Air Preparation Products
Filters, Regulators, Lubricators, & Airline Accessories
Catalog 0700P-E

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding
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# Air Preparation Products

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Relief Valve
Precision
Vacuum
Regulator
Precision
Filter /
Regulator
Input Signal
Amplifier

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Input Signal Amplifier ..............................E28-E29
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BOLD ITEMS ARE MOST POPULAR.
Precision Regulators

• Pipe Sizes 1/4 thru 2 Inch
• Flows to 150 SCFM
• Pressures to 500 PSIG

Air regulators are designed to provide quick response and accurate pressure regulation for the most demanding industrial applications.

• Precision 27R Series, 1/4 Inch
• Precision 27E Series, 1/4 Inch
• Dial Regulator 51R Series, 1/4 Inch
• Dial Regulator 52R Series, 1/4 thru 3/4 Inch
• Dial Regulator 53R Series, 3/4, 1 and 1-1/4 Inch
• Dial Regulator 54R Series, 1-1/2 and 2 Inch
• Compact High Precision P3RA302 Series, 1/4 Inch
• Standard High Precision P3RA102 Series, 1/4 Inch
• High Precision Relief Valve P3RA102BP Series, 1/4 Inch
• High Precision Vacuum Regulator P3RA171 Series, 1/4 Inch
• Precision Filter / Regulator P3EA632 Series, 1/4 Inch
• Precision Pneumatic Input Signal Amplifier P3BA208 Series, 1/4 Inch
• Precision Pneumatic Input Signal Amplifier P3BA45 Series, 1/2 and 3/4 Inch

Regulator Selection

1. Determine maximum system flow requirements.
2. Determine maximum allowable pressure drop at rated flow in SCFM.
3. Refer to flow chart and select regulator by choosing the curve that offers minimum pressure drop at desired flow in SCFM.

Reading Flow Charts to Size Regulators

Once the required flow is determined for a pneumatic application the regulator or filter/regulator can be selected by using the flow chart. The chart serves two different purposes. To read the flow, use the right side of the chart. To read the relief characteristics use the left side of the chart. When reading the flow chart, first determine the secondary pressure that will be used. Find the appropriate pressure curve on the graph. Given an acceptable pressure drop for an application, follow the flow curve until it intersects the pressure drop point. This will give the flow at that particular pressure drop.

WARNING
Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

CAUTION:
REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.
Dial Regulator
The Dial Regulator is a constant bleed, piston operated regulator. The pilot controlled pressure reducing valve provides exceptionally high air flow with steady pressure control and minimal secondary pressure drop. The non-rising adjustment knob provides quick selection of the desired secondary pressure in less than one full turn. The adjustment knob also can serve as the pressure indicator thereby eliminating the need for a pressure gauge. This regulator is specifically designed for applications requiring more accurate air circuit control, high air flow capacity with flat performance curves and quick regulator adjustment. The regulator can be used as a conventional regulator for standard air circuits or as a pilot regulator to provide pressure to the control chamber of a pilot operated (slave) regulator.

Operation
To set the regulator, turn the large dial adjustment knob to the desired secondary set pressure. This opens the pilot valve seat allowing air flow into the control chamber which forces the lower piston downward against the relief seat and opens the main valve. At the same time, the air in the control chamber forces the upper piston upward against Belleville springs which closes the pilot valve seat when the set pressure is attained. Secondary pressure in the chamber is now balanced against the control pressure through the lower piston. If demand flow increases, the constant control pressure will force the lower piston and the main valve further downward, and allow more flow downstream. A higher than desired secondary pressure will force the lower piston upward, closing the main valve seat and opening the main relief valve seat thereby allowing air to relieve to the atmosphere. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.
Precision Regulators Application Guide

Pneumatic pressure regulators are designed to provide a constant pressure output from a fluctuating supply pressure—much the way an electronic voltage regulator works. Pressure regulators provide varying degrees of accuracy with regard to their reduced pressure output. General Purpose pressure regulators work for most fluid power applications. However, for more pressure-critical applications precision regulators can provide the customer with the control they need.

A partial listing of things that can potentially cause regulator output pressure variation are:

- Temperature changes
- Inlet pressure changes
- Variations in flow
- Excess downstream pressure
- Cycling
- Time
- Leakage

Who needs precision regulators?

**Design level applications:**
When designing a pneumatic system it is important to determine not only the air flow that the application will require but also the acceptable level of pressure variation. Some pneumatic applications cannot tolerate fluctuations in pressure. These applications can include static situations with only a steady pressure maintained, or dynamic flow situations involving any number of changing variables in play while trying to maintain a constant pressure.

**Problem solving device for existing applications:**
Sometimes an existing pneumatic application does not meet the customer’s needs with regards to pressure control and/or stability. Any or all of the variables listed above can cause issues with pressure stability. As applications are expanded, added on to, or modified the pressure and flow requirements can change.

How do precision regulators differ from general purpose pneumatic regulators?

<table>
<thead>
<tr>
<th>Examples</th>
<th>High Precision Regulators</th>
<th>Precision Regulators</th>
<th>General Purpose Regulators</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensitivity: Reduced pressure repeatability/variation under no-flow condition</td>
<td>.005 to .010 PSIG (.1/8” to 1/4” of water column)</td>
<td>1 to 2 PSIG</td>
<td>3 to 4 PSIG</td>
</tr>
<tr>
<td>Regulator’s ability to control back pressure accurately: *key for cylinder applications</td>
<td>Begins to relieve at .005 to .010 PSIG overpressure</td>
<td>Begins to relieve at .5 to 2 PSIG overpressure</td>
<td>Begins to relieve at 5 to 10 PSIG overpressure</td>
</tr>
<tr>
<td>Regulator’s ability to maintain set pressure under varying flow, input pressure, temperature conditions:</td>
<td>High</td>
<td>Medium</td>
<td>Standard</td>
</tr>
<tr>
<td>Constant Bleed - does the regulator constantly bleed a small volume of air to the atmosphere to maintain stability?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

1” Water Column = .0360 PSI
1PSI = 27.7612 Inches Water Column
## Application Chart

