



SPENCE ENGINEERING COMPANY, INC.

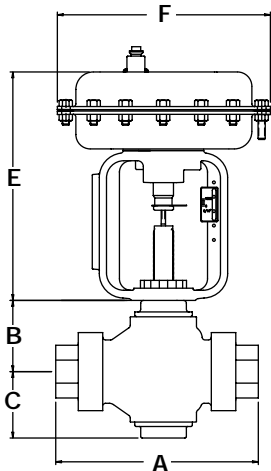
Technical Data

SD 8011B

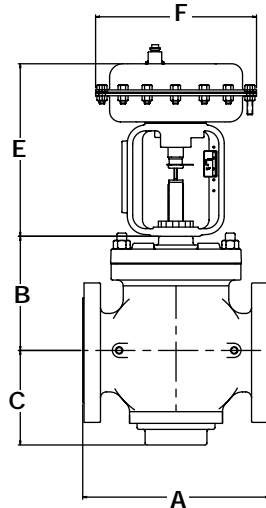
A division of CIRCOR International, Inc.

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SD 8011B/0610



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.

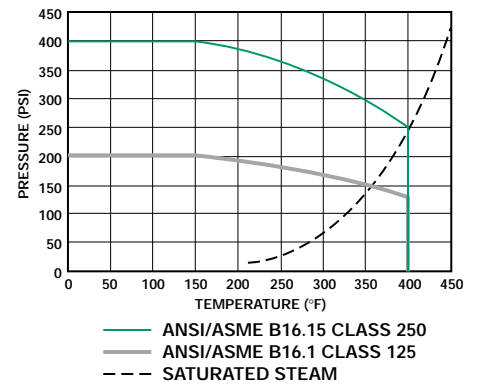
MAXIMUM RATED FLOW COEFFICIENTS* (Cv)

| 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 1/2 (181) | 7 3/8 (187) | — | 11 7/8 (302) | — | 11 1/4 (286) | — | 145 (66) |

PRESSURE/TEMPERATURE CHART



PRINTED IN U.S.A.

