aobo instrument

2024
PRODUCT
INTRODUCTION

Electromagnetic Flowmeter

CONTENTS

Company Profile

Weifang AOBO Instrument Technology Development Co., Ltd., founded in 2002, with registration capital of 10 million RMB, is a "High-Tech" and "Double-Software Certification" enterprise specialized in "flow measurement and intelligent measurement & control" industry, integrating R&D, production, sales and service.

The company has a core R&D team for computer software and technology, automatic intelligent control, HVAC engineering design and flow measurement. It has the ability to provide customers with specific solutions and complete sets of products according to their different needs, based on years of practical experience. Especially in the heating industry, by the customer's recognition, has a high reputation in the industry.

The products are mainly used in the measurement and control of "steam, liquid, gas, sewage and tap water"; and especially suitable for energy monitoring and energy-saving control in many industries, such as thermal power plants, thermal companies, residential heating, petroleum, chemical industry, papermaking, food, coating, printing & dyeing and HVAC.

Since its foundation, based on self-developed and leading technology, reliable quality, high-quality service and good reputation, our company has been warmly accepted by customers, and become a designated supplier for many central enterprises and listed companies.

Contact

AOBO Instrument Technology Development Co.,Ltd

No. 8009 Minzhu St.-Weifang,Shandong Province

261100,China

Mob.: +86 19953631088/+8619953631096

Email: aobometer@gmail.com

All of the catalogue and company information can be found at:

WWW.AOBOINSTRUMENT.COM

ABDT-LD Series Electromagnetic Flowmeter

I. Product Overview

ABDT-LD series intelligent electromagnetic flow meter is a relatively mature liquid measurement instrument for measuring the volume flow of conductivity liquid (conductivity≥5μs/cm) in the closed pipelines, suitable for the flow measurement of various acid solutions,alkali solutions,and salt solutions,clear water, sea water,sewage water, and food grade liquid and so on. It is widely used in industrial production process control, energy measurement, environmental protection and sewage treatment etc.. It can output (4~20) mA current signal, pulse signal and RS485 communication etc.. It is coupled with the display, recording instrument, accumulation operator or regulator fordetection, calculation, adjustment and control of flow.

II. Operational Principle

The working principle of the electromagnetic flowmeter is based on the Faraday law of electromagnetic induction. When a conductor moves in a magnetic field,an induced electric potential is generated at both ends of the conductor perpendicular to the direction of the magnetic field.The magnitude of the electric potential is proportional to the motion velocity of the conductor and the magnetic induction strength of the magnetic field.

When the conductive fluid flows at an average velocity of V(m/s) through an insulating catheter with an inner diameter of D(m) containing a pair of measuring electrodes,the pipeline is in a magnetic field with a uniform magnetic induction strength of B (T),then the induced electric potential E(V) is generated on a pair of electrodes.Its direction is perpendicular to the magnetic field.

Faraday law of electromagnetic induction is: E=B*D*V (1)

Volume flow is: $Q_V = \frac{\pi D^2}{4} V \ (\mathrm{m^3/s})$ (2)

Formulas (1) and (2) indicate that: $Q_V = \frac{\pi D}{4}\frac{E}{B}(m^3/h)$ (3)

Therefore, electromotive force can be expressed as: $E = \frac{4B}{\pi D}Q_V(V)$ (4)

When B is a constant, a certain fixed caliber D is also a known number, in formula (3) $\frac{\pi D}{4}\frac{1}{B} = K$ (a constant), then formula (3)can be overwritten to: $Q_V = K \bullet E$ (m^3/h). (5)

By formula (5) it is seen that the flow Q_V is proportional to the electric potential E.

