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Mag888
Electromagnetic Flow Converter

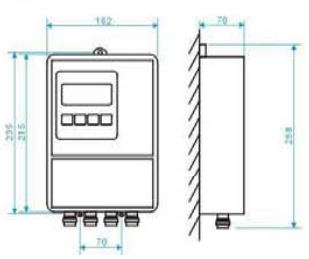
Features and Benefits

The Mag888 flow converter is used together with the Mag888 flow sensor to form a complete magnetic flowmeter, the digital Mag888 flowmeter, to measure liquid flows accurately. It utilizes state-of-the-art technologies in digital signal processing and electromagnetic sensor design. The converter can measure bidirectional flows and totalize the flow in both forward and reverse directions separately.

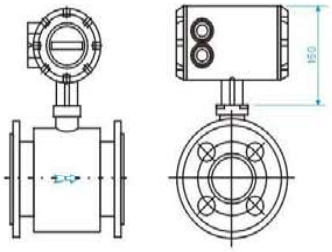
The digital Mag888 magnetic flowmeter has been widely used to measure the volume of conductive liquids such as water, sewage, acid, alkali, salt water as well as mixtures of liquids and solids.

Specifications

Accuracy: ±0.5% of the value displayed. ±0.3% is available upon request.
·Damping Time Constant: 0～100s (90%) selectable.
·Display and Buttons: Large LCD display with backlight. Display the instantaneous flow, total flow, and alarm.
·Totalizer: Three built-in totalizers: forward flow totalizer, reverse flow totalizer and net totalizer.
·Output Signal:
a. Analog output: Bi-directional, isolated 0～·10mA/4～20mA
Load resistor: 0～1.5KΩ for 0～10mA, 0～750Ω for 4～20mA
b. Frequency output: Forward & reverse flow output with the frequency range of 1～5000Hz.The external voltage must be lower than 35V and the max output current must be 250mA when the transistor is turned on.
c. Alarm output: Two isolated Open Collector Transistor (OCT) outputs for alarm signals. The external voltage must be lower than 35V and the max output current must be 250mA when the transistor is turned on. Alarm will be activated when the pipe is empty, the excitation circuits are broken or the volume of flow rate exceeds the value of designed limits.
d. Pulse output: the OCT circuit is used for forward or reverse flowrate output. The upper frequency of the output pulse can be up to 5000cp/s. The relevant value of pulse is from 0.0001 to 1.0m^3/cp. Pulse width can be set to 20ms or 50% occupancy. The external voltage must be lower than 35V and maximum output current must be 250mA when the transistor is on.
·Communication: RS232C. RS485 or HART Communication selectable. With lightning resistance.
·Power Failure: An anti-failure clock is built into the flow meter, which can save the power failure records for 16 times.
·Protection Class: IP65 and IP67 (dustproof and submerging for short term)



Remote type signal converter



Integral type signal converter

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Mag888-SF
Electromagnetic Flow Sensor - Flanged

Specifications

· Accuracy: ±0.5% of the value displayed. ±0.3% is selectable
· Caliber: DN10～DN3000mm (3/8"～120")
·Nominal Pressure: 0.6～4.0MPa
· Lining Material: Teflon, PFA, F46, Neoprene, Polyurethane.
· Electrode Type: General type, scraper type or replaceable type.
· Electrode Material: 0Cr18Ni12M02Ti, Hastelloy B, Hastelloy C, Titanium, Tantalum, Platinum-iridium, Stainless steel covered with tungsten.
· Medium Temperature:
Integral type:-10℃～+80℃
Remote type: Neoprene & Polyurethane Liner -10℃～+80℃
PTFE, PFA, F46 Liner -10℃～+160℃
· Ambient Temperature: -25℃～+60℃
· Ambient Humidity: 5～100%RH (relative humidity)
· Medium Electrical Conductivity: ≥15μs/cm standard. ≥5μs/cm upon request.
· Measuring Range: 1500:1, flow rate≤15m/s
· Structure Type: Integral type, remote type, submersible type, ex-proof type.· Protection Class: IP65 standard. IP68 optional.
IP65: dustproof and watertight:
IP68: dustproof and submersible for long term (only for remote type)
· Product Standard: JB/T9248-1999 Electromagnetic Flowmeter

