



Magnetic Flow Meter



LF-MF

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DESCRIPTION

Electromagnetic flow meter is based on Faraday's law of electromagnetism to measure the flow of conductive liquids. This flow meter micro-processor based processing electronic unit. LCD unit to display flow rate & totalized.

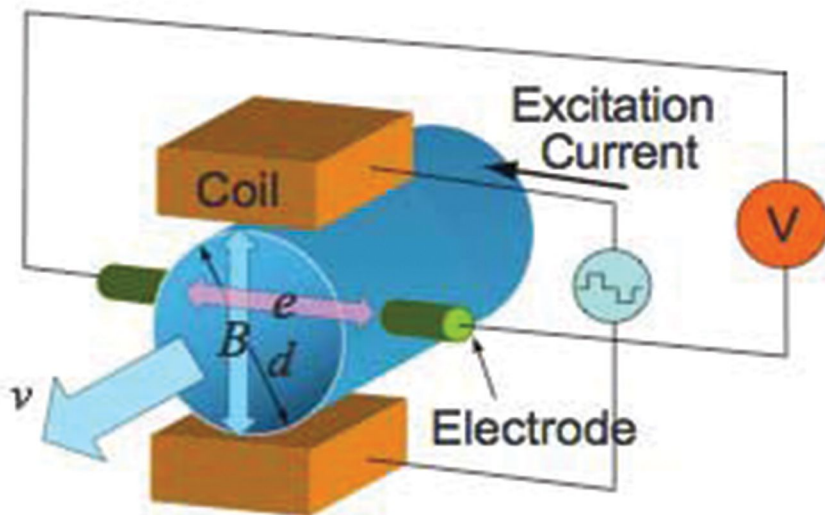


INTEGRAL VERSION

REMOTE DISPLAY

PRINCIPLE OF MAGNETIC FLOW METER BASED ON FARADAY LAW.

Magnetic flow meters works based on faraday's law of electromagnetic induction. According to this principle, when a conductive medium passes through a magnetic field B, a voltage E is generated which is proportional to the velocity V of the medium, the density of the magnetic field and the length of the conductor.



$$B \propto N \cdot I_{ex}$$

B: Magnetic Flux Density

N: Number of Coil Turns

I_{ex}: Excitation Current

$$e = k \cdot B \cdot v \cdot d$$

e: Electromotive Force

k: Constant

v: Mean Flow Velocity

d: Internal Diameter

In a magnetic flow meter, a current is applied to wire coils mounted within or outside the meter body to generate a magnetic fields. The liquid flowing through the pipe acts as the conductor and this induces a voltage which is proportional to the average flow velocity. This voltage is detected by sensing electrodes mounted in the mag-flow meter body and sent to a transmitter which calculates the volumetric flow rate based in the pipe dimensions.

FARADAY'S FORMULA

E is proportional to $V \times B \times D$ where:

E = the voltage generated in a conductor

V = the velocity of the conductor

B = the magnetic field strength

D = the length of the conductor



To apply this principle to flow measurement with a magnetic flow meter, it is necessary first to state that the fluid being measured must be electrically conductive for the Faraday principle to apply. As applied to the design of magnetic flow meters, Faraday's Law indicates that signal voltage (E) is dependent on the average liquid velocity (V) the magnetic field strength (B) and the length of the conductor (D) (which in this instance is the distance between the electrodes)

Feature: Integral or remote transmitter
High long term stability and reliability
Coil assembly in hermetically sealed welded construction

Application: Waste Water, Slurry, Raw Water, Sewage, Wood Pulp, chemicals, Food processing, fertilizer, sugar, beverages, pharmaceutical Industries,.

ADVANTAGES OF ELECTRONIC FLOW METER

The Obstruction to the flow is almost nil and therefore this type of meters can be used for measuring suspensions, including mud, sewage, pulp, etc.

They are not very much affected by upstream flow disturbances.

These meters can be used as bidirectional meters.

They are practically unaffected by variation in density, viscosity, pressure & temperature.

DISADVANTAGES OF ELECTRONIC FLOW METER

These meters can be used only for conductive liquids.

HOW TO USE MAGNETIC FLOW METER

Magnetic flow meters measure the velocity of conductive liquids in pipes, such as water, acids, caustic, and slurries. Magnetic flow meters can measure properly when the electrical conductivity of the liquid is greater than approximately 20 S/cm. Be careful because using magnetic flow meters on fluids with low conductivity, such as boiler feed water, or hydrocarbons, can cause the flow meter to turn off and measure zero flow.

