M-FGA0025-EN-V1.0

Electromagnetic flow sensor Manual

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IP67 CE SGS RoHS

2. Functions and features

This unit monitors liquids .
It detects the 2 process categories volumetric flow and consumed quantity .
This smart , highly precision electromagnetic flow sensor can be used for measuring conductive liquids or two-phase liquid-solid conductive mediums .

Applications :

Chemical industry, mining, water supply and drainage system , sewage treatment, food industry , port dredging industry etc on the volumetric flow detection, record , totalize , regulation and control.

Features :

Suitable for conductive liquids with conductivity :o >5us/cm
No choke unit, no remaining medium, almost no pressure loss, corrosion resistance
Positive/Negative flow
Not suitable for gases detecting and liquids contains large amounts of gas.Gases will cause severe fluctuation during measurement .
Adopts integral welding structure, good sealing performance;
Protection rating : IP65
Measuring accuracy is not influenced by pressure, temperature, density, viscosity and other physical parameters change of detected mediums
Adopts 32 bit embedded microprocessor, high-speed data preocess
With internal accumulator, display the consumed quantity
Support : RS485 communication protocol
With digital process, strong anti-interference ability , reliable measurement
User- friendly , simple menu operation
Practical function , obtains commonly used functions such as SP/RP/ASP/AEP / N_C setting
Self diagnosis and error indication .

3. Main technical parameters

3.1 Nominal Diameter
DN25

3.2 Technical data

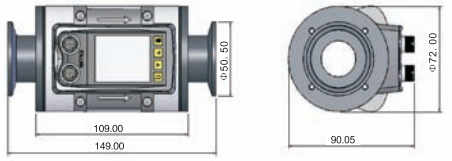
Material electronic conductivity : σ≧5 s/cm
Accuracy : ±1% (flow speed >1m/s)
or ±0.01m/s (flow speed <1m/s)
Current Output :
4~20mA DC Loading resistance: 0~500
PNP output:: maximum load current 200mA for normally open / close / consumed quantity alarm .
Volume alarm can be provided with pulse output

Medium temperature: 70
Pressure rating : PN=1.6MPa
IP rating : IP65
Supply voltage : 24V DC ±10% reverse polarity
Connection : Internal Thread , Quick connection
Power consumption: <5W
EMC :
GB/T 17626-1998.4 class 1
GB/T 17626-2006.2 class 2
GB/T 17626-1998.8 class 3
GB/T 17626.5-2008 class 2

3.3 Material

Housing : stainless steel 304
Liner Material: PP
Electrode Material: stainless steel 316L

4. Connection
Quick Connection



Thread type : RCI

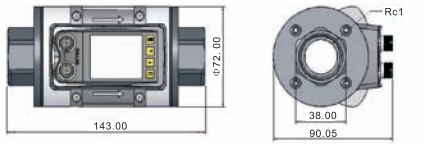


Figure 3 Connection

5. Installing introduction
Attention : Please read this document prior to installing the unit !
Unproper installation may greatly influence the measurement accuracy and other properties. What's worse , it might bring in abnormal performance during measurement .

5.1 Installation

2 kinds of installation mode : Quick connection and Internal thread
Make sure the central of smart magnetic flow sensor and measuring pipe are consistent with each other . And make sure this unit is grounded . otherwise it will cause measuring errors.
To avoid the error from attached gas or liner damage from vacuum, please refer to figure 4. before installation .
Install the unit so that the measuring pipe is always completely filled .
when mounted horizontally, ensure the electrode is horizontally placed to eliminate the effect of bubble on measurement.
For vertical installation, the wiring terminal should be placed on the upper end for the sake of display .

