



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 the rapid growth of CSA 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.

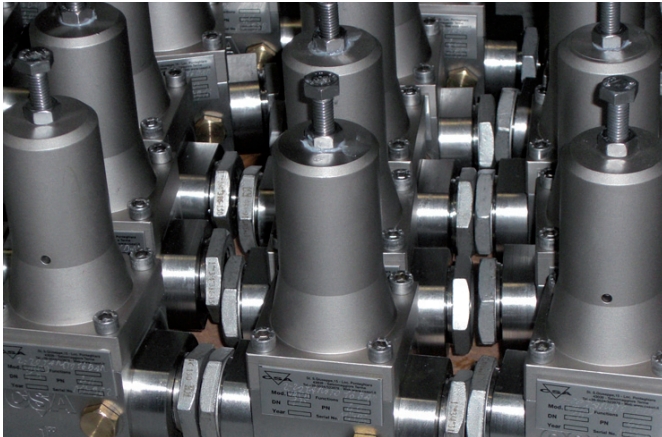
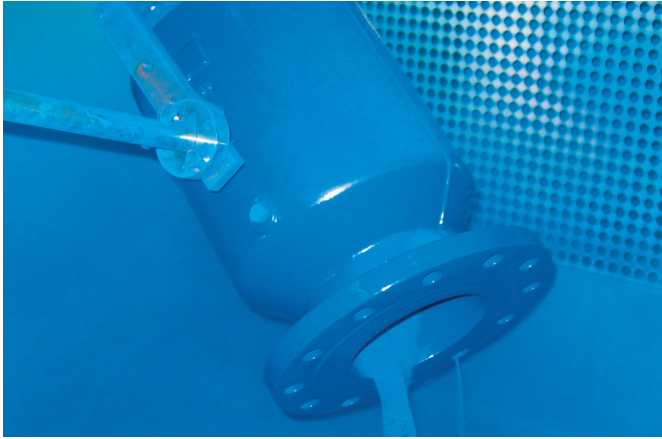
For this reason we have always aimed at developing a synergy between the various sectors of the company and thus ensuring:

- 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 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 450-10 or 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, pretreated 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.



**Ball float  
valves**



## Float valves Athena



### ▪ Equilibrium ball float valve with balanced single seat Mod. ATHENA

Direct acting level control valve. The body with three ways allows both the angle and globe pattern installations.

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### ▪ Equilibrium ball float valve with balanced single seat Mod. ATHENA 1"- 1" 1/4

Model with threaded connection. For the level regulation of small tanks and reservoirs.

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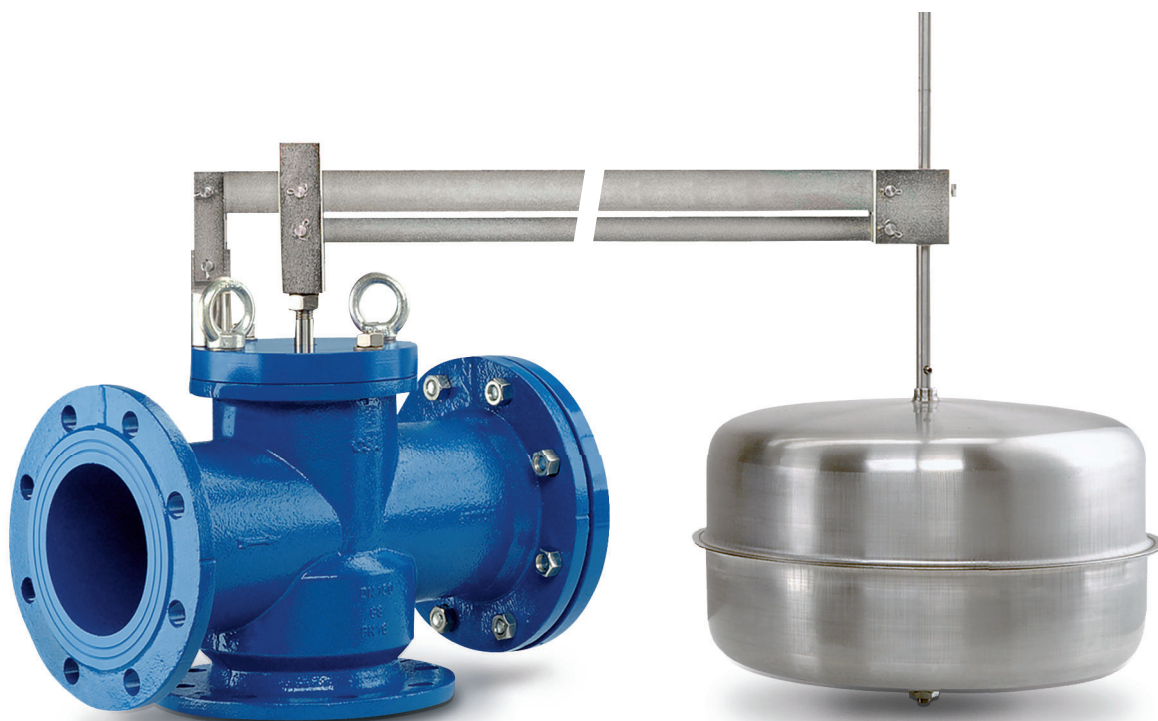
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## Equilibrium ball float valve with balanced single seat - Mod. ATHENA

The ATHENA is a single seat upstream pressure balanced equilibrium ball float valve, which automatically controls the constant level of a tank or reservoir, regardless of upstream pressure variations, and shuts off when the maximum level is reached. Thanks to its exclusive technology ATHENA brings the concept of reliability and performance to the highest standards.



