

## Working

Working of water level indicator or water gauge is very simple. When the cocks are opened, boiling water and steam from the boiler shell flow into the hard glass tube and maintain the same level as in the boiler which is visible to operator.

When the water level falls down beyond a safe limit, operator may switch on the feed pump to fill more water in the boiler shell.

In the water and steam passages in the gun metal tubes, a metal ball rest in the cavity made in the passage. In case of breakage of glass tubes by accident, water and steam contained at high pressure in the boiler rush with high speed towards broken glass tube due to large pressure difference between inside and outside of boiler.

Due to this, the ball resting in the cavity made in the passage lifts and rushes towards the end of gun metal tube and blocks the passage of steam or water flow. Then immediately the cock can be closed and glass tube can be replaced safely.

## Pressure Gauge

### Function

A pressure gauge is used to indicate the pressure of steam in the boiler. It is generally mounted on the front top of the boiler. Pressure gauge is of two types as

- (i) Bourdon Tube Pressure Gauge
- (ii) (ii) Diaphragm type pressure gauge. Both these gauges have a dial in which a needle moves over a circular scale under the influence of pressure.

At atmospheric pressure it gives zero reading. Some gauges indicate only the positive pressure but some are compound and indicate negative pressure or vacuum also. Looking at the gauge, boiler operator can check the safe working pressure of the boiler and can take necessary steps to keep the pressure within safe limits.

If pressure increases and crosses the safe limit due to any reason, the boiler shell material may fail and it can burst causing damage to life and property. Thus it is very important to constantly monitor pressure in a boiler with the help of pressure gauge.

## Construction & working

The bourdon tube is an elliptical spring material tube made with special quality bronze. One end of tube is connected to gauge connector and other end is closed and free to move.



A needle is attached to the free end of tube through a small gear mechanism. With the movement of tube under pressure, needle rotates on the circular scale. The movement of tube & hence needle is proportionate to the rise in pressure and so calibrated with scale.

The pressure gauge connector is attached to the boiler shell through a U-tube siphon and three way cocks. In the U-tube, condensate remains filled and so live steam does not come in direct contact of bourdon tube but it push or exert pressure on the condensate which further stretch bourdon tube. Steam is not allowed a direct contact with the gauge due to high temperature effect on the pressure recording. The three way cock is used to give an entire connection for inspector pressure gauge.

## **Spring loaded safety valve**

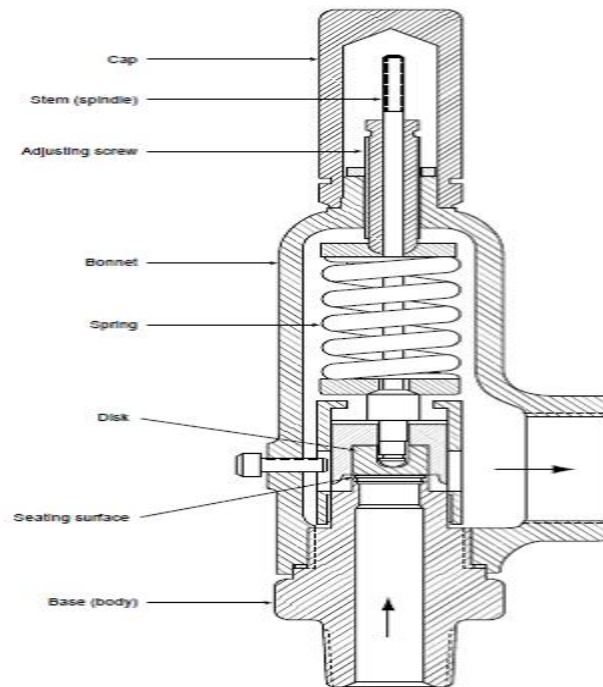
### **Function**

Spring loaded safety valve is a safely mounting fitted on the boiler shell and is essentially required on the boiler shell to safeguard the boiler against high pressure. It is a vital part of boiler and always be in good working condition to protect the boiler from bursting under high pressure and so to save life and property.

### **Construction**

it consists of two openings or valve seats which are closed by two valves attached to a single lever. The lever is pivoted at one end and attached to a spring at the middle.

The spring is fixed at the bottom end with the overall body of valve. Due to spring force, the liver and hence valves remain seated on the valve seats and do not allow the steam to escape. When the pressure force of steam exceeds the spring pulling force, valve & lever are lifted and steam escape thus decreasing the pressure below the safe limit. On decreasing the pressure valves sit again on their seats and thus stop the steam flow from the boiler. Sometimes, the lever may also be lifted manually to release steam if required.





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