

Baumann[™] 81000 Mikroseal Control Valve

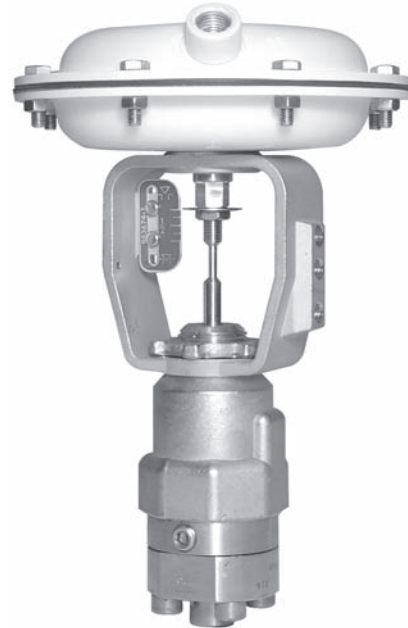
The Baumann 81000 Mikroseal control valve (figures 1 and 2) is excellent for throttling of liquid or gaseous media, particularly where wide flow variations are encountered. Its packless design allows for applications where leakage prone stem packings are not tolerated.

A nearly frictionless mechanical force-amplifying mechanism is employed to reduce the travel of the pneumatic or electric actuators. This allows the closure diaphragm to move precisely against the valve orifice to throttle or stop the passing fluid. The same nearly frictionless mechanism, composed of stainless steel and PTFE lined ball bearings and guide bushings, assures very precise positioning with negligible deadband. This permits direct operation from remote mounted I/P (current to pneumatic) signal converters.

Easy removal of the bonnet allows for inspection and cleaning of the valve seat and closure diaphragm while the actuator stays attached to the bonnet and the valve body remains in the line. During this process the actuator stays in calibration. A backup O-ring prevents leakage should the primary seal (diaphragm to valve body) fail. A tell-tale connection in the bonnet yoke can be utilized to show if the sealing diaphragm is damaged.

Features

- Compact and light-weight design reduces installed piping costs
- Packless construction
- Epoxy powder-coated actuator cases with stainless steel yoke and fasteners for corrosion resistance
- Multi-spring, field-reversible actuator with reduced deadband permits direct operation from remote signal devices
- Fisher® FIELDVUE[™] digital valve controller available for remote calibration and diagnostics in facilities utilizing PlantWeb[™] architecture



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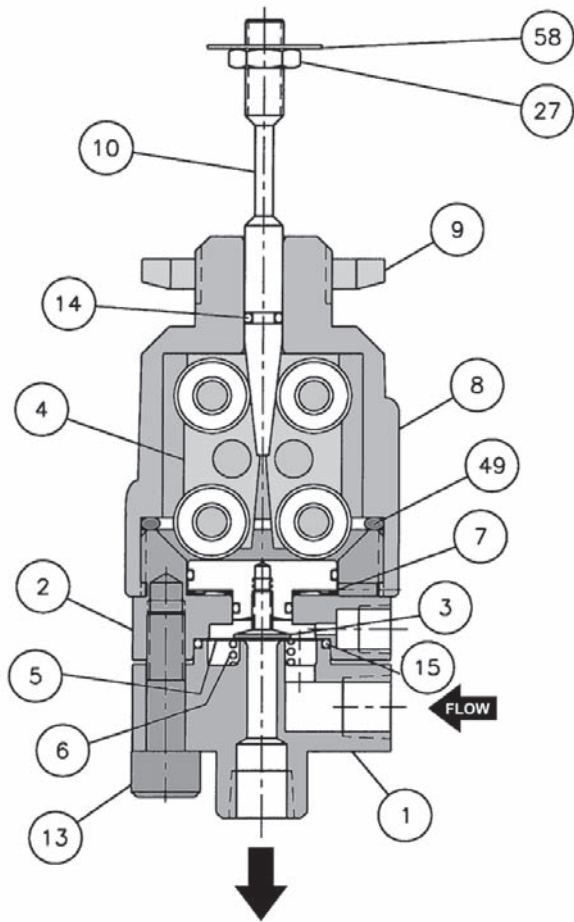
Figure 1. 81000 NPS 1/4 Angle Valve with Baumann 16 Actuator



