

T 8310-2/7 EN

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

Type 3271

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

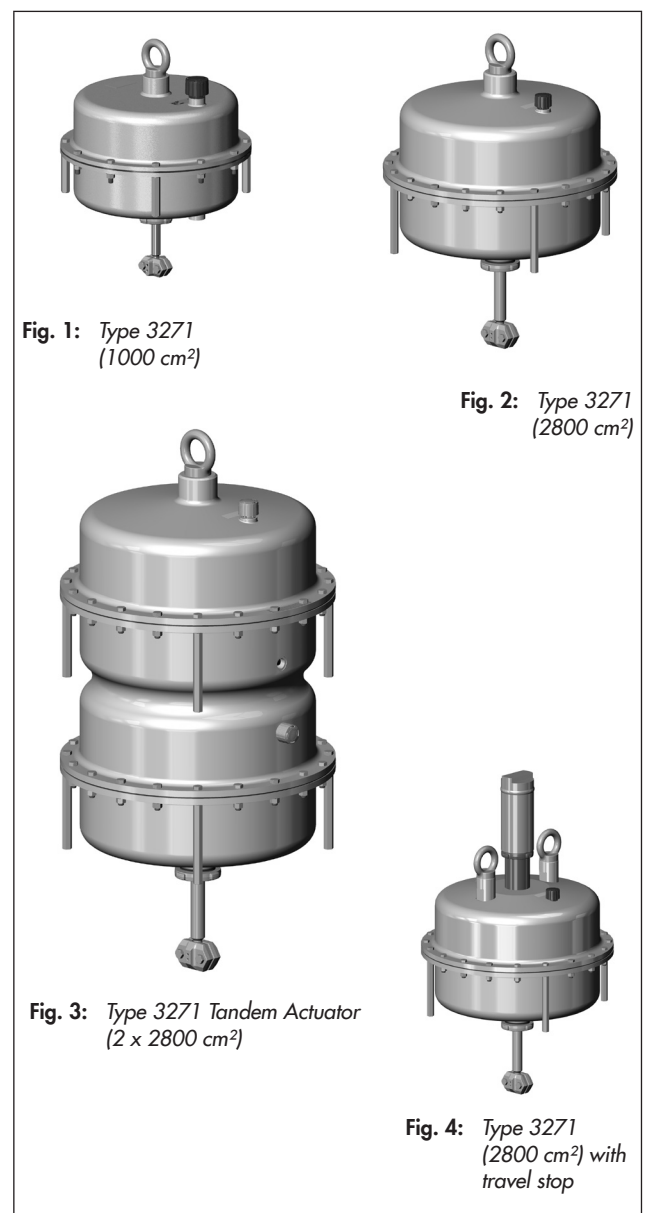
- Powerful thrust at high stroking speed
- Low friction
- Various bench ranges by varying the number of springs or their compression
- No special tools required to change the bench range or reverse the direction of action (also tandem actuator and version with handwheel)
- Permissible operating temperatures 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.



Principle of operation

The signal pressure p_{st} creates the force $F = p_{st} \times A$ at the diaphragm surface A (4) 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.

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.

