



Cert. No. LRQ 0963008

ISO 9001

# spirax sarco

TI-P305-11

CH Issue 1

## KEA Series 1/2" (DN15) to 8" (DN200) ANSI Two-port Control Valves

### Description

The KEA series control valves are a range of two-port single seat globe valves conforming to ANSI/ASTM specification. The valves are available in three body materials in sizes ranging from 1/2" to 8" (DN15 to DN200). When used in conjunction with a pneumatic or electric linear actuator they provide characterised modulating or on/off control.

### Valve characteristic - options:

<b>KEA</b>	<b>Equal percentage (E)</b> - Suitable for most modulating process control applications providing good control at low flowrates.
<b>KFA</b>	<b>Fast opening (F)</b> - For on/off applications only.
<b>KLA</b>	<b>Linear (L)</b> - 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 virtually identical.

### Valve stem sealing (PTFE as standard) - options:

<b>H</b>	Graphite packing
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### Valve seating (metal-to-metal as standard) - options:

<b>G</b>	<b>Soft seal (G)</b> - PTFE soft seal to provide a tight shut-off.
<b>W</b>	<b>Hard facing (W)</b> - Stellite faced plugs and seats for more arduous applications.

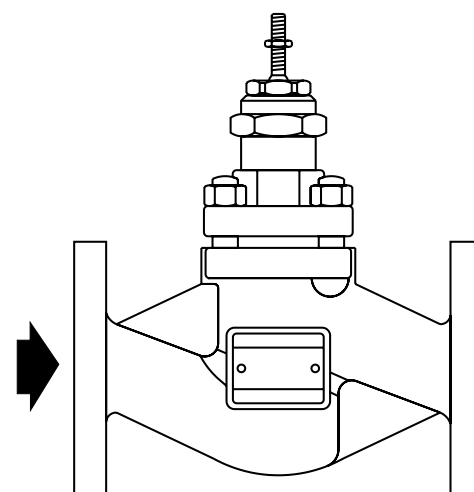
### The KEA series two-port control valves can be used with the following actuators and positioners:

<b>Electric</b>	EL3500 and EL5600 series
<b>Pneumatic</b>	PN1000, PN3000, PN4000, PN5000 and PN6000 PP5 (pneumatic) or EP5 (electropneumatic)
<b>Positioners</b>	ISP5 (intrinsically safe electropneumatic) SP2 (smart electropneumatic)

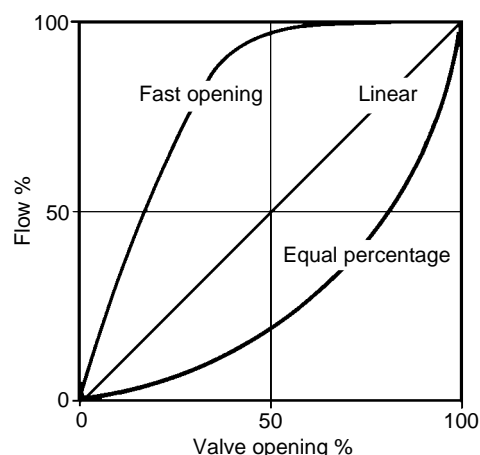
Refer to the relevant actuator Technical Information sheet for further details.

### Technical data

<b>Plug design</b>	1/2" to 1 1/4" (DN15 to DN32)	Caged parabolic
	1 1/2" to 8" (DN40 to DN200)	Vee port
<b>Leakage</b>	Metal-to-metal seat	ANSI/FCI 70/2 Class IV
	PTFE soft seal	ANSI/FCI 70/2 Class VI
<b>Rangeability</b>		50:1
<b>Travel</b>	1/2" to 2" (DN15 to DN50)	KEA and KLA 3/4" (20 mm)
		KFA 9/16" (15 mm)
	2 1/2" to 4" (DN65 to DN100)	KEA and KLA 1 3/16" (30 mm)
		KFA 3/4" (20 mm)
6" and 8" (DN150 and DN200)	KEA and KLA 2" (50 mm)	



### Typical flow characteristic curves



## Sizes and pipe connections

Type	Body material	Connections	Size range
KEA41	Cast steel	Screwed NPT	½", ¾", 1", 1¼", 1½" and 2" (DN15, DN20, DN25, DN32, DN40 and DN50)
KEA61	Stainless steel		
KEA71	Ductile iron		
KEA43	Cast steel	Flanged ANSI 150 and ANSI 300	½", ¾", 1", 1½", 2", 2½", 3", 4", 6" and 8" (DN15, DN20, DN25, DN40, DN50, DN65, DN80, DN100, DN150, DN200)
KEA63	Stainless steel		
KEA73	Ductile iron		

