

ΠΥΘΜΙΣΤΙΚΕΣ
ΒΑΛΒΙΔΕΣ

spirax
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TI-S24-71
CH Issue 10

Spira-trol™ Two-port Control Valves

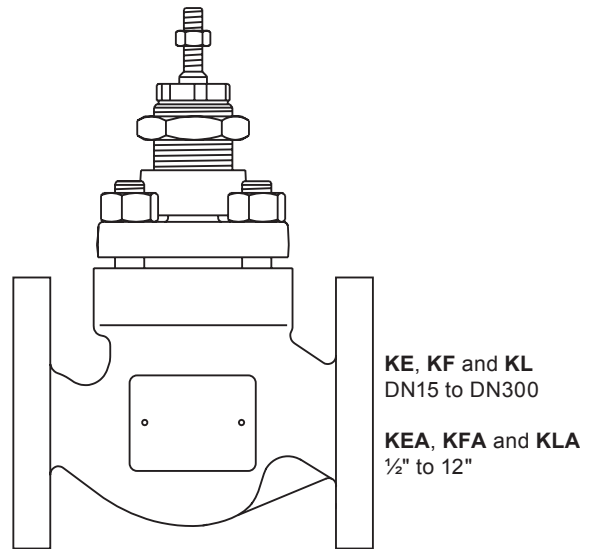
EN Standard KE, KF and KL DN15 to DN300 and ASME Standard KEA, KFA and KLA ½" to 12"

Description

Spira-trol™ is a range of two-port single seat globe valves with cage retained seats conforming to EN and ASME standard. These valves are available in three body materials in sizes ranging from DN15 to DN300 (½" to 12"). When used in conjunction with a pneumatic or electric linear actuator they provide characterized modulating or on/off control.



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Sizes and pipe connections

Body material	Connections	Type	Size range	
Carbon steel	Screwed NPT	KEA41	½", ¾", 1", 1¼", 1½" and 2"	
	Socket weld	KEA42	½", ¾", 1", 1¼", 1½" and 2"	
	Flanged	EN 1092 PN25 and PN40	KE43	DN15 to DN100
		EN 1092 PN16, PN25 and PN40	KE43	DN125, DN150, DN200, DN250 and DN300
		JIS 20 and KS 20	KE43	All variants between DN15 to DN100
		JIS 10, JIS 20, KS 10 and KS 20	KE43	DN125, DN150, DN200, DN250 and DN300
		ASME 300	KEA43	½", ¾", 1", 1½", 2", 2½", 3" and 4"
ASME 150 and ASME 300	KEA43	6" to 12"		
Stainless steel	Screwed	BSP	KE61	DN15, DN20, DN25, DN32, DN40 and DN50
		NPT	KEA61	½", ¾", 1", 1¼", 1½" and 2"
	Flanged	Socket weld	KEA62	½", ¾", 1", 1¼", 1½" and 2"
		EN 1092 PN40	KE63	All variants between DN15 to DN100
		EN 1092 PN16, PN25 and PN40	KE63	DN125, DN150 and DN200
		JIS 20 and KS 20	KE63	All variants between DN15 to DN100
		JIS 10, JIS 20, KS 10 and KS 20	KE63	DN125, DN150 and DN200
ASME 300	KEA63	½", ¾", 1", 1½", 2", 2½", 3" and 4"		
ASME 150 and ASME 300	KEA63	6" and 8"		
SG iron	Screwed	BSP	KE71	DN15, DN20, DN25, DN32, DN40 and DN50
		EN 1092 PN16 and PN25	KE73	All variants between DN15 to DN200
	Flanged	JIS 10 and KS 10	KE73	All variants between DN15 to DN200
		ASME 125 and ASME 250	KEA73	1", 1½", 2", 2½", 3", 4", 6" and 8"
		JIS10 and KS10		½", ¾", 1", 1¼", 1½", 2", 2½", 3" and 4"

Spira-trol™ valve characteristic - options:

KE and KEA Equal percentage (E) - Suitable for most modulating process control applications providing good control at all flowrates.

KF and KFA Fast opening (F) - For on/off applications only.

KL and KLA 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 KE or KEA control valve. With the exception of trim type, the KE, KEA, KF, KFA, KL and KLA control valves are identical.

Spira-trol™ valve options:


	PTFE chevron seals	Standard
	Graphite packing	High temperature applications
Stem sealing	Bellows / PTFE (B)	Zero emissions and thermal fluids
	Bellows / graphite (C)	Zero emissions, high temperature applications and thermal fluids
	Bellows / graphite secondary seals (D)	Zero emissions and high temperature applications
Seating	Metal-to-metal	431 stainless steel - standard 316L stainless steel - DN15 to DN100 only
	Soft seating	Up to 200 °C (392 °F) - PTFE for Class VI shut-off
		Up to 250 °C (482 °F) - 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 and anti-cavitation trim (see TI-S24-59)	

Spira-trol™ valves are compatible with the following actuators and positioners:

Electric	EL3500, EL7200, AEL3, AEL5 and AEL6 series
Pneumatic	PN1000, PN2000, PN9000 and TN2000 series
	PP5 (pneumatic) or EP500S (electropneumatic)
Positioners	EP500A (intrinsically safe + explosion proof electropneumatic)
	SP400 and SP500 (microprocessor based electropneumatic)

Note: Reference the product specific Technical Information sheet for further details.

Standards

Designed in accordance with EN 60534. This product fully complies with the requirements of the European Pressure Equipment Directive 2014/68/EC and carries the  mark when so required.

Certification

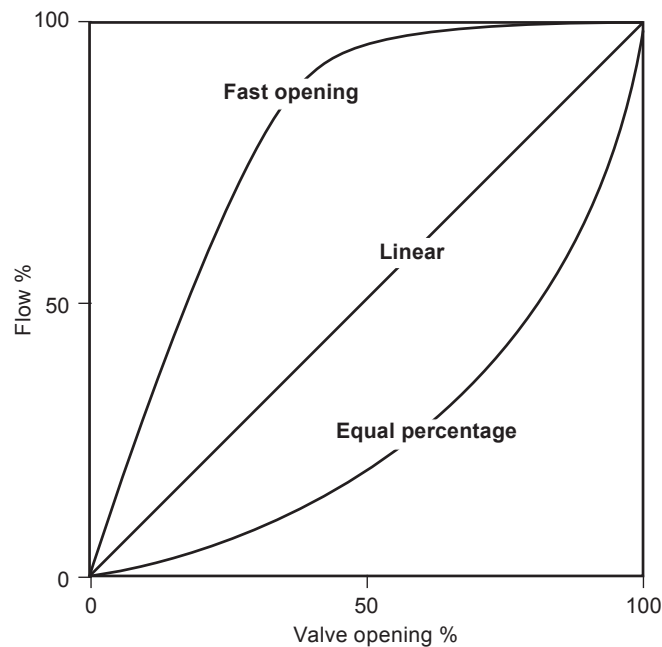
This product is available with certification to EN 10204 3.1. **Note:** All certification / inspection requirements must be stated at the time of order placement.



Technical data

Plug design		Parabolic	
Leakage	Metal-to-metal	Balanced	Class IV
		Unbalanced	Class IV (Class V is optional)
	Soft seal	Balanced	Class IV
		Unbalanced	Class VI
Rangeability	Equal	50:1	
	Linear	30:1	
	Fast	10:1	
Travel	DN15 - DN50	(½" - 2")	20 mm (¾")
	DN65 - DN100	(2½" - 4")	30 mm (1⅜")
	DN125 - DN300	(5" - 12")	70 mm (2¾")

Typical flow characteristic curves



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Materials - DN15 to DN100 (½" to 4") see pages 6 and 7 for the DN125 to DN300 (6" to 12")

Body material	Type	No.	Part	Material	
Carbon steel	KE43	1	Body	Cast steel BS EN 10213 GP 240GH+N (1.0619N)	
		2	Bonnet	DN15 to DN50 Forged steel EN 10222-2 P305GH 1.0436 DN65 to DN100 Cast steel BS EN 10213 GP 240GH+N (1.0619N)	
		2a	Bonnet extension	DN15 to DN100 Cast steel BS EN 10213 GP 240GH+N (1.0619N)	
		2c	Extended bonnet	Cast steel BS EN 10213 GP 240GH+N (1.0619N)	
	KEA41 KEA42 KEA43	1	Body	Cast steel ASTM A216 WCB	
		2	Bonnet	½" to 2" Forged steel ASTM A105N 2½" to 4" Cast steel ASTM A216 WCB	
		2a	Bonnet extension	Cast steel ASTM A216 WCB	
		2c	Extended bonnet	Cast steel ASTM A216 WCB	
	Stainless steel	KE61 KE63	1	Body	Stainless steel DIN GX5 CrNiMO 18-10 1.4581
			2	Bonnet	Stainless steel DIN GX5 CrNiMO 17-12-2 1.4401
2a			Bonnet extension	Stainless steel DIN GX5 CrNiMO 17-12-2 1.4401	
2c			Extended bonnet	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
KEA61 KEA62 KEA63		1	Body	Stainless steel ASTM A351 CF8M	
		2	Bonnet	Stainless steel ASTM A351 CF8M	
		2a	Bonnet extension	Stainless steel ASTM A351 CF8M	
		2c	Extended bonnet	Stainless steel ASTM A351 CF8M	
SG iron		KE71 KE73	1	Body	SG iron EN-GJS-400-18U-LT
			2	Bonnet	SG iron EN-GJS-400-18U-LT
	2a		Bonnet extension	Cast steel BS EN 10213 GP 240GH+N (1.0619N)	
	2c		Extended bonnet	Carbon steel 1.0619N	
	KEA71 KEA73	1	Body	SG iron ASTM A395	
		2	Bonnet	SG iron ASTM A395	
		2a	Bonnet extension	Cast steel ASTM A216 WCB	
		2c	Extended bonnet	Cast steel ASTM A216 WCB	
	All versions	2b	Bellows	Stainless steel AISI 316L	
		3	Stem lock-nut	Stainless steel AISI 431	
4		Bonnet gasket	Reinforced exfoliated graphite		
5		Seat retainer	Stainless steel ASTM A351 CF8M		
6		Valve seat ring	Seating version T	Stainless steel AISI 431 S29	
			Seating versions P and K	PEEK	
			All others	Stainless steel AISI 316L	
7		Seat gasket	Reinforced exfoliated graphite		
8		Valve plug and stem	Body	Stainless steel AISI 316L	
			Seating version W	Stellite 6	
			All others	Stainless steel AISI 431	
9 *		Lower stem guide	Glass filled PTFE		
10		Lower stem wiper	PTFE		
11 *		Packing guard washer	Stainless steel AISI 316L		
12 *		Spring	Stainless steel AISI 316L		
13		Packing spacer	Stainless steel AISI 316L		
14 *		Chevron packing set	PTFE		
15 *		Outer 'O' ring	Viton		
16 *		Upper stem guide	Glass filled PTFE		
17 *		Inner 'O' ring	Viton		
18		Gland nut	KE63	Stainless steel AISI 316L	
			All others	Stainless steel AISI 431 S29	
19		Scraper ring	PTFE		
20		Actuator clamp nut	KEA6_	Stainless steel	
			Others	Plated carbon steel	
21		Bellows assembly	Stainless steel AISI 316L		
22		Bonnet extension gasket	Reinforced exfoliated graphite		
23	Top plate (used on bonnet extension only)	Stainless steel AISI 316L			
24	Lower spindle bearing housing	Stainless steel AISI 316L			
25	Lower spindle bearing	Stellite 6 or stainless steel for KE43, KE71 and KE73			
26	Spindle lock and anti-rotation nut	Stainless steel			
27 and 28		For nuts and studs, see page 8			

