

High-Reliability Capacitive Medium-to-High Temperature Blade Tip Clearance Sensor

- Fully Triaxial Design
- Ceramic Spray Technology
- High Nickel Alloys
- Captive Design
- High Temperature Resistant
- High Reliability
- Long-Term Operation



GadCap's capacitive blade tip clearance sensors are recognised by users for their high reliability. Typical applications include:

- ✧ Industrial Gas Turbines S1 and S2
 - Up to 24K hours trouble-free operation
 - Multiple units installed worldwide
- ✧ Compressor testing with extensive sensor reuse
 - Typical service life of 5 years, some reaching 10 years
- ✧ Aero-engine turbine testing meets all customer usage requirements



High-Reliability Capacitive Medium-to-High Temperature

Blade Tip Clearance Sensor

Key Features and Specifications

- Fully triaxial, electrode - guard layer to reduce leakage capacitance, shell to reduce noise
- High nickel alloy electrode, guard & shell, excellent high-temperature oxidation resistance; internal structure changes are relatively coordinated with temperature variations
- Ceramic spray is for seamless insulation between electrode, guard and shell without requiring any ceramic to metallic welding or braising
- Captive design to prevent parts falling into engine
- LEMO connector to connect flexible cable
- Sensor tip operating temperature up to 1,000°C
- Relative humidity range: 10% - 85%
- Mineral insulated cable length up to 6m (customisable), maximum operating temperature 800°C
- Flexible cable maximum operating temperature: 200°C
- Blade tip clearance measurement range approximately = 3/4 electrode diameter; typical sensor measurement range: 0.01mm - 4 mm
- Measurement accuracy: $\leq 45\mu\text{m}$ (typical $15\mu\text{m}$ @ 1mm blade thickness at 1mm clearance)
- Robust, life exceeds 10,000 operating hours or mean failure rate less than twice per year
- Calibrated using static or dynamic calibration methods (dynamic preferred)
- Compatible and stable operation with mainstream capacitance conditioning modules in the industry, such as GadCap SOLO, MC925 high-frequency capacitance modules, etc.
- Sensor customisable based on user application; reference diagram below:

