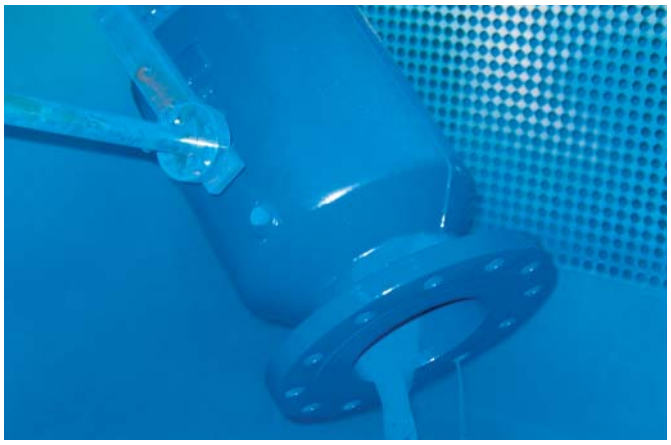
Automatic control valves
XLC 400 series

The company was founded in 1987 by transforming the former CSA, which was a trading company dealing with pipes and valves for water networks, into a manufacturing company, through the research and realization of pillar fire hydrants. Since then many other products have been added.
The history of our company is characterised by years of technical and commercial research, which have enabled us to offer a complete range of valves designed for controlling, regulating and protecting the pipelines under pressure in both waterworks and sewage lines as well as fire hydrants.
Our many industrial patents and innovative technical solutions, together with modern and attractive style of design, have made it possible to differentiate our products from those offered by competitors and have allowed us to become a point of reference in our sector.
Flexibility and reliability have been the key points of CSA's rapid growth over the last few years. We are perfectly aware that we are managing the world's most precious resource and, motivated by this responsibility and the commitment towards our customers, we have dedicated ourselves to constantly improving our products, placing them at the highest levels of quality.

Quality

In the manufacturing business today, quality is the fundamental requirement for achieving and maintaining a growing market share.
For this reason we have always aimed at developing a synergy between the various sectors of the company and thus ensuring:
-quick and precise answers;
-evaluation of data received and immediate response;
-rigorous control of incoming and outgoing products.
Since 1998 CSA is certified according to regulation ISO 9001 by RINA (Italian Naval Registry) recently converted into ISO 9001/2008.



During the research and realisation of new products, CSA has always focused his efforts on:
- Listening to the customer's needs and finding the best solution both at the design and operational phases.
- Guiding our R&D department to develop ranges of modern, reliable and complementary products.
- Adopting production techniques that, even while complying with the severest quality standards, would allow us to reduce delivery times.
- Guaranteeing complete technical support for our customers and prompt after-sales assistance.

This philosophy characterizes us not only as a valve manufacturer but also as a reliable partner whom you can always depend on for consulting and solutions.
The production cycle, aimed at the constant improvement of our products and complete customer satisfaction, ensures predetermined margins of tolerance by establishing production standards, which guarantee that the semi finished products reach the next production stage with the required specifications.
All our valves are made of ductile cast iron GJS 400-15 / 500-7 in absolute compliance with European standards, and are suitable for PN 25-40 bar.
The manufacturing process is carried out exclusively by means of numerically controlled lathes, mills, and horizontal machining units. Subsequent step-by-step controls are based on strict quality procedures.
Painting, pre-treated by sand blasting grade SA 2.5, is carried out inside a fluidized bed containing epoxy powder, which guarantees maximum surface protection. All our products are tested under water pressure and certified.

Automatic control valves XLC 400 series

The CSA range of automatic control valve consist of a globe pattern hydraulically operated valve, entirely produced in ductile cast iron with internal components in stainless steel. This valve, diaphragm actuated PN 25 class, is also called XLC 400 and represent the basic valve needed to perform a tremendous range of applications, that include pressure reduction, relief, sustain, flow control, level control and many more. Each function is obtained simply by changing the circuitry and pilots, that can be combined together.

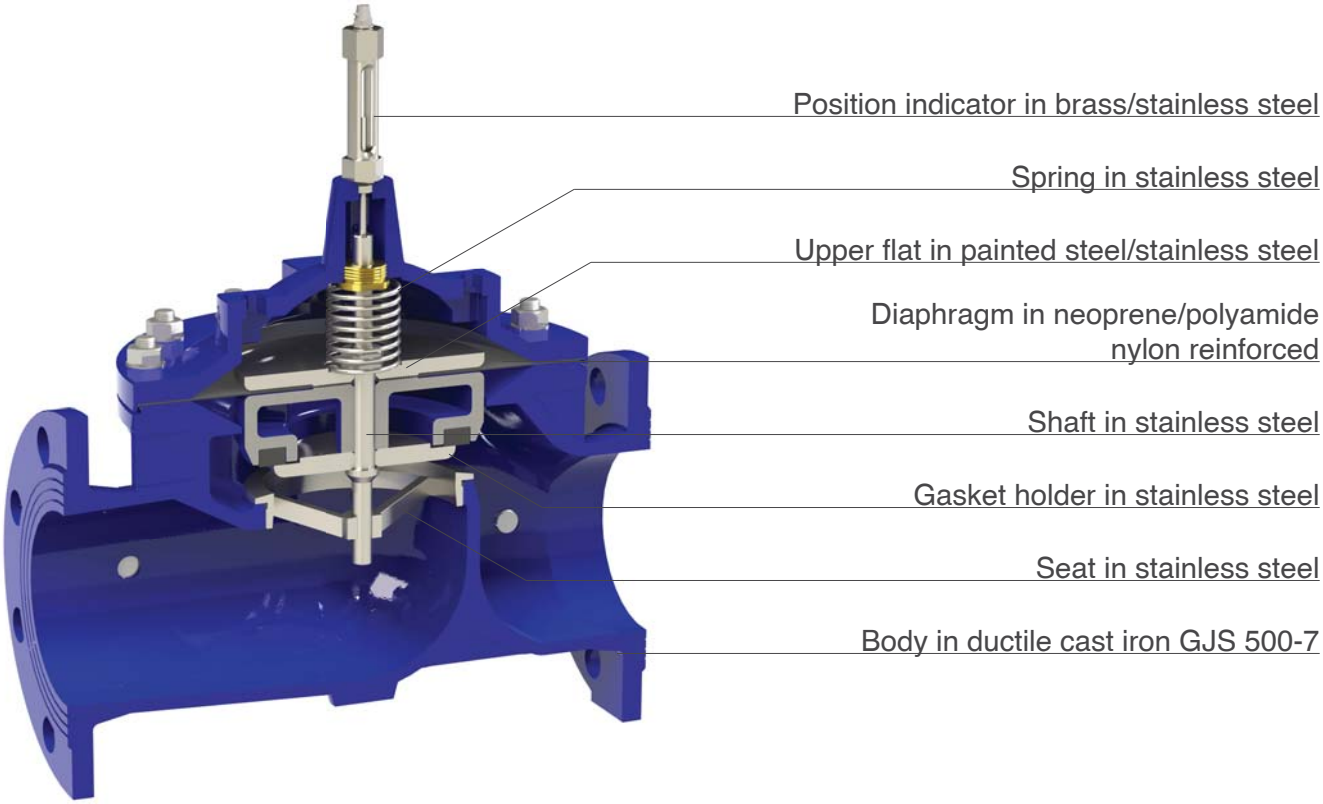
Technical features and benefits

- Body in ductile cast iron, PN 25 bar rated, full bore globe pattern design.
- Supplied with fixed flanges according to EN 1092/2, that can be changed to suit different pressure conditions.
- Designed to reduced head loss and minimize turbulence and noise during working conditions.
- Diaphragm with reinforced nylon fabric.
- Internal manufactured in stainless steel, obturator in ductile cast iron for large diameters.
- Maintenance can be easily performed from the top, without removing the valve from the pipe.
- Large expansion chamber to tolerate high pressure ratio.

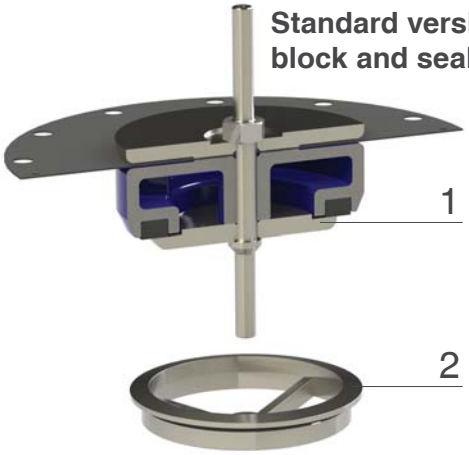
Applications

- Main transmission lines.
- Water distribution networks.
- Buildings.
- Industrial plants.

