

TI-P204-01
CTLS Issue 15

spirax

sarco

DRV7 and DRV7G

SG Iron

Pressure Reducing Valves

Description

The DRV7 is an SG iron direct acting bellows sealed pressure reducing valve. The standard version has an EPDM diaphragm and is suitable for steam, water and air applications. The DRV7 is available with a Nitrile rubber diaphragm (suffix 'N') for oil applications. A Nitrile rubber soft seated version (suffix 'G', limited to 90 °C) is also available for applications that require tight shut-off. It is recommended that for these applications a maximum pressure turndown ratio of 10:1 is observed.

Note: To protect the actuator diaphragm on steam applications a WS4 water seal pot must be installed in the downstream pressure signal line to the actuator. Refer to TI-S12-03 for details.

Available types:

DRV7 and DRV7G are available in 6 pressure ranges (suffix 1-6).

Downstream pressure ranges:

Range	Valve type	Actuator type	Spring colour	Pressure range bar	PN Rating
1	DRV7(G)B1(N)	1 or 1N	Yellow	*0.1 - 0.6	2.5
2	DRV7(G)B2(N)	2 or 2N	Yellow	**0.2 - 1.2	2.5
3	DRV7(G)B3(N)	3 or 3N	Blue	0.8 - 2.5	6.0
4	DRV7(G)B4(N)	4 or 4N	Blue	2.0 - 5.0	16.0
5	DRV7(G)B5(N)	5 or 5N	Blue	4.5 - 10.0	25.0
6	DRV7(G)B6(N)	5 or 5N	Red	8.0 - 20.0	25.0

* DN32 to DN50 Range 0.15 - 0.6, DN65 to DN100 Range 0.3 - 0.6

** DN65 to DN100 Range 0.4 - 1.2.

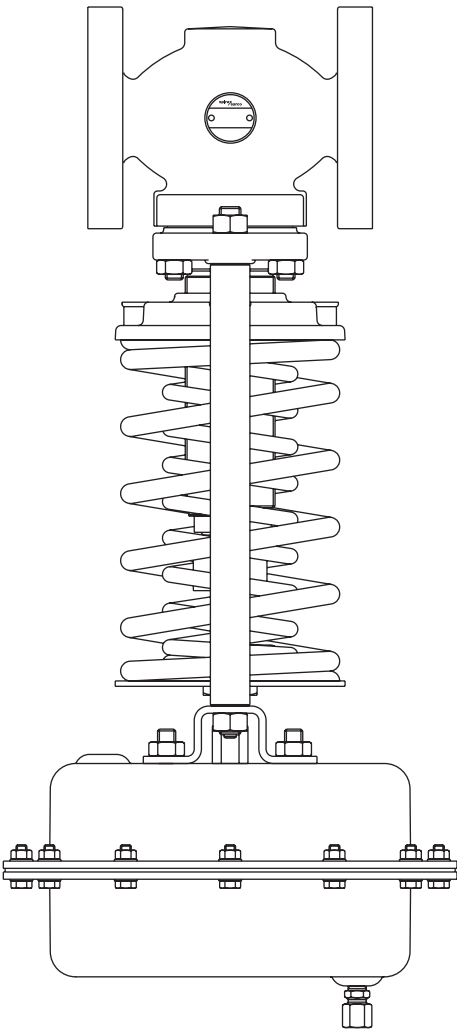
Sizes and pipe connections

DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80 and DN100.
Standard flanges: EN 1092 PN16 and PN25
Flanges available on request: ASME 150 and JIS

K_v values

Size DN	15	20	25	32	40	50	65	80	100
K _v	3.4	6.5	11.4	16.4	24	40	58	92	145

Note: The K_v values shown above are full capacities and should be used for safety valve sizing purposes where they are required.

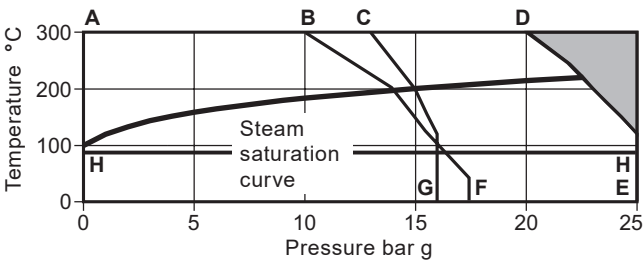


Flanged
DN15 to DN100

Control systems

Pressure reducing/surplussing valves

Pressure / temperature limits



The product **must not** be used in this region.

