

T 8093-1 EN

Series 240 · Type 3248 Cryogenic Valve

Type 3248-1 and Type 3248-7 Pneumatic Control Valves

ANSI version



Application

Globe or angle valve for cryogenic applications. Easy to service due to top-entry design

Nominal size	NPS 1 to 6
Pressure rating	Class 150 to 600
Temperatures	-425 to +149 °F (-254 to +65 °C)

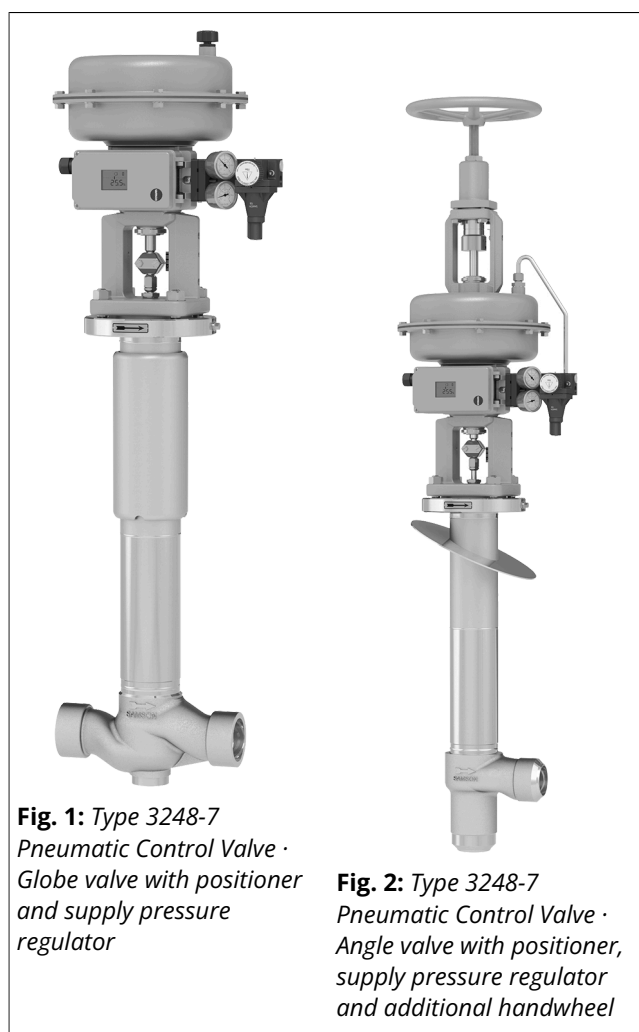


Fig. 1: Type 3248-7
Pneumatic Control Valve ·
Globe valve with positioner
and supply pressure
regulator

Fig. 2: Type 3248-7
Pneumatic Control Valve ·
Angle valve with positioner,
supply pressure regulator
and additional handwheel

Special features

The Type 3248 Cryogenic Valve is specially designed to meet the requirements of cryogenic applications.

- Standard metal bellows to meet strict emission requirements
- Minimized heat leakage thanks to the use of a metal bellows and a cryogenic extension bonnet
- Globe or angle-style valve body
- Installation in vacuum-insulated pipelines, air separation plants and peripheral plants made possible by a cover plate on the cryogenic extension bonnet
- Valve maintenance possible without removing it from the pipeline
- Top entry through the cryogenic extension bonnet allows easy access to the seat, plug and bellows after removal of the actuator
- The C_v coefficients can be modified in wide ranges by replacing the seat and valve plug

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

Versions

Standard version · Temperature range from -320 to +149 °F (-196 to +65 °C) · Stem sealed by metal bellows and self-adjusting V-ring packing made of pure PTFE or PTFE/carbon

- **Type 3248-1** · With Type 3271 Pneumatic Actuator with 175v2 to 2800 cm² actuator area (see Data Sheets ▶ T 8310-1, ▶ T 8310-2 and ▶ T 8310-3)
- **Type 3248-7** · With Type 3277 Pneumatic Actuator with 175v2 to 750v2 cm² actuator area for integral positioner attachment (see Data Sheet ▶ T 8310-1)

