Geo2001 Flood Controller

Installation and Operation Manual

Rev. 2 10/23/02 Part # 16550112

Table of Contents

QUICK START INSTRUCTIONS

This section is intended for field technicians, project engineers or anyone responsible for installing, operating or maintaining the GEO2001 Controller.

The envelope shipped with your GOE2001 Controller contains Quick Start Installation & Configuration Instruction. Familiarity with the information in this envelope is absolutely essential for safe trouble free installation and operation of the GEO2001 Controller.

THE GEO2001 QUICK START ENVELOPE CONTAINS THE FOLLOWING INSTRUCTION SHEETS:

Mounting Footprint	Dwg. #2085
Wiring Schematic	Dwg. #E3269
Interconnect Diagram	Dwg. #E3191

The information in this supplement is provided to complement the GEO2001 Installation & Operation manual. Although we highly recommend that all users read the entire Installation & 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.

GEO2001 CONTROLLER

Figure 1

Chapter 1: System Description

Function and Theory

The GEO2001 Anti-flood controller is a unique self-contained Smart System that can be utilized to prevent flooding in spaces where drainage is inadequate or a flooding condition can result from back flow. This is accomplished by shutting off the water supply to the building once a flood condition has been detected. Along with shutting off the water supply, the controller outputs both a remote alarm and a local alarm.

The controller monitors the state of two (2) float switches or conductivity sensors to determine if a flooding condition is present. The float switches or sensors are typically mounted in a sump or other low lying area that may be flooded. The sensor inputs can be delayed, before triggering an alarm, by a user adjustable delay timer. This feature has been incorporated to minimize nuisance tripping.

If one or both float switches detect a flood condition the controller goes to alarm mode which simultaneously turns control valve “off”, turns “on” the local alarm light, and “closes” the (2) remote alarm relays.

The GEO2001 controller was designed with inherent safety features:

1. A manual adjustable delay timer 0 – 60 seconds, to eliminate constant nuisance alarms.

2. Anti-vandalism circuitry – Any damage to the float switches or the connecting conductors will send the controller into alarm condition. Key locked entry enable / disable switch.

3. Fail safe circuitry – The situation which caused the alarm condition must be corrected before the controller can be manually reset.

4. UPS back–up power – The controller has an internal battery charging and back–up power supply. In the event of an AC power outage or damage to the incoming AC power conductors, the unit will run off the battery indicated by “flashing” power illuminator.

System Components

Controller Assembly

The control is housed in a rugged enclosure to prevent vandalism and damage. The internal assembly consists of the main CPU with terminal block for making external wiring connections and a battery to provide the battery back-up function. The box exterior has a green power state indicator lamp, a red alarm indicator lamp, and a key switch and reset button for resetting alarm conditions. The box also incorporates mounting flanges for ease of attaching control to support structure.

Status LED's

The inner CPU enclosure has three (3) LED's to indicate the status of the controller. A green LED is present to indicate that the AC power is connected and the power supply is operating properly. The second green LED is an indicator for a fully charged battery. The yellow LED is illuminated when battery charger circuit is in overcharge mode. In order for the two (2) battery LED's to be in the correct state, the unit must have completed a full battery charge cycle. This may take several hours when the control is initially powered on. Battery LED's may not indicate correct state if no battery is connected.

Switch Inputs

The GEO2001 control will accept two (2) types of switch inputs. The point level control-mercury-free Float Switches are a micro switch switching element housed in a polypropylene round tubular high buoyancy float housing. The Float Switch consists of a float body and electrical connection cable. These types of switch inputs are normally closed and thus offer fail safe wiring.
Conductivity probe type inputs may also be used with the control. In order for these types of probes to operate correctly, care must be taken in system grounding making certain that there is a good ground connection between the controller ground lug and the area expected to be flooded.

Delay Timer

In order to prevent nuisance tripping, an adjustable 0 – 60 second delay timer has been included in the design. This delay timer is accessible by opening the front cover of the controller box.

