High Level Probe

User Guide

Rev. 11/2026



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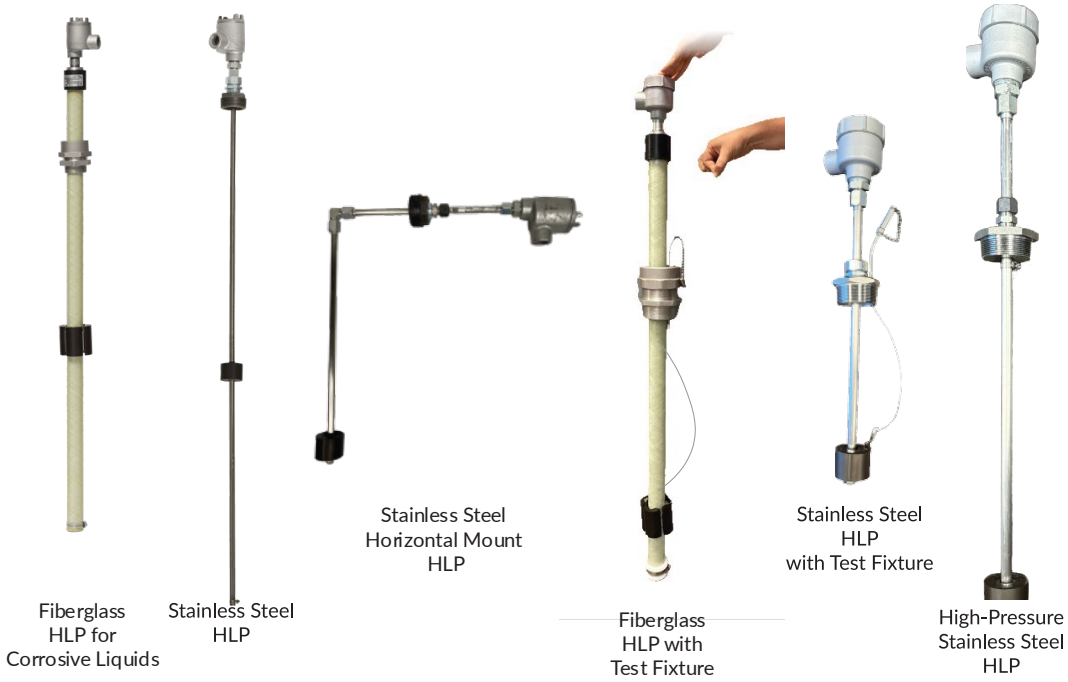
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INTRODUCTION

The Electrolab High Level Probe (HLP) is a float-actuated level switch designed to provide reliable point-level detection in liquid storage tanks. The probe is available in single-float and dual-float configurations for high-level, low-level, and multi-point monitoring applications. The standard probe mounts vertically through a female NPT connection on the top of the tank, while a side-mount version is available upon request. An adjustable mounting grip allows the probe to be positioned at the desired switching point.

The probe uses magnetically actuated reed switches to provide discrete level indication. As the float moves with changes in liquid level, the reed switch(es) change state, providing a dry-contact signal for use with SCADA systems, Programmable Logic Controllers (PLCs), alarm panels, or other monitoring equipment.

The HLP is available in a variety of configurations: Fiberglass or stainless steel, top-mount, side-mount, single-float, dual-float, with or without an integrated test fixture, and high-pressure.



Single-Float Configuration

In the single-float configuration, one float is used to detect a single liquid level point. When the float is in its normal resting position, the reed switch remains in its designated state. As the liquid level rises and lifts the float approximately 0.75 in., the switch changes state, providing a level alarm or control signal.

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Dual-Float Configuration



The dual-float configuration uses two independent floats and reed switch circuits mounted on a single probe assembly (see photo at right), allowing two separate liquid level points to be monitored through a single tank connection. The distance between the upper and lower floats is customized to meet the specific requirements of the application. During the ordering process, the customer specifies the desired spacing between float actuation points, enabling the probe to be configured for defined operating ranges, alarm setpoints, or pump control sequences.

