SONIC Flowteter

Intelligent Electromagnetic Flowmeter

Manual installation

Please read carefully before using the instrument manual and keep for inspection has been

Electromagnetic Flowmeter

Product characteristics:

● No moving parts inside the tubes, unimpeded flow components, measuring almost no additional pressure loss.

● Measurement results is irrelevant with the velocity distribution, fluid pressure, temperature, density, viscosity and other physical parameters.

● Measurement results is irrelevant with the velocity distribution, fluid

● High-resolution backlit LCD display, the entire Chinese menu operation, ease of use, simple operation, easy to understand.

● SMD devices and the use of surface-mount (SMT) technology, high reliability circuit.

● A 16-bit embedded microprocessors, the computing speed, high precision, low-frequency programmable frequency rectangular wave excitation, improved flow measurement stability, low power consumption.

● All digital processing, anti-jamming capability is strong, reliable measurement, high precision flow measurement range up to 150:1 ultra-low EMI switching power supply, changes in the scope of application of the supply voltage, anti-EMI good performance.

● Three Totalizer with internal device can be displayed in reverse positive cumulative total volume and margin Totalizer volume, with no power off internal clock can record 16 power off time.

● With RS485, RS232, Hart Modbus and other digital communications and signal output.

● With RS485, RS232, Hart Modbus and other digital communications and

● A self-inspection and self-diagnosis function.

一、Principle of Measurement

According to Faraday Law, the flowmeter is used to measure volumetric flowrate for inductive liquids and pulps.

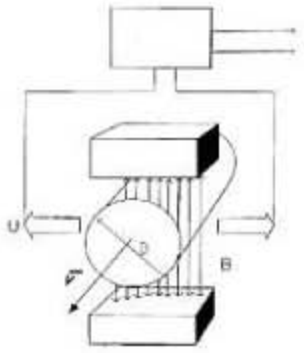
E=KBdV

K— Sensor corrected factor.

B – Magnetic flux density (Induction), its direction is right angle to flow direction.

V – Velocity of fluid.

d – Inner diameter of the measuring tube.



二、Description and technical data

Pipe's inside diameter of relative sensor(mm):

PTFE: 10,15,20,25,32,40,50,65,80,100,125,
150,200,250,300,350,400,450,500,600
Soft rubber:40,50, 65,80,100,125,150,200,250,300,
350,400,450,500,600,800,1000,1200

FLOW:

Positive and negative flow respectively

Repeatabliity: ±0.1%

Accuracy:

Pipe: 0.5 级,1.0 级

Operating temperature:

rubber lining: -20~+60℃
High-temperature rubber: -20~+90℃
PTFE: -30~+100℃
High-temperature PTFE: -30~+180℃

Pressure:

Pipe : DN10～DN150: ≤1.6Mpa

Velocity rang:

Velocity rang:0.3~15m/s

Conductivity of fluid:

More than≥5μs/cm

Current out put:

4-20mA with lelctric isolation
Pulse output

Materal of electrode:

Stainless steel,HastelloyB,HastelloyC,Titanium,Tantalum

Housing protection:

IP68(only for remote version),IP65(others)

Power supply:

85~265V，45~63HZ

Requirement for straight pipes :

Pipe: Upstream≥5DN，Downstream≥2DN

DN200~DN800： ≤1.0Mpa

DN800 以上：≤0.6Mpa

The dimension of the connecting flanges should accord to GB9119-88standards.

EX：mdⅡBT4

三、Conductivity of fluid ：

Liquid	Conductivity of fluid (μs/cm)	Liquid	Conductivity of fluid (μs/cm)
Acid	10×104-80×104	Beer	600~800
Lye	8×104-30×104	Malt juice	500~1000
Distilled water	0.01-5	Milk	200~300
Water and beverages	200-800	Water Jam	400~1000

四、Installation

Velocity rang ：

DN（mm）	10	15	20	25	32	40	50	65
Qmin(m^3/h)	0.0283	0.0636	0.12	0.176	0.29	0.452	0.7	1.19
Qmax(m^3/h)	4.24	9.54	16.96	26.5	43.42	67.85	106.0	179.0
DN（mm）	80	100	125	150	200	250	300	350
Qmin(m^3/h)	1.8	2.82	4041	6.36	11.3	17.6	25.4	34.6
Qmax(m^3/h)	271.0	424.0	662.0	954.0	1690	2650	3810	5190
DN（mm）	400	450	500	550	600	700	800	900
Qmin(m^3/h)	45.2	57.2	77.6	85.5	101.0	138.0	180.0	229.0
Qmax(m^3/h)	6780	8570	10600	12800	15200	20700	27100	34300
DN（mm）	1000	1100	1200	1400	1600	1800	2000	2200
Qmin(m^3/h)	282.0	342.0	407.0	554.1	732.7	916.0	1131.0	1368.4
Qmax(m^3/h)	42400	51300	61000	83121	108566	137404	169635	205258

五、Locationof installation：

(1) Avoid a strong electromagnetic field equipment (such as big motor, large transformers, etc.), against the magnetic field sensor impact.