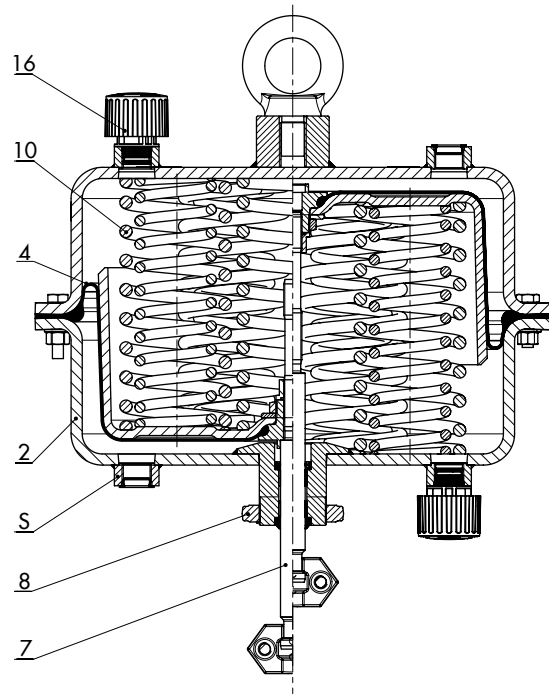


Fig. 5: Type 3271 with 1000 cm² actuator area

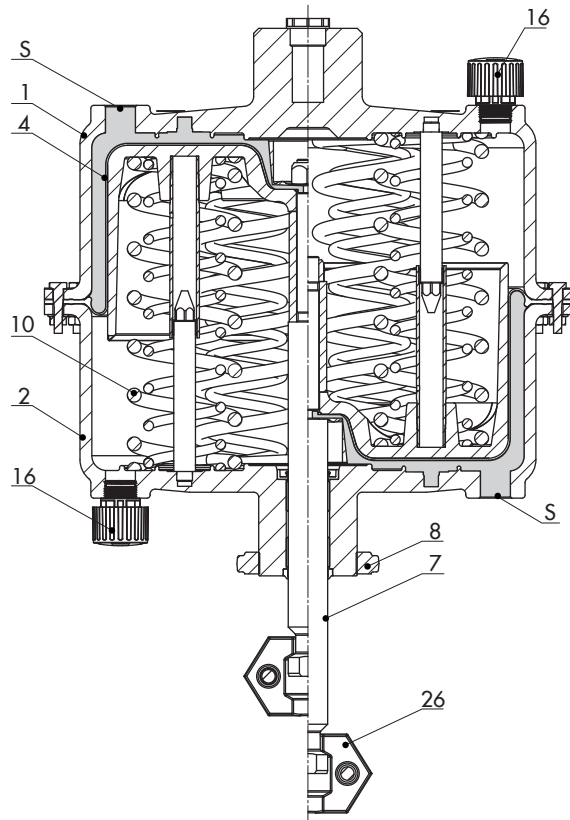


Fig. 6: Type 3271, 1400-120 cm² with female thread on the top diaphragm case

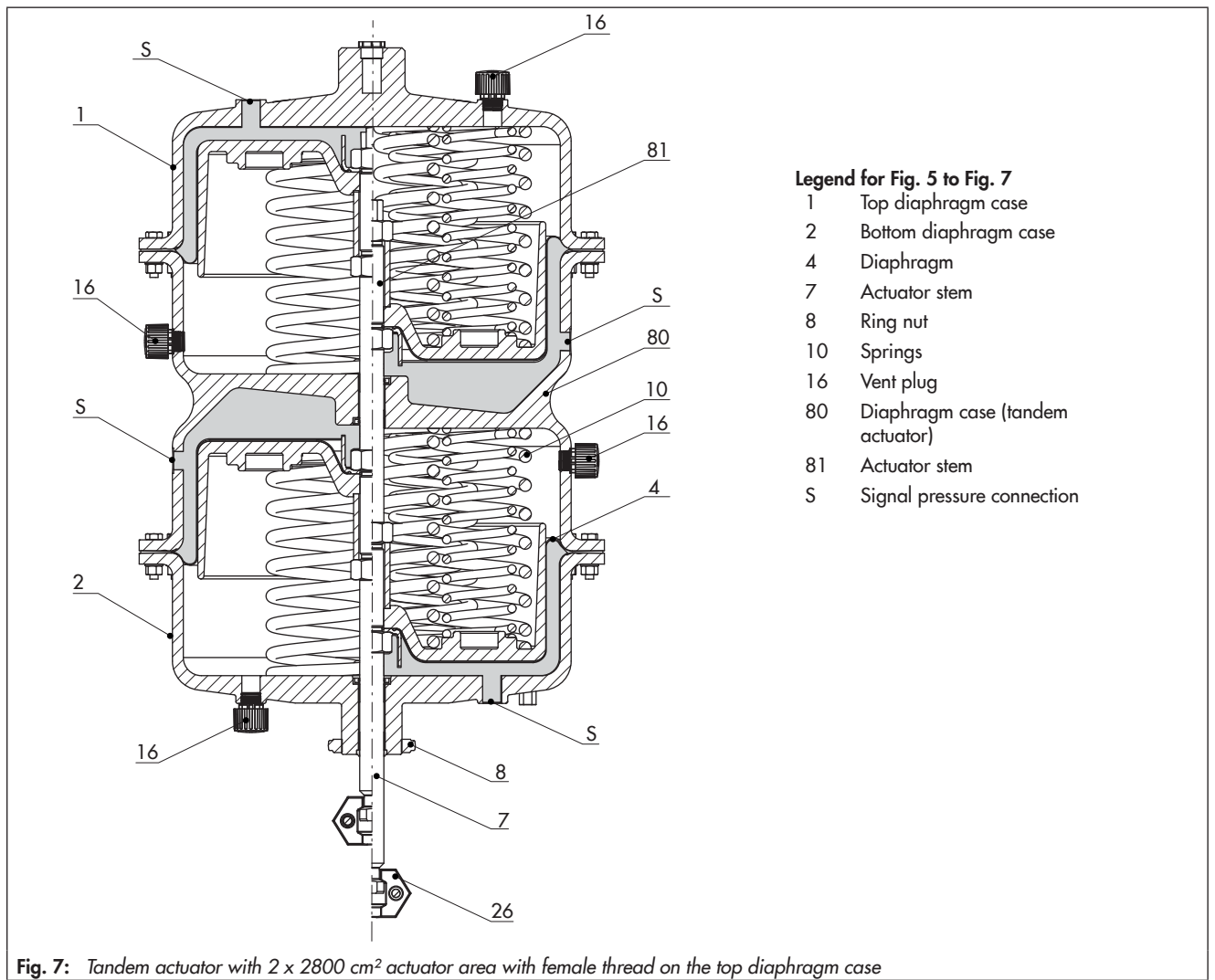


Table 1: Technical data**Table 1.1: Type 3271 Pneumatic Actuator**

Version	cm ²	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⁾			
Degree of protection		IP 54 ⁵⁾			
Materials					
Actuator stem		Stainless steel			
Actuator stem sealing		NBR	NBR		
		EPDM	PVMQ		
Housing and associated ambient temperature	1.0982 S460 MC Sheet steel, painted ≥ -60 °C	EN-GJS-400-18-LT ⁴⁾ -20 to +90 °C ⁶⁾			
		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

5) The pneumatic actuators do not pose any risk in the sense of the protection requirements described in DIN EN 60529. The IP rating depends on the connecting parts used on the pressurized side and the spring chamber side of the actuator. In this case, components (air vents as well as valves accessories, such as solenoid valves, positioners etc.) must be used that comply with the requirements. The maximum rating that can be achieved with the standard air vent is IP 54 ▶ AB 07. Depending on the IP rating of the valve accessories, a maximum rating of IP 66 can be achieved for an actuator with air purging of the actuator spring chamber.

6) Lower temperatures on request

Table 1.2: Versions

Version	1000 cm ²	1400-120 cm ²	2800 cm ²	2 x 2800 cm ²
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 cm ²	Rated travel in mm	Travel volume at rated travel in dm ³	Dead volume in dm ³	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	12	22	-	
						1.0 to 3.2 ¹⁾		1.5 to 3.7	10	10	32	-	-	8	18	28	
						1.5 to 4.2 ¹⁾		2.1 to 4.8	13	15	42	-	-	-	8	18	
