CSA waterworks line

Flow rate automatic control valve

Mod. XLC 330 and XLC 430

Introduction

This manual will provide you with the information to properly install and maintain CSA automatic control valves XLC 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 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

Recommended spare parts are listed on the assembly drawings available for each components of the valve in this manual. These parts should be stocked to minimize delays in case of malfunction. All CSA products and spare parts can be supplied by CSA official distributors or directly from CSA. When ordering spare parts please make reference to the assembly drawing and indentification plate present on the valve.

CSA Service

CSA service personnel are highly qualified to maintain and repair all CSA products, CSA also offers customized training program and consultation services.
For more information please contact CSA or visit the web site www.csasrl.it constantly updated.

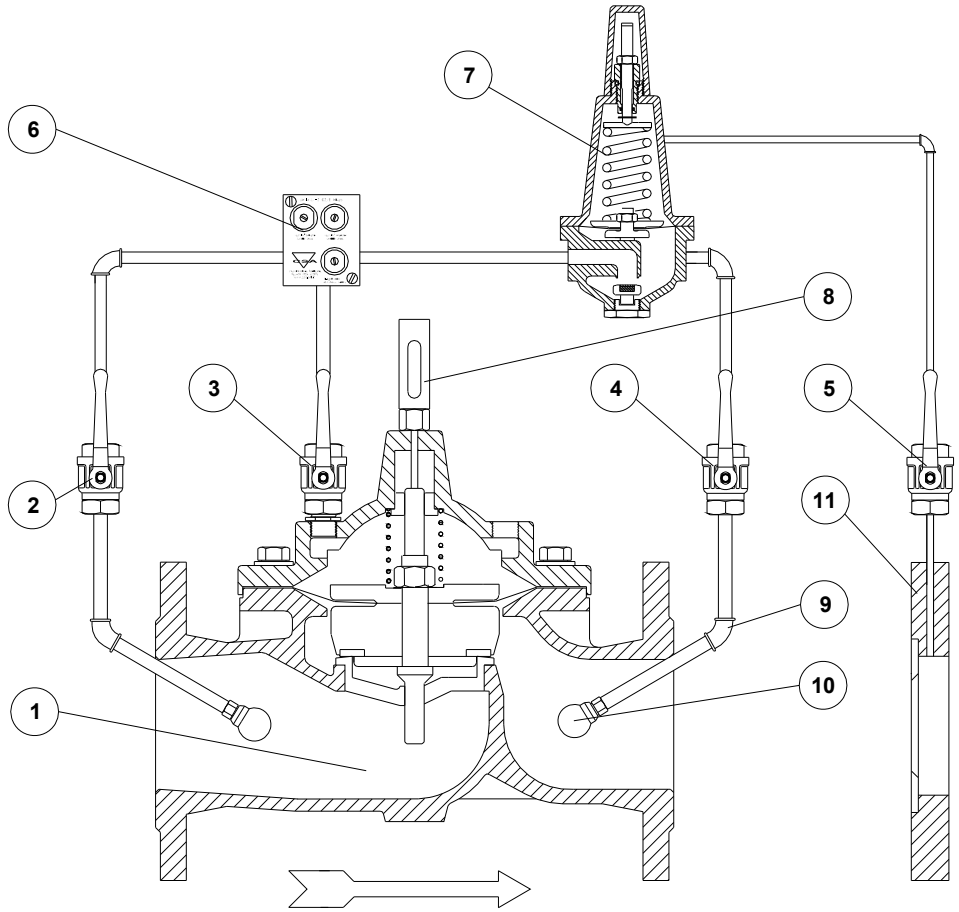
Contents

Description

The pilot operated control valve XLC series Mod. 330/430 is designed to automatically limit the flow to a constant value, thanks to the differential pressure generated across the flanged orifice (11), regardless of variation in demand and upstream pressure fluctuations. The value set point can be adjusted by acting on the pilot (7) according to a regulation curve provided with the valve.

The unit flow control device GR.I.F.O (6) is needed to stabilize the valve during operating conditions and regulate the flow in and out the main chamber.

Picture 1



N.	Component	Material
1	Main valve XLC	GJS 450-10 or GJS 500-7
2	Isolation valve	AISI 316
3	Isolation valve	AISI 316
4	Isolation valve	AISI 316
5	Isolation valve	AISI 316
6	Grifo 3/8"	AISI 303
7	MLP pilot	Bronze/AISI 303
8	Position indicator	AISI 303/Brass
9	Pipes	AISI 303/316
10	Fittings	AISI 316
11	Flanged orifice	Painted iron/AISI 304

Handling and storage

Lifting the valve improperly may damage it and the equipments 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.

