Type 3271 Pneumatic Actuators
1000, 1400-120, 2800 and 2x 2800 cm²

Application

Linear actuators particularly suitable for attachment to SAMSON Series 240, 250, 280 and 290 Valves

Actuator area	**1000 to 2800 cm²**
Travel	**Up to 160 mm**

The Type 3271 Pneumatic Actuators are diaphragm actuators with rolling diaphragm and internal compression springs.

Special features

- Powerful thrust at high stroking speed
- Low friction
- Various bench ranges by varying the number of springs or their compression
- No special tools required to change the bench range or reverse the direction of action (also tandem actuator and version with handwheel)
- Permissible operating temperatures from –60 to +90 °C
- Female thread on the top diaphragm case

Versions

– **Type 3271 · Pneumatic actuator** (Fig. 1 and Fig. 2), 1000, 1400-120 and 2800 cm² actuator areas

– **Type 3271 · Pneumatic tandem actuator** (Fig. 3), 2 x 2800 cm² actuator area

– **Type 3271 · Actuator with travel stop** (Fig. 4), minimum and maximum travel mechanically adjustable with 1000 cm² actuators with 60 mm travel, 1400 cm² with 120 mm travel and 2800 cm² actuators as well as with tandem actuators with 2 x 2800 cm²

Further versions

– **Type 3273 Side-mounted Handwheel** · See Data Sheet ▶ T 8312

– **Versions for other control media** (e.g. water) available on request.

Fig. 1: *Type 3271 (1000 cm²)*

Fig. 2: *Type 3271 (2800 cm²)*

Fig. 3: *Type 3271 Tandem Actuator (2 x 2800 cm²)*

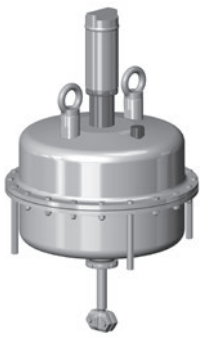

Fig. 4: *Type 3271 (2800 cm²) with travel stop*

Associated Information Sheet	**T 8300**
Information Sheet for control valves	**T 8000-1**
Data Sheet for actuators ≤750 cm²	**T 8310-1**

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Data Sheet **T 8310-2/7 EN**

Principle of operation

The signal pressure p_{st} creates the force $F = p_{st} \cdot A$ at the diaphragm surface A which is opposed by the springs (10) in the actuator. The bench range is determined by the number of springs used and their compression, taking into account the rated travel. The travel H is proportional to the signal pressure p_{st}. The direction of action of the actuator stem (7) depends on how the springs are installed in the actuator.

The stem connector (26) connects the actuator stem (7) with the plug stem of the valve.

The adjustable **mechanical travel stop** (Fig. 9) is suitable for actuators with 1000, 1400-120 and 2800 cm² actuator areas as well as tandem actuators. Using the travel stop, the actuator travel can be limited by up to 50 % in both directions (actuator stem extends or retracts) and permanently adjusted.

The tandem actuator (Fig. 7) contains two coupled diaphragms; they produce a positioning force that is twice as high as the force of a single actuator.

Direction of action

Actuators are available with the following directions of action:

- **Actuator stem extends (FA):** the springs cause the actuator stem to move to the lower end position when the diaphragm is relieved of pressure or when the supply air fails.
- **Actuator stem retracts (FE):** the springs cause the actuator stem to retract when the diaphragm is relieved of pressure or when the supply air fails.

Throttling or on/off service

The Type 3271 Pneumatic Actuators are designed for a maximum supply pressure of 6 bar when used for throttling service.

In on/off service and special actuators for throttling service, the supply pressure must be limited.

For the direction of action "actuator stem retracts (FE)", the permissible supply pressure must not exceed the upper bench range value by more than 3 bar:

Signal pressure range	Fail-safe action	Max. supply pressure
0.2 to 1.0 bar	Actuator stem retracts	4 bar
0.4 to 2.0 bar		5 bar
0.6 to 3.0 bar		6 bar

With the direction of action "actuator stem extends" and travel stop, the supply pressure must not exceed the upper bench range value by more than 1.5 bar.

