Fast acting anti water hammer valve Mod. VRCA

The CSA valve Mod. VRCA has been designed to avoid the devastating effects of water hammers in pipeline networks. The purpose is actually to prevent the pressure from rising above a preset value, thanks to its capability of discharging sufficient volume of water directly into the atmosphere.

Technical features and benefits

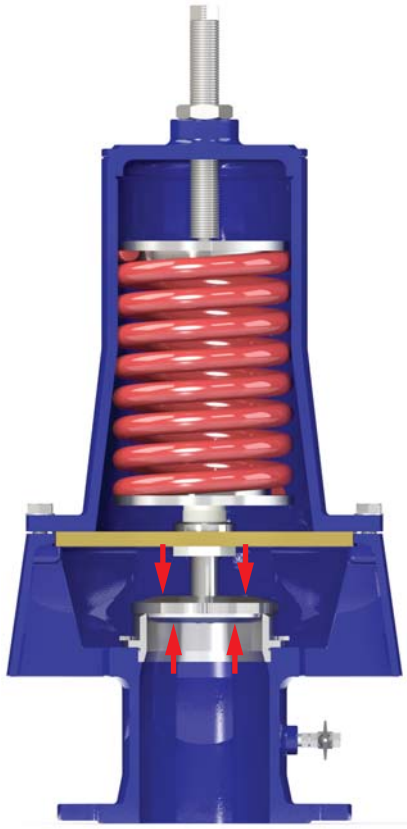
- Solid and compact design including the reduction cone between the inlet and the sealing seat.
- Negligible inertia of internal mobile parts.
- Perfect sealing seat impervious to cavitation thanks to a special plane gasket.
- Precise and perfect setting without any hysteresis effect thanks to a perfectly balanced and annealed spring.
- Low overpressure values above the preset cracking point thanks to a wide selection of springs.
- Series PN 25 (PN 40 on request).

Applications

- Downstream of pumping stations to cushion sudden overpressure as a result of pump start up (in case of one of more pumps in parallel). This is a perfect solution whenever the system is not equipped with soft-start or other devices to prevent water hammer during starting operations.
- Downstream and upstream of main transmission lines, or pipe segments, not able to endure critical conditions such as sudden and unexpected rise in pressure, and to guarantee reliable system protection.
- Downstream of a PRV as a safety device.
- Upstream of sectioning devices with rapid closing time.
- In general, whenever and wherever pipe bursts are expected.

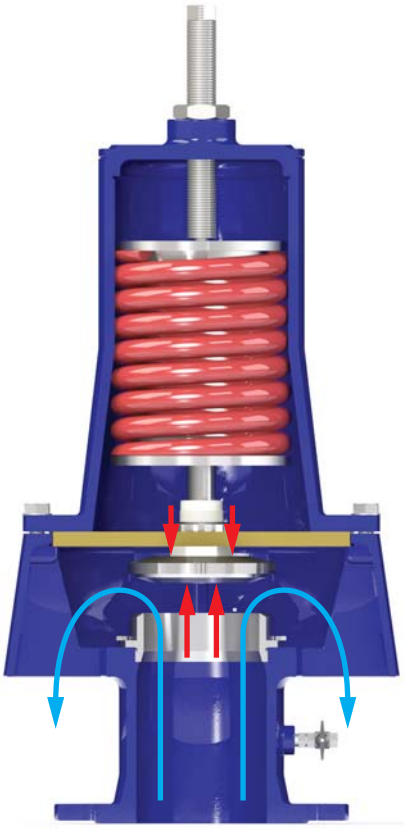
Operating principle

The valve must be preset at first, simply acting on the spring, to open whenever the pressure rises above a certain value considered critical for the system.
The particular shape, along with the perfect centering of the mobile block, will protect the upper part against water jets coming from VRCA's operation cycles. The valve is supplied with a pressure gauge and drainage ball valve in order to facilitate the setting procedure directly on the field.



Valve closed

Should the pressure remain below the valve's set point the VRCA will be perfectly closed, thanks to the compression of the spring acting on the obturator.



Valve open

Should the pressure rise above the valve's set point the VRCA will open, discharging to the atmosphere the excessive fluid volume necessary to avoid the upsurge.

