

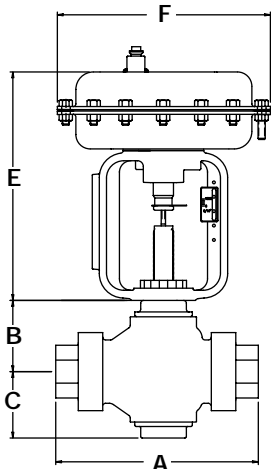


Technical Data

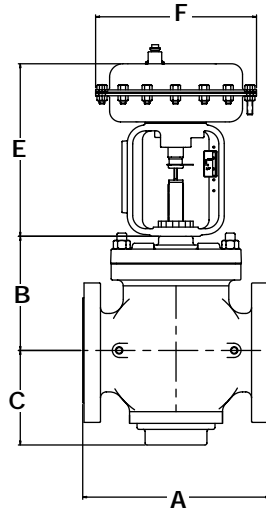
SD 8011A

A Division of CIRCOR International, Inc.

SPENCE ENGINEERING COMPANY, INC. 150 COLDENHAM ROAD, WALDEN, NY 12586-2035



K1 1/2" - 2"
ANSI B16.15



K4 2 1/2" - 4"
ANSI B16.1

KOMBAT K1 & K4 Control Valve Sizes 1/2" through 4" ANSI CLASS 125/250

The Kombat Series K Control Valve is designed for economical control of steam, water, gas and process applications in typical institutional, commercial and industrial processes. The Kombat Series K is available with either a direct or reverse acting actuator that meets most application requirements.

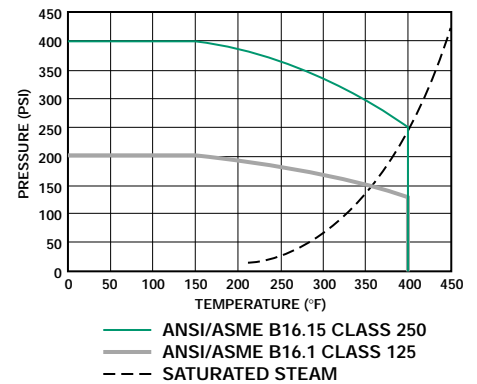
MAXIMUM RATED FLOW COEFFICIENTS* (Cv)

VALVE SIZE								
1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
5.2	7	11	20	25	30	71	94	146

DIMENSIONS inches (mm) AND WEIGHTS pounds (kg)

Size	A	B	C	E		F		Weight	
				36 in ²	60 in ²	36 in ²	60 in ²	36 in ²	60 in ²
1/2-3/4 (15)-(20)	5 1/2 (140)	1 1/16 (43)	1 3/16 (30)	9 7/8 (251)	—	9 1/4 (235)	—	21 (9.5)	—
1 (25)	7 3/16 (183)	2 7/8 (74)	2 5/16 (58)	9 7/8 (251)	11 3/4 (298)	9 1/4 (235)	11 1/4 (286)	25 1/2 (11.6)	39 (17)
1 1/4-1 1/2 (32)-(40)	8 7/8 (226)	3 3/8 (79)	2 7/8 (74)	9 7/8 (251)	11 3/4 (298)	9 1/4 (235)	11 1/4 (286)	31 1/2 (14.3)	45 (20)
2 (50)	8 7/8 (226)	3 3/8 (79)	2 7/8 (74)	9 7/8 (251)	11 3/4 (298)	9 1/4 (235)	11 1/4 (286)	33 1/2 (15.2)	47 (21)
2 1/2 (65)	9 3/8 (238)	5 1/4 (133)	4 3/8 (118)	—	11 1/2 (302)	—	11 1/4 (286)	—	72 (33)
3 (80)	10 (254)	6 3/8 (155)	5 3/8 (136)	—	11 7/8 (302)	—	11 1/4 (286)	—	84 (39)
4 (100)	11 1/8 (302)	7 3/8 (181)	7 3/8 (187)	—	11 7/8 (302)	—	11 1/4 (286)	—	145 (66)

PRESSURE/TEMPERATURE CHART



Cv TABLE

PERCENT OF TRAVEL			5	10	20	30	40	50	60	70	80	90	100
Valve Size	Travel	Orifice	Cv										
1/2	1/4	C	0.1	0.2	0.3	0.36	0.41	0.46	0.51	0.56	0.6	0.65	0.7
		E	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2	2.1
		A	0.3	0.6	1.2	1.7	2.2	2.6	2.9	3.1	3.2	3.25	3.3
		B	0.15	0.25	0.65	1.5	2.7	3.3	3.7	3.9	4.1	4.2	4.3
		T	0.7	1.2	2.0	2.7	3.2	3.8	4.3	4.7	4.9	5.1	5.2
3/4	5/16	T	0.7	1.3	2.4	3.3	4.2	4.9	5.5	6.0	6.4	6.8	7.0
1	1/4	T	0.7	1.3	2.4	3.8	5.5	7.4	9.0	10.0	10.6	10.9	11.0
1-1/4	5/16	T	0.8	1.7	4.0	6.5	9.3	12.6	15.3	17.0	18.1	19.1	20.0
1-1/2	5/16	T	1.0	2.0	4.5	7.2	9.9	12.4	15.2	18.2	20.9	23.4	25.0
2	5/16	T	1.0	2.0	4.5	7.4	10.6	15.1	18.8	22.8	26.1	28.3	30.0
2-1/2	3/4	T	5	11	23	36	46	53	59	62.5	65.7	68	71
3	3/4	T	5	11	30	47	61	72	79	85	90	92	94
4	3/4	T	12	23	46	69	89	104	116	127	134	140	146

