Pressure relief/sustaining valve
Mod. VSM

The CSA valve Mod. VSM automatically maintains and sustains a preset upstream pressure discharging any overpressure downstream.

Technical features and benefits

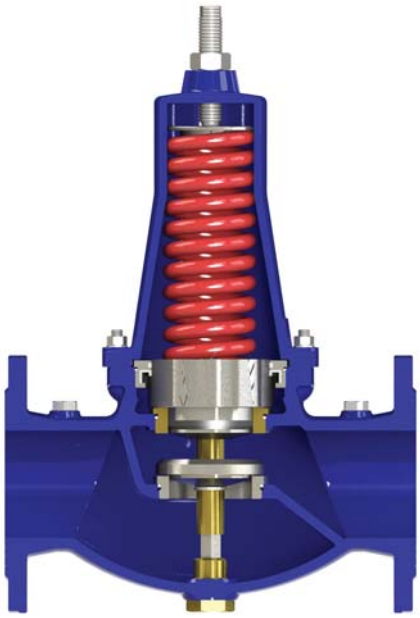
- Flanged version DN 50-150.
- Upstream pressure balanced, to stabilize and maintain the upstream pressure to a preset (and adjustable) value regardless of demand and downstream pressure variations.
- Ductile cast iron for body and cap, piston in stainless steel, seat in stainless steel, guiding bushing in stainless steel as well as bolts and nuts.
- Innovative self cleaning piston technology, pat. pending, to improve performances reducing maintenance operations.
- Mobile block composed of three components in gun metal / stainless obtained by CNC to ensure the maximum accuracy and sliding precision, this is to avoid friction and unexpected leakage.
- Large expansion chamber to increase the allowable pressure ratio, in order to reduce the risk of cavitation also in case of high Dp across the valve itself.
- Epoxy powder applied using FBT technology.

Applications

- Water distribution systems as a pressure relief/discharge valve.
- Fire fighting systems to discharge overpressure caused by pumps.
- Irrigation systems as an effective protection against water hammer and to prevent pumps from cavitating.
- Industrial plants, civil buildings and more.

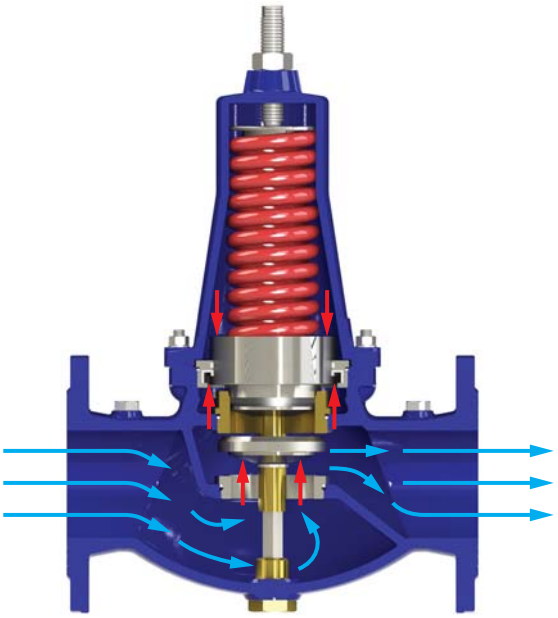
Operating principle

The operating principle of VSM is based on a piston sliding into two rings in stainless steel/bronze of different diameters. These rings, tightly connected to the body, form a watertight chamber also known as the compensation chamber. .



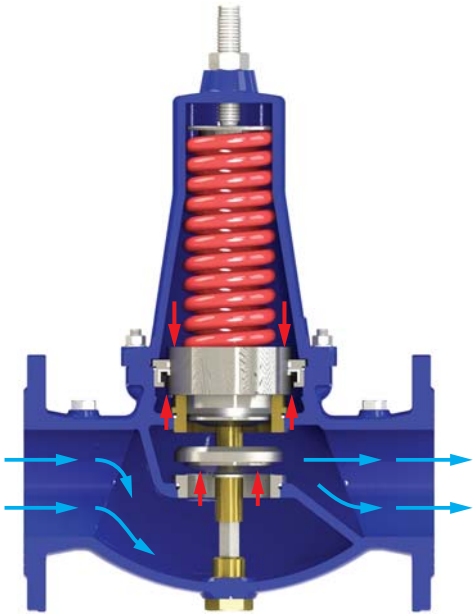
Valve normally closed

Without any incoming pressure the VSM is a normally closed valve, as shown in the picture, where the piston is kept pushed down by the force of the spring.



