

Customer application report: Milk truck tank cleaning**FOOD**

Complete sensor system for efficient milk truck CIP cleaning

The need for sanitary processes applies to milk trucks in the same way as they do for dairy plants. In this application a customer started operating its own modern CIP system for its own truck cleaning needs, but also as a service for other forwarders and other food products such as chocolate or jam. The complete equipment with Anderson-Negele sensors ensures the high efficiency of the entire installation.

The application

The CIP system consists of four tanks for fresh water, cleaning agents, returns and waste water and the parallel cleaning system for up to three trucks. The independent process lines are designed for fast, hygienic operation that is equally optimized in terms of ecological and economic aspects. From the tanks installed in the basement, the cleaning media are pumped upwards into the milk or food trucks and flow back from there through hydrostatic pressure. In contrast to the otherwise frequently practiced „lost process“, the circulation and multiple recycling of the cleaning agents was a crucial requirement here due to environmental protection and cost aspects.

The advantages of the application



- » Complete process sensor technology for reliable and sustainable CIP cleaning from a single source
- » Inline measurement of critical parameters enables precise process control and thus a verifiable quality for the certification of the cleaning
- » High measuring accuracy and short reaction times ensure resource efficiency (e.g. saving of cleaning agents, reduction of waste water volume)



HH (bottom) and IZMAG (top) monitor process pressure and flow after the pumps in the three cleaning lines

The CIP cleaning takes place in three stages:

1. pre-rinsing with water from the return tank
2. CIP cleaning with 1-phase cleaner, then depending on concentration either recirculation into cleaning agent tank or discharge into return tank
3. flushing with fresh water with discharge into the return tank

For reliable and certifiable cleaning and maximum utilization of the cleaning agents, temperature, conductivity and flow rate must correspond exactly to the specifications. These values are controlled permanently and with the utmost precision inline.

For all applications in the overall process the Anderson-Negele sensors were able to offer the appropriate solution, thus ensuring optimum function, efficiency and process reliability for the customer.

The Anderson-Negele solution

Different measuring methods ensure process reliability for the tanks. Capacitive level detectors LS in a special mini version installed at the top and bottom, transmit the full or empty signal to the PLC with the shortest reaction time in order to reliably prevent overflow during filling or pump idling. Type L3 pressure sensors are used for permanent volume measurement and to monitor the exact filling level. The temperature is continuously measured by dead-leg optimized TSM sensors.

For correct cleaning, the media must always be pumped into the truck and their integrated spray heads with a specified, optimum pressure. Installed right after the pump, electromagnetic flow meters IZMAG and pressure transmitters HH monitor accurately this process step. After the cleaning process, the media are analyzed inline and their return to the corresponding tanks is monitored by calorimetric flow switches of type FTS-141.

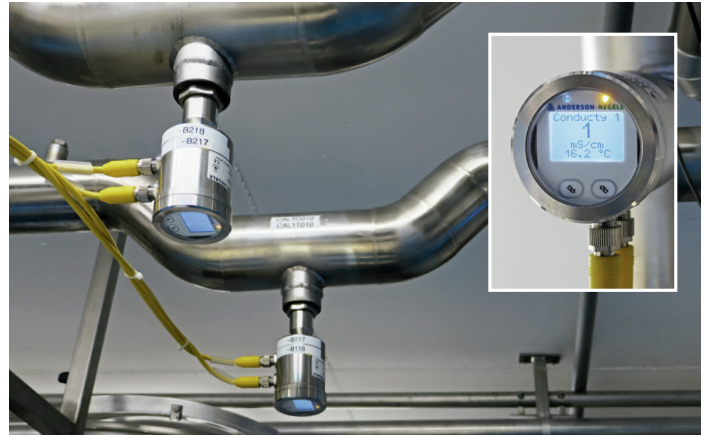
The analysis of the return media is one of the most important steps for an environmentally friendly and cost-efficient process. The ILM-4 inductive conductivity meter plays a central role in precisely determining the phase transition: during the discharge of the liquids at each cleaning stage the media are differentiated with cost-saving accuracy. Re-usable cleaning agent that flows off after cleaning can thus be returned to the tank to the maximum possible degree. In a separate, internal circulation and for permanent optimum cleaning result, its concentration is adapted to the specified ideal value by re-dosing with detergent and fresh water in the cleaning agent tank. The ILM-4 conductivity meter also ensures the highly precise measurement of conductivity and temperature required here.

With this plant we have broken new ground in our own business. The consultation already in the planning phase was very intensive and professional. For the operational start-up, we still had questions in order to optimally coordinate the entire plant and to bring it to optimum efficiency. At our request, a specialist from Anderson-Negele's technical service personally supported us. Since then everything has been running smoothly, virtually maintenance-free and to our complete satisfaction. ”

— Christoph Rock, General manager



The compact flow monitors FTS monitor the return flow of the media.



The lowering in each of the three return pipes avoids air bubbles and increases the measuring accuracy of the ILM-4 installed on the underside of the pipe.









Volume, temperature and level measurement of tank contents with L3, TSM and LS



The activation of the cleaning agent concentration in a separate circulation is monitored with an ILM-4.

Sensors used in the application

Conductivity ILM-4	Process pressure HH	Level/Volume L3
		
		
Advantages	Advantages	Advantages
<ul style="list-style-type: none"> · Freely selectable outputs: conductivity, temperature and concentration · Extremely short response time: 1.2 s 	<ul style="list-style-type: none"> · Robust and durable · Housing completely resistant against cleaning chemicals · Rapid response time 	<ul style="list-style-type: none"> · High precision pressure and hydro-static level measurement · Integrated tank linearization and density compensation

Project


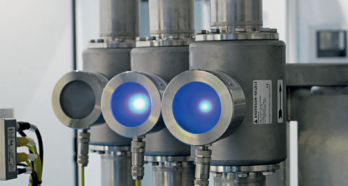








The sensors in this application are installed according to the European hygiene standard EHEDG

All sensors are also available with process connections compliant with 3A standard



Sensors used in the application

Point level LS	Flow meter IZMAG	Flow switch FTS	Temperature TSM
			
			
Advantages	Advantages	Advantages	Advantages
<ul style="list-style-type: none"> · Reliable switching · Small installation length and good cleanability · Measurement unaffected by the conductivity of the medium 	<ul style="list-style-type: none"> · Compact electronic device with stainless steel housing · High measurement accuracy and reproducibility: $\pm 0,5 \% \pm 2 \text{ mm/s}$ 	<ul style="list-style-type: none"> · Fully compensated measurement up to 100°C · Integrated safety switch-off at $t > 100^\circ\text{C}$ 	<ul style="list-style-type: none"> · Elastomer-free, hygienic installation without dead legs · Easy, fast installation and calibration