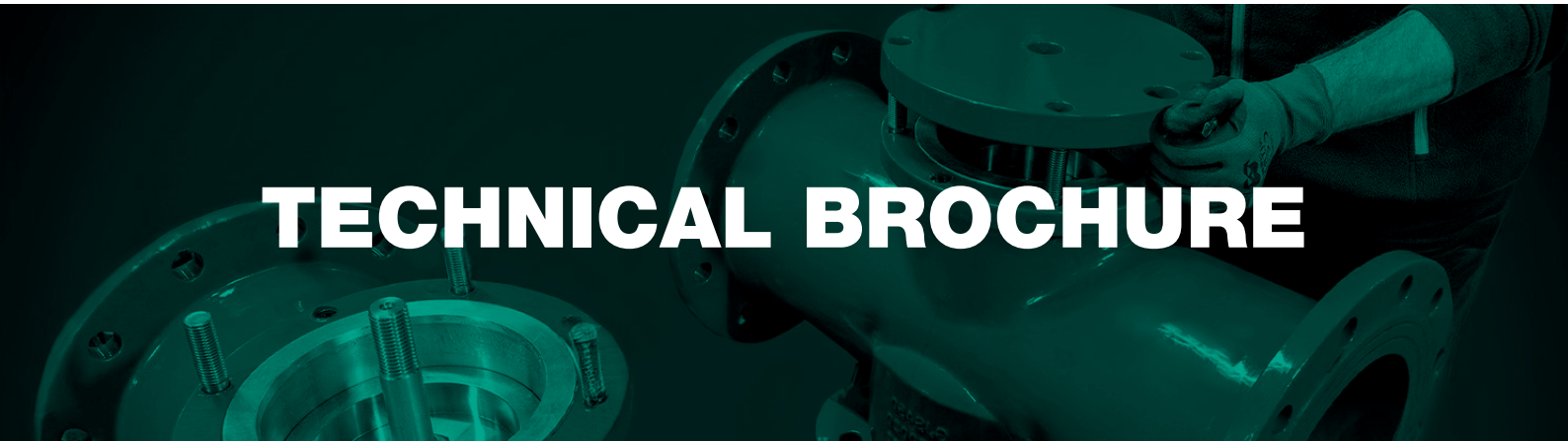
Pietro Fiorentini

H-ASX

Control valves



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H-ASX_technicalbrochure_ENG_revA

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Control valves

H-ASX 300 series

The H-ASX control valve series features a needle-type body with axial flow, hydraulically operated through pilot systems. It includes the exclusive GR.I.F.O II unit flow control device, a filter with a large mesh surface, and an innovative body design that allows installation in any orientation. Entirely made of ductile cast iron, with internal components in stainless steel, the valve is engineered to perform a wide range of functions, including pressure reduction, relief and sustaining, flow control, level control, and more. Each function can be achieved simply by modifying the control circuit and combining different pilot configurations.

Technical features and benefits

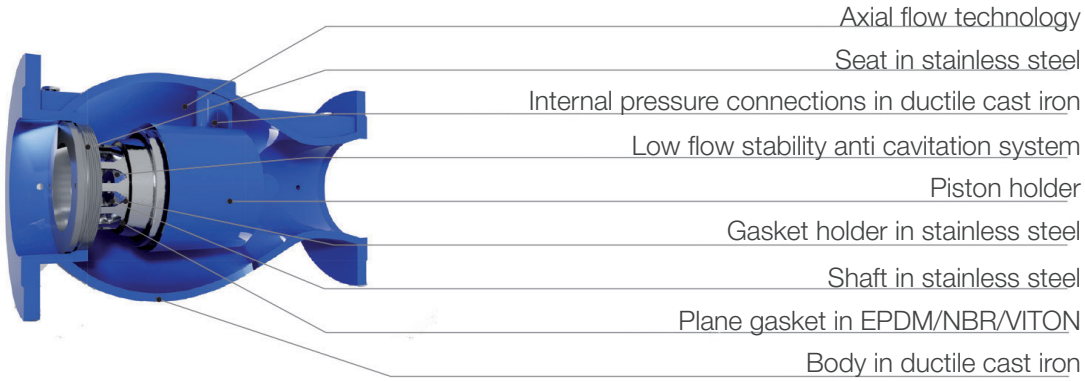
- Axial flow pattern body in ductile cast iron,rated for PN 25 bar, with a globe pattern design compliant with EN 1074 standards. Available in sizes from DN 50 mm to DN 600 mm.
- Large filter in stainless steel AISI 316
- Stainless steel seat and moving block, designed with low-flow stability and anti-cavitation systems.
- Designed to reduce head loss and minimize turbulence across a wide flow range.
- Piston actuated with reduced maintenance.
- Silent operation and vibration-free performance, suitable for buildings and urban applications.
- Reliable and innovative technology to minimize and reduce the complexity of standard control valves therefore the risk of failure.
- Various configurations of the modulating assembly are available, particularly concerning the seat and gasket holder, to ensure excellent resistance to cavitation, high stability at low flow rates, and effective noise reduction.

