



Cert. No. LRQ 0963008

ISO 9001

spirax/sarco

TI-P357-30

CH Issue 7

PN9000 Series Pneumatic Actuators for SPIRA-TROL K and L Series Control Valves

Description

The PN9000 series actuators are a compact range of linear actuators that are available in 3 diaphragm sizes for matching the requirements of valves at various differential pressures.

Each actuator is fitted with a mechanical travel indicator and incorporates a fully-rolling diaphragm, which provides good linearity over the operating stroke.

Available types

PN = Standard	Suffix E = Spring-extend
PNP = Electroless nickel plated	Suffix R = Spring-retract

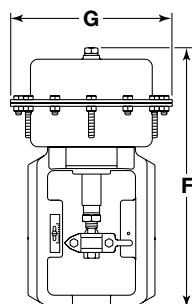
Optional extra

Manual handwheel	Suffix H
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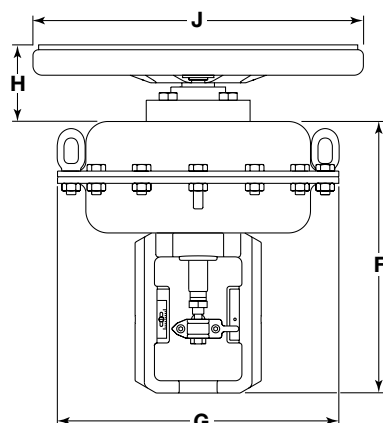
Important note: Throughout this document, reference has been made to the PN actuator.

Technical data

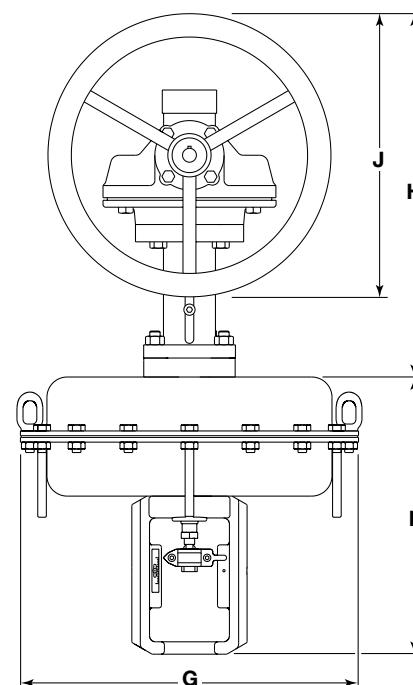
Temperature range	- 20°C to +110°C	
Maximum operating inlet pressure	PN9100	6 bar g
	PN9200	6 bar g
	PN9300	4 bar g
Air supply connection	1/4" NPT	
Actuator travel	PN9100	20 mm
	PN922_ and PN932_	20 mm
	PN923_ and PN933_	30 mm



PN9100



PN9200EH



PN9337RH

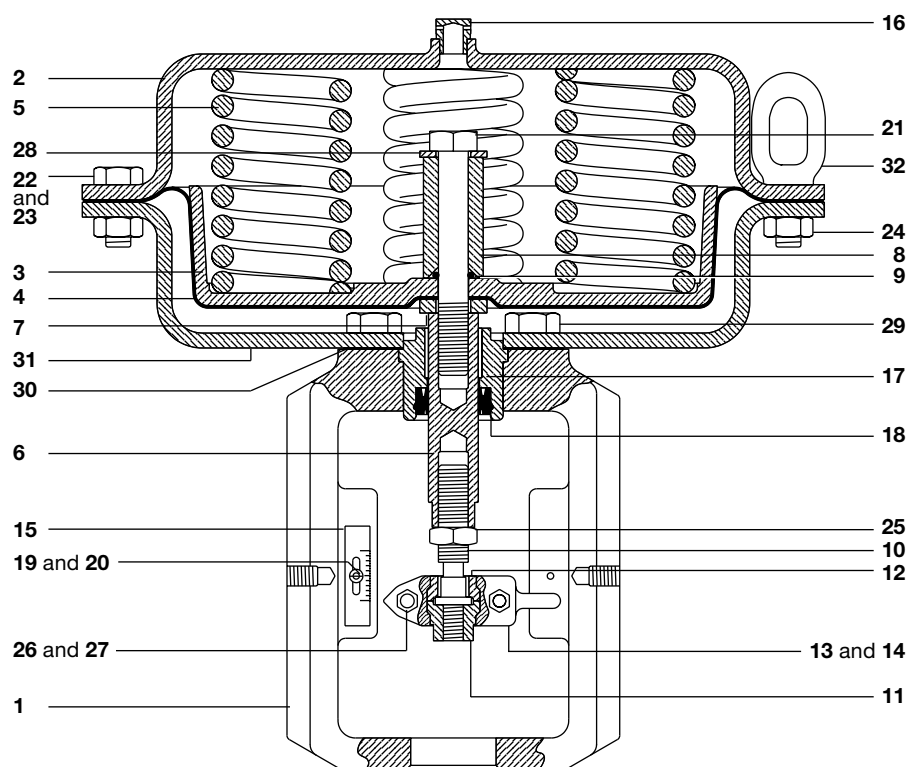
Dimensions / weights (approximate) in mm and kg