This flow meter does not obstruct flow, so it can be applied to clean, dirty, corrosive liquids. Magnetic flow meters can be applied to the flow of liquids that are conductive, so hydrocarbons and gases cannot be measured with this technology due to their non-conductive nature and gaseous state.

Magnetic flow meters do not require much upstream and downstream straight run so they can be installed in relatively short meter runs. Magnetic flow meters typically require 3-5 diameters of upstream straight run and 0-3 diameters of downstream straight run measured from the plane of the magnetic flow meter electrode.

Applications for dirty liquids are found in the water, wastewater, mining, power, pulp and paper, chemical industries. Waste and wastewater applications include custody transfer of liquids in force mains between water/waste water districts. Magnetic flow meters are used in water treatment plants to measure treated and untreated sewage, process water, water and chemical.

With proper attention to materials of construction, the flow of highly corrosive liquids and slurries can be measured. Corrosive liquid applications are commonly found in the chemical industry process, and in chemical feed systems used in most industries. Slurry applications are commonly found in the mining, pulp and paper and waste water industries.

Magnetic flow meters are often used where the liquid is fed using gravity. Be sure that the orientation of the flow meter is such that the flow meter is completely filled with liquid. Failure to ensure that the flow meter is completely filled with liquid can significantly affect the flow measurement.

TECHNICAL SPECIFICATION

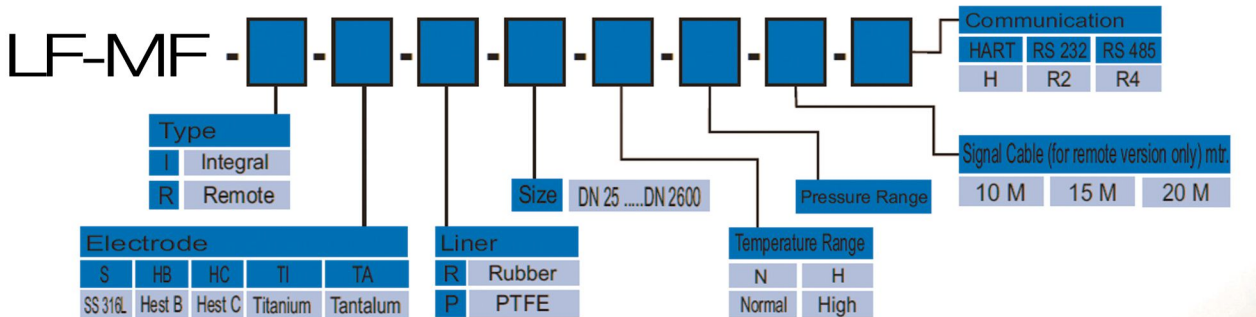
Model	LF-MF
LCD Display	16X2 (Two Line) Backlit LCD
Output	4-20 mA
Working Temp.	0-180° deg. C as per model selection
Power Supply	220 V AC, 50 Hz
Protection	IP 65 (IP - 68 on request)
Liner	Rubber / PTFE
Electrodes	SS 316L / Hastelloy C / Ta / Ti
Accuracy	0.3% - 0.5%
Flow Tube	SS 316
Line Size	DN 10 to DN 1000
Media Conductivity	10uS/cm
Media Temp.	0-180 C with remote transmitter 0-120 C with integral transmitter
Amb. Temp.	0-50 C
End Connection	CS / SS 304 / SS 316 / SS 316L
Coil Housing	CS / SS
Transmitter	Cast Aluminium
Flange / End. Conn..	ANSI / DIN / TRI - CLMP
Cable Gland	½" NPT (F)
Communication Port (optional)	Rs 232 / RS 485 MODBUS RTU Protocol
LED Display	4 Digit Indication for Flow Rate and 8 Digit Indication for Totaliser Programming from Front Keyboard for Engineering Units

FLOW RATE

Line Size (mm) Flow Range (m³ /hr) at 0.3 - 10 m/s

10	0.06 – 2.00
15	0.20 – 6.40
20	0.34 – 11.3
25	0.53 – 17.7
40	1.40 – 45.2
50	2.00 – 70.7
65	3.58 – 119
80	5.43 – 181
100	8.48 – 282
150	19.08 – 636
200	33.9 – 1131
250	53.0 – 1767
300	76.3 – 2544
350	103.9 – 3463
400	135.7 – 4525
450	171.7 – 5726
500	212.0 – 7069
600	305 – 10179
700	415 – 13854
800	542 – 18095
900	687 – 22902
1000	848 – 28274

MODEL SELECTION



* (All models may differ in looks & all specification may not be part of every version)
* (Specification may vary as per different model selected. Some feature may not be there in model selected.)