Applications

- Main transmission lines and water distribution networks
- Industrial plants
- Irrigation
- Cooling system
- Buildings

Technical features

The mobile block consists of the obturator, shaft, and gasket holder. The gasket holder is available in different versions, specifically engineered to ensure maximum accuracy and optimal performance based on sizing results, cavitation resistance, and specific design requirements.



AC version for low-flow stability and cavitation prevention

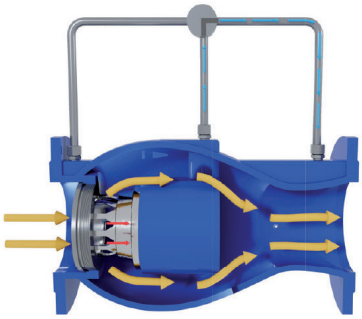
The anti-cavitation trim AC mobile block includes the seat and gasket holder (1a, 2a), designed to increase the allowable pressure ratio and resistance to cavitation. At the same time, it enhances valve stability to ensure maximum accuracy, even under no-flow conditions.

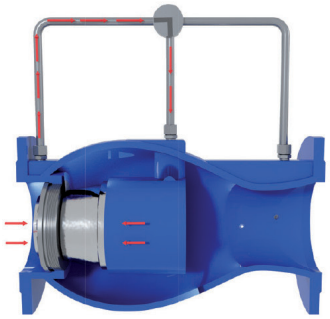
CP anti-cavitation version

The CP system features a different seat and gasket holder (1b, 2b), engineered for double energy dissipation between upstream and downstream. The holes can be customized according to the specific project requirements and desired performance.

Operating principle

on-off mode



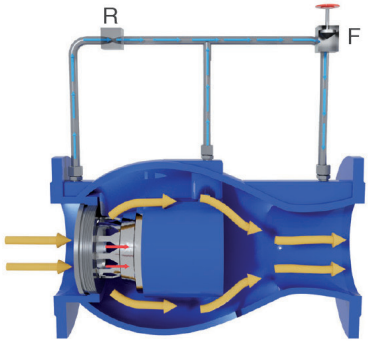


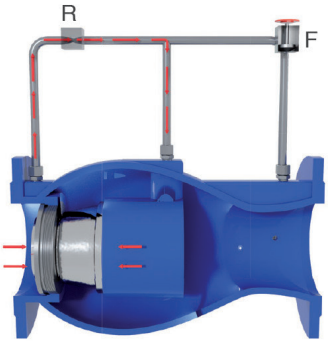
Valve opening
If the pressure inside the control chamber is vented to the atmosphere or another lower-pressure zone, the upstream pressure will act on the obturator, pushing it upwards and allowing the valve to fully open.

Valve isolated from the line
If the control chamber is isolated from the line pressure and the rest of the circuitry, the valve will remain in its current position, thus producing the head loss corresponding to that percentage of opening.

Valve closing
If the control chamber is connected to the upstream pressure, due to the difference in area between the larger upper diaphragm and the smaller obturator underneath, the valve will close completely.

Modulating mode





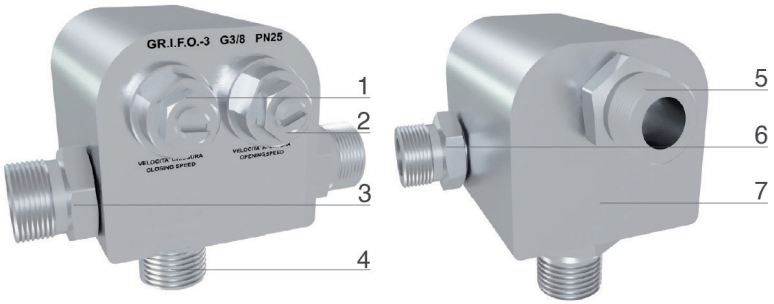
Valve opening
When modulation of the main valve is required, a restriction (R) must be installed between the upstream line pressure and the control chamber, along with a regulator (F) in the circuit. If the regulator opens fully, the pressure in the control chamber will be connected to the downstream, allowing the main valve to open completely.

Valve modulating
If the flow regulator (F) is throttled, pressure will build up between it and the control chamber, causing the valve to modulate to an intermediate position. This modulation is achieved thanks to the pressure difference created by the restriction (R) and the difference in surface area between the upper flat acting on the diaphragm and the obturator.

Valve closing
If the flow regulator (F) is completely closed, the upstream line pressure is fully diverted to the main control chamber. The mobile block is then actuated by the force exerted on the upper surface of the diaphragm, pushing the obturator down onto its seat and stopping the flow through the main valve.

