ENGLISH

INSTALLATION, USE AND MAINTENANCE MANUAL

Three-way valves

Diverter valves Series AD10-AD20-TD10

Mixer valves Series AM10-AM20- TM10

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1.0 SAFETY INFORMATION

Safe operation of this product is only guaranteed if it is properly installed, commissioned, used and maintained by qualified staff in accordance with the operating instructions.

1.01 INTENDED USE

Check that the valve is suitable for the intended use and application by checking:

- that the material of which the valve is made is compatible with the process fluid;

- that the valve is suitable for the pressures and temperatures of the process fluid;

- that an adequate safety device has been installed to prevent hazardous overpressures or overheating in the event of valve malfunction.

OMC valves are not designed to cope with external stresses that can be induced by the systems in which they are inserted. It is the installer's responsibility to take these efforts into account and to take appropriate precautions.

1.02 ACCESS

Ensure safe access and, if necessary, a safe work platform (with suitable protection) before starting to work on the product. Provide suitable lifting equipment, if necessary.

1.03 LIGHTING

Ensure adequate lighting for the type of work required.

1.04 HAZARDOUS FLUIDS IN THE PIPE

Take into account the contents of the pipe or what it may have previously contained. Pay attention to: flammable materials, substances which are hazardous to health, extreme temperatures.

1.05 ENVIRONMENTAL SITUATIONS

Take into consideration: areas at risk of explosion, lack of oxygen (e.g. tanks, wells, etc....), hazardous gases, temperature limits, high or low temperature surfaces, fire hazard (e.g. during welding), excessive noise, moving machines.

1.06 TEMPERATURE

Wait for the temperature to normalize after isolation to avoid the risk of burns or frostbite.

1.07 SYSTEM

Consider the possible effects on the whole planned work system.

Could the planned action put other parts of the system or the staff at risk?

Make sure that the shut-off valves are operated gradually in order to avoid abrupt changes to the system.

1.08 PRESSURIZED SYSTEMS

Make sure that pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and vent) and locking or labeling of closed valves. Do not consider the system depressurized even if the pressure gauge indicates zero pressure.

The valve is under pressure during operation. Before carrying out any maintenance or operations on the flanges and closing caps, make sure that the line is depressurized (0 bar) and at room temperature.

1.09 TOOLS AND CONSUMABLES

Before starting the work, make sure you have all the necessary equipment to carry it out, do not use makeshift equipment. Use only original OMC spare parts.

1.10 PROTECTIVE CLOTHING

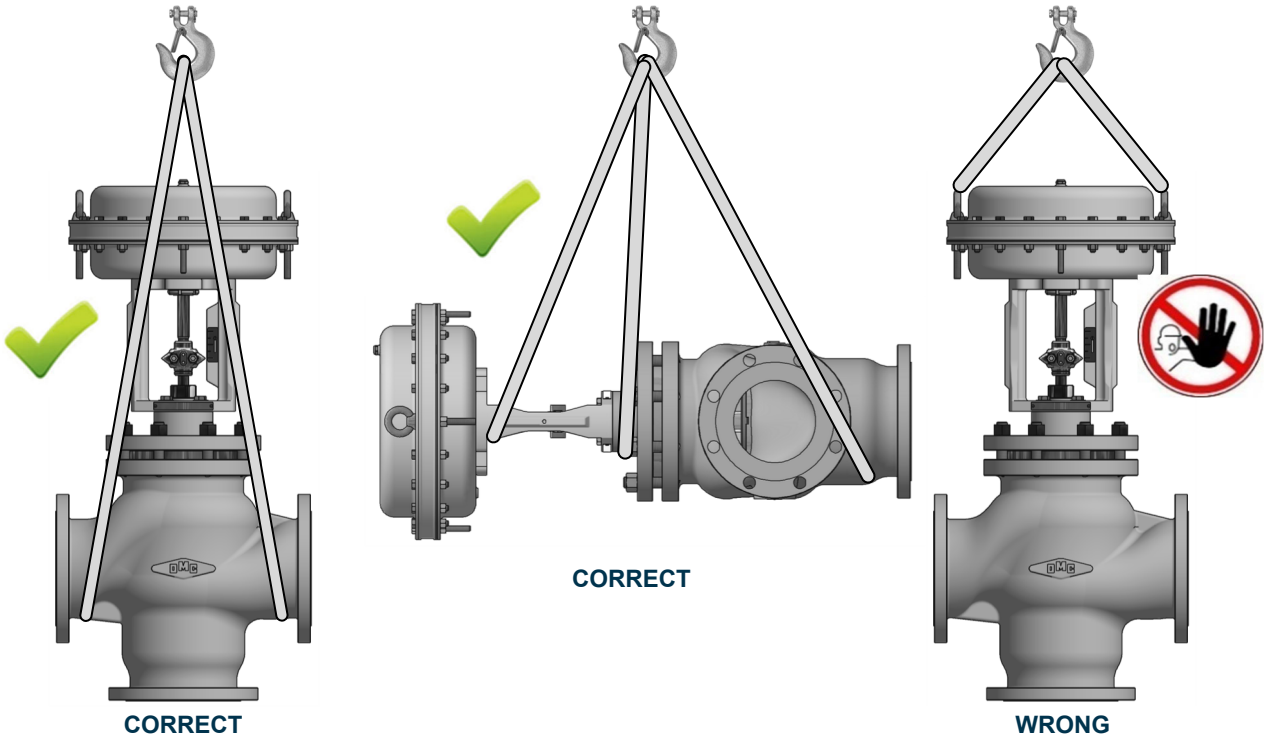
Consider whether you and/or others need protective clothing, for example, against chemicals, extreme temperatures, radiation, noise, falling objects, hazards to eyes and face.

1.11 QUALIFICATION OF WORKERS

All work must be carried out and supervised by experienced, trained and competent staff.

1.12 HANDLING

Use adequate means for handling the products, assessing all the risks related to lifting, the environment, the individual and the circumstances of the work that is about to be performed.



1.13 FREEZING

Plan to protect products from frost in environments with temperatures below the freezing point of the process fluid.

1.14 OTHER RISKS

During operation, the external surface of the product may be at hazardous temperatures. Be aware of this risk

1.15 DISPOSAL

For disposal, comply with the laws in force in the state/country/nation where you intend to dispose of the product.

1.16 RISK OF CORROSION AND/OR EROSION

Periodically check for any internal and/or external corrosion and/or erosion phenomena as they can cause significant damage to the parts under pressure, locally reducing their thickness and consequently their degree of safety.

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2.0 INSTALLATION

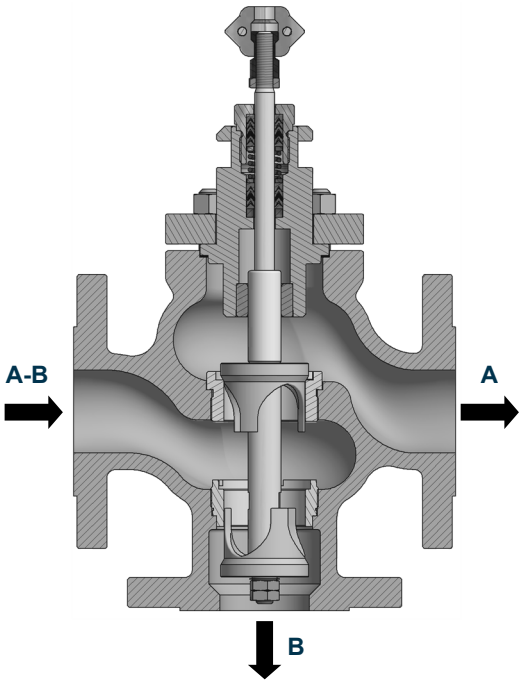
All work must be carried out and supervised by experienced, trained and competent staff.

The OMC valves' body casting highlights the flow direction, the nominal passage, the maximum operating pressure and the material.