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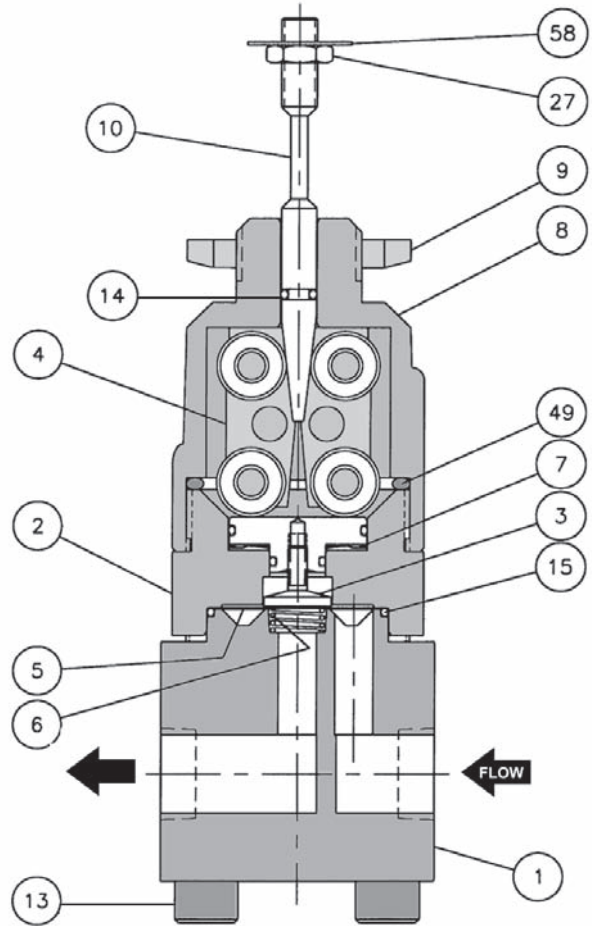
Figure 2. 81000 NPS 1/2 Inline Valve with Baumann 16 Actuator, and FIELDVUE DVC2000 Digital Valve Controller





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Figure 3. Baumann 81000 NPS 1/4 Angle Valve Body



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Figure 4. Baumann 81000 NPS 1/2 Inline Valve Body

Specifications

See table 4 for technical specifications and table 5 for actuator specifications

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Table 1. Materials of Construction

| Key Number | Description | Material |
|------------|-------------------------------|------------------------------------------------------|
| 1 | Valve Body | S31600 SST, standard / ASTM B575 N06022, optional |
| 2 | Bonnet Yoke | S31600 SST |
| 3 | Piston Subassembly | S30300 SST and FKM (Fluorocarbon) |
| 4 | Bearing Cartridge Subassembly | Stainless Steel and PTFE (Polytetrafluoroethylene) |
| 5 | Closure Diaphragm | S31600 SST, standard / N10276 Nickel Alloy, optional |
| 6 | Seat Spring | ASTM B575 N06022 |
| 7 | Wave Spring | S17700 SST |
| 8 | Bonnet | ASTM A743 CF8 |
| 9 | Drive Nut, Yoke | S30400 SST |
| 10 | Plunger | ASTM A276 S31600 Condition A |
| 13 | Allen head Bolts | Stainless Steel (18-8 SST) |
| 14 | O-Ring, Plunger | FKM (Fluorocarbon) |
| 15 | O-Ring | PTFE, FDA 21 CFR 177 (Polytetrafluoroethylene) |
| 27 | Jam Nut | Stainless Steel (18-8 SST) |
| 49 | O-Ring | FKM (Fluorocarbon) |
| 58 | Travel Indicator Disk | ASTM A240 S30400 |

Table 2. Allowable Pressure Drops

| VALVE SIZE | PLUG | | PLUG TRAVEL | AIR-TO-OPEN ACTION | | | | | | AIR-TO-CLOSE ACTION | | | | | |
|---------------|------|--------|----------------|--------------------|------|--------------------------------------------|------|-----------------|------|---------------------|------|--------------------------------------------|------|-----------------|------|
| | | | | Bench Range | | 3-15 psig (0.2-1.0 bar) Signal to Actuator | | With Positioner | | Bench Range | | 3-15 psig (0.2-1.0 bar) Signal to Actuator | | With Positioner | |
| | | | | bar | psig | bar | psig | bar | psig | bar | psig | bar | psig | bar | psig |
| 1/4 (6.35) | 0.01 | 0.0009 | 12.7 (0.50) | 0.2-1.0 | 3-15 | 10 | 150 | 19 | 275 | 0.2-0.9 | 3-13 | 10 | 150 | 19 | 275 |
| | 0.03 | 0.026 | | | | | | | | | | | | | |
| | 0.10 | 0.086 | | | | | | | | | | | | | |
| | 0.30 | 0.259 | | | | | | | | | | | | | |
| 1/2 (12.7) | 0.01 | 0.0009 | 12.7 (0.50) | 0.2-1.0 | 3-15 | 10 | 150 | 19 | 275 | 0.2-0.9 | 3-13 | 10 | 150 | 19 | 275 |
| | 0.03 | 0.026 | | | | | | | | | | | | | |
| | 0.10 | 0.086 | | | | | | | | | | | | | |
| | 0.30 | 0.259 | | | | | | | | | | | | | |
| | 0.50 | 0.43 | | | | | | | | | | | | | |
| 0.70 | 0.60 | | | | | | | | | | | | | | |