Remote type electro-magnetic flow sensor

Remote type electro-magnetic flow sensor

Table 1: Main performances of the lining materials

Lining Material	Main Performances	Applications
PTFE	1. The most steady material in plastics. Resistant to boiling hydrochloric acid, vitriolandaqua fortis as well as strong alkali and organic impregnants. 2. Not perfect in abrasion resistance.	Strong corrosive mediums such as strong acid and alkali
PFA	1. Same abrasion resistance as PTFE. 2. Strong load pressure resistance.	Applicable in the state of load pressure.
F46	1. Same abrasion resistance as PTFE. 2. Resistant to low abrasion. 3. Strong load pressure resistance.	Same as PTFE. Applicable in mediums of low abrasion
Neoprene	1. Good elasticity, retractability and abrasion resistance. 2. Resistant to low acid, alkali and salt, but not oxidation mediums.	Water, sewage, slurry and mineral serosity of low abrasion.
Polyurethane	1. Good abrasion resistance (10 times that of caoutchouc). 2. Not prefect in acid/alkali resistance. 3. Can't be used for water mixed with organic impregnants.	Applicable in mineral serosity, slurry and coal slurry of high abrasion

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Table2.Main performances of the electrode materials:

Electrode Materials	Applications
0CR18Ni12M02Ti	Applicable in water,sewage and corrosive mediums.Widely used in industries ofpetrol,chemistry,carbamide,etc.
Stainless steel covered with tungsten	Applicable in mediums of no corrosive and low abrasion.
Hastelloy R(HB)	Having strong resistance to hydrochloric acid of any consistence which is below boiling point.Also resistable against vitriol,phosphate,hydrofluoricacid, organicacid etc.which are oxidable acid,alkali and non-oxidable salt.
Hastelloy C(HC)	Be resistant to oxidable acid such as nitric acid,mixed acid as well as oxidable salt such as Fe+++,Cu++ and seawater.
Titanium(Ti)	Applicable in seawater,chloride,hypochlorite salt,oxidable acid,organic acid, alkali,etc.
Tantalum(Ta)	Having strong resistance to corrosive mediums that is similar with glass. Almost applicable in all chenical mediums except for hyduofluoric acid, oleum and alkali.
Platinum-iridium	Almost be applicable in all chemical mediums except for aqua fortis,ammonium salt.

FIGURATION AND INSTALLATION DIMENSION

Ⅰ.Figuration and dimension of the flowmeter

Picture 7.8 & 9 and Table 3 &4 shows the dimension and pressure of the flange type sensor. sor.

Table 3.

Caliber (mm)	Nominal Pressure (Mpa)	Figuration Dimension(mm) A	B	C	Referenced Weight(kg)
10	4.0	174	140	140	6
15		174	140	200	8
20		174	140	200	10
25		174	140	200	12
40		210	176	200	14
50		210	176	200	15
65		280	214	250	18
80		280	214	250	20
100		312	231	250	25
150		370	281	300	30
200	1.6	408	426	350	50
250		460	456	450	70
300		530	520	500	95
350		560	562	550	120
400		614	596	600	140
450		656	640	600	160
500		710	706	600	200
600		810	810	600	280

Note:manufacture according to consumers´requirement

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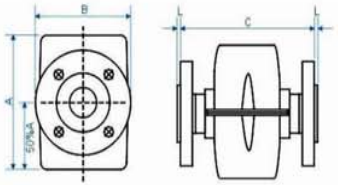
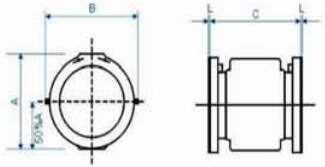
Table 4.

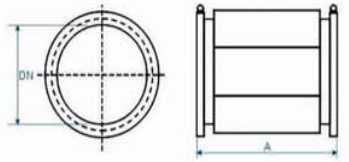
Caliber (mm)	Nominal Pressure (Mpa)	Length A (mm)	Referenced Weight(kg)
700	1.0	700	350
800		800	400
900		900	480
1000		1000	550
1200	0.6	1200	660
1400		1400	750
1600		1600	850
1800		1800	980
2000		2000	1200
2200		2200	1600
2400		2400	2000
2600		2600	2400
2800		2800	2700
3000		3000	2900



Picture7.Sensor of flange type(DN10-DN150)



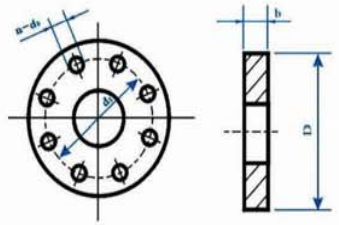
Picture8.Sensor of flange type(DN200-DN600)



Picture9.Sensor of flange type(DN700-DN300)

