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spirax sarco

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CH Issue 3

SPIRA-TROL

1/2" to 4"

ASME (ANSI) Two-port KEA, KFA and KLA Control Valves

Description

SPIRA-TROL is a range of two-port single seat globe valves with cage retained seats conforming to ASME (ANSI) standards. These valves are available in three body materials in sizes ranging from 1/2" to 4". When used in conjunction with a pneumatic or electric linear actuator they provide modulating control or on/off service.

SPIRA-TROL valve characteristic - options:

KEA	Equal percentage (E) - Suitable for most modulating process control applications providing good control at all flowrates.
KFA	Fast opening (F) - For on/off applications only.
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 KEA control valve. With the exception of trim type, the KEA, KFA and KLA control valves are identical.

SPIRA-TROL valve options:

Stem sealing	PTFE chevron seals	Standard
	Graphite packing	High temperature applications
	Bellows / graphite secondary seals (D)	Zero emissions and high temperature applications
	Bellows / PTFE (B)	Zero emissions
Seating	Bellows / graphite (C)	Zero emissions and High temperature applications
	Metal-to-metal	431 stainless steel - standard 316L stainless steel
	Soft seating	Up to 392°F: PTFE for Class VI shut-off Up to 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	
	Low noise	

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

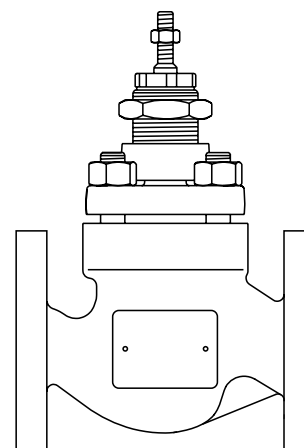
Electric	EL3500, EL5600 and EL7200 series
Pneumatic	PN1000 and PN9000 series
	PP5 (pneumatic) or EP5 (electropneumatic)
Positioners	ISP5 (intrinsically safe electropneumatic)
	SP200is, SP400 and SP500 (microprocessor based electropneumatic)
	SP300 (digital communications)

Refer to the relevant Technical Information sheet for further details.

Sizes and pipe connections

Type	Body material	Connections	Size range
KEA41	Carbon steel		
KEA61	Stainless steel	Screwed NPT	1/2", 3/4", 1", 1 1/4", 1 1/2" and 2"
KEA71	Ductile iron		
KEA42	Carbon steel		
KEA62	Stainless steel	Socket weld	1/2", 3/4", 1", 1 1/4", 1 1/2" and 2"
KEA43	Carbon steel		
KEA63	Stainless steel	Flanged ASME (ANSI) 300	1/2" and 3/4" (KEA43 and KEA63 only), 1", 1 1/2", 2", 2 1/2", 3" and 4"
KEA73	Ductile iron	Flanged ASME (ANSI) 125 and 250	

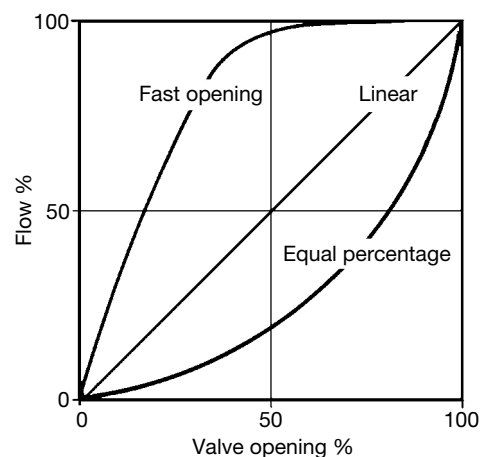
Notes:
- The 1/2" and 3/4" flanged sizes are not available in ductile iron.



Technical data

Plug design	Parabolic	
Leakage	Metal-to-metal	ASME (ANSI) Class IV
	Soft seal	ASME (ANSI) Class VI
Rangeability	Equal % and linear 50:1	
Travel	1/2" to 2"	3/4"
	2 1/2" to 4"	1 3/16"

