



TI-P327-01-US
Issue 2

TN2000 Series

Pneumatic Piston Actuators

for 6" and 8" Spira-trol Series Control Valves

Description

The TN2000 series pneumatic piston actuators are designed for use with 6" and 8" 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

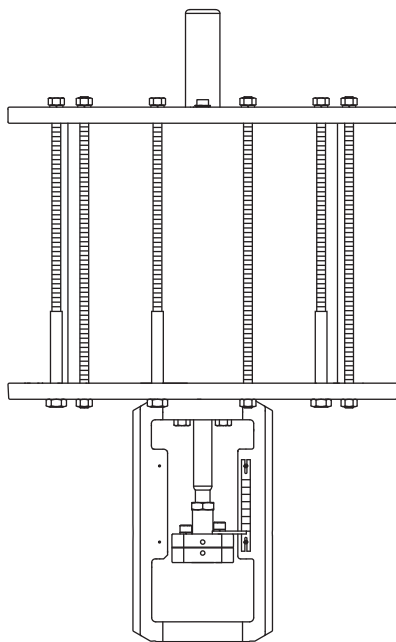
Technical data

Temperature range 5 °F to 230 °F (-15 °C to +110 °C)

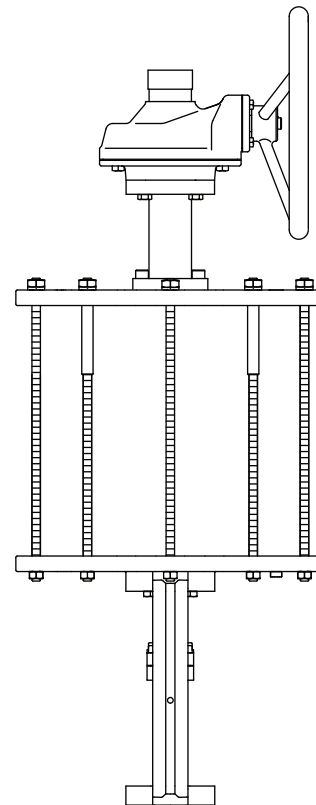
Maximum operating inlet pressure 150 psi g (10 bar g)

Air supply connection 3/8" screwed NPT

Actuator travel 2 3/4" (70 mm)

