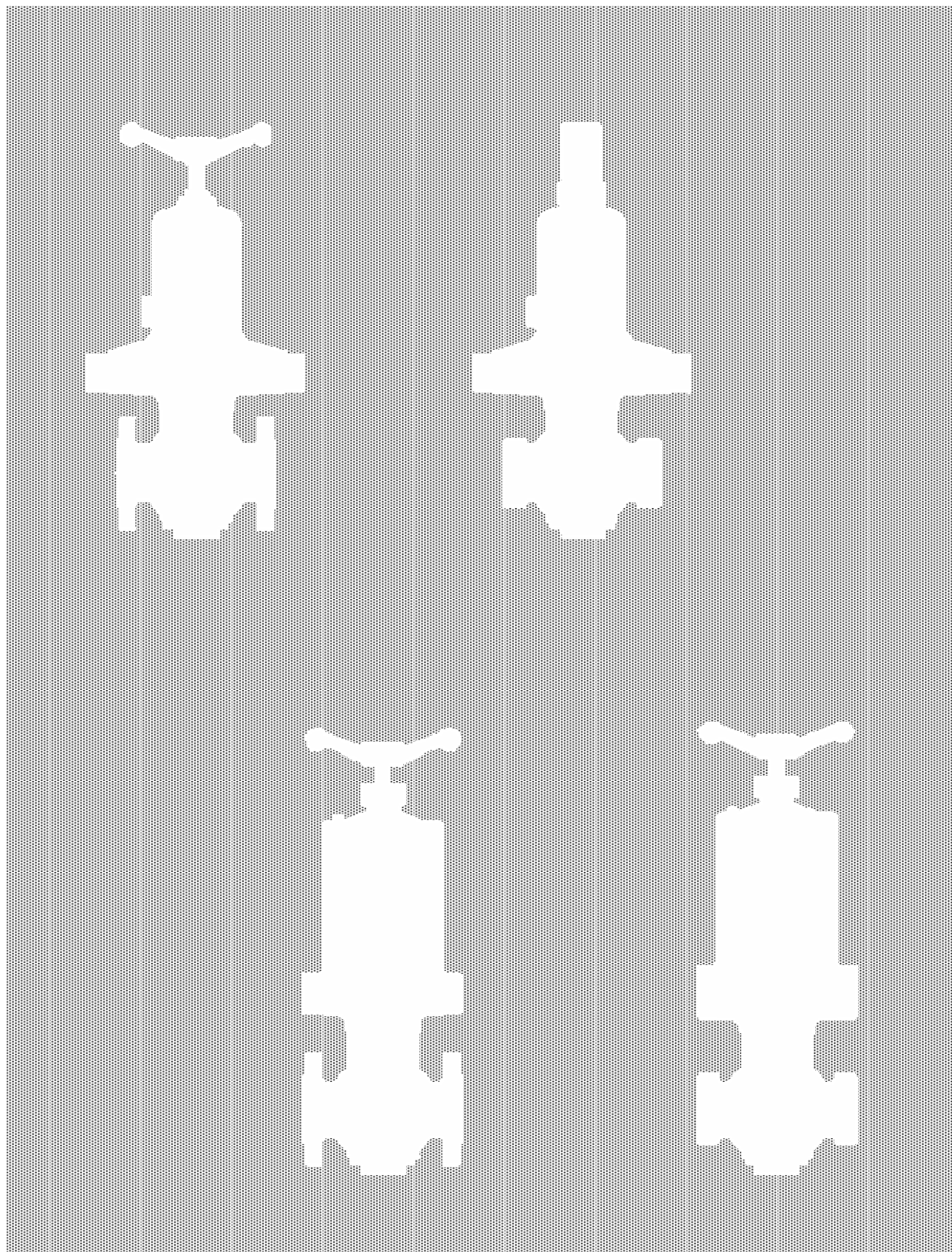




# I N S T R U C T I O N S

For installing and servicing self-operating  
pressure regulators UBS



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# I N S T R U C T I O N S

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### 1. GENERAL INFORMATION

#### 1.1 – RIGHT TO MAKE MODIFICATIONS AND "COPYRIGHT"

The regulations, standards, etc. mentioned in these operating instructions are based on the knowledge that was available when they were drawn up and are not subject to modification. Users are responsible for applying the latest versions of these.

The supplier reserves the right to make modifications and technical improvements to data and information whenever it sees fit. Under no circumstances may users require modifications or improvements to be made to valves that have already been delivered.

### 2. GUARANTEE

The scope and duration of the guarantee are indicated in the manufacturer's "General Conditions of Sale".

The applicable conditions are those that were in force at the moment of delivery.

Amongst other things, the guarantee does not cover damage to valves deriving from the following:

- ° Ignorance or non-observance of these operating instructions!
- ° Insufficiently trained fitters, operators or maintenance men;
- ° Normal wear and tear;
- ° Incorrect or negligent use of the valves.

The manufacturer declines all liability for the following which are not covered by the guarantee:

- ° Non-observance of accident prevention regulations and/or safety legislation;
- ° Incorrect assembly, start-up or use;
- ° Improper or incorrect use, inappropriate use or different working conditions from those agreed.

Users are solely liable for physical injury and/or damage to property if the above is not observed.

### 3. VALIDITY OF INSTRUCTIONS

**These instructions refer to self-operated single-seat pressure regulators featuring spring-loaded diaphragm servomotors:**

<b>UBS – UBS/V</b>	<b>SEE PARAGRAPH 8)</b> (Figs. 1-2-3-4-5)
<b>UBS/Vu – UBS/V/Vu</b>	<b>SEE PARAGRAPH 9)</b> (Fig. 8)
<b>UBS/D</b>	<b>SEE PARAGRAPH 10)</b> (Figs. 10-11)





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### 4. PRODUCT SAFETY INDICATIONS AND TAG SYSTEM

If and where appropriate, safety indications have been put inside tags on the sides of the pages of this manual.

These rectangular tags are placed vertically (as shown in the following examples) and contain four different messages communicating:

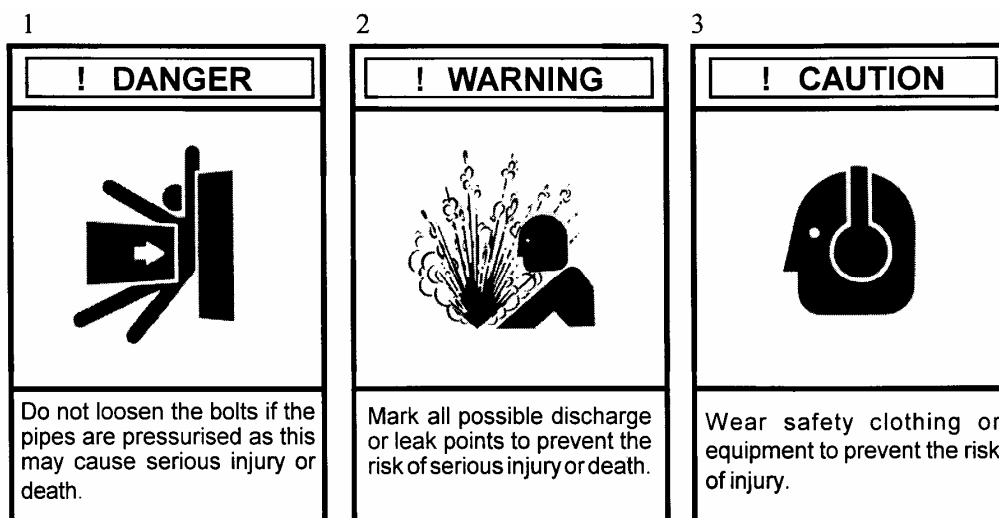
- The level of risk
- The nature of the risk
- The effects of the risk on people or products
- Instructions, if necessary, on how to avoid the risk

The box at the top contains a warning word (DANGER – WARNING – CAUTION – ATTENTION) which indicates the level of risk.

The box in the middle contains a drawing indicating the nature of the risk and its possible effects on people and property. In some cases, the drawing may suggest what preventive measures can be taken, such as wearing safety clothing.

