

T 8004-GR EN

Series SMS · SMS MG-1 and SMS MG-7 Pneumatic Control Valves

Type 251GR Globe valve

ANSI version



Application

Control valve for process engineering applications with high industrial requirements

Nominal size	NPS ½ to 8
Pressure rating	Class 150 to 900
Temperatures	-58 to +1022 °F (-50 to +550 °C)



Fig. 1: SMS MG-1: Type 251GR Globe Valve with Type 3271 Pneumatic Actuator

Type 251GR Globe Valve operated with

- Type 3271 Pneumatic Actuator (SMS MG-1 Control Valve)
- Type 3277 Pneumatic Actuator (SMS MG-7 Control Valve) for integral positioner attachment

Special features

- Plug and cage trim replaceable in the field
- Body made of cast steel
- Body made of cast stainless steel
- Soft seal
- Metal seal
- High-performance metal seal
- Balanced to handle high differential pressures

Optional with RFID tags with unique identification according to DIN SPEC 91406.

The control valves with their modular design can be equipped with various accessories, such as positioners, limit switches, solenoid valves and other devices according to DIN EN 60534-6-1¹⁾ and NAMUR Recommendation (see Information Sheet ► T 8350).

¹⁾ Accessories required. See associated actuator documentation.

Versions

Operating temperature (medium temperature) with PTFE packing for temperatures from -20 to +482 °F (-29 to +250 °C), with graphite packing in combination with insulating section from -58 to +1022 °F (-50 to +550 °C) or with bellows seal (independent from the packing version) up to +797 °F

(+425 °C), nominal size NPS ½ to 8, Class 150 to 900 (see Table 1)

- **SMS MG-1** (Fig. 1) • Type 251GR Globe Valve and Type 3271 Actuator with 350 to 2800 cm² actuator area (see Data Sheets ► T 8310-1, ► T 8310-2 and ► T 8310-3)
- **SMS MG-7** • Type 251GR Globe Valve and Type 3277 Actuator with 350 to 750v2 cm² actuator area for integral positioner attachment (see Data Sheet ► T 8310-1)

Further versions

- **Valve plug with pressure balancing**
- **Additional handwheel** • See Data Sheet ► T 8310-1
- **Type 251GR Valve with Type 3273 Hand-operated Actuator** • For valves with max. 30 mm rated travel and side-mounted handwheel for travel >30 mm (see Data Sheet ► T 8312)
- **SMS MG-TP Electric Control Valve** • On request
- Version with **clamped-in** or **screwed-in seat** or with **cage trim**
- **Version with insulating section for high temperatures**
- **Version with bellows seal**

Principle of operation of version with clamped-in/screwed-in seat

The medium flows through the valve in the direction indicated by the arrow. The valve plug determines the cross-sectional area of flow.

The valves can be equipped with a flow divider ST1 for noise reduction (see Data Sheet ► T 8081).

Pressure balancing must be used when high pressures or differential pressures act on the plug.

Fig. 2 and Fig. 3 show configuration examples.

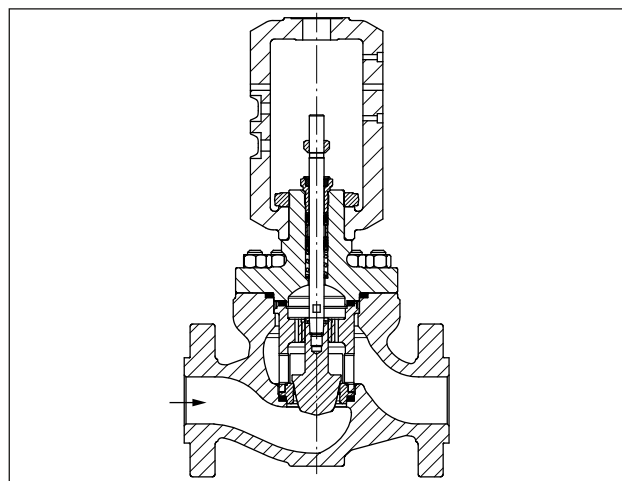


Fig. 2: Type 251GR Globe Valve with clamped-in seat

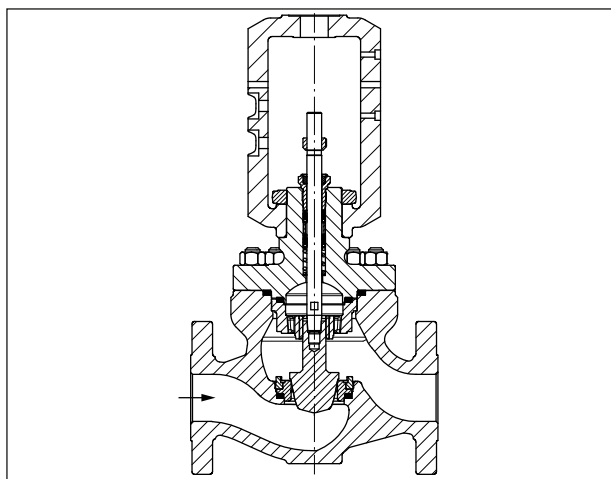


Fig. 3: Type 251GR Globe Valve with screwed-in seat

Principle of operation of cage version

The medium flows through the valve as indicated by the arrow on the valve body. A change in the pneumatic signal acting on the actuator changes the piston travel and how far the valve is opened as a result. The piston position and cage design determine the released cross-section and the flow rate with it.

