

# NINGBO AIMEI FLOWMETER

## Electromagnetic Flow-meter

Installation and operating  
Instructions LD Series



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NINGBO AIMEI METER MANUFACTURE CO.,LTD



ISO9001

# NINGBO AIMEI FLOWMETER

## Integrated Flow-meter



LD-□ Y/ZA/...



LD-□ Y/ZB/...

## Separating Flow-meter



LD-□ F/...



LD-□ F/...Ex/



ZA Transmitter



ZB Transmitter

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# 1

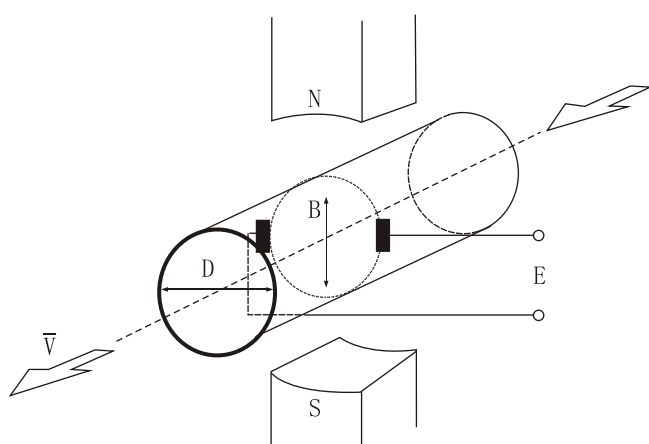
## Summary

LD series electromagnetic flowmeter is composed of sensor and converter. It works on Faraday's electromagnetic induction principle, used for the measuring of volumetric flowrate of liquid whose conductance is greater than  $5 \mu \text{ S/cm}$ . It also can measure the corrosive liquids as strong acid, alkali etc.,

and two phase(Liquid-solid) suspensions as mud, one pulp, paper pulp, etc., it is widely applied in the field of petroleum, chemical industry, metallurgy, textile, papermaking, environmental protection, food and municipal administration, irrigation project., river dredge ect.

# 2

## Measuring Principle



According to the Faraday's electromagnetic induction principle, a pair of measuring electrodes are installed on the wall of the pipe whose axes are perpendicular both to the measuring pipe axis and the magnetic flux. As the conductive liquid is moving along the pipe axis, the conductive liquid cuts the magnetic flux, an induced voltage is produced. This voltage is picked up by the electrodes and is proportional to the flowrate, its value is:

$$E = KBVD$$

E: Induced voltage  
 D: Distance between electrodes (inner diameter of pipe)  
 B: Magnetic flux intensity  
 $\bar{V}$ : Average flow velocity of conductive liquid  
 K: Coefficient related to the distribution of magnetic field etc.

The induced voltage E is regarded as the flow signal of the sensor and is transmitted to the converter. After through amplifying, converting, filtration and a series of digital treatment, the instantaneous and total flowrate are displayed on the LCD.

The transmitter has 4-20mA output, alarm and frequency outputs, and has RS-485, etc communication connection.

# 3

## Characteristics

- No obstacle existed in the measuring tube, so the pressure loss is zero, hardly blocked.
- If the proper electrodes and lining material are adopted, then the requirement of anticorrosion, wear resistance can be satisfied.
- The measuring results have no relation with the physical parameters of liquid, such as pressure, temperature, density, viscosity, conductivity rate (but not below the threshold), etc. It is not influenced by the circumstances, so the accuracy is high, working process is stable and reliable.
- Adopt the dual row flow indicator of back lighted dot array, display the instantaneous and total flowrate, simultaneously, also displays the working status, parameters, measuring units, etc.
- The measuring range of this flowmeter is wide, its rangeability normally is 20:1, generally can reach 30:1 or even larger.
- This flow meter has multi-functional outputs, can be matched with computer, combined instrument unit, can meet the requirements of printing, communication and networking.