Optional Test Feature

Probes equipped with the optional Test Feature include a test wire attached to the float assembly. Pulling the test wire manually raises the float, allowing the switch operation to be verified without opening the tank hatch or changing the liquid level inside the tank. This feature enables operators to safely confirm proper operation of the float, switch contacts, field wiring, PLC inputs, alarms, and SCADA indications during routine inspections and preventative maintenance.

Optional High-Pressure Design

The High-Level Probe is available in a high-pressure design for up to 150 psi.

Typical Applications

The High-Level Probe is commonly used for:

- High-level detection in oil, produced water, and saltwater tanks
- High-high level shutdown and alarm systems
- Pump control applications
- Liquid/leak detection in containment and spill detection areas

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PART NUMBER

Individual High-Level Probes are identified by their part numbers, which provide essential information about the probe.

HLP1.0S1-NC

HLP= High Level Probe

HLP**1.0**S1-NC

Measurement Length in Feet (customer specified from 1- 6 feet in 6-inch increments)

HLP1.0**S**1-NC

Tube Type: S= Stainless Steel or FG= Fiberglass

HLP1.0S**1**-NC

Number of Floats: 1= Single Float or 2= Dual Float

HLP1.0S1-**NC**

Switch Position Preference: NC= Normally Closed or NO= Normally Open

HLP1.0S1-NC**T**

Test Feature Option: NCT = Normally Closed with Test Feature or NOT = Normally Open with Test Feature

Horizontal Mount Version: 90 DEG

HLP1.0S1-NC-90 DEG

Other Options:

HLP Apparatus-SS – HLP mounting with Test Feature (included in -NCT)

CF8-8 FH4BZ-SS-OPT – Add on for high-pressure mounting

Also available with no mounting or wireless mounting

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SPECIFICATIONS

Specifications

The High-Level Probe uses magnetically actuated reed switches that are UL Recognized (File E47258) and rated for 10 W, 200 VDC, with a maximum switching current of 500 mA.

The float can be installed in either orientation to provide the desired switch action:

- Magnets Up: Provides Normally Closed (NC) output.
- Magnets Down: Provides a Normally Open (NO) output.

When configured as Normally Open, a clamp is required above the float to establish the switch actuation point and limit float travel.

Although the reed switches can operate at the ratings listed above, the voltage and current ratings shown on the sensor nameplate are intentionally reduced for safety and reliability. Always use the ratings indicated on the product label when designing or connecting the probe to external equipment.

Important Safety Information

- Do not open the enclosure while the circuit is energized or when an explosive atmosphere may be present.
- Always disconnect power before servicing, inspecting, or replacing components.
- To prevent the buildup of electrostatic charge, clean non-metallic surfaces only with a damp cloth.
- Installation must be completed in accordance with the applicable control drawing and all local electrical codes governing intrinsically safe equipment.
- **WARNING:** Reed switch outputs are intended for low-current signal applications only. Do not connect directly to electromechanical relay coils or other inductive loads. Connect the probe only to a PLC, RTU, SCADA digital input, or a solid-state relay suitable for dry-contact inputs.

Entity Parameters

- Supply Voltage: 0 to 45 VDC
- Maximum Current: 0.1 A (100 mA)

Approvals

UL Recognized Components

Intrinsically Safe (Ex ia) approved for use when installed in accordance with the specified control drawing and entity parameter requirements.

Refer to the product nameplate and applicable control drawing for complete approval information, installation requirements, and hazardous area classifications.



Mechanical Specifications
• 304 Stainless Steel or Fiberglass body • Stainless Steel model fits a 2” NPT-M port; Fiberglass model fits a 4” NPT-F port • High-density Nitrophyl float • Explosion-proof • Customer specified length from one foot and increasing in 1/2-foot increments up to 6 feet • Vertical tank mounting or 90°, side-mount option for installing to the side of a tank • Single- or dual-float option for detecting two levels. Customer specified distance between switches. • Selectable high- or low-level alarm option • Optional test fixture for verifying operation of the high-level detection feature • Optional High-pressure design for up to 150 psi • Hardwire or wireless compatible
Electrical Specifications
• Operating temperature range: -40°C to +80°C • Dry Contact ratings 1-45v, 100mA (max)

PROBE CONSTRUCTION

The High-Level Probe is constructed to be suitable for operation in hazardous locations. The Probe design (shown on the following page) consists of a combination of reed switches (A) mounted on a printed circuit board (B) with a pair of 22awg wires (C) as connections outside the stainless steel or fiberglass tubing.

