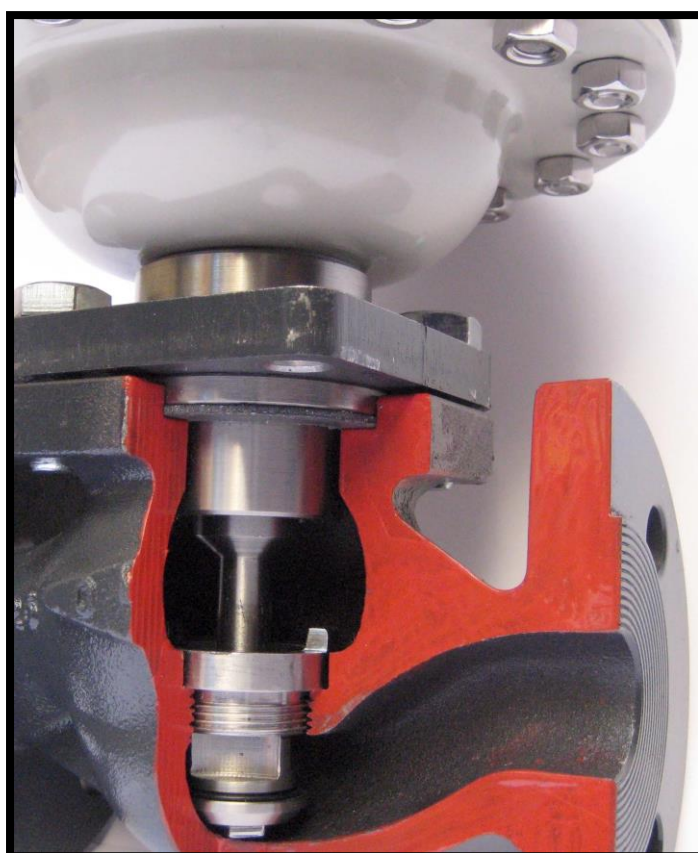




VALFONTA



USE, INSTALLATION AND MAINTENANCE MANUAL

PRESSURE REDUCING VALVE MODEL **M2**



Índice

1. IDENTIFICATION PLATE LEGEND.....	¡Error! Marcador no definido.
2. MAIN FEATURES	¡Error! Marcador no definido.
3. OPERATION	¡Error! Marcador no definido.
4. ATEX INSTRUCTIONS	5
5. SCHEME.....	6
6. ASSEMBLY	9
7. POSSIBLE TROUBLESHOOTING	12
8. INSTALLATION DRAWINGS	¡Error! Marcador no definido.
9. DISMANTLING AND ASSEMBLING	15
10. RECEIPT ON SITE	¡Error! Marcador no definido.



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



c) ATEX marked required according to DIRECTIVE 94/9/EC

 VALFONTA E 08915 – Badalona (ESPAÑA)	
TYPE: PRESSURE REDUCING VALVES SELF - ACTUATED	
MANUFACTURING YEAR: 2014	MANUFACTURING NUMBER:
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> II 2 G D </div> <div style="text-align: center;"> c IIC Tx c IIIC Tx°C </div> <div style="text-align: center;">  </div> </div>	
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

PRESSURE REDUCING VALVE MODEL **M2**

INSTRUCTIONS: USE AND INSTALLATION

2. MAIN FEATURES

Direct acting pressure reducing valve, without auxiliary power and compensated by diaphragm. Controls the outlet pressure even if there are oscillations in the inlet pressure

The valve closes when the downstream pressure increases.

Suitable for gases (air, nitrogen, ...), liquids and steam. Pressure range from 20 mbar to 10 bar with several different actuators. Diaphragm with intermediate reinforcing fabric

The condensation tank is available and is necessary when the fluid is steam or for liquids with a temperature higher than 125°C, to protect the membrane from overheating.

The reducing valve is not a safety valve and, when necessary, an overpressure protection must be installed.

3. OPERATION

The pressure reducing valves "VALFONTA M2" work through the principle of direct action.

The upstream pressure reaches the valve and pushes the shaft-piston-piston assembly (51, 26, 19) exerting the closing of the same automatically (item 28, 29, 31).

