

## ELMAG® 200

### MAINS / 24V DC POWERED ELECTROMAGNETIC FLOW METER

#### Features

- Universal Power Supply 90 to 250V AC / 24V DC / Solar Powered
- Suitable for conductive liquids
- Full bore type
- Empty pipe indication
- Material of construction in accordance to process parameters
- Local Indication through LCD Display
- Inbuilt Relay Status output (High / Low / Batch)
- HART Compatible
- Optional pressure measurement along with flow



#### Description

**E**lectronet series ELMAG®-200 are micro-controller based full bore type electromagnetic flow meters specially used for various industrial applications. These flow meters accurately measure the flow rate of conductive liquids and slurries in closed pipes. Due to its simple and rigid design, the flow meter is an obstruction less and maintenance-free instrument in place of conventional mechanical flow measuring devices. The use of 'Pulsed DC' technology offers highest ability and better measuring accuracy in the form of electrical signal 4–20 mA DC linearly proportional to volumetric flow. The instrument is based on Faraday's law of electromagnetic induction. A magnetic field is generated by the instrument in the flow tube. The fluid flowing through this magnetic field generates a voltage that is proportional to the flow velocity. Corresponding electrical output is provided with respect to measuring flow range.

#### Technical Specifications

Media	Liquid (Conductive)	
Conductivity	> 5 $\mu$ S/cm	
Viscosity	200 cp max	
Line Size	15 NB to 3000 NB	
Excitation	Pulsed DC	
Type of Output	Output : 1 (Any one)	1) 4 to 20mA DC 2) 4 to 20mA DC with HART (Generic)
	Output : 2 (Any one)	Pulse (Open Collector Type)
Display	LCD Display – 6 Digit for Flow Rate & 8 Digit for Totalizer Flow	
Engineering Unit	User Programmable (m <sup>3</sup> /hr by default)	
Calibration Range	Wet Calibrated at IEC/ISO/EN17025 Accredited Calibration Laboratory.	
Accuracy	< $\pm$ 0.5% of M.V. ( $\pm$ 5mm /sec) for Velocity Range 0.3 m/s to 6 or 12 m/s	
Linearity	+/- 0.5% of M.V.	
Repeatability	+/- 0.2% of M.V.	
Temperature Coefficient	+/- 0.05% per °C	
Process Temperature	-20 to 85°C max for Rubber Lining & -20 to 220°C for PTFE Lining	

Process Pressure	16 kg/cm <sup>2</sup> max (Higher on request)				
Material of construction	1) Lining – Neoprene / Hard / Ebonite Rubber, EPDM, PFA, PTFE, PU, CERAMIC				
	2) Flange – MS, CS, SS316, SS304				
	3) Electrode – SS316L, Hastelloy C, Platinum, Tantalum, Titanium				
	4) Coil Housing – MS, SS304, SS316				
Power Supply	Option 1 : 90 – 250 V AC, 50 Hz				
	Option 2 : 24 V DC (+/- 10%)				
	Option 3 : Solar Powered 24V DC / Solar Powered 3.6V DC				
Power Consumption	< 10 VA				
Isolation	1.4 KV between Input, Output & Power Supply				
Response Time	Less than 1 Sec.				
Electronics	Integral (Local) / Remote				
Electronic Protection Class	Field Mount Weather Proof IP-67, DIN Standard (IP 54), Flameproof (CMRI IIA IIB Certified)				
Sensor / Flow Tube Protection class	Weather Proof IP-67, IP-68				
Process Connections	ANSI150 flanged, as per table B 16.5 (Other On Requirement)				
Mounting	In-Line Horizontal / Vertical				
Ambient Conditions	Temperature -20 to 75°C / Humidity 5 to 95% non condensing				
Communication Output	Output : 1 (Any one)	RS485 supporting MODBUS RTU Protocol			
	Output : 2 (Any one)	<table border="1"> <tr> <td>1) GSM</td> <td>3) RF</td> </tr> <tr> <td>2) GPRS</td> <td>4) Ethernet MODBUS TCP</td> </tr> </table>	1) GSM	3) RF	2) GPRS
1) GSM	3) RF				
2) GPRS	4) Ethernet MODBUS TCP				
Certification	CE				

