

VML

**Solenoid safety valves for Air and Gas
Slow opening and fast closing type
DN10 ... DN80**

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VML2 - VML4

VML

Slow safety solenoid valve Class A – Group 2

The VML type valve is a slow opening single-stage solenoid valve, normally closed.

This type of device is suitable for air or gas blocking and releasing controls, required in gas power burners, atmospheric gas boilers, furnaces and others gas consuming appliances.

The VML type valves are made in accordance with EN161 standard (EC type examination certificate nr. 0063AQ1350).

1- Features

- ❑ Large range for inlet/outlet connections, from 3/8" to 3" pipes sizing.
- ❑ Provided with G1/4" pressure gauge on two sides in the inlet pressure chamber. Others gauge points on request.
- ❑ Optional G1/8" connection for closed position indicator micro switch (on request from 3/4" to 3").
- ❑ Fine mesh filter incorporated prevents dirty contamination of the seal seat.
- ❑ Maximum operating pressure 200 mbar or 360 mbar.
- ❑ Suitable for air and non-aggressive gases (EN 437, 1, 2 and 3 families).
- ❑ Easy adjustable flow rate, rapid stroke and opening time.
- ❑ Qualified for continuous service (100% ED) and endless ON/OFF cycles.
- ❑ Coil insulation is class H (180°C).
- ❑ Terminal box with PG connector.
- ❑ The large models are provided with a power saving electronic device, to reduce power consumption and working temperature.
- ❑ Valves are 100% tested by computerized testing machineries and are fully warranted.
- ❑ For valve identification see the following charts.

WARNING

- This control must be installed in compliance with the laws in force.
- Read instructions before use.
- Elettromeccanica Delta S.p.a. reserves the right to update or make technical changes without prior notice.

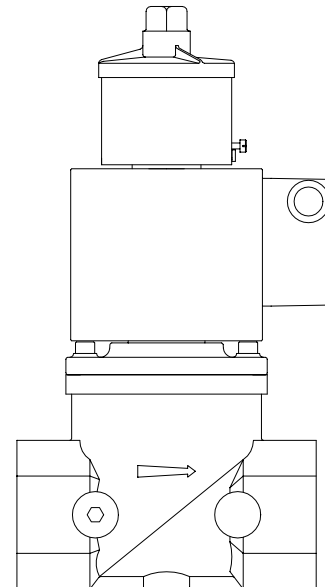


Fig. 1

2- Technical specifications

<i>Connections</i>	Gas threaded ISO 7/1 from Rp3/8" to Rp2" Flanged PN16 - ISO 7005 DN 65, DN 80
<i>Voltage rating</i>	230 VAC 50/60 Hz
<i>Voltage on request</i>	110 VAC 50/60 Hz
<i>Voltage tolerance</i>	-15% / +10%
<i>Power consumption</i>	see charts
<i>Environment temperature</i> ...	-15°C / +60°C
<i>Max. working pressure</i>	200 / 360 mbar
<i>Flow capacity</i>	see charts
<i>Seal</i>	NBR
<i>Closing time</i>	< 1 second
<i>Opening time</i>	adjustable from 4 to 25 s
<i>Protection class</i>	IP 54 (EN 60529)
<i>Cable gland</i>	PG09
<i>Overall dimensions</i>	see charts

3- Operation

The VML type valve is a safety shutting device using auxiliary power supply.

When it is de-energized, the spring pushes on the seal disc, keeping the gas passage closed. Now, the inlet chamber is under the gas line pressure, and it forces on the disc too, improving the seal.

When the coil is powered the valve opens rapidly or slowly, against the strength of the spring and gas pressure. The rapid stroke may be adjusted using the regulating screw on the top (see the *Service Instruction Section*), to adjust the initial gas flow. Main flow and opening time can be adjusted also.

If the power supply is shut off, the valve rapidly closes, interrupting the gas flow.

4- Accessories

A fine mesh filter is provided, to prevent dirty contamination of the seal seat. However, an external strainer must be installed upstream of the valve.

Inlet pressure area is provided with bilateral G1/4" gauges, to connect min/max adjustable pressure switches, leakage tester or other gas equipments. On request are available gauges in outlet area from DN32 model to DN50. These are standard from DN65 to DN80.

On request, valves are supplied with a G1/8" connection on the bottom, to installed a closed position indicator micro switch (from 3/4" to 3"). An adapting rod is provided too.

5- Coil features

The continuous service (100% ED) causes inevitable coil heating, depending of working environment. This situation is absolutely normal and has not to worry. To improve the coil cooling, install the valve allowing free air circulation.

