CSA waterworks line

Minimum – maximum automatic level control valve

Mod. XLC 440

Rev. 1 3/2015

Introduction

This manual will provide you with the information to properly install and maintain CSA automatic control valves XLC 400 series. The contents and the procedure are intended for technicians in charge of CSA valves only, prior to a theoretical and practical training by CSA qualified personnel only.

Safety

All safety messages in the instruction manual are flagged with the following symbol meaning danger, caution and warning. This means and makes reference to procedures that may lead to equipment and system damage and to severe injury or death for the personnel involved.

WARNING!

Personnel involved in the installation or maintenance of valves should always be alert to potential emission of water and pipeline material, and take the necessary safety precautions. Always wear the suitable protection like helmets, gloves, googles, when dealing and handling hazardous pipelines and valves.

Inspection

Your valve XLC 400 has been packaged to provide protection during shipment, however it can be damaged during transport. Please carefully inspect the unit for damages or discrepancies with the order upon arrival and report a claim immediately before unloading the goods.

Parts

When ordering spare parts please make reference to the assembly drawing and indentification tag present on the valve.

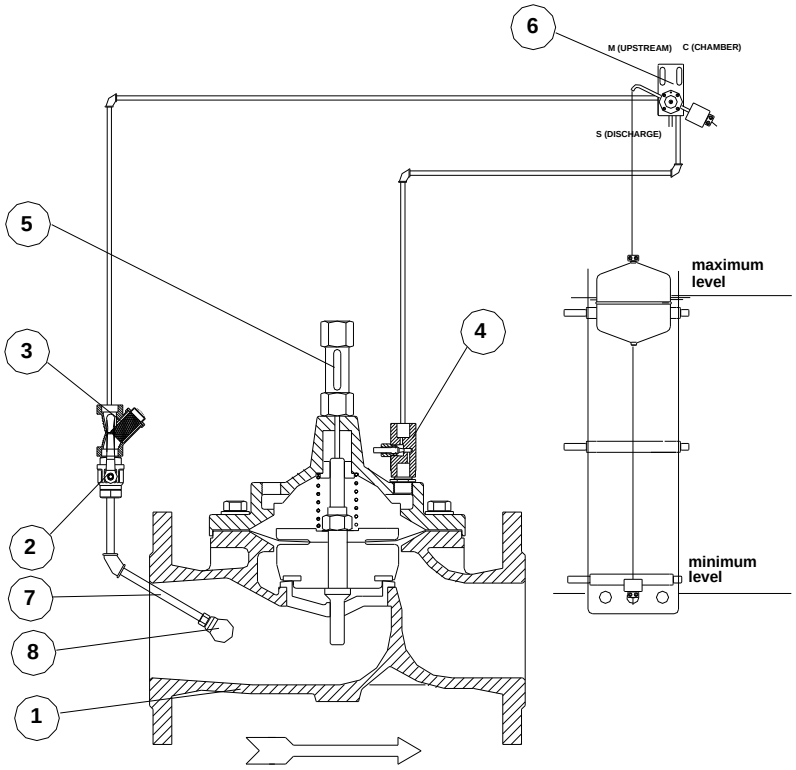
Contents

Description

The pilot operated control valve XLC 400 series Mod. 440 is designed to automatically control a tank level with a minimum and maximum regulation, regardless of variation in demand and upstream pressure fluctuations. The level inside the tank are determined by two mechanical blocks sliding inside the float's wire and with a maximum adjustment of 4 mt. The following picture is showing the lay-out and piping connections between the pilot and the valve. It is important to connect the upstream pressure coming from the filter (3) to the M pressure port engrave on the back of the Rotoway pilot (6), while the pressure inside the chamber taken from the needle valve (4) should be connected to the C pressure port engraved on the back of the Rotoway pilot (6).

The latter should be installed inside the main tank or outside with the use of a smaller stilling tank, secured and located on top of the water level. The use of auxiliary stilling tanks either inside the reservoir (as shown in the picture below) or outside is recommended to avoid turbulences on the water surface and oscillations of the float.