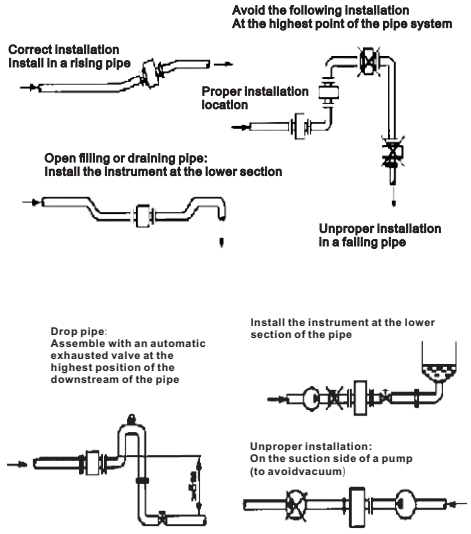


Figure 4 Installation in the pipe

5.2 Selection of installation location
Attention :
(1) the instrument should be installed in dry and ventilated places, do not install the unit where the water can easily penetrated.
(2) try to avoid direct exposure to sunshine and rain water . For outdoor installation, the instrument should be equipped with corresponding facilities to protect against rain water .
(3)avoid to install the unit in strong vibration environment ;
(4)avoid to install the unit near strong magnetic devices, such as a large motor, transformer etc .
(5) select a proper place which is convenient for repairmen, ; or the place where the unit can be moved conveniently .
5.3 Installation in pipe
Notice :
(1) The positive flow direction of the medium is marked on the unit by an arrow
(2) Ensure the measuring pipe is always completely filled .
(3) Arrange for inlet and outlet pipe lengths .
Inlet pipe lengths : straight pipe length >5D
Outlet pipe lengths : straight pipe length >3D
(calculating from center of the sensor: D----- inner diameter of the pipe)
(4) when the pipe diameter is not consistent with the sensor , users have to mounted another diverging or converging tube at both ends of the unit . Cone angle : 2 > 15 .
(5) Horizontal installation : ensure the electrode is placed at a horizontal position . In this case , the following phenomenon can be avoided :.

if the medium contains some air bubbles or precipitate, bubble is not easily adhere near the electrode, resulting in disconnect signal of the transducers converter ; meantime , the sediment will not cover the electrode, resulting in zero drift .
(6)For two-phase(liquid -solid) mediums, vertical installation is more favorable.
On one hand , this kind of installation can prevent the two phases from separation; on the other hand , it ensure that the possible abrasion of the liner will not be concentrated in a certain place .
Vertical installation: positive flow direction should be bottom -up to ensure that the measuring pipe is always completely filled.
5.4 Grounding
Make sure the instrument is well grounded .
This unit only generates a slight flow signal . Even in full range, there is only a signal of a few millivolts

6.Electrical connection

The national and international regulations for the installation of electrical equipment must be adhered to .
Manufacture do not supply the output cables . Users are supposed to select the wires as you prefer .
Please pay attention to the requirement of load current.

6.Electrical connection

6.1 Wiring (connect the unit as follows)

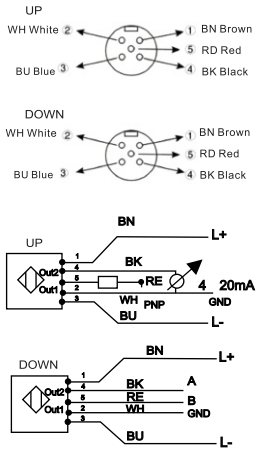
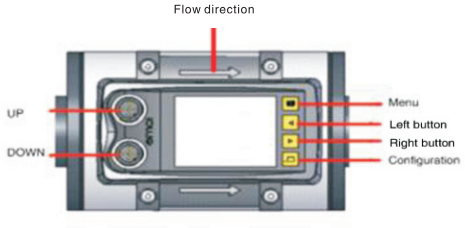


Figure 5 Wiring &connection

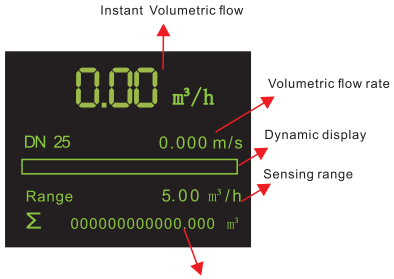
UP (for output) :
Pin 1 (BN) : L(+)
Pin 2 (WH) : negative terminal for output signals
Pin 3 (BL): L(-)
Pin 4 : (BK) 4-20mA output
Pin 5 : (RD) PNP output
DOWN (for communication):
Pin 1 (BN) : L(+)
Pin 2 (WH) : no function
Pin 3 (BL): L(-)
Pin 4 (BK): RS485_A
Pin 5 (RD) : RS485_ B
Warning : Two pair of power supply for output and communicationare mutually exclusive. Users can only choose one of them . Or it can cause short-circuit of terminal or power supply equipment!