Once the valve is closed, adjust the adjusting screw (13) in a clockwise direction. This causes the displacement of the spring (10), which likewise acts on the diaphragm (19) and the closure (28, 29, 31), opening the passage of the valve until it reaches the requested downstream pressure.

Max. inlet pressure	DN15-50 40 barg DN65-100 25 barg
Sizes	DN15 a DN100
Body material	PN25: Nodular (GGG40.3) PN40: Acero Carbono WCB (GSC25N) PN40: Acero inoxidable CF3M (1.4408)
Connections	Flanges EN PN16-PN25-PN40 Flanges ANSI 150 / 300 Thread BSP / NPT (up to 2")
Trim material	Acero Inoxidable AISI 316L
Max. temperatures	NBR: -20 a 80°C EPDM: -40 a 125°C FKM: consult PTFE: -40 a 180°C



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.

4. SPECIAL ATEX INSTRUCTIONS

- No limitation of use due to the ATEX substances.



- 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

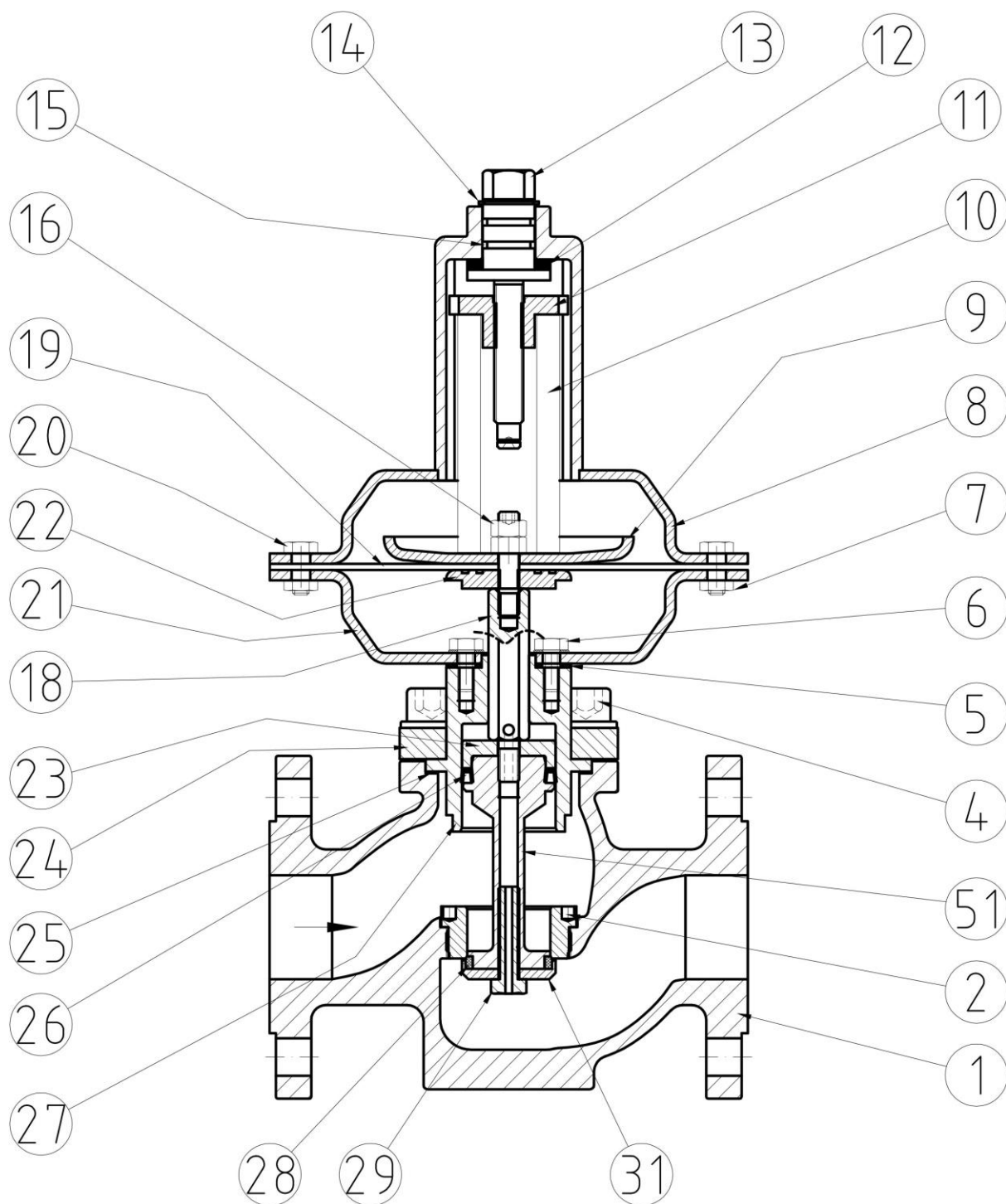
- Class II (combustible dust)