Picture 1



N.	Component	Material
1	Main valve XLC 400	GJS 500-7
2	Isolation valve	AISI 316
3	Filter	Brass/AISI 316
4	Needle valve	AISI 304
5	Position indicator	Brass/AISI 303
6	"Rotoway" pilot	AISI 303
7	Pipes	AISI 303/316
8	Fittings	AISI 316

Handling and storage

Lifting the valve improperly may damage it and the equipment around. It is mandatory not to fasten the valve around the circuit, fittings, pipes, solenoids or position indicators. Valves must be lifted only by cables, chains, located around the body, through the flanges holes or eyebolts. During hoisting always consider that the center of mass depends on the circuitry and pilots installed.

If installation will be delayed place the valve indoors in a secure watertight storage. Should that be unavailable use a vermin proof rain cover around the valve to keep off rain , mud , humidity. Place the valve on a solid and well drained surface base to prevent moisture, flood from reaching the body.

WARNING!

Lifting the valve in the wrong way may cause malfunctioning, emission of water spurts, injuries to the personnel and permanent damages of the valve.

Installation

The automatic control valve XLC 440 must be always installed in a horizontal position with the bonnet upwards. Smaller valves, (in general 150 mm and smaller) can be installed in a vertical pipe shouldn't be unavoidable. Prior to that consult us and specify the orientation in the order. A stable and non pulsating source of pressure is necessary for the proper performance of CSA control valves, whose minimum pressure is displayed on the technical brochure and always 0,5 bar on the pilot in addition to the headloss produced during working conditions. As an instance if the pilot is located 2 mt above the valve and the latter is producing an head loss of 2 mt during opening the minimum required prerssure for the valve to work will be 0,9 bar.

- Gate valves or other sectioning devices must be installed upstream and downstream of CSA control valves to allow for maintenance.
- The operating fluid must be free of air, air valves (CSA Mod. FOX 3F AS combination anti-slam) should be installed upstream and also downstream, in case of changes in slope and high on the piping points between the valve and the tank . This to avoid the accumulation of air pockets during working conditions, allow air discharge during pipe filling and entrance in case of pipe burst and draining.
- A suitable by-pass should be provided for servicing of the valve without interrupting the flow. For the by-pass sectioning do not use standard gate valve, likely to get damaged during modulation, but rely on globe pattern gate valves and/or CSA direct acting pressure reducing valves.
- If not included in the order install pressure gauge upstream a flow measurement device is always recommended to make sure hydraulic conditions remain within the values used for sizing, and the pressure doesn't drop below the minimum value required for the valve to work (see above).
- A strainer with suitable basket and mesh should be installed ahead of the valve to protect internal components from debris, particles and foreign material.
- Sufficient space should be provided around the valve for disassembly.
- Check direction of flow and make sure it is according to the marking on the valve's casting.
- Make sure the flanges and pipes connection are according to the valve's standard. The nuts and bolts setting has to be conducted in the proper way, gradual and symmetrical, in order not to produced additional stress and deformation.
- During handling be sure not to damage the glass of the position indicator, if present.
- Dot not install the XLC outdoor in case of low temperatures likely to generate frost, or excessive heat and humidity.
- The piping connection between the valve and the pilot, explained on page 4 of this manual, must be done avoiding the presence of high points, bends, or likely to generate air pockets.
- The two mechanical blocks present on the wire onto which the float is moving (part of Rotoway pilot 6) represent the upper and lower level to be regulated inside the tank, they can be moved by acting on the screw and set to a maximum distance of 4 meters between each other.

Set up

For the proper set up of XLC 400 Mod. 440 reader is advised to use the following points (rif. picture 1 on page 4).

WARNING!

The set up and valve regulation has to be carried out by qualified personnel only, or directly from CSA service. Improper actions can lead to permanent damages to the valve, its internal components and system equipment along with possible injuries of the people involved.

- Make sure the isolation ball valve of the circuitry (2) is fully open
- Make sure the needle valve (4) is not fully closed (the closing point is obtained by turning the screw clockwise until the mechanical block has been reached)
- The valve is at first isolated from the main line as both sectioning devices, upstream and downstream, are closed.

WARNING!

The difference in pressure generated by the valve during closing will produce a thrust proportional to the pressure and DN of the valve.

Anchorage blocks and way of preventing valve's movement or shifting need to be taken into account.

- If a downstream device is not present downstream pressure, if present, has to be removed from the piping between the valve and the tank.
- Make sure the connection between the piping and the pilot has been done as instructed.
- Put the pilot (6) to the closed position manually, as shown in the picture on page 4, acting on the lever and rotating it.
- Open the needle valve (4) by ½ of revolution, starting from the fully closed position.