Assembly Overview

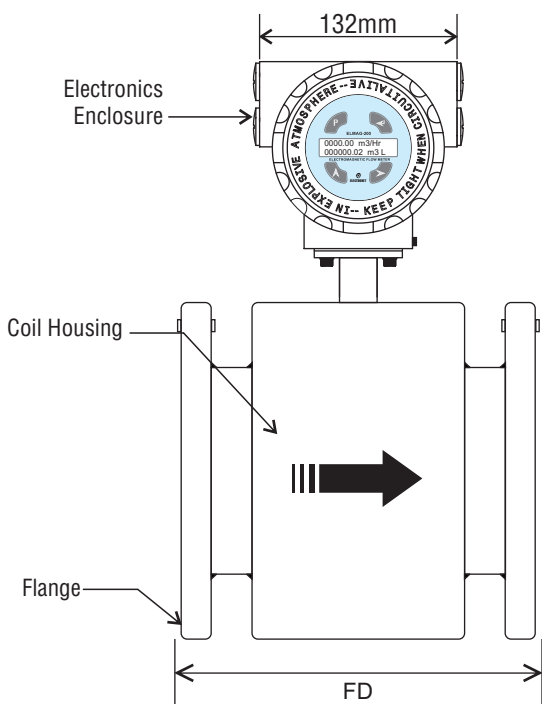


Fig. 1 Front View

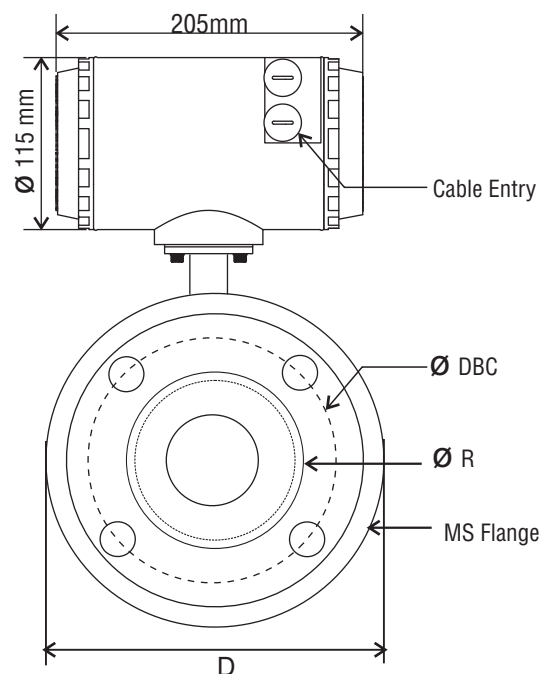


Fig. 2 Side View

TABLE : Dimensional Details Of Flange (as Per ANSI 150 # B-16.5) & Finished Product