Fig. 4 shows a configuration example.

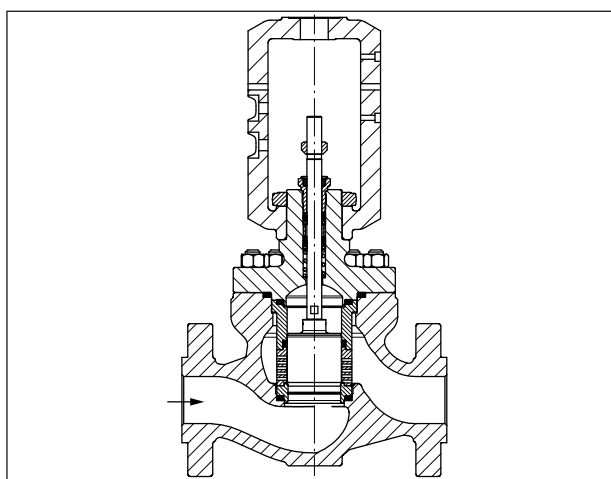


Fig. 4: Type 251GR Globe Valve with cage trim

All the trims shown in Fig. 2 to Fig. 4 are interchangeable in the field without any changes necessary to the pressure-bearing or pressure-retaining parts.

Fail-safe positions

Depending on how the springs are arranged in the Type 3271 or Type 3277 Pneumatic Actuator (see Data Sheets ► T 8310-1, ► T 8310-2 and ► T 8310-3), the valve has two different fail-safe positions that become effective when the supply air fails:

- **Actuator stem extends (fail-close):**
The valve is closed upon air supply failure.
- **Actuator stem retracts (fail-open):**
The valve is opened upon air supply failure.

Table 1: Technical data for Type 251GR · ANSI version

Material		Cast steel A216 WCC	Cast steel A217 WC6	Cast stainless steel A351 CF8M
Nominal size and pressure rating		Class 150/300/600: NPS ½ to 8 Class 900: NPS ½ to 6 ³⁾		
Type of end connections	Flanges	RF and RTJ according to ASME B16.5		
	Welding ends	According to ASME B16.25		
Seat-plug seal		Metal seal · High-performance metal seal		
Characteristic		Equal percentage · Linear · Mod. linear · On/off		
Rangeability		50:1		
Conformity				
Optional RFID tag		Application range according to the technical specifications and the explosion protection certificates. These documents are available on our website: ► www.samsongroup.com > Products > Electronic nameplate The permissible range for temperatures at the RFID tag is between -40 and +185 °F (-40 and +85 °C).		
Temperature ranges in °F (°C) · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet ► T 8000-2)				
Body with standard bonnet		-20 to +482 (-29 to +250) with PTFE packing · Up to +797 (+425) with graphite packing		
Body with insulating section		-20 to +797 (-29 to +425)	-20 to +932 (-29 to +500)	-58 to +1022 (-50 to +550)
Body with bellows seal		-20 to +797 (-29 to +425)	-20 to +932 (-29 to +500)	-58 to +797 (-50 to +425)
Trim ¹⁾	Metal seal	-58 to +1022 (-50 to +550)		
	Balanced with PTFE	-58 to +482 (-50 to +250)		
	Balanced, metal seal ⁴⁾⁵⁾	Room temperature up to +1022 (+550)		
Leakage class according to ANSI FCI 70-2				
Trim	Metal seal	Standard: IV · High-performance metal seal: V		
	Balanced, metal seal	With PTFE ring (standard): IV · High-performance metal seal: V		

¹⁾ Only in combination with suitable body material

²⁾ The temperature limits (in °F and °C) are not directly converted temperatures.

