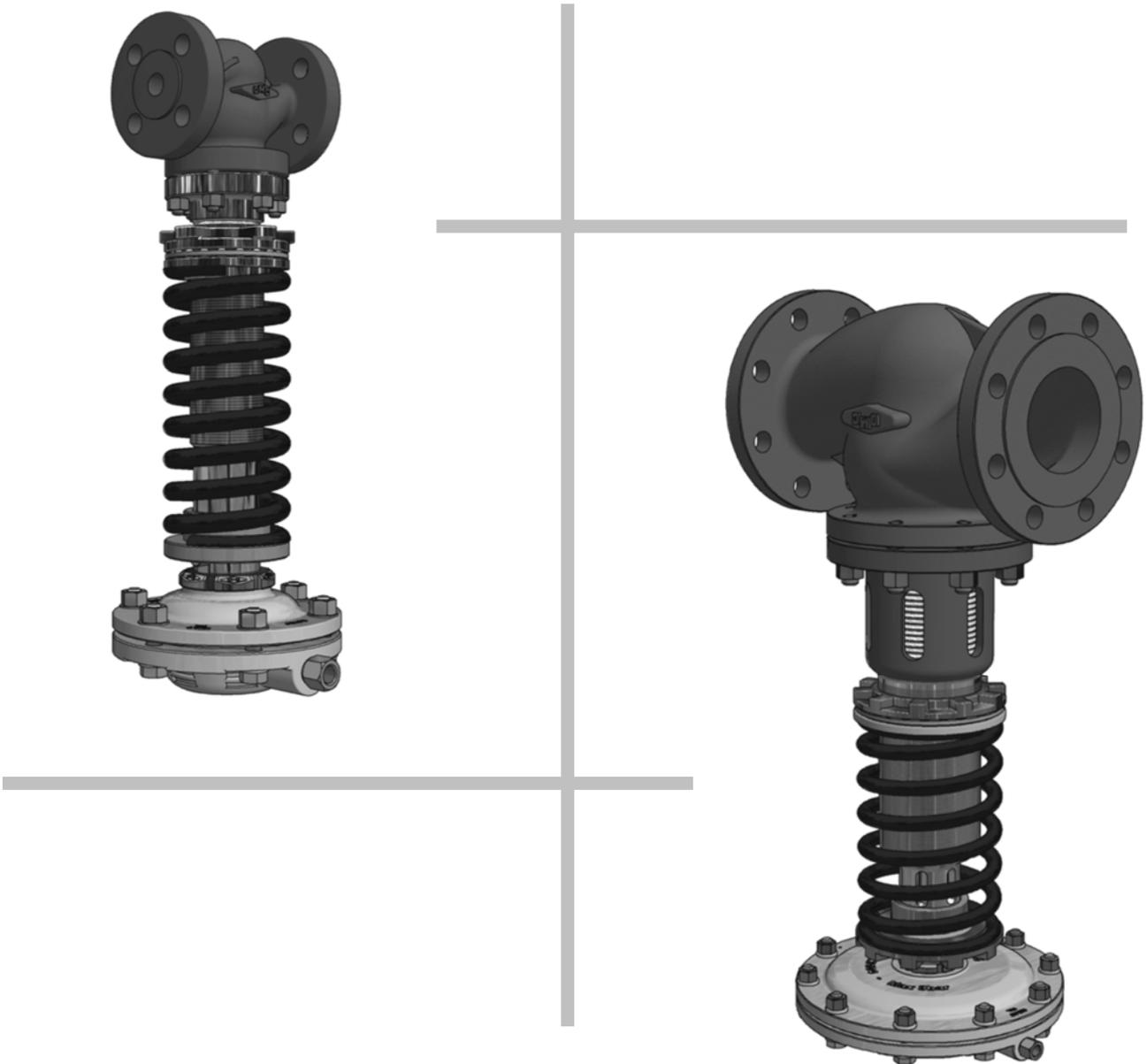


INSTALLATION, OPERATION AND MAINTENANCE MANUAL



Our products are manufactured under ISO-9001 Quality Assurance System, approved by CSQ certified under nr.9190.OMC2 - FIRST ISSUE 1994/08/04



Self-operated pressure reducers **RD10 / RA10**

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1.0 SAFETY INFORMATION

The safe operation of this product is ensured only if it is installed, commissioned, used and maintained in an appropriate way by qualified personnel in compliance with the operating instructions.

1.01 INTENDED USE

Verify that the valve is suitable for the intended use and application by controlling:

- that the material of which the valve is made up of is compatible with the process fluid;
- that the valve is suitable to the pressures and temperatures of the process fluid;
- to have arranged a suitable safety device which prevents, in case of valve malfunctioning, any hazardous overpressures or overtemperatures.

The OMC valves are not intended to withstand any external stresses which can be induced by the systems in which they are inserted. The installer must take account of these stresses and take the appropriate measures.

1.02 ACCESS

Ensure a safe access and, if required, a safe working platform (with a suitable protection) before operating on the product. Arrange the suitable lifting means, if required.

1.03 LIGHTING

Ensure a lighting which is suitable to the required type of work.

1.04 HAZARDOUS FLUIDS IN THE PIPE

Take account of the content of the pipe or anything it may have previously contained. Be careful to: flammable materials, substances hazardous for the health, temperature extremes.

