Flow Dividers for Control Valves
ST 1 · ST 2 · ST 3

Application

Valve components to reduce noise emission and are designed for installation in globe and angle valves used to control vapors or gases.

The noise emission of the control valves and the attached pipeline is determined by the free jet exiting the restriction and the jet's turbulent mixing zone in applications with gases and vapors. A particularly effective and low-cost solution to reduce noise is achieved by using flow dividers which shorten the free jet of gas or vapor and accelerate the exchange of energy in the mixing zone.

Special features

- Effective, reliable and cost-effective components for noise reduction
- Noticeable deviation from the characteristic only in the travel range beyond 80 %
- The valve's K_{VS} coefficient is reduced to the K_{VS} 1, K_{VS} 2 and K_{VS} 3 coefficients specified in the data sheets
- Installation in Types 3241, 3251 and 3254 Globe Valves, Type 3256 Angle Valves as well as globe valves in self-operated regulators
- In Series 280 Steam-converting Valves, the flow divider ST 3 is also used to split up and vaporize cooling water (see Data Sheet ▶ T 8251).

Versions

– **Flow divider ST 1** (Fig. 1) · Perforated sheet steel with perforated hole diameters of 2.5 mm; suitable for gases and vapors

– **Flow divider ST 2** (Fig. 2) · Two-ply perforated sheet steel, suitable for gases and vapors

– **Flow divider ST 3** (Fig. 3) · Corrosion-resistant wire mesh, suitable for gases and vapors · Special design for Series 250 and 280 Valves with internal and external perforated steel sheets (Fig. 4)

Further versions

– **Flow dividers ST 1 and ST 2** · Reinforced version for Series 240 Valves in DN 200 (NPS 8) and higher as well as for Series 250 Valves in the high-pressure range

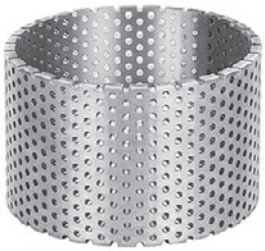


Fig. 1: *Flow divider ST 1*

Fig. 2: *Flow divider ST 2*

Fig. 3: *Flow divider ST 3*

Fig. 4: *Flow divider ST 3 with reinforcement*

Principle of operation (Fig. 5)

After having passed the cross-sectional area released between the valve seat (2) and the plug (3), the process medium reaches its maximum velocity. Before a noise-intensive, turbulent mixing zone can be created, the medium hits the inner wall of the flow divider (13) which splits up the jet into numerous smaller jets, thus ensuring low-noise energy transfer to the surrounding medium.

Calculation of noise emission for gases and vapors

The noise emitted by gases in single-stage and multi-stage valves is determined according to IEC 60534-8-3. This calculation method, however, does not apply to valves containing noise-reducing elements, such as flow dividers ST 1, ST 2 and ST 3. In this case, calculation is performed according to VDMA 24422, Edition 89.

The calculation is based on the jet power reached during expansion. An acoustical conversion ratio η_G is used to determine the noise emission. The graph highlights the difference between the conversion ratios depending on the differential pressure ratio. This difference immediately shows the level difference of the internal sound power. The difference between the sound pressure levels to be expected at one meter distance from the pipe is also sufficiently accurate.

Assuming a differential pressure ratio of x = 0.5, the difference in sound pressure level to be expected is –10 dB between a valve without a flow divider and a valve with a flow divider ST 1 and –20 dB between a valve without flow divider and a valve with a flow divider ST 3.

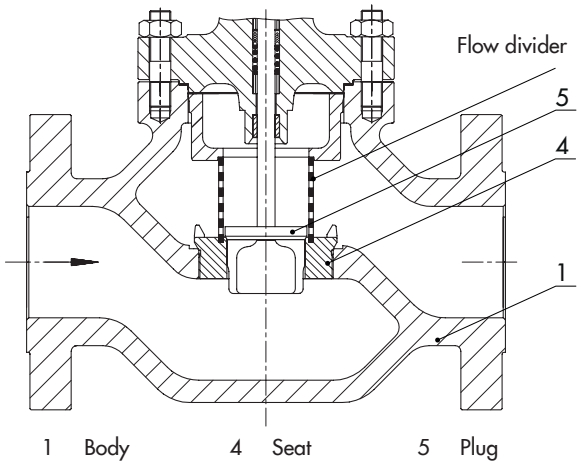
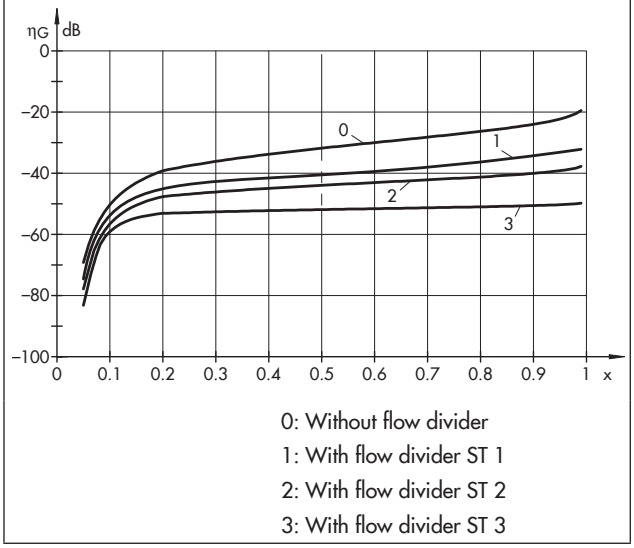


Fig. 5: *Type 3251 Valve with flow divider ST 1*



Specifications subject to change without notice

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