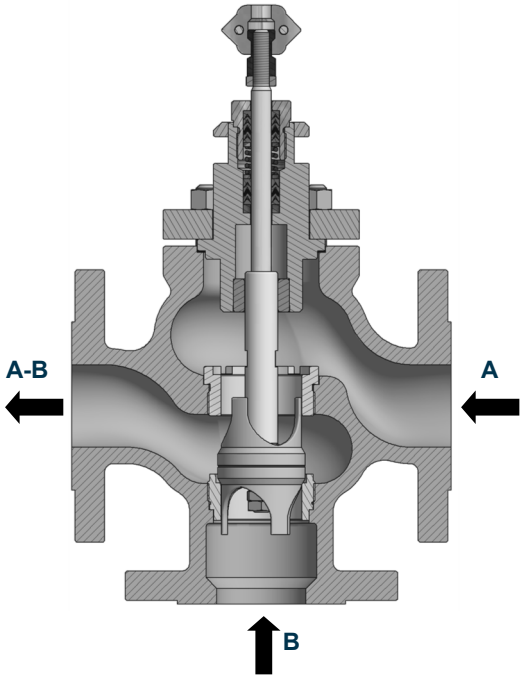
Before installing the valve, make sure that the pipe that conveys the process fluid is clean, proceeding, if possible, to an energetic blowing with steam or compressed air.

The installation of a filter upstream of the valve will prevent any dirt from entering the plug.

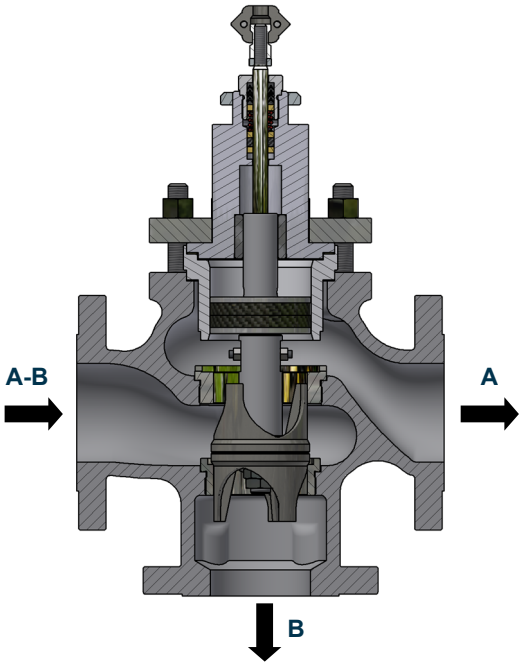
To allow periodic maintenance of valves mounted on continuously operating systems, it is recommended to install three shut-off valves, located upstream and downstream of the three-way valve; such three shut-off valves must have the same inner diameter as the control valve. When installing the valve, make sure that the flow in the pipe goes in the same direction as indicated by the arrow on the valve body.



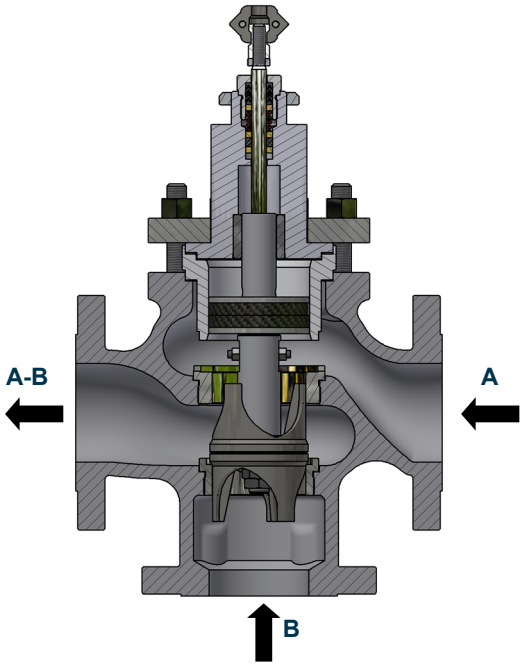
Pic. 1.1 Standard Diverter valve flows



Pic. 1.2 Standard Mixer valve flows



Pic. 1.3 Balanced Diverter valve flows



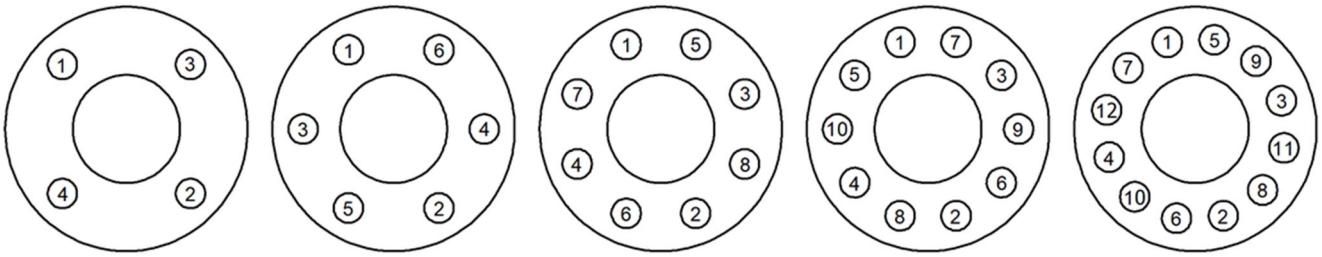
Pic. 1.4 Balanced Mixer valve flows

2.01 MOUNTING THE VALVE ON THE PIPE

To ensure uniformity of load and alignment, the flange bolts must be tightened gradually and in a criss-cross sequence, as shown in Pic. 2

Avoid overtightening. Use the recommended tightening torques. Avoid pipe misalignment. Choose the flange gaskets according to the operating conditions

WARNING!!! For valves with weld-on connections, have the welding operation carried out only by qualified staff and, in order to avoid possible damage to the valve, keep the valve body cold during such operation.

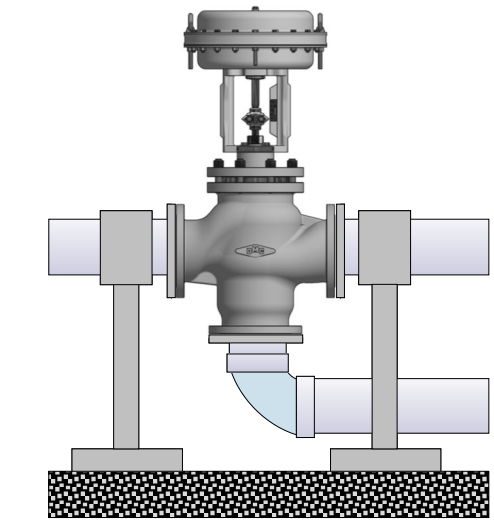


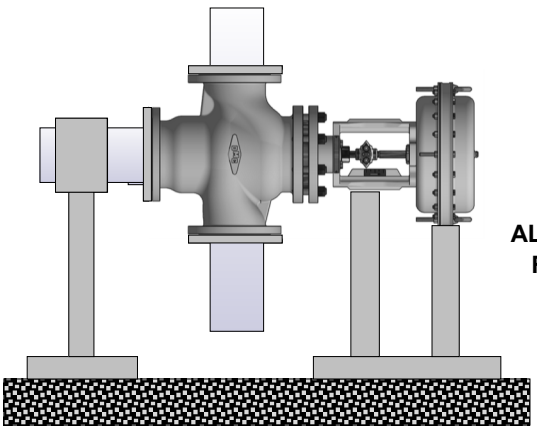
Pic. 2 Tightening sequence

WARNING!!! An excessive weight of the valve could compromise the structure of the system. If necessary, support the valve using suitable supports (Pic. 3) and/or ropes (Pic .4)

The mounting position of the valve does not limit its operation, however it is recommended to mount the valve with the actuator facing upwards as other positions could allow the accumulation of any impurities present in the fluid, damaging the valve.

