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Pneumatic Division
Richland, Michigan USA
www.parker.com/pneumatics

(11-18-2011)

DIRECTAIR 4 VALVE SERIES

INDEX

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Pneumatic Division
Richland, Michigan 49083

Installation & Service Instructions
V623BP

52 Series Air Control Valves

ISSUED: September, 2006
Supersedes: September, 2002

Doc.# V-623P, ECN# 060870, Rev. 8

⚠ 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.

Application Limits:

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

Operating Pressure Range:	**kPa**	**PSIG**	**bar**
Minimum* (Double Solenoid)	138	20	1.38
Minimum* (Single Solenoid)	241	35	2.41
Minimum (Remote Pilot)	Vac	Vac	Vac
Minimum (Manual / Mechanical)	Vac	Vac	Vac
Maximum	1034	150	10.34

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

External Pilot Pressure Range:	**kPa**	**PSIG**	**bar**
Minimum (Double)	138	20	1.38
Minimum (Single)	241	35	2.41
Maximum	1034	150	10.34

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

Voltage Range: +10% to –15% of rating

Port Identification / Connections:

Install valve in circuit per one of the following ANSI diagram (ports marked on valve or subbase):

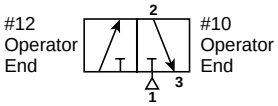
Port Identification

3-Way Service	
Port No.	**Function**
1	Inlet
2	Cylinder
3	Exhaust
10	Remote Pilot
12	Remote Pilot

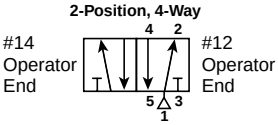
Port Identification

4-Way Service	
Port No.	**Function**
1	Inlet
2	Cylinder
3	Exhaust
4	Cylinder
5	Exhaust
12	Remote Pilot
14	Remote Pilot

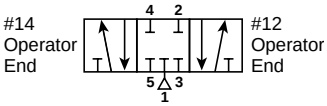
2-Position, 3-Way



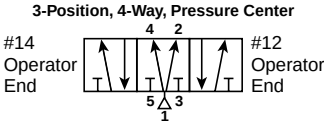
2-Position, 4-Way



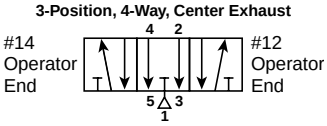
3-Position, 4-Way, All Ports Blocked



3-Position, 4-Way, Pressure Center



3-Position, 4-Way, Center Exhaust



Function	**Port #**				
	1	**2**	**4**	**3**	**5**
4-Way, Single Pressure	Inlet	Cyl.	Cyl.	Exh.	Exh.
4-Way, Dual Pressure	Exh.	Cyl.	Cyl.	Inlet 1	Inlet 2
3-Way, Normally Closed	Inlet	Cyl.	—	Exh.	—
3-Way, Normally Open	Exh.	Cyl.	—	Inlet	—
3-Way, Diverter	Out 1	Inlet	—	Out 2	—
3-Way, Selector	Inlet 1	Out	—	Inlet 2	—
2-Way, Normally Closed	Inlet	Out	—	Plug	—
2-Way, Normally Open	Plug	Out	—	Inlet	—

NOTE: All 2 & 3-Way functions may use 3-Way bodies (*24** ****). 4-Way bodies may be field converted to 2 & 3-Way functions by plugging ports.

⚠ 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.

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

Installation & Operating Instructions:

Valve should be installed with reasonable accessibility for service whenever possible – repair service kits are available. Keep pipe or tubing lengths to a minimum with inside clean and free of dirt and chips. Pipe joint compound should be used sparingly and applied only to the male pipe, never to the female port. Do not use PTFE tape to seal pipe joints – pieces have a tendency to break off and lodge inside the unit, possibly causing malfunction.

Air to the valve must be filtered to realize maximum component life.

⚠ **CAUTION: It is recommended that double solenoid and double remote air pilot operated valves be mounted so that the axis of the valve spool is in the horizontal plane. The valve may be rotated 360° around the axis for mounting convenience.**

Life Expectancy – Normal multi-million cycle life expectancy of these valves is based on the use of properly filtered air at room temperature.