### Technical features and benefits

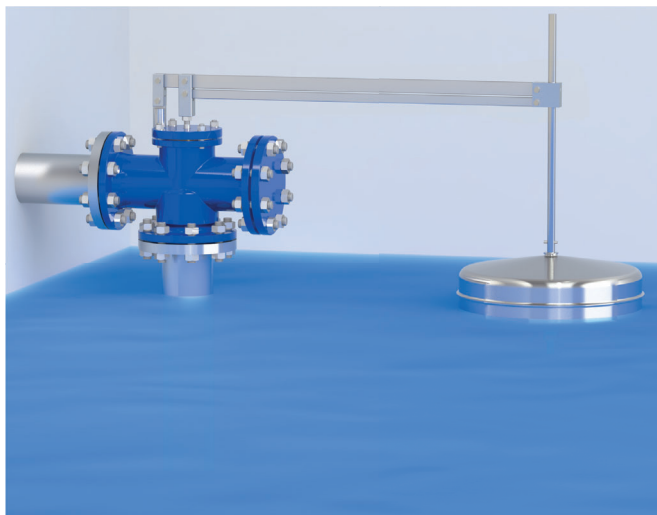
- Body in ductile cast iron with three ways, allowing the installation both with an angle or a globe pattern, containing an interchangeable sealing seat and piston in stainless steel and a guiding bush in bronze.
- Mobile block composed of the main shaft, obturator, gasket retainer and piston featuring a unique self-cleaning technology (pat. pending) to reduce the accumulation of dirt and maintenance operations.
- The lever mechanism, in zinc-plated or stainless steel, is obtained from a double rod (single rod for DN 40/50/65) which, by means of pivots, puts the shaft in communication with the float which imparts the movement allowing the opening or closing of the valve.
- A large float in stainless steel AISI 304/316 is connected to the lever mechanism by means of a stainless steel pipe, onto which it exerts a vertical force.
- The valves modulates and throttle the inflow proportionally to the consumption, accuracy and perfect water-tightness is guaranteed also with low pressure values.
- Thanks to the upstream pressure balanced seat the movement of the obturator and valve performance is not affected by upstream pressure fluctuations, transient and unwanted surges are therefore avoided.

### Applications

- Water distribution systems.
- Fire protection storage tanks.
- Irrigation systems.
- Whenever the constant level regulation and control function is required.

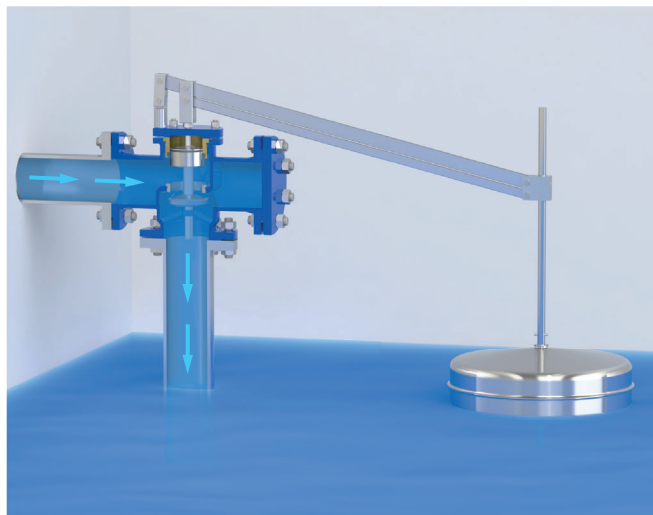
## Operating principle - Angle pattern installation

Athena ball float valve is the best solution for a constant maximum level control balancing the inflow and outflow demand. Driven by a large float in stainless steel the valve closes drip-tight at the maximum level, and modulates to maintain it as soon as it drops due to consumptions.



### Closed valve

When water level reaches the maximum operating point levers are perfectly horizontally aligned and the valve closes thanks to the upward force exerted by the float.

