

# Electro Magnetic Flow Meter

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## Introduction:

Electro Magnetic Flow Meter is a new range of bipolar pulsed dc Electromagnetic Flow meters in sizes 10 mm to 600 mm. They are based on Faraday's law of Electromagnetic Induction. The meter features flanged construction and is available with choice of liner and electrode materials. It has excellent accuracy and flow rangeability. The meter is suitable for use on wide range of corrosive, abrasive conductive liquids.

## Main Features:

- Based on Farady's law of electromagnetic induction.
- Flow lube sizes 10 mm to 600 mm
- Coil assembly in hermetically sealed welded construction
- Paste extruded extra thick PTFE liner
- Choice of PTFE/Neoprene Rubber/Hypalon/Polyurethane liners
- Integral or remote transmitter
- Field interchangeable electronics
- Optional LCD display for flow rate indication in engineering units
- No pressure loss
- High linearity due to characteristic magnetic field
- Absolute zero stability and noise elimination due to pulsed dc excitation
- Measurement independent of liquid properties

## Applications:

- \* Dairy & Food Processing Industries.
- \* Chemical, Petrochemical and Process Industries
- \* Fertilizer Industries
- \* Pharmaceutical Industries
- \* Food Industries
- \* Drug Industries
- \* Sugar Industries
- \* Beverage Industries
- \* Paper and Pulp industries
- \* Water and Waste Water Management
- \* Aluminum industries
- \* Steel industries
- \* Mining industries
- \* Dredging Industries
- and many others

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Operating Principle:

Series 6400 Electromagnetic Flowmeters are based on Farady's law of electromagnetic Induction. In a Electromagnetic Flowmeter, magnetic field is generated by a set of coils. As the conductive liquid passes through the electromagnetic field, an electric voltage is induced in the liquid, which is directly proportional to its velocity.

This induced voltage is perpendicular to both the liquid flow direction and the electromagnetic field direction. The voltage sensed by the electrodes is further processed by the transmitter to give standardised output signal.

The flux density of electromagnetic field in a given flowmeter and the distance between the electrodes are constant, therefore, the induced voltage is only -a function of liquid velocity.

$$E=K.B.v.D$$

where

E= Induced voltage

K= Flow tube constant

B= Magnetic field strength

v= Mean flow velocity

and D= Electrode spacing

Volume flow Q is calculated by equation:

$$Q= v * D^2 * (3.14) / 4$$

$$\text{Therefore, } Q= (E * D * 3.14) / (K * B * 4)$$

The induced voltage is not affected by the physical properties of the liquid like temperature, viscosity, pressure, density and conductivity as long as conductivity of the measured liquid is above minimum threshold level.

For reliable measurements, the pipe must be completely full of liquid.

The electromagnetic field coils are excited by pulsed dc technique, which eliminates the interfering noise and provides automatic zero correction.

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## Electro Magnetic Flow Meter

### Specifications

• Meter size (DN)	:	DN 10 to 600 mm
• Media Conductivity (Min.)	:	10 microS/cm (Consult factory for 5 microS/cm.)
• Media Pressure	:	PN 40 upto DN 80 PN 16 upto DN 200 PN 10 upto DN 600
• Media Temperature (PTFE)	:	0 -180°C with Remote transmitter 0 -120°C with Integral transmitter (0- 90°C max. for other liners)
• Ambient Temperature Range	:	0-50 deg.C.
• Materials: Pipe	:	SS-316 (Non Magnetic)
Liner	:	PTFE/Neoprene/Hypalon/Polyurethane Ceramic
Electrodes	:	SS/Hastelloy C/TA/Ti/Pt
Flanged End connections	:	CS/SS-304/SS-316/SS-316L
Coil Housing	:	SS / Carbon Steel Epoxy Coated
Transmitter	:	Cast Aluminum / HDP
• Flange/End connection Std.	:	DIN/ANSI/SMS/TRI-CLAMP
• Power Supply	:	240/110 V AC +/- 15% 50 Hz
• Power Consumption	:	20 VA
• Cable Gland Entry	:	1/2" NPT (F)
• Analog Output (Isolated)	:	4-20 mA DC / 0-20 mA DC
• Pulsed Output	:	Low Pulse Rate Output 10 to 36000 pulses per hour : a) output to drive directly external electromagnetic counter of 12 / 24V DC @ 200 mA capacity OR b) Open Collector Output High Pulse Rate Output 0.5 KHz/1KHz/10KHz (Open Collector Output)
• Maximum Load Resistance	:	1000 Ohm.
• Time Constant	:	5 Sec.
• Flow Velocity Range	:	0.3 to 10 mts/sec.
• Ingress Protection	:	IP-65 (IP-67 / IP-68 on request)
• Local Display	:	3-1/2 Digit, LCD (Optional)
• Accuracy	:	
For flow between 20 to 100%	:	+/- 0.5% on measured value (calibrated) at reference condition
For flow between 0 to 20%	:	+/- 1% of measured value (normal)
• Reference Conditions	:	
Power Supply	:	Nominal
Ambient Temperature	:	25 +/- 2 Deg. C.
Load Resistance	:	500 Ohm.
• Repeatability	:	+/- 0.2% of span.
• Effect of Ambient Temperature	:	Less than 0.2% per 10 Deg. C.
• Effect of Power Supply	:	Less than 0.1% per 10% voltage change.
• Effect of Load Resistance	:	Less than 0.1% of span.

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