The models from 1"¼ up to 3" are provided with a power saving electronic device. It has two stages of operation: full power is supplied to the coil while the valve is opening; low power is supplied while the valve is opened.

Coil and terminal box are provided with suitable gaskets, to avoid water and dirty contamination (see the *Service Instruction Section*).

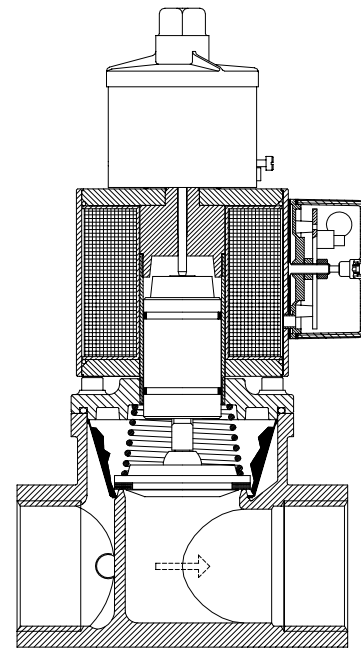


Fig. 2

6- General information

Backpressure sealing is compliant with the *Class A*: the maximum backpressure admitted, with leakage within the EN161 requirements, is 150mbar.

Maximum torsional stresses admitted are compliant with the *Group 2* of the EN161 standard.

All components are design to withstand any mechanical, chemical and thermal condition occurring during typical service.

Effective impregnation and surface treatments has been used to improve mechanical sturdiness, sealing and resistance to corrosion of the components.

Valves are suitable for use with air and non-aggressive gases included in the 1, 2 and 3 families (EN 437).

Materials used:

- Aluminium
- Brass
- Stainless steel
- Nitrile rubber (NBR)
- Ethylene propylene (EPDM)
- Fluoroelastomer (FPM)
- PTFE

7- Valve identification

Connections type		230V AC		110V AC		24V AC/DC		12V AC/DC	
Threaded	Flanged	360 mbar	200 mbar	360 mbar	200 mbar	200 mbar	130 mbar	200 mbar	130 mbar
3/8"		VML0		VML0B					
1/2"		VML1		VML1B					
3/4"		VML2		VML2B					
1"		VML3		VML3B					
1 ¹ / ₄ "		VML35		VML35B					
1 ¹ / ₂ "		VML4		VML4B					
2"		VML6		VML6B					
	DN 65 (*)	VML7	VML72	VML7B	VML72B				
	DN 80 (*)	VML8	VML82	VML8B	VML82B				

(*) V_{start} 3 mm minimum.

