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ISO 9001

spirax sarco

TI-P374-02

CH Issue 3

KE Series DN15 (½") to DN200 (8") Two-port Control Valves

Description

The KE series control valves are a range of two-port single seat globe valves conforming to EN 1092. The 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 characterised modulating or on/off control.

Valve characteristic - options:

KE **Equal percentage (E)** - Suitable for most modulating process control applications providing good control at low flowrates.

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

KL **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 control valve. With the exception of trim type, the KE, KF and KL control valves are virtually identical.

Valve stem sealing (PTFE as standard) - options:

H Graphite packing

B1 **Bellows sealed** - Valves DN15 to DN100 can be supplied with one of two bellows seal options. PN16 bellows (suffix B1) or PN40 bellows (suffix B4).

Valve seating (metal-to-metal as standard) options:

G **Soft seal (G)** - PTFE soft seal to provide a tight shut-off.

W **Hard facing (W)** - Stellite faced plugs and seats for more arduous applications.

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

Electric EL3500 and EL5600 series

Pneumatic PN1000, PN3000, PN4000, PN5000 and PN6000

PP5 (pneumatic) or EP5 (electropneumatic)

Positioners ISP5 (intrinsically safe electropneumatic)

SP2 (smart electropneumatic)

Refer to the relevant Technical Information sheet for further details.

Technical data

Plug design	DN15 to DN32 (½" to 1¼")	Caged parabolic
	DN40 to DN200 (1½" to 8")	Vee port
Leakage	Metal-to-metal	(0.01% of K _v)
	Soft seal	IEC 534-4 Class V1
Rangeability		50:1
Travel	DN15 to DN50 (½" to 2")	20 mm
	DN65 to DN100 (2½" to 4")	30 mm
	DN150 and DN200 (6" and 8")	50 mm

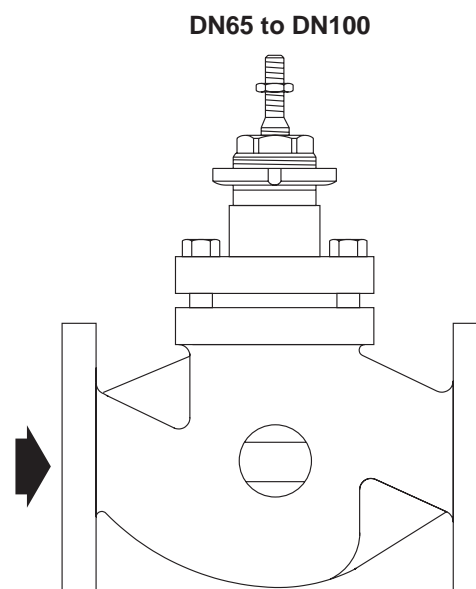
Sizes and pipe connections

Type	Body material	Connections	Size range
KE43, KE43B1 and KE43B4	Cast steel	Flanged PN40 or JIS 20*	DN15, 20, 25, 32, 40, 50, 65, 80, 100, 150 and 200
KE61	Stainless steel	Screwed BSP	½", ¾", 1"
KE63	Stainless steel	Flanged PN25, PN40, JIS 20 or KS 20*	DN15, 20, 25, 32, 40, 50, 65, 80 and 100
KE71, KE71B1	SG iron	Screwed BSP	½", ¾", 1", 1¼", 1½" and 2"
KE73, KE73B1	SG iron	Flanged PN16, PN25 or JIS 10*	DN15, 20, 25, 32, 40, 50, 65, 80, 100, 150 and 200

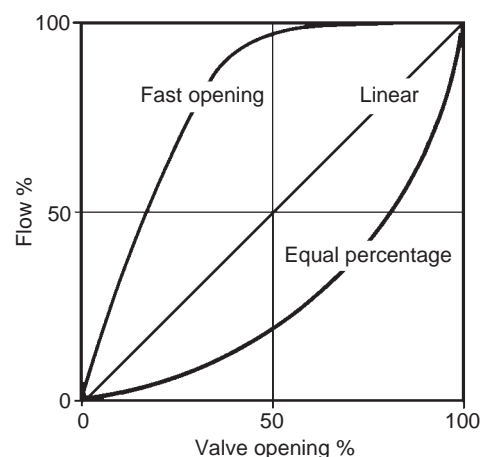
* Note: Other flange types are available on request, contact Spirax Sarco sales office for further information.

Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification.

