HOT SPOT MONITOR (HSM)

Early Detection with Continious Thermal Monitoring

G-HSM-18K

G-HSM-9SK

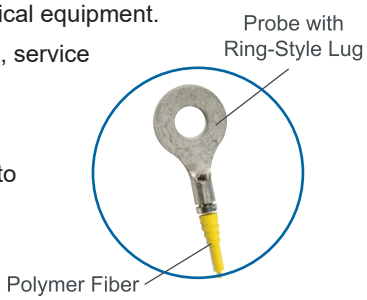
HSM FEATURES & BENEFITS

- **NFPA 70B Compliance:** Adheres to the 'Continuous Thermal Monitoring' standard with permanently mounted sensors that assess the thermal health of electrical equipment, enabling the extension of maintenance intervals beyond one year.
- **Advanced Safety Features:** Built-in alarming capabilities detect thermal anomalies early, preventing failures and costly shutdowns and ensuring operational safety and reliability.
- **Effortless Installation:** Non-conductive fiber probes easily integrate with existing electrical connections, such as busbars, breakers, and transformers, without requiring system modifications.
- **Universal Application:** Safe application across any voltage system, leveraging non-conductive technology to monitor critical, hard-to-reach components through the GraceSense™ Web Utility Interface, EtherNet I/P™, and MODBUS communication.

FOR MORE INFORMATION VISIT GRACESENSE.COM OR CALL 1.800.280.9517

OPERATION

GraceSense™ Hot Spot Monitor (HSM) is a non-conductive thermal monitoring device equipped with alarms that detect potential hot spots, allowing users to anticipate and prevent failures in electrical equipment. This proactive approach reduces financial losses by preventing unplanned outages, service interruptions, and equipment failures. The HSM offers straightforward plant-wide integration through MODBUS TCP/IP or EtherNet/IP™ and supports stand-alone applications via the GraceSense™ embedded web interface, which enables users to configure temperature alarm thresholds, set logging intervals, and manage internal relay operations.



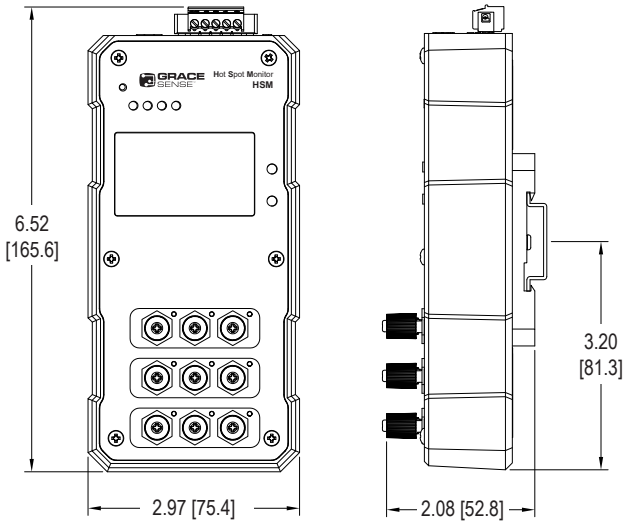
TECHNICAL SPECIFICATIONS

Varying fiber lengths and lug sizes available. **See Accessories section to the right.**

COMPONENT CODE	G-HSM-9SK	G-HSM-18K
Contents	Module with LCD display and sensors/channels (x9), 10m probes (x9), 0.5 in. ring-style lugs (x9), probe Allen driver, fiber trimmer, and Quick Start Guide	Module with sensors/channels (x18), 10m probes (x18), 0.5 in. ring-style lugs (x18), probe Allen driver, fiber trimmer, and Quick Start Guide
Polymer Optical Fiber Length	Standard 10m probes; optional 15m probes	
Probe Temperature Rating	**Standard Probe:** -40°C to 120°C (-40°F to 248°F) **High-Temperature Probe (sold separately):** -40°C to 160°C (-40°F to 320°F)	
Module Temperature Rating	-20°C to 70°C (-4°F to +158°F)	-40°C to 70°C (-40°F to +158°F)
Measurement Resolution	1°C (1°F)	
Measurement Accuracy	+/- 2°C (+/- 3.5°F)	
Communication Protocols	MODBUS RTU, MODBUS TCP/IP, EtherNet/IP™	
Output Relay	Normally Open Contact: 2A/250V	
Electrical Power Requirements	**Voltage:** 12–24 VDC (0.12A @ 24 VDC) **Power:** 3 W max	
Calibration	Pre-calibrated during manufacturing; no further calibration required.	
Insulation Dielectric Strength	80kV withstand (fiber provides enhanced dielectric strength to the probe assembly)	
Warranty	5-year warranty (register your HSM online for detailed warranty information)	

Note: Various probes, sensors, fiber lengths, and lug sizes are available. Refer to the Accessories section on the next page for details.

