Momentary signal applied to diaphragm #12 last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Momentary signal applied to diaphragm #14 last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3. (See Technical Data page for signal pressure range.)

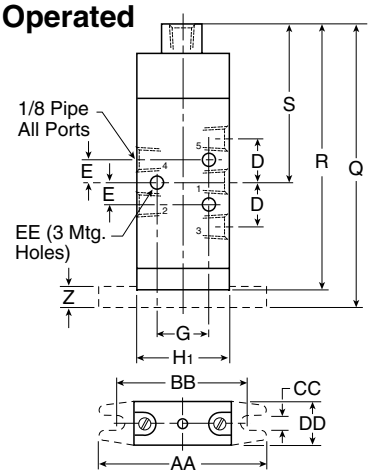


Model Selection Information

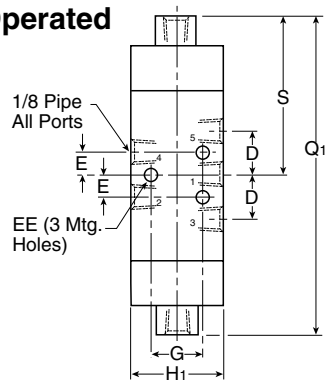
Function	Model Number
Double Diaphragm	**41066 1000**



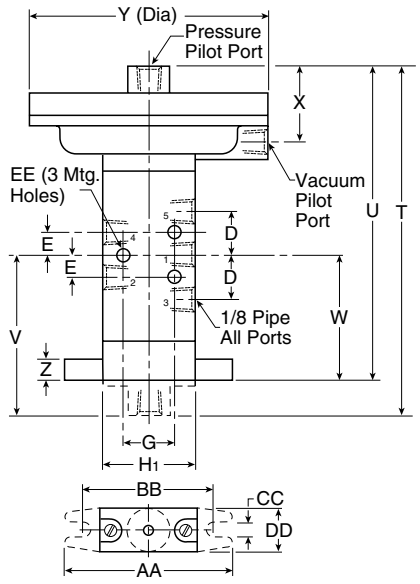
Single Remote Pilot Operated



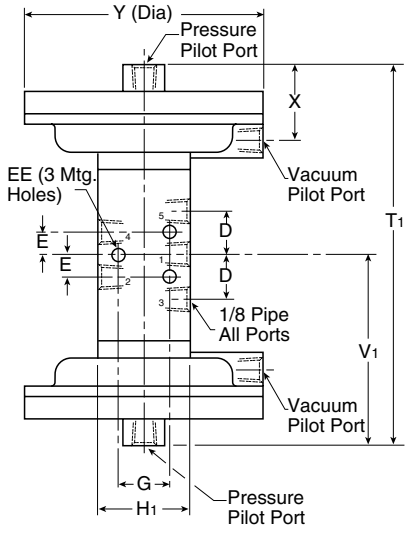
Double Remote Pilot Operated



Single Diaphragm Operated



Double Diaphragm Operated



Dimensions:

	inches	mm
A	5.75	146
B	4.42	112
C	2.88	73
D	0.63	16
E	0.31	8
F	2.25	57
G	0.75	19
H	1.25	32
H_1	1.31	33
J	1.25	32
K	2.44	62
L	0.91	23
M	0.59	15
N	0.34	9
Q	4.09	104
Q_1	4.62	177
R	3.86	98
S	2.31	59
T	5.17	131
T_1	5.72	145
U	4.64	118
V	2.31	59
V_1	2.86	73
W	1.78	45
X	1.14	29
Y	3.50	89
Z	0.25	6
AA	2.38	60
BB	1.88	48
CC	0.20	5
DD	0.62	16
EE	0.19	5

			imum (bar)
Solenoid	Solenoid	25 (1.7)*	150 (10.2)
Solenoid	Spring	45 (3.1)*	150 (10.2)
Solenoid	Pilot	25 (1.7)*	150 (10.2)
Pilot	Spring	28" Hg Vacuum	150 (10.2)
Pilot	Pilot	28" Hg Vacuum	150 (10.2)

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (45 PSIG min.) following the conversion procedure on the next page.

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

Pilot Signal Pressure

Function		Minimum PSIG (bar)	Maximum PSIG (bar)
Operator	Return		
Solenoid	Pilot/Solenoid	25 (1.7)	150 (10.2)
Solenoid	Spring	45 (3.1)	150 (10.2)
Pilot	Spring	45 (3.1)	150 (10.2)
Pilot	Pilot	25 (1.7)	150 (10.2)
Diaphragm	Spring	5 (0.34)	150 (10.3)
Diaphragm	Pilot	25 (1.7)	150 (10.2)
Diaphragm	Diaphragm	2 (0.13)	150 (10.2)

Temperature Range (Ambient)

32°F to 175°F (0°C to 80°C)

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

Materials

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

Lubrication

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

Suggested Lubricant

F442 Oil

Flow Rating (Cv)

Flow Path	Direct Pipe Spool, 1/8" Ports	Direct Pipe Poppet, 1/8" Ports
1 → 2	0.199	.125
1 → 4	0.191	—
2 → 3	0.192	.215
4 → 5	0.212	—
Avg.	0.199	N/A

Average Fill Time (Seconds)*

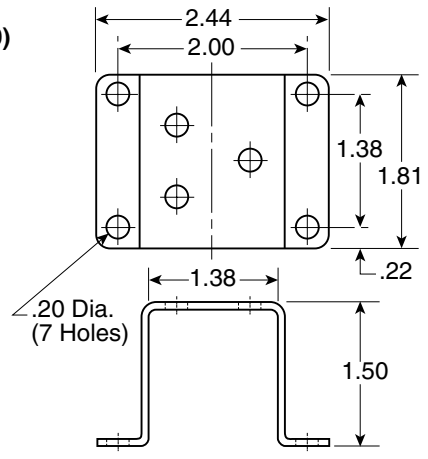
	1 cu. in. Test Chamber		12 cu. in. Test Chamber	
	Fill	Exhaust	Fill	Exhaust
Direct Pipe Ported	0.024	0.037	0.201	0.361

* With 90 PSIG supply, time required to fill from 0 to 81 PSIG and exhaust from 90 to 9 PSIG is measured from instant of energizing, or de-energizing at 120V/60Hz. Times shown are average.

Electrical Data (Conduit Solenoid)

Voltage & Frequency	Power Consumption (Watts)	Inrush (Amps)	Holding (Amps)
120V/60Hz	6.3	0.13	0.09
24VDC	6.0	—	0.33
240V / 60Hz	6.0	.06	.04
12VDC	6.0	—	.52
12V / 60Hz	5.5	.59	.42

Mounting Bracket Dimensions
(Part No. 41066 9000)



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

n

1. Remove two Phillips-head M-4 screws holding spring return housing to body and single 6-32 Phillips-head screw and o-ring from end of valve.
2. Remove two M-4 Phillips-head screws holding operator end to body and o-ring from counterbore in end of body.
3. Remove spool from body, reverse end-for-end, and replace into body.
4. Assemble the 6-32 screw and o-ring in opposite end of body from which it was removed.
5. Reassemble spring return housing and operator (with o-ring) to body at opposite ends from which they were removed. Valve is now Normally Open.

Internal to External Pilot

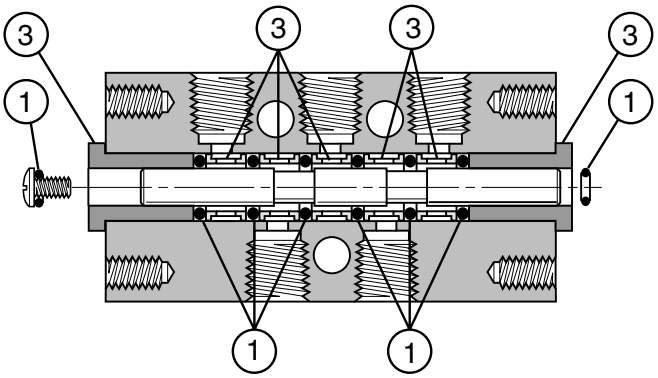
To operate solenoid valves below their minimum operating pressure, on vacuum, or for dual pressure applications, the valve must be converted to external pilot as follows:

1. Remove 1/8" pipe plug from solenoid end(s) of the valve as well as the Buna N disc beneath the plug.
2. Remove two M-4 Phillips-head cap screws holding solenoid actuating end to body.
3. Remove o-ring, now exposed, from counterbore in end of body and replace with Buna N disc.
4. Reassemble solenoid actuating end to body.
5. Attach an external pilot line (45 PSIG min.) where the 1/8" plug was removed from solenoid end(s).

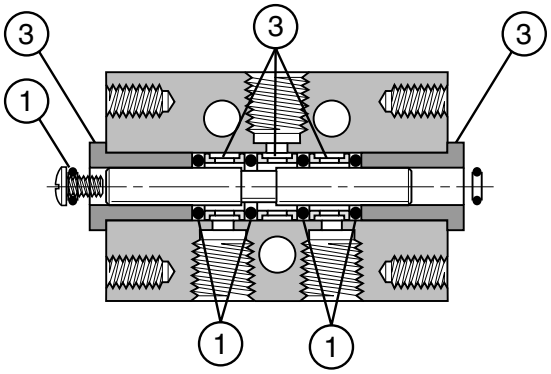
Solenoid Replacement Parts (Conduit Style)

Voltage & Frequency	Class B Coil 18" Leads	Operator Kit*
12V / 60Hz	K593158	**41000 8115**
24VDC	K593155	**41000 8123**
240 / 60Hz	—	**410008113**
240V / 60HZ	—	**410008116**
12VDC	K593154	**410008112**

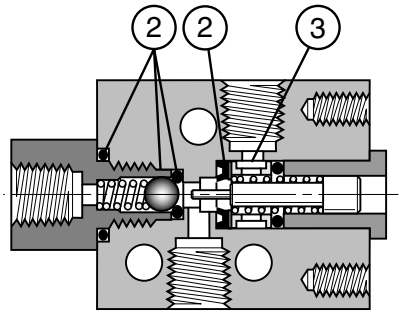
* Operator kit consists of plunger, o-ring, spring, plunger guide, housing, and coil.



4-Way Spool



3-Way Spool



3-Way Poppet

Service Kits

① Spool Valve Seal Kit (3 & 4-Way, Direct Pipe Ported) **41000 8000**

② Poppet Valve Seal Kit **40411 8000**

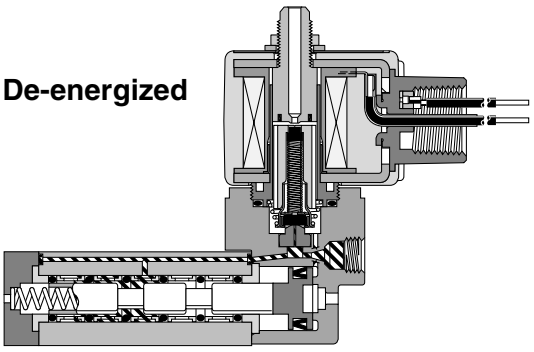
Spool Valve Seal Kit (3 & 4-Way, Base Mounted) **49400 8020**

Diaphragm Seal Kit **41066 8000**

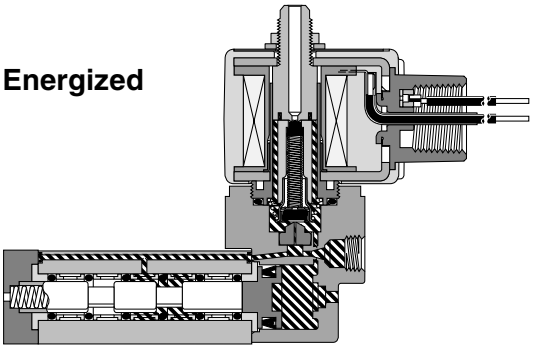
③ Body Service Kit **41000 8005**

- Inline: Cv = 0.83
  Subbase: Cv = 0.65
- 1/4 Inch Ports
- Three (3) Center Conditions Available on 3-Position Valves
- Single & Double Solenoid and Single & Double Remote Pilot Operated
- Stainless Steel Spool Withstands Wear and Corrosion
- Precision Aluminum Extruded Body
- Compact for Neat Appearance

