geotech

Single and Multi-Level Float Switch Probes

Installation and Operation Manual

Rev 09/03/25 Part # 26110012

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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 Single and Multi-Level Float Switch Probes are level-sensing devices used in environmental applications to detect the presence of fluids. These probes are commonly used to monitor groundwater levels, hydrocarbon layers, tankful and high/low sump conditions. The single-level probe detects a single fluid level, while the multi-level probe can detect multiple specific liquid levels or the interface between different fluids. These probes work in conjunction with control panels or other devices to automate processes like pumps or activate alarms.

The fundamental theory behind these probes is buoyancy and magnetism. A float, made of a buoyant material compatible with the target fluid, is designed to rise and fall with the liquid level. Embedded within the rigid stainless-steel shaft of the probe are one or more magnetic reed switches. As the float, which contains its own internal magnet, moves up or down the shaft, it passes over these reed switches. The magnetic field from the float causes the contacts within the reed switch to close or open, completing or breaking an electrical circuit. This change in electrical state sends a signal to a connected control panel or data logger, indicating that a specific fluid level has been reached. For detecting interfaces between different fluids (such as hydrocarbons and water), the probe may utilize a conductive tip and a specialized float. When the tip touches a conductive fluid like water, a circuit is completed, and the signal changes, allowing the user to differentiate between the two fluid types.

System Components

- **Probe/Stem:** This is the rigid tube or rod that extends into the tank. It acts as a guide for the float(s) and houses the reed switches. It can be made from a variety of materials, such as stainless steel, plastic, or brass, depending on the liquid it will be in contact with.

- **Float(s):** This is a hollow, buoyant component with an internal magnet. The float moves up and down the stem as the liquid level changes. In a multi-float system, multiple floats are used to detect different levels. The material of the float is chosen based on the liquid's specific gravity and chemical properties.
- **Reed Switch(es):** Located inside the stem, each reed switch is a hermetically sealed glass tube with two ferromagnetic contacts. When the float's magnet comes into close proximity, it pulls the contacts together, closing the circuit. The number of reed switches corresponds to the number of switching points on the probe.

- **Mounting Connection:** This component is at the top of the probe and allows for a secure installation into the tank. It can be a threaded connection, a flange, or a simple compression fitting.

- **Float Stops/Collars:** These are small rings or clips that are fixed to the stem to limit the travel of the float. They are essential for setting the high and low-level switching points.

- **Electrical Connection/Wiring:** This is the conduit through which the signal from the reed switch is transmitted to a control system, pump, or alarm. The number of wires will vary depending on if the switch is normally open (NO) or normally closed (NC) and the number of switching points.

Section 2: System Operation

Tank Full – Single Float Level Probes

The Geotech Tank Full Shut-Off Probe is an economical and versatile single-level float switch designed for reliable high-level fluid detection. This probe features a simple yet effective design, utilizing a float and a single reed switch to provide a clear signal when a specific fluid level is reached. Its customizable nature makes it an ideal solution for a variety of applications, with options for different vertical lengths, insert fitting types, and custom lead wire lengths and materials to suit specific tank or vessel configurations. As a straightforward and dependable component, the Tank Full Shut-Off Probe is an excellent choice for original equipment manufacturers (OEMs) looking for a cost-effective and easy-to-integrate solution for tank level control and overfill protection.

The table below shows the standard operation sequence.

