Geotech Geocontrol 2 Logic Unit

Installation and Operation Manual

Rev. 4/24/2013 Part # 11150170

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DOCUMENTATION CONVENTIONS

This 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.

Section 1: System Description

Function and Theory

Geotech's Geocontrol 2 utilizes advanced electronic logic to control both high rate purging and gentle low flow sampling. Simple to use, accurate microprocessor controlled on/off timers are utilized to recreate expert techniques for low-flow sampling.

The Geocontrol 2 high-pressure solenoid activated valve delivers even in the deepest sampling applications.

The Geocontrol 2 can be used with any bladder pump system with the use of simple quick-disconnect adapters.

Section 2: System Installation

READ BEFORE PROCEEDING ANY FURTHER

THE GEOCONTROL 2 REQUIRES DRY MOISTURE FREE AIR. TO DISREGARD WILL INCREASE THE LIKELIHOOD OF UNNECESSARY MAINTENANCE!

Determine your power source, either 115 VAC or 12 VDC.

Selecting Air Source

The following explanation is based on the Geotech Bladder Pump Model GEO1.66SS36 with .170 (4.3mm) ID air supply tubing. To determine the required capacity of the air source used, calculate the air consumption as follows. With 100 ft. of air line tubing in or out of the well, the air consumption is 125 cubic inches per cycle, with 6 cycles per minute (average).

Example: For 100 ft. (30.5m) of tubing you will need 125 cu. in. (2L) x 6 per min. which equals 750 cu. in. (12L) / min. or 45,000 cu. in. (737L) / hr. For each additional 100 ft. add 59 cu. in. (or 1 liter for every additional 30m).

If you plan to use an air compressor, we advise that you use one with a reserve tank to insure proper air supply to the pump. If you plan to use a Nitrogen Tank, see figure 2 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 of (1/2 PSI per foot) + 10 PSI for friction, or (.1 bar per meter) + .7 bar.

Example: For a pump 100 ft. away from the air source, use 100 ft. divided by 2 then add 10 PSI, this equals 60 PSI (100' / 2 + 10 = 60 PSI).
In metric: For a pump 30m away from the air source, use 30m divided by 2 then add .7 bar, this equals 15.7 bar (30m / 2 + .7 = 15.7 bar).

The additional 10 PSI (.7 bar) is to account for the pump itself and friction loss along the air line tubing.

Where the length of the air line to the Bladder Pump is 50 ft. (15m) or less, an additional 10 PSI (.7 bar) need not be added.