### Original Equipment Manufacturers (OEMs)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>User/Role Description</th>
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<tbody>
<tr>
<td>Air Gauging</td>
<td>Manufacturers of Air Gauging Equipment.</td>
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<tr>
<td>Anesthesia Equipment</td>
<td>Manufacturers</td>
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<tr>
<td>Calibration Stands</td>
<td>Similar to Test Stands</td>
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<tr>
<td>Clamping Pressure Control</td>
<td>End Effect Grippers, Roll Loading</td>
</tr>
<tr>
<td>Control Panels</td>
<td>Manufacturers and Users</td>
</tr>
<tr>
<td>Coordinate Measuring Machines</td>
<td>Manufacturers use in Force Counterbalance Applications in Z-axis</td>
</tr>
<tr>
<td>Dispensing Equipment</td>
<td>Adhesive, Paint, or any other form of Liquid or Gas</td>
</tr>
<tr>
<td>Food Process Machinery</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Gas Analyzers</td>
<td>Used for Reference and Calibration Air Pressures</td>
</tr>
<tr>
<td>Ink or Paint Robotics Spraying Systems</td>
<td>Manufacturers use to Maintain an Even Pressure on System</td>
</tr>
<tr>
<td>Leak Testing Equipment</td>
<td>Manufacturers of Equipment that Detects Leaks (i.e., Plastic Bottles)</td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>Manufacturers that Utilize for Blood Processing and Sampling as Examples</td>
</tr>
<tr>
<td>Oxygen Ventilators</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Pharmaceutical Process Machinery</td>
<td>Pill or Tablet Making Machines</td>
</tr>
<tr>
<td>Phone Cable Pressurization Systems</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Polishing Machinery</td>
<td>Used to Maintain Even Pressure on Polishing Head</td>
</tr>
<tr>
<td>Semi-conductor Manufacturing Machinery</td>
<td>Manufacturers</td>
</tr>
<tr>
<td>Smoke Stack Analyzers</td>
<td>Used for Reference and Calibration Air Pressures</td>
</tr>
<tr>
<td>Soil or Environmental Analysis Equipment</td>
<td>Used for Reference and Calibration Air Pressures</td>
</tr>
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<td>Tank Blanketing</td>
<td>Maintain Pressure on Top Level of a Tank or Storage Vessel</td>
</tr>
<tr>
<td>Test Equipment</td>
<td>Similar to Test Stands</td>
</tr>
<tr>
<td>Test Stands</td>
<td>Manufacturers of Test Stands, Laboratory Test Stands, Engineering Test Stands, Production Test Stands</td>
</tr>
<tr>
<td>Tool Balancers</td>
<td>Manufacturers of Tool Balancers, Manipulators, and Articulating Arms use High Relief Capacity Precision Regulators in a Force-balancing Application. Used as part of a Pneumatic Counter-balance System, the Regulator helps suspend the tool in the air and then makes it easy to move out of the way when not in use.</td>
</tr>
</tbody>
</table>

### System Integrators

- Automation Integrators: Anyone Involved in Designs or Projects that Automate Processes

### Energy Controls Systems

- HVAC: Anyone who would be involved in Designs that would include Damper and Louvre Control for HVAC Applications

### End Users

- Instrumentation Supervisors
- Instrumentation Technicians
- Project Engineers
- Store Room Supervisors

### MRO

- Chemical
- Petrochemical
- Pulp & Paper
- Food & Drug
- Refineries
- Power
- Mining
- Oil & Gas
**27R Regulator – Semi-Precision**

**Features**
- Fine adjustment sensitivity.
- Good repeatability and minimal pressure drop.
- High flow capacity.
- Two 1/4" gauge ports.
- Brass Poppet for long life.
- High Flow: 25 SCFM
- Modular with 05 Series FRL.
- Non-rising, removable knob.
- Multiple porting options.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Pressure</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>15 PSIG</td>
<td>27R112AD</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>30 PSIG</td>
<td>27R110AD</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>60 PSIG</td>
<td>27R114AD</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>125 PSIG</td>
<td>27R113AD</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

**Ordering Information**

**27R**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Pressure Range</th>
<th>Relief</th>
<th>Engineering Level</th>
<th>Port Typ</th>
<th>Options</th>
<th>Preset / Pressure Limited</th>
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<tbody>
<tr>
<td>1/4&quot;</td>
<td>10 - 15 PSIG</td>
<td>A</td>
<td>D</td>
<td>Blank NPT</td>
<td>No Options</td>
<td>Blank None</td>
</tr>
<tr>
<td>2/3 1/4&quot;</td>
<td>12 - 15 PSIG</td>
<td>A</td>
<td>D</td>
<td>1 BSPP</td>
<td>L† Preset</td>
<td>XXX* Preset</td>
</tr>
<tr>
<td></td>
<td>13 - 125 PSIG</td>
<td>A</td>
<td>D</td>
<td>2 BSPT</td>
<td>P† Non-Adjustable</td>
<td>Pressure</td>
</tr>
<tr>
<td></td>
<td>14 - 60 PSIG</td>
<td>A</td>
<td>D</td>
<td></td>
<td>S† Pressure Limiter Max. Adjustable</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING**

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

*Available Preset / Pressure Limited Range, 10 to 90 PSIG in 5 PSIG increments. For higher pressures, contact factory. (Example: 065 = 65 PSIG)
Technical Information

Flow Characteristics
27R110A* 1/4 Inch Ports
100 PSIG (6.9 bar) Primary Pressure

Flow Characteristics
27R114A* 1/4 Inch Ports
100 PSIG (6.9 bar) Primary Pressure

Flow Characteristics
27R113A* 1/4 Inch Ports
100 PSIG (6.9 bar) Primary Pressure

CAUTION:
REGULATOR PRESSURE AdjUSment – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

27R Regulator Kits & Accessories

Bonnet Assembly Kit ........................................ PS910P
Control Knob ....................................................... P0442001
Gauges – 1-1/2” Dial Face
30 PSIG (0 to 2.1 bar) ............................................. K4515N14030
60 PSIG (0 to 4.1 bar) ............................................. K4515N14060
160 PSIG (0 to 11.0 bar) ......................................... K4515N14160
300 PSIG (0 to 20.0 bar) ......................................... K4515N14300
2” Dial Face
60 PSIG (0 to 4.1 bar) ............................................. K4520N14060
160 PSIG (0 to 11.0 bar) ......................................... K4520N14160
300 PSIG (0 to 20.0 bar) ......................................... K4520N14300
Mounting Bracket Kit ........................................ PS963P
Panel Mount Nut – Metal ....................................... PS964P
Service Kit .......................................................... PS907P
Springs – 1-30 PSIG Range ................................. P04427
1-15 PSIG Range .................................................. P04428
0-60 PSIG Range .................................................. P04426
2-125 PSIG Range ................................................. P04425

Specifications

Bleed Rate ......................................................... 2.0 SCFM
Gauge Ports (2) .................................................... 1/4 Inch
Effect of Supply Pressure Variation –
0.5 PSIG (0.04 bar) for 25 PSIG (1.7 bar) change in P1

Relief Capacity –
0.5 SCFM (0.24 dm³/s) @ 5 PSIG (0.4 bar) increase in P2

Flow Capacity –
28 SCFM (13.2 dm³/s) @ 100 PSIG (6.9 bar) P1
and 20 PSIG (1.4 bar) P2

Port Threads ....................................................... 1/4, 3/8 Inch
Maximum Inlet Pressure ..................................... 250 PSIG (17.2 bar)
Relief Flow ............................................................ 5.0 SCFM
Repeatability ...................................................... ±.5 PSIG (±0.034 bar)
Response – ........................................................... 510 ms

The valve will open to full flow and fill a volume of 100 in³

Temperature Rating .................................................. -32°F to 175°F (0°C to 80°C)
Weight ............................................................... 1.0 lb. (0.45 kg)

Materials of Construction

Poppet ................................................................. Brass
Bonnet ................................................................. Plastic
Body ................................................................. Zinc
Collar, Knob ....................................................... Plastic
Diaphragm ........................................................ Nitrile
Bottom Cap ....................................................... Plastic
Seals ................................................................. Nitrile
Springs – Poppet & Control .................................. Steel
27E Filter / Regulator – Precision

**Features**
- Excellent water removal efficiency.
- High flow.
- Fine adjustment sensitivity.
- Good repeatability and minimal pressure drop.
- Modular with 05 Series FRL
- Non-Rising removable adjustment knob.
- High Flow: 20 SCFM

### Ordering Information

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>Poly Bowl† / Sight Gauge</th>
<th>Metal Bowl / Sight Gauge</th>
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<tbody>
<tr>
<td>1/4&quot;</td>
<td>27E12A13AB</td>
<td>27E14A13AB</td>
<td>27E22A13AB</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>27E24A13AB</td>
<td>27E14A13AB</td>
<td>27E24A13AB</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

† For Polycarbonate Bowl, see Caution on page A2.
§ SCFM = Standard cubic feet per minute at 150 PSIG inlet, 90 PSIG no flow secondary setting and 10 PSIG pressure drop.

