

REDUCTION AND COOLING STATIONS

INTRODUCTION:

The reduction and cooling stations are applied in the commercial power industry for maintaining the pressure and temperature of steam within the limits determined by the technological process by injecting the cooling liquid.



The main elements of the reduction and cooling stations are:

- steam reduction valves
- desuperheaters (injectors of cooling water)
- injection valves

1. The reduction valves reduce the steam pressure to the set value.

It is recommended to use the Z1B type valves for high parameters of pressure and temperature. They provide the possibility to apply multi-opening and multi-stage choking structures and balanced valve heads. Those solutions allow the possibility to eliminate choked flow, to limit the level of noise and to reduce the overloading forces.

The company offers not only straight-through valves but also angle valves made of forged rods.

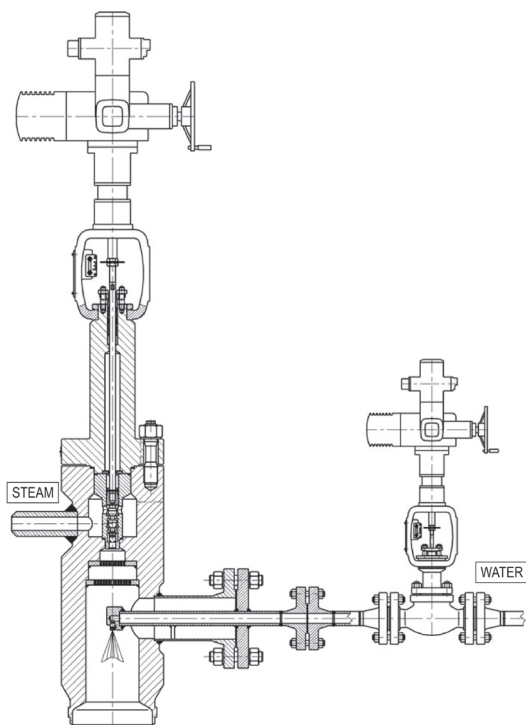


Fig. 1. Steam reduction valve - DN25 /DN150 angle valve made of material X10CrMoVNb9-1 (1.4903). Multi-stage valve head and choking plates at the outflow for the purpose of eliminating choked flow and limiting the noise. The cooling chamber is an integral part of the valve. In the drawing there are also visible: wash pipe desuperheater, injection valve of the anti-cavitation structure.



Fig. 2. Angle valve with an electric actuator.

2. Desuperheaters:

- piston type
- ring type
- lance type

The purpose of the desuperheaters is to transport the cooling water to the cooling chamber in the maximum atomization condition in the whole range of working pressures and flow.

The most commonly used tools are the **piston desuperheaters of the ST1 type**. They consist of the valve part with a one- or two-stage valve head, and the head with injection nozzles. They provide a wide range of control (about 40:1), do not require an injection valve and may be equipped with a pneumatic or electric drive. They are applied in the DN150 pipelines.



Fig. 3 Piston desuperheater of the ST1 type, with a pneumatic actuator.

For smaller diameters of the pipeline and lower requirements in terms of control (about 3:1), it is recommended to use the **SP1 ring desuperheaters and lance desuperheaters**. They require the use of an injection valve. The ring desuperheaters are fixed between the pipeline flanges. They contain 1..3 injection nozzles. The control of ring desuperheaters may be increased (up to about 15:1) by using multi-outlet injection valves.

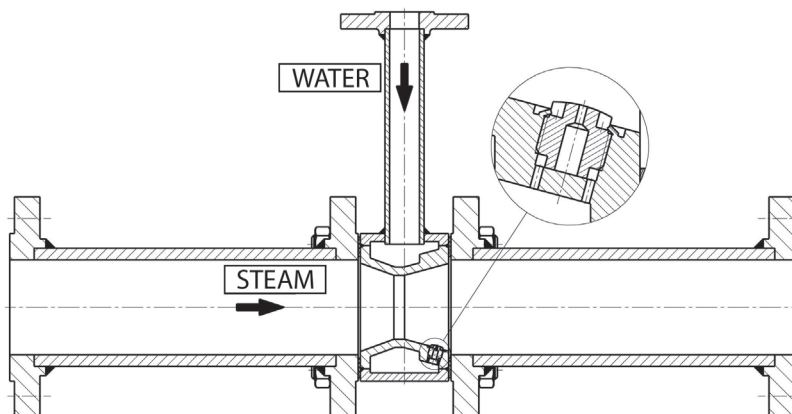


Fig. 4. Ring desuperheater.