Further versions

- Temperature range from -320 to -425 °F (-196 to -254 °C)
- Temperatures above 149 °F (65 °C) · On request
- Integrated seat · On request
- Free of oil and grease for oxygen service
- Version for ultrapure gas
- Pipe jacketing for installation in vacuum-insulated plant components
- Welding-neck ends · On request
- Pneumatic actuator with additional handwheel
- DIN version of cryogenic valve (see Data Sheet ▶ T 8093)

Design and principle of operation

The medium flows through the cryogenic valve in the direction indicated by the arrow. The position of the valve plug (5) in relation to the seat (4) determines the flow rate.

The metal bellows (37) ensures that the process medium has no direct contact with the V-ring packing (15). The packing to seal the stem to the atmosphere is self-adjusting. The stem seal can be checked at any time for leakage by removing the screw plug at the test connection (42).

Installation

SAMSON recommends mounting the valve at an angle between 15 and 25° to the horizontal plane. Contact SAMSON for smaller mounting angles as additional measures are required in this case. Avoid attaching the bracket or support in the area around bellows nut (41) (see Mounting and Operating Instructions ▶ EB 8093-1).

The medium must flow through the valve in the direction indicated by the arrow on the valve body.

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.

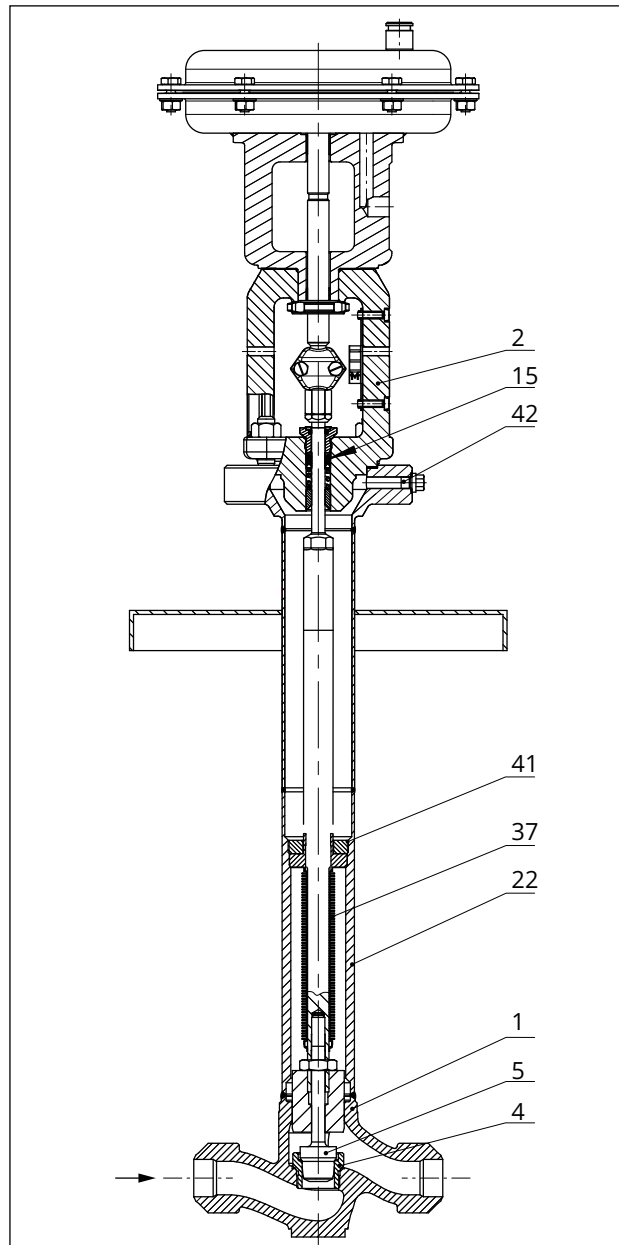


Fig. 3: Type 3248-7 Globe Valve, PN 40/Class 150/300

1	Body	15	V-ring packing
2	Bonnet	22	Bellows seal
3	Yoke	37	Plug stem with metal bellows
4	Seat	41	Bellows nut
5	Plug	42	Test connection

