

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 1" Bladder Pump operation is 500 ft. (150 m) below grade.
 2. **DO NOT** exceed an operating pressure of 250 psi.
 3. Air dryers are recommended, if using a compressor to operate the Bladder Pump.

Pump Assembly

Portable: The Bladder Pump can be connected to skip-bonded, dual 1/4" OD tubing, mounted on a reel.

- Push the drive and sample tubing over the tubing barbs on the stems. The drive tubing connects to the stem identified by a small dimple/indent beside it.
- Lower the assembled Bladder Pump into the well, using a stainless steel safety line connected to the eye safety stem on the pump. The Solinst Model 103 Tag Line can be used as a safety line if required.
- Connect the supply line 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 Model 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.

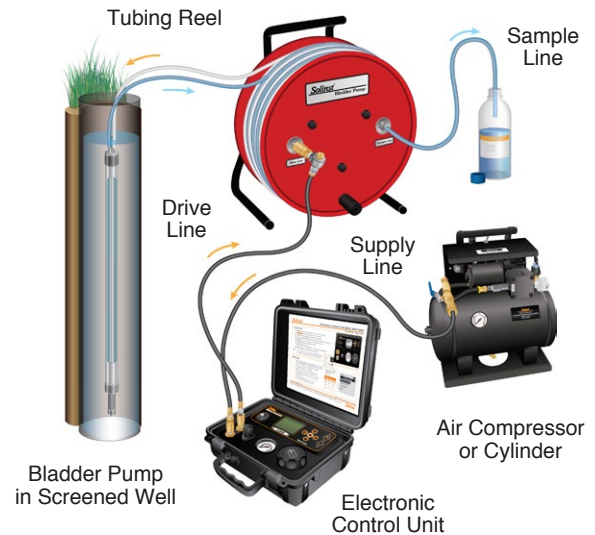
Dedicated: The Bladder Pump is assembled by connecting to a Dedicated Wellhead with 1/4" OD sample and drive line tubing.

- Cut the tubing to desired length. Push the drive and sample tubing over the tubing barbs on the stems. The drive tubing connects to the stem identified by a small dimple/indent beside it.
- 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 Kevlar cord or a stainless steel safety line connected to the suspension hook on the Wellhead, if desired. Push the Wellhead down firmly onto the riser casing.
- Attach a short (3 ft. or 1 m) length of sample line to the sample fitting on the Wellhead (see diagram at right for use of push fittings and adaptors).
- Connect the supply line from the compressed gas supply to the Control Unit. The drive line connects from the Control Unit to the top of the Wellhead (drive and supply lines come with the Model 464 Control Unit).

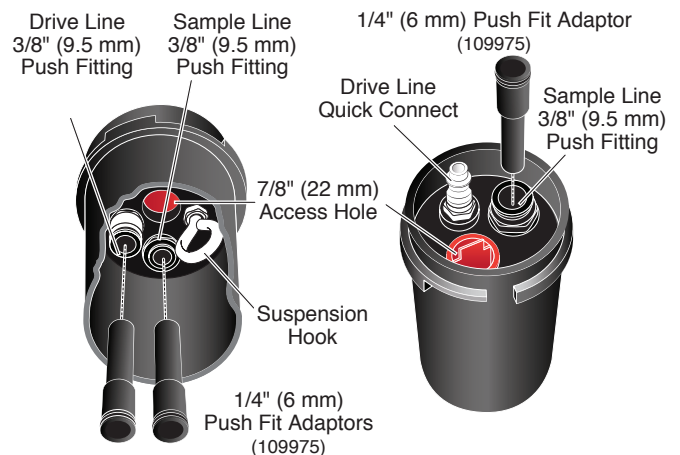
For detailed pumping instructions, please see the Solinst Model 464 Control Unit Operating Instructions.

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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. 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 washed before leaving Solinst, however, you may wish to decontaminate your pump before use. The pumping assembly should be decontaminated between wells.