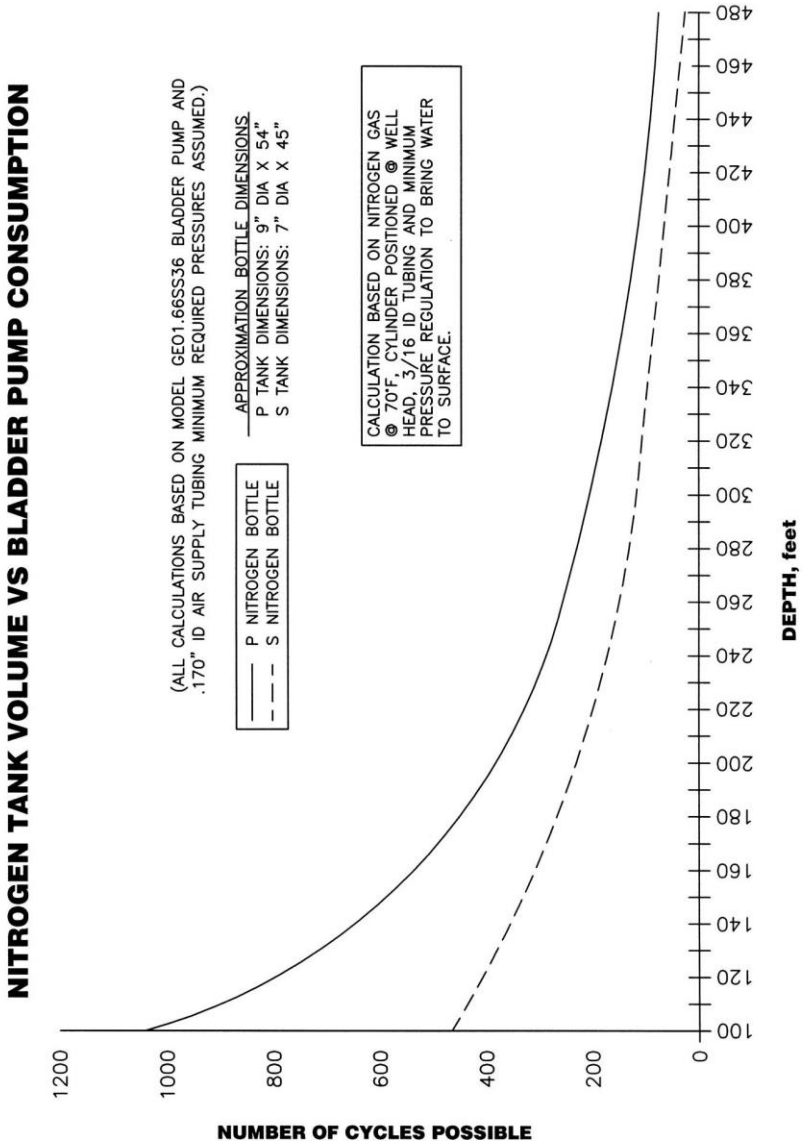

Figure 2-1 – Nitrogen tank volume vs. bladder pump consumption

Section 3: System Operation

To determine minimum operating pressures for the specific Bladder Pump model you are using, consult Pumps Specifications. Typically the minimum operating pressure will be 5 PSI (.35 bar) above static head.

Example: Bladder Pump depth is 50 feet. 50 / 2 = 25 + 5 = 30 PSI.
In metric: Bladder Pump depth is 15m. 15m / 2 = 7.5 + .35 bar = 7.85 bar
(The previous formula is not absolute and is meant to provide baseline information.)

At the wellhead, connect the air supply line from the air source (compressor, bottle, etc.) to the quick disconnect marked AIR INLET (see Section 2 on selecting an air source). Next, connect the air supply line hose whip to the air line at the well cap and the quick disconnect marked AIR OUTPUT.

Adjust the air source regulator to the appropriate psi, (see Section 2 on determining psi).

Switch the toggle from ON/OFF, depending on power supply selected.

Adjusting Cycle Timers

Adjust Charge Time knob to approx. 5 seconds, adjust Exhaust Time knob to approximately 15 seconds.

A 15 second exhaust cycle will be enough time to fill bladder at approximately 100 ft. (30.5m).

The charge cycle can be adjusted by watching the sample line. When a steady stream of water stops, set the charge cycle back about one second.

NOTE

Charge times will vary depending on the depth of well.
The following guidelines are based on a 0.5" ID tube:
- Standard Sampling: 0-30 second charge time (up to 172 ft.)
- *Deep Well Sampling: 0-60 second charge time (up to 345 ft.)
- *Max. Depth Sampling: 0-120 second charge time (up to 690 ft.)

DO NOT OVER CHARGE this will cause excessive bladder wear. Once the charge cycle is adjusted, measure the volume of the sample. Adjust the exhaust cycle back by one second at a time. Let the pump cycle a few times after each modification before adjusting again. Measure the volume of sample to make sure it is not decreasing. Continue to reduce the exhaust time back until the sample volume decreases. A decrease in sample volume indicates that the exhaust cycle is not long enough for the pump bladder to fill to its maximum. Add one second to the exhaust cycle at this point to make sure the maximum volume in the bladder is achieved.

The Geocontrol 2 has a red indicator LED labeled POWER. When the red LED is constant, the controller is in CHARGE TIME. When the red LED is blinking the controller is in EXHAUST TIME.

** Custom timer range*

Low Flow Sampling

The Geocontrol 2 includes a flow control valve, marked EXHAUST FLOW. The flow control valve ensures a true low flow of the sample by controlling the speed with which the bladder fills, regardless of the depth of the pump. Tightening the control knob clockwise will reduce the flow of the exhaust and slow the filling of the bladder. Turning the control knob counter-clockwise will increase the flow of exhaust thus increasing the speed of the flow of water into the bladder.

