

*Smart Sroat &
SROAT 1000 plus.*



manas
a name that spells trust . . .

SERIES: SROAT 1000A plus :

INTRODUCTION :

Manas has now introduced a new type of primary flow sensor & smart flow transmitter in their electromagnetic flow- meter series. This sensor works on the Faraday's law of electromagnetic induction. The meter is true volume measuring meter. The measurement is independent of Viscosity, Density, Dissolved/Undissolved solids, pressure or temperature of the flowing liquid as long as it maintains certain minimum conductivity. Various types of Liner & Electrode materials are available as per application requirements.

The new sensors are more compact in size & more sensitive. Earth ring or earth electrode, both option are available. Empty tube detection is also provided.

PRINCIPLE OF OPERATION:

The SROAT 1000 series electromagnetic flow meters work on FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION. It, in brief, states; 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 = Diameter of flow-sensor(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 is constant. Hence, the induced voltage is proportional to the flowing media. Thus the meter can be calibrated in terms of volumetric flow rate by knowing the cross-sectional area of the tube.

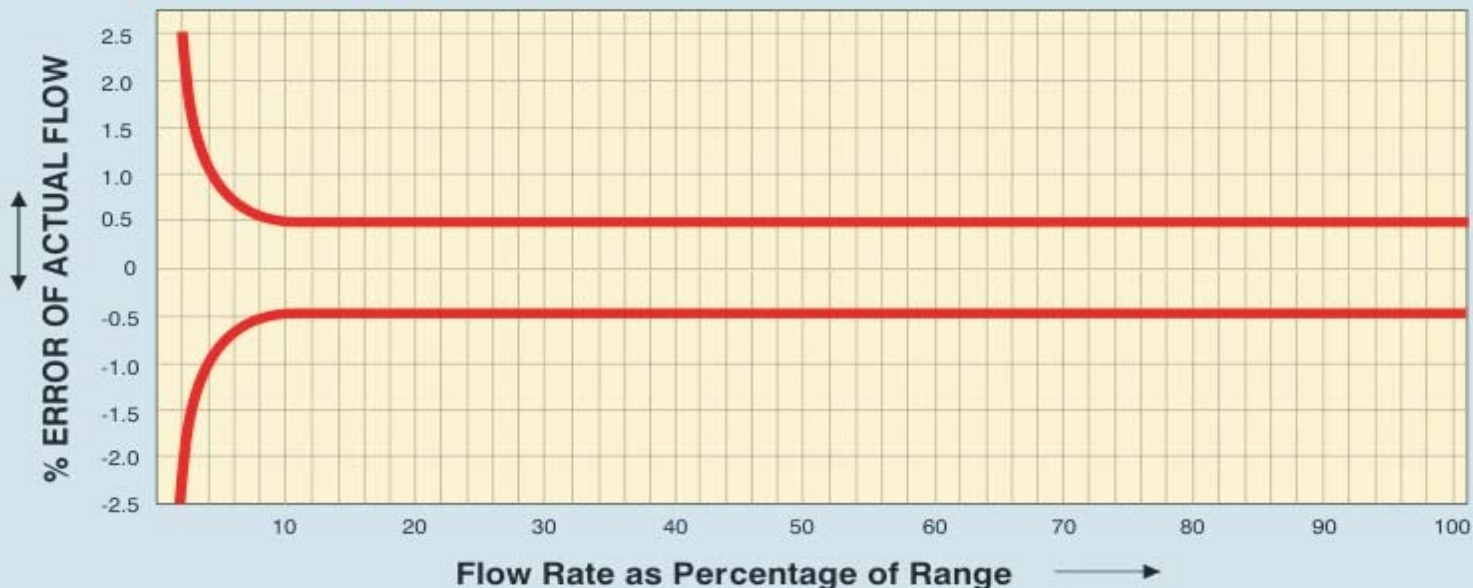
PRINCIPLE ADVANTAGES :

1. Robust, rugged, welded steel/stainless steel construction withstanding to IP65.
2. Very much suitable for submerged or buried application.
3. No Pressure Drop across the sensor, being full bore construction.
4. Measurement independent of un-dissolved solids.
5. Long lasting Ebonite rubber lining gives long life of sensor.
6. End connection flanges as per customer's Requirements.
7. Much better accuracy compared to other types of met.

