

#### **INSTALLATION OF COMPLETE UNITS SUPPLIED WITH GAUGE**

Pre-assembled (glycerin filled with gauge attached) SENTINEL Diaphragm Seals are easily installed into a piping system with the use of a close nipple and tee. PTFE tape should be used as the pipe sealant on all threads. Plastic models should be installed no more than hand tight. Plastic threads will expand as more pressure is applied. The use of tools may result in a cracked housing and possible leakage. Metal models should be tightened snug. A strap wrench can be used, but do not over tighten. The sharp edge of a close nipple can rupture the diaphragm.

Gauges on the SENTINEL Diaphragm Seal are filled with glycerin by the use of a vacuum evacuation method. **DO NOT DISASSEMBLE A PRE-ASSEMBLED Diaphragm Seal**, except for diaphragm replacement. Disassembly will lead to the loss of glycerin and a possibility of air entrapment. Air or any other gas allowed to enter the filled chamber will result in inaccurate gauge or switch readings.

#### **INSTALLATION AND FILLING FOR DIAPHRAGM SEALS WITHOUT FACTORY INSTALLED GAUGES**

1. Unassembled (unfilled without gauge) Diaphragm Seals must be completely filled with a temperature stable fluid. Glycerin, silicone or mineral oil are commonly used fluids. In addition, the gauge or other pressure instrument must also be filled with the fluid. All air must be removed from the chamber and the instrument to ensure accurate pressure/vacuum readings.
2. Pour liquid glycerin into the Diaphragm Seal (gauge side) until it reaches the top of the threads. Heating the glycerin to the temperature of hot tap water will thin it and ease the filling process. Tap the unit on a table to release any air bubbles. It is very important that no air remains in the glycerin side (gauge side) of the Diaphragm Seal.

If the Diaphragm Seal is to be installed on instrumentation other than a gauge, skip to step #6.

3. **DIAPHRAGM SEALS ON PRESSURE GAUGES**  
The air in the Bourdon tube inside the gauge must be replaced with glycerin. Remove the snubber of the new gauge if possible. The snubber is the plug in the inlet of the gauge. It contains a very small hole, which will create difficulty in filling the gauge tube. Removal will not affect the gauge performance because the SENTINEL Diaphragm Seal produces the same needle dampening affect as a snubber does.
4. The bourdon tube in the gauge may now be filled. Slowly pour or inject glycerin into the gauge's inlet port. Remember, warming the glycerin will help. The best gauge fill method is to pull a vacuum of 15 in. Hg in the bourdon tube.
5. A thin wire should be inserted into the inlet to aid in releasing the trapped air in the tube. Skip to step #7.
6. **DIAPHRAGM SEALS ON PRESSURE INSTRUMENTS**  
The pressure-sensing chamber of the instrument must be filled completely with glycerin allowing no air bubbles to remain. The instrument can then be installed onto a Sentinel Gauge Isolator.
7. When re-installing the gauge or instrument on the Diaphragm Seal, gently and lightly press up on the diaphragm with a blunt object (like the eraser end of a pencil) as the gauge is threaded on. Failing to do so may pressurize the Diaphragm Seal, leading to an inaccurate gauge pressure reading. While pressing up on the diaphragm, turn the gauge or instrument over and thread it into the Diaphragm Seal. Some glycerin will be lost during gauge installation - this is normal.

**Standard Product Warranty:** Blacoh Fluid Control warrants its products to be free of defective material and workmanship under normal use and service for two years from date of shipment. The remedy for any product defect covered under this warranty shall be limited to the replacement or repair of the defective part or parts and Blacoh will not be responsible for damages or injury caused to other products, machinery, buildings, property or person. This warranty shall be null and void if the product has been altered, misapplied, misused, or neglected of maintenance. Damage or loss resulting from over-pressurization of a product, whether from gas or fluid does not constitute a defect covered under this warranty nor will Blacoh be responsible in any way for any such damage or loss. Because Blacoh cannot anticipate or control the many different conditions under which its products may be used, Blacoh does not guarantee the applicability or suitability of its products for any particular use or purpose. Each user of Blacoh products should conduct its own tests to determine the suitability of each product for its intended uses or purposes. Blacoh products are sold with this limited warranty and each buyer assumes all responsibility for loss or damage, including consequential damage, arising from the handling and use of Blacoh products whether used in accordance with Blacoh's directions or otherwise. Statements concerning the possible use of Blacoh products are not intended as recommendations for any specific use of such products. This Standard Product Warranty shall be governed by and construed in accordance with the laws of the State of California.