1.05 ENVIRONMENTAL SITUATIONS

Take account of: areas at risk of explosion, lack of oxygen (such as tanks, wells, etc...), hazardous gases, temperature limits, high or low temperature surfaces, risk of fire (for example during welding operations), excessive noise, moving machines.

1.06 TEMPERATURE

Wait until the temperature normalizes after the interception to prevent any risks of burn or freezing.

1.07 SYSTEM

Take account of the possible effects on the whole expected working system.

May the intended measure put the other parts of the system or the personnel at risk?

Make sure that the shut-off valves are gradually activated in order to prevent any abrupt variations to the system.

1.08 PRESSURIZED SYSTEMS

Make sure that the pressure is isolated and discharged to the atmospheric pressure in safe conditions. Take account of a double insulation (double block and vent) and the blocking or the labelling of the closed valves. Do not consider the system depressurized even if the pressure gauge indicates zero pressure.

During the operation the valve is pressurized. Before performing any maintenance operation or action on the flanges and closing caps, make sure that the line is depressurized (0 bar) and at ambient temperature.

1.09 TOOLS AND CONSUMABLE PARTS

Before starting the work, make sure to have at your disposal all the tools required to perform it, do not make use of inappropriate tools. Use only OMC original spare parts.

1.10 PROTECTION CLOTHES

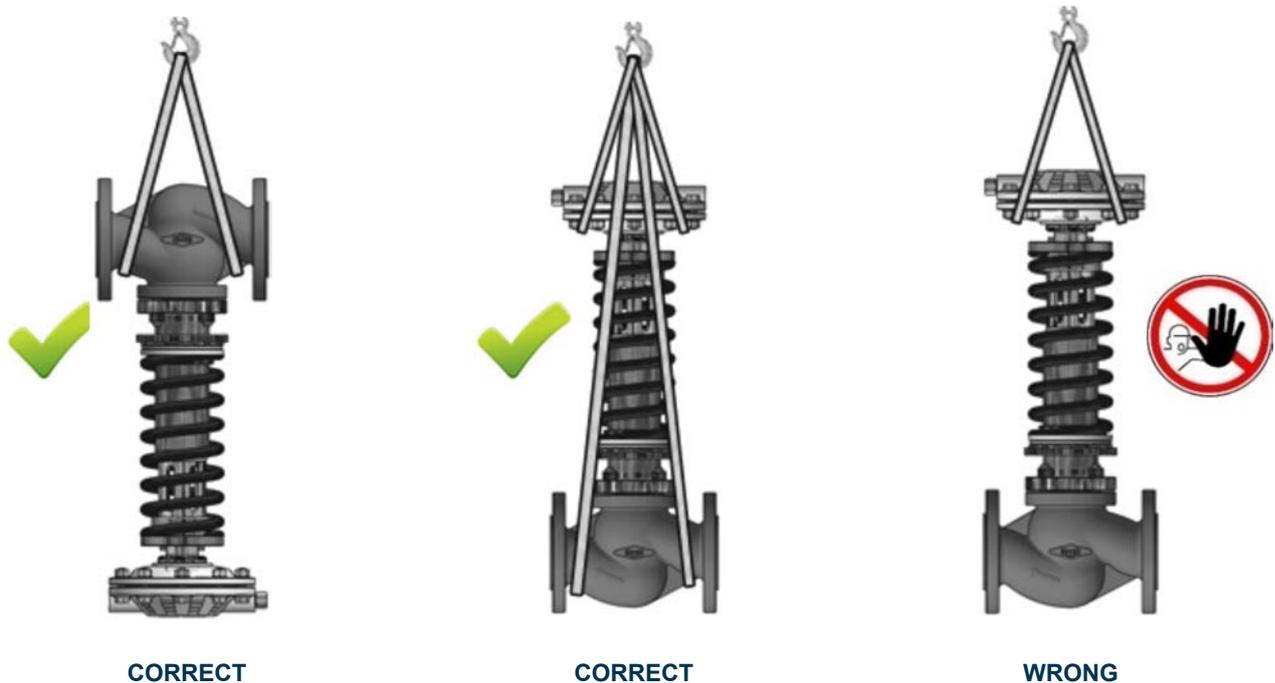
Take account of whether you and/or others need some clothes against the hazards, such as chemical products, temperatures, radiations, noise, fall of objects, risks for eyes and face.

1.11 QUALIFICATION OF THE WORKERS

All works must be performed and supervised by some skilled, trained and competent personnel.

1.12 HANDLING

Use suitable lifting means for the handling of the products by assessing all the risks concerning the lifting, the environment load, the individual and the circumstances of the work which is about to be performed.



1.13 FREEZING

Protect the products against frozen in environments with temperatures lower than the freezing point of the process fluid.

1.14 OTHER RISKS

During the operation, the external surface of the product can be at temperatures which are hazardous to touch. Take account of this risk.

1.15 DISPOSAL

For the disposal respect the legislation in force in the State/Country/Nation where the product should be disposed of.

1.16 RISK OF CORROSION AND/OR EROSION

Periodically verify any phenomena of internal and/or external corrosion and/or erosion as they may significantly damage the pressurized parts by locally reducing the thickness and as a consequence the safety degree.

2.0 INSTALLATION

All works must be performed and supervised by skilled, trained and competent personnel.

The OMC valves highlight the flow direction, the nominal passage, the maximum operating pressure and the material. Before installing the valve, make sure that the pipe which channels the process fluid is clean, by performing, if required, an energetic blowing with steam or compressed air.

