

Pneumatic Division

Richland, Michigan USA

www.parker.com/pneumatics



BL VALVE SERIES

Bulletin Number	Bulletin Description
<input type="checkbox"/> V350BP	Inline, Installation Instructions
<input type="checkbox"/> V351BP	Stacking, Installation Instructions
<input type="checkbox"/> V352BP	Manifold, Installation Instructions
<input type="checkbox"/> V353BP	Stacking Valve & Manifold Mounted Valve, Installation Instructions
<input type="checkbox"/> Safety Guide	PDN Safety Guide



Pneumatic Division North America
 Richland, Michigan 49083

Installation Instructions: V-350BP

"BL" Series Air Control Valves
 1/8" & 1/4" Inline

ISSUED: October, 1999
Supersedes: August, 1998

ECN# P27372

! WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Introduction

Follow these instructions when installing, operating, or servicing the product.

Application Limits

Operating Pressure:	kPa	psig	bar
Minimum	0	0	0
Maximum	1000	150	10.3

Ambient Temperature Range: -18°C to 60°C (0°F to 140°F)

Voltage Range: Rated Voltage +10, -15%

! CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Installation

! CAUTION: This valve contains solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

1. If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.
2. Operating voltage is 85-110% of rated voltage. These limits should not be exceeded.

Valve should be installed with reasonable accessibility for service. Exercise care in keeping tube lengths to a minimum. Plumbing should be free of dirt, chips & scale. Pipe joint compound should be used sparingly applied only to the fitting, never the valve body. Protect the valve from exposure to extreme temperatures, dirt and moisture to maximize life.

Factory Pre-Lubrication - All valves are pre-lubricated at the factory. Valves are suitable for, and perform best in non-lube service.

Recommended Lubricant - If in-service lubricant is used, ISO VG32 oil is recommended. ISO VG32 is specially formulated to promote maximum service life of air operated equipment. Other compatible lubricants should be of a straight paraffin base mineral oil having a viscosity of 100-200 SSU @ 100°F and an Aniline Point greater than 200°F.

! CAUTION: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additives.

Wiring - Follow all requirements for local and national electrical codes.

Electrical Connection:

1. Valve with lead wires should have power connected to the red wires. Ground should be connected to the green wire if provided.
2. Valves with 3-Pin male terminals should have power connected to the parallel terminals. Ground should be connected to the perpendicular terminal.
3. Valves with Brad Harrison Connector:
 - A. **3-Pin:** power should be connected to no. 2 and 3 terminals. Ground should be connected to no. 1 terminal.
 - B. **5-Pin:** power should be connected to no. 1 and 5 terminals. Ground should be connected to no. 3 terminal.

! WARNING

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

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

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

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.

Materials

- Body & Solenoid Cover Zinc
- Valving Elements Acetal & Polyamide
- Poppets Polyurethane
- Other Seals Nitrile
- Screws/Springs Steel
- Fixed Pole & Armature Iron
- Coil Copper & Polyphenylene Sulfide

Service Kits Available

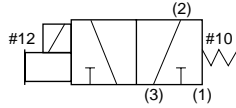
- Valve Body Service Kit** PS2701P
(consists of items # 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14 and 15)
- Solenoid Service Kit** PS2702**P
(consists of items # 5, 6, 7, 8, 9 and 10)

** Add Voltage Code.

Flow Paths, Port Identification And Connections

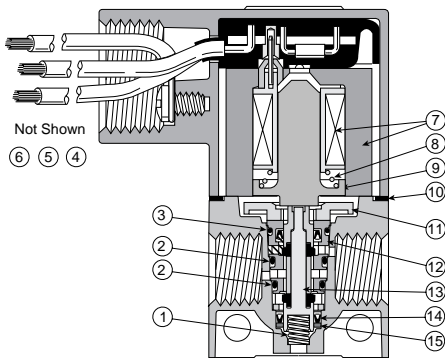
Port Identification

3-Way Service	
Port No.	Function
1	Inlet
2	Cylinder
3	Exhaust



Function	Port No.		
	1	2	3
3-Way, Normally Closed	Inlet	Cyl	Exh
3-Way, Normally Open	Exh	Cyl	Inlet
2-Way, Normally Closed	Inlet	Cyl	Plug
2-Way, Normally Open	Plug	Cyl	Inlet
Selector	Inlet	Cyl	Inlet
Diverter	Cyl	Inlet	Cyl