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 |

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

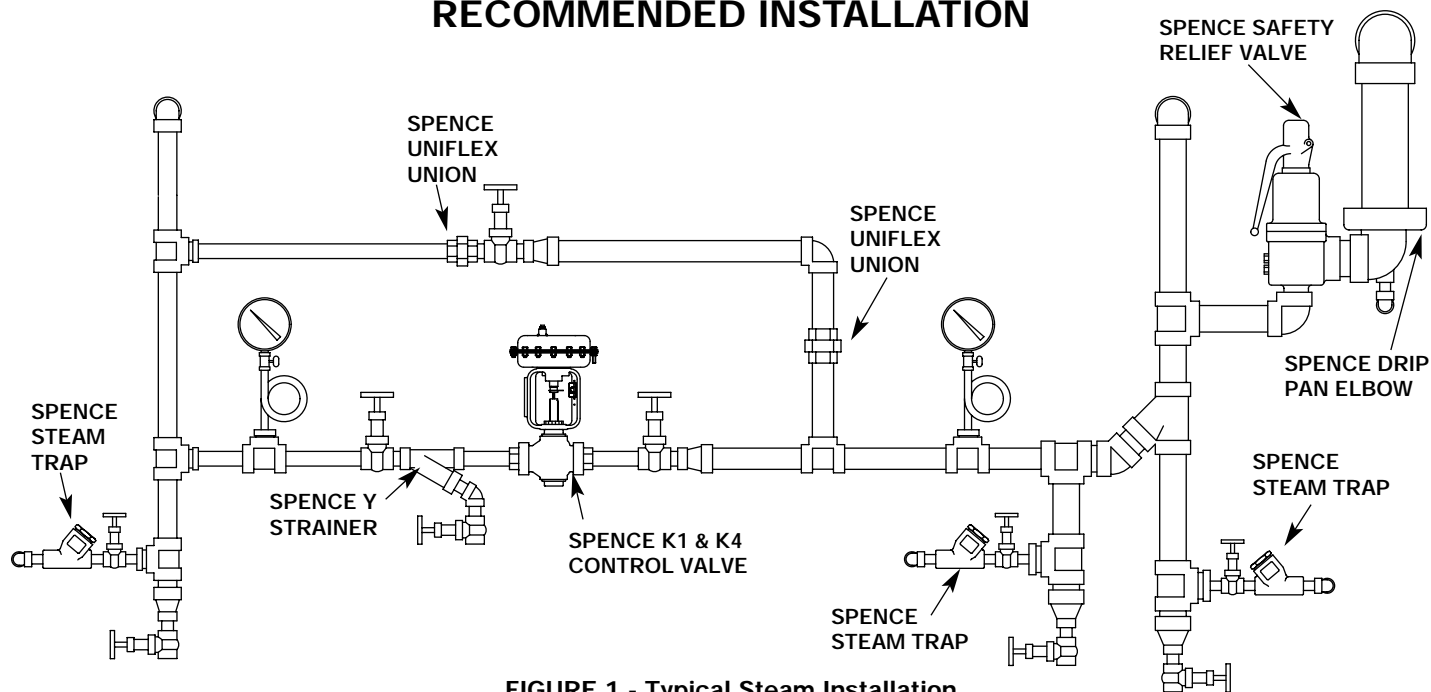


FIGURE 1 - Typical Steam Installation

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 | Actuator Code | Reverse Shutoff* | | | Bench Range | Actuator Code | 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 | RA | 400 | — | — | 3-12 | DA | 400 | — | — |
| | B | 36 | 6-15 | RA | 400 | — | — | 3-12 | DA | 300 | — | — |
| | | | — | — | — | — | — | 3-9 | DB | 400 | — | — |
| T | 36 | 6-15 | RA | 300 | — | — | 3-9 | DB | 400 | — | — | |
| 3/4 | T | 36 | 6-15 | RA | 100 | — | — | 3-9 | DB | 250 | — | — |
| | | | 9-15 | RB | 225 | — | — | — | — | — | — | — |
| | | | 12-15 | RC | 300 | — | — | — | — | — | — | — |
| | | 60 | 12-15 | RC | 400 | — | — | 3-7 | DG | 400 | — | — |
| 1 | T | 36 | 9-15 | RB | 150 | — | — | 3-9 | DB | 100 | — | — |
| | | | 12-15 | RC | 250 | — | — | — | — | — | — | — |
| | | | 13-15 | RE | 400 | — | — | — | — | — | — | — |
| | | 60 | — | — | — | — | — | 3-7 | DG | 400 | — | — |
| 1-1/4 | T | 36 | 9-15 | RB | 150 | — | — | 3-9 | DR | 150 | — | — |
| | | | 12-15 | RC | 200 | — | — | — | — | — | — | — |
| | | | 13-15 | RE | 250 | — | — | — | — | — | — | — |
| | | 60 | 12-15 | RG | 0-300 | — | — | 3-7 | DG | 300 | — | — |
| | | | 13-15 | RH | 400 | — | — | — | — | — | — | — |
| 1-1/2 | T | 36 | 12-15 | RC | 150 | — | — | — | — | — | — | — |
| | | | 13-15 | RE | 200 | — | — | — | — | — | — | — |
| | | 60 | 12-15 | RG | 225 | — | — | 3-7 | DG | 200 | — | — |
| | | | 13-15 | RH | 275 | — | — | — | — | — | — | — |
| 2 | T | 36 | 12-15 | RC | 50 | — | — | — | — | — | — | — |
| | | | 13-15 | RE | 75 | — | — | — | — | — | — | — |
| | | 60 | 12-15 | RG | 125 | — | — | 3-7 | DG | 100 | — | — |
| | | | 13-15 | RH | 175 | — | — | — | — | — | — | — |
| 2-1/2 | T | 60 | 10-15 | RH | 75 | 100 | 100 | 3-8 | DH | 70 | 110 | 200 |