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Typical flow characteristic curves



Limiting conditions

Body design conditions	KE43	PN40
	KE43B1	PN16
	KE43B4	PN40
	KE61 and KE63	PN40
	KE71 and KE73	PN25
	KE43B1, KE71B1 and KE73B1	PN16
Maximum design temperature	Standard packing PTFE	Maximum 250°C
	High temperature packing (H)	See operating limits
	PTFE soft seat (G)	Maximum 200°C
	High temperature bolting (S)	See operating limits
Maximum cold hydraulic test pressure of:	† KE43 (body and bonnet only)	60 bar g
	† KE61 and KE63 (body and bonnet only)	60 bar g
	† KE71 and KE73 (body and bonnet only)	38 bar g
Maximum differential pressures	See relevant actuator Technical Information sheet	

† **Warning:** Bellows must be removed if hydraulic testing is to be done.

Operating limits

KE43 and KE43B4 (cast steel)

	Body		Bonnet									
			Packing				High temperature bolts (S) and graphite packing	Bellows		High temperature bolts (S) and B4 bellows		
			PTFE		Graphite (H)			B4 (PN40)				
Pressure (bar)	40	22	40	36	40	31	40	22	40	31	40	22
Temperature (°C)	-10/+120	-10/+400	-10/+120	-10/+250	-10/+120	-10/+300	-10/+120	-10/+400	-10/+120	-10/+300	-10/+120	-10/+400

Note: If the soft seal (option G) is to be used then the maximum design temperature allowable is 200°C.

KE71, KE73, KE71B1, KE73B1 (SG iron) and KE43B1 (Cast steel)

	Body		Bonnet						B1 option			
			Packing				High temperature bolts (S) and graphite packing	Bellows		High temperature bolts (S) and B1 bellows		
			PTFE		Graphite (H)			B1 (PN16)				
Pressure (bar)	25	17	25	22	25	20	25	18	16	13	16	11.5
Temperature (°C)	-10/+120	-10/+350	-10/+120	-10/+250	-10/+120	-10/+300	-10/+120	-10/+350	-10/+120	-10/+300	-10/+120	-10/+350

Note: If the soft seal (option G) is to be used then the maximum design temperature allowable is 200°C.

KE61 (stainless steel)

	Body		Bonnet			
			Packing			
			PTFE		Graphite (H)	
Pressure (bar)	40	25	40	25	40	22
Temperature (°C)	-10/+45	-10/+250	-10/+45	-10/+250	-10/+50	-10/+400

Note: If the soft seal (option G) is to be used then the maximum design temperature allowable is 200°C.

KE63 (stainless steel)

	Body		Bonnet			
			Packing			
			PTFE		Graphite (H)	
Pressure (bar)	40	23	40	28	40	22
Temperature (°C)	-10/+50	-10/+400	-10/+50	0/+250	-10/+50	-10/+400

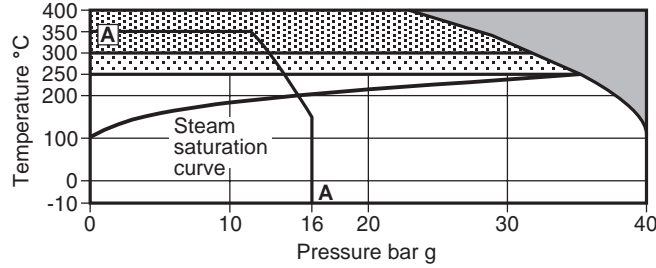
Note: If the soft seal (option G) is to be used then the maximum design temperature allowable is 200°C.

Differential pressure

For the maximum available differential pressure, see the relevant pneumatic or electric actuator Technical Information sheets.

Operating range

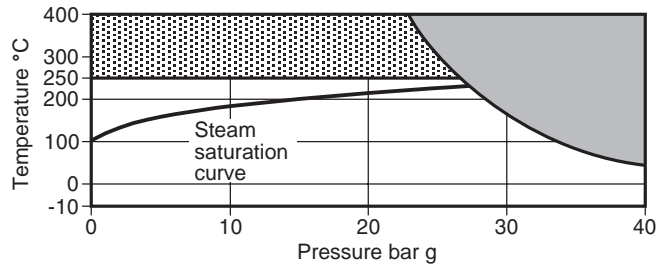
**KE43,
KE43B1 and KE43B4
(cast steel)**



- 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.

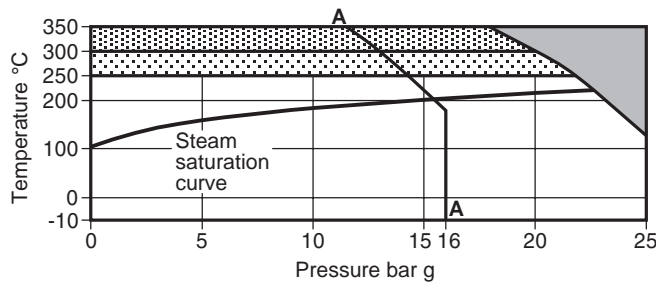
A - A Note: Valves fitted with PN16 bellows (B1) are limited to the maximum bellows rating of 16 bar.