Technical features

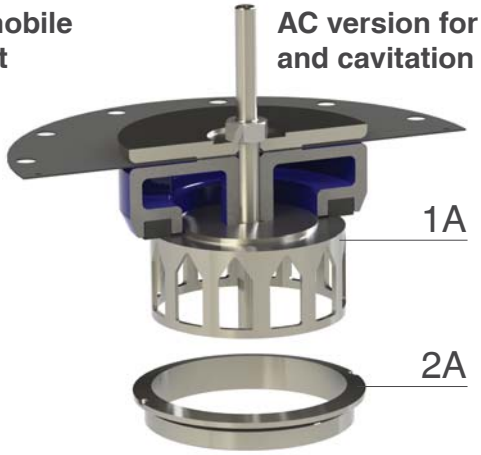


Standard version of mobile block and sealing seat



1. Gasket holder in stainless steel
2. Seat in stainless steel

AC version for low flow stability and cavitation prevention

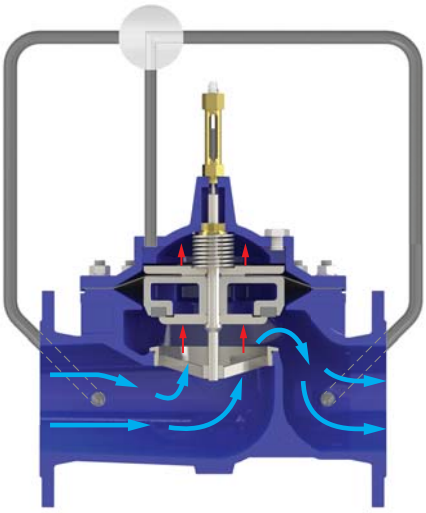


1. Anti-cavitation V-port
2. Seat in stainless steel for anti-cavitation system

The standard version of mobile block and sealing seat, depicted above, includes the obturator, diaphragm and a special gasket holder designed to guarantee the maximum accuracy also during the low opening of the valve. The mobile block with this version is guided in two points, on the cap and on the seat.

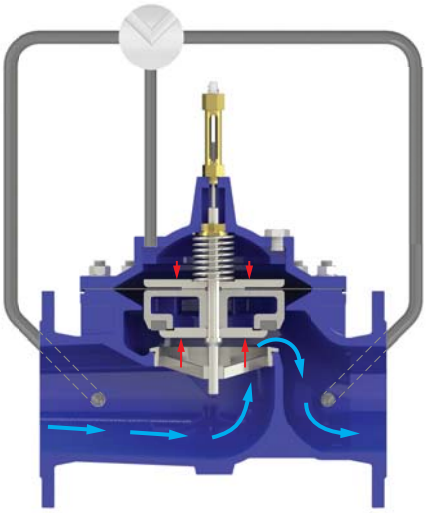
The AC system is obtained by means of a special seat and device which improves the guiding of the entire block, yet increasing the allowable pressure ratio and valve's performances, also in case of low flow rate avoiding vibrations and noise.

Operating principle on-off mode



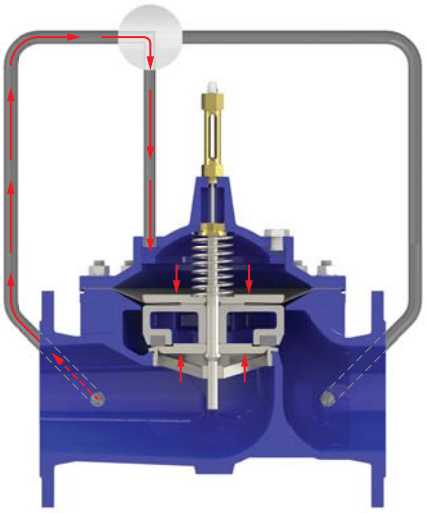
Valve opening

If the pressure inside the control chamber is put in communication with the atmosphere the entire upstream pressure will act on the obturator, pushing it upwards allowing the complete opening of the valve.



Valve modulating

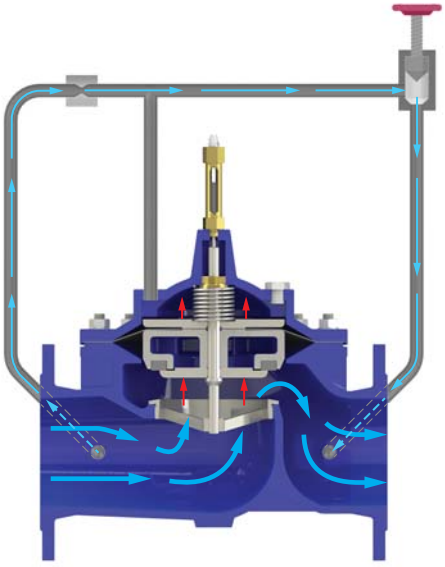
During working conditions if the control chamber is isolated from the upstream pressure the valve will remain in the same position, therefore producing the head loss corresponding to such opening percentage.



Valve closing

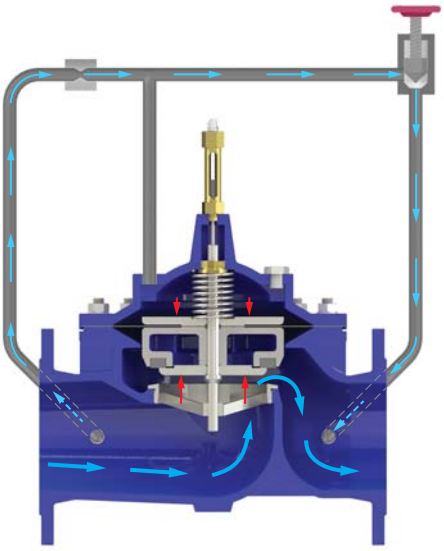
If the control chamber is put in communication with the upstream pressure, thanks to the difference in area between the upper flat with diaphragm, larger that the obturator underneath, the valve will close completely.

Operating principle modulating mode



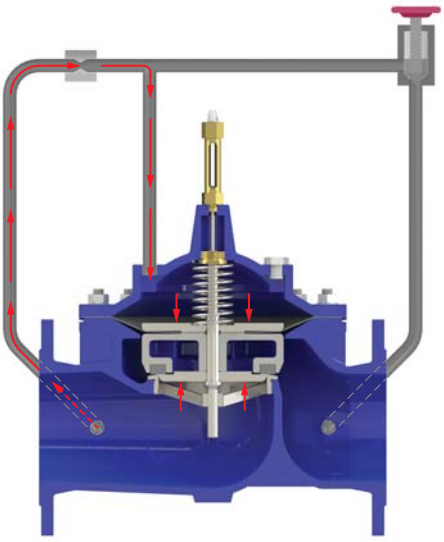
Valve opening

When the valve is set to modulate a restriction is required between the upstream pressure and control chamber, in addition to a modulating device as shown in the picture. If the latter is entirely open the pressure inside the control chamber will be relieved, allowing for the complete opening of the valve.



Valve modulating

During working conditions if the modulating device is throttled, reducing the flow passage through it, pressure will be applied inside the control chamber making the valve's mobile block reacting accordingly on the main valve XLC 400.



Valve closing

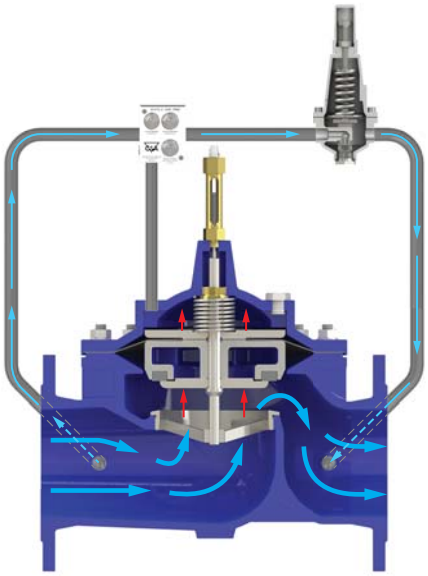
If the modulating device is completely closed, all the upstream pressure will be diverted into the control chamber. The mobile block will therefore be pushed down on the obturator, producing the interruption of flow through the XLC 400.

GR.I.F.O. 3/8G PN 25

The unit flow control “GR.I.F.O.” is a device, designed for modulation, that includes all the necessary functions required for the proper operation of CSA control valves. Entirely built in stainless steel, its compact design makes the circuit easy to be maintained and at the same time allows for a tremendous range of regulations.
GR.I.F.O. is composed of the following:
- a filter, with fine mesh in stainless steel AISI 316, to protect the hydraulic circuitry from possible dirt;
- three needles in stainless steel with check valves, responsible for the regulation of the main valve’s response time, opening and closing speed independently from each other;
- filtered and unfiltered pressure ports.

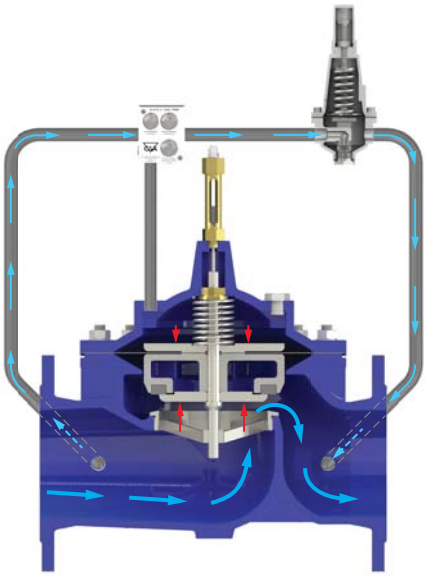
1. Closing speed regulation
2. Opening speed regulation
3. Adjustable orifice regulation
4. Unfiltered 1/8 G port
5. 3/8 G port
6. 3/8 G port
7. 3/8 G port
8. Filtered 1/8 G port
9. Filter

Operating principle modulating mode - pressure reduction



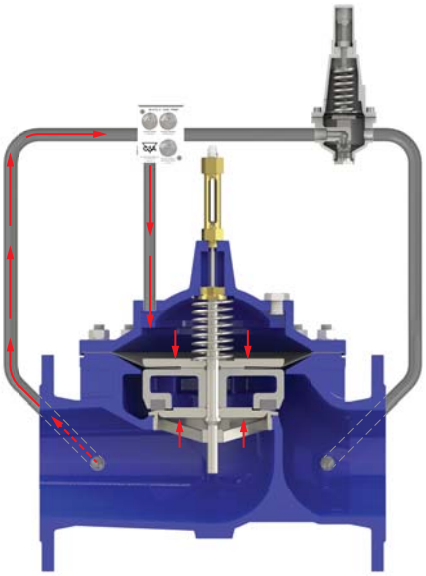
Valve opening

If the downstream pressure value becomes lower than the pilot’s set point the passage through the latter will increase, thus relieving pressure out of the main valve chamber XLC 400 with consequent opening as shown in the picture above.