Typical flow characteristic curves



Materials

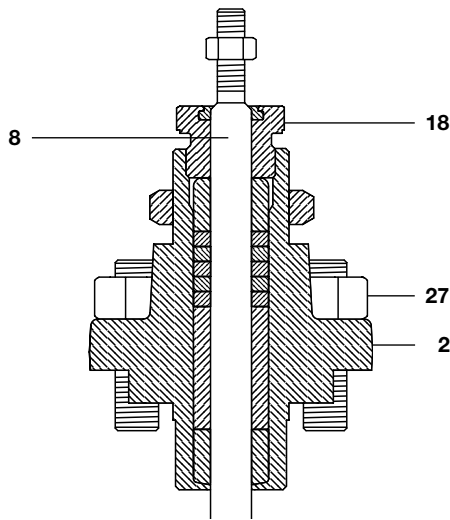
Type	No.	Part	Material	
KEA41 KEA42 KEA43	1	Body	Cast steel ASTM A216 WCB	
	2	Bonnet	½" to 2"	Forged steel ASTM A105N
			2½" to 4"	Cast steel ASTM A216 WCB
	2a	Bonnet extension	Cast steel ASTM A216 WCB	
	2b	Bellows	Stainless steel	
3	Stem lock-nut	Stainless steel		
KEA61 KEA62 KEA63	1	Body	Stainless steel ASTM A351 CF8M	
	2	Bonnet	Stainless steel ASTM A351 CF8M	
	2a	Bonnet extension	Stainless steel ASTM A351 CF8M	
	2b	Bellows	Stainless steel	
	3	Stem lock-nut	Stainless steel	
LE63	1	Body	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2	Bonnet	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2a	Bonnet extension	Stainless steel DIN GX5 CrNiMO 19-11-2 1.4408	
	2b	Bellows	Stainless steel	
	3	Stem lock-nut	Stainless steel	
All versions using PTFE seals	2c	Extended bonnet	Stainless steel AISI 316L	
	4	Bonnet gasket	Reinforced exfoliated graphite	
	5	Seat retainer	Stainless steel 316L	
	6	Valve seat ring	Stainless steel (see 'SPIRA-TROL valve options' on page 1)	
	7	Seat gasket	Reinforced exfoliated graphite	
	8	Valve plug and stem	Stainless steel (see 'SPIRA-TROL valve options' on page 1)	
	9 *	Lower stem guide	Glass filled PTFE	
	10	Lower stem wiper	PTFE	
	11 *	Packing guard washer	Stainless steel 316L	
	12 *	Spring	Stainless steel	
	13	Packing spacer	Stainless steel 316L	
	14 *	Chevron packing set	PTFE	
	15 *	Outer 'O' ring	Viton B	
	16 *	Upper stem guide	Glass filled PTFE	
	17 *	Inner 'O' ring	Viton	
	18	Gland nut	Stainless steel	
	19	Scraper ring	PTFE	
	20	Actuator clamp nut	KEA4_ and KEA7_	Plated carbon steel
			KEA6_	Stainless steel
	21	Bellows assembly	Stainless steel AISI 316Ti + 316L	
	22	Bonnet extension gasket	Reinforced exfoliated graphite	
	23	Top plate (used on bonnet extension only)	Stainless steel 316L	
	24	Lower spindle bearing housing	Stainless steel 316L	
	25	Lower spindle bearing	Stellite 6	
	26	Spindle lock and anti-rotation nut	Stainless steel 316L	
	27	Bonnet nuts	KEA4_ and KEA7_	Steel ASTM A914 Gr. 2H
			KEA6_	Steel ASTM A914 Gr. 8M
	28	Bonnet studs	KEA4_ and KEA7_	Steel ASTM A914 Gr. B7
KEA6_			Steel ASTM A914 Gr. B8 M2	

