CFM Instrument Co., Ltd

MAGNETIC FLOW METER



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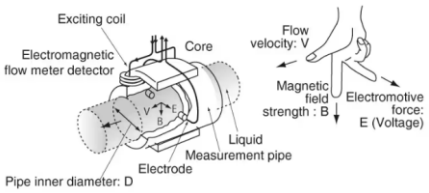
MAGNETIC FLOW METER

CATALOG

Brief Introduction

An intelligent electromagnetic flow meter consists of two parts: the sensor and the converter. It is based on Faraday's law of electromagnetic induction and is used to measure the flow volume of conductive liquids with conductivity higher than 5μS /cm. It can also measure the volume of evenly distributed suspension liquid, such as strong corrosive liquids, slurries, etc.

After setting the density, it can also measure the flow mass of conductive liquid, widely used for industrial purposes (petroleum, chemical, metallurgy, textile, paper, environmental protection, food, etc.), municipal management, water conservancy construction, river dredging and other fields of flow measurement.



Features

- Various connection methods
- Wide turn-down ratio
- Varies connection standard
- Multiple liner material options
- Various electrode material options
- Various output/input signals: Analog current, frequency, pulse.
- Explosion-proof certification: Support Exd ib MB II BT4 Gb.

Products Gallery



Compact Display Type



Remote Display Type



Flange Wafer Type



Mini Type

Products Gallery

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Thread Connection Type



Sanitary Tri-clamp Connection Type

Ceramic Liner Type



High-frequency Slurry Type





High-pressure Flange Type



Battery Power Type

Energy (Heating) Type



Insertion Type



Calibration & Testing Lab

The water flow laboratory is a complete set of equipment for reproducing the flow value and is one of the standard equipment for flow value detection, traceability, and conducting verification tests of the flowmeter. The company has accumulated a lot of practical experience in the measurement verification, calibration, testing, and evaluation of flowmeters. The existing equipment can carry out water flow testing and verification of flowmeter products with diameters up to DN600. The evaluation of results allows us to give customers open technical support and guides manufacturing and new product development.

The environment testing laboratory is used for the simulation testing and evaluation of products in alternating high and low-temperature environments. Through testing, the hidden defects in the production process, welding and product assembly, component defects, and electrical faults can be exposed in advance. Parametric measurement is used to eliminate the early failure of the product before use, to ensure that the factory products can stand the test of time. Through evaluation and improvement, we can further reduce product loss rate and improve output efficiency.

The Electromagnetic Compatibility (EMC) Test laboratory is a comprehensive assessment of the magnitude of electromagnetic interference (EMI) and interference immunity (EMS) of electronic products and is one of the most important indicators of product quality. Our company's electromagnetic flowmeter has passed the CE certification.

Calibration & Testing Lab

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Technical Data

Diameter	DN3-DN2000
Electrode Material	SS316L, Hb, Hc, Ti, Ta, Pt
Liner Material	Hard rubber, Polyurethane, PTFE, F46, PVDF, PEEK, Tefzel
Medium Conductivity	> 5 μs/cm as default
Accuracy	±0.5% of rate; ±0.2% optional
Velocity Range	0.3-12m/s
Ambient Temperature	-20℃ ~ +60℃
Medium Temperature	Rubber: ≤80℃; PTFE & F46: ≤120℃; PFA: ≤180℃
Nominal Pressure	0.6MPa ~ 4.0MPa (according to caliber or special order)
Protect Level	IP65, IP67, IP68 (remote type)
Output	Pulse, 4-20mA, flow rate alarm
Communication	Modbus, HART, Profibus DP
Power Supply	24V DC, 220V AC, Battery
Structure	Compact Type, Remote Type
Process Connection	Flange (DIN, ANSI, JIS etc.); Flange Wafer Type; Sanitary Tri-clamp Type;Thread Type; Insertion Type
Body Material	Carbon Steel, SS304 (SS316 as optional)

Technical Data

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(MINI TYPE ELECTROMAGNETIC FLOW METER)