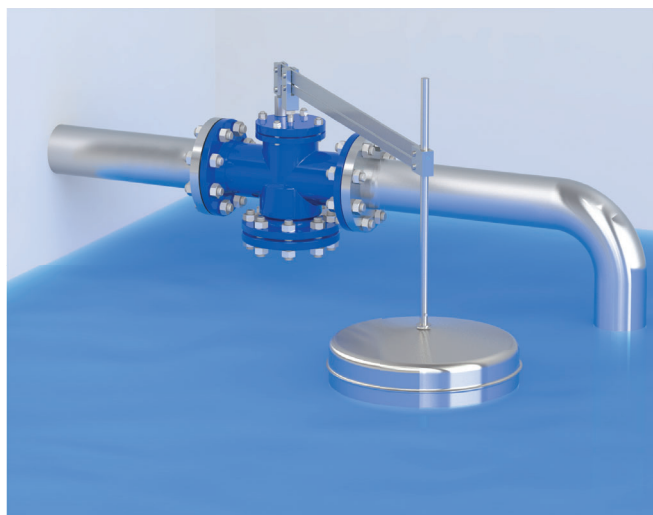
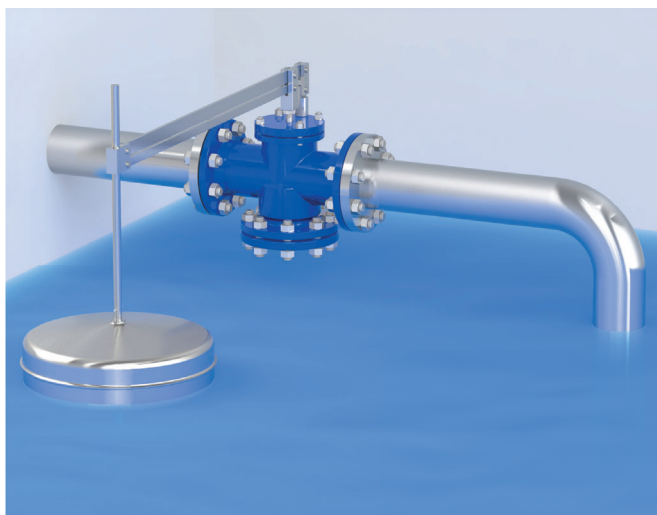


### Opened valve

As the reservoir level drops the valve opens proportionally through the levers, receiving a downward force from the float, to increase the filling rate.

## Globe pattern installation

The three ways body of Athena allows both the installations an angle and globe pattern, simply by placing the blank flange to the desired outlet. The lever mechanism is normally aligned with the valve axis. It is possible to rotate it on site, with an angle of 45°/90°, to fit the installation requirements.



## Optional



■ **Anti freezing device.** On request the valve is provided with a 3/8"G threaded outlet, which can be used as an anti-freezing device, simply by replacing the tap with a drainage ball valve discharging directly into the tank.

During the winter season, when the temperature drops consistently, the partial opening of the drainage port will create a flow circulation avoiding frost and possible damages related to it.



## Technical data



### Installation

- Make sure that the supply pipe has the flanges drilled according to the requested PN and that ATHENA is installed horizontally, properly fixed and sustained.
- Gate valves and filters have to be installed to allow for maintenance operations, and to prevent dirt from reaching the internal components of the valve.
- Position the valve in a place which is easy to reach and wide enough for maintenance and control purposes.
- Observe the overflow level and make sure that the outlet flange remains always above it, this is to avoid back-flow.
- In case of excessive  $\Delta p$ , to avoid cavitation and possible damages to the valve, a direct acting pressure reducing valve CSA VRCD series should be installed.

### Working conditions

Fluid: treated water.  
Maximum temperature: 70°C.  
Maximum pressure: 16 bar; contact CSA for higher values.

### Standard

Certified and tested in compliance with EN-1074/5.  
Flanges according to EN 1092/2.  
Epoxy painting applied through fluidized bed technology blue RAL 5005. Variations on flanges and painting on request.

DN mm	40	50	65	80	100	125	150	200	250	300
Kv (m³/h)/bar	21,6	21,6	46,8	68,4	108	155	245	360	648	1008

DN mm	40	50	65	80	100	125	150	200	250	300
Kv (m³/h)/bar	18,4	18,4	39,6	59,4	90	133	209	313	576	864

### Head loss coefficient for angle pattern

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

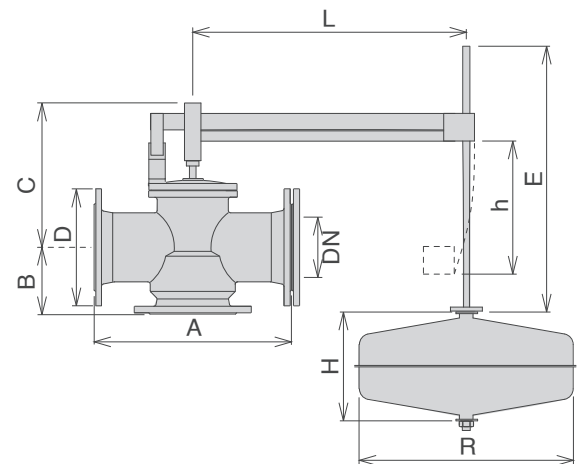
### Head loss coefficient for globe pattern

