

Type 3271

Hand-operated Actuator Type 3273

Application

Linear actuator in particular for attachment to Series 240, 250 and 280 Control Valves

Diaphragm area 1400 to 2800 cm²

Travel Up to 160 mm

The Type 3271 Pneumatic Actuator is a diaphragm actuator with a rolling diaphragm and internal springs.

Special features

- Powerful thrust at high stroking speed
- Low friction
- Different bench ranges by varying the number of springs or their compression
- No special tools required to change the bench range and to reverse the actuator action (also for tandem actuator and version with handwheel)
- Permissible operating temperatures from -50 to +120 °C
- Type 3273 Hand-operated Actuator for travels up to 160 mm

Versions

- **Type 3271 · Pneumatic actuator** (Fig. 1), effective diaphragm areas of 1400 and 2800 cm²
- **Type 3271 · Pneumatic tandem actuator** (Fig. 2), effective diaphragm area of 2 x 2800 cm²
- **Type 3271 · Pneumatic actuator with Type 3273 Hand-operated Actuator** for travels up to 160 mm using side-mounted handwheel (Figs. 9 and 10), effective diaphragm areas of 1400 or 2800 cm²
- **Type 3271 · Actuator with travel stop** (Fig. 7), minimum or maximum travel mechanically adjustable for 1400 cm² actuators with 60 mm travel and 2800 cm² actuators as well as 2 x 2800 cm² tandem actuators

Further versions

- Versions for other control media (e.g. water)
- **Type 3273 · Hand-operated Actuator** without pneumatic actuator, operated using side-mounted handwheel for travels up to 80 mm · On request



Fig. 1 · Type 3271
(1400-120)



Fig. 2 · Type 3271 Tandem Actuator
with 2 x 2800 cm²

Principle of operation

The signal pressure p_{st} generates a force $F = p_{st} \times A$ on the diaphragm area A (2). This force is balanced by the actuator springs (4). Taking into account the rated travel, the bench range is determined by the number of springs and their compression. The travel H is proportional to the signal pressure p_{st} . The operating direction of the actuator stem (7) depends on the arrangement of the springs.

The stem connector (8) connects the actuator stem (7) with the plug stem (10) of the valve.

Fig. 9 shows the side-mounted **Type 3273 Hand-operated Actuator** for actuators with effective diaphragm areas of 1400 and 2800 cm² and a maximum **travel of up to 80 mm**. The handwheel (23) is fixed to the worm-gear shaft (20) and moves the actuator stem over the worm-gear wheel (21) and the threaded bushing (22).

A side-mounted handwheel as illustrated in Fig. 10 is available for valves with **120 mm travel**.

The adjustable **mechanical travel stop** (Fig. 7) is suitable for actuator version 1400-60 as well as 2800 cm² actuators and tandem actuators. 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. 4) contains two coupled diaphragms; they produce a positioning force that is twice as high as the force of a single actuator.

Actuators are available with the following fail-safe actions:

Actuator stem extends (FA)

The springs cause the actuator stem to move to the lower end position (sectional drawings, right) 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 (sectional drawings, left) when the diaphragm is relieved of pressure or when the supply air fails.

