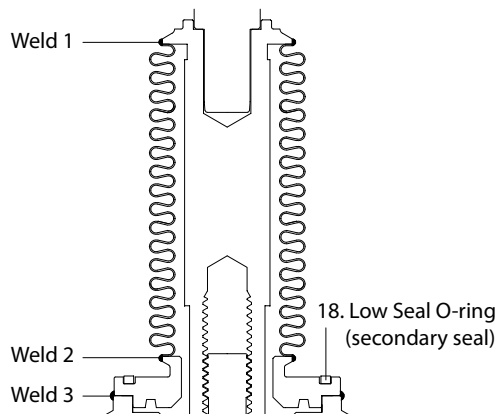


Figure 1.
Bellows Subassembly (Primary Seal)



Features

V13W series bellows valve offers the most difficult fluid handling applications. This design with the secondary sealing system fits to the need for a safe and reliable system.

Applications include cryogenic to high temperatures, high pressure to vacuum in power plants, instrumentation, panels, and critical sampling system for toxic, radioactive, and hazardous fluids.

Bellows subassembly (Figure 1)

Welding upper end of the bellows to 12. stem (weld 1) and the other end to 19. stem weld ring (weld 2), this bellows is then welded to the valve body (weld 3).

Bellows subassembly with the three places of welding provides all metal, hermetical sealed valve. This primary seal offers a complete sealing between the system and atmosphere where leakage is not accepted.

Secondary seal (6), (18).

All welded stainless steel valves with secondary seal makes this valve for the most difficult fluid containment applications.

Secondary sealing prevents leakage to atmosphere in the event of a bellows rupture due to excessive pressurization. Leakage past the primary seal is contained by secondary seal.

Actuator threads (2)

Hardened 440C stainless steel actuator is for maximum strength, wear resistance, and positive stem retraction.

Acme power transmission threads constructed on actuator (2) and the bonnet (8) for low operation torque and to handle the extreme force transmitted to the threads in high pressure bellows valve. The threads are not in contact with the process fluid and are protected from atmospheric containments by the packing (6).

Valve actuation

Valves in high pressure tend to stick in the closed position. The ball bearing (9), and double pin (10) on a shoulder of stem extension (11) provide positive lifting of stem (12) and stem retraction. Compressing or stretching the bellows allows linear motion of the stem with the convolutions.

Ported bonnet nut (15)

This allows monitoring sealing condition of weld 3 (Figure 1) and low seal O-ring (18).

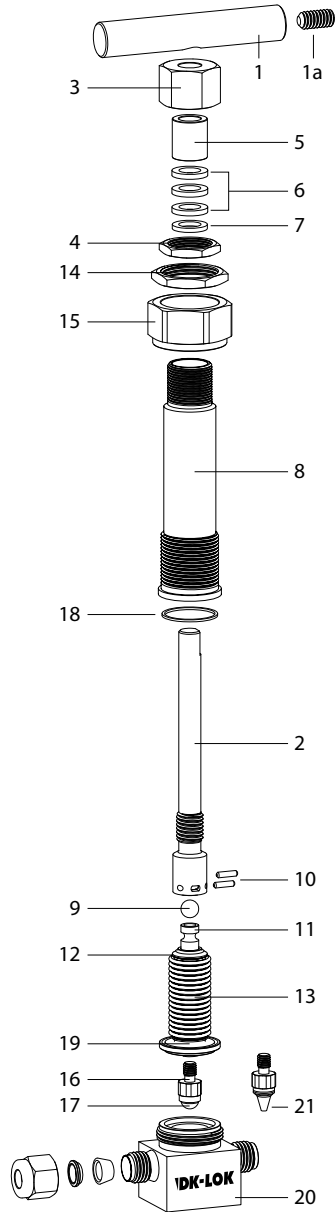
Turns to Open

Bellows valves operated by manual actuating bar handle requires around 1 3/4 turns on the V13WA series and 2 1/2 turns on the V13WB & V13WC series to open the valves to full flow.

