Temperature measurement in hydrogen production with the iTHERM SurfaceLine TM611

Non-invasive temperature measurement redefined

Benefits at a glance

- Accurate and quick measurement
- Reduced or eliminated risk of leakages
- Easy installation without opening the process
- Availability of different communication protocols

Process conditions

- Up to 700 bar
- 20°C - 150°C
- Purified water

In some applications of hydrogen production invasive temperature sensors reach their limits. The iTHERM SurfaceLine TM611 by Endress+Hauser revolutionizes temperature measurement in hydrogen production with its non-invasive technology. This innovative solution provides precise and rapid measurements, minimizes the risk of leaks and contamination, and allows for easy installation without process interruptions. With enhanced thermal coupling and modular design, the TM611 is ideal for high-pressure and purified water applications. Various sensor options and communication protocols ensure seamless integration into both existing and new systems.

Endress+Hauser

People for Process Automation

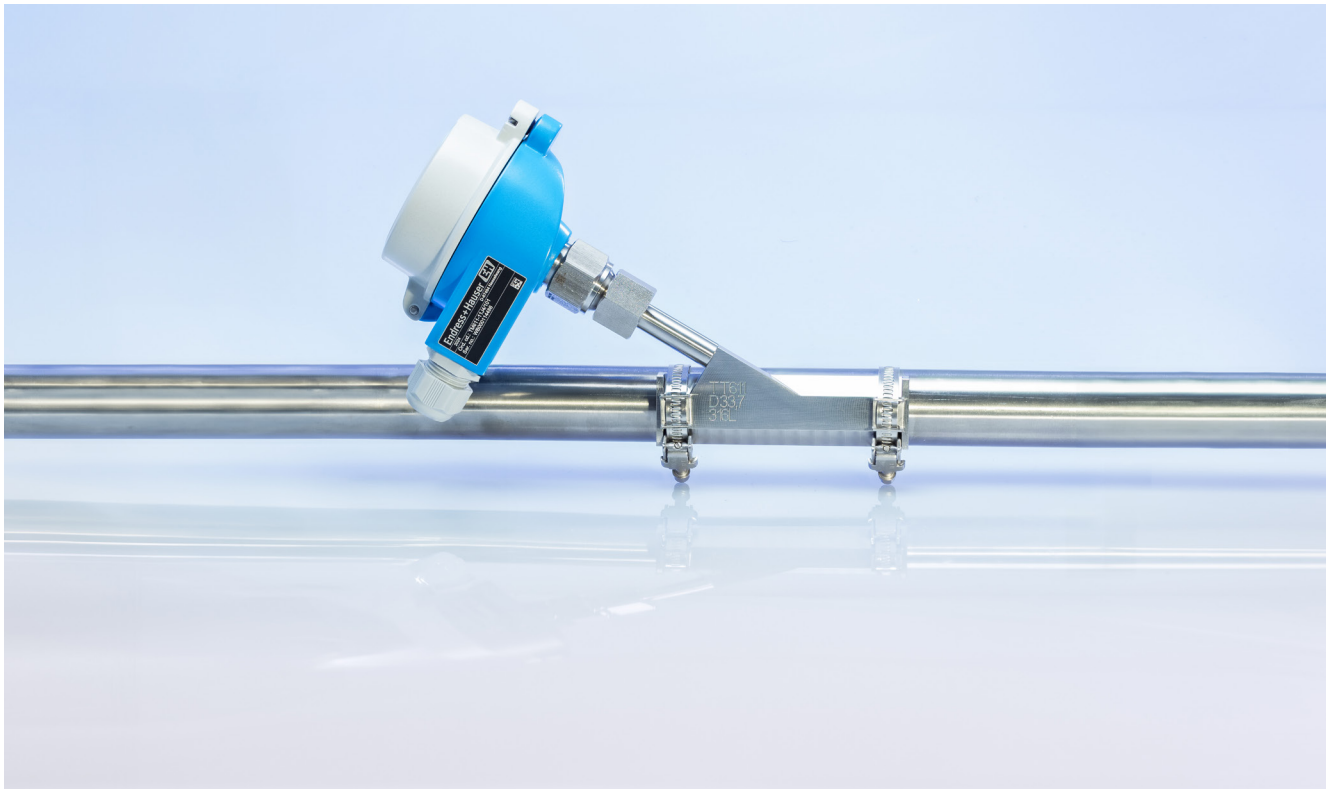
The challenge Hydrogen production has been developed for years and includes a variety of different process steps, such as water treatment, cooling and heating circuits, the electrolyzer or hydrogen storage and compression. Each of these steps involves different requirements and challenges for temperature measurement. Sometimes a simple sensor is sufficient, but for applications with high pressure or purified water, an invasive temperature sensor can cause many difficulties. For instance, direct contact with the medium must be avoided due to pressures of more than 500 bar. In addition, there is a risk of contaminating the purified water by opening the process. Typical applications are, for example, water after disinfection, the inlet to the electrolyzer or hydrogen storage and compression. For these types of applications, non-invasive sensors are already on the market, but they are not accurate enough and suffer from a long response time.

