28000 Series Varipak®
Control Valves

Precise Microflow Valves with Compact Design and Flexible Capabilities
Dresser Masoneilan
28000 Series Varipak®
Control Valves

Precise Microflow Valves
with Compact Design
and Flexible Capabilities
Features

Designed specifically for low flow applications, the Masoneilan 28000 Series Varipak provides excellent throttling control performance with a wide range of options and capabilities. Design optimization has also resulted in an extremely integrated and compact assembly. Key design features include:

Heavy Top-Guiding

Rugged valve plug support is provided along the entire stroke length using an integrated plug guide and seat ring. This ensures excellent plug stability and control even under high pressure drop conditions. Heavy guiding is critical for controlling vibration damage, providing dependable control and seating performance, and minimizing trim mechanical wear.

Application Flexibility

Ten standard contoured trim designs are available providing flexible application using the same body platform. This helps to eliminate the effects of valve oversizing and improves control loop performance resulting in higher process efficiency.

Adjustable $C_v$

In addition to multiple standard trim sets, the Varipak is also available with an adjustable $C_v$ option. This feature allows users to easily increase or decrease the $C_v$ setting in order to accommodate changing operating conditions. Adjustment is achieved by simply setting a knob within the actuator assembly (see page 5 for details).

Compact Assembly

Maximum space savings is provided by the Varipak assembly through modular design and force amplification actuator technology. The actuator also includes a low profile top-mounted handwheel option.

Anti-Cavitation Trim

Varipak is also available with an effective high pressure liquid letdown anti-cavitation trim solution – the Varilog® trim. This unique design includes a multi-stage axial flow plug and liner, which provides dirt tolerant operation and high wear resistance.

Design Flexibility

Other standard configurations include a High Pressure ASME Class 2500 design, a zero emissions Bellows Seal design, and a design for cryogenic applications. The Varipak is also available with an angle body design to accommodate existing piping configurations.

Ease of Maintenance

Varipak’s simple top-entry body construction includes an integrated body and bonnet design, which allows for easy access and removal of the quick change trim. The integral liner and seat ring also reduces components and simplifies assembly and disassembly. Modularity of the actuator design further enhances maintainability of this unique valve assembly.

Figure 1: Varipak Family
## Numbering System

### Actuator Type
- 27: Air-to-Close
- 28: Air-to-Open

### Body Series
- 28

### Actuator Mounting Position
- 0: Undefined
- 1: (*) (**)
- 2: (**)
- 3
- 4
- * Standard actuator mounting arrangement
- ** Flanged valve mounting position
- Face-to-face = 102 mm (4.02")

<table>
<thead>
<tr>
<th>Trim N°</th>
<th>Max. $C_v$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3.8</td>
</tr>
<tr>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5</td>
<td>0.10</td>
</tr>
<tr>
<td>6</td>
<td>0.050</td>
</tr>
<tr>
<td>7</td>
<td>0.025</td>
</tr>
<tr>
<td>8</td>
<td>0.010</td>
</tr>
<tr>
<td>9</td>
<td>0.004</td>
</tr>
</tbody>
</table>

### Adjustable $C_v$
- 0: Undefined
- 1: Without
- 2: With

### Construction Option
- Standard
- A: Angle
- BS: Bellows seal
- EB: Cryogenic
- HP: High pressure
- MS: Anti-cavitation
- SP: Special

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Optimized $C_v$ Characteristics

VariPak is far superior to conventional microflow valves in that it provides the user with a very wide range of nominal $C_v$ ranges from 0.0016 to 3.8, using only eight plugs and five seats.

