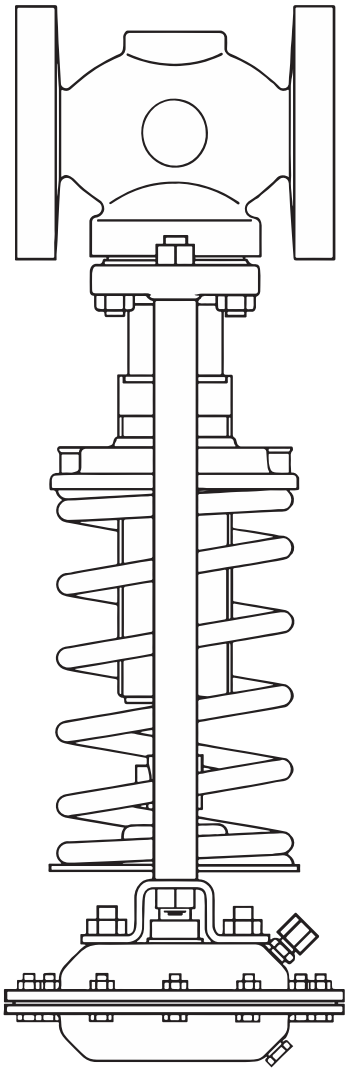
DEP4
Cast Steel
Excess Pressure Valve

Description

The **DEP4** is a cast steel direct acting bellows sealed excess pressure valve. The standard version as an EPDM diaphragm (limited to 125 °C) and is suitable for steam and water applications. Also available for oil applications is a Nitrile rubber diaphragm (suffix '**N**' i.e. DEP4B1N which is limited to 90 °C).
Note: To protect the actuator diaphragm on steam applications a WS4 water seal pot must be installed in the pressure signal line to the actuator. Refer to TI-S12-03 details.



Standards

The products listed below comply with the requirements of the European Pressure Equipment Directive (PED) and carry the CE mark when so required.

Certification

This product is available with a manufacturers' Typical Test Report and a certifcate of conformity to EN 10204 3.1 as an optional extra.
Note: All certification/inspection requirements must be stated at the time of order placement.

Available types

DN15 - DN100 flanged connections having 6 pressure ranges (suffix 1 - 6).

Upstream pressure ranges:

Range	Valve type	Actuator type	Spring colour	Pressure range (bar)			PN rating
				DN15 - DN40	DN50 - DN80	DN100	
1	**DEP4B1**	**11 or 11N**	Yellow	0.1 - 0.5	0.1 - 0.3	0.1 - 0.3	2.5
2	**DEP4B2**	**12 or 12N**	Yellow	0.2 - 0.8	0.2 - 0.5	0.2 - 0.5	2.5
3	**DEP4B3**	**13 or 13N**	Blue	0.5 - 1.7	0.4 - 1.3	0.4 - 1.0	6
4	**DEP4B4**	**14 or 14N**	Blue	1.4 - 3.4	1.0 - 2.6	0.8 - 2.5	16
5	**DEP4B5**	**15 or 15N**	Blue	3.2 - 7.5	2.3 - 5.5	2.3 - 5.0	25
6	**DEP4B6**	**15 or 15N**	Red	7.0 - 16.0	5.0 - 15.0	4.0 - 10.0	25

Sizes and pipe connections

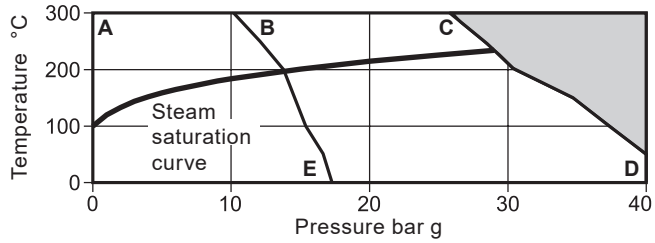
DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80 and DN100
Standard flange: EN 1092 PN40
Flanges available on request: ASME 150, ASME 300 and JIS.

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.

Pressure/temperature limits



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

A-C-D Flanged EN 1092 PN40 and ASME 300

A-B-E Flanged PN16

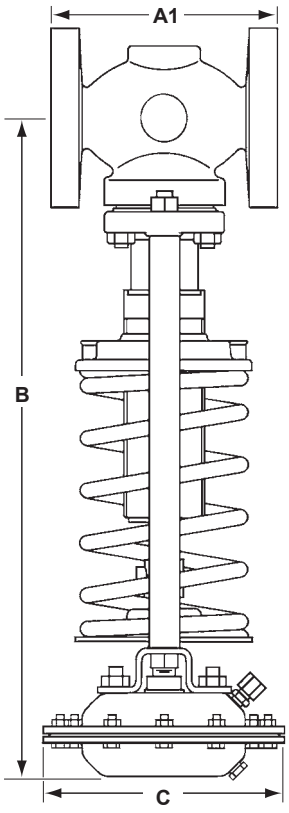
Note: In the case of liquid service, this product is to be used only on intermittant duty. Applications such as continuous pump recirculation may cause valve and pipework damage due to cavitation which is not covered under the terms of our warranty.