The OMC pressure reducers have been specifically designed for use on steam, water, compressed air, industrial inert gases and other fluids included in Group 2 of the Pressure Equipment Directive 2014/68/EU.

The reducer must be vertically installed on a horizontal pipe.

For any use of fluids with a temperature lower than 90°C the reducer can be installed with its head pointed either upward (Pic.1) or downward (Pic.2). For any use with steam or fluids with a temperature higher than 90°C, the reducer must be installed with its head pointed downward and its water seal pot installed on the line downstream the reducer by making sure to respect the distances and the pressure pipes shown in Pic.2. During the start-up, slowly open the "7" shut-off valve upstream to prevent any possible water hammer.

2.01 INSTALLATION OF THE VALVE ON THE PIPE

To ensure a uniform load and a uniform alignment, the flange bolts must be gradually tightened in criss-cross sequence, as shown in Pic.D (paragraph 4.02)

Prevent any excessive tightening. Use the recommended tightening torques.

Prevent any pipe misalignment.

2.02 PRESSURE PIPE (Pic.1 and Pic.2)

The line of the actuator's signal must be directly connected to the downstream pipe.

To obtain a good adjustment signal the downstream sensitive point must be far at least 1 meter or 15 times the diameter of the pipe from the reducer "3" or from changes in the flow direction.

The pipe "4" of the actuator's signal must be made of copper or stainless steel, its diameter must be equal to 8mm and its minimum length must be 1m .

2.03 PRESSURE GAUGES (Pic.1 and Pic.2)

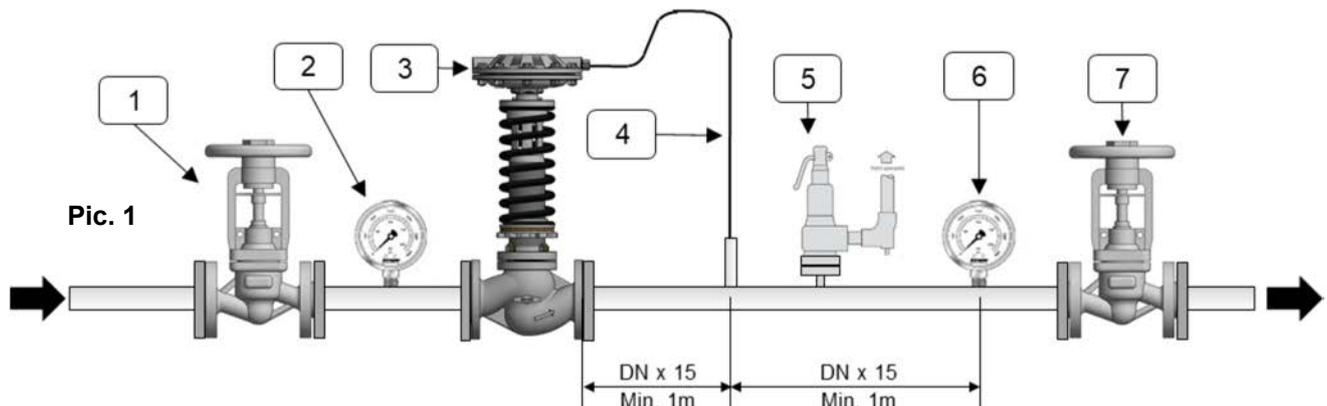
To activate the reducer "3" and keep the operating conditions under control you must install a pressure gauge "2" both upstream and downstream "6".

2.04 SHUT-OFF VALVES (Pic.1 and Pic.2)

To ensure future maintenance operations on the reducer "3" you should install a shut-off valve "1" upstream and a "7" one downstream the reducer.

2.05 SAFETY VALVE (Pic.1 and Pic.2)

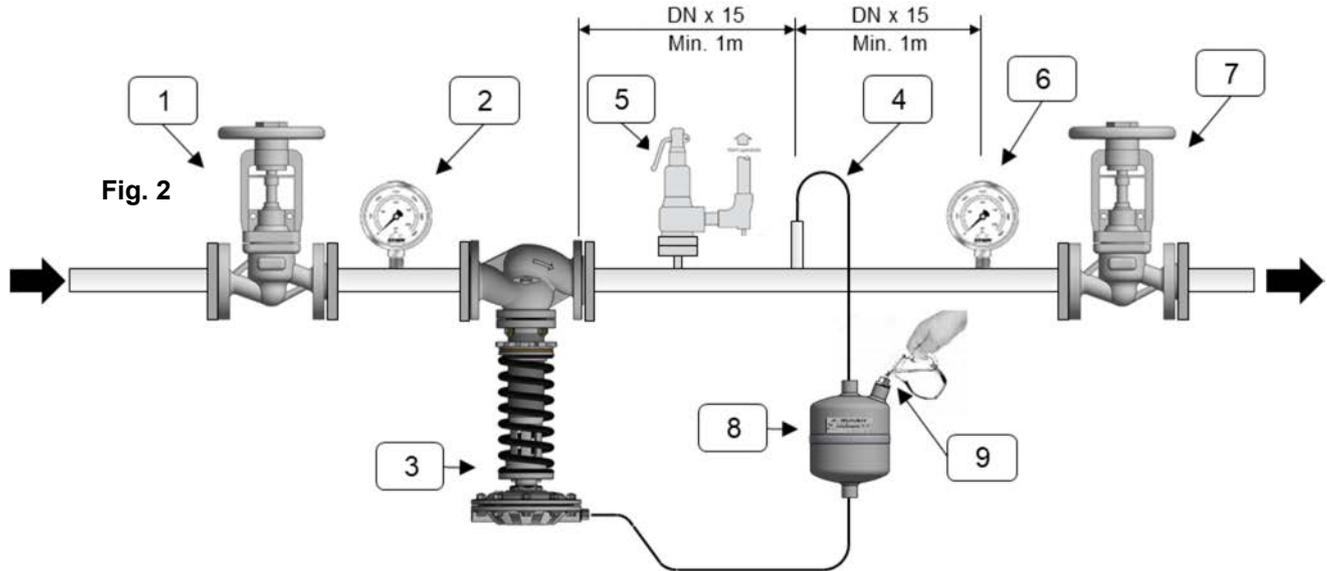
It's recommended that an appropriate safety valve "5" on the downstream side in order to protect the plant from any overpressure. The valve "5" must be set to open at a lower pressure than the safety of the equipment and dimensioned to discharge the entire reducer capacity "3", if it fails in the fully open position. The safety valve outlet pipe must be discharged in a safe and secure place.



