

The LLC1 Series is a single probe conductive liquid level control designed for OEM equipment and commercial appliances. This unit may be ordered with selectable or fixed fill or drain operation. A time delay (1-60s) prevents rapid cycling of the output relay. On adjustable units, the sensitivity adjustment allows accurate level sensing while ignoring foaming agents and floating debris. Isolated AC voltage is provided at the probe to prevent electrolysis. A trickle current of less than 1mA determines the presence or absence of liquid between the probe and common. The LLC1 Series printed circuit board is conformal coated to resist moisture and corrosion.

For more information see:
Appendix B, page 167, Figure 26 for dimensional drawing.
Appendix C, page 170, Figure 23 for connection diagram.

Operation

Drain (Pump-Down Mode): When the liquid level rises and touches the probe, a fixed time delay begins. This time delay prevents rapid cycling of the output relay and its load. At the end of the time delay, the output relay energizes and remains energized until the liquid level falls below the probe. The output relay then de-energizes and remains de-energized until the liquid again touches the probe.

Fill (Pump-Up Mode): When the liquid level falls below the probe, a fixed time delay begins. This time delay prevents rapid cycling of the output relay and its load. At the end of the time delay, the output relay energizes and remains energized until the liquid level rises and touches the probe. The output relay then de-energizes and remains de-energized until the liquid level again falls below the probe.

Features:

- Single probe level control for conductive liquids
- Isolated AC voltage on the probes
- Adjustable or fixed sensing up to 250K Ω
- Fill or drain operation available
- 24, 120, or 230VAC models are available
- Isolated, 10A, SPDT & non-isolated, SPST output contacts

Approvals:   

Auxiliary Products:

- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Electrode:** P/N: PHST-38QTN
- **Threaded probe (24"):** P/N: LLP-24
- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)

Available Models:

LLC14A1AX	LLC14B60AX
LLC14A5AX	LLC16A25AX
LLC14A7AX	LLC16A3AX
LLC14B15AX	LLC16B60A
LLC14B1AX	

If desired part number is not listed, please call us to see if it is technically possible to build.

Order Table:

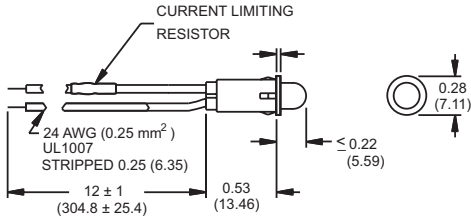
<u>LLC1</u>	<input checked="" type="checkbox"/> Input	<input checked="" type="checkbox"/> Operation	<input checked="" type="checkbox"/> Time Delay	<input checked="" type="checkbox"/> Sense Resistance	<input checked="" type="checkbox"/> Mounting
	-2 - 24VAC	-A - Drain	Fixed: Specify 1-60s in 1s increments	-A - Adjustable	-Blank - Surface mount
	-4 - 120VAC	-B - Fill		-F - Fixed (Specify fixed resistance (1-250) in 1K Ω increments.)	-X - 0.5 in. nylon standoffs (three)
	-6 - 230VAC				

