PONOT
Electromagnetic
Flowmeters

XFE Series Electromagnetic flowmeter

SUMMARY

1.1Features

Measurement is not affected by the variation of flow density, viscosity, temperature, pressure and conductivity. High accuracy measurement is guaranteed according to the linear measurement principle.

No obstacle in the pipe, no pressure-loss and lower requirement for straight pipeline.

DN 6 to DN2800 covers a wide range of pipe size. A variety of liners and electrodes are available to satisfy different flow characteristic.

Programmable low frequency square wave field excitation, improving measurement stability and reducing power consumption.

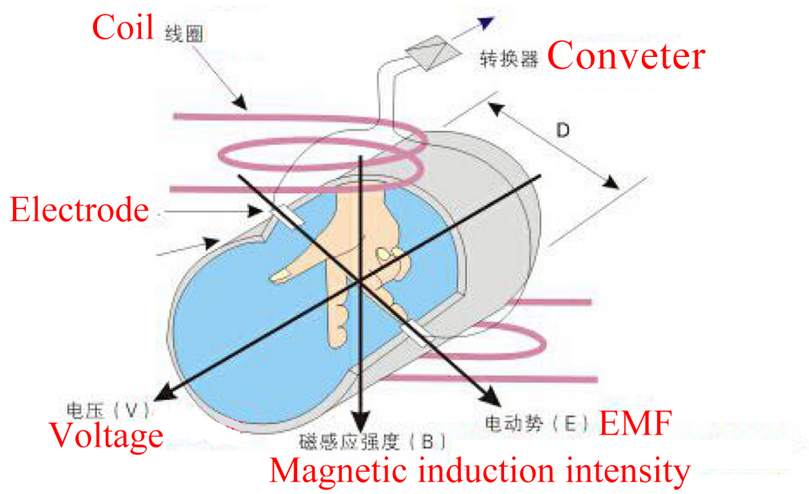
Implementing 16 bits MCU, providing high integration and accuracy; Full-digital processing, high noise resistance and reliable measurement; Flow measurement range up to 1500:1.

High definition LCD display with backlight.

RS485 or RS232 interface supports digital communication.

Intelligent empty pipe detection and electrodes resistance measurement diagnosing empty pipe and electrodes contamination accurately.

SMD component and surface mount technology (SMT) are implemented to improve the reliability.(converter EMF Magnetic induction intensity; Voltage; Electrode; Coil;)



1.2Main Applications

XFE series electromagnetic flowmeter can be used to measure the volume flow of conductive fluid in a closed pipeline. It is widely applied in the flow measurement and control in the fields of chemical and petroleum industry, metallurgy industry, water and waste water, agriculture and irrigation, paper making, food and beverage industry and pharmaceutical industry.

1.3Ambient Conditions

Ambient temperature: sensor: -25℃ to + 60℃; converter: -25℃ to + 60℃.

Relative humidity: 5% to 90%;

1.4Working Conditions

Maximum fluid temperature: Compact type: 60℃ Remote type: Teflon 150℃

Neoprene 80℃; 120℃ Polyurethane 70℃ Fluid conductivity: ≥ 5 S/cm

WORKING PRINCIPLES

2.1 Measuring Principles

The measuring principle of electromagnetic flowmeter is based on the electromagnetic induction law of Farady. The sensor is mainly composed of measuring tube with isolate lining, a pair of electrodes installed by penetration of the measuring tube wall, a pair of coils and iron core to produce working magnetic field. When the conductive fluid flows through the measuring tube of the sensor, the voltage signal in direct proportion to the average flow velocity of the fluid will be inducted on the electrodes. The signal is amplified and treated by the transmitter to realize various display functions.