Diameter	DN3-DN20
Electrode Material	SS316L, Hb, Hc, Ti
Liner Material	PEEK
Medium Conductivity	> 5 μs/cm as default
Accuracy	±0.5%-±1.0% of rate
Velocity Range	0.3-10m/s
Ambient Temperature	-20℃ ~ +60℃
Medium Temperature	-20℃ ~ +100℃
Nominal Pressure	0.6MPa ~ 1.6MPa
Protect Level	IP65, IP67 (Blind)
Output	Pulse
Communication	RS485
Power Supply	24VDC±20% (19.2V-28.8V)
Structure	Compact Type
Process Connection	Threaded, G1/2, G3/4, NPT 1/2 or others, SS304/SS316
Body Material	Aluminum with epoxy
Current Consumption	< 150mA
Dimension (H×W×D)	150*100*70(mm)

Velocity & Flow Range Table

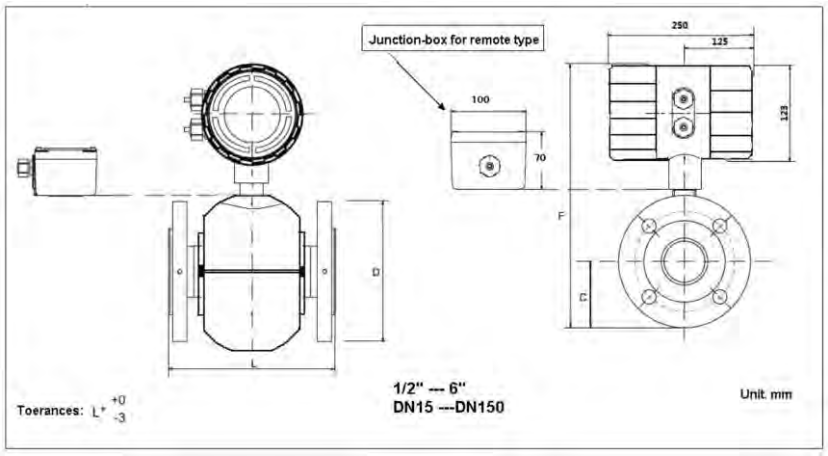
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Nominal Diameter		Full scale flow (m3/h)	Full scale flow (US Gal/min)				
mm	Inches	v=0.3 m/s	v=1.0 m/s	v =15m/s	v=1.0 ft/s	v=3.0 ft/s	v=49 ft/s
		Min		Max	Min		Max
15	½	0.1909	0.6362	9.543	0.6120	1.836	29.99
20	¾	0.3393	1.131	16.96	1.377	4.131	67.47
25	1	0.5301	1.767	26.51	2.448	7.344	120.0
32	1½	0.8686	2.895	43.43	3.825	11.47	187.4
40	1½	1.357	4.524	67.86	5.508	16.52	269.9
50	2	2.121	7.069	106.0	9.792	29.38	479.8
65	2½	3.584	11.95	179.2	15.30	45.90	749.7
80	3	5.429	18.10	271.4	22.03	66.10	1080
100	4	8.482	28.27	424.1	39.17	117.5	1919
125	5	13.25	44.18	662.7	61.20	183.6	2999
150	6	19.09	63.62	954.3	88.13	264.4	4318
200	8	33.93	113.1	1696	156.7	470.0	7677
250	10	53.01	176.7	2651	244.8	734.4	11995
300	12	76.34	254.5	3817	352.5	1058	17273
350	14	103.9	346.4	5195	479.8	1439	23510
400	16	135.7	452.4	6786	626.7	1880	30708
450	18	171.8	572.6	8588	793.1	2379	38864
500	20	212.1	706.9	10603	979.2	2938	47981
600	24	305.4	1018	15268	1410	4230	69092
700	28	415.6	1385	20782	1919	5758	94042
800	32	542.9	1810	27144	2507	7520	122830
900	36	687.1	2290	34353	3173	9518	155457
1000	40	848.2	2827	42412	3917	11750	191922
1200	48	1221	4072	61073	5640	16921	276368
1400	56	1663	5542	83127	7677	23031	376168
1600	-	2171	7238	108574	10027	30081	491321
1800	-	2748	9161	137414	12690	38071	621829
2000	-	3393	11310	169647	15667	47001	767690
2200	-	4105	13685	205273	18957	56872	928904
2400	-	4886	16286	244292	22561	67682	1105473
2600	-	5734	19114	286703	26477	79432	1297396
2800	-	6650	22167	332508	30708	92123	1504672
3000	-	7634	25447	381705	35251	105753	1727302

