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## **K99FL SERIES BULK TANK GAUGE INSTALLATION / OPERATING INSTRUCTIONS**

### **INSTALLATION INSTRUCTIONS:**

Only Qualified Personnel who are familiar with gauge glass valves and their operation should undertake installation of this product. Failure to properly install could result in serious personal injury and property damage.

Refer to opposite side of sheet for exploded gauge drawing with item numbers mentioned in these instructions.

1. Prior to actual installation, check specifications on identification decal per item 2 to make sure they are correct for application.

**Note: For steam-water applications, retainer rings per item 21 and ball checks per item 20 in upper and lower valve assemblies should be removed.**

2. Turn handwheel per item 17 on upper and lower gauge valves clockwise until stem closes against seat.
3. Remove gauge mounting flange/union nut assembly per item 23 from upper and lower valve assemblies.
4. Prepare to install gauge mounting flanges to vessel using appropriate flange gaskets and mounting hardware (not supplied by Kenco).
5. Ensure that sealing surfaces of flanges and gaskets are clean and free of any debris/defects.
6. Flange mounting bolt/stud threads should be well lubricated with a good quality thread lubricant.
7. Place gasket between vessel connection flange and gauge mounting flange and finger-tighten/lightly snug all fasteners using a crossing pattern as illustrated on opposite side of sheet.
8. Refer to flange gasket manufacturer's installation instructions for further procedures and bolt torque specifications.

**Note: Make sure smooth face of upper and lower gauge process connections are aligned with each other so gauge will be plumb after installation.**

9. Inspect O-ring seals per item 22 on face of upper and lower valve body to make sure they are in groove and installed with lubricant. Kenco factory installs O-rings using seal lubricant.
10. Thread union nuts onto gauge valve bodies finger-tight.
11. Center up lower and upper gauge valve bodies with installed gauge process connections before tightening union nuts in place. Tighten union nuts until they bottom out on valve assemblies.
12. Recheck vessel connections as well as 1/4" and 1/2" NPT vent and drain connections per items 11 and 12 on each end of gauge to ensure they are pressure tight.
13. Open upper gauge valve and then lower gauge valve by turning valve handwheels counterclockwise very slowly to avoid excessive thermal shock and mechanical stress on tubular gauge glass sight tube contained inside gauge frame.
14. Allow gauge temperature and pressure to slowly equalize with vessel.

**Note: Failure to slowly bring gauge into service can cause rapid pressurization of sight tube and could result in serious personal injury and property damage.**

15. Inspect gauge to insure there are no leaks prior to proceeding with installation.
16. Open valves completely after temperature and pressure have equalized to permit ball checks in valve bodies to properly seat in the event of possible glass breakage. (**Note:** In some circumstances where liquid being gauged tends to surge in a rapid manner, ball checks can seat and give a false level reading.)

### **MAINTENANCE INSTRUCTIONS:**

1. During system shutdown, gauge valves are to be left open to allow gauge to lose pressure and cool to ambient temperature with vessel.
2. Should gauge need maintenance while vessel is still in service, valves on each end of gauge to be closed completely to allow gauge to cool to ambient temperature if necessary. Liquid can then be carefully drained by using 1/4" or 1/2" NPT connection ports on lower end of gauge.

**Note: Do not proceed with any maintenance unless gauge has been relieved of all pressure or vacuum and has been allowed to reach ambient temperature. Gauge should also be flushed out to remove any hazardous liquids before handling if possible.**

3. Cleaning inside of sight tube per item 3 can be done without removal of tube itself. This can be accomplished by using a tube brush with access through 1/2" NPT vent and drain connection ports on each end of gauge.