Table 1

Switch Activation	Description
Tank Full Float	Shuts off pump(s) to any tank

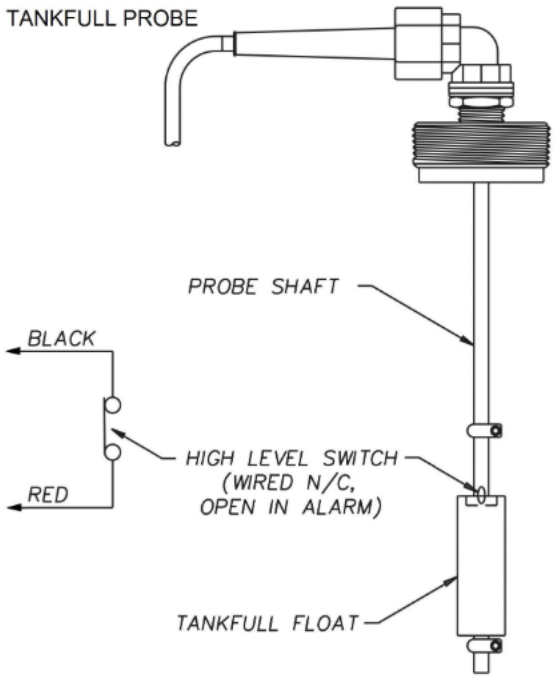


Figure 2-1 Tankfull

SDFS Reservoir Probe

The Geotech Small Diameter Filter Scavenger (SDFS) Reservoir Probe is a specialized monitoring tool designed to control and operate the SDFS system. It's used to detect both water level and product levels within the systems' product reservoir. The probe features a key safety function: a water-present sensor located in the reservoir. This sensor prevents the SDFS from drawing water when it should be exclusively scavenging product. The probe's integrated design allows it to provide the necessary feedback to automate the scavenging process effectively.

The table below shows the standard operation sequence.

Table 2

Switch Activation	Description
High product switch closes	Pump starts
High product switch opens	Pump stops
Water present switch closes	Alarm on, pump stops
Water present switch opens	Normal operation resumes
Tank Full switch opens	Alarm on, pump stops
Tank Full switch closes	Normal operation resumes

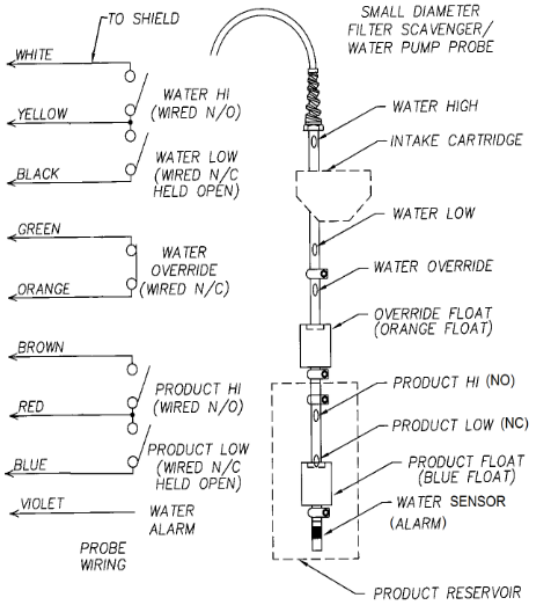


Figure 2-2 SDFS Level Probe

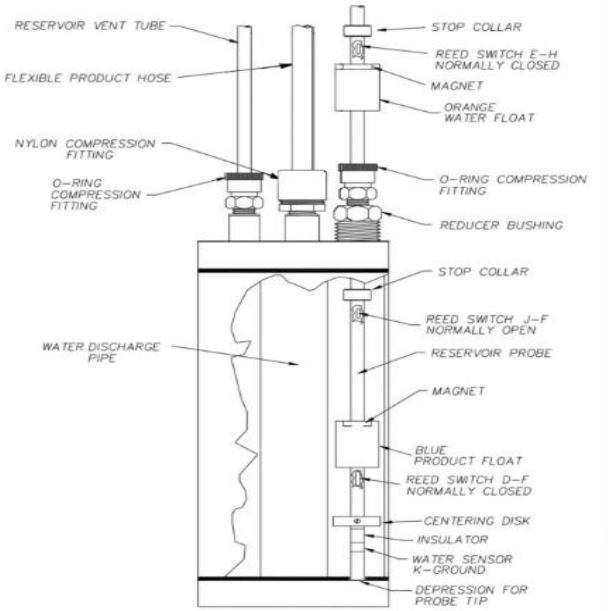


Figure 2-3 Reservoir Diagram

PRODUCT DISCHARGE TUBE HIDDEN BEHIND WATER DISCHARGE PIPE.WATER FLOAT ONLY PRESENT ON WTDP READY ASSEMBLY.

