Temperature monitoring of the air-cooling system in hydroelectric power plants

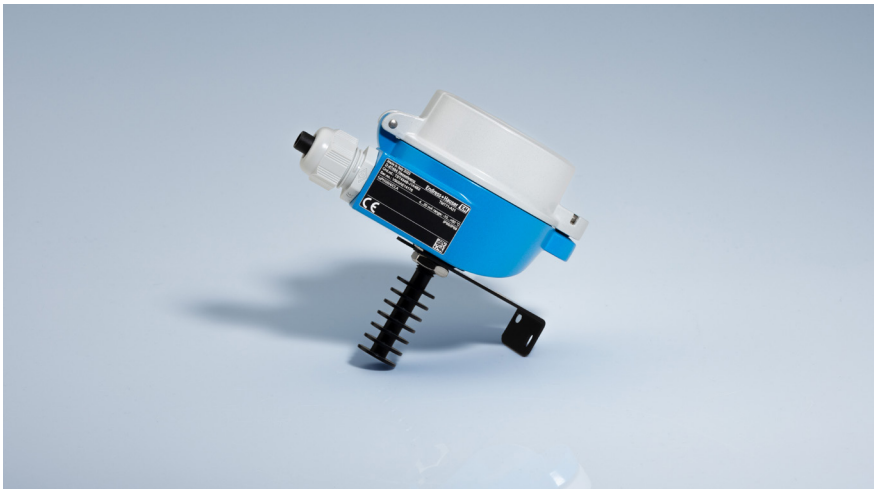
iTHERM ModuLine TST434B as the optimal solution for ambient temperature measurement

Benefits at a glance

- Overheating detection to protect the generator and extend its lifespan
- Energy savings through optimized control of the air cooling system
- Increased process safety through reliable and accurate temperature measurement in the air cooling system

Process conditions

- Process temperature: 4°C to 90°C (39°F to 194°F)
- Process pressure: ambient
- EMC compliance necessary
- High ambient relative humidity



Opportunities in the energy transition! The iTHERM ModuLine TST434B is the ideal solution for monitoring ambient air temperature in hydroelectric power plants, addressing the challenge of accurately measuring air temperature around generator cooling radiators to prevent overheating. Its robust design ensures reliable performance even in extreme conditions, offering energy savings, improved process safety, and extended generator lifespan through optimized cooling control. Easy to install and integrate, it supports various communication protocols and provides flexible configuration options, making it a versatile choice for modern hydroelectric power plants.

Endress+Hauser

People for Process Automation

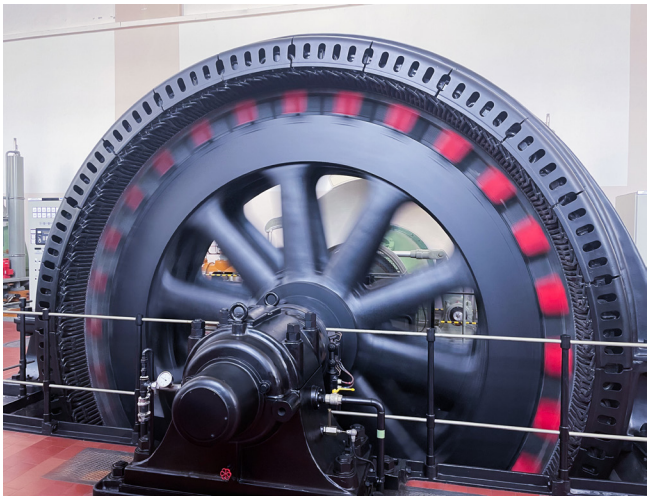
The challenge One of the main parts in a hydroelectric power plant is the generator unit, which transforms the power of water into electricity. In this process a lot of heat is generated as a byproduct. A cooling system is needed to protect the essential parts from overheating. The air cooling system uses cooling water to cool the radiators, which in turn cool down the generator unit.

Consistent and proper cooling helps to maintain the stability of the power generation process and extends the lifespan of the generators and other associated equipment. This reduces the need for frequent maintenance and replacements, leading to cost savings and more reliable power generation. Especially fluctuations in temperature can cause mechanical stress and potential failures in the system. Overheating can lead to reduced efficiency and increased wear and tear on the equipment. By keeping the generators at an optimal temperature, the cooling radiator ensures that the plant operates efficiently.

