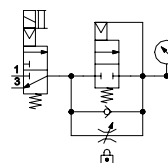


## SLOW START/ QUICK EXHAUST VALVE

- High exhaust capacity for quick depletion of downstream pressure
- Slow Starts provide gradual increase of downstream pressure and full flow once 70% of inlet pressure is reached
- Threaded ports allow for individual or modular mounting
- Manual override (momentary-pulse type) is standard when using the horizontal solenoid operator
- Optional extended temperature range of -40 °F to 176 °F (-40 °C to 80 °C); for air piloted models only (excludes solenoid operators)
- Constructions includes: 3/2 Quick Exhaust, 3/2 Slow Start/Quick Exhaust, and 2/2 Slow Start
- Electrical connections: Coil with DIN terminals; DIN Plug, DIN Plug with LED, and coil with built-in M12 3 Pin male connection (24 VDC)
- Voltages: 24 VDC, 120/60 & 115/50 VAC, 230-50/60 VAC, 24-50/60 VAC



| Performance Data  |                       |             |               |              |               |              |              |
|---|-----------------------|-------------|---------------|--------------|---------------|--------------|--------------|
| Series  | 651                   |             | 652           |              | 653           |              |              |
| Port Sizes  | 1/8, 1/4              |             | 1/4, 3/8, 1/2 |              | 1/2, 3/4, 1   |              |              |
| Thread Type   | NPTF, G & Rc          |             |               |              |               |              |              |
| Nominal Flow - Per ISO 6358<br><br>P1 = 91.4 PSI (6.3 bar)<br>ΔP = 14.5 PSI (1 bar) | SCFM (L/min ANR)      |             |               |              |               |              |              |
|   |                       | 1 → 2       | 2 → 3         | 1 → 2        | 2 → 3         | 1 → 2        | 2 → 3        |
|   | 1/8                   | 27.5 (780)  | 36.7 (1040)   | -            | -             | -            | -            |
|   | 1/4                   | 35.3 (1000) | 39.6 (1120)   | 53.0 (1500)  | 74.0 (2100)   | -            | -            |
|   | 3/8                   | -           | -             | 132.0 (3750) | 151.0 (4300)  | -            | -            |
|   | 1/2                   | -           | -             | 164.0 (4650) | 176.0 (5000)* | 174.8 (4950) | 238.0 (6740) |
|   | 3/4                   | -           | -             | -            | -             | 257.1 (7280) | 313.9 (8890) |
|   | 1                     | -           | -             | -            | -             | 290.6 (8230) | 316.4 (8960) |
| Minimum Operating Pressure PSIG (bar)   | 55 (3.8)**            |             |               |              |               |              |              |
| Maximum Operating Pressure PSIG (bar)   | 145 (10)              |             |               |              | 232 (16)***   |              |              |
| Ambient Temperature Range °F (°C)   | 14 to 122 (-10 to 50) |             |               |              |               |              |              |
| Fluid Temperature Range °F (°C)   | 14 to 122 (-10 to 50) |             |               |              |               |              |              |
| Fluid   | Air or Inert Gas      |             |               |              |               |              |              |
| Weight lbs. (kg)  | 0.85 (0.387)          |             | 0.97 (0.438)  |              | 3.51 (1.592)  |              |              |
| Weight lbs. (kg) - with sensing position  | —                     |             | 1.87 (0.848)  |              | 3.80 (1.724)  |              |              |

\*Exhaust flow on the 1/2" 652 product with a spool position sensor is 220 (6300)

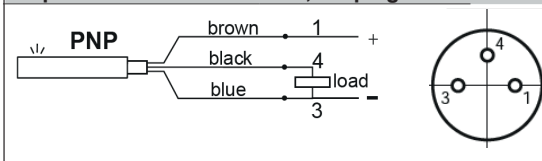
\*\*If P(1) supply flow is restricted on valves with internal pilot supply, momentary exhaust leakage can occur.

