Two/three way PN16 valves

<table>
<thead>
<tr>
<th>MODELS</th>
<th>SIZE</th>
<th>Kvs</th>
<th>STROKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-way</td>
<td>Three-way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VSB1</td>
<td>VMB1</td>
<td>1/2</td>
<td>1.6</td>
</tr>
<tr>
<td>VSB11</td>
<td>VMB11</td>
<td>1/2</td>
<td>2.5</td>
</tr>
<tr>
<td>VSB2</td>
<td>VMB2</td>
<td>1/2</td>
<td>4</td>
</tr>
<tr>
<td>VSB3</td>
<td>VMB3</td>
<td>3/4</td>
<td>6.3</td>
</tr>
<tr>
<td>VSB4</td>
<td>VMB4</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>VSB5</td>
<td>VMB5</td>
<td>1 1/4</td>
<td>16</td>
</tr>
<tr>
<td>VSB6</td>
<td>VMB6</td>
<td>1 1/2</td>
<td>22</td>
</tr>
<tr>
<td>VSB8</td>
<td>VMB8</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>VSB8A</td>
<td>VMB8A</td>
<td>2</td>
<td>40</td>
</tr>
</tbody>
</table>

100 kPa = 1 bar = 10 m H₂O

APPLICATION AND USE

Two-way VSB and three-way VMB valves can be used either for control or fluid detection in air-conditioning, thermooventilation and heating plants, both environmental and industrial, in machines for product thermal process. Three-way valves should be used only as mixing valves; angle way should never be used for control purposes.

ACTUATORS

VSB and VMB are actuated by CONTROLLI MVB, MVL, MVLA/C, SH, ST electrical and by PL600 and PG300 pneumatic actuators.

<table>
<thead>
<tr>
<th>VALVE MODELS</th>
<th>ACTUATORS Δ p max (Bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-way</td>
<td>Three-way</td>
</tr>
<tr>
<td>VSB1 VMB1</td>
<td>MVB +AG31</td>
</tr>
<tr>
<td>VSB11 VMB11</td>
<td>MVL +AG21</td>
</tr>
<tr>
<td>VSB2 VMB2</td>
<td>MVLA/C +AG31</td>
</tr>
<tr>
<td>VSB3 VMB3</td>
<td>SH-ST +AG31</td>
</tr>
<tr>
<td>VSB4 VMB4</td>
<td>PL600 +AG32</td>
</tr>
<tr>
<td>VSB5 VMB5</td>
<td>PG300 +AG34</td>
</tr>
<tr>
<td>VSB6 VMB6</td>
<td>PG340 +AG34</td>
</tr>
<tr>
<td>VSB8 VMB8</td>
<td>PG330 +AG34</td>
</tr>
<tr>
<td>VSB8A VMB8A</td>
<td>+AG34</td>
</tr>
</tbody>
</table>

Values in brackets represent the max. differential pressure granted by the actuator for fully closed valve only.

OPERATION

When stem is up, the direct way is closed, with stem down direct way is open.

MANUFACTURING CHARACTERISTICS

The valve body is in G25 cast iron (only DN1/2" valves have brass body and fitting). The plug is in brass with Contoured-type profile on direct way and V-port on angle way. The stem is in CrNi steel with threaded M8 end and female threaded connections. The stem packing is constituted by a Viton O-ring with graphited teflon scraper rings.

TECHNICAL CHARACTERISTICS

Body rating 1600 Kpa max (16 bar)

Control characteristics

VSB-VMB direct way
VMB angle way

equal-percentage
linear

Leakage

VSB-VMB direct way 0...0,03% of Kvs
VMB angle way 0...2% of Kvs

Connections

female threaded

Stoke

16,5 mm (max 18,5)

Allowed fluids

- water
max. max. temperature temperature
150 °C
-10 °C

(in case of ice on stem and gasket, use the stem-heater, see actuators data sheets: it is not applicable to V.B 1/2" valves)

- glycol added
max. max. temperature pressure
150 °C
2.5 bar (absolute value)

NOTE: If V.B valves are assembled with MVB+spacer (MVBBHT) the max. operating temperature is 140 °C, while without spacer is 120 °C. For other actuators the max. operating temperature is 150 °C.
**INSTALLATION**

Before valves are mounted, make sure that pipes are clean, free from welding slags, that are perfectly lined up with valve body and not subjected to vibrations.

