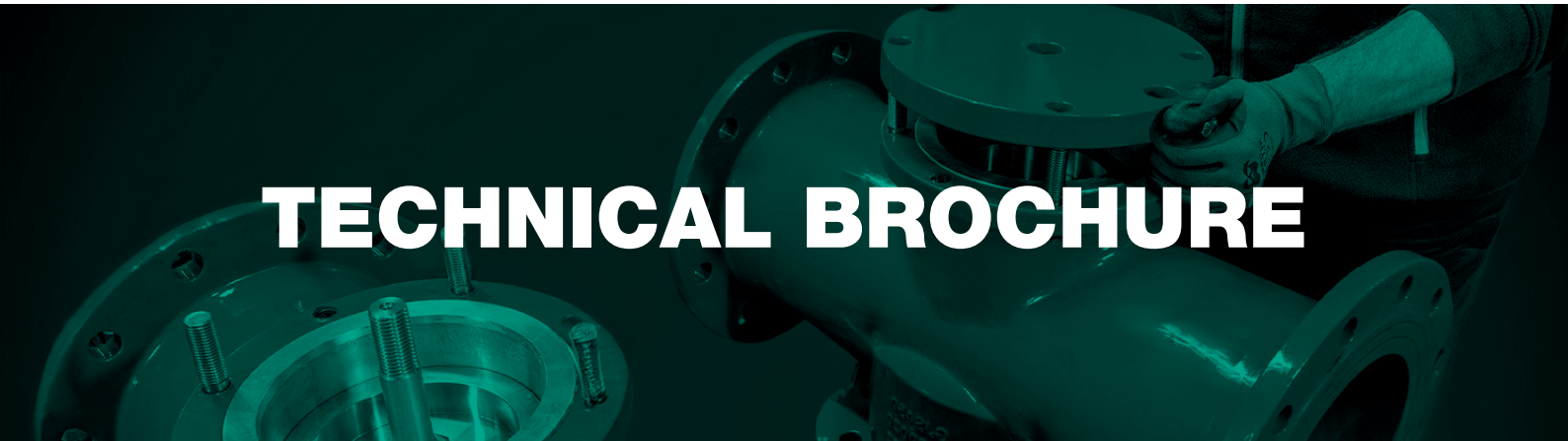
Pietro Fiorentini

H-PVS 90F

Safety valves



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H-PVS 90F_technicalbrochure_ENG_revA

Anti-water hammer quick-acting safety valve with flanged outlet **H-PVS 90F**

The **H-PVS 90F** safety valve is designed to prevent the effects of water hammer on pipelines. When the pressure reaches a preset maximum threshold, it acts immediately, discharging through its flanged end the quantity of water necessary to avoid overpressure. Its flanged outlet allows water to be conveyed.

Constructive features and advantages

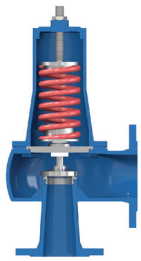
- Innovative design and durable construction with directional cone and deflector.
- Class PN 25; PN 40 on request.
- Negligible inertia and sliding friction thanks to floating plug technology.
- Perfectly watertight even at low pressures.
- High-frequency springs specially treated to avoid hysteresis effects; available in various calibration values.
- Flanged outlet allowing the conveyance of drained water.

Main applications

- Downstream of lifting stations to absorb the overpressure shock generated by the second variable motion phase, following the sudden stop of the pump or its uncontrolled start-up.
- Downstream and upstream of delivery lines and pipeline sections that cannot tolerate pressure surges.
- Downstream of reduction units, as a safety device.
- Upstream of shut-off devices whose abrupt or uncontrolled closure could generate sudden pressure increases.
- In general, where pressure increases may occur.

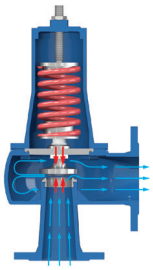
Operating principle

In order to open when the pressure exceeds the maximum threshold considered critical for the system, the valve must be pre-tuned by adjusting the spring compression. To facilitate this operation even when in range, the valve is supplied with a pressure gauge and a drain ball valve.



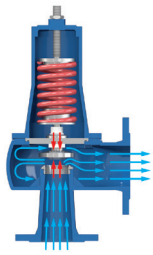
Normally closed valve

With no pressure or flow inside, the H-PVS 90F valve is normally closed; the plug is pushed down by spring force.



