

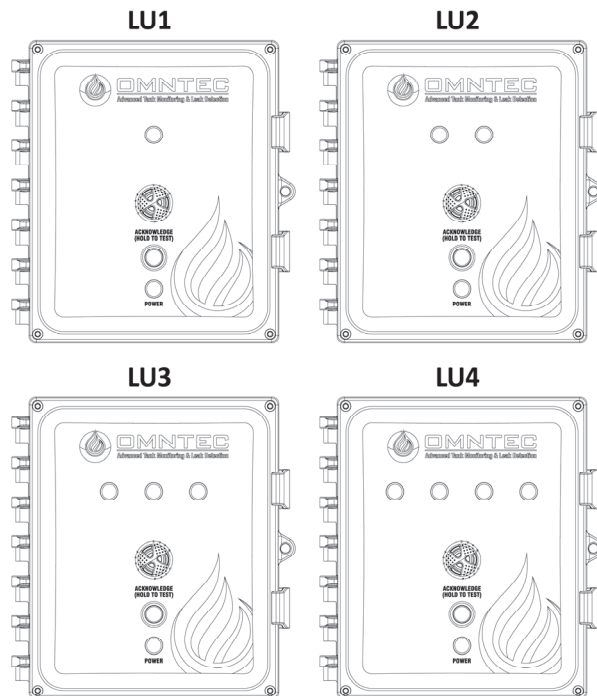


OMNTEC
Advanced Tank Monitoring & Leak Detection



DOC00012 rev1.3

LU SERIES MANUAL



LEAK AND OVERFILL ALARM SYSTEM

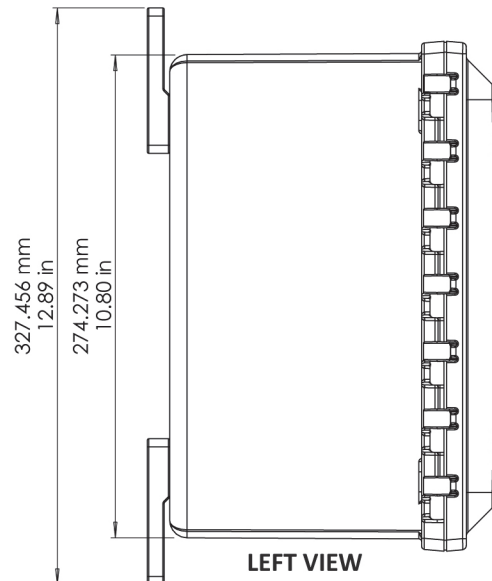
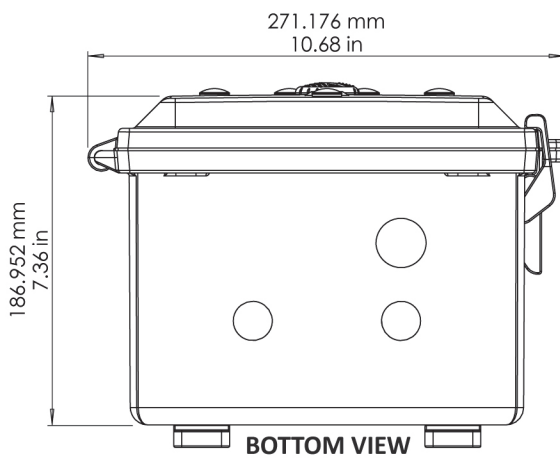
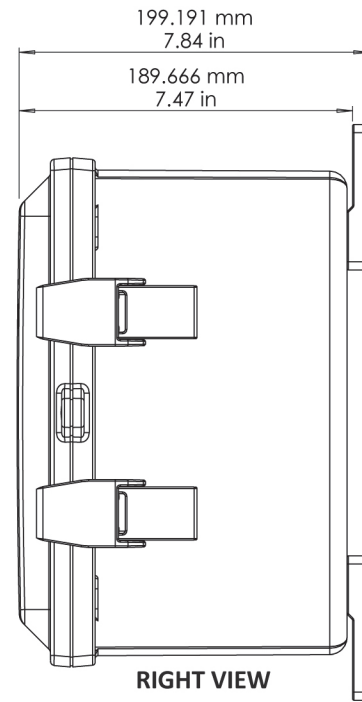
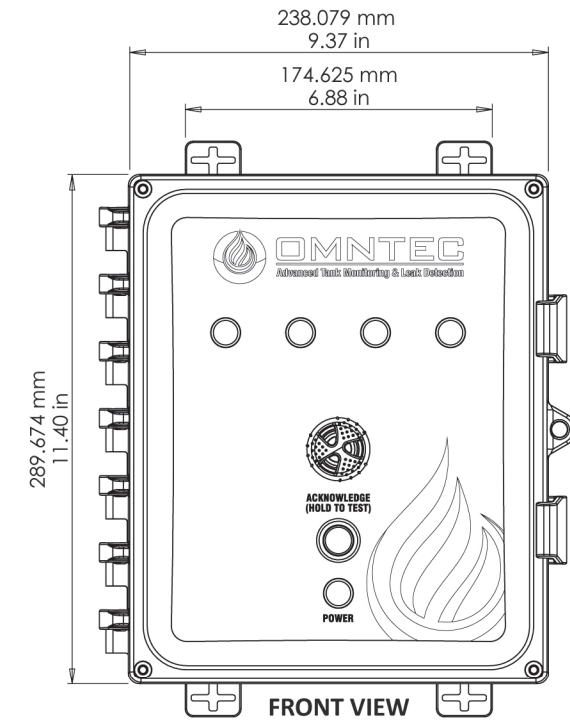
Revision 1.3

Document No. DOC00012

TABLE OF CONTENTS

DIMENSIONS	3
INSTALLATION	4
CONTROL DRAWING	15
SENSOR INSTALLATION	16
SENSOR WIRING.....	18
RAS SERIES REMOTE ANNUNCIATOR OPTION	21
RELAY CONNECTIONS	22
OPERATION AND TEST INSTRUCTIONS.....	23
TROUBLESHOOTING	24
LOG SHEET	25
OMNTEC MFG., INC. – LIMITED WARRANTY.....	26
APPENDIX A – DIP SWITCH SETTINGS	27

DIMENSIONS



INSTALLATION

NOTICE

Use of unauthorized parts in the LU system or modification to any parts of the system will nullify U.L. listing and our warranty. OMNTEC Mfg., Inc. will not be responsible for any claims arising from the safety and performance of modified units.

If you have any questions, please contact OMNTEC Mfg., Inc. at (631) 981-2001

READ THIS FIRST!

The LU Series is an associated apparatus for use in nonhazardous locations with intrinsically safe outputs for use in Class I, Groups C and D; or Class I Zone 0, Group IIB; hazardous locations when connected in accordance with **Control Drawing No. DOC00010**.



WARNING

All work must be performed only by authorized personnel who are qualified using intrinsically-safe design principles (NEC, CEC, and all local applicable codes) and are thoroughly familiar with the Installation Section of the LU Series Manual.

Improper wiring or installation can compromise the intrinsically-safe design of the system and create an electric shock and/or explosion hazard.

YOU CAN CAUSE DEATH OR SERIOUS PERSONAL INJURY TO YOURSELF, OTHERS AND/OR EXTENSIVE PROPERTY DAMAGE.



WARNING

Observe the following rules. Failure to do so will create an electric shock or explosion hazard that can result in death, personal injury, and/or property damage.

1. Do not permit unauthorized personnel to install or service the equipment.
2. Power to the controller must be removed before installing and servicing the equipment.

IMPORTANT SENSOR INFORMATION

ONLY INSTALL LU SERIES SENSORS

Please verify sensors have been installed according to the Installation Instructions provided before calling technical support

READ ME!

Earth Ground Warning

The earth ground terminal must be connected to maintain intrinsic safety, UL, NEC, CEC, and all local applicable codes.

READ ME!

Use Preformed Knockouts

If preformed knockouts are not used, intrinsic safety may be compromised, and warranty will be voided.

Do Not Drill into Enclosure

PRODUCT DESCRIPTION

System Overview

The OMNTEC LU Series is a leak detection and overfill alarm system designed to bring tank owners into compliance with applicable EPA and local regulations. It provides audible and visual alarm warnings for high, low, or leak conditions. Sensors can be added for monitoring interstitial spaces, piping sumps, double-wall piping, dispenser pans, dikes, and observation wells. Alarm conditions are identified by the controller, and optional low voltage remote high-level annunciators.

The system consists of a controller that is wall-mounted in a non-hazardous location and have sensors for monitoring product levels and leaks. Easy-to-read status is indicated by the controller's LED display lights.

System Specifications

SPECIFICATIONS	
Input Power:	80-240 VAC 47-63 Hz 30 W
Channel Indicator Lights:	Up to 4 LED Channel Indicators
Audible Alarm:	95 dB Piezoelectric Horn
System Status:	1 Power LED Indicator
Relay Ratings (Maximum):	6A @ 240 VAC 6A @ 30 VDC
Operating Temperature:	-40°F to 140°F (-40°C to 60°C)
Agency Approvals:	UL, cUL Listed

MODEL NOMENCLATURE

The Model Number designates the following:

LU			
			CHANNEL LIGHT COLOR CODE
			None All Red
			R Red
			A Amber
			Y Yellow
			G Green
			B Blue
			W White
		ENCLOSURE OPTIONS	
		None Non-Metallic	
		1 Metallic	
	NUMBER OF RELAYS		
	None All Relays Populated		
	2 Two Relays Populated		
	3 Three Relays Populated		
	4 Four Relays Populated		
NUMBER OF CHANNELS			
1 One Channel			
2 Two Channels			
3 Three Channels			
4 Four Channels			

Example for an LU with 4 channels, 3 relays, a metallic enclosure and a Red/Amber/Red/Red light color code:

LU4-3-1-RARR

SITE PREPARATION

Safety Requirements

It is the responsibility of the installer and operator to be familiar with and to comply with all applicable codes and regulations. The following are some safety tips to be used during installation and servicing:

- **Do not** perform any installation or service procedures if you are not qualified to work with intrinsically-safe systems.
- **Do not** perform any installation or service procedures if you are not familiar with the National Electrical Code and all other Federal, State, and Local codes and regulations pertaining to this installation.
- **Do not** perform any installation or service procedures until you have read through and understand this entire manual.
- **Do not** install the controller in a hazardous location.
- **Do not** drill through enclosure.
- **Do not** install RA(S) Series Remote Annunciators in hazardous locations.
- **Only** sensors are to be installed within hazardous locations.
- **Do not** substitute components. The intrinsic safety design can become compromised creating an explosion hazard. It will also void the warranty.
- **Do not** apply power to the controller until all other installation and wiring have been completed and inspected. Read **Figure 3 – Applying Power**. Applying power to the controller is the final step in the installation process.
- **Always** turn off power to the controller before servicing.
- Take all safety precautions to avoid accidents.
- Keep work area clean.
- **Block off work area** when operating on tanks and hazardous locations to prevent vehicles and pedestrians from entering the area.
- **Use proper fire prevention measures** to keep all sparks, flames, and other ignition devices away from the hazardous area.