WARNING!

The opening and the set point of the needle valve will affect the response time of the control valve, whose response is proportional to the opening. Excessive opening of the needle valve may therefore lead to water hammer and surge events.

- Open slowly the upstream sectioning device to 30% of the maximum passage
- Pressure will enter the control valve chamber, and it will be visible from the position indicator, showing the movement of the rod (5) moving down to the closed position, and slowly filled with liquid.
- Discharge air present inside the control chamber by the air release system present on top of the position indicator (5) leaving it open by at least 20 seconds then close it.
- Open completely the upstream gate valve.
- Open slowly the downstream gate valve if present to at least 30% of the maximum passage
- Put the pilot (6) to the open position, the opposite of the picture on page 4, by rotating the lever manually simulating the float moving down and acting on the lower mechanical block.
- You will notice the valve opening, the rod inside the position indicator slowly going up, and some flow will be produced to the downstream tank.
- Open completely the downstream gate valve and check if the minimum pressure remains within the value necessary for the valve to work.
- Try a few times the opening and closing of the valve, making sure the latter will respond properly and adjusting the needle valve , by throttling it, to increase the response time and therefore reduce water hammer.
- During these maneuvers leave enough time fir the system to stabilize
- Once the desired set point has been reached lock it

WARNING!

Regulations of needle valves and manual opening/closing has to be carried out slowly to avoid unwanted pulsations and pressure surges. Always leave enough time for the system to balance, in case of doubts and problems allow for some flow through the by-pass to stabilize the line and call CSA technical support.

- Always make sure the strainer (3) is cleaned to allow enough pressure for the valve to work
  In case of dirt valve would be unable to close

Valves epoxy painted FBT

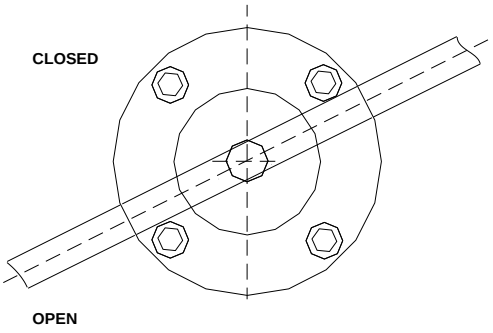
CAUTION!

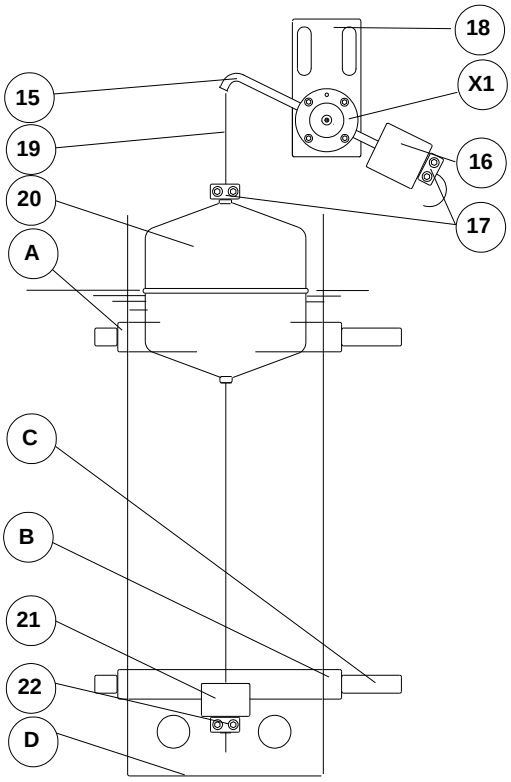
Valves epoxy painted using FBT requires washers flat washers to be installed on the flanges connections to prevent the paint from cracking or chipping.

Maintenance

CSA automatic control valves XLC 400 series have been designed with a sturdy and reliable construction to minimize servicing and possible malfunctioning. However we recommend to inspect them at least twice per year releasing the air accumulated inside the bonnet and checking the strainer. We recommend a thorough inspection and maintenance with complete disassembly every 4 years, according to the following instructions.

