

## T 8005-GR EN

### Series SMS · SMS HG-1 and SMS HG-7 Pneumatic Control Valves

#### Type 261GR Globe Valve

DIN version



#### Application

Control valve for process engineering applications with high industrial requirements

<b>Nominal size</b>	<b>DN 25 to 100</b>
<b>Pressure rating</b>	<b>PN 63 to 160</b>
<b>Temperatures</b>	<b>-50 to +425 °C</b>



**Fig. 1:** SMS HG-1: Type 261GR Globe Valve with Type 3271 Pneumatic Actuator

Type 261GR Globe Valve operated with

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

#### Special features

- 3-, 4- or 6-stage CDST plug fully replaceable in the field
- Body made of cast steel
- Body made of cast stainless steel
- 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 60534-6-1<sup>1)</sup> and NAMUR Recommendation (see Information Sheet ► T 8350).

<sup>1)</sup> Accessories required. See associated actuator documentation.

#### Versions

- **SMS HG-1** · Type 261GR Globe Valve and Type 3271 Actuator with 350 to 1400-60 cm<sup>2</sup> actuator area (see Data Sheets ► T 8310-1, ► T 8310-2 and ► T 8310-3)
- **SMS HG-7** · Type 261GR Globe Valve and Type 3277 Actuator with 350 to 750v2 cm<sup>2</sup> actuator area for integral positioner attachment (see Data Sheet ► T 8310-1)

Further versions

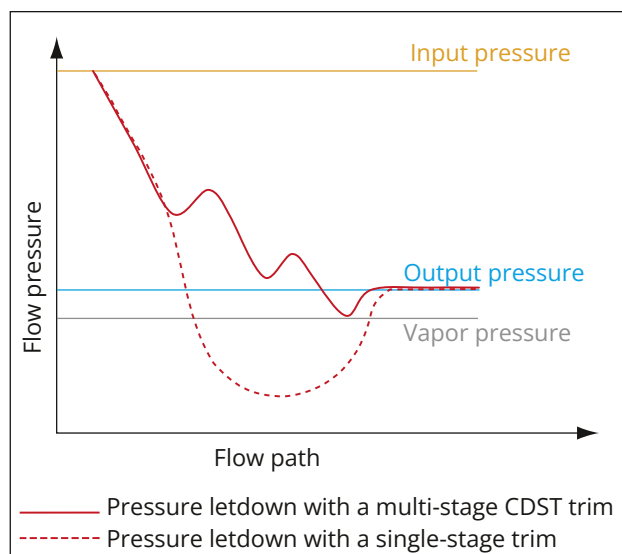
- **Valve plug with pressure balancing**
- **Additional handwheel** • See Data Sheet ▶ T 8310-1
- **Type 261GR Valve with Type 3273 Hand-operated Actuator** • For valves with max. 30 mm rated travel and side-mounted handwheel for travel >30 mm • See Data Sheet ▶ T 8312
- **SMS HG-TP Electric Control Valve** • On request

### Principle of operation of version with multi-stage CDST plug

The valves have a CDST (cavitation dirty service trim) plug, which is specially constructed for media containing solid matter or dirty media. The circumferential guide over the full length of the CDST plug makes it resistant to vibration.

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

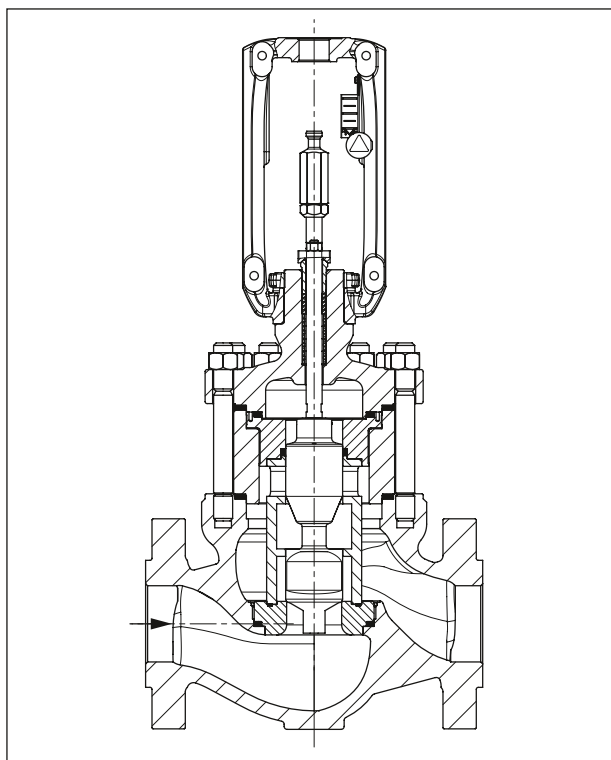
Compared to standard valve trims, the CDST trims considerably reduce the sound pressure level for differential pressure ratios between  $X_F = 0.25$  and  $X_F = 0.99$  by shifting the point of incipient cavitation.