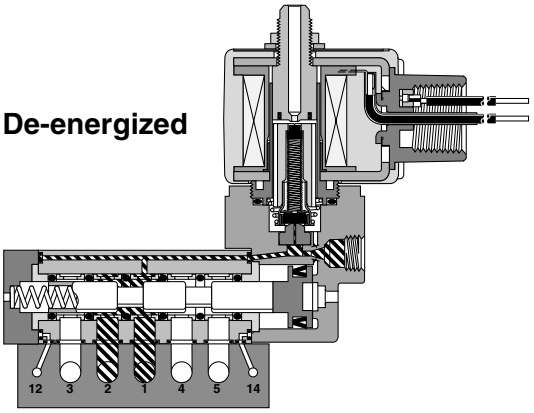
De-energized



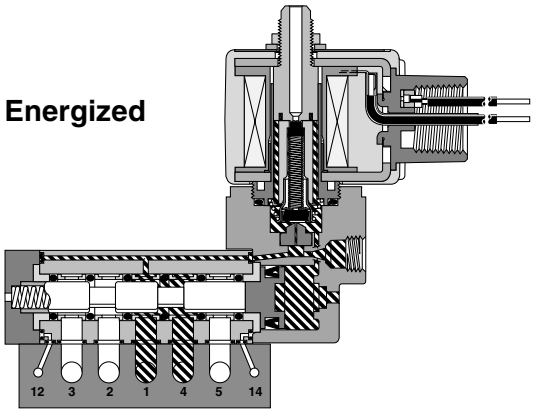
Energized



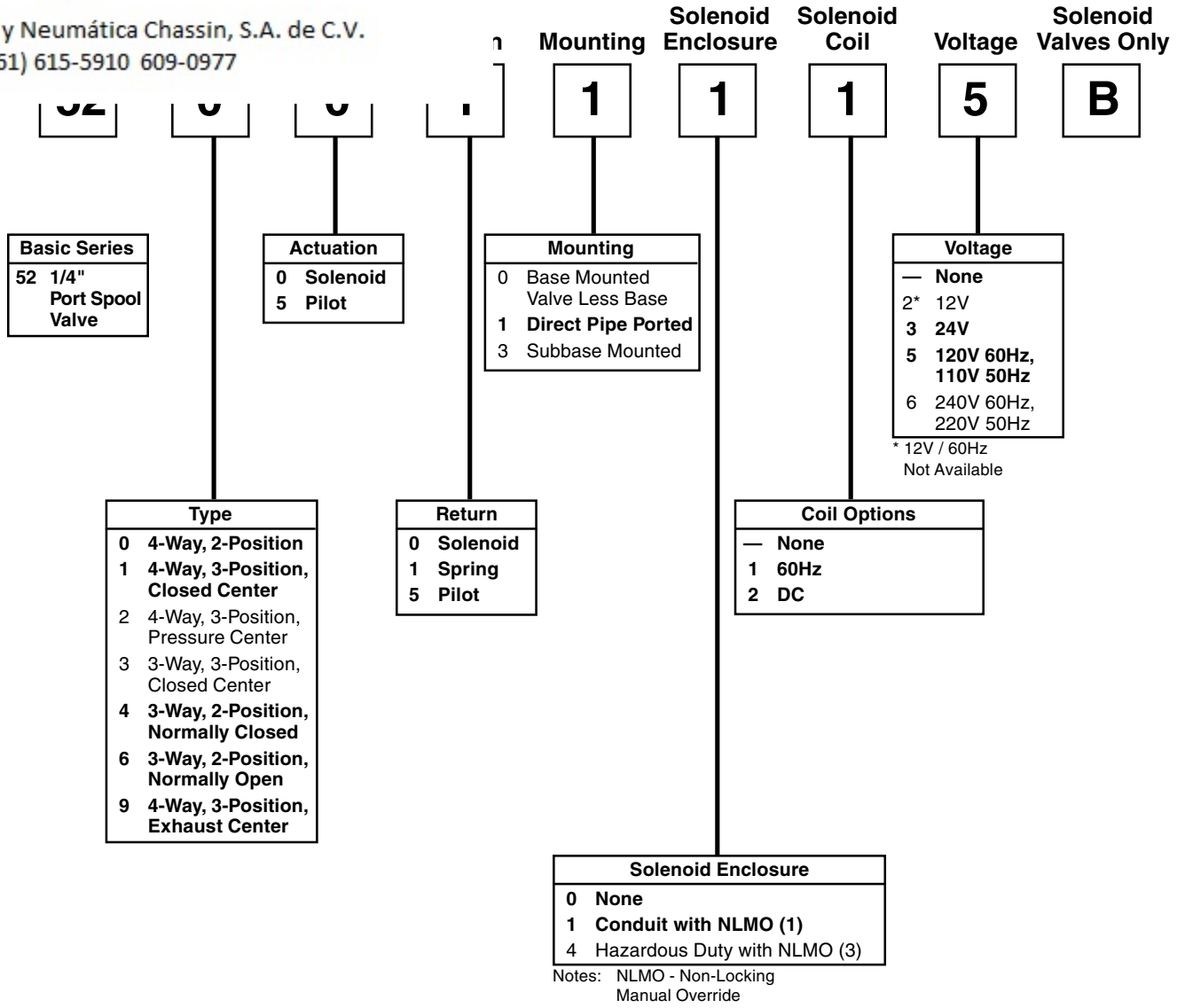
De-energized



Energized



Pressure **Exhaust**



Note: Standard Items in Bold.

(1) Meets NEMA 4.
(2) All units with Class "H" Coils contain fluorocarbon seals.
(3) Not available as a Class "H" Coil.

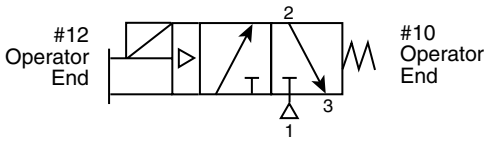
Single Solenoid

Application
These valves are used to operate single-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed the valve returns to its normal position. Valves may be externally piloted or converted to normally open. (See Technical Data page for conversion to external pilot.)

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
De-energized Position – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

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



Model Selection Information
(Listed for 120V/60Hz)*

Function	Model Number
Single Solenoid, Conduit Housing, Spring Return	**52401 1115B**

* See Valve Model Number System for other voltages.

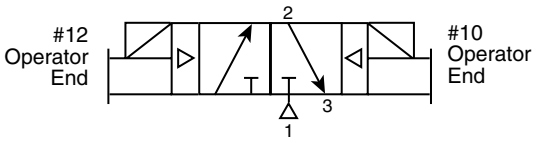
Double Solenoid

Application
These valves are used to operate single-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a "momentary" signal is applied to the other solenoid. (See Technical Data page for conversion to external pilot.)

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Solenoid Operator #10 energized last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Solenoid Operator #12 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information
(Listed for 120V/60Hz)*

Function	Model Number
Double Solenoid, Conduit Housing	**52400 1115B**

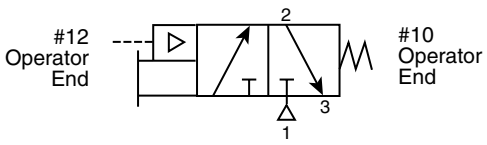
Single Remote Pilot

Application
These valves are used to operate single-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" pressure signal at #12 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.



Model Selection Information

Function	Model Number
Single Remote Pilot, Spring Return	**52451 1000**

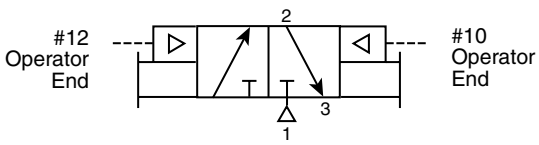
Double Remote Pilot

Application
These valves are used to operate single-acting cylinders. A "momentary" pressure signal applied to one pilot section shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the pilot end section.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

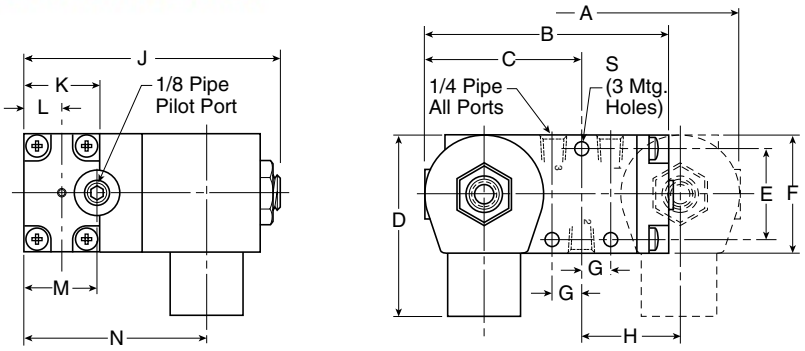
Operation
Momentary air signal applied to #10 Pilot Port last – Pressure at Inlet Port 1 is blocked. Outlet Port 2 is connected to Exhaust Port 3.

Momentary air signal applied to #12 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Exhaust Port 3 is blocked.

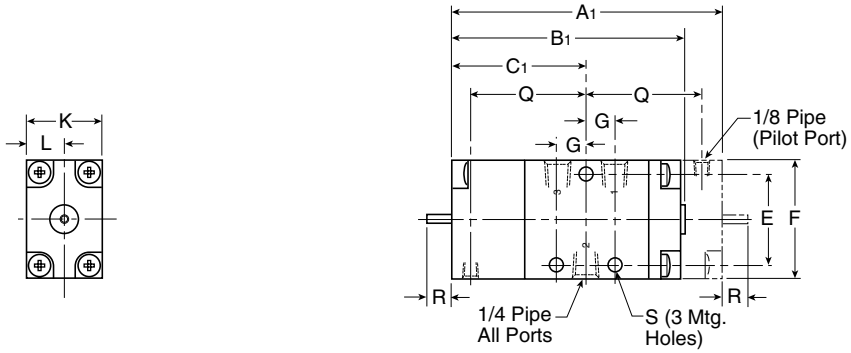


Model Selection Information

Function	Model Number
Double Remote Pilot	**52455 1000**



Single & Double Remote Pilot Operated



Dimensions:

	inches	mm
A	4.25	108
A_3	3.62	92
B	3.47	88
B_3	3.15	80
C	2.13	54
C_3	1.81	46
D	2.78	71
E	1.25	32
F	1.63	42
G	0.41	10
H	1.52	39
J	3.86	98
K	1.06	27
L	0.53	14
M	1.03	26
N	2.57	65
Q	1.55	28
R	0.32	8
S	0.19	5

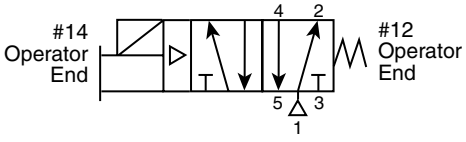
Single Solenoid

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
De-energized Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

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



Model Selection Information
(Listed for 120V/60Hz)*

Function	Model Number
Single Solenoid, Conduit Housing, Spring Return	**52001 1115B**

* See Valve Model Number System for other voltages.

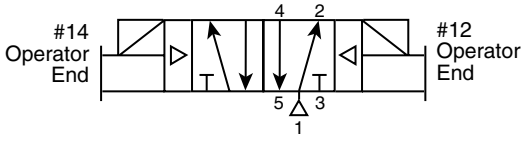
Double Solenoid

Application
These valves are used to operate double-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a "momentary" signal is applied to the other solenoid. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Solenoid Operator #12 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Solenoid Operator #14 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information
(Listed for 120V/60Hz)*

Function	Model Number
Double Solenoid, Conduit Housing	**52000 1115B**

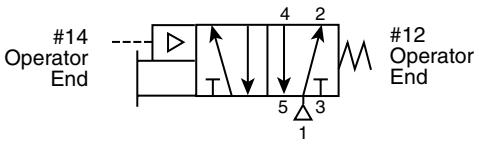
Single Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

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

Operated Position – With a "maintained" pressure signal at #14 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information

Function	Model Number
Single Remote Pilot, Spring Return	**52051 1000**

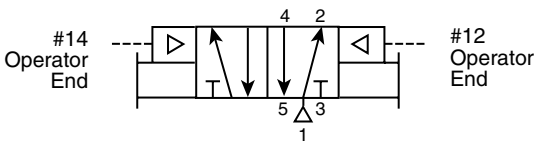
Double Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "momentary" pressure signal applied to one pilot section shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other pilot section.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

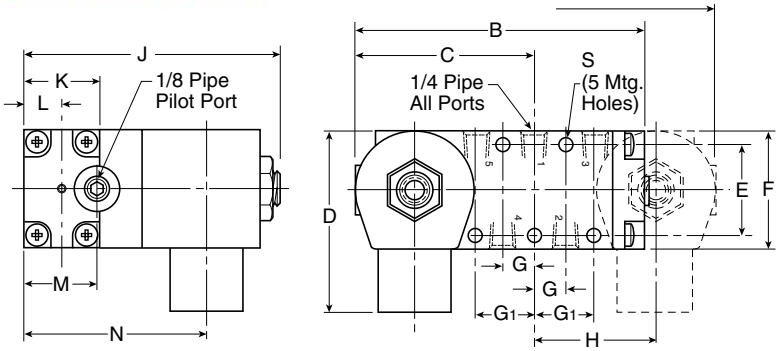
Operation
Momentary air signal applied to #12 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Momentary air signal applied to #14 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

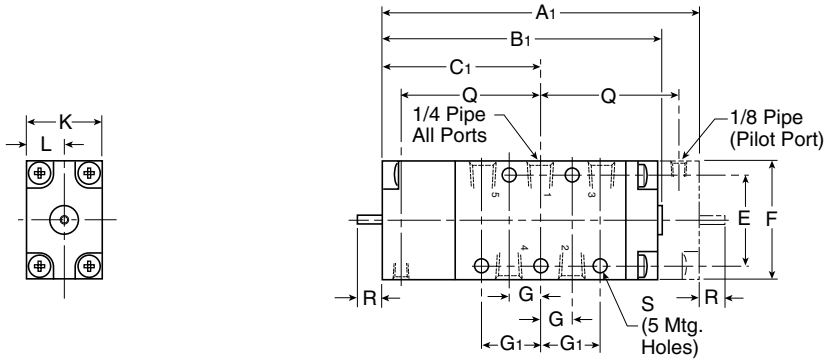


Model Selection Information

Function	Model Number
Double Remote Pilot	**52055 1000**



Single & Double Remote Pilot Operated



Dimensions:

	inches	mm
A	5.13	130
A_1	4.50	114
B	4.34	110
B_3	4.03	102
C	2.56	65
C_3	2.25	57
D	2.78	71
E	1.25	32
F	1.63	42
G	0.44	11
G_1	0.84	21
H	1.74	44
J	3.66	93
K	1.06	27
L	0.53	14
M	1.03	26
N	2.57	65
Q	1.96	50
R	0.32	8
S	0.19	5

Double Solenoid, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal applied alternately to the solenoids shifts the valve. When the signal is removed, springs return the valve to its center position. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Solenoid Operator #12 energized – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

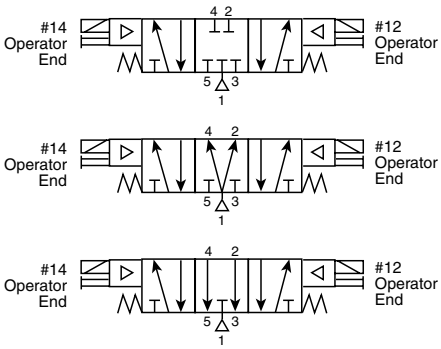
Solenoid Operator #14 energized – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Centered Position –

Type 1: All ports blocked.

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

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



Model Selection Information
(Listed for 120V/60Hz)*

Solenoid Enclosure	Center Position		
	Type 1 Closed Center	Type 2 Pressure Center	Type 9 Exhaust Center
Conduit	**52100 1115B**	**52200 1115B**	**52900 1115B**

* See Valve Model Number System for other voltages.

Double Remote Pilot, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal applied alternately to the Pilot Ports shifts the valve. When the signal is removed, springs return the valve to its center position.

