# CLA1-MF MAGNETIC FLOW METER

## Description

Electromagnetic flow meter operates on Faraday's law of electromagnetism to measure flow of conductive liquids. These flow meters efficiently measure liquid flow rate & converts it into 4-20mA output electrical current signal. Flow meter is sub classified into two main models :

Integral type - LCD display transmitter unit is mounted on the flow sensor housing.

Two part type - LCD display transmitter unit is separate wall mounted type & is connected to the flow sensor with special cable.

Flow meter consists of a hollow cylindrical shaped main flow sensing unit, made of non-conductive alloy material, its inner surface is lined with suitable insulation material. Two sensing electrodes are placed diagonally opposite to each other. When excitation signals are given to these electrodes, a magnetic field with a magnetic flux (B), is generated in the direction vertical to the measuring pipe sensor. At this time if the flux with specific electro-conductivity flows through the measuring pipe, the line of magnetic force will induct electromotive force E. Electromotive force E is in directly proportional to magnetic flux B. With the product of inside diameter'd' of flow meter pipe and average flow velocity V, electromotive force E (signal of the flow) is measured by electrodes and sent through cable to transmitter unit. Transmitter magnifies these flow signals by computing flow rate of flux and after converting displays it as liquid flow rate on LCD & a 4-20 mA current output is also obtained. $E = K B d V$

In the equation: E = signal voltage of inner electrodes (v)

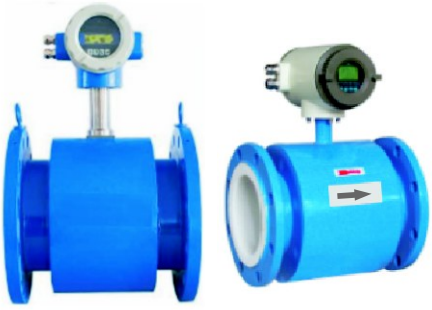
B = density of magnetic flux (T)

d = inside diameter of measuring pipe (m)

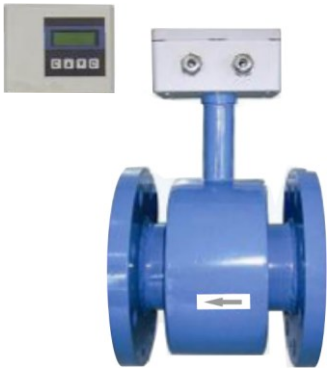
V = average flow velocity (m/s)

In above equation, d is a constant. Since excitation current is constant B is also a constant. We can know from E = KBdV that flow rate of volume Q is directly proportional to signal voltage E, that is, signal voltage of flow rate induction E is in linear relation to flow rate of volume Q. So if only E is measured flow rate Q can be defined, which is the basic operating principle of magnetic flow meter. From E = KBdV we can see that the temperature of the measured flux medium, density, pressure, electro-conductivity and the liquid-solid proportion of the liquid medium will not affect the measurement result. To moving condition if only it accords with the flow of axial symmetry (such as laminar flow) it will not affect the result of the measurement. Due to its operating principle, same magnetic flow meter can be used for different liquids having different physical parameters without any modification & with great efficiency.

Application: Water, sewage, chemicals, pharmaceutical, effluent, industrial waste, solid mixed liquids, acids etc.



*Integral Type*



*Two Part Type*

## Features

⇒ Reliable, quick response, no pressure loss
⇒ No moving parts, no obstruction to liquid flow hence no clogging
⇒ Wide range, different liner & electrode materials
⇒ Accurate, maintenance free, measurement not effected by temperature

## Technical Specification

| MODEL | CLA1-MF | |
|---|---|---|
| Versions | Integral | Two part |
| Transmitter Protection | IP 65 | IP 68 flow tube & IP 65 for transmitter |
| Connection | Flanged -CS | |
| Sizes | DN 25 ~ DN 2000 | |
| Liners | Rubber / PTFE | |
| Supply | 230 V AC , 50 Hz | |
| Output | 4 - 20 mA | |
| Process Temperature | -20. ~ 180 °C | |
| Media | Liquids with conductivity ratio more than 0.5 us/cm | |
| Electrode | SS 316 / Hestalloy / Ti | |
| Accuracy | 0.3% ~ 0.5% | |
| Housing / flow tube | SS | |
| Earthing Rings | SS | |

## Model Selection

**CLA1 - MF - □ - □ - □ - □**

| | |
|---|---|
| G | SS Earthing ring |
| Size | DN 25 ....2600 |
| Electrode | |
| S | SS 316L |
| T | Ti |
| H | HC |
| O | Others |
| Type | |
| I | Integral |
| T | Two Part |

*Contact us for other models & specifications not listed here.*
*Due to product enhancement technical specification may vary.*

Cirrus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