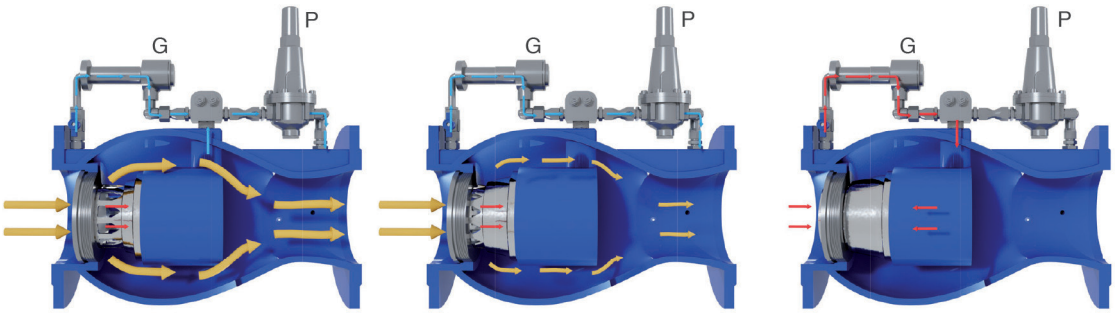
GR.I.F.O. II flow control device

Our exclusive unit flow control device GR.I.F.O. II (patent pending) has been designed to enhance flow stability and accuracy in hydraulic control valves of the H-ASX series. This is achieved through a combination of proprietary, smartly adjustable needle valves and integrated check valves. Entirely built in stainless steel, GR.I.F.O. II is corrosion-resistant, compact, and equipped with multiple pressure outlets. It offers an exceptional range of regulation while significantly reducing circuit complexity compared to other solutions available on the market. GR.I.F.O. It consists of two independently adjustable stainless steel needle flow stabilizer valves with integrated check valves. These allow for precise control of the main valve's response time, as well as independent adjustment of opening and closing speeds.



1. Closing speed regulation
2. Opening speed regulation
3. 3/8 G pressure outlet
4. 3/8 G pressure outlet
5. 3/8 G pressure outlet
6. 3/8 G pressure outlet
7. Construction in stainless steel AISI 316

Modulating for pressure reduction



Valve opening

If the downstream pressure drops below the preset and adjustable set point of the pilot (P), the pilot will open, allowing flow and pressure to be released from the main control chamber. As a result, the mobile block will be lifted, increasing the opening between the obturator and the seat in an effort to restore the desired downstream pressure.

Valve modulating

As demand gradually changes, the pilot (P) continuously regulates the flow into and out of the main chamber to compensate for pressure variations. The mobile block mirrors the pilot's movements, modulating the opening between the seat and the obturator to create the necessary head loss for pressure reduction.

Valve closing

If the downstream pressure rises above the pilot's (P) set point, the pilot will close, allowing pressure to build up inside the main chamber. This pressure forces the mobile block downward in an attempt to restore the desired downstream pressure. Under static conditions, the pilot remains fully closed, and the valve maintains the set downstream pressure.

Control valve configurations series **H-ASX**

H-ASX control valves series can be used in different configurations and applications depending on the circuits, pilots and other accessories that are installed.

The main functions you can perform are:

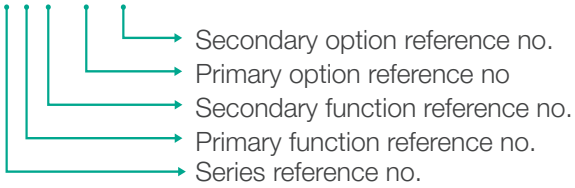
- Pressure reduction
- Support/relief of upstream pressure
- Flow control
- Level control
- Electronic remote control

The high versatility of H-ASX control valves allows them to be configured to perform several combined functions.

Nomenclature

The nomenclature of H-ASX control valves is defined according to the configuration of the piloting system and their function:

H-ASX 300-X-X



Function reference no.

- 1 - Pressure reduction
- 2 - Pressure support/relief
- 3 - Flow control
- 4 - Min. - max. level control
- 5 - Solenoid control (remote control)
- 6 - Constant level control
- 7 - Altitude control

Options reference no.

- G - With Stand-by pilot
- M - With actuator on the pilot
- ND - Night and Day (with 3 different settings)
- H - High sensitivity pilot flow control function
- P - Night and Day with external Bluetooth programmer
- T - Management via Scada system or external PLC
- R - Relief
- S - Support
- P- on/off function with battery-powered controller
- FR - Anti-backflow function (use of anti-backflow valve) on the pilot circuit

Main configurations

The main configurations of the H-FLUX series are:

Pressure reduction

- H-ASX 310 for **pressure reduction and stabilisation**

Electronic remote control

- H-ASX 353 **remotely controlled with step-by-step adjustment**

Other configurations on request.

