

# manas

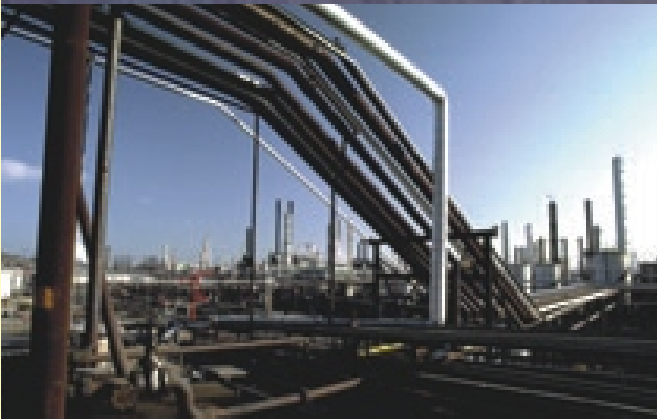
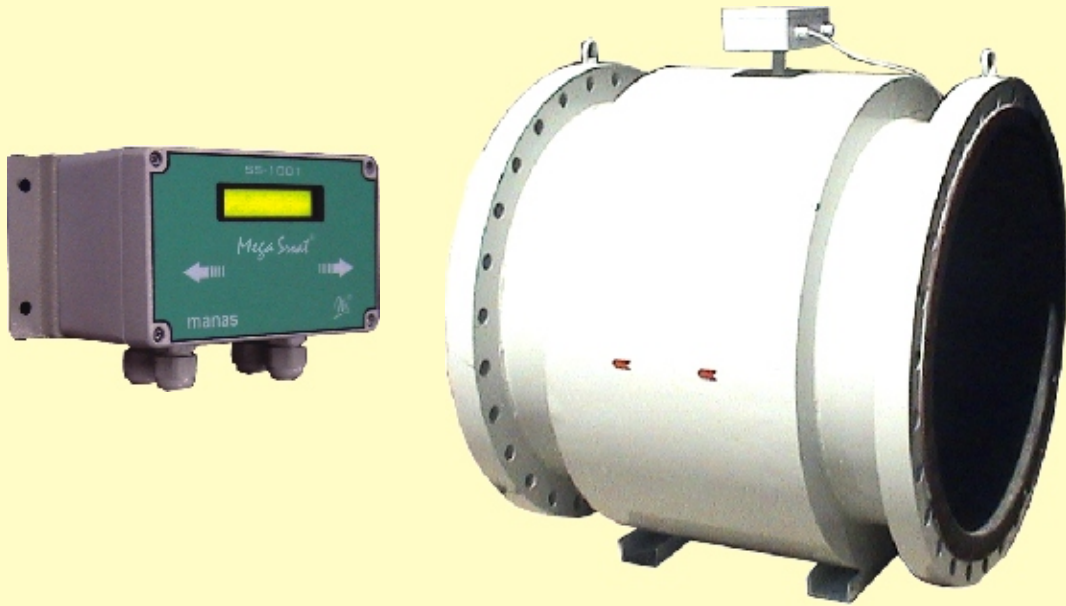
a name that spells trust....

AN ISO 9001: 2008 COMPANY



## We Measure Flow

# MEGA SROAT



## SERIES: MEGA SROAT AND SROAT 1000A / 1000 A+

### INTRODUCTION :

Series MEGA SROAT is offering large sized electromagnetic flow meters introduced by manas. The sizing ranges from 400mm diameter to 1600mm diameter. These flow meters are very accurate (Typically 0.5% of actual flow rate). Hard ebonite rubber lining makes these meters suitable for measurement of Raw Water containing even abrasive sand and quartz particles, mud etc. and still delivering long life. This Series is also suitable for sewage applications.

### PRINCIPLE OF OPERATION:

The MEGA SROAT series of 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.

### PRINCIPAL ADVANTAGES:

- Robust, rugged, welded steel/stainless steel construction withstanding to IP68.
- Very much suitable for submerged or buried application.
- No Pressure Drop across the sensor, being full bore construction.

