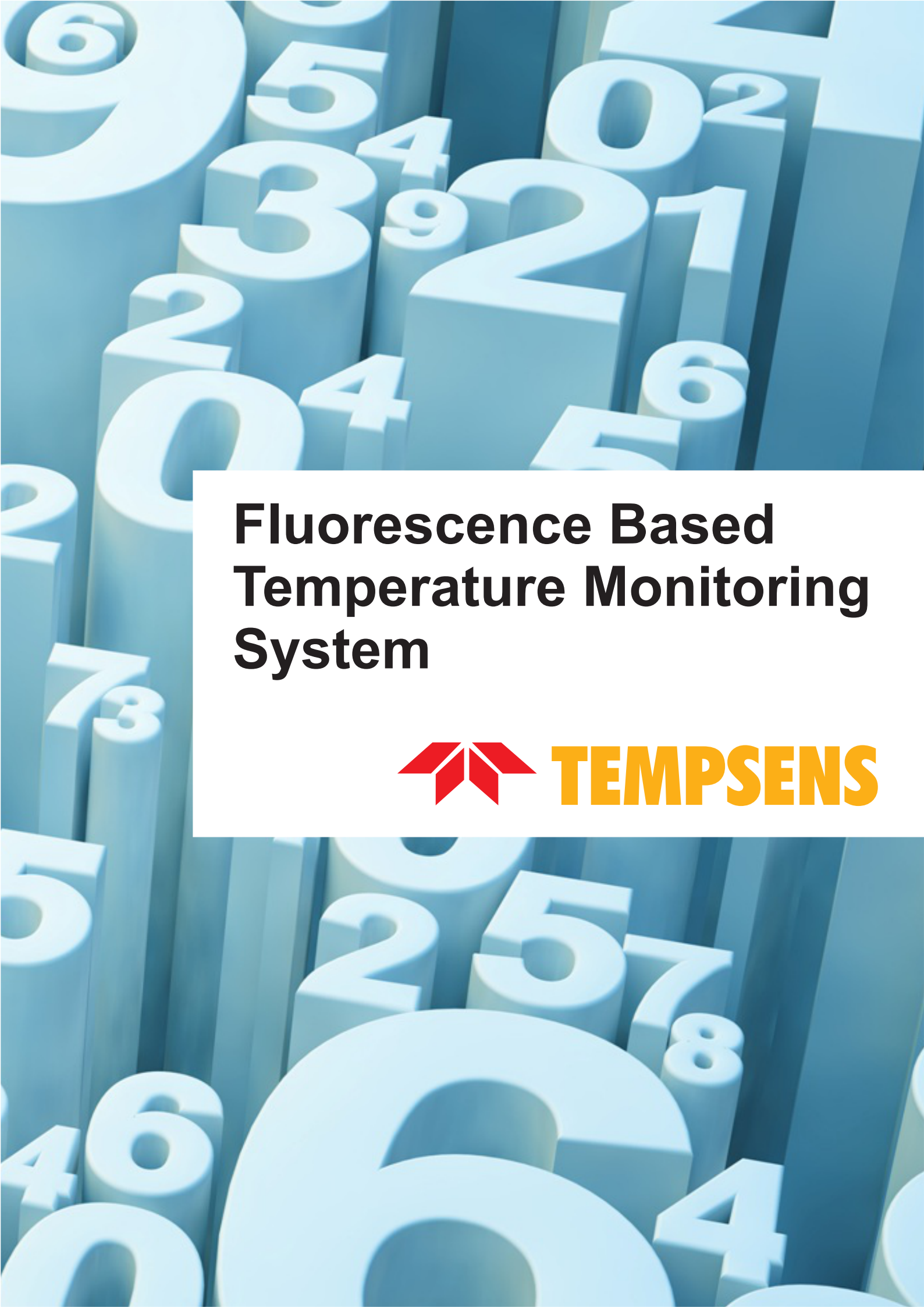


Fluorescence Based Temperature Monitoring System

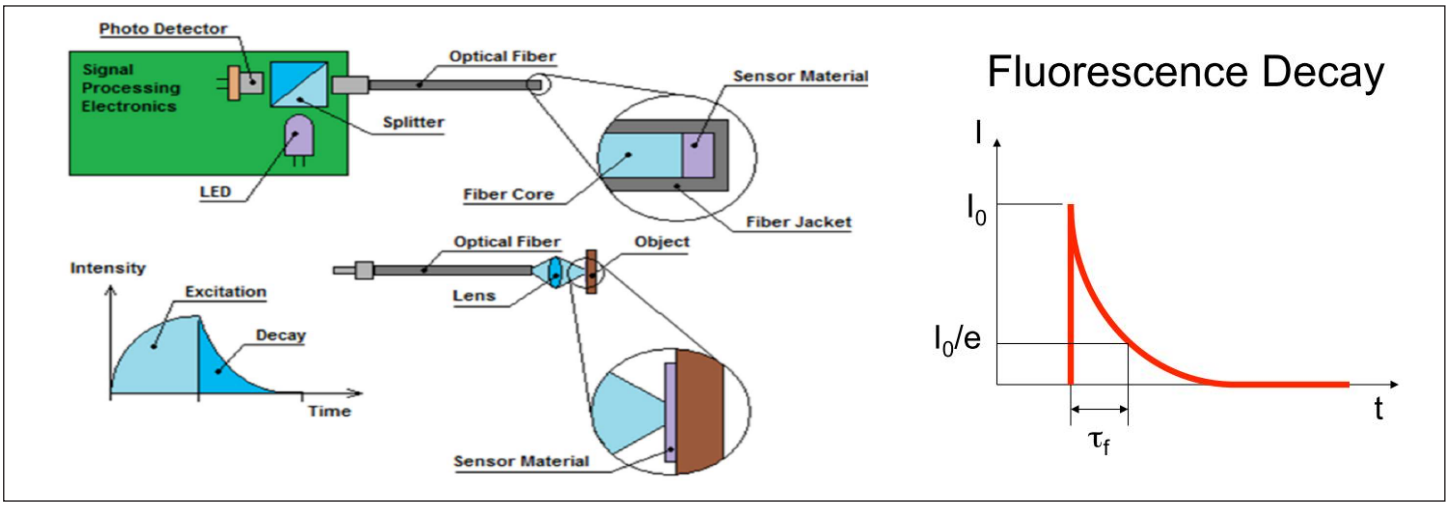
TEMPSENS

Fluorescence Based Temperature Monitoring System

Tempsens Fluorescence Fiber Optic Monitoring System is based on the characteristics found in rare earth fluorescent materials i.e. Fluorescence Lifetime. When the sensitive Rare Earth Material is stimulated by a Pulsed Light Source, electrons inside the sensitive rare earth material absorb photons, causing electrons to move from a low to a high state of excitation.

Once the light source has dissipated, the rare earth material emits photon and get back to ground state from it's excited state. The time taken by the Rare Earth Material to reach to ground state from excited state is known as “Fluorescence Lifetime”. It is dependent on Temperature and thus provides a wider application in Temperature Measurement Systems.

One of the many advantages resulting from this method of temperature monitoring is that the monitoring target only relies on the duration of the excited fluorescence of the material. The accuracy of the measurement is not affected by the light source's intensity, transmission loss, or optic coupling efficiency.



Measurement Solution for Power Contact in Energy Industry

Substations in the power industry are power facilities for transforming voltage, receiving and distributing energy, controlling power flow and adjusting voltage in the power system. They connect the power grids of all levels of voltage through their transformers, switchgears and power cables. In addition, Substation equipment also has measuring and controlling transformers, meter, relay protection device, and lightning protection devices etc.

The reliability of these devices is very important. For a long time, the safety monitoring of power grid equipment in our country has not been effectively carried out, resulting in frequent accidents, equipment damage, endangering personal safety, and directly affecting the development of people's lives and economic construction.