Flow (m3/h) = 0.00282744 × D2 × V (D = mm, V = m/s)
Flow (US Gal/min) = 2.44799 × D2 × V (D = inch, V = ft/s)

Installation Dimension

DN15-DN150



Installation Dimension

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DIN Flange Standard

DN	Nominal Pressure Class	Dimensions			Bolt Diameter						OD of flange (D)		Approximate weight(kg)	
					Bolt Circle(k)		Bolt Circle (A)		No. of bolts (n)					
GB DIN		L	C	F	1.6	4.0	1.6	4.0	1.6	4.0	1.6	4.0	1.6	4.0
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
15	1.6 or 4.0	200	48	315	65	65	14	14	4	4	95	95	7	7
20		200	53	325	75	75	14	14	4	4	105	105	9	9
25		200	58	330	85	85	14	14	4	4	115	115	11	11
32		200	70	380	100	100	18	18	4	4	140	140	12	12
40		200	75	380	110	110	18	18	4	4	150	150	13	13
50		200	83	385	125	125	18	18	4	4	165	165	14	14
65		200	93	405	145	145	18	18	4	8	185	185	22	23
80		200	100	420	160	160	18	18	8	8	200	200	26	28
100		250	118	455	180	190	18	22	8	8	235	235	28	32
125		250	135	500	210	220	18	26	8	8	270	270	35	41
150		300	150	500	240	250	22	26	8	8	300	300	38	44

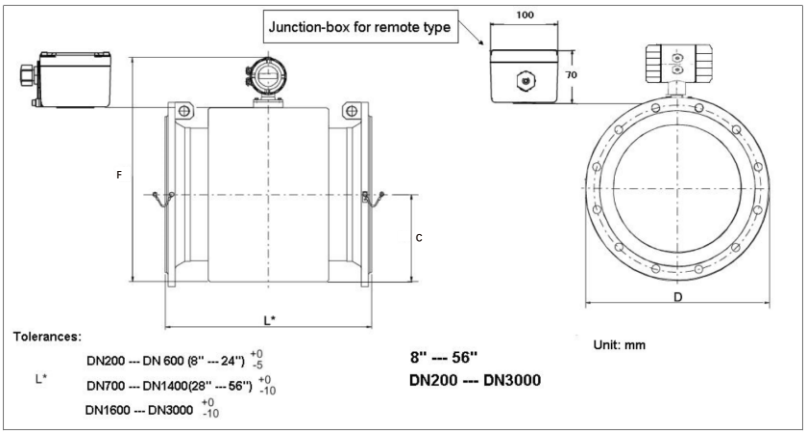
ANSI Flange Standard

DN	Nominal Pressure Class	Dimensions			Bolt Diameter						OD of flange (D)		Approximate weight(kg)	
					Bolt Circle (k)		Bolt Circle (A)		No. of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
mm	ANSI	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
15	1.6 or 4.0	200	48	315	60.5	66.5	15.7	15.7	4	4	89	95	8	8
20		200	59	325	69.9	82.6	15.7	19.1	4	4	99	117	10	10
25		200	62	330	79.2	88.9	15.7	19.1	4	4	108	124	11	13
32		200	67	380	88.9	98.6	15.7	19.1	4	4	117	133	11	13
40		200	78	380	98.6	114.3	15.7	22.4	4	4	127	155	12	16
50		200	83	385	120.7	127	19.1	22.4	4	8	152	165	14	16
65		200	96	405	139/7	149.4	19.1	22.4	4	8	178	191	24	27
80		200	105	420	152.4	168.1	19.1	22.4	4	8	191	210	28	33
100		250	127	455	190.5	200.2	19.1	22.4	8	8	229	254	32	40
125		250	140	500	215.9	235	22.4	22.4	8	8	254	279	38	51
150		300	159	500	241.3	269.7	22.4	22.4	8	8	279	318	41	60