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

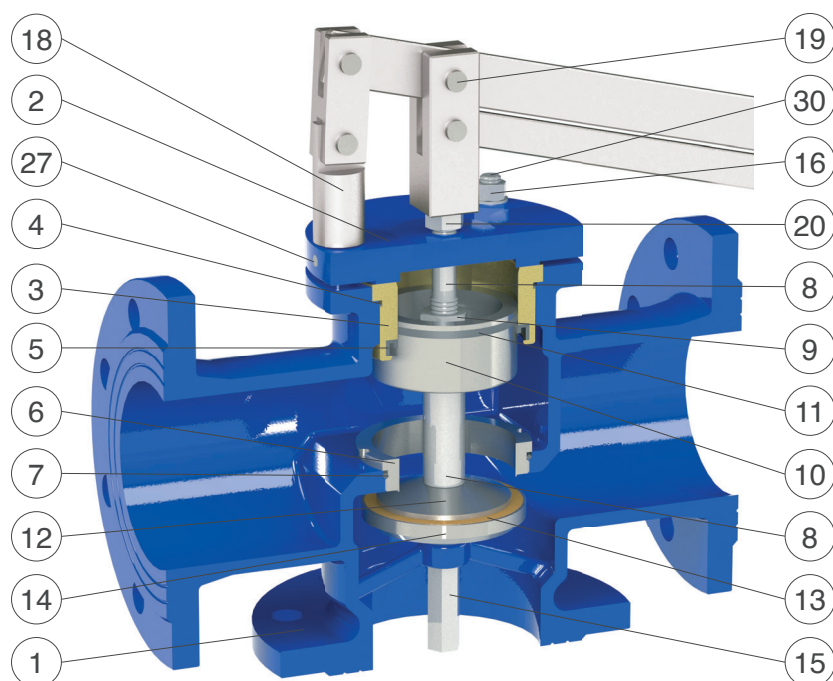
### Weights and dimensions

DN mm	A mm	B mm	C mm	D mm	L mm	H mm	R mm	h mm	E mm	Wt Kg
40	230	82,5	183	165	600	Ø220		145	525	21
50	230	82,5	183	165	600	Ø220		145	525	21
65	290	92,5	197	185	600	Ø220		205	525	26
80	310	100	230	200	830	200	300	250	600	33
100	350	125	250	220	830	180	400	220	600	41
125	400	125	250	250	830	180	400	221	600	49
150	480	162	371	285	1000	250	400	400	540	79
200	600	183	420	340	1000	250	400	300	540	118
250	730	273	540	405	1220	300	500	510	945	215
300	850	300	620	460	1400	400	500	615	1042	250

All values are approximate, consult CSA service for more details.



## Technical details



Athena DN 40/50-65

N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 450-10	
2	Cap	painted steel	
3	Guiding bushing	bronze CuSn5Zn5Pb5 (painted steel for DN 250-300)	stainless s. AISI 304/316
4	O-ring	NBR	EPDM/Viton
5	Lip gasket	NBR	EPDM/Viton
6	Seat	stainless steel AISI 304	stainless steel AISI 316
7	O-ring	NBR	EPDM/Viton
8	Guiding shaft	stainless steel AISI 303	stainless steel AISI 316
9	Blocking nut	stainless steel AISI 304	stainless steel AISI 316
10	Piston	stainless steel AISI 303	stainless steel AISI 316
11	Guiding ring	PTFE	
12	Counter-seat	stainless s. AISI 303 (painted steel for DN 250-300)	stainless s. AISI 304/316
13	Plane gasket	NBR	polyurethane
14	Obturator	stainless s. AISI 303 (AISI 304 for DN 200-250-300)	stainless steel AISI 316
15	Tightening nut	stainless steel AISI 303	stainless steel AISI 316
16	Nuts (or screws) and washers	stainless steel AISI 304	stainless steel AISI 316
17	Upper coupling	zinc-plated steel	stainless s. AISI 304/316
18	Lower coupling	zinc-plated steel	stainless s. AISI 304/316
19	Pivots	stainless steel AISI 303	stainless steel AISI 316
20	Blocking nut	stainless steel AISI 304	stainless steel AISI 316
21	Shaft pivot	zinc-plated steel	stainless s. AISI 304/316
22	Upper lever	zinc-plated steel	stainless s. AISI 304/316
23	Lower lever (from DN 80)	zinc-plated steel	stainless s. AISI 304/316
24	Float coupling (from DN 80)	zinc-plated steel	stainless s. AISI 304/316
25	Float rod	stainless steel AISI 304	stainless steel AISI 316
26	Float	stainless steel AISI 304	stainless steel AISI 316
27	Plug (screw from DN 150 to 300)	stainless steel AISI 304	stainless steel AISI 316
28	Elastic pin (from DN 80)	stainless steel AISI 304	
29	Screw	stainless steel AISI 304	stainless steel AISI 316
30	Studs (from DN 150 to 300)	stainless steel AISI 304	stainless steel AISI 316

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





## Equilibrium ball float valve with balanced single seat - Mod. ATHENA 1"- 1 1/4"

The ATHENA 1" - 1 1/4" is an equilibrium, single seat upstream pressure balanced float valve, which automatically controls the constant level of a tank or reservoir, regardless of upstream pressure variations, and shuts off when the maximum level is reached. Thanks to its exclusive technology this valve brings the concept of reliability and performance to the highest standards.