Probe Scavenger™ Level Probe

The Geotech Probe Scavenger Level Probe is a multi-level float switch designed specifically for the Geotech Small Diameter Probe Scavenger (SDPS) system. This advanced probe provides crucial real-time monitoring of both product (LNAPL) and water levels within a well. Its core function is to intelligently operate the SDPS system, ensuring efficient recovery of light non-aqueous phase liquids while preventing the recovery of water. The probe achieves this by automatically shutting down the system when product levels fall below the intake or when the water level rises to the intake point. This critical feature ensures the system remains dedicated to its primary task of product scavenging, maximizing the efficiency of the remediation process.

The table below shows the standard operation sequence.

Table 3

Switch Activation	Description
High product switch closes	Pump starts after delay time
High product switch opens	Pump stops
Water present switch closes	Alarm on, pump stops
Water present switch opens	Normal operation resumes
Tank Full switch opens	Alarm on, pump stops
Tank Full switch closes	Normal operation resumes

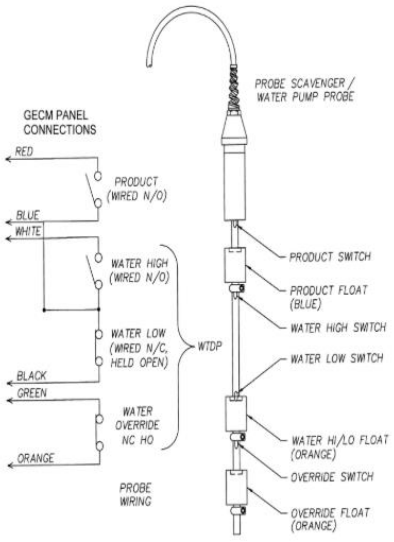


Figure 2-3 PSCAV Level **Probe Schematic**

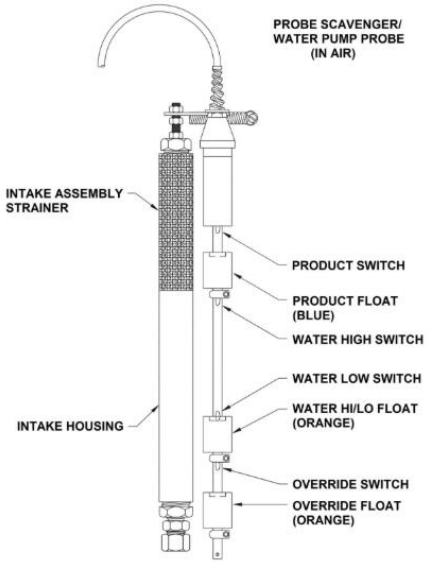


Figure 2-4 PSCAV Intake **& Level Probe**

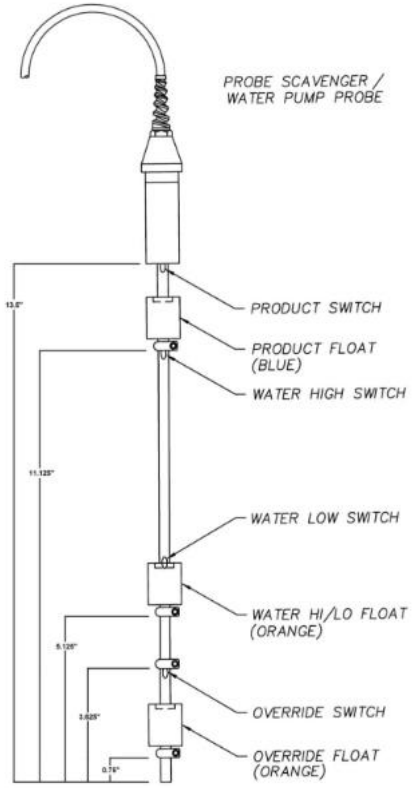


Figure 2-5 Standard PSCAV Level Probe Specifications

Sump Multi Float Switch Level Probe

The Geotech Sump Float Switch Probes are versatile multi-level float switches engineered for a range of sump-based applications, including air strippers, oil-water separators, and Soil Vapor Extraction (SVE) systems. These probes are designed for precise control and monitoring, capable of performing multiple functions within a single unit. Depending on the configuration, they can be used for high-level override to shut off influent water, activate an effluent transfer pump, or detect low vacuum to identify blower failure. Offered with a variety of threaded insert sizes, lengths, and cable options, these probes provide a customizable and reliable solution for automated fluid and vacuum management in complex remediation and industrial processes.