| | | | 12-15 | RQ | 125 | 125 | 125 | 3-8 | DH | 70 | 110 | 200 |
| | | | 22-30 | RT | — | 125 | 125 | 3-8 | DH | 70 | 110 | 200 |
| 3 | T | 60 | 10-15 | RH | 40 | 60 | 60 | 3-8 | DH | 40 | 60 | 100 |
| | | | 12-15 | RQ | 60 | 80 | 80 | 3-8 | DH | 40 | 60 | 100 |
| | | | 22-30 | RT | — | 110 | 110 | 3-8 | DH | 40 | 60 | 100 |
| 4 | T | 60 | 12-15 | RQ | 20 | 32 | 32 | 3-8 | DH | 10 | 15 | 25 |
| | | | 22-30 | RT | — | 50 | 50 | 3-8 | DH | 10 | 15 | 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 | CONNEC- TIONS | 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 | R B | MP | Q2 | Q1 |
| K1 - BZ, Single Seat, Pneumatic | A | C - 1/2 | 2 - 125# | 1 - Metal | 1 - V-ring | K1, K3, K4 only | K1, K3 only | K4 only | For use with K4 Valves Only | |
| K3 - BZ, 3-Way, Pneumatic | B | D - 3/4 | 8 - Unions | | | 36 - 36 in ² | DA - 3-12 Dir 36 | DH - 3 - 8 Dir 60 | AA - None | 01 - None |
| K4 - CI, Single Seat, Pneumatic | C | E - 1 | | | | 60 - 60 in ² | DB - 3-9 Dir 36 | RH - 10-15 Rev 60 | MI - Moore I/P | 02 - 3-15/4-20 mA |
| K5 - Z, Single Seat, Electric, (FC) | E | F - 1 1/4 | | | | K5, K6, K7 only | DC - 6-12 Dir 36 | RQ - 12-15 Rev 60 | MP - Moore P | 03 - 3-9/4-12 mA |
| K6 - BZ, Single Seat, Electric, (FO) | T-STD | G - 1 1/2 | | | | 90 - 0-10VDC | DD - 7-11 Dir 60 | RT - 22-30 Rev 60 | 4P - PMV P4 P | 04 - 9-15/12-20 mA |
| K7 - BZ, 3-Way, Electric | H - 2" | J - 2 1/2" | | | | 91 - 4-20mA | DG - 3-7 Dir 60 | DG - 3-7 Dir 60 | 5I - PMV P5 I/P | 05 - Feedback Potentiometer 1K |
| | K - 3 | M - 4 | | | | | DM - 7-11 Dir 60 | 01 - None | 5P - PMV P5 P | 05 - Feedback 4-20mA Posit. Tra |
| | | | | | | | RA - 6-15 Rev 36 | | | |
| | | | | | | | RB - 9-15 Rev 36 | | | |
| | | | | | | | RC - 12-15 Rev 36 | | | |
| | | | | | | | RE - 13-15 Rev 36 | | | |
| | | | | | | | RG - 12-15 Rev 60 | | | |
| | | | | | | | RH - 13-15 Rev 60 | | | |

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.