Actuator range	F	G	H	J	Weight	
					Actuator	With handwheel
PN9100E and variants	275	170	55	225	6	+ 5.86
PN9100R and variants	275	170	140	225	6	+ 2.5
PN9200E and variants	300	300	65	350	17	+ 7.2
PN9200R and variants	300	300	152	350	17	+ 3.77
PN9230E and variants	360	300	65	350	17	+ 3.77
PN9230R and variants	360	300	152	350	17	+ 3.77
PN9320E and variants	325	390	65	350	27	+ 7.2
PN9320R and variants	325	390	152	350	27	+ 3.77
PN9330E and variants	335	390	65	350	27	+ 7.2
PN9330R and variants	335	390	152	350	27	+ 3.7
PN9336E and variants	335	390	65	350	27	+ 7.2
PN9336R and variants	335	390	152	350	27	+ 3.77
PN9337E and variants	335	390	410	350	27	+ 21
PN9337R and variants	335	390	410	350	27	+ 21

Local regulations may restrict the use of this product to below the conditions quoted.

In the interests of development and improvement of the product, we reserve the right to change the specification without notice.

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No.	Part	Material
1	Yoke	SG iron
2	Upper diaphragm housing	Carbon steel (plated)
3	Diaphragm plate	Aluminium
4	Diaphragm	Reinforced NBR
5	Spring	Spring steel
6	Spindle	Stainless steel
7	Washer	Carbon steel (plated)
8	Spacer	Carbon steel (plated)
9	'O' ring	Viton
10	Connector	Stainless steel BS 970 431 S29
11	Adaptor	Stainless steel BS 970 431 S29
12	Collar	Carbon steel (plated)
13	Clamp front	Stainless steel
14	Clamp rear	Stainless steel
15	Scale	Stainless steel
16	Vent plug	Brass
17	Bearing	PTFE/steel composite
18	Seal	Polyurethane
19	Pan head screw	PN9000 Carbon steel (plated)
20	Nyloc nut	PNP9000 Stainless steel A2 - 70
21	Bolt	PN9000 Carbon steel (plated) Gr. 8.8
22	Hex. head screw (short)	PN9000 Carbon steel (plated) Gr. 8.8
23	Hex. head screw (long)	PNP9000 Stainless steel A2 - 70
24	Nut	PN9000 Carbon steel (plated) Gr. 8.8
25	Lock-nut	PNP9000 Stainless steel A2 - 70
26	Socket head screw	PN9000 Carbon steel (plated) Gr. 8.8
27	Nut	PNP9000 Stainless steel A2 - 70
28	Washer	Carbon steel (plated)
29	Screw	Carbon steel (plated) Gr. 8.8
30	Gasket	Reinforced graphite
31	Lower diaphragm housing	Carbon steel (plated)
32	Lifting eye	Cast steel

How to use the sizing data:

The following tables supply guidance as to the sizing of the PN9000 when it is used on the SPIRA-TROL K and L series valves.

Two conditions are illustrated in tabular form:

Class IV shut-off - Providing shut-off of the valve to the requirements of BS 5793-4 (IEC 60534-4) class IV.

Class VI shut-off - Providing shut-off of the valve to the requirements of BS 5793-4 (IEC 60534-4) class VI.

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.