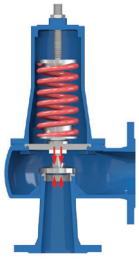
Valve fully open in operation

When the upstream pressure rises above the spring setting, the plug moves upwards and the valve moves to the fully open position.



Modulating valve

When the incoming pressure from upstream falls below the calibration value, the plug is pushed down, reducing the passage. The result is a pressure drop to restore the upstream pressure to the required value.



Valve closed (static conditions)

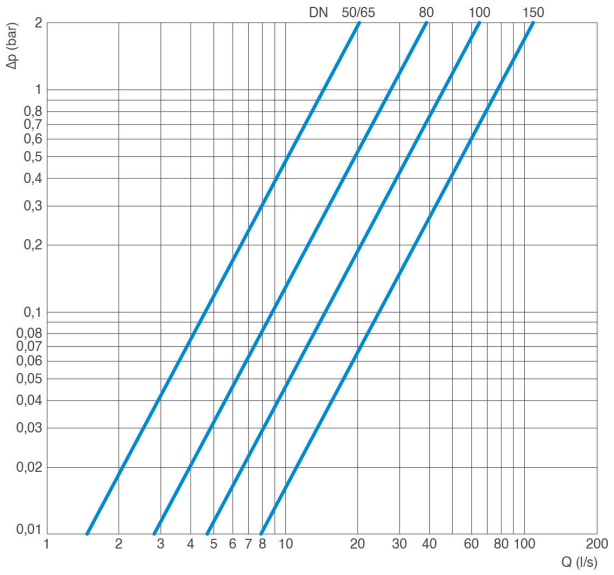
If the downstream withdrawal increases, and the upstream pressure falls below the spring setting, the valve moves to the fully closed position, maintaining the required pressure. This also occurs under static conditions.

Technical data

Pressure drop coefficient

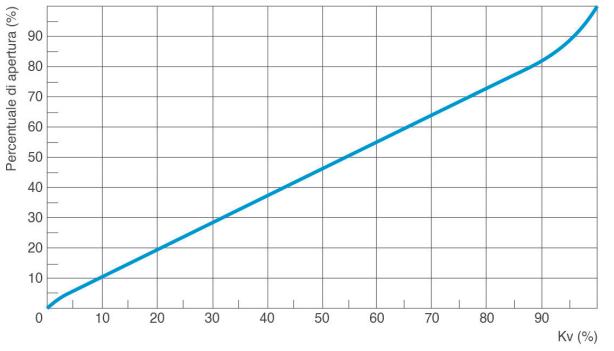
The Kv coefficient represents the flow rate that produces a pressure drop of 1 bar in the fully open valve.

DN (mm)	50/65	80	100	150
Kv (m3/h)	50	101	158	273
Stroke (mm)	17	21	23,5	35



Pressure drops chart

The graph opposite shows the pressure drops of the valves in the fully open position depending on the flow rate expressed in l/s.



Valve-Kv opening diagram

The graph opposite shows the Kv in relation to the plug stroke (both values are expressed as percentages).

Overpressure

The table shows the pressure variations of the valves according to calibration. H-PVS 90F valves are supplied with three different springs covering the pressure ranges:

- 1-8 bar
- 16 bar
- 16-25 bar

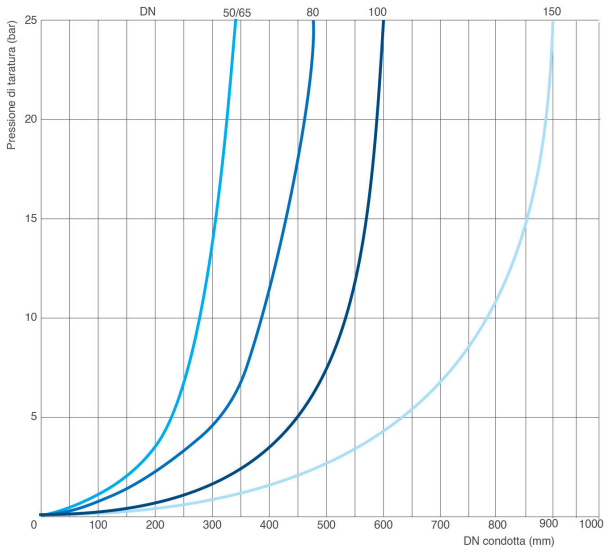
DN mm	PN bar	Spring bar	Overpressure bar
50/65	10	1-8	0.8
50/65	16	8-16	1.5
50/65	25	16-25	2.2
80	10	1-8	1
80	16	8-16	2
80	25	16-25	2.5
100	10	1-8	1
100	16	8-16	2
100	25	16-25	2.5
150	10	1-8	2
150	16	8-16	2.5
150	25	16-25	3.5

Preliminary dimensioning

The primary function of the valve is to protect pipeline systems, tanks and any other equipment from exceeding the design pressure conditions.