The box at the bottom may contain a message with instructions on how to avoid the risk. In the event of risks for people, the message may also contain a more precise definition of the risk and its effects on people.

- 1) **DANGER** – Immediate risk which will certainly cause serious injury or death.
- 2) **WARNING** – Risk or hazardous behaviour which may cause serious injury or death.
- 3) **CAUTION** – Risk or hazardous behaviour which may cause minor injury.





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## For installing and servicing self-operating pressure regulators UBS

### 5. SAFETY WARNINGS

Thorough maintenance operations and overhauls are important for the safe and reliable operation of all valves.

The service procedures recommended by CARRARO and described in this manual are effective methods for carrying out maintenance operations. Please note that this service manual contains various warning and caution notices which should be read carefully in order to minimise the risk of injury to people or the possibility of using incorrect work methods which may damage the valves or make them unsafe. It is important to realise, however, that these warnings cannot be exhaustive.

CARRARO is unable to know, assess and inform customers or users of all the conceivable methods of performing maintenance operations and all the risks deriving from the use of such methods.

Consequently, CARRARO has not even attempted to start such a task. Therefore, whoever uses a service method or piece of equipment which is not recommended by CARRARO must make sure that neither his own or other people's safety, nor valve safety and performance are jeopardised by the chosen method.

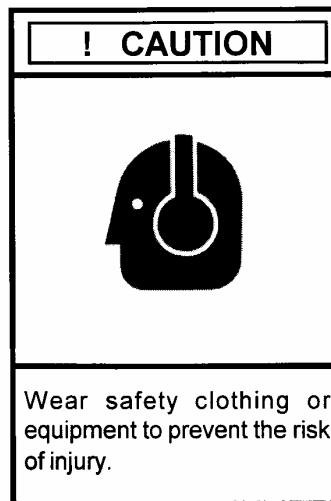
In case of doubt about the method used, please contact CARRARO.

Testing, installing or dismantling the valves or accessories may cause you to come into contact with fluids at very high pressures or temperatures and/or corrosive or erosive.

Therefore, take all safety precautions while testing, installing or dismantling the product; these include, wearing ear plugs, goggles and safety clothing, such as gloves, both in or near the work area.

Users of CARRARO products are responsible for training the staff that will use the product.

It is most important for these people to acquire a thorough knowledge of the instructions of the product, especially the ones contained in this manual.






# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS


### 6. SAFETY PRECAUTIONS

**! DANGER**



Decrease pressure and keep away from the discharge side when operating a valve in order to prevent serious injury or death.

**! CAUTION**



Wear suitable protection equipment in order to prevent injury.

**! WARNING**



Mark all possible discharge or leak points in order to prevent serious injury or death.

Always observe the current plant safety regulations together with the following indications:

° Wear safety clothing. Hot water can scald you and overheated steam is invisible.

° When dismantling a valve, wear safety clothing to prevent being sprayed by any process fluid that may have accumulated inside. **Remember that this fluid may generate a potentially explosive mixture.**

Make sure the valve is isolated from any pressure source in the system before starting to dismantle it.

° Inspect/service the valves at least once a year.

**The outer surfaces of the valves reach the same temperature as that of the fluid flowing inside them. For this reason, when installing a valve in a potentially explosive atmosphere, make sure that the flashover temperature of the mixture surrounding the valve is safely above that of the fluid flowing inside the valve and do not allow inflammable powders to deposit on the outer surface of the valve.**

° **The system must be equipotential at the connection between the valve and the piping in order to prevent the accumulation of electrostatic electricity on the outer surfaces of the system that can act as an efficient flashover trigger in a potentially explosive atmosphere.**

° Please consult CARRARO before working on valve parts.



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 7. TRANSPORT, STORAGE AND HANDLING


**! ATTENTION**



Do not lift horizontally or attach to the lifting lever or the spring.

#### Transport

Depending on their size, valves can be transported loose, packed in cardboard boxes or in wooden crates. All the valve ends are fitted with covers to prevent dirt from entering. Packs can be placed on pallets if required. Follow all and any indications written on the packaging.



**ATTENTION!**

**Operators moving loads must take all necessary precautions to prevent accidents.**

**! ATTENTION**



Do not allow foreign bodies to entering the valve inlet and outlet.

#### Storage

Valves must be kept in a dry place to protect them from atmospheric conditions. They may only be removed from their crates or packing immediately prior to installation. The end protections and covers must be kept on until the last moment. Valves, whether packed or not, must not be subject to violent knocks. Valves, whether packed or not, must always be kept upright, that is, never lying on one side, in order to prevent distortion and damage to internal parts.


#### Handling

When unpacking the valves and removing the end protectors immediately prior to installation, take great care to make sure that foreign bodies do not enter the valve inlet and outlet holes while it is being connected.

**! ATTENTION**



Handle with care. Do not drop or knock.



**ATTENTION!**

**When handling the valve, make sure the work area is kept clear in order to prevent injury to people and damage to property**



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 8 UBS – UBS/V

#### 8.1 Cross-section drawing

Fig. 1

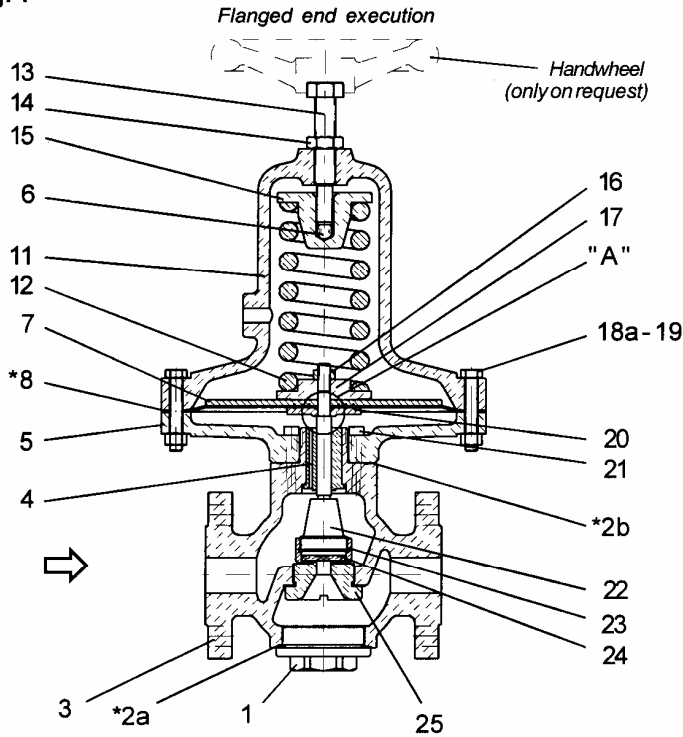
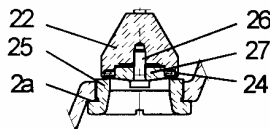


Fig. 5



Resilient tightness disc for valves ND 40 (1.½") and ND 50

Fig. 3

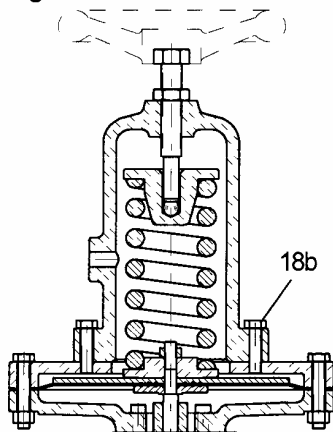


Fig. 4

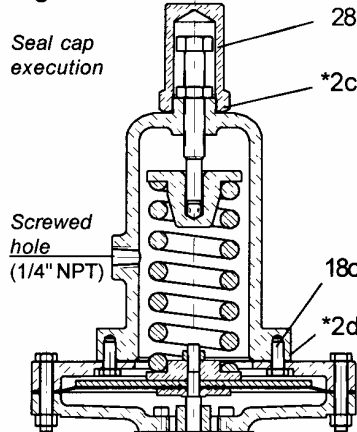
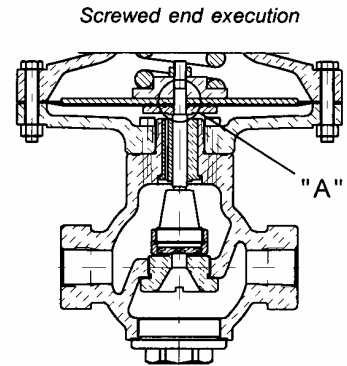
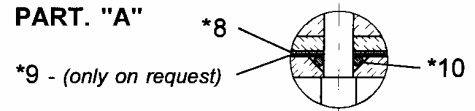