Valve modulating

As a consequence of gradual change and variation in demands the pilot will keep adjusting, this is to regulate the flow in and out of the main chamber. The XLC 400 will then follow the movements of the pilot producing the necessary head-loss required for the downstream pressure reduction.



Valve closing

If the downstream pressure value becomes higher than the pilot’s set point the passage through the pilot will decrease, thus conveying flow and pressure to the main chamber of the XLC 400 valve with consequent closure as shown in the picture above.

Downstream pressure reducing stabilizing valve **Mod. XLC 410**

The CSA XLC 410 control valve will reduce and stabilize the downstream pressure to a preset value, regardless of variations in demand and upstream pressure fluctuations.

Most popular configurations	
XLC 410-FR	downstream pressure reducing with back-flow prevention
XLC 410-ND	downstream pressure reducing stabilizing valve with programmer and two set points
XLC 412	downstream pressure reducing and up-stream pressure sustaining valve
XLC 415	downstream pressure reducing stabilizing valve with solenoid control

Installation layout

The picture depicted below shows the recommended installation layout of the CSA XLC 410.
The sectioning devices and by-pass are very important for maintenance operations, as well as the filter to prevent dirt from reaching the control valve. The direct acting pressure reducer CSA Mod. VRCD is the best choice on the by-pass due to long periods of inactivity. A pressure relief, CSA model VSM or XLC 420, must be present to prevent under any circumstances rise in pressure on the downstream line.

Upstream pressure sustaining-relief valve **Mod. XLC 420**

The CSA XLC 420 control valve will sustain, if installed in-line, and relief if installed in derivation from the main line, the upstream pressure to a pre-set value regardless of variations in demand.

Most popular configurations	
XLC 420-FR	upstream pressure relief/sustaining valve with back-flow prevention
XLC 421	upstream pressure relief surge anticipating control valve
XLC 424	combination of upstream pressure sustaining and min.-max. level control valve
XLC 425	upstream pressure sustaining-relief valve with solenoid control

Installation layout

The picture depicted below shows the recommended installation layout of the CSA XLC 420, used as a pressure relief in derivation from the main line to protect a pumping station. The sectioning device is very important for maintenance operations, whenever possible a filter too is needed to prevent dirt from reaching the control valve. The set point should always remain within 0,5-1 bar above the maximum steady state pressure value of the pumps.

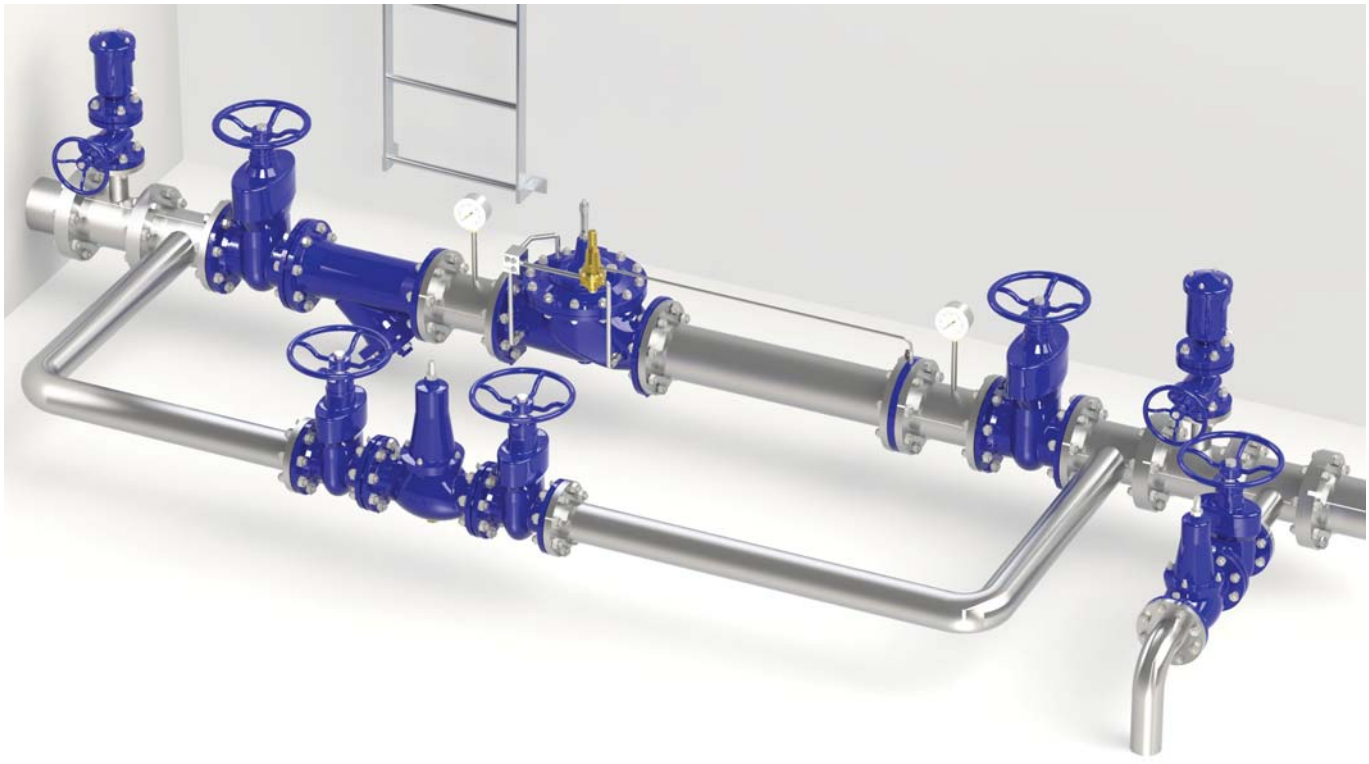
Flow control valve
Mod. XLC 430

The CSA XLC 430 flow control valve will automatically limit the flow to a preset value, regardless of pressure variations. In case of flow rate lower than the required set point the valve will be fully opened. For the proper installation the flanged orifice, supplied with the valve, must be installed at least 5 DN downstream.

Most popular configurations	
XLC 431	pressure reducing flow control valve
XLC 434	flow control valve with minimum-maximum level control
XLC 435	flow control valve with solenoid control

Installation layout

The picture below shows the recommended layout of the CSA XLC 430, flow control valve. The flange orifice, calculated and machined according to the project's requirements, is linked to the valve's pilot and has to be installed 5 DN downstream for the best performance and accuracy. The variation on the flow rate set point value, obtained by adjusting the pilot, is ±32%.



Minimum-Maximum level control valve **Mod. XLC 440**

The CSA XLC 440 minimum-maximum level control valve will automatically operate a on-off regulation to maintain the tank level within an adjustable range, going from approximately 15 cm up to 4 m. Thanks to a CSA needle valve the reaction time can be adjusted, to prevent water hammer effects during the closing phase.

Most popular configurations	
XLC 440-FR	minimum-maximum level control valve with back-flow prevention system
XLC 445	minimum-maximum level with solenoid control valve

Installation layout

The picture below shows the recommended layout of the CSA XLC 440, minimum-maximum level control valve. The connection between the valve and the pilot is obtained by means of two pipes, one linked to the upstream pressure and the other to the chamber. The stilling tank allows for the proper control without accessing directly to the tank. The valve is supplied with the CSA minimum-maximum pilot system adjustable with a range between 0,15 and 4 m.

On-off solenoid control valve **Mod. XLC 450**

The CSA XLC 450 solenoid control valve will either open or close in response to a signal from remote or by an external controller. Thanks to a CSA needle valve the reaction time can be adjusted, to prevent water hammer effects during the closing phase.

Most popular configurations	
XLC 450-P	on-off solenoid control valve with battery operated programmer

Installation layout

The solenoid control valve XLC 450 can be used whenever the on-off regulation is needed, the impulse is received by external equipments, sensors. The picture below shows a way of using CSA XLC 450 to control the tank in connection with a switch, sensing the level variation. The valve is usually supplied with the manual opening and closing circuit, to allow for regulations even in case of power failure.

Step by step solenoid control valve **Mod. XLC 453**

The CSA XLC 453 step by step solenoid control valve, usually installed in combination with a PLC or managed directly from the remote monitoring system, will perform a regulation in response to the signals sent to the solenoid valves. Thanks to a CSA needle valve, the reaction time can be adjusted to prevent water hammer effects, during the modulating/closing phase. The valve, as shown in the picture, can be supplied with an additional circuit for emergency situations of manual opening and closing.

Installation layout

The picture below shows the CSA XLC 453 installed in combination with a flow meter and linked to CSA PLC. The latter will constantly send impulses to the valve's solenoids to make it throttle as required. The purpose is to maintain the same flow regardless of pressure variations, or obtain a pressure management function according to variations in demand to reduce water loss and leakage. Another common application of XLC 453 is to regulate the water level of tanks, where the PLC is connected to sensors.