III. Product Characteristics

● It is not affected by changes in fluid density, viscosity, temperature, pressure and electrical conductivity. The linear measurement principles can achieve high precision measurements;

● No flow parts in measuring pipe, small pressure loss and low straight pipe section requirement;

● The nominal diameter DN6-DN2000 covers a wide range,lining and electrodes that meet the requirements of measuring a variety of conductive fluids;

● The converter adopts programmable low frequency rectangular wave excitation, which improves the stability of flow measurement and small power loss;

● The converter adopts a 16-bit embedded microprocessor with full digital processing, fast operation speed, strong interference resistance, reliable measurement, high accuracy and flow measurement range up to 1500:1;

● High definition backlight LCD display, full English character menu operation, easy to use, easy operation, easy to learn and easy to understand;

● RS485 digital communication signal output;

● It has the conductivity measurement function, which can determine whether the pipe of the sensor is fully filled, and has the self-inspection and self-diagnosis function;

● There are multiple alarm functions,such as empty pipe alarm,excitation alarm,upper and lower limited alarm;

● It uses SMD devices and surface mounting (SMT) technology with high circuit reliability;

- It can be used for the corresponding explosion-proof occasions.

IV. Performance Parameter(s)

Medium temperature: integrated type ≤70℃;

Nominal general diameter: DN6-DN2000;

Accuracy grade: grade 0.5;

Maximum flow speed: 15m/s;

Nominal pressure: 1.0MPa,1.6MPa,2.5MPa,4.0MPa,other specifications and standards can be used according to the user's requirements;

Fluid conductivity: ≥ 5us/cm;

Execution standard: JB/T9124.1-2019;

Ambient temperature: sensor (-25~60)℃, converter (-10~60)℃

Relative humidity: (5~85)%RH, without condensation;

Shell protection grade: IP6.

Explosion-proof:Ex d mb IIC T6 Gb

Power supply: AC220V, AC110V, DC24V, DC12V, DC3.6 battery.

V. Electrode Material Selection

Electrode material	Features and use scope
316L	Applicable: 1. Domestic water, industrial water, raw water, well water and urban sewage. 2. Weak corrosive acid, alkali and salt solution.
HB alloy	Applicable: 1. The hydrochloric acid (concentration is less than 10%) and so on non-oxidized acids. 2. Sodium hydroxide(concentration is less than 50%), all concentrations of ammonium hydroxide alkali solution. 3. Phosphoric acid, organic acid. Not applicable: Nitric acid.
HC alloy	Applicable: 1.Mixed acid, such as the mixed solution of chromic acid and sulfuric acid. 2. Oxidation salts such as Fe+++, Cu++, sea water. Not applicable:the hydrochloric acid.

Titanium	Applicable: 1. Salt, such as (1) chloride (chloride/magnesium and aluminum/calcium/ ammonium/iron, etc.) (2) Sodium salt,potassium salt, hypochlorite salt, sea water. 2.Potassium hydroxide, amine hydroxide and barium hydroxide alkali solution whose concentration are less than 50%; Not applicable: hydrochloric acid, sulfuric acid, phospic acid, hydrofluoric acid and other reductive acid.
Tantalum	Applicable: 1. Hydrochloric acid (concentration is less than 40%), dilute sulfuric acid and concentrated sulfuric acid (excluding fuming sulfuric acid); 2. Chloride dioxide, iron chloride, hypochlorite,sodium cyanide, lead acetate, etc.; 3. Nitric acid (including fuming nitric acid) and other oxidizing acid, aqua regia whose temperature is less than 80 degrees; Not applicable: alkali, hydrofluoric acid.
Platinum-iridium alloy	Applicable: Almost all acid, alkali and salt solutions (including fuming nitric acid, fuming sulfuric acid) Not applicable: aqua regia, ammonium salt.
Tungsten carbide	Applicable: large worn medium,paper pulp,sewage,resistant to interference of solid particles; Not applicable: inorganic acid, organic acid, chloride.