**KE61 and KE63
(stainless steel)**



- The product **must not** be used in this region.
- High temperature bolting and packing is required for use in this region (KE63 only).

**KE71 and KE71B1,
KE73 and KE73B1
(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 - A Note: Valves fitted with PN16 bellows (B1) are limited to the maximum bellows rating of 16 bar.

Materials

Cast steel and SG iron valves

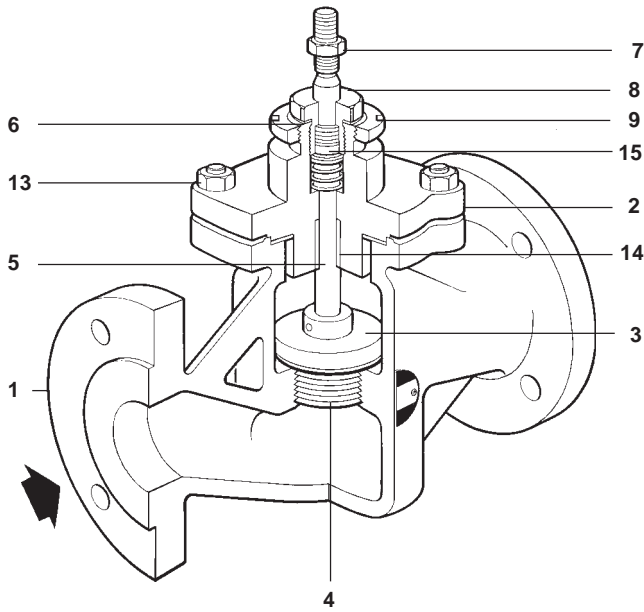
Type	No.	Part	Material	Material designation DIN version
KE71, KE71B1, KE73 and KE73B1	1	Body	SG iron	DIN 1693 GGG40.3
	2	Bonnet	SG iron	DIN 1693 GGG40.3
KE43, KE43B1 and KE43B4	1	Body	Cast steel	DN15 to DN100 DIN 17245 GSC 25N
			DN150 and DN200 DIN 17245 1.0619	
	2	Bonnet	Cast steel	DN15 to DN100 DIN 17245 GSC 25N
			DN150 and DN200 DIN 17245 1.0619	
Cast steel and SG iron	3	Valve plug	Stainless steel	BS 970 431 S29
	4	Valve seat	Stainless steel	BS 970 431 S29
	5	Valve stem	Stainless steel	DN15 to DN100 ASTM A276 316L
			DN150 and DN200 BS 970 431 S29	
	6	Gland nut gasket	Semi-rigid graphite laminated	
	7	Lock-nut	Stainless steel	DN15 to DN100 BS 6105 1981 A40.80
			DN150 and DN200 AISI 304	
	8	Gland nut	Stainless steel	BS 970 431 S29
	9	Mounting nut	Mild steel	DN15 to DN100 NFA 35553 CX 18S
			Mild steel zinc plated	DN150 and DN200 NFA 35553 CX 18C
	10	Gland rings	PTFE chevrons	PTFE
	11	Gland spring	Stainless steel	DN15 to DN50 BS 2056 316 S42
			DN65 to DN100 1.4310	
	12	Bonnet gasket	Semi-rigid graphite laminated	DN15 to DN100
			Reinforced exfoliated graphite	DN150 and DN200
	13	Bonnet studs	Steel	DN15 to DN50 BS 4439 Gr. 8.8
			DN65 to DN100 BS 1506 621 Gr. A	
			DN150 and DN200 UNI 3740 Gr. 5.6	
Bonnet nuts		Steel M10	DN15 to DN40 BS 3692 Gr. 8	
		Steel M12	DN50 BS 3692 Gr. 8	
		Steel M12	DN65 BS 3382 Pt 2	
	Steel M16	DN80 to DN100 BS 3382 Pt 2		
Steel	DN150 and DN200 UNI 3740 Gr. 5.5			
14	Bonnet guide	Stainless steel	DN150 and DN200 BS970 431 S29	
15	Guide bush	Filled PTFE	DN150 and DN200	
16	Spacer	Stainless steel	DN150 and DN200 AISI 304	
17	Washer	Stainless steel	DN150 and DN200 BS 970 431 S29	
18	Spring	Stainless steel	DN150 and DN200	
Cast steel and SG iron bellows sealed	13	Bonnet studs (B4)	Steel	DN15 to DN100 DIN 267 Gr. 8.8
		Bonnet nuts (B4)	Steel	DN15 to DN100 DIN 267 Gr. 8.8
	19	Bellows housing	Cast steel	DIN 17425 GSC 25N
	20	Bellows	Stainless steel	AISI 316 Ti
	21	Bellows gasket	Semi-rigid graphite laminated	
	22	Anti-rotation pin	Stainless steel	Bellows only AISI 304
	23	Seat gasket	Semi-rigid graphite laminated	
	24	Pin	Stainless steel	KE43, KE71 and KE73 AISI 302
			KE43B4 AIS 304	
KE61 and KE63 DIN 17440 1.4571				
25	Bellows lock-nut	Stainless steel	AISI 304	