SD 8011A/0205

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OPERATING PRINCIPLE

The Kombat K1 & K4 Valves are flow to open, globe style, pneumatic diaphragm control valves. The pneumatic actuator can be arranged to operate with either air to close or air to open

control. A controller sensing the controlled variable provides a signal to the actuator of the control valve to obtain the desired control.

RECOMMENDED INSTALLATION

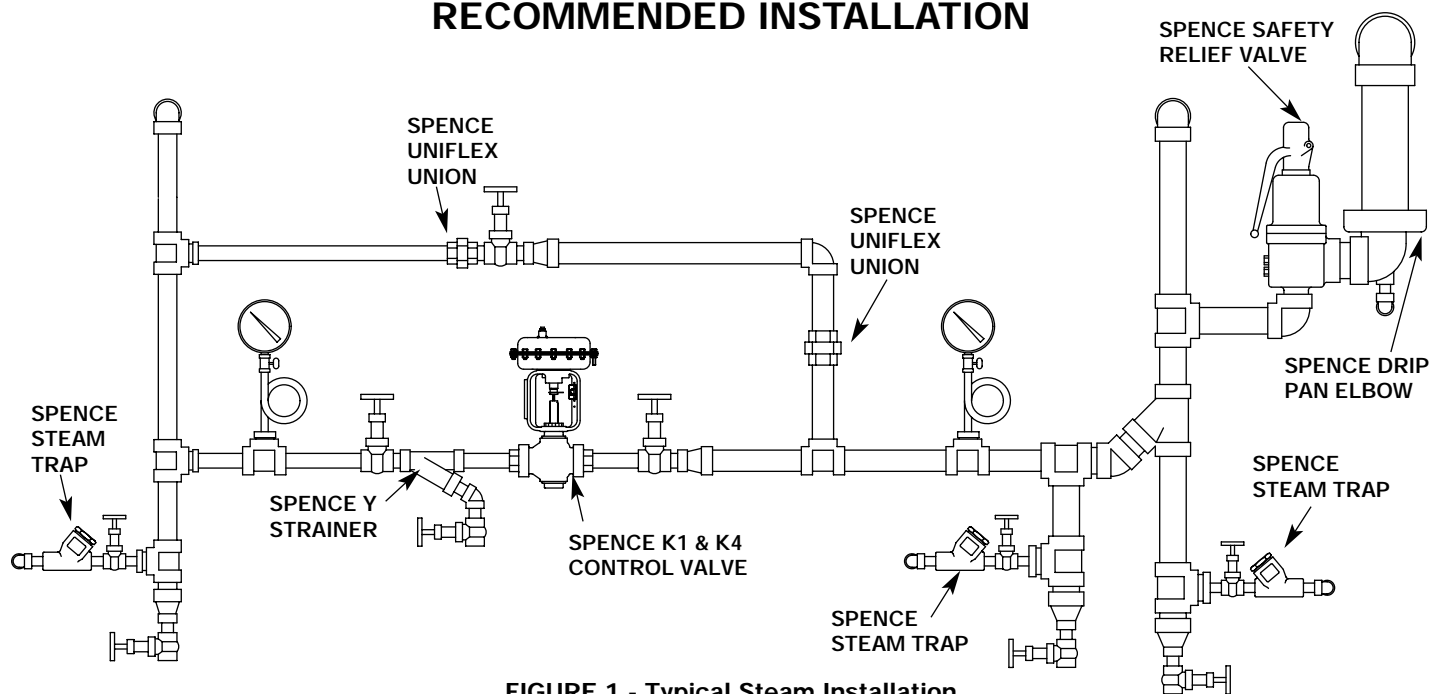


FIGURE 1 - Typical Steam Installation

INSTALLATION

CAUTION!

The piping system must be adequately designed and supported to prevent extraordinary loads to the pressure equipment.

Locate the valve in a straight run of horizontal pipe as shown in Figure 1. The valve should be mounted with the actuator in the upright position. Allow room for removal of the actuator. Prevent pipeline hammering in compressible fluid service by providing proper drainage before and after the valve. Avoid damaging effects of scale and dirt in pipelines by using a strainer. A 3-

valve by-pass to facilitate inspection and maintenance without interrupting service is recommended. To eliminate excessive noise with steam and other compressible fluids, enlarge the delivery pipe size to effect a reasonable flow velocity at the reduced pressure. A concentric transition is recommended. If possible, avoid sharp turns close to the valve bullheaded tee connections to a low pressure main. Install initial and delivery pressure gauges to indicate performance. If the rating of the delivery system or connected equipment is less than the initial pressure, provide a safety relief valve.