Pic. 1

2.06 WATER SEAL POT (Pic.2)

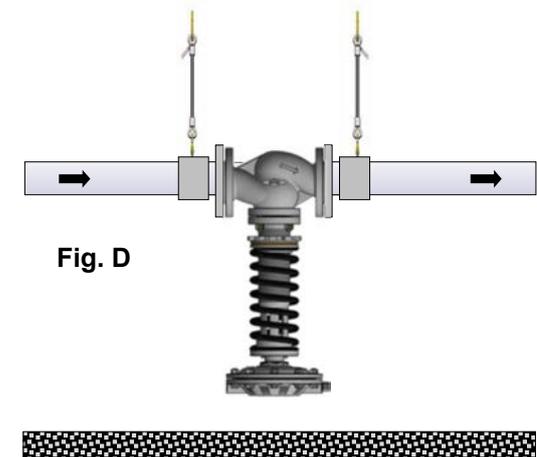
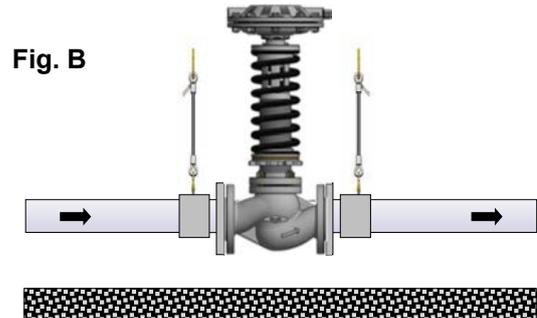
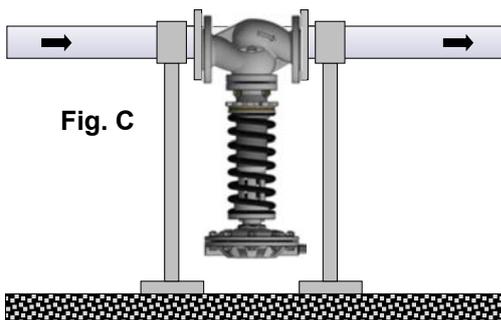
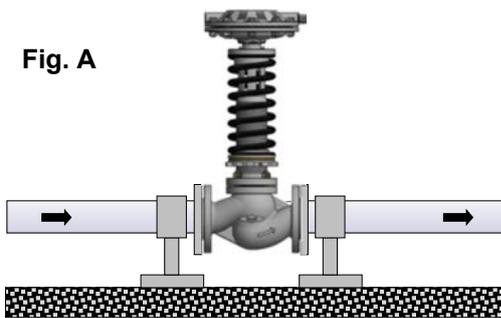
For installations on steam lines use an "8" water seal pot mounted between the pressure tap and the reducer's actuator. The "8" vessel must be filled with water before activating the valve. Remove the cap "9" and fully fill it with water. Put the cap back.



ATTENTION!!! The reducer balancing bellows (Pic.8 Pos.15) and the actuator's diaphragm (Pic.6 Pos.9) are subjected to wear. Do not install the reducer in zones where any leakages of the process fluid, due to breaks of the above-mentioned components, may injure people and/or animals and/or damage things.



