OMAL AUTOMATION

EMPOWERED PERFORMANCE

IT EN DE FR ES

INSTRUCTION MANUAL

VIP EVO

PNEUMATIC COAXIAL VALVE - PN40 / 580 psi

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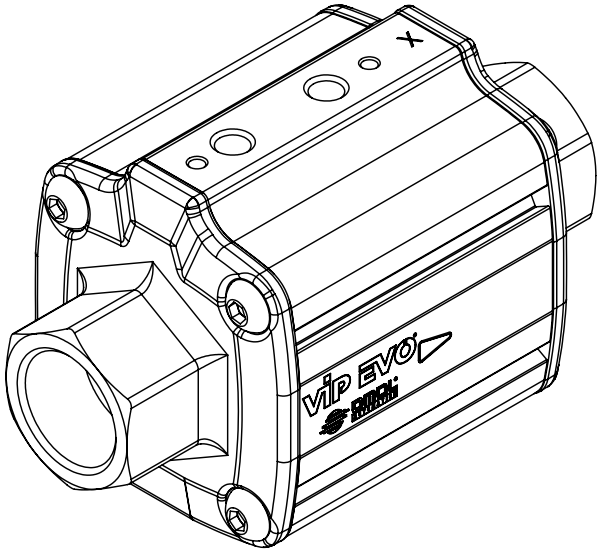
Environmentally friendly: under the green leaf icon you can find the instructions for a correct and environmentally friendly handling of the product.



OMAL reserves the right to change, at any time, features and data of its own products, to better improve their quality and lifetime.

FOREWORD

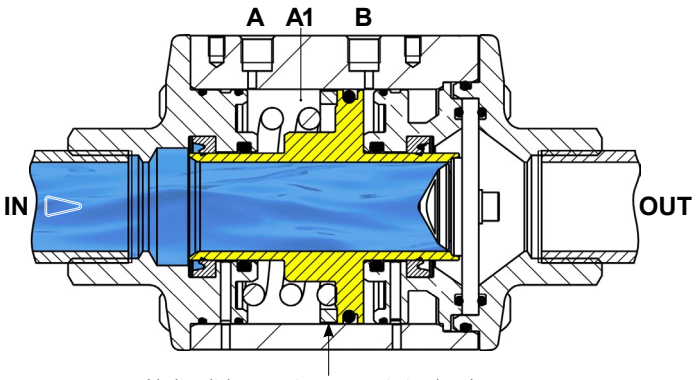
Present User's Installation and Maintenance Manual has been edited in conformity with:
- 2006/42/EC Directive "Machinery" (MD);
- 2014/34/UE Directive "Equipment and protection systems designated to be used in potentially explosive atmospheres" (ATEX);
- 2014/68/UE Pressure Equipment Directive (PED);

1. GENERAL FEATURES

The pneumatic coaxial valve "VIP EVO" is an interception valve (between pipe C-D) with built in control system (A-B). It works thanks to the internal movement of a piston supplied with air. At the end of its stroke (VIP EVO valve is an ON/OFF valve), the piston presses on the seat seal, stopping the fluid from flowing, or moves away from the seal, allowing the intercepted fluid to flow. As the seat is perfectly tight and the intercepted fluid pressures discharge on it, the pressure necessary to move the piston is almost independent from the fluid pressure. As a result OMAL has been able to design a light space saving and lasting valve. Internal fluid-dynamics has been designed to reduce turbulence and pressure loss.

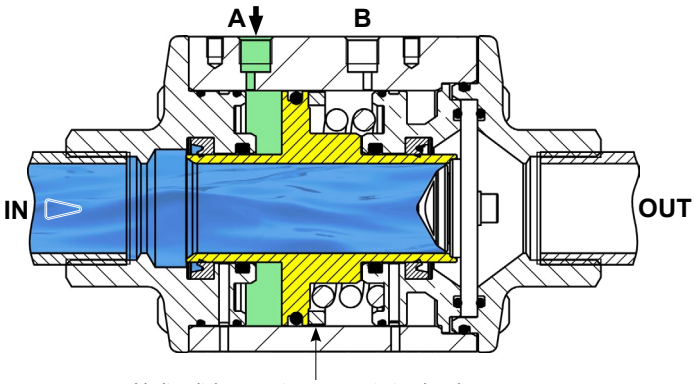
CLOSED VALVE

SPRING RETURN - SR N.C. The spring is in "**A1**", if there is no control, the piston will touch the seat seal: therefore, the preferable position is the closed one.



Limit switch magnet: on request at order phase.

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



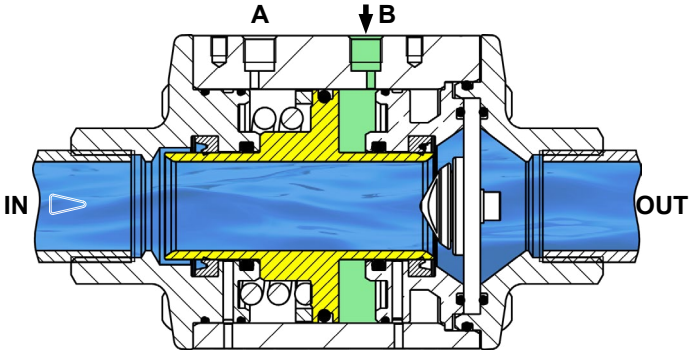
Limit switch magnet: on request at order phase.

DOUBLE ACTING - DA Supplying the hole "**A**" with air (the hole "**B**" must be discharging) the piston presses on the seat seal: the valve is closed.

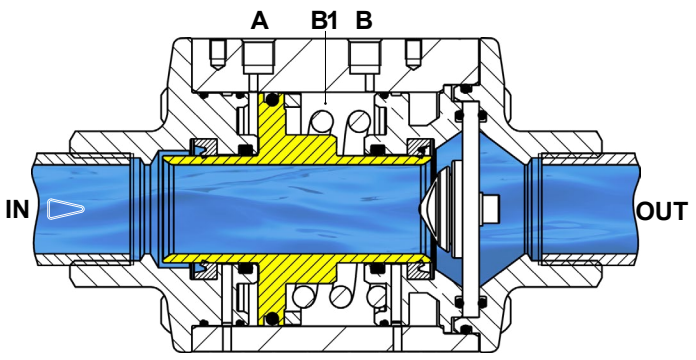
Double Acting DA versions: spring included for antistatic device.

OPENED VALVE

SPRING RETURN - SR N.C. 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.



SPRING RETURN SR - N.O. The spring is in "**B1**", if there is no control, the piston will be away from the seat seal: therefore, the preferable position is the open one.



DOUBLE ACTING - DA Supplying the hole "**B**" with air (the hole "**A**" must be discharging) the piston is at maximum distance from the seat seal: the valve is open.

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2. WORKING CONDITIONS

2.1 Installation
VIP EVO is suitable for indoor and outdoor installation and it can be used in any position. End connection are threaded, GAS according to EN 10226-1 Rp (ex ISO 7/1) or NPT.