Installation Dimension

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DN200-DN600



DIN Flange Standard

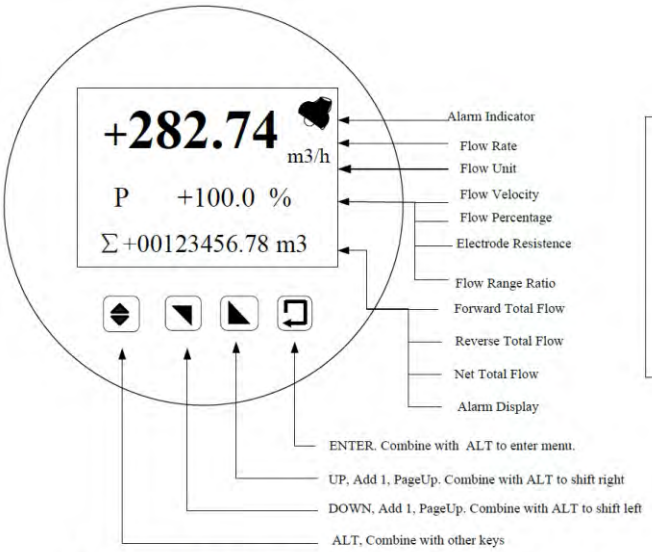
DN	Nominal Pressure Class	Dimensions			Bolt Diameter						OD of flange (D)		Approximate weight(kg)	
					Bolt Circle(k)		Bolt Circle (A)		No. of bolts (n)					
GB DIN		L	C	F	1.0	1.6	1.0	1.6	1.0	1.6	1.0	1.6	1.0	1.6
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
200	1.0 or 1.6	350	170	540	295	295	22	22	8	12	340	340	45	46
250		450	203	600	350	355	22	26	12	12	395	405	67	71
300		500	230	660	400	410	22	26	12	12	445	460	94	103
350		550	260	720	460	470	22	26	16	16	505	520	145	158
400		600	290	780	515	525	26	30	16	16	565	580	180	197
450		600	320	840	565	585	26	30	20	20	615	640	215	242
500		600	358	915	620	650	26	33	20	20	670	715	245	293
600		600	420	1040	725	770	30	36	20	20	780	840	335	418

ANSI Flange Standard

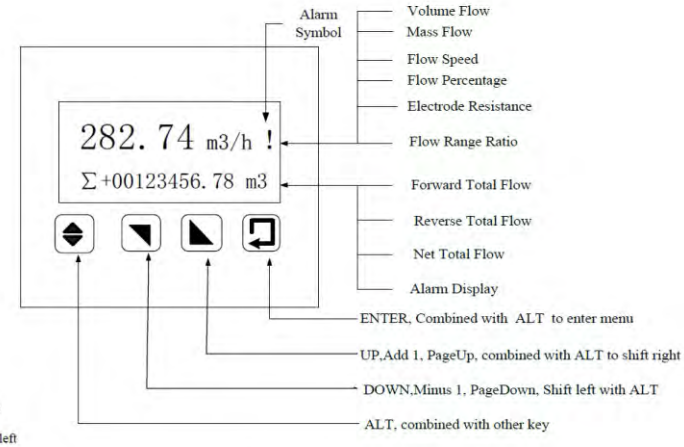
DN	Nominal Pressure Class	Dimensions			Bolt Diameter						OD of flange (D)		Approximate weight(kg)	
					Bolt Circle (k)		Bolt Circle (A)		No. of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
mm	ANSI	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
200	150 or 300	350	191	540	298.5	330.2	22.4	25.4	8	12	343	381	52	80
250		450	223	600	362	387.4	25.4	28.4	12	16	406	445	84	120
300		500	261	660	431.8	450.9	25.4	31.8	12	16	483	521	125	171
350		550	293	720	476.3	514.4	28.4	31.8	12	20	533	584	179	257
400		600	324	780	539.8	571.5	28.4	35.1	16	20	597	648	213	334
450		600	356	840	577.9	628.7	31.8	35.1	16	24	635	711	264	417
500		600	388	915	635	685.8	31.8	35.1	20	24	699	775	311	474
600		600	458	1040	749.3	812.8	35.1	41.1	20	24	813	914	423	690