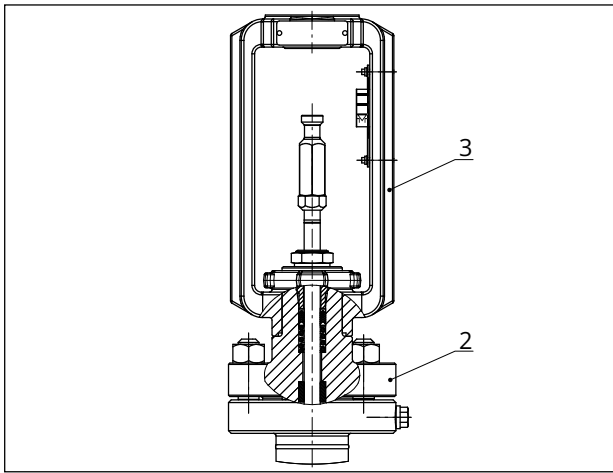


Fig. 4: Bonnet and yoke for PN 100/Class 600

2 Bonnet 3 Yoke

Differential pressures

Permissible differential pressures are listed in Information Sheet ► T 8000-4:

- Valves in Class 150 to 300 according to Tables 4.1 to 4.3
- Class 600 according to Tables 5.1 to 5.3

Table 1: Technical data for Type 3248 · ANSI version

Body style	Globe valve		Angle valve
Nominal size	NPS 1 to 6	NPS 1 to 6	NPS 1 to 6
Pressure rating	Class 150 to 300	Class 600	Class 150 to 600
End connections for globe and angle valves	Welding ends: Welding ends:	Socket weld ends NPS 1 to 2 Butt weld ends ASME B16.25 · NPS 3 to 6	Butt weld ends acc. to ASME B16.25
Seat-plug seal	Metal seal · Soft seal · High-performance metal seal		
Characteristic	Equal percentage or linear		
Rangeability	50:1 up to NPS 2 30:1 with NPS 3 to 6		
Temperature range	-321 to +149 °F (-196 to +65 °C) · Down to -425 °F (-254 °C) on request		
Leakage class according to ANSI FCI 70-2	Metal seal: IV · Soft seal: VI · High-performance metal seal: V		
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).		
Conformity	CE EAC		

Table 2: Materials for Type 3248 · ANSI version · Temperature range down to -321 °F (-196 °C)

Valve	Globe valve		Angle valve
Valve body	A351 CF8		
Seat ¹⁾	CrNiMo steel		
Plug ¹⁾	Metal seal	CrNiMo steel	
	Soft seal	Seal made of PTFE with glass fiber	
V-ring packing	PTFE with carbon or pure PTFE		
Cryogenic extension bonnet, metal bellows, bushings, plug stem	CrNiMo steel		

¹⁾ Seats and plug without soft seal also available with Stellite® hard facing · Plug up to seat bore 48 also available made of solid Stellite®.