The low cost of these valves makes replacement of the valve seals uneconomical. If the valve shows signs of wearing, simply discard and replace. If repair is desired order Valve Body Service Kit PS2701P and Solenoid Service Kit PS2702**P.



Part Identification List

Item No.	Description
1	Poppet Return Spring
2	O-ring
3	O-ring
4	Insert Ret./Body Screw
5	Screw Gasket
6	Cover/Body Screw
7	Coil/Pole Assembly
8	Armature Sprint
9	Armature
10	Gasket
11	Insert Retainer
12	Bore Insert
13	Poppet Assembly
14	Lip Seal
15	TFE Ring

Suffix/Voltage

Coil Suffix	Voltage/Frequency	Power
-45	12VDC	6.2 Watts
-49	24/60	6.5 Watts
-49	24/50	6.5 Watts
-49	22/50	5.5 Watts
-49	24VDC	7.2 Watts
-53	120/60	7.1 Watts
-53	120/50	6.7 Watts
-53	110/50	5.6 Watts
-57	240/60	7.8 Watts
-57	240/50	7.8 Watts
-57	220/50	6.6 Watts

Servicing Solenoid Section:

1. Remove solenoid cover by loosening the two (2) cover/body screws (item #6).
2. Disassemble and remove all items found in the solenoid service kit.
3. Note that the new coil winding is pre-assembled into the pole piece and should not be disassembled. Place this carefully into the cover and engage the contact pins into the receptacle sockets. Then install armature with spring.
4. Reassemble solenoid cover with previously assembled parts and tighten the two (2) cover/body screws (item #6) to 2.3 to 2.8 N•m (20 to 25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.

Servicing Valve Body

1. Remove the solenoid cover by loosening the two (2) cover/body screws.
2. Remove the two (2) insert retainer/body screws (item #4).
3. Disassemble and replace all items found in the valve body service kit in the following manner.
 - A. Grease poppet assembly (item #13). top seal, three (3) o-rings (items #2, 3), 2 lipseals (item #14).
 - B. Push lipseal (item #14) on poppet assembly with the open lip directed inboard as shown in cutaway view. Follow this with the TFE ring placed immediately next to the lipseal.
 - C. Grease poppet return spring (item #1) end and place into poppet assembly pocket.
 - D. Slip in all bore components as a subassembly.
 - E. Fit insert retainer and override lever assembly in nested position with manual override and tighten the two (2) screws to 0.5 to 0.7 N•m (4-6 in-lbs) torque.
4. Reassemble solenoid cover with armature and spring then tighten the two (2) cover/body screws to 2.3 to 2.8 N•m (20-25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.



Pneumatic Division North America
 Richland, Michigan 49083

Installation Instructions: V-351BP

"BL" Series Air Control Valves
1/8" & 1/4" Stacking

ISSUED: October, 1999
Supersedes: October, 1997

ECN# P27372

! WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Introduction

Follow these instructions when installing, operating, or servicing the product.

Application Limits

Operating Pressure:	kPa	psig	bar
Minimum	0	0	0
Maximum	1000	150	10.3

Ambient Temperature Range: -18°C to 60°C (0°F to 140°F)

Voltage Range: Rated Voltage +10, -15%

! CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Installation

! CAUTION: This valve contains solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

1. If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.
2. Operating voltage is 85-110% of rated voltage. These limits should not be exceeded.

