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▶ Measuring principle

EMF / Magmeters

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- OPTIFLUX Sensors
- WATERFLUX 2070
- Signal converters
- Special Purpose Flowmeters

Variable Area Flowmeters

Ultrasonic Flowmeters

Mass Flowmeters

Vortex Flowmeters

Flow Controllers

Level Measurement

Temperature & Pressure

Analysis

Batching Controller

Complete Batching Systems

Exi Controller

Exi Indicator

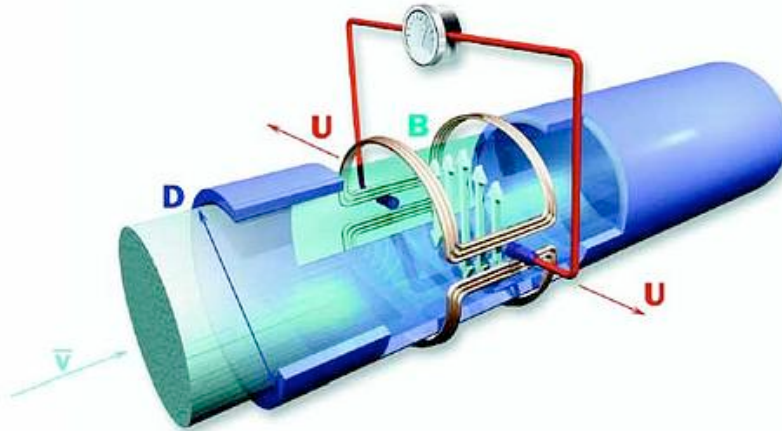
Communications

Loading Software

Electromagnetic flowmeters measure conductive liquids and slurries.

An electric conductor, in this case the electrically conductive medium, passes through a magnetic field. The voltage U induced in this medium is directly proportional to the mean flow velocity v .

Magnetic induction B (magnetic field strength) and the distance between electrodes D (nominal pipe diameter) are constant.



$$(1) U = K \times B \times v \times D$$

K instrument constant

B magnetic field strength

v mean flow velocity

D electrode spacing

The volumetric flow rate qv can be calculated according to

$$(2) qv = v \times D^2 \times \pi/4$$

It follows from equation (1) that

$$(3) v = U / K \times B \times D$$

Therefore:

$$(4) qv = (U / K \times B) \times D \times \pi/4$$

The induced voltage signal is picked up either by two measuring electrodes in conductive contact with the medium or indirectly by capacitive coupling. A signal converter amplifies the signal and converts it into a standard analog signal (e.g. 4 to 20 mA) and a frequency signal (e.g. 1 pulse for every US gallon or cubic metre of medium flowing through the measuring tube).

To ensure that the voltage is not short-circuited by the pipe wall, the measuring tube is made of an electrically insulating material or fitted with an insulating liner.

Measurement is largely independent of the flow profile and other properties of the medium, such as pressure, temperature, viscosity, density, consistency, electrical conductivity, and electrode contamination.

Measuring systems

The electromagnetic flowmeter consists of a flow sensor, that is installed in the pipeline, and a signal converter.

The compact design has the signal converter mounted directly on the flow sensor.

For systems with pulsed d.c. field the flow sensor field coils which generate the magnetic field are energized by a pulsed direct current from the signal converter.

The measuring signal is a squarewave voltage of the same frequency. These systems feature extremely small measuring errors.

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