A-D-E Flanged EN 1092 PN25

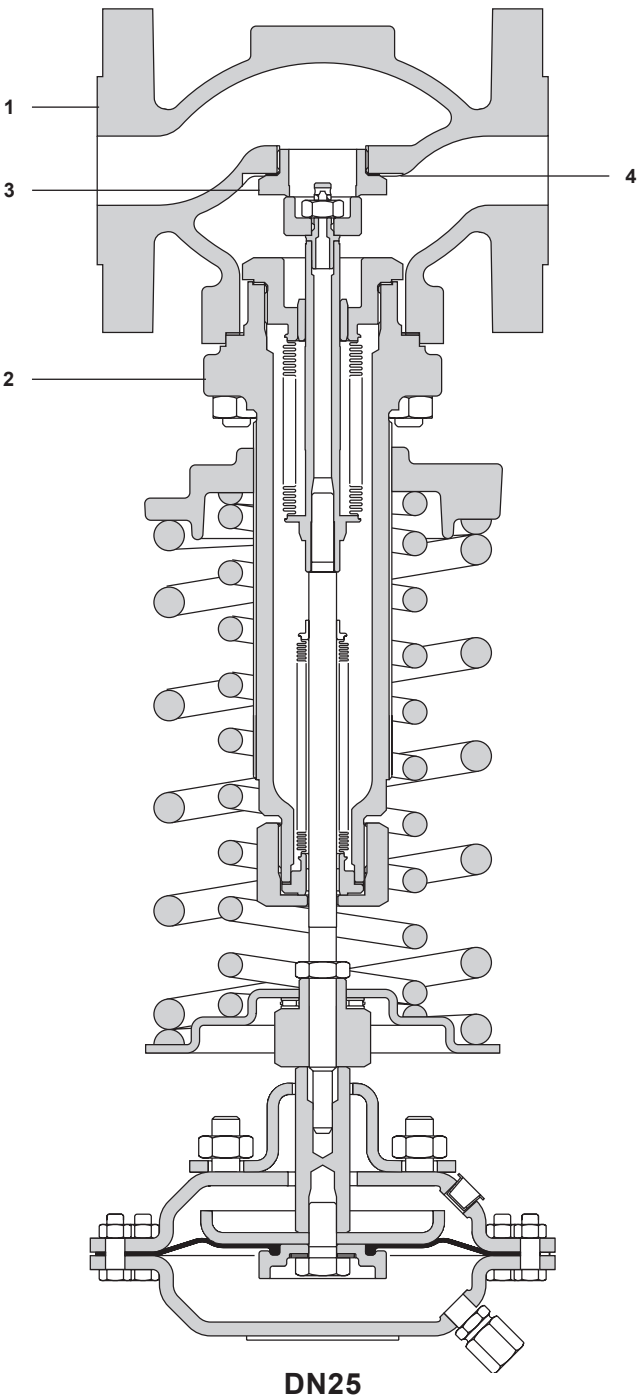
A-C-G Flanged EN 1092 PN16

A-B-F Flanged ASME 150.

H-H The DRV7G is limited to 90 °C

Body design conditions		PN25
Maximum design pressure		25 bar g @ 100 °C
Maximum design temperature	DRV7	300 °C @ 17.5 bar g
	DRV7G	90 °C @ 25 bar g
Minimum design temperature		0 °C
Maximum operating temperature	DRV7	300 °C @ 17.5 bar g
	DRV7G	90 °C @ 25 bar g
Minimum operating temperature		0 °C
Note: For lower operating temperatures consult Spirax Sarco		
Maximum differential pressure	DN15- DN50	25 bar
	DN65- DN100	20 bar
Designed for a maximum cold hydraulic test pressure of 38 bar g		
Note: With internals fitted, test pressure must not exceed 25 bar g		

