Two/three way PN16 valves

VSB-VMB

CE

MODELS		SIZE	Kvs	STROKE
Two-way	Three-way	(inches)	m^3/h	mm
VSB1	VMB1	1/2	1,6	16,5
VSB11	VMB11	1/2	1	16,5
VSB15	VMB15	1/2	2,5	16,5
VSB2	VMB2	1/2	4	16,5
VSB3	VMB3	3/4	6,3	16,5
VSB4	VMB4	1	8	16,5
VSB5	VMB5	1 1/4	16	16,5
VSB6	VMB6	1 1/2	22	16,5
VSB8	VMB8	2	30	16,5
VSB8A	VMB8A	2	40	16,5

100 kPa = 1 bar = 10 m H_2O

APPLICATION AND USE

Two-way VSB and three-way VMB valves can be used either for control or fluid detection in air-conditioning, thermo-ventilation 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.

VALVE MODELS		ACTUATORS Δ p max (Bar)				
Two way	Three way	MVB PG330 PG340 +AG34	MVLA/C +AG31 PG320 +AG34	MVL +AG31	SH-ST +AG21	PL600 +AG21
VSB1	VMB1	2(10)	2(10)	2(10)	2(10)	2(10)
VSB11	VMB11	2(10)	2(10)	2(10)	2(10)	2(10)
VSB15	VMB15	2(10)	2(10)	2(10)	2(10)	2(10)
VSB2	VMB2	2(10)	2(10)	2(10)	2(10)	2(10)
VSB3	VMB3	2(10)	2(10)	2(10)	2(10)	2(10)
VSB4	VMB4	2(6,5)	2(10)	2(10)	2(10)	2(8,4)
VSB5	VMB5	2(4)	2(6)	2(10)	2(10)	2(5)
VSB6	VMB6	2(2,5)	2(4)	2(8)	2(8)	2(3,5)
VSB8	VMB8	2(2)	2(3)	2(6)	2(6)	2(2,5)
VSB8A	VMB8A	2(2)	2(3)	2(6)	2(6)	2(2,5)

ΔP max = max differential pressure value ensured by the actuator for regular operation

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

For the assembly on actuators other than MVB, use the following accessories:

AG21 for SH-ST-PL600 actuators
AG31 for MVL-MVLA/C actuators
AG34 for PG 300 actuators

Note: in case of lack of voltage, with MVLA direct way is closed, with MVLC angle way is closed.

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	equal-percentage
VMB angle way	linear
Leakage	
VSB-VMB direct way	0...0,03% of Kvs
VMB angle way	0...2% of Kvs
Connections	female threaded
Stroke	16,5 mm (max 18,5)
Allowed fluids	
- water	
max. temperature	150 °C
min. temperature	-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 50%
- satured steam	
max. temperature	150 °C
max. pressure	2,5 bar (absolute value)
Weight	See overall dimensions

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

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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.

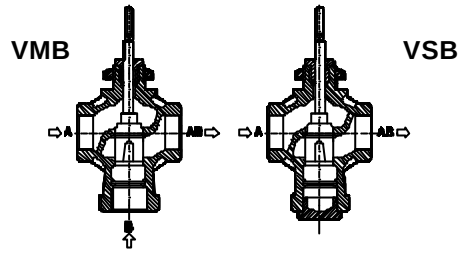

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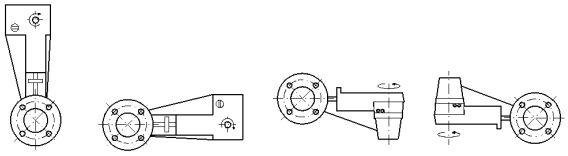
FIG. 1 **FIG. 2**

MOUNTING POSITIONS



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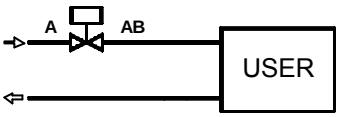
YES **NO**

