

NBSE



Engineering
GREAT Solutions

**Low Pressure Turbine
Bypass Valve**

NBSE - Turbine Bypass Valve

The NBSE 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 dump steam from reheat lines to condenser until the steam temperature matches the turbine blade temperature.

With the range of available body materials, the NBSE valve can be used for 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
- > Available in pressure seal bonnet and bolted bonnet design
- > Can be equipped with hydraulic, electromechanical or pneumatic actuator
- > Seal welded seat with Integral first stage PR tube allowing for quick maintenance and replaceable features
- > Spring loaded water injection nozzles
- > Different plug designs available

Benefits

- > Compact and robust design with more standardised components
- > Reduced number of components
- > Easy maintenance features allowing quick access to internals and PR tube
- > Inlet bonnet cage with drilled hole pattern to reduce the level of noise emission
- > No need for special tools for assembly/dissassembly
- > Exchangeable trim
- > Pilot plug design allowing for Class V / MSS SP 61 shut-off class
- > Modifies outlet allowing for improved mixing and atomisation
- > Modular design to meet all customer demands

Product specification

Body style

Forged angle type valve body, flow direction - flow to close

Nozzle connection

For steam pipes: butt-welding, acc. to customer's requirement
For spray water pipes: butt-welding, acc. to customer's requirement

Trim design

Welded seat ring, pilot operated trim

Steam data

Temperature range: up to 630°C
Inlet pressure: up to 80 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
Pressure seal and bolted bonnet design

Certification

Certified acc. to PED 2014/68/EU

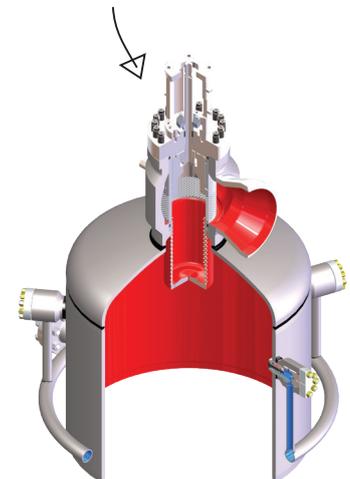
Design code

EN 12516-2, others upon request

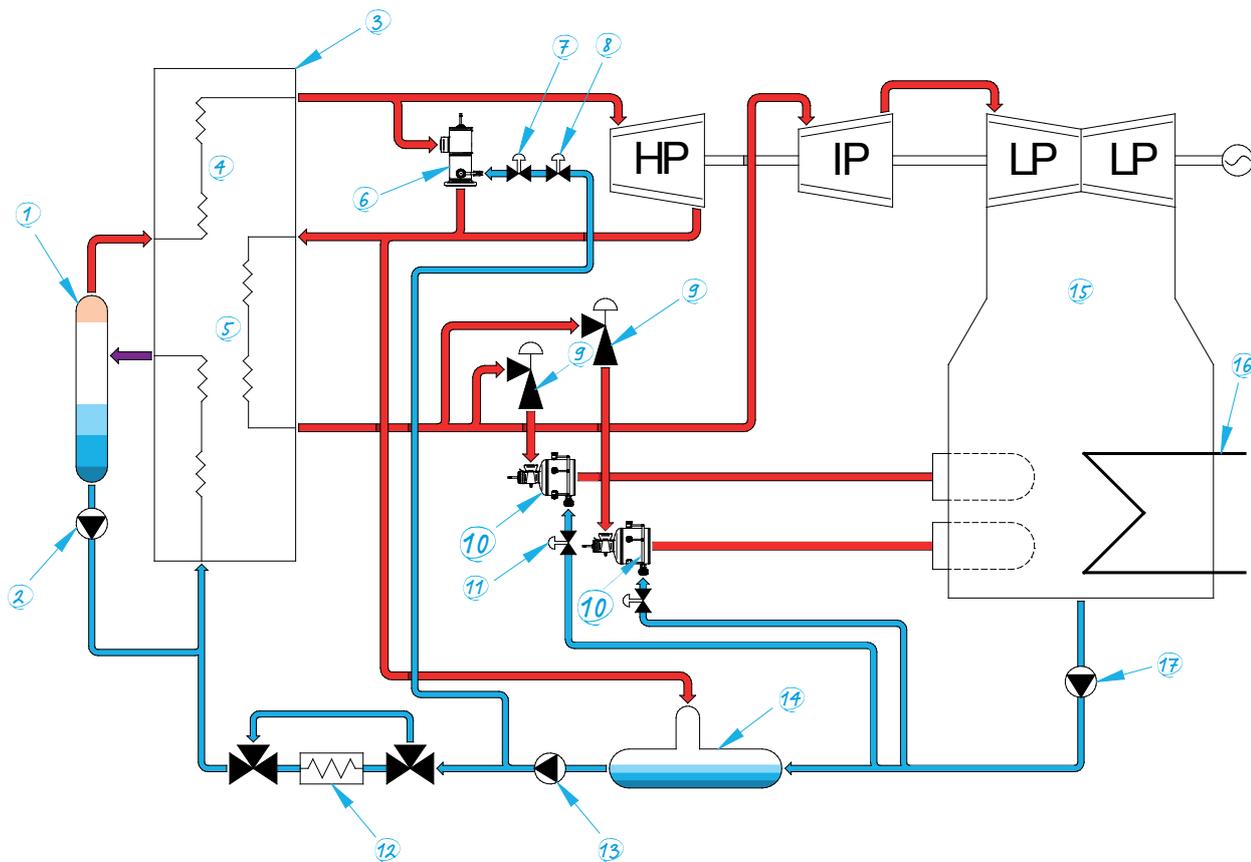
Self-sealing bonnet



Bolted bonnet design



Application example

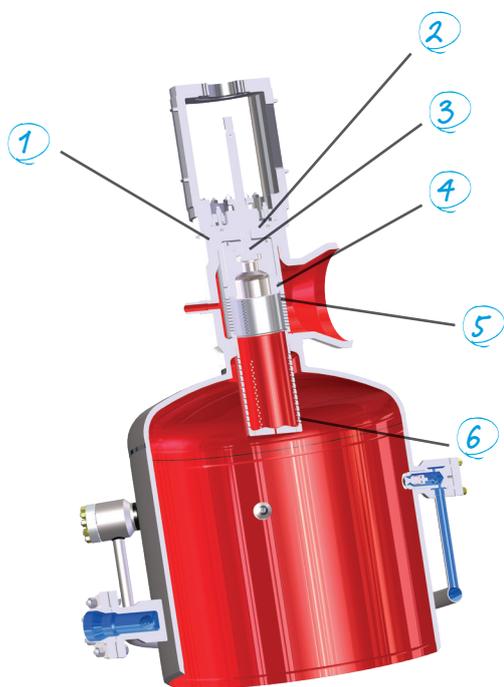


- 1. Separator
- 2. Boiler circulation pump
- 3. Boiler
- 4. Superheater
- 5. Reheater
- 6. HP bypass valve

- 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



No.	Part	Material*
1	Valve body	A182 F22 A182 F91 A182 F92
2	Bonnet cage	A182 F22 A182 F91 A182 F92
3	Stem	X19CrMoNbVN11-1 + Inconel (optional)
4	Plug assembly	X19CrMoNbVN11-1 A182 F92
5	Valve seat	A182 F22 + Stellite hard facing A182 F91+ Stellite hard facing A182 F92 + Stellite hard facing
6	PR-tube assembly	Gr. 22 A182 F91

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