³⁾ Class 900 only for version with clamped-in seat or cage trim

⁴⁾ Only for version with cage trim

⁵⁾ Only up to NPS 4

Table 2: Materials for Type 251GR · ANSI version

Body of standard version		Cast steel A216 WCC			Cast steel A217 WC6			Cast stain- less steel A351 CF8M
Valve bonnet		A216 WCC			A217 WC6			A351 CF8M
Plug stem		316/316L or XM-19-H						
Seal ring for balanced plug (plug/piston)		PTFE with carbon · Metal seal ⁷⁾						
Guide bushing		420 ¹⁾			420 ¹⁾⁶⁾			B574 N06455
Packing		PTFE packing loaded by internal or external springs or adjustable graphite packing						
Body gasket		Spiral wound gasket, graphite/316L						
Version with screwed-in seat and plug	Plug ³⁾	410 ²⁾	420 ¹⁾	316/316L ²⁾	410 ²⁾	420 ¹⁾	316/316L ²⁾	316/316L ²⁾
	Seat	410 ²⁾	420 ¹⁾	316/316L ²⁾	410 ²⁾	420 ¹⁾	316/316L ²⁾	316/316L ²⁾
	Seat fastening	CA6NM-B			CA6NM-B			CF3M
Version with clamped-in seat and plug	Plug ³⁾	410 ²⁾	420 ¹⁾	316/316L ²⁾	410 2 ²⁾	420 ¹⁾	316/316L ²⁾	316/316L ²⁾
	Seat	410 ²⁾	420 ¹⁾	316/316L ²⁾	410 2 ²⁾	420 ¹⁾	316/316L ²⁾	316/316L ²⁾
	Seat fastening	CA6NM-B			CA6NM-B			CF8M
Version with pis- ton and cage	Piston	410 2 ¹⁾	420 ¹⁾	316/316L ⁴⁾⁵⁾	410 2 ¹⁾	420 ¹⁾	316/316L ⁴⁾⁵⁾	316/316L ⁴⁾⁵⁾
	Cage	410 2 ¹⁾	420 ¹⁾	316/316L	410 2 ¹⁾	420 ¹⁾	316/316L	316/316L
	Seat	410 2 ¹⁾	420 ¹⁾	316/316L ²⁾	410 2 ¹⁾	420 ¹⁾	316/316L ²⁾	316/316L ²⁾
	Cylinder	410 2 ¹⁾	420 ¹⁾	316/316L	410 2 ¹⁾	420 ¹⁾	316/316L	316/316L

¹⁾ Heat treated

²⁾ Also with Stellite®-faced facing

³⁾ Plug made of Stellite® 6 (up to seat bore Ø ≤55 mm) available

⁴⁾ Hard chrome-plated guiding surface

⁵⁾ Guiding surface also Stellite® faced when the facing is Stellite®-faced

⁶⁾ T >932 °F (>500 °C): Made of N06625

⁷⁾ Only for version with cage trim

Fatigue resistance of bellows

SAMSON has calculated the service life of metal bellows for full or partial strokes depending on the material. These values can help determine maintenance intervals. Maintenance intervals may vary due to the operating conditions of the actual plant (especially the pressure and temperature of the process medium).

Table 3: Load cycles of metal bellows

Nominal size		Travel	Pressure rating Class 600/PN 100			
			Material: 1.4571		Material: 2.4819	
			Number of load cycles for ...			
NPS	DN	mm	Full strokes	Partial strokes (40 % of the full stroke)	Full strokes	Partial strokes (40 % of the full stroke)
1	25	15	200,000	>100 million	45,000	800,000
		19	50,000	100 million	25,000	400,000
2	50	15	450,000	>1 million	120,000	10 million
		19	150,000	>1 million	60,000	700,000
		30	11,000	1 million	14,000	20,000
3	80	15	1 million	>60 million	150,000	>280,000
		30	40,000	60 million	20,000	280,000
		38	10,000	1 million	9,000	150,000
4	100	15	1 million	>60 million	150,000	>280,000
		30	40,000	60 million	20,000	280,000
		38	10,000	1 million	9,000	150,000

C_v and K_{vs} coefficients for version with plug¹⁾ • Equal percentage or linear

Terms for control valve sizing according to DIN IEC 60534-2-1 and DIN IEC 60534-2-2: $F_L = 0.95$, $x_T = 0.75$

¹⁾ Parabolic plug (standard) • Values for other plug versions on request • Perforated plug: See Data Sheet ► T 8086

Table 4: Version with screwed-in seat (equal percentage or linear)

C _v		0.3	0.5	0.75	1.1	2	3	5	8	15	24	37	54	85	128	220	315	465	810
K _{vs}		0.26	0.43	0.65	0.95	1.7	2.6	4.3	6.9	13	21	32	47	74	110	190	273	400	700
C _v -1		–	–	–	–	1.8	2.7	4.5	8.2	14	22	34	49	76	116	200	284	420	730
K _{vs} -1		–	–	–	–	1.6	2.3	3.9	6.2	12	19	29	42	66	100	171	245	363	630
Seat bore	mm	4/8	6/8	6/8	6/8	12	12	24	24	27	33	42	55	70	85	110	130	170	228
Travel	mm	15	15	15	15	15	15	15	15	15	19	19	30	38	38	60	60	60	90

Table 5: Versions without flow divider (screwed-in seat)

C _v		0.3	0.5	0.75	1.1	2	3	5	8	15	24	37	54	85	128	220	315	465	810
K _{vs}		0.26	0.43	0.65	0.95	1.7	2.6	4.3	6.9	13	21	32	47	74	110	190	273	400	700
NPS	DN																		
½	15	•	•	•	•	•	•	•											
1	25			•	•	•	•	•	•	•									
1½	40					•	•	•	•	•	•	•							
2	50									•	•	•	•						
3	80											•	•	•	•				
4	100												•	•	•	•			
6	150														•	•	•	•	
8	200															•	•	•	•

Table 6: Versions with flow divider ST1 (C_v-1/K_{vs}-1) (screwed-in seat)

C _v -1		–	–	–	–	1.8	2.7	4.5	8.2	14	22	34	49	76	116	200	284	420	730
K _{vs} -1		–	–	–	–	1.6	2.3	3.9	6.2	12	19	29	42	66	100	171	245	363	630
NPS	DN																		
½	15					•	•	•											
1	25					•	•	•	•	•									
1½	40					•	•	•	•	•	•	•							
2	50									•	•	•	•						
3	80											•	•	•	•				
4	100												•	•	•	•			
6	150														•	•	•	•	
8	200															•	•	•	•

