



APPLICATION NOTE Chemical

Measuring the temperature in steam pipelines in a chemical plant

- Secure supply using steam as a heating medium
- Continuous monitoring of steam temperature
- Reliable measurement despite high mechanical loads

1. Background

In a chemical plant, process steam is used both to heat processes and as a heat transfer medium. The steam is generated centrally and transported and further distributed to various parts of the plant via large pipelines. To safeguard the processes and productions which depend on the steam, the steam temperature is measured at several points in the network. By measuring the temperature of the steam in the feed and return lines in combination with a flow measurement and a calculator, the energy consumption of a plant component or process can be calculated.

2. Measurement requirements

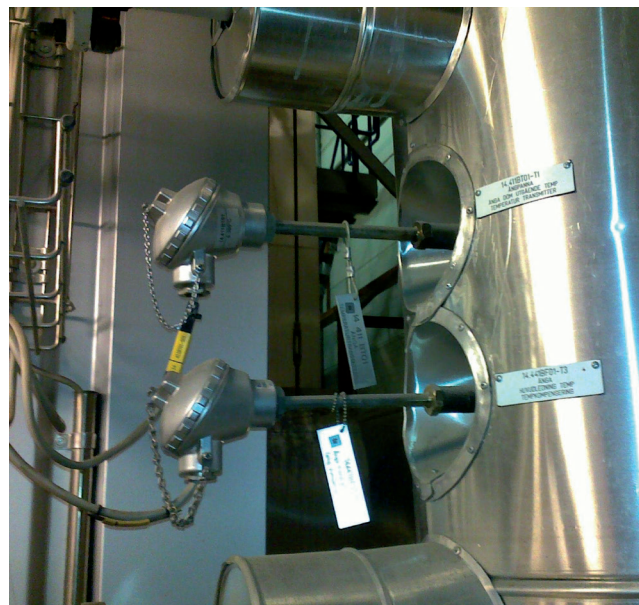
It is necessary to measure the temperature of the steam in DN 200 pipelines serving as transport lines to plant components. They carry medium pressure steam at 26 bar and 226 °C. The thermometers used must enable quick and accurate temperature measurement at a flow velocity up to 30 m/s in the 100 ... 300 °C range. The pipelines are for the most part completely insulated. At the measuring points, the thermometer neck pipe must be guided through the insulation to the outside. To minimise ongoing costs, the goal is maintenance and fault-free operation.

3. KROHNE solution

In the plant, a total of over 50 weld-in OPTITEMP TRA T30 (Form F) resistance thermometers with OPTITEMP TT 50 C temperature transmitters are used. The transmitter is integrated into the head of the thermometer (head-mount transmitter).

4. Customer benefits

Process conditions place high demands on the mechanical strength of the thermometer. OPTITEMP TRA T30 devices guarantee safe and reliable measurement of the steam temperature at the measuring points. To meet accuracy requirements, resistance thermometers were selected instead of thermocouples. Due to the high pressure and the flow velocity, Form F weld-in thermometers were used. This design keeps the risk of thermowell breakage as a result of vibration induced by vortex shedding to a minimum. The steel 1.4571 thermowell material is resistant up to 400 °C under the given conditions of use and welding sleeves for installation in pipelines were included in delivery. The thermometers are particularly sturdy to ensure fault-free operation. Maintenance is not required.



5. Product used

**OPTITEMP TRA T30 weld-in thermometer
with OPTITEMP TT 50 C head-mounted temperature transmitter**

- Specially designed for steam measurements
- Withstands high flow velocities
- Welding covers with particular strength in a variety of materials
- Optionally available with a HART compatible temperature signal converter



Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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