LMF Electromagnetic Flowmeter

LMF11
General Applications

LMF11B
Battery Operated

LMF12
Heat Meter (BTU)

LMF13
Sanitary Type

LMF14
Insertion Type

LMF14B
Insertion Type
Battery Operated

Products Performance & Features

- Modular functional design, practically for a variety of applications.
- No moving parts in the tube, No wear and tear.
- Easy to choose, easy to install, Maintenance-free and very low operating costs.
- High corrosive resistance; solid and reliable.
- Up to 400: 1 turndown ratio
- Easily achieve the positive cumulative flow, Reverse Cumulative and Difference Calculation.
- Built-in reference electrode, fully guarantee the stability of measurement.
- A variety of IP protection and installation methods, can be install for continuous immersion in water.
- Adopt EEPROM memory to measure operation data, safe and reliable protection of memory.

Applications

- Environmental protection and water treatment.
- Municipal water supply.
- HVAC Industry
- Food & Beverage and Pharmaceutical.
- Oil & Gas/ Petrochemical
- Fine Chemical

Product Description

LMF series of electromagnetic flowmeter SMD devices and surface mount (SMT) technology, circuit reliability, low power consumption, and the use of 32-bit embedded microprocessor, fast computing, high precision, low frequency rectangular wave excitation, The stability of the measurement. All digital processing, anti-interference ability, reliable measurement, high precision.

Ultra-low power EMI switching power supply, the use of a wide range of power supply voltage changes, EMC performance. Built-in three integrators, respectively, for positive cumulative, inverse cumulative and the difference calculation. With the average flow of automatic computing function, easy to calibrate the instrument.

At the same time also has a small signal cut off the function, the user can set the lower limit of the display panel and the lower limit of the flow, thus removing the interference of small signal flow. In order to enhance the safety, the flow meter is also equipped with a password latch function. After power meter, if you need to set parameters, you must enter the advanced password to set the parameters to prevent unauthorized personnel to change the instrument parameters.

Even if incident suddenly power failure, the flow meter operation results and user settings will not disappear, EEPROM can protect the set parameters and cumulative value.

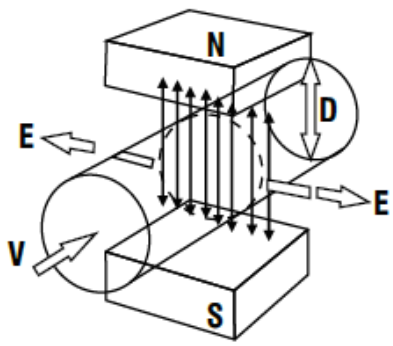
Classification of Products

LMF series smart electromagnetic flow meters consist of sensor and smart signal transducer. And it can be classified into two structures--- integral type and remote type according to the set-up form of the sensor and transducer. In terms of integral type electromagnetic flow meters, transducer and sensor directly assembles as a full ball type and can not be dissociated.
External power supply and Battery operated type is available as following model.

Working principle

The metering system of the electromagnetic flow meter primary is based on Faraday's laws of electromagnetic induction, on the channel border which is vertical each other with metering tube axis and line of magnetic field mount one pair detecting electrode, when the conductive liquid move along the metering tube axis the conductive liquid cutting the line of magnetic field induce the inductive E.M.F. This EMF detect out by two electrodes on the metering tube, numerical value size is:

E=KBVD
Here: E - inductive EMF;
K - instrument constant;
B - magnetic induction
V - average flow velocity in metering tube section;
D - metering tube inner diameter;



When measuring flow rate, the fluid flow through magnetic field vertical to flow direction, the conductive liquid movement induce one EMF in direct proportion to average flow velocity, so that require measured flow liquid conductivity higher than lowest limit. It's induction voltage signal is detected by two electrodes, and pass through a cable transmit to converter, after through signal treatment and correlative operation, take the integrating flow and the instantaneous delivery indicate on the display screen of the converter.
The sensed signal voltage is converted into the indexing, analogue, and digital output signals in the converter.

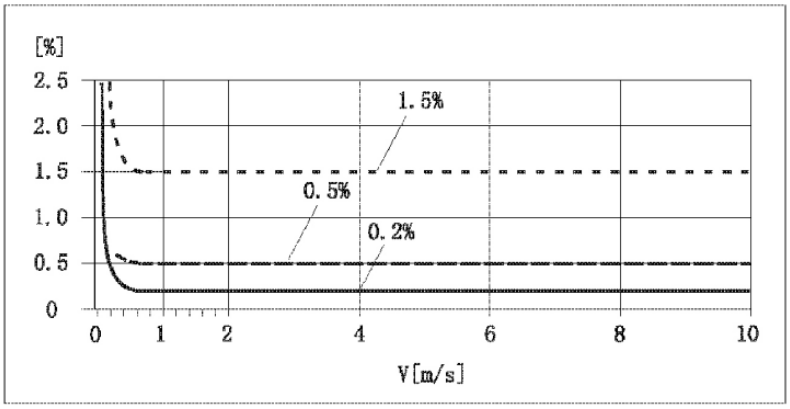
Technical Parameters

1. Normal working conditions

Ambient temperature	:	-25 - 60 ° C
Relative humidity	:	5% to 90%
Power supply	:	Single-phase AC power supply (85 ~ 250) V/ (45 ~ 63) Hz DC power supply 16VDC ~ 36VDC
Power consumption	:	less than 20W

2. Measurement accuracy

LMF11/LMF11B: ±0.2%,0.5%; LMF12: ±0.5%; LMF13: ±0.5%; LMF14/LMF14B: ±1.5%



3. Output variables

3.1 Analog current output

- Load resistance : (0-10) mA, (0 -1.5) k Ω,
  (4-20) mA, (0-750)Ω。
- Basic error : 0.1% ± 10μ A,

3.2 Digital frequency output

- Frequency output range : (1 ~ 5000) Hz
- Output Electrical Isolation : Opto-isolated, isolated voltage> 1000V
- Frequency output drive : FET output, the maximum withstand voltage 36VDC, the maximum load current of 250mA

3.3 Digital pulse output

- Output pulse range: (0-100) pulse / sec <higher than the upper elbow, will lose pulse>
- Output pulse equivalent: (0.001-1.000) m^3 / cp,
  (0.001-1.000) LTR /cp,
  (0.001-1.000) USG /cp,
  (0.001-1.000) UKG /cp ;
  Output pulse width : User software settings;
  Output Electrical Isolation : Opto-isolated, isolated voltage> 1000V
  Pulse output drive : FET output, the maximum withstand voltage 36VDC, the maximum load current of 250mA

3.4 Alarm output

- Alarm output contact : ALMH - upper limit alarm: ALML - lower limit alarm
- Output Electrical Isolation : Opto-isolated, isolated voltage> 1000V
- Alarm output drive : transistor output, the maximum withstand voltage of 36V, the maximum load current of 250mA

3.5 Digital communication interface and communication protocol:

- MODBUS interface
- RTU format
- Physical interface RS-485
- Electrical isolation 1000V
- HART interface: support standard HART protocol, configure the HART Communicator, can display the measured value online, and modify the instrument parameters

Electromagnetic Flowmeter

SPECIFICATIONS						
	LMF11	**LMF11B**	**LMF12**	**LMF13**	**LMF14**	**LMF14B**
Type	General Type	General Type (Battery Operated)	Heat Meter (BTU)	Sanitary Type	Insertion Type	Insertion Battery Operated
Accuracy	±0.2% , ±0.5%		±0.5%		±1.0% ; ±1.5%	
Repeatability	±0.06% , ±0.16%			±0.16%	±0.05%	
Medium temperature	-25 ~ 200℃				-25 ~ 130℃	
Conductivity	≥ 5 μS / cm (softening water ≥ 20 μS / cm)					
Calibration range	(3-2000)mm	(25-1200)mm	(3-2000)mm	(10-125)mm	(200-2000)mm	
Operating Pressure	0.6MPa / 1.0MPa / 1.6MPa / 2.5MPa / 4.0MPa / on request			1.0MPa	0.6MPa / 1.0MPa / 1.6MPa / on request	
	Class 150 / Class 300	N/A				
Flowrate	0.5 ~ 1.0 m/s					
Flow direction	Forward / Reverse					
Lining material	Hard rubber			N/A		
	PTFE			N/A	PTFE	
	F46/ PFA				N/A	
Electrode material	SS316L					
	Hastelloy B/ Hastelloy C/ Titanium/ Tantalum/ Platinum Iridium/ Tungsten carbide				N/A	
Number of electrodes	4	3	4	2		
Flange material	Carbon steel			N/A		
	SS304					
	SS316	N/A	SS316		N/A	
	SS316L	N/A	SS316L		N/A	
Installation method	Flange Type / Wafer type (without flange)			Tri-clamp / thread	Insertion flange / online plug-in	
Protection class	IP 65 IP 67 IP 68 (remote type only)	IP 68	IP 65 IP 67 IP 68 (remote type only)	IP 65	IP 65 IP 67 IP 68 (remote type only)	IP 68
Power supply	230 VAC / 24 VDC	lithium battery 12V ~ 24V	230 VAC / 24 VDC			lithium battery 12V ~ 24V
Output	4-20mA + pulse	N/A	4-20mA	4-20mA + pulse		N/A
Communication	HART / Modbus / Profibus	RS485 / GPRS / CMDA	Modbus	HART / Modbus / Profibus	HART / Modbus	RS485 / GPRS / CMDA
Sensor type	Integrated / remote		Remote	Integrated / remote		
Ambient	Ambient Temperature -25 ~ 60°C, Humidity 5% to 90%					