## Limiting conditions

Body design conditions	KEA41 and KEA43	ANSI 150 and ANSI 300	
	KEA61 and KEA63	ANSI 150 and ANSI 300	
	KEA71 and KEA73	ANSI 125 and ANSI 250	
Maximum design temperature	KEA41 and KEA43 or KEA61 and KEA63	PTFE chevron seals	482°F (250°C)
		Graphite seals	800°F (426°C)
	KEA71 and KEA73	PTFE chevron seals	450°F (232°C)
		Graphite seals	450°F (232°C)
Designed for a maximum cold hydraulic test pressure of:	KEA41 and KEA43	ANSI 150	425 psi g (29.3 bar g)
		ANSI 300	1100 psi g (75.8 bar g)
	KEA61 and KEA63	ANSI 150	425 psi g (29.3 bar g)
		ANSI 300	1100 psi g (75.8 bar g)
	KEA71 and KEA73	ANSI 125	300 psi g (20.7 bar g)
		ANSI 250	750 psi g (51.7 bar g)
Maximum differential pressures	See relevant actuator Technical Information sheet		

## Operating limits (figures are approximate)

### KEA41 and KEA43 (cast steel) - ANSI 300 flanges

	Body		Bonnet				
			Packing		Graphite (H)		
			PTFE		Graphite (H)		
Pressure	psi g	740	410	740	606	740	410
	(bar g)	(51)	(28)	(51)	(42)	(51)	(28)
Temperature	°F	14 to 100	800	14 to 100	482	14 to 100	800
	(°C)	(-10 to +38)	(427)	(-10 to +38)	(250)	(-10 to +38)	(427)

### KEA61 and KEA63 (stainless steel) - ANSI 300 flanges

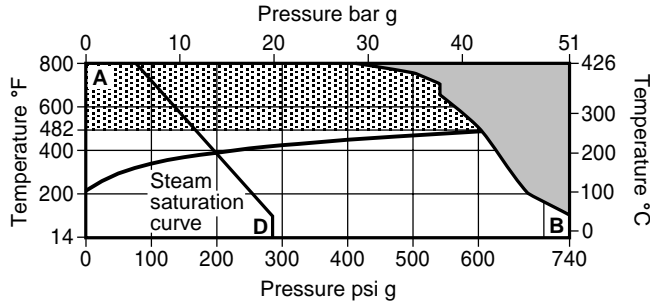
	Body		Bonnet				
			Packing		Graphite (H)		
			PTFE		Graphite (H)		
Pressure	psi g	720	420	720	500	720	420
	(bar g)	(50)	(29)	(50)	(34)	(50)	(29)
Temperature	°F	-20 to +100	800	-20 to +100	482	-20 to +100	800
	(°C)	(-29 to +38)	(427)	(-29 to +38)	(250)	(-29 to +38)	(427)

### KEA71 and KEA73 (ductile iron) - ANSI 250 flanges

	Body		Bonnet				
			Packing		Graphite (H)		
			PTFE		Graphite (H)		
Pressure	psi g	500	250	450	250	450	250
	(bar g)	(34)	(17)	(31)	(17)	(31)	(17)
Temperature	°F	14 to 150	450	14 to 150	450	14 to 150	450
	(°C)	(-10 to +65)	(232)	(-10 to +65)	(232)	(-10 to +65)	(232)

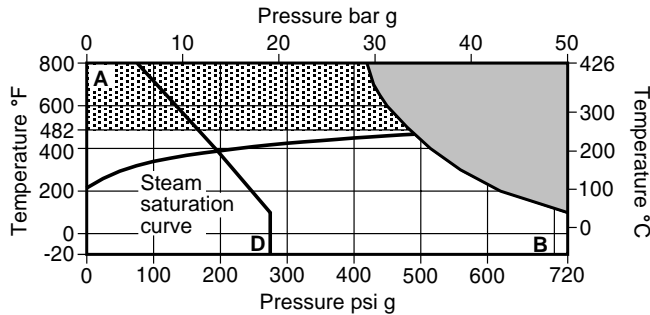
Operating range

**KEA41 and KEA43  
(cast steel)**



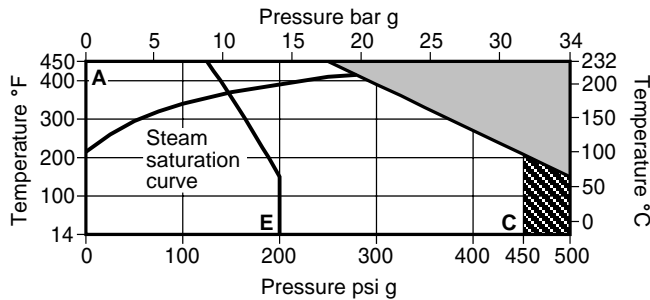
- The product **must not** be used in this region.
- Graphite stem sealing is required for use in this region. **Note:** As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.
- A - B** Flanged ANSI 300 and screwed NPT (KEA41).
- A - D** Flanged ANSI 150.

