

## PNEUMATIC VALVES

### Pneumatic valves

#### Vip - Pneumatic coaxial valve

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## Features

### GENERAL FEATURES

Both Double Acting and Spring Return VIP valves (either Normally Open or Normally Closed) are available in sizes ranging from 3/8" to 2".

Unidirectional flow.

GAS threaded ends as per UNI/ISO 7/1 Rp - DIN 2999 (NPT threads on request) with control fluid connections as per NAMUR interface.

Improved fluid dynamics allow minimum pressure losses. See Flow Pressure Diagram.

VIP valves can be used in any mounting position (horizontal, vertical or oblique). They can be provided with seals in NBR, FKM or EPDM:

- NBR: suitable for air, gas, oils, water etc..
- FKM: perfectly suitable for most fluid. Unsuitable for steam.
- EPDM: perfectly suitable for hot water and steam. Unsuitable for mineral products (oils, grease, etc..).

For further information about gas, explosive fluids, material compatibilities etc. please contact our technical department.

Valve opening and closing can be signalled by means of external magnetic limit switches (to be requested on ordering the valves, as they cannot be assembled afterwards).

According to 97/23 EC "PED" - ATEX version in conformity with directive 94/9/EC (to request at time of order)

### CONTROL MEDIA

Filtered compressed air, not necessarily lubricated. At temperatures from -20°C to 0°C, use dry air. In case of lubricated air, seal compatible oil must be used.

Air supply:


- 3 bar min.- 8 bar max. in Double Acting execution.
- 4,2 bar min.- 8 bar max. in Spring Return execution.

### OPERATING MEDIA

Pressure: 10 bar max, see diagram

Temperature:

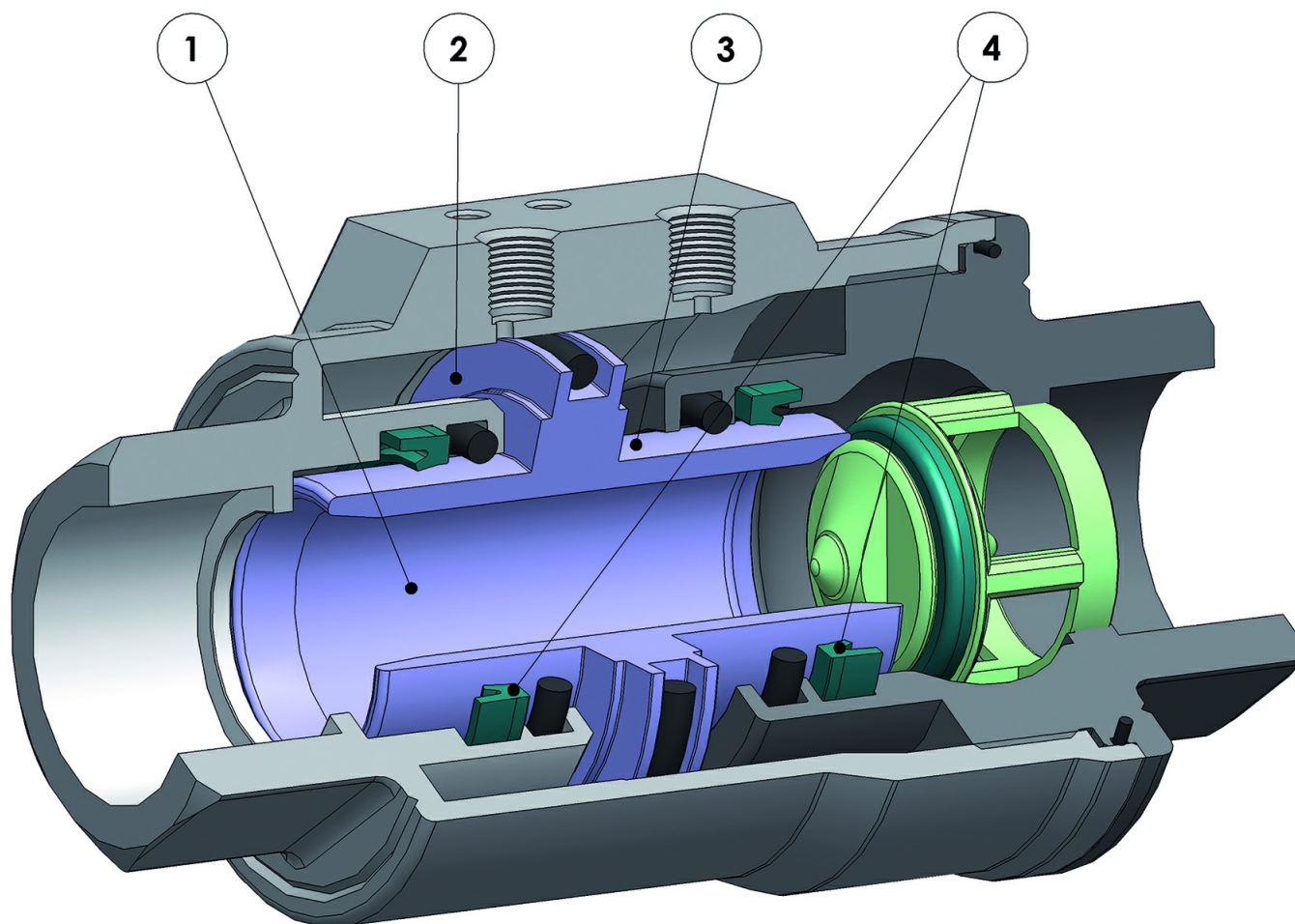
- from -20°C to +80°C (NBR);
- from -20°C to +150°C (FKM);

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- from -20° C to +150° C (EPDM).