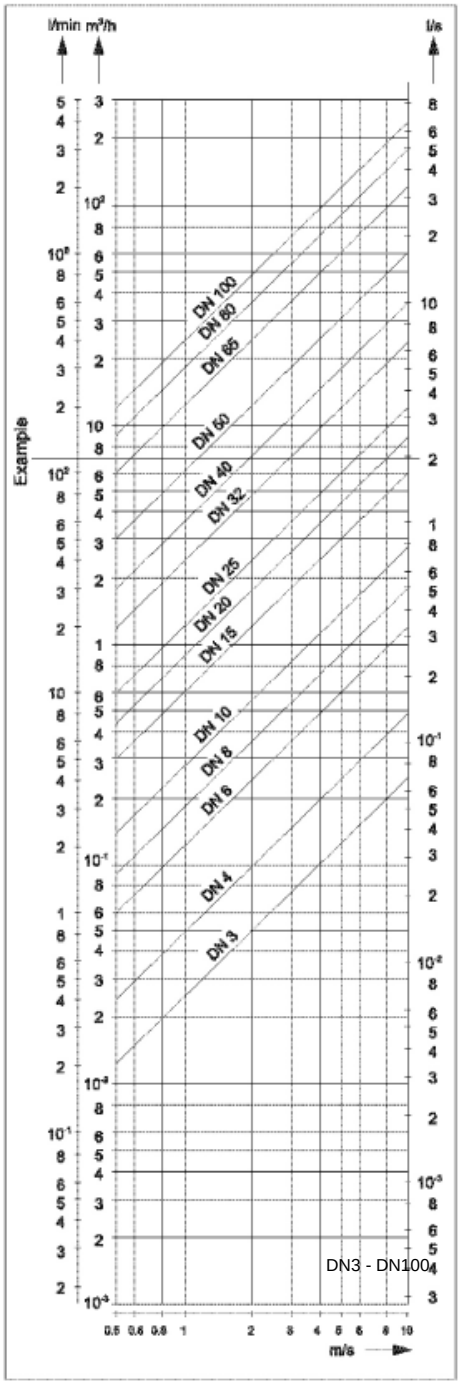
Flowmeter nominal size, pressure and flow range

The instantaneous volume flow is a function of the flow rate and the sensor aperture. The instantaneous flow bar graph shows the flow range that each flow meter can measure, and gives several sensor specifications suitable for measuring a given flow rate.

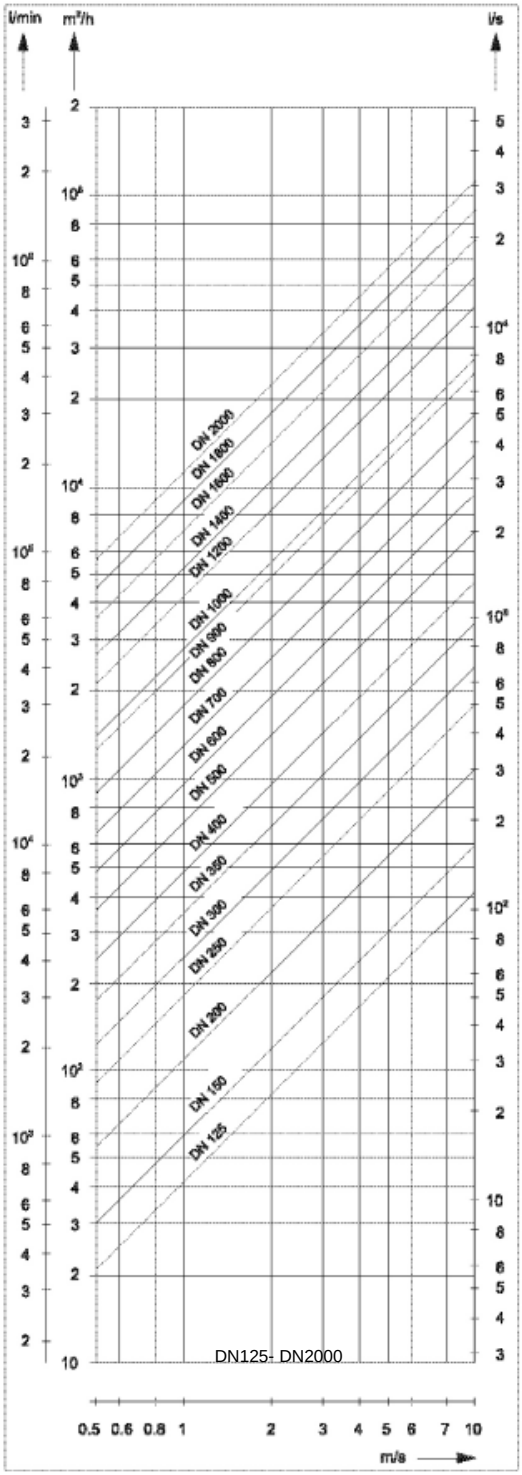
Size DN	Pressure MPa	Min. flowrate 0.5m/s	Max. flowrate 1.0m/s
3	4.0	0.2 l/min	4 l/min
4	4.0	0.4 l/min	8 l/min
6	4.0	1.0 l/min	20 l/min
8	4.0	1.5 l/min	30 l/min
10	4.0	2.25 l/min	45 l/min
15	4.0	5.0 l/min	100 l/min
20	4.0	7.5 l/min	150 l/min
25	4.0	10 l/min	200 l/min
32	4.0	20 l/min	400 l/min
40	4.0	30 l/min	600 l/min
50	4.0	3 m³/h	60 m³/h
65	4.0	6 m³/h	120 m³/h
80	4.0	9 m³/h	180 m³/h
100	1.6	12 m³/h	240 m³/h
125	1.6	21 m³/h	420 m³/h
150	1.6	30 m³/h	600 m³/h
200	1.6	54 m³/h	1080 m³/h
250	1.6	90 m³/h	1800 m³/h
300	1.6	120 m³/h	2400 m³/h
350	1.6	165 m³/h	3300 m³/h
400	1.6	225 m³/h	4500 m³/h
450	1.0	286 m³/h	5700 m³/h
500	1.0	330 m³/h	6600 m³/h
600	1.0	480 m³/h	9600 m³/h
700	1.0	660 m³/h	13200 m³/h
800	1.0	900 m³/h	18000 m³/h
900	1.0	1200 m³/h	24000 m³/h
1000	1.0	1350 m³/h	27000 m³/h
1200	0.6	2100 m³/h	42000 m³/h
1400	0.6	2700 m³/h	54000 m³/h
1600	0.6	3600 m³/h	72000 m³/h
1800	0.6	4500 m³/h	90000 m³/h
2000	0.6	5700 m³/h	114000 m³/h

The instantaneous flow of the electromagnetic flowmeter

example:
Instantaneous flow rate + 7m3 / h (maximum value is the upper limit of the range). When the flow rate is between 0.5 and 10 m / s, the applicable sensor diameter [DN20-DN65].



DN3 - DN100



DN125- DN2000

Selection of Electrode Material(s)

The material of the electrode is selected according to the corrosiveness of the fluid to be measured

Material	Corrosion resistance
SS 316L	1. Domestic water, industrial water, raw water, urban water 2. Dilute acid, dilute alkali and other weak corrosive, alkaline salt solution
Hastelloy B	1. Hydrochloric acid <less than 10% concentration) and other non - oxidizing acid 2. Uranium hydroxide (concentration less than 50%) of all concentrations of ammonium hydroxide alkaline solution. 3. Phosphoric acid, organic acids *Not applicable: nitric acid
Hastelloy C	1. A mixed solution of a mixed acid such as chromic acid and sulfuric acid 2. Oxidizing salts such as Fe +++, Cu ++, seawater *Not applicable: hydrochloric acid
Titanium	1. Salt, such as a) chloride (oxide / magnesium / aluminum / calcium / plating / iron, etc.) b) Sodium salt, ammonium salt, hypochlorite, sea water 2. Concentration of less than 50% potassium hydroxide, ammonium hydroxide, barium hydroxide alkaline solution *Not applicable: hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid and other reducing acids
Tantalum	1. Hydrochloric acid (concentration less than 40%), dilute sulfuric acid and concentrated sulfuric acid (not including fuming sulfuric acid) 2. Chlorine dioxide, ferric chloride, hypochlorous acid, sodium cyanide, lead acetate, etc. 3. Nitric acid (including fuming nitric acid) and other oxidizing acid, the temperature below 80 ℃ of aqua regia *Not applicable: Alkaline, hydrofluoric acid
Platinum (Pt)	1. Applicable: almost all acid, alkali, salt solution <including fuming sulfuric acid, fuming nitric acid) *Not applicable: aqua regia, ammonium salt
Tungsten carbide	1. Applicable: pulp, sewage, can interfere with solid particles *Not applicable: inorganic acid, organic acid, chloride

Selection of Lining Material(s)

Should be based on the corrosion of the measured medium, wear and temperature to choose. Hard / soft rubber can be resistant to the general weak acid, alkali corrosion, temperature 65 ℃, soft rubber wear resistance, PTFE (PTFE) almost resistant to heat acid other than strong acid, alkali corrosion, medium temperature up to 130 ℃, but not wear and tear. Polyurethane rubber has good wear resistance, but not acid, alkali corrosion, temperature resistance is also poor, the medium temperature is less than 65 ℃.