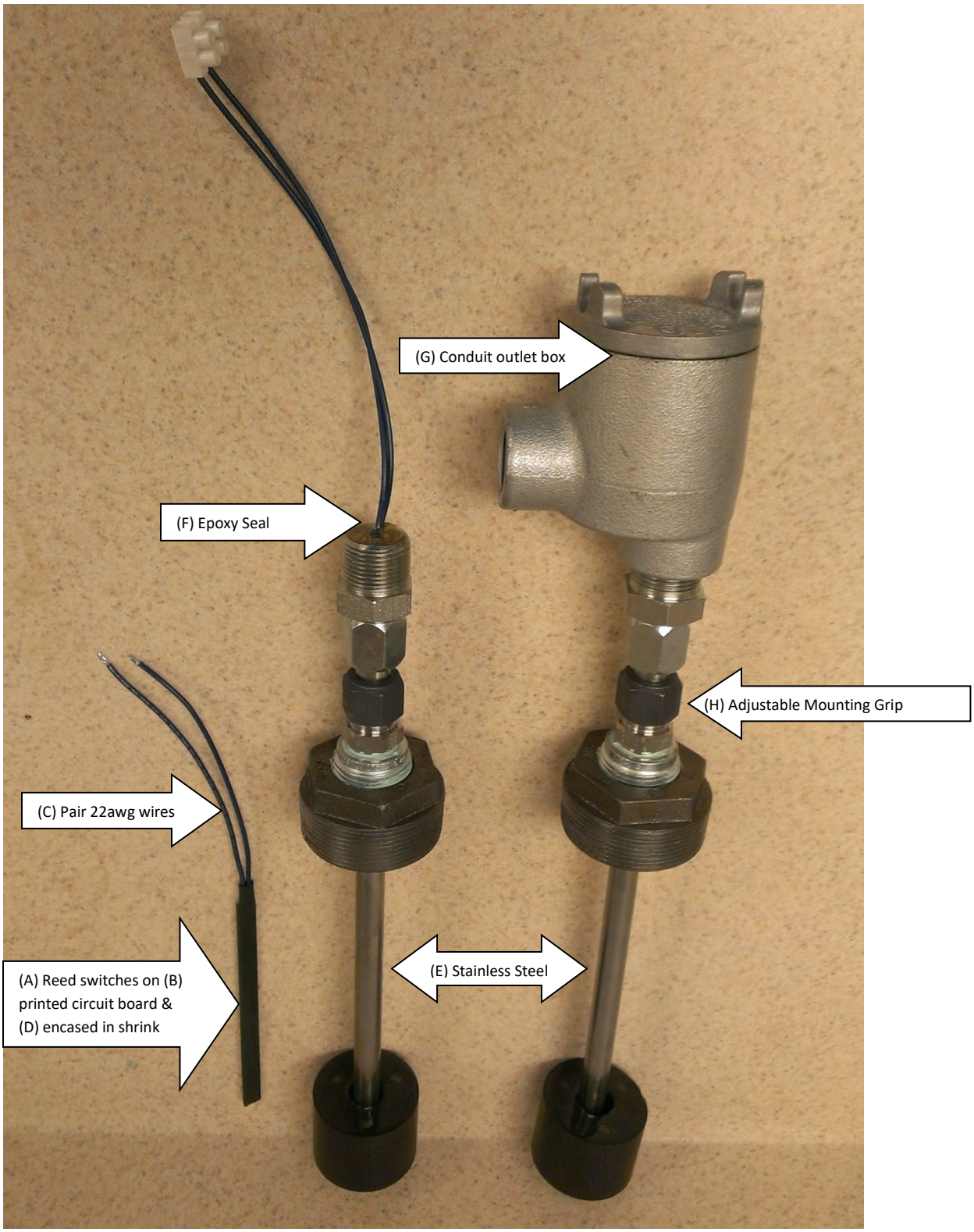
The reed switches are hermitically sealed by the manufacturer. The circuit board is encased in shrink tubing (D) and inserted into the stainless steel tube (E), as shown or fiberglass tube. The stainless steel tube is welded on the bottom end and epoxy sealed (F) on the top providing a gas tight seal. The wires protruding through the epoxy enter a UL listed (699G) conduit outlet box with cover (G), which is suited for hazardous locations. The Adjustable Mounting Grip (H) is available in two options: (1) a metal fastener that is used with side and top mount applications to hold the stainless steel tube firmly in place (this fastener prevents future adjustments from being made) or (2) a metal fastener with a rubber gasket which can be repositioned in the future, if needed.

