

## ELECTROMAGNETIC FLOW METER

### EMF200

#### Features

- Excellent measurement repeatability and linearity
- Good reliability and anti-interference performance
- Good pressure resistance sealing ability
- Self diagnosis for empty pipe Detection
- Low pressure loss measurement tube
- Extremely simple operation
- High degree of accuracy and intelligentization

#### Technical data

**Measuring principle :** Electromagnetic flow meter

**Flow range :** see the table (page 5)

**Flow unit :** m<sup>3</sup>/s, m<sup>3</sup>/m, m<sup>3</sup>/h, l/s, l/m, l/h, Gal/s, Gal/m, Gal/h, Kg/s, Kg/m, Kg/h, t/s, t/m, t/h

**Accuracy:** ±0.5% of reading (please see on page 3)

**Reliability :** 0.2%

**Response time :** 0.02s

**Pipe Diameter :** DN15...DN2000

**Velocity range :** 0.01 to 15 m/s

**Conductivity requirement :** >5 µS/cm (20 µS/cm for demineralized water)

**Display :** Monochrome LCD, white backlight; Size: 128 x 64 pixels

**Process Connection :** DIN Flange (Standard)

**Process Connection (option) :** ANSI Flange, JIS Flange and Tri-Clamp

**Pressure resistance :** depend on process connection

**Liquid Temperature :** see the table (page 2)

**Ambient Temperature :** -10...+55°C

**Ambient Pressure :** 86...106 kPa

**Relative Humidity :** 5...90 %RH

**Signal output :** Pulse, 4-20mA, RS485

**Power Supply :** 85...245Vac, 22...24Vdc or Lithium battery

**Power consumption :** Max. 15W

**Housing material :** Carbon steel (Option : 304Stainless Steel)

**Transmitter material :** painted die cast aluminum

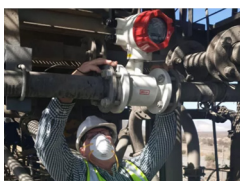
**Cable material :** Polyurethane

**Cable gland :** M20 x 1.5, polyamide

**Lining material :** (please see on page 2)

**Electrode material :** (please see on page 2)

**Protection type :** IP68 (Body), IP65 (transmitter)



#### Medium



Waste water



Water



Chemical - base /acids



Beverage

\*Note: Furthermore, these materials that are shown, please do not hesitate to contact us for consulting

#### Application



Tap Water



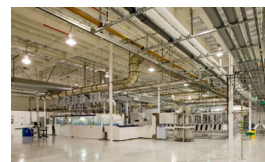
Sewage plant



Chemical plant



Mud pump



Food and drug factories



Print and dyeing mill

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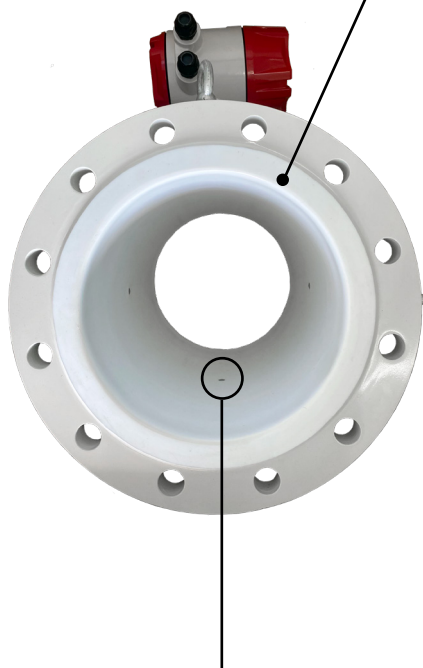
## ELECTROMAGNETIC FLOW METER EMF200

### Electrode & lining material

## How to select a "Electromagnetic flow meter" !!

### 1. Lining material

The lining is a inside tube of flow meter. It will contact with liquid. Thus, a selection of lining material is very important. If choose a lining material properly, there will increase a life - time of flow meter.