Lining material	The main function	Applicable scope
Hard rubber	• Can be resistant to hydrochloric acid at room temperature, acetic acid, oxalic acid, ammonia, phosphoric acid and 50% sulfuric acid, sodium hydroxide, potassium hydroxide • Avoid strong oxidants	• Below 65ºC • General acid, alkali, salt solution
Soft rubber	• Have better flexibility, better wear resistance • Resistance to the general low concentration of acid, alkali, salt medium corrosion	• Below 65 ° C • Measure the general water, sewage, mud, pulp • Weak acid, weak base, salt medium
Polypropylene (PP)	• Have good insulation, physical and chemical properties, viscosity • Weak vinegar, weak base, salt, oxidizer	• Below 90 ° C • Common water, hot water, sewage and industrial wastewater
Polytetrafluoroethylene (PTFE) **High temperature insulation (F46)** **Solubility poly tetrafluoroethylene (PFA)**	• The most stable chemical properties of plastic in a material, the ability to boil hydrochloric acid, sulfuric acid, nitric acid and aqua regia, but also resistant to alkali and a variety of organic solvents • Poor wear resistance and poor adhesion	• -40ºC to 130ºC (PTFE) • -40ºC to 180ºC (F46) • -40ºC to 200ºC (PFA) • Acid, alkali and other strong corrosive media • Sanitary media

Protection level

According to EN60529 standard, the enclosure protection class can be divided into:

- IP65 for the spray type, you can allow the faucet from any direction of the instrument water, spray pressure of 30kPa, the water is 12.5 liters / min, spray from the instrument from the distance of 3 meters.
- IP67 for the anti-flooding type, that is, the instrument can be immersed in water for a short time, the highest point should be underwater at least 150cm, duration of at least 30 minutes.
- IP68 for the diving type, should be able to work long hours in the water, the maximum depth of its penetration by the manufacturer and the user consultation.

Protection principle selection principle should be based on the above requirements and the actual conditions of the instrument selected. If the instrument below the ground, often flooded, should use IP68: If the instrument on the ground, you can use IP65.

LMF

Electromagnetic Flowmeter (General Application, Battery-operated)

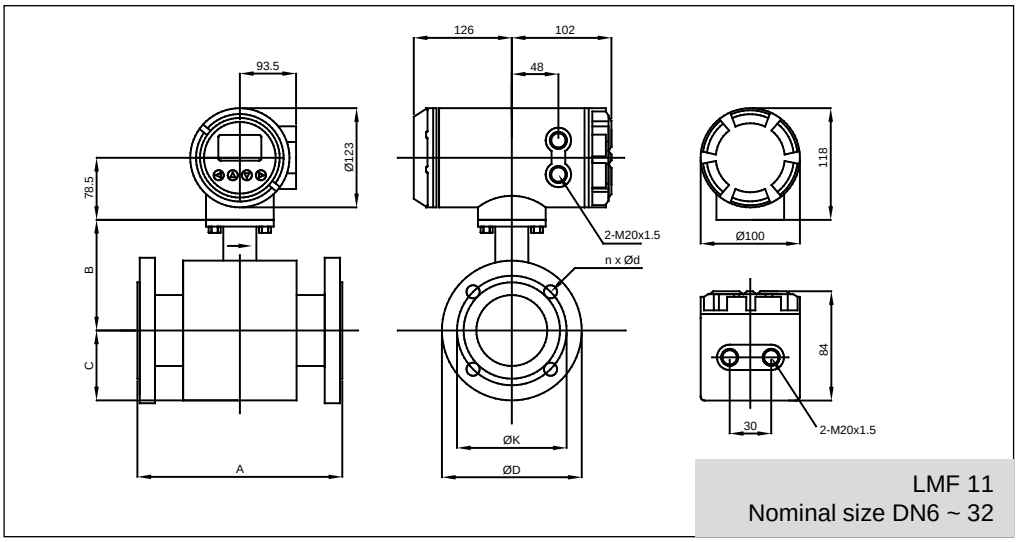
LMF11
(General Application)

LMF11B
(Battery-operated)

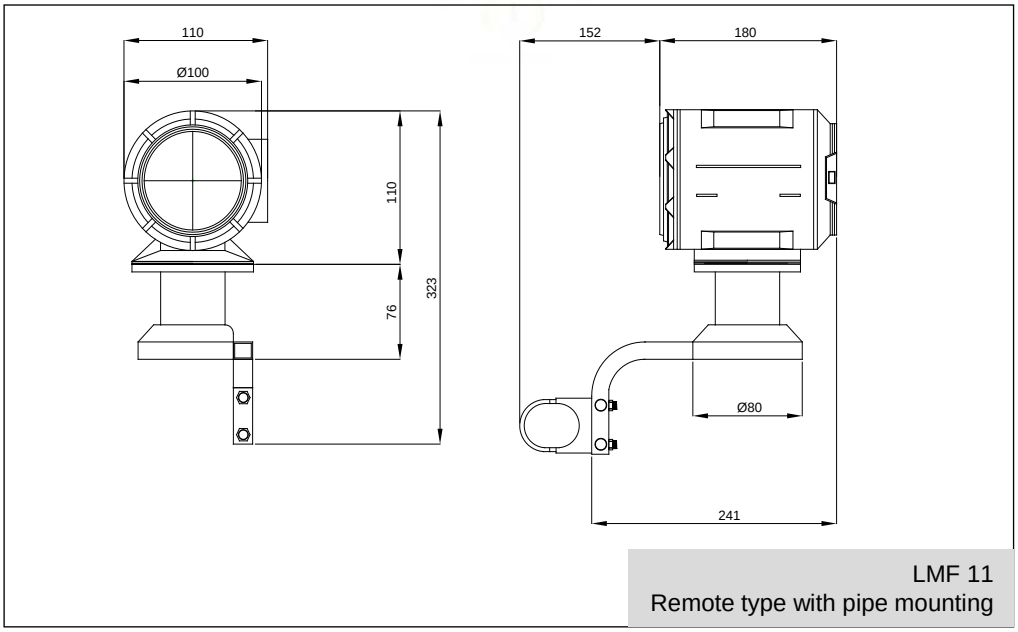
LMF12
Heat Meter (BTU)

Specification			
Model	**LMF11**	**LMF11B**	**LMF12**
Type	General Applications	General Type (Battery Operated)	General Applications
Accuracy	±0.2%, ±0.5%		±0.5%
Repeatability	±0.06% , ±0.16%		±0.5%
Medium temperature	-25 ~ 200℃		
Conductivity	≥ 5 μS / cm (softening water ≥ 20 μS / cm)		
Nominal size	DN6 – DN2000	DN10 – DN1200	DN6 – DN2000
Operating Pressure	0.6MPa / 1.0MPa / 1.6MPa / 2.5MPa / 4.0MPa / on request		
Flowrate	0.5 ~ 1.0 m/s		
Flow direction	Forward / Reverse		
Electrode material	SS316L/ Hastelloy B/ Hastelloy C/ Titanium/ Tantalum/ Platinum Iridium/ Tungsten carbide		
Lining material	Hard rubber/ PTFE/ F46/ PFA		
Number of electrodes	4	3	4
Measuring tube material	SS304		
Flange material	Carbon steel/ SS304/ SS316/ SS316L		
Installation method	Flange Type / Wafer type (without flange)		
Power supply	230 VAC/ 24VDC	Build-in Lithium battery (≥ 6 yrs) External lithium battery pack (≥10 yrs) 12-24 VDC external power	230 VAC/ 24VDC
Battery Life (LMF11B)	Low power consumption, standard conventional lithium battery pack (3.6V) for 5 to 6 years of continuous work and optional external battery pack to achieve the maximum battery life more than 10 years, reducing flow meter after installation maintenance costs.		
Protection class	IP65 (standard) IP67 IP68 (remote type only)	IP68	IP65 (standard) IP67 IP68 (remote type only)
Output	4-20mA /Pulse/ Frequency	N/A	4-20mA /Pulse/ Frequency
Electrical connection	M20 x 1.5; 1 /2" – 14NPT	M16 x 1.5	M20 x 1.5; 1 /2" – 14NPT
Communication	HART / Modbus (RS485)	RS485 / GPRS / CDMA	Modbus (RS485)
Sensor Type	Integrated / Remote		Remote
Language	Selectable English/ Chinese		

LMF11 - Dimension (mm)