Green hydrogen production

Our solution The first Endress+Hauser non-invasive temperature sensor solves these challenges without compromising on accuracy and response time. The new and innovative design of the iTHERM SurfaceLine TM611 is perfectly suited for demanding applications with high pressure or purified water. It is the ultimate sensor for temperature measurement without the risk of leaks, process interruptions and contamination.

The technology of the specially developed temperature sensor is based on an improved thermal coupling element that ensures superior measurement performance compared to electronic compensation. In combination with thermal insulation against the environment, it achieves comparable accuracy and response time to our Endress+Hauser high-quality invasive temperature measurement solutions.

iTHERM SurfaceLine TM611 is available with various Endress+Hauser sensor types, such as thin-film/wire-wound Pt100 elements or thermocouples, which have been optimized, standardized and qualified based on decades of customer experience. The combination of these sensor technologies with the innovative coupling to the process line leads to a significant improvement in the accuracy and responsiveness of the iTHERM SurfaceLine TM611 compared to conventional non-invasive measuring devices. This new thermometer is modular and can therefore be ordered in conjunction with a wide range of Endress+Hauser temperature transmitters offering various functions, approvals and smart features. In this way, all common communication protocols can be covered, making it easy to integrate the measuring point into existing and new system environments.



iTHERM SurfaceLine TM611 non-invasive temperature sensor

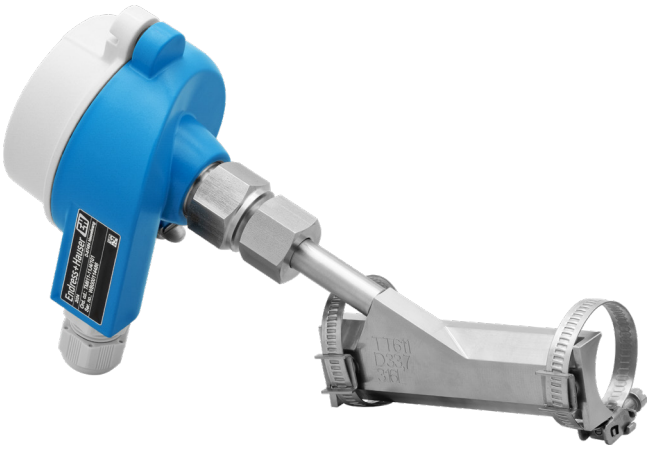
Result For temperature measurement in hydrogen applications with high pressure and purified water, the non-invasive measurement iTHERM SurfaceLine TM611 is a cost-effective, maintenance-free and accurate alternative to invasive measurement with conventional measuring devices.

Components

- iTHERM SurfaceLine TM611

Further applications

- Innovative non-invasive temperature measurement for hydrogen pipes: AI01401T



iTHERM SurfcaceLine TM611

www.adresses.endress.com

AI01420T/09/EN/01.25

Endress+Hauser

People for Process Automation