Material	Operating temperature	Properties
PTFE (Teflon) <i>*(F46 for DN15-DN25)</i>	-10...+100°C (for <b>Compact type</b> ) -10...+150°C (for <b>Remote type</b> )	Stable chemical property, proof against the corrosion of boiling hydrochloric acid, sulphuric acid, nitric acid and aqua regia, concentrated alkali <i>*F46 : chemical properties, but with better tensile strength and pressure resistance.</i>
Chloroprene Rubber (CR)	-10...+60°C	Average abrasiveness, good for acidic, alkali, and salts solutions.
Polyurethane (PU)	-10...+60°C	With very good antiabrasiveness; No good for acid, alkali solutions
Perfluoroalkoxy (PFA)	-10...+100°C (for <b>Compact type</b> ) -10...+180°C (for <b>Remote type</b> )	Stable chemical property, proof against the corrosion of boiling hydrochloric acid, sulphuric acid, nitric acid and aqua regia, concentrated alkali but with better tensile strength and pressure resistance.

**2. Electrode material :** The electrode material is very important part for flow meter. Because of this part is measurement part. To select a correct material for specified liquid will increase life-time of electrode.

Material	Corrosion resistance description
Stainless steel 316L	<b>Applicable :</b> Domestic/industrial water, sewage, weak acid and alkaline saline as well as concentrated nitric acid at room temperature <b>Not Applicable :</b> Hydrofluoric acid, hydrochloric acid, chlorine, bromine, iodine and other media.
Titanium	<b>Applicable :</b> chloride, hypochlorite, sea water, oxidizing acid. <b>Not applicable :</b> reducing acid such as hydrochloric acid, sulphuric acid
Tantalum	<b>Applicable :</b> most acids like concentrated hydrochloric acid, nitric acid and sulfuric acid including hydrochloric acid and nitric acid at the boiling point as well as sulfuric acid under 175°C. <b>Not applicable :</b> alkali, hydrofluoric acid and smoke sulfuric acid.
Hastelloy B	<b>Applicable :</b> Non-oxidizing acid, such as hydrochloric acid and hydrofluoric acid of certain concentration and other alkali liquor with a concentration of no less than 70% sodium hydroxide <b>Not Applicable :</b> Nitric acid and other oxidizing acids
Hastelloy C	<b>Applicable :</b> corrosion by oxidizing acids such as Nitric acid, acid mixtures and sulfuric acid and environmental corrosion by oxidation resistant salt or that contains other oxidants. For example, Hypochlorite solution higher than room temperature is strongly corrosion resistant to sea water. <b>Not Applicable :</b> Reducing acid and chloride such as hydrochloric acid
Tungsten carbide	<b>Applicable :</b> Domestic/industrial water, sewage, weak acid and alkaline saline as well as concentrated nitric acid at room temperature ( <i>highly resist wearing than SS316L</i> ) <b>Not Applicable :</b> Hydrofluoric acid, hydrochloric acid, chlorine, bromine, iodine and other media.
Platinum	Various acids, bases and salts, excluding aqua regia.

*please note : If the liquid is more than in a table, do not hesitate to consult us*

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## ELECTROMAGNETIC FLOW METER EMF200

### Flow rate table

Tube size		Precision flow range (m <sup>3</sup> /hr)		Measurable flow range (m <sup>3</sup> /hr)	
DN	Inch	Min	Max	Min	Max
15	1/2"	0.32	3.2	0.006	9.5
20	3/4"	0.56	5.6	0.011	17
25	1"	0.88	8.8	0.018	27
32	1" 1/4	1.4	14	0.03	43
40	1" 1/2	2.3	23	0.05	68
50	2"	3.5	35	0.07	106
65	2" 1/2	6	60	0.12	179
80	3"	9	90	0.18	271
100	4"	14	140	0.28	424
125	5"	22	220	0.44	663
150	6"	32	320	0.64	954
200	8"	56	560	1.1	1696
250	10"	88	880	1.8	2651
300	12"	127	1270	2.5	3817
350	14"	173	1730	3.5	5195
400	16"	226	2260	4.5	6786
500	20"	353	3530	7	10603
600	24"	509	5090	10	15268
700	28"	693	6930	14	20782
800	32"	905	9050	18	27143
900	36"	1150	11500	23	34353
1000	40"	1410	14100	28	42412
1200	48"	2040	20400	41	61073
1400	56"	2770	27700	55	83127
1500	60"	3180	31800	64	95426
1600	64"	3620	36200	72	108573
1800	72"	4580	45800	92	137413
2000	80"	5654	56540	113	169646