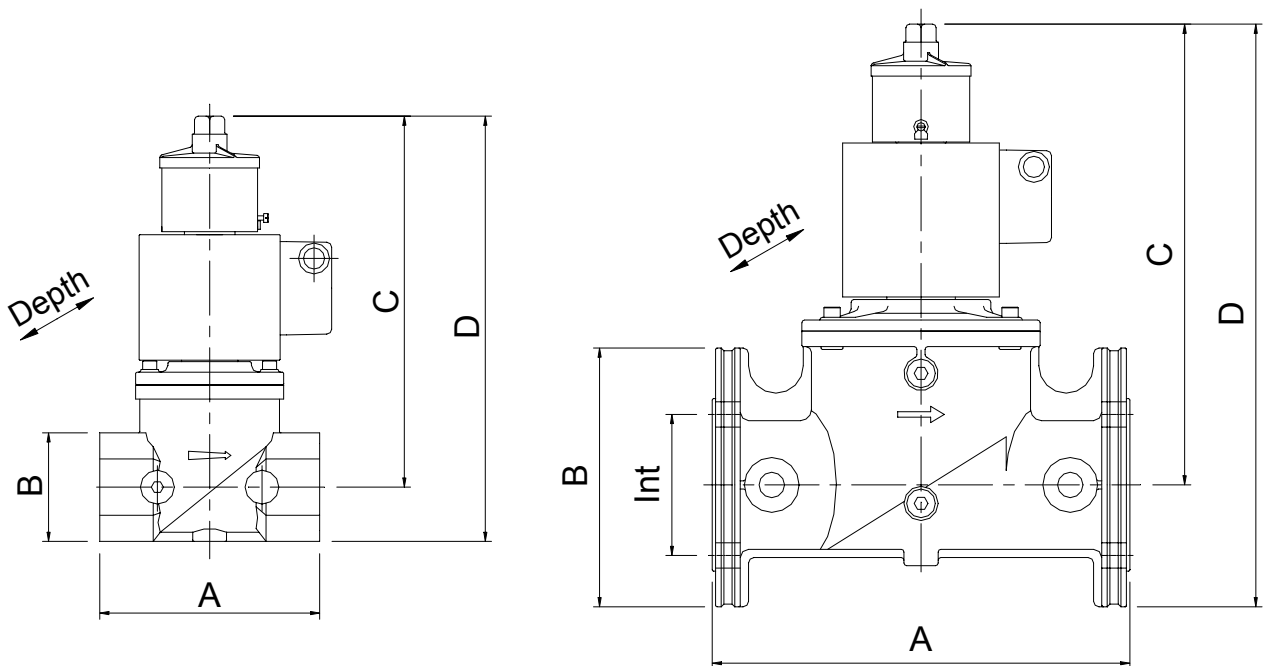
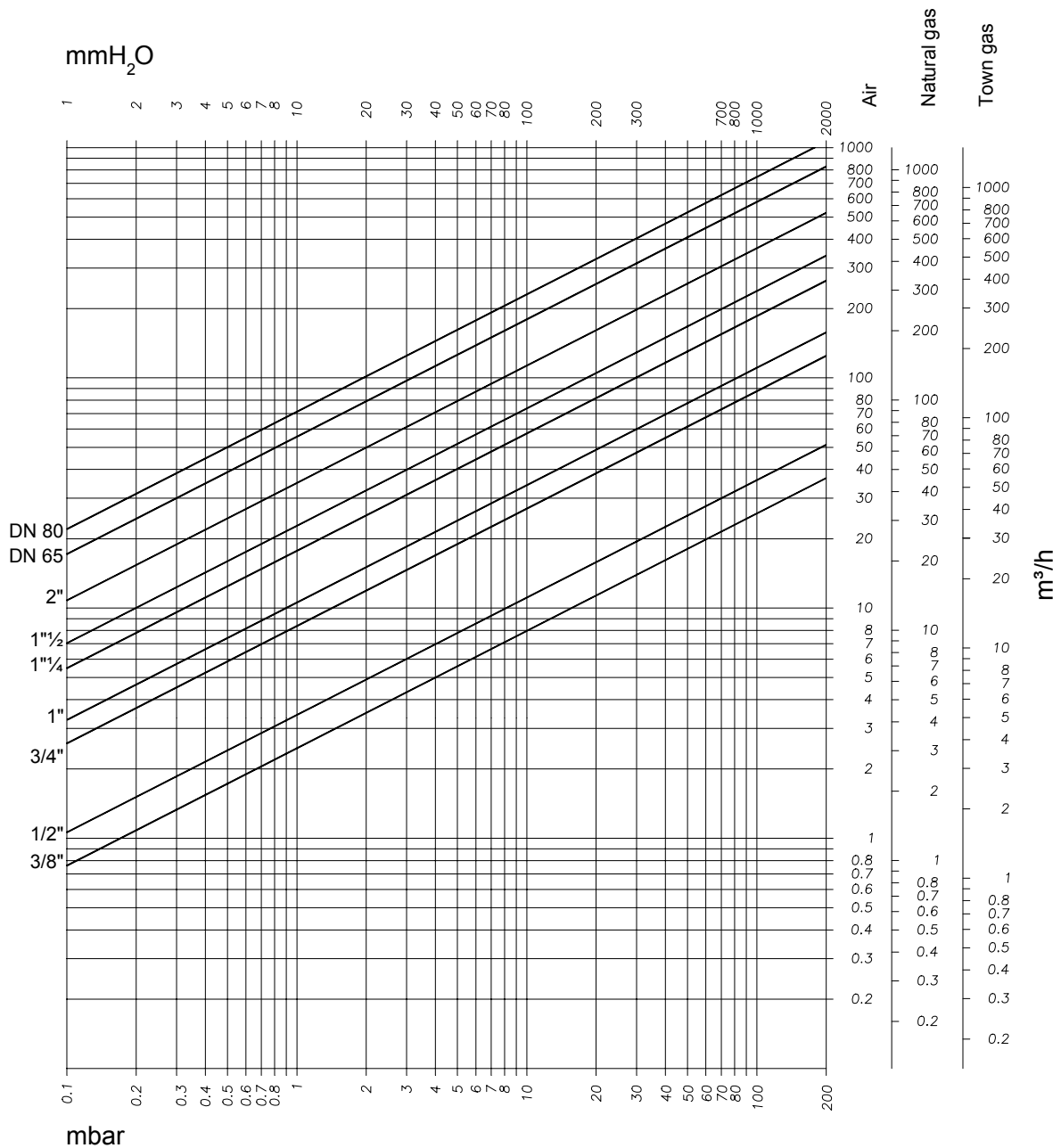