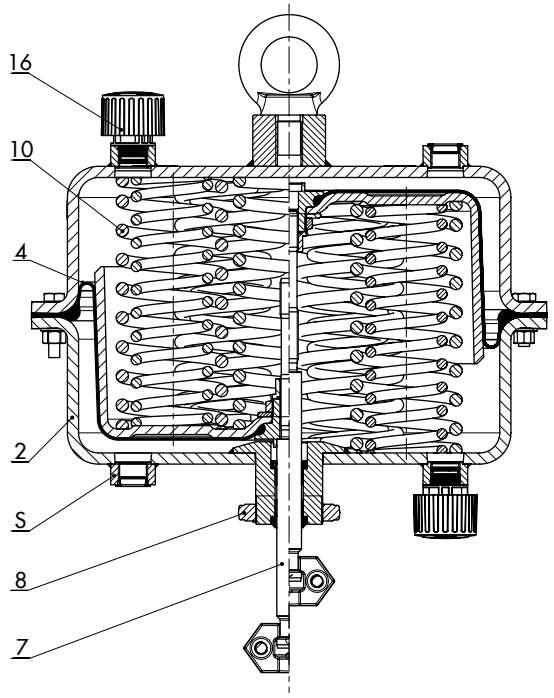


Fig. 5: *Type 3271 with 1000 cm² actuator area*

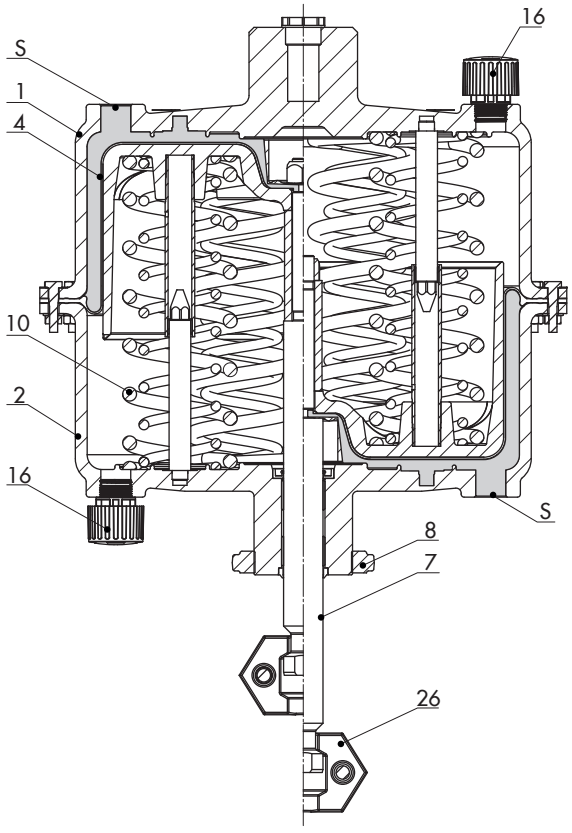
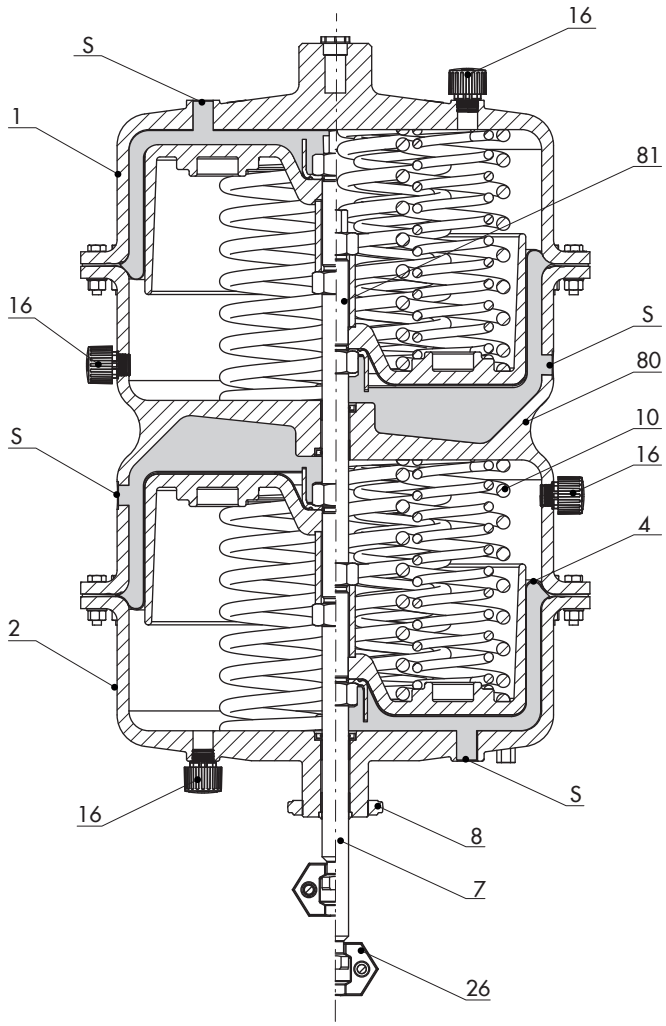