**WARNING**

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

### Bowl Options

- **Cartridge**
  - Polycarbonate Bowl
    - 1 Twist Drain
    - 2 Metal Bowl Guard / Twist Drain
    - N Auto Float Drain
    - P Metal Bowl Guard / Auto Pulse Drain
  - Metal Bowl
    - 3 Twist Drain
    - 4 Sight Gauge / Twist Drain
    - R Auto Float Drain
    - T Sight Gauge / Auto Pulse Drain

### Pressure Range

<table>
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<tr>
<th>Element</th>
<th>Without</th>
<th>With Gauge</th>
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</thead>
<tbody>
<tr>
<td>A 40 Micron</td>
<td>10-30 PSIG</td>
<td>10-30 PSIG</td>
</tr>
<tr>
<td>B 5 Micron</td>
<td>11-60 PSIG</td>
<td>11-60 PSIG</td>
</tr>
<tr>
<td>Z Adsorber</td>
<td>12-125 PSIG</td>
<td>12-125 PSIG</td>
</tr>
</tbody>
</table>

### Preset / Pressure Limited

<table>
<thead>
<tr>
<th>Options</th>
<th>Blank</th>
<th>No Options</th>
<th>L†</th>
<th>Non-Adjustable</th>
<th>P†</th>
<th>Preset Adjustable</th>
<th>S†</th>
<th>Pressure Limiter</th>
<th>T†</th>
<th>Max. Adjustable</th>
<th>Max. Non-Adj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Bold</td>
<td>NPT</td>
<td>BSPP</td>
<td>BSPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Requires Metal Bowl

---

**BOLD ITEMS ARE MOST POPULAR.**
CAUTION:
REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

27E Filter / Regulator Kits & Accessories

**Technical Information**

### Flow Characteristics

#### 27E12A10AB

- **Secondary Pressure - bar**
  - 0
  - 10
  - 20
  - 30
  - 40
- **Flow - SCFM**
  - 0
  - 1
  - 2
  - 3
  - 4

**CAUTION:**

#### Bowl Guard Kit –
- PS905P

**Bowl Kits –**
- Poly Bowl – Automatic Pulse Drain – PS995P
- Metal Bowl – Automatic Pulse Drain – PS997P
- Sight Gauge / Automatic Pulse Drain – PS996P
- Sight Gauge / Twist Drain – PS935P

**Control Knob –**
- P0442001

**Drain Kit –**
- PS998P
- PS11P
- PS15P
- PS13P

**Filter Element Kits –**
- 40 Micron – PS901P
- 5 Micron – PS902P
- Adsortor – PS931P

**Sight Gauge –**
- PS914P

**Gauges – 1-1/2” Dial Face**
- 30 PSIG (0 to 2.1 bar) – K4515N14030
- 60 PSIG (0 to 4.1 bar) – K4515N14060
- 160 PSIG (0 to 11.0 bar) – K4515N14160
- 300 PSIG (0 to 20.0 bar) – K4515N14300

**2” Dial Face**
- 60 PSIG (0 to 4.1 bar) – K4520N14060
- 160 PSIG (0 to 11.0 bar) – K4520N14160
- 300 PSIG (0 to 20.0 bar) – K4520N14300

**Mounting Bracket Kit (Includes Panel Mount Nut) –**
- PS963P

**Panel Mount Nut –**
- PS964P

**Springs – 1-15 PSIG Range**
- 1-30 PSIG Range – P04428
- 1-60 PSIG Range – P04427
- 1-60 PSIG Range – P04426
- 2-125 PSIG Range – P04425
- 2-200 PSIG – P02934

**Regulator Service Kit –**
- PS907P

**Bonnet Assembly Kit –**
- PS910P

### Specifications

**Bowl Capacity –**
- 2.0 Ounces

**Bleed Rate –**
- 2.0 SCFH

**Gauge Ports (2) –**
- 1/4 Inch

**Effect of Supply Pressure Variation –**
- 0.5 PSIG (0.04 bar) for 25 PSIG (1.7 bar) change in P1

**Flow Capacity –**
- 33 SCFM (1.56 dm/s) @ 100 PSIG (6.9 bar) P1
- and 20 PSIG (1.4 bar) P2

**Sump Capacity –**
- 0.9 Ounce

**Port Threads –**
- 1/4, 3/8 Inch

**Pressure & Temperature Rating –**
- Polycarbonate Bowl – 0 to 150 PSIG (0 to 10.3 bar)
- 32°F to 125°F (0°C to 52°C)
- Metal Bowl – 0 to 250 PSIG (0 to 17.2 bar)
- 32°F to 175°F (0°C to 80°C)
- Automatic Pulse Drain – 10 to 150 PSIG (0.7 to 10.3 bar)

**Relief Capacity –**
- 0.5 SCFM (0.024 dm/s) @ 5 PSIG (0.4 bar) increase in P2

**Repeatability –**
- ±0.14 PSIG (±0.0097 bar)

**Response –**
- 510 ms
- The valve will open to full flow and fill a volume of 100 in³

**Weight –**
- 1.35 lb. (0.6 kg)

### Materials of Construction

**Adjusting Stem –**
- Steel

**Body –**
- Steel

**Bonnet, Internal Parts –**
- Plastic

**Bowl Guard –**
- Steel

**Collar –**
- Plastic

**Diaphragm –**
- Nitrile

**Drain –**
- Plastic

**Filter Elements –**
- 40 Micron (Standard) – Plastic
- 5 Micron (Optional) – Plastic

**Adsorber (Optional) –**
- Activated Charcoal

**Knob –**
- Plastic

**Poppet –**
- Brass

**Seals –**
- Nitrile

**Sight Gauge –**
- Polymide (Nylon)

**Springs – Poppet & Control –**
- Steel

---

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics
51R Regulator – Relieving

**Features**
- Pressure reference indicating dial face.
- Non-rising, pressure-adjustment dial.
- Self-relieving.
- Full pressure adjustment in less than one full turn.
- Recommended for pilot-air applications.
- Flow capacity: 1/4” – 0.7 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Standard Pressure 5 to 160 PSIG (0.34 to 11 bar)</th>
<th>Low Pressure 2 to 40 PSIG (0.14 to 3 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>51R126RA</td>
<td>51R125RA</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

§ Inlet pressure 100 psig (6.9 bar). Secondary pressure 90 psig (6.2 bar).