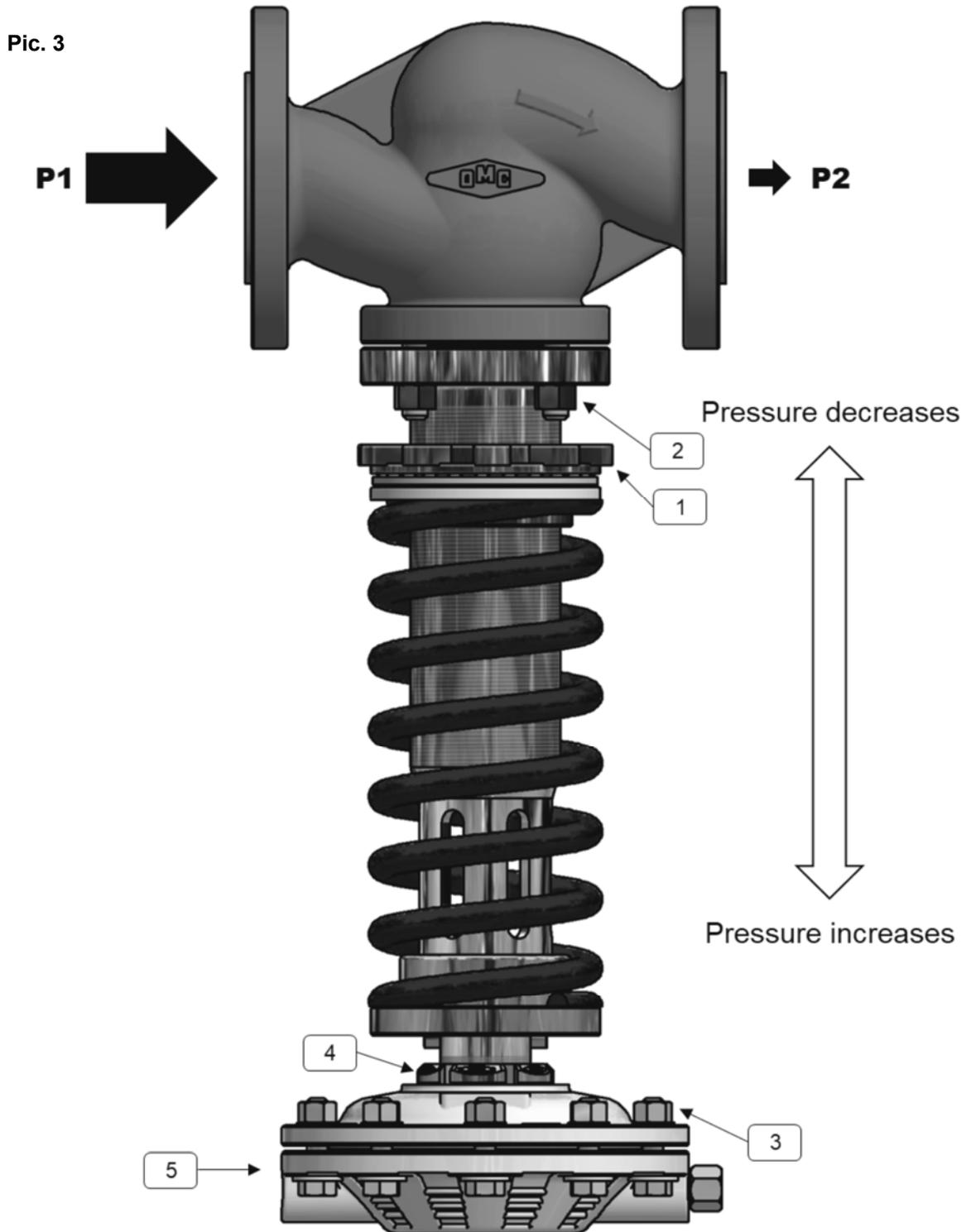
ATTENTION!!! Any excessive weight of the valve might damage the system's structure. If required, support the valve by using suitable devices (Pic. A and Pic. C) and/or ropes (Pic. B and Pic. D)



3.0 DOWNSTREAM PRESSURE CALIBRATION (Pic.3)

The reducer is supplied uncalibrated with the spring pushing plate in its lowest position. The required downstream pressure must be calibrated in zero-flow rate conditions or in normal operating conditions according to the requirements of the application and by taking account of the proportional deviation. The required downstream pressure is obtained by rotating the spring pushing plate "1" until the pressure gauge "6" Pic.1 and 2 indicates the required value.

The adjustment can be carried out by using a simple 17 mm fixed wrench. By compressing the adjustment spring the downstream pressure increases while, vice versa, the pressure decreases by reducing the spring tension.



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4.0 MAINTENANCE

Note: before starting any maintenance operations consult the “Safety Information” in chapter 1.
Before operating the reducer:

- ◆ depressurize the system
- ◆ close the upstream shut-off valve (Pic.1 and 2 Pos. 1)
- ◆ fully unload the calibration spring by acting on the ring nut “1” Pic.3.
- ◆ close the downstream shut-off valve (Pic.1 and 2 Pos. 7)
- ◆ wait until the whole pressure reducer reaches the ambient temperature

The reducer is not subjected to ordinary maintenance, but it is recommended to disassemble it every 12/18 months for a precautionary control of the components. The parts which show signs of wear must be replaced. Specifications of the Spare Parts are provided in paragraph 5.0.

Before performing any controls or installing the spare parts, make sure that the valve is intercepted and that the upstream and downstream pressure is relieved to zero; then rotate the spring pushing plate "1" Pic.3 so as to fully unload the spring.

The pipe "4" Pic.1 and 2 of the downstream sensing line must be detached from the actuator.



ATTENTION!!! The balancing bellows provided inside the reducer (Pic.8 Pos.15) is designed to support 10,000 cycles. Any break would let the fluid contained in the pipe go out. It is recommended to periodically replace the bellows, according to the actual use of the reducer. Do not install the reducer in zones where any leakages of the process fluid, due to a break of the bellows, may injure people and/or animals and/or damage things.



ATTENTION!!! The diaphragm provided in the actuator (Pic.6 Pos.9) is designed to support 10,000 cycles. Any break would let the fluid contained in the pipe go out. It is recommended to periodically replace the diaphragm, according to the actual use of the reducer. Do not install the reducer in zones where any leakages of the process fluid, due to a break of the diaphragm, may injure people and/or animals and/or damage things.

