



# VALFONTA



## USE, INSTALLATION AND MAINTENANCE MANUAL

### PNEUMATIC CONTROL VALVE MODEL **C1**

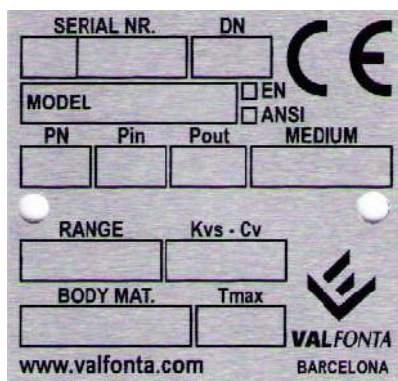


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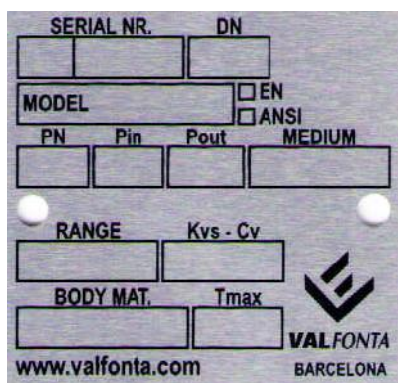
## 1. IDENTIFICATION PLATE LEGEND

a) CE marked is required according to PED 2014/68/UE



Identification plate for a valve with CE marking. The plate includes fields for SERIAL NR., DN, MODEL, PN, Pin, Pout, MEDIUM, RANGE, Kvs - Cv, BODY MAT., and Tmax. It also features the CE mark, the Valfonta logo, and the website www.valfonta.com.

b) CE marked is NOT permitted according to PED 2014/68/UE






Identification plate for a valve without CE marking. The plate includes fields for SERIAL NR., DN, MODEL, PN, Pin, Pout, MEDIUM, RANGE, Kvs - Cv, BODY MAT., and Tmax. It also features the Valfonta logo and the website www.valfonta.com.

Reference	Denomination	Units EN	Units ANSI
SERIAL NR.	Valve identification number (year / number)	-	-
MODEL	Valve model	-	-
DN	Nominal Diameter	mm	In
PN	Nominal pressure	barg	barg
Pin	Inlet pressure	barg	barg
Pout	Outlet pressure	barg	barg
Medium	Fluid to flow	-	-
Range	Outlet pressure range available	barg	barg
Kvs - Cv	Flow characteristic of the valve	Kv in m <sup>3</sup> /h	Cv in gpm
Body mat	Material of the body	-	-
Tmax	Maximum temperature permissible (normal conditions)	°C	°F



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

	VALFONTA E 08915 – Badalona (ESPAÑA)	
TYPE:	CONTROL VALVES ACTUATED BY PNEUMATIC ACTUATOR	
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)



## 2. MAIN FEATURES

Control valve are designed to control of gases, vapors and liquids according to the European Pressure Equipment Directive and certificated ISO 9001 quality assurance system.

Globe body, top entry, single seated, two way, direct or reverse action, multi spring pneumatic actuator. The modular concept of valve and a wide range of different trims available, allows a lot of combinations.

When used in conjunction with the pneumatic actuator they provide modulating control or on/off service. Actuator can be changed to direct or reverse actuation on line quickly.

The body shape gives optimum flow characteristics.

### VALVE FEATURES

DN15 to DN100

DN125 and DN150 (balanced inlet pressure)

DIN PN25 Nodular Iron GJS-400-18-LT (0.7043)

DIN PN25 Bronze RG-10 (EN-1982 CuSn10-CC480K)

DIN PN40 Carbon steel GP240GHN (1.0619)

DIN PN40 Stainless steel CF8M (1.4408)

Plug types equal percentage, linear or ON/OFF

Top guided standard construction

Connection Face Form B1 (acc. to EN 1092-1)

On request: Threaded BSP or NPT, BW, SW,...

