



SHD Series Electromagnetic Flow Meter

Product Overview

Unobstructed flow passage. No moving parts. No additional pressure drop. Favorable choice of materials for chemically aggressive liquids.

Overview

Electromagnetic flowmeter is a kind of inductive instrument designed by Faraday's law of electromagnetic induction to measure flow of conductive media in the tube. It adopts the technology of insertion of single chip to realize digital excitation and employs CAN local fieldbus.

Electromagnetic flow meter can realize local indication and output electrical current signal of 4-20mA which can be used to record, adjust and control. Electromagnetic flow meters are widely used in industrial sectors such as chemical industry, environmental protection, metallurgy, pharmaceutical, paper making, water supply and removal etc.

Besides measuring flow of general conductive liquid electromagnetic flowmeter can measure flow of liquid-solid mixed fluid, high-viscosity fluid and salt, strong acid and strong alkali.

Features

- Simple structures, firm, no movable parts and long operation life.
- No intercepting fluid parts, no pressure loss and fluid clogging.
- No mechanical inertia, quick response and good stability, application in automatic examination, adjustment and controlling.
- Measuring accuracy not influenced by physical parameters such as style, temperature, viscosity, density and pressure.
- Employ Teflon or rubber liner and different combination of electrode material such as Hastelloy C, Hastelloy B, 316L, Titanium and adapt the need of different mediums.
- Supply many styles of flowmeters such as inline type and insertion type, etc.
- Adopt EEPROM memory to measure operation data, safe and reliable protection of memory.
- Integral type flowmeters and remote type flowmeters.
- LCD back light display with high clearness.

Technical Specifications

a) Normal Operating Conditions

Environment temperature: $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$

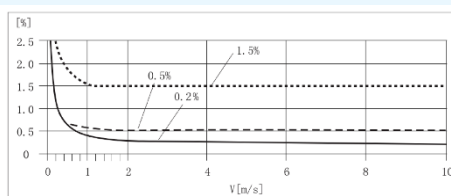
Relative Humidity: 5% ~90%

Power supply: 85VAC~250VAC; 16VDC~36VDC

Consumed power: less than 20W

b) Measuring Accuracy

Standard SE11/ Sanitary SE13: $\pm 0.5\%$; Inserted type SE 14: $\pm 1.5\%$



Basic Error

c) Output & Communication

Analog Current Output

Load Resistance: 0 mA~10 mA ,0 ~1.5 K Ω ,
Load Resistance: 4 mA~20mA ,0 ~750 Ω ,
Intrinsic Error: 0.1% $\pm$ 10 μ A

Digital Frequency Output

Frequency Output Range: 1 Hz ~ 5000 Hz
Output Electrical Isolation: Optoelectronic Isolation, Isolation Voltage: > 1000VDC
Frequency Output Driver: Field-Effect Tube Output, Max bearing Voltage 36VDC, Max load Current 250mA

Digital Pulse Output

Output Pulse Range: 0 pulse/second ~ 100 pulses /second. (Higher than 100 pulses/second, pulse can be lost)
Output Pulse Equivalent: 0.001~1.000 m³/cp;
0.001~1.000 LRT/cp;
0.001~1.000 USG/cp;
0.001~1.000 UKG/cp.
Output Electrical Isolation: Optoelectronic Isolation, Isolation Voltage: > 1000VDC
Frequency Output Driver: Field-Effect Tube Output, Max bearing Voltage 36VDC, Max load Current 250mA

Alarm Output

Alarm Output Point: ALH –Upper limit Alarm, ALML—lower limit Alarm
Output Electrical Isolation: Optoelectronic Isolation, Isolation Voltage: > 1000VDC
Frequency Output Driver: Field-Effect Tube Output, Max bearing Voltage 36VDC, Max load Current 250mA

Digital Communication

MODBUS Interface: RTU Format, Physical Interface RS-485, Electrical Isolation 1000VH
Hart Interface: Standard Hart Protocol, configure HART Communicator, can display the measuring valve on line and modify the instruments parameters.
PROFIBUS-DP option

