DATA SHEET

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

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

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

Fig. 2: *Type 3381-3-3 Silencer*

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

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

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Further versions

- **Combination of Type 3381-1 and Type 3381-1R** with two attenuation plates in different nominal sizes (see Fig. 6 and Fig. 7)
- **Special materials** (e.g. Monel®, Hastelloy®) · On request
- **Special materials for Type 3381-1R** for nominal sizes <DN 200/NPS 8 · On request
- **Welding ends** · On request
- **Larger nominal sizes** · On request
- **JIS version** · On request

Principle of operation

The Type 3381 Silencer functions as a fixed restriction to raise the pressure at the valve outlet. The attenuation plates cause the pressure downstream of the silencer to be reduced 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. Δp is generally between 1 and 7 bar.

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

Type 3381-1 Silencer

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

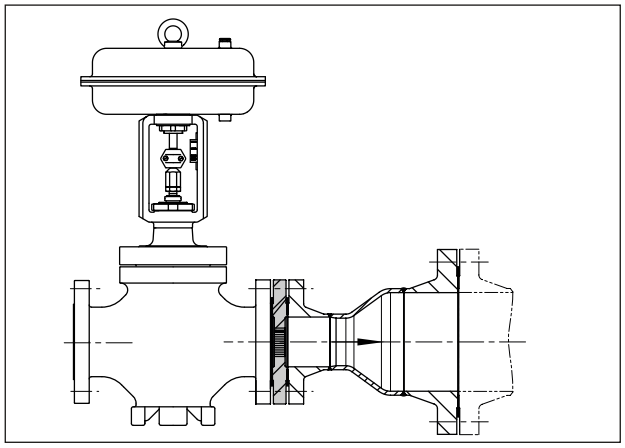

Fig. 3: *Type 3381-1: Attenuation plate at the valve upstream of a possible pipe expander*

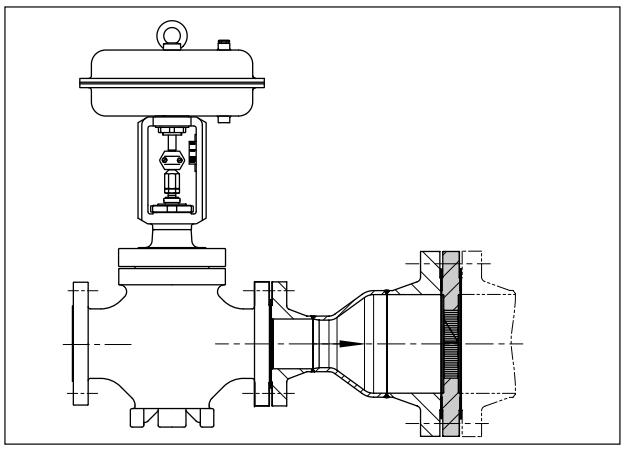

Fig. 4: *Type 3381-1: Attenuation plate downstream of the pipe expander*

Type 3381-1R Silencer

The diameter and possibly the thickness of the attenuation plates in Type 3381-1R are reduced compared to Type 3381-1 (see Fig. 5). Only the nominal sizes and pressure ratings listed in Table 2 can be combined with one another for this version (in standard materials).

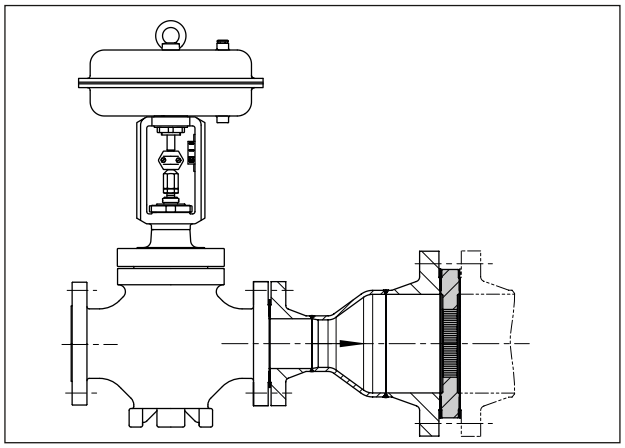

Fig. 5: *Type 3381-1R: Reduced construction of attenuation plate downstream of the pipe expander*

