

Model LDBE Electromagnetic Flowmeter



Model LDBE intelligent electromagnetic flowmeter is a fully intelligent electromagnetic flowmeter developed by our company with the most advanced technology. It is very different from the old analog or non-intelligent electromagnetic flowmeter, especially in service life, appearance, reliability, stability and measurement accuracy. LDBE intelligent electromagnetic flowmeter core uses high-speed central processing unit, equipped with backlight and wide temperature LCD in Chinese and English. It has complete functions, intuitive display and more convenient operation. In addition, we have designed a 4-6 multi-electrode structure, which further ensures the accuracy and stability of measurement, meets the field conditions without grounding ring, and reduces the workload of installation and maintenance.

Electromagnetic flowmeter is a flowmeter with high precision, high reliability and long service life, so we pay attention to every aspect of design, material selection, process and testing . The characteristics of this product are as follows:

1. The measurement accuracy is high. The induction voltage signal of the sensor has a linear relationship with the average velocity of flow. The measurement is not affected by the changes of density, viscosity, temperature, pressure and conductivity of the fluid.
2. Long service life, no movable parts, no obstruction parts in the pipeline, no pressure loss in the measurement.
3. Easy to use, easy to operate, high-definition backlight LCD display, English menu operation, users or according to the needs of the site, online range modification.
4. With RS485, RS232, Hart and Modbus communication protocol etc.
5. With the self-test and self diagnosis function.
6. Programmable low frequency rectangular wave excitation improves the stability of flow measurement and reduces power loss.
7. With 16-bit embedded microprocessor, the operation speed is fast and the precision is high.
8. Full digital processing, strong anti-interference ability, reliable measurement.
9. It has two-way flow measurement function and can display positive and negative flow.
10. The parameters are set flexibly and the flow converter has interchangeability.

Operating Principle

LDBE intelligent electromagnetic flowmeter is suitable for measuring volume flow of conductive liquid and slurry in closed pipeline, such as clean water, sewage, various acid-alkali-salt solutions, mud, pulp, pulp and food liquids. Therefore, it is widely used in chemical fibers, food, paper

making, sugar making, water supply and drainage, environmental protection, water conservancy, steel, petroleum, chemical industry, pharmaceutical and other fields.

The measuring principle of LDBE intelligent electromagnetic flowmeter is based on Faraday's law of electromagnetic induction. When conductive liquid moves in the magnetic field to cut the magnetic induction line, the induction potential is generated in the conductor. Its induction potential E is as follows:

$$E=KBVD$$

Formula: K - - - Instrument Constant, B - - - Magnetic Induction Intensity, V - - - Measuring the Average Velocity in the Pipeline Section, D - - - Measuring the Internal Diameter of the Pipeline Section

When measuring the flow rate, the conductive liquid flows through the magnetic field perpendicular to the flow direction at the velocity V . The flow of the conductive liquid induces a voltage proportional to the average flow rate. The inductive voltage signal is detected by two or more electrodes directly in contact with the liquid, and sent to the converter through the cable for intelligent processing. Then the LCD display or conversion is made into standard signals 4-20mA and 0-1 KHz output.

Technical Parameters

Nominal diameter DN series (mm):

Pipeline PTFE lining: 10,15,20,25,32,40,50,65,80,100,125 150,200,250,300,350,400,450,500,600.

Pipeline Rubber lining: 40,50,65,80,100,125,150,200,300,350,400,500,600,800,1000,1200

Note: Special specifications can be customized

Flow Direction:

Positive and negative flow, net flow, Range ratio: 150:1. Repeatability error: measurement value (+0.1%)

Accuracy Class: Pipeline Type: 0.5, 1.0

The measured medium temperature:

Ordinary rubber lining: - 20 ~+60 °C

High Temperature Rubber Lining: - 20 ~+90 °C

PTFE lining: - 30 ~+100 °C

High Temperature PTFE Lining: - 30 ~+180 °C

Rated Operating pressure:

Pipeline type: DN10—DN65: ≤2.5Mpa, DN80—DN150: ≤1.6Mpa, DN200—DN1200: ≤1.0Mpa

Flow measurement range: Flow measurement range convective velocity range is 0.3-15m/s.