Shut off capabilities:

- Class IV (metal to metal)
- Class VI (PTFE+GR seat)

On request, PEEK seal, stellite faced seat,...

Double V-Rings packing as standard

Full port as standard. Reduced port on request

Low noise and anticavitation cage available

NAMUR IEC 534.6 clamp as standard

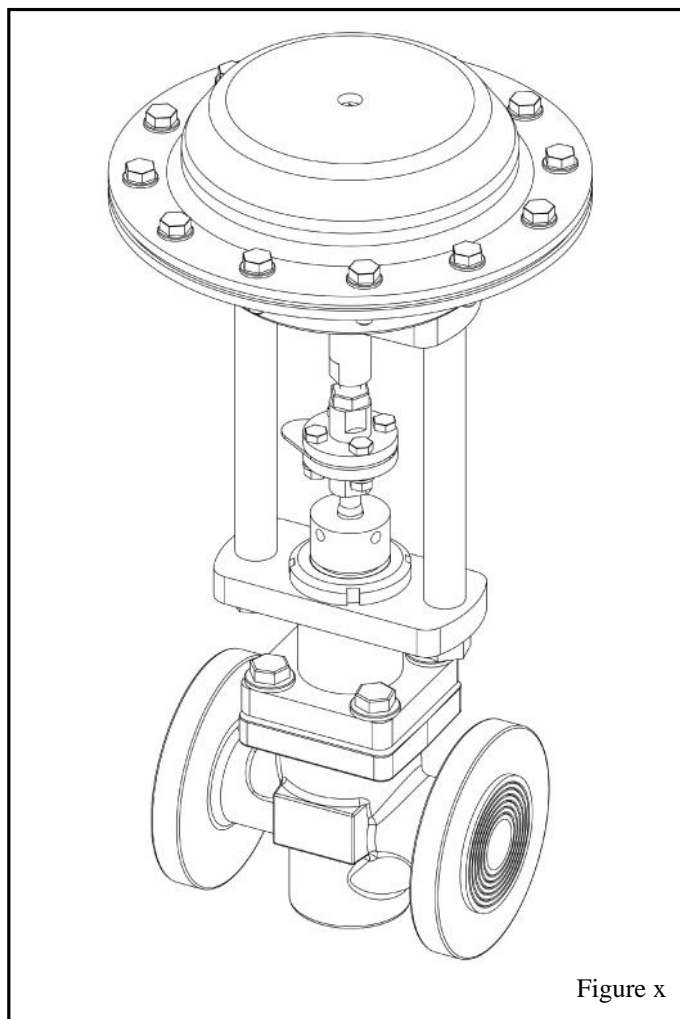


Figure x

### COMPATIBLE ACTUATOR FEATURES

Steel 1.0335 epoxy painted

Diaphragm EPDM + reinforced fabric (optionally NBR)

Temperature -20°C to +70°C

Allowable air pressure up to 5 barg (Conn. 1/4" BSP-F)

4 actuator sizes: D230, D295, D350 and D430

### OPTIONS

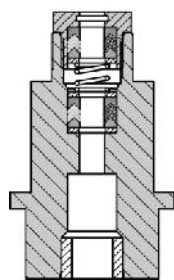
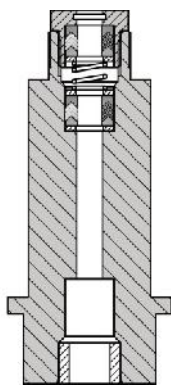
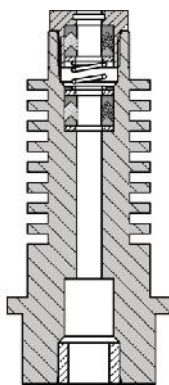
Electro pneumatic (Ex) positioner transmitter 4-20 mA, Smart positioner, Air filter regulator, Top-work manual hand wheel, stainless steel construction, solenoid valves, alarm contacts, ...