Valve should be installed with reasonable accessibility for service. Exercise care in keeping tube lengths to a minimum. Plumbing should be free of dirt, chips & scale. Pipe joint compound should be used sparingly applied only to the fitting, never the valve body. Protect the valve from exposure to extreme temperatures, dirt and moisture to maximize life.

Factory Pre-Lubrication - All valves are pre-lubricated at the factory. Valves are suitable for, and perform best in non-lube service.

Recommended Lubricant - If in-service lubricant is used, ISO VG32 oil is recommended. ISO VG32 is specially formulated to promote maximum service life of air operated equipment. Other compatible lubricants should be of straight paraffin base mineral oil having a viscosity of 100-200 SSU @ 100°F and an Aniline Point greater than 200°F.

! Caution: Do not use synthetic, reconstituted, or oils with an alcohol content or detergent additives.

Wiring - Follow all requirements for local and national electrical codes.

Electrical Connection:

1. Valve with lead wires should have power connected to the red wires. Ground should be connected to the green wire if provided.
2. Valves with 3-Pin male terminals should have power connected to the parallel terminals. Ground should be connected to the perpendicular terminal.
3. Valves with Brad Harrison Connector:
 - A. **3-Pin:** power should be connected to no. 2 and 3 terminals. Ground should be connected to no. 1 terminal.
 - B. **5-Pin:** power should be connected to no. 1 and 5 terminals. Ground should be connected to no. 3 terminal.

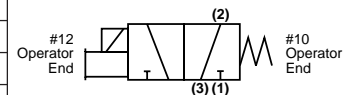
Materials

Body & Solenoid Cover	Zinc
Valving Elements	Acetel & Polyamide
Poppets	Polyurethane
Other Seals	Nitrile
Screws/Springs	Steel
Fixed Pole & Armature	Iron
Coil	Copper & Polyphenylene Sulfide

Flow Paths, Port Identification And Connections

Port Identification

3-Way Service	
Port No.	Function
1	Inlet
2	Cylinder
3	Exhaust



! WARNING

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

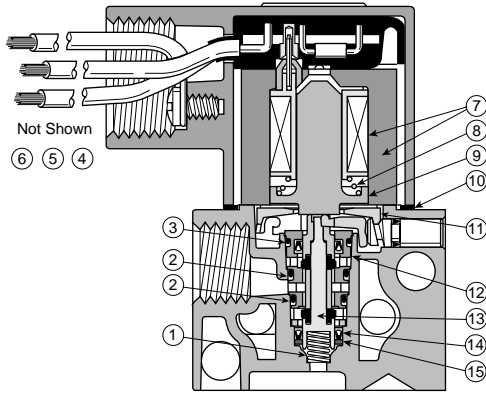
This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences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

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

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.

Function	Port No.		
	1	2	3
3-Way, Normally Closed	Inlet	Outlet	Exh
3-Way, Normally Open	Inlet	Outlet	Exh
Selector	Inlet	Outlet	Inlet
Diverter	Outlet	Inlet	Outlet

The low cost of these valves makes replacement of the valve seals uneconomical. If the valve shows signs of wearing, simply discard and replace. If repair is desired order valve body service kit PS2701P and solenoid service kit PS2702**P.



Part Identification List

Item No.	Description
1	Poppet Return Spring
2	O-ring
3	O-ring
4	Insert Retainer/Body Screw
5	Screw Gasket
6	Cover/Body Screw
7	Coil/Pole Assembly
8	Armature Spring
9	Armature
10	Gasket
11	Insert Retainer
12	Bore Insert
13	Poppet Assembly
14	Lip Seal
15	TFE Ring

Service Kits Available

Valve Body Service Kit PS2701P
(consists of items # 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14 and 15)

Solenoid Service Kit PS2702**P
(consists of items # 5, 6, 7, 8, 9 and 10)