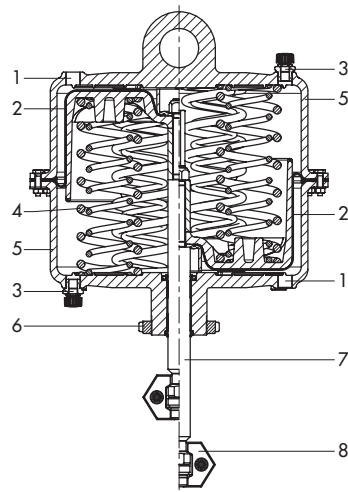


Fig. 3 · Type 3271, version 1400-120

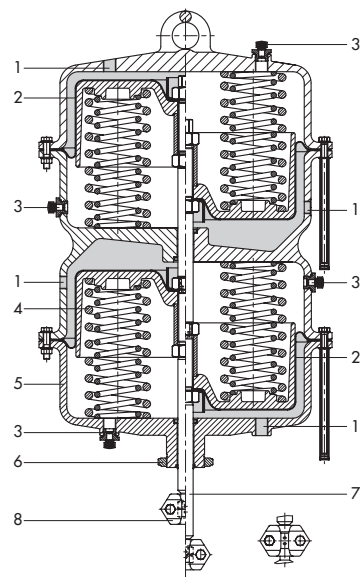


Fig. 4 · Tandem actuator with 2 x 2800 cm²

Legend

- | | |
|------------------------------|---------------------|
| 1 Signal pressure connection | 20 Worm-gear shaft |
| 2 Diaphragm | 21 Worm-gear wheel |
| 3 Vent | 22 Threaded bushing |
| 4 Springs | 23 Handwheel |
| 5 Diaphragm cases | |
| 6 Annular nut | |
| 7 Actuator stem | |
| 8 Stem connector | |

Throttling or on/off service

In throttling service, the Type 3271 Pneumatic Actuator can be used for supply pressures up to max. 6 bar.

In on/off service, the supply pressure must be reduced.

For fail-safe action "actuator stem retracts (FE)", the permissible supply pressure must not exceed the upper bench range value by more than 3 bar.

Example

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

For fail-safe action "actuator stem extends (FA)" and travel stop, the supply pressure must not exceed the upper bench range value by more than 1.5 bar.

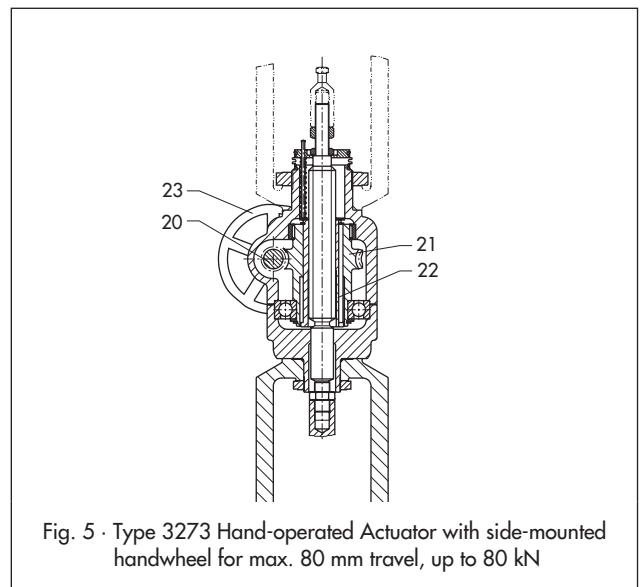


Fig. 5 · Type 3273 Hand-operated Actuator with side-mounted handwheel for max. 80 mm travel, up to 80 kN

Table 1a · Technical data for Type 3271 Pneumatic Actuator

Version	cm ²	1400-60	1400-120	2800	2 x 2800
Maximum supply pressure		6 bar ¹⁾			
Permissible operating temperatures	Stand. material NBR -35 to 90 °C ²⁾	Standard material NBR -35 to 90 °C ²⁾	Standard material NBR -35 to 90 °C ²⁾		
	Special material EPDM (for air free of oil) -50 to 120 °C ³⁾				
Materials					
Rolling diaphragm	NBR (nitrile rubber) Butyl with fabric reinforcement	NBR with fabric reinforcement			
	EPDM with fabric reinforcement				
Actuator stem	1.4571	1.4404	1.4548.4		
Actuator stem sealing	NBR (nitrile rubber)			NBR	
	EPDM	NBR			
Diaphragm cases	Sheet steel, powder-coated	EN-JS1030 (GGG-40)			

1) Observe restrictions for on/off service specified above

2) Lower temperature limited to -20 °C in on/off service

3) Lower temperature limited to -40 °C in on/off service

Table 1b · Technical data for Type 3273 Hand-operated Actuator

Version	3273 (Fig. 5, 9)	3273 (Fig. 10)
Max. travel range	80 mm	160 mm
Permissible force	80 kN	150 kN
Permissible ambient temperature	100 °C	100 °C
Materials		
Housing	EN-JS1030 (GGG-40)	EN-JS1030 (GGG-40)
Spindle and threaded nut	1.4104/G-CuSn12Pb	EN-GJS-500-7 (GGG-50)/1.0503
Handwheel	Aluminum	EN-JL1040 (GG-25)