\*\*\* Pressure rating is 145 psig (10 bar) when equipped with a digital gauge or digital pressure switch.

| Materials in Contact with Fluid |                 |
|---------------------------------|-----------------|
| Body                            | Aluminum        |
| Seals                           | NBR/FKM         |
| Springs                         | Stainless Steel |

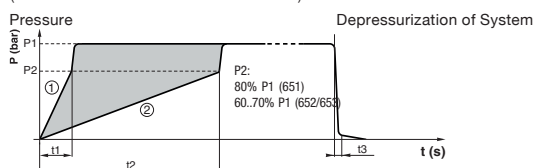
| Operating Data |           |                  |        |       |
|----------------|-----------|------------------|--------|-------|
|                | 24/DC     | 120/60           | 240/60 | 24/60 |
| Power          | -         | 9 VA             | 9 VA   | 9 VA  |
| Holding        | 3.0 Watts | 4 VA (3.0 Watts) |        |       |

### Pin assignment of position detection sensor, M8 plug



## System Pressurization and Depressurization Curves

(with Automatic Soft Start Device)




The adjustment range for the pressurization time lies between curves (1) and (2).



The transition to full flow takes place automatically as soon as the downstream pressure reaches 80% (651)/60% to 70% (652/653) of the upstream pressure.



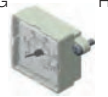

| Filling and venting times (seconds)                       | Series 651 | Series 652 | Series 653 |
|---|------------|------------|------------|
| t1 (with screw loosened by 6 (651)/7 (652)/8 (653) turns) | 8.0        | 3.2        | 2.8        |
| t2 (with screw loosened by 1 turn)                        | 112.0      | 23.0       | 18.5       |
| t3 (venting time)   | 4.8        | 1.0        | 0.5        |




These times correspond to a supply pressure (Pa) of 6.3 bar, a transition pressure (P2) of 80% (651)/60% to 70% (652/653) P1 (not adjustable) and a downstream capacity of **10 liters**.