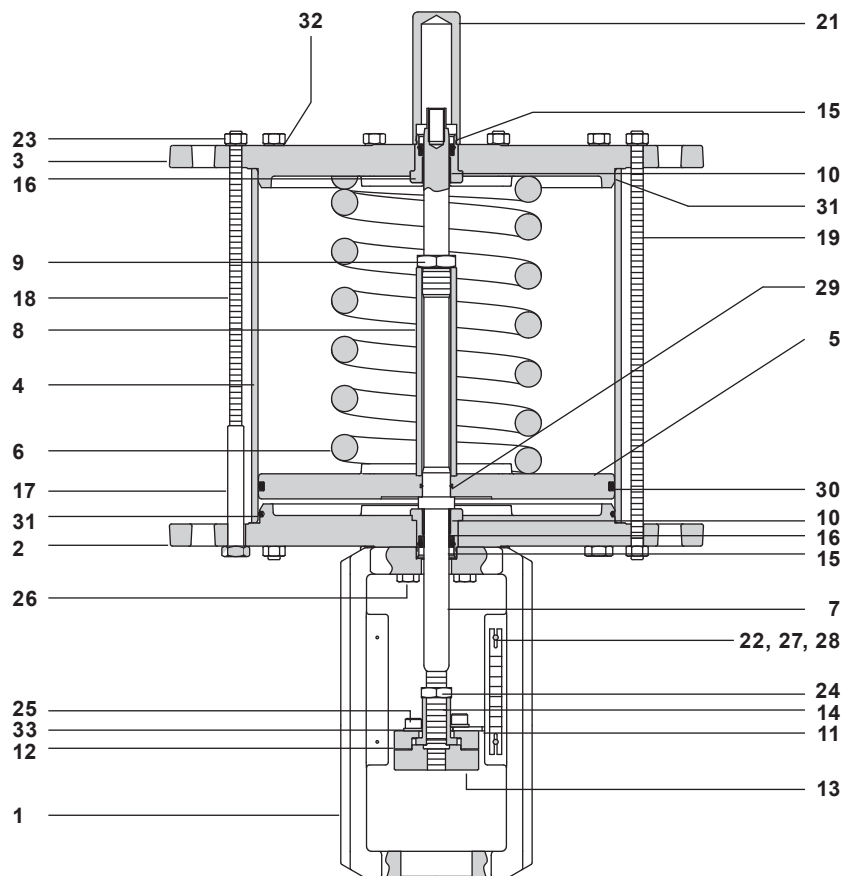


TN2277SE



TN2277SRH

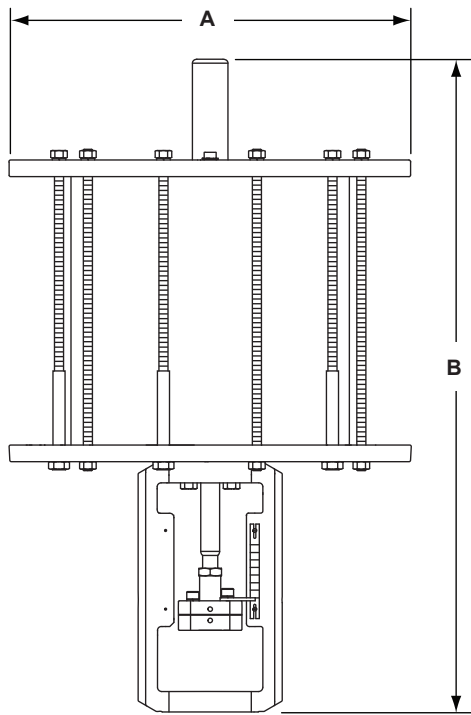
Materials



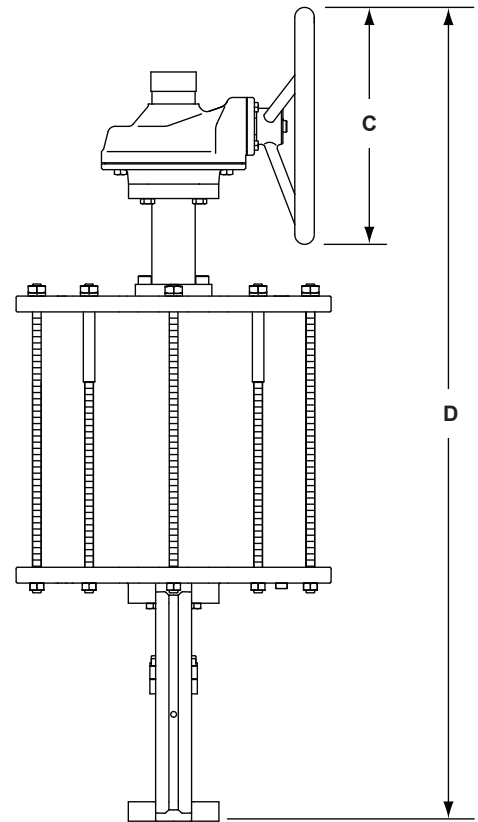
No.	Part	Material
1	Yoke	SG iron
2	Lower cylinder end cap	SG iron BS EN 1563 GJS 400 18U-LT
3	Upper cylinder end cap	SG iron BS EN 1563 GJS 400 18U-LT
4	Cylinder	Composite tube
5	Piston	SG iron
6	Spring	Chrome vanadium steel
7	Spindle	Stainless steel
8	Spindle sleeve	Carbon steel (plated)
9	Lock-nut	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) inches and pounds



TN2277SE



TN2277SRH

Actuator range	A	B	C	D	Weight	
					Actuator	With handwheel
TN2277SE and variants	21	34	13	47	255	+ 46
TN2277DE and variants	21	34	13	47	255	+ 46
TN2277SR and variants	21	34	13	44.5	255	+ 42
TN2277DR and variants	21	34	13	44.5	255	+ 42
TN2277NDA and variants	21	34	13	-	216	-

How to use the sizing data:

The tables on pages 4, 5 and 6 supply guidance as to the sizing of the TN2000 when it is used on the Spira-trol K and L series control valves.

To select a suitable actuator:

- Identify the column containing the valve and gland material selected.
- Identify the maximum operating pressure condition, including any transient pressures likely to occur, within the selected column.
- Read back to the left hand side of the table to identify the suitable actuator for the application.

For conditions outside of those illustrated please contact Spirax Sarco.