Vacuum tightness: 740 mm Hg

## Features & benefits



FEATURES & BENEFITS		
1	Internal diameter equal to the diameter of the pipe	High flow capacity
2	Pneumatic actuator integrated in the valve	Space saving (-60%) and reduced costs compared to an automated valve
3	Piston with chemical nickel plating	High corrosion resistance
		Lower wear of the seals due to the increase of the surface hardness (400 -550 HV)
4	Lip seals	Less wear of the seal comparing with an o-ring
		Several seal materials available
	No external moving parts	Maximum safety
		Easy mounting
	Long life time granted	Lifetime 10 times longer than a ball valve with with reduced maintenance costs
	100% in- house manufacturing process technology	Maximum control and accuracy in all the stages of the manufacturing process
	Less Air consumption	80% less air consumption compared to an actuated valve with SR pneumatic actuator therefore less load on the compressor or the possibility of using a smaller compressor's size.

	ATEX Certificate	Installation is allowed in a potential explosive environment
	PED Certificate	Full compliance with European Safety Standards for Pressure Equipment

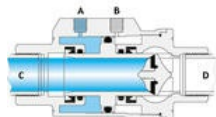
# Working principle

## WORKING PRINCIPLE

A VIP valve (patented by OMAL exclusively) is a proper automatic valve embodying both interception device (between pipe C-D) and control device (A-B).

It works thanks to the internal movement of a piston supplied with air. At the end of its stroke (a VIP valve is an ON/OFF valve), the piston presses on the seat seal or moves away from it letting the intercepted fluid flow or stopping it from flowing. As the seat is perfectly tight and the intercepted fluid pressures discharge on it, the pressure necessary to move the piston is completely independent of the fluid pressure. As a result OMAL has been able to design a light space saving and lasting valve. Its full bore and its improved internal dynamics allow minimum pressure losses, too.

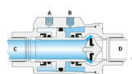
### CLOSED VALVE



Supplying the hole "A" with air (the hole "B" must be discharging) at the end of its stroke the piston presses on the seat seal: the valve is closed.

As in Spring Return N.C. executions the spring is in "A", if there is no control, the piston will touch the seat seal: therefore, the preferable position is the closed one.

### TRANSITIONARY PHASE

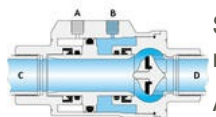


During the transitional phase (the picture shows the opening transition in a Double Acting execution), one of the two holes is supplied. The piston moves axially changing the previous closed or open state. In Spring Return N.C. executions, the closing is caused by the spring (if there is no control).

In Spring Return N.O. executions, the opening is caused by the spring (if there is no control).

Both opening and closing transitional phases last less than a second.

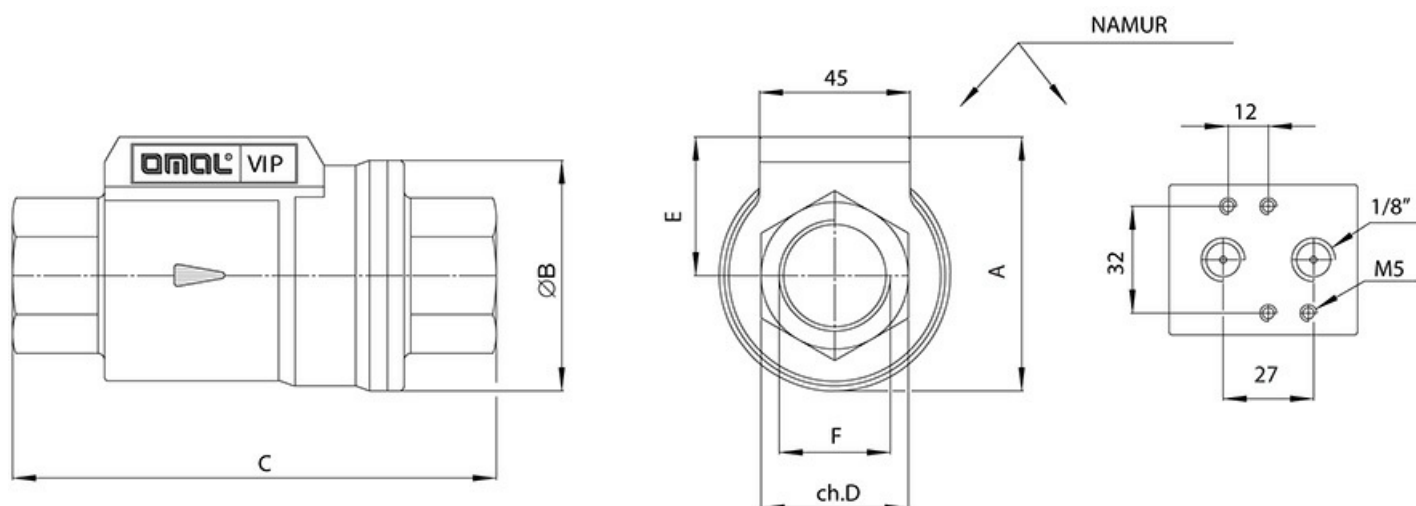
### OPENED VALVE



Supplying the hole "B" with air (the hole "A" must be discharging) at the end of its stroke the piston is at maximum distance from the seat seal: the valve is open.

As in Spring Return N.O. executions the spring is in "B", if there is no control, the piston will be away from the seat seal: therefore, the preferable position is the open one.

