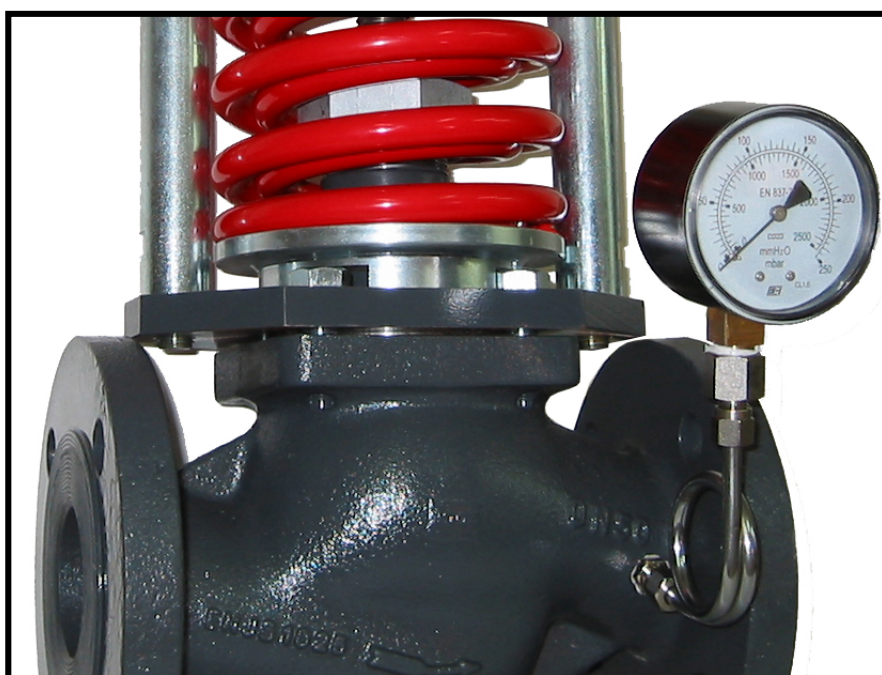




VALFONTA



USE, INSTALLATION AND MAINTENANCE MANUAL

EXCESS PRESSURE VALVE (PRESSURE RELIEF VALVE)

MODEL **S1**



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1. IDENTIFICATION PLATE LEGEND

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

SERIAL NR. DN

MODEL ☐ EN ☐ ANSI

PN Pin Pout MEDIUM

RANGE Kvs - Cv

BODY MAT. Tmax

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

SERIAL NR. DN

MODEL ☐ EN ☐ ANSI

PN Pin Pout MEDIUM

RANGE Kvs - Cv




BODY MAT. Tmax

www.valfonta.com VALFONTA BARCELONA

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)



PRESSURE REGULATOR WITHOUT AUXILIARY ENERGY

EXCESS PRESSURE VALVE (PRESSURE RELIEF VALVE) MODEL **S1**

2. MAIN FEATURES

The S1 model is self-operated pressure excess valve.

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

It has a very quick response to the demand.

Globe valve, single seat.

The stem is sealed by the double layer bellow. It is made in stainless steel 316Ti.

To avoid any damage on the bellows, S1 series is provided of an anti rotation system.

The diaphragm is enhanced with an intermediate lining.

Regulation range between 0,5 and 15 barg with different actuators. Valve opens when the upstream pressure increases. Maximum inlet pressure 15 barg.

Fluids

Liquids, compressed air, neutral gases and steam.

Nominal pressure	PN25 – PN40 Class 150 – Class 300
Sizes	DN15 to DN100 DN125 to DN200, consult
Body material	Nodular Iron GGG40.3 Carbon steel A216 WCB Stainless steel A351 CF3M
Connections	Flanged DIN PN16-PN40 Flanged ANSI 150 / 300 Threaded BSP / NPT, consult
Trim material	Stainless steel AISI 304L/316L
Diaphragm Material	NBR -20°C to 80°C EPDM -40°C to 125°C EPDM + PTFE 125°C to 220°C

3. OPERATION

To control the pressure with the excess pressure valve S1 model, the diaphragm (H) is compressed by the springs (K) through the adjusting nut (F).