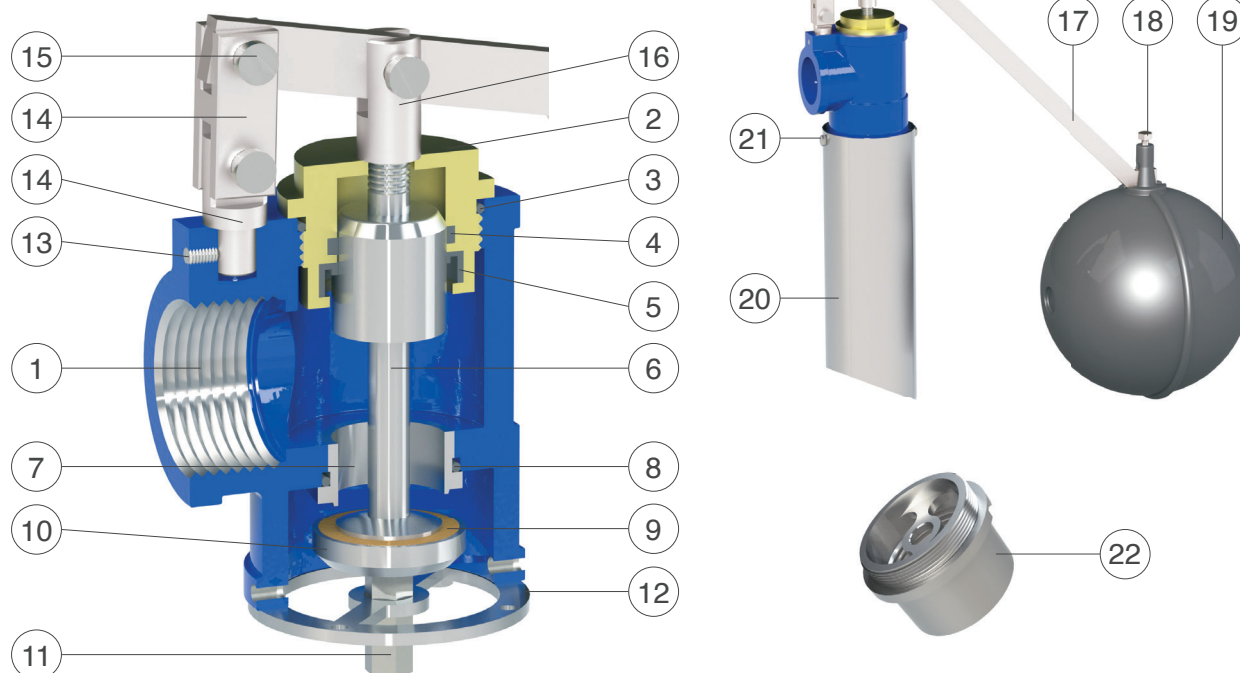
### Technical features and benefits

- Body in ductile cast iron PN 16.
- Cover in brass or stainless steel provided with the self cleaning piston technology driving system.
- Mobile block containing the piston and obturator, both in stainless steel.
- The lever mechanism is made in zinc-plated or stainless steel and composed of a rod which, thanks to a system of pivots, puts the main shaft in communication with the float allowing the opening or closing of the valve.
- Designed for angle pattern installation only and to allow flow conveyance through the outlet.
- The valves modulates and throttle the inflow proportionally to the consumption, accuracy and perfect water-tightness is guaranteed also with low pressure values.
- Thanks to the upstream pressure balanced seat the movement of the obturator and valve performance is not affected by upstream pressure fluctuations, transient and unwanted surges are therefore avoided.
- Pipe (available on request) Ø 76,1X1,5 mm in stainless steel to convey the flow towards the tank.

### Applications

- Water distribution systems.
- Fire protection storage tanks.
- Irrigation systems.
- Whenever the constant level regulation and control function is required.

## Technical details



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 450-10	
2	Cap	stainless steel AISI 303	stainless s. AISI 316
3	O-ring	NBR	EPDM/Viton
4	Guiding ring	PTFE	
5	Gasket	NBR	EPDM/Viton
6	Piston with shaft	stainless steel AISI 303	stainless steel AISI 316
7	Seat	stainless steel AISI 303	stainless steel AISI 316
8	O-ring	NBR	EPDM/Viton
9	Plane gasket	NBR	polyurethane
10	Obturator	stainless steel AISI 303	stainless steel AISI 316
11	Tightening nut	stainless steel AISI 303	stainless steel AISI 316
12	Lower guiding ring	stainless steel AISI 304	stainless steel AISI 316
13	Plug	stainless steel AISI 304	stainless steel AISI 316
14	Upper and lower coupling	zinc-plated steel	stainless s. AISI 304/316
15	Pivots	stainless steel AISI 303	stainless steel AISI 316
16	Shaft coupling	zinc-plated steel	stainless steel AISI 316
17	Float lever	zinc-plated steel	stainless steel AISI 316
18	Screw	zinc-plated steel	stainless s. AISI 304/316
19	Float	polyethylene	stainless steel
20	Conveying pipe (optional)	stainless steel AISI 304	stainless steel AISI 316
21	Screws (optional)	stainless steel AISI 304	stainless steel AISI 316
22	Threaded outlet insert	stainless steel AISI 304	stainless steel AISI 316

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

## Working conditions and head loss

Fluid: treated water.

Maximum temperature: 70°C.

Maximum pressure: 16 bar.

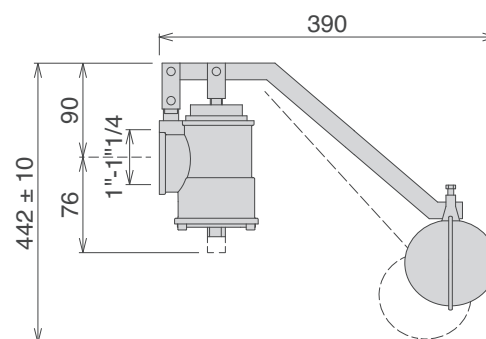
The Kv of the valve, meaning the flow rate expressed in m<sup>3</sup>/h producing a head loss of 1 bar, is 12,6.