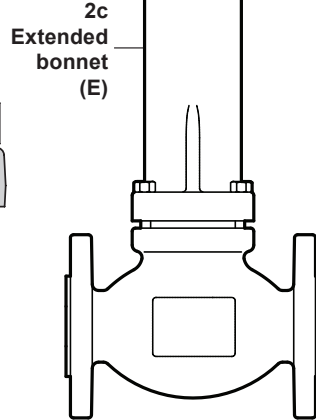
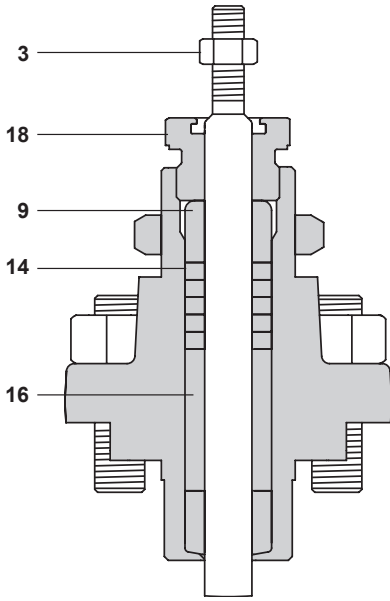

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KE valve with extended bonnet (E)

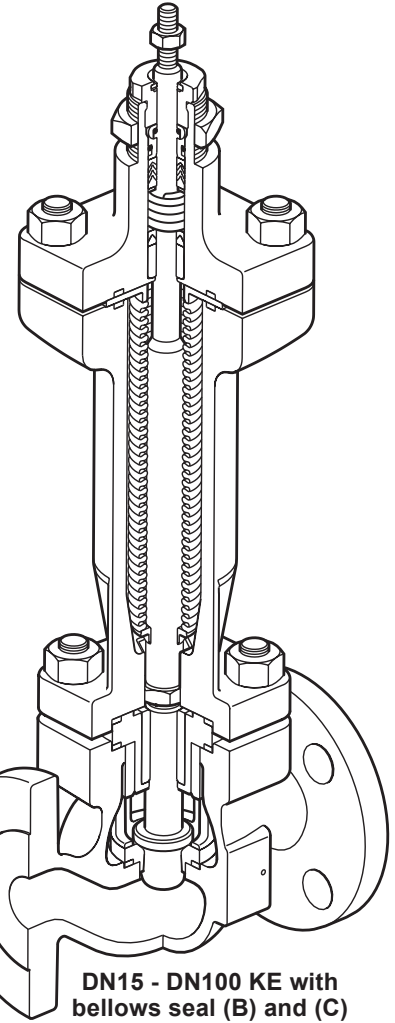
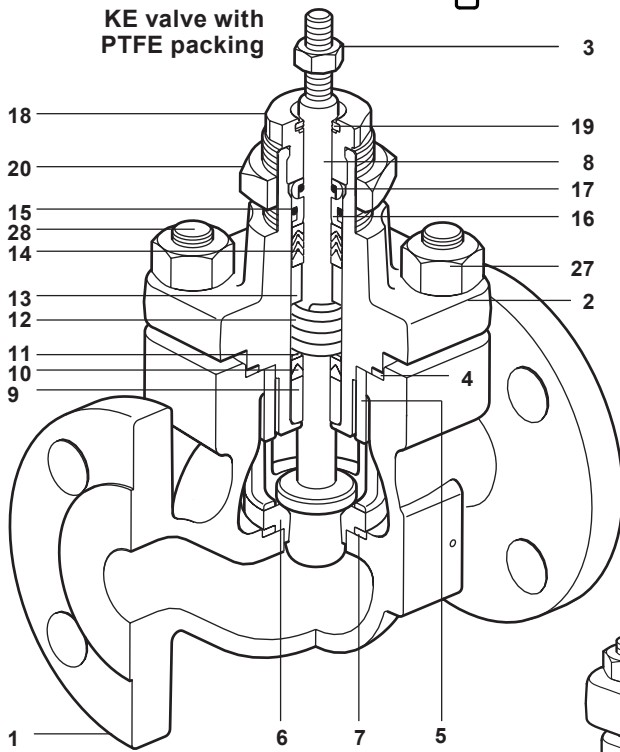
* Graphite packing

High temperature packing	9	Lower and upper stem guide	Stellite 6
	16	Grafoil packing	Graphite rings
	10, 11, 12, 15, 17 and 19		
Not used			

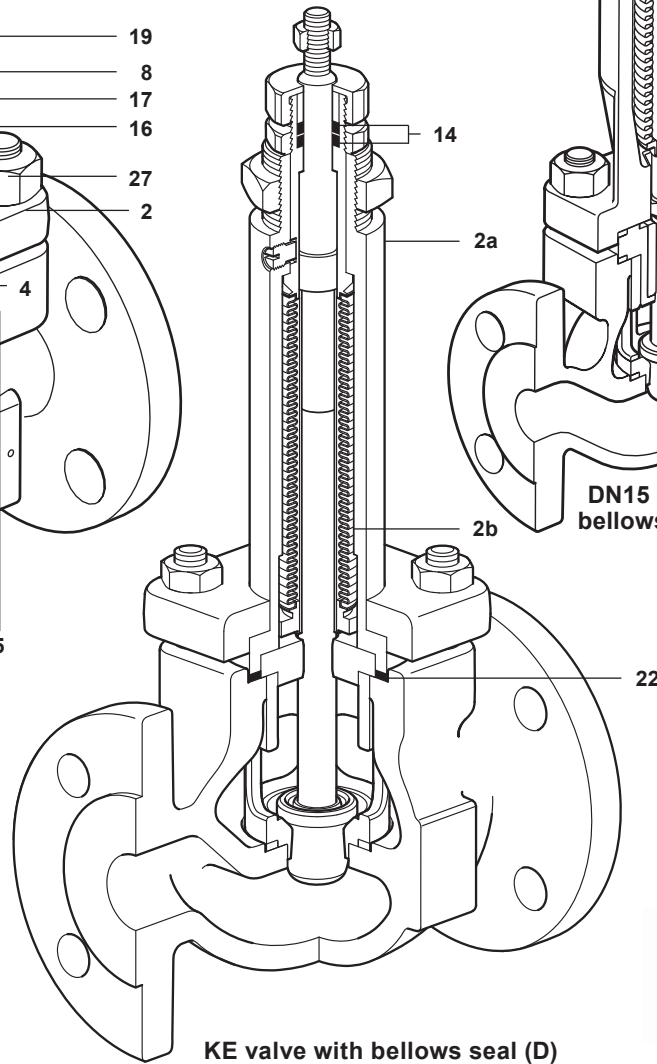
KE valve with graphite packing



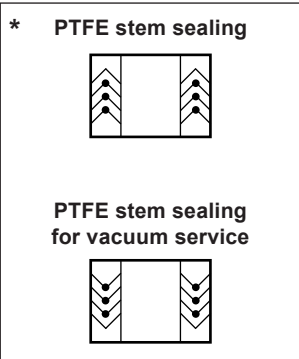
KE valve with PTFE packing



DN15 - DN100 KE with bellows seal (B) and (C)



KE valve with bellows seal (D)



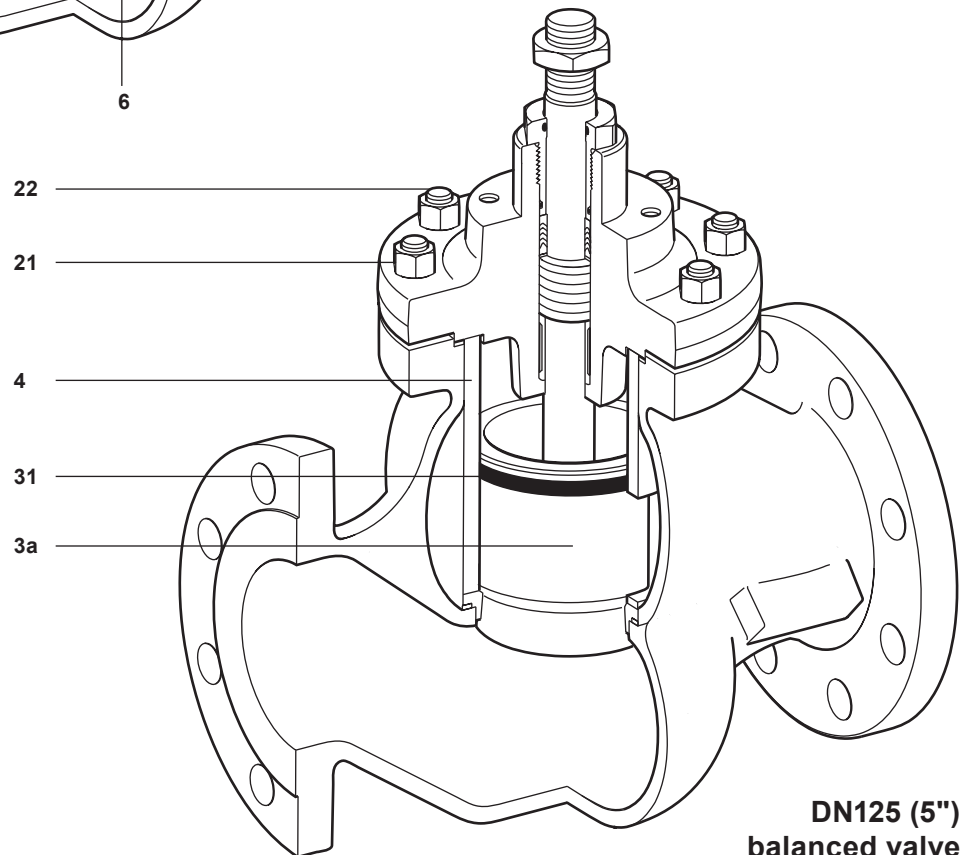
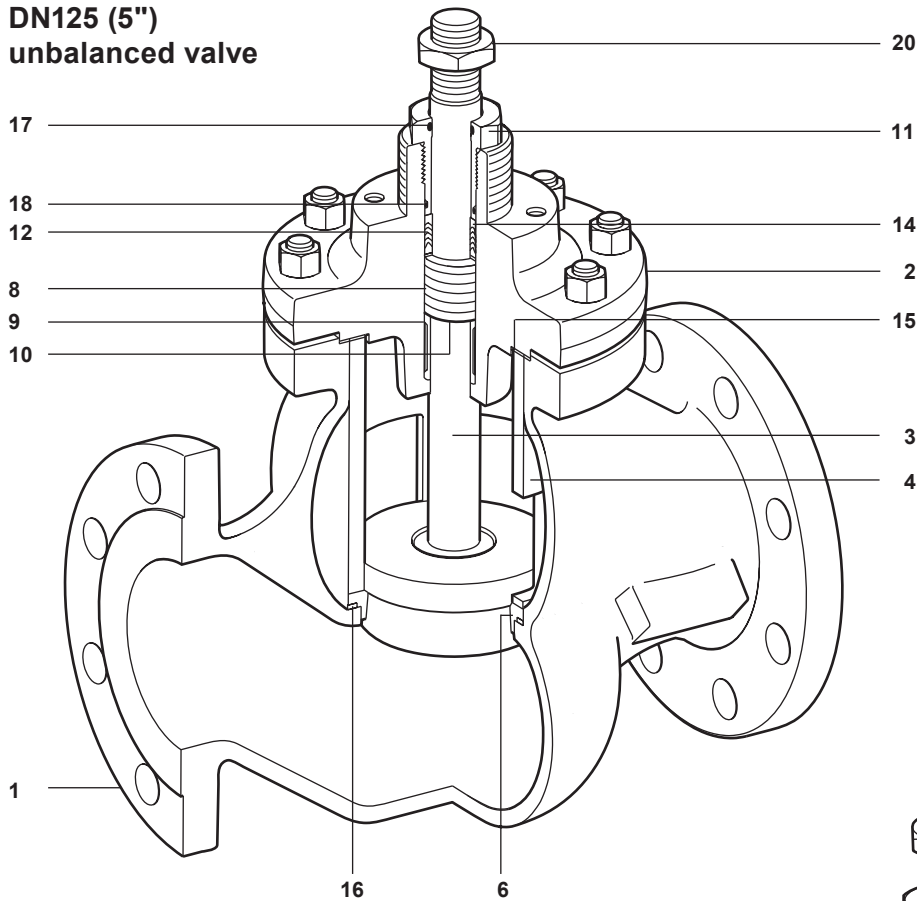
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Materials - DN125 to DN300 (6" to 12") see pages 4 and 5 for the DN15 to DN100 (½" to 4")