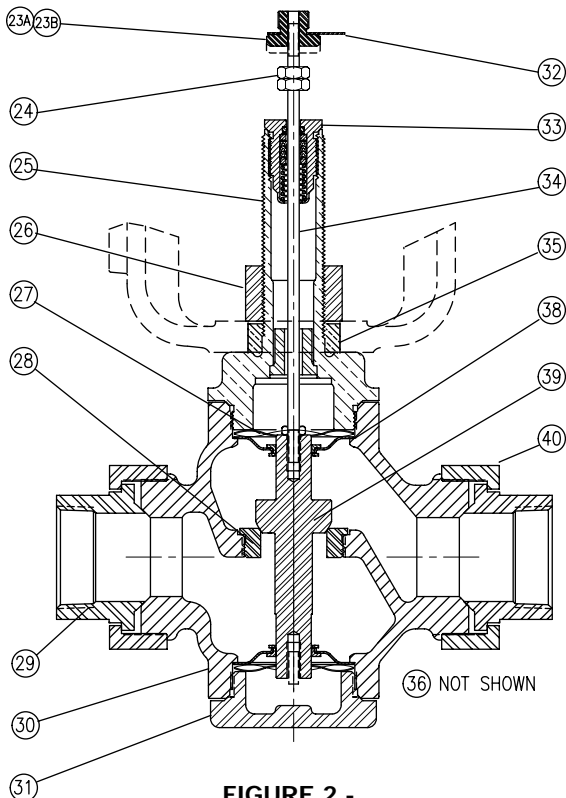
It is solely the responsibility of the system designer and the user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Assistance shall be afforded with the selection of the materials based 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

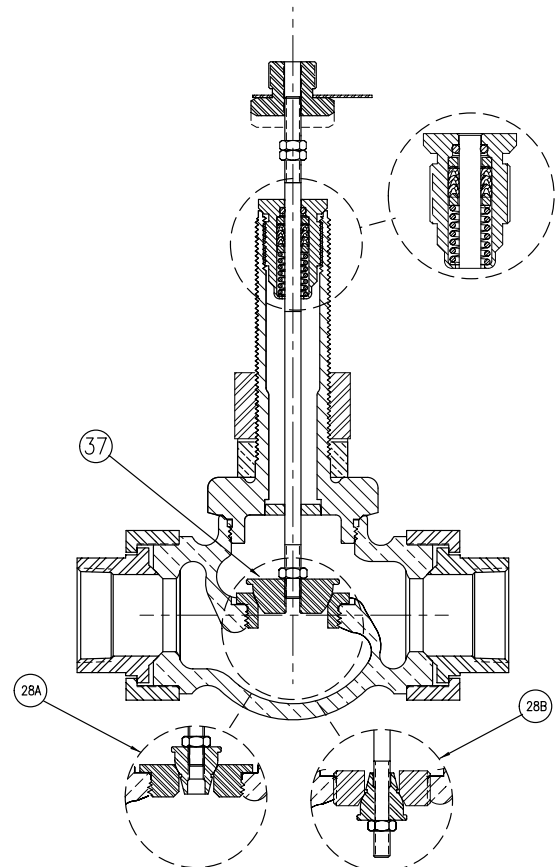
| ITEM NO. | PART NAME | MATERIAL | VALVE SIZE | | | | | |
|----------|--------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | 1/2 | 3/4 | 1 | 1-1/4 | 1-1/2 | 2 |
| 23A* | STEM BOLT - SHORT | BRASS | 04-17277-00 | 04-17277-00 | 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

