

Distributed Temperature Sensor DTSX200

The DTSX200 is a fiber-optic distributed temperature sensor. It uses the temperature dependence of Raman backscatter of incident pulse light that it generates inside an optical fiber. This sensor has a measurement function equivalent to those of multiple temperature sensors arranged in a longitudinal direction, enabling the measurement of temperatures at every meter along a 6-km optical fiber.

In recent years, unconventional energy resources have been attracting attention as alternatives to conventional oil. To extract the heavy oil component from oil sand, its viscosity must be decreased by using steam or some other means. To ensure efficient mining, changes in the underground temperature distribution should be monitored.

The environmental tolerance of the DTSX200 has been strengthened for operation under severe conditions at mining sites. It also can be used in a wide variety of applications such as detecting leaks in LNG tanks and pipelines, detecting fires of belt conveyers and architectural structures, controlling temperature at hot sections in plants, and monitoring the temperature of power lines.

FEATURES

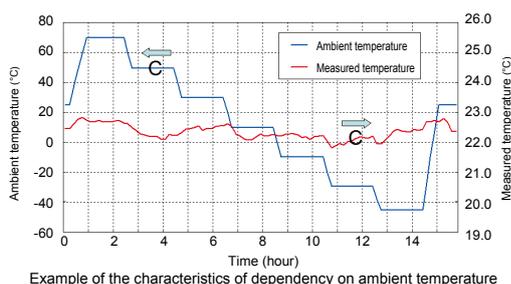
■ Easy to integrate in process control systems

The DTSX200 works smoothly with industrial instruments and control devices to improve the efficiency of production processes from temperature measurement to production control in production control systems. The functions for seamlessly and safely connecting customers' networks are also enhanced.

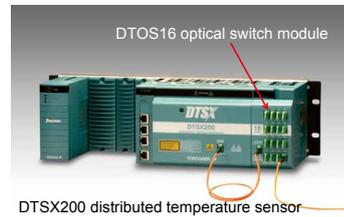
- Automatically generating LAS*1 and WITSML*2 format data files
- Supporting file transfer protocols with high security
- Long term data storage and automatic retransmission after recovery
- Managing accounts and preventing falsification

■ Tolerance to severe conditions

With a wide operating temperature range from -40°C to $+65^{\circ}\text{C}$, the DTSX200 can stably measure temperatures in harsh environments. The graph below shows an evaluation example of its tolerance to the environment.



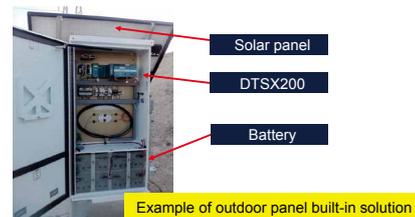
While the ambient temperature was changed in steps between -45°C and $+70^{\circ}\text{C}$, the DTSX200 measured the temperature of an optical fiber whose temperature was fixed at room temperature. The fluctuation of measured temperature is within 1°C across the entire ambient temperature range.



■ Compact, lightweight, and low power consumption

The DTSX200 is one of the smallest sensors in the industry: about one quarter the size of previous models. A compact optical switch module for selecting fibers to be monitored (up to 16 channels) can be mounted on a 19-inch rack with the DTSX200.

With small power consumption of up to 10 W in the ambient temperature range of -40°C to $+65^{\circ}\text{C}$, it can be easily powered by a solar panel and batteries where no other power source is available.



SPECIFICATIONS

Item	Specifications
Measurement temp. range	-200°C to $+800^{\circ}\text{C}$ (depending on optical fiber characteristics)
Temperature resolution	0.5°C or smaller for a 6-km optical fiber
Temperature fluctuation	Within 2°C for DTSX200 ambient temperature range of -40°C to $+65^{\circ}\text{C}$
Distance resolution	Up to 1 m
Operating temperature	-40°C to $+65^{\circ}\text{C}$ (full performance across the range)
Power consumption	Up to 10 W DC (DTSX200 alone)
Resistance to corrosive gases	G3 (ANSI/ISA-571.04)
Explosion proof	Limited energy (Ex nL)

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*1: LAS: Log ASCII Standard

*2: WITSML: Well site Information Transfer Standard Markup Language.