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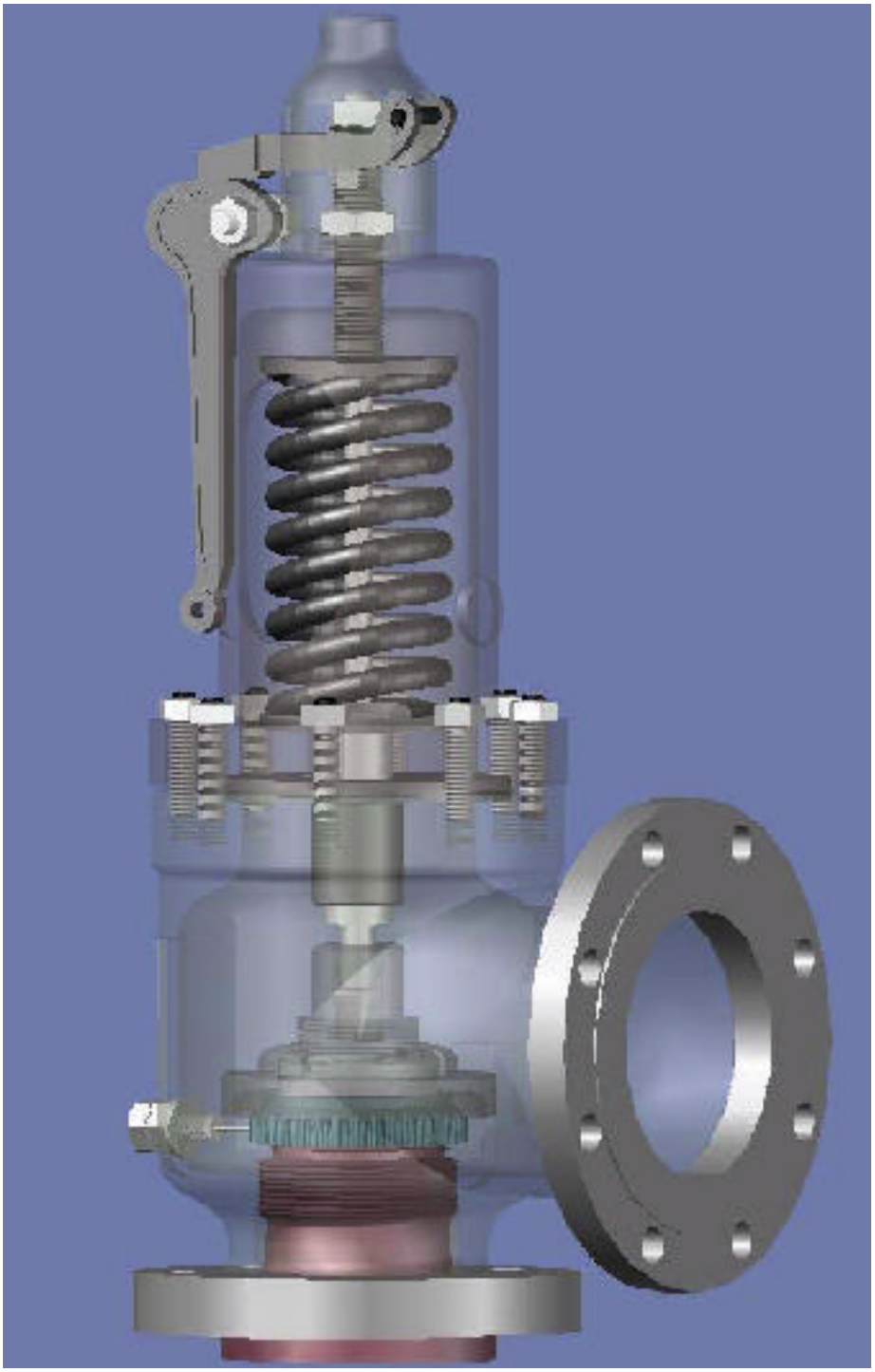
06-07

Safety relief valve — Series SRV



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How Pressure Relief Valves Operate

Pressure relief valves are force balanced valves and when the inlet pressure increases; it overcomes a spring load causing the imbalance at the disk. The valve then relieves the fluid and reduces the pressure in the system.

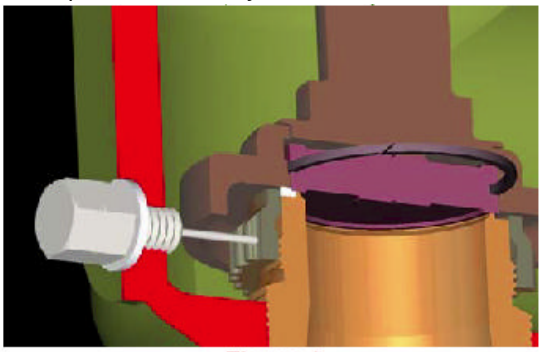

Figure 1

Normally when the valve is closed (See Figure 1), the vessel pressure (P) is acting against the seating area (A) which is opposed by the spring force. As the pressure "P" increases at seat area "A" the force at seat tends to nullify the spring force and the pressure builds up in chamber "B" (See Figure 2).