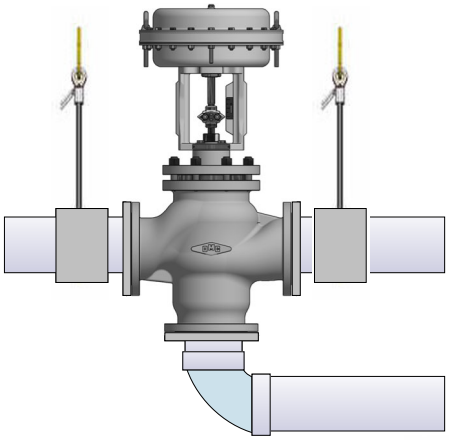
Pic. 3
Installation with ground supports

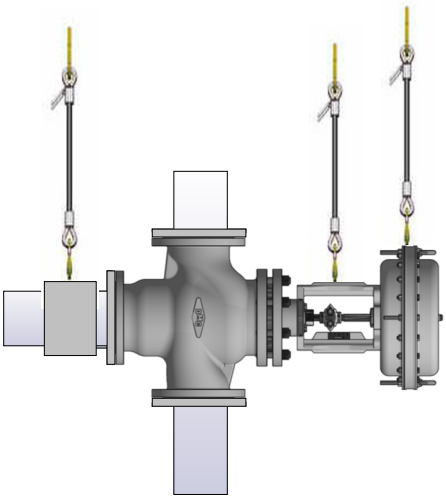




EXAMPLES OF INSTALLATION ALLOWED BUT NOT RECOMMENDED

Pic. 4
Installation with lifting ropes





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3.0 ACTUATOR CONNECTION

3.01 PNEUMATIC ACTUATOR CONNECTION

The pneumatic actuator is equipped with two 1/4"NPT connections, one of which is closed by a filter. Connect the control air pipe to the connection that remains free. The control air must be clean and dehumidified, free of oils and greases and must not exceed a maximum permissible pressure. The signal necessary to control the valve is shown on the plate on the actuator's yoke. If the valve is equipped with a pilot positioner, refer to the its manual.

For maintenance operations of OMC pneumatic actuators refer to the specific manual.

3.02 ELECTRICAL ACTUATOR CONNECTION

For connecting the electric actuator, refer to the specific manual.

4.0 MAINTENANCE

All the operations described below must be carried out and supervised by expert, trained and competent staff. OMC valves are uniquely identified by a serial number shown on the plate located on the actuator yoke. To order spare parts or for any need, always refer to the aforementioned number.

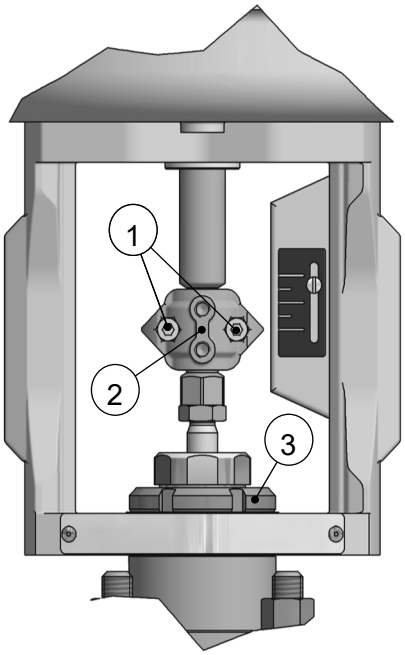
The valve is pressurized during operation. Before carrying out any maintenance or operations on the flanges and closing caps, make sure that the line is depressurized (0 bar) and at room temperature.

4.01 VALVE/ACTUATOR SEPARATION

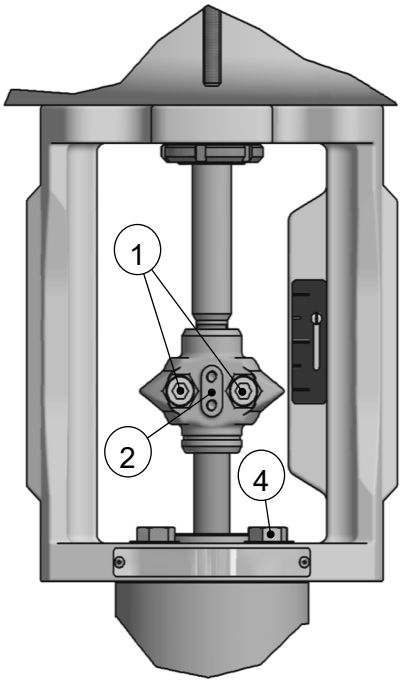
Referring to Pic. 5 (for DN15÷DN100/1/2”÷4” valves) or Pic. 6 (for DN125÷DN200/6”÷8” valves) proceed as follows:

- Bring the valve to 50% of the stroke
- Unscrew the screws (1) completely and remove the clamps (2)
- For DN15 ÷ DN 100 (1/2” ÷ 4”) valves completely unscrew the ring nut (3).
- For DN125 ÷ DN 250 (6” ÷ 10”) valves completely unscrew the screws (4).
- Remove the actuator

To reassemble everything, repeat the operations in the reverse direction, paying attention to the realignment of shafts and the size (A)



Pic. 5 DN15 ÷ 100/1/2”÷4” valves



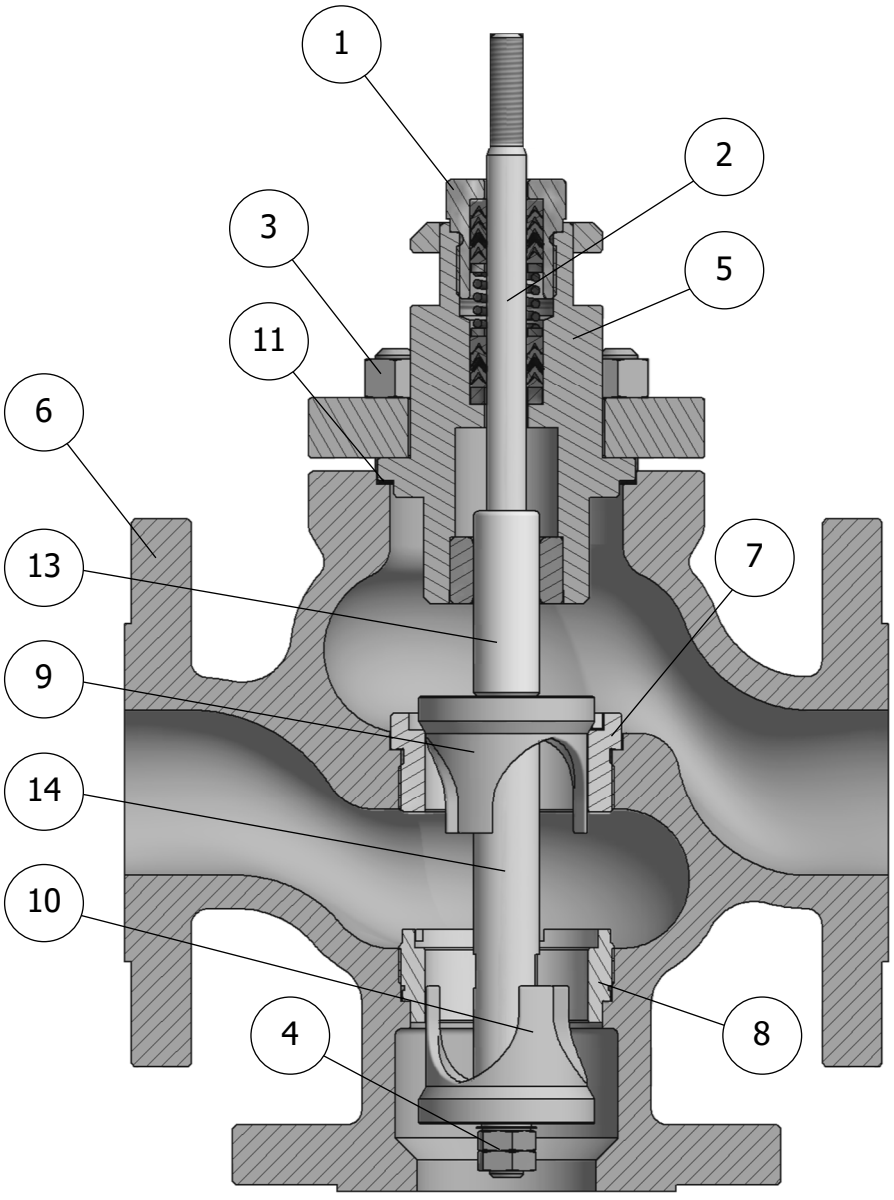
Pic. 6 DN125 ÷ 250/6” ÷ 10” valves

4.02 REPLACEMENT OF SEAT/PLUG IN DIVERTER VALVE

Referring to Pic. 7 proceed as follows:

- Separate the actuator from the valve body as described in the previous paragraph
- Loosen the nut (1) and completely unscrew the bolts (5).
- Completely unscrew the bolts (4) keeping the rod (2) locked
- Separate the bonnet assembly (5) from the valve body (6).
- Remove the rod (2) complete with the upper plug (9) from the bonnet (5).
- Unscrew the seats (7) and (8) using the appropriate wrenches
- Remove the lower plug (10)
- If necessary, replace seats (7) and (8)
- Insert the new plug into the bonnet (5) taking care to grease the rod with silicone oil.
- Always replace the body gasket (11) by carefully cleaning the support surfaces.
- Reassemble everything by repeating the operations in reverse order, paying attention to the realignment of shafts, seats and plugs, consequently.
- Tighten the nuts (3) gradually and in a criss-cross sequence, as shown in the example in Pic. 2 paragraph 2.01, applying the torques indicated in chapter 5

Warning: when replacing the rod (2) it is also necessary to replace the packing gland (see next paragraphs).



