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Air Preparation Units
General Line, QIX,
High Efficiency Filters,
Dial & Precision Regulators

Section B
\textbf{CAUTION:}

Polycarbonate bowls and sight dome, being transparent and tough, are ideal for use with Filters and Lubricators. They are suitable for use in normal industrial environments, but should not be located in areas where they could be subjected to direct sunlight, an impact blow, nor temperatures outside of the rated range. As with most plastics, some chemicals can cause damage. Polycarbonate bowls and sight dome should not be exposed to chlorinated hydro-carbons, ketones, esters and certain alcohols. They should not be used in air systems where compressors are lubricated with fire-resistant fluids such as phosphate ester and di-ester types.

Metal bowls are recommended where ambient and/or media conditions are not compatible with polycarbonate bowls. Metal bowls resist the action of most such solvents, but should not be used where strong acids or bases are present or in salt laden atmospheres. Consult the factory for specific recommendations where these conditions exist.

\textbf{TO CLEAN POLYCARBONATE BOWLS USE MILD SOAP AND WATER ONLY! DO NOT} use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which are damaging to this plastic.

\textbf{Metal bowl guards are recommended for all applications.}
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Filtration
The average 10-hp compressor handles four million cubic inches of air per hour. This air can contain billions of contaminating particles. At high concentration and high speed, these particles can be extremely harmful. They block orifices, erode components, and clog clearances between moving parts. In addition, when ambient air is drawn into a compressor, it can, depending on weather conditions, have relative humidity up to 100 percent. As air is compressed and cooled, some water vapor condenses out as free water, and even with a compressor aftercooler, some moisture is swept downstream into the air system. This may result in rusted pneumatic tools and components, contaminated lubricants, and frozen air lines during low temperature periods. Other types of foreign matter in air lines include: impurities generated within the air line, such as wear particles, pipe scale and rust; construction and assembly debris; and contaminants introduced into the air system during maintenance or through leakage passages. All these contaminants, which are of a size to cause air stream problems, should be removed by the filter.

How to Select the Proper Filter
Filter element rating is the prime selection criterion. This rating must match the requirements of all downstream components. Next, the flow capacity and pressure rating of the filter should be considered. Finally, port size should match system piping to avoid unnecessary pressure drops through restricting adapters. Bowl material and the type of drain for the application are other choices to be made. The first step in choosing a filter is to determine the filtration requirements of the most critical components used in that system. Contamination particle size is measured in micrometers. A micrometer is one millionth of a meter or 0.000039 inches. Frequently, micrometer is abbreviated as micron or symbolized by the Greek letter µ. Particle-removing filter elements are rated according to the particle size they will trap. For most industrial applications, filter elements rated at 40 microns are adequate. When necessary, filtration as low as 5 microns or finer can be provided. Remember, however, that finer filtration increases the pressure drop through the element. As micron size rating varies, so does the size and type of filter. Most oils entrained in a compressed air stream are in the form of tiny mist or aerosol droplets which can pass through a standard industrial filter element. If it is necessary to remove these aerosols, an oil-removal type coalescing filter can be used. The sub-micron oil particles which escape an oil-removal filter should have no detrimental effect on industrial pneumatic components. But if these particles must be removed for applications such as spray painting, a coalescing type element should be used.

Filter Construction
Most pneumatic filters consist of two basic elements: a die-cast body, into which the inlet and outlet piping is connected, and a sealed removable bowl which contains collected contaminants. The bowl is fitted with a drain mechanism to remove liquids before they rise to the baffle level. The drain system usually operates while the filter is under pressure, but the unit must be exhausted to remove the bowl for cleaning and element service. The piping need not be disturbed. Generally a transparent bowl is the most convenient because it provides easy visual inspection of the sump level. However, hostile environment, higher pressure, or higher temperature may require a metal bowl for safety. The most common plastic used for bowls is polycarbonate. This material performs satisfactorily for air pressures below 150 PSIG and temperatures between 40° and 120° F. Watts offers polyethylene bowl guards for added safety. As the pressure or temperature requirement increases, you may have to specify a metal bowl with sight gauge. For extreme conditions, it is recommended that the sight gauge be eliminated. (Please refer to the individual model descriptions for specifications on bowls.) Thus, the environment determines the choice of bowl. Polycarbonates offer great strength and visibility, but can be attacked by certain chemicals. Metal bowls offer the highest pressure and temperature rating, and provide superior protection when installed in an environment containing chemicals that are incompatible with polycarbonate.

Filter Operation
When pressurized air enters a typical filter body. The curved inlet and deflector direct the incoming air in a downward whirling pattern. Centrifugal force hurls the larger solid and liquid water particles outward where they collect on the inner surface of the filter bowl. The particles spiral down past a baffle into a quiet chamber. The baffle prevents turbulent air in the upper bowl from re-entraining liquid contaminants and carrying them downstream. Then the dry, cleaner air follows a convoluted path through the filter element, where finer solid particles are filtered out. Finally, filtered air passes up the center of the element and out the discharge port.
Coalescing Filters

These high-efficiency filters operate on a somewhat different principle than particulate air filters. The key difference is in the element, where a fiber network is narrowly spaced to trap smaller contaminants. The special fibers hold any liquid particle which contacts them.

Pre-filtered (A particulate filter must be used prior to a coalescing filter) air enters the cylindrical element at the center. As it flows through the element, particles are captured by three different mechanisms: direct interception as particles impinge on the fibers; inertial impaction as particles are thrown against fibers by the turbulent air stream; and diffusion as smaller particles vibrate with Brownian movement to collide with fibers and other particles. As a result, coalescing elements can capture particles smaller than the nominal size of the flow passages through the element.

Collected liquid migrates to the crossing points of the fibers where larger drops form or coalesce. Pressure differential through the element then forces these drops to the downstream surface of the element where they gravitate downward to the sump.

The filtered air then exits through the outlet port.

It is very important that the air be pre-filtered, as larger contaminants tend to block the passages between fibers, reducing the efficiency of the coalescing element.
**F602 General Purpose Filters**

**Features**
- Excellent Water Removal Efficiency
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Unique Deflector Plate that Creates Swirling of the Air Stream Ensuring Maximum Water and Dirt Separation
- Large Filter Element Surface Guarantees Low Pressure Drop and Increased Element Life
- 40 Micron Filter Element Standard, 5 Micron Available
- Metal Bowl with Sight Gauge Standard
- Twist Drain as Standard, Optional Auto Drain
- Large Bowl Capacity
- High Flow: 1/4" - 45 SCFM\(^6\)
  3/8" - 68 SCFM\(^6\)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Manual Twist Drain</th>
<th>BSPP Manual Twist Drain</th>
<th>NPT Internal Auto Drain</th>
<th>BSPP Internal Auto Drain</th>
</tr>
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<tbody>
<tr>
<td>1/4&quot;</td>
<td>F602-02BJ</td>
<td>F602G02BJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>F602-03BJ</td>
<td>F602G03BJ</td>
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<th>Port Size</th>
<th>NPT Manual Twist Drain</th>
<th>BSPP Manual Twist Drain</th>
<th>NPT Internal Auto Drain</th>
<th>BSPP Internal Auto Drain</th>
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<td>F602-02WJ</td>
<td>F602G02WJ</td>
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<td></td>
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<tr>
<td>3/8&quot;</td>
<td>F602-03WJ</td>
<td>F602G03WJ</td>
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**F602 Filter Dimensions**

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<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>F602-02B, F602-03B</td>
<td>2.90</td>
<td>5.53</td>
<td>6.05</td>
<td>2.50</td>
<td>0.52</td>
<td>1.46</td>
</tr>
<tr>
<td>(74)</td>
<td>(140)</td>
<td>(154)</td>
<td>(64)</td>
<td>(13)</td>
<td>(37)</td>
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</table>

<table>
<thead>
<tr>
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<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>F602-02W, F602-03W</td>
<td>2.91</td>
<td>5.37</td>
<td>5.89</td>
<td>2.50</td>
<td>0.52</td>
<td>1.46</td>
</tr>
<tr>
<td>(74)</td>
<td>(136)</td>
<td>(150)</td>
<td>(64)</td>
<td>(13)</td>
<td>(37)</td>
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</tr>
</tbody>
</table>

**Ordering Information**

**F 602 — 02 W J /**

- **Port Threads**
  - NPT
  - G BSPP
- **Port Size**
  - 02 1/4 Inch
  - 03 3/8 Inch
- **Bowl**
  - B Polycarbonate with Plastic Bowl Guard
  - W Metal with Sight Gauge
- **Elements**
  - G 5 Micron
  - J 40 Micron
- **Drains and Options**
  - Blank
  - Manual Twist Drain
  - R Internal Auto Drain
  - S Automatic Pulse Drain (For Polycarbonate Bowls [B] Only)
  - U Semi-Auto Drain
  - X11 No Internal Parts

**Engineering Change Designator**
Will be entered at factory.

**Bold Items are Most Popular.**
For other models refer to ordering information below.

\(^*\) For polycarbonate bowl see Caution on page B2.

\(^6\) SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop with 40 micron element.
Technical Information

F602 Filter Kits & Accessories

Bowl Kits –
Metal with Sight Gauge (W)............................ BK605WY
Polycarbonate (B)............................................. BK602Y

Drain Kits –
Internal Auto (All)............................................. SA602MD
Manual Twist (All)................................. SA600Y7-1
Automatic Pulse (B)........................................... RK602SY
Semi-Automatic “Overnight” Drain............... SA602A7
(Drains automatically under zero pressure)

Filter Element Kits –
5 Micron (B,W)............................................. EK602VY
40 Micron (B,W)............................................. EK602Y

Mounting Bracket Kit .................................. (All) SAF602-0571

Repair Kits –
Deflector, Secondary Baffle, Primary Baffle,
and Retaining Rod (B,W)............................. RK602Y
Internal Auto Drain (All).............................. RK602MD
Metal Bowl with Sight Gauge (W)............... RKB605WY

Specifications

Bowl Capacity .......................................................... 5 Ounces
Port Threads .......................................................... 1/4, 3/8 Inch

Pressure & Temperature Ratings –
Polycarbonate Bowl................................. 0 to 150 PSIG (0 to 10.2 bar)
40°F to 125°F (4.4°C to 52°C)
Metal Bowl........................................... 0 to 250 PSIG (0 to 17.2 bar)
40°F to 150°F (4.4°C to 65.6°C)
(With Internal Auto Drain 20 to 175 PSIG (1.4 to 11.9 bar)

Weight –
Polycarbonate Bowl.......................... 1.5 lb. (0.68 kg) / Unit
18 lb. (8.16 kg) / 12-Unit Master Pack
Metal Bowl........................................ 1.8 lb. (0.82 kg) / Unit
22 lb. (9.98 kg) / 12-Unit Master Pack

Materials of Construction

Body .......................................................... Zinc
BOWLS –
(B).................................................. Polycarbonate Polycarbonate
(W).................................................. Metal (Zinc) with Sight Gauge

Bowl Guards .......................................................... Plastic

Drain –
Manual Twist & Overnight.............................. Brass
Internal Auto & Piston......................................... Acetal

Filter Elements –
40 Micron (Standard)............................. Polypropylene
5 Micron (Optional)................................. Polypropylene

Seals .......................................................... Buna N

Sight Gauge.......................................................... Nylon
F602 General Purpose Filters

Features
- Excellent Water Removal Efficiency
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Unique Deflector Plate that Creates Swirling of the Air Stream Ensuring Maximum Water and Dirt Separation
- Large Filter Element Surface Guarantees Low Pressure Drop and Increased Element Life
- 40 Micron Filter Element Standard, 5 Micron Available
- Metal Bowl with Sight Gauge Standard
- Twist Drain as Standard, Optional Auto Drain
- Large Bowl Capacity
- Optional High Capacity Bowl(s) Available
- High Flow: 1/2" - 90 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manual Twist Drain</td>
<td>Manual Internal Auto Drain</td>
</tr>
<tr>
<td>Polycarbonate Bowl* / Plastic Guard</td>
<td>F602-04BJ</td>
<td>F602G04BJ</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>F602-04BJR</td>
<td>F602G04BJR</td>
</tr>
<tr>
<td>Metal Bowl / Sight Gauge</td>
<td>F602-04WJ</td>
<td>F602G04WJ</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>F602-04WJR</td>
<td>F602G04WJR</td>
</tr>
<tr>
<td>Aluminum Bowl 16 oz. without Sight Gauge</td>
<td>F602-04EJ</td>
<td>F602G04EJ</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>F602-04EJR</td>
<td>F602G04EJR</td>
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</tbody>
</table>

Bold Items are Most Popular. For other models refer to ordering information below.

* For polycarbonate bowl see Caution on page B2.

SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop with 40 micron element.

F602 Filter Dimensions

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Manual Twist Drain</td>
<td>Manual Internal Auto Drain</td>
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<tr>
<td>F602-04B</td>
<td>3.77 (96) 5.97 (152) 6.56 (167) 3.25 (83) 0.59 (15) 1.88 (48)</td>
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<tr>
<td>F602-04E</td>
<td>3.79 (96) 9.30 (236) 9.89 (251) 3.25 (83) 0.59 (15) 1.90 (48)</td>
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<tr>
<td>F602-04W</td>
<td>3.77 (96) 6.12 (156) 6.71 (170) 3.25 (83) 0.59 (15) 1.88 (48)</td>
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</table>

inches (mm)

Ordering Information

F 602 — 04 W J /**

B8
Technical Information

F602 Filter Kits & Accessories

Bowl Kits –
- Aluminum (E) .................................................. BK603A
- Metal with Sight Gauge (W) .......................... BK605WA
- Polycarbonate with Plastic Bowl Guard (B) .... BK602A

Drain Kits –
- External Auto (B,W) ......................................... SA602D
- External Auto (E) ............................................. SA603D
- Internal Auto (All) ............................................. SA602MD
- Manual Twist (All) ........................................... SA600Y7-1
- Semi-Automatic “Overnight” Drain .................. SA602A7
  (Drains automatically under zero pressure)

Filter Element Kits –
- 5 Micron (All) .................................................. EK602VA
- 40 Micron (All) .................................................. EK602A

Mounting Bracket Kit ........................................ (All) SAF60-0572

Repair Kits –
- Deflector, Baffle Assembly, and Retaining Rod (All) .... RK602A
- External Auto Drain (All) ................................. RK602D
- Internal Auto Drain (All) ................................... RK602MD
- Metal Bowl with Sight Gauge (W) .................... RK605WA

Specifications

Bowl Capacity –
- (B, W) .................................................. 8 Ounces
- (E) .................................................. 16 Ounces

Port Threads .................................................. 1/2 Inch

Pressure & Temperature Ratings –
- Polycarbonate Bowl (B) ................................ 0 to 150 PSIG (0 to 10.2 bar)
  40°F to 125°F (4.4°C to 52°C)
- Metal Bowl (W) ........................................... 0 to 250 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)
- Aluminum Bowl (E) .................................... 0 to 300 PSIG (0 to 20.4 bar)
  40°F to 150°F (4.4°C to 65.6°C)
- With Internal Auto Drain (R) ....................... 20 to 175 PSIG (1.4 to 11.9 bar)
  40°F to 125°F (4.4°C to 52°C)
- With External Auto Drain (Q) ..................... 0 to 250 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)
  (Except with Polycarbonate “B” Bowl - See bowl limits)

Weight –
- Polycarbonate Bowl (B) ................................ 2.4 lb. (1.09 kg) / Unit
  19 lb. (8.6 kg) / 8-Unit Master Pack
- Metal Bowl (W) ........................................... 2.8 lb. (1.27 kg) / Unit
  22 lb. (9.98 kg) / 8-Unit Master Pack
- Aluminum Bowl (E) ..................................... 3.6 lb. (1.63 kg) / Unit
  29 lb. (13.15 kg) / 8-Unit Master Pack

Materials of Construction

Body .......................................................... Zinc

Bowls –
- (B) .................................................. Polycarbonate
- (W) .................................................. Metal (Zinc)
- (E) .................................................. Aluminum

Bowl Guards .................................................. Plastic

Drain –
- Manual Twist & Overnight .......................... Brass
- Internal Auto .......................... Acetal

Filter Elements –
- 40 Micron (Standard) ............................... Polypropylene
- 5 Micron (Optional) ............................... Polypropylene

Seals .......................................................... Nitrile

Sight Gauge ................................................. Nylon
F602 Standard Filters

Features
- Excellent Water Removal Efficiency
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Unique Deflector Plate that Creates Swirling of the Air Stream Ensuring Maximum Water and Dirt Separation
- Large Filter Element Surface Guarantees Low Pressure Drop and Increased Element Life
- 40 Micron Filter Element Standard, 5 Micron Available
- Metal Bowl with Sight Gauge Standard
- Twist Drain as Standard, Optional Auto Drain
- Large Bowl Capacity
- Optional High Capacity Bowl(s) Available
- High Flow: 3/4” - 220 SCFM§
  1” - 240 SCFM§

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<td>Manual Twist Drain</td>
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<td>Metal Bowl / Sight Gauge</td>
<td>F602-06WJ</td>
<td>F602-06WJR</td>
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<tr>
<td>3/4”</td>
<td>F602-08WJ</td>
<td>F602-08WJR</td>
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<tr>
<td>1”</td>
<td>F602-06EJ</td>
<td>F602-06EJR</td>
</tr>
<tr>
<td>Aluminum Bowl 32 oz. without Sight Gauge</td>
<td>F602-08EJ</td>
<td>F602-08EJR</td>
</tr>
</tbody>
</table>

F602 Filter Dimensions (inches (mm))

| F602-06W, F602-08W | A 4.90 (124) | B 7.88 (200) | C 8.72 (221) | D 4.06 (103) | E 0.84 (21) | F 2.45 (62) |
| F602-06E, F602-08E | A 4.90 (124) | B 11.10 (282) | C 11.94 (303) | D 4.06 (103) | E 0.84 (21) | F 2.45 (62) |

Ordering Information

F 602 — 06 W J /**

Port Threads
— NPT
G BSPP
Port Size
06 3/4 Inch
08 1 Inch
Bowl
E 32 oz. Large Capacity without Sight Gauge
W 16 oz. Metal with Sight Gauge
Elements
G 5 Micron
J 40 Micron
Drains and Options
Blank
Manual Twist Drain
Q External Heavy Duty Auto Drain
R Internal Auto Drain
U Semi-Auto Drain

BOLD ITEMS ARE MOST POPULAR.
**Technical Information**

**F602 Filter Kits & Accessories**

Bowl Kits –
- Metal with Sight Gauge (W) .................................. BK605WB
- Aluminum (E) .................................................... BK603B

Drain Kits –
- External Auto (W) ........................................... SA602D
- External Auto (E) ............................................. SA603D
- Internal Auto (All) .......................................... SA602MD
- Manual (All) .................................................. SA600VY7-1
  - Semi-Automatic “Overnight” Drain .............. SA602A7
  - (Drains automatically under zero pressure)

Filter Element Kits –
- 40 Micron (All) ............................................... EK602B
- 5 Micron (All) .................................................. EK602VB

Mounting Bracket Kit
(Pair or 2 Kits of Pipe Mounted Brackets needed) –
- (3/4" Unit) .......................................................... SA200AW57
- (1" Unit) ............................................................. SA200CW57

Repair Kits –
- Deflector, Baffle Assembly, and Retaining Rod (E,W) ........ RK602B
- External Auto Drain (All) ................................ RK602D
- Internal Auto Drain (All) ...................................... RK602MD
- Metal Bowl with Sight Gauge (W) .................. RKB605WB

**Specifications**

Bowl Capacity –
- Metal Bowl (W) ............................................. 16 Ounces
- Metal Bowl (E) .................................................. 32 Ounces
- Port Threads .................................................... 3/4", 1 Inch

( ) = BOWL TYPE

---

**Pressure & Temperature Ratings**

<table>
<thead>
<tr>
<th>Type</th>
<th>Primary Pressure - bar</th>
<th>Primary Pressure - PSIG</th>
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</thead>
<tbody>
<tr>
<td>Metal Bowl (W)</td>
<td>1.7 3.4 5.2 6.9 10.3</td>
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</tr>
<tr>
<td>Aluminum Bowl (E)</td>
<td>0 to 175 PSIG (0 to 12 bar)</td>
<td></td>
</tr>
<tr>
<td>With Internal Auto Drain (R)</td>
<td>0 to 175 PSIG (0 to 12 bar)</td>
<td></td>
</tr>
<tr>
<td>With External Auto Drain (Q)</td>
<td>0 to 50 PSIG (0 to 3.5 bar)</td>
<td></td>
</tr>
</tbody>
</table>

**Weight**

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Bowl (W)</td>
<td>6.3 lb. (2.86 kg) / Unit</td>
</tr>
<tr>
<td>Aluminum Bowl</td>
<td>7 lb. (3.18 kg) / Unit</td>
</tr>
</tbody>
</table>

**Materials of Construction**

**Body** .......................................................... Zinc
**Bowls** –
- Metal Bowl (W) ............................................. Zinc with Sight Gauge
- Metal Bowl (E) .................................................. Aluminum without Sight Gauge
**Drain** –
- Manual Twist & Overnight .................................. Brass
- Housing “R” ....................................................... Acetal
- Housing “Q” ....................................................... Bronze
**Filter Elements** –
- 40 Micron (Standard) ....................................... Polypropylene
- 5 Micron (Optional) .......................................... Polypropylene
**Seals** .......................................................... Nitrile
**Sight Gauge** .................................................. Nylon

---

“Q” Option External Heavy Duty Auto Drain SA602D / SA603D

For heavy duty applications where the filter is being used to remove large volumes of liquid and/or particulate matter from the airstream, the external automatic drain ("Q" option) should be used.

---

www.wattsfluidair.com

Richland, Michigan

Pneumatic Division

B11
F602 Standard Filters

**Features**
- Excellent Water Removal Efficiency
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Unique Deflector Plate that Creates Swirling of the Air Stream Ensuring Maximum Water and Dirt Separation
- Large Filter Element Surface Guarantees Low Pressure Drop and Increased Element Life
- 40 Micron Filter Element Standard, 5 Micron Available
- Metal Bowl with Sight Gauge Standard
- Twist Drain as Standard, Optional Auto Drain
- Large Bowl Capacity
- Optional High Capacity Bowl(s) Available
- High Flow: 1-1/4" - 390 SCFM
  1-1/2" - 450 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manual Twist Drain</td>
<td>Internal Auto Drain</td>
</tr>
<tr>
<td>Metal Bowl / Sight Gauge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>F602-10WJ</td>
<td>F602-10WJR</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>F602-12WJ</td>
<td>F602-12WJR</td>
</tr>
<tr>
<td>Aluminum Bowl 32 oz. without Sight Gauge</td>
<td>F602-10EJ</td>
<td>F602-10EJR</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>F602-12EJ</td>
<td>F602-12EJR</td>
</tr>
</tbody>
</table>

Bold items are Most Popular.
For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop with 40 micron element.