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

Recommended Lubricant – Use F442 oil. This oil is specially formulated to provide peak performance and maximum service life from all air operated equipment. Otherwise, use a straight paraffin base mineral oil of viscosity 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 additive.**

⚠ **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.**

Wiring Instructions:

Solenoid operators are on the same end as depicted in the ANSI diagrams. Either wire may be “Hot”.

NOTE: In addition to above instructions, follow all requirements for local and national electrical codes.

Subbase Port Connections:

1. Connect inlet air supply to Port 1.
2. Connect mufflers (or plumb exhaust) to Ports 3 and 5.
3. Connect cylinder Ports 2 and 4 to ends of cylinder or other device to be supplied with air.
4. For pilot operated valves connect pilot signal air to Ports 12 and 14.

Conversion Procedures:

Normally Closed 3-Way to Normally Open

1. Remove four phillips-head screws from each end section and detach.
2. While holding body assembly by the bushings, slide the spool out of the body assembly. Reverse the spool end-for-end and replace it in body assembly.
3. Reassemble end sections to opposite ends of body from which they were removed. Tighten screws 1.5 to 2.0 Nm (13 to 18 in-lbs).

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 and rubber disc from solenoid end(s).
2. Remove four phillips-head screws holding solenoid actuating end(s) to body.
3. Replace the o-ring with the rubber disc on the exposed end of valve body (disc over thru hole).
4. Reassemble solenoid end section(s) to body. Tighten screws 1.5 to 2.0 Nm (13 to 18 in-lbs).
5. Attach external pilot supply line(s) (35 PSIG min.) where the 1/8" pipe plug(s) were removed.

Service Kits:

Valve Seal Kit
(Contains all seals found in 3 & 4-Way bodies and all actuator styles) 52000 8050
(Fluorocarbon) 52000 8500

Body Service Kit (Contains bushings, springs, retainers and shells for all body styles) 52001 8005

⚠ **CAUTION: Foot operated valves must be protected against inadvertent operation that can cause serious bodily injury. Use of a pedal guard is strongly recommended as it will reduce the likelihood of inadvertent operation. If this is not suitable in your application, utilize equivalent protection.**

Parker Pneumatic

Pneumatic Division North America
Richland, Michigan 49083

Installation Instructions:
V-625P

Foot Guard Kit No. 52071-8001

ISSUED: April, 1999
Supersedes: 52071-7006 June, 1998

ECN# 9071

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- **Service according to procedures listed in these instructions.**
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Installation Instructions:

1. Place foot guard over valve and align with holes as illustrated.
2. Install three screws with nuts (furnished in guard kit) and tighten.

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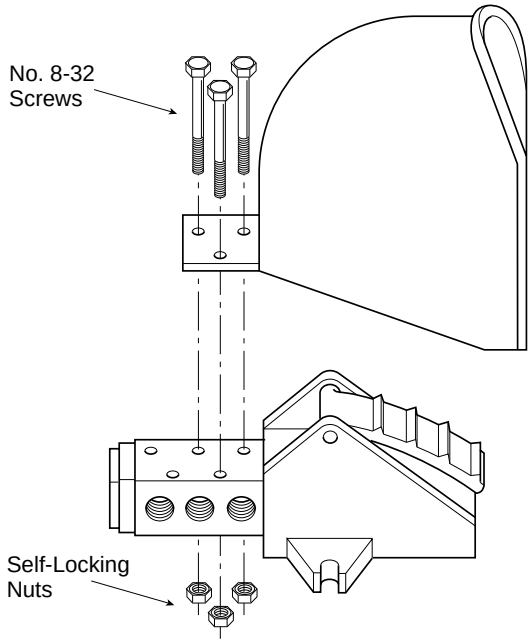
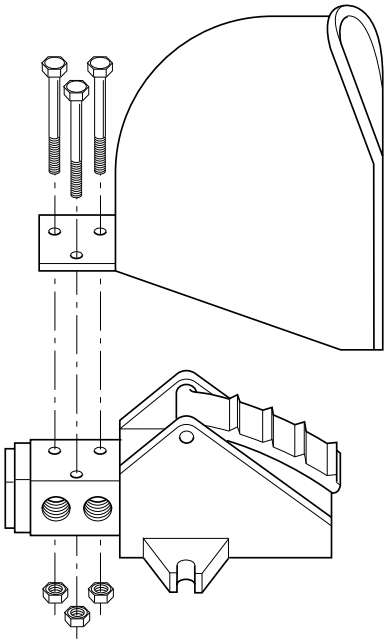
⚠ **Caution: This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.**

