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ISO 9001

spirax sarco

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 CH Issue 2

SPIRA-TROL DN15 to DN100

LE, LF and LL Two-port Control Valves

Description

SPIRA-TROL is a range of two-port single seat globe valves with cage retained seats conforming to EN standards. These valves are available in three body materials in sizes ranging from DN15 to DN100. When used in conjunction with a pneumatic or electric linear actuator they provide modulating control or on/off service.

SPIRA-TROL valve characteristic - options:

LE	Equal percentage (E) - Suitable for most modulating process control applications providing good control at all flowrates.
LF	Fast opening (F) - For on/off applications only.
LL	Linear (L) - Primarily for liquid flow control where the differential pressures across the valve is constant.

Important note: Throughout this document, reference has been made to the standard LE control valve. With the exception of trim type, the LE, LF and LL control valves are identical.

SPIRA-TROL valve options:

	PTFE seals	Standard
Stem sealing	Bellows / graphite	Zero emissions and High temperature applications
	Graphite packing	High temperature applications
Seating	Metal-to-metal	431 stainless steel - standard 316L stainless steel
	Soft seating	Up to 200°C: PTFE for class VI shut-off Up to 250°C: PEEK for class VI shut-off
	Hard facing	316L stainless steel with Stellite 6 facing for more arduous applications
Bonnet type	Standard bonnet	
	Extended bonnet	for large pipe lagging or hot/cold applications
Trim	Standard trim	
	Low noise cage	

SPIRA-TROL two-port control valves are compatible with the following actuators and positioners:

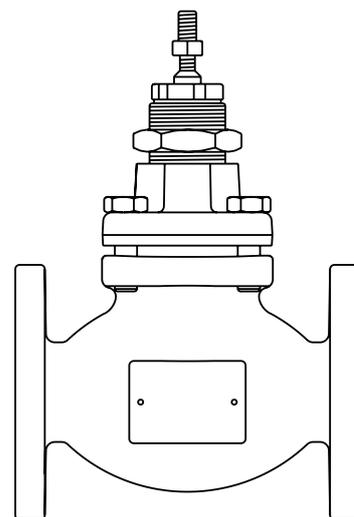
Electric	EL3500, EL5600 and EL7200 series
Pneumatic	PN1000 and PN9000 series
	PP5 (pneumatic) or EP5 (electropneumatic)
Positioners	ISP5 (intrinsically safe electropneumatic)
	SP200is, SP400 and SP500 (microprocessor based electropneumatic)
	SP300 (digital communications)

Refer to the relevant Technical Information sheet for further details.

Sizes and pipe connections

Type	Body material	Connections	Size range
LE31	Cast iron	Screwed BSP	DN15, DN20, DN25, DN32, DN40 and DN50
LE33	Cast iron		
LE43	Carbon steel	Flanged PN16,	DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80 and DN100
LE63	Stainless steel	JIS 10 and KS 10	

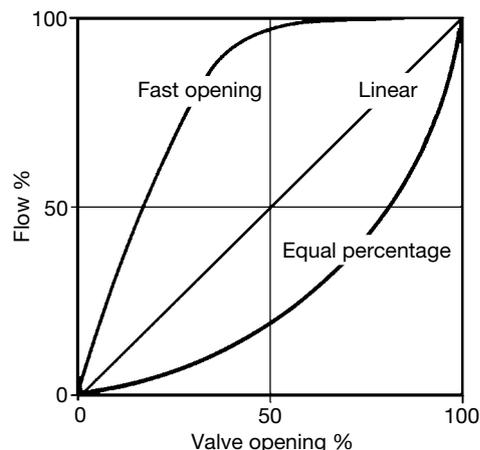
Note: The PN16 flange for the DN65 LE33 has 4 bolt holes as standard; 8 bolt holes are available on request.
The PN16 flange for the DN65 LE43 and LE63 has 8 bolt holes as standard; 4 bolt holes are available on request.