The stainless steel probes and all metal components of all HLPs are treated with e9 Treatments' Surface Treatment Solution. This hydrophobic and oleophobic treatment significantly reduces paraffin and other types of buildup on metal surfaces, helping to ensure long-lasting measurement accuracy.



Single-float fiberglass probe on left, single-float stainless steel probe on right.

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INSTALLATION

Typical Configuration

The probe provides one pair of wires for each switch circuit. These outputs are intended for connection to a PLC, RTU, SCADA system, or other monitoring device to provide reliable status indication of tank liquid levels.

To install the sensor, follow the simple steps below:

1. Carefully insert the bottom end of the sensor into the tank top port and lower the sensor slowly in the tank. Be careful with the float, so that it does not hang up on the port edge.

2. Slide the reducer/sensor mount assembly down to the tank port and tighten it into the port. Position the sensor to the desired depth and tighten the cord grip or compression nut sufficiently so that the sensor does not slip.

3. Connect the pair of wires exiting the head (conduit outlet box) to the PLC per the instructions for your specific PLC.

WARNING: On the fiberglass High Level Probe tube, the maximum measured capacitance on the metallic hose clamp to ground is 4.14 pF. A risk of ignition due to electrostatic discharge is present. Be sure to take necessary precautions against electrostatic discharge.

