

# Type 3271 Pneumatic Actuators

## 1000, 1400-120, 2800 and 2x 2800 cm<sup>2</sup>



### Application

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

<b>Actuator area</b>	<b>1000 to 2800 cm<sup>2</sup></b>
<b>Travel</b>	<b>Up to 160 mm</b>

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

### Special features

- Powerful thrust at high response 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 to reverse the actuator action (also tandem actuator and version with handwheel)
- Permissible operating temperatures from -60 to +90 °C

### Versions

- **Type 3271 · Pneumatic actuator** (Fig. 1 and Fig. 2), 1000, 1400-120 and 2800 cm<sup>2</sup> actuator areas
- **Type 3271 · Pneumatic tandem actuator** (Fig. 3), 2 x 2800 cm<sup>2</sup> actuator area
- **Type 3271 · Actuator with travel stop** (Fig. 8), minimum and maximum travel mechanically adjustable with 1000 cm<sup>2</sup> actuators with 60 mm travel, 1400 cm<sup>2</sup> with 120 mm travel and 2800 cm<sup>2</sup> actuators as well as with tandem actuators with 2 x 2800 cm<sup>2</sup>

### Further versions

- **Type 3273 Side-mounted Handwheel** · See Data Sheet ▶ T 8312
- **Versions for other control media** (e.g. water) available on request.
- **Versions with female thread** on the top diaphragm case for actuators with 1400-120, 2800 and 2 x 2800 cm<sup>2</sup> actuator areas (only with special material 1.5638/A352 LC3)

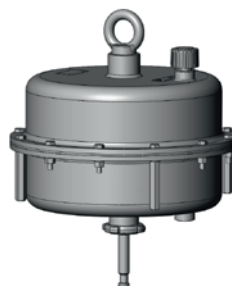


Fig. 1: Type 3271 (1000 cm<sup>2</sup>)

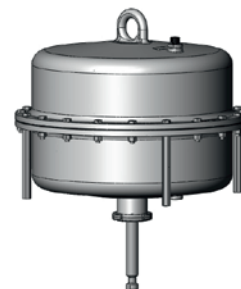


Fig. 2: Type 3271 (2800 cm<sup>2</sup>)

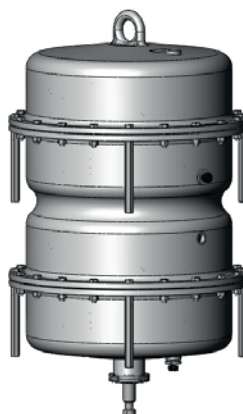


Fig. 3: Type 3271 (2 x 2800 cm<sup>2</sup>)

## Principle of operation

The signal pressure  $p_{st}$  creates the force  $F = p_{st} \cdot A$  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. 8) is suitable for actuators with 1000, 1400-120 and 2800 cm<sup>2</sup> 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. 6) 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:

Bench 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.