MIN. MAX. LEVEL CONTROL PILOT MOD. “ROTOWAY”





N.	Component	N.	Material
X1	"Rotoway" pilot	1	S.S., brass, Delrin
15	Rod	1	Stainless steel
16	Counterweight	1	Brass
17	Stop collar	3	Brass
18	Mounting plate	1	Stainless steel
19	Wire	1	Stainless steel
20	Float	1	Stainless steel
21	Counterweight	1	Brass
22	Screws 5X10	6	Stainless steel
A	Pipe DN 200*	1	PVC
B	stainless steel ring*	2	AISI 304
C	Screws*	2	AISI 304
D	Sealed bottom*	1	PVC

* not supplied

Operating principle

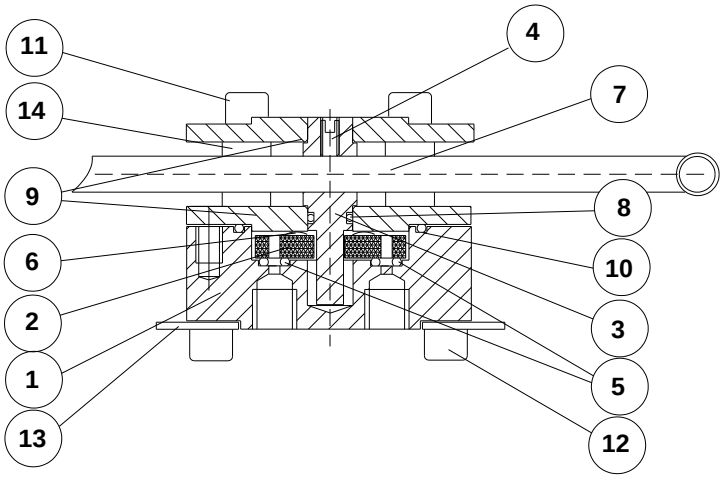
The float in stainless steel slides freely on the steel wire with two position blocks corresponding to the minimum and the maximum level, which can be regulated according the project requirement.

The “Rotoway” pilot is connected to the valve with two small pipes with a ID of at least 6 mm (not supplied) which can be in copper, plastic or stainless steel. The first one connects the fitting 1/8”G (placed on the filter outlet of the main valve) with the fitting on the pilot Rotoway indicated with an “M”, and the second one connects the pilot itself (fitting indicated with a C) with the fitting 1/8”G placed on the needle valve placed on top of the main valve control chamber.

As a consequence of the rise of the liquid level in the tank the float slides on the wire until it reaches the upper stop block (as shown in the picture on the right), set to the maximum level pushing it upwards. This will basically invalidate the equalizing effect of the counterweight (16) therefore the main rod (15), due to the balancing weight (21), will turn upwards putting the upstream pressure in communication with main valve’s control chamber which will close.

When the liquid level in the tank decreases the float drops by sliding on the wire, the rod remains in the original position, until the float actually comes in contact with the lower stop preset at the minimum level, then pushing it downwards and putting the entire system to the opening position (see the upper picture on the lef). Thanks to its weight the float will make the rod turn downwards putting the main chamber in communication with the atmosphere, water will be discharged out of the Rotoway pilot through the fitting marked by S making the XLC main valve open completely.

N.	Component	N.	Material
1	Body	1	Stainless steel
2	Disk	1	Delrin
3	Shaft	1	Bronze
4	M4X6 plug	1	Stainless steel
5	O-ring 2012 (2.90X1.78)	3	NBR
6	Elastic collar	1	Stainless steel
7	Weight holder	1	S.S. pipe 8X1
8	O-ring 106 (6.75X1.78)	1	NBR
9	External plates	2	Stainless steel
10	O-ring 2150 (37.82X1.78)	1	NBR
11	Screws M6X30	4	AISI 304
12	Screws M6X12	2	AISI 304
13	Support	1	Stainless steel
14	Spacers	4	Stainless steel



Set up

Rotoway is installed on the tank above the maximum level and clamped to the wall in a perfectly vertical position.

In order to avoid disturbances of the float movements, mainly caused by turbulences on water surface, it is necessary to install a DN 250 or larger plastic pipe, closed at the bottom and drilled along the surface to allow the entrance of water, to house the float. Just make sure not to engender any friction between the float and the pipe.

If air is likely to enter the hydraulic circuitry, because of frequent interruption of water supply, low pressure conditions, turbulences, we strongly recommend to install a small air release valve right upstream of the pilot and always avoid high points or severe changes in slopes on the circuitry between the main valve and the Rotoway pilot.