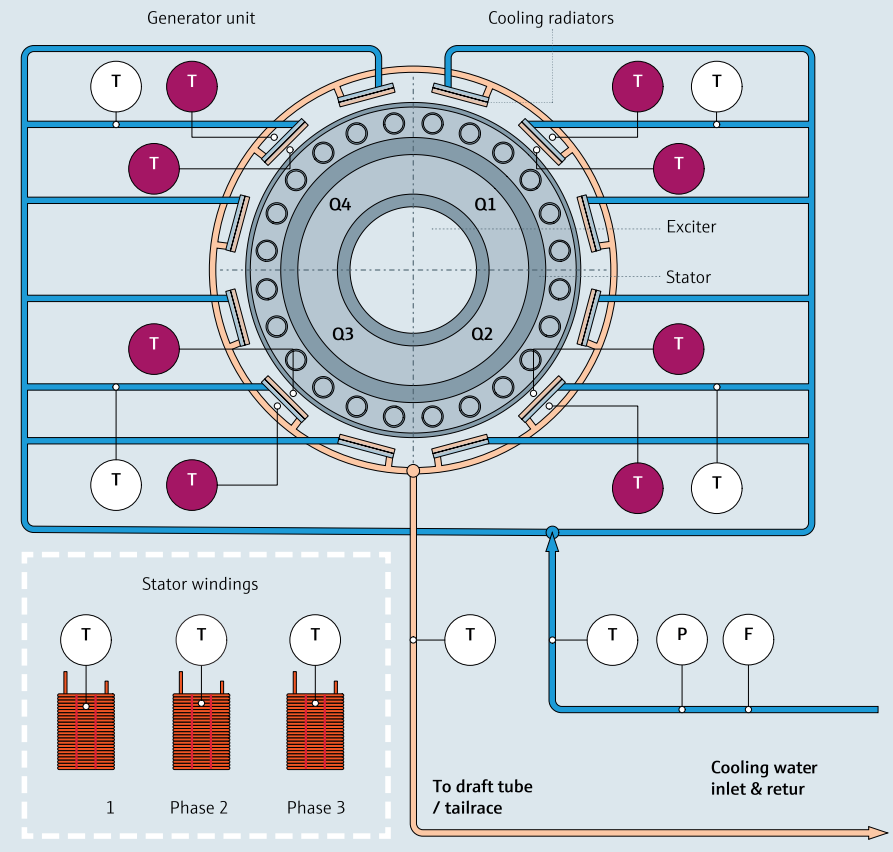
Temperature sensors are monitoring the temperatures of the cold- and warm- air for the radiators. Sometimes simple RTDs are used but an ambient RTD temperature sensor delivers more accurate measurement.

Due to moving parts a direct measurement of the generator temperature is not possible. Therefore, the air temperature around the cooling radiators needs to be measured at several points.

The challenge is to install a special thermometer to measure the ambient temperature of the generator, which provides particularly accurate results and also meets all the challenges of a hydroelectric power plant.



Hydroelectric power plant generator unit



Application drawing: Air cooling system

Our solution The iTHERM ModuLine TST434B is perfectly suited to solve the challenges of temperature measurement in the cooling system of a hydroelectric power plant. The RTD temperature sensor is specially designed for monitoring air temperature and provides accurate results. It is available as a complete unit including Endress+Hauser temperature transmitters for wired sensors. With a wide range of common outputs and communication protocols, they offer easy customization. The modular thermometer from Endress+Hauser is characterized by its simple and fast wall mounting. It has robust terminal heads according to DIN EN 50446 or stable plastic housings that provide optimal protection against extreme environmental conditions. Thanks to the flexible selection of the appropriate output signal, such as 4 to 20 mA, HART®, PROFIBUS® PA, FOUNDATION Fieldbus™, IO-Link, PROFINET® over Ethernet-APL/SPE, the thermometer can be seamlessly integrated into the process environment. With an ingress protection rating of IP66/68 (NEMA Type 4x enclosure) and a maximum measuring range of −50 to +150 °C (−58 to +302 °F), it offers reliable performance.

Optional transmitter features such as various approvals, easy Bluetooth configuration with the SmartBlue app or plug-in terminals for quick and easy wiring further increase the versatility of the ambient air thermometer.