Fig. 2



PART. "A"



- 1 - Cover
- \* 2 - Set of gaskets
- 3 - Valve body
- 4 - Guide
- 5 - Lower diaphragm case
- 6 - Ball
- 7 - Upper diaphragm plate
- \* 8 - Diaphragm
- \* 9 - Protection (if requested)
- \*10 - O-Ring gasket
- 11 - Spring cover
- 12 - Spring
- 13 - Adjusting screw
- 14 - Lock nut
- 15 - Spring loader
- 16 - Nut
- 17 - Spring guide
- 18 - Screw
- 19 - Nut
- 20 - Lower diaphragm plate
- 21 - Screw
- \*22 - Plug
- \*23 - Ring Nut
- \*24 - Disc
- \*25 - Seat
- \*26 - Screw
- \*27 - Gasket plate
- 28 - Cap

\* RECOMMENDED SPARE PARTS

Note: The servomotors with diameter 220 and 360 in carbon steel or stainless steel are provided with a decomposed spring cover.

ATEX Construction Gr. II Cat. 2





# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

Figs.1-2-3-4-5 and Part. "A"- "B" show the cross-sections of UBS and UBS/V valves together with part names and versions.

### 8.2 INSTALLATION

8.2.1 The UBS and UBS/V valves must be installed with the servomotor (2) facing upwards and the diaphragm horizontal, as shown in Fig.6. In overflow valves regulating very low pressures (normally lower than 100 mm water column; the rating plate is always mounted upside down and is therefore indicative), they must be mounted with the servomotor facing downwards and horizontal, as shown in Fig. 7; the weight of the mobile equipment is greater than the force of the pressure regulated on the diaphragm and must therefore be supported by the spring.

8.2.2 Before mounting the valve on the piping, make sure the insides of the pipes are scrupulously clean, especially the upline section; blow down the piping if possible to eliminate any remaining dirt: small drops of solder may seriously damage the valve.

Fig.6

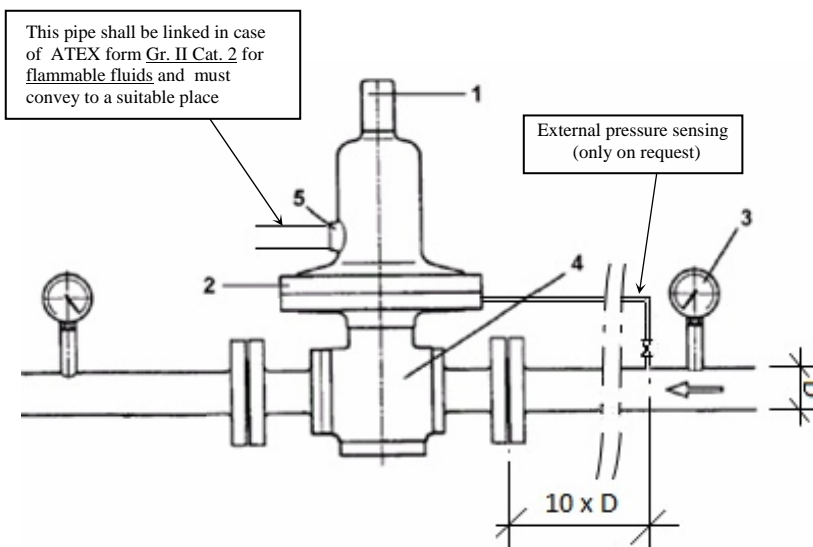
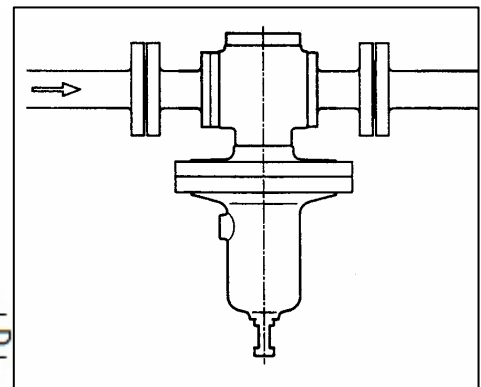


Fig.7



- 1) Adjustment screw (spring-loader)
- 2) Servomotor
- 3) Pressure gauge
- 4) Valve body
- 5) Drain hole

8.2.3 **WARNING ON ATEX:** the spring cover is not airtight (*ATEX form Gr. II Cat. 2 for non-flammable fluids* - Fig.3) in case of harmless fluids (e.g., inert gases like nitrogen, carbon dioxide, noble gases). It's equipped with a hole (see fig. 6 / 7), whose chief function is that to drain the pressure whether the diaphragm cracked. Meanwhile in case of flammable fluids the spring cover is airtight (*ATEX form Gr. II Cat. 2 for flammable fluids* - Fig.4), made from carbon steel and stainless steel, the hole (5) in Fig.6 and 7 is always threaded 1/4" NPT and must be connected to pipe conveying the discharge to a suitable place (at atmospheric pressure).



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

8.2.4 Please bear in mind that the regulated pressure sensing is located inside the valve, for which reason the pressure drops in the piping connecting the valve to the ambient under control must be added to the calibration pressure value.

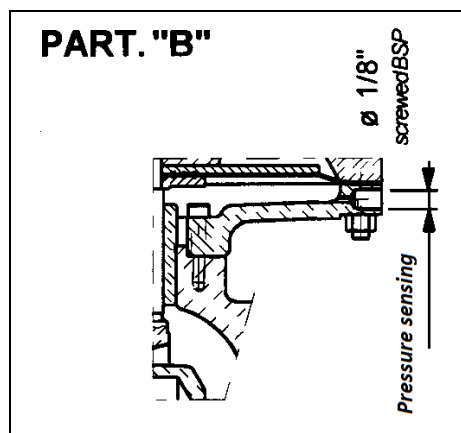
This must be considered when calculating the size of the above piping.

8.2.5 When it is essential to avoid pressure variations at the point of use, the valves are fitted with an external pressure sensing, as shown in Fig. 6. In that case connect the servomotor to the sensing line upline at a distance of at least 10 times pipe diameter 'D'.

The sensing line must always be connected to the side of the main pipe or on top of it, never underneath, otherwise solid substances may obstruct the pressure sensing.

To dismount the valve, attach the joints in three pieces in the appropriate positions on the sensing line.

The 1/8" female threaded connector is shown in Part "B".



*External pressure sensing (only on request)*

8.2.6 Generally speaking, the fluid crossing the overflow valves has been checked to make sure it is clean; if there are any doubts about this, fit a filter upline from the overflow valves.

8.2.7 If in the plant there is the possibility that the pressure in contact with the diaphragm exceeds the maximum diaphragm rating, it is necessary to install the safety relief device shown in Fig. A. The device is mounted on the lower diaphragm case, through a 1/8" Gas female threaded hole and a threaded nipple 1/8" Gas male 3/8" Gas female (on the opposite side respect the pressure sensing in case of external pressure sensing construction). It consists (see Fig. A) in a plug, pressed by a spring properly calibrated depending on the maximum diaphragm rating, that can move inside a cylindrical body, due to the fluid action, gradually discovering a 1/4" NPT threaded female discharge hole. The discharge flow, discharged versus ground, can be released in atmosphere or properly collected, depending on working medium nature.

It's foreseen, if necessary, an ATEX version of the device: in this case, the discharge flow must be collected in inert atmosphere, through an appropriate tube with 1/4" NPT male threaded connection, to avoid potentially explosive mixtures generation.



