DP163, DP163G and DP163Y Pilot Operated Pressure Reducing Valves with Stainless Steel Bodies

Description

The DP163, DP163G and DP163Y pilot operated pressure reducing valves have been manufactured using stainless steel.

Available types

DP163	Suitable for steam applications
DP163G	Is a soft seal version available for compressed air and inert industrial gases. **Note:** It is not recommended for oxygen service.
DP163Y	Having a lower rate pressure control spring is suitable for steriliser/autoclave applications

Standards

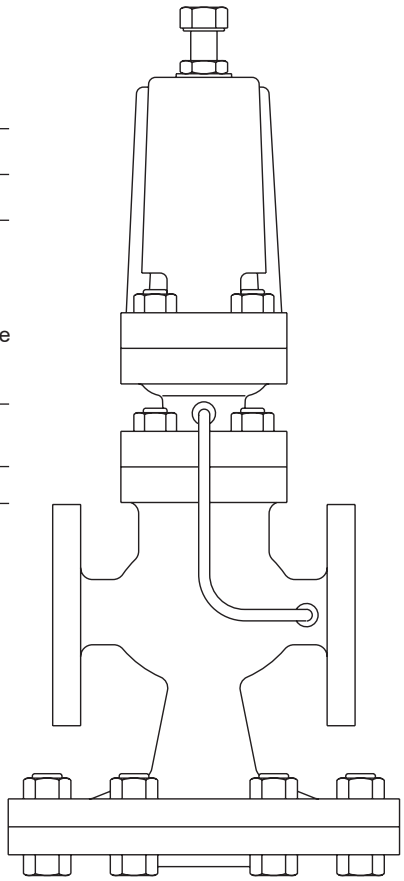
This product fully complies with the requirements of the EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations and carries the CE mark when so required.

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN15LC - Low Capacity version	DN15, DN20, DN25, DN32, DN40, DN50 and DN80. (½", ¾", 1", 1¼", 1½", 2", and 3")
Standard flanges:	EN 1092 PN25 and PN40, BS 10 Table 'J' and ASME (ANSI) 300.
Available on request:	ASME (ANSI) 150 and JIS 20.



Kv values

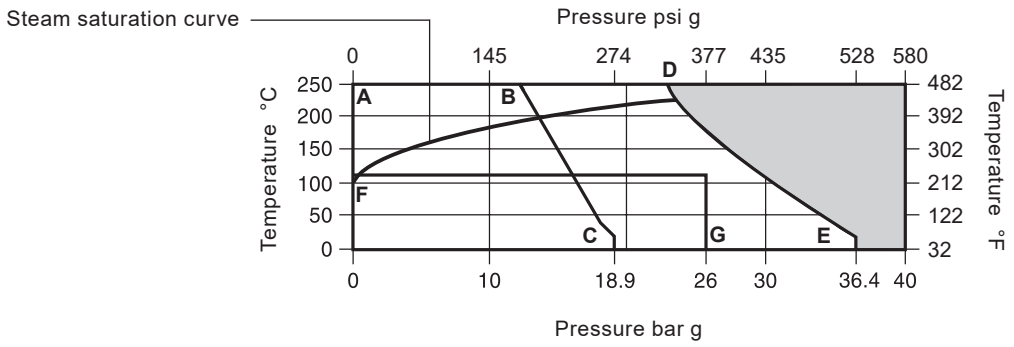
The Kv maximum values shown below are full capacities and should be used for safety valve sizing purposes only.

DN15LC	DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN80 (3")
1.0	2.8	5.5	8.1	12.0	17.0	28.0	64.0

For conversion:
Cv (UK) = Kv x 0.963
Cv (US) = Kv x 1.156

Note: Where the internal balance pipe is used the valve capacity will be reduced.

Pressure/temperature limits



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

A-D-E Flanged EN 1092 PN40, BS 10 Table J and ASME (ANSI) 300.

A-B-C Flanged ASME (ANSI) 150.

F-G DP163G limited to 120 °C @ 26 bar g (248 °F @ 377 psi g).

Note: Two colour coded pressure adjustment springs are available for the following downstream pressure ranges:

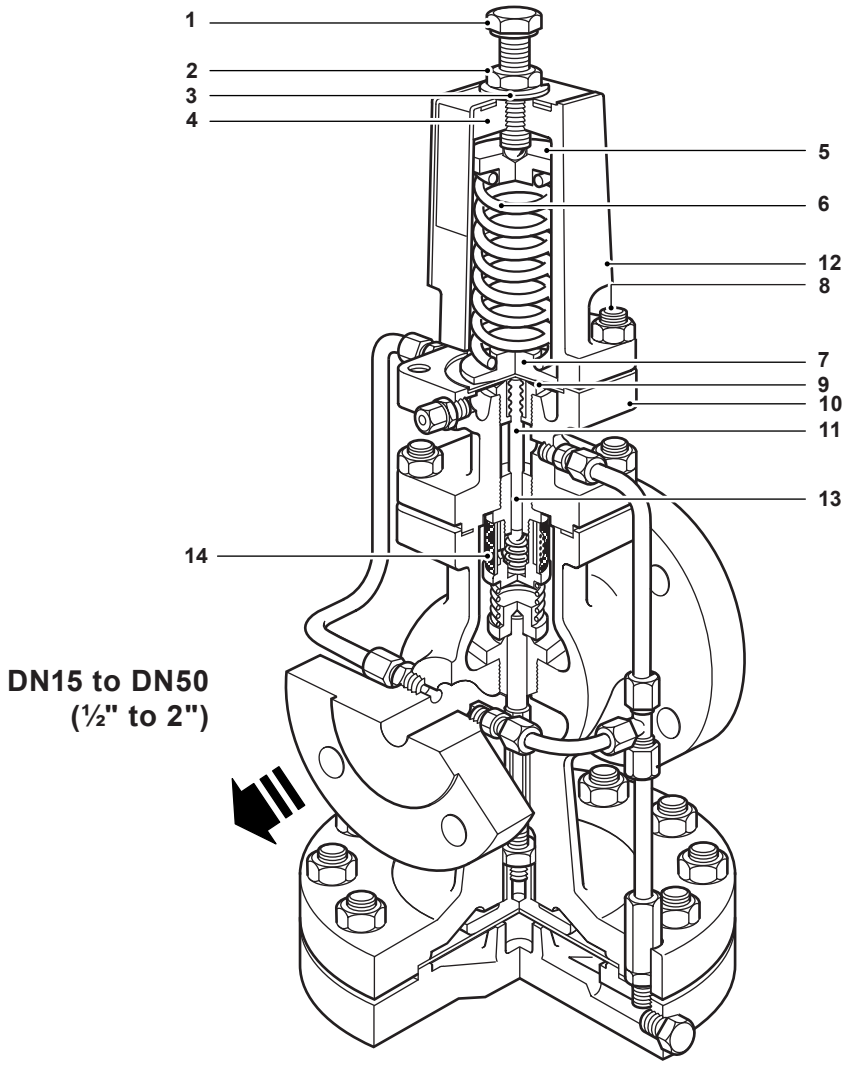
Red 0.2 bar g to 17 bar g (2.9 psi g to 247 psi g)

Grey 16.0 bar g to 21 bar g (232 psi g to 305 psi g)

Yellow 0.2 bar g to 3.0 bar g (2.9 psi g to 43.5 psi g) (DP163Y only)

Body design conditions			PN40
Maximum design pressure	**A-D-E**	36.4 bar g @ 20 °C	528 psi g @ 68 °F
	A-B-C	18.9 bar g @ 20 °C	274 psi g @ 68 °F
Maximum design temperature		250 °C @ 24 bar g	482 °F @ 348 psi g
Minimum design temperature		-10 °C	14 °F
Maximum upstream pressure for saturated steam service	**A-D-E**	25 bar g	363 psi g
	A-B-C	14 bar g	203 psi g
Maximum operating temperature	**A-D-E**	250 °C @ 24 bar g	482 °F @ 348 psi g
	A-B-C	250 °C @ 12.1 bar g	482 °F @ 175 psi g
Minimum operating temperature Note: For lower operating temperatures consult Spirax Sarco		0 °C	32 °F
Maximum differential pressure	**A-D-E**	25 bar g	363 psi g
	A-B-C	14 bar g	203 psi g
Designed for a maximum cold hydraulic test pressure of:		60 bar g	870 psi g
Note: With internals fitted, test pressure must not exceed:		40 bar g	580 psi g