### F602 Filter Dimensions

<table>
<thead>
<tr>
<th>F602-10W, F602-12W</th>
<th>F602-10E, F602-12E</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>4.90 (124)</td>
<td>8.18 (208)</td>
</tr>
<tr>
<td>4.90 (124)</td>
<td>11.41 (290)</td>
</tr>
</tbody>
</table>

**Ordering Information**

| F  | 602 | —  | 10  | W  | J  | /** |

**Port Threads**
- NPT
- G BSPP

**Port Size**
- 10 1-1/4 Inch
- 12 1-1/2 Inch

**Bowl**
- E 32 oz. Large Capacity without Sight Gauge
- W 16 oz. Metal with Sight Gauge

**Elements**
- G 5 Micron
- J 40 Micron

**Drains and Options**
- Blank
- Manual Twist Drain
- Q External Heavy Duty Auto Drain
- R Internal Auto Drain
- U Semi-Auto Drain

**Engineering Change Designator**
Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
**Technical Information**

### F602 Filter Kits & Accessories

**Bowl Kits** –
- Metal with Sight Gauge (W) .............................................. BK605WB
- Aluminum (E) ................................................................. BK603B

**Drain Kits** –
- External Auto (W) .......................................................... SA602D
- External Auto (E) ............................................................ SA603D
- Internal Auto (All) .......................................................... SA602MD
- Manual (All) ................................................................. SA600Y7-1
- Semi-Automatic “Overnight” Drain ................................... SA602A7
  (Drains automatically under zero pressure)

**Filter Element Kits** –
- 40 Micron (All) ............................................................. EK602B
- 5 Micron (All) ............................................................... EK602VB

**Repair Kits** –
- Deflector, Baffle Assembly, and Retaining Rod (All) ........... RK602C
- External Auto Drain (All) ................................................ RK602D
- Internal Auto Drain (All) .................................................. RK602MD
- Metal Bowl with Sight Gauge (W) .................................... RKB605WB

### Specifications

**Bowl Capacity** –
- Metal (W) ................................................................. 16 Ounces
- Aluminum (E) ............................................................. 32 Ounces

**Port Threads** ............................................................ 1-1/4, 1-1/2 Inch

[Diagram of Flow Characteristics F602-10WJ
1-1/4-inch Port]

[Diagram of Flow Characteristics F602-12 WJ
1-1/2-inch Port]

“Q” Option External Heavy Duty Auto Drain
SA602D / SA603D
For heavy duty applications where the filter is being used to remove large volumes of liquid and/or particulate matter from the airstream, the external automatic drain (“Q” option) should be used.

### Pressure & Temperature Ratings

<table>
<thead>
<tr>
<th>Pressure Drop - PSIG</th>
<th>Pressure Drop - bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.1</td>
</tr>
<tr>
<td>1.5</td>
<td>0.3</td>
</tr>
<tr>
<td>2.0</td>
<td>0.5</td>
</tr>
<tr>
<td>2.5</td>
<td>0.7</td>
</tr>
<tr>
<td>3.0</td>
<td>0.9</td>
</tr>
<tr>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>4.0</td>
<td>1.3</td>
</tr>
<tr>
<td>4.5</td>
<td>1.5</td>
</tr>
<tr>
<td>5.0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**Body** ................................................................. Zinc

**Bowls** –
- (W) ................................................................. Metal (Zinc) with Sight Gauge
- (E) ................................................................. Aluminum without Sight Gauge

**Drain** –
- Manual Twist & Overnight ......................................... Brass
- Housing “R” ............................................................. Acetal
- Housing “Q” ............................................................ Bronze

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

**Seals** ................................................................. Nitrile

**Sight Gauge** ............................................................ Nylon
F602 Standard Filters

Features
- Excellent Water Removal Efficiency
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Unique Deflector Plate that Creates Swirling of the Air Stream Ensuring Maximum Water and Dirt Separation
- Large Filter Element Surface Guarantees Low Pressure Drop and Increased Element Life
- 40 Micron Filter Element Standard, 5 Micron Available
- Metal Bowl with Sight Gauge Standard
- Twist Drain as Standard, Optional Auto Drain
- Large Bowl Capacity
- Optional High Capacity Bowl(s) Available
- High Flow: 2" & 2-1/2" - 1200 SCFM§

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Manual Twist Drain</th>
<th>NPT Internal Auto Drain</th>
<th>BSPP Manual Twist Drain</th>
<th>BSPP Internal Auto Drain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Bowl / Sight Gauge</td>
<td>F602-16WJ</td>
<td>F602-16WJR</td>
<td>F602G16WJ</td>
<td>F602G16WJR</td>
</tr>
<tr>
<td>2&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1/2&quot;</td>
<td>F602-20WJ</td>
<td>F602-20WJR</td>
<td>F602G20WJ</td>
<td>F602G20WJR</td>
</tr>
<tr>
<td>Aluminum Bowl 32 oz. without Sight Gauge</td>
<td>F602-16EJ</td>
<td>F602-16EJR</td>
<td>F602G16EJ</td>
<td>F602G16EJR</td>
</tr>
<tr>
<td>2&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1/2&quot;</td>
<td>F602-20EJ</td>
<td>F602-20EJR</td>
<td>F602G20EJ</td>
<td>F602G20EJR</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop with 40 micron element.

Ordering Information

F 602 — 16 W J /**

Port Threads
- NPT
- G BSPP

Port Size
16 2 Inch
20 2-1/2 Inch

Bowl
E 32 oz. Large Capacity without Sight Gauge
W 16 oz. Metal with Sight Gauge

Elements
J 40 Micron

Drains and Options
Blank Manual Twist Drain
O External Heavy Duty Auto Drain
R Internal Auto Drain
U Semi-Auto Drain

Engineering Change Designator
Will be entered at factory.
Technical Information

F602 Filter Kits & Accessories

Bowl Kits –
- Metal with Sight Gauge (W) .......... BK605WB
- Aluminum (E) ......................... BK603B

Drain Kits –
- External Auto (W) ........................ SA602D
- External Auto (E) ........................ SA603D
- Internal Auto (All) ...................... SA602MD
- Manual (All) ............................ SA600Y7-1
- Semi-Automatic “Overnight” Drain  .. SA602A7
  (Drains automatically under zero pressure)

Filter Element Kits – .......................... 40 Micron (All) EK602G

Repair Kits –
- Deflector, Baffle Assembly, and Retaining Rod (All) ........ RK602G
- External Auto Drain (All) .............. RK602D
- Internal Auto Drain (All) .............. RK602MD
- Metal Bowl with Sight Gauge (W) .... RKB605WB

Specifications

Bowl Capacity –
- Metal (W) .................................. 16 Ounces
- Aluminum (E) ............................. 32 Ounces

Port Threads .................................. 2, 2-1/2 Inch

“Q” Option External Heavy Duty Auto Drain
SA602D / SA603D
For heavy duty applications where the filter is being used to remove large volumes of liquid and/or particulate matter from the airstream, the external automatic drain (“Q” option) should be used.

Pressures & Temperature Ratings –
- Metal Bowl (W) ........................... 0 to 250 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)
- Aluminum Bowl (E) ..................... 0 to 300 PSIG (0 to 20.4 bar)
  40°F to 150°F (4.4°C to 65.6°C)
- With Internal Auto Drain (R) ........ 20 to 175 PSIG (1.4 to 11.9 bar)
  40°F to 125°F (4.4°C to 52°C)
- With External Auto Drain (Q) ........ 0 to 250 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)

Weight –
- Metal Bowl (W) ........................... 9.8 lb. (4.45 kg) / Unit
  39 lb. (17.69 kg) / 4-Unit Master Pack
- Aluminum Bowl (E) ..................... 10.3 lb. (4.67 kg) / Unit
  11 lb. (4.99 kg) / 1-Unit Master Pack

Materials of Construction

Body .............................................. Aluminum

Bowls –
  (W) ............................................ Metal (Zinc) with Sight Gauge
  (E) ............................................ Aluminum without Sight Gauge

Drain –
  Manual Twist & Overnight ............... Brass
  Housing “R” .............................. Acetal
  Housing “Q” .............................. Bronze

Filter Elements –
  40 Micron (Standard) .................... Polypropylene

Seals ............................................. Buna N

Sight Gauge ..................................... Nylon

( ) = BOWL TYPE
# F701 Coalescing Filters

## Features
- Removes Liquid Aerosols and Sub-micron Particles
- Protects Pneumatic Systems from Contamination that Standard Particulate Filters Will Not Catch
- Two Different Grade Elements Available
- Differential Pressure Pop-up Indicator Standard
- Differential Pressure Gauge Optional
- High Flow Design

Note: All coalescing filters should be protected by a particulate filter (i.e., F602, or other) installed upstream.

## Ordering Information

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Flow (SCFM)*</th>
<th>Part Number</th>
<th>Flow (SCFM)*</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>22</td>
<td>F701-02W3P</td>
<td>36</td>
<td>F701-02W7P</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>22</td>
<td>F701-03W3P</td>
<td>36</td>
<td>F701-03W7P</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>53</td>
<td>F701-02E3P</td>
<td>88</td>
<td>F701-02E7P</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>53</td>
<td>F701-03E3P</td>
<td>88</td>
<td>F701-03E7P</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>53</td>
<td>F701-04E3P</td>
<td>88</td>
<td>F701-04E7P</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>95</td>
<td>F701-06E3P</td>
<td>158</td>
<td>F701-06E7P</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>170</td>
<td>F701-06L3P</td>
<td>285</td>
<td>F701-06L7P</td>
</tr>
<tr>
<td>1&quot;</td>
<td>95</td>
<td>F701-08E3P</td>
<td>158</td>
<td>F701-08E7P</td>
</tr>
<tr>
<td>1&quot;</td>
<td>170</td>
<td>F701-08L3P</td>
<td>285</td>
<td>F701-08L7P</td>
</tr>
</tbody>
</table>

* Dry media flow. For wet media info see table to right.

---

## F701 Coalescing Filter Dimensions

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Bowl Capacity</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4, 3/8, 1/2 Inch (W)</td>
<td>8 oz.</td>
<td>3.76 (96)</td>
<td>6.12 (155)</td>
<td>7.09 (180)</td>
<td>3.25 (83)</td>
<td>.97 (25)</td>
</tr>
<tr>
<td>1/4, 3/8, 1/2 Inch (E)</td>
<td>16 oz.</td>
<td>3.76 (96)</td>
<td>9.37 (238)</td>
<td>10.34 (262)</td>
<td>3.25 (83)</td>
<td>.97 (25)</td>
</tr>
<tr>
<td>3/4, 1 Inch (E)</td>
<td>32 oz.</td>
<td>4.95 (126)</td>
<td>11.77 (299)</td>
<td>13.00 (330)</td>
<td>4.00 (101)</td>
<td>1.23 (31)</td>
</tr>
<tr>
<td>3/4, 1 Inch (L)</td>
<td>100 oz.</td>
<td>4.95 (126)</td>
<td>21.39 (543)</td>
<td>22.63 (575)</td>
<td>4.00 (101)</td>
<td>1.23 (31)</td>
</tr>
</tbody>
</table>

"G" Differential Pressure Gauge add 2.00(50.8) to C & E.
"Q" External Auto Drain add 1.70 (43.1) to B & C.

* Inches (mm)

**Engineering Change Designator**
Will be entered at factory.

---

* "G" Option Not Available with Bowl Option "L"
F701 Series
Coalescing Filters

Element Selection

<table>
<thead>
<tr>
<th>Element Grade</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>General air coalescing applications when total removal of liquid aerosols and suspended fines is required in all pressure ranges. Protection of air dryers, air gauging, air logic, modulating systems, critical air conveying, most breathing air systems, etc.</td>
</tr>
<tr>
<td>10</td>
<td>Precoalescer or prefilter for Grade 6 to remove gross amounts of water and oil, or tenacious aerosols which are difficult to remove. Upgrading existing particulate equipment to coalescing without increase in pressure drop.</td>
</tr>
</tbody>
</table>

Element Specifications

<table>
<thead>
<tr>
<th>Grade</th>
<th>D.O.P. Coalescing Efficiency</th>
<th>Maximum Oil Carrying Capacity</th>
<th>Pressure Drop (PSIG) @ Rated Flow</th>
<th>Particulate Micron Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>99.97%</td>
<td>0.008</td>
<td>1.0</td>
<td>0.01</td>
</tr>
<tr>
<td>10</td>
<td>95%</td>
<td>0.85</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*Tested per BCAS 860900 at 40 ppm inlet.

Minimum Recommended Flow – 20% of Rated Flow

Maximum Pressure (With Manual Drains) –
1/4, 3/8, 1/2 Inch (W) 0 to 250 PSIG (0-17 bar)
1/4, 3/8, 1/2 Inch (E) 0 to 300 PSIG (0-20 bar)
3/4 Inch (E) 0 to 300 PSIG (0-20 bar)
1 Inch (L) 0 to 300 PSIG (0-20 bar)

Maximum Pressure (With Automatic Drains) –
“R” Drain 175 PSIG (12 bar)
“T” Drain 250 PSIG (17 bar)
“Q” Drain 250 PSIG (17 bar)

Maximum Temperature – 32°F to 150°F (0°C to 65°C)
Minimum Primary Pressure Drop 0.1 PSIG

Weight –
1/4, 3/8, 1/2 Inch (W 8 oz.) 2.5 lb.
1/4, 3/8, 1/2 Inch (E 16 oz.) 2.5 lb.
3/4 Inch (E 32 oz.) 5 lb.
1 Inch (L 100 oz.) 8 lb.

Materials of Construction

Body & Flange Ring  Zinc
Bowl – Metal Bowl (W) Zinc with Nylon Sight Gauge
Metal Bowl (E) (L) Aluminum

Drains –
Automatic Float Drain  Acetal
Housing “R”, “T” Bronze
Manual Twist Drain  Brass

Seals & Float – Buna N
Springs  Stainless Steel

Element (Media) – Borosilicate Fibers & Felt
Element End Caps  Urethane
Seals  Buna N

( ) = BOWL TYPE
### 30F, 31F, 32F Coalescing Filters – Main Line

**Features**

- Removes Liquid Aerosols and Sub-micron Particles
- Liquids Gravitate to the Bottom of the Element and Will Not Re-enter the Airstream
- Oil Free Air For Critical Applications, such as Air Gauging and Pneumatic Instrumentation and Controls
- Differential Pressure Indicator Standard
- High Flow:

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Model</th>
<th>Sump Capacity</th>
<th>SCFM ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2”</td>
<td>30F</td>
<td>14.8 Oz.</td>
<td>350</td>
</tr>
<tr>
<td>2”</td>
<td>31F83</td>
<td>17.9 Oz.</td>
<td>450</td>
</tr>
<tr>
<td>2”</td>
<td>31F8L</td>
<td>20.9 Oz.</td>
<td>625</td>
</tr>
<tr>
<td>2-1/2”</td>
<td>32F9</td>
<td>29.7 Oz.</td>
<td>800</td>
</tr>
<tr>
<td>3”</td>
<td>32FN</td>
<td>29.7 Oz.</td>
<td>1000</td>
</tr>
</tbody>
</table>

² SCFM = Standard cubic feet per minute at 90 PSIG inlet and 5 PSIG pressure drop.

### Main Line – Coalescing Filter Dimensions

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>30F73</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>17.97</td>
<td>20.52</td>
<td>13.50</td>
</tr>
<tr>
<td>31F77</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>17.76</td>
<td>20.32</td>
<td>13.50</td>
</tr>
<tr>
<td>31F83</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>23.60</td>
<td>26.15</td>
<td>19.25</td>
</tr>
<tr>
<td>31F8L</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>28.60</td>
<td>31.15</td>
<td>24.02</td>
</tr>
<tr>
<td>31F87</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>23.40</td>
<td>25.95</td>
<td>19.25</td>
</tr>
<tr>
<td>31F8M</td>
<td></td>
<td>6.00</td>
<td>5.67</td>
<td>2.55</td>
<td>28.39</td>
<td>30.06</td>
<td>24.02</td>
</tr>
<tr>
<td>32F9L</td>
<td></td>
<td>8.00</td>
<td>7.60</td>
<td>3.31</td>
<td>34.64</td>
<td>37.94</td>
<td>28.50</td>
</tr>
<tr>
<td>32F9M</td>
<td></td>
<td>8.00</td>
<td>7.60</td>
<td>3.31</td>
<td>34.40</td>
<td>37.74</td>
<td>28.50</td>
</tr>
<tr>
<td>32FNL</td>
<td></td>
<td>8.00</td>
<td>7.60</td>
<td>3.31</td>
<td>34.40</td>
<td>37.74</td>
<td>28.50</td>
</tr>
<tr>
<td>32FNLM</td>
<td></td>
<td>8.00</td>
<td>7.60</td>
<td>3.31</td>
<td>34.40</td>
<td>37.74</td>
<td>28.50</td>
</tr>
</tbody>
</table>

### Ordering Information

**30F 7 3 E C P**

**Bowl Options**

- 3. Short Bowl (30F, 31F)
- 4. Long Bowl (31F, 32F)
- Metal Bowl with Automatic Float Drain
- 7. Short Bowl (30F, 31F)
- 8. Long Bowl (31F, 32F)

**Elements**

- E. Grade 6
- H. Grade 10

**Engineering Level**

- C Current

**Options**

- P. Pressure Differential Indicator

Most common part numbers shown bold, with Grade 6 Elements (for Grade 10 Elements, replace “E” with “H” in the 6th position). For other models refer to ordering information below.
Technical Information

30F, 31F, 32F Coalescing Filter Kits & Accessories

Bowl Kit –
- Metal / Twist Drain –
  - 30F ...................................................................................... 41618P
  - 31F83 .................................................................................. 41619P

DPI Replacement Kit –
- 30F, 31F83, 31F8L, 32F ........................................................ 2003P

Differential Pressure Indicating Gauge –
- 30F, 31F83, 31F8L, 32F ........................................................ 2111P

Drain Kits –
- Automatic Float Drain –
  - 30F, 31F83, 31F8L, 32F ................................................. PS506P

Filter Element Kits –
- Grade 6 (Standard) –
  - 30F ......................................................................... 9920-011x1P
  - 31F83 ..................................................................... 9920-012x1P
  - 31F8L ..................................................................... 9920-013x1P
  - 32F ......................................................................... 9920-014x1P
- Grade 10 (Optional) –
  - 30F ......................................................................... 9920-015x1P
  - 31F83 ..................................................................... 9920-016x1P
  - 31F8L ..................................................................... 9920-017x1P
  - 32F ......................................................................... 9920-018x1P

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Sump Capacity</th>
<th>Port Threads</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>30F</td>
<td>14.8 Oz.</td>
<td>1-1/2&quot;</td>
<td>11.9 lb. (5.4 kg)</td>
</tr>
<tr>
<td>31F83</td>
<td>17.9 Oz.</td>
<td>2&quot;</td>
<td>14.0 lb. (6.4 kg)</td>
</tr>
<tr>
<td>31F8L</td>
<td>20.9 Oz.</td>
<td>2&quot;</td>
<td>15.9 lb. (7.2 kg)</td>
</tr>
<tr>
<td>32F9</td>
<td>29.7 Oz.</td>
<td>2-1/2&quot;</td>
<td>35.0 lb. (15.9 kg)</td>
</tr>
<tr>
<td>32FN</td>
<td>29.7 Oz.</td>
<td>3&quot;</td>
<td>34.2 lb. (15.9 kg)</td>
</tr>
</tbody>
</table>

Operation –
- Normal Operating Pressure Drop ......................... 2 PSIG
- Maximum Recommended Pressure Drop ....................... 10 PSIG (Element should be replaced)
- Minimum Recommended Flow .................................. 20%

Pressure & Temperature Ratings –
- 0 to 250 PSIG (0 to 17.2 bar) 32°F to 175°F (0°C to 80°C)

Materials of Construction

Body ............................................................ Aluminum
Bowl .................................................. Aluminum without Sight Gauge
Drains –
- Twist Drain .................................................. Brass Petcock
- Automatic Float Drain –
  - Housing, Float .................................................. Plastic
  - Seals .................................................. Buna N
  - Springs, Push Rod .................................. Stainless Steel

Filter Element –
- Borosilicate & felt glass fibers 99.97% DOP efficiency
- Largest Aerosol Particle Passed (Grade 6) ........ 0.75 Microns
- Largest Solid Particle Passed (Grade 6) ........ 0.30 Microns

Seals .................................................. Nitrile
DD Desiccant Dryers

Features
- These Desiccant Dryers are a Convenient and Cost-Effective Means of Ensuring Your Sensitive Pneumatic Applications are Never Exposed to Damaging Moisture
- Compact Size for Point-of-Use Applications
- Drying Efficiency Down to -40°F Pressure Dew Point
- Easily and Quickly Serviced
- Sightglass in Bowl to Monitor Desiccant
- Built-in Particulate after Filter Prevents Downstream Dust
- No Electricity Needed
- Low Pressure Drop
- No Purge Air Lost as with Other Dryer Types

Applications
- Paint Spraying
- Instrument Air
- Laboratory Instruments
- Control Air Systems
- Air Blanketing

Performance
The rated flow capacities are nominal ratings provided for reference. These capacities are recommended for minimal pressure drop and average desiccant life. A supply of low flow / low humidity air will provide longer desiccant life: whereas, high flow / high humidity air will require more frequent desiccant changes. Installed in an application with intermittent flow, these desiccant dryers will typically dry air for weeks before the silica gel desiccant requires replacement or regeneration.

Ordering Information

<table>
<thead>
<tr>
<th>Port Size</th>
<th>15 SCFM</th>
<th>30 SCFM</th>
<th>60 SCFM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desiccant Capacity¹</td>
<td>2.5 lb¹</td>
<td>5 lb¹</td>
<td>10 lb¹</td>
</tr>
<tr>
<td>1/4” ²</td>
<td>DD15-02</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3/8” ²</td>
<td>DD15-03</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>1/2” ²</td>
<td>DD15-04</td>
<td>DD30-04</td>
<td>DD60-04</td>
</tr>
<tr>
<td>3/4”</td>
<td>DD15-06</td>
<td>DD30-06</td>
<td>DD60-06</td>
</tr>
<tr>
<td>1”</td>
<td>N/A</td>
<td>DD30-08</td>
<td>DD60-08</td>
</tr>
</tbody>
</table>

Notes:
1. Desiccant must be ordered separately
2. These units supplied with reducer bushings

* Dimension does not include reducer bushings for 1/4”, 3/8”, 1/2” versions.

inches
(mm)
Technical Specifications – DD Series

Desiccant Dryers

As the wet compressed air enters through the inlet, the air travels down through the bed of desiccant which adsorb the water vapor and aerosols. The silica gel desiccant beads will reduce the humidity down to a -40°F pressure dew point. After the moisture has been removed, the dry air passes through a sintered bronze filter element (eliminating dust downstream), up the tube and out the outlet port. As the desiccant becomes saturated with moisture, the dew point will begin to rise. This is evident when the blue silica gel desiccant beads in the sight gauge change to pink, indicating the need for desiccant replacement. Simply remove the flange and bowl and replace with new desiccant or regenerate saturated desiccant by heating to 275°F.