Table 3. Flow Coefficients (ASME/ISA/IEC) and ISA Sizing Factors

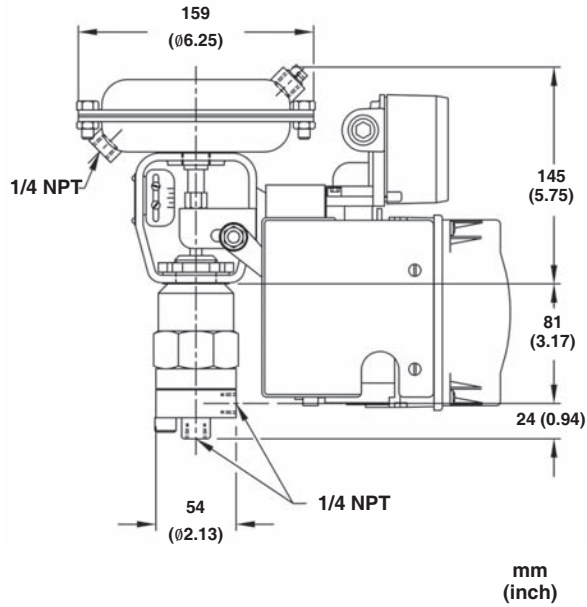
| ORIFICE DIA-METER | DIA-PHRAGM TRAVEL | Cv AT VALVE OPENING - PERCENT OF VALVE STEM TRAVEL | | | | | | | | | | | F _L | F _d | X _T | K _C |
|-------------------|-------------------|----------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------------|----------------|----------------|----------------|
| | | 5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | | | |
| 0.635 (0.025) | 0.177 (0.007) | 0.00001 | 0.0001 | 0.0010 | 0.0024 | 0.0038 | 0.0052 | 0.0066 | 0.0076 | 0.0084 | 0.0092 | 0.01 | 0.85 | 0.50 | 0.61 | 0.61 |
| 1.60 (0.063) | | 0.00003 | 0.0003 | 0.002 | 0.005 | 0.009 | 0.013 | 0.017 | 0.021 | 0.024 | 0.027 | 0.03 | | 0.50 | | |
| 7.92 (0.312) | | 0.0002 | 0.001 | 0.010 | 0.030 | 0.050 | 0.060 | 0.068 | 0.076 | 0.084 | 0.092 | 0.10 | | 0.20 | | |
| 7.92 (0.312) | 0.381 (0.015) | 0.0004 | 0.002 | 0.020 | 0.070 | 0.120 | 0.150 | 0.180 | 0.210 | 0.240 | 0.270 | 0.30 | | 0.20 | | |
| 13.2 (0.520) | 0.304 (0.012) | 0.0007 | 0.003 | 0.040 | 0.100 | 0.150 | 0.200 | 0.250 | 0.310 | 0.370 | 0.430 | 0.50 | | 0.20 | | |
| 13.2 (0.520) | 0.381 (0.015) | 0.001 | 0.005 | 0.070 | 0.160 | 0.220 | 0.300 | 0.380 | 0.460 | 0.540 | 0.620 | 0.70 | | 0.20 | | |

Table 4. Technical Specifications

| | | |
|--------------------------------------|---------------------------------------|-----------------|
| VALVE BODY RATING | 18.9 bar CWP (275 psi CWP) | |
| NOMINAL SIZE | 6.35 mm or 12.7 mm (NPS 1/4 or 1/2) | |
| CONNECTIONS | NPT (Flanged or Welded Ends Optional) | |
| SEAT LEAKAGE | ASME/FCI 70-2, Class IV | |
| BONNET | Bolted | |
| CHARACTERISTIC | Modified Equal Percentage | |
| MAXIMUM OPERATING TEMPERATURE | 177°C (350°F) | |
| WEIGHTS | 6.35 mm (1/4 inch) | 1.35 kg (3 lbs) |
| | 12.7 mm (1/2 inch) | 1.82 kg (4 lbs) |