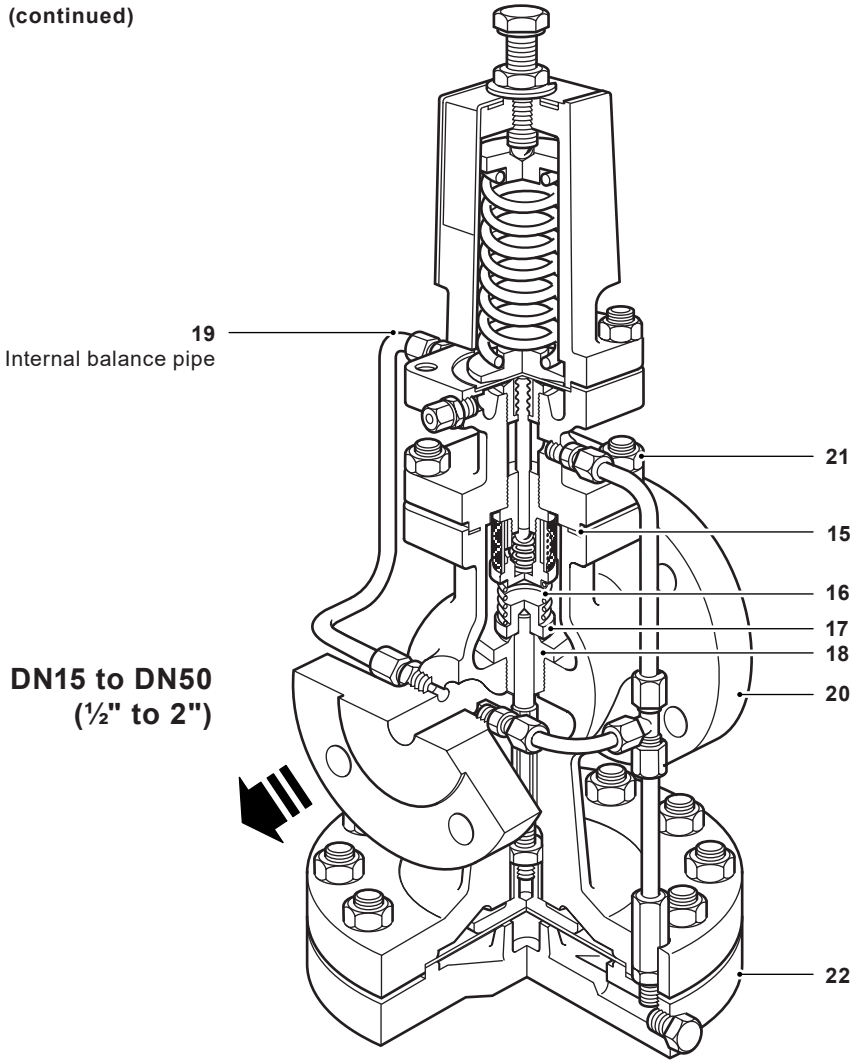
Materials



No.	Part		Material	
1	Adjustment screw		Stainless steel	BS 6105 A4/80
2	Adjustment lock-nut		Stainless steel	BS 6105 A4/80
3	Washer		Stainless steel	BS 1449 304 S16
4	Spring housing		Stainless steel	DIN 3100 316 C12
5	Top spring plate		Stainless steel	BS 970 431 S29
6	Pressure adjustment spring		Stainless steel	BS 2056 302 S25
7	Bottom spring plate		Stainless steel	BS 970 431 S29
8	Spring housing	Securing nuts	Stainless steel	BS 6105 A4/80
		Securing studs	Stainless steel	BS 6105 A4/80
			DN15 to DN50 (½" to 2")	M10 x 30 mm
9	Pilot diaphragm		Stainless steel	BS 1449 316 S31
10	Pilot valve housing		Stainless steel	BS 3100 316 C12
11	Pilot valve plunger		Stainless steel	BS 970 431 S29
12	Spring housing cover		Stainless steel	BS 1449 304 S12
13	Pilot valve and seat unit		Stainless steel	BS 970 431 S29
14	Internal strainer		Stainless steel	BS 1449 304 S16

Materials continued on the next page

Materials (continued)



No.	Part		Material	
15	Body gasket	Stainless steel reinforced exfoliated graphite		
16	Main valve return spring		Stainless steel	BS 2056 302 S25
17	Main valve		Stainless steel	BS 970 431 S29
18	Main valve seat		Stainless steel	BS 970 431 S29
19	Balance pipe assembly		Stainless steel	BS 3605 304 S14
20	Main valve body		Stainless steel	BS 3100 316 C12
21	Pilot valve housing	Securing nuts	Stainless steel	BS 6105 A4/80
		Securing studs	Stainless steel	BS 6105 A4/80
			DN15 to DN20 (½" to 2")	M10 x 25 mm
			DN25 to DN50 (1" to 2")	M12 x 30 mm
			DN80 (3")	M12 x 40 mm
22	Main diaphragm chamber		Cast stainless steel	BS 3100 316 C12

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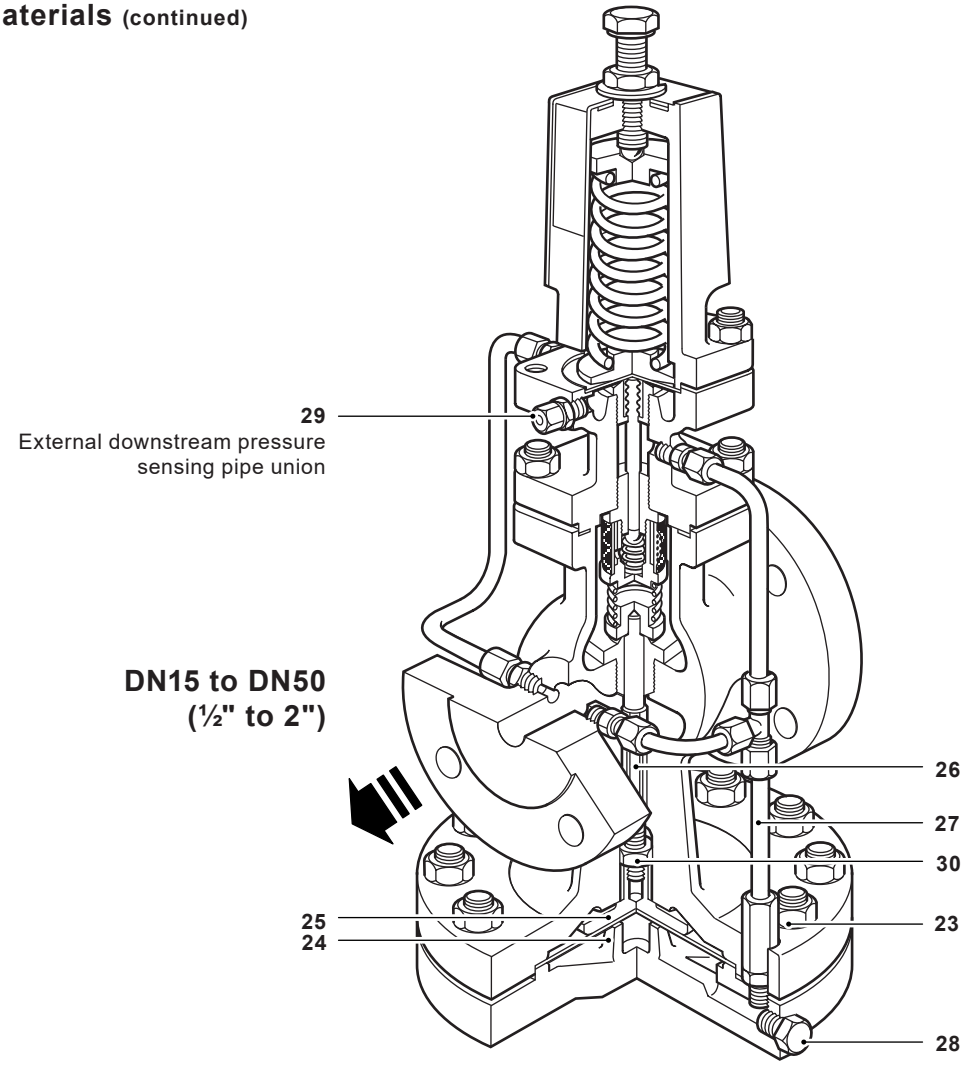
Materials (continued)