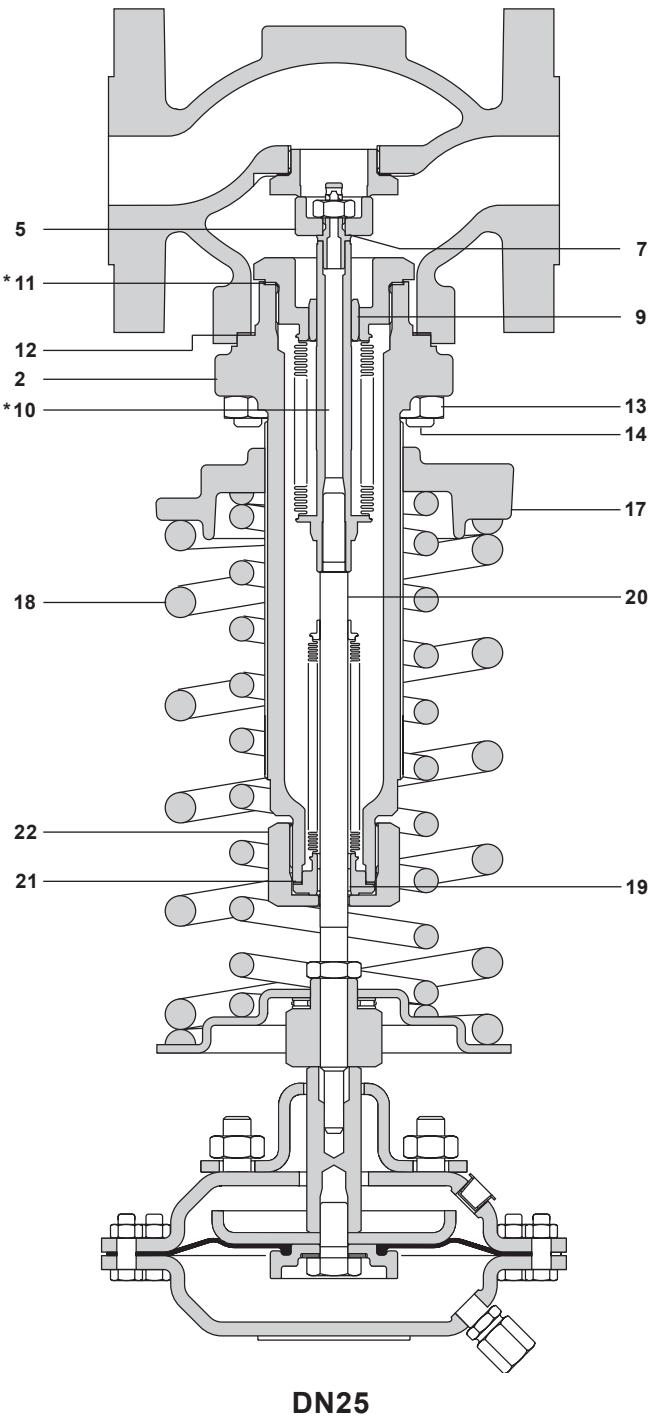
Materials



No.	Part	Material	
1	Body	DN15 to DN50	SG iron DIN 1693 GGG 40.3
		DN65 to DN100	SG iron ENG JS 400-18-LT
2	Bonnet	SG iron	DIN 1693 GGG 40.3
3	Valve seat	Stainless steel	BS 970 431 S29
4	Valve seat gasket	DN15	Stainless steel
		DN20 and DN25	Mild steel
		DN32 to DN50	Reinforced exfoliated graphite

Materials (continued)

No. Part		Material		
5	Valve head	DRV7	Stainless steel	BS 970 431 S29
		DRV7G (soft seated)	Stainless steel / Nitrile	BS 970 431 S29
6	Valve head screw	DN15 and DN20	Stainless steel	BS 6105 A2
7	Valve head seal		Arlon 1555	
8	Bush	DN15 and DN20	Stainless steel	BS 970 431 S29
9	Bush (part of item 10)	DN25 to DN100	Stainless steel	BS 970 431 S29
10	Balancing bellows assembly	DN25 to DN100	Stainless steel	AISI 316 (L)
11	Balancing bellows gasket	DN25 to DN100	Reinforced exfoiliated graphite	
12	Bonnet gasket		Reinforced exfoiliated graphite	
13	Bonnet nuts		Steel	DIN 267 Pt13 Gr. 8
14	Bonnet studs	DN15 to DN40 M10	Steel	DIN 267 Pt13 Gr. 8.8
		DN50 and DN65 M12		
		DN80 and DN100 M16		
15	Pillars		Steel zinc plated	BS 970 230 M07
16	Pillars nuts		Steel zinc plated	BS 3693 Gr. 8
17	Spring adjuster		Cast iron zinc plated	DIN 1691 GG25
18	Spring(s)		Chrome Vanadium	
19	Bush (part of 20)		PTFE / steel composite	
20	Sealing bellows assembly		Stainless steel	AISI 316(L)
21	Sealing bellows gasket	DN15 and DN20	Stainless steel 'S' type	
		DN25 to DN100	Reinforced exfoiliated graphite	
22	Clamp nut	DN25 to DN100	Steel zinc plated	BS 970 230 M07



