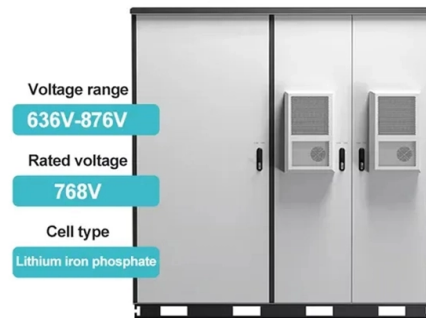


Fiji Pipeline Temperature Measurement Optical Cable System



AI Overview

The Fiji Pipeline uses a distributed fiber optic temperature sensing (DTS) system to provide continuous, real-time monitoring of pipeline temperatures along its entire length. Technology Overview The system relies on fiber optic sensor cables embedded along the pipeline, which measure temperature continuously using Raman or Brillouin scattering techniques. A laser pulse is sent through the fiber, and the backscattered light is analyzed to determine the temperature at specific points along the pipeline. This method, known as Optical Time Domain Reflectometry (OTDR), allows precise temperature profiling with spatial resolution down to one meter. The DTS system can detect temperature variations as small as $\pm 0.1^{\circ}\text{C}$, enabling early identification of blockages, leaks, or integrity issues. Fiber Optic Cable Design The optical cables are typically armored or metal-tubing cables to withstand harsh subsea and buried environments. The fiber is embedded in a protective tube and wrapped between tensile armors during pipe manufacturing, ensuring durability against mechanical stress, rodent damage, and environmental hazards. For high-temperature or cryogenic conditions, specialized coatings such as polyimide or metal are used, while standard polyacrylate coatings suffice for normal operating temperatures. The cable terminates at the topside end fitting with an optical connector for integration with the monitoring system. Operational Benefits The DTS system provides real-time temperature profiles from seabed to surface, which is critical for:

- Flow assurance: Detecting blockages or abnormal cooling/heating along the pipeline.
- Integrity management: Monitoring axial movement, pipe burial, or upheaval buckling.
- Leak detection: Identifying hot or cold spots indicative of leaks or third-party interference.
- Late-life field management: Supporting intelligent operational decisions as producti...

Article Content

Distributed Sensing Applications | DAS & DTS

Distributed Acoustic Sensing (DAS) and Distributed Temperature Sensing (DTS) technologies enable real-time, non-intrusive, and highly precise monitoring of kilometers-long areas through a single

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HAWK's Praetorian Fiber Optic Sensing System delivers real-time distributed acoustic sensing (DAS) for pipelines, conveyors, perimeters, power cables, and railways — up to 80km in a single system. No

Enhance Pipeline Monitoring with Fiber-Optic Sensing

This article explores how distributed fiber-optic sensing redefines pipeline safety and reliability by enabling real-time monitoring, early leak detection, and proactive maintenance.

Fiber Optic Temperature Sensor DTSX

Using sensing technology that takes advantage of the characteristics of fiber optic cable, DTSX is a temperature sensor that can be laid out following the shape of the object to be measured. By

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Distributed Temperature & Strain Sensing (DTSS)| B-OTDR | AP

These systems provides a spatially well-resolved profile, enabling real-time measurement of temperature or strain distributions with high accuracy, making it ideal for long infrastructure such as pipelines,

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The ability to measure temperatures and strain at thousands of points along a single fiber is particularly interesting for the monitoring of elongated structures such as pipelines, flow lines, oil wells, and

Distributed fibre optic sensors for pipeline protection

The unique feature of distributed fibre optic sensors is that the system utilises sensing cables that are based on standard fibre optic cables, to obtain a measurement profile along the entire

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Long-Range Pipeline Monitoring by Distributed Fiber Optic Sensing

Distributed fiber optic sensing presents unique features that have no match in conventional sensing techniques. The ability to measure temperatures and strain at thousands of points along a single

Fiber Optic Pipeline Monitoring

The Praetorian Fiber Optic Sensing System emits a laser pulse down a fiber optic cable to measure vibration and temperature and the position of that vibration and temperature. Using a combination of

Leakage detection using fiber optics distributed temperature ...

The present paper presents and discusses the possibility to actively and automatically monitor leakages using distributed fiber optics sensing techniques. The second part of the paper focuses on a practical

Leakage Detection Using Distributed Acoustic Sensing in Gas Pipelines

The novelty of this work lies in the successful detection of gas leaks using internally deployed fiber optic cables, which has not been demonstrated in previous studies. This deployment

Distributed Temperature Sensing (DTS) | AP Sensing

Distributed Temperature Sensing (DTS) systems provide temperature information for accurate thermal monitoring, fire detection, and condition assessment by utilizing standard fiber optic cables. These

Leak detection using Distributed Fibre-Optic Sensing (DFOS)

Whether you want to monitor the temperature, strain, vibration, or acoustic signals of your pipeline leakage, monitoring CO₂ and H₂ (onshore/offshore) storage, we have the right skills and

Distributed Temperature Sensing (DTS) Brochure

Measure the temperature along a fiber optic cable or optical loss/attenuation, bend detection and integrity monitoring (Patent pending) with the integrated dual wavelength Rayleigh OTDR.

Distributed optical fibre sensor for infrastructure monitoring: Field ...

The project employed two optical fibre cables for temperature and strain measurements positioned on top of the pipeline in soft backfill material. During the monitoring period, numbers of

Pipeline Monitoring | Fiber Optic Leak Detection | AP Sensing

Distributed Fiber Optic Sensing (DFOS) provides the capability to monitor your entire pipeline infrastructure 24/7. By utilizing a fiber optical cable as a sensor, this technology ensures early

Distributed Temperature Sensing (DTS): Working Principle,

For retrofitting existing infrastructure, fiber optic cables can be attached externally to pipelines or cables using clamps or adhesive strips, or placed inside protective conduits. Proper

Fiber Optic Sensor Cables for Advanced Monitoring | AP Sensing

Fiber optic sensor cables are the key enabler for real-time monitoring of temperature, strain, and acoustic signals across diverse and challenging environments. Depending on the application and the

DTSX3000 Distributed Temperature Sensor

What Is Distributed Temperature Sensing? Distributed temperature sensing (DTS) measures temperature distribution over the length of an optical fiber cable using the fiber itself as the sensing

Optical Fiber Sensors for High-Temperature Monitoring: A Review

This paper reviews the sensing principle, structural design, and temperature measurement performance of fiber-optic high-temperature sensors, as well as recent significant

Use of Fibre-Optic Sensors for Pipe Condition and Hydraulics ...

This paper is a review of existing fibre-optic sensing systems with pipe applications, and is focused on the areas of condition monitoring, leak detection and flow parameter measurement.

Distributed Temperature Sensing (DTS) Brochure

The VIAVI Distributed Temperature Sensing (DTS) solution is based on Raman scattering technology. Measure the temperature along a fiber optic cable or optical loss/attenuation, bend detection and

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.dknconsulting.co.za>

Email: info@dknconsulting.co.za

Phone: +31 6 2948 7351

Address: Herengracht 123, 1015 BT Amsterdam, Netherlands

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