VI. Lining Material Selection

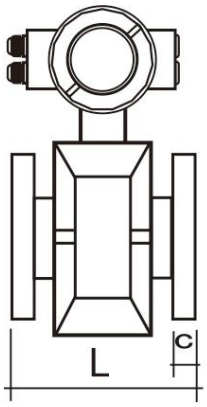
Lining material	Main performance	Scope of application
PTFE	1. One of the most stable materials in plastic that can withstand boiling hydrochloric acid, sulfuric acid, nitric acid and aqua regia and it can resist strong acid and a variety of organic solvents. 2. Poor wear resistance and adhesion performance.	1. Temperature-resistant ≤ 80℃ 2. Strong corrosive medium such as acid and alkali. 3. Sanitary medium.
PFA	1. Chemical stability, electrical insulation, lubricity, non-viscosity and combustible properties are similar to F46, but the PFA material strength, aging resistance and temperature resistance are better than F46. 2. Good adhesion with metal and better wear resistance than PTFE, F46. 3. Low smoke, refractory, high temperature resistance and high temperature mechanical strength are higher than PTFE and F46.	1. Long-term use temperature resistance ≤ 150℃. 2. It can be used to measure most strong corrosive mediums such as strong acid, strong alkali and strong oxidizer; but it is not for KOH, nitric acid, hydrofluoric acid, etc.

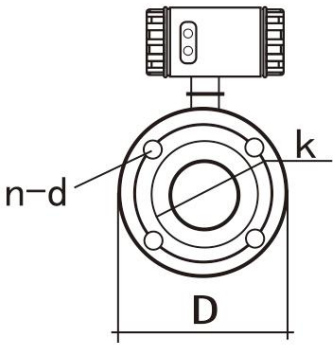
F46	1. Chemical stability, electrical insulation, lubricity, non-viscosity and combustible properties are similar to PTFE, but the F46 material strength, aging resistance and temperature resistance are better than PTFE. 2. Good adhesion with metal and better wear resistance than PTFE. 3.Excellent anti-tear performance.	1. Long-term use temperature resistance ≤ 110℃ 2. It can be used to measure most strong corrosive mediums such as strong acid, strong alkali and strong oxidizer, but it is not for KOH, nitric acid, hydrofluoric acid, etc.
Rubber	1. Excellent elasticity, good wear resistance. 2. It has resistance to corrosion of general low concentration acid, alkali and salt medium and it has no resistance to corrosion of oxidation medium.	1.Temperature resistance ≤ 65℃ 2.Measure the general water, sewage, mud and mineral slurry.
Polyurethane rubber	1. Excellent wear resistance and good oil resistance. 2. High strength,good tear resistance, but the acid and alkaline resistance are poor.	1. Generally long-term temperature resistance≤ 60℃

VII. Outline Size

Outline and installation size of the electromagnetic flow sensor (in mm)

Integrated type



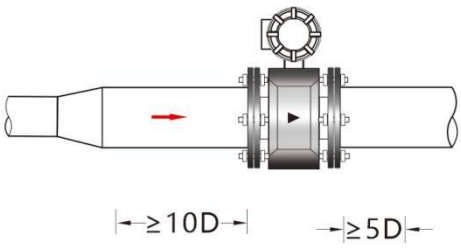


Nominal diameter	L	Flange dimensions (GB/T9124.1-2019)					
		D	K	d	N	C	PN
10	200	90	60	14	4	14	4.0MPa
15	200	95	65	14	4	14	
20	200	105	75	14	4	16	

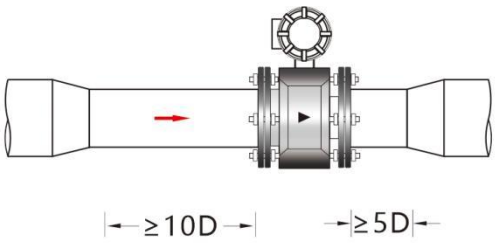
25	200	115	85	14	4	16	
32	200	140	100	18	4	18	
40	200	150	110	18	4	18	
50	200	165	125	18	4	20	
65	200	185	145	18	8*	20	
80	200	200	160	18	8	20	
100	250	220	180	18	8	22	
125	250	250	210	18	8	22	1.6MPa
150	300	285	240	22	8	24	
200	350	340	295	22	12	26	
250	450	405	355	26	12	29	
300	500	445	400	22	12	26	
350	500	505	460	22	16	30	
400	600	565	515	26	16	32	
450	600	615	656	26	20	36	
500	600	670	620	26	20	38	
600	600	780	725	30	20	42	
700	700	910	840	36	24	38	
800	800	1025	950	39	24	38	
900	900	1125	1050	39	28	40	
1000	1000	1255	1170	42	28	42	1.0MPa
1200	1200	1455	1380	39	32	38	
1400	1400	1675	1590	42	36	42	
1600	1600	1915	1820	48	40	46	