- Measurement independent of un-dissolved solids.
- Long lasting Ebonite rubber lining gives long life of sensor.
- End connection flanges as per customer's Requirements.
- Much better accuracy compared to other types of meters in its class.

### APPLICATIONS :

- 1) Extremely useful for large water supply schemes.
- 2) Suitable for Sewage measurements
- 3) Municipal water measurement schemes.

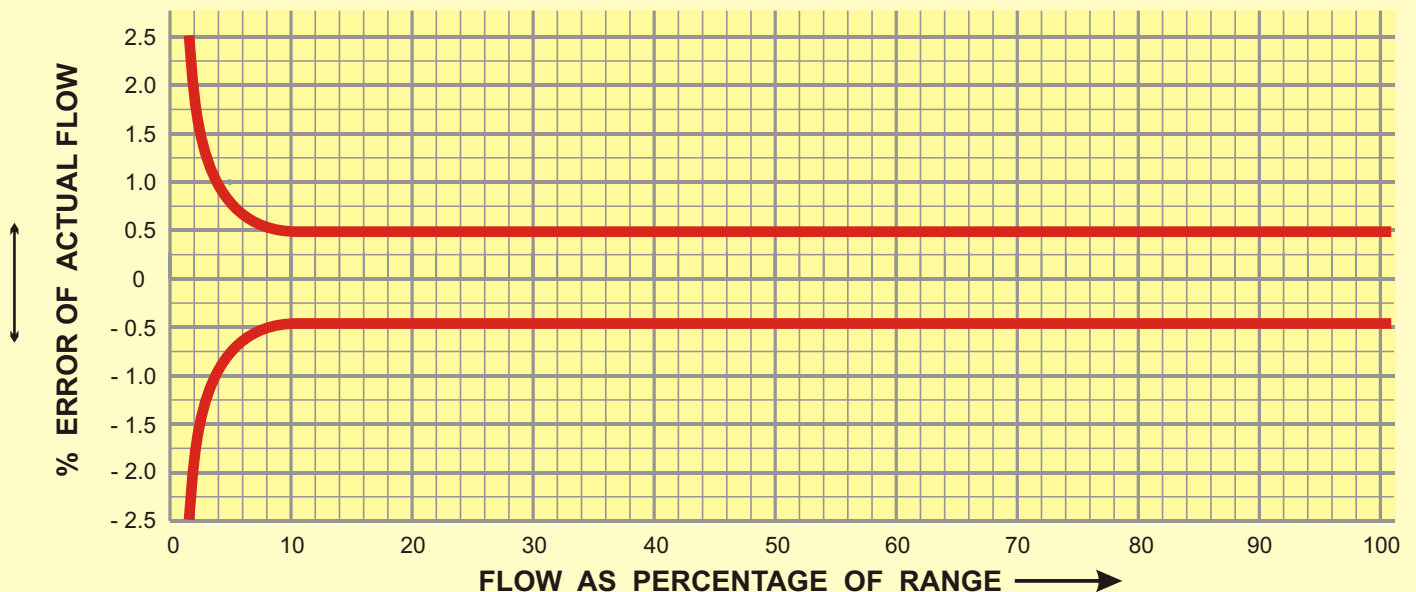
### \*TECHNICAL SPECIFICATIONS:

#### A) PRIMARY FLOW SENSOR : - Mega Sroat

1. Meter Size : DN 400 to DN 1600
2. Media Pressure : PN 10
3. Media Temperature : 0-80°C max
4. Operating Ambient : 0 - 60 °C  
Temperature
5. **Material of construction**

Pipe	: SS 304 [ non magnetic ]
Electrodes	: SS 316/SS 316L/ or others as per compatibility with service liquid.
Liner	: Hard Ebonite rubber
Flanges	: CS/SS 316/ SS 304/ SS 316 L
Coil Housing	: CS (Polyurethane Painted) / SS304/ SS 316
Earth Electrodes	: SS 316/SS 316L / Hastalloy C / or others
Body Material	: CS/SS 316/ SS 304
6. Flange Standard : ANSI /BS/AWWA/Any other as per customer's Specs.
7. Power Supply to Field Coils : Pulsed DC
8. Ingress Protection : IP-68

