

# Geotech High Vacuum Sampler

Installation and Operation Manual





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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

The High Vacuum Sampler is an air-sampling device that uses a compressor to draw air from a sampling source and convey that sample into sealable sample bags. When an external 12 VDC power source connects to the unit, the compressor is capable of producing a vacuum of up to 27 in-Hg. Typical applications include soil vapor points or Soil Vapor Extraction (SVE) systems.

Figure 1-1 is an example of the High Vacuum Sampler. Each High Vacuum Sampler comes with a standard DC power cord (Figure 1-2) to allow the unit to operate from a 12VDC battery or cigarette lighter. An optional 110VAC power cord with adapter (Figure 1-2) is also available. 1-liter and 3-liter sample bags (Figures 1-3 and 1-4) are available from Geotech which can be used to easily collect air samples. See Section 8 for part numbers to these accessories.

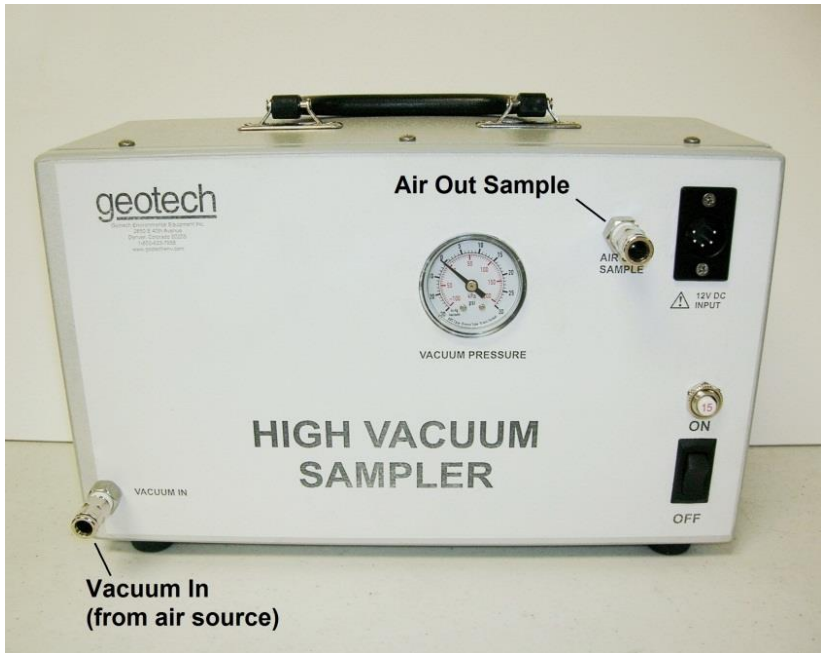


Figure 1-1

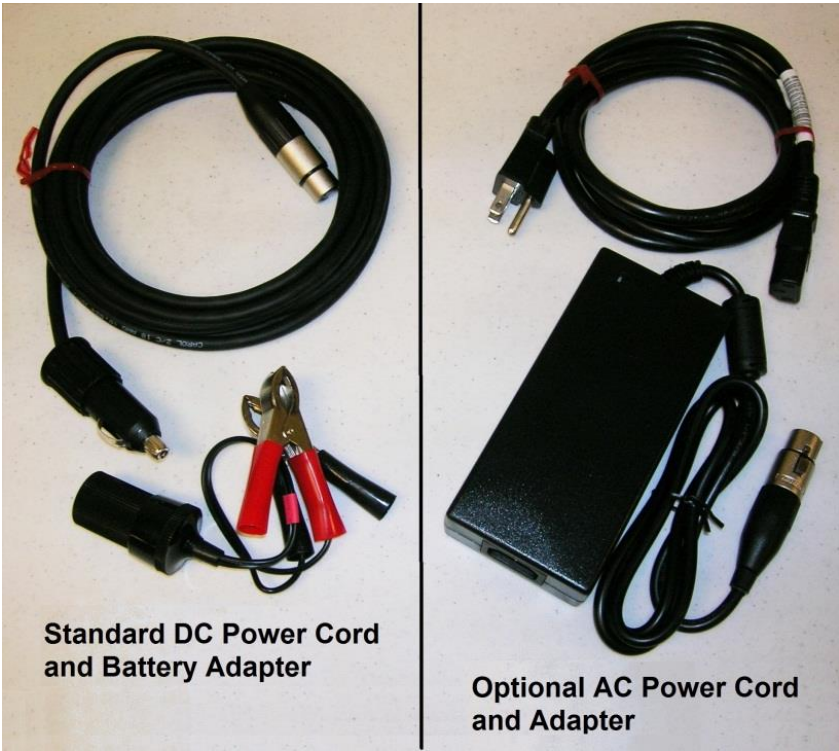


Figure 1-2

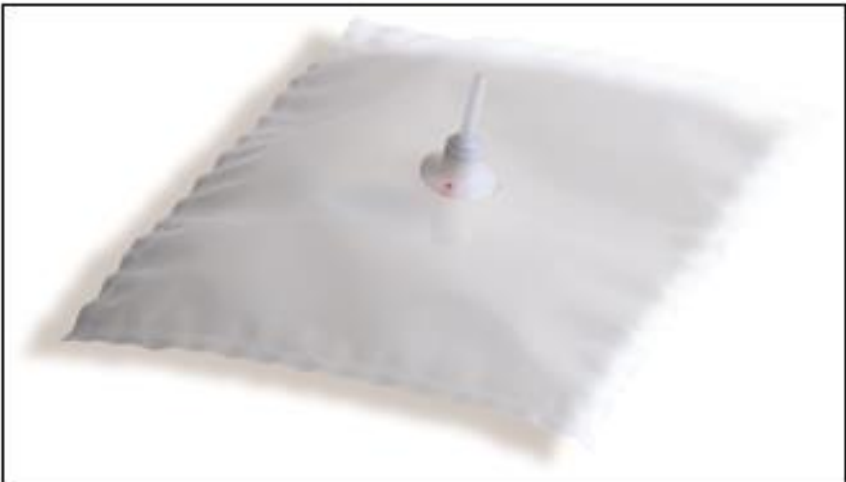


Figure 1-3 – Example of ALTEF 1 Liter Bag



Figure 1-4 – Example of Tedlar 1 and 3 Liter Bags

## Section 2: System Installation



Verify the 12VDC system to be used is rated and fuse protected for operation at 15 amps continuous operation. Failure to verify system rating could result in damage to equipment. Over-heated wiring and other materials or components in contact or near by the power delivery system could pose a potential fire or burn hazard.

### Installing the High Vacuum Sampler

1. Verify that the power switch is in the “OFF” position.
2. Plug the DC power input cord into a fuse protected 12V lighter receptacle on a negatively grounded system or plug the optional AC power cord with 12VDC adapter into a 110VAC power source. If the unit is wired directly to a 12V battery, make sure to connect the positive (red) alligator clip to the positive (red) battery terminal and connect the negative (black) alligator clip to the negative (black) battery terminal.
3. Securely plug the circular plug connector on the opposite end of the cable to the corresponding receptacle on the face of the controller.
4. Turn on the High Vacuum Sampler briefly and verify its operation. Place your thumb over both ports: Air should be blowing out the AIR OUT port and vacuum should be present at the VACUUM IN port. Use the System Troubleshooting procedures in Section 5 when there is no air flow or vacuum response on the gauge.