Not shown

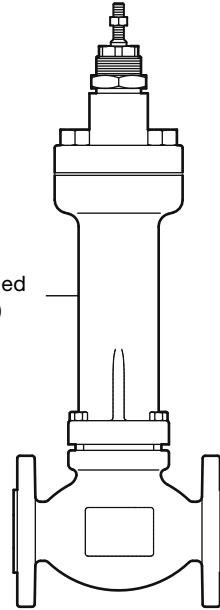
*** Graphite packing**

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

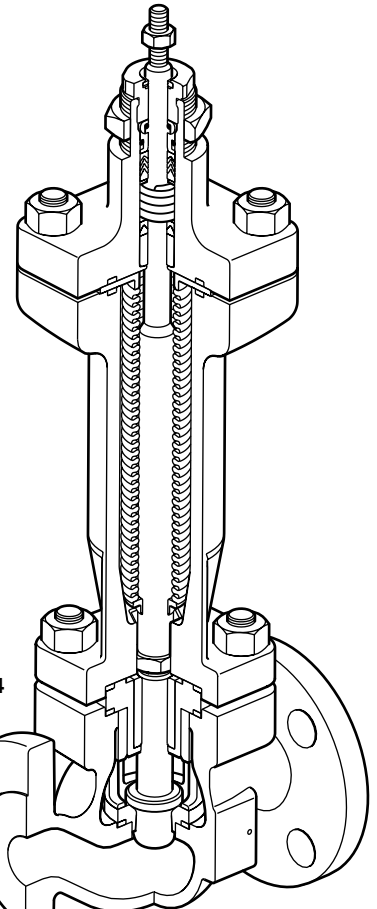
Bonnet with graphite packing



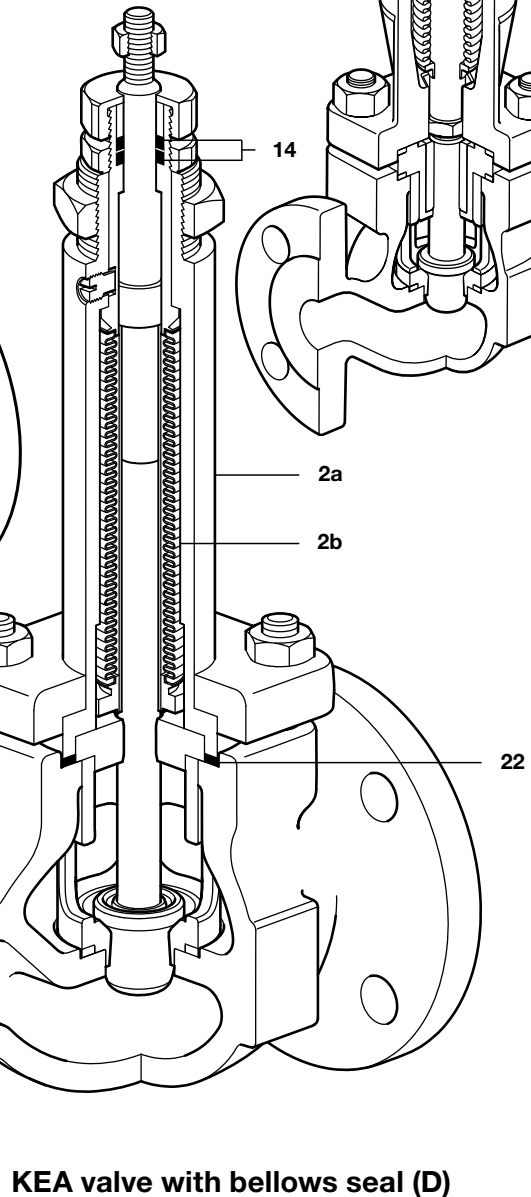
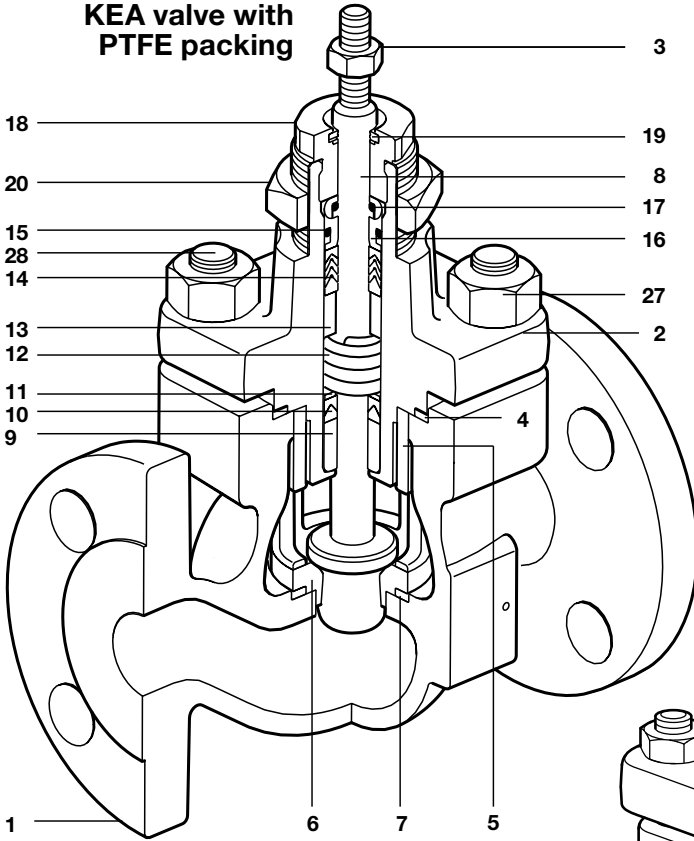
KEA valve with extended bonnet (E)



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




KEA valve with PTFE packing



KEA valve with bellows seal (D)

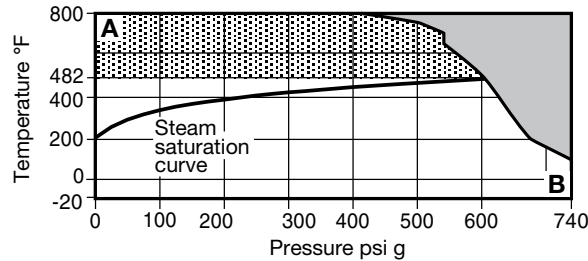
Pressure/temperature limits - Valve body

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

 Graphite stem sealing is required for use in this region

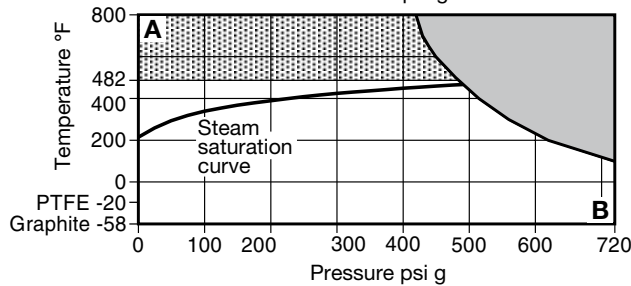
- Notes:**
1. Where the process fluid temperature is sub-zero and the ambient temperature is below +5°C, the external moving parts of the valve and actuator must be heat traced to maintain normal operation.
 2. When selecting a valve with a bellows sealed bonnet, the pressure/temperature limits of the bellows must be read in conjunction with the valve pressure/temperature limits shown below.
 3. As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.

**KEA41
KEA42
and
KEA43
(Carbon steel)**



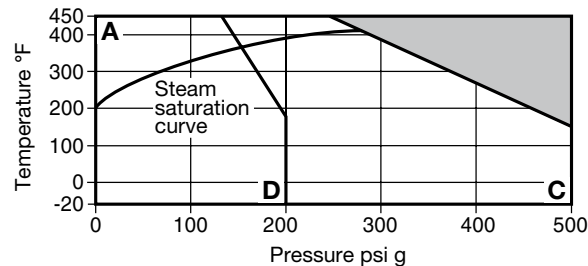
A - B Flanged ASME (ANSI) 300 and screwed NPT and SW.