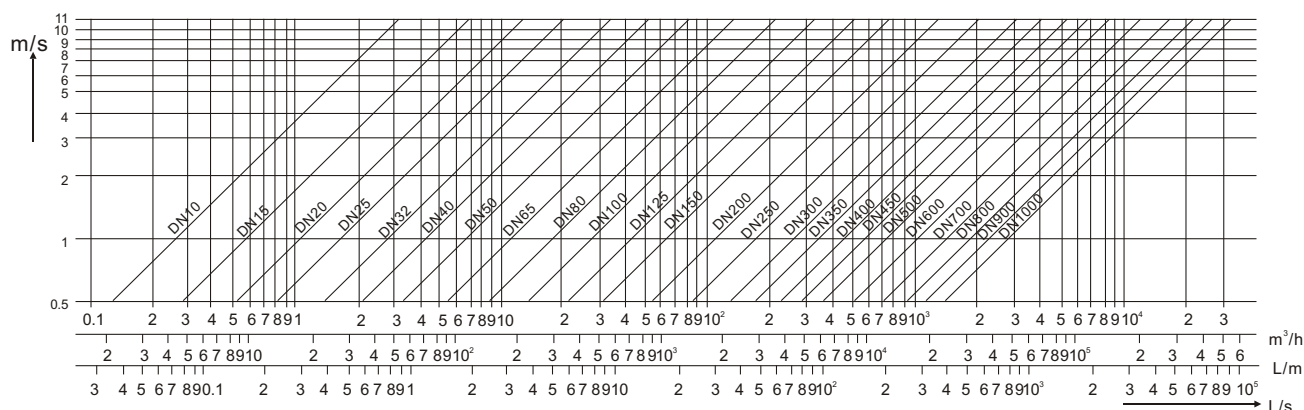
## Main technical

Conductivity of medium	$>5\ \mu\text{ S/cm}$
velocity	0.3~12m/s
Flow range	Within the measurable range of flow velocity, the range of volumetric flow rate is programmable, see the table.
Accuracy	Measured value $\pm 0.5\%$ , $\pm 1\%$
Environment temperature	$-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$
Medium temperature	$T_1 \leq 65^{\circ}\text{C}$ , $T_2 \leq 120^{\circ}\text{C}$ , $T_3 \leq 180^{\circ}\text{C}$
Working pressure	DN 10~80 : $\text{PN} \leq 4\text{MPa}$
	DN 100~150 : $\text{PN} \leq 1.6\text{MPa}$
	DN 200~1000 : $\text{PN} \leq 1.0\text{MPa}$
	DN 1200~2000 : $\text{PN} \leq 0.6\text{MPa}$
	DN2200: $\text{PN} \leq 0.25\text{MPa}$
	(higher pressure can be specially ordered)
Power supply	220V AC 50Hz (90~245V AC 50Hz) 24V DC (20~36V DC)
Power consumption	6.5VA
Protection grade	Standard type IP65, special type IP67 or IP68
Electrode material	316L, Hc, Pt, Ti, Ta
Liner material	1. Polychloroprene rubber 2. PTFE 3. Polyurethane rubber

## Flow selection table( Refer to the chart diagram)

Diameter (mm)	Minimum flow selection (m <sup>3</sup> /h)	Selection of usual full-scale range of flow rate (m <sup>3</sup> /h)
10	0.10	0.4,0.5,0.6,0.8,1.0,1.2,1.6,2.0,2.5
15	0.20	1.0,1.2,1.6,2.0,2.5,3.0,4.0,5.0,6.0
20	0.35	2.0,2.5,3.0,4.0,5.0,6.0,8.0,10.0,12.0
25	0.55	3.0,4.0,5.0,6.0,8.0,10.0,12.0,14.0,16.0
32	1.0	5.0,6.0,8.0,10.0,12.0,16.0,20.0
40	1.5	8.0,10.0,12.0,16.0,20.0,25.0,30.0,40.0
50	2.5	12.0,16.0,20.0,25.0,30.0,40.0,50.0,60.0,70.0
65	4.0	20.0,25.0,30.0,40.0,50.0,60.0,80.0,100.0,120.0
80	5.5	25.0,30.0,40.0,50.0,60.0,80.0,100.0,120.0,160.0
100	8.5	40.0,50.0,60.0,80.0,100.0,120.0,160.0,200.0,250.0
125	14	60.0,80.0,100.0,120.0,160.0,200.0,250.0,300.0,400.0
150	20	100.0,120.0,160.0,200.0,250.0,300.0,400.0,500.0,600.0
200	35	160.0,200.0,250.0,300.0,400.0,500.0,600.0,800.0,1000.0
250	55	200.0,250.0,300.0,400.0,500.0,600.0,800.0,1000.0,1200.0,1600.0
300	80	300.0,400.0,500.0,600.0,800.0,1000.0,1200.0,1600.0,2000.0,2500.0
350	105	400.0,500.0,600.0,800.0,1000.0,1200.0,1600.0,2000.0,2500.0,3000.0
400	135	500.0,600.0,800.0,1000.0,1200.0,1600.0,2000.0,2500.0,3000.0,4000.0
450	175	600.0,800.0,1000.0,1200.0,1600.0,2000.0,2500.0,3000.0,4000.0,5000.0
500	215	800.0,1000.0,1200.0,1600.0,2000.0,2500.0,3000.0,4000.0,5000.0,6000.0
600	305	1000.0,1200.0,1600.0,2000.0,2500.0,3000.0,4000.0,5000.0,6000.0,10000.0
700	415	1200.0,1600.0,2000.0,2500.0,3000.0,4000.0,5000.0,6000.0,10000.0,12000.0
800	545	1600.0,2000.0,2500.0,3000.0,4000.0,5000.0,6000.0,10000.0,12000.0,16000.0
900	690	2000.0,2500.0,3000.0,4000.0,5000.0,6000.0,10000.0,12000.0,16000.0,20000.0
1000	850	2500.0,3000.0,4000.0,5000.0,6000.0,10000.0,12000.0,16000.0,20000.0,25000.0
1200	1250	6000.0, 10000.0,15000.0,20000.0,25000.0,30000.0,35000.0
1400	1700	8000.0,10000.0,20000.0,30000.0,40000.0,50000.0
1600	2500	10000.0,20000.0,30000.0,40000.0,50000.0,65000.0
1800	3000	15000.0,20000.0,30000.0,40000.0,50000.0,60000.0,70000.0,80000.0
2000	3500	20000.0,40000.0,60000.0,80000.0,100000.0
2200	4000	20000.0,40000.0,60000.0,80000.0,100000.0,120000.0

**Chart Diagram Related to the Diameter;  
Flow Velocity and Volumetric Flow Rate**



- Normally 2~6m/s flow velocity of the medium is advisable. If specially required, the minimum shall not lower than 0.3m/s, the maximum not higher than 12m/s. Too low flow velocity will cause the going-down of the electromagnetic signal, which will lead to a decrease of the measurement accuracy. In case the fluid contains solid particles, it is necessary to set the flow velocity at lower than 3m/s. For viscous liquids the corresponding flow velocity shall be at a higher value, which is helpful for automatically eliminating the dirt on the electrodes and also favourable to improving the measurement accuracy.

