



ENERGY MEASUREMENT IN A FURNITURE FACTORY



HVAC / Industrial energy efficiency

“Because of our positive experience with the portable measuring device, we are also fitting more and more stationary energy measuring points with Flexim’s ultrasonic systems. Non-invasive, wear-free measurement from the outside is a huge advantage, especially in the industrial sector, where



*Heiko Hupfeld, Managing Director,
Optima Energietechnik und
Anlagenbau GmbH*



Measuring Task

Recording of thermal energy flows and hydraulic balancing in the heating center of a large furniture factory

Supporting commercial customers in optimizing their energy generation systems and heating networks is one of the main focuses in the range of services provided by Optima Energietechnik und Anlagenbau GmbH. In the manufacturing industry, the focus is on the product. The people involved in a company often lack the awareness or time to find out how much energy is required for production or whether there is potential for optimization in the use of energy (such as heat or compressed air). Long-established structures often make it difficult to record amounts of energy and to assign their consumption to individual areas. Optima is there to provide customers with advice and to assist with planning and optimization. The use of measurement technology plays a key role in this.

A large furniture company commissioned Optima with the planning and construction of a new heating center for one of its plants. The boiler installed there provides the necessary process heat for various drying systems in the plant as well as the room heating. The prerequisite for any optimization is always the recording of the current situation and the determination of the current and foreseeable future demand. In view of

climate change and higher pricing of CO₂ emissions, the fuel used is of vital importance. Optima therefore recommended the installation of a new boiler fired primarily with wood chips with a nominal output of 2.4 MW, the integration of two buffer tanks for 1,000 ft³ of hot water each, the reduction of the installed pump power and the measurement of the amount of heat generated and consumed. An essential condition for the energy-optimized operation of the heating network is also a good hydraulic balance.



Solution

Flexim's non-intrusive measurement technology has proven to be the ideal solution for this measurement task. One of the characteristic advantages of clamp-on ultrasonic measurement technology is that it can be thoroughly tested for its suitability on-site without any

disruption to system operation.

In a preliminary on-site test, the Flexim France service team was able to show that the non-intrusive gas flow measurement with FLUXUS® G works extremely well. At the same time, they were able to determine the ideal installation locations that best take the disturbed flow conditions into account.

Due to the convincing test measurements, ENGIE decided to replace the turbine meters with two stationary FLUXUS® G721 ultrasonic measuring systems from Flexim. For the transducers, the GRK1S52 type was chosen. These transducers work with Lamb waves and thus ensure a strong measurement signal over the entire temperature range and overall operating states, including shutdowns and restart processes.

The transmitters have inputs for pressure and temperature. By calculating the measured values for pressure and temperature, the transmitter can output the standard volume or mass flow of the gas. For this purpose, Flexim has created an individual data set for the gas composition used at ENGIE Combigolfe.

The turbine can now be optimally controlled using the data for the natural gas mass flow transmitted by the FLUXUS® G721 ultrasonic systems to the process control system. Thierry Fougedoire from the ENGIE Combigolfe maintenance team sums up the positive experience with Flexim as follows:

"Our main concern was to achieve a reliable measurement of the natural gas flow that feeds the turbine of the Combigolfe power plant. Maintenance of the wetted flowmeters required a production stop every time, incurring costs and delays. Despite a regular maintenance plan, there were frequent failures in the measurements.

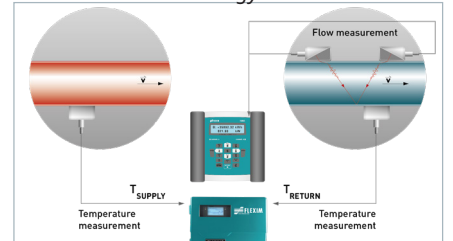
The technical solution offered by Flexim with the FLUXUS® G721 enabled us to install a reliably working flow measurement without having to interrupt production. The Flexim team was available to us at all times and supported us in every way, from selecting the product to commissioning and checking the measurement. The installation in record time and the accuracy of the measurement will allow us to carry out the performance test in our power plant in optimal conditions."



The heating center of the furniture factory during the modernization work.



An indispensable tool for the energy experts at Optima for years: the portable FLUXUS® G601 CA Energy.



The heat flow measurement with FLUXUS® is carried out using the differential method, i.e. by determining the amount of heat flowing into and out of the system.



The FLUXUS® F721 TE is used as the measuring transmitter for stationary heat quantity measurements.

Measuring Points and Instrumentation

Pipelines	6", steel
Medium	hot water (230 °F in the return flow)
Measuring Devices	1 portable clamp-on FLUXUS® G601 CA Energy ultrasonic flowmeter for liquids, gases and heat quantities 1 pair of CDQ1EZ7 clamp-on ultrasonic transducers (shear wave) for liquids 1 pair of GRM1NC3 clamp-on ultrasonic transducers (Lamb wave) for gases 4 pairs of Pt100 clamp-on temperature sensors (paired in accordance with EN 1434-1) 4 stationary FLUXUS® F721 TE clamp-on ultrasonic flowmeters for measuring the quantities of heat 4 pairs of CDP2E52 clamp-on ultrasonic transducers (shear wave), mounted in Variofix L 4 pairs of Pt100 clamp-on temperature sensors (paired in accordance with EN 1434-1)

Advantages

- Accurate non-intrusive measurement of thermal energy flows creates consumption transparency and opens up further potential for efficiency in operation
- Minimal installation effort and maximum flexibility with regard to possible subsequent modifications to the system
- Very high measuring accuracy thanks to high-precision flow measurement with paired and traceable calibrated temperature sensors (EN 1434-1)
- Modbus interface for transferring measurement data to the energy management system

Customer

Optima Energietechnik und Anlagenbau GmbH, Spangenberg, Germany, www.optima-energietechnik.de

"Advice, planning, optimization" – the motto of Optima Energietechnik und Anlagenbau GmbH simultaneously describes its three main areas of business. Founded in Kassel in 1981, the company is represented by the two managing directors Heiko Hupfeld and Markus Arlt, who, with their many years of experience in the areas of system planning and project management, are available to their customers as competent contacts for all questions relating to energy. In addition to the planning of new systems, the focus is primarily on the optimization of energy generation systems and heat networks in existing and therefore grown structures of industrial or commercial companies. In 2019, the company moved to Spangenberg in northern Hesse.



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