Table 1c · Available versions

Version	1400-60	1400-120	2800 cm ²	2 x 2800 cm ²
Travel stop on both sides	•	•	•	•
Type 3273, max. 80 mm travel	•	•	• (max. 3 bar)	–
Side-mounted handwheel	–	•	•	•
Type 3271, max. 120 mm travel	–	•	•	•
Type 3271	•	•	•	•

Table 2 · Bench ranges for 1400 and 2800 cm² Pneumatic Actuators · All pressures in bar (gauge)

Pretensioned springs cannot be used with fail-safe action “actuator stem retracts” for Series 240, 250 and 280 Control Valves.

Actuator Type	Effective diaphragm area [cm ²]	Rated travel [mm]	Travel volume at rated travel [dm ³]	Dead volume [dm ³]	Max. travel [mm] ¹⁾	Bench range [bar] (signal pressure range at rated travel)	Additionally possible spring compression [%]	Operating range with spring compression [bar]	Number of springs	Spring force at 0 mm travel [kN] ²⁾	Spring force at rated travel [kN] ²⁾	Thrust [kN] ²⁾ at rated travel and a supply pressure [bar] of					
												1.4	2.0	3.0	4.0	5.0	6.0
Type 3271	1400	60	8.3	5.7	80	0.2 to 1.0	25	0.4 to 1.2	6	2.8	14	5.6	14	28	42	56	70
						0.4 to 2.0		0.8 to 2.4	12	5.6	28	-	14	28	42	56	
						0.5 to 2.5		1.0 to 3.0	18	7	35	-	7	21	35	49	
						1.1 to 2.4		1.4 to 2.7	18	15.4	33.6	-	8.4	22.4	36.4	50.4	
						1.3 to 2.8		1.7 to 3.2	24	18.2	39.2	-	2.8	16.8	30.8	44.8	
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	5.6	-	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										

Actuator Type	Effective diaphragm area [cm ²]	Rated travel [mm]	Travel volume at rated travel [dm ³]	Dead volume [dm ³]	Max. travel [mm] ¹⁾	Bench range [bar] (signal pressure range at rated travel)	Additionally possible spring compression [%]	Operating range with spring compression [bar]	Number of springs	Spring force at 0 mm travel [kN] ²⁾	Spring force at rated travel [kN] ²⁾	Thrust [kN] ²⁾ at rated travel and a supply pressure [bar] of					
												1.4	2.0	3.0	4.0	5.0	6.0
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	11.2	-		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. Zero travel not taken into account (see Table 3a)

2) The forces specified relate to the bench range

3) Springs already pretensioned

Table 3 · Dimensions and weights

Table 3a · Versions without handwheel

Actuator	Type	3271			
		7	6	6	8
Refer to Fig.					
Effective area	cm ²	1400-60	1400-120	2800	2 x 2800
Height	H	197	380	520	1020
	H _{4, rated} FA	165	285	315	
	H _{4, max} FA	169	288	325	
	H _{4, max} FE	185	315	355	
	H5	-		-	
	H6	54	85	85	
	H7	90	110	110	
Travel stop	H8 ¹⁾	180	-	500	
Diameter	∅ D	530	534	770	
	∅ D2	22	40	40	
∅ d (thread)		M60x1.5	M100x2	M100x2	
Pneum. connection (optional)	a	G 3/4 / 3/4 NPT	G 1/1 NPT	G 1/1 NPT	
	a2	-		-	
Weight in kg					
Without handwheel	kg	70	175	450	950

¹⁾ Travel stop on both sides (Fig. 7)

