



VALFONTA



INSTRUCTIONS: OPERATION AND INSTALLATION

EXCESS PRESSURE VALVE MODEL **S2**

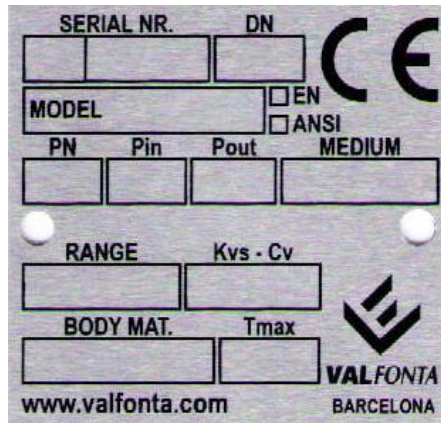


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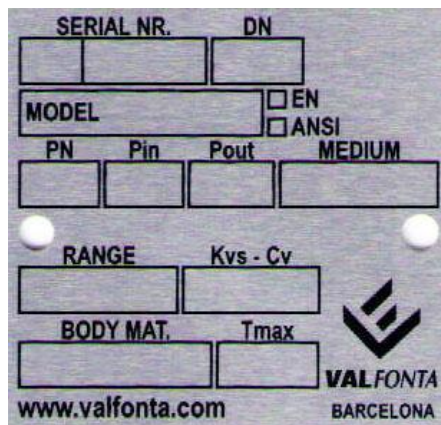


1. IDENTIFICATION PLATE LEGEND

a) CE marked is required in accordance with PED 2014/68/UE






b) CE marked is NOT required in accordance with PED 2014/68/UE



| | |
|-----------|---|
| SERIAL N. | VALVE IDENTIFICATION NUMBER. VALFONTA WILL NEEDS THIS NUMBER FOR SPARE PARTS OR COMMENTS RESPECT OF THIS VALVE. |
| MOD. | VALVE MODEL |
| DN | VALVE NOMINAL DIAMETER |
| PN | VALVE NOMINAL PRESSURE. |
| MEDIUM | FLUID |
| P.IN | INLET PRESSURE |
| P.OUT | OUTLET PRESSURE |
| BODY | BODY MATERIAL |
| KVS. | KV VALVE |



ATEX marked required according to DIRECTIVE 94/9/EC

| | | |
|---|--|---|
|  | VALFONTA | E 08915 – Badalona (ESPAÑA) |
| TYPE: | EXCESS PRESSURE VALVES SELF - ACTUATED | |
| MANUFACTURING YEAR: | 2014 | MANUFACTURING NUMBER: |
|  | II 2 G D | c IIC Tx c IIIC Tx°C  |
| TECHNICAL FILE IN CUSTODY : | LOM | CERTIFICATION NUMBER: LOM 14.034 U |

| Reference | Denomination |
|-----------|---|
| II 2 | ATEX category, zones 1 & 21 |
| G | Class I application (flammable liquids and gases) |
| D | Class II application (combustible dust) |
| c IIC | Safety construction protection mode for substances IIC |
| C IIIC | Safety construction protection mode for substances IIIC |
| Tx / Tx°C | Termal class according fluid temp. used |
| LOM | Number of certification from ExNB (LOM) |



SELF-OPERATED PRESSURE REGULATORS

EXCESS PRESSURE VALVE MODEL S2

INSTRUCTIONS: OPERATION AND INSTALLATION

2. MAIN FEATURES

Self-actuating excess pressure valve, fully balancing by diaphragm. It's used to maintain the pressure upstream of the valve to an adjusted set point.

When upstream pressure rises above a set point, the valve opens proportionally pressure rising.

This series of regulators is suitable for steam, compressed air, non-hazardous gases and liquids.

Actuator mounts diaphragm with intermediate reinforced lining.

Set pressure regulating range between 0,02 and 8 barg with different actuators (up 16 barg under request).

Condensation tank (pot) is available and necessary for steam or fluid upper to 125°C, to protect the diaphragm against overheating.