Fig. 3

Model	Connections	Maximum Pressure (mbar)	Power Consump. (W)	Overall Dimensions (mm)							Weight (Kg)
				A	B	C	D	Depth	Int	Holes	
VML0	3/8"	360	20	77	32	180	196	88	-	-	1.8
VML1	1/2"	360	20	77	32	180	196	88	-	-	1.8
VML2	3/4"	360	45	96	46	200	222	88	-	-	2.7
VML3	1"	360	45	96	46	200	222	88	-	-	2.7
VML35	1 ¹ / ₄ "	360	45/180*	153	65	258	290	120	-	-	6
VML4	1 ¹ / ₂ "	360	45/180*	153	65	258	290	120	-	-	6
VML6	2"	360	45/180*	156	77	264	302	106	-	-	6.3
VML7	DN 65	200/360	60/240*	305	190	335	424	200	145	4x18	14.5
VML8	DN 80	200/360	60/240*	305	190	335	424	200	160	8x18	14.5

(*) Working/Opening

8- Loss of pressure



Formula of conversion from air to other gases

Gas type	Specific gravity (kg/m ³)	K
Natural Gas	0.80	1.25
Town Gas	0.57	1.48
Liquid Gas	2.08	0.77
Air	1.25	1.00

+15°C, 1013 mbar, dry

$$V_{\text{AIR}} = \frac{V_{\text{GAS TO BE USED}}}{K}$$

$$K = \sqrt{\frac{\text{AIR SPECIFIC GRAVITY}}{\text{GAS SPECIFIC GRAVITY}}}$$

9- Valve installation

Verify the line pressure is lower of the maximum working pressure admitted to the valve.

Check correspondence of flow direction with arrow printed on valve body.

Check correct alignment of connecting pipes and allow enough space from the walls to allow free air circulation.

Make sure no foreign body is entered into the valve during handling.

Install in an area that is protected from rain and water splashes or drops.

Threaded models:

1. Put sealing agent onto the pipe thread (avoid excessive quantities of fittings glue which could enter in the valve and damage the seal seat).
2. Screw the pipes using proper tools only. Do not use unit as lever because damage to the valve stem could result.

Flanged models:

1. Position the gasket and insert the bolts.
2. Screw the nuts tightening them crosswise and using proper tools only.

Avoid overtightening and mount tension free.

Following chart shows the maximum values of bending moment (F_{max}), torque (T_{max}) and screws driving torque (C_{max}), according with EN13611.

DN	F_{max} (Nm) $t < 10$ s	T_{max} (Nm)	C_{max} (Nm)
3/8"	70	35	-
1/2"	105	50	-
3/4"	225	85	-
1"	340	125	-
1 1/4"	475	160	-
1 1/2"	610	200	-
2"	1100	250	-
65	1600	-	50
80	2400	-	50

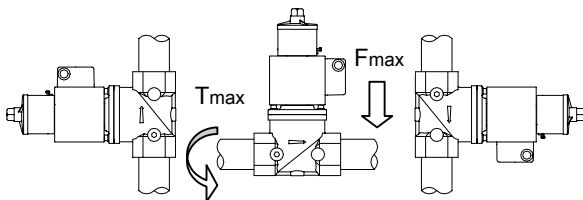


Fig. 4

Valve may be mounted with coil in horizontal or vertical position. Coil may be oriented 360 degrees in any direction.

10- Electrical connections (IEC 730-1)

Check correspondence between valve voltage rating and line power supply, before making any electrical connections.

1. Switch off power supply and remove protection cover.
2. Connect power cables to rectifier circuit terminal board.
3. Should cables pass through originally closed opening, use the rubber disc placed underneath the box plug to close any other opening.
4. Screw back the box cover, taking care to use all gaskets properly, because this could condition the valve life duration.