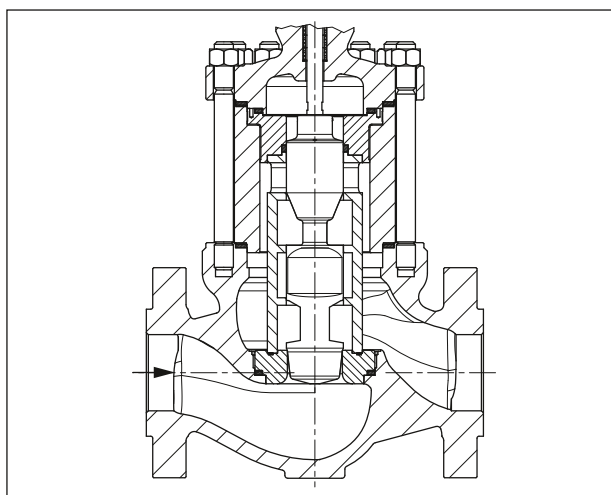
**Fig. 2:** Pressure drop across a multi-stage and single-stage trim

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

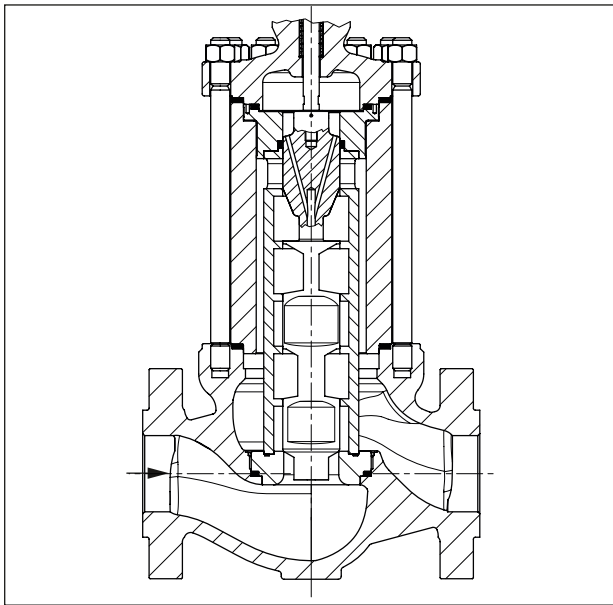
Fig. 3 to Fig. 5 show configuration examples.



