

T 8084 EN

Series 3381 · Type 3381 Silencer

DIN and ANSI versions



Application

Noise attenuation for liquids, gases and vapors · Velocity reduction at the valve outlet for gases and vapors

Valve size **DN 40 to 800** · **NPS 1½ to 32**
Pressure rating **PN 10 to 400** · **Class 150 to 2500**

Type 3381 Silencer acting as a fixed restriction to reduce the sound pressure level.

- Single attenuation plates in Type 3381-1 (see Fig. 3 and Fig. 4) or reduced version with single attenuation plates as Type 3381-1R (see Fig. 5)
- System with two to five attenuation plates in a housing (Type 3381-3, Fig. 8) or as a wafer-type version (Type 3381-4, Fig. 9)
- Flow velocity reduction of compressible media at the valve outlet
- Used in conjunction with SAMSON Series 240 and Series 250 Valves

Versions

- **Type 3381-1** · Single attenuation plates mounted between the valve or a pipe expander and the pipe flange (Fig. 3, Fig. 4).
- **Type 3381-1R** · Reduced construction using less material: single attenuation plates with reduced diameter and possibly reduced thickness, clamped between the valve or a pipe expander and the pipe flange (Fig. 5). Available in standard materials in DN 200/NPS 8 and larger based on the pressure rating as specified in Table 2.
- **Type 3381-3-X** · Silencer with two to five attenuation plates located in one housing. An additional pipe expander is not required (Fig. 8).
- **Type 3381-4-X** · System with two to five attenuation plates installed as a wafer-type version. Usually downstream of a pipe expander (Fig. 9).

Further versions

- **Combination of Type 3381-1 and Type 3381-1R** with two attenuation plates in varying valve sizes (Fig. 6, Fig. 7)
- **Special materials** (e.g. Monel, Hastelloy) · On request
- **Special materials for Type 3381-1R** for valve sizes < DN 200/NPS 8 · On request



Fig. 1: Type 3241-7 Control Valve with Type 3381-3 Silencer

Fig. 2: Type 3381-3-3 Silencer

- **Welding ends** · On request
- **Larger valve sizes** · On request
- **JIS version** · On request

Principle of operation

The Type 3381 Silencer provides noise attenuation by acting as a fixed restriction. The silencer raises the pressure of the medium flow at the valve outlet and reduces the pressure downstream of the silencer to the required downstream pressure p_2 . As a result, the sound pressure level is reduced. In applications using compressible media, it additionally lowers the flow velocity at the valve outlet.

The pressure reduction per attenuation plate (Δp) depends on the flow rate and the prevailing operating temperature. Generally, the pressure reduction is between 5 and 7 bar.

A five-stage silencer (Type 3381-3-5 and Type 3381-4-5) normally provides a maximum pressure drop of 35 bar.

Type 3381-1 Silencer

In Type 3381-1 the attenuation plate can be installed upstream and/or downstream of the pipe expander (Fig. 3, Fig. 4, Fig. 6). The nominal size of the attenuation plate depends on the nominal size of the valve or pipe expander.

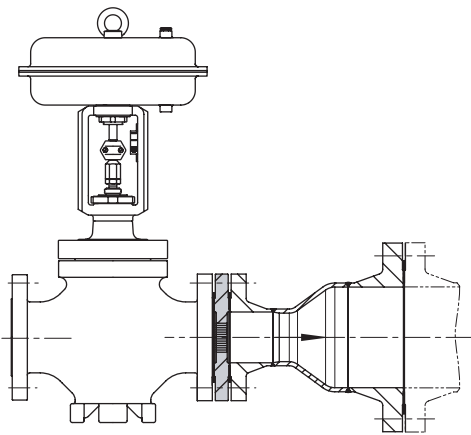


Fig. 3: Type 3381-1: Attenuation plate on the valve upstream of a possible pipe expander

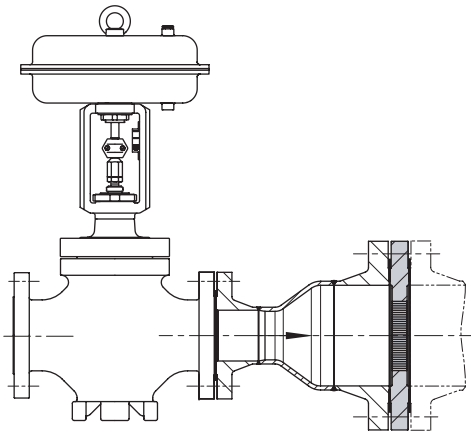


Fig. 4: Type 3381-1: Attenuation plate downstream of pipe expander

Type 3381-1R Silencer

In Type 3381-1R, the diameter and possibly the thickness of the attenuation plates are reduced compared to Type 3381-1 (Fig. 5).

Only the valve sizes and nominal pressures listed in Table 2 can be combined with one another for this version (in standard materials).