Body design conditions		PN40
Maximum design pressure		40 bar g @ 50 °C
Maximum design temperature		300 °C @ 25.8 bar g
Minimum design temperature		0 °C
Maximum operating temperature	EPDM diaphragm	125 °C
	Nitrile diaphragm	90 °C
Minimum operating temperature (ambient) **Note:** For lower operating temperatures consult Spirax Sarco		0 °C
Maximum differential pressure	DN15 - DN50	25 bar
	DN65 - DN100	20 bar
Designed for a maximum cold hydraulic test pressure of:		60 bar g
Note: With internals fitted, test pressure must not exceed:		40 bar g

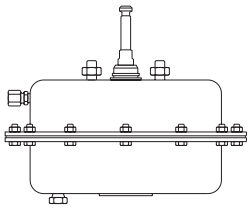
Dimensions (approximate) in millimetres

Size	EN 1092 PN40	Flanged ASME 300	ASME 150	Downstream pressure range									
				1		2		3		4		5 + 6	
	A1	A1	A1	B	C	B	C	B	C	B	C	B	C
DN15	130	130	127	553	305	516	250	459	208	459	168	459	143
DN20	150	150	143	553	305	516	250	459	208	459	168	459	143
DN25	160	162	153	562	305	525	250	468	208	458	168	468	143
DN32	180	181	176	632	305	595	250	538	208	538	168	538	143
DN40	200	203	198	632	305	595	250	538	208	538	168	538	143
DN50	230	233	229	635	305	598	250	541	208	541	168	541	143
DN65	290	297	295	635	305	598	250	541	208	541	168	541	143
DN80	310	319	314	637	305	600	250	543	208	543	168	543	143
DN100	350	366	350	744	305	707	250	650	208	650	168	650	143

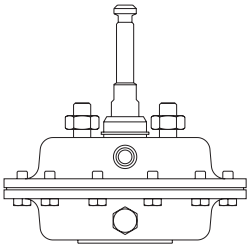
DEP with Type 13/13N or Type 14/14 actuator



Type 11/11N and 12/12N actuator arrangement



Type 15/15N actuator arrangement



Valve weight (kg)

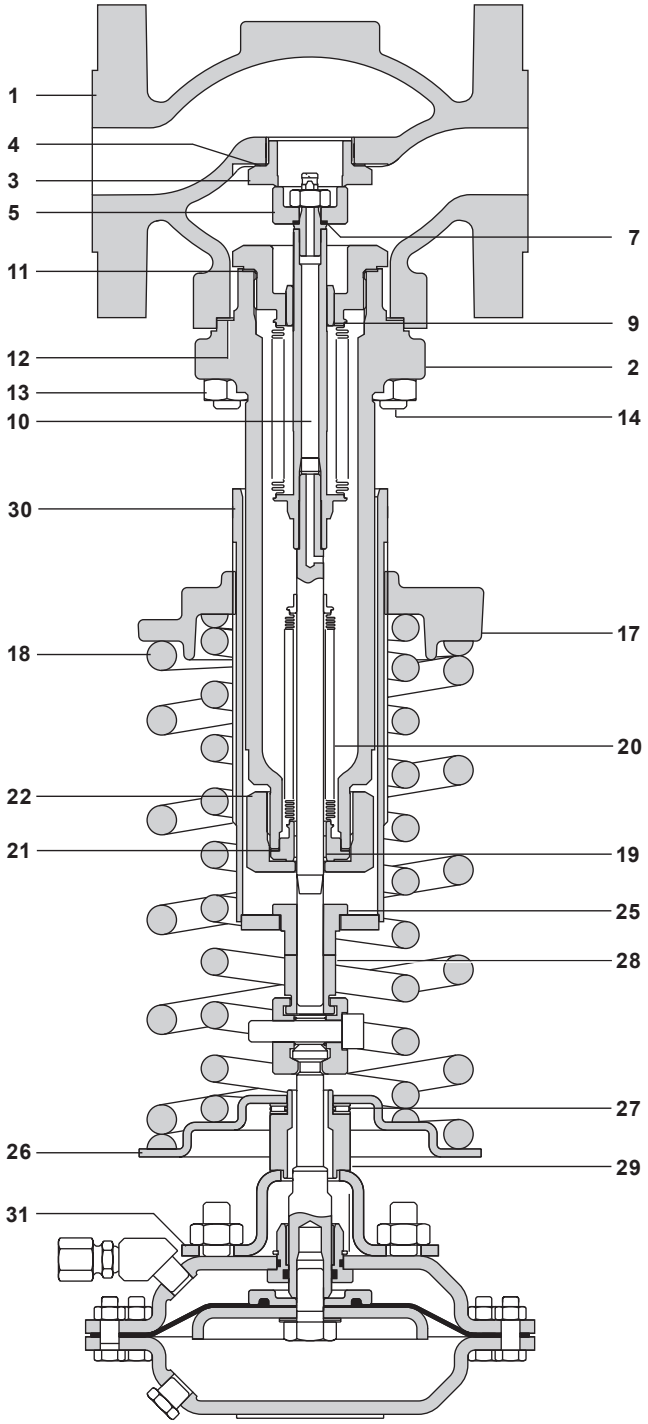
Valve size		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100
Weight	Yellow spring	11.6	13.3	16.7	21.4	23.7	26.3	37.7	46.0	69.8
	Blue spring	11.6	13.3	16.7	21.4	23.7	26.3	37.7	46.0	69.8
	Red spring	13.6	14.8	18.2	22.9	25.2	27.8	39.4	47.7	72.5

Actuator weight (kg)

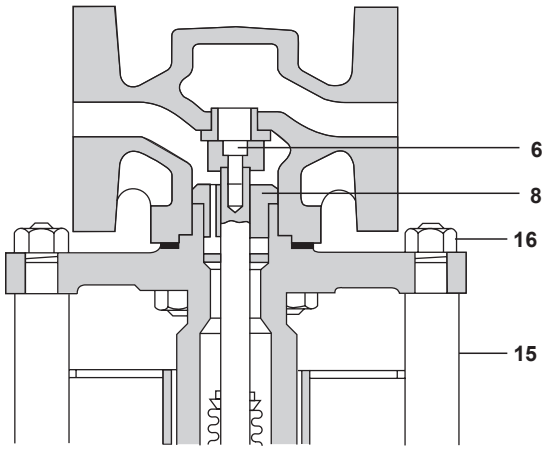
Actuator type	1 or 1N	2 or 2N	3 or 3N	4 or 4N	5 or 5N	Note:
Weight	12.3	6.5	4.0	2.6	2.7	To calculate the total product weight add the valve and actuator weights together.