4-Way Valves



3-Way Valves



Pneumatic Division
Richland, Michigan 49083

Service Instructions: V-626CP

52 Series Air Control Valves

ISSUED: September, 2002
Supersedes: December, 1999

Doc.# V-626P, ECN# P28780, Rev. 6

⚠ WARNING

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

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Application Limits:

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Operating Pressure Range:	**kPa**	**PSIG**	**bar**
Minimum* (Double Solenoid)	138	20	1.38
Minimum* (Single Solenoid)	241	35	2.41
Minimum (Remote Pilot)	Vac	Vac	Vac
Minimum (Manual / Mechanical)	Vac	Vac	Vac
Maximum	1034	150	10.34

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

External Pilot Pressure Range:	**kPa**	**PSIG**	**bar**
Minimum (Double)	138	20	1.38
Minimum (Single)	241	35	2.41
Maximum	1034	150	10.34

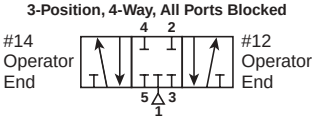
Ambient Temperature Range: 0°C to 80°C (32°F to 175°F)
Voltage Range: +10 to -15% of rating

Wiring Instructions:

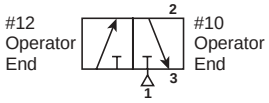
Solenoid operators are on the same end as depicted on the ANSI diagrams. Either wire may be "Hot".

NOTE: In addition to the above instructions, follow all requirements for local and national electrical codes.

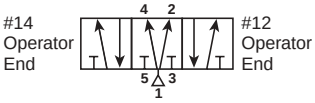
3-Position, 4-Way, All Ports Blocked



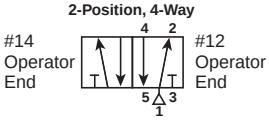
2-Position, 3-Way



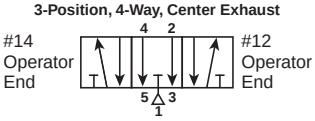
3-Position, 4-Way, Pressure Center



2-Position, 4-Way



3-Position, 4-Way, Center Exhaust



Conversion Procedures

Normally Closed 3-Way to Normally Open

1. Remove four phillips-head screws from each end section and detach.
2. While holding body assembly by the bushings, slide the spool out of the body assembly. Reverse the spool end-for-end and replace it in body assembly.
3. Reassemble end sections to opposite ends of body from which they were removed. Tighten screws 1.5 to 2.0 Nm (13 to 18 in-lb).

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 and rubber disc from solenoid end(s).
2. Remove four phillips-head screws holding solenoid actuating end(s) to body.
3. Replace the o-ring with the rubber disc on the exposed end of valve body (disc over thru hole).
4. Reassemble solenoid end section(s) to body. Tighten screws 1.5 to 2.0 Nm (13 to 18 in-lb).
5. Attach external pilot supply line(s) (35 PSIG min.) where the 1/8" pipe plug(s) were removed.

Service Procedures

NOTE: All cleaning of parts to be done with mineral spirits or equivalent cleaning solution. Grease should be a PTFE based lubricant (Accrolube®). All parts showing nicks, scratches or other signs of wear or damage should be replaced.

1. Mark end sections to ensure re-assembly on the proper end. Remove four phillips-head screws from each end section and detach. Remove spring (where applicable).

REFER TO FIGURE A FOR STEPS 2 THROUGH 8.

2. **3-Position Valves Only -** Compress the retainer with groove **(F)** and spring **(C)** then remove clip **(E)**. Disassemble the retainers, spring and spool **(H or K)** and clean. If damaged, replace retainers, spring and clip from the body service kit. Reassemble to spool with clip **(E)** facing retainer with groove **(F)**.