**KEA61
KEA62
KEA63
(Stainless steel)**



A - B Flanged ASME (ANSI) 300 and screwed NPT and SW.

**KEA71
and
KEA73
(Ductile iron)**

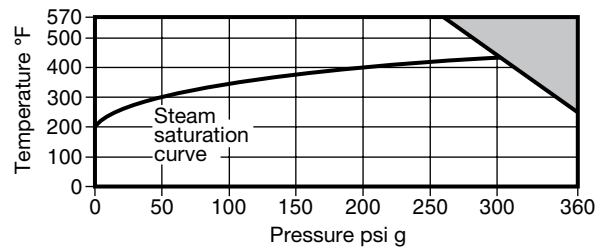


A - C Flanged ASME (ANSI) 250 and screwed NPT and SW.
A - D Flanged ASME (ANSI) 125.

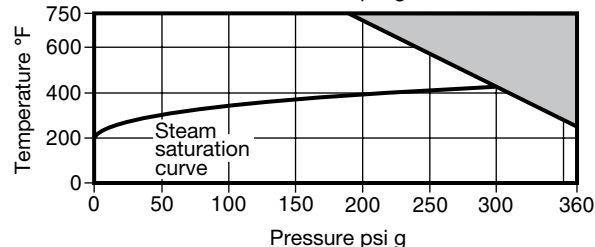
Pressure/temperature limits - Bellows

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 above.

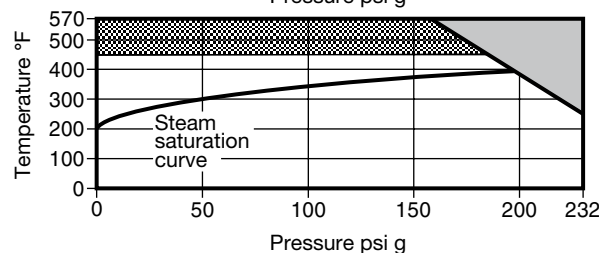
Bellows B




Bellows C



Bellows D



 **Please note** that the KEA71D and KEA73D are limited to a maximum operating temperature of 450°F

Pressure/temperature limits

Body design conditions	KEA4_	ASME (ANSI) 300	
	KEA6_	ASME (ANSI) 300	
	KEA7_	ASME (ANSI) 250	
Maximum design pressure	KEA4_	740 psi g @ 100°F	
	KEA6_	720 psi g @ 100°F	
	KEA7_	500 psi g @ 150°F	
Maximum design temperature	KEA4_	800°F	
	KEA6_	800°F	
	KEA7_	450°F	
Minimum design temperature	KEA4_	-20°F	
	KEA6_	-58°F	
	KEA7_	-20°F	
Maximum operating temperature	Standard packing PTFE chevron	482°F	
	PTFE soft seat (G)	392°F	
	PEEK soft seat (K)	482°F	
	Graphite packing (H)	800°F	
	Extended bonnet (E) with PTFE chevron	482°F	
	Extended bonnet (E) with graphite packing	800°F	
	Bellows (please see Bellows pressure/temperature rating shown on page 5)	572°F	
Minimum operating temperature	KEA4_	-20°F	
	KEA6_	PTFE packing -20°F Graphite packing -58°F	
	KEA7_	-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.	KEA4_	1100 psi g	
	KEA6_	1100 psi g	
	KEA7_	ASME (ANSI) 125	300 psi g
		ASME (ANSI) 250	750 psi g

