



Pneumatic Division
Richland, Michigan 49083

**Installation & Service Instructions:
V671BP**

“MK” Series Air Control Valves
1/8" Inline & Subbase, 3/2 & 4/2

ISSUED: September, 2006
Supersedes: June, 2001

DOC.# V-671P, ECN# 060870 Rev. 3

⚠ 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.

Safety Guide

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: www.parker.com/safety

Introduction

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

VALVE IS NOT DESIGNED FOR FIELD SERVICE

Application Limits

These products are intended for use in general purpose compressed air systems only.

Operating Pressure:	kPa	PSIG	bar
Maximum	827	120	8.27
Minimum	0	0	0

Ambient Temperature Range: -15°C to 60°C (5°F to 140°F)

Voltage Range: 85-110% of rated voltage. These limits should not be exceeded.

EXCEPTION: The 47 and 48 voltage code rated Valves may be operated at 70-125% of the rated voltage (3/2 valves only).

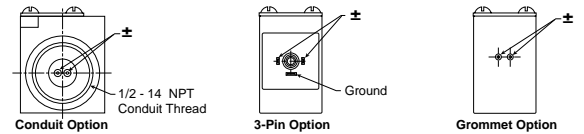
⚠ CAUTION: An interruption of 10 milliseconds or greater to the power supplied to the solenoid of a solenoid operated valve may cause the valve to shift. Provision must be made to prevent power interruption of this duration to avoid unintended, potentially hazardous, consequences.

⚠ 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:

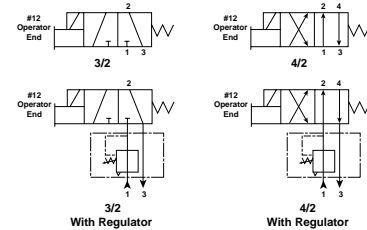
If this solenoid operated valve is used in a circuit with other inductive loads, the solenoid should be electrically protected with a voltage suppression device (e.g. transient voltage suppressor or varistor) that has

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.

Wiring Detail



Symbols



3-Way Options	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

4-Way Options	Port No.			
	1	2	3	4
Normal Function	Inlet	Cylinder	Exhaust	Cylinder
4-Way used as 3-Way, NC	Inlet	Plug	Exhaust	Cylinder
4-Way used as 3-Way, NO	Inlet	Cylinder	Exhaust	Plug

Subbase Valve Assembly

1. Install the Selector Plate (Item 2) on top of the manifold and push the projections into their appropriate holes.
2. Place the valve on the selector plate. Install the two Socket Head Cap Screws (Item 1) provided and tighten to .7 to 1.1 Nm (6 to 10 in-lb) torque using a 2.5mm hex wrench.

⚠ 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.

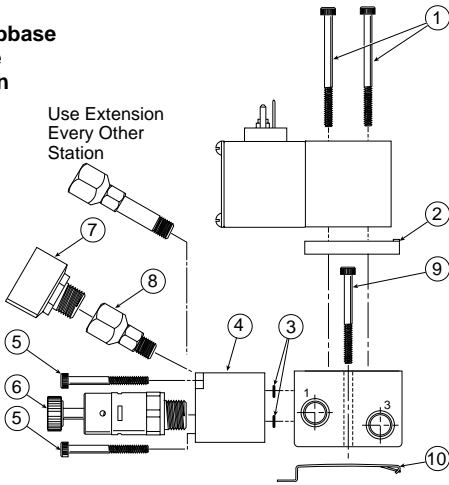
This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences 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.

- When DIN Rail Mounting Bracket is provided: install Screws (Item 9) through the Manifold and secure the DIN Rail Connecting Bracket (Item 10) on both ends of the Manifold.
- When Regulator Kit is provided: Install the two O-rings provided (Item 3) into the slots on the Regulator Housing (Item 4). Install the Regulator Housing (Item 4) using the two Mounting Screws (Item 5) and tighten to .7 to 1.1 Nm (6 to 10 in-lb) torque using a 2.5mm hex wrench. Install the Regulator (Item 6) into the Housing (Item 4) and torque to 1.7 to 2.3 Nm (15 to 20 in-lb).
- When Gauge Kit is provided: Install the appropriate Pipe Fitting (Item 8) into the Regulator Housing (Item 4) Install the Gauge (Item 7) on to the Pipe Fitting.
- Test valve for functional operation and for internal and external leakage. If leakage is audible (likely indicating improper assembly) do not operate – conduct assembly again.

MK 3/2 Subbase Valve Shown



Recommended Lubricant

If in-service lubricant is used, F442 oil is recommended. F442 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.