Body material	Type	No.	Part	Material
Carbon steel	KE43	1	Body	Cast steel BS EN 10213 GP 240GH+N (1.0619N)
		2	Bonnet	Cast steel BS EN 10213 GP 240GH+N (1.0619N)
	KEA43	1	Body	Cast steel ASTM A216 WCB
		2	Bonnet	Cast steel ASTM A216 WCB
Stainless steel	KE63	1	Body	Stainless steel EN 10213 (1.4408)
		2	Bonnet	Stainless steel EN 10213 (1.4408)
	KEA63	1	Body	Stainless steel ASTM A351 CF8M
		2	Bonnet	Stainless steel ASTM A351 CF8M
SG iron	KE73	1	Body	SG iron EN-GJS-400-18U-LT
		2	Bonnet	SG iron EN-GJS-400-18U-LT
	KEA73	1	Body	SG iron ASTM A395
		2	Bonnet	SG iron ASTM A395
All versions	3	Plug and stem assembly	All others	Stainless steel AISI 431
			KE63	Stainless steel AISI 316L
			Seating version W	Stellite 6
	4	Cage	Stainless steel BS 31462 Grade ANC 2	
	6	Valve seat ring	Seating version T	Stainless steel AISI 431 S29
			Seating versions P and K	PEEK
			All others	Stainless steel Stellite 6
	9	Bearing	Stellite	
	10	Spacer (not used in DN125 valves)	Stainless steel BS EN 1127	
	11	Gland nut	Stainless steel AISI 416	
	14	Washer	Stainless steel AISI 316L	
	15	Bonnet gasket	Stainless steel / graphite	
	16	Seat gasket	Stainless steel / graphite	
	20	Stem nut	Stainless steel AISI 316	
	21	Standard bonnet nut	KE43	Carbon steel BS EN ISO 898-1 Grade 8.8
			KE63	Stainless steel A2-80
			KE73	Carbon steel BS EN ISO 898-1 Grade 8.8
			KEA43	Carbon steel ASTM A194 2H
			KEA63	Stainless steel ASTM A194 8M
			KEA73	Carbon steel ASTM A194 2H
High temperature bonnet nut		Stainless steel DIN ISO 3506 A2		
22	Standard stud	KE43	Carbon steel BS EN ISO 898-1 Grade 8.8	
		KE63	Stainless steel A2	
		KE73	Carbon steel BS EN ISO 898-1 Grade 8.8	
		KEA43	Carbon steel ASTM A193 B7	
		KEA63	Stainless steel ASTM A193 B8M2	
		KEA73	Carbon steel ASTM A193 B7	
	High temperature bonnet nut	Stainless steel DIN ISO 3506 A2-80		
PTFE gland versions	8	Spring	Stainless steel	
	12	Chevron packing set	PTFE	
	17	Stem 'O' ring	Viton	
	18	Bonnet 'O' ring	Viton	

High temperature gland versions	26	Gland packing	Graphite
	3a	Plug and stem assembly	Stainless steel
Balanced versions	29	Cage	Stainless steel
	31	Balanced seal	Graphite

DN125 (5") unbalanced valve



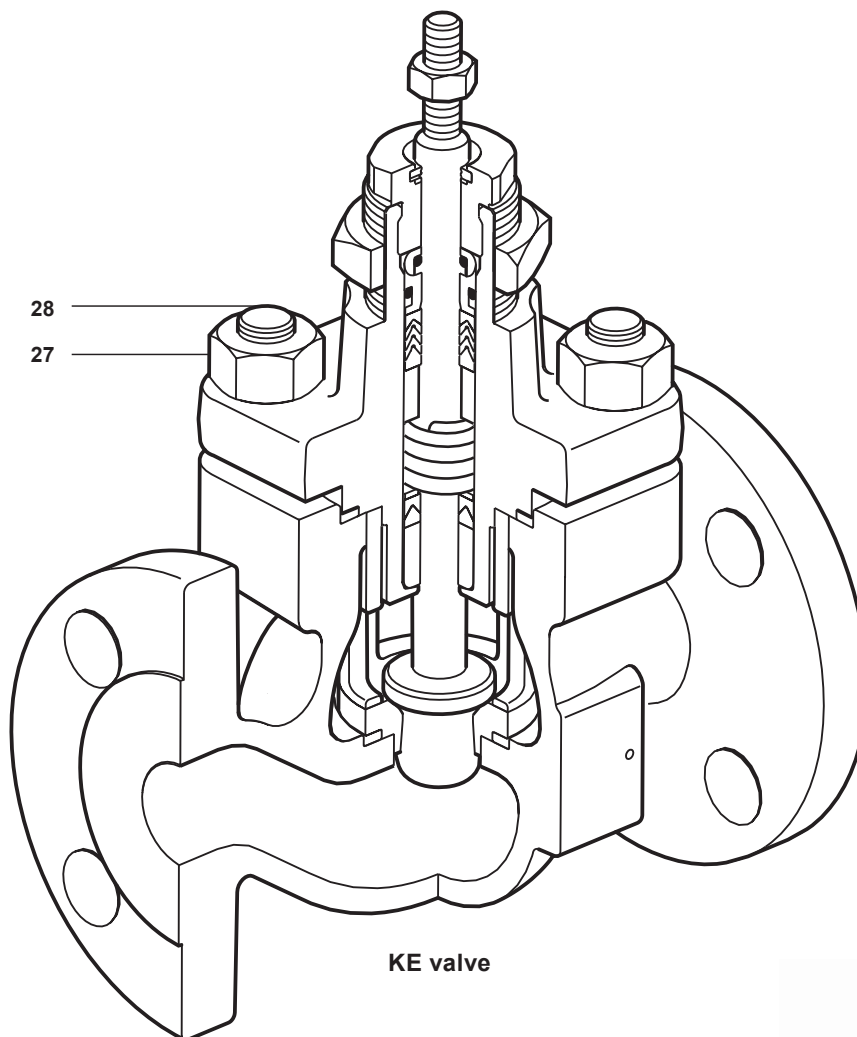
DN125 (5") balanced valve



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Materials - Nuts and studs DN15 to DN100 (1/2" to 4") see pages 6 and 7 for the DN125 to DN300 (6" to 12")

Body material	No.	Part	Material		
All versions	27	Standard bonnets nuts	KE4_ KE7_	Steel	BS 3692 Gr.8
			KE6_	Stainless steel	DIN ISO 3506 A2-70
		High temperature bonnets nuts	KE4_ and 7_	Stainless steel	ISO3506 A2
			Standard bonnet studs	KEA4_ KEA6_ KEA7_	Steel
	28	Standard bonnet studs	KE4_ KE7_	Steel	BS 3692 Gr.8
			KE6_	Stainless steel	DIN ISO 3506 A2-70
			High temperature bonnet studs	KE4_ and 7_	Stainless steel
		Standard bonnet studs	KEA4_	Steel	ASTM A193 Gr.B7
			KEA6_	Steel	ASTM A193 Gr. B8 M2
			KEA7_	Steel	ASTM A193 Gr. B7



K_v values

Valve size		DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")	
High capacity	Equal %	4.9	7.2	11.0	17.5	31.0	46.0	90	115							
Standard trim	Full port	Equal %	4.0	6.3	10.0	16.0	25.0	36.0	63	100	160	245	370	580	700	1000
		Linear	4.0	6.3	10.0	16.0	25.0	36.0	63	100	160	260	390	640	780	1100
		Fast opening	4.0	6.3	10.0	18.0	28.0	50.0	85	117	180	260	390	640	780	1100
	Reduced trim 1	Equal %	2.5	4.0	6.3	10.0	16.0	25.0	36	63	100	200	287	370	580	700
		Linear	2.5	4.0	6.3	10.0	16.0	25.0	36	63	100	200	287	550	640	780
	Reduced trim 2	Equal %	1.6	2.5	4.0	6.3	10.0	16.0	25	36	63	100	132	232	370	580
		Linear	1.6	2.5	4.0	6.3	10.0	16.0	25	36	63	100	132	232	550	640
	Reduced trim 3	Equal %	1.0	1.6	2.5	4.0	6.3	10.0	16	25	36	63	103	163	232	370
		Linear	1.0	1.6	2.5	4.0	6.3	10.0	16	25	36	63	103	163	232	550
	Reduced trim 4	Equal %		1.0	1.6		4.0	6.3		16					163	232
		Linear		1.0	1.6		4.0	6.3		16					163	232
	Reduced trim 5	Equal %			1.0			4.0								163
		Linear			1.0			4.0								163
	Microflute		0.5	0.5	0.5											
			0.2	0.2	0.2											
		0.1	0.1	0.1												
		0.07	0.07	0.07												
		0.01	0.01	0.01												

Note: For low noise and anti-cavitation K_v please see TI-S24-59

C_v (US) values

$$C_v \text{ (US)} = C_v \text{ (UK)} \times 1.2009$$

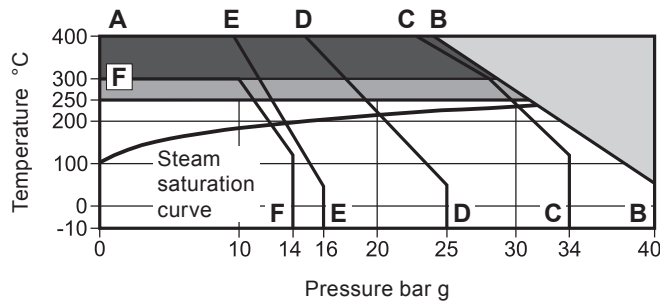
Valve size		DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")		
High capacity	Equal %	5.7	8.3	12.7	20.2	36.0	53.0	104.0	133.0							
Standard trim	Full port	Equal %	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	185.0	433	679	809	1156	
		Linear	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	185.0	456	749	902	1272	
		Fast opening	4.6	7.3	12.0	21.0	32.0	58.0	98.0	135.0	208.0	456	749	902	1272	
	Reduced trim 1	Equal %	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	336	433	670	809	
		Linear	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	336	636	740	902	
	Reduced trim 2	Equal %	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	154	271	428	670	
		Linear	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	154	271	636	740	
	Reduced trim 3	Equal %	1.2	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	120	191	268	428	
		Linear	1.2	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	120	191	268	636	
	Reduced trim 4	Equal %		1.2	1.8		4.6	7.3		18.0					188	268
		Linear		1.2	1.8		4.6	7.3		18.0					188	268
	Reduced trim 5	Equal %			1.2			4.6								188
		Linear			1.2			4.6								188
	Microflute		0.58	0.58	0.6											
			0.23	0.23	0.23											
		0.12	0.12	0.12												
		0.081	0.081	0.081												
		0.012	0.012	0.012												

Note: For low noise and anti-cavitation C_v please see TI-S24-59



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Pressure/temperature limits - KE43 (Carbon steel)



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

High temperature packing is required for use in this region.