**Formula to calculate the relation between the flow rate , flow velocity and diameter:**

$$Q = \frac{3600}{4} \pi D^2 v = 900 \pi D^2 v$$

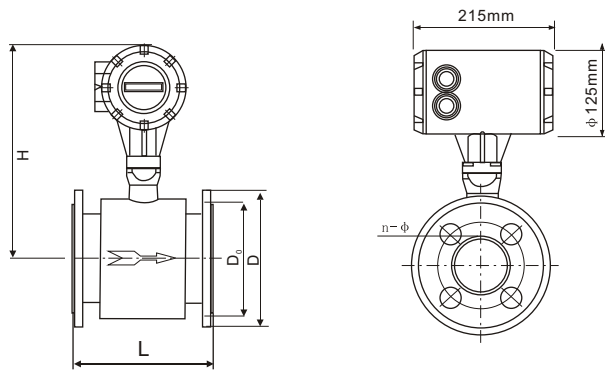
Q: Flow rate (m³/h)

v: Flow velocity (m/s)

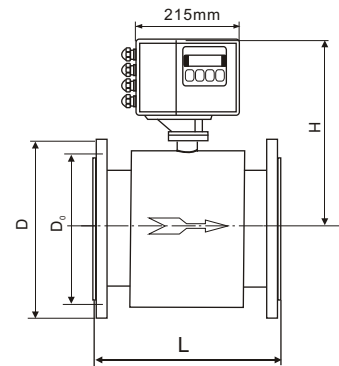
D: Diameter(m)

- After the diameter of the flowmeter being determined, it is necessary to increase as the full measurement range value (by 15%~30%) according to the preset maximum technological flow. In the practical use, shall do best not to allow the flow to exceed the full range value, otherwise, the flow measurement of this part will have a larger error. In addition, the ratio between the maximum and minimum flows shall not be larger than 20 to assure of precise measurements.

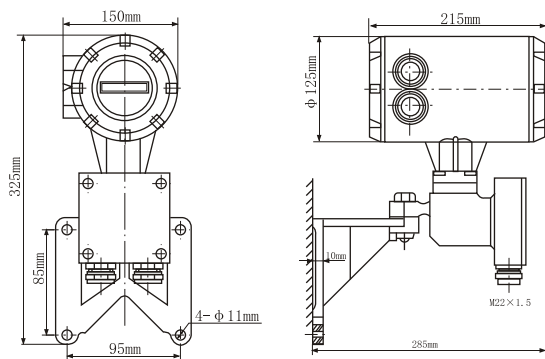
## Dimensions of the Integrated Type and the Separating Type



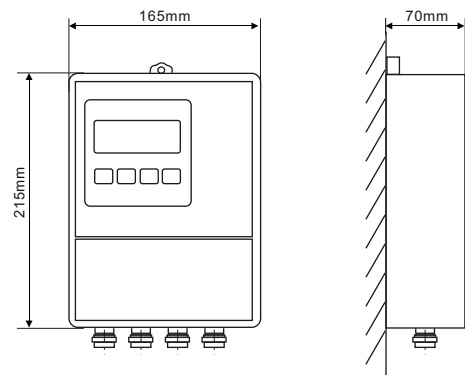
LD-□ Y/ZA/...



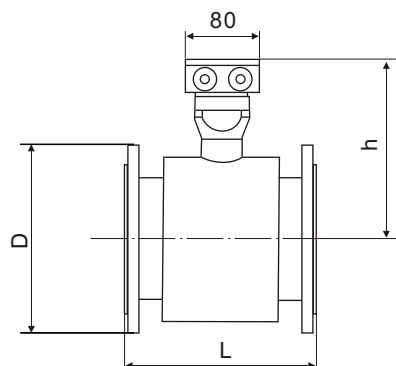
LD-□ Y/ZB/...



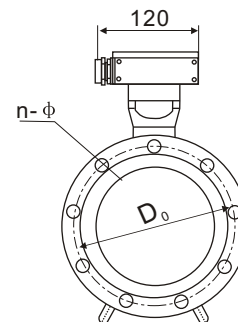
ZA Transmitter



ZB Transmitter



DN10~2200 mm Sensor

Flange Standard :  
DIN

LD-□ F/...

## Dimensions (mm)

Diameter	Pressure MPa	L	D	D <sub>o</sub>	H	h	n- φ
10	4.0	150	90	60	220	102	4- φ 14
15		150	95	65	222	106	4- φ 14
20		150	105	75	230	110	4- φ 14
25		150	115	85	235	115	4- φ 14
32		150	140	100	255	122	4- φ 18
40		150	150	110	260	127	4- φ 18
50		200	165	125	270	140	4- φ 18
65		200	185	145	275	148	8- φ 18
80		200	200	160	280	154	8- φ 18
100	1.6	250	220	180	290	163	8- φ 18
125		250	250	210	320	175	8- φ 18
150		300	285	240	330	200	8- φ 22
200	1.0	350	340	295	340	220	8- φ 22
250		400	395	350	360	240	12- φ 22
300		500	445	400	405	285	12- φ 22
350		500	505	460	440	320	16- φ 22
400		600	565	515	470	350	16- φ 26
450		600	615	565	500	380	20- φ 26
500		600	670	620	530	410	20- φ 26
600		600	780	725	590	470	20- φ 30
700		700	895	840	650	530	24- φ 30
800		800	1015	950	720	600	24- φ 33
900		900	1115	1050	770	650	28- φ 33
1000		1000	1230	1160	830	700	28- φ 36
1200	0.6	1200	1405	1340	950	800	32- φ 33
1400		1400	1630	1560	1050	900	36- φ 36
1600		1600	1830	1760	1150	1000	40- φ 36
1800		1800	2040	1970	1250	1100	44- φ 39
2000		2000	2265	2180	1350	1200	48- φ 42
2200	0.25	2200	2405	2340	1450	1300	52- φ 33



## Model Selection and Instruction

LD—

Electromagnetic  
Flow-meter

Diameter

**Y** Integrated type

**F** Separating type

**Transmitter model**

**FOX** (FoxBoRo IMT25 I/A U.S.)

**ZA** (Circular)

**ZB** (Square)

**Power supply**

**AC** 220V AC 50Hz (90~245V AC 50Hz)

**DC** 24V DC (20~36V DC)

**Output signal**

**If:** 4~20mA、1KHz

**RS:** Rs-485

**Ht:** Hart

**Explosion-proof request**

**N:** No explosion-proof

**Ex:** Explosion-proof (only Separating type )

**Medium temperature**

**T1** ≤ 65℃

**T2** ≤ 120℃

**T3** ≤ 180℃ (only Separating type )

**Liner material**

**NE** Polychloroprene rubber (DN50~DN2200)

**PTFE** Teflon (DN10~DN600)

**PUNE** Polyurethane rubber (DN25~DN800)

**Material of electrode**

**316L** Stainless steel 316L

**Hc** Hastelloy c

**Pt** Platinum

**Ti** Titanium

**Ta** Tantalum

**Full-seale range of flowrate (refer to flow selection table)**

**Length of Signal line (m)** (only Separating type )





## Selection of Electrode & Lining Materials

### Selection of Electrode Materials

- It is up to user to select the material for electrode according to the corrosiveness of the medium under measurement. For normal media may consult the relevant anti-corrosion manual. For the mixed acids and other else media with complicate components, material selection is subject to the sample trial.