**51R Regulator Dimensions**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A (in)</th>
<th>B (mm)</th>
<th>C (in)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>G (mm)</th>
<th>H (in)</th>
<th>J (mm)</th>
<th>K (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2.80</td>
<td>71</td>
<td>2.60</td>
<td>66</td>
<td>2.60</td>
<td>66</td>
<td>0.40</td>
<td>10</td>
<td>1.30</td>
</tr>
<tr>
<td>H</td>
<td>2.20</td>
<td>56</td>
<td>1.25</td>
<td>31.8</td>
<td>0.18</td>
<td>4.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inches (mm)

**WARNING**

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

**Ordering Information**

Port Size: 1 1/4 Inch
Springs: 25 2 to 40 PSIG, 26 5 to 160 PSIG
Relief: R Relieving
Engineering Level: A Current
Thread Type: Blank NPT, 1 BSPP

BOLD ITEMS ARE MOST POPULAR.
51R Regulator Kits & Accessories
Adjustment Dial Knob .............................................. RRP-16-024
O-ring, Repair Kit ............................................................ GRP-95-260
Piston and Bonnet Repair Kit ......................................... RRP-95-765
Spring, Regulation, Belleville Washer –
  2 to 40 PSIG (2.8 bar) ............................................... RRP-95-906
  5 to 160 PSIG (11.0 bar) ............................................ RRP-95-905
Tamper Resistant Kit ................................................ RRP-95-585
Valve, Pilot with O-ring and Valve Spring ................. RRP-96-934

Specifications
Adjusting Range Pressure ........................................ 2 to 40 PSIG (0 to 2.8 bar)
  5 to 160 PSIG (0 to 11.0 bar)
Bleed Rate ................................................................. 0.05 SCFM
Maximum Operating Temperature .............................. 150°F (65.5°C)
Maximum Supply Pressure .......................................... 300 PSIG (20.7 bar)
Port Threads .............................................................. 1/4"
Weight ........................................................................ 1.3 lb. (0.5 kg)

Materials of Construction
Body ................................................................. Zinc
Bonnet .......................................................... Zinc / Brass
Piston ............................................................ Acetal
Seals ......................................................... Nitrile
Springs ......................................................... Steel
Valve Assembly ................................................ Brass / Nitrile / Acetal
52R Regulator – Relieving

Features
- Balanced poppet design.
- Non-rising, pressure-adjusting dial.
- High-relief flow (3/16" relief orifice).
- Two 1/4" gauge ports.
- Piston operated.
- Flow capacity: 1/4" – 117 SCFM§
  3/8" – 180 SCFM§
  1/2" – 195 SCFM§
  3/4" – 220 SCFM§

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Standard Pressure 5 to 160 PSIG (0.34 to 11 bar)</th>
<th>Low Pressure 2 to 40 PSIG (0.14 to 3 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>52R126RA</td>
<td>52R125RA</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>52R226RA</td>
<td>52R225RA</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>52R326RA</td>
<td>52R325RA</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>52R426RA</td>
<td>52R425RA</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

§ Inlet pressure 100 PSIG (6.9 bar). Secondary pressure 90 PSIG (6.2 bar).

WARNING
Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

Ordering Information

Port Size
- 1 1/4 Inch
- 2 3/8 Inch
- 3 1/2 Inch
- 4 3/4 Inch

Springs
- 25 2 to 40 PSIG
- 26 5 to 160 PSIG

Relief
- 1 BSPP

Engineering Level
- A Current

Thread Type
- Blank
- NPT

BOLD ITEMS ARE MOST POPULAR.
Technical Information

Flow Characteristics 52R126R

Flow Characteristics 52R226R

Flow Characteristics 52R426R

Flow Characteristics 52R326R

52R Regulator Kits & Accessories

- Adjustment Dial Knob .................................................. RRP-16-024
- O-ring, Repair Kit .......................................................... GRP-95-260
- Piston Bottom and O-ring Seal ...................................... RRP-95-192
- Pistons and Bonnet Repair Kit ........................................ RRP-95-766
- Spring, Regulation, Belleville Washer –
  2 to 40 PSIG Range ..................................................... RRP-95-906
  5 to 160 PSIG Range ................................................... RRP-95-905
- Tamper Resistant Kit ..................................................... RRP-95-585
- Valve, Main with U-Cup Seal & Bottom Plug ................. RRP-95-914
- Valve, Main with U-Cup Seal ......................................... RRP-95-151
- Valve, Pilot with O-ring and Valve Spring ...................... RRP-96-934

Specifications

- Adjusting Range Pressure: 2 to 40 PSIG (0 to 2.8 bar) / 5 to 160 PSIG (0 to 11.0 bar)
- Bleed Rate: 0.05 SCFM
- Gauge Ports: Two Ports 1/4" (Can be used as additional High Flow 1/4 Inch Outlet Ports)
- Maximum Operating Temperature: 150°F (65.5°C)
- Maximum Supply Pressure: 300 PSIG (20.7 bar)
- Port Threads: 1/4", 3/8", 1/2", 3/4"
- Weight: 2.3 lb. (1.04 kg)

Materials of Construction

Body .......................................................... Zinc / Brass
Bonnet .......................................................... Zinc / Acetal
Piston ......................................................... Acetal
Seals .......................................................... Nitrile
Springs ...................................................... Steel
Valve Assembly .............................................. Brass / Nitrile / Acetal
**53R Regulator – Relieving**

**Features**
- Balanced poppet design.
- Non-rising, pressure-adjusting dial.
- High-relief flow (3/16" relief orifice).
- Two 1/4" gauge ports.
- Piston operated.
- Flow capacity: 3/4" – 400 SCFM
  1" – 650 SCFM
  1-1/4" – 700 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Standard Pressure 5 to 160 PSIG (0.34 to 11 bar)</th>
<th>Low Pressure 2 to 40 PSIG (0.14 to 3 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>53R426RA</td>
<td>53R425RA</td>
</tr>
<tr>
<td>1&quot;</td>
<td>53R526RA</td>
<td>53R525RA</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>53R626RA</td>
<td>53R625RA</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

§ Inlet pressure 100 PSIG (6.9 bar). Secondary pressure 80 PSIG (5.5 bar).

**53R Regulator Dimensions**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.20 (132)</td>
<td>4.30 (109)</td>
<td>2.60 (66)</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>1.70 (43)</td>
<td>1.23 (31)</td>
<td>4.30 (109)</td>
</tr>
<tr>
<td>G</td>
<td>H</td>
<td>J</td>
</tr>
<tr>
<td>3.00 (76)</td>
<td>2.20 (56)</td>
<td>1.21 (33)</td>
</tr>
</tbody>
</table>

**WARNING**

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.

**Ordering Information**

BOLD ITEMS ARE MOST POPULAR.
Technical Information

53R Regulator Kits & Accessories

<table>
<thead>
<tr>
<th>Kit Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment Dial Knob</td>
<td>RRP-16-024</td>
</tr>
<tr>
<td>O-ring, Repair Kit</td>
<td>GRP-95-261</td>
</tr>
<tr>
<td>Piston, Bottom and O-ring Seal</td>
<td>RRP-95-192</td>
</tr>
<tr>
<td>Pistons and Bonnet Repair Kit</td>
<td>RRP-95-766</td>
</tr>
<tr>
<td>Spring, Regulation, Belleville Washer –</td>
<td>RRP-95-906</td>
</tr>
<tr>
<td>2 to 40 PSIG Range</td>
<td>RRP-95-905</td>
</tr>
<tr>
<td>5 to 160 PSIG Range</td>
<td>RRP-95-585</td>
</tr>
<tr>
<td>Tamper Resistant Kit</td>
<td>RRP-95-152</td>
</tr>
<tr>
<td>Valve, Main with O-ring Seal</td>
<td>RRP-96-935</td>
</tr>
<tr>
<td>Valve, Pilot with O-ring and Valve Spring</td>
<td></td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusting Range Pressure</td>
<td>2 to 40 PSIG (0 to 2.8 bar)</td>
</tr>
<tr>
<td></td>
<td>5 to 160 PSIG (0 to 11.0 bar)</td>
</tr>
<tr>
<td>Bleed Rate</td>
<td>0.05 SCFM</td>
</tr>
<tr>
<td>Gauge Ports</td>
<td>Two Ports 1/4&quot;</td>
</tr>
<tr>
<td>Maximum Operating Temperature</td>
<td>150°F (65.5°C)</td>
</tr>
<tr>
<td>Maximum Supply Pressure</td>
<td>300 PSIG (20.7 bar)</td>
</tr>
<tr>
<td>Port Threads</td>
<td>3/4&quot;, 1&quot;, 1-1/4&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>4.0 lb. (1.8 kg)</td>
</tr>
</tbody>
</table>