Status Lights

Green Light

Condition	**Status**
Solid	Good AC supply
Dark	No power
Flashing	Bad AC, Running off battery

Red Light

Condition	**Status**
Solid	Alarm Condition
Dark	No alarm

Remote Alarm

Two (2) form C dry contacts are provided at the terminal block to add user flexibility for monitoring control state. Contacts may be wired either normally open or closed. The state of both contacts changes when an alarm occurs.

Chapter 2: System Installation

Mounting Footprint

Locate desirable mounting location and secure controller box using mounting flanges. The control is suitable for mounting indoors in areas that will not be flooded. The control is **NOT** rated for mounting in explosive environments, wet environments, or outdoors.

Do not connect this equipment to fire protection systems.

The Geo2001 flood controller is certified for installation indoors in dry locations only.

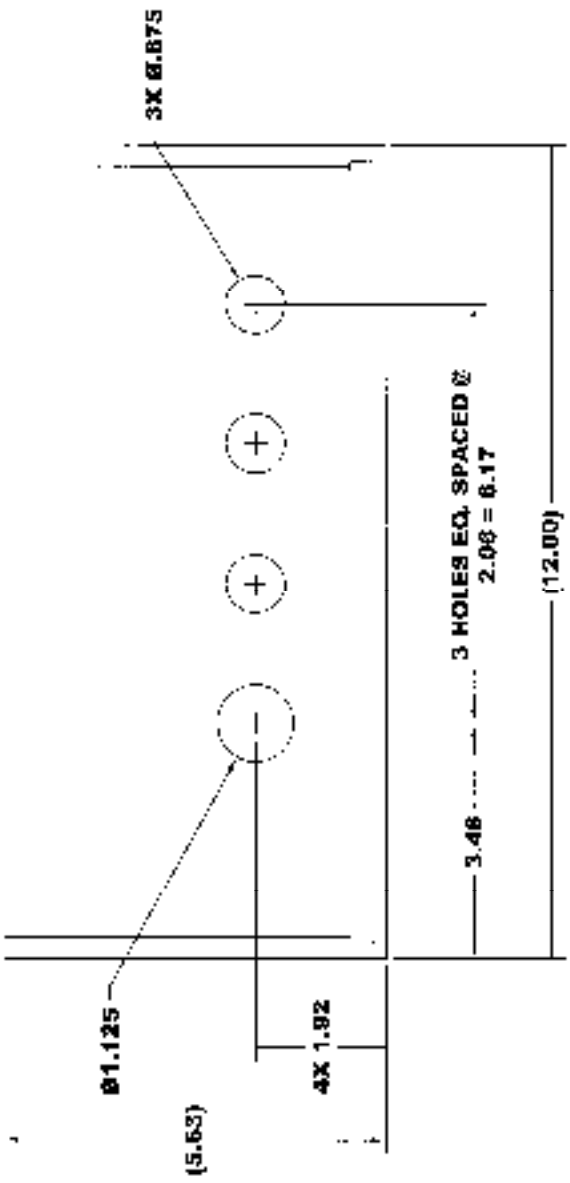
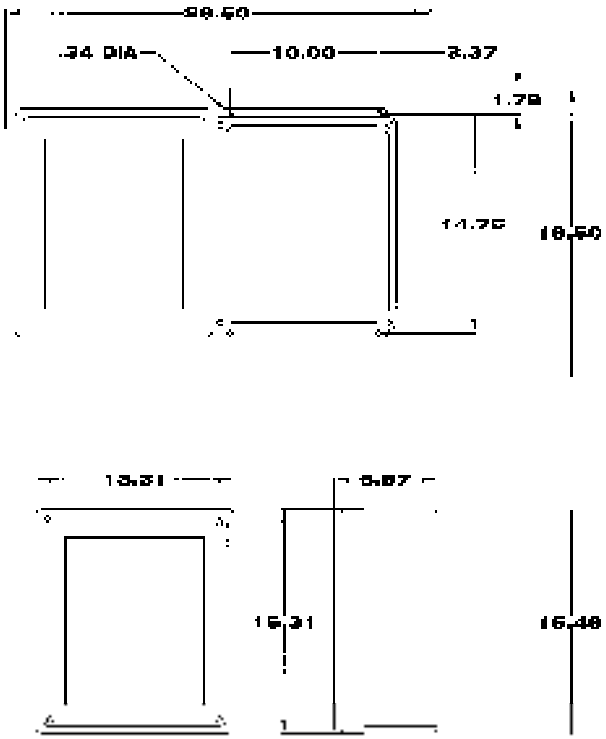