The excess pressure valve is not a safety valve, and then if necessary, an overpressure protection must be installed.

| | |
|------------------------------------|--|
| Max. permissible upstream pressure | 16 barg |
| Max. permissible temperature | -10 to 80°C (gases and liquids) Up 180°C (steam) |
| Sizes | DN15 to DN100 |
| Body material | Nodular Iron (GGG40.3) Bronze RG10 (consult) Carbon steel (GSC25N) Stainless steel (1.4408) |
| Connections | Flanged DIN PN16-PN40 Flanged ANSI 150 / 300 Threaded BSP / NPT, consult |
| Trim material | Stainless steel Aisi 304L (optionally AISI 316L) |
| Diaphragm Material | EPDM until 125°C EPDM + PTFE 125°C to 180°C |
| Seal material | NBR, EPDM, PEEK, PTFE, PTFE+Graphite, ... |

3. OPERATING

To control the pressure with the excess pressure valve S2 model, the diaphragm is compressed by the spring through the adjusting screw.

When upstream pressure arrives to the diaphragm via external or internal control line, and rises above the adjusted set point, valve opens proportionally to the change in pressure. This set point can be adjusted with the adjusting screw.

S2 valves are perfectly suitable for controlling gases in the temperature range between -10 and +80°C (or 0 to 180°C when soft seal is PTFE+GR and diaphragm EPDM+PTFE).

The valve opens when inlet pressure rises.

The regulator must be carefully handled, transported and stored. Protect the regulator against adverse influences, such as dirt, moisture or frost before it is installed.

When regulators are too heavy to be lifted by hand, fasten the lifting sling at a suitable place on the valve body.

Do not attach any lifting equipment, slings or supports to mounting parts, such as the adjusting screw or control line.





Special ATEX instructions

- No limitation of use due to the ATEX substance.
- Limitations due to thermal class:

Class I (flammable liquids and gases)

| TEMPERATURE CLASS | MAX. SURFACE TEMPERATURE | APPROPRIATE FOR SUBSTANCES WITH IGNITION TEMPERATURE |
|-------------------|--------------------------|--|
| T1 | 450°C | Ti >450°C |
| T2 | 300°C | Ti >300°C |
| T3 | 200°C | Ti >200°C |
| T4 | 135°C | Ti >135°C |
| T5 | 100°C | Ti >100°C |
| T6 | 85°C | Ti >85°C |