Technical data

Plug design	Parabolic	
Leakage	Metal-to-metal	Class IV
	Soft seal	Class VI
Rangeability	50:1	
Travel	DN15 to DN50	20 mm
	DN65 to DN100	30 mm

Typical flow characteristic curves



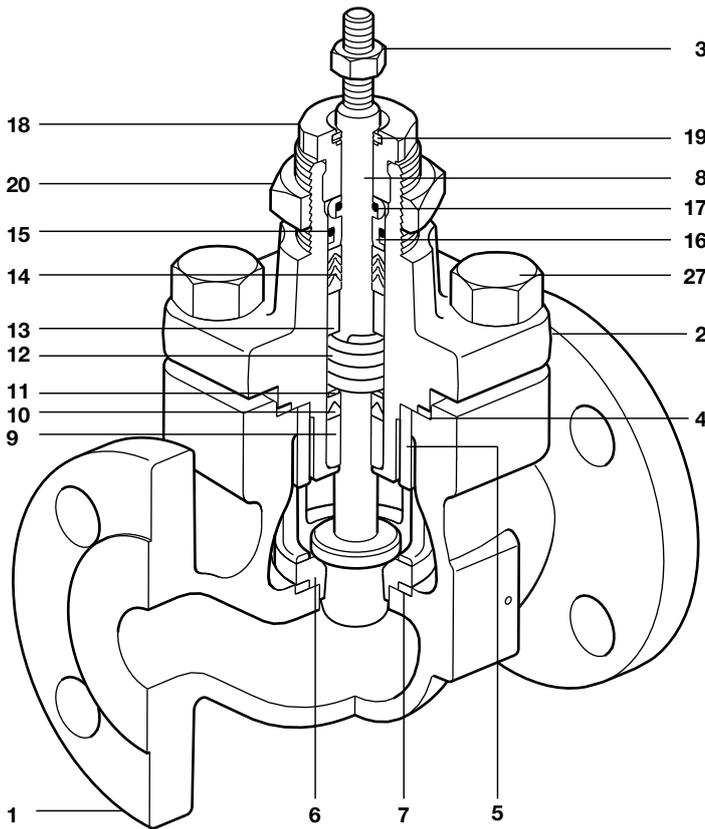
Materials

Type	No.	Part	Material	
LE31 LE33	1	Body	SG iron BS EN-GLS-400-18u-LT	
	2	Bonnet	SG iron EN-GLS-400-18u-LT	
	2a	Bonnet extension	Cast steel BS EN 10213 GP240GH+N (1.0619N)	
	2b	Bellows	Stainless steel	
	3	Stem lock-nut	Stainless steel	
LE43	1	Body	Carbon steel BS EN 10213 GP240GH+N (1.0619N)	
	2	Bonnet	DN15 to DN50	Carbon steel EN 10222-2 P305GH 1.0436
			DN65 to DN100	Carbon steel BS EN 10213 GP240GH+N (1.0619N)
	2a	Bonnet extension	Carbon steel BS EN 10213 GP240GH+N (1.0619N)	
	2b	Bellows	Stainless steel	
3	Stem lock-nut	Stainless steel		
LE63	1	Body	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2	Bonnet	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2a	Bonnet extension	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2b	Bellows	Stainless steel	
	3	Stem lock-nut	Stainless steel	
All versions using PTFE seals	2c	Extended bonnet	Stainless steel AISI 316L	
	4	Bonnet gasket	Reinforced exfoliated graphite	
	5	Seat retainer	Stainless steel 316L	
	6	Valve seat ring	Stainless steel	
	7	Seat gasket	Reinforced exfoliated graphite	
	8	Valve plug and stem	Stainless steel	
	9 *	Lower stem guide	Glass filled PTFE	
	10	Lower stem wiper	PTFE	
	11 *	Packing guard washer	Stainless steel 316L	
	12 *	Spring	Stainless steel	
	13	Packing spacer	Stainless steel 316L	
	14 *	Chevron packing set	PTFE	
	15 *	Outer 'O' ring	Viton B	
	16 *	Upper stem guide	Glass filled PTFE	
	17 *	Inner 'O' ring	Viton	
	18	Gland nut	Stainless steel	
	19	Scraper ring	PTFE	
	20	Actuator clamp nut	Plated carbon steel	
	22	Bonnet extension gasket	Reinforced exfoliated graphite	
	23	Top plate (used on bonnet extension only)	Stainless steel 316L	
	24	Lower spindle bearing housing	Stainless steel 316L	
	25	Lower spindle bearing	Stellite 6	
	26	Spindle lock and anti-rotation nut	Stainless steel 316L	
	27	Set screws	LE3_ and LE4_	Steel DIN 933618.8
			LE6_	Stainless steel DIN ISO 3506 A2 - 70