### Precise $C_v$ Calibration and Selection - $C_v$ and $F_L$

<table>
<thead>
<tr>
<th>Valve Sizes</th>
<th>Trim No.</th>
<th>Min.</th>
<th>Risk-Free&lt;sup&gt;(3)&lt;/sup&gt;</th>
<th>Max.</th>
<th>Without Adjustable $C_v$ Function</th>
<th>Critical Flow Factor $F_L$</th>
</tr>
</thead>
<tbody>
<tr>
<td>.5&quot; (15mm)</td>
<td>9</td>
<td>0.0016</td>
<td>0.0020</td>
<td>0.0024</td>
<td>0.0028</td>
<td>0.0032</td>
</tr>
<tr>
<td>.75&quot; (20mm)</td>
<td>8</td>
<td>0.004</td>
<td>0.005</td>
<td>0.006</td>
<td>0.007</td>
<td>0.008</td>
</tr>
<tr>
<td>1&quot; (25mm)</td>
<td>7</td>
<td>0.010</td>
<td>0.013</td>
<td>0.016</td>
<td>0.019</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>0.020</td>
<td>0.025</td>
<td>0.030</td>
<td>0.035</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0.04</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.10</td>
<td>0.13</td>
<td>0.16</td>
<td>0.19</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.25</td>
<td>0.30</td>
<td>0.35</td>
<td>0.40</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1.9</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1.5</td>
<td>1.9</td>
<td>2.3</td>
<td>2.6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

(1) Flangeless, flanged or threaded connections.
(2) Flangeless connections.
(3) The “Risk-free” setting allows for easy valve capacity adjustments in the field to meet changing service conditions.

Figure 3: Flow Coefficient Adjustment
General Data

■ Body
  Type: globe style
  angle style optional
  Sizes:
  1" (DN 25) standard
  1/2" (DN 15) and 3/4" (DN 20) optional
  Materials:
  Standard: type 316L St. St.
  Optional: Monel®, Hastelloy® C, Alloy 20, others
  Options:
  Flanged valve
  Anti-cavitation Varilog®
  High pressure
  Bellows seal
  Cryogenic
  Angle valve
  NACE version

■ Trim
  Plug type: contoured, heavy top guided
  Seat type: multi-staged anti-cavitation (Varilog) optional
  Cv ratio: 500/1 at max. Cv
            200/1 at min. Cv
  Flow characteristics: linear (trim No. 0 to 5)
                       modified linear (trim No. 6 to 9)
  Flow Direction: flow-to-open
                  flow-to-close optional

■ Actuator
  Type: spring-opposed rolling diaphragm
  Action: direct or reverse, easily performed without additional parts
  Cv adjustment: optional adjustable knob/lever
  Handwheel: optional top mounted
  Air connection: 1/8” NPT

Temperature Range/Seat Leakage

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Temperature Range(1)</th>
<th>Seat Class(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard and High Pressure Valves</td>
<td>-320°F to +650°F (-192°C to +343°C)</td>
<td>IV</td>
</tr>
<tr>
<td>Cryogenic Valves</td>
<td>-455°F to +300°F (-270°C to +150°C)</td>
<td>V</td>
</tr>
<tr>
<td>Varilog Anti-Cavitation Valves</td>
<td>-20°F to +650°F (-29°C to +343°C)</td>
<td></td>
</tr>
</tbody>
</table>

(1) Please consult Masonelann for applications outside the temperature ranges noted.
(2) Class IV seat leakage is standard and Class V is optional. Seat leakage class ratings per IEC 534-4 and ANSI/FCI 70-2.

Rating/End Connections**

<table>
<thead>
<tr>
<th>Valve Sizes</th>
<th>Maximum Cv</th>
<th>ASME Class 150-1500 ISO PN 20-250</th>
<th>ASME Class 150-600 ISO PN 20-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches/mm</td>
<td></td>
<td>Flangeless Threaded SW BW</td>
<td>Flanged Face-to-Face: 6.3” (160mm)</td>
</tr>
<tr>
<td>.5 15</td>
<td>2.3</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>.75 20</td>
<td>2.3</td>
<td>• (1)</td>
<td>•</td>
</tr>
<tr>
<td>1 25</td>
<td>3.8</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

* Available with maximum rating of ASME Class 600/ISO PN 100.
** Please consult Masonelann for applications requiring ASME Class 2500/ISO PN 420 rating.
Materials of Construction

