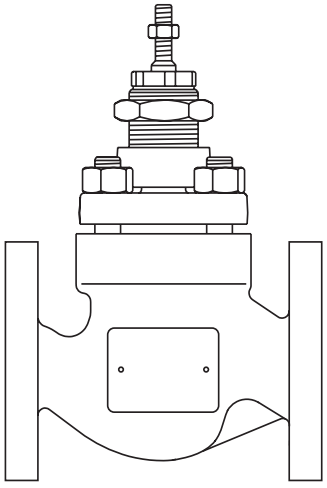
Spira-trol™ Two-port Control Valves EN Standard KE, KF and KL DN15 to DN200 and ASME Standard KEA, KFA and KLA ½" to 8"

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 DN200 (½" to 8"). When used in conjunction with a pneumatic or electric linear actuator they provide characterized modulating or on/off control.



KE, **KF** and **KL**
DN15 to DN200

KEA, **KFA** and **KLA**
½" to 8"

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 and DN200
		JIS 20 and KS 20	**KE43**	All variants between DN15 to DN100
		JIS 10, JIS 20, KS 10 and KS 20	**KE43**	DN125, DN150 and DN200
		ASME 300	**KEA43**	½", ¾", 1", 1½", 2", 2½", 3" and 4"
		ASME 150 and ASME 300	**KEA43**	6" and 8"
Stainless steel	Screwed	BSP	**KE61**	DN15, DN20, DN25, DN32, DN40 and DN50
		NPT	**KEA61**	½", ¾", 1", 1¼", 1½" and 2"
	Socket weld		**KEA62**	½", ¾", 1", 1¼", 1½" and 2"
	Flanged	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
	Flanged	EN 1092 PN16 and PN25	**KE73**	All variants between DN15 to DN200
		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:

Stem sealing	**PTFE chevron seals**	Standard
	Graphite packing	High temperature applications
	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 - ½" to 4" 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, AEL6 series and CVL
Pneumatic	PN1000, PN2000, PN9000 and TN2000 series
Positioners	PP5 (pneumatic)
	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 CE mark when so required.

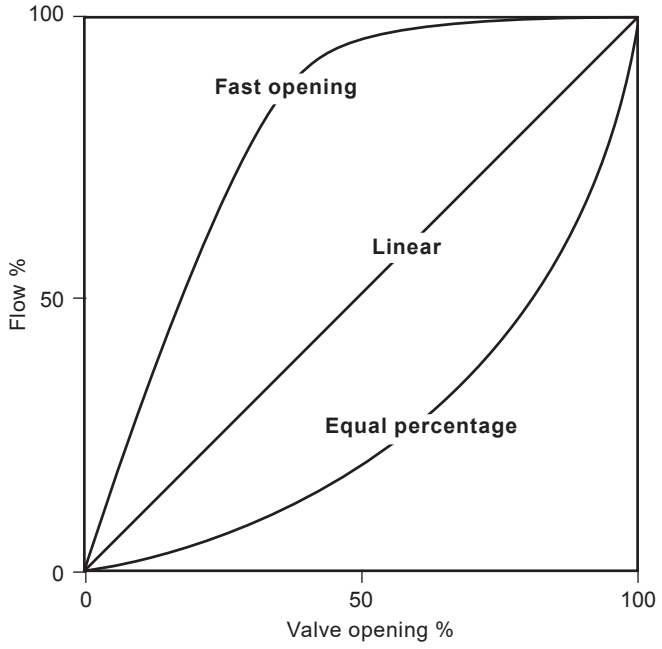
Certification

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.

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 (1 3/16")
	DN150 and DN200	(6" and 8")	70 mm (2¾")

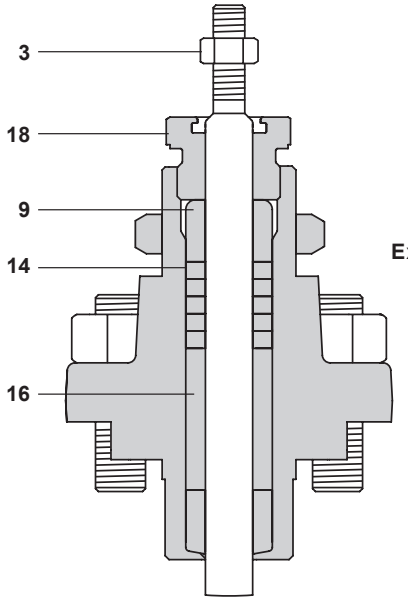
Typical flow characteristic curves

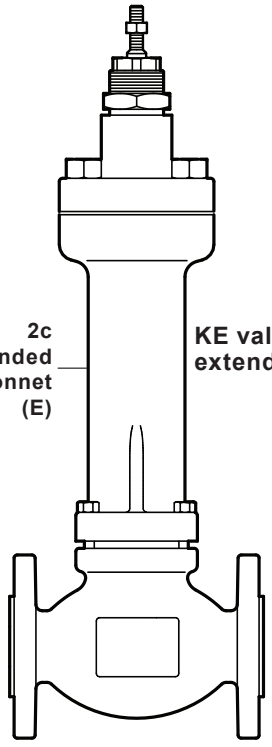


Materials - DN15 to DN100 (½" to 4") see pages 6 and 7 for the DN125 to DN300 (6" to 12")

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			
		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			
		2a	Bonnet extension			
		2c	Extended bonnet		Stainless steel	ASTM A351 CF8M
SG iron	KE71 KE73	1	Body		SG iron	EN-GJS-400-18U-LT
		2	Bonnet			
		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			
		2a	Bonnet extension		Cast steel	ASTM A216 WCB
		2c	Extended bonnet			
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				

KE valve with graphite packing



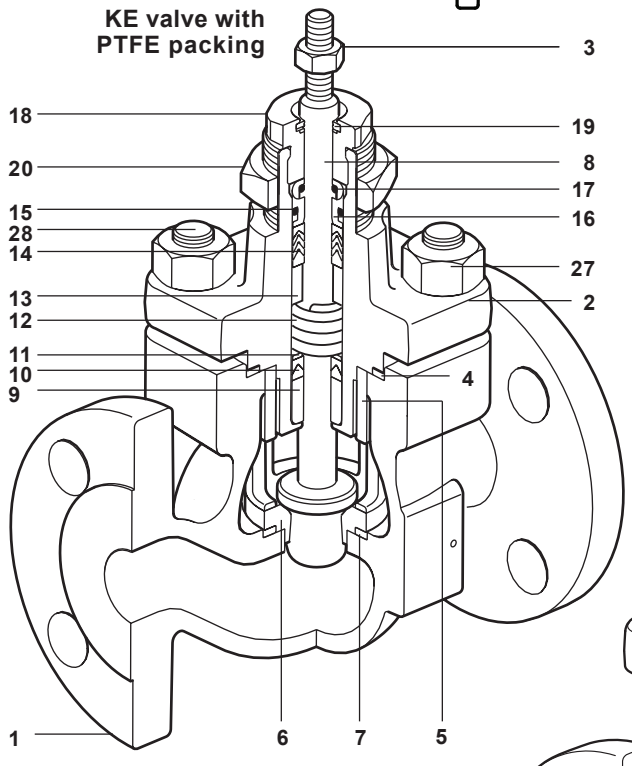


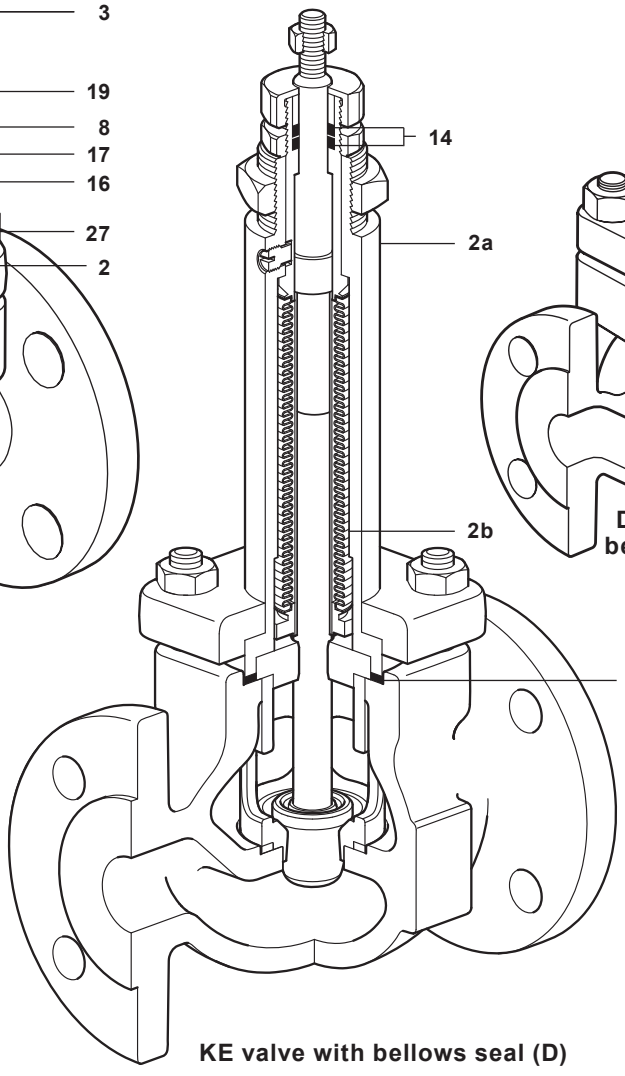
KE valve with extended bonnet (E)

