Electromagnetic Flowmeter Selection Manual

ZHEJIANG SUPCON TECHNOLOGY CO.,LTD.
ZHEJIANG SUPCON INSTRUMENT CO.,LTD.

TABLE OF CONTENTS

C

Company Profile

2000

Established in 2000

6000+

More than 6000 global customers

Zhejiang SUPCON Instrument Co., Ltd. (referred to as "SUPCON Instrument"), founded in 2000, is one of the high-tech enterprises in Zhejiang Province as a holding subsidiary of Zhejiang SUPCON Technology Co., Ltd., specializing in R&D and production of industrial automation instrument. The company has got a lot of awards and honorary certificates of National Technology Center, Zhejiang Province AAA "Contract-honoring and Credit-keeping" Enterprise, Zhejiang province Demonstration Enterprise of Credit Management, Zhejiang Province Software Enterprise, Zhejiang Province High-tech Enterprise Research Centre and Zhejiang Province Well-known Firm etc. The company also has several National-Local Engineering Lab, Provincial Lab, Provincial Key R&D institute, Smart City Development Research Centre and post-doctoral research station.

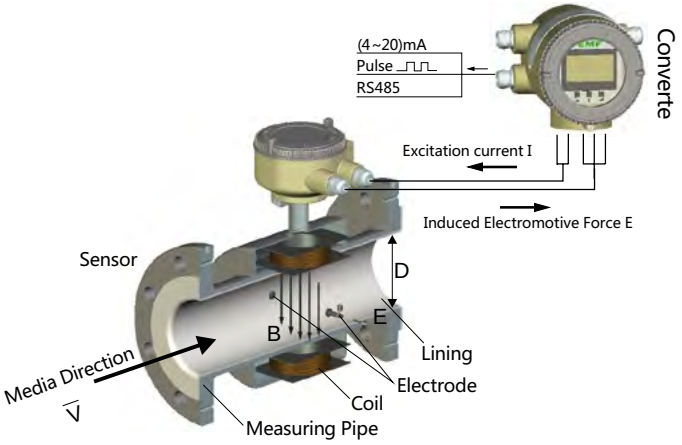
With powerful technology innovation and R&D, the company owns 23 issued patents, 24 software copyrights, one international standard and 5 national standards.

For about 20 years now, SUPCON Instrument has formed a complete industrial chain covering from the field to control room, including MultiF series multi-function intelligence instruments, SupField series field instruments and SFT2000 series vector frequency converter. The main products include smart pressure transmitter, temperature transmitter, electromagnetic flowmeter, safety barrier, isolator, surge protector, intelligent data gateway, paperless recorder, controller, batch controller, process calibrator, HART protocol hand-held communicator, etc.

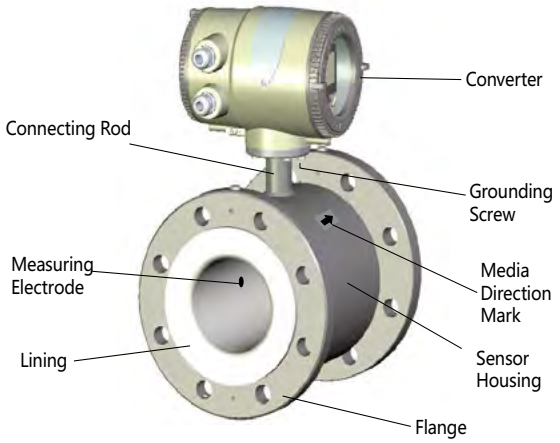
"Create value for our customers, persevering through struggle and innovation, promising dedication and integrity, and striving for excellence" is SUPCON values. SUPCON Instrument has grown continuously in the management level since its establishment. The company has got the certifications of ISO9001, ISO14000, ISO18000, ISO 10012:2003. For SUPCON products, already approved by authority organization of SIL certificate, ATEX certificate, IECEx certificate, CCS certificate, CE certificate, Explosion-proof certificates etc.

Electromagnetic Flowmeter

Schematic Diagram



EMF8901 Split Electromagnetic Flowmeter Anatomical Drawing



EMF8901 Integrated Electromagnetic Flowmeter Schematic Diagram

Measuring principle

The electromagnetic flowmeter is an instrument for measuring conductive liquids flow in circle tube, its working principle based on Faraday' s law of Electromagnetic:

When the conductive liquid is cutting the magnetic lines in the magnetic field, the ends of the conductor will induce electromotive force(E), which is vertical to the direction of movement and magnetic field. The electromotive force and the velocity of conductive liquid(V) are in a direct ratio, that is E=BLV(B: magnetic induction strength of the magnetic field; L: conductor length; V: velocity of cutting the magnetic lines).

EMF89 Series Intelligent Electromagnetic Flowmeter

Product Introduction

EMF89 series electromagnetic flowmeter consists of EMF89 type converter and 01 Flange type, 02 Holder-Type, 03 Insertion Type, 05 Thread-type, 06 Clamped Type. It can be an integrated electromagnetic flowmeter by equipping the converter with the sensor directly, also can be a split type electromagnetic flowmeter by connecting the converter and sensor with a cable line.

Integrated Type

EMF8901 Flange Type

EMF8902 Holder Type

EMF8905 Thread Type

EMF8906 Clamped Type

Split Type

EMF8901 Flange Type

EMF8902 Holder Type

EMF8903 Insertion Type

EMF8905 Thread Type

EMF8906 Clamped Type

E

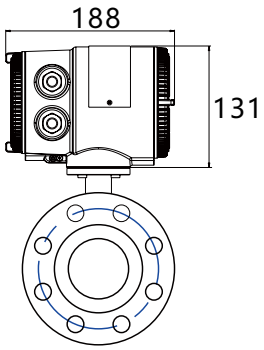
EMF89 Type Electromagnetic Flowmeter Converter

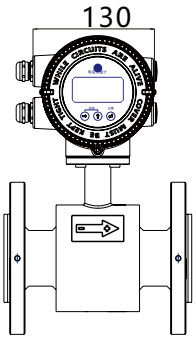
Feature

- Excellent turn down rate
- Can measure the tiny flow of 2L/h
- Can measure the forward and reverse flow
- Multiple power supply: battery power, solar power etc
- Converter with high reliability and good interchangeability
- Easy to install, few restricting factors in spot installation
- Applicable to measure the flow of various conductive liquid
- Sensor supports various international standard flange connection
- Stable performance, good repeatability and high accuracy(can reach 0.2%)
- With the nonlinear correction of meter factor, can modify the parameters online
- Many communication ways: GPRS, BlueTooth wireless output, MODBUS, Hart etc
- Can be used in the case of negative pressure with the technology of stainless steel lining
- Good adaptability to the media with highly corrosive resistance and strong ware resistance
- No restricted baffle, no pressure loss, hard to clog, saving energy and reducing consumption
- Can be used in the case of negative pressure with the technology of stainless steel lining
- Can operate it without opening the cover by using the Phone Bluetooth or ultrared remote control
- Applicable to measure the flow of various conductive liquid(conductivity > 5us/cm), such as water, waster water, slurry, paper pulp, assorted beverages, chemical raw material, viscous liquid, suspension liquid

Product Introduction

EMF89 type electromagnetic flowmeter converter is the high performance intelligent electromagnetic flowmeter converter with the most advanced design idea and technology. It has much pioneering technology in the world. Every detail from the design structure, manufacturing process and test process secure the products to achieve the advantage of high accuracy, high performance and wide range.



