

Pressure Measurement & Control

Temperature Measurement & control

≤150°C Cable 80 kg/cm<sup>2</sup>

Process Control Instrument

Flow Measurement & Control

Conductive liquid / Slurry

10 μm/cm<sup>2</sup>

Duplex

RTD Pulsed DC

ss 316 L ss304

**aaavad<sup>®</sup>**  
**INSTRUMENT**

Flameproof

Simplex

K Type

Pt 100

Triclover

Relay

Portable Instruments

Hastelloy C

VALUE OF WORDS

**Electromagnetic Flow Meter**

## Working Principle

Electromagnetic Flowmeters are based on Faraday's Law of Electromagnetic Induction. In an Electromagnetic Flowmeter, the 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 standardized output signal or displayed in appropriate engineering unit. The electromagnetic flow meter accurately measures the flow rate of conducting liquids or slurries flowing in closed pipes. It is obstruction less and hence does not add pressure drop to the process. Absence of moving parts eliminates the need for maintenance. The performance of the instrument is not affected by the properties of the material such as corrosiveness, viscosity and density.

## Features

- Empty Pipe Detection
- Low Flow Cut off
- Display in User Selectable units
- Programmable Pulse on-time
- Adjustable Damping
- Digital Output
- Full bore type
- Suitable for conductive liquids
- Maintenance free
- Simple & cost effective construction
- Flow measurement in forward and reverse direction



## Technical Specifications

<b>Model</b>	AMAG-I / AMAG-R / AMAG-O	<b>Flanged std</b>	ANSI 150
<b>Media</b>	Conductive liquid / Slurry	<b>End connection</b>	Flanged
<b>Line size</b>	15 NB to 500 NB, Customised	<b>Accuracy</b>	0.5 % of the reading
<b>Conductivity</b>	>10 $\mu$ S/cm	<b>Display</b>	LED/LCD
<b>Excitation</b>	Pulsed DC	<b>Display unit</b>	M3, ltr, Gallen all standard engineering unit
<b>Working pressure</b>	10 kg/cm <sup>2</sup>	<b>Power supply</b>	85 to 230 v ac,50 Hz / 24 V dc
<b>Working temperature</b>	70°C for rubber , 120°C for PTFE	<b>Out put</b>	4-20 mA, Pulse, Relay (Optional)
<b>Velocity</b>	0.3 to 10 m/s	<b>Communication</b>	RS 485, RS 232, HART (Optional)
<b>Sensor housing</b>	MS/SS/CS	<b>Protection class for sensor</b>	Std 65, Optional IP 68 for remote
<b>Measuring tube</b>	ss304	<b>Protection class for transmitter</b>	IP 67
<b>Electrode</b>	ss 316 L / Hastelloy C	<b>Transmitter MOC</b>	Aluminum Die cast

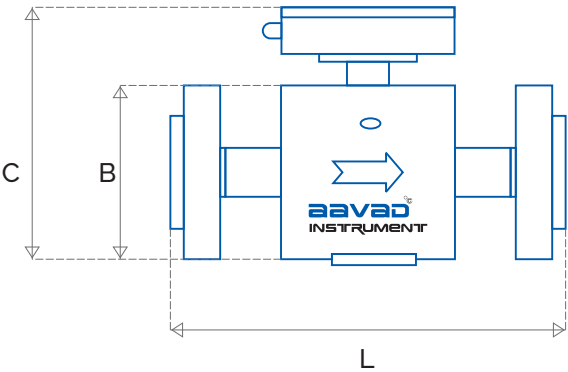
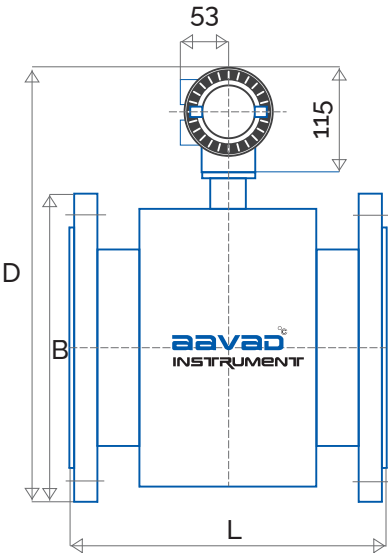
## Industry Served

- Food Industry
- Chemical Industry
- Energy
- OEM Industry
- Automation Industry
- Thermal Power Energy
- Process Industry
- Waste Water Managment