**KEA61 and KEA63  
(stainless steel)**



- The product **must not** be used in this region.
- Graphite stem sealing is required for use in this region. **Note:** As standard the KEA, KFA, KLA series two-port control valves are supplied with the PTFE stem sealing option.
- A - B** Flanged ANSI 300 and screwed NPT (KEA61).
- A - D** Flanged ANSI 150.

**KEA71 and KEA73  
(ductile iron)**



- The product **must not** be used in this region.
- The product should not be used in this region or beyond its operating range as damage to the internals may occur.
- A - C** Flanged ANSI 250 and screwed NPT (KEA71).
- A - E** Flanged ANSI 125.

**Materials**

**Cast steel and ductile iron valves**

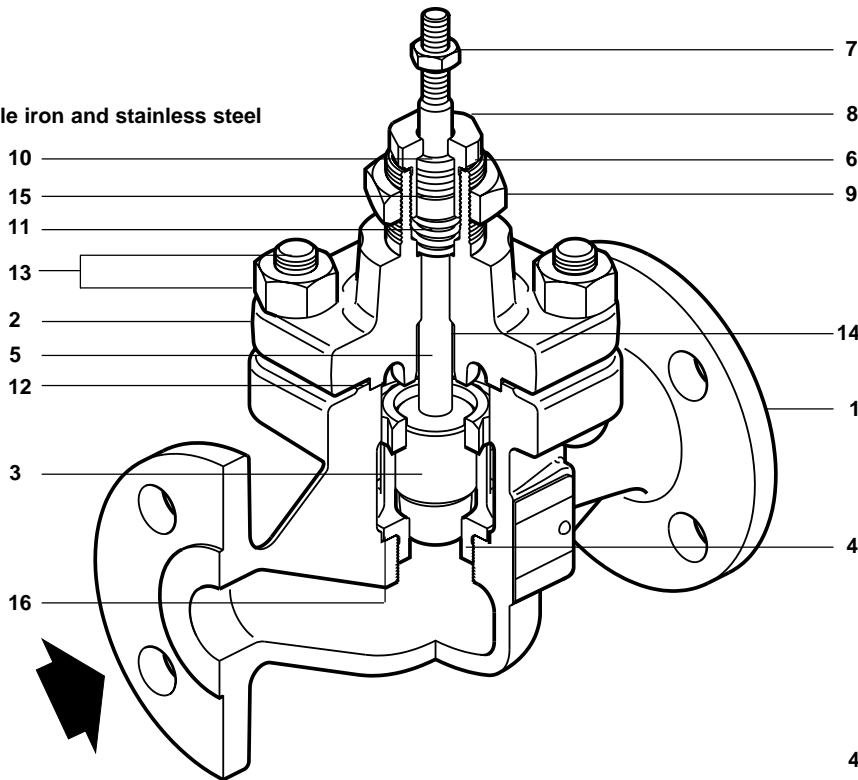
Type	No.	Part	Material	Material designation ANSI version
KEA41 and KEA43	1	Body	Cast steel	ASTM A216 WCB
	2	Bonnet	Cast steel	ASTM A216 WCB
KEA71 and KEA73	1	Body	Ductile iron	ASTM A395
	2	Bonnet	Ductile iron	ASTM A395
Cast steel and ductile iron	3	Valve plug	Stainless steel	ASTM A276 Gr. 431
	4	Valve seat	Stainless steel	ASTM A276 Gr. 431
	5	Valve stem	Stainless steel	ASTM A276 Gr. 431
	6	Gland nut gasket	Semi-rigid graphite laminated	
	7	Lock-nut	Stainless steel	
	8	Gland nut	Stainless steel	ASTM A276 Gr. 431
	9	Mounting nut	Mild steel zinc plated	
	10	Gland seals	PTFE chevrons	
			Graphite rings	
	11	Gland spring	Stainless steel	
	12	Bonnet gasket	Semi-rigid graphite laminated	
	13	Bonnet studs	Steel	ASTM A193 B7
		Bonnet nuts	Steel	ASTM A194 2H
	*14	Bonnet guide	Stainless steel	ASTM 440B Hardened
	15	Guide bush	PEEK 1/2" to 2" (DN15 to DN50) only	
			PTFE 2 1/2" to 4" (DN65 to DN100)	
316L spacer with graphite seal (DN15 to DN100)				
16	Seat gasket	Semi-rigid graphite laminated		