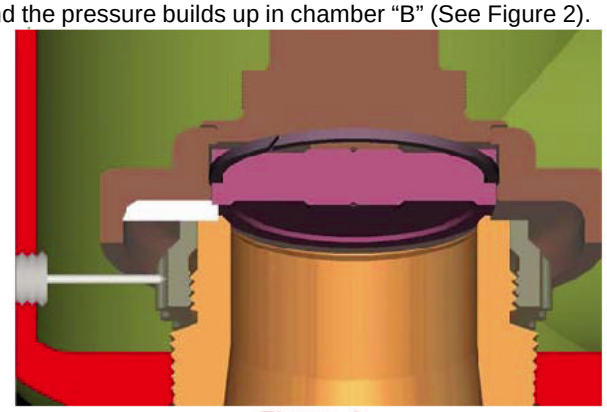

Figure 2

Since the pressure is now acting over a larger area, suddenly an additional force is available which cases the valve to open rapidly casing the valve to POP. By bringing up or down the blow down ring, opening of secondary chamber is controlled which alters the pressure build up rate in this chambers.In compressible fluid service the valve will "simmer" following the "pop". When the system pressure increases by one to two percent of the set value, fluid will go past the seating surfaces with a sound into secondary chamber "B" as a result of restriction of flow in to this area. Once the valve has opened, an additional pressure build-up at "C" occurs. (See Figure 3)

Figure 3

This is due to the sudden increase in flow and the restriction to flow through another annular orifice formed between the skirt of the disc holder and the outside diameter of the blow down ring. This additional force at "C" causes the disc to lift fully at "pop". Flow is restricted by the opening between the nozzle and disc until the disc has been lifted from the nozzle approximately 25% of the nozzle diameter. After the disc has attained this extent of lift, flow is then restricted by the orifice at Nozzle and not by the area between the seating surfaces. Blow down is the difference between opening and reseat pressure of a valve which can be controlled with some limitations, by positioning the blow down ring. Blow down is caused by the result of the spring force not being able to overcome the abstract of the forces at "A", "B", and "C" until the pressure at "A" drops below the set pressure.

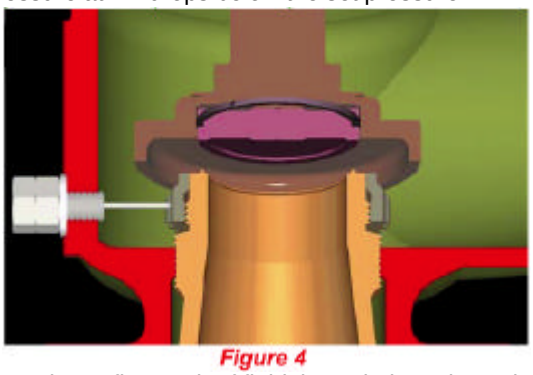

Figure 4

Figure 4 shows flow path of fluid through the valve. It is significant to recognize that the system pressure enters through the nozzle and remains at a high pressure until it escapes through the secondary area. Pressure downstream of the secondary annular orifice is much lower than the system pressure.

NOTE: BLOWDOWN SETTINGS – Production testing required by Manufacturers of safety relief valves is governed by ASME Section VIII, UG -136 (d), which does not require the setting of blow down during production test. Adjusting rings on the flanged safety relief valve series are factory set to determined ring settings. This will provide a consistent opening and closing pressure on the safety relief valve.

Adjusting Ring

The adjusting ring in the safety relief valve is preset to determine its position before putting the valve on line. Presetting reduces the necessity of popping the valve on line to ascertain that the ring has been set properly for attaining the required lift and capacity.

Simple Blow down Adjustment

Adjustment of blow down, or reseating pressure in a safety relief valve, is by means of a blow down ring. When it is moved up, blow down is increased; however it will decrease the reseat pressure. When moved down, the blow down is decreased and it will increase the reseating pressure. The simplicity and advantages of these arrangements are obvious other valves have two or more adjusting rings.

