

Operating Principles

When the Solinst Bladder Pump is placed in a well or borehole, water rises inside the bladder and sample tubing to static level. Compressed nitrogen or air is supplied to the pump via the drive tubing using a Control Unit. Applying pressure causes the bladder to compress and closes the bottom check valve, forcing water from the bladder into the sample tubing.

During a vent cycle the pressure is released from the drive tubing. The bladder returns to its initial state as water re-enters the pump, while the top check valve prevents water already in the sample tubing from falling back into the bladder. Cycling the drive and vent provides water flow, the rate of which can be adjusted for purging or sampling.

- Notes:**
1. The maximum depth for stainless steel Bladder Pump operation is 500 ft. (150 m) below grade.
 2. **DO NOT** exceed an operating pressure of 250 psi.
 3. The 464 External Filter (#112832) is recommended, if using a compressor to operate the Bladder Pump

Pump Operation

Portable: The pump will be attached to skip-bonded, dual 1/4" OD tubing, mounted on a reel.

- To accommodate the 1/4" sample tubing, insert the 1/4" compression adaptor into the 3/8" sample line fitting. The 3/8" fitting nut may have to be loosened first, then tightened after the 1/4" adaptor is inserted (see overleaf).
- Push the tubing inserts into the tubing and into the drive and sample compression fittings of the Bladder Pump. The compression fitting nuts may have to be loosened before the tubing is inserted. Tighten the nut 1-1/4 turns past finger tight for a proper seal (see overleaf).
- Lower the assembled Bladder Pump into the well, using a Kevlar cord or stainless steel safety line connected to the eye bolt on the pump. The Solinst Model 103 Tag Line can be used for this purpose.
- Connect the supply line with the optional 464 External Filter from the compressed gas source to the Control Unit. The drive line connects from the Control Unit to the reel (drive and supply lines come with the 464 Control Unit).
- Attach a short (3 ft. or 1 m) length of 1/4" OD sample line to the sample connector on the reel.

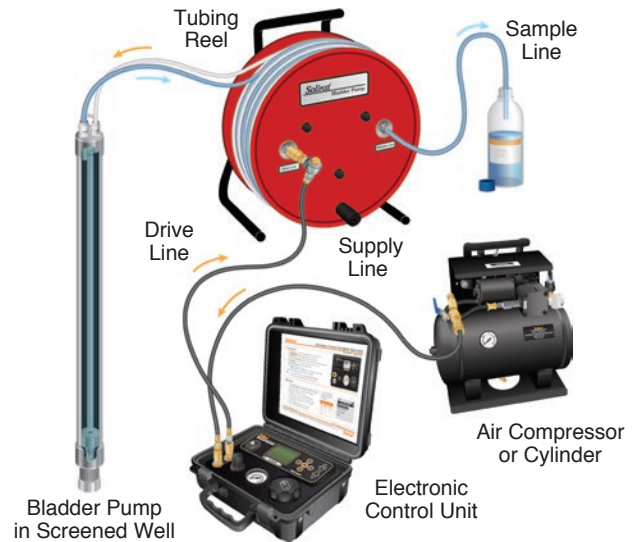
Dedicated: Tubing is cut to length, as required, for attachment to a Wellhead.

- Cut the tubing to desired length. See step b) above for tubing connection instructions to the pump.
- Attach the sample line and drive line to the appropriate push fitting on the underside of the Wellhead (see diagram at right for use of push fittings and adaptors).
- Lower the Bladder Pump into the well, using a Kevlar cord or stainless steel safety line. Attach the safety line to the suspension hook on the underside of the Wellhead. Push the Wellhead down firmly onto the riser casing.
- Connect the supply line with the optional 464 External Filter from the compressed gas source to the Control Unit. The drive line connects from the Control Unit to the Wellhead (drive and supply lines come with the 464 Control Unit).
- Attach a short (3 ft. or 1 m) length of 3/8" OD sample line to the sample connector on the Wellhead (see diagram at right for use of push fitting).