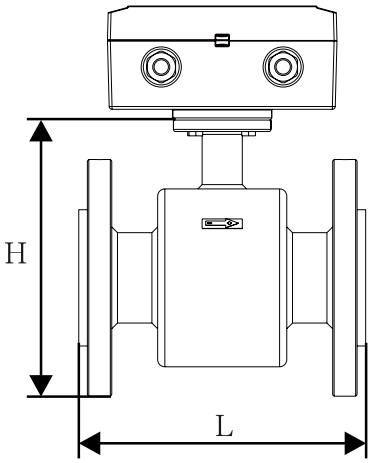


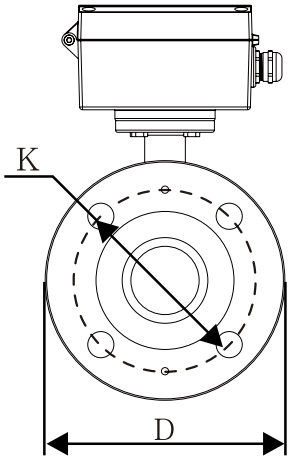
Technical Data

Display	4-line English LCD display, display the data of forward and reverse flow, percentage of flow and flow velocity.
Parameter Setting	Setting the parameters with the button, ultrared remote control and Bluetooth(smart phone).
Language	Chinese, English
Current Output	4~20mA. Loop resistance ≤ 500Ω (can choose with HART protocol)
PIO	Can choose passive pulse output, active pulse output, state output/alarm output and contact signal input.
	Passive pulse output: 30V DC(off), 200mA(on), (0.0001~5000)Hz;
	Pulse width:50% duty cycle or the fixed value(≤ 100ms)
	Active pulse output: (0.0001~2)Hz, ≤ 150mA, 15VDC ±20%
	Pulse width: ≤ 100ms (The default value:20ms)
	State/Alarm output: contact capacity: 30V DC(off), 200mA(on)
	Contact Input: Passive contact, Load resistance: closed ≤ 200Ω, disconnected ≥ 100kΩ
Communication	RS485(MODBUS-RTU, MODBUS-ASCII)
Power Supply	220VAC, 24VDC, (100~240)VAC
Alarm	Empty pipe alarm, reverse alarm, upper limit and lower limit alarm.
Protection Level	IP67, IP65
Accuracy	0.5, 0.3
Explosion-proof Class	Ex ia/d eII C T3-T6 Ga/Gb
Structure	Integrated Type, Split Type

F

Flange Type Sensor





Product Introduction

Flange type sensor uses the way of connecting the flange with the pipe, has various types of electrode material and lining material for choosing. The sensor and converter can be combined into the integrated electromagnetic flowmeter or split electromagnetic flowmeter.

Technical Data

Diameter(mm)	DN3-DN1200
Pressure	(0.6~4)MPa (Depend on the different diameters, reference sheet 1, can customize the special pressure)
Electrode Material	SS316, Hc, Hb, Ti, Ta,W,Pt
Lining Material	Ne, PTFE, PU, FEP, PFA
Temperature	(-40~180)℃ (Note: Limited by the lining material)
Shell Material	Carbon steel(can customize the stainless steel shell)
Protection level	IP65, IP67, IP68
Flange Connection	GB/T9119-2010(can connect with HG20593-2009 flange directly), JIS, ANSI or customized
Scraper Type Electrode	In order to make customers convenient to remove the slit covered on the electrode surface and assure the normal use of product, it is usually used for the large diameter of DN150-DN1200, and it is applied in the sewage measurement.

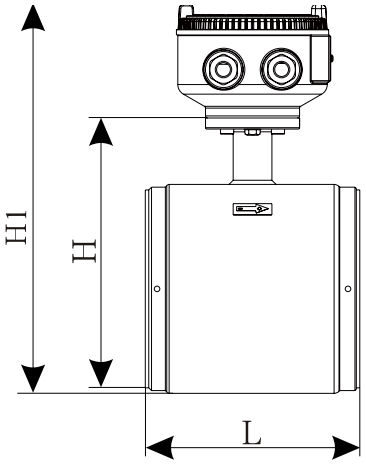
Flange Type Sensor Dimension and Diameter, Pressure, Lining Material

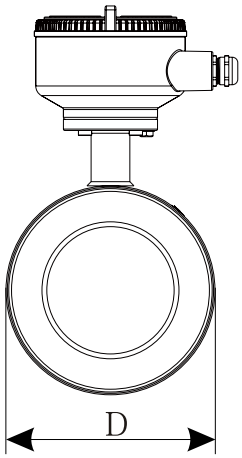
Diameter (mm)	Pressure (MPa)	Lining Material					Dimension (mm)			Connection Size		Weight (kg)
		FEP	Ne	PU	PTFE	PFA	L	D	H	K	N×Φ	
10a	4.0	○				○	150	95	137.5	60	4×14	2.8
10		○				○						3.5
15		○		○	○	○			140	65		3.5
20		○		○	○	○		105	145	75		4.5
25		○		○	○	○		115	152.5	85		4.5
32		○		○	○	○		140	165	100	4×18	6.5
40		○		○	○	○		150	175	110		7.0
50		○	○	○	○	○	200	165	186.5	125		9.5
65		○	○	○	○	○		185	208	145	8×18	12
80		○	○	○	○	○		200	225	160		15
100	1.6	○	○	○	○	○	250	220	243	180		17
125		○	○	○	○	○		250	272.5	210		21
150		○	○	○	○	○	300	285	305	240	8×22	28
200	1.0	○	○	○	○	○	350	340	362.5	295		36
250		○	○	○	○	○	400	395	402.5	350	12×22	49
300		○	○	○	○	○	450	445	452	400		61
350		○	○	○	○	○		505	506.5	460	16×22	79
400		○	○	○	○	○	500	565	562	515	16×26	99
450			○		○		600	615	612.5	565	20×26	121
500			○		○			670	691.5	620	20×26	143
600			○		○			780	786.5	725	20×30	143
700			○		○		700	895	897.5	840	24×30	260
800			○		○		800	1015	1007.5	950	24×33	342
900			○		○		900	1115	1115.5	1050	28×33	420
1000			○		○		1000	1230	1223	1160	28×36	503
1200	0.6		○		○		1200	1405	1410.5	1380	32×33	666