APPLICATIONS :

1. **Sewage Treatment :**
Waste water measurement, sludge measurement etc.
2. **Effluent Treatment :**
Untreated as well as treated effluent measurement.
3. **Industrial utility Management :**
Measuring water consumed by each plant. Water audit.
4. **Water Supply Schemes :**
Raw water as well as treated water measurement.
5. **Sugar industries & Distilleries :**
Measurement of imbibitions water, raw juice etc. Measurement of spent wash, Fermented wash molasses etc.
6. **Automobile Industries :**
Flow measurements of coolant, for radiator efficiency.
7. **Chemical Industries :**
Measurement of acidic, alkaline chemicals, slurries with & without dissolved solids.
8. **Food & Beverages :**
Special end connection like sms union, Triclover clamp, fully SS body, PTFE or PFA liner available.
9. **Boiler Feed Water Measurement.**

TYPICAL ERROR DIAGRAM :



ELECTROMAGNETIC FLOW –METER (FULL BORE)

TECHNICAL SPECIFICATIONS:

METERING TUBE : Sroat 1000 plus

1. Meter Size:	: DN 10 to DN 350 For higher sizes refer our catalog for Mega-Sroat Cat No. : Fc-FBE-08
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 Liner : 0 -150°C max. Rubber Liner : 0 - 90° max.
4. Ambient Temperature Range	: 0 - 50°C
5. Material	Pipe : SS 304 [non-magnetic] Electrode : SS 316 /SS316L/Hastelloy C/ Ta/Ti./Any Other Liner : PTFE / Hard Rubber / Neoprene/Soft Rubber/ PFA. Flanges : MS-CS / SS 316 / SS 316L / SS 304. Body Material : MS-CS / SS 304 / SS 316.
6. Flange Standards	: ANSI / DIN / BS/Any Other.
7. Power Supply to field coils	: Pulsed DC

FLOW RATE TABLE : Flow Rate at V = 1 m/s

DN	M3/Hr.	LPM	LPS
10	0.282	4.712	0.078
15	0.636	10.602	0.176
20	1.130	18.849	0.314
25	1.767	29.452	0.490
32	2.895	48.254	0.804
40	4.523	75.398	1.256
50	7.068	117.809	1.963
65	11.945	199.098	3.318
80	18.095	301.592	5.026
100	28.274	471.238	7.853
125	44.178	736.310	12.271
150	63.617	1060.287	17.671
200	113.097	1884.955	31.415
250	176.714	2945.243	49.087
300	254.469	4241.150	70.685
350	346.356	5772.608	96.210

TRANSMITTER SROAT 1000 A plus

1. Mounting	: Remote Mounted (standard) Integral mounted (on request)
2. Min. Media Conductivity	: 5 μ s / cm (for lower conductivities consult factory)
3. Signal Output	: 1) 4-20 ma dc isolated in max. 600 ohms 2) Pulsed Output : 1pulse per hour to 100,000 pulse/hour(Open collector 3 wire), Programmable. 3) Status Output : Empty Tube Detection.
4. Flow Velocity Range	: 0.1 m/s to 10 m/s.
5. Accuracy	: \pm 0.5% of reading (at ref. conditions) between 100% to 10% of calibrated range.
6. Ref. Conditions	: Power Supply nominal +/- 10%. Temperature 27°C \pm 2°C
7. Repeatability	: \pm 0.2% of reading
8. Ambient Temperature	: 0 to 50°C
9. Temperature Drift	: \pm 0.015% per °C max.
10. Humidity	: 90% R. H. max. non condensing
11. Housing	: Al. Die cast.
12. Power Supply	: 230 V ac/ 110 V ac, 50HZ/ 24 V dc.
13. Damping	: Adjustable from 5 to 30 Secs.
14. Cable Entries	: 4 no. For Remote Amplifier 2 no. For Integral Amplifier PG11 / 1/2" NPT / 1/2" BSP
15. Ingress Protection	: IP-65
16. Local Display	: 16 X 2 Line LCD for instantaneous flow rate , Forward & Reverse total flow.
17. PC. Communication	: RS232 or RS 485 (Protocol MODBUS RTU) Baud rate -19200 / 9600 / 4800 / 2400 –Programmable
18. Data Logging	: Time Stamped 5000 /10000 Number of readings can be logged. (One reading per hour)
19. GSM Modem Support	: Online data can be transferred by using GSM modem.

How to Calculate Velocity :

Please Refer the Velocity Table where flow rates at 1 meter/sec. Velocity through different sizes of flow meter are given. In general through large size of meters the velocity taken is between 1 to 3 meters/sec. This also is suitable velocity range because Manas meters work comfortably up to 1m/sec. full scale velocity.

Sample Calculation for Velocity in Flow Tube :

Please Refer the Velocity Table where flow rates at 1 meter/sec. Velocity through different sizes of flow meter are given. In general through large size of meters the velocity taken is between 2 to 3 meters/sec.

Given flow rate by customer :300 m³/hr.(Say)

Expected Velocity through Flow meter :2.5m/Sec. (Approximately)

Flow rate at 1 meter/Sec. Velocity : 300/2.5=120m³/hr.

