

Geotech Bladder Pumps

Installation and Operation Manual



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DOCUMENTATION CONVENTIONS

This document uses the following conventions to present information:



WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.



CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.



NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

Chapter 1: System Description

Function and Theory

Geotech’s pneumatic Bladder Pumps operate with a unique action, ideal for both gentle low-flow sampling and high flow rate purging. Timed on/off cycles of compressed air alternately squeeze the flexible bladder to displace water out of the pump to the surface and then exhaust allowing the pump to refill.

Fluid enters and fills the pump through the fluid inlet check valve at the bottom of the pump body via hydrostatic pressure. Once fill, compressed air enters the space between the bladder and the interior of the pump housing, squeezes the bladder, and pushes the fluid to the surface (see figure 1). Driven by the BP Controller or Geocontrol PRO, this cycle automatically repeats.

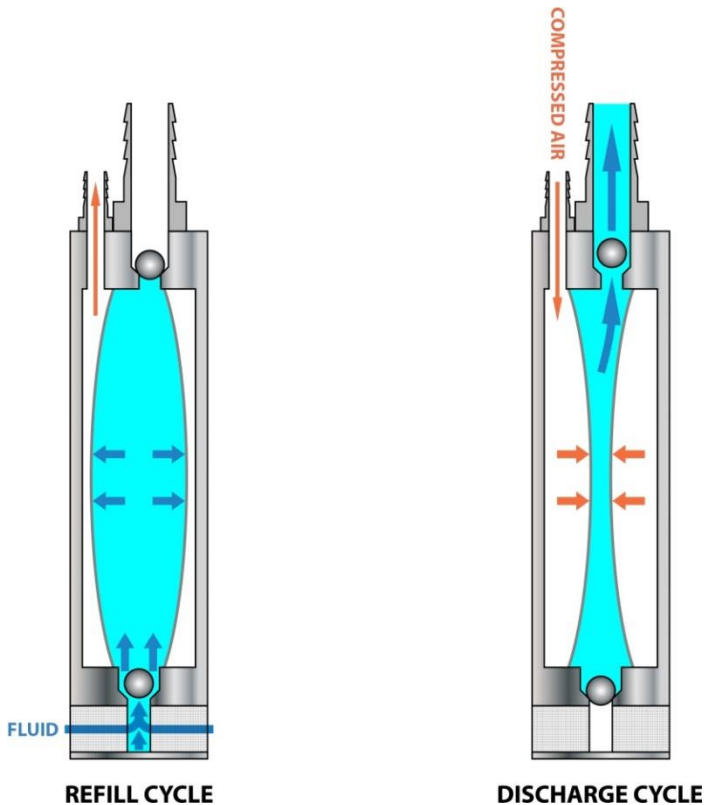


Figure 1 –Bladder Pump Operation

Compressed air does not contact the sample! The bladder prevents contact between the pump drive air and the sample.



Be sure to read and understand your portable generator and/or portable air compressor user manual for proper installation and operation and Earth grounding instructions. If using portable compressed gas tanks, be sure to exercise proper caution, use safety protection devices as outlined by the supplier, and observe any additional safety requirements mandated by local jurisdiction.

System Components

A Geotech Bladder Pump consists of three main parts (see figure 2):

- The Bladder Cartridge Assembly
- Pump Housing
- Intake Screen

**Optional: Drop Tube Intake Assembly*

Bladder Cartridge Assembly

Geotech's 1.66" (4 cm) Bladder Cartridge Assembly (for 18"/46 cm and 36"/91 cm lengths) is factory assembled and tested, and is designed to be field replaceable.

The .850" (2 cm) and .675" (1.7 cm) Bladder Cartridge's are easily replaceable see, Chapter 4: System Maintenance.

Pump Housing

The bladder pump housing is constructed of electro polished 316 Stainless Steel. The housing components consist of threaded top and bottom caps, and the housing tube. Viton O-rings provide the high pressure seals between the end caps and the housing tube.

Intake screen

The intake filter screen is constructed of 316 Stainless Steel and is easily removable for field maintenance. The intake filter screen is intended to protect and extend the life of the bladder material (see warranty).

**Optional: Drop Tube Intake Assembly*

An optional drop tube can be used to sample from depths below the specified maximum sampling depth. The drop tube assembly connects a remote intake to the pump through a tube connected to the pump inlet. The intake depth can be any custom length of tubing. The pump assembly itself must still be submerged below the water level. This means the depth to water cannot exceed the maximum pumping depth of the pump.

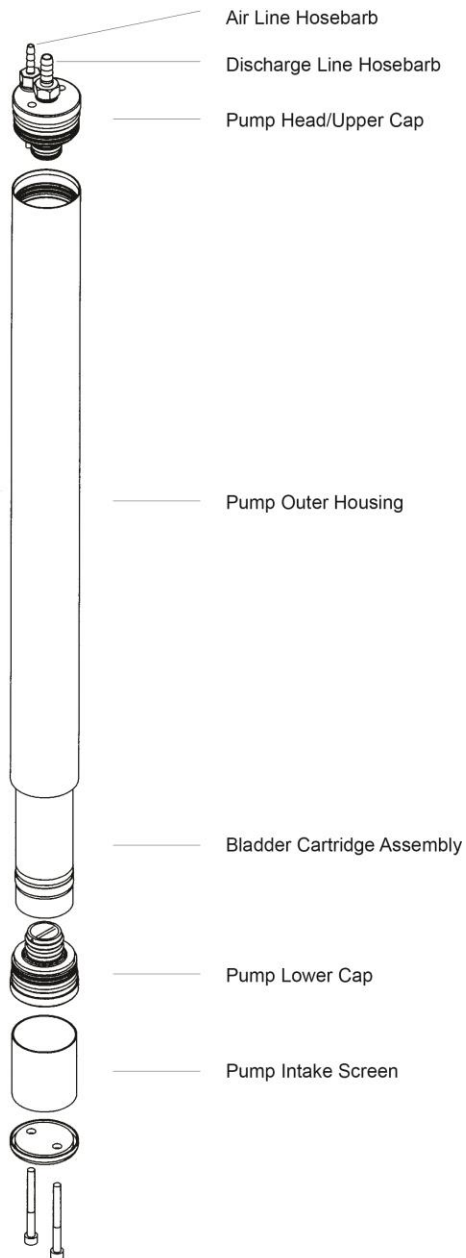


Figure 2 – Basic* Bladder Pump Assembly

**Example above is based on 1.66"/4 cm configuration*

Chapter 2: System Installation

The user must determine site specific parameters such as water level, recharge rate and adherence to low flow purging guidelines.