Constant level control valve **Mod. XLC 460**

The CSA XLC 460 constant level control valve will automatically maintain the tank level within a range of approximately 15 cm. Thanks to a CSA needle valve the reaction time can be adjusted, to prevent water hammer effects during the closing phase. It is important to follow the instructions enclosed in the set up and installation manual, for the proper layout and minimum pressure required.

Most popular configurations	
XLC 426	upstream pressure sustaining level control valve
XLC 460-rotoway	constant level control valve with stainless steel pilot
XLC 465	constant level control valve with on-off solenoid control

Installation layout

The picture below shows the recommended installation layout of XLC 460, linked to the pilot through a single pipe, two pipes in case of the version with stainless steel pilots. The filter is always needed upstream to prevent dirt from entering the main valve, affecting the performance. A minimum pressure of 0,4 bar is always needed on the pilot to make the valve work properly.

Altitude control valve
Mod. XLC 470

The CSA XLC 470 altitude control valve will maintain the level of a water tower or a tank, regardless of upstream pressure variations, acting with an accuracy of few cm of water column.
The modulating control ensures a smooth regulation and absence of water hammer, as the valve will react proportionally to the variations in demand.

Most popular configurations	
XLC 427	Upstream pressure sustaining altitude control valve
XLC 470-FR	Altitude control valve with back-flow prevention mechanism
XLC 475	Altitude valve with on-off solenoid control

Installation layout

The picture below shows the recommended installation layout of XLC 470, where the control is obtained without any external piping and simply through a pilot sensing the static pressure coming from the water tower. A minimum of 4 meters static pressure, in addition to head loss during valve's opening, will be needed to make this model work properly.

Downstream pressure reducing stabilizing valve with programmer and two set point values **Mod. XLC 410-ND**

The CSA XLC 410-ND control valve will reduce and stabilize the downstream pressure to a pre-set value regardless of variations in demand and upstream pressure fluctuations. Thanks to the presence of two independent circuits and pilots, controlled by a programmer, the valve can switch from the higher to the lower pressure in response to a signal.
A maximum of three programs per day are available. Should the downstream pressure exceeds the pilot's set point the valve will close drip tight assuring the proper operation also in static conditions.

Downstream pressure reducing and upstream pressure sustaining valve **Mod. XLC 412**

The CSA XLC 412 control valve will reduce and stabilize the downstream pressure and, at the same time, sustain the upstream pressure to a preset value. The combination of these two functions, where the master pilot is the upstream pressure sustaining, is done regardless of variations in demand.
If the downstream pressure increases above, or the upstream pressure decreases below, the set point of the corresponding pilots the valve will close drip tight assuring the proper operation also in static conditions.

Downstream pressure reducing stabilizing valve with solenoid control **Mod. XLC 415**

The CSA XLC 415 control valve will reduce and stabilize the downstream pressure to a preset value regardless of variations in demand and upstream pressure fluctuations. Thanks to a solenoid the valve will be able to open or close completely, in response to a signal sent from remote or by a controller. Should the downstream pressure exceeds the pilot's set point the valve will close drip tight, assuring the proper operation also in static conditions.

Upstream pressure relief surge anticipating control valve **Mod. XLC 421**

The CSA XLC 421 control valve, installed in derivation from the main line, will act as a pressure relief of the upstream pressure. Thanks to another pilot, in case of pump failure the valve will sense the drop in pressure and, as a consequence of that, the chamber will be put in communication with the atmosphere, before the rise in pressure coming from the second phase of the transient. For the proper sizing and water hammer analysis please contact CSA.

Combination of upstream pressure sustaining and minimum-maximum level control valve **Mod. XLC 424**

The CSA XLC 424 control valve sustains the upstream pressure to a preset value regardless of variations in demand and, at the same time, it controls and regulates the minimum and maximum level inside a tank.
In case of decrease of the upstream pressure below the set point the valve will close drop-tight ensuring the proper operation also in static conditions.

Upstream pressure sustaining-relief valve with solenoid control **Mod. XLC 425**

The CSA XLC 425 control valve will sustain, if installed in-line, and relief if installed in derivation from the main line, the upstream pressure to a preset value regardless of variations in demand. Thanks to the solenoid control the valve will be able to close or open, in response to a signal sent from remote or by an external controller.
If the upstream pressure decreases below the pilot set point the valve will close drip tight, assuring the proper operation also in static conditions.

Pressure reducing flow control valve **Mod. XLC 431**

The CSA XLC 431 pressure reducing flow control valve automatically reduces and stabilizes the downstream pressure to a preset value and, at the same time, it limits the flow to a requested set point, regardless of pressure variations. If the downstream pressure rises above the downstream pilot setting, the valve will close drop tight to ensure the proper operation also in static conditions. For the proper installation the flanged orifice, supplied with the valve, must be installed at least 5 DN downstream.

Flow control valve with minimum-maximum level control **Mod. XLC 434**

The CSA XLC 434 level regulation flow control valve limits the flow to a requested set point, regardless of pressure variations. At the same time, thanks to a three ways on-off level control pilot CSA mod. Rotoway, she controls the minimum-maximum level inside a tank. During the opening phase of the pilot, in case of flow rate lower than the set point the valve will be fully opened. For the proper installation the flanged orifice, supplied with the valve, must be placed at least 5 DN downstream.
Please consult CSA technical support for the proper sizing and minimum pressure needed to ensure the best performance of this valve.

Flow control valve with solenoid control **Mod. XLC 435**

The CSA XLC 435 flow control valve limits the flow to a requested set point, regardless of pressure variations. Thanks to a solenoid the valve will either close or open in response to a signal, sent from remote or by an external controller.
In case of flow rate lower than the set point the valve will be fully opened. For the proper installation the flanged orifice, supplied with the valve, must be placed at least 5 DN downstream.

On-off solenoid control valve with battery operated programmer **Mod. XLC 450-P**

The solenoid control CSA XLC 450-P will either open or close in response to the signal sent by a battery operated programmer. Thanks to a CSA needle valve the reaction time can be adjusted to prevent water hammer effects, during the closing phase. A maximum of three programs per day can be used. The valve can be supplied on request with an additional circuit, for emergency situations of manual opening and closing.

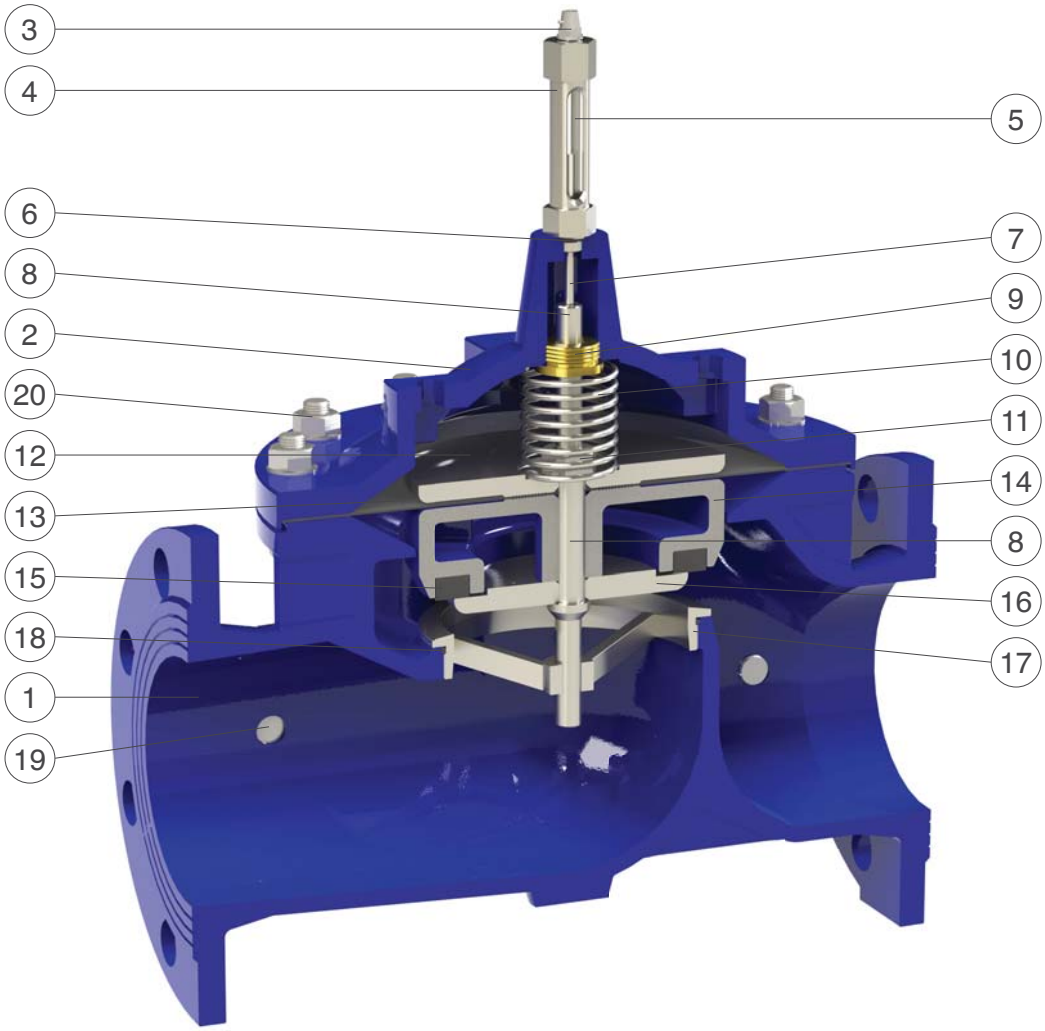
Constant level control valve **Mod. XLC 460 - rotoway**

The CSA XLC 460-rotoway constant level control valve will automatically maintain the tank level within a range of approximately 15 cm, by means of a three ways pilot entirely built in stainless steel. Thanks to a CSA needle valve the reaction time can be adjusted to prevent water hammer effects during the closing phase. It is important to follow the instructions enclosed in the set up and installation manual, for the proper layout and minimum pressure required.