# Dimensions and codes



## DIMENSION TABLE

DN nominal diameter	mm.	10	15	20	25	32	40	50
size	GAS.	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"
bore	mm.	10	15	20	25	32	40	50
A	mm.	54	60	70	76	92	102	115
øB	mm.	46	51,7	63,5	69	86	96	109
C	mm.	98	112	135	143	165	180	207
ch. D	mm.	22	27	33	41	50	60	75
E	mm.	31	34	39	42	49	54	60
double acting air	dm <sup>3</sup> /cycle	0,024	0,035	0,063	0,080	0,150	0,219	0,310
spring return air	dm <sup>3</sup> /cycle	0,012	0,017	0,031	0,040	0,075	0,109	0,155
weight double acting "DA"	Kg.	0,80	1	1,59	1,8	3,13	3,5	5,5
weight spring return "SR"	Kg.	0,85	1,05	1,69	1,88	3,41	3,7	5,8

## VIP CODE WITH SEALING IN NBR

nominal diameter mm.	10	15	20	25	32	40	50
VIP code double acting "DA"	VDA10003	VDA10004	VDA10005	VDA10006	VDA10007	VDA10008	VDA10009
VIP code "DA" + 1 limit switch	VDA10603	VDA10604	VDA10605	VDA10606	VDA10607	VDA10608	VDA10609
VIP code "DA" + 2 limit switch	VDA10703	VDA10704	VDA10705	VDA10706	VDA10707	VDA10708	VDA10709
VIP code spring return "SR" N.O.	VNA10003	VNA10004	VNA10005	VNA10006	VNA10007	VNA10008	VNA10009
VIP code "SR" N.O. + 1 limit switch	VNA10603	VNA10604	VNA10605	VNA10606	VNA10607	VNA10608	VNA10609
VIP code "SR" N.O. + 2 limit switch	VNA10703	VNA10704	VNA10705	VNA10706	VNA10707	VNA10708	VNA10709
VIP code spring return "SR" N.C.	VNC10003	VNC10004	VNC10005	VNC10006	VNC10007	VNC10008	VNC10009
VIP code "SR" N.C. + 1 limit switch	VNC10603	VNC10604	VNC10605	VNC10606	VNC10607	VNC10608	VNC10609
VIP code "SR" N.C. + 2 limit switch	VNC10703	VNC10704	VNC10705	VNC10706	VNC10707	VNC10708	VNC10709

## VIP CODE WITH SEALING IN FKM

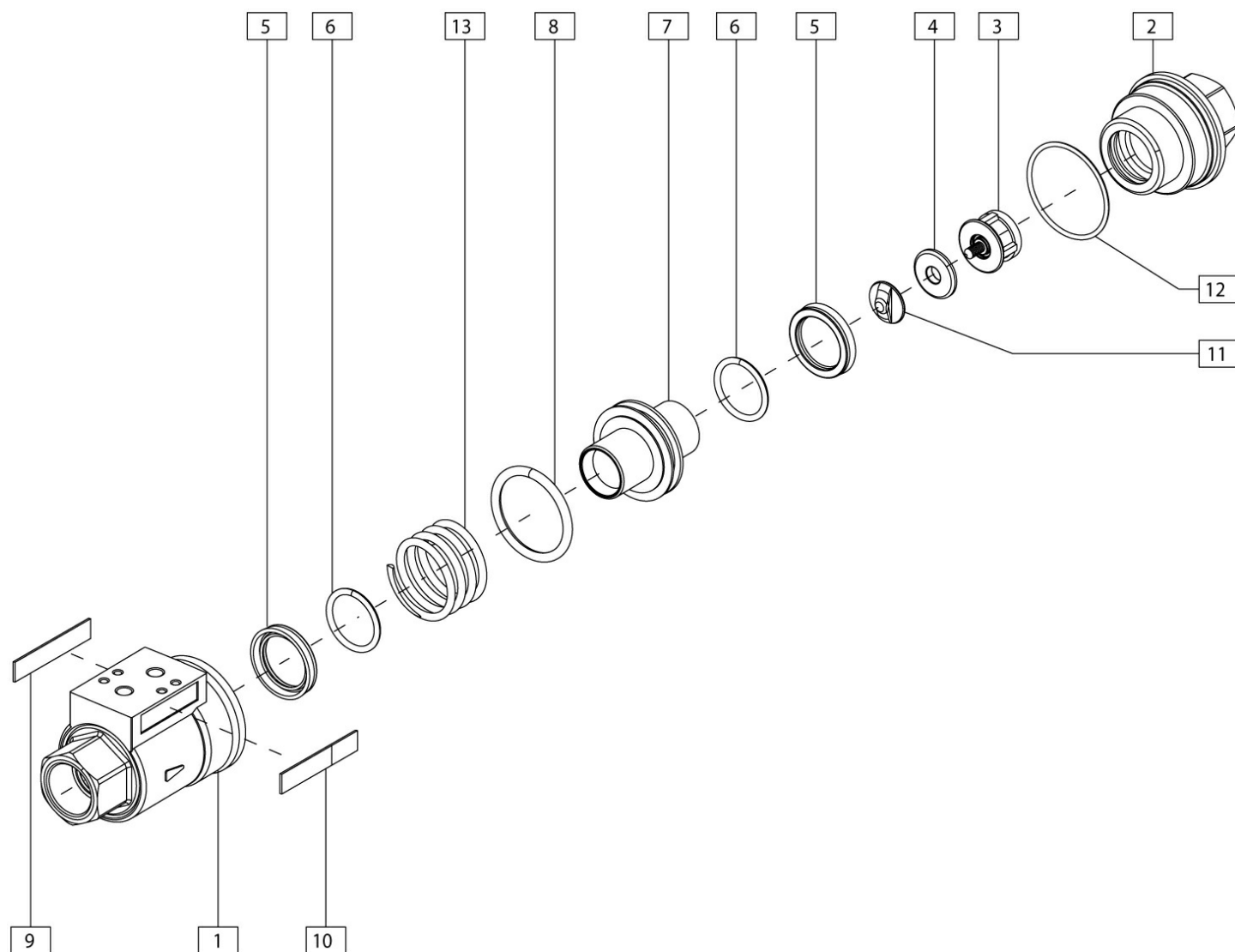
VIP code double acting "DA"	VDA20003	VDA20004	VDA20005	VDA20006	VDA20007	VDA20008	VDA20009
VIP code DA+1 limit switch	VDA20603	VDA20604	VDA20605	VDA20606	VDA20607	VDA20608	VDA20609
VIP code DA+2 limit switch	VDA20703	VDA20704	VDA20705	VDA20706	VDA20707	VDA20708	VDA20709