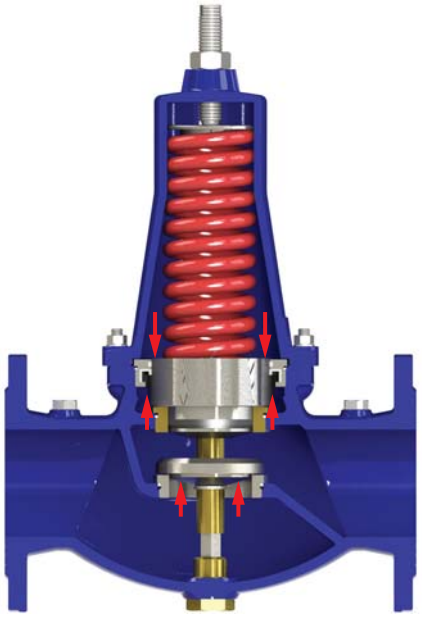
Valve fully open

Should the upstream pressure rise above the valve's set point, obtained by the compression of the spring, the VSM will open completely allowing the full passage through the seat.



Valve modulating

Should the upstream pressure fluctuate around the valve's set point the resultant of the force, obtained by it acting on the obturator and the compensation chamber pushing upwards, against the spring pushing downwards, will move the obturator producing the required head loss to stabilize the upstream pressure to the minimum required value.



Valve fully closed (static conditions)

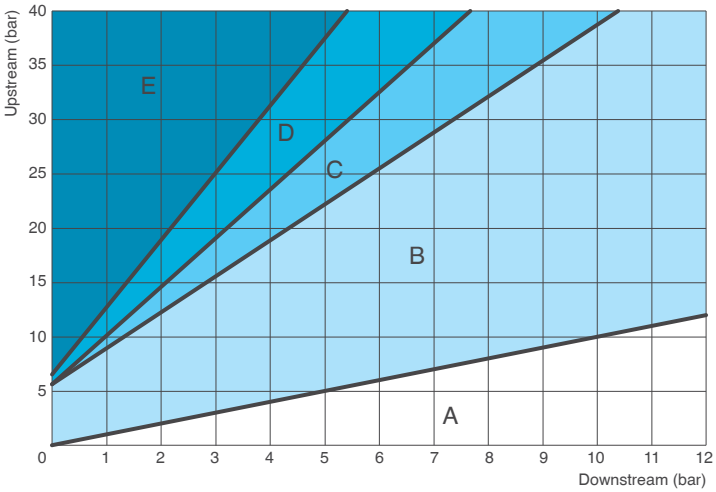
In case of a drop of the upstream pressure below the valve's set point, should the modulating phase of the valve not be enough to stabilize the minimum requested value, the valve will close maintaining the required upstream pressure even in static conditions.

Technical data

DN mm	50	65	80	100	125	150
Kv (m^3/h)/bar	22	51	83	122	166	194

Head loss coefficient

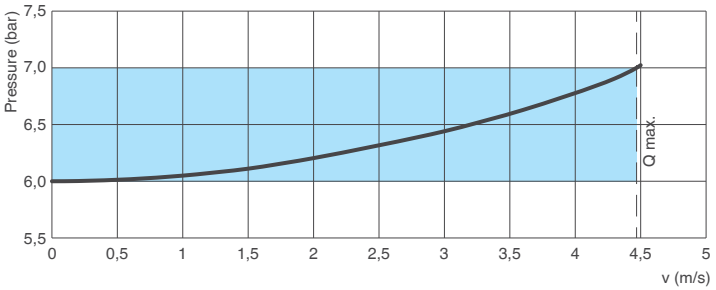
Kv coefficient representing the flow rate which is flowing through the valve fully open producing a head loss of 1 bar.



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.



Upstream pressure buildup

The plot is showing the increase in the upstream pressure that occurs through the valve, when the flow increases. The area depicted in blue includes the recommended working range and maximum velocity of the valve, used as a pressure relief only.

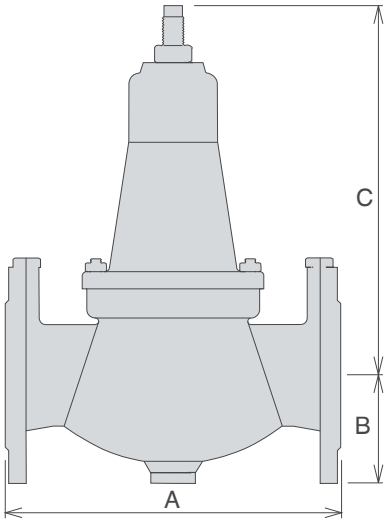
Working conditions

Treated water/air temperature: max. 70°C.
Maximum working pressure 40 bar.
Upstream pressure values: from 1,5 to 6 bar or from 5 to 12 bar.
Higher values on request.