Mounting
These valves may be oriented in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Pressure signal at #12 Pilot Port – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

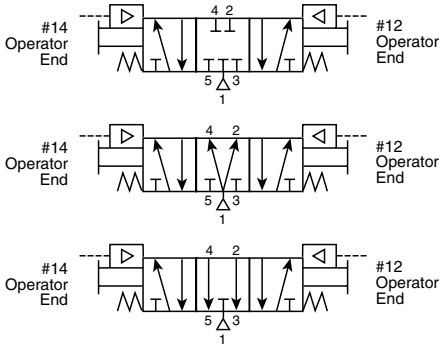
Pressure signal at #14 Pilot Port – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Centered Position –

Type 1: All ports blocked.

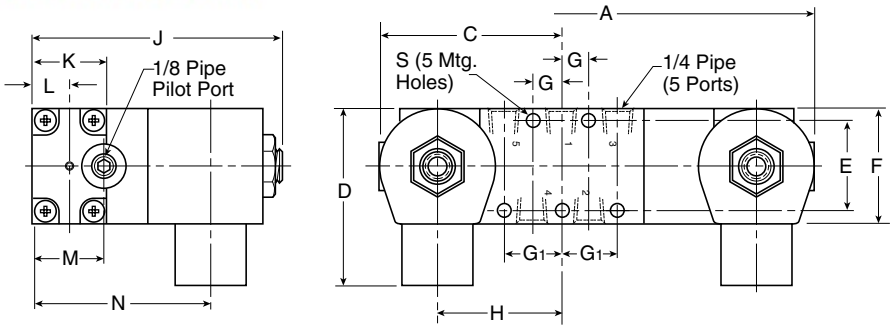
Type 2: Pressure at Inlet Port 1 is connected to Outlet Ports 2 & 4.

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

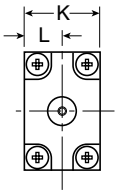


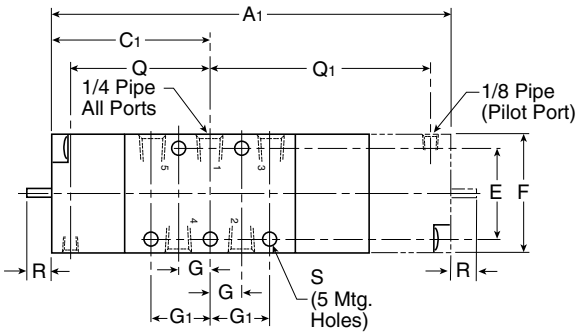
Model Selection Information

Function	Center Position		
	Type 1 Closed Center	Type 2 Pressure Center	Type 9 Exhaust Center
Double Remote Pilot	**52155 1000**	**52255 1000**	**52955 1000**



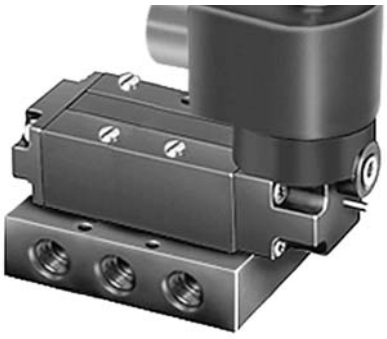
Double Remote Pilot
3-Position





Dimensions:

	inches	mm
A	6.13	156
A_3	5.50	140
C	2.56	65
C_3	2.25	57
D	2.78	71
E	1.25	32
F	1.63	42
G	0.44	11
G_1	0.84	21
H	1.74	44
J	3.86	98
K	1.06	27
L	0.53	14
M	1.03	26
N	2.57	65
Q	1.96	50
Q_1	2.96	75
R	0.32	8
S	0.19	5



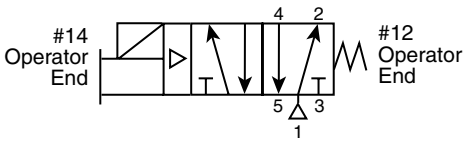
Single Solenoid

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves may be oriented in any position and are designed for subbase mounting.

Operation
De-energized Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

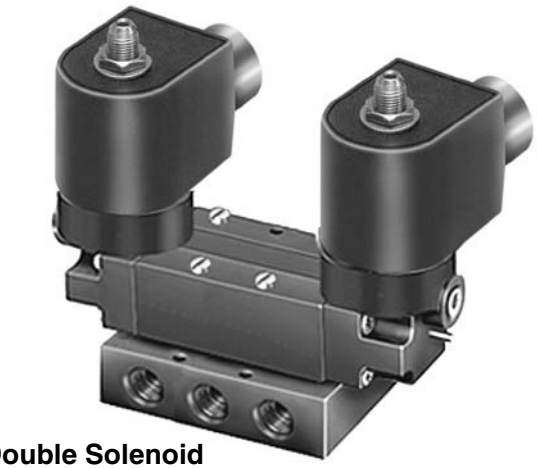
Energized Position – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information
(Listed for 120V/60Hz)*

Function	Subbase Model Number
Single Solenoid, Conduit Housing, Spring Return	**52001 3115B**

* See Valve Model Number System for other voltages.



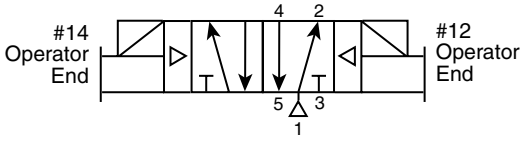
Double Solenoid

Application
These valves are used to operate double-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a momentary signal is applied to the other solenoid. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves are designed for subbase mounting with the axis of the valve spool in the horizontal plane.

Operation
Solenoid Operator #12 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Solenoid Operator #14 energized last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information
(Listed for 120V/60Hz)*

Function	Subbase Model Number
Double Solenoid, Conduit Housing	**52000 3115B**

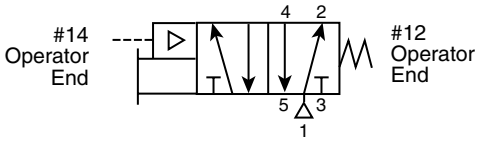
Single Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be oriented in any position and are designed for subbase or manifold mounting.

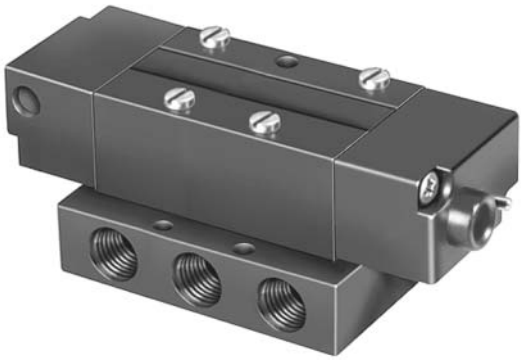
Operation
Normal Position – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Operated Position – With a "maintained" pressure signal at #14 Pilot Port. Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.



Model Selection Information

Function	Subbase Model Number
Single Remote Pilot, Spring Return	**52051 3000**



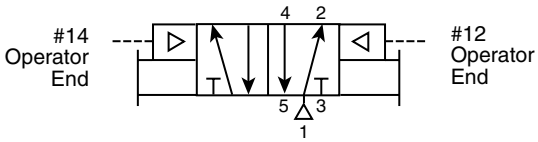
Double Remote Pilot

Application
These valves are used to operate double-acting cylinders. A "momentary" pressure signal applied to one Pilot Port shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other Pilot Port.

Mounting
These valves are designed for subbase or manifold mounting with the axis of the valve spool in the horizontal plane.

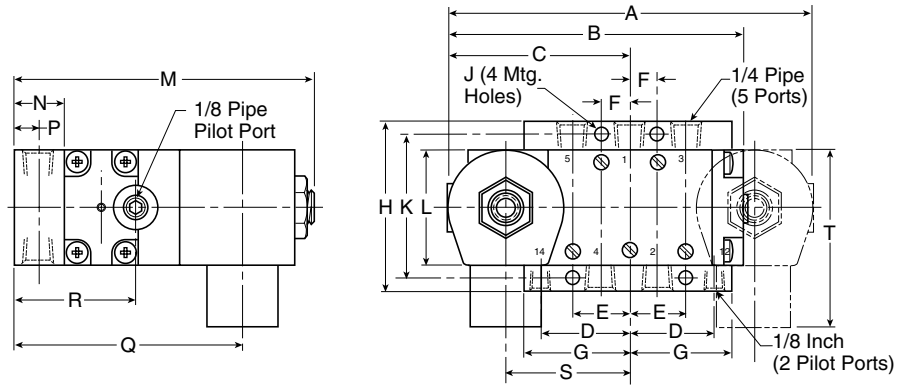
Operation
Momentary air signal applied to #12 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

Momentary air signal applied to #14 Pilot Port last – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

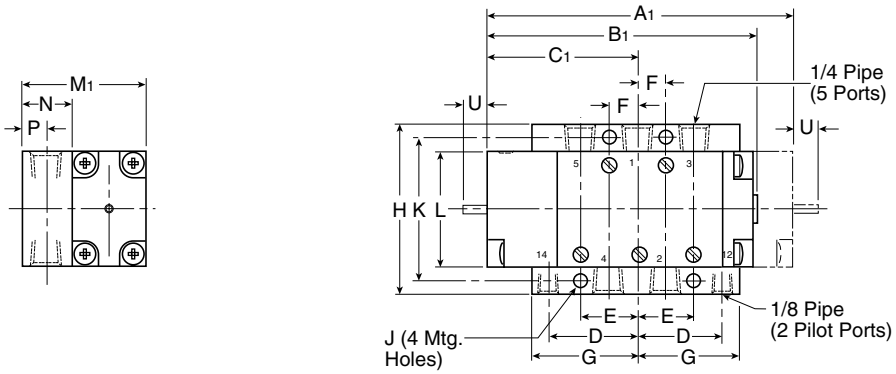


Model Selection Information

Function	Subbase Model Number
Double Remote Pilot	**52055 3000**



Single & Double Remote Pilot Operated



Dimensions:

	inches	mm
A	5.13	130
A_1	4.50	114
B	4.34	110
B_1	4.03	102
C	2.56	65
C_1	2.25	57
D	1.25	32
E	0.84	21
F	0.44	11
G	1.50	38
H	2.38	60
J	0.19	5
K	2.00	51
L	1.63	42
M	4.61	117
M_1	1.81	46
N	0.75	19
P	0.38	10
Q	3.32	84
R	1.78	45
S	1.74	44
T	2.78	71
U	0.32	8

Double Solenoid, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal applied alternately to the solenoids shifts the valve. When the signal is removed, springs return the valve to its center position. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

Mounting
These valves may be oriented in any position and are designed for subbase mounting.

Operation
Solenoid Operator #12 energized – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

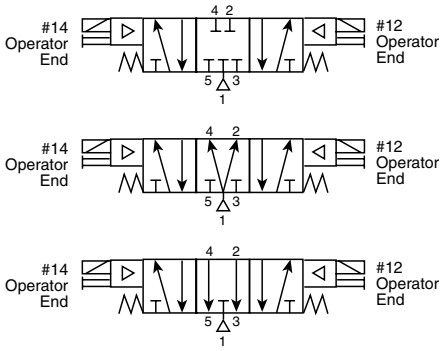
Solenoid Operator #14 energized – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Centered Position –

Type 1: All ports blocked.

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

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



Model Selection Information
(Listed for 120V/60Hz)*

Solenoid Enclosure & Base Style	Center Position		
	Type 1 Closed Center	Type 2 Pressure Center	Type 9 Exhaust Center
Conduit Subbase	**52100 3115B**	**52200 3115B**	**52900 3115B**

* See Valve Model Number System for other voltages.

Double Remote Pilot, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal applied alternately to the Pilot Ports shifts the valve. When the signal is removed, springs return the valve to its center position.

Mounting
These valves may be oriented in any position and are designed for subbase mounting.

Operation
Pressure signal at #12 Pilot Port – Pressure at Inlet Port 1 is connected to Outlet Port 2. Outlet Port 4 is connected to Exhaust Port 5.

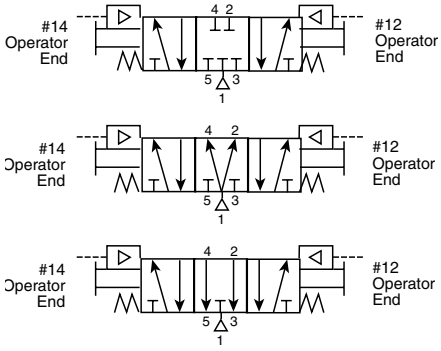
Pressure signal at #14 Pilot Port – Pressure at Inlet Port 1 is connected to Outlet Port 4. Outlet Port 2 is connected to Exhaust Port 3.

Centered Position –

Type 1: All ports blocked.

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

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



Model Selection Information

Base Style	Center Position		
	Type 1 Closed Center	Type 2 Pressure Center	Type 9 Exhaust Center
Subbase	**52155 3000**	**52255 3000**	**52955 3000**

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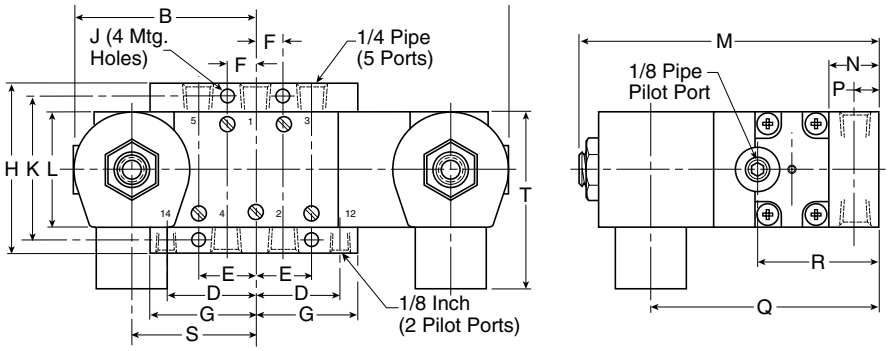
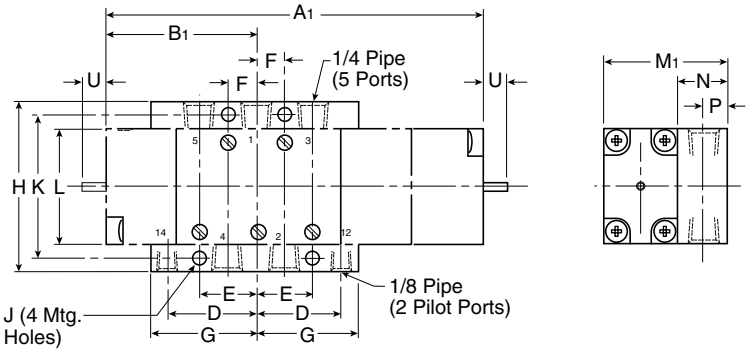


Double Remote Pilot 3-Position



Dimensions:

	inches	mm
A	6.13	156
A_1	5.50	140
B	2.56	65
B_1	2.25	57
D	1.25	32
E	0.84	21
F	0.44	11
G	1.50	38
H	2.38	60
J	0.19	5
K	2.00	51
L	1.63	42
M	4.61	117
M_1	1.81	46
N	0.75	19
P	0.38	10
Q	3.32	84
R	1.78	45
S	1.74	44
T	2.78	71
U	0.32	8

			imum (bar)
Solenoid	Solenoid	20 (1.4)	150 (10.3)
Solenoid	Spring	35 (2.4)*	150 (10.3)
Pilot	Spring	35 (2.4)	150 (10.3)
Pilot	Pilot	20 (1.4)	150 (10.3)

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted (35 PSIG min.) following the conversion procedure on the next page.