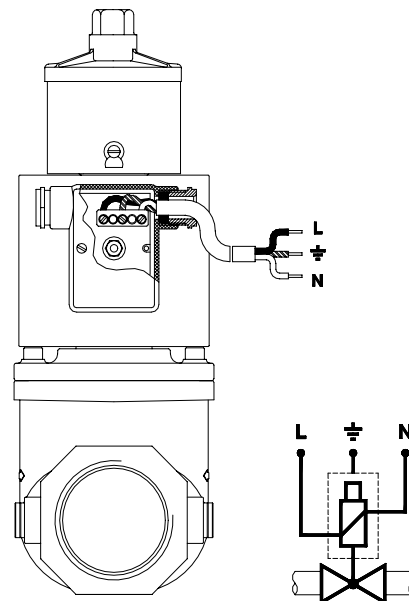


Fig. 5

WARNING

- To prevent product damage and dangerous situations, read the Installation and Service Instructions carefully.
- Turn off all power before servicing any part of the system.
- Perform leak and functional tests after mounting. A gas leak detection spray may be used also.
- Coil and terminal box must be replaced with identical spare parts only.
- If the coil is turned, make sure the brake is properly tightened and the coil is locked.
- Use all gaskets properly (void warranty).
- All wiring must be in compliance with local and national codes.
- Make sure all works are performed by qualified technicians only.

11- Fast stroke adjustment (Vstart)

Fast flow section may be adjusted:

1. Remove plastic cap.
2. Using an hexagonal wrench, turn the outer screw clockwise to decrease or counter-clockwise to increase the initial fast stroke.
3. When adjustment is completed, screw back the plastic cap.

NOTE: in the DN65 and DN80 models the minimum adjustable stroke is 3 mm.

12- Flow rate adjustment (Vmax)

Flow rate may be adjusted from 0 cubic meters/h up to the maximum admitted:

1. Remove plastic cap.
2. Keeping the outer screw fixed, use a screw driver to turn the internal screw clockwise to decrease or counter-clockwise to increase flow rate (factory setting is max. flow rate).
3. When adjustment is completed, screw back the plastic cap.

NOTE: the flow rate regulation can not be lower than the fast flow section.

13- Opening time adjustment (T)

To regulate opening time, turn the screw located on the side of the brake. One fourth of a turn clockwise increases opening time by 2÷3 s, up to a maximum of about 25 s (slow run).

Factory setting is about 12÷14 s.

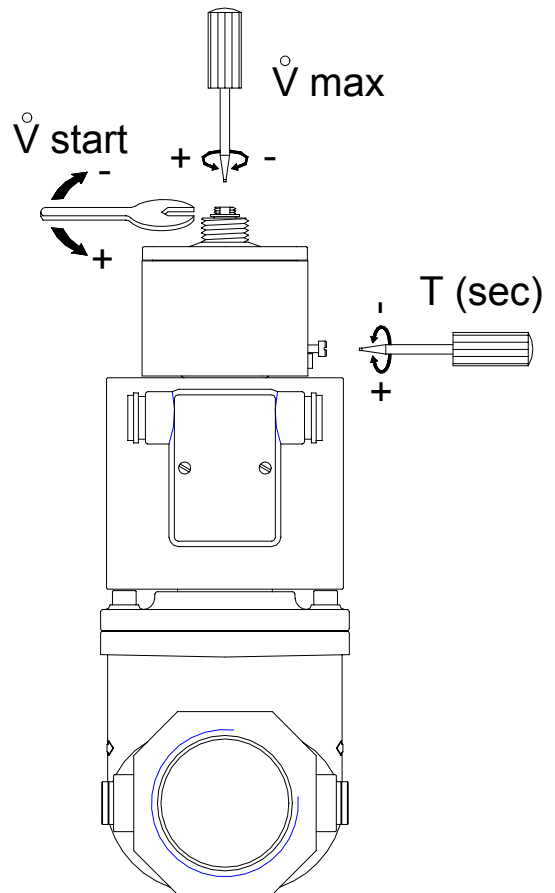


Fig. 6

14- Coil replacement

Before to start with coil replacement, make sure it is the cause of failure.

To perform coil replacement do the following:

1. Make sure an identical one spare part is available.
2. Switch off power supply and remove the box cover.
3. Disconnect the wires from terminal board.
4. To remove brake, turn it counter clockwise.
5. Extract and replace coil.
6. Reassemble following the inverse sequence.

WARNING

- Perform the fast stroke adjustment before of the flow rate adjustment.
- Make sure that capacity adjustments are made while burner is working.
- Check the regulation is not changed during reassembly.
- Adjustments below 40% of capacity are unadvisable because they may cause turbulence.

WARNING

- When reassemble, use all gaskets properly.
- Perform functional test after mounting.
- All works must be executed by qualified technicians only and in compliance with local and national codes.