Pump Tubing Lines

Geotech's Bladder Pumps are engineered for easy installation and use. Dedicated Bladder Pumps are available with the tubing attached. Well identifications (supplied by customer) are located on tags connected to the tubing, and on the tubing bags.

If not pre-attached, upon reaching the well head, connect the air line tubing to air line connection at the top of the Bladder Pump (see figure 3).

For the 1.66" (4 cm) pumps, the air line is smaller than the discharge line. For the .675" (1.7 cm) and .850" (2 cm) diameter pumps, both air and discharge lines are the same size. The letter "A" has been stamped near the air line hose barb on the top of the pump.

Next attach the discharge line to the discharge line connection at the top of pump (see figure 3).

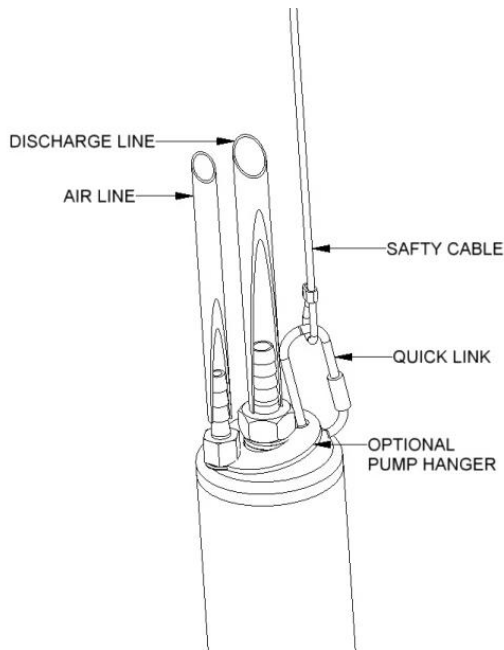


Figure 3 – Pump Head



Failure to attach air and fluid lines to the appropriate ports could result in damage to the bladder.

Safety Cable

Before deploying any sampling pump, secure a safety cable from an anchoring point at or near the well head to the top of the pump.

The optional Bladder Pump Hanger is attached to the Quick Link on the safety cable. Carefully lower the Bladder Pump into the well using the Reverse Coil Method to avoid kinking, until the desired depth is achieved or until the well cap seats.

Reverse Coil Method

When lowering the pump into the well it is important to reverse the natural bend of the coiled tubing so that the tubing will straighten out as it is lowered (see figure 4). As the pump and tubing are lowered into the well, the direction of the bend should be reversed from the direction in which it is coiled. If the tubing is allowed to uncoil naturally and the natural bend not interrupted, the tubing will continue its coil into the well. Using the reverse coil method will avoid hang-ups or difficulty in lowering the pump into the well, especially when the well is not completely vertical, or has come out of alignment for any reason.

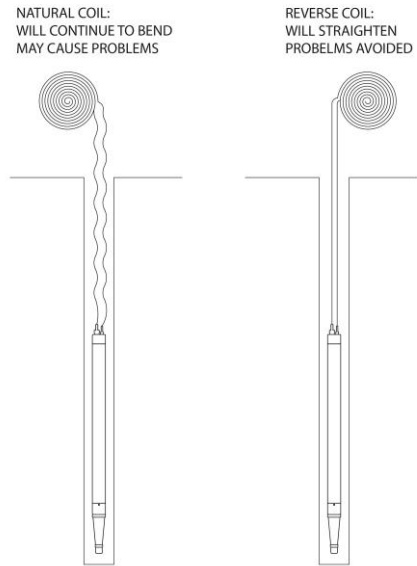


Figure 4 – Reverse Coil Method

Optional Drop Tube Assembly

If a Drop Tube Intake assembly is employed, a third tubing line is necessary to connect from the bottom of the bladder pump to the top of the Drop Tube.

For deployment of optional Drop Tube Assembly attach desired length of drop tube to the intake hose barb and hose barb on bottom of pump. Send the drop tube intake down the well followed by the drop tube tubing, then the pump and finally the air and fluid discharge lines.

Chapter 3: System Operation

Bladder Pump Operation

Fluid enters the pump through the fluid inlet check valve at the bottom of the pump body via hydrostatic pressure. The pump **MUST** be submerged to operate. The bladder then fills with fluid. Compressed air enters the space between the bladder and the interior of the pump housing. The intake check valve closes and the discharge check valve (top) opens. Compressed air squeezes the bladder, pushing the fluid to the surface. The discharge check valve prevents back flow from the discharge tubing.

Selecting an Air Source

Air consumption depends on the volume of tubing and the size of deployed Bladder Pump. Follow the general guidelines and examples below to calculate the air consumption for specific sampling configurations.