Maximum Seat Tightness

To achieve seat tightness, finish of seating surfaces is of utmost important. Seat finish in a safety relief valve is of the utmost importance. Seat surfaces of Safety valves are precision machined, lapped and checked with a monochromatic check lamp for its optical flatness. Thinner seat width allows even heat dissipation and compensate for temperature variation to avoid thermal distortion preventing leakage for high temperature fluid

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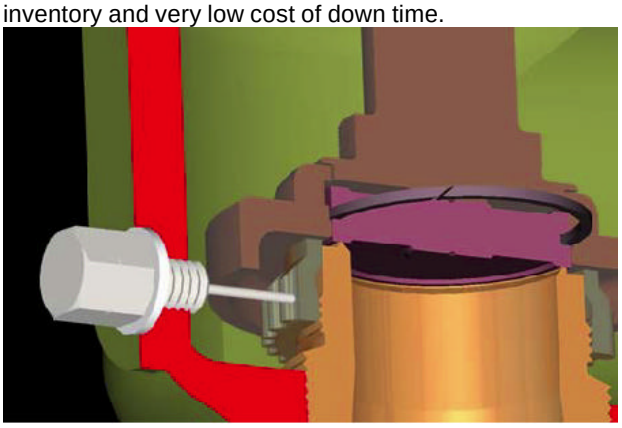
applications. For low temperature fluid applications Soft seat options are available.

Design Simplicity

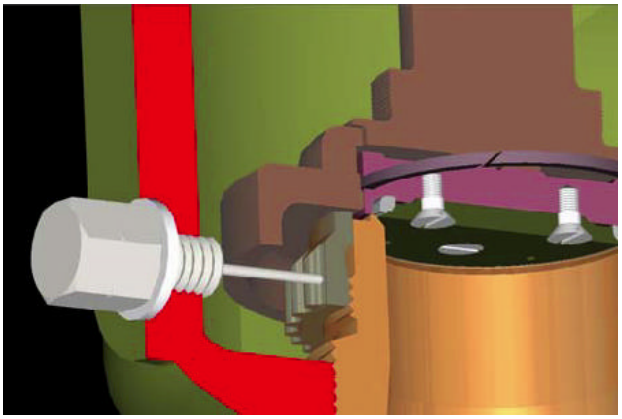
These safety relief valves uses fever parts and call for minimum inventory of spares offering great savings. This also results in simplified maintenance.

Valve Interchangeability

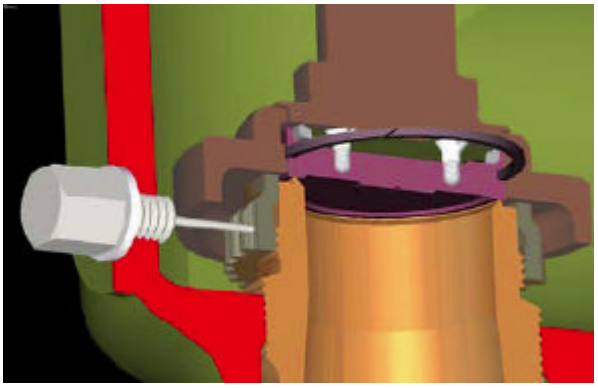
Disk holder configuration in Mascot Safety Relief Valve can allow disk for Soft seat as well as disk for Metal seat. In fact if valve is ordered for a Soft seat, just by using the flipping the disk vertically and using other face of the disk it can be used as valve with a metal seat without needing ANY extra parts. For metal seated valve, the disk has two seat faces, so in case of one surface giving away, there is always another one already available in the valve itself. All one needs to do is to flip the disk vertically. This results in maintaining a lower inventory and very low cost of down time.



Metal seat



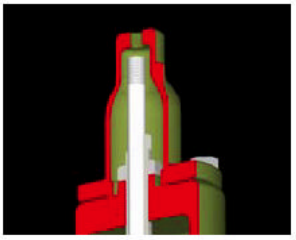
Soft seat

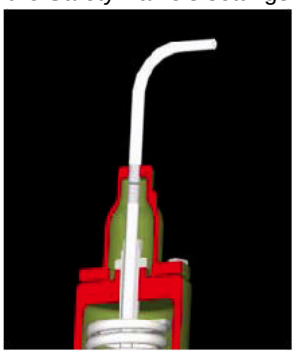


Soft seat reversed

Cap and Lever Interchangeability

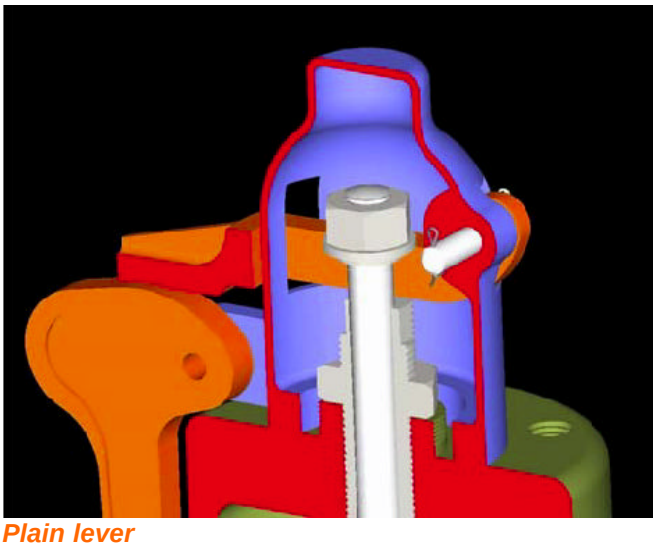
Bolted, screwed, packed or open lever and plain cap design is available. Test gag provisions can be made on any of these cap assembly. Any of these options can be implemented with whatever may be your present arrangements, without disturbing the Safety Valve's settings.