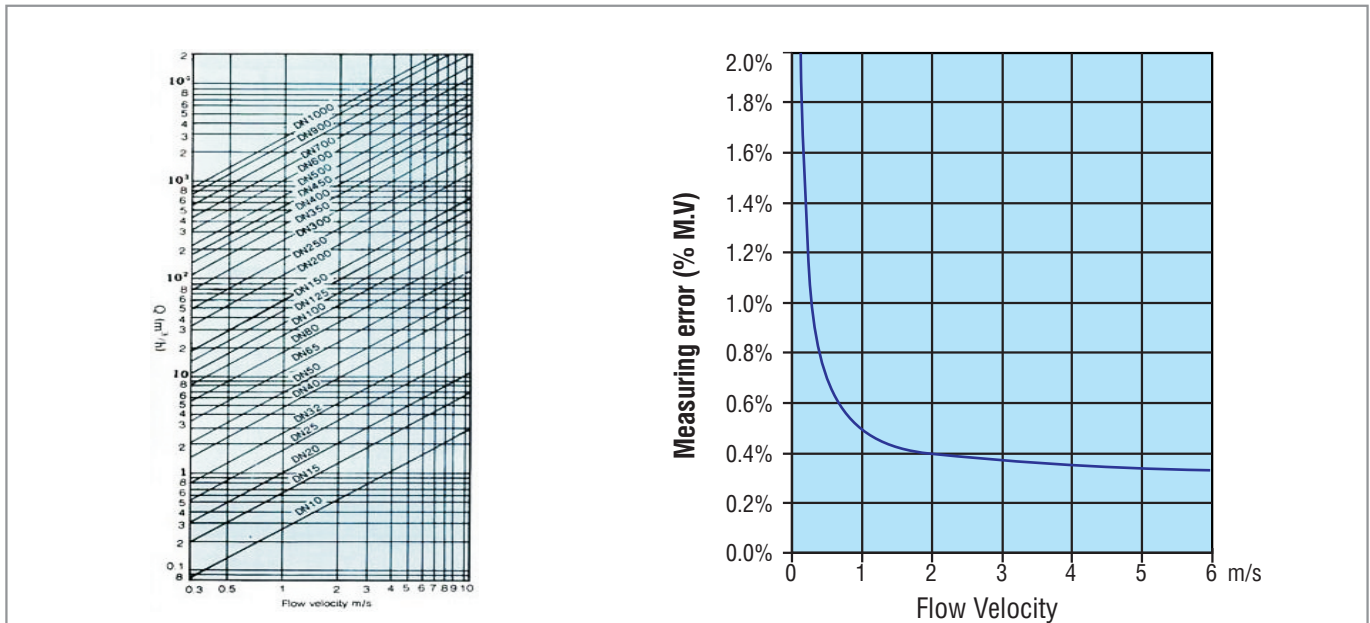
Refer Drg. Fig.1 & 2

Line Size Inch	NB	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 <sup>3</sup> /hr) for Velocity 0.3m/s to 6m/s	
										Min.	Max.
1/2"	15	88.9	34.9	60.3	15.9	4	11.1	125	200	0.19	3.817
3/4"	20	98.4	42.9	69.8	15.9	4	12.7	125	200	0.33	6.785
1"	25	107.9	50.8	79.4	15.9	4	14.3	145	200	0.53	10.602
1 1/4"	32	117.5	63.5	88.9	15.9	4	15.9	155	200	0.86	17.371
1 1/2"	40	127.0	73.0	98.4	15.9	4	17.5	155	200	1.35	27.143
2"	50	152.4	92.1	120.6	19.0	4	19.0	165	200	2.12	42.4115
2 1/2"	65	177.8	104.8	139.7	19.0	4	22.2	185	200	3.58	71.675
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
10"	250	406.4	323.8	361.9	25.4	12	30.2	405	460	53.014	1060.28
12"	300	482.6	381.0	431.8	25.4	12	31.8	485	510	76.340	1526.81
14"	350	533.4	412.7	476.7	28.6	12	34.9	555	562	103.908	2078.16
16"	400	596.9	469.9	539.7	28.6	16	36.5	605	612	135.716	2714.33
18"	450	635.0	533.4	577.8	31.7	16	39.7	605	612	171.766	3435.33
20"	500	698.5	584.2	635.0	31.7	20	42.9	630	612	212.057	4241.15
24"	600	812.8	692.1	749.3	34.9	20	47.6	755	612	305.362	6107.25

Note : Flange to flange distance (FD) Tolerance : 1) 1/2"(15NB) to 6"(150NB) : +/-3mm 2) 8"(200NB) to 24"(600NB) : +/-5mm

- All dimensions are in 'mm'
- For dimensions of line size above 600NB, please consult factory.
- 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.

Flow Nomograph



Applications

Food Industry	Chemical Industry	Atomic Energy	Manufacturing Industry
Automation Industry	Thermal Power Energy	Process Industry	Water Treatment Industry

Product Ordering Information :

Order Code for Flow Transmitter

Sample Order Code : TX 1 A2 B2 C1 D2 EX F2 GX HI I2

Parameter	Code	Description
TX	Electronics Transmitter	TX 1 Field Mount Weather Proof IP67
		TX 3 DIN Standard (IP 54)
		TX 4 Flameproof (CMRI IIA IIB Certified)
A	Power Supply	A1 90 to 250 VAC
		A2 24V DC
		A4 Solar Powered 24V DC
		A5 Solar Powered 3.6V DC
B	MOC Electronics Enclosure	B1 Aluminium Die Cast
		B2 SS316
C	Electrical Connection	C1 M20 *1.5 F
		C2 1/2 Inch NPT F
		CY Other
D	Output 1 (Any One)	D1 4 to 20 mA
		D2 4 to 20 mA HART (Generic)
		DX NA
E	Output 2 (Any One)	E1 Pulse (Open Collector Type)
		EX NA