FIG. 3

APPLICATION SCHEMES

VSB VALVES

a) Variable flow control when used



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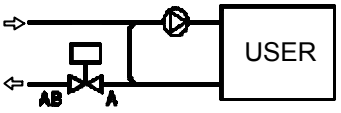
b) Constant flow when used in injection circuits



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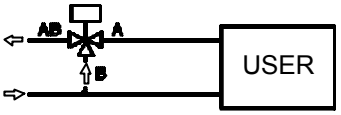
VMB VALVES

c) Variable flow mixing when used



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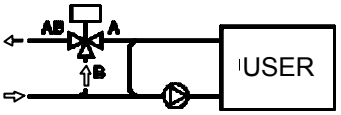
d) Constant flow mixing when used in injection or tapping circuits



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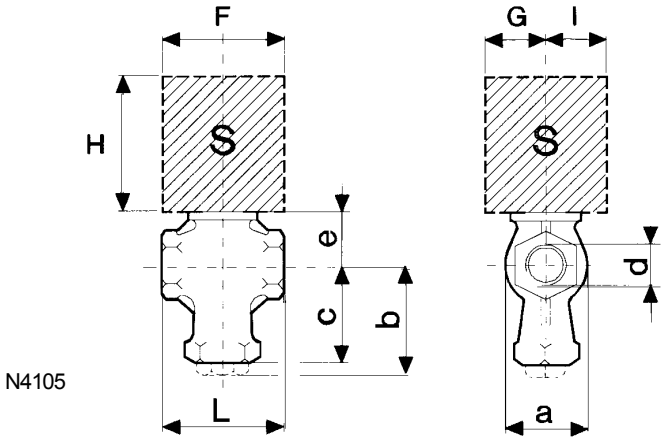
OVERALL DIMENSIONS (mm.)



N4105

S = Minimum required dimensions for actuator mounting

VALVE DIMENSIONS (mm)							WEIGHT (Kg.)
DN"	d	VSB-VMB			VSB	VMB	
		L	a	e	b	c	
1/2	G 1/2	80	54	17	70	70	1,1
3/4	G 3/4	85	54	34,5	79	67,5	1,1
1	G 1	95	62	39,5	83	72,5	1,5
1 1/4	G 1 1/4	108	70	43,5	90	78,5	2
1 1/2	G 1 1/2	120	81	51	98	85,5	2,7
2 (V.B8A)	G 2	194	97	54,5	111	97	5
2 (V.B8)	G 2	142	97	54,5	111	97	4

ACTUATOR DIMENSIONS (mm)				
	H	F	G	I
MVB	300	150	190	160
MVL	371	220	30	148
MVLA/C	371	220	58	148
SH	420	160	70	250
ST	420	160	70	210
PL600	470	300	200	200
PG300	142	Ø 190	95	95

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

Valve actuators

MVB

CE

MODEL	TIMING (s.)	POWER SUPPLY V~	ACTION
MVB 26	65	230	floating
MVB 46	65	24	floating
MVB 22	30	230	floating
MVB 28	420	230	floating
MVB 36	65	24	prop (165 ohm)
MVB 56	65	24	prop (V– or mA)
MVB 52	30	24	prop (V– or mA)

Timing refers to 16,5 mm standard stroke. For different strokes use the following formula:

$$\text{Stroke time (seconds)} = \text{Timing} \times \frac{\text{Stroke (mm)}}{16.5}$$

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,havng stroke from 10.8 to 20 mm.

Valve body	Nominal diameter	Model
PN 16	DN 1/2 "...2"	VSB (2 way)
PN 16	DN 1/2 "...2"	VMB (3 way)

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– and 0...200 uA) 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.