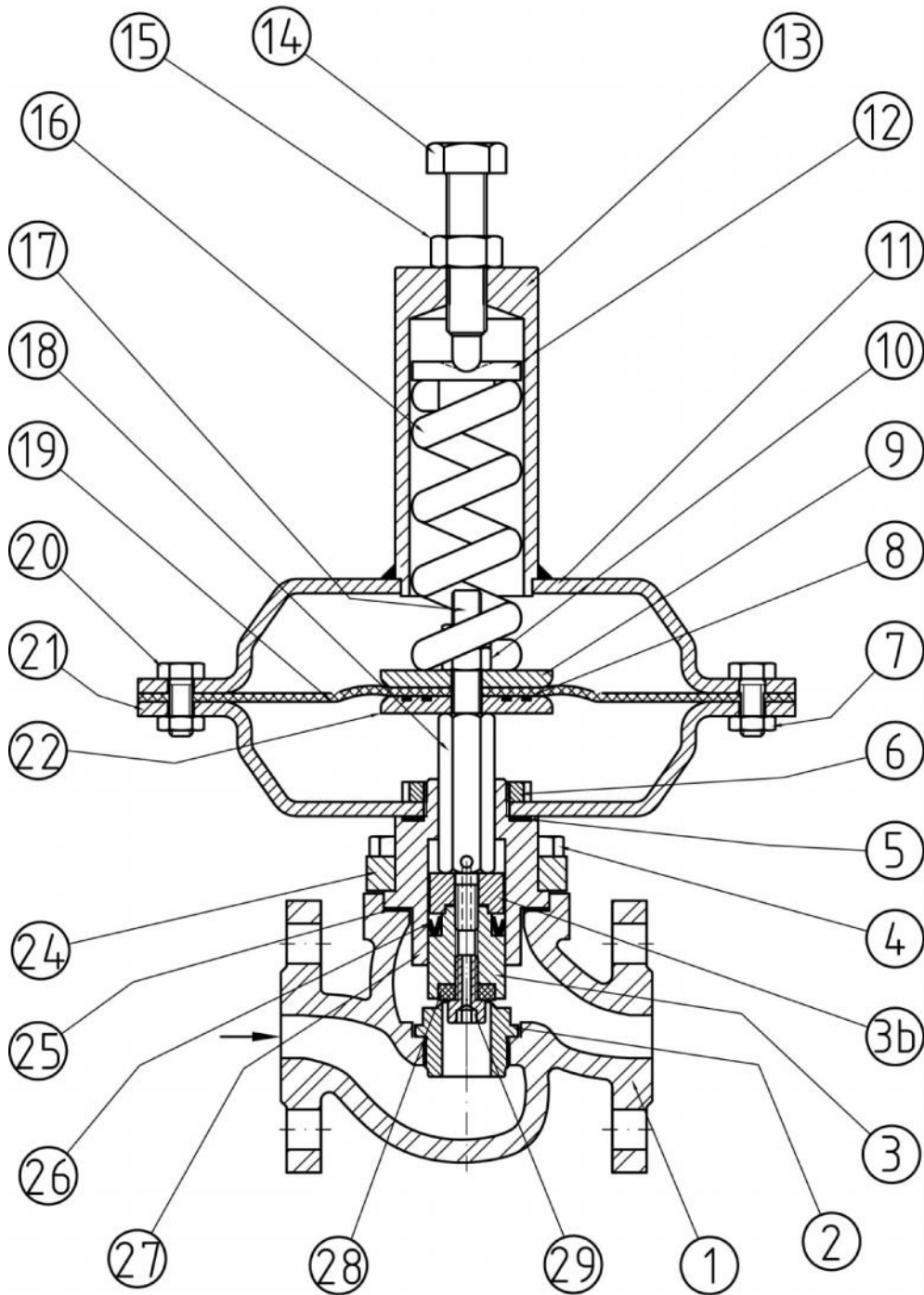
- Class II (combustible dust)

$$T(x) = 2/3 MIT_{cloud}$$

$$T(x) = 5 \text{ mm } MIT_{layer} - 75 \text{ K}$$



4. SCHEME



This device must be installed by specialized personnel with knowledge and experience. They must know about the current regulations in order to judge the risks that may involve this work.

Important: Be sure that the valve and actuator never exceed the service temperature for which has been designed.



5. ASSEMBLY

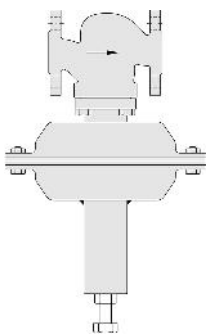
The pipe must be cleaned carefully before installing the valve, to prevent that any small element or impurity may affect the reducing valve work.

It is also very important to install a strainer in front of the valve in order to protect it.

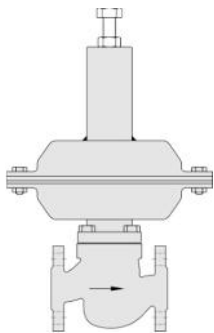
Excess pressure valve must be installed in a horizontal pipe and the direction of the flow should be in the same direction that shows the valve body.

When the steam is condensed, the pipe should be inclined to help with the evacuation.

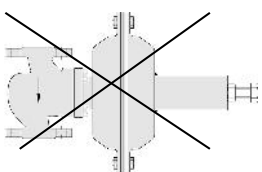
Assembly Position



Standard position for any fluids and temperature above 0°C .



