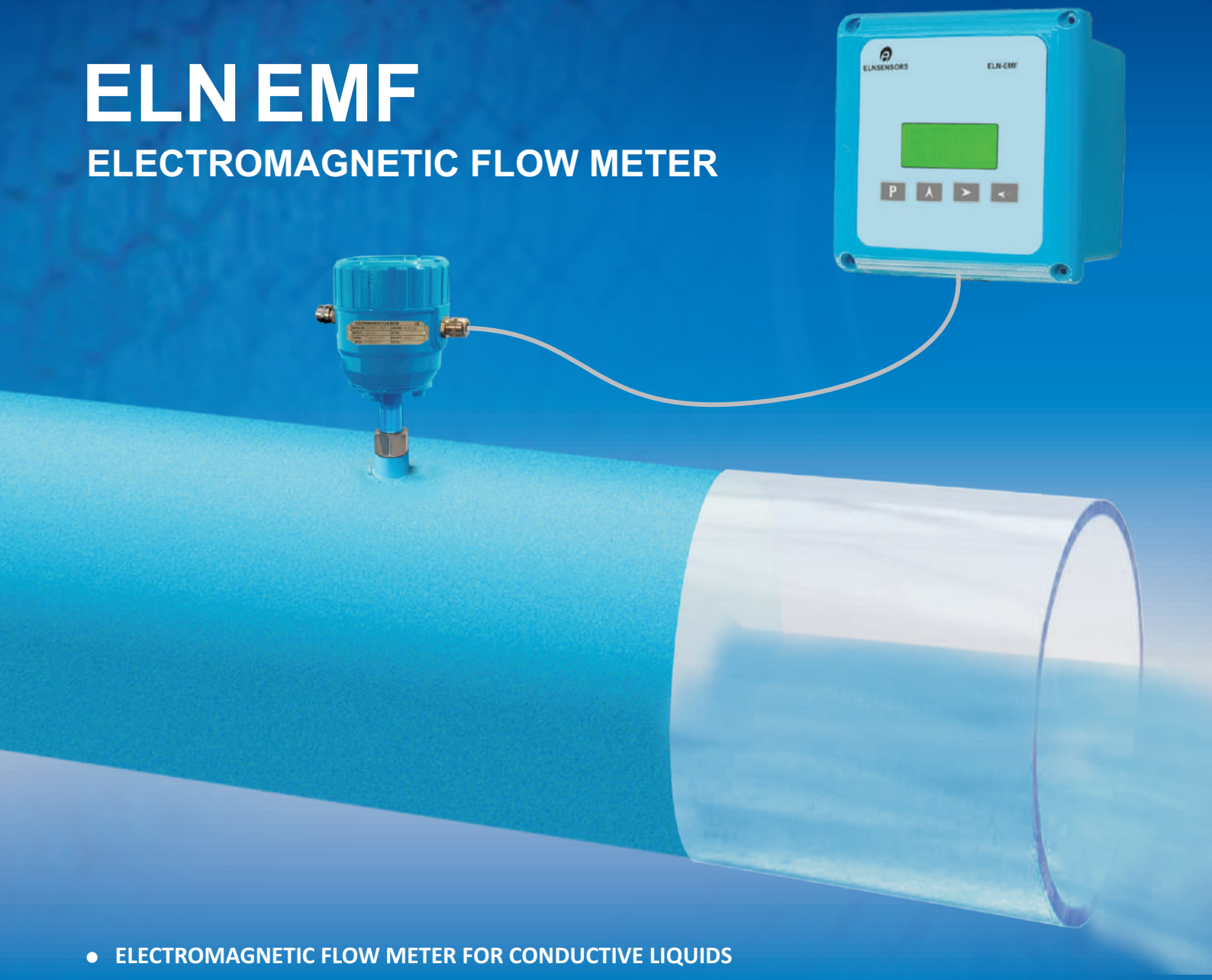
ELN EMF

ELECTROMAGNETIC FLOW METER



- ELECTROMAGNETIC FLOW METER FOR CONDUCTIVE LIQUIDS
- FLOW MEASUREMENT OF COMPLETELY AS WELL AS PARTIALLY FILLED PIPE LINES
- 230V AC / 24V DC / SOLAR POWERED
- WET CALIBRATION AT IN-HOUSE NABL (ILAC) ACCREDITEDFLOW CALIBRATION LABORATORY
- OVERFLOW / HIGHFLOW / LOWFLOW ALARM CONTACTS
- IOT ENABLED DEVICE
- WIRED OR WIRELESS SIGNAL TRANSMISSION
- COST-EFFECTIVE SINGLE INSTRUMENT FOR MULTIPARAMETER MEASUREMENTS

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Measuring Principle

The ELNEMF is an Electromagnetic Flow meter used for measurement Flow & Level of Conductive Liquids.