### Corrosion-proof performance of the electrode materials

Electrode Materials	Corrosion-proof performance
00Cr17Ni14Mo2 (316L)	Corrosion-proof performance Quite strongly resistant to corrosion from nitric acid, <5% sulphuric acid, boiling phosphoric acid, formic acid and alkali solutions as well as sulfurous acid under a certain pressure, sea water, acetic acid and others. Can be widely used in petroleum, chemical, urea and vinylon industries, etc. Sea water, saline water, weak acids, weak bases
Hc	Resistant to corrosion of oxidated acids, such as nitric acid, mixed acid or mixture of chromic acid with sulphuric acid, also resistant to corrosion of oxidated salts, such as Fe <sup>+++</sup> , Cu <sup>++</sup> , or to corrosion of other oxidizing agents, such as hypo-argenate solution at higher than normal temperature and sea water, etc.
Pt	Suitable for almost all the Acid Solution, alkali solution and Salt Solution (including sulfuric acid fuming and Nitric acid Fuming), but not suitable for nitro hydrochloric acid and Ammonium.
Ti	Resistant to corrosion of sea water, diverse chlorides, hypo-chlorizates, oxidated acids (including fuming nitric acid), organic acids, bases, etc. Not resistant to corrosion of fairly pure reductive acids (such as sulphuric acid, hydrochloric acid), But if they contain fluoridating agent, the corrosiveness will decrease a lot.
Ta	Excellent resistant to corrosion, very similar to glass. Almost resistant to corrosion of whatever chemical medium except hydrofluoric acid, fuming sulphuric acid and bases.

### Selection of Lining Materials

- Shall carry out selection according to the corrosiveness of the medium under measurement. Chloroprene rubber can resist against corrosion of common weak acids, weak bases, can withstand 65°C temperature and also is wear-resistant. Polytetrafluoroethylene can resist against corrosion of almost all the strong acids and alkali except hot phosphoric acid, withstands maximum 180°C of the medium temperature, but not wear-resistant.

### Performance of usual lining material and scope of its usage

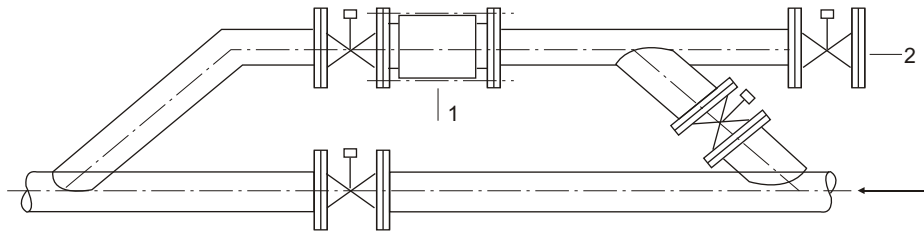
Lining Materials	mostly performance	apply extension
PTFE (Teflon)	1. It is a material with the most stable chemical performance among the plastic materials, can withstand boiling hydrochloric acid, sulphuric acid, nitric acid and aqua regia as well as concentrated bases and diverse organic solvents. 2. Poor wear-resistance and adhesion.	1. -40°C ~ +180°C 2. Strong corrosive media, such as acids and alkali 3. Sanitary media 4. Not suitable for backward pressure pipeline
NE (Polychloroprene rubber)	1. Excellent elasticity, top breaking strength and good wear-resistance. 2. Resistant to corrosion of common low-concentrated acids, bases, salts, but not to non-oxidating media.	1. <65°C 2. To measure common water, sewerage, mud, mining
PUNE (Polyurethane rubber)	1. with good abrasion resistance (ten times as natural rubber) 2. with bad acid resistance and alkali resistance	1. <65°C 2. neutral mash, coal slurry and mud slurry with strong wear



## Sensor Installation

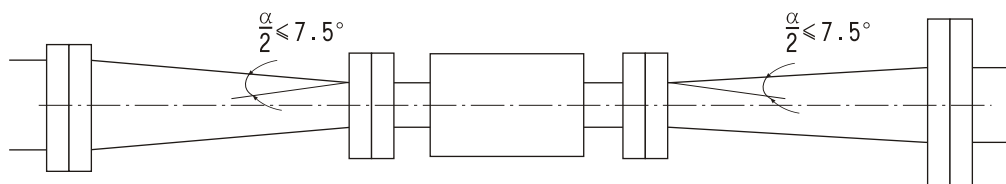
### Attentions for the Sensor Installation

- Place and position to install the sensor may be selected according to needs. May install it horizontally, obliquely or vertically. However, the axis of the two electrodes shall be generally in the horizontal position. No matter which way is selected for installation, the pipeline shall be surely filled with medium under measurement. There shall never be any non-full pipe section or any air bubbles to congregate in the pipeline.
- Flow direction: The arrow on the sensor indicates the forward flow direction.
- Because the distance between the sensor flange and outside case is limited, the connecting bolt shall be inserted from the lateral side of the pipe. This requires an enough space at the flange of the sensor connecting pipe.
- If the pipeline system is subject to strong vibration, it is necessary to add supports to the pipeline on the two sides of the sensor.
- If the medium under measurement is a grave foul liquid, or a liquid easily fouling in the pipeline, it's better to install the sensor on a by-pass pipe for easier cleaning. (as the figure shows)