Converter Display Content

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Compact LCD Transmitter Front Panel

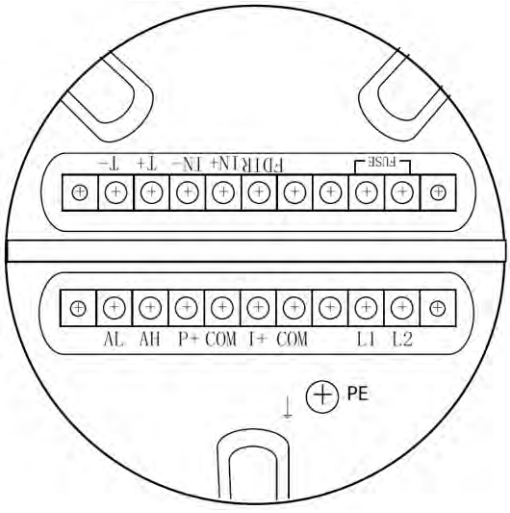


Remote LCD Transmitter Front Panel

The instrument has two operation modes: measurement mode and setup mode. When powered up, the instrument automatically enters measurement mode and immediately begins to measure the flow rate within the meter flow tube. In setup mode, the instrument configuration menu is accessed and instrument parameters can be adjusted to the users' desired configuration via the front panel keys.

Setup mode access is protected by up to 5 passwords, each intended for use by different classes of users with different access requirements. Return to measurement mode after viewing and/or changing any parameter is simply achieved by pressing a key for 3 seconds. When in setup mode, if there is no key operation for 3 minutes, the instrument automatically returns to measurement mode.

Wires Terminal Description

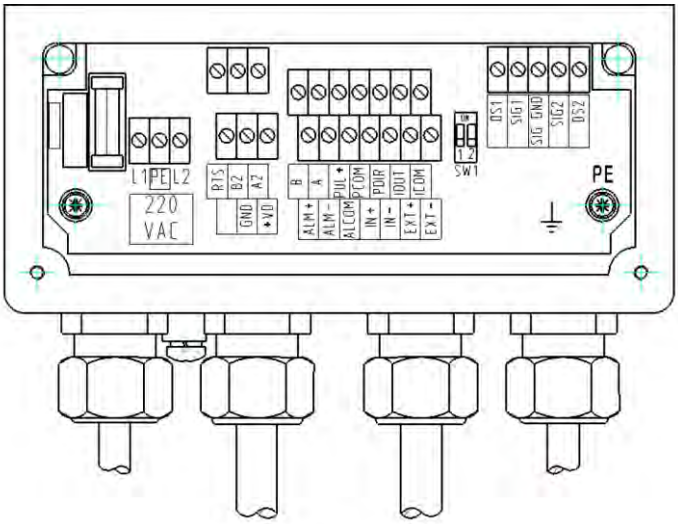


Compact-type Terminal Function Table

AL	Flow Low Alarm +ve	T+	RS-485 A
AH	Flow High Alarm +ve	T-	RS-485 B
P+	Frequency / Pulse Output +ve	IN+	Input contact +
COM	Alarm/flow direction/ pulse output -ve	IN-	Input contact -
I+	Current output +	FDIR	Flow direction indicator +ve
COM	Current output -		
L1	220VAC L(24VDC +)		
L2	220VAC N(24VDC -)	PE	Power Ground

Converter Display Content

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Remote-type Terminal Function Table