Position for gases and liquids when the temperature of the fluid does not exceed 80°C

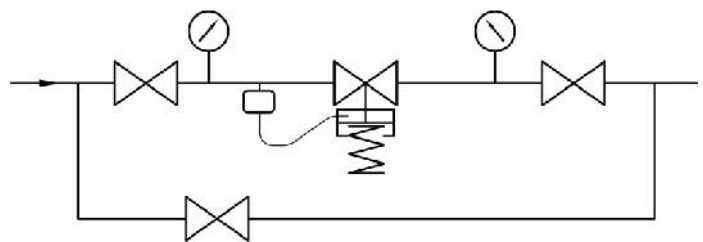


This situation is not allowed because the valve will not work properly.

The supports holding the valve will be done in the pipe and as close as possible to the flanges but never fixed in the valve or the actuator, to eliminate unnecessary tensions.

Installation in bypass

If you install a valve in bypass, which is highly recommended, with their isolation valves, according to the scheme:



Control Line

The external control line must be connected to the main pipeline in upstream pressure, at least 1 meter from the valve, through a tube (10 x 1 mm).

If the upstream pressure has oscillations, it is recommended to install a needle valve in the control line.

External control line it's necessary for liquids with temperatures above 125°C and steam, and recommended for liquids below 125°C.

For gases isn't necessary because valve mounts the internal control line.

The control line connection for pressure tapping must always be directly attached to the vessel (tank) because the medium is in the expanded state and no turbulence occurs at this point (see installation drawing).



Condensating Pot

The Condensating Pot will be only necessary for liquids with temperatures above 125°C and steam, in order to protect the diaphragm from overheating. The pot is always in the highest place of the pipe.

The connection of the control line of the pot to the main pipe will be made laterally to the center of it and with a slight slope to slide into the pipe.

All the connections of the actuator and the condensating pot are for a 10x1 tube.

The condensating pot should be filled with water to overflowing.

Start-up

If the steam or liquid flows over 125 ° C is necessary to install and fill with water the condensating pot. Screw the cap and tight it.

Open the check valves slowly (to prevent water hammer). First on the upstream pressure side.

Regulation of the valve

To avoid premature breakdown of the diaphragm, Valfonta sets the pressure value approximately at requested value.

To adjust the set pressure (upstream pressure), turn the regulating nut with a standard tool.

Compressing the spring (turn right) increases the set upstream pressure and decompressing the spring, decreases.

The pressure gauge located on the upstream pressure side allows the adjusted set point to be monitored.

Leak-off line connection

Special excess pressure valve can be delivered with a leak-off line connection.

Connect the leak-off line to the G ¼ female thread connection on top of the actuator housing. In the event of a diaphragm rupture in the actuator, any process medium that escapes can be fed through a pipe to a safe location.

Pressure fluctuations

To eliminate any oscillations, the following measures may be helpful:

- Check the pressure tapping of the control line. If need be, relocate the point of tapping.
- Check the sizing data used for the regulator. If necessary, change the KVS coefficient, seat diameter or diaphragm



ATEX requirements

- **IMPORTANT!** The respective national regulations as well as general engineering rules governing the installation and operation of equipment in explosive atmospheres must be observed.
- The valves are ATEX category "II 2 GD" according to 100a ATEX Directive (94/9/EC).
- **IMPORTANT!** The device can only be used in potentially explosive locations Class I (gases, vapors or liquids) Zones 1 and 2 and Class II (combustible dusts) areas 21 and 22, according to the specifications in the Directive 1999/92/EC , as well as the Electro technical Regulations.

Electrostatic discharges

Under certain conditions, electrostatic discharges that are capable of ignite explosive atmospheres, can be produced. The most important measure of protection is equipotential bonding of all conductive parts and earthing.

In order to avoid electrostatics discharges, the installation of devices and control elements must be earthing.

- **IMPORTANT!** Connecting the valves to process: it should be ensured electrical continuity of $<10^6$.
- **IMPORTANT!** National regulations on maintenance, service, inspection and repair of apparatus and equipment for explosive atmospheres, as well as general engineering rules must be observed.

COMMISSIONING

IMPORTANT! User is the only responsible for a safe use of the devices.