Pic. 7 diverter valve

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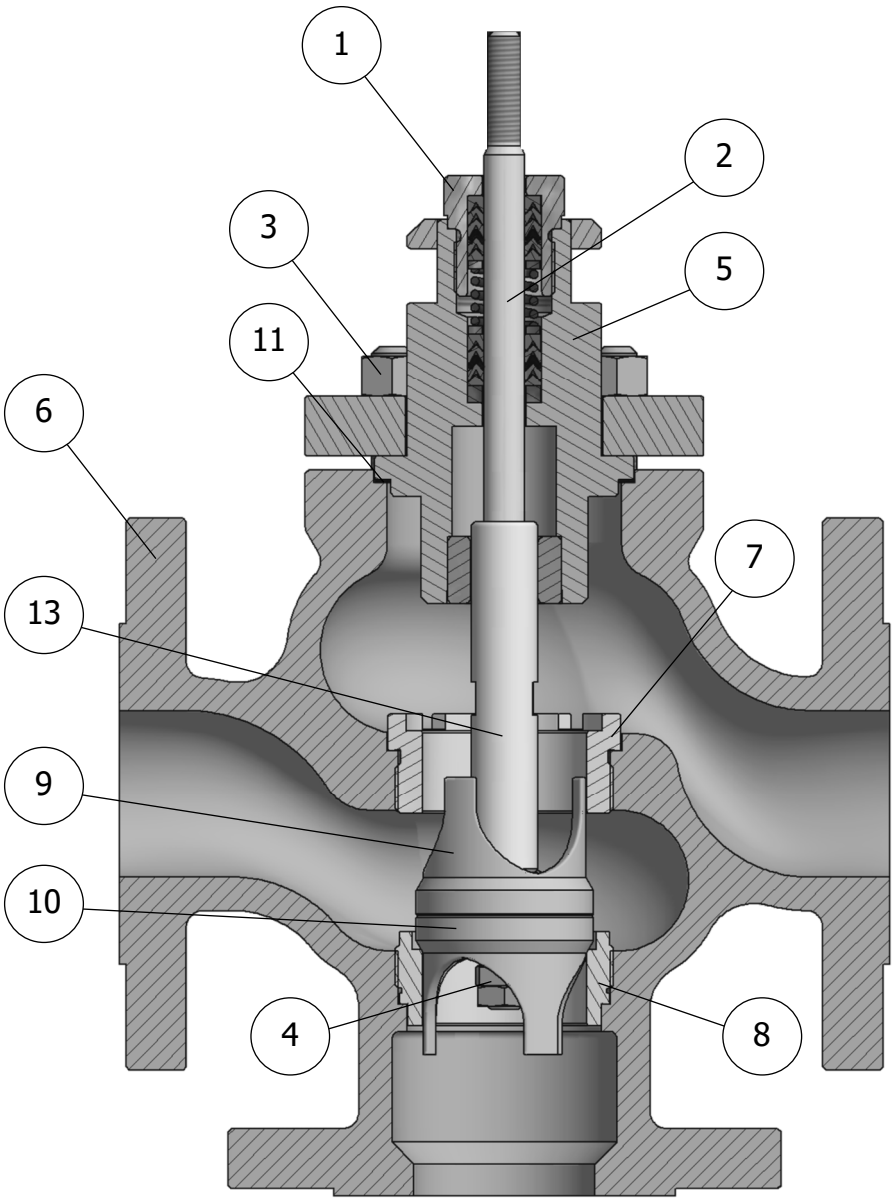
4.03 REPLACEMENT OF SEAT/PLUG IN MIXER VALVE

Referring to Pic. 8 proceed as follows:

- Separate the actuator from the valve body as described in the previous paragraph
- Loosen the nut (1) and completely unscrew the bolts (5).
- Separate the bonnet assembly (5) from the valve body (6).
- Remove the rod (2) complete with the plugs (9) and (10) from the bonnet (5).
- Unscrew and replace the seats (7) and (8) using the appropriate wrenches
- Insert the new plug assembly into the bonnet (5) taking care to grease the rod with silicone oil.
- Always replace the body gasket (11) by carefully cleaning the support surfaces.
- Reassemble everything by repeating the operations in reverse order, paying attention to the realignment of shafts, seats and plugs, consequently.
- Tighten the nuts (3) gradually and in a criss-cross sequence, as shown in the example in Pic. 2 paragraph 2.01, applying the torques indicated in chapter 5

Warning: when replacing the plug it is also necessary to replace the packing gland (see next paragraphs).



Pic. 8 Mixer valve

4.04 REPLACEMENT OF SEAT/PLUG IN DIVERTER VALVE WITH BELLOWS

Referring to Pic. 9 proceed as follows:

- Separate the actuator from the valve body as described in the previous paragraph
- Loosen the nut (1) and completely unscrew the bolts (3).
- Completely unscrew the bolts (4) keeping the rods (2) and (14) locked

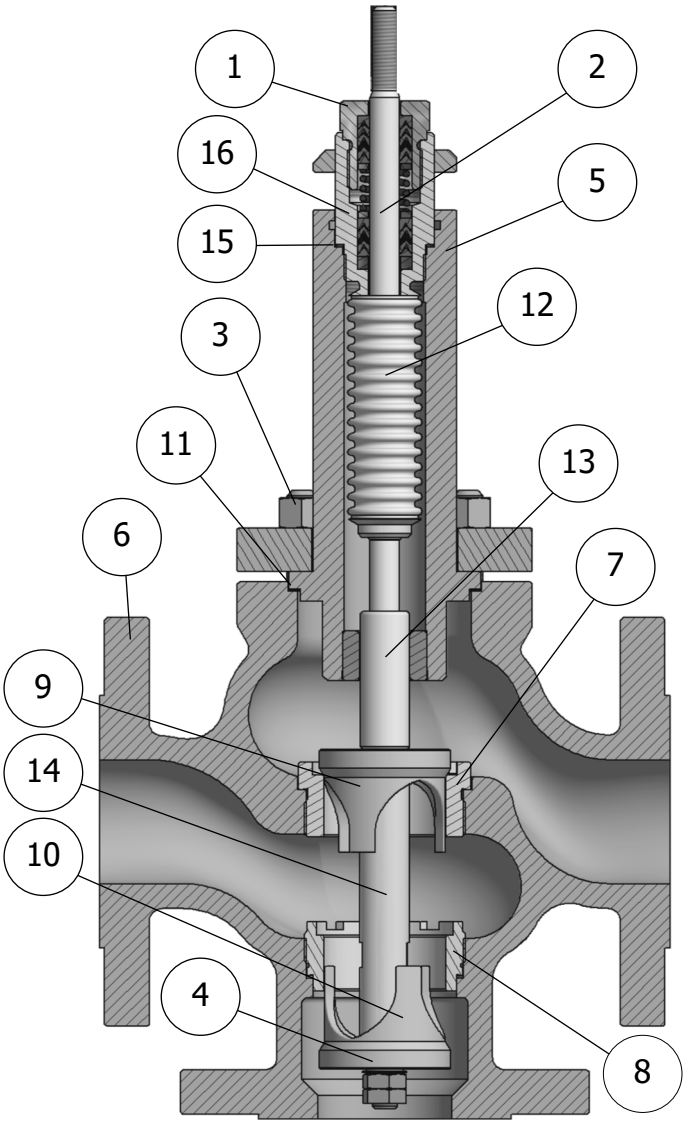
⚠ **WARNING!!! Any rotation of the rods (2) and (14) would break the bellows (12)**

- Separate the bonnet assembly (5) from the valve body (6).
- Separate the plug (9) from the rod (13) by removing the pin on the rod (14) by unscrewing it
- Unscrew the seats (7) and (8) using the appropriate wrenches
- Remove the lower plug (10)
- If necessary, replace seats (7) and (8)
- If necessary, replace the bellows (12) and the gasket (15) by unscrewing the body (16)

⚠ **Warning!!! the body (16) the rod (2) and the bellows (12) constitute a single indivisible component**

- Always replace the body gasket (11) by carefully cleaning the support surfaces.
- Reassemble everything by repeating the operations in reverse order, paying attention to the realignment of shafts, seats and plugs, consequently.
- Tighten the nuts (3) gradually and in a criss-cross sequence, as shown in the example in Pic. 2 paragraph 2.01, applying the torques indicated in chapter 5

Warning: it is always advisable to also replace the packing gland (see next paragraphs).