Decontamination

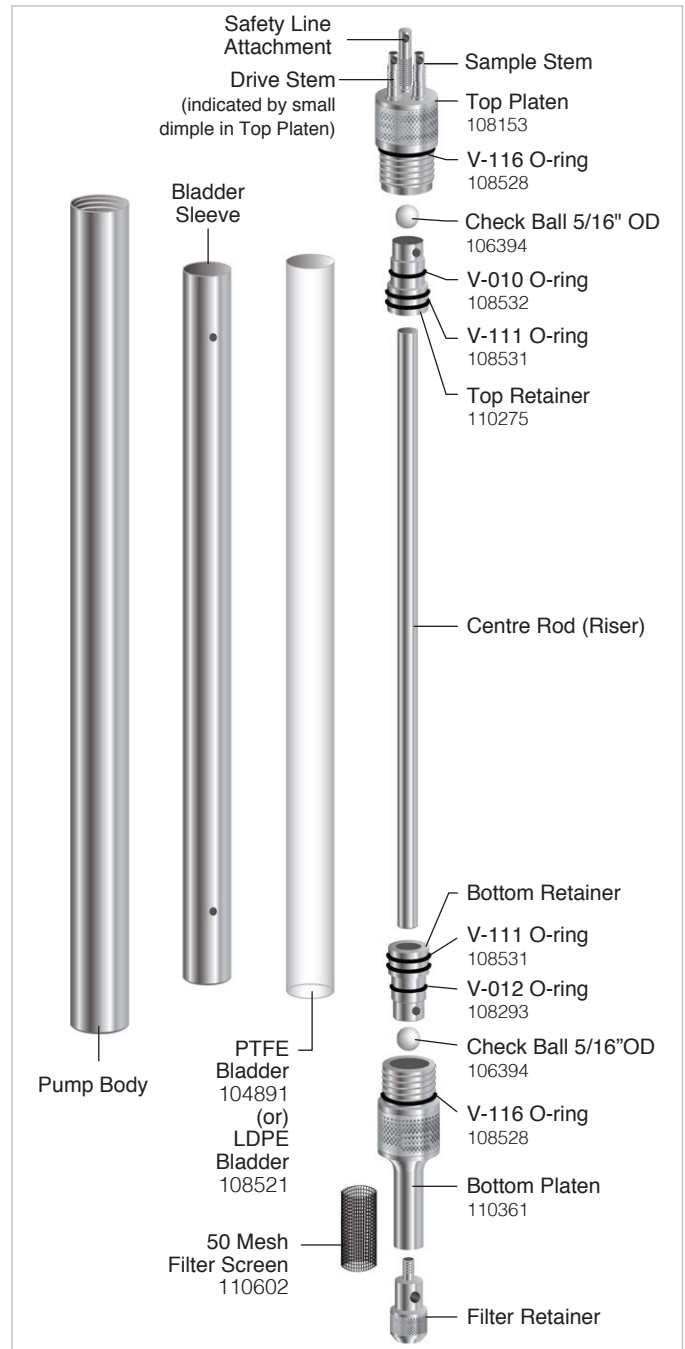
- Notes:**
1. Always follow your local guidelines and standard protocols.
 2. Do not use acetone on the O-rings.

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.
5. The Pump's interior can be cleaned without disassembling by flushing your cleaning solution up and through the Pump's intake. With the Pump's Filter removed, use a peristaltic pump connected to the Bottom Platen, to push the cleaning solution through the Pump. Then flush the Pump with deionized water.

Reassembly

1. Manually slide the Bladder into the Bladder Sleeve. It will extend beyond the Bladder Sleeve at both ends.
2. Using your finger, flare both ends of the Bladder.
3. If necessary install new O-rings on both Top and Bottom Retainers and both Platens (8 in total).
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. 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. Take the Bottom Platen and drop the 5/16" OD Teflon Check Ball into it.

9. Fit the end of the bladder assembly firmly into the Bottom Platen.
10. Slip the Pump Body over the assembly and screw it onto the Bottom Platen.
11. Drop a Check Ball into the Top Platen and screw the Pump Body onto it.
12. Shake the assembled pump to hear if the Check Balls rattle. If not, repeat steps 8 to 11, to ensure that the Check Balls are positioned correctly.
13. Fit the Filter Screen onto the Bottom Platen and screw the Filter Retainer into place.



1" Stainless Steel Bladder Pump