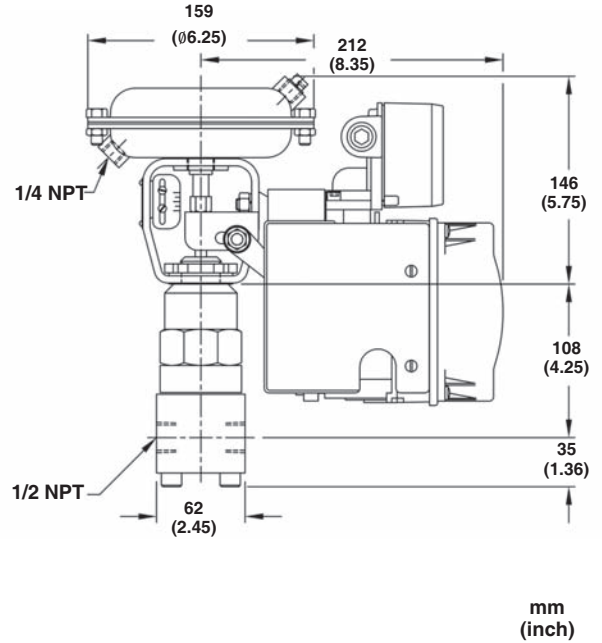
Table 5. Actuator Specifications

| | |
|----------------------------------|--------------------------------------------------------------------------------------------------|
| TYPE | 16 Multi-Spring Diaphragm (Single Acting) |
| NOMINAL SIZE | 103cm ² (16in ²) |
| AIR FAILURE | Open or Closed (Field Reversible) |
| BENCH SPRING RANGE | 0.2 – 0.9 bar (3–13 psi), fail open / 0.2–1.0 bar (3–15 psi) fail closed |
| TRAVEL | 12.7 mm (0.5 inch) |
| AMBIENT TEMPERATURE RANGE | –29 to 71°C (–20 to 160°F) |
| MAXIMUM AIR PRESSURE | 2.4 bar (35 psig) |
| DIAPHRAGM MATERIAL | CR (Chloroprene), TPES (Polyester Thermoplastic) |
| SPRING CASES | Steel, Powder Epoxy-Coated Appliance White per FDA 21 CFR 175.300 with Stainless Steel Fasteners |
| YOKE | CF8M Stainless Steel |
| WEIGHT | 2.1 kg (4.6 lbs) |



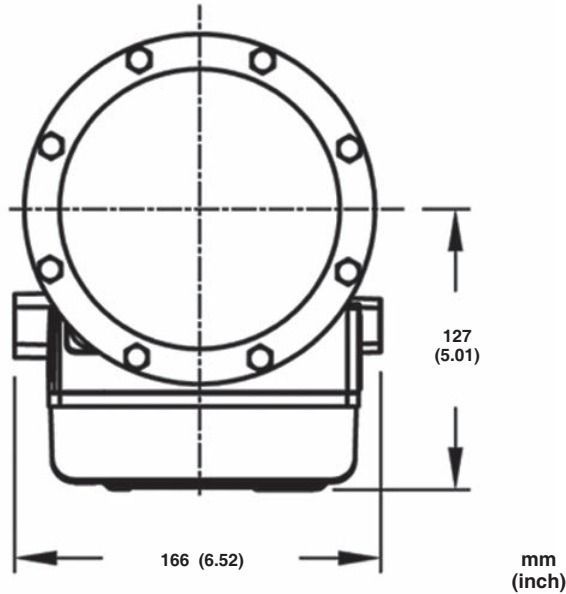
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Figure 5. 81000 Angle Valve with Baumann 16 Actuator and FIELDVUE DVC6000 Digital Valve Controller