VIII. Installation Precautions

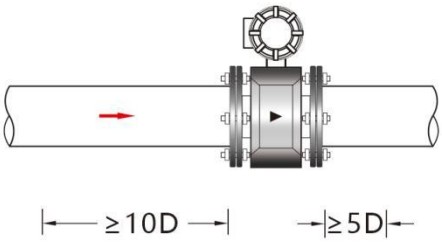
Keep a long enough straight pipe section upstream and downstream of the electromagnetic flow sensor (D is the sensor diameter) as required in the figure below.



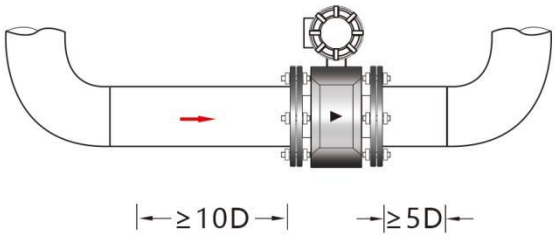
Horizontal straight pipe



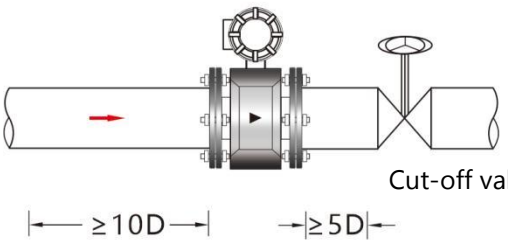
Install at low place of pipe to ensure full



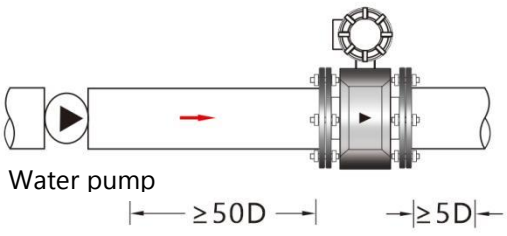
Concentric pipe expanding



Concentric pipe contracting



Valve installation behind meter to avoid turbulent flow



Water pump installation before meter to avoid negative pressure and maintain 50-fold straight pipe sections

Note: Please consult the company for other installation problems.

IX. Product Type Selection

ABDT-LD	a	b	c	d	e	f	g	h	i	j

a	Instrument	LD	XXXmm	
b	Nominal pressure	10		1.0MPa
		16		1.6MPa
		25		2.5MPa
		40		4.0MPa
c	Lining material	1		PTFE
		2		Rubber
		3		Polyurethane rubber
		4		F46
		5		PFA with mesh
		6		F46 with mesh
		7		Nitrile rubber
d	Electrode material	1		316L
		2		Hastelloy B
		3		Hastelloy C
		4		Ti
		5		Latinumiridium-Alloy
		6		Ta
		7		Tungsten Carbide
e	Case protection	1		IP65
		2		Sensor IP68+Converter IP65
		3		IP67
		4		IP68
f	Ex-mark	0		None
		1		EXDMBIICT6 GB Unibody
		2		EXDMBIICT6 GB Split-type
g	Accessories	0		None
		1		Grounding Electrode
		2		Grounding Flange
		3		Inlet Protection Flange
		4		Electrode Scraper
h	Structure	Er		Separated type
		Eh		Integratde type
i	Power Supply	1		AC 220V±10%
		2		DC 24V
		3		DC 3.6V
		4		DC 12V
		5		AC 110V
j	Converter type	1		Standard
		2		Low Conductivity type
		3		Slurry type
		4		Filling type
		5		Dual-power Supply type
		6		Battery Power Remote type
		7		BTU type(Paired PT1000)