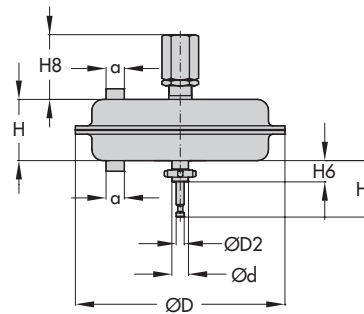


Fig. 7 · Version with mechanical travel stop

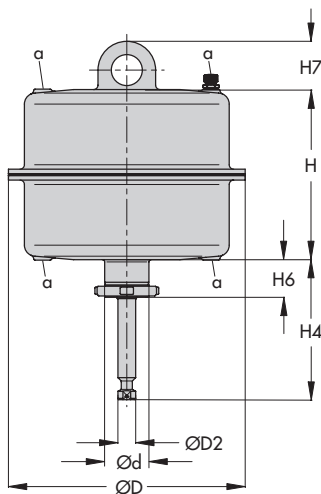


Fig. 6 · Type 3271 Actuator, 1400-120 version

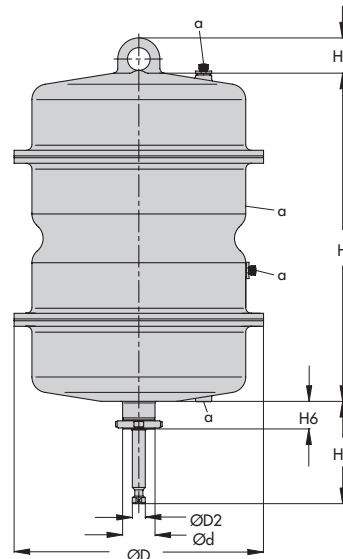


Fig. 8 · Type 3271 as tandem actuator

Table 3b · Type 3271 Pneumatic Actuator and Type 3273 Hand-operated Actuator with side-mounted handwheel
 ≤ 80 mm travel · Fig. 9

Valve	DN	50 to 100			125 to 150		
	NPS	2 to 4			6		
Seat bore	mm	≤ 100			≤ 150		
Travel	mm	Up to 30			Up to 60		
Actuator	cm ²	1400-60	1400-120	2800	1400-60	1400-120	2800
H3	mm	932	1202		1032	1202	
H5	mm	295	480		395	480	
H9	mm	395	480		395	480	
Weight in kg							
With actuator		165	300	575	169	303	578
Without actuator ¹⁾		70			70		

Valve	DN	200 to 250			300 to 500		
	NPS	8 to 10			12 to 20		
Seat bore	mm	≤ 200			≤ 200		
Travel	mm	Up to 60			Up to 60		
Actuator	cm ²	1400-60	1400-120	2800	1400-60	1400-120	2800
H3	mm	1032	1202		1117	1222	
H5	mm	395	480		480	500	
H9	mm	395	480		395	480	
Weight in kg							
With actuator		172	305	580	175	310	585
Without actuator ¹⁾		70			70		