The table below shows the standard operation sequence.

Table 4

Switch Activation	Description
HI OVERRIDE (blue float)	Shut off influent water pump
HI LEVEL (orange float)	Turn on effluent transfer pump
LO LEVEL	Turns off effluent transfer pump
Tank Full switch opens	Alarm on, pump stops
Tank Full switch closes	Normal operation resumes

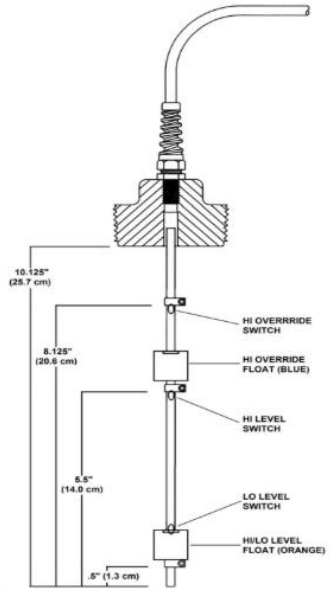


Figure 2-6 Standard Probe configuration LOPRO II AirStripper

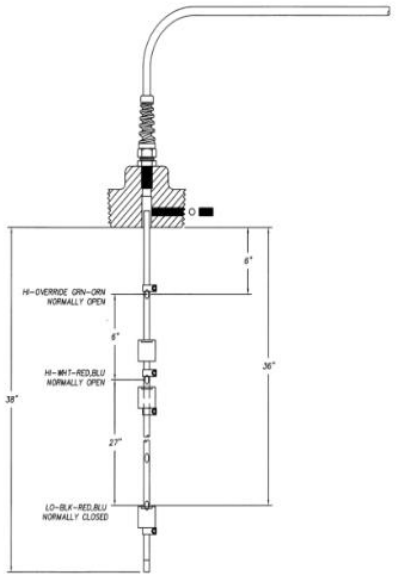


Figure 2-7 50408-1 LOPRO II

Sump Probe (LOPRO III)

The Geotech Sump Probe is a multi-level float switch specifically designed to integrate with systems like the Lo-Pro III air stripper. It's engineered to provide critical control signals to the system's control panel, ensuring safe and efficient operation. Within the air stripper, this probe is placed in the sump to monitor fluid levels, allowing it to perform functions such as high-level override, which shuts off the influent water to prevent overfilling, and activation of the effluent transfer pump once the treated water reaches a specific level. The probe may also be configured to detect a low vacuum, which can signal a blower failure.

The table below shows the standard operation sequence.

Table 5

Switch Activation	Description
HI OVERRIDE (blue float)	Shut off influent water pump
HI LEVEL (orange float)	Turn on effluent transfer pump
LO LEVEL	Turns off effluent transfer pump
LO Vacuum	Detects blower failure, Shuts off feed pump
HI Vacuum	Signals panel, Shuts off blower

