

APPLICATION REPORT Power Generation

Fuel gas measurement for a duct burner in a combined heat and power plant

- Flow rate monitoring of a fuel gas mixture for supplementary firing at HRSG inlet
- Ultrasonic flow measurement on a duct burner fuel gas skid
- Robust metering solution without moving parts for even and transient flow conditions



1. Background

For a combined heat and power plant (CHP) in Scandinavia, the engineering company De Jong Combustion manufactured a gas-fired duct burner for supplementary firing in a heat recovery steam generator (HRSG).

The duct burner is located between the hot oil heater and the HRSG downstream of the gas turbine and is used to increase steam production. This specific duct burner is equipped with 6 burner elements and is fired with natural and refinery gas or a mixture of the two. It can be controlled, started and stopped independently. All in all the burner and its fuel supply have a pivotal role in the control of the power plant.

2. Measurement requirements

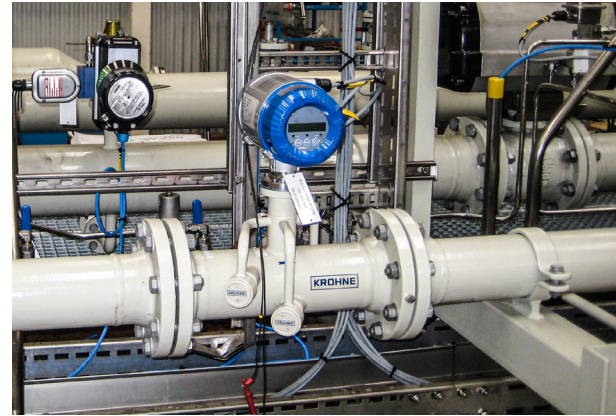
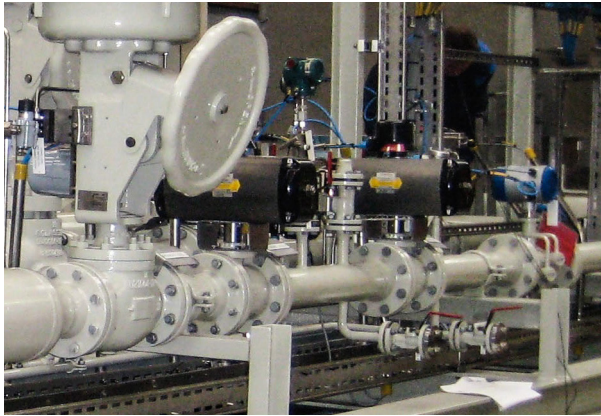
For the firing of the duct burners, natural gas and refinery gas is used in different mixtures depending on the availability of the refinery gas. The duct burner fuel gas is conditioned by a fuel gas skid which mixes the different gases, regulates the heating value as well as gas pressure and enables a balanced supply to the individual burner elements.

As the core control element, a gas flowmeter is required which can accept different gas compositions, offers a high turndown ratio and is insensitive to dynamic flow changes. The reliability of the flowmeter has a direct influence on the reliability and availability of the entire plant.

KROHNE

3. KROHNE solution

De Jong Combustion decided on the OPTISONIC 7300 ultrasonic gas flowmeter, which operates without moving or rotating parts, offers a high turndown ratio with very good low-end accuracy and measures the flow rate with immediate response. The integrated diagnostic functions ensure a reliable measurement. Additional diagnostic capabilities supply additional information about the gas composition.



OPTISONIC 7300 C mounted on fuel gas skid

4. Customer benefits

The OPTISONIC 7300 has no moving or rotating parts and is robust against transient flow conditions. The ultrasonic measuring principle is based on a time measurement, no regular maintenance or calibration is required by design. The coverage of a large dynamic flow range of >100:1 enables accurate measurements even at the low end. Additional process information can be gained from the flowmeter which can for example be used to detect changes in fuel composition.

The meter does not produce any swirl or pressure loss. The installation is quite easy, no additional external impulse lines or transmitters need to be installed. No winterization is required for the proper function.

5. Product used

OPTISONIC 7300 C

- Ultrasonic gas flowmeter for natural gas, process gas and utility gas applications
- 2-path meter, for standard volume flow metering, independent of media properties
- No maintenance, no pressure drop, large dynamic range (turndown ratio: 100:1)
- Integrated volume correction to standard conditions (using P+T measurement)
- Flange: DN50...1000 / 2...40", max. PN450 / ASME Cl 2500; also weld-in connections
- 3 x 4...20 mA, HART®, Modbus, FF



Contact

Would you like further information about these or other applications?

Do you require technical advice for your application?

application@krohne.com

Please visit our website for a current list of all KROHNE contacts and addresses.



www.krohne.com