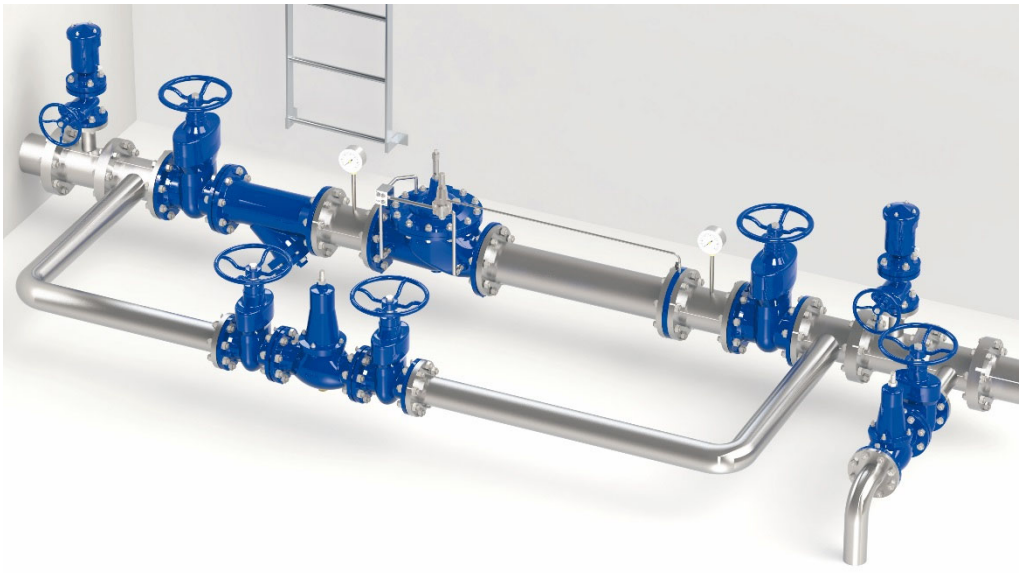
WARNING!

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 330-430 must be always installed in a horizontal position with the bonnet upwards. Smaller valves, (150 mm and smaller) can be installed in a vertical pipe shouldn't be unavoidable. Prior to that consult CSA 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 should be at least 1.5 bar on the pilot, obtained by the value required for the valve to work (0,5 bar) in addition to the head-loss produced during working conditions by the valve itself and the flanged orifice.

- 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 downstream and upstream. 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 gauges upstream and downstream, a flow measurement device is always recommended to make sure hydraulic conditions remain within the values used for sizing.
- A Y strainer with suitable basket and mesh should be installed ahead of the valve to protect internal components from debris, particles and foreign material.
- Be sure to allow a distance of at least 0,5 DN between the valve and the flanged orifice and if possible 0,3 DN between the flanged orifice and any change in direction, variation of flow, pressure.
- 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.
- During handling be sure not to damage the glass of the position indicator, if present.



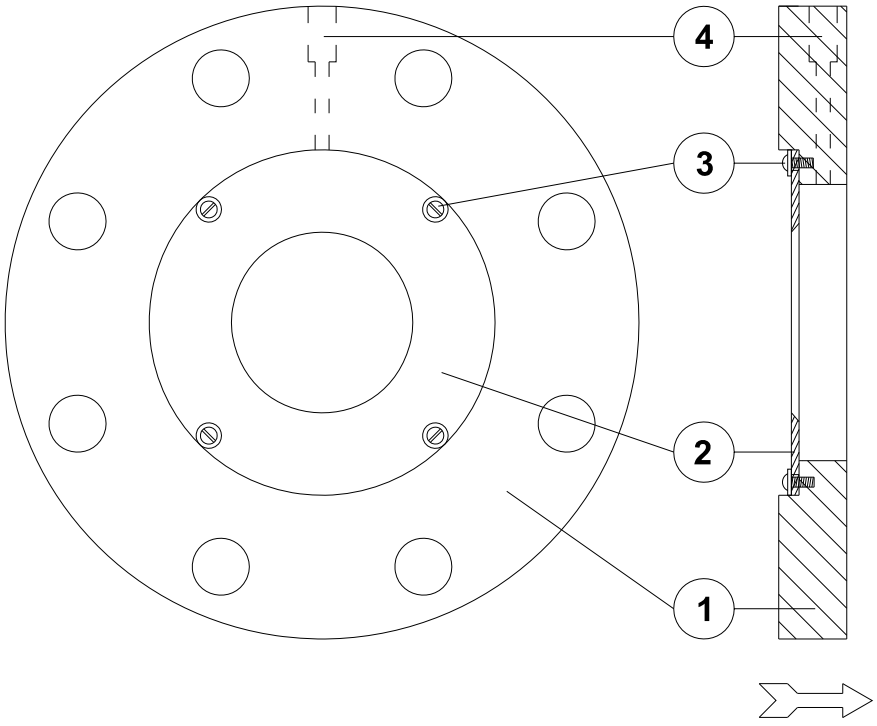
Set up

For the proper set up of XLC Mod. 330-430 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 equipments along with possible injuries of the people involved.**

- Make sure the isolation ball valves of the circuitry (2-3-4-5) are fully open
- Make sure the connection between the flanged orifice and the pilot chamber has been made according to the drawing below where the pressure port (4) is connected with the pilot's cover

Picture 2 flanged orifice



N.	Component	Material
1	Flange	Painted steel
2	Flat	AISI 304
3	Screws	AISI 304/316
4	Threaded port	

- The valve is at first isolated from the main line as both sectioning devices, upstream and downstream, are closed.
- The flanged orifice (ref picture nr 2 on page 7) is composed of a flange and a stainless

WARNING!

Regulations of pilots 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.

steel disk (2) inside, calculated and machined according to the flow rate to control whose value depends on the pilot setting and it is proportional to the charge of the spring. Usually the valve is preset set at the factory, if not the regulation chart of flow rate versus pilot adjustment is supplied with the valve.

WARNING!

The difference in pressure generated by the valve during the flow control will produce a thrust proportional to the pressure itself.

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

- Be sure to install the flanged orifice in the right direction following the arrow present on it (in case of doubts the pressure port is always downstream of the stainless steel disk)
- Close the isolation ball valve (4)
- Slowly operate on the upstream gate valve to open it by 30 %, leaving the downstream sectioning device completely closed.
- Pressure will enter the valve's body, circuitry and bonnet pushing down the diaphragm and mobile block against the obturator and inducing the valve's closure
- Remove the air entrapped in the bonnet, during the operation, by means of the air release device located on top of the position indicator (8) leaving it flowing for at least 20 seconds.
- Open completely the upstream gate valve
- Open the isolation ball valve (4)
- Slowly open the downstream gate valve, to a maximum of 40% of the stroke, to generate some flow through the valve and give the valve enough time to react, this depends on how big is the system downstream and on the variations in demands.
- Look at the position indicator (8) and make sure the shaft is not subject to any vibrations or chattering
- Once the valve has stabilized open the downstream gate valve completely
- Check the flow rate and make sure it is consistent with what has been ordered, if a specific value wasn't provided with the order confirmation remove the hood on the pilot and act on

the pilot's adjusting screw following the regulation curve provided to reach the required value.

- Once the valve has reached the desired value set the locking nut and place the hood on top of the pilot.
- The unit flow control device GR.I.F.O. is exclusive from CSA and contains needle valves, filter and check valves used for the proper valve's stability and regulation. If present do never change the settings before consulting with CSA technical support.

Valves epoxy painted FBT

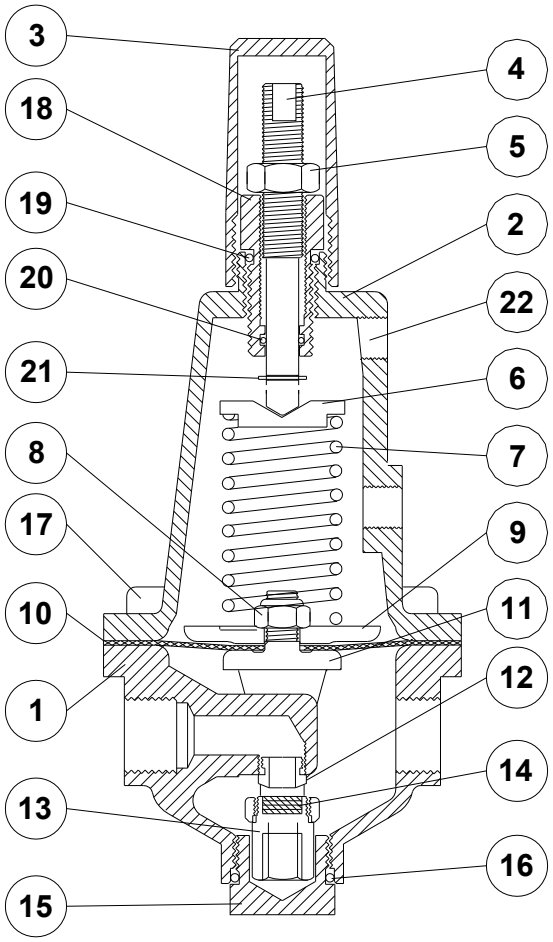
CAUTION!

