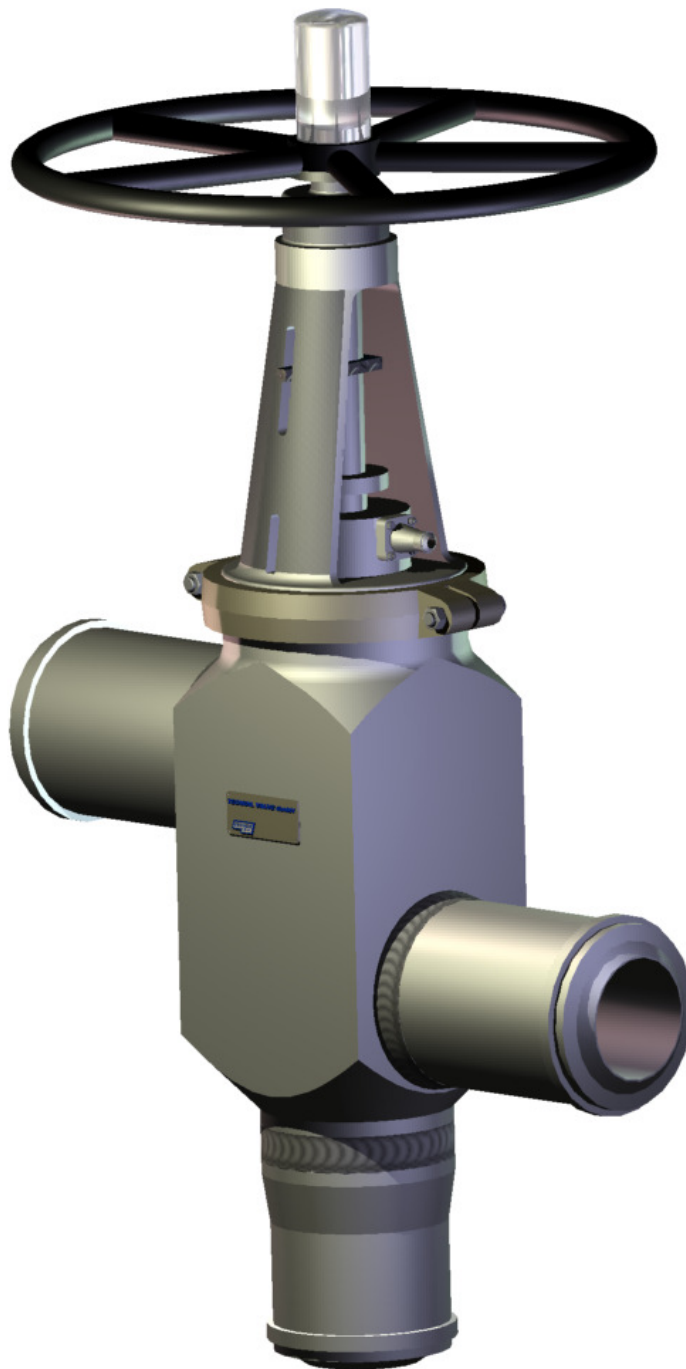


Preheater bypass system COV/QCV



1.1 Application

To improve the efficiency of a steam vessel system, feed-water, flowing from the feed-water tank to the vessel, is heated by a preheater.

The preheater is a heat exchanger with tubes containing feed-water. From the outside, the tubes receive steam drawn-off from the turbine.

In the case of a leakage in the tubing system, water of higher pressure rushes into the vapor room of lower pressure. To avoid any damages by

- a) penetration of feed-water into the turbine
- b) build-up of inadmissible pressure in the preheater jacket,

the preheater must be separated from the feed-water pressure tube as soon as possible. This will be provided by the preheater protection unit, i.e. by quick closing valves which are controlled by their own medium and located at the in- and outlet of the preheater. Normally a change-over valve is located at the inlet and a stop valve at the outlet.

2.1 Construction and function

The following circuit diagrams show some arrangements together with their control units. The circuit diagrams show the valves in normal working position with opened preheater pipe train and locked bypass tube.