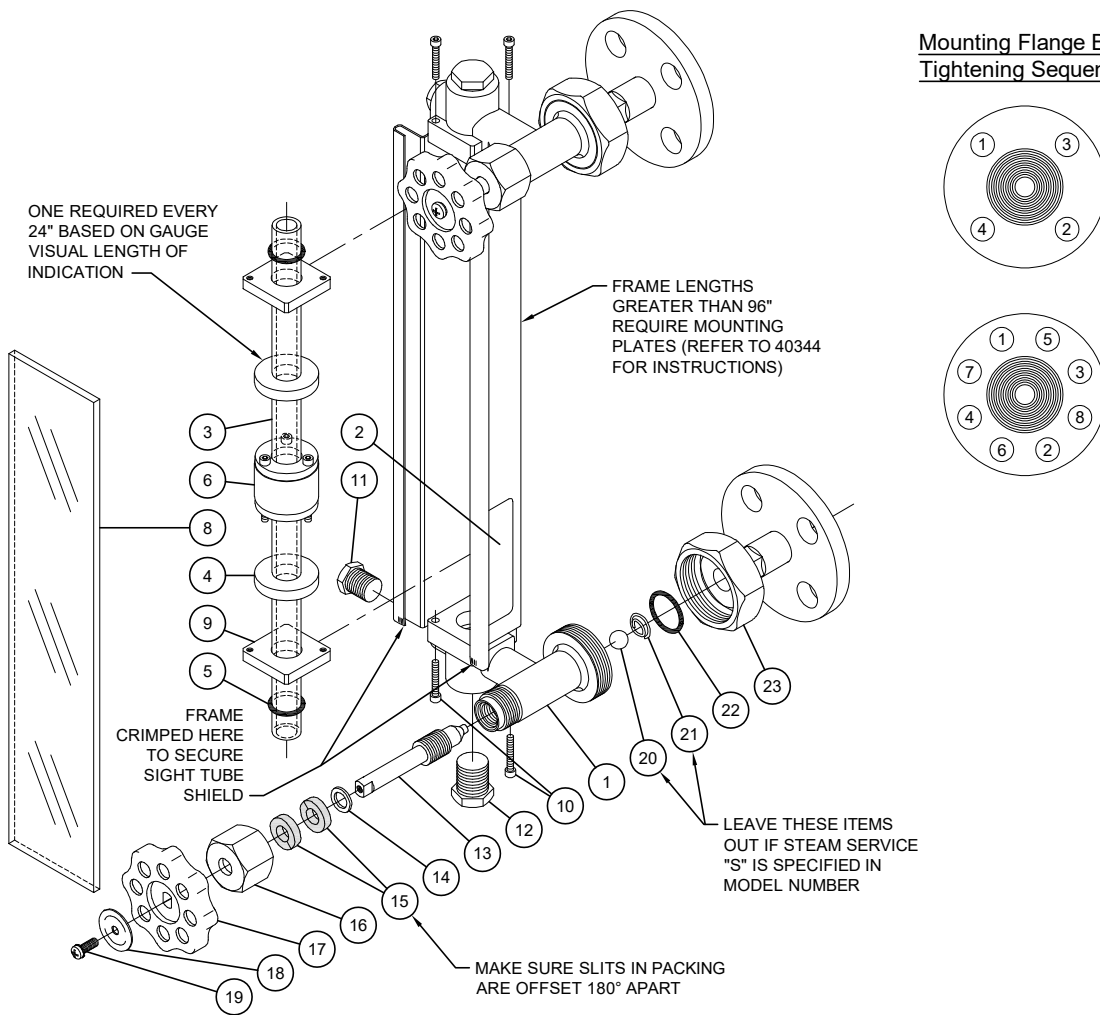
**4. Sight Tube removal is as follows:**

- Remove existing thermoplastic or expanded metal sight tube shield per item 8 by bending crimped portions of gauge frame away from shield so it can easily slide out. (Note: Due to potential sharp edges, gloves are recommended when removing expanded metal sight tube shields.)
- Remove hex socket head screws per item 10 from each end of gauge.
- Carefully push sight tube per item 3 up into upper gauge frame connection block as far as is required to enable lower end of sight tube to swing out from inside of gauge frame. (Note: On very short gauges, it may be necessary to remove sight tube through 1/2" NPT vent port on upper end of gauge.)
- Carefully lower sight tube out of upper gauge frame connection block. (Note: Extra care should be taken if sight tube has splicer(s) per item 6 so sight tube assembly does not come apart.)
- Remove O-ring seals per item 5, O-ring compression plates per item 9, sight tube isolator(s) per item 4 and sight tube splicer(s) per item 6 from sight tube. (Note: Sight tube may or may not have sight tube isolator(s) or sight tube splicer(s).)

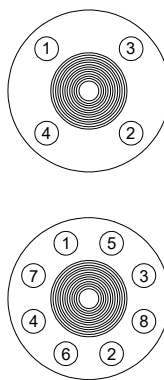
**5. Sight Tube installation is as follows:**

- Slide sight tube isolator(s) per item 4, O-ring compression plate per item 9 and new O-ring seal per item 5 onto each end of sight tube per item 3.
- Assemble sight tubes and splicer per item 6 if sight tube splicer(s) exists. See sight tube splicer assembly illustration and instructions below.
- With threaded holes in compression plates per item 9 aligned with holes in upper and lower gauge frame connection blocks, carefully push upper end of sight tube into upper gauge frame connection block as far as is required to enable lower end of sight tube to swing over and into the lower gauge frame connection block. (Notes: Extra care should be taken if sight tube has splicer(s) so sight tube assembly does not come apart. On very short gauges, it may be necessary to install the sight tube through 1/2" NPT vent port on upper end of gauge.)
- Install hex socket head screws per item 10 into blocks on each end of gauge and thread them into O-ring compression plates per item 9 and tighten securely. (Notes: Kenco recommends using lubricant on threads to protect against galling. Be sure to alternate back and forth between screws while tightening to ensure that plates are tightened down evenly.)

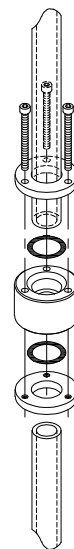
6. Valve stem assembly per items 13 through 19 on each end of gauge to be assembled and disassembled as illustrated in exploded gauge drawing below. (Note: When reassembling valve stems, Kenco recommends using lubricant on threads to protect against corrosion, seizure, galling, etc.)



Mounting Flange Bolt Tightening Sequence



Sight Tube Splicer Assembly



Assemble multi-piece sight tube splicer with new O-rings on sight tubes if one exists. If sight tube splicer body is metal, there are (2) PTFE O-rings that will need to be installed between ends of sight tube and sight tube splicer body to avoid sight tube contact with metal sight tube splicer body. (Note: Be sure to alternate back and forth between screws while tightening to ensure that O-ring compression plates are tightened down evenly.)

**DECLARATION AND CONFIRMATION:**

**Asbestos materials are not utilized in any assembly or subassembly component during the construction of this product.**