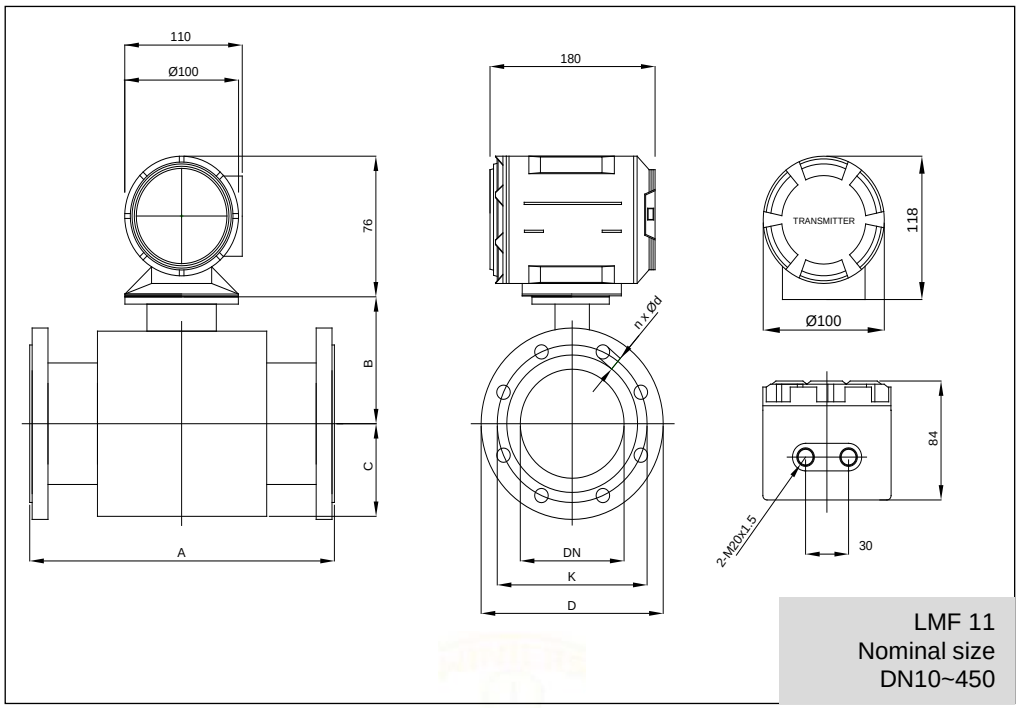


LMF 11
Nominal size DN6 ~ 32

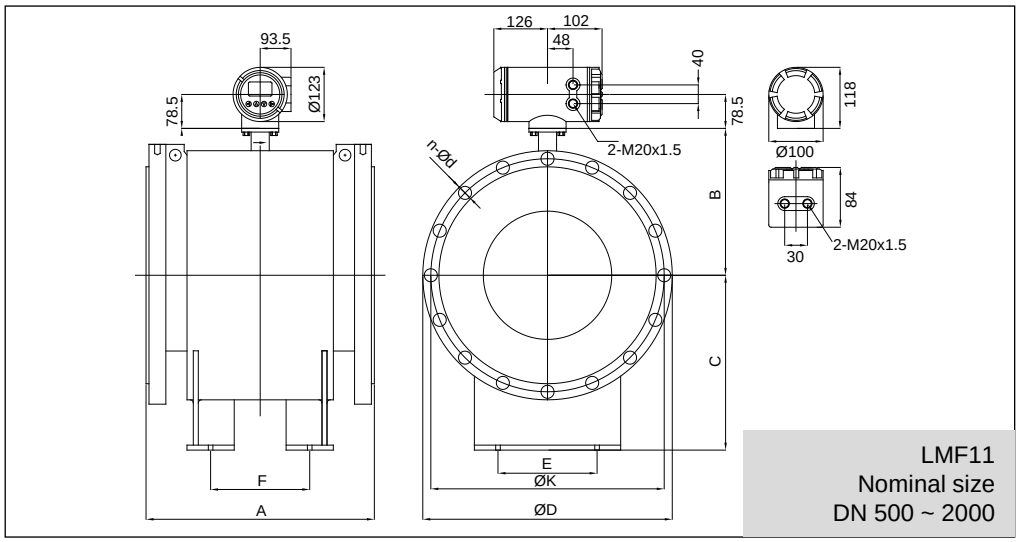


LMF 11
Remote type with pipe mounting

LMF11 - Dimension (mm)

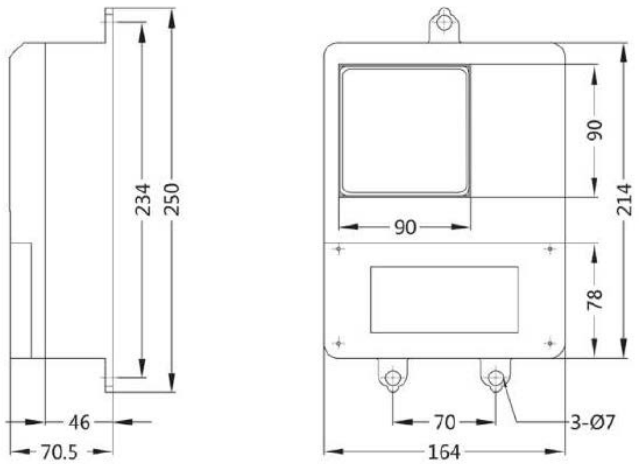


LMF 11
Nominal size
DN10~450

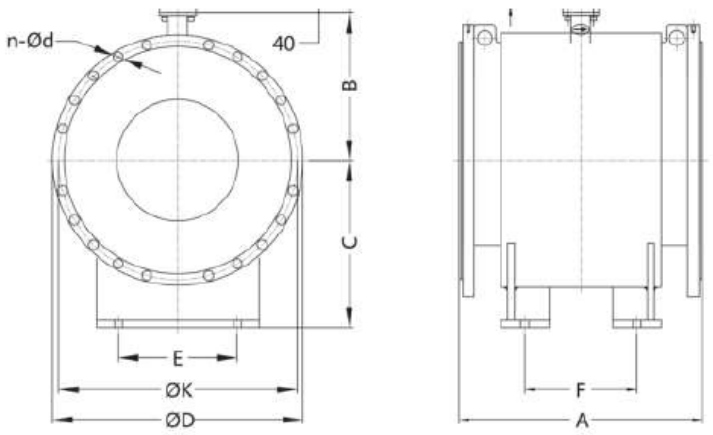


LMF11
Nominal size
DN 500 ~ 2000

LMF11/12 - Dimension (mm)

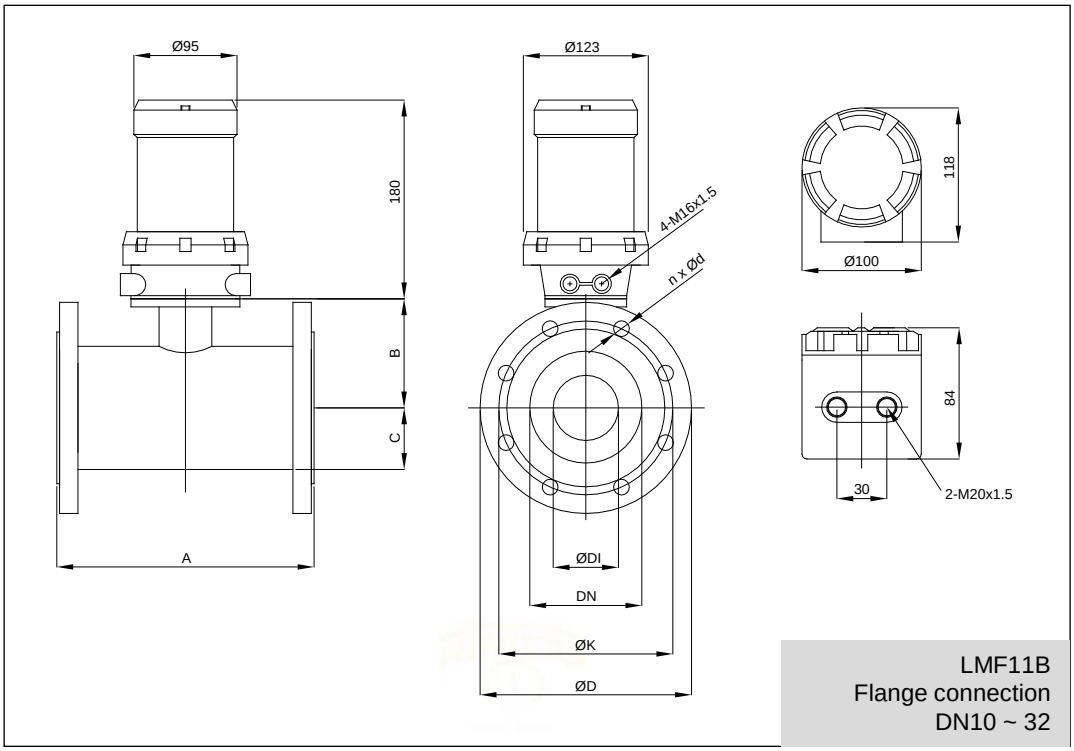


LMF11/12 Transducer (IP65)
Sensor nominal size below DN500
refer LMF11

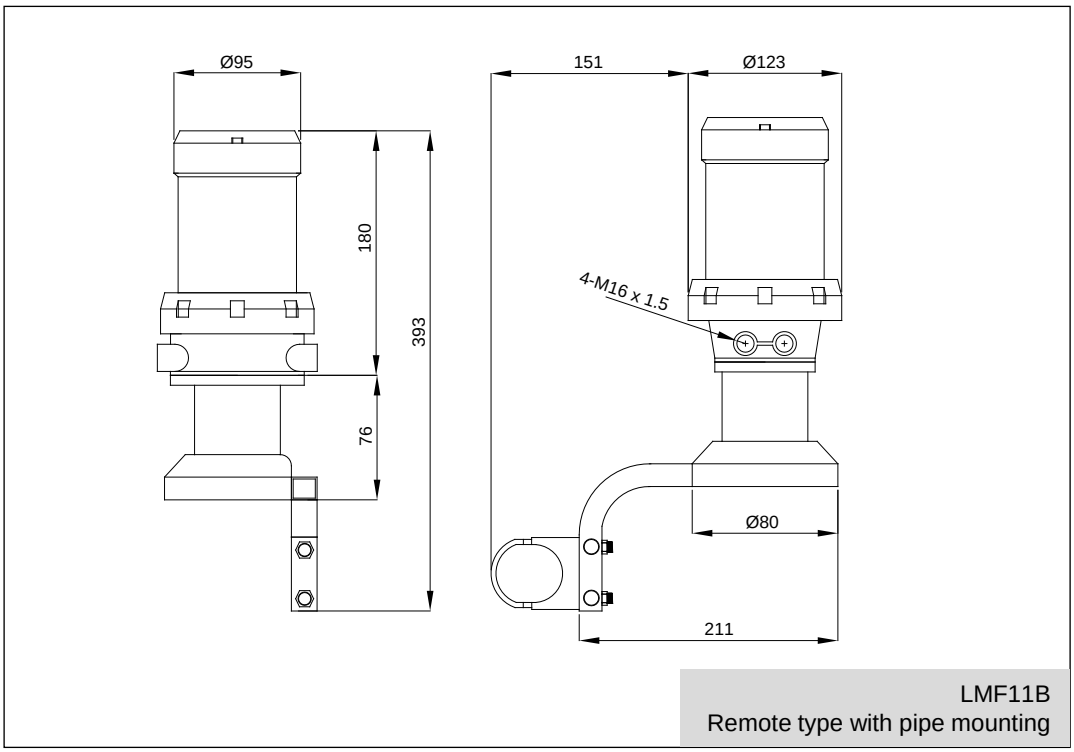


LMF11/12 Remote Type Sensor
nominal size
DN500 – DN2000

LMF11B - Dimension (mm)