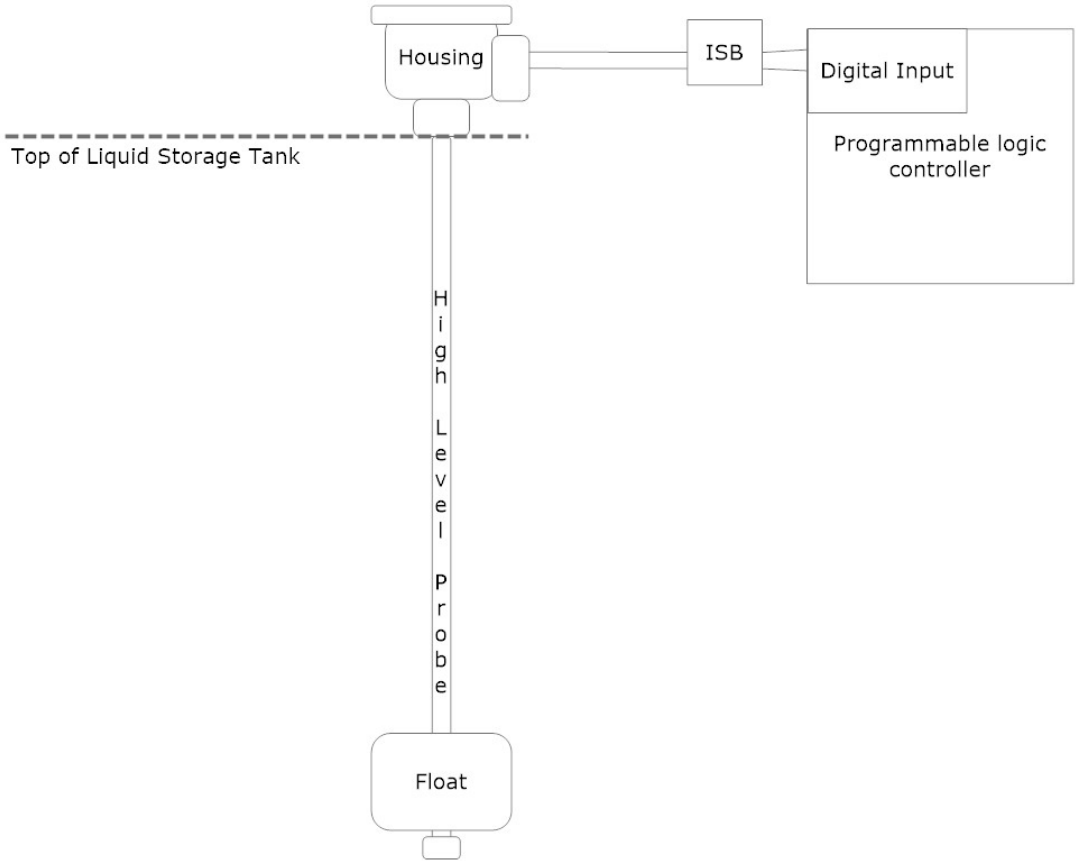
WIRING

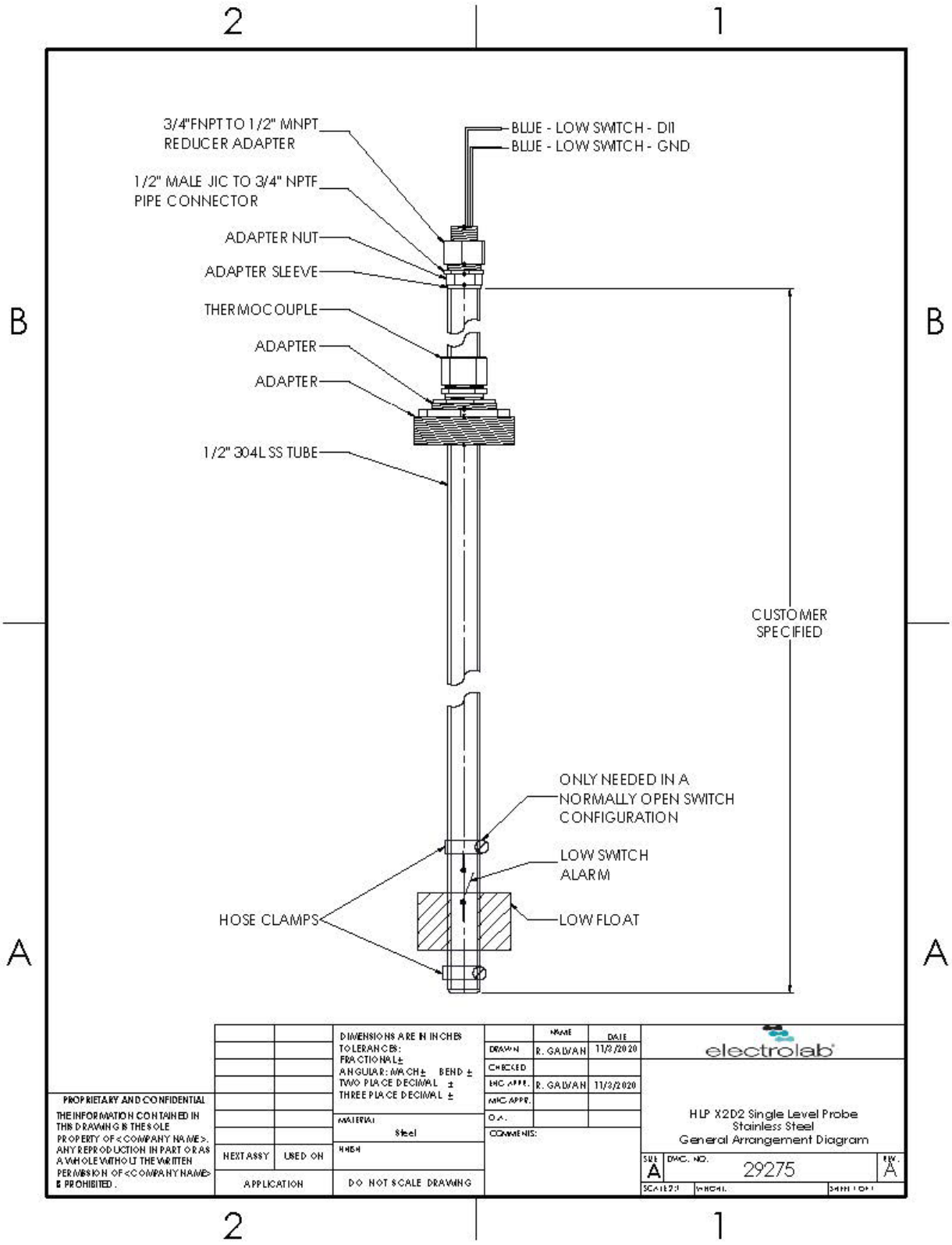
The probe has 2 wires per discrete circuit that are intended for status only (discrete Input to a processor). The reed switches are not intended to drive a load.

