Solution Note

Honeywell

Slurry Flow Measurement Using the Honeywell Smart Multivariable Transmitter (SMV3000) Flow measurement in the chemical industry

Problem: Accurate flow data for aluminum oxide slurry

Accurate measurement of slurry is a headache for process engineers because of the abrasiveness and tendency to agglomerate. One method of measuring slurry flow is differential pressure across a primary flow element. The choice of primary flow elements is limited. Pitot tubes are unsuitable due to clogging. Orifice plates face this problem with the additional complication of erosion of the critical orifice bore. Mass flow measurement using corolis meters is used in low flow applications. Due to high viscosity, and abrasiveness, oversize meters are selected leading to loss of accuracy and high cost of ownership.

Plant engineers at a large chemical plant needed to measure the flow of aluminum oxide slurry while compensating for temperature. The flow measurement needed to be carried out at minimal cost. In addition, the environment where the equipment was located experienced periodic power surges, which could interfere with 4-20 ma analog communication. The customer flow application was a 500 lb/minute flow in horizontal steel pipe. Although the slurry was not corrosive, the presence of water and the abrasive nature of the solids caused the engineers to specify 316L stainless steel as the material of construction for the primary flow element.

Solution: The Honeywell Smart Multivariable Transmitter (SMV3000) with coin primary flow Element

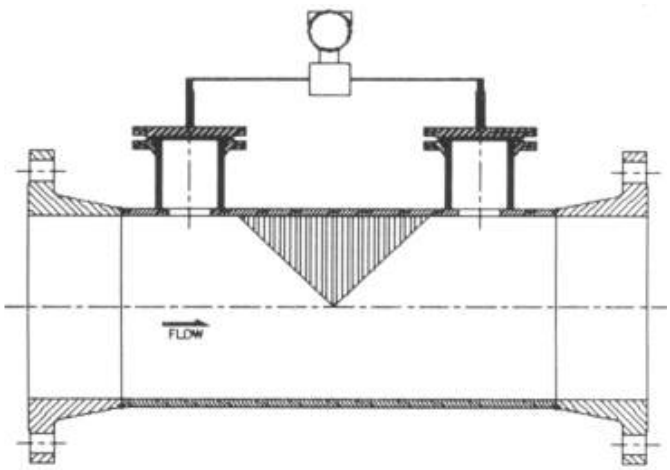
In consultation with the local Honeywell representative, the plant engineers identified the Smart Multivariable Transmitter (SMV3000) Honeywell in conjunction with Preso Coin Meter, as a possible solution. The customer chose the Honeywell/Preso solution based on the availability of a complete solution: A DP flow transmitter, pressure/temperature compensation, calculated flow and a primary flow element matched to the transmitter for the slurry flow application.

The SMV 3000 measures flow based on the three process variables of differential pressure, static pressure and temperature. The SMV3000 utilizes temperature data from an RTD or other temperature measurement probe.

SMV3000 Smart Multivariable Transmitter

The diagram above shows the installation of the SMV3000 used for slurry flow measurement. In this case, the SMV3000 was connected with remote seals in order to prevent slurry from entering the transmitter.

High measurement accuracy using the Preso Coin Meter is obtained through NIST traceable calibration. Linear performance of the flow measurement is assured down to Reynolds Numbers 500.



Preso Coin Meter with SMV3000 Attached

SMV3000 Benefits in Slurry Flow

- Accurate measurement of process flow hrough compensation for pressure and temperature variation.
- The remote seal design effectively isolates the SMV 3000 from the slurry.
- The SMV has extensive temperature fault diagnostics to sense when a RTD or TC probe fails.
- Significant dollar saving through the use of a single transmitter to provide several process variable measurements plus flow calculation
- Microprocessor-based electronics results in increased reliability and functionality.
- Digital integration to the Honeywell TPS provides the security of digital integration plus a wide range of diagnostic and configuration capabilities.
- Rapid and effective configuration of the SMV 3000 by using the Smart Configuration Toolkit (SCT3000).
- In conjunction with MTS, the SMV 3000 can be utilized to provide relay closure for valve shut off.

Preso Coin Meter Benefits

- Rugged materials of construction permit flow measurement of virtually any slurry, abrasive or corrosive liquid
- Factory assembled packages available to ensure ease of installation.
- Various sizes, flange ratings are available flow applications.
- Accuracy assured through factory dry calibration to +/-0.5% of flow rate (NIST Traceable).
- No moving parts / unaffected by entrained solids

Solution Description	Model
Smart Multivariable Transmitter SMV 3000 with stainless steel materials of construction. Honeywell Remote Seals: stainless steel diaphragm.	SMA125-E1A-00000-MB,F1D3+XXXX with ANSI 150, 316SS remote seals
Preso Coin Meter,4 inch, 316L SS materials of construction, ANSI 150# flanges	Coin-400-1-FL-STD-150LBS

More Information

For more information on SMV300 Transmitter, visit www.honeywellprocess.com, or contact your Honeywell account manager.

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