Not shown

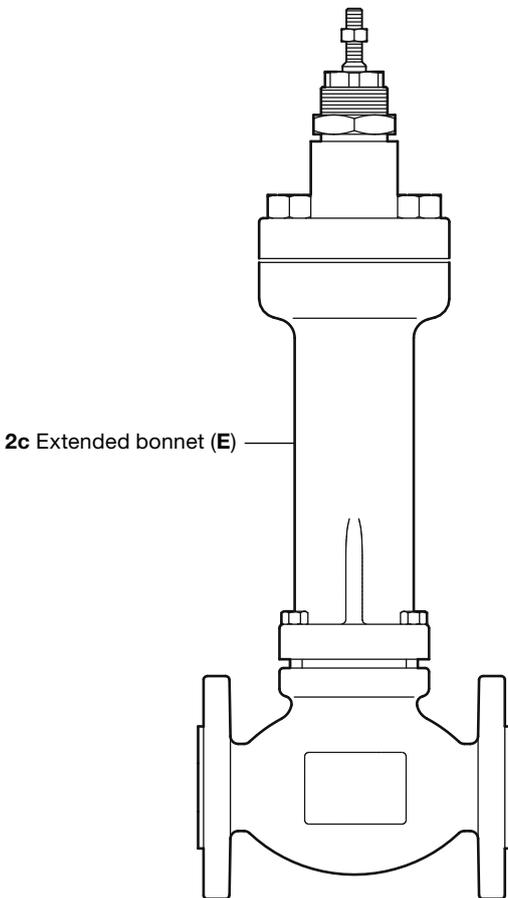
* Graphite packing

High temperature packing	9	Lower and upper stem guide	Stellite 6
	16		
	14	Grafoil packing	Graphite rings
	11	Not used	
	12		
	15		
	17		
19			

