

Foxboro® CFT50 Digital Coriolis Mass Flowmeter

Custody Transfer for the Dairy Industry

Summary

The Foxboro CFT50 Coriolis Mass Flow Transmitter allows mass flowmeters to operate uninterrupted during traditionally difficult to measure applications, including problematic liquid/gas flow. With no moving parts in the stream it is capable of performing in batch applications starting with empty flowtube conditions and is designed to control the Coriolis meter throughout all stages of gas void fraction for continuous, precise measurement.

Business Value

With the Foxboro custody transfer system users can expect a rapid payback, usually within six months of implementation saving thousands of dollars that was previously spent on maintaining scales, or lost to the inefficiencies and poor performance of traditional custody transfer meters and conventional Coriolis flow measurement devices.



About The CFT50 Digital Coriolis Transmitter

The Foxboro® CFT50 Coriolis Mass Flow Transmitter features a patented digital processing system that allows mass flowmeters to operate uninterrupted during traditionally difficult to measure applications, including problematic liquid/gas flow. Capable of performing in batch applications starting with empty flowtube conditions, the CFT50 is designed to control the Coriolis meter throughout all stages of gas void fraction for continuous, precise measurement.

Benefits

- Unmatched precision of milk loading and unloading measurement without skips or stalls
- Improved cost accountability during custody transfers
- Reduced maintenance
- Significant savings over alternative technologies
- Better integration with digital communications systems
- Certified nationally by NTEP



Technical Challenge

Thousands of dollars worth of unprocessed milk changes ownership daily, as haulers transfer milk in large tank trucks from dairy farmers to milk processing plants. While ensuring that all milk is accounted for during transfer, it is important for the seller and buyer. Historically, milk-processing plants had no custody transfer systems in place, or used scales, which were expensive to maintain. Other custody transfer flowmeters, sometimes called fiscal meters or billing meters, may be somewhat less expensive to maintain, but are not maintenance-free. Positive displacement (PD) or turbine meters, the most widely used flowmeters for custody transfer applications in other industries, still require regular maintenance on meter bearings, gears, and other moving parts. Once maintenance is complete, the meters must be recalibrated and typically replaced within a year.

Coriolis meters have emerged as the choice for milk transfer applications as they provide outstanding accuracy and direct measurements of mass, density, and temperature. Coriolis mass flowmeters have no moving parts in the stream and provide a lower-maintenance alternative to PD meters. However, conventional Coriolis meters cannot deal with some common conditions that occur when transferring milk. For example, tank truck transfer lines contain air and milk at the start and end of a delivery, and can result in substantial over- or under-billing.

Foxboro Measurements and Instruments has developed a custody transfer solution, requiring little or no maintenance, and certified nationally by the National Type Evaluation Program (NTEP) for accurate fiscal metering of milk.

The Foxboro Solution

The Foxboro custody transfer solution includes a Coriolis flowmeter, custody transfer indicator, and slip printer. The heart of the system is the Foxboro CFT50 Coriolis transmitter, which employs patented digital technology that compensates for variations in the amount of gas or liquid in a flow.

The microprocessor-based meter prevents erratic flowtube vibrations that cause measurement failures with liquid/gas flow. This provides accurate measurement of quantities from the beginning to the end of a batch custody transfer. The CFT50 flowmeter has no moving parts to wear out, no internal mechanisms to replace, and generally requires no recalibration.

In addition to the CFT50, the Foxboro custody transfer solution includes a transfer indicator with a printer interface. The CFT50 sends pulses to the indicator to start the batch count. The custody transfer indicator then communicates with the printer to produce a ticket that accurately documents the mass of milk transferred. The indicator also features a stop/reset button to rezero after each batch and to trigger a printout of the total.

The Foxboro custody transfer solution is certified nationally by NTEP, with an accuracy of $\leq 0.2\%$. NTEP controls fiscal metering in the U.S., and certifies custody transfer mass meters for compliance per the National Conference on Weights and



Measures (NCWM). In addition, each individual installation must be certified and sealed by the local state inspector. The Foxboro custody transfer solution includes seal-out hardware to allow a local inspector to verify the CFT50 flowmeter and protect it from tampering or interference. After calibration, the indicator's front buttons are disabled to prevent accessing the instrument's calibration menu after the device has been sealed. Furthermore, the system is available with 3A authorization for sanitary applications.

Results

Dairy industry users of the Foxboro custody transfer system can expect rapid payback, usually within six months of implementation. This system is ideal for fast transfer of milk from tank trucks, where a high volume of air accompanies the liquid transferred from the bottom of the trucks. In addition to gaining additional revenue by not overpaying, users can save thousands of dollars previously spent on maintaining scales, or lost to the inefficiencies and poor performance of traditional custody transfer meters and conventional Coriolis flow measurement devices. Installations have been certified in several states including Ohio and West Virginia, and the Foxboro Measurements and Instruments division is moving forward with installations in additional states.

Ask about our next generation flow transmitter, Model CFT51, which offers all these benefits and more!

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January 2016
Part Number: FD-AS-F-001

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