Note: DE, DR and DA actuators require a double acting positioner. SE and SR actuators require a single acting positioner.

Unbalanced flow under applications

Caution 1: Maximum operating air pressure onto the actuator must not exceed 150 psi g.

Caution 2: DE and DR versions must not exceed 120 psi g.

Maximum differential pressures for Class IV shut-off : Unbalanced valves

KEA with PTFE (P)

or

Graphite stem seal (H)

Actuator	Actuator operating air pressure (psi g)	Valve maximum differential pressure			
		6"		8"	
		PTFE	Graphite	PTFE	Graphite
TN2277SE	60 min.	33	29	-	-
TN2277DE	90	522	518	279	277
	120	685	681	371	369
TN2277SR	105	276	276	145	145
TN2277NDA	75	326	322	169	167
	90	407	403	215	212
	105	489	485	261	258
	120	570	566	306	304
	135	652	648	352	350
	150	733	729	398	396

Maximum differential pressures for Class VI shut-off : Soft seated unbalanced valves

KEA with PTFE (P)

or

Graphite stem seal (H)

Actuator	Actuator operating air pressure (psi g)	Valve maximum differential pressure			
		6"		8"	
		PTFE	Graphite	PTFE	Graphite
TN2277SE	60 min.	110	106	62	60
TN2277DE	90	599	595	337	335
	120	740	740	429	426
TN2277SR	105	362	348	203	203
TN2277NDA	75	403	399	226	224
	90	484	480	272	270
	105	566	562	318	316
	120	647	643	364	362
	135	729	725	410	407
	150	740	740	456	453

Unbalanced flow over applications

Recommended for On-Off Applications ONLY

Caution 1: Maximum operating air pressure onto the actuator must not exceed 150 psi g.

Caution 2: DE and DR versions must not exceed 120 psi g.

Maximum differential pressures for Class IV shut-off : Unbalanced valves

KEA with PTFE (P)
or
Graphite stem seal (H)

Actuator	Actuator operating air pressure (psi g)	Valve maximum differential pressure			
		6"		8"	
		PTFE	Graphite	PTFE	Graphite
TN2277SE	60 min.	450	450	251	251
TN2277SR	60 min.	189	185	106	103
	60	521	517	291	288
TN2277DR	90	687	683	383	381
	120	740	740	476	474
TN227NDA	75	392	388	219	217
	90	475	471	265	263
	105	558	554	311	309
	120	641	637	358	355
	135	724	720	404	402
	150	740	740	450	448

Maximum differential pressures for Class VI shut-off : Soft seated unbalanced valves

KEA with PTFE (P)
or
Graphite stem seal (H)

Actuator	Actuator operating air pressure (psi g)	Valve maximum differential pressure			
		6"		8"	
		PTFE	Graphite	PTFE	Graphite
TN2277SE	60 min.	460	455	256	254
TN2277SR	105	189	185	106	103
	60	521	517	291	288
TN2277DR	90	687	683	383	381
	120	740	740	476	474
TN227NDA	75	392	388	219	217
	90	475	471	265	263
	105	558	554	311	309
	120	641	637	348	355
	135	724	720	404	402
	150	740	740	450	448

Balanced applications

Maximum differential pressures for Class IV shut-off : Balanced valves

KEA with PTFE (P)

or

Graphite stem seal (H)

Actuator	Actuator operating air pressure (psi g)	Valve maximum differential pressure					
		DN125		DN150		DN200	
		PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
TN2277SE	60 min.	740	740	740	740	740	-
TN2277DE	15	740	740	740	740	740	740
TN2277SR	105	740	740	740	740	740	740
TN2277NDA	75	740	740	740	740	740	740
	90	740	740	740	740	740	740
	105	740	740	740	740	740	740
	120	740	740	740	740	740	740
	135	740	740	740	740	740	740
	150	740	740	740	740	740	740

Actuator	Condition	Thrust (lbf)
TN2277SE	Spring thrust	3,150
TN2277SR	Spring thrust	3,150
TN2277NDA	75 psi g	10,900
	90 psi g	13,140
	105 psi g	15,380
	120 psi g	17,610
	135 psi g	19,840
	150 psi g	22,070

TN2000 series selection guide

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 N = double-acting (no spring)	7
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	

Selection example:

TN

2

2

7

7

SE

How to order
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.

