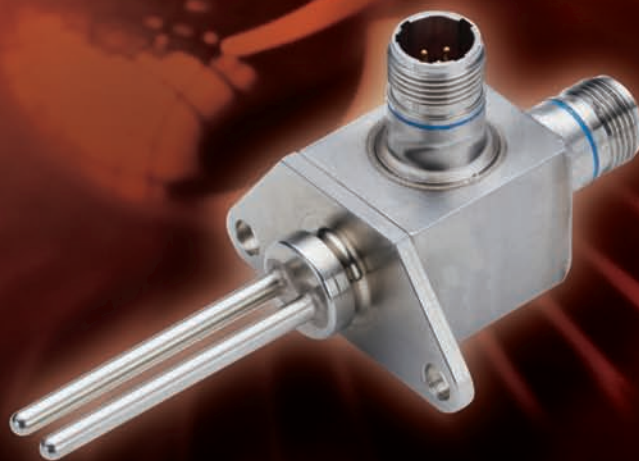


HARCOSEMCO
EMPOWERED 2 BE BETTER

SENSORS



ENGINE | FIXED WING | ROTORCRAFT

N1/N2 SPEED SENSOR

Our Speed and Torque Sensors include Magnetic Reluctance and Hall Effect sensors. These sensors respond to the presence or the interruption of a magnetic field by producing output proportional to the magnetic field strength. Our sensors are durable, reliable, have long-life, and are compatible with other electronic circuits.

FEATURES

- Single coil
- Multi coil
- Variable reluctance
- Hall effect

BENEFITS

- Zero speed detection
- 100% testing to real condition
- High reliability

APPLICATIONS

- N1/N2, NP/NF, Gearbox



OIL TEMPERATURE RTD

RTDs are considered to be among the most accurate temperature sensors available. Our RTDs also feature high immunity to electrical noise. Using multiple RTD elements allows the units to monitor oil levels.

FEATURES

- Single/Multi element
- Cold junction compensation
- Level/Temperature

BENEFITS

- Customizable
- Adjusts for delta temperature across the engine
- Reduces FADEC complexity
- Highly reliable

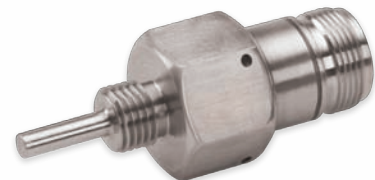
APPLICATIONS

- Fluids other than oil
- Oil level
- Oil temperature

OTHER RTD APPLICATIONS

Temperature monitoring of critical aircraft components and subsystems such as:

- Nacelle temperature sensor - integrated into a rigid harness to monitor PW1000 Engine Nacelle temperature
- Engine fuel
- Cabin temperature control
- Compressor discharge
- Avionics
- Cylinder heads
- Engine bearing oil
- Hydraulic fluids
- Inlet air ducts (T1)
- Air flow



FUEL TEMPERATURE RTD

The Fuel Temperature RTD is a hermetically sealed unit that monitors Fuel Temperature, using various RTD elements such as Platinum wire wound. RTDs are considered to be among the most accurate temperature sensors available. In addition to offering high accuracy, they provide excellent stability and repeatability. Our RTDs are engineered for the most exacting applications and environments. Probe tip, channel and sheath designs are optimized to maintain accuracy in the most turbulent fuel environments.

FEATURES

- Application-specific design • High-accuracy platinum wire-wound elements
- Hermetically sealed construction • Low excitation current • High signal-to-noise ratio
- Fast linear response • Excellent stability • Wide temperature range • Low maintenance
- High reliability

BENEFITS

- Economical solution for highly accurate temperature measurement
- Small packages add little weight to the system



OTHER RTD APPLICATIONS

Temperature monitoring of critical aircraft components and subsystems such as:

- Nacelle temperature sensor - integrated into a rigid harness to monitor PW1000 Engine Nacelle Temperature
- Engine fuel • Cabin temperature control • Compressor discharge • Avionics • Cylinder heads • Engine bearing oil
- Hydraulic fluids • Inlet air ducts (T1) • Air flow

FLEXIBLE THERMOCOUPLE ASSEMBLY

Our hermetically sealed probes have demonstrated consistent, trouble-free performance in installations around the globe. In typical applications, multiple EGT probes are connected to a single, flexible cable assembly. This provides the ability to easily replace individual probes—a distinct maintenance advantage over rigid thermocouple harnesses.