Level Measurement:
Level probe is guided with SS tubes arranged in flow tube to sense the level of fluid.

Flow Measurement:
The flow measurement method is based on Faraday's Law of Electromagnetic Induction.

An electrically conductive fluid flows inside an electrically insulated pipe through a magnetic field. This magnetic field is generated by a current flowing through a pair of field coils.
Inside of the fluid a voltage V is generated:
$V = v * k * B * D$
in which:

v = mean flow velocity k = factor correcting for geometry
B = magnetic field strength D = distance between electrodes
V = Voltage Generated

Calculation of Partial / Filled Pipe Flow:
The flow rate

	Q	=	A* V
Where	A	–	Area of the liquid section
	V	–	Velocity of the Liquid

Calibration:
ELNEMF is manufactured and calibrated for flow and pressure measurements in NABL Accredited (ISO17025) calibration lab for line sizes starting from 80NB to 200NB.

Technical Specifications

Measuring Parameter	Engineering Unit
Flow	m^3/hr, MLD

Construction	
Flow Tube	80NB to 200NB Flanged as per ASA150#B16.5
Master Electronics	Remote Mounted measurement electronics accepts signal from flow tube

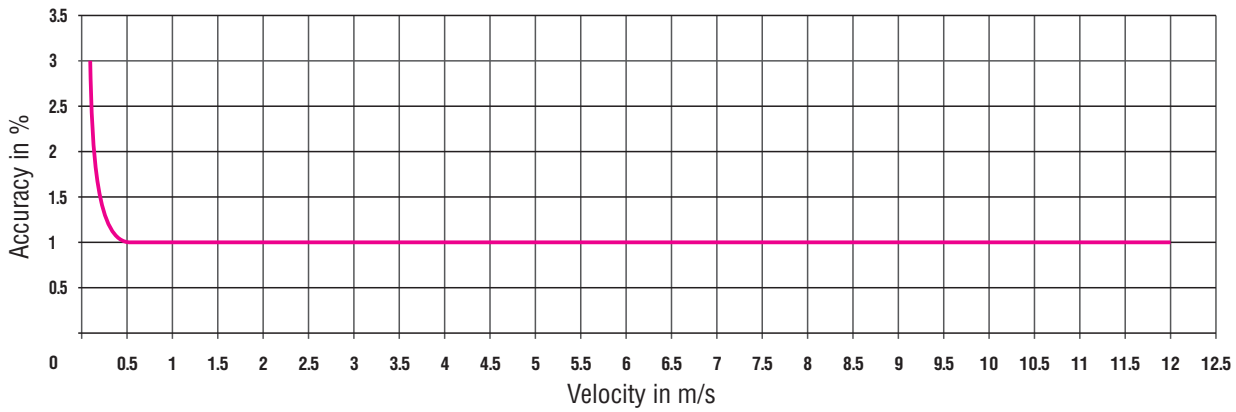
Process Conditions	
Process temperature	–20 to +100°C or –20 to +250°C
Ambient temperature	0 to 65°C
Storage temperature	0 to 65°C
Measurement Range	0.3 to 6 m/s or 12 m/s
Pressure Range	0 to 10 kg/cm^2 Gauge
Electrical Conductivity	>10 µS/cm
Permissible solid content	< 20%
Density	< 1.15 kg / m3

Flow Accuracy

ELNEMF is calibrated by direct volume comparison. The wet calibration at our ISO 17025 NABL Accredited Calibration Laboratory validates the performance of flow meter under laboratory condition against accuracy limits.