Electrical Wiring

All electrical work should be performed by qualified personnel only and in accordance with the NEC, CEC, and/or all Federal, State, and Local codes and regulations as pertains to this installation.

Observe the following when selecting and installing wires and cables:

- Up to 4 sensors may be connected to the LU. See **Control Drawing DOC00010** for Sensor Wiring.
- Sensor cables must be completely enclosed in conduit from the junction box to the console (contact factory for direct-burial applications).
- Sensor cables may share the same conduit.
- Sensor cables must be run in conduits that are separate from other wiring
- All wiring must enter the controller through the designated preformed knockouts (see **Figure 2 – Panel Knockouts for Conduit**).



WARNING

Failure to comply can create an electric shock or explosion hazard causing death, personal injury, and/or property damage.



CAUTION

Failure to make electrical splices, conduits, and junction boxes water-tight can result in system failure due to wet wires.

Conduit Application

Observe the applicable codes pertaining to which cables may or may not be combined into a single conduit.

Use and select the proper conduit types and sizes in accordance with applicable codes. Even in situations where they are not required by code, it is recommended that they are used to protect wiring.

Note: Make certain that all conduits and junction boxes are dry and watertight where applicable. Wet wires can result in the faulty operation of the system.

Observe the following when selecting and installing conduit:

- Determine the conduit size based on the number and size of cables it will carry.
- Rigid metal conduit, ½-inch or larger (use reducer couplings, do not drill into box), is recommended between the controller and the tank area.
- Do not combine sensor cables with other wires in the same conduit.
- Install the conduit seal fittings in accordance with NFPA 70 (National Electrical Code), NFPA 30 (Automotive and Marine Station Code), and all local applicable codes.
- All wires should enter the controller via a conduit.



WARNING

Failure to comply can create an electric shock or explosion hazard causing death, personal injury, and/or property damage.

Junction Box Application

Use waterproof junction boxes for outdoor, underground, or potentially wet applications to provide access to sensor connections after installation.

Note: Make certain that all conduits and junction boxes are dry and watertight. Wet wires can result in the faulty operation of the system.

Observe the following when selecting and installing junction boxes:

- Use waterproof junction boxes for each sensor splice.
- Junction box size should meet code requirements
- For manway applications mount the junction box high in the manway so that it will not become submerged in water after a heavy rain.

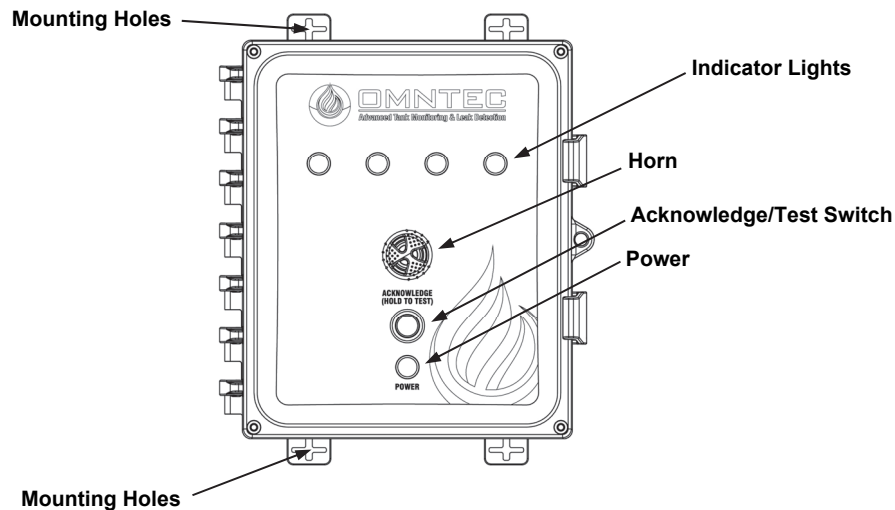
CONTROLLER INSTALLATION

Controller

The LU Series controller is mounted in a non-hazardous area and requires 80-240 VAC, 47-63 Hz, 30 W. It monitors all sensors providing status and alarm information on up to 4 LED indicators. Audio/visual remote alarms (RA(S) Series) can be connected to the controller as well.

Note: RA(S) Series remote annunciators are optional equipment.

Figure 1 – Front Panel



Observe the following installation requirements:

- Locate the controller in a **non-hazardous** location.
- Locate controller at eye-level where it is easily accessible, and alarms will be heard.
- Locate the controller in areas where temperatures will stay between -40°F and 140°F (-40°C and 60°C).
- Use proper anchor bolts for wall type.
- Make certain that there is sufficient clearance for opening the controller door.
- Allow for sufficient clearance around the controller for conduit access. All conduits will enter the controller through the designated preformed knockouts. (see **Figure 2 – Panel Knockouts for Conduit**).
- Avoid installing in corners.
- Do not install behind doors that may cause damage to the unit.

Mounting the Controller

The controller is mounted on the wall using the mounting flange (see **Figure 1 – Front Panel**).

1. Place the panel against the wall and use it as a template
2. Install proper anchors and bolts for wall type.

Wiring, Controller Knockout Designations, and Mounting

All wiring must be performed in accordance with **Control Drawing No. DOC00010**. Before making any connections inside the panel, refer to **Control Drawing Document No. DOC00010** supplied with equipment.

All wiring enters the controller via conduit through the designated preformed knockouts as shown in **Figure 2 – Panel Knockouts for Conduit**. You must adhere to the following wiring requirements; failure to do so will void the warranty:

- K1 is reserved for **Intrinsically Safe Input** cables only.
- K2 is reserved for **Optional Output** wires only.
- K3 is reserved for **Input Power** lines and can also be used for supporting **High Voltage Relay** applications
- The cover for the **wiring compartment** for the **Intrinsically Safe Circuit Terminals** must be in place and **secured** in use to **maintain separations** to Non-Intrinsically Safe Circuits

Note: AC input must come in, dressed tight, and contact must not be made with the IS Barrier or ANY other PC Board Circuitry. The barrier cover must be able to open freely.

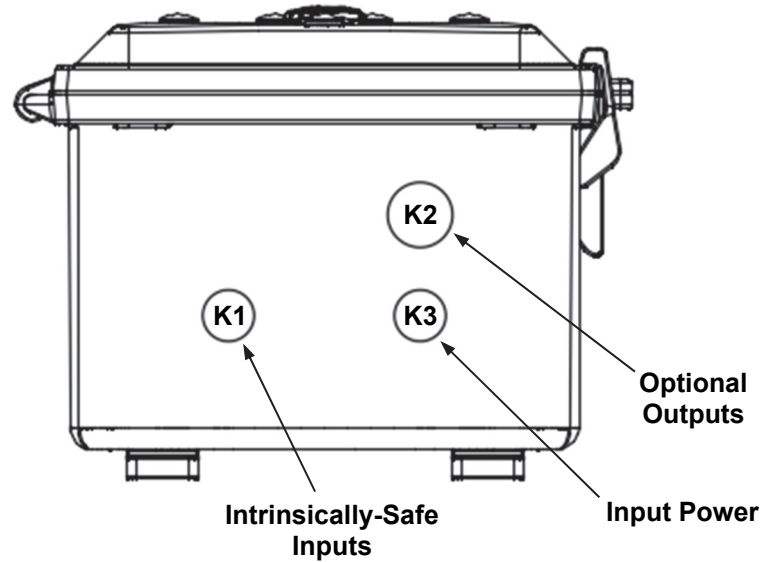


Failure to comply will defeat the intrinsically-safe design of the system and will create an explosion hazard.

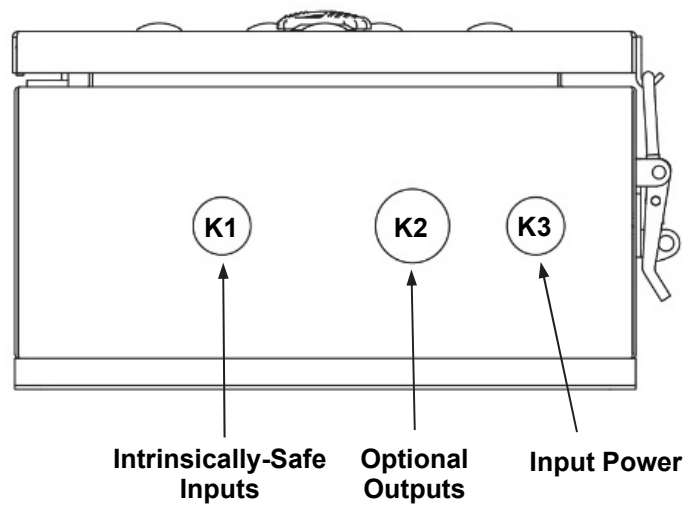
Consult the NEC, CEC, and all local applicable codes pertaining to voltage and wire specification requirements for merging wires into the same conduit.

Figure 2 – Panel Knockouts for Conduit

Non-Metallic



Stainless Steel



EYS Seal-Off Fitting

Consult NEC, CEC, and all local applicable codes for EYS installation. Make installations as follows:

- Install EYS seal-off fittings in accordance with applicable codes.
- Prior to applying appropriate sealing compound in all EYS, be sure entire system is functioning properly.

AC Power Line

The AC power line will run from the control panel directly to a minimum 15-amp circuit breaker within a **circuit breaker panel via conduit. Select wire in accordance with code for this installation.**

Note: To maintain intrinsically-safe design principles and UL requirements, field ground and earth ground must be installed properly (see Figure 3 – Applying Power).