**PRESSURE – TEMPERATURE RATINGS (according to EN12516-1 and EN 1092-2)**

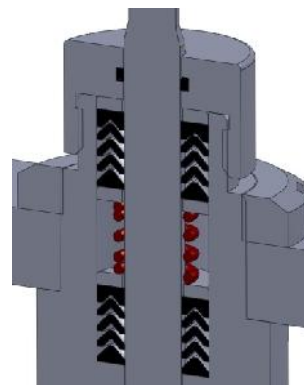
Nominal Pressure	Body material	Services temp.	°C	-10	50	100	150	200	250	300	350
PN25 – Class 150	Nodular Iron (0.7043) EN-GJS-400-18	Working pressure	bar	25	25	25	24	23	21	20	17
PN40 – Class 300	Carbon steel GP240GH (1.0619)		bar	40	40	36	35	34	33	30	29
PN40 – Class 300	Stainless steel AISI 316 (1.4408)		bar	40	38	33	30	28	26	25	24

**BONNET**

Bonnet	Working Temperature	Material
Standard	-5 to +200°C	* Zinc plated Steel 1.1191
Finned	> +200°C	
Extended	< -5°C	Stainless steel AISI 316 (1.4408)
Bellow seal	Consult us	

**STANDARD**

**EXTENDED**

**FINNED**

**STEM SEALING**

Material	PN	Working Temperature
* PTFE+GR V-Rings (spring loaded)	50	Up to +200°C
PTFE V-Rings	50	Up to +150°C
Graphite Rings	50	Up to +350°C
Bellow seal	25	Up to +350°C

**STANDARD DOUBLE PACKING**


Packing spring: Stainless steel



# VALVE DIMENSIONS, WEIGHT AND Kv VALUES

DN		15	20	25	32	40	50	65	80	100	125	150
Kv	(m³/h)	3.5	5	9	15	22	35	60	85	130	200	260
Cv	(gpm)	4	5.8	10.4	17.5	25	41	70	100	152	234	304
Stroke	(mm)	20						30			40	
A (EN 558-1)	(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 10,86"	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 (with AP295)	(mm)	345	345	411	411	436	436	470	470	490	-	-
L (with AP430)	(mm)	390	390	455	455	480	480	515	515	535	610	640
Valve Weight (without actuator)	(kg)	5	6	7	8	12	15	20	25	40	75	100

Available under request

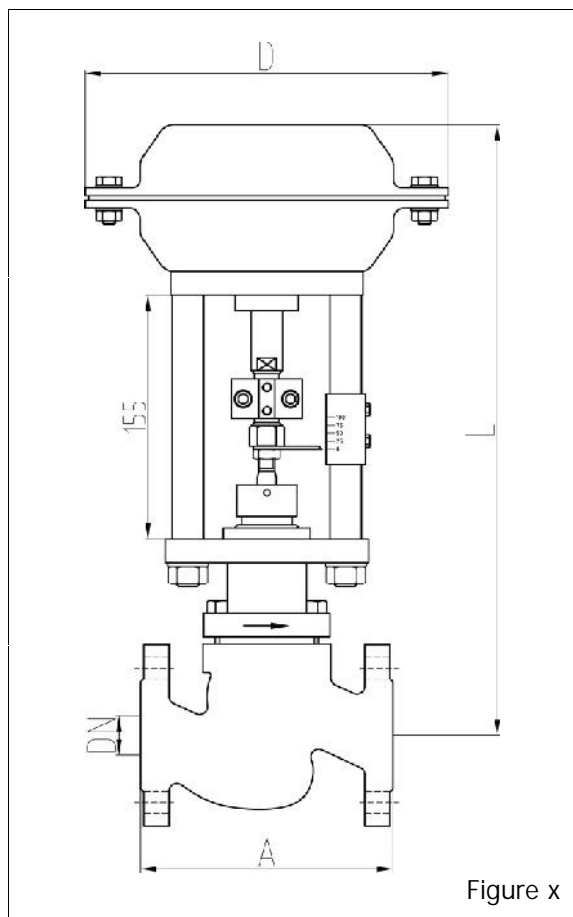
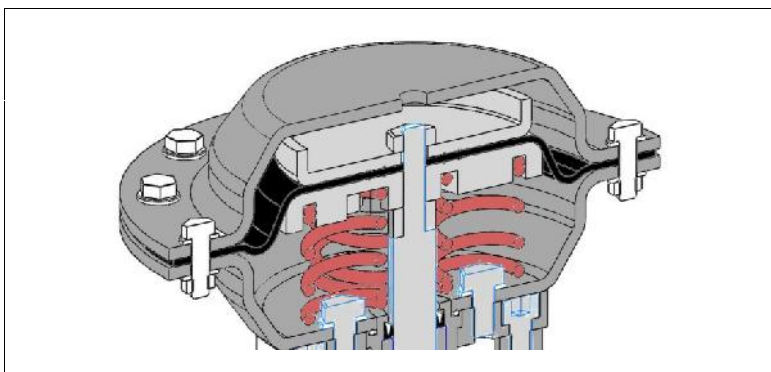