* Graphite packing

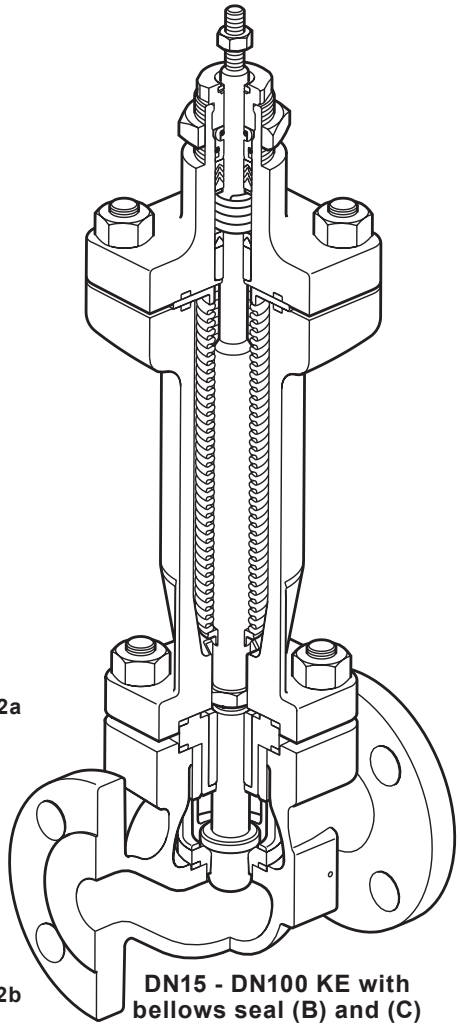
High temperature packing	9 16	Lower and upper stem guide	Stelite 6
	14	Grafoil packing	Graphite rings
	10, 11, 12, 15, 17 and **19** **Not used**		

KE valve with PTFE packing



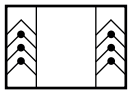


KE valve with bellows seal (D)

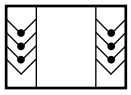


DN15 - DN100 KE with bellows seal (B) and (C)

* PTFE stem sealing



PTFE stem sealing for vacuum service

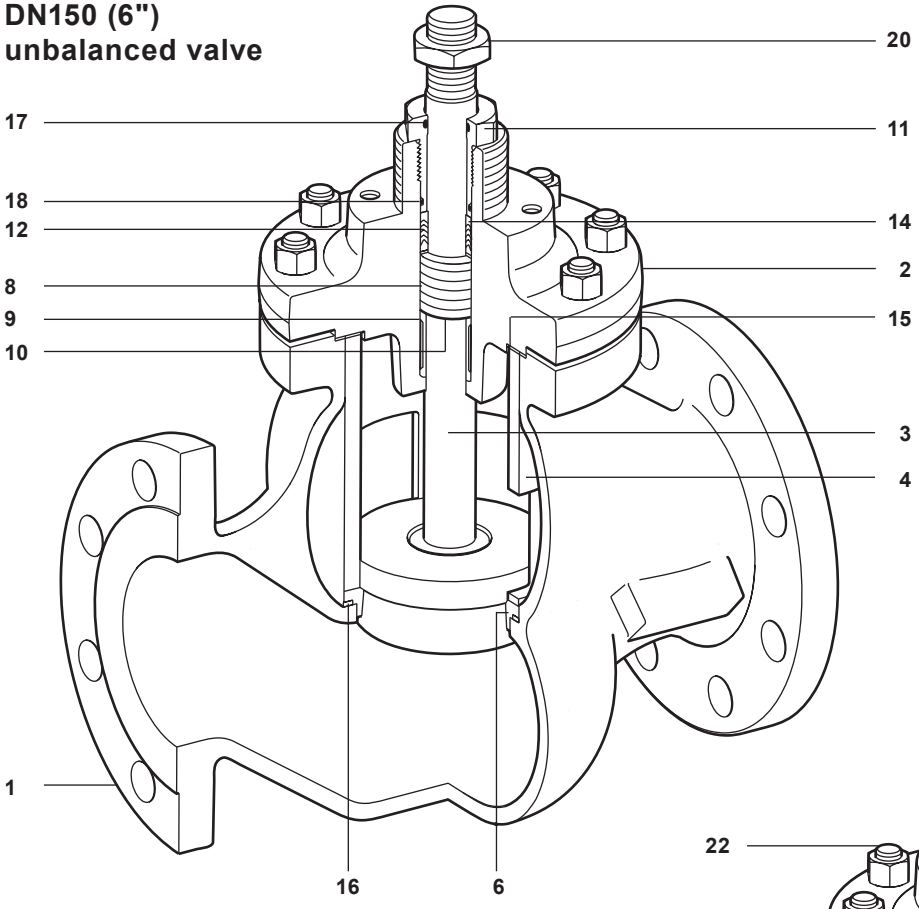


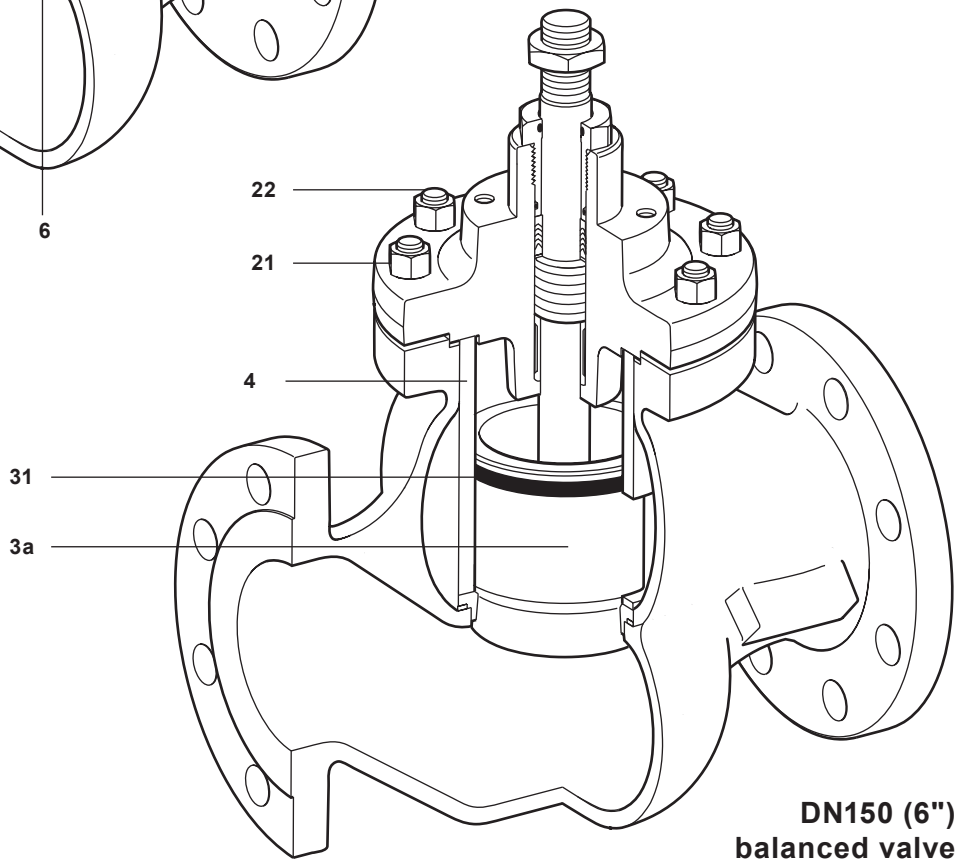
Materials - DN150 to DN200 (6" and 8") see pages 4 and 5 for the DN15 to DN100 (½" to 4")