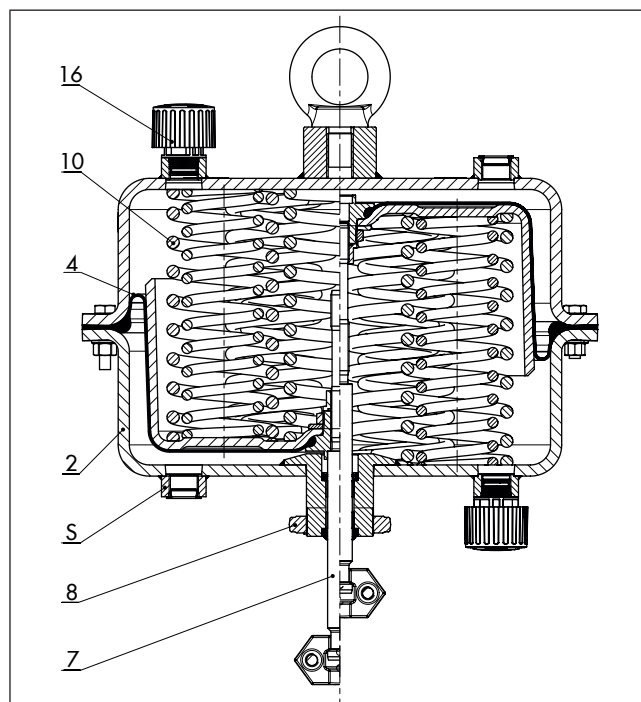


Fig. 4: Type 3271 with 1000 cm<sup>2</sup> actuator area

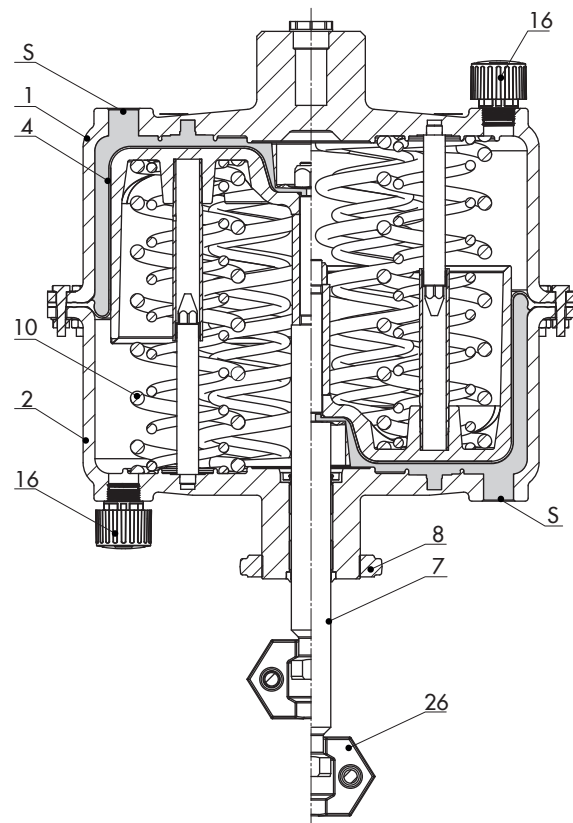
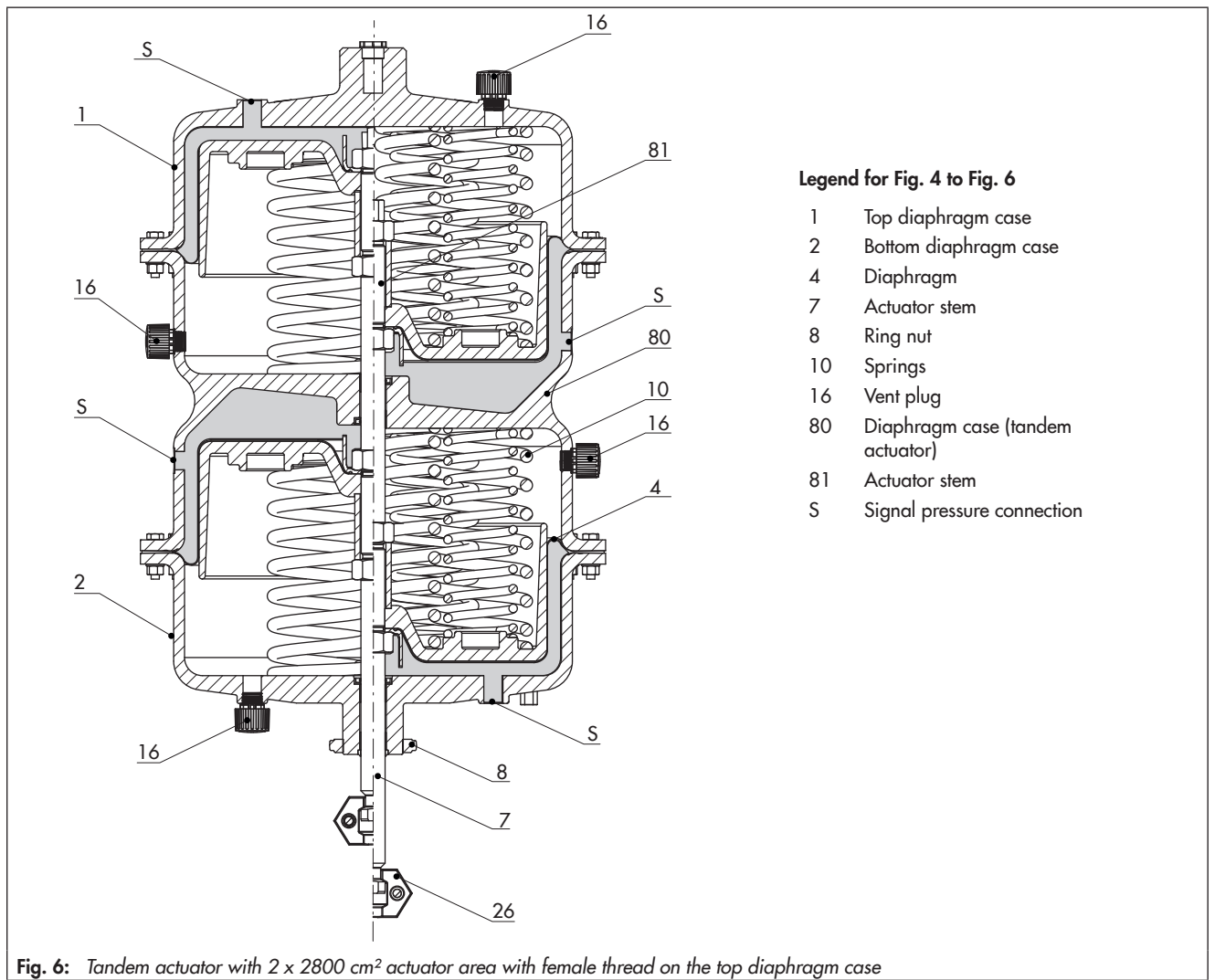