START-UP

Flush piping system thoroughly to clear it of welding beads, scale, sand, etc. Install valve with the arrow on the side of the valve body pointing in the direction of fluid flow. Install controller and accessories in accordance with instructions furnished by the manufacturer of these items. Connect necessary air lines and/or electrical connections to diaphragm chamber and valve mounted accessories. Use 1/4" O.D. tubing for all air lines. If

length of the air line exceeds 25 ft, use 3/8" O.D. tubing. Insulation, if desired, may be applied to the valve body only. Do not insulate bonnet. Caution: Hazardous fluids may be handled by this valve. Only qualified personnel, who are familiar with your installation, should be permitted to install, readjust, inspect or maintain the valve.

TROUBLESHOOTING

For troubleshooting of the controlling device and accessories, see instruction furnished by manufacturer of these items. To troubleshoot valve and actuator, check for the following: change in operating conditions; pneumatic signal failure; diaphragm

failure; foreign matter lodged between seat ring and plug; actuator vent plug may be: plugged, missing, replaced with a solid plug; packing leakage.

K1 & K4 ACTUATOR SHUTOFF TABLE

(Refer to Temperature Limits)

Size (inches)	Orifice	Act. Size	Bench Range	Reverse Shutoff*			Bench Range	Direct Shutoff*		
				3-15 psi	0-20 psi†	0-30 psi‡		3-15 psi	0-20 psi†	0-30 psi‡
1/2	A, C, E	36	6-15	0-400	—	—	3-12	0-400	—	—
	B	36	6-15	0-400	—	—	3-12	0-300	—	—
		60	—	—	—	—	3-9	301-400	—	—
3/4	T	36	6-15	0-300	—	—	3-9	0-400	—	—
		60	6-15	0-100	—	—	3-9	0-250	—	—
			9-15	101-225	—	—	—	—	—	—
1	T	36	12-15	0-400	—	—	3-7	0-400	—	—
		60	12-15	0-150	—	—	3-9	0-100	—	—
			12-15	151-250	—	—	—	—	—	—
1-1/4	T	36	13-15	251-400	—	—	—	—	—	—
		60	12-15	0-300	—	—	3-7	0-300	—	—
			13-15	301-400	—	—	—	—	—	—
1-1/2	T	36	12-15	0-150	—	—	—	—	—	—
		60	13-15	151-200	—	—	—	—	—	—
			12-15	0-225	—	—	3-7	0-200	—	—
2	T	36	13-15	226-275	—	—	—	—	—	—
		60	12-15	0-50	—	—	—	—	—	—
			13-15	51-75	—	—	—	—	—	—
2-1/2	T	60	12-15	0-125	—	—	3-7	0-100	—	—
		60	13-15	126-175	—	—	—	—	—	—
			10-15	0-75	0-100	0-100	3-8	0-70	0-110	0-200
3	T	60	12-15	76-125	101-125	101-125	3-8	0-70	0-110	0-200
		60	22-30	—	125	125	3-8	0-70	0-110	0-200
			10-15	0-40	0-60	0-60	3-8	0-40	0-60	0-100
4	T	60	12-15	41-60	0-80	0-80	3-8	0-40	0-60	0-100
		60	22-30	—	81-110	81-110	3-8	0-40	0-60	0-100
			12-15	0-20	0-32	0-32	3-8	0-10	0-15	0-25
4	T	60	22-30	—	33-50	33-50	3-8	0-10	0-15	0-25

* Shutoff pressures are in conformance with ANSI/FCI 70-2 Class IV

† Based on 20 psi air supply with positioner.

CAUTION: K1 designed for 3-15 psi. Do not exceed 20 psi.

‡ Based on 30 psi air supply.

Reverse Acting - Fail Closed/Air to Open (FC/ATO)

Direct Acting - Fail Open/Air to Close (FO/ATC)

PRODUCT IDENTIFICATION

KOMBAT SERIES K VALVE ORDERING CODE

MODEL NUMBER (Must be 2 Digits)	ORIFICE	SIZE	CONNECTIONS	TRIM	PACKING	— ACTUATOR (Must be 2 Digits)	SPRING (Must be 2 Digits)	— POSITIONER (Must be 2 Digits)	POSIT. SET (Must be 2 Digits)	ACCESSORIES (Must be 2 Digits)
example: K1	I	E	8	1	1	— 36	RB	—	Q2	Q1
K1 - Bronze, Pneumatic	A	C - 1/2	2 - 125 Flg	1 - Metal	1 - V-ring	K1 & K4 only	K1, K5, K6 only	K4 only	For use with K4 Valves Only	
K4 - Cast Iron, Pneumatic	B	D - 3/4	8 - Unions			01 - None	DA - 3-12 Dir 36	DH - 3 - 8 Dir 60	A - None	01 - None
K5 - Bronze, Electric, FC	C	E - 1				36 - 36 in ²	DB - 3-9 Dir 36	RH - 10-15 Rev 60	MI - Moore I/P	02 - 3-15/4-20 mA
K6 - Bronze, Electric, FO	E	F - 1 1/4				60 - 60 in ²	RA - 6-15 Rev 36	RO - 12-15 Rev 60	MP - Moore P	03 - 3-9/4-12 mA
	T	G - 1 1/2					RB - 9-15 Rev 36	RT - 22-30 Rev 60	4P - PMV P4 P	04 - 9-15/12-20 mA
		H - 2"				K5 & K6 only	RC - 12-15 Rev 36		5I - PMV P5 I/P	05 - Feedback Potentiometer 1K
		J - 2 1/2				90 - 0-10VDC	RD - 13-15 Rev 36		5P - PMV P5 P	05 - Feedback 4-20mA Posit. Tra
		K - 3				91 - 4-20mA	DF - 3-10 Dir 60			
		M - 4				92 - 0-135 ohm	DG - 3-7 Dir 60			
							RG - 12-15 Rev 60			
							RH - 13-15 Rev 60			
							01 - None (K5, K6 only)			