2.2 Intercepted medium
Body material, sealing material and working condition depend on intercepted media and environment. Customer must indicate with the order the operating condition of the valve to ensure chemical compatibility.
Operating conditions affect life of valve (temperature, pressure, abrasive and/or corrosive media). With liquid mediums do not exceed usual flow speed of 5 m/s to avoid water hammers, vibrations or cavitation. Internal pressure of valves, even accidental peak, must not exceed maximum operated pressure in any condition.

2.3 Operating temperature
Standard working temperature depends on seal materials:
NBR: from –20°C (-4°F) to 80°C (176°F).
EPDM: from –20°C (-4°F) to 150°C (302°F).
FKM: from –20°C (-4°F) to 150°C (302°F).

2.4 Operating medium
Use filtered compressed air not necessarily lubricated or inert gases compatible with internal actuator parts and lubricants. Operating medium must have a dew point equal to -20°C (-4°F) or, at least, 10°C (10°F) below the ambient temperature (ISO 8573-1, Class 3). Maximum particle size must not exceed 40 µm (ISO 8573-1, Class 5).

2.5 Supply operating pressure
When valve intercepts lubricant fluid (water, oil, lubricated air) minimum control media pressures are:
3÷8,5 bar / 44÷123 psi (Double Acting).
4÷8,5 bar / 58÷123 psi (Spring Return N.C.).
4,5÷8,5 bar / 65÷123 psi (Spring Return N.O.).

2.6 Switching time
VIP EVO switching time depends on size valves, configuration (double acting or spring return), working condition and operational (supply pressure, flow capacity, pipe size connection, solenoid valve performance).

2.7 Switching time in standard condition (times in ms)

DN nominal diameter	mm	10	15	20	25	32	40	50
Switching Time	ms	25/40	30/55	40/60	45/70	50/80	70/120	100/160

2.8 External protection
VIP EVO valves are suitable for indoor and outdoor installation. Aluminium cylinder has an external corrosion protection realized by a 20µm technical oxidation layer.

3. FUNCTIONAL SAFETY

OMAL VIP EVO valves are suitable for installations which require high level of functional reliability, up to SIL3, in compliance with the IEC 61508 Standard.

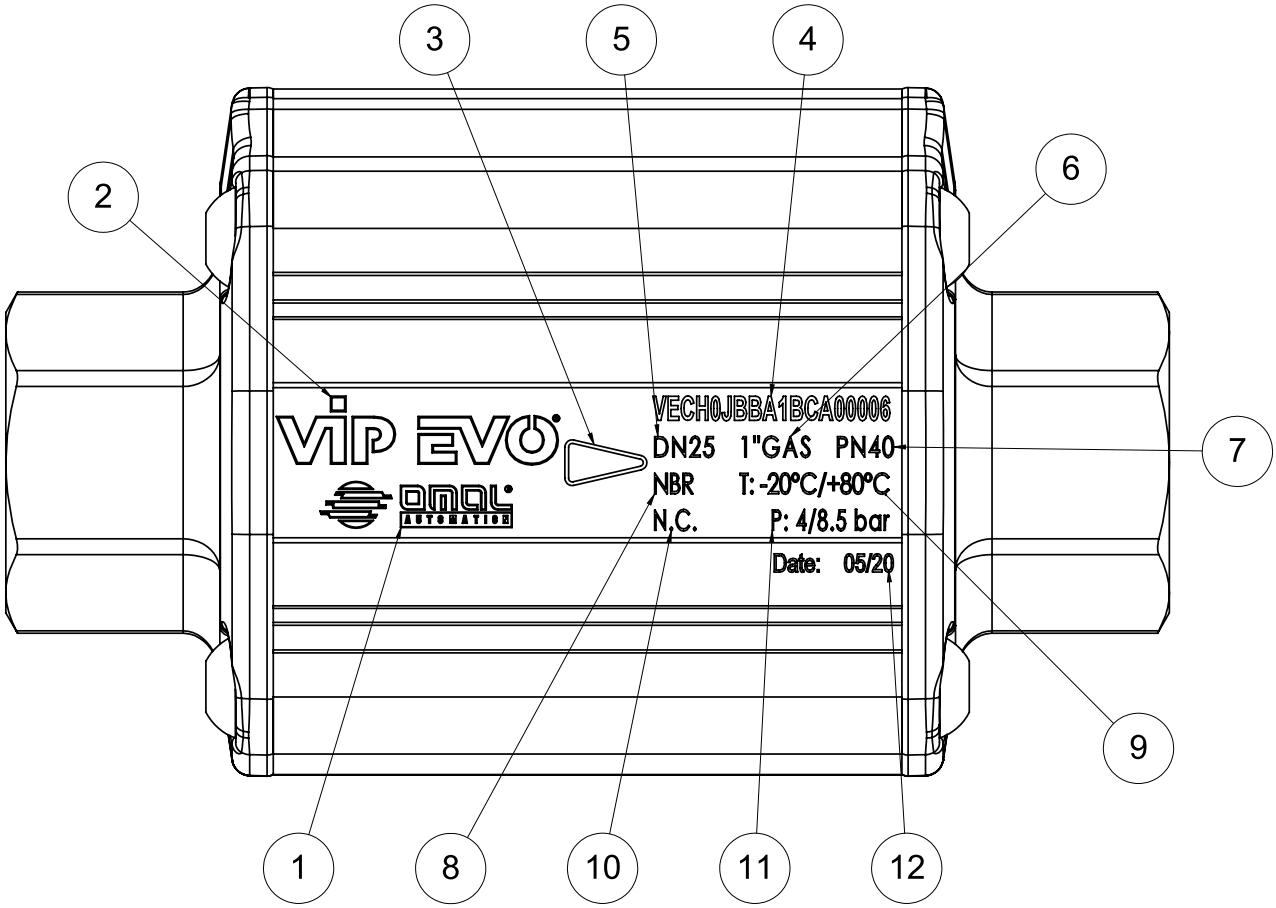
3.1 Oxygen service valves
Valves for oxygen service are produced, checked and verified according to the procedures of the OMAL Quality System to be specifically used in OXYGEN application. All components, grease and sealants are compatible and certified to operate with pure oxygen at maximum 30 bar (435 psi), up to 60°C (140°F). All valves are shipped in plastic bags to avoid any organic contamination.

⚠ Before install the valves ensure that package is undamaged and control under UV light presence of hydrocarbons.

3.2 Marking and classification

Valves cylinders are impressed by laser marking or by an additional label as below indicated.