# Dimension Chart

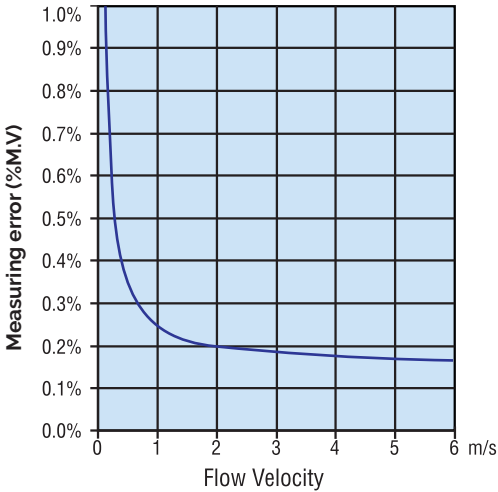
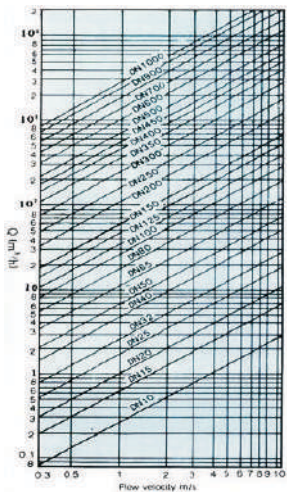
DN	L (mm)	B (mm)	C (mm)	D (mm)	PCD of Flange
DN 15	191	89.9	193.9	253.9	60.5
DN 20	191	98.4	293.4	263.4	70.0
DN 25	191	107.9	212.9	272.9	79.5
DN 32	191	117.5	222.5	282.5	89.0
DN 40	191	127.0	232.0	292.0	98.5
DN 50	192	152.4	257.4	317.4	120.5
DN 65	192	177.8	282.8	342.8	139.5
DN 80	192	190.5	295.5	355.5	152.5
DN 100	237	228.6	333.6	393.6	190.5
DN 125	240	254	359.0	419.0	216.0
DN 150	240	279.6	384.6	444.6	241.5
DN 200	310	342.9	447.9	507.9	298.5
DN 250	362	406.9	511.9	571.9	362.0
DN 300	412	482.6	587.6	647.6	432.0
DN 350	412	533.4	638.4	698.4	476.0
DN 400	515	596.4	701.4	761.4	539.5
DN 450	515	635.0	740.4	800.4	578.0
DN 500	516	698.5	803.5	663.5	635.0



# Minimum - Maximum Flow Table

Size in mm	Flow Range (m <sup>3</sup> / hr) at 0.3 to 10 M/S	
	MINIMUM	MAXIMUM
15	0.19	6.35
20	0.34	11.34
25	0.53	17.66
32	0.87	29.93
40	1.36	45.21
50	2.12	70.65
65	3.58	119
80	5.42	180
100	8.48	282
125	13.25	441
150	19.08	635
200	33.92	1130
250	53.01	1766
300	76.34	2543
350	103.91	3461
400	135.72	4521
450	171.77	5722
500	212.06	7065

# Flow Nomograph



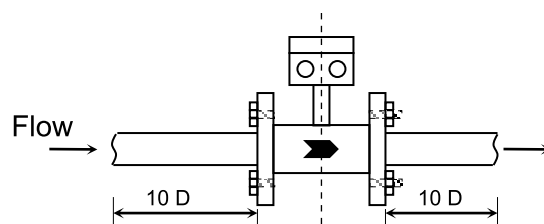
## Installation Guide

The Primary Flow Tube can be installed at any point in the pipe run either horizontal or vertical provided the following conditions are met:

The **direction of flow** through the pipe is same as indicated on the primary flow tube by a red arrow.

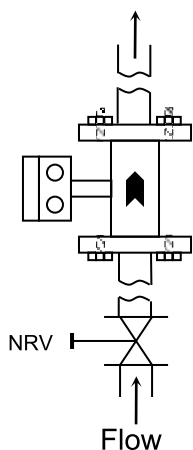
**Straight lengths** of maximum 10 D on upstream and minimum 10 D on down-stream as shown. If disturbances like cork screwing or vortex flow conditions are present straight lengths should be increased or flow straighteners should be used.

Flaps, slidegates, valves etc should be arranged at a distance of at least 5D downstream of primary flow tube.

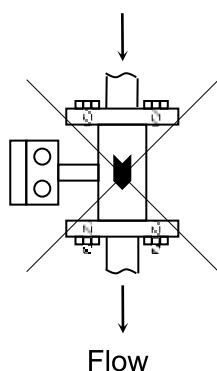


Ensure that primary flow tube remains **completely filled** by the fluid under measurement even under no flow condition. This ensures trouble free and reliable operation of the Flow Meter. Select a location on the pipe, which will always run full of liquid. For vertical installations the direction of flow against Gravity ensures full pipe.