Constant level control valve with on-off solenoid control **Mod. XLC 465**

The CSA XLC 465 constant level control valve automatically maintains the tank level within a range of approximately 15 cm, and in combination with a solenoid, also enables a on-off control in response to a signal from remote or by a controller. Thanks to a CSA needle valve the reaction time can be adjusted, to prevent water hammer effects during the closing phase. It is important to follow the instructions enclosed in the set up and installation manual for the proper layout and minimum pressure required.

Technical details



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 500-7	
2	Cap	ductile cast iron GJS 500-7	
3	Air release valve 1/8 G	stainless steel AISI 304	stainless steel AISI 316
4	Position indicator	s.s. AISI 303 (nickel-plated brass OT58 from DN 250)	stainless steel AISI 303
5	Position indicator glass	Pyrex glass	
6	Position indicator O-ring	NBR	EPDM/Viton
7	Indicator stem	stainless steel AISI 303	
8	Main shaft	stainless steel AISI 303	stainless steel AISI 316
9	Guide ring	bronze CuSn5Zn5Pb5	stainless s. AISI 304/316
10	Spring	stainless steel AISI 302	
11	Locking nut	stainless steel AISI 304	stainless steel AISI 316
12	Upper flat	painted steel Fe 37	stainless s. AISI 304/316
13	Diaphragm	neoprene-Nylon	
14	Obturator	AISI 303 (DN 50-65), Fe 37, GJS 500-7 (from DN 150)	stainless s. AISI 304/316
15	Plane gasket	NBR	
16	Gasket holder	stainless steel AISI 303 (304 from DN 150)	stainless steel AISI 316
17	Seat	stainless steel AISI 303 (316 from DN 150)	stainless steel AISI 316
18	Seat O-ring	NBR	EPDM/Viton
19	Pressure outlet taps	stainless steel AISI 316	
20	Studs, nuts and washers	stainless steel AISI 304	stainless steel AISI 316

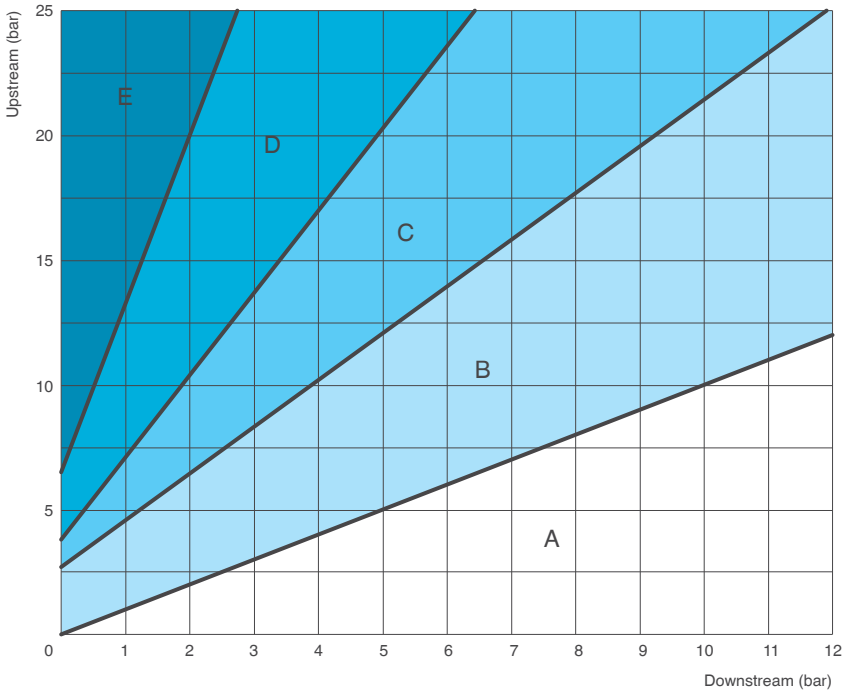
The list of materials and components is subject to changes without notice.

Technical data

Head loss coefficient

Kv coefficient representing the flow rate which is flowing through the valve fully open, and producing a head loss of 1 bar.

DN (mm)	40	50	65	80	100	125	150	200	250	300	400
Kv (m^3/h)	40,6	40,6	68	100	169	187	410	662	1126	1504	2682
Stroke (mm)	15	15	18	21	27	27	43	56	70	84	111



Cavitation chart

The cavitation phenomenon is very important during the proper valve sizing process since it may lead to substantial damages, in addition to vibration and noise. The cavitation chart has to be used to determine whether the intersection of the line, connecting upstream and downstream pressure conditions, lies within one of the 5 zones to be identified as follows:

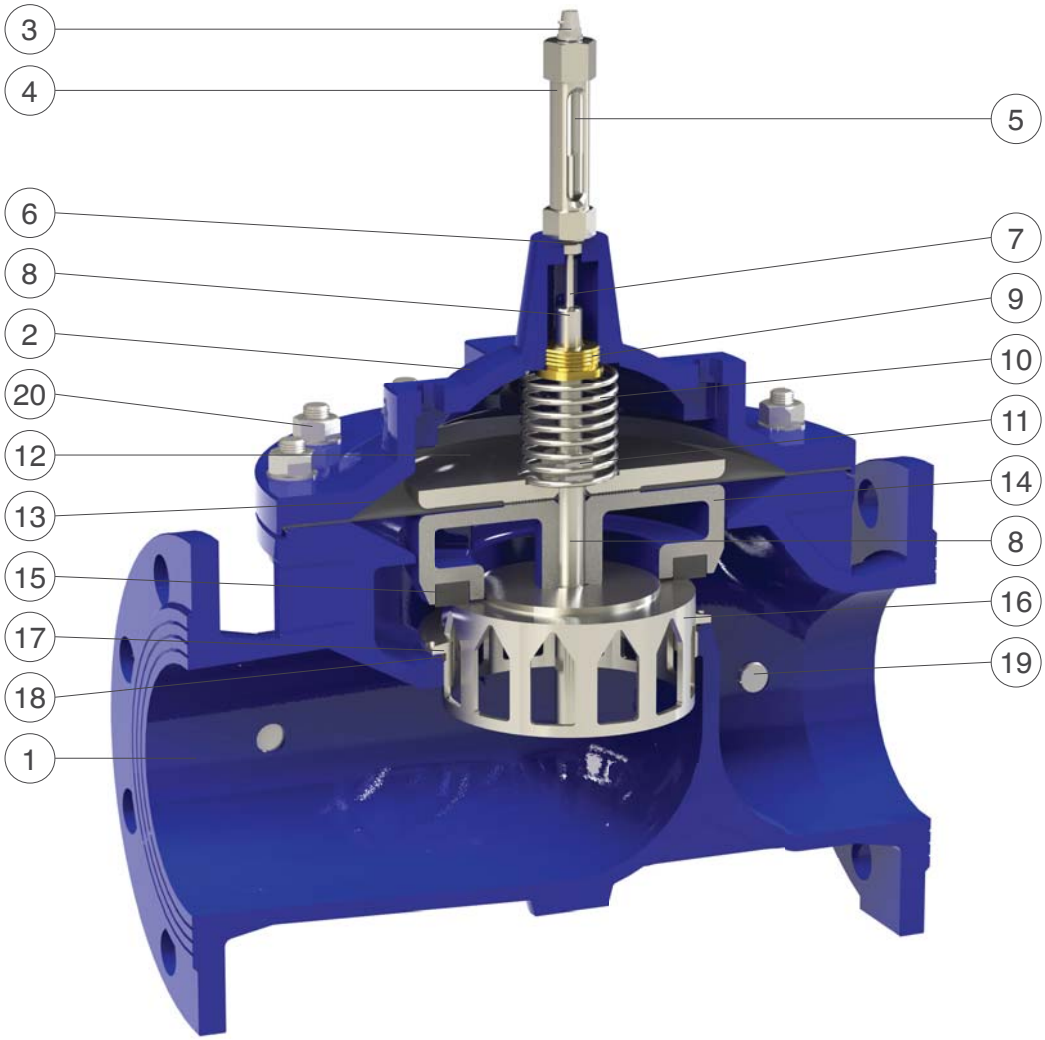
- A: Out of the possible working conditions;
- B: Recommended working conditions;
- C: Incipient cavitation;
- D: Damage cavitation;
- E: Choked and unpredictable conditions, please consult CSA for further assistance.

Recommended flow rate

The following chart shows the recommended flow rate for the proper sizing of XLC 400 control valves.