The valve is always closed upstream pressure = downstream pressure.

When upstream pressure arrives to the diaphragm via external control line (L), and rises above the adjusted set point, valve opens proportionally to the change in pressure. This set point can be adjusted with the adjusting nut (F).

RECOMMENDATIONS

This series must be used only as a excess pressure valve. Excess pressure valve is not a safety valve. If necessary, a suitable overpressure protection must be installed on site in the plant section.

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)

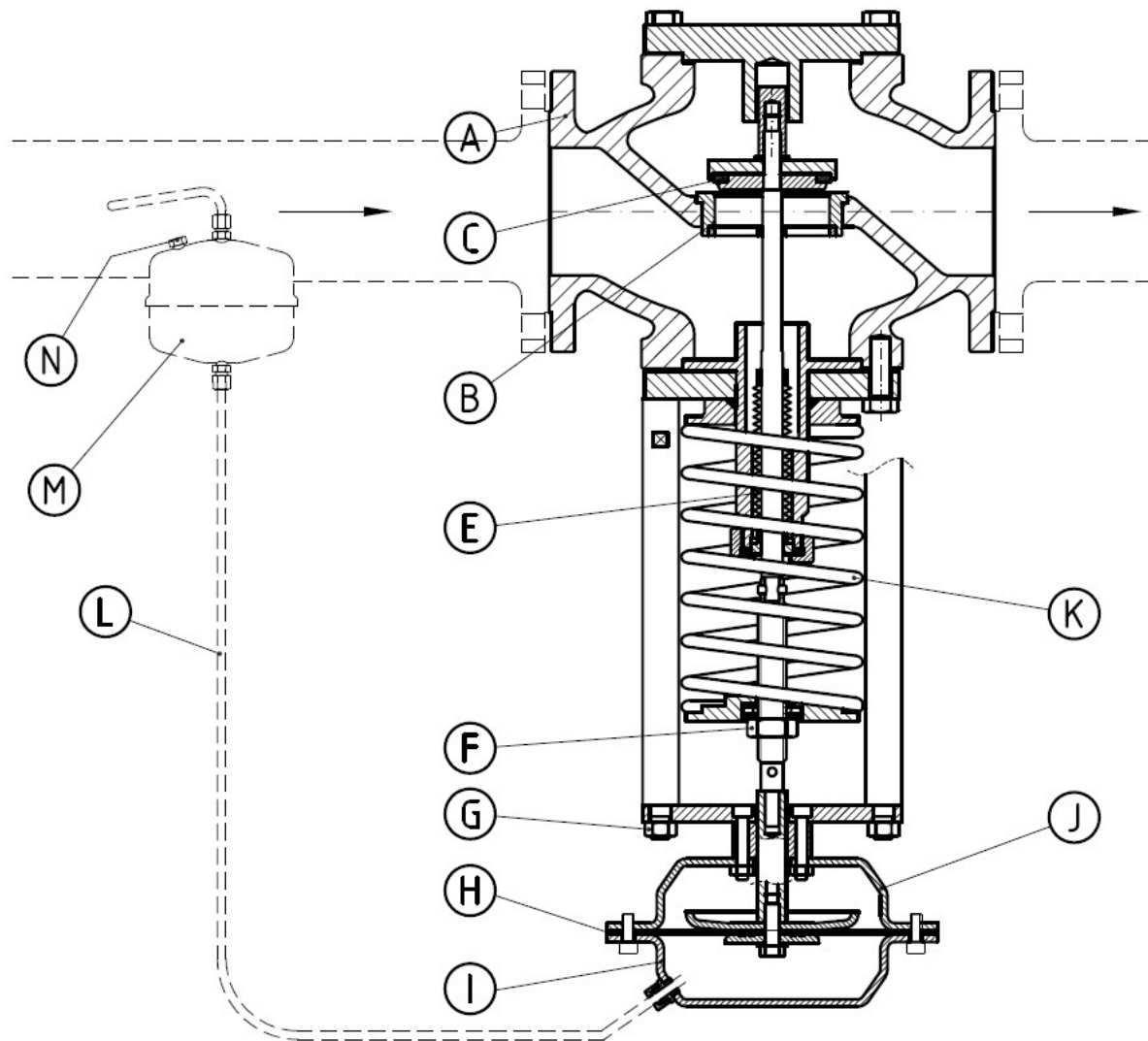
TEMPERATURE CLASS	MAX. SURFACE TEMPERATURE	APPROPRIATE FOR SUBSTANCES WITH IGNITION TEMPERATURE
T1	450°C	Ti >450°C
T2	300°C	Ti >300°C
T3	200°C	Ti >200°C
T4	135°C	Ti >135°C
T5	100°C	Ti >100°C
T6	85°C	Ti >85°C