Figure 4: Sectional View
# Materials of Construction

## Materials* (Standard and NACE Construction) (1)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Temperature Range</th>
<th>Description</th>
<th>Standard Materials (Optional Materials)</th>
<th>NACE Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-320°F -196°C</td>
<td>Body</td>
<td>316L St. St. ASTM A182 Gr. F 316L (forging)</td>
<td>22 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>316L St. St. ASTM A351 Gr. CF3M (casting)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Optional: Monel®, Hastelloy® C, Alloy 20</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-20°F +232°C</td>
<td>Seat</td>
<td>17-4 PH St. St. ASTM A664 Gr. 630 Condition H900 (Max CV ≥ 0.10, trims No. 0 to 5)</td>
<td>MONEL K 500 35 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solid Stellite® No. 6 (Max C}_{v} ≤ 0.05, trims No. 6 to 9)</td>
<td>35 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Optional: 440C St. St. Monel®, Hastelloy® C, Alloy 20</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-320°F -196°C</td>
<td>Plug and Stem S/A</td>
<td>Plug Solid Stellite® No. 6 (Max C}_{v} ≥ 0.10, trims No. 0 to 5)</td>
<td>22 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stem 316 St. St. (Max C}_{v} ≥ 0.10, trims No. 0 to 5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>One Piece Solid Stellite® No. 12 (Max C}_{v} ≥ 0.05, trims No. 6 to 9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Optional: 440C St. St. Monel®, Hastelloy® C, Alloy 20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-20°F +232°C</td>
<td>Seat Ring Gasket</td>
<td>Grafoil® with 316 St. St. inserts</td>
<td>PTFE Fiberglass Reinforced</td>
</tr>
<tr>
<td>5</td>
<td>-20°F +232°C</td>
<td>Seat Ring Retainer</td>
<td>17-4 PH St. St. ASTM A664 Gr. 630 Condition H1075</td>
<td>MONEL K 500 35 HRC Max.</td>
</tr>
<tr>
<td>6</td>
<td>-320°F -196°C</td>
<td>Packing</td>
<td>PTFE (standard up to ASME Class 1500)</td>
<td>PTFE (standard up to ASME Class 1500)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lattylong® (with optional Viton® O-rings)</td>
<td>Lattylong® (with optional Viton® O-rings)</td>
</tr>
<tr>
<td>7</td>
<td>-20°F +232°C</td>
<td>Packing Follower</td>
<td>303 St. St. ASTM A582 TY 303</td>
<td>ASTM A479 TY 304 22 HRC Max.</td>
</tr>
<tr>
<td>8</td>
<td>-20°F +232°C</td>
<td>Packing Spacer</td>
<td>316 St. St. ASTM A479 TY 316</td>
<td>22 HRC Max.</td>
</tr>
<tr>
<td>9</td>
<td>-20°F +232°C</td>
<td>Packing Flange</td>
<td>304 St. St. AISI 304</td>
<td>ASTM A743 Gr. CF8 22 HRC Max.</td>
</tr>
<tr>
<td>10</td>
<td>-20°F +232°C</td>
<td>Packing Flange Studs</td>
<td>304 St. St. ASTM A193 Gr. B8 (Class III)</td>
<td>304 St. St. ASTM A193 Gr. B8 (Class I or II) 22 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>304 St. St. ASTM A193 Gr. B8 (Class I or II) 22 HRC Max.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>-20°F +232°C</td>
<td>Packing Flange Nuts</td>
<td>304 St. St. ASTM A194 Gr. 8 (Class III)</td>
<td>304 St. St. ASTM A194 Gr. 8 (Class I or II) 22 HRC Max.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>304 St. St. ASTM A194 Gr. 8A (Class III)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-20°F +232°C</td>
<td>Safety Pin</td>
<td>316 St. St. ASTM A479 TY 316</td>
<td>22 HRC Max.</td>
</tr>
<tr>
<td>13</td>
<td>-20°F +232°C</td>
<td>C_{v} Adjustment Knob</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>14</td>
<td>-20°F +232°C</td>
<td>Actuator Cover</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Optional: Stainless Steel</td>
<td>Optional: Stainless Steel</td>
</tr>
<tr>
<td>15</td>
<td>-20°F +232°C</td>
<td>Handwheel (optional)</td>
<td>Lexan® + Austenitic St. St.</td>
<td>Lexan® + Austenitic St. St.</td>
</tr>
</tbody>
</table>