** Add Voltage Code.

Suffix/Voltage

Coil Suffix	Voltage/Frequency	Power
-45	12VDC	6.2 Watts
-49	24/60	6.5 Watts
-49	24/50	6.5 Watts
-49	22/50	5.5 Watts
-49	24VDC	7.2 Watts
-53	120/60	6.9 Watts
-53	120/50	6.9 Watts
-53	110/50	5.6 Watts
-57	240/60	7.8 Watts
-57	240/50	7.8 Watts
-57	220/50	6.6 Watts

Servicing Solenoid Section:

1. Remove solenoid cover by loosening the two (2) cover/body screws (item #6).
2. Disassemble and remove all items found in the solenoid service kit.
3. Note that the new coil winding is pre-assembled into the pole piece and should not be disassembled. Place this carefully into the cover and engage the contact pins into the receptacle sockets. Then install armature with spring.
4. Reassemble solenoid cover with previously assembled parts and tighten the two (2) cover/body screws (item #6) to 2.3 to 2.8 N•m (20 to 25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.

Servicing Valve Body

1. Remove the solenoid cover by loosening the two (2) cover/body screws.
2. Remove the two (2) insert retainer/body screws (item #4).
3. Disassemble and replace all items found in the valve body service kit in the following manner.
 - A. Grease poppet assembly (item #13), top seal, three (3) o-rings (items #2, 3), 2 lipseals (item #14).
 - B. Push lipseal (item #14) on poppet assembly with the open lip directed inboard as shown in cutaway view. Follow this with the TFE ring placed immediately next to the lipseal.
 - C. Grease poppet return spring (item #1) end and place into poppet assembly pocket.
 - D. Slip in all bore components as a subassembly.
 - E. Fit insert retainer and override lever assembly in nested position with manual override and tighten the two (2) screws to 0.5 to 1.7 N•m (4 to 6 in-lbs) torque.
4. Reassemble solenoid cover with armature and spring then tighten the two (2) cover/body screws to 2.3 to 2.8 N•m (20 to 25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.

Instructions for converting NC to NO:

The seal between valves can be installed to provide either normally open (N.O.) or normally closed (N.C.) service. When assembling valves to one another, the seal must be positioned such that the indicator tab on the seal is next to the appropriate symbol on the ends of the body casting. Turn on air pressure and electrical power source. Test valve for proper functional operation and for internal and external leakage.

Assembly Hint:

When assembling individual valves to form a stacking assembly, install tie rods into the threaded end plate and build up in a vertical fashion. Tie rod screws must be tightened to 4.5 to 5.1 N•m (40 to 45 in-lbs) torque. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage.

Refer to instruction sheet V-353P for additional information.



Pneumatic Division North America
 Richland, Michigan 49083

Installation Instructions: V-352BP

**"BL" Series 1/8" Manifold
 2-Way & 3-Way Valves**

**ISSUED: October, 1999
 Supersedes: October, 1997**

ECN# P27372

! WARNING

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Introduction

Follow these instructions when installing, operating, or servicing the product.

Application Limits

Operating Pressure:	kPa	psig	bar
Minimum	0	0	0
Maximum	1000	150	10.3

Ambient Temperature Range: -18°C to 60°C (0°F to 140°F)

Voltage Range: Rated Voltage +10, -15%

! CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

Installation

! CAUTION: This valve contains solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

1. If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.
2. Operating voltage is 85-110% of rated voltage. These limits should not be exceeded.

Valve should be installed with reasonable accessibility for service. Exercise care in keeping tube lengths to a minimum. Plumbing should be free of dirt, chips & scale. Pipe joint compound should be used sparingly applied only to the fitting, never the valve body. Protect the valve from exposure to extreme temperatures, dirt and moisture to maximize life.

Factory Pre-Lubrication - All valves are pre-lubricated at the factory. Valves are suitable for, and perform best in non-lube service.