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## For installing and servicing self-operating pressure regulators UBS

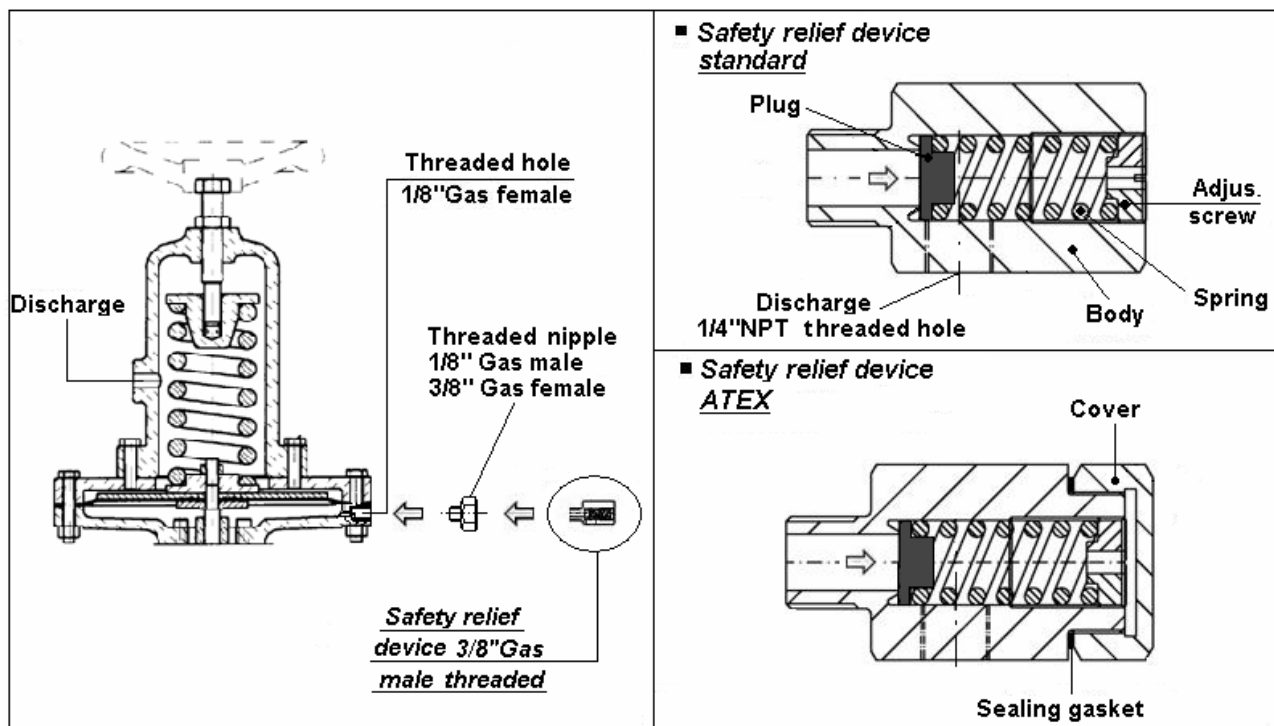


Fig.A

### 8.3 START-UP AND CALIBRATION (Fig. 1÷5)

Regulation equipment is normally supplied calibrated to the value indicated in the order; the set pressure must be checked in real operating conditions.

If the valve does not open at the required set pressure, loosen the lock nut (14) and turn the adjustment screw (13) clockwise to increase overflow pressure or anti-clockwise to reduce it; in case of construction with seal cap (Fig.4), first remove the cap (28).

After checking set pressure, tighten the lock nut (14); remount the cap (28) in case of construction with seal cap (Fig.4).



### **ATTENTION!**

**During valve start-up or operation, do not touch any part of the valve as this can conduct heat if the fluid used is at a high temperature.**



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 8.4 MAINTENANCE (see Figs.1-2-3-4-5)

8.4.1 If the regulated fluid is clean and the plant is fitted with a filter, maintenance operations will be infrequent occurrences.

The user must check the seats at least once a year depending on the need for the valve to close airtight. When performing this inspection, the internal components can be dismantled without removing the body from the line, but it is easier to work if the entire valve is removed from the piping. Before starting the above operation, make sure the recommended spare parts are available (Figs.1-2-3-4-5, parts list).

#### 8.4.2 Dismounting the components (see Figs.1-2-3-4-5)

##### 8.4.2.1 Dismounting the servomotor

Release the spring by unscrewing the adjustment screw (13) after loosening the lock nut (14), leaving it in position or noting down its position on the adjustment screw in order to restore calibration after reassembly.

If the spring housing is airtight (Fig. 4), first remove the cap (28) with gasket (2c). Remove the spring cover (11) by loosening the nuts (19); do not disassemble the spring cover of the 220 and 360 servomotors.

Remove the spring (12). Unscrew the nut (16). Remove the diaphragm (8), after having removed spring guide (18) and diaphragm plate (7).

##### 8.4.2.2 Dismounting the body

Unscrew and remove the cover (1) with gasket (2a). Unscrew the seat (25) with a screwdriver (see Figs. 1, 2 and 5).

Pull the plug (22) off its guide (4) and remove it from the body (3).

##### 8.4.2.3 Parts inspection

All the components are now ready to be inspected. Replace any worn ones. Clean all the parts. In particular, check the state of the disk of the plug (24), both elastic and metal, and the seat of the orifice (25). If the seat is worn, work it by rubbing with a metal disk and abrasive paste. If this is not enough, rework it on the lathe. If no expert operators are available, send the whole valve back to our factory for revision. Another important component to control is the diaphragm (8); replace it if the surface is in poor condition. The same applies to the Teflon protection. Replace all the gaskets (2a-b-c-d), at least once a year, after cleaning the surfaces they lie on.

##### 8.4.2.4 Reassembly

Carry out the dismantling operations in reverse order.

Fit the stem of the plug (22) into the body (3) and push it onto its guide (4). Tighten the seat (25), making sure that the relevant gasket (2a) is new and correctly positioned. Replace the small retention ring (10) after thoroughly cleaning its seat.

Mount the diaphragm (8), taking care to mount the protection (9), where applicable, underneath, towards the valve body, lying on the little plate (20). Remount the disk (7) and the spring guide (17), and fully tighten the nut (16).

Match the holes of the diaphragm with the ones in the lower diaphragm case (5) and remount the spring (12), spring loader (15) and cover (11). Screw back the cover (1). Return the screw (13) to the position marked by the nut (14) or the position you noted down (see 8.4.2.1). Exact calibration must then be checked when the valve starts working again.

##### 8.4.2.5 Replacing the diaphragm only

If the diaphragm deteriorates or breaks during operation or requires replacement without having to perform any other maintenance operations and if the valve is easy to access, perform the operations listed in paragraph 8.4.2.1, leaving the valve on the piping, preventing the operating medium inflow to the valve itself and discharging the pressure on the main line. At the end of operations proceed to reassembly with inverse operations from those described in paragraph 8.4.2.1.

Check calibration once more when the valve starts working again and adjust if necessary.



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N.B.: After each maintenance operation, replenish your stock of spare parts by reordering used items.