Ⅱ. Flange Dimension

Picture10 and Table 5 shows the connecting flange and dimension



Executive standard of the connection flange

4.0 MPa(DN10~DN150)	GB/T9119-2000
1.6MPa(DN200~DN600)	GB/T9119-2000
1.0MPa(DN700~DN1000)	GB/T9115-2000
0.6MPa(DN1200~DN3000)	GB/T9115-2000

Picture10.Connection flange

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Table5

	Caliber (mm)	D	D1	d0	Th	n	b
4.0	10	90	60	14	M12	4	14
	15	95	65	14	M12	4	14
	20	105	75	14	M12	4	16
	25	115	85	14	M12	4	16
	40	150	110	18	M16	4	18
	50	165	125	18	M16	4	20
	65	185	135	18	M16	8	22
	80	200	`60	18	M16	8	24
	100	235	190	22	M20	8	26
	150	300	250	22	M24	8	30
1.6	200	340	295	22	M20	12	26
	250	405	355	26	M24	12	28
	300	460	410	26	M24	12	32
	350	520	470	26	M24	16	35
	400	580	525	30	M27	16	38
	450	640	585	30	M27	20	42
	500	715	650	33	M30	20	46
	600	840	770	36	M33	20	52
1.0	700	895	840	30	M27	24	30
	800	1015	950	33	M30	24	32
	900	1115	1050	33	M30	28	34
	1000	1230	1160	36	M33	28	34
0.6	1200	1405	1340	33	M30	32	28
	1400	1630	1560	36	M33	36	32
	1600	1830	1760	36	M33	40	34
	1800	2045	1970	39	M36	44	36
	2000	2265	2180	42	M39	48	38
	2200	2475	2390	42	M39	52	42
	2400	2685	2600	42	M39	56	44
	2600	2905	2810	48	M45	60	46
	2800	3115	3020	48	M45	64	48
	3000	3315	3220	48	M45	68	50

Note:Flange could made according to ANSI standard upon request without any charge.

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Mag888-SS
Electromagnetic Flow Sensor – Sanitary

· Food grade

· Snap-in pipe joint

· PFA lining material

· Accuracy: ±0.5% of the value displayed

· Caliber: DN10～DN3000mm (3/8"～120")

·Nominal Pressure: 0.6～4.0MPa

· Measuring Range: 1500:1, flow rate≤15m/s

· Structure Type: Integral type, remote type

· Protection Class: IP65 standard. IP68 optional

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Mag888-SI
Electromagnetic Flow Sensor - Insertion

OVERWIEW

The Mag888-SI insertion magnetic flow sensor is compatible with the Mag888-C flow converter. Together they form a magnetic flowmeter that provides an economical solution to large pipe applications where high accuracy flow measurement is needed.

FEATURES AND APPLICATIONS

- Measurement is independent of fluid density, viscosity, humidity, temperature, pressure and conductivity.
- There are no obstacle part in the measuring tube, no pressure damage to the tube.
- The high reliable out-insertion installing mode with which the sensor can be installed without removing the measuring pipe makes the flow-meter particularly applicable in fields where the water can't be cut off for long. In addition, it can be equipped on the old pipe with locale hatching.
- With simple structure, the flow-meter is of high reliability without lining in the measuring pipe.
- The wide range of the nominal bore is suitable for all the pipe size between DN300 and DN3000.
- The integral grounded electrode guarantees the grounding well.
- The sensor with advanced processing technology and liquid airproof is of long natural life and of nice resistance to shaking leakage. It guarantees the instrument good precision and stability.

PERFORMANCE SPECIFICATIONS

- Caliber: DN300~DN3000mm
- Nominal pressure: 1.6MPa
- Measuring probe material: carbon steel, SUS304 stainless steel.
- Material of the sensor measuring noddle: PVC, ABS, Polypropylene.
- Electrode material: 0Cr18Ni12M02Ti, Hastelloy B, Hastelloy C.
- Accuracy: flow rate≤0.5m/s, ±0.5%;
  flow rate of full range > 1m/s, ±1.0%.
- Medium temperature: PVC, ABS--+60; Polypropylene-- +80℃.
- Ambient temperature: -25℃~+60℃
- Relative humidity: 5%~95%.
- Atmosphere pressure: 86~106KPa.
- Length of straight pipe: upstream 10D; downstream 5D.
- Protection Class: IP65, IP68 (optional).
- Connection Mode: Flange type
- Ex-proof Mark: ExmdIIBT4

