



TN2000 Series Pneumatic Piston Actuators for DN125 to DN300 SPIRA-TROL Series Control Valves

Description

The TN2000 series pneumatic piston actuators are designed for use with DN125 to DN300 SPIRA-TROL control valves. There are three versions available: Single-acting (with spring), Double-acting (with spring) and Double-acting (no spring) for matching the requirements of valves at various differential pressures and in a variety of applications.

Available types

SE = Single-acting, spring-extend

SR = Single-acting, spring-retract

DE = Double-acting, spring assisted (extend)

DR = Double-acting, spring assisted (retract)

DA = Double-acting, no spring

Optional extra

Manual handwheel

Technical data

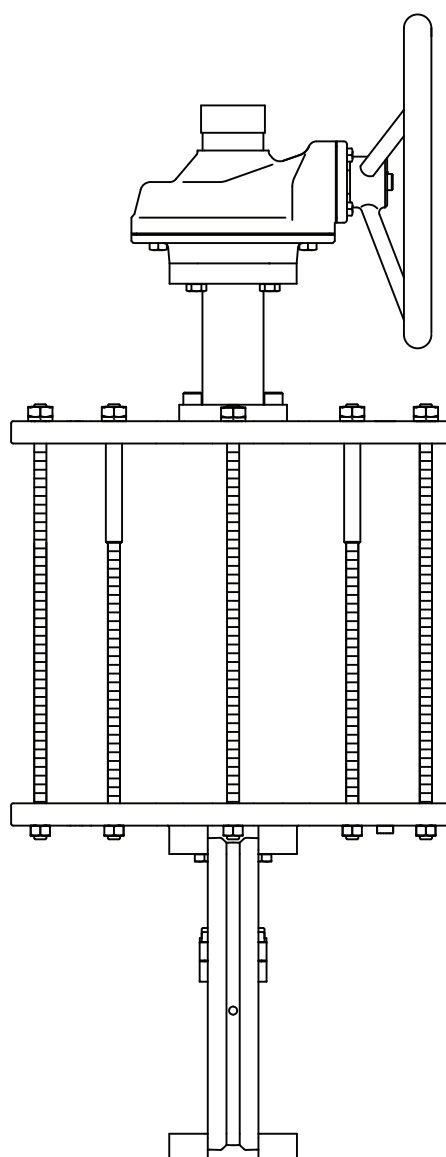
Temperature range - 15 °C to +110 °C

Maximum operating inlet temperature 10 bar g

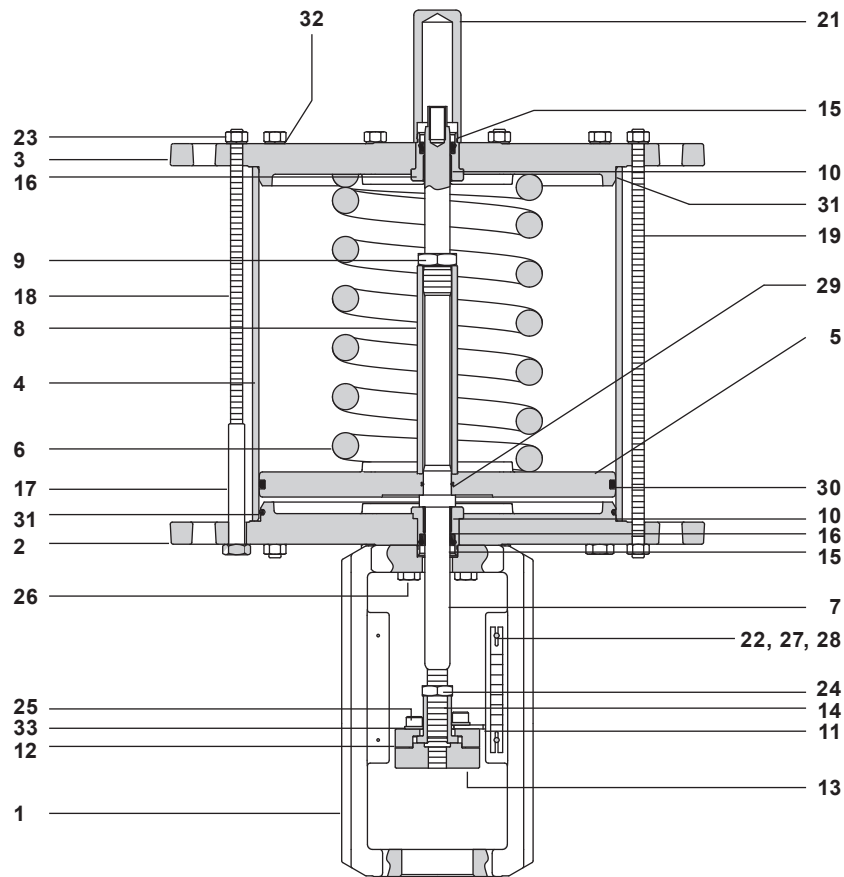
Air supply connection 3/8" screwed NPT

Actuator level 70 mm

Note: Volume booster is recommended for use with this type of actuator.