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3. Remove spool or spool assembly **(H, J, K or L)** and clean. Note which end spring or spring bore in spool was on.
4. Remove bushings **(M)**, o-rings **(P)** and shells **(N)**. Discard o-rings. Clean bushings, shells and body.
5. Apply grease to the body bore and o-rings **(P)**. Sandwich an o-ring between each shell and slide assembly into body bore. Insert another o-ring and a bushing into each end of body.
6. While holding body assembly by the bushings, slide spool into body with spring or spring bore on same end as prior to disassembly.
7. **Base Mounted Valves Only -** Remove valve from subbase or manifold by loosening valve mounting screws. Remove and discard o-rings **(Q & R)**. Lightly grease new o-rings and place in counterbores. Reassemble body to subbase or manifold by tightening screws 1.5 to 2.0 Nm (13 to 18 in-lb).
8. Replace o-rings and/or washer **(S)** found in ends of body. Thru hole in body requires an o-ring for internally piloted valves, a washer for externally piloted valves. A light coating of grease will ensure sealing/retention.
9. **All Solenoid and Pilot Actuator End Sections (Figs. B - C)**:
   a. Remove the piston **(A)** with needlenose pliers. Remove lipseal **(B)** on piston **(A)** and discard. Clean and inspect the bore. Replace end section if required. Replace lipseal with new seal (lightly coated with grease).
   b. Remove override **(C)** and clean. Lubricate and reassemble override.
   c. Reassemble piston. Grooved end of lipseal and hollow end of piston must face bottom of bore.
10. Re-install end sections and torque four phillips-head screws 1.5 to 2.0 Nm (13 to 18 in-lb). For spring return valves, install spring end first, followed by the operating end section. Hold the operating end section down while torquing screws.
11. **Conduit Style Solenoid Operator (Fig. C) -** Remove hex nut **(K)** and washer **(L)** from top of operator and remove coil **(E)**. Remove the plunger guide **(F)**, spring **(G)**, o-ring **(J)** and plunger **(H)**, using spanner wrench 740007100B. Clean all parts taking special care to remove all foreign matter from seat areas. Replace coil, plunger and guide, or entire operator. Assemble parts in reverse order of disassembly. Tighten hex nut 2.3 to 2.8 Nm (20 to 25 in-lb).

CHART A: Replacement Coils

[Only Available for "B" Level Solenoid Valves (Ex. 520001115B)]

Voltage & Frequency	Class "F" Coil Conduit	Class "F" Hazardous Duty
24V 60 Hz	PS3914XXX13P	PS3916XXX13P
120V 60 Hz, 110V 50Hz	PS3914XXX15P	PS3916XXX15P
240V 60 Hz, 220V 50Hz	PS3914XXX16P	PS3916XXX16P
12VDC	PS3914XXX22P	PS3916XXX22P
24VDC	PS3914XXX23P	PS3916XXX23P
Voltage & Frequency	**Class "H" Coil Conduit**	**Class "H" Hazardous Duty**
24V 60 Hz	PS3914XXX93P	PS3916XXX93P
120V 60 Hz, 110V 50Hz	PS3914XXX95P	PS3916XXX95P
240V 60 Hz, 220V 50Hz	PS3914XXX96P	PS3916XXX96P
120VDC	PS3914XXX05P	PS3916XXX05P

CHART B: Solenoid Replacement Parts

(Coil with Plunger and Guide Assembly)

Voltage & Frequency	Class "F" Coil Conduit	Class "F" Hazardous Duty
24V 60 Hz	PS393434113P	PS393634113P
120V 60 Hz, 110V 50Hz	PS393434115P	PS393634115P
240V 60 Hz, 220V 50Hz	PS393434116P	PS393634116P
12VDC	PS393434122P	PS393634122P
24VDC	PS393434123P	PS393634123P
Voltage & Frequency	**Class "H" Coil Conduit**	**Class "H" Hazardous Duty**
24V 60 Hz	PS393434293P	PS393634293P
120V 60 Hz, 110V 50Hz	PS393434295P	PS393634295P
240V 60 Hz, 220V 50Hz	PS393434296P	PS393634296P
120VDC	PS393434205P	PS393634205P