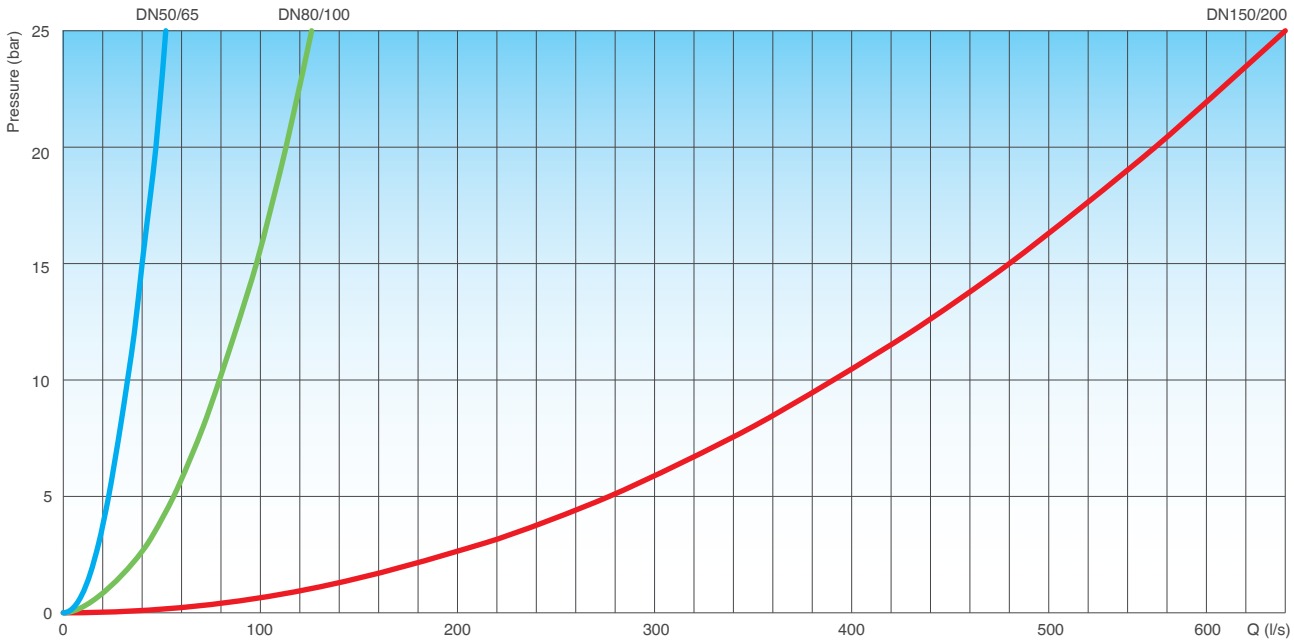
Optional

■ The spring setting, gasket materials and other technical features related to the valve's response time and performances, can be modified on request according to the project conditions.

Technical data

VRCA sizing chart

CSA technical department, by means of advanced simulation tools, is at your complete disposal for hydraulic modelling and transient analysis.
In the hope of making the sizing process easier, you will find below the sizing chart showing the actual VRCA performances in terms of protection capabilities. The vertical axis represents the pressure and the horizontal one represents the corresponding flow rate of the valve.
We recommend to size the valve to discharge a percentage of the system flow rate, in steady state conditions, ranging from 30 up to maximum 45%. If the required value falls on the left of one of the curves VRCA will be able to protect the system.
Nevertheless we always suggest contacting our technical support for a numerical analysis.

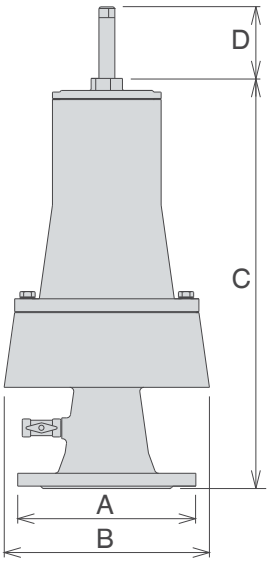


Working conditions

Treated water with a maximum temperature of 70°C.
Maximum pressure 25 bar.
Setting ranges: 0-8 bar, 8-16 bar, 16-25 bar.
Higher pressure values on request.