DN (mm)	Flow rate (l/s)				
	Low head loss (0,1-0,15 bar)		Recommended		Pressure relief
	Min.	Max.	Min.	Max.	Max.
50	0,6	3,9	1,0	8,8	13
65	1,0	6,6	1,8	15	23
80	1,5	10	2,7	22	35
100	2,3	16	4,3	35	54
125	2,5	16	4,6	37	60
150	5,2	35	9,5	80	123
200	9,4	63	17	141	219
250	14	98	27	220	343
300	21	140	39	317	494
400	37	250	70	565	879

Technical details - Anti-cavitation version



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 500-7	
2	Cap	ductile cast iron GJS 500-7	
3	Air release valve 1/8 G	stainless steel AISI 304	stainless steel AISI 316
4	Position indicator	s.s. AISI 303 (nickel-plated brass OT58 from DN 250)	stainless steel AISI 303
5	Position indicator glass	Pyrex glass	
6	Position indicator O-ring	NBR	EPDM/Viton
7	Indicator stem	stainless steel AISI 303	
8	Main shaft	stainless steel AISI 303	stainless steel AISI 316
9	Guide ring	bronze CuSn5Zn5Pb5	stainless s. AISI 304/316
10	Spring	stainless steel AISI 302	
11	Locking nut	stainless steel AISI 304	stainless steel AISI 316
12	Upper flat	painted steel Fe 37	stainless s. AISI 304/316
13	Diaphragm	neoprene-Nylon	
14	Obturator	AISI 303 (DN 50-65), Fe 37, GJS 500-7 (from DN 150)	stainless s. AISI 304/316
15	Plane gasket	NBR	
16	Anti-cavitation V-port	stainless steel AISI 303 (304 from DN 150)	stainless steel AISI 316
17	Seat for anti-cavitation system	stainless steel AISI 303 (316 from DN 150)	stainless steel AISI 316
18	Seat O-ring	NBR	EPDM/Viton
19	Pressure outlet taps	stainless steel AISI 316	
20	Studs, nuts and washers	stainless steel AISI 304	stainless steel AISI 316

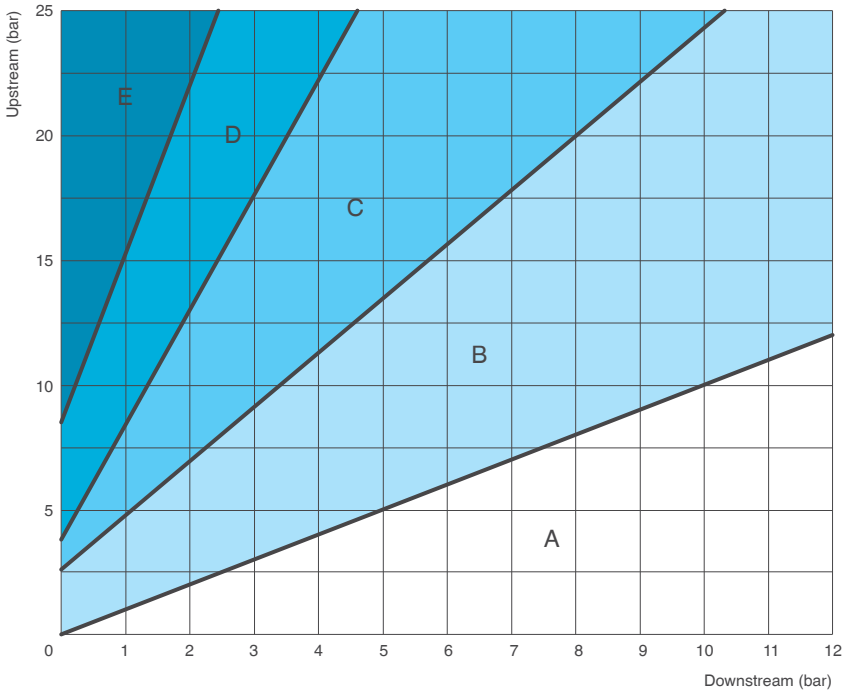
The list of materials and components is subject to changes without notice.

Technical data - Anti-cavitation version

Head loss coefficient

Kv coefficient representing the flow rate which is flowing through the valve fully open, and producing a head loss of 1 bar.

DN (mm)	40	50	65	80	100	125	150	200	250	300	400
Kv (m^3/h)	32,5	32,5	56	79	132	146	312	523	867	1173	2012
Stroke (mm)	15	15	18	21	27	27	43	56	70	84	111



Cavitation chart

The cavitation phenomenon is very important during the proper valve sizing process since it may lead to substantial damages, in addition to vibration and noise. The cavitation chart has to be used to determine whether the intersection of the line, connecting upstream and downstream pressure conditions, lies within one of the 5 zones to be identified as follows:

- A: Out of the possible working conditions;
- B: Recommended working conditions;
- C: Incipient cavitation;
- D: Damage cavitation;
- E: Choked and unpredictable conditions, please consult CSA for further assistance.

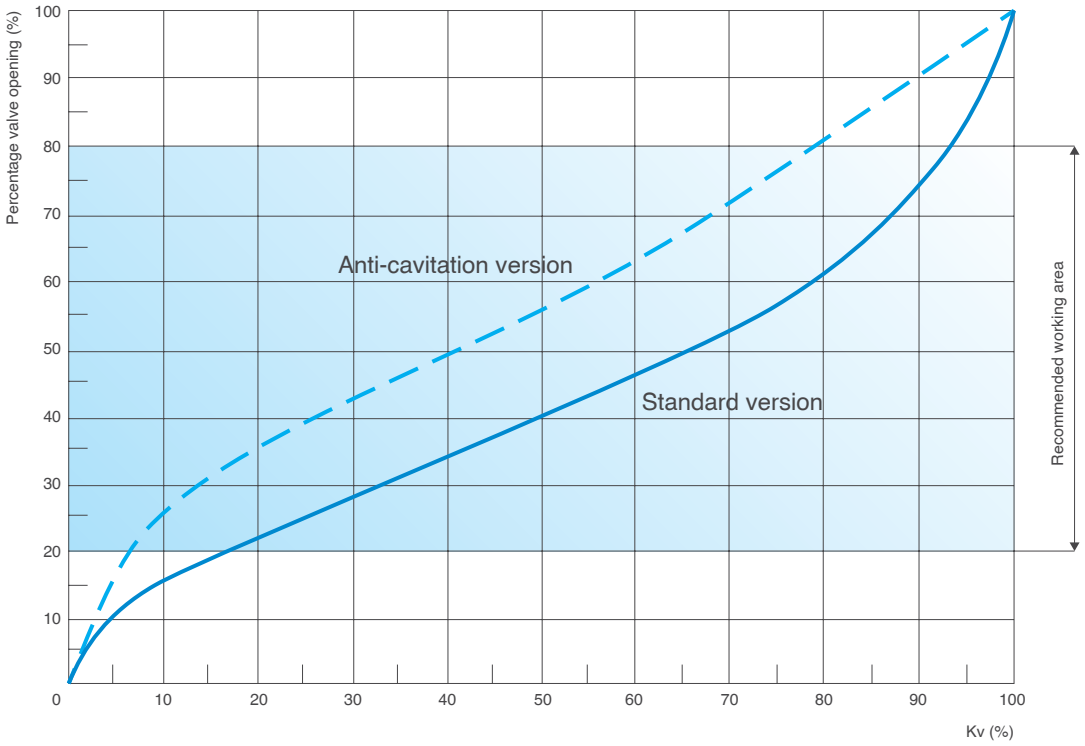
Recommended flow rate

The following chart shows the recommended flow rate for the proper sizing of XLC 400 control valves.

DN (mm)	Flow rate (l/s)				
	Low head loss (0,1-0,15 bar)		Recommended		Pressure relief
	Min.	Max.	Min.	Max.	Max.
50	0,4	3,1	0,8	7,4	11
65	0,7	5,4	1,3	12	19
80	1,1	8,2	2,1	17	29
100	1,7	13	3,5	28	45
125	1,8	14	3,8	30	50
150	3,9	28	7,6	65	100
200	7,3	52	13	115	180
250	11	81	22	182	281
300	15	116	31	263	410
400	26	200	58	457	720

