Measuring Instruments for Steam

Steam generation and distribution

Flow measurement (steam quantity and quality)
Prowirl F 200 (vortex meter)

- Multivariable vortex meter (incl. flow computer) for direct mass and volume measurement of saturated or superheated steam with best-in-class accuracy
- Optionally available with integrated pressure and temperature measurement for the calculation of delta heat and energy flow
- Maximum accuracy thanks to "PremiumCal" calibration

Unique worldwide: steam quality measurement (dryness fraction)

Flow measurement (steam quantity)
Differential pressure flow measurement

- For mass and volume measurement of saturated or superheated steam
- Nominal diameters: DN 10 to 1000 (⅜ to 40")
- Recognized and standardized technology since 1929 (ISO 5167)
- External pressure and temperature compensation required

Pressure measurement
Cerabar PMP51B

- Pressure measuring range: up to 400 bar (6000 psi)
- Process temperatures up to 400°C (752°F) with diaphragm seal
- Wireless control of the device in the process area with the SmartBlue App without process interruption
- Reduce systematic failures — error-free SIL commissioning and proof testing
- High accuracy (up to +/- 0.055%)

Fuel consumption measurement

Flow measurement (natural gas)
t-mass F/I 300/500

- Patented fully metallic, drift-free sensor provides reliable measurement over prolonged periods of time and even after repeated exposure to temperature cycling
- Optional bidirectional measurement and reverse flow detection — a first for thermal mass flowmeters!
- Heartbeat Verification allows for onboard, traceable verification without process interruption — third-party attested

Flow measurement (fuel oil)
Promass E 200 (Coriolis)

- For mass and volume measurement of liquid fuels
- With highly accurate, direct density measurement
- High measuring accuracy (±0.25%) and turndown (over 1000:1)

Promass I 300 enables permanent in-line viscosity measurement to control the optimum combustion of fuels.

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Measurement of condensate, fresh water and feed water

Flow measurement (feed water)
Prowirl F 200 (vortex meter)

- For volume, energy and mass measurement of feed water
- Optionally available with integrated temperature measurement for the calculation of delta heat and energy flow
- Robust design: over 400,000 installations worldwide

Flow measurement
Proline Promag W 10 (electromagnetic)

- For cost-effective volume measurement of make-up water with sufficient conductivity (>50 µS/cm)
- No pressure loss
- High measuring accuracy (±0.5%)
- Very high turndown (1000:1)

Flow measurement (condensate)
Prosonic Flow 92F (ultrasonic)

- For volume measurement of hot condensate — independent of electrical conductivity and low flow rate
- Suitable for use up to 200°C (392°F)
- Immune to magnetite deposits
- No pressure loss — low risk of flashing
- Also available as clamp-on version for measurement from outside without opening the pipe

Temperature measurement
TR13 / TR15 (butt-weld version)

- For temperature differential measurement
- Tapered shank design allows for fast response times
- High flexibility due to modular assembly with standard terminal heads and customized immersion length

Data logging and evaluation

Data logging/evaluation
Memograph M RSG45

- For the visualization and recording of performance data and consumption data
- For calculating the thermal energy content and aggregate energy flows from the measured values for flow, temperature and/or pressure
- Calculation standard according to IAPWS-IF97/ASME

Fuel consumption is measured to determine the boiler efficiency and the (carbon dioxide) emissions produced. To calculate the efficiency of a boiler, the thermal energy content of the feed water must be taken into account by measuring the temperature and flow. Furthermore, the thermal energy content of the condensate return lines and the added water is needed to calculate the total efficiency of the boiler system.

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