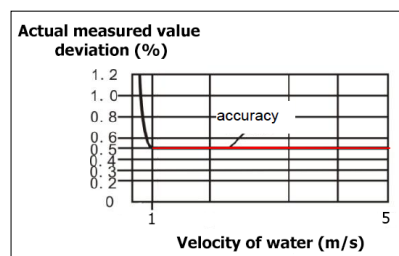
### The accuracy :

Velocity of flow	Indication error
$V < 1$ m/s	$\pm 0.5\% \pm 2$ mm/s
$1 \leq V \leq 5$ m/s	$\pm 0.5\%$

\*V is the velocity of water

Medium temperature 20°C, Pressure 0.1 MPa

Note : the current output corresponds to the accuracy, that is, the pulse output accuracy plus 0.05% of the flow rate.



### • Precision flow range

The precision flow range is a flow range within accuracy. It means if the flow rate is within these range it will not error more than 0.5% of reading.

### • Measurable flow range

The measurable flow range is a flow range that flow meter can measure flow rate. It depends on size of tube.

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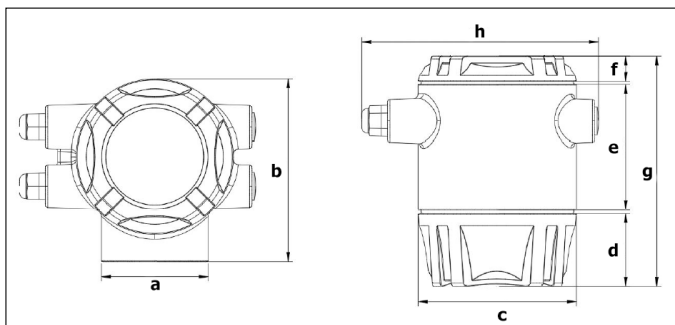
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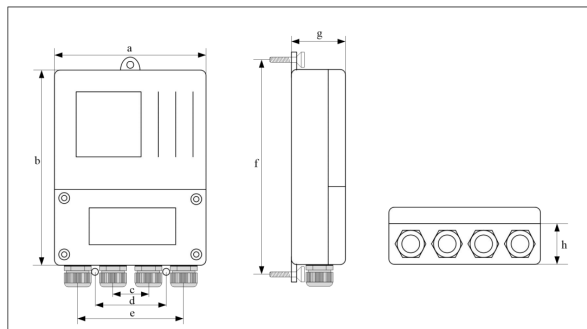
### Dimension of display

#### Compact type



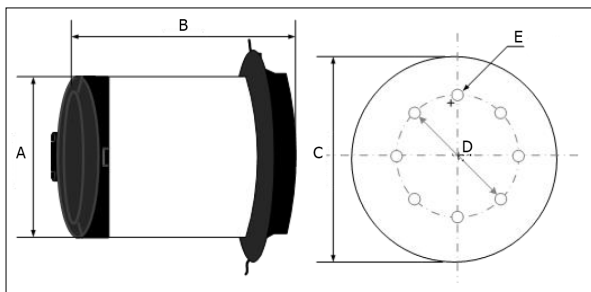
Length (mm)							
a	b	c	d	e	f	g	h
Ø87	150	Ø128	60	103	21	190	192

#### Remote Type



length (mm)								Weigth (Kg)
a	b	c	d	e	f	g	h	
164	214.5	34	70	102	233.5	69.7	45.7	0.6