4.01 TIGHTENING TORQUES

VALVE DIAMETER	SEAT (Pic.8 Pos.17) Nm ±10%	BODY NUTS (Pic.8 Pos.2) Nm ±10%	ACTUATOR BLOCKING RING NUT (Pic.4 Pos 4) Nm ±10%	ACTUATOR MODEL	NUTS (Pic.6 Pos 8) Nm ±10%
DN15 - 1/2"	190	30	300	AR085	40
DN20 - 3/4"	190	30	300	AR100	40
DN25 - 1"	240	30	300	AR120	40
DN32 - 1" 1/4	350	30	300	AR150	40
DN40 - 1" 1/2	570	50	300	AR205	50
DN50 - 2"	570	50	300	AR265	50
DN65 - 2" 1/2	700	100	300		
DN80 - 3"	700	100	300		
DN100 - 4"	850	100	300		

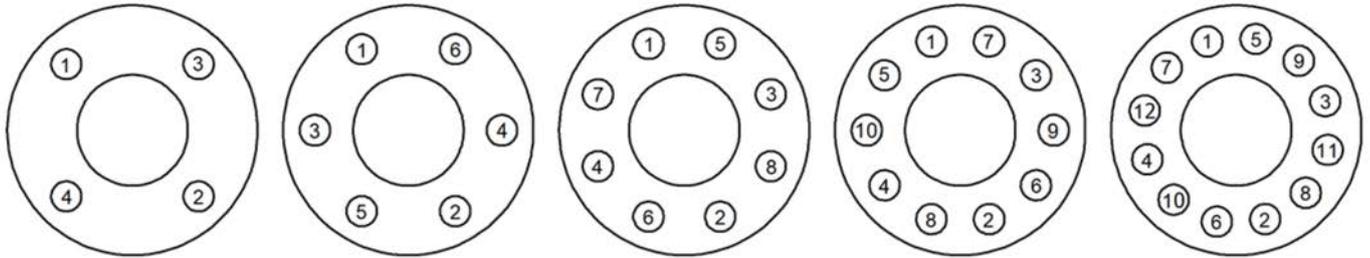


4.02 TIGHTENING SEQUENCE

To ensure the uniformity of the load and the alignment, the bolts must be gradually tightened and in criss-cross sequence, as indicated in Pic.E

Prevent any excessive tightening. Use the recommended tightening torques

Pic. E



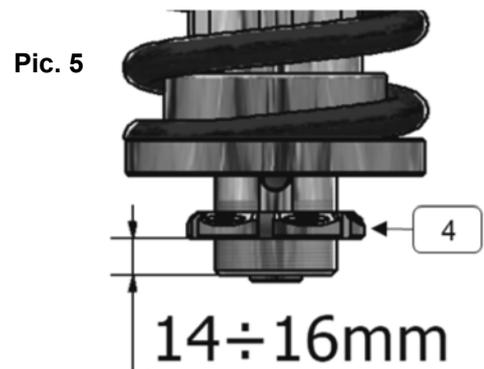
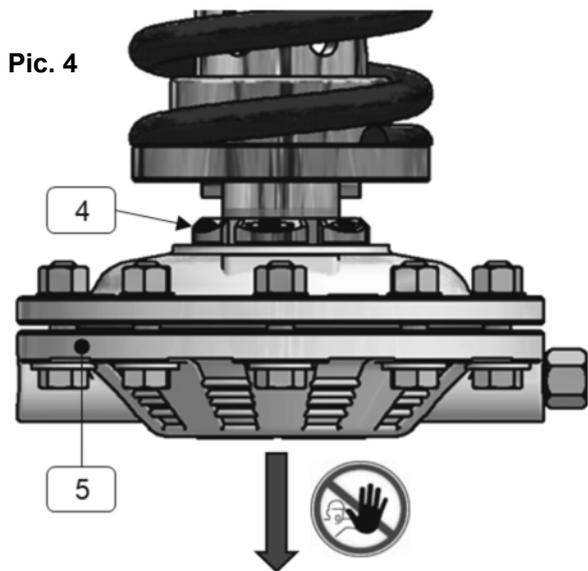
4.03 REPLACEMENT OF THE ACTUATOR

- ◆ depressurize the system
- ◆ close the upstream shut-off valve (Pic.1 and 2 Pos. 1)
- ◆ fully unload the calibration spring by acting on the ring nut "1" Pic.3.
- ◆ close the downstream shut-off valve (Pic.1 and 2 Pos. 7)
- ◆ wait until the whole pressure reducer reaches the ambient temperature
- ◆ loosen the ring nut "4" (Pic. 4)
- ◆ grab the actuator "5" (Pic. 4) and rotate it counterclockwise until it is completely unscrewed.



ATTENTION!!!! TO THE ACTUATOR WEIGHT

- ◆ set the ring nut "4" in the position shown in Pic.5
- ◆ completely screw the new actuator with the ring nut "4".
- ◆ tighten the ring nut "4"