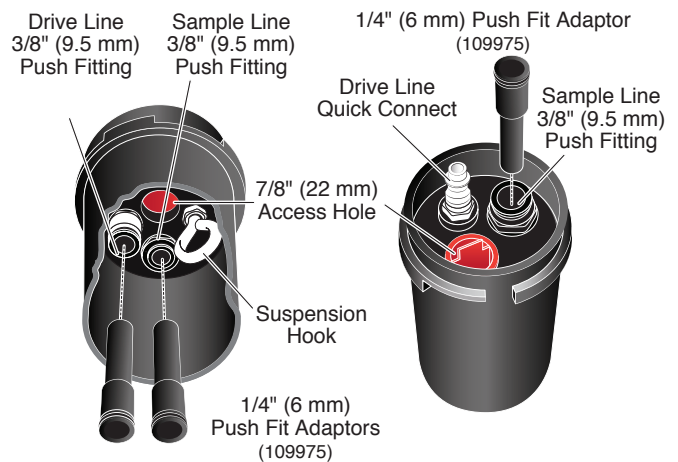
For detailed pumping instructions, please see the Solinst Model 464 Control Unit Operating Instructions.

Note: Tube fittings are based on use of 1/4" drive line and 3/8" sample line. A 3/8" to 1/4" adaptor is also supplied, if dual 1/4" tubing is preferred, or when using a portable reel.

Portable Sampling Setup



Dedicated Wellhead Setup (110227)



Wellheads come with three 1/4" push fit adaptors so that either 1/4" or 3/8" tubing can be used, as preferred. To attach tubing just push into push fitting. To release tubing push down on both sides of the top ring and pull tubing out.

Optional Drive Line Adaptor (107117)



When the Bladder Pump is deployed without a Wellhead or Tubing Reel, use a Drive Line Adaptor to allow the connection of the drive line quick connect fitting from the Control Unit to the drive line pump tubing.

Disassembly

1. Unscrew and remove the Filter Retainer, Filter Screen and Top and Bottom Platens, being careful not to lose the Check Balls. Remove the Bladder Sleeve from the Pump Body.
2. Remove the Top and Bottom Retainers from the Bladder Sleeve. While gripping the Bladder Sleeve, you may need to push one end onto a solid surface to help get the first Retainer out, then use the Center Rod to push the other Retainer out. Slide the Center Rod out of the Bladder.
3. Remove the Bladder from the Bladder Sleeve using a pair of needle nose pliers.

Note: The pump has been decontaminated before leaving Solinst, however, you may wish to decontaminate your pump before use. The pump should be decontaminated between wells.