VIP code spring return "SR"N.O.	VNA20003	VNA20004	VNA20005	VNA20006	VNA20007	VNA20008	VNA20009
VIP code "SR" N.O.+1 limit switch	VNA20603	VNA20604	VNA20605	VNA20606	VNA20607	VNA20608	VNA20609
VIP code "SR" N.O.+2 limit switches	VNA20703	VNA20704	VNA20705	VNA20706	VNA20707	VNA20708	VNA20709
VIP code spring return"SR" N.C.	VNC20003	VNC20004	VNC20005	VNC20006	VNC20007	VNC20008	VNC20009
VIP code "SR" N.C.+1 limit switch	VNC20603	VNC20604	VNC20605	VNC20606	VNC20607	VNC20608	VNC20609
VIP code"SR"N.C.+2 limit switches	VNC20703	VNC20704	VNC20705	VNC20706	VNC20707	VNC20708	VNC20709
Degreased execution for oxygen applications	VNC90503	VNC90504	VNC90505	VNC90506	VNC90507	VNC90508	VNC90509
Spare seals KIT	KGVV0103	KGVV0104	KGVV0105	KGVV0106	KGVV0107	KGVV0108	KGVV0109

#### VIP CODE WITH SEALING IN EPDM

nominal diameter mm.	10	15	20	25	32	40	50
VIP code double acting "DA"	VDA30003	VDA30004	VDA30005	VDA30006	VDA30007	VDA30008	VDA30009
VIP code "DA" + 1 limit switch	VDA30603	VDA30604	VDA30605	VDA30606	VDA30607	VDA30608	VDA30609
VIP code "DA" + 2 limit switch	VDA30703	VDA30704	VDA30705	VDA30706	VDA30707	VDA30708	VDA30709
VIP code spring return "SR" N.O.	VNA30003	VNA30004	VNA30005	VNA30006	VNA30007	VNA30008	VNA30009
VIP code "SR" N.O. + 1 limit switch	VNA30603	VNA30604	VNA30605	VNA30606	VNA30607	VNA30608	VNA30609
VIP code "SR" N.O. + 2 limit switch	VNA30703	VNA30704	VNA30705	VNA30706	VNA30707	VNA30708	VNA30709
VIP code spring return "SR" N.C.	VNC30003	VNC30004	VNC30005	VNC30006	VNC30007	VNC30008	VNC30009
VIP code "SR" N.C. + 1 limit switch	VNC30603	VNC30604	VNC30605	VNC30606	VNC30607	VNC30608	VNC30609
VIP code "SR" N.C. + 2 limit switch	VNC30703	VNC30704	VNC30705	VNC30706	VNC30707	VNC30708	VNC30709

# Exploded and material table



13\* Only for spring return version

## MATERIAL TABLE

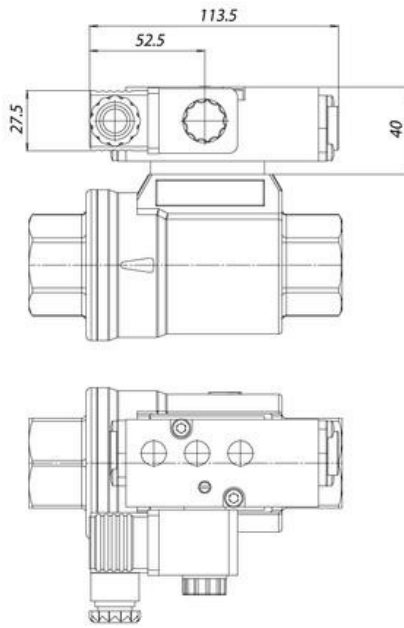
Pos.	Description	Q.ty	Material	Standard treatment
1	body	1	brass	EN 12165 CW617N - nickel plated
2	sleeve	1	brass	EN 12165 CW617N - nickel plated
3	seat	1	brass	EN 12165 CW617N - nickel plated
4**	seat-seal	1	NBR/FKM/EPDM	
5**	lip seal	2	NBR/FKM/EPDM	
6**	stem O-ring	2	NBR/FKM/EPDM	
7	piston	1	brass	EN 12164 CW614N - nickel plated
8**	piston O-ring	1	NBR/FKM/EPDM	
9	technical label	1	Polyestere	
10	OMAL label	1	Polyestere	
11	seat nut	1	brass	EN 12164 CW614N - nickel plated
12**	sleeve O-ring	1	NBR/FKM/EPDM	
13	spring (only for SR)	1	Stainless steel	

\*\* Components of spare part kit

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## Accessories - NAMUR solenoid valve



### Solenoid valve 5/2 as per NAMUR

This solenoid valve is designed for the selection of the functions 5/2 and 3/2, which is realized by using wing the appropriate plate.