Materials

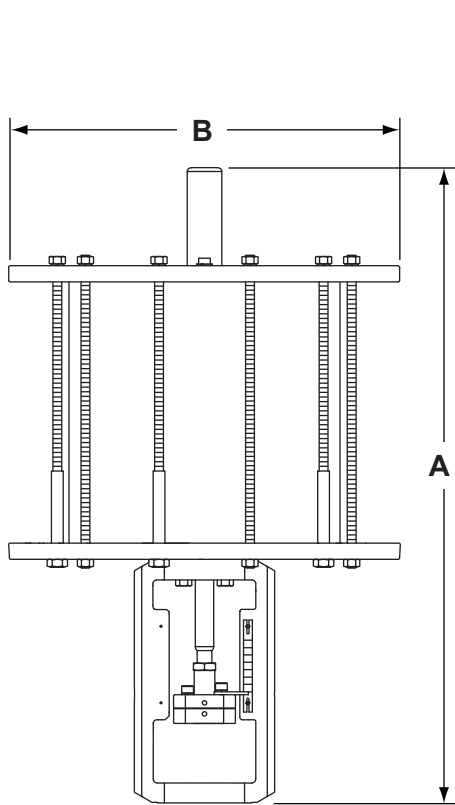


No. Part	Material
1 Yoke	SG iron
2 Lower cylinder end cap	SG iron BS EN 1563 GJS 400 18U-LT
3 Upper cylinder end cap	SG iron BS EN 1563 GJS 400 18U-LT
4 Cylinder	Composite tube
5 Piston	SG iron
6 Spring	Chrome vanadium steel
7 Spindle	Stainless steel
8 Spindle sleeve	Carbon steel (plated)
9 Lock-nut	M27 Carbon steel (plated)
10 Bearing and seal insert	Carbon steel (plated)
11 Indicator plate	Stainless steel
12 Top connector	Carbon steel (plated)
13 Bottom connector	Carbon steel (plated)
14 Connector	Stainless steel
15 Rod seal wiper	Polyurethane
16 DU plain bearing	PTFE/steel composite
17 Long nut	Carbon steel (plated)

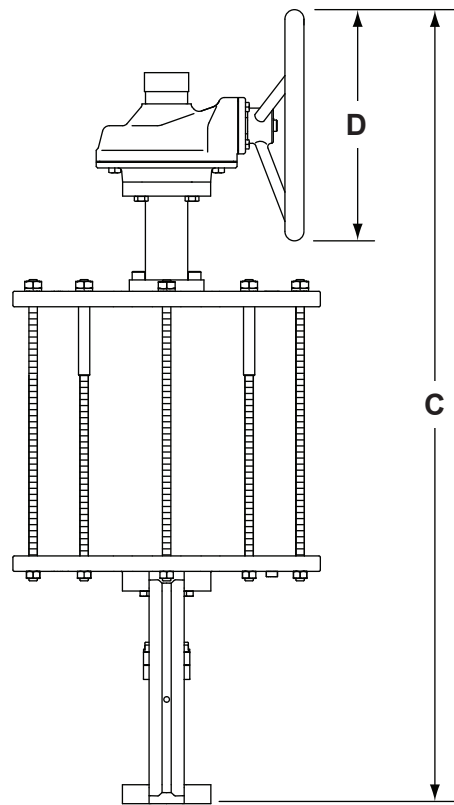
No. Part	Material
18 Nut and threaded bar	Carbon steel (plated)
19 Threaded bar	M12 Carbon steel (plated)
20 3/8" NPT vent plug (not shown)	LD Polyethylene
21 Cover	PVC
22 Scale	Stainless steel
23 Nut	M12 Carbon steel (plated)
24 Lock-nut	M20 Stainless steel
25 Cap screw	Carbon steel (plated)
26 Bolt	M12 Stainless steel
27 Pan head screw	Carbon steel (plated)
28 Nut	M2.5 Carbon steel (plated)
29 'O' ring	Fluorocarbon rubber (Viton)
30 'O' ring	Fluorocarbon rubber (Viton)
31 'O' ring	Fluorocarbon rubber (Viton)
32 Spring washer	M12 Carbon steel (plated)
33 Spring washer	M10 Carbon steel (plated)

Dimensions/weights (approximate) in mm and kg

Actuator range	A	B	C	D	Weight	
					Actuator	With handwheel
TN2277SE and variants	863	532	1197	330	116	+ 21
TN2277DE and variants	863	532	1197	330	116	+ 21
TN2277SR and variants	863	532	1132	330	116	+ 19
TN2277DR and variants	863	532	1132	330	116	+ 19
TN227NDA and variants	863	532	-	330	98	-



TN2277SE



TN2277SRH

How to use the sizing data:

The following tables supply guidance as to the sizing of the TN2000 when it is used on the SPIRA-TROL series control valves.

