

VST Series

INAIL approved and calibrated safety valves

Technical Data Sheet



Description

VST Series INAIL approved and calibrated safety valves automatically discharge enough liquid to ensure that the safety pressure setpoint is not exceeded. They protect the boiler and system, and require no energy except the pressurised fluid. The valves are designed and manufactured in compliance with "R" regulations - 2009 edition, applied technical specifications of Italian Ministerial Decree 1-12-1975.

VST

Diaphragm safety valve, fixed setting. CW617N brass body and cap. PN10. Overpressure: 10%. Blowdown: <20%. Temperature range: -10÷120°C. F/F connections with oversized outlet.

INAIL approved and calibrated.

Compliant with PED 2014/68/EU with identification number CE0425.



Type	Part No.	DN	bar	Weight (g)
VST	0212122	1/2" x 3/4"	2.25	420
VST	0212125	1/2" x 3/4"	2.5	420
VST	0212127	1/2" x 3/4"	2.7	420
VST	0212130	1/2" x 3/4"	3	420
VST	0212135	1/2" x 3/4"	3.5	420
VST	0212140	1/2" x 3/4"	4	420
VST	0212145	1/2" x 3/4"	4.5	420
VST	0212150	1/2" x 3/4"	5	420
VST	0212154	1/2" x 3/4"	5.4	420
VST	0212160	1/2" x 3/4"	6	420
VST	0213122	3/4" x 1"	2.25	780
VST	0213125	3/4" x 1"	2.5	780
VST	0213127	3/4" x 1"	2.7	780
VST	0213130	3/4" x 1"	3	780
VST	0213135	3/4" x 1"	3.5	780
VST	0213140	3/4" x 1"	4	780
VST	0213145	3/4" x 1"	4.5	780
VST	0213150	3/4" x 1"	5	780
VST	0213154	3/4" x 1"	5.4	780
VST	0213160	3/4" x 1"	6	780
VST	0214122	1" x 1.1/4"	2.25	1000
VST	0214125	1" x 1.1/4"	2.5	1000
VST	0214127	1" x 1.1/4"	2.7	1000
VST	0214130	1" x 1.1/4"	3	1000
VST	0214135	1" x 1.1/4"	3.5	1000
VST	0214140	1" x 1.1/4"	4	1000
VST	0214145	1" x 1.1/4"	4.5	1000
VST	0214150	1" x 1.1/4"	5	1000
VST	0214154	1" x 1.1/4"	5.4	1000
VST	0214160	1" x 1.1/4"	6	1000

IS

Exposed drain funnel for safety and thermal drain valves.



Type	Part No.	DN	Weight (g)
IS	0235115	1/2" FF	270
IS	0235120	3/4" FF	400
IS	0235125	1" FF	600
IS	0235132	1.1/4" FF	1000

Technical features	
Nominal pressure	PN10
Overpressure	10%
Blowdown	<20%
Maximum operating temperature	-10÷120°C
PED class	IV

Materials	
Body and cap	CW617N brass
Diaphragm and seals	EPDM
Manual discharge knob	Impact-resistant technopolymer
Setting spring	Galvanised C100 steel
Disc	CW617N brass

Approvals

CE mark

VST Series safety valves meet the requirements of the Pressure Equipment Directive 2014/68/UE (PED). The valves are classified in category IV, considered the highest risk category, given that they are safety devices and bear the CE mark followed by the number 0425, identifying the approval authority.

INAIL

VST Series safety valves are manufactured in accordance with the specifications and requirements of "R" regulations Chap. R.2.A (2009 Edition) and are supplied with INAIL approval and calibration certificates. The **INAIL approval certificate** is issued to the manufacturer after testing to ensure that it fully conforms with the operating characteristics required by the regulations. The document is valid for five years: all valves manufactured within this timeframe are INAIL approved indefinitely and can be used in systems without any time limits.

The valves are tested individually and supplied with a unique calibration report, showing the serial number of the valve marked on the non-removable metal disc fixed in the knob. The **calibration report** must remain with the valve for its full service life.

Application

VST Series safety valves are generally used in closed-loop heating systems with nominal heat output of more than 35kW that use hot water at temperatures below 110°C. The safety valve protects the boiler and system tank from sudden, unexpected pressure surges.

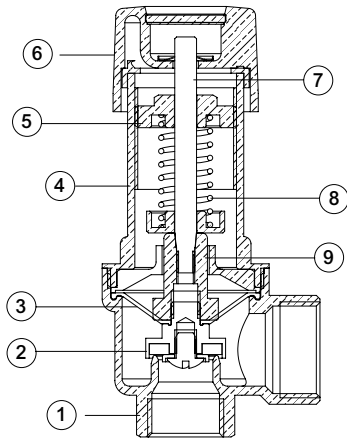
Valve opening can be triggered for various reasons:

- fluid temperature rises above the maximum set value, resulting in uncompensated expansion;
- expansion vessel undersized;
- circuit overfilled.