(1) Materials and processes in accordance with the requirements of NACE specification MR0103.

Applications requiring compliance to MR0175, 2003 Rev. or ISO 15156 would require engineering review.

(2) Materials designated for these parts conform to NACE Class III bolting requirements.

(3) Materials designated for these parts conform to NACE Class I or Class II bolting requirements.

(4) Consult Masoneilan for NACE Applications above ASME Class 600 rating.

* Materials noted throughout text are for reference only. Masoneilan reserves the right to supply trade name material or equivalent.
Standard Flangeless Varipak

28000 Series

The standard flangeless Varipak valve is widely used in all industries. This can be attributed to the overall compactness and simplicity of the flangeless construction, and the wide application range of the stainless steel body design.

- Numbering system: see page 4.
- General data: see page 6.
- Materials: standard construction, see page 8.
- Accessories and options: see page 15.

![Figure 5: Standard Flangeless Varipak](image)

Rated \( C_v \) Range/Weight

<table>
<thead>
<tr>
<th>Body/Actuator Assembly Weight</th>
<th>Rated ( C_v ) Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.4 lbs (7 kg)</td>
<td>3.8 to 0.0040 (trim No. 0 to 9)</td>
</tr>
</tbody>
</table>

Dimensions – inches (mm)

<table>
<thead>
<tr>
<th>Standard Varipak (Stainless Steel)</th>
<th>Bar Stock Body (For Non-Castable Material)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a removal clearance of 5.5 inches (140 mm)</td>
<td>2 holes tapped 5/16” – 18 UNC depth 11 (7/16”)</td>
</tr>
</tbody>
</table>
Standard Flanged Varipak

28000 Series

The Varipak is also available in flanged configurations with connections and ratings as indicated in the table below.

- Numbering system: see page 4.
- General data: see page 6.
- Materials: standard construction, see page 8.
- Accessories and options: see page 15.

<table>
<thead>
<tr>
<th>Face-to-Face Dimensions</th>
<th>Flange Ratings</th>
<th>Body/Actuator S/A Weight*</th>
<th>Rated Cᵥ Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; (102mm)</td>
<td>ASME Class 150-600 ISO PN 20-100 (raised face only)</td>
<td>8 to 10 kg (17.4 to 22 lbs)</td>
<td>3.8 to 0.0040 (trim No. 0 to 9)</td>
</tr>
<tr>
<td>6.3&quot; (160mm)</td>
<td>ASME Class 150-1500 ISO PN 20-250 DIN PN 10-250 (RF, FF, RTS, etc...)</td>
<td>10 to 12 kg (22 to 26.5 lbs)</td>
<td></td>
</tr>
</tbody>
</table>

* depending on rating.

Dimensions – inches (mm)

Provide a removal clearance of 5.5 inches (140 mm)
Varilog® Anti-Cavitation Varipak

28000 MS Series

The Varilog multi-stage trim design provides unmatched anticavitation performance in low flow applications.

It minimizes erosion and vibrations, which typically leads to failure in conventional single-seated valves. The Varilog trim is available with the standard Varipak body designs in either the flanged or flangeless configurations.

- Numbering system: see page 4.
- Accessories and options: see page 15.
- General data: see page 6.
- Materials: see chart below.