Laboratory Reference Conditions	Media : Water
	Temperature : 15 to 40 °C
	Operating Pressure : 0.1 to 3.6 Bar Gauge
	Upstream Length : 10D
	Downstream Length : 5D
Accuracy of Fully Filled Pipe	⩽+/– 0.5% +(+/–5mm per sec.) for Velocity 0.3 m/s to 6 m/s or 12 m/s
Accuracy of Partially Filled Pipe Line	⩽+/– 1% +(+/–5mm per sec.) for Velocity 0.3 m/s to 6 m/s or 12 m/s
Partially Flow Measurement	From 25% to 100% of Fluid Level of in closed pipes

Graph



Electrical Parameters

Power Supply	24V DC / 100 to 230V AC (50/60Hz)
	Solar Powered (20Watt, 24V DC)
Power Consumption	20W

Master Electronics

Ingress Protection	Weatherproof IP67
Power Supply	24V DC / 100 to 230V AC (50/60Hz)
	Solar Powered (20Watt, 24V DC)
Power Consumption	Less than 20W
MOC of Enclosure	Aluminum Dia Cast PU Painted / SS316
Electrical Connection	M 20 x 1.5 (other on request) / Circular Metal Connector
Output 1	4 to 20mA
Output 2	Pulse Output (Open Collector type) for Flow Measurement
Communication Output	RS485 (MODBUS RTU) / GSM / GPRS

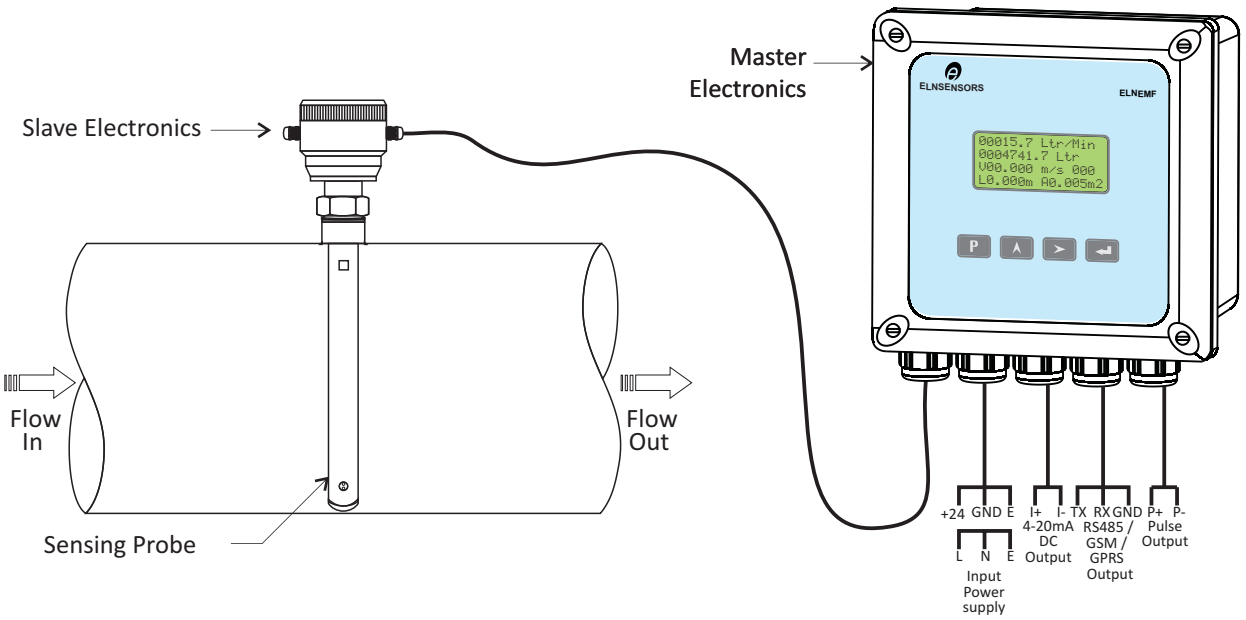
Flow Tube

Line Size	80 NB to 200 NB
Material of Construction	2) Flange – MS, CS, SS316, SS304
	3) Electrode – SS316L, Hastelloy C, Platinum, Tantalum, Titanium
	4) Coil Housing – MS, SS304, SS316
Process Connection	Flanged
Media Conductivity	>10 µS/cm
Velocity	0.5 to 6 m/s or 12 m/s
Viscosity	200cp (max.)
Mounting	In–Line Horizontal / Vertical
Ambient Conditions	Temperature –20 to 75°C / Humidity 5 to 95% non condensing

Note:
1) Suitable for clean conductive liquid having solid particles not more than 100 microns in size.
2) For slurry & other chemical applications, please consult factory.
3) ELNEMF will be supplied with following components:
   a)Master Electronics
   b)Flow Tube