In use, parts that affect the explosion protection of the valves must be checked and act accordingly, f.e.:

- Fixing Elements -screws, nuts, shafts, etc.- see technical documentation of the product supplied. It must be ensure its tightening, proper operation and / or change when necessary. After 2.500h of working or 6 natural months (whichever comes first).
- The seals will be replaced by original spare parts: every 25,000 hours or when periodic inspections result said (the lower range).
- Any other action arising from inspection and maintenance plan, set by the user
- **IMPORTANT!** If repainting the valves and / or spare parts, ensure there is no paint on moving parts, mounting flange and closure sealing.

INSPECTIONS

- **IMPORTANT!** National Regulations must be observed. It is user's responsibility to establish an inspection and maintenance plan for these devices in order to ensure their proper use.
- Inspections must be performed by "qualified staff" because of the kind of equipment and / or installation.
- Purposes can be used to guide the requirements of the UNE-EN 60079-17, in order to establish the inspection plan.
- **IMPORTANT!** When inspections are "Detailed" or it is degree is "Close", the devices will be completely shut out.

MAINTENANCE

Spare parts are subject to normal wear. They must be inspected and replaced when necessary.

The frequency of the inspections and maintenance depends on the severity of the service conditions. This section provides instructions about replacement, packing, stem, plug and seat.

All maintenance operations can be performed with the valve body installed.

Before any maintenance, ensure the valve is depressurised and clear of media, and isolate it both upstream and downstream. Be sure the temperature isn't dangerous.

