

DN15 to 100mm
KE43B, 71B and 73B Control Valves
Installation and Maintenance Instructions

- 1. Operation*
- 2. Installation and
commissioning*
- 3. Valve options*
- 4. Maintenance*

1. Operation

1. General description

With the development of modern industrial processes, experience has shown that the advantage of precise control instruments will be lost unless the associated control valves have good operating and flow characteristics. The KE range of valves have been designed to meet these requirements and embody a precise equal percentage linear and fast opening flow characteristic having a high turndown ratio. Many common components are utilised throughout the range, thus ensuring the minimum stocking of spare parts by users.

2. Technical details and ratings

Maximum body pressure at 120°C.

SG iron (KE71B and 73B)	25 bar
Cast steel (KE43B)	40 bar

Maximum temperatures:

SG iron	250°C
Cast steel	DN15-50 300°C
	DN65-100 350°C

Refer to appropriate TI sheet for relevant pressure / temperature relationships.

KE71B and 73B valves TI-P301-01

KE43B valves TI-P301-03

Maximum differential pressure against which the valve will shut off is dependent upon the actuator used. Refer to appropriate actuator TI sheet.

3. Valve options

The Spirax Sarco KE valve range has a number of options which are available over and above the standard valve details contained on TI-P356-01, TI-P353-01 and TI-P300-01.

4. Nomenclature

KE71B SG iron screwed valves

KE73B SG iron flanged valves

KE43B Cast steel flanged valves

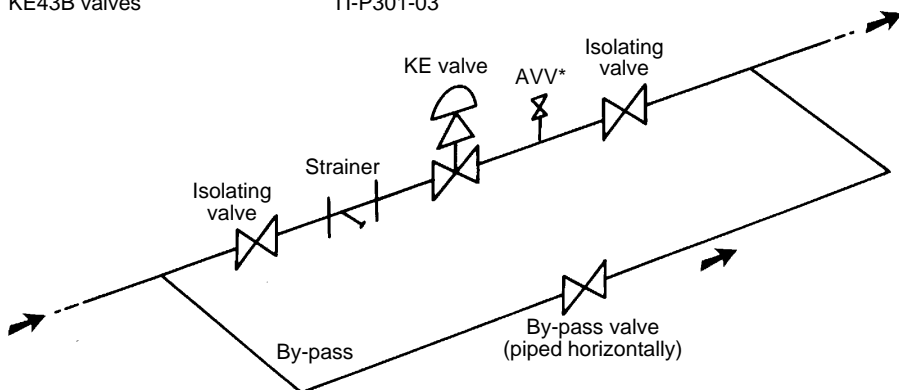


Fig. 1

*Anti-vacuum valve recommended for steam installations.

2. Installation and commissioning

5. Valves should be installed in a horizontal pipeline so that flow is in the direction indicated by the arrow cast on the body. Unless adequately supported, valves should be positioned vertically upwards or downwards. A suitable strainer should always be fitted before the control valve.

6. Bypass arrangements (Fig. 1)

It is recommended that isolating valves be fitted

upstream and downstream of the control valve together with a manual regulating valve to bypass the group. The process may then be controlled by the bypass valve while the control valve is isolated for maintenance purposes.

7. Commissioning

For commissioning instructions refer to the Operation, Installation and Maintenance Instructions, covering Spirax Sarco Actuators.

3. Valve options



Certificate No. FM163

ISO 9001

spirax/sarco

TI-S24-14
CH Issue 3

KE Valve Options

Description

The Spirax Sarco KE valve range has a number of options which are available over and above the standard valve details contained on TI-P356-01, TI-P353-01 and TI-P300-01.

• Spindle sealing

High temperature packing (H)

Design temperature -10°C to 400°C*

Material Graphite rings

* (S) High temperature packing and high temperature bolting is required above 300°C.

Note: Differential pressures contained in TI-P357-10 and TI-P357-02 do not apply when high temperature packing is used. Contact Spirax Sarco for details.

Bellows sealed (B)

See TI-P301-01, TI-P301-02, and TI-P301-03.