Table 7: Version with clamped-in seat (equal percentage or linear)

C _v		0.3	0.5	0.75	1.1	2	3	4.5	5	8	14	15	24	34	37	49	54	85	116	128	200	220	315	420	465	730	810
K _{vs}		0.26	0.43	0.65	0.95	1.7	2.6	3.9	4.3	6.9	12	13	21	29	32	42	47	74	100	110	171	190	273	363	400	630	700
Seat bore	mm	4/8	6/8	6/8	6/8	12	12	24	24	24	24	27	33	42	42	55	55	70	85	85	110	110	130	170	170	228	228
Travel	mm	15	15	15	15	15	15	15	15	15	15	15	19	19	19	30	30	38	38	38	60	60	60	60	60	90	90

Table 8: Versions without flow divider (clamped-in seat)

C _v		0.3	0.5	0.75	1.1	2	3	4.5	5	8	14	15	24	34	37	49	54	85	116	128	200	220	315	420	465	730	810
K _{vs}		0.26	0.43	0.65	0.95	1.7	2.6	3.9	4.3	6.9	12	13	21	29	32	42	47	74	100	110	171	190	273	363	400	630	700
NPS	DN																										
½	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1	25			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1½	40					.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	50										.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	80														.	.	.	.	.	.	.	.	.	.	.	.	.
4	100																.	.	.	.	.	.	.	.	.	.	.
6	150																	.	.	.	.	.	.	.	.	.	.
8	200																			.	.	.	.	.	.	.	.

C_v and K_{vs} coefficients for version with cage • Equal percentage or linear**Table 9: Version with cage (equal percentage or linear)**

		Cage with full flow rate							Cage with reduced flow rate						
C _v		17	37	60	136	225	475	835	11	24	42	95	146	335	600
K _{vs}		14.5	32	52	118	195	410	720	9.4	21	36	82	126	290	520
Trim		1½/16"	17/8"	2½/16"	3½"	4½"	7"	9"	1½/16"	17/8"	2½/16"	3½"	4½"	7"	9"
Travel	mm	19	19	30	38	60	75	90	19	19	30	38	60	75	90

Table 10: Versions with cage • FTO (Flow to open)

		Cage with full flow rate							Cage with reduced flow rate						
C _v		17	37	60	136	225	475	835	11	24	42	95	146	335	600
K _{vs}		14.5	32	52	118	195	410	720	9.4	21	36	82	126	290	520
NPS	DN														
1	25	.							.						
1½	40		.							.					
2	50			.							.				
3	80				.							.			
4	100					.							.		
6	150						.							.	
8	200							.							.

C_V and K_{VS} coefficients for version with flow divider cage FDC1 • Equal percentage, linear or modified linear

Table 11: *Version with cage FDC1 (equal percentage)*

		Cage with full flow rate							Cage with reduced flow rate						
C _V -FDC1		14	30	49	110	178	382	676	10	20	34	76	123	266	475
K _{VS} -FDC1		12	26	42	95	154	330	585	8.5	17	29	66	106	230	410
Trim		1 ⁵ / ₁₆ "	1 ⁷ / ₈ "	2 ⁵ / ₁₆ "	3 ¹ / ₂ "	4 ¹ / ₂ "	7"	9"	1 ⁵ / ₁₆ "	1 ⁷ / ₈ "	2 ⁵ / ₁₆ "	3 ¹ / ₂ "	4 ¹ / ₂ "	7"	9"
Seat bore	mm	31.34	45.63	56.74	86.98	112.38	176.15	227	31.34	45.63	56.74	86.98	112.38	176.15	227
Cage inside Ø	mm	33.34	47.63	58.74	88.98	114.38	177.98	228.8	33.34	47.63	58.74	88.98	114.38	177.98	228.8
Travel	mm	19	19	30	38	60	75	90	19	19	30	38	60	75	90

Table 12: *Versions with cage FDC1 (C_V-FDC1/K_{VS}-FDC1) • (equal percentage)*

		Cage with full flow rate							Cage with reduced flow rate						
C _V -FDC1		14	30	49	110	178	382	676	10	20	34	76	123	266	475
K _{VS} -FDC1		12	26	42	95	154	330	585	8.5	17	29	66	106	230	410
NPS	DN														
1	25	•							•						
1½	40		•							•					
2	50			•							•				
3	80				•							•			
4	100					•							•		
6	150						•							•	
8	200							•							•