Table 3: Materials for Type 3248 · ANSI version · Temperature range from -321 °F to -425 °F (-196 to -254 °C)

Valve	Globe valve		Angle valve
Valve body	316L		
Seat ¹⁾	CrNiMo steel		
Plug	Metal seal	CrNiMo steel	
	Soft seal	PCTFE seal	
V-ring packing	PTFE with carbon or pure PTFE		
Cryogenic extension bonnet, metal bellows, bushings, plug stem	CrNiMo steel		

¹⁾ Integrated seat on request

C_v and K_{vs} coefficients for Type 3248 Valve · ANSI version

Table 4: Overview

C _v		0.12 to 0.3	0.5 to 1.2	2 to 5	7.5 to 12	20	30	47	70	95	75	120	190	300
K _{vs}		0.1 to 0.25	0.4 to 1	1.6 to 4	6.3 to 10	16	25	40	60	80	63	100	160	260
Seat Ø	in	0.12	0.24	0.47	0.945	1.22	1.5	1.9	2.48	3.15	2.48	3.15	3.94	5.12
	mm	3	6	12	24	31	38	48	63	80	63	80	100	130
Travel	in	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	1.18	1.18	1.18	1.18
	mm	15	15	15	15	15	15	15	15	15	30	30	30	30

Table 5: Nominal sizes and associated C_v coefficients · Applicable to globe valves made of cast materials and angle valves made of cast or forged materials

C _v		0.12 0.2 0.3	0.5 0.75 1.2	2 3 5	7.5 12	20	30	47	70	95	75	120	190	300
NPS	DN													
1	25	•	•	•	•									
1½	40		•	•	•	•	•							
2	50		•	•	•	•	•	•						
3	80						•	•	•	•				
4	100										•	•	•	
6	150										•	•	•	•

Table 6: Nominal sizes and associated C_v coefficients · Applicable to globe valves made of forged materials

Seat bore		3	6	12	24	31	38	48	63	80	100	110 ¹⁾	130
NPS	DN	C _v coefficients											
1	25	0.12 0.2 0.3		2 3 5	7.5 10.5								
1½	40		0.5 0.75 1.2	2 3 5	7.5 12	20	26	35					
2	50			2 3 5	7.5 12	20	30	47					
3	80						30	47	70	95			
4	100								75	105	145		
6	150								75	120	190	235	255

¹⁾ No standard

Dimensions and weights

i Note

Height H7 is the minimum clearance for service work. The actuator dimensions and the height H3 (see Table 15) must also be observed. The largest value applies.

Height H1 and the specified weights are reference values. The exact dimensions and weights depend on various factors, e.g. actuator size and overall height.

Table 7: Type 3248 Globe Valve made of stainless steel, short pattern, Class 150 to 300, without cover plate · ANSI version · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
Socket weld ends				Butt weld ends (Schedule 10s)			
L	in	7.75	9.25	10.5	12.5	14.5	17.75
	mm	197	235	267	318	368	451
H1	in	29.75	29.9	29.9	33	38.74	44.76
	mm	756	760	760	838	984	1137
H2	in	1.73	2.8	2.8	3.66	4.37	6.85
	mm	44	71	71	93	111	174
H5	in	24	24	24	24	30.31	36.34
	mm	610	610	610	610	770	923
H6	in	9.45	9.45	9.45	-	-	-
	mm	200	200	200	-	-	-
H7	in	41.34	35.43	35.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
ØC	in	1.35	1.95	2.45	-	-	-
	mm	34.5	49.5	62	-	-	-
D	in	0.5	0.62	0.7	-	-	-
	mm	12.7	15.8	17.5	-	-	-
Weight ¹⁾ without actuator	lbs	38	62	62	122	210	289
	kg	17	30	30	55	95	131

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 8: Type 3248 Globe Valve made of stainless steel, long pattern, Class 150 to 300, with cover plate · ANSI version · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
		Socket weld ends			Butt weld ends (Schedule 10s)		
L	in	8.25	9.88	11.25	13.25	15.5	20
	mm	210	251	286	337	394	508
H	in	26.77	26.93	26.93	30	30.43	35.43
	mm	680	684	684	762	773	900
H2	in	1.73	2.8	2.8	3.66	4.37	6.85
	mm	44	71	71	93	111	174
H4	in	17.36	17.36	17.36	17.36	17.36	21.69
	mm	441	441	441	441	441	551
H5	in	21	21	21	21	22	27
	mm	534	534	534	534	559	686
H6	in	3.15	3.94	3.94	-	-	-
	mm	80	100	100	-	-	-
H7	in	41.34	35.43	35.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
Ød ¹⁾	in	9.84	10.63	10.63	14.57	16.93	16.93
	mm	250	270	270	370	430	430
ØC	in	1.33	1.91	2.41	-	-	-
	mm	33.8	48.6	61.1	-	-	-
D	in	0.5	0.5	0.5	-	-	-
	mm	12.7	12.7	12.7	-	-	-
Weight ²⁾ without actuator	lbs	38	62	62	122	210	289
	kg	17	30	30	55	95	131