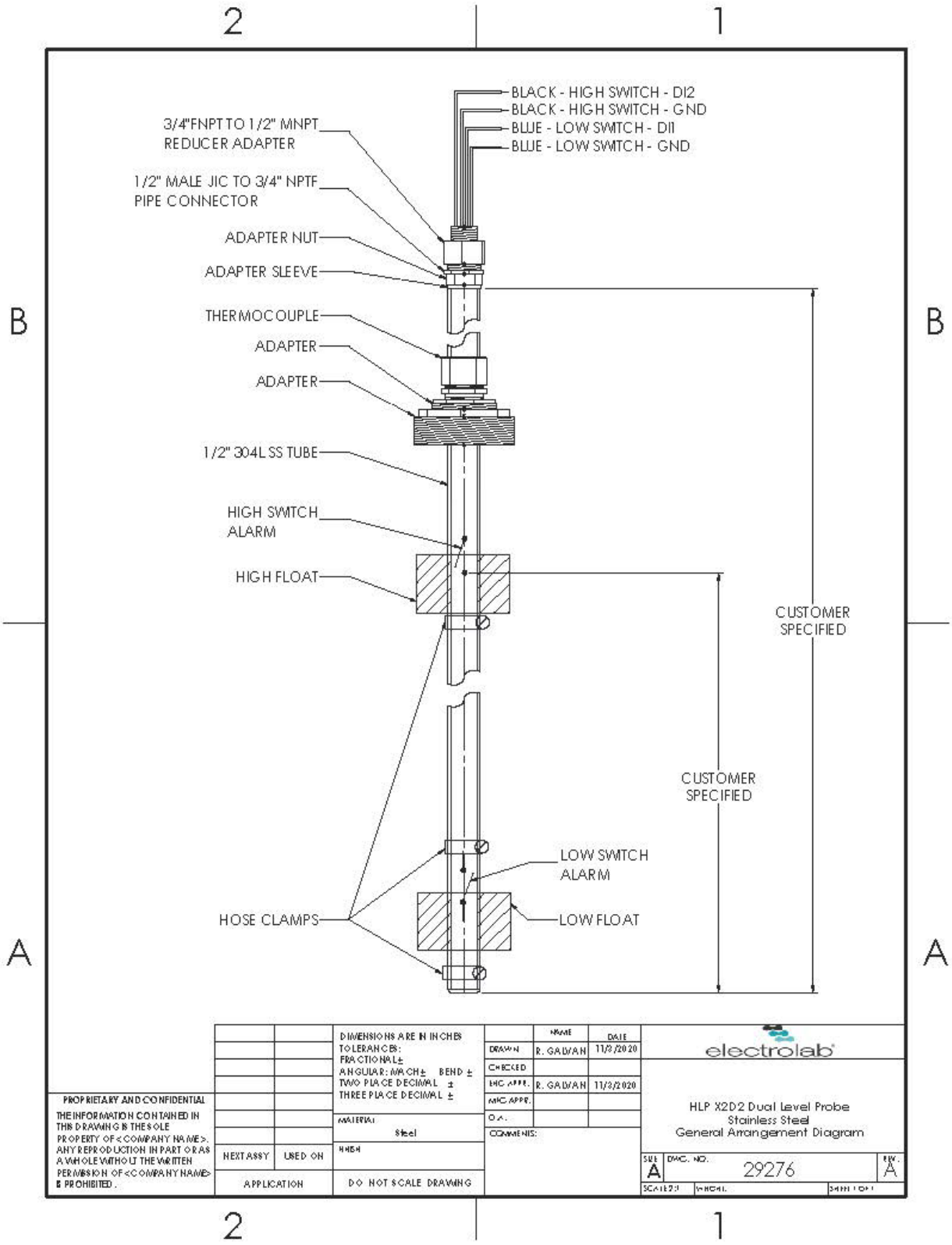
NOTE: Please refer to the manual for your Programmable Logic Controller (PLC) for instructions on how to install these two wires for digital input, as this may vary based on your specific installation and configuration.

