Liquitrend QMW43

Efficient hygiene for filling systems in the food and beverage industry

Filling machines for liquid or pasty products

Filling machines have become an indispensable part of everyday life for manufacturers of liquids and pastes. Several thousand bottles, cups, pouches or tubes can be filled and sealed safely and hygienically per hour. Since liquids and pastes are very sensitive, they are produced inside a closed process. This way, external contamination and microbiological hazards can be minimised. For this reason, aseptic filling machines are used both for packaging the food and for precise filling of the products. This takes place in a closed cabin. Hygiene and thorough cleaning must also be ensured during the filling itself when sensitive products have direct contact with the environment.

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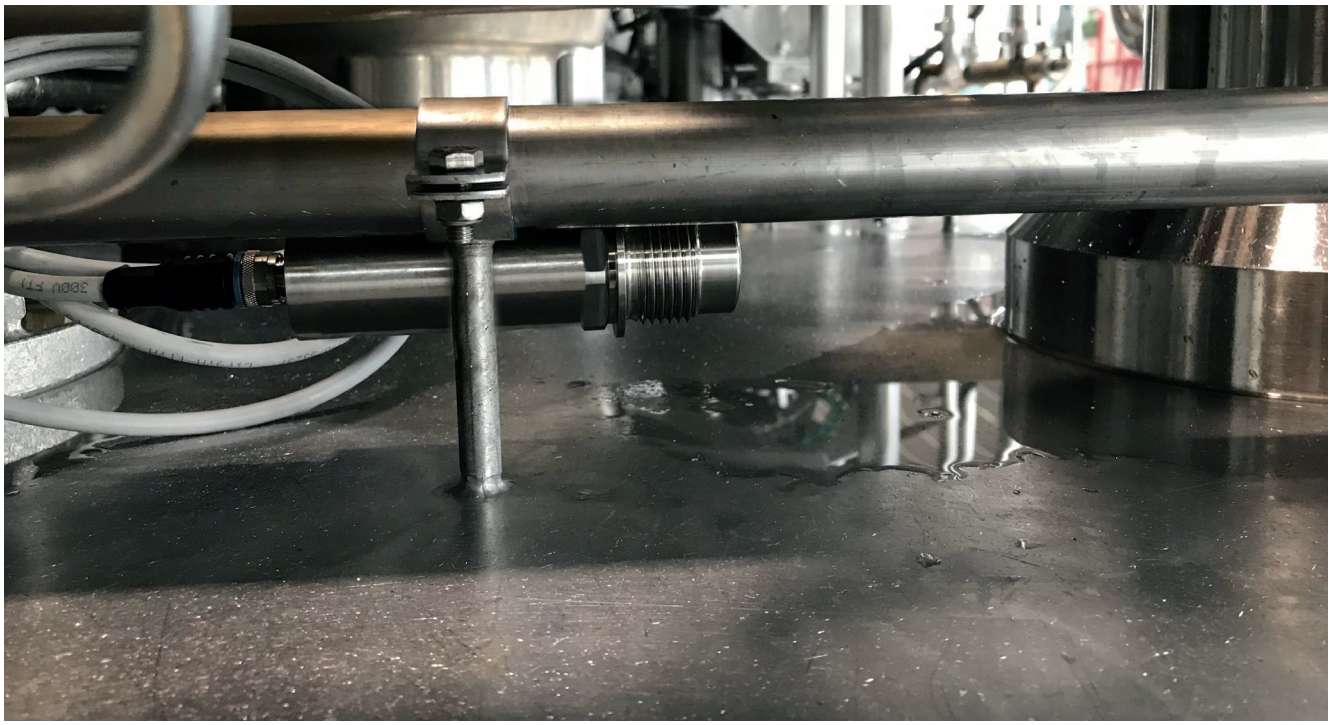
Conventional solutions to ensure hygiene in filling machines

Normally, cleaning lances are located inside the cabin of an automatic filling machine. These enable CIP (clean in place) of the filling plant and conveyor belts in addition to the ability to clean the feed lines. In this way, cleaning agents and water reach the areas which need to be cleaned. Four factors are required for sufficient cleaning: the chemical cleaning agent, the required temperature and duration of the clean, and a mechanical cleaning component, the shear force. The latter is guaranteed within the piping system by the flow velocity.

When cleaning agents or rinsing water leave the pipe, pressure and flow velocity decrease. This also reduces the shear performance required for thorough cleaning. With a reduced shear performance, installations outside the pipes, such as the walls and floor of the filling cabin or bracket, may no longer be sufficiently cleaned. In addition to the automated CIP sequence of the filling machine, manual cleaning of the cabin and the entire installation must therefore be carried out at regular intervals. This demands substantial time and effort. First, the intervals need to be determined and checked. Then the filling has to be stopped within the set intervals and the cabin opened and cleaned. Production is not possible during this time-consuming process.



Optimising cleaning cycles in filling machines

The Liquitrend QMW43 can be used to monitor the degree of contamination inside the filling machine. The conventional, empirical, determination of the time for manual cleaning and visual inspection of the filling machine is no longer necessary. The Liquitrend reliably and accurately measures the contamination thickness on the sensor surface. It can be installed at critical installation points and allows conclusions about the hygiene status in the installation environment. This innovative measuring device determines the contamination level efficiently, regardless of the type of contamination and media properties. By setting trigger points, the time for manual cleaning of the cabins can be determined.

If the contamination growth has reached a thickness that is considered critical for sustainable hygiene of the filling machine, manual cleaning should be started.

The measured value analysis of the Liquitrend QMW43 also provides information on the buildup formation of various products. In this way the Liquitrend assists the system operator with predictive maintenance and allows optimised cleaning with minimal disruption to the filling process.

By determining the product conductivity, plant operators can also see whether the buildup comes from cleaning agents or residues of the filling product. This allows further optimisation of the cleaning process and can lead to savings in disposal costs.

Optimising cyclic manual cleaning of filling machines in a brewery

In a typical brewery, a CIP is carried out once a week in the filling machine and a manual internal cleaning of the filling cabin takes place once a month. The optimal time for this manual cleaning is currently determined by a visual external inspection by the quality assurance staff.

The following aspects should be considered:

a) the time required to visually inspect the cabin

b) the repeatability and proof of the inspection are difficult because not all critical installation points are visible from the outside. In addition, the evaluation of a visual inspection depends on the auditor.

By installing the Liquitrend QMW43 at a hard to see and critical point in the filling cabin, data on the actual contamination can be obtained. This data can then be used to optimise the manual cleaning time for the cabin, improving hygiene, plant availability and documentation.

Calculation

Before	Filling periods/cycles	1 x /week (5 days) = 52 filling periods /year
	Manual cleaning time:	3 hours/4 filling periods
	Time for visual inspection:	26 hours/year

After	⇨ The measured values of the Liquitrend QMW43 enabled to set a trigger for manual cleaning at 0.4mm coverage on the sensor surface (average during the filling phases)
	⇨ Extension of manual cleaning from 4 to 6 filling periods.
	⇨ Savings of 5 manual cleanings of the filler cabin per year: 15 working hours
	⇨ Assuming costs of approx. £110 per hour worked, this equates to a saving of £1,650 in labour costs per year
	⇨ In addition, visual inspections can be reduced. This means an additional time saving of more than 13 hours per year and thus savings of more than £1,430 per year

Find out more about our Liquitrend QMW43 online:
www.uk.endress.com/QMW43

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