Figure 7: Varilog Trim Subassembly

Specific Characteristics

<table>
<thead>
<tr>
<th>Rated Cᵥ Range</th>
<th>Critical Flow Factor Fₖ</th>
<th>Temperature Range</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 to 0.050 (trim No. 3 to 6)</td>
<td>0.98</td>
<td>-20°F to +660°F (-29°C to +350°C)</td>
<td>Seat: ASTM A 564 Gr. 630 Condition H900 Type 17-4 PH St. St.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Plug: One part from solid Stellite No. 12 or ASTM A 276 type 440 C St. St.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Parts: Standard Construction: see page 8</td>
</tr>
</tbody>
</table>

Dimensions – inches (mm)

Standard Varipak (Stainless Steel)

Bar Stock Body
(For Non-Castable Material)

Provide a removal clearance of 5.5 inches (140 mm)
High Pressure Varipak

28000 HP Series

Where very high upstream pressure occurs or where the pressure drop exceeds the pressure rating of the standard body (see page 9), a high pressure Varipak is the recommended choice.

- Numbering system: see page 4.
- General data: see page 6.
- Accessories and options: see page 15.
- Materials: see chart below.

Specific Characteristics

<table>
<thead>
<tr>
<th>Rated $C_v$ Range</th>
<th>Body Rating</th>
<th>Seat Leakage</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 to 0.0040 (trim No. 3 to 9)</td>
<td>ASME Class 2500 ISO PN 420</td>
<td>Class IV</td>
<td>Body: ASME A 182 Gr. F 316L; Optional: ASTM A182 Gr. F 316</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Parts: Standard Construction: see page 8</td>
</tr>
</tbody>
</table>

Dimensions – inches (mm)

Provide a removal clearance of 5.5 inches (140 mm)
Bellows Seal Varipak

28000 BS Series

A version of the Varipak with bellows seal is available for applications requiring zero leakage at the packing box. This type of valve is often needed for applications involving the handling of flammable, toxic or explosive fluids.

- Numbering system: see page 4.
- General data: see page 6.
- Accessories and options: see page 15.
- Materials: see chart below.

Specific Characteristics

<table>
<thead>
<tr>
<th>Rated Cv Range</th>
<th>Body Rating</th>
<th>Seat Leakage</th>
<th>Operating Pressures</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3 to 0.0040</td>
<td>ASME Class 150-600 ISO PN 10-100</td>
<td>Class IV</td>
<td>Body: ASTM A 182 Gr. F 316L Optional: A182 Gr. F 316</td>
<td></td>
</tr>
<tr>
<td>(trim No. 1 to 9)</td>
<td></td>
<td></td>
<td>Plug/Bellows Subassembly: Plug and Seat: Standard Materials Bellows Assembly: 316L St. St. Viton® O-rings</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions – inches (mm)

Provide a removal clearance of 5.6 inches (140 mm)
Cryogenic Varipak

28000 EB Series

Simplified maintenance
The cryogenic Varipak meets the requirements of cryogenic processes requiring thermal insulation. An ‘insulating interface’ sets up between the valve body (‘cold zone’) and the body extension located in the higher temperature area (‘warm zone’). The valve body assembly and its thermal extension are positioned inside the ‘cold box’. The plug can be easily removed and inspected without disturbing the valve body. This precludes any preliminary, complicated dismounting, and more importantly, prevents interfering in any way with the ‘cold box’.

Body
The valve body, manufactured from a material suitable for low temperatures, maintains ductility in service. It can be conveniently mounted to suit any specific piping needs. However, arrangements must be made so that the angle between the valve axis and vertical does not exceed 60°.

Body extension
The body extension and coupling sleeve are thin-walled metal tubes so as to minimize the inflow of heat by conduction. The annular space is reduced in order to exclude any convection currents.

Plug
The design of the plug allows the working parts to be perfectly centered in relation to the seat and provides a uniform temperature zone for the guiding.