Volume of Tubing

TUBE I.D.	TUBING LENGTH					
	1 ft/ 0.3 m	10 ft/ 3 m	50 ft/ 15 m	100 ft/ 30 m	250 ft/ 76 m	500 ft/ 152 m
0.17 in/ 0.43 cm	0.3 in³/ 5 cm³	3 in³/ 50 cm³	15 in³/ 246 cm³	30 in³/ 492 cm³	75 in³/ 1230 cm³	150 in³/ 2460 cm³
0.25 in/ 0.64 cm	0.6 in³/ 10 cm³	6 in³/ 100 cm³	30 in³/ 492 cm³	60 in³/ 984 cm³	150 in³/ 2460 cm³	300 in³/ 4920 cm³

Volume of Bladder Pumps

BP DIAMETER	BP LENGTH	VOLUME (in³)
1.66 in/ 4 cm	36 in/ 91 cm	78 in³/ 1278 cm³
1.66 in/ 4 cm	18 in/ 46 cm	39 in³/ 640 cm³
0.85 in/ 4 cm	18 in/ 46 cm	10 in³/ 164 cm³
0.675 in/ 4 cm	18 in/ 46 cm	6 in³/ 100 cm³

Calculation guideline:

$$\begin{aligned} &\text{Volume of Tubing (in³/cm³)} \\ &+ \text{Volume of Bladder Pump (in³/ cm³)} \\ &= \text{Air Consumption per cycle (in³/ cm³)} \end{aligned}$$

If planning to use an air compressor, use one with a reserve tank to insure proper air supply to the pump. If using a Nitrogen Tank, see figure 5 for Nitrogen Tank Volume vs. Bladder Pump consumption.

Determining PSI

Determine the air pressure needed to operate the Bladder Pump based on the length of the air supply line to the pump (well depth).

Use the simplified formula:

$$\begin{aligned} 0.5 \text{ PSI (per foot)} + 10 \text{ PSI (to account for tubing friction)} &= \text{required PSI} \\ 0.12 \text{ bar (per meter)} + 0.7 \text{ bar (to account for tubing friction)} &= \text{required bar} \end{aligned}$$

As mentioned above, the additional 10 PSI/ 0.7 bar is to account for the pump itself and friction loss along the airline tubing. When the length of the airline is 50 ft./15 meters or less, there is no need for the additional pressure.

To determine minimum operating pressures for the specific Bladder Pump model you are using, consult the pump's specifications. Typically, the minimum operating pressure will be 5 PSI/ 0.4 bar above static head.



The formulas stated above are not absolute, and are meant to provide baseline information.

Flowrates

Flowrates depend on pump size and pump depth. For example, a large pump at shallow depths will produce the most flow, and a small pump at maximum depths will product the least amount of flow. Speak with a Geotech representative to determine the best configuration to meet sampling needs.

If using a nitrogen tank as an air source, see figure 5, Nitrogen Tank Volume vs. Bladder Pump consumption.

For determining the number of cycles it will take to receive sample fluid at the well head, see figure 6, Cycles vs. Depth.