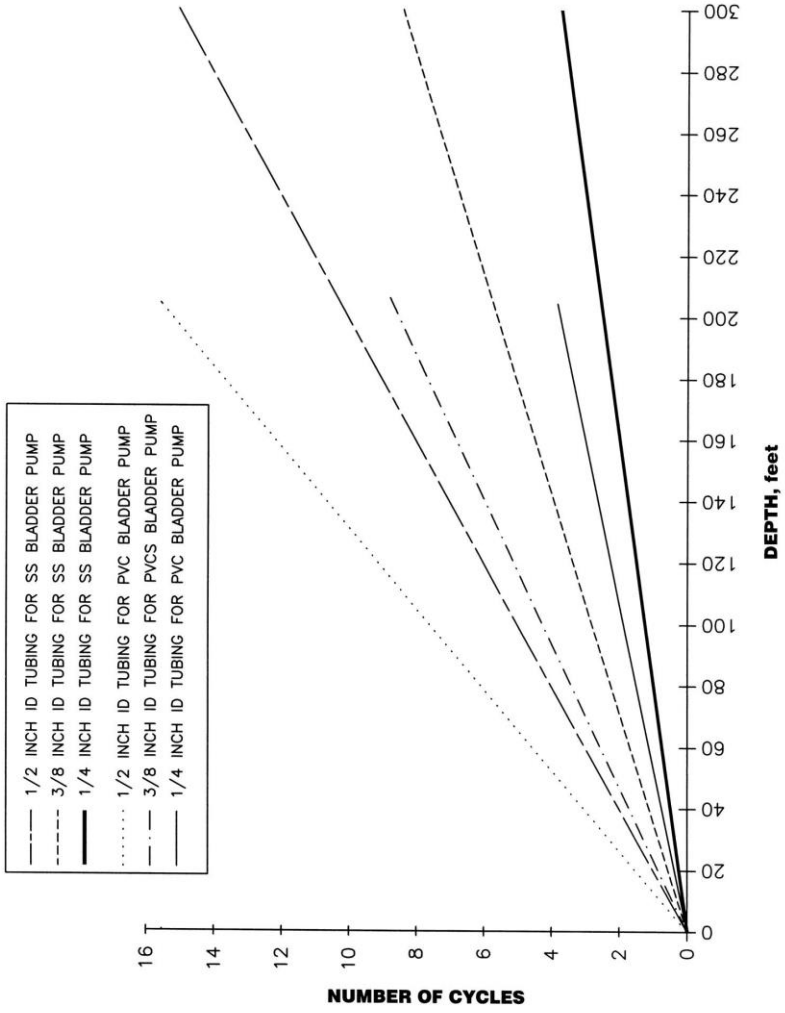

Figure 3-1 – Cycles vs. Depth

Section 4: System Maintenance

The Geocontrol 2 does not require a regular maintenance program.

As stated in installation and operation, this unit requires dry, moisture-free air. To disregard will increase the likelihood of unnecessary maintenance.

Section 5: System Troubleshooting

Problem: Unit will not turn on.

Solution:

- Check power source and cables for damage.
- If using DC, verify that you have a 12 VDC power source. If on AC, verify that you are getting a consistent 115 VAC current.

Problem: Unit turns on but cycles rapidly, no pumping.

Solution:

- Charge and exhaust times not set correctly.
- Check and adjust charge and exhaust cycle times (i.e., if charge time too long and exhaust time too short, or charge time too short). Review Section 3 for correct cycle times.

Problem: Turns on, cycles correctly but does not pump water.

Solutions:

- Check for tubing kinks.
- Check pressure on gauge, may be too low. Calculate based on .5 PSI per foot (.1 bar per meter) of head and add 10 PSI (.7 bar) for friction.
- If psi is good, check your exhaust flow, may be completely shut, try turning three times to the left. (Exhaust is the brass valve).

Problem: Unit was working but quit cycling.

Solutions:

- Check power source.
- If power source is good, check air source.
- Air source is good - have you been using clean dry air? If not contact Geotech at 1-800-833-7958

Section 6: System Specifications

Model: Geocontrol 2

Maximum Ratings

Input DC Power Source	0.5-13.8 VDC
DC Current Draw	0.5 Amps
DC Input Surge Current	<50 Amps
Input AC Power Source	105-130 VAC
AC Current Draw	0.1 Amps
AC Input Surge Current	<15 Amps
Input AC Line Frequency	45-65 Hz
Maximum Power	15 Watts

Performance

Input Air Pressure	300 PSI (20.5 bar)
Operating Depth	0-690 Feet (0-210m)
* On Timer Range	0.125 to 30 Seconds
* Off Timer Range	0.125 to 30 Seconds
Timer Resolution	0.125 Seconds
Timer Accuracy	±0.125 Seconds

Environmental

Operating Temperature Range	32° – 158°F (0-70º C)
Storage Temperature Range	-4° – 185°F (-20° to 85º C)
Position Effect	0.10% change at any angle
Vibration	No change after 10G RMS 20 to 2000 Hz
Shock	No change after 50Gs for 11minutes
EMI Emissions	Class A

Physical

Enclosure	7 x 16 x 12 in. (18 x 41 x 30.5 cm)
Weight	14 Pounds (6.3 kg)
Enclosure Material	Structural resin

* *Custom timer ranges available*

Section 7: System Schematic

Figure 7-1 – Example of Geocontrol 2 panel.