**ATTENTION!**

**When welding piping, do not attach the earth connector to the valve as this may damage important sliding parts.**

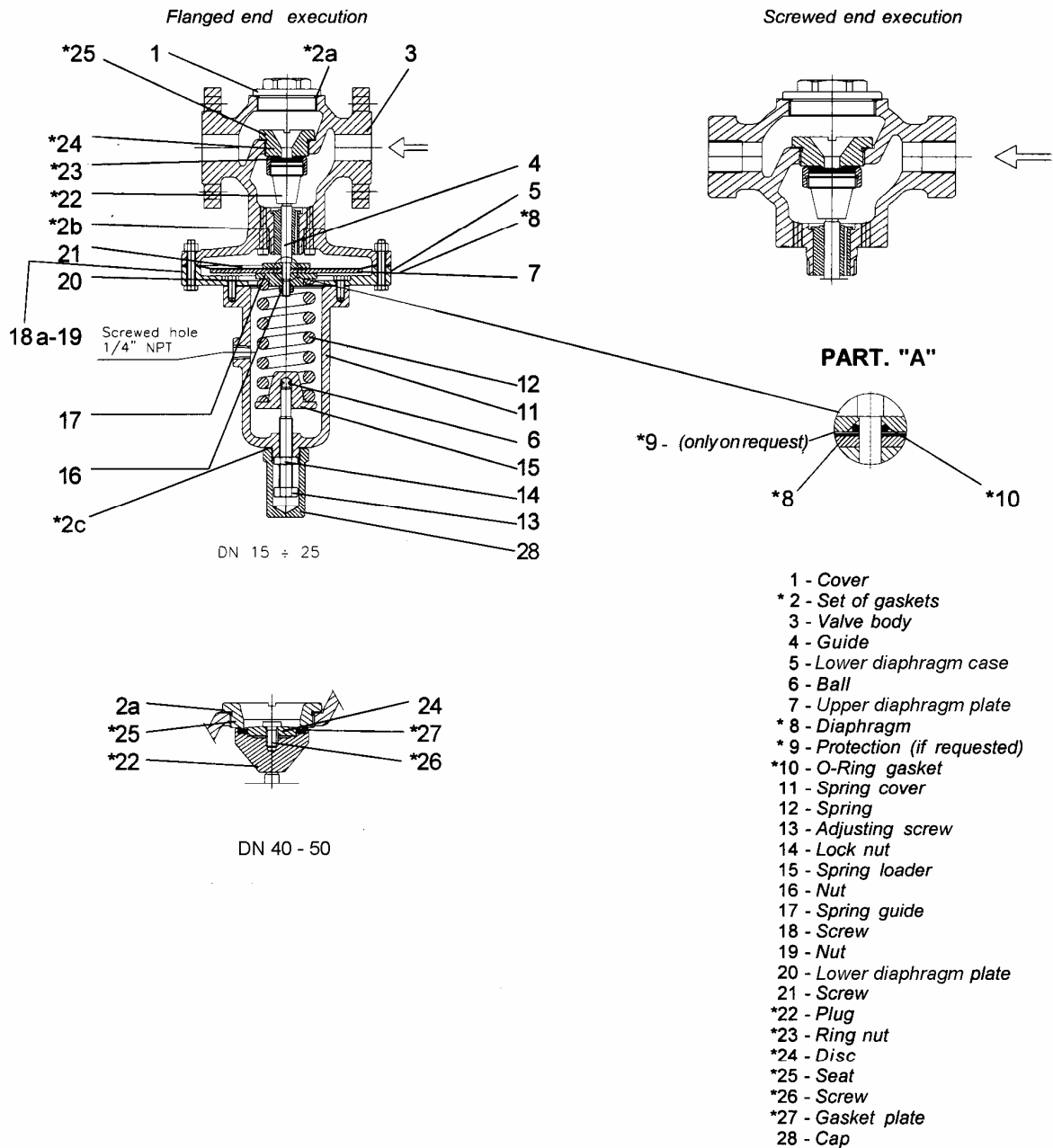


# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 9 UBS/Vu – UBS/V/Vu

#### 9.1 Cross-section drawing



Note: The servomotors with diameter 220 and 360 in carbon steel or stainless steel are provided with a decomposed spring cover.

**Fig.8**



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 9.2 INSTALLATION

9.2.1 Before installing the valve, remove the plastic covers protecting the flanges or connectors.

9.2.2 Make sure the data indicated on the rating plate corresponds to operating conditions



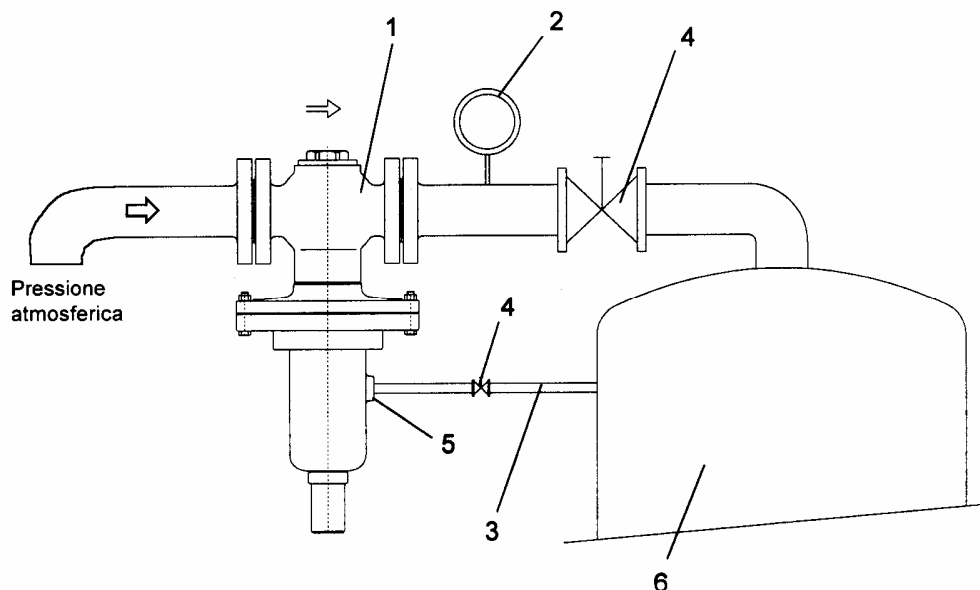
### ATTENTION!

**Check that the maximum positive pressure that can occur in the equipment being protected does not exceed the following values:**

Diameter of Servomotor in mm	Maximum positive pressure in bar
* 360	1.5
* 220	5

\* This data can be derived from the valve code shown on the rating plate

**Fig.9**



- 1 – Depression valve UBS/Vu – UBS/V/Vu
- 2 – Vacuum pressure gauge
- 3 – ¼ NPT pipe

- 4 – On/off valve
- 5 – Three-piece joint
- 6 – Equipment to protect

9.2.3 Figure 9 shows the installation layout of the UBS/Vu - UBS/V/Vu valve.

The pipes connecting the valve to the tank being protected must be straight and horizontal or slightly leaning towards the tank.



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9.2.4 Before mounting the valve on the piping, make sure the insides of the pipes are scrupulously clean, especially the upline section; blow down the piping if possible to eliminate any remaining dirt: small drops of solder may seriously damage the valve.



### **ATTENTION!**

**The valve must always be installed with the servomotor facing down. The section of inlet tubing at atmospheric pressure must also face downwards in order to prevent impurities or water from depositing at the valve inlet in the event of outdoor installations**

### **9.3 START-UP AND CALIBRATION** (Fig. 8)

9.3.1 Valves are normally supplied calibrated to the value indicated in the order. *This calibration must be checked in real operating conditions.*

If the valve does not open at the required calibration value, remove the cap (28), loosen the lock nut (14) and turn the adjustment screw (13) clockwise to increase overflow pressure or anti-clockwise to reduce it. After checking opening pressure, start the plant at full power and adjust calibration as required by turning the adjustment screw (13); then tighten the lock nut (14).

### **9.4 MAINTENANCE** (Fig. 8)



### **ATTENTION!**

**Before dismantling the valve, make sure the recommended spare parts are available (fig. 8). After each operation, replenish your stock of spare parts by reordering used items.**



### **ATTENTION!**

**Only use original spare parts.**

9.4.1 If the regulated fluid is clean and the plant is fitted with a filter, as recommended, maintenance operations will be infrequent occurrences.

The user must check the seats *at least once a year* depending on the need for the valve to close airtight. When performing this inspection, the internal components can be dismantled without removing the body from the line, but it is easier to work if the entire valve is removed from the piping.





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### 9.4.2 DISMOUNTING THE COMPONENTS (Fig. 8)

#### 9.4.3 Dismounting the servomotor

Remove the cap (28) and release the spring by unscrewing the adjustment screw (13) after loosening the lock nut (14), leaving it in position or noting down its position on the adjustment screw in order to restore set pressure after assembly.

Remove the spring cover (11) by unscrewing the nuts (19); do not disassemble the spring cover.