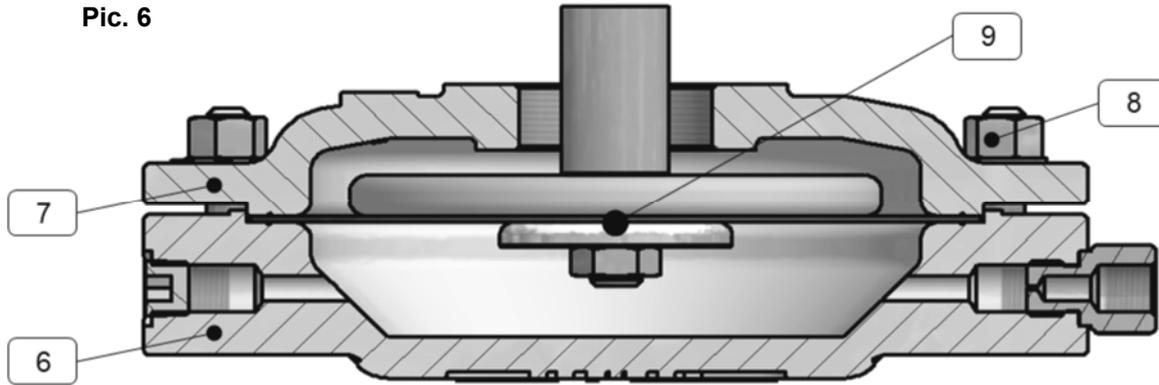


4.04 REPLACEMENT OF THE DIAPHRAGM GROUP

- ◆ separate the actuator from the reducer as described in chapter 4.0.3
- ◆ separate the lid "6" from the lid "7" by unscrewing the nuts "8" (Pic.6)
- ◆ replace the diaphragm group "9" with the new diaphragm group
- ◆ re-assemble the parts by following the indications of chapter 4.01 and 4.02
- ◆ re-install the actuator on the reducer as described in chapter 4.03

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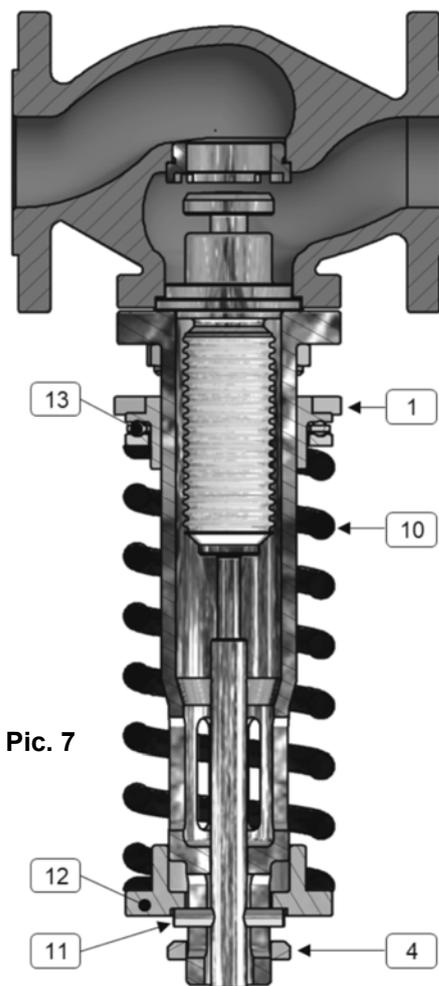
Pic. 6



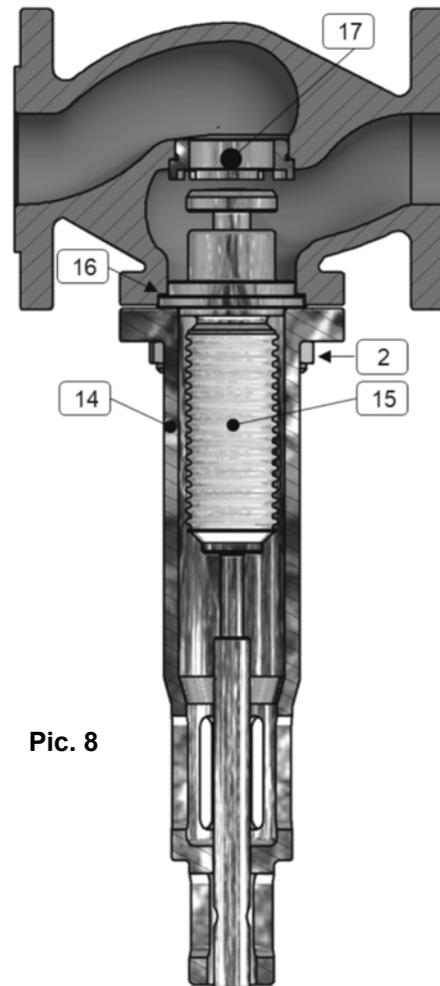
4.05 REPLACEMENT OF THE BELLOWS GROUP/PLUG

- ◆ separate the actuator from the reducer as described in chapter 4.03
- ◆ fully decompress the spring "10" by acting on the ring nut 1 (Pic.7)
- ◆ remove the ring nut "4" and remove the pin "11"
- ◆ remove in sequence the ring nut "12", the spring "10" and the bearing "13"
- ◆ unscrew the nuts "2" Pic.8 and remove the bonnet "14"
- ◆ remove the bellows group/plug "15"
- ◆ if required replace the seat "17" by tightening it as described in chapter 4.01
- ◆ replace the gasket "16"
- ◆ install the new bellows group/plug by following the operations in the reverse order.

For the tightening operations follow the indications of chapters 4.01 and 4.02



Pic. 7



Pic. 8

5.0 AVAILABLE SPARE PARTS



ATTENTION!!! The OMC reducers are univocally identified by a serial number applied on the reducer and a serial number applied on the actuator, to order the spare parts or for any other need, always refer to such serial numbers.