Materials

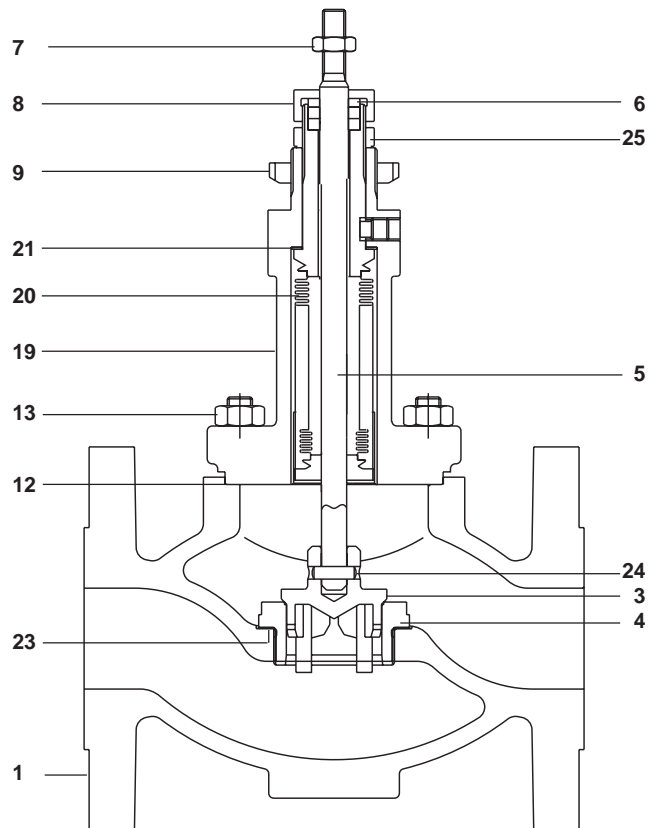
Stainless steel valves

Type	No.	Part	Material	Material designation DIN version
KE61 and KE63	1	Body	Stainless steel (316L)	DIN 17445 1.4581
	2	Bonnet	DN15 to DN50	DIN 17440 1.4401
			DN65 to DN100	DIN 17445 1.4581
	3	Valve plug	Stainless steel (316L)	ASTM A351 CF3M
	4	Valve seat	Stainless steel (316L)	ASTM A276 316L
	5	Valve stem	Stainless steel (316L)	ASTM A276 316L
	6	Gland nut gasket	Semi-rigid graphite laminated	
	7	Lock-nut	Stainless steel	DIN ISO 3506 A4-80
	8	Gland nut	Stainless steel (316L)	ASTM A276 316L
	9	Mounting nut	Mild steel	NFA 35553 CX 18S
	10	Gland rings	PTFE chevrons	PTFE
	11	Gland spring	DN15 to DN50	BS 2056 316 S42
			DN65 to DN100	1.4310
	12	Bonnet gasket	Semi-rigid graphite laminated	
	13	Bonnet studs	Stainless steel	DIN ISO 3506 A2-80
Bonnet nuts			Steel M10 DN15 to DN40	DIN ISO 3506 A2-80
			Steel M12 DN50 to DN65	
			Steel M16 DN80 to DN100	
14	Bonnet guide	Stainless steel	AISI 440B Hardened	
15	Guide bush	Glass reinforced	PTFE	
24	Pin	Stainless steel	DIN 17440 1.4571	

