

spirax sarco

TI-IBR15-16IN
 Issue 2

DP143 and DP143H

Pilot Operated

Pressure Reducing Valves with Cast Steel Bodies

Description

The DP143 and DP143H pilot operated pressure reducing valves have been manufactured using cast steel.

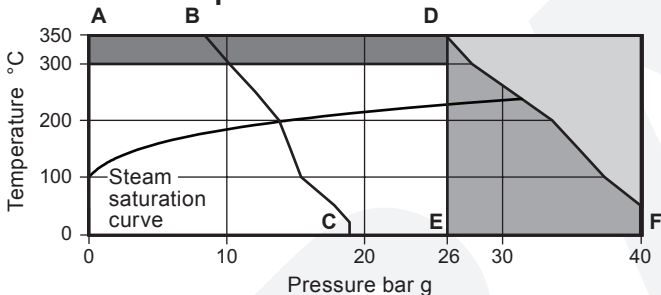
Available types

DP143 Suitable for steam applications
DP143H Is a high temperature version for use up to 350 °C.

Sizes and pipe connections

DN15LC - Low Capacity version, DN15, DN20, DN25, DN32, DN40, DN50 & DN80
 Standard flanges: ASME 300.
 Available on request: ASME 150 and BS 10 Table 'J'.

Pressure / temperature limits



- The product **must not** be used in this region.
- Due to the material strength of the main diaphragm the product **must not** be used in this region.
- Use the high temperature DP143H version in this region.

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

A-D-E Flanged ASME (ANSI) 300 and BS10 Table J.

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

Red 0.2 bar g to 17 bar g **Grey** 16.0 bar g to 24 bar g
Yellow 0.2 bar g to 3 bar g (used for low pressure precision control)

Body design conditions	PN40	
Maximum design pressure	A-B-C	18.9 bar g @ 20°C
	A-D-E	26 bar g
	A-D-F	40 bar g
Maximum design temperature	350°C @ 26 bar g	
Minimum design temperature	0°C	
Maximum upstream pressure for saturated steam service	A-B-C	14 bar g
	A-D-E	26 bar g
Maximum operating temperature	DP143	300°C @ 26 bar g
	DP143H	350°C @ 26 bar g
Minimum operating temperature	0°C	
Note: For lower operating temperatures consult Spirax Sarco.		
Maximum differential pressure	A-B-C	14 bar
	A-D-E	26 bar
Designed for a maximum cold hydraulic test pressure of:	For ASME 150	28.4 bar g
	For ASME 300	60 bar g
Note: With internals fitted, test pressure must not exceed:	40 bar g	

Kv values

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

DN15LC	DN15	DN20	DN25	DN32	DN40	DN50	DN80
1.0	2.8	5.5	8.1	12.0	17.0	28.0	64.0

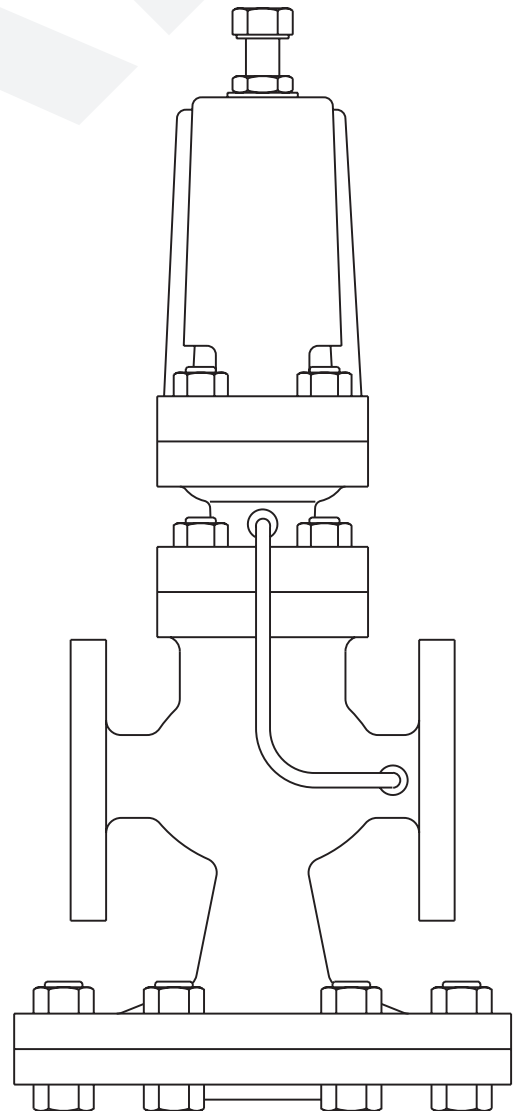
For conversion:

$$Cv (UK) = Kv \times 0.963 \quad Cv (US) = Kv \times 1.156$$

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

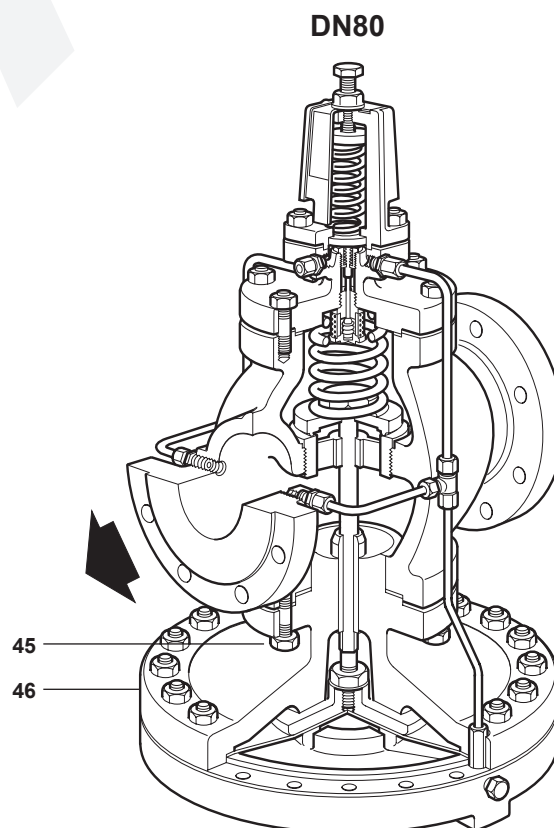
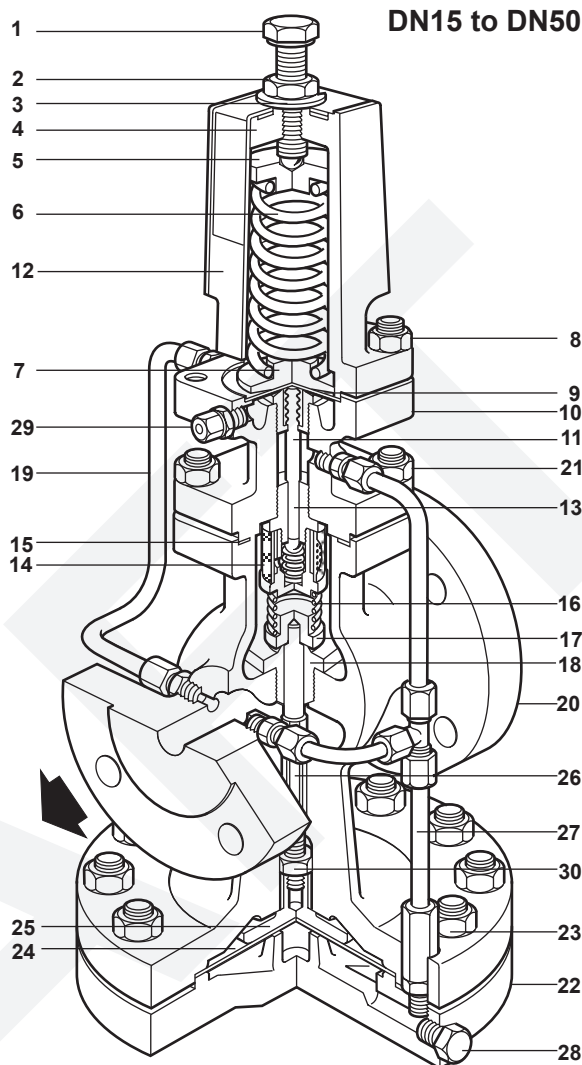
Standards and Certification

This product fully complies with the requirements of the Indian Boiler Regulations, 1950.