**\*Note:** A bonnet guide is used on: - All valves above 1 1/2" (DN40).  
 - All valves with hard faced trims (W) less than 1 1/2" (DN40).  
 - All valves fitted with soft seal (G)

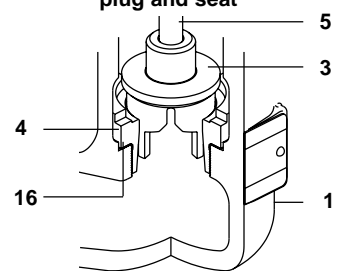
**KEA**

1/2" to 1 1/4"  
(DN15 to DN32)

Cast steel, ductile iron and stainless steel



**KEA**  
1 1/2" to 4"  
(DN40 to DN100)  
plug and seat



**Materials**

**Stainless steel valves**

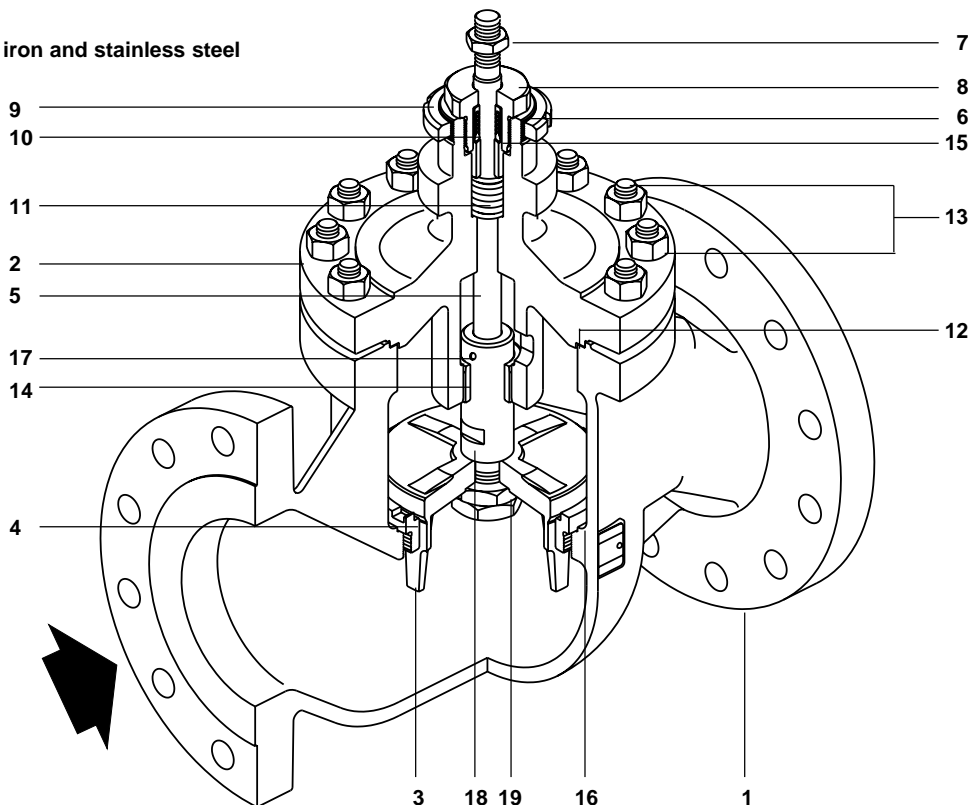
Type	No.	Part	Material	Material designation ANSI version
KEA61 and KEA63	1	Body	Stainless steel	ASTM A351 CF8M
	2	Bonnet	Stainless steel	ASTM A351 CF8M
	3	Valve plug	Stainless steel	ASTM A276 316L
	4	Valve seat	Stainless steel	ASTM A276 316L
	5	Valve stem	Stainless steel	ASTM A276 316L
	6	Gland nut gasket	Semi-rigid graphite laminated	
	7	Lock-nut	Stainless steel	
	8	Gland nut	Stainless steel	ASTM A276 316L
	9	Mounting nut	Mild steel zinc plated	
	10	Gland seals	PTFE chevrons Graphite rings	
	11	Gland spring	Stainless steel	
	12	Bonnet gasket	Semi-rigid graphite laminated	
	13	Bonnet studs	Stainless steel	ASTM A193 B8 M2
		Bonnet nuts	Stainless steel	ASTM A194 8M
	*14	Bonnet guide	Stainless steel	ASTM 440B Hardened
	15	Guide bush	PEEK ½" to 2" (DN15 to DN50) only	
			PTFE 2½" to 4" (DN65 to DN100)	
			316L spacer with graphite seal (DN15 to DN100)	
	16	Seat gasket	Semi-rigid graphite laminated	
17	Pin	Stainless steel (DN150 to DN200)	AISI 302	
18	Valve post	Stainless steel (DN150 to DN200)	ASTM A276 Gr. 431	
19	Plug lock-nut	Stainless steel (DN150 to DN200)	ASTM A194 2H	