AC Power Connections at the Controller

The LU requires its own dedicated circuit. Input power must be 80-240 VAC, 47-63 Hz. Bring the AC power line into the panel via the conduit knockout K3 as shown in **Figure 2 – Panel Knockouts for Conduit.**

Make the following connections inside the controller:

1. Connect the line voltage wire to the **L** terminal.
2. Connect the neutral wire to the **N** terminal.
3. Connect the field ground wire to the **F.G.** terminal.
4. Connect the earth ground wire to the chassis ground lug.

Note: The cover must be able to open and close freely.

Bring the other end of the AC power line into the circuit breaker panel and connect to a minimum 15-amp circuit breaker.

Main Panel and Sub-Panel Grounding

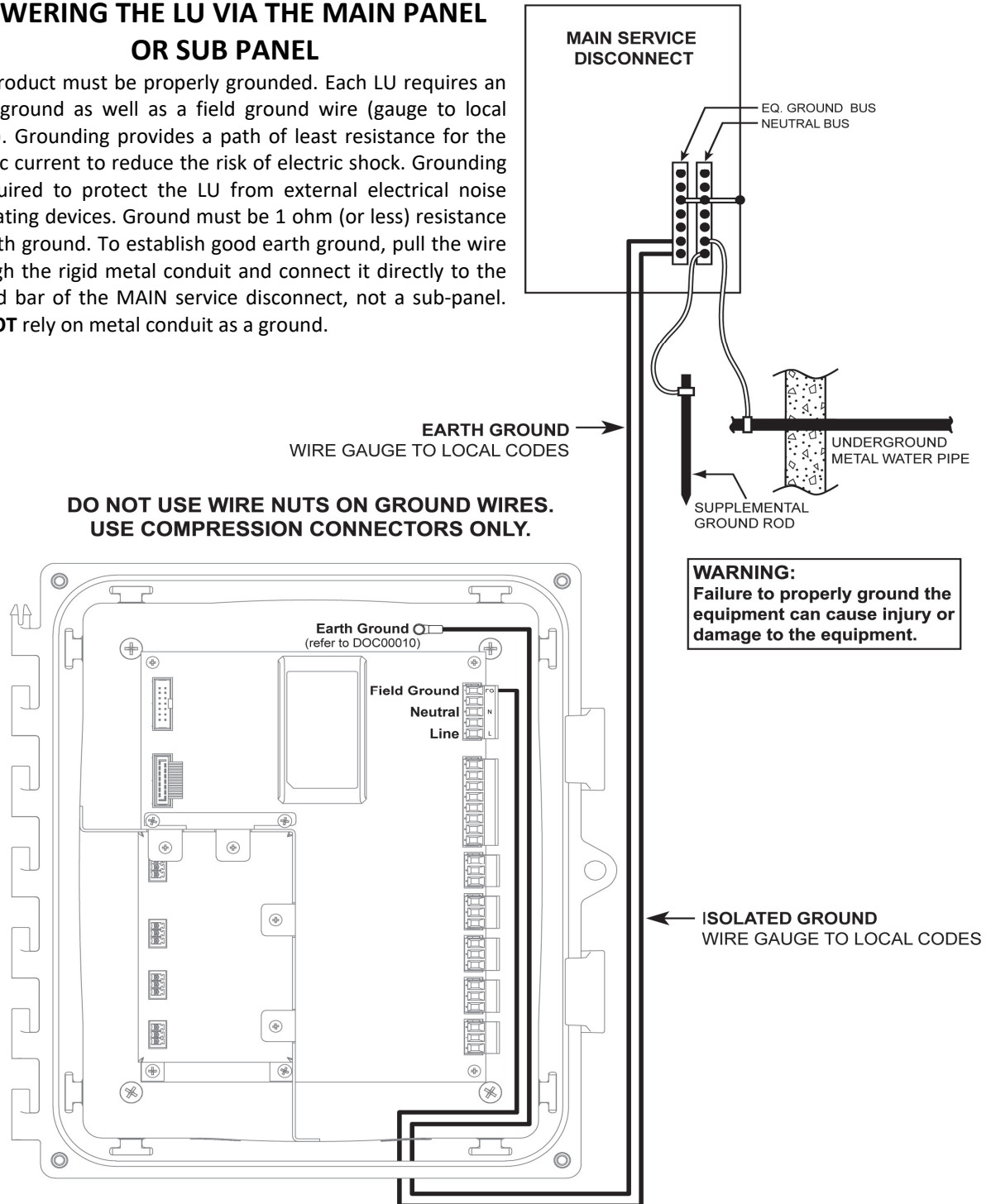
Pull the wire through the rigid metal conduit and connect it directly to the ground bar of the **main** electrical service panel, not a sub-panel. **DO NOT** rely on the metal conduit as ground. See **Figure 3 – Applying Power.**

Powering Controller via Main Panel or Sub Panel

Figure 3 – Applying Power

POWERING THE LU VIA THE MAIN PANEL OR SUB PANEL

This product must be properly grounded. Each LU requires an earth ground as well as a field ground wire (gauge to local codes). Grounding provides a path of least resistance for the electric current to reduce the risk of electric shock. Grounding is required to protect the LU from external electrical noise generating devices. Ground must be 1 ohm (or less) resistance to earth ground. To establish good earth ground, pull the wire through the rigid metal conduit and connect it directly to the ground bar of the MAIN service disconnect, not a sub-panel. **DO NOT** rely on metal conduit as a ground.



MARKINGS AND CERTIFICATIONS

LU SERIES
**LEAK DETECTION &
OVERFILL ALARM SYSTEM**

SERIAL NO. _____

Tank Monitoring Equipment
(Associated Apparatus Appareillage Connexe)


LISTED
FILE E139410

Associated Apparatus; non-hazardous locations;
[AEx ia Ga] IIB; [Ex ia Ga] IIB provides
intrinsically safe outputs for use in Class I,
Groups C and D or Class I Zone 0, Group IIB
hazardous locations when connected in
accordance with control drawing number
DOC00010. Warning: substitution of components
may impair intrinsic safety.
Advertissement: la substitution de composants
peut compromettre la securite intrinseque

ELECTRICAL RATINGS
INPUT: 80-240 V, 0.75 A / 115 VAC
& 0.5 A / 230 VAC (TYP.), 47-63 Hz

ENTITY PARAMETERS
SENSOR INPUTS: $U_o = 12.75V$, $I_o = 216mA$,
 $C_o = 1.7\mu F$, $L_o = 0.768mH$, $P_o = 621mW$
 $-40^{\circ}C \leq T_{amb} \leq 60^{\circ}C$
Type 1 Enclosure

OMNTEC Mfg., Inc.
2420 Pond Road
Ronkonkoma, New York 11779

Certifications and conditions of use:

The LU complies with the following standards:

- UL 508 ED.18
 - UL60079-0 ED.7
 - UL60079-11 ED.6
 - UL913 ED.8
 - CSA C22.2 No. 14 ED.13
 - CAN/CSA C22.2 No. 60079-0:19
 - CAN/CSA C22.2 No. 60079-11:14
- The associated apparatus must be connected to an intrinsically-safe apparatus, following the conditions and entity parameters listed on the control drawing.
 - For installations in which both the C_i and L_i of the intrinsically-safe apparatus exceeds 1% of the C_o and L_o parameters of the associated apparatus (excluding the cable), then 50% of C_o and L_o parameters are applicable and shall not be exceeded. The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu F$ for Groups I, IIA and IIB and $600nF$ for Group IIC.

CONTROL DRAWING

IMPORTANT: THIS CONTROL DRAWING DOES NOT REFLECT THE ACTUAL LOCATION OF CONDUIT ENTRY (SEE NOTE 4)

SCHEDULE DRAWING: CANNOT BE CHANGED -WO- CERTIFICATION AGENCY APPROVAL

REVISIONS			
ZONE	REV	DESCRIPTION	DATE
	1.1	INITIAL RELEASE	7/8/24
			D.L.

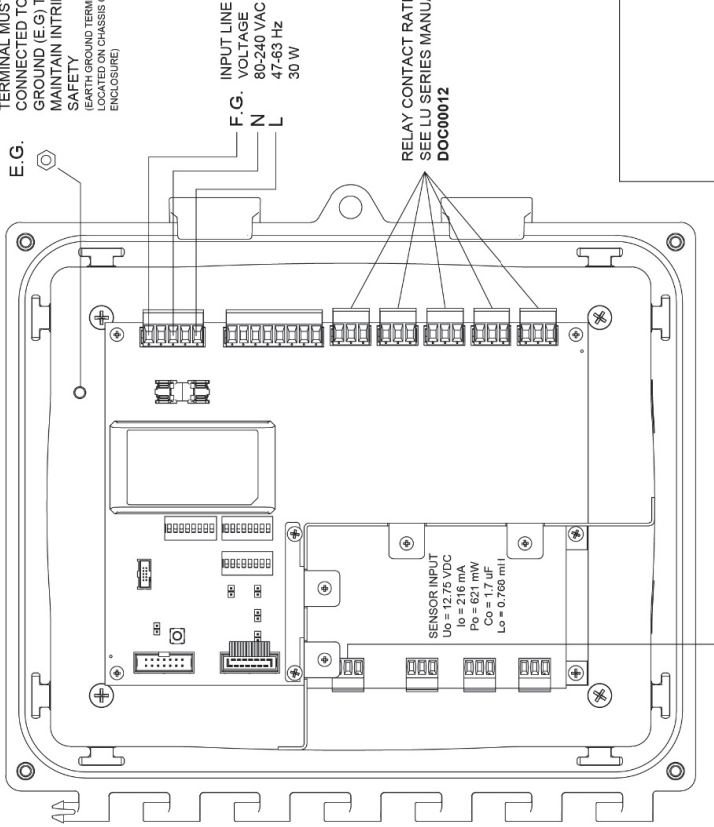
CLASS I, GROUPS C AND D OR CLASS I, ZONE 0 GROUP IIB HAZARDOUS LOCATIONS

NON-HAZARDOUS LOCATION

WARNING: THIS

TERMINAL MUST BE CONNECTED TO EARTH GROUND (E.G.) TO MAINTAIN INTRINSIC SAFETY

(EARTH GROUND TERMINAL IS LOCATED ON CHASSIS OF METALLIC ENCLOSURE)



MODEL LU

NOTES:

1. ALL WIRING MUST MEET NATIONAL ELECTRICAL CODES OR OTHER APPLICABLE LOCAL CODES.
2. SYSTEM EARTH GROUND MUST BE CONNECTED TO TERMINAL F.G. TO INSURE INTRINSIC SAFETY AND MUST BE LESS THAN 1 OHM WITH RESPECT TO EARTH GROUND.
3. OPTIONAL REMOTE REQUIRED #22 AWG LOW VOLTAGE COMMUNICATION WIRE MINIMUM.
4. SEE INSTALLATION INSTRUCTIONS FOR PROPER CONDUIT ENTRY.