Remove the spring (12). Unscrew the nut (16). Remove the diaphragm (8), after having removed spring guide (18) and upper diaphragm plate (7).

#### 9.4.4 Dismounting the body

Unscrew and remove the cover (1) with gasket (2a).

Unscrew the seat (25) with a screwdriver (Fig. 8).

Pull the plug (22) off its guide (4) and remove it from the body (3).

#### 9.4.5 Parts inspection

All the components are now ready to be inspected.

Replace any worn ones. Clean all the parts. In particular, check the state of the disk of the plug (24) and the seat of the orifice (25), (see 8.4.2.3).

#### 9.4.6 Reassembly

Carry out the dismounting operations in reverse order.

Fit the stem of the plug (22) into the body (3) and push it onto its guide (4).

Tighten the seat (25), making sure that the relevant washer is in good condition and correctly positioned.

Replace the small retention ring (10) after thoroughly cleaning its seat.

Mount the diaphragm (8), taking care to mount the protection (9), where applicable, towards the area in contact with the tank fluid, fitted between the diaphragm (8) and the upper diaphragm plate (7).

Remount the upper diaphragm plate (7) and spring guide (17), and then fully tighten the nut (16).

Match the holes of the diaphragm with the ones in the lower diaphragm case and remount the spring (12), spring loader (15) and cover (11). Screw back the cover (1). Return the screw (13) to the position marked by the nut (14) or the position you noted down (see 9.2.4). Exact set pressure must then be checked when the valve starts working again.

#### 9.4.7 Replacing the diaphragm only

If the diaphragm deteriorates or breaks during operation or requires replacement without having to perform any other maintenance operations and if the valve is easy to access, perform the operations listed in paragraph 9.4.3, leaving the valve on the piping, and closing the shut off valves (4) Fig.9 on the main line and sensing line. At the end of operations proceed to reassembly with inverse operations from those described in paragraph 9.4.3.

Check calibration once more when the valve starts working again and adjust if necessary.



# I N S T R U C T I O N S

## For installing and servicing self-operating pressure regulators UBS

### 9.5 OPERATING FAULTS

Some faults that may occur during operation together with the action to take are shown below.

FAULT	REASON	ACTION
Leaking while the valve is closed for valves also working with positive pressure	Valve not airtight	Dismount the valve and replace the gasket.
Difficulty in adjusting the vacuum in the tank for valves only working in a vacuum.	Valve de-calibrated	Check calibration as per point 9.3
	Valve not airtight	Dismount the valve and replace the gasket.
	Diaphragm broken	Dismount servomotor assembly and replace the diaphragm, O-ring and spring cover, where applicable.
	Gaskets 2A, 2B, 2C and 2D worn	Replace the gaskets

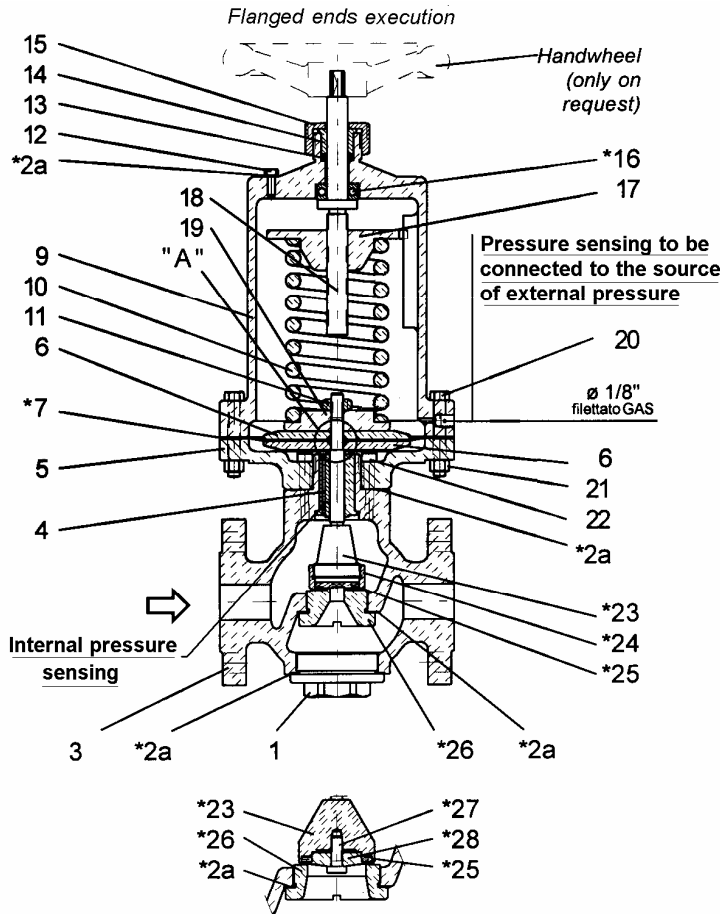


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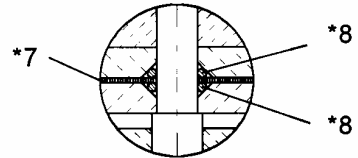
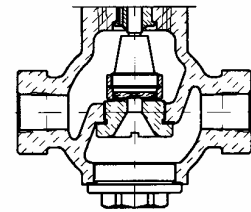
## For installing and servicing self-operating pressure regulators UBS

### 10) UBS/D

#### 10.1 Cross-section drawing UBS/D1 – UBS/V/D1 (Fig. 10)

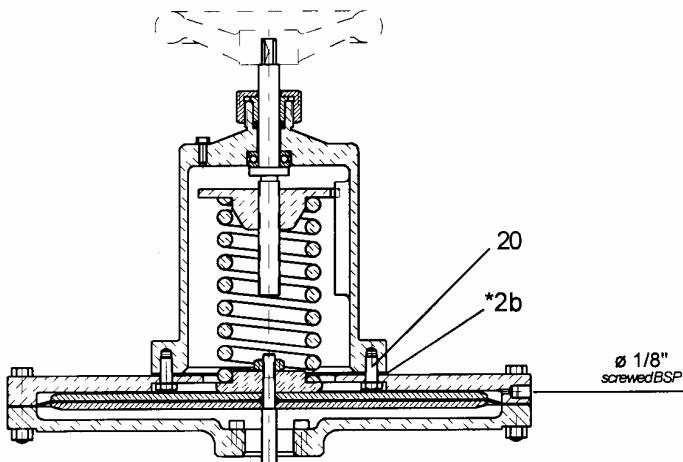


Screwed ends execution



- 1 - Cover
- \* 2 - Set of gaskets
- 3 - Valve body
- 4 - Guide
- 5 - Lower diaphragm case
- 6 - Diaphragm plate
- \* 7 - Diaphragm
- \* 8 - O-Ring gasket
- 9 - Spring cover
- 10 - Spring
- 11 - Nut
- 12 - Screw
- \*13 - Gasket
- 14 - Lock nut
- 15 - Packing gland
- \*16 - Bearing
- 17 - Spring loader
- 18 - Adjusting screw
- 19 - Spring guide
- 20 - Screw
- 21 - Nut
- 22 - Screw
- \*23 - Plug
- \*24 - Ring nut
- \*25 - Disc
- \*26 - Seat
- \*27 - Screw
- \*28 - Gasket plate

Resilient tightness disc for valves ND 40 (1.½") and ND 50 (2")