5. Attach an air hose to the sample source and the other end to the VACUUM IN port on the sampler. Next, connect an air hose to the AIR OUT port and the other end to the sample bag.

The High Vacuum Sampler is ready to collect the sample.



## Section 3: System Operation



Do not operate this equipment if it has visible signs of significant physical damage other than normal wear and tear.



Operating the equipment in any way other than described within this document could potentially damage the equipment.

For use with negative (-) ground systems only. Damage will result if the supply voltage exceeds 14 VDC.

### System Check

Double check that the 12VDC system positive and negative are not reversed at any connection point before turning the device on.

Attach all tubing to the appropriate ports and proceed with collecting air samples.

When operating the High Vacuum Sampler the vacuum gauge should never exceed -25 in Hg. Should the gauge ever hover between -22 and -25 in Hg, it would mean there is a significant clog somewhere along the input line from the sample source, or the vacuum at the source is greater than the High Vacuum Sampler's potential.

### Collecting an Air Sample

Geotech can provide 1 liter and 3 liter sample bags. These bags have a polypropylene locking combo valve with septum. See Section 8 for part numbers.

Use the following procedure to collect an air sample.

1. Connect all tubing to the High Vacuum Sampler.
2. Turn on the unit and allow the air flow to run prior to attaching your sample bag so that a good sample can be acquired.
3. Push the valve stem in on the bag to open the valve and connect the AIR OUT tubing to the valve. The bag will begin to fill.
4. Once the bag is full, pull the valve stem out to lock the sample into the bag. Remove the hose from the valve stem.
5. Continue with more samples or turn off the unit. Disconnect the power source when not in use.



Some care must be taken when filling the sample bags. Like a balloon, if too much pressure is applied the bag will pop.

## Section 4: System Maintenance

### Maintenance Procedures

Disconnect power source when not in use.

Unit must be returned to Geotech Environmental Equipment for any service. In order to ensure a long service life, keep the High Vacuum Sampler clean. Often a soft, damp cloth can be used to remove dust and dirt from the exterior surfaces of the enclosure. In extreme cases, or to remove aged caked on dirt and dust, a mild soap and water solution can be applied to a soft cloth and used to clean the exterior surfaces of the High Vacuum Sampler. Do not immerse, soak or directly spray liquids on the High Vacuum Sampler.