Pic. 9 Diverter valve with bellows

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4.05 REPLACEMENT OF SEAT/PLUG IN MIXER VALVE WITH BELLOWS

Referring to Pic. 10 proceed as follows:

- Separate the actuator from the valve body as described in the previous paragraph
- Loosen the nut (1) and completely unscrew the bolts (3).
- Completely unscrew the bolts (4) keeping the rods (2) and (9) locked

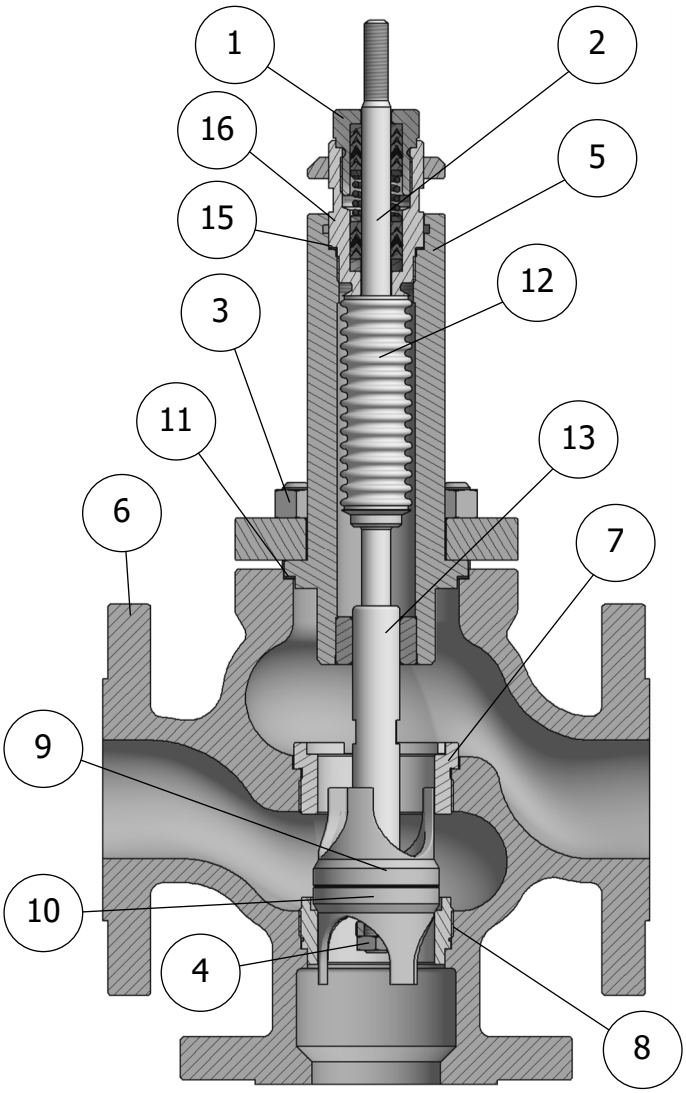
⚠ **WARNING!!! Any rotation of the rods (2) and (9) would break the bellows (12)**

- Separate the bonnet assembly (5) from the valve body (6).
- Unscrew the seat (7) **using** the appropriate wrenches
- Remove the plugs (9) and (10)
- If necessary, replace seats (7) and (8)
- If necessary, replace the bellows (12) and the gasket (15) by unscrewing the body (16)

⚠ **Warning!!! the body (16) the rod (2) and the bellows (12) constitute a single indivisible component**

- Always replace the body gasket (11) by carefully cleaning the support surfaces.
- Reassemble everything by repeating the operations in reverse order, paying attention to the realignment of shafts, seats and plugs, consequently.
- Tighten the nuts (3) gradually and in a criss-cross sequence, as shown in the example in Pic. 2 paragraph 2.01, applying the torques indicated in chapter 5

Warning: it is always advisable to also replace the packing gland (see next paragraphs).

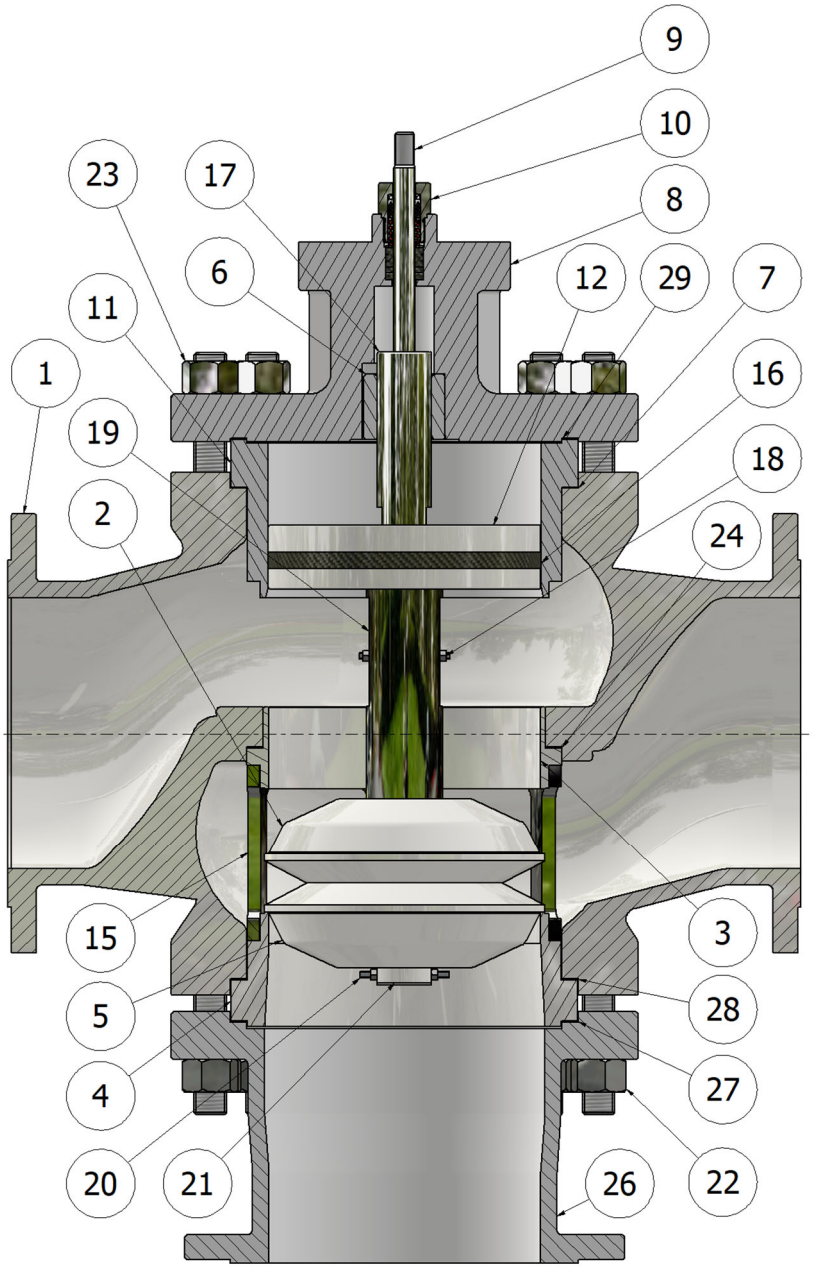


Pic. 10 Mixer valve with bellows

4.06 REPLACEMENT OF SEAT/PLUG IN DN250/10” VALVES

- Referring to Pic. 11 proceed as follows :
- Separate the actuator from the valve body as described in the previous paragraph
- Unscrew the bolts (22) completely
- Separate the stub (26), unscrew the screws (29) and the nut (21)
- Remove the seat (4), the gaskets (27) and (28), the cage (15), the plugs (2) and (5), the seat (3) and the gasket (24)
- Loosen the packing gland (10), unscrew the nuts (23) and remove the bonnet (8)
- Remove the gasket (29), the balancing chamber (11) and the gasket (7)
- Remove the assembly (9)-(17)-(12)-(16)-(19)-(18)
- Remove the screws (18) and unscrew the pin (19)
- Replace the damaged parts and reassemble everything by repeating the operations in the reverse direction, paying attention to the realignment of shafts, seats and plugs.
- Tighten the nuts (23) and (22) gradually and in criss-cross sequence, as indicated in the example in Pic. 2 paragraph 2.01 by applying the torques indicated in chapter 5

Warning: always replace the packing gland (10) (see next paragraphs) and the gaskets (29), (7), (16), (24), (27) and (28).

