DATA SHEET

T 8093 EN

Series 240 · Type 3248 Cryogenic Valve

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

DIN version

Application

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

Nominal size	**DN 25 to 150**
Pressure rating	**PN 16 to 100**
Temperatures	**-273 to +65 °C**



Fig. 1: *Type 3248-7 · Steel globe valve with positioner and supply pressure regulator*



Fig. 2: *Type 3248-7 · Steel angle valve with positioner and supply pressure regulator*



Fig. 3: *Type 3248-7 · Aluminum 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 K_{VS} 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.

A safety manual containing the safety-related data is optionally available for use in safety-instrumented systems (SIL requirements).

Versions

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

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Edition April 2026

– **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 -196 to -273 °C
– Temperatures above 65 °C · On request
– Free of oil and grease for oxygen service
– Version for ultrapure gas
– Pipe jacketing for installation in vacuum-insulated plant components
– Pneumatic actuator with additional handwheel
– ANSI version of cryogenic valve (see Data Sheet ▶ T 8093-1)

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 the bellows nut (41) (see Mounting and Operating Instructions ▶ EB 8093).

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.

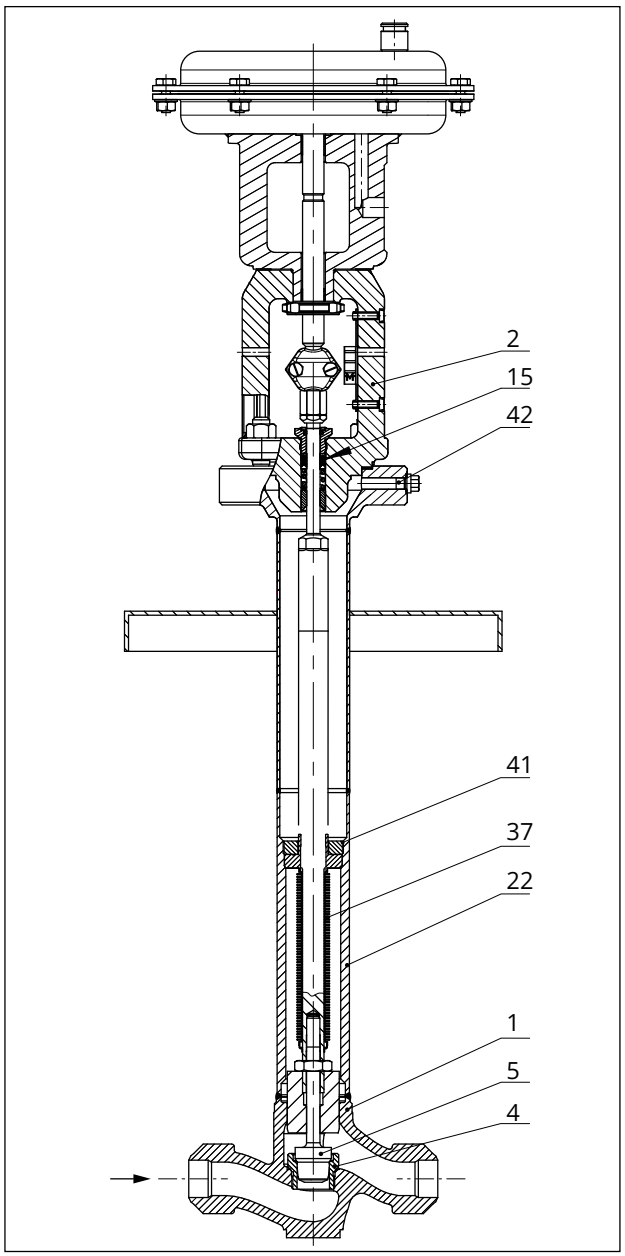


Fig. 4: *Type 3248-7 Globe Valve, PN 40/Class 150/300*

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

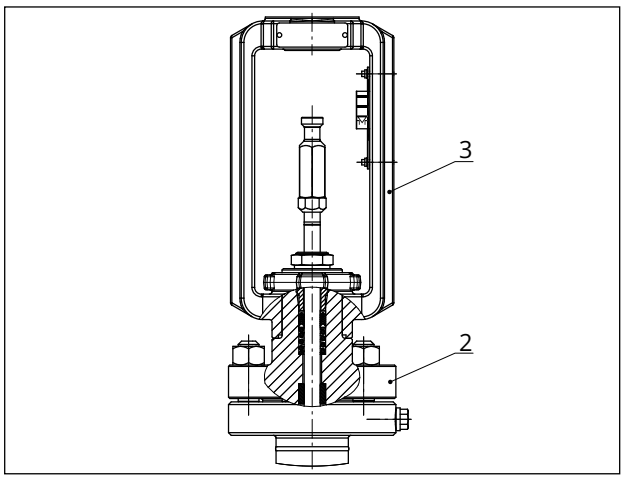


Fig. 5: *Bonnet and yoke for PN 100/Class 600*

2 Bonnet 3 Yoke

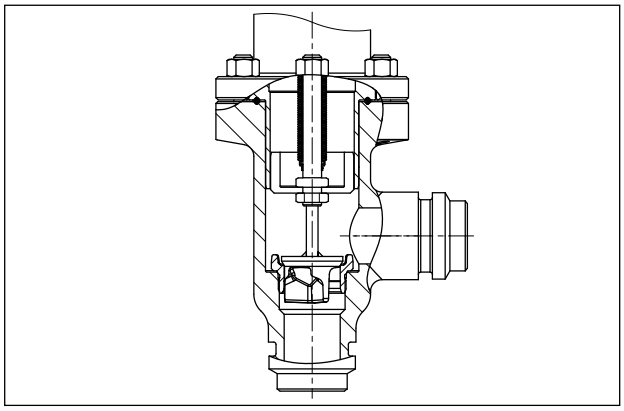


Fig. 6: *Type 3248 Angle Valve with aluminum body, PN 40*

Differential pressures

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