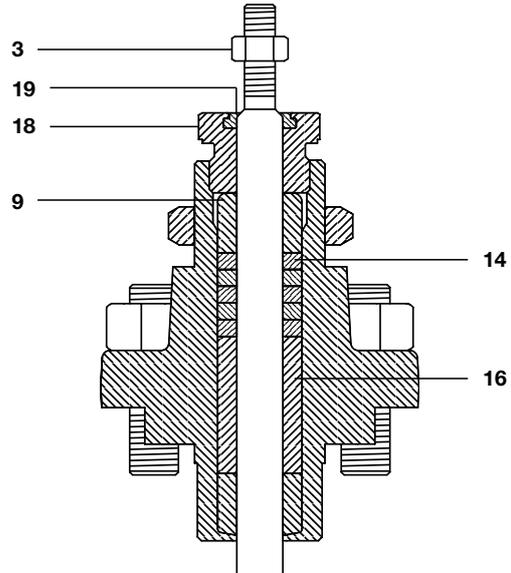


**LE valve
with PTFE packing**

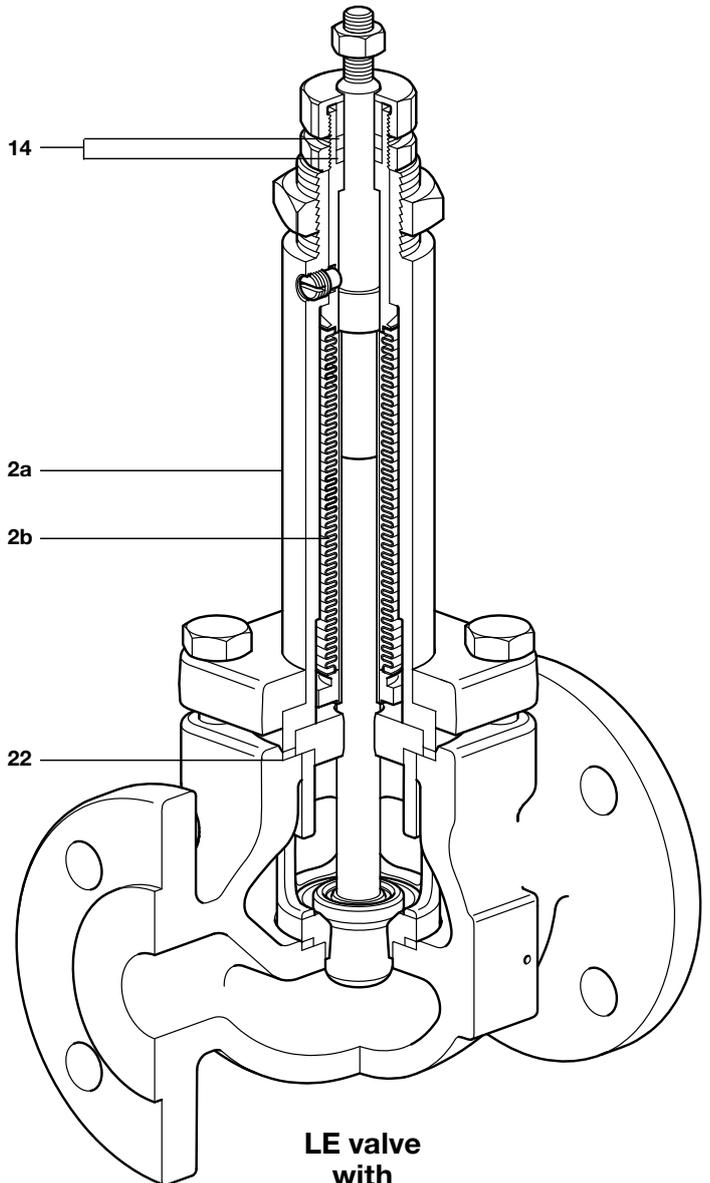
**LEA valve with
extended bonnet (E)**



2c Extended bonnet (E)



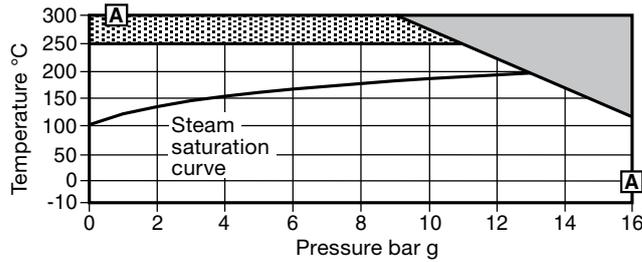
Bonnet with graphite packing



**LE valve
with
bellows seal (D)**

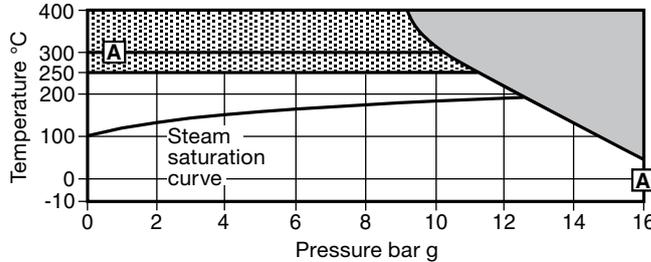
Pressure/temperature limits

**LE31 LE31B
LE33 LE33B
(Cast iron)**



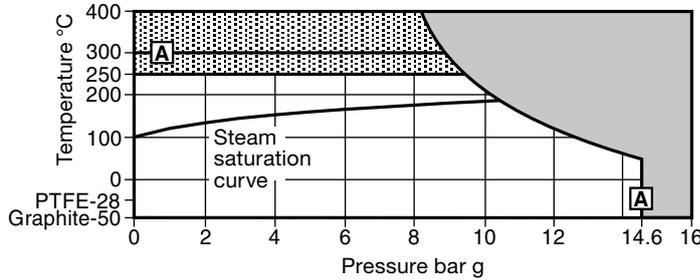
Please note - Bellows sealed valves (Option D) are limited to A - A.

**LE43 LE43B
(Carbon steel)**



Please note - Bellows sealed valves (Option D) are limited to A - A.

**LE63 LE63B
(Stainless steel)**



Please note - Bellows sealed valves (Option D) are limited to A - A.

Note: Where the process fluid temperature is sub-zero and the ambient temperature is below +5°C, the external moving parts of the valve and actuator must be heat traced to maintain normal operation.

- The product **must not** be used in this region.
- High temperature graphite packing is required for use in this region.

Body design conditions		PN16
Maximum design pressure	LE31	16 bar g @ 120°C
	LE33	16 bar g @ 120°C
	LE43	16 bar g @ 50°C
	LE63	14.6 bar g @ 50°C
Maximum design temperature	LE31	300°C
	LE33	300°C
	LE43	400°C
	LE63	400°C
Minimum design temperature	LE31	-10°C
	LE33	-10°C
	LE43	-10°C
	LE63	-50°C
Maximum operating temperature	Standard packing PTFE chevron	250°C
	PTFE soft seat (G)	200°C
	PEEK soft seat (K)	250°C
	High temperature packing (H)	400°C
	Extended bonnet (E) with PTFE chevron	250°C
	Extended bonnet (E) with graphite packing	400°C
	Bellows (D)	300°C
Minimum operating temperature	LE31	-10°C
	LE33	-10°C
	LE43	-10°C
	LE63	-50°C
Note: For lower operating temperatures consult Spirax Sarco.	PTFE packing	-28°C
	Graphite packing	-50°C
Maximum differential pressures:	See relevant actuator Technical Information sheet	
Maximum cold hydraulic test pressure of: Warning: If the valve is fitted with a bellows it must be removed if hydraulic testing is to be done.	LE31	24 bar g
	LE33	24 bar g
	LE43	24 bar g
	LE63	24 bar g

