Series 250

Pneumatic control valve with AC-3 Trim

Application

Optimized trim for **low-noise and low-wear pressure reduction for liquids with differential pressures up to 100 bar**

Nominal size	**DN 15 to 200** ·	**NPS ½ to 8**
Nominal pressure	**PN 40 to 400** ·	**Class 300 to 2500**
Temperature range	**–10 to 220 °C** ·	**14 to 428 °F**

The optimized three-stage **AC-3** Trim is used in

- Type 3251 Globe Valves or
- Type 3256 Angle Valves

Special features

- Raised seat
- Multi-stage parabolic plug
- Additional plug guiding integrated into the seat
- Optionally low-wear version equipped with stellited seating surfaces or hardened trim

Standard version

– **AC-3** · Optimized three-stage trim for Type 3251 Globe Valves and Type 3256 Angle Valves in nominal sizes from DN 15 to DN 200 or NPS ½ to 8

Additional versions

– AC-3 Trim engineered for special applications for pressure drops over 100 bar or 1450 psi · Details available on request

– Five-stage AC-5 Trim optimized for low-noise and low-wear performance for Type 3254 Globe Valves or Type 3256 Angle Valve · Details available on request

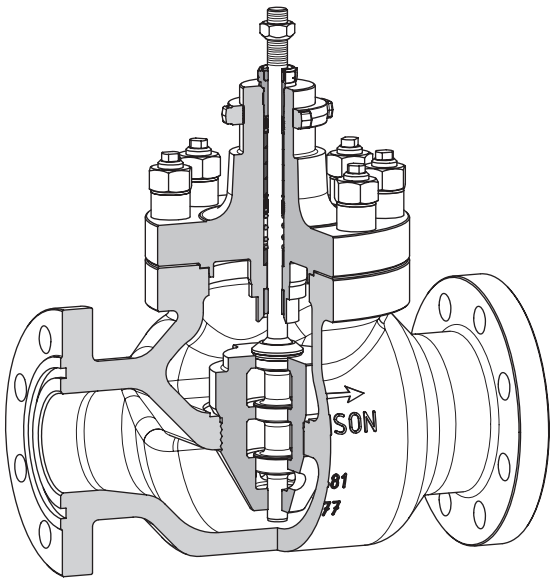

Fig. 1 · Type 3251 Globe Valve with AC-3 Trim

Associated Information Sheet **T 8000-1 EN, -2 EN**
Pneumatic actuators **T 8310-1 EN, T 8310-2 EN**

Edition November 2006

Data Sheet **T 8083 EN**

Principle of operation

The medium flows through the valve against the closing direction of the plug. The valve plug determines the cross-sectional area of flow.

To avoid vibrations, the plug is double guided by a guide bushing at the top and a second guide in the seat.

Compared to standard valve trims, the AC-3 Trims considerably reduce the sound pressure level for differential pressure ratios between $X_F = 0.25$ and $X_F = 0.95$ by shifting the point of incipient cavitation.
Depending on the valve load, the sound pressure level is reduced to varying degrees.

The differential pressure ratio X_F is defined as

$$X_F = \frac{\Delta p}{p_1 - p_v}$$

with Δp being the differential pressure across the valve, p_1 being the upstream pressure, and p_v representing the vapor pressure of the medium.

The reduction of the sound pressure level ΔLp_{Aa} compared to a standard valve trim is exemplified in Fig. 3. The diagram illustrates four different valve loads.

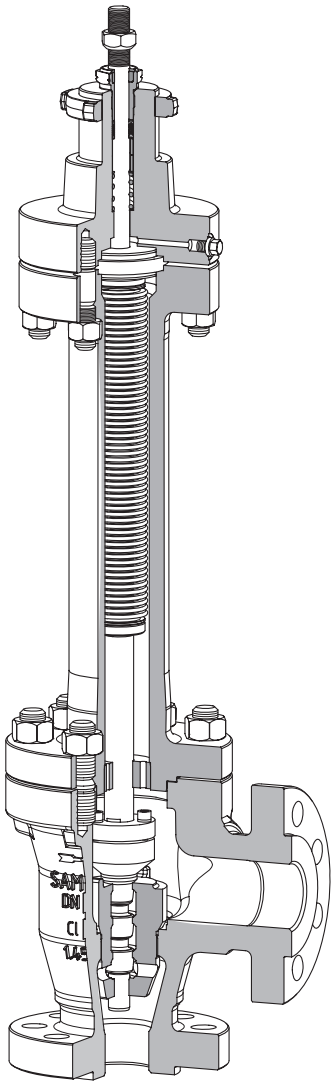

Fig. 2 · Type 3256 Angle Valve with AC-3 Trim and metal bellows seal

Table 1 · Technical data for AC-3 Trim

	AC-3
Nominal size	DN 15 to 200 · NPS ½ to 8 · Depending on valve type
Nominal pressure	PN 40 to 400 · Class 300 to 2500 · Depending on valve type
Temperature range	–10 to 220 °C · 14 to 428 °F
Δp_{max} · Max. perm. differential pressure	Case 1: < 100 bar · 1450 psi, if no restrictions on trim material apply
	Case 2: < 60 bar · 870 psi, if any restriction on trim material applies
Medium	Liquids only
Direction of flow	Flow-to-open (FTO) only
Closure member	Double-guided multi-stage parabolic plug
Seat-plug seal Leakage class (DIN EN 1349)	Metal sealing: Class IV IV-S1 for SB ≥ 100 · IV-S2 for SB < 100
Characteristic	Equal percentage or linear
Trim materials	1.4571 · 1.4006 · 1.4112
Wear resistance	Multi-stage pressure relief · Stellited seating surfaces · Hardening (up to DN 150/NPS 6)
Plug balancing	≤ DN 100/NPS 4: K_V 25/C_V 30 and higher, except with hardened plugs DN 100 to 150/NPS 4 to 6: K_V 40/C_V 47 and higher, except with hardened plugs DN 200/NPS 8: K_V 63/C_V 75 and higher, except with hardened plugs
Valve bonnet	Standard · Insulating section · Bellows seal

Reduction of the sound pressure level
The diagram illustrates the reduction of the sound pressure level when using an AC-3 Trim as opposed to a standard trim.