Figure x

## ACTUATOR DIMENSIONS AND WEIGHT

	AP.230	AP.295	AP.350	AP.430
D (mm)	230	295	350	430
Superficie (cm²)	150	300	450	700
Weight (Kg)	10	13	18	25





### 3. OPERATION

The process medium flows through the valve in the arrow direction. The position of the plug is changed thanks the signal pressure acting on the diaphragm of the actuator. The plug (item 3+4) is connected with the valve stem (item 8) and with the actuator stem (item 103) to open or close the valve.

The C1 valve can be supplied in two different fail-safe positions depending on the spring position in the actuator:

- Fail-close (normally closed or actuator stem extends)  
When signal pressure fails (low pressure or fail pressure), the springs move the stems and close the valve.  
When signal pressure returns to normal pressure again, the valve opens because the air pressure force is higher than the force of springs.
- Fail-open (normally open or actuator stem retracts)  
When signal pressure fails (low pressure or fail pressure), the springs move the stems and open the valve.  
When signal pressure returns to normal pressure again, the valve closes because the air pressure force is higher than the force of springs.

#### General Safety instructions

The control valve may only be mounted, started up or serviced by fully trained and qualified personnel, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger. All safety instructions and warnings in these mounting and operating instructions, particularly those concerning assembly, start-up and maintenance, must be observed.

The control valves fulfill the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity that includes information about the applied conformity assessment procedure. The declaration of conformity is available on request.

For appropriate operation, make sure that the control valve is only used in areas where the operating pressure and temperatures do not exceed the operating values which are based on the valve sizing data submitted in the order. The manufacturer does not assume any responsibility for damage caused by external forces or any other external influence! Any hazards which could be caused in the control valve by the process medium, operating pressure, signal pressure or by moving parts are to be prevented by taking the appropriate precautions.

For installation and maintenance work on the valve, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well. If necessary, allow the control valve to cool down or warm up to reach ambient temperature prior to starting any work on the valve.

Prior to performing any work on the valve, make sure the supply air and control signal are disconnected or blocked to prevent any hazards that could be caused by moving parts.

Special care is needed when the actuator springs are preloaded. These actuators are labeled correspondingly and can also be identified by three long bolts at the bottom of the actuator. Prior to starting any work on the valve, you must relieve the compression from the preloaded springs.