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 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 inside the pilot's cover and checking the strainer inside the GR.I.F.O, if present, or placed as a separate entity in the circuitry. We recommend a thorough inspection and maintenance with complete disassembly every 4 years, according to the following instructions.

MLP – Flow rate control pilot



N.	Component	Material
1	Body	Ni-plated bronze/st. steel
2	Cover	Ni-plated bronze/st. steel
3	Hood	Stainless steel
4	Driving screw	Stainless steel
5	Nut	Stainless steel
6	Spring guide	Stainless steel
7	Spring	Stainless steel
8	Self-locking nut	Stainless steel
9	Upper flat	Stainless steel
10	Diaphragm	Neoprene
11	Obturator holder	Stainless steel
12	Sealing seat	Stainless steel
13	Gasket holder	Stainless steel
14	Plane gasket	NBR
15	Tap	Stainless steel
16	O-ring	NBR
17	Screws	Stainless steel
18	Water-tight spacer	Stainless steel
19	O-ring	NBR
20	O-ring	NBR
21	Stop pin	Stainless steel
22	Pressure port	

The flow rate control pilot is a diaphragm operated valve, spring loaded and direct acting, that can be installed basically in any position. Present on the XLC 330-430 circuit, and linked to the flanged orifice by means of the pressure port (22), the MLP function is to throttle the flow in response to the differential pressure, between the cover and the diaphragm, compensated by the spring (7) to allow for a range of regulation and flow control.

Operation

The valve is normally opened thanks to the force exerted by the spring (7) over the diaphragm (10), that is opposed to the differential pressure acting on the diaphragm created by the downstream pressure applied directly below it and the inlet pressure (coming from the flanged orifice) acting on top. When the differential pressure exceeds the force of the spring the obturator (13) is pushed up closing the passage through the pilot, therefore leading the upstream pressure (on the XLC 330-430) towards the main chamber and allowing the main valve to throttle which will result in a reduction of flow rate, because of the head loss created between the obturator and the main valve seat. We obtain the regulation by acting on the screw (4), i.e. clockwise to increase the flow rate and counter-clockwise to decrease it following the curve provided by CSA.

Disassembly

It is not necessary to remove the pilot from the circuit for the disassembly. Instead use the enclosed picture which indicates the numbers specified here below to perform the operations.

1- Remove the hood of the pilot (3) loosen the tightening nut (5) and turn the screw (4) anticlockwise, until the spring is completely unloaded.
2- Unscrew the water tight spacer (18) pulling out the entire block composed of the spacer (18), screw (4), stop pin (21) making sure not to damage the o-ring (19) Do not remove the o-ring (20) unless strictly require
3- Remove the screws (17) holding the cover (2).
4- Separate the cover, the spring (7) and the spring guide (6)
5- With a monkey wrench remove the lower tap (15) making sure not to damage the o-ring (16)
6- With a monkey wrench unscrew the tightening nut (8) to remove the upper flat (9) and the diaphragm (10).
7- Again with key unscrew the gasket holder (13) and pull out the staple shaped obturator guide (11).
8- Check the sealing seat (12) and if necessary remove it using a 13 tube key.
9- Inspect the obturator plane gasket (14), clean it and replace if necessary

Inspection and repair

During these operations carefully check every detail to find damage, in particular the diaphragm and the sealing seat gasket. The pilot is very sturdy and the materials are designed to guarantee many years of working conditions for which, generally, it is sufficient to remove the deposits and make sure to keep the metallic internal components properly lubricated. If that is not enough we strongly recommend you to contact CSA technical support or order the maintenance kit.

Reassembly

To reassembly the pilot you have to repeat, obviously in reverse sequence, the same steps specified in the dismantling phase, while paying attention to:

- Place the diaphragm (10) on the staple shaped obturator guide (11), then the upper flat (9) and the self-locking nut(8) which must not be excessively tight so as not to wear the internal components, please contact CSA for any doubt related to the torque required to perform the operation.

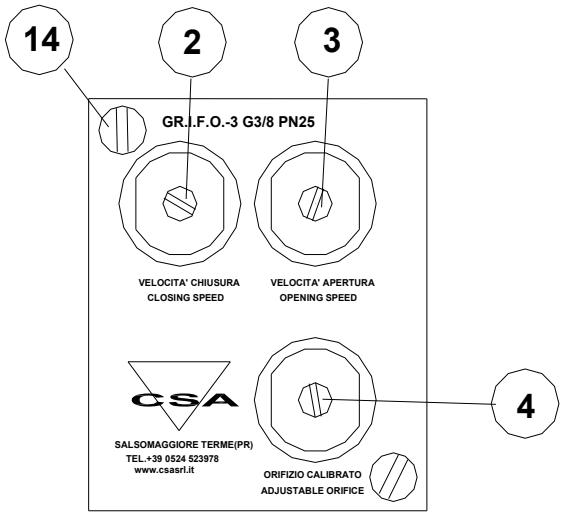
- Now insert this component (10) in the body with a light pressure in such a way as to make its holes match the ones of the diaphragm.