DN65 to DN200



**Bellows sealed (B4 shown)
DN15 to DN100**



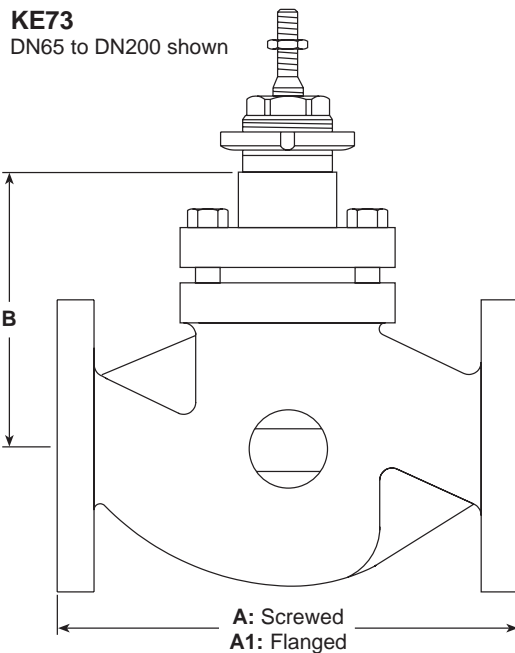
K_v values

Plug type		Nominal size																	
		DN15 ½"	DN20 ¾"	DN25 1"	DN32 1¼"	DN40 1½"	DN50 2"	DN65 2½"	DN80 3"	DN100 4"	DN150 6"	DN200 8"							
Standard trims	Travel	mm	20	20	20	20	20	20	20	30	20	30	20	30	30	50	30	50	
	Full port	Equal %	4	6.3	10	16	25	36	-	63	-	100	-	160	-	300	-	470	
		Linear	4	6.3	10	16	25	36	-	63	-	100	-	160	-	320	-	500	
	Reduced trim 1	Equal %	1.6	4	6.3	10	16	25	36	-	-	63	-	100	-	240	-	300	
		Linear	1.6	4	6.3	10	16	25	36	-	-	63	-	100	-	250	-	320	
	Reduced trim 2	Equal %	1	1.6	4	6.3	10	16	25	-	36	-	-	63	160	-	-	240	
		Linear	1	1.6	4	6.3	10	16	25	-	36	-	-	63	160	-	-	250	
	Reduced trim 3	Equal %	0.4	1	1.6	4	6.3	10	16	-	25	-	36	-	100	-	160	-	
		Linear	0.4	1	1.6	4	6.3	10	16	-	25	-	36	-	100	-	160	-	
	Travel	mm	15	15	15	15	15	20	20	20	38	38	50						
	Full port	on / off	4	6.3	10	18	28	50	85	117	180	330	540						
	Perforated trim	Travel	mm	20	20	20	20	20	20	30	20	30	20	30	30	50	30	50	
		Full port		-	-	8	12	18	26	-	50	-	63	-	90	-	170	-	298
		Reduced trim 1	Equal %	-	-	-	-	-	-	26	-	-	50	-	63	-	125	-	170
Reduced trim 2			-	-	-	-	-	-	18	-	26	-	-	50	90	-	-	125	

For conversion: C_v (UK) = K_v x 0.963 C_v (US) = K_v x 1.156

KE43, KE61, KE63, KE71 and KE73 - Dimensions and weights (approximate)

Size	Dimensions (mm)			Weights (kg)				
	BSP A	PN16/25/40 A1	B	KE43	KE61	Standard KE63	KE71	KE73
DN15	88	130	90	4.1	2.3	4.1	2.3	3.6
DN20	102	150	90	4.7	2.8	4.7	2.8	4.2
DN25	134	160	99	8.0	4.0	8.0	4.0	7.0
DN32	144	180	104	10.3	-	10.3	5.0	9.2
DN40	150	200	104	11.5	-	11.5	7.0	10.2
DN50	180	230	108	14.2	-	14.2	8.6	12.5
DN65	-	290	155	22.8	-	22.8	-	19.5
DN80	-	310	161	30.0	-	30.0	-	25.3
DN100	-	350	180	44.0	-	44.0	-	36.4
DN150	-	480	480	90.0	-	88.0	-	85.0
DN200	-	600	600	110.0	-	108.0	-	105.0