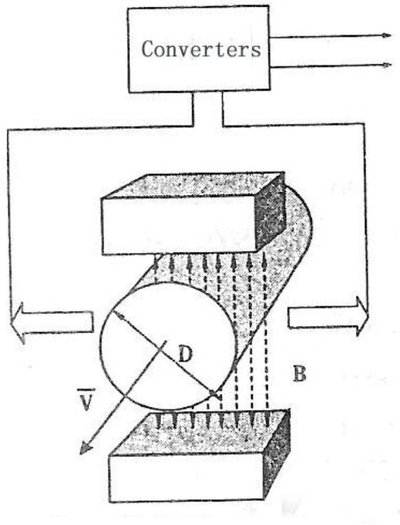


Figure one:Principle of Electromagnetic Flowneter

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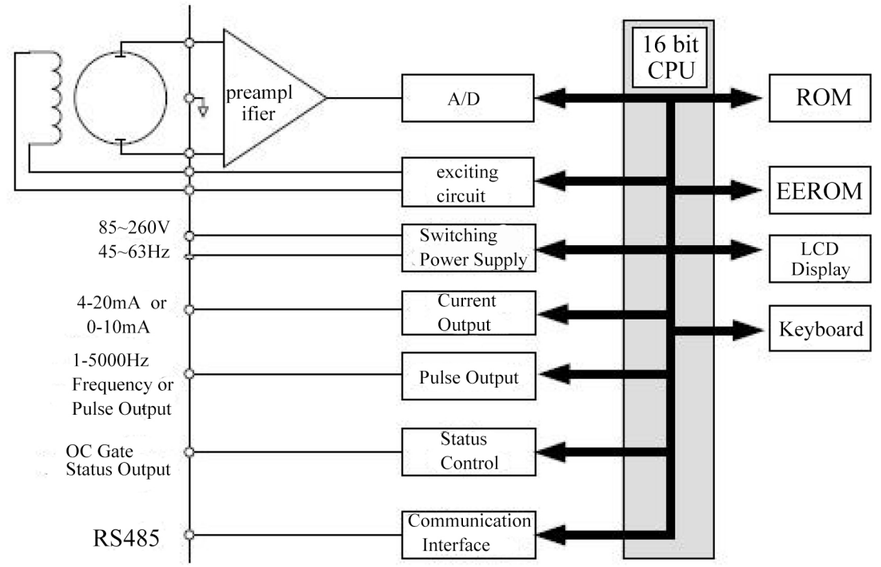
2.2 Converter Circuit Schematic

The converters supplies a stable exciting current to the coil in the sensor of electronetic flowmeters to get B constant and amplifies the electromotive force and convert it into standard signals of current or frequency so that the signals can be used for displaying, controlling and processing. The schematic of converter circuit is shown in Fig. 2.1.



PRODUCT TECHNICAL PARAMETER

3.1.Measuring fluid:conductive liquid

3.2.Accuracy level: level 0.5 (special grade 0.2)

3.3.Repeatability:0.15% 0.25%

3.4.Fluid temperature:-25°C~180°C~250°C

3.5.Medium velocity range:0.3~12m/s(extend to 0.1~15m/s)

3.6.conductivity:≥ 5μ/cm

3.7.Electrode material:Stainless Steel、 Tantalum、Titanium、Hastelloy Alloy B、Hastelloy Alloy C、Platinum Iridium Alloy、Stainless Steel Coating Tungsten Carbide、Ni.

3.8.Lining Material:Chloroprene Rubber CR、Fluoroplastic（ F4、F46、PFA）、Polyurethane、Alumina Ceramic.

3.9.Body Flange And Shell Material:Stainless Steel、Carbon Steel、others（Special order）

3.10.Installation form: flange connection, clamp type, thread connection, clamp, oil connection, plug-in type, etc.

3.11.Protection level:IP65、IP67、IP68.
3.12.Converter power supply:85~265V A.C、11~40V D.C、Lithium Battery
3.13.Output Signal:Current, Pulse, frequency、HART Agreement、RS232/RS485、GPRS.
3.14.Structure Type:Split Type、Integral Type、Plug-in Type.
3.15.Power waste:0.65W
3.16.Working environment: Environmental temperature：-25°C~60°C、relative humidity：5%~90%.
3.17.Explosion-proof grade:No explosion proof and explosion proof ExdeibmbIICT3-T6
3.18.Converter display interface: Chinese and English LCD display interface and operation interface can be switched (customizable other languages), can display instantaneous flow, cumulative flow, there are a variety of flow units for selection.
3.19.Categories: sanitary, diving, high pressure, scraper type, high temperature type, electromagr

Integrated type

Romete control type

Insertion type

Electromagnetic calorimeter

Caliber Selection.

According to the diagram of the maximum flow, minimum flow and bore of flowmeter, the inner diameter of flowmeter and the velocity of flow, the caliber of electromagnetic flowmeter can be chosen economically.
Maximum flow and minimum flow must correspond to the number in the following table

Flow calculation formula:$Q=V.(\pi D^2/4)= 0.002826VD^2$

Internal Diameter	10	15	20	25	32	40	50	65
Qmin(m3/h) Qmax(m3/h)	0.0848 3.39	0.1908 7.63	0.3391 13.56	0.5299 21.20	0.8681 34.73	1.3565 54.26	2.1198 84.78	3.5820 143.28
Internal Diameter	80	100	125	150	200	250	300	350
Qmin(m3/h) Qmax(m3/h)	5.4259 217.04	8.478 339.12	13.2469 529.88	19.0755 763.02	33.912 1356.48	52.9875 2119.5	76.302 3052.08	103.8555 4154.22
Internal Diameter	400	450	500	600	700	800	900	1000
Qmin(m3/h) Qmax(m3/h)	135.648 5425.95	171.680 6867.18	211.95 8478	305.208 12208.22	415.22 166.16.9	542.592 21703.68	686.718 27468.82	847.80 33912
Internal Diameter	1200	1400	1600	1800	2000	2200	2400	2600
Qmin(m3/h) Qmax(m3/h)	1220.83 48833.3	1661.69 66467.5	2170.37 86814.7	2746.872 109874.9	3391.20 135648	4103.352 164134.1	4883.32 195333.1	5731.12 229245.12

In the formula:Q-m^3/h,V-m/s,D-mm
Velocity range:0.3~12m/s (Extended range0.1~15m/s)

When measuring clean water, the economic flow rate is 1.5~3m/s;When measuring the crystallization solution, 3~4m/s is suitable for cleaning and preventing adhesion and deposition;When measuring the abrasive fluid such as ore pulp, 1~2m/s is appropriate to reduce the wear of lining and electrode.