When the current passes, ,the temperature of the connection parts such as isolation switch, switchgear dynamic and static contacts, cable head and so on rises, which causes equipment aging and decline in insulation which can lead to short circuit, equipment damage and interrupt power supply.

Conventional method of monitoring the thermal condition of the connection is involves the on-duty personnel to regularly use infrared thermal imager, thermometer or temperature display patch to monitor the equipment offline which can only measure the contact temperature exposed outside, but there is no effective monitoring method for the contact temperature in the closed metal switchgear cabinet.

Application Areas

- Transformer Winding Temperature Measurement
- Switchgear Hot Spot Temperature Monitoring
- Energy Industry
- Industrial Microwave Industry
- Medical Industry

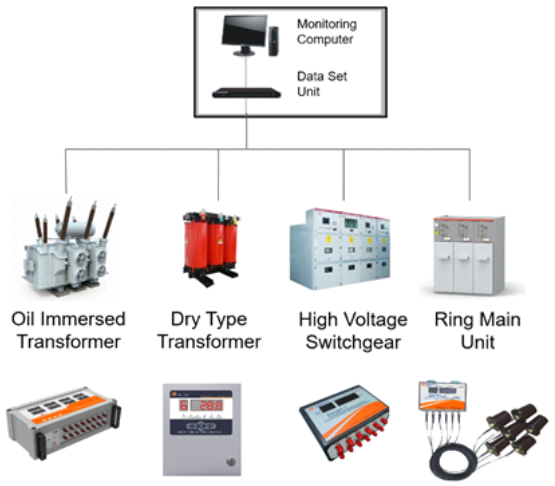
TEMPSENS

Fluorescence Based Temperature Monitoring System

Life of a transformer is greatly dependent on temperature of the windings. Over-temperature of winding will lead to insulation aging, burnout, breakdown and other accidents. Partial discharge and Partial overheating s in transformer interior can also cause the temperature change of transformer, which makes the performance of transformer different from that of normal operation. According to the "6°rule ", the relationship between transformer aging rate and temperature is based on the reference temperature.

The aging rate of transformer increases by one time for every 6°C rise in temperature, that is to say, the life of transformer decreases by half. Therefore, the winding temperature of transformer plays a decisive role in the aging of insulation material and the life of transformer. At present, there is no effective monitoring method for transformer winding temperature rise.

At present, the maintenance and correction of power equipment in power system is transiting from fault maintenance, preventive maintenance to condition-based maintenance. Therefore, the introduction of optical fiber sensing technology and the use of optical fiber sensing temperature monitor are important means to ensure the safe operation of high-voltage transformers.



Advantages of Fluorescent Optical Fiber Temperature Measurement System

- ✓ Highly stable, with great degree of accuracy, calibration-free, interchangeability.
- ✓ Immune to EMI, Microwaves. Good insulation performance integrated into intelligent switchgear and passed the type test.
- ✓ Gives Accurate and Reliable Temperature Reading where Thermocouple and RTD's cannot be used.
- ✓ Long service life, maintenance-free.
- ✓ The probe is small in size and can be used to measure the hot spot in depth, so as to realize the real and effective monitoring of the hot spot.
- ✓ It can be displayed locally and integrated into the control system conveniently.
- ✓ Easy installation and flexible networking.
- ✓ Low cost performance ratio.

Temperature Range	-40° - 260°C
Temperature Accuracy	± 1°C
Temperature Resolution	0.1°C
Display	Digital Tube Display
Number Of Channels	1-16
Temperature Unit	C° or F°
Response Frequency	2 Second Per Channel
Communication Protocol	MODBUS
Power Supply	AC 230v , 50Hz
Digital Interface	RS 485 USB Analog O/P : 4-20 mA Relay O/P
Memory	1 GB Memory Space , USB Port Accessible
Power Consumption	⩽10 W
Fiber Optic Length	1 m to 25 m
Operating Temperature	-20°C – 65°C

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