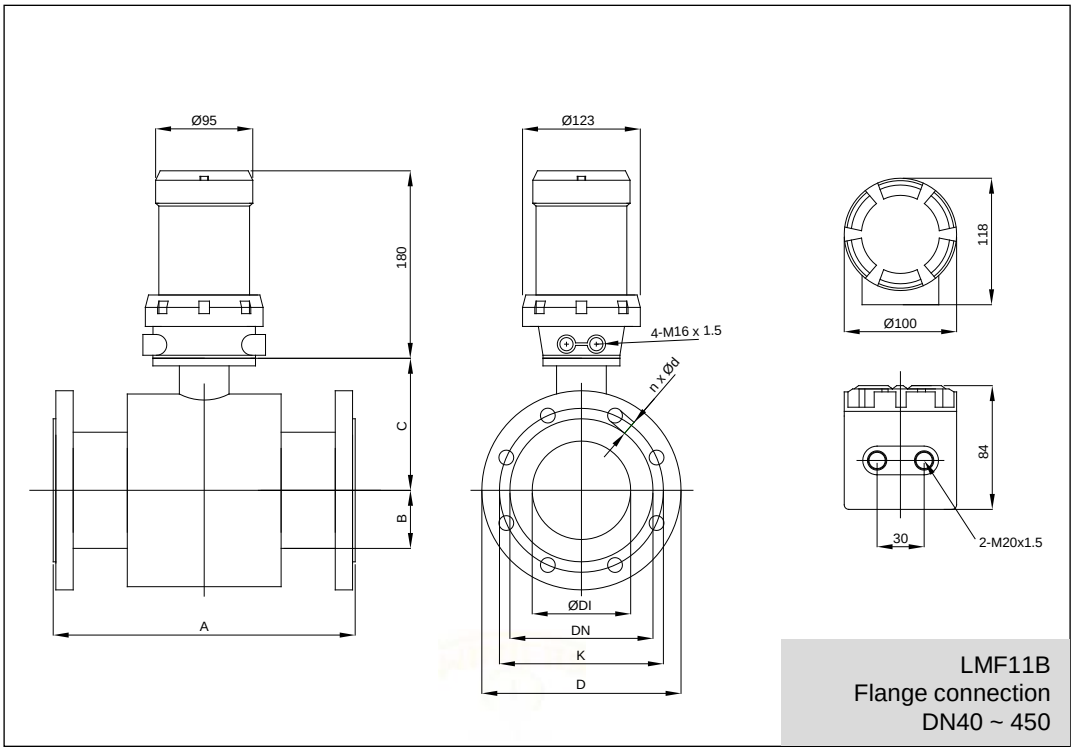


LMF11B
Flange connection
DN10 ~ 32

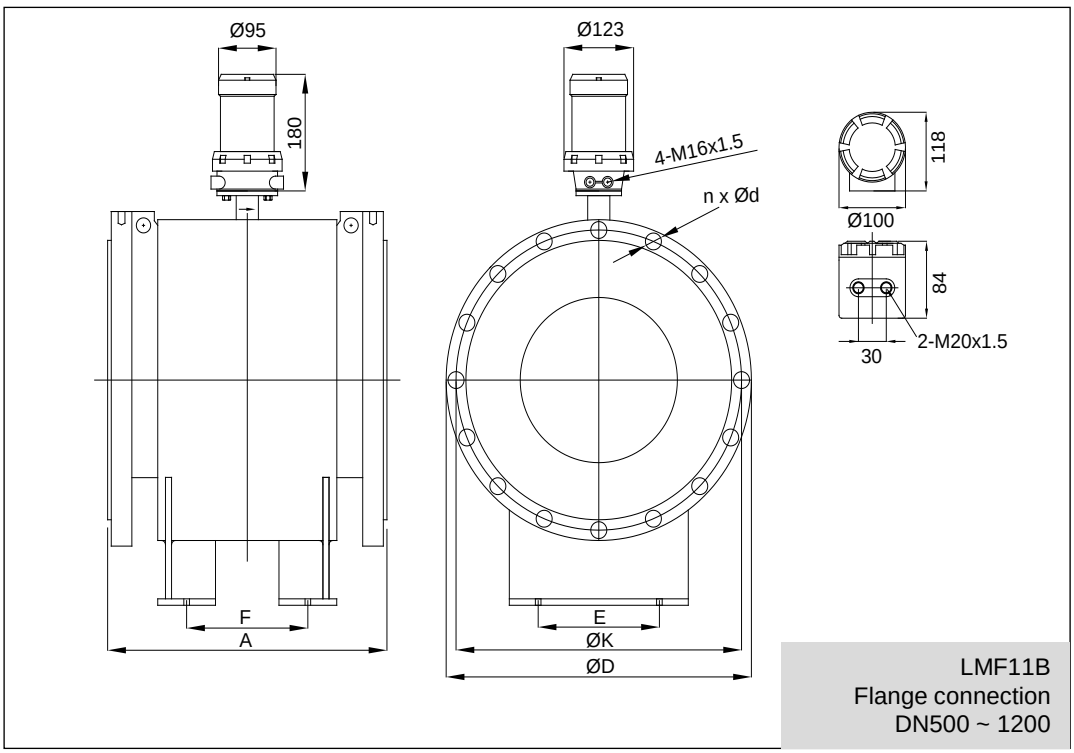


LMF11B
Remote type with pipe mounting

LMF11B - Dimension (mm)



LMF11B
Flange connection
DN40 ~ 450



LMF11B
Flange connection
DN500 ~ 1200

LMF11 / LMF11B / LMF12 Nominal Dimension (mm)

DN	Pressure								
	MPa	A	B	C	E	F	Φ D	Φ K	n x Φd
10	4.0	150	95	50			90	60	4 x Φ14
15							95	65	
20							105	75	
25			100	55			115	85	
32			105	60			140	100	4 x Φ18
40			110	65			150	110	
50		197/202	121	76			165	125	
65			130	85			185	145	8 x Φ18
80			135	90			200	160	
100	1.6	247/252	145	100			220	180	
125			161	116			245	210	
150		297/302	171	126			280	240	8 x Φ22
200		348/352	199	154			335	295	12 x Φ26
250		398/402	224	179			405	355	12 x Φ22
300		498/502	249	204			440	400	
350			274	229			500	460	16 x Φ22
400		598/602	305	260			565	515	16 x Φ26
450	1.0		330	285			615	565	20 x Φ26
500		/600	360	403	300	240	670	620	
600			410	453		270	780	725	20 x Φ30
700		/700	467	560	400	350	895	840	24 x Φ30
800		/800	517	610		400	1010	950	24 x Φ33
900		/900	567	660		470	1110	1050	28 x Φ33
1000		/1000	617	712		570	1225	1160	28 x Φ36
1200	0.6	/1200	719	814	600	710	1400	1340	32 x Φ33
1400		/1400	819	914		900	1625	1560	36 x Φ36
1600		/1600	919	1036	800	1040	1825	1760	40 x Φ36
1800		/1800	1021	1138		1180	2045	1970	44 x Φ39
2000		/2000	1121	1238		1350	2265	2180	48 x Φ42

Electromagnetic Flowmeter (General Application)

LMF11 – Ordering information

Description	Series	
General application flowmeter	LMF11	

Accuracy level	
Standard ±0.5%	A
High Precision ±0.2%	B

Installation method	
Flange	F

Lining material	
Hard Rubber	H
PTFE	T
F46	R
PFA	P
on request	Z

Nominal size	Pressure rating	
DN6	4.0MPa	06
DN8	4.0MPa	08
DN10	4.0MPa	10
DN15	4.0MPa	15
DN20	4.0MPa	20
DN25	4.0MPa	25
DN32	4.0MPa	32
DN40	4.0MPa	40
DN50	4.0MPa	50
DN65	4.0MPa	65
DN80	4.0MPa	80
DN100	1.6MPa	1H
DN125	1.6MPa	1Q
DN150	1.6MPa	1F
DN200	1.6MPa	2H
DN250	1.6MPa	2F
DN300	1.6MPa	3H
DN350	1.6MPa	3F
DN400	1.6MPa	4H
DN450	1.0MPa	4F
DN500	1.0MPa	5H
DN600	1.0MPa	6H
DN700	1.0MPa	7H
DN800	1.0MPa	8H
DN900	1.0MPa	9H
DN1000	1.0MPa	1T
DN1200	0.6MPa	2M
DN1400	0.6MPa	4M
DN1600	0.6MPa	6M
DN1800	0.6MPa	8M
DN2000	0.6MPa	0M

LMF11 – Ordering information continue...