GENERAL ARRANGEMENT DRAWING

ELNEMF : MAINS / 24V DC POWERED



ELNEMF : SOLAR POWERED

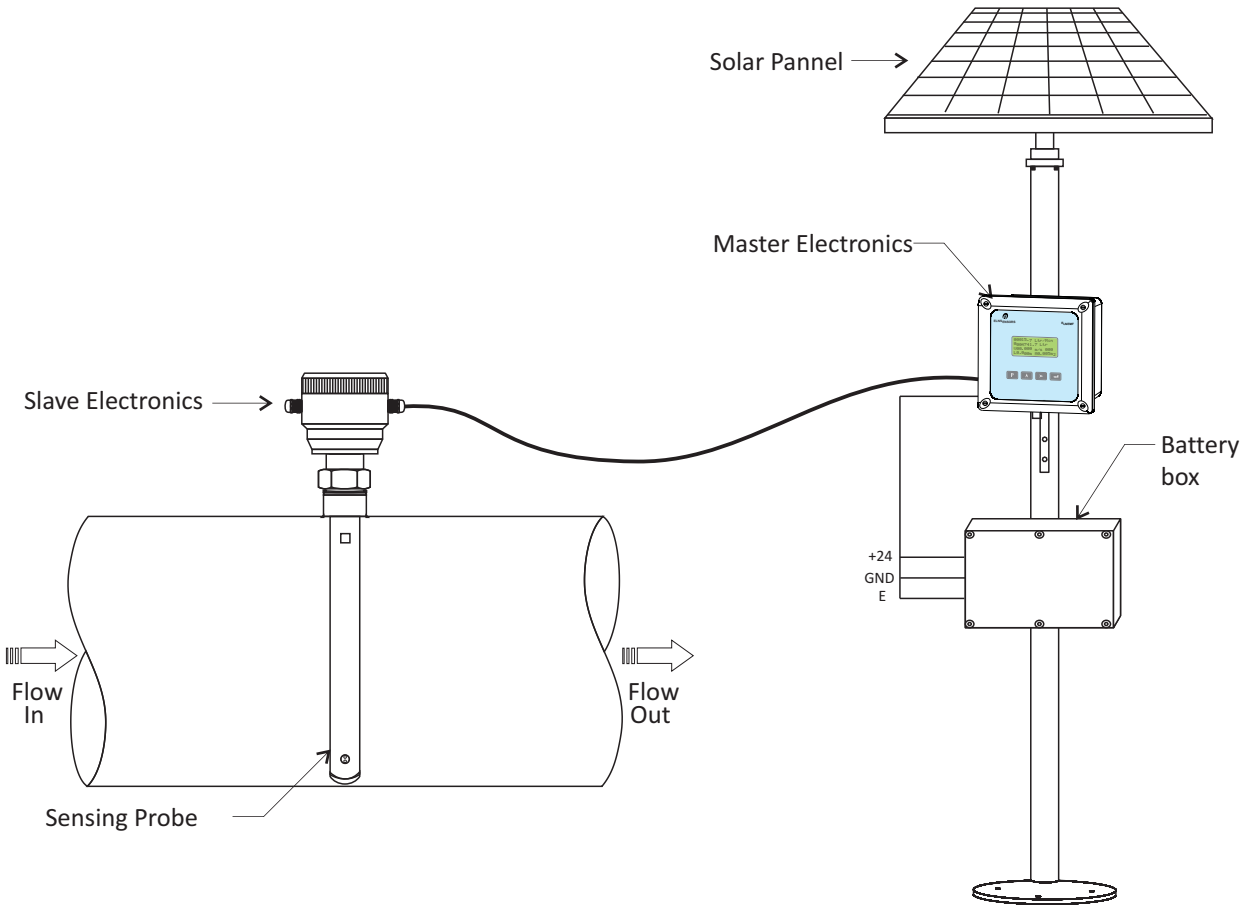


TABLE : Dimensional Details (Flow Meter with ANSI 150 Flange)