As said and reiterated before user should always ensure a minim pressure on the valve to work, that is 0,5 bar plus headloss (during valve's opening) plus the difference in elevation between the valve and the pilot itself.

How to balance the Rotoway's lever

It is very important, in order to make the Rotoway work properly, to balance its lever. This operation, which is usually carried out at our testing facilities before supplying the valve, must be executed any time the equilibration between the counterweight located on the rod and the compensator, laying on the stop collar on the wire, for some reason is likely to be changed for practical reasons or simply improper usage.

The float is sliding onto the stainless steel wire provided with two mechanical stops preset to indicate the max. and the min. level within the valve is supposed to work.

Just use the following procedure:

1) Remove from the stainless steel wire the lower mechanical stop and its weight

2) Take out the float and put the stop and the weight back to their previous position.

3) Check for the correct balance between the upper counterweight and the lower counterweight to make sure of that the rod remains at the position where it has been placed. To do this properly simply act on the counterweight of the rod simply by unscrewing the plug and moving it back and forth with gradual adjustments. Then check again to see if the balance has been reached.

4) The pilot and the lever shouldn't never change position (either fully open or closed) unless it is prompted to do so by the float's movement.

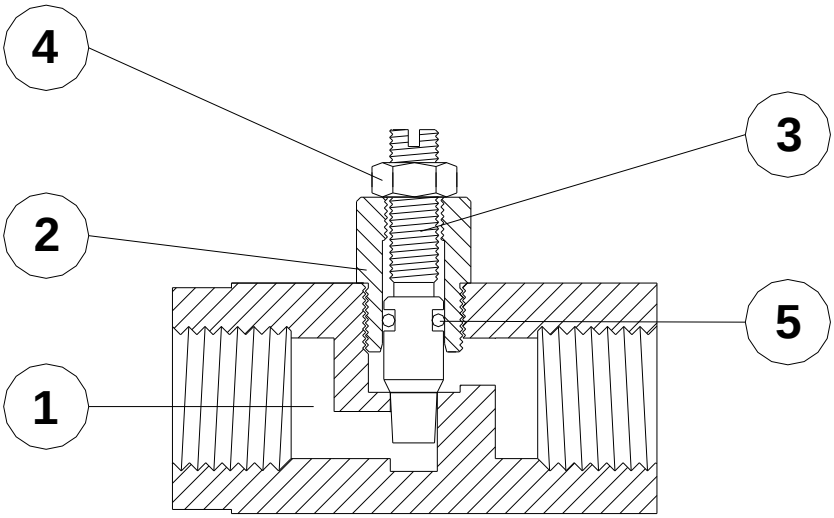
For further assistance please contact us.

How to unassembly the Rotoway (ref picture on the top part of this page)

To do maintenance on the Rotoway simply unscrew the plug (4), remove the lever (7).

Remove the screws (11) and pull out the plates (9) and shaft (4) making sure not to loose or damage the o-rings inside (8 and 10). Remove and clean the disks (2) checking for the status of the orings (5), clean or replace them if necessary. Contact us for further assistance.

NEEDLE VALVE 3/8-VS



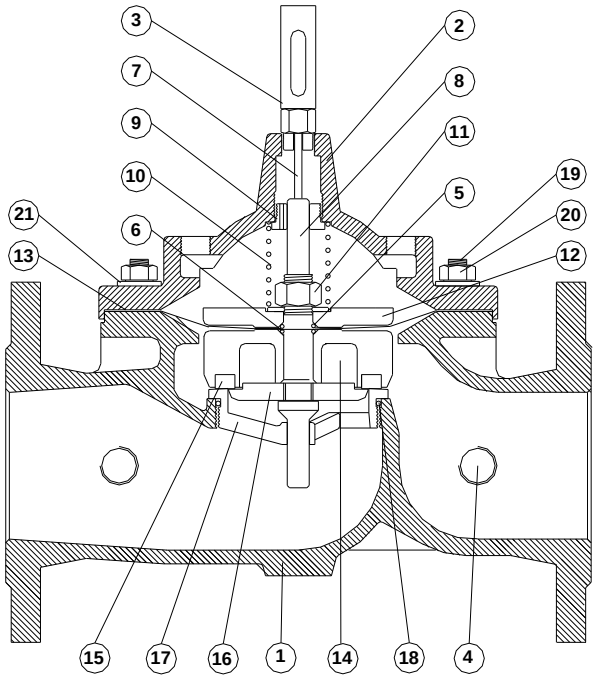
N.	Component	N.	Material
1	Body	1	Stainless steel
2	Sleeve	1	Stainless steel
3	Needle	1	Stainless steel
4	M6 nut	1	Stainless steel
5	O-Ring	1	NBR
Spare parts: 3-5			

VS needle valve is mainly used whenever GRIFO is not necessary, like XLC 440, XLC 450,XLC 460, and more in general where we need to decrease the flow control of the main chamber to very limited values.