Materials

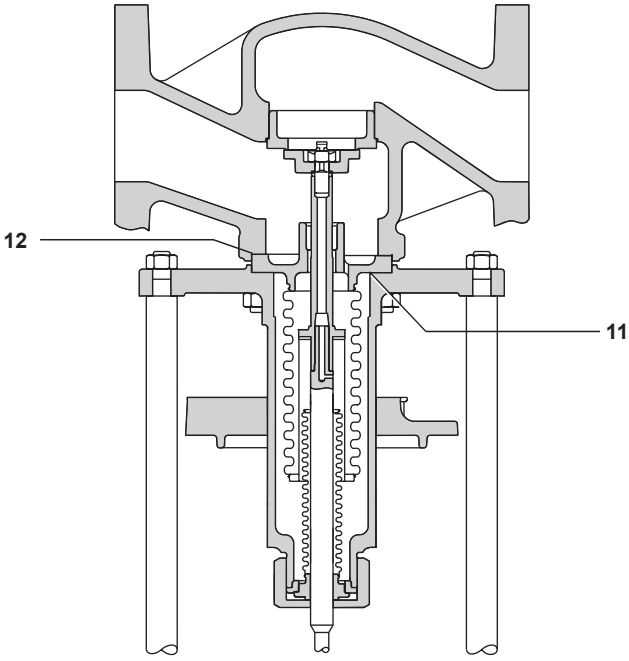
No.	Part			Material	
1	Body			Cast steel	GP 240 GH
2	Bonnet			Cast steel	DIN 17245 GSC25
3	Valve seat			Stainless steel	BS 970 431 S29
4	Valve seat gasket	DN15		Stainless steel	
		DN20 and DN25		Mild steel	
		DN32 to DN50		Reinforced exfoliated graphite	
5	Valve head			Stainless steel	BS 970 431 S29
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		AISI 316L	
11	Balancing bellows gasket	DN25 to DN100		Reinforced exfoliated graphite	
12	Bonnet gasket			Reinforced exfoliated graphite	
13	Bonnet nuts			Steel	DIN 267 Pt13 Gr. 8
14	Bonnet studs	DN15 to DN40	M10		
		DN50 and DN65	M12	Steel	DIN 267 Pt13 Gr. 8.8
		DN80 and DN100	M16		
15	Pillars			Zinc plated steel	BS 970 230 M07
16	Pillar nuts			Zinc plated steel	BS 3693 Gr. 8
17	Spring adjuster			Zinc plated cast iron	DIN 1691 GG25
18	Spring(s)			Chrome vanadium	
19	Bearing bush (part of item 20)			PTFE/steel composite	
20	Sealing bellows assembly			Stainless steel	AISI 316L
21	Sealing bellows gasket	DN15 and DN20		Stainless steel 'S' type	
		DN25 to DN100		Reinforced exfoliated graphite	
22	Clamp nut	DN25 to DN100		Zinc plated steel	BS 970 230 M07
25	Lock-nut			Zinc plated steel	BS 970 230 M07
26	Spring plate			Zinc plated steel	BS 1449 Pt 1 HR14
27	Needle bearing			Steel	
28	Setting nut			Zinc plated steel	BS 970 230 M07
29	Bearing locator			Zinc plated steel	BS 970 230 M07
30	Adjuster sleeve			Zinc plated steel	
31	Mounting plate			Zinc plated steel	BS 1449 Pt 1 HR14



DN25 to DN50 (part 46 is not shown)