Fig. 6: *Type 3271, 1400-120 cm² with female thread on the top diaphragm case*



Legend for Fig. 5 to Fig. 7

1	Top diaphragm case
2	Bottom diaphragm case
4	Diaphragm
7	Actuator stem
8	Ring nut
10	Springs
16	Vent plug
80	Diaphragm case (tandem actuator)
81	Actuator stem
S	Signal pressure connection

Fig. 7: *Tandem actuator with 2 x 2800 cm² actuator area with female thread on the top diaphragm case*

Table 1: *Technical data*

Table 1.1: *Type 3271 Pneumatic Actuator*

Version **cm²**	**1000**	**1400-120**	**2800**	**2 x 2800**
Max. supply pressure	6 bar [1]			
Permissible ambient temperatures	Diaphragm material NBR: –35 to +90 °C [2] [3]			
	Diaphragm material PVMQ: –60 to +90 °C [3]			
Compliance	EAC			
Materials				
Actuator stem	1.4548.4	1.4404	1.4548.4	
Actuator stem sealing	NBR	NBR		
	EPDM	PVMQ		
Housing and associated ambient temperature	1.0982 S460 MC Sheet steel, painted ≥–60 °C	EN-JS1030 (GGG-40) [4] Spheroidal graphite iron Max. 100 °C		
		1.5638/A352 LC3 Painted cast steel ≥–60 °C		

1) Observe supply air restrictions.
2) In on/off service, lowest temperature restricted to –20 °C
3) Install vent plug (▶ AB 07) for temperatures below –20 °C.
4) Not with diaphragm material PVMQ

Table 1.2: *Versions*

Implementation	**1000 cm²**	**1400-120 cm²**	**2800 cm²**	**2 x 2800 cm²**
Mechanical travel stops on both sides	•	•	•	•
Additional handwheel, 50 kN	•	–	–	–
Additional handwheel, 80 kN	•	• [1]	• [1] (max. 3 bar)	–
Additional handwheel, 150 kN	–	•	•	•
Throttling or on/off service	•	•	•	•

1) Max. 60 mm

Table 2: *Bench ranges for 1000, 1400 and 2800 cm² pneumatic actuators*

All pressures in bar (gauge) · Pretensioned springs cannot be used with the direction of action "actuator stem retracts" for Series 240, 250 and 280 Valves.