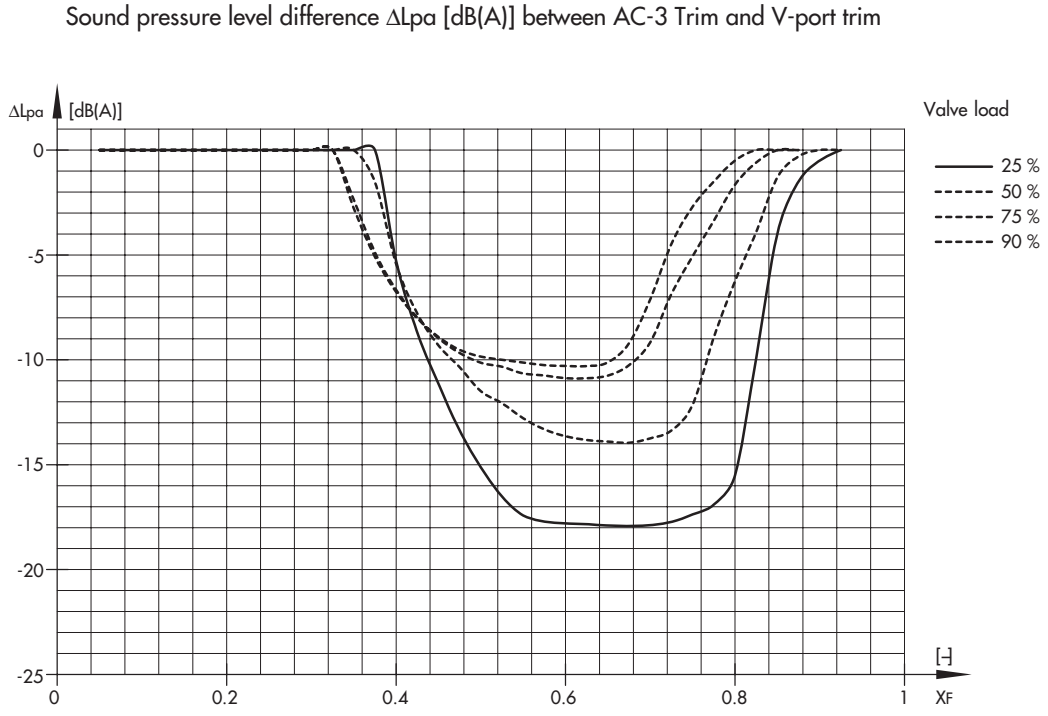

Fig. 3 · Valve DN 80 (NPS 3) and K_V 25 (C_v 30)

Permissible differential pressures for Type 3251 and Type 3256 Valves are available on request

The following details are required on ordering

Operating pressure	in bar (a), bar (g) or psi (a), psi (g) at minimum, standard, and maximum flow rate
Flow rate	kg/h or m^3/h in standard or operating state at minimum, standard, and maximum flow rate
Process medium	Density in kg/m^3 and temperature in °C/°F
Pipe diameter	DN … or NPS
Nominal pressure	PN … or ANSI Class ...
Material	According to Table 1

Specifications subject to change without notice.

Table 2 · AC-3 Trim · Nominal sizes with associated K_{VS} and C_V coefficients

The specified travels must be achieved including an overtravel of 10 %.
The use of a mechanical travel stop is recommended for actuators with fail-safe action "stem extends".

DN/in	Seat bore [mm]	Travel [mm]	Kv	Cv	Valve Type
DN 15 NPS ½	12	7.5	0.4	0.5	3256
	16		0.63	0.75	
	18		1.0	1.2	
	22		1.6	2.0	
DN 25 NPS 1	12	7.5	0.4	0.5	3251 3256
	16		0.63	0.75	
	18		1.0	1.2	
	22		1.6	2.0	
			2.5	3.0	
			3.5	4.0	
DN 40 NPS 1½	16	7.5	0.63	0.75	3251 3256
	18		1.0	1.2	
	22		1.6	2.0	
	24		2.5	3.0	
	31		4.0	5.0	
			6.3	7.5	
DN 50 NPS 2	18	15	1.0	1.2	3251 3256
	22		1.6	2.0	
	24		2.5	3.0	
	31		4	5	
			6.3	7.5	
	38		10	12	
DN 80 NPS 3	24	15	2.5	3.0	3251 3256
	31		4.0	5.0	
			6.3	7.5	
	38		10	12	
			12	14	
	50		16	20	
	63		25	30	
DN 100 NPS 4	31	15	4	5	3251 3256
			6.3	7.5	
	38		10	12	
			12	14	
	50		16	20	
	63		25	30	
	80		40	47	
DN 150 NPS 6	31	15	6.3	7.5	3251 3256
	38		10	12	
			12	14	
	50	30	16	20	
	63		25	30	
	80		40	47	
	100		63	75	
DN 200 NPS 8	50	30	16	20	3251 3256
	63		25	30	
	80		40	47	
	100		63	75	
			80	95	