

# Busbar Temperature Monitoring

Detection of Overheated Busbars as an Indicator of Problems with Power Distribution Systems

# Q

Question

How can monitoring busbar temperatures prevent power outages, loss of productivity, fires, and/or explosions?

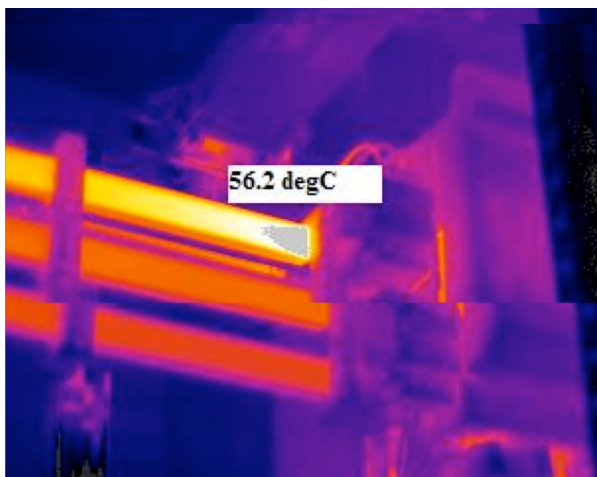


# A

Answer

## Situation Analysis

Nearly every factory, shopping mall, airport, office complex and high-rise apartment has an electrical room that provides power distribution throughout the facility. The power distribution system usually includes high-voltage metal-clad switchgear, cast resin transformers, low-voltage switchgear and panel-boards. A fault or failure in any one of these components can result in power outages, loss of productivity, and even fire or explosions. Overload, phase imbalance, power factor, corrosion and poor electrical connections all result in the generation of heat. Any generation of heat is an indication of loss of energy and wasted power. Heat also contributes to a shortening of the life of the equipment by up to 85%. The conditions may develop slowly over time or can result from a catastrophic fault. Since contact measurement would be dangerous, it is necessary to use noncontact infrared sensors. Continuous temperature measurement is also an important instrument for the planning of predictive maintenance cycles.



*Thermal image of busbars shows one is overheating*

- Measurement temperature range: -40 to 1800 °C (-40 to 3272°F)
- Ambient temperature: -10 to 180 °C (14 to 356°F)
- Dedicated close focus lens for spot sizes down to 0.5mm (0.02 inch)

# A

## Answer

### Solution and Improvements

Continuous monitoring of the busbar within a switchgear cabinet can provide both instantaneous alarms for fault conditions and trend analysis for predictive maintenance. Predictive maintenance is a most effective tool to prolong the life and efficiency of the equipment and to minimize shutdowns. A trend detected during continuous monitoring will allow for maintenance of the equipment at your choosing to minimize downtime.

The most effective solution to busbar temperature monitoring is the use of infrared point sensors. Infrared sensors provide safe noncontact measurement of real-time busbar temperatures. The Raytek MI3 is ideally suited for this monitoring function. Optical resolutions range from 2:1 up to 100:1 which allows the sensor to be safely mounted within the cabinet at a distance from the busbar to avoid flashover to the sensor and electromagnetic interference (EMI).

The sensor head and mounting bracket do not require any special insulating material for mounting to the equipment structure. The sensor electronics may be mounted at up to 30 meters (98 feet) from the sensor head and outside the switchgear enclosure. Output signals are typically fed into a PLC or distributed computer control system for alarming and trending. Typically, six infrared sensors are used for busbar monitoring, three for input and three for output.



Raytek Compact Series MI3



Adjustable Mounting Bracket

### Raytek Product

Compact Series MI3

### Benefits

- Increased Safety
- Increased Productivity
- Continuous Monitoring
- Predictive Maintenance

### Accessories

- Adjustable Mounting Bracket
- Optional RS485 output
- DataTemp® Multidrop Software

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