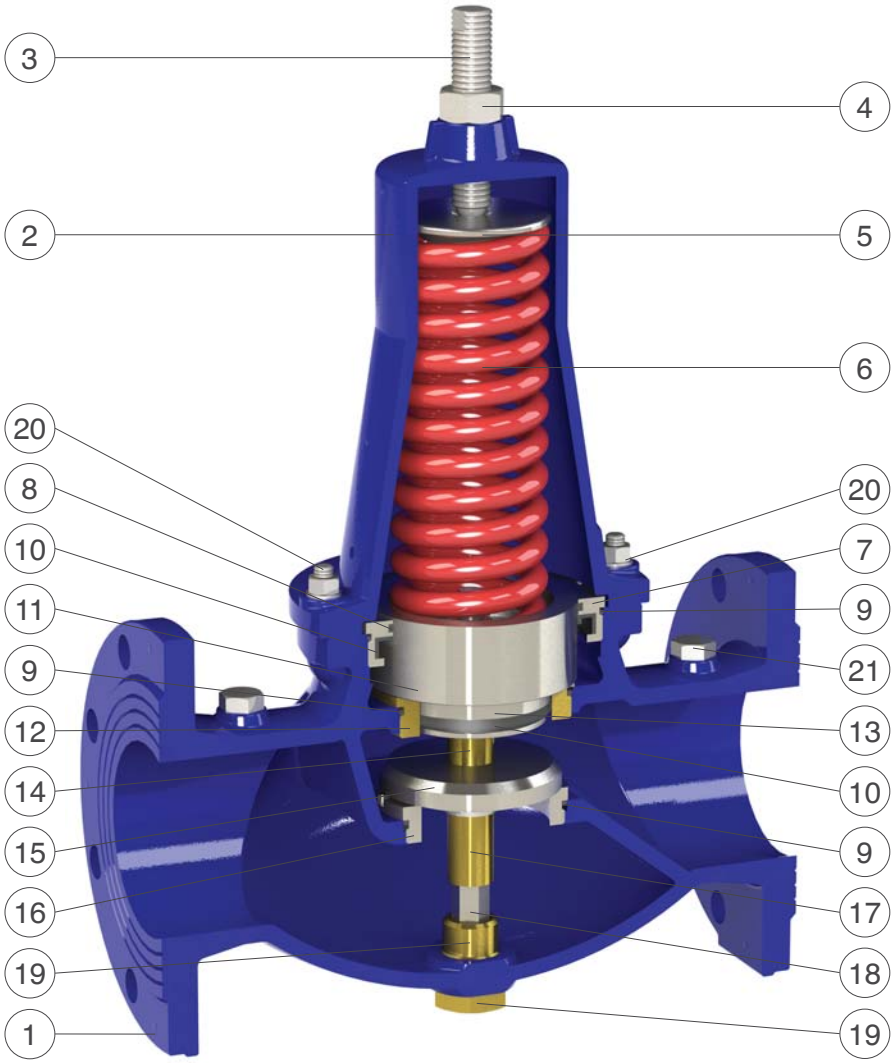
Standard

Designed in compliance with EN-1074/4.
Flanges according to EN 1092/2.
Epoxy painting applied through fluidized bed technology blue RAL 5005.
Changes and variations on the flanges and painting details available on request.

DN mm	50	65	80	100	125	150
A mm	230	290	310	350	400	450
B mm	83	93	100	117	135	150
C mm	280	320	350	420	590	690
Weight Kg	12	19	24	34	56	74



Technical details



N.	Component	Material	Standard
1	Body	ductile cast iron	GJS 500-7
2	Cap	ductile cast iron	GJS 500-7
3	Driving screw	stainless steel	AISI 304/316
4	Nut	stainless steel	A2/A4/AISI 316
5	Spring guide	stainless steel	AISI 304/316
6	Spring	spring steel	Si -Cr
7	Main bush	stainless steel	AISI 304/316
8	Sliding ring	PTFE	
9	O-ring	NBR	
10	Gasket	NBR	
11	Upper piston	stainless steel	AISI 304/316
12	Lower reinforcements	bronze/stainless steel	AISI 304/316
13	Lower piston	stainless steel	AISI 304/316
14	Central spacer	brass/stainless steel	OT58/AISI 304/316
15	Obturator guide	stainless steel	AISI 304/316
16	Obturator sealing seat	stainless steel	AISI 304/316
17	Lower spacer	brass/stainless steel	OT58/AISI 304/316
18	Guiding shaft	stainless steel	AISI 304/316
19	Driving tap	brass/stainless steel	OT58/AISI 304/316
20	Studs, nuts and washers	stainless steel	A2/A4/AISI 316
21	Taps for pressure gauges	stainless steel	A2/A4/AISI 316