Temperature Range (Ambient)
32°F to 175°F (0°C to 80°C)

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

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

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

Suggested Lubricant
F442 Oil

Flow Rating (Cv)

Flow Path	Direct Pipe Ported 1/4" Ports	Subbase Mounted 1/4" Side Ports
1 → 2	0.821	0.665
1 → 4	0.840	0.672
2 → 3	0.835	0.642
4 → 5	0.830	0.657
Avg.	0.832	0.659

Direct Pipe Ported
Average Fill Time (Seconds)*

0 cu. in. Test Chamber		25 cu. in. Test Chamber	
Fill	**Exhaust**	**Fill**	**Exhaust**
0.057	0.105	0.364	0.730

Base Mounted
Average Fill Time (Seconds)*

0 cu. in. Test Chamber		25 cu. in. Test Chamber	
Fill	**Exhaust**	**Fill**	**Exhaust**
0.064	0.120	0.429	0.842

* With 90 PSIG supply, time required to fill from 0 to 81 PSIG, and exhaust from 90 to 9 PSIG is measured from the instant of energizing or de-energizing at 120V/60Hz. Times shown are average.

Electrical Data (Conduit Solenoid)
Voltage Range +10 / -15% of Nominal

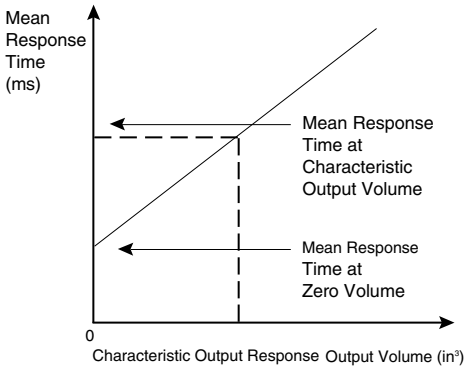
Voltage & Frequency	Power Consumption (Watts)	Inrush (Amps)	Holding (Amps)
24V/60Hz 22V/50Hz	10.3	1.66	1.03
120V/60Hz 110V/50Hz	9.3	0.25	0.15
240V/60Hz 220V/50Hz	8.8	0.11	0.06
12VDC	8.7	—	0.71
24VDC	8.1	—	0.34

Hazardous Duty / Listing
Valves designed for hazardous locations are UL Approved as follows:

National Electric Code**	Ambient Conditions
Class I Div. 1 Group C	Ethyl, Ether, etc., Gases & Vapors
Class I Div. 1 Group D	Gasoline, etc., Gases & Vapors
Class II Div. 1 Group E	Metal Dust
Class II Div. 1 Group F	Coal, Coke, Carbon Black Dust
Class II Div. 1 Group G	Flour, Starch, Grain Dust

**See article 500 – Hazardous (Classified) Locations, National Electric Code.

Mean Response Time vs. Volume



Terms and Definitions*
For the purpose of this standard, the following definitions apply. For definitions of other terms, see ANSI/B93.2.

3.1 Response Time: The time interval in which the pressure in a test chamber connected to an Outlet Port of a pneumatic directional control valve changes by 90% between specified pressure levels in response to a change in the control signal to that valve.

3.2 Test Chamber: A vessel of measured volume capable of statically containing an imposed pressure.

3.3 Output Volume: The sum of the downstream volume under test, composed of the test chamber, its connecting conductors, fittings and the pressure transducer."

* Response time data obtained and presented in accordance with ANSI/(NFPA) T3.21.8, "Pneumatic fluid power – Measurement of response time – Directional control valves."

1. Remove four screws holding the spring return housing to body.
2. Remove two screws holding operator end to body.
3. Remove spool from body, reverse end-for-end, and replace into body.
4. Reassemble spring return housing and operator to body at opposite ends from which they were removed. Valve is now Normally Open.

Internal to External Pilot

To operate solenoid valves below their minimum operating pressure, on vacuum, or for dual pressure applications, the valve must be converted to external pilot as follows:

1. Remove 1/8" pipe plug from solenoid end(s) and remove rubber plug from cavity.
2. Remove two screws holding solenoid actuating end to body.
3. Discard the o-ring and insert rubber plug in its place.
4. Reassemble solenoid actuating end to body.
5. An external pilot line (35 PSIG min.) should be attached where the 1/8" plug was removed from solenoid end(s).

Note for Solenoid / Plunger / Stop Assembly Kits:
These assemblies are NOT interchangeable with Design Level A.

Solenoid Replacement Parts (Conduit-style)

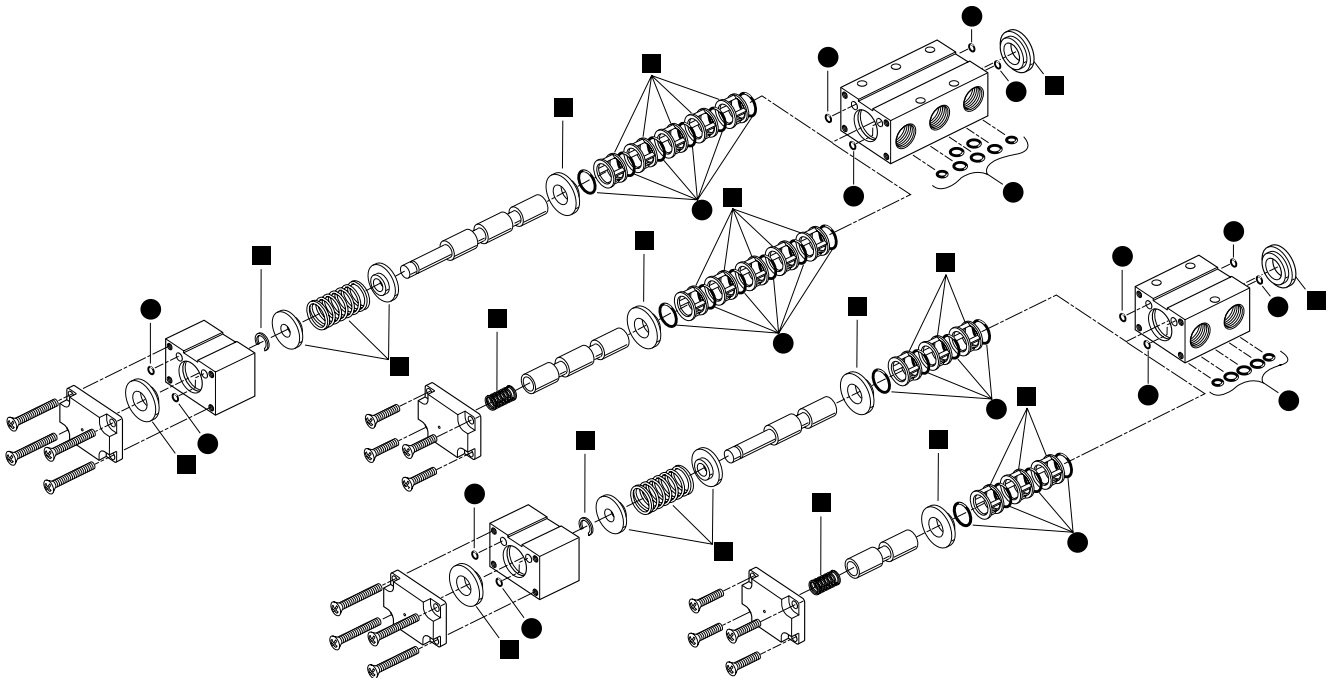
Voltage & Frequency	Class F Kit 18" Leads	Plunger & Stop Assembly Kit
24V/60Hz	**PS3914XXX13P**	**PS3924341XXP**
120V/60Hz	**PS3914XXX15P**	**PS3924341XXP**
240V/60Hz	**PS3914XXX16P**	**PS3924341XXP**
12VDC	**PS3914XXX22P**	**PS3924341XXP**
24VDC	**PS3914XXX23P**	**PS3924341XXP**

Complete Solenoid Replacement Kit (Conduit-style)

Voltage & Frequency	Operator Replacement Kit*
24V/60Hz	**PS393434113P**
120V/60Hz	**PS393434115P**
240V/60Hz	**PS393434116P**
12VDC	**PS393434122P**
24VDC	**PS393434123P**

* Operator replacement kit consists of a plunger assembly, o-ring, spring, stop assembly, and solenoid.

- ● Valve Seal Kit (contains all soft seals found in 3 & 4-Way bodies and all actuator styles) **52000 8050**
  All fluorocarbon **52000 8500**
- ■ Body Service Kit (contains bushing, springs, retainers and shells from 2 & 3-Position, 3 & 4-Way bodies) **52001 8005**



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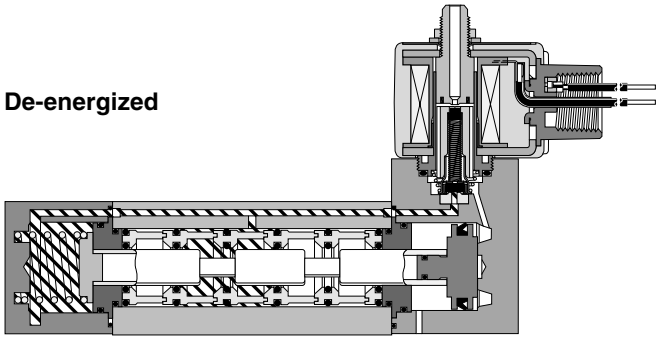
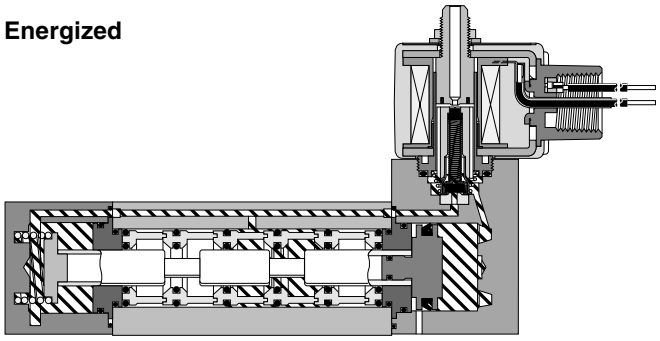
- Cv = 2.3 (129 SCFM at full DP)
- 1/4 & 3/8 Inch Ports
- Direct Pipe Ported for Economy
- Solenoid, Remote Pilot, Lever, Pedal and Treadle Operators
- Air-assisted Spring Return Guarantees Fast, Positive Spool Return
- Three (3) Center Conditions Available on 3-Position Valves
- Hard-coat Anodized Aluminum Spool for Minimum Friction and Wear Resistance
- Hazardous Duty Enclosures Optional

De-energized

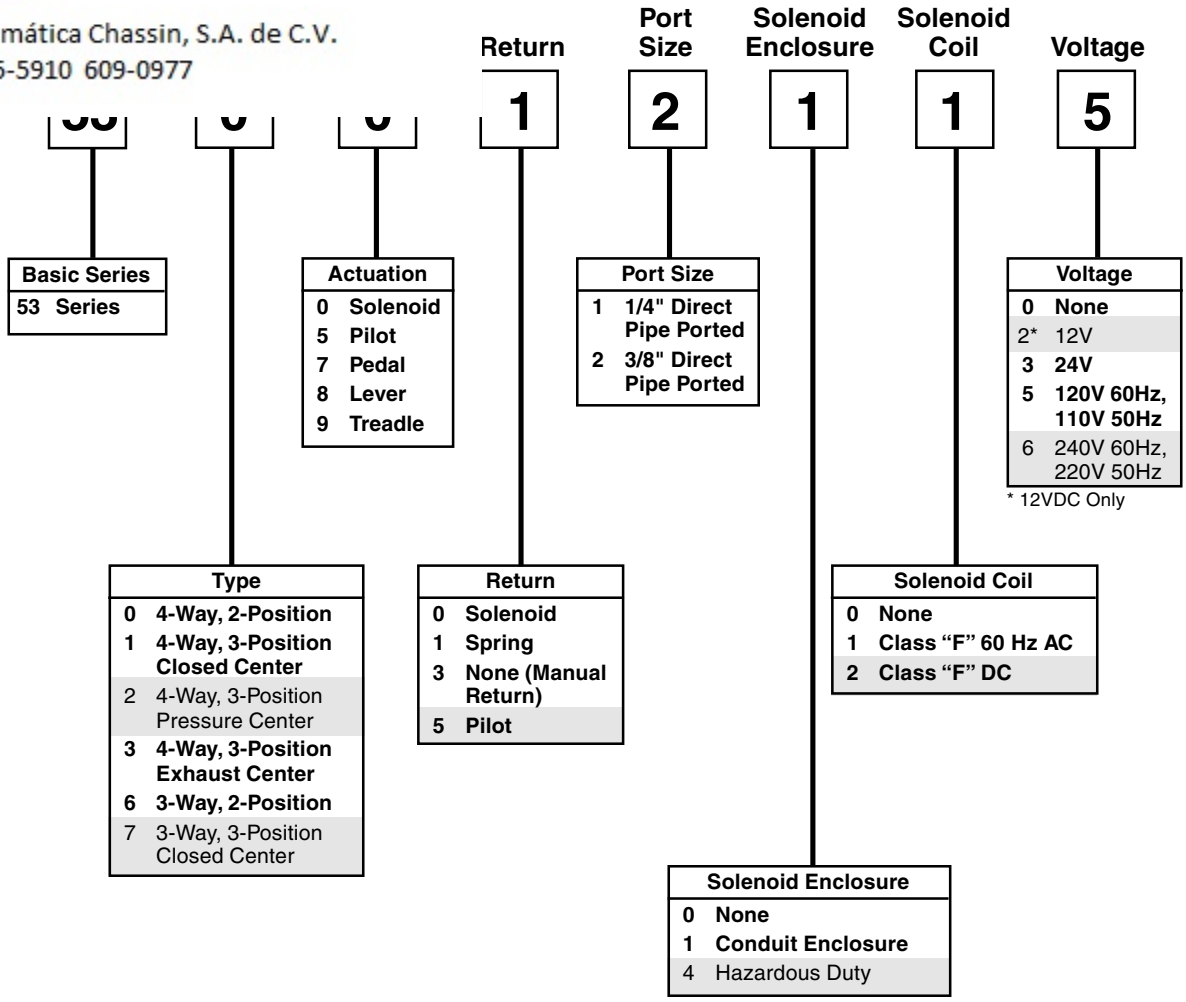


Pressure **Exhaust**

Energized



Pressure **Exhaust**



Note: Shaded options have been discontinued. Refer to back of Catalog for Cross Reference Information.

