Hampshire Controls Corp.

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LD-200 Liquid Nitrogen Level Sensor

User Instructions

Operation

The **LD-200** uses a cryogenic thermistor to sense the surface of liquid nitrogen by monitoring the temperature change, of the probe, as the liquid drops away.

Normally, the alarm will sound and the output relay will change states as the level drops below the tip of the probe.

The alarm can be silenced for a period of 10 minutes by pressing the MUTE button, the ALARM LED will continue to flash and the output relay will stay in the ”alarm” condition.

Returning to normal operation, meaning probe submerged in LN2, will clear the mute and reset the alarm.

Any alarm condition, muted or not, will cause the SPDT contacts to switch to alarm state. The user can wire to the “Normally Open” (NO, closed on alarm) or “Normally Closed” (NC, open on alarm) contacts. The contacts are isolated and can switch a load of up to 1 Amp, typically a remote beeper, dialer, or Central Monitoring System, all available separately from Hampshire Controls.

Sensitivity

There is a sensitivity adjustment on the face of the control box. As set at the factory, the alarm will trip within 1/4” of the probe tip and adjustment should not be necessary.

Turning this adjustment, with a small screwdriver, to the extreme left (CCW) will be the most sensitive position. After a 5-second delay the alarm will probably sound, despite the probe being in LN2. If the alarm does trip, back off from this position, turning CW, keeping in mind a 5 second delay, until the alarm resets. This will be the most sensitive position, and may give occasional false alarms, so turn 1/16 turn (CW) more.

Installation

Put the tip of the probe into the Liquid Nitrogen to be monitored.

Plug the power supply into an AC outlet.

After an initial beep the alarm should show a green light.

Test the installation by sliding the probe up until it is no longer submerged. The alarm should sound after an 8-second delay.

If a remote alarm is desired it can be hooked to a set of connectors inside the alarm:

1. Open the **LD-200** Alarm by removing the two phillips screws from the back and pulling off the cover.
2. Feed your remote alarm wire through the **LD-200** box and up to the terminal block at the top of the pc board. For alarm-on-closure use the COM and NO connectors. For alarm-on-open use COM and NC connections.

Instructions for "Daisy Chain" (To connect multiple alarms to one external device.)
The best way to connect multiple alarms to one device is to connect them in series; this way a broken wire or tripped alarm will open the circuit, causing the external device to see an alarm. The device receiving the alarm must be set to alarm when the complete circuit becomes open.

You will need:
Screwdriver, Phillips #1
Screwdriver, Straight-blade, 1/8" wide
Cutting pliers
Wire stripper
Wire, 20 – 24 AWG 2-conducter "zip cord" (looks light-weight lamp cord) is best.

Step 1
Open the **LD-200** Alarms by removing the two phillips screws from the back and pulling off the cover.

Step 2
Feed your wire through the **LD-200** box and up to the terminal block at the top of the pc board. For the 2nd, 3rd etc **LD-200** you will need to bring a loop of wire to the top of the pc board.

Step 3
The **LD-200** pc board is marked **NO COM** and **NC**, connect the ends of your alarm wire to **Com** and **NC,** one conductor to each, polarity unimportant. Bring the other ends of your wire to the remote device (dialer or whatever) but don't connect yet.

For each **LD-200** that has a loop of wire, cut one conductor, (either one) at the top of the loop. Strip the two ends and connect to **Com** and **NC (**polarity unimportant**).**

Step 4
Make sure that the wires exiting the box have some kind of strain relief, so they can't pull the connector off the pc board, a wire tie works well, then reassemble boxes.

Step 5
Test the circuit with a continuity meter. The two conductors at the remote device should show continuity, (when any alarm is alarming they will show "open").
Connect the wires to the remote device.
Done.