## How to Order - Slow Start/Quick Exhaust Valve

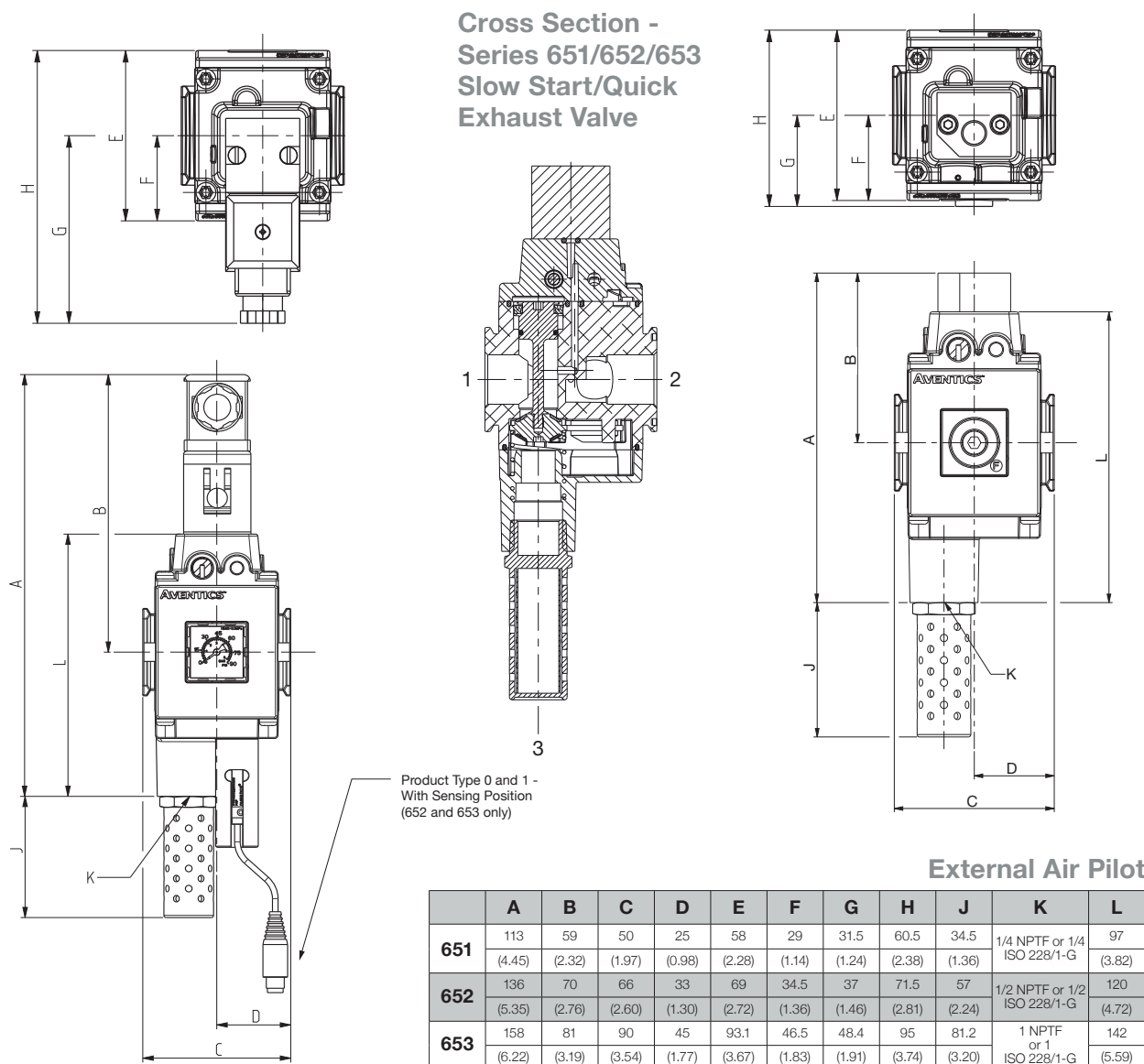
|  |  |
|--|--|
| <p><b>Port Type</b></p> <p>8 = NPTF</p> <p><sup>1</sup> G = ISO 228/1-G</p> <p>J = ISO 7/1 Rc</p> <p><b>Product Series</b></p> <p>651</p> <p>652</p> <p>653</p> <p><b>Revision</b></p> <p>A</p> <p><b>Product Type</b></p> <p>0 = 3/2 Quick Exhaust Valve with Sensing Position (652 and 653 only)</p> <p>1 = 3/2 Slow Start/Quick Exhaust Valve with Sensing Position (652 and 653 only)</p> <p>4 = 2/2 - Slow Start</p> <p>5 = 3/2 - Quick Exhaust</p> <p>6 = 3/2 - Slow Start/Quick Exhaust</p> <p><b>Valve Type</b></p> <p>E = External Air Pilot (1/8 NPT air pilot signal port)</p> <p>P = Internal Air Pilot (Available on 2/2 Slow Start only)</p> <p>S = Solenoid Pilot</p> <p><b>Pilot Valve/Electrical Connection</b></p> <p>0 = No Electrical Connection</p> <p>1 = Vertical Solenoid, without DIN Connector (651 or 652 only; must order with option 110)</p> <p>2 = Vertical Solenoid, DIN Connector with LED (651 or 652 only; must order with option 110)</p> <p>3 = Vertical Solenoid, DIN Connector w/o LED (651 or 652 only; must order with option 110)</p> <p><sup>2</sup> 4 = Vertical Solenoid, 3 Pin M12 Connection (651 or 652 only; must order with option 110)</p> <p>5 = Horizontal Solenoid, without DIN Connector</p> <p>6 = Horizontal Solenoid, DIN Connector with LED</p> <p>7 = Horizontal Solenoid, DIN Connector without LED</p> <p><sup>2</sup> 8 = Horizontal Solenoid with 3 Pin M12 Connection</p> <p>9 = Without Pilot Operator</p> <p><b>Port Size</b></p> <p>1 = 1/8 (Series 651)</p> <p>2 = 1/4 (Series 651 or 652)</p> <p>3 = 3/8 (Series 652)</p> <p>4 = 1/2 (Series 652 or 653)</p> <p>5 = 3/4 (Series 653)</p> <p>6 = 1 (Series 653)</p> <p>1 Conforms to ISO standards 1179-1</p> <p>2 Available for 24 VDC voltage only</p> <p>3 For Series 653, voltage EW = 120/60 VAC only</p> <p>4 If multiple options are required, please use the online CAD configurator on the website to generate the part number (<a href="http://www.emerson.com">www.emerson.com</a>), or consult factory</p> <p>5 Option 117 (ATEX Zones 1-21) is available with Valve Type E or P. For Valve Type S (Solenoid Pilot), please select 9 under the Pilot Valve/Electrical Connection. Consult factory for further information</p> | <p><b>Voltage</b></p> <p>FT = 115/50 VAC (653 only)</p> <p><sup>3</sup> EW = 120/60, 115/50 VAC</p> <p>F1 = 24 VDC</p> <p>FQ = 24 50/60 VAC</p> <p>FH = 230 50/60 VAC (651 or 652)</p> <p>F8 = 230/50 VAC (653 only)</p> <p>DE = 230/60 VAC (653 only)</p> <p>00 = No Voltage</p> <p><b>Options</b></p> <p>A00 = No Options</p> <p>101 = Side Mounting Brackets</p> <p>109 = FKM Seals</p> <p>110 = Without Manual Override</p> <p>111 = Metal Muffler</p> <p>112 = Polyethylene Muffler</p> <p>113 = Stainless Steel Fasteners</p> <p><sup>5</sup> 117 = ATEX Zones 1-21 </p> <p>122 = Inverted Mounting</p> <p>123 = Gauge Type Mounted for Right-to-Left Flow</p> <p>201 = 110 + 111</p> <p><b>Gauge Type</b></p> <p>B = Digital Pressure Switch - PNP (Rated Pressure - 0-145 PSIG/0-10 bar)</p> <p>C = Digital Pressure Switch - NPN (Rated Pressure - 0-145 PSIG/0-10 bar)</p> <p>D = Digital Gauge (Rated Pressure - 0-145 PSIG/0-10 bar)</p> <p>F = Low Profile Gauge PSI/bar</p> <p>G = Low Profile Gauge bar/PSI</p> <p>H = Low Profile Gauge PSI/bar with Pressure Range Indicator</p> <p>J = Low Profile Gauge bar/PSI with Pressure Range Indicator</p> <p>N = No Gauge with Port Plate (1/8 NPTF)</p> <p>P = No Gauge with Port Plate (1/8 ISO 7/1 Rc)</p> <p>Q = Round Gauge bar/PSI</p> <p>R = Round Gauge PSI/bar</p> <p>0 = No Gauge Port</p> |
|--|--|