¹⁾ 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		6	11.2	56	-	-	28	56	84	112	
						0.5 to 2.5		9	14	70	-	-	14	42	70	98	
						0.6 to 3.0		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		9	25.2	61.6	-	-	22.4	50.4	78.4	106.4	
						1.0 to 2.7		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		9	33.6	78.4	-	-	5.6	33.6	61.6	89.6	
						1.3 to 3.3		12	36.4	92.4	-	-	-	19.6	47.6	75.6	
Type 3271	2x 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		12	22.4	112	-	-	56	112	168	224	
						0.5 to 2.5		18	28	140	-	-	28	84	140	196	
						0.6 to 3.0		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		18	50.4	123.2	-	-	44.8	100.8	156.8	212.8	
						1.0 to 2.7		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		18	67.2	156.8	-	-	11.2	67.2	123.2	179.2	
						1.3 to 3.3		24	72.8	184.8	-	-	-	39.2	95.2	151.2	

¹⁾ Based on lower bench range value. The zero travel is not taken 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			
		See	Fig. 1 · Fig. 8	Fig. 10	Fig. 2 · Fig. 10
Actuator area	cm ²	1000	1400-120	2800	2 x 2800
Height	H ¹⁾	313	–	–	–
	H'	267	470	585	1085
	H _a	19	–	–	–
	H _{4, rated} FA	165	285	–	315
	H _{4, max} FA	169	288	–	325
	H _{4, max} FE	185	315	–	355
	H ₆	54	85	–	85
	H ₇ ²⁾	90	128	–	128
Travel stop	H ₈	220	500	–	500
Diameter	∅D	462	534	–	770
	∅D ₂	22	40	–	40
∅d (thread)		M60x1.5	M100x2	–	M100x2
Pneumatic connection (optional)	a	G 3/4/3/4 NPT	G 1/1 NPT	–	G 1/1 NPT
	a ₂	–	–	–	–
Weight ³⁾ in kg					
Without handwheel		80	175	450	950

¹⁾ In versions in which the lifting eyelet is welded directly onto the housing or the design does not allow for a horizontal connecting surface on the housing, H' and H are identical. The value H' applies in this case.

²⁾ Height of eyebolt according to DIN 580. Height of the swivel hoist may differ.

³⁾ 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.).

