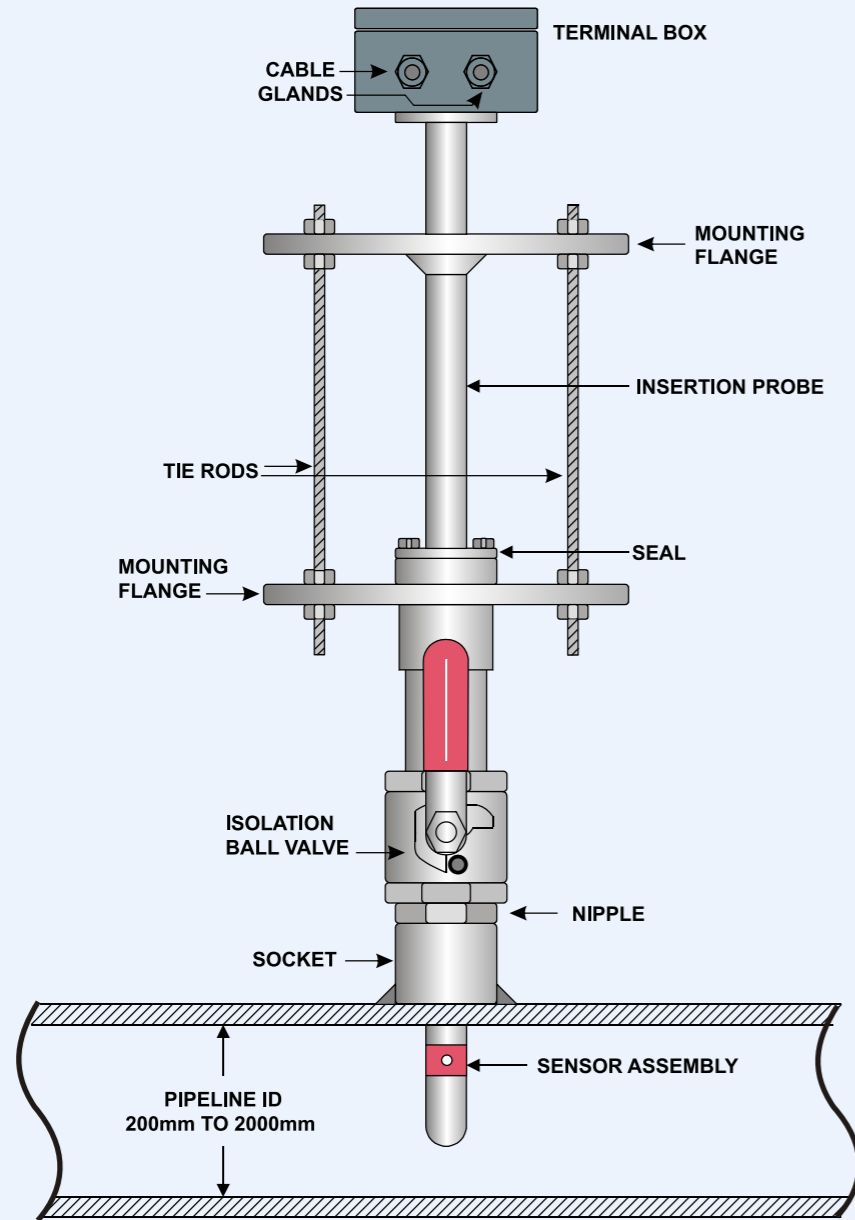


**SCHEMATIC DIAGRAM FOR  
INSERTION PROBE ASSEMBLY**



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# WE MEASURE WIDE AQUA FLOW



## INSERTION MAGMETER SROAT 1000i

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Regd. Office: 704, T-7, Panchsheel Works: 151, Vishnu Enclave, Opp. Primrose, Opp. Govindpuram, Ghaziabad (U.P)-201013, INDIA  
Govindpuram, Hapur Road, Ghaziabad (U.P)-201013, INDIA  
sales.fortunexis@gmail.com | sales@fortunexis.in  
91 80767 51198 | +91 85959 51883

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# MAGNETIC FLOW METER SROAT 1000i

## INTRODUCTION

The Manas make Insertion Type Electromagnetic flow meter, called SROAT - 1000i is an ideal solution for water flow measurement in large diameter pipes. Fairly good accuracy of measurement (typically  $\pm 1\%$  of flow rate) can be achieved with little care in installation of probe and transmitter. The electrical conductivity of liquid under measurement can be as low as 20

microsiemens / cm. Being insertion type, there is virtually no pressure loss. Most economical as compared to its counterpart in full bore measurement or ultrasonic measurement.

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

## PRINCIPLE OF OPERATION

The method of flow measurement is based on 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 = Pulsed magnetic flux density.

v = Mean velocity of the media

d = Distance between the sensing electrodes

For a given probe and compatible amplifier the flux density 'B' is constant, the distance between the electrodes is constant. Hence, the induced voltage 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-sectional area of the pipe on which the probe is installed.