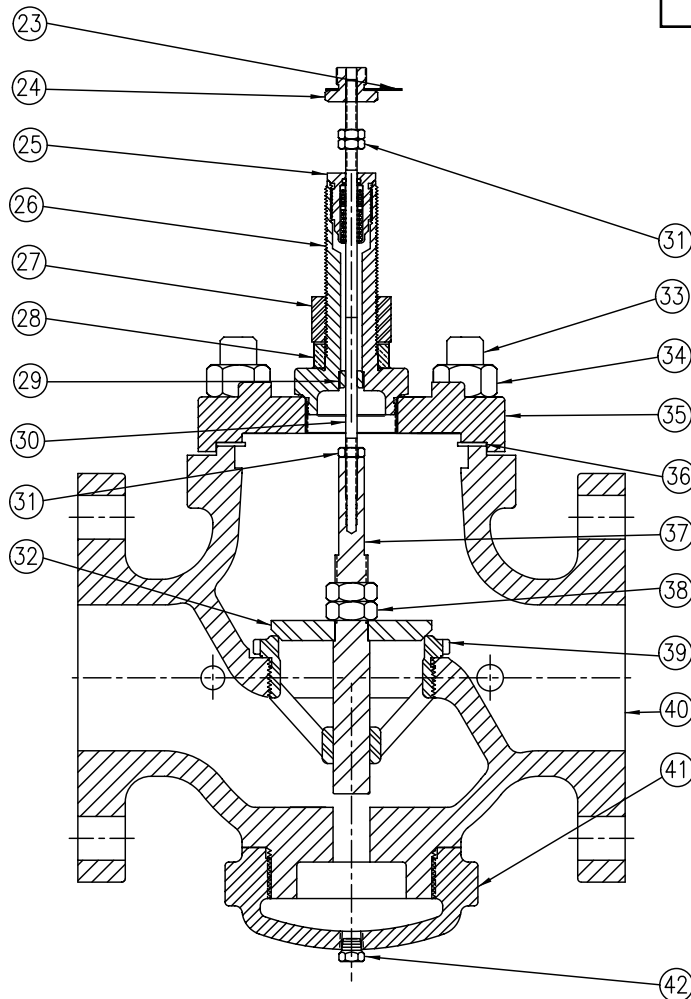
| ITEM NO. | PART NAME | MATERIAL | VALVE SIZE | | |
|----------|--------------|---------------|------------|------------|------------|
| | | | 2-1/2 | 3 | 4 |
| 23 | Pointer | Aluminum | 5-12962-0 | 5-12962-0 | 5-12962-0 |
| 24 | Stem bolt | Brass | 4-17277-0 | 4-17277-0 | 4-17277-0 |
| 25 | Packing 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

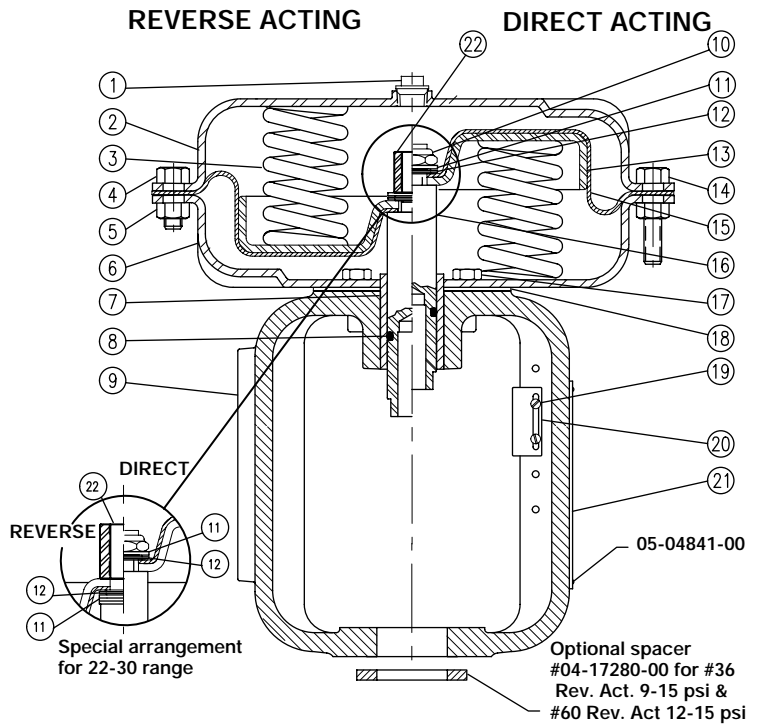


FIGURE 6 - ACTUATOR ASSEMBLY - K1 & K4

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 |

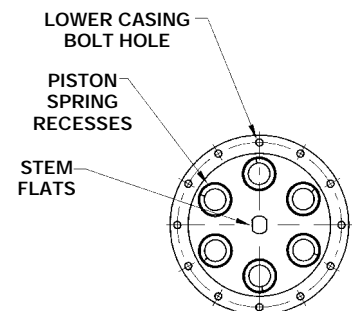


FIGURE 8 - PISTON DIAPHRAGM ASSEMBLY