Referring Velocity Table, DN200 is having 113.097 m³/hr. flow rate at 1 m/sec. velocity.

We get velocity for given flow rate through DN200 :300/113.097=2.65m/sec.

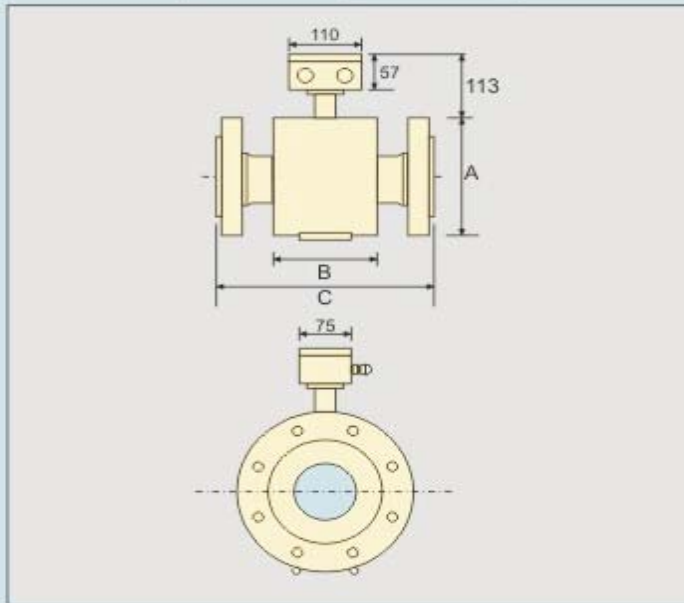
This is suitable velocity. Thus in this case DN200 is suitable meter.

Alternately, Suppose the given line size is 250NB. Flow rate is 300 m³/hr. Velocity through DN 250 flow meter, V=300 m³/hr./176.714=1.69m/s. Where, 176.714 is the flow rate in m³/hr., Specified for 1meter velocity through DN250 meter as per the above velocity table. This is near to our requirement of 1.5 meters/sec. This way you may find the velocity in the given line/flow meter for given flow rate. Or you may find suitable line size for given flow rate.

Meter Dimensions (mm)

Table For Meter Dimensions SROAT 1000 plus (mm)

DN (mm)	A	B	C
10,15	88.9	76	200
20	98.4	76	200
25	107.9	100	200
32	117	100	200
40	127	105	200
50	152	99	200
65	177	92	200
80	190	89	200
100	228	135	250
125	254	135	250
150	279	170	300
200	343	205	350
250	406	240	200
300	482	290	500
350	533	290	550



ORDERING INFORMATION :

FLOW METER SIZE			
DN 10	: 3/8"	DN 80	: 3"
DN 15	: 1/2"	DN 100	: 4"
DN 20	: 3/4"	DN 125	: 5"
DN 25	: 1"	DN 150	: 6"
DN 32	: 1 1/4"	DN 200	: 8"
DN 40	: 1 1/2"	DN 250	: 10"
DN 50	: 2"	DN 300	: 12"
DN 65	: 2 1/2"	DN 350	: 14"

LINER MATERIAL	
LM01	: PTFE
LM02	: Neoprene
LM03	: Soft Rubber
LM04	: Hard Rubber
LM05	: PFA
LM06	: Any Other

ELECTRODE MATERIAL	
EM01	: Stainless Steel 316
EM02	: Stainless Steel 316L
EM03	: Hastelloy C 4
EM04	: Hastelloy C 22
EM05	: Hastelloy C 276
EM06	: Tantalum
EM07	: Titanium
EM08	: Any Other

FLANGE / END CONNECTION STANDARDS	
FS01	: DIN PN 16
FS02	: DIN PIN 25
FS03	: DIN PIN 40
FS04	: ANSI 150, B 16.5
FS05	: BS 10, Table E
FS06	: BS 10, Table F
FS07	: Any Other

FLANGE / END CONNECTION MATERIAL	
FM01	: Mild Steel / Carbon Steel
FM02	: Stainless Steel 304
FM03	: Stainless Steel 316
FM04	: Stainless Steel 316L

BODY MATERIAL	
BM01	: Mild Steel
BM02	: SS 304
BM03	: SS 316
BM04	: SS 316L

FLOW TRANSMITTER - Sroat 1000 A plus	
FT01	: Integral
FT02	: Remote

POWER SUPPLY	
01	: 110 V AC ± 10%, 50 Hz
02	: 230 V AC ± 10%, 50 Hz
03	: 24 V AC ± 10%

DN 25 LM01 EM01 FS01 FM01 BM01 FT01 02

Sample Order Code

Due to continuous development specifications are subject to change without prior notice

Manufactured By

Authorised Distributor



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