Therefore, the safety valve remains inoperative when the system is operating normally.

Operation

The fluid in the system exerts pressure on the disc, which pushes against the spring until the pressure exceeds the declared setting. The disc then slowly starts to open, allowing the water flow to inflate the diaphragm. The valve opens and discharges into the air, relieving the system from dangerous pressure for the boiler and system components. The disc opens fully before the fluid pressure exceeds the pressure setpoint by 10% (**overpressure**). The valve closes before the pressure drops to 20% less than the setpoint pressure (**blowdown**). The outlet port has a wider diameter than the inlet port, to increase the discharge capacity of the valve. The characteristics of the materials prevent the valves from seizing as a result of ageing.



Key

- 1 - Valve body
- 2 - Disc
- 3 - Diaphragm
- 4 - Cap
- 5 - Setting nut
- 6 - Manual discharge knob
- 7 - Disc stem
- 8 - Setting spring
- 9 - Disc stem

Sizing

The safety valve must be sized to ensure a discharge flow rate (Q), expressed in kg/h of vapour, of not less than:

$$Q = P/0.58$$

where

P = nominal heat output of boiler (kW)

The setpoint pressure of the valve, plus the permitted overpressure, must not exceed the maximum operating pressure of the boiler. For boilers with individual heat output exceeding 580 kW (500,000 kcal/h), the discharge flow rate must be divided between at least two safety valves.

Technical data and discharge flow rates with overpressure of 10% and blowdown of 20%

Model	Pressure in bar			Ø of orifice mm	Section of orifice cm ²	Flow coefficient K	Discharge flow rate Kg/h	Nominal heat output of boiler	
	setting	max discharge	min closure					Kcal/h	kW
1/2" x 3/4"	2.25	2.475	1.80				205.67	102,839	119.29
1/2" x 3/4"	2.50	2.75	2.00				221.40	110,703	128.41
1/2" x 3/4"	2.70	2.97	2.16				233.78	116,892	135.59
1/2" x 3/4"	3.00	3.30	2.40				253.74	126,873	147.17
1/2" x 3/4"	3.50	3.85	2.80				284.07	142,035	164.76
1/2" x 3/4"	4.00	4.40	3.20	15	1.7671	0.71	318.07	159,039	184.48
1/2" x 3/4"	4.50	4.95	3.60				344.78	172,393	199.97
1/2" x 3/4"	5.00	5.50	4.00				376.39	188,196	218.30
1/2" x 3/4"	5.40	5.94	4.32				399.70	199,850	232.42
1/2" x 3/4"	6.00	6.60	4.80				442.81	221,407	256.83
3/4" x 1"	2.25	2.475	1.80				412.01	206,006	238.96
3/4" x 1"	2.50	2.75	2.00				443.52	221,760	257.24
3/4" x 1"	2.70	2.97	2.16				468.31	234,156	271.62
3/4" x 1"	3.00	3.30	2.40				508.30	254,151	294.81
3/4" x 1"	3.50	3.85	2.80	20	3.1416	0.80	569.04	284,522	330.04
3/4" x 1"	4.00	4.40	3.20				637.17	318,585	369.55
3/4" x 1"	4.50	4.95	3.60				690.67	345,336	400.58
3/4" x 1"	5.00	5.50	4.00				753.98	376,992	437.31
3/4" x 1"	5.40	5.94	4.32				804.25	402,125	466.50
3/4" x 1"	6.00	6.60	4.80				887.04	443,520	514.48
1" x 1.1/4"	2.25	2.475	1.80				571.37	285,670	331.37
1" x 1.1/4"	2.50	2.75	2.00				615.03	307,515	356.71
1" x 1.1/4"	2.70	2.97	2.16				649.41	324,705	376.65
1" x 1.1/4"	3.00	3.30	2.40				704.86	352,433	408.82
1" x 1.1/4"	3.50	3.85	2.80	25	4.9087	0.71	789.09	394,548	457.67
1" x 1.1/4"	4.00	4.40	3.20				883.56	441,783	512.46
1" x 1.1/4"	4.50	4.95	3.60				957.75	478,879	555.49
1" x 1.1/4"	5.00	5.50	4.00				1,045.55	522,776	606.42
1" x 1.1/4"	5.40	5.94	4.32				1,120.24	560,117	649.79
1" x 1.1/4"	6.00	6.60	4.80				1,230.06	615,031	713.43