MAINTENANCE

Warning: Injury or death can occur due to failure to completely isolate valve from all sources of pressure before beginning disassembly. Do not proceed until valve has been completely isolated from process stream and vented to atmosphere.

REMOVAL OF ACTUATOR FROM VALVE BODY ASSEMBLY

Close inlet and outlet stop valves. Be sure valve body is not under pressure. Remove all accessories from control valve. Refer to Figure 2.

Reverse Acting Pneumatic Actuator

Loosen stem nuts (24) and move to approximately 1/3 down valve stem. Re-tighten being careful not to move valve stem. Energize actuator with air to lift the plug off the seat. Disengage lock nut (26) from bonnet (25). De-energize actuator. The actuator and yoke should move away from bonnet. Lift actuator and yoke assembly along with plug (39) off the seat. With an adjustable wrench, unthread valve stem from actuator stem (Fig. 6, #16) until valve stem is disengaged from actuator stem. Remove stem nuts, indicator, packing nut and lock nut.

Direct Acting Pneumatic Actuator

Energize actuator with air slightly (in case of back seating). Loosen stem nuts (24) and re-tighten approximately 1/8" away from actuator stem (Fig. 6, #16). Disengage lock nut (26) from bonnet (25). With an adjustable wrench, unscrew valve stem from actuator stem. When valve stem reaches seat, lift actuator (to prevent galling seat and plug). Remove stem nuts, indicator and lock nut.

DISASSEMBLY OF VALVE BODY

Remove stem nuts (24), indicator (32) and lock nut (26). Lift yoke off bonnet (25). To complete body disassembly, unscrew bonnet for K1 and cap (42) for K4. For K4 remove bonnet nuts (34) and lift off blind flange (35), bonnet, stem and plug assembly (37). Remove gasket (36). A new gasket should be installed each time valve body is disassembled. Turn stem and plug assembly out of bonnet through packing. Replace packing if necessary. All parts should be inspected for wear and cleaned thoroughly before re-assembling valve body.

DISASSEMBLY OF ACTUATOR

Remove actuator from valve. Remove regular casing bolts (4) and casing nuts (5). Gradually loosen nuts on remaining long casing bolts (14) to allow pre-compression of actuator springs. Remove upper casing (2). Pull actuator stem (16), along with diaphragm (15), springs (3) and piston (13), out through bushing (7). Place a wrench on the machined flats of actuator stem, and remove stem nut (10) or travel stop (22), seal washer (12) and stem washer (11). Remove o-ring (8) from bushing and replace if necessary. Lubricate o-ring after installing.

RE-ASSEMBLY OF ACTUATOR

Refer to Figure 6 for correct orientation of casings, diaphragm (15), piston (13), stem (16) and springs (3) for direct or reverse action. Be sure piston spring recesses line up between casing ribs as shown in Figure 8C. Lubricate bushing O-ring (8) and insert actuator stem through bushing. Re-attach upper casing (2) with long bolts (14) & nuts (5), tightening alternately. Install remaining casing nuts and bolts. Apply air to diaphragm case and check for leakage, full travel and dead band less than .2 psi.

LAPPING PLUG INTO SEAT

Seats and plugs should never require more than the lightest touch up with very fine (400 grit) grinding compound. Heavy lapping will produce galling, a wider seating surface and a groove in the plug, all of which tend to cause leakage. Reface a damaged surface before attempting to grind it in. Lap sparingly. Replace stem and plug (39) in bonnet (25) through packing. Apply lapping compound to plug. Place bonnet and bonnet flange (35 for K4 only) on body. After lapping, disassemble and clean all parts thoroughly.

PACKING REPLACEMENT

Check stem for gouges if packing leaks. Replacement packing cartridges can be installed.

RE-ASSEMBLY OF VALVE BODY (K1)

Tighten bonnet (25) to body. Replace yoke (9), lock nut (26), stem nuts (24) and travel indicator (32) over stem (34).

RE-ASSEMBLY OF VALVE BODY (K4)

Install a new gasket (36). Attach bonnet (26) and bonnet flange (35) to body with bonnet studs and nuts (33, 34). Be sure to tighten bolts alternately and evenly to ensure proper seating of the plug. Replace yoke (9), lock nut (27), stem nuts (31) and travel indicator (23) over stem (30).

REPLACING ACTUATOR ON VALVE BODY - PNEUMATIC

Put actuator assembly over valve stem. Place lock nut (Fig. 2, #26), and stem nuts (24) with travel indicator (32) on valve stem. Rest actuator stem (16) on valve stem. Tighten stem nuts approximately 2/3 down valve stem. Lift actuator assembly and engage valve stem with actuator stem (be careful not to gall plug & seat).