- Class II (combustible dust)

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

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

4. SCHEME



- A – Body valve
- B – Seat (replaceable)
- C – Seal
- E – Bellows
- F – Regulating nut
- G – Nut
- H – Diaphragm
- I – Actuator casing (upper)
- J – Actuator casing (lower)
- K – Springs
- L – Impulse Pipe
- M – Tank (only for steam)
- N – Cap



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 and pressure for which has been designed.



5. ASSEMBLY

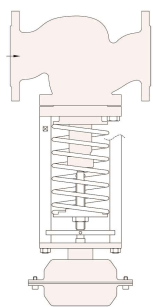
The pipe must be cleaned carefully before installing the valve, to prevent that any small element or impurity may affect the valve work.

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

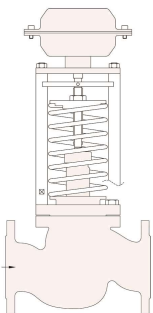
Excess pressure valve must be installed in a horizontal pipe and the direction of the flow should be in the same direction that shows the valve body.

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

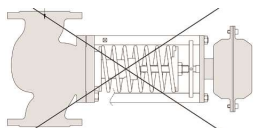
Assembly Position



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

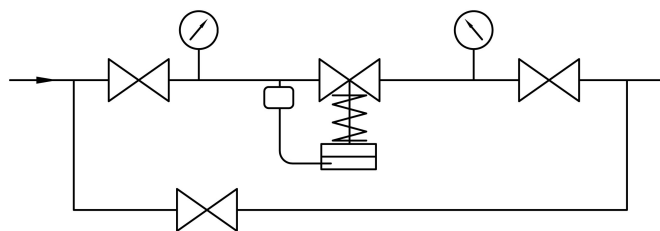


This situation is not allowed because the valve will not work properly.

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 by-pass

If you install a valve in bypass, which is highly recommended, it must spliced back to the main pipe after the control line, and with their check valves, according to the scheme:



Control line

The control line must be connected to the main pipeline in upstream line (p1) , at least 1 meter from the valve (or 10xDN), through a tube (10 x 1 mm).

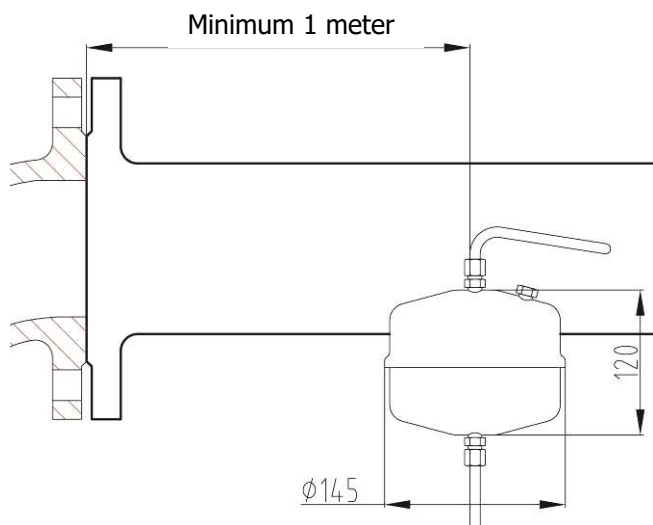
If the inlet pressure tends to oscillate, it is recommended to install a needle valve at the control line.