## Standard

Certified and tested in compliance with EN 1074/5.

Threaded BSP connections.

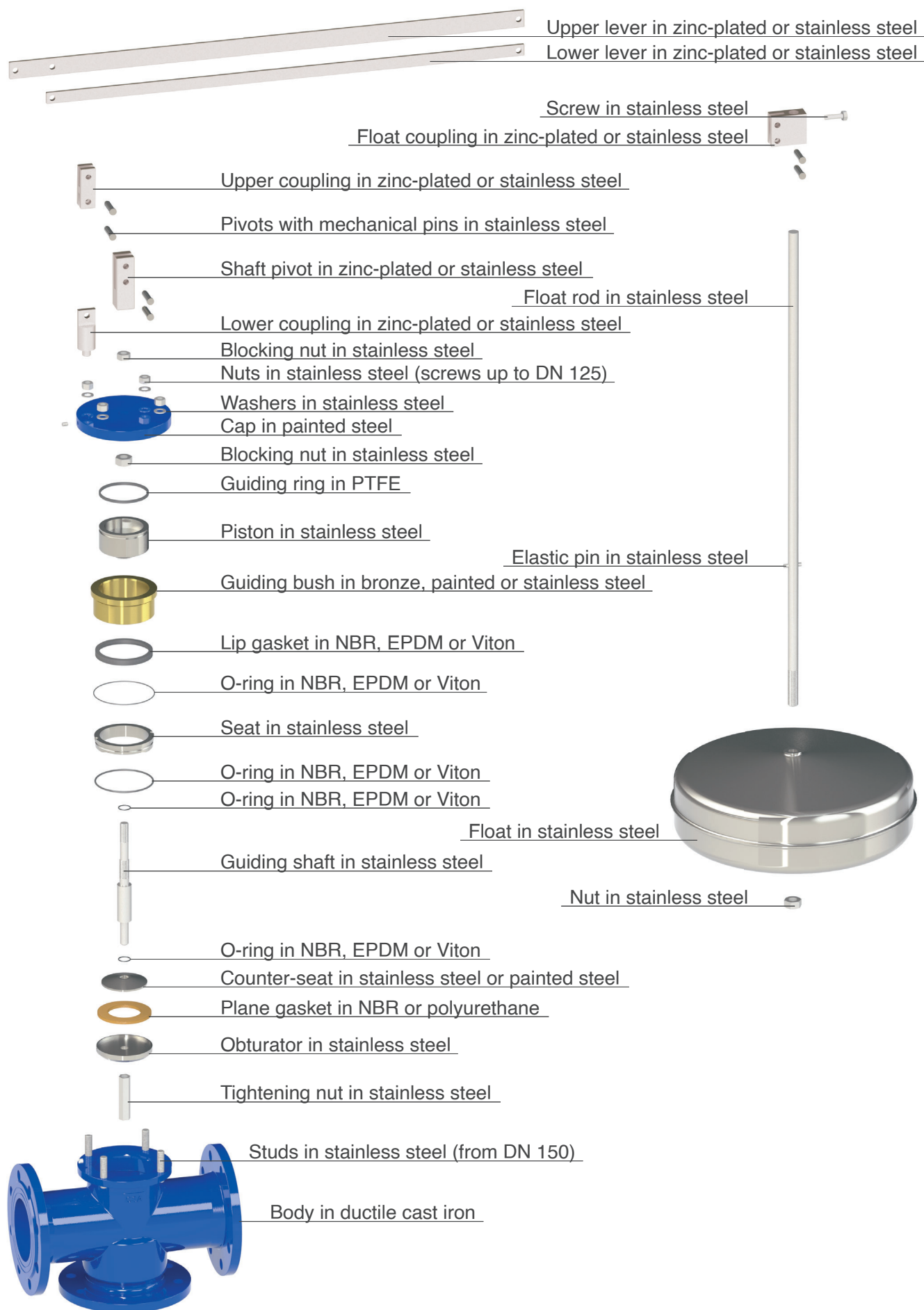
Epoxy painting applied through fluidized bed technology blue RAL 5005.



Values are approximate, consult CSA for more details.