**Fig. 3:** Type 261GR Globe Valve with 3-stage CDST plug



**Fig. 4:** Type 261GR Globe Valve with 4-stage CDST plug




**Fig. 5:** Type 261GR Globe Valve with 6-stage CDST plug and pressure balancing

### 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 261GR · DIN version**

Material		Cast steel 1.0619	Cast stainless steel 1.4408
Nominal size and pressure rating		DN 25 to 100 <sup>3)</sup> · PN 63 to 160	
Type of end connections	Flanges	B1 and B2 according to DIN EN 1092	
	Welding ends	DIN EN 12627	
Seat-plug seal		Metal seal · High-performance metal seal	
Characteristic		Linear <sup>2)</sup>	
Rangeability		On request (depending on nominal size, valve version and number of trim stages)	
Conformity			
Optional RFID tag		Application range according to the technical specifications and the explosion protection certificates. These documents are available on our website: ► <a href="http://www.samsongroup.com">www.samsongroup.com</a> > Products > Electronic nameplate The permissible range for temperatures at the RFID tag is between -40 and +85 °C.	
Temperature ranges in °C · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet ► T 8000-2)			
Body with standard bonnet		-10 to +250 with PTFE packing Up to +400 with graphite packing	-50 to +250 with PTFE packing Up to +425 with graphite packing
Trim <sup>1)</sup>	Metal seal	-50 to +425	
	Balanced with PTFE	-50 to +250	
Leakage class according to DIN EN 60534-4			
Trim	Metal seal	Standard: IV · High-performance metal seal: V	
	Balanced, metal seal	With PTFE ring (standard): IV · High-performance metal seal: V	

<sup>1)</sup> Only in combination with suitable body material

<sup>2)</sup> Other on request

<sup>3)</sup> Only for version with cage trim

**Table 2: Materials for Type 261GR · DIN version**

Body of standard version		Cast steel 1.0619	Cast stainless steel 1.4408
Valve bonnet		1.0619	1.4408
Intermediate piece		1.0460	1.4401/1.4404
Plug stem		XM-19-H	
Seal ring for balanced plug		PTFE with carbon · Graphite	
Packing		PTFE packing loaded by internal or external springs or adjustable graphite packing	
Body gasket		Spiral wound gasket, graphite/1.4401/1.4404	
Version with clamped-in seat and plug	Plug <sup>3)</sup>	1.4401/1.4404/1.4125 <sup>1)</sup>	1.4401/1.4404 <sup>4)</sup>
	Seat	1.4401/1.4404/1.4125 <sup>1)</sup>	1.4401/1.4404 <sup>2)</sup>
	Liner	1.4401/1.4404/1.4125 <sup>1)</sup>	1.4401/1.4404 <sup>3)</sup>
	Cylinder	1.4401/1.4404/1.4125 <sup>1)</sup>	1.4401/1.4404 <sup>3)</sup>

<sup>1)</sup> Heat treated

<sup>2)</sup> Also with Stellite®-faced facing and guide for media containing solid matter

<sup>3)</sup> Kolsterized

<sup>4)</sup> Kolsterized for media containing solid matter



## K<sub>VS</sub> coefficients for version with plug<sup>1)</sup> • Linear

<sup>1)</sup> CDST • Values for other plug versions on request

**Table 3:** Flow coefficients for version with CDST trim

K <sub>VS</sub>		0.66	1.29	2.65	1.81	4.91	10.1	8	16.4	21.2	11.5	16.8	35.3
CDST stages		6	4	3	6	4	3	6	4	3	6	4	3
Seat bore	mm	18	18	18	35	35	35	55	55	55	70	70	70
Travel	mm	10	10	10	15	15	15	25	25	25	38	38	38
<b>DN</b>													
25		•	•	•									
50					• <sup>1)</sup>	• <sup>1)</sup>	• <sup>1)</sup>						
80								• <sup>1)</sup>	• <sup>1)</sup>	• <sup>1)</sup>			
100											• <sup>1)</sup>	• <sup>1)</sup>	• <sup>1)</sup>

<sup>1)</sup> Versions also with PTFE pressure balancing

## Entrained dirt particles

SAMSON has calculated the maximum diameter of entrained dirt particles that can be flushed out of a fully open valve. Depending on how far the valve is opened during throttling service, even smaller sized particles may clog up the valve. It may be necessary to briefly move the valve to the fully open position to flush out the valve. How often the valve needs to be flushed out may vary due to the operating conditions and the individual case of use.

**Table 4:** Maximum permissible size of entrained dirt particles at 100 % travel for version with type A CDST plug

DN	K <sub>VS</sub> coefficient	CDST stages	Max. perm. particle diameter
25	2.65	3	3.5 mm
	1.29	4	0.4 mm
	0.66	6	0.2 mm
50	10.1	3	7.8 mm
	4.9	4	1.0 mm
	1.81	6	0.3 mm
80	21.2	3	11.1 mm
	16.4	4	2.8 mm
	8	6	1.2 mm
100	35.3	3	14.7 mm
	16.8	4	3.7 mm
	11.5	6	1.0 mm