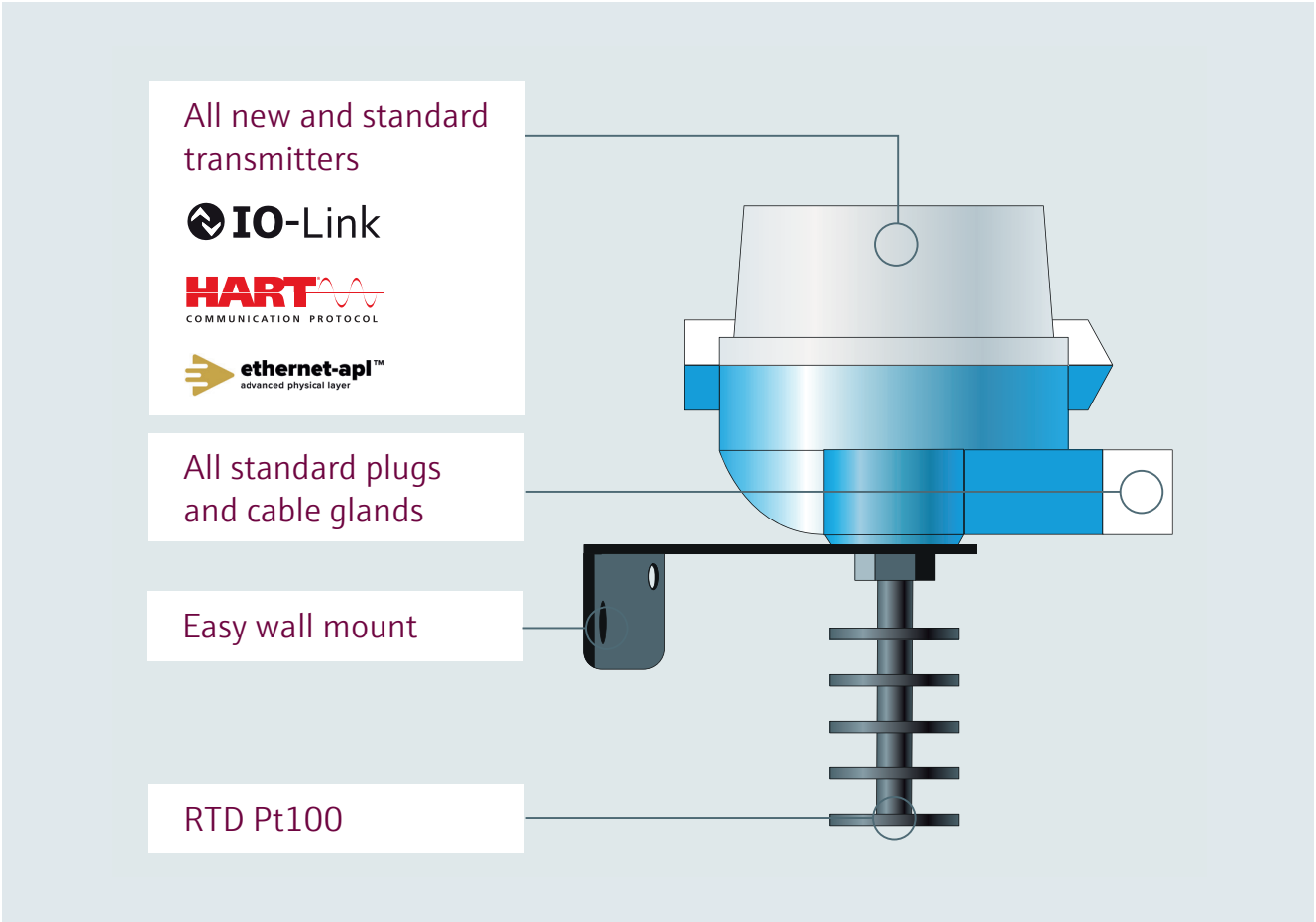
Components

- iTHERM ModuLine TST434B

Result The cooling of the radiators is essential for the safe, efficient, and stable operation of a hydroelectric power plant, ensuring that the equipment remains in good working condition and the plant can consistently produce electricity.

With the iTHERM ModuLine TST434B Endress+Hauser offers the perfect solution to ensure that the cooling system is working properly and to prevent the generator unit from overheating.

iTHERM ModuLine TST434B from Endress+Hauser



iTHERM ModuLine TST434B infographic

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