Maximum differential pressures for Class IV shut-off - PN9000E

KE, LE, KEA and LEA with PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum differential pressures bar																	
		DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
		PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9126E	1.0 – 2.0	28	13	20	9	12	4	10	3	2	-	1	-	-	-	-	-	-	-
PN9123E	2.0 – 4.0	40	40	40	40	37	29	29	23	11	8	7	5	-	-	-	-	-	-
PN9220E	0.2 – 1.0	14	-	9	-	4	-	4	-	-	-	-	-	-	-	-	-	-	-
PN9220E	0.4 – 1.2	40	33	36	24	22	14	18	12	6	3	3	2	-	-	-	-	-	-
PN9226E	1.0 – 2.0	40	40	40	40	40	40	40	40	24	21	16	14	-	-	-	-	-	-
PN9236E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	8	6	5	4	2	2
PN9223E	2.0 – 4.0	40	40	40	40	40	40	40	40	40	40	38	36	-	-	-	-	-	-
PN9233E	2.0 – 4.0	-	-	-	-	-	-	-	-	-	-	-	-	20	18	12	11	7	7
PN9320E	0.2 – 1.0	40	32	35	24	22	14	17	11	6	3	3	1	-	-	-	-	-	-
PN9320E	0.4 – 1.2	40	40	40	40	40	40	40	38	17	15	12	10	-	-	-	-	-	-
PN9330E	0.4 – 1.2	-	-	-	-	-	-	-	-	-	-	-	-	6	4	3	2	1	1
PN9336E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	22	20	12	11	7	6
PN9337E	2.5 – 3.5	-	-	-	-	-	-	-	-	-	-	-	-	40	40	35	34	21	21

KE, LE, KEA and LEA with Bellows and PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum differential pressures bar																	
		DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
		PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9226E	1.0 – 2.0	40	40	40	40	36	29	27	21	10	7	6	4	-	-	-	-	-	-
PN9236E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	5	5	3	3	2	2
PN9223E	2.0 – 4.0	40	40	40	40	40	40	40	40	40	37	27	25	-	-	-	-	-	-
PN9233E	2.0 – 4.0	-	-	-	-	-	-	-	-	-	-	-	-	17	17	11	11	7	7
PN9320E	0.4 – 1.2	39	24	29	17	18	10	12	6	3	1	1	-	-	-	-	-	-	-
PN9336E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	12	10	7	6	4	3
PN9337E	2.5 – 3.5	-	-	-	-	-	-	-	-	-	-	-	-	40	40	30	28	18	17

Maximum differential pressures for Class VI shut-off - PN9000E (PTFE (G) seat seal only)

KE, LE, KEA and LEA with PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum differential pressures bar																	
		DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
		PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9120E	0.2 – 1.0	4	-	3	-	2	-	2	-	1	-	-	-	-	-	-	-	-	-
PN9120E	0.4 – 1.2	14	-	11	-	7	-	6	-	2	-	2	-	-	-	-	-	-	-
PN9125E	0.4 – 2.0	14	-	11	-	7	-	6	-	2	-	2	-	-	-	-	-	-	-
PN9126E	1.0 – 2.0	40	27	33	22	22	14	17	11	7	5	5	3	-	-	-	-	-	-
PN9123E	2.0 – 4.0	40	40	40	40	40	40	37	31	16	13	11	9	-	-	-	-	-	-
PN9220E	0.2 – 1.0	28	14	22	11	15	7	12	5	5	2	4	2	-	-	-	-	-	-
PN9220E	0.4 – 1.2	40	40	40	37	33	25	25	19	11	8	8	6	-	-	-	-	-	-
PN9230E	0.4 – 1.2	-	-	-	-	-	-	-	-	-	-	-	-	4	2	3	2	2	1
PN9226E	1.0 – 2.0	40	40	40	40	40	40	40	40	29	26	21	19	-	-	-	-	-	-
PN9236E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	11	10	7	6	5	4
PN9223E	2.0 – 4.0	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9233E	2.0 – 4.0	-	-	-	-	-	-	-	-	-	-	-	-	23	22	15	14	9	9
PN9320E	0.2 – 1.0	40	40	40	37	32	24	25	19	11	8	8	6	-	-	-	-	-	-
PN9320E	0.4 – 1.2	40	40	40	40	40	40	40	40	23	20	16	14	-	-	-	-	-	-
PN9330E	0.4 – 1.2	-	-	-	-	-	-	-	-	-	-	-	-	9	7	6	4	4	3
PN9336E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	23	21	15	14	9	8
PN9337E	2.5 – 3.5	-	-	-	-	-	-	-	-	-	-	-	-	40	40	37	36	23	23