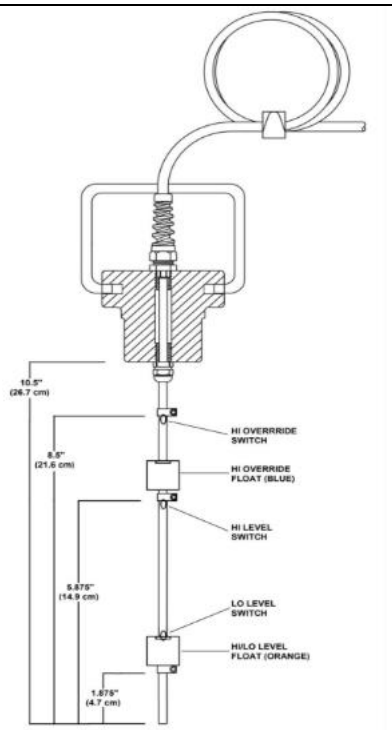


Figure 2-8 LOPRO III Sump Probe Schematic

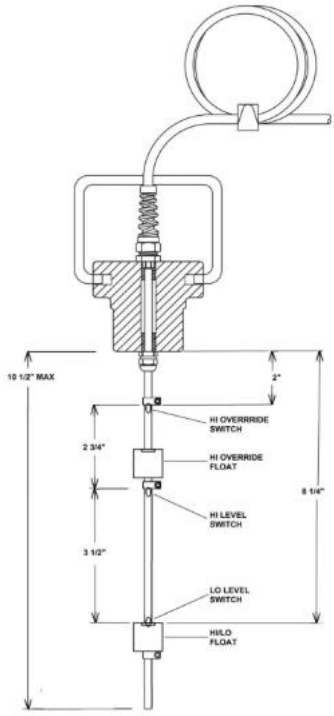


Figure 2-9 LP3 Probe LOPRO III

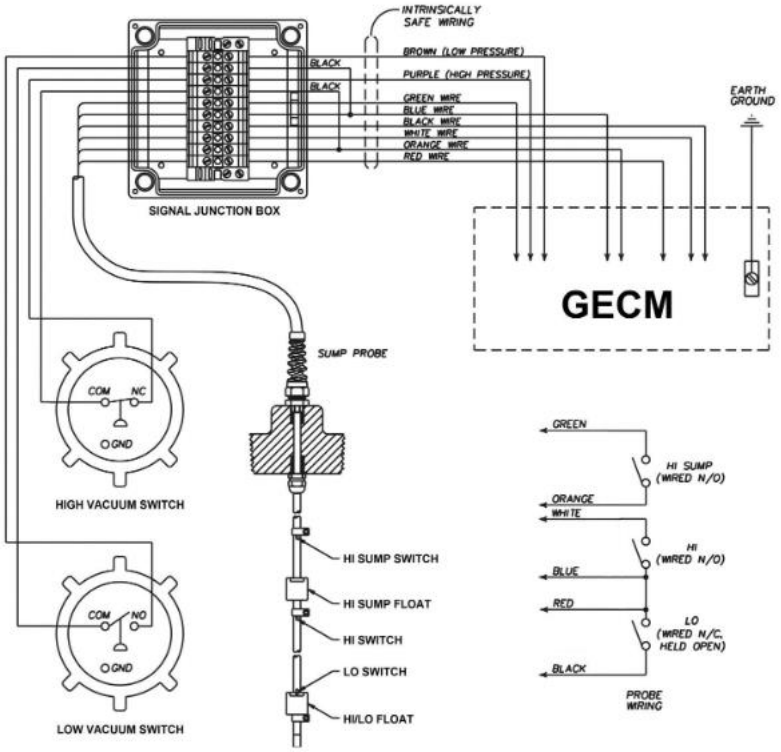


Figure 2-10 Wiring Diagram LOPRO-B (LOPRO III)

Water Table Depression Pump

The Geotech WTDP (Water Table Depression Pump) multi-float level probe is a multi-level-sensing device designed to automate and optimize the operation of a WTDP system. It features multiple float switches along its length, allowing it to detect and differentiate between several fluid levels within a well. This probe is crucial for controlling the WTDP by providing the necessary signals to the control panel, enabling it to turn the pump on or off at predetermined water levels. By doing so, it ensures that the pump efficiently creates and maintains a cone of depression in the water table, which is essential for the effective concentration and recovery of hydrocarbons or other liquid contaminants. The multi-float design ensures that the system operates only when needed, preventing dry-running and maximizing the efficiency of the remediation process.

The table below shows the standard operation sequence.

Table 6

Switch Activation	Description
High water switch closes	Pump starts
Low water switch opens	Pump stops
Low override switch closes	Alarm on, pump stops
Low override switch opens	Normal operation resumes
N.O. Aux. switch closes	Alarm on, pump stops
N.O. Aux. switch opens	Normal operation resumes
N.C. Aux. switch closes	Alarm on, pump stops
N.C. Aux. switch opens	Normal operation resumes

Optional Shut offs

The table below shows some common methods used to shut off a Water Table Depression Pump.