Recommended Lubricant - If in-service lubricant is used, ISO VG32 oil is recommended. ISO VG32 is specially formulated to promote maximum service life of air operated equipment. Other compatible lubricants should be of straight paraffin base mineral oil having a viscosity of 100-200 SSU @ 100°F and an Aniline Point greater than 200°F.

! CAUTION: Do not use synthetic, reconstituted, or oils with alcohol content or detergent additives.

Wiring - Follow all requirements for local and national electrical codes.

Electrical Connection:

1. Valve with lead wires should have power connected to the red wires. Ground should be connected to the green wire if provided, or to a ground terminal or under a MTG screw.
2. Valves with 3-pin male terminals should have power connected to the parallel terminals. Ground should be connected to the perpendicular terminal.
3. Valves with Brad Harrison Connector:
 - A. **3-pin:** power should be connected to no. 2 and 3 terminals. Ground should be connected to no. 1 terminal.
 - B. **5-pin:** power should be connected to no. 1 and 5 terminals. Ground should be connected to no. 3 terminal.

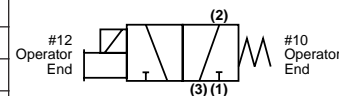
Materials

Body, Solenoid Cover & Manifold	Zinc
Valving Elements	Acetel & Polyamide
Poppets	Polyurethane
Other Seals	Nitrile
Screws/Springs	Steel
Fixed Pole & Armature	Iron
Coil	Copper & Polyphenylene Sulfide

Flow Paths, Port Identification And Connections

Port Identification

3-Way Service	
Port No.	Function
1	Inlet
2	Cylinder
3	Exhaust



! WARNING

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

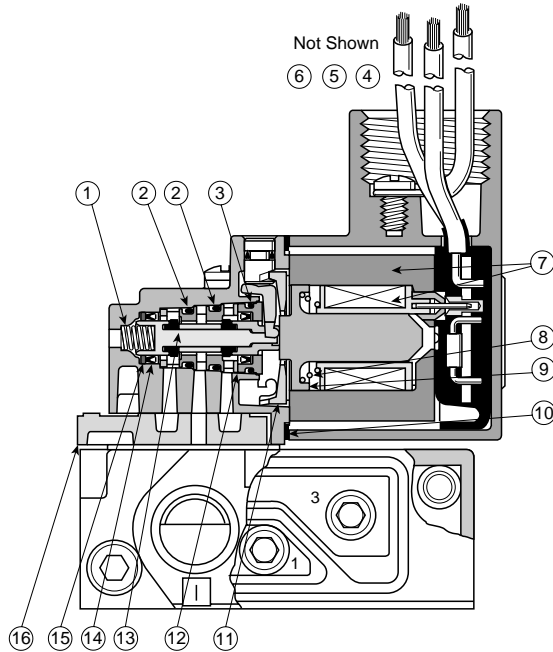
This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences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

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

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.

Function	Port No.		
	1	2	3
3-Way, Normally Closed	Inlet	Outlet	Exh
3-Way, Normally Open	Inlet	Outlet	Exh
2-Way, Normally Closed	Inlet	Outlet	
2-Way, Normally Open	Inlet	Outlet	
Selector	Inlet	Outlet	Inlet
Diverter	Outlet	Inlet	Outlet

The low cost of these valves makes replacement of the valve seals uneconomical. If the valve shows signs of wearing, simply discard and replace. If repair is desired order valve body service kit PS2701P and solenoid service kit PS2702**P.