Main Technical Parameters

Table 1 Main Technical Parameters of Electromagnetic Flow meter

Model	SE 11 Standard	SE13 Sanitary	SE14 Insertion type
Medium	Conductivity Fluids		
Accuracy	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 1.5\%$
Repeatability	$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.75\%$
Fluid Temperature	-25°C ~ 130°C	-25°C ~ 130°C	-25°C ~ 130°C
Conductivity	$\geq 5\mu\text{S/cm}$ (soft water should be $\geq 20\mu\text{S/cm}$)		
Size	10~2000 mm	10~125 mm	200~3000 mm
Operation Pressure	0.6Mpa/1.0Mpa/1.6Mpa/2.5Mpa/4.0Mpa/Others		
Velocity	0.5 m/s ~ 10 m/s		
Flow Direction	Forward / Reversed		
Electrodes Material	316L / Hastelloy C2, B4/Tantalum/Titanium/Platinoidita/others		
Liner Material	Rubber /PTFE/PFA	PFA/PTFE	PTFE
Electrodes Type	Standard		
Qty of Electrodes	2 pairs (measuring & grounding)		1 pair (measuring)
Tube Material	304 Stainless Steel		
Flange Material	CS /304 SST	304 Stainless steel	304 Stainless steel
Installation Type	Flange	Tri-clamp	Flange/plug-in
Protection level	IP65/P68 (Remote Version)		
Power	220VAC $\pm 20\%$ 60HZ / 24 VDC		
Signal Output	4~20mA		
Communication	Hart/Modbus/Profibus		
Electrical connection	2 * M20 * 1.5		
Explosive-Proof	Exd eia II C T3~T6		
Construction Type	Compact / Remote		
Operation Environment	Environment temperature:-25 ~+60°C; Relative Humility: 5% ~90%		

Product Selection

Table 2 Nominal Diameter, Pressure & Flow Range

Size(DN)	Pressure	Min flow range velocity(0-0.5)m/s	Max Flow range velocity(0-10)m/s
10	4.0 Mpa	(0-2.25)L/min	(0-45)L/min
15	4.0 Mpa	(0-5)L/min	(0-100)L/min
20	4.0 Mpa	(0-7.5)L/min	(0-150)L/min
25	4.0 Mpa	(0-10L)/min	(0-200)L/min
32	4.0 Mpa	(0-20L)/min	(0-400)L/min
40	4.0 Mpa	(0-30L)/min	(0-600)L/min
50	4.0 Mpa	(0-3)m³/h	(0-60)m³/h
65	4.0 Mpa	(0-6)m³/h	(0-120)m³/h
80	4.0 Mpa	(0-9)m³/h	(0-180)m³/h
100	1.6 Mpa	(0-12)m³/h	(0-240)m³/h
125	1.6 Mpa	(0-21)m³/h	(0-420)m³/h
150	1.6 Mpa	(0-30)m³/h	(0-600)m³/h
200	1.6 Mpa	(0-54)m³/h	(0-1080)m³/h
250	1.6 Mpa	(0-90)m³/h	(0-1800)m³/h
300	1.0 Mpa	(0-120)m³/h	(0-2400)m³/h
350	1.0 Mpa	(0-165)m³/h	(0-3300)m³/h
400	1.0 Mpa	(0-225)m³/h	(0-4500)m³/h
500	1.0 Mpa	(0-330)m³/h	(0-6600)m³/h
600	1.0 Mpa	(0-480)m³/h	(0-9600)m³/h
700	1.0 Mpa	(0-660)m³/h	(0-13200)m³/h
800	1.0 Mpa	(0-900)m³/h	(0-18000)m³/h
900	1.0 Mpa	(0-1200)m³/h	(0-24000)m³/h
1000	1.0 Mpa	(0-1350)m³/h	(0-27000)m³/h
1200	0.6 Mpa	(0-2100)m³/h	(0-42000)m³/h
1400	0.6 Mpa	(0-2700)m³/h	(0-54000)m³/h
1600	0.6 Mpa	(0-3600)m³/h	(0-72000)m³/h
1800	0.6 Mpa	(0-4500)m³/h	(0-90000)m³/h
2000	0.6 Mpa	(0-5700)m³/h	(0-114000)m³/h