• Plug and seat treatment

Soft seal (G)

Design temperature -10°C to 200°C

Material PTFE

Leakage IEC 534-4 Class VI

Hard faced trims (W)

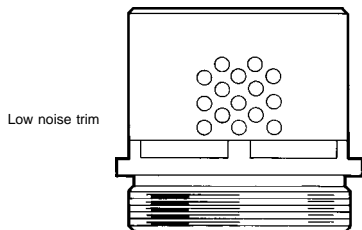
Design temperature -10°C to 400°C

Material Stellite (cobalt / chromium / tungsten alloy)

Low noise trim (N) Reduces noise level by 10 dBA

Design temperature -10°C to 400°C

Material 316L stainless steel



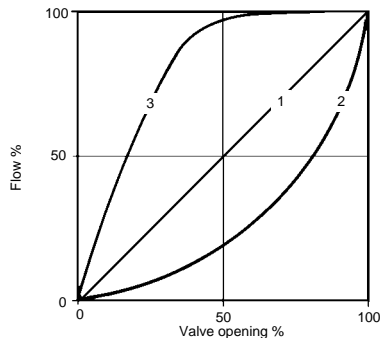
Low noise trim

• Valve characteristic

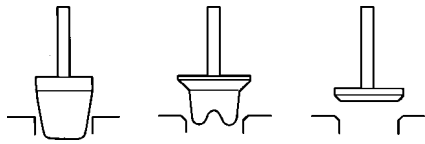
The following options are available for the entire KE valve range:-

1. Linear (L)
2. Equal percentage (E)
3. Fast opening (F)

Flow characteristic curves



Typical valve plug designs



1. Linear (L) 2. Equal percentage (E) 3. Fast opening (F)

• Capacity values K_{vs}

Size DN	15	20	25	32	40	50	65	80	100
Equal % / Linear	4	6.3	10	16	25	36	63	100	160
	1.6	6.3	10	16	16	25	36	63	100
*Reduced K_{vs}	1.0	4	6.3	10	10	16	25	36	63
	0.4	1.6	4	6.3	6.3	10	16	25	36
Fast opening	4	6.3	10	18	28	50	85	117	330
Low noise	-	-	8	12	18	26	50	63	90

*The reduced trim option is only available with the standard equal percentage and linear trim.

Control valve selection guide

Valve size	DN 15, 20, 25, 32, 40, 50, 65, 80, 100	DN25
Valve series	K series - 2 port	K
Valve characteristic	L = Linear E = Equal percentage F = Fast opening	E
Body material	4 = Cast steel 6 = Stainless steel 7 = SG iron	7
Connections	1 = Screwed 3 = Flanged	3
Stem sealing option	B = Bellows sealed D = Bellows sealed with high temperature bolting H = High temperature packing S = High temperature packing with high temperature bolting	
Seating option	G = Soft seal (PTFE) W = Hard facing	
Trim	N = Low noise	N
Kvs	To be specified	Kvs10
Connection type	To be specified	PN25

DN25 K E 7 3 N Kvs10 PN25

How to order

Example: 1 - DN25 KE 73 N Kvs 10 with PN25 flanges

Control valve spares

See TI-P301-02 for bellows sealed control valves spares
See TI-S24-10 for KE 43, 63, 71 and 73 valve spares.

4. Maintenance

8. Procedure for renewing stem seals (Fig.2.)

Safety note: care should be taken when handling gaskets since the stainless steel reinforcing strip can easily inflict cuts.

- a) Isolate valve on both sides.
- b) Remove actuator from valve.

Refer to Installation & Maintenance Instructions covering Spirax Sarco Actuators.

- c) Remove locknut (1).
- d) Unscrew the four nuts (8), securing the bonnet to the bellows housing and carefully slide the bonnet assembly off the valve stem.

CAUTION: Care should be taken in removing the bonnet since fluid under pressure may be trapped between the isolating valves.

- e) Unscrew gland nut (3), remove and discard the gland ring set (4) and gasket (4a).
- f) Examine parts for signs of damage or deterioration and renew as necessary. Note that score marks or scaly deposits on valve stem (5) will lead to early failure of the seals.
- g) Clean parts taking care to avoid scratching stem or bore of gland nut.
- h) Using new top bellows flange gasket (7) refit the bonnet (6) on the bellows housing leaving the stem protruding. Replace the four nuts (8) and tighten to the correct torque (see chart), ensuring valve plug is on its seat.
- i) To replace new stem seal assembly (4), firstly fit spring and washer over valve stem, (5). If damaged, gasket (4a) should be replaced by sliding over the thread of gland nut (3). New Chevron gland seals should be firmly inserted into the gland nut (3), care being taken to avoid damage to the sealing edges. Refit gland nut (3) over the valve stem (5), screwing down to ensure gasket (4a) is bedded down onto the bonnet (6). Chevron seals should be fitted into gland nut (3) as shown in Fig. 2.
- j) Ensure that the stem (5) moves freely.
- k) Refit valve locknut (1).
- l) Bring valve back into service.
- m) Check for leakage at gland.