DS1	Shield Drive 1	IOUT	Current output +
SIG1	Signal Input 1	ICOM	Current output -
SIG GND	Signal Ground	PUL+	Frequency/pulse output +
SIG2	Signal Input 2	PCOM	Frequency/pulse output -
DS2	Shield Drive 2	PDIR	Flow direction indicator +
Ext+	Coil Excitation +	A	RS-485 A
EXT-	Coil Excitation -	B	RS-485 B
L1	220VAC L(24VDC +)	ALM-	Flow Low Alarm +ve
L2	220VAC N(24VDC -)	ALM+	Flow High Alarm +ve
A2	Profibus-DP A	ALCOM	Alarm output -ve
B2	Profibus-DP B	IN+	Input contact +
RTS	Profibus-DP RTS	IN-	Input contact -

Application Reference Electrodes & Liners

Electrode Material	Properties of measured material (for reference only)	Note
316L	Domestic water, industrial water, raw well water, urban sewage, weak corrosive acid, alkali, and salt solutions.	
Hastelloy alloy B	Hydrochloric acid (concentration less than 10%), and other non-oxidizing acids Sodium hydroxide (concentration less than 50%), all concentrations of alkali-ammonium hydroxide solution Phosphoric acid, and organic acids.	Not apply to nitric acid.
Hastelloy alloy C	Mixed acids such as chromic acid and sulfuric acid solution Oxidizing salts such as Fe+++, Cu++, water	Not apply to hydrochloric acid.
Titanium	Salts, such as (1) chloride (ammonium oxide/calcium/magnesium/Aluminum/iron/etc.) (2) the sodium salt, potassium salt, ammonium salt, and sodium hypochlorite salts, as well as potassium hydroxide, ammonium hydroxide, and barium hydroxide caustic soda solution sea water concentrations less than 50%.	Not apply to hydrochloric acid, sulfuric acid, phosphoric acid hydrofluoric acid, and other reducing acids.
Tantalum	Hydrochloric acid (concentration less than 40%). Dilute sulfuric acid and concentrated sulfuric acid (not including oleum) Chlorine dioxide, ferric chloride, hypochlorite, sodium hydroxide, lead acetate, Nitric acid (including fuming nitric acid), and other oxidizing acid, aqua regia with temperature below 80 degrees centigrade.	Not apply to alkali and hydrofluoric acid.
Platinum	Almost all of the acid, alkali, and salt solutions (including fuming sulfuric acid, and fuming nitric acid).	Not apply to aqua regia, ammonium salt.
Tungsten Carbide	Pulp, sewage, and solid particles with anti-interference properties.	Not apply to inorganic acids, organic acids, or chlorides.