Table 13: *Version with cage FDC1 (linear)*

		Cage with full flow rate							Cage with reduced flow rate						
C _V -FDC1		15	34	54	123	200	432	760	11	22	37	85	136	300	526
K _{VS} -FDC1		13	29	47	106	171	370	650	9.4	19	32	74	118	260	455
Trim		1 ⁵ / ₁₆ "	1 ⁷ / ₈ "	2 ⁵ / ₁₆ "	3 ¹ / ₂ "	4 ¹ / ₂ "	7"	9"	1 ⁵ / ₁₆ "	1 ⁷ / ₈ "	2 ⁵ / ₁₆ "	3 ¹ / ₂ "	4 ¹ / ₂ "	7"	9"
Seat bore	mm	31.34	45.63	56.74	86.98	112.38	176.15	227	31.34	45.63	56.74	86.98	112.38	176.15	227
Cage inside Ø	mm	33.34	47.63	58.74	88.98	114.38	177.98	228.8	33.34	47.63	58.74	88.98	114.38	177.98	228.8
Travel	mm	19	19	30	38	60	75	90	19	19	30	38	60	75	90

Table 14: *Versions with cage FDC1 (C_V-FDC1/K_{VS}-FDC1) • (linear)*

		Cage with full flow rate							Cage with reduced flow rate						
C _V -FDC1		15	34	54	123	200	432	760	11	22	37	85	136	300	526
K _{VS} -FDC1		13	29	47	106	171	370	650	9.4	19	32	74	118	260	455
NPS	DN														
1	25	•							•						
1½	40		•							•					
2	50			•							•				
3	80				•							•			
4	100					•							•		
6	150						•							•	
8	200							•							•

Table 15: Version with cage FDC1 (mod. lin)

C_V-FDC1		17	37	60	136	225	475	835
K_{VS}-FDC1		14.5	32	52	118	195	410	720
Trim		1 ⁵ / ₁₆ "	1 ⁷ / ₈ "	2 ⁵ / ₁₆ "	3½"	4½"	7"	9"
Seat bore	mm	31.34	45.63	56.74	86.98	112.38	176.15	227
Cage inside Ø	mm	33.34	47.63	58.74	88.98	114.38	177.98	228.8
Travel	mm	19	19	30	38	60	75	90

Table 16: Versions with cage FDC1 (C_V-FDC1/K_{VS}-FDC1) • (modified linear)

C_V-FDC1		17	37	60	136	225	475	835
K_{VS}-FDC1		14.5	32	52	118	195	410	720
NPS	DN							
1	25	•						
1½	40		•					
2	50			•				
3	80				•			
4	100					•		
6	150						•	
8	200							•

Table 17: Dimensions in inch and mm for SMS MG-1 and SMS MG-7 Control Valves

Valve		NPS	½	1	1½	2	3	4	6	8
Length L (RF flanges)	Class 150	in	7.25	7.25	8.75	10	11.75	13.88	17.75	21.38
		mm	184	184	222	254	298	352	451	543
	Class 300	in	7.5	7.75	9.25	10.5	12.5	14.5	18.62	22.38
		mm	190	197	235	267	318	368	473	568
	Class 600	in	8	8.25	9.88	11.25	13.25	15.5	20	24
		mm	203	210	251	286	337	394	508	610
	Class 900	in	11.5	11.5	13.12	14.75	17.38	20.12	28.12	–
		mm	292	292	333	375	441	511	714	–
Length L (RTJ flanges)	Class 150	in	7.25	7.25	9.25	10.5	12.25	14.38	18.25	21.88
		mm	184	197	235	267	311	365	464	556
	Class 300	in	7.94	8.25	9.75	11.12	13.12	15.12	19.25	23
		mm	201	210	248	283	334	384	489	584
	Class 600	in	7.94	8.25	9.88	11.37	13.37	15.62	20.12	24.12
		mm	201	210	251	289	340	397	511	613
	Class 900	in	11.5	11.5	13.12	14.87	17.5	20.24	28.24	–
		mm	292	292	333	378	444	514	717	–
Length L (welding ends)	Class 150 to 600	in	8	8.25	9.88	11.25	13.25	15.5	20	24
		mm	203	210	251	286	337	394	508	610
	Class 900	in	11	11	13	14.75	18.12	20.87	30.25	–
		mm	279	279	330	375	460	530	768	–
Height H4 standard version		in	6.3	6.3	6.3	7.32	8.27	9.61	12.56	15.94
		mm	160	160	160	186	210	244	319	405
Height H4 with insulating section		in	8.86	8.86	10.04	11.42	12.4	14.76	20.87	24.02
		mm	225	225	255	290	315	375	530	610
Height H4 with bellows seal		in	15.98	15.98	15.71	18.27	22.05	22.64	33.46	On req.
		mm	406	406	399	464	560	575	850	On req.
H8 for actuator	350 cm²	in	11.26	11.26	11.26	11.26	11.26	11.26	19.8	–
		mm	286	286	286	286	286	286	503	–
	350v2 cm²	in	11.26	11.26	11.26	11.26	11.26	11.26	19.8	–
		mm	286	286	286	286	286	286	503	–
	355v2 cm²	in	11.26	11.26	11.26	11.26	11.26	11.26	19.8	–
		mm	286	286	286	286	286	286	503	–
	750 cm²	in	11.26	11.26	11.26	11.26	11.26	11.26	19.8	–
		mm	286	286	286	286	286	286	503	–
	1000 cm²	in	13.43	13.43	13.43	13.43	13.43	13.43	19.8	19.8
		mm	341	341	341	341	341	341	503	503
	1400-60 cm²	in	13.43	13.43	13.43	13.43	13.43	13.43	19.8	19.8
		mm	341	341	341	341	341	341	503	503
	1400-120 cm²	in	–	–	–	20.71	20.71	20.71	23.15	23.15
		mm	–	–	–	526	526	526	588	588
	2800 cm²	in	–	–	–	20.71	20.71	20.71	23.15	23.15
		mm	–	–	–	526	526	526	588	588
	2x 2800 cm²	in	–	–	–	20.71	20.71	20.71	23.15	23.15
		mm	–	–	–	526	526	526	588	588