Kvs values

Size		Nominal size										
		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100		
Travel		20 mm						30 mm				
Standard trims	Full port	Equal %	4.0	6.3	10.0	16.0	25.0	36	63	100	160	
		Linear	4.0	6.3	10.0	16.0	25.0	36	63	100	160	
		Fast opening	4.0	6.3	10.0	18.0	28.0	50	85	117	180	
	Reductions	Trim 1	Equal %	2.5	4.0	6.3	10.0	16.0	25	36	63	100
			Linear	2.5	4.0	6.3	10.0	16.0	25	36	63	100
		Trim 2	Equal %	1.6	2.5	4.0	6.3	10.0	16	25	36	63
			Linear	1.6	2.5	4.0	6.3	10.0	16	25	36	63
		Trim 3	Equal %	1.0	1.6	2.5	4.0	6.3	10	16	25	36
			Linear	1.0	1.6	2.5	4.0	6.3	10	16	25	36
		Trim 4	Equal %	0.4	1.0	1.6	-	-	-	-	-	-
			Linear	0.4	1.0	1.6	-	-	-	-	-	-
	Micro flute	Linear		0.5	0.5	0.5	-	-	-	-	-	-
			0.2	0.2	0.2	-	-	-	-	-	-	
			0.1	0.1	0.1	-	-	-	-	-	-	

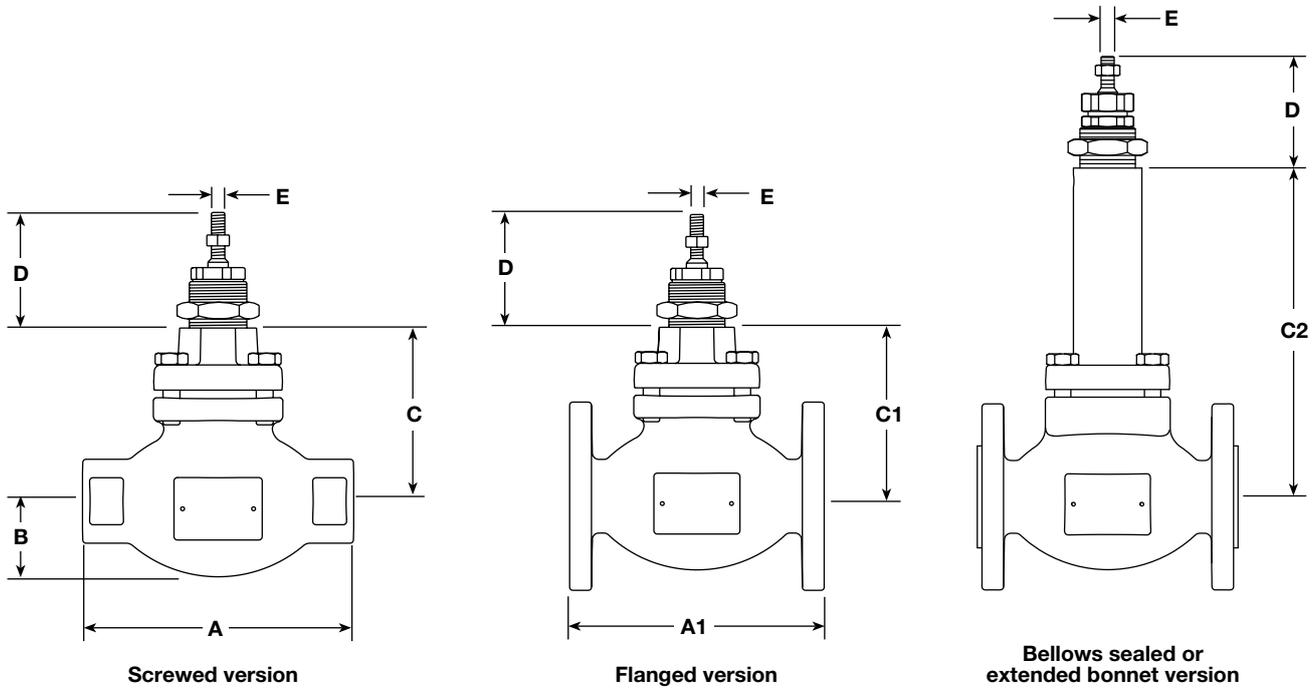
Travel		20 mm						30 mm			
Low noise trim	Full port	4.0	6.0	8.0	17	20	27	55	63	90	
	Reduced trim 1	Linear	3.5	5.0	6.0	12	13	15	35	40	60
	Reduced trim 2	Linear	3.0	4.0	4.5	7	7	7	30	33	40

