High Pressure Turbine Bypass Valve
The VBSE is a steam conditioning valve used for steam throttling and desuperheating through spray water injection, directly at the outlet. Used for start-ups and load rejection, they bypass the steam to various reheat lines until the steam temperature matches the turbine blade temperature.

With a range of available body materials, the VBSE valve can be used for the main steam pressures and temperatures of today’s most advanced single and double reheat thermal power plants.

### Key features
- Specially designed for modern ultra-supercritical power plants load ramping and trip case requirement
- Forged body design with flow-to-close flow pattern
- Pressurised seal bonnet design allowing for greater reliability at high pressures
- Can be equipped with hydraulic, electromechanical or pneumatic actuator.

### Benefits
- Compact and robust design with more standardised components
- Reduced number of components
- Easy maintenance features allowing quick access to internals and pressure reduction tube
- Inlet bonnet cage with drilled hole pattern to reduce the level of noise emission
- No need for special tools for assembly/dissassembly

### Product specification

#### Body style
Forged angle type valve body, flow direction - flow-to-close

#### Nozzle connection
For steam pipes: butt-welding, according to customer’s requirement
For spray water pipes: butt-welding, according to customer’s requirement

#### Trim design
Welded seat ring, pilot operated trim

#### Steam data
- Temperature range: up to 630°C
- Inlet pressure: up to 350 bar

#### Seat leakage class
EN 12266-1 Cl. B or MSS-SP61 or ANSI/ FCI 70.2 Cl. V

#### Actuation
Hydraulic, electric or pneumatic actuator

#### Serviceability
All internal trim parts, seat ring (welded), spray nozzles

#### Options
- Transition pieces for large pipe diameters and material compatibility.
- Prewarming and/or drain connection available upon request
- Integral inlet upon request

#### Certification
Certified acc. to PED 2014/68/EU

#### Design code
EN 12516-2, others upon request
Application example

1. Separator
2. Boiler circulation pump
3. Boiler
4. Superheater
5. Reheater
6. HP bypass valve
7. HP spray water control valve
8. HP spray water stop valve
9. LP isolation valve
10. LP bypass valve
11. LP spray water control valve
12. HP water heater
13. HP feed water pump
14. Deaerator
15. Condenser
16. Circulation water
17. Condensate pump

Valve breakdown

<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Material*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve body</td>
<td>A182 F22, A182 F91, A182 F92</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet cage</td>
<td>A182 F22, A182 F91, A182 F92</td>
</tr>
<tr>
<td>3</td>
<td>Stem</td>
<td>X19CrMoNbVN11-1 + Inconnel (optional)</td>
</tr>
<tr>
<td>4</td>
<td>Plug assembly</td>
<td>X19CrMoNbVN11-1, A182 F92 (Optional)</td>
</tr>
<tr>
<td>5</td>
<td>Valve seat</td>
<td>A182 F22 + Stellite hard facing, A182 F91 + Stellite hard facing, A182 F92 + Stellite hard facing</td>
</tr>
<tr>
<td>6</td>
<td>PR-tube assembly</td>
<td>Gr. 22, A182 F91</td>
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</tbody>
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