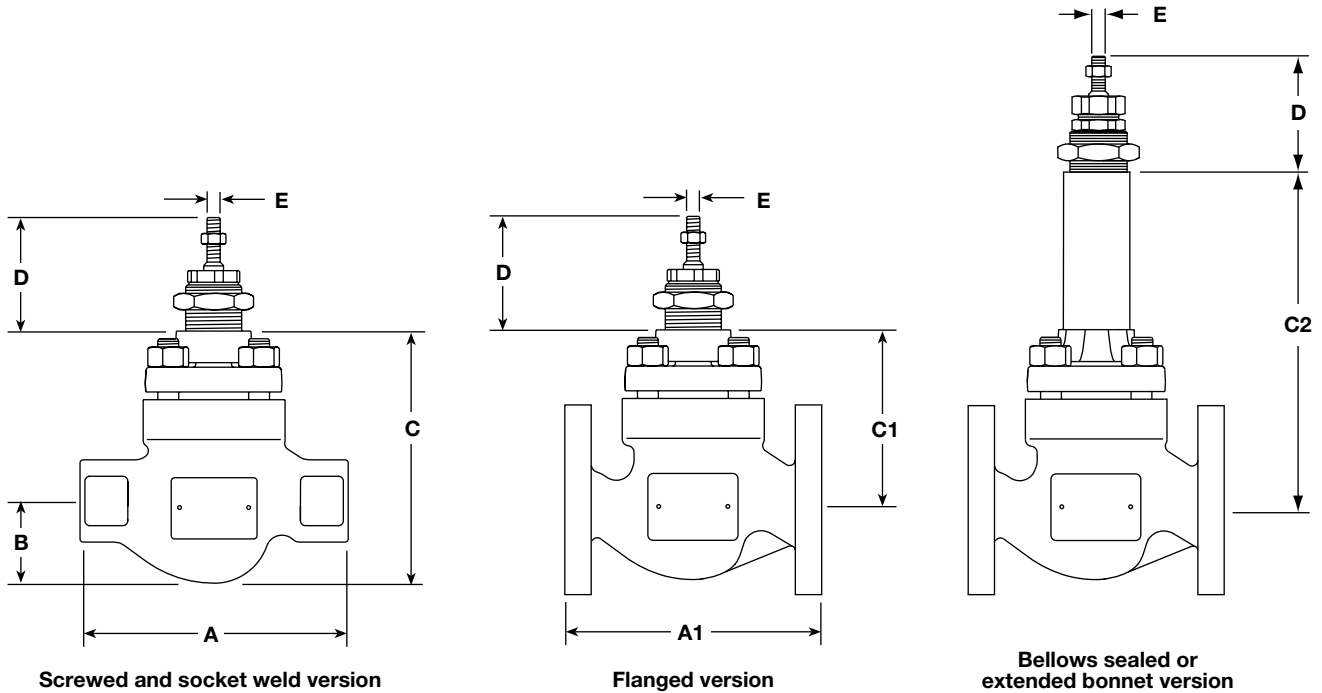
Cv values

Size			Nominal size								
			1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
Travel			3/4"						1 1/16"		
Standard trims	Full port	Equal %	5.0	7.5	12.0	16.0	30.0	45	75	120	190
		Linear	5.0	7.5	12.0	16.0	30.0	45	75	120	190
		Fast opening	5.0	7.5	12.0	16.0	32.0	50	88	136	210
	Reduced trim 1	Equal %	2.5	5.5	8.5	18.0	16.0	33	48	85	130
		Linear	2.5	5.5	8.5	12.0	18.0	33	48	85	130
	Reduced trim 2	Equal %	1.8	2.5	6.0	8.5	13.0	18	36	50	90
		Linear	1.8	2.5	6.0	8.5	13.0	18	36	50	90
	Reduced trim 3	Equal %	1.0	1.8	3.0	6.0	9.0	14	18	38	53
		Linear	1.0	1.8	3.0	6.0	9.0	14	18	38	53
	Micro flute		0.5	0.5	0.5	-	-	-	-	-	-
		0.2	0.2	0.2	-	-	-	-	-	-	
		0.1	0.1	0.1	-	-	-	-	-	-	

Travel			3/4"						1 1/16"		
Low noise trim	Full port	Equal %	4.6	7.0	9.3	14.0	23	31.0	64.0	73.0	104.5
		Linear									
	Reduced trim 1	Equal %	4.0	5.8	7.0	11.5	15	17.5	40.5	46.5	69.5
		Linear									
	Reduced trim 2	Equal %	3.4	4.6	5.2	8.0	8.5	9.0	34.5	38.0	46.5
		Linear									

Dimensions for the SPIRA-TROL (approximate) in inches

Valve size	A Screwed	A1 Flanged		B Screwed	C Screwed	C1 Flanged	C2		D	E Thread
	NPT and SW	ASME 125	ASME 250 ASME 300	NPT and SW	NPT and SW	ASME 125 ASME 150 ASME 250 ASME 300	Extended bonnet	Bellows sealed bonnet		
1/2"	6 1/2"	-	7 1/2"	1 3/4"	4"	4"	97 "	97 "	2 3/4"	M8
3/4"	6 1/2"	-	7 1/2"	1 3/4"	4"	4"	97 "	97 "		
1"	7 3/4"	7 1/4"	7 3/4"	2 1/4"	4"	4"	97 "	97 "		
1 1/4"	8 1/2"	-	-	2 1/4"	5 3/16"	-	10 1/2"	10 1/2"		
1 1/2"	9 1/4"	8 3/4"	9 1/4"	2 1/2"	5 3/16"	5 3/16"	10 1/2"	10 1/2"		
2"	10 1/2"	10"	10 1/2"	3"	5 3/16"	5 3/16"	10 1/2"	10 1/2"		
2 1/2"	-	10 1/2"	11 1/2"	-	-	7 7/8"	14 1"	14 1/2"	3 3/16"	M12
3"	-	11 3/4"	12 1/2"	-	-	7 7/8"	14 1"	14 1/2"		
4"	-	13 3/4"	14 1/2"	-	-	8 1/2"	14 3/4"	15"		