Dimensions for the SPIRA-TROL (approximate) in mm

Valve size	A	A1	B	C	C1	C2		D	E
	Screwed BSP	Flanged* PN16 JIS 10 KS 10	Screwed BSP	Screwed BSP	Flanged PN16 JIS 10 KS 10	Extended bonnet**	Bellows sealed bonnet		Thread
DN15	130	130	40	103	103	237	237	69	M8
DN20	155	150	45	103	103	237	237	69	
DN25	160	160	50	103	103	237	237	69	
DN32	185	180	60	132	132	267	267	69	
DN40	205	200	65	132	132	267	267	69	
DN50	230	230	80	127	127	267	267	69	
DN65	-	290	-	-	201	359	368	81	M12
DN80	-	310	-	-	201	359	368	81	
DN100	-	350	-	-	216	375	381	81	

* **Note:** The PN16 flange for the DN65 LE33 has 4 bolt holes as standard; 8 bolt holes are available on request.
 The PN16 flange for the DN65 LE43 and LE63 has 8 bolt holes as standard; 4 bolt holes are available on request.

** **Note:** See item 2c, page 3 for actual outline view of extended bonnet.

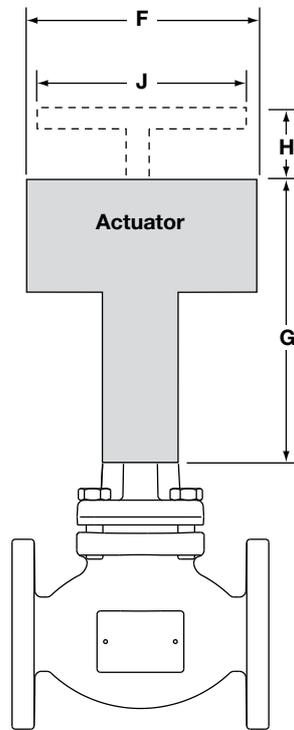


Weights for the SPIRA-TROL (approximate) in kg

Valve size	LE31	LE33	LE43	LE63	Bellows and extended bonnet
DN15	4.0	5.0	5.0	5.0	4.5
DN20	5.0	6.0	6.0	6.0	4.5
DN25	5.5	6.5	6.5	6.5	4.5
DN32	9.0	10.0	10.0	10.0	5.5
DN40	10.0	12.8	12.8	12.8	5.5
DN50	11.0	15.0	15.0	15.0	5.5
DN65	-	32.0	32.0	32.0	9.5
DN80	-	36.0	36.0	36.0	9.5
DN100	-	53.0	53.0	53.0	13.0

Dimensions / weights for the PN actuator range (approximate) in mm and kg

Actuator range	F	G	H	J	Weight	
					Actuator	With handwheel
PN1500 and PN2500	405	1 114	-	-	55	-
PN1600 and PN2600	465	1 116	-	-	70	-
PN9100E and variants	275	170	55	225	6	+ 5.86
PN9100R and variants	275	170	140	225	6	+ 2.50
PN9200E and variants	300	300	55	225	17	+ 7.20
PN9200R and variants	300	300	140	225	17	+ 3.77
PN9320E and variants	325	390	65	350	27	+ 7.20
PN9320R and variants	325	390	150	350	27	+ 3.77
PN9330E and variants	335	390	65	350	27	+ 7.20
PN9330R and variants	335	390	150	350	27	+ 3.77



Dimensions / weights for the EL actuator range (approximate) in mm and kg

Actuator range	F	G	Weight
EL3500	135 x 161	242	1.3
EL3500 SE	135 x 161	284	2.4
EL3500 SR	135 x 161	284	2.4
EL560_	177	460	4.5
EL561_	177	460	4.8
EL562_	177	460	5.2
EL563_	177	506	7.0
EL564_	225	569	10.0
EL565_	227	807	20.0
EL506_	162	445	8.7
EL7200 series	100	471	3.0

Spare parts

SPIRA-TROL

The spare parts available are shown in solid outline. Parts drawn in broken line are not supplied as spares.