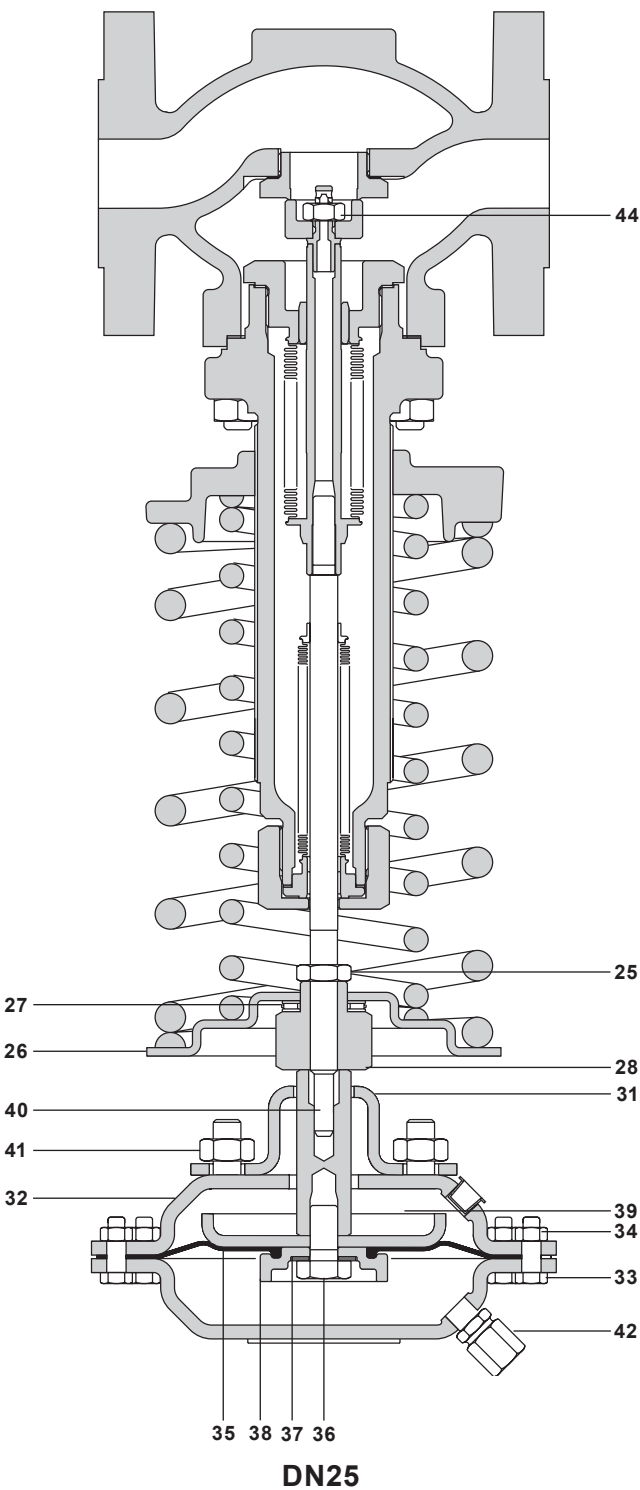
* Please note:
Parts numbered 10 and 11 are for DN25 to DN100 only

Control systems

Pressure reducing/surplussing valves

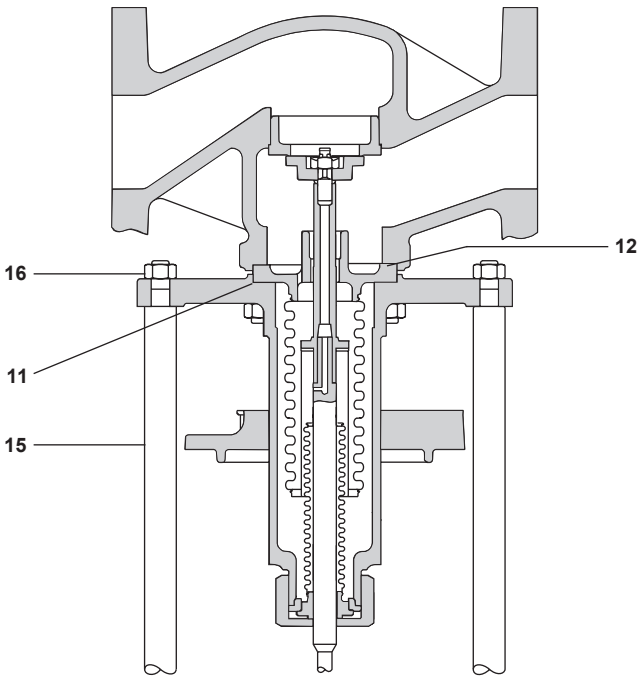
Materials (continued)