9. Procedure for renewing valve plug, seat and bellows assembly.

Note: Due to the delicate nature of the bellows assembly, it is highly recommended that for renewal of the stem/bellows assembly, valve plug and /or seat, the complete valve is returned to Spirax Sarco Service Department.

- a) Isolate valve on both sides.
- b) Remove actuator from valve. Refer to Installation and Maintenance Instructions covering Spirax Sarco Actuators.
- c) Remove locknut (1).
- d) Unscrew the four nuts (8) securing the bonnet to the bellows housing and remove the bonnet assembly.

CAUTION: Care should be taken in removing the bonnet since fluid, under pressure, may be trapped between the isolating valves.

- e) Unscrew the four nuts (16) securing the bellows housing to the valve body and remove the housing complete with stem and plug. Carefully supporting the bellows housing, remove the pin fixing the valve head to the stem. Remove the valve head and withdraw the stem/bellows assembly from the bellows housing.
- f) Unscrew and remove valve seat (9). Remove seat gasket (10) and replace with new seat gasket (10).
- g) Lightly smear the threads of the new seat (9) with silicon grease and screw it into the body. Tighten to the correct torque (see chart).
- h) Insert replacement stem/bellows assembly (5) with new lower bellows flange gasket (11) ensuring that the anti-rotation pin (2) locates in the slot in the bellows housing (12) and taking great care not to damage the bellows.
- i) Fit the valve plug (13) and the head pin (14). Peen the entrance to the head pin bore to prevent the pin working loose in operation. Ensure that there are no protrusions likely to catch or damage the seat cage bore.
- j) Using a new gasket (15) refit the bellows housing (12) on the valve body. Replace the four nuts (16) and tighten to the correct torque (see chart).
- k) Using a new gasket (7) refit the bonnet (6) on the bellows housing (12). Replace the four nuts (8) and tighten to the correct torque (see chart).
- l) Fit new stem seal assembly (4) and gasket (4a) as described in paragraph 8(i), ensuring valve stem (5) moves freely after assembly.

- m) Refit actuator and connect actuator to valve stem.
- n) Bring valve back into service.
- o) Check for leakage around all the gasket joints and at the bonnet leak check point.

Chart of recommended torques (N m)

Size	Seat (9)	Bonnet nuts (8)	Gland housing (3)	Bellows housing nuts
DN15	40 ± 5	15-20	25-30	15-20
DN20	53 ± 3	15-20	25-30	20-25
DN25	80 ± 5	15-20	25-30	25-30
DN32	130 ± 5	15-20	25-30	40-45
DN40	220 ± 5	15-20	25-30	40-45
DN50	150 ± 5	15-20	25-30	60-65
DN65	300 ± 12	42-48	32-38	47-53
DN80	400 ± 16	42-48	32-38	55-61
DN100	600 ± 24	42-48	32-38	45-51

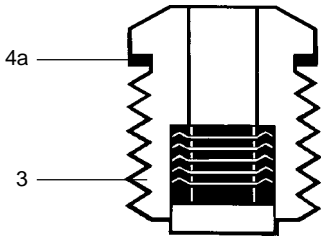
Attention should be given to leaking glands immediately. If left, the valve spindle may be damaged by scoring.

Note: To avoid damage to gland seals the valve stem(5) should be correctly fitted within the bonnet before replacing gland nut (3)/ chevron seal assembly.

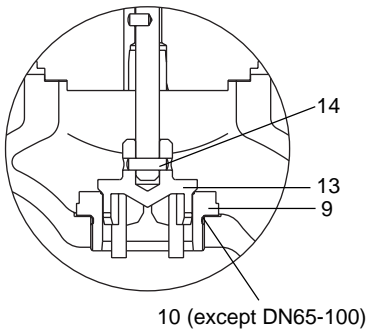
Handling precautions for PTFE

Within its working temperature range PTFE is a completely inert material, but when heated to its sintering temperature it gives rise to gaseous decomposition products or fumes which can produce unpleasant effects if inhaled. Fumes can be produced during processing: for example, when the material is heated to sinter it, or when brazed connections are being made to cable insulated PTFE. The inhalation of these fumes is easily prevented by applying local exhaust ventilation to atmosphere as near to their source as possible.

