geotech

Marschalk
Model # 94000
12-volt DC Portable oil-less
Air Compressor
Operation Manual

DOCUMENTATION CONVENTIONS

This manual uses the following conventions to present information:

WARNING

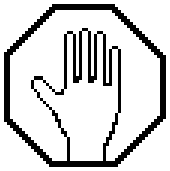
An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.

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.



In order to ensure that your Marschalk Compressor has a long service life and operates properly, adhere to the cautions below and read this manual before use.

Read and understand the information contained in this manual and the included compressor manufacturer's manual before operating unit.

This unit operates from a 12-volt DC power supply only. Do not operate in rain. Observe polarity (Black Neg. /Red Pos.).

Compressed air can cause serious injury. Always direct air stream away from personnel. Wear eye protection.

All compressors and engines generate heat under normal operating conditions. To avoid serious burns, never touch the compressor head, exhaust parts, compressor relief valve, or engine muffler during or immediately after operation.

Do not tamper with air compressor unit relief valve, as it has been preset at the factory and is not adjustable.

Before use: Inspect all fittings and hoses for signs of damage, or loose fittings. With normal operation some vibration will occur, which can cause fittings to come loose. Inspect and tighten as necessary as part of a normal maintenance program and prior to each use of the unit. Never operate a damaged unit.

Before transporting, servicing, cleaning or removal of any part, shut down compressor, remove power, and relieve tank and hose pressure.

The air compressor provided with this unit is of the oil-less type, and as such, needs NO lubrication/oil.

Always shut off air discharge ball valve at tank before attaching/detaching any air hoses or air handling equipment.

Always remove power from unit before transporting or performing maintenance or servicing.

WARNING: TO AVOID THE RISK OF TANK FAILURE; DRAIN TANK FREQUENTLY DURING AND AFTER EACH USE, TO MINIMIZE CONDENSATION BUILD-UP AND CORROSION INSIDE TANK. WHEN DRAINING THE TANK, IF DEBRIS OR HEAVY RUST PARTICLES ARE DRAINED ALONG WITH WATER, CONTACT MANUFACTURER FOR POSSIBLE TANK REPLACEMENT. IT IS RECOMMENDED THAT TANK BE INSPECTED ANNUALLY AND REPLACED EVERY 3 YEARS.

AFTER READING THE MANUAL, IF YOU HAVE ANY QUESTION ABOUT THE OPERATION OR SAFETY FEATURES OF THIS UNIT, PLEASE CONTACT GEOTECH ENVIRONMENTAL AT 800-833-7958.

Chapter 1: System Description

Function and Theory

Congratulations on your purchase of Marschalk's *System 1* portable 12 volt D.C. oil-less compressed air system. The design of this unit has evolved over a ten-year period during which continuous field-testing and user input have provided important design criteria. The unit sets standards for quality, reliability, and portability in a compressed air package for groundwater monitoring. It is one of the very few packages available today that is designed and built specifically to meet the needs of the Low Flow sampling method. Unlike other "tire inflation" compressors, the model 94000 has been designed to provide years of trouble-free operation.
Every unit is inspected, operated for several hours, and then re-inspected before leaving our plant to ensure that each unit arrives in perfect operating condition.

System Components

The following components and equipment are provided as part of the 94000 package:

- A continuous duty oil-less air compressor capable of operating at an output pressure of 90 psi, with an air delivery rate of 0.4 scfm @ 90 psi, 0.65 scfm @ 50 psi, and 1.25 scfm @ atmospheric pressure.

- The air compressor package includes a 3 gallon air storage tank, with drain petcock, for smoothing out air delivery, reserve air needed to maximize bladder pump cycle times, and more efficient pumping of deeper wells. The air storage tank is provided complete with all inlet and discharge fittings, including a male plug quick-connect fitting on the tank discharge for connection of the controller air hose, which is also included.

- A Gast 1/6th horsepower heavy duty motor-mounted oil-less piston compressor for quiet and efficient operation and long-term reliability.

- High quality submersible wiring throughout for durability.

- A Carrying handle to facilitate transport of the unit.

- A pressure switch for automatic on/off operation.

- 15 ft. air hose, part number 51150059, with brass quick-connect fittings on each end, and an inline air filter on the controller end of the hose.

- A pressure gauge and tank discharge valve

- A stainless/FEP hose between compressor head and air tank.

- A 12 ft. battery power cable with 50 amp clips for connection to an external 12 volt D.C. battery.