Reverse Acting

When sufficient engagement is met, the actuator can be energized with air to place the yoke on the bonnet (25) and lift the plug off the seat. Tighten lock nut and packing nut.

Direct Acting

Engage valve stem with actuator stem so no contact is made between plug and seat when bottom of yoke is rested on bonnet. Tighten lock nut.

ACTUATOR ADJUSTMENT - PNEUMATIC

Close inlet and outlet stop valves. Be sure valve body is not under pressure. Place a wrench on the machined flats of

actuator stem (16). Counter two stem nuts (24) approximately halfway down the threads of the stem (34).

Reverse Acting

Apply sufficient air pressure to diaphragm case to start moving valve through its rated travel. This is shown by travel indicator (32). Engage lower stem nut (24) and turn body stem (34) into actuator stem (16) until pre-compression of actuator springs (3) is relieved (plug should not be seating on seat ring when air pressure is removed from actuator case). Apply prescribed setting pressure to actuator. This is determined by specific operating conditions. Turn body stem out of actuator stem until plug seats on seat ring (28). To prevent galling, do not turn body

stem after plug has contacted seat ring. Turn stem nuts up plug & stem assembly and tighten to lock them in position. Reduce air signal to 0 psi and calibrate indicator scale (20). Check that full travel is achieved with a 15 psi signal (for 22-30 spring range, use 30 psi signal).

Direct Acting

Engage lower stem nut (24) and turn body stem (34) into actuator stem (16) until plug & stem assembly stops at upper limit of travel and/or a slight downward movement of actuator stem is detected. Turn stem nuts up body stem and tighten them to lock in position. Calibrate indicator scale (20). Check that full travel is achieved at a 3 psi signal.

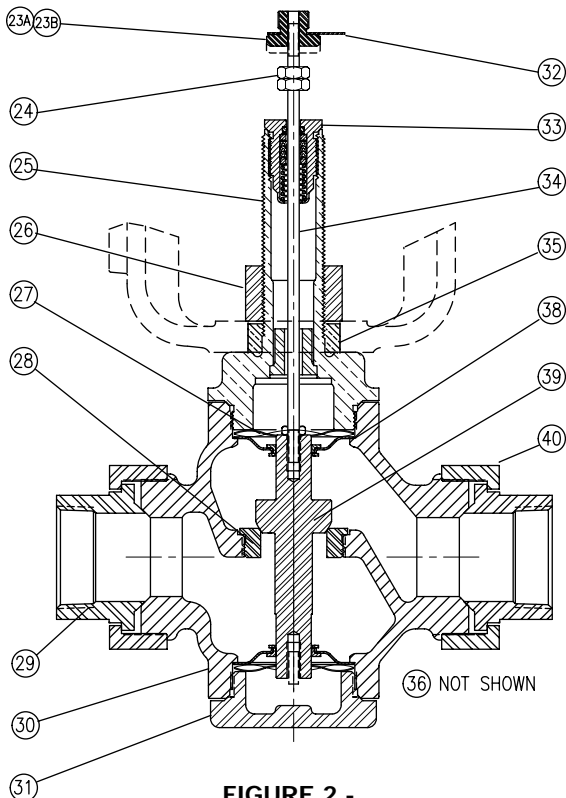
It is solely the responsibility of the system designer and the user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Assistance shall be afforded with the selection of the materials based on the technical information supplied to Spence Engineering Company, Inc.; however, the system designer and user retain final responsibility. The designer should consider applicable Codes, material compatibility, product ratings and application details in the selection and application. Improper selection, application or use of the products described herein can cause personal injury or property damage. If the designer or user intends to use the product for an application or use other than originally specified, he must reconfirm that the selection is suitable for the new operating conditions.