APPAREILLAGE CONNEXE:
AVERTISSEMENT: LA
SUBSTITUTIA DE COMPOSANTS
PEUT COMPROMETTRE LA
SECURITE INTRINSEQUE

1. ASSOCIATED APPARATUS ENTITY PARAMETERS:

SENSOR INPUT
 $U_o = 12.75 \text{ VDC}$
 $I_o = 216 \text{ mA}$
 $P_o = 621 \text{ mW}$
 $C_o = 1.7 \text{ uF}$
 $L_o = 0.768 \text{ mH}$

2. THE OUTPUT CURRENT OF THIS ASSOCIATED APPARATUS IS LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN-CIRCUIT VOLTAGE AND SHORT-CIRCUIT CURRENT.
3. SELECTED INTRINSICALLY SAFE EQUIPMENT MUST BE THIRD PARTY LISTED AS INTRINSICALLY SAFE FOR THE APPLICATION, AND HAVE INTRINSICALLY SAFE ENTITY PARAMETERS CONFORMING WITH TABLE 1 BELOW.

TABLE 1:
I.S. EQUIPMENT ASSOCIATED APPARATUS

$U_o \leq U_i$
 $C_o \geq C_{cable} + C_i$
 $L_o \leq L_i$
 $P_o \leq P_i$

4. THIS ASSOCIATED APPARATUS MAY ALSO BE CONNECTED TO SIMPLE APPARATUS AS DEFINED IN 504.2 OF THE NEC, CLAUSE 3.5.4 OF IEC 60079-14 AND THE CEC AND TEMPERATURE CLASSIFIED IN ACCORDANCE WITH ARTICLE 504.10(B) OF THE NATIONAL ELECTRICAL CODE AND CLAUSE 12.2.5.2 OF IEC 60079-14.
5. CAPACITANCE AND INDUCTANCE OF THE FIELD WIRING FROM THE INTRINSICALLY SAFE EQUIPMENT TO THE ASSOCIATED APPARATUS SHALL BE CALCULATED AND MUST BE INCLUDED IN THE SYSTEM CALCULATIONS AS SHOWN IN TABLE 1. CABLE CAPACITANCE, C_{cable} , PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE, C_i , MUST BE LESS THAN THE MARKED CAPACITANCE, C_o (OR C_{o1}), SHOWN ON ANY ASSOCIATED APPARATUS USED. THE SAME APPLIES FOR INDUCTANCE (Leakage, L_i AND L_o , RESPECTIVELY), WHERE THE CABLE CAPACITANCE AND INDUCTANCE PER FOOT ARE NOT KNOWN. THE FOLLOWING VALUES SHALL BE USED:
 $C_{cable} = 60 \text{ pF/ft (197 pF/m)}$, $L_{cable} = 0.2 \text{ uH/ft (0.66 uH/m)}$
6. THE ASSOCIATED APPARATUS MUST BE CONNECTED TO A SUITABLE GROUND ELECTRODE OR EARTHING POINT IN ACCORDANCE WITH THE NEC, CEC, IEC 60079-14 OR OTHER LOCAL INSTALLATION CODES AS APPLICABLE. RESISTANCE OF THE GROUND PATH MUST BE LESS THAN 1 ohm.
7. WHERE MULTIPLE CIRCUITS EXTEND FROM THE SAME PIECE OF ASSOCIATED APPARATUS, THEY MUST BE INSTALLED IN SEPARATE CABLES OR IN ONE CABLE HAVING SUITABLE INSULATION. REFER TO 504.30(B) OF THE NEC (ANSI/NFPA 70) AND ISA RP12.6 OR IEC 60079-14 OR OTHER LOCAL CODES FOR INSTALLING INTRINSICALLY SAFE EQUIPMENT.
8. INTRINSICALLY SAFE CIRCUITS MUST BE WIRED AND SEPARATED IN ACCORDANCE WITH 504.20 OF THE NEC, CEC OR IEC 60079-14 OR OTHER LOCAL CODES, AS APPLICABLE.
9. THIS ASSOCIATED APPARATUS HAS NOT BEEN EVALUATED FOR USE IN COMBINATION WITH ANOTHER ASSOCIATED APPARATUS.
10. POWER SUPPLY MUST NOT USE OR GENERATE MORE THAN 250 V rms OR DC WITH RESPECT TO EARTH.
11. FOR INSTALLATIONS IN WHICH BOTH THE C_i AND L_i OF THE INTRINSICALLY SAFE APPARATUS EXCEEDS 1% OF THE C_o AND L_o PARAMETERS OF THE ASSOCIATED APPARATUS (EXCLUDING THE CABLE), THEN 50% OF C_o AND L_o PARAMETERS ARE APPLICABLE AND SHALL NOT BE EXCEEDED. THE REDUCED CAPACITANCE OF THE EXTERNAL CIRCUIT (INCLUDING CABLE) SHALL NOT BE GREATER THAN $1 \mu\text{F}$ FOR GROUPS I, IIA AND IIB AND 600nF FOR GROUP IIC.

OMNTEC MFG., INC. 2420 POND RD.
RONKONKOMA, NY 11779

LU SERIES ENTITY SYSTEM CONTROL DRAWING

DRAWN: E.D.	DATE 5/1/24	SIZE B	FSCM NO. 58219	DWG NO. DOC00010	REV 1.1
MATERIAL:	SCALE NONE	SHEET 1 of 1			

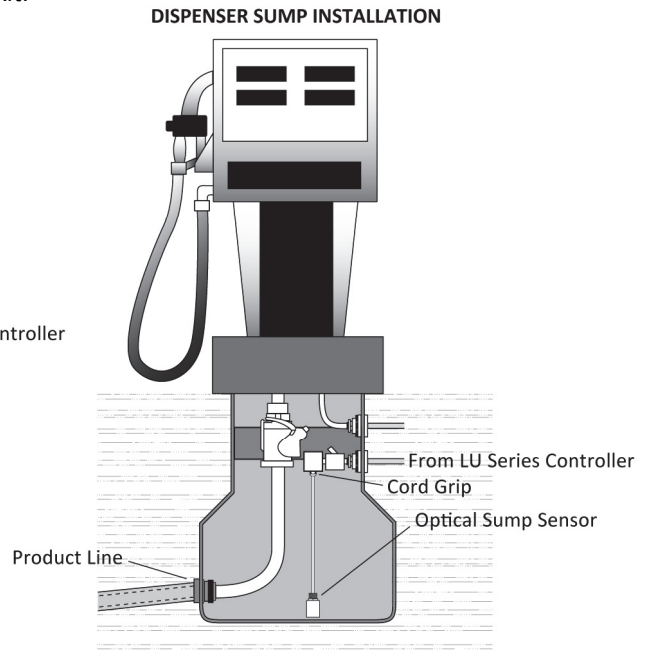
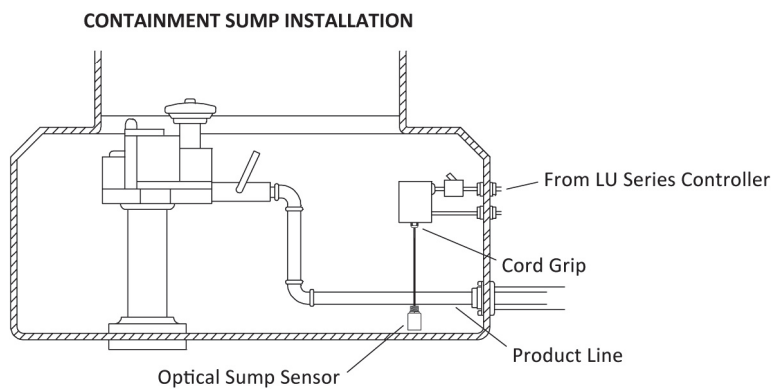
SENSOR INSTALLATION

OPTICAL SUMP SENSORS

Part Numbers: LS-ASC, PDS

The leak sensor is designed to detect liquid in sumps or containment areas.

To install the leak sensor in the above ground sump, mount a junction box between 2 and 3 feet above bottom of containment area. Attach sensor to junction box via conduit or cable clamp, leaving a $\frac{1}{4}$ " clearance between the sensor end and the bottom of the containment area. For detailed wiring scheme refer to **Sensor Input Wiring Types**, page 20 & 21 and document no. **100120 - LU Sensor Input Configuration**. Connect sensor cables to control unit cables in junction box using supplied SK-4 connector sealing kit.



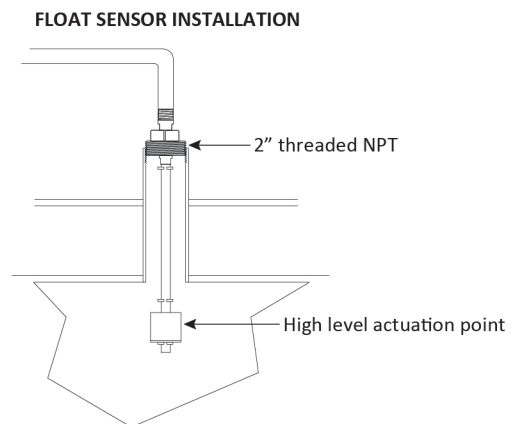
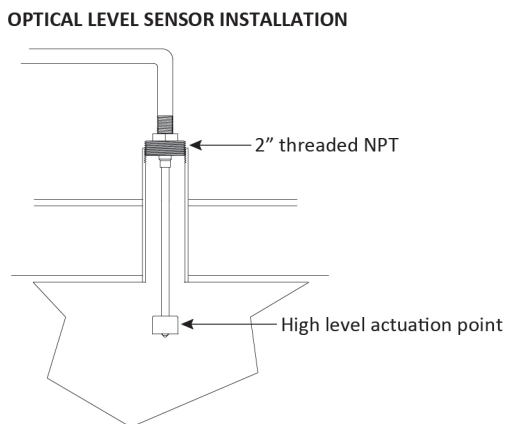
OPTICAL LEVEL & FLOAT SWITCH SENSORS

Part Numbers (Optical Level Sensors): L Series

Part Numbers (Float Switch Sensors): LF Series, OWI Series

The level sensor is primarily used to detect a liquid level inside the tank. The sensor detects a single liquid level and is typically used for overfill protection at 90% tank capacity.