Figure 2



TYPICAL MOUNTING CONFIGURATION
SHOWN WITH COVER OPEN

Figure 3

AC Power Wiring

All AC wiring should be done by a qualified electrician. Before wiring AC incoming power to the GEO2001 controller, confirm incoming power is off.

All external wiring to the control terminal block should be a maximum of 14 AWG. End of wires should be looped to prevent disconnection in the event of a loose screw.

Refer to figure 4, page 13, or quick start package Dwg. # E3269 wiring schematic. To wire AC power to the controller, remove the cover plate for the terminal strips. Wire the AC neutral line to the terminal marked AC white wire the AC hot line to the terminal marked AC black. Wire the AC ground line to the lug. It is also recommended that a ground wire be attached from the ground lug to the terminal block marked AC green.

Float Switches

The Controller has (2) sensor inputs. Both inputs must be present for operation.

Refer to figure 4 page 13, or quick start package Dwg. # E3269 wiring schematic. Normally closed float type switches wire into the sensor “A” and “B” inputs on the terminal block. Polarity of wiring is unimportant, however if normally closed sensors are used, the probe invert jumper must be in place.

For conductivity probe sensors, wire sensor leads to the side marked “HIGH” on the terminal block sensor “A” and “B” inputs. Connect a good ground from the “LOW” side of the sensor inputs to the sump or area that will be wetted. In order for conductivity sensors to operate correctly, make certain that the probe invert jumper is NOT installed.

Remote Alarm

Before wiring the Remote Alarm connections confirm the system is grounded and the AC power is off.

For connection of Remote Alarm refer to figure 4 page13 or refer to Quick Start package Dwg. # E3269. Wiring into remote alarm terminals must be 14 AWG max. Make connections to “C” and either NO or NC depending upon your requirements. These contacts are dry contacts and may be used to switch either AC or DC. See specification for current and voltage ratings.

Valve Wiring

Before wiring the Valve connections confirm the system is grounded and ALL power is off.

For connection of valve refer to figure 4 page 13 or refer to Quick Start package Dwg. # E3269. Connect valve to terminal block using maximum 14 AWG wire. Controller is designed to run an AC actuated valve so wiring polarity is unimportant. Valve is wired into terminal block positions labeled valve + and -. Connect ground wire from valve to grounding lug.

Do not connect the Geo2001 flood controller to fire protection systems.