Application Reference Electrodes & Liners

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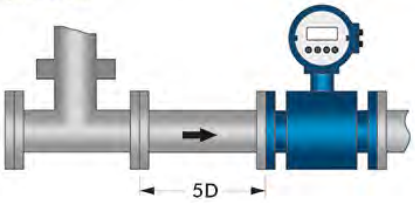
Lining Material	Main Properties	Application Range of Lining	Examples of Measurable Media	Note
PTFE	1. Chemical stability is good, but chlorine element and metal sodium in the melting state have a certain corrosion resistance to the product. 2. It is hydrochloric acid, sulfuric acid, and aqua regia-resistant, and organic solvent does not affect it. 3. Bad wear resistance and adhesive properties, excellent electrical insulating properties, but bad corona resistance.	1. Long-term usage temperature of the flowmeter r is -10 ~+120°C 2. For use in measurement of most of strong corrosive media such as strong acid, alkali, and oxidant, but not suitable for KOH, nitric acid, hydrofluoric acid, etc. 3. Health Media	1.Hydrochlo acid, sulfuric acid 2. Other strong acids, alkalis.	1. Not suitable for K OH, nitric acid, and hydrofluoric acid. 2. Generally, not for use in the measurement of electrolytes, e.g. NaCl solution from the electrolytic tank. 3. Not suitable for media with solid particles.
PFA	1. Its chemical stability, electrical insulation property, lubricating property, non-stick property, and incombustibility are similar to FEP(F46), but the strength, aging resistance, and temperature resistance of PFA material are superior to PTFE, and FEP. 2. Adhesion with metal is good; wear resistance is better than PTFE, FEP 3. Low smoke, fire resistance, high-temperature resistance. High-temperature mechanical strength is two times higher than PTFE.	1. Long-term usage temperature of the flowmeter is -40~+160°C. 2. For use in measurements of most strong corrosive media such as strong acid, alkali, oxidant, but not suitable for KOH, nitric acid, hydrofluoric acid, etc. 3. Health Media	1. Hydrochloric acid, sulfuric acid. 2. Other strong acids, alkalis, and oxidants. 3. Media with less fine particles. 4. Beer, saponified liquefied gas, etc.	1. Not suitable for KOH, nitric acid, and hydrofluoric acid. 2. Generally, not for use in the measurement of slurry, coal pulp, and core pulp.
Polyurethane Rubber	1. Excellent wear resistance, and good oil resistance. 2. High strength good tearing resistance, bad acid, and alkali resistance. 3. Bad heat resistance, generally 60°.	1. Long-term usage temperature is generally -10~+80°C 2. Good wear resistance, suitable for fluid containing solid particles. 3. Not for use in measurement of water containing organic solvent.	1. Neutral and strong wearing ore pulp, coal pulp, and mud. 2. Domestic water, industrial water, sewage, and seawater.	1. The temperature of fluid ranges between 0 and 40°C 2. Generally, is not for use in the measurement of media of organic solvent.
Chloroprene Rubber	1. Good elasticity and tearing resistance, oil resistance. 2. Bad aging resistance, its brittleness temperature is -28°C. 3. Wear resistance is inferior to polyurethane rubber. 4. Corrosion resistance to ordinary low-concentration acid, alkali, and salt media, non-corrosion resistance to oxidizing media.	1. Long-term usage temperature is -10~+80°C. 2. Slight pollution because the anti-aging agent is contained therein. 3. Suitable for measurements of low-concentration acid, alkali, salt media, and sewage.	1. Normal water, and sewage. 2. Slurry, ore pulp	1. Not for use in the measurement of food. 2. Not suitable for measurement of strong acid, alkali, and oxidizing media.
Ceramics	1. Non-deformation at high strength, high temperature, and high pressure. 2. Unique platinum -alumina metal ceramic electrode. 3. Good anti-slurry and anti-noise ability, suitable for permeable fluid. 4. Good wear resistance, which is ten times the polyurethane.	1. Suitable for high-temperature high-pressure fluid, viscous fluid, and corrosive fluids. 2. Permeable fluid, a slurry containing solid particles.	1. Slurry containing hard solid, corrosive fluid, viscous fluid, high-temperature high-pressure fluid. 2. Chromium sulfate, 25% of sodium, hypochlorite, nitric acid, etc.	1. Not suitable for hydrofluoric acid, nitric acid, aqua acid, NaOH, 70% concentration n of sulfuric acid. 2. Not for use in partial salt substances such as copper sulfate, or sodium bicarbonate.