For UL compliance, an approved barrier device (ISB on the following drawing) is required for Class I, Div. 1, Intrinsically Safe areas.

High Level Probe




2
1
B
A
3/4"FNPT TO 1/2" MNPT
REDUCER ADAPTER
1/2" MALE JIC TO 3/4" NPTF
PIPE CONNECTOR
ADAPTER NUT
ADAPTER SLEEVE
THERMOCOUPLE
ADAPTER
ADAPTER
1/2" 304L SS TUBE
BLUE - LOW SWITCH - DII
BLUE - LOW SWITCH - GND
CUSTOMER
SPECIFIED
ONLY NEEDED IN A
NORMALLY OPEN SWITCH
CONFIGURATION
LOW SWITCH
ALARM
LOW FLOAT
HOSE CLAMPS
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <COMPANY NAME>. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <COMPANY NAME> IS PROHIBITED.
NEXT ASSY
USED ON
APPLICATION
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
MATERIAL
Steel
FINISH
DO NOT SCALE DRAWING
NAME
DATE
DRAWN
R. GALVAN
11/3/2020
CHECKED
ENG APPR.
R. GALVAN
11/3/2020
MFG APPR.
Q.A.
COMMENTS:
electrolab
HLP X2D2 Single Level Probe
Stainless Steel
General Arrangement Diagram
SIZE
A
DWG. NO.
29275
REV.
A
SCALE: 1
WEIGHT:
SHEET 1 OF 1


2
1
B
A
BLACK - HIGH SWITCH - DI2
BLACK - HIGH SWITCH - GND
BLUE - LOW SWITCH - DI1
BLUE - LOW SWITCH - GND
3/4"FNPT TO 1/2" MNPT
REDUCER ADAPTER
1/2" MALE JIC TO 3/4" NPTF
PIPE CONNECTOR
ADAPTER NUT
ADAPTER SLEEVE
THERMOCOUPLE
ADAPTER
ADAPTER
1/2" 304L SS TUBE
HIGH SWITCH
ALARM
HIGH FLOAT
CUSTOMER
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DO NOT SCALE DRAWING
NAME
DATE
DRAWN
R. GALVAN
11/3/2020
CHECKED
ENG APPR.
R. GALVAN
11/3/2020
MFG APPR.
Q.A.
COMMENTS:
electrolab
HLP X2D2 Dual Level Probe
Stainless Steel
General Arrangement Diagram
SIZE
A
DWG. NO.
29276
REV.
A
SCALE: 1:1
WEIGHT:
SHEET 1 OF 1

TECHNICAL ASSISTANCE

Installation, troubleshooting, and other technical assistance for the High-Level Probe may be obtained by contacting the manufacturer, Electrolab, Inc:

Electrolab, Inc.
159 Enterprise Parkway
Boerne, Texas 78006
(888) 301-2400
E-mail: Insidesales@electrolabcontrols.com