Full-working input power - D.C.: 2,5 W

Full-working input power - A.C.: 2 W

Supply voltage tolerances: +/- 10%

Coil insulation: F-class

Protection with connector: IP65

Electric connection: PG 9

Pneumatic connections: inlet 1/4"; outlet 1/8" ISO 228

Max. pressure: 10 bar

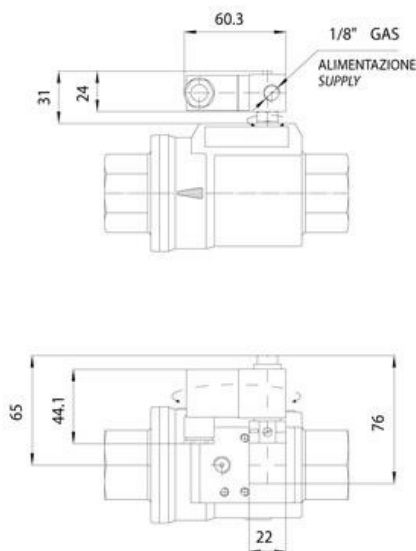
Operating media temperature: from -10°C to +80°C

Ambient temperature: from -10°C to +50°C

**Namur solenoid valve**

Solenoid valve	ER8188A2	ER8188A4	ER8188A5	ER8188C2	ER8188C4
Voltage	24V AC	115V AC	230V AC	24V DC	110V DC

## Accessories - Micro solenoid



### Micro solenoid valve

This solenoid valve is connected by a joint which fits directly to the actuator air intake, without other fittings or fixing screws.

3/2 solenoid valve, with solenoid available in the following voltages: 24-110-220V AC; 12-24V DC.

Starting input power - A.C.: 9 VA

Full-working input power - D.C.: 5 W

Full-working input power - A.C.: 6 VA

Supply voltage tolerances: +/- 10%

Copper wire insulation: H-class

Coil insulation: F-class

Protection with connector: IP65

Electric connection: PG 9 any orientation acceptable 360°

Pneumatic connections: 1/8" ISO 228 any orientation acceptable 360°

Max. pressure: 10 bar

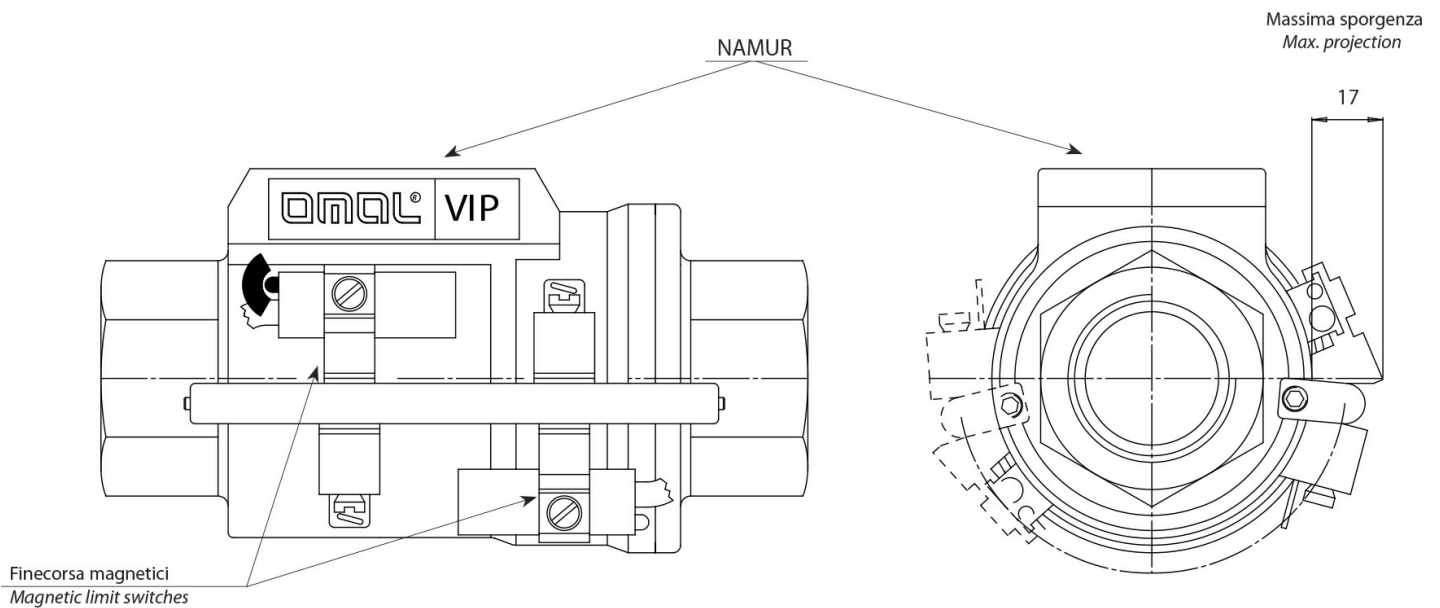
Operating media temperature: from -10°C to +50°C

Ambient temperature: from -10°C to +50°C

∅ Bore 1,3 mm

Micro solenoid valve					
Solenoid valve	EP415024	EP415110	EP415220	EP412012	EP412024
Voltage	24V AC	115V AC	230V AC	12V DC	24V DC

# Accessories - Magnetic limit switches

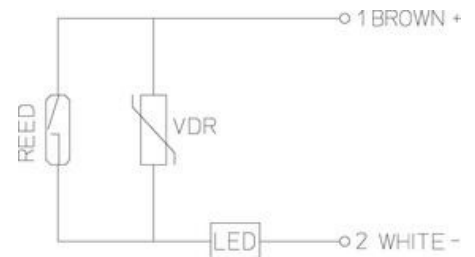


A VIP valve can be provided with magnetic limit switches and signalling LED.

Limit switches are supplied with a KIT which makes it possible to fix them on the outside easily and quickly.