Equipment should be repaired by Geotech Environmental Equipment factory trained repair technicians only. Improper repair of equipment may result in degradation of performance and/or service life. Disassembly exposes potentially dangerous moving components that could injure someone who is not properly trained to repair this equipment.

## Section 5: System Troubleshooting

The Geotech High Vacuum Sampler has been designed and manufactured to provide a long service life and trouble free operation in the field. If the compressor (vacuum) becomes sluggish then check the supply voltage. If the supply voltage falls below 12 VDC, the compressor's performance will be directly affected. A fully charged battery will produce the best results.

Other sources of low vacuum may be attributed to 12V lighter receptacles or plug connections. Make certain these connections are securely plugged in and clear of any debris. Once securely plugged in, rotating the connection can often help if there is a dead spot in the connector. Also, check for connection and cable fatigue, cracks, surface oxidation, rust etc.

### Troubleshooting Procedures

**Problem:** Compressor does not turn on

#### Solutions:

- Double check battery polarity is correct. In other words, the positive and negative cables are connected positive to positive and negative to negative. The High Vacuum Sampler is protected from damage due to reverse polarity connection.
- If ambient temperatures are in excess of 104°F (~40°C) then disconnect from power and let sit in a cool location. Do not open the case for any reason. This will not hasten the cooling process, but will invite debris into internal components that could result in reduced life or immediate equipment failure.
- If the compressor still does not turn on then call Geotech Service at 1-800-833-7958 to arrange for the equipment to be sent back to a factory authorized repair location.
- If the 15 Amp circuit breaker is tripped, push to reset. If it trips again, call Geotech Service at 1-800-833-7958 to arrange for the equipment to be sent back to a factory authorized repair location.

**Problem:** Compressor turns on but there is no air flow to the sample bag

#### Solutions:

- Remove the air line from the AIR OUT port. Turn on the unit and block the AIR OUT port with your thumb. If there is pressure against your thumb then check the tubing for cuts, kinks and holes.
- Verify that the sample bag has not been cut or perforated.

**Problem:** Compressor turns on, there is air flow out, but the gauge does not read any vacuum.

**Solutions:**

- Remove the air line from the VACUUM IN port. Turn on the unit and block the VACUUM IN port with your thumb. If there is vacuum then your thumb will stick to the port. The gauge should read about -20 psi vacuum when the port is completely blocked. If there is vacuum then check the tubing between the VACUUM IN port and the sample source for cuts, kinks and holes. If there is no vacuum then call Geotech Service at 1-800-833-7958 to arrange for the equipment to be sent back to a factory authorized repair location.



The compressor will still push air through the AIR OUT port, but with no vacuum reading on the gauge it's possible that you may not be collecting a sample from the source. However, an air sample without any head may not move the gauge either.

**Problem:** Compressor turns on and there is vacuum along with air flowing out, but there is no vacuum indicated on the gauge.

**Solutions:**

- The pressure gauge has failed. However, operation of the device may continue even though the gauge feature is not operational. Call Geotech Service at 1-800-833-7958 to arrange for the equipment to be sent back to a factory authorized repair location.

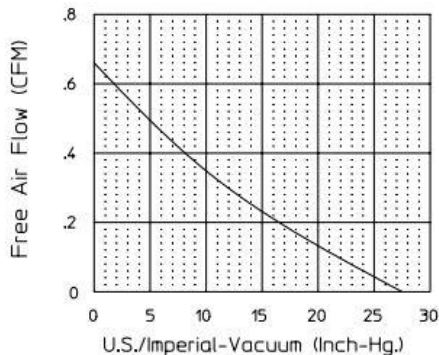
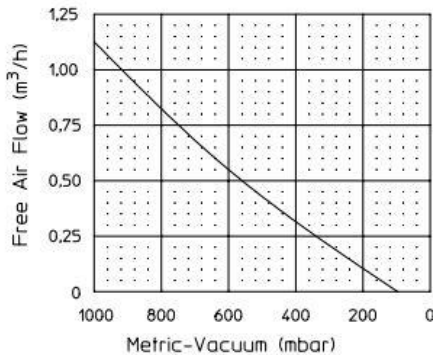
## Section 6: System Specifications

Power Requirements:	72-84 W, 12-14 VDC input at 7.5 Amps
Nominal Operating Current:	6 Amps DC
Over Current Protection:	15 Amps
Maximum Operating Vacuum:	27 in Hg
Ambient Operational Temperature:	50°F-104°F (10°C-40°C)
Dimensions:	6.70" H x 4.80" x 11.40" W (17.02cm H x 12.92cm D x 28.96cm W)
Weight:	11.4lbs (5.17kg)
Case: (optional)	21.5" L x 15" H x 7.5" W (54.6 cm L x 38.1cm H x 19.05cm W)
Case Weight:	7.9 lbs. (3.6 kg) total

Free Air CFM @ 10 Vac in-Hg	0.38
Free Air CFM @ 20 Vac in-Hg	0.16

### Features:

- Approximately 45 to 60 minute operation with 8Ah lead acid battery.
- Reverse polarity protection.
- Optional AC cord with adapter for use with world mains connection.