DN15 and DN20

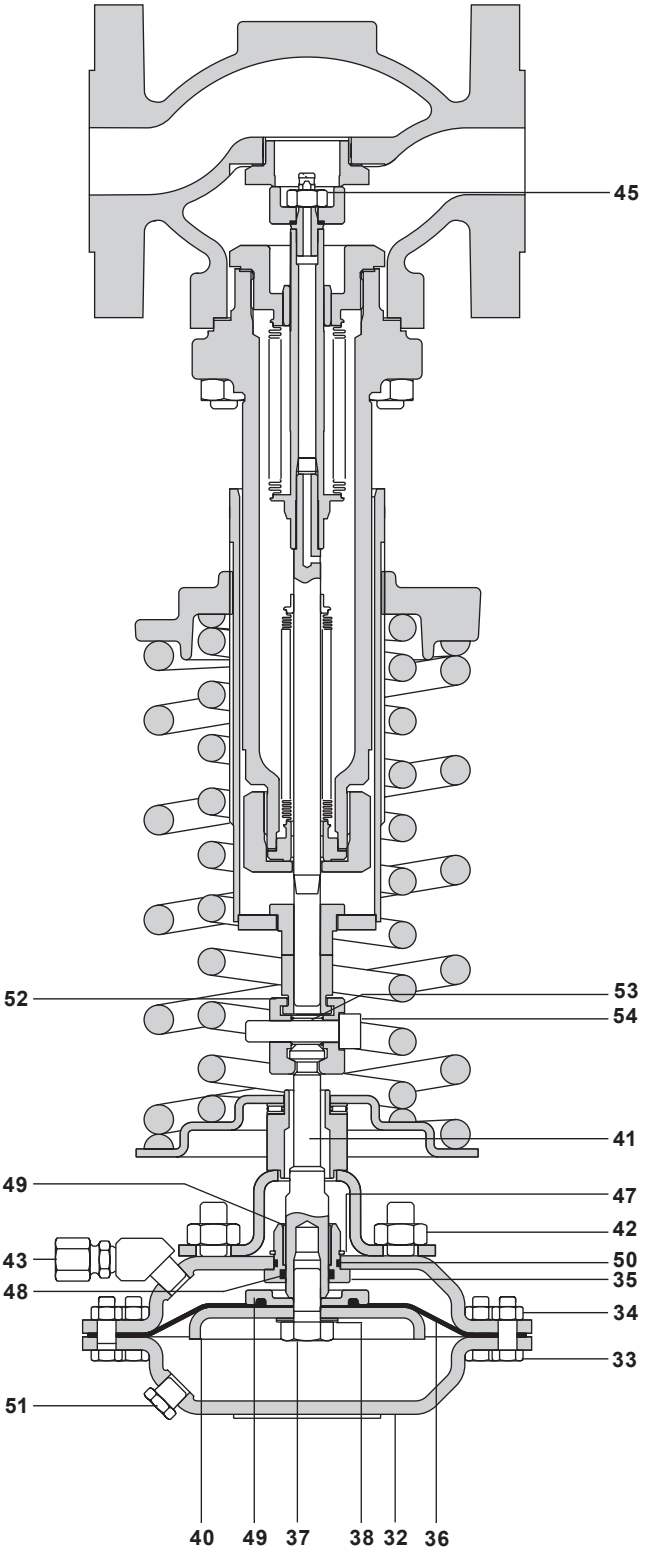


DN65 to DN100

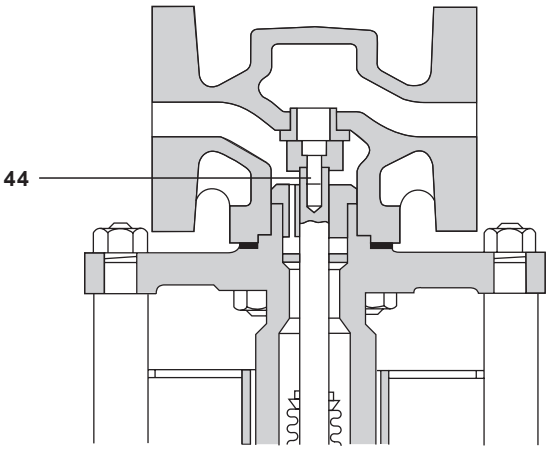
Materials are continued on the next page

Materials (continued)

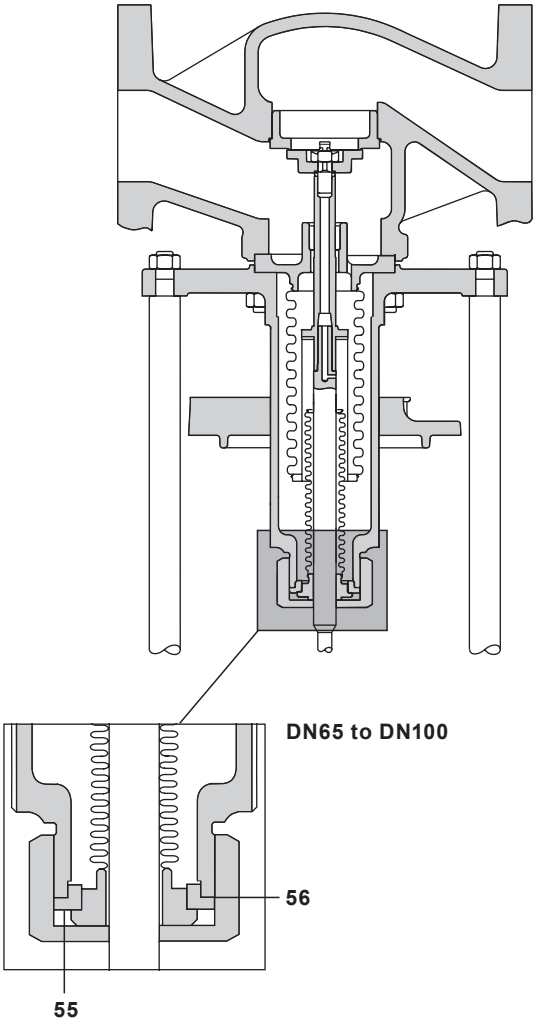
No.	Part		Material	
32	Housing	Types 11(N) to 14(N)	Steel	DIN 1514 St W24
		Type 15(N)	Steel	BS EN 10025 S355 J2G3
33	Housing screws	Types 11(N) to 12(N)	Zinc plated steel	BS 3692 Gr. 5.6
		Types 13(N), 14(N) and 15(N)	Zinc plated steel	BS 3692 Gr. 8.8
34	Housing nuts	Types 11(N) and 12(N)	Zinc plated steel	BS 3692 Gr. 5.6
		Types 13(N), 14(N) and 15(N)	Zinc plated steel	BS 3692 Gr. 8
35	Spindle guide		Stainless steel	BS 970 431 S29
36	Diaphragm		EPDM fabric reinforced or suffix 'N' Nitrile fabric reinforced	
37	Hexagon headed bolt		Stainless steel	BS 6105 A2
38	Sealing washer		Fibre	
39	Diaphragm clamp		Stainless steel	ASTM A351 CF8M
40	Piston		Zinc plated carbon steel	BS 1449 Pt 1 HR14
41	Spindle		Zinc plated carbon steel	BS 970 230 M07
42	Mounting nuts		Zinc plated steel	BS 3692 Gr. 8
43	Coupling		Zinc plated steel	
44	Thread insert	DN15 and DN20	Stainless steel	DTD 734
45	Self-locking nut	DN25 to DN100	Zinc plated steel	BS 1449 CR4
46	Washer	Type 12(N) only	Zinc plated steel	BS 1449 CR4
47	Cirlclip		Zinc plated steel	
48	Spindle seal 'O' ring		EPDM or suffix 'N' Nitrile	
49	Bearing bush		PTFE/steel composite	
50	Housing seal 'O' ring		EPDM or suffix 'N' Nitrile	
51	Vent plug		Plastic	
52	Coupling clamp		Zinc plated steel	ASTM A216 Gr. WCB
53	Spring		Spring steel	BS 5216 Gr. M4
54	Clamp screw		Zinc plated steel	BS 4168 Gr. 12.9
55	Clamp plate	DN65 to DN100 only	Stainless steel	ASTM A276 316L
56	Clamp plate gasket		Reinforced exfoliated graphite	