The level sensor is installed into the tank via the 2" bushing which is an integral part of the sensor. This sensor screws directly into a 2" female threaded NPT (use a reducer bushing if necessary).



Connection of the sensor to the control unit cable is made in a junction box. For detailed wiring scheme refer to **Sensor Input Wiring Types**, page 20 & 21 and document no. **100120 - LU Sensor Input Configuration**. These connections must be made using supplied SK-4 connector sealing kit.

OPTICAL INTERSTITIAL SENSORS

Part Numbers (Fiberglass): LWF-*, PDWF-* (* denotes tank diameter)

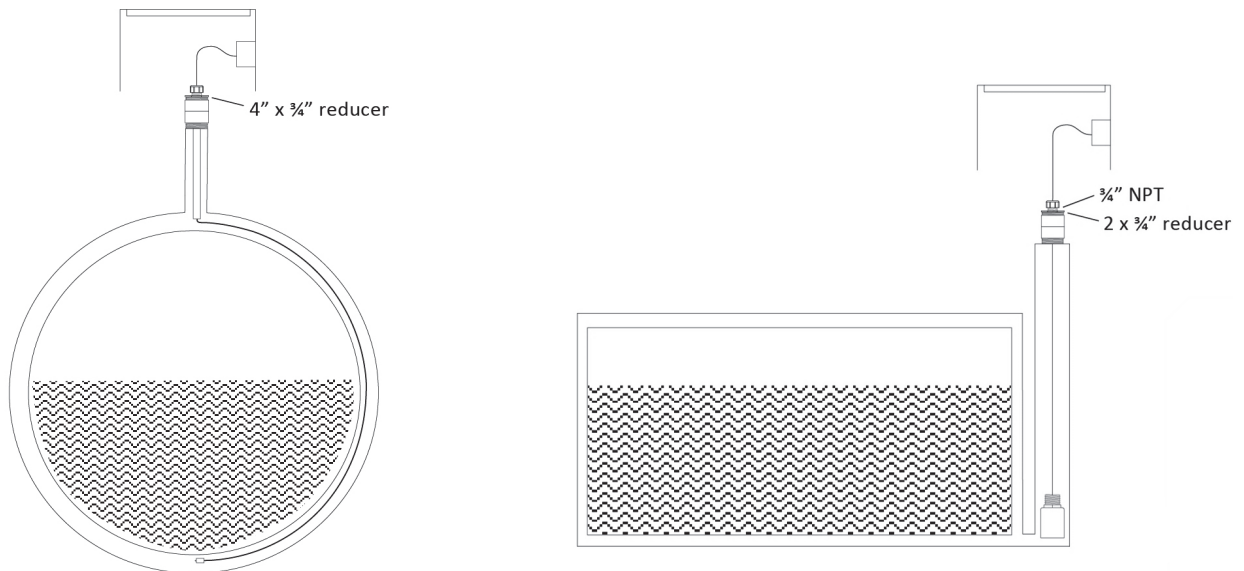
Part Numbers (Steel): LWS, PDWS

Optical Leak Sensor Fiberglass Interstitial Installation

The interstitial sensor is designed to detect the presence of liquid within the interstitial space of a double-wall fiberglass tank. It is installed through the designated interstitial port. For tanks installed with a pitch, position the sensor at the lowest point of the tank to ensure optimal detection. Insert the sensor into the interstitial port, guiding it along the outside of the inner tank wall. When the handle contacts the inner tank, the sensor is correctly seated at the bottom of the interstitial space. Reduce the riser to a 3/4" NPT connection and install the supplied cord grip. This fitting is required to prevent liquids from entering the interstitial space. Next, run conduit from the interstitial manhole to the central junction box located within the manway. Install a second cord grip on the sensor cable, then pull the cable through the conduit. Secure the cord grip to the conduit and tighten firmly. For detailed wiring scheme refer to **Sensor Input Wiring Types**, page 20 & 21 and document no. **100120 - LU Sensor Input Configuration**. Finally, connect the sensor wires in the central junction box to the control unit cables, using the SK-4 connector sealing kit to ensure a secure and sealed connection.

Optical Leak Sensor Steel Interstitial Installation

To install the leak sensor in the interstitial space of tank, feed the cable through the appropriate bushing required to adapt the interstitial port to 3/4" NPT (cord grip). Feed wires through cord grip, leaving it loose. Gently lower sensor down interstitial port until it rests on the bottom. Install cord grip into the bushing. Pull sensor up by the cable until it just comes off the bottom. Maintain this position and tighten the cord grip fitting. This is required to seal the interstitial port. For detailed wiring scheme refer to **Sensor Input Wiring Types**, page 20 & 21 and document no. **100120 - LU Sensor Input Configuration**. Connect sensor cables to control unit cables in junction box using supplied SK-4 connector sealing kit.



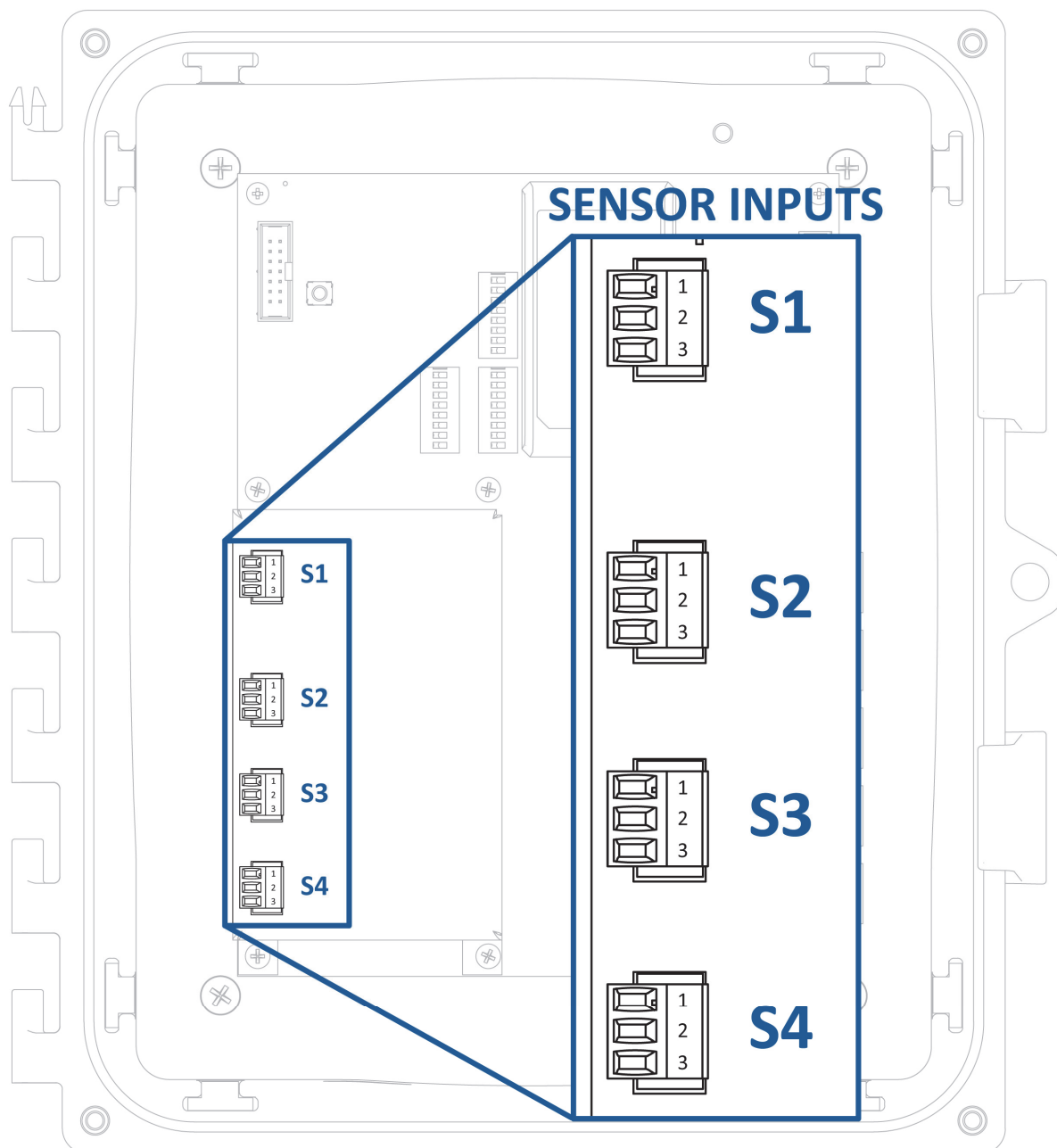
SENSOR WIRING

SENSOR INPUT LOCATIONS (INSIDE LU SERIES SYSTEM)

Refer to document number **100120 - LU Series Sensor Input Configuration** to determine which sensor inputs to use.