1	Manufacturer Name, Logo	7	Nominal pressure or maximum working pressure
2	Brand name	8	Seal material
3	Flow direction	9	Temperature rating
4	Product code	10	Configuration type
5	Nominal dimension	11	Pressure operating media
6	Thread type	12	Date



4. CODING SCHEME

AA	B	C	D	E	F	G	H	I	J	K	L	M	N	P	QQ

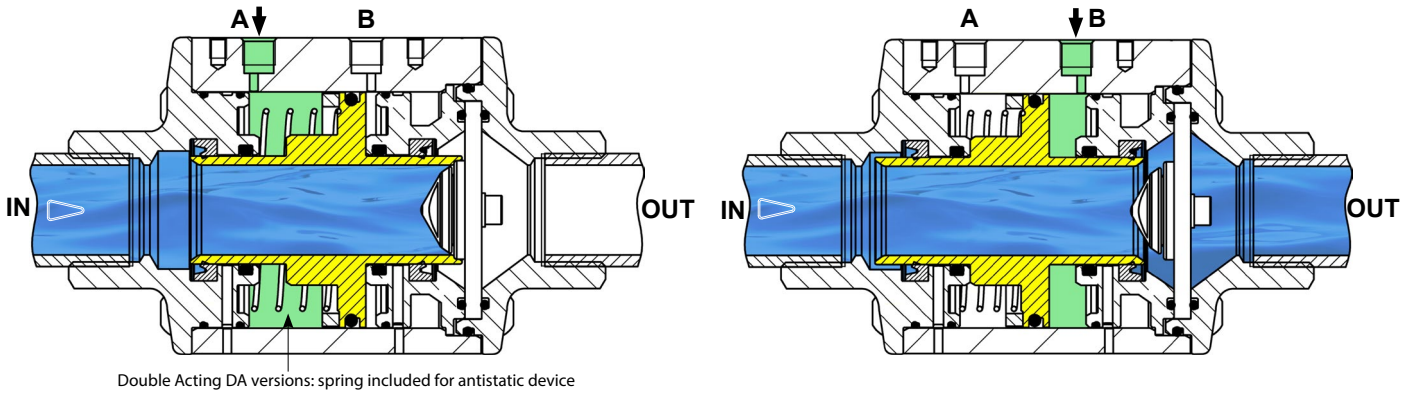
Types meanings	Feature	Reference	
AA	Brand	VE	VIP EVO
B	Configuration	D	Double Acting
		A	Normally Open
		C	Normally Close
C	Nominal pressure	H	40 bar (580 psi)
		C	30 bar (435 psi) Oxygen valves
D	Type of valve	0	Standard
		X	Oxygen service
E	Seat material	J	PTFE + GF
F	Internal seals material	B	NBR
		E	EPDM
		V	FKM
G	Other seals	B	NBR
		E	EPDM
		V	FKM
H	Body material and treatment	A	Aluminium Black anodized
I	Air supply thread	1	1/8” GAS
		2	1/8” NPT
J	Sleeves material and treatment	B	Brass nichel plated
K	Piston material and treatment	C	Brass nichel plated
L	Internal support material and treatment	A	Brass
M	Limit switch predisposition	0	w/o magnet
		1	with magnet
N	Personalization	0	OMAL
P	Sleeves thread	0	GAS 10226 Rp (7/1)
		4	NPT
QQ	Size	03	DN 10 - 3/8”
		04	DN 15 - 1/2”
		05	DN 20 - 3/4”
		06	DN 25 - 1”
		07	DN 32 - 1”1/4
		08	DN 40 - 1”1/2
		09	DN 50 - 2”

5. FUNCTIONNING

Below described the main operating configuration.

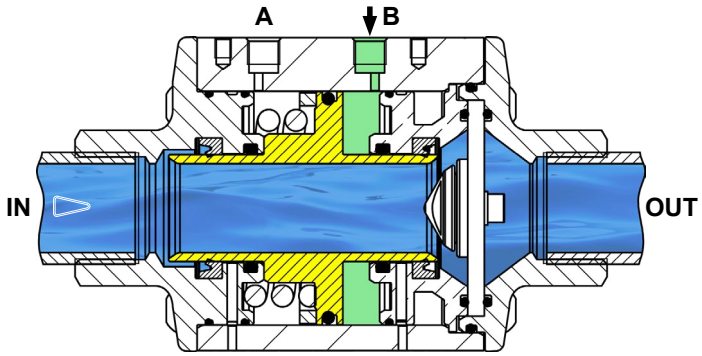
5.1 Double acting (DA) valve

Supplying air to connection A (3÷8,5 bar / 44÷123 psi), the piston closes the valve. A NAMUR 5/2 solenoid valve may be used.



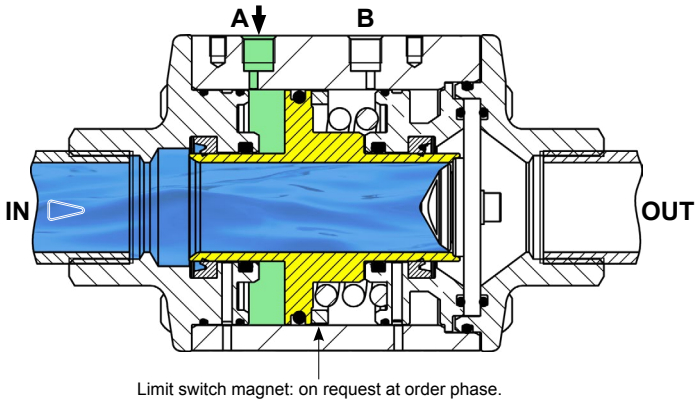
5.2 Spring Return NORMALLY CLOSE (N.C.)

Supplying air to connection B (4÷8,5 bar / 58÷123 psi), the piston opens the valve. By stopping air supply, the spring closes the valve. A 3/2 NAMUR solenoid valve may be used.



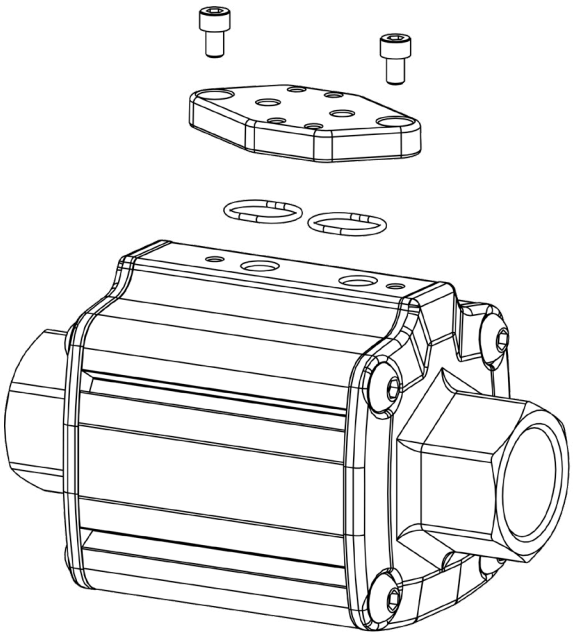
5.3 Spring Return NORMALLY OPEN (N.O.)