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

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

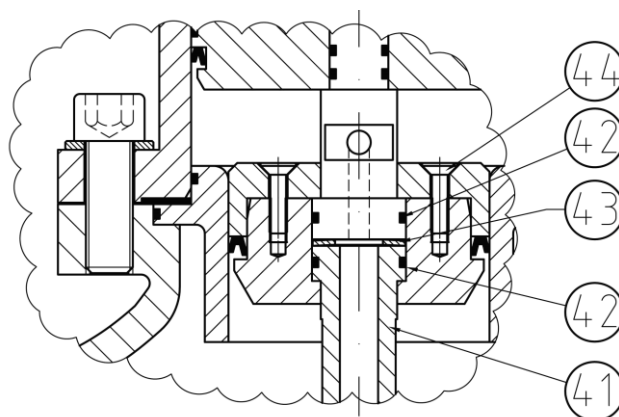


5. SCHEME





	Description	Material		Description	Material
1	Body	Stainless steel CF8M-316 Bronze RG10 Carbon steel WCB Nodular Iron GGG40.3	20	Bolt	Stainless Steel A2-70
2	Seat	1.4404 - SS 316L	21	Lower actuator	1.0335 (Sheet Steel with Epoxy painting) ro 1.4404 - SS 316L
4	Bolt	Galvanized Steel 8.8 / A2-70	22	Diaphragm lower plate	1.4404 - SS 316L
5	Gasket	PTFE	23	Collar guide	1.4404 - SS 316L
6	Bolt	Stainless Steel A2-70	24	Cover	Galvanized Steel 1.1141
7	Nut	Stainless Steel A2-70	25	Gasket	Graphite
8	Upper actuator	1.0335 (Sheet Steel with Epoxy painting) ro 1.4404 - SS 316L	26	Balancing collar	NBR / FKM / EPDM / PTFE + GR
9	Spring support	1.0035 sheet steel galvanized	27	Bush guide	1.4404 - SS 316L
10	Regulation spring	Spring steel 52SiCrNi5 (epoxy)	28	Obturator	NBR / FKM / EPDM / PTFE + GR
11	Regulation nut	Galvanized Steel 8.8	29	Screw seal	Stainless Steel A2-70
12	Bearing	PTFE+GR	31	Support seal	1.4404 - SS 316L
13	Regulation stem	1.4404 - SS 316L	51	Bush stem	1.4404 - SS 316L
14	Safety washer	Stainless Steel A2-70			
15	O-ring	NBR / FKM / EPDM			
16	Nut	Stainless Steel A2-70			
17	O-ring	NBR / FKM / EPDM	41	Stem	1.4404 - SS 316L (DN100)
18	Stem	1.4404 - SS 316L	42	O-ring	NBR (DN100)
19	Diaphragm	NBR / EPDM / FKM	43	Washer spring	1.4404 - SS 316L (DN100)
19	Diaphragm (optional)	PTFE	44	Screw	Stainless Steel A2-70 (DN100)
				Recommended spare parts	



Scheme for DN100



6. ASSEMBLY

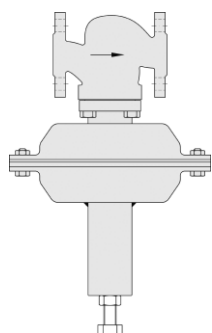
The pipe must be cleaned carefully before installing the valve, to prevent that any small element or impurity may affect the reducing valve work.

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

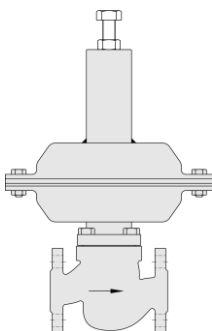
Reducing valve must be installed in a horizontal pipe and the direction of the flow should be in the same direction that shows the valve body.