25	Lock-nut	DN32 to DN50	Steel zinc plated	BS 970 230 M07
		DN15 to DN25, DN65 to DN100	Steel zinc plated	BS 3692 Gr. 8
26	Spring plate		Steel zinc plated	BS 1449 Pt1 HR14
27	Needle bearing		Steel	
28	Setting nut		Steel zinc plated	BS 970 230 M07
29	Bearing plate	DN32 to DN50	Steel zinc plated	BS 1449 Pt1 HR14
30	Circlip	DN32 to DN50	Steel zinc plated	
31	Mounting plate	DN25 to DN50	Steel zinc plated	BS 1449 Pt1 HR14
32	Housing	Types 1(N) to 4(N)	Steel	DIN 1514 St W24
		Type 5(N)	Steel	BS EN 10025 S355 J2G3
33	Housing screws	Types 1(N)	Steel zinc plated	BS 3692 Gr. 5.6
		Types 2(N), 3(N), 4(N) and 5(N)	Steel zinc plated	BS 3692 Gr. 8.8
34	Housing nuts	Types 1(N)	Steel zinc plated	BS 3692 Gr. 5
		Types 2(N), 3(N), 4(N) and 5(N)	Steel zinc plated	BS 3692 Gr. 8
35	Diaphragm		EPDM fabric reinforced	
		Diaphragm suffix 'N'	Nitrile fabric reinforced	
36	Hex. headed bolt		Stainless steel	BS 6105 A2
37	Sealing washer		Fibre	
38	Diaphragm clamp		Stainless steel	ASTM A351 CF8M
39	Piston		Steel zinc plated	BS 1449 Pt1 HR14
40	Spindle		Steel zinc plated	BS 970 230 M07
41	Mounting nuts		Steel zinc plated	BS 3692 Gr. 8
42	Coupling		Steel zinc plated	
43	Thread insert	DN15 and DN20	Stainless steel	DTD 734
44	Self-locking nut	DN25 to DN100	Stainless steel	BS 6105 A2



Materials (continued)

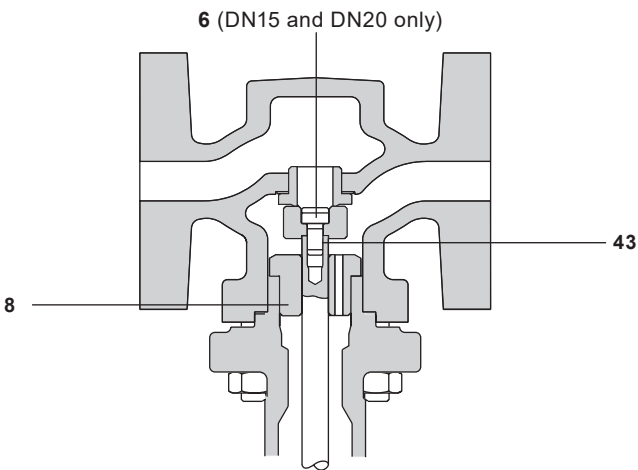
No.	Part		Material	
6	Valve head screw	DN15 and DN20	Stainless steel	BS 6105 A2
8	Bush	DN15 and DN20	Stainless steel	BS 970 431 S29
11	Balancing bellows gasket	DN25 to DN100	Reinforced exfoiliated graphite	
12	Bonnet gasket		Reinforced exfoiliated graphite	
15	Pillars		Steel zinc plated	BS 970 230 M07
16	Pillars nuts		Steel zinc plated	BS 3693 Gr. 8
25	Lock-nut	DN32 to DN50	Steel zinc plated	BS 970 230 M07
		DN15 to DN25, DN65 to DN100	Steel zinc plated	BS 3692 Gr. 8
28	Setting nut		Steel zinc plated	BS 970 230 M07
29	Bearing plate	DN32 to DN50	Steel zinc plated	BS 1449 Pt1 HR14
30	Circlip	DN32 to DN50	Steel zinc plated	
43	Thread insert	DN15 and DN20	Stainless steel	DTD 734



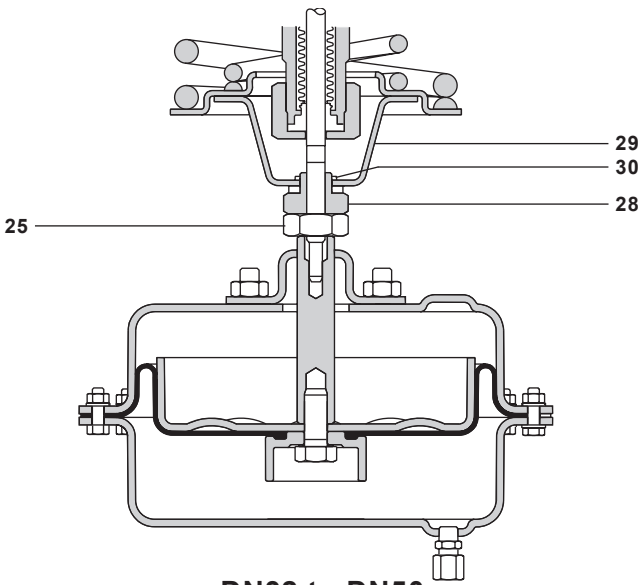
DN65 to DN100

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DN15 and DN20



DN32 to DN50

Control systems

Pressure reducing/surplussing valves

Spare parts for the DN15 and DN20 valves

The spare parts available for sizes DN15 and DN20 valves are detailed below. No other parts are supplied as spares.