Specifications

Control	Type.....ON/OFF (single level) resistance sensor with built-in time delay to prevent rapid cycling	Protection	Surge.....IEEE C62.41-1991 Level A
Sense Voltage	Low voltage AC between probe & common. Isolated from input & output.	Isolation Voltage	\geq 1500V RMS between input, output & probe
Sense Resistance	Fixed or adjustable to 250K Ω	Mechanical	
Sense Resistance Tolerance	Adjustable - guaranteed range Factory fixed \pm 10%	Mounting	Surface mount to probe common with two #6 (M3.5 x 0.6) screws or 0.50 in. (12.7 mm) nylon standoffs with three #6 (M3.5 x 0.6) screws (use Terminal 5 for probe common)
Time Delay		Termination	0.25 in. (6.35 mm) male quick connect terminals
Range	Fixed 1 - 60s in 1s increments	Dimensions (Open Board)	3.5 x 2.75 x 2 in. (88.9 x 69.9 x 50.8 mm)
Input		Environmental	
Voltage	24, 120, or 230VAC	Operating / Storage Temperature	-20 $^{\circ}$ to 55 $^{\circ}$ C / -40 $^{\circ}$ to 80 $^{\circ}$ C
Tolerance	24VAC.....-15% - 20% 120 & 230VAC.....-20% - 10%	Coating	Printed circuit board is conformal coated to resist moisture and corrosion
AC Line Frequency	50/60 Hz	Weight	\cong 8.7 oz (247 g)
Output			
Type	Electromechanical relay		
Form	Non-isolated, SPST & Isolated, SPDT contacts		
Rating	10A resistive @ 120/240VAC & 28VDC; 1/3 hp @ 120/240VAC		
Life	Mechanical - 1 x 10 7 ; Electrical - 1 x 10 5		