Table 3 Model Selection

Item	Code	Description
Factory Mark	SHD	Silver Automation Instruments
Meter Type	SE11	Standard (0.5% accuracy)
	SE13	Sanitary type (0.5% accuracy, DN10~125, Tri-clamp)
	SE14	Insertion type (1.5% accuracy, DN200-3000)
Size	-xxx	10~2000mm
Electrodes Material	E0	316L SS
	E1	Hastelloy B
	E2	Hastelloy C
	E3	Titanium
	E4	Tantalum
	E5	Pt/iridium alloy
	E6	Tungsten carbide
Liner	L1	Teflon/PTFE
	L2	F46/FEP
	L3	PFA
	L4	Hard Rubber
	L5	Polyurethane rubber
Rated Pressure	1G	GB 1.6Mpa 1D DIN PIN16 1A ANSI 150LB
	2G	GB 2.5Mpa 2D DIN PIN25 2A ANSI 300LB
	3G	GB 4.0Mpa 3D DIN PN40 3A ANSI 600LB
	S	Special
Working Temp	E	<60°C
	H	<150°C
Protection Grade	P0	Ip65
	P2	Ip68 (only for remote version, sensor IP68, converter IP65)

Item	Code	Description
Converter	0	Compact
	1	Remote (standard cable 10m)
Output & Communication	S0	4~20mA
	S1	RS-485
	S2	HART
	S3	Profibus-DP
	S4	Pulse output
Housing Material	H0	Carbon steel
	H1	304 SS
	H2	Special
Flange Material	F0	Carbon steel
	F1	304
	F2	Special
Power Supply	G0	220V AC (85~256V, 45~63Hz)
	G1	24V DC (18~36V)
	G2	Battery supply (no output)
Explosion Proof	0	Non
	Ex	Exd eia IIC T3~T6

Table 4 Selection of Liner

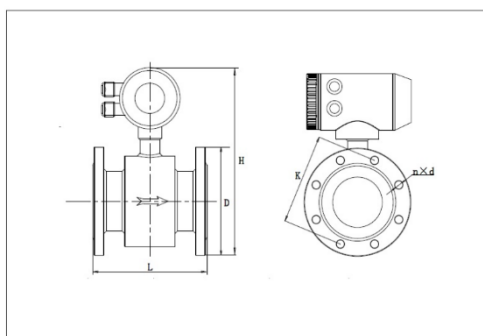
Liner	Main Function	Application
Hard Rubber	Resistant to Hydrochloric acid, acetic acid, oxalic acid, ammonia water, phosphoric acid and 50% Sulfuric acid, sodium hydroxide and potassium hydroxide in normal temperature	1. Temp. less than 65°C 2. Common acid, alkali, salt solution
PTFE F46 PFA	Most steady plastic of chemical living energy; resist boiling hydrochloric acid, sulfuric acid, nitric acid, nitro- hydrochloric acid, thick alkali and all kinds of organic solvent; Poor abrasion and adhesion performance	1. -40°C ~130°C (PTFE) -40°C ~180°C (F46) -40°C ~180°C (PFA) 2. Strong corrosive fluids such as acid and alkali 3. For sanitary/hygienic purpose

