

Temperature Sensor Applications for Rotating Machinery

Overview

Minco temperature sensors deliver critical protection for a broad range of rotating machinery and industrial equipment—including power generators, pumps, compressors, gearboxes, and facility/process systems. Overheating of windings, bearings, and other vital components can lead to unplanned downtime, costly repairs, or even catastrophic failure. That's why industries around the world trust Minco for dependable, accurate, and durable temperature sensing solutions.



Whether you're generating power, moving fluids, or compressing gases, Minco solutions are designed to integrate seamlessly into your application. From standard sensors to fully customized assemblies, our products combine precision, performance, and innovation.

Why Choose Minco?


- Complete product portfolio: Wide selection of high-performance sensors designed for rotating machinery and process environments.
- Proven reliability: Solutions backed by rigorous testing, industry certifications, and a track record of success across diverse industries.
- Custom capabilities: Tailored engineering to meet your unique performance, packaging, and installation requirements.
- Cost-effective and efficient: Designed for ease of installation and maintenance to reduce total cost of ownership and downtime.
- Global expertise: Worldwide sales professionals and customer service teams offering responsive, localized support.
- Testing and certifications: Many Minco products are designed and tested to meet strict global standards and are approved for key industry certifications, including IECEx, SIL, ATEX, CSA, KCs, CCC, and PESO.

With Minco, you're not just getting a sensor—you're gaining a technology partner committed to maximizing your operational uptime and protecting your equipment investments. Let us help you meet the challenges of today's complex systems with solutions built on precision, innovation, and trust.

Motors and Generators

Preventing overheating of windings and bearings is vital to the continuous performance of motors and generators. A large percentage of motor failures are related to stator winding insulation. It has been estimated that stator insulation life is cut in half for every 10°C above the rated insulation temperature. And bearing temperature is often used as an indicator of bearing condition. Minco sensors set the industry benchmark for over-temperature protection, offering dependable defense for your critical equipment. Our temperature sensing solutions are designed for durability and accuracy, leveraging advanced engineering, proprietary manufacturing, and customized development.

Minco offers a comprehensive suite of temperature sensing products engineered specifically for motors and generators, ensuring total thermal protection from core to enclosure. From stator slot RTDs that provide real-time monitoring of winding temperatures to bearing embedment sensors that detect early signs of wear, our solutions help prevent unplanned downtime and extend equipment life. Thermal-Ribbon™ sensors provide an ideal option for surface sensing or retrofit installations, while anti-condensation heaters mitigate moisture-related risks. Our integrated systems—including transmitters, monitors, and alarms—supply seamless data communication and control, supporting predictive maintenance strategies and enhancing the reliability of your rotating machinery.


Motors and Generators		
	Stator sensors	Installed between stator windings to provide continuous protection and track temperature trends for predictive maintenance
	Bearing embedment sensors	Installed directly in bearing shoes to monitor bearing condition and provide over-temperature protection
	Thermal-Ribbon sensors	Installed on end turns of stator winding when stator slot is not accessible
	Anti-condensation heaters	Installed on windings or housings to prevent moisture accumulation that could lead to corrosion or electrical failure
	Probes and assemblies	Installed through motor equipment frame, exhaust, or in bearings to provide over-temperature protection
	Transmitters	Converts RTD or thermocouple input for communication over long distances, with protocols including standard 4-20mA, HART, FOUNDATION Fieldbus, and PROFIBUS PA
	Monitors and alarms	Safeguards equipment with up to twelve temperature inputs, controlling up to five outputs based on user-programmable set-points



Facilities and Process Applications

Accurate temperature measurement is critical in maintaining continuous, efficient, and safe facility and process operations. From HVAC systems to chemical processing and energy management, Minco temperature sensors deliver precise, dependable performance in even the most demanding environments. Our industry-proven solutions help you optimize processes, reduce maintenance costs, and prevent equipment failures. Minco is your trusted partner for temperature sensing in facility and process applications.


Minco's comprehensive temperature sensing solutions are engineered for integration into your new or existing facility and process operations. Our probes and assemblies are ideal for direct installation in fluid process lines, delivering accurate, real-time data for optimal thermal control. To avoid expensive hot taps or down time, our non-invasive Thermal-Ribbon™ sensors attach externally to tanks, pipes, and surfaces, with extraordinary accuracy and responsiveness. We also offer a range of transmitters that convert sensor signals for long-distance communication using standard 4-20mA, HART®, FOUNDATION™ Fieldbus, or PROFIBUS PA protocols. To enhance system protection, Minco monitors and alarms provide multi-point temperature tracking and control with timely alerts and programmable relay switching to prevent costly failures.