NITROGEN TANK VOLUME VS BLADDER PUMP CONSUMPTION

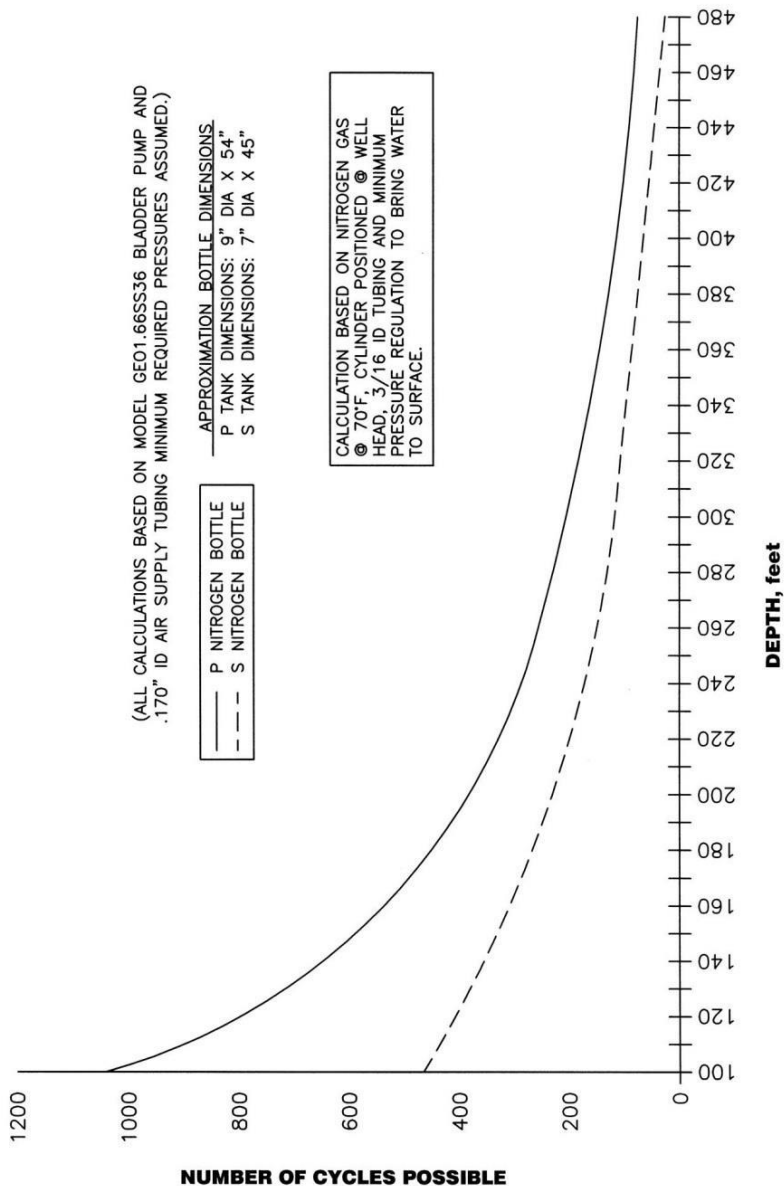


Figure 5 – Tank Volume vs. BP Consumption

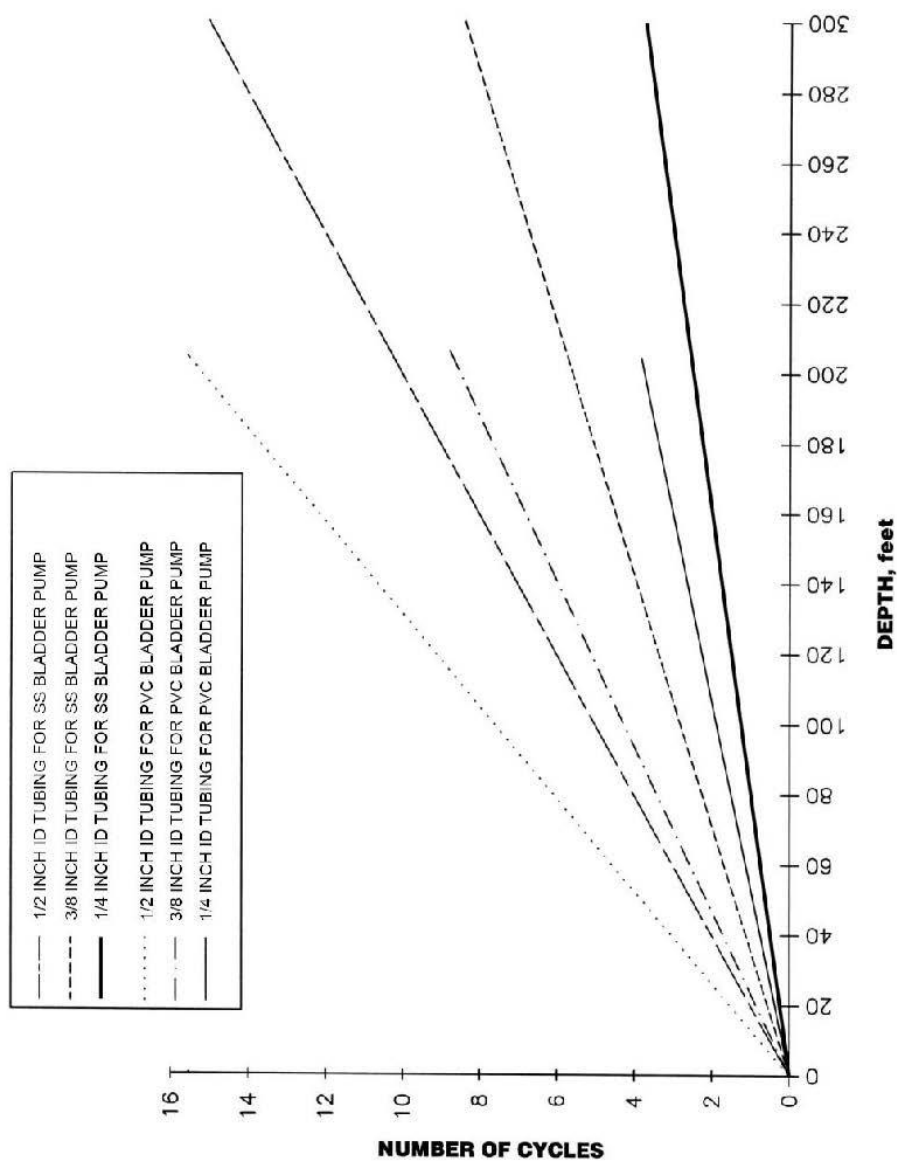


Figure 6 – Cycles vs. Depth

Chapter 4: System Maintenance

Bladder Pump

As with any pump, scheduled or periodic maintenance should be performed, according to your sampling program and specific site conditions. Generally, the more turbid or sandy the water, the more maintenance and cleaning are required.

Replacement bladders, as well as other key components, can be found in Chapter 7: Replacement Parts List.

Disassemble Bladder Pump per instructions, decontaminate or replace parts as needed, then reassemble. Inspect all check balls for wear and replace as necessary. Inspect all O-rings for splits or cracks and replace as necessary.

Replacing the Bladder Cartridge

1.66"/ 4 cm Models

Pull pump from the well, it is not necessary to remove the air and sample lines from the pump. Take care, as the pump may be filled with fluid.

(Models w/screens) Using an allen wrench, remove the shoulder bolts from the intake screen cap.

While holding pump body with your hand or with a strap wrench, use a spanner tool to turn the lower head in a counter clockwise direction and remove (see figure 7). Pump head will be very snug due to the high pressure O-ring seal. Once the seal is broken, the lower head will turn very easily.

The internal bladder cartridge can now be removed for maintenance or replacement. Gently tap the tube housing on a firm wood like surface until the cartridge drops from the upper head seal. Reach into the tube with one or two fingers and pull the cartridge free.

For the 1.66"/ 4 cm models, rebuild the pump in the order it was disassembled.



Inspect O-rings and bladder for damage.
Replace if torn, ripped or excessively worn.

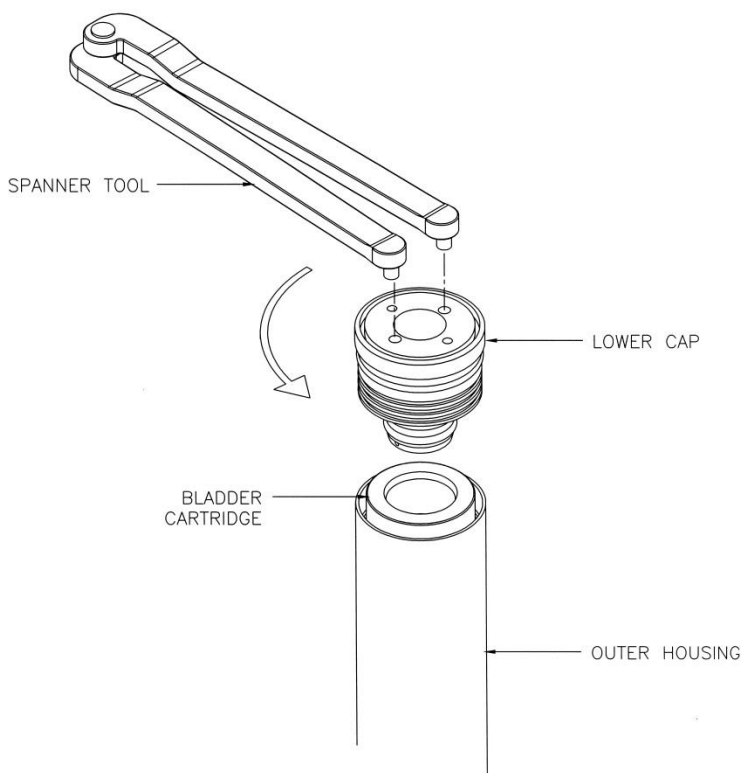


Figure 7 – 1.66 BP Lower Cap Removal

.850 and .675 Models

Pull pump from the well, it is not necessary to remove the air and sample lines from the pump. Take care, as the pump may be filled with fluid.

