

Motor and Generator Applications

Advanced temperature sensing and control solutions for power generation



For more than 50 years, Minco has provided temperature sensing and control solutions for advanced power generation applications. We understand the demanding requirements of these applications and deliver proven, engineered solutions to meet your requirements.

Protecting Motors and Generators

It's critical to protect your windings and bearings from overheat! Minco sensors are the industry standard for over-temperature protection of Motors and Generators. Rely on Minco to protect your valuable equipment. Our temperature sensing solutions are engineered to provide reliability and performance through our advanced designs, proprietary manufacturing technologies and custom development.

- Comprehensive portfolio of flexible, high performance products and custom capabilities
- Reliability you can count on, backed by comprehensive testing, certifications and a three-year warranty
- Cost-effective solutions designed for easy installation and maintenance
- Comprehensive global support through a responsive worldwide network of engineering, sales and customer service support
- Custom engineered solutions to meet specific applications requirements

Testing and Certifications

Minco understands the critical requirements of your applications. We will work with you to ensure that our products meet your requirements for testing and industry certifications, including:



Minco Offerings

Minco offers a broad array of products for motor and generator applications, including standard products, configurable products, and custom engineered assemblies and solutions.

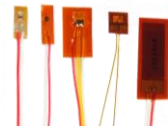
Stator winding sensors



Bearing embedment sensors



Thermal ribbon sensors



Anti-condensation heaters



Probes and assemblies



Transmitters, monitors and alarms



Stator Winding Sensors



Engineered to provide reliability and performance in demanding applications

Product Information

- Installed between stator windings to provide continuous protection of motors and generators
- Single and dual RTD elements and Thermocouples
- Class F (155°C) and Class H (180°C)
- Broad range of sizes and dimensions, up to 6 meters
- Certified for use in hazardous areas

Product Advantages

- **Reliable transitions** – Minco-pioneered etched foil transition tabs ensure reliable transitions between delicate sensing element wire and robust lead wires in wire-wound constructions
- **VPI resistance** – Laminated (not glued) assembly provides a completely sealed sensor to improve resistance to VPI processing and withstand harsh installation and operating conditions
- **Immunity to electrical noise** – Bifilar wound sensing elements eliminate inductance making RTDs virtually immune to electrical noise
- **High strength** – Specialty lead wire manufacturing techniques optimize lead pull strength and sealing for demanding handling and VPI applications
- **Accurate and reliable** – Advanced welding processes ensure reliable connections and accurate performance in high vibration and high temperature environments
- **Heavy duty leads** – Demanding AWG #18 lead wires available to address robust VPI and termination requirements
- **True averaging** – Wire-wound constructions for true averaging capability to detect hot-spots a point sensor would commonly miss
- **Electrical and mechanical protection** – Twisted and shielded cable options for electrical noise and mechanical protection

Bearing Embedment Sensors



Designed for fast response and flexible mounting in harsh environments

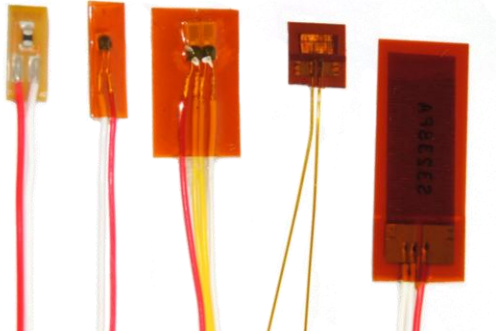
Product Information

- Installed directly in bearing shoes to provide over-temperature protection
- Single and dual RTD elements and Thermocouples
- Over temperature protection up to 260°C
- Broad range of mounting options include spring-loaded, bolt-on, epoxied, or directly in the Babbitt layer of bearings
- Certified for use in hazardous areas

Product Advantages

- **Reliable oil seal** – Oil seal solutions including proprietary elastomer filled cables with no length limit, epoxy-filled feed-throughs, and compression fittings eliminate oil wicking and allow adjustable fitting placement
- **High strength** – Specialty lead wire manufacturing techniques optimize lead pull strength and sealing for demanding applications
- **Electrical and mechanical protection** – Twisted and shielded cable options for electrical noise and mechanical protection

Thermal Ribbon Sensors



Thin and flexible for convenient mounting and fast response anywhere a sensor is needed

