

Safety valves are the ultimate protection device for tanks and pipelines. They prevent pressure limits being exceeded once all automatic control and monitoring equipment has failed.

Normal safety valves initially open proportionally up to a pressure rise of 10 %. This initial phase is followed by the full opening of the valve, allowing a large flow of medium. Especially in the case of liquids, the wide proportional range results in a continuous operation.

Pressure rise:

above 1 bar set pressure 10 % up to required valve lift;
below 1 bar set pressure 0.1 bar.

Proportional safety valves open almost continuously as the pressure rises. They produce the valve lift required for draining the volume within a maximum pressure rise of 10 %. They are used where only small volumes are expected to be drained (e.g. thermal expansion) and where the loss of medium is to be minimised.

Pressure rise:

above 1 bar set pressure 10 % up to required valve lift;
below 1 bar set pressure 0.1 bar.

Full lift safety valves open instantly up to maximum lift within a pressure rise of 5 %. Because of their instant opening they are used where suddenly larger flow volumes or fast pressure rises may occur. They are mainly used for relieving pressure in vapours and gases.

Pressure rise:

above 1 bar set pressure 5 % up to the max. valve lift;
below 1 bar set pressure 0.1 bar.

Closing pressure difference

compressible media	10 %
below 3 bar	0,3 bar
non-compressible media	20 %
below 3 bar	0,6 bar

System operating pressure

The plant or system operating pressure should be at least 5 % below the safety valve closing pressure to ensure that the safety valve closes correctly.

Variable back pressure

During blow-off the variable back pressure created by blowing-off must not exceed 15 % of the valve operating pressure. If the variable back pressure is more than 15 % of the valve operating pressure, the valve capacity must be checked. For higher pressures safety valves fitted with pressure-compensating metal bellows should be used.

External back pressure

A constant external back pressure (caused by the system) can be compensated by selecting a suitable spring. In this case the above statements are not applicable.

Installation

Safety valves must always be installed with the spring cover at the top.

Safety valve inlet

The inlet spigots for safety valves should be as short as possible and must not produce a pressure drop exceeding 3 % of the valve operating pressure. If the pressure drop is greater, the inlet pipeline diameter should be increased. The edge of the inlet spigot should be chamfered or rounded.

Blow-off pipeline

For vapours or gases the blow-off pipeline should rise, whilst for liquids it should be installed with a fall. Please make sure that a blowing safety valve does not create a hazard, especially when a safety valve with open spring cover is installed.

Draining of condensate

To keep away dirt and foreign bodies from the safety valve, the blow-off line must have a condensate drain installed at its lowest point. In addition a drain orifice may be provided in the valve itself (this may be necessary for special operating environments such as ships). Before commissioning the valve the plastic plug inserted by the manufacturer must be replaced by a screwed plug.

Drain lines must have no constriction; they must have a fall away from the valve and an outlet which is open to view; the draining of the medium must not create a hazard. If the medium is steam the above requirement can be met by installing steam traps.

Leakage

Safety valves fitted with bellows feature a relief orifice in the spring cover. If medium leaks from this orifice, the bellows is faulty. In the case of toxic or hazardous media you must make sure that these are drained safely.

Insulation

If insulation is used it must not be applied to the spring cover or cooling area (if provided).

Maintenance

Safety valves must be cleaned and serviced at regular intervals. The service intervals depend on the ambient atmosphere (corrosive, dirty) and mode of operation (occasional, continual).

Function check

From time to time the valve should be checked for correct functioning either by manual venting or blowing off. Steam generators are subject to the regulations given in Section 6 of TRD 601 Sheet 1, Issue 6.83.

A slight leakage can be cured by blowing-off. If this does not stop the leak the sealing surfaces are probably damaged.

The valve should be closed by a sudden release of the venting lever.

After testing the lever must no longer be engaged with the coupling. To disengage the lever it should be pushed towards the centre of the spring cover until the venting fork is free.

Valves free of oil and grease or silicone

Please pay attention to order a fit only spares free of oil and grease resp. free of silicone.

Please consult our engineer if extreme operating conditions apply or whenever you are in doubt.

Notes on Safety, Operating instruction etc. MUST be followed.