(2) It should be installed in the ventilation in the dry, avoid moist and stagnant water.

(3) The all-weather cover should be used to prevent the housing from the direct sunlight or rain when the device in the open. The flowmerter should avoid the excessive vibration, high changing ambient temperature and long-time shower.

(4) The electromagnetic flowmeter must be installed in the pipe fully filled with medium.

六、Pequirement of installation：

(1)Installation may be horizontal or vertical, but make sure no deposit on the electrodes when horizontal installation.

(2)The electromagnetic flowmeter should not be installed in the pipe section with a free pipe outlet that could run empty. When installation in a downstream pipe, please make sure the pipe is always fully filled with medium.

(3)The electromagnetic flowmeter should not be installed at the highest point of the pipe because of the accumulation of gas.

(4)Requirement for straight pipes ：≥5DN，Downstream≥2DN

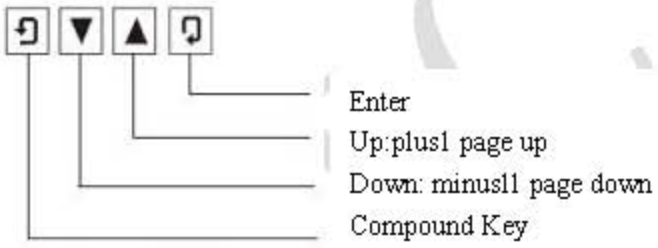
TOP

(1) When use "Compound" key, you should press "Compound" key and "Up" or "Down" both;

(2) It will return to the measure way automatically after 3 minutes when under the parameter setting way;

(3) Direct select of zero correction about the flow, you can move the cursor to the left + or - , and use "Down" or "Up" to switch;

(4) Unit select of flow, you can move the cursor to "Flow Range", and use "Down" or "Up" to switch.



Function keys for setting parameters

To set or correct working parameters, the converter should be running in parameters setting way instead of measuring status.

In measuring status, click "Enter" keys getting to the select of parameter and transfer password (0000), and then correct the password with one of the new passwords that are provided by manufacturer. Finally, push the "Enter" keys to work in Parameters Setting Way.

九、Parameters setting menu

There24 parameters of L-Mag, user can set every parameter. The List of Parameters is shown below:

Setting Parameters in Menu

Code	Parameter words	Setting Way	Grades	Range
1	Language	Select	2	Chinese/English
2	Com Addres	Set count	2	0～99
3	Baud Rate	Select	2	600～14400
4	Sensor Size	Select	2	3～3000
5	Flow Range	Set count	2	0～99999
6	Flow Rspns	Select	2	0～100
7	Flow Direct	Select	2	Forward/ Reverse
8	Flow Zero	Set count	2	±0.000~±9.999
9	Flow Cutoff	Set count	2	0～99%
10	Cut Disp Ena	Select	2	Enable/Disable
11	Total Unit	Select	2	0.001L～m^3
12	Analog Type	Select	2	0～10mA /4～20mA
13	Pulse Type	Select	2	Freque / Pulse
14	Pulse Unit	Select	2	0.001L～1m^3
15	Frequen Max	Select	2	1～ 5000 HZ
16	Mtsensor Ena	Select	2	Enable/Disable
17	Mtsnsr Trip	Set count	2	999.9 %
18	Mtsensor Crc	Set count	2	0.0000～3.9999
19	Alm High Ena	Select	2	Enable/Disable
20	Alm High Val	Set count	2	000.0～ 199.9 %
21	Alm Low Ena	Select	2	Enable/Disable
22	Alm Low Val	Set count	2	000.0～199.9 %
23	Clear Total	Password	3	000000～399999
24	Total Key	Set count	4	000000～399999

十、Alarm information

Intelligent converters have self-diagnose function. Without trouble of power and hardware circuit, the normal trouble can be alarmed correctly. This information displays

"!" on the left of LCD. The trouble is like this:

Normal flow

Flow empty pipe alarm;

System exciting alarm.

十一、Troubleshooting

No display:

a) Check the power supply connection;

b) Check the power fuse to see for OK;

c) Check the contrast of LCD and regulate it to working state;

Exciting alarm

a) Check if the exciting cables EX1 and EX2 did not connected;

b) Check if the total resistance of sensor's exciting coil resistances less than 150Ω;

c) If a) and b) are OK, the converter is failed.

Empty pipe alarm

* If measured fluid full of testing pipe of sensor;

* When shorting circuit three connectors SIG 1, SIG 2, SIGGND of converter, and no "Empty Alarm" displayed then the converter works OK. In this case, it is possible that conductivity of measured fluid may be small or empty threshold of empty pipe and range of empty pipe are set wrongly.