Table 5 Selection of Materials of Electrodes

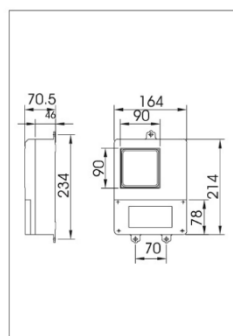
Electrodes	Performance of resisting erosion and abrasion
Stainless steel 0Cr18Ni12Mo2Ti	Apply to industrial water, domestic water, polluted water, etc. with weak erosion, applied in petroleum chemical industry, steel and iron, etc. and fields in government and environmental protection
Hastelloy B	Good performance of resisting erosion to hydrochloric acid of all degrees of density below the boiling point; resisting sulfuric acid, phosphoric acid, hydrofluoric acid, organic acid, etc. non-chlorine acid, alkali, erosion of non-oxidized salty fluid
Hastelloy C	Resisting non-oxidized acid, such as nitric acid, nitration mixture, or the erosion of the mixture of chromic acid and sulfuric acid; resisting oxidized salt such as Fe ⁺⁺⁺ , Cu ⁺⁺ or the erosion of other oxidizers, such as the erosion of higher than normal temperature hypochlorite liquor and the sea water
Titanium	Resisting erosion of sea water, all kinds of chloride and hypochlorite, oxidized acids (including Fuming sulfuric acid), organic acid, alkali; not resisting the erosion of purer reducing acids (such as sulfuric acid, hydrochloric acid); if oxidizer exists in acids (such as nitric acid, Fe ⁺⁺⁺ , Cu ⁺⁺) the erosion will reduce greatly.
Tantalum	Good performance of resisting erosion, similar to glass; Besides hydrofluoric acid, fuming nitric acid, alkali, nearly can resist erosion of all chemical mediums (including boiling hydrochloric acid, nitric acid and below 150jæ sulfuric acid). Not resisting erosion in alkali.
Pt/ Iridium Alloy	Can nearly resist all chemical matters, not fit for aqua regia and ammonium salt
Stainless Steel Painting Tungsten Carbide	Fit for mediums without erosion and strong attrition

Remarks: Due to multiple types the erosion is subject to complex factors such as temperature, density, flow rate etc., this sheet is only for reference. Users should make decision according to practical conditions, if necessary make experiment of resisting erosion of to-be-chosen materials, such as the experiment of hanging pieces.

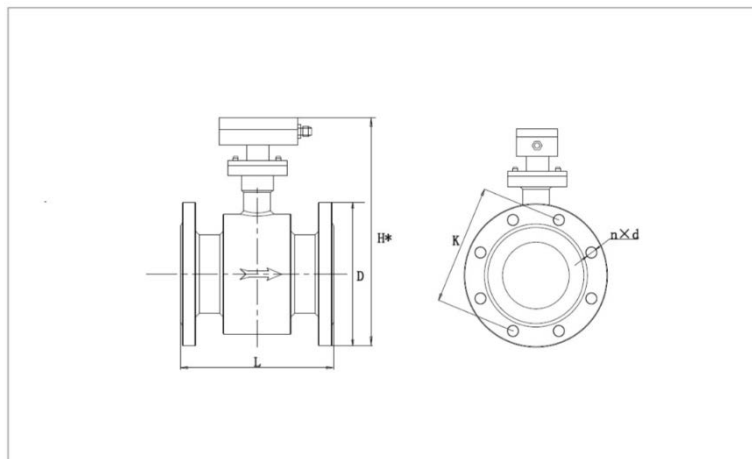
Dimensions



DN10~DN2000 Electromagnetic Flow meter



Remote Version Converter



DN10~DN2000 Remote Version Electromagnetic Flow meter

Size (mm)	L (mm)	D (mm)	K (mm)	H (mm)	H* (mm)	Nxd (mm)	Pressure
10	200	90	60	310	220	4x14	4MPa
15	200	95	65	310	220	4x14	
20	200	105	75	315	225	4x14	
25	200	115	85	325	235	4x14	
32	200	140	100	325	235	4x18	
40	200	150	110	340	250	4x18	1.6MPa
50	200	165	125	355	265	4x18	
65	200	185	145	375	285	4x18	
80	250	200	160	385	295	8x18	
100	250	220	180	415	325	8x18	
125	250	250	210	445	355	8x18	
150	300	285	240	475	385	8x22	
200	350	340	295	505	415	12x22	1.0MPa
250	450	395	350	590	500	12x22	
300	500	445	400	645	555	12x22	
350	500	505	460	695	605	16x22	
400	500	565	515	745	655	16x26	
450	550	615	565	825	735	20x26	
500	550	670	620	878	788	20x26	
600	600	780	725	988	898	20x30	0.6MPa
700	700	860	810	1095	1005	24x30	
800	800	975	920	1208	1118	24x34	
900	900	1075	1020	1310	1220	28x34	
1000	1000	1175	1120	1413	1323	28x36	
1200	1200	1450	1340	1525	1435	32x33	
1400	1400	1630	1560	1735	1645	36x36	
1600	1600	1830	1760	1965	1875	40x36	0.6MPa
1800	1800	2045	1970	2155	2065	44x39	
2000	2000	2265	2180	2365	2275	48x42	