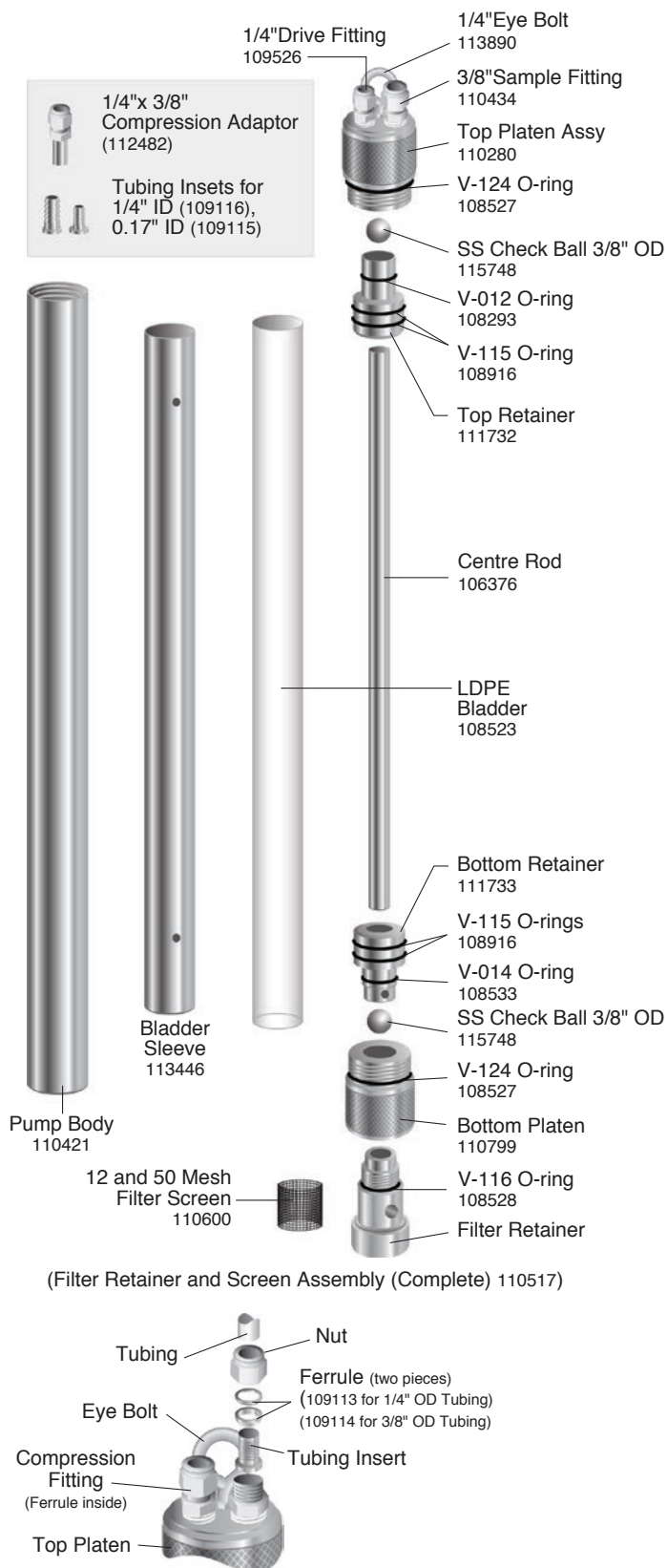
Decontamination

1. Completely disassemble the Pump.
2. Wash all pump components with phosphate-free soap or a detergent.
3. Rinse all components thoroughly with deionized water.
4. Replace any worn O-rings and Bladder if necessary, and reassemble.

Reassembly

1. Manually slide the new Bladder into the Bladder Sleeve. It will extend beyond the Bladder Sleeve at both ends.
2. Using your fingers, slightly stretch/flare both ends of the Bladder.
3. If necessary install new O-rings on both Top and Bottom Retainers and both Platens. (Total of 8.)
4. Slide the Bladder so about 1/4" extends beyond one end of the Bladder Sleeve. Hold the other end of the replacement Bladder to minimize slip within the Sleeve. Liberally lubricate a Retainer with water, and insert it first at a 45° angle and rotate gently back and forth until the Bladder has been pushed about 1/4" past the second O-ring on the Retainer.
5. Insert the Centre Rod into the Sleeve and ensure it seats in the Retainer.
6. If required, trim the Bladder at the other end so it extends at least 1/4" beyond the Bladder Sleeve. Lubricate the second Retainer with water, insert it at a 45° angle then align it onto the Centre Rod. Working gently to avoid twisting or crumpling of the Bladder, push the Retainer into the Bladder until the Centre Rod is fully seated in both Retainers and the Bladder has been pushed about 1/4" past the second O-ring on the Retainer.
7. Using a sharp knife, trim any excess Bladder material so it is flush with the edges of the Bladder Sleeve on both ends.
8. Put the Filter Screen over the Filter Retainer. Screw the Filter Retainer into the Bottom Platen.
9. Drop the 3/8" OD 316 stainless steel Check Ball into the Bottom Platen. Do not force the ball in, as the correct ball should drop in easily.
10. Fit the Bottom Retainer of the assembly firmly into the Bottom Platen.
11. Slip the Pump Body over the assembly and screw it onto the Bottom Platen.
12. Drop a 3/8" OD 316 stainless steel Check Ball into the Top Platen and screw the Pump Body onto it.
13. Shake the assembled pump to hear if the Check Balls rattle. If not, repeat steps 10 to 12 to ensure that the Check Balls are positioned correctly.

Model 407 2 ft. x 1.66" dia. SS Bladder Pump (114291)



Note: Be careful not to lose the two pieces of the ferrule if loosening or removing the nut from the compression fitting.