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INSTALLATION & OPERATING INSTRUCTIONS FOR THE LWNM CONTROL

This document should be used by trained personnel as a guide to install the ProtoDesign Inc. low water control. Follow necessary wiring practices as defined by the national electric code (NEC). Installation or selection of equipment should always be accompanied by trained technical personnel. Reset and probe wires runs should be separated from high voltage wire runs.

We recommend that secondary (redundant) Low Water Cut-Off controls be installed on all steam boilers with heat input greater than 400,000 BTU/hour or operating above 15 psi of steam pressure. At least two controls should be connected in series with the burner control circuit to provide safety redundancy protection should the boiler experience a low water condition. Moreover, at each annual outage, the low water cut-offs and probes should be dismantled, inspected, cleaned, and checked for proper calibration and performance. If used as a LWCO, the control must be installed in series with all other limit and operating controls.

SPECIFICATIONS:

Ambient Operation Temp: 0 to 150 deg. F.
Humidity: 85% (non-condensing)
UL Approval: UL353 limit control
Supply Voltage: 120/220/240VAC 50/60 Hz.,10% line variation.
(220/240VAC for operating control only, non-limit)
Contact Ratings: SPDT, 10A, 1/3H.P. 120/240VAC. Rated 100,000 cycles rated load.
Contact Configuration: SPST (Form A), N.O .Non-Powered Contacts
Power Consumption: 1.5VA
Wiring Terminals: Optional 11 Pin Plug-In Module socket, #6-32 screws with pressure clamps. Open board design ¼" quick connects on high voltage and 3/16" quick connects on low voltage.
Probe wire distances: 100 feet max. using MTW or THHN #14 or #16 AWG wire.
Reset terminal wires: 50 feet max. using same wire type described above.

OPERATION:

TEST FEATURE (Option A) Allows the LWCO circuit to be tested. Holding down the reset button for 3 seconds will allow the LWCO circuit to trip, which simulates the loss of water without the need to drain the water in the boiler. The control will return to normal operation once the reset button is pressed a second time or after a one-minute timeout.

Manual Reset With a normally closed pushbutton installed across RESET terminals **TB7** & **TB8**, and after a low water condition, the relay will remain de-energized until the pushbutton is pressed after the liquid rises to the level of the probe. With no pushbutton installed control will be in **Automatic Reset.** Ordering **Option F** allows 85 sec. before manual reset is required, eliminating nuisance Lockouts.

LWCO - When the liquid rises to the LOW electrode on terminal **TB6**, the control energizes, changing state of the (LW) load contacts (LED2 will be lit). The control remains energized until the liquid level recedes below LOW electrode on terminal **TB6**. The control then de-energizes, (LED2 will not be lit) returning load contacts to original state. Unless otherwise specified, there is a three-second time delay on decreasing level. Liquid must be below LOW probe on terminal **TB6** for a full three seconds before control de-energizes.

POWER OUTAGE FEATURE:

The power outage feature is a standard feature for the LW. When using the manual reset feature, if power interruption occurs when the probes are in liquid the relay will de-energize. When power is restored if the liquid is in contact with the probe the relay will energize without a manual reset. This feature eliminates boiler lockouts due to power outages when using the reset function.

CSD-1 CODE COMPLIANCE

On Manual Reset units, if the control is in a low- water condition (water off probe) when there is an interruption of power, the control will remain in a low-water condition when power is restored. The reset button will need to be pressed when the water level is restored to a level above the probe.

