

Technical Report – Process optimization while cutting costs

# End-to-end sensor solutions in food and beverage technology

The production of mayonnaise and salad dressings confronts metrology with some very demanding challenges. Frequently varying recipes, many ingredients of different textures and specific filling levels bring conventional instruments to their limits. Baumer sensor solutions using *CleverLevel*, *CombiPress* and *CombiLyz* optimize the production processes at Homann's to ensure the high quality of their gourmet products.

Since 1978, the Homann location in the German city of Bottrop has been producing premium convenience food. Gourmet salads of the Homann and Nadler brand are popular and well-known far beyond the region. Both traditional brands belong to the Theo Müller Group. Two years ago, in close collaboration with Baumer they elaborated on new concepts for process optimization in the manufacture of mayonnaise, salad creams and dressings.

## Level detection in storage, mixing and buffer tanks

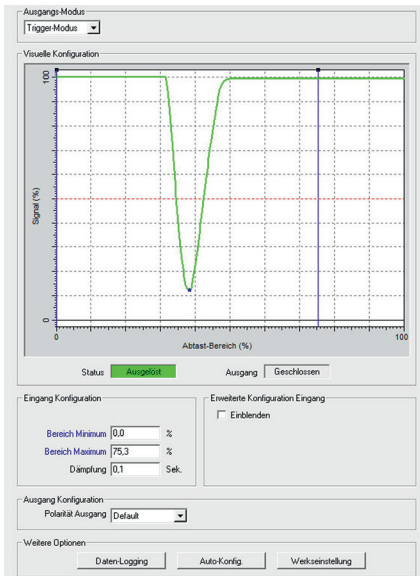
Precise and reproducible switching operations are a must, even in apparently simple tasks like level detection. In storage tanks, conventional capacitive level switches, commonly known as

"micro wave switches" provide only limited reliability. They require medium-specific configuration. Outside the thresholds, the low dielectric constant of some media like edible oil ( $DK \ \epsilon_r < 10$ ) may cause measuring errors if a film of lye has remained on the sensing tip after cleaning. To Homann, this was one consideration for choosing *CleverLevel*, the configurable universal level controller. Operating on frequency sweep technology, it reliably detects the level of any media as a one-sensor solution for both oil and water.

Depending on recipes and dielectric properties of ingredients in mixing tanks, Homann previously deployed product combinations of capacitive limit switches and vibrating forks. Depending on the



The universal *CleverLevel* limit switch in action: Here, installed at a buffer tank.



The FlexProgram software allows for configuration of stepless trigger thresholds or windows, for example to suppress or detect foam and adhesion.



Even severe adhesion by viscous media like mayonnaise will not impair the *CleverLevel* precision in the measured results.

media, response times ranged from very slow to highly sensitive which resulted in impaired process efficiency. Homann replaced their conventional solution with *CleverLevel* which has an extremely fast response time. Baumer helped Homann determine the optimum configuration which is conveniently changed and visualized via FDT/DTM-based FlexProgram software.

Once the mayonnaise, salad cream or dressing is fully emulsified and dispersed, it is pumped into buffer tanks until being added to the salad in a later production step. Here, medium-specific viscosity and adhesion play an important role. Conventional solutions using vibrating forks and capacitive limit switches were prone to measuring errors caused by adhering media. *CleverLevel* is maintenance-free and not affected by media adhesion. Unpredictable downtime for system ventilation and pump changing now are things of the past.

According to Frank Piatkowski, application and process engineer at Homann, "*CleverLevel* is the one-sensor solution for different media and applications. Since deploying *CleverLevel*, we have been experiencing a significant reduction in technical malfunctions".

Measuring hydrostatic pressure in tanks of vinegar, edible oil and glucose.

Homann's Bottrop location uses a large outdoor vinegar tank. For consistent level monitoring they were looking for a precise and reliable yet easy, convenient and outdoor-capable solution.

Homann decided on Baumer's *CombiPress* pressure transmitter. Thanks to 0.1% (MEW) accuracy and active temperature compensation, it solidly provides unambiguous measured results, independent of media and ambient temperature. Easy configuration via the large touchscreen eliminates the need for an additional operating unit. The robust housing with high IP67 rating reliably endures harsh outdoor conditions.

Capable of detecting medium-specific density and filling levels, Homann also installed *CombiPress* in glucose containers and horizontal tanks of edible oil. Here *CombiPress* excels with its integrated linearization function. Baumer also offers matching adaptors for optimum process connection.

Piatkowski is content: "Whether indoor or outdoor, the Baumer sensors contribute towards hassle-free automation and once installed, they are neither 'susceptible nor perceptible.'"



The *CombiPress* display providing visual information on the measured hydrostatic tank pressure instead of a number value eases on-site readout.



*CombiLyz* at CIP installations ensures hassle-free CIP processes.

### Conductivity measurement in CIP processes

Every cycle in dressing or mayonnaise production requires CIP (Cleaning in Place). The reproducible process precisely defines detergent dosing under consideration of pressure and temperature. At the Homann CIP installations in Bottrop, dosing needed to be improved - and Baumer's new *CombiLyz* conductivity sensor was the solution. Thanks to fast response time it ensures precise measured results at a maximum deviation of < 1%. The measuring connection of the inductive sensing element provides a 6.6 mm wide channel which even will tolerate

fabric or solid-containing media. Homann successfully optimized detergent dosing and cut down on raw material costs.

"The innovative Baumer products will again be part of our considerations when investing into new and state-of-the-art CIP installations," Piatkowski says. "Baumer tackles our requirements in terms of optimization or specialized products as incentives for new developments and ensures expert implementation".



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At Baumer, hygienic designs and stringent mandatory product certifications are a matter of course. All Baumer process sensors deployed at Homann's comply with the high EHEDG standards and are certified by the European Hygienic Equipment Design Group. Furthermore, compliance to EN 1935/2004 and EN 10/2011 for food-safe products will reduce the total Hazard Analysis and Critical Control Points (HACCP).

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