Note: When placing an order for spare parts please specify clearly the full product description as found on the label of the valve body, as this will ensure that the correct spare parts are supplied.

Available spares - LE, LF and LL

Actuator clamping nut	A	
Gasket set (Non-bellows sealed)	B, G	
Stem seal kits	PTFE chevrons	C
	Graphite packing	C2
PTFE to Graphite conversion kit	C1	
* Equal percentage trim (No gaskets supplied)	D, E	
Plug stem and seat kit	Fast opening trim (No gaskets supplied)	D1, E
	Linear trim (No gaskets supplied)	D2, E
PTFE or PEEK soft seat seal	H	

* Specify if reduced trim.

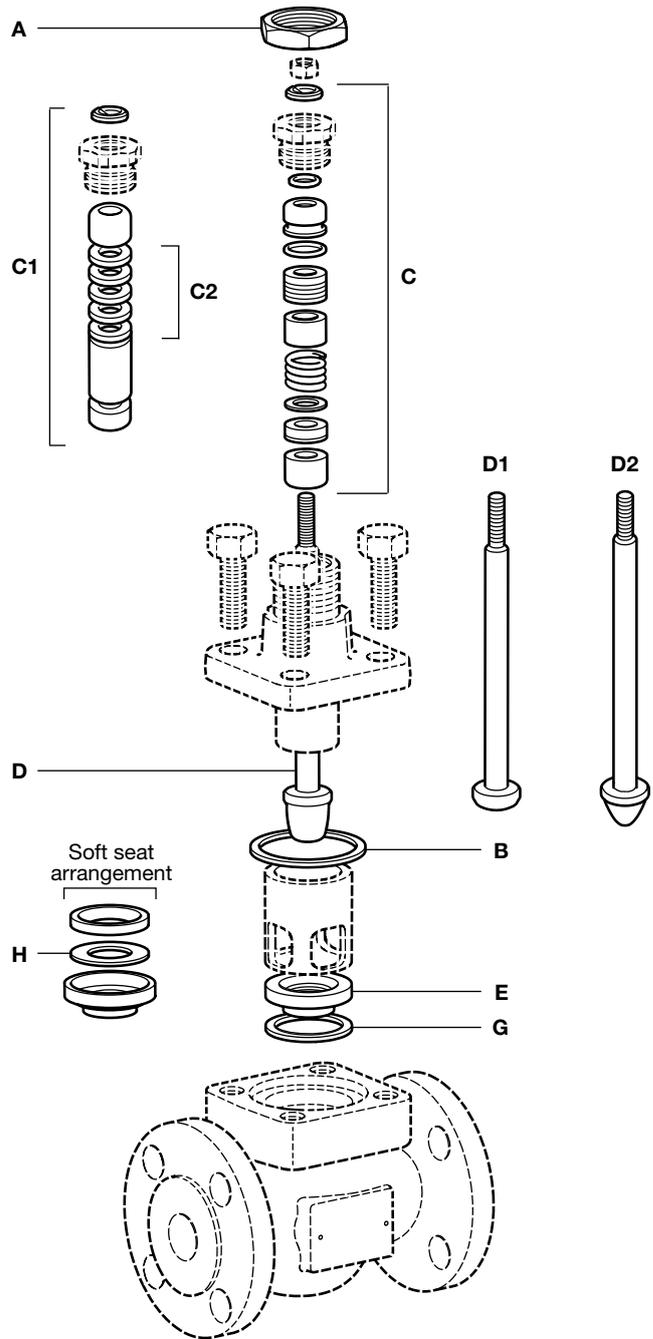
How to order spares

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

Example: 1 - PTFE stem seal kit for a Spirax Sarco DN25 SPIRA-TROL two-port LE43 PTSUSS.2 K_v10 control valve.

How to fit spares

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



Spare parts

SPIRA-TROL with bellows seal (D)

The spare parts available are shown in solid outline. Parts drawn in broken line are not supplied as spares.

Note: When placing an order for spare parts please specify clearly the date code (found on the label of the valve body), this will ensure that the correct spare parts are supplied.

Available spares - LE_B, LF_B and LL_B

Actuator clamping nut	A
Gasket set (Bellows sealed)	B, G
Stem seal kits PTFE chevrons	C
* Equal percentage trim (No gaskets supplied)	D3, E
Plug stem and seat kit Fast opening trim (No gaskets supplied)	D4, E
Linear trim (No gaskets supplied)	D5, E
Bellows seal assembly	F
PTFE or PEEK soft seat seal	H

* Specify if reduced trim.