- During this operation pay particular **attention to the correct alignment of the staple shaped obturator guide with the protuberance of the body, in order to avoid contact and friction that could affect the proper operation of the pilot.**

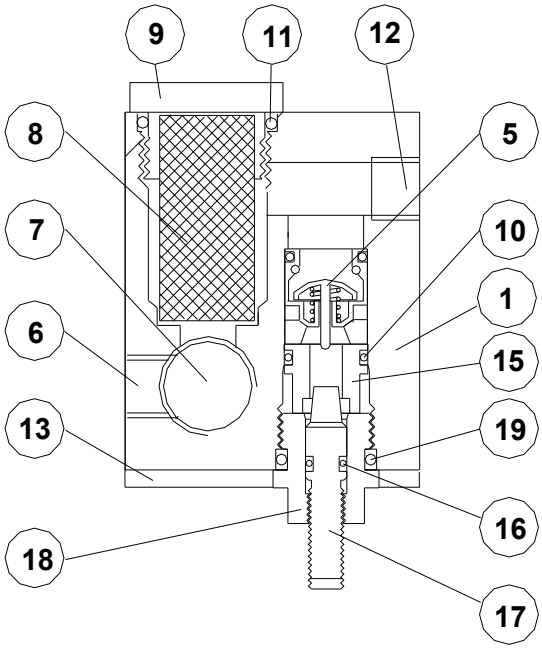
- At this point screw the obturator (13) on the staple shaped obturator guide and proceed with the tap (16), provided with o-ring (17) so that the gasket holder (14) can slide inside of it.

- For the rest simply follow the instruction provided before backwards

GR.I.F.O. 3 – 3/8″ PN 25



N.	Component	Material
1	Body	AISI 303
2	Closing speed control	AISI 303
3	Opening speed control	AISI 303
4	Reaction time control	AISI 303
5	Check valve	Polyacetal
6	Not filtered pressure outlet 1/8G with tap	Brass
7	Inlet 3/8G	
8	Filter	AISI 304
9	Filter tap	AISI 303
10	O-ring	NBR
11	O-ring	NBR
12	Filtered pressure outlet 1/8G with tap	Brass
13	Cover	Plexiglass
14	Screws M4X6	AISI 304
15	Seal bushing	AISI 303
16	O-ring	NBR
17	Pin	AISI 303
18	Guiding nut	AISI 303
19	O-ring	NBR



Correspondance between the position and the DN orifice	
Turns in opening	DN mm
0,5	1.4
1	1.8
1,5	2.05
2	2.25
2,5	2.45
3	2.65
3,5	2.85
4	3
4,5	3.10
5	3.25
5,5	3.4
6	3.55

The “GR.I.F.O.” (Integrated Group Filter Orifices) is a CSA unit flow control device that includes all the necessary functions, needed for the proper regulation and stability of the main valve. Its compact design makes the entire circuitry easy to be maintained, simple and intuitive yet allowing a tremendous range of regulations compared to other solutions on the market.

It is completely manufactured in stainless steel AISI 303 and contains :

- a fine mesh filter in AISI 304 (8) to protect the pilot circuit from possible dirt, maintained simply by unscrewing the tap (9).

- the intervention also called reaction speed regulator* (4) of the main valve, and the opening (3) and closing (2) speed regulators* of the valve’s main chamber, independent one from the other, obtained by CSA fine adjustment needle valves and check valves (5)

- replaceable check valves (5) placed upstream of every regulator to limit the flow and control the acceleration during the valve opening and closing.
- an upstream outlet not filtered protected by a cap 1/8 G (6)
- an upstream pressure outlet filtered, 1/8 G, (12)
- The adjustment is normally done in the factory although it is possible to modify it on the spot, in order to find the optimal regulation according to the function required.

Herewith enclosed are the optimal values for the most common XLC applications expressed in terms of revolutions, starting from the fully closed position and turning anticlockwise.