## Section 7: System Schematic

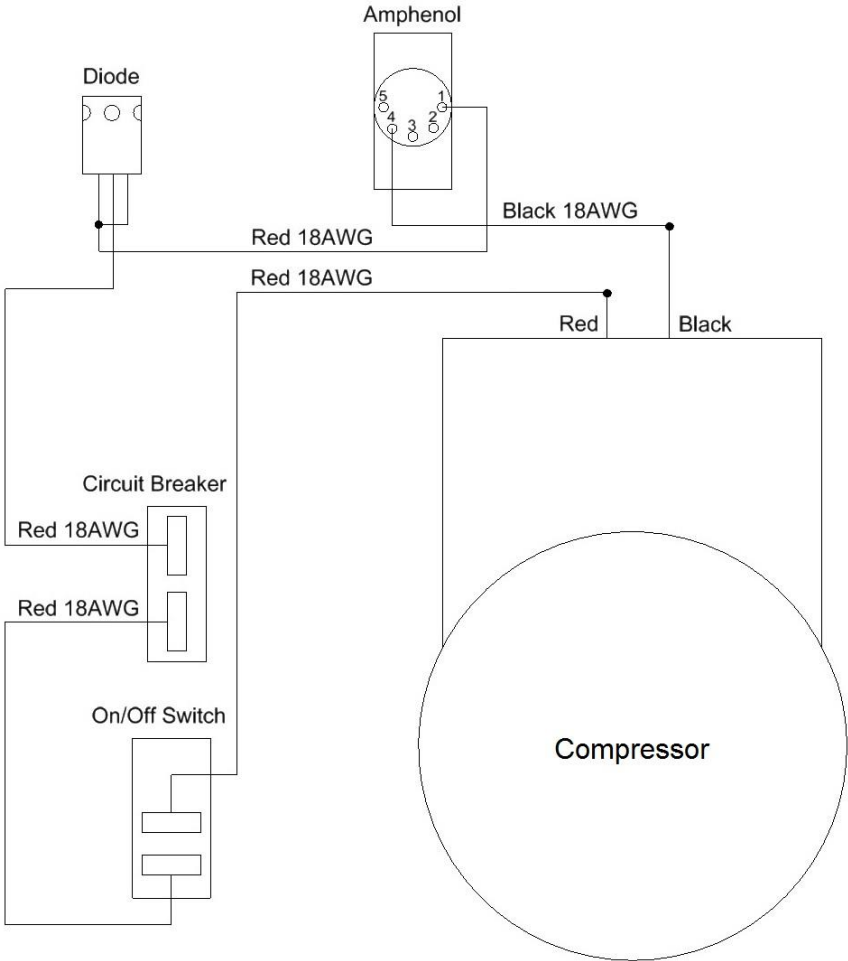


Figure 7-1 – High Vacuum Sampler Wiring Diagram

## Section 8: Replacement Parts and Accessories

Parts List	Parts Description
82150020	HIGH VACUUM SAMPLER
PPP103001	QCK CNCT,NCKL,1/4X1/8MPT,PUSH/ PULL
87050501	TUBING,PE,.170x1/4,FT POLYETHYLENE
87050509	TUBING,FEP,.170x1/4,FT
51150063	POWER SUPPLY,EXTERNAL,AC ADAPT 12V,100W
81150019	ADAPTOR,CONTROLPRO-WELL CAP INCLUDES 10FT TUBING
57500008	ASSY,POWER CORD,DC W/ AMP
17500035	ADAPTER,CIGARETTE TO CLIPS
77250000	BATTERY/CHARGER,MODULAR,12VDC 8Ah, MALE CIG PLUG
51150127	CASE,GEOCONTROL PRO,CE
12150020	TEDLAR BAG,3 LITER,10"x10" 1 GROMMET,SAMPLE COLLECTION
12150035	TEDLAR BAG,1 LITER,7"x7" 1 GROMMET,SAMPLE COLLECTION
12150473	ALTEF BAG,1 LITER,7"x7" 1 GROMMET
12150474	ALTEF BAG,3 LITER,10"X10" 1 GROMMET
12151001	MANUAL,HIGH VACUUM SAMPLER

# NOTES

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**DOCUMENT REVISIONS**

EDCF#	DESCRIPTION	REV/DATE
-	Previous Release	12/17/12
1570	Edited description for spare part # 87050509. Added Revision History Table - SP	05/06/13

## 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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