No.	Part		Material	
23	Main diaphragm	Securing nuts	Stainless steel	BS 3692 Gr. 8
		Securing bolts	Stainless steel	BS 6105 A4/80
			DN15 to DN20 (½" to 2")	M12 x 50 mm
			DN25 and DN32 (1" to 1¼")	M12 x 60 mm
			DN40 and DN50 (1½" to 2")	M12 x 65 mm
			DN80 (3")	M12 x 80 mm
24	Main diaphragms		Stainless steel	BS 1449 316 S31
25	Main diaphragm plate		Stainless steel	BS EN 10088-3 1.4307
26	Pushrod		Stainless steel	BS 970 431 S29
27	Control pipe assembly		Stainless steel	BS 3605 304 S14
28	Plug ⅛" BSP		Stainless steel	BS 970 431 S29
29	Pressure pipe union		Stainless steel	BS 970 316 S31
30	Lock-nut		Stainless steel	BS 6105 A4/80

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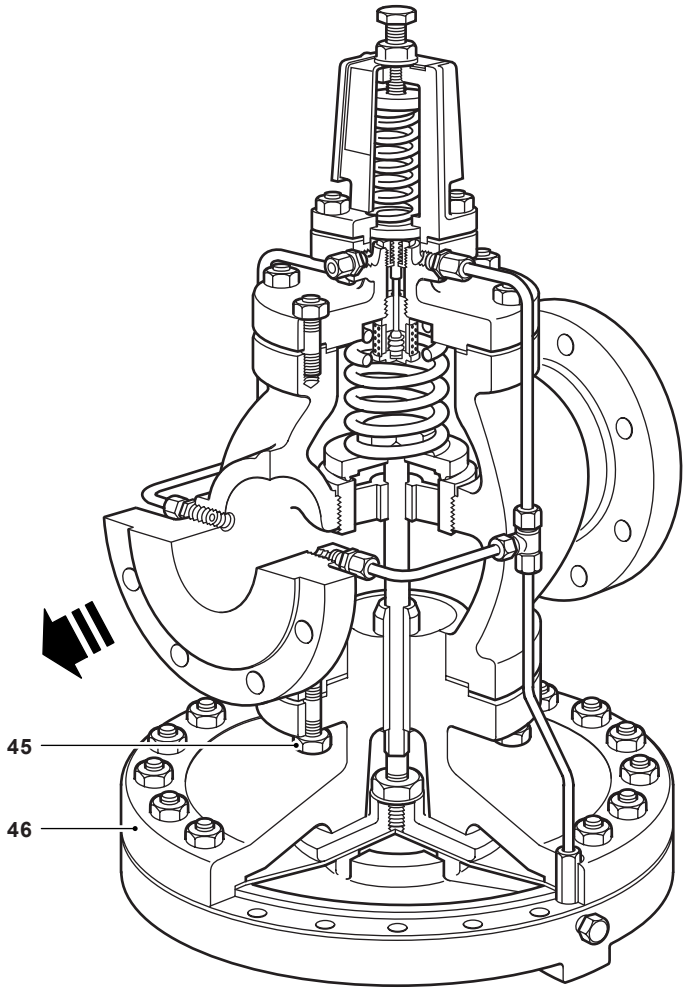
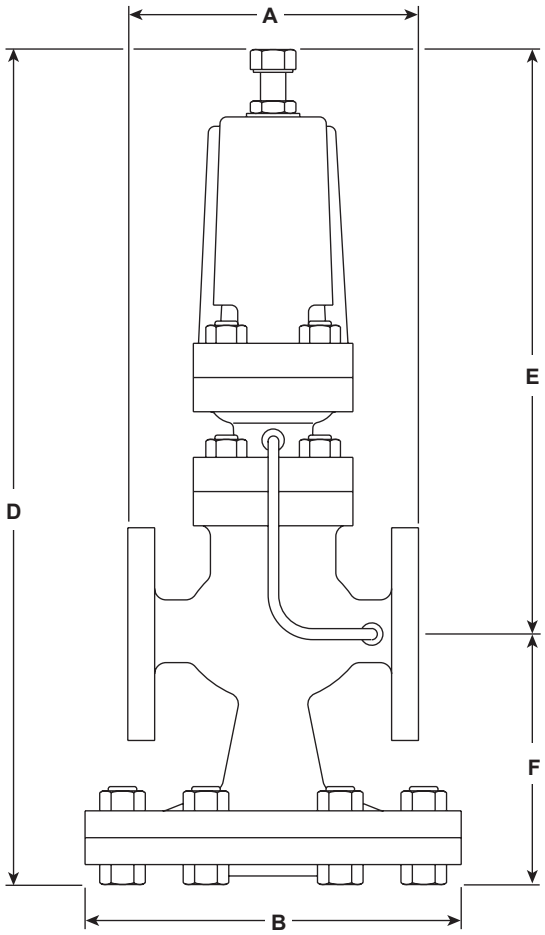
Materials (continued)