#### Battery Type



Length (mm)				
A	B	C	D	E
Ø102	160	130	Ø64	8-M6

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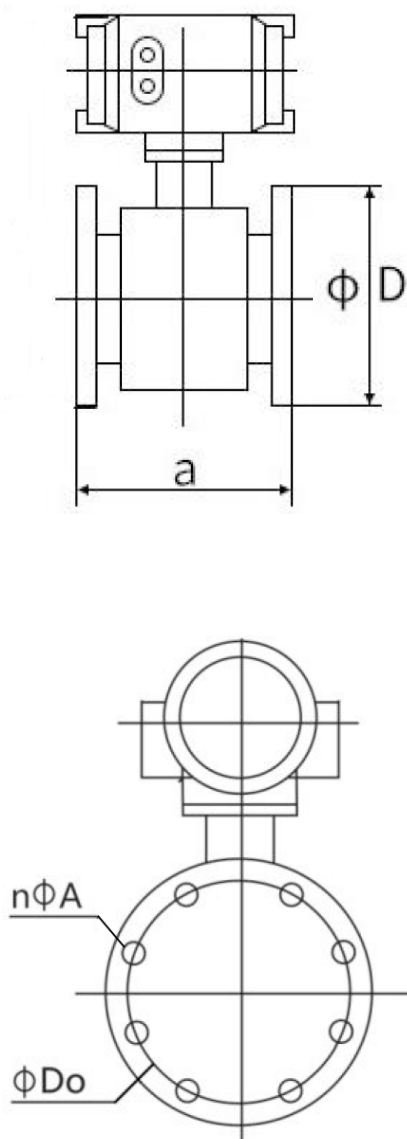
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### Dimension and Drawing



DN	a	ØD	ØDo	nØA	Pressure
6	102	76	58	4*7	1.6 MPa
10	150	90	60	4*14	
15	150	95	65	4*14	
20	150	105	75	4*14	
25	150	115	85	4*14	
32	150	135	100	4*18	
40	150	145	110	4*18	
50	200	160	125	4*18	
65	200	180	145	8*18	
80	200	195	160	8*18	
100	250	215	180	8*18	
125	250	245	210	8*18	
150	300	280	240	8*23	
200	350	335	295	12*23	1 MPa
250	400	390	350	12*23	
300	500	440	400	12*23	
350	500	500	460	16*23	
400	600	565	515	16*25	
450	600	615	565	20*25	
500	600	670	620	20*25	
600	600	780	725	20*30	
700	700	895	840	24*30	
800	800	1010	950	24*34	
900	900	1110	1050	28*34	
1000	1000	1220	1160	28*34	0.6 MPa
1200	1200	1405	1340	32*34	
1400	1400	1630	1560	34*36	
1600	1600	1830	1760	34*40	
1800	1800	2045	1970	42*44	
2000	2000	2265	2180	48*48	
2200	2200	2405	2390	48*52	

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## ELECTROMAGNETIC FLOW METER EMF200

### Information

- Type of flow meter**



Compact type



Compact type with  
stainless steel 304 housing



Compact type  
clamp connection version  
*\*Note : product does not include clamp*



Remote type



Battery type

- Battery working time**

Cycle measuring time	50mA Excitation use time
30 seconds	74 months
25 seconds	62 months
20 seconds	49 months
15 seconds	34 months
14 seconds	34 months
13 seconds	32 months
12 seconds	30 months
11 seconds	27 months
10 seconds	24 months
9 seconds	21 months
8 seconds	18 months
7 seconds	15 months
6 seconds	13 months
5 seconds	10 months
3 seconds	7 months