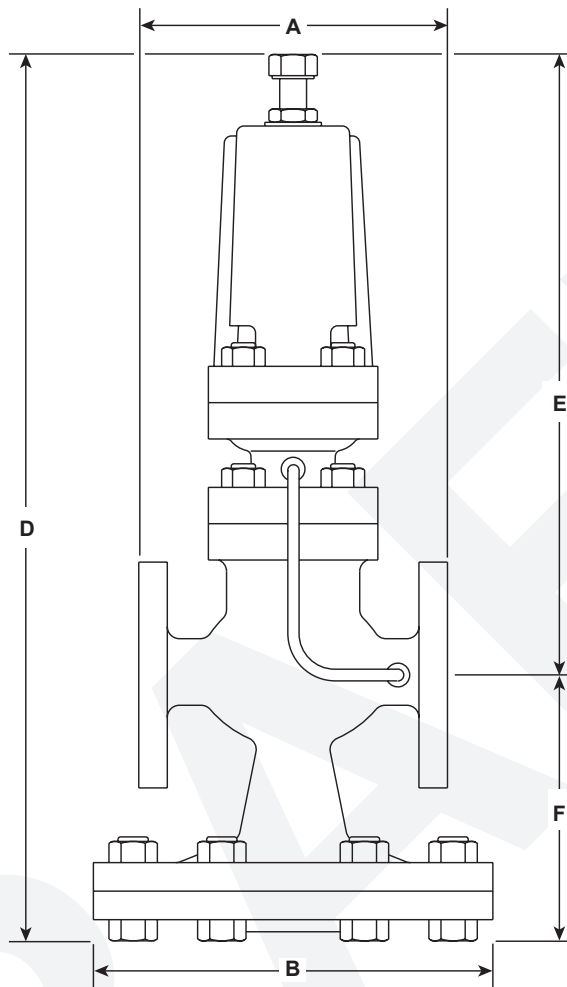


Materials

No.	Part	Material	
1	Adjustment screw	Steel	Gr. 8.8
2	Adjustment lock-nut	Steel	Gr. 8
3	Washer	Stainless steel	AISI 304
4	Spring housing	Cast steel	GP240 GH +N
5	Top spring plate	Stainless steel	AISI 316
6	Pressure adjustment spring	Stainless steel	AISI 302
7	Bottom spring plate	Free cutting steel	
8	Spring housing	Securing nuts	Steel Gr. 8
		Securing studs	Steel Gr. 8.8
9	Pilot diaphragm	Stainless steel	AISI 316
10	Pilot valve housing	Steel	GP240 GH +N
11	Pilot valve plunger	Stainless steel	AISI 431
12	Spring housing cover	Stainless steel	AISI 304
13	Pilot valve and seat unit	Stainless steel	AISI 431
14	Internal strainer	Stainless steel	AISI 304
15	Body gasket	Stainless steel reinforced exfoliated graphite	
16	Main valve return spring	Stainless steel	AISI 302
17	Main valve	Stainless steel	AISI 431
18	Main valve seat	Stainless steel	AISI 431
19	Balance pipe assembly	Stainless steel	AISI 304
20	Main valve body	Cast steel	GP240GH +N
21	Pilot valve housing	Securing nuts	Steel Gr. 8
		Securing studs	Steel Gr. 8.8
22	Main diaphragm chamber	Cast steel	GP240GH +N
23	Main diaphragm	Securing nuts	Steel Gr. 8
		Securing bolts	Steel Gr. 8.8
24	Main diaphragms	Stainless steel	AISI 316
25	Main diaphragm plate	Stainless steel	AISI 431
26	Push rod	Stainless steel	AISI 431
27	Control pipe assembly	Stainless steel	AISI 304
28	Plug 1/8" BSP	Steel	
29	Pressure pipe union	Steel	
30	Lock-nut	Steel	Gr. 8
45	Body studs	Steel	Gr. 8.8
		Steel	Gr. 8
46	Upper main diaphragm chamber	Cast steel	GP240GH +N



Dimensions / weights (approximate) in mm and kg



Sizes	ASME 300	ASME 150	BS 10 Table J	B	D	E	F	Weight
	A	A	A					
DN15 LC	130	122	130	175	405	277	128	15
DN15	130	122	130	175	405	277	128	15
DN20	150	142	150	175	405	277	128	16
DN25	160	156	164	216	440	288	152	23
DN32	183	176	184	216	440	288	152	25
DN40	209	200	209	280	490	305	185	40
DN50	236	230	243	280	490	305	185	42
DN80	319	310	325	350	580	322	258	103

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	0.2 to 17 bar g	
	Grey	16 to 24 bar g	J
	Yellow	0.2 to 3 bar g	
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	
	(set of 12)	DN25 and DN32	
	(set of 16)	DN40 and DN50	R
	(set of 20)	DN80	
Set of main body studs and nuts (DN80)	(set of 6)		T
Pushrod and main diaphragm plate assembly			V, W, X

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 DP143 pressure reducing valve.

