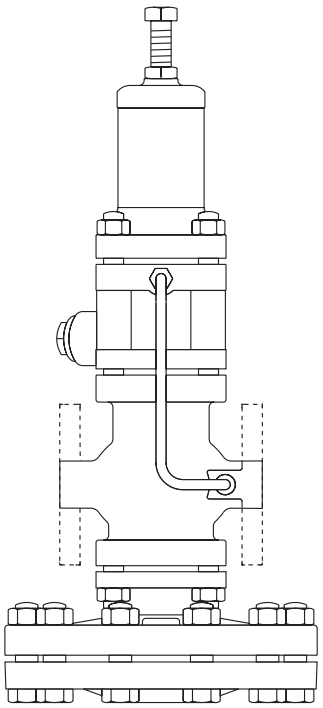
Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification without notice. © Copyright 2016

DP27S and DP27SY Pilot Operated Pressure Reducing Valves with SG Iron Bodies

Description

The DP27S and DP27SY pilot operated pressure reducing valves have bodies manufactured using SG iron.These products are not suitable for oxygen service.

Available types	**DP27S**	Suitable for steam or compressed air applications.
	DP27SY	Suitable for steriliser or critical low pressure control applications. It uses a lower rate control spring with a downstream pressure range of 0.2 - 3.0 bar.



Standards

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

Certification

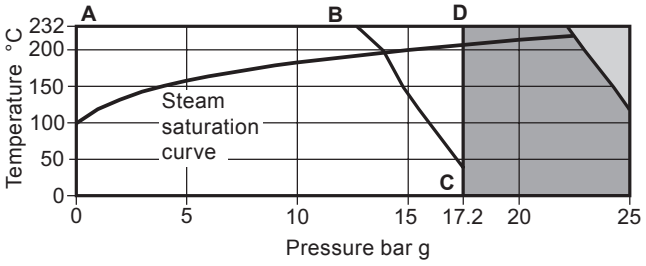
This product is available with a manufacturer's Typical Test Report and IBR certification.
Note: All certification / inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

DN15LC - Low Capacity version
DN15, DN20, DN25, DN32, DN40 and DN50

Screwed	BSP or NPT (DN15 to DN25 only).
Standard flanges:	DN15 - DN50 ASME 150
	DN15 ASME 300
	DN25 - DN50 ASME 300

Pressure / temperature limits



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

For optimum performance, the maximum design pressure should not exceed 17.2 bar g.

A-D-C Screwed and flanged ASME 300

A-B-C Flanged ASME 150.

Note: A variable rate conical pressure adjustment spring is fitted providing a downstream pressure range of 0.2 - 17 bar g. For the DP27SY downstream pressure range is 0.2 - 3 bar g.

Body design conditions		PN25
Maximum design pressure	**A-D-C**	17.2 bar g @ 232 °C
	A-B-C	17.2 bar g @ 40 °C
Maximum design temperature		232 °C @ 17.2 bar g
Minimum design temperature		-10 °C
Maximum upstream pressure for saturated steam service		17 bar g
Maximum operating temperature		232 °C @ 17.2 bar g
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco		0 °C
Maximum differential pressure		17 bar
Designed for a maximum cold hydraulic test pressure of :		25.8 bar g