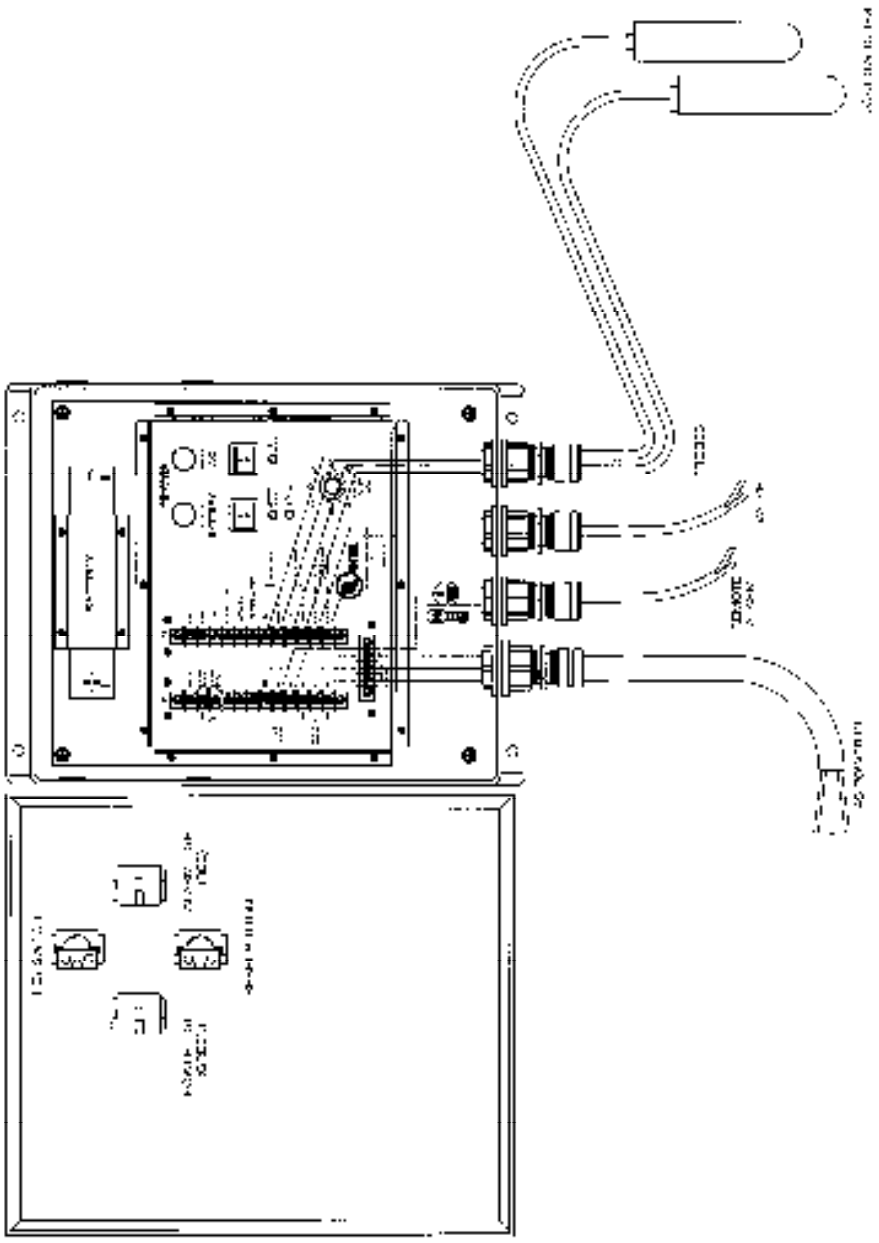


Figure 4

Chapter 3: System Operation

GEO2001 System Test

The GEO2001 system test can be easily and quickly performed.

1. Make all connections, Float Switches, Valve, Alarms
2. Turn on power. Ensure green power light is on.
3. Lift one or both Float Switches past horizontal, closer to vertical.
4. The controller alarm has a timer delay, and the timer has been factory set for 10 seconds.
5. After the elapsed time the red alarm will turn on, and the valve will shut off.

Control Reset Test

Fault condition must be connected before control can be reset.

6. Insert key
7. Turn key to on position (right)
8. Push reset button (red alarm light will turn off)
9. Turn key to off position (left)
10. Remove key

The GEO2001 controller has been designed with a nuisance alarm avoidance feature. Lift one or both Float Switches, hold for a few seconds, (be sure not to exceed set time) and set back, down the GEO2001 controller will reset automatically, and avoid an alarm condition.

If system fails test consult Quick Start Documentation Dwg. # E3269 or Dwg. # E3191 before contacting Geotech Environmental Equipment Inc.