Part Identification List

Item No.	Description
1	Poppet Return Spring
2	O-ring
3	O-ring
4	Insert Retainer/Body Screw
5	Screw Gasket
6	Cover/Body Screw
7	Coil/Pole Assembly
8	Armature Spring
9	Armature
10	Gasket
11	Insert Retainer
12	Bore Insert
13	Poppet Assembly
14	Lip Seal
15	TFE Ring
16	Selector Plate

Service Kits Available

Valve Body Service Kit	PS2701P
(consists of items #1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14 and 15)	
Solenoid Service Kit	PS2702**P
(consists of items #5, 6, 7, 8, 9 and 10)	
Selector Plate Kit 3-Way, N.C.	PS2712P
(consists of item #16)	
Selector Plate Kit 3-Way, N.O.	PS2713P
(consists of item #16)	
Selector Plate Kit 2-Way, N.C.	PS2714P
(consists of item #16)	
Selector Plate Kit 2-Way, N.O.	PS2715P
(consists of item #16)	

Suffix/Voltage

Coil Suffix	Voltage/Frequency	Power
-45	12VDC	6.2 Watts
-49	24/60	6.5 Watts
-49	24/50	6.5 Watts
-49	22/50	5.5 Watts
-49	24VDC	7.2 Watts
-53	120/60	6.7 Watts
-53	120/50	6.7 Watts
-53	110/50	5.6 Watts
-53	120VDC	7.2 Watts
-57	240/60	7.8 Watts
-57	240/50	7.8 Watts
-57	220/50	6.6 Watts

Servicing Solenoid Section:

1. Remove solenoid cover by loosening the two (2) cover/body screws (item #6).
2. Disassemble and remove all items found in the solenoid service kit.
3. Note that the new coil winding is pre-assembled into the pole piece and should not be disassembled. Place this carefully into the cover and engage the contact pins into the receptacle sockets. Then install armature with spring.
4. Reassemble solenoid cover with previously assembled parts and tighten the two (2) cover/body screws (item #6) to 2.3 to 2.8 N•m (20 to 25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.

Servicing Valve Body

1. Remove the solenoid cover by loosening the two (2) cover/body screws.
2. Remove the two (2) insert retainer/body screws (item #4).
3. Disassemble and replace all items found in the valve body service kit in the following manner.
 - A. Grease poppet assembly (item #13), top seal, three (3) o-rings (items #2, 3), 2 lipseals (item #14).
 - B. Push lipseal (item #14) on poppet assembly with the open lip directed inboard as shown in cutaway view. Follow this with the TFE ring placed immediately next to the lipseal.
 - C. Grease poppet return spring (item #15) end and place into poppet assembly pocket.
 - D. Slip in all bore components as a subassembly.
 - E. Fit insert retainer and override lever assembly in nested position with manual override and tighten the two (2) screws to 0.5 to 0.7 N•m (4 to 6 in-lbs) torque.
4. Reassemble solenoid cover with armature and spring then tighten the two (2) cover/body screws to 2.3 to 2.8 N•m (20 to 25 in-lbs) torque.
5. Turn on air pressure and electrical power source. Test valve for functional operation and for internal and external leakage. If leakage is audible do not operate - conduct repairs again.

Instructions for converting NC to NO:

Selector plates (item #16) can be changed to change the valve function. Remove the valve body assembly from the base by removing the two (2) body/manifold screws. Remove the existing selector plate. Place the new selector plate with the appropriate function into the cavity in the valve body assembly. The function can be read on this selector plate when viewed from the side opposite the cavity. Replace the valve body assembly and selector plate on the manifold base. Reinstall the two screws and tighten to 16 to 20 in-lbs torque. Turn on air pressure and electrical power source. Test valve for proper functional operation and for internal and external leakage.

Assembly Hint:

When assembling valves to form a manifold assembly, install tie rods into the threaded end plate and build up in a vertical fashion. Tie rod screws must be tightened to 4.5 to 5.1 N•m (40 to 45 in-lbs) torque. Turn on air pressure and electrical power source. Test valve for proper functional operation and for internal and external leakage.

Refer to Instruction Sheet V-353BP for additional information.