1) Gear only

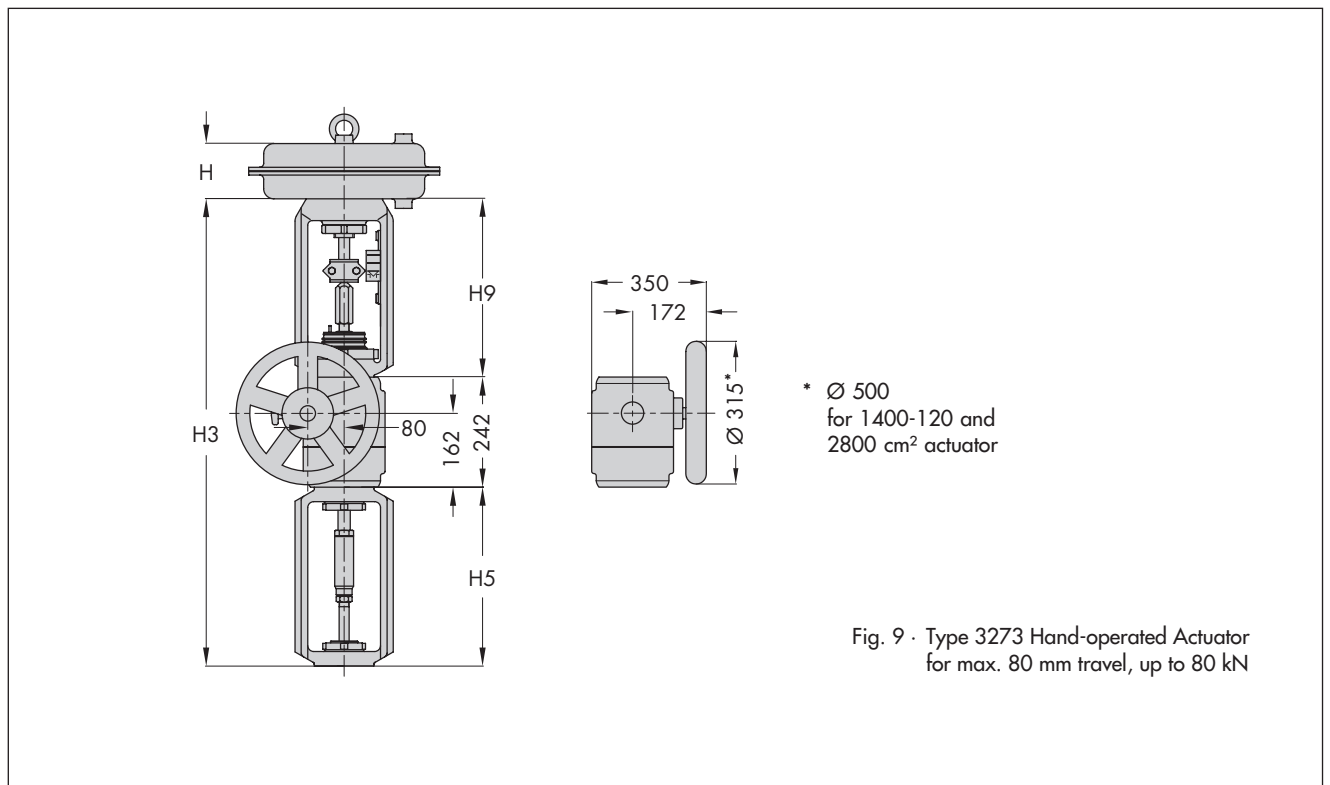
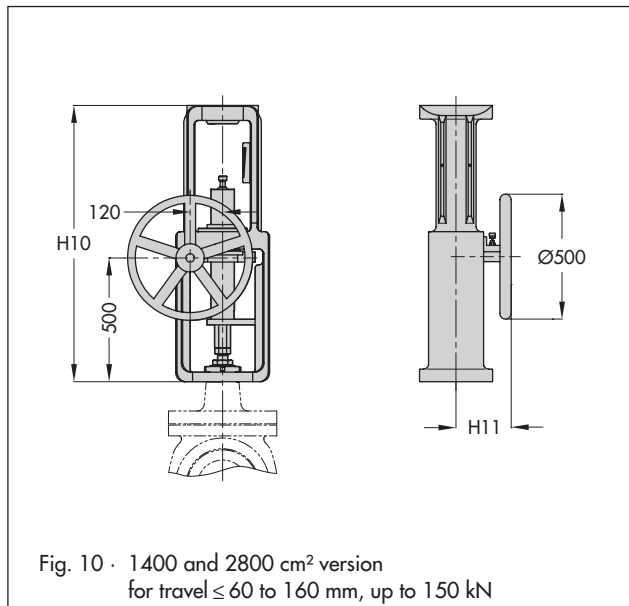


Table 3c · Pneumatic and hand-operated actuator with side-mounted handwheel · Travel up to 160 mm · Fig. 10

Actuator	cm ²	1400-120	2800	2 x 2800
H10	mm	1105	1105	1105
H11	mm	220	220	220
Weight without actuator	kg	250	250	250



Ordering text

Actuator	Type 3271
Optional	Handwheel Travel stop Tandem actuator
Diaphragm area	... cm ²
Travel	... mm
Bench range	... bar
Fail-safe action	Actuator stem extends or Actuator stem retracts
Signal pressure connection	G ... / ... NPT
Rolling diaphragm	NBR/EPDM

Specifications subject to change without notice.