Chapter 4: System Maintenance

GEO2001 Controller

The GEO2001 Controller System was designed and tested for years of maintenance free service. The internal components were selected based on an industrial grading scale, for rugged use, and years of uninterruptible service. The GEO2001 needs no regular maintenance.

Float Switches

The Float Switches like the components in the controller were selected for maintenance free operation. The Float Switches need no regular maintenance.

UPS (Uninterruptible Power Supply)

The UPS has an internal sealed battery. In order to insure battery circuit is operating correctly, it is recommended that testing be performed once a year. Testing is done by opening the controller door and turning the AC switch to the off position. Allow unit to run off the battery for ½ hour and check that green status light on controller door flashes and controller operates for the duration of the test. Once testing is complete, turn AC power switch back on.

The battery has a pre-determined life span, specified by the manufacturer. The determined working life of the battery is 3 years. It will be necessary to replace the UPS battery at regular 3 year intervals to ensure proper system operation and reliability.

Chapter 5: System Troubleshooting

Q: Alarm will not reset.

A: Both float (or switch) inputs must be operating correctly before an alarm can be cleared.
-Check key switch position, reset button, and wiring.
-Check float switches with Ohm meter. Disconnect leads from terminal block before testing.
-Check probe invert jumper.
-Check Float wiring faulty.

Q: Control will not run from AC Power.

A: -Check incoming AC voltage with meter.
-Check AC fuse.
-Make sure AC power switch is in the up position.

Q: Control will not run from battery.

A: -Check battery voltage with volt meter.
-Check battery fuse.
-Check battery wiring.
-Make sure battery power switches is in the up position.

Q: Control will not go into alarm.

A: -Delay set pot setting.
-Check floats (or switches) for proper operation with Ohm meter. Disconnect leads from terminal block before testing.
-Float wiring bad.

Q: Output valve driver will not energize valve.

A: -Control in alarm mode.
-Valve wiring bad.
-Disconnect valve from terminal block and test with Ohm meter. Reading should be ground 8.5Ω.

Q: Remote alarm not functioning.

A: -Check wiring for bad conductors or connections.
-Make certain correct contacts are being used.

Q: Front cover illuminators not working.

A: -Bulb is bad. Replace with 12V bulb.
-Bad or broken wire.
-Check for 12VDC on terminal block by measuring from battery (-) to 12VDC output with volt meter.

Q: Over charge LED is “on”.

A: -Over charge LED should stay on for awhile, and then go off. This is normal.

Chapter 6: System Specifications

Refer to figures 2 and 3 for a panel layout diagram showing dimensions, mounting configuration, and wiring access points.

Maximum Ratings

Input DC Voltage	18 VDC
Input AC Voltage	90-135 VAC
AC Line Frequency	45-65 Hz
Input Power	24 W
Maximum Valve Output	8 VA

Relay Contacts

Contact rating AC	5 A @ 250VAC
Contact rating DC	2 A @ 12VDC

Performance

Battery back-up time, 2.2AH	2 hrs.
Charge Current	370 mA
Timer Delay	0 – 60 sec.
Timer Resolution	0.125 sec.
Timer Accuracy	±1 %

Environmental

Ambient Operating Temp	-40 to 60 °C
Storage Temp	-55 to 100 °C
Humidity	5% to 95% Relative NC
Shock	TBD
Vibration	TBD
EMI Emissions Conducted	FCC, class A
Physical Size	14” W x 16” H x 7” D
Weight	18 lbs.

Package to Include:

(1) Controller
(2) Float Switch w/16ft. Cable
(4) Connectors

Battery Life

Float State Life	3 yrs.