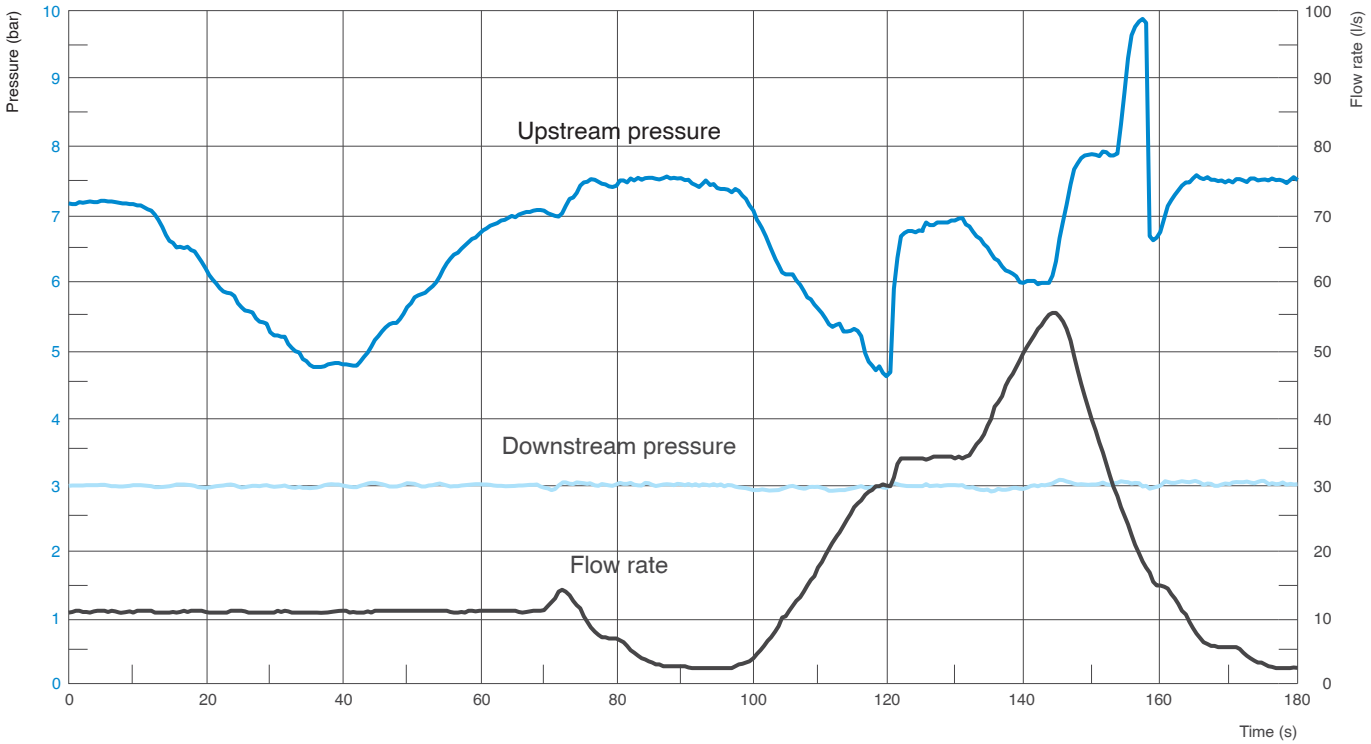
Kv to valve opening chart

The following chart shows the opening percentage of XLC 400 and XLC 400-AC (provided with anti-cavitation system) versus the Kv.



Pressure reducing performance chart

Actual hydraulic laboratory results.



Technical data

The CSA XLC 400 and 400-AC series represent the state of the art of hydraulic engineering. Designed with European certified ductile iron and produced with potable water approved components only, XLC line of control valves can be supplied with 4-20 mA position transmitter of the opening percentage, or on-off sensors. Turbines and power generation systems combined with CSA electronic equipments and solutions are available on request.

Working conditions

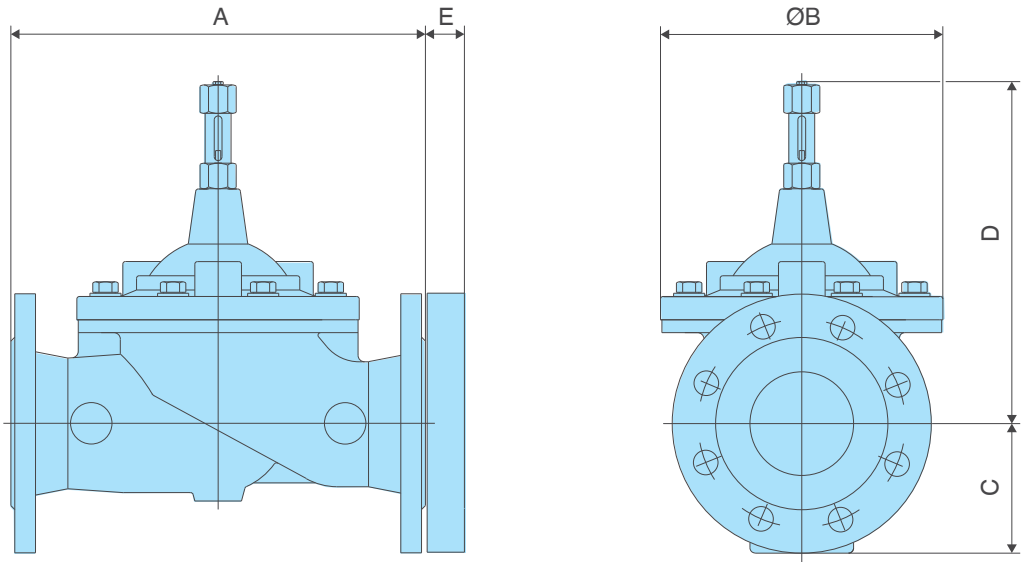
Treated filtered water with a maximum temperature of 70°C.
Minimum pressure on the pilot : 0,5 bar plus head loss.
Maximum pressure : 25 bar.

Standard

Designed in compliance with EN 1074.
Pressure rating 25 bar.
Flanges according to EN 1092/2 (different drilling standard on request).
Epoxy painting applied through FBT technology blue RAL 5005.

Available size and pattern

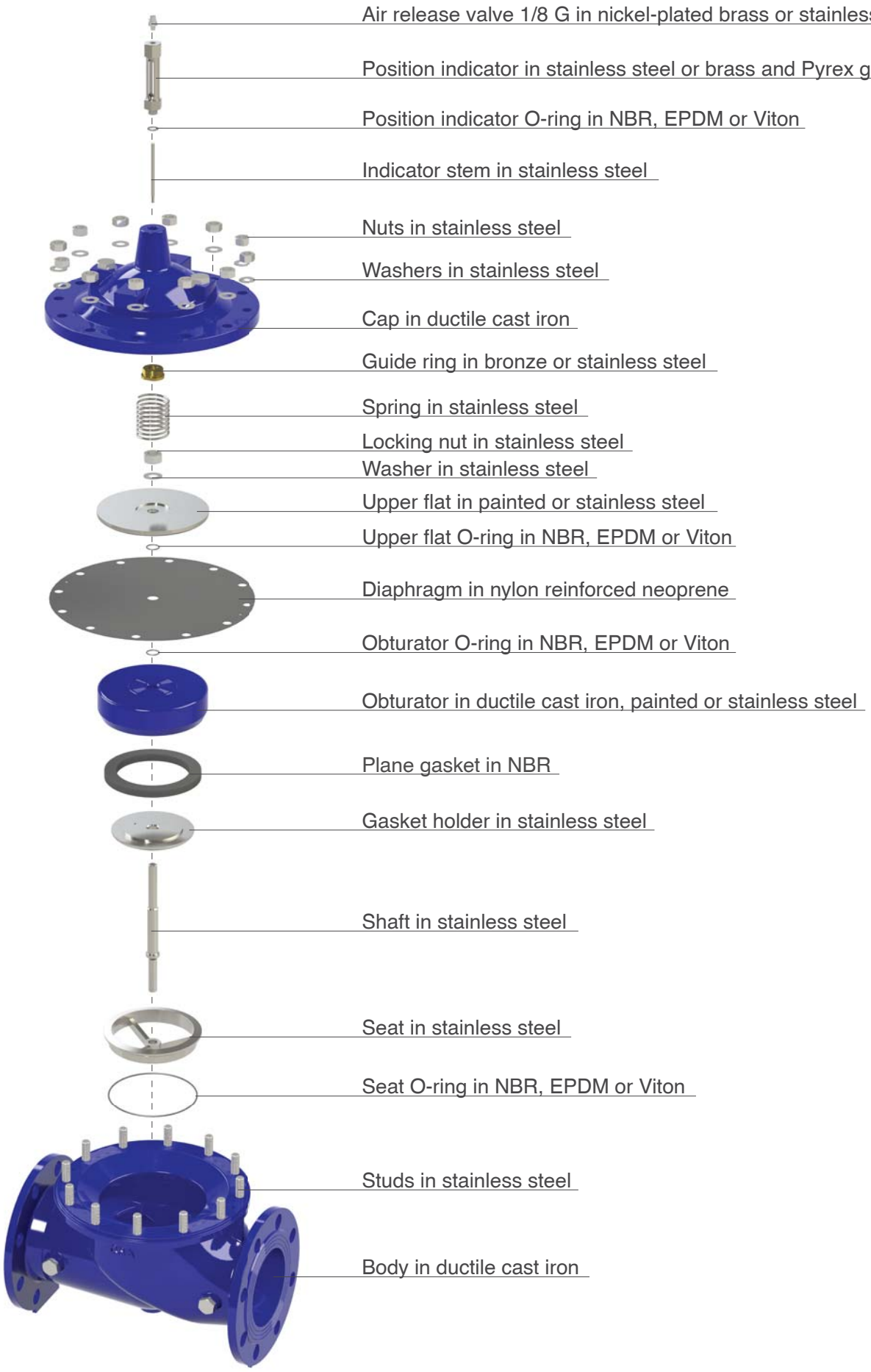
DN 40-DN 400 globe pattern.