Note:
1.Marked "O" in the sheet means that this lining material is available for these sizes .
2. If the working pressure of the measured pipe over the flowmeter, standard, it needs to be customized.
3. The connection size in the sheet is according to CB/T9119-2010 standard, the requirement of connection size according to ANSI/JIS or others standard, it needs to be customized.

H

Holder Type Sensor





Product Introduction

Holder type sensor uses the flangeless design. It has the advantage of integrated structure, lightweight and convenient remove. Using short measuring pipe is beneficial to remove the dirt from the pipe wall.

Technical Data

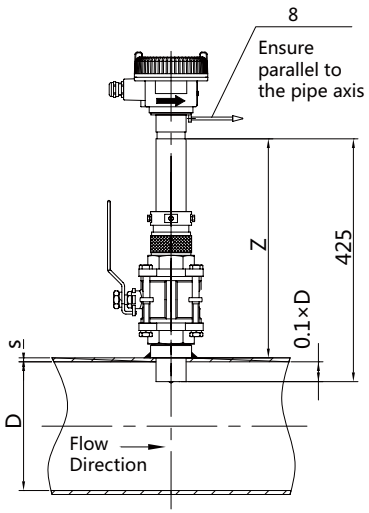
Diameter(mm)	DN25~DN300
Electrode Material	SS316, Hc, Hb, Ti, Ta, W, Pt
Lining Material	FEP
Shell Material	Carbon steel(can customize the stainless steel shell)
Temperature	(-40~180)℃ (Note: Limited by the lining material, reference sheet 7)
Protection level	IP65, IP67, IP68
Connection	Holder Type. Applied in corresponding pressure of the flange with all kinds of standard(such as GB, HG)
Multi-electrode structure	Isolated pipe uses 3(4) electrode structure, 1(2) of grounding electrodes ensure that the measured media and sensor body remain equipotential, then can install flowmeter on the isolated pipe without using grounding ring.
Pressure	Reference 01 flange type sensor

Dimension(mm) sheet 2

Dimension	D	L	H	H1	Weight (kg)
25	67	90	116	199	2.7
32	76	100	125	208	3.4
40	82	100	131	214	3.7
50	96	115	145	228	5
65	116	115	165	248	6
80	127	130	176	259	6.5
100	147	155	196	279	9
125	177	155	226	309	11
150	202	185	251	334	13.5
200	257	215	306	389	21
250	320	250	369	452	29
300	372	290	421	504	37

H

Insertion Type Sensor



Product Introduction

Insertion type sensor and various converters combined into the insertion electromagnetic flowmeter, mainly used in measuring the flow of large diameter, it has the advantage of convenient installation and cheap price. In particular, after using the technology of hot-tapping and installation with pressure, insertion electromagnetic flowmeter can be installed in case of continuous flow, and also can be installed on cast-iron pipes and cement pipes.

Insertion electromagnetic flowmeter is used in measuring the flow of medium-sized pipes in industries of water or petrochemical etc.

Technical Data

Diameter (mm)	≤ DN6000
Electrode Material	SS316L
Lining Material	PTFE
Temperature	(0~120)℃
Protection Level	IP65, IP67, IP68
Pressure	1.6MPa
Accuracy	1.5%, 2.5%

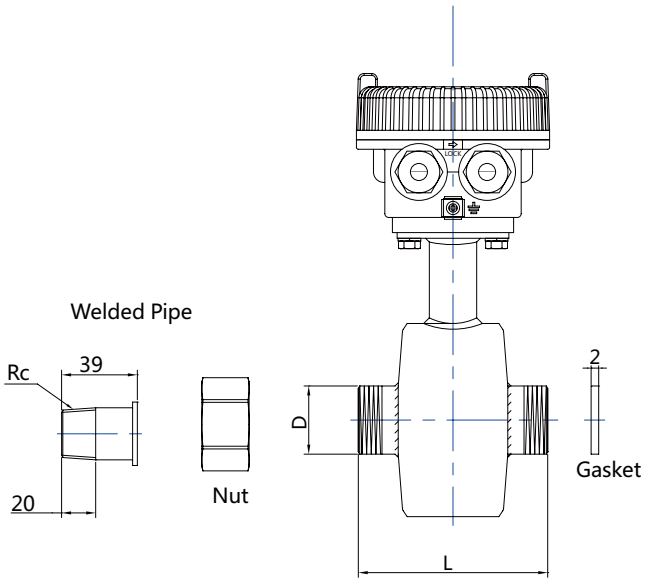
Installation Dimension (mm) Sheet 3

Size	Diameter	H
S	DN200~DN600	425
M	DN700~DN2400	
L	DN2600~DN4200	
XL	DN4400~DN6000	

Z=425-S-0.1*D (Value Z error -3)
S: Thinkness of Pipe
D: Pipe Diameter

T

Tread Type Sensor



Product Introduction

Tread type sensor breaks through the conventional design of electromagnetic flowmeter. It makes up the fatal flaw of some flow meters in the field of small flow measurement. It has the advantage of light and handy appearance, convenient installation, wide measuring range and hard to clogged, etc.