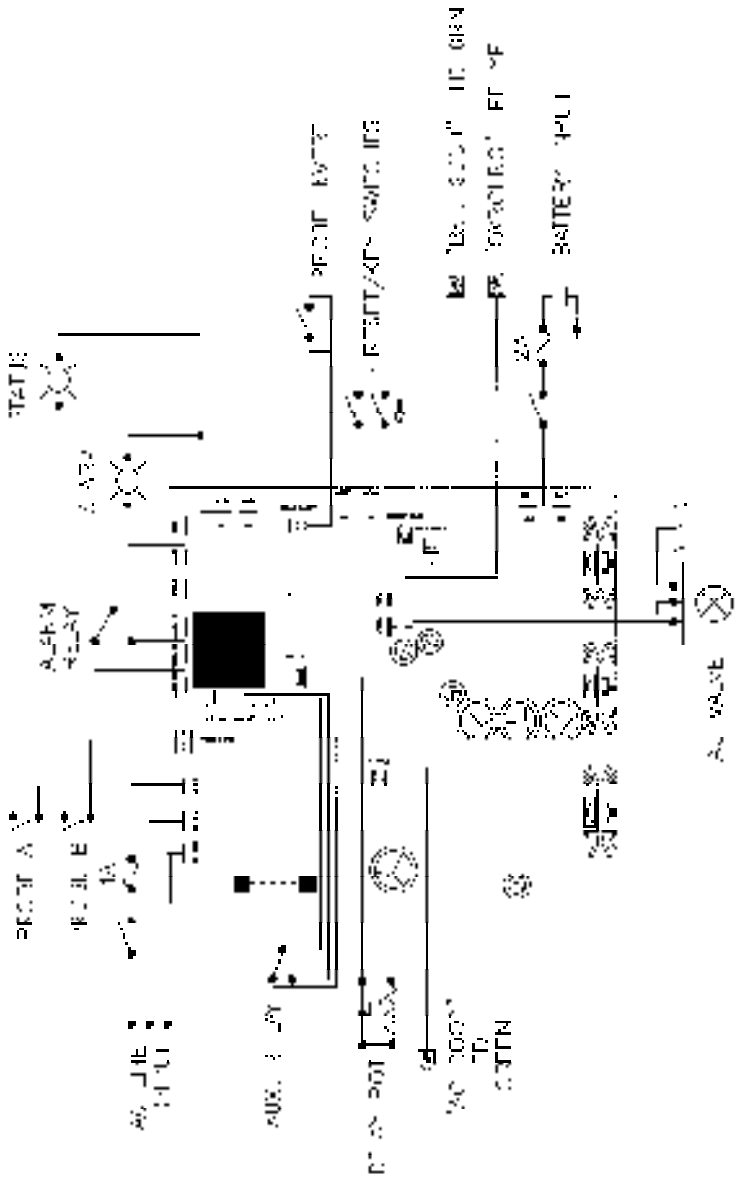
Float Switch

Standard Cable Length	16 feet

UL Listing

Industrial Process Control	UL 3121-1
UL file number	E225829

Chapter 7: System Schematic



Chapter 8: Replacement Parts List

DESCRIPTION	PART NUMBER
ENCLOSURE/LATCH	16550003
UPS	16550016
ASSY PCB	56550003
FLOAT SWITCH	16550020
2 POS KEY LOCK N/0	16550009
PUSH BUTTON BLK.FLUSH N/O	16550010
PILOT LIGHT-GREEN 12V	16550011
PILOT LIGHT-RED 12V	16550012
LIGHT BULB REPLACEMENT	16550035
FUSE 1A 250 V SLO-BLO	PPE011026
FUSE 2A 250 V SLO-BLO	PPE011072
MANUAL	16550112

Notes

GEO2001 PRODUCT INFORMATION SHEET

MODEL: ANTI-FLOOD CONTROLLER

MODEL NUMBER:

_____

SERIAL NUMBER:

_____

DATE OF MFG:

_____

QA/QC:

_____

INSTALLATION DATE:

_____

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.

Geotech Environmental Equipment, Inc

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