0871LH1

Freezing Rain Sensor

Campbell Scientific's 0871LH1 Freezing Rain Sensor detects the presence of icing conditions so that appropriate actions can be taken to prevent damage to power and communication lines, to warn of road hazards, or to keep ice off of wind turbine blades or a plane's wings. Ice on a wind turbine's blades is undesirable because:

- The blade can throw large chunks of ice a considerable distance—an extremely dangerous, potentially lethal situation.
- Formation of ice can cause unbalanced loading on the turbine's blades, bearings, and gear box.
- Ice reduces the turbine's power output.

The 0871LH1 can be used for wind prospecting applications by helping predict the amount of time a potential wind power site may be out of commission due to icing conditions. Additionally, the sensor lets users know when ice is preventing their wind sensors from providing data.

Measurement Process

The 0871LH1 uses resonant frequencies to determine the presence of icing conditions. Its main component is a nickel alloy rod that has a natural resonant frequency of 40 kHz. As ice collects on the rod, the added mass causes the resonant frequency to decrease. When the frequency decreases to 130 Hz (or 0.02-in. layer of ice), an internal heater automatically defrosts the sensor.

Ordering Information

Freezing Rain Sensor

0871LH1   Goodrich Freezing Rain Sensor. Requires the purchase of a sensor cable and a mounting kit (see below). The 24 Vdc power kit is also required if the heater is used (see below).

Common Accessories

0871LH1CBL-L   0871LH1 Sensor Cable with user-specified cable length; enter length, in ft, after the -L.

26966   0871LH1 Mounting Kit

26967   0871LH1 24V Power Supply Kit

Specifications

Set Point: Ice signal activates when probe ice thickness exceeds 0.020 ±0.005 in.

Operating Modes
Sensing: Operating with no ice or with probe ice thickness below the set point.
Deicing: Operating with probe ice thickness exceeding the set point.

Discrete Output Signals
Ice Signal: – No icing: Open[1]
– Icing detected: Ground[2]
Status Signal: – Operating correctly: Ground[2]
– Failure detected: Open[1]

RS-422 Output Signals
Ice State: 1 = Ice, 0 = No Ice
Fail State: 1 = Fail, 0 = No Fail (OK)

Built-In-Test (BIT)
Commanded: Performed at initial power-up. If a failure is detected and verified, the ice detector stops detecting and annunciating icing conditions; the heaters are disabled; and a failure is annunciated.
Continuous: Hardware and software BIT verifies that internal electronics are functioning properly.

Output Format: RS-422 output operates at 9600 baud

[1]For the Output Signal specifications, "Open" has an impedance of ≥200 k.

[2]For the Output Signal specifications, "Ground" has a maximum current sink of 50 mA.

Specifications Continued

Electrical

Input Voltage: 22 to 29.5 Vdc

Power Consumption
Sensing Mode: 15 Watts maximum
Delcing Mode: 50 Watts maximum

Environmental

Temperature Range
Operating: −55° to +71°C
Storage: −65° to +90°C

Random Vibration: 7.9 Grms (DO-160D, Category R)

Shock: MIL 810D METHOD 516

Physical

Weight: 0.7 lb (0.3 kg) maximum

Dimensions
Base Diameter: 2.88 in. (7.32 cm)
Base Height: 1.5 in. (3.81 cm)
Plate Size: 2.9 x 2.9 x 0.085 in.
(7.37 x 7.37 x 0.22 cm)
Strut Diameter: 1.22 in. (3.10 cm)
Strut Height: 1.0 in. (2.54 cm)
Rod Diameter: 0.25 in. (0.64 cm)
Rod Height: 1.0 in. (2.54 cm)

Electrical Connectors
Mechanical: MS27474T10B199PN
Mating: MS27474T10B199SN