Technical Data

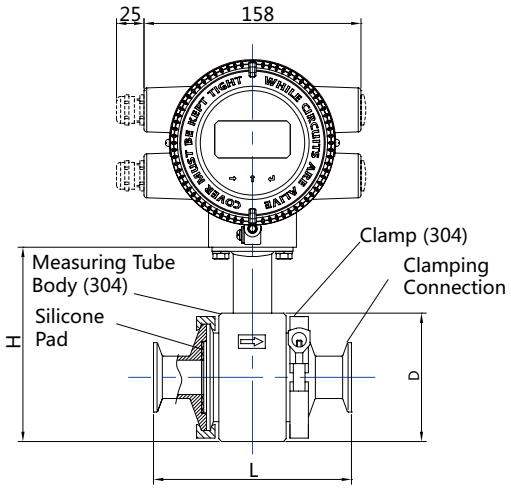
Diameter (mm)	DN5~DN50
Electrode Material	SS316, Hastelloy Alloy C
Lining Material	FEP, PFA
Temperature	Limited by the temperature resistance of lining materials, reference sheet 7
Protection Level	IP65,IP67,IP68
Connection	Tread type
Pressure	1.0MPa

Dimension Size(mm) Sheet 4

Diameter	D	L	Rc
5	G½	90	¼
10	G¾		⅜
15	G1	100	½
20			¾
25	G1¼		1
32	G1½		1¼
40	G2		1½
50	G2½	130	2

C

Clamped Type Sensor



Product Introduction

Clamped type sensor with full stainless steel shell and the lining material meets the health requirements, specifical design for the industries of food, beverage and medicine. The technological process often needs regular cleaning and disinfection. To remove conveniently, the sensor generally in the form of clamp fitting connects with the measured pipe.

Technical Data

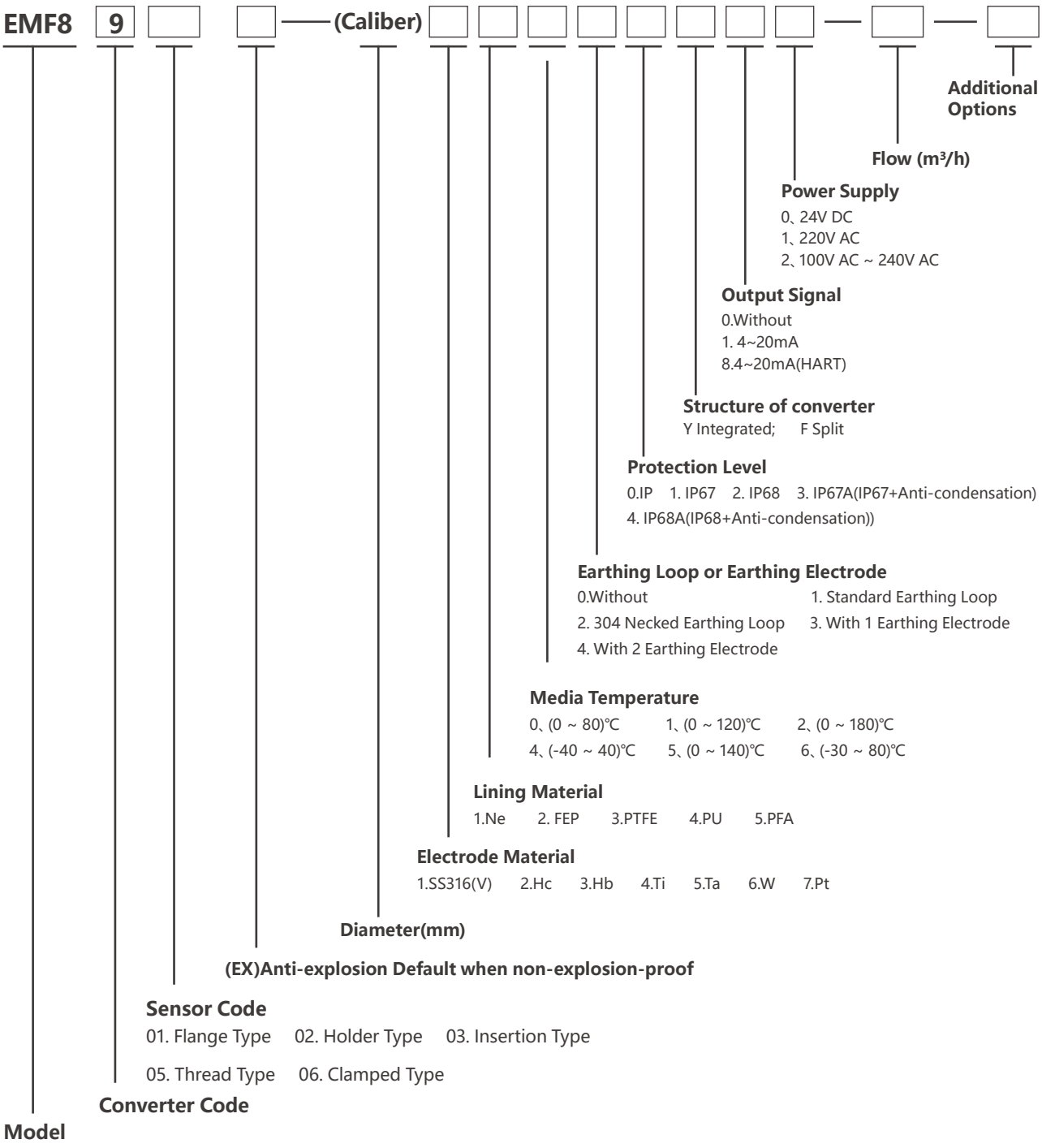
Diameter (mm)	DN15~DN80
Electrode Material	SS316
Lining Material	PTFE, FEP, PFA
Shell Material	SS 304(or 316, 316L)
Short Liquid Pipe	Material 316L; Clamp standard: DIN32676 or ISO2825
Temperature	Limited by the temperature resistance of lining materials, reference sheet 7
Protection Level	IP65,IP67,IP68
Connection	Clamped type
Pressure	1.0MPa

Dimension Size(mm Sheet 5

Diameter	D	L	H
15	150	87	135
25			
32		92	140
40		102	150
50		112	160
65	208	132	180
80		144	192

