

# PFAS Free Spectra Silicone Bladder Pump 2.0

Operation Manual



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# Product Introduction

## Introduction

The Spectra Bladder Pump Sil 2.0 is a groundwater sampling bladder pump operated with the Spectra Hydro Pro Controller/Compressor. Bladder pumps are generally used where peristaltic pumps fail – at depths greater than 22ft. Bladder pumps operate in tandem with a compressor and controller, allowing them to reach greater depths than a peristaltic pump. These pumps are connected to a controller/compressor through an airline. The airline is connected to an internal bladder.

The air line connects the pump with the controller and pressurizes the chamber with the bladder. This causes the bladder to contract and expel the water within through the water line. Backflush is avoided by check valves. This occurs in a cyclical manner as set on the controller. With Pump time denoting the amount of time the Air Compressor is active in pushing air into the chamber, and refill time denoting the amount of time the Air Compressor is off and the water is refilling into the chamber.

The benefit of using a bladder is that it can operate at greater depths than the peristaltic pump. The peristaltic pump is only able to produce 33ft of lift, meaning it is inoperable at depths greater than 33ft. Whereas the bladder pump can operate at depths up to 300ft (depending on conditions). The bladder pump offers less turbulence as it operates cyclically meaning it causes less disruption within the well. This leads to less turbid samples and a more representative sample of actual well conditions.

## Functional Design Theory

The Spectra Bladder Pump sought to innovate the current bladder pump market through 3 key areas:

1. **Reduction of Plastic Waste:** Current Bladder Pumps solely offer LDPE/PTFE bladder sleeves, contribution large amounts of plastic to the landfills. The Spectra Bladder Pump Sil 2.0 uses inert less toxic medical grade silicone sleeves.
2. **Ease of Use:** A throughout analysis of the current Bladder Pump market found that all of them to be difficult to use, the changing of the Bladder provided extreme discomfort especially under extreme conditions. The Spectra Bladder Pump has an easy to swap design and easy to clean Pump head and does not require extensive deconstruction of the pump to swap bladders.
3. **PFAS Compliance:** Recent studies have completely omitted the usage of Teflon Bladder Sleeves due to PFAS leeching. Also, studies have shown mixed results on the usage of LDPE Bladder Sleeves. Spectra designed the Spectra Silicon Bladder Sleeve with PFAS sampling in mind. Our sleeves have been factory analyzed to contain none of the 34 PFA. In addition, recent studies confirm Silicon tubing as not contributing to PFAS contamination.
4. **Reducing the risk of cross contamination:** The Spectra Bladder Pump addresses the issue of PFAS in a twofold manner: through an elimination of potential PFAS cross contaminating materials (Contains no LDPE, HDPE, Teflon parts) and it reduces the time and effort required to change bladders. The Spectra Bladder Pump Sil 2.0 is the only bladder pump in the market to eliminate all PFAS cross contaminants, employing an all Stainless steel/Silicone build.

## System and Components

### **Pump Head**

The Spectra Bladder Pump Sil 2.0 Pump head incorporates a top headed water intake. The check valve is located on the side of the Pump (2.0) or the top of the pump (1.0). The Spectra Bladder Pump is quick and easy to replace, simply detach the Pump Head from the body and remove the connector and silicone tubing. Place the Pump head into a lab provided or Spectra PFAS free container with Deionized water and dishwasher soap, close the lid and shake. Remove from the calibration cup and rinse with deionized water.

### **Pump Body**

Built with 304 SS the pump body is a rugged container that can be disassembled and reassembled.

### **Pump Bottom Plug**

The Bottom Plug includes the serial number of the pump and other identification numbers.

### **Silicon Bladder Sleeve**

The Spectra Silicon Bladder Sleeve is a trademark of Spectra Scientific Inc and is the only truly PFAS free sampling sleeve for Bladder Pump Systems.

### **Stainless Steel Collar**

Easy to grip, new design. Zero room for inherit PFAS contamination as it is built from 304 SS.

### **Stainless Steel Connections**

**Push Connects** – Easy to use, rugged steel push/quick connects.

**Collared Connects** – Easy to use, rugged collared connections. Both options are available and easily interchangeable on the field.