Remove the lower screen and housing by turning the housing in a counter clockwise direction. Use your hand or a strap wrench.

Remove the lower PTFE compression ring by pulling off end of the internal center tube assembly.



Pull the lower end of the bladder towards the middle of the internal center tube assembly and remove O-ring from the lower end of the tube.

Remove the upper PTFE compression ring and slide the ring off of the end of the internal center tube assembly.

Slide the bladder off of the internal center tube weldment assembly. The bladder can now be replaced or serviced. Rebuild the pump in the order it was disassembled.



SS Check Ball must be inside Intake Assembly. The configuration shown may damage pump.



To reassemble .850 and .675 Models:

Install O-ring to upper end of the center tube weldment assembly.



Slide bladder onto the center tube assembly and over the O-ring on the upper end of the center tube assembly.

Be careful not to roll the O-ring when sliding the bladder over this end.



Slide a PTFE compression ring over the bladder and push down over bladder and upper end of the center tube



With the upper end of the bladder secured by the PTFE compression ring, slide the second compression ring over the bladder about midway down the assembly.

Slide the bladder up, beyond the bottom of the center tube assembly, exposing the lower end of the center tube and install the O-ring into the groove on the lower end.

Slide the bladder back down over the O-ring *being careful not to roll the O-ring*.

Now slide the PTFE compression ring over the bladder until it seats flush with the bottom of the center tube assembly.



Replace the outer housing. Be sure the outer housing is sealed against the upper cap.



Replace the bottom intake assembly by screwing it into the bottom of the pump. There shouldn't be any gaps between the outer housing and top or bottom caps.

Chapter 5: System Troubleshooting

Problem: Air is cycling through controller but will not pump.

Solutions:

- Discharge and Fill times are not set correctly. Check and adjust Discharge and Fill cycle times (i.e. if Discharge time is too long or if Fill and Discharge time is too short).
- Possible compromise in air line tubing. Check air line pumps for leaks. If needed, repair using compression union or replace tubing.
- Check pump intake screen for blockage and clean as needed.

Problem: Controller is cycling but the pump stops producing water.

Solutions:

- Check drawdown level of water in the well. Ensure the pump is fully submerged and off of the bottom of the well.
- Check psi at the regulator and adjust as necessary (see “Determining PSI” in Chapter 3).
- Check for kinks in the discharge line.
- Check pump intake screen for obstructions.
- Discharge time is too long or Fill time is too short; causes pressure build up in pump, causing the pump not to fill.
- Check power source, assure a strong reliable power supply. If using old or weak battery, the control valves may not operate properly.

Problem: Getting air bubbles in sample line.

Solutions:

- Overcharging pump. Reduce discharge cycle time so that discharge cycle ends as fluid discharge trails off. Inspect pump for compromised bladder or o-rings.
- Pump is being overpressurized. Reduce psi to what is necessary to overcome pumping head.
- Check discharge line for holes or kinks. Repair using compression union or replace tubing.

Problem: Discharge line drains back into pump.

Solution:

- Check valve is compromised. Remove Hosebarb on pump discharge outlet. Check the check ball seat for debris. Clean and re-install.

If you are experiencing other problems than mentioned above, please call Geotech Technical Support for immediate assistance, (800) 833-7958.

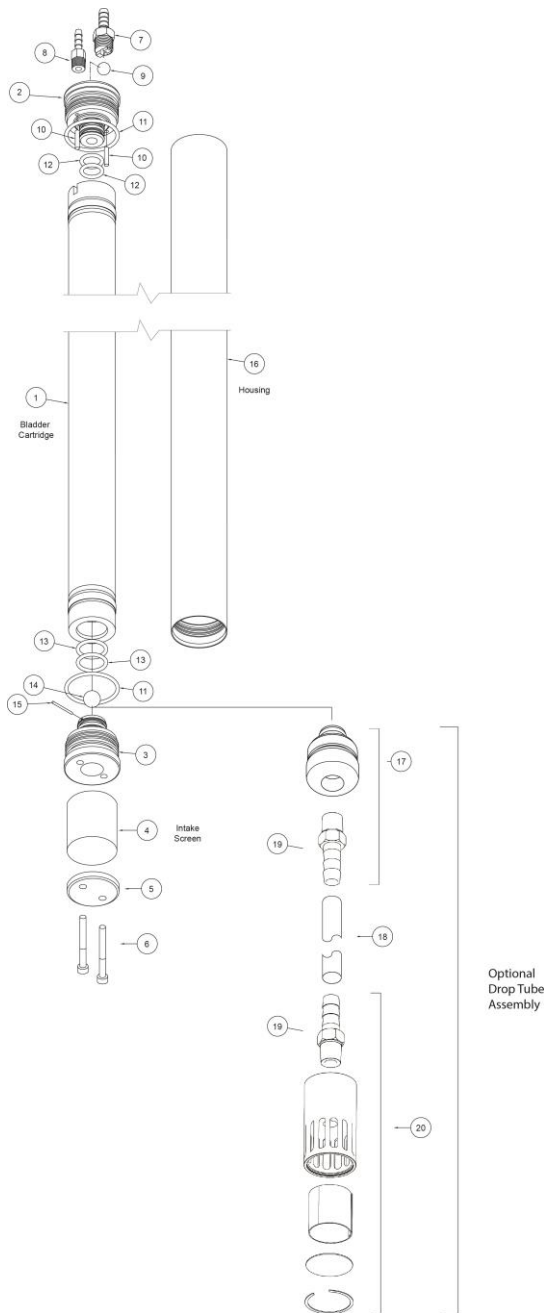
Chapter 6: System Specifications

	1.66, 36"	1.66, 18"	0.850	0.675
Pump Housing	316 SS	316 SS	316 SS	316 SS
Pump Ends	316 SS	316 SS	316 SS	316 SS
Bladder Material	PTFE	PTFE	PTFE	PTFE
Bladder Collar Material	PTFE	PTFE	PTFE	PTFE
Outer Diameter	1.66" 40 mm	1.66" 40 mm	.850" 21.6 mm	.675" 17 mm
Length w/ screen	38" 96.5 cm	20" 51 cm	18 5/8" 47 cm	18 3/4" 47.625 cm
Length w/o screen	36" 91.4 cm	18" 45.7 cm	18" 45.7 cm	18" 45.7 cm
Weight	5 lbs. 1.9 Kg	2.5 lbs. 0.93 Kg	1.1 lbs. 500 g	0.83 lbs. 376 g
Volume/Cycle	21.1 oz. 625 mL	10.5 oz. 313 mL	1 oz. 29 mL	0.5 oz. 15 mL
Min. Well I.D.	2" 50 mm	2" 50 mm	1" 25 mm	.75" 19 mm
Min. Operating Pressure	5 psi (ash)* (.3 bar)	5 psi (ash)* (.3 bar)	5 psi (ash)* (.3 bar)	5 psi (ash)* (.3 bar)
Operating Pressure	10-450psi 0.7-31 bar	10-450psi 0.7-31bar	10-100 psi 0.7-7 bar	10-100 psi 0.7-7 bar
Proof Pressure	675 psi 46 bar	675 psi 46 bar	150 psi 10 bar	150 psi 10 bar
Burst Pressure	1350 psi 92 bar	1350 psi 92 bar	300 psi 20 bar	300 psi 20 bar
Max. Sampling Depth	1000' 305 m	1000' 305 m	200' 61 m	200' 61 m
Tubing Size				
Air Line	.17" ID x .25" OD (4 mm ID x 6 mm OD)	.17" ID x .25" OD (4 mm ID x 6 mm OD)	.17" ID x .25" OD (4 mm ID x 6 mm OD)	.17" ID x .25" OD (4 mm ID x 6 mm OD)
Discharge Line	0.25" ID x .375" OD (6 mm ID x 10MM OD)	0.25" ID x .375" OD (6 mm ID x 10MM OD)	.17" ID x .25" OD (4 mm ID x 6 mm OD)	.17" ID x .25" OD (4 mm ID x 6 mm OD)

*ash = above static head

Chapter 7: Replacement Parts List

1.66 Stainless Steel Bladder Pump Components (18" and 36" Models)



Bladder Pump, 1.66, Stainless Steel, 36", Screened - 81150100

Item	Qty	Description	Part No.
1	1	ASSY,CARTRIDGE,BP,166,SS,36	51150100
2	1	CAP,UPPER,BP,166,SS	11150104
3	1	CAP,LOWER,BP,166,SS,SCREENED	11150107
4	1	SCREEN,INTAKE,BP,SS,166	11150109
5	1	CAP,INTAKE SCREEN,BP,166,SS	11150108
6	2	SCREW,SS6,10-24x2",SCK CAP	17200241
7	1	HOSEBARB,SS6,1/4X1/4MPT,MODIFIED DISCHARGE LINE	11150106
8	1	HOSEBARB,SS6,.170 X 1/8MPT,AIR LINE	21150019
9	1	BALL,SS6,3/8"	17500081
10	2	PIN,DOWEL,SS6,1/8 X 5/8 LONG	17500131
11	2	O-RING,VITON,#126,BROWN	17500104
12	2	O-RING,VITON,#113,BROWN	17500103
13	2	O-RING,VITON,#114,BROWN	17500106
14	1	BALL,SS6,1/2"	17500082
15	1	ROD,SS6,1/16"D,STRAIGHT	17500102
16	1	HOUSING,SS6,BP1.66,36"	11150110
17	§	ASSY,LOWER CAP,166 DROP TUBE	51150113
18	§	TUBING, PE, 1/3 x 1/2, FTm, POLYETHYLENE	87050503
19	§	HOSEBARB, SS6, 1/2 x 1/2 MPT	17200156
20	§	ASSY,INTAKE,1.66SS,DROP TUBE,WITH 1/2" HOSE BARB	51150071
Not Shown:			
	1	ASSY,HANGER,SS6,BP,SAFETY CABLE, 1.66	51150119
	1	MANUAL, BLADDER PUMPS	21150035