S

Selection of the Code



Additional Options

Additional Options	Default Value	Selection Code	Description
Sensor pressure for Flange, Holder type (P)	Reference Sheet1, Sheet 2	P1: 0.6MPa P2: 1.0MPa P3: 1.6MPa P4: 2.0MPa P5: 2.5MPa P6: 4.0MPa P7: 5.0MPa P8: 6.4MPa	Not be higher than the pressure of pipe connection
Pipe connection for Flange, Holder type (C or J)	International Standard Flange with Appropriate Pressure	C1: PN6 C2: PN10 C3: PN16 C4: PN25 C5: PN40 C6: PN64 C7: PN100 J1: ANSI 150# J2: ANSI 300# J3: JIS 10K J4: JIS 20K	Choose higher standard when there is no flange with appropriate pressure
Piping Form (K or N)	K1 or N1	K1: DIN32676 K2: ISO2852 N1: Welding N2: Inch Taper Pipe Thread	Clamped Type:K Thread Type:N
Pipe/Nuts Material(G)	304/304	G1: 304/304; G2: H62 Cu/H62 Cu; G3: 304/H62 Cu	Selection for Thread Type
Flange(Ring) Material(T)	CS	T1:CS T2:304SS T3:316SS T4:316LSS	Selection for Flange, Holder Type
Shell material (E)	CS	E1:CS E2:304SS E3:316SS E4:316LSS E5:Injection Molding	Selection for Flange, Holder, Thread, Clamped Type.
Earthing Material(A)	Earthing Loop:304, Earthing electrode is same as measuring electrode	A1:304 Earthing Loop A2:316L A3:Hc A4:Ti A5: Ta A6:Pt Earthing Electrode	304 only for Earthing Loop, Pt only for Earthing Electrode.
Companion Flange(F)	Without	F1:CS F2:304SS F3:316SS F4:316LSS	Selection for flange, holder type.
Bolts, Nuts(B)	Without	B1:CS B2:SS	Selection for flange, holder type.
Gasket(H)	Without	H1:Ne H2:PTFE	Selection for flange, holder type.
Power Cable Gland(W)	W3	W1:Nylon W2:Waterproof Gland W3:M20*1.5 Interface Waterproof Gland W4: G1/2 Interface Waterproof Gland W5 1/2NPT Interface Waterproof Gland	Power Cable Threading Hole
Output Cable Gland(X)	X3	X1:Nylon X2:Waterproof Gland X3:M20*1.5 Interface Waterproof Gland X4: G1/2 Interface Waterproof Gland X51/2NPT Interface Waterproof Gland	Output Cable Threading Hole
Split Converter Signal Cable Gland(Y)	Y3	Y1:Nylon Y2:Waterproof Gland Y3:M20*1.5 Interface Waterproof Gland Y4:G1/2 Interface Waterproof Gland Y5:1/2NPT Interface Waterproof Gland	Converter Signal Cable Threading Hole
Split Sensor Signal Cable Gland(Y)	Z3	Z1:Nylon Z2:Waterproof Gland Z3:M20*1.5 Interface Waterproof Gland Z4:G1/2 Interface Waterproof Gland Z5:1/2NPT Interface Waterproof Gland	Sensor Signal Cable Threading Hole
Length of Cable(m)(L)	10	For example: L15 means that the length of cable is 15 meters	Only for Split Type
Accuracy(Q)	0.5	Q1:0.3; Q2:0.5; Q3: 1.0; Q4: 1.5; Q5:2.5	Insertion Type: Default Q5, can choose Q4
Certificate(S)	Certificate of Quality	S1: Calibration Data	
Appearance Treatment(V)	PU Coating	V1:PU Coating V4:Polishing V2:Anti-corrosive Epoxy Coating V3:Strengthen Anti-corrosive Coating	
RS485(R)	Without	R1:MODBUS	
PIO Configuration(D)	Without	D1:Passive Pulse D2:Active Pulse D3:State/Alarm Output D4:Contact Input	
Handheld operator(M)	Without	M2:Bluetooth Operator	
Special Feature	Without	DSP:Low conductivity, quick Response	
Ball Valve(U)	With	U1:With U2:Without	Only for Insertion Type

S

Selection Guide

Electrode Material Selection (Sheet 6)

Material	Code	Performance of Corrosion Resistance
316L	V	Used in industrial water, domestic water, sewage, neutral solution and the weak acid such as carbonic acid and acetic acid.
Hastelloy Alloy C	Hc	Oxidation resistance acid (such as nitric acid, mixed acid, complex acid mixed with sulfuric acid). Have good corrosion resistance to seawater, alkali solution and chloride solution.
		Inapplicable to hydrochloric acid and Hydrofluoric acid.
Hastelloy Alloy B	Hb	Has good corrosion resistance to non-oxidative acid, akaliti, salt, Inapplicable to: nitric acid.
Ti	Ti	Have good corrosion resistance to sea water,chloride,hypochlorite and various hydroxides.
		Inapplicable to: reducing acids like hydrochloric acid,sulfuric acid,hydrofluoric acid.
Ta	Ta	Almost have the corrosion resistance to all chemical media,generally used for hydrochloric acid and sulfuric acid. Inapplicable to:hydrofluoric acid,alkali and fuming sulfuric acid.
Tungsten Carbide	W	Have good wear resistance,used for the wearing media such as mud and paper pulp, but with poor corrosion resistance.
Platinum-iridium Alloy	Pt	Besides aqua acid and ammonium salt.almost have the corrosion resistance to all acid,alkali and salt solution.

Lining Material Selection(Sheet 7)

- For high-temperature media (≥ 140°)" , preference for PFA lining.
- In the case of negative-pressure, should select FEP.
- For the wearing media such as slurry and pulp should select PU or FEP lining.
- For the media with sanitation requirement should select FEP(or PTFE) lining.
- For easy scaling media such as paper pulp, preference for FEP or PFA lining.

Material	Performance of Corrosion Resistance	Working Temperature	Applicable Range	Diameter(mm)
PTFE	Almost have the corrosion resistance to all chemical media.	(-40-180)℃	All media besides the fluid in negative-pressure pipe and also the fluid has the good wear resistance.	DN15-DN1200
Ne	Have the corrosion resistance to low consistence acid, alkali and salt, besides oil.	(-30 ~ 80)℃	Industrial water,sewage,low consistence acid, alkali and salt solutions.	DN50- DN1200
PU	Have good wear resistance.used for the wearing slurry, but with poor corrosion resistance.	(-30 ~ 80)℃	Liquid containing solid grains(grout, slurry)	DN15-DN400
FEP	The corrosion resistance is equal to PTFE.	(-40-140)℃	All fluid besides the wearing media such as mortar.	DN3-DN400
PFA	Have the corrosion resistance to all chemical media. The temperature resistance is better than FEP.	(-40-180)℃	Same as PTFE, preference for sustained high temperature.	DN3-DN400

Diameter Selection

- When the measured flow rate is faster than 0.5m/s, should select the same diameter size of flowmeter as the process pipe.
- Should select a smaller diameter size of flowmeter than process pipe as the following cases:
  1. When the measured flow rate is too low to meet the requirement of velocity range or when the measurement accuracy is unsatisfactory under the lower velocity (The high-performance measuring accuracy according to the flow rate over 1m/s).
  2. In an application scenario which media is easy to adhere to the tube wall: when measuring the media slurry or syrup, it is easy to occur scaling in pipes then influence the working of the flowmeter. Reducing the diameter of the flowmeter can increase the pipeline velocity with freedom from deposits formation.