¹⁾ The cover plate is prepared for mounting at an angle of 25°, mounted unattached and not welded to the insulating section. Other angles for mounting the cover plate on request.

²⁾ 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 9: Deviating dimensions for the forged version of Type 3248 Globe Valve for temperatures down to -425 °F (-254 °C), Class 150 to 300 · ANSI version · Dimensions in inches and mm

Valve	NPS	1	1½	2	3	4	6
L	in	8.25	9.88	11.25	13.25	15.5	20
	mm	210	251	286	337	394	508
H1	in	33.62	42.72	42.72	46.65	45.2	46.81
	mm	854	1085	1085	1185	1148	1189
H5	in	27.87	36.81	36.81	37.68	36.77	38.39
	mm	708	935	935	957	934	975

Table 10: Type 3248 Globe Valve made of stainless steel, long pattern, Class 600, without cover plate · ANSI version · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
Socket weld ends				Butt weld ends (Schedule 10s)			
L	in	8.25	9.88	11.25	13.25	15.5	20
	mm	210	251	286	337	394	508
H1	in	35.31	35.2	35.2	35.71	42.03	58.43
	mm	897	894	894	907	1067.5	1484
H2	in	1.73	2.8	2.8	3.66	4.37	6.85
	mm	44	71	71	93	111	174
H3	in	35.43	23.62	23.62	27.56	31.5	39.37
	mm	900	600	600	700	800	1000
H5	in	24	24	24	24	30.31	36.34
	mm	610	610	610	610	770	923
H7	in	41.34	35.43	25.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
ØC	in	1.35	1.95	2.45	-	-	-
	mm	34.5	49.5	62	-	-	-
D	in	0.5	0.62	0.7	-	-	-
	mm	12.7	15.8	17.5	-	-	-
Weight ¹⁾ without actuator	lbs	42	78	78	177	239	419
	kg	19	35	35	80	108	190

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 11: Type 3248 Globe Valve made of stainless steel, long pattern, Class 600, with cover plate · ANSI version · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
		Socket weld ends			Butt weld ends (Schedule 10s)		
L	in	8.25	9.88	11.25	13.25	15.5	20
	mm	210	251	286	337	394	508
H1	in	32.36	32.17	32.17	32.76	38.74	51.1
	mm	822	817	817	832	984	1298
H2	in	1.73	2.8	2.8	3.66	4.37	6.85
	mm	44	71	71	93	111	174
H3	in	35.43	23.62	23.62	27.56	31.5	39.37
	mm	900	600	600	700	800	1000
H4	in	17.36	17.36	17.36	17.36	21.69	23.62
	mm	441	441	441	441	551	600
H5	in	21	21	21	21	27	29
	mm	534	534	534	534	686	737
H7	in	41.34	35.43	35.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
Ød ¹⁾	in	9.84	10.63	10.63	14.57	16.93	16.93
	mm	250	270	270	370	430	430
ØC	in	1.33	1.91	2.41	-	-	-
	mm	33.8	48.6	61.1	-	-	-
D	in	0.5	0.5	0.5	-	-	-
	mm	12.7	12.7	12.7	-	-	-
Weight ²⁾ without actuator	lbs	42	78	78	177	239	419
	kg	19	35	35	80	108	190

¹⁾ The cover plate is prepared for mounting at an angle of 25°, mounted unattached and not welded to the insulating section. Other angles for mounting the cover plate on request.

