

Continuous Monitoring for Sugar Solution Leaks in Boiler Feed Tanks

Industry: Food

Product: Inductive conductivity analyzers

Introduction

In the past, the boiler feed tank systems in sugar factories had to be checked several times a day to make sure there were no sugar solution leaks. This was a very laborious process and, as continuous monitoring was not possible, monitoring results were not reliable. When a leak occurred, recovery operations were very costly and time-consuming.

With the FLXA21 and ISC450 inductive conductivity analyzers,

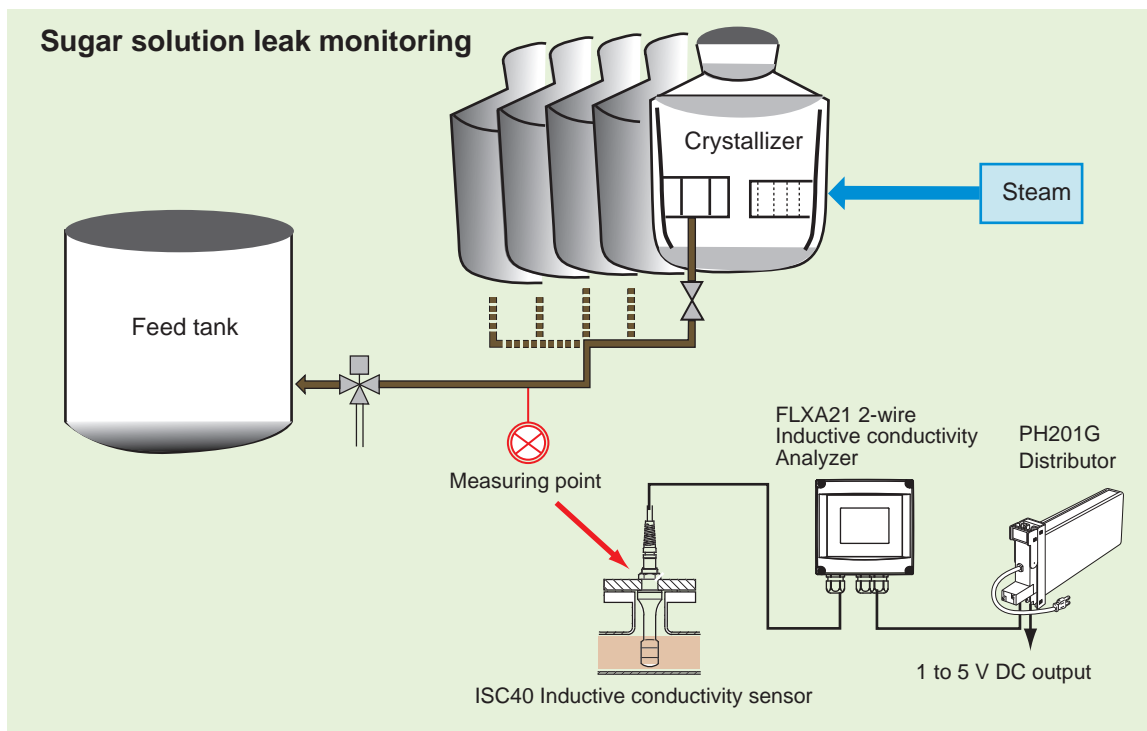
these are now problems of the past: both devices enable stable, continuous monitoring and the quick detection of sugar solution leaks, preventing serious problems from ever developing.

Expected Benefits

- Automatically detect sugar solution leaks in sugar factories
- Reduces operating costs

Process Overview

In sugar factories, crystallizers and concentrators produce a large amount of steam drain, which is reused as boiler feed water. However, sugar leaked during the boiler feed process can mix into this water. When that happens, the sugar can decompose into an organic acid at high temperatures, thereby decreasing the pH of the water. If the boiler operates with water at a low pH level, it can become corroded. The lowered pH needs to be raised to a normal level by performing a blowdown or the like, and the losses potentially caused by this process are not necessarily small. The sugar solution leak must be quickly detected before a minor problem turns into something much worse. For this reason, continuous monitoring is essential.



Solution Details

Measurement system

2-wire inductive conductivity system

Sensor

ISC40G(J)-GG-T1-X□

Analyzer

FLXA21-D-P-S-AA-C5-NN-A-N-LA-N

Dedicated distributor for analyzer

PH201G-A□*B

4-wire inductive conductivity system

Sensor

ISC40G(J)-GG-T1-Y□

Converter

ISC450G-A-□

Utilities

FLXA21 2-wire inductive conductivity analyzer

Power supply voltage: 17 – 40 V DC (from distributor)

Power consumption: 0.9 VA maximum

PH201G distributor

Power supply: 100 V: 20 to 130 V DC/80 to 138 V AC, 47 to 63 Hz

220 V: 120 to 340 V DC/138 to 264 V AC, 47 to 63 Hz

Power consumption: 24 V DC: approx. 200 mA

100 V AC: approx. 7 VA

220 V AC: approx. 11 VA

ISC450G 4-wire inductive conductivity converter

Power supply: 90 to 264 V AC, 50/60 Hz

Power consumption: 15 VA maximum

Cautions

As the contact output of the PH201G is always magnetically excited, it should be kept closed even when the power is turned off to perform maintenance.

Field Data

Process conditions

Steam return line of crystallizer outlet

Measurement liquid: steam drain (plus sugar solution)

Monitoring range: 0 – 200 $\mu\text{S}/\text{cm}$

Temperature: approx. 80°C

Alarm level: 100 $\mu\text{S}/\text{cm}$ (contact output can be used with the ISC450G)

Measurement data