High temperature bolting and packing is required for use in this region

A - B Flanged EN 1092 PN40.

A - C Flanged JIS/KS 20K.

A - D Flanged EN 1092 PN25.

A - E Flanged EN 1092 PN16.

A - F Flanged JIS/KS 10K.

Notes:

- 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.
- When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown in table below.

Body design conditions		PN40
Maximum design pressure		40 bar g @ 50 °C
Maximum differential pressure design	PTFE soft seat (G)	7 bar
	PEEK soft seat (K)	7 bar
	Full PEEK seat (P)	19 bar
Maximum design temperature		400 °C
Minimum design temperature		-10 °C
Maximum operating temperature	PTFE soft seat (G)	200 °C
	Standard packing PTFE chevron	
	PEEK seat (K and P)	250 °C
	Extended bonnet (E) with PTFE chevron	
	High temperature packing (H)	400 °C
	Extended bonnet (E) with graphite packing	

Note: We recommend that an extended bonnet (E) with graphite packing is used where valve operation is above 300 °C.

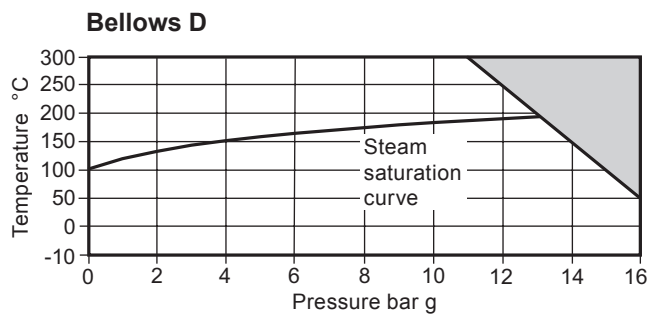
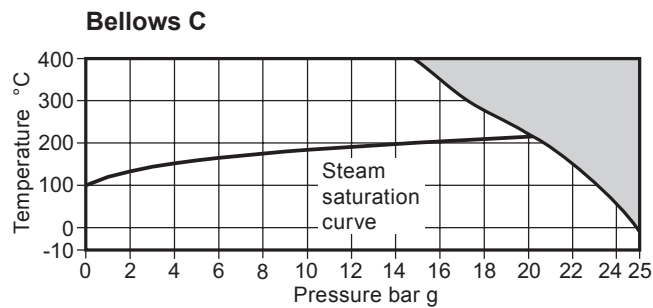
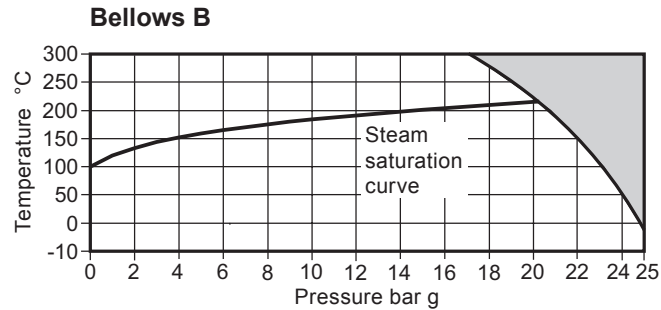

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Pressure/temperature limits - KE43 (Carbon steel)

Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 10.

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



Minimum operating temperature

Note: For lower operating temperatures consult Spirax Sarco.

-10 °C

Maximum differential pressures

See relevant actuator Technical Information sheet

Maximum cold hydraulic test pressure of:

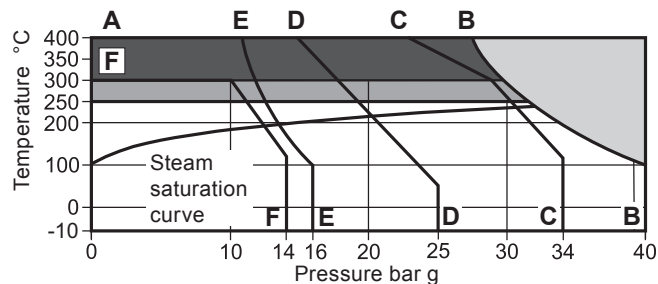
Warning: If the valve is fitted with a bellows it must be removed if hydraulic testing is to be done.

Bellows B	38 bar g
Bellows C	
Bellows D	24 bar g



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Pressure/temperature limits - KE61 and KE63 (Stainless steel)



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

- A - B** Flanged EN 1092 PN40 and Screwed BSP.
- A - C** Flanged JIS/KS 20K.
- A - D** Flanged EN 1092 PN25.
- A - E** Flanged EN 1092 PN16.
- A - F** Flanged JIS/KS 10K.

Notes:

1. 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.
2. When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown in table below.

Body design conditions	PN40	
Maximum design pressure	40 bar g @ 50 °C	
Maximum differential pressure design	PTFE soft seat (G)	7 bar
	PEEK soft seat (K)	7 bar
	Full PEEK seat (P)	19 bar
Maximum design temperature	400 °C	
Minimum design temperature	-10 °C	
Maximum operating temperature	PTFE soft seat (G)	200 °C
	Standard packing PTFE chevron	250 °C
	PEEK seat (K and P)	250 °C
	Extended bonnet (E) with PTFE chevron	250 °C
	High temperature packing (H)	400 °C
	Extended bonnet (E) with graphite packing	400 °C

Note: We recommend that an extended bonnet (E) with graphite packing is used where valve operation is above 300 °C.

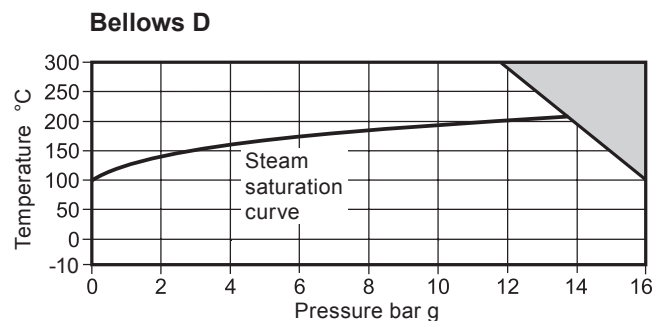
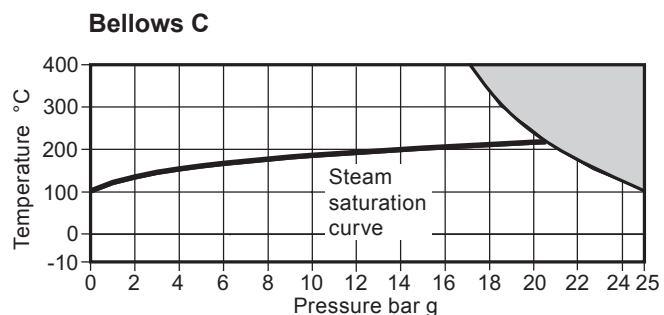
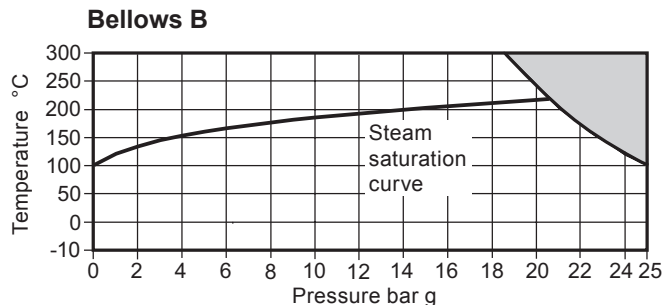


Pressure/temperature limits - KE61 and KE63 (Stainless steel)

Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 12.

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

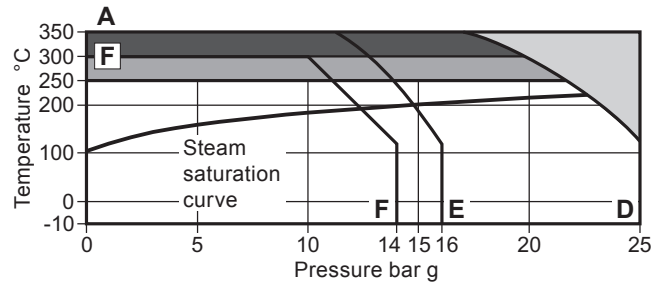


Minimum operating temperature	PTFE packing	-10 °C
Note: For lower operating temperatures consult Spirax Sarco.	Graphite packing	
Maximum differential pressures	See relevant actuator Technical Information sheet	
Maximum cold hydraulic test pressure of:	Bellows B	38 bar g
Warning: If the valve is fitted with a bellows it must be removed if hydraulic testing is to be done.	Bellows C	
	Bellows D	24 bar g

Pressure/temperature limits - KE71 and KE73 (SG iron)



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

High temperature packing is required for use in this region.

High temperature bolting and packing is required for use in this region

A - D Flanged EN 1092 PN40 and Screwed BSP.

A - E Flanged EN 1092 PN16.

A - F Flanged JIS/KS 10.

Notes:

- 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.
- When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown in table below.

Body design conditions	PN25	
Maximum design pressure	25 bar g @ 120 °C	
Maximum differential pressure design	PTFE soft seat (G)	7 bar
	PEEK soft seat (K)	7 bar
	Full PEEK seat (P)	19 bar
Maximum design temperature	350 °C	
Minimum design temperature		-10 °C
	PTFE soft seat (G)	200 °C
Maximum operating temperature	Standard packing PTFE chevron	
	PEEK seat (K and P)	250 °C
	Extended bonnet (E) with PTFE chevron	
	High temperature packing (H)	
	Extended bonnet (E) with graphite packing	350 °C

Note: We recommend that an extended bonnet (E) with graphite packing is used where valve operation is above 300 °C.


Pressure/temperature limits - KE71 and KE73 (SG iron)

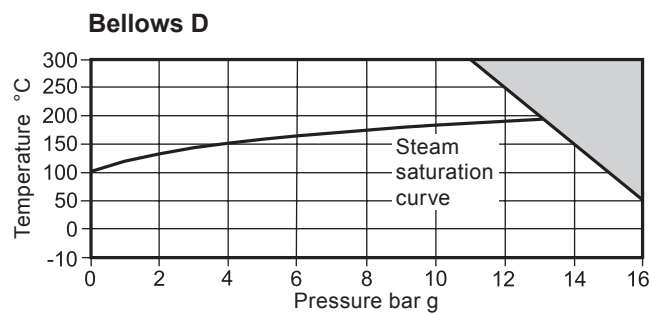
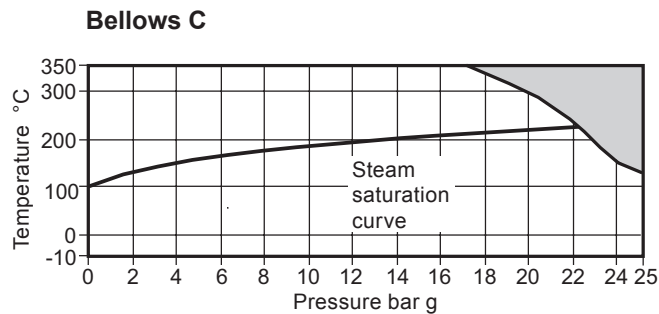
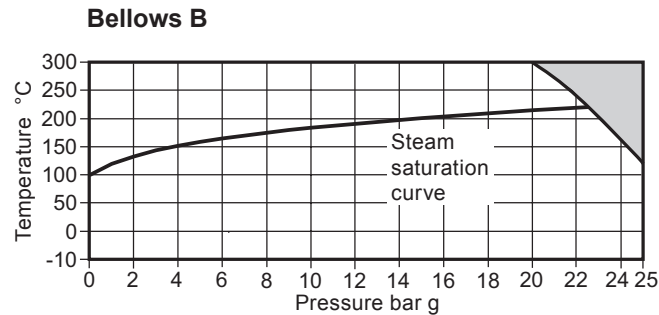


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Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 14.