Line Size		Flange Diameter D (mm)	Diameter of Raised Face R (mm)	Diameter of Bolt Hole Circle DBC (mm)	Diameter of Bolt Hole (mm)	No. of Holes	Thickness of Flange	Housing OD (mm)	Flange to Flange Distance (FD) (mm)	Flow Range (m^3/hr) for Velocity 0.3m/s to 6m/s	
Inch	NB									Min.	Max.
3”	80	190.5	127.0	152.4	19.0	4	23.8	205	200	5.42	108.573
4”	100	228.5	157.2	190.5	19.0	8	23.8	245	260	8.48	169.646
5”	125	254.0	185.7	215.9	22.2	8	23.8	265	260	13.25	265.071
6”	150	279.4	215.9	241.3	22.2	8	25.4	285	310	19.085	381.703
8”	200	342.9	269.9	298.4	22.2	8	28.6	355	360	33.929	678.584

Note : Flange to flange distance (FD) Tolerance : 1) 3”(80NB) to 6”(150NB) : +/–3mm 2) 8”(200NB) : +/–5mm

- All dimensions are in ‘mm’
- Typical mounting dimensions are for reference only.

- Wet Calibrated at IEC/ISO/EN17025 Accredited Calibration Laboratory.
- Flow meter should be selected with the help of Nomograph (recommended full scale velocity).
- Flow indication of 6 digit max. up to 999999.

Product Ordering Information : Order Code for Flow Transmitter

Sample Order Code : TX1 | A1 | B2 | C1 | D1 | E1 | F2 | G1

Parameter		Code	Description
TX	Electronics Transmitter	TX1	Master + Slave Electronics (80NB to 200NB)
A	Power Supply	A1	90 to 250 VAC
		A2	24V DC
		A3	Solar Powered
B	MOC Electronics Enclosure	B1	Aluminium Die Cast
		B2	SS316
C	Electrical Connection	C1	M20 *1.5 F
		C2	½ Inch NPT F
		CY	Other
D	Output 1	D1	4 to 20 mA
		DX	NA

Parameter		Code	Description
E	Output 2	E1	Pulse (Open Collector Type)
		EX	NA
F	Alarm Relay Output	F1	1 Relay Output
		F2	2 Relay Outputs
		FX	NA
G	Communication Output (Any One)	G1	RS485 (MODBUS RTU)
		G2	GSM
		G3	GPRS
		GX	NA

Note :
- Accuracy defined at Lab Conditions.
- Relay & Alarms are programable.
  Relay 1 is programmable for High / Low /Batch.
  Relay 2 is programmable for High / Low.

Product Ordering Information : Order Code for Flow Tube

Sample Order Code : FT 80 | K2 | L1 | M2 | N1 | O1 | P1

Parameter		Code	Description	Code	Description
FT	Flow Tube	FT 80	80 NB	FT 150	150 NB
		FT 100	100 NB	FT 200	200 NB
		FT 125	125 NB		
K	Remote Cable Length	K1	5 Meter		
		K2	10 Meter		
		K3	15 Meter		
		K4	25 Meter		
		KY	Other		
L	MOC of Flow Sensor Assembly	L1	ABS Plastic		
		L2	Peek		
M	Sensor Mounting Flange Rating	M1	ANSI 125 B 16.5		
		M2	ANSI 300 B 16.5		

Parameter		Code	Description
N	Sensor Probe MOC	N1	SS316
		N2	Hastelloy C
O	Sensor Electrode MOC	O1	SS316L
		O2	Hastelloy C
		O3	Platinum
		O4	Tantalum
		O5	Titanium
P	ELNEMF Sensor Installation	P1	Fixed Inline
		P2	Hot Retractable

Note :
- Due to our continuous product revisions, design specification and
- model numbers are subject to change without notice.
- To be used for industrial applications.
  For other requirement please consult factory.

Applications

Industrial Water

- Cooling/chilled Water
- Power Plants

Municipal Water

- Raw water intake
- Plant process
  - Chemical Processing
  - Filter Balancing
  - Plant Balancing
  - Back washing
- Plant process
  - Billing
  - Storage Management
  - Pump Station Management
- Water Loss Management
  - District Metering
  - Minimum Night Flow Monitoring
  - PRV flow based modulation

Other Applications

- Raw river water
- Effluent water
- Small & medium diameter of pipework

Quick Questions to suggest you suitable Product Code

- Power Supply : _____
- Line Size : _____
- Flowing Media : _____
- Flow Range
- 1. Minimum : _____
  2. Operating : _____
  3. Maximum : _____
- Process Temperature : _____
- Process Pressure : _____
- Required Outputs : _____
  : _____
  : _____
- Required Quantity : _____

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