The lance desuperheaters are most frequently equipped with one injection nozzle and are recommended for the pipelines up to DN100.

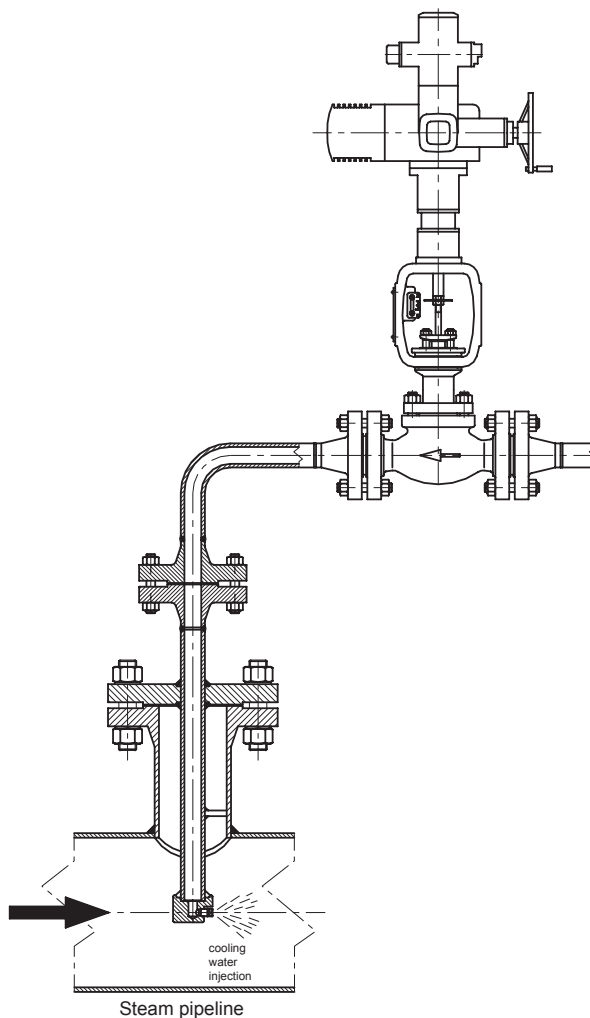


Fig. 5 Lance desuperheater

3. Injection valves.

The role of injection valves is usually played by the control valves of the Z1A type. Due to the parameters of the cooling water, in many cases it is necessary that the valve be anti-cavitalional.

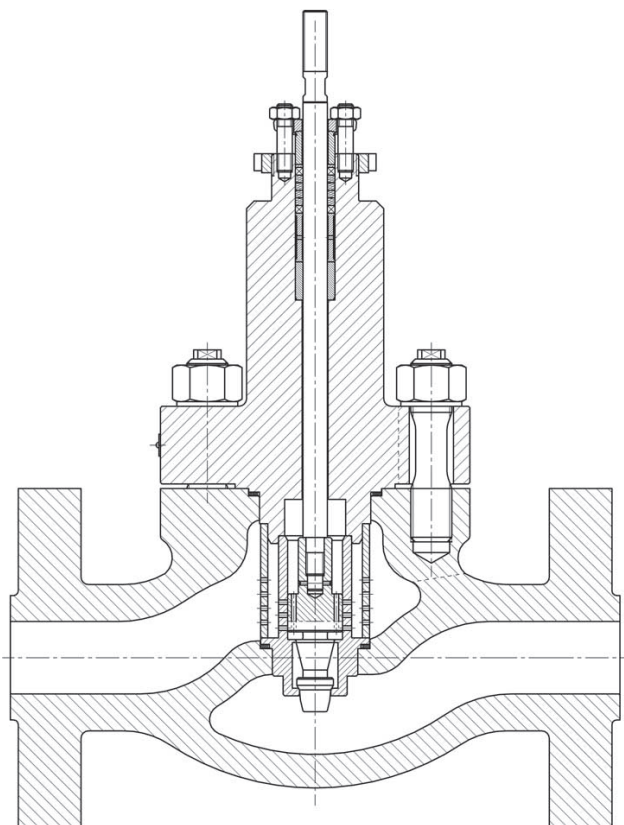


Fig. 6. Valve of the Z1A type, with a multi-stage valve head and a choking cage.