## 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. SCHEMES

## VALVE PARTS

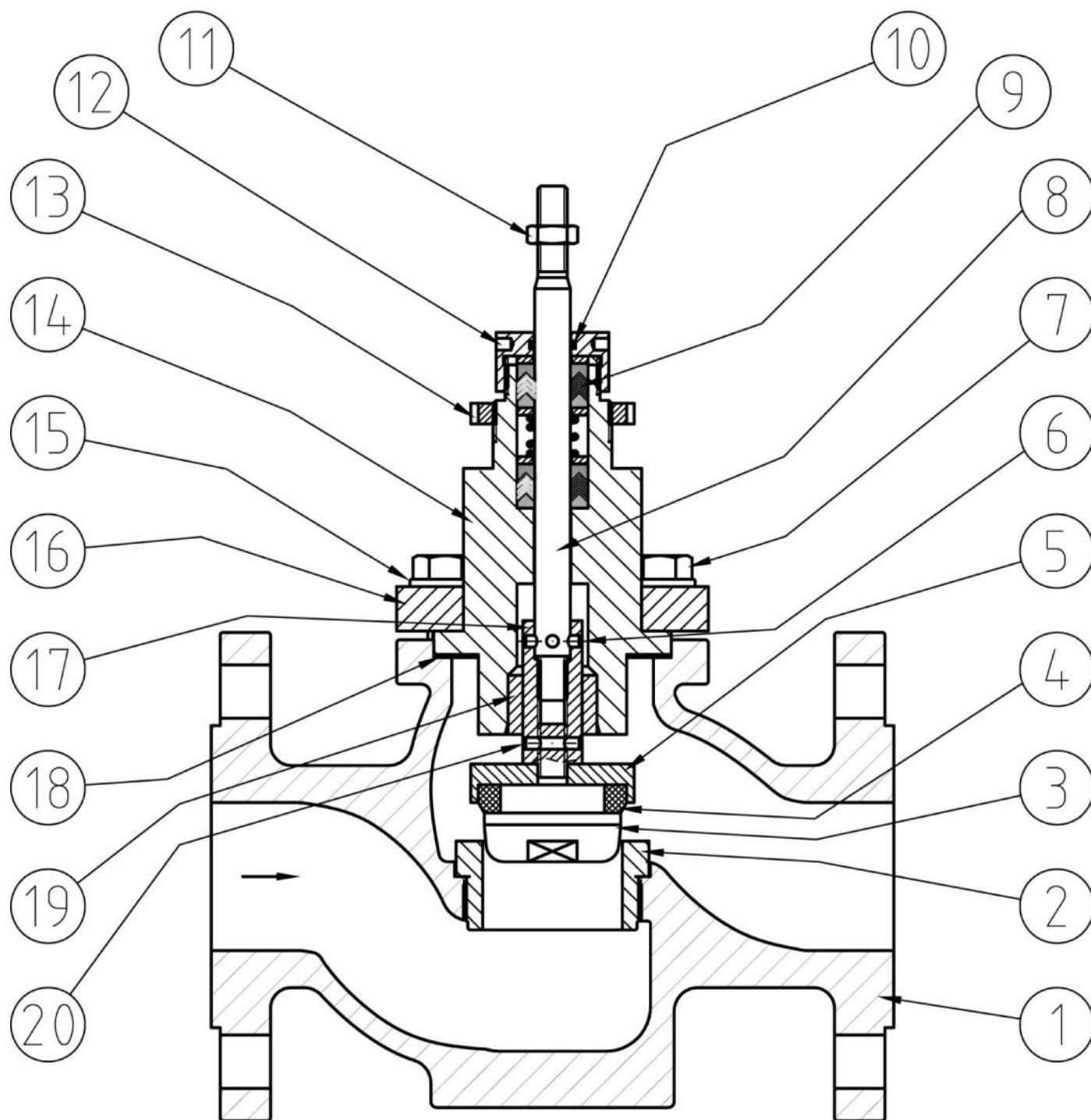


FIGURE X

JANUARY 2014



	Description	Material		Description	Material
1	Body	Nodular Iron GGG40.3, Bronze RG10 Carbon steel WCB Stainless steel CF8M-316	11	Blocking Nut	Stainless steel A-2
2	Seat	Stainless steel AISI 316L	12	Packing cap nut	Stainless steel AISI 316L
3	Guide	Stainless steel AISI 316L	13	Clamping nut	Zinc plated steel 1.1191
4	Seal	PTFE+Graphite	14	Bonnet	See Bonnet table
5	Support seal	Stainless steel AISI 316L	15	Washer	Stainless steel A-2
6	Block Pin	Steel	16	Bonnet cover	Steel 1.1191
7	Bolts	Zinc plated steel 1.1191	17	Plug stem	Stainless steel AISI 316L
8	Stem	Stainless steel AISI 316L	18	Gasket	Graphite
9	Packing group	(See stem sealing table – pag. 2)	19	Guide	Steel
10	O-ring	Viton	20	Block Pin	Steel

Recommended spare parts

	Description	Material		Description	Material
101	Nut	Zinc plated steel 1.1191	118	Screws	Zinc plated steel 1.1191
102	Pillar	Zinc plated steel 1.1191	119	Nuts	Zinc plated steel 1.1191
103	Actuator stem	Stainless steel AISI 316L	120	Washer	Brass
104	Gasket	NBR	121	Actuator support	Zinc plated steel 1.1191
