

KABIR INSTRUMENTS & TECHNOLOGY

ELECTROMAGNETIC FLOW METER :

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| <ol style="list-style-type: none"> 1. Remote Mounting 2. Integral Mounting Inbuilt Display 3. Integral Transmitter Inbuilt Display/Panel Mounted Display 4. Teflon Lining M.S./C.S. Full Bore Types | <ol style="list-style-type: none"> 5. Rubber Lining M.S./S.S. Full Bore Type 6. New Model H3DP/PVC Full Bore Type 7. New Model HDP/PVC Low weight, Low Cost, Better Quality Used for Corrosive/Non Corrosive Fluid & Liquids |
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INTRODUCTION

Electromagnetic Flow meter called as magmax Virtually appropriates the ideal flow meter suitable for wide range of liquid flow measurements even with very low conductivities. The meter offers no resistance to flow hence the pressure drop is almost negligible. The measurement being based on Faraday's Law of Electromagnetic Induction, is independent of viscosity, density, pressure & temperature of flowing medium.

The measurement is not affected by solid impurities as long as the min. conductivity of $5\mu\text{s/cm}$ is available. It is a true volumetric flow measurement. We offer various materials of construction for meter body, meter lining & electrodes to cover majority of corrosive liquids.

The technique called as Pulsed DC is used which offers very high zero stability & accuracy of measurement. The standard current output of 4 - 20 mA DC is provided which is linearly proportional to volumetric flow rate & additional frequency output is also provided.

PRINCIPLE ADVANTAGES

1. Use of pulsed DC magnetization & auto zero technique offers excellent long term zero stability.
2. Measurement is independent of velocity profile across the diameter of the pipe-line.
3. Measurement results are independent of density, viscosity, pressure, temperature, solid - impurities & conductivity variations [above $5\mu\text{ siemens/cm.}$]
4. No additional pressure drop across the meter which relieves the process designer while sizing his pumping requirements. Simple to install as no special precautions of straight pipe lengths required.
5. Compatible with virtually all corrosive / non - corrosive liquids.
6. Protection class offered IP 65.
7. Reasonably higher ratio of Return on Investment.



ELECTROMAGNETIC FLOWMETER FULL BORE & INSERTION TYPE

PRINCIPLE OF OPERATION

The method of flow measurement is based of **Faraday's law** of electromagnetic induction. When a conductor moves within a magnetic field, voltage is induced in it which is proportional to the velocity of conductor.

In this case the conductor is flowing media. The equation is as below.

E = B.v.D.

Where,

E = Induced voltage (proportional to velocity)

B - Magnetic flux density

v = Mean velocity of the media

D = Distance between the sensing electrodes.

For a given size of flow tube & compatible amplifier the flux density 'B' is constant, the distance between the electrodes 'D' is constant. Hence, the induced voltage 'E' is proportional to the velocity of the flowing media. Thus, the unit can be calibrated in terms of volumetric flow rate by knowing the cross section area of the Tube.

APPLICATIONS

This meter is more suitable with those fluids which present difficulties in handling. Fluids such as effluents, slurries, pulps brines & other highly corrosive liquids, acids & bases, fermented wash, molasses etc.

Following industries can find lot of application of this flow measurement technique.

- Effluent Treatment Plants.
- Sewage Treatment Plants.
- Water Supply Schemes.
- Steel & Aluminium.
- Sugar Industries & Distilleries.
- Pulp & Paper.
- Chemical & Pharmaceutical.
- Petrochemicals & Fertilizers.
- Food & Drugs.
- Pump Manufactures.

ELECTROMAGNETIC FLOW METER (FULL BORE)

SPECIFICATIONS

METERING TUBE

1. Meter Size : DN 10 to DN 1000 for higher sizes contact Company.
2. Media Pressure : Up to DN 80 - PN 40
From DN 100 to DN 200-PN 16
DN 250 to DN 350 - PN 10
3. Media Temperature: PFA Liner 0 - 200° C max.
PTFE Line 0 - 150° C max.
Rubber Liner 0 - 90° C max.
4. Ambient Temperature Range : 0 - 50° C
5. Materials :
 - Pipe : SS 304 (non-magnetic)
 - Electrodes: SS 316/Hastelloy C / Titanium.
 - Liner : PTFE / Neoprene / Soft Rubber / Hard Rubber / PFA
 - Flanges : Carbon Steel / SS 316/SS 316L/ SS 304
 - Coil Housing : Carbon Steel, P.U. Painted. / S.S
6. Flange Standard : ANSI / DIN/BS / SMS / Tri-clamp
7. Power Supply to Field coils : Pulsed DC

TRANSMITTER

1. Type : Integral Mounted (standard) / Remote Mounted (on request)
2. Min. Media Conductivity : 5µS/cm (for lower conductivities consult factory)
3. Signal Output : 4-20 mA dc isolated in max.
Additional option : 600 ohms.
Pulsed Output : with adjustable count rate from 1 count/Hr to 105 Counts/Hr (Open collector with 100mA / 24 V dc capacity)