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			
	KEA63	1	Body		Stainless steel	ASTM A351 CF8M
		2	Bonnet			
SG iron	KE73	1	Body		SG iron	EN-GJS-400-18U-LT
		2	Bonnet			
	KEA73	1	Body		SG iron	ASTM A395
		2	Bonnet			
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	**KE43** **KE73**	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
Balanced versions	**3a**	Plug and stem assembly	Stainless steel
	29	Cage	Stainless steel
	31	Balanced seal	Graphite

DN150 (6") unbalanced valve

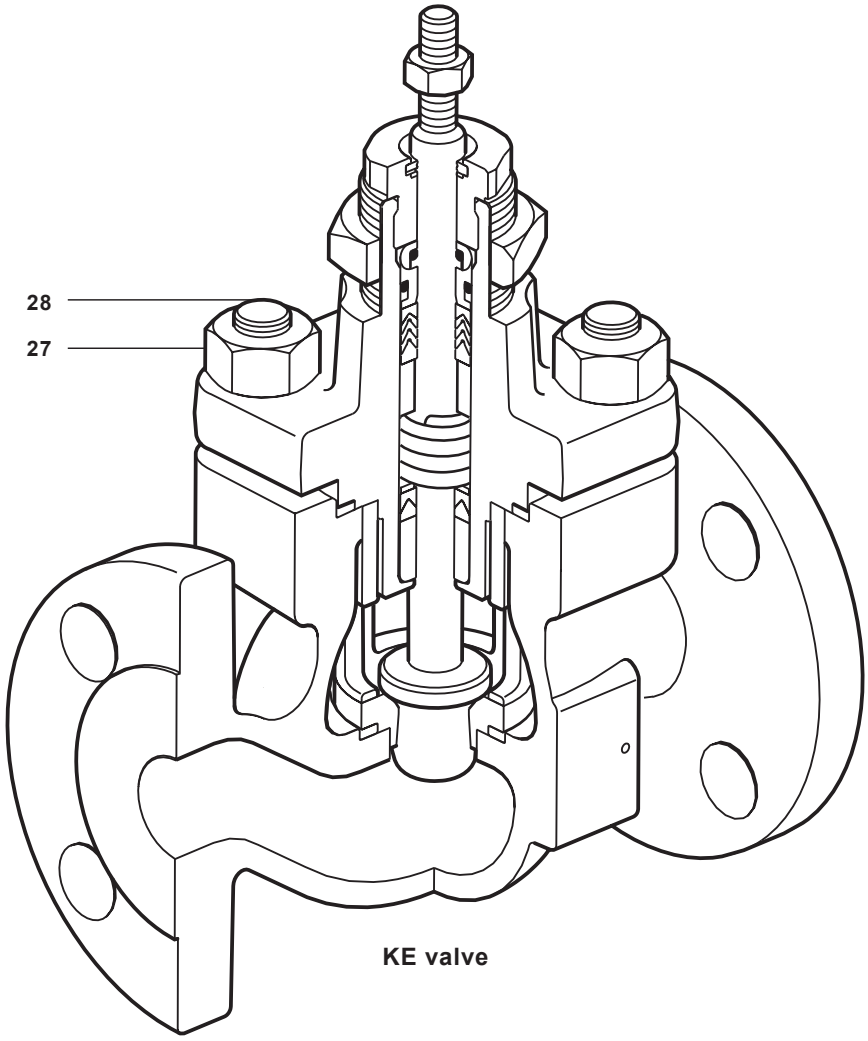




DN150 (6") balanced valve

Materials - Nuts and studs DN15 to DN100 (½" to 4") see pages 6 and 7 for the DN150 to DN200 (6" and 8")

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	ASTM A194 Gr.2H
	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	ISO3506 A2
		Standard bonnet studs	KEA4_	Steel	ASTM A193 Gr.B7
			KEA6 _	Steel	ASTM A193 Gr. B8 M2
			KEA7 _	Steel	ASTM A193 Gr. B7



KE valve

K_V values

Valve size			DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN150 (6")	DN200 (8")
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	370	580
		Linear	4.0	6.3	10.0	16.0	25.0	36.0	63	100	160	390	640
		Fast opening	4.0	6.3	10.0	18.0	28.0	50.0	85	117	180	390	640
	Reduced trim 1	Equal %	2.5	4.0	6.3	10.0	16.0	25.0	36	63	100	287	370
		Linear	2.5	4.0	6.3	10.0	16.0	25.0	36	63	100	287	550
	Reduced trim 2	Equal %	1.6	2.5	4.0	6.3	10.0	16.0	25	36	63	132	232
		Linear	1.6	2.5	4.0	6.3	10.0	16.0	25	36	63	132	232
	Reduced trim 3	Equal %	1.0	1.6	2.5	4.0	6.3	10.0	16	25	36	103	163
		Linear	1.0	1.6	2.5	4.0	6.3	10.0	16	25	36	103	163
	Reduced trim 4	Equal %		1.0	1.6		4.0	6.3		16			
		Linear		1.0	1.6		4.0	6.3		16			
	Reduced trim 5	Equal %			1.0			4.0					
		Linear			1.0			4.0					
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

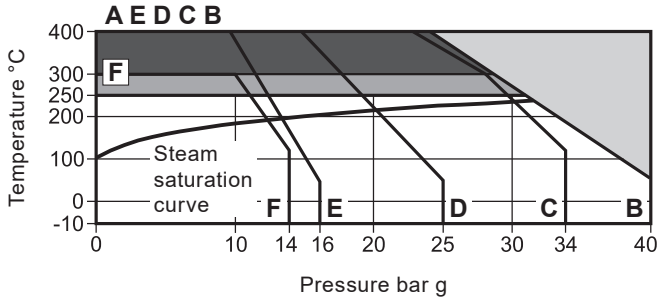
C_V (US) values

C_V (US) = C_V (UK) x 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")
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
		Linear	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	185.0	456	749
		Fast opening	4.6	7.3	12.0	21.0	32.0	58.0	98.0	135.0	208.0	456	749
	Reduced trim 1	Equal %	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	336	433
		Linear	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	116.0	336	636
	Reduced trim 2	Equal %	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	154	271
		Linear	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	73.0	154	271
	Reduced trim 3	Equal %	1.2	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	120	191
		Linear	1.2	1.8	2.9	4.6	7.3	12.0	18.0	29.0	42.0	120	191
	Reduced trim 4	Equal %		1.2	1.8		4.6	7.3		18.0			
		Linear		1.2	1.8		4.6	7.3		18.0			
	Reduced trim 5	Equal %			1.2			4.6					
		Linear			1.2			4.6					
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

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:

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 PEEK seat (K and P) Extended bonnet (E) with PTFE chevron	250 °C
	High temperature packing (H) 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.

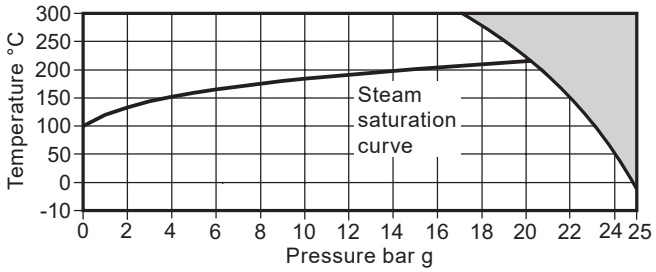
Pressure/temperature limits - KE43 (Carbon steel)

Maximum operating temperature - Bellows only

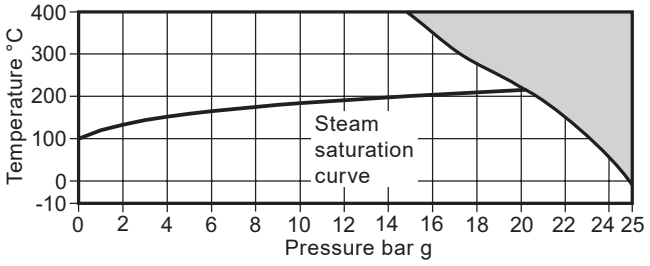
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 10.