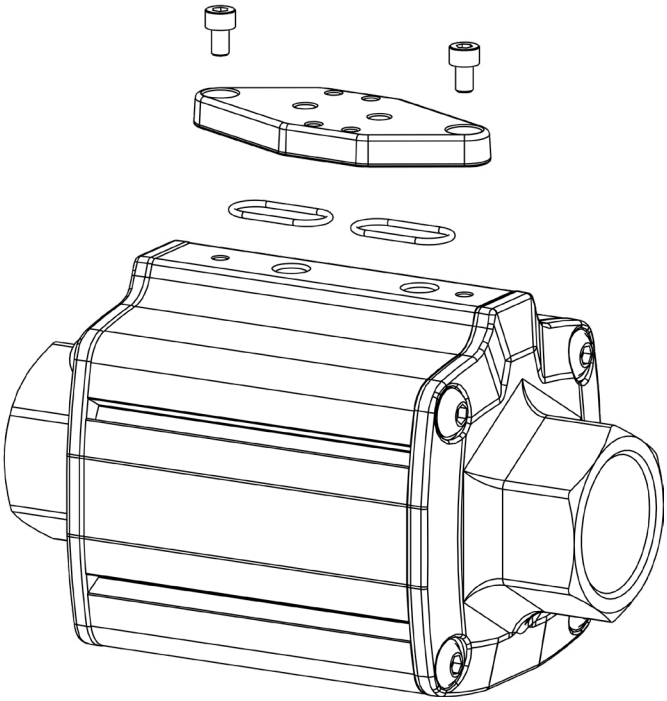
Supplying air to connection A (4,5÷8,5 bar / 65÷123 psi), the piston closes the valve. By stopping air supply, the spring opens the valve. A 3/2 NAMUR solenoid valve may be used.



5.4 Connection diagram

Remote operation control should be done connecting a piping system directly to ports (A for normally open B for normally close). It's possible to direct connect a solenoid valve with VDE/VDI 3845 NAMUR interface with plate (kit must be request:
KBNV0003 for valves DN10÷DN25;
KBNV0007 for valves DN32÷DN50.





6. SAFETY NOTICE

! Valve must be used within pressure and temperature limits only, avoid overpressure and thermal shock.

! Valve must be used only with compatible media; if used with unintended media both metal and seals components can be attacked with potential malfunctions.

! Regularly inspect the valve and control any presence of corrosion or abrasion that can compromise valve functionality.

! During installation, service or maintenance activities valve and pipes must be pressure-less, disconnect air feeding and make sure that air ports have been completely vented.

! Do not remove any component if valve is still under pressure or installed in the pipe.

! Valve is unidirectional (an arrow marked on the body indicate flow direction). Before connecting the valve to the pipe line, make sure that valve is correctly orientated.

! Actuator installation shall be done in compliance with National safety/technical Standards or Regulations.

! **OMAL cannot be considered responsible for any damage to people, animals or things due to an improper use of the product.**

7. INSTALLATION INSTRUCTIONS

VIP EVO is an axial valve with integrated actuator; manual operations are not possible. Operating media is air or gas controlled by a mechanic, pneumatic or electropneumatic valve.

- Carefully read this instruction manual and the handbook included in the box.
- Take care of valve features limit indicated on the labels to ensure the suitability.

The design of the valve takes into account the loads arising from the line (axial forces, bending moments, etc.), as required by the reference standards.

Please verify valve conditions according to the above safety warnings.

7.1 Valve installation Safety warnings

⚠ Before installing VIP EVO valve, make sure that all tubes are free from dirt or welding residues not to damage the seat seals. The valve must not be affected by tube expansions.

⚠ Check valve conditions, before installation, to detect eventually failure during transport and/or storage.

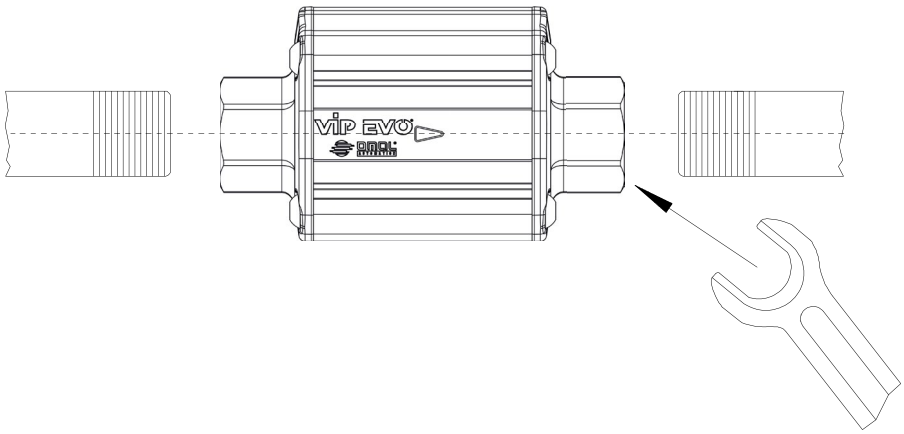
⚠ Check that packaging, upon reception, is intact, free of damage due to bumps or falls that may have occurred during transportation.

⚠ Check that product that has been received correspond exactly to what had been requested.

⚠ Check also the correct operating conditions (valve is unidirectional) written on the label or engraved on the valve.

⚠ Standard sealing means (such as P.T.F.E., hemp ecc...) must be used on threads.

⚠ Use the wrench on the exagonal end of VIP EVO only, not to damage the valve.

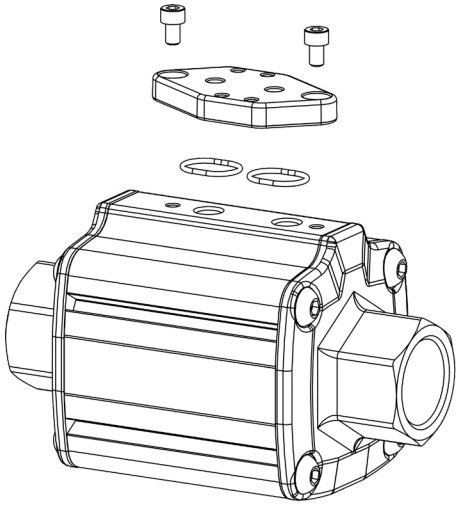


SIZE		TORQUE	
		Nm	ft-lbs
DN10	3/8”	35	25
DN15	1/2”	50	36
DN20	3/4”	85	62
DN25	1”	125	92
DN32	1”1/4	160	118
DN40	1”1/2	200	147
DN50	2”	250	184

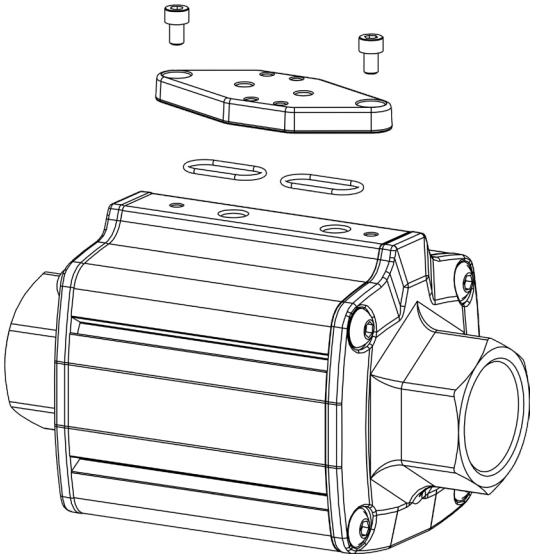
7.2 Namur plate installation

If a direct installation of a Namur solenoid valve is requested, it's possible to use an adapting plate (must be ordered separately).