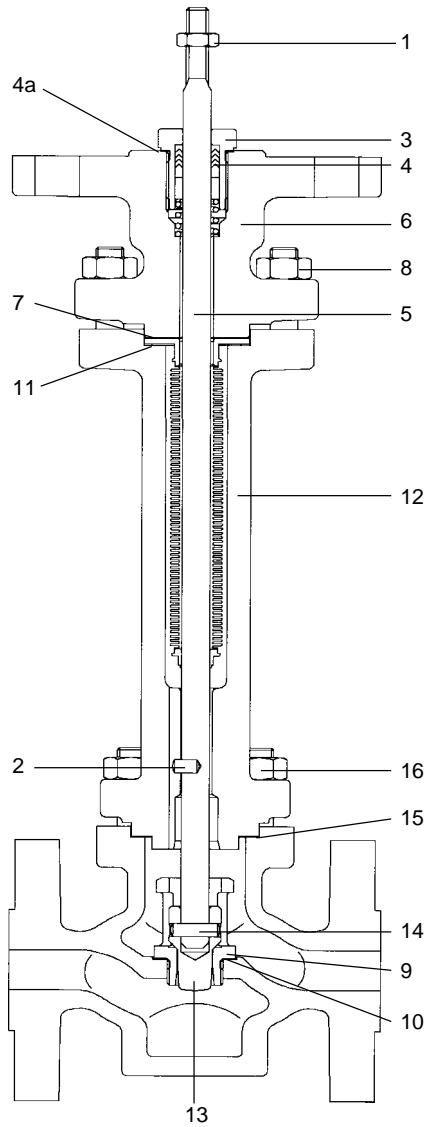
Smoking should be prohibited in workshops where PTFE is handled because tobacco contaminated with PTFE will during burning give rise to polymer fumes. It is therefore important to avoid contamination of clothing, especially the pockets, with PTFE and to maintain a reasonable standard of personal cleanliness by washing hands and removing any particles lodged under the fingernails.



Chevron seals
correct installation



DN40 - 100



DN15 - 32

Fig. 2

**Spare parts - DN15 to 100
KE43B, 71B and 73B valves**

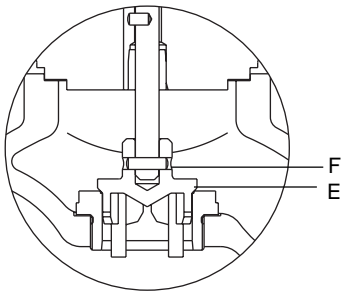
AVAILABLE SPARE

Valve gland seal kit (spring, guide bush chevrons and gasket)	A, B, C, D
Valve plug and plug pin	E, F
Valve seat and seat gasket	G, H
Bonnet gasket (Packet of 3)	J
Bellows gasket (Packet of 6)	K
Spindle/bellows assembly and plug pin	L, F

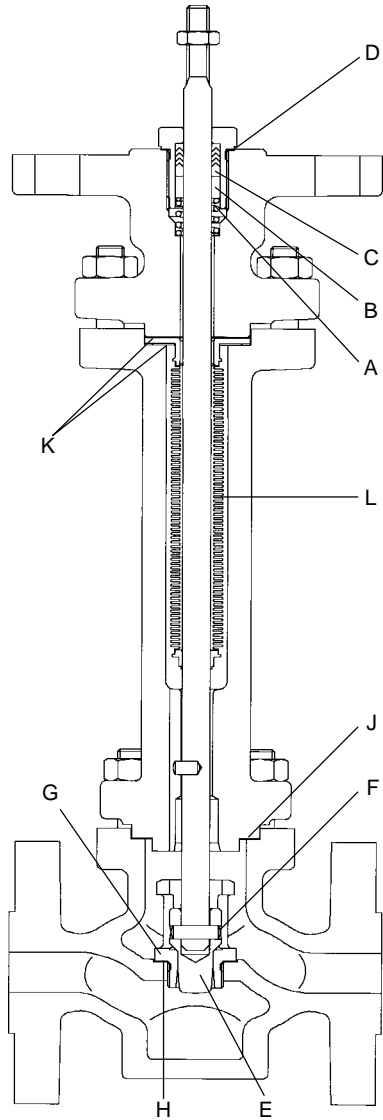
How to order spares

Always order spares by using the description given in the column headed available spare and stating the size and type of valve.

Example: 1- Valve seat and seat gasket kit for DN25 KE73B control valve.



DN40 - 100



DN15 - 32