²⁾ 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 12: Type 3248 Angle Valve made of stainless steel, Class 300 · ANSI version · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
L	in	3.86	5.25	5.25	6.25	7.25	9.31
	mm	98	133	133	159	184	236
H1	in	32.68	33.27	33.27	40.04	43.62	43.35
	mm	830	845	845	1017	1108	1101
H4	in	23.62	23.62	23.62	25.59	29.53	29.53
	mm	600	600	600	650	750	750
H5	in	26.93	27.36	27.36	31.02	35.16	34.92
	mm	684	695	695	788	893	887
H7	in	41.34	35.43	35.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
Ød	in	11.1	11.1	11.1	11.1	11.1	11.1
	mm	282	282	282	282	282	282
Butt weld ends/pipe connection		SCH 10S	SCH 10S	SCH 10S	SCH 10S	SCH 10S	SCH 10S
Weight ¹⁾ without actuator	lbs	38	62	62	115	203	283
	kg	17	30	30	52	92	128

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 13: Deviating dimensions for the forged version of Type 3248 Angle Valve for temperatures down to -425 °F (-254 °C), Class 300 · ANSI version · Dimensions in inches and mm

Valve	NPS	1	1½	2	3	4	6
L	in	3.86	5.25	5.25	6.25	7.25	9.31
	mm	98	133	133	159	184	236
H1	in	32.68	41.38	41.38	44.7	42.99	43.35
	mm	830	1051	1051	1135.5	1092	1101
H5	in	26.93	35.47	35.47	35.69	34.53	34.92
	mm	684	901	901	906.5	877	887

Table 14: Type 3248 Angle Valve made of stainless steel, Class 600 · Dimensions in inches and mm · Weights in lbs and kg

Valve	NPS	1	1½	2	3	4	6
L	in	3.86	5.25	5.25	6.25	7.25	9.31
	mm	98	133	133	159	184	236
H1	in	31.42	31.42	31.42	31.32	37.13	47.64
	mm	798	798	798	795.5	943	1210
H4	in	15.75	15.75	15.75	15.75	16.69	21.65
	mm	400	400	400	400	500	550
H5	in	20.08	20.28	20.28	19.61	25.39	25.55
	mm	510	515	515	498	645	649
H7	in	41.34	35.43	35.43	35.43	43.31	43.31
	mm	1050	900	900	900	1100	1100
Ød	in	11.1	11.1	11.1	11.1	11.1	11.1
	mm	282	282	282	282	282	282
Butt weld ends/pipe connection		SCH 40S	SCH 40S	SCH 40S	SCH 40S	SCH 40S	SCH 40S
Weight ¹⁾ without actuator	lbs	42	78	78	170	232	389
	kg	19	35	35	77	105	176

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

Actuator area		cm ²	175v2	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800
Diaphragm ØD		in	8.46	11.02	11.02	11.02	15.51	18.19	20.87	21.02	30.32
Diaphragm ØD		mm	215	280	280	280	394	462	530	534	770
H ²⁾	Type 3271	in	3.07	3.23	3.62	5.16	9.29	15.87	13.27	23.54	28.07
H ²⁾	Type 3271	mm	78	82	92	131	236	403	337	598	713
H ²⁾	Type 3277	in	3.07	3.23	3.23	4.76	9.29	-	-	-	-
H ²⁾	Type 3277	mm	78	82	82	121	236	-	-	-	-
H3 ³⁾		in	4.33	4.33	4.33	4.33	7.48	24.02	24.02	25.59	25.59
H3 ³⁾		mm	110	110	110	110	190	610	610	650	650
H5	Type 3277	in	3.98	3.98	3.98	3.98	3.98	-	-	-	-
H5	Type 3277	mm	101	101	101	101	101	-	-	-	-
Thread	Type 3271		M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	M60x1.5	M60x1.5	M100x2	M100x2
Thread	Type 3277		M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	-	-	-	-
a	Type 3271		G ¼ (¼ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ⅜ (⅜ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	G 1 (1 NPT)	G 1 (1 NPT)
a2	Type 3277		G ⅜ ⁴⁾	G ⅜ ⁴⁾	G ⅜ ⁴⁾	G ⅜ ⁴⁾	G ⅜ ⁴⁾	-	-	-	-