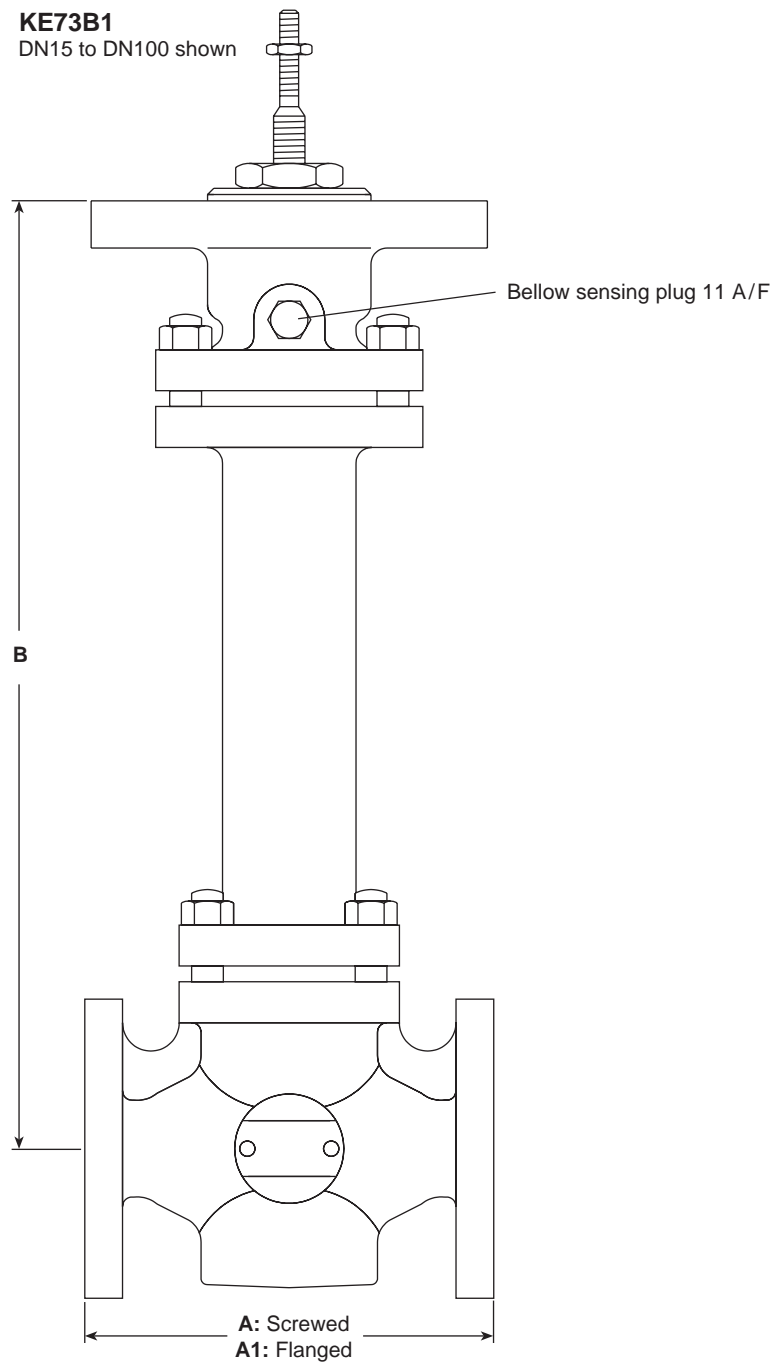


KE43B1, KE43B4, KE71B1 and KE73B1 - Dimensions and weights (approximate)

Size	Dimensions (mm)				Weights (kg)			
	BSP A	PN25/40 A1	B1 bellows B	B4 Bellows B	Bellows bonnet			
					KE43B1	KE43B4	KE71B1	KE73B
DN15	88	130	172.5	303	4.8	7.6	3.0	4.3
DN20	102	150	172.5	301	5.4	8.5	3.5	4.9
DN25	134	160	181.5	300	8.7	11.9	4.7	7.7
DN32	144	180	184.0	308	11.0	15.1	5.7	9.9
DN40	150	200	184.0	313	12.2	16.2	7.7	10.9
DN50	180	230	187.5	314	14.9	19.0	9.3	13.2
DN65	-	290	279.5	355	27.8	29.1	-	24.5
DN80	-	310	283.5	359	35.2	37.5	-	30.5
DN100	-	350	291.0	366	49.5	53.4	-	41.9
DN150	-	-	-	-	-	-	-	-
DN200	-	-	-	-	-	-	-	-

KE73B1

DN15 to DN100 shown



K series control valve selection guide:

Valve size	DN15, DN20, DN25, DN32, DN40, DN50, DN65, DN80, DN100, DN150 and DN200 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4", 6" and 8"	<input type="text" value="DN25"/>
Valve series	K = K series 2-port control valve	<input type="text" value="K"/>
Valve characteristic	E = Equal percentage F = Fast opening L = Linear	<input type="text" value="E"/>
Body material	4 = Carbon steel 6 = Stainless steel 7 = SG iron	<input type="text" value="7"/>
Connections	1 = Screwed (BSP) 3 = Flanged	<input type="text" value="3"/>
Stem sealing options	Blank = Standard PTFE chevron B1 = PN16 bellows seal B4 = PN40 bellows seal (KE43 only) H = Graphite packing	<input type="text"/>
Seating options	Blank = Standard metal-to-metal G = Soft seal (PTFE) W = Hard facing (stellite)	<input type="text"/>
Trim	Blank = Standard N = Low noise cage	<input type="text"/>
Other option	Blank = Standard bolting S = High temperature bolting	<input type="text"/>
K_v	To be specified	<input type="text" value="K<sub>v</sub> 10"/>
Connection type	To be specified	<input type="text" value="PN25"/>

Selection example:

DN25	K	E	7	3				K _v 10	Flanged PN25
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How to order

Example: 1 off Spirax Sarco DN25 KE73 K_v 10 having flanged PN25 connections.

