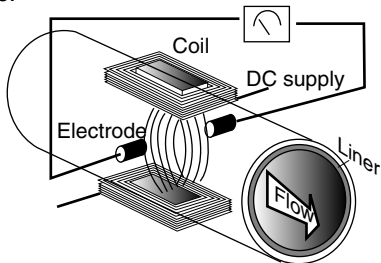


OVERVIEW

Badger Meter's M-Series® Model M-3000 electromagnetic (mag) flowmeter provides non-intrusive flow measurement in almost any conductive fluid or slurry. Targeted to a variety of industrial and municipal applications, the M-3000 is virtually unaffected by density, temperature, pressure and viscosity changes and provides an accurate and reliable long term metering solution. The state of the art microprocessor signal converter produces flow accuracies of $\pm 0.25\%$. The M-3000 is FM approved for Class I, Div 2 hazardous service and features a wide selection of optional liner, electrode and flange materials.

OPERATION

This flow meter is a stainless steel flow tube lined with a nonconductive material. Two DC powered electromagnetic coils are attached to the outside of the flow tube. The coils diametrically oppose each other. Two electrodes are located in the flow tube on an axis perpendicular to that of the coils. When the coils are energized, a magnetic field is created across the pipe diameter. As a conductive fluid flows through this magnetic field a voltage is induced across the electrodes. This voltage is proportional to the average fluid flow velocity and is picked up by the two electrodes. Processed digitally by the amplifier, this induced voltage produces a very accurate signal. Advantages of this technology are that with no parts in the flow stream there is no pressure loss and accuracy is not affected by temperature, pressure, viscosity, density, or flow profile. With no moving parts there is practically no required meter maintenance.



APPLICATION

Model M-3000 Mag Meters are designed for use in most industrial and municipal flow applications. Whether the fluid is water or something highly corrosive, very viscous, contains a moderate amount of solids or requires special handling, this meter is able to accurately measure it. The Model M-3000 electrode circuits are intrinsically safe. The design has been tested and approved by Factory Mutual (FM) in the United States and the Canadian Standards Association (CSA International) in Canada.



BadgerMeter, Inc.



Model M-3000 Mag Meter

FEATURES

- $\pm 0.25\%$ accuracy independent of fluid viscosity, density and temperature
- Unaffected by most in-fluid solids
- Rated for Class I, Div 2 hazardous locations
- CSA Certified
- CE and FCC compliant
- NEMA 4X/6P (IP66/IP67) Rating
- Pulsed DC magnetic field for zero point stability
- No pressure loss for low operational costs
- Long life, corrosion resistant liners
- Precise calibration
- Empty pipe detection
- Integral and remote Amplifier mounting capability
- Optional grounding rings or grounding electrode
- Measurement largely independent of flow profile

Electrodes

Looking into the flow tube from either end of the meter, the two measuring electrodes can be seen positioned at 3 o'clock and 9 o'clock. Badger® Mag meters have an "Empty Pipe Detection" feature. Empty Pipe Detection is accomplished by positioning a third electrode close to the 12 o'clock position. Any time this electrode is not covered by fluid, (for a minimum of five seconds), the meter displays an Empty Pipe Detection condition, sends out an error message if desired, and stops measuring to maintain accuracy. When the electrode is again covered with fluid, the error message disappears and the meter continues measuring.

As an option to grounding rings to assure proper grounding in a given installation, an optional grounding electrode (4th electrode) can be factory installed at the 6 o'clock position during the flow tube manufacturing process.