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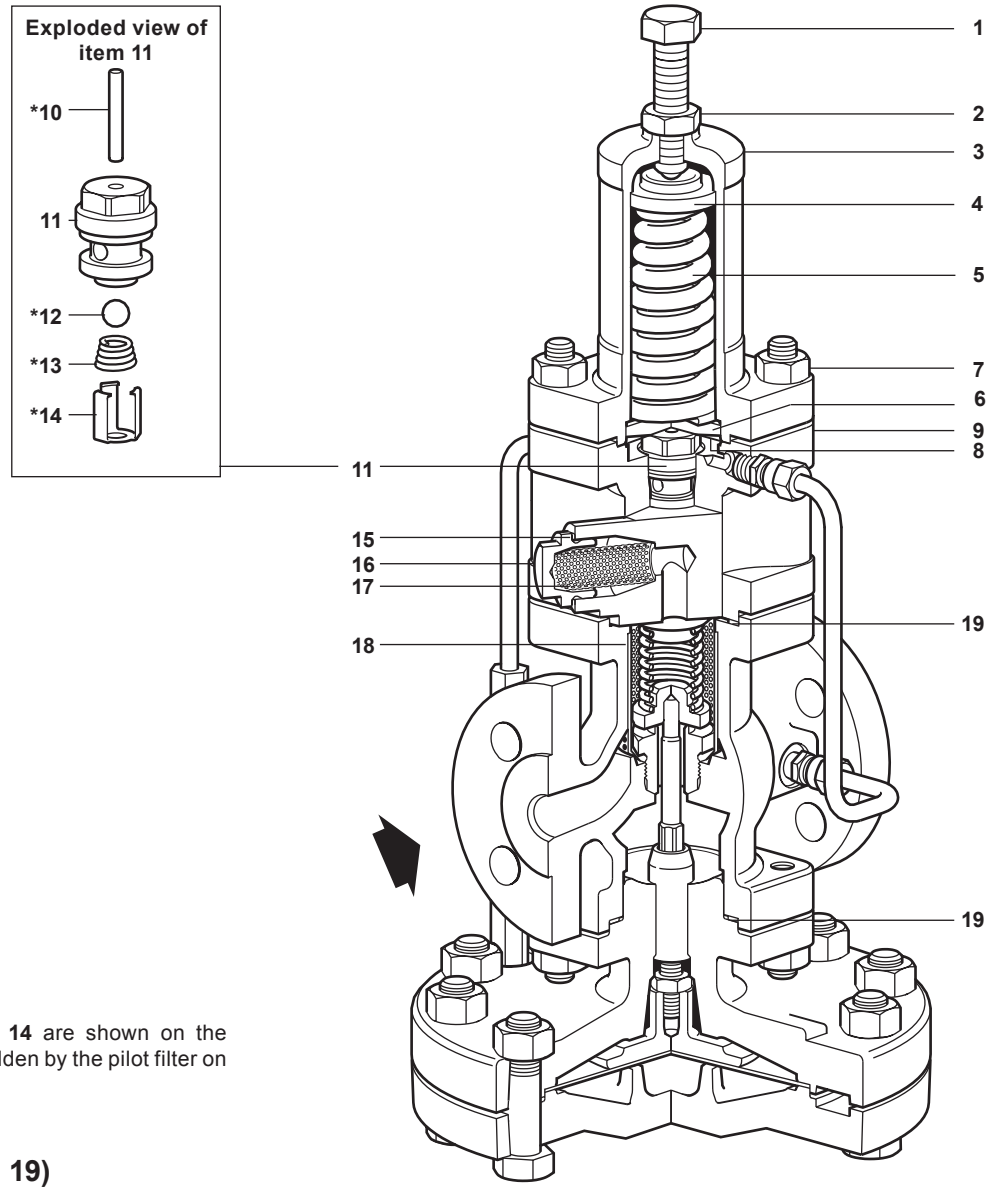


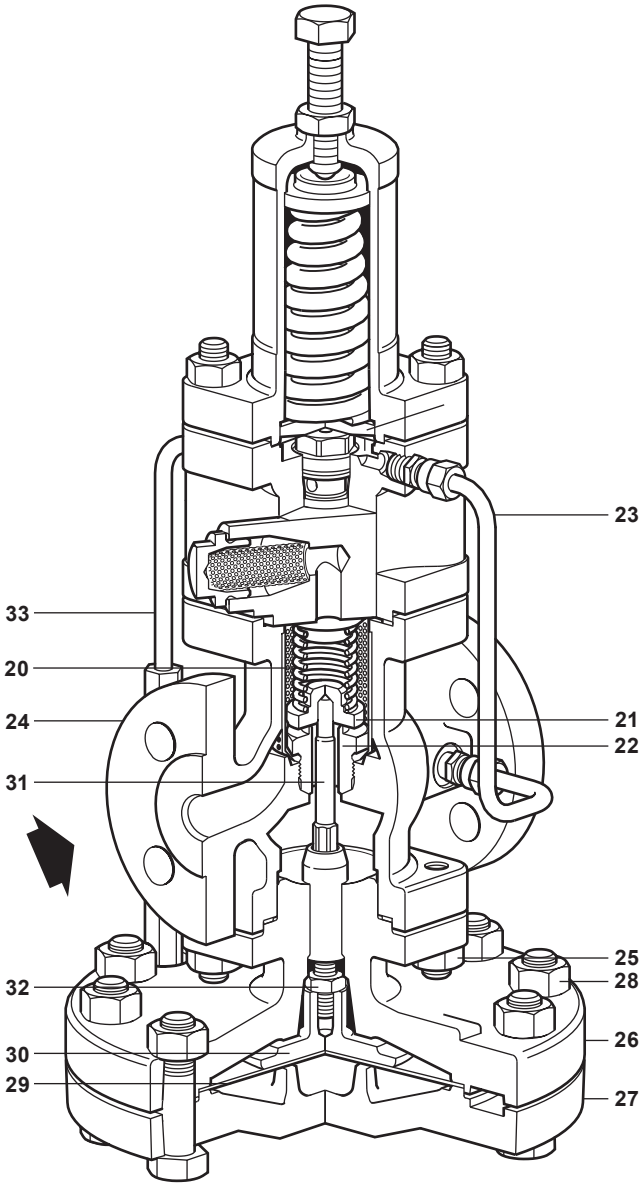
* **Note:** Items **10, 12, 13** and **14** are shown on the exploded view, as they are hidden by the pilot filter on the main illustration.