Fig. 5: Type 3271, 1400-120 cm<sup>2</sup> with female thread on the top diaphragm case



**Table 1: Technical data**

**Table 1.1: Type 3271 Pneumatic Actuator**

Version	cm <sup>2</sup>	1000	1400-120	2800	2 x 2800
Max. supply pressure		6 bar <sup>1)</sup>			
Permissible ambient temperatures		Diaphragm material NBR: -35 to +90 °C <sup>2) 3)</sup>			
		Diaphragm material PVMQ: -60 to +90 °C <sup>3)</sup>			
Compliance		<b>EAC</b>			
<b>Materials</b>					
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) <sup>4) 5)</sup> Spheroidal graphite iron Max. 100 °C			
		1.5638/A352 LC3 <sup>4)</sup> 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) The diaphragm case has either a welded-on lifting eyelet or female thread depending on the diaphragm case material.

5) Not with PVMQ diaphragm material.

**Table 1.2: Versions**

Version	1000 cm <sup>2</sup>	1400-120 cm <sup>2</sup>	2800 cm <sup>2</sup>	2 x 2800 cm <sup>2</sup>
Mechanical travel stops on both sides	•	•	•	•
Additional handwheel, 50 kN	•	-	-	-
Additional handwheel, 80 kN	•	• <sup>1)</sup>	• <sup>1)</sup> (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 cm<sup>2</sup> 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 [cm <sup>2</sup> ]	Rated travel [mm]	Travel volume at rated travel [dm <sup>3</sup> ]	Dead volume [dm <sup>3</sup> ]	Max. travel [mm] <sup>1)</sup>	Bench range [bar] (Signal pressure range at rated travel)	Add. possible spring compression [%]	Operating range with spring compression [bar]	No. of springs	Spring force at 0 mm travel [kN] <sup>2)</sup>	Spring force at rated travel [kN] <sup>2)</sup>	Thrust [kN] <sup>2)</sup> at rated travel and supply pressure [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 <sup>1)</sup>		1.5 to 3.7	10	10	32	-	-	8	18	28	
<sup>1)</sup> With fail-safe action "actuator stem extends" only																	
Type 3271	1400	120	16.6	4.7	130	0.4 to 1.2	0 <sup>3)</sup>	-	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	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		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			

<sup>1)</sup> Based on lower bench range value, not taking zero travel (to unseat the plug) into account (see Table 3).

<sup>2)</sup> The forces specified relate to the bench range.

<sup>3)</sup> The springs are already preloaded.

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

Actuator	Type	3271			
		See	Fig. 1 · Fig. 7	Fig. 9	Fig. 2 · Fig. 9
Actuator area	cm <sup>2</sup>	<b>1000</b>	<b>1400-120</b>	<b>2800</b>	<b>2 x 2800</b>
Height	H	313	380 <sup>1)</sup> /470 <sup>2)</sup>	520 <sup>1)</sup> /585 <sup>2)</sup>	1020 <sup>1)</sup> /1085 <sup>2)</sup>
	H4 <sub>rated</sub> FA	165	285	315	
	H4 <sub>max</sub> FA	169	288	325	
	H4 <sub>max</sub> FE	185	315	355	
	H6	54	85	85	
	H7 <sup>3)</sup>	90	110	110	
Travel limit	H8 <sup>4)</sup>	220	500	500	
Diameter	ØD	462	534	770	
	ØD2	22	40	40	
Ød (thread)		M60 x 1.5	M100 x 2	M100 x 2	
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 for version with welded-on lifting eyelet (material EN-JS1030)

2) Height for version with female thread (material 1.5638/A352 LC3)

3) Height with welded-on lifting eyelet or height of eyebolt according to DIN 580. Height of the swivel lifting hook may differ.