DN80



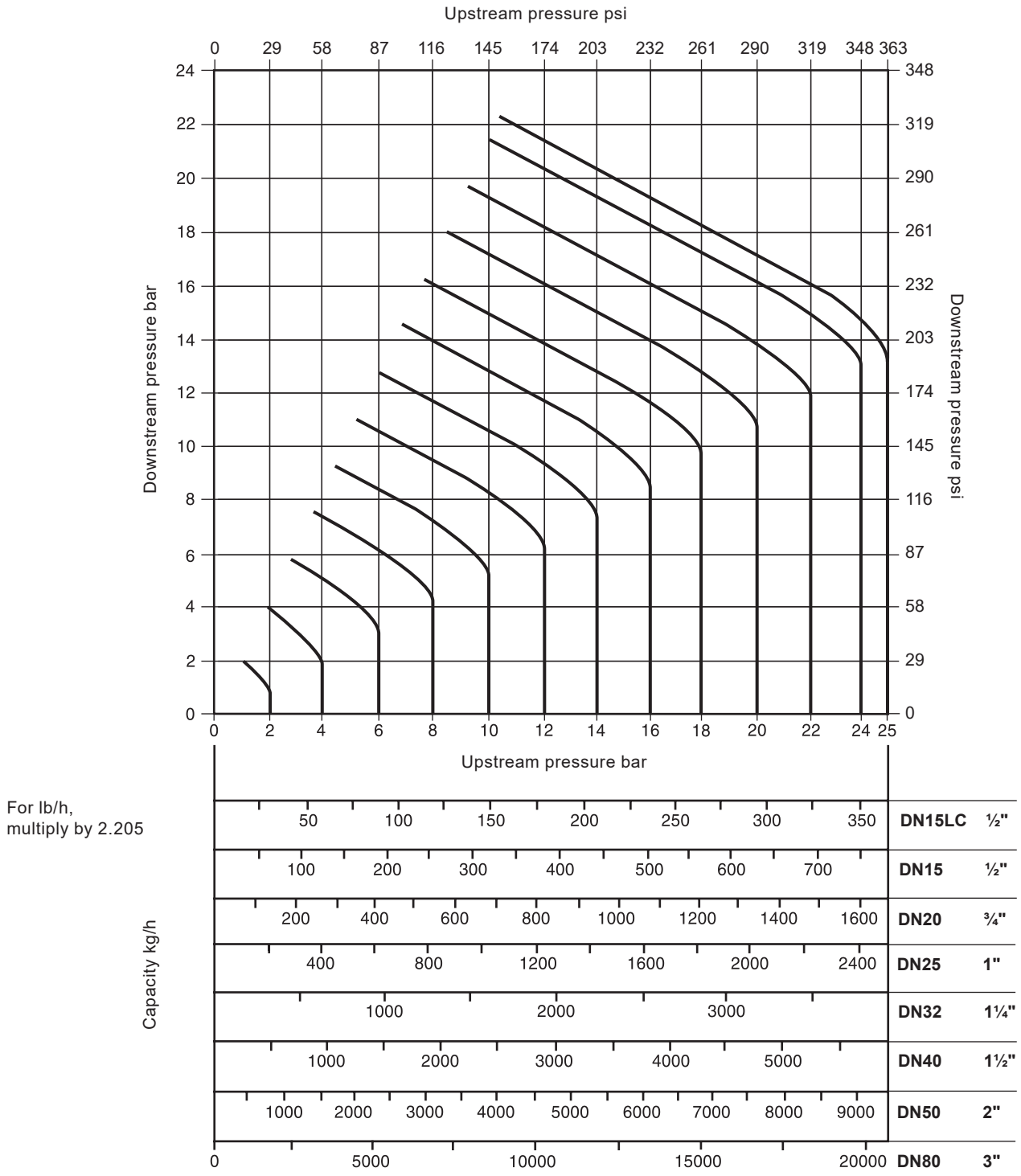
No.	Part	Material	
	Body nuts	Stainless steel	BS 3692 Gr. 8
45	Body studs	Stainless steel	BS 6105 A4/80
		DN80 (3") only	M12 x 40 mm
46	Upper main diaphragm chamber	Stainless steel	BS 3100 316 C12

Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Sizes	EN 1092 PN40 A	ASME 300 A	ASME 150 A	BS 10 Table J A	B	D	E	F	Weight
DN15 LC	130 (5.12)	130 (5.12)	122 (4.80)	130 (5.12)	175 (6.89)	405 (15.9)	277 (10.9)	128 (5.04)	15 (33.1)
DN15									
DN20	150 (5.91)	150 (5.91)	142 (5.59)	150 (5.91)					16 (35.3)
DN25	160 (6.30)	160 (6.30)	156 (6.14)	164 (6.46)	216 (8.50)	440 (17.3)	288 (11.3)	152 (5.98)	23 (50.7)
DN32	180 (7.09)	183 (7.20)	176 (6.93)	184 (7.24)					25 (55.1)
DN40	200 (7.87)	209 (8.23)	200 (7.87)	209 (8.23)	280 (11.0)	490 (19.3)	305 (12.0)	185 (7.28)	40 (88.2)
DN50	230 (9.06)	236 (9.29)	230 (9.06)	243 (9.57)					42 (92.6)
DN80	310 (12.2)	319 (12.6)	310 (12.2)	325 (12.8)	350 (13.8)	580 (22.8)	322 (12.7)	258 (10.2)	103 (227)

Steam capacities chart



Steam capacities chart

Note

The capacities quoted above are based on valves fitted with an external pressure sensing pipe. Reliance on the internal balance pipe will mean that capacities may be reduced. In the case of low downstream pressure this reduction could be up to 30% of the valve capacity.