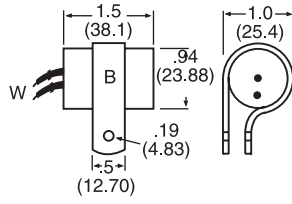
Appendix B - Dimensional Drawings

FIGURE 24



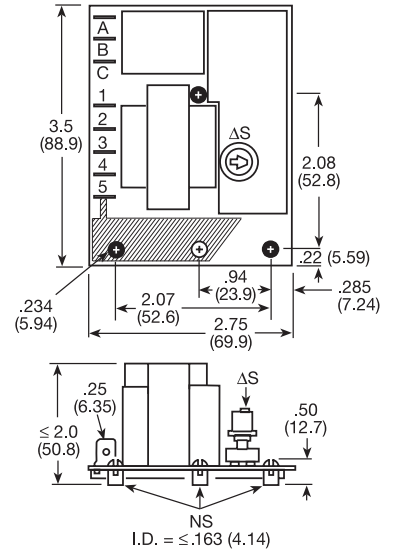
LPM

FIGURE 25



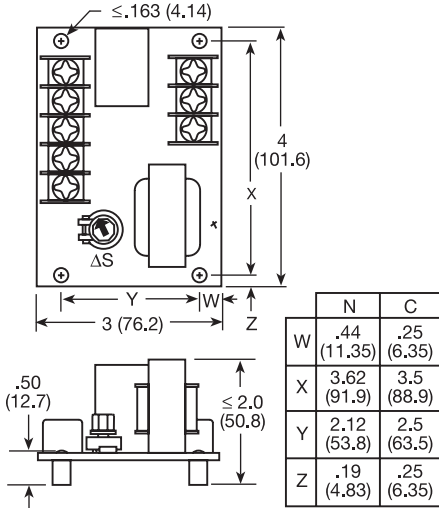
MSM

FIGURE 26



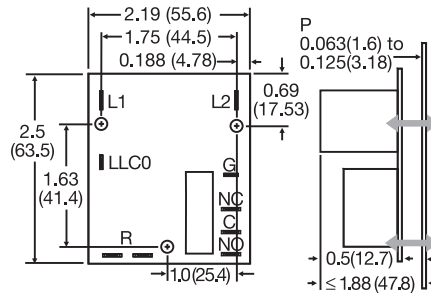
LLC1

FIGURE 27



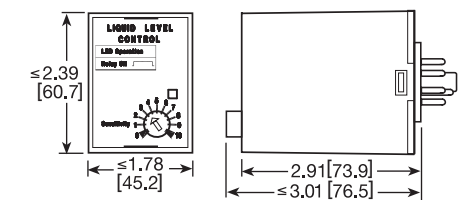
LLC2

FIGURE 28



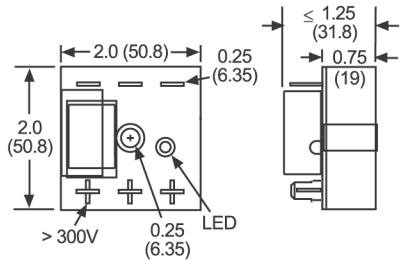
LLC8

FIGURE 29



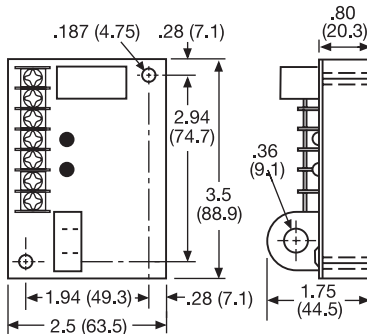
LLC5

FIGURE 30



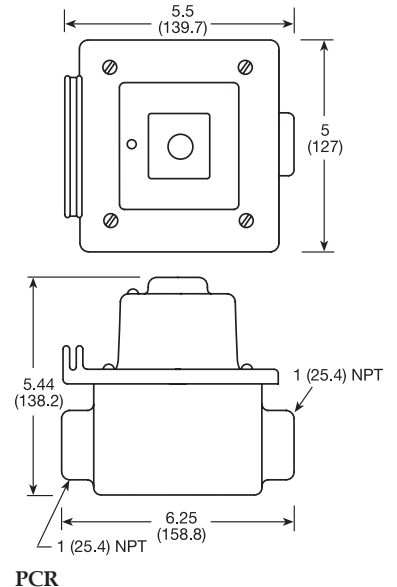
TVM; TVW

FIGURE 32



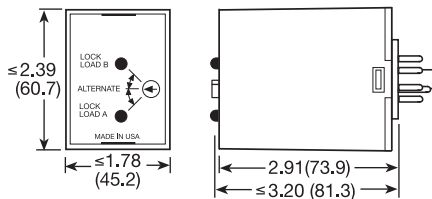
FB; SCR

FIGURE 33



PCR

FIGURE 31

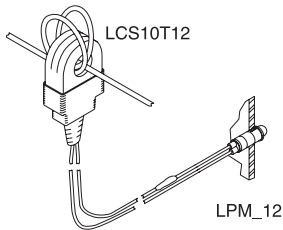


ARP

inches (millimeters)

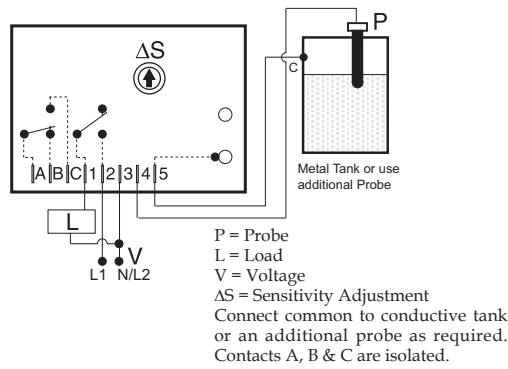
Appendix C - Connection Diagrams

FIGURE 22 - LCS10T12



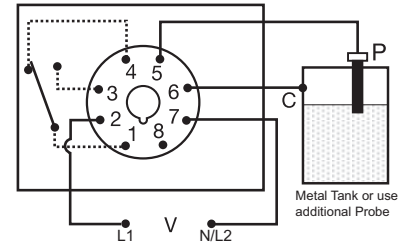
Wire Length: 500 ft. (152.4m) max. (Customer Supplied)
CAUTION: The LCS10T12 must be connected to the LPM12 or LPMG12 before current flows to prevent damage or shock hazard. Monitored wires must be properly insulated.

FIGURE 23 - LLC1 Series



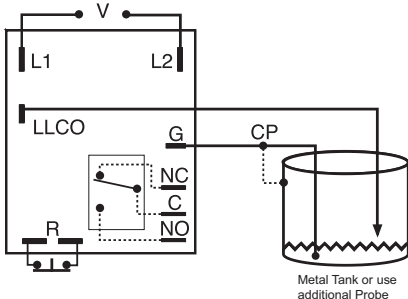
P = Probe
 L = Load
 V = Voltage
 ΔS = Sensitivity Adjustment
 Connect common to conductive tank or an additional probe as required.
 Contacts A, B & C are isolated.