Accessories

For control valves

- Anti-cavitation seats
- Limit switches
- Position transmitter
- Stroke limiters

For the pilot circuit

- GR.I.F.O. II adjustment unit
- MRV stand-by pilot
- MRV2 pressure modulation pilot
- MSM upstream pressure relief pilot
- MLP flow limitation pilot
- MPZ high-sensitivity altitude pilot
- 2-way and 3-way auxiliary valves mod. A2 and A3
- Minimum and maximum ROTOWAY levels control pilot
- MCP constant level control pilot
- Flow-regulating needle valves
- Additional filter
- Autonomous battery-operated programmer
- Solenoid valve appl. for remote control
- Pressure gauges

Pressure reducing and stabilizing control valve **H-ASX 310**

The H-ASX is an axial flow, hydraulically operated automatic control valve designed to reduce and stabilize downstream pressure at a constant value, regardless of fluctuations in demand or upstream pressure conditions. Typically equipped with a low-flow stability and cavitation-reduction cage, the H-ASX is entirely made in ductile cast iron with an FBT epoxy coating and stainless steel internal components. Thanks to its exclusive axial flow pattern, the valve is engineered to minimize head loss, noise, and cavitation damage.

Applications

- Downstream of pumps, to reduce the pressure on the main supply line
- Installed in derivation from the main line, to stabilize the pressure of secondary line and water users
- As a protection against pressure increases in industrial equipment and civil installations
- On the inlet supply line of storage tanks, to stabilize pressure and flow required for the level control
- On each floor of buildings, in irrigation systems, and wherever pressure reduction is required.

Downstream pressure pilot adjustment range

- Blue spring: 0.7 to 7 bar
- Red spring: 1.5 to 15 bar
- Values lower than 0.7 available with high sensitivity pilots

Note to the engineer

- Inlet and outlet pressure, and flow rate are required for the proper sizing
- The valve can be installed either horizontally or vertically; for sizes above 200 mm, horizontal installation is recommended
- A minimum length of 3 DN downstream of the valve is recommended for the best accuracy

Additional features

- H-ASX 310-FR downstream pressure reducing with back-flow prevention
- H-ASX 310-H downstream pressure reducing with high sensitivity pilot
- H-ASX 310-G downstream pressure reducing with over pressure guard

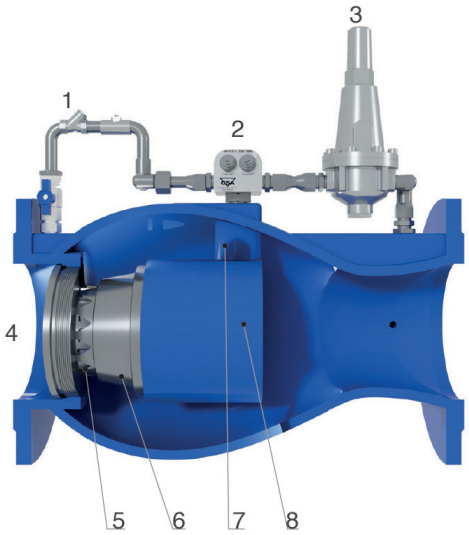
Working conditions

Treated water	Maximum temperature 70°C
Maximum operating pressure	25 bar
Minimum operating pressure	0.7 bar

Operating principle

The H-ASX is an automatic control valve operated by a two-way pilot (3) made of stainless steel AISI 316, featuring a preset and adjustable set point. When the downstream pressure rises above the pilot's set point, the pilot throttles and limits the flow directing inlet pressure to the main chamber (8). This action pushes the obturator (6) down toward the seat (4), creating the head loss necessary for the valve to reduce and stabilize the downstream pressure at a constant value.

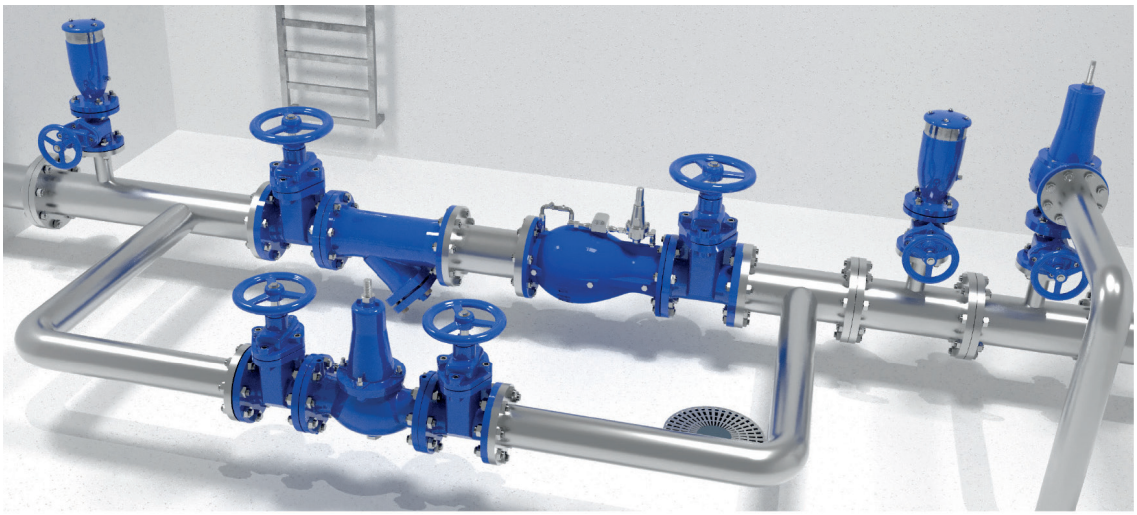
If the downstream pressure falls below the pilot's set point, the obturator (6) moves according to the flow direction, increasing the passage through the seat (4). This reduces the head loss and allows the pressure to rise.The flow into and out of the main chamber (8) is controlled by the regulation unit with filter GR.I.F.O. II (2), which includes needle valves and flow stabilizers essential for the valve's response time and accuracy, even during rapid demand variations.