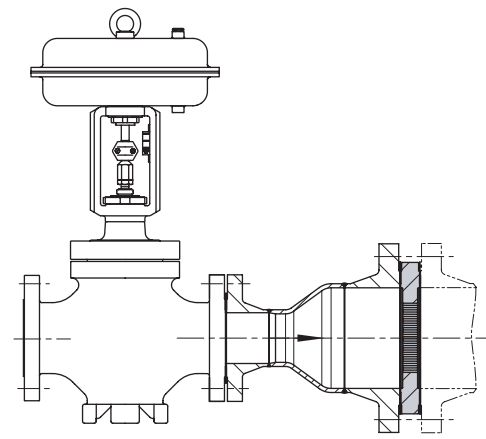


Fig. 5: Type 3381-1R: Reduced construction with attenuation plate downstream of the pipe expander

Combination from Type 3381-1 and Type 3381-1R

The Type 3381-1 and Type 3381-1R can be combined with one another (Fig. 6, Fig. 7). Two attenuation plates of different valve sizes are installed: one at the valve outlet and one downstream of the pipe expander.

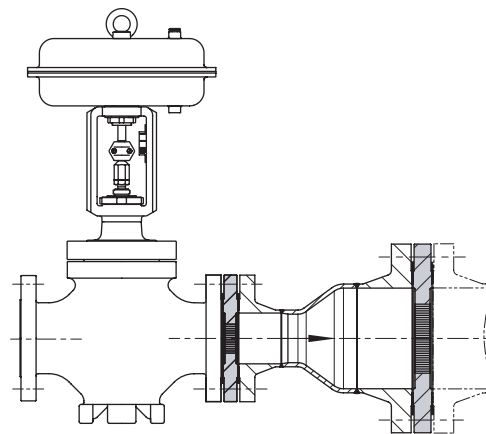


Fig. 6: Attenuation plates at the valve and downstream of the pipe expander

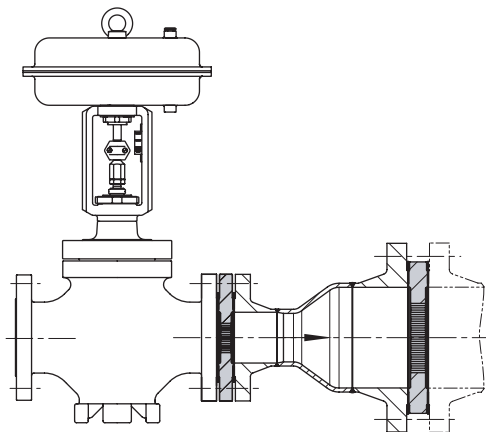


Fig. 7: Attenuation plates at the valve and downstream of the pipe expander

Type 3381-3-X Silencer

In Type 3381-3-X, two to five attenuation plates can be installed one after the other in one housing (Fig. 8). The valve sizes of the inlet and outlet can vary: the nominal inlet size of the housing corresponds to the nominal valve size. The nominal outlet size corresponds to the downstream nominal pipe size. A pipe expander is already integrated into the housing. The "x" in the type designation indicates the number of attenuation plates installed. The silencer is delivered as a ready-to-install unit with nuts and bolts (but without gaskets).

Type 3381-4-X Silencer

In Type 3381-4-X, two to five attenuation plates are clamped between the valve outlet or pipe expander and the pipeline (wafer-type version). A pipe expander must be installed if the nominal size of the attenuation plates is larger than that of the valve (Fig. 9).

The "x" in the type designation indicates the number of attenuation plates.

Dimensions

The dimensions of Type 3381-3-X and Type 3381-4-X depend on the number of attenuation plates and the nominal pressure. Further details are available on request.

Note concerning all versions

The pipe expander is not included in the scope of delivery.