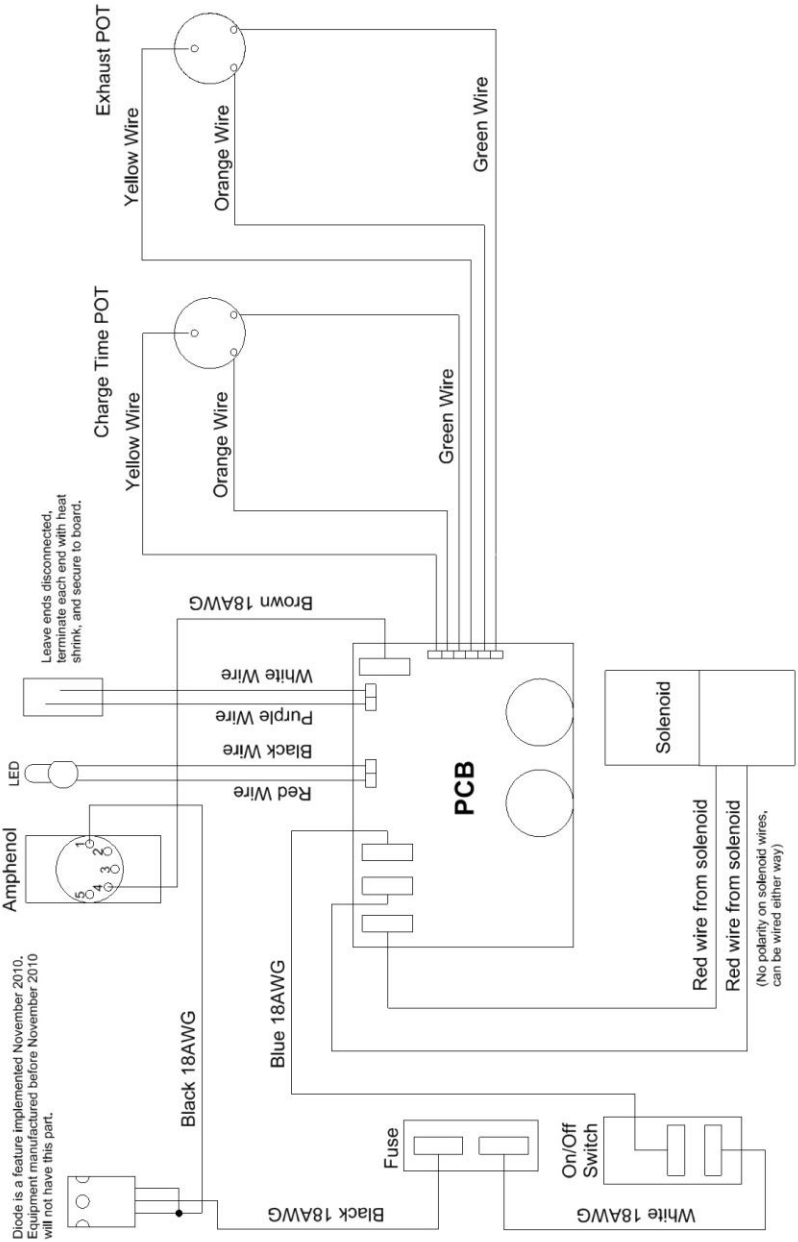

Figure 7-2 – Geocontrol 2 Wiring Diagram

Section 8: Replacement Parts List

Part Number	Part Description
81150104	New Unit
51150064	Assy, AC Power Cord
57500008	Assy, DC Power Cord
51150038	Assy, Air Inlet Hose
51150039	Assy, Air Exhaust Hose
11150170	Manual
PPE011026	Fuse
51150048	Potted PCB

NOTES

DOCUMENT REVISIONS		
EDCF#	DESCRIPTION	REV/DATE
-	Initial Release	10/18/02
1565	Added charge time ranges for varying well depths (page 6), Added revision history table (page 15) - SP	04/24/13

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 our 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.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

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 the equipment for a fee, which will be applied to the repair order invoice.

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