XFE Series Electromageletic Flowmeter Lining Material.

Material type	Performance characteristics	Apply fluids	Noted
Chloroprene Rubber	Wear resistance is medium, and compared with other rubber, it has good oil resistance and chemical resistance	The upper and lower waters, sea water, industrial water and mud water	The corrosion resistance of organic solvents and some acids and alkaline solutions is weak
Fluoroplastic F4、F46、PFA	1 、 the inner surface is smooth and difficult to adhere to the deposition layer 2, a wide range of applications, the highest capacity of 150 C high temperature. 3, corrosion resistance is superior, almost all chemicals can resist. 4, and measuring tube can not be bonded, only close to the sleeve, and can not be used for negative pressure.	1, hydrofluoric acid, hydrochloric acid, acetic acid and other high permeability liquid 2, sulfuric acid, caustic soda, electrolyte and other strong corrosive liquid 3, easy to produce scaling, precipitation, attachment, solidification of the liquid 4. A liquid with hygienic requirements	1, poor wear resistance 2, not resistant to some oxides and a small number of liquid corrosion or erosion 3, three, chlorine fluoride, high temperature three fluoride oxygen and fluoride, as well as liquid fluorine, liquid oxygen, ozone and other non corrosion resistance
Polyurethane	1, abrasion resistance is superior, 10 times as natural glue 2, poor corrosion resistance, can only be used for weak acids, weak bases and other liquids	Sea water, mud, sludge, water, ore pulp, coal slurry	1, can not be used for acid, lye and organic solvent mixture 2, the use of temperature needs less than 80C
Alumina Ceramic	1. The abrasion resistance is about 10 times of that of polyurethane 2, high temperature and high pressure without deformation, brittle, non liquid temperature changes 3. The inner surface is smooth and difficult to adhere to scale	Hard slurry, corrosive liquid, high temperature and high pressure liquid, easy to adhere to scale solution	1, heat shock (ie high temperature changes sharply) difference 2 、 mechanical shock resistance is poor. It is fragile and brittle, prevents the clamping force from being uneven 3. Applied to fluorine acid, phosphoric acid and alkali solution

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The Selection Table Of XFE Electromagnetic Flowmeter

Instrument Type	XFE Electromagenetic Flowmeter、XFER Electromagnetic Calorimeter							
Nominal Diameter (mm)	**015**	DN15	**125**	DN125	**601**	DN600	**202**	DN2000
	020	DN20	**151**	DN150	**701**	DN700	**222**	DN2200
	025	DN25	**201**	DN200	**801**	DN800	**242**	DN2400
	032	DN32	**251**	DN250	**901**	DN900	**262**	DN2600
	040	DN40	**301**	DN300	**102**	DN1000	**282**	DN2800
	050	DN50	**351**	DN350	**122**	DN1200	**302**	DN3000
	065	DN65	**401**	DN400	**142**	DN1400	**322**	DN3200
	080	DN80	**451**	DN450	**162**	DN1600		
	101	DN100	**501**	DN500	**182**	DN1800		
Structure Type	**F**	Split Type						
	Y	Integral Type						
	C	Plug-in Type						
Nominal Pressure（MPa）	**16**	PN16						
	XX	Special Pressure Customization						
Lining Material	**R**	Chloroprene Rubber (Maximum Temperature 80 Degrees), Silicone Rubber (Maximum Temperature 250 Degrees)						
	F	Fluoroplastic F4、F46、PFA						
	P	Polyurethane						
	C	Alumina Ceramic						
Electrode Material	**1**	Stainless Steel						
	2	Tantalum						
	3	Titanium						
	4	Hastelloy Alloy B						
	5	Hastelloy Alloy C						
	6	Platinum Iridium Alloy						
	7	Stainless Steel Coating Tungsten Carbide						
Body Flange And Shell Material	**A**	Stainless Steel						
	B	Carbon Steel						
Shell Protection Grade	**L**	IP65						
	M	IP67						
	H	IP68						
Power Supply	**1**	85~265V 45~400Hz						
	2	11~40V D.C						
	3	Lithium Battery						
Output Signal	**A**	Current, Pulse, frequency						
	H	HART Agreement						
	R	RS232/RS485						
	G	GPRS						

Note: The company can be customized in accordance with customer requirements industry-specific products. More Product Display