



APPLICATION REPORT

Food & Beverage

Equipping a filling machine with Coriolis mass flowmeters

- High filling accuracy at little or no conductivity
- Filling of both carbonated and still liquids with a single filling machine
- High level of repeatability, even in the case of variable quantities



1. Background

For precise control of the filling quantity, filling machines (rotary filling machines or linear filling machines) are equipped with flow measuring devices. Particularly when PET bottles, pouches and cans are filled with water, lemonade, tea and milk products, it is typically electromagnetic flowmeters that are used.

2. Measurement requirements

Krones AG, based in Neutraubling, Germany, designs, develops, manufactures and installs machines and complete systems for process, filling and packaging technology as well as intralogistics. Information technology and factory planning complete the company's product portfolio. The company won a contract from a soft drink producer for a rotary filling machine with 112 filling stations for the filling of different products in one filling line. In addition to carbonated products, it had to be able to fill still products as well. The meters used must not only have superior accuracy but also good repeatability (long-term stability).

3. KROHNE solution

As water from osmosis installations is increasingly used in place of well water in the production of beverages, the conductivity of the water is between 5 and 10 $\mu\text{S}/\text{cm}$ or $\mu\text{mohs}/\text{cm}$. As a result, the accuracy of the electromagnetic flowmeters deteriorates to such a degree that the standard accuracy of the complete filling system also becomes worse. Coriolis mass flowmeters can be used as an alternative to electromagnetic meters.

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They measure regardless of viscosity, conductivity or inlet runs and can also determine precise volume or mass flow in extremely short filling times. Kronos decided to equip the filling stations with the OPTIBATCH 4011 C with the nominal size DN 15 / (approx.) ½". The flowmeters were supplied with hygienic flange connections conforming to DIN 11864-2.

4. Customer benefits

Using Coriolis mass flowmeters makes it possible to fill different products with varying conductivities. OPTIBATCH 4011 C was specifically developed for use with filling machines and features superior accuracy through direct measurement as well as measurements that are stable over the long term. The filling processes can take place both with and without pressure. Depending on requirements, both carbonated and non-carbonated products can be filled using the meters. The mass pulses are transmitted directly from the OPTIBATCH 4011 C to the total control system via a multi-pole connector. A separate evaluation unit is not required. The entire electronics of the measuring device are integrated into a fully welded stainless steel housing. A PC-supported programme is used to record filling processes or adjust settings on the meters.



OPTIBATCH 4011 C on the filling machine (seen from the inside)

5. Product used

OPTIBATCH 4011 C

- Coriolis mass flowmeter, specifically designed for use with filling machines
- High measuring accuracy and repeatability, even with non-conducting and fatty liquids
- Compact dimensions, short installation length, low pressure loss
- A variety of hygienic connections available
- Fully welded stainless steel housing with integrated electronics
- Multi-pole connector to transmit mass and volume pulses
- Certified to 3A and EHEDG



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