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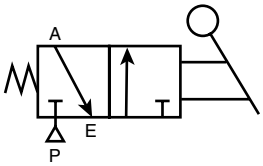
Lever Operated, Spring Return

Application
These valves are used to operate single-acting cylinders. Pushing and holding the lever shifts the valve. When the lever is released, the valve returns to its normal position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Normal Position – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Actuated Position – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Information

Function	Ports	Model Number
Lever Operated, Spring Return	1/4"	53681 1000
	3/8"	53681 2000

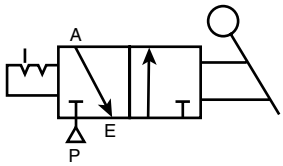
Lever Operated, Detented

Application
These valves are used to operate single-acting cylinders. Pushing the lever shifts the valve. The valve remains in this position until the lever is pulled.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Lever pushed last (toward body) – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Lever pulled last (away from body) – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Information

Function	Ports	Model Number
Lever Operated, Detented	1/4"	53683 1000
	3/8"	53683 2000

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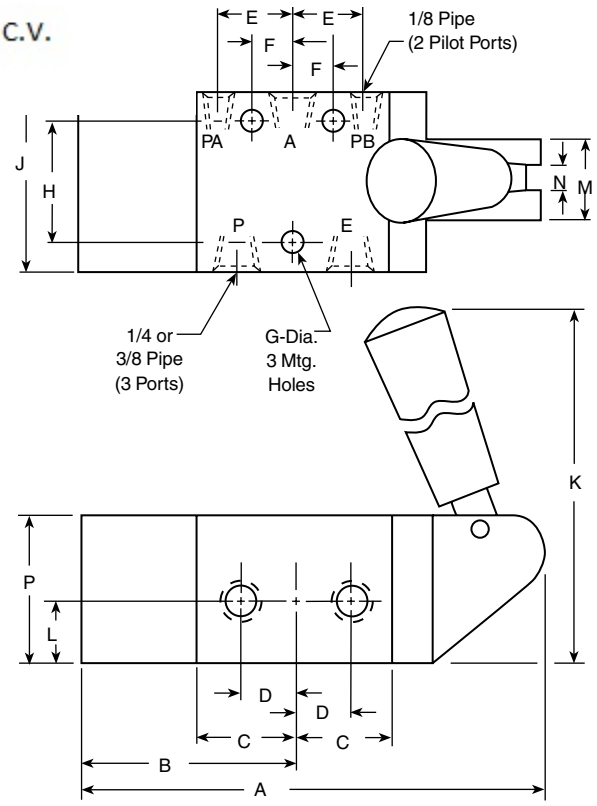
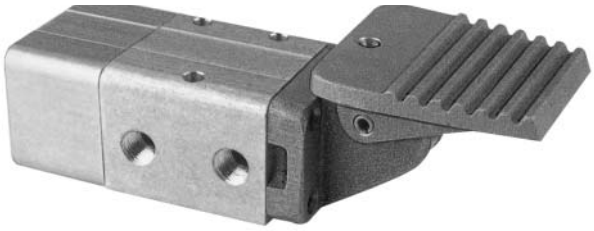


Dimensions:

	inches	mm
A	5.73	146
B	2.63	110
C	1.19	30
D	0.69	18
E	0.88	22
F	0.50	13
G	0.27	7
H	1.63	41
J	2.25	57
K	6.00	152
L	0.78	20
M	1.00	25
N	0.39	10
P	1.84	47



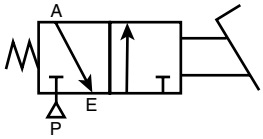
Pedal Operated

Application
These valves are used to operate single-acting cylinders. Pressing and holding the pedal shifts the valve. When the pedal is released, the valve returns to its normal position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Normal Position – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Actuated Position – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.

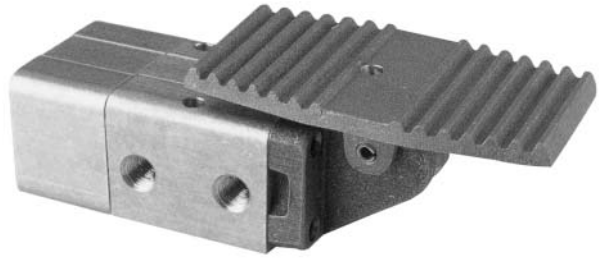


⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Function	Ports	Model Number
Pedal Operated, Spring Return	1/4"	53671 1000
	3/8"	53671 2000



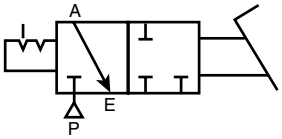
Treadle Operated

Application
These valves are used to operate single-acting cylinders. Depressing the toe of the treadle shifts the valve. Depressing the heel of the treadle returns the valve.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Toe pressed last – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Heel pressed last – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Function	Ports	Model Number
Treadle Operated	1/4"	53693 1000
	3/8"	53693 2000

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Richland, Michigan
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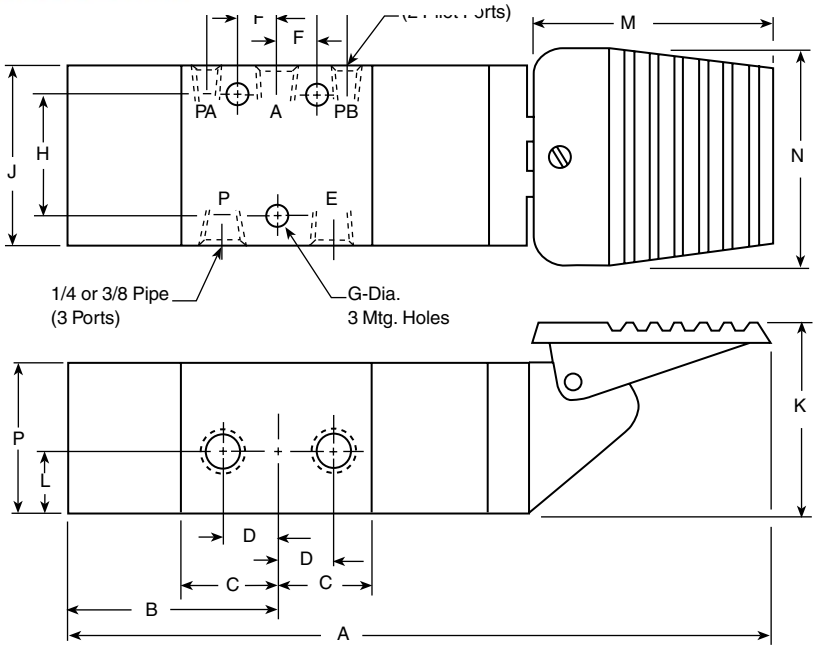
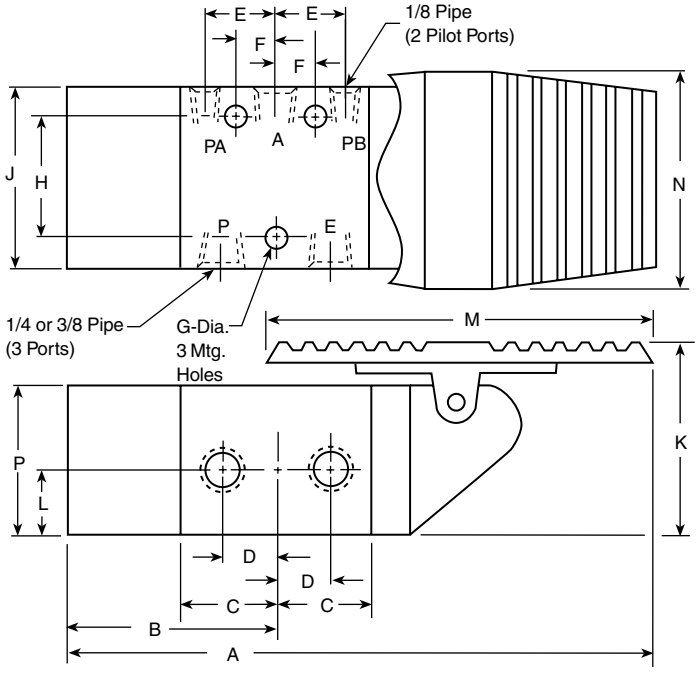


Dimensions:

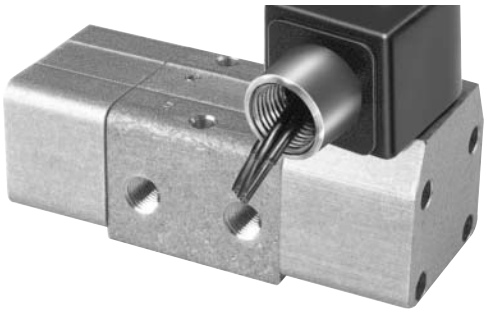
	inches	mm
A	7.42	188
B	2.63	67
C	1.19	30
D	0.69	18
E	0.88	22
F	0.50	13
G	0.27	7
H	1.63	41
J	2.25	57
K	2.47	63
L	0.78	20
M	3.06	78
N	2.75	70
P	1.84	47

Treadle Operated

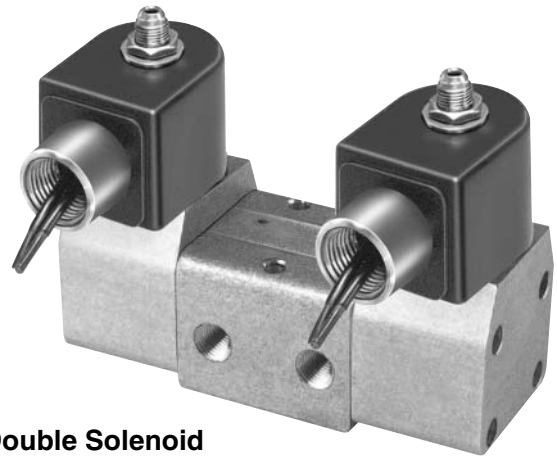


Dimensions:

	inches	mm
A	7.41	188
B	2.63	67
C	1.19	30
D	0.69	18
E	0.88	22
F	0.50	13
G	0.27	7
H	1.63	41
J	2.25	57
K	2.47	63
L	0.78	20
M	4.88	124
N	2.75	70
P	1.84	47



Single Solenoid



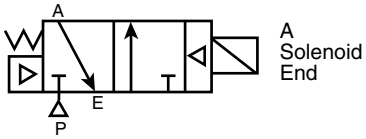
Double Solenoid

Application
These valves are used to operate single-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position. Valves may be externally piloted or converted to normally open. (See Technical Data page.)

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
De-energized Position – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Energized Position – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Info. (Listed for 120V 60Hz)*

Function	Ports	Model Number
Single Solenoid, Spring Return	1/4"	53601 1115
	3/8	53601 2115

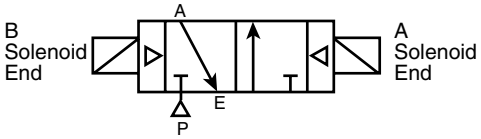
* See Valve Model Number System for other voltages.

Application
These valves are used to operate single-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a "momentary" signal is applied to the other solenoid. (See Technical Data page for conversion to external pilot.)

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Solenoid B energized last – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

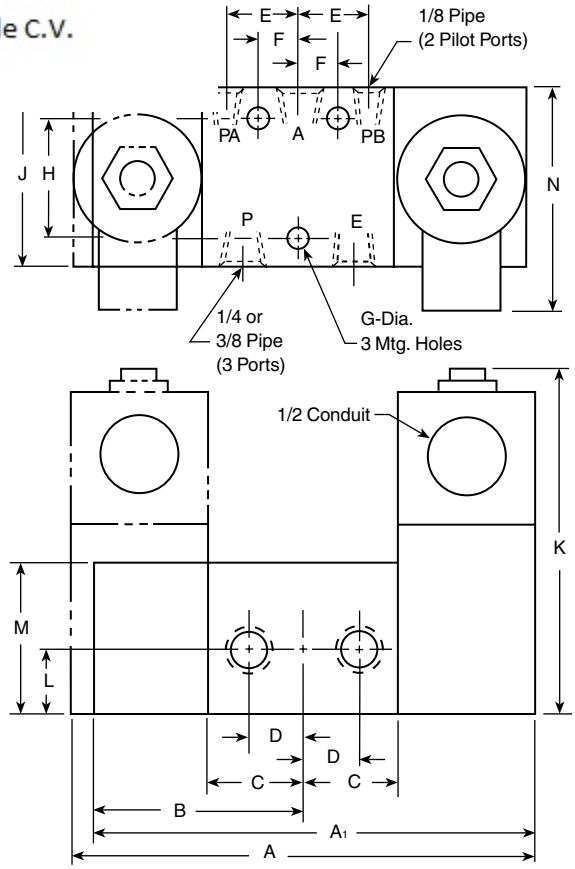
Solenoid A energized last – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Info. (Listed for 120V 60Hz)*

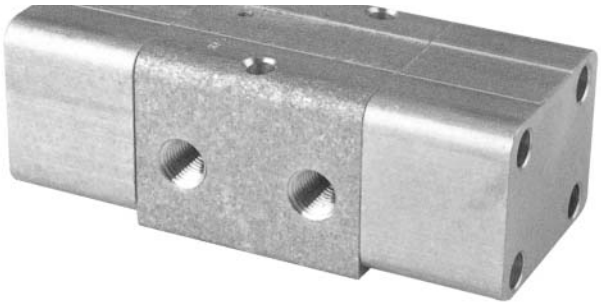
Function	Ports	Model Number
Double Solenoid	1/4"	53600 1115
	3/8	53600 2115

* See Valve Model Number System for other voltages.