The large filtration unit (1) ensures long-lasting performance while minimizing maintenance requirements.

Installation layout

The H-ASX 310 installation lay-out includes sectioning devices, a filter to prevent dirt from reaching the control valve and a by-pass for maintenance operations. The direct-acting pressure reducing valve W-VAL HP is the ideal choice for the bypass, thanks to its high reliability even after extended periods of inactivity. Anti-surge combination air valves WAVE 3S-AWH are recommended upstream and downstream In addition, a H-PVS 90F pressure relief valve should be installed downstream to avoid pressure increases in the main line.



Remotely controlled needle valve with step-by-step regulation **H-ASX 353**

The H-ASX 353 automatic needle valve opens and closes in response to pulses sent to two normally closed solenoids. Thanks to the needle valves included in the circuit, the closing and opening speeds of the valve can be adjusted independently of each other, to ensure smooth and accurate operation. Typically supplied with a manual emergency circuit to intervene when the solenoids are not functioning, and equipped with a 4-20 mA position indicator, the valve has been designed to reduce pressure drops, vibrations and damage related to the cavitation phenomenon.

Applications

- in combination with programmers, to regulate pressure according to flow rate variations, with the aim of reducing losses
- On tank supply lines, for constant or variable level control
- In heating and cooling systems, to regulate flow based on temperature changes

Solenoid valve data

- Voltage: 24 V DC, 24 V/50 Hz, 230 V/50 Hz. Other voltage on request
- Electrical consumption: inrush AC (VA) 24, hold AC (VA) 17 (8 W), DC hot/cold coil 8/9 W

Note to the designer

- The different modulation systems guarantee accurate regulation even with low flow rates and high pressure differentials
- Recommended flow rates and operating conditions are given in the H-ASX valve catalogue
- The duration of the pulses sent to the solenoids varies depending on the valve size and operating conditions

Optional configurations

- H-ASX 353-FR remote-controlled valve with step-by-step regulation and anti-backflow system
- H-ASX 353-5 remote-controlled valve with step-by-step regulation and solenoid for remote emergency opening
- H-ASX 353-R remote-controlled valve with step-by-step regulation and rapid relief pilot

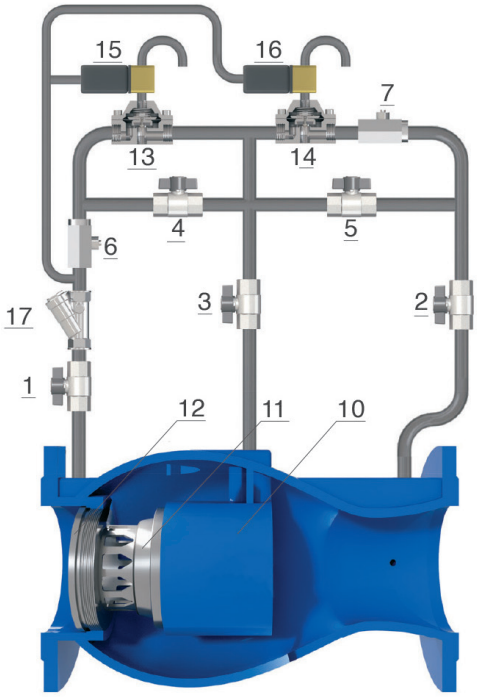
Operating conditions

Fluid: treated water	Maximum temperature 70°C
Maximum pressure	16 bar (higher on request)
Minimum pressure	1.5 bar