Parameter	Code	Description
F	Alarm or Relay Output	F1 1 Relay Output
		F2 2 Relay Outputs
		FX NA
<i>(maximum two alarms or two Relays )</i>		
G	Communication Output 1 (Any One)	G1 RS485 (MODBUS RTU)
		GX NA
H	Communication Output 2 (Any One)	H1 GSM
		H2 GPRS
		H3 RF
		H4 Ethernet MODBUS TCP
		HX NA
I	Process Pressure Calibration Range	I1 10 Kg
		I2 20 Kg
		IX NA

Note :

- In case of flameproof version only electronics enclosure is flameproof certified.
- Accuracy defined at Lab Conditions.
- Relay & Alarms are programmable. Relay 1 is programmable for High / Low / Batch.

Order Code for Flow Tube											
Sample Order Code : FT 15 J2 K2 L1 M2 N1 O3 P1 Q1 R2 S1 U1											
Parameter	Code	Description	Code	Description	Parameter	Code	Description				
FT	Flow Tube	FT 15	15 NB	FT 600	600 NB	P	Flow Tube Lining Material	P1	Neoprene Rubber (Above 40 NB)		
		FT 20	20 NB	FT 700	700 NB			P2	Hard Rubber (Above 40 NB)		
		FT 25	25 NB	FT 800	800 NB			P3	Ebonite Rubber (Above 40 NB)		
		FT 32	32 NB	FT 900	900 NB			P4	EPDM (40 to 3000 NB)		
		FT 40	40 NB	FT 1000	1000 NB			P5	PFA (15 to 300 NB)		
		FT 50	50 NB	FT 1100	1100 NB			P6	PTFE (15 to 600 NB)		
		FT 65	65 NB	FT 1200	1200 NB			P7	PU (15 to 400 NB)		
		FT 80	80 NB	FT 1400	1400 NB			P8	Ceramic (15 to 200 NB)		
		FT 100	100 NB	FT 1500	1500 NB			PY	Other		
		FT 125	125 NB	FT 1600	1600 NB			PX	NA		
		FT 150	150 NB	FT 1800	1800 NB	Q	Flange Standard and Rating	Q1	ANSI 150 B16.5		
		FT 200	200 NB	FT 2000	2000 NB			Q2	ANSI 300 B16.5		
		FT 250	250 NB	FT 2200	2200 NB			Q3	ANSI 600 B 16.5		
		FT 300	300 NB	FT 2400	2400 NB			Q4	DIN PN 10 EN 1092-1		
		FT 350	350 NB	FT 2600	2600 NB			Q5	DIN PN 16 EN 1092-1		
		FT 400	400 NB	FT 2800	2800 NB			Q6	DIN PN 25 EN 1092-1		
		FT 450	450 NB	FT 3000	3000 NB			Q7	DIN PN 40 EN 1092-1		
		FT 500	500 NB					Q8	IS 1538		
		Q9	BS 10 Table D					Q10	BS 10 Table E		
		Q11	BS 10 Table H					Q12	AWWA Table D		
Q13	AWWA Table F			QY	Other						
QX	NA			R	Material of construction - Flow Tube	R1	SS304				
			R2			SS316					
			RY			Other					
M	Process Connection	M1	Threaded (15 to 50 NB)			S	Material of construction - Electrode	S1	SS316L		
		M2	Flanged (15 To 3000 NB)					S2	Hastelloy C		
		M3	Triclover (15 to 100 NB)					S3	Platinum		
		M4	SMS Union (25 to 100 NB)					S4	Tantalum		
		M5	Compact (Wafer) - 15 to 200 NB Maximum					S5	Titanium		
N	Material of construction - Flange	N1	MS			U	Inline Pressure Sensor	U1	10 Kg		
		N2	CS					U2	20 Kg		
		N3	SS304					UX	NA		
		N4	SS316								
		NX	NA								
O	Material of construction - Coil Housing	O1	MS			Note :					
		O2	SS304			▪ Due to our continuous product revisions, design specification and model numbers are subject to change without notice.					
		O3	SS316			▪ To be used for industrial applications.					
					▪ For other requirement please consult factory.						

**ELECTRONET EQUIPMENTS PVT. LTD.**

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