



APPLICATION REPORT Food & Beverage

Differential pressure measurement to regulate a vapour compressor

- Heat recovery for the thermal treatment of wort
- Measuring the differential pressure between the vapour chamber and the atmosphere
- Long-term reduction in costs and CO₂ emissions thanks to better automated process steps



1. Background

The König Brewery in Duisburg, Germany, produces the alcohol-free beer König Pilsener Alkoholfrei and the beer-lemonade mix König Pilsener Radler in addition to its namesake, the premium beer König Pilsener. The long-established company stands for both high standards when it comes to product quality as well as the sustainable and cost-saving use of energy sources. To achieve this, the production facilities need to be appropriately designed. The need for heat energy is particularly great when it comes to wort boiling. Generating steam to thermally treat the wort is extremely energy-intensive. In order to sustainably reduce energy costs, the brewery relies on the heat recovery process when boiling wort.

2. Measurement requirements

The vapours generated when boiling wort are collected and compressed. When compressed, the temperature of the vapour increases from 100 °C / 212 °F to about 120 °C / 248 °F, which means that it can then be used again immediately to boil wort.

The König Brewery uses a mechanical vapour compressor to compress the steam. It is only activated when the vapour pressure above the wort reaches a minimum gauge pressure of 25 mbar / 0.36 psi. Until now the company has been using a U-tube manometer to determine the differential pressure. However, as part of the continued modernisation and automation of the plant, this device had to be replaced. A state-of-the-art differential pressure transmitter that could directly transfer its measuring signal to the central control room was required.



A look at the compressor unit

3. KROHNE solution

The OPTIBAR DP 7060 C differential pressure transmitter was chosen. The KROHNE device measures the vapour pressure above the wort compared to the atmospheric pressure outside of the tank. The extremely compact measuring cell provides the measurements with step response times of just 125 ms to the programmable logic controller (PLC). This guarantees reliable and stable process control. Once the predetermined minimum differential pressure has been reached, the control system activates the vapour compressor.



Differential pressure measurement in the wort kettle

4. Customer benefits

Thanks to the use of the OPTIBAR DP 7060 C, the heat recovery works smoothly via the PLC. The brewery has been able to considerably reduce the energy requirements for this energy intensive process step. Now, considerably less primary energy is required to produce steam for the boiling process. That means that in the long term König reduces both energy costs and CO₂ emissions in beer production. König also benefits from the long service life of the OPTIBAR DP 7060. The sturdy design of the measuring device ensures a reduction in the cost of maintenance and replacement parts.

5. Product used

OPTIBAR DP 7060 C

- Differential pressure transmitter for the measurement of flow, level, differential pressure, density and interface
- Very good repeatability and long-term stability of the measuring signal
- Extremely quick step response times <125 ms
- Measuring ranges up to 30 mbar / 0.44 psi even without electronic spreading
- Turn down up to 100:1, higher on request
- Universal modularity of the entire OPTIBAR process series
- Comprehensive diagnostics and configuration



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