


MSV




Engineering
GREAT Solutions

Reheater Safety Valve

MSV - Reheater Safety Valve

Three solenoid bypass valves (SBE) are provided between the upper and the lower piston chamber of the hydraulic actuator. De-energizing one of these solenoid valves opens a flow path between the piston chambers and allows the steam pressure to open the safety valve. Due to the operating principle, the valve can be used with back pressures up to 0.5 x inlet pressure without influencing capacity or trip pressure.

After relief operation, the valve is re-closed and kept closed with hydraulic fluid forced through another solenoid valve APL. The high force provided by the hydraulic actuator keeps the valve tight for years of plant operation.

Three redundant pressure switches sense the system pressure and provide the trip signal for relief operation. The safety control cabinet SC contains the necessary relays to operate the solenoid valves and the test logic for regular testing of the safety valve function. Up to 4 parallel safety valves can be connected to one safety cabinet.



Long-life, tight shut-off

Key features

- > Forged and bolted design with inlet separate from outlet
- > Material change between inlet and outlet is easily implemented
- > Backseat seals gland during the relief operation
- > Double acting hydraulic actuator to keep valve completely tight during the normal operation
- > Hydraulic power operated, to ensure high seat sealing force for constant tight shut-off
- > No spring required, steam pressure opens the valve
- > Three solenoid bypass valves are provided per actuator for redundancy
- > Complete system is type tested and has a type approval number from TÜV

Benefits

- > Very high relief capacities in one valve
- > Tight shut-off over years due to high seating force
- > Valve lifts without any external energy
- > Completely testable during normal plant operation
- > No spring required
- > Safety function according to EN4126-5 (TRD421) (type approval)

Safety function

Reheater safety valve

MSV

Closing solenoid valve

APL

Solenoid bypass valves

3 x SBE per main valve

Limit switches

R+4K for feedback to safety cabinet SC)

Safety cabinet

SC (for up to 4 parallel safety valves)

Triplicated safety device

3 x Pressure switches with lockable isolation valves and test pressure tap

Positioner

N/A – Junction box only

Hydraulic power unit

HV

Product specification

Design code

EN 12516-2
Others upon request

Body style

Angle type; flow-to-open
Bolted or welded

Nozzle connection

Butt-welding acc. to customer requirements

Steam data range

650°C / 40-80 bar

Back pressure

Max. 0.5 x inlet pressure

Seat/stem tightness

Tight shut-off - EN 12266-1 Cl.B, MSS-SP61 or ANSI/FCI 70.2 Cl. V.

Actuation

Double-acting hydraulic actuator

Typical stroking time

2-3 seconds to open

Serviceability

Replaceable stem/plug
Bolted bonnet or pressurised sealed bonnet

Options

Inlet/ outlet materials for compatibility with pipe materials

Orientation

For serviceability, actuator on top recommended

Safety valve certificate

EN 4126-5 (TRD 421) - Type approval available

Operating principle

The safety system operation is based on the "1 out of 3" principle. Tripping of one of the three activation paths causes the safety valves to open. If the pressure in the steam system rises above the set pressure of one of the three safety switches, the corresponding solenoid valve on the actuator is de-energized. The solenoid bypass valve opens and the steam pressure will open the safety valve. No hydraulic energy is required to open the safety

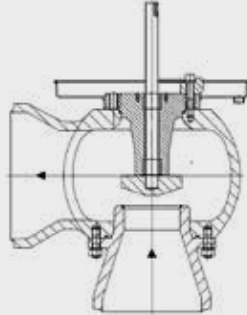
valves. Up to four safety valves can be connected to one safety control cabinet. When pressure has decreased below the trip pressure of the pressure switches, the bypass solenoid valves are energized again. Another solenoid valve closes the safety valve again and keeps the safety valve closed under normal operation. Manual opening by command or by an additional signal from the boiler control system are also available

The safety system has a built-in test function which serves for regular testing of the safety valves including all relevant components of the safety control system during normal operation of the plant. Therefore, the valve need never be removed during the plants lifetime. Pressure switches are checked by isolating them from the steam pressure and connecting them to a test pump. The main valve stems move during the tests. The functional test is carried out path by path.

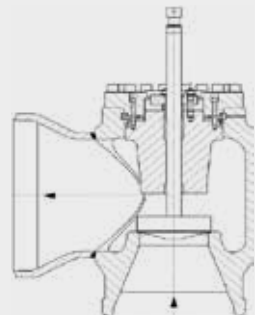
Typical materials

Inlet/Outlet*	A182 F22 / 10CrMo9-10
	A182 F91 / X10CrMoVNb9-1
Valve seat	A182 F92 / X10CrWMMoVNb9-2
	Stellite hard facing
Stem	X19CrMoVNbN11-1
	Inconel 718
Bonnet	A182 F22 / 10CrMo9-10
	A182 F91 / X10CrMoVNb9-1

Note: Other materials available upon request
* Depending on the design, the body can be the same as the inlet or the outlet



Trim design bolted bonnet version

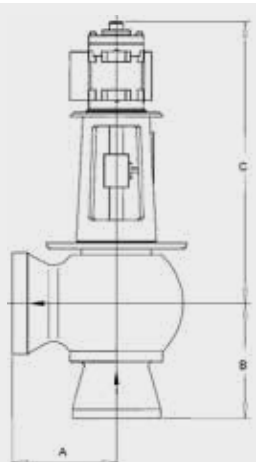


Trim design pressurised bonnet version

Typical dimensions

Type	A (mm)	B (mm)	C (mm)	Stroke (mm)	KV nom	KV relief	Weight
MSV 160	420	450	1250	50	921	839	~620
MSV 180	450	460	1360	56	1165	1061	~770
MSV 200	510	520	1390	62	1439	1311	~945
MSV 220	510	520	1390	68	1742	1587	~1160
MSV 250	610	615	1440	75	2248	2048	~1435
MSV 280	660	660	1470	85	2820	2569	~1710
MSV 300	700	700	1685	95	3238	2950	~1830

Note: Values are for reference only. Final dimensions will be stated in the top assembly drawing



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