Actuator type	Actuator area in cm²	Rated travel in mm	Travel volume at rated travel in dm³	Dead volume in dm³	Max. travel in mm [1]	Bench range in bar (Signal pressure range at rated travel)	Add. possible spring compression in %	Operating range with spring compression in bar	No. of springs	Spring force at 0 mm travel in kN [2]	Spring force at rated travel in kN [2]	Thrust in kN [2] at rated travel and supply pressure in bar of					
												1.4	2.0	3.0	4.0	5.0	6.0
Type 3271	1000	60	6.4	6.1	80	0.4 to 2.0	25	0.8 to 2.4	6	4	20	–		10	20	30	–
						0.6 to 3.0		1.2 to 3.6	9	6	30	–		–	10	20	30
						0.8 to 2.8		1.3 to 3.3	9	8	28	–		2.0	12	22	–
						1.0 to 3.2 [*]		1.5 to 3.7	10	10	32	–		–	8	18	28
[*] With fail-safe action "actuator stem extends" only																	
Type 3271	1400	120	16.6	4.7	130	0.4 to 1.2	0 [3]	–	3	5.6	16.8	2.8	11.2	25.2	39.2	53.2	67.2
						0.8 to 2.4			6	11.2	33.6	–	–	8.4	22.4	36.4	50.4
						1.0 to 3.0			9	14	42			–	14	28	42
						1.2 to 3.6			12	16.8	50.4				5.6	19.6	33.6
Type 3271	2800	120	33	16.5	160	0.2 to 1.0	25	0.4 to 1.2	3	5.6	28	11.2	28	56	84	112	140
						0.4 to 2.0		0.8 to 2.4	6	11.2	56	–		28	56	84	112
						0.5 to 2.5		1.0 to 3.0	9	14	70	–		14	42	70	98
						0.6 to 3.0		1.2 to 3.6	12	16.8	84	–			28	56	84
						0.8 to 1.7	25	1.0 to 1.9	6	22.4	47.6	–	8.4	36.4	64.4	92.4	120.4
						0.9 to 2.2		1.2 to 2.5	9	25.2	61.6	–		22.4	50.4	78.4	106.4
						1.0 to 2.7		1.4 to 3.1	12	28.0	75.6	–		8.4	36.4	64.4	92.4
						1.1 to 2.3	25	1.4 to 2.6	6	30.8	64.4	–		19.6	47.6	75.6	104
						1.2 to 2.8		1.6 to 3.2	9	33.6	78.4	–		5.6	33.6	61.6	89.6
						1.3 to 3.3		1.8 to 3.8	12	36.4	92.4	–			19.6	47.6	75.6
Type 3271	2 x 2800	120	66	33	160	0.2 to 1.0	25	0.4 to 1.2	6	11.2	56	22.4	56	112	168	224	280
						0.4 to 2.0		0.8 to 2.4	12	22.4	112	–		56	112	168	224
						0.5 to 2.5		1.0 to 3.0	18	28	140	–		28	84	140	196
						0.6 to 3.0		1.2 to 3.6	24	33.6	168	–			56	112	168
						0.8 to 1.7	25	1.0 to 1.9	12	44.8	95.2	–	16.8	74.8	128.8	184.8	240.8
						0.9 to 2.2		1.2 to 2.5	18	50.4	123.2	–		44.8	100.8	156.8	212.8
						1.0 to 2.7		1.4 to 3.1	24	56.0	151.2	–		16.8	72.8	128.8	184.8
						1.1 to 2.3	25	1.4 to 2.6	12	61.6	128.8	–		39.2	95.2	151.2	208
						1.2 to 2.8		1.6 to 3.2	18	67.2	156.8	–		11.2	67.2	123.2	179.2
						1.3 to 3.3		1.8 to 3.8	24	72.8	184.8	–			39.2	95.2	151.2

1) Based on lower bench range value, not taking zero travel (to unseat the plug) into account (see Table 3).
2) The forces specified relate to the bench range.
3) The springs are already preloaded.

Table 3: *Dimensions and weights for versions without handwheel*

Actuator	**Type**	**3271**			
	Refer to	Fig. 1 · Fig. 8	Fig. 10	Fig. 2 · Fig. 10	Fig. 3 · Fig. 11
Actuator area	cm^2	**1000**	**1400-120**	**2800**	**2 x 2800**
Height	H	313	470	585	1085
	$H4_{rated}FA$	165	285	315	
	$H4_{max}FA$	169	288	325	
	$H4_{max}FE$	185	315	355	
	H6	54	85	85	
	H7 [1]	90	128	128	
Travel limitation	H8	220	500	500	
Diameter	ØD	462	534	770	
	ØD2	22	40	40	
Ød (thread)		M60x1.5	M100x2	M100x2	
Pneumatic connection (optional)	a	G ¾/¾ NPT	G 1/1 NPT	G 1/1 NPT	
	a2	–		–	
Weight [kg]					
Without handwheel		80	175	450	950

[1] Height of eyebolt according to DIN 580. Height of the swivel lifting hook may differ.