Valve		NPS	½	1	1½	2	3	4	6	8
H2 ¹⁾	CI 150 to 300	in	1.73	2	2.44	2.97	4.15	5.47	7.28	8.46
		mm	44	51	62	75.5	105.5	139	185	215
	CI 600	in	1.73	2	2.44	2.97	4.15	5.59	7.28	8.46
		mm	44	51	62	75.5	105.5	142	185	215
	Class 900	in	1.73	2.24	2.44	3.05	4.19	5.98	7.83	8.46
		mm	44	57	62	77.5	106.5	152	199	215

¹⁾ The H2 dimension is the distance from the middle of the flow channel to the bottom of the valve body. The dimension up to the bottom of the flange may differ. It may be lower or higher. Flange standards (see Table 1).

Table 18: Further dimensions¹⁾ in combination with Type 3271 Pneumatic Actuator or Type 3277 Pneumatic Actuator

Actuator area		cm ²	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800	2x 2800
Diaphragm ØD		in	11.02	11.02	11.02	15.51	18.19	20.87	21.02	30.32	30.32
Diaphragm ØD		mm	280	280	280	394	462	530	534	770	770
H ²⁾	Type 3271	in	3.23	3.62	5.16	9.29	15.87	13.27	23.54	28.07	47.76
H ²⁾	Type 3271	mm	82	92	131	236	403	337	598	713	1213
H ²⁾	Type 3277	in	3.23	3.23	4.76	9.29	–	–	–	–	–
H ²⁾	Type 3277	mm	82	82	121	236	–	–	–	–	–
H3 ³⁾		in	4.33	4.33	4.33	7.48	24.02	24.02	25.59	25.59	25.59
H3 ³⁾		mm	110	110	110	190	610	610	650	650	650
H5	Type 3277	in	3.98	3.98	3.98	3.98	–	–	–	–	–
H5	Type 3277	mm	101	101	101	101	–	–	–	–	–
Thread	Type 3271		M30x1.5	M30x1.5	M30x1.5	M30x1.5	M60x1.5	M60x1.5	M100x2	M100x2	M100x2
Thread	Type 3277		M30x1.5	M30x1.5	M30x1.5	M30x1.5	–	–	–	–	–
a	Type 3271		G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G 1 (1 NPT)	G 1 (1 NPT)	G 1 (1 NPT)
a2	Type 3277		G ¾	G ¾	G ¾	G ¾	–	–	–	–	–

¹⁾ The specified dimensions are theoretical maximum design values for a specific standard device configuration. They do not reflect every possible case of use. The actual values for individual devices may differ depending on the device configuration and the specific application.

²⁾ Height including lifting eyelet or female thread and eyebolt according to DIN 580. Height of the swivel hoist may differ. Actuators up to 355v2 cm² without lifting eyelet or female thread.

³⁾ Minimum clearance required to remove the actuator

Dimensional drawings

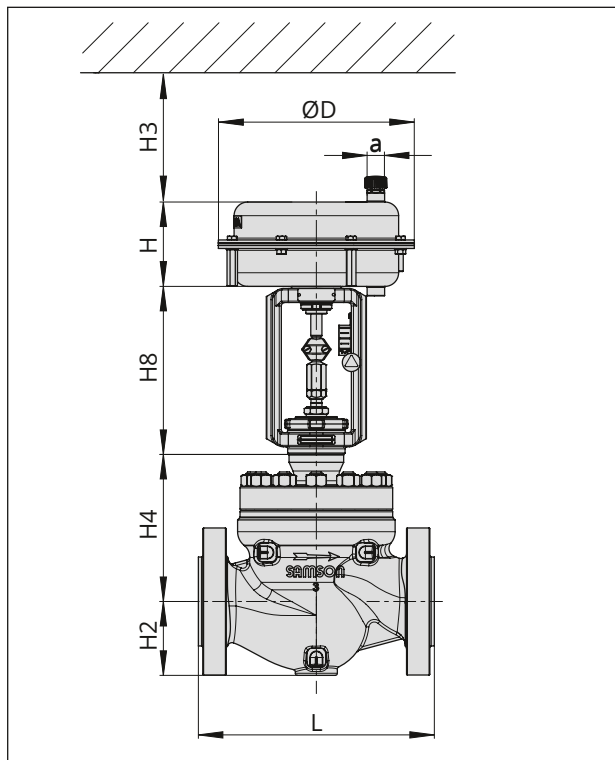


Fig. 5: SMS MG-1 Control Valve: Type 251GR Valve with Type 3271 Pneumatic Actuator