Spare parts

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

KE43, KE61, KE63, KE71 and KE73

Valve spares - DN15 to DN100

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

Available spares

Actuator clamping nut		A
PTFE gland seal kit for DN15 to DN50 (gasket, chevrons, spring, upper and lower bearings, 'O' ring and gland nut)		B
PTFE gland seal kit for DN65 to DN100 (gasket, chevrons, guide bush and spring)		B1
Graphite gland seal kit (H) (high temperature seal) (graphite stem seals, stuffing box gasket)		C
Note: The graphite gland seal kit is suitable for stuffing box and bonnet designs.		
Standard plug and stem assembly with bonnet gasket		D, E
* Plug and stem		
Soft seated plug and stem assembly with bonnet gasket		D1, E
Bonnet gasket (set of 3)		E
Seat, seat gasket and bonnet gasket		F, G, E
Valve stem only	DN150 and DN200	H
Valve plug and stem kit	DN150 and DN200	H, D
Valve seat only	DN150 and DN200	F

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

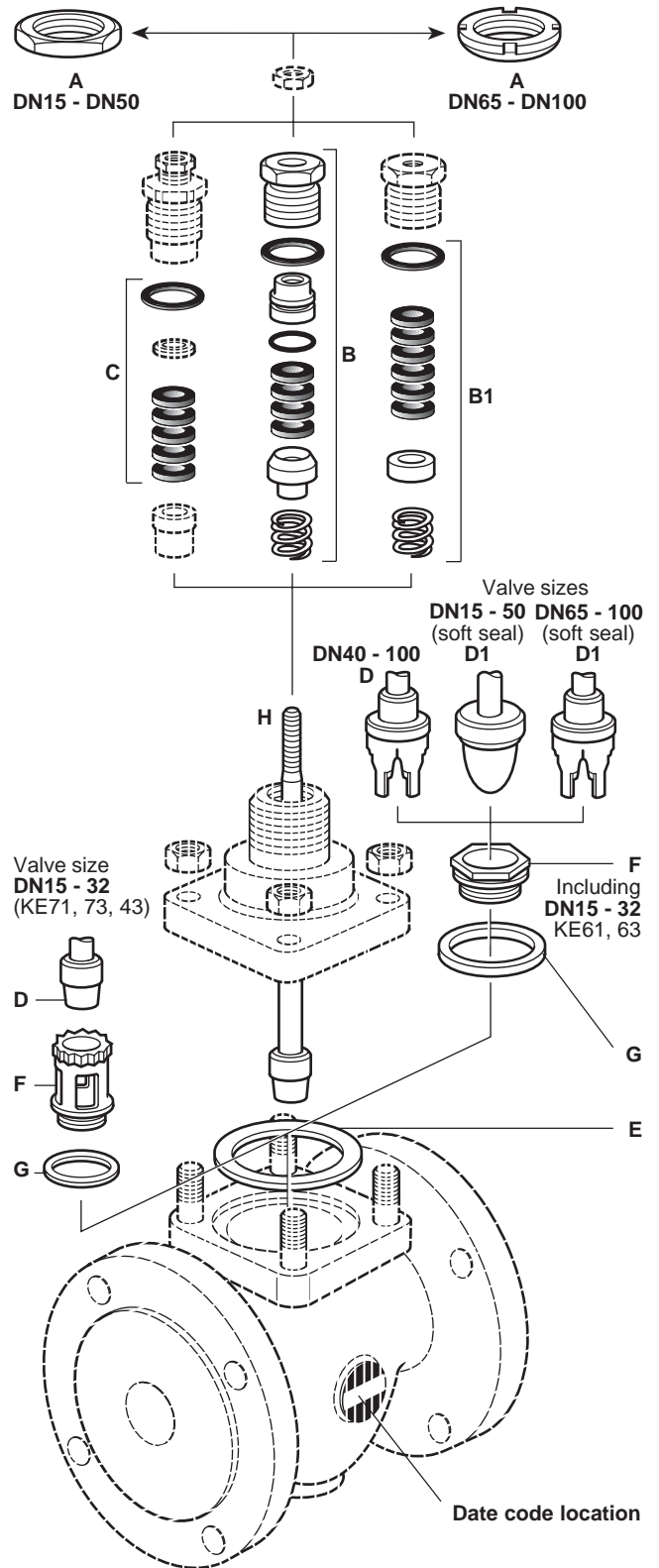
How to order spares

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

Example: 1 - PTFE gland seal kit for a Spirax Sarco DN25 KE73 two-port control valve. Date coded 204.

