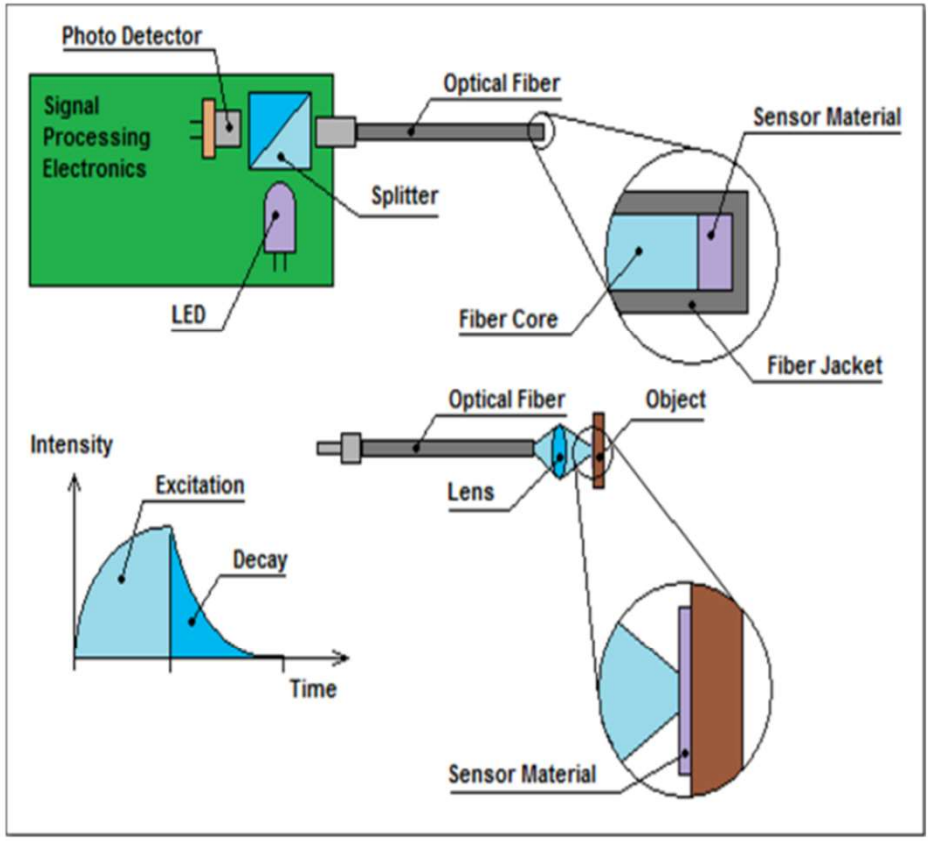
Herch Opto Electronic Technology Co., Ltd

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

Product

Condition Based Real Time Switchgear Temperature Monitoring Solution With Fiber Optic Sensor

Working Principle



PRINCIPLE

The fiber optic temperature sensors are based fluorescence decay technology. Upon being stimulated by a light source, electrons inside the sensitive rare earth material absorbs 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.

Why to Monitor

With ever-increasing power demands, electric utilities find themselves in a race to maximize the reliability of their electrical assets while minimizing downtime. As a critical junction point in power distribution, switchgear represents one of the most vulnerable links in the power grid. These valuable assets are subject to overheating due to overloaded circuits, unbalanced loads, or loose or damaged. If left unattended, these conditions can lead to failures resulting in costly damage to switchgear and surrounding equipment, power production loss, and in extreme cases, severe injury or death.

How to Monitor

Condition-based monitoring has been in practice for some time, but mostly through periodic manual inspection while the switchgear is powered down. Implementing continuous monitoring gives electric utilities the ability to collect data generated during switchgear's normal operating conditions, thereby providing awareness to problems in real time of asset failure resulting in unplanned downtime. Real-time trending during full load electrical stresses, vibration, insulation breakdown, and environmental influences, quickly provides insight into the health of the utility's asset. When performing continuous monitoring, it is not critical to identify the exact location of degradation, but to understand the trend of the defect over time. Possessing the ability to monitor and trend the most common failure modes allows for planned maintenance events to assess the health of the asset over time versus running the risk.