KE, LE, KEA and LEA with Bellows and PTFE stem seal or Graphite stem seal (H)

Actuator	Spring range	Maximum differential pressures bar																	
		DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
		PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9123E	2.0 – 4.0	16	1	12	-	8	-	6	-	3	-	2	-	-	-	-	-	-	-
PN9226E	1.0 – 2.0	40	40	40	40	40	39	36	30	16	13	11	9	-	-	-	-	-	-
PN9236E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	5	5	3	3	2	2
PN9223E	2.0 – 4.0	40	40	40	40	40	40	40	40	40	40	33	31	-	-	-	-	-	-
PN9233E	2.0 – 4.0	-	-	-	-	-	-	-	-	-	-	-	-	17	17	11	11	7	7
PN9320E	0.4 – 1.2	40	38	40	30	28	20	22	16	9	7	7	5	-	-	-	-	-	-
PN9330E	0.4 – 1.2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-
PN9336E	1.0 – 2.0	-	-	-	-	-	-	-	-	-	-	-	-	16	14	10	9	6	6
PN9337E	2.5 – 3.5	-	-	-	-	-	-	-	-	-	-	-	-	40	40	33	32	20	20

Maximum differential pressures for Class IV shut off - PN9000R

KE, LE, KEA and LEA with PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum air pressure	Maximum differential pressures bar																	
			DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9120R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	36	34	25	23	-	-	-	-	-	-
PN9120R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	34	32	24	22	-	-	-	-	-	-
PN9125R	0.4 - 2.0	6	40	40	40	40	40	40	40	40	28	25	19	17	-	-	-	-	-	-
PN9126R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	28	25	19	17	-	-	-	-	-	-
PN9123R	2.0 – 4.0	6	40	40	40	40	37	29	29	23	11	8	7	5	-	-	-	-	-	-
PN9220R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9220R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9230R	0.4 – 1.2	6	-	-	-	-	-	-	-	-	-	-	-	-	40	40	34	33	21	20
PN9226R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9236R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	28	27	17	16
PN9223R	2.0 – 4.0	6	40	40	40	40	40	40	40	40	40	40	38	36	-	-	-	-	-	-
PN9233R	2.0 – 4.0	6	-	-	-	-	-	-	-	-	-	-	-	-	20	18	12	11	7	7
PN9320R	0.2 – 1.0	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9320R	0.4 – 1.2	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9330R	0.4 – 1.2	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	39	38	24	23
PN9336R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	27	26	17	16
PN9337R	2.5 – 3.5	4	-	-	-	-	-	-	-	-	-	-	-	-	8	6	5	3	2	2

KE, LE, KEA and LEA with Bellows and PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum air pressure	Maximum differential pressures bar																	
			DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9120R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	22	19	15	13	-	-	-	-	-	-
PN9120R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	20	18	14	12	-	-	-	-	-	-
PN9125R	0.4 - 2.0	6	40	40	40	40	40	40	36	30	13	11	9	7	-	-	-	-	-	-
PN9126R	1.0 – 2.0	6	40	40	40	40	40	40	36	30	13	11	9	7	-	-	-	-	-	-
PN9220R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9220R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9230R	0.4 – 1.2	6	-	-	-	-	-	-	-	-	-	-	-	-	40	40	32	32	20	20
PN9226R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9236R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	26	26	16	16
PN9223R	2.0 – 4.0	6	40	40	40	40	40	40	40	40	37	27	25	-	-	-	-	-	-	-
PN9233R	2.0 – 4.0	6	-	-	-	-	-	-	-	-	-	-	-	-	17	17	11	11	7	7
PN9320R	0.2 – 1.0	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9320R	0.4 – 1.2	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9330R	0.4 – 1.2	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	34	33	21	20
PN9336R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	35	34	22	21	13	12

Maximum differential pressures for Class VI shut-off - PN9000R (PTFE (G) seat seal only)

KE, LE, KEA and LEA with PTFE or Graphite stem seal (H)