K1 VALVE BODY ASSEMBLY PART NUMBERS

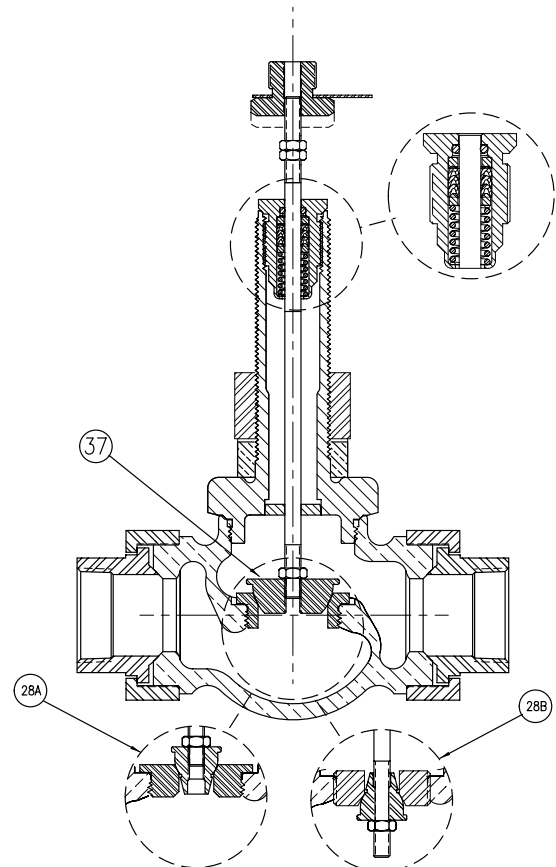
ITEM NO.	PART NAME	MATERIAL	VALVE SIZE					
			1/2	3/4	1	1-1/4	1-1/2	2
23A*	STEM BOLT - SHORT	BRASS	04-17277-00	04-17277-00	04-17277-00	04-17277-00	04-17277-00	04-17277-00
23B**	STEM BOLT - LONG	BRASS	04-17281-00	04-17281-00	04-17281-00	04-17281-00	04-17281-00	04-17281-00
24	STEM NUT	BRASS	05-17342-00	05-17342-00	05-17342-00	05-17342-00	05-17342-00	05-17342-00
25	BONNET ASSY	BRASS	557B109-01	557B109-01	557B107-02	557B107-02	557B110-02	557B110-02
26	LOCK NUT	ST STL	05-17330-00	05-17330-00	05-17330-00	05-17330-00	05-17330-00	05-17330-00
27	WAVE WASHER	ST STL	—	—	122A155-01	122A155-02	122A155-02	122A155-02
28A	SEAT RING, 1/2A K1	ST STL	SN217	—	—	—	—	—
	SEAT RING, 1/2B K1	ST STL	SUU217	—	—	—	—	—
	SEAT RING, 1/2C K1	ST STL	SN217	—	—	—	—	—
	SEAT RING, 1/2E K1	ST STL	SN217	—	—	—	—	—
	SEAT RING, T K1	ST STL	SX217	SM217	562A114-02	562A114-03	562A114-04	562A114-05
28B	SEAT RING, 1/2A K5	ST STL	562A110-01	—	—	—	—	—
	SEAT RING, 1/2B K5	ST STL	562A110-01	—	—	—	—	—
	SEAT RING, 1/2C K5	ST STL	562A110-01	—	—	—	—	—
	SEAT RING, 1/2E K5	ST STL	562A110-01	—	—	—	—	—
	SEAT RING, T K5	ST STL	562A112-01	562A113-01	562A114-02	562A114-03	562A114-04	562A114-05
29	TAILPIECE	GALV IRON	SX227	SMP462	SMP463	SBB227	SMP465	SMP593
30	BODY	BRONZE	292B110-01	292B110-01	SAM1167B	SAN1167B	SAN1167B	564B116-01
31	CAP	BRASS	—	—	557B101-01	SB312E	SB312E	SB312E
32	TRAVEL INDICATOR	ALUM	05-12962-00	05-12962-00	05-12962-00	05-12962-00	05-12962-00	05-12962-00
33	V RING PACKING SET	TFE/SS/VITON	204A104-01	204A104-01	204A104-01	204A104-01	204A104-01	204A104-01
34	STEM	ST STL	552A117-01	552A117-01	552A115-01	552A115-02	552A115-02	552A115-02
35*	YOKE BUSHING	BRASS	04-17278-00	04-17278-00	04-17278-00	04-17278-00	04-17278-00	04-17278-00
36**	SPACER	BRASS	04-17280-00	04-17280-00	04-17280-00	04-17280-00	04-17280-00	04-17280-00
37	NUT	ST STL	05-17342-00	05-17342-00	—	—	—	—
38	GUIDE	ST STL	—	—	556A111-01	556A111-02	556A111-02	556A111-02
39	PLUG, 1/2A	ST STL	554A154	—	—	—	—	—
	PLUG, 1/2B	ST STL	554A158	—	—	—	—	—
	PLUG, 1/2C	ST STL	554A153	—	—	—	—	—
	PLUG, 1/2D	ST STL	554A156	—	—	—	—	—
	PLUG, 1/2E	ST STL	554A159	—	—	—	—	—
	PLUG, T	ST STL	554A157	554A155	554A146-02	554A146-03	554A146-04	554A146-05
40	UNION NUT	GALV IRON	SMP487	SMP467	SMP468	SMP470	SMP470	SMP592

* Not included in body assembly; order K-KIT separately.