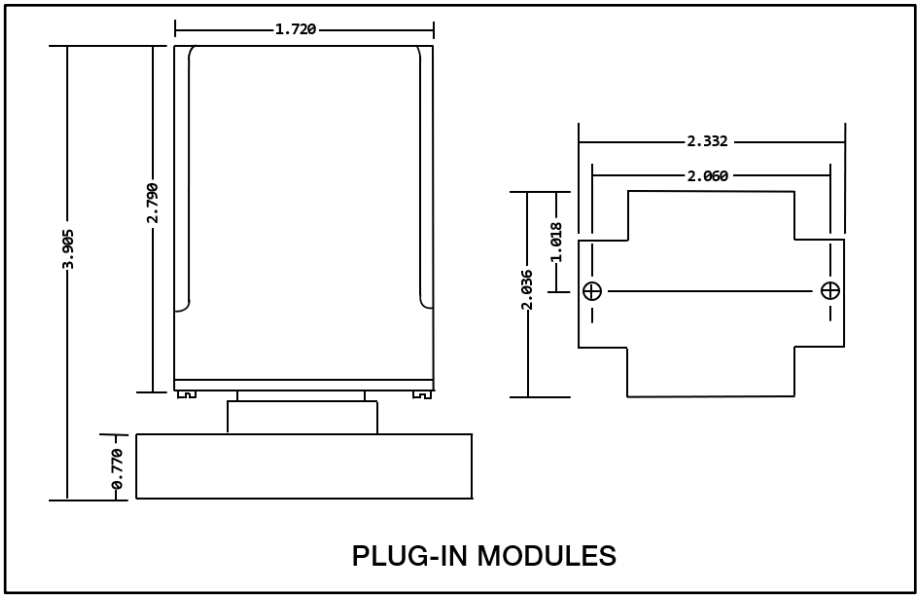
PROBE BUILD UP DETECTION

If the resistance of the probe to ground increases to approximately 10k above sensitivity set point the control will turn off and indicate probe buildup (LED blinking). To clear error, clean or replace probe. In manual reset mode, probe must be in liquid and reset button pushed for 30 seconds. In automatic reset mode, error will clear 30 seconds after probe is in liquid.

Maintenance Schedule

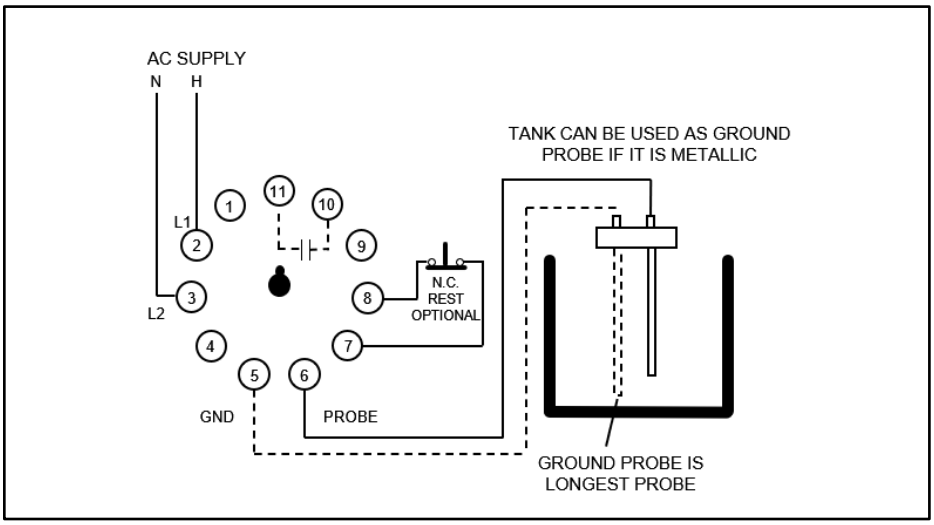
- Inspect probe annually for scale build-up and clean if necessary. Make certain there is no scale or build-up on the probe or its white insulator.
- Replace probe every 10 years. More frequent replacement of the probe is required if it is used in locales where significant water treatment is required, where more frequent cleaning is necessary, or in applications with high make-up water requirements.
- Replace the low water cut-off every 15 years or after 100,000 cycles on the relay.

DIMENSIONAL DRAWING



PLUG-IN MODULES

TYPICAL WIRING DIAGRAM



MODEL NUMBER DESIGNATION

LWNM – X – X – X – X – XX – X

OPTIONAL CHARACTERS (any combination):
Blank, A=Test feature, C=Conformal Coat, D=RoHS, F=Alternate lockout

FALLING LEVEL TIME DELAY:
03 = 3 sec. (Standard), 30 = 30 sec.

MODE: A = Direct (Standard)

SUPPLY VOLTAGE: 1=120VAC (Standard), 2 = 240VAC, 3 = 220VAC
(240VAC and 220VAC for operating control only, not for limit control)

SENSITIVITY:
C=26K (Standard), (contact factory for other sensitivity options)

PACKAGE:
4 = 11 pin Module with non-powered contacts
5 = 11 pin Module with non-powered contacts and mating socket

MODULE SOCKET P/N: LCS – 11