Desiccant Dryers Kits & Accessories

Desiccant - Silica Gel 100% Indicating –
(6) .88 lb. Bags .................................................. SGM100-1
(24) .88 lb. Bags .................................................. SGM100-4

Flow Tube Repair Kit (Tube, Filter Element(s), Adaptor)
DD15 .................................................. RKDD15-02-06
DD30 .................................................. RKDD30-03-08
DD60 .................................................. RKDD60-03-08

Mounting Brackets (Recommended for DD15 & DD30 only) –
1/4 Inch Pipe Size (Pair of Pipe Mounted Brackets) ... SA200CW57
1 Inch Pipe Size (Pair of Pipe Mounted Brackets) ..... SA200CW57

Spring Check Valve for Inlet (250 PSIG max.) –
(Maximizes Life of Desiccant)
1/4 Inch NPT .................................................. 003393001
3/8 Inch NPT .................................................. 003393002
1/2 Inch NPT .................................................. 003393003
3/4 Inch NPT .................................................. 003393004

Specifications

Desiccant Capacity (Desiccant must be ordered separately) –
DD15 .................................................. 2.5 lb.
DD30 .................................................. 5 lb.
DD60 .................................................. 10 lb.

Pressure & Temperature Ratings –
Optimum working temperature .......................... Below 100° F
Pressure Range ................................................... 0 to 300 PSIG
Temperature Range ........................................... -32°F to 180°F

Weight (Housing Only) –
DD15 (add 2.5 lb for weight full) ......................... 8 lb.
DD30 (add 5 lb for weight full) ............................. 13 lb.
DD60 (add 10 lb for weight full) ......................... 20 lb.

Materials of Construction

Bowl –
DD15, DD30 .................................................. Aluminum
DD60 .................................................. Steel

Flow Tube .................................................. CPVC

Filter Elements .................................................. Sintered Bronze

Head & Flange Ring .............................................. Zinc

Other Hardware ................................................ Brass

Seals .......................................................... Buna-N

Sight Glass ..................................................... Glass & Steel

Installation Tips

• Always place a moisture separator/particulate filter (i.e., F602) to remove bulk moisture and a coalescing filter (i.e., F701) to remove oil upstream of desiccant dryer. Desiccant coated with oil will not adsorb oil.

• Automatic drains should be used in prefilter.

• A spring ball check valve should be installed at the dryer inlet to maximize the life of the desiccant.

Air Preparation Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Type of Filter</th>
<th>Example</th>
<th>Function Served in Compressed Air System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Particulate / Moisture Removal Filters</td>
<td>F602</td>
<td>Removes bulk moisture &amp; particulate matter¹</td>
</tr>
<tr>
<td>2</td>
<td>Coalescing Filters</td>
<td>F701, 30F, 31F</td>
<td>Removes fine particulate matter, moisture droplets and aerosols, but NOT vapor²</td>
</tr>
<tr>
<td>3</td>
<td>Desiccant Dryer</td>
<td>DD15, DD30, DD60</td>
<td>Removes moisture vapor³</td>
</tr>
</tbody>
</table>

Notes:
1. Removes approx 75% of moisture.
2. Removes approx 99.97% efficient in removing oil & water aerosols >.01 micron.
3. Provides pressure dew point of -40° F with unsaturated desiccant.

Air Compressor
Aftercooler & Drain Trap
Stage 1
Stage 2
Stage 3
Dryer

Wet Air In: Dry Air Out

Quick Remove Flange

Blue Silica Gel Desiccant

Sight Glass

Desiccant Dryers

Richland, Michigan

Pneumatic Division

www.wattsfluidair.com
Regulation
An air regulator is a specialized control valve. It reduces upstream supply pressure level to a specified constant downstream pressure.

Pneumatic equipment that is operated at higher-than-recommended pressure wastes the energy to generate that pressure. It creates a potential safety hazard, and probably will wear out prematurely. Operating below specified pressure can cause the machine to fail to meet design performance specifications. Therefore, precise air pressure control is essential to efficient operation of air-powered equipment.

How to Select the Proper Regulator
While regulator bodies are generally constructed of die-cast metal, other external parts may be either metal or plastic. Remember that all-metal construction is best for tough applications, where abuse is likely to occur, but plastic construction is generally lower in cost. For normal industrial applications, either construction is suitable.

Inlet pressure rating and downstream controlled range, as well as flow capacity, must be determined before selecting a regulator. Port size should match piping size.

Required response time, relieving capability, and type of adjustment are other considerations. Highly sensitive, lightweight diaphragm sensors vs. the slower, but often more durable, piston sensors. Self-relieving vs. non-relieving regulators. T-Handles or knobs as the adjustment mechanism, or air pilot operated regulator which offer remote adjustment. Other choices to be made include gauge, panel mount and other special options.

Regulator Construction
Regulators are generally constructed using a die-cast metal body. Other external parts, such as the spring cage and bottom plug, may be either metal or plastic. All-metal construction offers more durability in tough applications where abuse is likely to occur, while the plastic construction offers lower cost. For normal industrial applications (temperature range of 40° to 120° F and supply pressure to 300 PSIG), either construction will serve well.

Lightweight diaphragm sensors offer quick response and high sensitivity to air pressure changes. Piston sensors are somewhat slower but may be more durable. Where downstream pressure requirements change rapidly enough to cause regular chatter, slower response may be an advantage.

If the self-relieving feature is not needed for an application, simpler non-relieving regulators are available.

For regulators with an adjustment spring, a -Tee Handle or knob provides the external link to the spring on various models.

Pilot-operated regulators substitute air pressure in the chamber above the sensor to provide the reference force. Remote adjustment through a separate pilot regulator thus becomes possible, or the pilot signal can be fed back from a downstream location for precise control.

The balanced inner valve design exposes both sides of the inner valve to essentially the same pressure. This eliminates much of the effect that changes in inlet pressure might have on inner valve position and orifice opening.

Regulator Operation
In a typical regulator, an inner valve sets the size of an orifice which connects inlet port to outlet port. The sensing element, often a diaphragm or piston mechanically linked to the inner valve, reacts to downstream pressure and a reference force to position the inner valve. The reference force can be a spring, or an air pilot chamber.

The valve is normally open. High pressure air enters and flows through the orifice toward the outlet. Downstream pressure is connected through an aspirator tube to the bottom of the diaphragm. As downstream pressure increases, the diaphragm is forced upward, compressing the adjustment spring. When the diaphragm moves, the inner valve spring pushes the inner valve disc upward to throttle the orifice. If downstream pressure exhausts, the mechanical sequence reverses and the inner valve disc opens the orifice until the set pressure is reached again.

The arrangement of separate diaphragm chamber and aspirator tube accomplishes two purposes. First, the diaphragm is moved out of the potentially abrasive air stream. Second, and more important, if the downstream system calls for high flow, this flow generates a low pressure venturi effect at the end of the aspirator tube and into the diaphragm chamber. The diaphragm therefore reacts more quickly to open the orifice via the inner valve, thereby improving response time to high flow demands.

Some circuits may be subject to downstream-generated high pressure (from high temperatures or heavy vertical loads on cylinders, for example). This high pressure is reduced by a self-relieving feature built into the regulator. The inner valve stem normally blocks a relieving orifice in the center of the diaphragm. If excessive pressure lifts the diaphragm off the stem, air bleeds through the orifice and out the spring cage vent until the system returns to the set pressure.
## Regulators

### Regulator Comparison Chart

<table>
<thead>
<tr>
<th></th>
<th>Examples —→</th>
<th>Standard Regulator</th>
<th>Precision Regulator</th>
<th>High Precision Regulators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R10, R11, R119</td>
<td>R216</td>
<td>R210</td>
<td>R220</td>
</tr>
<tr>
<td><strong>Repeatability / Sensitivity</strong></td>
<td>Regulator’s ability to return to a set pressure after inducing flow.</td>
<td>2 to 4 PSIG</td>
<td>0.5 to 1.0 PSIG</td>
<td>0.005 PSIG 1/8” Water Column</td>
</tr>
<tr>
<td><strong>Reduced Pressure Variation</strong></td>
<td>This refers to the regulator’s ability to maintain a consistent output pressure when faced with variables such as time, cycling, temperature, supply pressure, flow, etc.</td>
<td>Average</td>
<td>Good</td>
<td>Best</td>
</tr>
<tr>
<td><strong>Input Pressure</strong></td>
<td>Unregulated air pressure going into the regulator</td>
<td>Varies</td>
<td>Varies</td>
<td>150 PSIG Max.</td>
</tr>
<tr>
<td><strong>Effect of Supply Pressure Variation on Regulated Pressure</strong></td>
<td>Reduced / set pressure variation when input pressure changes by 100 PSIG</td>
<td>Approx. 3 to 6 PSIG</td>
<td>4 PSIG</td>
<td>0.020 PSIG</td>
</tr>
<tr>
<td><strong>Reduced Pressure Range</strong></td>
<td>Reduced pressure ranges available</td>
<td>Varies</td>
<td>Varies</td>
<td>2 to 40 PSIG 2 to 120 PSIG</td>
</tr>
<tr>
<td><strong>Flow Capacity</strong></td>
<td>Regulator’s flow capacity</td>
<td>Varies</td>
<td>Varies</td>
<td>14 SCFM</td>
</tr>
<tr>
<td><strong>Exhaust (Relief) Capacity</strong></td>
<td>Regulator’s exhaust/relief flow rating when backpressure is introduced from downstream</td>
<td>Low</td>
<td>Low</td>
<td>3 SCFM</td>
</tr>
<tr>
<td><strong>Overpressure to Relieve</strong></td>
<td>Regulator’s sensitivity to relieve excess downstream pressure over the set pressure.</td>
<td>Average (5-10 PSIG)</td>
<td>Good (1 PSIG)</td>
<td>Best (0.005 PSIG)</td>
</tr>
<tr>
<td><strong>Constant Bleed</strong></td>
<td>Does the regulator constantly bleed air to the atmosphere to maintain accuracy?</td>
<td>No</td>
<td>Varies</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Size Constraints</strong></td>
<td>Overall size of regulator</td>
<td>Varies</td>
<td>Varies</td>
<td>4.5” x 2.06” W</td>
</tr>
<tr>
<td><strong>Mounting Constraints</strong></td>
<td>Mounting options or Bracket</td>
<td>Varies</td>
<td>Panel, Pipe, Panel, Pipe, or Bracket</td>
<td>Panel, Pipe, or Bracket</td>
</tr>
<tr>
<td><strong>Port Size</strong></td>
<td>Inlet / Outlet port size</td>
<td>Varies</td>
<td>Varies</td>
<td>1/4”</td>
</tr>
</tbody>
</table>

### Diagrams

1. **Standard Regulator**
   - T-handle Adjusting Screw
   - Lock Nut
   - Spring Washer
   - Control Spring
   - Spring Cage
   - Diaphragm Assembly
   - Innnervalve Assembly
   - Body
   - Spring, Bottom
   - Bottom Plug

2. **Pilot Regulator Application**
   - Use This Gauge For Setting Reduced Pressure
   - IN
   - OUT
   - Pilot Port
   - Diaphragm Assembly
   - Innnervalve Assembly
   - Body
   - Spring, Bottom
   - Bottom Plug

3. **Pilot Operated Regulator**
   - IN
   - OUT
**R10 / R11 General Purpose Regulators**

**Features**
- High Flow Performance
- Featuring Rugged Design for the Most Demanding Applications
- Diaphragm Operated Design with Balanced Poppet Design for Quick and Accurate Regulation
- Accurate Pressure Regulation
- Panel Mountable
- High Flow: 1/4" - 80 SCFM§
  3/8" - 80 SCFM§
  1/2" - 100 SCFM§
- R10: Push-to-Lock, Pull-to-Adjust. Adjusting Lock is engaged when Knob is Removed Rendering Unit Tamper Resistant
- R11: Heavy Duty Tee Handle Adjustment

### Ordering Information

<table>
<thead>
<tr>
<th>Port Size</th>
<th>R10 NPT</th>
<th>R11 NPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>R10-02C</td>
<td>R11-02C</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>R10-03C</td>
<td>R11-03C</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>R10-04C</td>
<td>R11-04C</td>
</tr>
</tbody>
</table>

**Bold items are most popular.**
**For other models refer to ordering information below.**

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

### R10 Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>1.40</td>
<td>3.38</td>
<td>2.33</td>
<td>4.78</td>
<td>1.38</td>
</tr>
<tr>
<td>(57)</td>
<td>(36)</td>
<td>(86)</td>
<td>(59)</td>
<td>(121)</td>
<td>(35)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>1.40</td>
<td>4.72</td>
<td>2.33</td>
<td>6.13</td>
<td>1.38</td>
</tr>
<tr>
<td>(57)</td>
<td>(36)</td>
<td>(120)</td>
<td>(59)</td>
<td>(156)</td>
<td>(35)</td>
</tr>
</tbody>
</table>

**NOTE:** 1.75 Dia. (44mm) hole required for panel mounting.

### Options
- **G** Gauge
- **K** Non-Relieving
- **P** Panel Mount Nut
- **X64** Fluorocarbon O-Rings and Diaphragm
- **N** Panel Mount Threads at Top of Bonnet (R11 Only)
- **X81** Brass Body
- **X8** Low Temp. Version
- **X7** Brass Bottom Plug

**Engineering Change Designator**
- Will be entered at factory.

**Note:** Beginning January 2008, Brass Bottom Plug is Optional - Nylon is Standard.
- **X8** Brass Bottom Plug Standard with X64, X81, and X8 Options.

**BOLD ITEMS ARE MOST POPULAR.**
Technical Information

Flow Characteristics
R10-02C / R10-03C
1/4 & 3/8 Inch Ports
100 PSIG (6.9 bar) Primary Pressure

Flow Characteristics
R10-04C
1/2 Inch Ports
100 PSIG (6.9 bar) Primary Pressure

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.

R10 / R11 Regulator Kits & Accessories
Control Knob (R10) ................................................................. R10Y54
Tee Handle (R11) ................................................................. SA16Y53

Gauges –
2" Dial Size, 1/4" Back Connection
0 to 60 PSIG (0 to 400 kPa) ........................................... K4520N14060
2" Dial Size, 1/4" Back Connection
0 to 160 PSIG (0 to 1100 kPa) ........................................... K4520N14160
2" Dial Size, 1/4" Back Connection
0 to 300 PSIG (0 to 2068 kPa) ........................................... K4520N14300

Mounting Bracket Kit ...................................................... SAR10Y57
Panel Mount Nut –
Plastic .................................................................................. R10X51-P
Aluminum ............................................................................ R10X51-A

Repair Kits –
Non-Relieving ................................................................. RKR10KY
Non-Relieving (Viton) .......................................................... RKR10KYX64
Relieving ................................................................. RKR10Y
Relieving (Viton) ................................................................. RKR10YX64

Cage Kit –
R10 .................................................................................. CKR10Y
R11 .................................................................................. CKR11Y

Specifications
Gauge Ports (2) ................................................................. 1/4 Inch
Port Threads ................................................................. 1/4, 3/8, 1/2 Inch
Supply Pressure ............................................................ 300 PSIG Maximum (20.4 bar)
Temperature Rating .................................................. -40°F to 125°F (4.4°C to 52°C)
Weight ................................................................. 1.3 lb (0.59 kg) / Unit
32 lb (14.51 kg) / 24-Unit Master Pack

Materials of Construction
Adjusting Knob –
R10 .................................................................................. Acetal
R11 (Tee Handle) ................................................................. Steel

Body .................................................................................. Zinc

Bottom Plug ................................................................. Nylon
Optional ............................................................................ Brass

Elastomers ........................................................................... Buna N

Spring Case –
R10 .................................................................................. Acetal
R11 .................................................................................. Zinc
Features

- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Diaphragm Operated Design with Balanced Poppet Design for Quick and Accurate Regulation
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Heavy Duty Tee Handle Adjustment
- Reverse Flow Version Available
- Panel Mount Version Available
- High Flow: 1/4" - 100 SCFM, 3/8" - 110 SCFM, 1/2" - 150 SCFM

Ordering Information

**Bold Items are Most Popular.**

For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Relieving</th>
<th>BSPP Relieving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Gauge 0-125 PSIG Reduced Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>R119-02C</td>
<td>R119G02C</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>R119-03C</td>
<td>R119G03C</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>R119-04C</td>
<td>R119G04C</td>
</tr>
<tr>
<td>With Gauge 0-125 PSIG Reduced Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>R119-02CG</td>
<td>—</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>R119-03CG</td>
<td>—</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>R119-04CG</td>
<td>—</td>
</tr>
</tbody>
</table>

R119 Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>R119-02C, R119-03C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.00</td>
<td>1.38</td>
<td>4.60</td>
<td>2.74</td>
<td>5.98</td>
<td>0.96</td>
</tr>
<tr>
<td>(76)</td>
<td>(35)</td>
<td>(117)</td>
<td>(705)</td>
<td>(152)</td>
<td>(24)</td>
</tr>
<tr>
<td>R119-04C</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.56</td>
<td>1.56</td>
<td>5.20</td>
<td>3.25</td>
<td>6.76</td>
<td>1.27</td>
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<tr>
<td>(90)</td>
<td>(40)</td>
<td>(132)</td>
<td>(83)</td>
<td>(172)</td>
<td>(32)</td>
</tr>
</tbody>
</table>

Panel Mount Version

**NOTE:** Beginning on the following dates, the regulators listed will come standard with Nylon Bottom Plugs. 1/4" & 3/8" January 2008 1/2" March 2008

**Brass Bottom Plug Standard with X64 Option.**

**Technical Information**

**Flow Characteristics**

- **R119-02C**
  - 1/4 Inch Ports
  - 100 PSIG (6.9 bar) Primary Pressure

- **R119-03C**
  - 3/8 Inch Ports
  - 100 PSIG (6.9 bar) Primary Pressure

- **R119-04C**
  - 1/2 Inch Ports
  - 100 PSIG (6.9 bar) Primary Pressure

**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.

---

**R119 Regulator Kits & Accessories**

**Gauges –**

- 2" Dial Size, 1/4" Back Connection
  - 0 to 60 PSIG (0 to 400 kPa) ........................................... K4520N14060
- 2" Dial Size, 1/4" Back Connection
  - 0 to 160 PSIG (0 to 1100 kPa) ...................................... K4520N14160
- 2" Dial Size, 1/4" Back Connection
  - 0 to 300 PSIG (0 to 2068 kPa) ...................................... K4520N14300

**Mounting Bracket Kit –**

- 1/4", 3/8", 1/2" ................................................................. SA15Y57
- 1/2" .................................................................................. 18A57

**Panel Mount Conversion Kit –**

- 1/4", 3/8" ........................................................................... 4202
- 1/2" .................................................................................. 4204

**Repair Kits –**

- Non-Relieving Diaphragm,
  - Valve Assembly (1/4", 3/8"; All PSIG) ......................... RK118Y
- Relieving Diaphragm,
  - Valve Assembly (1/4", 3/8"; All PSIG) ......................... RK119Y
- Non-Relieving Diaphragm,
  - Valve Assembly (1/2"; 25, 60, 125 PSIG) .................. RK118A
- Non-Relieving Diaphragm,
  - Valve Assembly (1/2"; 250 PSIG) ............................ RK118A250
- Relieving Diaphragm,
  - Valve Assembly (1/2"; 25, 60, 125 PSIG) ................. RK119A

For Fluorocarbon Repair Kits, add X64 to Kit Number suffix.

**Specifications**

**Gauge Ports (2) ............................................................... 1/4 Inch**

**Port Threads ................................................................. 1/4, 3/8, 1/2 Inch**

**Reduced Pressure Range ........................................ 2 to 125 PSIG (0.15 to 8.5 bar)**

**Supply Pressure ......................................................... 300 PSIG Maximum (20.4 bar)**

**Temperature Rating ................................................. 40°F to 125°F (4.4°C to 52°C)**

**Weight –**

- R119-02, R119-03 ......................................................... 1.8 lb. (0.82 kg) / Unit
- 26 lb. (11.79 kg) / 12-Unit Master Pack
- R119-04 ................................................................. 3.2 lb. (1.45 kg) / Unit
- 27 lb. (12.25 kg) / 8-Unit Master Pack

**Materials of Construction**

- Adjusting Screw, Springs ................................................. Steel
- Body, Spring Cage ............................................................ Zinc
- Bottom Plug ..................................................................... Nylon
- Innervalve ......................................................................... Brass
- Seals ................................................................................ Buna N
R119 Standard Regulators

Features
- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Diaphragm Operated Design with Balanced Poppet Design for Quick and Accurate Regulation
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Heavy Duty Tee Handle Adjustment
- Reverse Flow Version Available
- High Flow: 3/4" - 300 SCFM
  1" - 400 SCFM
  1-1/4" & 1-1/2" - 500 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Relieving</th>
<th>BSPP Relieving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Gauge 0-125 PSIG Reduced Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>R119-06C</td>
<td>R119G06C</td>
</tr>
<tr>
<td>1&quot;</td>
<td>R119-08C</td>
<td>R119G08C</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>R119-10C</td>
<td>R119G10C</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>R119-12C</td>
<td>R119G12C</td>
</tr>
<tr>
<td>With Gauge 0-125 PSIG Reduced Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>R119-06CG</td>
<td>—</td>
</tr>
<tr>
<td>1&quot;</td>
<td>R119-08CG</td>
<td>—</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>R119-10CG</td>
<td>—</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>R119-12CG</td>
<td>—</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.