Protection Grade Selection

The ingress protection grade is according to the standard of GB4208-2008 and IEC60529-2001.

- IP65 grade is water-resistant type. The equipment can withstand water projected from any direction by water tap.
- IP67 grade can complete temporary water submersion. It is no problem with immersing the equipment into the water in a short time.
- IIP68 grade is submerged type. The equipment is suitable for continuous immersion in water.
- The principle of selecting IP grade is according to the standard mentioned above. When installing flowmeter at a place where is located under the ground surface or easy to be flooded, it needs to select the IP68 sensor.
- When measuring freeze water, should choose IP67 or IP68 grade sensor to prevent from the frosting and fogging within the sensor.
- The EMF89 type converter is IP67 grade. For the requirement of IP68 sensor, should choose the split type electromagnetic flowmeter.

Sensor Temperature Range Selection

- There are 6 level temperature ranges of EMF89 series electromagnetic flowmeter for measuring media(reference selection model sheet). It needs to select the right temperature level to ensure that the flowmeter can work well.
- Please notice that the pressure-withstanding value will reduce with the increase in temperature(reference sheet 10).
- When the temperature of measuring media is lower than ambient, should pay attention to avoid condensation.

Flow rate (Measuring range) Selection

Every electromagnetic flowmeter in the factory will be strict calibration and commissioning. It is better for the range(upper limit flow rate) close to the measured flow under the precondition of "measuring range must be larger than the measured flow". As usual, it should make the measured flow rate between 50%~80% of measuring range. It also is available to adjust the measuring range of EMF89 type electromagnetic flowmeter according to the requirement of the actual situation. The maximum measured flow rate can reach 12m/s.

Scale Flow Selection (Sheet8)

Diameter DN (mm)	Flow(m3/h)														
10g	0.03	0.05	0.06	0.08	0.1	0.12	0.16	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0
10	0.1	0.16	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6	2	2.5	2.8
15	0.2	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.5	3.0	4	5	6.0	6.3
20	0.4	0.6	0.8	1	1.2	1.6	2	2.5	3	4.0	5.0	6	8	10	11.3
25	0.6	1	1.2	1.6	2	2.5	3	4	5	6.0	8.0	10	12	16	17.7
32	0.9	1.6	2	2.5	3	4	5	6	8	10	12	16	20	25	28
40	1.4	2.5	3	4	5	6	8	10	12	16	20	25	30	40	45
50	2.1	4	5	6	8	10	12	16	20	25	30	40	50	60	70
65	4	6	8	10	12	16	20	25	30	40	50	60	80	100	120
80	6	10	12	16	20	25	30	40	50	60	80	100	120	160	180
100	8	16	20	25	30	40	50	60	80	100	120	160	200	250	280
125	13	25	30	40	50	60	80	100	120	160	200	250	300	400	440
150	19	40	50	60	80	100	120	160	200	250	300	400	500	600	630
200	34	60	80	100	120	160	200	250	300	400	500	600	800	1000	1100
250	53	100	120	160	200	250	300	400	500	600	800	1000	1200	1400	1600
300	76	160	200	250	300	400	500	600	800	1000	1200	1600	1800	2000	2500
350	100	200	250	300	400	500	600	800	1000	1200	1600	2000	2200	2500	3000
400	140	250	300	400	500	600	800	1000	1200	1600	2000	2500	2600	3000	4000
450	170	300	400	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000
500	210	400	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	7000
600	310	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	6000	10000
700	420	700	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	6000	8000	13000
800	540	800	1000	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	18000
900	690	1000	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	12000	20000
1000	850	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	12000	16000	28000
1200	1220	2000	2500	3000	4000	5000	6000	8000	9000	10000	12000	16000	20000	26000	40000

注 1: Zone data is the recommended range value

注 2: The conversion formula of flow rate and velocity is $V=\frac{354xF}{D^2}$

V——Velocity of flow (m/s) F——Flow (m^3/h) D——Flowmeter Caliber (mm)

Sensor Type Selection

Selecting sensor type according to the conditions of the pipe:

- The advantage of 01 type sensor is complete product specifications, conforming to the habits of users.
- It is few technical restrictions of 02 type sensor to connect flange on the process pipe.

Selecting sensor type according to the requirements of hygiene:

- Preference for holder type sensor and clamped type sensor. In necessity, select SST 316 housing.

Power Supply Selection

- The optional power supply of EMF89 series electromagnetic flowmeter: 24VDC, 220VAC, (100~240)VAC.

Structure Selection

For the convenience of installation reasons, recommend using integrated flange electromagnetic flowmeter.

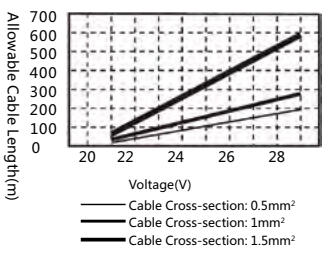
For the reasons of the operating condition:

- When installing flowmeter at a place where is located under the ground surface or easy to be flooded, it needs to select split type flowmeter with IP68 grade.
- When installing flowmeter in the environment with the high-temperature pipe or easy to freeze frost and strong corrosivity, it needs to select split type flowmeter.

Ground (ring) selection

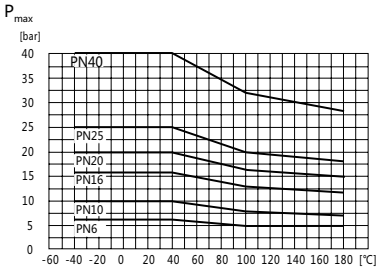
- When the grounding condition of the pipeline is poor (include isolated pipe), it needs to choose the multielectrode sensor or to equip with grounding rings on both sides.
- The company provides various materials grounding ring. When measuring the wearing media, it needs to choose the grounding ring with neck to protect the lining port.
- When measured media with strong corrosive, it can use a grounding electrode instead of the grounding ring to reduce cost.