## Dimensions

**Table 5:** Dimensions in mm for SMS HG-1 and SMS HG-7 Control Valves

Valve	DN	25	50	80	100
Length L (flanges)	PN 63 to 160	230	300	380	430
Height H4 (version with standard bonnet)	3-stage CDST	192	227	300	388
	4-stage CDST	218	262	353	470
	6-stage CDST	270	332	458	634
H8 for actuator	350 cm <sup>2</sup>	286	286	286	286
	350v2 cm <sup>2</sup>	286	286	286	286
	355v2 cm <sup>2</sup>	286	286	286	286
	750 cm <sup>2</sup>	286	286	286	286
	1000 cm <sup>2</sup>	341	341	341	341
	1400-60 cm <sup>2</sup>	341	341	341	341

Valve	DN	25	50	80	100
H2 <sup>1)</sup>	PN 63	70	90	108	142
	PN 100	70	98	115	142
	PN 160	70	98	115	147

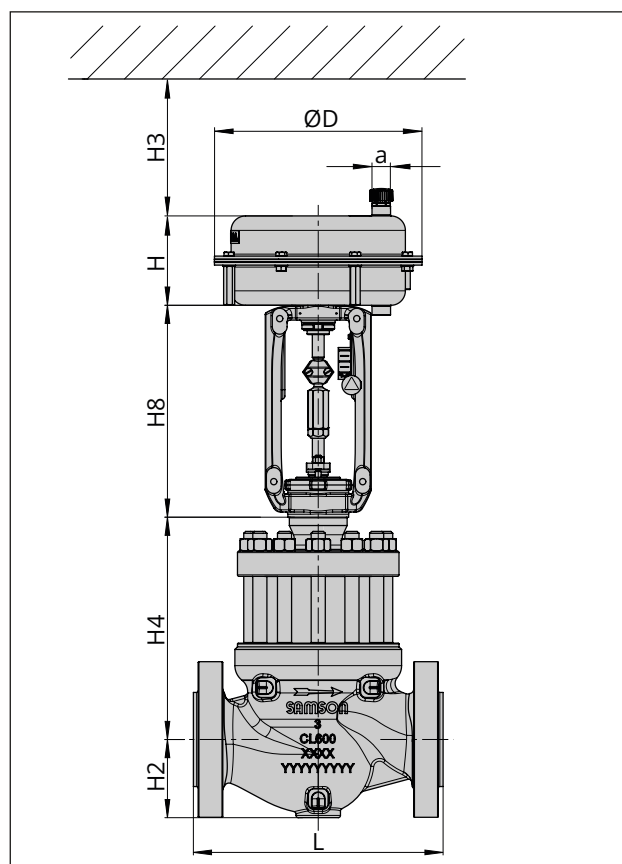
<sup>1)</sup> The H2 dimension is the distance from the middle of the flow channel to the bottom of the valve body. The dimension up to the bottom of the flange may differ. It may be lower or higher. Flange standards (see Table 1).

**Table 6: Further dimensions<sup>1)</sup> in combination with Type 3271 Pneumatic Actuator or Type 3277 Pneumatic Actuator**