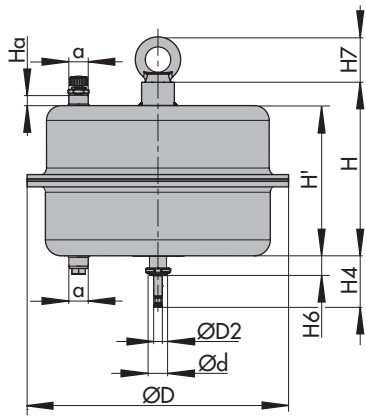


Fig. 8: Type 3271, 1000 cm²

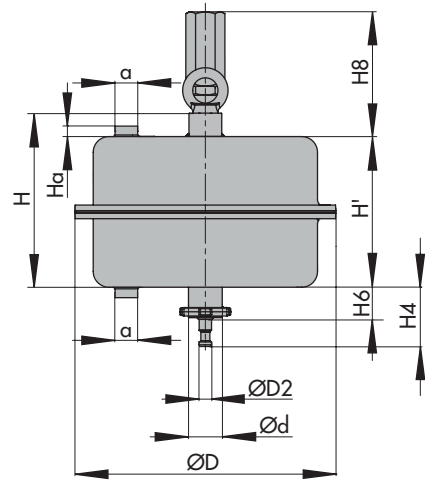


Fig. 9: Type 3271, 1000 cm² with mechanical travel stop

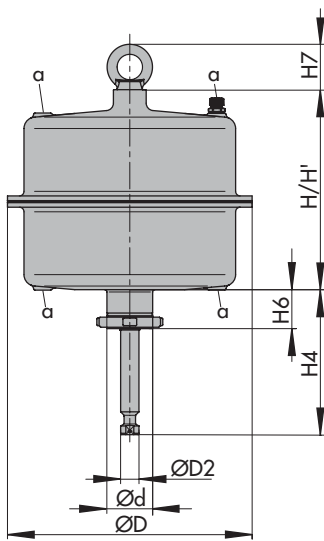


Fig. 10: Type 3271, 1400-120 cm²

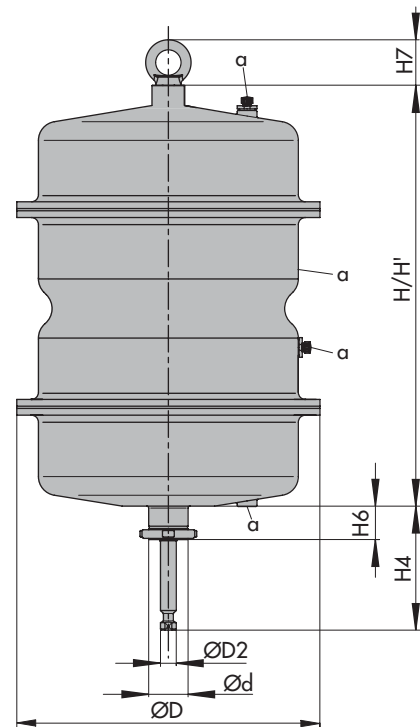


Fig. 11: Type 3271 as tandem actuator

Accessories

The pneumatic actuators with 1000, 1400-120, 2800 and 2 x 2800 cm² actuator area have a female thread on the top diaphragm case to allow an eyebolt or swivel hoist 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 hoist is designed for setting a control valve assembly upright or for lifting the actuator without valve. The swivel hoist can be ordered (accessories).

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

Ordering text

Actuator	Type 3271
Actuator area	... cm ²
Travel	... mm
Optional	Travel limitation Tandem actuator
Bench range	... bar
Direction of action	Actuator stem extends (FA) Actuator stem retracts (FE)
Signal pressure connection	G .../... NPT
Housing material	Refer to Table 1.1
Rolling diaphragm	NBR/PVQM

List of documentation for Type 3271 and Type 3277 Pneumatic Actuators

Device type	Actuator area in cm ²	Data sheet		Mounting and operating instructions
		General product line	SAM001 ¹⁾ product line	
Types 3271 and 3277 Pneumatic Actuators	120	Included in this data sheet	▶ T 8310-11/14/15/16	▶ EB 8310-1
	350			▶ EB 8310-6
	175v2 · 350v2 · 750v2			▶ EB 8310-5
	355v2			▶ EB 8310-4
Type 3271 Pneumatic Actuator	1000	▶ T 8310-2/7	▶ T 8310-12 –	▶ EB 8310-2
	1400-120 · 2800 · 2 x 2800			▶ EB 8310-7
	1400-60	▶ T 8310-3	▶ T 8310-13	▶ EB 8310-3
	1400-250	▶ T 8310-8	–	▶ EB 8310-8

¹⁾ The customer standard SAM001 indicates SAMSON devices that comply with the NAMUR Recommendation NE 53. After subscribing to the ▶ NE53 newsletter, users of these devices automatically receive information on any hardware or software changes. Separate data sheets have been created for Type 3271 and Type 3277 Pneumatic Actuators that comply to the SAM001 standard.