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

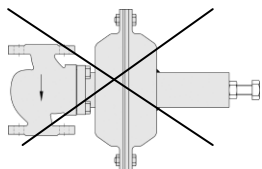
Assembly position



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



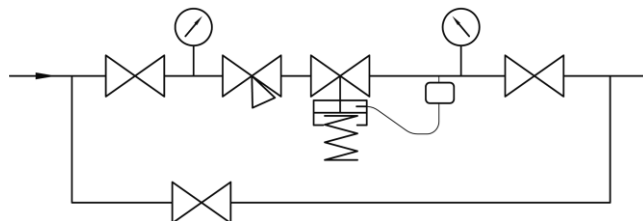
This situation is not allowed because the valve would not work properly.

The condensantion tank must be fully filled.

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

Pressure reducing valve will be supplied with internal control line, so external control line is not estricly necessary.

Howwver, is customer requires with order or in case of steam the control line must be connected to the main pipeline in downstream pressure, **at least 1 meter from the valve**, through a tube (10 x 1 mm).

If after the valve, there is a distributor, the connection of the control line must be connected to the distributor, although there are several meters between them.

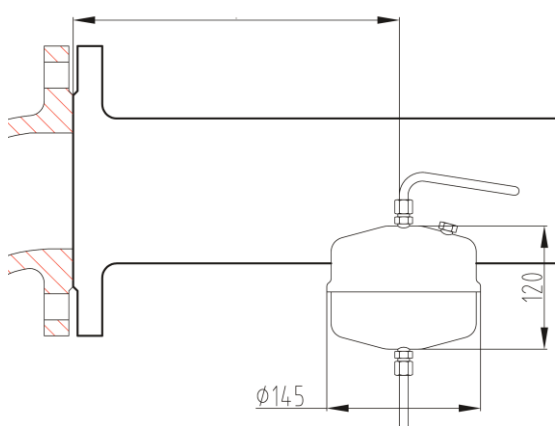
If the reducing valve oscillates, it is recommended to install a needle valve in the control line.

Condensation tank

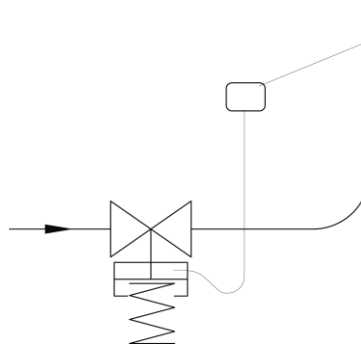
The Condensating Pot will be only necessary for liquids with temperatures above 125°C and steam, in order to protect the membrane from overheating. The pot is always in the highest place of the pipe.

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.

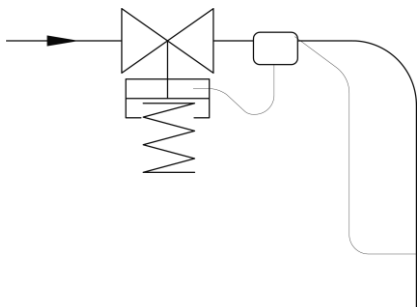
All the connections of the actuator and the condenser pot are for a 10x1 tube.



If the control line connection is placed over the outlet flange, the condenser pot must be installed according to this scheme:



If the connection of the control line is located below the outlet flange, the condenser pot installation should be according to the following scheme:



Start-up

Open the check valves slowly (to prevent water hammer).

To adjust the set pressure (downstream pressure), turn the regulating nut(14).
Compressing the spring (turn right) increases the outlet pressure and decompressing the spring, decreases.

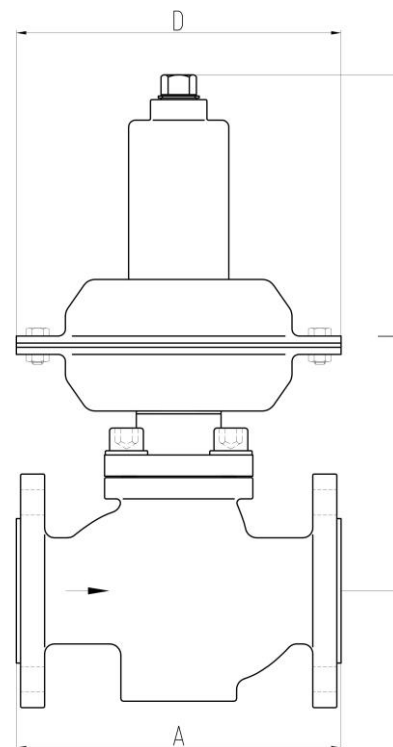


Dimensions, weight and Kv

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	11,75	352,5	In.
A (ANSI 300 LB)	-	-	7,76	-	9,25	10,5	11,5	12,50	-	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 (diameter D in mm.)