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

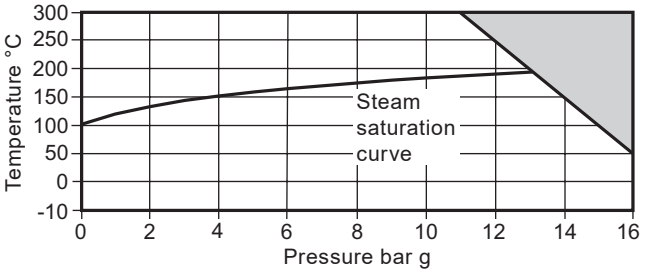
Bellows B



Bellows C

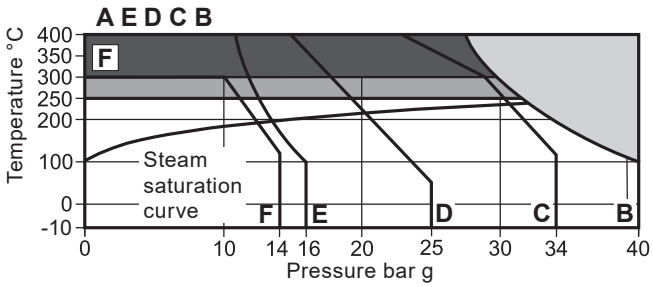


Bellows D



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

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)	
	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.

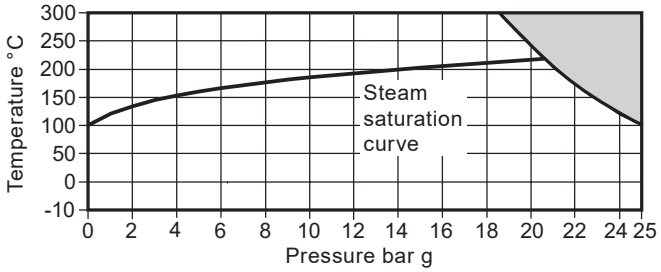
Pressure/temperature limits - KE61 and KE63 (Stainless steel)

Maximum operating temperature - Bellows only

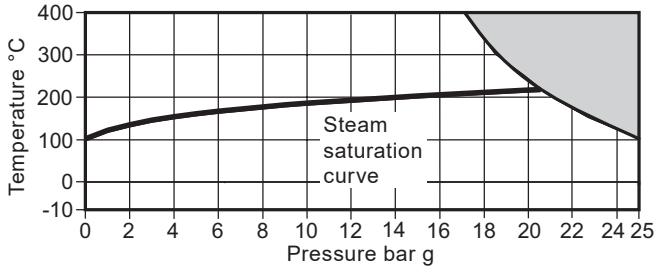
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 12.

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

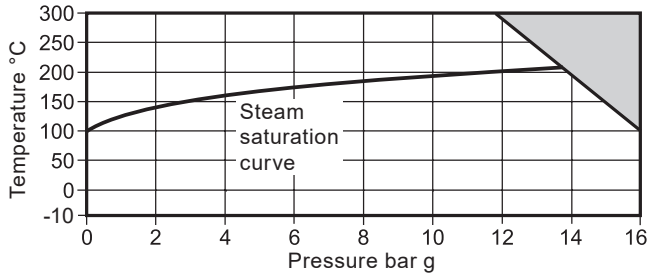
Bellows B



Bellows C

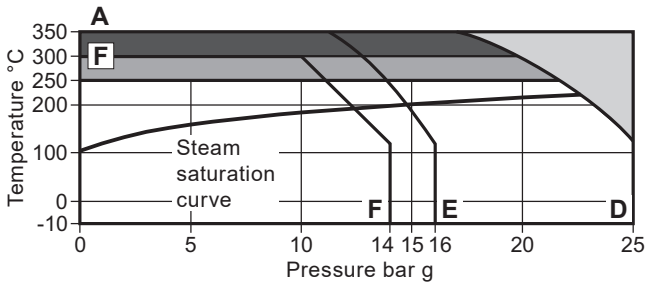


Bellows D



Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco.	PTFE packing	-10 °C
	Graphite packing	
Maximum differental 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

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



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:

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		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
Maximum operating temperature	PTFE soft seat (G)	200 °C
	Standard packing PTFE chevron PEEK seat (K and P) Extended bonnet (E) with PTFE chevron	250 °C
	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.

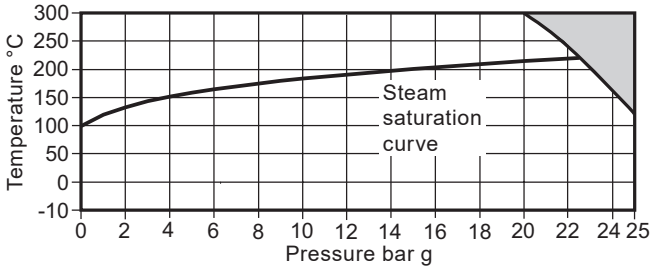
Pressure/temperature limits - KE71 and KE73 (SG iron)

Maximum operating temperature - Bellows only

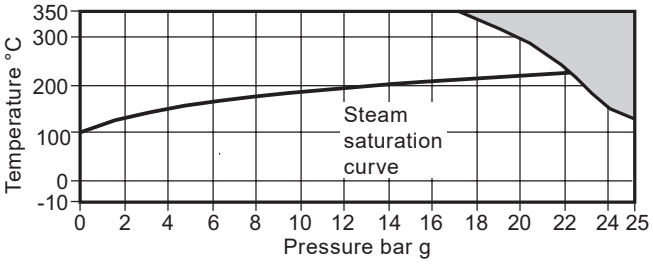
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 14.

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

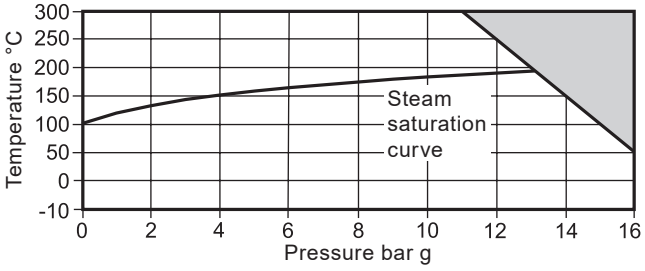
Bellows B



Bellows C

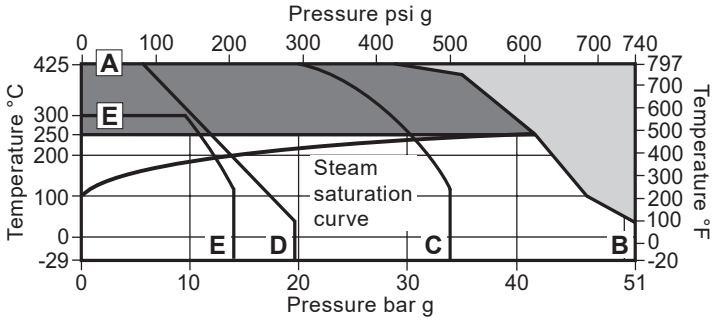


Bellows D



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

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:

1. Where the process fluid temperature is sub-zero and the ambient temperature is below +5 °C (41 °F), 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 above.
3. 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	(101.5psi g)
	PEEK soft seat (K)	7 bar	(101.5psi g)
	Full PEEK seat (P)	19 bar	(275.5 psi g)
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) Extended bonnet (E) with PTFE chevron	250 °C	(482 °F)
	Graphite packing (H) Extended bonnet (E) with graphite packing	425 °C	(800 °F)

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

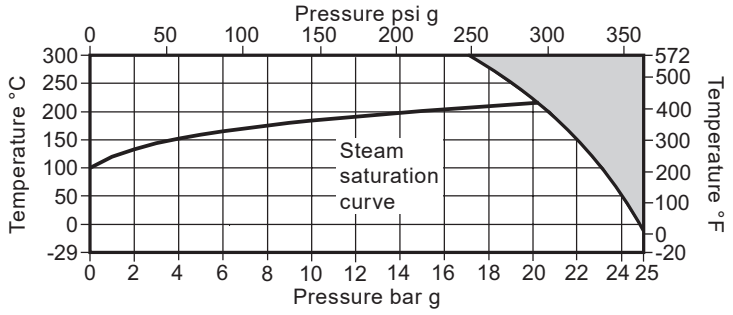
Pressure/temperature limits - KEA41, KEA42 and KEA43 (Carbon steel)

Maximum operating temperature - Bellows only

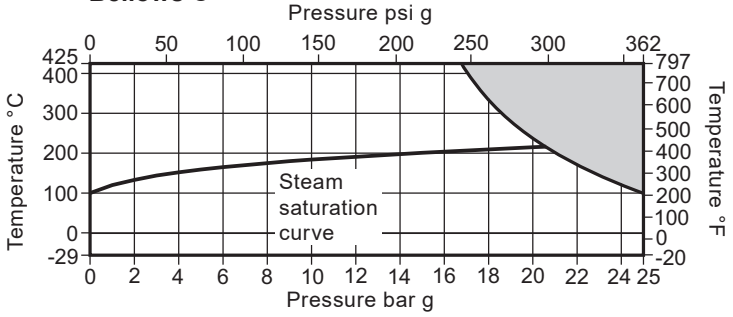
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 16.