Since the magnets are situated inside the valve, they must be assembled while mounting the VIP and not afterwards.

That's the reason why the limit switches must be requested on ordering the valve.

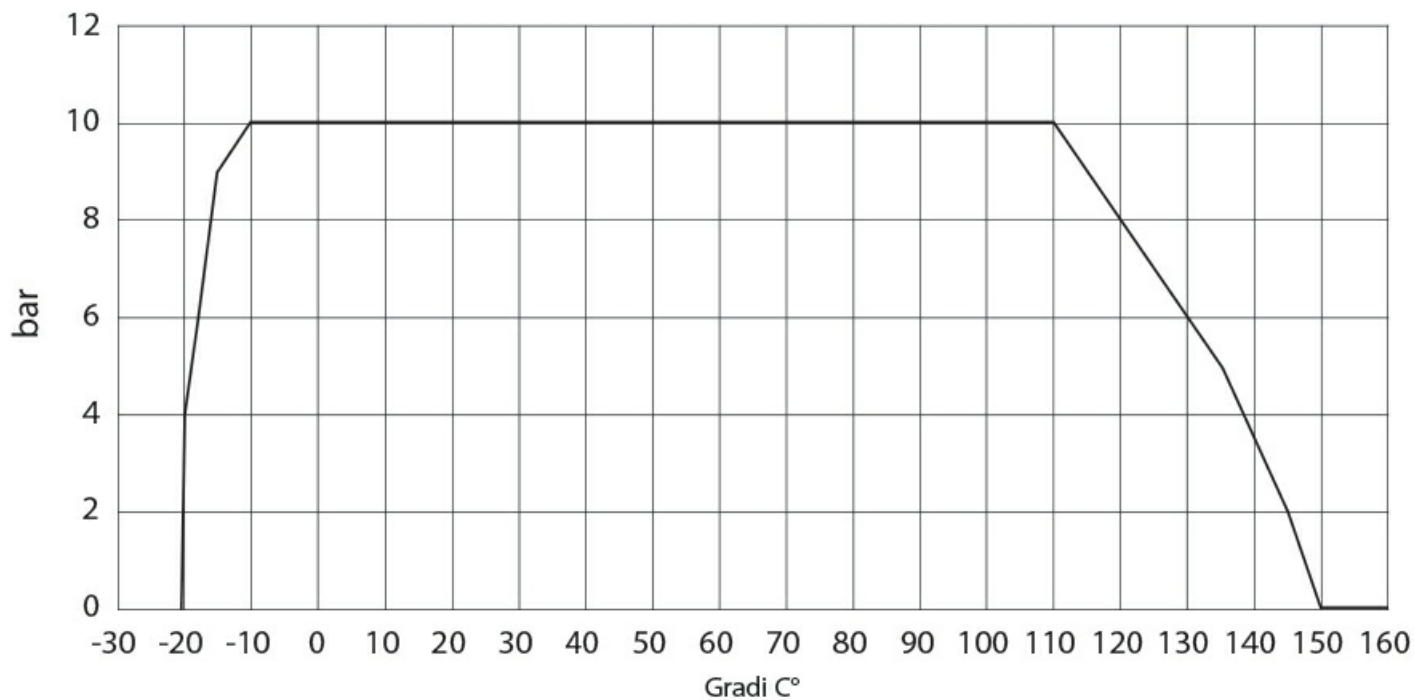


LIMIT-SWITCH ELECTRICAL FEATURES	
Switch indicator	LED
Protection level	IP 67
Nominal voltage with direct current	3 - 250 V dc
Nominal voltage with alternating current	3 - 250 V ac
Maximum voltage drop	2,5 V
Maximum power with direct current	50 W
Maximum power with alternating current	50 VA
Maximum current at 25 °C (resistive load)	1 A
Protection against inductive tension peaks	250 VR
Inverse polarity protection	
Maximum applicable load (coil with overvoltage suppressor)	10 W
Maximum applicable load (simple coil)	10 W
Maximum applicable load (PLC)	
Electric life (resistive load 20% max. power short distance between load and switch)	10x10 <sup>6</sup>
Repeatability	0,1 mm
Operating time (resistive load)	2 ms
Release time (resistive load)	0,1 ms
Working temperature	-30 / +80 °C