## APPLICATIONS

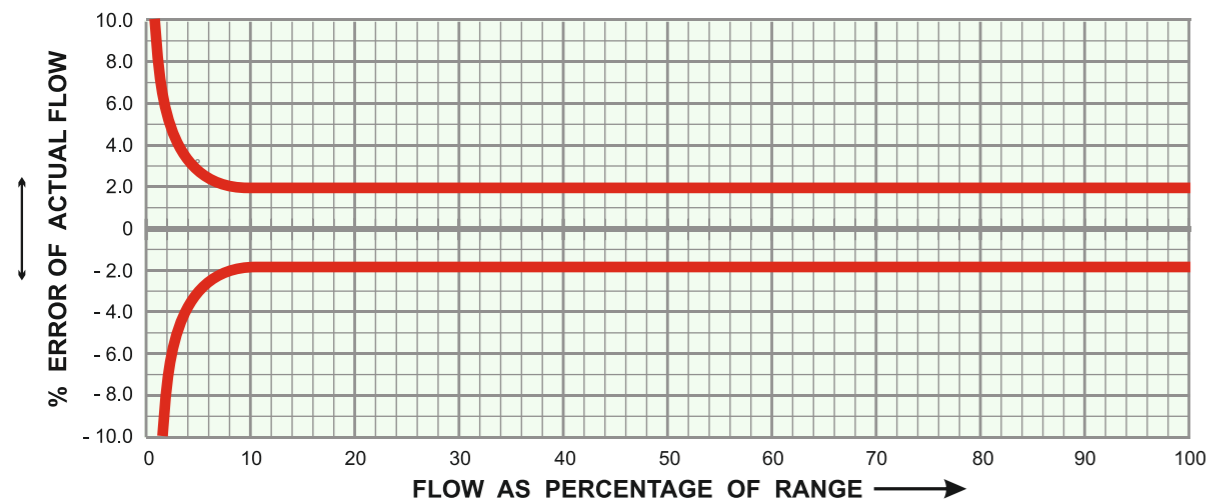
Following industries find application of this flow measurement technique

- Water Supply
- Public Services and Utilities
- Effluent Treatment Plants
- Pharmaceutical Industries
- Sugar Industries and Distilleries
- Food and Drugs

## PRINCIPAL ADVANTAGES

- Excellent long term stability using pulsed dc magnetization and auto zero technique.
- Measurement results are independent of density, viscosity, pressure, temperature, solid-impurities and conductivity variations (above 5  $\mu\text{S}/\text{cm}$ )
- No additional pressure drop across the meter
- Compatible with virtually all corrosive / non-corrosive liquids.
- IP-68 class of protection offered, for sensor and IP-67 for transmitter

## ERROR DIAGRAM



## INSERTION FLOW METER

### INSERTION PROBE: SROAT 1000i

Applicable line Sizes	: DN 200 to DN 2000
Media Pressure	: 10 kg/cm max.
Media Temperature	: 0 - 60°C
Ambient Temperature Range	: 0 - 50°C
Materials : Insertion Probe	: SS 304
Electrodes	: SS 316
Wetted Parts	: SS 304, SS 316, Epoxy
Weld in socket	: SS 304
Flange Mounting Assembly (Refer Sketch on rear page)	: SS 304
Power Supply To Field Coils	: Pulsed DC
Terminal box	: IP-68

For line sizes above DN 1200 contact to Factory.

### FLOW RATE TABLE (Flow rate at v = 1 m/s)

Dia. (mm)	M3/Hr.	MLD	Cu.ft./Sec.
200	113.097	2.7143	1.1094
250	176.714	4.2411	1.7335
300	254.469	6.1072	2.4962
350	346.360	8.3126	3.3977
400	452.389	10.8573	4.4378
500	706.858	16.9646	6.9340
600	1017.875	24.4290	9.9850
700	1385.441	33.2506	13.5907
800	1809.556	43.4293	17.7511
900	2290.219	54.9652	22.4662
1000	2827.431	67.8583	27.7360
1200	471.500	97.7160	39.9400
1400	5541.765	133.0024	54.3626
1600	7238.223	173.7174	71.0043
1800	9160.876	219.8610	89.8648
2000	11309.724	271.4333	110.9442

### TRANSMITTER SROAT 1001A+

Type	: Remote Mounted
Min. Media Conductivity	: 5 $\mu\text{S}/\text{cm}$
Signal Output	: 4-20 mA dc Isolated in max. 600 ohms
Coil Excitation Frequency	: 6.25 Hz
Display	: 16 characters * 2 rows LCD display for instantaneous flow rate, totaliser, Engg. Units, fault messages etc.
Flow Velocity Range	: 0.1 m/s to 2 m/s
Accuracy	: $\pm 2\%$ Of Reading (for range between 100% to 10% of flow rate At Ref. Condition)
Reference conditions	: Power supply nominal, Amb. Temp. 27 C $\pm 2$ C
Ambient Temperature	: 0 - 50°C
Temperature Drift	: $\pm 0.015\%$ Per °C max..
Humidity	: 90% R. H. max. non condensing
Material Of Housing	: Al. Die cast
Power Supply*	: 230 V ac / 110 V ac / 24 Vdc $\pm 10\%$
Damping	: Adjustable from 5 to 30sec.
Cable Entries	: PG 13.5 For Input PG 11 for rest
Ingress Protection	: IP-67

**\*Battery back-up can optionally be provided for measurement and totalisation of flow in case of power failure by providing a separate powering unit.**

## COMPARISON OF VARIOUS TYPES OF FLOW METERS

PARAMETER	INSERTION SROAT 1000i	VORTEX INSERTION	TURBINE	ORIFICE
Accuracy	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$
Min.Vel.	0.1 m/s	0.6 m/s	0.6 m/s	-
Pr. Drop	NIL	NIL	Considerable	Considerable
Effect of Viscosity and Density variations	No Effect	Very Much	Very Much	Very Much
Solid Particle Impurities	No Effect	Wears Out	Wears Out	Wears Out Errors In Measurements
Vibration of Pipe	Immune	Affects Reading	Affects Reading	Not Recommended
Orientation	No Effect	No Effect	Affects Accuracy	-