DN25 to DN50 (part 46 is not shown)



DN15 and DN20



DN65 to DN100

Sizing and selection for steam applications

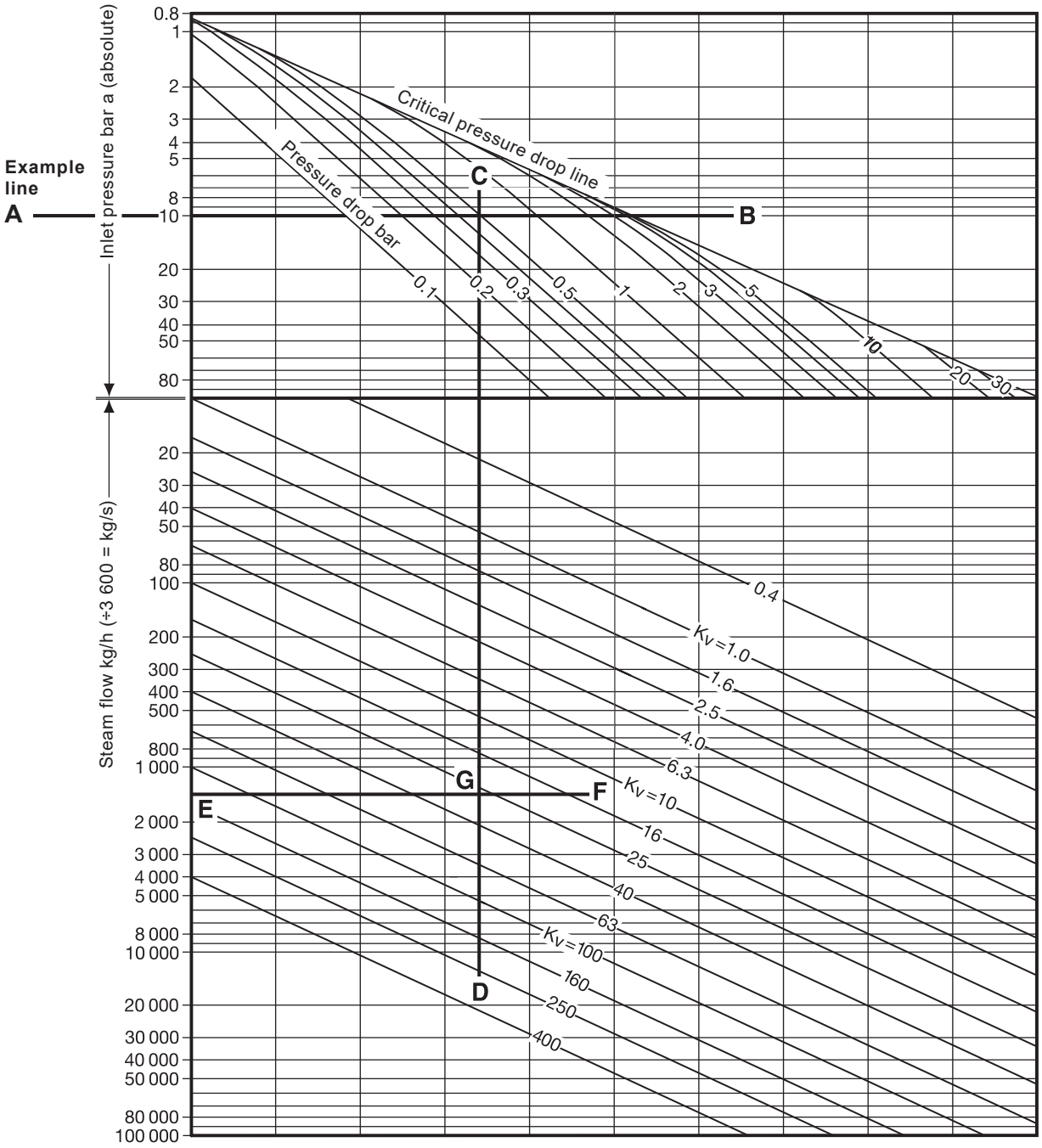
The sizing chart below can be used to determine the K_V value of the valve for steam applications by plotting:

- Upstream pressure.
- Maximum valve pressure drop.
- Maximum steam load.

Where the K_V value is known, the chart can be used to determine pressure drop across the valve for any given flowrate.