DIMENSIONS



INSTALLATION

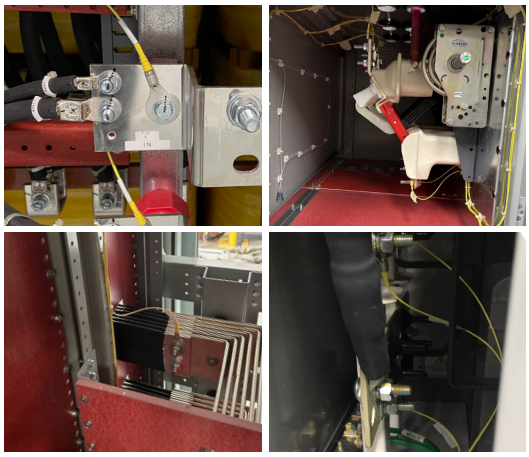
The HSM is installed on the DIN rail inside a low-voltage or control compartment. Fiber temperature probes, using ring-style connectors, link to existing bolted connections at typical sites for hot spots such as busbars and lug connections. The fiber is routed through the system and connects to the HSM module, enabling continuous thermal monitoring. GraceSense™ offers a power supply assembly service to mount the HSM module, a universal power supply, and fused terminal blocks on a DIN rail. This assembly is fully wired and tested to ensure a seamless plug-and-play installation.

APPLICATIONS

Electrical hot spots are primarily caused by currents running through components such as lugs, screw terminals, circuit breaker stabs, and bus-bar joints. Infrared thermography often misses these critical areas because they are inaccessible or obstructed. The reliability of internal bolted connections—key potential hot spots—can be impaired by wide load fluctuations and general breakdowns stemming from vibration, loose connections, or partial discharge phenomena.

The following are potential applications:

- Low /medium voltage switchgear, MCCs, and Drives
- DC switchgear, MCCs, and Drives
- Large UPS batteries and inverters
- Bus ducts and busbars connections
- High current junction boxes
- Load break and transfer switches
- Motors, generators, and dry-type transformers



ACCESSORIES (SOLD SEPARATELY)

High-Temperature Probe
(G-HSM-FB-HT)
Up to 160⁰ C

Ambient Probe
Inside (G-HSM-AI)
Outside (G-HSM-AO)

Probes - Set of 3
10M (G-HSM-FB3-L010)*
15M (G-HSM-FB3-L015)

Ring-Style Lug - Set of 3
.25in (G-HSM-LG D250)
.375in (G-HSM-LG-D375)
.50in (G-HSM-LG-D500)*

Included in HSM Kits along with a Probe Tightening Tool, Fiber Trimmer and Quick Start Guide.

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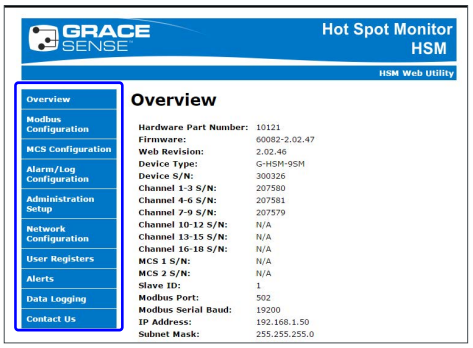
ENGINEER OUT THE RISKS OF THERMOGRAPHY

Description	Thermography Inspections	Hot Spot Monitor™ (HSM)
Incident Energy Exposure	High	None
Special Skills & Certifications	Required	No
Access to Obstructed Points	No	Yes
Alarm Capability		
Plant-Wide Integration		
Inspection frequency	Intermittent	Continuous
Data logging	Manual	Auto

COMMUNICATION



The GraceSense™ Web Utility interface offers intuitive navigation, enabling users to easily configure network settings, temperature thresholds, relay outputs, and alarm functions. Once configured, users can monitor temperature logs and receive warning alerts, with the option to download data for further analysis and trending. ***For more detailed guidance, please visit the support section at GraceSense.com.***

FREQUENTLY ASKED QUESTIONS

Q: What is your recommendation for monitoring critical connections?

A: We recommend prioritizing monitoring points by starting with the load side, followed by the line side and field termination connections.

Q: Can the HSM operate as a stand-alone device, or must it be integrated into another control system?

A: Flexible built-in communication makes plant-wide integration simple. For stand-alone applications, establish a network connection to the device via the GraceSense™ web utility interface to configure, view and retrieve the data.

Q: How does the external alarm output function?

A: The HSM module includes a 2A/250V Normally Open output contact, which can be configured to activate an alarm or horn when any programmed temperature threshold is exceeded.

Q: What do the LEDs on each temperature channel signify?

A: Each channel requires sufficient fiber power for accurate temperature readings. A green LED indicates the status is OK, while a red one signifies a failed status. A failed status occurs if the fiber is damaged or installed with a bend radius of less than 0.5 inches.

Q: Which HMIs and PLC controllers can the HSM interface with?

A: The HSM can interface with any device that supports Modbus RTU 485, Modbus TCP I/P, or EtherNet I/P™.

Q: How much data can the HSM module store?

A: Each HSM module has 16 MB of onboard memory, sufficient to store nine years of data logged at fifteen-minute intervals.

Q: What precautions should I take when installing the fiber temperature probes?

A: Ensure the equipment is de-energized, following your facility's electrical safety procedures. Securely mount fiber probe assemblies to each monitoring point. Maintain a bend radius of 0.5 inches or greater when routing the fiber, ensure separation between phase conductors, and avoid sharp edges and rough surfaces. Refer to the installation guide for detailed instructions.

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