FEATURES

- Temperature Range: -65°F to 2300°F • Accuracy: $\pm 2^\circ\text{F}$ from 32°F to 530°F, $\pm .4\%$ from 530°F to 2000°F

BENEFITS

- Single unit – saving weight and complexity • Highly reliable • Additional features can be added

APPLICATIONS

- Exhaust Gas Temperature • Inlet Sensor • T5 Sensor



EXHAUST GAS TEMPERATURE SENSOR (EGT)

This integrated sensor is perfect for air inlet applications. The temperature sensor is an RTD. The pressure sensor is a strain-gauge instrumented silicon diaphragm buried in a machined housing. The silicone diaphragm distorts the strain gauge to measure pressure. The resistance delta is proportional to pressure.

Our hermetically sealed probes have demonstrated consistent, trouble-free performance in installations around the globe. In typical applications, multiple EGT probes are connected to a single, flexible cable assembly. This provides the ability to easily replace individual probes—a distinct maintenance advantage over rigid thermocouple harnesses.

FEATURES

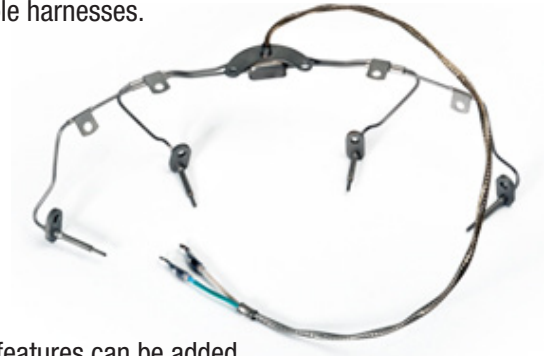
- Pressure and temperature sensor in one unit (P1/T1)
- Temperature range: -65°F to 2300°F
- Accuracy: $\pm 2^\circ\text{F}$ from 32°F to 530°F, $\pm .4\%$ from 530°F to 2000°F

BENEFITS

- Single unit – saving weight and complexity
- Highly reliable
- Additional features can be added

APPLICATIONS

- Inlet sensor
- Temperature and pressure



TOTAL AIR TEMPERATURE SENSORS (TATS)

A Total Air Temperature Sensor is a heated probe mounted on the surface of the aircraft. It is manufactured with corrosion-resistant materials, and is hermetically sealed. Total air temperature is an essential input to an air data computer in order to enable computation of static air temperature and hence true airspeed. Our sensors are currently being used on U.S. military aircraft, as well as numerous derivative models. In addition to our wide range of in-stock sensors, we can customize features such as the mounting flange and connector, depending on your specific application. We are one of only a few companies that can produce TAT technology sensors.

FEATURES:

- Fuselage and engine TAT options
- Specially constructed to prevent de-icing heat from adversely affecting temperature output
- Special design requirements can be met
- Can be boom mounted



OUTSIDE AIR TEMPERATURE SENSORS (OATS)

We manufacture three versions of Outside Air Temperature Sensors (OAT). The OAT Sensors are designed and fabricated to stringent standards utilizing integrated 3D modeling, comprehensive in-house aerodynamic test and evaluation facilities, and specialized manufacturing processes that include customized fine wire winding of sensing elements. OATs are a cost effective replacement for Total Air Temperature (TAT) sensors.

FEATURES AND BENEFITS

The following pertains to part number 100366-XX shown:

- Non-de-iced fuselage mount (formation of ice inhibited by aerodynamic design)
- Rugged, hermetically sealed construction • Wide temperature range • Low excitation current
- No moving parts • DO-160 environmental compliance • Custom configurations
- Tip-sensitive measurement (avoids the boundary layer)



BRAKE TEMPERATURE SENSORS

The Brake Temperature Sensor uses an RTD or Premium Type K material. Its housing is manufactured from stainless steel. With a welded connector the unit is hermetically sealed. Our brake temperature sensors are manufactured with probe designs that are customized to envelope fit requirements. Custom, repeatable, bending achieves probe tips that can fit intricate geometries.

FEATURES

- Application-specific design • High-accuracy platinum wire-wound elements
- Hermetically sealed construction • Low excitation current • High signal-to-noise ratio
- Fast linear response • Excellent stability • Wide temperature range
- Low maintenance • High reliability





RIGID THERMOCOUPLE RAKE ASSEMBLY

Custom-designed rigid thermocouple assemblies provide a cost-effective solution for measuring critical temperature parameters in commercial and military aircraft, and industrial and marine gas turbines applications. Leveraging years of application experience, our rigid assemblies incorporate innovative design, superior construction, excellent performance, and proven reliability for installations around the world. We also offer an array of thermocouples with our SEMPAK® material, a dense composite of metal sheath and wire which is insulated by a compacted ceramic.