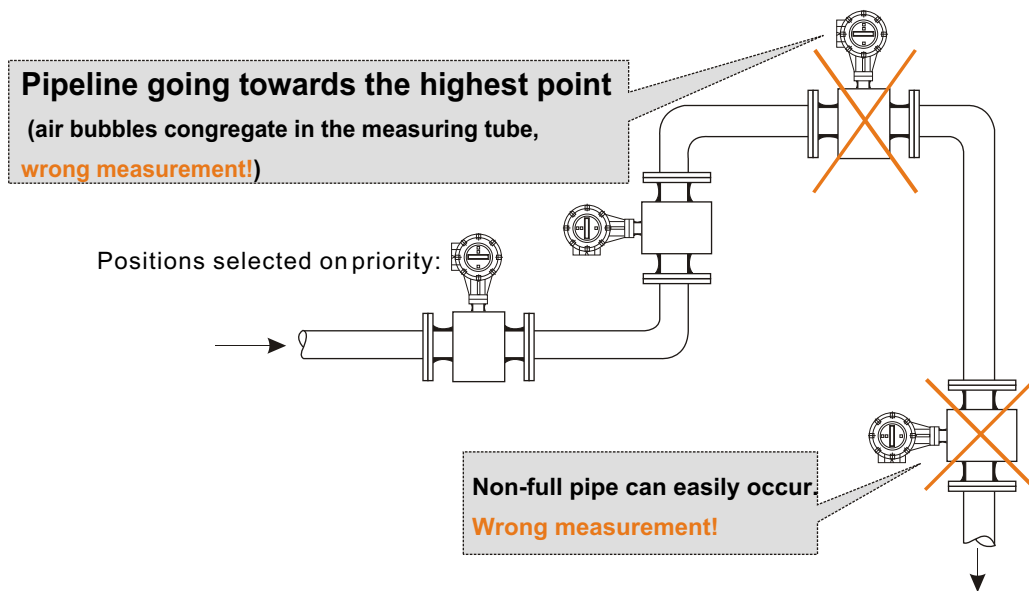
1、Flowmeter 2、Clean valve

- Never allow any ferrous magnetic objects to be set closely to the sensor. The sensor shall be kept far away from any strong electromagnetic fields which may affect the sensor's magnetic fields and signal voltage.
- For the needs to check the zero point, the sensor shall be full of medium and set the flow speed at zero. This can be effected by closing the stop valves mounted both on the upper and lower reaches of the sensor. These valves shall not be mounted in the area smaller than  $5 \times DN$  in the upper reaches and  $2 \times DN$  in the lower reaches.
- To avoid whirlpool to form after the valves have been mounted, it is necessary to check carefully to guarantee a cocentric installation of both the sealings and the earthing ring.
- To avoid interference, the signal cable and the power-supply cable or exciting current cable shall not be laid in a same steel tube. When arrange them in a parallel way they shall not be too close to each other, but keeping a certain distance between each other.
- The length of the straight pipe in the upper reaches of the sensor shall not be less than  $5DN$ , that in the lower reaches shall not less than  $2DN$ .  $DN$  is the path diameter of the sensor. In case this requirement can be met on the spot, a flow orthosis device shall be mounted in the upper reaches to eliminate the whirlpools to form in the medium flow and improve the flow field distribution, raise the measurement accuracy and stability. In case the sensor and the connection tube are different in the caliber, it is necessary to add a specially shaped tube with two differently sized ends. In order to ensure the measurement accuracy shall carry out the installation as per the figure. (See the figure).



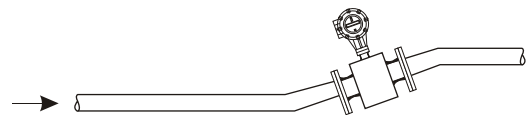
### Suggestions for correct installation of the electromagnetic flowmeter :

To avoid measurement errors caused by air congregation in the pipeline and damage of the lining inside the sensor caused by the negative pressure such formed, please pay attention to the following points:



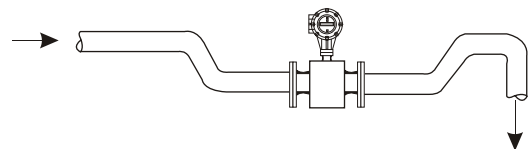
#### Pipeline going horizontally

If not possible to install the flowmeter on the slightly up-going pipe section, be sure to ensure a sufficient flow speed in prevention of air, gas or steam from congregation in the upper part of the pipeline.



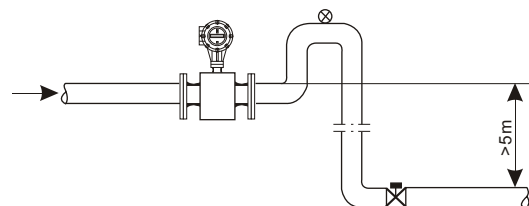
#### For the length of the open aperture perfusion-in tube

Install the low tube in piping segment to the appearance



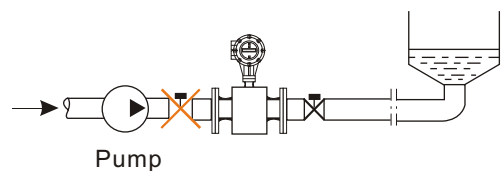
#### Discharging downwards pipe If exceeds 5m

Shall install an air-discharge valve (vacuum) in the lower reaches of the flowmeter



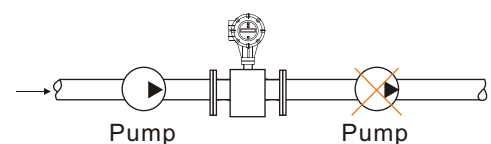
#### Long pipeline system

Usually to install a control valve and a stop valve in the lower reaches of the flowmeter.

