Liquid Nitrogen Level Sensor

Operation

The Liquid Nitrogen Level Sensor uses a cryogenic RTD 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 state as the level drops below the tip of the probe.

The alarm can be silenced for a selectable period of time 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.

An alarm delay can also be specified. After the unit recognizes a temperature above LN2, the green status (TIMING) LED will switch to YELLOW and the unit will delay for a selectable period of time before alarming.

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, the output contacts connects to a remote beeper, dialer, or Central Monitoring System, all available separately.

Setting the Probe Trip Point

As set at the factory, the alarm will trip within 1/4” of the probe tip and adjustment should not be necessary. If resetting of the trip point is desired, the push-button located at the base of the unit should be used. (See the External Connections figure, below).

Submerge the probe in LN2. Wait 2 minutes for the temperature reading to stabilize. Press the pushbutton once to activate trip point setting, observe the status LED alternate yellow/green. Press a second time to set the trip point. Observe the status LED flash green 7 times to signify successful setting of the new trip point. If the button is not pressed a second time, the ALARM LED will light a single long RED pulse to signify no change.

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Setting the Mute and Delay Periods

Setting	Mute (minutes)
1	5
2	10
3	15
4	20
5	30
6	60

To set the Mute time, hold the MUTE button until the ALARM LED begins a quick flash sequence. After the LED goes out, tap the MUTE button the desired setting count, between 1 and 6 taps. After a pause, the ALARM LED will flash the new setting. A single long pulse signifies failure and no change.

To determine the current Mute setting, tap the MUTE button. The ALARM LED will blink the current setting.

Setting	Delay
1	0
2	30 sec
3	1 min
4	5
5	10
6	30

To set the Delay time, hold the DELAY button until the ALARM LED begins a quick flash sequence. After the LED goes out, tap the DELAY button the desired setting count, between 1 and 6 taps. After a pause, the ALARM LED will flash the new setting. A single long pulse signifies failure and no change.

To determine the current Delay setting, tap the DELAY button. The ALARM LED will blink the current setting.

External Connections

All external connections, and one slide switch, are on the bottom rear of the case, shown above. From left to right, the functions are:

- Relay output connection (contacts), single pole, double throw (SPDT), for connection to a remote alarm or monitoring system. The COM/NO side closes on alarm, and the COM/NC opens on alarm.
- Push button to set the probe calibration, described above.
- EXT Switch input - not applicable to LD-215
- RTD input for cryogenic RTD.
- Power input for 6-12 volt DC power supply. Note that GND is (-) and 6 to12 volts DC is (+).

Battery

The Liquid Nitrogen Level Sensor uses two NiMH AA cells for backup of operation.

Insert the cells in the compartment at the back of the unit. Please note that polarity must be observed, to prevent damage to the internal battery voltage monitor.

Initial Setup

Plug the power supply into an AC outlet, or operate on battery power.

- Push the RESET button to restart the program.
- Put the tip of the probe into the Liquid Nitrogen to be monitored.
- After an initial beep the TIMING LED should blink green.
- Test the installation by sliding the probe up until it is no longer submerged.
- The TIMING LED will start to blink yellow within10 seconds. This indicates that the probe is registering an alarm level temperature.
- After the alarm delay period, the bright red ALARM LED will blink, and the beeper will sound.

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