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

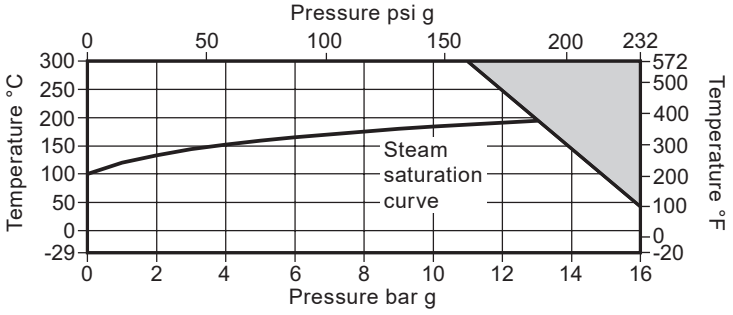
Bellows B



Bellows C

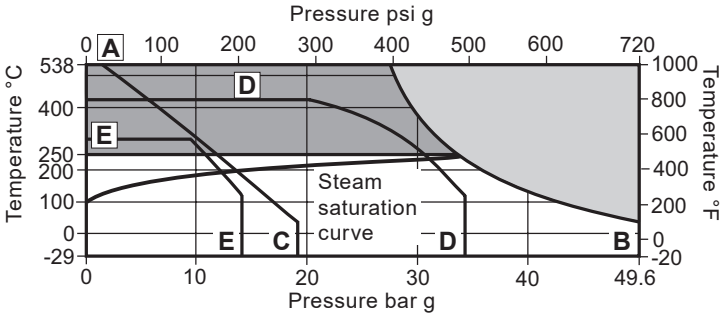


Bellows D



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

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:

1. Where the process fluid temperature is sub-zero and the ambient temperature is below +5 °C (41 °F), 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 above.
3. 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	(101.5psi g)
	PEEK soft seat (K)	7 bar	(101.5psi g)
	Full PEEK seat (P)	19 bar	(275.5 psi g)
Maximum design temperature		538 °C	(1 000 °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) Extended bonnet (E) with PTFE chevron	250 °C	(482 °F)
	Graphite packing (H) Extended bonnet (E) with graphite packing	538 °C	(1 000 °F)

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

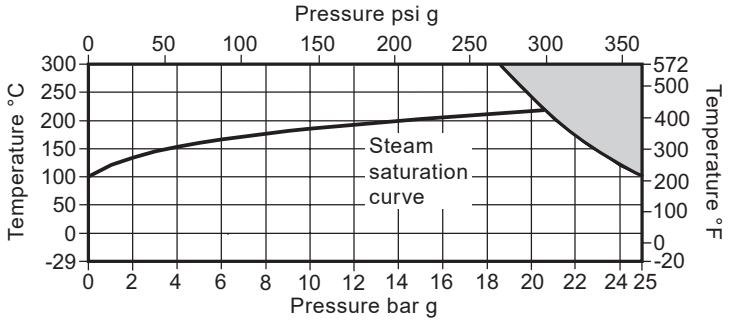
Pressure/temperature limits - KEA61, KEA62 and KEA63 (Stainless steel)

Maximum operating temperature - Bellows only

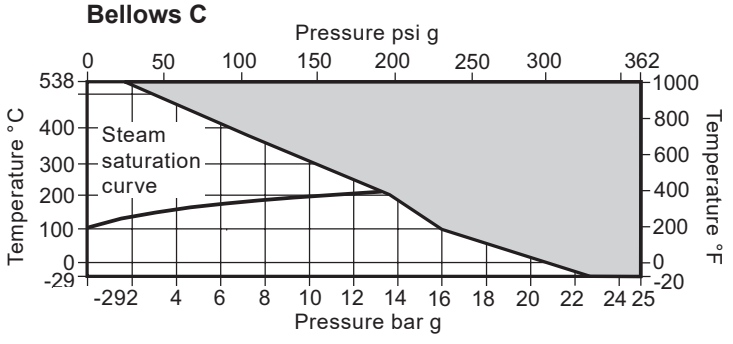
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 18.

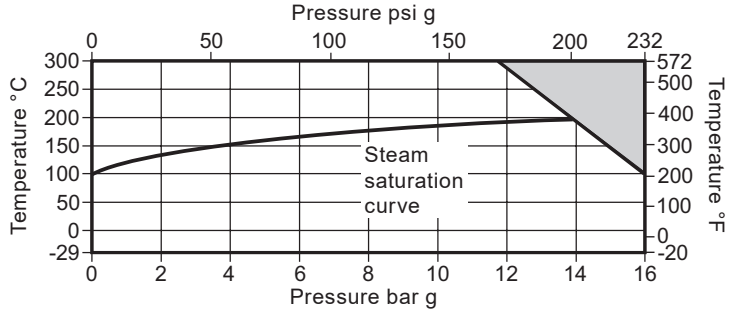
The product **must not** be used in this region.

Bellows B



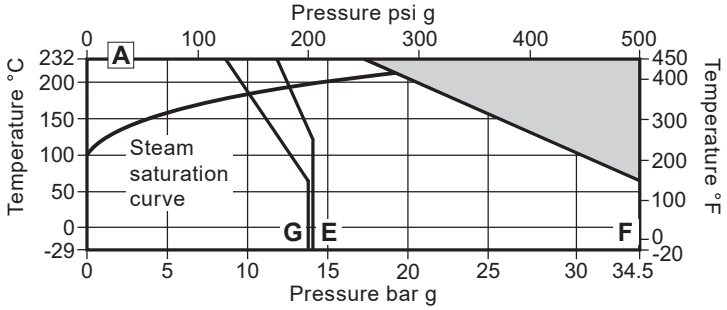
Bellows C





Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco.	PTFE packing	-29 °C	(-20 °F)
	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 / Bellows C	38 bar g	551 psi g
	Bellows D	24 bar g	348 psi g

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:

1. Where the process fluid temperature is sub-zero and the ambient temperature is below +5 °C (41 °F), 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 above.
3. 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	(101.5psi g)
	PEEK soft seat (K)	7 bar	(101.5psi g)
	Full PEEK seat (P)	19 bar	(275.5 psi g)
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	232 °C	(450 °F)
	PEEK seat (K and P)		
	Graphite packing (H)		
	Extended bonnet (E) with PTFE chevron		
	Extended bonnet (E) with graphite packing		

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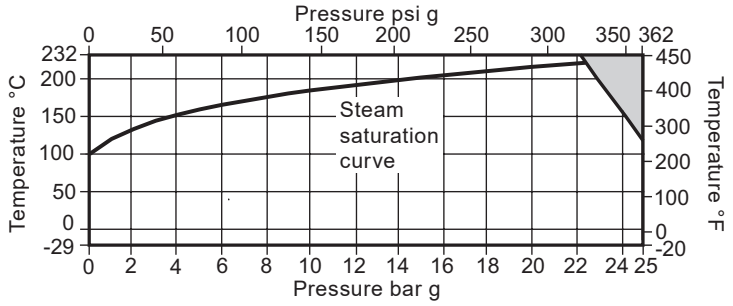
Pressure/temperature limits - KEA71 and KEA73 (SG iron)

Maximum operating temperature - Bellows only

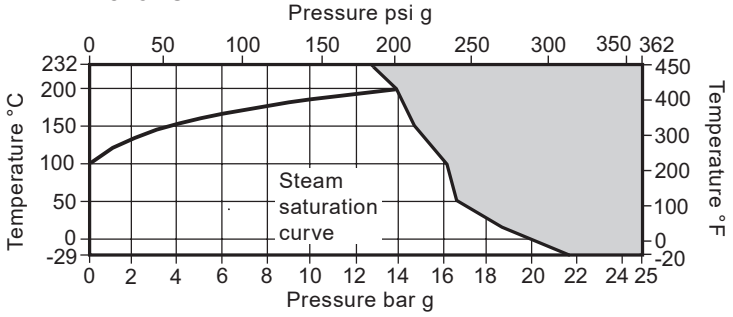
Note: When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown on page 20.