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 mm^2 wires
N.2 conduit opening	with a rubber membrane break through 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.
Input signal	
Floating	2 SPST connections
Proportional (pot.)	165 Ohm
Proportional control	
voltage (max 0.1 mA)	8...11 V/4...7 V/6...9 V/0...10 V/2...10 V/ 1...5 V
current (250 Ohm)	4…20 mA
Output signal (remote position indicator)	
voltage	0...10 /10...0 V– (2 mA max)
current	0...200 uA

Product conforms to EMC 89/336 directive with reference to: EN50081-1 for emission EN50082-1 for immunity

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
MVBPA2	For MVB46-P.c. board with 1 Kohm aux. potentiometer

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INSTALLATION

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 havingstroke 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, avaliable on request.

ELECTRONIC BOARD

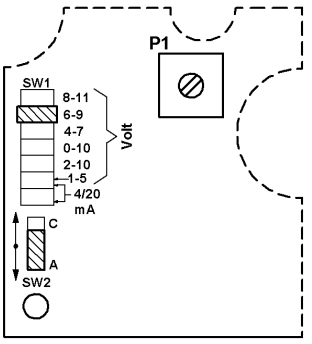


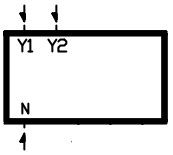
FIG. 1

N3099

TERMINAL BOARD — LEGEND

– MVB 2. (230 V~)

– MVB 46(24 V~)



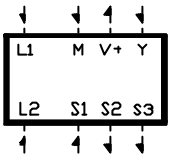
Y1 Joint up
N Common
Y2 Joint down

Input signal (1)

TERMINAL BOARD — LEGEND

– MVB 5.
– MVB 36

L1 — Power supply
L2 — 24 V ~ ±10%



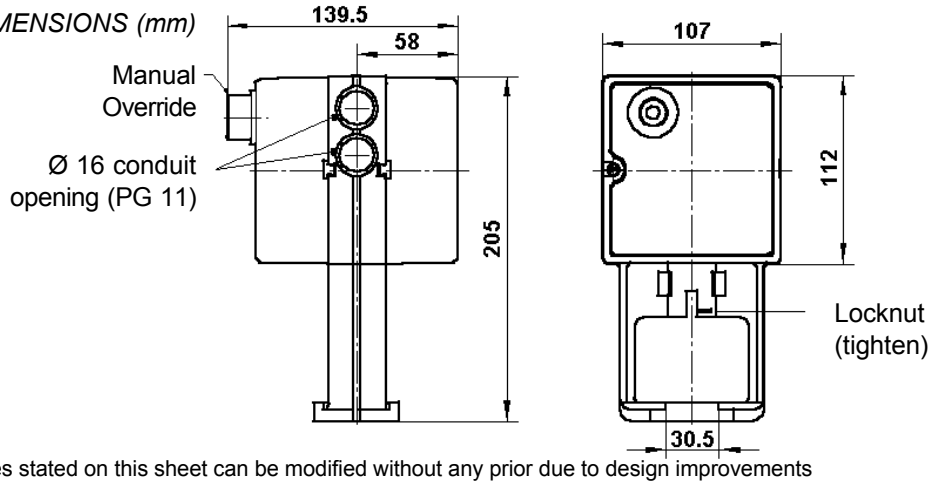
M Common
V+ Output +15 V- (2)
Y Input signal (3)

S3 0...10V- or 0...200 Ua
S2 10...0V- or 200...0 uA (4)
S1 Common (analogical)

N3009

(1) With voltage between N (Common) and Y1 (phase from controller contact): joint moves upwards. If voltage is between N and Y2: joint comes down. Without voltage the controller remains in the position gained.
(2) For MVB36 model connect the cursor of the controller potentiometer (165 ohm) to Y terminal , the ends to M and to V+ terminals
(3) The joint moves up when the jumper on SW2 is in A position (fig. 1) and the input signal increases.
(4) Connect the current input indicator to S3 (or S2) and S1 terminals.Connect the voltage input indicator to S3 (or S2) and M terminals. The left value of voltage (current) range corresponds to joint up.

OVERALL DIMENSIONS (mm)



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