Subbase Kits Available

Kit No.	Description
PS2105P.....	3/2 NC Selector Plate Kit
PS2106P.....	3/2 NO Selector Plate Kit
PS2109P.....	Regulator Blanking Plate Kit
PS2131122P.....	Regulator Kit Without Gauge, 2-60 PSI
PS2131133P.....	Regulator Kit Without Gauge, 5-125 PSI
PS2131155P.....	Regulator Kit With Gauge, 2-60 PSI
PS2131166P.....	Regulator Kit With Gauge, 5-125 PSI
PS2188P.....	Valve to Subbase Bolt Kit
PS2194P.....	3/2 Subbase Blanking Plate Kit
PS219401P.....	4/2 Subbase Blanking Plate Kit
PS2195P.....	10-32 Extension Kit (10 / Kit)
PS2196P.....	Swivel Adapter Kit (5 / Kit)

Instructions for Converting NC to NO - 3/2 Valves Only

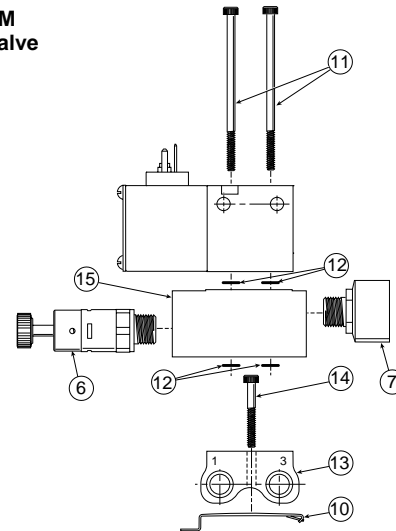
Selector Plates (Item 2) can be changed to convert function. Remove the Valve Body Assembly from the Base by removing the two Body / Manifold Screws (Item 1). Remove the existing Selector Plate (Item 2). Place the new Selector Plate with the appropriate function on the Subbase. The function can be read on this Selector Plate when viewed from the side opposite the Solenoid. Replace the Valve Assembly on the Selector Plate. Reinstall the two Screws (Item 1) and tighten .7 to 1.1 Nm (6 to 10 in-lb) torque. Turn on air pressure and electrical power

source. Test valve for proper functional operation and for internal and external leakage.

Inline Valve on Inlet / Exhaust Manifold Assembly

- Install two of the four O-rings (Item 12) in the counterbores on top of the Manifold.
- Place the Valve on the Manifold. For normally closed operation (3/2 Valves), line up the Solenoid end of the Valve with the Port 1 on the Manifold. For normally open operation (3/2 valves only), line up the Solenoid end of the Valve with the Port 3 on the manifold. Install the two Socket Head Cap Screws (Item 11) provided and tighten to 1.5 to 1.9 Nm (13 to 17 in-lb) torque using a 2.5mm hex wrench. For 4/2 valves, the Solenoid end on the Valve must always line up with Port 1 of the Manifold.
- When DIN Rail Mounting Bracket is provided, install Screws (Item 14) through the Manifold and secure the DIN Rail Connecting Bracket (Item 10) on both ends of the Manifold.
- When Sandwich Regulator Kit is provided: Install the Sandwich (Item 15) on top of the Manifold (Item 13). Line up Port 1 on the Manifold with the Regulator end of the Sandwich. Install the remaining two of the four O-rings provided (Item 12) into the slots on top of the Sandwich. Install the two Mounting Screws (Item 11) and tighten to 1.5 to 1.9 Nm (13 to 17 in-lb) torque using a 2.5mm hex wrench. The 3-Way valve can be oriented as described in paragraph (2) for NO or NC operation. Install the Regulator (Item 6) into the Sandwich (Item 15) and torque to 1.7 to 2.3 Nm (15 to 20 in-lb).
- When Gauge is provided: Install the Gauge (Item 7) directly into the Sandwich Regulator Housing (Item 15), or install Pipe Nipples (Item 8) (Items not shown) to Gauge port then to Gauge. Gauge diameter is larger than Regulator width, so Gauge mounting must be staggered.
- Test valve for functional operation and for internal and external leakage. If leakage is audible (most likely indicating improper assembly) do not operate – conduct assembly again.
- When Selector Sandwich is required, install similar to Item 15. The Selector Sandwich allows selective isolation of either the inlet or exhaust or both, when Sandwich is between valve and IEM.

MK 3/2 IEM Assembly Valve Shown



IEM Kits Available

Kit No.	Description
PS2130122P	Regulator Kit Without Gauge, 2-60 PSI
PS2130133P	Regulator Kit Without Gauge, 5-125 PSI
PS2130155P	Regulator Kit With Gauge, 2-60 PSI
PS2130166P	Regulator Kit With Gauge, 5-125 PSI
PS2144P	Selector Sandwich Kit
PS2166P	3/2 or 4/2 IEM NPT Ported Blanking Plate Kit
PS2169P	3/2 or 4/2 IEM Blanking Plate Kit
PS2184P	3/2 or 4/2 Valve to IEM O-Ring Kit (10 / Kit)
PS2187P	3/2 or 4/2 Valve to IEM Bolt Kit (10 / Kit)
PS2190P	Din Rail Mounting Kit, Subbase & IEM



Pneumatic Division
Richland, Michigan 49083
269-629-5000

PDNSG-1

Pneumatic Division Safety Guide

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

⚠ WARNING:

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

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

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

1. GENERAL INSTRUCTIONS

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

2. PRODUCT SELECTION INSTRUCTIONS

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

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- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
 - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
 - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

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

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
 - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
 - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
 - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
 - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.
- Caution: Leak detection solutions should be rinsed off after use.**
- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
 - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
 - Government and / or industrial standards.
 - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
 - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
 - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
 - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
 - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
 - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.