## Spare parts breakdown



## Spare parts breakdown

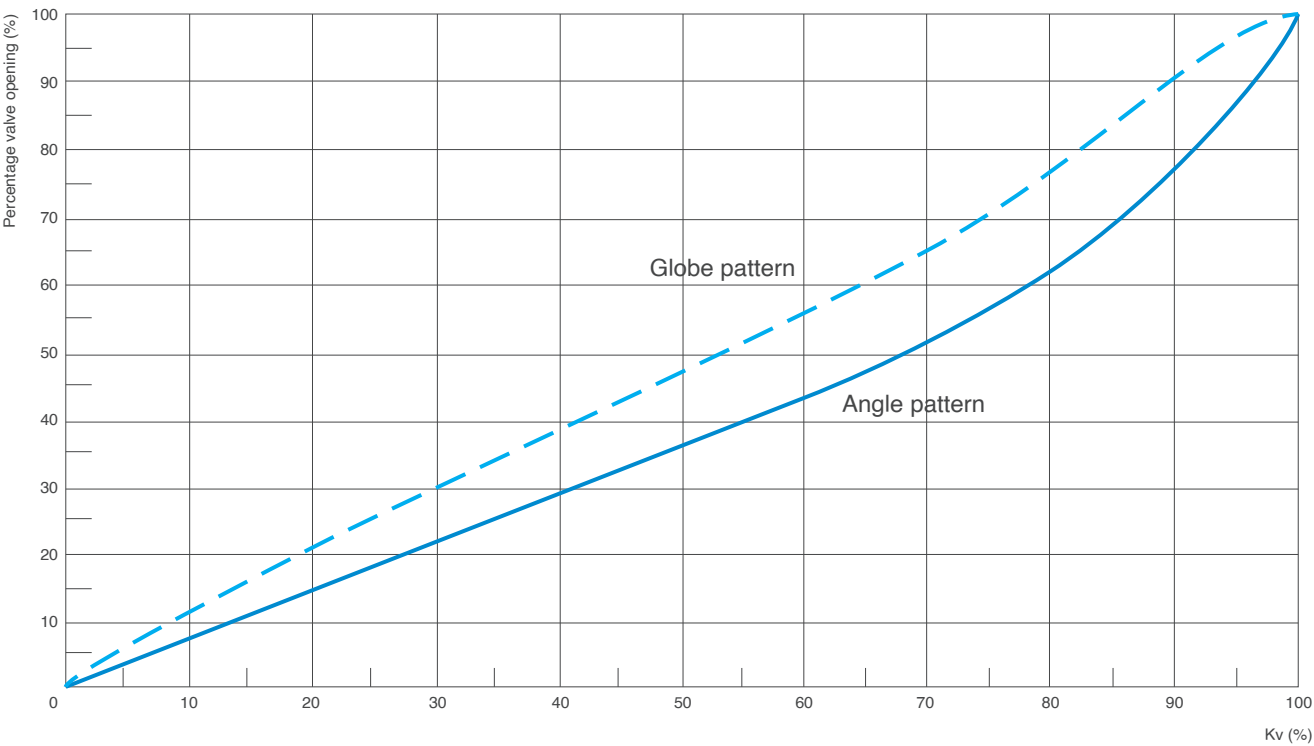






### Kv to valve opening chart

The following chart shows the opening percentage of Athena valves versus the Kv.



### Recommended flow rate

The following chart shows the recommended flow rate for the proper sizing of Athena valves.

#### Athena - angle pattern

DN (mm)	40/50	65	80	100	125	150	200	250	300
Flow rate min. (l/s)	0,3	0,5	0,8	1,2	1,9	2,7	4,8	7,4	11
Flow rate max. (l/s)	6,4	10	16	25	40	58	103	161	233
Emergency (l/s)	7,8	13	20	31	49	70	125	196	282

#### Athena - globe pattern

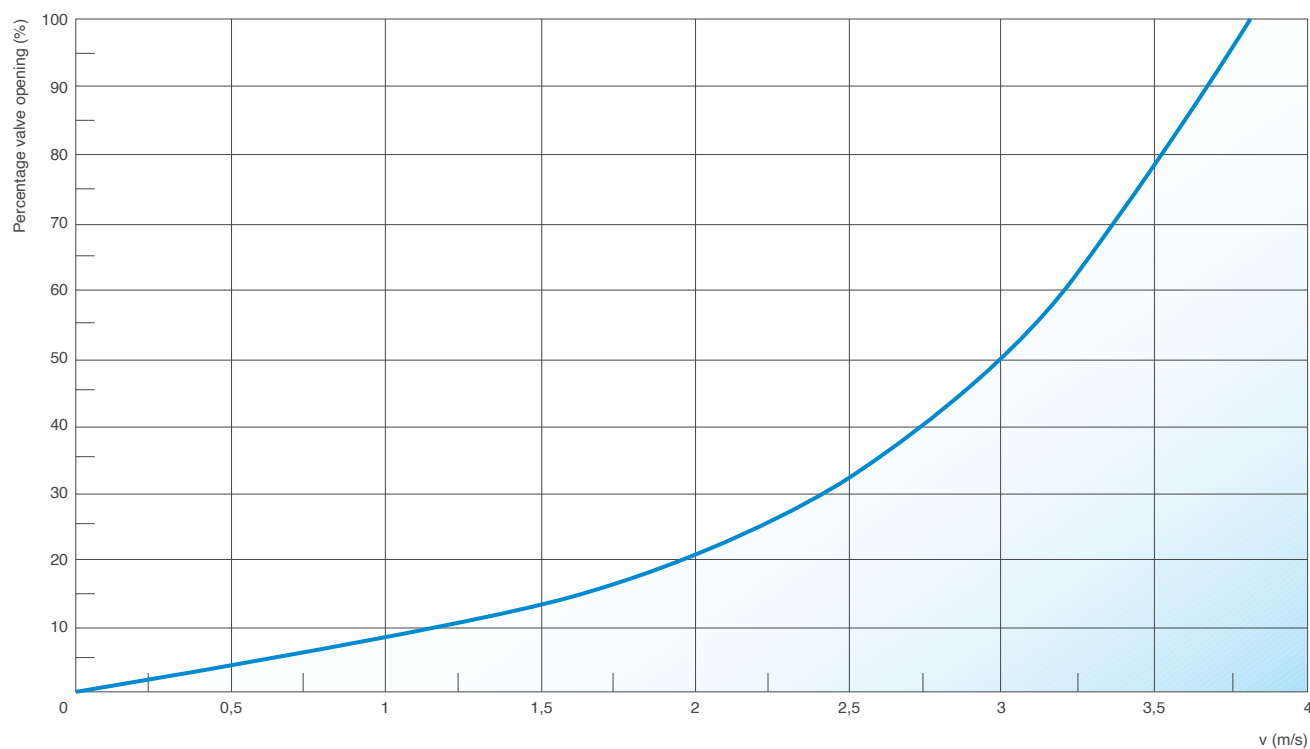
DN (mm)	40/50	65	80	100	125	150	200	250	300
Flow rate min. (l/s)	0,4	0,7	1,1	1,6	2,5	3,6	6,3	9,9	15
Flow rate max. (l/s)	5,1	8,6	13	20	31	45	81	127	183
Emergency (l/s)	6,4	10	16	25	40	58	103	161	233