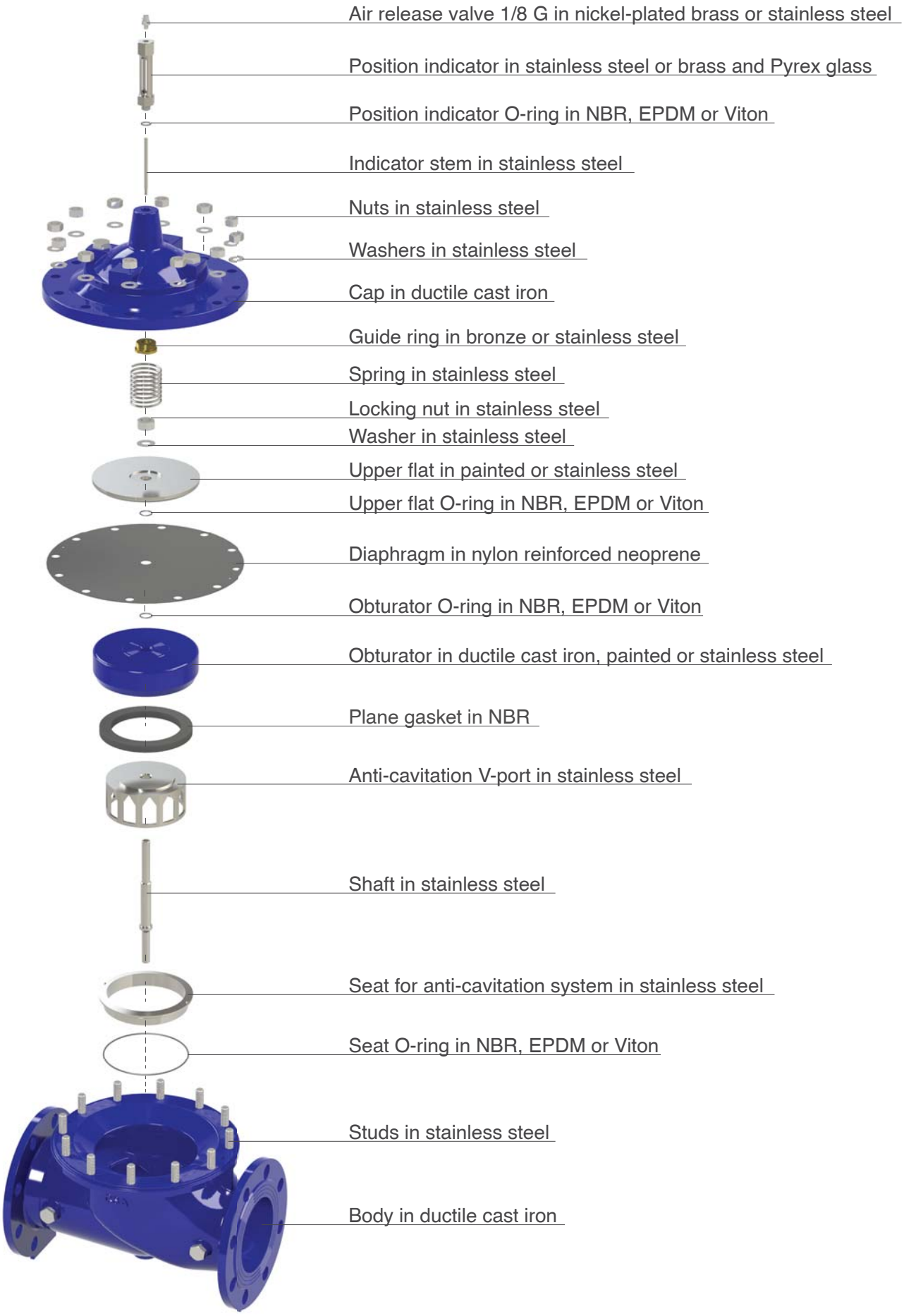
DN (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Weight (Kg)
40	230	162	83	233	30	18
50	230	162	83	233	30	18
65	290	194	93	255	30	23,5
80	310	218	100	274	30	28
100	350	260	118	316	30	39
125	400	304	135	383	30	47
150	480	370	150	431	30	84
200	600	454	180	523	30	138
250	730	570	213	620	40	264
300	850	710	242	670	40	405
400	1100	895	310	870	40	960

The dimension E in the picture above refers only to applications where it is necessary to add a flanged orifice downstream or upstream of the valve, for example for flow control or cavitation prevention.

Spare parts breakdown



Spare parts breakdown - Anti-cavitation version



Advanced testing facilities

Designed to reproduce real conditions of modern water distribution systems the CSA testing facility is able to assess the dynamic performances of automatic control valves, direct acting pressure control valves, air valves and anti water hammer valves.
Provided with a high capacity booster pumps station, and linked to an advanced high frequency pressure transducers and flow meters, the testing rig allows for a real time visualization of pressure and flow evolutions. Water hammer events can also be simulated and recorded to prove the efficacy of CSA fast acting relief valve, in addition to level control for which, using an auxiliary stilling tank, a part of the pipeline system is entirely dedicated.
The PLC and control station allows for the operation of step by step and solenoid operated valves to determine the sensitivity of such kind of application and pressure management solutions. Thanks to this important and powerful tool valves can be customized, simulated and set according to the project requirements assuring the perfect performance and accuracy.

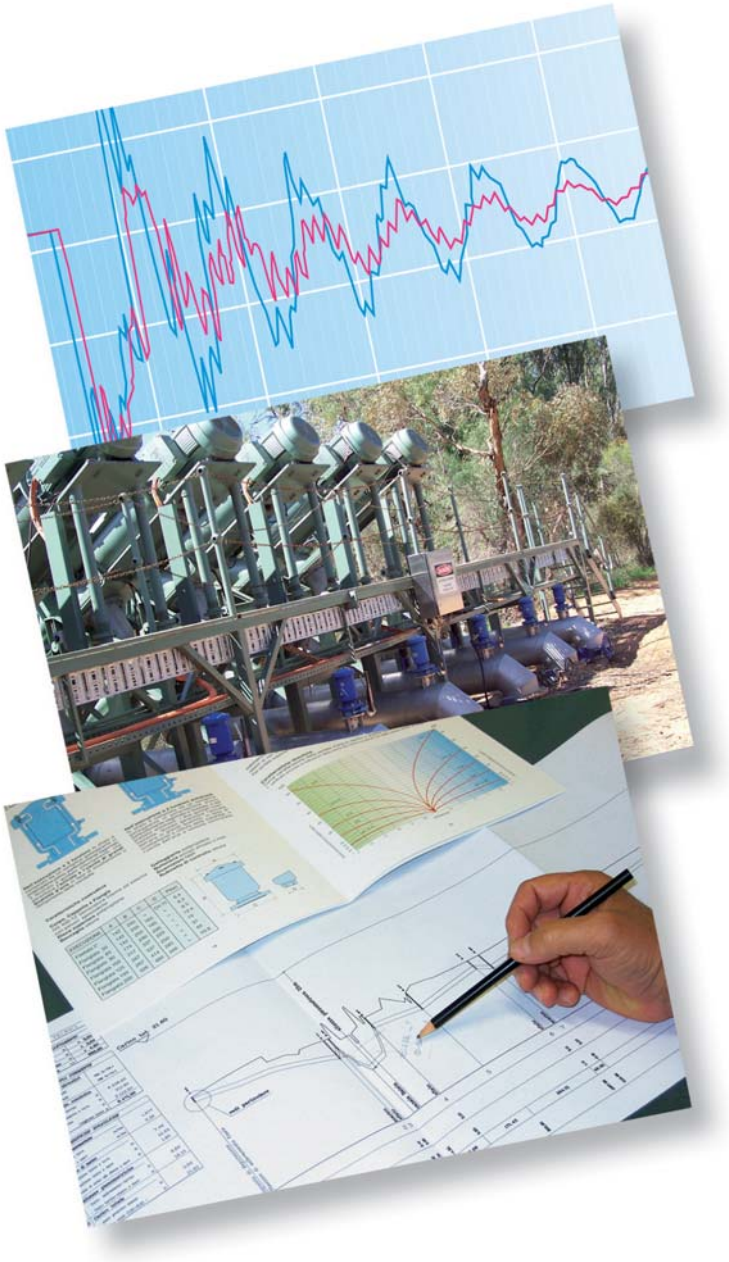
The testing process

All our valves undergo severe tests according to EN standards to ensure they are mechanically resistent, watertight, and high performing. After testing every valve is identified by means of a metallic tag or sticker, and duly registered and certified.

CSA HYCONSULT

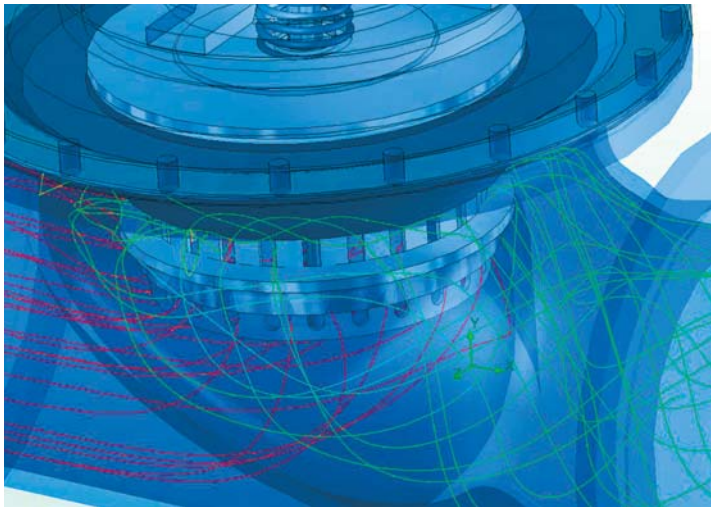
Water hammer analysis
CSA Hyconsult

CSA Hyconsult was founded to provide designers and consultants, involved in the design of water distribution and sewage systems, with accurate and unique technical support.
CSA Hyconsult has specialized in hydraulic modelling and transients analysis, entirely through the use of modern computational tools and advanced algorithms. Simulations are essential to predict system responses to events under a wide range of conditions without disrupting the actual system.
Using simulations, problems can be anticipated in possible or existing situations, and solutions can be evaluated in order to invest time, money and material in the most productive manner.



Research and innovation

CSA has always regarded knowledge as being indispensable for the kind of research that consistently feeds innovation at all levels. The R&D department at CSA constantly strives to improve product performance and continually searches for new solutions to meet our customer's needs. Twenty years of experience in valve design and sizing, supported by advanced computational tools, cooperation with external entities at the highest level, and test facilities for the verification of theoretical results which are available for our customers, guarantee our professionalism and reliability.



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