FIGURE 24 - LLC4 Series



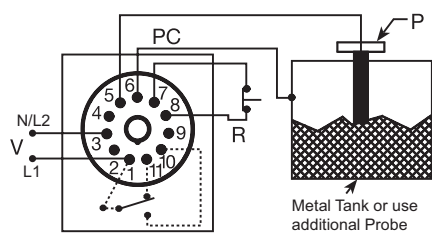
P = Probe
 C = Probe Common
 V = Voltage
 Relay contacts are isolated.
 Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 25 - LLC8 Series



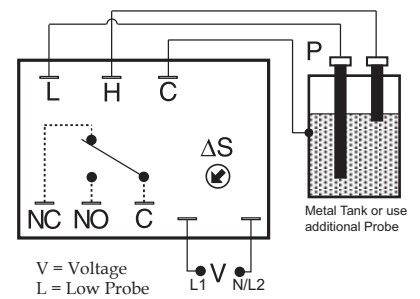
V = Voltage
 LLCO = Low Level Probe
 G or CP = Ground or Common (Reference) Probe
 R = Optional NC Reset Switch (not included)
 NO = Normally Open
 NC = Normally Closed
 C = Common or Transfer Contact
 Relay contacts are isolated.
 Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 26 - LLC6 Series



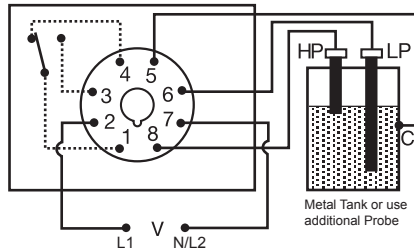
PC = Probe Common
 P = Probe
 V = Voltage
 R = Optional NC Reset Switch
 Connect probe common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 27 - LLC2 Series



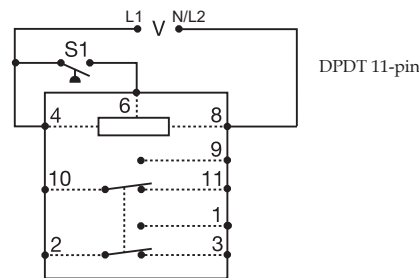
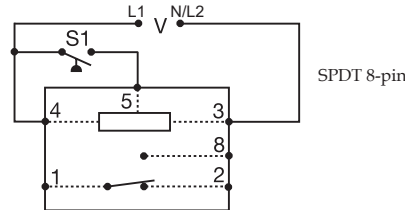
V = Voltage
 L = Low Probe
 H = High Probe
 C = Probe Common
 ΔS = Sensitivity Adjustment
 NC = Normally Closed
 NO = Normally Open
 Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 28 - LLC5 Series

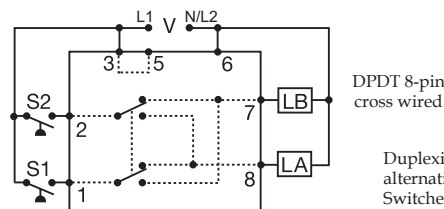


HP = High Level Probe
 LP = Low Level Probe
 C = Probe Common
 V = Voltage
 Relay contacts are isolated.
 Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 29 - ARP Series



Relay contacts in above are isolated.



V = Voltage
 LA = Load A
 LB = Load B
 S1 = Primary Control Switch
 S2 = Lag Load Switch

Duplexing (Cross Wired): Duplexing models operate the same as alternating relays and when both the Control (S1) and Lag Load (S2) Switches are closed, Load A and Load B energize simultaneously.

The DPDT 8-pin, cross wired option, allows extra system load capacity through simultaneous operation of both motors when needed. Relay contacts are not isolated.