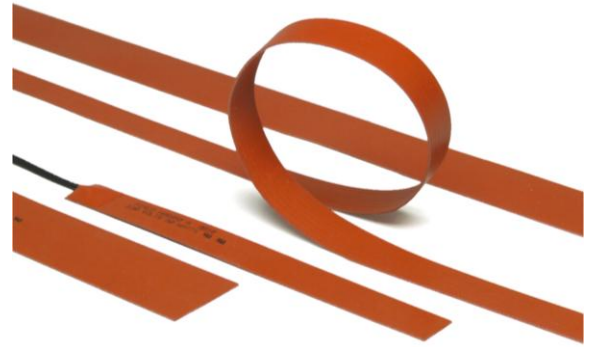
Production Information

- Often installed on end turns of stator winding when stator slot is not accessible
- Single and dual RTD elements and Thermocouples
- High temperature protection up to 260°C

Product Advantages

- **Reliable transitions** – Minco-pioneered etched foil transition tabs ensure reliable transitions between delicate sensing element wire and robust lead wires in wire-wound constructions
- **Consistent performance** – Extensive material processing knowledge delivers the highest stability and reliability to ensure accurately measurement over time
- **Electrical and mechanical protection** – Twisted and shielded cable options for electrical noise and mechanical protection

Anti-Condensation Heaters



Flexible to meet installation and application requirements

Production Information

- Installed on windings or housings to prevent moisture that could lead to corrosion or frost damage and resulting breakdowns
- Wire-wound element sealed inside flexible silicone rubber insulation
- Uniform heating to 220°C (428°F)
- Lengths up to 60" (1.5 m)
- UL component recognition

Product Advantages

- **Rugged and long-lasting** – Proprietary heater element wire routing process delivers reliable, long-lasting performance
- **Environmental protection** – Heater element sealed inside the substrate to protect from VPI processes, humidity and other environmental conditions

Probes and Assemblies



Application specific configurations engineered to provide performance and reliability

Production Information

- Installed against bearings or in fluids to provide over-temperature protection
- Single and dual RTD elements and Thermocouples
- Temperature ratings to meet demanding application requirements
- Broad range of configuration options to provide optimal performance while addressing demanding environmental and installation requirements
- Certified for use in hazardous areas

Product Advantages

- **Electrical isolation** – Isolated tip probes for installation where bearings are electrically hot
- **Field modification** – Stainless steel or fiberglass constructions can be user-shortened in the field
- **Fast response** – Copper tip sensitive probes with hollowound technology deliver fast time response
- **Accurate and reliable** – Advanced welding processes ensure reliable connections and accurate performance in high vibration and high temperature atmospheres
- **Intimate sensor contact** – Innovative spring-loaded fittings with fluid seal and tool-free installation ensure intimate contact with bearing or machinery housing
- **System accuracy** – Match calibrated transmitters improve system accuracy
- **Environmental protection** – Stainless steel connection heads enable use in corrosive environments, as well as certified assemblies approved for use without the need of a thermowell
- **Flexible installation** – Thick-walled, hand bendable probes allow custom installation routing
- **Electrical and mechanical protection** – Twisted, shielded, and armored cable options for electrical noise and mechanical protection

Transmitters, Monitors and Alarms



Range of capabilities to meet communication, monitoring and alarm requirements

Product Information

- Variety of programmable transmitters to convert RTD and thermocouple input for communication over long distances
- Transmitter communication protocols include HART, FOUNDATION Fieldbus, PROFIBUS PA, and standard 4-20mA
- Monitors and alarms to safeguard equipment and process fluids, offering up to 12 temperature inputs and controls output based on user-programmable set-points
- Monitor communication include Modbus over USB, RS-485 or RS-232

Product Advantages

- **System accuracy** – Reduced system error through match calibrated transmitters to improve accuracy over the complete temperature range
- **Easily installed** – Industry standard DIN packaging allows drop in capability
- **Environmental protection** – Electronics encapsulated in epoxy resists contaminants and protects components
- **Safe use** – recognized and tested by authorities for safe use in hazardous areas

Additional Capabilities

Minco's broad development, integration and assembly capabilities make us more than just a sensor supplier. Our capabilities enable optimal functional and packaging efficiency, as well as greater flexibility for your organization. We offer:

- Comprehensive development support
- Seamless integration of sensors, controllers, heaters, flex circuits and other electronics
- Broad based assembly capabilities

For more information on the advantages of working with Minco to develop advanced temperature sensing solutions for your power generation applications, contact your local Minco representative.