**Dimensions: mm (inches) Series 651/652/653 Slow Start/Quick Exhaust Valve**



**Solenoid Pilot**

|            | A             | B             | C            | D            | E              | F              | G            | H               | J              | K                           | L             |
|------------|---------------|---------------|--------------|--------------|----------------|----------------|--------------|-----------------|----------------|-----------------------------|---------------|
| <b>651</b> | 170<br>(6.69) | 116<br>(4.57) | 50<br>(1.97) | 25<br>(0.98) | 58<br>(2.28)   | 29<br>(1.14)   | 72<br>(2.83) | 101<br>(3.98)   | 34.5<br>(1.36) | 1/4 NPTF or 1/4 ISO 228/1-G | 97<br>(3.82)  |
| <b>652</b> | 193<br>(7.60) | 127<br>(5.00) | 66<br>(2.60) | 33<br>(1.30) | 69<br>(2.72)   | 34.5<br>(1.36) | 72<br>(2.83) | 106.5<br>(4.19) | 57<br>(2.24)   | 1/2 NPTF or 1/2 ISO 228/1-G | 120<br>(4.72) |
| <b>653</b> | 214<br>(8.43) | 137<br>(5.39) | 90<br>(3.54) | 45<br>(1.77) | 93.1<br>(3.67) | 46.5<br>(1.83) | 94<br>(3.70) | 140.5<br>(5.53) | 81.2<br>(3.20) | 1 NPTF or 1 ISO 228/1-G     | 142<br>(5.59) |