



# Same again?

Consistent flavor is essential in any distilling or brewing operation

**FRANK FRENZEL** – Across the food and beverage industry, consistency of product taste is a critical factor – and this is particularly the case where beer is concerned: Consumers expect their favorite tittle to taste the same regardless of where it was brewed or how it was bottled, transported, stored and poured. However, brewers have to cope with naturally grown products that can vary by harvest, soil type, storage conditions and so on. Even beers with few ingredients – like the German beers brewed according to the

German beer purity law, which contain only barley, hops, yeast and water – require great diligence on the part of the brewer to ensure consistency of taste from batch to batch. Brewing a good beer is part art but there is also a good deal of science involved and this requires precise process control and repeatable, standard solutions that can be deployed across multiple production sites. ABB's comprehensive range of instrumentation can help beverage makers achieve consistency and quality while lowering production costs.

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Beer makers have to make sure that their products are of top quality and consistency if they want to retain loyal customers and gain new ones.

1 A robot stacking kegs concludes the chain of ABB automation that assists the beer maker.



**W**ith origins thousands of years old, brewing has now evolved into a global multibillion-dollar business.

Competition between brewers is fierce and beer drinkers have become more discerning, so beer makers have to make sure that their products are of top quality and consistency if they want to retain loyal customers and gain new ones.

The process of making beer is at once simple but complicated. Each step of brewing is relatively straightforward and the ingredients are usually few – just barley, hops, yeast and water in the case of German beers. Conspiring against the production of the perfect pint, however, are the vagaries of the ingredients – natural variations in the cereals, yeast and water used – and the criticality of parameters such as temperature, concentrations and quantities in the process itself.

To ensure top quality and consistency, a modern brewery will be equipped with the very best control, sensing and instrumentation technology available. This automation technology will also facilitate

three other major ambitions of brewers: optimized raw material use, reduction in energy use and maximized brewery availability.

The beer industry represents a significant customer base for ABB and the company has developed a comprehensive range of products to meet the needs of the sector. The products ABB offers support the beer maker all the way from the arrival of raw materials at the brewery to the shipment of the packaged product → 1. In particular, ABB automation instrumentation enables the user to maintain consistency and high quality and run his process in the most efficient manner.

#### Go with the flow meter

Effective control of flows in the brewery is one of the most critical elements of the beer making process. ABB offers a range of flowmeters that exploit a number of fundamental principles and that are suitable for different tasks. The ABB mass flow CoriolisMaster Hygienic FCH400 meter, described in detail on pages 34–36 of this issue of ABB Review, for example, uses the Coriolis effect to simultaneously measure flow rate and density, and deliver concentration values. This stainless steel, European Hygienic Engineering and Design Group (EHEDG) – approved, precision device has an accuracy of up to 1 g/l or,

with field calibration, 0.5 g/l. In common with other ABB instrumentation for the food and beverage industry, the CoriolisMaster communicates via a 4 to 20 mA loop or a variety of other outputs. The CoriolisMaster is used, for example, to measure the density of the wort (the liquid extracted from the mashing process) or to control hop extract dosage.

Operating on a magnetic-inductive principle and designed specifically for the food and beverage, pharmaceutical and biotechnical industries, ABB's HygienicMaster FEH300 flowmeter can be found in almost every part of the brewing process – dosing the water added during

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#### Title picture

ABB's wide range of instrumentation helps brewers and distillers ensure consistency of taste in their products.





mashing, monitoring the amount of water flowing into the wort boiling process and so on. Manufactured from FDA-approved materials and certified in accordance with EHEDG and 3-A for the dairy and food industry, this flowmeter is available in an integral mount or remote mount design. The HygienicMaster FEH500 version provides enhanced functionality and extended diagnostic functions.

Where a more robust flowmeter is needed, the magnetic-inductive FSM4000 can be used. The FSM4000 uses AC technology in combination with DSP (digital signal processor) data processing, which makes it very suitable for processes that change rapidly and require fast response times or short-term dosing – for example where the cyclic nature of pumps causes feedstock variations.

A vortex principle is used in the VortexMaster FSV430/450 flowmeter. The FSV430/450 has a high turndown ratio and, having no moving parts, is very suitable for use in steam lines or other challenging applications. Its brother, the SwirlMaster FSS430/450, can be installed with hardly any straight inlet or outlet sections. Similarly, the ABB VA Master FAM540 metal cone variable-area flowmeter can be used for liquid, steam or gases, especially when aggres-

## ABB's Hygienic-Master FEH flowmeter can be found in almost every part of the brewing process.

sive or opaque fluids are to be metered. In breweries it is used, for example, to control the flow of sterile air. Gases can also be metered with the ABB FMT400-VTCS, which delivers a direct mass flow measurement. The FMT400-VTCS requires no additional pressure and temperature compensation, and because it has no moving parts it exhibits no wear and is maintenance-free.

### Sensors and transmitters

Control of process temperature in a brewery is as critical as flow control and for this, ABB has a selection of temperature sensors and transmitters, such as the TSP121 – available in a range of versions including Pt100 and Pt1000 – and the TTH300 two-wire transmitter. These devices enable the brewer to keep a close eye on the critical temperatures throughout the brewing process.

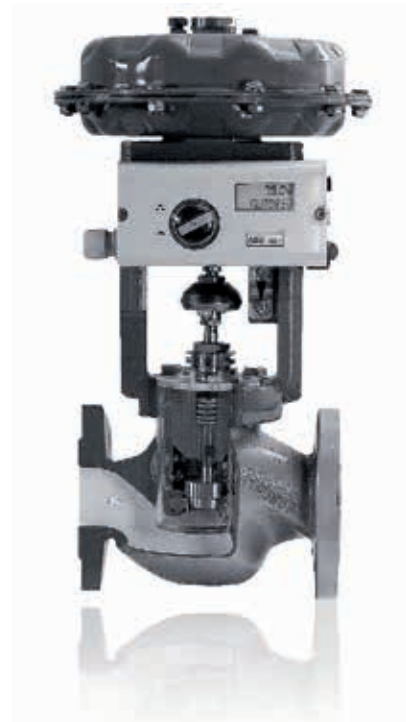


ABB pressure sensors, level sensors, and probes and analyzers for pH are found in multiple locations in the typical brewery. Valves, such as the TZIDC family of electro-pneumatic positioners, and the Screenmaster SM500F recorder, round out the selection of ABB automation instrumentation products that can be used by the brewer → 2–3.

### Integrated instrumentation

Though beer is usually made from just four basic ingredients, brewing it is by no means a simple task. Multiple parameters throughout the process have to be tightly monitored and controlled for the final product to taste just right and for quality and consistency to be maintained. ABB is a one-stop-shop for a wide range of integrated automation instrumentation that helps achieve these targets as well as enables the brewer to optimize raw material use, reduce energy consumption and maximize the brewery uptime.

#### Frank Frenzel

ABB Automation Products GmbH  
Göttingen, Germany  
frank.w.frenzel@de.abb.com