Range (barg)	DN15 DN20	DN25 DN32	DN40 DN50	DN65	DN80	DN100
0,02 - 0,05	350	350	-	-	-	-
0,03 - 0,1	295	295	350	350	-	-
0,1 - 1	295	295	295	295	295	295
0,2 - 1,5	-	-	-	-	295	295
0,2 - 2	230	230	230	230	-	-
0,5 - 2	-	-	-	-	-	230
1 - 4	-	-	-	-	230	230
1 - 6	175	175	175	175	-	-
3 - 8	-	-	-	-	230	230
3 - 10	175	175	175	175	-	-



Technical data

Nominal pressure	PN16-PN25-PN40 o CLASE 150-CLASE 300		
Nominal size	DN15 to DN50	DN65 to DN80	DN100
Max. permissible differential pressure Δp	25 bar	20 bar	16 bar
Max. permissible temperature: body	Refer to technical sheet HT-101		
Max. permissible temperature: plug	PTFE+GR: 180°C (with Condensation tank) EPDM: 125°C 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. POSSIBLE BREAKDOWNS

Symptom	Possible reason	Solution
You can not adjust the outlet pressure.	The actuator does not get pressure.	Clean or replace capture of control and check "racords" of connection.
Outlet pressure rises above the set one.	Pressure port blocked.	Clean or replace capture of control and check "racords" of connection.
	Actuator escape	Inspect diaphragm and gaskets and replace them if they are damaged.
	Eroded seal	Dismantle the actuator, springs and the body cover of the valve to inspect the seal. Replace it if it is necessary.
	Balancing gasket wear	Dismantle the actuator, springs and the body cover of the valve to inspect the balancing gasket. Replace it if it is necessary. (only DN65 to DN100)
In total charge, the outlet pressure is under the required one.	Submeasured valve for the requested load.	Check if the valve size is enough for that load. Replace it for a bigger DN valve.
It does not provide the total charge and the valve is properly dimensioned.	The valve does not reach the maximum path.	Consult with the manufacturer.
The flow is low and the outlet pressure oscillates.	Too big control line	Replace the 10x1 pipe for the 6x4 one, and all the racords necessary for his connection.
	Too big increasing pressure	Install two valves in series to reduce the reducing rate.
	The outlet pressure control line is very close to the valve.	Check that the line is at least 1 m. from any valve to avoid turbulences.

Please contact with producer in case of any additional question.



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.:

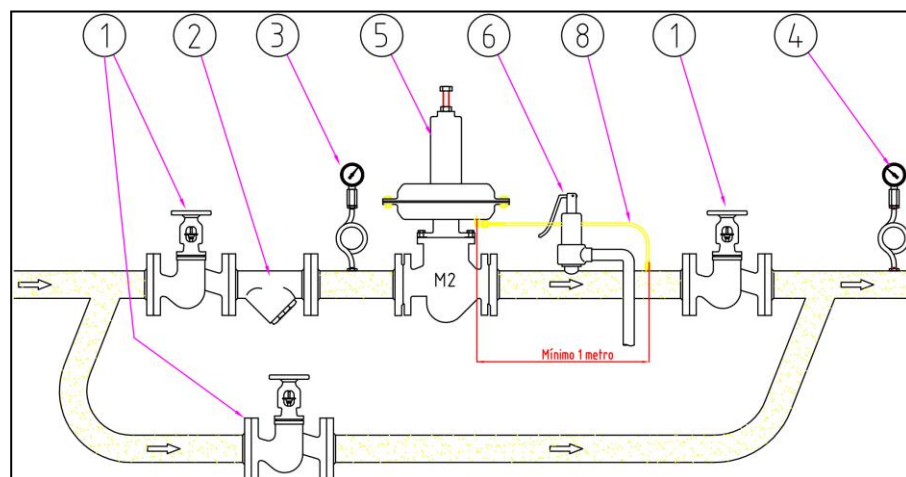
- Fixing Elements -screws, nuts, shafts, etc.- see technical documentation of the product supplied. It must be ensure its tightening, proper operation and / or change when necessary. After 2.500h of working or 6 natural months (whichever comes first).
- The seals will be replaced by original spare parts: 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.