FEATURES

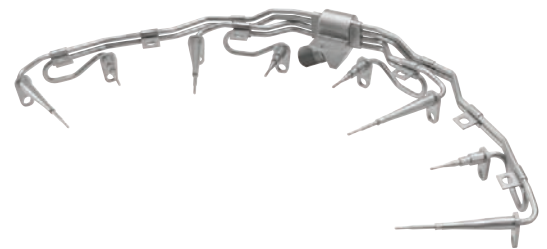
- Application-specific design • Rugged superalloy construction • Mineral insulated cable • Hermetically sealed
- Wide temperature range • Fast response time • High shock resistance • OEM spec compliance
- Multiple measurement points • Dual channel • Averaging/Individual readings

BENEFITS

- Harsh environmental operation • High accuracy • Excellent stability
- Ease of installation • Low maintenance • Low-cost redundancy

APPLICATIONS

- Exhaust gas temperature (EGT) • T3 through T6 • Sensor system
- Industrial power generation



THERMOCOUPLE IMMERSION PROBES

HarcoSemco's family of immersion probes are typically used for total temperature, stagnation, and direct reading applications. Temperature and/or pressure sensing can be incorporated in the same housing. Immersion probes provide specific or averaging of temperatures at multiple immersion depths with resistance balancing for true electrical average. These immersion probes are often used with flexible thermocouple assemblies and are designed with studs to accommodate attachment to ring terminals on the flexible thermocouple assemblies.

FEATURES

- Individually replaceable sensors • Enclosed or exposed junctions • Temperature range of -65°F to 2300°F
- Hermetically sealed

BENEFITS

- Custom engineering provides the best performance and fit to meet demanding application • Removable, replaceable sensing element can be incorporated to optimize field maintenance

APPLICATIONS

- Oil temperature monitoring • Fuel temperature monitoring • Exhaust gas



INTEGRATED THERMOCOUPLE/CABLE ASSEMBLY

The Integrated Thermocouple-Cable Assembly is a high temperature-capable design that features an overmolded transition at the cable to probe interface. This provides a moisture-proof seal to the probe. Coupled with the overmolded connector, the entire cable assembly is waterproof.

FEATURES

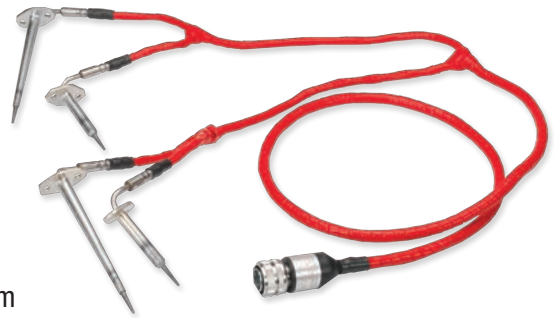
- Incorporates EMI/RFI shielding
- Abrasion resistant jacketing of Teflon® spiral wrap
- Stainless steel or other materials can be utilized based on environmental operating conditions
- Separate sensor immersion depths with individual or averaged outputs
- Color coded cable

BENEFITS

- Flexible harness incorporates probes and eliminates need for multiple part management.

APPLICATIONS

- Exhaust gas temperature (EGT)
- T3 through T6
- Sensor system
- Industrial power generation



ENVIRONMENTAL SYSTEM SENSORS

Environmental system sensors are all manufactured using RTD Elements, they are placed in a metallic housing and terminated with flexible leads or terminated to a connector. The connector termination can be hermetically sealed or environmental sealed.

- Bleed Air Temperature Sensors
- Wing Anti-Icing Sensors
- Pack Discharge Temperature Sensors
- Mixed Manifold Sensors
- Cabin Temperature
- Air Flow Sensors



AIR FLOW SENSORS

Air Flow Sensor consists of high stability platinum RTD's, a precision heater and an electronic interface that provides analog DC voltages. The basic design and the measurement range are adaptable to any installation.

As a pioneer in sensor technology, we offer a variety of sensors that can be customized for your particular environment or application. Our Electronic Flow Sensor is often used in the avionics cooling system for low flow detection and operates on the "thermal dispersion" principle where flow rate is proportional to the temperature of a heated element in cross-flow.



CUSTOM THERMOCOUPLE, CABLE HARNESS AND SENSOR SOLUTIONS.

HARCOSEMCO EMPOWERED 2 BE YOUR GLOBAL PARTNER.

HarcoSemco's mission is to provide superior service, technologically advanced products and custom solutions for challenging aerospace applications. We deliver on that commitment by empowering our people to provide a better customer experience, find innovative solutions, and deliver quality products on time, every time. We have been the partner of choice in the Aerospace industry for over 65 years and continue to be a cutting edge supplier that you can trust.



The fusion of Harco & Semco has created a truly exceptional, united body of people whose attention to detail, unwavering desire to innovate, and devotion to their customers is second to none. We at HarcoSemco, look forward to working with you.

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