Dimensions:

	inches	mm
A	5.75	146
A_1	5.51	140
B	3.63	69
C	1.19	30
D	0.69	18
E	0.88	22
F	0.50	13
G	0.27	7
H	1.63	41
J	2.25	57
K	4.43	113
L	0.78	20
M	1.84	47
N	3.14	80



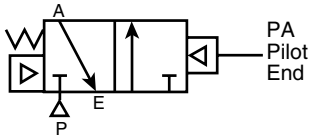
Single Remote Pilot

Application
These valves are used to operate single-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Normal Position – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Operated Position – With a "maintained" pressure signal at the Pilot Port PA. Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Information

Function	Ports	Model Number
Single Remote Pilot, Spring Return	1/4"	53651 1000
	3/8"	53651 2000

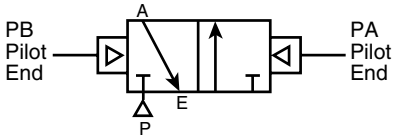
Double Remote Pilot

Application
These valves are used to operate single-acting cylinders. A "momentary" pressure signal applied to one Pilot Port shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other Pilot Port.

Mounting
These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation
Momentary air signal applied to Pilot Port PB last – Pressure at Inlet Port P is blocked. Outlet Port A is connected to Exhaust Port E.

Momentary air signal applied to Pilot Port PA last – Pressure at Inlet Port P is connected to Outlet Port A. Exhaust Port E is blocked.



Model Selection Information

Function	Ports	Model Number
Double Remote Pilot	1/4"	53655 1000
	3/8"	53655 2000

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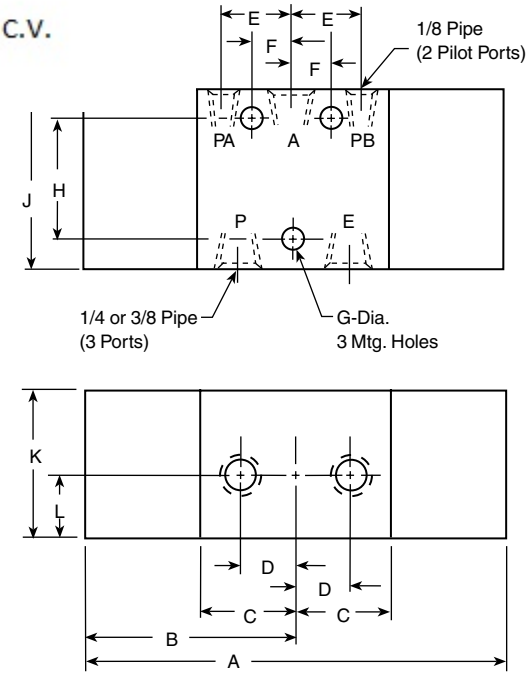


Dimensions:

	inches	mm
A	5.26	137
B	2.63	67
C	1.19	30
D	0.69	18
E	0.88	22
F	0.50	13
G	0.27	7
H	1.63	41
J	2.25	57
K	1.84	47
L	0.78	20

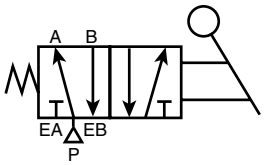
Lever Operated, Spring Return

Application
These valves are used to operate double-acting cylinders. Pushing and holding the lever shifts the valve. When the lever is released, the valve returns to its normal position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Normal Position – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Actuated Position – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Information

Function	Ports	Model Number
Lever Operated, Spring Return	1/4"	53081 1000
	3/8"	53081 2000

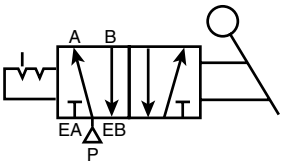
Lever Operated, Detented

Application
These valves are used to operate double-acting cylinders. Pushing the lever shifts the valve. The valve remains in this position until the lever is pulled.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Lever pushed last (toward body) – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Lever pulled last (away from body) – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Information

Function	Ports	Model Number
Lever Operated, Detented	1/4"	53083 1000
	3/8"	53083 2000

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Richland, Michigan
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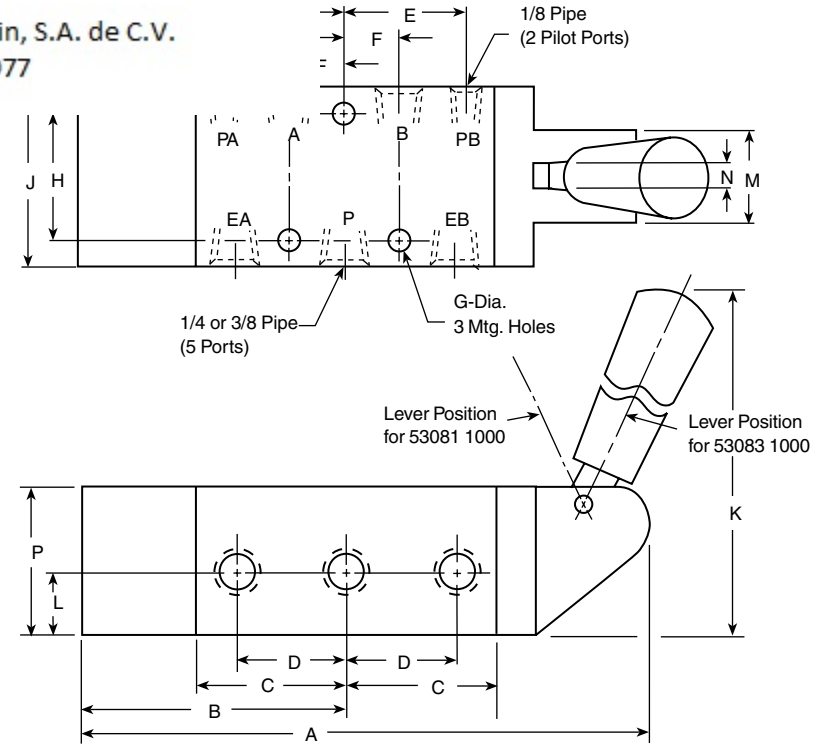
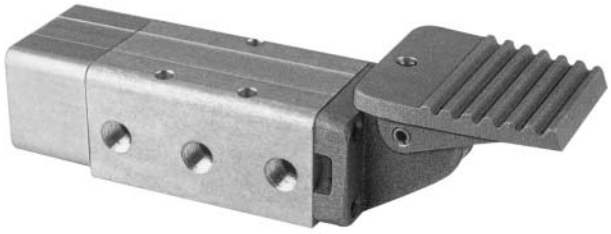


Dimensions:

	inches	mm
A	5.26	180
B	2.63	84
C	1.19	48
D	0.69	35
E	0.88	38
F	0.50	18
G	0.27	7
H	1.63	41
J	2.25	57
K	1.84	152
L	0.78	20
M	1.00	25
N	0.39	10
P	1.84	47



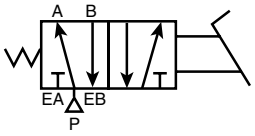
Pedal Operated

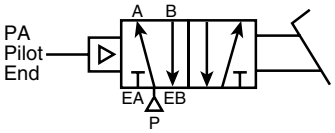
Application
These valves are used to operate double-acting cylinders. Pressing and holding the pedal shifts the valve. When the pedal is released, the valve returns to its normal position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Normal Position – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Actuated Position – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.





⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Function	Ports	Model Number
Pedal Operated, Spring Return	1/4"	53071 1000
	3/8"	53071 2000
Pedal Operated, Remote Pilot Return	1/4"	53075 1000
	3/8"	53075 2000

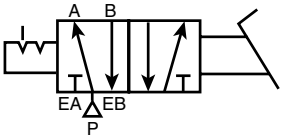
Treadle Operated

Application
These valves are used to operate double-acting cylinders. Pressing the toe of the treadle shifts the valve. Pressing the heel of the treadle returns the valve.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Toe pressed last – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Heel pressed last – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



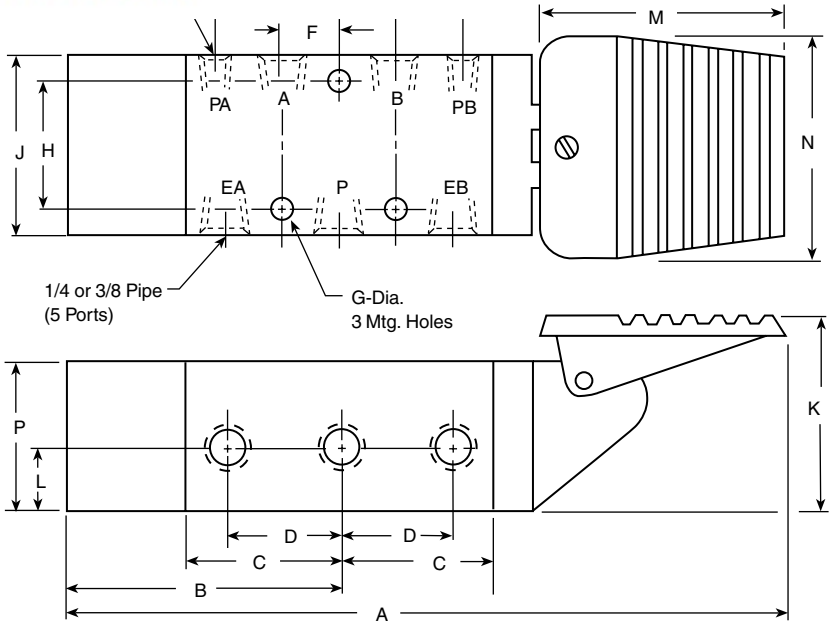
⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Function	Ports	Model Number
Treadle Operated Detented	1/4"	53093 1000
	3/8"	53093 2000

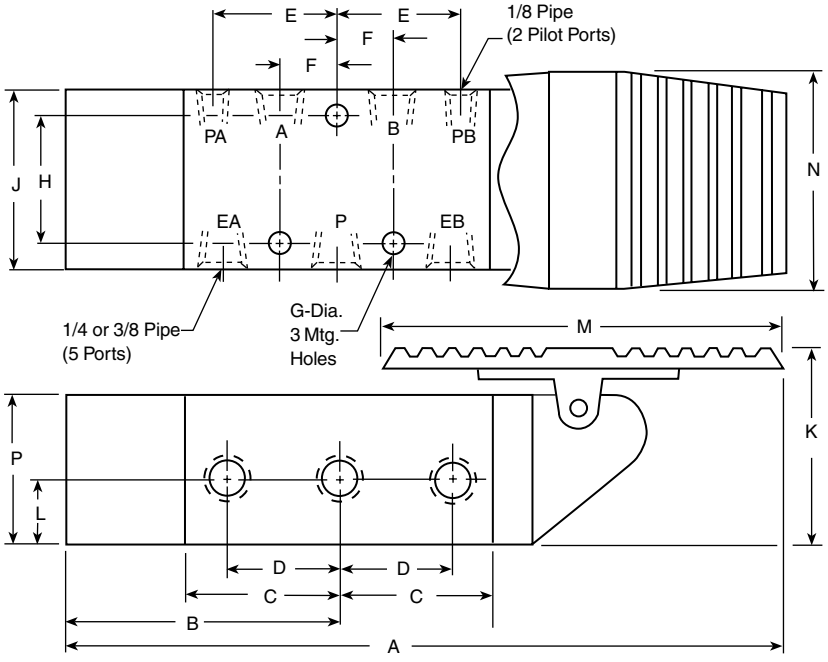
rated



Dimensions:

	inches	mm
A	8.79	223
B	3.32	84
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	2.47	63
L	0.78	20
M	3.06	78
N	2.75	70
P	1.84	47

Treadle Operated



Dimensions:

	inches	mm
A	8.78	223
B	3.32	84
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.22	7
H	1.63	41
J	2.25	57
K	2.47	63
L	0.78	20
M	4.88	124
N	2.75	70
P	1.84	47

Spring Centered, 3-Position

Application
These valves are used to operate double-acting cylinders. Pushing and holding the lever in either direction shifts the valve. When the lever is released, springs return the valve to its center position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Lever pulled (away from body) – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

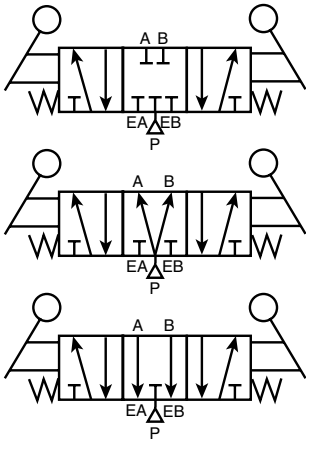
Lever pushed (toward body) – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Normal Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.



Model Selection Information

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	**53181 1000**	**53281 1000**	**53381 1000**
3/8"	**53181 2000**	**53281 2000**	**53381 2000**

Detented, 3-Position

Application
These valves are used to operate double-acting cylinders. Pushing or pulling the lever shifts the valve. The valve remains detented in its last position until the lever is manually centered.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Lever pulled last (away from body) – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

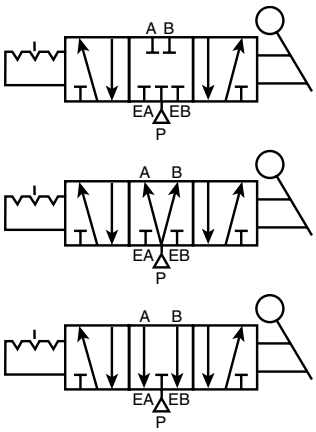
Lever pushed last (toward body) – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Center Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.



Model Selection Information

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	**53183 1000**	**53283 1000**	**53383 1000**
3/8"	**53183 2000**	**53283 2000**	**53383 2000**

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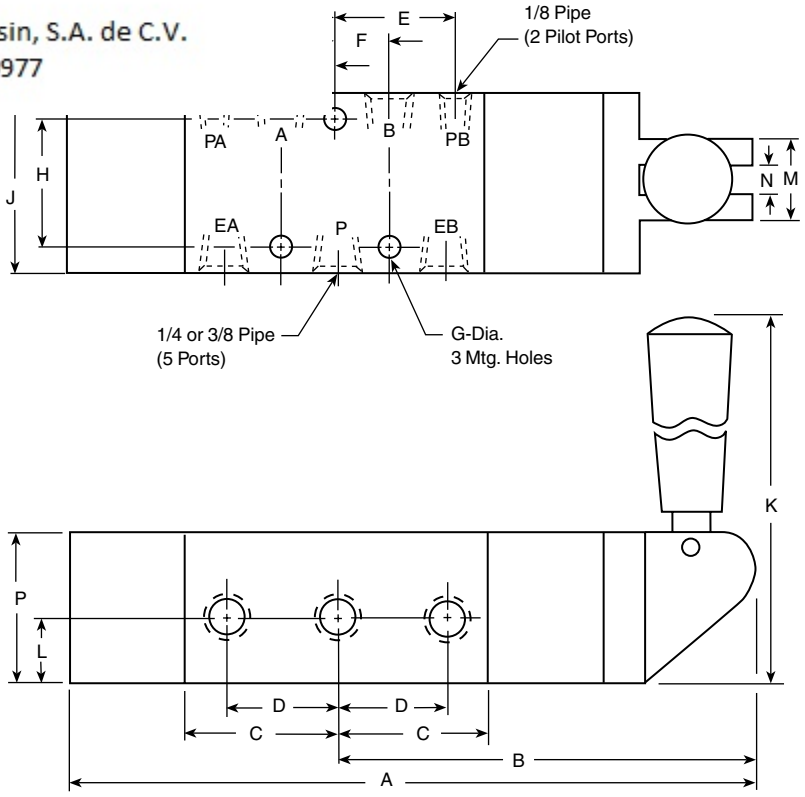


Dimensions:

	inches	mm
A▲	8.44	214
B	5.13	130
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	6.00	152
L	0.78	20
M	1.00	25
N	0.39	10
P	1.84	47

▲ Subtract 1.34" for 3-Position Detented Valves.

Spring Centered, 3-Position

Application
These valves are used to operate double-acting cylinders. Pressing and holding the heel or toe of the treadle shifts the valve. When the treadle is released, springs return the valve to its center position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Toe pressed – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port A is connected to Exhaust Port EA.

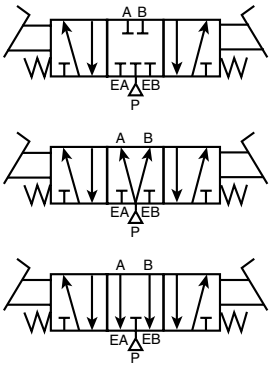
Heel pressed – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

Normal Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.

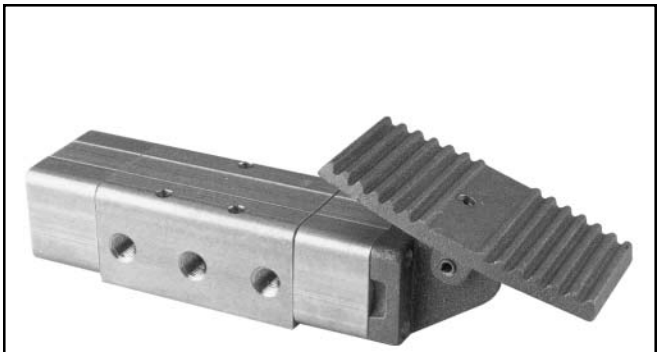


⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	**53191 1000**	**53291 1000**	**53391 1000**
3/8"	**53191 2000**	**53291 2000**	**53391 2000**



Detented, 3-Position

Application
These valves are used to operate double-acting cylinders. Pressing the heel or toe of the treadle shifts the valve. The valve remains detented in its last position until the treadle is manually centered.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Toe pressed last – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

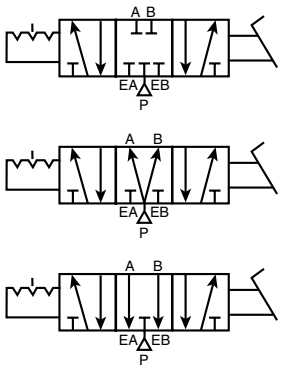
Heel pressed last – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

Center Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.



⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

See accessories for guard kits.

Model Selection Information

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	**53193 1000**	**53293 1000**	**53393 1000**
3/8"	**53193 2000**	**53293 2000**	**53393 2000**

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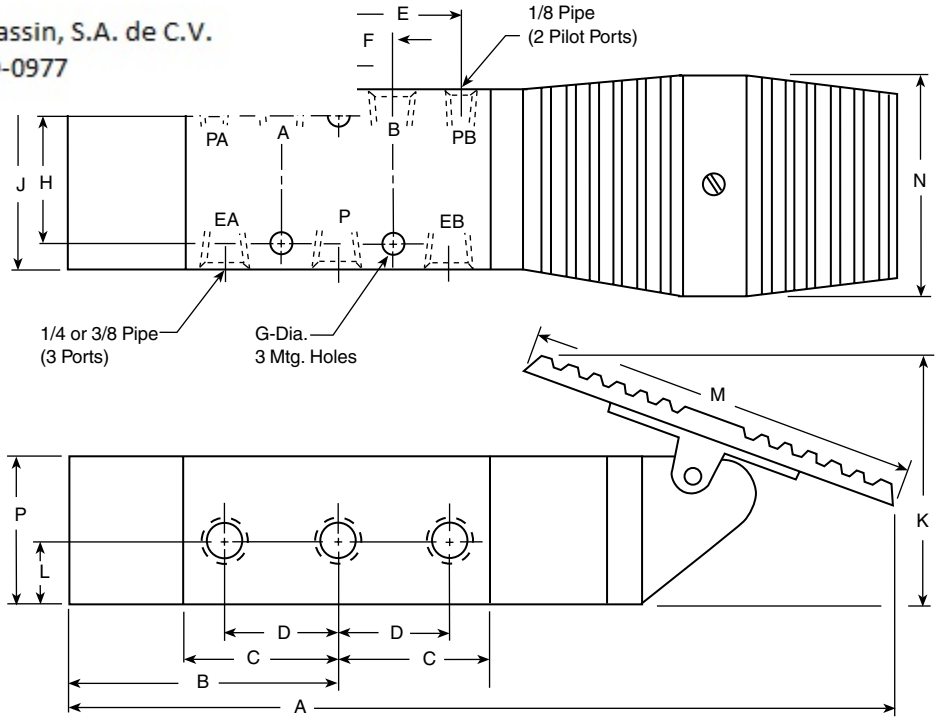


⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.219.

Dimensions:

	inches	mm
A▲	10.12	257
B	3.32	84
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	3.84	48
L	0.78	20
M	4.88	124
N	2.75	70
P	1.84	47

▲ Subtract 1.34" for 3-Position Detented Valves.

Single Solenoid

Application

These valves are used to operate double-acting cylinders. A "maintained" electrical signal shifts the valve. When the signal is removed, the valve returns to its normal position. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

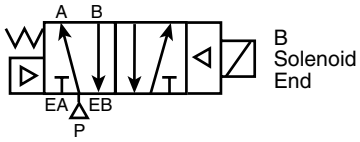
Mounting

These valves may be mounted in any position and are designed to inline mounted or surface mounted using the through holes provided in the valve body.

Operation

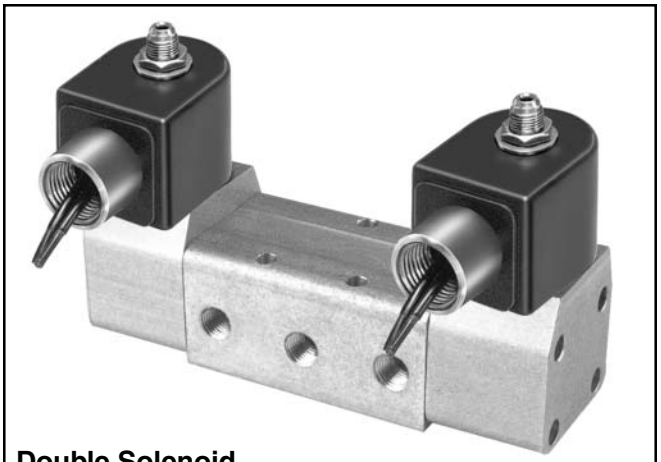
De-energized Position – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Energized Position – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Info. (Listed for 120V 60Hz)*

Function	Ports	Model Number
Single Solenoid, Spring Return	1/4"	53001 1115
	3/8"	53001 2115



Double Solenoid

Application

These valves are used to operate double-acting cylinders. A "momentary" electrical signal applied to one of the solenoids shifts the valve. The valve remains in this position until a momentary signal is applied to the other solenoid. Conversion to external pilot permits the valve to be used for dual pressure or vacuum service. (See Technical Data page.)

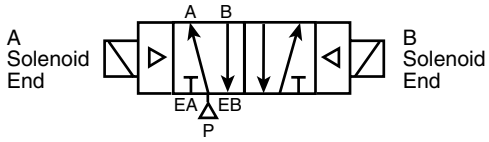
Mounting

These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation

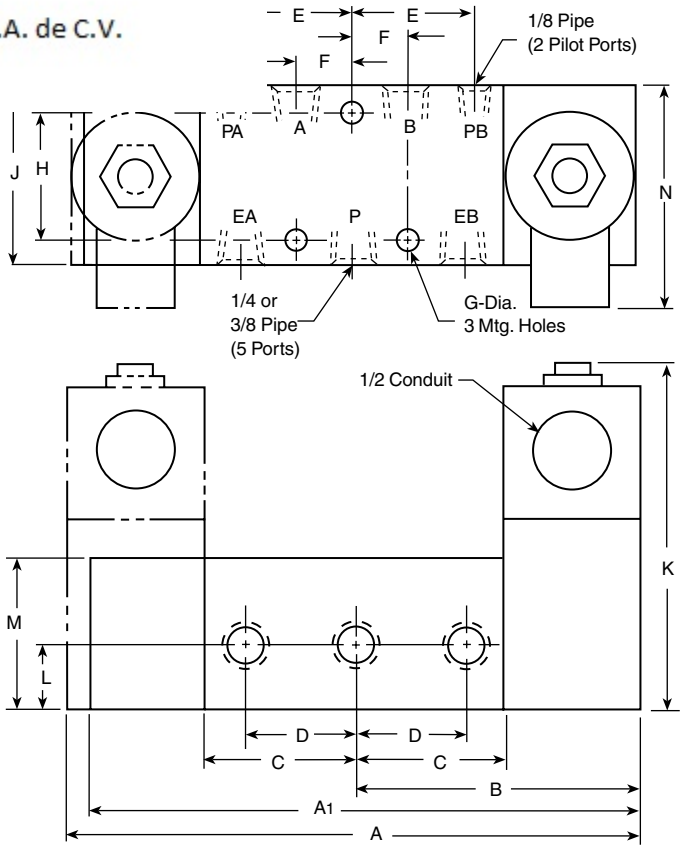
Solenoid A energized last – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Solenoid B energized last – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Info. (Listed for 120V 60Hz)*

Function	Ports	Model Number
Double Solenoid	1/4"	53000 1115
	3/8"	53000 2115



Dimensions:

	inches	mm
A	7.13	181
A1	6.88	175
B	3.57	91
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	4.43	113
L	0.72	20
M	1.84	47
N	3.14	80

Single Remote Pilot

Application

These valves are used to operate double-acting cylinders. A "maintained" pressure signal shifts the valve. When the signal is removed, the valve returns to its normal position.

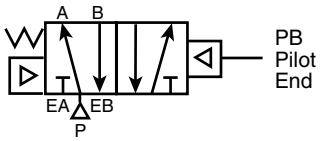
Mounting

These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation

Normal Position – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Operated Position – With a "maintained" pressure signal at the PB Pilot Port. Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Information

Function	Ports	Model Number
Single Remote Pilot, Spring Return	1/4"	53051 1000
	3/8"	53051 2000

Double Remote Pilot

Application

These valves are used to operate double-acting cylinders. A "momentary" pressure signal applied to one Pilot Port shifts the valve. The valve remains in this position until a "momentary" pressure signal is applied to the other Pilot Port.

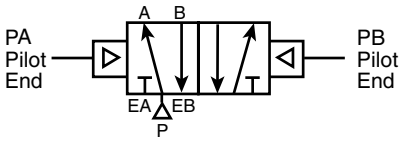
Mounting

These valves should be oriented with the axis of the valve spool in the horizontal plane, and are designed to be mounted inline or surface mounted using the through holes provided in the valve body.

Operation

Momentary air signal applied to Pilot Port PA last – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

Momentary air signal applied to Pilot Port PB last – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.