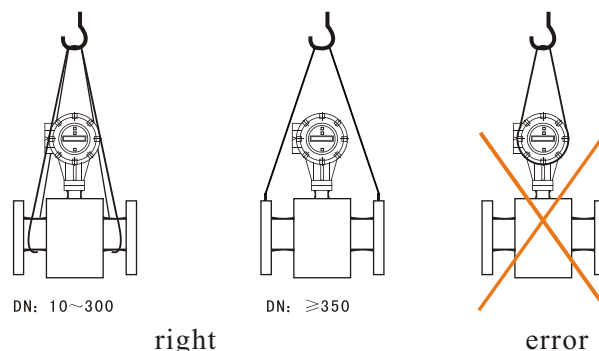


#### Pump

Never install the flowmeter at the suction end of the pump (vacuum!). But install it in the lower section of the pipeline.






Never practice the following erroneous ways at the time of installing and lifting





## **Transmitter Installation ,Repair & Maintenance**




### **Install**

-  This flowmeter can be installed either as an integral whole unit on the spot, or in a detached way on the wall.
-  Installation shall avoid impacts and places with strong AC magnetic fields.
-  Never install the meter in any sunshine, rain-afflicted and damp ambience.

### **Maintain**

-  In case the transmitter shows abnormality, first shall check whether the outside structure is damaged, whether the cable is in a sound condition and whether the public power supply voltage is normal.
-  When the abnormality of the transmitter is confirmed, may open the meter cover and check if the fittings have been loosened, displaced and whether the components are hot or burnt, etc. If possible, please, try with a new transmitter of same flow/model as replacement and see if the suspected transmitter is truly abnormal.

### **Maintenance**

-  Shall periodically check whether the transmitter is water-afflicted, damp and corroded.
-  Periodically wash the electrodes and measuring tube, paying attention to no damage to the electrodes and linings.
-  Periodically check the ageing of the cables and condition of contact.

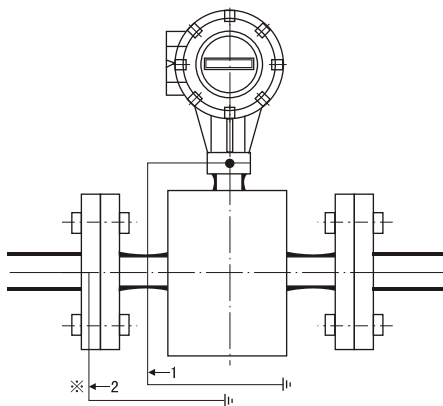
## **Function of the Earthing Ring**

If the pipeline connecting with the meter is insulating (relatively to the medium under measurement), shall apply the earthing ring, for which the material is to be selected according to the corrosiveness of the medium under measurement. If the sensor is made of PTFE, an earthing ring shall be applied to protect the PTFE revers from damage.

### **Instrument Earthing Question**

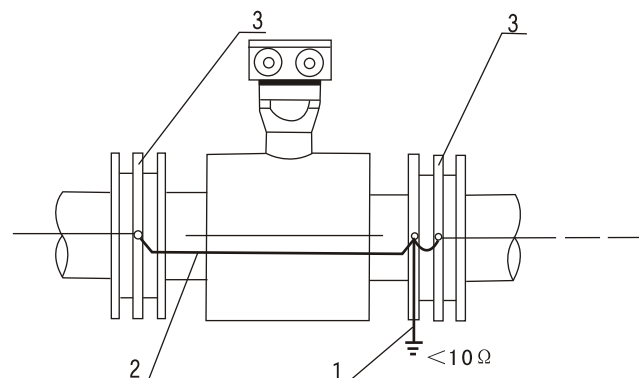
The factor whether the outside case is earthened or not directly affects the accuracy and stability of the measurement. The earthing lead shall not conduct any interference voltage. So otherwise electrical appliances shall not connect with the same earthing wire.

- When delivered from our factory, the output part of the commutator has been already fitted with the earthing wire. Just conduct the earthing only as required upon installation. But the sensor in its turn, connects with the metallic pipeline. The medium inside the latter has already had a good electrical connection with the earth, so the sensor doesn't need adding any earthing wire. If there is more rigid requirements for the earthing, or the ambience has relatively strong electromagnetic interference, an independent earthing wire may be set up for the sensor, subject to a earthing bar being buried into over 5m deep damp earth and the earthing wire shall be a multi-sectioned copper wire with its cross section not less than 4mm<sup>2</sup> (See the figure)



**Fig.1**

- 1. Commutator earthing wire
- 2. Sensor earthing wire
- ※ Earthing copper wire



**Fig.2**

- 1. Earthing device wire (in case of fairly strong interference from outside)
- 2. Meter earthing wire (provided with delivery)
- 3. Earthing flange or earthing ring.

**Note 1:** To install the sensor on the metallic pipeline: There is no insulating coating on the inner wall of the metallic pipeline. Conduct earthing as per A/M figure. (Fig.1)

**Note 2:** To install the sensor on the plastic pipeline or insulation-coated. painted pipeline: Shall mount earthing rings (or short tubes with earthing wire) on the two ends of the sensor so as to create a short circuit between the medium under measurement, flowing in the pipeline, and the earth, otherwise the flowmeter can't do a normal work. (Fig.2)

## Keyboard Defining



Compound key

**Lower key:** decrease 1、Down key , And Compound key combination left replacement key**Upper key:** adding 1、Up key , And Compound key combination right replacement key**Confirmation key :** And Compound key To enter into the parameter-setting state.

## Keyboard operation instruction

Transmitter has two running states.

- \* Automatic measuring state
- \* Parameter setting state

After being powered, the flowmeter enters into the measuring state automatically, during which it automatically completes the measuring and displays corresponding data; In the parameter-setting state four top board keys are used to complete the parameter-setting.