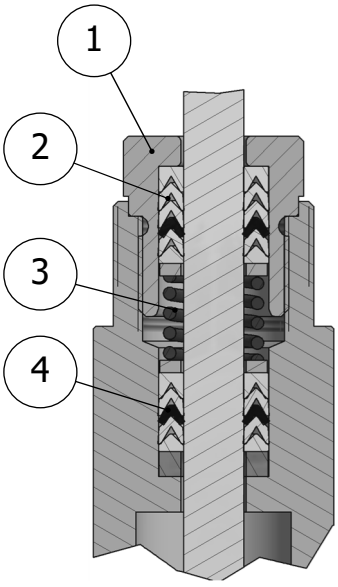


Pic. 11 DN250/10” valve

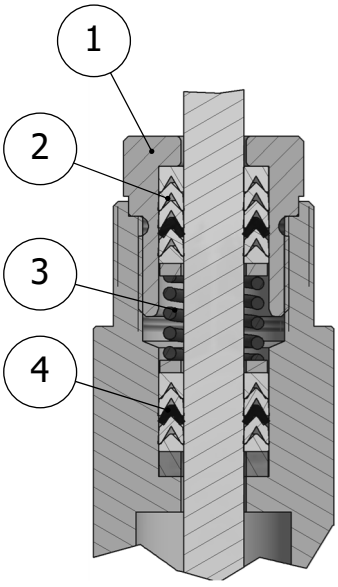
4.06 REPLACEMENT OF SEAT/PLUG IN DN250/10" VALVES

Referring to Pic. 11 proceed as follows :

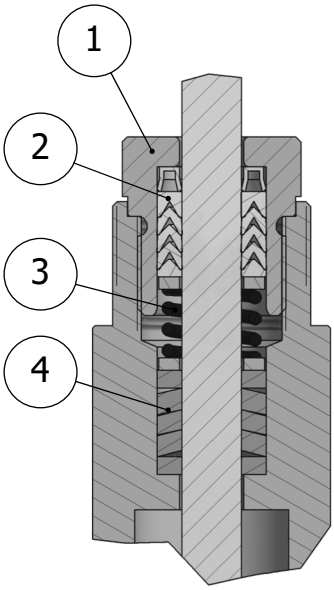
- Remove the plug as described in the previous paragraphs
- Completely unscrew the screw (1).
- Remove the upper packing gland (2).
- Extract the spring (3)
- Extract the lower packing gland (4).
- Replace the O-ring (5) if any
- Carefully clean the housing chamber and grease it with silicone oil.
- Insert the new packing gland as indicated in the pictures corresponding to your model
- Screw the nut (1) without bringing it to the end of the stroke
- Insert the plug taking care to grease the rod with silicone oil.
- Always replace the body gasket by carefully cleaning the support surfaces.
- Reassemble everything as described in the previous paragraphs
- Tighten the nut (1) as indicated in chapter 5