Materials (Parts 1 to 19)

No.	Part		Material	
1	Adjustment screw		Steel	Gr. 8.8
2	Adjustment lock-nut		Steel	Gr. 8
3	Spring housing		SG iron	DIN1693 GGG 40
4	Top spring plate		Stainless steel	ASTM A351/A351M CF8M
5	Pressure adjustment spring		Stainless steel	AISI 302
6	Bottom spring plate		Steel	
7	Spring housing	Securing nuts	Steel	Gr. 8
		Securing studs	Steel	Gr. 8.8
			DN15 to DN32	M10 x 95 mm
			DN40 and DN50	M12 x 95 mm
8	Pilot diaphragms		Stainless steel	AISI 316
9	Pilot valve chamber		SG iron	EN-GJS-400-18-LT
* **10**	Pilot valve plunger		Stainless steel	AISI 321
11	Pilot valve seat with integral seal		Stainless steel + PTFE	AISI 431
* **12**	Pilot valve ball		Stainless steel	AISI 440C
* **13**	Pilot valve spring		Stainless steel	AISI 302
* **14**	Pilot valve clip		Stainless steel	AISI 301
15	Pilot filter cap gasket		Stainless steel	AISI 304
16	Pilot filter cap		Stainless steel	AISI 431
17	Pilot filter element		Stainless steel	AISI 316
18	Internal strainer		Stainless steel	AISI 316L
19	Body gasket		Stainless steel reinforced exfoliated graphite	

Materials (Parts 20 to 34)

No.	Part		Material	
20	Main valve return spring		Stainless steel	AISI 302
21	Main valve		Stainless steel	AISI 431
22	Main valve seat		Stainless steel	AISI 431
23	Balance pipe assembly		Stainless steel	AISI 304
24	Main valve body		SG iron	DIN 1693 GGG 40.3
25	Main body	Securing nuts	Steel	Gr. 8
		Securing studs	Steel	Gr. 8.8
			DN15 to DN32	M10 x 25 mm
			DN40 and DN50	M12 x 30 mm
26	Main diaphragm chamber - upper		SG iron	DIN 1693 GGG 40.3
27	Main diaphragm chamber - lower		SG iron	DIN 1693 GGG 40.3
28	Main diaphragm	Securing nuts	Steel	Gr. 8
		Securing bolts	Steel	Gr. 8.8
			DN15 to DN32	M12 x 50 mm
			DN40 and DN50	M12 x 55 mm
29	Main diaphragms		Stainless steel	AISI 316
30	Main diaphragm plate		Stainless steel	AISI 304
31	Pushrod		Stainless steel	AISI 431
32	Lock-nut		Steel	BS 3692 Gr. 8
33	Control pipe assembly		Stainless steel	AISI 304
34	Plug ⅛"	BSP	Steel	AISI 431 **Note:** This item is hidden from view



