



Model 135 Liquid Helium Level Monitor^{CE}

The Model 135 is an advanced liquid helium level monitor which incorporates AMI's patented sample-and-hold design with automatic helium level sensor vacuum burnout protection. The Model 135 is ideal for operation in systems where it is important to monitor the liquid helium level while also minimizing the helium losses. Microprocessor-based electronics provide 0.1% readout accuracy. Nonvolatile, read only memory maintains instrument calibration without battery backup. Watchdog timer circuitry and low line voltage (brownout) detector prevent microprocessor lock-up and provide fail-safe operation.

High and low alarm functions

The Model 135 adds "High" and "Low" alarm setpoints which activate front panel LED warning indicators and rear panel relay outputs in the event of an overflow or liquid loss condition. The alarms also energize an audible warning which can be silenced from the front panel. "High" and "Low" setpoints are programmable from 0 to 100 percent of sensor active length.

Minimal liquid helium losses

In order to minimize liquid helium loss, the Model 135 automatically energizes the **liquid helium level sensor** at user programmable time intervals and monitors the normal (resistive) zone as it progresses from the top of the sensor toward the liquid surface. As soon as the normal zone reaches the liquid surface, the level reading is saved and the current in the sensor is turned off until the next sample interval occurs. An LED sensor current indicator is illuminated during each sample. Sample intervals are user programmable from the front panel and can be set between "0.0" (continuous reading) to "600.0" minutes or hours. A manual update switch provided on the front panel can also be set to obtain continuous readings during a helium transfer period or to manually force an immediate measurement.

Sensor burnout protection

The Model 135 provides automatic helium level sensor vacuum burnout protection. A liquid helium level sensor energized in a vacuum environment will self-heat to the point of burnout within seconds. AMI's innovative microprocessor-based circuitry detects incipient sensor burnout and de-energizes the sensor before damage can occur. A 5% increase in sensor resistance will trigger this protection, causing the current to be switched off for 6 seconds before attempting to resume normal operation.

Convenient display

The Model 135 is equipped with a 4 digit LED digital display which provides liquid helium level indication in inches, centimeters, or percent as selected by a front panel switch. Front panel sensor calibration allows the user to calibrate the instrument quickly and easily for any length sensor. Calibration can be performed in either inches or centimeters of sensor active length with automatic reading crossover between inches, centimeters, and percent.

Remote computer monitoring or controlled operation

The Model 135 can be provided with an optional **0-10 volt DC signal** on the rear panel of the instrument for use with a recorder. A **4-20 mA current loop option** is available in lieu of the voltage signal. Computer interface options, including **RS-232 Serial Port/Data Logger** or **IEEE-488**, are also available.

View the Model 135 Manual ([Technical Support page](#))



Model 135 Specifications at 25 °C

Level Measurements

Resolution: 0.1%, 0.1 cm, or 0.1 in

Accuracy: $\pm 0.5\%$ of active sensor length

Linearity: $\pm 0.1\%$

Sensor Current: 75 mA nominal

Sensor Voltage: approx. 70 VDC for 80" active sensor length

Operating Parameters

HI and LO Alarms: 0% to 100% adjustable

HI/LO Alarm Relay Contact Ratings: 30 VAC or 60 VDC, 10 VA (up to 0.5 A max)
[normally open, closed on alarm]

Sample-and-Hold Period: 0.1 to 600.0 minutes (or hours)

0-10 Volt Analog Output

Integral Non-linearity: $\pm 0.012\%$

Resolution: 16 bits

Total Error: $\pm 1.1\%$

Voltage Drift (0-10 V): 100 ppm / °C

4-20 mA Analog Output @ 24 V

Vext Supply Range: 13-32 VDC

Integral Non-linearity: $\pm 0.012\%$

Resolution: 16 bits

Total Error: $\pm 0.25\%$

Current Drift (4-20 mA): 75 ppm / °C

PSRR: 10 mA / V

Power Requirements

Primary*: 90-132 VAC or 180-264 VAC 50-60 Hz,
50 VA

Physical

Dimensions (Standard): 97 mm H x 213 mm W x 273 mm D
(3.8" H x 8.4" W x 10.75" D)

Weight (Standard): 1.8 kg (4.0 lbs)

Dimensions (Rack Mount): 89 mm H x 483 mm W x 273 mm D
(3.5" H x 19" W x 10.75" D)

Weight (Rack Mount): 2.3 kg (5.0 lbs)

Environmental

Ambient Temperature: Operating: 0 °C to 50 °C (32 °F to 122 °F)
Non-operating: -20 °C to 60 °C (-4 °F to 140 °F)

Relative Humidity: 0% to 95%; non-condensing

* Maximum active sensor length is limited to 68 inches for input line voltages below 105 VAC or 210 VAC.