Introducing OSENSA’s PWR+ Fiber Optic Temperature Sensing Solutions

Medium Voltage Temperature Monitoring

The Need for Continuous Monitoring

Hot spots on medium voltage equipment are common, hard to detect, highly dangerous to personnel, and potentially catastrophic if not discovered in time. Overheating in electrical equipment can be caused by overloaded circuits, unbalanced loads, and loose or damaged connections. These thermal points are typically located inside energized equipment behind safety doors or covers.

The legacy approach of locating potential hot spots and monitoring them on a set schedule with infrared thermal imaging is expensive, inaccurate and hazardous to the electrical personnel. Ideally these scans should be done under peak load, but this practice is either no longer permitted or is being phased out. Electrical equipment susceptible to hot spots and thermal run-away include switchgear, busbars, disconnect switches and other connections in non-accessible locations.

OSensa’s PWR+ Thermal Monitoring Solution

OSensa’s PWR+ medium voltage temperature sensing solutions provide continuous monitoring of electrical hot spots in equipment up to 38kV. The installation is simple and provides real-time monitoring and notification when a temperature problem arises. Expensive monitoring visits are no-longer required, and personnel safety is no-longer compromised. Operational costs are minimized by early detection and maintenance planning.

OSensa’s PWR+ solutions include the following components:

- Temperature Transmitter - FTX-910/610/310-PWR+
- Temperature Probes with Fasteners – PRB-110, PRB-910
- Display and Control Module – HMI-100-PWR+, or
- Industrial PC – TCU-300
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Temperature Transmitters (Signal Conditioners)
The FTX-910-PWR+ is a fiber optic temperature transmitter in a compact 35mm DIN-rail mountable format. Each transmitter accepts 9 optical fiber sensor inputs and includes one programmable from C relay output for alarms. The FTX-910-PWR+ is powered by 12-24V DC and includes isolated RS-485 serial connectivity over industry standard Modbus RTU protocol. Multiple transmitters can be connected in series on a standard 35mm DIN rail with power and RS-485 communication supplied by the five-pin T-Bus connector. 6 channel (FTX-610-PWR+) and 3 channel (FTX-310-PWR+) transmitters are also available.

Temperature Probes
The PRB-110 plastic optical probes and the PRB-910 high-temperature probes install on switchgear contacts, busbars, cast resin transformers, motors, and generator windings to provide reliable 24/7 thermal monitoring with noise-free performance. The probes are constructed from durable, high dielectric strength materials and have been tested to safely operate on equipment rated up to 38 kV (3 phase). OSENSA’s medium voltage probes have been tested against, and exceed, the IEEE C37.23-2003 “IEEE Standard for Metal-Enclosed Bus” standard.

OSensa’s medium voltage probes are highly durable and will not interfere with the surrounding electrical equipment. The probes are easily cut to length at time of installation with a supplied cutter, and are simply inserted and tightened into the FTX-910/610/310-PWR+ temperature transmitters. For attachment to the monitored equipment, ring lugs in 1/4”, 3/8” and 1/2” sizes are supplied which easily fasten to the end of the probes. The PRB-110 senses temperatures up to 120°C and the PRB-910 senses temperatures up to 200°C.

PRB-110 (120°C max. temperature at ring)

PRB-910 (200°C max. temperature at ring)
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Display and Control Module

OSensa’s HMI-001-PWR+ touch panel display provides remote ethernet connectivity, real-time display and data logging for up to 27 fiber optic channel inputs. The intuitive touch interface enables easy configuration of external relays for alarms and hardware control. Plug in a USB stick for virtually unlimited data logging capability. An additional relay board is available to expand system control capabilities.

Industrial PC

OSensa’s TCU-300 is a small form-factor Industrial PC that easily integrates with OSENSA’s FTX-series fiber optic temperature transmitters providing internet connectivity, alarms, data logging, and control. It supports up to 256GB of micro SD card storage, and a full-size HDMI connector for local HMI display. It also features 8 programmable outputs for driving external relays, in addition to three USB ports for removable storage, keyboard, or wireless LAN connectivity. There are also two isolated RS-485 ports for master and slave Modbus communications. Other protocols supported include DNP3 and Modbus over TCP/IP.

OSensa’s Switchgear and BusBar Temperature Monitoring Solutions Meet the Challenge

OSensa’s PWR+ Medium Voltage Temperature Monitoring Solutions provide continuous, real-time temperature monitoring, protecting equipment and maximizing personnel safety. The rugged temperature probes easily attach to bolted connection points, and accurately and instantaneously measure temperatures up to 200°C. Temperatures can be monitored and logged real-time with either the HMI-100 Display and Control Module, or with the TCU-300 Temperature Control Unit, with alarms for identifying temperature concerns and alerting appropriate personnel.
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