- Valves in PN 16 to 40 according to Tables 1.1 to 1.3
- PN 63 to 100 according to Tables 2.1 to 2.3

Table 1: *Technical data for Type 3248 · DIN version*

Body style	**Globe valve**	**Angle valve**	
Body material	**Steel**	**Steel**	**Aluminum**
Nominal size	DN 25 to 150	DN 25 to 150	DN 25 to 150
Pressure rating	PN 16 to 100	PN 16 to 100	PN 16 to 40
End connections for globe and angle valves	Welding ends acc. to DIN EN 12627	Welding ends acc. to DIN EN 12627	Welding ends acc. to ISO 9692-3
Seat-plug seal	Metal seal · Soft seal · High-performance metal seal		
Characteristic	Equal percentage or linear		
Rangeability	50:1 up to DN 50 30:1 with DN 80 to 150		
Temperature range	-196 to +65 °C · Down to -273 °C on request		
Leakage class according to DIN EN 60534-4	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 +85 °C.		
Conformity	CE EAC		

Table 2: *Materials for Type 3248 · DIN version*

Valve		**Globe valve**	**Angle valve**	
Valve body		1.4308	1.4308	EN AW-5083
Seat[1)]		CrNiMo steel	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®.

K_{VS} coefficients for Type 3248 Valve · DIN version

Table 3: *Overview*

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	mm	3	6	12	24	31	38	48	63	80	63	80	100	130
Travel	mm	15	15	15	15	15	15	15	15	15	30	30	30	30

Table 4: *Nominal sizes and associated K_{VS} coefficients*

K_{VS}	**0.1 0.16 0.25**	**0.4 0.63 1**	**1.6 2.5 4**	**6.3 10**	**16**	**25**	**40**	**60**	**80**	**63**	**100**	**160**	**260**
DN													
25	•	•	•	•									
40		•	•	•	•	•							
50		•	•	•	•	•	•						
80						•	•	•	•				
100										•	•	•	
150										•	•	•	•

i ***Note***

Height H7 is the minimum clearance for service work. The actuator dimensions and the height H3 (see Table 10) 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 5: *Type 3248 Globe Valve made of stainless steel, PN 16 to 40 · DIN version · Dimensions in mm · Weights in kg*