How to fit spares

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



**Bellows sealed valve
Spares - DN15 to DN100**

Available spares

	PTFE gland seal kit for DN15 to DN50 (gasket, chevrons, spring, upper and lower bearings, 'O' ring and gland nut)	B
Gland seal kits	PTFE gland seal kit DN65 to DN100 (gasket, chevrons, guide bush and spring)	B1
	Graphite gland seal kit (B1 only) (graphite stem seals, stuffing box gasket)	C
Note: The graphite gland seal is suitable for stuffing box and bonnet designs.		
* Plug and pin	Standard plug	J, K
	Soft seated plug	J1, K
Seat and seat gasket		F, G
Bonnet gasket (pack of 3)		E
Bellows gasket (pack of 6)		M
B1 Spindle / bellows assembly and plug pin		K, L, M
B4 Spindle / bellows assembly and plug pin		K, L

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

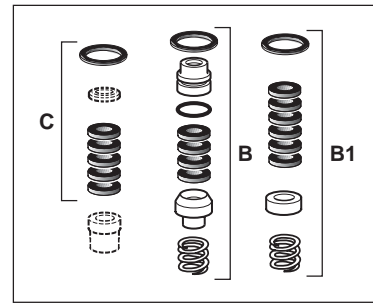
How to order spares

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

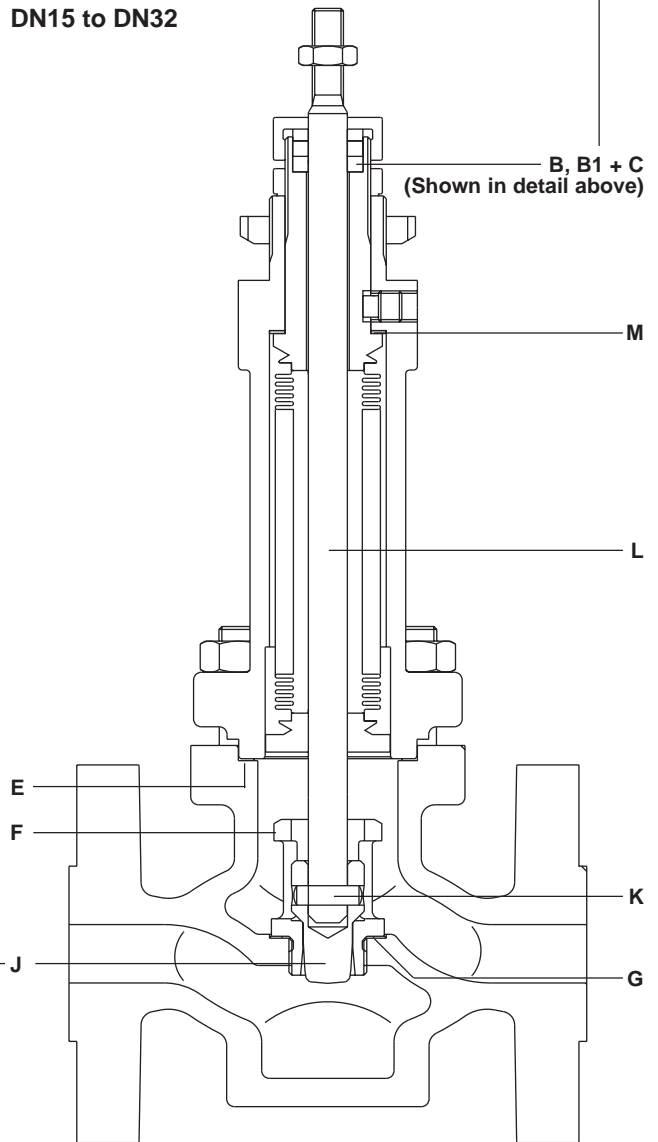
Example: 1 - Seat and seat gasket kit for a Spirax Sarco DN25 KE73B1 bellows sealed two port control valve. Date coded 204.

How to fit spares

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



DN15 to DN32



DN40 to DN100