Note: When the accuracy is ± 0.2%, the caliber is limited to DN10 ~ DN1000.

Electrode material	Electrode grounding	
SS 316L	Yes	E
Hastelloy B	Yes	N
Hastelloy C	Yes	O
Titanium	Yes	I
Tantalum	Yes	Q
Platinum Iridium	Yes	G
Tungsten carbide	Yes	V
on request	Yes	Z

Operating pressure	
0.6MPa	B
1.0MPa	C
1.6MPa	D
2.5MPa	E
4.0MPa	F
Class 150	G
Class 300	H
on request	Z

Flange material	
Wafer type (without flange)	0
Carbon steel	1
SS 304	2
SS 316	3
SS 316L	4

Companion flange	
No	0
Carbon steel	1
SS 304	2
SS 316	3
SS 316L	4

Grounding ring	
No	A
SS 304	B
SS 316	C
SS 316L	D
on request	Z

Process temperature	
Standard <65 ℃	0
Standard <130 °C	1
Standard <180 °C	2
Standard <200 °C	3

Display LCD & sensor	
Integrated	T
Remote type	R

Electromagnetic Flowmeter (General Application)

LMF11 – Ordering information continue...

Output + Communication							
4 ~ 20mA + pulse	01						
4 ~ 20mA + HART	02						
4 ~ 20mA + Modbus	03						
4 ~ 20mA + Profibus	04						
Power supply							
230 VAC	G						
24 VDC	K						
Protection class							
IP65 (Standard)	0						
IP67	1						
IP68 (Remote type only)	2						
Explosion protection							
No	0						
Flameproof Ex-d, Ex-ia IIC T3~T6	EX						
Electrical connection							
M20 × 1.5	0						
1/2 "-14 NPT	1						
Cable length (Remote type only)							
Standard 5 meters	R5						
on request (up to 50 meters)	RX						
Sensor selection material (Optional)							
SS 304	-X						
SS 316	-Y						
SS 316L	-Z						
on request	/0						

Electromagnetic Flowmeter (Battery-operated)

LMF11B – Ordering information

Description	Series
Battery-operated flowmeter	LMF11B

Accuracy level	
Standard ±0.5%	A
High Precision ±0.2%	B

Installation method	
Flange	F

Lining material	
Hard Rubber	H
PTFE	T
F46	R
PFA	P
on request	Z

Nominal size	Pressure rating	
DN10	4.0MPa	10
DN15	4.0MPa	15
DN20	4.0MPa	20
DN25	4.0MPa	25
DN32	4.0MPa	32
DN40	4.0MPa	40
DN50	4.0MPa	50
DN65	4.0MPa	65
DN80	4.0MPa	80
DN100	1.6MPa	1H
DN125	1.6MPa	1Q
DN150	1.6MPa	1F
DN200	1.6MPa	2H
DN250	1.6MPa	2F
DN300	1.6MPa	3H
DN350	1.6MPa	3F
DN400	1.6MPa	4H
DN450	1.0MPa	4F
DN500	1.0MPa	5H
DN600	1.0MPa	6H
DN700	1.0MPa	7H
DN800	1.0MPa	8H
DN900	1.0MPa	9H
DN1000	1.0MPa	1T
DN1200	0.6MPa	2M

Electrode material	
SS 316L	E
Hastelloy C	O
on request	Z

Electromagnetic Flowmeter (Battery-operated)

LMF11B – Ordering information continue…

Operating pressure	
0.6MPa	B
1.0MPa	C
1.6MPa	D
2.5MPa	E
4.0MPa	F
on request	Z

Flange material	
Wafer type (without flange)	0
Carbon steel	1
SS 304	2
on request	3

Companion flange	
No	0
Carbon steel	1
SS 304	2
on request	Z

Grounding ring	
No	A
SS 304	B
on request	Z

Process temperature	
Standard <65 ℃	0
Standard <130 °C	1
Standard <180 °C	2
on request	Z

Display LCD & sensor	
Integrated	T
Remote type	R

Communication	Power Source	
RS485	Lithium battery powered	01
RS485	12V-24V external power supply	02
GPRS	Built-in lithium battery	03
CDMA	Built-in lithium battery	04

Power supply	
Built-in lithium battery power supply	C
Built-in lithium battery-powered plus 12V-24V external power supply	E

Protection class	
IP65 (Standard)	0
IP67	1
IP68 (Remote type only)	2

Cable length (Remote type only)	
Standard 5 meters	R5
on request (up to 10 meters)	RX

LMF11B – Ordering information continue…

Pressure sensor interface (optional)			
No	N		
Yes	Y		
External power supply (optional)			
External lithium battery pack	01		
Solar power	02		

Note 1: Modified PP lining only applies to the diameter DN25-DN300.

Note 2: DN10-20 F46 lining only.

Advantages:

- No External Power Required for Remote Locations (Battery Operated Type)
- Low power consumption, standard conventional lithium battery pack for 5 to 6 years of continuous work.
- Optional external battery can be achieve the maximum battery life more than 10 years, it can be reduce the flow meter maintenance costs.

More information of battery life 5 year service life for transmitter, data collection every 20 minutes.
The data of flow, for example:

2016/09/19/12:05 100l/s
2016/09/19/12:25 102l/s
2016/09/19/12:45 101l/s

Every 20 minutes, the transmitter will record the time and flow data.
The module will package 3 data, and send the data to data collection server every 1 hour.

This standard data collection and sending frequency in enough for most of application, more frequent of data collection and sending, more power would be consume by transmitter or module, that would make the service life decrease.

5 year service life for CDMA/GPRS module, data sending every 1 hour.

Electromagnetic Flowmeter (Heat Meter - BTU)

LMF12 – Ordering information

Description	Series
Heat Meter (BTU)flowmeter	LMF12

Accuracy level	
Standard ±0.5%	A

Installation method	
Flange	F

Temperature sensor	
PT100	T1
PT1000	T2

Lining material	
Hard Rubber	H
PTFE	T
F46	R
PFA	P
on request	Z

Nominal size	Pressure rating	
DN6	4.0MPa	06
DN8	4.0MPa	08
DN10	4.0MPa	10
DN15	4.0MPa	15
DN20	4.0MPa	20
DN25	4.0MPa	25
DN32	4.0MPa	32
DN40	4.0MPa	40
DN50	4.0MPa	50
DN65	4.0MPa	65
DN80	4.0MPa	80
DN100	1.6MPa	1H
DN125	1.6MPa	1Q
DN150	1.6MPa	1F
DN200	1.6MPa	2H
DN250	1.6MPa	2F
DN300	1.6MPa	3H
DN350	1.6MPa	3F
DN400	1.6MPa	4H
DN450	1.0MPa	4F
DN500	1.0MPa	5H
DN600	1.0MPa	6H
DN700	1.0MPa	7H
DN800	1.0MPa	8H
DN900	1.0MPa	9H
DN1000	1.0MPa	1T
DN1200	0.6MPa	2M

LMF12 – Ordering information continue...

Nominal size	Pressure rating	
DN1400	0.6MPa	4M
DN1600	0.6MPa	6M
DN1800	0.6MPa	8M
DN2000	0.6MPa	0M

Note: Standard without temperature sensor

Electrode material	Electrode grounding	
SS 316L	Yes	E
Hastelloy B	Yes	N
Hastelloy C	Yes	O
on request	Yes	Z

Operating pressure	
0.6MPa	B
1.0MPa	C
1.6MPa	D
2.5MPa	E
4.0MPa	F
on request	Z

Flange material	
Wafer type (without flange)	0
Carbon steel	1
SS 304	2
SS 316	3
SS 316L	4

Companion flange	
No	0
Carbon steel	1
SS 304	2
SS 316	3
SS 316L	4

Grounding ring	
No	A
SS 304	B
SS 316	C
SS 316L	D

Process temperature	
Standard <65 ℃	0
Standard <90 °C	1
Standard <130 °C	2
Standard <180 °C	3
Standard <200 °C	4

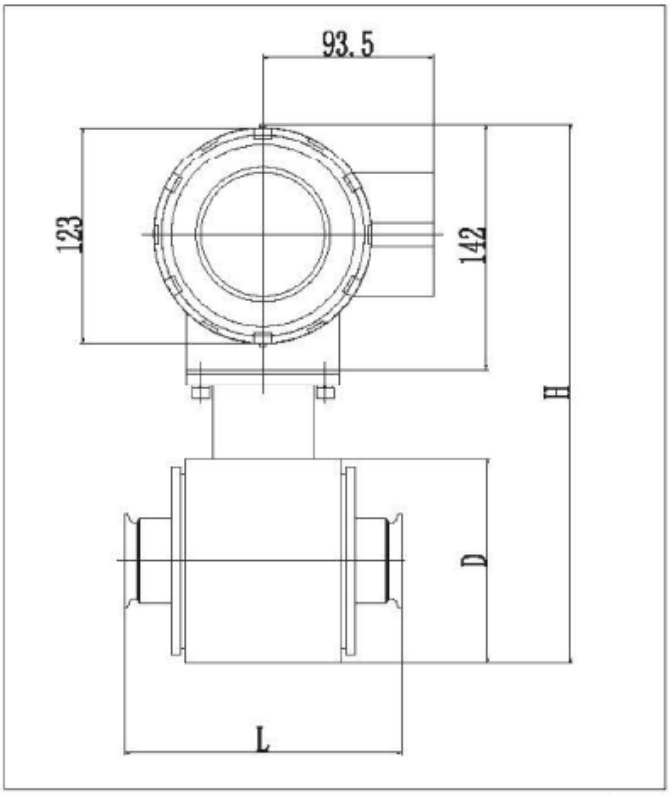
Display LCD & sensor	
Remote type	R

Output + Communication	
4 ~ 20mA + Modbus	01

LMF12 – Ordering information continue...