Technologies Available

• IR Sensor

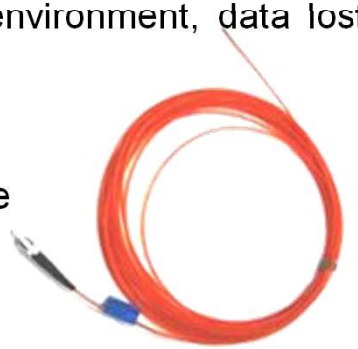
Contactless measurement, measurement limitations are present when adjacent surfaces have different emissivity or reflections. The mounting locations are limited, cannot perform monitoring procedures behind bus insulators and cable shrouds because line of sight is required. Finally, the proper alignment of the single-pixel camera is difficult to achieve and is susceptible to misalignment when subject to vibration and shock.

• Wireless Sensor

Indirect contact measurement due to metal sensor, System is powered by batteries which have a limited life span. The associated cost of taking the switchgear out of service to replace batteries is untenable from an operational perspective. Biggest problem is easy to be interfered in electromagnetic environment, data lost happens often.

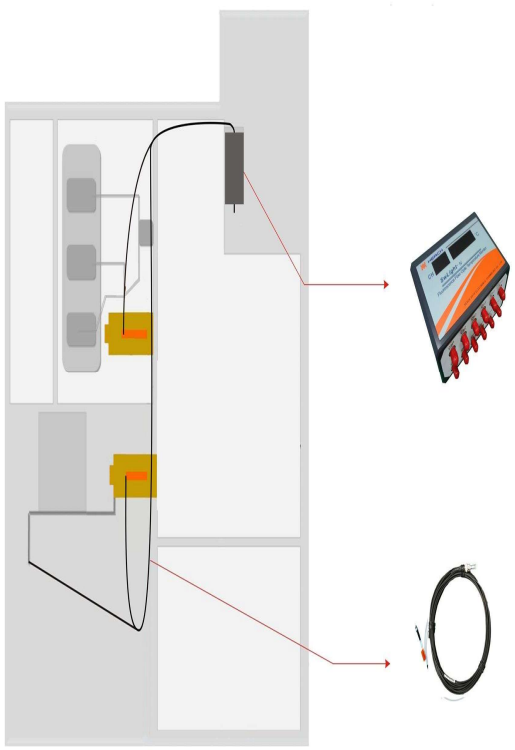
• Fiber-Optic System

The fiber optic is made of glass, due to material feature, it is of high dielectric performance and long lifetime, immune to EMI, can be put onto the (hard to reach) measuring point for direct contact & real time measurement and measurement accuracy is high.



Conclusion: Fiber optic temperature monitoring system is the most reliable and easy to deploy condition based, real time monitoring solution for switchgears.

Specification



Temperature Range	-40℃-200℃ (depends on probe)
Temperature Accuracy	±1℃
Temperature Resolution	0.1℃
Number of Channels	Up to 12 channels
Temperature Unit	℃
Display Mode	Digital tube display
Response Frequency	1 second per channel
Temperature Frequency	1Hz
Optic Interface	ST Optic Connector
Power Supply	220VAC 24V DC
Digital Interface	Two RS-485
Power Consumption	﹤6W
Communication Protocol	Modbus
Fiber Optic Length	To confirm

Test Report

XIHAR

No. 110911G

检 验 报 告 副本

Test Report

试品型号: KYN□-12(Z)/T1250-31.5型
TYPE

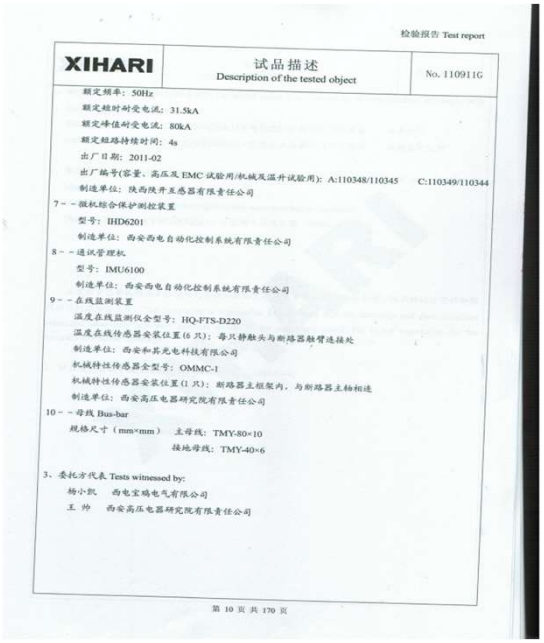
试品名称: 智能交流金属封闭开关设备
DESIGNATION INTELLIGENT A.C. METAL-ENCLOSED SWITCHGEAR