Valve	DN	25	40	50	80	100	150
L	mm	210	251	286	337	394	508
H1	mm	854	864	864	1052	1147.5	1188.5
H2	mm	44	71	71	93	111	174
H4[2)]	mm	600	600	600	700	800	800
H5	mm	708	714	714	824	933.5	974.5
H7	mm	1050	900	900	900	1100	1100
Ød	mm	282	282	282	282	282	282
Welding ends/pipe connection[2)]		Ø33.7x2.3	Ø48.3x2.6	Ø60.3x3.2	Ø88.9x4	Ø114.3x5	Ø168.3x5.6
Weight[1)] without actuator	kg	17	30	30	55	96	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.).

2) Deviating dimensions on request

Table 6: *Type 3248 Globe Valve made of stainless steel, PN 63 to 100 · DIN version · Dimensions in mm · Weights in kg*

Valve	DN	25	40	50	80	100	150
L	mm	210	251	286	337	394	508
H1	mm	822	817	817	832	984	1298
H2	mm	44	71	71	93	111	174
H4[2)]	mm	600	600	600	600	650	800
H5	mm	734	734	734	734	770	923
H7	mm	1050	900	900	900	1100	1100
Ød	mm	282	282	282	282	282	282
Welding ends/pipe connection[2)]		Ø33.7x3.2	Ø48.3x3.6	Ø60.3x4	Ø88.9x5.6	Ø114.3x6.3	Ø168.3x7.1
Weight[1)] without actuator	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.).

2) Deviating dimensions on request

Table 7: *Type 3248 Angle Valve in stainless steel version with aluminum body, PN 16 to 40[2] · DIN version · Dimensions in mm · Weights in kg*

Valve	DN	25	40	50	80	100	150
L	mm	98	133	133	159	184	236
H1	mm	825	827	827	1035	1120	1149
H4	mm	600	600	600	700	800	800
H5	mm	679	677	677	807	906	935
H7	mm	1050	900	900	900	1100	1100
Ød	mm	282	282	282	282	282	282
Welding ends/pipe connection		Ø35x3.5	Ø50x4	Ø60x4	Ø89x5	Ø114x6	Ø162x8
Weight[1] without actuator	kg	19	31	31	51	95	115

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.).

2) Higher pressure ratings on request

Table 8: *Type 3248 Angle Valve made of stainless steel, PN 16 to 40 · DIN version · Dimensions in mm · Weights in kg*

Valve	DN	25	40	50	80	100	150
L	mm	98	133	133	159	184	236
H1	mm	830	845	845	1017	1108	1101
H4	mm	600	600	600	650	750	750
H5	mm	684	695	695	788	893	887
H7	mm	1050	900	900	900	1100	1100
Ød	mm	282	282	282	282	282	282
Welding ends/pipe connection		Ø33.7x2.3	Ø48.3x2.6	Ø60.3x3.2	Ø88.9x4	Ø114.3x5	Ø168.3x5.6
Weight[1] without actuator	kg	16.5	27	27	57	98	127

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 9: *Type 3248 Angle Valve made of stainless steel, PN 63 to 100 · DIN version · Dimensions in mm · Weights in kg*

Valve	DN	25	40	50	80	100	150
L	mm	98	133	133	159	184	236
H1	mm	998	998	998	995.5	1043	1260
H4[2]	mm	600	600	600	600	600	600
H5[2]	mm	710	715	715	698	745	699
H7	mm	1050	900	900	900	1100	1100
Ød	mm	282	282	282	282	282	282
Welding ends/pipe connection		Ø33.7x3.2	Ø48.3x3.6	Ø60.3x4	Ø88.9x5.6	Ø114.3x6.3	Ø168.3x7.1
Weight[1] without actuator	kg	18	31	31	61	107	186

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.).