IMPORTANT! Use only genuine parts or recommended by VALFONTA, SL



6. POSSIBLE TROUBLESHOOTING

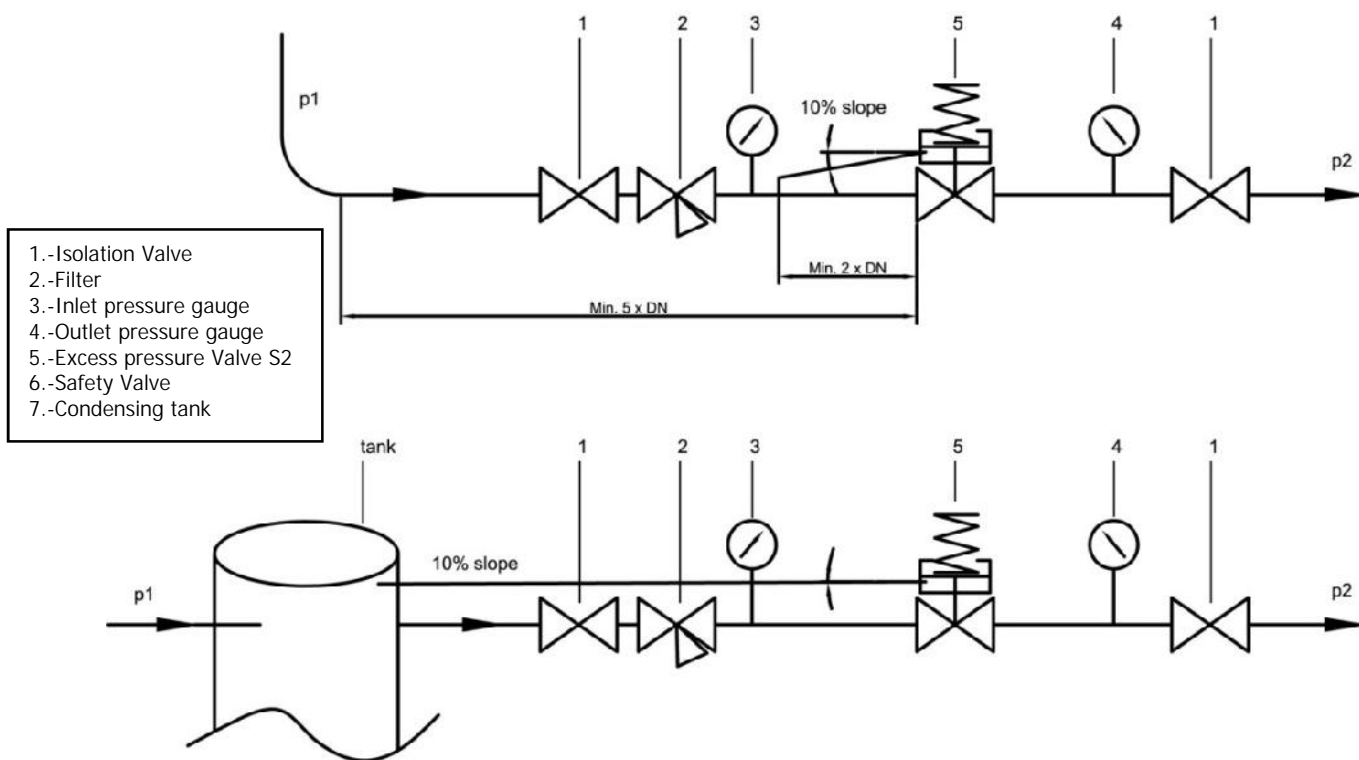
| Trouble | Possible reasons | Recommended response |
|---|--|--|
| Pressure exceeds the adjusted set point | Insufficient pressure on the operating diaphragm | Clean the control line and the screw joint with restriction |
| | Seat and plug worn down | Disassemble the regulator and replace damaged parts |
| | Pressure tapped at the wrong place | Reconnect control lines at a different place. Do not tap pressure at pipe bends or necks |
| | With steam: Condensation pot in the wrong position | Reconnect pot at a different place or replace it |
| | Control response too slow | Install larger screw joint at the diaphragm actuator |
| Pressure drops below the adjusted set point | Valve installed against the flow; see arrow on body | Check direction of flow. Install valve correctly |
| | Pressure tapped at the wrong place | Reconnect control line at a different place |
| | Valve or KVS coefficient too small | Check valve sizing. Install larger valve, if necessary |
| | With steam: Condensation pot in the wrong position | Reconnect pot at a different place or replace it. |
| | Foreign particles blocking the plug | Disassemble the regulator and replace damaged parts |
| Control disorders | Particles between seat and plug | Remove foreign particles. Replace damaged parts |
| Slow control response | Dirt in the control line | Clean the control line |
| Upstream pressure fluctuates | Valve too large | Check valve sizing. Select smaller KVS coefficient, if necessary |
| | Restriction in the screw joint of the actuator too large | Install smaller screw joint |
| | Pressure tapped at the wrong place | Select better place for pressure tapping |
| Loud noises | High flow velocity, cavitation | Check sizing. Install flow divider with gases and steam |

Technical data

| | | | |
|--|---|--|--------|
| Nominal pressure | PN16-PN25-PN40 or CLASS 150-CLASS 300 | | |
| Nominal size | DN15 to DN50 | DN65 to DN80 | DN100 |
| Max. permissible differential pressure p | 16 bar | 12 bar | 10 bar |
| Max. permissible temperature: body | Refer to technical sheet HT-101 | | |
| Max. permissible temperature: plug | metal: 180°C PTFE+GR: 180°C PEEK: 180°C EPDM, FPM: 150°C NBR: 80°C | metal: 180°C PTFE+GR: 180°C PEEK: 180°C EPDM, FPM: 150°C NBR: 80°C | |
| Max. permissible temperature: actuator | Diaphragm EPDM till 125°C Diaphragm EPDM+PTFE and condensation tank till 180°C | | |



7. INSTALLATION DRAWING



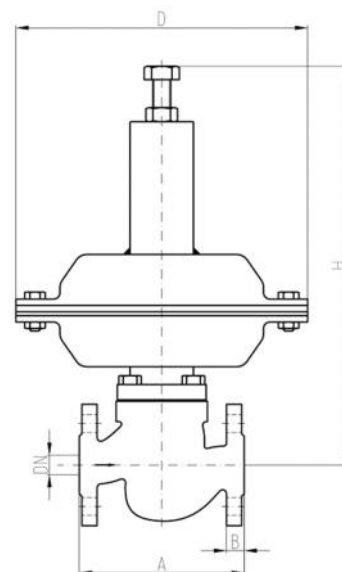
- 1.- Isolation Valve
- 2.- Filter
- 3.- Inlet pressure gauge
- 4.- Outlet pressure gauge
- 5.- Excess pressure Valve S2
- 6.- Safety Valve
- 7.- Condensing tank