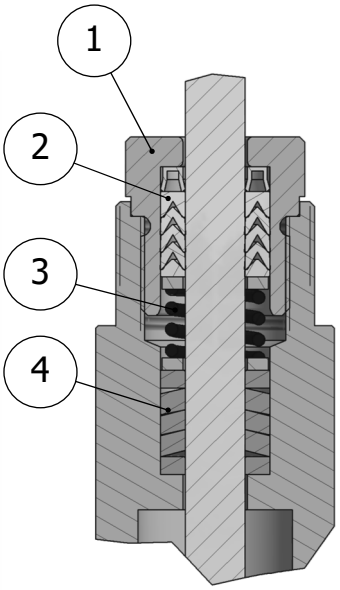
Pic. 8
LP200 - C-Pack1



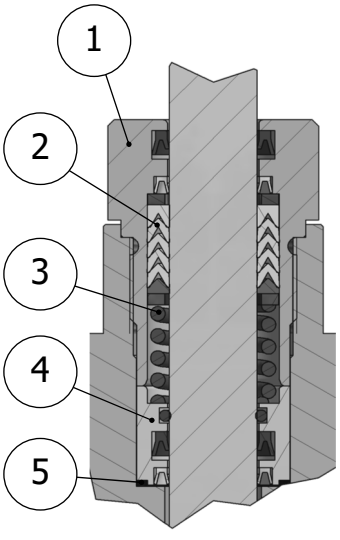
Pic. 9
SP200



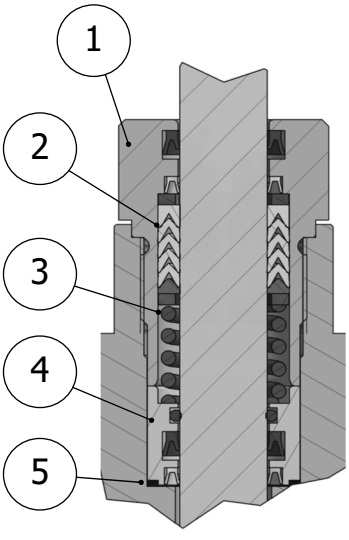
Pic. 10
HP200



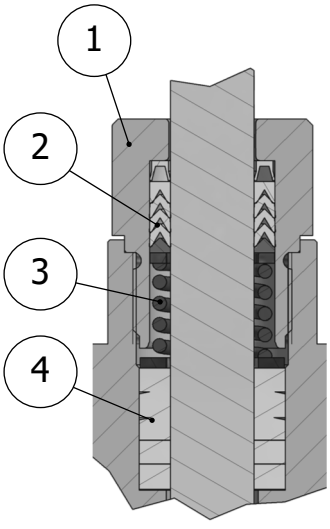
Pic. 11
EcoPack1 - H-Pack1



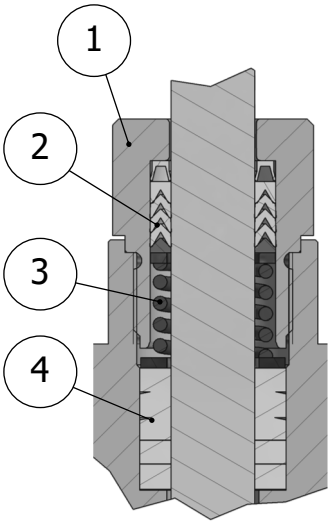
Pic. 12
LP400 - C-Pack2



Pic. 13
SP400



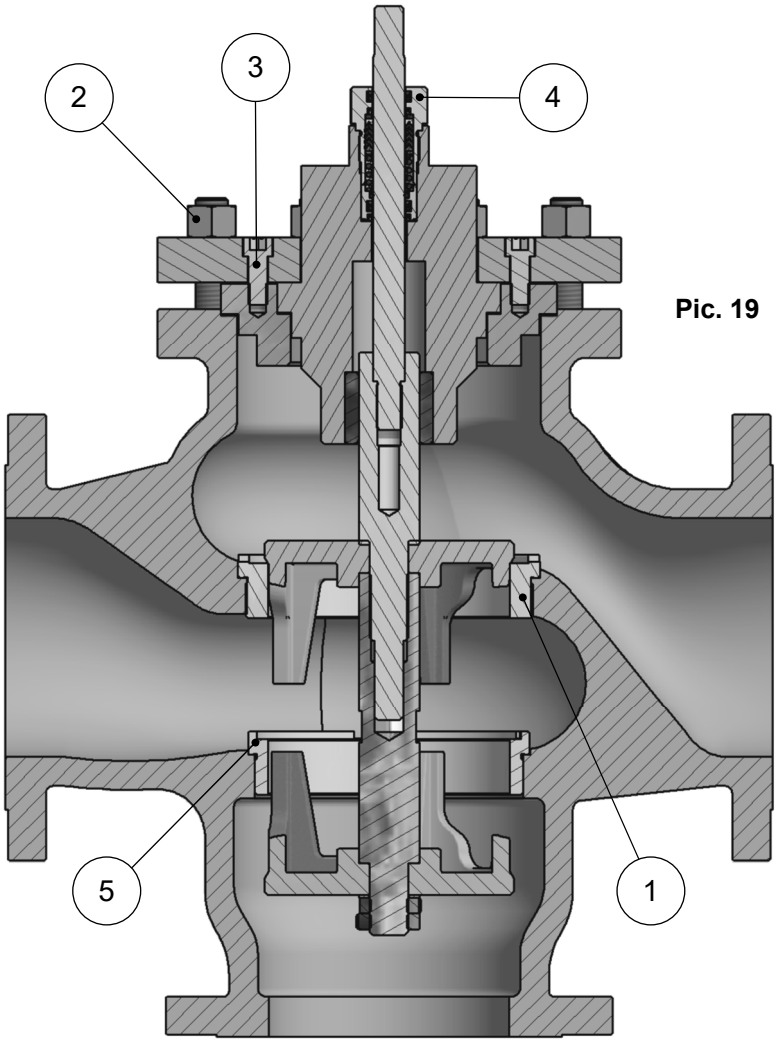
Pic. 14
HP600 - HP900



Pic. 11
EcoPack2 - H-Pack2

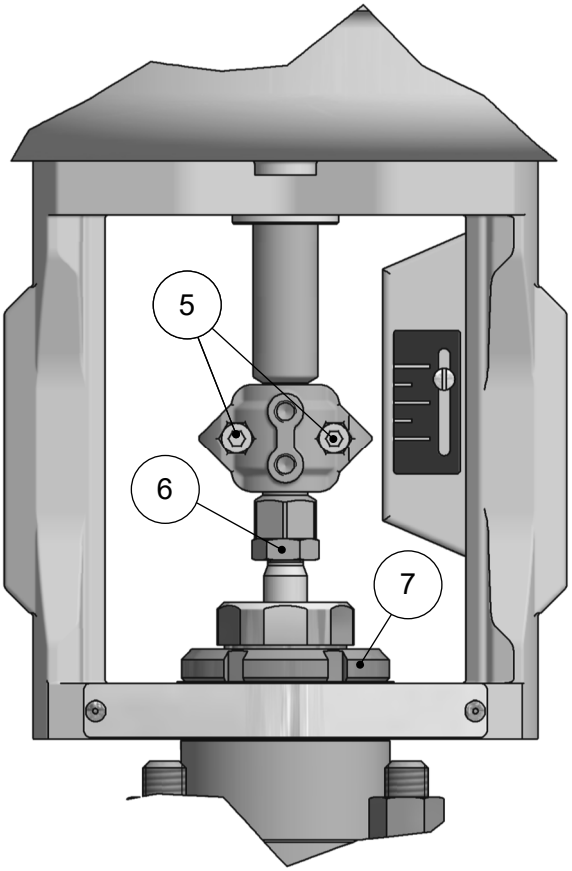
5.0 TIGHTENING TORQUES (with graphite/stainless steel gaskets)

VALVE DIAMETER		SEAT (1-5) Nm ±10%	BONNET NUTS (2) Nm ±10%		SCREWS (3) Nm ±10%	NUT(4) Nm ±10%
			AD10-AM10-TD10-TM10	AD20-AM20		
DN15	//	190	20	//	//	190
//	1/2”	240	40	//	//	190
DN20	3/4”	190	40	//	//	190
DN25	1”	240	40	60	//	190
DN32	1” 1/4	350	60	//	//	190
DN40	1” 1/2	60	60	110	//	190
DN50	2”	60	60	110	//	190
DN65	2” 1/2	700	180	//	//	190
DN80	3”	700	180	240	//	190
DN100	4”	850	180	340	//	190
DN125	5”	900	340	//	85	240
DN150	6”	900	340	//	85	240
DN200	8”	950	450	//	85	240
DN250	10”	//	800	//	//	240

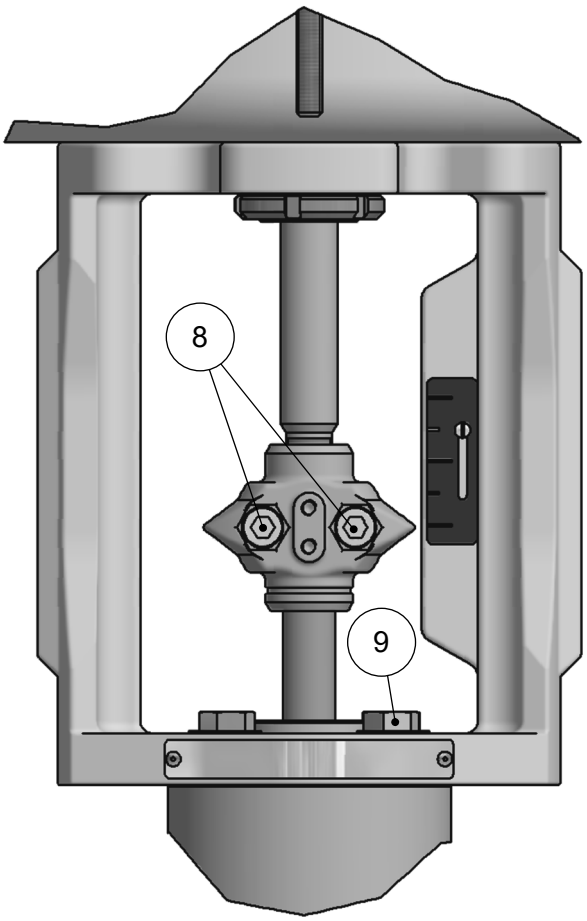


Pic. 19

VALVE DIAMETER		NUTS (9) Nm ±10%	NUT (6) Nm ±10%	RING NUT (7) Nm ±10%	SCREWS (5) Nm ±10%	SCREWS (8) Nm ±10%
DN15	1/2”	//	40	350	5	//
DN20	3/4”	//	40	350	5	//
DN25	1”	//	40	350	5	//
DN32	1” 1/4	//	40	350	5	//
DN40	1” 1/2	//	40	350	5	//
DN50	2”	//	40	350	5	//
DN65	2” 1/2	//	40	480	5	//
DN80	3”	//	40	480	5	//
DN100	4”	//	40	480	5	//
DN125	5”	80	//	//	//	50
DN150	6”	80	//	//	//	50
DN200	8”	80	//	//	//	50
DN250	10”	100	//	//	//	50