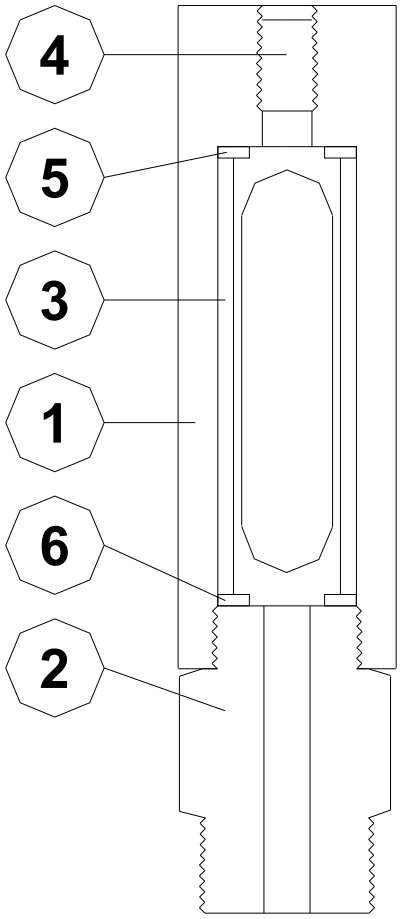
Type	Reaction speed	Opening speed	Closing speed
XLC 410	**3**	**1**	**5**
XLC 412	**3,5**	**3**	**4**
XLC 420	**3**	**3**	**4**
XLC 430	**3**	**3**	**3**
Others	**Please contact CSA for further information**		

The regulators are needle valves designed by and exclusive property of CSA Srl and the rotation permits to obtain a specific passage. For example the regulation 3 means that, starting from the complete closed needle (turned clockwise), unscrewing 3 turns in opening you will get the indicated regulation.

Maintenance

The “GRIFO” is particularly sturdy, extremely simple and reliable so it does not require maintenance but we strongly advise to proceed regularly, at least twice per year, with a clearing of the filter from dirt and deposits, simply by unscrewing the tap (9) and washing the mesh. This procedure can be carried out without interrupting the flow through the main valve, and simply by isolating the main circuit by means of the isolation ball valve and removing the pressure right upstream of the GRIFO.

Visual position indicator



The visual position indicator, normally present on CSA valves unless otherwise stated, is extremely useful to detect the movement of the shaft therefore of the internal mobile block during working conditions. This is to assess the absence of vibrations, chattering and to confirm the proper behavior of the valve. Entirely made in stainless steel a transparent glass pipe will show the movement of the position indicator sliding inside while an air release on top, operated by a pin (4), will enable customer purge out air pockets accumulated during working conditions inside the control chamber of the main valve.

DIsassembly

The CSA position indicator is a sturdy and solid item not subject to maintenance, in case of frost and unexpected and accidental impact it may break. For the disassembly simply hold the lower part (2) and unscrew the upper part (1). Make sure the plane gaskets (5-6) are not damaged or lost during this phase, clean and replace if necessary. The glass pipe (3) can be cleaned in case of dirt accumulated inside and turbidity. The upper pin (4) is inserted and equipped with an o-ring, do not remove it unless strictly required.

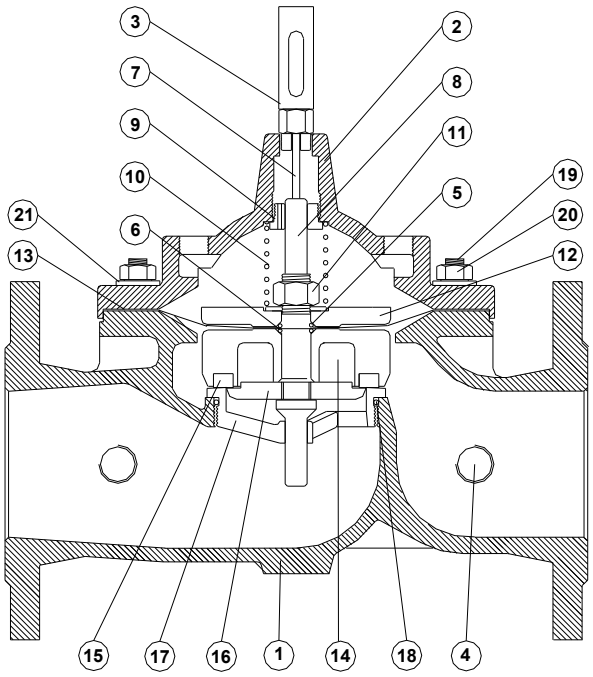
N.	Component	Material
1	Upper part	stainless steel
2	Lower part	stainless steel
3	Glass pipe	Pyrex glass
4	Pin	stainless steel
5	Gasket	Vulkolan
6	Gasket	Vulkolan

Problems solving (ref picture on page 16 and picture 1 on page 4)

Problem	Cause	Solution
The main valve doesn't close	The gate valves are closed	Open the gate valves
	The isolation ball valves of the circuit are closed	Open the ball valves
	There is no pressure inside the main chamber	Check the pressure coming into the circuit
	The diaphragm is damaged (see the following section "checking the diaphragm")	Replace the diaphragm
	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 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 mobile block is stuck due to stones, pebbles, debris that remain trapped inside the valve	Clean the main shaft and replace all the components affected by deposit or corrosion

Please contact CSA for further assistance and / or send pictures and movies of the installation along with the valve's serial number and order confirmation.