Actuator	Spring range	Maximum air pressure	Maximum differential pressures bar																	
			DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9120R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	40	39	29	28	-	-	-	-	-	-
PN9120R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	40	37	28	26	-	-	-	-	-	-
PN9125R	0.4 - 2.0	6	40	40	40	40	40	40	40	40	33	30	23	21	-	-	-	-	-	-
PN9126R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	33	30	23	21	-	-	-	-	-	-
PN9123R	2.0 – 4.0	6	40	40	40	40	40	40	37	31	16	13	11	9	-	-	-	-	-	-
PN9220R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9220R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9230R	0.4 – 1.2	6	-	-	-	-	-	-	-	-	-	-	-	-	40	40	37	35	23	22
PN9226R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9236R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	30	29	19	18
PN9223R	2.0 – 4.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9233R	2.0 – 4.0	6	-	-	-	-	-	-	-	-	-	-	-	-	23	22	15	14	9	9
PN9320R	0.2 – 1.0	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9320R	0.4 – 1.2	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9330R	0.4 – 1.2	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	40	40	26	25
PN9336R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	30	29	19	18
PN9337R	2.5 – 3.5	4	-	-	-	-	-	-	-	-	-	-	-	-	11	9	7	6	4	4

KE, LE, KEA and LEA with Bellows and PTFE stem seal or Graphite stem seal (H)

Actuator	Spring range	Maximum air pressure	Maximum differential pressures bar																	
			DN15		DN20		DN25		DN32		DN40		DN50		DN65		DN80		DN100	
			PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite	PTFE	Graphite
PN9120R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	28	25	20	18	-	-	-	-	-	-
PN9120R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	26	24	19	17	-	-	-	-	-	-
PN9125R	0.4 - 2.0	6	40	40	40	40	40	40	40	39	20	17	14	12	-	-	-	-	-	-
PN9126R	1.0 – 2.0	6	40	40	40	40	40	40	40	39	20	17	14	12	-	-	-	-	-	-
PN9123R	2.0 – 4.0	6	16	1	12	-	8	-	6	-	3	-	2	-	-	-	-	-	-	-
PN9220R	0.2 – 1.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9220R	0.4 – 1.2	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9230R	0.4 – 1.2	6	-	-	-	-	-	-	-	-	-	-	-	-	40	40	32	32	20	20
PN9226R	1.0 – 2.0	6	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9236R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	26	26	16	16
PN9223R	2.0 – 4.0	6	40	40	40	40	40	40	40	40	40	40	33	31	-	-	-	-	-	-
PN9233R	2.0 – 4.0	6	-	-	-	-	-	-	-	-	-	-	-	-	17	17	11	11	7	7
PN9320R	0.2 – 1.0	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9320R	0.4 – 1.2	4	40	40	40	40	40	40	40	40	40	40	40	40	-	-	-	-	-	-
PN9330R	0.4 – 1.2	4	-	-	-	-	-	-	-	-	-	-	-	-	40	40	37	36	23	23
PN9336R	1.0 – 2.0	4	-	-	-	-	-	-	-	-	-	-	-	-	39	38	25	24	16	15
PN9337R	2.5 – 3.5	4	-	-	-	-	-	-	-	-	-	-	-	-	4	2	2	1	1	1

PN9000 series selection guide:

Type	PN = Polyester powder coated (standard)	PNP
	PNP = Electroless nickle plated	
Series	9 = 9000 series	9
Actuator size	1 = 100 cm ²	3
	2 = 340 cm ²	
	3 = 670 cm ²	
Valve travel	2 = 20 mm	3
	3 = 30 mm	
Spring rating	0 = 0.2 to 1.0 bar (option for 0.4 to 1.2 bar)	7
	3 = 2.0 to 4.0 bar	
	5 = 0.4 to 2.0 bar (PN9100 series only)	
	6 = 1.0 to 2.0 bar	
	7 = 2.5 to 3.5 bar (PN933_ series only)	
Spring action	E = Spring-extend	E
	R = Spring-retract	
Manual override	H = Handwheel (optional)	

How to order/selection example:

1 off Spirax Sarco PNP9337E pneumatic actuator.

Spare parts

The only spares available are clearly indicated below and are common for both spring-extend and spring-retract versions.

Available spares

Stem seal kit	17, 18, 30
Diaphragm kit	4, 9
Travel indicator kit	15, 19, 20
Spring kit	5
Linkage kit (suitable for Mk1 and SPIRA-TROL valves)	10, 13, 14, 26, 27

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 - Stem seal kit for a PN9120 pneumatic actuator.