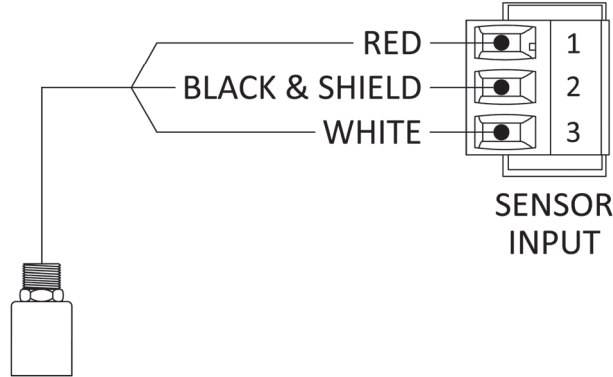
RECOMMENDED WIRE

- Float Switch - **minimum 2 conductor #22 AWG**
- Optical Sensor - **minimum 3 conductor #22 AWG shielded with drain wire**
- PD Sensor - **minimum 4 conductor #22 AWG shielded with drain wire**

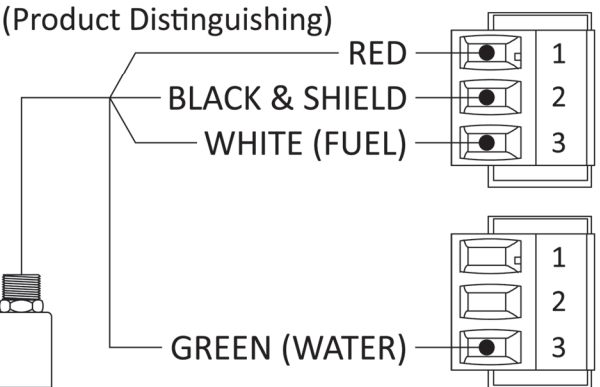


SENSOR INPUT WIRING TYPES

OPTICAL SENSOR



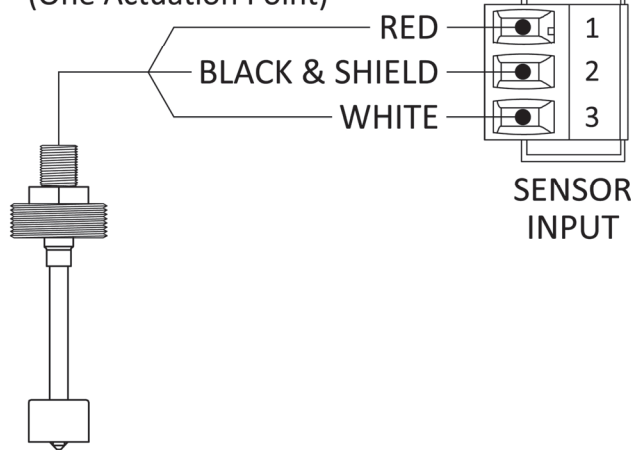
PD SENSOR



PD sensor requires two sensor inputs, either 1 & 2 and/or 3 & 4.

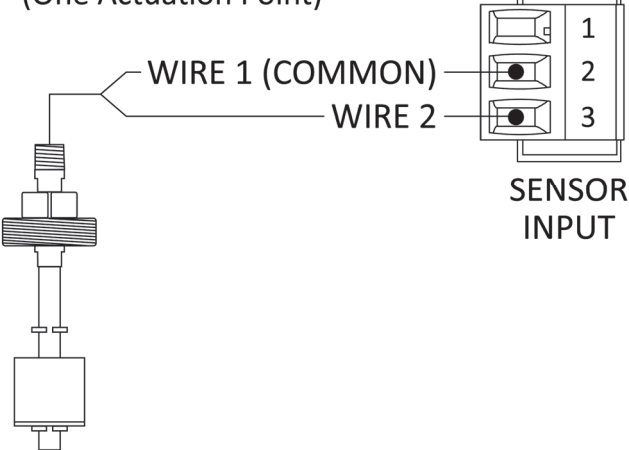
L-1 OPTICAL LEVEL SENSOR

(One Actuation Point)



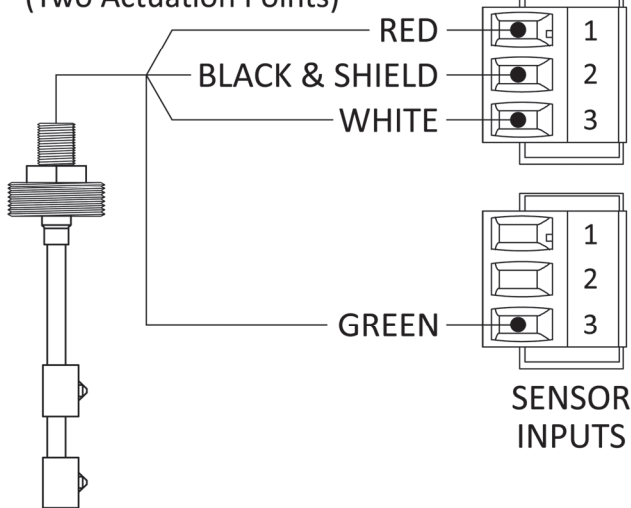
LF-1 FLOAT LEVEL SENSOR

(One Actuation Point)



L-2 OPTICAL LEVEL SENSOR

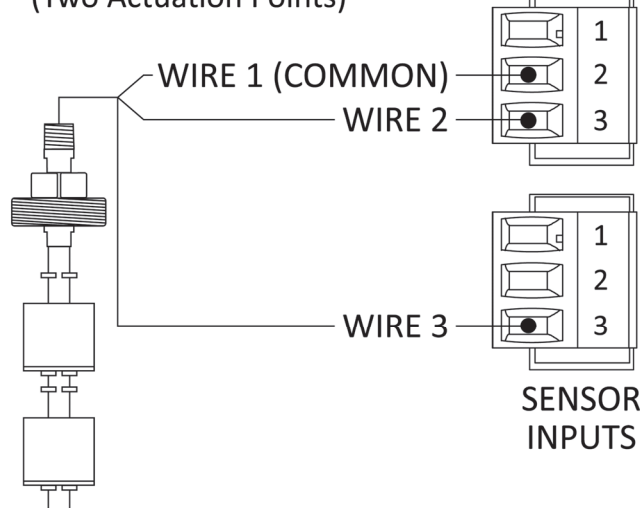
(Two Actuation Points)



L-2 sensor requires two consecutive sensor inputs.

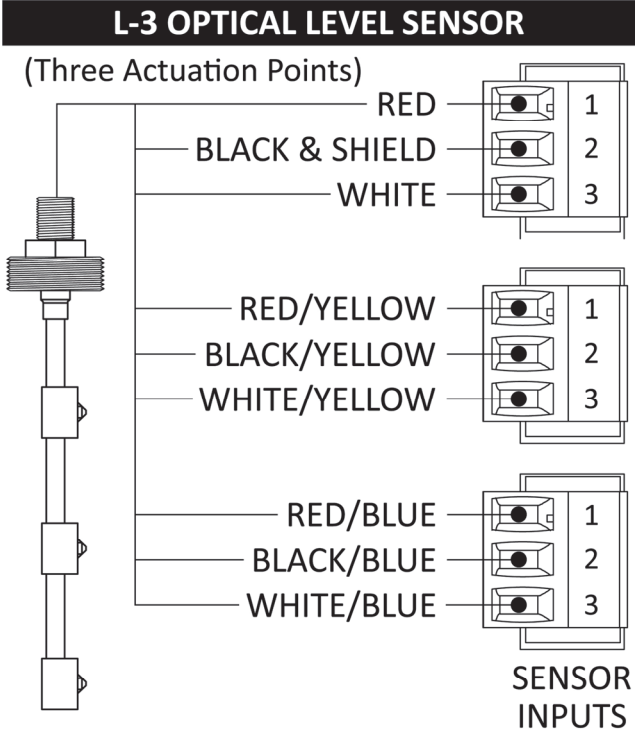
LF-2 FLOAT LEVEL SENSOR

(Two Actuation Points)

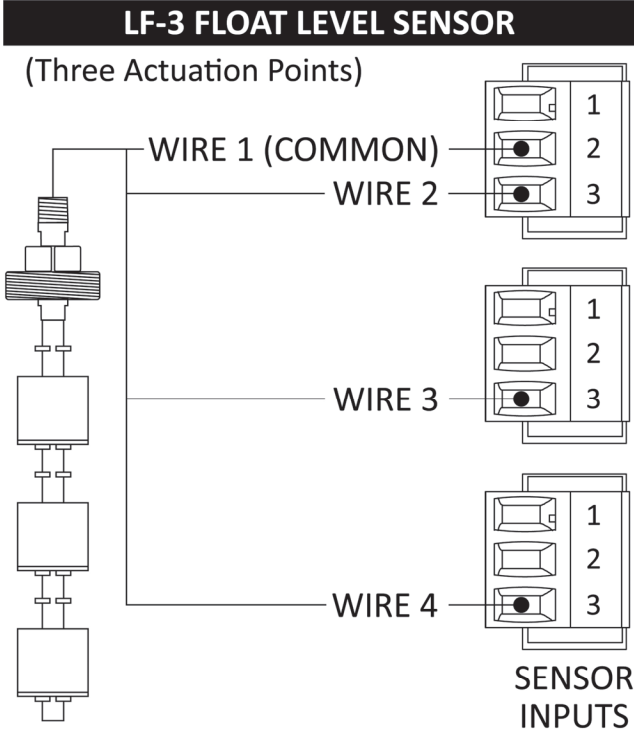


LF-2 sensor requires two consecutive sensor inputs.

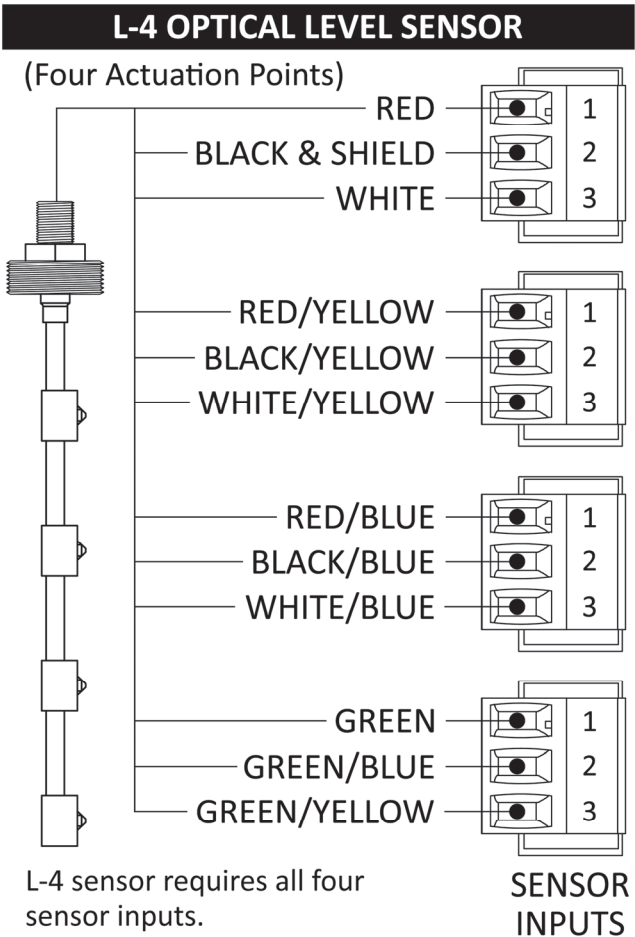
SENSOR INPUT WIRING TYPES (continued)