Interventions on the main XLC 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 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.**

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 CSA 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.

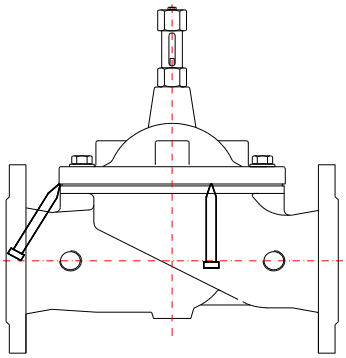
Should that be the case simply proceed to a proper cleaning leaving it in a muriatic acid solution 5% as long as necessary, shouldn't that be sufficient then proceed with a fine abrasive cloth until the deposit is completely removed.

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 CSA 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 (20) and the washers (21). 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 (11) take off the upper flat (12) the O-rings (5 and 6) check the diaphragm (13) looking for damage and, after having pulled out the plane gasket (15) 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 (9).

Examine the sealing seat (17) 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 CSA 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-Rings (5 and 6) and to **set the nut tight** (11) 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 (10) 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.

General sales conditions

1. ORDERS AND ORDER CONFIRMATION – The Order is accepted by us and the sales contract concluded at the moment when a copy of our order confirmation indicating all conditions regulating the supply of goods is returned to us duly signed or If we receive no response within the next 48 hours, from the date of submittal of our order confirmation, as we will interpret that an approval and confirmation of the conditions and clauses hereby stated.
2. PRICES – The prices confirmed remain valid until delivery indicated by us and refer to goods which are normally ready, ex works with normal packaging included (unless stated otherwise and unless a special packaging will be needed for the supply). After the emission of the order confirmation and until the moment of product delivery, CSA srl reserves the right to change the indicated prices when cost increases of raw materials, labor, energy sources or production can be proven to have taken place and are justified.
3. TERMS OF DELIVERY – The terms of delivery, of presentation at testing and shipment, however and wherever indicated, are intended as indicative forecasts of set-up times and are to be used only as guidelines, with no commitment for our company. Eventual delays cannot therefore in any case lead to compensation for damages, to requests for fines or to the cancellation of the contract, even partially, unless those consequences have been expressly accepted by us at the moment the order was placed.
4. PACKING - Normal packaging is always included in the price. Any special packaging, expressly requested by the client, will be charged at cost. Our company provides packaging according to its experience and habits and remains explicitly exonerated from any type of responsibility for loss or damage.
5. RENDERING – Unless otherwise agreed all our sales are intended as ex works at our warehouse our loading on means of transport. The sale ex works or destination limits its effects to the inclusion into the price of shipping cost materials; said shipping consequently is performed at the buyer's risk and peril, it being understood that materials themselves are also intended in such a sale, delivered in our warehouse. Eventual agreements with shippers, including the total amount and payment of the cost of transport, are to be considered concluded and carried out on behalf of the buyer who accepts and confirms our action at this time. The nominal weights and dimensions reported in our catalogues are indicative and liable to variations without prior notice and are not considered binding in regards to CSA srl.
6. GUARANTEE – All CSA srl products conform to the standards quoted on our catalogues and successive modifications, tested individually at the plant and regularly certified are covered by guarantee for a period of one year from the date of invoice. The guarantee is limited to the substitution and to the repair free of charge of parts which compose the product and which have resulted as defective due to faults in manufacturing. See the disclaimer notice section also available on line for more information
7. DEFECTS AND COMPLAINTS – Eventual complaints regarding products which do not correspond to what is specified in our order confirmation will not be considered valid if not presented by registered letter within the maximum term of eight days after receiving the goods. This limit is extended to ninety days for the notification of hidden defects. If the complaint is prompt and well-founded, the obligation of our company is limited to the substitution of the goods which have been recognized as not consistent, in the same delivery place as per the original provision, prior return of this, excluding any right on the part of the buyer to request the cancellation of the contract and compensation for damages and reimbursement of costs sustained for any reason. The replacement of materials will not take place if the buyer does not immediately suspend the operation or use of the materials that are the object of dispute. Eventual complaints or protests do not entitle the buyer under any circumstances to suspend or delay the payments of the goods supplied.
8. DAMAGES – All CSA srl products are covered by insurance. Eventual damages caused by product malfunctioning must be reported within 24 hours with indications of the approximate amount of damages and the name of the damaged party. The imputed product and all documentation of said damage must be at the disposal of CSA and the Insurance company until the case has been closed. CSA srl disclaims every responsibility for eventual damages to people, animals or things deriving from the incorrect installation of materials supplied by CSA or in any way deriving from the use of equipment without observing the safety rules or without the prior execution of the expected controls and maintenance. In addition to possible repair, substitution or reimbursement, the buyer accepts that CSA srl will not be responsible for any loss, cost or damage of any type deriving from the product, its use, installation or substitution, marking, the maintenance pamphlet attached, the technical brochure and from any other documentation in paper or electronic form issued by CSA srl and either directly or indirectly connected to CSA srl.
9. RETURNED MATERIALS – The buyer cannot for any reason return the product without our explicit written authorization and in this affirmative case the material must be returned ex work to our plant.
10. PAYMENT – Payment of our invoices must be made within the established expiry terms. Delay of invoice payment, even if partial, puts the application of late interest rates into effect at the measure corresponding to the Prime Rate ABI increased by 4 percentage points. In case of default on the part of the buyer our company will have the right, pending every other action, to demand payment in advance of remaining provisions to settle every contract and to suspend the shipment of remaining orders also if relative to other contracts without detriment to its right to reimbursement of damages.
11. RESERVED PROPERTY – Goods are to be considered as sold on the condition of reserved property and therefore they will remain the property of CSA srl until the entire price has been paid.
12. RENUNCIATION – In addition to cases of circumstances beyond our control or others foreseen by law including state of alarm, mobilization, blockades or wars, strikes, agitations, plant occupations, closings, fires, public disaster, etc our company has the right to renounce in part or entirely from the sales contract definitely concluded, as well as those in process, when facts and circumstances that substantially alter the state of the markets, currency value and the conditions of Italian industry occur. In these cases, in the event that our company withdraws from the contract