- Frequency Output : 0 -10 KHz prop. to -100% Flow rate (open collector with 10 or 4-20 mA/ 24 v dc max.)
4. Coil Excitation Frequency : Selectable DIP switch.
 - a) 25 Hz
 - b) 12.5 Hz
 - c) 6.25 Hz
 - d) 3.125 Hz
5. Display : a) 4 digit LED calibrated in % engineering units for flow rate indication.
b) 9 digit LED non resettable type for totalised quantity.
6. Flow Velocity Range: 0.3 m/s to 12 m/s
7. Accuracy : ±0.5% of reading (at ref. condition between 100% to 10% of calibrated
±0.75% of reading for flow rate between 10% to 5% (refer accuracy graph)
8. Ref. Conditions : Power Supply normal.
Temperature 27°C±2°C
9. Repeatability : ±0.2% of reading
10. Ambient Temperature : 0-50°C
11. Temperature Drift : ±0.015% per°C max.
12. Humidity : 90% R.H. max. non condensing
13. Material of Housing : Aluminum Die cast.
14. Power Supply : 230VAC/ 110V AC, 50 Hz/24V
15. Damping : Adjustable from 5 to 30 sec
16. Cable Entries : 4 nos for remote amplifier 2 nos for integral amplifier ½" NPT ½" BSP/ Pg11 (Female)
17. Ingress Protection : IP-65 equivalent

SELECTION TABLE FOR ELECTROMAGNETIC FLOWMETER

Meter size full scale range Q 100% in m³/hr

DN.	Inch	V=0.3m/s Min	V=1m/s	V = 12m/s Max
15	½	0.190	0.636	7.634
20	¾	0.3393	1.131	21.20
25	1	0.5302	1.767	21.20
32	1¼	0.8686	2.895	34.74
40	1½	1.358	4.524	54.28
50	2	2.121	7.068	84.82
65	-	3.584	11.95	143.3
80	3	5.429	18.90	217.1
100	4	8.483	28.2	339.2
125	5	13.26	44.18	530.1
150	6	19.09	63.62	763.1
200	8	33.93	113.1	1357
250	10	53.02	176.7	2120
300	12	76.35	254.5	3053
350	14	103.9	364.4	4156
400	16	135.8	452.4	5428
500	20	212.1	706.9	8482
600	24	305.4	1018	12215

The Optimum flow velocity should be 2-3 m/s or 6/9 ft/s, for products with solid contents 3 and 5 m/s or 9- 15 ft/s. The exact flow velocity can be determined from columns in the tables. For V = 12 m/s as shown in the following example :

Example for m³/hr

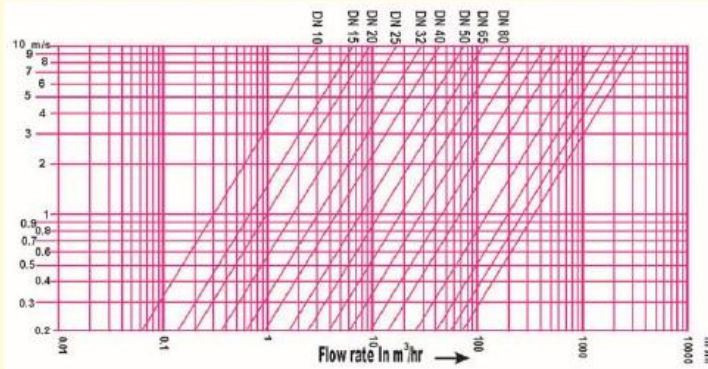
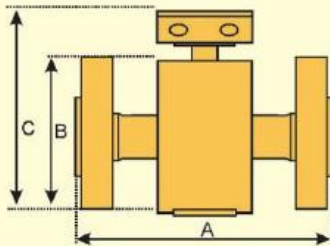
Meter size - DN 80

Desired measuring range : 55 m³/hr
from the table 1 obtain for

$$V = \frac{12\text{m/s the flow rate of}}{217.1\text{m}^3/\text{hr at DN 80}}$$

$$V = \frac{55\text{m}^3/\text{hr}}{217.1\text{m}^3/\text{hr}} \times 12\text{ m/s}$$

$$V = 3.04\text{ m/s}$$



Flow Rate in m³/hr

Meter Size DN	A mm	B mm	C mm	Weight Kg.	Weight +/-
15	200	110	270	6.0	1.0
20	200	110	270	6.5	1.0
25	200	110	270	7.5	1.0
32	200	120	280	8.5	1.0
40	200	128	288	9.0	1.5
50	200	150	310	11.0	1.5
65	200	175	335	14.5	1.5
80	200	190	350	16.5	1.5
100	250	225	385	22.0	1.5
125	250	255	410	26.0	1.5
150	250	280	435	29.0	2.0
200	300	340	500	43.0	2.0
250	350	450	560	57.0	2.0
300	400	450	640	77.0	2.0

ECONOMICAL SERIES OF ELECTROMAGNETIC FLOWMETERS SANDWICH TYPE

1. : SS Threaded flow meters (DN 25-DN 80)
2. : Sandwich flow meters (DN 25- DN 300)
3. : Wafer flow meters (DN 25 - DN 300)

Can be made available for chemicals with proper selection of Compatible liners and electrodes.

Compact in size and absolutely no compromise on performance.

Accuracy better than ±0.5% of actual flow rate.

Small in size, Less in weight and easy to install.

Specially designed for water and wastewater measurement,