



Oxygen measurement in milk packaging line

Summary

Powdered milk or dried milk is a manufactured dairy product made by the evaporating the liquid in milk. One purpose of drying milk is to preserve it; milk powder has a far longer shelf life than liquid milk and does not need to be refrigerated. Excess oxygen causes powdered milk to oxidize, resulting in reduced shelf life and spoilage.

Application

Milk powder is drawn by a vacuum pump to a separator on top of a bulk hopper. Before it reaches the separator the milk powder is pre-gassed with nitrogen through a control valve. The powder is then dropped into the hopper where additional nitrogen is added. Oxygen measurement is taken from the head space of the hopper which feeds packaging lines to fill can and bags of powdered milk.

Challenge

Food grade sterility and reliability is important to this process. It is important that the wetted material be stainless steel. Food processing occurs in wash down environments thereby requiring the instrument and sample system to be installed in a water tight stainless steel enclosure.

Benefits:

- Rugged and reliable with no moving parts
- Sensor is not consumed as with electrochemical cells
- Simple field calibration
- Process may be automated with display/controller
- Turnkey sample conditioning system



Solution

A Panametrics XMO2pro thermoparamagnetic is the best choice for this application. The XMO2pro has no moving parts and carries the ingress and hazardous area certifications demanding industrial use. The transmitter provides a fully scalable 4–20mA signal and has an RS232 interface. A turnkey sample system is prewired and preplumbed. The XMO2pro is simple to calibrate by purging with nitrogen for the zero calibration and instrument air (21% O2) for the span calibration. The XMO2pro may be equipped with a display/controller to automate the calibration process.

Application specifications

Application	0–21% Oxygen (2% nominal)
Temperature	Ambient
Pressure	Slight positive pressure