MSENSE® FO
FIBER-OPTIC ONLINE TEMPERATURE MEASUREMENT.

WWW.REINHAUSEN.COM
Detecting hot spots at an early stage

According to a study from CIGRE, winding problems are the cause of 45% of transformer failures.

A mere increase of 12°C in the winding temperature drastically reduces the service life of the transformer by 75%.

Conventional winding temperature measurements provide a calculated, average display of the temperature profile. Precise hot spot detection can be crucial, particularly in critical applications.

Online winding temperature in real time

The MSENSE® FO combines several assemblies in an innovative design for fiber-optic online temperature monitoring. The practical MSENSE® FO system for your power transformer is the result of combining this design with decades of experience in the field and a great deal of expertise.

The most important advantages:
- Simple integration into the design and value chain of a power transformer
- Durable, standard-compliant and practical
- Innovative preparation and processing of all measured values
- Connection to SCADA and digital management systems, e.g. ETOS®.

The MSENSE® FO system is the key to hot-spot detection and your effective tool for dynamic overload and lifetime management, ensuring a high level of operational reliability and efficiency.

Power transformer failures result in substantial costs. Precise overload management guarantees a long service life and efficient operation.
PRECISE MEASUREMENT OF THE WINDING TEMPERATURE.

The MSENSE FO system accurately depicts the winding temperature continuously in real time.

Fiber-optic sensor
- User-optimized solutions
- Based on GaAs technology
- Extremely low PD performance (< 2 pC)
- Very high tensile force (> 60 N)
- Surpasses ASTM D3426 and D-149 standards

System solution: MSENSE® FO ECU-I
Electronic unit for GaAs technology for direct integration into ETOS®
- 8 or 12 sensors supported
- Internal reference sensor for maximum reliability and availability
- Including MSET-FO software
- Up to 3 units can be easily integrated into ETOS®

Stand-alone solution: MSENSE® FO ECU-S
Electronic evaluation unit for GaAs technology for independent monitoring of the winding temperature, including a display
- Up to 16 sensors supported
- Internal reference sensor for maximum reliability and availability
- Including MSET-FO software
- 8 programmable relay outputs (optional)
- 8 programmable analog outputs (optional)
- IEC 61850, DNP 3.0 and Modbus TCP (optional)
Technical features

- Measuring range: -80°C to +200°C
- Resolution: 0.1°C
- Accuracy: ± 1°C

Accessories

- Bushing and mounting flange
- Pre-installed optical bushings (optional)
- Leakage test performed ex works (optional)
- Protective housing in IP65 standard (optional)

Optical connecting cable

- For single-fiber or multi-fiber use for up to 12 fibers
- Environment- and user-based resistance and properties

MSENSE® FO: installation and components
OVERLOAD AND ASSET LIFETIME MANAGEMENT.

Intelligent preparation and processing of temperature data in ETOS®, the innovative MR system solution.

Manage overload and asset lifetime by integrating MSENSE® FO into ETOS®

- Dynamic overloads
- Improved temperature management
- Data-based asset lifetime management
- Data-based asset management

MSENSE® FO test unit

For use during installation, heat run tests and quality assurance

- 4 optical input channels
- Measuring range: -80°C to +200°C
- Accuracy: +/- 1.0°C
- Power supply via USB 2.0 and rechargeable battery
- 100% prevention of irreversible errors in the production process of transformers
MSENSE® FO. AN OVERVIEW OF THE HIGHLIGHTS.

- High level of expert knowledge of MR and its partners
  - 50% of electricity worldwide flows through MR products
  - Our value proposition: precision, quality, and a long service life

- Prevention of costly transformer failures
  - Assurance of proper transformer function
  - Assurance of equipment service life
  - Protection of investment/assets

- Monitoring of dynamic loading to guarantee grid stability
  - Dynamic overloads
  - Improved temperature management
  - Data-based asset lifetime management

- Extremely simple integration into the value chain and ETOS®
  - A wide variety of installation options that meet the most stringent requirements
  - Preconfigured for ETOS

- 24/7 MR service
  - 8,000 customers in 185 countries
  - 49 locations with 7 training centers

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THE POWER BEHIND POWER.