105	Bolt	Zinc plated steel 1.1191	122	O-ring	NBR
106	Bolt	Zinc plated steel 1.1191	123	Actuator stem guide	Delrin
107	Lower Diaphragm plate	Zinc plated steel 1.1191	124	-	-
108	Washer	Zinc plated steel 1.1191	125	Mounting support	Zinc plated steel 1.1191
109	Spring guide plate	Aluminium	140	Connector A	Zinc plated steel 1.1191
110	Springs	1.0904 Spring carbon steel 55Si7	141	Connector B	Zinc plated steel 1.1191
111	Drain plug	Brass – Steel	142	Bolt (x2)	Zinc plated steel 1.1191
112	Guide	Zinc plated steel 1.1191	143	Connector stem	Stainless steel 1.4408
113	Nut	Zinc plated steel 1.1191	144	Nut	Stainless steel A-2
114	Washer	Zinc plated steel 1.1191	145	Valve stem connector	Zinc plated steel 1.1191
115	Upper actuator case	1.0335 (Sheet steel with epoxy paint)	146	Stroke indicator	Stainless steel AISI-304
116	Diaphragm	EPDM + reinforced fabric	147	Bolt	Zinc plated steel 1.1191
117	Lower actuator case	1.0335 (Sheet steel with epoxy paint)			

Recommended spare parts



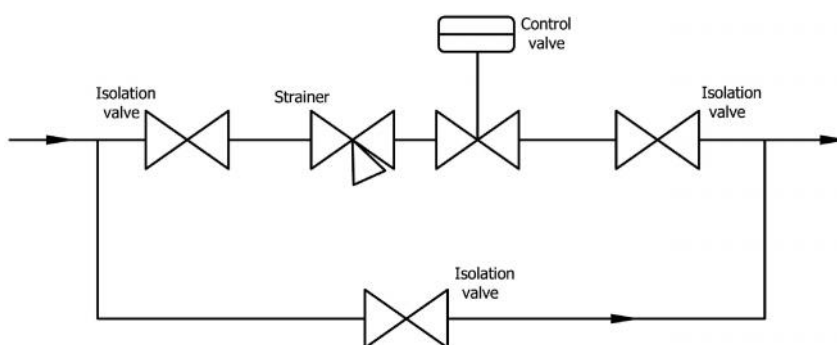
## 5. INSTALLATION

Before actioning any installation, check materials, pressure and temperature and their maximum values. Do not exceed the performance rating of the valve.