4) Travel stop on both sides (Fig. 8)

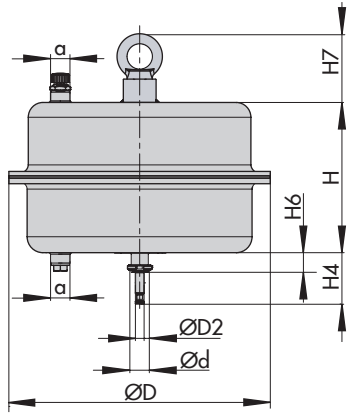


Fig. 7: Type 3271, 1000 cm<sup>2</sup>

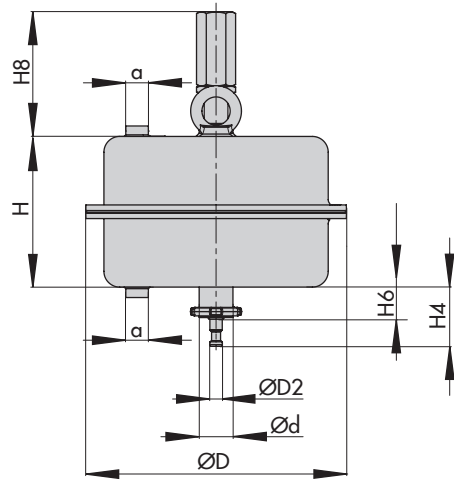


Fig. 8: Type 3271, 1000 cm<sup>2</sup> with mechanical travel stop

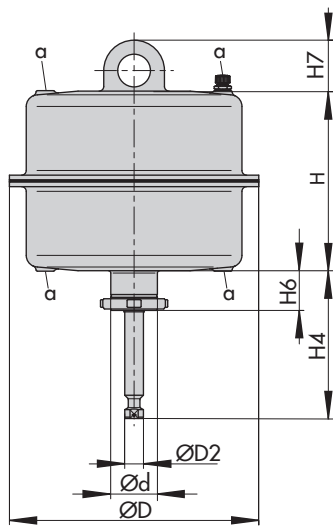


Fig. 9: Type 3271, 1400-120 cm<sup>2</sup>

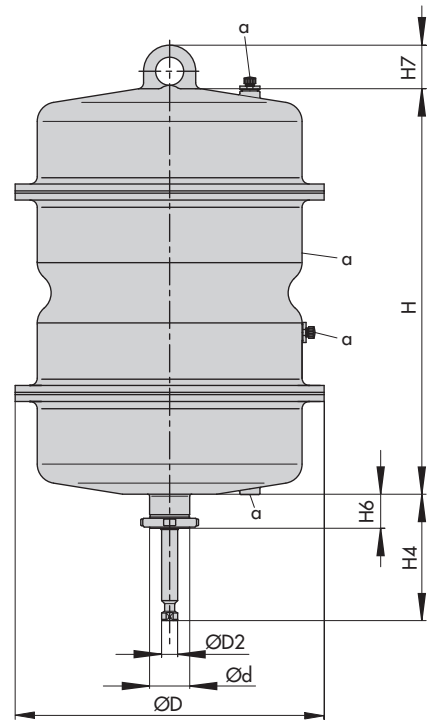


Fig. 10: Type 3271 as tandem actuator

## Accessories

The pneumatic actuators with 1400-120, 2800 and 2 x 2800 cm<sup>2</sup> actuator areas made of the special material 1.5638/A352 LC3 as well as all actuators with 1000 cm<sup>2</sup> 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 number	
	Ring bolt (DIN 580)	Swivel lifting hook
1000 cm <sup>2</sup>	8325-0135	8442-1018
1400-120 cm <sup>2</sup> 2800 cm <sup>2</sup> 2x 2800 cm <sup>2</sup>	8325-1101	8442-1019

The pneumatic actuators with 1400-120, 2800 and 2 x 2800 cm<sup>2</sup> actuator areas made of the standard material EN-JS1030 have a welded-on lifting eyelet which is only intended for lifting the actuator.

## Ordering text

Actuator	Type 3271
Actuator area	... cm <sup>2</sup>
Travel	... mm
Optional	Travel stop Tandem actuator
Bench range	... bar
Direction of action	Actuator stem extends (FA) Actuator stem retracts (FE)
Signal pressure connection	G .../... NPT
Rolling diaphragm	NBR/PVQM/EPDM (1000 cm <sup>2</sup> only)

## List of documentation

Device type	Actuator area [cm <sup>2</sup> ]	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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**T 8310-2/7 EN**