The valve can be mounted in any position except upside-down (for MVL - MVLA/C actuators see Fig. 3).

While assembling, respect the flow directions indicated by the letters located on the valve body (see Fig. 1 and 2) and the application schemes.

**MOUNTING POSITIONS**

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**APPLICATION SCHEMES**

- **VSB VALVES**
  - a) Variable flow control when used
    
  ![Diagram](N4097)
  
  - b) Constant flow when used in injection circuits
    
  ![Diagram](N4097)
  
  - c) Variable flow mixing when used
    
  ![Diagram](N4097)
  
  - d) Constant flow mixing when used in injection or tapping circuits
    
  ![Diagram](N4097)

**OVERALL DIMENSIONS (mm.)**

![Diagram](N4062)

- S = Minimum required dimensions for actuator mounting

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<table>
<thead>
<tr>
<th>DN&quot;</th>
<th>d</th>
<th>I</th>
<th>L</th>
<th>a</th>
<th>e</th>
<th>b</th>
<th>c</th>
<th>H</th>
<th>F</th>
<th>G</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>G 1/2</td>
<td>80</td>
<td>54</td>
<td>17</td>
<td>70</td>
<td>70</td>
<td>1,1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>G 3/4</td>
<td>85</td>
<td>54</td>
<td>34,5</td>
<td>79</td>
<td>67,5</td>
<td>1,1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>G 1</td>
<td>95</td>
<td>62</td>
<td>39,5</td>
<td>83</td>
<td>72,5</td>
<td>1,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1/4</td>
<td>G 1 1/4</td>
<td>108</td>
<td>70</td>
<td>43,5</td>
<td>90</td>
<td>78,5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>G 1 1/2</td>
<td>120</td>
<td>81</td>
<td>51</td>
<td>98</td>
<td>85,5</td>
<td>2,7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (V.B8A)</td>
<td>G 2</td>
<td>194</td>
<td>97</td>
<td>54,5</td>
<td>111</td>
<td>97</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (V.B8)</td>
<td>G 2</td>
<td>142</td>
<td>97</td>
<td>54,5</td>
<td>111</td>
<td>97</td>
<td>4</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The performances stated on this sheet can be modified without any prior notice due to design improvement.

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Automatic control systems for:

- air conditioning/heating/industrial thermal process.

**ISO 9002**

**CONTROLLI**

Rev. i 03/02 2 DBL008E
Valve actuators

### TECHNICAL CHARACTERISTICS

- **Power supply**: 24 or 230 V~ ±10%
- **Power consumption**: 5 VA
- **Frequency**: 50/60 Hz
- **Max stroke**: 21 mm (mechanical stroke end)
- **Timing**: see available models
- **Close off force**: 450 N
- **Room temperature**
  - working: 5T50 °C
  - storage: 25T65 °C
- **Max fluid temperature**: 120 °C (140 °C with MVBHT)
- **Allowed room moisture**: 80% R.H.
- **Class protection**: II (CEI 107-10)
- **Terminal board**: screw-type for 1.5 to 2.5 mm² wires
- **N.2 conduit opening**: with a rubber membrane breakthrough hole (Ø=16 mm) replaceable by PG 11 compression glands
- **Protection degree**: IP 50 for environments with normal pollution according to IEC730-1 (93) 6.5.3
- **Weight**: 0.8 Kg.

### APPLICATION AND USE

The actuators are equipped with a reversing synchronous motor and an electronic board available in three different models respectively for:

- floating control
- proportional control (potentiometric)
- proportional control (voltage or current)

Due to their versatility these actuators can be mounted both on new “Controlli” globe valves up to DN 2” as well as on different manufacturer valves, having stroke from 10.8 to 20 mm.