- Display of flow meter**



Compact type



Remote type



Battery type

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## Ordering Code

<b>Series : EMF200-x-x-x-x-x-x-x</b>				
<b>x : Pipe diameter</b>				
<b>xx:</b> DN15-200				
<b>x : Type of flow meter</b>				
<b>DA</b> : Compact type + display + pulse + 4-20mA + RS485				
<b>DB</b> : Display + battery				
<b>DR</b> : Remote type (10 meter) + display + pulse + 4-20mA + RS485				
<b>DRxx</b> : Remote type with special cable range ( <i>max. 30 meters</i> ) + display + pulse + 4-20mA + RS485 <i>Example : DR25 is Remote type with 25 meters of cable</i>				
<b>x : Process connection</b>				
<b>FD16</b> : Flange DIN PN16 ( <i>Standard for DN15 - 150</i> )				
<b>FD10</b> : Flange DIN PN10 ( <i>Standard for DN200 - DN1000</i> )				
<b>FA150</b> : Flange ANSI 150				
<b>FJ10</b> : Flange JIS10K				
<b>C</b> : Tri-clamp ( <i>for food industry</i> ); <i>only for S04; Stainless steel 304 body</i>				
<b>xx</b> : The special connection is below.**				
<b>x : Lining material</b>				
<b>L1</b> : PTFE (F46 for DN15 - DN25)				
<b>L2</b> : Chloroprene Rubber (CR)				
<b>L3</b> : Polyurethane (PU)				
<b>L4</b> : Perfluoroalkoxy (PFA)				
<b>x : Electrode material</b>				
<b>E1</b> : 316L stainless steel				
<b>E2</b> : Titanium				
<b>E3</b> : Tantalum				
<b>E4</b> : Hastelloy B				
<b>E5</b> : Hastelloy C				
<b>E6</b> : Tungsten carbide				
<b>E7</b> : Platinum				
<b>x : Power supply</b>				
<b>P1</b> : 220 Vac				
<b>P2</b> : 24 Vdc				
<b>B</b> : Battery ( <i>Standard for DB; battery version</i> )				
<b>x : Body material (option)</b>				
<b>-</b> : Carbon steel				
<b>S04</b> : Stainless steel 304				

### \*\*Special Process Connection

**FD25** : Flange DIN PN25 | **FD40** : Flange DIN PN40

**FA300** : Flange ANSI 300 | **FA600** : Flange ANSI 600

**FJ20** : Flange JIS 20K | **FJ30** : Flange JIS 30K

**Example** : EMF200-50-DA-FD16-L1-E1-P1

Electromagnetic flow meter Compact type, DN50, DIN flange, Signal output pulse + 4-20mA + RS485, 220 Vac Power supply, Electrode : 316L, Lining : PTFE

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### Accessories (options)

#### GDR : Grounding ring



##### Features

- Requirement when using a MAG Meter in a system with **non-conductive** pipes, such as PVC, ABS, CPVC, etc.
- Grounding rings can significantly reduces electrical noise
- The material is stainless steel 304
- Vary size of grounding rings according to tube size

#### FDI-7600 : Flow totalizer display



##### Features

- Display indicator for flow meter, able to record the totalizer and flow rate together
- Built-in memory for recording data
- There is a software for management data, graphing, export data to CSV file

#### DL7 : data logger



- Up to 42 input/output signals
- Up to 100 displayed channels
- 2 GB internal data memory, advanced data logging
- 7" touchscreen colour LCD
- Ethernet port, Modbus TCP Client/Server
- RS-485 port, Modbus RTU Master/Slave

#### IoT-WiFi : IoT module for wifi version



##### Feature

- Wi-Fi are available
- The IoT module can receive a signal from Instrument for monitoring in real-time , support adjustment
- The IoT module can receive 4 analog and 1 digital signal from industry instrument.
- Application can be widely used in industrial automatic control, base station/computer room monitoring, environmental monitoring, water conservancy project, power industries, agriculture, etc.

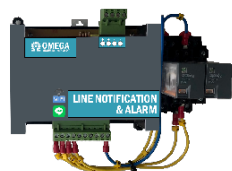
#### IoT-GPRS/4G: IoT module for 4G version



##### Feature

- 4G are available
- The IoT module can receive a signal from Instrument for monitoring in real-time , support adjustment
- The IoT module can receive 4 analog and 1 digital signal from industry instrument.
- Application can be widely used in industrial automatic control, base station/computer room monitoring, environmental monitoring, water conservancy project, power industries, agriculture, etc.

#### LINE : Line alert



##### Feature

- Automatically report status when it starts working.
- The messages are available to be created in Thai and English languages freely
- The notification can be alarmed max. 9 times continuously
- The user can be maximum 500 users in LINE group for receiving a notification
- Compact, modern and comfortable for monitoring
- The equipment can be connected with every controller or PLC which signal out a relay

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