DN10 - DN25: KBNV0003



DN32 - DN50: KBNV0007



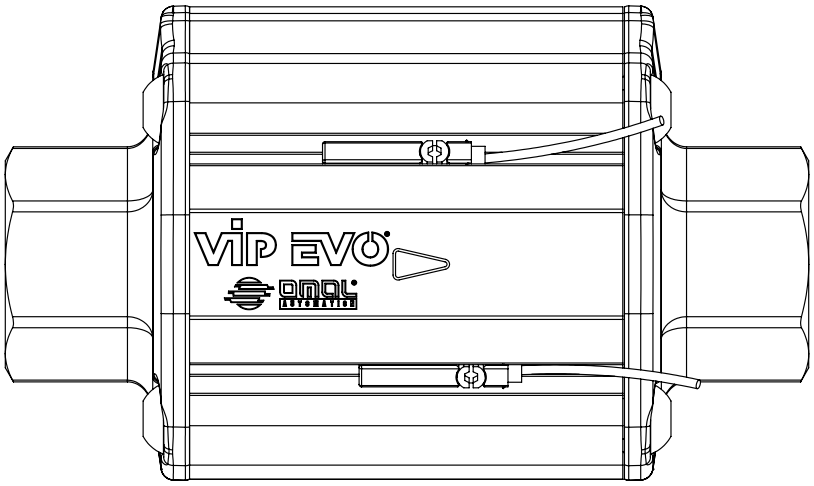
Kit is composed by an aluminium plate, two O-rings (NBR) and two A2-70 M5x8 screw with hexagonal socket head cap screws ISO 4762 / UNI 5931 (4 mm Allen wrench is required). Before installing clean upper surface and remove dust.
Insert the two O-rings in the seal seat of the plate; using a compatible grease may help to ensure the right position of the O-rings.
Lock the plate with screw at 3 Nm (26 In-lb).

7.3 Magnetic sensor installation

Valve body has four slots to easily mount and fix magnetic sensor.

Valve must be requested with predisposition for magnetic sensor.

It's possible to use one sensor, for open or close position, or two sensors, one for each position.
Ensure that the valve is in the correct configuration (open or close). Insert the sensor in a slot and move it until the light of the sensor turns on. Then turn the screw to fix the position.



8. MAINTENANCE

The efficiency of the product is the result of a good and careful maintenance; check the system efficiency status at least once a year, providing immediate replacement of worn parts, in case leaks are found both in pipe line and outside the valve (checking the two holes in the body).
OMAL provide the main seat spare kit or complete spare kit.

When ordering spare kit control material of seat and sealing laser printed over the body or communicate valve code.

Any maintenance should be performed by qualified personnel. If you use a VIP EVO valve properly and in accordance with the instructions, it WILL BE MAINTENANCE FREE!

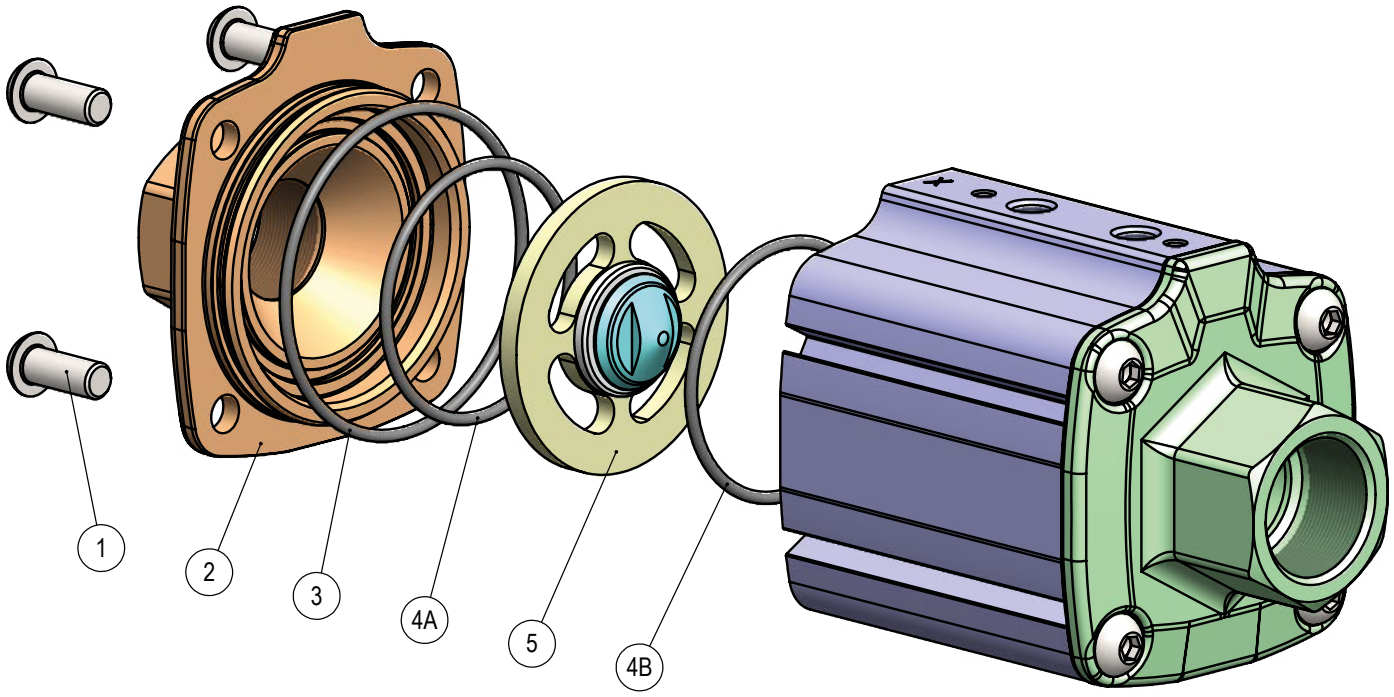
Check the characteristics of the intercepted fluid since it might be corrosive, toxic, inflammable, polluting or dangerous; in this case make proper cycles of flushing with inert fluid or specific passivating.