The listed parts are for the following valve types:	Valve assemblies	DRV7	Stainless steel seated
		DRV7G	Nitrile soft seated
	Actuator assemblies	Types 1 to 5	EPDM diaphragm
		Types 1N to 5N	Nitrile diaphragm

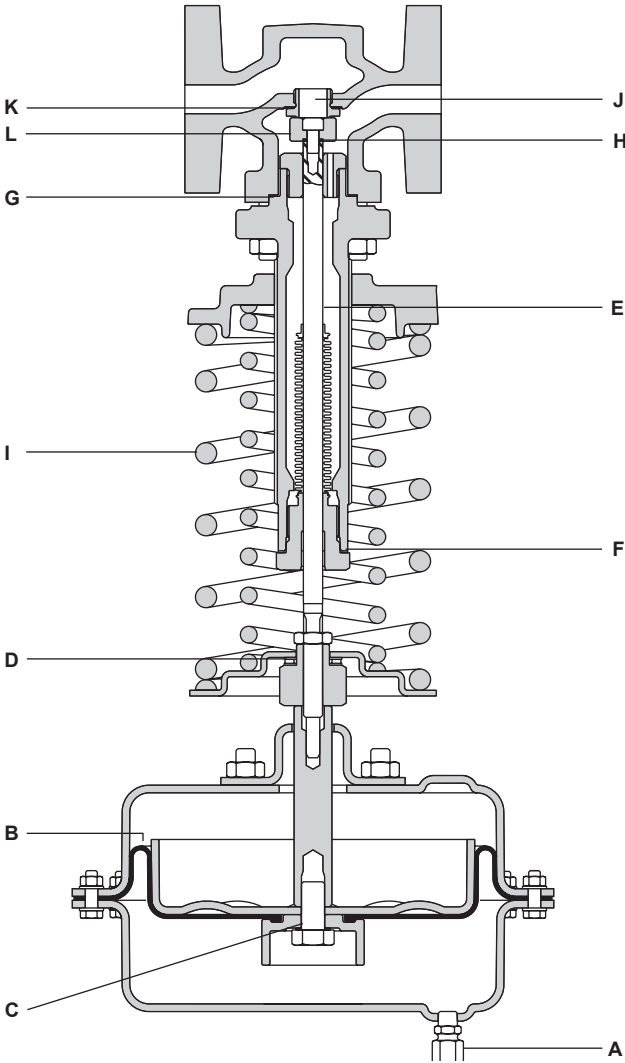
Available spares

Coupling		A
Diaphragm set	Diaphragm and sealing washer.	B, C
Needle bearing		D
Sealing bellows set	Sealing bellows assembly, sealing bellows gasket and bonnet gasket.	E, F, G
Control spring(s)		I
Seat/head set	Seat, seat gasket, head, bonnet gasket and head seal.	J, K, L, G, H
Gasket set	Sealing bellows gasket, bonnet gasket and seat gasket.	F, G, K

How to order spares
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example: 1 - Gasket set for a Spirax sarco DN15 DRV7B1 pressure reducing valve.

How to fit spares
Full fitting instructions are given in the Installation and Maintenance Instructions supplied with the spare(s).



DN15 and DN20

Spare parts for the DN25 to DN100 valves

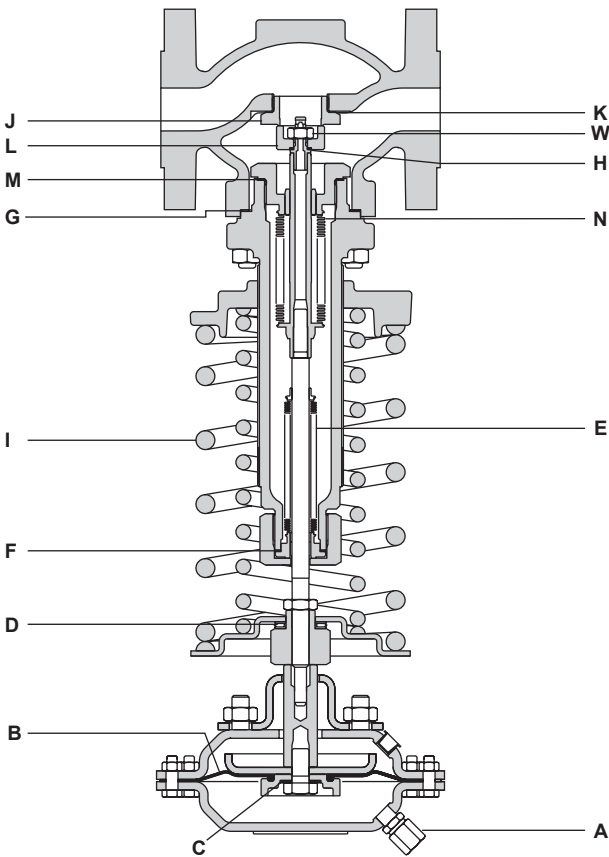
The spare parts available for sizes DN25 to DN100 valves are detailed below. No other parts are supplied as spares.