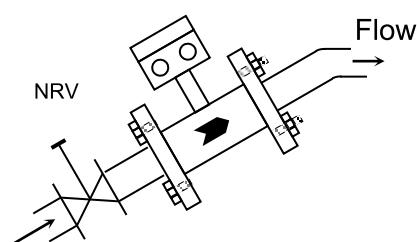
Some of the recommended installations are as under :



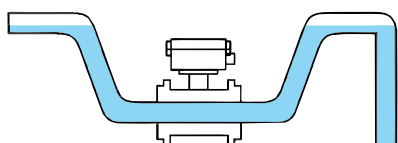
Recommended



Not Recommended



Recommended



For partially filled pipes or pipes with download flow and free outlet the flow meter should be located in a U-tube.

# Ordering Code

AMAG-

O	P1	1	C1	Y	015	A	1	E1	L1	F4
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Transmitter type

I : integral  
R : Remote  
O : LED Display

Power Supply

P1 : 85 to 250V AC  
P2 : 24V DC

Output

1 : 4-20 mA  
2 : Pulse  
3 : Combine Both

Communication

C1 : RS 485 (Mod Bus RTU)  
C2 : HART  
C3 : GSM (External)

Data logger

y : External  
n : Not Requ.

Sensor Size

015 (1/2")  
020 (3/4")  
025 (1")  
032 (1.25")  
040 (1.5")  
050 (2")  
065 (2.5")  
080 (3")  
100 (4")  
125 (5")  
150 (6")  
200 (8")  
250 (10")  
300 (12")  
350 (14")  
400 (16")  
450 (18")  
500 (20")

Transmitter Housing

A : Aluminum  
F : Flame Proof  
G : Any Other

Coil Housing

1 : MS  
2 : CS  
3 : SS 304  
4 : SS 316

Electrode

E1 : SS 316 L  
E2 : Hastalloy c  
E3 : Any Other

Lining

L1 : Hard Rubber  
L2 : Neoprene  
L3 : PTFE  
L4 : PFA

Flanged Material

F1 : MS  
F2 : CS  
F3 : SS 304  
F4 : SS 316

## How to Select the Electrode Material

Electrode	Suitable	Not suitable for
316L	Domestic water, industrial water, raw water, city sewage, weak corrosion of acid, alkali, salt solution	Strong acid, alkali etc
Hastelloy alloy B	Concentration is less than 10% of non oxidizing acid, concentration of less than 50% sodium hydroxide, all concentrations of ammonium hydroxide alkaline solution; phosphoric acid & organic acid	Nitric acid
Hastelloy C	Mixed acid ( such as chromic acid & sulfuric acid solution); oxidizing salts ( such as seawater, including Cu <sup>+++</sup> , Fe <sup>+++</sup>	Hydrochloric acid
Titanium	Salts (such as sodium, potassium, chloride, ammonium salts ,sodium hypochlorite, still water ), concentration of less than 50% potassium hydroxide , ammonium hydroxide, barium hydroxide alkaline solution	Hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid & other reductive acid
Tantalum	Hydrochloric acid ( concentrations of less than 40% ), dilute sulfuric acid & concentrated sulfuric acid ( not including oleum); chlorine dioxide , ferric chloride, hypochlorous acid, sodium chloride, lead acetate; nitric acid including fuming nitric acid, an oxidizing acid )	Alkali, hydrofluoric acid
Platinum Gold	Almost all of the sour alkali salt solution including fuming sulfuric acid & fuming nitric acid	Aqua regia, ammonium salt

## How to Choose the Lining Material

According to the measured medium corrosion, wear and temperature, select lining material, as shown in the following table:

Lining	Symbol	Performance	Temp	Usage occasions
Rubber	CR	Wear resistance of medium, high average concentrations of acid-base salt solution	≤70°C	Tap water , industrial water , sea water
PTFE	PTFE	The chemical properties of stability, high boiling hydrochloric acid sulfuric acid , aqua regia, concentrated alkali corrosion	≤150°C	Corrosive acid, salt, solution
Fluorinated ethylene propylene	F46 or FEP	Chemical properties equivalent to F4, tensile strength is higher than that of F4	≤180°C	Corrosive acid salt solution, negative pressure
Polyurethane	PU	Excellent wear resistance, Not suitable for resistance to acid	≤70°C	Slurry, pulp and other abrasive

\* This is for customer information only. we are not supplying all above specifications materials



### AAVAD INSTRUMNET :

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**Bank** : Kotak Mahindra Bank LTD **I A/c Name** : Aavad Instrument **I A/C No.** : 1411117509 **I IFSC Code** : KKBK0000839