Vs is completely made in S.S. therefore extremely sturdy and impervious to era and cavitation phenomena, nevertheless we recommend carrying out maintenance to remove scale deposits.

Servicing is very easy and straightforward and if you have any problems doing that please contact our tech support immediately or refer to the above picture to order spare parts.

Interventions on the main XLC 400 valve



N.	Component	Material
1	Body	GJS 450-10 or GJS 500-7
2	Cap	GJS 450-10 or GJS 500-7
3	Position indicator	St. steel/Ni-plated brass
4	Pressure outlet tap	AISI 316
5	Upper flat o-ring	NBR/EPDM/Viton
6	Obturator o-ring	NBR/EPDM/Viton
7	Indicator stem	AISI 303
8	Main shaft	AISI 303/AISI 316
9	Guide ring	Bronze/AISI 303/AISI 316
10	Spring	AISI 302
11	Locking nut	AISI 303/AISI 316
12	Upper flat	Painted st./AISI 304/316
13	Diaphragm	Neoprene-nylon
14	Obturator	St. st./paint. st./GJS 450-10/500-7
15	Plane gasket	NBR
16	Gasket holder	AISI 303/AISI 304/AISI 316
17	Seat	AISI 303/AISI 316
18	Seat o-ring	NBR/EPDM/Viton
19	Studs	AISI 304/AISI 316
20	Nuts	AISI 304/AISI 316
21	Washers	AISI 304/AISI 316

In case of malfunctioning or defects, that can be found on the main valve, is possible to intervene without removing the product from the pipeline. The defects can be either internal and external.

The **external defects** mainly concerns the pilot circuit and are not related to the main body of the XLC 400 control valve.

The **internal defects** concern the mobile block, or the deterioration of the internal components.

Problems can be summed up in three categories:

a) the valve is blocked, the mobile block does not move;

b) the mobile block moves but the valve does not react because the diaphragm is damaged.

c) the diaphragm is OK but the valve does not close or leakages is reported.

The possible causes lead to:

- **defects on the diaphragm;**
- **defects on the movements of the mobile block;**
- **friction caused by deposits and corrosion;**
- **problems on the gaskets;**
- **defects on the sealing seat.**

Problems solving

Problem	Cause	Solution
The main valve doesn't close	The gate valves are closed	Open the gate valves
	The ball valves of the circuit are closed	Open the ball valves
	There is no pressure inside the main chamber and/or the filter on circuit is full of dirt	Check the pressure coming into the circuit and the filter on the circuit, clean it if necessary
	The diaphragm is damaged (see the following section "checking the diaphragm")	Replace the diaphragm
	There is not enough pressure on the system for the valve to close	Check the pressure upstream during the valve's opening and make sure the value is not below what's recommended in this manual. Act downstream producing back pressure or contact us for support
	The mobile block is stuck due to corrosion, deposits, cavitation	Clean the main shaft and replace all the components affected by deposit or corrosion
	The mobile block is stuck due to stones, pebbles, trapped inside the main body	Remove the material from the valve
	The plane gasket of the obturator is ruined	Replace the plane gasket
	The sealing seat is ruined	Replace the sealing seat
	The needle valve is closed	Open the needle valve
	There is accumulated inside the main chamber or in the piping connecting the valve to the Rotoway pilot	Release the air of the chamber through the position indicator and piping as explained

The main valve doesn't open	The gate valves are closed	Open the gate valves
	The ball valves of the circuit are closed	Open the ball valves
	There is no pressure on the main supply line	Check the upstream pressure
	The needle valve on the circuit is closed	Open the needle valve
	There is accumulated inside the main chamber or in the piping connecting the valve to the Rotoway pilot	Release the air of the chamber through the position indicator and piping as explained

1) Checking the diaphragm

In order to verify if the diaphragm has suffered any damage simply proceed as follows:

a) slowly close the upstream and downstream gate valves;

b) close all the ball valves of the circuit;

c) completely open the air vent valve from the position indicator, if the latter is not present the fitting of the isolation valve on the chamber;

d) open the upstream gate valve slowly but not completely little by little so that the pressure enters the main valve body.