The listed parts are for the following valve types:

Valve assemblies	DRV7	Stainless steel seated
	DRV7G	Nitrile soft seated
Actuator assemblies	Types 1 to 5	EPDM diaphragm
	Types 1N to 5N	Nitrile diaphragm

Available spares

Coupling		A
Diaphragm set Diaphragm and sealing washer.		B, C
Needle bearing		D
Sealing bellows set Sealing bellows assembly, and sealing bellows gasket.		E, F
Control spring(s)		I
Seat/head set DN25 to DN50 Seat, seat gasket, head, self-locking nut, head seal and bonnet gasket.	J, K, L, W, H, G	
Head set DN65 to DN100 Head, self-locking nut, head seal, bonnet gasket and balancing bellows gasket.	L, W, H, G, M	
Balancing bellows set DN25 to DN50 Balancing bellows assembly, balancing bellows gasket, bonnet gasket, head seal, self-locking nut, sealing bellows gasket.	N, M, G, H, W, F	
Balancing bellows set DN65 to DN100 Balancing bellows assembly, balancing bellows gasket, bonnet gasket, self-locking nut and head seal.	N, M, G, W, H	
Gasket set DN25 to DN50 Sealing bellows gasket, bonnet gasket, seat gasket and balancing bellows gasket.	F, G, K, M	
Gasket set DN65 to DN100 Sealing bellows gasket, bonnet gasket and balancing bellows gasket.	F, G, M	



DN25 to DN50

4.6

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Available spares for DN65 to DN100 on the next page

Control systems

Pressure reducing/surplussing valves

Available spares

Coupling	A
Diaphragm set Diaphragm and sealing washer.	B, C
Needle bearing	D
Sealing bellows set Sealing bellows assembly, and sealing bellows gasket.	E, F
Control spring(s)	I
Seat/head set DN25 to DN50 Seat, seat gasket, head, self-locking nut, head seal and bonnet gasket.	J, K, L, W, H, G
Head set DN65 to DN100 Head, self-locking nut, head seal, bonnet gasket and balancing bellows gasket.	L, W, H, G, M
Balancing bellows set DN25 to DN50 Balancing bellows assembly, balancing bellows gasket, bonnet gasket, head seal, self-locking nut, sealing bellows gasket.	N, M, G, H, W, F
Balancing bellows set DN65 to DN100 Balancing bellows assembly, balancing bellows gasket, bonnet gasket, self-locking nut and head seal.	N, M, G, W, H
Gasket set DN25 to DN50 Sealing bellows gasket, bonnet gasket, seat gasket and balancing bellows gasket.	F, G, K, M
Gasket set DN65 to DN100 Sealing bellows gasket, bonnet gasket and balancing bellows gasket.	F, G, M

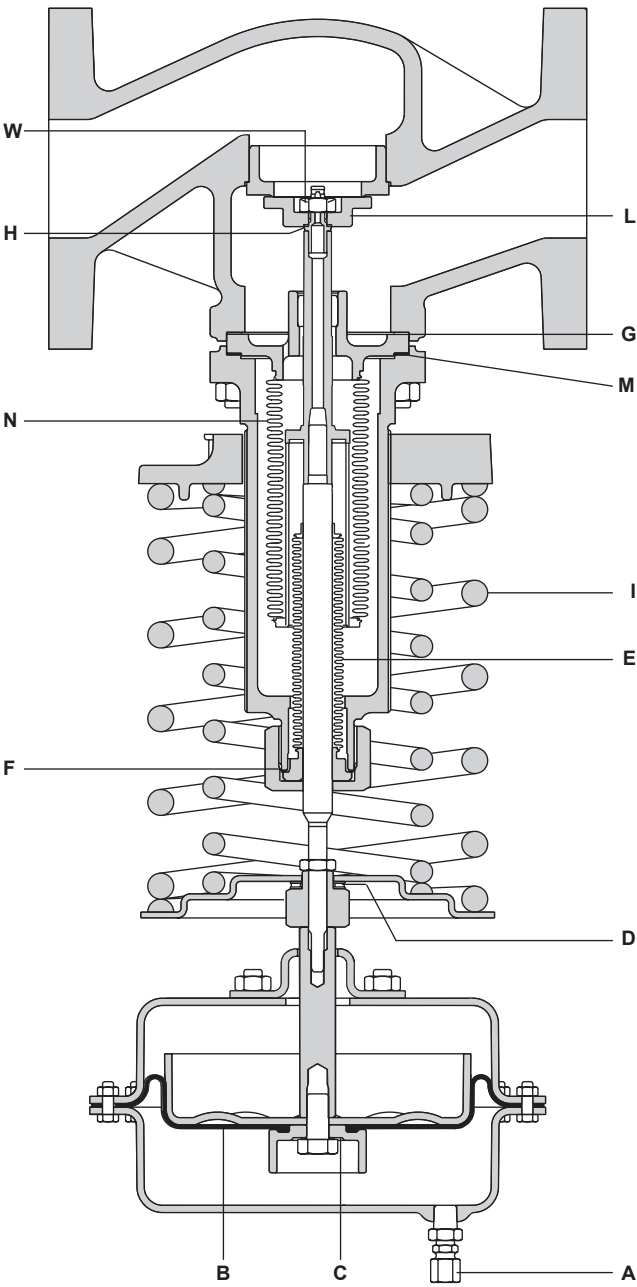
How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example: 1 - Gasket set for a Spirax sarco DN25 DRV7B1 pressure reducing valve.