K_V sizing example:
Maximum flowrate 1 500 kg/h
Upstream pressure 9 bar g (10 abs)
Maximum pressure drop 0.5 bar

Draw a horizontal line **A - B** at 10 abs.
At intersection with 0.5 pressure drop draw a vertical line **C - D**.
Draw a vertical line **E - F** at 1 500 kg/h.
At intersection **G**, read the required K_V = 28.
Valve size required DN50 having the next highest K_V of 40.



Note: The sizing chart is empirical and should not be used for critical applications.

Sizing and selection for water applications

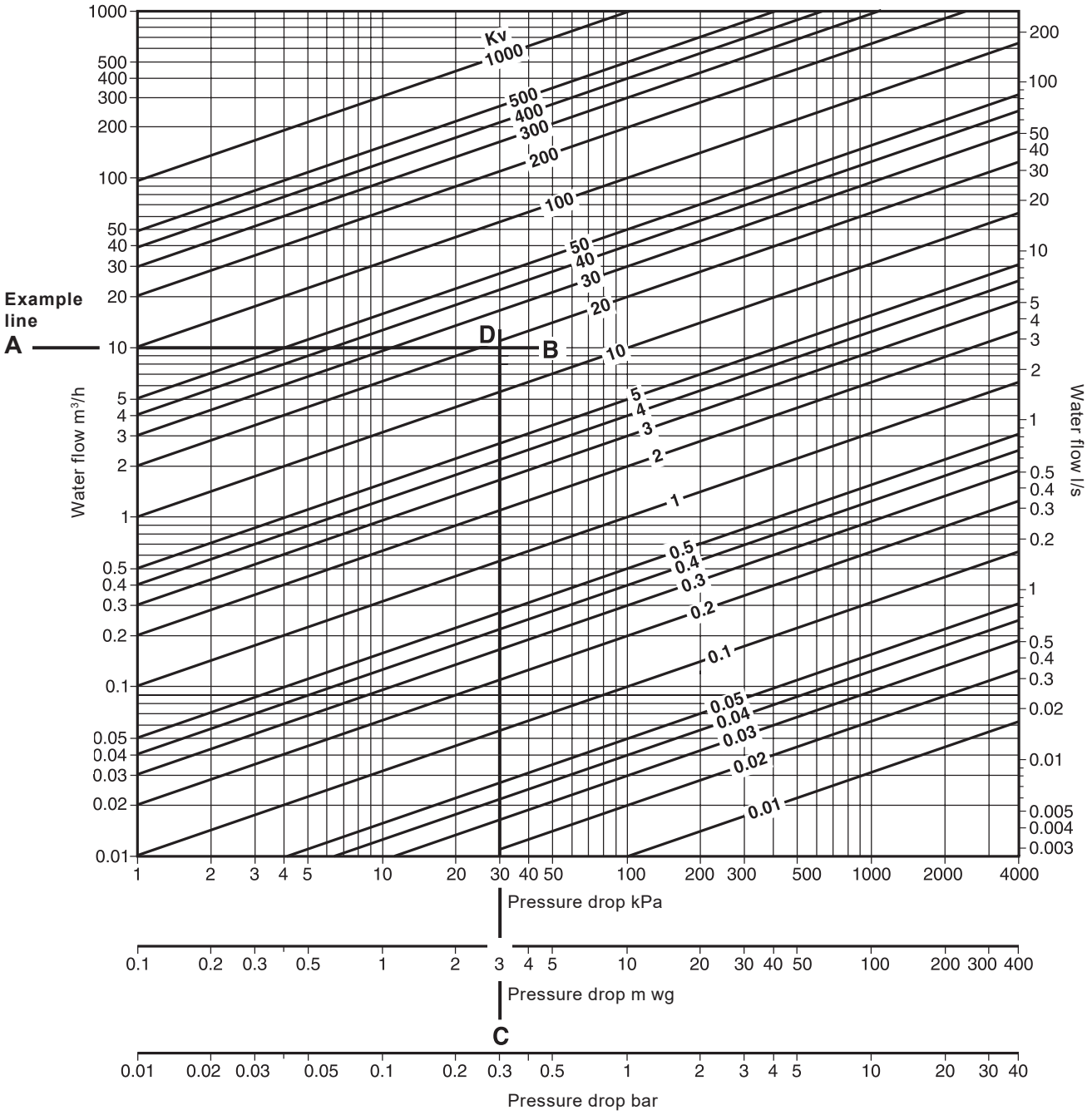
The sizing chart below can be used to determine the K_V value of the valve for water applications by plotting:

- Maximum flowrate.
- Maximum valve pressure drop.

Where the K_V value is known, the chart can be used to determine pressure drop across the valve for any given flowrate.

K_V sizing example:
Maximum flowrate 10 m³/h.
Maximum allowable pressure drop 0.3 bar.

Draw a horizontal line **A - B** at 10 m³/h.
Draw a vertical line **C - D** at 0.3 bar pressure drop.
At intersection **E**, read the required K_V = 19.
Valve size required DN40 having the next highest K_V of 24.



Note: The sizing chart is empirical and should not be used for critical applications.

