Photo courtesy of Gulfstream

# Ice Detectors

## 0871NA Series

UTC Aerospace Systems ice detectors do more than just detect the presence of ice—they can be used to calculate ice accretion rate and liquid water content (LWC).

With over 50 years of ice detection experience and innovation, UTC Aerospace Systems continues to be at the forefront of icing technology. Flexible, robust designs detect ice in a wide range of icing environments and have demonstrated their success around the world on both aircraft and ground-based applications.

### Benefits & Features

- Customization available, including connector type, strut/flange and outputs, based on customer requirements
- Frequency data allows multiple calculations to be performed
- Heated strut and probe provide robust de-icing capability
- Small size offers greater flexibility for mounting and installation
- Built-in test capability verifies internal electronics are functioning properly
- Diagnostic information available to aid failure troubleshooting via serial communications
- Compatible with aluminum or composite skin

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### General Specifications

**Connector** MS3474L14-15P

**Power Consumption**

| | |
|---|---|
| Sensing Mode | 5 Watts max. at 115 VAC (360-800 Hz) |
| De-icing Mode | Approximately 330 Watts at 115 VAC (360-800 Hz), depending on configuration |

**Discrete Outputs: Customer-selectable output configuration**

| | |
|---|---|
| Ice | Open / Ground |
| Status | Open / Ground |

**Size**

| | |
|---|---|
| Weight | Approximately 1.0 lb. |

**Serial Ports** RS-485 (RS-232 available with line level converter)

### Theory of Operation

UTC Aerospace Systems ice detectors use a magnetostrictive technology to drive the sensing probe to resonate at its natural frequency. As ice accretes on the probe, a shift in resonance frequency occurs. When the resonance frequency reaches the set point, an ice signal is activated and the strut and probe de-ice. The heaters remain on for a predetermined time once ice has debonded from the probe to ensure the ice is removed.

### State-of-the-art Testing Capabilities

UTC Aerospace Systems has one of the most capable icing wind tunnels in the world. Aerodynamic and icing testing is essential to analyze the effectiveness of our products. The new icing wind tunnel allows UTC Aerospace Systems to meet the new, stringent icing requirements set forth by the world's aviation regulatory agencies. It offers significantly increased capabilities, such as colder temperatures and higher altitudes, and is capable of producing both solid ice particles and supercooled liquid water droplets in high concentrations. Extensive wind tunnel testing allows us to optimize the design for performance throughout the flight envelope and environmental conditions experienced in flight.

### Operational Considerations

UTC Aerospace Systems ice detectors are designed to meet the demanding aerospace requirements of RTCA DO-160 for environmental conditions. These factors, as well as droplet impingement and unit orientation, should be considered with each installation. Software meets DO-178B, Level A requirements. Hardware development follows SAE ARP4754A, Level A standards.

### Ice Detection Sensitivity

- Sensitive to less than 0.001 inches of ice
- Customer-selectable ice signal threshold (typically 0.020 inches)

### Icing Measurements

The rate of ice accretion on ice detectors and monitored surfaces—for example, wing, tail, engine nacelle, etc.—depends on a complex heat transfer balance dependent on many atmospheric and aircraft parameters. By understanding these relationships, ice detector output can be used to activate ice protection and stall protection. It can also be used to calculate ice accretion rate and liquid water content (LWC).

**For additional information:**
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