Conductivity range: Electrical conductivity of measured fluid (> 5 u s/cm)

Most of the media consisting of water have the conductivity in the range of 200-800 mu s/cm, and the electromagnetic flux can be used.

Output current and load resistance: The maximum collector current of 4~20mA fully isolated load resistance < 750 ohm pulse frequency 0-1KHZ photoelectric isolation OCT external power supply < 35V on-line is 25mA.

Electrode materials: Stainless steel containing molybdenum, titanium (Ti), tantalum (Ta), Hastelloy (H), platinum (Pt) or other special electrode materials containing molybdenum.

Protection Class: Diving type: IP68, other IP65

Power supply: 85~265V,45~63HZ

Length of straight pipe section: Pipeline type: upstream (> 5DN), downstream (> 2DN).

Connection: Flange connection is used between flowmeter and piping. Flange connection size should meet the requirements of GB9119-88.

Explosion-proof mark: mdlIBT4.

Ambient temperature: -25℃~+60℃.

Relative temperature: 5%~95%.

Total power consumption: Less than 20W.

Maximum and minimum flows must be in line with the following table

Caliber (mm)	10	15	20	25	32	40	50	65
Qmin(m3/h)	0.0848	0.1908	0.3391	0.5299	0.8681	1.3565	2.1195	3.5820
Qmin(m3/h)	3.39	7.63	13.56	21.20	34.73	54.26	84.78	143.28
Caliber (mm)	80	100	125	150	200	250	300	350
Qmin(m3/h)	5.4259	8.478	13.2469	19.0755	33.912	52.9875	76.302	103.8555
Qmin(m3/h)	217.04	339.12	529.88	763.02	1356.48	2119.5	3052.08	4154.22
Caliber (mm)	400	450	500	550	600	700	800	900
Qmin(m3/h)	135.648	171.6795	211.95	256.46	305.208	415.422	542.592	686.718
Qmin(m3/h)	5425.96	6867.18	8478	10258.38	12208.22	16616.88	21703.68	27468.82
Caliber (mm)	1000	1100	1200	1400	1600	1800	2000	2200
Qmin(m3/h)	847.80	1025.838	1220.832	1660.688	2170.368	2746.872	3991.20	4103.352
Qmin(m3/h)	33912	41033.52	48833.28	6647.52	86814.72	109874.88	135648	164134.08

Flow calculation formula: $Q=V \cdot \pi(D/2)^2=0.002826V D^2$ Formula: Q-m3/h, V-m/s, D-mm

Velocity range: 0.3-12m/s (extended range 0.1-15m/s is also possible)

Please note that the actual maximum working pressure must be less than the rated working pressure of the flowmeter. The maximum and minimum operating temperatures must meet the temperature requirements specified by the flowmeter. Determine if there is a negative pressure.

You can choose the corresponding electromagnetic flowmeter according to the flow in the table above. If the inner diameter of the selected electromagnetic flowmeter does not match the inner diameter of the current process pipeline, the pipe should be shrunk or expanded. If the pipe is shrinking, whether the pressure loss caused by pipe shrinkage will affect the process flow should be considered. Considering the product price, small-caliber electromagnetic flowmeter can be chosen to save cost.

When measuring clean water, its economic flow rate is 1.5-3m/s; when measuring easily crystallized solution, it is appropriate to increase the flow rate, 3-4m/s, which can act as self-cleaning and prevent adhesion deposition; when measuring abrasive fluids such as ore pulp, it is appropriate to reduce the flow rate, 1.0-2m/s, in order to reduce the wear of lining and electrodes. Practical applications rarely exceed 7m/s, and more rarely exceed 10m/s.