Specific Characteristics

<table>
<thead>
<tr>
<th>Rated Cv Range</th>
<th>Temperature Range</th>
<th>Body Rating</th>
<th>Seat Leakage</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.8 to 0.10 (trim No. 0 to 5)</td>
<td>-455°F to +300°F (-270°C to +150°C)</td>
<td>ASME Class 150-600 ISO PN 20-100 excepted trim No. 0: ASME Class 150-300 ISO PN 20-50</td>
<td>Class IV</td>
<td>Body and Extension: ASTM A 182 Gr. F 316L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Plug/Stem: Standard Material</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Seat: Trim No. 0: Standard Material Trim No. 1 to 5: ASTM A 564 Gr. 630 Condition H900 Type 17-4 PH, St. St.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>O-ring Seat Gasket: PTFE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Other Parts: Standard Construction: see page 8</td>
</tr>
</tbody>
</table>

Dimensions – inches (mm)

Provide a removal clearance of 5.5 inches (140 mm)
Accessories and Options

Pneumatic Positioner (Model 7700P)

- **Type**: pneumatic, force balance
- **Mounting**: built-in bracket in actuator
- **Action**: direct: increasing instrument signal increases air output
- **Characteristics**
  - Linear
- **Instrument signal**
  - 200 to 1000, 400 to 2050 or 3 to 15, 6 to 30 or 3 to 27 psi (200 to 1850 mbar)
  - 3 to 9, and 9 to 15 psi (200 to 600 and 600 to 1000 mbar) split range
- **Connections**
  - 1/4” NPT instrument and supply – 1/8” NPT output
- **Average air consumption**
  - 0.15 scfm at 30 psi supply (0.26 Nm³/h at 2.1 bar supply)
- **Max. air output**
  - 4.20 scfm (7 Nm³/h)
- **Supply pressure effect**
  - 0.05% of full stroke variation per psi supply pressure change
  - (0.07% per 100 mbar)
- **Open loop gain**
  - 70
- **Linearity**
  - ± 0.5%
- **Sensitivity**
  - 0.1%
- **Repeatability**
  - 0.1%
- **Full stroke time**
  - less than one second
- **Weight**
  - 3.3 lbs (1.5 kg)

Other Accessories
Proximity sensors and limit switches
Digital positioners – HART® and Fieldbus Foundation
Handwheel, airsets and solenoid valves

Electropneumatic Positioner (Model 7700E)

- **Type**: electropneumatic, force balance
- **Mounting**: compact, without external linkage to the actuator (see Fig. 15)
- **Action**: direct: increasing instrument signal increases air output
- **Characteristics**
  - Linear
- **Instrument signal**
  - 4-20 mA
- **Air Connections**
  - 1/4” NPT supply – 1/8” NPT output
- **Average air consumption**
  - 0.24 scfm (0.4 Nm³/h)
- **Electrical connections**
  - 1/2” NPT or M20
- **Weight**
  - 7.7 lbs (3.5 kg)

Hazardous Location Protection
ATEX Approvals (94/9/EC Directive)
Explosionproof
No. SIRA 02 ATEX 1274
Intrinsic Safety
No. SIRA 02 ATEX 2277 X
FM (Factory Mutual) Approvals
Explosionproof
Intrinsic Safety
Non-incendive and Dust-ignitionproof
CSA Approvals
(Canadian Standards Association)
Explosionproof
Intrinsic Safety
Non-incendive
Standard Actuator Options

Figure 13: Non-Adjustable Cv Actuator

Figure 14: Varipak with Non-Adjustable Cv Actuator (cover removed)

Figure 15: Varipak with 7700E Electropneumatic Positioner

Figure 16: Adjustable C, Actuator
Notes
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Dresser Inc. is a global leader in providing highly-engineered infrastructure products for the global energy industry. Leading brand names within the Dresser portfolio include Dresser Wayne® retail fueling systems, Waukesha® natural gas-fired engines, Masoneilan® control valves, Consolidated® pressure relief valves, and ROOTS® blowers and rotary gas meters. The company has manufacturing and customer service facilities strategically located worldwide and a sales presence in more than 150 countries. www.dresser.com.

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