## Key functions in the automatic measuring state

- \* **Lower key:** To select the lower row display content on the screen in cycles forward/backward accumulative calculation value; plus/minus accumulative calculation flow difference value and alarm content.
- \* **Upper key:** To select the upper row display content on the screen in cycles momentary flow, flow speed, ratio in percentage, conductivity ratio and alarm indication .
- \* **Compound key+confirmation key:** To enter into the parameter-setting state.
- \* **Confirmation key:** To return to the automatic measuring state.

### Key functions in the parameter-setting state

- \* **Lower key**: To lessen the figure at the cursor by 1.
- \* **Upper key**: To increase the figure at the cursor by 1
- \* **Compound key+lower key**: To move the cursor leftward.
- \* **Compound key+upper key**: To move the cursor rightward.
- \* **Confirmation key**: To enter into/exit from the submenu. Keeping this key pushed for over 2 seconds in either state to return to the automatic state.

Note: ①When use the **compound key**, push down the **compound key** first then hold the **upper key** or the **lower key** pushed.

②In the parameter-setting state if there is no key-push operation within 3 minutes, the meter will automatically return to the measuring state.

③Flow unit, flow direction and plus/minus mark selections: Use **upper key** or **lower key** for shifting to meet the requirements.

### Parameter-setting key operation:

If want to set or change the parameter on the flowmeter the meter shall be made to enter into the parameter-state from the measuring state. In the measuring state, push down the **compound key+confirmation key** to display: "0000 ". After that input correct password and push down again the **compound key+confirmation key** to enter into the parameter-setting state. The meter is designed to have 6-grade passwords. Our company provides also another operation passwords at the users' functional requirements.

## Parameter-setting Schedule

Number	Parameter	setup fashion	Parameter letter extension
1	Language	choice	Chinese, English
2	Meter communication address	set amount	0~99
3	Meter communication speed	choice	600~14000
4	Pipeline caliber measuring	choice	3~3000
5	Meter measurement distance setting	set amount	0~99999
6	Measurement damping time	choice	0~100
7	Flow direction selection term	choice	Forward, Backward
8	Flow zero-point amendment	set amount	$\pm 0.000$
9	Minor signal removal point	set amount	0~99%
10	Permissible removal display	choice	Permitted/Forbidden
11	Flow calculation unit	choice	0.00001L~1m3
12	Current output type	choice	0~10mA/4~20mA
13	pulse output method	choice	Frequency/pulse
14	pulse unitary equivalent	choice	0.00001L~1m3
15	Frequency output range	choice	1~5000Hz
16	Empty pipe alarm permission	choice	Allowed/Forbidden
17	Empty pipe alarm value	set amount	99.9%
18	Empty pipe measurement distance amendment	set amount	0.0000~3.9999
19	Upper limit alarm permission	choice	Allowed/Forbidden
20	Upper limit alarm value	set amount	000.0~99.9%
21	Lower limit alarm permission	choice	Allowed/Forbidden
22	Lower limit alarm value	set amount	000.0~99.9

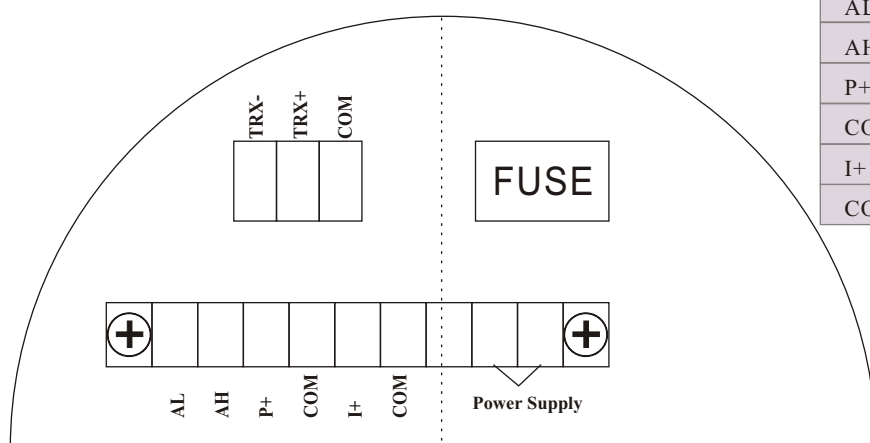


# 12 ZA ZB Transmitter Connection

## ZA Transmitter Connection

## ZA Transmitter Connection Connection Terminal

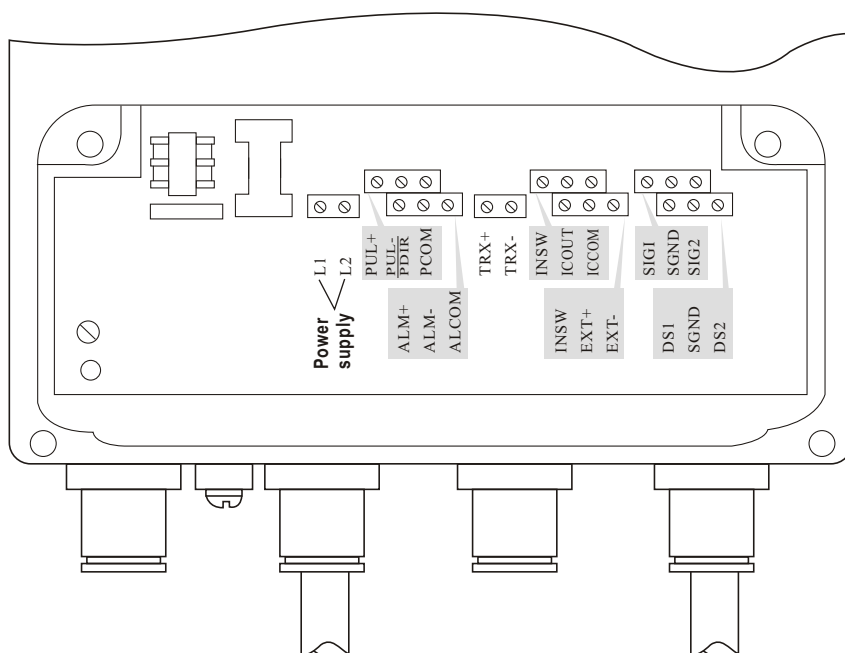
### ● Connection Terminal



TRX <sup>+</sup>	Communication output +
TRX <sup>-</sup>	Communication output --
COM	Grounding
AL	Lower limit alarm output
AH	Upper limit alarm output
P+	Frequency/pulse output
COM	Grounding
I+	Current output
COM	Grounding

