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Ingenuity for life

Raising the level of brewing technology with radar level measurement

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With a range of industry-standard process connections, SITRANS LR250 is suitable for a broad range of hygienic applications

The year is 1040 and you are thirsty. How about a beer?

Fast forward to today, almost a millennium after monks in Weihenstephan, Germany, opened the world's first brewery, and you will still find some of the world's best wheat beer in this region.

With the help of Siemens level measurement, Research Brewery Weihenstephan – part of the Technische Universität München – has been instrumental in advancing the brewing process and in quenching the thirst of beer lovers the world over.

Bavarian beer university

Based in Freising, about 18 miles north of Munich, Research Brewery Weihenstephan operates as a training and research center.

The facility produces 630 to 1100 quarts in each batch of beer, concentrating their attention on flavor process engineering, raw material usage, product design, and food safety.

During their studies, all students in the brewery engineer and brewmaster programs work with process equipment, which is used at every step of the brewing process.

Technicians continuously measure and refine this brewing process – from the early grain mash and wort collection stages all the way to fermentation, maturation, and filtering.

Water is added to crushed barley or wheat to create a slurry called “mash.” The slurry is heated and wort collection begins. Wort is a fluid created after enzymes have converted grain starches and proteins into digestible sweeteners and protein.

Fermentation process instrumentation

Hops are added to the wort and later, yeast, which begins the fermentation stage. Research Brewery Weihenstephan has 12 fermentation and maturation vessels, all of which must be closely monitored.

Level measurement in these vessels is key to quality control and the addition of ingredients. Researchers can test different flavors for new beer varieties by adding varying amounts of hop solutions and ingredients. But vessel contents must be measured throughout the additive process.

Three of the process vessels are equipped with Siemens radar transmitters. SITRANS LR250 non-contacting transmitters continuously monitor levels during vessel filling and emptying as well as for control of solutions or other ingredients throughout the fermentation process.

The transmitters were not a challenging installation, as they feature industry-standard process connections – in this case ISO 2852 (Tri-clamp). Using the device’s Quick Start Wizard, technicians programmed the devices and were up and running in minutes.

Refreshingly reliable measurements

Non-contacting level measurement with these radar transmitters brings a number of benefits to Research Brewery Weihenstephan.

First, other measuring devices can produce inaccurate measurements, making process control challenging for operators. False readings will disturb the batch sequence of filling and emptying.

A false low-level reading during emptying, for example, can cause an overflow in the following batch, since the tank is not truly empty when material starts flowing in.

Second, food-processing environments require hygienic equipment. The non-contacting, fully encapsulated FDA-approved flush-mounted lens antenna is easy to clean and reduces buildup.

Unlike with contacting technology, there is no need to remove SITRANS LR250 during clean-in-place cycles.

Both of these factors save time and money for any brewing facility. Easy-to-install devices mean that technicians can spend their time elsewhere in the busy plant, rather than tending to the instrumentation’s setup or maintenance.

In addition, reliable, accurate measurement gives operators knowledge of exactly how much material is contained in the process vessel, ensuring that no overfills occur from false low-level readings.



SITRANS LR250 radar level transmitter, with hygienic, encapsulated antenna

Brewing up efficiency

Elsewhere in the plant, Siemens process instrumentation helps to keep brewing operations running smoothly.

- SITRANS F M MAG 1100 F flowmeter sensors measure the flow of water to different production steps such as the wort and beer stages.
- SITRANS FC430 Coriolis flowmeter measures the density and the flow of wort going to the fermentation step.

All of the facility's instrumentation is connected through the SIMATIC PCS 7 control system from Siemens. From the comfort of the control room, technicians can monitor the entire brewery's operations. If any problems arise,

they are alerted immediately and can troubleshoot issues before a stoppage in production occurs.

"With SITRANS LR250's hygienic antenna," says Dr. Florian Schuell, head brewer at Weihenstephan, "we now have the accurate content of wort and beer in the vessels and can feed in the precise ratio of additives. This really improves the data quality of our analytical research in the final beer product."

From medieval brewing to today's automated brew facility, beer has been a part of Weihenstephan for ages. And with Siemens instrumentation, research at this facility is measured and controlled, every step of the way.



Installing the SITRANS LR250 was easy, and the facility now has reliable, high-performance continuous level measurements on their process vessels

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