DATA SHEET

T 8065 EN

Series 250 · Type 3256-1 and Type 3256-7 Pneumatic Control Valves

Type 3256 Angle Valve

DIN version

Application

Control valve for process engineering applications with high industrial requirements

Nominal size	**DN 15 to 300**
Pressure rating	**PN 16 to 400**
Temperatures	**-196 to +550 °C**



Fig. 1: *Type 3256-1 Control Valve with Type 3271 Pneumatic Actuator, positioner and solenoid valve*

Special features

Type 3256 Angle Valve with

- Type 3271 Pneumatic Actuator (Type 3256-1 Control Valve)
- Type 3277 Pneumatic Actuator (Type 3256-7 Control Valve) for integral positioner attachment

Valve body made of

- Cast steel
- Cast stainless steel, high-temperature cast steel or cast cold-resisting steel
- Special materials

Low-noise valve plug

- Metal seal
- Soft seal up to PN 40
- 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[1)] and NAMUR Recommendation (see Information Sheet ▶ T 8350).

[1)] Accessories required. See associated actuator documentation.

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

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Versions

Operating temperature (medium temperature) with PTFE packing for temperatures from -10 to +220 °C or with adjustable high-temperature packing for -10 to +350 °C, nominal sizes DN 15 to 500, pressure rating PN 16 to 400 (see Table 1)

- **Type 3256-1** (Fig. 1) • Type 3256 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)
- **Type 3256-7** • Type 3256 Valve and Type 3277 Actuator with 350 to 750v2 cm² actuator area for integral positioner attachment (see Data Sheet ▶ T 8310-1)

Further versions

- **Welding or welding-neck ends** according to DIN EN 12627
- **Flow divider** or **AC-1/AC-3 trim** for noise reduction · See Data Sheets ▶ T 8081, ▶ T 8082 and ▶ T 8083
- **Valve plug with pressure balancing** · See Table 4 to Table 7
- **Perforated plug** · See Data Sheet ▶ T 8086
- **Ceramic or carbide metal internal parts** · See Data Sheet ▶ T 8071
- **Special version for flashing service**
- **Insulating section or bellows seal** · See Technical data
- **Heating jacket** · On request
- **Additional handwheel** · See Data Sheet ▶ T 8310-1
- **ANSI version** · NPS ½ to 20, Class 150 to 2500, see Data Sheet ▶ T 8066
- Type 3256 Control 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)
- **Type 3256-2 Electric Control Valve** · Details on request

Principle of operation

A seat and plug with plug stem are installed in the valve. The plug stem is connected to the actuator stem by the stem connector clamps and is sealed by a packing.

The medium flows through the valve in the direction indicated by the arrow. A rise in signal pressure causes the force acting on the diaphragm in the actuator to increase. The springs are compressed. Depending on the selected direction of action, the actuator stem retracts or extends. As a result, the position of the plug in the seat changes and determines the flow rate through the valve and the pressure p_2 with it.

The version with bellows seal (see Fig. 3) is fitted with a test connection to monitor the stainless steel bellows.

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

Pressure balancing must be used when high pressures or differential pressures act on the plug (see Fig. 4).

Fig. 2 to Fig. 4 show configuration examples:

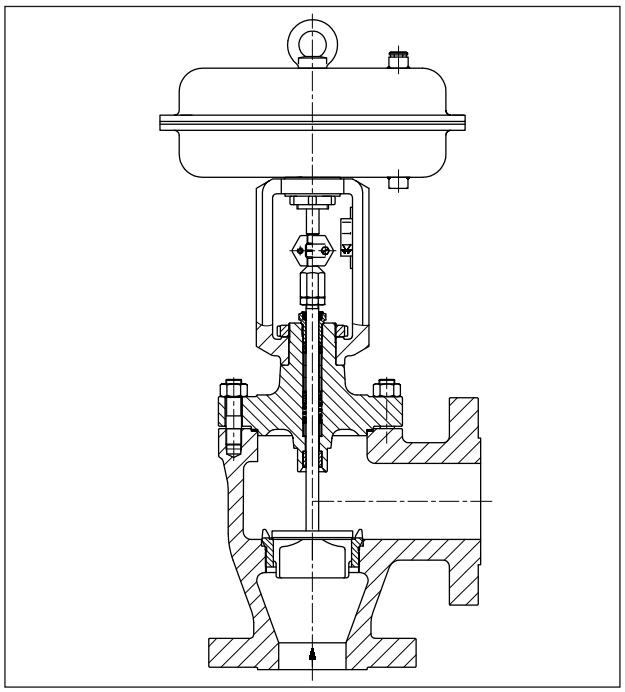


Fig. 2: *Type 3256-1 Control Valve with Type 3271 Actuator*

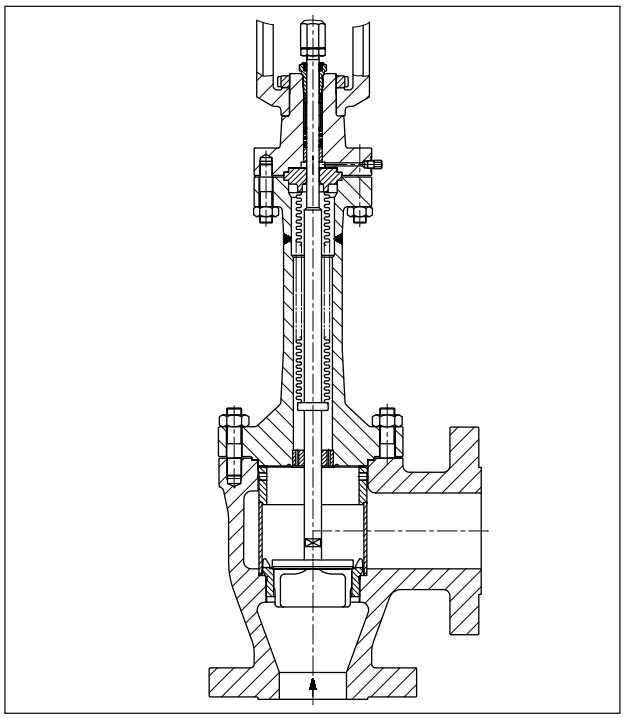


Fig. 3: *Type 3256 Valve with bellows seal and flow divider ST 1*

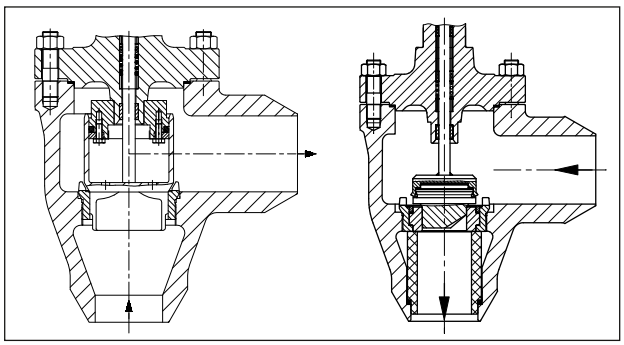


Fig. 4: *Left: Type 3256 Valve with balanced valve plug*
Right: Type 3256 Valve with ceramic trim and ceramic anti-wear pipe

Differential pressures

See Information Sheet ▶ T 8000-4 for permissible differential pressures.