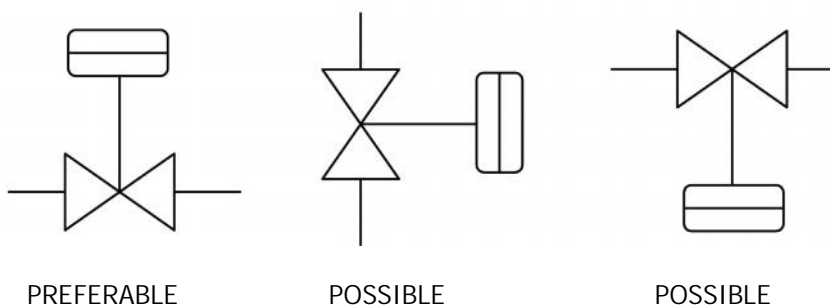
Valves must be installed with the least amount of vibration possible and without any stress.

For a better work, upstream and downstream of the valve should be free of any obstruction for a length of at least 6xDN.

It is recommended that isolating valves be fitted upstream and downstream of the control valve, together with a manual bypass control valve. This enables the process to be controlled manually using the bypass valve while the pneumatic valve is isolated for maintenance.



Determine the correct installation situation and the direction of fluid flow. The valve should preferably be installed along a horizontal pipeline with the valve mounted above the pipe.



Ensure adequate space is provided for the removal of the actuator from the valve body for maintenance purposes:  
Open isolation valves slowly, until normal operating conditions are achieved.  
Check for leaks and correct operation.

### Air supply connection

The AP pneumatic actuator has a 1/4" BSP-F port to connect the air supply.

This air must be dry, free from oil and water. Maximum pressure supplied 4 barg.

Control signal is marked in characteristic plate on the valve yoke.

### Valve travel adjustment

Valfonta deliver the valve with the actuator and pre-calibrated following customer requirements.

If a re-adjust is necessary, proceed as follows:

- Release air supply till  $\pm 30\%$  of valve travel
- Loosen the nut (item 144) maintaining fixed the connector stem (item 143)
- Loosen 2 screws (item 142)
- Turn connector stem (item 143) to adjust the spring span, maintaining fixed the actuator stem (item 103) to avoid diaphragm torsion.
- Lock the 2 screws (item 142)
- Lock the nut (item 144) maintaining fixed the connector stem (item 143)



## 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  $<10^6$  .



## 6. DISMANTLING AND ASSEMBLING

- **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.
- **IMPORTANT!** Inspection and maintenance of ATEX controller is made according to the specific instructions in its documentation.

### **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

Remove the actuator from the valve, following Installation and maintenance instructions covering Valfonta AP actuators.

All Valfonta valves have been identified with a unique serial number in characteristic plate on the body valve.

In case of spare parts order, please refer to this number.

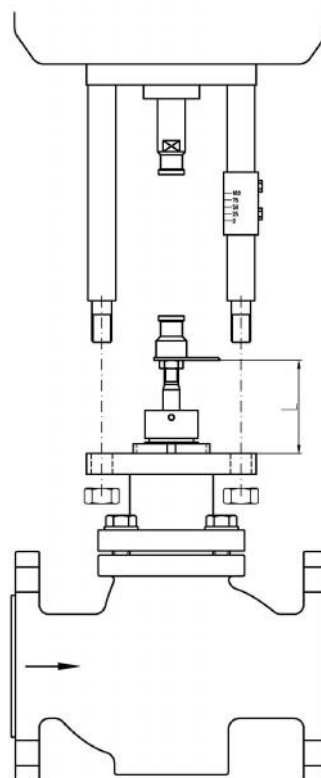
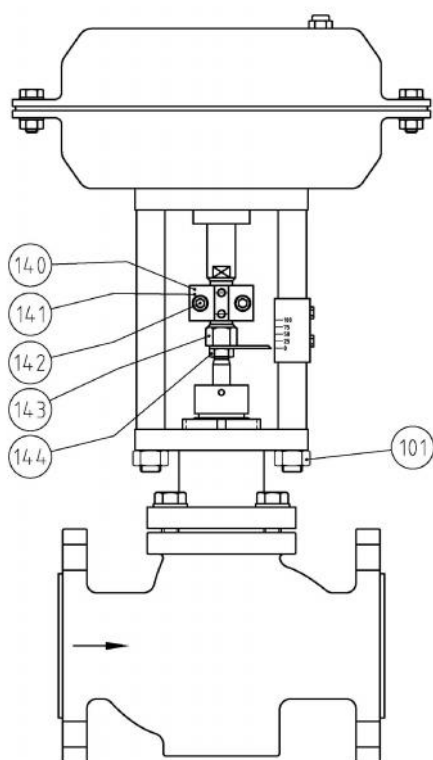