24VD power supply voltage and cable length relationship table(sheet 9)



The thickness and length of the cable will affect the effective supply voltage

Relation table between pressure resistance and temperature of flowmeter(sheet 10)



As the temperature rises, the maximum pressure

S

Selection Example

EMF8901- (150) 13001Y11-200m³/h-F1B1H1

Description

- Integrated mount
- Flange sensor
- IP67
- Electrode 316L
- AC220 power supply
- Output (4~20)mA
- Measuring range: 200 m^3/h
- Lining material PTFE
- Temperature range (0~80)℃
- Diameter of electromagnetic DN150
- Additional options: CS Companion Flange, CS Bolts and Nuts, Ne gasket

Default Parameters

- Accuracy 0.5
- Factory certificate
- Cable entry: M20*1.5
- Sensor pressure: 1.6MPa
- The coating of housing is PU
- Process connection: Flange PN16
- The material of sensor flange and housing is CS

EMF8903-(500)13001F80-80m3/h

Description

- Electrode 316L
- Insertion sensor
- IP67
- Split structure
- Output (4~20)mA+HART
- AC220 power supply
- Measuring range: 80 m^3/h
- Lining material PTFE
- Temperature range (0~80)℃
- Diameter of electromagnetic DN500

Default Parameters

- Factory certificate
- Cable entry: M20*1.5
- Electrical accuracy grade 2.5
- With ball valves for installation

EMF8902- (125) 22000Y11-160m³/h-F1B1H2

Description

- Integrated mount
- Holder sensor
- IP65
- Electrode Hc
- AC220 power supply
- Output (4~20)mA
- Measuring range: 160m³/h
- Lining material FEP
- Temperature range (0~80)℃
- Diameter of electromagnetic DN125
- Additional options: PN16 Companion Flange, CS Bolts and Nuts, Ne gasket

Default Parameters

- Accuracy 0.5
- Factory certificate
- Cable entry: M20*1.5
- Sensor pressure: 1.6MPa
- The coating of housing is PU.
- The pressure of flange ring: 1.6MPa.
- The material of sensor flange and housing is CS.

EMF8906- (65) 15000Y11-40m³/h-K2

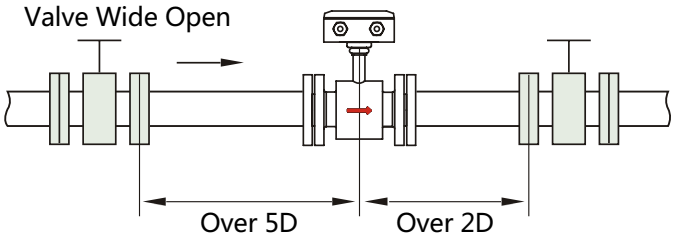
Description

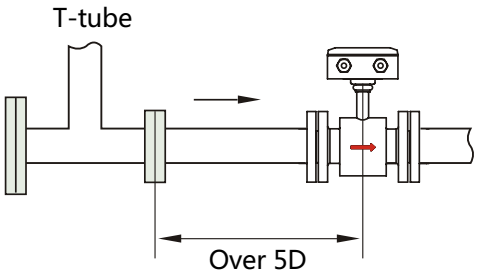
- Integrated mount
- Electrode 316L
- IP65
- Output (4~20)mA
- AC220 power supply
- Lining material PFA
- Measuring range: 40m³/h
- Temperature range (0~80)℃
- Additional options: K2 defines ISO2852 clamp
- This model is consist of 9 type converter and DN65 06 clamped sensor

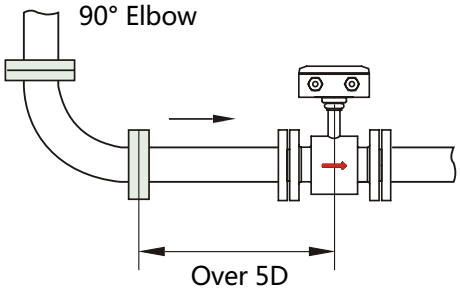
Default Parameters

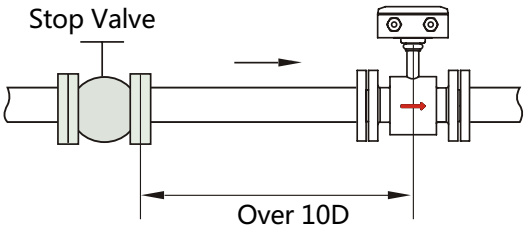
- Accuracy 0.5
- Polished look
- Factory certificate
- Cable entry: M20*1.5

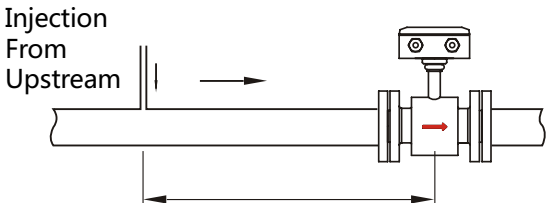
Installation Guide

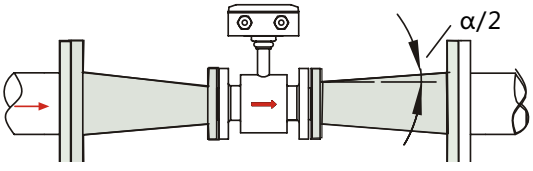












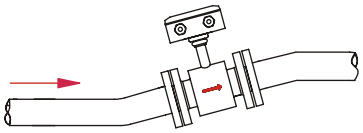
Note 1: Do not insert or install anything upstream of the measuring line that may affect the flow velocity distribution.

Note 2: Downstream straight pipe sections may not be necessary, but if downstream valves or other joints will affect upstream flow regimes, it is necessary to set 2D ~ 3D straight pipe sections downstream.

Installation Method

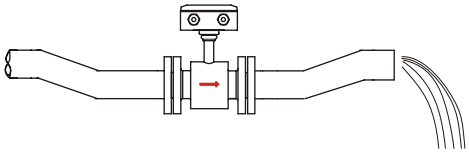
- measuring piping to be always full of liquid.
- For liquids or grout containing solid particles, recommend vertical mounting(flow direction is from down to up) to avoid precipitation in measure tube.