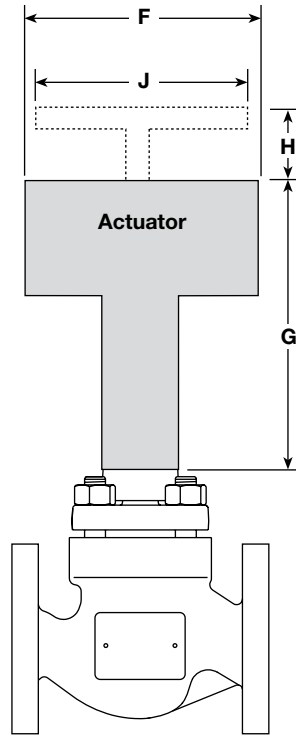


Weights for the SPIRA-TROL (approximate) in lbs

Valve size	KEA41 and KEA42 KEA61 and KEA62 KEA71	KEA43	KEA63	KEA73	Additional bellows and extended bonnet
1/2"	16	16	16	16	10
3/4"	16	18	18	18	10
1"	22	20	20	20	10
1 1/4"	25	31	31	29	12
1 1/2"	31	36	36	31	12
2"	33	38	40	38	12
2 1/2"	-	78	78	84	21
3"	-	86	89	91	21
4"	-	124	124	132	28

Dimensions / weights for the PN actuator range (approximate) in ins and lbs

Actuator range	F	G	H	J	Weight	
					Actuator	With handwheel
PN1500 and PN2500	16"	46"	-	-	121.00	-
PN1600 and PN2600	18 ⁵ / ₁₆ "	46"	-	-	154.00	-
PN9100E and variants	10 ⁷ / ₈ "	6 ¹ / ₁₆ "	2 ³ / ₁₆ "	8 ⁷ / ₈ "	13.25	+ 13.00
PN9100R and variants	10 ⁷ / ₈ "	6 ¹ / ₁₆ "	5 ¹ / ₂ "	8 ⁷ / ₈ "	13.25	+ 5.50
PN9200E and variants	11 ⁷ / ₈ "	11 ⁷ / ₈ "	2 ³ / ₁₆ "	8 ⁷ / ₈ "	37.50	+ 15.75
PN9200R and variants	11 ⁷ / ₈ "	11 ⁷ / ₈ "	5 ¹ / ₂ "	8 ⁷ / ₈ "	37.50	+ 8.50
PN9320E and variants	12 ⁷ / ₈ "	15 ⁹ / ₁₆ "	2 ⁹ / ₁₆ "	13 ³ / ₄ "	59.50	+ 15.75
PN9320R and variants	12 ⁷ / ₈ "	15 ⁹ / ₁₆ "	15 ⁷ / ₈ "	13 ³ / ₄ "	59.50	+ 8.50
PN9330E and variants	13 ³ / ₈ "	15 ⁹ / ₁₆ "	2 ⁹ / ₁₆ "	13 ³ / ₄ "	59.50	+ 15.75
PN9330R and variants	13 ³ / ₈ "	15 ⁹ / ₁₆ "	15 ⁷ / ₈ "	13 ³ / ₄ "	59.50	+ 8.50



Dimensions / weights for the EL actuator range (approximate) in ins and lbs

Actuator range	F	G	Weight
EL3500	5 ¹ / ₄ " x 6 ¹ / ₄ "	9 ¹ / ₂ "	3
EL3500 SE	5 ¹ / ₄ " x 6 ¹ / ₄ "	11"	6
EL3500 SR	5 ¹ / ₄ " x 6 ¹ / ₄ "	11"	6
EL560_	7"	18"	10
EL561_	7"	18"	11
EL562_	7"	18"	12
EL563_	7"	20"	15
EL564_	8 ³ / ₄ "	22 ¹ / ₂ "	22
EL565_	8 ³ / ₄ "	31 ³ / ₄ "	44
EL506_	6 ¹ / ₄ "	17 ¹ / ₂ "	19
EL7200 series	4"	18 ¹ / ₂ "	6.5

Spare parts

SPIRA-TROL

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

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

Available spares - KEA, KFA and KLA

Actuator clamping nut		A
Gasket set (Non-bellows sealed)		B, G
Stem seal kits	PTFE chevrons	C
	PTFE to Graphite conversion kit	C1
	Graphite packing	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 or PEEK soft seat seal		H

* Specify if reduced trim.