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 3256 · DIN version*

Material			**Cast steel 1.0619**		**Cast steel 1.7357**		**Cast stainless steel 1.4408**	
Nominal size[1]		DN	15 to 150	200 to 300	15 to 150	200 to 300	15 to 150	200 to 300
Pressure rating[1]		PN	16 to 400	16 to 100	16 to 400	16 to 100	16 to 400	16 to 100
Type of end connections		Flanges	All DIN EN versions					
		Welding ends	DIN EN 12627					
Seat-plug seal			Metal seal · Soft seal · High-performance metal seal					
Characteristic			Equal percentage · Linear · On/off (▶ T 8000-3)					
Rangeability			50:1					
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					
Temperature ranges in °C · Permissible operating pressures according to pressure-temperature diagram (see Information Sheet ▶ T 8000-2)								
Body without insulating section			-10 to +220 · Up to +350 with high-temperature packing					
Body with insulating section or bellows seal			-10 to +400[3]		-10 to +500		-196 to +550	
Valve plug[2]	Standard	Metal seal	-196 to +550					
		Soft seal	-196 to +220					
	Balanced with PTFE ring		-50 to +220[3]					
	Balanced with graphite ring		200 to 500[4]					
Leakage class according to DIN EN 60534-4								
Valve plug	Standard	Metal seal	Standard: IV · High-performance metal seal: V					
		Soft seal	VI					
	Balanced, metal seal		With PTFE ring (standard): IV · High-performance metal seal: V					
			With graphite ring: IV					

1) DN 400 and 500 on request; up to PN 400 on request

2) Only in combination with suitable body material

3) Lower temperatures on request

4) Higher temperatures on request

Table 2: *Materials for Type 3256 · DIN version*

Standard version Body[1]		**Cast steel 1.0619**	**Cast steel 1.7357**	**Cast stainless steel 1.4408**
Valve bonnet		1.0460/1.0619	1.7335/1.7357	1.4408/1.4401
Seat and plug[2]	Metal seal	1.4006/1.4008	1.4006/1.4008	1.4404/1.4409
Seal ring for	Soft seal	PTFE with 15 % glass fiber		
	Pressure balancing	PTFE with carbon · Graphite		
Guide bushing		1.4112		2.4610
Packing[3]		V-ring packing: PTFE with carbon; spring: 1.4310 or high-temperature packing		
Body gasket		Graphite seal on metal core		
Insulating section		1.0460/1.0619	1.7335/1.7357	1.4408/1.4401

Standard version Body[1]	Cast steel 1.0619	Cast steel 1.7357	Cast stainless steel 1.4408
Bellows seal[5]			
Intermediate piece	1.0460/1.0619	1.7335/1.7357	1.4408/1.4401
Metal bellows		1.4571[4]	
Heating jacket		1.4404	

1) Other materials (e.g. for high-temperatures or low temperatures) as well as special materials for applications with seawater · 1.4538, duplex 1.4470, nickel-based alloy 9.4610 · See pressure-temperature diagrams in Information Sheet ▶ T 8000-2

2) Seats and metal-seated plug also with Stellite® facing or plug made of solid Stellite® available (up to max. K_{VS} 630)

3) Other packings on request (▶ T 8000-6)

4) Other bellows material on request

5) Bellows with both >DN 200 and >PN 100 on request

K_{VS} coefficients

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

Table 3: *Overview with flow divider ST 1 (K_{VS}-1), ST 2 (K_{VS}-2) or ST 3 (K_{VS}-3)*

K_{VS}	0.1 0.16 0.25 0.4	0.63	1.0	1.6	2.5	4	6.3	10	16	25	40	63	100	160	250	360	630	1000	1500
K_{VS}-1	–			1.45	2.2	3.6	5.7	9	14.5	22	36	57	90	144	225	320	560	900	1350
K_{VS}-2	–					3.2	5	8	13	20	32	50	80	125	200	290	500	800	1200
K_{VS}-3	–					3	4.8	7.5	12	20	30	47	75	120	190	270	480	750	1100
Seat Ø in mm	6			12		24			31	38	50	63	80	100	125	150	200	250	300
Travel in mm	15										30				60			120	

Table 4: *Versions without flow divider · PN 16 to 400*

K_{VS}	0.1 0.16 0.25 0.4	0.63	1.0	1.6	2.5	4	6.3	10	16	25	40	63	100	160	250	360	630	1000	1500
DN																			
15	•	•	•	•	•	•													
25	•	•	•	•	•	•	•	•											
40	•	•	•	•	•	•	•	•	•	•									
50						•	•	•	•	•	•								
80						•	•	•	•	•	•	•	•[1]						
100										•	•	•	•[1]	•[1]					
150												•	•	•[1]	•[1]	•[1]			
200													•	•	•[1][2]	•[1]	•[1]		
250													•	•	•[1][2]	•[1]	•[1]	•[1]	
300														•	•[1][2]	•[1]	•[1]	•[1]	•[1]