DIMENSIONS

| | | | | | | | | | | |
|-----------------|-----|-----|------|------|------|------|-------|-------|-------|-------------------|
| DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | |
| Kv value | 3,5 | 5 | 9 | 13,5 | 22 | 32 | 57 | 82 | 115 | m ³ /h |
| A (EN PN40) | 130 | 150 | 160 | 180 | 200 | 230 | 290 | 350 | 350 | mm |
| A (ANSI 150 LB) | | | 7,25 | - | 8,75 | 10 | 10,86 | 13,88 | 352,5 | In. |
| A (ANSI 300 LB) | | | 7,76 | - | 9,25 | 10,5 | 11,5 | 14,49 | 368 | In. |
| H | 315 | 315 | 325 | 325 | 360 | 360 | 390 | 390 | 410 | mm |
| Aprox. Weight | 8 | 9 | 12 | 13 | 15 | 20 | 30 | 42 | 55 | kg |

Outlet Pressure Ranges (diameters D in mm.)

| | | | | | | | | | |
|---------------|----|------|----------------|------|----|----|----|----------------|-----|
| DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| 20 - 40 mbar | | D350 | | | - | | | - | |
| 30 - 100 mbar | | D295 | | D350 | | | | - | |
| 80 - 300 mbar | | | D295 | | | | | D350 | |
| 0,2 - 2 bar | | | D230 | | | | | D295 | |
| 0,8 - 3 bar | | | D195 | | | | | D230 | |
| 2 - 8 bar | | | D175 | | | | | D195 | |
| 5 - 16 bar | | | D175 - CONSULT | | | | | D175 - CONSULT | |





8. DISMANTLING AND ASSEMBLING THE VALVE

- a. Unscrew completely the adjusting screw (14) to loosen the spring.
- b. Ensure that there is no pressure in the pipe line and the temperature of valve and pipe is ambient.
- c. Remove and clean control line. (internal control line, it's not necessary).
- d. Unscrew bolts (20) and nuts (7).
- e. Remove upper actuator (11) and regulating spring (16). If necessary, replace diaphragm (19) and their o-rings (8):
 - i. Unscrew nuts (10) with a wrench, when we fasten the screw (17) with an allen wrench.
 - ii. Lift the cover (9) and replace diaphragm (19) and their o-rings (8) and reassemble.
- f. Unscrew bolt group (17)-diaphragm support (22) anticlockwise direction, fasten the stem (18).
- g. Remove the spring (23), unscrew and replace nut KM6 (6) with special tool to prevent the damage and lift the actuator (21).
- h. Unscrew cover bolts (4) and we lift the guide (27).
- i. Lift and replace, if necessary, cover-body gasket (25).
- j. In a workbench replace seal (28) and compensating gasket (26) if necessary.
- k. Check the seal to assure is not damaged.
- l. Clean and reassembly.



9. RECEIPT ON SITE

ATTENTION! Transport and storage of these devices should be in their original packaging.

RECEIPT ONSITE

When receiving the equipment on site, it should be unpacked to check that they agree with the request and delivery notes. At least, verification shall be performed:

- Visual,
- Mechanical

After these checks, if it will not be installed immediately, it will keep in dry and protected atmosphere.

Visual Inspection

Check that during transport, unloading and installation, the devices have not been damaged.

Mechanical Verification

Check all moving parts of the apparatus, as well as screws and other elements fulfill their mission.

IMPORTANT! If is observed abnormality during these guidelines reception, contact urgently VALFONTA to clarify responsibilities and put the devices in correct status.

The contents of that document are subject to change without notice.