Condensation Tank

The Condensation 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 condenser pot are for a tube of 10x1 mm.



This mounting position must be adhered to; otherwise the safe functioning of the excess pressure valve cannot be guaranteed.

Start-up

Make sure the control line is correctly connected and needle valve open.

For steam uses, is necessary to install the condensation pot and fill it with water until it starts to overflow. Screw the cap and tight it.
All pipes must be completely drained and dry.
Allow time for the pipe and valve to warm up.

For liquids uses above 125°C, fill the condensation pot with the process medium.

For liquids uses below 125°C, the condensation pot is not necessary.

Regulation of the valve

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

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

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.

Decommissioning

Close first the shut-off valve on the upstream side of the valve and then on the downstream side of the valve.



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 $<10^6 \Omega$.
- **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	Restriction in the screw joint of the actuator dirty or too small	Clean screw joint or install larger screw joint
	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

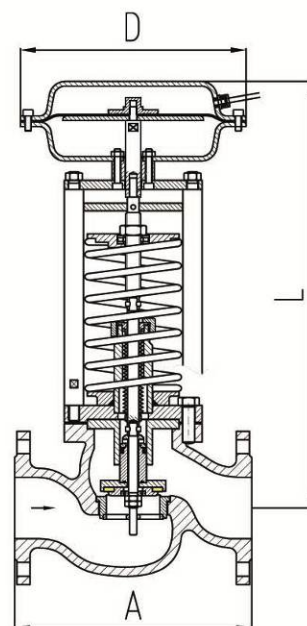
Nominal pressure	PN16-PN25-PN40 or CLASS 150-CLASS 300		
Nominal size	DN15 to DN50	DN65 to DN80	DN100
Max. permissible differential pressure Δp	16 bar	12 bar	10 bar
Max. permissible temperature: body	Refer to technical sheet HT-101		
Max. permissible temperature: plug	PTFE+GR: 220°C EPDM, FPM: 150°C NBR: 80°C	PTFE+GR: 220°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