The water that flows will raise the mobile block and the membrane therefore, the air vent will discharge the remaining water trapped inside the main valve bonnet.

When all the water of the main chamber has been expelled (this operation could take a few minutes and is related to the DN of the valve as well as the opening percentage of the upstream gate valve) if the membrane is not damaged, the flow will come to an end and you can be sure the cause of the problem has to be found somewhere else.

On the contrary if the flow keeps going the diaphragm is surely damaged or the nut fixing the membrane to the shaft is not tightened enough, therefore intervene accordingly, simply by replacing the diaphragm or setting the nut tight.

Warning: remember to close the upstream gate and decrease all the remaining pressure inside the valve before removing the bonnet.

Movement of the mobile block

In order to verify the proper movement of the mobile block to proceed as follows: isolate the main chamber closing the two isolation ball valves on the upstream and downstream side of the valve's body, and open the drain port located on top of the position indicator. In this way you will relief the pressure out of the valve's bonnet.

Attention: with this operation we will basically open the valve completely, therefore no regulation will be performed. Make sure to avoid dangerous consequences of the pressure system onto which the valve is acting.

When the main valve is **completely opened mark the glass of the indicator to the corresponding position.**

Now close leave the isolation ball valve downstream and open the correspondent upstream, also close the air release valve on the position indicator. The main valve will close.

Verify that the valve closes following the movement downwards of the indication rod (a slowing down in the final phase is normal and caused by the bending and adjustment of the diaphragm).

When the valve is closed, mark the glass of the indicator to the corresponding position and verify that the movement of the rod is like the one indicated below, if different, then means that there is something preventing the proper movement of the mobile group and please contact us immediately.

DN in mm	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**	**300/400**
Stroke in mm	**15**	**18**	**21**	**27**	**27**	**43**	**56**	**70**	**84**

The clogging can be located between the seat and obturator if the indication rod is in closed position and the flow continues, or between the sealing seat and cap if the valve does not reach the complete opening. Before proceeding to dismantling the cover, it is suggested to do some manual opening and closing operations putting the main chamber under pressure and discharging it. This operation proved to be enough in some situations to flush the dirt downstream. If not take the cover apart.

3) Friction of the shaft

One of the more frequent causes of the mobile group movement obstruction are the corrosion and deposits on the main shaft causing friction. They can be due to particles (conveyed from the water) or to limestone deposits (for extremely hard water) that in the long run cause the jamming of the main shaft on the guiding devices, because of the high friction value.

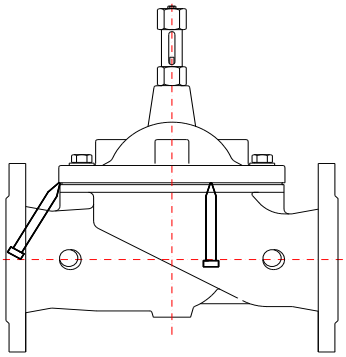
Should that be the case simply proceed to a proper cleaning leaving it in a muriatic acid solution 5% as long as necessary, shouldn't that be sufficient then proceed with a fine abrasive cloth until the deposit is completely removed.

4) Plane gasket

The valve must close watertight once the pressure has entered the main chamber and if we have enough pressure to do it which is at least 0,5 bar acting on the pilot in addition to headloss during outflow, if that doesn't happen proceed with the inspection of the plane gasket performance assuring the closure between the obturator and the sealing seat.

5) Sealing seat

One more reason that could be responsible for the improper closure of the valve may be the sealing seat, occurring in case of dirt and deposits or damaged due to cavitation. In these cases we must proceed with an accurate inspection to clean the component by means of sandpaper then polish it, if the problem can't be solved on the spot please contact our technical support for immediate assistance.



Disassembly

As mentioned before make sure that the gate valves upstream and downstream of the valves have been properly closed and set tight.