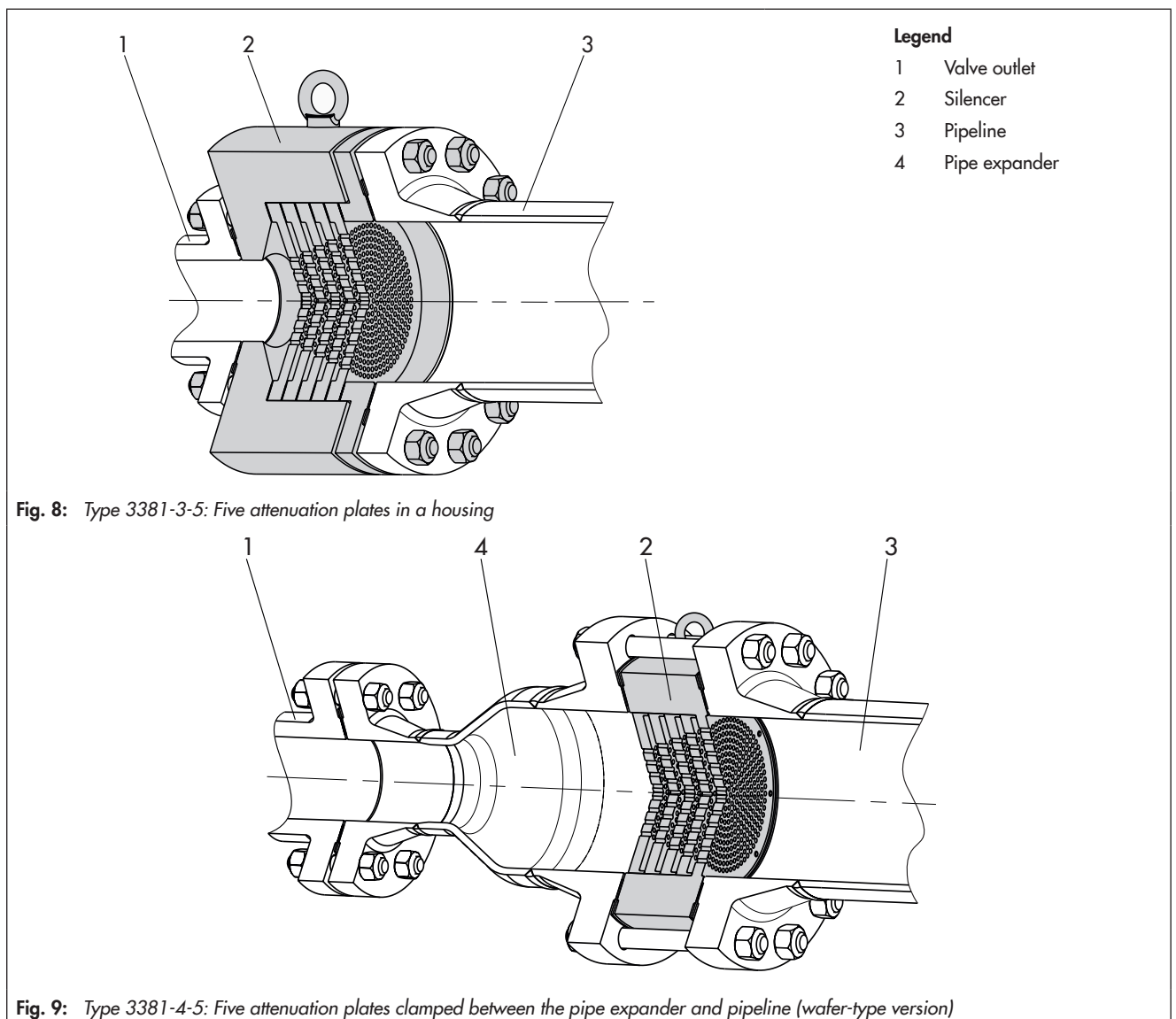


Table 1: Technical data

| Type 3381-1, Type 3381-1R, Type 3381-3-X or Type 3381-4-X Silencer | | | | |
|--|---------------------------------|----------------------------------|-------------------|-------------------------------------|
| Version according to | DIN | | ANSI | |
| Material ¹⁾ | Forged steel P250GH · 1.0460 | Forged stainless steel 1.4401 | Forged steel A105 | Forged stainless steel A182 F316 |
| Valve size | DN 40 to 800 | | NPS 1½ to 32 | |
| Pressure rating ^{2) 3)} | PN 10 to 400 | | Class 150 to 2500 | |
| Type of connection | All DIN EN versions | | All ANSI versions | |
| Temperature range ⁴⁾ | -50 to +400 °C | | -58 to +750 °F | |

1) Other materials on request

2) Only valve sizes possible according to the standard

3) Varying pressure ratings for the inlet and outlet cannot be implemented

4) Other temperature ranges on request

Table 2: Possible wafer-type versions for Type 3381-1R as well as for combinations of Type 3381-1 and Type 3381R**Note:**

- Wafer-type version only for standard materials according to Table 1
- Only valve sizes possible according to the standard and depending on the nominal pressure

| DIN EN versions | | ANSI versions | |
|-------------------|------------------------|-------------------|------------------------|
| Valve size | Pressure rating (min.) | Valve size | Pressure rating (min.) |
| DN 200 | PN 400 and higher | NPS 8 | Class 2500 and higher |
| DN 250 | PN 250 and higher | NPS 10 | Class 1500 and higher |
| DN 300 | PN 100 and higher | NPS 12 | Class 600 and higher |
| DN 350 | PN 63 and higher | - | - |
| DN 450 | PN 40 and higher | NPS 16 and larger | All pressure ratings |
| DN 600 and larger | All pressure ratings | - | - |

Selecting and sizing the silencer and the upstream control valve

Always size the silencer together with the upstream control valve to achieve the best results.

1. Calculate the suitable K_{VS} coefficient according to IEC 60534.
2. Select nominal size from Table 2.
3. Select materials, pressure and temperature from Table 1 and from the pressure-temperature diagram (see ► T 8000-2)

The number of attenuation plates and the nominal size is determined from the operating data.

Order specifications:

| | |
|--------------------------|--|
| Valve size/pipe diameter | DN ... or NPS ... Upstream and downstream of the vena contracta |
| Pressure rating | PN ... or Class ... According to DIN, ANSI or JIS |
| Material | According to Table 1 |
| Process medium | Density in kg/m ³ and temperature in °C or °F |
| Flow rate | kg/h or m ³ /h In standard or operating state with minimum, normal and maximum flow rate |
| Operating pressure | bar or psi with minimum, normal and maximum flow rate |