Chapter 2: System Installation

1. Turn the red-handled operating lever located on the side of the pressure switch to the “Off” position.

2. Connect the BLACK alligator clip on the end of the power cable to the NEGATIVE terminal of the battery.

3. Connect the RED alligator clip to the POSITIVE terminal of the battery.

4. **RED = POSITIVE; BLACK = NEGATIVE**

5. This is a standard connection for 12 volt D.C. power, and is found on virtually every vehicle battery.

6. Close the ball valve located on the discharge side of the air storage tank (handle perpendicular to the body of the valve when closed).

7. Verify that battery connections are secure and polarity is correct

8. Turn the lever on the pressure switch to the “Auto” position.

9. The unit should immediately start and pressure will begin to build up in the tank as indicated on the pressure gauge located on the tank.

Chapter 3: System Operation

During actual operating time, the compressor uses 22 amp/hrs of current. (160 amps required to start a momentarily stopped rotor) Therefore, it is recommended that a marine deep cycle or vehicle battery be used to operate the unit.

The automatic operation of the unit from the pressure switch should minimize the actual power consumed during sampling of wells.

For instance, users have advised us that when performing Low Flow purging and sampling in accordance with Marschalk's recommendations, and sampling wells of 20 ft. depths, a small garden tractor battery having a current capacity of 35 amp/hr will last them up to 6 or 7 hours.

When tank pressure reaches about 90 psig, you are now ready to use the air compressor for pumping applications. As indicated on the pressure switch label, the compressor will shut off when tank pressure reaches 90 psig, and will come back on when tank pressure drops to about 70 psig.

Connect the quick-connect end of the air line provided to the air tank. Connect the other end which has the in-line filter, as well as a female quick-connect on it, to the pump controller's air inlet port, which is a male quick-connect on any Marschalk pump controller.

NOTE: Prior to connecting the airline to the controller, turn the controller pressure regulator knob in the counterclockwise direction until it feels "loose". This will ensure that low pressure will be present at the controller discharge. It is important to start the controller set-up process with the pressure at a minimum point. Increase the pumping pressure 3-5 psi during each pump cycle until water begins coming out of the discharge tube at the surface. At this point you can fine-tune the pumping pressure to achieve your desired flow rate.

Low Flow Purging and Sampling

The Model 94000 12 vdc compressor has been designed for Low Flow purging and sampling. The unit will operate most efficiently where long pump cycles are used. If your target flow rate is 200 mls/minute, use 2 x 30 second pump cycles per minute. Water should be discharged during the entire duration of each pump cycle. For 100 mls/minute flow rate, use 1 x 1 minute pump cycle.

If Low Submergence operation of the pump controller is necessary, longer pump cycles become even more important, as the vacuum used during the enhanced fill cycle is created by compressed air from the compressor. When using Low Submergence, keep the enhanced fill cycle as short as possible. It is important that the compressor pressure at the tank outlet be maintained above 35-40 psig to ensure continuous satisfactory operation of the pump controller.

Chapter 4: System Maintenance

Although the unit requires little maintenance, there are a few things that need attention on any piece of equipment, particularly an air compressor.

Keep the air storage tank drained during operation of the compressor. The higher the compressor's duty cycle is, the more often the tank should be drained. To drain the tank, simply open drain petcock on the bottom of the air tank for a few seconds, then close the petcock.

Periodically check for loose hardware and tighten as necessary. This includes all nuts and bolts used to hold the unit together.

Make sure all wiring fasteners are tightened.