#### Athena 1" - 1" 1/4

Flow rate min. (l/s)	0,1
Flow rate max. (l/s)	1,9
Emergency (l/s)	2,4

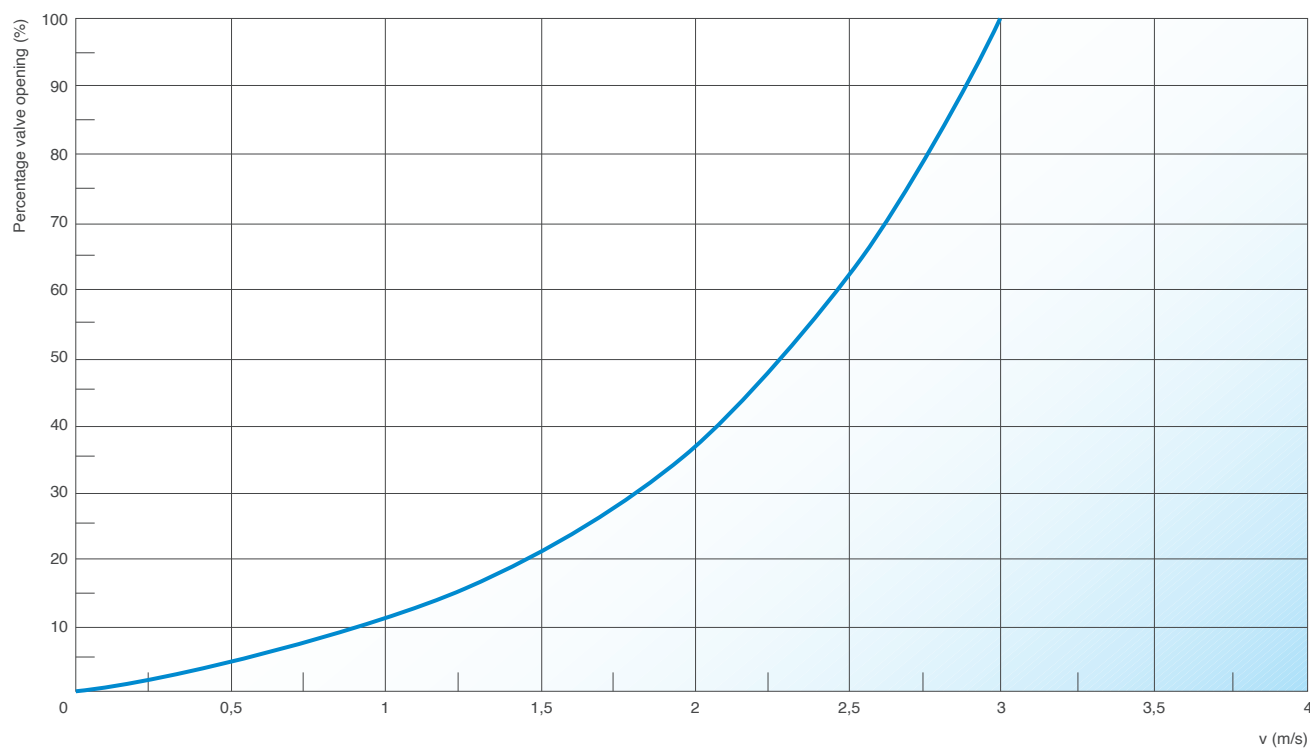
## Velocity chart to opening - Angle pattern

The following chart shows the maximum recommended velocity, versus opening percentage, to avoid cavitation.



## Velocity chart to opening - Globe pattern

The following chart shows the maximum recommended velocity, versus opening percentage, to avoid cavitation.





### Advanced testing facilities

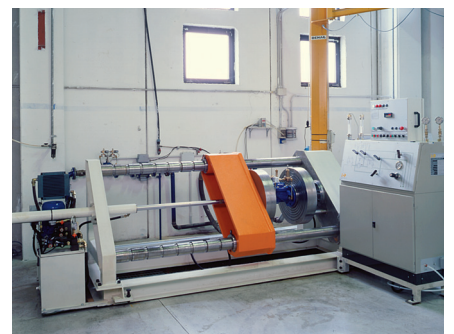
Designed to reproduce real conditions of modern water distribution systems the CSA testing facility is able to assess the dynamic performances of automatic control valves, direct acting pressure control valves, air valves and anti water hammer valves.

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 resistant, 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.