Materials of Construction

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Zinc</td>
</tr>
<tr>
<td>Bonnet</td>
<td>Zinc / Brass</td>
</tr>
<tr>
<td>Piston</td>
<td>Acetal</td>
</tr>
<tr>
<td>Seals</td>
<td>Nitrile</td>
</tr>
<tr>
<td>Springs</td>
<td>Steel</td>
</tr>
<tr>
<td>Valve Assembly</td>
<td>Brass / Nitrile / Acetal</td>
</tr>
</tbody>
</table>
54R Regulator – Relieving

Features

- Balanced poppet design.
- Non-rising, pressure-adjusting dial.
- High-relief flow (3/16" relief orifice).
- Two 1/4" gauge ports.
- Piston operated.
- Flow capacity: 1-1/2" – 1,600 SCFM§
  2" – 1,600 SCFM§

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Standard Pressure</th>
<th>Low Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 to 160 PSIG (0.34 to 11 bar)</td>
<td>2 to 40 PSIG (0.14 to 3 bar)</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>54R726RA</td>
<td>54R725RA</td>
</tr>
<tr>
<td>2&quot;</td>
<td>54R826RA</td>
<td>54R825RA</td>
</tr>
</tbody>
</table>

Standard part numbers shown bold. For other models refer to ordering information below.

§ Inlet pressure 100 PSIG (6.9 bar). Secondary pressure 80 PSIG (5.5 bar).

WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

<table>
<thead>
<tr>
<th>Part Size</th>
<th>Springs</th>
<th>Relief</th>
<th>Engineering Level</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 1-1/2 Inch</td>
<td>25 2 to 40 PSIG</td>
<td>R Relieving</td>
<td>A Current</td>
<td>Blank NPT BSPP</td>
</tr>
<tr>
<td>8 2 Inch</td>
<td>26 5 to 160 PSIG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BOLD ITEMS ARE MOST POPULAR.
Technical Information

54R Regulator Kits & Accessories
Adjustment Dial Knob ................................................. RRP-16-024
O-ring, Repair Kit ..................................................... GRP-95-262
Piston, Bottom and O-ring Seal ................................. RRP-95-192
Pistons and Bonnet Repair Kit ................................. RRP-95-766
Spring, Regulation, Belleville Washer –
  2 to 40 PSIG Range ................................................ RRP-95-906
  5 to 160 PSIG Range ............................................... RRP-95-905
Spring, Main Valve ................................................... RRP-95-024
Tamper Resistant Kit ................................................. RRP-95-585
Valve, Main with O-ring Seal ................................. RRP-95-153
Valve, Pilot with O-ring and Valve Spring .......... RRP-96-935

Specifications
Adjusting Range Pressure ................................. 2 to 40 PSIG (0 to 2.8 bar)
  5 to 160 PSIG (0 to 11.0 bar)
Bleed Rate ............................................................. 0.05 SCFM
Gauge Ports ......................................................... Two Ports 1/4"
  (Can be used as additional High Flow 1/4 Inch Outlet Ports)
Maximum Operating Temperature ......................... 150°F (65.5°C)
Maximum Supply Pressure ................................. 300 PSIG (20.7 bar)
Port Threads ......................................................... 1-1/2", 2"
Weight ................................................................. 9 lb. (4.1 kg)

Materials of Construction
Body ......................................................................... Zinc
Bonnet ................................................................. Zinc / Brass
Piston ................................................................. Zinc
Seals ................................................................. Nitrile
Springs .............................................................. Steel
Valve Assembly ..................................................... Brass / Nitrile / Acetal
The P3RA302 Regulator is designed for applications that require high capacity and accurate process control in a small package. A poppet valve which is balanced by utilizing a convoluted diaphragm, insures a constant output pressure even during wide supply pressure variations. Stability of regulated pressure is maintained under varying flow conditions through the use of an aspirator tube which adjusts the air supply in accordance with the flow velocity.

### Features

- Control sensitivity of .250" (.63 cm) water column variation allows use in precision applications.
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes.
- Flow of up to 40 SCFM with 100 PSIG supply allows use in applications with high flow requirements.
- An aspirator tube compensates downstream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the Regulator without removing it from the line.

### Ordering Information

| P3RA302 | 4 | 2 |

### Springs

- 3 0.5 to 30 PSIG
- 4 1 to 60 PSIG
- 5 2 to 100 PSIG

### Pipe Size

- 2 1/4" NPT

### Options

- Blank
- No Options
- H  BSPP
- N  Non-Relieving

---

**Note:** Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

**BOLD ITEMS ARE MOST POPULAR.**

---

**WARNING**

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.
Technical Information

Flow Characteristics
Model P3RA302
2-100 PSIG (13.8-690 kPa) Range

Operating Principles
The P3RA302 Regulator uses the force balance principal to control the movement of the valve assembly which in turn controls the output pressure. When the regulator is adjusted for a specific set point, the downward force of the Positive Bias Spring causes the Diaphragm Assembly to move downward. The Supply Valve opens and allows air to pass to the Outlet Port. As the set point is reached, the downward force exerted by the Positive Bias spring is balanced by the upward force of the downstream pressure acting on the bottom of the Diaphragm Assembly. The resultant force moves the supply Valve upward to reduce the flow of air to the Outlet Port. Outlet pressure is maintained as a result of balance between forces acting on the top and bottom of the Diaphragm Assembly.

Specifications
Supply Pressure .......... 250 PSIG, (17.0 bar), (1700 kPa) Maximum
Flow Capacity .......... 40 SCFM (68 m³/HR) @ 100 PSIG, (7.0 bar), (700 kPa) Supply
and 20 PSIG, (1.5 bar), (150 kPa) Setpoint
Exhaust Capacity .......... 2.0 SCFM (3.4 m³/HR) where Downstream Pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) Setpoint
Supply Pressure Effect .......... Less than 0.2 PSIG, (.014 bar), (.14 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in Supply Pressure
Sensitivity .............. .250° (.010 PSIG) (.64 cm) Water Column
Ambient Temperature ............. -40°F to +200°F, (-40°C to 93°C)
Hazardous Locations ........ Acceptable for use in Zones 1 and 2 for Gas Atmosphere: Groups IIA and IIB and Zones 21 and 22 for Dust Atmospheres

Materials of Construction
Body and Housing ......................... Aluminum
Diaphragms ................................. Nitrile on Dacron
Trim ........................................ Brass
P3RA102 Regulator – High Precision

Features

- Control sensitivity of .125" (.32) water column allows use in precision processes.
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint.
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere.
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- An aspirator tube compensates downstream pressure droop under flow conditions.

The P3RA102 Regulator is designed for applications that require high capacity and accurate process control. A poppet valve which is balanced by utilizing a rolling diaphragm, insures a constant output pressure even during wide supply pressure variations. Stability of regulated pressure is maintained under varying flow conditions through the use of an aspirator tube which adjusts the air supply in accordance with the flow velocity.