Table 7

Shut off device	Description
Sump Probe	Attach the orange and green leads from the sump probe to J3-7 and J3-8, respectively, on the ORS RCM™ 1000
Air Stripper High/Low Pressure Switch	Attach the two leads from the high or low pressure switch to J3-7 and J3-8, respectively, on the RCM™ 1000
Tank Full Probe	Attach the red and black leads from the tank full probe to J3-5 and J3-6, respectively, on the RCM™ 1000

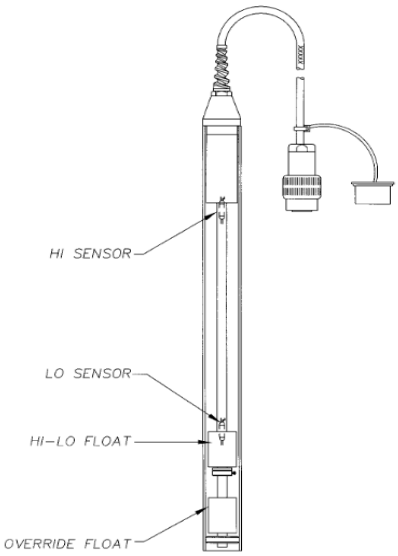


Figure 2-11 WTDP Multi Float Switch Probe

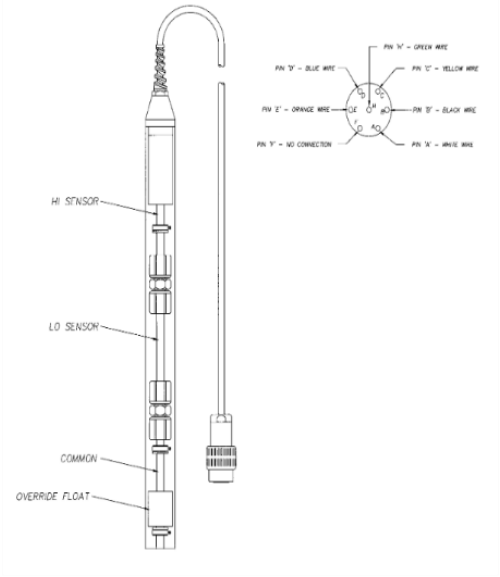


Figure 2-12 WTDP 9 Pin Connector Schematic

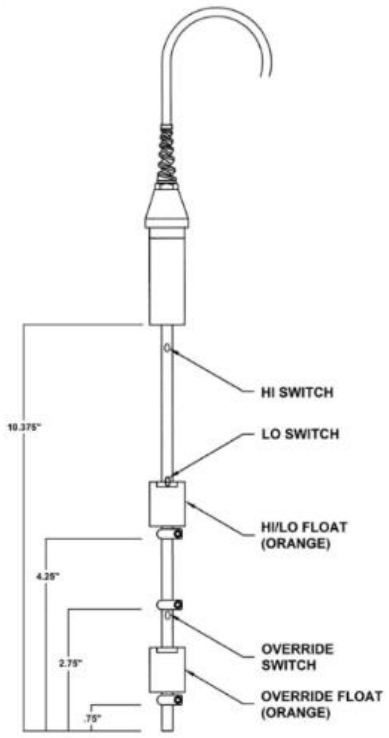


Figure 2-13 Standard WTDP Multi Float Switch Specifications

Section 3: System Troubleshooting

Problem: The reed switch level probe provides inaccurate readings, or there is no signal output at all.

Solution: Start by inspecting the float and the probe itself. The most common cause is a stuck or damaged float. Check if the float is freely moving along the stem of the probe. Debris, sludge, or a physical obstruction can prevent the float from moving correctly. Clean the probe and float if there is any build-up. Also, check the float stops (or collars) to ensure they haven't come loose or been moved from their correct position, which would prevent the float from reaching the intended switch point.

Problem: The level switch signal is unstable, rapidly switching on and off.

Solution: This issue, often called "contact bounce," can be caused by the float being on the very edge of the reed switch's sensing range. The float's magnet may be just strong enough to close the switch, but slight movements or vibrations cause it to open and close repeatedly. To fix this, reposition the float stop to ensure the float is moved fully into the sensing range, creating a firm and stable contact. Additionally, magnetic interference from other equipment or metal objects nearby can disrupt the reed switch's magnetic field, leading to erratic behavior. Try to relocate the probe or use magnetic shielding if possible.