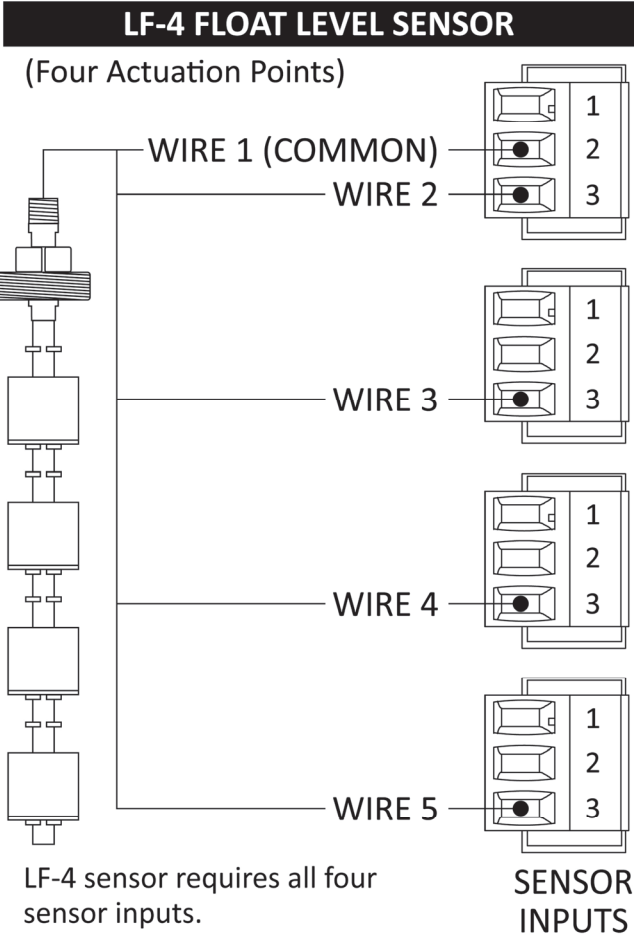
L-3 sensor requires three consecutive sensor inputs.



LF-3 sensor requires three consecutive sensor inputs.



L-4 sensor requires all four sensor inputs.



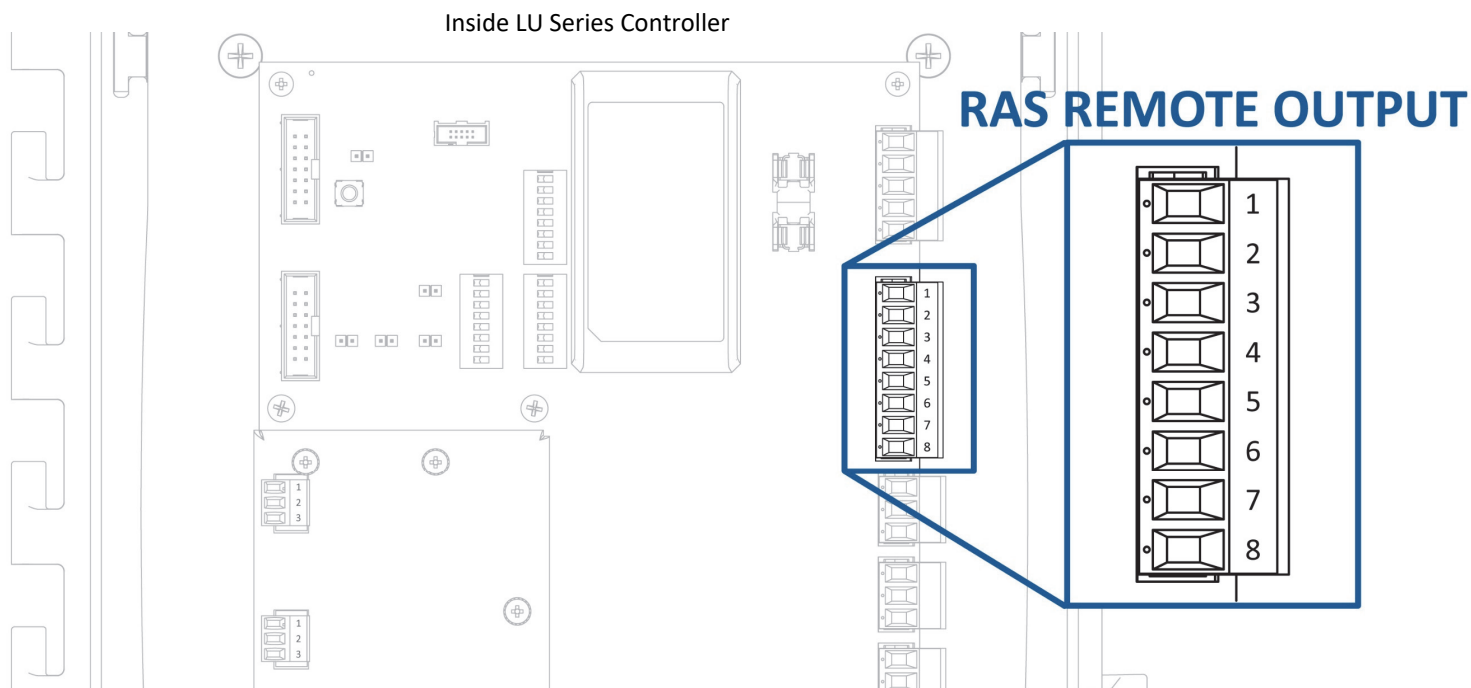
LF-4 sensor requires all four sensor inputs.

RAS SERIES REMOTE ANNUNCIATOR OPTION

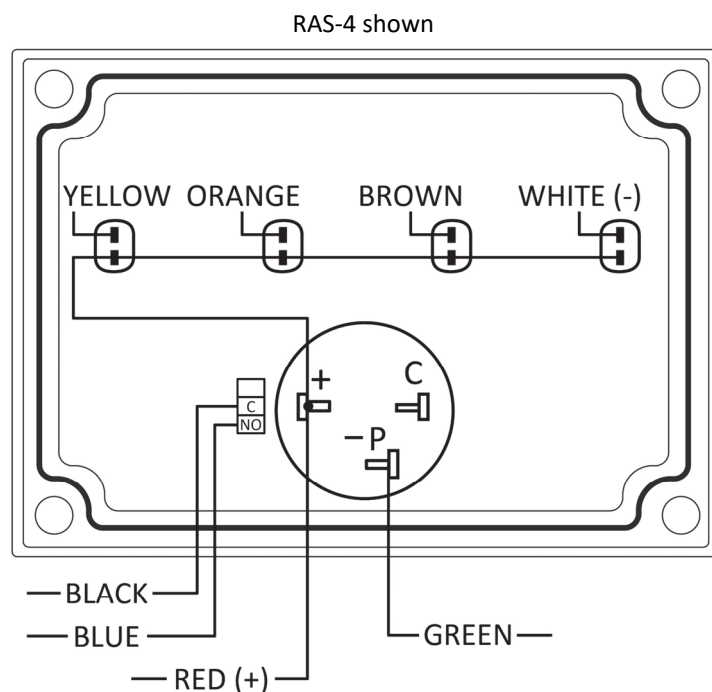
Mount remote annunciator within audio/visual range of the filling operator.

NOTE: The remote must be outside of the HAZARDOUS AREA. Pull appropriate low voltage wire from the remote to the control unit. Run wires through watertight conduit and junction boxes using K2 Knockout. See drawing below for wiring details.

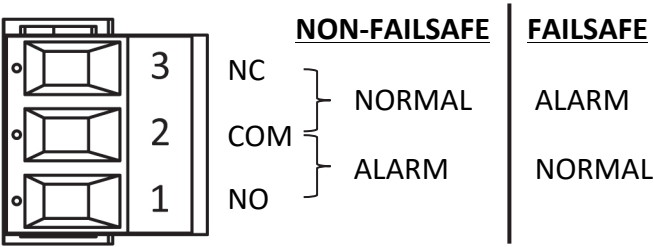
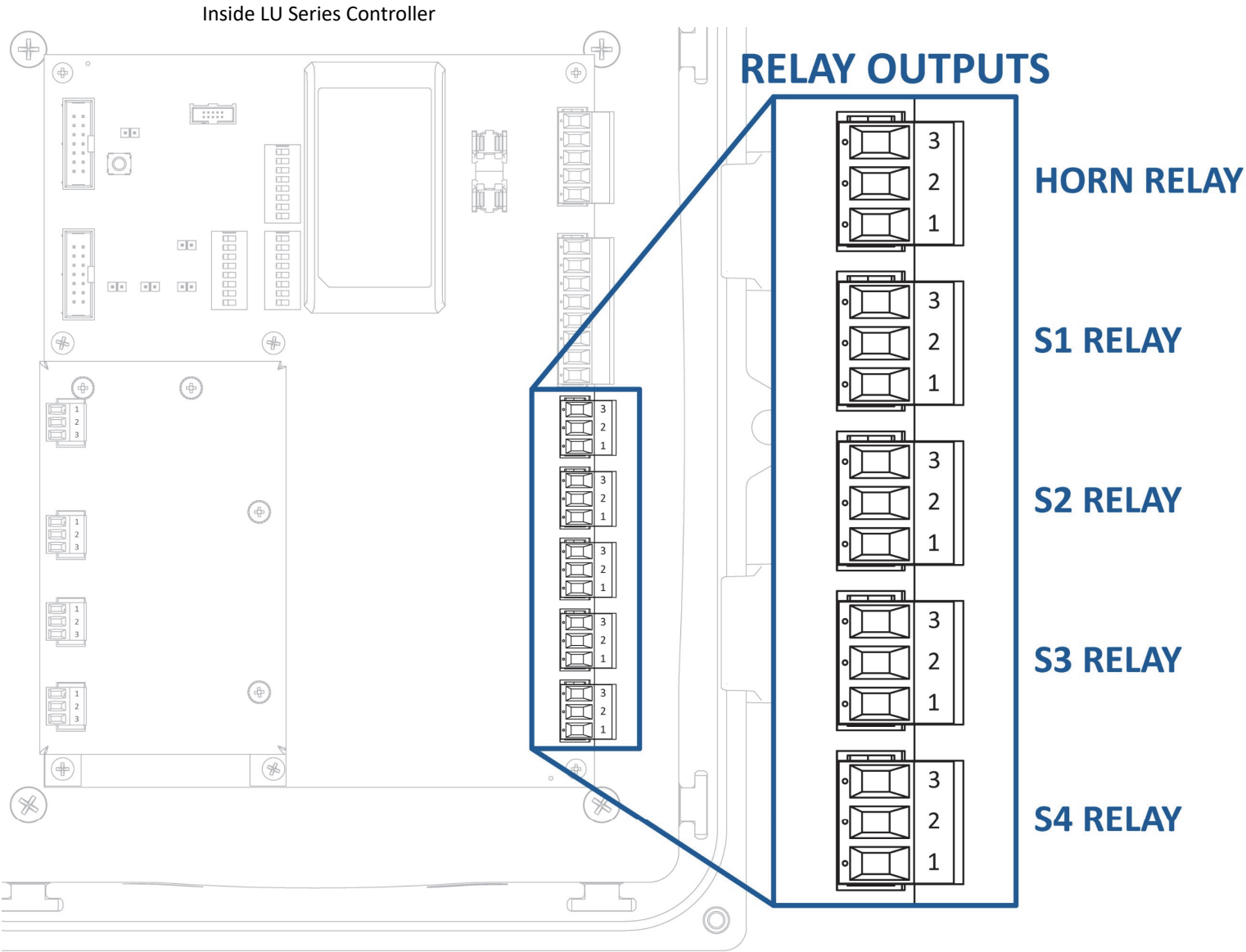
RAS REMOTE OUTPUT WIRING