How to fit spares

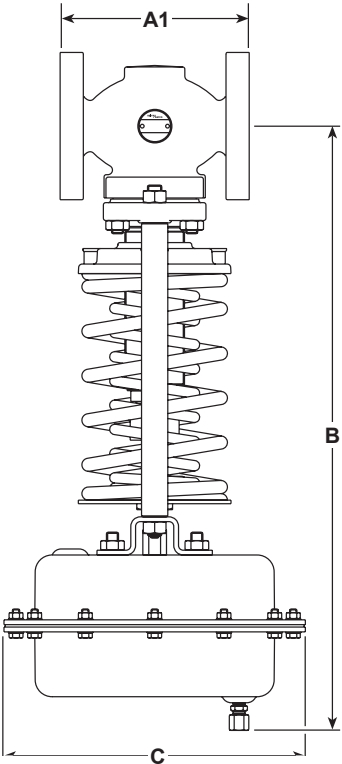
Full fitting instructions are given in the Installation and Maintenance Instructions supplied with the spare(s).



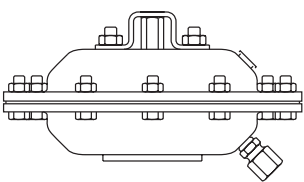
DN65 to DN100

Dimensions (approximate) in millimetres

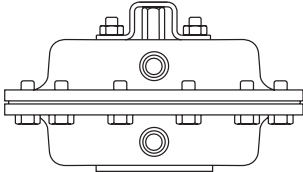
Size	Flanged		Actuator type									
	EN 1092 PN25	ASME 150	1		2		3		4		5 + 6	
	A1	A1	B	C	B	C	B	C	B	C	B	C
DN15	130	127	537	305	511	250	426	208	426	168	411	143
DN20	150	143	537	305	511	250	426	208	426	168	411	143
DN25	160	153	546	305	520	250	435	208	435	168	420	143
DN32	180	176	608	305	582	250	497	208	497	168	482	143
DN40	200	198	608	305	582	250	497	208	497	168	482	143
DN50	230	229	611	305	585	250	500	208	500	168	485	143
DN65	290	295	633	305	607	250	522	208	522	168	507	143
DN80	310	314	639	305	613	250	528	208	528	168	513	143
DN100	350	350	744	305	718	250	633	208	633	168	618	143



DRV with
flanged connections and
Type 1/1N or 2/2N actuator



Type 3/3N or 4/4N
actuator arrangement



Type 5/5N actuator
arrangement

Control systems
Pressure reducing/surplussing valves

Valve weight (kg)

Valve size		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
Weight	Yellow spring	10.8	11.8	14	18.8	20.4	23.0	31.7	38.2	53.9
	Blue spring	10.8	11.8	14	18.8	20.4	23.0	31.7	38.2	53.9
	Red spring	11.8	12.8	15	20.2	21.8	24.4	33.5	40.0	56.5
Reduction for Screwed body		-1.7	-2.2	-2.2	-3.6	-3.9	-5.5	-	-	-

Note: To calculate the total product weight add the valve and actuator weights together.

Actuator weight (kg)

Actuator type	1 or 1N	2 or 2N	3 or 3N	4 or 4N	5 or 5N
Weight	12.3	6.5	3.9	2.5	2.6

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S12-04) supplied with the product.

Installation note:

Caution - To protect the actuator diaphragm on steam applications a WS4 series water seal pot must be installed in the downstream pressure signal line to the actuator. Refer to TI-S12-03 for details.

The valve should be mounted vertically downwards in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body. For applications with downstream temperatures below 125 °C the valve can alternatively be mounted vertically upwards.

How to order

Example: 1 off Spirax Sarco DN40 DRV7B3 direct acting pressure reducing valve having flanged PN40 connections.

Note: Add suffix 'N' if the Nitrile rubber diaphragm is required. i.e. DRV7B3N.