X. Liquid Flow and Velocity Table

Flow Velocity - Flow Rate Comparison Table								
Flow velocity m/s / Flow rate m^3/h / Diameter mm	0.3	0.5	1	2	3	4	5	6
6	0.030	0.051	0.102	0.204	0.305	0.407	0.509	0.610
8	0.054	0.090	0.181	0.362	0.543	0.724	0.904	1.085
10	0.085	0.141	0.283	0.565	0.848	1.130	1.413	1.696
12	0.122	0.204	0.407	0.814	1.221	1.623	2.035	2.442
15	0.191	0.318	0.636	1.272	1.909	2.545	3.181	3.815
20	0.339	0.565	1.131	2.262	3.393	4.527	5.655	6.782
25	0.530	0.883	1.767	3.534	5.301	7.069	8.836	10.598
40	1.356	2.261	4.523	9.048	13.572	18.096	22.620	27.130
50	2.120	3.532	7.069	14.137	21.206	28.274	35.343	42.390
65	3.582	5.970	11.946	23.892	35.838	47.784	59.730	71.639
80	5.426	9.043	18.096	36.191	54.287	72.382	90.478	108.518
100	8.478	14.130	28.274	56.549	84.823	113.097	141.371	169.560
150	19.080	31.790	63.617	127.235	190.852	254.470	318.086	381.510
200	33.91	56.52	113.10	226.19	339.29	452.39	565.49	678.24
250	52.99	88.31	176.71	353.43	530.14	706.86	883.57	1059.75
300	76.30	127.17	254.47	508.94	763.40	1017.88	1272.35	1526.04
350	103.86	173.09	346.36	692.72	1039.08	1385.44	1731.80	2077.11
400	135.65	226.08	452.39	904.78	1357.17	1809.56	2261.95	2712.96
450	171.68	286.13	572.56	1145.11	1717.67	2290.22	2862.78	3433.59
500	211.95	353.25	706.86	1413.72	2120.58	2827.43	3534.29	4239.0
600	305.21	508.68	1017.88	2035.75	3053.63	4071.50	5089.38	6104.16
700	415.42	692.37	1385.44	2770.88	4156.32	5541.77	6927.21	8308.44
800	542.59	904.32	1809.56	3619.11	5428.67	7238.23	9047.79	10851.8
900	686.72	1144.53	2290.22	4580.44	6870.66	9160.88	11451.1	13734.4
1000	847.8	1413.0	2827.4	5654.9	8482.3	11309.7	14137.2	16956.0
1200	1220.83	2034.72	4071.5	8143.0	12214.5	16286.0	20357.5	24416.6
1400	1661.69	2769.48	5541.8	11083.5	16625.3	22167.1	27708.8	33233.8
1600	2170.37	3617.28	7238.2	14476.5	21714.7	28952.9	36191.1	43407.4
1800	2746.87	4578.12	9160.9	18321.8	27482.7	36643.5	45804.4	54937.4
2000	3391.2	5652.0	11309.7	22619.5	33929.2	45238.9	56548.7	67824.0
2200	4103.35	6838.92	13684.8	27369.6	41054.3	54739.1	68423.9	82067.0
2400	4883.33	8138.88	16286.0	32572.0	48858.1	64144.1	81430.1	97666.6
2600	5731.13	9551.88	19113.4	38226.9	57340.3	76453.7	95567.1	114622.6

Contact

AOBO Instrument Technology Development Co.,Ltd

No. 8009 Minzhu St.-Weifang,Shandong Province

261100,China

Mob.: +86 19953631088/+8619953631096

Email: aobometer@gmail.com

All of the catalogue and company information can be found at:

WWW.AOBOINSTRUMENT.COM