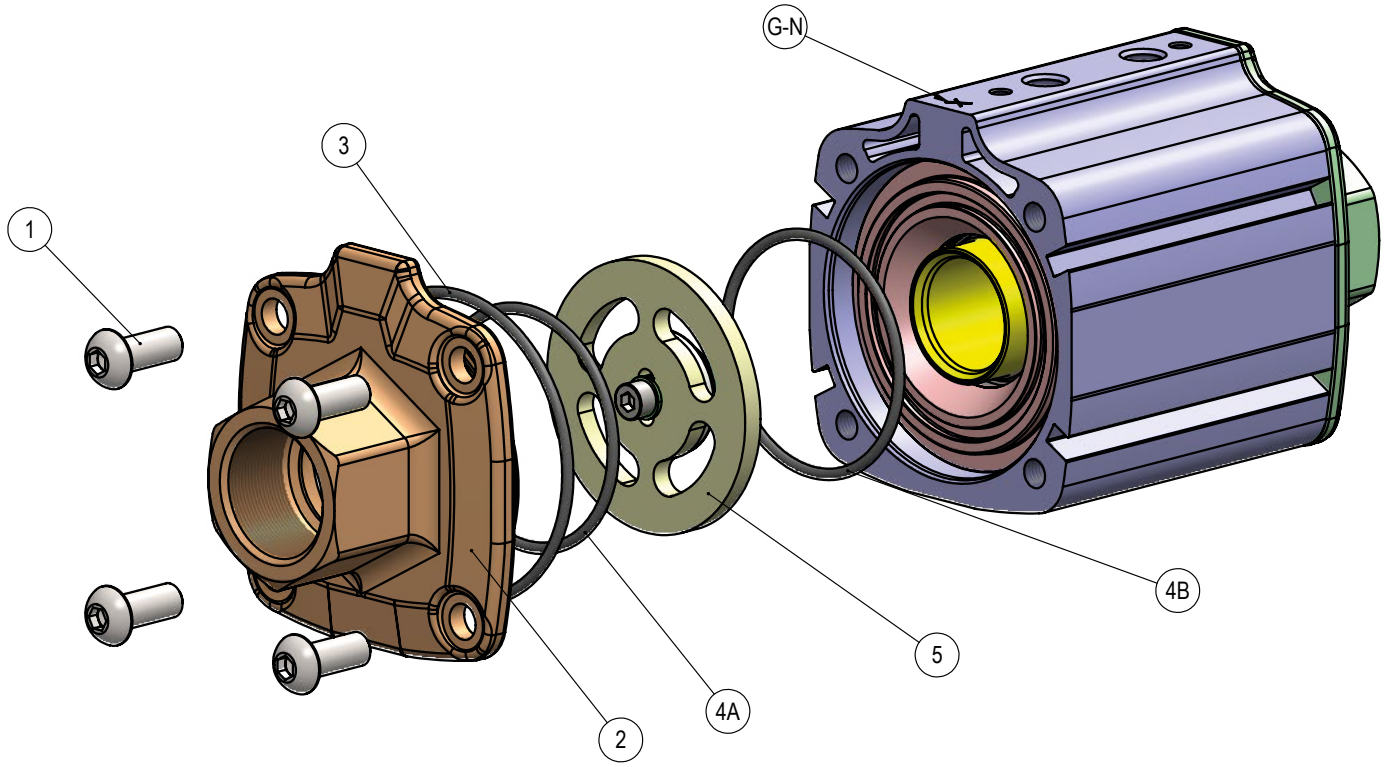
Before disassembling the valve, make sure that the air and the electric supplies are completely disconnected, both up and down the valve. All taps next to the valve should be kept closed during maintenance procedures.

Wear full protective equipment (according to the characteristic of the fluid) before proceeding with the maintenance.

8.1 Main seat spare kit

Before replacing main seat control that material of received kit is correct.



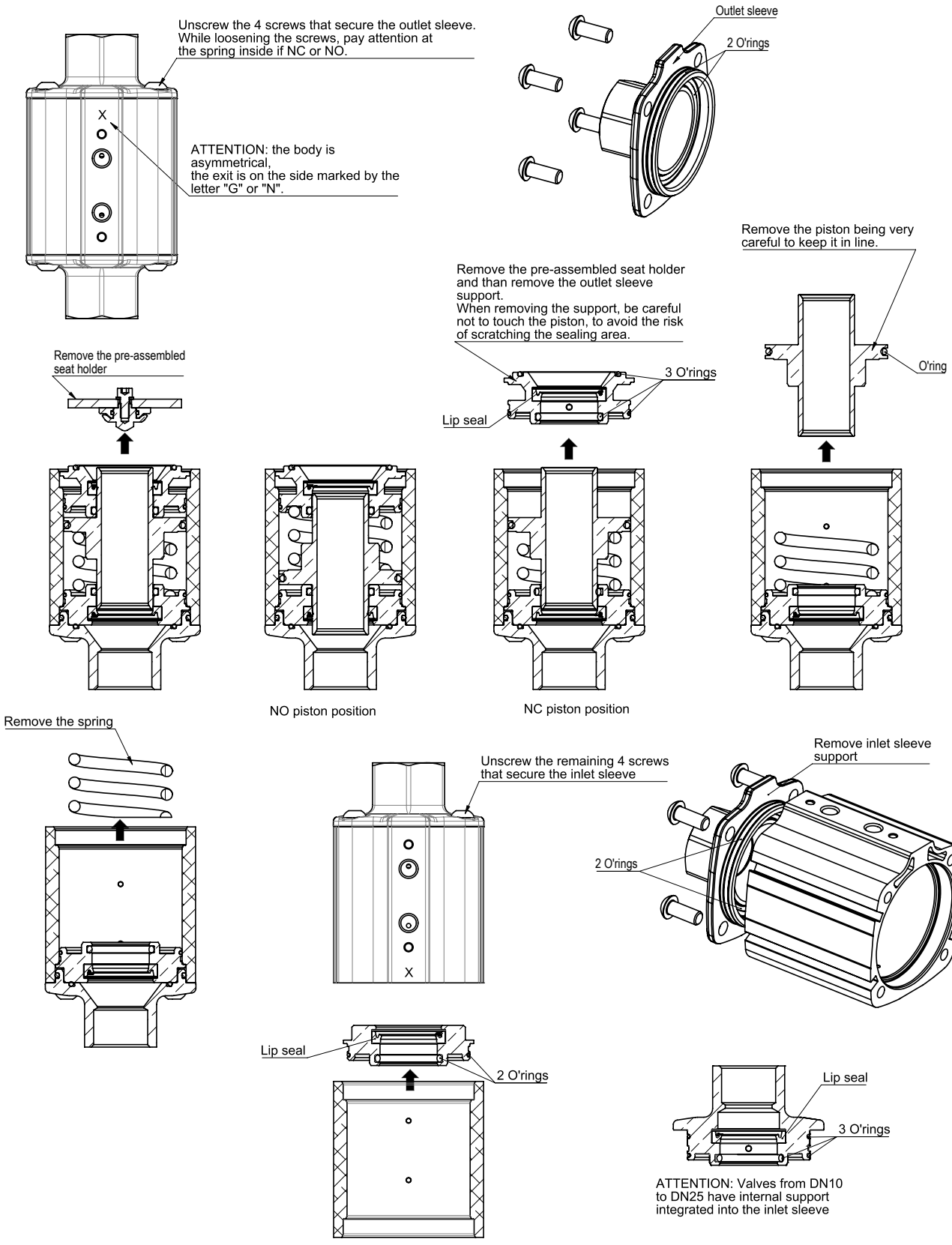


Look at the upper part of the body for G or N letter that indicate the outlet (downstream) sleeve.
Remove the screw (1) and then the sleeve (2).
Remove the disc with seat (5) and substitute OR (4). Use grease compatible with OR material.
Put the new disc with seat in its position
Remove sleeve OR (3) and replace it with the new one.
Remove second disc OR (4B) and replace it with the new one.
Centre the sleeve over the disc and close the valve with correct torque.

