Electromagnetic Flowmeter

CHEMAG 300

Robust Accurate. Reliable.

www.chemtrols.com

Electromagnetic Flowmeter.

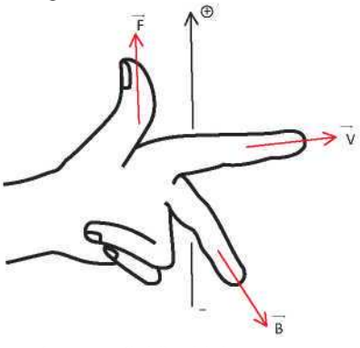
The Chemag 300 Flowmeter is based on the latest state-of-the-art microprocessor based electronics and is capable of handling a wide range of applications. The sensors are fully welded with the electromagnetic coils isolated from the effects of variations in the ambientand process temperature.

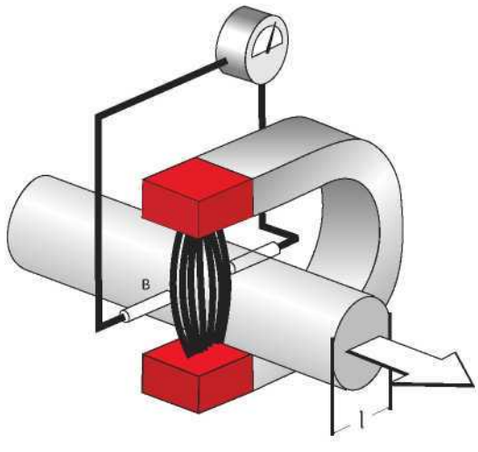
With a choice of wetted part and lining material the Chemag 300 Flowmeter is capable of handling a range of applications; from very simple to highly complex applications which includes highly abrasive as well as highly aggressive liquids.

Chemag 300 is yet another product from the Chemtrols manufacturing range and enjoys the strong service support synonymous withChemtrols.

Principle of Operation:

The Electromagnetic flow meter works on "Faraday's Law of Electromagnetic Induction"





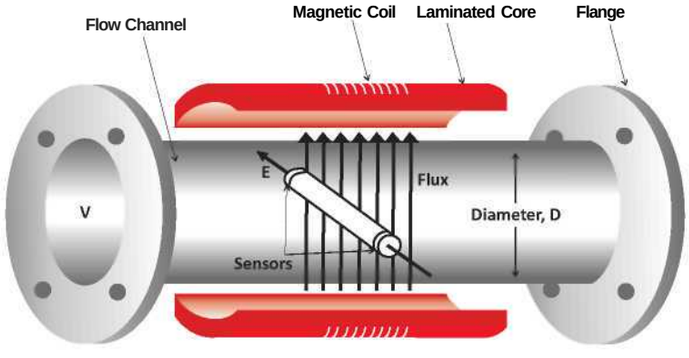
In a conductor (processfluid) which moves perpendicular to magnetic field, an emf (F) is induced which is proportional to the magnetic field strength (B), length of conductor (I, pipe ID), and velocity (V) of conductor.

FocB.I.v

Since, for a given flow meter, Length of conductor (Pipe ID) & Magnetic Field strength (B) is constant, the induced voltage is proportional to the Velocity of conductor (process Fluid). The flow readings are obtained by multiplying the Sensors constant and area of cross sections of pipe. The sensor constant is derived during wet calibration of each individual flow meter.

Features:

- Universal Powersupply
- Stable and Reliable measurement over wide span
- Auto Zero Correction
- Choice of wetted parts
- Choiceof lining material
- Bi-direction Flow measurement
- Raised Electronics
- Inbuilt Diagnostic Features
- Low Flow cut off
- Empty Pipe detection
- Built-in 20,000 points data logger



Applications:

- Rawwater, Potable water, Sea water, Waste water, Cooling water, Heat exchangers
- Industrial & Domestic Effluent
- Syrups, Molasses, Fruit Juice, Pulp & Beverages
- Acidic&Alkalinesolutions
- Brinesolutions
- Paper Pulp, Black, Green & White Liquor

Industries:

- Water and Waste water Management
- Cement
- Steel
- Sugar
- Distilleries
- Food and Beverages
- Fertilizer
- Power Plants
- Paper & Pulp
- Chemical
- Heat Exchangers
- Petrochemical Plants