Power supply					
240 VAC	G				
24 VDC	K				
Protection class					
IP65 (Standard)	0				
IP67	1				
IP68	2				
Explosion protection					
No		0			
Flameproof Ex-d, Ex-ia IIC T3~T6		EX			
Electrical connection					
M20 × 1.5			0		
1/2 "-14 NPT			1		
Cable length (Remote type only)					
Standard 5 meters				R5	
On request (up to 50 meters)				RX	
Sensor selection material (Optional)					
SS 304					-X
SS 316					-Y
SS 316L					-Z

LMF13 - Dimension (mm)



DN	Pressure			
	MPa	L	D	H
10	1.0	180	100	287
15				
20				
25			110	297
32				
40				
50		230	152	339
65			170	357
80			180	367
100		270	200	387
125			246	426

LMF13 – Ordering information

LMF13 Series Flowmeter DN10-DN125

Accuracy standard: ± 0.5%

Description	Series
Sanitary flowmeter	LMF13

Pipe connection	
Tri-Clamp (3A)	T
DIN11851	R
on request	Z

Lining material	
F46	R
PFA	P

Pipe connection size	
DN10	10
DN15	15
DN20	20
DN25	25
DN32	32
DN40	40
DN50	50
DN65	65
DN80	80
DN100	1H
DN125	1Q

Electrode material	Electrode grounding	
SS 316L	No	S
Hastelloy B	No	B
Hastelloy C	No	H
Titanium	No	M
Tantalum	No	T
Platinum Iridium	No	P

Tri-clamp material	
SS 304	0
SS 316	1
SS 316L	2

Tri-clamp pressure rating	
1.0 MPa	C

Process temperature	
Standard <180 °C	1
Standard <200 °C	2

Display LCD & sensor	
Integrated	T
Remote type	R

Power supply	
220 VAC	G
24 VDC	K

Electromagnetic Flowmeter (Sanitary Type)

LMF13 – Ordering information continue...

Output + Communication							
4 ~ 20mA + pulse	01						
4 ~ 20mA + HART	02						
4 ~ 20mA + Modbus	03						
4 ~ 20mA + Profibus	04						
Protection class							
IP65 (Standard)	0						
Explosion protection							
No	0						
Flameproof Ex-d, Ex-ia IIC T3~T6	EX						
Electrical connection							
M20 × 1.5	0						
1/2 "-14 NPT	1						
Cable length (Remote type only)							
Standard 5 meters	R5						
on request (up to 50 meters)	RX						
Sensor selection material (Optional)							
SS 304	-X						
SS 316	-Y						
SS 316L	-Z						

LMF14 & LMF14B

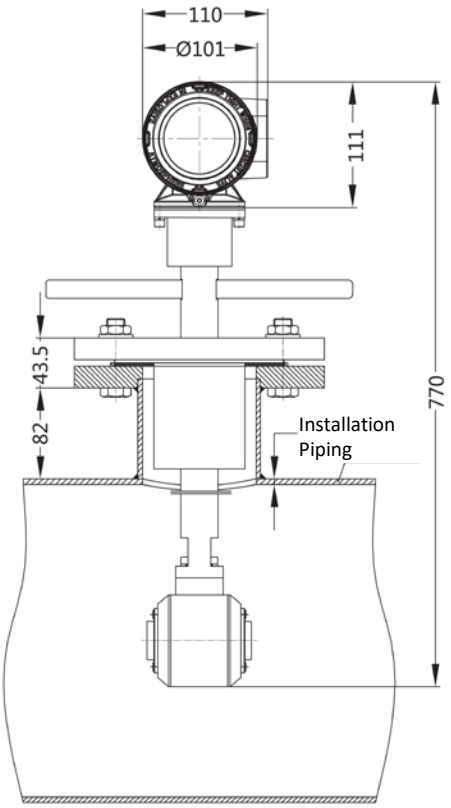
Electromagnetic Flowmeter
(Insertion Type, with / without Battery-operated)

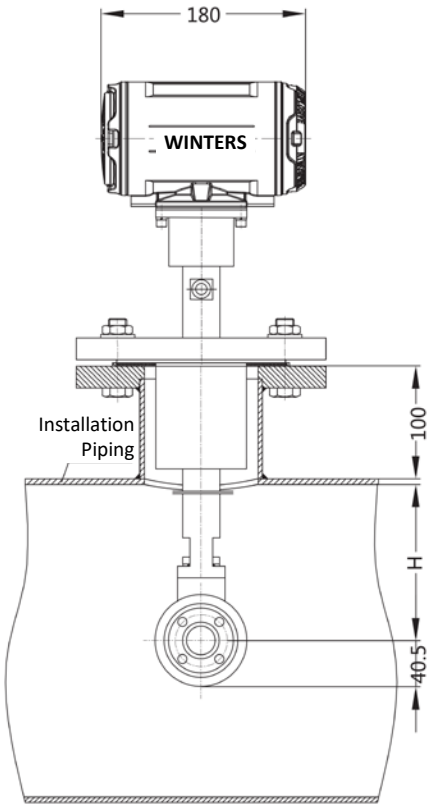
LMF14
(External Power)

LMF14B
(Battery-operated)

Specification		
Model	**LMF14**	**LMF14B**
Type	Insertion Type	Insertion Type (Battery Operated)
Accuracy	±1.5%	
Repeatability	±0.5%	
Medium temperature	-25 ~ 130℃	
Conductivity	≥ 5 μS / cm (softening water ≥ 20 μS / cm)	
Nominal size	DN200 – DN2000	
Operating Pressure	0.6MPa / 1.0MPa / 1.6MPa	
Flowrate	0.5 ~ 1.0 m/s	
Flow direction	Forward / Reverse	
Electrode material	SS316L	
Lining material	PTFE	
Number of electrodes	2	
Measuring tube material	SS304 (Insertion Rod)	
Flange material	SS304/ SS316/ SS316L	
Installation method	Fixed Flange Type / Plug in/out	
Power supply	230 VAC/ 24VDC	Build-in Lithium battery (≥ 6 yrs) External lithium battery pack (≥10 yrs) 12-24 VDC external power
Battery Life (LMF11B)	Low power consumption, standard conventional lithium battery pack (3.6V) for 5 to 6 years of continuous work and optional external battery pack to achieve the maximum battery life more than 10 years, reducing flow meter after installation maintenance costs.	
Protection class	IP65 (standard) IP67 IP68 (remote type only)	IP68
Output	4-20mA /Pulse/ Frequency	N/A
Electrical connection	M20 x 1.5; 1 /2" – 14NPT	M16 x 1.5
Communication	HART / Modbus (RS485)/ Profibus	RS485 / GPRS / CDMA
Sensor Type	Integrated / Remote	
Working environment	Environment temperature -25 to 60ºC; Humidity 5% to 90%RH	
Language	Selectable English/ Chinese	

LMF14 - Dimension (mm) & Fixed Flange Type Installation Method

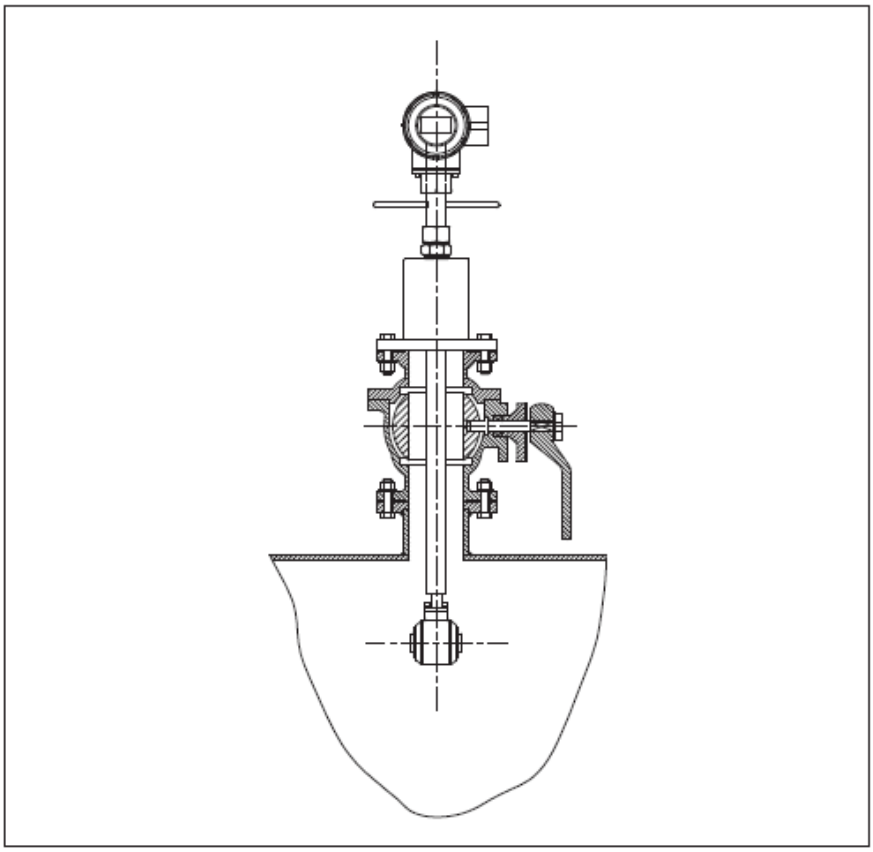




LMF14
Flange fixed type connection
DN200 ~ 2000

On-site pipe open a DN100 diameter hole, install a 100mm length with DN100 diameter metal pipe and DN100 1.6Mpa flange welded together. Install the standard flange-mounted Insertion type Electromagnetic flowmeter on the flange.