SIZE	SCREW ISO 7380	mm	TORQUE			
			Nm		lb-ft	
DN10	M6	4	4	6	3,0	4,4
DN15						
DN20						
DN25	M8	5	7	10	5,2	7,4
DN32						
DN40	M10	6	18	23	13,3	17,0
DN50	M12	8	30	45	22,1	33,2

8.2 Complete spare kit
It also possible to change all seals (O-rings and lip seals).

HOW UNMOUNT THE VALVE



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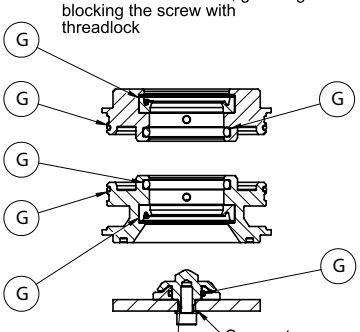
HOW TO MOUNT THE VALVE

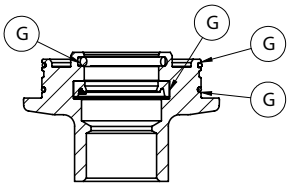
Grease and insert the respective ORs and the lip seals in the supports sleeves (*). Pre-assemble the seat, greasing the OR blocking the screw with threadlock



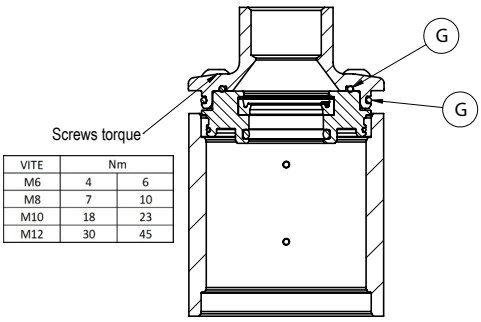
DN10 and DN15 valve has a threaded pin fixed with a nut

	Nm	
M4	0.8	2.5
M5	1.5	3
M6	-	5

(*): Valves from DN10 to DN25 have integrated internal support in the inlet sleeve

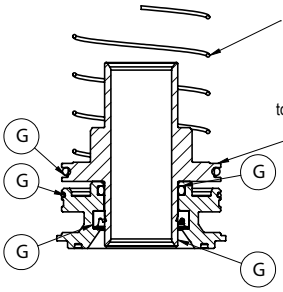


Insert the input support into the body.
ATTENTION: the body is asymmetrical, the exit is from the side marked by the letter "G" or "N".
Grease a sleeve and insert the ORs; close the sleeve.
For valves from DN10 to DN25 insert the sleeve of
inlet with seals fitted and greased.

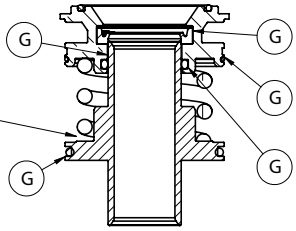


VITE	Nm	
M6	4	6
M8	7	10
M10	18	23
M12	30	45

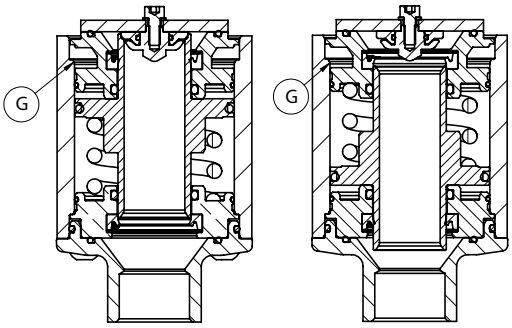
Grease the edge of the piston and insert it in the output support.
Piston position for NC and DA



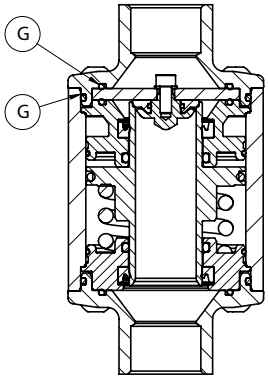
For NO valves turn the piston as in figure and position the spring between piston and output support.



Insert the piston with the outlet support into the body and place the pre - assembled sealing seat on the support



Insert the second sleeve and screw the remaining 4 screws with the same torque



G = GREASE

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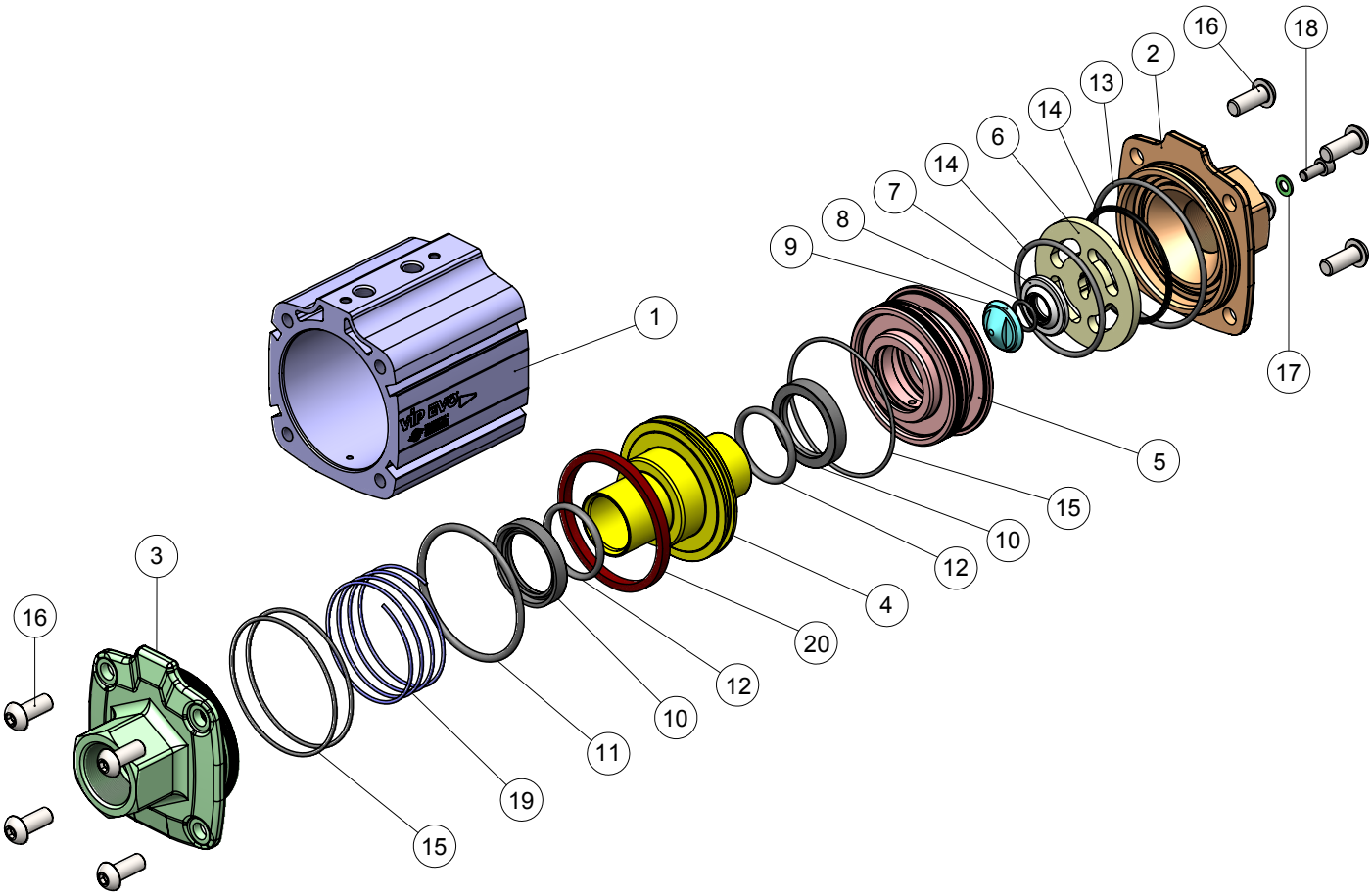
9. MATERIALS AND DURABILITY