How to use the chart

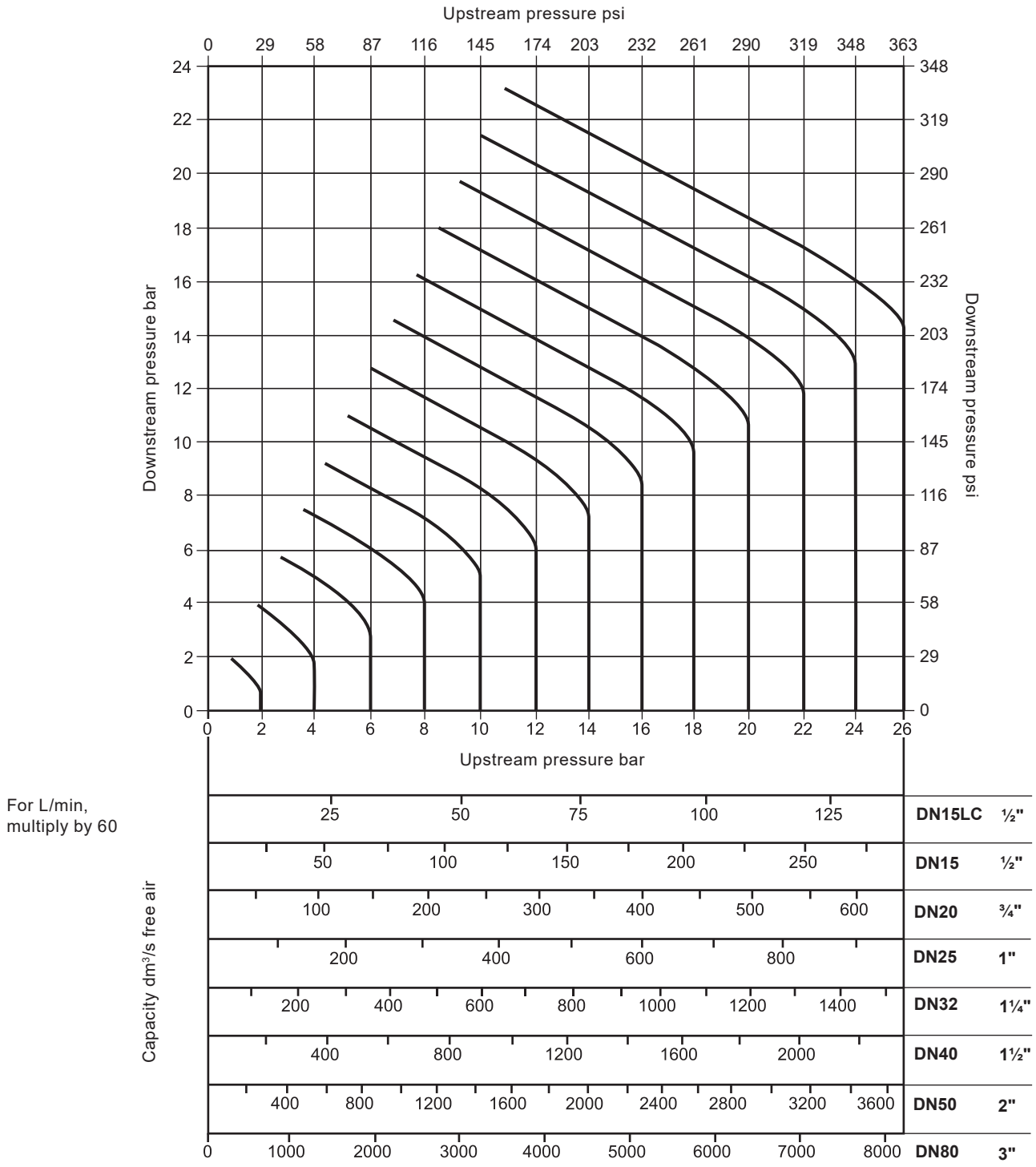
Saturated steam

A valve is required to pass 600 kg/h (1323 lb/h) reducing from 6 bar to 4 bar (87.0 psi to 58.0 psi). Find the point at which the curved 6 bar (87.0 psi) upstream pressure line crosses the horizontal 4 bar (58.0 psi) downstream pressure line. A perpendicular dropped from this point gives the capacities of all DP sizes under these conditions. A DN32 (1¼") valve, is the smallest size which will carry the required load.

Superheated steam

Because of the higher specific volume of superheated steam a correction factor must be applied to the figure obtained from the chart above. For 55 °C (131 °F) of superheat the factor is 0.95 and for 100 °C (212 °F) of superheat the factor is 0.9.
Using the example given for saturated steam, the DN32 (1¼") valve would pass 740 x 0.95 = 703 kg/h (1550 lb/h) if the steam had 55 °C (131 °F) of superheat.
It is still big enough to pass the required load of 600 kg/h (1323 lb/h).

Compressed air capacities chart



Compressed air capacities chart

How to use the chart

Capacities are given in cubic decimetres of free air per second (dm^3/s). The use of the capacity chart can be best explained by an example. Required, a valve to pass 100 dm^3/s of free air reducing from 12 bar to 8 bar (174 psi to 116 psi).
Find the point at which the curved 12 bar (174 psi) upstream pressure line crosses the horizontal 8 bar (116 psi) downstream pressure line. A perpendicular dropped from this point shows that whereas a DN15LC valve will only pass 57 dm^3/s and is therefore not large enough, a DN15 (½") valve will pass approximately 120 dm^3/s under these conditions and is the correct valve size to choose.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P006-07) supplied with the product.

Installation note: The valve should be installed in a horizontal pipeline with the direction of flow as indicated by the arrow on the valve body.

How to order

Example: 1 off Spirax Sarco DN32 DP163 pilot operated pressure reducing valve fitted with a red pressure adjustment spring and having flanged EN 1092 PN25 connections.