**\*Note:** A bonnet guide is used on: - All valves above 1½" (DN40).  
 - All valves with hard faced trims (W) less than 1½" (DN40).  
 - All valves fitted with soft seal (G)

**KEA**

6" and 8"  
(DN150 to DN200)

Cast steel, ductile iron and stainless steel



**C<sub>v</sub> and K<sub>vS</sub> flowrate coefficients and travel**

**C<sub>v</sub> (US) values**

Valve size		½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"	8"
Travel	inches	¾	¾	¾	¾	¾	¾	¾ 1⅜	¾ 1⅜	¾ 1⅜	1⅜ 2	1⅜ 2
Equal %	C <sub>v</sub>	4.7	7.4	12.0	19.0	29.0	42.0	- 74	- 117	- 187	- 280	- 492
Linear	C <sub>v</sub>	4.7	7.4	12.0	19.0	29.0	42.0	- 74	- 117	- 187	- 280	- 492
Reduced	C <sub>v</sub>	1.9	4.7	7.4	12.0	19.0	29.0	42* -	- 74	- 117	- 220	- 420
equal % and	C <sub>v</sub>	1.2	1.9	4.7	7.4	12.0	19.0	29* -	42* -	- 74	187 -	- 320
linear trims	C <sub>v</sub>	0.5	1.2	1.9	4.7	7.4	12.0	19* -	29* -	42* -	117 -	187 -
Low noise	C <sub>v</sub>	-	-	9.3	14.0	21.0	30.3	- 58	- 74	- 105	- 200	- 350

**K<sub>vS</sub> values**

Valve size		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200
Travel	mm	20	20	20	20	20	20	20 30	20 30	20 30	30 50	30 50
Equal %	K <sub>vS</sub>	4.0	6.3	10.0	16.0	25.0	36.0	- 63	- 100	- 160	- 238	- 418
Linear	K <sub>vS</sub>	4.0	6.3	10.0	16.0	25.0	36.0	- 63	- 100	- 160	- 238	- 418
Reduced	K <sub>vS</sub>	1.6	4.0	6.3	10.0	16.0	25.0	36* -	- 63	- 100	- 187	- 357
equal % and	K <sub>vS</sub>	1.0	1.6	4.0	6.3	10.0	16.0	25* -	36* -	- 63	159 -	- 272
linear trims	K <sub>vS</sub>	0.4	1.0	1.6	4.0	6.3	10.0	16* -	25* -	36* -	100 -	159 -
Low noise	K <sub>vS</sub>	-	-	8.0	12.0	18.0	26.0	- 50	- 63	- 90	- 170	- 298

\*To obtain the correct signal-to-travel relationship with the reduced C<sub>v</sub> (K<sub>v</sub>) trims identified a positioner must be used.

**C<sub>v</sub> (US) values - Fast opening characteristic only**

Valve size		½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"	8"
Travel	inches	9/16	9/16	9/16	9/16	9/16	9/16	¾	¾	¾	1½	2
Fast opening	C <sub>v</sub>	4.7	7.4	12.0	21.0	32.8	59.0	99.0	137.0	211.0	383.0	630.0