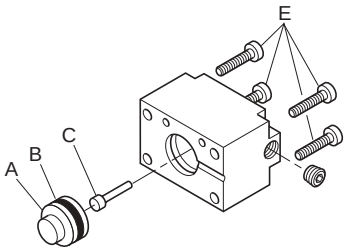


Figure B

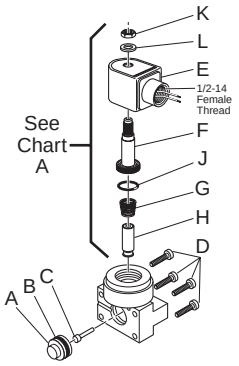
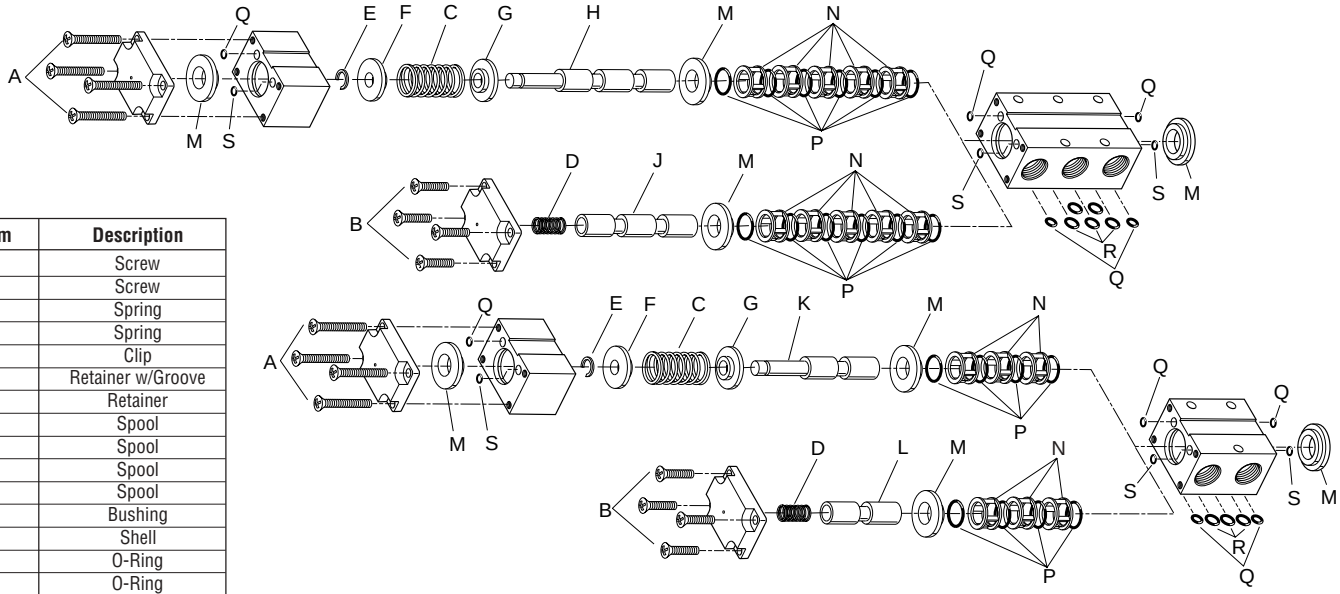


Figure C



Item	Description
A	Screw
B	Screw
C	Spring
D	Spring
E	Clip
F	Retainer w/Groove
G	Retainer
H	Spool
J	Spool
K	Spool
L	Spool
M	Bushing
N	Shell
P	O-Ring
Q	O-Ring
R	O-Ring
S	O-Ring

Figure A
3 & 4-Way Body Assemblies

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

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

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

1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

1.2. Fail-Safe: Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.

1.3 Relevant International Standards: For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See www.iso.org for ordering information.

1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
- Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
- Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Flow Rate: The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

2.2. Pressure Rating: Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

2.3. Temperature Rating: Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

2.4. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.5. Lubrication and Compressor Carryover: Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

2.6. Polycarbonate Bowls and Sight Glasses: To avoid potential polycarbonate bowl failures:

- Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
- Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
- Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.

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

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

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.

4.3. Lockout / Tagout Procedures: Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)

4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

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

4.5. Routine Maintenance Issues:
- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
- Government and / or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
- Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.