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

⁴⁾ An adapter G ⅜ to ⅜ NPT is available for the a2 connection. It can be ordered separately using the following article number: 100160362

Table 16: Weights¹⁾ for Type 3271 and Type 3277 Pneumatic Actuators

Type ... Actuator	Actuator area in cm ²		175v2	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800
3271	Without handwheel	lbs	13	18	26	33	79	176	154	386	992
3271	Without handwheel	kg	6	8	11.5	15	36	80	70	175	450
3271	With handwheel	lbs	22	29	37	44	90	397	386	661 ²⁾ / 937 ³⁾	1268 ²⁾ / 1544 ³⁾
3271	With handwheel	kg	10	13	16.5	20	41	180	175	300 ²⁾ / 425 ³⁾	575 ²⁾ / 700 ³⁾
3277	Without handwheel	lbs	22	27	33	42	89	-	-	-	-
3277	Without handwheel	kg	10	12	15	19	40	-	-	-	-
3277	With handwheel	lbs	31	38	44	53	100	-	-	-	-
3277	With handwheel	kg	14	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

Dimensional drawings

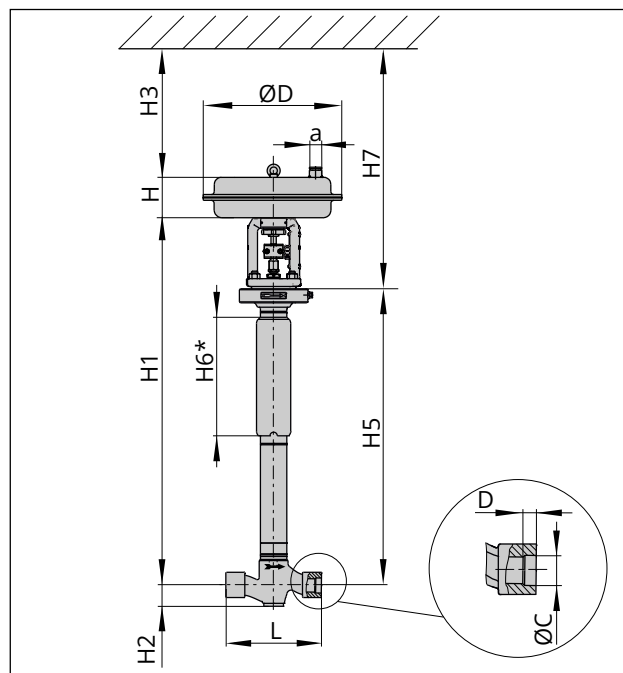


Fig. 5: Type 3248-1 Globe Valve

* H6 only in Class 150 to 300 and NPS 1 to 2

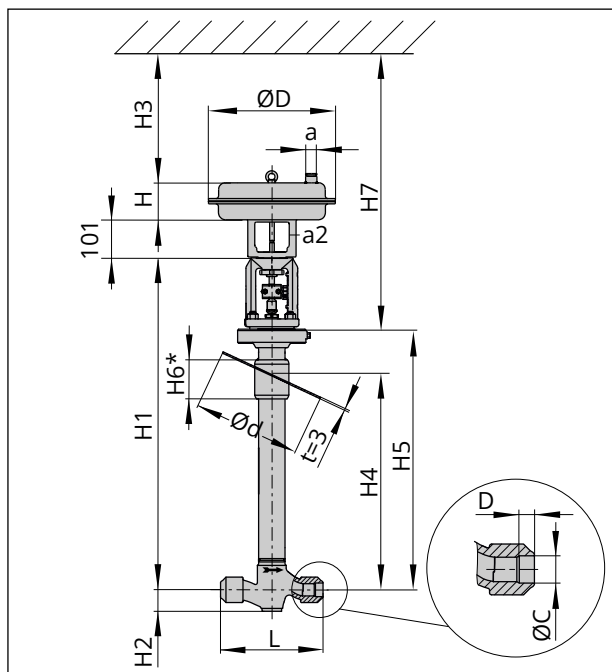


Fig. 6: Type 3248-7 Globe Valve

* H6 only in Class 150 to 300 and NPS 1 to 2

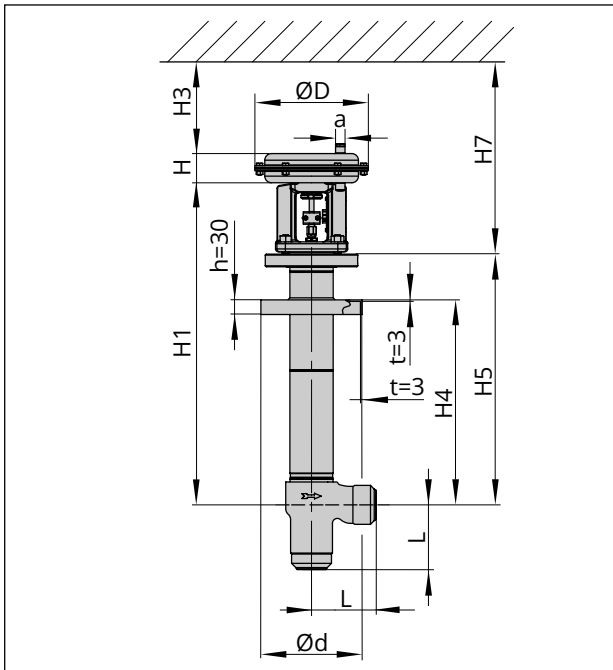


Fig. 7: Type 3248#1 Angle Valve with stainless steel body

Valve/actuator assignment