## ZB Transmitter Connection

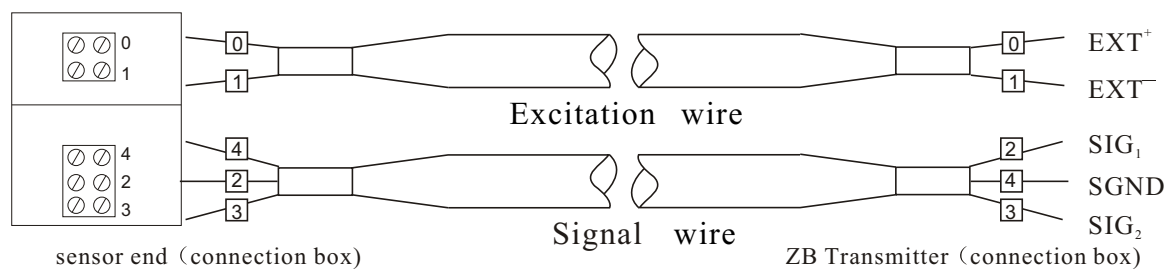
### ● Connection Terminal



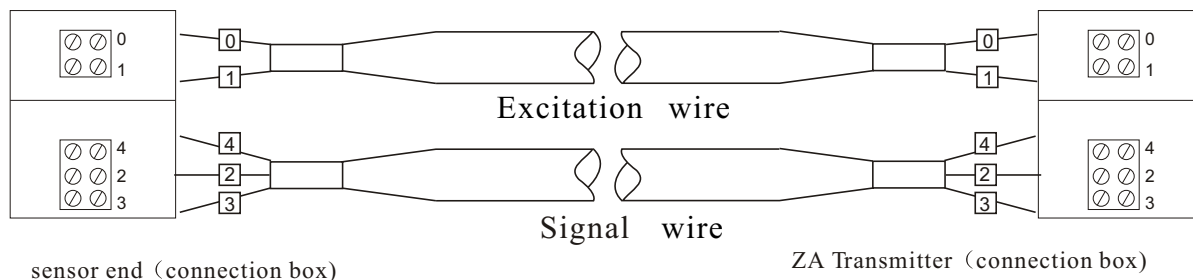
## ZB Transmitter Connection Connection Terminal

SIG <sub>1</sub>	Flow signal (2)	⇒ Detached part-connection sensor
SGND	Flow signal screen layer (4)	
SIG <sub>2</sub>	Flow signal (3)	
DS <sup>1</sup>	Exciting screen layer	
DS <sub>2</sub>	Exciting screen (for testing)	
INSW	Switch input contact	
EXT <sup>+</sup>	Excitation (0)	
EXT <sup>-</sup>	Excitation (1)	
INSW	Switch input contact (for testing)	⇒ Standard current signal output 0 ~10mA or 4 ~20mA
ICOUT	Current output	
ICCOM	Current output Grounding	
PUL <sup>+</sup>	Flow frequency/pulse output	⇒ Frequency/pulse output
PUL <sup>-</sup> PDIR	Flow direction indication (for testing)	
PCOM	Frequency/pulse output Grounding	
ALM <sup>+</sup>	Upper limit alarm output	⇒ Alarm output
ALM <sup>-</sup>	Lower limit alarm output	
ALCOM	Alarm output Grounding	
TRX <sup>+</sup>	Communication output +	⇒ RS485 communication interface
TRX <sup>-</sup>	Communication output -	

## Separating type sensor and ZB Transmitter connection box



## Separating type sensor and ZA Transmitter connection box



# 13

## Notice for Order

For placing orders the following conditions shall be determined




- (1) Model and flow measurement range: To determine the model according to the sensor caliber. The measurement range of the meter shall not lower than the maximum actual flow of the pipeline under measurement, but keeping the normal flow 50% larger than the selected measurement range in order to attain a higher measurement accuracy.
- (2) If impulse (frequency) output is required, please, inform the equivalent of the impulse and the frequency value of the full range of measurement. (Normally is 1KHz)
- (3) The meter shall meet the requirements of the medium under measurement in the working pressure and temperature.
- (4) The lining and electrodes that are in contact with the medium under measurement shall be corrosion-resistant.
- (5) Please, instruct if the flanges and fasteners for installation shall be provided by supplier
- (6) Length of signal and excitation wires between the transmitter and sensor normally is 30m. Short is better, the largest is 100 m.

Note: Please, instruct the special requirements in writing if any.

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## Flowmeter Technical Data & Specification Book for Order-Placing

Denomination of Product	<b>Electromagnetic Flowmeter</b>		Quantity	
Model	LD— <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/>			
Name of Medium & Its State illustration				
Way of Installation & Pipeline Condition				
Caliber and Material of the Connecting Pipeline			Working Pressure	
Material of Liner		Material of electrode		
Integrated /Separating		Lead length for Separating type		
Working Flowrate	Minimum	Normal	Maximum	
Manufacturer	LD— <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/> / <input type="text"/>			
Final Confirmation				
Accessory remark				

- 注:  The model, technical requirements and the measurement distance range finally confirmed by the manufacturer are subject to the confirmation by the user, only after which the formal contract can be signed.
-  Assessor remark indicates the supporting service provided by the manufacturer.
-  Please, ask for the technical data & specification book of the flowmeter from our company.

# NINGBO AIMEI FLOWMETER

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