Model Selection

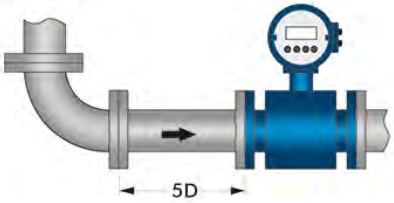
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Specification	Model Code												Details
CFM-LDG													Electromagnetic Flow Meter
Diameter	DN3-DN2000												Stand for diameter
Process Connection		DXX											D10: DIN PN10 flange;D25;DIN PN 25 flange
		AXX											A15: ANSI 150# flange;A30; ANSI 300# flange
		JXX											J10: JIS 10K flange; J20; JIS 20K flange
		XXX											On request
Liner Material			1										Hard Rubber (DN50-DN1200)
			2										PTFE: (≤DN1200)
			3										Polyurethane (≤DN1200)
			4										PFA (≤DN250)
			5										F46 (≤DN250)
Electrode Material				1									SS316L
				2									Hastelloy C
				3									Hastelloy B
				4									Titanium
				5									Tantalum
				6									Platinum
Grounding Connection					0								Flange Grounding
					1								Grounding Ring
					2								Grounding Electrode
Protection & Explosion-proof						1							IP65
						2							IP67 (only for compact type)
						3							IP68 (only for remote type)
Structure							C						Compact Display Type
							R						Remote Display Type
Power Supply								A					85-265 V AC (45-63Hz)
								D					16-36V DC
								B					3.6V Battery Power
Output									0				Standard (4-20mA, Pulse and Alarm)
									M				Standard + Modbus
									H				Standard + HART
Material										S4			Stainless Steel 304
										CS			Carbon Steel
Additional Configuration											0		None
											J		Relay Output
											T		Power Down Timer
											F		Enhancements
											Q		Batch Control
											S		High Frequency Slurry
											R		Infrared Remote Control
											G		GPRS Communication

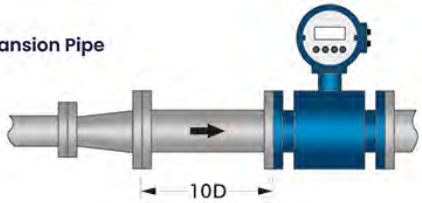
T Shaped Pipe



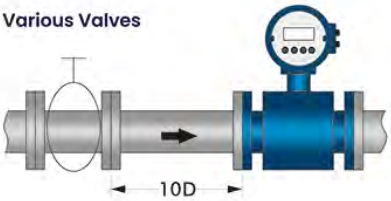
90° Elbow



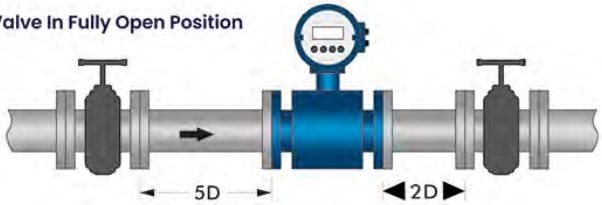
Expansion Pipe

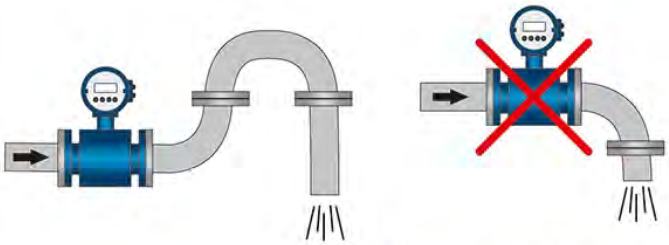


Various Valves



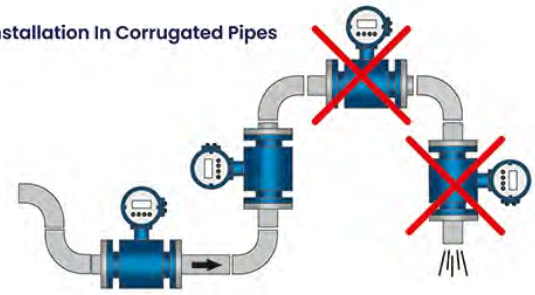
Valve In Fully Open Position



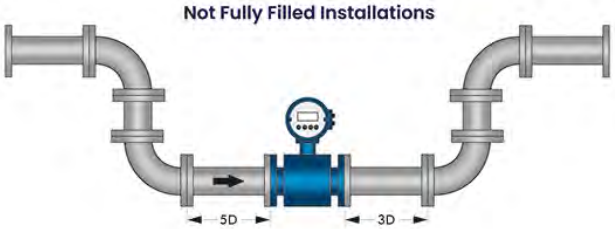


Installation In Open-Ended Lines

Installation In Corrugated Pipes



Not Fully Filled Installations



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