Relieve the pressure of the main chamber simply by closing the isolation valves of the circuit and opening one of its fittings. Proceed with the removal of the circuitry, in order to facilitate the intervention on the cover, only after having noted down the layout

Remove the nuts (4) and the washers (5). If the valve has been working for a long time you may notice that all the parts in contact with the diaphragm will tend to get stuck, in this case simply hit the lower part of the cover to loosen it by means of a plastic hammer and a chisel driving it upwards. After that, hoisting the valve vertically using eyebolts. Remove the internal mobile block and put it into a grip with **clamps in soft material such as brass or aluminum**, be extremely careful doing that because the upper and lower main shaft surface responsible of the valve-s guiding mechanism , if worn or etched, may cause the blocking of the valve due to its bind in the bearings.

Remove the nut and the washer (10) take off the upper flat (11) the O-rings (21) check the diaphragm looking for damage and, after having pulled out the plane gasket (13)by means of a screw driver (please make sure not to wear the gasket itself or its housing) examine it carefully.

Check the driving bush on the cover (7).

Examine the sealing seat (15) looking for scratches that may affect the proper water tightness and for possible sign of cavitation.

The sealing seat is made in stainless steel and it usually doesn't require particular maintenance, a very important thing though is to guarantee proper cleaning by means of sand paper.

Up to DN 150 the sealing seat is screwed into the body while for the remaining DN it is set tight by several screws. To carry out a further inspection and removal of the sealing seat, and in case of cavitation, please contact our technical support for immediate assistance.

Inspection

After all the components have been dismantled we need to look for any damage caused by wear of the surface, deposits, corrosion or something else.

It is strongly advised to replace every 4 years all the components made in rubber, responsible for the water tightness of the valve, such as O-Rings, the diaphragm, the plane gasket.

Reassembly

To reassemble do the reverse of the disassembly procedure positioning the main shaft back into the grip along with all the pieces. It is very important not to forget the O-Ring (21) and to **set the nut tight** (10) to assure a proper torque between the diaphragm and the plane gasket. Please be extremely careful with this step because a nut not properly tight may engender movements making the mobile block unstable, therefore affecting the valve's performance.

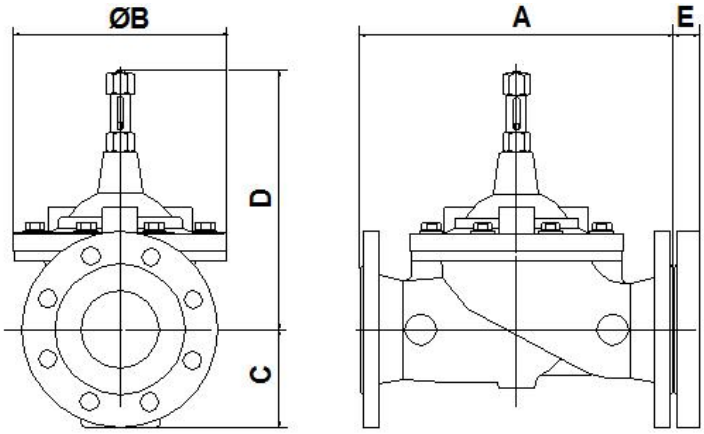
Put the mobile group back into the valve's body placing the shaft into the sealing seat guide, make the holes of the diaphragm match the studs and position the spring (9) under the cover.

Set the nuts tight using a cross over pattern, then put the circuitry back to its original position.

Final inspection

Make sure that the internal mobile block can move without any friction, this can be verified simply by gradually putting the main chamber under pressure and checking the movement of the indication rod, as explained before.

Examine the status of the plane gasket simply by checking the perfect water tightness of the sealing seat. At this point proceed by opening the upstream gate valve full throttle to have the normal working conditions, check for any leakage through the cover or the nuts, should that happen set them tighter.



DN	40	50	65	80	100	125	150	200	250	300	400
A (mm)	230	230	290	310	350	400	480	600	730	850	1100
B (mm)	162	162	194	218	260	304	370	454	570	710	710
C (mm)	83	83	93	100	118	135	150	180	213	242	310
D (mm)	233	233	255	274	316	383	431	523	620	670	709
E (mm)	30	30	30	30	30	30	30	30	40	40	40
Weight (Kg)	18	18	23.5	28	39	47	84	138	264	405	560

Standard drilling according to UNI EN 1092-2.
Standard flange PN16; PN10-25 on request.
Testing procedure according to UNI EN 1074.

Working conditions:
-Potable or treated water filtered with a 2 mm mesh
-Maximum temperature 70° C

We reserve the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only.