J9 PIN NO.	DESCRIPTION	RAS WIRE	RAS MODEL
1	GROUND	BLACK	RAS-1 AND UP
2	COMMON HORN	GREEN	RAS-1 AND UP
3	S4 SENSOR	YELLOW	RAS-4
4	S3 SENSOR	ORANGE	RAS-3 AND UP
5	S2 SENSOR	BROWN	RAS-2 AND UP
6	S1 SENSOR	WHITE	RAS-1 AND UP
7	HORN SILENCE SWITCH	BLUE	RAS-1 AND UP
8	+12VDC	RED	RAS-1 AND UP



RELAY CONNECTIONS



OPERATION AND TEST INSTRUCTIONS

1. Verify that the **green POWER light** on the front panel is illuminated, confirming system power and functionality.

2. Sensor Operation

- a. Optical sensors are solid state and use a normally-closed light loop within a prism. The controller continuously tests the sensor by sending and receiving a pulsating signal.
- b. When liquid is present, the light path is broken, causing an alarm condition. The panel responds by illuminating the corresponding light and sounding the horn.
- c. Because OMNTEC optical sensors operate on a normally-closed principle, any disconnection, short circuit, or sensor malfunction will also trigger an alarm.
- d. Float switches use a magnet and reed switch. In a dry condition they are normally closed; when liquid raises the float, the switch opens, activating the alarm.

Note: Float switches cannot be tested from the front panel and must be physically checked.

3. System Test

- a. Press and hold the **TEST button** on the panel.
- b. Verify that all indicator lights illuminate and the horn sounds.
- c. The test simulates an alarm by temporarily interrupting the normally-closed signal loop.

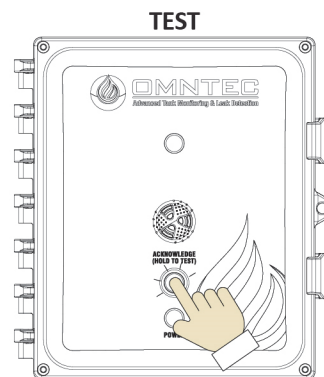
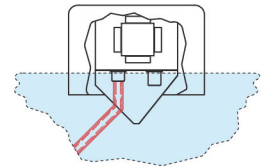
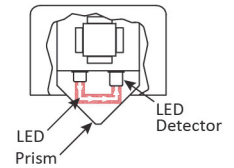
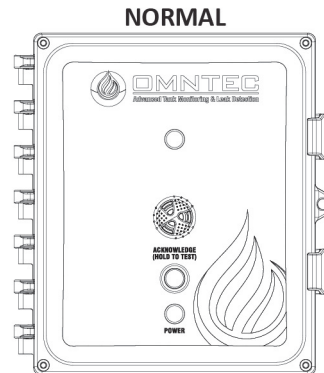
4. Maintenance Schedule

- a. Test the system at least **weekly**.
- b. Verify **sensor placement annually**, ensuring correct positioning (e.g., high level, interstitial, sump, piping sump).

5. Recordkeeping

- a. Record all alarms, malfunctions, and test results in a **dated and signed log**.

Note: Set High Level no greater than **95%**. Pump shutdown is available when using the on-board relays.



TROUBLESHOOTING

VERIFY THE FOLLOWING BEFORE SEEKING FURTHER ASSISTANCE:

1. Verify Dip Switch Settings
2. Controllers have their own separate isolated Earth Ground
3. Controllers have their own separate isolated Field Ground
4. The Controller should have 13.8 VDC on the output of the power supply
5. 120VAC wires are in their own separate isolated conduit
6. Remote Annunciator wires are in their own separated isolated conduit
7. Sensor wires are in their own separate isolated conduit
8. Check that all sensor wiring is correct and that Black & Shield Drain are connected to ground at removable input connector
9. Sensor head (prism) is not exposed to any external light (i.e.: sunlight, indoor light, etc)
10. Sensors are free of dirt and debris
11. Sensor extension cables are minimum 3 conductor #22 AWG shielded with drain wire
12. Sensors wires do not exceed 2000 ft.
13. The "POWER" LED should be illuminated

LOG SHEET

[illegible]

OMNTEC MFG., INC. – LIMITED WARRANTY

At OMNTEC, we stand behind the quality of our products.

- **LU Series Systems** – Warranted for **one (1) year** from the date of shipment against defects in material and workmanship when properly installed and maintained.
- **Replacement Parts & Add-Ons** – Warranted for **ninety (90) days** from the date of shipment.
- **What We Cover** – If a product is found to be defective, OMNTEC will, at its option, **repair or replace** the part after evaluation at our factory. A **Return Material Authorization (RMA)** must be obtained before returning any parts.
- **What's Not Covered** – This warranty does not apply to custom equipment, misuse, neglect, improper installation, unauthorized modifications, or improper maintenance.

Important Limits:

OMNTEC's liability is limited to the purchase price of the defective component. This warranty is **exclusive and replaces all other warranties**, whether express or implied. OMNTEC is not responsible for any indirect or consequential damages, including but not limited to lost profits, loss of use, or business interruption.

APPENDIX A – DIP SWITCH SETTINGS

SWITCH NUMBER	INDIVIDUAL SWITCH NUMBER	SWITCH OFF	SWITCH ON	DESCRIPTION
S1	1	SP1 Disabled	SP1 Enabled	Enable/Disable Sensor Position 1
S1	2	SP1 Horn OFF	SP1 Horn ON	Enable/Disable Horn on Alarm
S1	3	SP1 Reverse Alarm or Float Low Alarm OFF	SP1 Reverse Alarm or Float Low Alarm ON	Enable/Disable Reverse Alarm State
S1	4	SP1 Non Optical Sensor	SP1 Optical Sensor	Non Optical or Optical Sensor in Use
S1	5	SP2 Disabled	SP2 Enabled	Enable/Disable Sensor Position 2
S1	6	SP2 Horn OFF	SP2 Horn ON	Enable/Disable Horn on Alarm
S1	7	SP2 Reverse Alarm or Float Low Alarm OFF	SP2 Reverse Alarm or Float Low Alarm ON	Enable/Disable Reverse Alarm State
S1	8	SP2 Non Optical Sensor	SP2 Optical Sensor	Non Optical or Optical Sensor in Use
S2	1	SP3 Disabled	SP3 Enabled	Enable/Disable Sensor Position 3
S2	2	SP3 Horn OFF	SP3 Horn ON	Enable/Disable Horn on Alarm
S2	3	SP3 Reverse Alarm or Float Low Alarm OFF	SP3 Reverse Alarm or Float Low Alarm ON	Enable/Disable Reverse Alarm State
S2	4	SP3 Non Optical Sensor	SP3 Optical Sensor	Non Optical or Optical Sensor in Use
S2	5	SP4 Disabled	SP4 Enabled	Enable/Disable Sensor Position 4
S2	6	SP4 Horn OFF	SP4 Horn ON	Enable/Disable Horn on Alarm
S2	7	SP4 Reverse Alarm or Float Low Alarm OFF	SP4 Reverse Alarm or Float Low Alarm ON	Enable/Disable Reverse Alarm State
S2	8	SP4 Non Optical Sensor	SP4 Optical Sensor	Non Optical or Optical Sensor in Use
S3	1	PDS SP1/SP2 Link OFF	PDS SP1/SP2 Link ON	Link for Product Distinguishing Sensor in SP1/SP2
S3	2	PDS SP3/SP4 Link OFF	PDS SP3/SP4 Link ON	Link for Product Distinguishing Sensor in SP3/SP4
S3	3	Alarm Delay 2 Seconds *	Alarm Delay 5 Seconds	Time to Verify an Alarm
S3	4	Auto Horn Timeout See Table 2	Auto Horn Timeout See Table 2	Horn Timeout Settings OFF*, 1, 5, 10 Minutes
S3	5	Auto Horn Timeout See Table 2	Auto Horn Timeout See Table 2	
S3	6	Pump Control Mode OFF	Pump Control Mode ON	Enable/Disable Pump Control Mode
S3	7	Failsafe Relays OFF	Failsafe Relays ON	Enable/Disable Failsafe Relays (Failsafe Enabled: Power off is alarm condition)
S3	8	N/A	N/A	N/A

Note: * Denotes factory defaults.

Table 1

S3 Auto Horn Timeout – Determines the length of time for Automatic horn silence.	
Switches S3-4 & S3-5	
S3-4 Off - S3-5 Off	Off *
S3-4 On - S3-5 Off	1 Minute
S3-4 Off - S3-5 On	5 Minutes
S3-4 On - S3-5 On	10 Minutes

Table 2