Pneumatic Division North America
Richland, Michigan 49083

Installation Instructions: V-353BP

Assembly Procedure:

"BL" Series

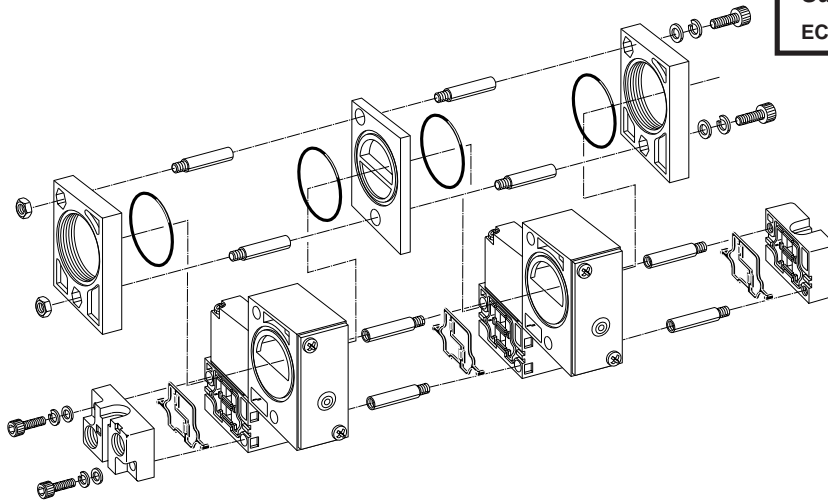
1/8" and 1/4" Stacking Valve

1/8" Manifold Mounted Valve

ISSUED: October, 1999

Supersedes: October, 1997

ECN# P27372



Stacking Valve

Stacking End Plate Kit PS2703P

Each kit contains a Right and Left side plate, (item #1) Stacking Seal, (item #2) Tie Rod Screws, (item #2) Lockwashers, (item #2) Flat Washers.

Common Conduit End Plate Kit PS2711P

Each kit contains (item #2) Common Conduit End Plates, (item #1) Conduit Box Interface o-ring, (item #2) Tie Rod Screws, (item #2) Lockwashers, (item #2) Flat Washers.

Stacking Valve Assembly Procedure:

1. Pre-assemble tie rods and screw into end plate with seal track.
2. Place the end plate with the seal track facing upward and install seal.
3. Slide the first valve over tie rods mating the valve flat surface against the seal surface. Refer to NOTE for proper positioning of valve body seal.

NOTE: The function of each valve is determined by installation of the valve body seal: For 3-way, normally closed (3 N.C.) operation, install seal with the tab in the function slot marked N.C. on the valve body. For 3-way normally open (3 N.O.) operation, install seal with the tab in the function slot marked N.O. on the valve body.

4. Proceed with assembly of the remaining seals and valves, following the valve body seal installation NOTE.
5. Assemble the remaining end plate with the flat washers, lock washers and tie rod screws, and tighten to 4.5 to 5.1 N•m (40-45 in-lbs) torque.
6. Make plumbing and electrical connections.

⚠ CAUTION: This valve contains solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

1. If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating

of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.

2. Operating voltage is 85-110% of rated voltage. These limits should not be exceeded.



CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

7. Turn on air pressure and electrical power source. Test for proper functional operation and for internal and external air leakage.

Refer to Maintenance Bulletin V-351P for additional installation and service information.