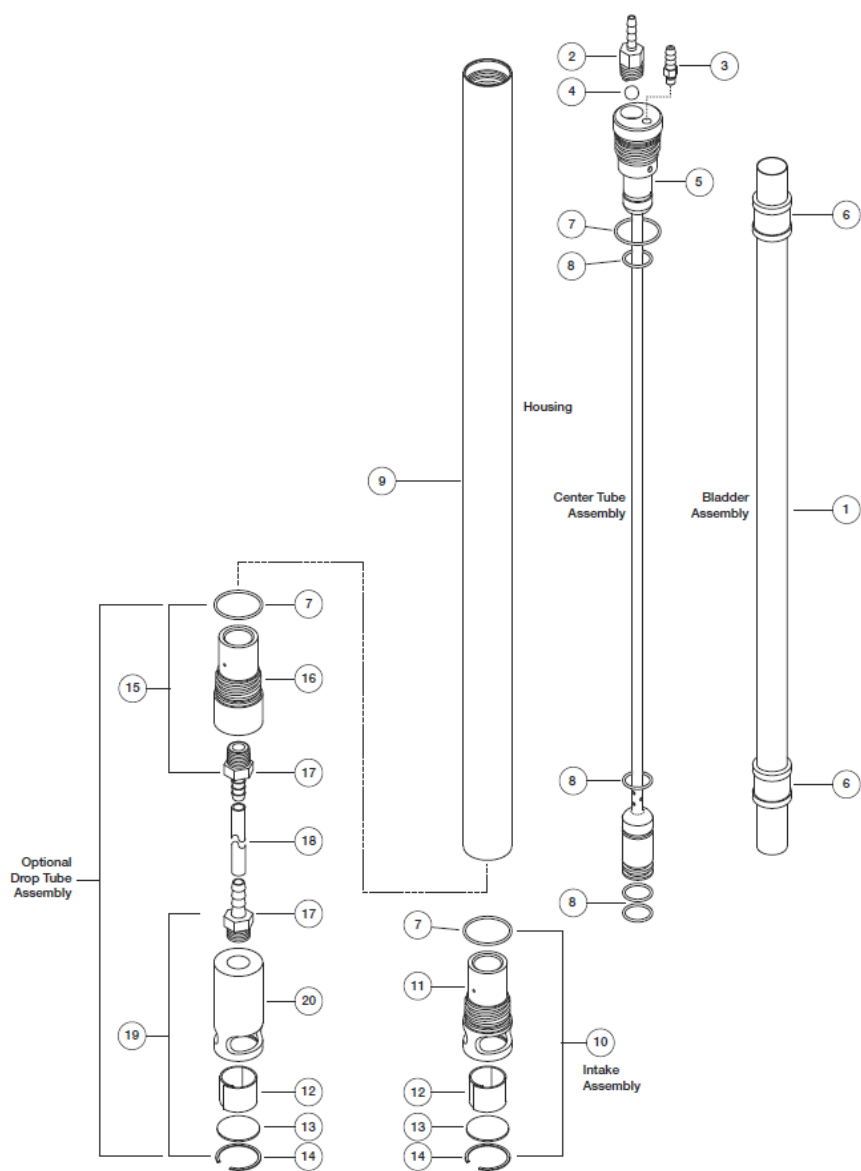
§ = Sold Separately

Bladder Pump, 1.66, Stainless Steel, 18", Screened – 81150107

Item	Qty	Description	Part No.
1	1	ASSY,CARTRIDGE,BP,166,SS,18	51150114
2	1	CAP,UPPER,BP,166,SS	11150104
3	1	CAP,LOWER,BP,166,SS,SCREENED	11150107
4	1	SCREEN,INTAKE,BP,SS,166	11150109
5	1	CAP,INTAKE SCREEN,BP,166,SS	11150108
6	2	SCREW,SS6,10-24x2",SCK CAP	17200241
7	1	HOSEBARB,SS6,1/4X1/4MPT,MODIFIED DISCHARGE LINE	11150106
8	1	HOSEBARB,SS6,.170 X 1/8MPT,AIR LINE	21150019
9	1	BALL,SS6,3/8"	17500081
10	2	PIN,DOWEL,SS6,1/8 X 5/8 LONG	17500131
11	2	O-RING,VITON,#126,BROWN	17500104
12	2	O-RING,VITON,#113,BROWN	17500103
13	2	O-RING,VITON,#114,BROWN	17500106
14	1	BALL,SS6,1/2"	17500082
15	1	ROD,SS6,1/16"D,STRAIGHT	17500102
16	1	HOUSING,SS6,BP1.66,18"	11150153
17	§	ASSY,LOWER CAP,166 DROP TUBE	51150113
18	§	TUBING, PE, 1/3 x 1/2, FTm, POLYETHYLENE	87050503
19	§	HOSEBARB, SS6, 1/2 x 1/2 MPT	17200156
20	§	ASSY,INTAKE,1.66SS,DROP TUBE,WITH 1/2" HOSE BARB	51150071
Not Shown:			
	1	ASSY,HANGER,SS6,BP,SAFETY CABLE, 1.66	51150119
	1	MANUAL, BLADDER PUMPS	21150035