Ordering Information

P3RA102 6 2

<table>
<thead>
<tr>
<th>Springs</th>
<th>Pipe Size</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 0.5 to 30 PSIG</td>
<td>2 1/4&quot; NPT</td>
<td>Blank  No Options</td>
</tr>
<tr>
<td>4 1 to 60 PSIG</td>
<td></td>
<td>H BSPP</td>
</tr>
<tr>
<td>6 2 to 150 PSIG</td>
<td></td>
<td>N Non-Relieving</td>
</tr>
</tbody>
</table>

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

WARNING

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.
Technical Information

Flow Characteristics
Model P3RA102

Operating Principles
The P3RA102 Series regulator use the force balance principal to control the movement of the Valve Assembly that controls the output pressure. When the regulator is adjusted for a specific set point, the downward force of the Positive Bias Spring moves the Diaphragm Assembly downward. The Supply Valve opens and allows air to pass to the Outlet Port. As the set point is reached, the downward force exerted by the Positive Bias Spring is balanced by the force of the downstream pressure that acts on the Diaphragm Assembly. The resultant force moves the Supply Valve upward to reduce the flow of air to the Outlet Port. Outlet pressure is maintained as a result of balance between forces acting on the top and bottom of the Diaphragm Assembly.

Specifications
Supply Pressure ........... 500 PSIG, (35.0 bar), (3500 kPa) Maximum
Flow Capacity –
40 SCFM (68 m³/HR) @ 100 PSIG, (7.0 bar), (700 kPa) Supply and 20 PSIG, (1.5 bar), (150 kPa) Setpoint
Exhaust Capacity –
5.5 SCFM (9.35 m³/HR) where Downstream Pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) Setpoint
Supply Pressure Effect –
Less than 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in Supply Pressure
Sensitivity ..................... .125" (.005 PSIG) (.32 cm) Water Column
Ambient Temperature ..............+40°F to +200°F, (-40°C to 93°C)
Hazardous Locations –
Acceptable for use in Zones 1 and 2 for Gas Atmosphere: Groups IIA and IIB and Zones 21 and 22 for Dust Atmospheres

Materials of Construction
Body and Housing ......................... Aluminum
Diaphragms .................. Buna N on Dacron (Standard Unit Only)
Trim ........................ Brass, Zinc Plated Steel

P3RA102 Series
High Precision Regulator

Technical Specifications – P3RA102

High Precision Regulator

P3RA102 Kits & Accessories
Mounting Bracket Kit –
Zinc Plated Steel................................. PS09921

Service Kits –
0 to 200 PSIG, Relieving........................ PS12125-1
0 to 200 PSIG, Non-relieving .................. PS12125-4
Tamper Resistant Kit .................. PS12165
**P3RA102BP Relief Valve – High Precision**

**Features**
- Control sensitivity of .125" (.32) water column allows use in precision applications.
- A separate Control Chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the P3RA102BP without removing it from the line.
- Mounting Bracket is available.

The P3RA102BP is a high capacity relief valve that relieves excess pressure in a pneumatic system.

The P3RA102BP provides greater accuracy than standard relief valves over a narrow pressure range. The P3RA102BP is an excellent choice for a wide range of precision applications.

- **WARNING**
  - Product rupture can cause serious injury.
  - Do not connect regulator to bottled gas.
  - Do not exceed maximum primary pressure rating.

### Ordering Information

<table>
<thead>
<tr>
<th>P3RA102</th>
<th>6</th>
<th>2</th>
<th>BP</th>
</tr>
</thead>
</table>

**Springs**
- 3: 0.5 to 30 PSIG
- 4: 1 to 60 PSIG
- 6: 2 to 150 PSIG

**Pipe Size**
- 2: 1/4" NPT

**Options**
- BP: Back Pressure

**Options**
- Blank
- No Options
- H: BSPP
- N: Non-Relieving

**Note:** Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

**Bold Items Are Most Popular.**
**Technical Information**

**Flow Characteristics Model P3RA102BP**

<table>
<thead>
<tr>
<th>Output Pressure PSIG</th>
<th>Flow Rate - SCFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

**Operating Principles**

The P3RA102BP Regulator uses the force balance principle to open the Relief Valve and vent system pressure when the set point is exceeded.

Downstream pressure is transmitted through the Aspirator Tube to the bottom of the Diaphragm Assembly. When you adjust the range screw for a specific set point, the Positive Bias Spring compresses and exerts a force on the top of the Diaphragm Assembly. As long as the pressure acting on the bottom of the Diaphragm Assembly produces a force less than the spring force acting on the top of the Diaphragm Assembly, the Relief Valve remains closed. When system pressure increases, the force on the bottom of the Diaphragm Assembly increases until it reaches the set point. When system pressure increases beyond the set point, the assembly moves upward, lifting the Relief Valve from its seat and vents the downstream air.

If downstream pressure decreases below the set point, the assembly moves downward closing the Relief Valve.

**Specifications**

<table>
<thead>
<tr>
<th>Set Point Range</th>
<th>System Pressure (Maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-200 PSIG</td>
<td>300 PSIG</td>
</tr>
<tr>
<td>(0.15-14 bar)</td>
<td>(21.0 bar)</td>
</tr>
<tr>
<td>(15-1400 kPa)</td>
<td>(2100 kPa)</td>
</tr>
<tr>
<td>300-400 PSIG</td>
<td>500 PSIG</td>
</tr>
<tr>
<td>(21-28 bar)</td>
<td>(35.0 bar)</td>
</tr>
<tr>
<td>(2100-2800 kPa)</td>
<td>(3500 kPa)</td>
</tr>
</tbody>
</table>

**Flow Capacity (SCFM)**

40 (68 m³/HR) @ 100 PSIG, (7.0 bar), (700 kPa) System Pressure

**Sensitivity**

0.125” (.005 PSIG) (.32 cm) Water Column

**Ambient Temperature**

-40°F to +200°F, (-40°C to +93°C)

**Materials of Construction**

- **Body and Housing**: Aluminum
- **Trim**: Zinc Plated Steel, Brass
- **Nozzle**: Nitrile on Dacron

**P3RA102BP Kits & Accessories**

- **Mounting Bracket Kit** – Zinc Plated Steel
- **Service Kits** – 0 to 200 PSIG, Standard
- **Tamper Resistant Kit**
**P3RA171 Vacuum Regulator – High Precision**

**Features**
- Control sensitivity of .125" (.32) water column allows use in precision applications.
- Balanced supply valve minimizes effects of vacuum variation.
- Aspirator tube compensates for downstream pressure droop under flow conditions.
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Construction allows servicing without removing from the line.

The P3RA171 is a high accuracy vacuum regulator that provides uniform vacuum regulation independent of vacuum supply changes and flow demand. This unit has a diaphragm assembly with three springs to provide a more balanced loading of the diaphragm.

**Ordering Information**

<table>
<thead>
<tr>
<th>P3RA171</th>
<th>3</th>
<th>2</th>
<th>N</th>
<th>N</th>
<th>K</th>
<th>N</th>
</tr>
</thead>
</table>

- **Springs**: 3 0 to 30 Hg
- **Pipe Size**: 2 1/4" NPT
- **Thread Type**: N NPT
- **Options**: N Nitrile
- **Options**: K Knob Assembly
- **Options**: N Non-Relieving

**Note**: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

**WARNING**

Product rupture can cause serious injury. Do not connect regulator to bottled gas. Do not exceed maximum primary pressure rating.
Technical Information

**Flow Characteristics**

Model P3RA171

![Graph](graph.png)

**Specifications**

- **Vacuum Supply (Max):** 29.92 Hg (760 torr)
- **Flow Capacity:** 3 SCFM @ 650 torr Supply, 250 torr Setpoint
- **Sensitivity:** 0.125" (0.005 PSIG) (0.32 cm) Water Column
- **Ambient Temperature:** -40°F to +200°F, (-40°C to +93°C)
- **Vacuum Supply Effect:** Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) Change in Vacuum Supply

**Materials of Construction**

- **Body and Housing:** Aluminum
- **Trim:** Zinc Plated Steel, Brass
- **Elastomers:** Nitrile

**Operating Principles**

The Model P3RA171 Series vacuum regulator uses the force balance principle to control the movement of the Valve Assembly that controls output vacuum.