## ERROR DIAGRAM



## TRANSMITTER SROAT 1000A PLUS / SROAT 1000A

### Common Specs. to both transmitters :

1. Type : Integral mounted [std.]  
Remote Mounted  
[on request]
2. Min. Media Conductivity :  $\geq 5 \mu\text{s/cm}$  [ for lower  
conductivities consult  
factory]
3. Flow Velocity Range : 0.1 m/s to 10 m/s
4. Accuracy :  $\pm 0.5\%$  of reading [at ref.  
conditions] between  
100% to 10% of  
calibrated range.  
 $\pm 0.75\%$  of reading for  
flow rate between 10 to  
5% [refer accuracy graph]
6. Ref. Conditions : Power supply nominal.  
Temperature  $27^\circ\text{C} \pm 2^\circ\text{C}$
7. Repeatability :  $\pm 0.2\%$  of reading
8. Ambient Temperature : 0 -  $50^\circ\text{C}$
9. Temperature Drift :  $\pm 0.015\%$  per  $^\circ\text{C}$  max.
10. Humidity : 90 % R. H. max. non  
condensing
11. Material of Housing : Al. Die cast.
12. Power Supply : 230 V ac/ 110 V ac  
50 Hz/24 Vdc.
13. Damping : Adjustable from 5 to 30 Secs.
14. Cable Entries : 4 no. For remote amplifier  
2 no. For integral amplifier  
 $\frac{1}{2}$ " NPT /  $\frac{1}{2}$ " BSP /  
PG11 [Female]
15. Ingress Protection : IP-67

### Transmitter : Sroat 1000 A plus

- 1 Display(Optional) : 16 Character x 2line LCD for  
instantaneous flow rate and  
cumulative flow.
- 2 Pulse Output : 1 pulse per hour to 100,000  
pulses \ hour,  
(Open collector 3 Wire),  
programmable.
- 3 Comm. Port : RS 232 or RS 485 with  
MODBUS RTU compatible to  
serial printer.
- 4 Data Logging : Up to 5000 readings can be  
stored on real time base.  
These readings can be  
viewed latter using a  
keyboard or may be  
printed.

### Transmitter : Sroat 1000 A

1. Signal Output : 4-20 mA dc isolated in max.  
600 ohms
2. Coil Excitation Frequency : 12.5Hz/6.25 Hz
3. Local Display : a)  $3 \frac{1}{2}$  digit LCD calibrated  
in % or engineering units  
for flow rate indication  
b) 8 digit LCD non  
resettable type for totalised  
quantity.

### FLOW RATE TABLE :

Flow rate at  $v = 1\text{m/s}$

DN	m3/Hr.	LPM	LPS	MLD	DN	m3/Hr.	LPM	LPS	MLD
400	452.389	7539.816	125.664	10.8	800	1809.556	30159.26	502.654	43.429
450	572.555	9542.580	159.043	13.7	900	2290.219	38170.32	636.172	54.965
500	706.858	11780.960	196.349	16.9	1000	2827.431	47123.85	785.398	67.858
600	1017.875	16964.590	282.743	24.4	1200	4071.501	67858.34	1130.972	97.716
700	1385.441	23090.690	384.845	33.2	1400	5541.765	92362.75	1539.379	133.002
750	1590.430	26507.170	441.786	38.1	1600	7238.223	120637.1	2010.618	173.717

### How to calculate velocity.

Pl. 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 :

Pl. 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 m/sec.

Given flow rate by customer :3000 m3/hr. (Say)

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

Flow rate at 1 meter/sec. velocity :  $3000/2.5 = 1200$  m3/hr.

Referring Velocity table, DN700 is having 1385.441 m3/hr. flow rate at 1 m/sec. velocity.

We get velocity for given flow rate through DN700 :  $3000/1385.441 = 2.165$  m/sec.

This is suitable velocity. Thus in this case DN700 is suitable meter.