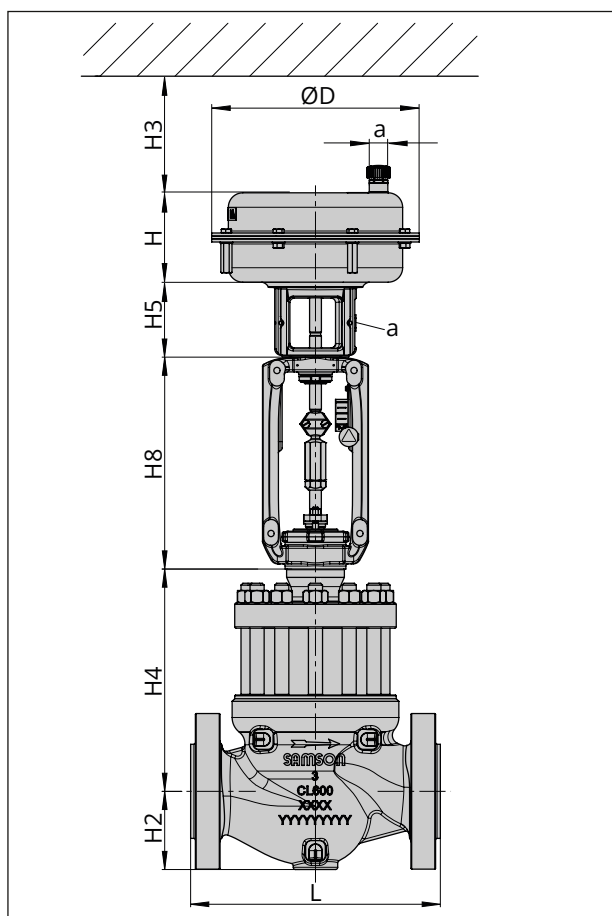
Actuator area		cm <sup>2</sup>	350	350v2	355v2	750v2	1000	1400-60
Diaphragm ØD		mm	280	280	280	394	462	530
H <sup>2)</sup>	Type 3271	mm	82	92	131	236	403	337
H <sup>2)</sup>	Type 3277	mm	82	82	121	236	–	–
H3 <sup>3)</sup>		mm	110	110	110	190	610	610
H5	Type 3277	mm	101	101	101	101	–	–
Thread	Type 3271		M30x1.5	M30x1.5	M30x1.5	M30x1.5	M60x1.5	M60x1.5
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)
a2	Type 3277		G ¾	G ¾	G ¾	G ¾	–	–

- <sup>1)</sup> 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.
- <sup>2)</sup> Height including lifting eyelet or female thread and eyebolt according to DIN 580. Height of the swivel hoist may differ. Actuators up to 355v2 cm<sup>2</sup> without lifting eyelet or female thread.
- <sup>3)</sup> Minimum clearance required to remove the actuator

## Dimensional drawings



**Fig. 6: SMS HG-1 Control Valve: Type 261GR Valve with Type 3271 Pneumatic Actuator**



**Fig. 7: SMS HG-7 Control Valve: Type 261GR Valve with Type 3277 Pneumatic Actuator**

## Weights

**Table 7:** Weights in kg for Type 261GR Valve with B1 flanges according to DIN EN 1092-1

Valve		DN	25	50	80	100
Version with standard bonnet						
Valve <sup>1)</sup> without actuator	PN 63	3-stage CDST	26	51	72	142
		4-stage CDST	27	54	83	157
		6-stage CDST	29	58	94	170
	PN 100	3-stage CDST	26	53	81	153
		4-stage CDST	27	56	91	169
		6-stage CDST	29	60	107	184
	PN 160	3-stage CDST	31	55	105	173
		4-stage CDST	32	58	113	189
		6-stage CDST	34	62	129	204

<sup>1)</sup> 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 8:** Weights<sup>1)</sup> for Type 3271 and Type 3277 Pneumatic Actuators

Type ... Ac- tuator	Actuator area in cm <sup>2</sup>		350	350v2	355v2	750v2	1000	1400-60
3271	Without handwheel	kg	8	11.5	15	36	80	70
3271	With handwheel	kg	13	16.5	20	41	180	175
3277	Without handwheel	kg	12	15	19	40	–	–
3277	With handwheel	kg	17	20	24	45	–	–

<sup>1)</sup> 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.).

Selection and sizing of the valve

- 1. Calculate  $K_{VS}$  coefficient according to DIN EN 60534-1.
- 2. Select nominal size DN and  $K_{VS}$  coefficient.
- 3. Calculation of permissible differential pressure  $\Delta p$  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	DN ...
Pressure rating	PN ...
Body material	See Table 2
Bonnet	Standard
Type of end connections	Flanges or welding ends
Plug	CDST: 3-stage, 4-stage or 6-stage Standard or balanced Metal seal or high-performance metal seal
Characteristic Actuator	Linear 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 $\text{kg/m}^3$ and temperature in $^{\circ}\text{C}$
Flow rate	in $\text{kg/h}$ or $\text{m}^3/\text{h}$ in standard or operating state
Pressure	$p_1$ and $p_2$ in bar (absolute pressure $p_{\text{abs}}$ ), 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 8005-GR