The sizing and selection of the valve should only be carried out by specialised technicians who understand its operation and the effects on the variable motion of the fluid. At this stage, it is crucial to consider parameters such as overpressure and blow-down effect.

For guidance purposes only, and for a preliminary assessment only, see the sizing chart below for the most suitable size of the H-PVS 90F valve depending on the nominal diameter (DN) of the pipeline and the calibration pressure.



Recommended flow rate

The table shows the recommended maximum flow rates for different valve DNs.

DN (mm)	50/65	80	100	150
Max. flow rate (l/s)	12.5	26	41	72

Operating conditions

Treated water	70°C
Maximum pressure	25 bar
Spring calibration range:	1 to 8 bar, 8 to 16 bar, 16 to 25 bar (higher pressure values on request)

Standard

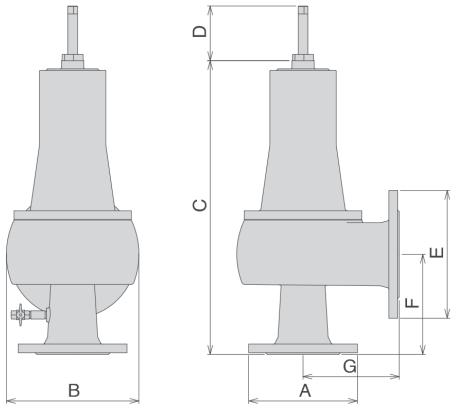
- Certification and testing according to EN 1074/5
- Flanges with drilling according to EN 1092-2
- RAL 5005 blue epoxy paint applied with fluid bed technique

Modifications to flanges and painting on request.

Dimensions and weights

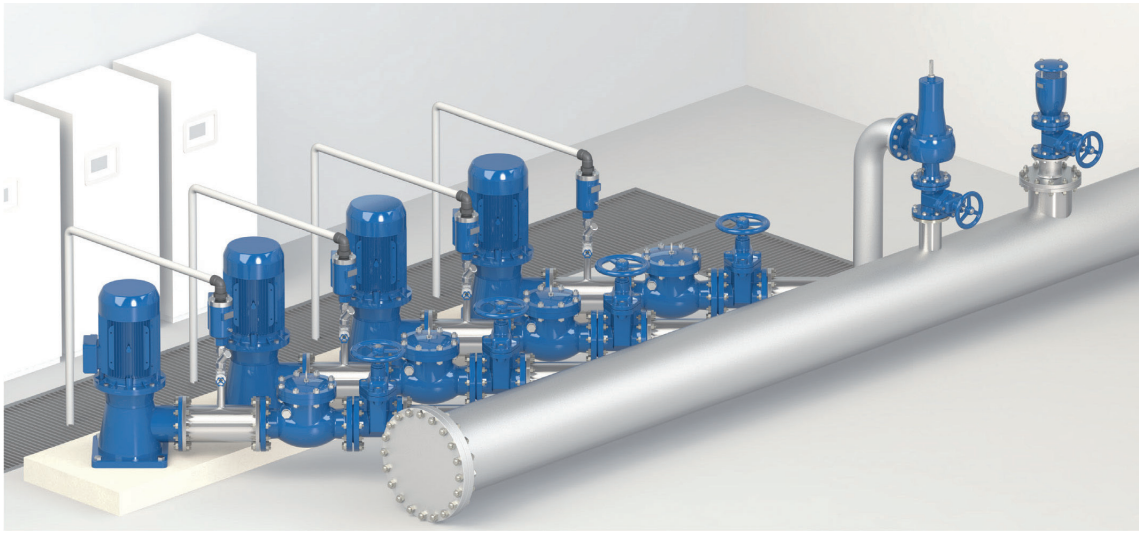
DN* mm	A mm	B mm	C mm	D mm	E mm	F mm	G mm	DN** seat mm	Weight Kg
50/65	185	188	418	100	200	130	150	43,5	20
80	200	244	542	130	235	184	177	60	36
100	235	244	567	130	270	196,5	177	75	41
150	300	409	758	165	360	235	335	100	111

