



**HERCH**

# **Herch Opto Electronic Technology Co., Ltd**

World's Leading Fiber Optic Temperature Sensing & Measurement Solution Provider



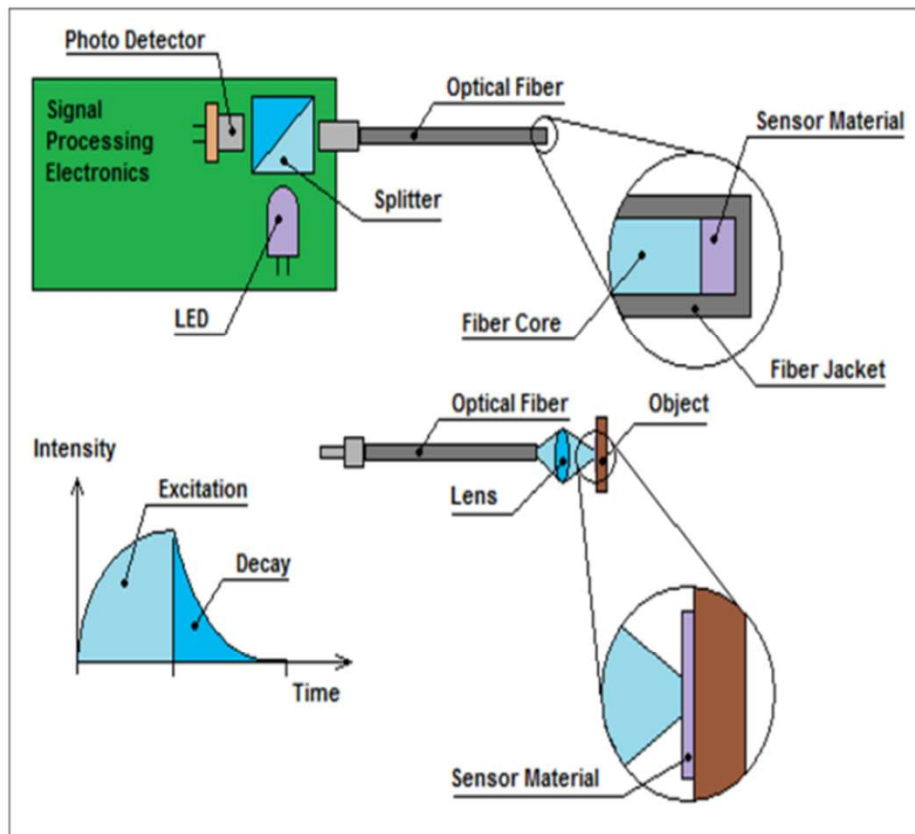
Product



**Cast Resin Transformer Direct Winding Temperature Monitoring Solution Using Fiber Optic Sensor**



## Principle



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The fiber optic temperature sensors are based on fluorescence decay technology. Upon being stimulated by a light source, electrons inside the sensitive rare earth material absorb photons, which move from a low to a high state of energy. When they return to the low state, they fluoresce. When the stimulation stops, the fluorescence begins to attenuate exponentially. The duration of attenuation is temperature dependent only. And the temperature can be found out by monitoring the duration of the fluorescence.



## Technology Comparison

Cast-resin transformers (CRTs) are ideally suited for applications where safety is paramount. Unlike oil-filled transformers, CRTs are non-flammable and much lighter, making them attractive for residential, light-industrial and hospital installations.

One challenge, however, is the limited cooling capacity of air and the relatively weak thermal conductivity of resin, which makes CRTs vulnerable to overheating. As these transformer types operate at considerably high temperatures (90°C to 125°C above ambient), close and accurate monitoring of their winding and core temperatures is critical. Overloading of the transformer increases winding temperatures, prematurely breaking down the insulation and decreasing transformer life. Destructive events such as partial discharge can also damage insulating epoxy, resulting in hot spots. The epoxy is also susceptible to cracking as a result of mechanical and electrical loading. As aging of the transformer is directly related to the winding temperature during operation, continuous temperature monitoring enables efficient loading and extends service life.

Many CRTs are equipped with resistance temperature detectors (RTDs) for monitoring temperatures in the low-voltage windings. RTDs, however, cannot be inadequately insulated for use in high voltage windings.

Fiber optic temperature sensors do not suffer any of the technical challenges associated with RTDs. They can be routed directly to critical transformer monitoring points such as the windings & core. The temperature sensor transmitter is of digital RS-485 Modbus communication perfectly suited for smart grid dry type transformer temperature monitoring.

PT 100 Sensor			Indirect measurement, low accuracy
Fiber Optic Sensor			Direct measurement, high accuracy

## Specification

Temperature Range	-40°C-200°C
Temperature Accuracy	±1°C
Temperature Resolution	0.1°C
Number of Channels	Up to 6 channels
Temperature Unit	°C
Display Mode	Digital tube display
Response Frequency	1 second per channel
Temperature Frequency	1Hz
Optic Interface	ST Optic Connector
Power Supply	220V AC
Digital Interface	RS-485
Power Consumption	< 10W
Communication Protocol	Modbus
Fiber Optic Length	Per requirement





## Key Features

01

Passive sensors, Immune to EMI, can be placed directly to the windings & core

02

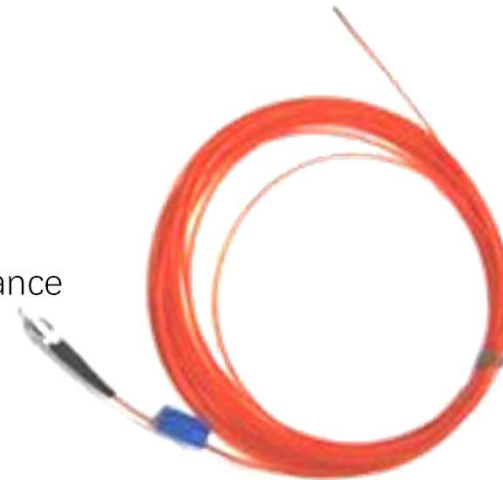
24/7 real time & remote temperature monitoring & cooling control

03

Safe from Partial Discharge unlike RTDs

04

Prevention of premature failure, preventative maintenance





## Field Installations





# THANK YOU