Spare parts for the DN15 and DN20 valves

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

Available spares

Coupling		**A**
Diaphragm set	Diaphragm and sealing washer.	**B**, **C**
Needle bearing		**D**
Sealing bellows set	Sealing bellows assembly, sealing bellows gasket, bonnet gasket and head seal.	**E**, **F**, **G**, **H**
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**
Actuator spindle guide assembly	Spindle guide, bearing bush, spindle seal 'O' ring, housing seal 'O' ring and circlip.	**P**, **R**, **S**, **T**,

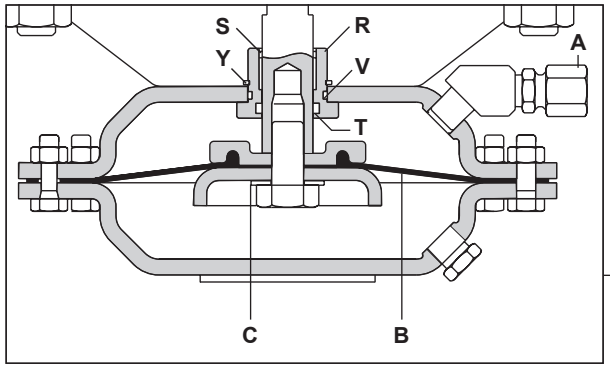
How to order spares

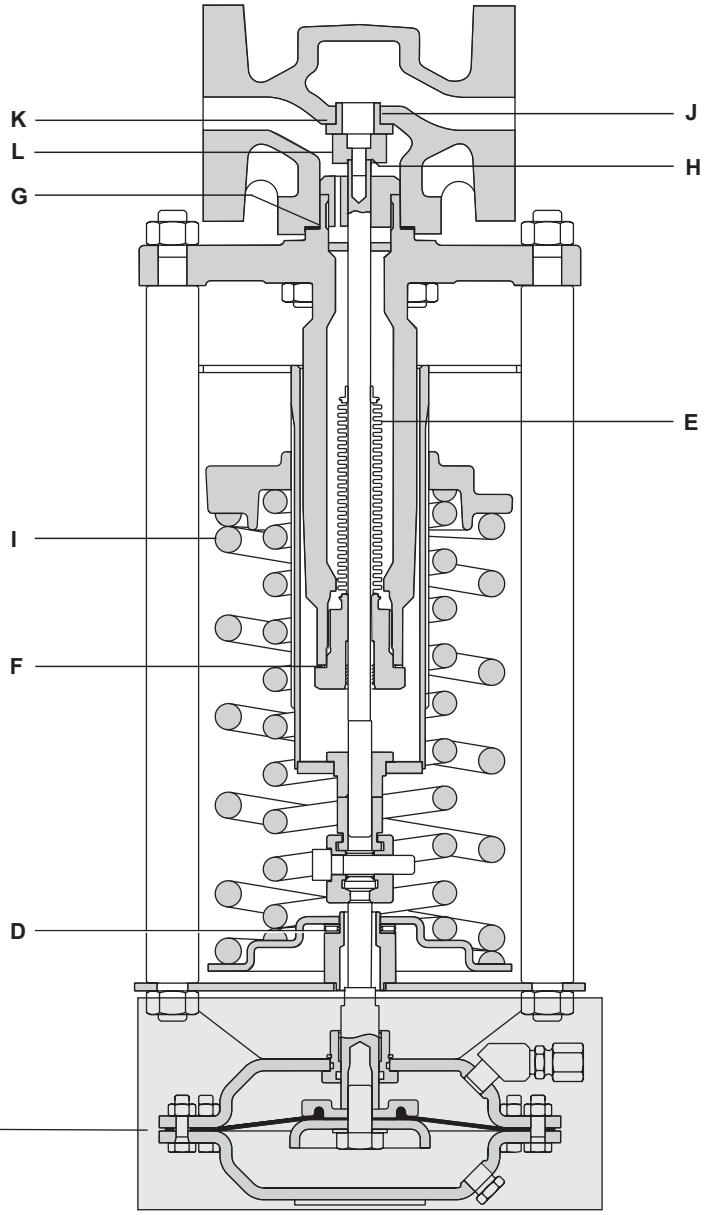
Always order spares by using the description given in the column headed 'Available spares' and state the size and type of valve.

Example: 1 - Gasket set for a Spirax Sarco DN15 DEP4B1 express pressure 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 DN50 valves

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

Available spares

Coupling	**A**
Diaphragm set	**B**, **C**
Diaphragm and sealing washer.	
Needle bearing	**D**
Sealing bellows set Sealing bellows assembly, sealing bellows gasket: - Clamp plate gasket DN65 to DN100.	**E**, **F**, **X**
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**
Balancing bellows set DN25 to DN50 Balancing bellows assembly, balancing bellows gasket,bonnet gasket, head seal, sealing bellows gasket.	**N**, **M**, **G**, **H**, **F**
Gasket set DN25 to DN50 Sealing bellows gasket, bonnet gasket, seat gasket, balancing bellows gasket.	**F, G, K, M**
Actuator spindle guide assembly Spindle guide, bearing bush, spindle seal 'O' ring, housing seal 'O' ring and circlip.	**P, R, S, T, V**