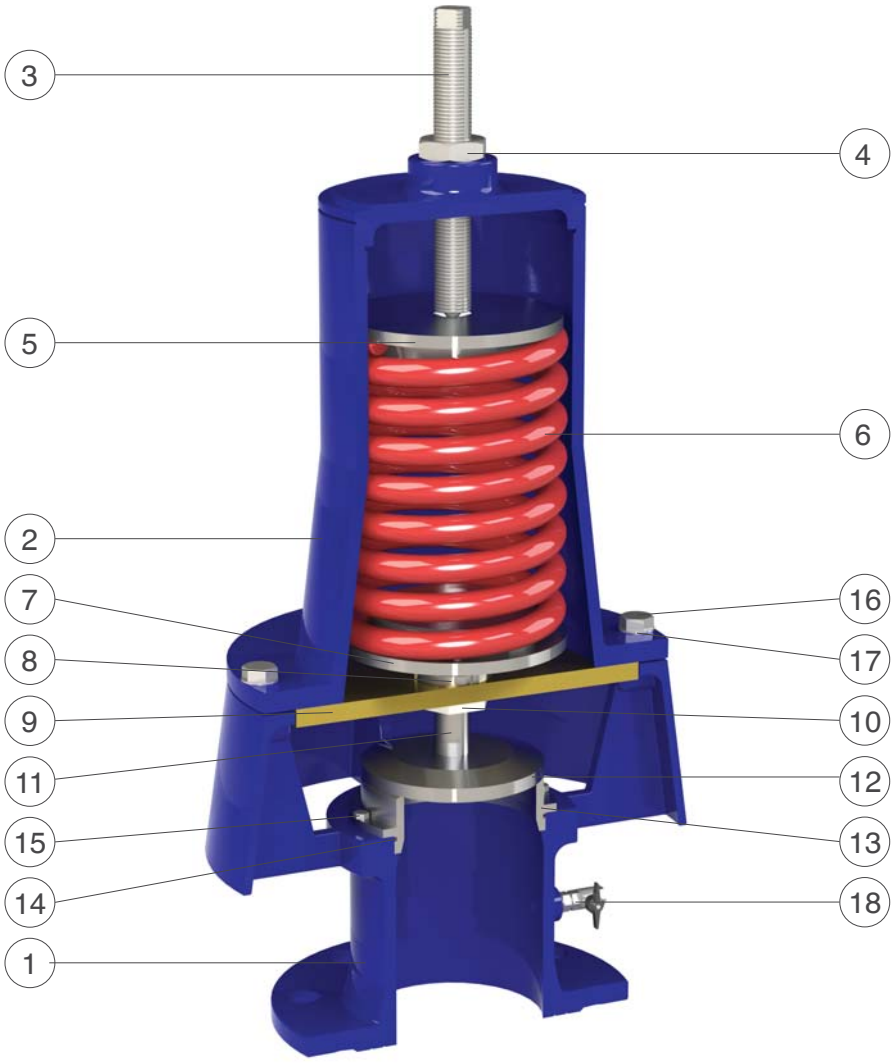
Standard

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	A mm	B mm	C mm	D mm	Seat DN mm	Weight Kg
50/65	185	185	417	40	40	14
80/100	235	242	540	50	62	28
150	300	404	720	220	137	75
200	360	404	720	220	137	79

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 support	stainless steel	AISI 304/316
6	Spring	spring steel	Si-Cr
7	Spring housing	stainless steel	AISI 304/316
8	Ring	stainless steel	AISI 304/316
9	Separation plate	brass/s.s./painted steel	OT 58/AISI 304/Fe 37
10	Driving sleeve	delrin polyoxymethylene	
11	Shaft	stainless steel	AISI 304/316
12	Obturator	stainless steel	AISI 316
13	Sealing seat	stainless steel	AISI 316
14	O-ring	NBR	
15	Screws	stainless steel	A2/A4/AISI 316
16	Screws	stainless steel	A2/A4/AISI 316
17	Washers	stainless steel	A2/A4/AISI 316
18	Ball valve 1/4”	nickel plated brass	