

VHB and VHBS



Engineering
GREAT Solutions

Feedwater Heater Bypass Valves

VHB and VHBS Bypass Valves

In thermal power generation, the feedwater heater uses heat transfer from extraction steam to preheat the feedwater, improving the overall plant efficiency. If the feedwater heater malfunctions then it needs to be isolated using a bypass system to allow maintenance without disrupting the flow of feedwater to the boiler. The bypass system consists of two on/off valves placed upstream and downstream from the feedwater heater, with two separate conduits connecting them. One conduit routes the feedwater through the heater, while the other bypasses it.

Key features

- > Body manufactured with fully machined forgings
- > Two on/off valves
- > Three-way valves
- > Built-in water hydraulic actuation as standard
- > Electrical, pneumatic or external water-hydraulic actuation available as options

Benefits

- > Protects feedwater heater steam jacket against tube rupture or leakage
- > Protects turbine extraction from excessive backpressure
- > Allows bypass of feedwater heater during peak loads to increase power output from the turbine
- > Contoured plug to minimise pressure drop of the trim
- > Easy maintenance
- > Allows maintenance without disrupting flow

Product specification

Valve type

VHB, VHBS

Selection

Use IMI CCI PowerSiz sizing program

Pressure class

Up to ANSI-4500 (higher ratings may be achieved on request)

Actuator type

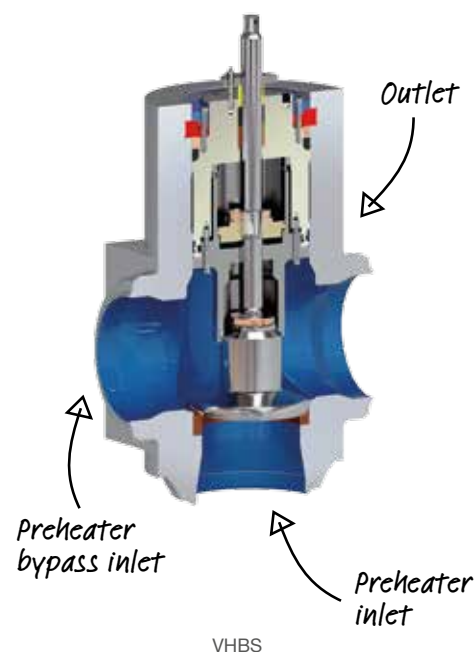
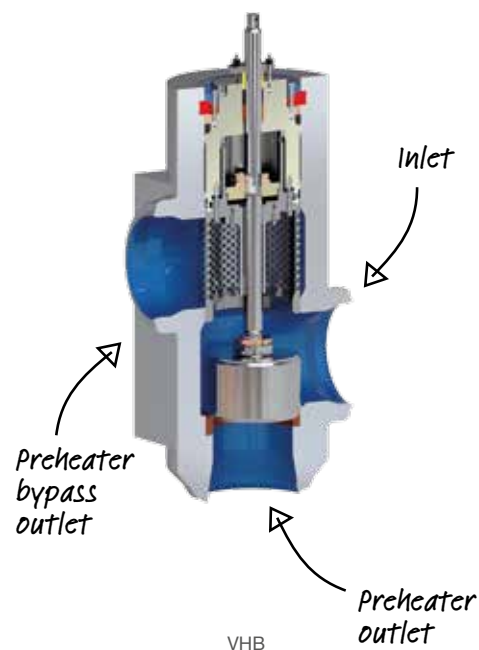
Water hydraulic, pneumatic, electromechanical

Leakage class

ANSI class III (against bypass line)
ANSI class V (against feedwater heater)

Regulatory standards

PED, ASME

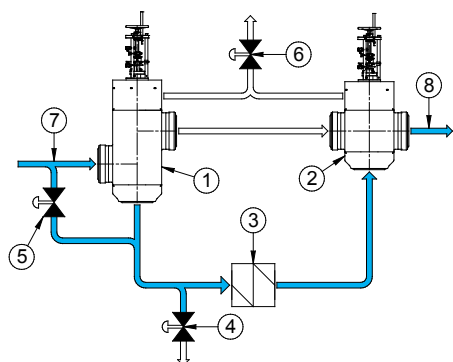


Water hydraulics

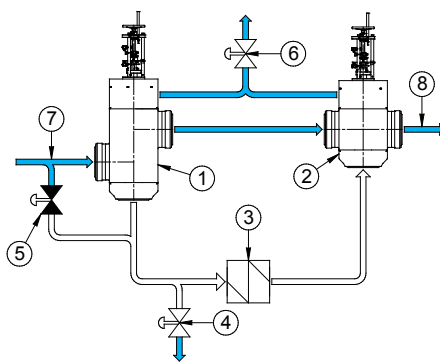
The VHB and VHBS with built-in water hydraulic actuators use the water pressure supplied by the feed water pump to open and close the valve. Stroke speed is controlled using a manual control valve installed in the pipe connecting to the evacuation valve. The valve can be secured in a closed position using a hand wheel installed on the yoke.