#### Valve body Nominal diameter Model

<table>
<thead>
<tr>
<th>PN 16</th>
<th>DN 1/2 “...2”</th>
<th>VSB (2 way)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN 16</td>
<td>DN 1/2 “...2”</td>
<td>VMB (3 way)</td>
</tr>
</tbody>
</table>

### OPERATION

All actuator models are equipped with an advanced design motor using a magnetic clutch to avoid electric end switches, thus improving the global system reliability.

An additional feature is provided on voltage/current proportional models: an output signal (0...10 V– 10...0 V–) indicating the valve stem position. An internal jumper provides the rotation sense inversion. Moreover, there is a device which doesn’t supply the motor when the actuator is at both end stroke for a time equivalent to twice as timing.

All models are equipped with a manual override device.

### MANUFACTURING CHARACTERISTICS

The actuator has been manufactured using thermo-plastic materials: in particular new technopolimers have been utilized for the most stressed parts, allowing a reduction in weight of the apparatus while granting the necessary mechanical features. The printed circuit board is placed in an easy access position together with the optional auxiliary microswitch, fully adjustable on the whole stroke.

### POSSIBLE COMBINATIONS AND CONNECTIONS

The actuators can be connected to “Controlli” DIGITROLL 2000, 4000, 5000, 7000 and series 200, 300, 400 and 500 controllers. They can also be connected to any other controller having a driving signal as showed in the “TECHNICAL CHARACTERISTICS” paragraph.

The following accessories are available:

- **MODEL**
- **DESCRIPTION**
  - **244** Stem heater (24 V ~ -25VA). Avoid mounting on V_B.F Ø 15 valves
  - **D36** Auxiliary micro-switch with adjustable cam (SPDT 10 (3) A-250 V ~ ). Disconnection 1B according to IEC730-1 (93) 6.4.3.2
  - **AG22** Linkage for V2/V3-500 valves
  - **AG23** Linkage for Cazzaniga valves
  - **AG40** Linkage for VB7000 valves
  - **MVBHT** Spacer to reduce the direct exposure of the actuator with high temperature fluids

Invensys Controls Italy S.r.l.
CONTROLLI Division
16010 SANT’OLCESE Genova - Italy
Tel. +39 01073061
Fax +39 0107306870/871
E-mail info@controlli.org
Web www.controlli.org

Rev. h 03/02 1 DBL005E
INSTALATION

The actuator can be mounted in any position but the vertical one is preferable; it is necessary to leave at least 10 cm. above the actuator for maintenance. The electric connections must be performed by removing the cover with the writing “TERMINALS ON THIS SIDE” and operating according to the existing standards.

After completing the connections, supply the motor and make sure the electric operation is regular and that the valve completes the whole stroke.

Actuator with electronic board for proportional voltage and current input

The actuators are calibrated for 6...9 V– input signal. To select a different signal range, it is necessary to move the jumper on SW1 from 6...9 set position to the desired one (see Fig. 1).

To select the 4...20 mA field, insert two jumpers using also the one pre-set in open position.

The actuator rotation direction can be reversed by moving the jumper on SW2 from A to C position (see Fig. 1).

Actuators with electronic board for proportional potentiometric input

To change the rotation direction, reverse the connections between M and V+ terminals.

Mounting on other manufacturer valve bodies.

Because of its versatility the actuator can be mounted on different valves having stroke from 10.8 to 20 mm, with M8x1.25 threaded stem and 71 mm distance between the stem top and the actuator linkage support plane.

The actuator linkage to the valve body has a Ø=30,5 mm hole. The model with a floating driving signal is self-adjusting to different strokes (the standard one is 16.5 mm).

However, if the stroke is different from 16.5, it’s necessary to carry on the calibration as follows:

- Remove the cover on the knob side.
- For MVB52/56 only, make sure that jumper SW2 is in A position (Fig. 2).
- Supply the actuator between L1 and L2 terminals with Y terminal disconnected.
- Wait the actuator to reach the lower stroke end.
- Connect the positive of the voltmeter to S2 terminal and the negative to M.
- Rotate P1 trimmer until the voltmeter indicates 0 V.

The actuator can be installed on valves with different coupling assemblies using dedicated linkages, available on request.

OVERALL DIMENSIONS (mm)

[Diagram of actuator with dimensions labeled]

The performances stated on this sheet can be modified without any prior due to design improvements.