**K<sub>vS</sub> values - Fast opening characteristic only**

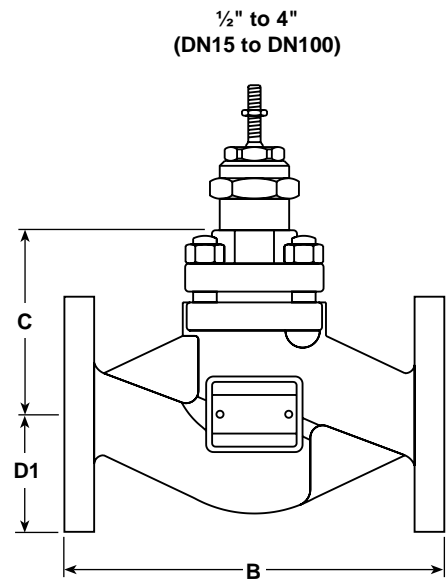
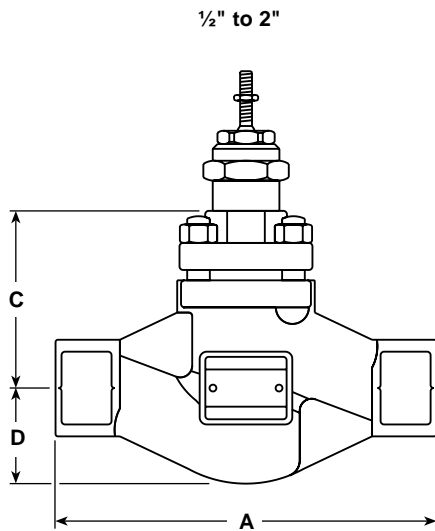
Valve size		DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200
Travel	mm	15	15	15	15	15	15	20	20	20	38	50
Fast opening	K <sub>vS</sub>	4.0	6.3	10.0	18.0	28.0	50.0	85.0	117.0	180.0	238.0	425.0

**Note: For product compatibility with pneumatically actuated valves:**

- ¾" (20 mm) travel pneumatic actuators must be used for valve sizes ½" to 2" (DN15 to DN50).
- 1⅜" (30 mm) travel actuators for valve sizes 2½" to 4" (DN65 to DN100).
- 2" (50 mm) travel actuators for valve sizes 6" and 8" (DN150 and DN200).

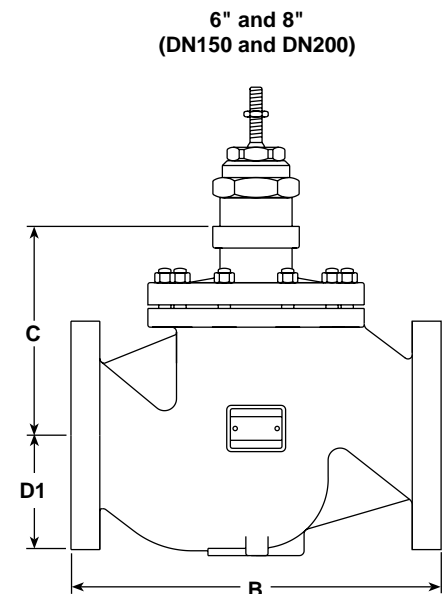
**Dimensions (approximate) in inches (mm)**

Valve size	A	B		C	D	D1			
		ANSI 125 ANSI 150	ANSI 250 ANSI 300			ANSI 125 ANSI 150	ANSI 250 ANSI 300		
1/2" (DN15)	6.5 (165)	7.3 (184)	7.5 (191)	3.3 (84)	1.69 (43)	-	-	-	-
3/4" (DN20)	6.5 (165)	7.3 (184)	7.6 (194)	3.4 (87)	1.7 (44)	-	-	-	-
1" (DN25)	7.8 (197)	7.3 (184)	7.8 (197)	3.8 (96)	2.0 (51)	-	-	-	-
1 1/4" (DN32)	8.5 (216)	-	-	4.0 (101)	2.3 (58)	-	-	-	-
1 1/2" (DN40)	9.3 (235)	8.8 (222)	9.3 (235)	4.0 (101)	2.5 (64)	-	-	-	-
2" (DN50)	10.5 (267)	10.0 (254)	10.5 (267)	4.2 (106)	3.0 (76)	-	-	-	-
2 1/2" (DN65)	-	10.9 (276)	11.5 (292)	5.4 (136)	-	7.0 (179)	-	7.5 (191)	-
3" (DN80)	-	11.8 (298)	12.5 (318)	5.6 (141)	-	7.5 (191)	-	8.3 (210)	-
4" (DN100)	-	13.9 (353)	14.5 (368)	6.5 (165)	-	9.0 (230)	-	10.0 (255)	-
6" (DN150)	-	17.8 (451)	18.6 (473)	11.1 (283)	-	11.0 (280)	-	12.5 (319)	-
8" (DN200)	-	21.4 (543)	22.4 (568)	13.0 (330)	-	13.5 (344)	-	15.0 (382)	-