Operation

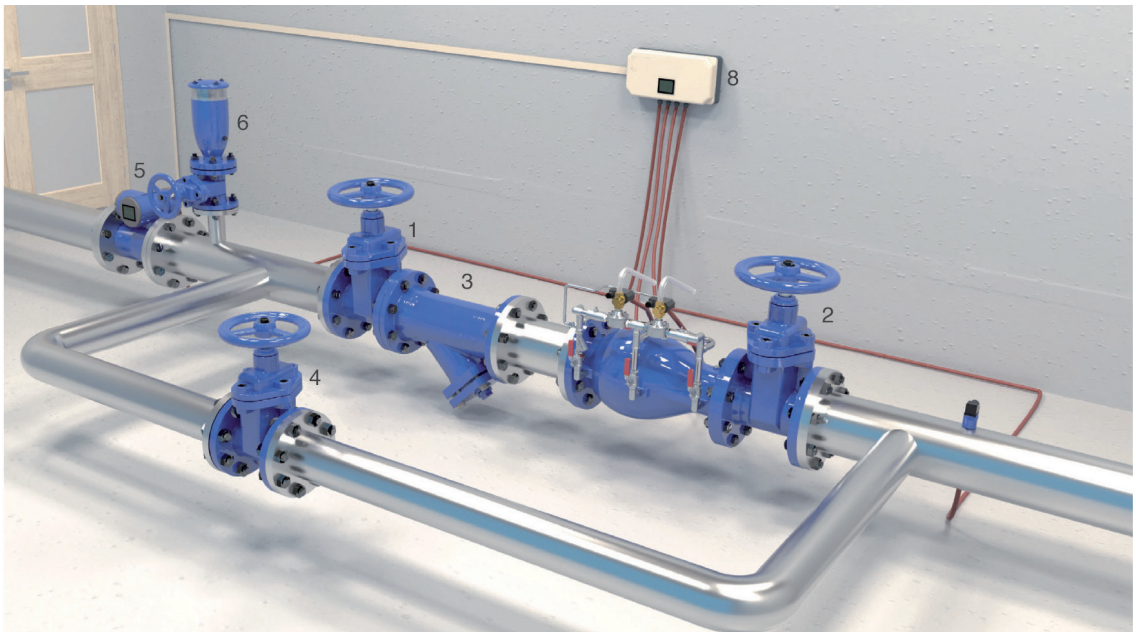
The model H-ASX 353 is equipped with two normally open solenoids (15 and 16), which act on two flow accelerators (13 and 14). When the upstream solenoid (15) is actuated, the accelerator 13 allows a flow towards the valve chamber (10) proportional to the number and duration of the pulses received; In this way, the passage between the plug (11) and the seat (12) is reduced. By activating the downstream solenoid (16), a flow out of the chamber (10) is allowed, resulting in a reduction in internal pressure and gradual opening of the main valve. In any case, the flow in the circuit is regulated by the two needle valves (6 and 7).

Manual control (4 and 5) is always provided, unless otherwise requested, to adjust the valve in the absence of electrical power or when the solenoids are not active. A filter (17), installed upstream, protects the solenoid and other circuit components from contact with impurities and debris.