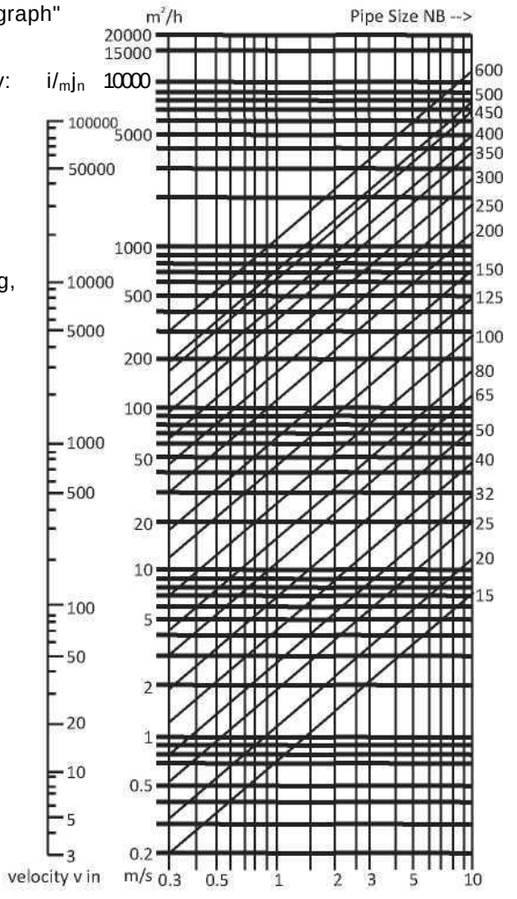
Sizing Criteria:

Electromagnetic flowmeter is a velocity measuring device; the sizing of the flowmeter depends on the velocity of fluid. A handy tool like the "Nomograph" is often used for selection of a flowmeter for a particular flow rate. However, one can use the following formula to calculate the flow velocity:

$$\text{Velocity (m/sec)} = 353.53^{*} \frac{\text{Flowrate (in lvf/hr)}}{\text{Square of Pipe Dia (mm)}}$$

By ruleofthumb Electromagneticflowmetersgiveoptimum performance between 1-6 m/sec, hence the metersshould be sized accordinglyforall liquids except for abrasive ones. For abrasive liquids, in horizontal mounting, the recommended maximum velocity is 2.5 m/sec. However, for vertical mounting it is 4 m/sec.

Typical example for measuring ranges of few meters corresponding to recommended velocity ranges are as under:



Meter (mm)	Measuring Range (Q) (m^3/hr)	
	Q at Im/s	Q at 6 m/s
50	7.1	43
100	28.5	170
150	64	380
200	114	680
250	178	1060

Specifications:

Performance :

Precision	±0.5% of Reading
Linearity	±0.5%
Repeatability	±0.1% of FSD
Velocity	0.5 to 10 m/s
Response Time	<100 msec

Functional:

System Architecture	Integral or Remote Transmitter, Microprocessor-based electronics, all user data is stored in non-volatilememory without additional battery backup.
Sensor coil Excitation	Pulsed DC.
Fluid Conductivity	>5 µS/cm (Micro Siemens per Centimeter)
Power Supply	1. Universal 90 - 240VAC, 50 Hz 2. 24 VDC
Power Consumption	<10VA
Programming	Through front panel push buttons.
Output	1. Isolated 4 -20mA DC 2. Pulse 3. RS485 with MODBUS RTU
Display	16 Characters, 2 Lines, Alphanumeric LCD.
Transmitter Enclosure	**Polyurethane painted, Cast Aluminum**
Ambient Temperature	0 - 70°C
Cable Entries	¾" ET, 2 Nos.
Ingress Protection	IP67

Sensor:

Line Size	15 to 600mm NB
Lining	Rubber, PTFE
Electrodes	SS316L, HastalloyC, Platinum Rh
Meter Pipe	Seamless SS304, SS316
Coil Housing	Mild Steel, SS304
End Connections	Flanged; CS, MS, SS
Process Temperature	0-85°C, Optional - 150°C
Process Pressure	10 Barg
Ingress Protection	IP68

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