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

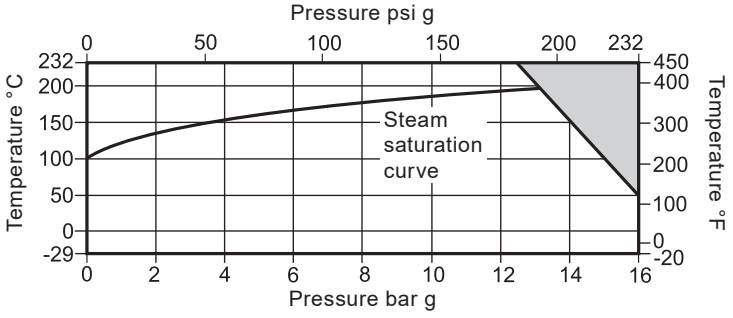
Bellows B



Bellows C



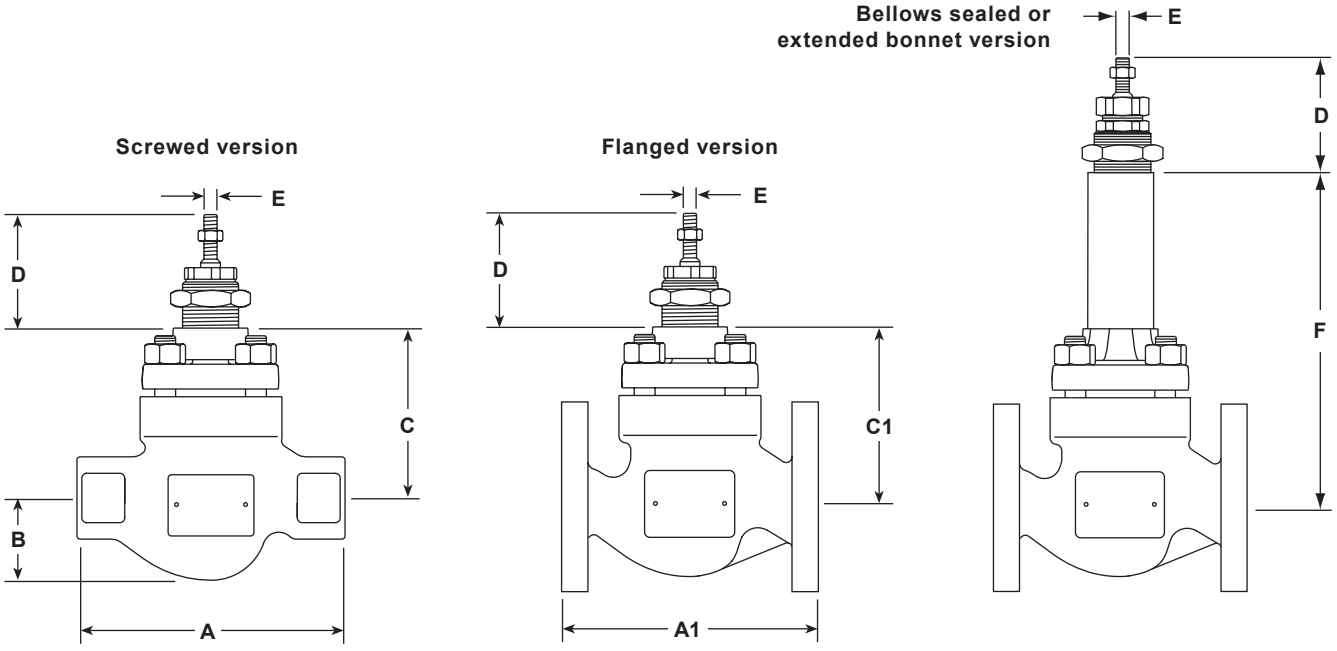
Bellows D



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

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

Valve size	Screwed						Flanged										
	BSP			NPT			KE valves				KEA valves			D	E	F	
	A	B	C	A	B	C	A1			C1	A1		C1				
							PN16 PN25 PN40	JIS/KS 10	JIS/KS 20		KS 10 ASME 125 and 150	KS 20 ASME 250 and 300			Thread	Bellows seals	Extended bonnet
DN15 (½")	130	40	103	165 (6½")	44 (1¾")	102 (4")	130	130	130	103		190 (7½")	102 (4")	69 (2¾")	M8	237 (9")	336 (13.25")
DN20 (¾")	155	45	103	165 (6½")	44 (1¾")	102 (4")	150	150	150	103		190 (7½")	102 (4")				
DN25 (1")	160	50	103	197 (7¾")	57 (2¼")	102 (4")	160	160	160	103	184 (7¼")	197 (7¾")	102 (4")				
DN32 (1¼")	185	60	132	216 (8½")	57 (2¼")	127 (5")	180	180	180	132			127 (5")			267 (10½")	354 (13.94)
DN40 (1½")	205	65	132	235 (9¼")	63 (2½")	127 (5")	200	200	200	132	222 (8¾)	235 (9¼")	127 (5")				
DN50 (2")	230	80	127	267 (10½")	76 (3")	127 (5")	230	230	230	127	254 (10")	267 (10½")	127 (5")				
DN65 (2½")							290	290	290	201	267 (10½)	292 (11½")	200 (7⅞")	81 (3")	M12	368 (14½")	416 (16.38")
DN80 (3")							310	310	310	201	298 (11¾)	317 (12½")	200 (7⅞")			368 (14½")	
DN100 (4")							350	350	350	216	349 (13¾)	368 (14½")	216 (8½")			381 (15")	431 (17")
DN150 (6")							480	451	473	275	451 (17¾")	473 (18⅝")	279 (11")	125 (4 ⅞")	M30		556 (21⅞")
DN200 (8")							600	543	568	341	543 (21⅜")	568 (22⅜")	343 (13½")				621 (24½")



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)	
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)

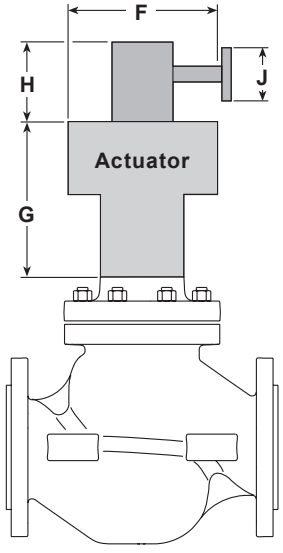
Dimensions/weights for the PN actuator range approximate in mm and kgs (inches and lbs)

Actuator range and variants	F		G		H		J		Weight Actuator		Weight With handwheel	
	mm	inches	mm	inches	mm	inches	mm	inches	kg	lbs	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 7/8"	300	11 7/8"	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											+6.00	+13.50
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		

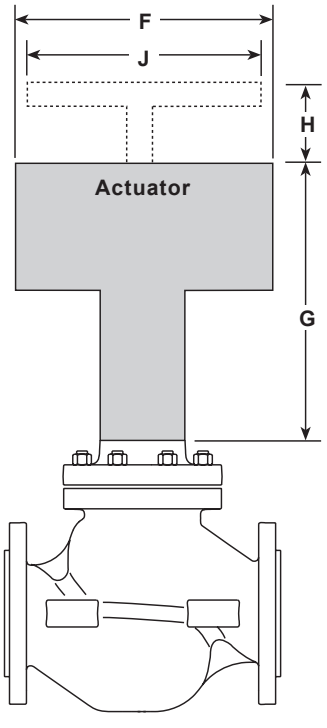
Dimensions/weights for the EL and AEL actuator ranges

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



Side mounted handwheel



Top mounted handwheel

Spare parts

Spira-trol™ two-port control valve
DN15 to DN100 - ½" 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**
Stem seal kits	**PTFE** packing	**C**
	Graphite packing	**C1**
	Graphite seal set	**C2**
Plug stem and seat kit	* **Equal percentage trim** (No gaskets supplied)	**D**, **E**
	Fast opening trim (No gaskets supplied)	**D1**, **E**
	Linear trim (No gaskets supplied)	**D2**, **E**
PTFE soft seat seal		**H**

Specify if reduced trim.