Plain cap and Plain cap with a test gag

Packed lever



Plain lever

Minimum Guiding Area

In process industries where corrosion or contaminations build up on the guiding surface of the valve, it is detrimental to have larger guiding surface then required to align the searing surface of Disk and Nozzle. Minimized guiding surface will be less prone to sticking and galling.

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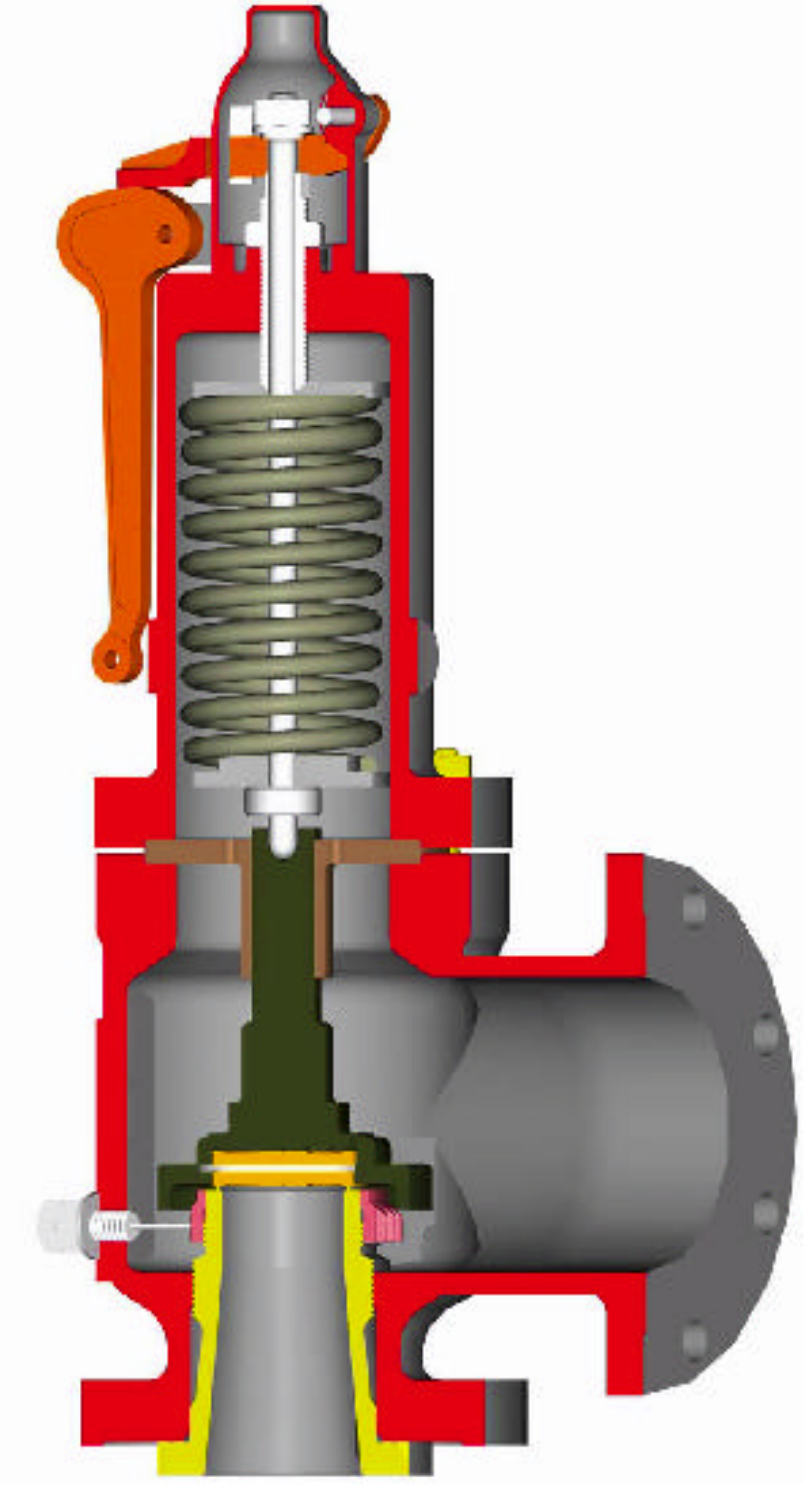

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