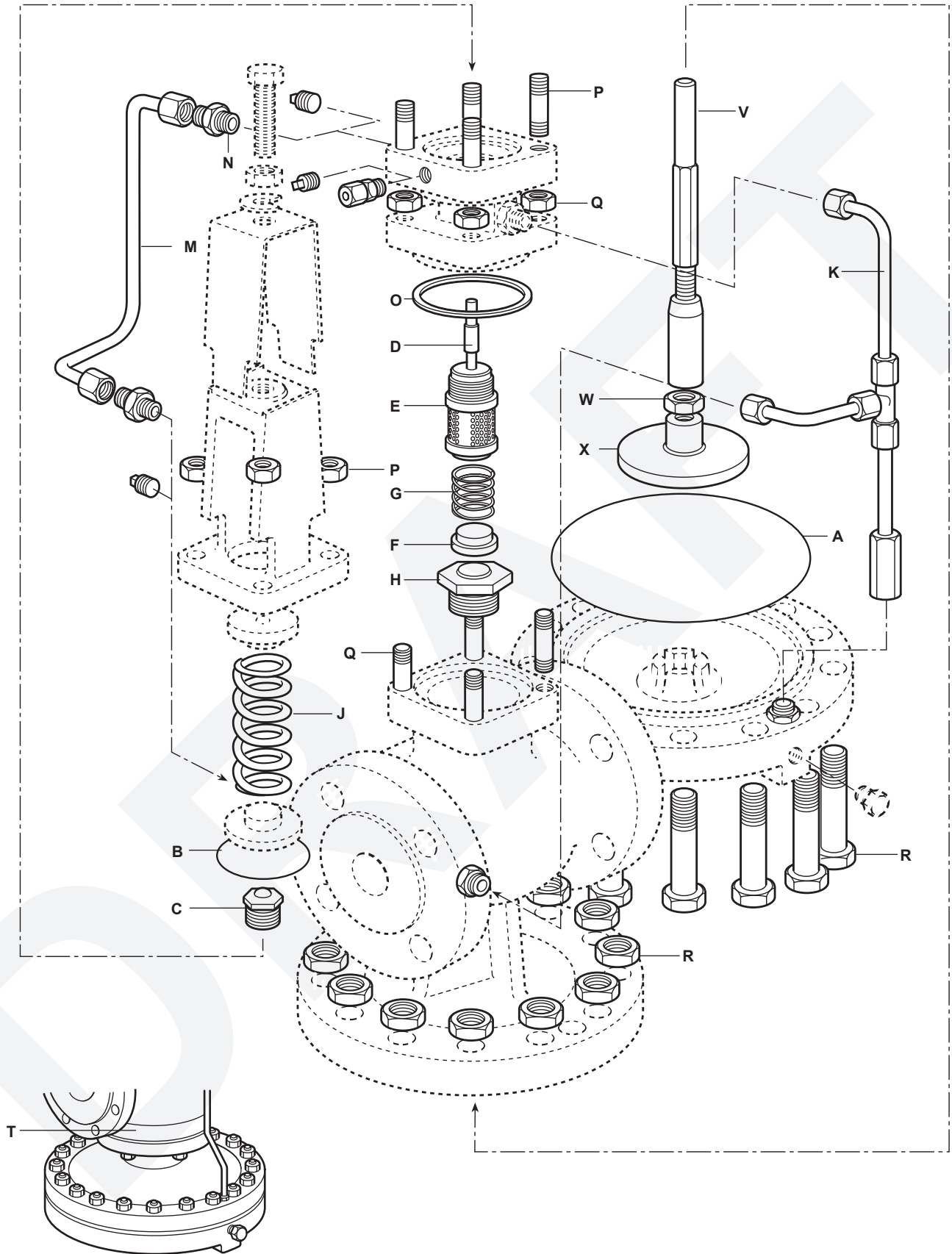
How to fit. See the Installation and Maintenance Instructions supplied with the pressure reducing valve. Further copies are available on request.

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 is common to these sizes by the letter 'a'. The letter 'b' indicates that sizes DN25 and DN32 use one common diaphragm.