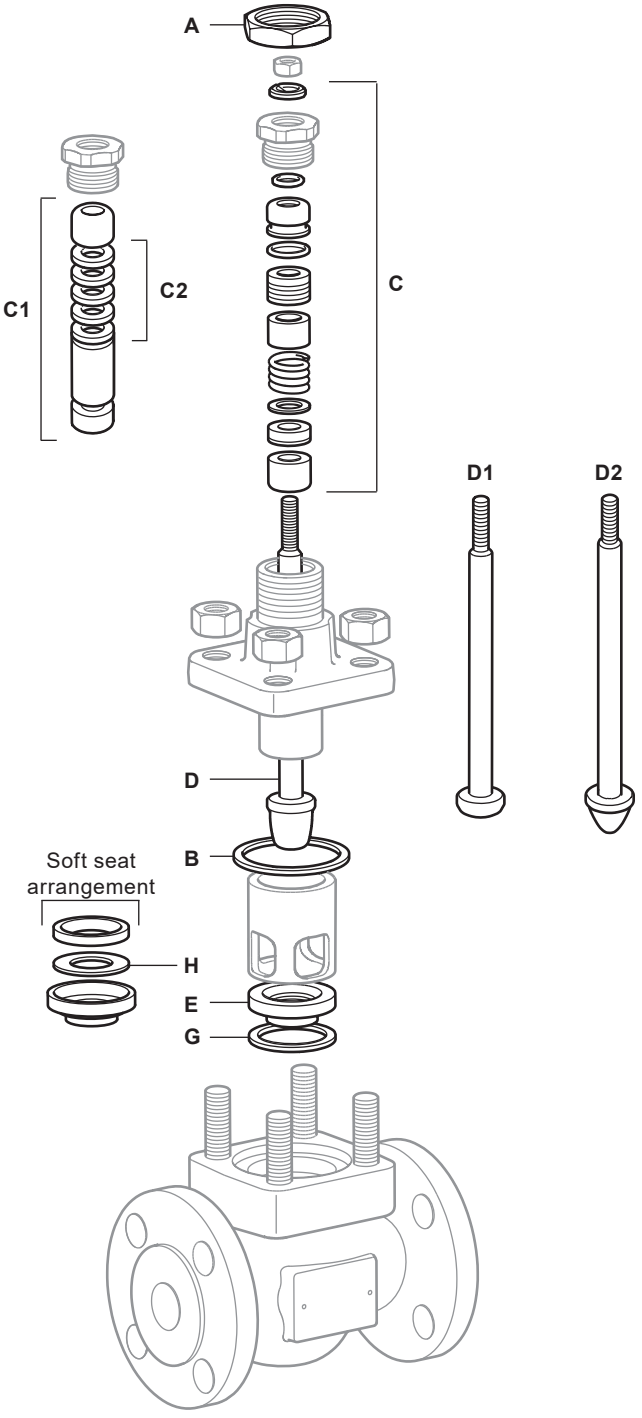
How to order spares

* 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.

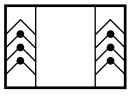
Example: 1 - PTFE stem seal kit for a Spirax Sarco DN25 Spira-trol™ two-port KE43 PTSUSS.2 K_{VS} 10 control valve.

How to fit spares

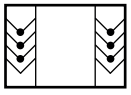
Full fitting instructions are given in the Installation and Maintenance Instructions supplied with the spare.



* **PTFE stem sealing**



PTFE stem sealing for vacuum service



Spare parts

Spira-trol™ two-port control valve
Balanced and unbalanced
DN150 and DN200 - 6" and 8"

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.

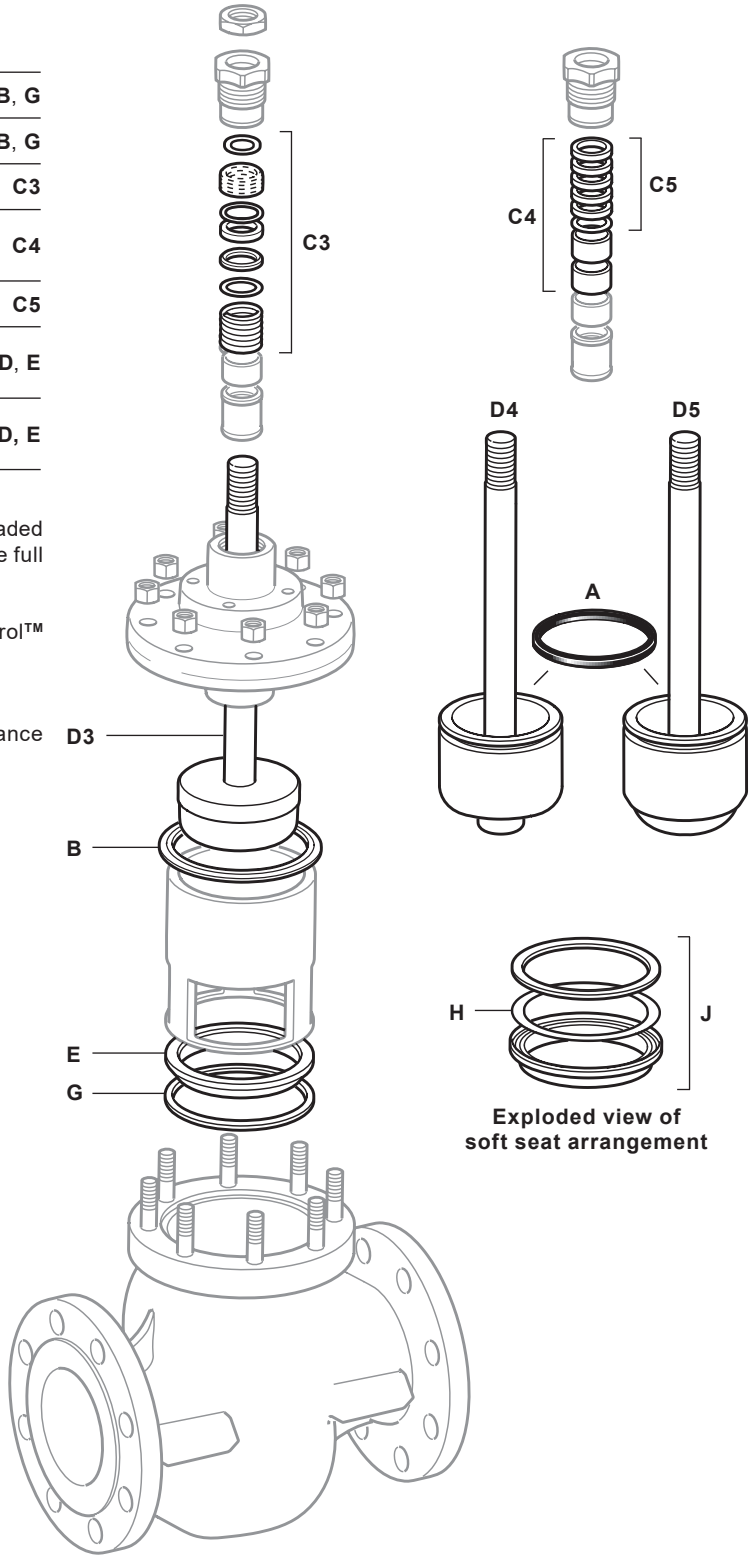
Available spares - K series

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.