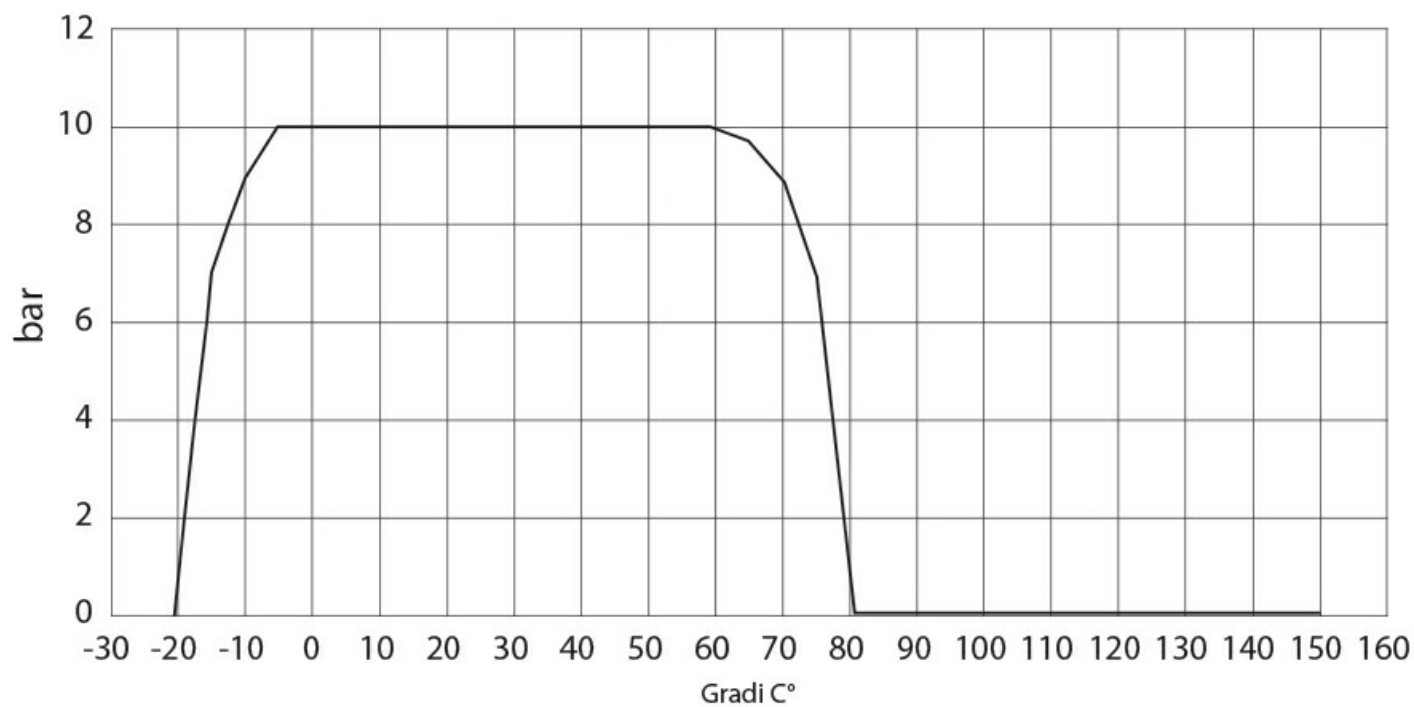
Impact resistance (11ms)	50 g
Vibration resistance	1000 Hz
Sensor type	1
Connecting cable 2m	n° 2 fili

