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WHEN MEASUREMENTS MATTER

0871LH1

Freezing-Rain Sensor

Warns of Ice Danger

Protects roads, power lines, aircraft, wind turbines

Overview

The 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.

Benefits and Features

- Can be used to help prevent damage to power lines, and to warn of icy road hazards, ice on planes' wings, and ice on wind turbine blades
- Automatically defrosts itself when ice accumulation reaches a 0.5 mm layer of ice

Wind Energy Applications

The 0871LH1 can detect ice on a wind turbine's blade, which 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.

Technical Description

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 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 0.5 mm (0.02 in) ± 0.13 mm (0.006 in)
- Output Format: RS-422 output operates at 9600 bps
- Operating Voltage: 18 to 29.5 Vdc
- Power Draw
  Sensing Mode: 5 W maximum at 24 Vdc
  De-icing Mode: 27 W maximum at 24 Vdc
- Temperature Range
  Operating:–55° to +71°C
  Storage: –65° to +90°C
- Random Vibration: 7.9 grms (DO-160C, Category E)
- Shock: DO-160C
- Weight: 0.3 kg (0.7 lb)
- Base Diameter: 7.32 cm (2.88 in)
- Base Height: 3.81 cm (1.5 in)
- Plate Size: 7.37 x 7.37 x 0.22 cm (2.9 x 2.9 x 0.085 in)
- Strut Diameter: 3.10 cm (1.22 in)
- Strut Height: 2.54 cm (1.0 in)
- Rod Diameter: 0.64 cm (0.25 in)
- Rod Height: 2.54 cm (1.0 in)

Operating Modes

- Sensing: Operating with no ice or with probe ice thickness below the set point
- De-icing: Operating with probe ice thickness exceeding the set point

Discrete Output Signals

- Ice Signal
  No Icing: Open
  Icing Detected: Ground
- Status Signal
  Operating Correctly: Ground
  Failure Detected: Open

RS-422 Output Signals

- Ice Signal
  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.

Electrical Connectors

- Mechanical: MS27474T10B199PN
- Mating: MS27474T10B199SN