9.1 Valve component and bill of materials



N.	Description	Material
1	Pilot actuator cylinder	Aluminum
2	Output sleeve	Brass
3	Input sleeve	Brass
4	Piston	Brass
5	Internal support	Brass
6*	Seat support	316L S.S.
7*	Seat	PTFE+GF
8*	O-ring Seat	NBR/EPDM/FKM
9*	Seat nut	Brass
10**	Lip seal	NBR/EPDM/FKM
11**	Command piston O-ring	NBR/EPDM/FKM
12**	Internal piston O-ring	NBR/EPDM/FKM
13*	Sleeve-body O-ring	NBR/EPDM/FKM
14*	Frontal O-ring	NBR/EPDM/FKM
15**	Support O-ring	NBR/EPDM/FKM
16	Closing Screw	A2-70
17	Washer	A2 (304 S.S.)
18	Screw	A2-70
19	Spring	301 S.S.
20	Magnet	Plastic ferrite

*Main seat spare kit.
**Complete spare kit (including main seat spare kit).

10. ATEX SPECIFICATION

The VIP EVO valve can be provided in conformance with the European Directive ATEX 2014/34 UE for the suitability of the equipment intended for the use in Potentially Explosive Atmosphere, OMAL declare the conformity of product of the above mentioned Atex directive in the limits of its Classification and Zone Classification.

A) EQUIPMENT CLASSIFICATION:
- Equipment Group II;
- Category 2;
- Gas Zone 1, Dust Zone 21;
- Type of protection: Ex h (with constructional safety 'c');
- Gas group IIC;
- Dust group IIIC;
- Temperature Class T6…T3 (as per following table);
- EPL: Gb (Gas), Db (Dust);

T. max fluid and T. max ambient	Temperature Class	Max surface temperature
-20°C ≤T≤ 60°C (-4°F≤T≤140°F)	T6	T85°C (185°F)
60°C <T≤ 75°C (140°F≤T≤167°F)	T5	T100°C (212°F)
75°C <T≤ 110°C(*) (167°F≤T≤230°F)	T4	T135°C (275°F)
110°C <T≤ 150°C (*) (230°F≤T≤302°F)	T3	T175°C (347°F)

(*) FKM and EPDM SEALS

B) EQUIPMENT MARKING:

II 2G Ex h IIB/IIC T6..T3 Gb X
II 2D Ex h IIIC T85°C..T175°C Db X
Tech. file N. 18-80475-AC01

Whenever the valve may be installed in the Potentially Explosive Atmosphere the operator before starting the installation must observe the suitability of the equipment classification and special installation instruction included that follow the actuator. In case of instruction missing or any doubts please call the OMAL technical department.

11. STORAGE

OMAL valves packaging is designed to provide protection during shipment; however, they can be damaged in transport. Before to store them, verify eventual shipping damages. Keep valves in their original packaging during storage.
It is recommended to keep valves in a dry and clean environment at temperatures -10°C÷60°C (14°F÷140°F).
If valves should be stored for a long period before installation, it is recommended to control them before installing them on plant.

12. TROUBLESHOOTING

POTENTIAL EFFECT OF FAILURE	POTENTIAL CAUSE OF FAILURE	SOLUTION
Leakage downstream	Main seat corrupted	Verify integrity of seat
	Air supply not enough to close properly the piston	Verify that supply pressure value corresponds to operation requirements (see valve label). If valve is NC verify minimum opening pressure
Leakage from inlet hole	Stem O-ring damage	Seals replacement (see section 8.2)
	Cylinder damage	Contact us for repair
	Piston damage	
Leakage from outlet hole	Seals damage	Seals replacement (see section 8.2)
Slow movement	Piston seal damage	Verify compatibility with intercepted media
Leakage form plate	Low pressure air supply	Verify integrity of air supply system

13. DISPOSAL OF PRODUCTS AT THE END OF THEIR LIFE CYCLE

OMAL pneumatic valves are designed to be completely disassembled at end of their life. Components can be separated to be recovered or disposed. Raw materials have been selected in order to ensure minimal environmental impact and components are not contaminated by hazardous substances to grant health and safety of operators, users, installers and maintenance workers.
Recovering or disposal activities must be done by qualified personnel only outfitted with appropriate protective equipment (PPE) according to product size and device application life use. Waste generated by installation, maintenance or disposal process has to be managed according to National Standards/Regulations where product is installed. Next general guidelines should be followed:
- Metal components (aluminium/steel) can be recovered/disposed as raw material.
- Sealing elements such as Or-Ring or Gaskets (NBR, FPM, FVMQ...), as contaminated by fluids or lubricants, must be disposed of.
- Packaging materials should be transferred to separate waste collection system available in the Country.

14. DECLARATION OF CONFORMITY

OMAL S.p.A. pneumatic valves have been designed, manufactured and tested to meet the requirements of the following European standards and are marked, where provided, with the relative CE conformity marking:

- 2006/42/EC Directive “Machinery”;
- Regulation (EC) No 1907/2006 and successive concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH);
-2014/68/UE Pressure Equipment Directive (PED).

15. ENVIRONMENT IMPACT

OMAL pneumatic valves and relevant production processes are designed to respect the environment and to prevent pollution:

- machining, assembly, packaging and shipping processes are internal;
- suppliers and subcontractors are close to our plant to reduce CO_2 emissions;
- 90% of components can be recovered or disposed as raw materials;
- pneumatic valves, correctly installed, do not need maintenance avoiding producing waste;
- pneumatic valves packaging is completely recyclable.