



Temperature measurement in the active part with MSENSE® FO

reinhausen.com



How can I detect high temperatures directly in the windings in order to prevent damage?

Why MSENSE® FO?

The equipment transformer consists of several components, each of which is subject to certain failure modes. To obtain a quick overview of the condition of individual transformer systems, you use structured systems of condition assessment (cf. CIGRÉ TB 761, Condition Assessment for Power Transformers, March 2019) under the aspects of

- replacement of equipment
- safety of equipment
- maintenance of equipment
- oil treatment

Temperature measurement is one of the most important parameters for assessing the condition of the active part. In combination with other additional examination methods, you can detect changes in your transformer equipment at an early stage and thus optimize both operational safety and operating costs. Compared to conventional temperature measurements, the MSENSE® FO offers the possibility to record the temperature at several points simultaneously and thus to obtain an exact overview of the temperature distribution of your active part.

How does MSENSE® FO work?

A mirror is attached to a gallium arsenide (GaAs) crystal at the end of a fiber optic cable (FOC). By means of a light source, light is coupled into the fiber optic cable via miniaturized optics, which is reflected again at the mirror and detected by means of a detector. Light at a wavelength of 850 nm can now transport electrons of the semiconductor GaAs from the ground state across the band gap into the conduction band, thereby releasing its energy to the electrons. The semiconductor becomes opaque in the process. The band gap and thus the energy required to move the electrons from the ground state into the conduction band is temperature-dependent; in GaAs, the wavelength (corresponding to the energy of the irradiated light) shifts by 0.4 nm/K. If the light transmission is measured as a function of the wavelength, the temperature can be determined very accurately.

Your advantages

- Distributed multi-point measurement of the temperature in the active part - up to 24 measuring points
- Greater independence from the manufacturer's transformer model for determining the HotSpot temperature through real multi-point measurements
- Very accurate temperature measurement, thus aging models can be improved - the certainty of the model predictions is increased
- Gradual expansion of the measurement system – cost-effective integration of the optical fibers during transformer manufacturing, purchase of the electronic evaluation unit at a later stage (distributed investment)
- Integration into ETOS®, the expert at your side for data analysis, evaluation and recommendations for action
- We are there when you need us - global service network MR with 24/7 availability
- Personal support from your local MR Sales representative



→ [More information](#)

Contact us at: MSENSE@reinhausen.com