LMF14 - Dimension (mm) & Plug-in/Out Type Installation Method



LMF14
Plug-in/out type connection
DN200 ~ 2000

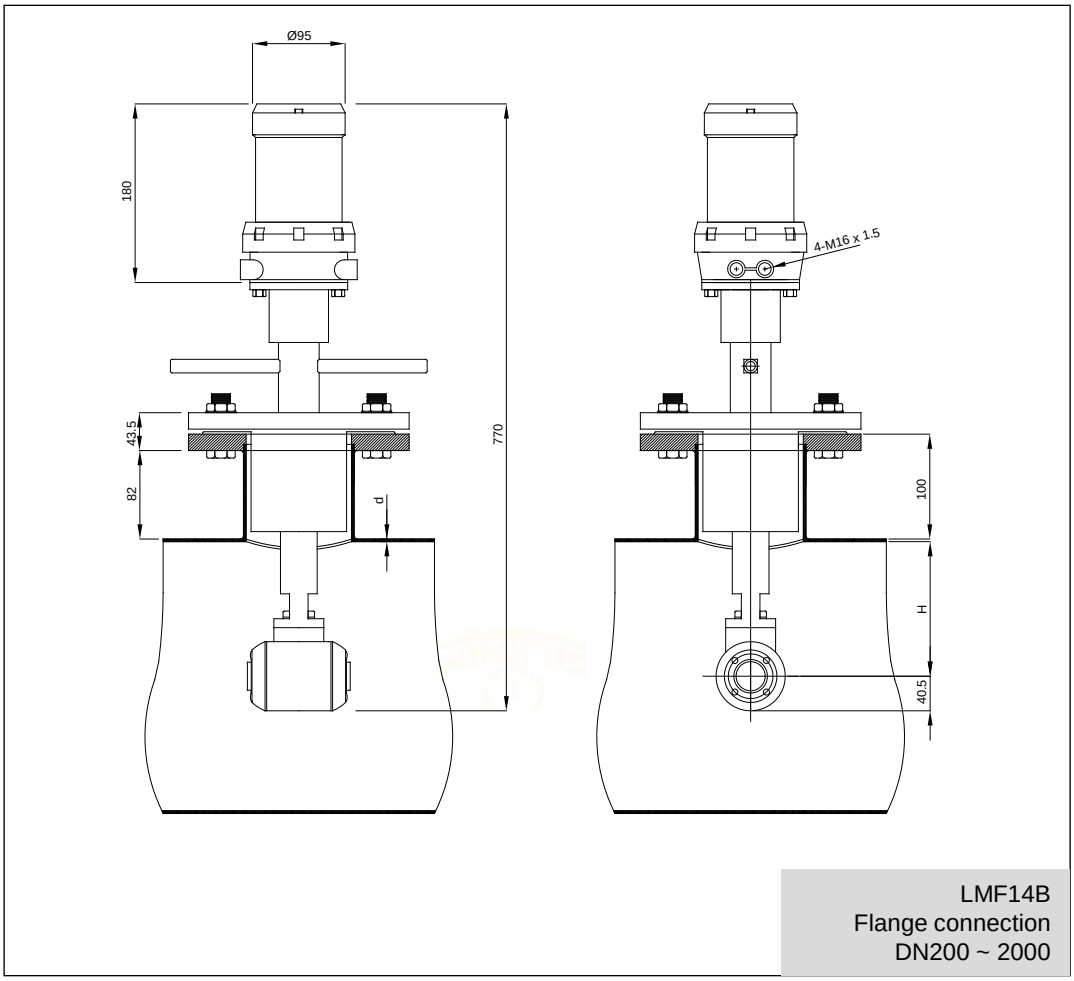
Flange fixed type Insertion electromagnetic flowmeter installation diagram on basis additional to installed a full port DN100 ball valve.

User can drive the Plug-in/out type flow meter to the highest point without shutting down media supply, close the ball valve and remove the flowmeter.

Insertion type flowmeter measuring point insertion depth
H: diameter D <DN500mm, H = 1 / 2D; diameter D> DN500mm, H = 1 / 5D.

Electromagnetic Flowmeter (Insertion Type)

LMF14B - Dimension (mm)



LMF14B
Flange connection
DN200 ~ 2000

Electromagnetic Flowmeter (Insertion Type)

LMF14 – Ordering information

Description	Series																	
Insertion flowmeter	LMF14																	
Accuracy level																		
Standard ±1.5%		A																
High Precision ±1.0%		B																
Installation method																		
Fixed Flange type			G															
Plug-in/ Out			Z															
Lining material																		
PTFE				T														
on request				Z														
Nominal size																		
DN200					2H													
DN250					2F													
DN300					3H													
DN350					3F													
DN400					4H													
DN450					4F													
DN500					5H													
DN600					6H													
DN700					7H													
DN800					8H													
DN900					9H													
DN1000					1T													
DN1200					2M													
DN1400					4M													
DN1600					6M													
DN1800					8M													
DN2000					0M													
Electrode material																		
SS 316L						S												
Hastelloy C						H												
Operating pressure																		
0.6MPa							B											
1.0MPa							C											
1.6MPa							D											
on request							Z											
Flange material	**Companion flange**																	
SS 304 (DN100 PN1.6)	No							0										
SS 304 (DN100 PN1.6)	Carbon steel + welding base							1										
SS 304 (DN100 PN1.6)	Stainless steel + welding base							2										
Process temperature																		
Standard <130 °C									0									

Electromagnetic Flowmeter (Insertion Type)

LMF14 – Ordering information continue…

Display LCD & sensor								
Integrated	T							
Remote type	R							
Output + communication								
4 ~ 20mA + pulse	01							
4 ~ 20mA + HART	02							
4 ~ 20mA + Modbus	03							
Power supply								
230 VAC	C							
24 VDC	D							
Protection class								
IP65 (standard)	0							
IP67	1							
IP68 (remote type only)	2							
Explosion protection								
No	0							
Flameproof Ex-d, Ex-ia IIC T3~T6	EX							
Cable length (Remote type only)								
Standard 5 meters	R5							
on request (up to 10 meters)	RX							

Electromagnetic Flowmeter (Insertion Type, Battery-operated)

LMF14B – Ordering information

Description	Series
Insertion flowmeter with battery-operated	LMF14B

Accuracy level	
Standard ±1.5%	A
High Precision ±1.0%	B

Installation method	
Fixed Flange type	G
Plug-in/ Out	Z

Lining material	
PTFE	T
on request	Z

Nominal size	
DN200	2H
DN250	2F
DN300	3H
DN350	3F
DN400	4H
DN450	4F
DN500	5H
DN600	6H
DN700	7H
DN800	8H
DN900	9H
DN1000	1T
DN1200	2M
DN1400	4M
DN1600	6M
DN1800	8M
DN2000	0M

Electrode material	
SS 316L	S
Hastelloy C	H

Operating pressure	
0.6MPa	B
1.0MPa	C
1.6MPa	D
on request	Z

Flange material	Companion flange	
SS 304 (DN100 PN1.6)	No	0
SS 304 (DN100 PN1.6)	Carbon steel + welding base	1
SS 304 (DN100 PN1.6)	Stainless steel + welding base	2

Process temperature	
Standard <130 °C	0
on request	Z

Electromagnetic Flowmeter (Insertion Type, Battery-operated)

LMF14B – Ordering information continue…

Display LCD & sensor		
Integrated		T
Remote type		R

Communication	Power Source	
RS485	Lithium battery powered	01
RS485	12V-24V external power supply	02
GPRS	Built-in lithium battery	03
CDMA	Built-in lithium battery	04

Power supply	
Built-in lithium battery power supply	C
Built-in lithium battery-powered plus 12V-24V external power supply	E

Protection class	
IP65 (standard)	0
IP67	1
IP68 (remote type only)	2

Cable length (Remote type only)	
Standard 5 meters	R5
on request (up to 10 meters)	RX

Advantages:

- No External Power Required for Remote Locations (Battery Operated Type)
- Low power consumption, standard conventional lithium battery pack for 5 to 6 years of continuous work.
- Optional external battery can be achieve the maximum battery life more than 10 years, it can be reduce the flow meter maintenance costs.

More information of battery life 5 year service life for transmitter, data collection every 20 minutes.
The data of flow, for example:

2016/09/19/12:05 100l/s
2016/09/19/12:25 102l/s
2016/09/19/12:45 101l/s

Every 20 minutes, the transmitter will record the time and flow data.
The module will package 3 data, and send the data to data collection server every 1 hour.

This standard data collection and sending frequency in enough for most of application, more frequent of data collection and sending, more power would be consume by transmitter or module, that would make the service life decrease.

5 year service life for CDMA/GPRS module, data sending every 1 hour.