Ordering Information

R119-06C, R119-08C
R119-10C, R119-12C

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

Features
- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Diaphragm Operated Design with Balanced Poppet Design for Quick and Accurate Regulation
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Heavy Duty Tee Handle Adjustment
- Reverse Flow Version Available
- High Flow: 3/4" - 300 SCFM
  1" - 400 SCFM
  1-1/4" & 1-1/2" - 500 SCFM

<table>
<thead>
<tr>
<th>Port Threads</th>
<th>Port Size</th>
<th>Reduced Pressure Range</th>
<th>Options</th>
<th>Engineering Change Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT</td>
<td>06 3/4 Inch</td>
<td>C 0-125 PSIG</td>
<td>G Gauge</td>
<td>Will be entered at factory.</td>
</tr>
<tr>
<td>G BSPP</td>
<td>08 1 Inch</td>
<td>D 0-250 PSIG</td>
<td>K Non-Relieving</td>
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<tr>
<td></td>
<td>10 1-1/4 Inch</td>
<td></td>
<td>X64* Fluorocarbon O-Rings and Diaphragm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 1-1/2 Inch</td>
<td></td>
<td>X80 Reverse Flow*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X7† Brass Bottom Plug *</td>
<td></td>
</tr>
</tbody>
</table>

* Reverse flow for use downstream of control valves.

†NOTE: Beginning March 2008, Brass Bottom Plug is Optional - Nylon is Standard.
** Brass Bottom Plug Standard with X64 Option.

Catalog 0305-2 (Revised 10-07-08) Standard Regulators
3/4, 1, 1-1/4 & 1-1/2 Inch Ports

Pneumatic Division
Richland, Michigan
www.wattsfluidair.com
Technical Information

Flow Characteristics

<table>
<thead>
<tr>
<th>3/4 Inch Ports 100 PSIG (6.9 bar) Primary Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow - SCFM</td>
</tr>
<tr>
<td>0 50 100 200 300 400 500</td>
</tr>
<tr>
<td>Flow - dm³/s</td>
</tr>
<tr>
<td>0 50 100 150 200 250 300</td>
</tr>
<tr>
<td>Secondary Pressure - bar</td>
</tr>
<tr>
<td>0 2 4 6 8 10 12</td>
</tr>
<tr>
<td>Secondary Pressure - PSIG</td>
</tr>
<tr>
<td>0 5 10 15 20 25 30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 Inch Ports 100 PSIG (6.9 bar) Primary Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow - SCFM</td>
</tr>
<tr>
<td>0 50 100 200 300 400 500</td>
</tr>
<tr>
<td>Flow - dm³/s</td>
</tr>
<tr>
<td>0 50 100 150 200 250 300</td>
</tr>
<tr>
<td>Secondary Pressure - bar</td>
</tr>
<tr>
<td>0 2 4 6 8 10 12</td>
</tr>
<tr>
<td>Secondary Pressure - PSIG</td>
</tr>
<tr>
<td>0 5 10 15 20 25 30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1-1/4 Inch Ports 100 PSIG (6.9 bar) Primary Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow - SCFM</td>
</tr>
<tr>
<td>0 100 200 300 400 500</td>
</tr>
<tr>
<td>Flow - dm³/s</td>
</tr>
<tr>
<td>0 100 200 300 400</td>
</tr>
<tr>
<td>Secondary Pressure - bar</td>
</tr>
<tr>
<td>0 2 4 6 8</td>
</tr>
<tr>
<td>Secondary Pressure - PSIG</td>
</tr>
<tr>
<td>0 5 10 15 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1-1/2 Inch Ports 100 PSIG (6.9 bar) Primary Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow - SCFM</td>
</tr>
<tr>
<td>0 100 200 300 400 500</td>
</tr>
<tr>
<td>Flow - dm³/s</td>
</tr>
<tr>
<td>0 100 200 300 400</td>
</tr>
<tr>
<td>Secondary Pressure - bar</td>
</tr>
<tr>
<td>0 2 4 6 8</td>
</tr>
<tr>
<td>Secondary Pressure - PSIG</td>
</tr>
<tr>
<td>0 5 10 15 20</td>
</tr>
</tbody>
</table>

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.

R119 Regulator Kits & Accessories

Gauges –

2" Dial Size, 1/4" Back Connection
0 to 60 PSIG (0 to 400 kPa) .................. K4520N14060
2" Dial Size, 1/4" Back Connection
0 to 160 PSIG (0 to 1100 kPa) .................. K4520N14160
2" Dial Size, 1/4" Back Connection
0 to 300 PSIG (0 to 2068 kPa) .................. K4520N14300

Mounting Bracket Kit .............................. 18B57

Repair Kits –

Non-Relieving Diaphragm,
Valve Assembly (3/4", 1") .................. RK118B
Non-Relieving Diaphragm,
Valve Assembly (1-1/4", 1-1/2") .................. RK118D
Relieving Diaphragm,
Valve Assembly (3/4", 1") .................. RK119B
Relieving Diaphragm,
Valve Assembly (1-1/4", 1-1/2") .................. RK119D

For Fluorocarbon Repair Kits, add X64 to Kit Number suffix.

Specifications

Gauge Ports (2) ........................................... 1/4 Inch
Port Threads ........................................... 3/4, 1, 1-1/4, 1-1/2 Inch
Reduced Pressure Range .................. 2 to 125 PSIG (0.15 to 8.5 bar)
Supply Pressure .............................. 300 PSIG Maximum (20.4 bar)
Temperature Rating ................. 40°F to 125°F (4.4°C to 52°C)

Weight –

R119-06, R119-08 .......................... 6.2 lb. (2.81 kg) / Unit
.................................. 25 lb. (11.34 kg) / 4-Unit Master Pack
R119-10, R119-12 .......................... 7.2 lb. (3.27 kg) / Unit
.................................. 29 lb. (13.15 kg) / 4-Unit Master Pack

Materials of Construction

Adjusting Screw, Springs ......................... Steel
Body, Spring Cage .............................. Zinc
Bottom Plug ................................ Nyon
Innervalve ................................. Brass
Seals ......................................... Buna N
R119 Pilot Operated Regulators

Features

• Adapted for Control by a Remote or Distant Small Pilot Regulator. Ideal for Maximum Capacity Requirements in Applications where Units are Not Readily Accessible
• High Flow Performance Featuring Rugged Design for the Most Demanding Applications
• Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
• Diaphragm Operated Design with Balanced Poppet and Constant Bleed Pilot for Quick and Accurate Regulation.
• Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
• Reverse Flow Available
• High Flow: 1/4" - 100 SCFM\(^3\)
  3/8" - 110 SCFM\(^3\)
  1/2" - 150 SCFM\(^3\)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Relieving</th>
<th>BSPP Relieving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Gauge 0-125 PSIG Reduced Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>R119-02J</td>
<td>R119G02J</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>R119-03J</td>
<td>R119G03J</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>R119-04J</td>
<td>R119G04J</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

Ordering Information

R  119 — 02 J  /**

Port Threads
— NPT
G BSPP

Port Size
02 1/4 Inch
03 3/8 Inch
04 1/2 Inch

Reduced Pressure Range
J Air Pilot Operated

Options
K Non-Relieving
X64* Fluorocarbon
O-Rings and Diaphragm
X71 Non-Bleed Pilot (For use with Electronic Controllers)
X7† Brass Bottom Plug

Engineering Change Designator
Will be entered at factory.

*NOTE: Beginning on the following dates, the regulators listed will come standard with Nylon Bottom Plugs. 1/4" & 3/8" January 2008 1/2" March 2008
†Brass Bottom Plug Standard with X64 Option.

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

BOLD ITEMS ARE MOST POPULAR.
Technical Information

R119 Regulator Kits & Accessories

Gauges –
- 2" Dial Size, 1/4" Back Connection
  0 to 60 PSIG (0 to 400 kPa) .............................................. K4520N14060
- 2" Dial Size, 1/4" Back Connection
  0 to 160 PSIG (0 to 1100 kPa) ......................................... K4520N14160
- 2" Dial Size, 1/4" Back Connection
  0 to 300 PSIG (0 to 2068 kPa) ........................................ K4520N14300

Repair Kits –
- Non-Relieving Diaphragm,
  Valve Assembly (1/2") .................................................. RK118X20A
- Non-Relieving Diaphragm,
  Valve Assembly (1/4", 3/8") .......................................... RK118X20Y
- Relieving Diaphragm,
  Valve Assembly (1/2") .................................................. RK119X20A
- Relieving Diaphragm,
  Valve Assembly (1/4", 3/8") .......................................... RK119X20Y

For Fluorocarbon Repair Kits, add X6 to Kit Number suffix.

Specifications

Gauge Ports (2) ................................................................. 1/4 Inch
Port Threads .......................................................... 1/4, 3/8, 1/2 Inch

Reduced Pressure Range –
Adjustable to within 5 to 7 PSIG of Supply Pressure

Supply Pressure ................................ 300 PSIG Maximum (20.4 bar)

Air Consumption –
Constant bleed from air pilot chamber: approx. 0.17 SCFM (10 SCFH)

Temperature Rating ............................... 40°F to 125°F (4.4°C to 52°C)

Weight –
R119-02J, R119-03J .................................................. 1.6 lb. (0.73 kg) / Unit
19 lb. (8.62 kg) / 12-Unit Master Pack
R119-04J .................................................. 2.6 lb. (1.18 kg) / Unit
21 lb. (9.53 kg) / 8-Unit Master Pack

Materials of Construction

Body, Ring, Top Plate .......................................................... Zinc
Bottom Plug .............................................................. Nylon
Innervalve ................................................................. Brass
Seals ................................................................. Buna N
**R119 Pilot Operated Regulators**

**Features**
- Adapted for Control by a Remote or Distant Small Pilot Regulator. Ideal for Maximum Capacity Requirements in Applications where Units are Not Readily Accessible
- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Diaphragm Operated Design with Balanced Poppet and Constant Bleed Pilot for Quick and Accurate Regulation.
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Reverse Flow Version Available
- High Flow: 3/4", 1" - 300 SCFM\(^\text{g}\), 1-1/4" & 1-1/2" - 380+ SCFM\(^\text{g}\)

**Port Size | NPT Relieving | BSPP Relieving**
---|---|---
Without Gauge 0-125 PSIG Reduced Pressure
3/4" | R119-06J | R119G06J
1" | R119-08J | R119G08J
1-1/4" | R119-10J | R119G10J
1-1/2" | R119-12J | R119G12J

Bold Items are Most Popular.
For other models refer to ordering information below.

\(\text{g}\) SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

**R119 Regulator Dimensions**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>R119-06J, R119-08J</td>
<td>4.72</td>
<td>1.87</td>
<td>2.94</td>
<td>4.38</td>
<td>4.81</td>
<td>2.47</td>
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<td></td>
<td>(120)</td>
<td>(47)</td>
<td>(75)</td>
<td>(111)</td>
<td>(122)</td>
<td>(63)</td>
</tr>
<tr>
<td>R119-10J, R119-12J</td>
<td>4.94</td>
<td>1.81</td>
<td>3.32</td>
<td>4.94</td>
<td>5.13</td>
<td>2.88</td>
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<td>(125)</td>
<td>(46)</td>
<td>(84)</td>
<td>(125)</td>
<td>(130)</td>
<td>(73)</td>
</tr>
</tbody>
</table>

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

**Ordering Information**

| R | 119 | — | 06 | J | /** |

**Port Threads**
- NPT
- G BSPP

**Port Size**
- 06 3/4 Inch
- 08 1 Inch
- 10 1-1/4 Inch
- 12 1-1/2 Inch

**Reduced Pressure Range**
- J Air Pilot Operated

**Options**
- K Non-Relieving
- X64* Fluorocarbon O-Rings and Diaphragm
- X71 Non-Bleed Pilot (For use with Electronic Controllers)
- X7† Brass Bottom Plug

**Engineering Change Designator**
Will be entered at factory.

*NOTE: Beginning March 2008, Brass Bottom Plug is Optional - Nylon is Standard.
* Brass Bottom Plug Standard with X64 Option.
Technical Information

R119 Regulator Kits & Accessories

Gauges –
- 2" Dial Size, 1/4" Back Connection
  0 to 60 PSIG (0 to 400 kPa) .......................... K452ON14060
- 2" Dial Size, 1/4" Back Connection
  0 to 160 PSIG (0 to 1100 kPa) ......................... K452ON14160
- 2" Dial Size, 1/4" Back Connection
  0 to 300 PSIG (0 to 2068 kPa) ........................ K452ON14300

Repair Kits –
- Non-Relieving Diaphragm,
  Valve Assembly (3/4", 1") ............................. RK118X20B
- Non-Relieving Diaphragm,
  Valve Assembly (1-1/4", 1-1/2") ................. RK118X20D
- Relieving Diaphragm,
  Valve Assembly (3/4", 1") ...................... RK119X20B
- Relieving Diaphragm,
  Valve Assembly (1-1/4", 1-1/2") .................. RK119X20D

For Fluorocarbon Repair Kits, add X64 to Kit Number suffix.

Specifications

Gauge Ports (2) ............................................................... 1/4 Inch
Port Threads ........................................ 3/4, 1, 1-1/4, 1-1/2 Inch
Reduced Pressure Range –
Adjustable to Within 5 to 7 PSIG of Supply Pressure
Supply Pressure .......................... 300 PSIG Maximum (20.4 bar)
Air Consumption –
Constant bleed from air pilot chamber: approx 0.17 SCFM (10 SCFH)
Temperature Rating ............. 40°F to 125°F (4.4°C to 52°C)
Weight –
R119-06J, R119-08J .................. 5.2 lb. (2.36 kg) / Unit
R119-10J, R119-12J .................. 5.6 lb. (2.54 kg) / Unit
42 lb. (19.05 kg) / 8-Unit Master Pack
46 lb. (20.87 kg) / 8-Unit Master Pack

Materials of Construction

Body, Ring, Top Plate ..................................................... Zinc
Bottom Plug ................................................................. Nylon
Innervalve ................................................................. Brass
Seals ................................................................. Buna N
R119 Pilot Operated Regulators

Features
- Adapted for Control by a Remote or Distant Small Pilot Regulator. Ideal for Maximum Capacity Requirements in Applications where Units are Not Readily Accessible
- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Piston Operated Design with Balanced Poppet and Dual Constant Bleed for Quick and Accurate Regulation
- High Flow: 2" & 2-1/2" - 1500+ SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Relieving</th>
<th>BSPP Relieving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Gauge</td>
<td>0-125 PSIG Reduced Pressure</td>
<td></td>
</tr>
<tr>
<td>2&quot;</td>
<td>R119-16J</td>
<td>R119G16J</td>
</tr>
<tr>
<td>2-1/2&quot;</td>
<td>R119-20J</td>
<td>R119G20J</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.

SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

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

Ordering Information

| R | 119 | 16 | J |

Port Threads
- NPT
- G BSPP

Port Size
- 16 2 Inch
- 20 2-1/2 Inch

Reduced Pressure Range
- J Air Pilot Operated

NOTE: Non-Relieving Not Available.

BOLD ITEMS ARE MOST POPULAR.
Technical Information

R119 Regulator Kits & Accessories

Gauges –
2” Dial Size, 1/4” Back Connection
0 to 60 PSIG (0 to 400 kPa) .................. K4520N14060
2” Dial Size, 1/4” Back Connection
0 to 160 PSIG (0 to 1100 kPa) .................. K4520N14160
2” Dial Size, 1/4” Back Connection
0 to 300 PSIG (0 to 2068 kPa) .................. K4520N14300

Repair Kits –
Piston Type Regulation (2”, 2-1/2”) .................. RK119G

Specifications

Gauge Ports (2) .............................................. 1/4 Inch
(Can be used for Full Flow)
High Pressure Outlet for Pilot (Not seen in photo) .......... 1/4 Inch

Port Threads .............................................. 2, 2-1/2 Inch

Reduced Pressure Range –
Adjustable to Within 5 to 7 PSIG of Supply Pressure

Supply Pressure ..................................... 300 PSIG Maximum (20.4 bar)

Air Consumption –
Constant Bleed from Air Pilot Chamber:
Approx. 0.17 SCFM (10 SCFH)

Constant Bleed from Reduced Pressure:
Approx. 0.17 SCFM (10 SCFH)

Temperature Rating .................. 40°F to 125°F (4.4°C to 52°C)

Weight –
R119-16J, R119-20J .......................... 11 lb. (4.99 kg) / Unit
12 lb. (5.44 kg) / 1-Unit Master Pack

Materials of Construction

Body, Piston ............................................ Aluminum
Seals ......................................................... Buna N
Innervalve .............................................. Brass & Stainless
W51R Dial Regulator – Relieving

Features
- Pressure Reference Indicating Dial Face
- Non-rising, Pressure-adjustment Knob
- 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</th>
<th>Low Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</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></td>
<td>W51R126RA</td>
<td>W51R125RA</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.

SCFM = Standard cubic feet per minute at 100 PSIG inlet, 90 PSIG no flow secondary setting, and 25 PSIG pressure drop.

W51R Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.80 (71)</td>
<td>2.60 (66)</td>
<td>2.60 (66)</td>
<td>0.40 (10)</td>
<td>1.30 (33)</td>
</tr>
<tr>
<td>G</td>
<td>H</td>
<td>J</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>1.56 (39.6)</td>
<td>2.20 (56)</td>
<td>1.25 (31.8)</td>
<td>.18 (4.6)</td>
<td></td>
</tr>
</tbody>
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Ordering Information

<table>
<thead>
<tr>
<th>W51R</th>
<th>1</th>
<th>26</th>
<th>R</th>
<th>A</th>
</tr>
</thead>
</table>

Port Size
- 1 1/4 Inch

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

Adjustment
- R Relieving

Engineering Level
- A Current

Thread Type
- Blank NPT
- 1 BSPP

BOLD ITEMS ARE MOST POPULAR.
Pneumatic Division
Richland, Michigan
www.wattsfluidair.com

Technical Information

W51R Regulator Kits & Accessories
Adjustment Dial Knob ............................................. RRP-16-024-80
O-ring, Repair Kit .................................................. GRP-95-260
Piston and Bonnet Repair Kit .................................. RRP-95-765-80
Spring, Regulation, Belleville Washer
2 to 40 PSIG (276 kPa) ......................................... RRP-95-906-80
5 to 160 PSIG (1103 kPa) ....................................... RRP-95-905-80
Tamper Resistant Kit ............................................. RRP-95-585-80
Valve, Pilot with O-ring and Valve Spring ............... RRP-96-934-80

Specifications
Adjusting Range Pressure ................................. 2 to 40 PSIG (14 to 276 kPa)
5 to 160 PSIG (34 to 1103 kPa)
Bleed Rate ........................................................... 0.05 SCFM
Maximum Operating Temperature ..................... 150°F (65.5°C)
Maximum Supply Pressure ............................... 300 PSIG (2068 kPa)
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

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.
W52R Dial 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

Port Size | High Flow
         | Low Pressure
         | 5 to 160 PSIG
         | 2 to 40 PSIG
1/4"     | W52R126RA  | W52R125RA
3/8"     | W52R226RA  | W52R225RA
1/2"     | W52R326RA  | W52R325RA
3/4"     | W52R426RA  | W52R425RA

Bold Items are Most Popular.
For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, (1/4, 1/2 & 3/4) 90 PSIG, (3/8) 80 PSIG no flow secondary setting, and 25 PSIG pressure drop.

W52R Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.10</td>
<td>3.20</td>
<td>2.60</td>
<td>0.95</td>
<td>1.60</td>
</tr>
<tr>
<td>(104)</td>
<td>(81)</td>
<td>(66)</td>
<td>(24)</td>
<td>(71)</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
<td>H</td>
<td>J</td>
<td>K</td>
</tr>
<tr>
<td>4.30</td>
<td>2.70</td>
<td>2.20</td>
<td>2.08</td>
<td>0.18</td>
</tr>
<tr>
<td>(109)</td>
<td>(69)</td>
<td>(56)</td>
<td>(52.8)</td>
<td>(4.6)</td>
</tr>
<tr>
<td>L</td>
<td>2.07</td>
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</tr>
<tr>
<td>(52.6)</td>
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</tr>
</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>W52R</th>
<th>Port Size</th>
<th>Springs</th>
<th>Adjustment</th>
<th>Engineering Level</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 1/4 Inch</td>
<td>25 2 to 40 PSIG</td>
<td>R Relieving</td>
<td>Current</td>
<td>Blank NPT</td>
</tr>
<tr>
<td>2</td>
<td>3/8 Inch</td>
<td>26 5 to 160 PSIG</td>
<td></td>
<td></td>
<td>NPT (1)</td>
</tr>
<tr>
<td>3</td>
<td>1/2 Inch</td>
<td></td>
<td></td>
<td></td>
<td>BSPP</td>
</tr>
<tr>
<td>4</td>
<td>3/4 Inch</td>
<td></td>
<td></td>
<td></td>
<td>BSPP</td>
</tr>
</tbody>
</table>

BOLD ITEMS ARE MOST POPULAR.
**Technical Information**

**Flow Characteristics W52R266RA**

- **3/8 Inch Ports**
  - Primary Pressure 100 PSIG (6.9 bar)

<table>
<thead>
<tr>
<th>Secondary Pressure - PSIG</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Pressure - Bar</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**Flow Characteristics W52R326RA**

- **1/2 Inch Ports**
  - Primary Pressure 100 PSIG (6.9 bar)

<table>
<thead>
<tr>
<th>Secondary Pressure - PSIG</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Pressure - Bar</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**Flow Characteristics W52R426RA**

- **3/4 Inch Ports**
  - Primary Pressure 100 PSIG (6.9 bar)

<table>
<thead>
<tr>
<th>Secondary Pressure - PSIG</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Pressure - Bar</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**Flow Characteristics W52R126RA**

- **1/4 Inch Ports**
  - Primary Pressure 100 PSIG (6.9 bar)

<table>
<thead>
<tr>
<th>Secondary Pressure - PSIG</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Pressure - Bar</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**W52R Regulator Kits & Accessories**

- **Adjustment Dial Knob** .................................................. RRP-16-024-80
- **O-ring, Repair Kit** .................................................... GRP-95-260-80
- **Piston Bottom and O-ring Seal** ................................. RRP-95-192-80
- **Pistons and Bonnet Repair Kit** ............................... RRP-95-766-80
- **Spring, Regulation, Belleville Washer**
  - 2 to 40 PSIG Range .................................................. RRP-95-906-80
  - 5 to 160 PSIG Range ................................................ RRP-95-905-80
- **Tamper Resistant Kit** .............................................. RRP-95-585-80
- **Valve, Main with U-Cup Seal & Bottom Plug** ............ RRP-95-914-80
- **Valve, Main with U-Cup Seal** ..................................... RRP-95-151-80
- **Valve, Pilot with O-ring and Valve Spring** .............. RRP-96-934-80

**Specifications**

- **Adjusting Range Pressure** 2 to 40 PSIG (14 to 276 kPa)
  - 5 to 160 PSIG (34 to 1103 kPa)
- **Bleed Rate** .......................................................... 0.05 SCFM
- **Gauge Ports** ......................................................... Two Ports 1/8" (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 (2068 kPa)
- **Port Threads** ....................................................... 1/4", 3/8", 1/2", 3/4"
- **Weight** .............................................................. 2.3 lb. (1.04 kg)

**Materials of Construction**

- **Body** ................................................................. Zinc
- **Bonnet** .............................................................. Zinc / Brass
- **Piston** ............................................................... Acetal
- **Seals** ................................................................. Nitrile
- **Springs** ............................................................. Steel
- **Valve Assembly** .................................................... Brass / Nitrile / Acetal
W53R Dial 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>High Flow 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>W53R426RA</td>
<td>W53R425RA</td>
</tr>
<tr>
<td>1&quot;</td>
<td>W53R526RA</td>
<td>W53R525RA</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>W53R626RA</td>
<td>W53R625RA</td>
</tr>
</tbody>
</table>

Bold items are Most Popular.
For other models refer to ordering information below.

$ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 90 PSIG no flow secondary setting, and 10 PSIG pressure drop.

W53R Regulator Dimensions

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Springs</th>
<th>Adjustment</th>
<th>Engineering Level</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 3/4 Inch</td>
<td>25 2 to 40 PSIG</td>
<td>R Relieving</td>
<td>A Current</td>
<td>Blank NPT</td>
</tr>
<tr>
<td>5 1 Inch</td>
<td>26 5 to 160 PSIG</td>
<td></td>
<td></td>
<td>1 BSPP</td>
</tr>
</tbody>
</table>

BOLD ITEMS ARE MOST POPULAR.
**Technical Information**

**Flow Characteristics**

**W53R Series Dial Regulators**

---

**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.

---

**W53R Regulator Kits & Accessories**

- Adjustment Dial Knob ........................................ RRP-16-024-80
- O-ring, Repair Kit ........................................... GRP-95-261-80
- Piston, Bottom and O-ring Seal ........................... RRP-95-192-80
- Pistons and Bonnet Repair Kit .............................. RRP-95-766-80
- Spring, Regulation, Belleville Washer
  - 2 to 40 PSIG Range ...................................... RRP-95-906-80
  - 5 to 160 PSIG Range ................................... RRP-95-905-80
- Tamper Resistant Kit ........................................ RRP-95-585-80
- Valve, Main with O-ring Seal .............................. RRP-95-152-80
- Valve, Pilot with O-ring and Valve Spring ............... RRP-96-935-80

---

**Specifications**

- **Adjusting Range Pressure** .................................. 2 to 40 PSIG (14 to 276 kPa)
  5 to 160 PSIG (34 to 1103 kPa)
- **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 (2068 kPa)
- **Port Threads** .......................................................... 3/4", 1", 1-1/4"
- **Weight** ................................................................. 4.0 lb. (1.8 kg)

---

**Materials of Construction**

- **Body** ................................................................. Zinc
- **Bonnet** ............................................................... Zinc / Brass
- **Piston** ............................................................... Acetal
- **Seals** ................................................................. Nitrile
- **Springs** .............................................................. Steel
- **Valve Assembly** .................................................. Brass / Nitrile / Acetal
W54R Dial 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>High Flow 5 to 160 PSIG (0.34 to 11 bar)</th>
<th>Low Pressure 2 to 40 PSIG (0.14 to 2.8 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2”</td>
<td>W54R726RA</td>
<td>W54R725RA</td>
</tr>
<tr>
<td>2”</td>
<td>W54R826RA</td>
<td>W54R825RA</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 90 PSIG no flow secondary setting, and 10 PSIG pressure drop.

W54R Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.80 (173)</td>
<td>5.30 (135)</td>
<td>32.60 (90)</td>
<td>2.80 (71)</td>
<td>1.15 (29)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.80 (489)</td>
<td>5.30 (135)</td>
</tr>
</tbody>
</table>

Inches (mm)

Ordering Information

<table>
<thead>
<tr>
<th>W54R</th>
<th>7</th>
<th>26</th>
<th>R</th>
<th>A</th>
</tr>
</thead>
</table>

Port Size
7 1-1/2 Inch
8 2 Inch

Springs
25 2 to 40 PSIG
26 5 to 160 PSIG

Adjustment
R Relieving

Engineering Level
A Current

Thread Type
Blank NPT
1 BSPP

BOLD ITEMS ARE MOST POPULAR.
Technical Information

**W54R Regulator Kits & Accessories**
- Adjustment Dial Knob ............................................... RRP-16-024-80
- O-ring, Repair Kit .................................................. GRP-95-262-80
- Piston, Bottom and O-ring Seal ............................ RRP-95-192-80
- Pistons and Bonnet Repair Kit ................................ RRP-95-766-80
- Spring, Regulation, Belleville Washer
  - 2 to 40 PSIG Range ................................................. RRP-95-906-80
  - 5 to 160 PSIG Range .............................................. RRP-95-905-80
- Spring, Main Valve .................................................. RRP-95-024-80
- Tamper Resistant Kit .............................................. RRP-95-585-80
- Valve, Main with O-ring Seal .................................. RRP-95-153-80
- Valve, Pilot with O-ring and Valve Spring ............... RRP-96-935-80

**Specifications**
- Adjusting Range Pressure
  - 2 to 40 PSIG (14 to 276 kPa)
  - 5 to 160 PSIG (34 to 1103 kPa)
- 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 (2068 kPa)
- 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
R216 Precision Regulators

Features

- High Flow Performance Featuring Rugged Design for the Most Demanding Applications
- Ideal for Those Installations Calling for Constant Pressure with Wide Variation in Flow
- Diaphragm Operated with Large Surface Area and Aspirator for Quick and Precise Regulation
- Heavy Duty Tee Handle Adjustment
- Panel Mount Version Available
- High Flow: 1/4” & 3/8” - 40 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT Relieving</th>
<th>BSPP Relieving</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4”</td>
<td>R216-02F</td>
<td>R216G02F</td>
</tr>
<tr>
<td>3/8”</td>
<td>R216-03F</td>
<td>R216G03F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hand Wheel Knob, Without Gauge 0-20 PSIG Reduced Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Size</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>1/4”</td>
</tr>
<tr>
<td>3/8”</td>
</tr>
</tbody>
</table>

R216 Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.25 (108)</td>
<td>1.24 (31.6)</td>
<td>4.25 (108)</td>
<td>4.25 (108)</td>
<td>4.78 (121)</td>
<td>0.85 (21.5)</td>
</tr>
</tbody>
</table>

R216-02FP, R216-03FP

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.25 (108)</td>
<td>1.24 (31.6)</td>
<td>4.25 (108)</td>
<td>4.25 (108)</td>
<td>4.78 (121)</td>
<td>0.85 (21.5)</td>
</tr>
</tbody>
</table>

inches (mm)

Bold Items are Most Popular.
For other models refer to ordering information below.

SCFM = Standard cubic feet per minute at 100 PSIG inlet, 75 PSIG no flow secondary setting, and 20 PSIG pressure drop.

Ordering Information

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Reduced Pressure Range</th>
<th>Options</th>
<th>Engineering Change Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 1/4 Inch</td>
<td>E 0-8 PSIG</td>
<td>K Non-Relieving</td>
<td>Will be entered at factory.</td>
</tr>
<tr>
<td>03 3/8 Inch</td>
<td>F 0-20 PSIG</td>
<td>P Panel Mount with Knob</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H 0-50 PSIG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
Technical Information

**Flow Characteristics**

![Flow Characteristics Diagram]

---

**WARNING**

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

---

**WARNING**

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.

---

**R216 Regulator Kits & Accessories**

- Round Plastic Knob ............................................. 118Y51
- Panel Mount Conversion Kit (Spring Cage, Knob, Hardware) ..................... 4206
- Repair Kits –
  - Non-Relieving Diaphragm, Valve Assembly (1/4", 3/8") ............................................. RK216KY
  - Relieving Diaphragm, Valve Assembly (1/4", 3/8") ............................................. RK216Y

---

**Specifications**

- Gauge Port (1) .......................................................... 1/8 Inch
- Port Threads ................................................. 1/4, 3/8 Inch
- Reduced Pressure Range ............. 5 to 20 PSIG (0.03 to 1.4 bar)
- Supply Pressure .................. 300 PSIG Maximum (20.4 bar)
- Temperature Rating ............... -40°F to 125°F (-4°C to 52°C)
- Weight .................................. 2.2 lb. (1.00 kg) / Unit 18 lb. (8.16 kg) / 8-Unit Master Pack

---

**Materials of Construction**

- Body, Spring Cage ............................................ Zinc
- Bottom Plug ................................................ Brass
- Seals .................................................. Buna N
R210 / R220 High Precision Regulator

Features

- Accurate Pressure Regulation
  Controls Output Pressure to within 0.1% Accuracy
- Multi-Stage Regulation for Maximum Control and Stability
- Two Full Flow Gauge Ports
- Super Sensitive Relief. Downstream Pressure Buildup, Down to 0.005 PSIG Above the Set Pressure, is Automatically Vented through Internal Relief Valve
- R220 has High Exhaust Relief Capacity

Applications

The R210 and R220 regulators are well suited for any process that requires very precise regulation of air pressure in pipes and vessels. These regulators are often used, but not limited to the following applications:

- Air Gauging
- Gas Mixing
- Calibration Standards
- Air Hoists
- Web Tensioning
- Gate Actuators
- Roll Loading
- Valve Operators
- Cylinder Loading

Ordering Information

<table>
<thead>
<tr>
<th>Relieving</th>
<th>Reduced Pressure Range (PSIG)</th>
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<tbody>
<tr>
<td>In / Out Ports</td>
<td>2 to 40</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>R210-02A</td>
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R210 / R220 Regulator Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.06</td>
<td>4.35</td>
<td>3.82</td>
<td>0.53</td>
</tr>
<tr>
<td>(52)</td>
<td>(110)</td>
<td>(97)</td>
<td>(13.5)</td>
</tr>
</tbody>
</table>

Inches (mm)
Technical Information

R210 / R220 Regulator Kits & Accessories

Mounting Bracket Kits –
Pipe Mounting (Pair) ........................................ SA200YW57
Right Angle Mounting ........................................... 446-707-045

Service Kits –
2-40 PSIG ....................................................... RKR210A*
2-120 PSIG ....................................................... RKR210C*
2-120 PSIG (High Relieving) ................................ RKR220C*
* Parts in Kit: Diaphragms, Gasket, Bleed Orifice

Specifications

Constant Bleed Rate ......................................... Less than 0.08 SCFM (0.15 m³/hr)
(Equals Bleed Rate plus other consumption)
Total Air Consumption ...................................... 6 SCFH (0.21 m³/hr)
Effect of Supply Pressure Variation of 25 PSIG (1.7 bar) on Outlet:
Less than 0.005 PSIG (0.0003 bar)
Exhaust (Relief) Capacity –
At 5 PSIG (0.34 bar) above 20 PSIG (1.38 bar) Setpoint
Standard Model ............................................. 3 SCFM (3.4 m³/hr)
High-Relief Model ........................................... 11 SCFM (17 m³/hr)
Flow Capacity –
At 100 PSIG (6.89 bar) Supply,
20 PSIG (1.38 bar) Outlet ................................. 14 SCFM (25 m³/hr)
Gauge Ports ................................................... 1/4” NPTF
(Can be used as additional full flow 1/4” outlet ports)

Operating Pressure Range:

| PRIMARY – Maximum | 150 | 10.34 |
| SECONDARY – Spring Pressure | 40 PSIG | Minimum | 2 | 0.14 |
| | | Maximum | 40 | 2.76 |
| | 120 PSIG | Minimum | 2 | 0.14 |
| | | Maximum | 120 | 8.27 |

Operating Temperature Range ........... -18°C * to 65°C (0°F* to 150°F)
* Temperatures below 0°C (32°F) require moisture free air.

Repeatability / Sensitivity ....................... 0.005 PSIG (0.0003 bar)
Inches of Water Column = 1/8”

Weight .......................................................... 1.4 lb (0.64 kg)

Materials of Construction

Adjusting Stem & Capsule ................................ Stainless Steel
Body ................................................................. Zinc
Control Knob .................................................. Plastic
Diaphragm(s) .................................................. Buna-N
Seals ............................................................... Buna-N
Springs ........................................................... Stainless Steel
Valve Poppet ................................................... Stainless Steel

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.
R230 High Flow Precision Regulator

Features
- Adjusting Knob.
- Diaphragm Design for Good Repeatability, Response and Sensitivity
- Balanced Poppet
- Two Full Flow Gauge Ports
- Precise Regulation. Will Sense a Decrease in Downstream Pressure as Small as 1/4” of Water Column (0.010 PSIG)
- High Flow Capacity. Flows of 80 SCFM Attainable with Minimal Drop
- Stable Output. Dampening Action of Aspiration Tube makes Regulator Insensitive to Changes in Flow
- On-line Maintenance. Can be Serviced Without Removal of Air Line

The R230 is designed for applications that require high flow 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.

Applications
The R230 regulators are an ideal choice for any application that calls for accurately maintained output pressure under high flow conditions. This includes, but is not limited to such applications as:
- Test Equipment
  - Gas Mixing
  - Valve Operators
  - Positioning Cylinders
  - Laboratory Equipment
  - Web Tensioning
  - Clutch & Brake Controls
  - Roll Loading
  - Test Panels
  - Actuators

Ordering Information

<table>
<thead>
<tr>
<th>Reduced Pressure Range (PSIG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In / Out Ports</strong></td>
</tr>
<tr>
<td><strong>Port Size</strong></td>
</tr>
<tr>
<td>1/4”</td>
</tr>
<tr>
<td>3/8”</td>
</tr>
</tbody>
</table>
Technical Information

R230 Regulator Kits & Accessories

Mounting Bracket Kit ........................................ 446-707-025

Service Kits – Relieving
0 to 2 PSIG ......................................................... RKR230E*  
0 to 30 PSIG ..................................................... RKR230B*  
0 to 60 PSIG ...................................................... RKR230C*  
0 to 150 PSIG .................................................... RKR230D*  
  * Parts in Kit: Diaphragm, Poppet, O-ring

Specifications

Constant Bleed Rate ........................................ 1.0 to 12.5 SCFH
(Depending upon output pressure)

Gauge Ports ..................................................... Two Ports 1/4*
(Can be used as additional Full Flow 1/4 Inch Outlet Ports)

Effect of Supply Pressure Variation –
Less than 0.1 PSIG for 100 PSIG (6.89 bar) change

Exhaust (Relief) Capacity –
4 SCFM with downstream pressure 5 PSIG above set pressure. ... Exhaust commences at 0.01 PSIG above set pressure.

Flow Capacity –
At 100 PSIG (6.89 bar) Supply,  
80 PSIG (5.5 bar) outlet.............. 80 SCFM (37.8 dm3/s)

Operating Temperature Range ...................... 40°C to 71°C  
(-40°F to 160°F)

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.

R230 Series
High Flow Precision Regulators

Catalog 0305-2
Technical Specifications – R230

Operating Pressure Range –
PRIMARY – Maximum
PSIG  bar  250 17

Port Threads ............................................. 1/4*

Exhaust (Relief) Capacity ................................. 4.0 SCFM
(Downstream pressure 5 PSI above set pressure)

Repeatability / Sensitivity .......................... ±0.010 PSIG (±0.00068 bar)

Inches of Water Column = 1/4*

Response ......................................................... 250 ms
The valve will open to full flow and fill a volume of 1250 cm³

Weight ......................................................... 1 lb. 10 oz. (0.7 kg)

Materials of Construction

Adjusting Stem & Spring .................................. Steel
Biased Spring ................................................ Stainless Steel
Body, Bonnet .................................................. Aluminum
Control Knob ................................................. Plastic
Diaphragm ................................................. Buna-N Elastomer and Polyester Fabric
Seals ......................................................... Buna-N
Valve Poppet ................................................. Brass
Valve Poppet Seat ........................................... Buna-N
P3HP Electronic Proportional Regulator

Features
- Low Watt Power Consumption
- High Visibility LED Display
- User Friendly and Easily Accessible Software
- Special Applications
- Compact and Light Weight
- Flexible Mounting Options
- 0 to 10V Control Signal, Adjustable to 4-20mA via Touch Pad Control

Foot Bracket

DIN Rail

Ordering Information

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<tr>
<th>P3HPA</th>
<th>9</th>
<th>2</th>
<th>A</th>
<th>D</th>
<th>2</th>
<th>V</th>
<th>D</th>
<th>1</th>
<th>A</th>
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<tbody>
<tr>
<td>Port Type</td>
<td>Port Size</td>
<td>Pressure Range</td>
<td>Control Signal</td>
<td>Output</td>
<td>Input Connector</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; G Thread (BSP) Female</td>
<td>2 1/4</td>
<td>0-2 bar (0-29 PSI)</td>
<td>V 0-10 V*</td>
<td>D Digital, PNP</td>
<td>1 M12 (4-Pin)</td>
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<tr>
<td>9 NPT Female</td>
<td></td>
<td>D 0-10 bar (0-145 PSI)</td>
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<td>M 4 to 20 mA Fixed</td>
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<td></td>
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<tr>
<td>* Available on Request</td>
<td></td>
<td></td>
<td>* Factory setting is 0-10 V control signal, 4-20 mA control signal available via parameter 4 on keypad.</td>
<td></td>
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<td>P* PNP or 0 to 10V</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>* Selectably by means of parameter 6.</td>
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P3HP Series
1/4 Inch Ports

Catalog 0305-2
(Revised 11-25-09)
Technical Information

Flow Characteristics [Supply Pressure 150 PSI (10 bar)]

<table>
<thead>
<tr>
<th>Flow (SCFM)</th>
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<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Pressure (PSI)</td>
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<td>4</td>
<td>6</td>
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<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>Output Pressure (bar)</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>

Specifications

Flow Capacity* ........................................... 35 SCFM (16.5 dm³/s)
Accuracy Linearity ...................................... <= 0.3% F.S.*
Current Consumption ................................. Max. 200 mA with No Load
Dead Band – Preset at 1.3% F.S.*, adjustable via parameter 13.
Degree of Protection .................................. IP65
Maximum Operating Pressure –
2 bar Unit .................................................. 3 bar (43.5 PSI)
10 bar Unit .................................................. 10.5 bar (152 PSI)
Minimum Operating Pressure ................. P2 Pressure + 0.5 bar (7.3 PSI)
Power Consumption .................................. 1.1 W
Supply Voltage .......................................... 24 VDC +/- 10%
Temperature Range ..................................... 32°F to 122°F (0°C to 50°C)
Weight ...................................................... 10 oz.

Materials of Construction

Core Housing .............................................. Brass
Magnet Core ............................................. Steel
Regulator Housing ..................................... Techno Polymer
Remaining Seals ......................................... NBR
Seats and Auxiliary Piston ......................... Delrin, Brass
Solenoid Valve Poppet ................................ FP1
Solenoid Valve Housing ......................... Techno Polymer
Port Connections –
Standard Version .................................. Brass
Food .................................................... Stainless Steel
Valve ..................................................... Polyurethane

For Parameter Adjustment Details, refer to Instruction Sheet 2R210.

Accessories

Cable (M12, 4-pin connection w/2m cable) ............... CB-M12-4P-2M
DIN Rail Mounting Kit .................................. P3HKA00MK
Foot Bracket Mounting Kit .............................. P3HKA00MF
Seal Kit (valve seat, cover seal) .......................... 3538200
Valve Kit (2 valves, screws, cover seal) ................. 3538100
Lubrication
Many pneumatic system components and most pneumatic tools require oil lubrication for proper operation and long service life. This lubricant is typically carried by the air stream. Too little oil can cause excessive wear and premature failure. Too much oil is wasteful and can become a contaminant, particularly when carried over with the air exhaust. Intermittent lubrication may be the worst situation because the oil film can dry out to form sludges and varnishes on internal surfaces.

Air line lubricators meter oil from a reservoir into the moving air stream. In general terminology, the oil droplets are usually termed a fog. For best results, the lubricator should be located as close as possible to the point where lubrication is required.

How to Select the Proper Lubricator
Use of proper lubricator can greatly extend the life of expensive downstream pneumatic equipment. Lubricators often are selected according to pipe size. Other selection factors are type of bowl material, bowl size, and refilling system capability. Bowls are available in both polycarbonate and metal. Polycarbonate offers the advantage or transparency, for simplified inspection of oil level and condition. However, caution must be exercised when using polycarbonate bowls in any area where certain chemicals are used. (Please read the warning carefully.)

In addition to choice of bowls, minimum and maximum flow rates and pressure requirements should also be considered. Be sure to check the pressure drop curves, to make certain the selected model will not create a higher pressure drop than the system design can tolerate.

Lubricator Construction
Bowls are available in polycarbonate and metal, subject to the same constraints discussed in the Filter Section. Transparent polycarbonate simplifies inspection of the oil level and checking for dirt and liquid condensate in the oil. Note that the system must be exhausted before removing the bowl.

In some models, the system must also be exhausted before opening the fill plug to recharge the lubricator. Other designs automatically bypass the air during refilling.

⚠️ Warning
The plastic material used to manufacture the plastic bowls, and the sight gauge on metal bowls, may be attacked by certain chemicals. Do not use this lubricator on systems with air supplied by a compressor lubricated with synthetic oils or oils containing phosphate esters or chlorinated hydrocarbons. These oils can carry over into the air lines and chemically attack and possibly rupture the bowl or sight gauge. Also, do not expose the bowls or sight gauge to materials such as carbon tetrachloride, trichlorethylene, acetone, paint thinner, cleaning fluids, or other harmful materials, for they too will cause the plastic to craze and/or rupture. For use in environments where these, or any, chemicals may be present, consult the factory for approval.

Lubricator Installation
The lubricators listed in this catalog should be placed before any valving and stay pressurized before, during, and after machine tool cycles. These lubricators should be placed no farther away than 15 feet from the desired point of lubrication.
Lubricators

Lubrication Operation

Most lubricator designs include a high-velocity venturi section in the air flow path which creates a low-pressure area to draw oil from the reservoir through a capillary tube to the point of injection. There, the air stream breaks up the oil into droplets.