When the regulator is adjusted for a specific set point, the upward force of the Range Springs moves the Diaphragm Assembly upward. The Supply Valve opens and allows air to pass to the inlet port. As the set point is reached, the upward force exerted by the Range Springs is balanced by the force of the vacuum that pulls downward on the Diaphragm Assembly. The resultant force moves the Supply Valve downward to reduce the flow of air to the inlet port. Outlet vacuum is maintained as a result of balance between forces acting on the top and bottom of the Diaphragm Assembly.
P3EA632 Filter / Regulator – Precision

Features
- The no-brass construction is well suited to harsh environments.
- Internal and external epoxy finish for superior corrosion resistance.
- Non-bleed design to reduce consumption.
- Integral Relief Valve.
- A Gauge Port provides convenient pressure gauge mounting.
- The standard 5-micron filter minimizes internal contamination.
- The Filter Dripwell contains a Drain Plug to easily drain trapped liquids.
- Standard Tapped Exhaust.
- Soft Relief Seat minimizes air loss.

Ordering Information

<table>
<thead>
<tr>
<th>Springs</th>
<th>Pipe Size</th>
<th>Thread Type</th>
<th>Adjustment</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 1 to 60 PSIG</td>
<td>2 1/4&quot; NPT</td>
<td>N NPT</td>
<td>S Screw (Std.)</td>
<td>Blank None</td>
</tr>
<tr>
<td>5 2 to 120 PSIG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WARNING
Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Note: Other Spring Ranges, Port Sizes, and Options Available.
Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.
Operating Principles

When you turn the Adjustment Screw to a specific setpoint, the Spring exerts a downward force against the top of the Diaphragm Assembly. This downward force opens the Supply Valve. Output pressure flows through the Outlet Port and the passage to the Control Chamber where it creates an upward force on the bottom of the Diaphragm Assembly.

When the setpoint is reached, the force of the Spring that acts on the top of the Diaphragm Assembly balances with the force of output pressure that acts on the bottom of the Diaphragm Assembly and closes the Supply Valve.

When the output pressure increases above the setpoint, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Output pressure flows through the Exhaust Valve and out of the Exhaust Vent on the side of the unit until it reaches the setpoint.

P3EA632 Kits & Accessories

Service Kits –  
1 to 60, 2 to 120 PSIG .................................................. PS19968-NR  
Tamper Resistant Kit ........................................................ PS12165

Specifications

Supply Pressure ............... 250 PSIG, (17 bar), (1700 kPa) Maximum  
Flow Capacity (SCFM) ........ 25 (42.5 m³/HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint  
Exhaust Capacity (SCFM) ........ 0.8 (1.36 m³/HR)  
where downstream pressure is 5 PSIG, (35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint. (0.8 SCFM for 120 # unit)

Maximum Supply Pressure ............... 250 PSIG, (14 bar), (1400 kPa)  
Consumption ......................................................... Undetectable  
Supply Pressure Effect ............... Less than 1.25 PSIG, (.09 bar), (9 kPa) change in supply pressure (1.90 PSIG for 120 # unit)  
Supply Pressure Effect ............... Change in output pressure (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint  
Sensitivity ............... 1.0” (.036 PSIG) (2.54 cm) Water Column  
Temperature Range ............... -10°F to + 160°F, (-23°C to + 71°C)

Materials of Construction

Body and Housing ...................... Epoxy Coated Aluminum  
Trim ...................... Stainless Steel, Nickel Plated Steel  
Elastomers ...................... Nitrile
P3BA208 Pneumatic Input Signal Amplifier – Precision

Features

- The P3BA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio.
- A balanced Supply Valve minimizes the effects of supply pressure variation.
- An Aspirator Tube compensates downstream pressure droop under flowing conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction allows servicing without removal.
- Mounting Bracket available.

Ordering Information

<table>
<thead>
<tr>
<th>P3BA208 Regulator Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 3.00 (76.2)</td>
</tr>
<tr>
<td>B .94 (23.8)</td>
</tr>
<tr>
<td>C 2.13 (53.9)</td>
</tr>
<tr>
<td>C1 .94 (23.8)</td>
</tr>
<tr>
<td>D .13 (3.2)</td>
</tr>
<tr>
<td>E 3.88 (98.3)</td>
</tr>
<tr>
<td>E1 4.31 (109.5)</td>
</tr>
</tbody>
</table>

Inches (mm)

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory
**P3BA208 Series**

**Precision Pneumatic Input Signal Amplifier**

---

**Operating Principles**

The P3BA208 Input Signal Amplifier is a pneumatic device capable of high flow and exhaust capacity. This device uses a force balance system to control the movement of the supply and exhaust valves.

At set point, the force due to signal pressure that acts on the top of the Upper Diaphragm balances with the force due to output pressure acting on the bottom of the Lower Diaphragm.

---

**Specifications**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Signal:Output</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1:1</td>
<td>1:2</td>
<td>1:3</td>
<td></td>
</tr>
<tr>
<td>Maximum Output Pressure, PSIG (bar)</td>
<td>150 (10.0)</td>
<td>150 (10.0)</td>
<td>150 (10.0)</td>
<td></td>
</tr>
<tr>
<td>Maximum Supply Pressure, PSIG (bar)</td>
<td>250 (17.0)</td>
<td>250 (17.0)</td>
<td>250 (17.0)</td>
<td></td>
</tr>
<tr>
<td>Flow Capacity SCFM, (m³/HR)</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>100 PSIG, (7.0 bar ) Supply, 20 PSIG, (1.5 bar ) Output.</td>
<td>(76.5)</td>
<td>(76.5)</td>
<td>(76.5)</td>
<td></td>
</tr>
<tr>
<td>Exhaust Capacity SCFM, (m³/HR)</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Downstream Pressure 5 PSIG, (.35 bar) Above Output Pressure Set Point of 20 PSIG, (1.5 bar),</td>
<td>(18.7)</td>
<td>(18.7)</td>
<td>(18.7)</td>
<td></td>
</tr>
<tr>
<td>Sensitivity (Water Column)</td>
<td>.250&quot; (.64 cm)</td>
<td>.500&quot; (1.27 cm)</td>
<td>.750&quot; (1.9 cm)</td>
<td></td>
</tr>
<tr>
<td>Ratio Accuracy</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>% of 100 PSIG, (7.0 bar) Output Span</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>% of Output Span with (7.0 bar) Input Span</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Supply Pressure Effect, PSIG (bar)</td>
<td>0.10</td>
<td>0.20</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>for change of 100 PSIG, (7.0 bar),</td>
<td>(.007)</td>
<td>(.014)</td>
<td>(.021)</td>
<td></td>
</tr>
<tr>
<td>Ambient Temperature, °F (°C)</td>
<td>-40 to +200</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-40 to +93)</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

---

**Materials of Construction**

- **Body and Housing**: Aluminum
- **Diaphragm**: Nitrile on Dacron Fabric
- **Trim**: Zinc Plated Steel, Brass

---

**P3BA208 Kits and Accessories**

- **Mounting Bracket**: PS09921
- **Service Kits**
  - 1:1 Ratio: PS19513-11
  - 1:1 Ratio w/ By-Pass Valve: PS19513-11I
  - 1:2 Ratio: PS19513-12
  - 1:3 Ratio: PS19513-13
P3BA45 Pneumatic Input Signal Amplifier – Precision

**Features**
- Five signal to output ratios meet most control element requirements.
- Control sensitivity of water column allows use in precision applications.
- Large Supply and Exhaust Valves provide high forward and exhaust flows.
- Soft Supply and Exhaust Valve seats minimize air consumption.
- A balanced Supply Valve minimizes the effect of supply pressure variation.
- An Aspirator Tube compensates downstream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the P3BA45 without removing it from the line.

