

Failure monitoring in the cooling loop

Protonkühlung Baus, one of the leading producers of yogurt and cheese in Germany, successfully uses Beckhoff's FM 4 availability sensors for failure monitoring in cooling loops.

Bids from the quality of the product, a crucial factor for Bauer lies in the constant and reliable operation of its production plants. Complying with environmental standards and the requirements of the German Drinking Water Ordinance are further important process parameters.

Monitoring the complex piping systems in dairy plants of this size is a special challenge. The application described here pertains to only one part of the plant: the cooling loop.

Complex piping systems in the cooling loop

The cooling loop of the entire production plant consists of numerous heat exchangers in a widely branched piping system, all of which are supplied with ice water from one central ice water line. Bauer was looking for a system to monitor the quality of the water in the cooling loop for the following reasons:

First, the German Drinking Water Ordinance requires water that is used as process water or cooling water in the production of food or beverages to be of drinking water quality.

Second, contamination might be detectable or at least instantly discernible. Leakages in the heat exchangers may lead to pollution of the cooling water or even to contamination of the product.

Central monitoring of the plant

The solution lies in the application of FM 4 availability sensors, which are used in the main cooling water supply line and in all return flow lines of the heat exchangers. The sensor measurements are diagnosed and recorded in a central control unit. The program compares the availability values measured in the return flow lines to the reference value of the supply line. If notification is issued in the control system if a availability value exceeds the alarm limit set in the program.

On the basis of the records, it is then determined whether this is a temporary disturbance, trapped air or whether it is a case of actual contamination. In cooperation with the production program, which are also recorded, this arrangement allows faster detection and localization of the leakage in the widely branched plant and thus ensures early detection of ice water loop contamination.

This helps avoid full plant shutdowns and contamination with all of the consequences and costs.

Company

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Availability sensor FM 4



FM 4 sensors flow line



Availability sensor FM 4

1. PLC
2. Water supply
3. Beckhoff FM 4
4. Cooling Water Tank
5. Distribution
6. Load W1
7. Load W2
8. Load W3
9. Load W4
10. Load W5

Applied: 10 heat exchanger per hour