Before each use, inspect all wiring for chafing

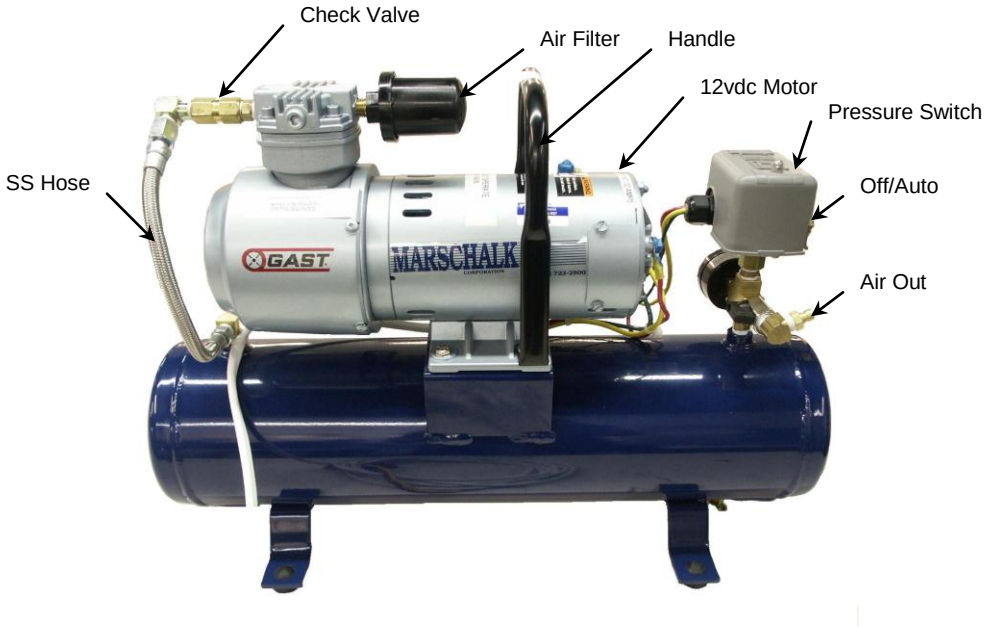
Periodically inspect the inlet air filter element and replace as necessary to ensure a clean air supply to the unit.

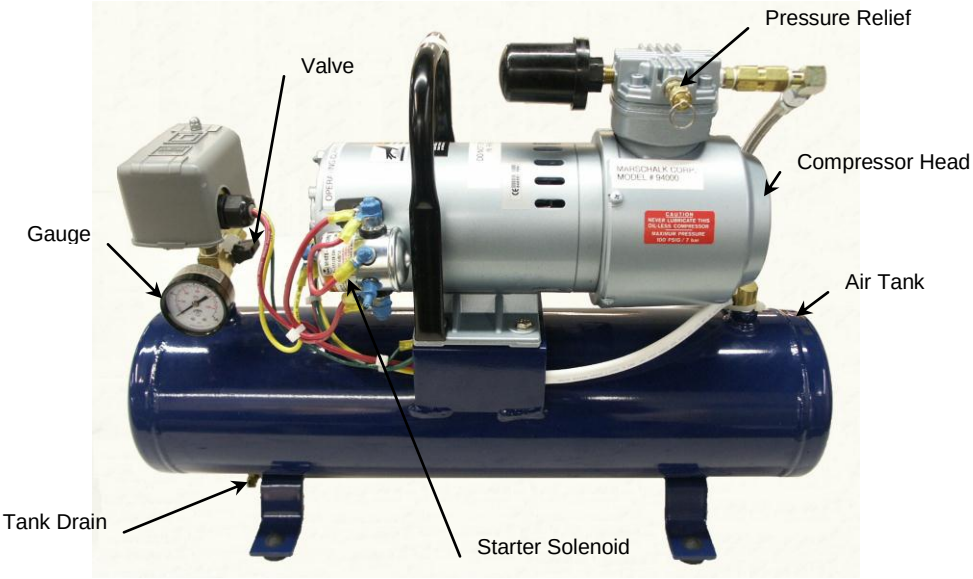
Contact Geotech Environmental for any spare or repair parts which may be necessary.

Chapter 5: System Specifications

Horse Power		1/6hp
Voltage		12VDC
Running Amperage		22 Amps
Starting Amperage		160 Amps
Storage Capacity		3 Gallons
Max Pressure		100 PSI
SCFM @ Atmosphere		1.25
SCFM @ 50 PSI		0.65
SCFM @ 90 PSI		0.40
Case:	Height	12 in
	Length	24 in
	Width	20 in
Tank:	Height	8-1/2 in
	Length	24-1/4 in
	Width	8-1/2 in
Compressor:		
	Height	8-1/2 in
	Length	14 in
	Width	6 in

Chapter 6: System Schematic





Chapter 7: Replacement Parts

Power Cable	11200479
Black Battery Clip	11350006
Red Battery Clip	11350007
Air Compressor w/ 12 V motor	17250017
Air Tank	17250018
Pressure Gauge	17250019
Starter Solenoid	17250020
Pressure Switch	17250021
Ball Valve	17250022
Check Valve	17250024
Rubber Feet	17250026
Stainless Steel Hose	27250003
Wellhead Hose	51150058
Air Supply Hose	51150059
Air Supply Hose Inline Filter	11150238
Hose Adapter	51150060
Carrying Case	77250012

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 abuse, misuse, or inability to use this product. 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 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

Geotech Environmental Equipment, Inc

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(303) 320-4764 ● **(800) 833-7958** ● FAX (303) 322-7242

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