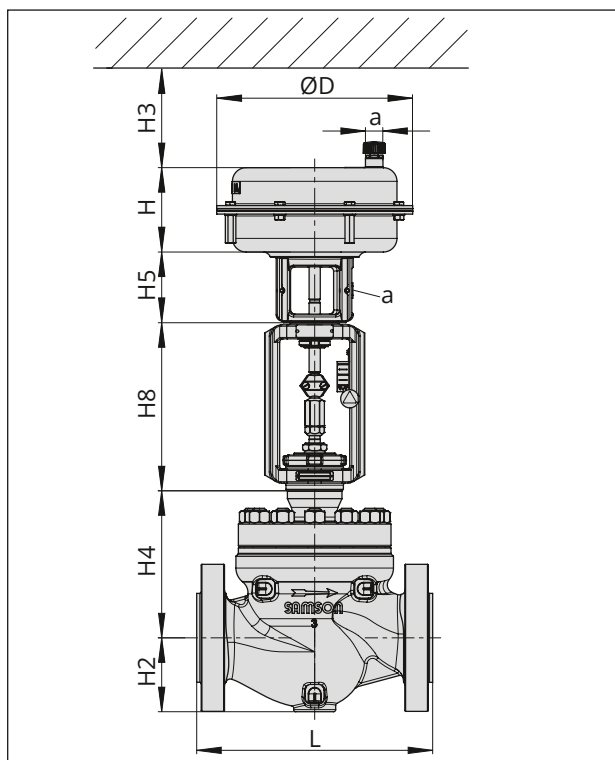


Fig. 6: SMS MG-7 Control Valve: Type 251GR Valve with Type 3277 Pneumatic Actuator

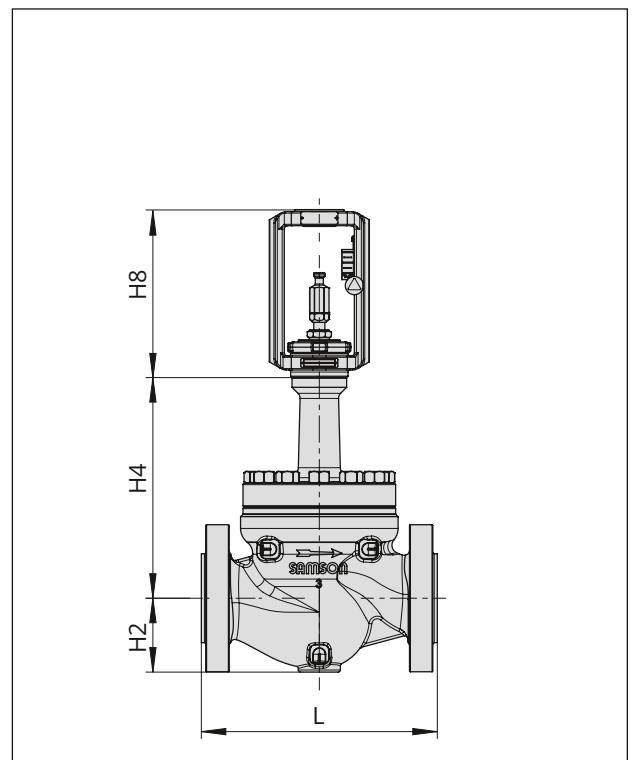


Fig. 7: Type 251GR Valve with insulating section

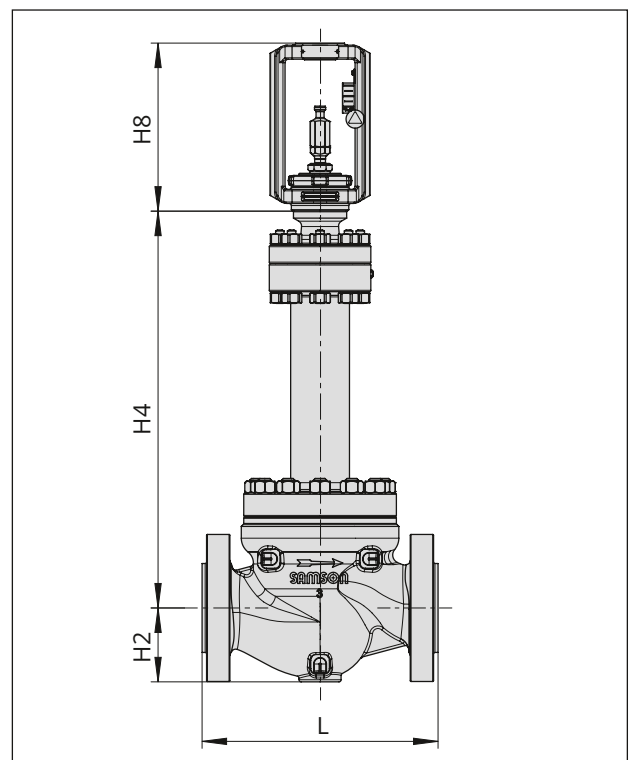


Fig. 8: Type 251GR Valve with bellows seal

Table 19: *Weights in lbs and kg for Type 251GR Valve with RF flanges according to ASME B16.5*