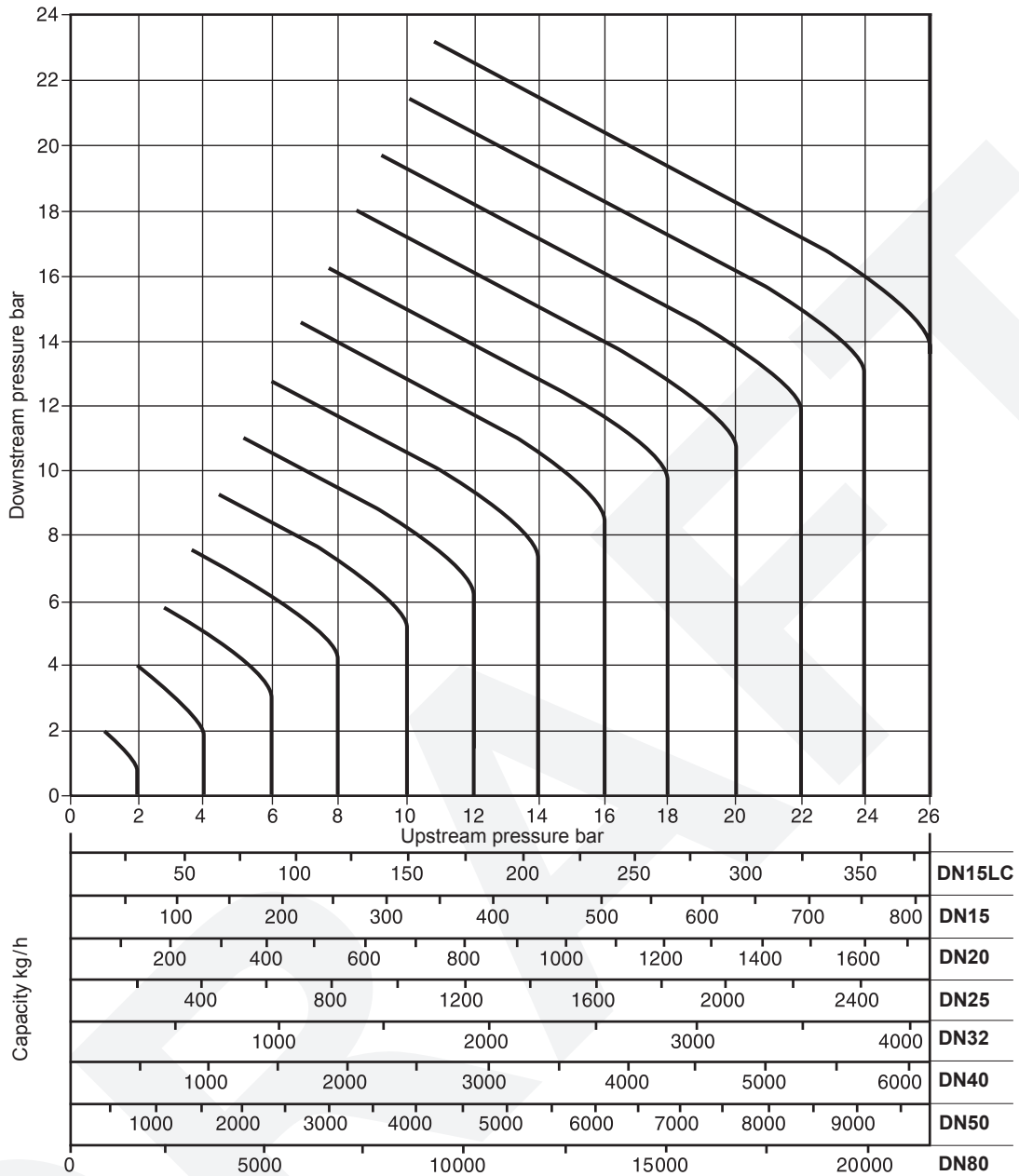
Some parts, particularly pilot and main valve assemblies are specific to particular models.

Size	DN15LC	DN15	DN20	DN25	DN32	DN40	DN50	DN80
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



Arrangement of main diaphragm chamber DN80 size only.

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 reducing from 6 bar to 4 bar. Find the point at which the curved 6 bar upstream pressure line crosses the horizontal 4 bar downstream pressure line. A perpendicular dropped from this point gives the capacities of all DP sizes under these conditions. A DN32 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 of superheat the factor is 0.95 and for 100 °C of superheat the factor is 0.9.

Using the example given for saturated steam, the DN32 valve would pass $740 \times 0.95 = 703$ kg/h if the steam had 55 °C of superheat. It is still big enough to pass the required load of 600 kg/h.

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-IBR15-15IN) 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 DP143 pilot operated pressure reducing valve fitted with a red pressure adjustment spring and having flanged ASME 300 connections.