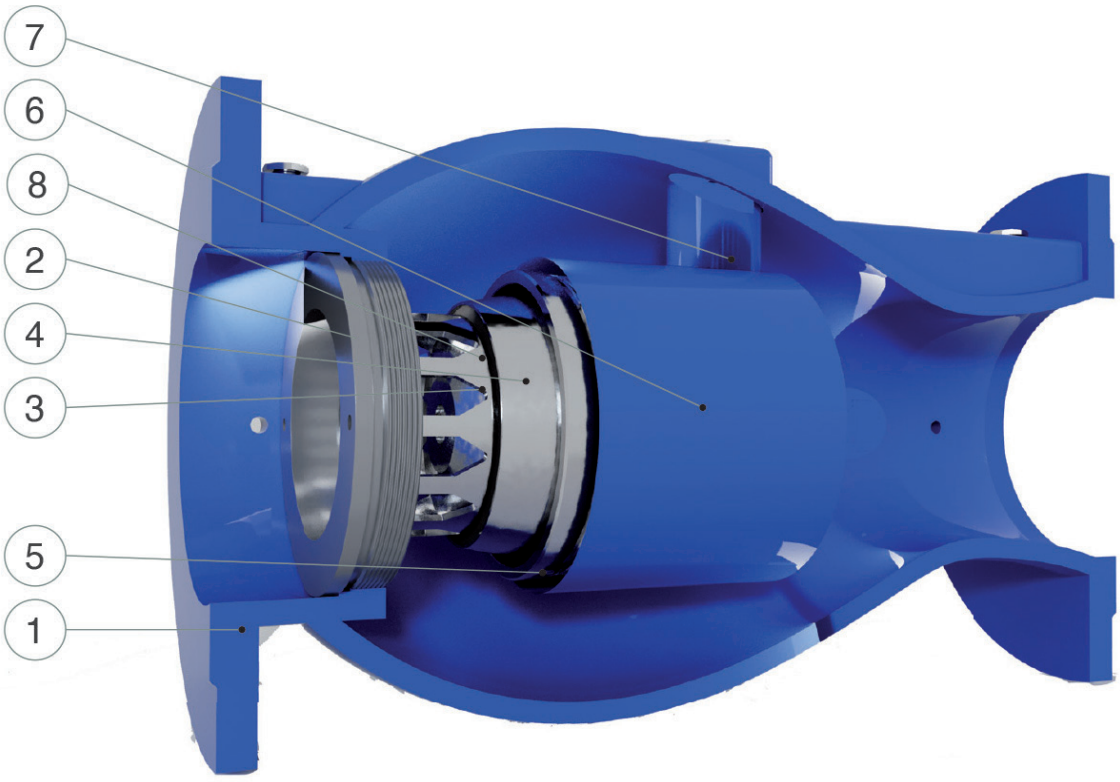
Installation diagram

In the following image H-ASX 353 is connected to a flow meter (5). A control unit (8) constantly sends pulses to the solenoids to maintain a constant flow, regardless of upstream pressure fluctuations, or to regulate the downstream pressure according to flow rate variations, thus minimising pressure drops. Shut-off valves (1, 2) and maintenance bypasses (4), a filter (3) and a WAVE 3S-AWH anti-water hammer air valve (6) are required upstream.



Technical details

H-ASX 300 - Standard version AC



No.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 450-10	
2	Seat	stainless steel AISI 316	
3	AC system	stainless steel AISI 304/303	stainless steel AISI 316
4	Piston	stainless steel AISI 304/303	stainless steel AISI 316
5	Guiding bush	Bronze	
6	Control chamber	ductile cast iron GJS 450-10	
7	Pressure outlets	stainless steel AISI 304	
8	Plane gasket	EPDM	

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

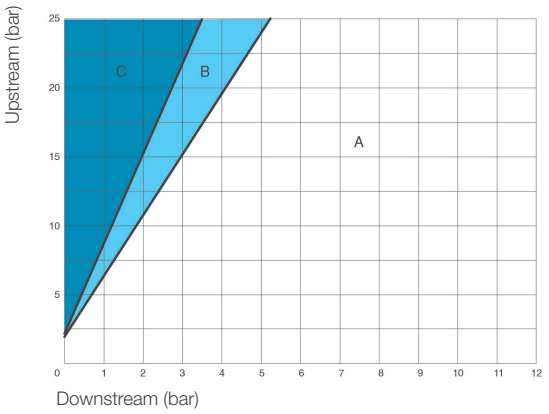
Technical data

H-ASX 300 - Standard version AC

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)	50	80	100	150	200	250	300	400	500	600
Kv (m^3/h)	18	43,2	64,8	195	336	803	1245	2376	3456	4636

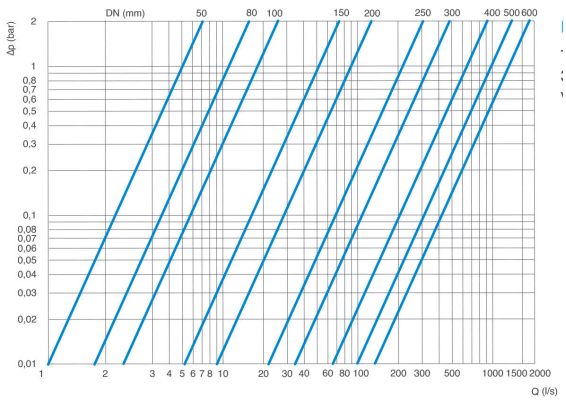


Cavitation chart

Cavitation analysis is essential for preventing potential damage, as well as vibration and noise. The cavitation chart should be used to determine whether the operating point—identified by the intersection of the lines representing upstream (y-axis) and downstream (x-axis) pressure conditions—falls within one of the three zones, defined as follows:

- A: Recommended working conditions;
- B: Noise cavitation;
- C: Damage cavitation.

The chart is to be used for valves modulating with an opening percentage between 35-40% at standard water temperature and elevation below 30 0 m.



Head loss chart

The chart shows the head loss of fully open H-ASX 300 automatic control valves versus flow rate (l/s).

Recommended flow rate

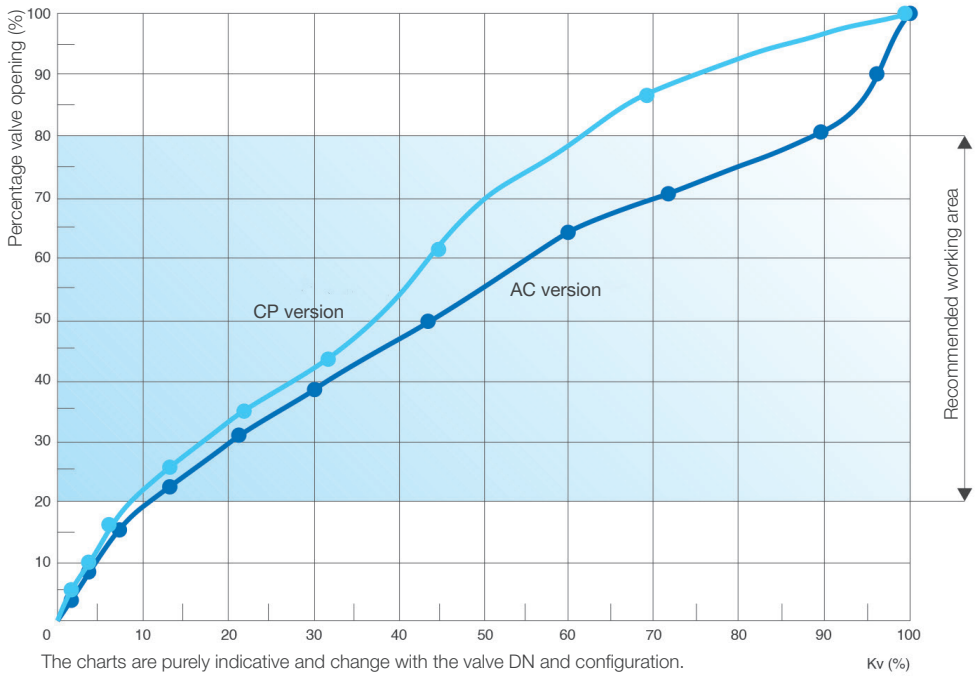
The following chart shows the recommended flow rate for the proper sizing of H-ASX 300 control valve standard version.