Facilities and Process Applications		
	Probes and assemblies	Installed in process flows to monitor and control fluid temperature
	Non-invasive sensors	Installed on tanks, pipes, and various surfaces to monitor temperature without draining, drilling, tapping or welding
	Transmitters	Converts RTD and thermocouple input for communication over long distances, with protocols including standard 4-20mA, HART, FOUNDATION Fieldbus, and PROFIBUS PA
	Monitors and alarms	Safeguards equipment with up to twelve temperature inputs, controlling up to five outputs based on user-programmable set-points.



Pumps, Compressors and Gearbox Applications

From thrust bearings to compressed air, Minco provides a comprehensive suite of temperature sensing and control solutions tailored for pumps, compressors, and gearboxes. Our probe assemblies maintain intimate thermal contact with journal bearings to deliver fast, accurate feedback for over-temperature protection, while our bearing embedment sensors deliver real-time temperature data from within bearing shoes to help identify wear or lubrication issues early. Minco transmitters offer reliable communication across long distances using standard 4-20mA, HART, FOUNDATION Fieldbus, and PROFIBUS PA protocols. Advanced monitors and alarms offer multi-point protection with user-configurable set-points. Use a standard thermowell assembly for monitoring compressed gas or pumped fluid temperatures or take advantage of Minco's innovative engineering with a compact probe sensor and integral 4-20mA transmitter. Installation couldn't be easier than the mating connector and shielded cable.

Pumps, Compressor, and Gearbox Assemblies		
	Probes and assemblies	Installed in bearings or equipment frame to provide over-temperature protection
	Transmitters	Converts RTD and thermocouple input for communication over long distances, with protocols including standard 4-20mA, HART, FOUNDATION Fieldbus, and PROFIBUS PA
	Monitors and alarms	Safeguards equipment with up to twelve temperature inputs, controlling up to five inputs based on user-programmable set-points.
	Bearing embedment sensors	Installed directly in bearing shoes to monitor bearing condition and provide over-temperature protection



Temperature Sensor Product Detail

Stator Winding Sensors



Comprehensive Sensing Options: Available with single/dual RTDs or thermocouples, Class F (155°C) and Class H (180°C) ratings, and a wide range of sizes up to 6 meters. Certified models available for hazardous areas.



Built for Harsh Environments: Laminated (not glued) construction ensures VPI resistance, durability, and reliability in extreme conditions, including high vibration and temperature.

Reliable and Accurate: Proprietary element to lead wire transition, advanced welding techniques, and non-inductive elements deliver precise measurements and exceptional electrical noise immunity in a robust design.

Heavy-Duty Construction: Specialty manufacturing techniques and options like AWG #18 lead wires, twisted/shielded cables, and optimized sealing provide mechanical strength and protection.

Enhanced Monitoring Performance: True averaging sensing enables detection of critical hot spots, offering continuous and accurate protection for motors and generators.

Direct Bearing Integration: Sensors are installed directly in bearing shoes or embedded in the Babbitt layer to provide accurate overtemperature protection up to 260°C.

Flexible Sensor Options: Available with single or dual RTD elements and thermocouples to suit various monitoring needs. Select models certified for use in hazardous areas.



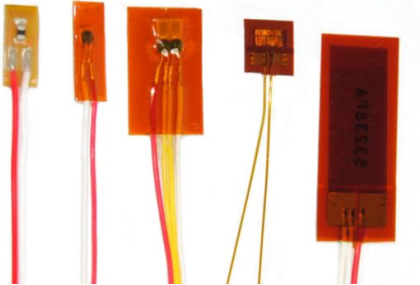
Versatile Mounting Methods: Choose from spring-loaded, Babbitted, bolt-on, or embedded/potted configurations to match application requirements.

Advanced Sealing & Durability: Oil seal solutions—including proprietary elastomer-filled cables and epoxy-filled feed-throughs—prevent oil wicking, while rugged lead wire construction ensures long-term reliability.

Bearing Embedment Sensors



Thermal Ribbon Sensors



Precise Surface Temperature Monitoring: Thin-profile design enables direct contact with surfaces and windings, ensuring fast, accurate thermal readings.