for impediments that do not depend on its own deed or fault, the buyer will not have the right to compensation and must, if requested by our company, pay for goods which have already been prepared.

13. DISPUTE – Every contract is regulated by Italian law. The Court of Parma is responsible for the examination and resolution of any dispute or controversy resulting from business involving our company.

14. DISCLAIMER NOTICE – CSA srl products and solutions are warranted for one year from date of shipment against manufacturing defects in material and workmanship that develop in the service for which they are designed, provided the products are installed and used in accordance with all applicable instructions and limitations issued by CSA srl. within the terms of such warranty period we will repair or replace defective material, free of charge, that is returned to our factory, transportation charges prepaid, if upon inspection, the material is found to have been defective at time of original shipment. This warranty is expressly conditioned on the purchaser's providing written notification to CSA srl immediate upon discovery of the defect.

This warranty shall not apply if the product has been altered or repaired by others, CSA srl shall make no allowance or credit for such repairs or alterations unless authorized in writing by CSA srl. The foregoing warranty is exclusive and in lieu of all other warranties and representations, whether expressed, implied, oral or written, including but not limited to any implied warranties or merchantability or fitness for a particular purpose. All such other warranties and representations are hereby cancelled.

CSA srl shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of the product. CSA srl shall not be liable for any damages or charges for labour or expense in making repairs or adjustments to the product. CSA srl shall not be liable for any damages or charges sustained in the adaptation or use of its engineering data and services, reports, sizing provided, technical communication by any nature, movies and any kind of information which may be used for projects, engineering and installation purposes

No representative of CSA srl may change any of the foregoing or assume any additional liability or responsibility in connection with the product. The liability of CSA srl is limited to material replacements F.O.B. Salsomaggiore Terme (43039), Località Ponteghiara, Parma, Italy.

15. LIMITATIONS OF USE / INSTALLATION AND LIMITS LIABILITY - With the signature of the present:

A) the buyer is committed to not use in any way and/or install the products sold by CSA srl in the territory USA, Canada and Mexico.

B) the buyer is informed, that in case of use/installation of products CSA srl, also in the work of third parties, in violation of point a), CSA srl will not answer in any way of any damage also caused a third party to the products sold. If CSA srl pay the money according to the damages described here, the buyer with the signature of the present agree to refund CSA srl.

C) the buyer is informed that the insurance produced by CSA srl is not operating in the territories of the USA, Canada and Mexico states.

Sales and Service

For information about our service, approvals, certifications:

Web site: www.csasrl.it E-Mail : info@csasrl.it

CSA srl Inc. reserves 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.

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