## System Operation

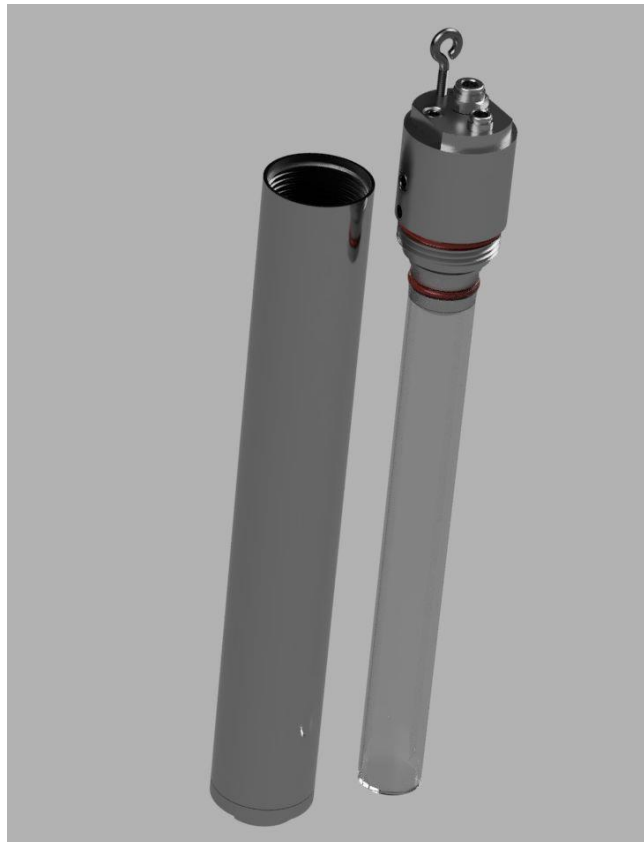
The Spectra Bladder Pump operates in tandem with the Spectra Hydro Pro Controller. The Spectra Hydro Pro is a rugged all-in-one compressor/controller that controls the refill and discharge times for the Spectra Bladder Pump. It is operable with other controllers/compressors as well, for more information contact us directly.

### System Setup

To operate the SBP – simply connect your waterline to the centrally located connection. For reference this is the connection located above the sleeve where water is stored. Connect the airline to the side connection that pressurizes the chamber. Ensure all connections are tight to prevent leak. Lower the Bladder Pump into the well and begin sampling.

### System Decontamination

1. Take the Spectra Bladder Pump and twist the Pump Head counterclockwise to detach from the body. Remove the head and connected bladder, ensure precautions are taken as bladder maybe filled with water.



2. Remove Collar from the bladder and remove the bladder. Apply decontamination procedures to the stainless-steel collar and remove the used bladder. Place the pump head within a PFAS Free Lab container or a Spectra PFAS Free Calibration Cup. Mix 1 part dishwasher soap for 3 parts Deionized water and shake thoroughly. Remove from cup and rinse with deionized water.



3. Take the decontaminated Pump Head and apply deionized water to collar area to ensure easy changing of bladder sleeves. Install the Bladder Sleeve as such and apply the collar above the sleeve.



4. Reinstall the Pump Head to the body. The Spectra Bladder Pump is now available for reuse.

## System Specifications

	2 in	1 in
Pump Head	304 SS	
Pump Body	304 SS	
Pump Bottom Plug	304 SS	
Airline/Waterline Connections	304 SS Quick Connect/Collared	
Bladder Material	Spectra Silicone Bladder Sleeve	
Bladder Collar Material	304 SS	
Volume per Stroke	75 ml	
Pump Outer Diameter	1.75in, 4.445cm	
Pump Length	13.5in, 34.29cm	
Fitting Sizes	1/4in OD AirLine, 3/8 OD Waterline or 1/4in OD Airline/ ¼ in OD Waterline	