Table 17: Class 150/300

Nominal valve size	Stem diameter	Actuator area
NPS 1 to 2	0.39 inch 10 mm	175v2 to 750v2 cm ²
NPS 3	0.63 inch 16 mm	350 to 750v2 cm ²
NPS 4 to 6	0.63 inch 16 mm	350 to 1400-60 cm ²

Table 18: Class 600

Nominal valve size	Stem diameter	Actuator area
NPS 1	0.47 inch 12 mm	175v2 to 750v2 cm ²
NPS 1½ to 3	0.63 inch 16 mm	350 to 1400-60 cm ²
NPS 4	0.63 inch 16 mm	350 to 1400-120 cm ²
NPS 6	1.58 inch 40 mm	1000 to 2800 cm ²

Ordering text

The following specifications are required on ordering:

Type 3248 Valve	Globe or angle valve
Nominal size	NPS ...
Pressure rating	Class ...
Flow coefficients	C _v ...
Characteristic	Equal percentage or linear
Body material	See Table 2
Type of end connections	Welding ends or welding-neck ends on request
	Pipe dimensions
	Height
	Cover plate
Actuator	Type 3271 or Type 3277 (see Data Sheets ▶ T 8310-1, ▶ T 8310-2 and ▶ T 8310-3)
Actuator area	... cm ²
Bench range	... bar or psi
Fail-safe action	Actuator stem extends/retracts
RFID tag	Yes/No
Valve accessories	Positioner and/or limit switch

Associated Information Sheets ▶ T 8000-X

Associated Data Sheets for ▶ T 8310-1 to

Types 3271/3277 Pneumatic Actuators ▶ T 8310-3

Associated Mounting and Operating Instructions ▶ EB 8093-1