8. INSTALLATION DRAWINGS

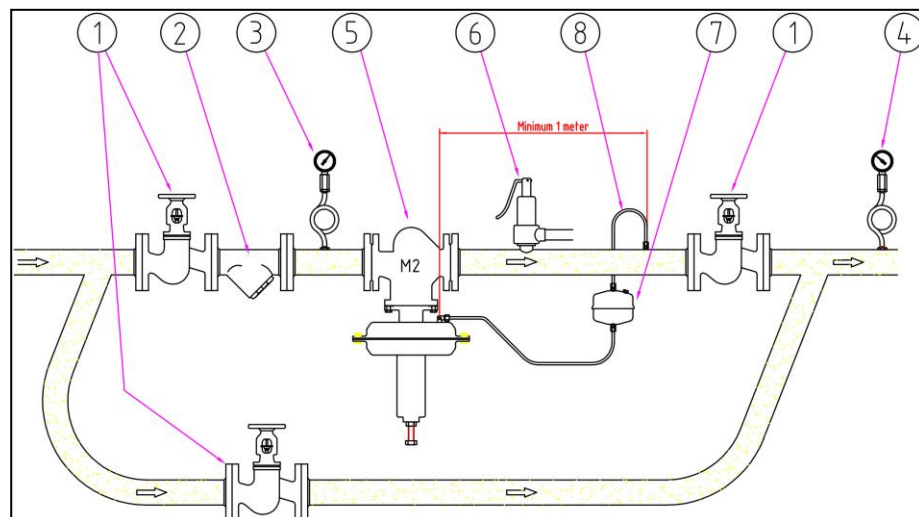
WATER AND NEUTRAL GASES



- 1.- Isolation Valve
- 2.- Filter
- 3.- Inlet pressure gauge
- 4.- Outlet pressure gauge
- 5.- Reducing valve M2
- 6.- Safety valve
- 7.- Condensation tank
- 8.- Control line(optional)

(control line,optional. Standard valve is supplied with internal line)

STEAM



- 1.- Isolation Valve
- 2.- Filter
- 3.- Inlet pressure gauge
- 4.- Outlet pressure gauge
- 5.- Reducing valve M2
- 6.- Safety valve
- 7.- Condensation tank
- 8.- Control line(mandatory)

(control line and condensation tank,mandatories)



9. DISMANTLING AND ASSEMBLING THE VALVE

- a.** Unscrew completely the adjusting nut (14) to loosen the springs.
- b.** Ensure there is no pressure in the pipe line and the temperature of valve and pipe is ambient.
- c.** Disassemble and clean the control tube. (If the shot is internal, it is not necessary).
- d.** Unscrew the screws (20) and their nuts (7).
- e.** Lift the upper actuator (11) and the adjustment spring (16). If necessary, replace the membrane (19) and its joints (8):
 - i.** Unscrew nuts (10) with a spanner, while keeping the shaft (17) fastened with an Allen key
 - ii.** Lift the cover (9) and replace the membrane (19) and its gaskets (8) and mount.
- f.** Unscrew the stud assembly (17) - lower membrane support (22) counterclockwise, holding the shaft (18)
- g.** Remove the spring (23), unscrew and replace the nut (6) and remove the lower actuator (21)
- h.** Unscrew the screws (4) of the cover and remove the guide (27).
- i.** Remove and replace, if necessary, the gasket (25) of the cover body
- j.** With a special tool (ask VALFONTA for a detailed plan) unscrew the seat (2) and lift the valve parts challenge
- k.** En un banco de trabajo, reemplazar el cierre (28) y el émbolo de compensación (26) if necessary.
- l.** On a work bench, replace the seal (28) and the compensation piston (26) if necessary.
- m.** Check that the seal is not damaged
- n.** Clean and reassembly



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

1. 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.