High Speed Proportional Pneumatic Control Valves

The M-Series valves are instrument grade, proportional, pneumatic directional control valves engineered for high performance applications. Designed to directly interface with a PLC, motion controller, or with compatible Enfield electronics, the M-Series valves provide high speed linear control.

**Features**
- 5/3 Bi-Directional Proportional Flow Control Valve
- Direct Acting Linear Force Motor
- Infinitely Variable Valve Positioning (3 Extreme Positions)
- Low Hysteresis
- High Bandwidth
- Fast Shifting Time
- Low Leakage
- High Linearity

**Applications**
High performance open and closed loop systems:
- Motion Control
- Flow Control
- Pressure Control
- Force Control
- Vacuum Control
- Mixing
- Ultra-Fast Switching (<5 ms)

**Compatibility**
Controllers
- C1 Controller & Driver (M2s)
- LS-C10 Controller & Driver (M2s)
- LS-C41 Controller & Driver (All)

Drivers
- D1 Proportional Linear Motor Valve Driver (M2s)

**Mechanical Specifications**
- **Pressure:** -1...15 bar (vacuum...225 psi)
- **Ports:** 3/8” NPTF
- **Mounting:** 2 x 10–32 Through Holes
- **Temperature Range:** 0ºC– 50ºC (32ºF – 122ºF)
- **Filtration:** 5 μm Particulate
  0.3 μm Coalescing
- **Media:** Unlubricated, Dry, Neutral Gas
- **Environmental Protection Class:** IP65
- **Gating Element:** Spool and Sleeve

**Electrical Specifications**
- **Current:** -1A...0...1A with Enfield Approved Electronics
- **Power Consumption:** Maximum < 8W

**Material Specifications**
- **Body:** Aluminum 6061
- **Spool & Sleeve:** Stainless Steel 440C
- **Seals & Gaskets:** Nitrile
- **Other:** Nickel Plated Steel & Copper

**Performance Specifications**
- **Shifting Time:** < 2.8 ms
- **Hysteresis:** Average Hysteresis < 5 %
  Maximum Hysteresis <10%
- **Valve Type:** 5-Port, 3-Position, Proportional
- **Flow (5.5 → 0 bar):** 1750 SLPM
  (60 SCFM)
- **Turndown Ratio:** 250:1
The M-Series High Speed Proportional Pneumatic Valves enable high precision industrial and automation applications. In addition to the proportional response and ultra-fast response time, the construction of these valves feature an IP65 environmental protection rating. With 3/8” NPTF ports, the M-Series offers the highest flow capacity of the Enfield product line allowing for faster responses and quicker dynamics. Featuring three different electronics packages, users can select the M-Series valve that most easily integrates into their design.

<table>
<thead>
<tr>
<th>Valve Specifications</th>
<th>M1d</th>
<th>M2d</th>
<th>M2s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Valve &amp; Driver</td>
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<td>Valve</td>
</tr>
<tr>
<td><strong>Electrical Connection</strong></td>
<td>3-Pin M8 x 1 (Male)</td>
<td>6-Pin Alden PL500 (Female)</td>
<td>3-Pin M8 x 1 (Male)</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>0...5 VDC</td>
<td>-10...10 VDC</td>
<td>-1A...0...1A from Enfield Electronics</td>
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<tr>
<td></td>
<td>0...10 VDC</td>
<td>-5...5 VDC</td>
<td>Enfield Electronics</td>
</tr>
<tr>
<td></td>
<td>0...20mA</td>
<td>0...5 VDC</td>
<td>0...10 VDC</td>
</tr>
<tr>
<td></td>
<td>4...20mA</td>
<td>0...20 mA</td>
<td>4...20 mA</td>
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<tr>
<td></td>
<td>PWM (&gt;2 kHz)</td>
<td>4...20 mA</td>
<td></td>
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<tr>
<td><strong>Dimensions</strong></td>
<td>158.7 x 55.0 x 45.0 mm</td>
<td>171.9 x 55.0 x 45.0 mm</td>
<td>158.3 x 55.0 x 45.0 mm</td>
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<td></td>
<td>(6.25 x 2.17 x 1.77 in)</td>
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<td>(6.23 x 2.17 x 1.77 in)</td>
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<tr>
<td><strong>Weight</strong></td>
<td>818 g (28.8 oz)</td>
<td>852 g (30.0 oz)</td>
<td>795 g (28.0 oz)</td>
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