Exploded view of soft seat arrangement

Spare parts

Spira-trol™ two-port control valve with bellows seal - Type D DN15 to DN100 - ½" 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

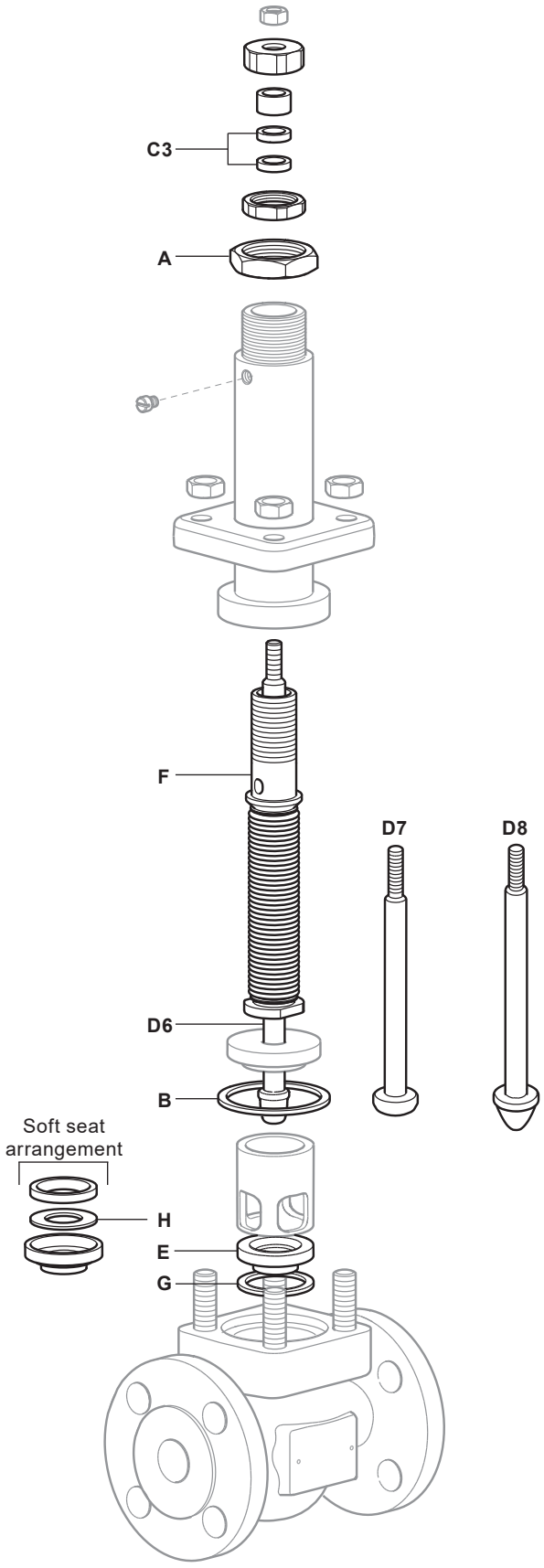
Actuator clamping nut		**A**
Gasket set	(Bellows sealed)	**B**, **G**
Stem seal kit	**Graphite** secondary seal and gasket set	**C3**
Plug stem and seat kit	***Equal percentage trim** (No gaskets supplied)	**D6**, **E**
	Fast opening trim (No gaskets supplied)	**D7**, **E**
	Linear trim (No gaskets supplied)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



Spare parts

Spira-trol™ two-port control valve with bellows seal - Types B and C DN15 to DN100 - ½" 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

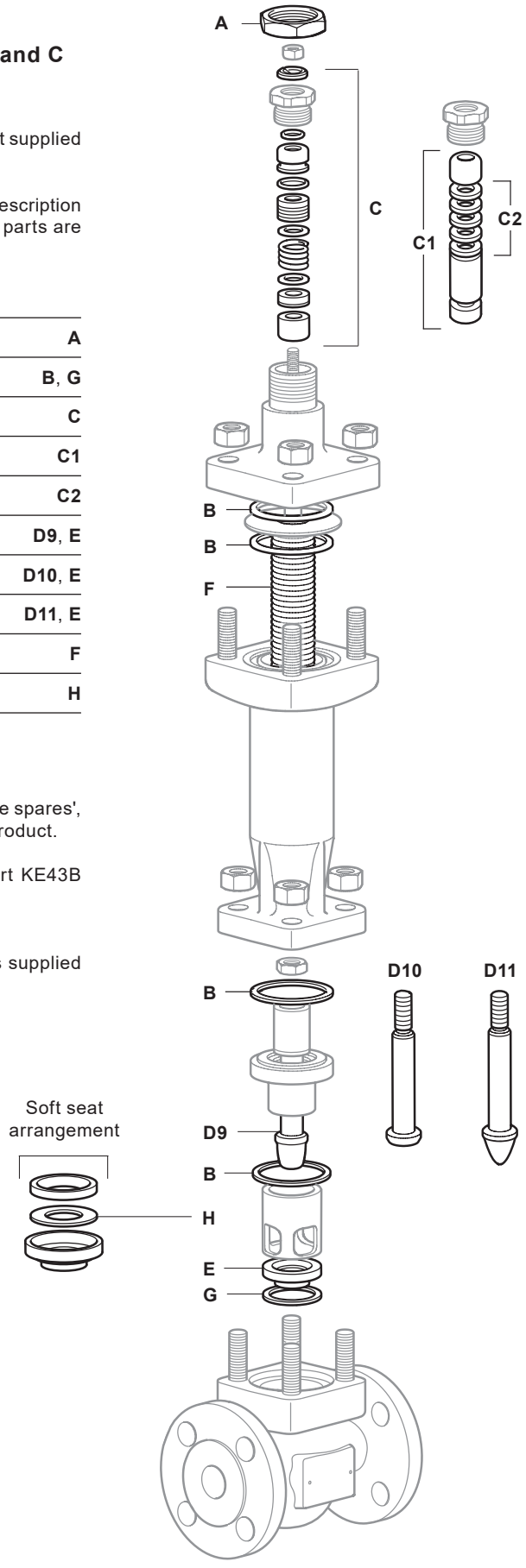
Actuator clamping nut		**A**
Gasket set	(Bellows sealed)	**B**, **G**
Stem seal kits	**PTFE** packing	**C**
	Graphite packing	**C1**
	Graphite seal set	**C2**
Plug stem and seat kit	*** Equal percentage trim** (No gaskets supplied)	**D9**, **E**
	Fast opening trim (No gaskets supplied)	**D10**, **E**
	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_{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	EN standard =	DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250 and 300	**1"**
	ASME standard =	½", ¾", 1", 1¼", 1½", 2", 2½", 3", 4", 5", 6", 8", 10" and 12"	
Valve series	K =	K series 2-port control valve	**K**
Valve characteristic	E =	Equal percentage	**E**
	F =	Fast opening	
	L =	Linear	
Flange type	A =	ASME	**A**
	Blank =	EN (PN)	
Flow	Blank =	under	**Blank**
	T =	over	
Body material	4 =	Carbon steel	**4**
	6 =	Stainless steel	
	7 =	SG iron	
Connections	1 =	Screwed	**3**
	2 =	Socket weld	
	3 =	Flanged	
Stem sealing	B =	Bellows/PTFE secondary seals	**P**
	C =	Bellows/graphite secondary seals	
	D =	Bellows/graphite secondary seals	
	H =	Graphite	
	N =	PTFE with Nitronic bush - ½" to 2" only	
	P =	PTFE	
	V =	PTFE for vacuum service	
Seating	G =	PTFE soft seat	**T**
	K =	PEEK soft seat	
	P =	Full PEEK	
	S =	316L stainless steel	
	T =	431 stainless steel	
	W =	316L with stellite 6 facing	
Type of trim	A1 =	1 stage anti-cavitation	**S**
	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	
Trim balancing	B =	Balanced	**U**
	U =	Unbalanced	
Bonnet type	E =	Extended	**S**
	S =	Standard	
Bolting	H =	High temperature	**S**
	S =	Standard	
Finish	Blank =	Standard	
	N =	ENP coating	
Series	2 =	.2	**.2**
K_{VS}		To be specified	**C_V 12**
Connection type		To be specified	**Flanged ASME 300**

Selection example:

1"	-	**K**	**E**	**A**	**4**	**3**	**P**	**T**	**S**	**U**	**S**	**S**		**.2**	-	**C_V 12**	-	**Flanged ASME 300**

How to order

Example: 1 off Spirax Sarco Spira-trol™ 1" KEA43PTSUSS.2 C_V 12 two-port control valve having flanged ASME 300 connections.