Sensor of Insertion Electromagnetic Flowmeter

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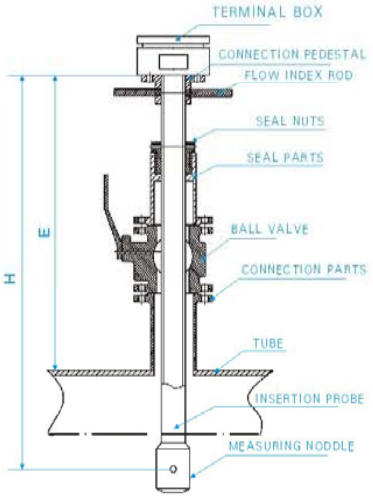
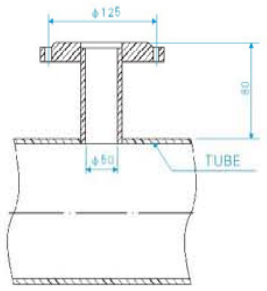
CONFIGURATION AND INSTALLATION

The insertion probe must be fitted exactly perpendicular to the axis of the line.
Picture14 shows the sensor structure;
Picture15 shows the installation size.



Picture14. Sensor structure



Picture15. Installation of the connection series

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Mag888-SD
Electromagnetic Flow Sensor - Diving

Electromagnetic Flow Sensor (Diving Type)

OVERWIEW

The Electromagnetic Flowmeter is submersible type of flowmeter mainly used for flow volume measurement in open or closed channels. It is mainly used in industries of water supply and drain in the country, drain of industrial sewage, sewage treatment and agriculture irrigation, etc.

FEATURES AND APPLICATIONS

- Caliber: DN50, 100, 200, 400, 600, 800mm.
- Accuracy: 1.0%; 2.0% (coupled with a dummy)
- Measuring range: 0~1m/s to 0~10m/s (flow rate)
- Medium Electrical conductivity: ≥ 15 ũ s/cm.
- Max diving depth: 10m.
- Electrode material: 0Cr18Ni12M02Ti, Titanium, Hastelloy B, Hastelloy C, special material.
- Medium Temperature: 0℃~+40℃
- Sensor output signal: 0~0.2mVp~p to 0~2mVp~p
- Flowmeter output signal: 4~20mA. DC and 0~5000Hz or 0~2000Hz.
- Product standard: CJ/T3017-1993 Diving Type Electromagnetic Flowmeter.

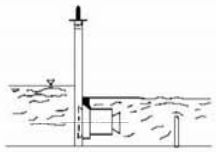
Sensor for Diving Type Electromagnetic Flowmeter

INSTALLATION

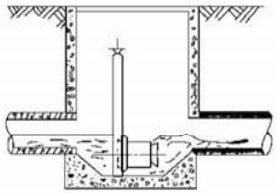
I. Installation Position

- Choose the symmetrical section and steady stream position of the open (closed) channel to build in. Installed the sensor on the flashboard and make sure the whole of it is below the water. The flashboard should be strong enough to support the sensor and the water power.
- The length of straight channel should be more than 5 times of the width.
- Flow direction mark on the sensor should be consistent with the direction of the medium.

II. Installation Mode



Picture16. Installation in the open channel.



Picture17. Installation in the well.

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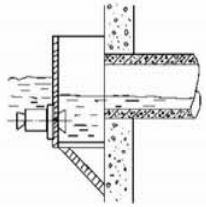
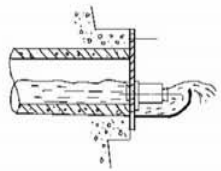
CONFIGURATION AND INSTALLATION



Picture18. Installation at intake end of channel.



Picture19. Installation at discharge of channel.

MODEL SELECTION AND APPLICATION EXAMPLES

Sensor should be selected according to measured liquid and measuring conditions. The notice the followingalarm:

I. The scale flow of the flowmeter shouldn't be lower than the max flow of the measured liquid and make the normal flow exceed 50% of the measuring range to achieve perfect accuracy.

II. The electrode material should be chosen according to the corrosive status of the medium.

III.Decide the caliber of the sensor according to the following rules:

Firstly work out the max average flow rate in the sensor according to the max flow in the measured pipe:

$$Vm=353.7\times\frac{Qm}{D^2} \qquad (1)$$

Notes: Vm – flow rate in the sensor at the moment of max flow (m/s)
Qm – max flow of the measured pipe (m3/h)
D – caliber of the sensor (mm)

Then work out losing of the water noddle:

$$h=\frac{V^2m}{2g} \qquad (2)$$

Notes: h – losing of the water noddle (m)
g – gravity acceleration (g = 9.81m/s2)

Enhance the caliber of the sensor or install a dummy if h > 0.3m.