Combination of Type 3381-1 and Type 3381-1R

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

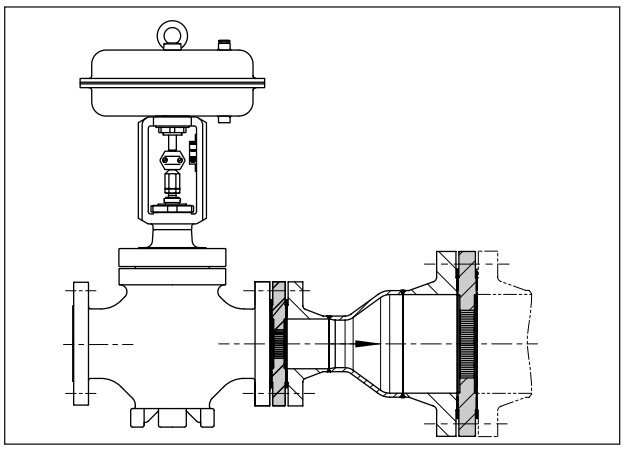

Fig. 6: *Attenuation plates at the valve and downstream of the pipe expander*

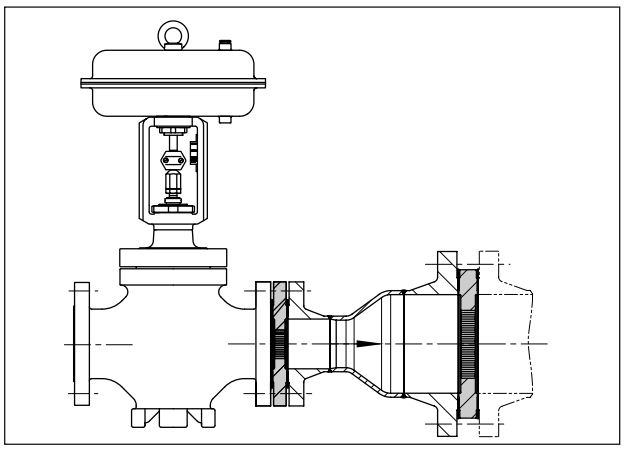

Fig. 7: *Attenuation plates at the valve and downstream of the pipe expander*

Type 3381-3-X Silencer

Two to five attenuation plates in Type 3381-3-X can be installed one after the other in one housing (see Fig. 8). The nominal 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

Two to five attenuation plates in Type 3381-4-X 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 (see Fig. 9).

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

Dimensions

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

Note concerning all versions

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

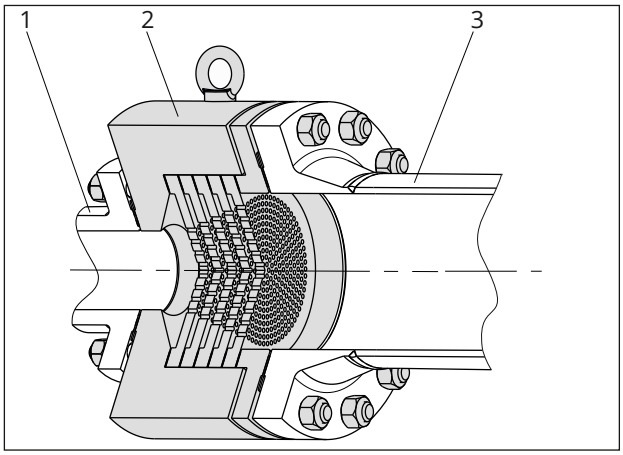

Fig. 8: *Type 3381-3-5: Five attenuation plates in a housing*

1 Valve outlet
2 Silencer
3 Pipeline

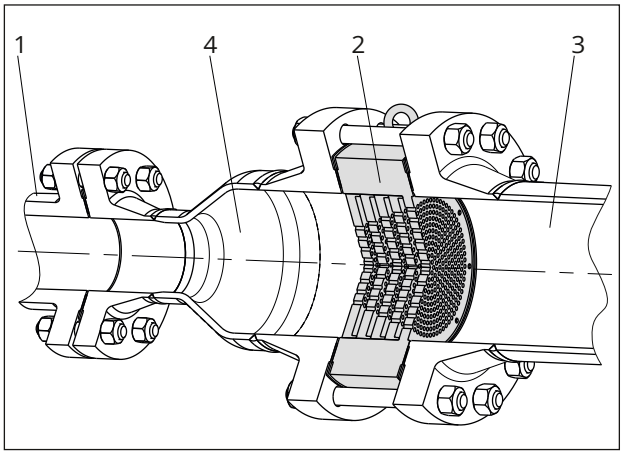

Fig. 9: *Type 3381-4-5: Five attenuation plates clamped between the pipe expander and pipeline (wafer-type version)*

1 Valve outlet
2 Silencer
3 Pipeline
4 Pipe expander

Table 1: *Technical data for Type 3381*

Types 3381-1, 3381-1R, 3381-3-X and 3381-4-X Silencers				
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
Nominal size	DN 40 to 800		NPS 1½ to 32	
Pressure rating[2)3)]	PN 10 to 400		Class 150 to 2500	
Type of end connections	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 nominal 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 3381-1R*

DIN EN versions[1)]		ANSI versions[1)]	
Nominal size	**Pressure rating (min.)**	**Nominal 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	–	–

1) **Note:**

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

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 K_{VS} coefficient according to DIN EN 60534.
2. Select nominal size (see Table 2).
3. Select materials, pressure and temperature from Table 1 and from the pressure-temperature diagram (see Information Sheet ▶ T 8000-2).

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

Ordering text

The following specifications are required on ordering:

Nominal size or pipe diameter	DN ... or NPS ... upstream and downstream of the vena contracta
Pressure rating	PN ... or Class ... according to DIN, ANSI or JIS
Material	See Table 1
Process medium	Density in kg/m³ or lb/cu.ft and temperature in °C or °F
Flow rate	in kg/h or lbs/h or m³/h or cu.ft/min in standard or operating state with minimum, normal and maximum flow rate
Operating pressure	in bar or psi with minimum, normal and maximum flow rate

Associated Information Sheets ▶ T 8000-X

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