In a typical lubricator, filtered and regulated air enters the lubricator housing and is channeled in either of two directions depending on flow rate. At low flow rates, all the air passes through the venturi where it mixes with metered oil droplets. Under higher flow conditions, the spring-loaded bypass valve opens and the excess flow bypasses the venturi, then blends with the lubricated air at a downstream point. A manual adjustment (needle valve) in the housing sets the oil drip-rate into the air stream; a sight gauge allows that rate to be monitored. Fill plugs at the lubricator top provide access to refill the reservoir with oil. The bowl is removable for cleaning.
L606 General Purpose Lubricators

Features

• Metal Bowl with Sight Gauge & Drain
  - Standard
• Polycarbonate Sight Dome
• Bowl can be Filled while Air Line is Under Pressure
• Proportional Oil Delivery Over a Wide Range of Air Flows
• Large Capacity Bowl
• Precision Needle Valve Assures Repeatable Oil Delivery and Provides Simple Adjustment of Delivery Rate
• High Flow: 1/4" - 45 SCFM
  3/8" - 72 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT No Drain</th>
<th>BSPP No Drain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polycarbonate Bowl* / Plastic Guard</td>
<td>L606-02B</td>
<td>L606G02B</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>L606-03B</td>
<td>L606G03B</td>
</tr>
<tr>
<td>Metal Bowl / Sight Gauge</td>
<td>L606-02W</td>
<td>L606G02W</td>
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<tr>
<td>1/4&quot;</td>
<td></td>
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<tr>
<td>3/8&quot;</td>
<td>L606-03W</td>
<td>L606G03W</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.
For other models refer to ordering information below.
* For polycarbonate bowl see Caution on page B2.
§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop.

Ordering Information

L606 Lubricator Dimensions

<table>
<thead>
<tr>
<th>L606-02B, L606-03B</th>
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</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td>2.98</td>
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<tr>
<td>(76)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>L606-02W, L606-03W</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>2.98</td>
</tr>
<tr>
<td>(76)</td>
</tr>
</tbody>
</table>

Add 9/16" For X9 Option

BOLD ITEMS ARE MOST POPULAR.
**Technical Information**

**L606 Lubricator Kits & Accessories**

- Adjusting Knob ..................................................... 606Y72
- Bowl Kits –
  - Polycarbonate with Plastic Bowl Guard (B) ................. BK606Y
  - Zinc with Sight Gauge (W) ....................................... BK605WY
- Button Head Fill Fitting (M14 male thread) ................... L606C14
- Dip Tube Kit .......................................................... DTK606
- Drip Spout Kit ......................................................... RK606SY
- Mounting Bracket ................................................. SAF602-0571
- Repair Kits –
  - Needle Valve Assembly (B,W) ................................. RK606Y
  - Sight Gauge for “W” Bowl .................................. RK605WY

**Specifications**

- **Bowl Capacity** .................................................. 5 Ounces
- **Port Threads** .................................................. 1/4, 3/8 Inch
- **Pressure & Temperature Ratings** –
  - Polycarbonate Bowl ............................. 0 to 150 PSIG (0 to 10.2 bar) 40°F to 125°F (4.4°C to 52°C)
  - Metal Bowl .................................................. 0 to 50 PSIG (0 to 17. bar) 40°F to 150°F (4.4°C to 65.6°C)
- **Weight** –
  - Polycarbonate Bowl .......................... 1.8 lb. (0.82 kg) / Unit
  - Metal Bowl ............................................... 2.2 lb. (1.00 kg) / Unit
  - 15 lb. (6.80 kg) / 8-Unit Master Pack
  - 17.6 lb. (7.98 kg) / 8-Unit Master Pack

**Materials of Construction**

- **Body** ............................................................... Zinc
- **Bowls** –
  - Polycarbonate .......................... Polycarbonate with Polyethylene Guard
  - Metal ........................................锌 with Polyurethane Sight Gauge
- **Drain** .............................................................. Brass
- **Seals** ............................................................... Buna N
- **Sight Gauge** ..................................................... Nylon
L606 General Purpose Lubricators

Features

- Metal Bowl with Sight Gauge & Drain
- Polycarbonate Sight Dome
- Bowl can be Filled while Air Line is Under Pressure
- Proportional Oil Delivery over a Wide Range of Air Flows
- Large Capacity Bowl
- Optional High Capacity Bowl(s) Available
- Precision Needle Valve Assures Repeatable Oil Delivery and Provides Simple Adjustment of Delivery Rate
- High Flow: 1/2" - 110 SCFM

Port Size | NPT No Drain | BSPP No Drain
---|---|---
Polycarbonate Bowl* / Plastic Guard
1/2" | L606-04B | L606G04B
Zinc Bowl / Sight Gauge
1/2" | L606-04W | L606G04W
Aluminum Bowl 16 oz. without Sight Gauge
1/2" | L606-04E | L606G04E
Aluminum Bowl 64 oz. with Sight Gauge
1/2" | L606-04G | L606G04G

Bold Items are Most Popular.
For other models refer to ordering information below.

* For polycarbonate bowl see Caution on page B2.
§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop.

L606 Lubricator Dimensions

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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</thead>
<tbody>
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<td>2.31</td>
<td>3.25</td>
<td>7.75</td>
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<td>(96)</td>
<td>(138)</td>
<td>(59)</td>
<td>(83)</td>
<td>(197)</td>
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<td>3.25</td>
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<td></td>
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<td>(59)</td>
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<td>(216)</td>
<td>(48)</td>
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<td>L606-04E</td>
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<td>2.31</td>
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<td>(59)</td>
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<td>(257)</td>
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<td>L606-04G</td>
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<td>12.05</td>
<td>2.50</td>
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<td>(127)</td>
<td>(243)</td>
<td>(63)</td>
<td>(151)</td>
<td>(306)</td>
<td>(64)</td>
</tr>
</tbody>
</table>

Ordering Information

L 606 — 04 W /**

Port Threads
- NPT
- BSPP

Bowl

- B 8 oz. Polycarbonate with Plastic Bowl Guard
- E 16 oz. Large Capacity without Sight Gauge, with Drain
- G 64 oz. Large Capacity with Sight Gauge
- W 8 oz. Metal with Sight Gauge & Drain

Options

- H Button Head Fill Fitting
- X9 Manual Twist Drain on Plastic Bowl (Increases Product Length by 9/16 Inch)

Engineering Change Designator

Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
L606 Lubricator Kits & Accessories

Adjusting Knob ................................................................. 606Y72

Bowl Kits –
- Aluminum (E) ............................................................. BK603A
- Aluminum with Sight Gauge (G) ......................... BK606X30A
- Polycarbonate with Plastic Bowl Guard (B) ......... BK606A
- Zinc with Sight Gauge (W) ................................. BK605WA

Button Head Fill Fitting (M14 male thread) .......... L606C14

Dip Tube Kit ................................................................. DTK606

Drip Spout Kit ............................................................... RK606SY

Mounting Bracket ....................................................... SAF602-0572

Repair Kits –
- Adjusting Knob (All) ............................................... 606Y72
- Needle Valve Assembly (All) ................................. RK606Y
- Sight Gauge Bowl Repair Kit (W) .......... RKB605WA
- Sight Gauge Bowl Repair Kit (G) .......... RKB606X30A

Specifications

Bowl Capacity –
- Aluminum (E) ............................................................. 16 Ounces
- Aluminum with Polycarbonate Sight Gauge (G) ....... 64 Ounces
- Polycarbonate with Polyurethane Bowl Guard (B) .... 8 Ounces
- Zinc with Nylon Sight Gauge (W) .............................. 8 Ounces

Port Threads ................................................................. 1/2 Inch

Pressure & Temperature Ratings –
- Aluminum Bowl (E) ...................................................... 0 to 300 PSIG (0 to 20.4 bar)
- 40°F to 150°F (4.4°C to 65.6°C)
- Polycarbonate Bowl with Polycarbonate Sight Gauge (G) .... 0 to 150 PSIG (0 to 10.2 bar)
- 40°F to 125°F (4.4°C to 52°C)
- Polycarbonate Bowl with Polyurethane Bowl Guard (B) .... 0 to 150 PSIG (0 to 10.2 bar)
- 40°F to 125°F (4.4°C to 52°C)
- Zinc Bowl with Nylon Sight Gauge (W) ................. 0 to 50 PSIG (0 to 17.2 bar)
- 40°F to 150°F (4.4°C to 65.6°C)

Weight –
- Aluminum Bowl (E) ................................................. 3.5 lb. (1.59 kg) / Unit
- 27.8 lb. (12.61 kg) / 8-Unit Master Pack
- Aluminum Bowl with Polycarbonate Sight Gauge (G) .... 6.9 lb. (3.13 kg) / Unit
- 27.6 lb. (12.52 kg) / 4-Unit Master Pack
- Polycarbonate Bowl with Polyurethane Bowl Guard (B) .... 2.5 lb. (1.13 kg) / Unit
- 20.3 lb. (9.21 kg) / 8-Unit Master Pack
- Zinc Bowl with Nylon Sight Gauge (W) ................. 3.3 lb. (1.50 kg) / Unit
- 26.4 lb. (11.97 kg) / 8-Unit Master Pack

Materials of Construction

Body ................................................................. Zinc

Bowl –
- Aluminum with Polycarbonate Sight Gauge (G) ....... Aluminum
- Zinc with Nylon Sight Gauge (W) .............................. Zinc

Seals ................................................................. Buna N
L606 Standard Lubricators

Features
- Metal Bowl with Sight Gauge & Drain
- Standard
- Polycarbonate Sight Dome
- Bowl can be Filled while Air Line is Under Pressure
- Proportional Oil Delivery over a Wide Range of Air Flows
- Large Capacity Bowl
- Optional High Capacity Bowl(s) Available
- Precision Needle Valve Assures Repeatable Oil Delivery and Provides Simple Adjustment of Delivery Rate
- High Flow: 3/4" - 325 SCFM
  1" - 350 SCFM

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Bowl / Sight Gauge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>L606-06W</td>
<td>L606G06W</td>
</tr>
<tr>
<td>1&quot;</td>
<td>L606-08W</td>
<td>L606G08W</td>
</tr>
<tr>
<td>Aluminum Bowl 32 oz. without Sight Gauge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>L606-06E</td>
<td>L606G06E</td>
</tr>
<tr>
<td>1&quot;</td>
<td>L606-08E</td>
<td>L606G08E</td>
</tr>
<tr>
<td>Aluminum Bowl 64 oz. with Sight Gauge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>L606-06G</td>
<td>L606G06G</td>
</tr>
<tr>
<td>1&quot;</td>
<td>L606-08G</td>
<td>L606G08G</td>
</tr>
</tbody>
</table>

Bold Items are Most Popular.

For other models refer to ordering information below.

SCFM = Standard cubic feet per minute at 100 PSIG inlet, and 5 PSIG pressure drop.

Ordering Information

L 606 — 06 W /**

Port Threads
- NPT
- G BSPP

Port Size
- 06 3/4 Inch
- 08 1 Inch

Bowl
<table>
<thead>
<tr>
<th>Bowl</th>
<th>Capacity</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>32 oz.</td>
<td>Large Capacity 3/4&quot; &amp; 1&quot; without Sight Gauge with Drain</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>64 oz.</td>
<td>Large Capacity with Sight Gauge 3/4&quot; &amp; 1&quot;</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>16 oz.</td>
<td>Metal with Sight Gauge &amp; Drain 3/4&quot; &amp; 1&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Options
- H Button Head Fill Fitting
- X9 Manual Twist Drain on Plastic Bowl (Increases Product Length by 9/16 Inch)

Engineering Change Designator
Will be entered at factory.

L606 Lubricator Kits & Accessories

Adjusting Knob ................................................................. 606Y72

Bowl Kits –
  Aluminum (E) ................................................................. BK603B
  Aluminum with Sight Gauge (G) ........................................ BK606X30B
  Zinc with Sight Gauge (W) ............................................... BK605WB

Button Head Fill Fitting (M14 male thread) ..................... L606C14

Dip Tube Kit ................................................................. DTK606

Drip Spout Kit ............................................................... RK606SY

Mounting Bracket –
  3/4 Inch units (2 required per unit) ................................. SA200AW57
  1 Inch units (2 required per unit) ................................. SA200CW57

Repair Kits –
  Needle Valve Assembly (All) ........................................ RK606Y
  Sight Gauge Bowl Repair Kit (W) ......................................... RK606X30B

Specifications

Bowl Capacity –
  Aluminum (E) ................................................................. 32 Ounces
  Aluminum with Polycarbonate Sight Gauge (G) ................ 64 Ounces
  Zinc with Nylon Sight Gauge (W) ........................................ 16 Ounces

Port Threads ................................................................. 3/4, 1 Inch

Pressure & Temperature Ratings –
  Aluminum Bowl (E) ......................................................... 0 to 300 PSIG (0 to 20.4 bar)
  40°F to 150°F (4.4°C to 65.6°C)

  Aluminum Bowl with Polycarbonate Sight Gauge (G) ........... 0 to 150 PSIG (0 to 10.2 bar)
  40°F to 125°F (4.4°C to 52°C)

  Zinc Bowl with Nylon Sight Gauge (W) .............................. 0 to 50 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)

Weight –
  Aluminum Bowl (E) .......................................................... 5.5 lb. (2.49 kg) / Unit
  22.3 lb. (10.12 kg) / 4-Unit Master Pack

  Aluminum Bowl with Polycarbonate Sight Gauge (G) ............. 7.2 lb. (3.27 kg) / Unit
  28.8 lb. (13.06 kg) / 4-Unit Master Pack

  Zinc Bowl with Nylon Sight Gauge (W) ................................ 4.2 lb. (1.91 kg) / Unit
  16.6 lb. (7.53 kg) / 4-Unit Master Pack

Materials of Construction

Body ................................................................. Zinc

Bowl –
  (E) .............................................................................. Aluminum
  (G) .............................................................................. Aluminum with Polycarbonate Sight Gauge
  (W) ............................................................................ Zinc with Nylon Sight Gauge

Seals ................................................................. Buna N
L606 Standard Lubricators

**Features**
- Metal Bowl with Sight Gauge - Standard
- Polycarbonate Sight Dome
- Bowl can be filled while Air Line is Under Pressure
- Proportional Oil Delivery Over a Wide Range of Air Flows
- Large Capacity Bowl
- Optional High Capacity Bowl(s) Available
- Precision Needle Valve Assures Repeatable Oil Delivery and Provides Simple Adjustment of Delivery Rate
- High Flow: 1-1/4" - 325 SCFM
  1-1/2" - 400 SCFM

**Standard Lubricators: 1-1/4 & 1-1/2 Inch Ports**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Zinc Bowl / Sight Gauge</th>
<th>Aluminum Bowl 32 oz. without Sight Gauge</th>
<th>Aluminum Bowl 64 oz. with Sight Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-1/4&quot;</td>
<td>L606-10W</td>
<td>L606-10G</td>
</tr>
<tr>
<td></td>
<td>1-1/2&quot;</td>
<td>L606-12W</td>
<td>L606-12G</td>
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<th>L606G10W</th>
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<tr>
<td></td>
<td>1-1/2&quot;</td>
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<td></td>
<td>1-1/2&quot;</td>
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<table>
<thead>
<tr>
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<th>L606-12W</th>
<th>L606G12W</th>
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<tbody>
<tr>
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<td></td>
<td>1-1/2&quot;</td>
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<tbody>
<tr>
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<tr>
<td></td>
<td>1-1/2&quot;</td>
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<td>1-1/2&quot;</td>
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**L606 Lubricator Dimensions**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>L606-10W, L606-12W</th>
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<tbody>
<tr>
<td>A</td>
<td>B</td>
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<tr>
<td>4.97</td>
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<tr>
<td>C</td>
<td>D</td>
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<td>2.84</td>
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<td>(72.2)</td>
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<tr>
<td>E</td>
<td>F</td>
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<td>4.81</td>
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<td>(122)</td>
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<td>5.00</td>
<td>7.99</td>
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<td>2.84</td>
<td>4.81</td>
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<td>(72.2)</td>
<td>(122)</td>
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<tr>
<td>12.80</td>
<td>13.97</td>
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<td>(325)</td>
<td>(255)</td>
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<td>2.50</td>
<td>2.48</td>
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<td>(64)</td>
<td>(63.1)</td>
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**Ordering Information**

L 606 — 10 W H /**

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<tr>
<th>Port Threads</th>
<th>Port Size</th>
<th>Bowl Capacity</th>
<th>Description</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT</td>
<td>10 1-1/4 Inch</td>
<td>E 32 oz.</td>
<td>Large Capacity without Sight Gauge with Drain</td>
<td>1-1/4&quot; &amp; 1-1/2&quot;</td>
</tr>
<tr>
<td>G BSPP</td>
<td>12 1-1/2 Inch</td>
<td>G 64 oz.</td>
<td>Large Capacity with Sight Gauge</td>
<td>1-1/4&quot; &amp; 1-1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W 16 oz.</td>
<td>Metal with Sight Gauge &amp; Drain</td>
<td>1-1/4&quot; &amp; 1-1/2&quot;</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>H Button Head Fill Fitting X9* Manual Twist Drain on Plastic Bowl (Increases Product Length by 9/16 Inch)</th>
</tr>
</thead>
</table>

**Engineering Change Designator**

Will be entered at factory.
Technical Information

L606 Lubricator Kits & Accessories

Adjusting Knob ......................................................... 606Y72

Bowl Kits –
  Aluminum (E) .............................................................. BK603B
  Aluminum with Sight Gauge (G) .............................. BK606X30B
  Zinc with Sight Gauge (W) ........................................ BK605WB

Button Head Fill Fitting (M1 male thread) ................. L606C14

Dip Tube Kit ............................................................ DTK606

Drip Spout Kit ........................................................... RK606SY

Repair Kits –
  Needle Valve Assembly (All) .................................. RK606Y
  Sight Gauge Bowl Repair Kit (W) ......................... RKB605WB
  Sight Gauge Bowl Repair Kit (G) ......................... RKB606X30B

Specifications

Bowl Capacity –
  Aluminum (E) ....................................................... 32 Ounces
  Aluminum with Polycarbonate Sight Gauge (G) .... 64 Ounces
  Zinc with Nylon Sight Gauge (W) ....................... 16 Ounces

Port Threads ............................................... 1-1/4, 1-1/2 Inch

Pressure & Temperature Ratings –

- Aluminum Bowl (E) ........................................... 0 to 300 PSIG (0 to 20.4 bar)
  40°F to 150°F (4.4°C to 65.6°C)

- Aluminum Bowl with Polycarbonate Sight Gauge (G) .. 0 to 150 PSIG (0 to 10.2 bar)
  40°F to 125°F (4.4°C to 52°C)

- Zinc Bowl with Nylon Sight Gauge (W) ................... 0 to 50 PSIG (0 to 17.2 bar)
  40°F to 150°F (4.4°C to 65.6°C)

Weight –

- Aluminum Bowl (E) ........................................ 8.3 lb. (3.76 kg) / Unit
  33.2 lb. (15.06 kg) / 4-Unit Master Pack

- Aluminum Bowl with Polycarbonate Sight Gauge (G) .... 10 lb. (4.54 kg) / Unit
  40 lb. (18.14 kg) / 4-Unit Master Pack Zinc Bowl with
  Nylon Sight Gauge (W) ....................................... 7.5 lb. (3.40 kg) / Unit
  28.2 lb. (12.79 kg) / 4-Unit Master Pack

Materials of Construction

- Body ......................................................... Zinc
- Bowls –
  (E) ......................................................... Aluminum
  (G) ......................................................... Aluminum with Polycarbonate Sight Gauge
  (W) ......................................................... Zinc with Nylon Sight Gauge
- Seals .............................................................. Buna N
Hi-Flow Mist Lubricators

**Features**

- Metal Bowl with Sight Gauge and Manual Drain – Standard
- Polycarbonate Sight Dome for 360° Visibility
- Bowl can be Filled while Air Line is Under Pressure
- Proportional Oil Delivery Over a Wide Range Of Air Flows
- High Flow: 1000 SCFM

**09L Lubricator Dimensions**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>09L84BA</th>
<th>09L8PBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Bowl / Sight Gauge – 1 Quart</td>
<td>2&quot;</td>
<td>09L84BA</td>
<td></td>
</tr>
<tr>
<td>Metal Bowl / Sight Gauge – 3 Quart</td>
<td>2&quot;</td>
<td>09L8PBA</td>
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</tbody>
</table>

**Ordering Information**

<table>
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<tr>
<th>Port Size</th>
<th>8 2 Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowl Options</td>
<td>Metal Bowl</td>
</tr>
<tr>
<td>1 Quart</td>
<td>Sight Gauge / Manual Twist Drain</td>
</tr>
<tr>
<td>3 Quart</td>
<td>Sight Gauge / Manual Twist Drain</td>
</tr>
<tr>
<td>Options</td>
<td>B Without Tamperproof Cap</td>
</tr>
<tr>
<td>Engineering Level</td>
<td>A Current</td>
</tr>
<tr>
<td>Thread Type</td>
<td>Blank NPT</td>
</tr>
</tbody>
</table>

**Bold Items are Most Popular.**

For other models refer to ordering information below.