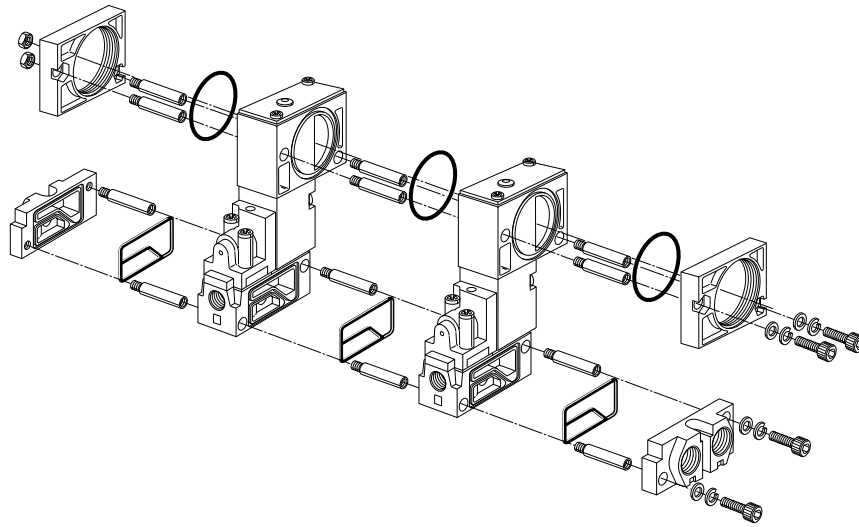


FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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

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

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.



Plumbing Connection

Function	Port 1	Port 2	Port 3
3-Way, Normally Closed	Inlet	Outlet	Exhaust
3-Way, Normally Open	Inlet	Outlet	Exhaust

Manifold Mounted Valve

Manifold End Plate Kit PS2705P

Each kit contains a Right and Left Side Plate, (item #1) Manifold Seal, (item #2) Tie Rod Screws, (item #2) Lockwashers, (item #2) Flat Washers.

Common Conduit End Plate Kit PS2711P

Each kit contains (item #2) Common Conduit End Plates, (item #1) Conduit Box Interface o-ring, (item #2) Tie Rod Screws, (item #2) Lockwashers, (item #2) Flat Washers.

Manifold Valve Assembly Procedure:

1. Pre-assemble tie rods and screw into end plate with seal track.
2. Place the end plate with the seal track facing upward and install seal.
3. Arrange valves in order of assembly by their predetermined functional operation.

NOTE: The valves function identification can be found on the tab of the selector plate located between the valve body and manifold base. The wording on the selector plate is as follows:

- 2-Way Normally Closed - 2-Way N.C.
- 2-Way Normally Open - 2-Way N.O.
- 3-Way Normally Closed - 3-Way N.C.
- 3-Way Normally Open - 3-Way N.O.

4. Slide the first valve over tie rods mating the manifold flat surface against the seal surface.

5. Proceed with assembly of the remaining seals and valves.
6. Assemble the remaining end plate with the flat washer, lock washers and tie rod screws, and tighten to 4.5 to 5.1 N•m (40 to 45 in-lbs) torque.
7. Make plumbing and electrical connections.

⚠ CAUTION: This valve contains solid state components that can be damaged by transient voltage spikes, over-voltage or high temperature. To protect against premature solenoid failure, please read and adhere to the following:

1. If this solenoid operated valve is used in a circuit with other inductive loads. The solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has a minimum rating of 1.6 times the rated voltage of the solenoid valve and sufficient capacity to dissipate the energy of other inductive loads.
2. Operating voltage is 85-110% of rated voltage. These limits should not be exceeded.
8. Turn on air pressure and electrical power source. Test for functional operation and for internal and external air leakage.

Refer to Maintenance Bulletin V-352P for additional service information.

Plumbing Connection

Function	Port 1	Port 2	Port 3
3-Way, Normally Closed	Inlet	Outlet	Exhaust
3-Way, Normally Open	Inlet	Outlet	Exhaust
2-Way, Normally Closed	Inlet	Outlet	
2-Way, Normally Open	Inlet	Outlet	



Pneumatic Division
Richland, Michigan 49083
269-629-5000

PDNSG-1

Pneumatic Division Safety Guide

ISSUED: August 1, 2006

Supersedes: June 1, 2006

Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

⚠ WARNING:

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
 - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
 - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
 - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
 - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
 - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
 - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
 - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

Pneumatic Division Safety Guide

2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
 - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
 - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
 - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
 - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
 - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
 - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
 - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
 - Government and / or industrial standards.
 - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
 - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
 - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
 - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
 - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
 - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.