**Not included in body assembly; order separately.



**FIGURE 2 -
VALVE BODY ASSEMBLY - K1 1" - 2"**



**FIGURE 4 -
VALVE BODY ASSEMBLY - K1 - 1/2" - 3/4"**

K4 VALVE BODY ASSEMBLY PART NUMBERS

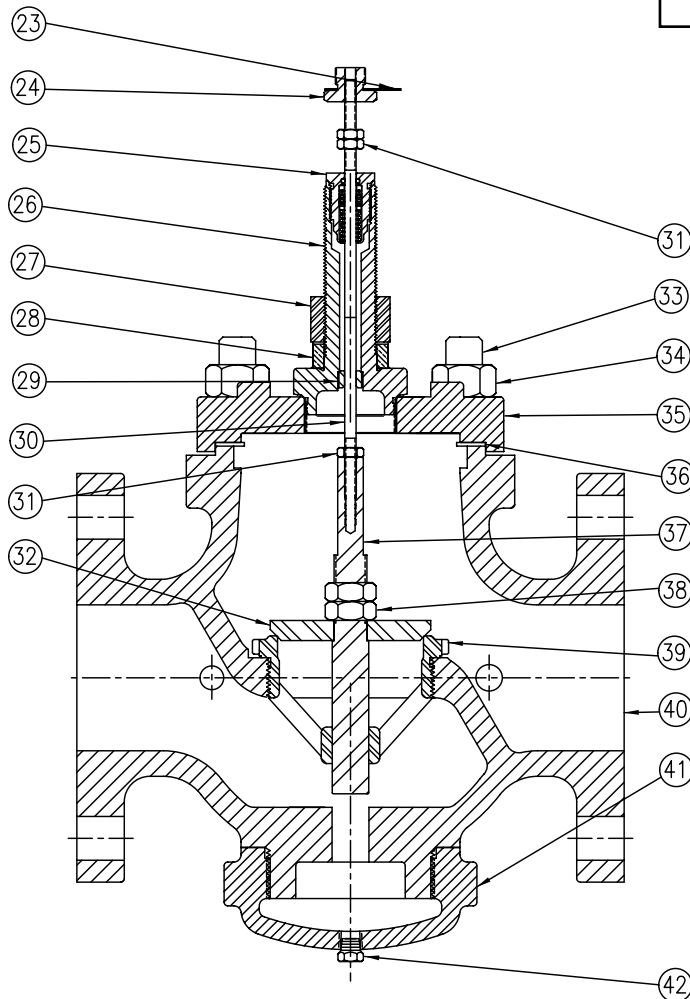
ITEM NO.	PART NAME	MATERIAL	VALVE SIZE		
			2-1/2	3	4
23	Pointer	Aluminum	5-12962-0	5-12962-0	5-12962-0
24	Stem bolt	Brass	4-17277-0	4-17277-0	4-17277-0
25	Packing box	Brass	204A104-01	204A104-01	204A104-01
26	Bonnet	Ductile iron	558B113-02	558B113-02	558B113-02
27	Nut	Stl/zinc pltd	5-17330-0	5-17330-0	5-17330-0
28	Yoke bushing	Brass	4-17278-0	4-17278-0	4-17278-0
29	Stem bearing	303 ss	SU260	SU260	SU260
30	Valve stem	303 ss	552A117-02	552A117-02	552A117-02
31	Nut	316 ss	5-17342-0	5-17342-0	5-17342-0
32	Disc	420 ss	4-08242-0	4-01918-0	4-01931-0
33	Tap stud	Steel	4-10119-0	4-05443-0	4-10119-0
34	Nut	Steel	5-02860-0	5-02856-0	5-02860-0
35	Blind flange	Cast iron	4-17334-0	4-17337-0	4-17334-0
36	Gasket	Graphite	5-02367-1	5-02369-1	5-02371-1
37	Disc stem	304 ss	4-17333-0	4-17340-0	4-17344-0
38	Nut	C1018	5-02973-0	5-02973-0	5-02974-0
39	Seat Ring	420 ss	4-11539-0	4-11484-0	4-11565-0
40	Body	Cast iron	4-00653-0	4-00655-0	4-00659-0
41	Cap	Cast iron	4-01325-0	4-17339-0	4-17346-0
42	Pipe plug	12L14	4-03769-0	4-03769-0	4-03769-0

When ordering parts, it is essential that the valve type, size, service and serial number be stated.

Select part by item number, but order by part number.

Specify complete part number when ordering.

K1 and K4 are designed and manufactured in accordance with Article 3, Section 3 of the Pressure Equipment Directive.



**FIGURE 5 -
VALVE BODY ASSEMBLY - K4**

K1 & K4 ACTUATOR PART NUMBERS

ITEM #	PART NAME	MATERIAL	PART #	QTY
1	Vent plug	H.D.poly	—	1
2	Upper casing	Stl/powder coat	—	1
3	Springs	Steel	See Below	See Below
4	Casing bolt standard	304 ss	—	10/14
5	Casing nut	316ss	—	12/16
6	Lower casing	Stl/powder coat	—	1
7	Bushing	Bronze	—	1
*8	O Ring	Buna-n	5-04017-0	1
9	Yoke	Cl/powder coat	—	1
*10	Stem nut	Steel	5-13374-0	1
*11	Stem washer	316 ss	5-12963-0	1/3
*12	Seal washer	Steel	5-13203-0	1
13	Piston	316 ss	—	1
*14	Casing bolt long	304 ss	5-04889-0	2
*15	Diaphragm - 36 sq. in. Diaphragm - 60 sq. in.	Nitrile	0-12968-0 @-12986-0	1 1
16	Actuator stem	303 ss	—	1
17	Machine screw	Steel	—	3
18	Casing gasket	Buna-n	—	1
19	Machine screw	Steel	—	2
*20	Indicator scale	Aluminum	5-13190-0	1
*21	Specification plate	Aluminum	5-13199-0	1
**22	Stop 12-15 psi Stop 10-15 & 22-30 psi	Brass	5-17360-0 5-17362-0	1 1

*These parts furnished in Actuator Repair Kit.