Flexible, Low-Mass Construction: Conforms to curved or irregular surfaces without adding significant mass or disrupting machinery balance.

Enhanced Reliability in Harsh Environments: Engineered for durability under high vibration, extreme temperatures, and oil or chemical exposure – including products certified for use in hazardous areas.



Customizable for Specific Applications: Tailored lengths, sensor types, and insulation materials support unique machinery requirements and space constraints.

Supports Predictive Maintenance: Real-time thermal data helps detect early signs of overheating or wear, reducing unplanned downtime and extending equipment life.

Anti-condensation Heaters

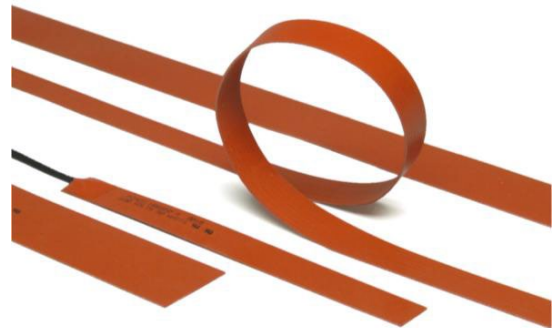
Reliable Moisture Protection: Prevents condensation on windings or housings, reducing the risk of corrosion, electrical failure, and frost damage in rotating equipment.

Built to Endure: Proprietary wire routing techniques and rugged construction ensure long-lasting performance, even in harsh environments.

Flexible, High-Performance Design: Wire-wound element is sealed within a durable silicone rubber insulation, allowing uniform heating up to 220°C (428°F) and compatibility with VPI processes.

Custom Fit and Versatility: Available in lengths up to 60" (1.5 m) to suit a wide range of machinery configurations and installation needs.

Certified Quality: Backed by UL component recognition for safety and performance assurance in demanding industrial applications.



Probes and Assemblies



Flexible Installation & Custom Fit: Hand-bendable probes, tool-free spring-loaded fittings, and field-modifiable designs simplify routing and ensure intimate contact with bearing surfaces or housings.

Reliable Performance in Harsh Conditions: Stainless steel heads, armored cables, and corrosion-resistant materials provide superior protection against moisture, vibration, and electrical noise – including products certified for use in hazardous areas.



Broad Range of Options for Demanding Applications: Single and dual element RTDs and thermocouples, copper tip-sensitive probes, and isolated tip designs support high-performance needs, including insulated bearings and hazardous areas.

Precision & System Accuracy: Advanced welding, match-calibrated transmitters, and fast-response sensors deliver consistent, accurate readings in high-vibration, high-temperature environments.

Designed for Critical Protection: Ideal for installation on bearings or in sumps, Minco assemblies deliver dependable temperature measurement for process control and to protect essential rotating equipment.

Precision Communication for Maximum Accuracy

Match-calibrated transmitters reduce system error and deliver highly accurate temperature data across the full operating range.

User-Friendly, Plug-and-Play Design

Industry-standard DIN packaging ensures quick, seamless integration into existing systems, simplifying installation and maintenance.

Safe and Durable Performance

Epoxy-encapsulated electronics resist environmental contaminants, and all devices are safe for use in industrial environments.

Flexible Signal Conversion and Protocol Support

Transmitters convert RTD or thermocouple inputs with support for 4–20 mA, HART, FOUNDATION Fieldbus, and PROFIBUS PA, enabling easy connectivity with modern control systems.

Smart Monitoring and Equipment Protection

Monitors and alarms handle up to 12 temperature inputs and control up to five outputs based on user-defined set-points, with communication via Modbus over USB, RS-485, RS-232, or Minco's free configuration software.

Transmitters, Monitors and Alarms



Additional Capabilities

Minco's broad development, integration and assembly capabilities make us more than just a sensor supplier. We can design for 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

Minco temperature sensors provide essential protection for a wide range of rotating machinery and industrial systems, safeguarding critical components like windings, bearings, and more. With a focus on reliability, precision, and performance, Minco ensures that your equipment operates safely and efficiently, even in the harshest environments. Backed by decades of proven expertise, a comprehensive product portfolio, and custom engineering capabilities, Minco is the trusted partner for OEMs and engineers worldwide. Our commitment to quality, cost-effectiveness, and responsive support helps minimize downtime, reduce maintenance costs, and protect your valuable assets. Choose Minco for innovative solutions designed to meet the demands of today's complex systems and drive long-term operational success.