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



Minimum operating temperature -10 °C
Note: For lower operating temperatures consult Spirax Sarco.

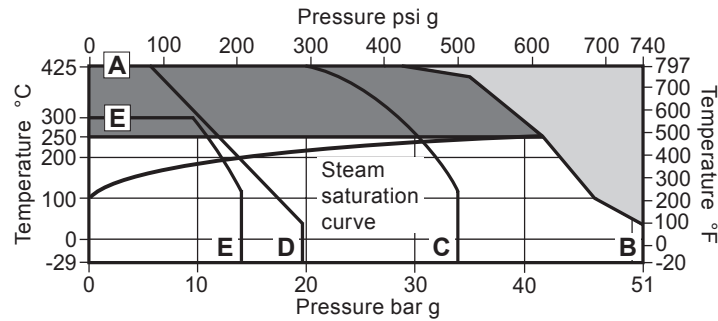
Maximum differential pressures See relevant actuator Technical Information sheet


<p>Maximum cold hydraulic test pressure of:</p> <p>Warning: If the valve is fitted with a bellows it must be removed if hydraulic testing is to be done.</p>	Bellows B	38 bar g
	Bellows C	38 bar g
	Bellows D	24 bar g




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Pressure/temperature limits - KEA41, KEA42 and KEA43 (Carbon steel)



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

 Graphite stem sealing is required for use in this region

A - B Flanged ASME 300 and screwed NPT and SW.

A - C Flanged JIS/KS 20.

A - D Flanged ASME 150.

E - E Flanged JIS/KS 10.

Notes:

- 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.
- When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown above.
- As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.


Body design conditions		ASME 150 and ASME 300	
Maximum design pressure	ASME 150 (6" to 12" only)	19.6 bar g @ 38 °C	(284 psi g @ 100 °F)
	ASME 300	51.1 bar g @ 38 °C	(740 psi g @ 100 °F)
Maximum differential pressure design	PTFE soft seat (G)	7 bar	
	PEEK soft seat (K)	7 bar	
	Full PEEK seat (P)	19 bar	
Maximum design temperature		425 °C	(800 °F)
Minimum design temperature		-29 °C	(-20 °F)
Maximum operating temperature	PTFE soft seat (G)	200 °C (392 °F)	
	Standard packing PTFE chevron		
	PEEK seat (K and P)	250 °C (482 °F)	
	Extended bonnet (E) with PTFE chevron		
	Graphite packing (H)	425 °C (800 °F)	
	Extended bonnet (E) with graphite packing		

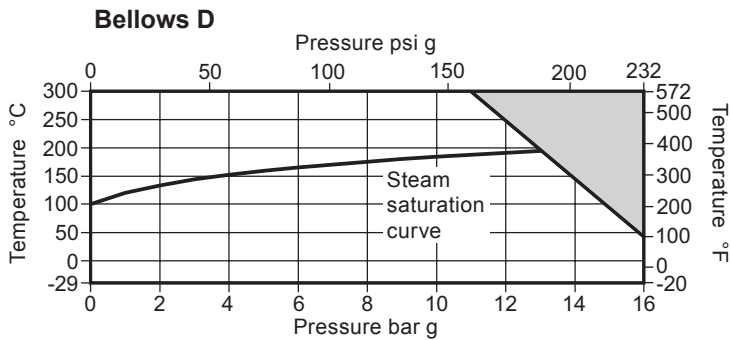
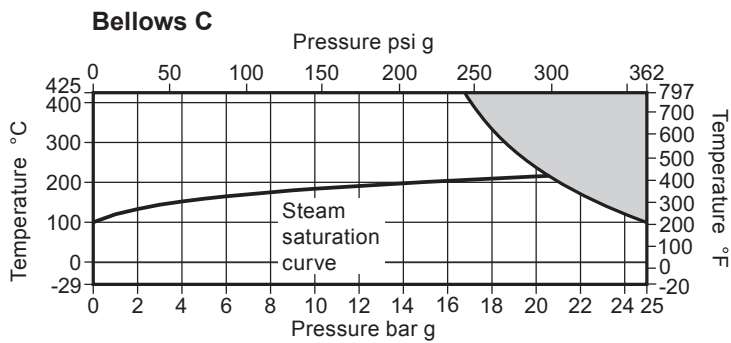
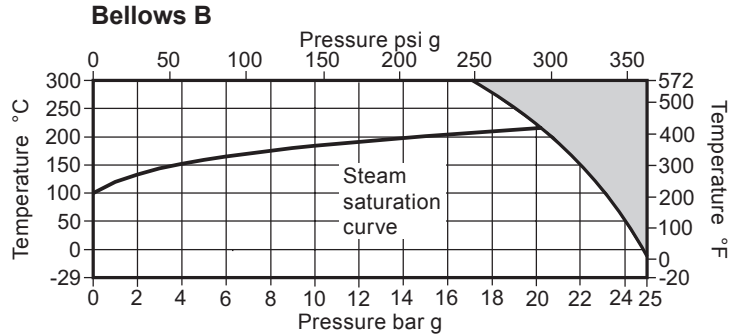
Note: We recommend that an extended bonnet (E) with graphite packing is used where valve operation is above 300 °C (572 °F).

Pressure/temperature limits - KEA41, KEA42 and KEA43 (Carbon steel)

Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 16.

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



Minimum operating temperature

Note: For lower operating temperatures consult Spirax Sarco.

-29 °C (-20 °F)

Maximum differential pressures

See relevant actuator Technical Information sheet

Maximum cold hydraulic test pressure of:

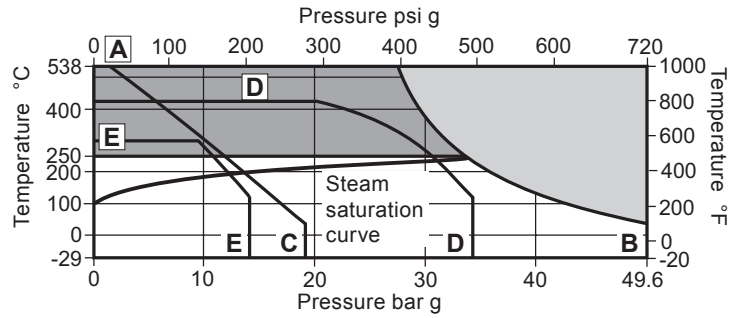
Warning: If the valve is fitted with a bellows it must be removed if hydraulic testing is to be done.


Bellows B	38 bar g	551 psi g
Bellows C		
Bellows D	24 bar g	348 psi g



CHRYSsafidis

Pressure/temperature limits - KEA61, KEA62 and KEA63 (Stainless steel)



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

 Graphite stem sealing is required for use in this region

A - B Flanged ASME 300 and screwed NPT and SW.

A - C Flanged JIS/KS 20.

D - D Flanged ASME 150.

E - E Flanged JIS/KS 10.

Notes:

- 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.
- When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown above.
- As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.

Body design conditions		ASME 150 and ASME 300	
Maximum design pressure	ASME 150 (6" to 8" only)	19.6 bar g @ 38 °C (275 psi g @ 100 °F)	
	ASME 300	49.6 bar g @ 38 °C (720 psi g @ 100 °F)	
Maximum differential pressure design	PTFE soft seat (G)	7 bar	
	PEEK soft seat (K)	7 bar	
	Full PEEK seat (P)	19 bar	
Maximum design temperature		538 °C	(1000 °F)
Minimum design temperature		-29 °C	(-20 °F)
Maximum operating temperature	PTFE soft seat (G)	200 °C	(392 °F)
	Standard packing PTFE chevron		
	PEEK seat (K)	250 °C	(482 °F)
	Extended bonnet (E) with PTFE chevron		
	Graphite packing (H)	538 °C	(1000 °F)
	Extended bonnet (E) with graphite packing		


Note: We recommend that an extended bonnet (E) with graphite packing is used where valve operation is above 300 °C (572 °F).

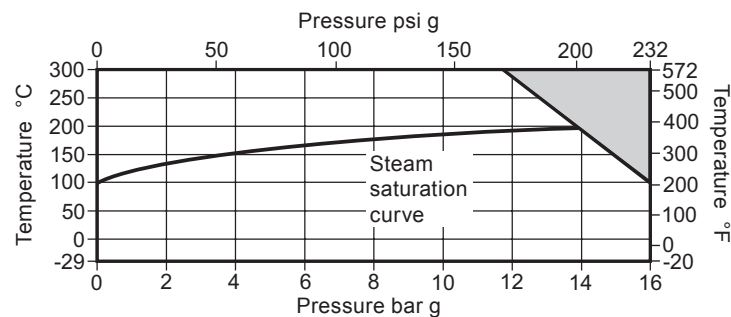
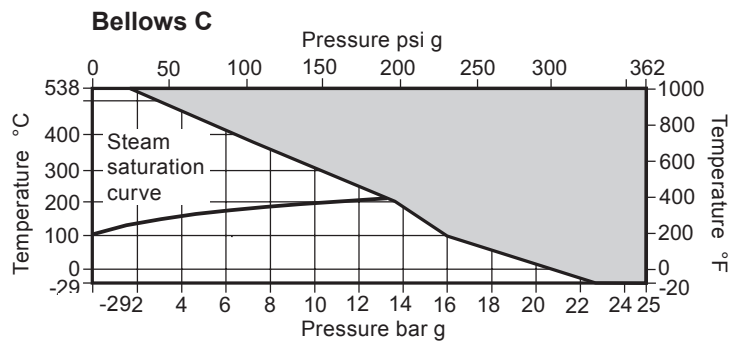
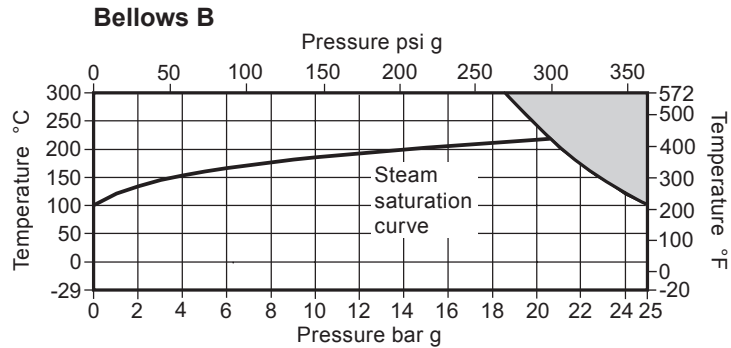


Pressure/temperature limits - KEA61, KEA62 and KEA63 (Stainless steel)

Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 18.

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



Minimum operating temperature	PTFE packing	-29 °C	(-20 °F)
Note: For lower operating temperatures consult Spirax Sarco.	Graphite packing	-50 °C	(-58 °F)

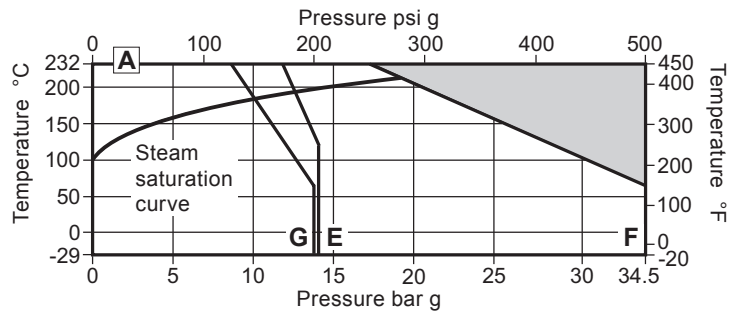
Maximum differential pressures See relevant actuator Technical Information sheet

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.	Bellows B	38 bar g	551 psi g
	Bellows C		
	Bellows D	24 bar g	348 psi g



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Pressure/temperature limits - KEA71 and KEA73 (SG iron)



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

A - E Flanged JIS/KS 10.