2) Different overall height possible

Table 10: *Further dimensions[1] in combination with Type 3271 Pneumatic Actuator or Type 3277 Pneumatic Actuator*

Actuator area		cm²	175v2	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800
Diaphragm ØD		mm	215	280	280	280	394	462	530	534	770
H[2]	Type 3271	mm	78	82	92	131	236	403	337	598	713
H[2]	Type 3277	mm	78	82	82	121	236	–	–	–	–
H3[3]		mm	110	110	110	110	190	610	610	650	650
H5	Type 3277	mm	101	101	101	101	101	–	–	–	–

Actuator area		cm²	175v2	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800
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 11: *Weights[1)] for Type 3271 and Type 3277 Pneumatic Actuators*

Type ... Actuator	Actuator area in cm²		175v2	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800
3271	Without handwheel	kg	6	8	11.5	15	36	80	70	175	450
3271	With handwheel	kg	10	13	16.5	20	41	180	175	300[2)]/ 425[3)]	575[2)]/ 700[3)]
3277	Without handwheel	kg	10	12	15	19	40	–	–	–	–
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

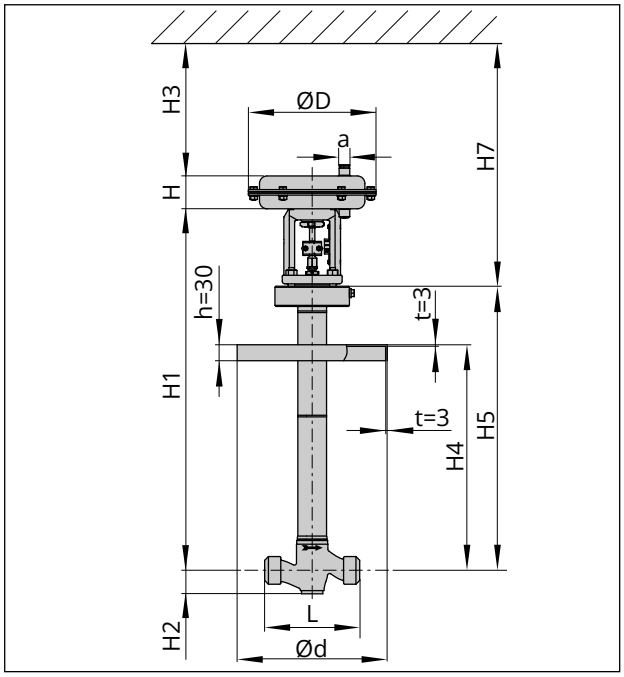


Fig. 7: *Type 3248-1 Globe Valve with stainless steel body*

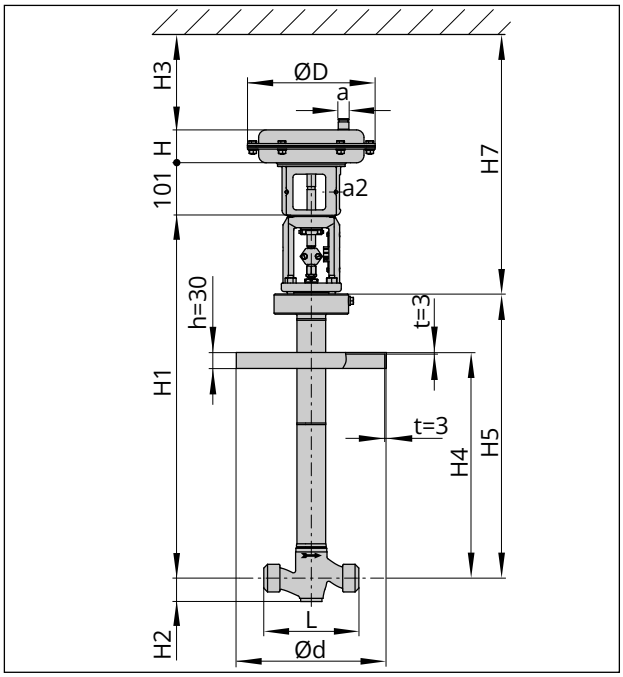