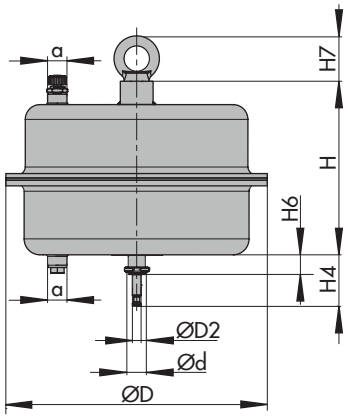


Fig. 8: *Type 3271, 1000 cm²*

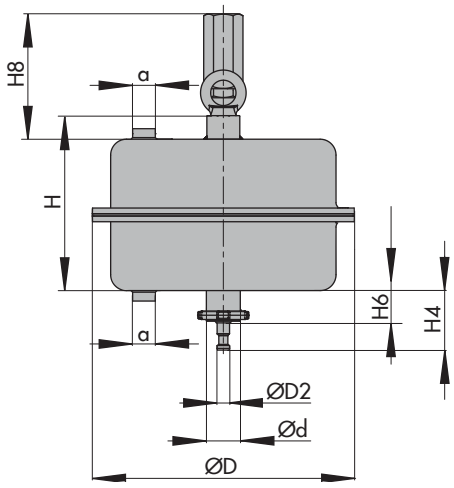


Fig. 9: *Type 3271, 1000 cm² with mechanical travel stop*

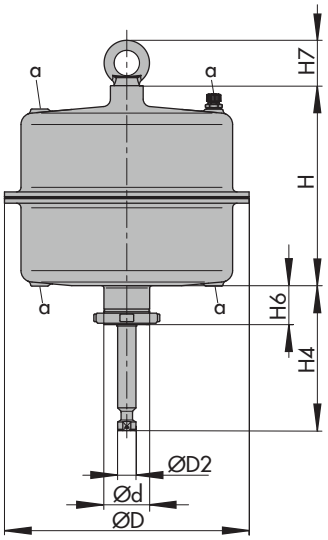


Fig. 10: *Type 3271, 1400-120 cm²*

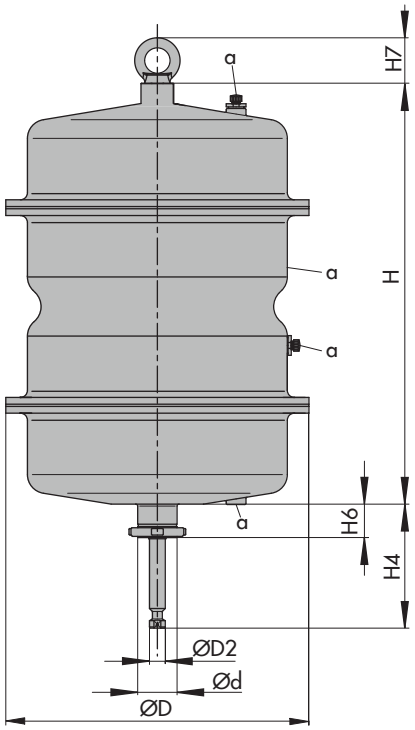


Fig. 11: *Type 3271 as tandem actuator*

Accessories

The pneumatic actuators with 1000, 1400-120, 2800 und 2 x 2800 cm² actuator area have a female thread on the top diaphragm case to allow an eyebolt or swivel lifting hook to be screwed into it. The eyebolt can be used to vertically lift the actuator and is included in the scope of delivery. The swivel lifting hook is designed for setting a control valve assembly upright or for lifting the actuator without valve. The swivel lifting hook can be ordered (accessories).

Actuator area	Item no.	
	Ring bolt (DIN 580)	Swivel lifting hook
1000 cm²	8325-0135	8442-1018
1400-120 cm² 2800 cm² 2x 2800 cm²	8325-1101	8442-1019

Ordering text

Actuator	Type 3271
Actuator area	… cm²
Travel	… mm
Optional	Travel limitation Tandem actuator
Signal pressure range	... bar
Direction of action	Actuator stem extends (FA) Actuator stem retracts (FE)
Signal pressure connection	G .../... NPT
Rolling diaphragm	NBR/PVQM/EPDM (1000 cm² only)

List of documentation

Device type	Actuator area in cm²	Data sheet	Mounting and operating instructions
Types 3271 and 3277 Pneumatic Actuators	120	▶ T 8310-1/4/5/6	▶ EB 8310-1
	240 · 350 · 700		▶ EB 8310-6
	175v2 · 350v2 · 750v2		▶ EB 8310-5
	355v2		▶ EB 8310-4
Type 3271 Pneumatic Actuator	1000	Included in this data sheet	▶ EB 8310-2
	1400-120 · 2800 · 2 x 2800		▶ EB 8310-7
	1400-60	▶ T 8310-3	▶ EB 8310-3
	1400-250	▶ T 8310-8	▶ EB 8310-8

Specifications subject to change without notice

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