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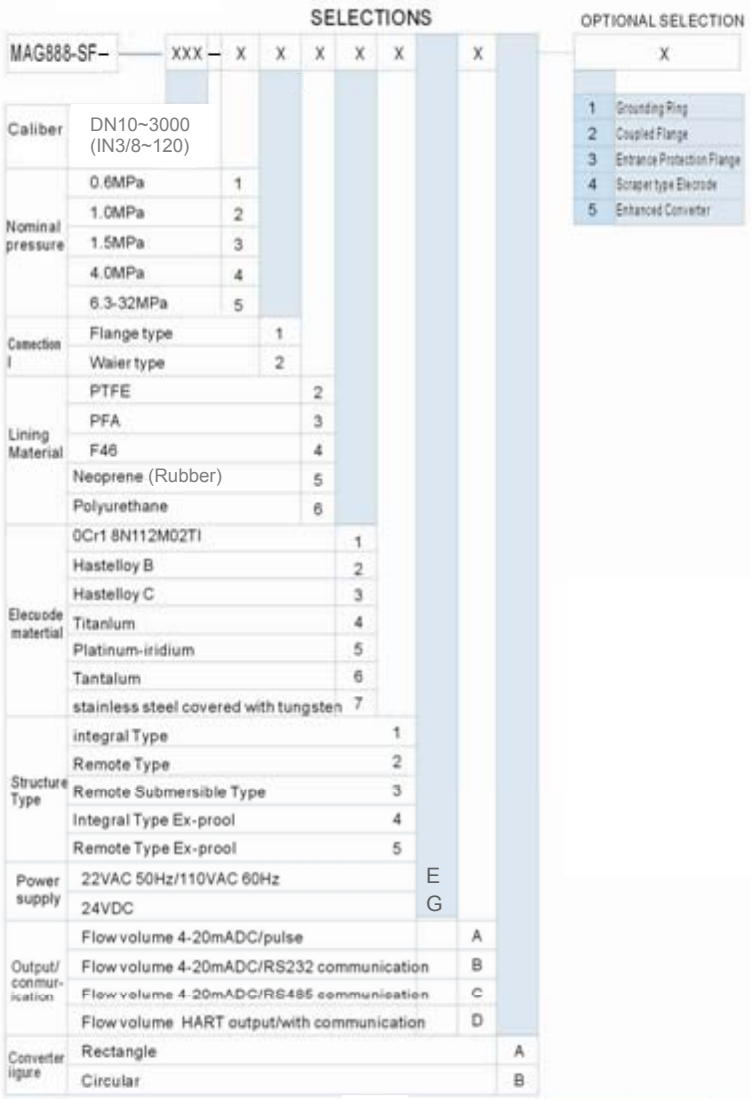
Model Number
Flange-type Magnetic Flowmeter



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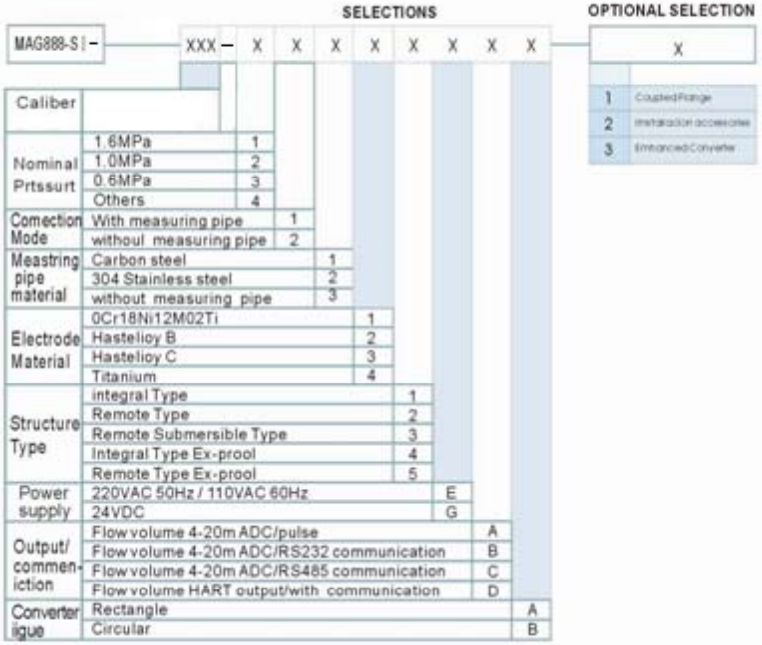
Model Number
Insertion-type Magnetic Flowmeter



Model Number
Sanitary-type Magnetic Flowmeter