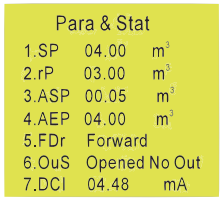
7. Parameter setting

7.1 Visual indication and Button definition



Button and terminal diagram





Display Panel of operating status

7.2 Buttons definition

This instrument is designed with two kinds of operating mode :
automatic measuring mode parameter setting mode
When connected to the power supply , the instrument enter the measurement mode automatically .
Under automatic measuring condition, instrument automatically measure and display the corresponding data.
Under the parameter measurement condition ,users can finish parameter setting with four panel set.

Key function under automatic measurement status

: scrolling display first line content of the screen.

: scrolling display second line content of the screen.

MENU + display current parameters and output status.

MENU + :scrolling display content of the fourth line.

Key function under parameter setting status

: Cursor move towards left side or menu move upward

: figure (at cursor position) + 1 or menu move downward

:confirm the current setting value

MENU : Entry / exit sub menu

Note :(1)when using the MENU Press MENU rst , then press and hold or

(2) Under parameter setting condition, automatically return to the measuring state if there is no button action in 1 minute .

7.3 Lock /Unlock

This sensor can be locked electrically to escape the parameter set from changing accidentally .The button are unlock while repower in .

Lock : This instrument owns automatic button lock function . When there is no button being pressed in 1 minute , it will lock the button automatically .

Under locked status the detection of changes of the volumetric flow rate is Running regularly .

Unlock + MENU

then appear as "state conversion code(****)", input the code , then convert to Parameter setting mode .

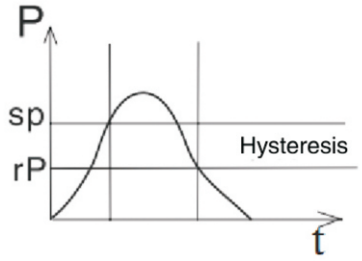
7.4 Code of the instrument

Code: 8906

Item	Parameter name	Range	Explanation
1	SP Settings	0- full range	Switching alarm point (SP)
2	rP Settings	0-SP	hysteresis alarm points (rP)
3	N_C Settings	normally Open / Close alarm of Consumed quantity	PNP normally open and normally closed set / Consumed quantity alarm
4	ASP Settings	0- range	Analogue ASP
5	AEP Settings	0- range	Analogue AEP
6	Flow Direction	Positive Flow Direction / Negative Flow direction	Modify of flow direction
7	Range Settings	0-17.6 m³/h	DN25 diameter maximum flow rate : 17.6 m³/h
8	DisD Settings	horizontal screen / vertical screen	screen display direction
9	Total Settings	0.01-999.99 m³	Consumed quantity alarm
10	Clear SUM	Y/N	Clear the accumulation

7.6 Explanation of the menu

1.SP Settings
When the flow rate increases and reach the corresponding switching point(SP) , it outputs .
2. rP Settings
When the flow rate is less than the switching point rP, the output will be switch off



Hysteresis

3、 N_C Settings
Normally open, normally closed and consumed quantity alarm .This unit adopts PNP output.

4、 ASP Settings
Analogue start value for volumetric flow . Set together with Analog end value(5). This unit supports ASP and AEP inverted settings , in this case if users set the output at ASP to be 20mA, then output at AEP is 4mA.

5、 AEP Settings
Analogue end value for volumetric flow .Set together with Analog start value(4) In order to distinguish during measurement, AEP and ASP should not be too close each other .

6、 Flow Direction
Flow direction setting , for the sake of convenient display .

7、 Range Settings
Volumetric flow range setting. This setting is correlated with interface dynamic display .

8、 DisD Settings
Screen display direction setting. Provide horizontal screen and vertical screen settings to adapt to different installation location . 9、 Total Settings
When N_C Settings is set to Total Alarm, when and the transient consumed quantity reaches Total Setting, the output will have switch and pulse outputs , Pulse duration: default value is 1s (users can set duration through specific software).

10、 Clear SUM
Selecting the Clear SUM parameter for Y, then click the confirmation button. After about 1s,the system