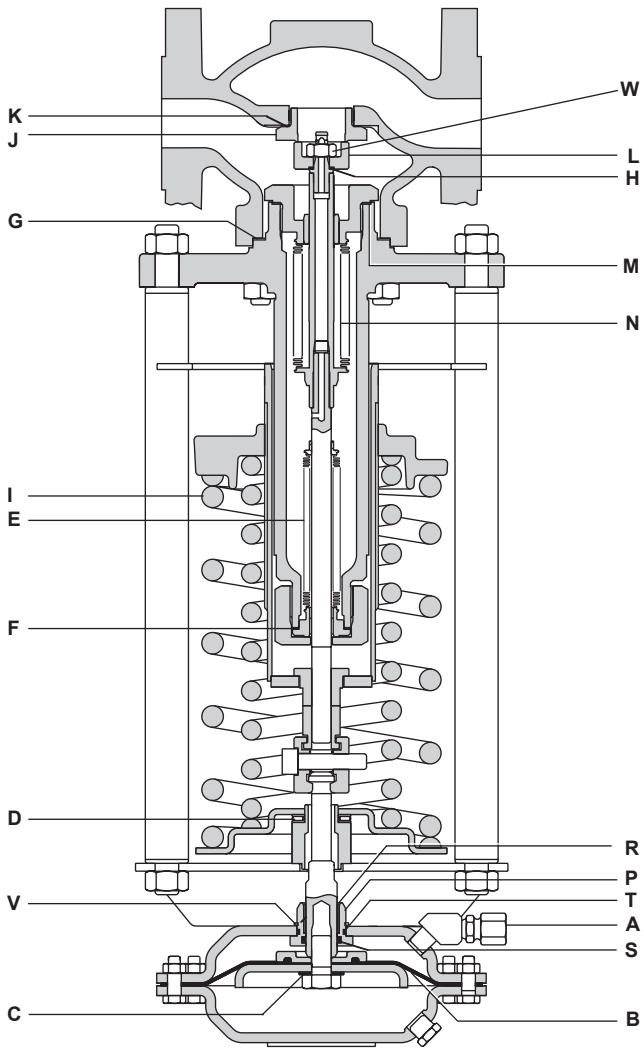
How to order spares

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 DN25 DEP4B1 excess pressure valve.

How to fit spares

For full fitting instructions see the Installation and Maintenance Instructions supplied with the spare(s).



DN25 to DN50

Spare parts for the DN65 to DN100 valves

The spare parts available for sizes DN65 to DN100 valves are detailed below. No other parts for these sizes are supplied as spares.

Available spares

Coupling	**A**
Diaphragm set	**B**, **C**
Diaphragm and sealing washer.	
Needle bearing	**D**
Sealing bellows set Sealing bellows assembly, sealing bellows gasket: - Clamp plate gasket DN65 to DN100.	**E**, **F**, **X**
Control spring(s)	**I**
Head set DN65 to DN100 Head, head seal, self-locking nut, bonnet gasket and balancing bellows gasket.	**L**, **H**, **W**, **G**, **M**
Balancing bellows set DN65 to DN100 Balancing bellows assembly, balancing bellows gasket, bonnet gasket and head seal.	**N, M, G, H**
Gasket set DN65 to DN100 Sealing bellows gasket, bonnet gasket, balancing bellows gasket and clamp plate gasket.	**F, G, M, X**
Actuator spindle guide assembly Spindle guide, bearing bush, spindle seal 'O' ring, housing seal 'O' ring and circlip.	**P, R, S, T, V**

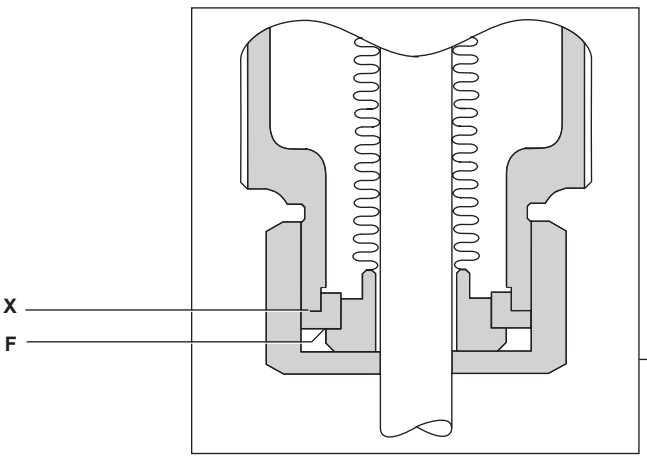
How to order spares

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

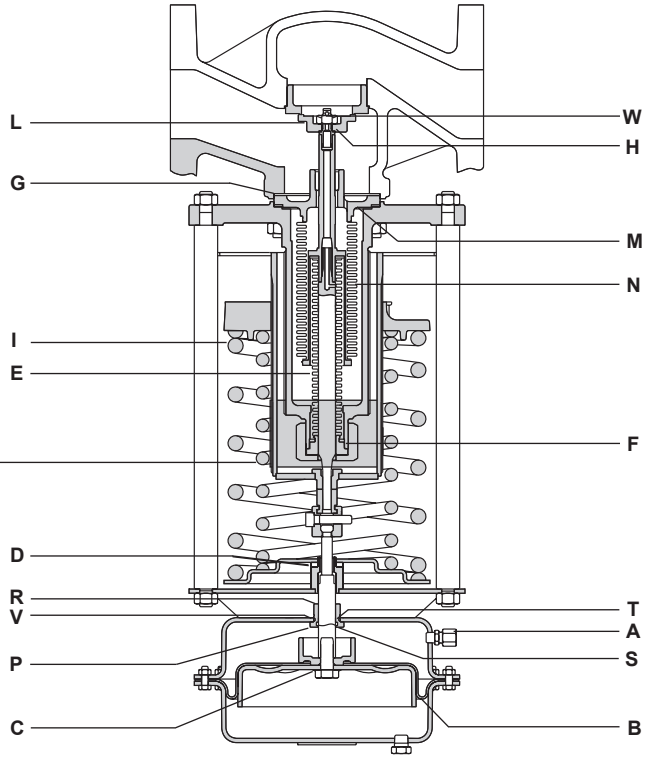
Example: 1 - Gasket set for a DN25 DEP4B1 excess pressure valve.

How to fit spares

For full fitting instructions see the Installation and Maintenance Instructions supplied with the spare(s).



DN65 to DN100



DN65 to DN100

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-S12-10) 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 upstream 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 DEP4B3 direct acting excess pressure valve having flanged PN40 connections.

Note: Add suffix 'N' if the Nitrile rubber diaphragm is required. i.e. DEP4B3N.