DN (mm)			50	80	100	150	200	250	300	400	500	600
Flow rate (l/s)	Recommended	Min.	0,3	0,5	1	2	3.2	5	7	11	14	21
		Max.	4	9,4	15	44	75	179	277	528	768	1030
	Pressure relief	Max.	6	14	21	63	108	254	401	761	1105	1490

H-ASX 300 - AC and CP versions - Technical data

Kv to valve opening chart

The following chart shows the opening percentage of H-ASX 300-AC and H-ASX 300-CP versus the Kv.



The charts are purely indicative and change with the valve DN and configuration.

Working conditions

Treated filtered water	Maximum temperature 70°C
Maximum pressure	25 bar
Minimum pressure on the pilot	0.5 bar (plus head loss)

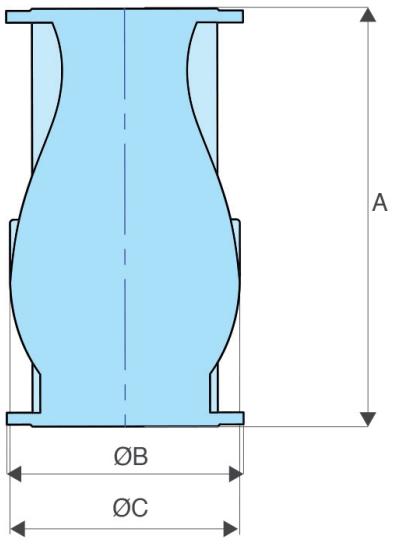
Standard

- Certified and tested in compliance with EN 1074/5
- Pressure rating 25 bar
- Flanges according to EN 1092/2 (different drilling on request)
- Epoxy painting applied through FBT technology blue RAL 5005

Weights and dimensions

DN mm	A mm	B mm	C mm	Weight (Kg)	
				Body	Total
50	230	165	117	10,5	12
80	310	200	170	20	23
100	350	220	219	24,5	27
150	480	300	275	45	60
200	600	340	330	74,5	85
250	730	405	403	142	157
300	850	485	453	200	225
400	1100	645	637	430	480
500	1250	715	715	760	900
600	1450	840	922	1160	1350

All values are approximate, consult our customer service for more details.



Customer Centricity

Pietro Fiorentini is one of the main Italian international company with high focus on product and service quality.

The main strategy is to create a stable long-term oriented relationship, putting the customer's needs first. Lean management and thinking and customer centricity are used to improve and maintain the highest level of customer experience.

Support
One of Pietro Fiorentini's top priorities is to provide support to the client in all phases of project development, during installation, commissioning and operation. Pietro Fiorentini has developed a highly standardized intervention management system, which helps to facilitate the entire process and effectively archive all the interventions carried out, drawing on valuable information to improve the product and service. Many services are available remotely, avoiding long waiting times or expensive interventions.

Training
Pietro Fiorentini offers training services available for both experienced operators and new users. The training is composed of the theoretical and the practical parts, and is designed, selected and prepared according to the level of use and the customer's need.

Customer Relation Management (CRM)
The centrality of customer is one of the main missions and vision of Pietro Fiorentini. For this reason, Pietro Fiorentini has enhanced the customer relation management system. This enables us to track every opportunity and request from our customers into one single information point.

Sustainability

Here at Pietro Fiorentini, we believe in a world capable of improvement through technologies and solutions that can shape a more sustainable future. That is why respect for people, society and the environment form the cornerstones of our strategy.

Our commitment to the world of tomorrow

While in the past we limited ourselves to providing products, systems and services for the oil & gas sector, today we want to broaden our horizons and create technologies and solutions for a digital and sustainable world, with a particular focus on renewable energy projects to help make the most of our planet's resources and create a future in which the younger generations can grow and prosper.

The time has come to put the why we operate before the what and how we do it.

Pietro Fiorentini

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