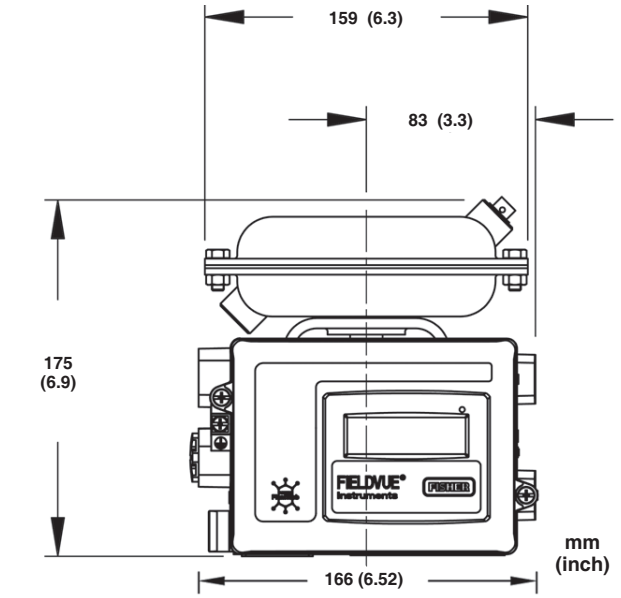
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Figure 6. 81000 Inline Valve with Baumann 16 Actuator and FIELDVUE DVC6000 Digital Valve Controller



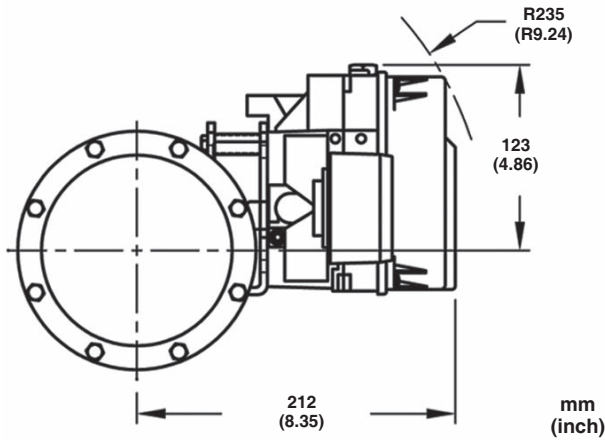
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Figure 7. Baumann 16 Actuator with FIELDVUE DVC2000 Digital Valve Controller, Top View



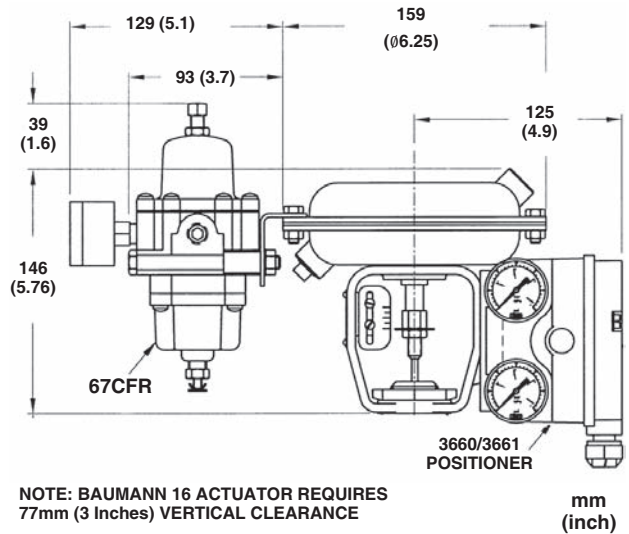
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Figure 9. Baumann 16 Actuator with FIELDVUE DVC2000 Digital Valve Controller



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Figure 8. Baumann 16 Actuator with FIELDVUE DVC6000 Digital Valve Controller, Top View



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Figure 10. Baumann 16 Actuator with Fisher 3660/3661 and 67CFR Airset

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Table 6. Model Numbering System

| 16 Actuator Size | 81 81000 | Maximum Cv | | End Connections | | 2 Bonnet Construction | | Valve Body Material | | Valve Body Style | | |
|------------------------|-------------|------------|------|-----------------|---|-------------------------------|---|------------------------|---|------------------------|---|--------|
| | | Cv | Kv | | | | | | | | | |
| 16 | | 3 | 0.01 | 0.009 | 0 | Screwed (NPT) / Flangeless | 2 | Bolted | S | 316 SST | A | Angle |
| | | 4 | 0.03 | 0.026 | 3 | Special | | | H | N06022 Nickel Alloy | I | Inline |
| | | 6 | 0.10 | 0.086 | | | | | | | | |
| | | 7 | 0.30 | 0.259 | | | | | | | | |
| | | 8 | 0.50 | 0.43 | | | | | | | | |
| | | 9 | 0.70 | 0.60 | | | | | | | | |

Note

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