Valve		NPS	½	1	1½	2	3	4	6	8
Standard version (standard bonnet)										
Valve ¹⁾ with- out actuator	CI 150	lbs (ap- prox.)	20	29	37	64	101	148	298	511
		kg (ap- prox.)	9	13	17	29	46	67	135	232
	CI 300	lbs (ap- prox.)	22	33	46	68	112	174	355	589
		kg (ap- prox.)	10	15	21	31	51	79	161	267
	CI 600	lbs (ap- prox.)	22	33	49	75	128	225	470	820
		kg (ap- prox.)	10	15	22	34	58	102	213	372
	CI 900	lbs (ap- prox.)	33	46	66	119	194	298	681	-
		kg (ap- prox.)	15	21	30	54	88	135	309	-
Version with insulating section										
Valve ¹⁾ with- out actuator	CI 150	lbs (ap- prox.)	24	33	44	68	115	168	355	589
		kg (ap- prox.)	11	15	20	31	52	76	161	267
	CI 300	lbs (ap- prox.)	24	35	51	75	128	196	417	672
		kg (ap- prox.)	11	16	23	34	58	89	189	305
	CI 600	lbs (ap- prox.)	26	37	53	82	132	231	500	851
		kg (ap- prox.)	12	17	24	37	60	105	227	386
	CI 900	lbs (ap- prox.)	37	51	71	123	198	304	712	-
		kg (ap- prox.)	17	23	32	56	90	138	323	-

Valve		NPS	½	1	1½	2	3	4	6	8
Version with bellows seal										
Valve ¹⁾ with- out actuator	CI 150	lbs (ap- prox.)	-	29	37	60	93	146	282	467
		kg (ap- prox.)	-	13	17	27	42	66	128	212
	CI 300	lbs (ap- prox.)	-	33	44	64	106	174	346	551
		kg (ap- prox.)	-	15	20	29	48	79	157	250
	CI 600	lbs (ap- prox.)	-	35	49	71	112	201	414	688
		kg (ap- prox.)	-	16	22	32	51	91	188	312
	CI 900	lbs (ap- prox.)	-	-	-	-	-	-	-	-
		kg (ap- prox.)	-	-	-	-	-	-	-	-

¹⁾ The weights specified apply to a specific standard device configuration. Weights of other valve configurations may differ depending on the version (material, trim etc.).

Table 20: Weights¹⁾ for Type 3271 and Type 3277 Pneumatic Actuators

Type ... Actuator	Actuator area in cm ²		350	350v2	355v2	750v2	1000	1400-60	1400-120	2800	2x 2800
3271	Without handwheel	lbs	18	26	33	79	176	154	386	992	2095
3271	Without handwheel	kg	8	11.5	15	36	80	70	175	450	950
3271	With handwheel	lbs	29	37	44	90	397	386	661 ^{2)/} 937 ³⁾	1268 ^{2)/} 1544 ³⁾	On req.
3271	With handwheel	kg	13	16.5	20	41	180	175	300 ^{2)/} 425 ³⁾	575 ^{2)/} 700 ³⁾	On req.
3277	Without handwheel	lbs	27	33	42	89	–	–	–	–	–
3277	Without handwheel	kg	12	15	19	40	–	–	–	–	–
3277	With handwheel	lbs	38	44	53	100	–	–	–	–	–
3277	With handwheel	kg	17	20	24	45	–	–	–	–	–

¹⁾ The weights specified apply to a specific standard device configuration. Weights of other actuator configurations may differ depending on the version (material, number of actuator springs etc.).

²⁾ Side-mounted handwheel up to 80 mm travel

³⁾ Side-mounted handwheel with travel higher than 80 mm travel

Selection and sizing of the valve

1. Calculate C_v coefficient according to DIN EN 60534-1.
2. Select nominal size NPS and C_v coefficient.
3. Calculation of permissible differential pressure Δp on request
4. Select the valve body material from Table 1 and Table 2 as well as from the pressure-temperature diagrams (see Information Sheet ► T 8000-2).
5. Select accessories from Table 1 and Table 2.

Ordering text

The following specifications are required on ordering:

Nominal size	NPS ...
Pressure rating	Class ...
Body material	See Table 2
Bonnet	Standard bonnet, insulating section or bellows seal
Type of end connections	Flanges or welding ends
Plug/piston	Standard or balanced Soft seal, metal seal or high-performance metal seal
Characteristic	Equal percentage, linear, mod. linear or on/off
Actuator	Type 3271 or Type 3277 (see Data Sheets ► T 8310-1, ► T 8310-2 and ► T 8310-3)
Fail-safe action	Fail-close or fail-open
Process medium	Density in lb/cu.ft or kg/m ³ and temperature in °F or °C
Flow rate	lbs/h or kg/h or cu.ft/min or m ³ /h in standard or operating state
Pressure	p_1 and p_2 in bar or psi (absolute pressure p_{abs}), with minimum, normal and maximum flow rate
RFID tag	Yes/No
Valve accessories	Positioner and/or limit switch

Associated Information Sheet	► T 8000-X
Associated Data Sheets for pneumatic actuators	► T 8310-1 to ► T 8310-3
Associated Mounting and Operating Instructions	► EB 8004-GR