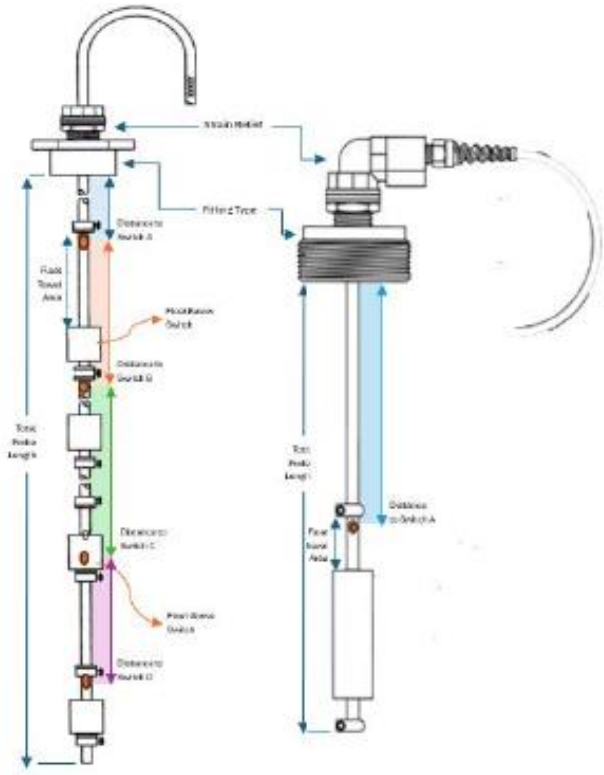
Problem: A specific reed switch on the probe is not working, even when the float is in the correct position.

Solution: This can be a sign of a damaged or "welded" reed switch. Exposing the switch to currents higher than its rated capacity can cause its internal contacts to fuse together. Use a multimeter to test the resistance of the switch. If it reads as an open circuit (infinite resistance) when the float's magnet is present, the switch is likely damaged and needs to be replaced. A multimeter can also detect if the switch is permanently "stuck" in a closed position (zero ohms resistance) even with no magnet present. Also, confirm the wire colors match the level switch being tested

Section 4: System Specifications

Probe Function:	Float, Conductivity or Combination of Both
Switch Distance:	Minimum of 1" (.3m)
Switch Contact Type:	Open or Normally Closed
Type of Floats:	Product Float (Blue) SG 60, Water Float (orange) SG 90, SST Product Float, SST Water Float
Float Material:	Urethane or Stainless Steel (SST)
Float travel area in inches:	Minimum 6-inches* (.15m)
Shaft Material:	300 Series Stainless Steel
Switch Type:	Magnetic Reed
Fitting:	Threaded Connection, Slip Fit Connection, Custom Available
Cable Options:	Polyurethane, ETFE
Cable Length:	10', 25', 50', 75', 100' or custom (3m, 7.6m, 15m, 23m, 30m)
8 Pin Connector:	Optional
Power Requirement:	5 Volt DC with I.S. Energy Level
Strain Relief Orientation:	Straight or 90° Degree

**The total length of the level probe is the physical dimension of the probe's stem from the end of the mounting threads to the bottom of the probe. This measurement determines the maximum liquid depth the probe can monitor. It's critical to ensure the total length is slightly greater than the maximum liquid level in the tank to ensure all desired switch points can be accommodated and to allow for proper installation.*