Kv values

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

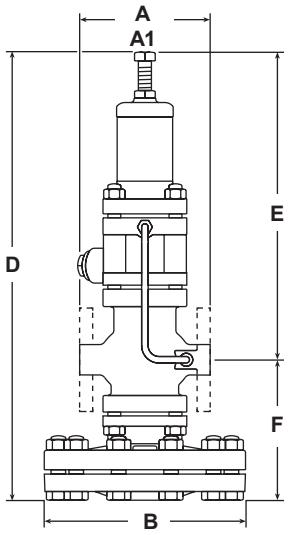
DN15LC	DN15	DN20	DN25	DN32	DN40	DN50
1.0	2.8	5.5	8.1	12.0	17.0	28.0

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

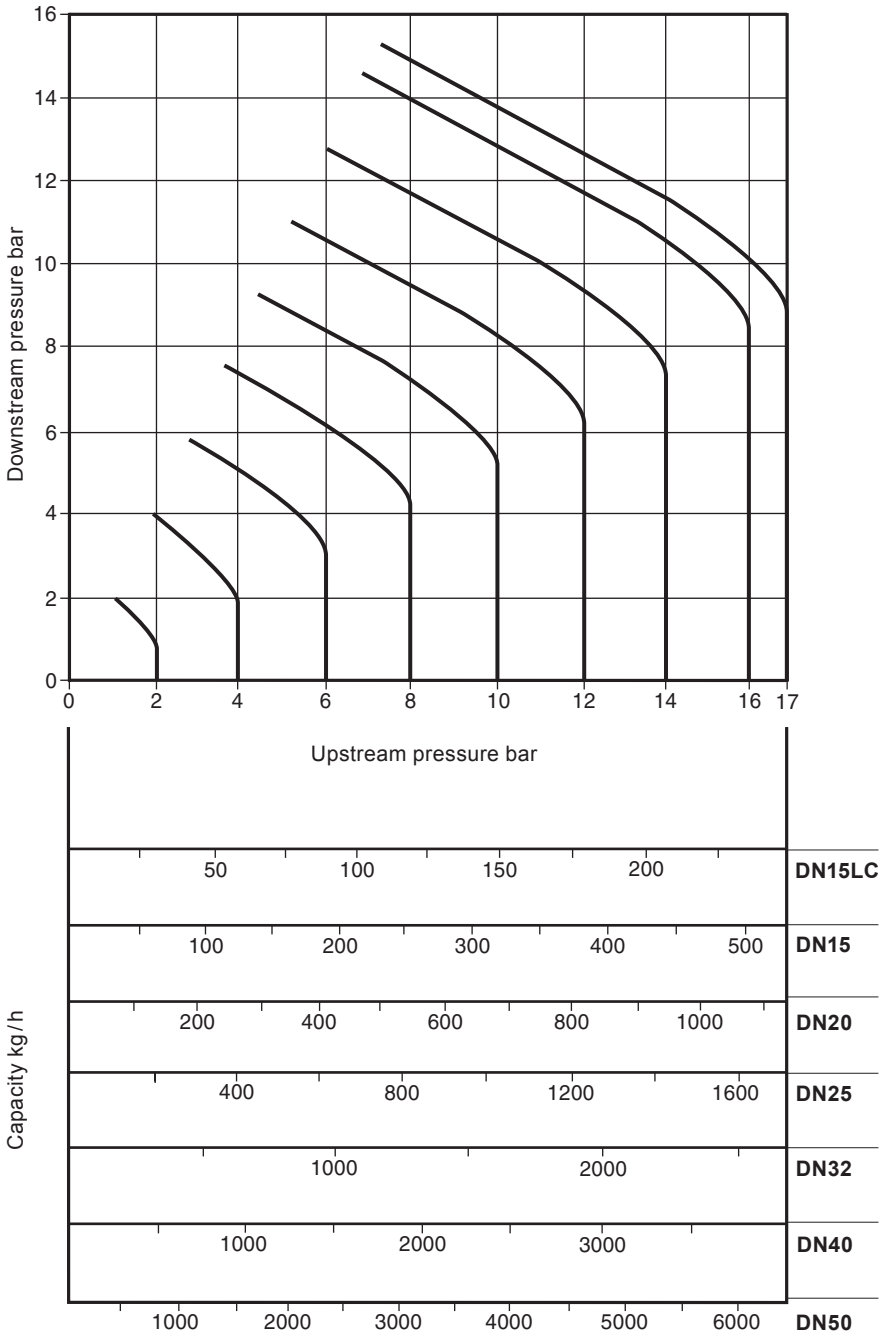
Note: Where the internal balance pipe is used the valve capacity will be reduced.

Dimensions / weights (approximate) in mm and kg

	Screwed	Flanged						Weight	
		ASME 300	ASME 150						
Size	A	A1	A1	B	D	E	F	Screwed	Flanged
DN15LC	160	127	120	185	415	283	132	13.2	14.0
DN15	160	127	120	185	415	283	132	13.2	14.0
DN20	160	-	139	185	415	283	132	13.2	14.9
DN25	180	160	160	207	440	293	147	14.2	17.2
DN32	-	182	176	207	440	293	147	-	18.2
DN40	-	200	199	255	480	302	178	-	30.2
DN50	-	230	228	255	480	302	178	-	32.2



Steam capacities chart



Note

The capacities quoted above are based on valves fitted with an external pressure sensing pipe. Reliance on the internal pressure sensing 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.

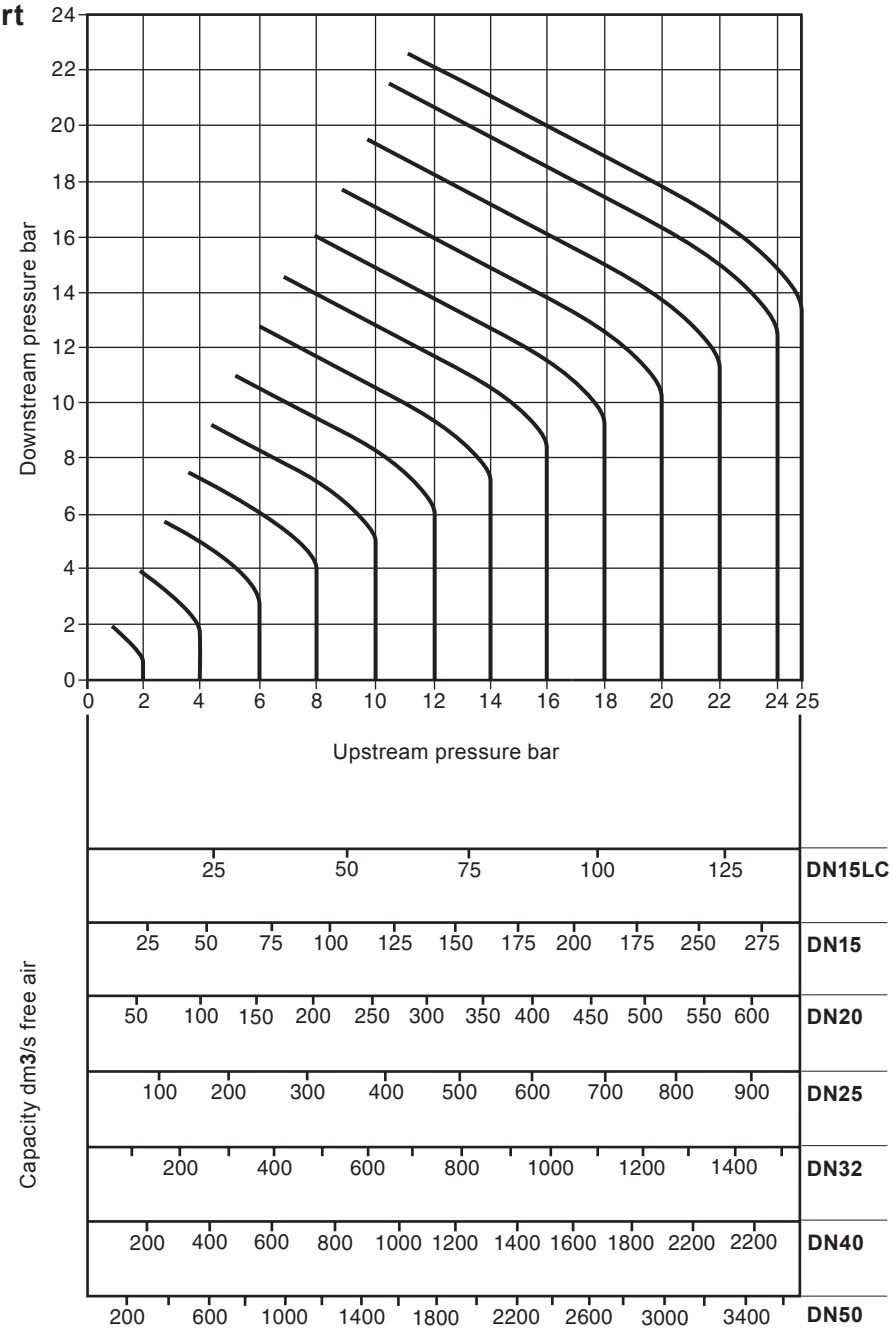
Superheated steam

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 x 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.

Compressed air capacities chart



How to use the chart

Capacities are given in cubic decimetres of free air per second (dm³/s). The use of the capacity chart can be best explained by an example. Required, a valve to pass 100 dm³/s of free air reducing from 12 bar to 8 bar.

Find the point at which the curved 12 bar upstream pressure line crosses the horizontal 8 bar downstream pressure line. A perpendicular dropped from this point shows that whereas a DN15LC valve will only pass 57 dm³/s and is therefore not large enough, a DN15 valve will pass approximately 120 dm³/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-IBR16-27IN) supplied with the product.

Installation note:

The pilot operated pressure reducing valve should be installed in a horizontal pipeline, protected by a strainer and a separator, with the direction of flow as indicated by the arrow on the valve body.

How to order example:

1 off Spirax Sarco DN32 DP27S pilot operated pressure reducing valve having a 0.2 - 17 bar spring and flanged ASME 300 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 assembly inclusive of filter element				**C**
* Pilot filter element and cap gasket	(packet of 3 off each)			**E, F**
Main valve assembly				**K, L**
* Internal strainer				**M**
Main valve return spring				**N**
Pressure adjustment spring	**DP27S**		0.2 to 17 bar	**O**
	DP27SY		0.2 to 3 bar	
* Control pipe assembly				**P**
* Balance pipe assembly				**Q**
* Body gasket (3 off)				**R**
Set of spring housing / actuating chamber cover securing studs and nuts	(set of 4)			**S**
Set of main body studs and nuts	(set of 4)			**T**
Set of diaphragm securing bolts and nuts	Valve sizes	½" - DN32	(set of 10)	**V**
		DN40 and DN50	(set of 12)	
Pushrod and main diaphragm plate assembly				**Y**

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.