* Check if the signal cable is OK;

* Check if the electro-poles are OK or not.

Let the flow is zero, then the displayed conductivity should be less than 100%.

Resistances of SIG1 to SIGGND and SIG2 to SIGGND are all less than 50kΩ (conductivity of water) during measurement operation. (It is better to test the resistances by means of multimeter with pointer to see the charging process well.)

* The DC voltage should be less than 1V between DS1 and DS2 testing the voltage by means of multimeter. If DC voltage is larger than 1V, the electro poles of sensor were polluted that have to be cleaned.

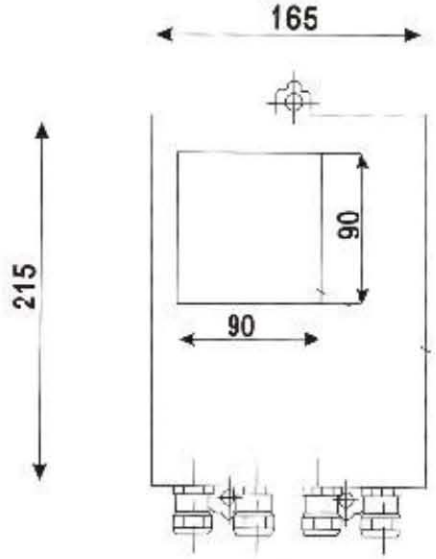
Measure flow disallow

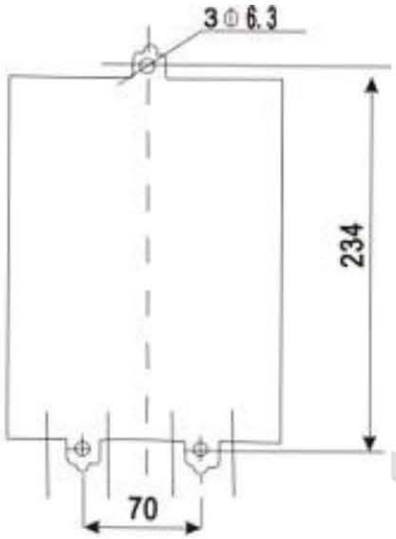
* If measured fluid full of testing pipe of sensor;

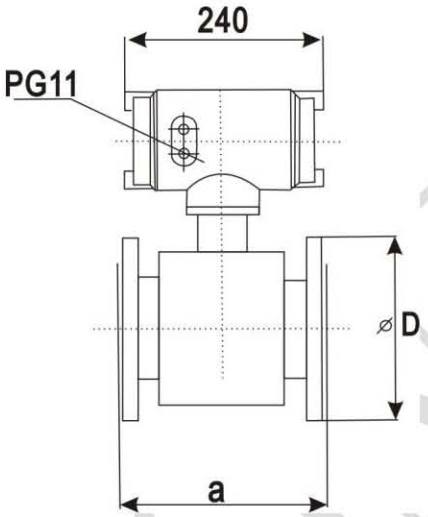
* Check if the signal cable is OK;

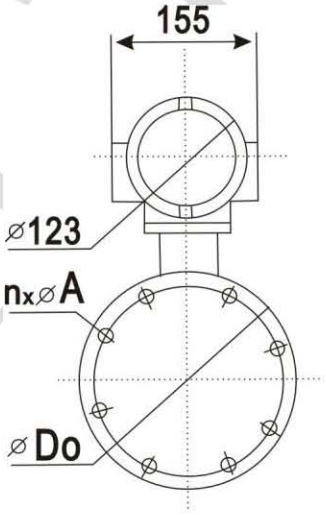
* Check the sensor modulus and sensor zero whether set as the sensor scutcheon or leave factory checkout.

The appearance of size flowmeter









DN	a	D	Do	n×A
10	230	90	60	4×14
15	230	95	65	4×14
20	230	105	75	4×14
25	230	115	85	4×14
32	230	140	100	4×18
40	230	150	110	4×18
50	230	165	125	4×18
65	230	185	145	8×18
80	230	200	160	8×18

100	230	220	180	8×18
125	280	250	210	8×18
150	280	285	240	8×22
200	310	340	295	8×22
250	360	395	350	12×22
300	460	445	400	12×22
350	460	505	460	16×22
400	460	565	515	16×26
450	460	615	565	20×26
500	600	670	620	20×26
600	600	780	725	20×30
700	700	895	840	24×30
800	800	1015	950	24×33
900	900	1115	1050	28×33
1000	1000	1230	1160	28×36
1200	1200	1405	1340	32×33
1400	1400	1630	1560	36×36
1600	1600	1830	1760	40×36
1800	1800	2045	1970	44×39
2000	2000	2265	2180	48×42
2200	2200	2405	2315	52×45

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