DESCRIPTION	PICTURE	POSITION
Complete actuator	4	5
Diaphragm group	6	9
Bellows group / actuator	8	15
Seat	8	17
Body gasket	8	16
Calibration spring	7	10
Spring supporting bearing	7	13

6.0 MALFUNCTIONING: SYMPTOMS, CAUSES AND REMEDIES

Note: before starting any maintenance operations consult the “Safety Information” in chapter 1. To disassemble this product you must first depressurize the system and wait until the reducer’s temperature is equal to the ambient temperature

SYMPTOM	CAUSE	REMEDY
The downstream pressure exceeds the required calibration one	Actuator not properly dimensioned	Control the design data and, if required, replace it (Chap. 4.03)
	Sensing line pipe (Pic.1 pos.4) obstructed	Disassemble the pipe and clear it
	Actuator diaphragm (Pic.6 pos.9) damaged	Replace (Chap. 4.04)
	Plug or seat damaged	Replace (Chap. 4.05)
	Bellows group damaged	Replace (Chap. 4.05)
In full-load conditions the downstream pressure is lower than the required cali-	Actuator not properly dimensioned	Control the design data and, if required, replace it (Chap. 4.03)
The actuator is properly dimensioned but the reducer does not provide the maximum flow rate	The reducer is not properly dimensioned	Control the design data and, if required, replace it
The downstream pressure fluctuates	The downstream pressure pipe is too close to the valve or some turbulences	Make sure about the proper installation of the reducer (Chap. 2.0)
	The pressure reduction ratio is too high.	Consider two valves in series to decrease the reduction ratio
	Pressure pipe (Pic.1 pos.4) too sensitive	Reduce the pipe section.

7.0 PRESSURE/TEMPERATURE RELATIONSHIP

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

- OMC-TUV-00

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

8.0 REFERENCES OF THE EUROPEAN DIRECTIVE FOR PRESSURE EQUIPMENT 2014/68/EU

VALVE BODY OF THE REDUCER RD10

PN16	PN25	PN40	CATEGORY	FLUIDS	EC MARKING	PROCEDURE OF CONFORMITY EVALUATION
DN15÷DN50	DN15÷DN40	DN15÷DN32	Art. 4 Par.3	Group 2	NO	Art. 4 Par.3
DN65÷DN100	DN50÷DN100	DN40÷DN100	1	Group 2	YES	A

VALVE BODY OF THE REDUCER RA10

ANSI 150	ANSI 300	CATEGORY	FLUIDS	EC MARKING	PROCEDURE OF CONFORMITY EVALUATION
1/2"÷2"	1/2"÷1"	Art. 4 Par.3	Group 2	NO	Art. 4 Par.3
2"1/2 ÷ 4"	1"1/2 ÷ 4"	1	Group 2	YES	A

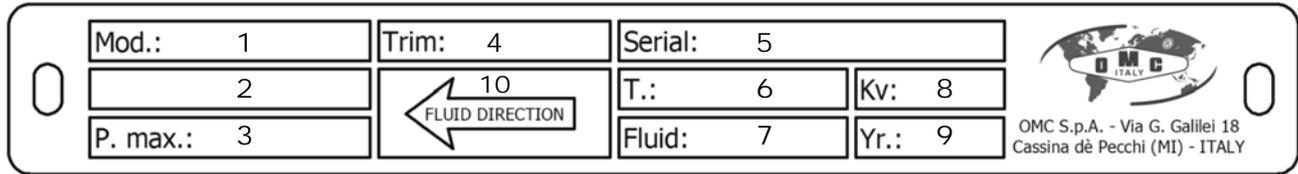
ACTUATORS

CATEGORY	FLUIDS	EC MARKING	PROCEDURE OF CONFORMITY EVALUATION
Art. 4 Par.3	Group 2	NO	Art. 4 Par.3

9.0 PLATES

9.01 VALVE IDENTIFICATION PLATE

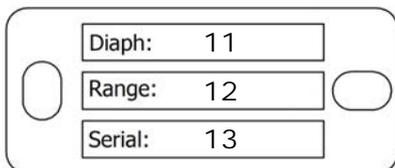
All OMC valves are provided with an identification plate for the identification unique of the valve.



LEGEND

NUMBER	TEXT	DESCRIPTION
1	Mod.	Reducer model
2		Nominal diameter and nominal pressure of the valve
3	P.Max.	Maximum input pressure
4	Trim	Material of seat/plug
5	Serial	Valve serial number
6	T	Maximum and minimum allowed temperatures of the process fluid
7	Fluid	Process fluid
8	Kv	Outflow coefficient of the valve
9	Yr:	Year of manufacture
10	Fluid Direction	Direction of the process fluid's flow

9.02 ACTUATOR IDENTIFICATION PLATE

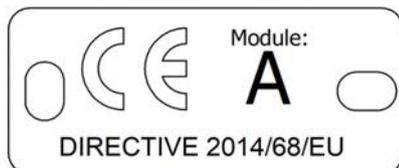


LEGEND

NUMBER	TEXT	DESCRIPTION
11	Diaph	Material of the actuator's diaphragm
12	Range	Actuator's scale range
13	Serial	Actuator serial number

9.03 "EC" PLATE PURSUANT TO DIRECTIVE 2014/68/EU

If planned (see paragraph 8.0) the valve is provided with an "EC" plate containing the following data



LEGEND

TEXT	DESCRIPTION
CE	It indicates the conformity to all manufacturer's obligations
Module: A	Procedure of conformity validation
DIRECTIVE 2014/68/EU	European directive concerning pressurized equipment 2014/68/EU

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