** Used in K4 only

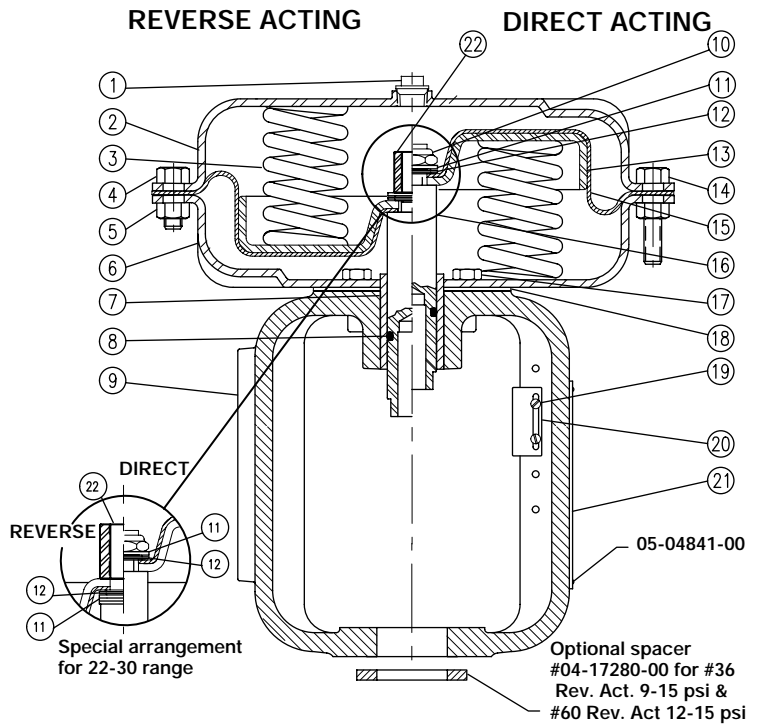


FIGURE 6 - ACTUATOR ASSEMBLY - K1 & K4

K1 & K4 ACTUATOR SPRING KITS

Part #	Notes	Reverse Shutoff (Air-to-Open) Bench Range				Direct Shutoff† (Air-to-Close) Bench Range				Spring Kit Includes:			
		K1		K4**		K1		K4		Spring		Other	
Part #	Notes	Code	Range	Code	Range	Code	Range	Code	Range	QTY	Color	Part#	
36KIT100	(1)	36RA	6 - 15	-	-	36DA	3 - 12	-	-	6	YELLOW	05-12991-00	-
36KIT102	(3)	36RB	9 - 15	-	-	-	-	-	-	6	YELLOW	05-12992-00	-
36KIT104	(2) (4)	36RC	12 - 15	-	-	-	-	-	-	6	RED	05-13090-01	-
36KIT108	(2) (4)	36RE	13 - 15	-	-	-	-	-	-	6	GREEN	05-13085-00	05-04889-00 (2) Bolts
36KIT110	(1)	-	-	-	-	36DB	3 - 9	-	-	6	METAL	05-05121-00	-
60KIT100	(1) (4)	60RG	12 - 15	-	-	60DG	3 - 7	-	-	6	BROWN	05-13093-01	-
60KIT102	(1) (4)	60RH	13 - 15	60RH	10 - 15	-	-	DH	3 - 8	4	BROWN	05-13093-01	-
60KIT104	(5)	-	-	60RQ	12 - 15	-	-	-	-	6	BLACK	05-13097-00	05-04889-00 (2) Bolts
60KIT110	(1)	-	-	60RT	22 - 30	-	-	-	-	6	BROWN	05-13093-00	See detail in Fig. 6

† For Direct Shutoff - Invert Springs, Piston and Diaphragm from Reverse Shutoff Actuator.

** To convert a K1 actuator to a K4 actuator you must add travel stop (05-17362-00) into the actuator and vice versa.

- (1) For K1 & K4 ONLY - Mounts using KKIT-1
- (2) For K1 ONLY - Mounts using KKIT-2
- (3) For K1 ONLY - Mounts using KKIT-3
- (4) Includes J-Valve travel scale
- (5) For K4 ONLY - Mounts using KKIT-1 & spacer 04-17280-00

ACTUATOR REPAIR KIT PART NUMBERS

36 SQ. IN.	60 SQ. IN.
51447	51448

K1 & K4 ACTUATOR CONNECTOR KITS

PART #	SIZE	ORIFICE	SEAT STYLE	FOR USE WITH		KKIT Includes:		
				K1	K4	Stem Bolt	Bushing	Spacer
KKIT-1	1/2 - 4	All	All	X	X	04-17277-00	04-17278-00	-
KKIT-2	1/2 - 2	All	All	X		04-17281-00	07-17278-00	-
KKIT-3	1/2 - 2	All	All	X		04-17281-00	04-17278-00	04-17280-00

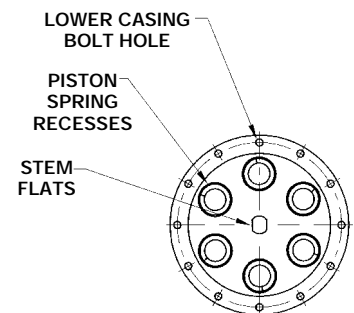


FIGURE 8 - PISTON DIAPHRAGM ASSEMBLY