A - F Flanged ASME 250 and screwed NPT and SW.

A - G Flanged ASME 125.

Notes:

- 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.
- When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown above.
- As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.

Body design conditions		ASME 125 and ASME 250	
Maximum design pressure	ASME 125	13.8 bar g @ 65 °C (200 psi g @ 150 °F)	
	ASME 250	34.5 bar g @ 65 °C (500 psi g @ 150 °F)	
Maximum differential pressure design	PTFE soft seat (G)	7 bar	
	PEEK soft seat (K)	7 bar	
	Full PEEK seat (P)	19 bar	
Maximum design temperature		232 °C	(450 °F)
Minimum design temperature		-29 °C	(-20 °F)
Maximum operating temperature	PTFE soft seat (G)	200 °C (392 °F)	
	Standard packing PTFE chevron		
	PEEK seat (K and P)		
	Graphite packing (H)	232 °C	(450 °F)
	Extended bonnet (E) with PTFE chevron		
	Extended bonnet (E) with graphite packing		




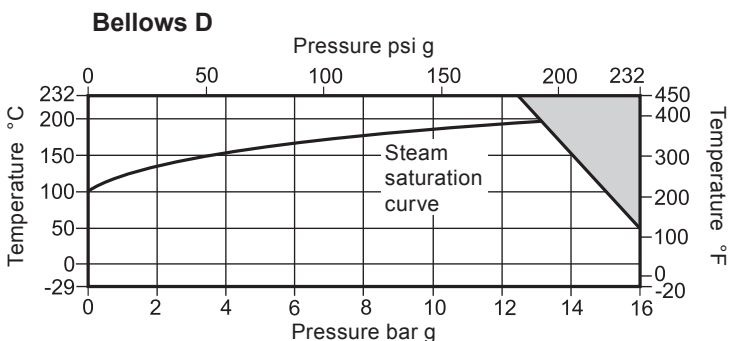
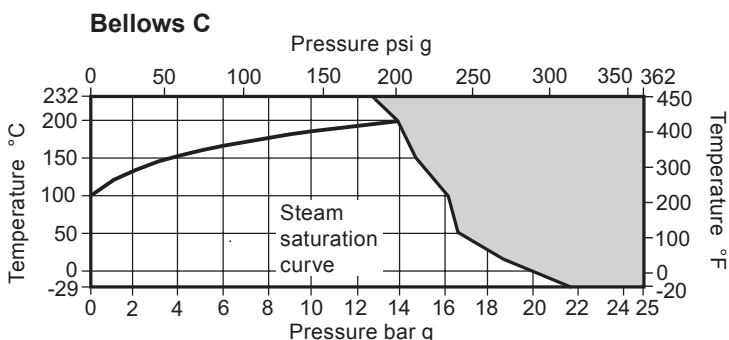
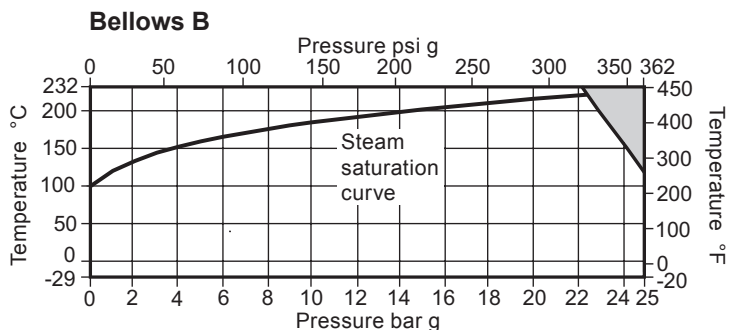
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Pressure/temperature limits - KEA71 and KEA73 (SG iron)

Maximum operating temperature - Bellows only

Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 20.

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



Minimum operating temperature

Note: For lower operating temperatures consult Spirax Sarco.

-29 °C (-20 °F)

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.

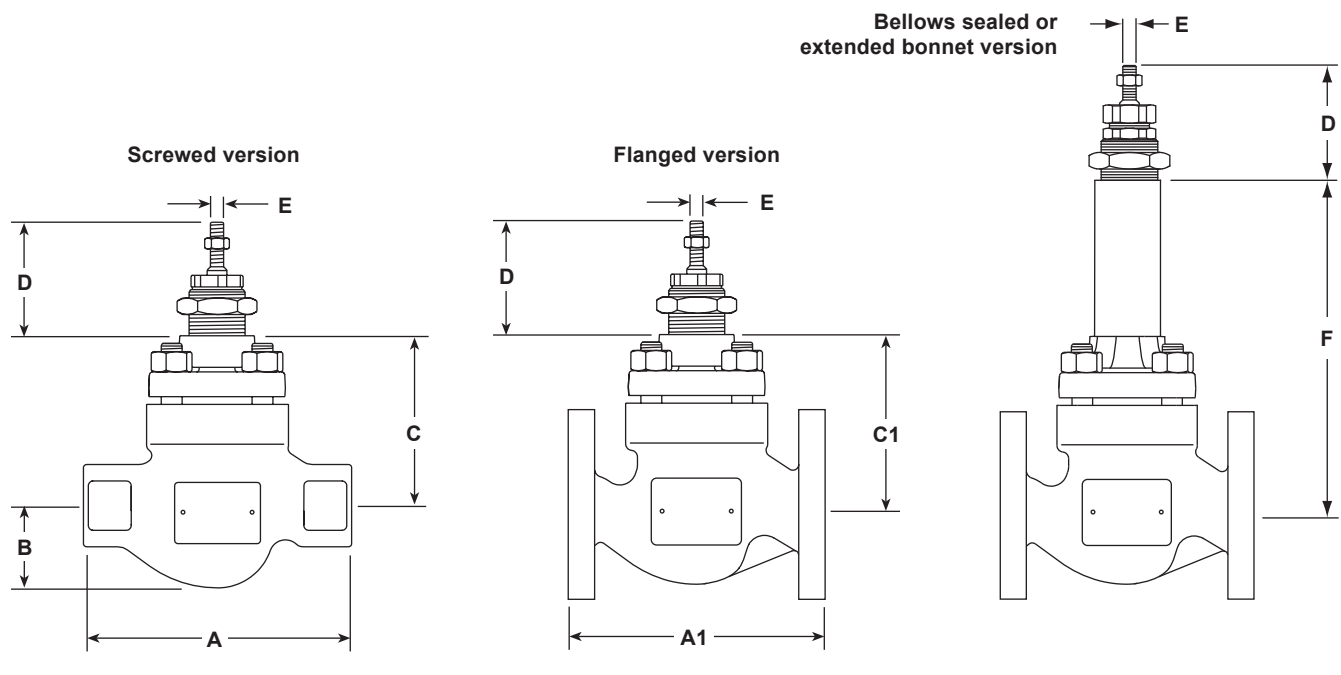
Bellows B	38 bar g	551 psi g
Bellows C		
Bellows D	24 bar g	348 psi g



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Dimensions for the **Spira-trol™ two-port control valve** approximate in mm and (inches)

Valve size	Screwed						Flanged						D	E	F		
	BSP			NPT			KE valves			KEA valves					Thread	Bellows seals	Extended bonnet
	A	B	C	A	B	C	A1		C1	A1		C1					
	PN16 PN25 PN40		JIS/KS 10 20		ASME 125 and 150		ASME 250 and 300										
DN15 (1/2")	130	40	103	165 (6 1/2")	44 (1 3/4")	102 (4")	130	130	130	103		190 (7 1/2")	102 (4")	69 (2 3/4")	M8	237 (9")	336 (13.25")
DN20 (3/4")	155	45	103	165 (6 1/2")	44 (1 3/4")	102 (4")	150	150	150	103		190 (7 1/2")	102 (4")				
DN25 (1")	160	50	103	197 (7 3/4")	57 (2 1/4")	102 (4")	160	160	160	103	184 (7 1/4")	197 (7 3/4")	102 (4")				
DN32 (1 1/4")	185	60	132	216 (8 1/2")	57 (2 1/4")	127 (5")	180	180	180	132			127 (5")				
DN40 (1 1/2")	205	65	132	235 (9 1/4")	63 (2 1/2")	127 (5")	200	200	200	132	222 (8 3/4")	235 (9 1/4")	127 (5")				
DN50 (2")	230	80	127	267 (10 1/2")	76 (3")	127 (5")	230	230	230	127	254 (10")	267 (10 1/2")	127 (5")				
DN65 (2 1/2")							290	290	290	201	267 (10 1/2")	292 (11 1/2")	200 (7 7/8")	81 (3")	M12	368 (14 1/2")	416 (16.38")
DN80 (3")							310	310	310	201	298 (11 3/4")	317 (12 1/2")	200 (7 7/8")				
DN100 (4")							350	350	350	216	349 (13 3/4")	368 (14 1/2")	216 (8 1/2")				
DN125 (5")							400	403	425	257				125 (4 7/8")	M30		538 (21 1/5")
DN150 (6")							480	451	473	275	451 (17 3/4")	473 (18 5/8")	279 (11")				
DN200 (8")							600	543	568	341	543 (21 3/8")	568 (22 3/8")	343 (13 1/2")				
DN250 (10")							730	673	708	344	673	708	344 (13 1/2")				
DN300 (12")							850	737	775	355	737	775	355 (14")				



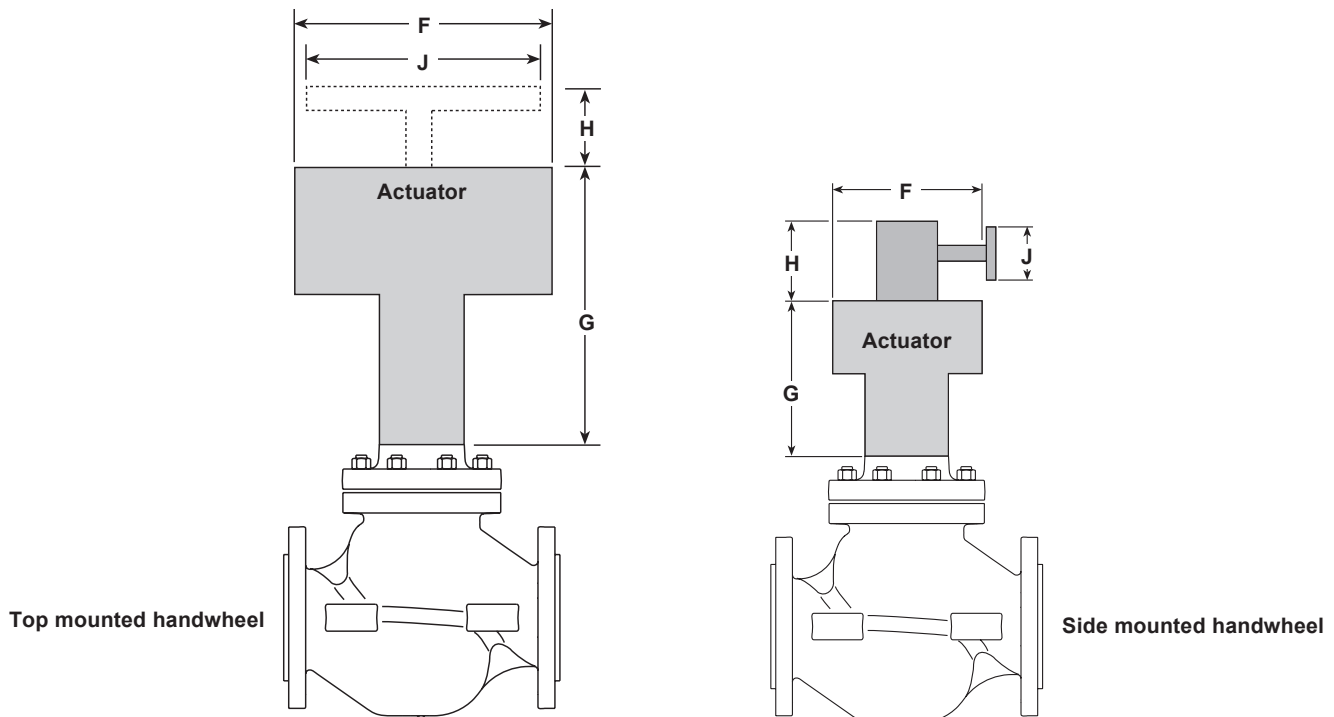
Weights for the **Spira-trol™ two-port control valve** approximate in kg (and lbs)