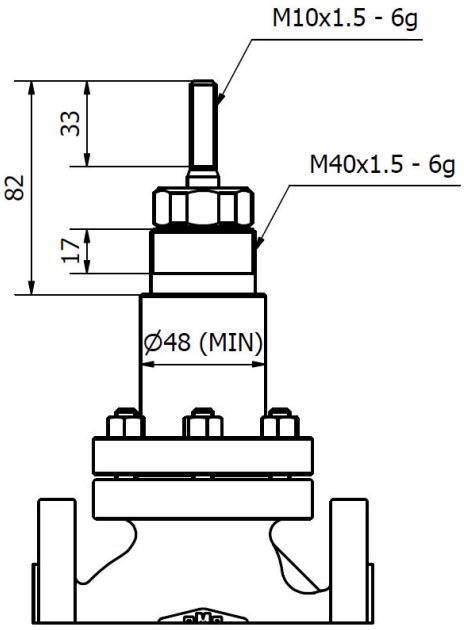
Pic. 20 DN15÷100 / ½”÷4” valves



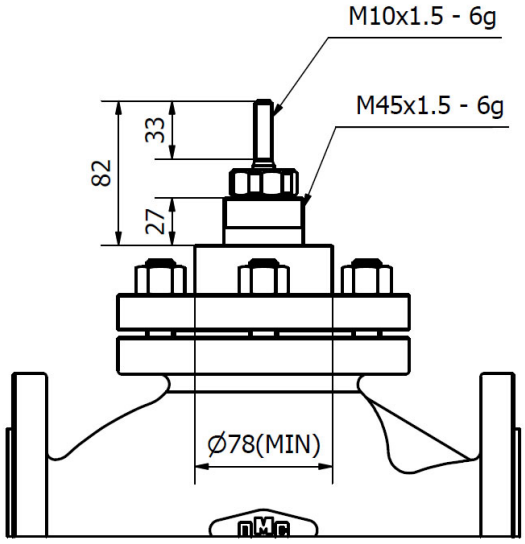
Pic. 21 DN125÷200 / 6”÷10” valves

ENGLISH

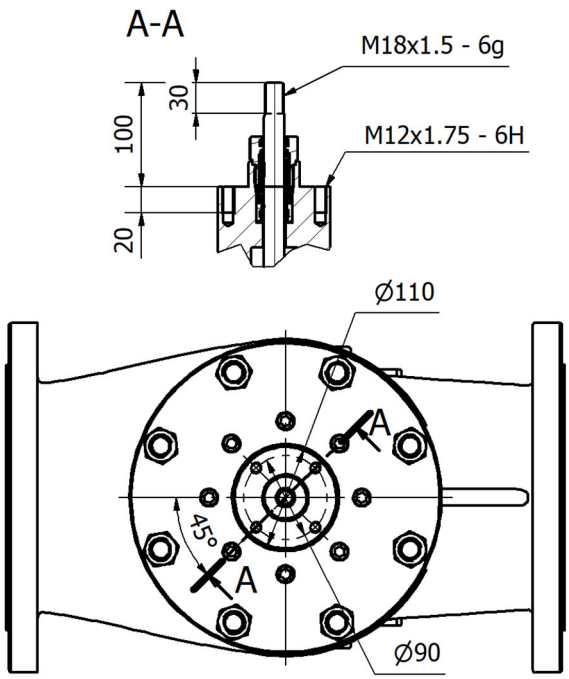
6.0 ACTUATOR CONNECTION DIMENSIONS



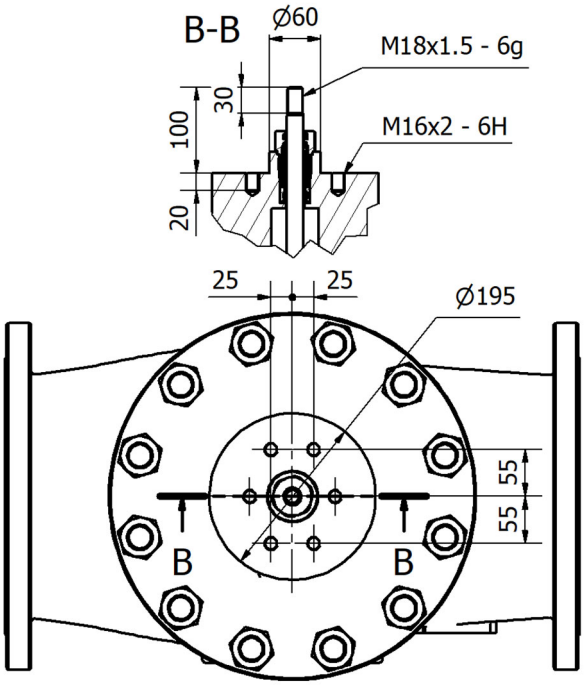
Pic. 22
DN15 ÷ 50 valves
1/2” ÷ 2” valves



Pic. 23
DN65 ÷ 100 valves
2” 1/2 ÷ 4” valves



Pic. 24
DN 125 ÷ 200 PN 16/40 valves
6” ÷ 8” ANSI 150/300 valves



Pic. 25
DN 250 PN 16/40 valves
DN 125 ÷ 200 PN 63/100 valves
6” ÷ 8” ANSI 600 valves

7.0 PERIODIC OPERATIONS

After 24 hours from the first start-up, check the connections to the pipe and the tightness of the flange bolts. Inspect the valve annually, checking for wear and replacing any damaged parts.

Periodically check for any internal and/or external corrosion and/or erosion phenomena as they may significantly damage the pressurized parts, locally reducing their thickness and consequently their degree of safety.

8.0 AVAILABLE SPARE PARTS

DESCRIPTION	PICTURE	POSITION
Upper and lower seat of diverter / mixer valve	7-8	7-8
Diverter valve plug complete with rod	7	4-10-14-9-13
Mixer valve plug complete with rod	8	4-10-9-13
ZEB 20 bellows assembly	9-10	2-16-15-12
Body gasket	9-10-11-12	11
LP200 stem packing gland	11	//
SP200 stem packing gland	12	//
HP200 stem packing gland	13	//
EcoPack 1 stem packing gland	14	//
LP400 stem packing gland	15	//
SP400 stem packing gland	16	//
HP400 stem packing gland	17	//
EcoPack 2 stem packing gland	18	//

WARNING!!! OMC valves are uniquely identified by a serial number shown on the plate located on the actuator yoke. To order spare parts or for any other need, always refer to the aforementioned number.

9.0 PRESSURE/TEMPERATURE RELATIONSHIP

For the pressure drop in relation to temperature refer to the document:

- OMC-RPT-001

The actual use of the valve depends on the combination of the materials of which it is made.

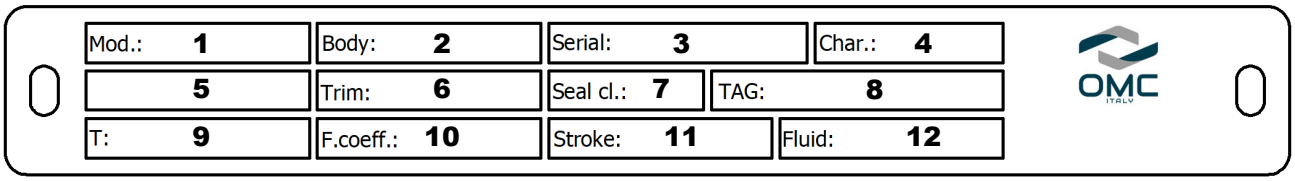
10.0 REFERENCES OF EUROPEAN DIRECTIVE FOR PRESSURE EQUIPMENT 2014/68/EU

SIZE	FLUIDS	CE MARKING	CONFORMITY ASSESSMENT PROCEDURE
DN15÷DN25 1/2" ÷ 1"	Group 1	NO	Art. 4 Par.3
DN32÷ DN250 1"1/2 ÷ 10"	Group 1	YES	B + C2

11.0 PLATES

11.01 IDENTIFICATION PLATE

All OMC valves are provided with an identification plate to make the identification of the valve univocal.

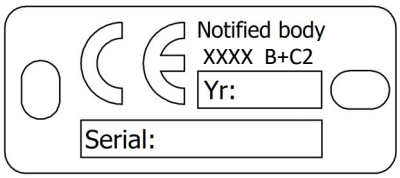


KEY

NUMBER	TEXT	DESCRIPTION
1	Mod.	Valve model
2	Body	Valve body material
3	Serial	Valve serial number
4	Char.	Regulation characteristic (equal percentage, linear, etc.)
5		Nominal diameter and nominal pressure of the valve
6	Trim:	Seat/plug material
7	Seal cl.	Valve seal class
8	TAG	Any technical identification of the Customer
9	T	Minimum and maximum permissible temperature of the process fluid
10	F.coeff.	Valve outflow coefficient
11	Stroke	Plug stroke
12	Fluid	Process fluid

11.02 "CE" PLATE PURSUANT TO DIRECTIVE 2014/68/EU

If required (see paragraph 10.0) the valve is provided with a "CE" plate bearing the following data



KEY

CE	Indicates compliance with all obligations of the manufacturer
Notified body	Notified Body that notifies the quality of the production system
XXXX	Number of the Notified Body that notifies the quality of the production system
B	EU examination of type - type of production (Module B) according to directive 2014/68/EU
C2	Production control (Module C2) directive 2014/68/EU
Yr.	Year of production
Serial	Valve serial number