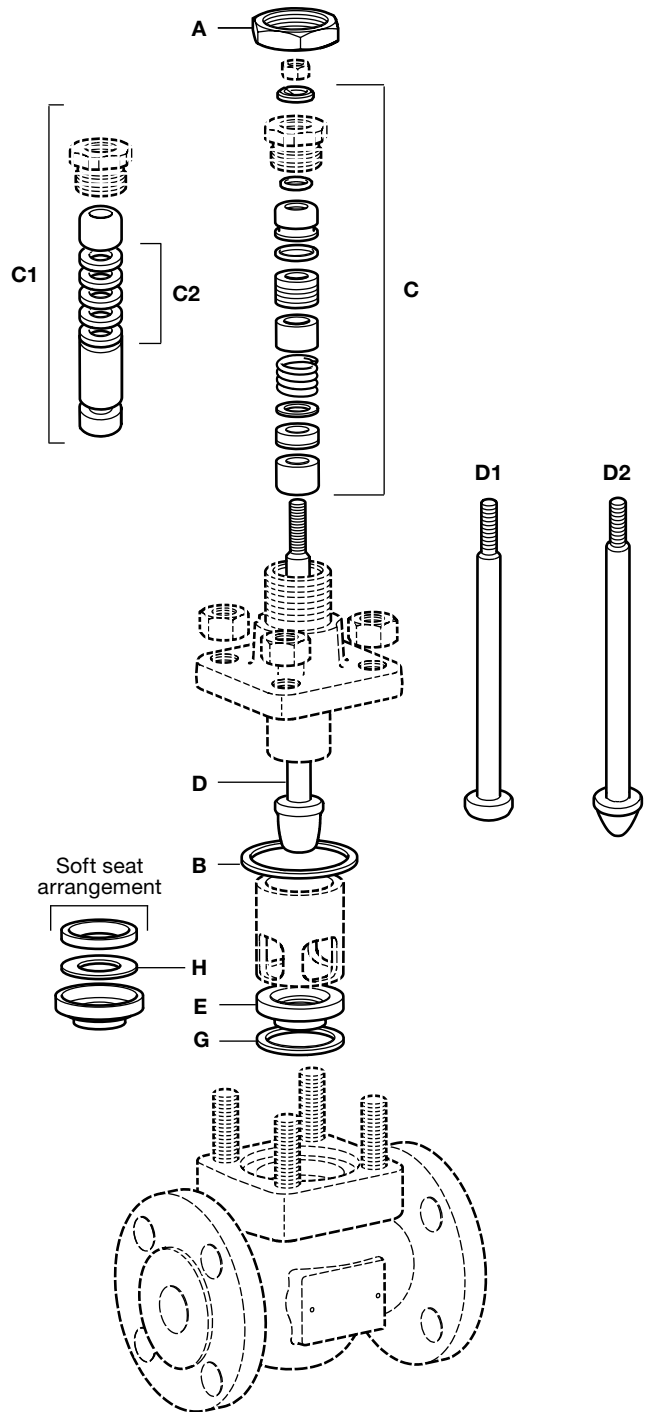
How to order spares

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

Example: 1 - PTFE stem seal kit for a Spirax Sarco 1" SPIRA-TROL two-port KEA41 PTSUSS.2 Cv 12 control valve.

How to fit spares

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



Spare parts

SPIRA-TROL with bellows seal (Type B and C) DN15 to DN100

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 and L series

Actuator clamping nut		A
Gasket set (Bellows sealed)		B, G
Stem seal kits	PTFE chevrons	C
	PTFE to Graphite conversion kit	C1
	Graphite packing	C2
Plug stem and seat kit	* Equal percentage trim (No gaskets supplied)	D3, E
	Fast opening trim (No gaskets supplied)	D4, E
	Linear trim (No gaskets supplied)	D5, E
Bellow seal assembly		F
PTFE soft seal		H

* Specify if reduced trim.

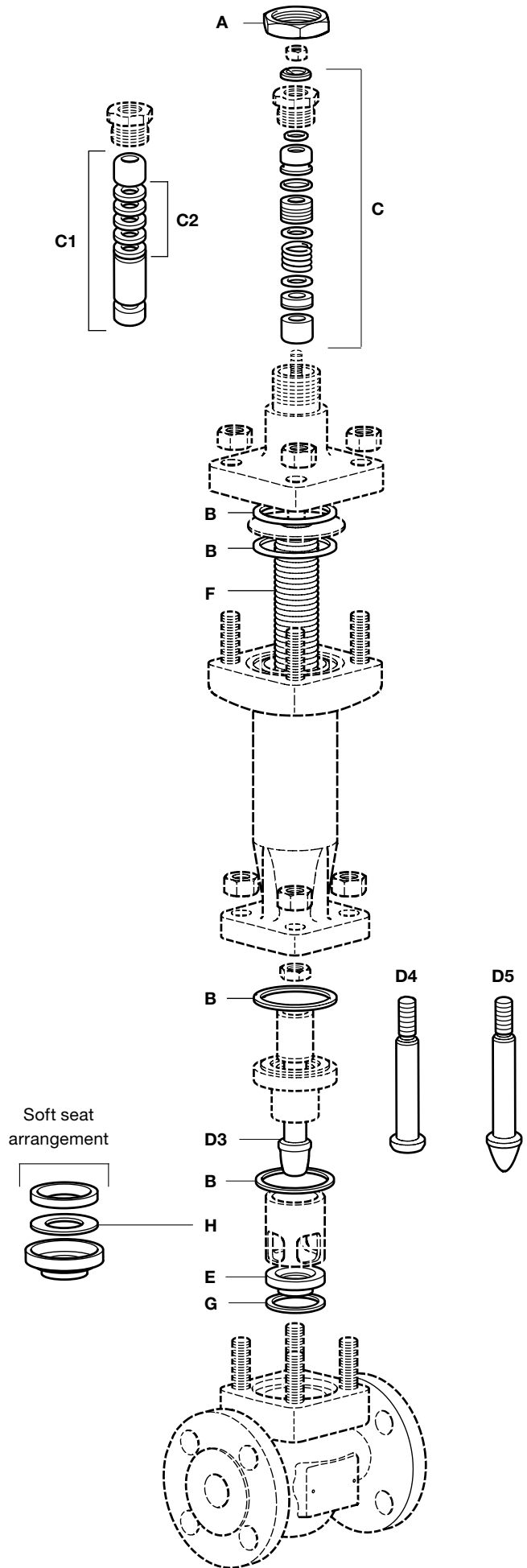
How to order spares

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 1" SPIRA-TROL two-port KEA41B TSUSS.2 Cv 12 control valve.