委托单位: 西电宝鸡电气有限公司
CLIENT XD BAOJI ELECTRIC CO.,LTD

制造单位: 西安高压电器研究院有限责任公司
MANUFACTURER XI'AN HIGH VOLTAGE APPARATUS RESEARCH INSTITUTE CO.,LTD

检验类别: 型式试验(绝缘、温升及短路性能) TYPE TESTS(DIELECTRIC, TEMPERATURE-RISE AND SHORT-CIRCUIT PERFORMANCE)
TEST CLASSIFICATION

西安高压电器研究院有限责任公司
XI'AN HIGH VOLTAGE APPARATUS RESEARCH INSTITUTE CO.,LTD
国家高压电器质量监督检验中心
NATIONAL QUALITY SUPERVISION & INSPECTION CENTER FOR HIGH VOLTAGE APPARATUS



检验报告 Test report

XIHARI | 试品描述 Description of the tested object | No. 110911G

额定频率：50Hz
额定短时耐受电流：31.5kA
额定峰值耐受电流：80kA
额定短路持续时间：4s
出厂日期：2011-02
出厂编号(容量、高压及 EMC 试验用/机械及温升试验用)：A:110348/110345 C:110349/110344
制造单位：陕西陕开互感器有限责任公司
7－－微机综合保护测控装置
型号：IHD6201
制造单位：西安西电自动化控制系统有限责任公司
8－－通讯管理机
型号：IMU6100
制造单位：西安西电自动化控制系统有限责任公司
9－－在线监测装置
温度在线监测仪全型号：HQ-FTS-D220
温度在线传感器安装位置(6 只)：每只静触头与断路器触臂连接处
制造单位：西安和其光电科技有限公司
机械特性传感器全型号：OMMC-1
机械特性传感器安装位置(1 只)：断路器主框架内，与断路器主轴相连
制造单位：西安高压电器研究院有限责任公司
10－－母线 Bus-bar
规格尺寸（mm×mm） 主母线：TMY-80×10
接地母线：TMY-40×6
3、委托方代表 Tests witnessed by:
杨小凯 西电宝鸡电气有限公司
王 帅 西安高压电器研究院有限责任公司

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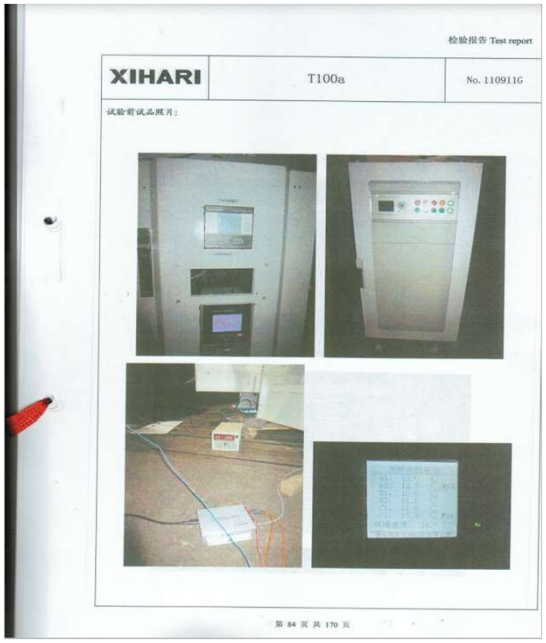

检验报告 Test report

XIHARI | T100a | No. 110911G

试验前试品照片：

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Type Tested in China's XIHARI Lab with Switchgear Manufactured by China XD Group

Reference















THANK YOU