**\* RECOMMENDED SPARE PARTS**

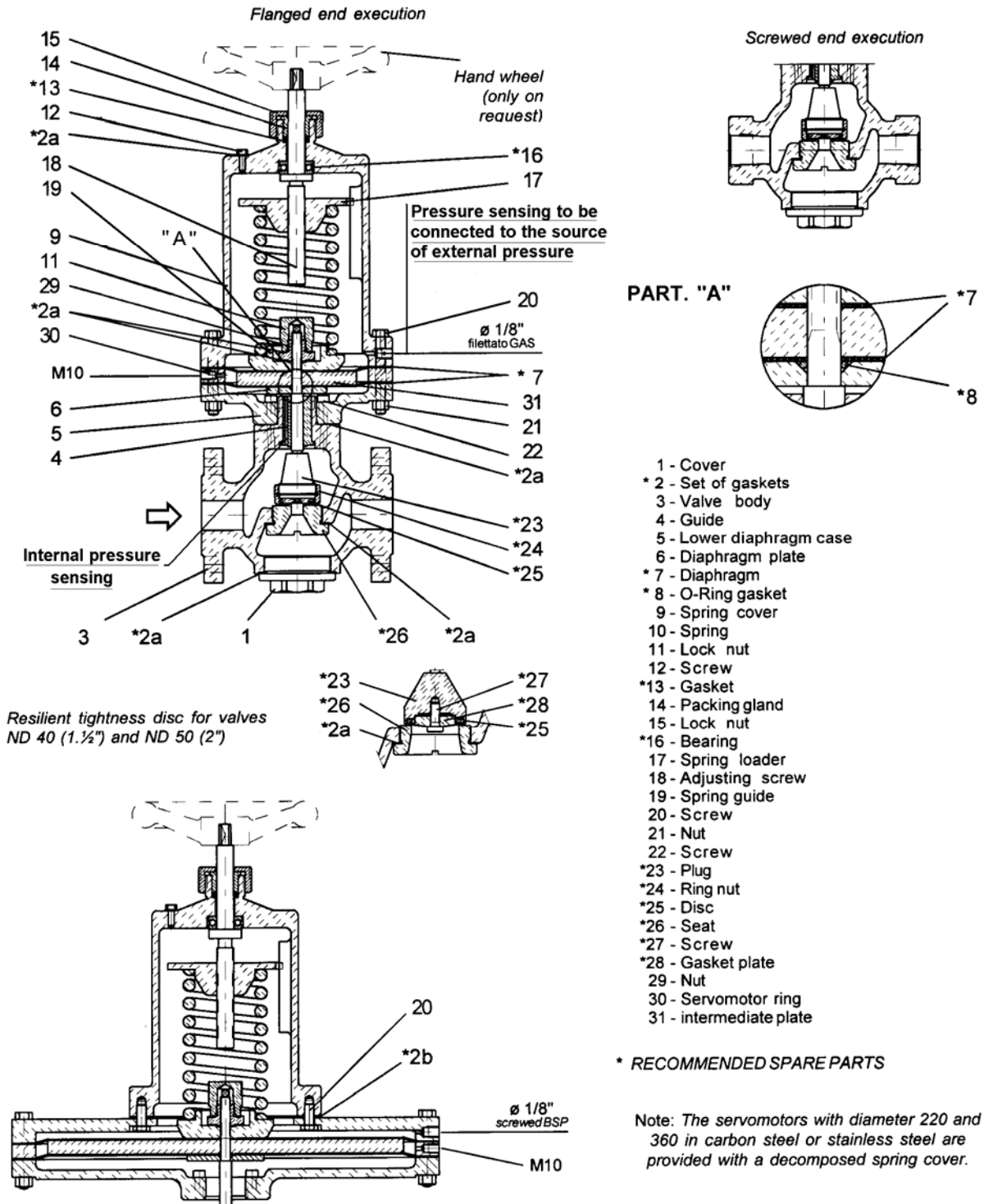
Note: The servomotors with diameter 220 and 360 in carbon steel or stainless steel are provided with a decomposed spring cover.



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## For installing and servicing self-operating pressure regulators UBS

### 10.2 Cross-section drawing UBS/D/2 – UBS/V/D/2 (Fig. 11)





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## For installing and servicing self-operating pressure regulators UBS

The **UBS/D** valves comprise two groups of regulators:

### Group 1:

All the group 1 regulators have just one diaphragm; one of the controlled pressures acts under the diaphragm through an internal pressure sensing while the other acts over the diaphragm through a pressure sensing on the spring cover. The plug is kept closed by the spring. The following types belong to this group:

- **UBS/D1 and UBS/V/D1 (see Fig. 10);**

### Group 2:

All the group 2 regulators have two diaphragms separated by a chamber communicating with the outside; the controlled pressures act under the lower diaphragm (through an internal pressure sensing) and over the upper diaphragm (through a pressure sensing on the spring cover). The plug is kept closed by the spring.

The following types belong to this group:

- **UBS/D2 and UBS/V/D2 (see Fig. 11).**

## 10.3 INSTALLATION

10.3.1 All UBS/D regulators must be installed with the servomotor facing upwards and the diaphragm horizontal.

### 10.3.2 Installation diagrams

In most cases the flow crosses the valve as shown by the arrow in Figs.10 and 11.

The installation diagrams are therefore as follows:

10.3.3 - Group 1 valves: Fig. 12

10.3.4 - Group 2 valves: Fig. 13

10.3.5 Install an on/off valve upline, downline and on the sensing and discharge line, in order to service the valve (if necessary) while the plant is pressurised.

Install one filter or pressure gauge upline from the regulator and another one on the sensing line, as shown in the diagrams, in order to calibrate the differential pressure and keep it constantly under control.

10.3.6 Before mounting the valve on the piping, make sure the insides of the pipes are scrupulously clean, especially the upline section; blow down the piping if possible to eliminate any remaining dirt: small drops of solder may seriously damage the valve.

10.3.7 In group 2 valves, the chamber between the two diaphragms must be connected to piping taking the discharge to a suitable place, at atmospheric pressure. This hole can be closed with a plug or pressure gauge with an electrical contact for the remote signalling that the diaphragm has broken, as long as the downline plant is protected as shown in the following point.

10.3.8 If there is the slightest possibility of the pressure upline from the reduction valve exceeding the maximum admissible pressure for the installation, caused by the failure of the overflow valve, a safety valve must be installed upline, without an on-off valve in between, in order to discharge the entire flow crossing the differential pressure regulator.

10.3.9 Please bear in mind that a regulated differential pressure sensing may be fitted inside the valve, for which reason the pressure drops in the piping connecting the valve to the sensing point must be added to the regulated differential pressure value, creating pressure variations according to the variation in flow; this must be considered when calculating the size of the connection piping.

10.3.10 When it is essential to avoid pressure variations at the point of use, the regulator can be fitted with an external pressure sensing, replacing the internal one and fitted to the lower flange of the





# INSTRUCTIONS

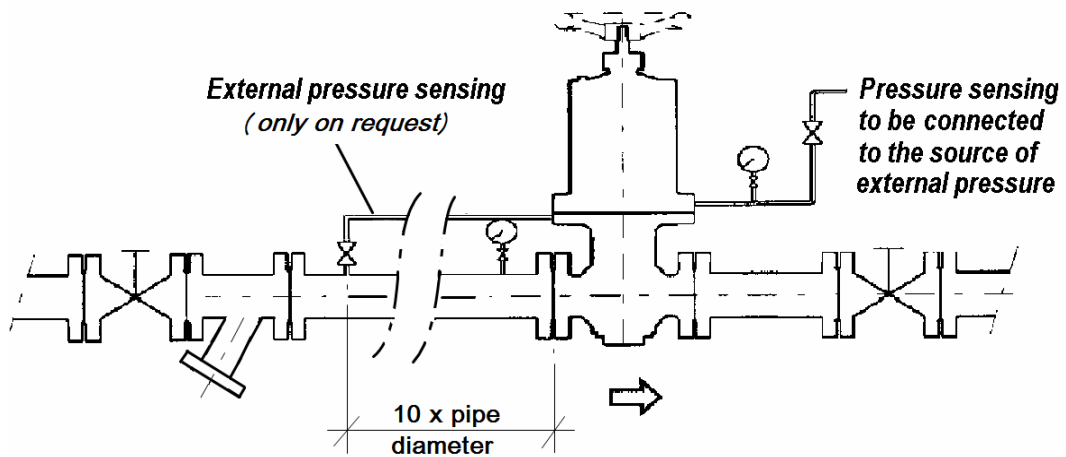
## For installing and servicing self-operating pressure regulators UBS

servomotor, as shown in Figs. 12-13. In that case connect the servomotor to the sensing line upline at a distance of at least 10 times pipe diameter 'D'.