Install in slightly ascension pipeline

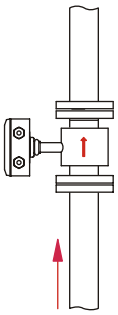


Horizontal Pipe

Install in low-position pipeline

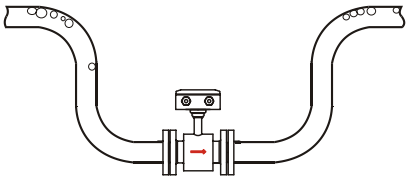


Drainage Pipe

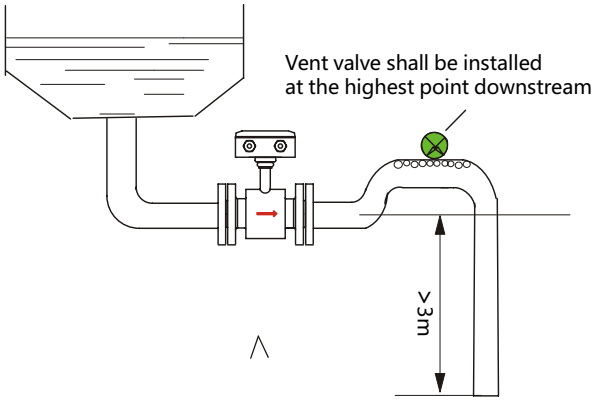


Vertical Pipe

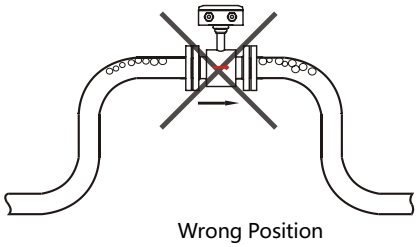
Make sure the measuring position where don’ t accumulate or generate bubble



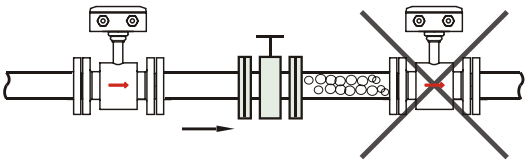
Right Position



Free Drop Tube



Wrong Position

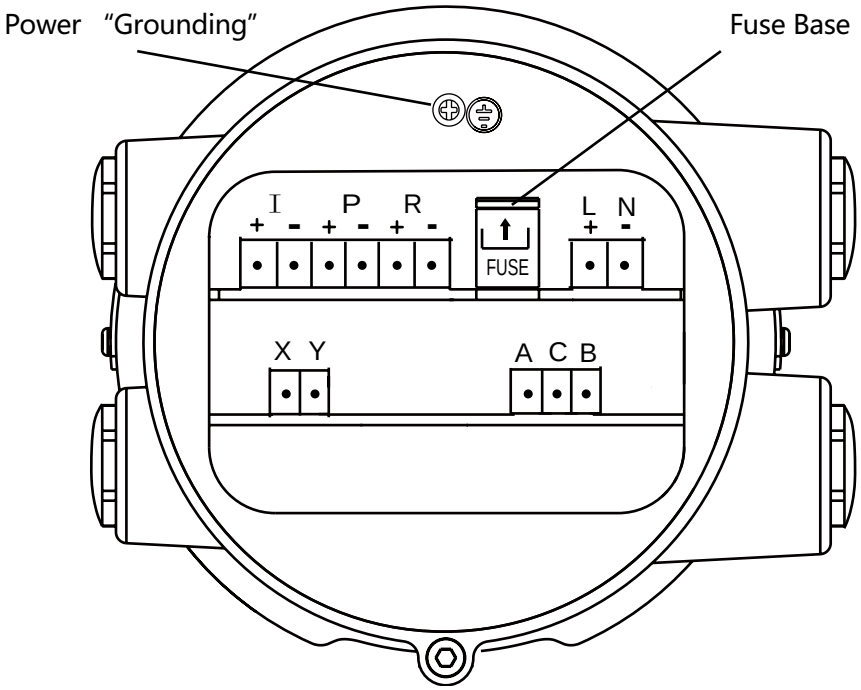


Right Position

Wrong Position

Wiring Guide

EMF89 Type Wiring Diagram

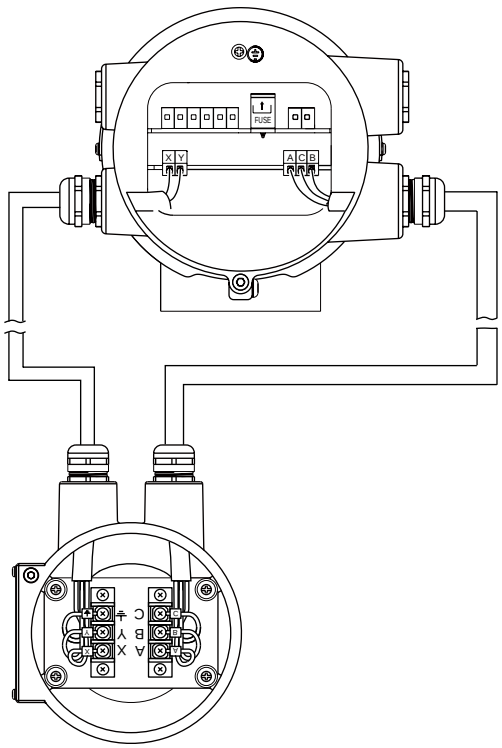


Terminal Instruction

Terminal	Description
I+/I-	Output (4~20)mA
P+/P-	PIO
R+/R-	RS-485
L/N (+/-)	Power interface
⏚	Power "Grounding"

Terminal	Description
A	A, B Electromotive force input
C	
B	
X	Excitation current output
Y	

Connection between sensor and converter

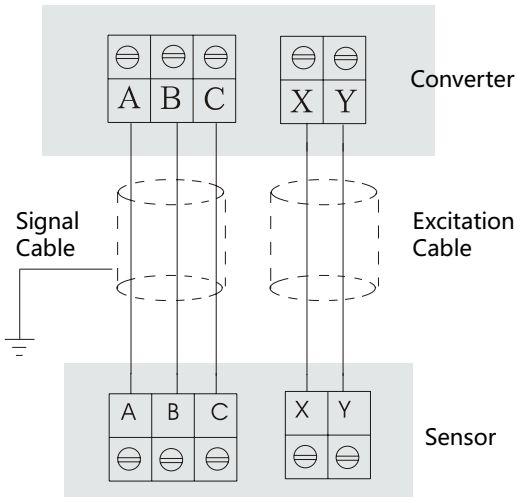


Cable Specification

Excitation cable: 2-core sheathed cable (RVV), core cross-section area ≥ 0.5mm^2

Signal cable: 3-core shielded cable (RVVP), core cross-section area ≥ 0.5mm^2

Note:
It has completed the reliable connection between the converter and sensor of an integrated electromagnetic flowmeter during the process of assembling.



Create Value For Customers

Insist On Struggle And Innovation

Dedicated To Integrity, The Pursuit Of Excellence

Zhejiang SUPCON Instrumentation Co., Ltd.

Address: Zhongkong Science and Technology Park, No. 309, Liuhe Road, Binjiang District, Hangzhou

Website: www.supcon.com www.supconauto.com

Business Consulting: 0571-86667729 / 0571-86667888

After-sales service: 400-887-6000