* Inlet
** Outlet

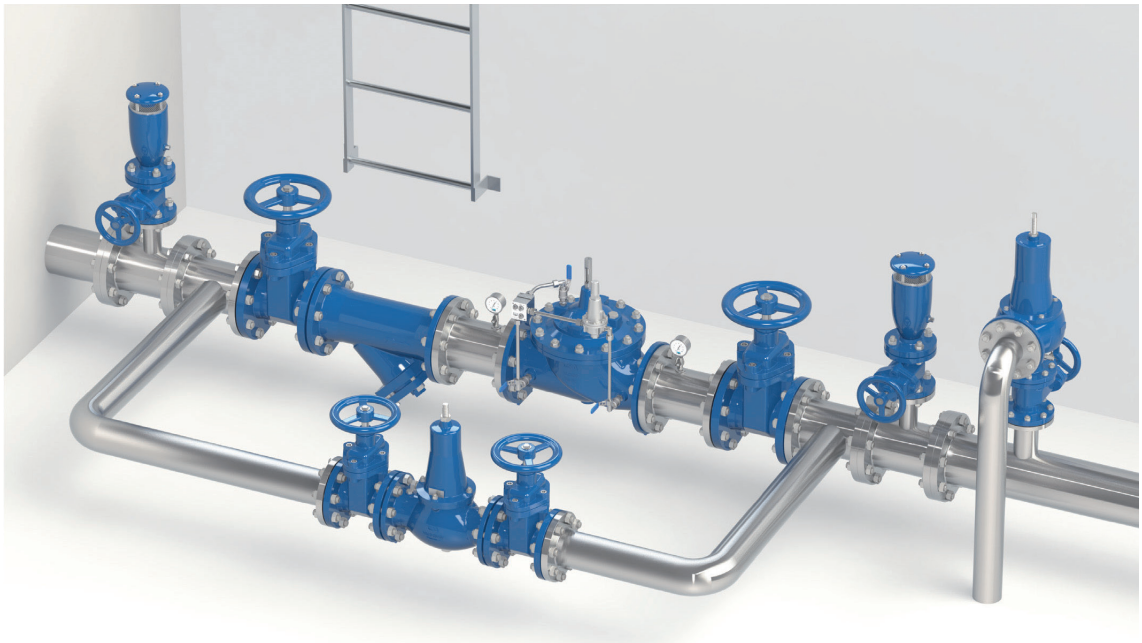


Examples of installations

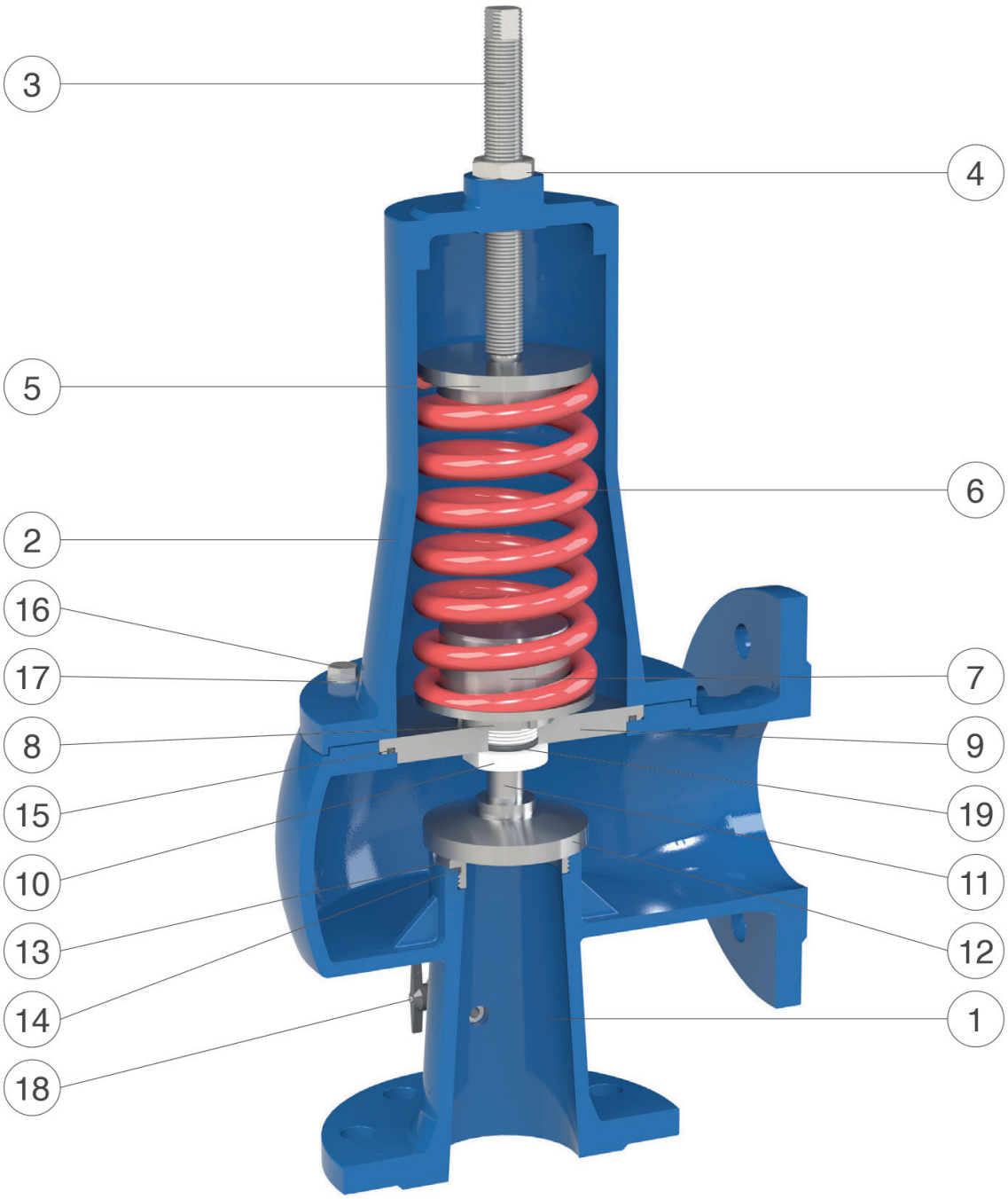
Lifting stations. The H-PVS 90F valve must be placed downstream of the check valves. To avoid negative pressures when stopping the pumps, it is recommended to also install anti-water hammer vents of the WAVE or WAVE LITE 3S AWH model.



Reduction units. Positioned downstream of a reduction unit, the valve protects the main pipeline from uncontrolled pressure increases. The installation includes the H-VAL 310/410 pressure reducing valve, a maintenance bypass and upstream and downstream WAVE or WAVE LITE 3S AWH anti-water hammer vents.



Construction details



No.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 450-10	
2	Cap	ductile cast iron GJS 450-10 and painted steel	
3	Control screw	AISI 304 stainless steel	AISI 316 stainless steel
4	Locking nut	AISI 304 stainless steel	AISI 316 stainless steel
5	Upper spring plate	AISI 303 stainless steel (304 for DN 150-200)	AISI 316 stainless steel
6	Spring	coated spring steel 52SiCrNi5	
7	Lower spring plate	AISI 303 stainless steel (304 for DN 150-200)	AISI 316 stainless steel
8	Clamping ring nut	AISI 304 stainless steel	AISI 316 stainless steel
9	Separation plate	stainless steel AISI 304 (painted steel for DN 150-200)	AISI 316 stainless steel
10	Sliding bushing with O-ring	Delrin (AISI 304 stainless steel for DN 150-200) and NBR	
11	Shaft	AISI 304 stainless steel	AISI 316 stainless steel
12	Plug with flat gasket	AISI 303 stainless steel (304 for DN 150-200) and PU	AISI 316 stainless steel
13	Plug seal seat	AISI 304 stainless steel (303 for DN 50/65)	AISI 316 stainless steel
14	O-ring	NBR	EPDM/Viton
15	O-ring	NBR	EPDM/Viton
16	HH screws	AISI 304 stainless steel	AISI 316 stainless steel
17	Washers	AISI 304 stainless steel	AISI 316 stainless steel
18	Ball valve 1/4"	nickel-plated brass	AISI 316 stainless steel
19	O-ring	NBR	EPDM/Viton

The table of materials and components is subject to change without notice.

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