**Weights (approximate) in lbs (kg)**

Valve size	KEA41 KEA61 KEA71		KEA43 KEA63		KEA73	
	1/2" (DN15)	8.4 (3.8)	10.6 (4.8)	10.6 (4.8)	10.6 (4.8)	10.6 (4.8)
3/4" (DN20)	8.8 (4.0)	13.2 (6.0)	13.2 (6.0)	13.2 (6.0)	13.2 (6.0)	13.2 (6.0)
1" (DN25)	12.1 (5.5)	18.1 (8.2)	18.1 (8.2)	18.1 (8.2)	18.1 (8.2)	18.1 (8.2)
1 1/4" (DN32)	17.6 (8.0)	-	-	-	-	-
1 1/2" (DN40)	19.9 (9.0)	30.9 (14.0)	30.9 (14.0)	29.8 (13.5)	29.8 (13.5)	29.8 (13.5)
2" (DN50)	23.2 (10.5)	36.4 (16.5)	36.4 (16.5)	34.2 (15.5)	34.2 (15.5)	34.2 (15.5)
2 1/2" (DN65)	-	59.5 (27.0)	59.5 (27.0)	57.3 (26.0)	57.3 (26.0)	57.3 (26.0)
3" (DN80)	-	72.8 (33.0)	72.8 (33.0)	70.6 (32.0)	70.6 (32.0)	70.6 (32.0)
4" (DN100)	-	103.6 (47.0)	103.6 (47.0)	101.4 (46.0)	101.4 (46.0)	101.4 (46.0)
6" (DN150)	-	165.0 (75.0)	165.0 (75.0)	162.0 (74.0)	162.0 (74.0)	162.0 (74.0)
8" (DN200)	-	249.0 (113.0)	249.0 (113.0)	244.0 (111.0)	244.0 (111.0)	244.0 (111.0)



**K\_A series control valve selection guide:**

<b>Valve size</b>	Screwed 1/2" to 2" (DN15 to DN50)	<input type="text" value="1"/>
	Flanged 1/2" to 8" (DN15 to DN200)	
<b>Valve series</b>	K = K_A series 2-port control valve	<input type="text" value="K"/>
<b>Valve characteristic</b>	E = Equal percentage	
	F = Fast opening	<input type="text" value="E"/>
	L = Linear	
<b>Design standard</b>	A = ANSI/ASTM specification	<input type="text" value="A"/>
<b>Body material</b>	4 = Carbon steel	
	6 = Stainless steel	<input type="text" value="7"/>
	7 = Ductile iron	
<b>Connections</b>	1 = Screwed NPT	
	3 = Flanged	<input type="text" value="3"/>
<b>Stem sealing options</b>	Blank = Standard PTFE chevron	<input type="text"/>
	H = Graphite packing	
<b>Seating options</b>	Blank = Standard metal-to-metal	<input type="text"/>
	G = Soft seal (PTFE)	
	W = Hard facing (stellite)	
<b>Trim</b>	Blank = Standard	<input type="text"/>
	N = Low noise cage	
<b>C<sub>v</sub></b>	To be specified	<input type="text" value="C&lt;sub&gt;v&lt;/sub&gt;12"/>
<b>Connection type</b>	To be specified	<input type="text" value="ANSI 125"/>

**Selection example:**

<b>1"</b>	<b>K</b>	<b>E</b>	<b>A</b>	<b>7</b>	<b>3</b>				<b>C<sub>v</sub>12</b>	<b>ANSI 125</b>
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**How to order**

**Example:** 1 off Spirax Sarco 1" KEA73 C<sub>v</sub>12 having flanged ANSI 125 connections.



### Spare parts

**Note:** When placing an order for spares please indicate clearly the product date code (found on the label of the valve body e.g. F9) to ensure that the correct parts are supplied.

#### ½" to 4" sizes

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

**KEA41, KEA61 and KEA71** screwed ½" to 2" (DN15 to DN50)  
**KEA43, KEA63 and KEA73** flanged ½" to 4" (DN15 to DN100)

#### Available spares

Actuator clamping nut	<b>A</b>
Gland seal kits	<b>B1</b>
PTFE Gland seal kit (gasket, chevrons, guide bush and spring)	
Graphite gland seal kit (H - high temperature seal option)	<b>C</b>
Standard plug and stem assembly with bonnet gasket	<b>D, E</b>
* Plug and stem Soft seated plug and stem assembly with bonnet gasket	<b>D, E</b>
Bonnet gasket (pack of 3)	<b>E</b>
Seat, seat gasket and bonnet gasket	<b>F, G, E</b>

\* **Note:** Please state equal percentage, linear or fast opening plug when placing an order.