1) Version also available with balanced plug

2) Pressure balancing only for ≥ PN 63

Table 5: *Versions with flow divider ST 1 (K_{VS}-1) · PN 16 to 160*[3)]

K_{VS}-1	–			1.45	2.2	3.6	5.7	9	14.5	22	36	57	90	144	225	320	560	900	1350
DN																			
15				•	•	•													
25				•	•	•	•	•											
40				•	•	•	•	•	•	•									
50						•	•	•	•	•	•								
80						•	•	•	•	•	•	•	•[1)]						
100										•	•	•	•[1)]	•[1)]					
150												•	•	•[1)]	•[1)]	•[1)]			
200													•	•	•[1)2)]	•[1)]	•[1)]		
250													•	•	•[1)2)]	•[1)]	•[1)]	•[1)]	
300														•	•[1)2)]	•[1)]	•[1)]	•[1)]	•[1)]

1) Version also available with balanced plug

2) Pressure balancing only for ≥ PN 63

3) PN 250 to 400 with flow divider ST 1 and pressure balancing on request

Table 6: *Versions with flow divider ST 2 (K_{VS}-2) · PN 16 to 160*[3)]

K_{VS}-2	–			3.2	5.0	8	13	20	32	50	80	125	200	290	500	800	1200
DN																	
50				•	•	•	•	•	•								
80				•	•	•	•	•	•	•	•[1)]						
100								•	•	•	•[1)]	•[1)]					
150										•	•	•[1)]	•[1)]	•[1)]			
200											•	•	•[1)2)]	•[1)]	•[1)]		
250											•	•	•[1)2)]	•[1)]	•[1)]	•[1)]	
300												•	•[1)2)]	•[1)]	•[1)]	•[1)]	•[1)]

1) Version also available with balanced plug

2) Pressure balancing only for ≥ PN 63

3) PN 250 to 400 with flow divider ST 2 and pressure balancing on request

Table 7: *Versions with flow divider ST 3 (K_{VS}-3) · PN 16 to 160*[4)]

K_{VS}-3	–			3	4.8	7.5	12	20	30	47	75	120	190	270	480	750	–
DN																	
50				•[4)]	•[4)]	•[4)]											
80				•[4)]	•[4)]	•[4)]	•[4)]	•[4)]	•								
100								•[4)]	•	•							
150										•	•	•[1)]	•[1)]				
200											•	•	•[1)2)]	•[1)]			
250											•	•	•[1)2)]	•[1)]	•[1)]		
300												•	•[1)2)]	•[1)]	•[1)]	•[1)]	