**Ordering Information**

<table>
<thead>
<tr>
<th>P3BA45</th>
<th>1</th>
<th>4</th>
<th>A</th>
</tr>
</thead>
</table>

**Pipe Size**
- 1 1/2" NPT
- 2 3/4" NPT

**Type**
- A 45 Series

**Options**
- Blank
- No Options
- E Tapped Exhaust
- H BSPP
- I By-Pass Valve

**P3BA45 Regulator Dimensions**

<table>
<thead>
<tr>
<th>A</th>
<th>4.50 (114.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>3.41 (86.5)</td>
</tr>
<tr>
<td>C</td>
<td>3.86 (98)</td>
</tr>
<tr>
<td>C1</td>
<td>1.56 (39.6)</td>
</tr>
<tr>
<td>D</td>
<td>0.31 (7.9)</td>
</tr>
<tr>
<td>E</td>
<td>5.67 (128.8)</td>
</tr>
<tr>
<td>E1</td>
<td>5.83 (148.2)</td>
</tr>
</tbody>
</table>

**Inches (mm)**

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.
Technical Information

Flow Characteristics
Model P3BA45

Operating Principles
When signal pressure on the top of the Signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the force of the signal pressure that acts on the top of the Signal Diaphragm balances with the force of the output pressure that acts on the bottom of the Control Diaphragm to close the Supply Valve.

When the output pressure increases above the signal pressure, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Because the Poppet Valve is closed, pressure flows down the Connecting Tube to the bottom of the Motor Diaphragm. This pressure keeps the Supply Valve tightly closed while in the exhaust mode. The Poppet Valve opens and excess output pressure exhausts through the vent in the side of the unit until it reaches the setpoint.

Specifications

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Signal:Output</th>
<th>1:1</th>
<th>1:2</th>
<th>1:3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Output Pressure, PSIG (bar)</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Maximum Supply Pressure, PSIG (bar)</td>
<td>250</td>
<td>250</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Flow Capacity SCFM, (m³/HR)</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Exhaust Capacity SCFM, (m³/HR)</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Sensitivity (water column)</td>
<td>1.0&quot; (2.54 cm)</td>
<td>2.0&quot; (5.08 cm)</td>
<td>3.0&quot; (7.62 cm)</td>
<td></td>
</tr>
<tr>
<td>Ratio Accuracy</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>% of Output Span with 100 PSIG (7.0 bar) Input Span</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Supply Pressure Effect, PSIG (bar)</td>
<td>0.10</td>
<td>0.20</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>for change of 100 PSIG, (7.0 bar), (700 kPa)</td>
<td>(.007)</td>
<td>(.014)</td>
<td>(.021)</td>
<td></td>
</tr>
<tr>
<td>Ambient Temperature, °F (°C)</td>
<td>-40 to +200</td>
<td>-40 to +93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P3BA45 Kits and Accessories

Service Kits –

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Kit Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1</td>
<td>PS19549-1</td>
</tr>
<tr>
<td>1:1 w/ Tapped Exhaust</td>
<td>PS19549-1E</td>
</tr>
<tr>
<td>1:3</td>
<td>PS19549-3</td>
</tr>
<tr>
<td>1:2</td>
<td>PS19549-2</td>
</tr>
<tr>
<td>1:1 w/ Tapped Exhaust, I Option</td>
<td>PS19549-20E</td>
</tr>
</tbody>
</table>

Materials of Construction

Body and Housing: Aluminum
Diaphragm: Nitrile on Dacron Fabric
Trim: Zinc Plated Steel, Brass

P3BA45 Series
Precision Pneumatic Input Signal Amplifier

Catalog 0700P-E
Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics
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.


1.4. 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.
- Assuring compliance with all applicable government and industry standards.
- 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 that all user’s performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.

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.

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatics
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, 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.
1. Terms and Conditions. Seller’s willingness to offer Products, or accept an order for Products, or to or from Buyer is subject to these Terms and Conditions or any new version of the terms and conditions found on-line at www.parker.com/saletypes’. Seller objects to any additional terms or conditions of Buyer’s order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on Seller’s quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other tax, unless otherwise specified by Seller. Unless otherwise specified by Seller, or F.C.A., Seller’s facility’s (INCOMER 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller’s Credit Department. Buyer’s use of terms of art, will indemnify, defend and hold Seller harmless from any loss or damage arising out of any change product features, specifications, designs and availability with notice to Buyer.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller’s facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery, no delivery of shipment at Buyer’s request beyond the respective dates indicated shall be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer’s acts or omissions.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery. Unless otherwise stated, Seller may make special tooling for any Product sold hereunder. The foregoing provisions of this Section shall constitute a warranty of merchantability which is entire warranty pertaining to Products and all attached parts shall be provided hereunder. Seller disclaims all other warranties, express and implied, including design, merchantability and fitness for any particular purpose.

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller shall be allowed unless asserted in writing within 5 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of the same transaction in which an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

6. LIMITATION OF LIABILITY. Upon notification, Seller will, at its option, repair or replace a defective Product, or, if it desires to do so, refund the purchase price. In no event shall Seller be liable to Buyer for any special, indirect, incidental or consequential damages arising out of, or as the result of, the sale, delivery, non-delivery, servicing, use or failure thereof, of the Products or for any claim for special, indirect, incidental or consequential damages arising out of the Products or for any claim for damage or special charges or expenses of any nature incurred without Seller’s written consent, even if Seller has been negligent, whether in contract or tort. In no event shall Seller be liable under any claim made by Buyer exceed the purchase price of the Products.

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for its final selection of the Products. If a Product is stated to be suitable for a particular purpose, it must be used in accordance with all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

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

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such tooling shall remain Seller’s property notwithstanding any change in ownership or title, unless otherwise specified by Seller, or F.C.A., Seller’s facility’s (INCOMER 2010). Buyer shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The preceding provisions of this Section shall constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.

10. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are hereby merged.

11. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer’s employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Buyer’s use of patterns, plans, designs, or specifications furnished by Buyer to manufacture Product; or (d) Buyer’s failure to comply with any of the terms and conditions. Seller shall not indemnify Buyer under any circumstance except as expressly provided in this Section.

12. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller’s written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential damages or similar rights except as provided in this Section. Seller will have no liability for infringement of any patents, copyrights, trade dress, trade secrets or similar rights as described in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, trademarks, copyrights, trade dress and trade secrets (“Intellectual Property Rights”). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in a action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller’s obligation to defend and hold Buyer harmless against such claims includes investigating, settling and defending any claims it may determine, or may reasonably determine, that such claims are without merit. Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including any negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The preceding provisions of this Section shall constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.