Spare parts

Available spares

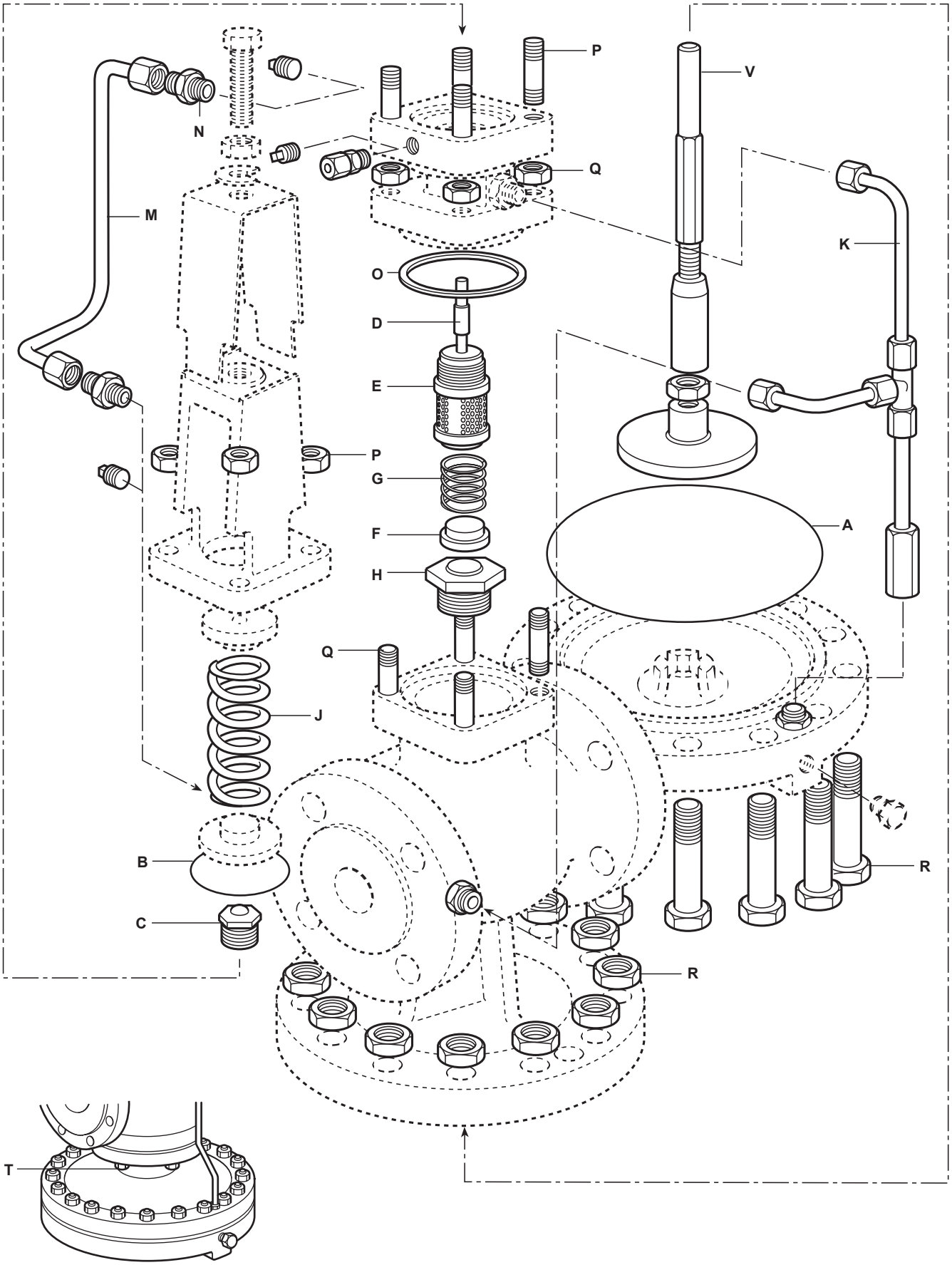
Maintenance kit A stand-by set of spares for general maintenance purposes and covers all spares marked*					
* Main diaphragm	(2 off)				**A**
* Pilot diaphragm	(2 off)				**B**
Pilot valve seal assembly					**C**
* Pilot valve and plunger assembly					**D, E**
Main valve assembly					**F, H**
* Main valve return spring					**G**
Pressure adjustment spring	Red	DP163 and DP163G	0.2 to 17 bar	(2.9 to 247 psi)	**J**
	Grey	DP163 and DP163G	16 to 21 bar	(232 to 305 psi)	
	Yellow	DP163Y and DP163G	0.2 to 3 bar	(2.9 to 43.5 psi)	
* Control pipe assembly					**K**
* Balance pipe assembly					**M, N**
* Body gasket		(packet of 3)			**O**
Set of spring housing securing studs and nuts	(set of 4)				**P**
Set of pilot valve housing securing studs and nuts	(set of 4)				**Q**
Set of diaphragm chamber securing bolts and nuts	(set of 10)	DN15 and DN20 (½" and ¾")			**R**
	(set of 12)	DN25 and DN32 (1" and 1¼")			
	(set of 16)	DN40 and DN50 (1½" and 2")			
	(set of 20)	DN80 (3")			
Set of main body studs and nuts (DN80 (3"))	(set of 6)				**T**
Pushrod and main diaphragm plate assembly					**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 pressure reducing valve.

Example: 1 - Main valve assembly for a Spirax Sarco DN15 DP163 pressure reducing valve.

How to fit - See the Installation and Maintenance Instructions supplied with the pressure reducing valve. Further copies are available on request.



Arrangement of main diaphragm chamber DN80 (3") size only.

Interchangeability of spares

The following table shows how in certain sizes some parts are interchangeable. For example in the line headed 'Main diaphragm' the diaphragm used in the following sizes: DN15LC, DN15 and DN20 (½" and ¾") is common to these sizes by the letter 'a'. The letter 'b' indicates that sizes DN25 and DN32 (1" and 1¼")use one common diaphragm.
Some parts, particularly pilot and main valve assemblies are specific to particular models e.g 'DP163G'. Interchangeability is therefore restricted to model type for some parts.
Please note for storage purposes: The spare parts marked † are not of the same material as those for the DP143, consequently they are not compatible for interchangeability.

Size	DN15LC (½")	** DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN80 (3")
Main diaphragm	a	a	a	b	b	c	c	d
Pilot diaphragm	a	a	a	a	a	a	a	a
Pilot valve seal assembly	a	a	a	a	a	a	a	a
Pilot valve and plunger assembly	a	a	a	a	a	a	a	a
Main valve assembly	a	b	c	d	e	f	g	h
Main valve return spring	a	a	a	b	b	c	c	d
Pressure adjustment spring	a	a	a	a	a	a	a	a
Control pipe assembly †	a	a	b	c	d	e	f	g
Balance pipe assembly †	a	a	b	c	d	e	f	g
Body gasket †	a	a	a	b	b	c	c	d
Set of spring housing securing studs and nuts †	a	a	a	a	a	a	a	a
Set of pilot valve housing securing studs and nuts †	a	a	a	b	b	c	c	d
Set of diaphragm chamber securing bolts and nuts †	a	a	a	b	b	c	c	d
Set of main body studs and nuts †	–	–	–	–	–	–	–	a

**** Not available for the DP163G**