How to fit spares

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



Spare parts

SPIRA-TROL with bellows seal (Type D)

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

Note: When placing an order for spare parts please specify clearly the 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 - KEA_B, KFA_B and KLA_B

Actuator clamping nut	A
Gasket set (Bellows sealed)	B, G
Stem seal kit	Graphite secondary seal and gasket set C2
	* Equal percentage trim (No gaskets supplied) D3, E
Plug stem and seat kit	Fast opening trim (No gaskets supplied) D4, E
	Linear trim (No gaskets supplied) D5, E
Bellows seal assembly	F
PTFE or PEEK soft seat seal	H

* Specify if reduced trim.

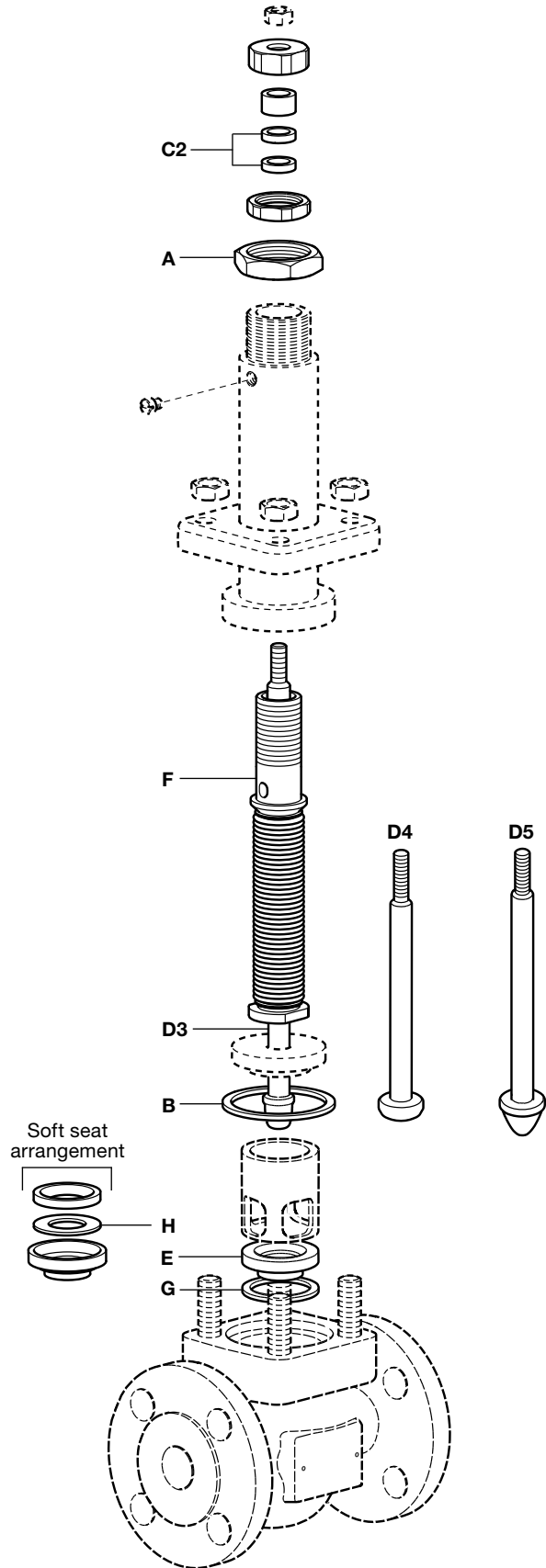
How to order spares

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

Example: 1 - PTFE stem seal kit for a Spirax Sarco 1" SPIRA-TROL two-port KEA41B TSUSS.2 Cv 12 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	½", ¾", 1", 1¼", 1½", 2", 2½", 3" and 4"	1"
Valve series	K = K series 2-port control valve	K
Valve characteristic	E = Equal percentage F = Fast opening L = Linear	E
Design code	A = ASME (ANSI)	A
Flow direction	T = Flow over plug (not available for low noise trim) Blank = Flow under plug	
Body material	4 = Carbon steel 6 = Stainless steel 7 = Ductile	4
Connections	1 = Screwed 2 = Socket weld (Not available for body material 7, Ductile) 3 = Flanged	3
Stem sealing	P = PTFE B = Bellows / PTFE chevron seals C = Bellows / Graphite seals D = Bellows / graphite secondary seal H = Graphite	P
Seating	T = 431 stainless steel G = PTFE soft seat K = PEEK soft seat S = 316L stainless steel W = 316L with stellite 6 facing	T
Type of trim	S = Standard trim P = Low noise cage	S
Trim balancing	U = Unbalanced	U
Bonnet type	S = Standard E = Extended (not available if bellows seal selected)	S
Bolting	S = Standard	S
Series	2 = .2	.2
C_v	To be specified	C_v 10
Connection type	To be specified	Flanged ASME 300

Selection example:

1"	-	K	E	A		4	3	P	T	S	U	S	S	.2	-	Cv 10	-	Flanged ASME 300
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How to order

Example: 1 off Spirax Sarco 1" SPIRA-TROL KEA43PTSUSS.2 Cv10 two-port control valve having flanged ASME 300 connections.