SCFM = Standard cubic feet per minute at 90 PSIG inlet and 5 PSIG pressure drop.
Technical Information

09L Lubricator Kits & Accessories

Fill Cap Kit ................................................................. PS610P
Lubricator Service Kit ............................................... PS607P
Metal Bowl – Sight Gauge / Twist Drain .................. PS612P*

Oil –
1 Gal................................................................. F442002
12 Quart Case...................................................... F442003
4 Gallon Case...................................................... F442005

Sight Dome Kit ..................................................... PS613P
* 1 Quart Bowl

Specifications

Bowl Capacity ...................................................... 1 Qt. (Standard)
3 Qt. (Optional)

Bowl ......................................................... Metal with Sight Gauge

Drain ............................................................ Manual Twist Drain

Port Threads ......................... 2 Inch

Pressure & Temperature Rating .... 0 to 150 PSIG (0 to 10.3 bar)
32°F to 150°F (0°C to 66°C)

Suggested Lubricant ................. F442 Oil

Petroleum based oil of 100 to 200 SUS viscosity
at 100°F and an aniline point greater than 200°F

(DO NOT USE OILS WITH ADDITIVES,
COMPOUNDED OILS CONTAINING SOLVENTS,
GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

Weight –
1 Qt.............................................................. 10.2 lb. (4.6 kg)
3 Qt.............................................................. 13.7 lb. (6.2 kg)

Materials of Construction

Body .................................................... Zinc Alloy, Die Cast
B11 / B12 General Purpose Filter / Regulators

Features
- High Flow Performance
- Diaphragm Operated Design
- Excellent Water Removal Efficiency
- Metal Bowl with Sight Gauge, Twist Drain and 40 Micron Element Standard
- Panel Mountable
- High Flow: 1/4" - 70 SCFM
  3/8" - 70 SCFM
  1/2" - 80 SCFM
- **B11**: Push-to-Lock, Pull-to-Adjust. Adjusting Lock is engaged when Knob is Removed Rendering Unit Tamper Resistant
- **B12**: Heavy Duty Tee Handle Adjustment

**Ordering Information**

<table>
<thead>
<tr>
<th>B</th>
<th>11</th>
<th>—</th>
<th>04</th>
<th>W</th>
<th>J</th>
<th>C</th>
<th>/**</th>
</tr>
</thead>
</table>

**Series**
- 11 Tamper Resistant, Snap Lock, Removable Knob
- 12 Tee Handle

**Port Threads**
- NPT
- BSPP

**Port Size**
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch

**Bowl**
- D Metal without Sight Gauge
- W Metal with Sight Gauge

**Reduced Pressure Range**
- A 0-25 PSI
- B 0-60 PSI
- C 0-125 PSI
- D 0-250 PSI

**Options**
- G Gauge
- K Non-Relieving
- R Internal Auto Drain
- S Automatic Pulse Drain
- U Semi-Auto Drain
- X64 Fluorocarbon O-Rings and Diaphragm

**Engineering Change Designator**
- Will be entered at factory.

**BOLD ITEMS ARE MOST POPULAR.**
B11 / B12 Integral Filter / Regulator

Kits & Accessories

- **Bowl Kits**
  - Zinc (D).............................................. BKF11Y
  - Zinc with Sight Gauge (W)..................... BKF11WY

- **Cage Kits**
  - B11 .................................................. CKR10Y
  - B12 .................................................. CKR11Y

- **Drain Kits**
  - Internal Auto Drain
    - (Max. Press. = 175 PSIG; Max. Temp. = 120°F) .......... SA602MD
  - Automatic Pulse Drain (Maximum Pressure = 175 PSIG) ...... 4210
  - Semi-Automatic “Overnight” Drain .................. SA602A7
    (Drains automatically under zero pressure)

- **Filter Element Kits**
  - 40 Micron (All) .................................... EKF10Y
  - 5 Micron (All) ..................................... EKF10VY

- **Gauges**
  - 2" Dial Size, 1/4" Back Connection
    - 0 to 60 PSIG (0 to 400 kPa) .................. K4520N14060
  - 2" Dial Size, 1/4" Back Connection
    - 0 to 160 PSIG (0 to 1100 kPa) .............. K4520N14160
  - 2" Dial Size, 1/4" Back Connection
    - 0 to 300 PSIG (0 to 2068 kPa) .............. K4520N14300

- **Mounting Bracket Kit** .......................... SAR10Y57

- **Panel Mount Nut**
  - Plastic .............................................. R10X51-P
  - Aluminum ........................................ R10X51-A

* Specify same model / revision number for repair kit as for filter/regulator. For example, B11-02DJC/M3 uses RKR10YM3.

**Technical Information**

![Flow Characteristics B11-04DJ](image1)

**Flow Characteristics**

- B11-04DJ
  - 1/2-inch Ports
  - 100 PSIG (6.9 bar) Primary Pressure

![Flow Characteristics B11 / B12](image2)

**Flow Characteristics**

- B11 / B12
  - 1/4 & 3/8 Inch Ports
  - 100 PSIG (6.9 bar) Primary Pressure

**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.

**Specifications**

- **Bowl Capacity** ........................................ 4 Ounces
- **Gauge Ports (2)** ...................................... 1/4 Inch
- **Port Threads** .......................................... 1/4, 3/8, 1/2 Inch
- **Supply Pressure**
  - Zinc Bowl (D) ....................................... 300 PSIG Maximum (20.4 bar)
  - Zinc Bowl with Sight Gauge (W) .............. 250 PSIG Maximum (17.2 bar)
  - with Auto Drain ................................... 175 PSIG Maximum (12.1 bar)
- **Temperature Rating**
  - Zinc Bowl ........................................... 40°F to 150°F (4.4°C to 65.6°C)
  - Zinc Bowl with Auto Drain ...................... 40°F to 125°F (4.4°C to 52°C)
- **Weight** ............................................. 1.3 lb. (0.59 kg) / Unit
  - 12.4 lb. (5.62 kg) / 8-Unit Master Pack

**Materials of Construction**

- **Adjusting Knob** ..................................... Acetal
  - B12 (Tee Handle) .................................. Steel
- **Body** .................................................. Zinc
- **Bowls** ................................................ Zinc
  - Without Sight Gauge .............................. Zinc
  - With Nylon Sight Gauge ......................... Zinc
- **Seals** ................................................ Buna N

**Repair Kits**

- Non-Relieving Diaphragm, Valve Assembly* (All)........ RKR10KY
- Relieving Diaphragm, Valve Assembly* (All) .............. RKR10Y
- Internal Auto Drain Repair Kit ......................... RK602MD

---

* Catalog 0305-2
** Technical Specifications – B11 / B12**

---

Pneumatic Division
Richland, Michigan
www.wattsfluidair.com
Standard Combinations – C10 & C11 Series

• See individual component pages for details.
• Gauges included on combinations.

Two & Three-Unit Combo

<table>
<thead>
<tr>
<th>Series</th>
<th>Port</th>
<th>Filter / Regulator with Lubricator</th>
<th>Filter, Regulator Lubricator</th>
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<tbody>
<tr>
<td>C10</td>
<td>1/4&quot;</td>
<td>C10-02BLWJCW</td>
<td>C10-02FRLWJCW</td>
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<tr>
<td></td>
<td>3/8&quot;</td>
<td>C10-03BLWJCW</td>
<td>C10-03FRLWJCW</td>
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<td></td>
<td>1/2&quot;</td>
<td>C10-04BLWJCW</td>
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<tr>
<td>C11</td>
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<td>1/2&quot;</td>
<td>C11-04BLWJCW</td>
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For other models, refer to ordering information below.

Ordering Information

<table>
<thead>
<tr>
<th>C</th>
<th>10</th>
<th>04</th>
<th>FRL</th>
<th>W</th>
<th>J</th>
<th>C</th>
<th>W</th>
</tr>
</thead>
</table>

Regulator Adjustment
- 10 Knob
- 11 Tee Handle

Port Size
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch

Combination
- BL 2-Unit
- FRL 3-Unit

Elements
- G 5 Micron
- J 40 Micron

Filter Bowl Options
- B Polycarbonate / Plastic Bowl Guard (Filter Only)
- D Metal w/o Sight Gauge (B-Unit Only)
- W Metal w/ Sight Gauge

Drains and Options
- H Button Head Fill Fitting (Lubricator)
- K Non-Relieving Regulator
- R Internal Auto Drain (Filter)
- X9* Manual Twist Drain on Plastic Bowl Lubricator

Regulator Reduced Pressure Range
- C 0-125 PSIG
- D 0-250 PSIG

CAUTION:
REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within its 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.

Lubricator Bowl Options
- B Polycarbonate / Plastic Bowl Guard
- W Metal w/ Sight Gauge with Drain

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.

* Not Available with “W” Bowl.
Three-Unit Combo

C628 Series

Standard Combinations

- See individual component pages for details.
- Gauges included on combinations.

<table>
<thead>
<tr>
<th>Series</th>
<th>Port</th>
<th>Model Numbers</th>
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<td>C628-02FRLWJCW</td>
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<td>C628-04FRLWJCW</td>
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<td>1-1/2&quot;</td>
<td>C628-12FRLWJCW</td>
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</table>

For other models, refer to ordering information below.

Ordering Information

| C 628 — 04 FRL W J C W |

Filter Bowl Options

- Bowl Capacity Description Size
- B 5 oz. Polycarbonate w/Plastic Bowl Guard 1/4" & 3/8"
- B 8 oz. Polycarbonate w/Plastic Bowl Guard 1/2"
- E 16 oz. Large Capacity w/Sight Gauge 3/4" thru 1-1/2"
- W 5 oz. Metal w/Sight Gauge 1/4" & 3/8"
- W 8 oz. Metal w/Sight Gauge 1/2"
- W 16 oz. Metal w/Sight Gauge 3/4" thru 1-1/2"

Elements

- H Button Head Fill
- K Non-Relieving Regulator
- O External Heavy Duty Auto Drain (Filter)
- R Internal Auto Drain (Filter)
- X9 Manual Twist Drain on Plastic Bowl Lubricator

Regulator Reduced Pressure Range

- C 0-125 PSIG
- D 0-250 PSIG

Lubricator Bowl Options

- Bowl Capacity Description Size
- B 5 oz. Polycarbonate w/Plastic Bowl Guard 1/4" & 3/8"
- B 8 oz. Polycarbonate w/Plastic Bowl Guard 1/2"
- E 16 oz. Large Capacity w/Sight Gauge 3/4" thru 1-1/2"
- W 5 oz. Metal w/Sight Gauge w/Drain 1/4" & 3/8"
- W 8 oz. Metal w/Sight Gauge w/Drain 1/2"
- W 16 oz. Metal w/Sight Gauge w/Drain 3/4" thru 1-1/2"

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.

BOLD ITEMS ARE MOST POPULAR.

Catalog 0305-2
B67
Pneumatic Division
Richland, Michigan
www.wattsfluidair.com
QIX Modular FRL System

QIX is the Premium FRL System for the Demanding, High Performance Manufacturer

Addressing the needs of the production-oriented plant more than a decade ago, WATTS FluidAir pioneered a breakthrough in FRL technology. The QIX Series of high flow, generously sized filters, regulators lubricators and accessories.

Designed around the parameters of one inch pipe, every QIX component is manufactured with wide open internal porting for maximum efficiency and optimum performance at flow rates up to 250 SCFM.

QIX Means Less Downtime

Qix is short for “Quick Insert eXchange”. By means of removable connector -inserts, any QIX unit easily adapts to a variety of pipe sizes ranging from 1” down to 1/4”. Each time you change pipe size or units, you change only the insert - not the filter, regulator, or lubricator. Pull two pins with a pair of pliers and your change is made in seconds.

QIX Means Less Inventory Plus Simplified Specification, Ordering and Service

The QIX concept enables you to stock one basic size filter, regulator or lubricator module along with an assortment of economical insert kits. You save as much as 50% on inventory. Working with fewer part numbers, you simplify engineering specs, lessen purchasing efforts and improve overall service.

Durable Textured Finish

All QIX components are powder coated to ensure a hard, durable finish.

Particulate Filters (F20)

Deflector plate insures maximum water removal while 40 micron element eliminates damaging particulate mater. Oil-removing coalescing filters (F21) are also available.

One-piece rugged metal bowls with sight gauge and bright liquid level indicating float are standard on all filters and lubricators.

Regulators (R20)

Accurate high-flow regulators are equipped with positive snap lock, push / pull adjusting knobs for easy operation. Bayonet style spring cage is removed with only the push of a button. Piston and o-ring is replaceable in seconds, using standard pliers.

Lubricators (L20)

Bypass valve system provides consistent lubrication under variable flow conditions. Removable adjusting knob renders the lubricator tamperproof (standard). QIX lubricators are fillable under pressure.

Inserts

All QIX components connect using inserts, o-rings and pins. Pins are easily removed using standard pliers. No special tools are required.

Threaded end inserts, 1/4” through 1”, make it easy to replace a complete FRL in seconds without breaking pipe connections. Also allows you to stock only one FRL for all your 1/4” through 1” plant needs.

Shut-Off Valves (IK20V)


Automatic Float Drain

Optional automatic float drain removes condensate as required. Manual drain is standard.

Pressure Switch

Low cost miniature pressure switch easily integrates into your QIX system via a porting block. The switch provides an electric signal when set pressure is achieved.

Porting Block

Insert style porting blocks are available with 1/4” NPT branch lines. They allow the mounting of a pressure switch or branching off a non-lubricated line.
Quick Insert Xchange

QIX Modular FRL System

- Shutoff Valves
- Particulate Filters
- Automatic Float Drain
- Inserts
- O-rings
- Pressure Gauges
- Regulators
- Pressure Switch
- Porting Block
- Lubricators
F20 & F21 QIX Particulate & Coalescing Filters

Features

- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- For Heavy Duty Applications with Minimum Pressure Drop Requirement
- Excellent Water Removal Efficiency
- Available in Both Particulate (F20) and Coalescing (F21) Configurations
- Metal Bowl with Sightgauge Standard
- High Flow - 180 SCFM for 3/4" & 1" Sizes (F20) 20 SCFM (F21 Coalescing)

F20 & F21 Filter Dimensions

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>D*</th>
<th>E</th>
<th>F</th>
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<tr>
<td>20</td>
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<td>4.50</td>
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<td>(173)</td>
<td>(19)</td>
<td>(89)</td>
<td>(114)</td>
<td>(192)</td>
<td>(45)</td>
</tr>
</tbody>
</table>

inches (mm)

* 1/4 thru 3/4 Inch Port Insert Size
** 1 Inch Port Insert Size

Ordering Information

| F | 20 | — | 00 | W | J | /** |

Filter Types
- 20 Particulate
- 21 Coalescing

Port Threads
- NPT
- G* BSPP
* If ordering BSPP Port Inserts Separately - Order "00" Unit

Port Size
- 00 No Port Inserts
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch
- 06 3/4 Inch
- 08 1 Inch

Elements
- J F20 40 Micron
- G F20 5 Micron
- J* F21 .3 Micron Coalescing
* Only Available with F21

Drains and Options
- R Internal Auto Float Drain
- S Automatic Pulse Drain
- U Semi-Auto Drain

Engineering Change Designator
Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
QIX F20 & F21 Kits & Accessories

Drains –
- Automatic Float Drain .................................................... SA602MD
- Automatic Pulse Drain .................................................... 4212
- Semi-Automatic “Overnight” Drain ...................................... SA602A7
  (Drains automatically under zero pressure)

Bowl Kit ............................................. BKF21WA
Bowl Sight gauge Repair Kit ........................................... RKB605WB
Combination Connector .............................................. IK0CC
  (Connects 2 QIX units together)
Combination Porting Block ........................................... IK0CP
  (same as IK0CC, except with 1/8” top branch outlet)

Element Kits –
- Particulate (F20) 40 micron ............................................ EKF20A
- Particulate (F20) 5 micron ............................................... EKF20VA
- Coalescing (F21) .01 micron ............................................ EKF601J

Mounting brackets (pair) .................................................. MK20-0100
  (Mounts directly to port inserts)

Port Insert Kits (includes o-rings & pins) NPT –
- 1/4” Port Size ................................................................. IK20Y
- 3/8” Port Size ................................................................. IK20X
- 1/2” Port Size ................................................................. IK20A
- 3/4” Port Size ................................................................. IK20B
- 1” Port Size ................................................................. IK20C

Shut-off Valve w/lockout (for inlet) ........................................ IK20V

Specifications
- Bowl Capacity ................................................................. 10 oz.

Filter Element Rating –
- “J” (F20 particulate) .................................................. 40 micron
- “G” (F20 particulate) .................................................. 5 Micron
- “J” (F21 coalescing) .................................................. 0.1 Micron

Maximum Pressure ................................................... 250 PSIG
  With Autodrain .................................................. 175 PSIG

Port Threads / Inserts –
- 00 ............................................................ No Port Inserts
- 02 ............................................................ 1/4”
- 03 ............................................................ 3/8”
- 04 ............................................................ 1/2”
- 06 ............................................................ 3/4”
- 08 ............................................................ 1”

Temperature Range ................................................... 40°F to 150°F (4.4°C to 65.6°C)
  With Auto Drain ................................................... 40°F to 125°F (4.4°C to 52°C)
Weight ................................................................. 2.1 lb
  (For total weight add .1 lb for port inserts)

Materials of Construction

Body ................................................................. Zinc
Bowl ................................................................. Zinc
Drain ................................................................. Brass

Filter Element –
- Particulate ................................................................. Polypropylene
- Coalescing ............................................................... Borosilicate Fibers

Thread Inserts ................................................................. Zinc
Seals ................................................................. Buna-N
Sight gauge ............................................................... Nylon
R20 & R21 QIX Regulators

Features
- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- Piston Operated for High Flow Performance
- Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulation
- Panel Mountable
- High Flow: 250 SCFM for 3/4" & 1" Port Sizes

R20 Features
- Push-to-Lock, Pull-to-Adjust, Remove-for-Tamper-Resistant Knob Feature

R21 Features
- Heavy Duty Tee Handle Adjustment

R20 / R21 Regulator Dimensions

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D*</th>
<th>D**</th>
<th>E</th>
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<td>(86)</td>
<td>(142)</td>
<td>(89)</td>
<td>(114)</td>
<td>(161)</td>
</tr>
</tbody>
</table>

* 1/4 thru 3/4 Inch Port Insert Size
** 1 Inch Port Insert Size

Ordering Information

R 20 — 00 C /**

Adjustment Type
- 20 Knob
- 21 Tee-Handle

Port Threads
- NPT
- G* BSPP
* If ordering BSPP Port Inserts Separately - Order “G00” Unit

Port Size
- 00 No Port Inserts
- 02 1/4 Inch
- 03 3/8 Inch
- 04 1/2 Inch
- 06 3/4 Inch
- 08 1 Inch

Reduced Pressure
- B 0-60 PSIG
- C 0-120 PSIG
- D 0-250 PSIG

Options
- P Panel Mount Nut (Plastic)
- G Gauge
- K Non-Relieving

Engineering Change Designator
Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
Technical Specifications – R20, R21

QIX Series
Regulators

Technical Information

**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.

---

### QIX R20 & R21 Kits & Accessories

- **Combination Connector** ........................................... IK20CC
  (Connects 2 QIX units together)
- **Combination Porting Block** .................................... IK20CP
  (same as IK20CC, except with 1/8" top branch outlet)
- **Mounting brackets (pair)** ....................................... MK20-0100
  (Mounts directly to port inserts)
- **Wall Mounting Bracket** ......................................... SAR20A57
  (Uses panel mount threads - includes plastic panel mount nut)
- **Panel Mount Nut –**
  - Plastic.......................................................... R10X51-P
  - Aluminum...................................................... R10X51-A
- **Port Insert Kits (includes o-rings & pins) NPT –**
  - 1/4" Port Size........................................... IK20Y
  - 3/8" Port Size............................................ IK20X
  - 1/2" Port Size............................................ IK20A
  - 3/4" Port Size............................................ IK20B
  - 1" Port Size.............................................. IK20C
- **Repair Kit - Internal Parts (Piston, Innervalve, Seals) –**
  - Relieving.................................................. RKR20A
  - Non-Relieving (K)..................................... RKR20KA
- **Spring Cage Kit –**
  - R20...................................................... CKR20A
  - R21...................................................... CKR21Y
- **Shut-off Valve w/lockout (for inlet)** .................. IK20V

### Specifications

- **Gauge Ports** .................................................... (2) 1/4"
- **Maximum Pressure** ........................................... 300 PSIG

---

Flow Characteristics
R20 / R21
Supply Pressure 100 PSI

---

<table>
<thead>
<tr>
<th>Flow - SCFM</th>
<th>Flow - dm³/s</th>
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<td>720</td>
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<tr>
<td>100</td>
<td>1200</td>
</tr>
</tbody>
</table>

---

**Port Threads / Inserts –**

- 00 .................................................. No Port Inserts
- 02 .................................................. 3/8" 1/4"
- 03 .................................................. 3/8"
- 04 .................................................. 1/2"
- 06 .................................................. 3/4"
- 08 .................................................. 1"

**Reduced Pressure Range –**

- “B” .................................................. 0-60 PSIG
- “C” .................................................. 0-120 PSIG
- “D” .................................................. 0-250 PSIG

**Temperature Range** ........................................ 40°F to 150°F

**Weight** .......................................................... 2.6 lb

(For total weight add .1 lb for port inserts)

### Materials of Construction

- **Adjusting Knob** ........................................... (R/B 20) Acetal
- **Adjusting Screw (all)** ................................ Steel
- **Body** ......................................................... Zinc
- **Bottom Plug** ............................................. Brass
- **Innervalve** ................................................ Brass
- **Piston** ....................................................... Nylon
- **Seals** ....................................................... Buna-N
- **Spring Cage** ............................................. Zinc
- **Springs** ..................................................... Steel
- **Thread Inserts** .......................................... Zinc

---

Pneumatic Division
Richland, Michigan
www.wattsfluidair.com

B73
L20 QIX Lubricators

Features
- Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
- High Flow Venturi and By-pass Valve to Minimize Pressure Drop and Ensure Consistant Lubrication at All Rated Flows
- Excellent Water Removal Efficiency
- Tamper Resistant Removable Drip Control Knob
- Manual Drain Standard
- High Flow: 250 SCFM for 3/4" & 1" Port Sizes

Options
H Button Head
Fill Fitting

Ordering Information

| Port Size | 00 No Port Insert
| 02 1/4 Inch | 03 3/8 Inch | 04 1/2 Inch | 06 3/4 Inch | 08 1 Inch |

Port Threads
- NPT
G* BSPP
* If ordering BSPP Port Inserts Separately - Order "-00" Unit

Options
H Button Head Fill Fitting

Engineering Change Designator
Will be entered at factory.