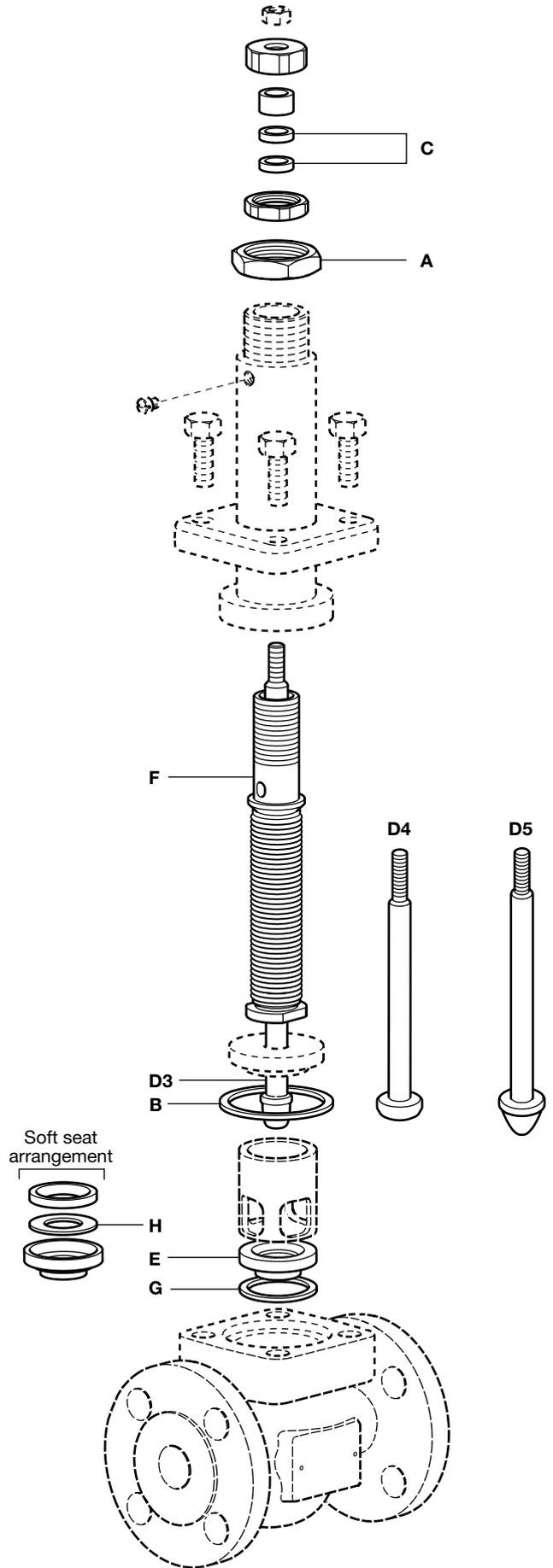
How to order spares

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

Example: 1 - PTFE stem seal kit for a Spirax Sarco DN25 SPIRA-TROL two-port LE43B TSUSS.2 K_{VS}10 control valve.

How to fit spares

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



SPIRA-TROL selection guide:

Valve size	DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80 and DN100	DN25
Valve series	L = L series 2-port control valve	L
Valve characteristic	E = Equal percentage F = Fast opening L = Linear	E
Flow direction	T = Flow over plug (not available for low noise trim) Blank = Flow under plug	
Body material	3 = Cast iron 4 = Carbon steel 6 = Stainless steel	4
Connections	1 = Screwed 3 = Flanged	3
Stem sealing	P = PTFE D = Bellows/Graphite seals H = Graphite	P
Seating	T = 431 stainless steel G = PTFE soft seat K = PEEK S = 316L stainless steel W = 316L with stellite 6 facing	T
Type of trim	S = Standard trim P = Low noise cage	S
Trim balancing	U = Unbalanced	U
Bonnet type	S = Standard E = Extended (not available if bellows seal selected)	S
Bolting	S = Standard	S
Series	2 = .2	.2
K_{vs}	To be specified	K_{vs} 10
Connection type	To be specified	Flanged PN16

Selection example:

DN25	-	L	E		4	3	P	T	S	U	S	S	.2	-	K _{vs} 10	-	Flanged PN16
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How to order

Example: 1 off Spirax Sarco DN25 SPIRA-TROL LE43PTSUSS.2 K_{vs} 10 two-port control valve having flanged PN16 connections.