#### How to order spares

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

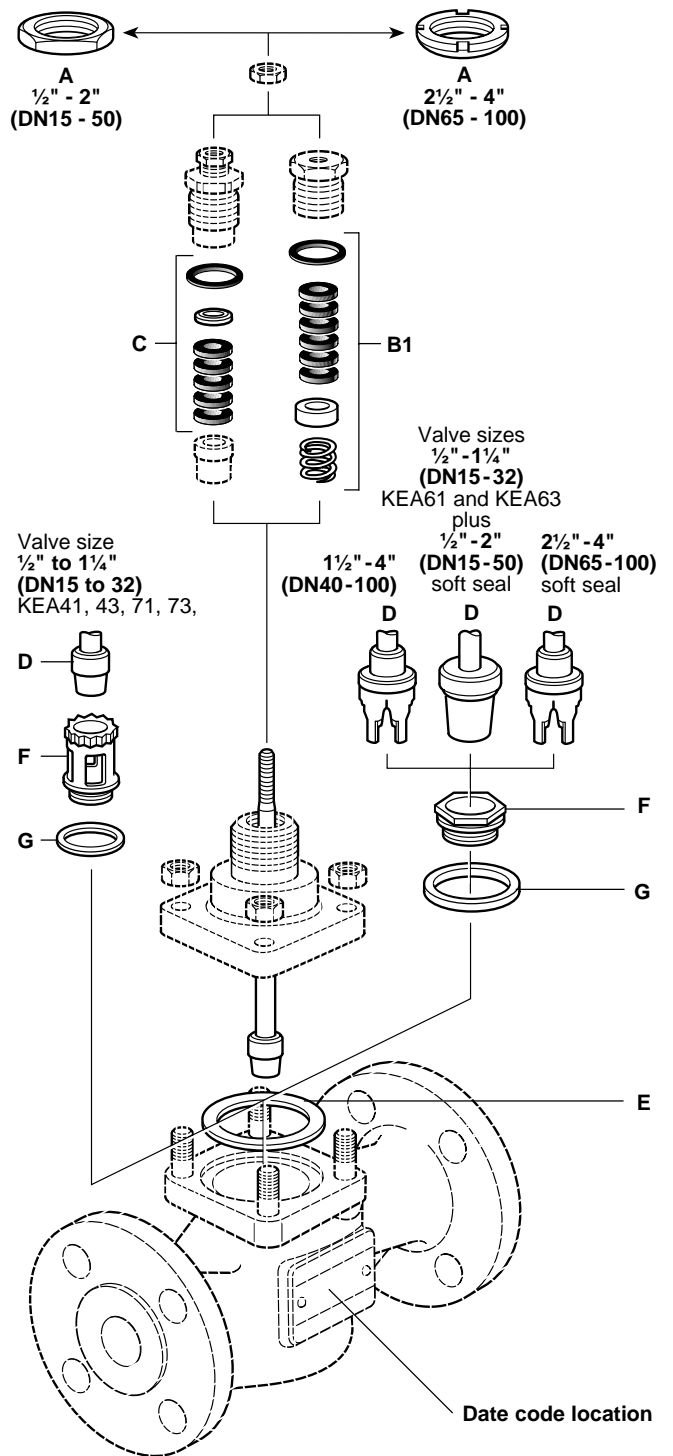
1"    **KEA73**       **Cv 12**    **ANSI 150**

#### Example:

1 - Seat, seat gasket and bonnet gasket for a Spirax Sarco 1" KEA73 two-port control valve Cv12 having flanged ANSI 150 connections. Date coded F9.

#### How to fit spares

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



**Spare parts**

**Note:** When placing an order for spares please indicate clearly the product date code (found on the label of the valve body e.g. F9) to ensure that the correct parts are supplied.

**6" to 8"**

The spare parts available are shown in solid outline. Parts drawn in broken line are not supplied as spares. These spares are for flanged sizes 6" and 8" (DN150 and DN200).

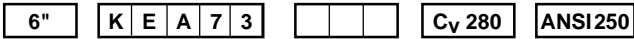
**Available spares**

Actuator clamping nut	<b>A</b>
PTFE Gland seal kit (gasket, chevrons, guide bush and spring)	<b>B</b>
Gland seal kits Graphite gland seal kit (H - high temperature seal option) (top support ring, graphite stem seal, bottom support ring)	<b>C</b>
Standard plug and stem assembly with bonnet gasket	<b>D, E</b>
* Plug and stem Soft seated plug and stem assembly with bonnet gasket	<b>D, E</b>
Bonnet gasket (pack of 3)	<b>E</b>
Seat, seat gasket and bonnet gasket	<b>F, G, E</b>
Soft seat seal kit (PTFE) soft seal and bonnet gasket	<b>H, E</b>

\* **Note:** Please state equal percentage, linear or fast opening plug when placing an order.

**How to order spares**

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



**Example:**

1 - Seat, seat gasket and bonnet gasket for a Spirax Sarco 6" KEA73 two-port control valve Cv280 having flanged ANSI 250 connections. Date coded F9.

**How to fit spares**

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