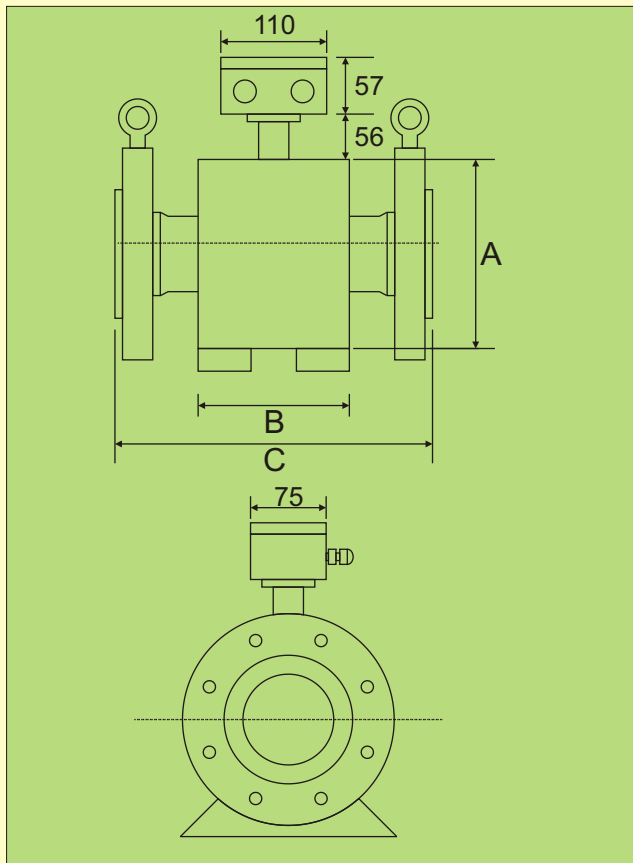
Alternately, Suppose the given line size is 800 NB. Flow rate is 3000 m3/Hr. Velocity through DN 800 flow meter,  $V = 3000\text{m}^3/\text{hr.}/1809.556 = 1.658$  m/s. Where, 1809.556 is the flow rate in m3/hr., specified for 1 meter velocity through DN800 meter as per the above velocity table. This 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 /or flow meter size for given flow rate.

## ORDERING INFORMATION

Table for Meter Dimensions MEGA-SROAT(mm)			
DN(mm)	A	B	C
400	600	325	600
450	635	415	650
500	700	500	700
600	810	550	800
700	850	700	900
750	910	750	950
800	1000	800	1000
900	1085	800	1100
1000	1200	800	1200
1200	1410	900	1400
1400	1600	1000	1400
1600	1840	1100	1600

### Note -

1. All dimensions are in mm.
2. Dimension 'C' is without earth rings.
3. Dimensions are with terminal box.



FLOW METER SIZE	
DN 400 : 16"	DN 800 : 32"
DN 450 : 18"	DN 900 : 36"
DN 500 : 20"	DN 1000 : 40"
DN 600 : 24"	DN 1200 : 48"
DN 700 : 28"	DN 1400 : 56"
DN 750 : 30"	DN 1600 : 64"

LINER MATERIAL
LN-01 : Hard Rubber
LN-02 : Soft Rubber
LN-03 : Neoprene Rubber

ELECTRODE MATERIAL
EL-01 : SS316
EL-02 : SS316L
EL-03 : HASTELLOY 'C

FLANGE/END CONNECTION STANDARDS
FCS-01 : AWWA : CLASS D
FCS-02 : ANSI : CLASS 150
FCS-03 : BS-10 : TABLE F-UPTO DN 600
FCS-04 : ANY OTHER

FLANGE MATERIAL
FM-01 : Carbon Steel
FM-02 : Mild Steel
FM-03 : Any Other

BODY MATERIAL
BM-01 : Mild Steel
BM-02 : SS304
BM-03 : SS316
BM-04 : SS316L

FLOW TRANSMITTER TYPE
FTT-01 : Blind
FTT-02 : With Display

FLOW TRANSMITTER MOUNTING
FT-01 : Integral
FT-02 : Remote (wall)

POWER SUPPLY
01 : 110 VAC ± 10%, 50 Hz
02 : 230 VAC ± 10%, 50Hz

DN 600 LN 02 EL 03 FCS 01 FM 01 BM 01 FTT02 FT02 02

\* Due to continuous development specifications are subject to change without prior notice.

## manas microsystems pvt. ltd.

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