1) Version also available with balanced plug

2) Pressure balancing only for ≥ PN 63

3) Version not possible with bellows seal

4) PN 250 to 400 with flow divider ST 3 and pressure balancing on request

Dimensions

Specifications in mm

Table 8: *Type 3256 Valve · DIN version*

Valve	DN	15	25	40	50	80	100	150	200	250	300
Length L (flanges and welding ends)	PN 10 to 40	90	100	115	125	155	175	225	275	*)	*)
	PN 63 to 160	105	115	130	150	190	215	275	325	*)	*)
	PN 250	115	130	150	175	225	260	350	400	*)	*)
	PN 320	115	130	150	175	225	260	350	400	*)	*)
	PN 400	127[1)]	150[1)]	189[1)]	222[1)]	285[1)]	333[1)]	454[1)]	*)	*)	*)
H8 for actuator	350 cm²	240	240	240	240	240	240	–	–	–	–
	350v2 cm²	240	240	240	240	240	240	418	–	–	–
	355v2 cm²	240	240	240	240	240	240	418	418	–	–
	750v2 cm²	240	240	240	240	240	240	418	418	418	–
	1000 cm²	–	–	–	295	295	295	418	418	418	–
	1400-60 cm²	–	–	–	295	295	295	418	418	*)	*)
	1400-120 cm²	–	–	–	480	480	480	503	503	503[2)]	650
	2800 cm²	–	–	–	480	480	480	503	503	503[2)]	650
	2 x 2800 cm²	–	–	–	480	480	480	503	503	503[2)]	650
With standard bonnet											
H4	PN 10 to 160	134	129	129	175	160	170	210	*)	*)	*)
	PN 250 to 400	175	170	170	221	242	296	371	547	*)	*)
With insulating section											
H4	PN 10 to 160	335	330	331	445	430	440	560	*)	*)	*)
	PN 250 to 400	370	366	366	486	500	546	717	*)	*)	*)
With bellows seal											
	Travel										
H4	15 to 120	PN 10 to 40	343	338	339	566	561	541	606	904	*)	*)
	120	PN 63 to 160	–	–	–	–	–	–	–	–	*)	*)
	15 to 60	PN 63 to 160	343	338	339	566	561	541	739	*)	*)	*)
		PN 250 to 320	621	617	610	524	500	611	*)	–	–	–
		PN 400	621	617	610	*)	*)	*)	*)	–	–	–

*) On request

1) Face-to-face dimensions acc. to SAMSON standard

2) H8 = 650 mm with 250 mm seat bore

Table 9: *Further dimensions[1)] in combination with Type 3271 Pneumatic Actuator or Type 3277 Pneumatic Actuator*

Actuator area		cm²	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800	2x 2800
Diaphragm ØD		mm	280	280	280	394	462	530	534	770	770
H[2)]	Type 3271	mm	82	92	131	236	403	337	598	713	1213
H[2)]	Type 3277	mm	82	82	121	236	–	–	–	–	–
H3[3)]		mm	110	110	110	190	610	610	650	650	650
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	–	–	–	–	–

Actuator area		cm²	350	350v2	355v2	750v2	1000	1400-60	1400-120	2800	2x 2800
a	Type 3271		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)	G 1 (1 NPT)
a2	Type 3277		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