## System Troubleshooting

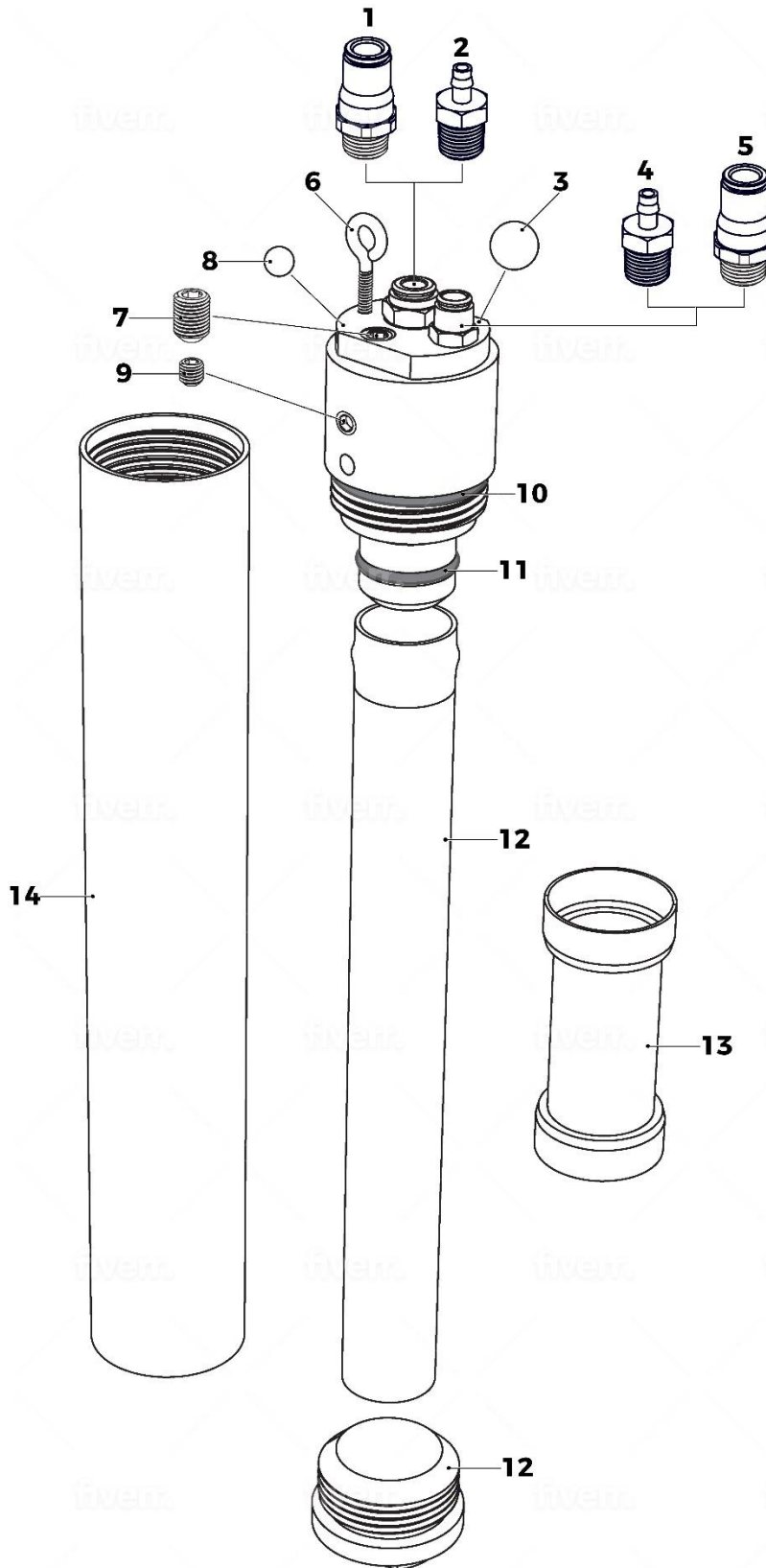
**Problem:** System is not Pumping Water

**Solution:** Check to ensure the airline is not leaking. This can be done by removing the pump from the well and running it in a bucket of water. If a significant number of bubbles are formed near the airline, then remove the pump and tighten the airline. Check where the tubing and airline connection meet and ensure a tight + secure connection.

**Problem:** System is not Pumping Water

**Solution:** Ensure that the depth of the well does not exceed 100 PSI/200 ft. For deeper wells ensure that the compressor is powerful enough to operate at higher depths and a collar is secured on the internal bladder to prevent slippage.

# System Components and Part Numbers





## Warranty

Spectra Scientific Inc warrants this product for failures due to manufacturer's workmanship or material defect for 12 months from the date of purchase for delivery (or delivery whichever is later) by the user. In the event of any failure during this warranty period, simply return the unit to Spectra Scientific, nothing else is required. We stand behind our products. Spectra Scientific Inc will either repair or replace the unit, free of charge.

The warranty is void if the product has been abused, misused, or repairs attempted by unauthorized persons. If Spectra Scientific determines that a failure is the result of misuse a repair estimate will be provided to the customer.

This warranty described above is exclusive, nontransferable and in lieu of all other warranties expressed or implied, including but not limited to any implied warrant of fitness for a particular purpose and all warranties arising from the course of dealing or usage of trade. The buyer's sole exclusive remedy is for repair or replacement of the non-conforming product. In no event shall Spectra Scientific Inc be liable to the buyer, or any person for any special, indirect, incidental or consequential damages whether the claims are based in contract, tort (including negligence) or otherwise in respect to or arising out of the product purchase. The extent of liability is a full refund of the purchase price upon the return of the non-conforming unit.

## Serial Number:

Demo Unit