Selection of Electrode Materials

The material of the electrode should be selected according to the corrosivity of the fluid under test. Please consult the relevant corrosion manual and test the special fluid.

Material	Corrosion resistance
316L	Applicability: 1. Domestic water, industrial water, raw well water, municipal sewage. 2. Weak corrosive acid, alkali and salt solutions
Hastelloy B	Applicability: 1. Hydrochloric acid (concentration less than 10%) and all concentration of ammonium hydroxide alkali solution 2. Sodium hydroxide (concentration less than 50%), all concentration of ammonium hydroxide alkali solution 3. Phosphoric acid, organic acid Not applicable: hydrochloric acid
Hastelloy C	Applicability: 1. Mixed acid such as mixed solution of chromic acid and sulfuric acid 2. Oxidative salts such as Fe ⁺⁺ , Cu ⁺ , seawater Not applicable: hydrochloric acid
Titanium (Ti)	Applicability: 1. Salt, such as: (1) chloride (chloride/magnesium/aluminum/calcium/ammonium/titanium, etc.) (2) Sodium salt, potassium salt, ammonium salt, hypochlorite, sea water 2. Potassium chloride, ammonium hydroxide and barium hydroxide alkali solutions with concentration less than 50% Not applicable: hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid, barium cyan oxide alkali solution
Tantalum (Ta)	Applicability: 1. Hydrochloric acid (concentration less than 40%), dilute sulfuric acid and concentrated sulfuric acid (excluding fuming sulfuric acid) 2. Chlorine dioxide, magnesium chloride, hypochlorite, sodium cyanide, lead acetate, etc. 3. Oxidative acids such as nitric acid (including fuming nitric acid), aqua regia at temperatures below 80 °C Not applicable: alkali, hydrofluoric acid
Platinum (Pt)	Applicability: Almost all acid, alkali and salt solutions (including fuming sulfuric acid and fuming nitric acid) Not applicable: Aqua regia, ammonium salt

Interlining Material Selection Instructions

The lining material should be selected according to the corrosiveness, abrasion and temperature of the tested medium.

Lining material	designation	function	MAX TEMP	Applicable liquid	pipe diameter
rubber	CR	Medium abrasion resistance, corrosion resistance of acid and	<80°C	Tap water, industrial water,	DN50-2200

		alkali salts with low concentration		sea water	
	PU	Excellent wear resistance, poor acid and alkali resistance	<60°C	Pulp, pulp, etc.	DN25-500
Fluoroplastics	F4 or PTFE	Chemical performance is very stable, resistant to boiling of hydrochloric acid, sulfuric acid, Aqua regia, concentrated alkali corrosion	<180°C	Corrosive acid-base salt liquids	DN25-1200
	F46 or FEP	Chemical properties are slightly inferior to those of F4	<120°C	Corrosive acid-base salt liquids	DN15-200
	F4 or ETFE	Chemical properties are slightly inferior to those of F4		Corrosive acid-base salt liquids	DN250-2200
Plastic	PO	Chemical stability	<60°C	sewage	DN50-2200
	PPS		<110°C	hot water	DN50-2200

Selection of Protection Class

IP65: Sprinkler-proof type, which allows the tap to spray water from any direction to the sensor. The sprinkler pressure is 30kPa, the water output is 12.5 L/s, and the distance is 3 m.

IP68: Diving type, long-term working in water.

The protection level should be chosen according to the actual situation. The sensor should be installed below the ground. If it is often flooded, IP68 should be selected. The sensor should be installed above the ground and IP65 should be selected.

Selection of additional functions

The basic type of LDBE intelligent electromagnetic flowmeter has been shown, and the output functions of 4-20mA and 0-1kHz alarm can be selected according to the actual situation.

Split type installation: Sensors should be installed below the ground or for other reasons. Split type installation should be selected.

RS-485 communication: For communication between converter and other equipment, RS-485 communication function should be selected.