There are three applications:

Unbalanced flow under applications	Unbalanced on/off flow over applications	Balanced flow under applications
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Two conditions are illustrated in tabular form in each of the applications:

Class IV shut-off - Providing shut-off of the valve to the requirements of EN 60534-4 (IEC 60534-4) Class IV.

Class VI shut-off - Providing shut-off of the valve to the requirements of EN 60534-4 (IEC 60534-4) Class VI.

Class V shut-off - Providing shut-off of the valve to the requirements of EN 60534-4 (IEC 60534-4) Class V.

To select a suitable actuator:

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- Identify the column containing the valve and gland material selected.
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- Identify and compare the maximum operating pressure condition, including any transient pressures likely to occur, within the selected column.
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Note: Flow over the plug for modulating control is not recommended. Flow over is only suitable for on/off applications.

For conditions outside of those illustrated, including double acting versions, please contact Spirax Sarco.

Note: For TN2277SR, the values in the following tables are based on the air pressure indicated below the product nomenclature of the specific unit. For double acting actuators in the event of air failure you will require an air pressurised tank to position the valve.

For fluctuating pressure control applications, or applications requiring rapid response (e.g. accumulator control) a pneumatic volume booster is recommended.

TN2277SE			Valve maximum differential pressure							
			DN125		DN150		DN200 DN250 DN300 reduced		DN300 full	
Flow			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
Unbalanced	Under	Metal seated (T, W) Class IV	7,8	7	4,8	4,2	2,2	1,9		
		Metal seated (T, W) Class V**	3,0	2,2	0,8	0,3				
		Soft seated (G, K) Class VI	10,9	10,0	7,3	6,7	4,1	3,7	1,4	1,3
		Soft seated (P) Class VI	10,4	9,6	6,9	6,3	3,8	3,4	1,3	1,1
Balanced		All seated (T, W, P, K, G) Class IV	103,4	96,2	71,6	64,8	32,5	29,3	11,8	10,4
Unbalanced	Over	All seated (T, W, P, K, G) Class IV, V, VI	29,8	29,0	19,6	19	10,8	10,5	3,9	3,8

Flow over : on/off application only with unbalanced trim only.

For flow over maximum differential pressure, 6bar g air supply is considered for others air pressure please consult Spirax Sarco.

TN2277SR with 6 bar air supply*			Valve maximum differential pressure							
			DN125		DN150		DN200 DN250 DN300 reduced		DN300 full	
Flow			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
Unbalanced	Under	Metal seated (T, W) Class IV	24,7	23,8	16,1	15,5	8,6	8,3	2,6	2,5
		Metal seated (T, W) Class V**	19,9	19,0	12,1	11,6	5,6	5,3	0,7	0,9
		Soft seated (G, K) Class VI	27,7	26,9	18,6	18,0	10,4	10,1	3,8	3,7
		Soft seated (P) Class VI	27,2	26,4	18,2	17,6	10,1	9,8	3,6	3,5
Balanced		All seated (T, W, P, K, G) Class IV	103,4	96,2	71,6	64,8	32,5	29,3	11,8	10,4
Unbalanced	Over	All seated (T, W, P, K, G) Class IV, V, VI	11,8	10,9	7,7	7,2	4,3	3,9	1,5	1,4

*For other air supply pressures please consult Spirax Sarco.

Flow over are for on/off application only and unbalanced trim only.

** Class V has an additional cost impact on the valve. Please contact Spirax Sarco for details.

Note: The differential pressures stated are at 100% of actuator thrust. It is recommended that valve assemblies are not selected to operate at the absolute maximum differential pressure, especially for steam applications where the downstream pressure can operate in vacuum. Please contact Spirax Sarco for further information.

How to order

Ordering a TN2000 Series Actuator

Type	TN	TN
Series	2 = 2000 series	2
Actuator size	2 = 993 cm ²	2
Valve travel	7 = 70 mm	7
Spring rating	7 = with spring	7
	N = double-acting (no spring)	
Action	SE = Single-acting, spring-extend	SE
	SR = Single-acting, spring-retract	
	DE = Double-acting, spring assisted (extend)	
	DR = Double-acting, spring assisted (retract)	
	DA = Double-acting, no spring	
Manual override	H = Handwheel (optional) not available for the NDA version	

Ordering example:

1 off Spirax Sarco TN2277SE pneumatic piston actuator.

Spare parts

The spare parts available are common across the range of actuators detailed in this document. No other parts are available as spares.

Available spares

'O' ring kit	15, 29, 30, 31
Travel indicator kit	22, 27, 28
Spring	6
Handwheel	A
EH kit	B
RH kit	C

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the actuator model.

Example: 1 - 'O' ring kit for a Spirax Sarco TN2277SE pneumatic piston actuator.