A jam nut (4) is provided for locking the gland nut (3).

Additional Features

- Non-rotating stem disc (17).
- Standard panel (14) and bottom mounting.
- Union bonnet construction allows packing (6) replacement for maintenance.
- Safety back-seat sealing in the valve closed position.
- DK-Lok tube fitting and socket or butt weld end connections.
- Regulating stem disc for V13WA series.



Materials of Construction

| Component | Material Grade/ASTM specification |
|-----------------------------------|---|
| 1. Handle | Aluminum Blue-anodized /B211 |
| 1a. Set Screw | Alloy Steel/ANSI 18.3 |
| 2. Actuator | 440C SS/A276 |
| 3. Gland Nut | 316SS/A479 or A276 |
| 4. Jam Nut | 316SS/A479 or A276 |
| 5. Gland | 316SS/A479 or A276 |
| 6. Packing | GRAFOIL, optional PTFE/D1710 |
| 7. Spacer | 316SS/A479 or A276 |
| 8. Bonnet | 316SS/A479 or A276 |
| 9. Ball Bearing | 316SS/A479 or A276 |
| 10. Pin (2) | 416SS |
| 11. Stem Extension | 440CSS/A276 or A276 |
| 12. Stem | 316SS/A479 or A276 |
| 13. Bellows | Type 321 /A240 or 1.4541-DIN EN10028-7 |
| 14. Panel Mount Nut | 316SS/A479 or A276 |
| 15. Bonnet Nut | 316SS/A479 or A276 |
| 16. Stem Adapter | 316SS/A479 or A276 |
| 17. Spherical stem disc | Cobalt alloy/AMS 5373 |
| 21. Optional regulating stem disc | 316SS/A479 or A276 |
| 18. Low Seal O-Ring | 316SS/A479 |
| 19. Stem Weld Ring | 316SS/A479 |
| 20. Body | 316SS/A479 |

Wetted parts and lubricants are listed in blue.

Lubricants

Spherical stem disc : Fluorinated-based.
Non-wetted lubricant : Silicon based

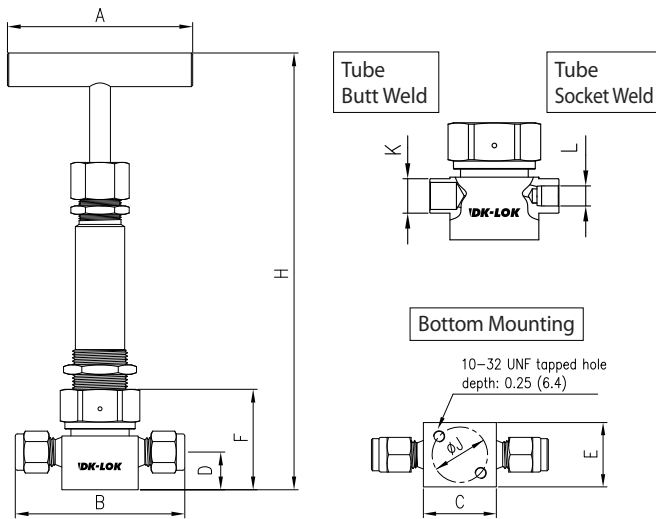
Factory test

Every bellows valve is vacuum-tested with helium at room temperature for 5s to a maximum leak rate of 4×10^{-9} std cm³/s at the seat, envelope, and all seals.

Cleaning and Packaging

Every bellows valve is cleaned and packaged in accordance with DK-Lok Corporation cleaning standard DC-01. Optional DC-11 cleaning for oxygen application is available on request.