Dimensional drawings

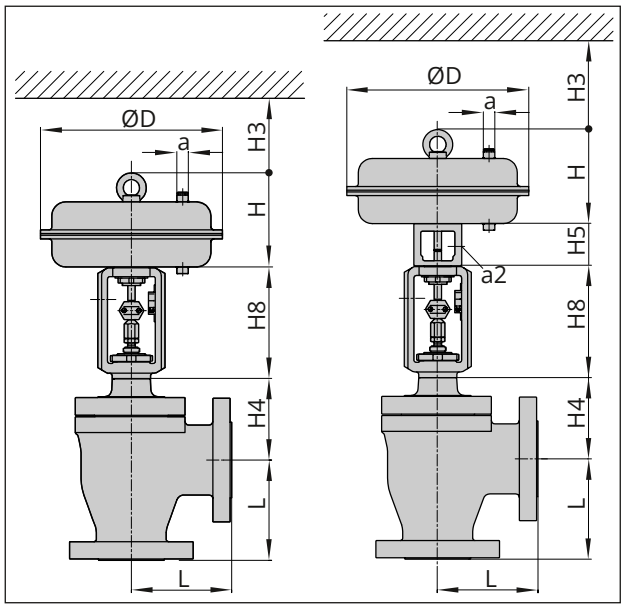


Fig. 5: *Left: Type 3256-1 · Right: Type 3256-7*

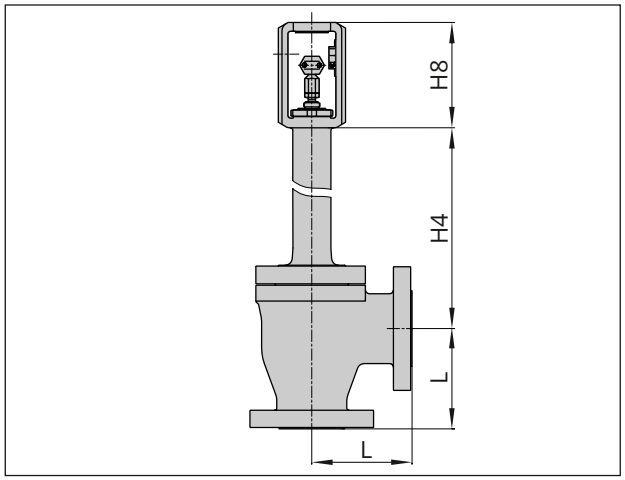


Fig. 6: *Type 3256 with bellows seal or insulating section*

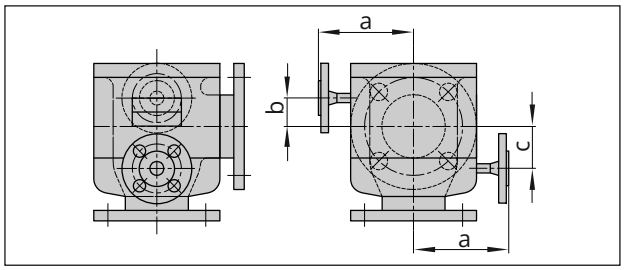


Fig. 7: *Type 3256 with heating jacket · Dimensions on request*

Weights

Specifications in kg

Table 10: *Type 3256 Valve · DIN version*

Valve			DN	15	25	40	50	80	100	150	200	250	300
With standard bonnet													
Weight[1] without actuator	PN 16 to 40	Approx.		12	15	22	35	58	75	190	420	*)	*)
	PN 63 to 160	Approx.		20	25	33	58	92	125	300	*)	*)	*)
	PN 250 to 400	Approx.		*)	*)	*)	*)	*)	*)	*)	–	–	–
With insulating section													
Weight[1] without actuator	PN 16 to 40	Approx.		18	21	28	45	68	85	200	*)	*)	*)
	PN 63 to 160	Approx.		26	31	39	68	102	135	315	*)	*)	*)
	PN 250 to 400	Approx.		*)	*)	*)	*)	*)	*)	*)	*)	*)	*)
With bellows seal													
Weight[1] without actuator	PN 16 to 40	Approx.		18	21	28	45	68	85	200	*)	*)	*)
	PN 63 to 160	Approx.		26	31	39	68	102	135	315	*)	*)	*)
	PN 250 to 400	Approx.		*)	*)	*)	*)	*)	*)	*)	–	–	–

*) On request

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: *Weights[1] for Type 3271 and Type 3277 Pneumatic Actuators*

Type ... Actuator	Actuator area in cm²		350	350v2	355v2	750v2	1000	1400-60	1400-120	2800	2x 2800
3271	Without handwheel	kg	8	11.5	15	36	80	70	175	450	950
3271	With handwheel	kg	13	16.5	20	41	180	175	300[2]/ 425[3]	575[2]/ 700[3]	*)
3277	Without handwheel	kg	12	15	19	40	–	–	–	–	–
3277	With handwheel	kg	17	20	24	45	–	–	–	–	–

*) On request

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 K_{VS} coefficient according to DIN EN 60534-1.
2. Select nominal size DN and K_{VS} coefficient from Table 3 and from Table 4 to Table 7.
3. Determine the permissible differential pressure Δp from the pressure-temperature diagrams in Information Sheet ▶ T 8000-4.
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:

Type	3256
Nominal size	DN …
Pressure rating	PN …
Body material	See Table 2
Bonnet	Standard bonnet, insulating section or bellows seal
Type of end connections	Flanges or welding ends
Plug	Standard or balanced Soft seal, metal seal or high-performance metal seal
Characteristic	Equal percentage, 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	Actuator stem extends/retracts
Process medium	Density in kg/m³ and temperature in °C
Flow coefficients	in kg/h or m³/h in standard or operating state
Pressure	p_1 and p_2 in bar (absolute pressure p_{abs}), with minimum, normal and maximum flow rate
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 8065

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