# Diagrams and Working plan

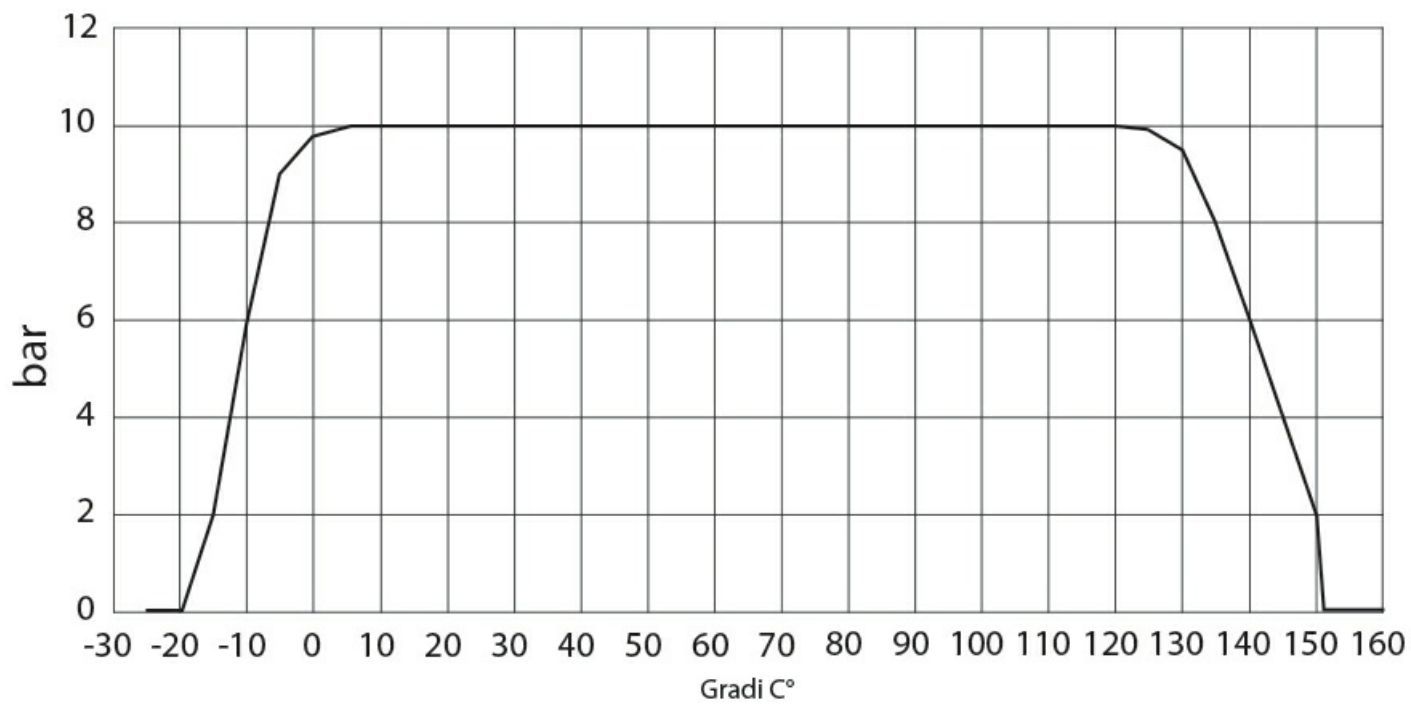
VIP EPDM PRESSURE TEMPERATURE DIAGRAM



VIP NBR PRESSURE TEMPERATURE DIAGRAM

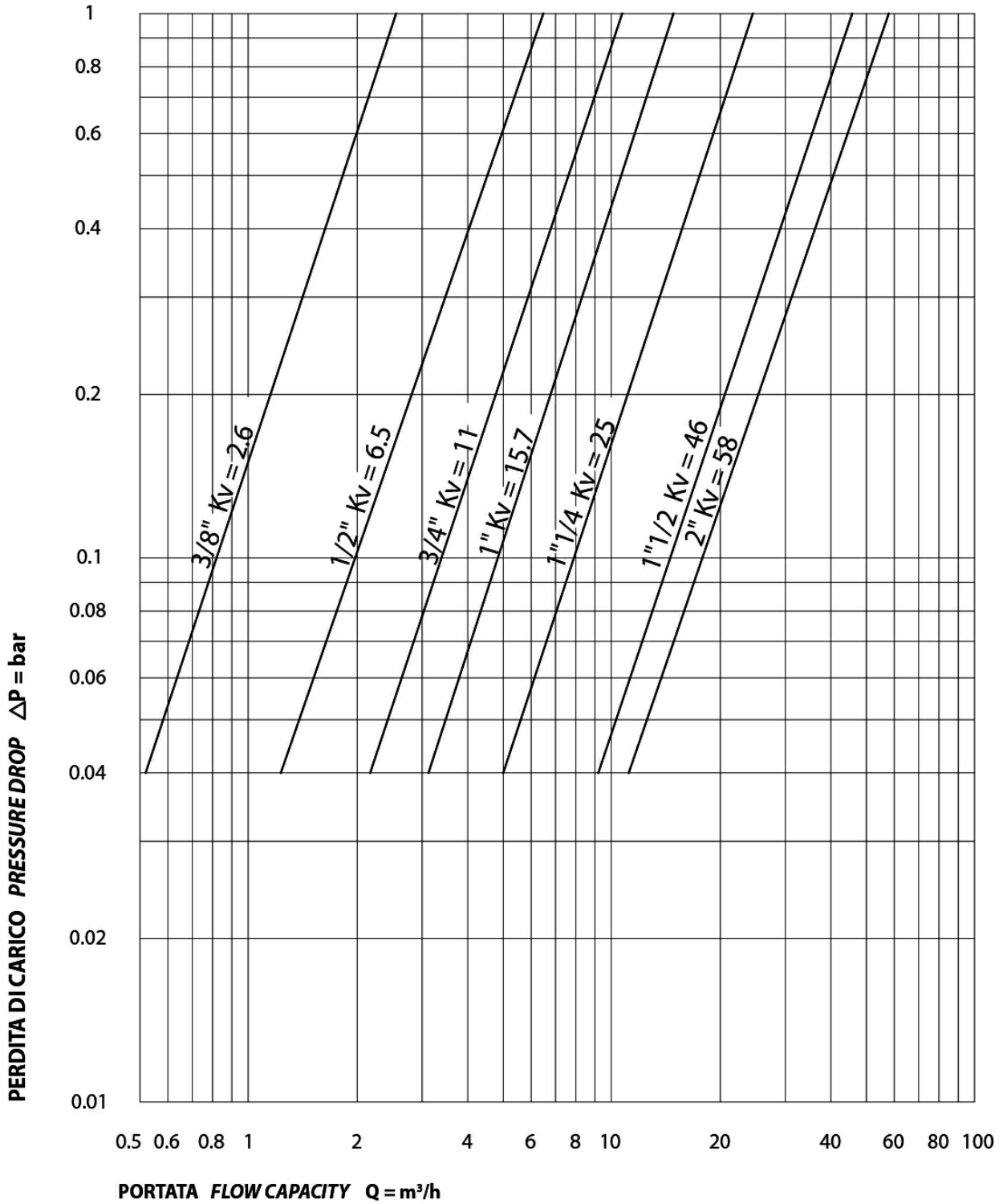


VIP FKM PRESSURE TEMPERATURE DIAGRAM



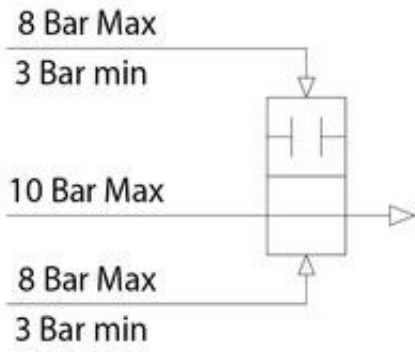
FLOW PRESSURE DROP DIAGRAM AND Kv NOMINAL COEFFICIENT

Il valore Kv é il valore di portata in mc/h (con acqua a 15°C) provocante la caduta di pressione di 1 bar.  
*Kv is the coefficient, expressed in mc/h (with water at 15°C) causing a pressure loss of 1 bar.*

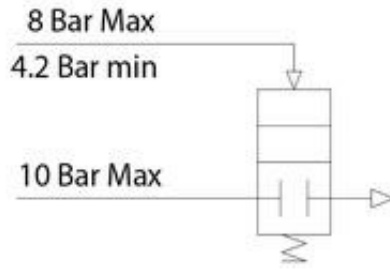


Kv is the coefficient, expressed in mc/h (with water at 15°C) causing a pressure loss of 1 bar.

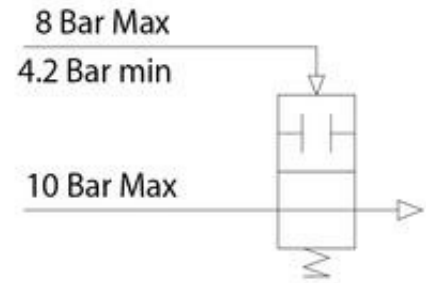
**WORKING PLAN**



Double acting VIP Working plan



Spring return Normally closed VIP Working plan



Spring return Normally open VIP Working plan