Valve size	KE valves					KEA valves					Additional bellows and Extended bonnet	Additional balanced
	KE43	KE61	KE63	KE71	KE73	KEA43	KEA63	KEA73	KEA41 KEA42 KEA61 KEA62 KEA71			
DN15 (½")	6	4.5	5.5	4.5	5.5	7.3 (16)	7.3 (16)	7.3 (16)	7.3 (16)	4.5 (10)		
DN20 (¾")	6.8	5.5	6.8	5.5	6.8	8.2 (18)	8.2 (18)	8.2 (18)	7.3 (16)			
DN25 (1")	7	6	7	6	7	9.1 (20)	9.1 (20)	9.1 (20)	10 (22)			
DN32 (1¼")	13.5	11.5	13.5	11.5	13.5	14.1 (31)	14.1 (31)	13.2 (29)	11.3 (25)	5.5 (12)		
DN40 (1½")	14	12	14	12	14	16.3 (36)	16.3 (36)	14.1 (31)	14.1 (31)			
DN50 (2")	17	13	17	13	17	17.2 (38)	18.1 (40)	17.2 (38)	15 (33)			
DN65 (2½")	35		35		35	35.4 (78)	35.4 (78)	38.1 (84)		10 (21)		
DN80 (3")	40		40		40	39 (86)	40.4 (89)	41.3 (91)				
DN100 (4")	54		54		54	56.2 (124)	56.2 (124)	59.9 (132)			13 (28)	
DN125 (5")	81		81		81					16 (35)	2 (4.4)	
DN150 (6")	121		121		121	130 (286)	130 (286)	130 (286)		16 (35)	3 (7)	
DN200 (8")	210		210		210	210 (462)	210 (462)	210 (462)		16 (35)	10 (22)	
DN250 (10")	228					242 (533)				16 (35)	10 (22)	
DN300 (12")	451					465 (1025)				16 (35)	16 (35)	



Dimensions / weights for the **PN actuator range** approximate in mm and kgs (inches and lbs)

Actuator range and variants	F		G		H		J		Weight			
	mm	inches	mm	inches	mm	inches	mm	inches	Actuator kg	lbs	With handwheel kg	lbs
PN1500 and PN2500	405	16"	1 114	46"					55	121.00		
PN1600 and PN2600	465	18 ⁵ / ₁₆ "	1 116	46"					70	154.00		
PN9100E	170	6 A"	275	10 ⁷ / ₈ "	55	2 ³ / ₁₆ "	225	8 ⁷ / ₈ "	6	13.25	+5.86	+13.00
PN9100R					140	5 ¹ / ₂ "					+2.50	+5.50
PN9200E	300	11 ¹ / ₈ "	300	11 ¹ / ₈ "	55	2 ³ / ₁₆ "	225	8 ⁷ / ₈ "	17	37.50	+7.20	+15.75
PN9200R					140	5 ¹ / ₂ "					+3.77	+8.50
PN9320E	390	15 ¹ / ₂ "	325	12 ⁷ / ₈ "	65	2 ⁹ / ₁₆ "	350	13 ³ / ₄ "	27	59.50	+7.20	+15.75
PN9320R					150	15 ⁷ / ₈ "					+3.77	+8.50
PN9330E	390	15 ¹ / ₂ "	335	13 ³ / ₈ "	65	2 ⁹ / ₁₆ "	350	13 ³ / ₄ "	27	59.50	+7.20	+15.75
PN9330R					150	15 ⁷ / ₈ "					+3.77	+8.50
PN9400E	732	28 ³ / ₄ "	465	18 ¹ / ₃ "					60	132.00		
PN9400R												
TN2000E	284	11 ¹ / ₄ "	334	13 ⁵ / ₃₂ "	144	5 ⁴³ / ₆₄ "	350	13 ³ / ₄ "	18	40.50	+5.00	+11.25
TN2000R												
TN2000DA	284	11 ¹ / ₄ "	334	13 ⁵ / ₃₂ "					16	36.00		
TN2100E	405	16"	369	14 ¹ / ₂ "	402	15 ⁵³ / ₆₄ "	330	13"	37	83.25	+23.00	+51.75
TN2100R												
TN2100DA	405	16"	369	14 ¹ / ₂ "					30	67.50		
TN2277E	532	21"	863	34"	330	13"	330	13"	116	255.00	+21.00	+46.00
TN2277NDA	532	21"	863	34"					98	216.00		


Dimensions / weights for the **EL and AEL actuator ranges** approximate in mm and kgs (and in inches and lbs)

Actuator range	F		G		Weight	
	mm	inches	mm	inches	kg	lbs
EL3500	135 x 161	5 ¹ / ₄ " x 6 ¹ / ₄ "	242	9 ¹ / ₂ "	1.3	3.0
EL3500 SE and SR	135 x 161	5 ¹ / ₄ " x 6 ¹ / ₄ "	284	11"	2.4	6.0
EL7200 series	100	4"	471	18 ¹ / ₂ "	3.0	6.5
AEL55 and AEL65	180	7"	557	22"	10.0	22.0
AEL51, AEL52, AEL53, AEL62 and AEL63	177	7"	459	18"	5.0	11.0
AEL54 and AEL64	177	7"	490	19"	7.0	15.5
AEL56 and AEL66	226	9"	760	30"	20.0	44.0

Spare parts

Spira-trol™ two-port control valve DN15 to DN100 - 1/2" to 4"

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 - K series

Actuator clamping nut		A
Gasket set	(Non-bellows sealed)	B, G
	PTFE packing	C
Stem seal kits	Graphite packing	C1
	Graphite seal set	C2
	* 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 soft seat seal		H

Specify if reduced trim.

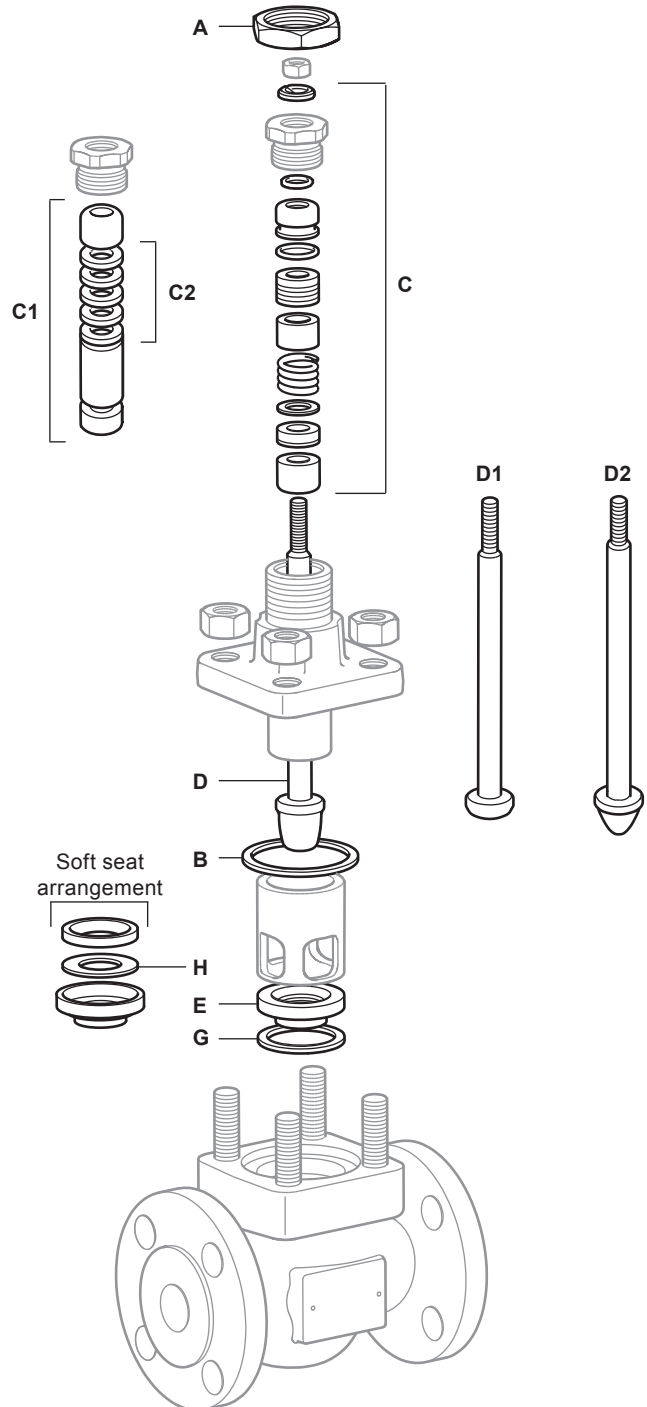
How to order spares

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

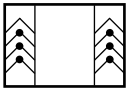
Example: 1 - PTFE stem seal kit for a Spirax Sarco DN25 Spira-trol™ two-port KE43 PTSUSS.2 Kvs 10 control valve.

How to fit spares

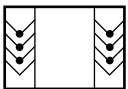
Full fitting instructions are given in the Installation and Maintenance Instructions supplied with the spare.