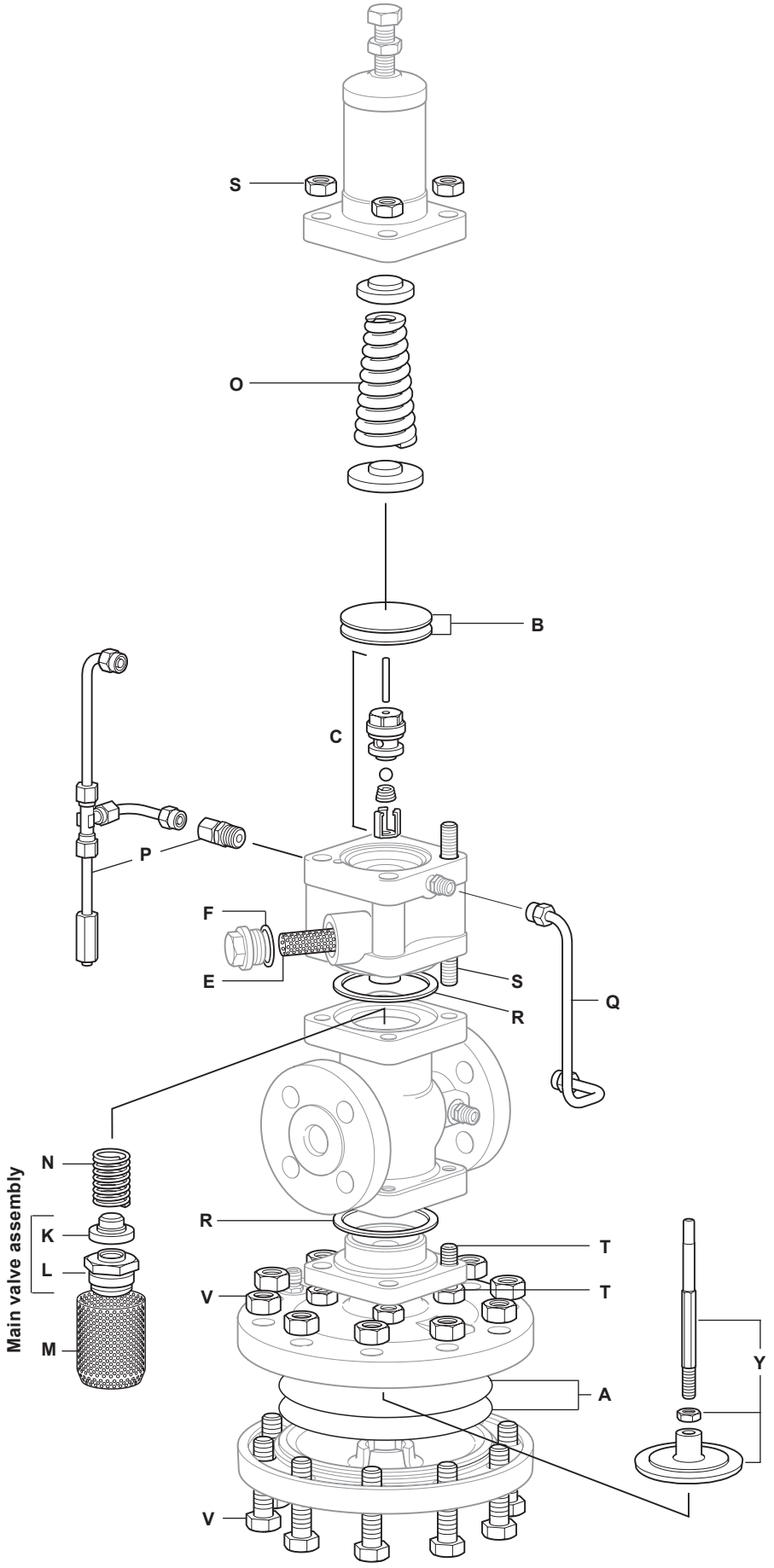
Example: 1 - Main valve assembly for a 1" Spirax Sarco Type DP27S pressure reducing valve.

How to fit. See 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 screwed valves ½" and ¾" is common to these sizes by the letter 'a', the letter 'c' indicates that one diaphragm is common to the DN40 and DN50 valves.

	Screwed				Flanged						
Size DN	**½"LC**	**½"**	**¾"**	**1"**	**15LC**	**15**	**20**	**25**	**32**	**40**	**50**
Maintenance kit	a	a	a	b	f	f	a	b	c	d	e
Main diaphragm	a	a	a	b	a	a	a	b	b	c	c
Pilot diaphragms	a	a	a	a	a	a	a	a	a	a	a
Pilot valve chamber assembly	a	a	a	a	a	a	a	a	a	b	b
Pilot filter element	a	a	a	a	a	a	a	a	a	a	a
Pilot filter cap gaskets	a	a	a	a	a	a	a	a	a	a	a
PTFE seals	a	a	a	a	a	a	a	a	a	a	a
Main valve assembly	a	b	c	d	a	b	c	d	e	f	g
Internal strainer	a	a	a	b	f	f	a	b	c	d	e
Main valve return spring	a	a	a	a	a	a	a	a	a	c	c
Pressure adjustment spring	a	a	a	a	a	a	a	a	a	a	a
Control pipe assembly	a	a	a	b	f	f	a	b	c	d	e
Balance pipe assembly	a	a	a	b	f	f	a	b	c	d	e
Body gasket	a	a	a	a	a	a	a	a	a	b	b
Set of spring housing securing studs and nuts	a	a	a	a	a	a	a	a	a	b	b
Set of main body studs and nuts	a	a	a	a	a	a	a	a	a	b	b
Set of diaphragm securing bolts and nuts	a	a	a	a	a	a	a	a	a	b	b
Pushrod and main diaphragm plate assembly	a	a	a	b	a	a	a	b	b	c	c


S
O
B
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M
Main valve assembly
R
T
T
V
A
Y
V