During normal mode, the valves are kept open due to the internal pressure from the water flowing through the heater. Dump and evacuation valves are to be kept closed. It is also recommended that the filling valve is closed at this time.

When transitioning to bypass mode, the evacuation valve should open and the filling valve should close, reducing pressure in the actuator's lower chamber. This will cause the valve plugs to close against the seat, putting the valves in bypass mode. Any water in the feed water heater piping is drained by opening the dump valve.



Normal mode

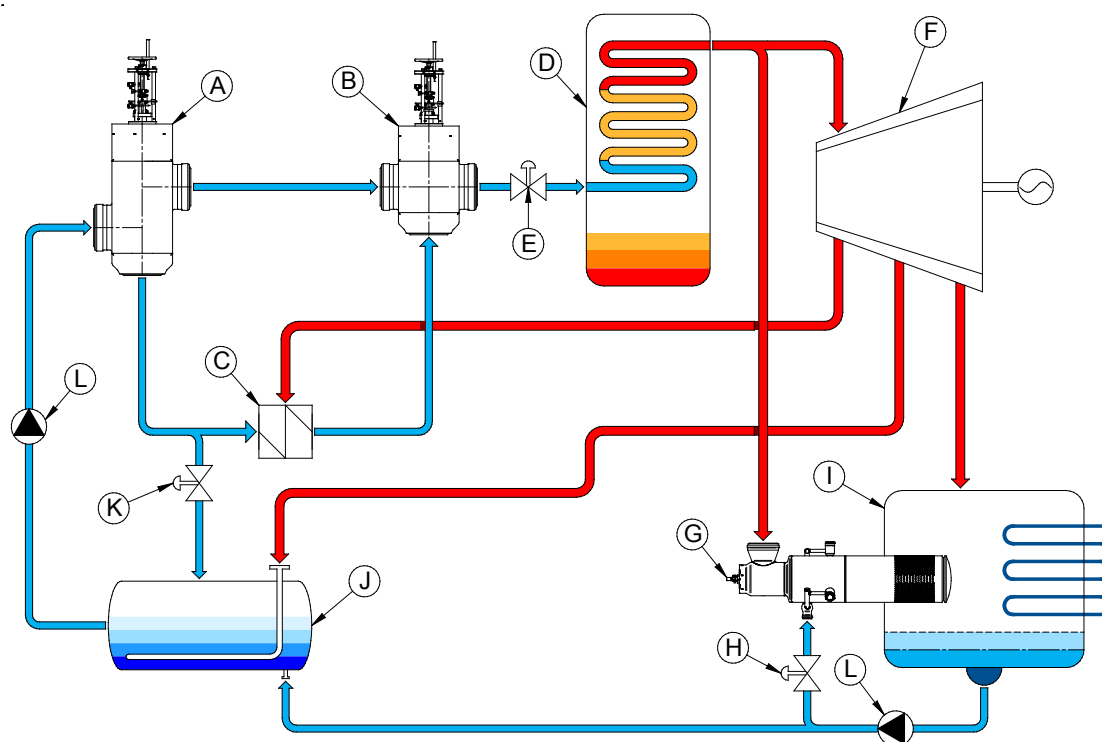


Bypass mode

- 1. VHB
- 2. VHBS
- 3. Feed water heater
- 4. Dump valve

- 5. Filling valve
- 6. Evacuation valve
- 7. Feed water from tank
- 8. Water line to boiler

Application example



- A. VHB bypass valve
- B. VHBS bypass valve
- C. Feed water heater
- D. Boiler
- E. Feed water control valve

- F. Steam turbine
- G. Steam turbine bypass valve with dump tube
- H. Spray water control valve
- I. Condenser

- J. Feed water tank
- K. Dump valve
- L. Feed water pump

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