* PTFE stem sealing



PTFE stem sealing for vacuum service



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Spare parts

Spira-trol™ two-port control valve Balanced and unbalanced DN125 to DN300 - 6" to 12"

The spare parts available are shown in solid outline. Parts drawn in a grey 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 - K series

Gasket set Non bellows sealed	Balanced	A, B, G
	Unbalanced	B, G
Stem seal kit	PTFE chevrons	C3
	Graphite packing conversion kit (DN15 to DN100)	C4
	Graphite seal set	C5
Plug stem and seat kit	Balanced (No gaskets supplied)	A, D, E
	Unbalanced (No gaskets supplied)	D, E

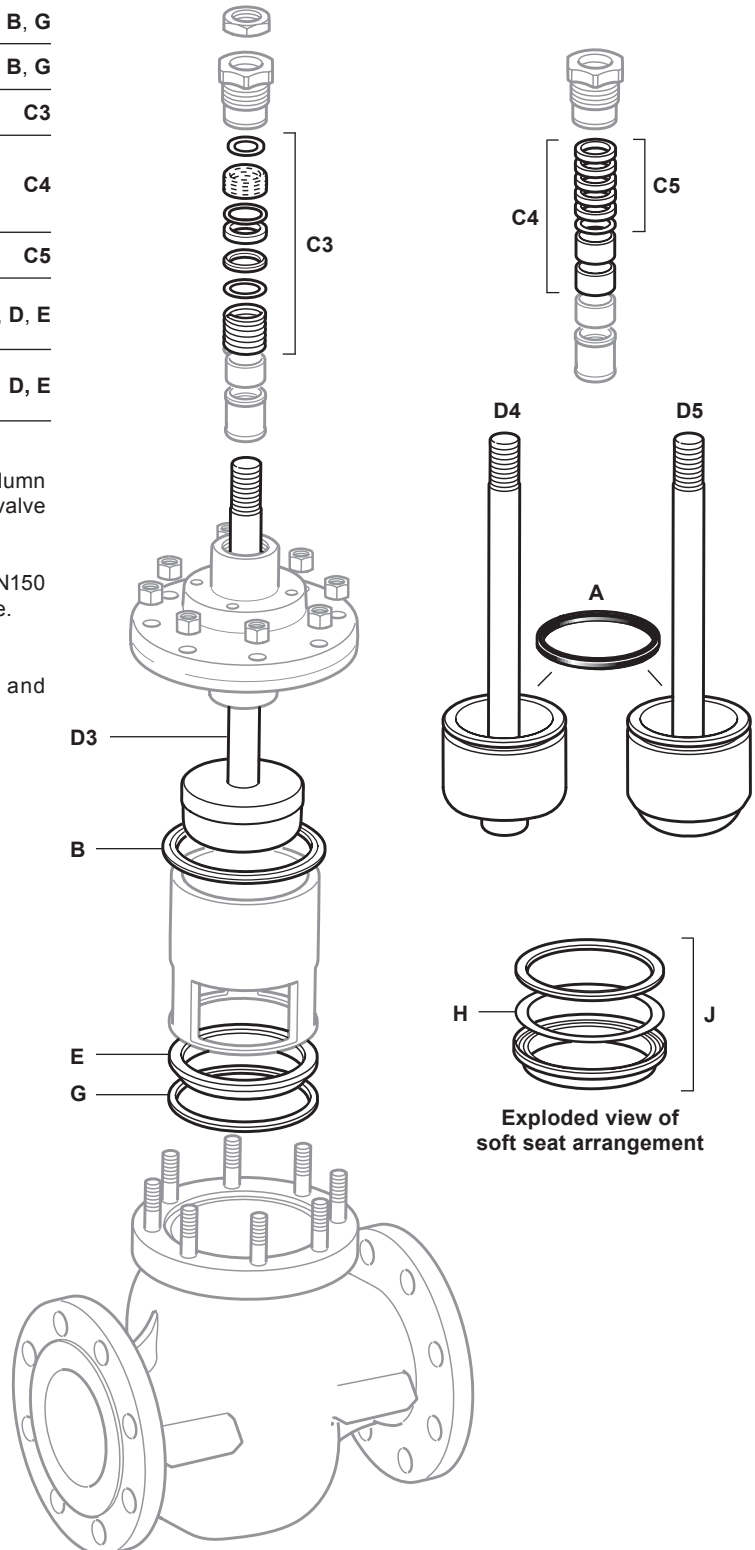
How to order spares

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

Example: 1 - PTFE stem seal kit for a Spirax Sarco DN150 Spira-trol™ two-port KE43 PTSBSS.2 Kvs 370 control valve.

How to fit spares

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



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Spare parts

Spira-trol™ two-port control valve with bellows seal - Type D DN15 to DN100 - 1/2" to 4"

The spare parts available are shown in solid outline. Parts drawn in a grey 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 - K series

Actuator clamping nut		A
Gasket set	(Bellows sealed)	B, G
Stem seal kit	Graphite secondary seal and gasket set	C3
	*Equal percentage trim (No gaskets supplied)	D6, E
Plug stem and seat kit	Fast opening trim (No gaskets supplied)	D7, E
	Linear trim (No gaskets supplied)	D8, E
Bellows seal assembly		F
* PTFE soft seat seal		H

Specify if reduced trim.

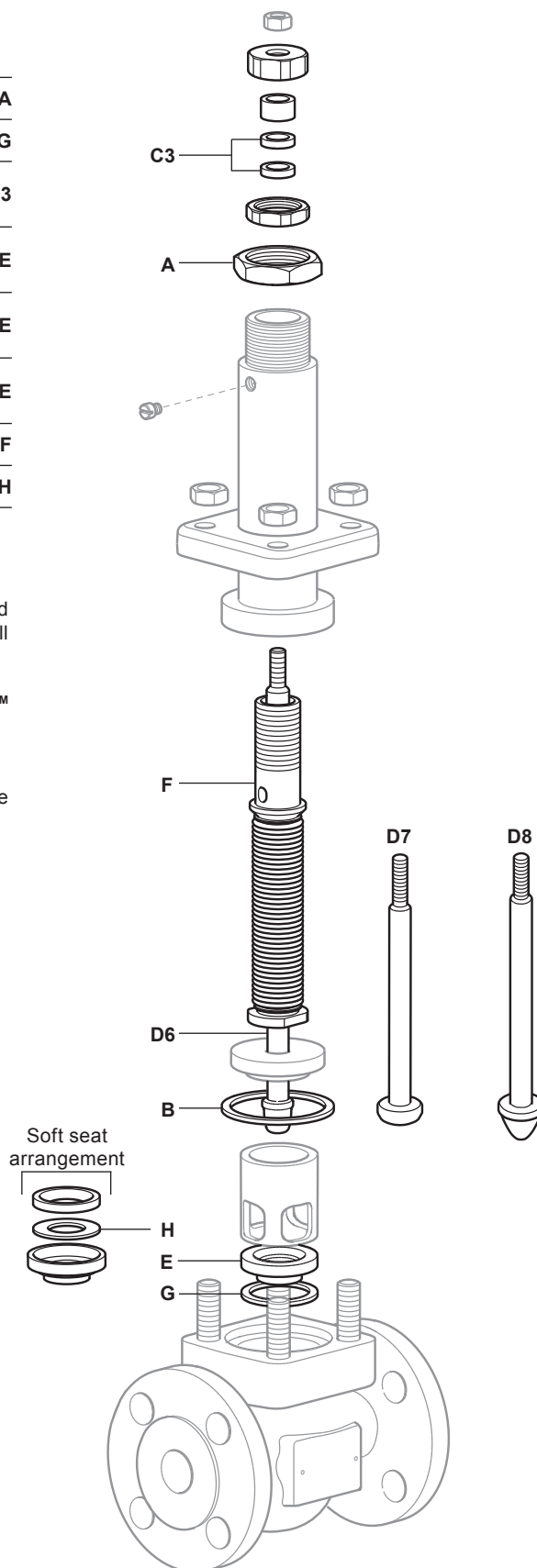
How to order spares

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

Example: 1 - Graphite stem seal kit for a Spirax Sarco DN25 Spira-trol™ two-port KE43B TSUSS.2 Kvs10 control valve.

How to fit spares

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



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Spare parts

Spira-trol™ two-port control valve with bellows seal - Types B and C DN15 to DN100 - 1/2" to 4"

The spare parts available are shown in solid outline. Parts drawn in grey 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 - K series

Actuator clamping nut		A
Gasket set	(Bellows sealed)	B, G
	PTFE packing	C
Stem seal kits	Graphite packing	C1
	Graphite seal set	C2
	* Equal percentage trim (No gaskets supplied)	D9, E
Plug stem and seat kit	Fast opening trim (No gaskets supplied)	D10, E
	Linear trim (No gaskets supplied)	D11, E
Bellow seal assembly		F
PTFE soft seat seal		H

Specify if reduced trim.

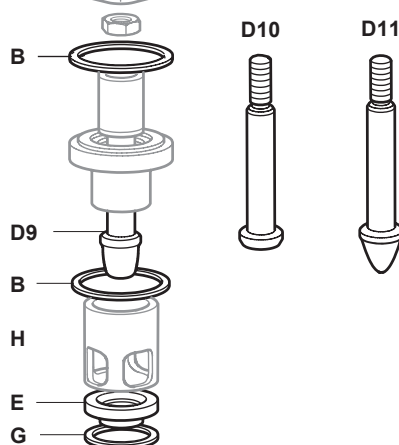
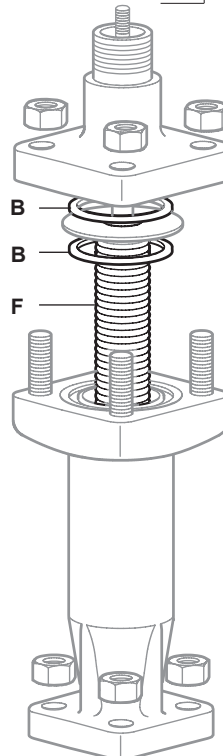
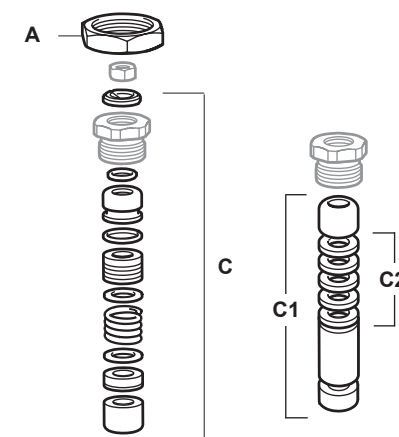
How to order spares

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

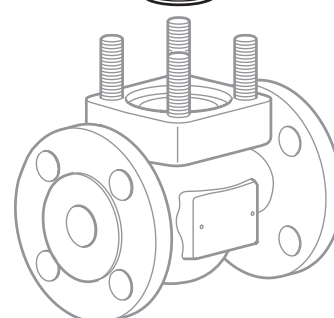
Example: 1 - PTFE stem seal kit for a Spirax Sarco DN25 Spira-trol™ two-port KE43B TSUSS.2 K_V10 control valve.

How to fit spares

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



Soft seat
arrangement



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Spira-trol™ selection guide:

Valve size	EN standard = DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250 and 300 ASME standard = ½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4", 5", 6", 8", 10" and 12"	DN25
Valve series	K = K series 2-port control valve	K
Valve characteristic	E = Equal percentage F = Fast opening L = Linear	E
Flange type	A = ASME Blank = EN (PN)	Blank
Flow	Blank = under T = over	Blank
Body material	4 = Carbon steel 6 = Stainless steel 7 = SG iron	4
Connections	1 = Screwed 2 = Socket weld 3 = Flanged	3
Stem sealing	B = Bellows / PTFE secondary seals C = Bellows / graphite secondary seals D = Bellows / graphite secondary seals H = Graphite N = PTFE with Nitronic bush - DN15 to DN50 only P = PTFE V = PTFE for vacuum service	P
Seating	G = PTFE soft seat K = PEEK soft seat P = Full PEEK S = 316L stainless steel T = 431 stainless steel W = 316L with stellite 6 facing	T
Type of trim	A1 = 1 stage anti-cavitation A2 = 2 stage anti-cavitation P1 = 1 stage low noise cage P2 = 2 stage low noise cage P3 = 3 stage low noise cage S = Standard trim	S
Trim balancing	B = Balanced U = Unbalanced	U
Bonnet type	E = Extended S = Standard	S
Bolting	H = High temperature S = Standard	S
Finish	Blank = Standard N = ENP coating	
Series	2 = .2	.2
Kvs	To be specified	Kvs 16
Connection type	To be specified	Flanged PN40

Selection example:

DN32	-	K	E	4	3	P	T	S	U	S	S		.2	-	Kvs 16	-	Flanged PN40
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How to order

Example: 1 off Spirax Sarco Spira-trol™ DN32 KE43PTSUSS.2 Kvs 16 two-port control valve having flanged PN40 connections.