Installation

The safety valve must be installed as required by the technical specifications set down in "R" regulations - 2009 Edition, in accordance with the direction of flow shown by the arrow cast into the valve body. The valve must be connected to the highest part of the boiler or to the outlet pipe in the immediate vicinity of the boiler. In the latter case, the length of the pipe between the safety valve and the connection of the outlet pipe to the boiler must not exceed one metre. It must not be possible to shut off the pipe connecting the safety valve to the boiler, nor should the section of this pipe be at any point less than the safety valve inlet port section. The discharge pipe must be visible and routed to a siphon or receptacle (**IS Series**) so as not to cause injury to persons or damage to property, and to facilitate inspection in the event of opening. In order not to impair correct valve operation, avoid installing an elbow on the discharge pipe. Instead, use a curve with a radius of at least 3 times the diameter of the pipe. To ensure perfect efficiency, the safety valves require regular inspection. Over time, foreign matter may build up close to the disc; therefore the valve seat should be flushed periodically (e.g. at the start of the heating season). It can be flushed through manual discharge of the valve by turning the knob in the direction of the arrows. Almost all leaks (dripping, incomplete closing) are caused by debris lodged between the seat and disc; therefore, periodic inspection and flushing prevent these leaks and any ensuing problems.

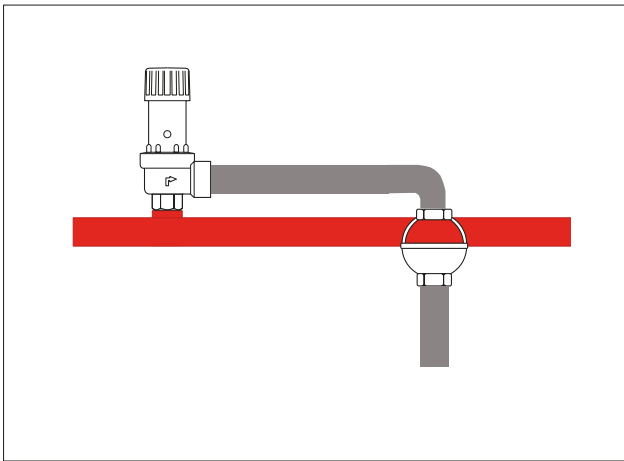


Fig.1 Direct installation of the funnel on the discharge pipe

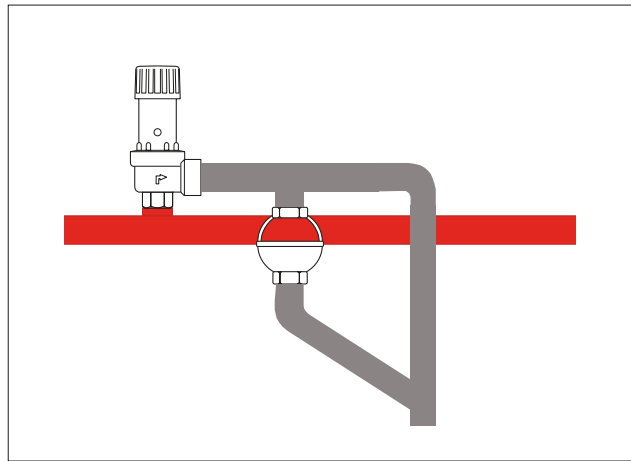
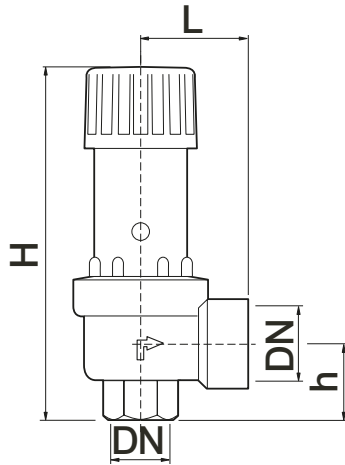


Fig.2 Common installation of the funnel where the discharge flow rate is high

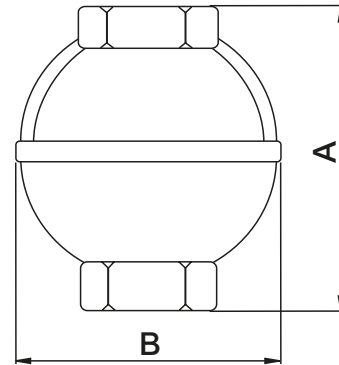
Overall dimensions (mm)

VST



DN	L	H	h
1/2" x 3/4"	37	119	24
3/4" x 1"	48	165	29
1" x 1.1/4"	54	190	34.5

IS



DN	A	B
1/2"	61	45
3/4"	65	57
1"	78	68
1.1/4"	113	97

Specification text

VST Series

Diaphragm safety valve with fixed setting **VST Series** – WATTS brand. CW617N brass body and cap. PN10. Overpressure: 10% Blowdown <20% Temperature range: -10÷120°C. 1/2"-1" F/F connections with oversized outlet. Suitable for water with glycol: up to 50%. INAIL approved and calibrated. Compliant with PED 1014/68/EU with identification number CE0425.

IS Series

Exposed brass drain funnel **IS Series** – WATTS brand – for safety and thermal drain valves. Diameters from 1/2" to 1 1/4" with FF connections.



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