Fig. 8: *Type 3248-7 Globe Valve with stainless steel body*

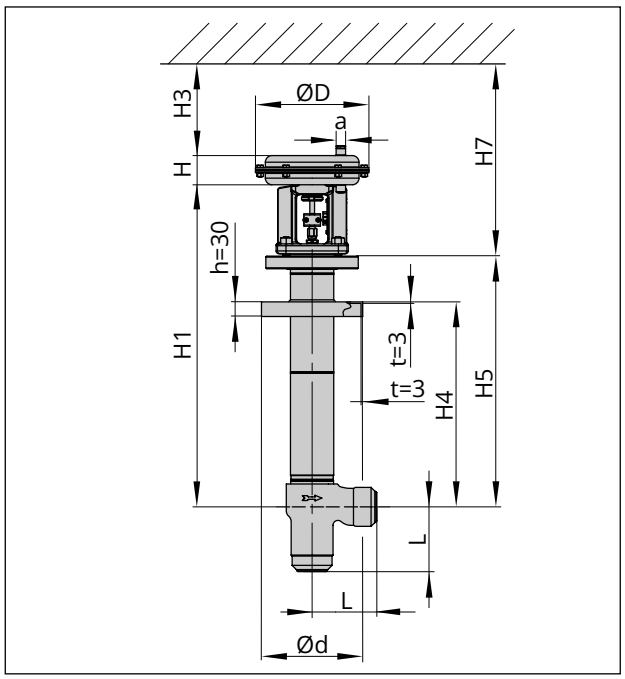


Fig. 9: *Type 3248#1 Angle Valve with stainless steel body*

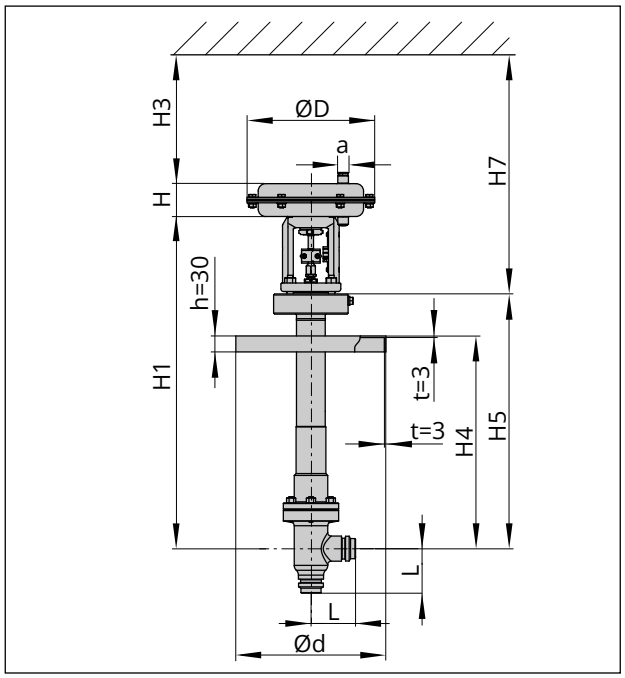


Fig. 10: *Type 3248-1 Angle Valve with stainless steel body*

Valve/actuator assignment

Table 12: *PN 16 to 40*

Nominal valve size	Stem diameter	Actuator area
DN 25 to 50	10 mm	175v2 to 750v2 cm²
DN 80	16 mm	350 to 750v2 cm²
DN 100 to 150	16 mm	350 to 1400-60 cm²

Table 13: *PN 63 to 100*

Nominal valve size	Stem diameter	Actuator area
DN 25	12 mm	175v2 to 750v2 cm²
DN 40 to 80	16 mm	350 to 1400-60 cm²
DN 100	16 mm	350 to 1400-120 cm²
DN 150	40 mm	1000 to 2800 cm²

Ordering text

The following specifications are required on ordering:

Type 3248 Valve	Globe or angle valve
Nominal size	DN ...
Pressure rating	PN ...
Flow coefficients	K_{VS} ...
Characteristic	Equal percentage or linear
Body material	See Table 2
Type of end connections	Welding ends or welding-neck ends 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
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 Types 3271/3277 Pneumatic Actuators	▶ T 8310-1 to ▶ T 8310-3
Associated Mounting and Operating Instructions	▶ EB 8093