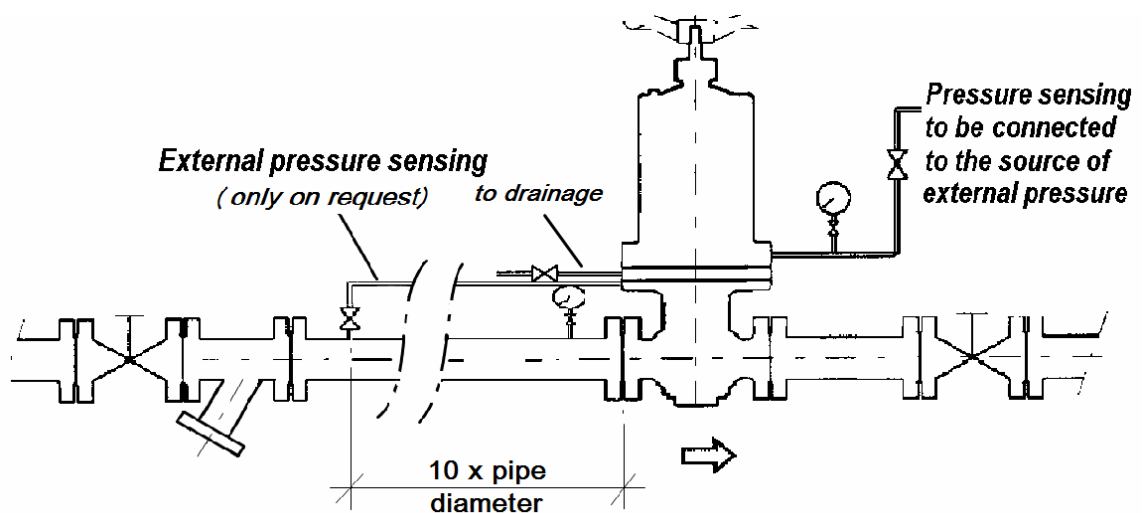
The sensing line must always be connected to the side of the main pipe or on top of it, never underneath, otherwise solid substances may obstruct the pressure sensing.

To dismantle the valve, attach the joints in three pieces in the appropriate positions on the sensing line. The 1/8" female threaded connector is shown in Part "B".

**Fig.12** Example of installation layout - Group 1 valves: "UBS/D1 and UBS/V/D1"



**Fig. 13** Example of installation layout – Group 2 valves: "UBS/D2 and UBS/V/D2"





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## For installing and servicing self-operating pressure regulators UBS

### 10.4 START-UP AND CALIBRATION (Figs.10-11)

This operation is similar for both groups.

The regulators are factory calibrated at the set pressure indicated in the order. If necessary is possible to modify the set pressure at operating conditions on the plant as follow.

Loosen the lock nut (14) and correct the position of the adjustment screw (18) reading the pressure indicated by the gauge; this must be done when the system is working at normal operating condition. Then, tighten the lock nut (14).

### 10.5 MAINTENANCE (Figs.10-11)

10.5.1 If the regulated fluid is clean and the plant is fitted with a filter, maintenance operations will be infrequent occurrences. **The user must check the seats at least once a year depending on the need for the valve to close airtight.**

When performing this inspection, the internal components can be dismantled without removing the body from the line, but it is easier to work if the entire valve is removed from the piping.

Before starting the above operation, make sure the recommended spare parts are available (Figs.10-11, parts list).

#### 10.5.2 Dismounting the components

Dismounting and remounting operations for all types of UBS/D regulators as long as the diaphragms are considered. These are:

- 1 simple elastomer diaphragm for UBS/D1 and UBS/V/D1;
- 2 elastomer diaphragms (one per side) for UBS/D2 and UBS/V/D2.

Make sure the spares match the above and take great care when mounting the diaphragm assembly.

#### 10.5.3 Dismounting the servomotor

Loosen the lock nut (14) and release the spring (10) by turning the adjustment screw (18) and count and note down the number of turns in order to restore calibration after reassembly. Remove the spring cover (9) by loosening the nuts (21). Do not touch the spring cover of the 220 and 360 servomotors. Remove the spring (10). Then:

- For UBS/D1 and UBS/V/D1 valves (Fig.10): unscrew the nut (11), remove spring guide (19) and the diaphragm (7) with the relevant plates (6) and O-ring (8);
- For UBS/D2 and UBS/V/D2 valves (Fig.11): unscrew the lock nut (11) and remove the O-ring (2a), then unscrew the nut (29) and remove the relevant O-ring (2a); remove the spring guide (19), two diaphragm assembly (7) with diaphragm plate (6), servomotor ring (30) and relevant O-ring (8), and intermediate plate (31).

#### 10.5.4 Dismounting the body

Unscrew and remove the cover (1) with relevant gasket (2a). Unscrew the seat (26) with a screwdriver (see Fig. 10-11).

Pull the plug (23) off its guide (4) and remove it from the body (3).

#### 10.5.5 Parts inspection (Figs.10-11)

All the components are now ready to be inspected. Replace any worn ones. Clean all the parts. In particular, check the state of the disk of the plug (24), both elastic and metal, and the seat of the orifice (26). If the seat is worn, true it by rubbing it with a metal disk and abrasive paste. If this is not enough, turn it again on the lathe. If no expert operators are available, send the whole valve back to our factory for revision. Another important component to control is the diaphragm (7); replace it if the surface is in poor condition. Replace all the gaskets at least once a year, after cleaning the surfaces they lie on.



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### 10.5.6 Reassembly

Carry out the dismantling operations in reverse order. Push the stem of the plug (23) into its guide (4) and tighten the seat (26). Screw back the cover (1). Mount the diaphragm/s. Make sure the seats of the O-rings are perfectly clean before mounting them. Assemble:

- for D1 valves (Fig. 10) the assembly: plug (23), diaphragm plate (6) (with relevant gaskets (8)), diaphragm (7), spring guide (19), and nut (11).
- for D2 valves (Fig. 11) the assembly: plug (23), diaphragm plate (6) (with relevant gaskets (8)), lower diaphragm (7), intermediate plate (31) and servomotor ring (30), upper diaphragm (7), spring guide (19) (with relevant gaskets (2a)), nut (29) and lock nut (11).

Match the holes of the diaphragm/s with the holes in the lower diaphragm case (5) and remount the spring (10), spring loader (17) and spring cover (9). Turn the adjustment screw (18) the number of turns noted down during dismantling. Exact calibration must then be checked when the valve starts working again.

### 10.5.7 Replacing the diaphragm only

If the diaphragm deteriorates or breaks during operation or requires replacement without having to perform any other maintenance operations and if the valve is easy to access, perform the operations listed in paragraph 10.5.3, leaving the valve on the piping, preventing the operating medium inflow to the valve itself and discharging the pressure on the main line. Prevent the external pressure source medium inflow and discharge the pressure inside cover-spring through the discharge screw (12) Fig.10-11, conveying the medium if necessary. Disconnect the pressure sensing on the spring-cover. At the end of operations proceed to reassembly with inverse operations from those described in paragraph 10.5.3. Check calibration once more when the valve starts working again and adjust if necessary.

## 11 REPAIRS

**11.1** If it is not possible to eliminate the problems, send faulty valves to the supplier/manufacturer, together with a description of the problem.

**11.2** In order to receive spare parts or information, always quote the series number shown on the rating plate attached to the valve or punched on the outer surface of the flanges.

**11.3** Rating plate (*example*)

<div style="border: 1px solid black; border-radius: 15px; padding: 10px;"> <p>Type of valve.....</p> <p>Series n°.....</p> <p>Ends.....</p> <p>Upstr.press. .... Downstr.press. ....</p> <p>Q.....Mc/h Medium..... Temp.....</p> <p style="text-align: center;"> <b>CARRARO</b> tel.02/269912.1</p> </div>
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**11.4** To ensure the valves treated in this manual work correctly, they should be serviced by Carraro engineers or by Carraro-authorized Service Centres using original spare parts.

**ATTENTION!**

**The maker declines all liability for modifications to the product or operations that are not contemplated in this manual.**