All circuit diagrams have the following functions:

2.1.1 Function with automatic switch-over to bypass

The level sensor feeds an electrical pulse to the control valve which opens the relief tube. Pressure under the control piston of the main valves is reduced.

Because of the pressure difference, the change-over and the quick stop valves shift at the piston. The interconnecting bore in the sealing plug provides for the pressure compensation between the space above the control piston and the feed-water tube. The switching speed can be adjusted by the flow control valves.

Subsequently both valves are blocked through the screwed down threaded spindle. An increase of the tightening force on the blocking spindles improves the sealing at the valve seats.

2.1.2 Resetting the two main valves to standard position

Rotate the locking spindles of the two main valves up to position

'Preheater pipe train open'.

Fill the preheater through the stop valves up to working pressure.

At an internal pressure of min. 50 bars pressure compensation at any position, the valves will shift over.

If you want the valves to shift at lower pressure, you must indicate the pressure.

With very low shifting pressures must the upper control piston space be relieved by opening another valve.

Due to the current spindle lifting force in position 'preheater open' and should it be necessary to relief the upper piston space, the preheater protection valves shift.

To revert to normal operation, you must shut the stop valves.

The plug coupling is only used for adjusting the valves with the hand wheel in unpressurized condition. In this case, the stop valve must always be closed.

Pull-off the plug coupling immediately after use. The stop valves are used for filling the preheater - always close them after filling the preheater.

3.1 Construction and function

The following circuit diagrams show some arrangements with their control units.

The circuit diagrams show the valves in standard working position with opened preheater pipe train and locked bypass tube.

Preheater protection units, circuit diagram 1

Function during automatic shifting to bypass.

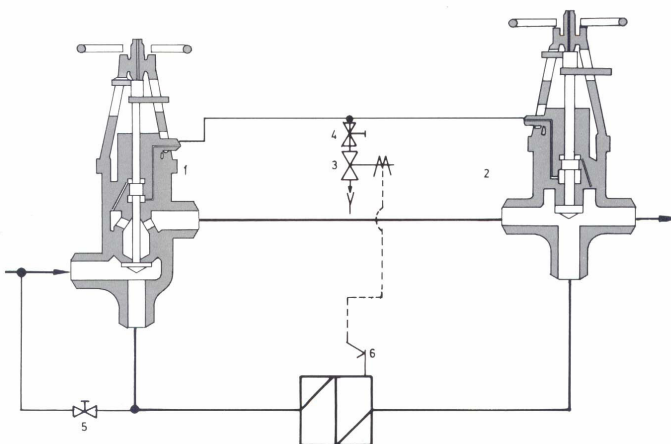
The solenoid control valve receives an electrical pulse from the level sensor and releases the pulse tube.

The pressure below the control piston of the main valves decreases, and both, the change-over valve and the quick stop valve shift.

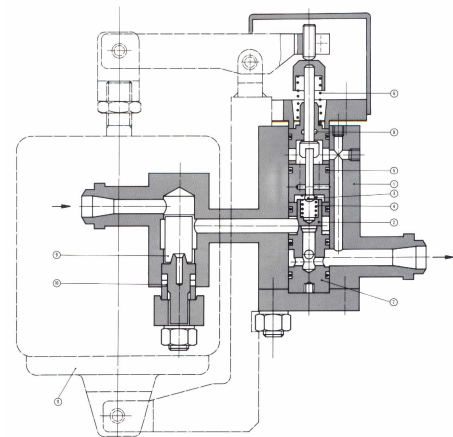
The compensation bore in the casing closure serves to compensate the pressure between the space above the control piston and the feed-water tube.

The shifting speeds are set by the flow control valves. Blocking the two valves is carried out by screwing-down the threaded spindles.

Feedwater operated system



Pilot control valve



Preheater Bypass System

Control by control valve with electric drive.

The control valve with electric drive receives an electrical pulse from the level sensor and opens the pulse tube.

The pressure below the control piston of the two main valves decreases, and both, the change over valve and the quick stop valve shift.

The shifting speed of the two main valves can be set individually by the flow control valves. Blocking the two valves in bypass-position is carried out by screwing down the threaded spindle.

3 Way Preheater Inlet Valve with electric actuator