Model Selection Information

Function	Ports	Model Number
Double Remote Pilot	1/4"	53055 1000
	3/8"	53055 2000

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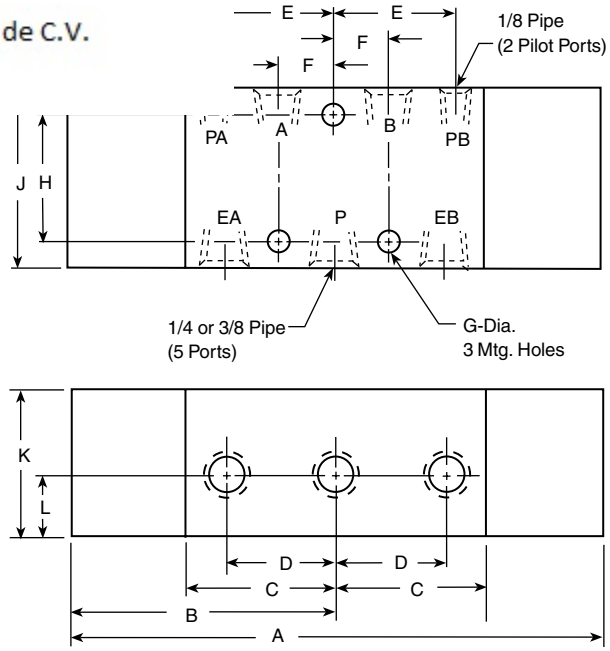


Dimensions:

	inches	mm
A	6.63	168
B	3.32	84
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	1.84	47
L	0.78	20

Double Solenoid, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" electrical signal applied alternately to the solenoids shifts the valve. When the signal is removed, springs return the valve to its center position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Solenoid Operator A energized – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

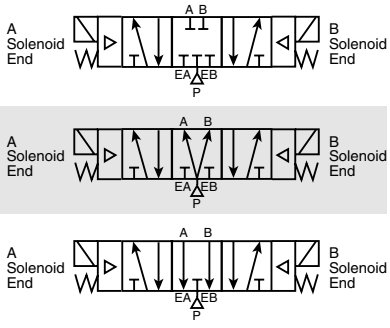
Solenoid Operator B energized – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

Normal Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.



Model Selection Info. (Listed for 120V 60Hz)*

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	53100 1115	53200 1115	53300 1115
3/8"	53100 2115	53200 2115	53300 2115

* See Valve Model Number System for other voltages.

Double Remote Pilot, 3-Position

Application
These valves are used to operate double-acting cylinders. A "maintained" pressure signal applied alternately to the Pilot Ports shifts the valve. When the signal is removed, springs return the valve to its center position.

Mounting
These valves may be mounted in any position and are designed to be inline mounted or surface mounted using the through holes provided in the valve body.

Operation
Pressure signal at Pilot Port PA – Pressure at Inlet Port P is connected to Outlet Port A. Outlet Port B is connected to Exhaust Port EB.

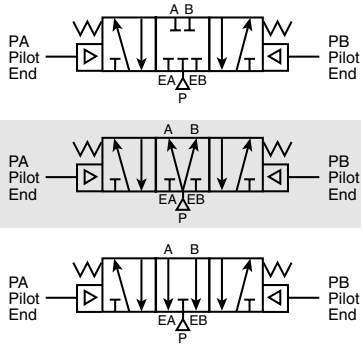
Pressure signal at Pilot Port PB – Pressure at Inlet Port P is connected to Outlet Port B. Outlet Port A is connected to Exhaust Port EA.

Normal Position –

Function 1 All ports blocked.

Function 2 Pressure at Inlet Port P is connected to Outlet Ports A & B.

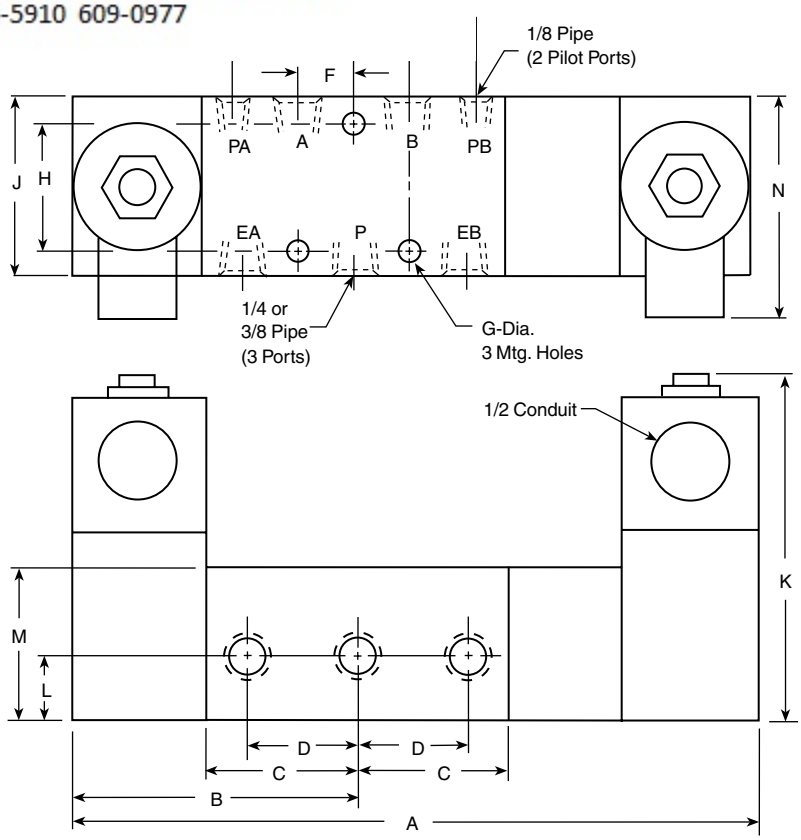
Function 3 Pressure at Inlet Port P is blocked. Outlet Ports A & B are connected to Exhaust Ports EA & EB.



Model Selection Information

Port		Center Position	
	Function 1 Closed Center	Function 2 Pressure Center	Function 3 Exhaust Center
1/4"	53155 1000	53255 1000	53355 1000
3/8"	53155 2000	53255 2000	53355 2000

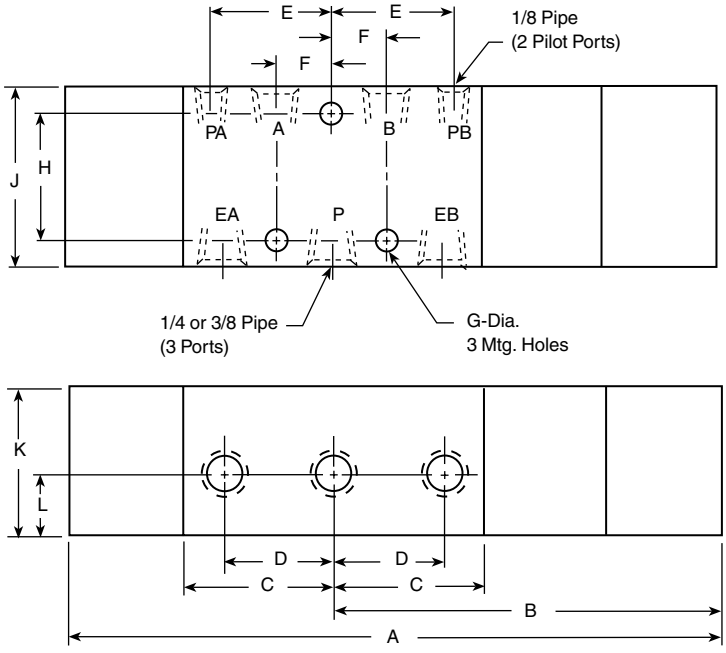
rated, 3-Postion



Dimensions:

	inches	mm
A	8.47	215
B	3.57	91
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	4.43	113
L	0.78	20
M	1.84	47
N	3.14	80

Double Remote Pilot Operated, 3-Position



Dimensions:

	inches	mm
A	7.97	202
B	4.66	118
C	1.88	48
D	1.38	35
E	1.50	38
F	0.69	18
G	0.27	7
H	1.63	41
J	2.25	57
K	1.84	47
L	0.78	20

0.3 bar)*

0.3 bar)*

Double Solenoid,
2-Position ..... 30 to 150 PSIG (2 to 10.3 bar)*
Remote Pilot &
Manual Valves ..... Vacuum to 200 PSIG (13.8)*

* For lower pressure or vacuum operation, solenoid(s) may be externally piloted following the conversion procedure on this page.

Temperature Range (Ambient)

32°F to 180°F (0°C to 82°C)

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

Materials

Body and Actuator Housings ..... Aluminum Extrusion
Solenoid ..... Plated Steel, Copper, Stainless Steel
Spool ..... Hard-coat Anodized Aluminum
Bushings ..... Brass
Spacers ..... Delrin
Seals ..... Buna (Nitrile)

Lubrication

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

Flow Rating (Cv)

Flow Path	Port Size	
	1/4"	3/8"
P → A	2.27	2.49
P → B	2.27	2.34
A → EA	2.25	2.45
B → EB	2.35	2.45
Avg.	2.29	2.43

Suggested Lubricant

F442 Oil

Average Fill Time (Seconds)*

Function	12 cu. in. Test Chamber		100 cu. in. Test Chamber	
	Fill	Exhaust	Fill	Exhaust
Single				
Solenoid	0.054	0.074	0.166	0.283
Double				
Solenoid	0.037	0.055	0.149	0.260

* With 90 PSIG supply, time required to fill from 0 to 81 PSIG and exhaust from 90 to 9 PSIG is measured from instant of energizing, or de-energizing at 120V 60Hz. Times shown are average.

Electrical Data (Conduit Solenoid)

Voltage & Frequency	Power Consumption (Watts)	Inrush (Amps)	Holding (Amps)
24V/60Hz	10.3	1.66	1.03
120V/60Hz	9.3	0.25	0.15
240V/60Hz	8.8	0.11	0.06
12VDC	8.7	—	0.71
24VDC	8.1	—	0.34

Conversion Procedures

Normally Closed 3-Way to Normally Open

1) Loosen the slotted screws holding each actuator housing to the valve body.
2) Separate both actuator housings from the valve body.
3) Remove spool from body, reverse end-for-end, and replace into body.
4) Reassemble both actuator housing to body at opposite ends from which they were removed. Valve is now Normally Open.

Internal to External Pilot

To operate solenoid valves below their minimum operating pressure, on vacuum, or for dual pressure applications, the valve must be converted to external pilot as follows:

1) Loosen the slotted screws holding the solenoid actuator housing to the valve body.
2) Separate the solenoid actuator housing from the valve body.
3) Remove the rubber plug from the 1/8" hole and reposition it in the similar hole near the top of the valve body.
4) Reassemble solenoid actuator housing to body.
5) An external pilot line (45 PSIG min.) should be attached to the 1/8" external Pilot Port.

Solenoid Service Kit (Includes Solenoid with Plunger & Stop Assy)

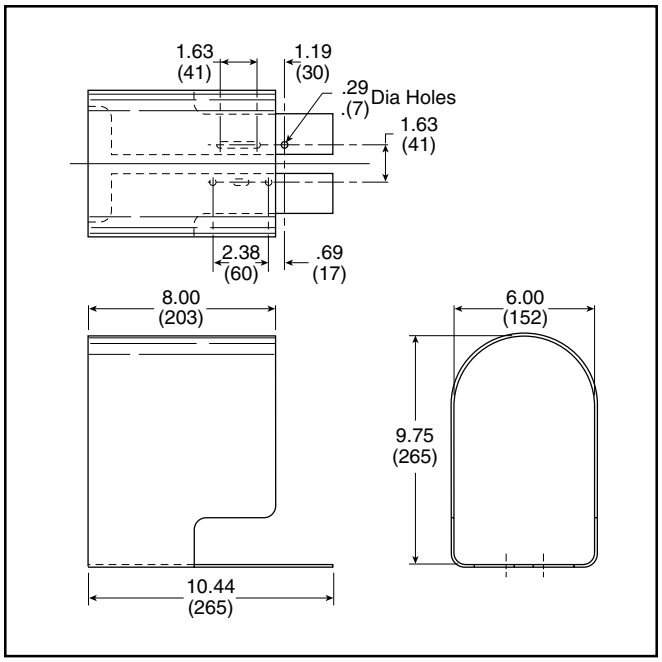
Voltage & Frequency	Standard	Hazardous Duty
24V/60Hz	PS393434113P	PS193634113P
120V/60Hz	PS393434115P	PS193634115P
240V/60Hz	PS393434116P	PS193634116P
12VDC	PS393434122P	PS193634122P
24VDC	PS393434123P	PS193634123P

Note: Conduit Style

Service Kit For All Valve Bodies **53000 8000**
Service kit includes all soft seals found in 3-Way & 4-Way valve bodies as well as solenoid and pilot actuator assemblies.

Pedal guard meets safety requirements for foot-operated valves by protecting pedal from accidental tripping from all angles. Guard is constructed of steel for strength and durability. One model fits any pedal or treadle-operated "Directair 6" Series valve.

⚠ **CAUTION:**
This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.



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		Difference of Suggested Replacement and/or Recommended Kits
		Service Kit 53000800 Service Kit PS193634113P
530001516	Use Service Kits	Service Kit 53000800 Service Kit PS393434116P
530002123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
530002155	Use Service Kits	N/R KIT
530002415	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
530002516	Use Service Kits	Service Kit 53000800 Service Kit PS393434116P
530011123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
530011415	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
530012122	Use Service Kits	Service Kit 53000800 Service Kit PS393434122P
530012123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
530012153	Use Service Kits	N/R KIT
530012155	Use Service Kits	N/R KIT
530012413	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
530012415	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
530012423	Use Service Kits	Service Kit 53000800 Service Kit PS193634123P
530012516	Use Service Kits	Service Kit 53000800 Service Kit PS393434116P
530012615	Use Service Kits	N/R Kit
531001123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
531001415	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
531002122	Use Service Kits	Service Kit 53000800 Service Kit PS393434122P
531002415	Use Service Kits	Service Kit 53000800 Service Kit PS193634115P
532002115	Use Service Kits	Service Kit 53000800
532552000	Use Service Kits	Service Kit 53000800
532811000	Use Service Kits	Service Kit 53000800
532812000	Use Service Kits	Service Kit 53000800
532831000	Use Service Kits	Service Kit 53000800
532932000	Use Service Kits	Service Kit 53000800
536011123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
536012122	Use Service Kits	Service Kit 53000800 Service Kit PS393434122P
536012123	Use Service Kits	Service Kit 53000800 Service Kit PS393434123P
536012423	Use Service Kits	Service Kit 53000800 Service Kit PS193634123P
536012615	Use Service Kits	N/R KIT
537811000	Use Service Kits	Service Kit 53000800
537812000	Use Service Kits	Service Kit 53000800
537831000	Use Service Kits	Service Kit 53000800
537832000	Use Service Kits	Service Kit 53000800
530007007	Use Service Kits	N/R Kit
530007008	Use Service Kits	N/R Kit

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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "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 an item sold pursuant to this contract 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 an item sold hereunder 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 said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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