Custom Control Probes available

Call Us at: 1-800-833-7958

Section 5: Parts and Accessories

Part Number	QTY	Description One	Description Two
WTDP DENSITY PROBES BARE WIRE			
2950193-08	EA	PROBE,DENSITY,HI	50 CABLE,WTDP,NO CONNECTOR
2950193-09	EA	PROBE,DENSITY,LO/LOOR	50 CABLE,WTDP,NO CONNECTOR
2390055	EA	PROBE,DENSITY,HI/LO/LOOR	25 CABLE,WTDP,NO CONNECTOR
2390056	EA	PROBE,DENSITY,HI/LO/LOOR	50 CABLE,WTDP,NO CONNECTOR
2390057	EA	PROBE,DENSITY,HI/LO/LOOR	100 CABLE,WTDP,NO CONNECTOR
WTDP DENSITY PROBES 8 PIN CONNECTOR			
56120006	EA	PROBE,DENSITY,HI/LO/LOOR	25 CABLE,WTDP,8PIN CONNECTOR
56120014	EA	PROBE,DENSITY,HI/LO/LOOR	50 CABLE,WTDP,8PIN CONNECTOR
56120007	EA	PROBE,DENSITY,HI/LO/LOOR	100 CABLE,WTDP,8PIN CONNECTOR
56120001	EA	PROBE,DENSITY,HI/LO/LOOR,SS FLOATS	100 PTFE CBL,WTDP,8PIN CONNECT
WTDP CONDUCTIVITY PROBES 8 PIN CONNECTOR			
56120012	EA	PROBE,COND,HI/LO/LOOR	25 CABLE,WTDP,8PIN CONNECTOR
56120005	EA	PROBE,COND,HI/LO/LOOR	50 CABLE,WTDP,8PIN CONNECTOR
56120004	EA	PROBE,COND,HI/LO/LOOR	100 CABLE,WTDP,8PIN CONNECTOR
SVE/OWS/TRANSFER TANK PROBES			
2950524-01	EA	PROBE,DENSITY,PRODUCT,32",HIHI/HI/LO	50 CABLE,OWS,NO CONNECTOR,LARG
56090016	EA	PROBE,DENSITY,PRODUCT,HIHI/HI/LO	20 CABLE,SITE TUBE,LARG DIAME
56090017	EA	PROBE,PRODUCT,HIHI/HI/LO,SS FLOATS	25 CABLE,SVE,LARGE DIAMETER
SDPS DENSITY PROBES			
56120010	EA	PROBE,DENSITY,PRODUCT HI,H20 HI/LO/LOOR	25 CABLE,SDPS,8PIN CONNECTOR
56120013	EA	PROBE,DENSITY,PRODUCT HI/H20 HI/LO/LOOR	50 CABLE,SDPS,8PIN CONNECTOR
56120009	EA	PROBE,DENSITY,PRODUCT HI/H20 HI/LO/LOOR	100 CABLE,SDPS,8PIN CONNECTOR
2390072	EA	PROBE,DENSITY,PRODUCT HI,H20 HI/LO/LOOR	100 CABLE,SDPS,NO CONNECTOR

56120002	EA	PROBE,DENSITY,PRODUCT HI,H2O HI/LO/LOOR	100 PTFE CBL,SDPS,8PIN CONNECT
SDPS CONDUCTIVITY PROBES			
56120003	EA	PROBE,COND,PRODUCT HI,H20 HI/LO/LOOR	25 CABLE,SDPS,8PIN CONNECTOR
56120011	EA	PROBE,COND,PRODUCT HI,H20 HI/LO/LOOR	100 CABLE,SDPS,8PIN CONNECTOR
56120015	EA	PROBE,VISCOUS,PRODUCT HI,H20 HI/LO/LOOR	50 CABLE,SDPS,8PIN CONNECTOR,L
SWPS PROBES			
56030008	EA	PROBE,DENSITY,PRODUCT HI/H20 HI	25 CABLE,SWPS,3PIN CONNECTOR
LOPRO PROBES			
2100076	EA	PROBE,DENSITY,HIHI/HI/LO	10FT CABLE,LOPROII,SUMP,LAR
2450014	EA	PROBE,DENSITY,HIHI/HI/LO	10FT CABLE,LOPROIII SUMP,LARGE
TANKFULL PROBES			
56650100	EA	PROBE,TANKFULL,3/4" & 2" BUNG,HI	25 CBL,SIPPER,4PIN CONNECTOR
2390073	EA	PROBE,TANKFULL,3/4" & 2" BUNG,HI	25 CABLE,NO CONNECTOI
2390069	EA	PROBE,TANKFULL,3/4" & 2" BUNG,HI	50 CABLE,NO CONNECTOI
56020009	EA	PROBE,TANKFULL,3/4" & 2" BUNG.HI	25 CABLE,8PIN CONNECTO
56120019	EA	PROBE,TANKFULL,3/4" BUNG,HI	150 CABLE,VAR LENGTH,N CONN
PROBE CABLE OPTIONS			
ORS418005	FT	CABLE,28AWG,8 COND,URETH	
99533	FT	CABLE,24AWG,6 COND	PTFE JACKET

Revision History		
Project #	**Description**	**Date**
M2491	Created Customer Probe Manual – AL, AH	9/3/25

NOTES

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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 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.

Geotech Environmental Equipment, Inc.
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