§ = Sold Separately

.850 Stainless Steel Bladder Pump Components

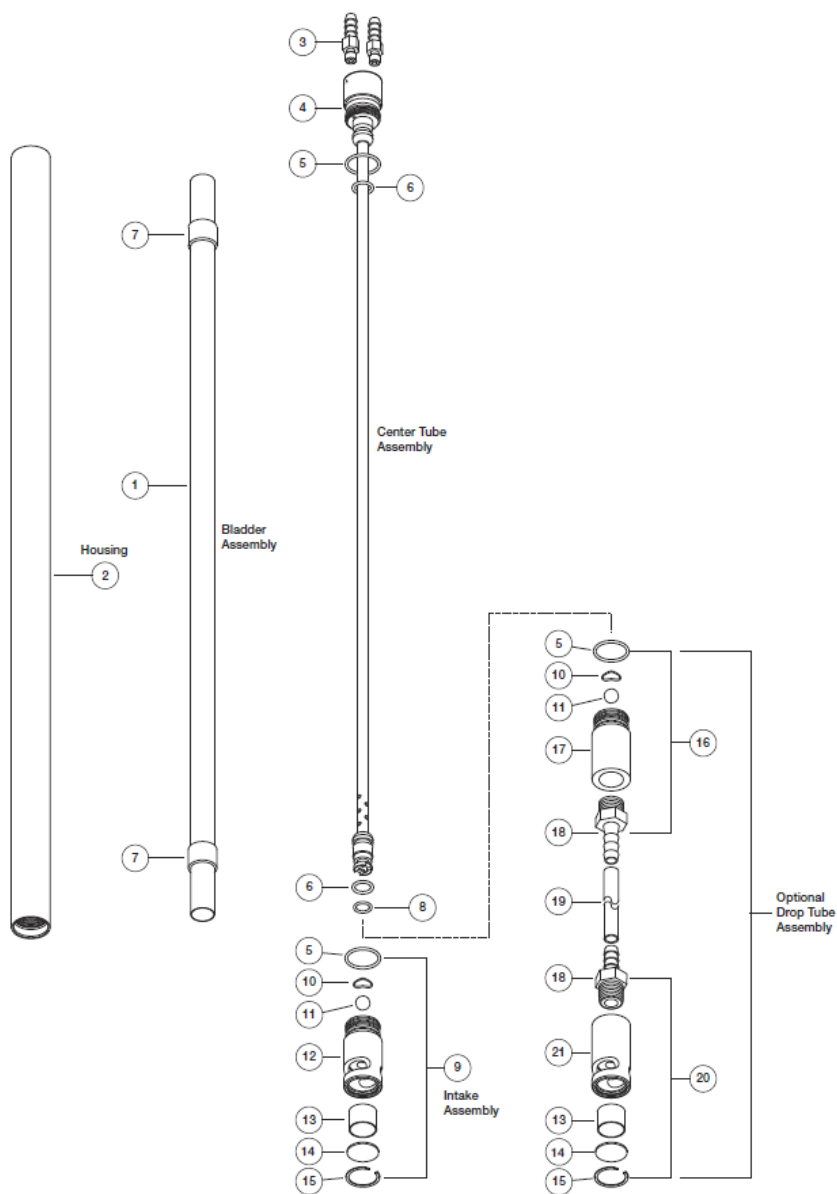


Bladder Pump, .850, Stainless Steel, Screened - 81150115

Item	Qty	Description	Part No.
1	1	BLADDER ,PTFE, .85 BP	51150051
1	§	BLADDER, PE, .85 BP, EA	21150100
1	§	BLADDER, PE, .85, CE, 12PK	21150099
2	1	HOSEBARB, SS6, MOD, .170 X 1/8 NPT DISCHARGE	11150118
3	1	HOSEBARB, SS6, .170 X 10/24 AIR	17200245
4	2	BALL, SS6, 1/4"	17500079
5	1	CAP UPPER WELDMENT, SS6, .85 BP	21150045
6	2	RING, COMPRESSION, PTFE, .850, CE, BP	21150048
7	2	O-RING, VITON, CS .0629, ID 17.1MM	17500112
8	4	O-RING, VITON, #012	17500111
9	1	HOUSING, SS6, .850, BP	21150047
10	1	ASSY, BOTTOM INTAKE, .85 BP	51150118
11	1	CAP, LOWER, SS6, .850, BP	21150046
12	1	SCREEN, INTAKE, SS6, .85 BP	21150050
13	1	DISC, PTFE, .85 BP	21150049
14	1	RING, SNAP, SS6, INTERNAL, .85 BP	11150053
15	§	ASSY, LOWER CAP, .850 BP, DROP TUBE, CE, W/ 1/4" HOSEBARB	51150129
16	§	DROP TUBE, CAP LOWER, .850 BP, CE SS	21150109
17	§	HOSEBARB, SS6, 1/4 X 1/8 MPT	17200072
18	§	TUBING, PE, 1/4 X 3/8, FT POLYETHYLENE	87050502
19	§	ASSY, INTAKE, .850 BP, DROP TUBE, CE, W/ 1/4" HOSEBARB	51150069
20	§	INTAKE, DROP TUBE, .850 BP, CE, SS	21150111
Not Shown:			
	1	MANUAL, BLADDER PUMPS	21150035
	§	SPARE PARTS KIT, .85, BP, CE [Items 4 (2), 6 (2), 7 (2), 8 (4), 12, 13, 14]	51150123
	§	KIT, .85 BP, O-RING SET, CE, O-RING SERVICE KIT [Items 7 (2), 8 (4)]	91150013

§ = Sold Separately

.675 Stainless Steel Bladder Pump Components



Bladder Pump, .675, Stainless Steel, Screened - 81150117

Item	Qty	Description	Part No.
1	1	BLADDER, PTFE, .675, BP, CE	51150126
1	§	BLADDER, PE, .675, EA	21150102
1	§	BLADDER, PE, .675, CE, 12PK	21150101
2	1	HOUSING, SS6, .675, BP	21150032
3	2	HOSEBARB, SS6, .170 X 10/24 AIR	17200245
4	1	WELDMENT, INNER, SS6, .675 BP	51150125
5	2	O-RING, VITON, #014	17500119
6	2	O-RING, VITON, #107	17500604
7	2	RING, COMPRESSION, PTFE, .675 BP, CE	21150106
8	1	O-RING, VITON, #009	17500113
9	1	ASSY, BOTTOM INTAKE, .675, BP	51150120
10	1	RETAINER, BALL, .675 BP, TACO	21150087
11	1	BALL, SS6, 1/4"	17500079
12	1	CAP, LOWER, SS6, .675 BP	21150031
13	1	SCREEN, INTAKE, SS6, .675 BP	11150317
14	1	DISC, PTFE, .675 BP	21150033
15	1	RING, SNAP, SS, .675 BP	11150182
16	§	ASSY, LOWER CAP, .675 BP, DROP TUBE, CE	51150130
17	§	DROP TUBE, CAP LOWER, .675 BP, CE SS	21150110
18	§	HOSEBARB, SS6, 1/4 X 1/8 MPT	17200072
19	§	TUBING, PE, 1/4 X 3/8, FT POLYETHYLENE	87050502
20	§	ASSY, INTAKE .675 BP, DROP TUBE CE	51150070
21	§	INTAKE, DROP TUBE, .675 BP, CE, SS	21150112
Not Shown:			
	1	MANUAL, BLADDER PUMPS	21150035
	§	SPARE PARTS KIT, .675, BP, CE [Items 5(2), 6 (2), 7(2), 8, 10, 11, 13, 14, 15]	51150124
	§	KIT, .675 BP, O-RING SET, CE O-RING SERVICE KIT [Items 5 (2), 6 (2), 8]	91150014

§ = Sold Separately

DOCUMENT REVISIONS		
EDCF#	DESCRIPTION	REV/DATE
Project 1375	Release, SP	3/11/2014
EDCF # 1870	Corrected Replacement Parts List (Ch. 7) for 1.66 pump, SP	2/17/2015

Notes

Notes

The Warranty

For a period of one (1) year from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

Equipment Return Policy

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

**FOR A RETURN MATERIAL AUTHORIZATION, PLEASE CALL OUR SERVICE
DEPARTMENT AT 1-800-833-7958 OR 1-800-275-5325.**

Model Number: _____
Serial Number: _____
Date: _____

Equipment Decontamination

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used.

Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate equipment for a fee, which will be applied to the repair order invoice.

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