L20 Filter Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D*</th>
<th>D**</th>
<th>E</th>
<th>F</th>
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<tr>
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<td>6.82 (173)</td>
<td>2.04 (52)</td>
<td>3.50 (89)</td>
<td>4.50 (114)</td>
<td>8.86 (228)</td>
<td>1.77 (45)</td>
</tr>
</tbody>
</table>

* Inches (mm)
** 1/4 thru 3/4 Inch Port Insert Size
*** 1 Inch Port Insert Size

BOLD ITEMS ARE MOST POPULAR.
## Technical Information

### QIX L20 Kits & Accessories
- **Bowl Kit** .............................................. BKF21WA
- **Bowl Sightgauge Repair Kit** ................... RKB605WB
- **Button Head Fill Fitting** ....................... L606C14 (M14 male thread)
- **Combination Connector** ........................ IK20CC (Connects 2 QIX units together)
- **Drip Control Repair Kit** ......................... RKL100
- **Internal By-pass Repair Kit** ................. RKL20A
- **Mounting Brackets (pair)** ..................... MK20-0100
- **Port Insert Kits (includes o-rings & pins) NPT**
  - 1/4" Port Size ...................................... IK20Y
  - 3/8" Port Size ...................................... IK20X
  - 1/2" Port Size ...................................... IK20A
  - 3/4" Port Size ...................................... IK20B
  - 1" Port Size ........................................ IK20C
- **Shut-off Valve w/lockout (for inlet)** ......... IK20V

### Specifications
- **Bowl Capacity** ..................................... 10 oz.
- **Maximum Pressure** ............................... 250 PSIG

<table>
<thead>
<tr>
<th>Port Threads / Inserts</th>
<th>No Port Inserts</th>
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<th>3/8&quot;</th>
<th>1/2&quot;</th>
<th>3/4&quot;</th>
<th>1&quot;</th>
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<tbody>
<tr>
<td>00</td>
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<td>02</td>
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<td>03</td>
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<tr>
<td>04</td>
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<tr>
<td>06</td>
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<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Materials of Construction
- **Body** ............................................... Zinc
- **Bowl** ............................................... Zinc
- **Drain** ............................................. Brass
- **Drip Control** .................................... Polyurethane
- **Seals** ............................................. Buna-N
- **Sightgauge** ....................................... Nylon
- **Thread Inserts** ................................. Zinc

### Flow Characteristics

![Flow Characteristics Graph]

- **Supply Pressure 100 PSIG**
- **Flow Characteristics L20**
- **Temperature Range** ............................... 40°F to 150°F
- **Weight** ............................................. 3.3 lb
  (For total weight add .1 lb for port inserts)
B20 & B21 QIX Filter / Regulators

Features
• Unique Interchangeable QIX Inserts Allow One Module to Accommodate 5 Port Sizes 1/4", 3/8", 1/2", 3/4", 1"
• Piston Operated Regulator for High Flow Performance
• Excellent Water Removal Efficiency
• Secondary Aspiration Plus Balanced Poppet Provides Quick Response and Accurate Pressure Regulatorion
• Excellent Water Removal Efficiency
• Manual Drain Standard
• Automatic Drain Optional
• Panel Mountable
• High Flow: 250 SCFM for 3/4" & 1" Port Sizes

B20 Features
• Push-to-Lock, Pull-to-Adjust, Remove-for-Tamper Resistant Knob Feature

B21 Features
• Heavy Duty Tee Handle Adjustment

Ordering Information

<table>
<thead>
<tr>
<th>B</th>
<th>20</th>
<th>00</th>
<th>W</th>
<th>J</th>
<th>C</th>
<th>/<em>/</em></th>
</tr>
</thead>
</table>

Adjustment Type
• 20 Knob
• 21 Tee Handle

Port Threads
• NPT
• G* BSPP
* If ordering BSPP Port Inserts Separately - Order "G00" Unit

Port Size
• 00 No Port Inserts
• 02 1/4 Inch
• 03 3/8 Inch
• 04 1/2 Inch
• 06 3/4 Inch
• 08 1 Inch

Elements
• G 5 Micron
• J 40 Micron

Reduced Pressure Range
• B 0-60 PSIG
• C 0-125 PSIG
• D 0-250 PSIG

Drains and Options
• G Gauge
• K Non-Relieving
• P Panel Mount Nut (Plastic)
• R Internal Auto Float Drain
• S Automatic Pulse Drain
• U Semi-Auto Drain

Engineering Change Designator
Will be entered at factory.

BOLD ITEMS ARE MOST POPULAR.
QIX B20 & B21 Kits & Accessories

Drains –
- Automatic Float Drain .......................................................... SA602MD
- Automatic Pulse Drain .......................................................... 4212
- Semi-Automatic “Overnight” Drain ........................................ SA602A7
  (Drains automatically under zero pressure)

Bowl Kit ...................................................................................... BKF21WA
Bowl Sightgauge Repair Kit ..................................................... RKB605WB
Combination Connector ............................................................... IK0CC
  (Connects 2 QIX units together)
Combination Porting Block .......................................................... IK20CP
  (same as IK20CC, except with 1/8” top branch outlet)

Element Kits—
- Particulate (F20) 40 micron ............................................... EKF20A
- Particulate (F20) ................................................................. 5 micron EKF20VA

Mounting Brackets (pair) ............................................................ MK20-0100

Panel Mount Nut –
- Plastic .................................................................................. R10X51-P
- Aluminum ............................................................................. R10X51-A

Port Insert Kits (includes o-rings & pins) NPT –
- 1/4” Port Size ................................................................. IK20Y
- 3/8” Port Size ................................................................. IK20X
- 1/2” Port Size ...................................................................... IK20A
- 3/4” Port Size ...................................................................... IK20B
- 1” Port Size .......................................................................... IK20C

Repair kit - internal parts (piston, innervalve, seals) –
- Relieving ............................................................................... RKR20A
- Non-Relieving (K) .............................................................. RKR20KA

Spring Cage Kit –
- R20 .................................................................................. CKR20A
- R21 .................................................................................. CKR21Y

Wall Mounting Bracket ............................................................... SAR 20A57
  (uses panel mount threads - includes plastic panel mount nut)

Specifications

- Bowl Capacity ........................................................................ 10 oz.

Filter Element Rating –
- “J” (particulate) ............................................................... 5 Micron
- “G” (particulate) ............................................................... 40 micron

- Gauge Ports (2) ........................................................................ 1/4”
- Maximum Pressure .......................................................... 250 PSIG
  With Auto Drain ............................................................... 175 PSIG
- Port Threads / Inserts –
  00 ........................................................................... No Port Inserts
  02 ........................................................................... 1/4”
  03 ........................................................................... 3/8”
  04 ........................................................................... 1/2”
  06 ........................................................................... 3/4”
  08 ........................................................................... 1”
- Reduced Pressure Range –
  “B” .............................................................................. 0-60 PSIG
  “C” .............................................................................. 0-120 PSIG
  “D” .............................................................................. 0-250 PSIG
- Temperature Range .......................................................... 40°F to 150°F (4.4°C to 65.6°C)
  With Auto Drain .............................................................. 40°F to 125°F (4.4°C to 52°C)
- Weight .................
  (For total weight add .1 lb for port inserts) ........................................ 4.5 lb

Materials of Construction

- Adjusting Knob (R/B 20) ...................................................... Acetal
- Adjusting Screw (all) ............................................................ Steel
- Body ...................................................................................... Zinc
- Bottom Plug ........................................................................ Brass
- Bowl ...................................................................................... Zinc
- Drain ..................................................................................... Brass
- Filter Element (particulate) .................................................. Polypropylene
- Innervalve ............................................................................. Brass
- Piston ...................................................................................... Nylon
- Seals ....................................................................................... Buna-N
- Sightgauge ............................................................................. Nylon
- Spring Cage .......................................................................... Zinc
- Springs .................................................................................... Steel
- Thread Inserts ......................................................................... Zinc

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.
### QIX Combinations – C20 / C21 Series

- See individual component pages for details.
- Gauges included on combinations.

#### Three-Unit Combo

- **C20-FRL**
- **C20-BL**

#### Ordering Information

<table>
<thead>
<tr>
<th>C20-BL</th>
<th>C20-FRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment Type</td>
<td></td>
</tr>
<tr>
<td>20 Knob</td>
<td></td>
</tr>
<tr>
<td>21 Tee Handle</td>
<td></td>
</tr>
</tbody>
</table>

- **Port Threads**
  - NPT
  - G* BSPP
  * If ordering BSPP, Port Inserts Separately - Order “G00” Unit

- **Port Size**
  - 02 1/4 Inch
  - 03 3/8 Inch
  - 04 1/2 Inch
  - 06 3/4 Inch
  - 08 1 Inch

- **Combination**
  - BL 2-Unit
  - FRL 3-Unit

- **Regulator Reduced Pressure Range**
  - B 0-60 PSIG
  - C 0-125 PSIG
  - D 0-250 PSIG

- **Elements**
  - G 5 Micron
  - J 40 Micron

- **Drains and Options**
  - K Non-Relieving
  - R Internal Auto Float Drain
  - S Automatic Pulse Drain

- **Engineering Change Designator**
  Will be entered at factory.

**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.

BOLD ITEMS ARE MOST POPULAR.
### QIX Port Insert Kits & Accessories

Port Insert Kits (includes o-rings & pins) NPT BSPP

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>IK0Y</td>
<td>IK0YG</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>IK0X</td>
<td>IK0XG</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>IK0A</td>
<td>IK0AG</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>IK0B</td>
<td>IK0BG</td>
</tr>
<tr>
<td>1&quot;</td>
<td>IK0C</td>
<td>IK0CG</td>
</tr>
</tbody>
</table>

**Combination Connector** (connects 2 QIX units together)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IK0CC</td>
<td>IK0CC</td>
</tr>
</tbody>
</table>

**Combination Porting Block** (same as IK0CC, except with 1/4" top branch outlet)

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IK0CP</td>
<td>IK0GCP</td>
</tr>
</tbody>
</table>

**IK20CP Porting Block and 1908 Pressure Switch**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>NPT</th>
<th>BSPP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PST20</td>
<td></td>
</tr>
</tbody>
</table>

### QIX MK20 Mounting Brackets

Part Number: MK20-0100

Kit contains 2 brackets and 4 screws

### QIX IK20V Shut-Off Valve

This modular, 3-way ball valve attaches between the port insert and the inlet side of any QIX component. This valve shuts off the air pressure and vents the downstream pressure through a 1/8" NPTF port in the bottom of the valve.

**Features**

- Inline Mounting
- 5 amp Rated Snap Action Micro Switch
- Brass Body
- Compact Size
- Flying Leads Electrical Connection
- IP65 Rated
- Field Adjustable 25-100 PSIG
- +/- 2% Repeatability
- Single Pole / Double Throw Switch

**Specifications**

- **Electrical**........................................5 AMP, 12/24VDC, 125/250VAC
- **Maximum Inlet Pressure**..........................300 PSIG (20 bar)
- **Mechanical Life**..................................2x10^6 at 75 PSIG (5 bar)
- **Electrical Connection**..........................18" Flying Leads
- **Electrical Protection**..........................IP65
- **Pressure Differential “Dead Band”** ..........15 to 20 PSIG (1.03 to 1.39 bar)
- **Repeatability**....................................±2% at 70°F (20°C) Ambient
- **Temperature Range**............................-40°F to 180°F (-40°C to 80°C)
- **Weight**...........................................0.23 lb. (0.11 Kg)
- **Diaphragm**.......................................Nitrile
- **Housing**.........................................Brass

**Pressure Switch – P01908**

- Green (Normally Closed)
- Red (Normally Open)
- Black (Common)
In-Line Bronze Filters

Features
- All Bronze Unit
- Designed for Applications where Fine Straining of Air is Required
- Porous Bronze Element Strains Out Particles Larger than 90 Microns (.0035 Inch)

![Inline Bronze Filters](image)

### Replacement Elements
- 5 Micron ........................................ 137AY77-5
- 20 Micron ...................................... 137AY77-20
- 90 Micron ..................................... RK137Y

### Specifications
- **Maximum Pressure**: 300 PSIG
- **Performance** – Pressure Drop (PSIG) at Various Conditions
  - **Flow**
    - Supply Pressure 100 PSIG
      - 5: .05
      - 10: .15
      - 15: .06
      - 20: 1.20
      - 25: 1.70
    - Supply Pressure 150 PSIG
      - 5: .02
      - 10: .10
      - 15: .30
      - 20: .70
      - 25: 1.00
- **Weight** – 
  - 1/4" & 3/8": 9 lb. (0.41 kg) / Unit
  - 1/2": 1.1 lb. (0.49 kg) / Unit

### Materials of Construction
- **Body**: Bronze
- **Element** –
  - Standard: 90 Micron Porous Bronze
  - Optional: 5 Micron Porous Bronze
- **Seals**: Buna N

### In-Line Bronze Filters

<table>
<thead>
<tr>
<th>Port Size</th>
<th>90 Micron Element*</th>
<th>No Drain</th>
<th>With Manual Petcock Drain</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>137-02</td>
<td></td>
<td>137-02A</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
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<td></td>
<td>137-03A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>137-04</td>
<td></td>
<td>137-04A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Add "V" Suffix for 5 Micron Element.

### With No Drain

<table>
<thead>
<tr>
<th>Port Size</th>
<th>90 Micron Element*</th>
<th>No Drain</th>
<th>With Manual Petcock Drain</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>137-02</td>
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<td>137-02A</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>137-03</td>
<td></td>
<td>137-03A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>137-04</td>
<td></td>
<td>137-04A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### With Manual Twist Drain

<table>
<thead>
<tr>
<th>Port Size</th>
<th>90 Micron Element*</th>
<th>No Drain</th>
<th>With Manual Petcock Drain</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>137-02</td>
<td></td>
<td>137-02A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>137-03</td>
<td></td>
<td>137-03A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>137-04</td>
<td></td>
<td>137-04A</td>
<td></td>
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</tr>
</tbody>
</table>

* Add "V" Suffix for 5 Micron Element.
D11-04 Tank Drain

**Features**
- Metal Bowl without Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 175 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Zinc
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 4 oz.
- Weight per Unit – 1 lb.
- Master Pack Quantity – 24
- Master Pack Weight – 25 lbs.

D11-04W Tank Drain

**Features**
- Metal Bowl with Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 175 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Zinc
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 4 oz.
- Weight per Unit – 1 lb.
- Master Pack Quantity – 24
- Master Pack Weight – 25 lbs.

608-04D Tank Drain

**Features**
- Polycarbonate Bowl with Polyethylene Bowl Guard
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 150 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Aluminum
- Bowl – Polycarbonate
- Seals – Buna-N
- Bowl Capacity – 8 oz.
- Weight per Unit – 2 lb.
- Master Pack Quantity – 8
- Master Pack Weight – 17 lbs.

608-04DW Tank Drain

**Features**
- Metal Bowl with Sight Glass
- Port Size – 1/2 Inch NPTF
- Minimum Supply Pressure – 30 PSIG
- Maximum Supply Pressure – 255 PSIG
- Max. Operating Temperature – 125° F (52° C)
- Body – Aluminum
- Bowl – Zinc
- Seals – Buna-N
- Bowl Capacity – 8 oz.
- Weight per Unit – 2 lb.
- Master Pack Quantity – 8
- Master Pack Weight – 17 lbs.
WMPS32 Digital Pressure Gauge / Sensor

Features

- **Pressure Ranges:**
  - Positive Pressure 0 to 145 PSI
- **Sensor Output:**
  - 2 NPN or PNP Open Collector
  - Transistor Output, 30VDC, 125mA
  - Optional Analog Output, 4 to 20mA
  - Optional Analog Output, 1 to 5VDC
- **Switch Point and Window Comparator Mode**
- **4 Selectable Units of Measure**
  - (mmHg, -bar, -kPa, inHg)
  - (kgf/cm², PSI, bar, kPa)
- **Output Response Time Less Than 2.0 Milliseconds**
- **RoHS**
- **Air and Non-Corrosive Gases**
- **Error Message**

Cautions

The MPS-32 Pressure Sensor is designed to monitor pressure and is not a safety measure to prevent accidents. The compatibility of the sensor is the responsibility of the designer of the system and specifications.

Operating Environment

- Parker Sensors have not been investigated for explosion-proof construction in hazardous environments.
- Do not use with flammable gases, liquids, or in hazardous environments.
- Avoid installing the sensor in locations where excessive voltage surges could damage or affect the performance of the sensor.

Operations

- Dedicate a power supply of 10.8 to 26.4VDC to the sensor and set the ripple to Vp-p10% or less. Avoid excessive voltage. Avoid voltage surges.
- A small amount of internal voltage drop is possible. Ensure the power supply minus any internal voltage drop exceeds the operating load.
- Verify the operating media is compatible with the specified sensor. Check the chemical make-up, operating temperatures, and maximum pressure ranges of the system before installing.

Installation

- Installation of air dryer system is recommended to remove moisture.

- Never insert an object into the pressure port other than an appropriate fluid connector.
- Avoid short-circuiting the sensor. Connect the brown lead to V+ and blue lead to 0V.
- Do not connect the output lead wires (black / white) to the power supply.
- Outputs not being used should be trimmed and insulated.
- Install as shown using the metal mounting bracket.

Error Messages

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Err</td>
<td>Zero Reset Error</td>
<td>Reset Zero Below 3% of F.S.</td>
</tr>
<tr>
<td>Er1</td>
<td>System Error (Internal)</td>
<td>Contact Factory</td>
</tr>
<tr>
<td>CE1</td>
<td>Over current of Output 1</td>
<td>Load current exceeds maximum 125mA.</td>
</tr>
<tr>
<td>FFF</td>
<td>Applied pressure exceeds pressure range</td>
<td>Apply pressures within the rating of the sensor</td>
</tr>
</tbody>
</table>
MPS-32 Ordering Numbers

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Port Size</th>
<th>Output Circuit</th>
<th>Electrical Connector</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 145 PSI</td>
<td>1/8 NPSF*</td>
<td>PNP Sourcing</td>
<td>4 Pin, M8</td>
<td>MPS-P32N-PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NPN Sinking</td>
<td>4 Pin, M8</td>
<td>MPS-P32N-NC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PNP Sourcing with 4-20mA</td>
<td>4 Pin, M8</td>
<td>MPS-P32N-PCI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PNP Sourcing with 1-5VDC</td>
<td>4 Pin, M8</td>
<td>MPS-P32N-PCA</td>
</tr>
</tbody>
</table>

* Mounting Bracket Included

Internal Circuit for Open Collector and Analog Output Wiring

Specifications

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Positive (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of Measure</td>
<td>bar: 0.01</td>
</tr>
<tr>
<td>Media (with unit-switching function)</td>
<td>MPA: 0.001</td>
</tr>
<tr>
<td>Proof Pressure</td>
<td>kgf/cm²: 0.01</td>
</tr>
<tr>
<td>Media</td>
<td>PSI: 1</td>
</tr>
<tr>
<td>Media</td>
<td>Air &amp; Non-Corrosive Gases</td>
</tr>
<tr>
<td>N</td>
<td>0 to 1 MPa</td>
</tr>
<tr>
<td>Materials</td>
<td>N</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Operating Temperature: 32 to 122°F (0 to 50°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Storage Temperature: 14 to 140°F (-10 to 60°C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>Humidity: 35 to 85% RH</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>Electrical Connection: 4-Pin, M8 Connector, (G) Grommet Open Lead</td>
</tr>
<tr>
<td>Power Supply</td>
<td>Power Supply: 12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less</td>
</tr>
<tr>
<td>Display</td>
<td>Display: 3 + 1/2 Digit, 2 Color, 7-Segment LED</td>
</tr>
<tr>
<td>Display Refresh</td>
<td>Display Refresh: .1 to 3.0 Seconds, Variable (Factory set at 0.1)</td>
</tr>
<tr>
<td>Control Output</td>
<td>Control Output: NPN (Sinking), PNP (Sourcing), Open Collector, max 125mA, 2 Output</td>
</tr>
<tr>
<td>Switch Output</td>
<td>Switch Output: Output Signal, NPN or PNP, Normally Open or Closed, LED Indicator</td>
</tr>
<tr>
<td>Output Modes</td>
<td>Output Modes: Hysteresis or Window Comparator</td>
</tr>
<tr>
<td>Response Time</td>
<td>Response Time: 2ms or less, (Variable 32, 128, 1024ms)</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Repeatability: ± 0.3% of F.S. ± 1 digit or less</td>
</tr>
<tr>
<td>Analog Output</td>
<td>Analog Output: 1 to 5VDC (1 ± 0.04V, 5 ± 0.04V); Output Impedance 1kΩ; Linearity 0.5% of F.S.; Response Time 2ms or less</td>
</tr>
<tr>
<td>Current Output</td>
<td>Current Output: 4 to 20mA; Linearity ±0.5% of F.S. or less; Maximum Load Impedance 300Ω with Power Supply Voltage of 12V; 600Ω with Power Supply Voltage of 12V; Minimum Load Impedance 50Ω</td>
</tr>
<tr>
<td>Thermal Error</td>
<td>Thermal Error: 32 to 122°F (0 to 50°C) 25°C (77°C) ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)</td>
</tr>
<tr>
<td>General Protection</td>
<td>General Protection: IP50, CE Marked, EMC-EN61000-6-2: 2001</td>
</tr>
<tr>
<td>Current Consumption</td>
<td>Current Consumption: &lt;80mA</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>Vibration Resistance: 10 to 150Hz, Double Amplitude 1.5mm, XYZ, 2 hrs.</td>
</tr>
<tr>
<td>Shock Resistance</td>
<td>Shock Resistance: 10G, XYZ</td>
</tr>
<tr>
<td>Material</td>
<td>Material: Housing: ABS (gray), Pressure Port: Zinc Die-cast, Diaphragm: Silicone</td>
</tr>
<tr>
<td>Mass</td>
<td>Mass: 1.7 oz. (45g) (Not including cable)</td>
</tr>
</tbody>
</table>
WMPS32 Programming

1. Hold and press 1x to output set open or closed selecting units of measure.
   Easy Mode Activation

2. Press 2x to output mode 1 hysteresis or window comparator.

3. Press 4x to output mode 2 hysteresis or window comparator.

4. Press 1x to output 1 switch point setting hysteresis mode.

5. Press 3x to output 2 switch point setting hysteresis mode.
   Window Comparator Mode
   Low
   High

6. Press 5x to automatic teach mode & auto surveillance.
   Note: When auto surveillance is turned on P1 is added to output 1 setting. Output 2 is turned off and P-1 becomes output 2.

7. Press 6x to display refresh settings / output response time interval.

8. Press 7x to display peak value, bottom value or their difference.

9. Press 8x to special display features.
   Wait 3 seconds

10. Press 9x to display color choices red and/or green, energy save.
    Or press 1x to return.

11. Hold and press 1x to lock.

12. Press 1x to peak value.

13. Press 1x to bottom value.

14. Press for 3 seconds to zero reset.
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 Watts valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Watts 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 Watts 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 Watts technical service department if you have any questions or require any additional information. See the Watts publication for the product being considered or used, or call 269-629-5000, or go to www.wattsfluidair.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.
4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

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

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: Watts published Installation Instructions must be followed for installation of Watts valves, FRLs and vacuum components. These instructions are provided with each Watts valve or FRL sold, or by calling 269-629-5000, or at www.wattsfluidair.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 Watts valve and FRL sold, or are available by calling 269-629-5000, or by accessing the Watts web site at www.wattsfluidair.com.


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.
The items described in this document and other documents or descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors, are hereby offered for sale at prices to be established by Parker Hannifin Corporation, its subsidiaries and its authorized distributors. The terms and conditions herein contained in Buyer’s offer. Acceptance of Seller’s products shall in all events constitute such assent.

1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller’s products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer’s acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller’s acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer’s assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer’s offer. Acceptance of Seller’s products shall in all events constitute such assent.

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

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

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

5. Limitation of Remedy: SELLER’S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS AGREEMENT OR ITEMS SOLD HEREUNDER SHALL BE LIMITED EXCLUSIVELY TO REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER’S SOLE OPTION.

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

7. Special Tooling: A tooling charge may be imposed for any special tooling, without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller’s property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items, so manufactured, even if such apparatus has been specially converted or adapted for purchase by Buyer is expressly conditioned upon Buyer’s and/or Seller’s sole discretion.

8. Buyer’s Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer’s property, may be considered obsolete and may be destroyed by Seller or Seller’s successors or assignees who have acquired Buyer’s property without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller’s possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are not so taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter “Intellectual Property Rights”). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller’s obligation to defend and indemnify Buyer is conditioned on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on designs or specifications furnished by Buyer or on items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.

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

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

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