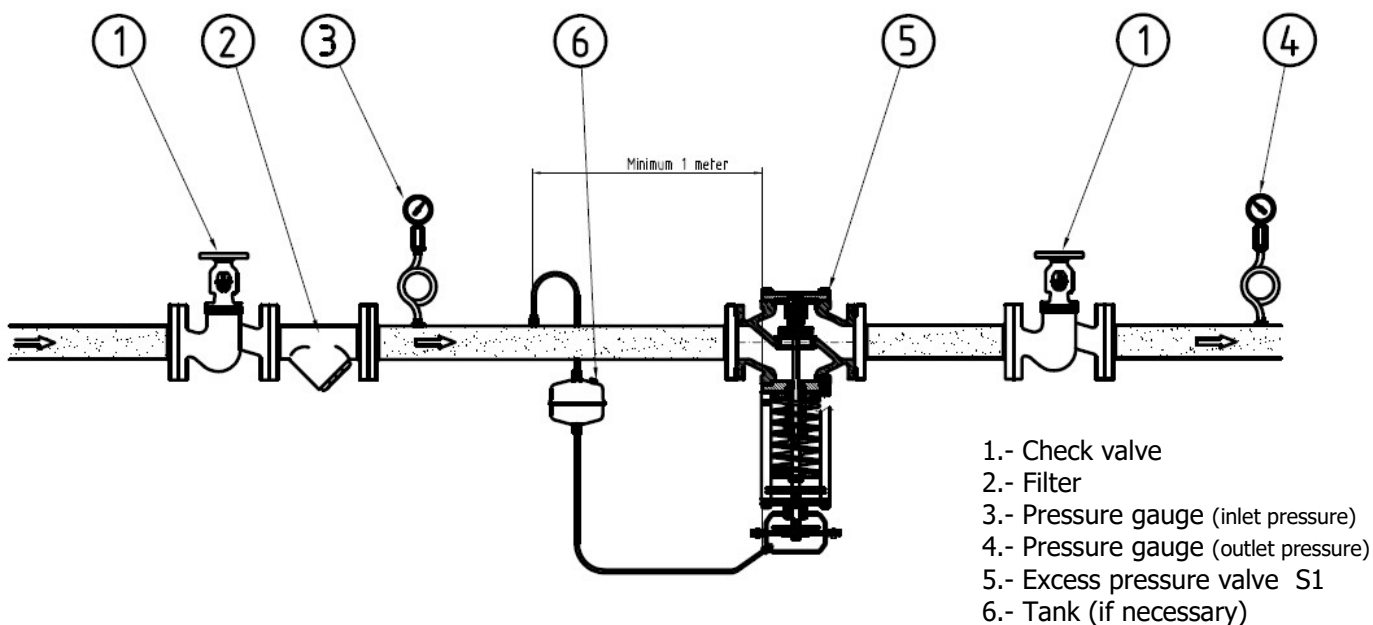
Dimensions, weight and Kv

DN	15	20	25	32	40	50	65	80	100	125	150
Kv (m ³ /h)	3.5	5	9	13.5	22	32	57	82	115	190	240
A EN (mm)	130	150	160	180	200	230	290	310	350	400	480 *
A ANSI150 (mm) (inches)	-	-	184 7,25"	-	222 8,75"	254 10"	276 10,9"	298.5 11,75"	352.5 13,88"	-	451 17,75"
A ANSI300 (mm) (inches)	-	-	197 7,76"	-	235 9,25"	267 10,51"	292 11,5"	317.5 12,50"	368 14,49"	-	-
L (mm)	440	445	450	455	463	475	560	560	575	600	640
Weight (kg.)	20	22	24	28	32	35	52	57	68	85	105



Outlet pressure ranges (diameters D in mm.)

Range (bar g)	DN15 a DN50	DN65 a DN100	DN125 a DN150
0,5 - 1,5	295	295	350
1 - 3	255	255	295
2 - 5	230	230	255
4 - 8	175	175	230
7 - 12	-	175	175
7 - 15	175	consult	Consult





DISMANTLING AND ASSEMBLING THE VALVE

- a. Unscrew completely the adjusting nut (13) to loosen the springs.
- b. Ensure there is no pressure in the pipe line and the temperature of valve and pipe is ambient.
- c. Unscrew the nuts (15).
- d. Remove actuator group. In a workbench, if necessary, replace the diaphragm (19) and o-rings (22):
 - i. Unscrew bolts and nuts (25).
 - ii. Remove diaphragm group and unscrew nut (21) of stem (24).
 - iii. Replace diaphragm (19) and o-rings (22) and reassemble in reverse.
- e. Remove columns (31), regulation nut (13), Guide (30), axial bearing (11), upper spring support (12)
- f. Remove cover (51):

NOTICE: make absolutely sure that no torque is applied to the bellow stem because will be damage.

1. DN15 – DN100: Unscrew seal stem (43) and remove item 43-39-40-3.
 2. DN125-DN150: Remove guide (36) and their joints (35). Unscrew nuts (42) and remove items group 5-37-4-38-39-40-3-41.
- g. Unscrew bellow nut (32) and lift bellow group (33) with their o-ring (9). Replace If necessary.
 - h. Check the seat to assure is not damaged.
 - i. Clean and reassembly.



8. 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.