Ordering Information and Dimensions



| Basic Ordering | | End Connections | | Orifice | Dimensions, in (mm) | | | | | | | | | |
|----------------|-------|--------------------------|--------|--------------|---------------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|
| Number | | Inlet | Outlet | | B | C | D | E | F | H | J | K | L | A |
| V13WA- | D4T- | 1/4 in. DK-Lok | | 0.172 (4.37) | 2.46 (62.5) | | | | | | | - | - | |
| | D6M- | 6mm DK-Lok | | 0.172 (4.37) | 2.46 (62.5) | 1.13 (28.7) | 0.56 (14.2) | 1.00 (25.4) | 1.49 (37.8) | 6.45 (164) | 1.00 (25.4) | - | - | |
| | SW4T- | 1/4 in. Tube Socket Weld | | 0.156 (3.96) | 1.68 (42.7) | | | | | | | 0.38 (9.7) | 0.25 (6.4) | |
| | W6T- | 3/8 in. Tube Butt Weld | | 0.156 (3.96) | 1.68 (42.7) | | | | | | | | | |
| V13WB- | D6T- | 3/8 in. DK-Lok | | 0.265 (6.73) | 3.09 (78.5) | | | | | | | - | - | |
| | D10M- | 10mm DK-Lok | | 0.281 (7.14) | 3.11 (79.0) | 1.57 (39.9) | 0.50 (12.7) | 1.13 (28.7) | 1.61 (40.9) | 6.59 (167) | 1.13 (28.7) | - | - | 2.75 (69.9) |
| | SW6T- | 3/8 in. Tube Socket Weld | | 0.281 (7.14) | 2.27 (57.7) | | | | | | | 0.50 (12.7) | 0.38 (9.7) | |
| | W8T- | 1/2 in. Tube Butt Weld | | 0.281 (7.14) | 2.27 (57.7) | | | | | | | | | |
| V13WC- | D8T- | 1/2 in. DK-Lok | | 0.312 (7.92) | 3.30 (83.8) | | | | | | | - | - | |
| | D12M- | 12mm DK-Lok | | 0.281 (7.14) | 3.30 (83.8) | 1.57 (39.9) | 0.50 (12.7) | 1.13 (28.7) | 1.61 (40.9) | 6.59 (167) | 1.13 (28.7) | - | - | |
| | SW8T- | 1/2 in. Tube Socket Weld | | 0.312 (7.92) | 2.27 (57.7) | | | | | | | 0.75 (19.1) | 0.50 (12.7) | |
| | W12T- | 3/4 in. Tube Butt Weld | | 0.312 (7.92) | 2.27 (57.7) | | | | | | | | | |

Ordering information.

Select the desired valve basic ordering number, and optional disc.

Note :

Optional regulating disc is applicable only to V13WA series

V13WA-D4T-

-R

-S

| | |
|---|---------------------------|
| Stem Disc Designator | Valve Material Designator |
| Nil : Spherical stem disc R : Regulating stem disc | S : stainless steel 316 |

Pressure-Temperature Ratings

Ratings are for SS316 valves with spherical and regulating stem disc.

| Temperature, °F (°C) | Working Pressure, psig (bar) |
|-------------------------|------------------------------|
| -20 to 650 (-28 to 343) | 2500 (172) |
| 700 (371) | 2120 (146) |
| 750 (398) | 1740 (119) |
| 800 (426) | 1360 (93.7) |
| 850 (454) | 980 (67.5) |
| 900 (482) | 600 (41.3) |
| 950 (510) | 540 (37.2) |
| 1000 (537) | 480 (33.0) |
| 1050 (565) | 425 (29.2) |
| 1100 (593) | 360 (24.8) |
| 1150 (621) | 300 (20.6) |
| 1200 (648) | 250 (17.2) |

Technical Data

| Valve series | Stem disc | Cv | Internal Volume in.3(cm3) |
|--------------|---------------------|------|---------------------------|
| V13WA | Standard spherical | 0.36 | 0.11 (1.8) |
| V13WB | | 1.0 | 0.25 (4.1) |
| V13WC | | 1.2 | 0.27 (4.4) |
| V13WA | Optional regulating | 0.36 | 0.11 (1.8) |