## Removing actuator from valve

- Remove the 2 screws (item 142) and the stem connectors (item 140 and 141).
- Loosen the 2 nuts (item 101) completely.
- Catch the actuator pillars and raise the actuator from valve body.

Measure accurately the dimension L because this is the reference to reassembly.

Re-assembly in reverse order ensuring the alignment of the stems and assure the same dimension L.





## Replacement of valve bonnet

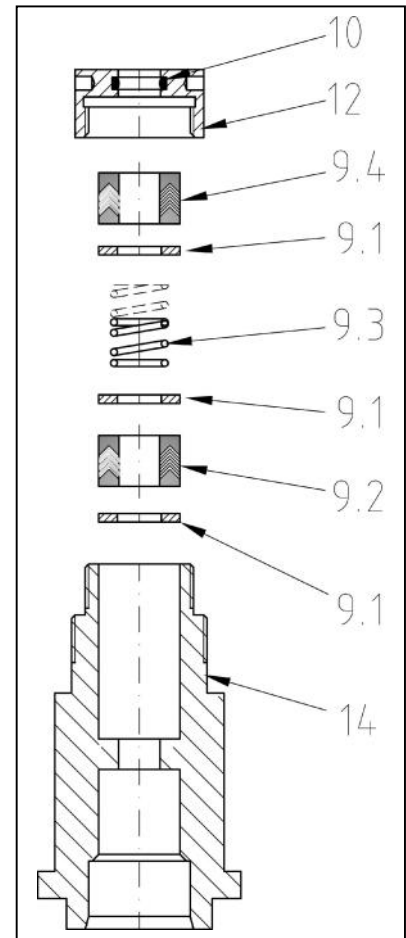
- Remove the actuator.
- Unscrew bolts (7) and lift washers (15) and bonnet cover (16).
- Remove the bonnet (14) and remove the stem assembly (3-4-5-8-17-19).
- Remove the body gasket and replace if necessary.

### Replacement of PTFE packing

- Unscrew the packing cap nut (12) and replace the attached O-ring (10).
- Remove and discard the packing, washers and spring (9.1-9.2-9.3-9.4) replacing for new spare parts.
- Clean the packing cavity and fit the new spare parts in order shown in next figure. Take care to mount the chevron seals in the correct orientation.

### Replacement of Graphite packing

- Unscrew the packing cap nut (12) and replace the attached O-ring (10).
- Remove and discard the old graphite packing and washers, replacing for new spare parts.
- Clean the packing cavity and fit the new spare parts.



## Replacement of actuator diaphragm

### CAUTION: SPRINGS UNDER TENSIVE STRESS

- Unscrew and remove screws (118) and nuts (119) except the long ones.
- Unscrew and remove the long screws (118) and nuts (119). Loosen gradually.
- Remove the Upper actuator case (115) and springs (110).
- Unscrew, maintaining fixed the actuator stem (103), the nut (113) and remove washer (114), guide (112) and springs guide plate (109).
- Replace the diaphragm (116) and re-assembly all parts in reverse order.



## 7. 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.**