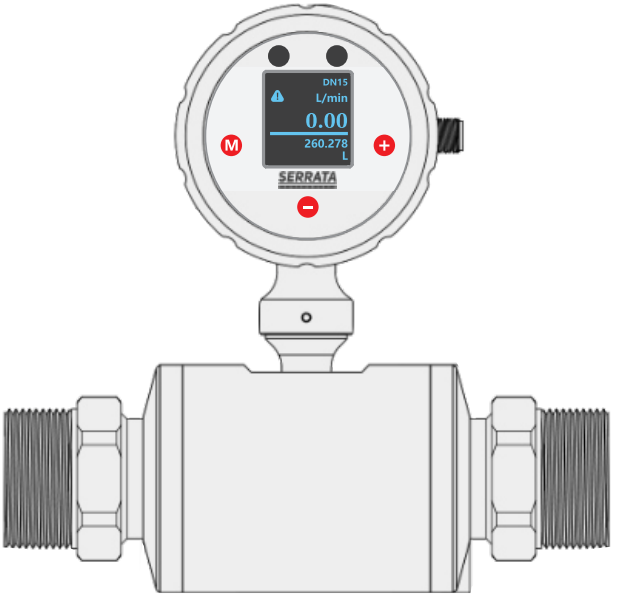
SERRATA
INSTRUMENTS



Operation Instruction Manual

Electromagnetic flowmeter

FlowM.260 Series

V.25.1.0.1

Safety statement

-Before installing this device, please read this document to ensure that the product is suitable for your application and is not limited in any way;

-Failure to follow the operating instructions or technical data may result in personal injury or property damage;

-Check the compatibility of the product material with the medium to be tested in all applications;

-The equipment is only used as the medium to be tested, and it must only be ensured that the equipment is used correctly for long-term stable operation.

Ensure that the tested medium will not cause damage to the tested part of the product;

! The responsibility for determining whether the measurement sensor is suitable for the application lies with the operator, and the manufacturer accepts no responsibility for the consequences of improper use by the operator.Improper installation and use of the sensor results in invalid claims under warranty. Flow sensors monitor the medium flow of fluids

Precautions : Beware of personal injury, overpressure danger!

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1.1 Product Overview

According to Faraday's electromagnetic induction principle, when a conductive body passes perpendicularly through a magnetic field B, an electromotive force (EMF) will be induced. In this flowmeter, the moving conductor is the flowing conductive medium, and the magnetic field B is emitted perpendicular to the direction of the flowing medium, with the induced electromotive forces U at E1 and E2 proportional directly to the flow velocity V of the medium.

U=K×B×V×D
K-factor of K-type flowmeter
D-internal probe spacing

The induced electromotive force U, after further processing, is converted into a standard electrical signal output or displayed.

1.2 Functional characteristics

- Compact design saves installation space
- Anti-corrosion sensor technology
- All electronic design without viscosity of moving parts
- Automatic temperature compensation
- Pulse output/analog output /RS485 communication optional
- Low pressure loss
- Strong anti-fouling ability

1.3 Technical parameter

◇ Measuring range: See range table

◇ Suitable pipe diameter: DN4...DN25 (see selection table)

◇ Measuring medium : Conductive liquid (conductivity >20uS/cm)

◇ Accuracy: ≤±0.5% of full range

◇ Repeatability: ≤±0.2% of full range

◇ Pressure resistance: max 16 bar

◇ Supply voltage: 24±10%Vdc

◇ Current consumption: <100mA

◇ Electrical protection: reverse polarity protection, short circuit protection

◇ Output

Pulse output: NPN output, pull-up resistor 2K

Analog output: 4...20mA, current limit 26mA, load resistance < 250Ω

◇ Response time: <100ms

◇ Ambient temperature: -25...80 ℃

◇ Medium temperature : -40...120 (No thermal shock) (optional high temperature 160℃)

◇ Materials

Electrode : Stainless Steel 316TI

Process connection : Stainless Steel 316TI

Measuring tube : PEEK

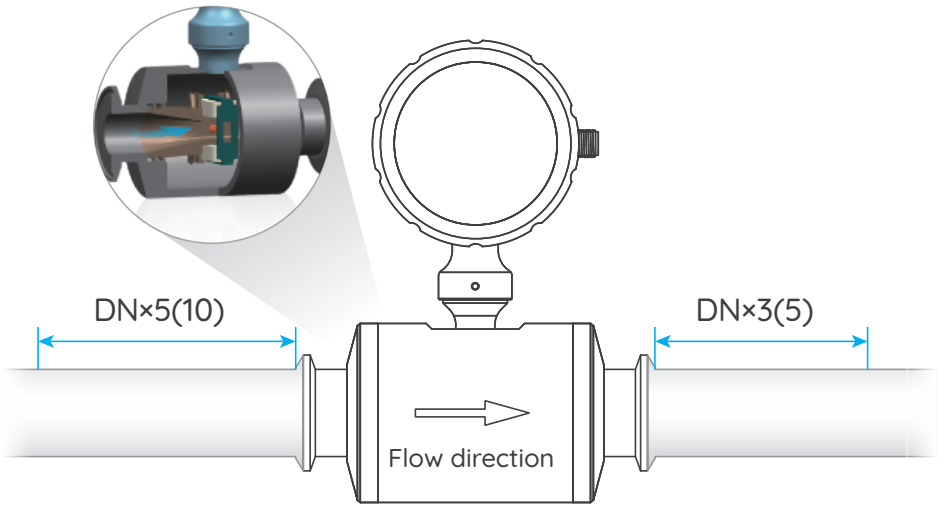
Seal: EPDM

Housing: Stainless Steel 304

◇ Electrical connection: M12×1 connector

◇ Process connection: External Thread

2.1 Installation precautions



Electromagnetic flowmeter installation method:

1. Select an installation position

The straight pipe section where the fluid flow is stable in the piping system should be selected. Generally, the length of the upstream straight pipe section is 5 to 10 times the pipe diameter, and the length of the downstream straight pipe section is 3 to 5 times the pipe diameter. Stay away from strong magnetic fields and strong electric field interference sources, such as large motors, transformers, high-voltage lines, etc. If it is not possible to stay away, shielding measures should be taken. The installation position should be easy to maintain and repair, and have enough operation space.

2. Installation method

Horizontal installation: The electromagnetic flowmeter can be installed horizontally, but it is necessary to ensure that the electrode axis is parallel to the ground, and the pipes at both ends of the flowmeter should be on the same horizontal plane to avoid high and low drop. Vertical installation: can also be installed vertically, this time should ensure that the electrode axis and the ground vertical.

Electromagnetic flowmeter installation precautions:

Handle the flowmeter gently during installation to avoid collision and falling.

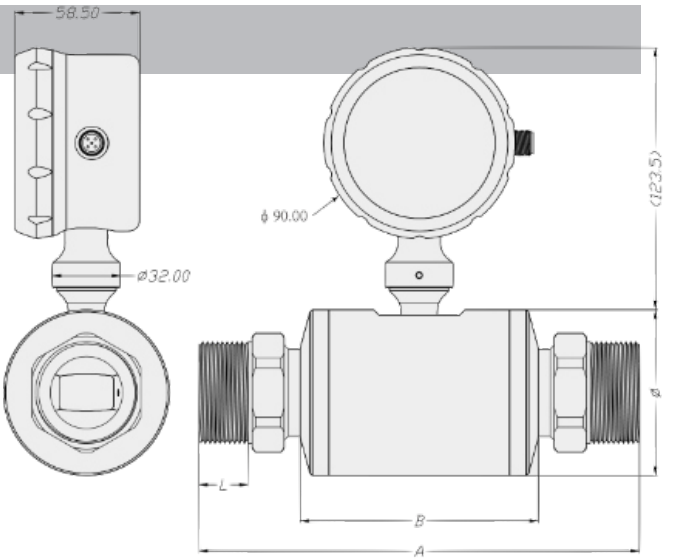
Install in strict accordance with the product instructions, and do not arbitrarily change the installation method and connection line. After the installation is complete, check whether the connection parts are secure and the cables are correctly connected.

3.1 Wiring diagram

Pulse/current /RS485

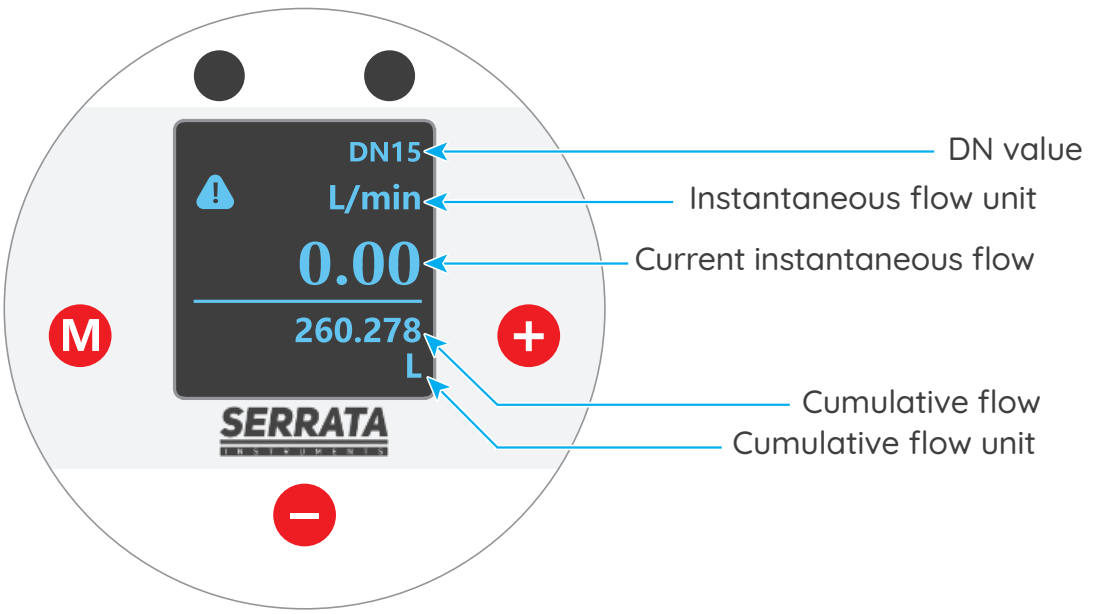
Pin	color	function
2	BN - Brown	power supply(+)
7	BU - Blue	power supply(-)
8	RD - Red	RS485(A)
4	YL - Yellow	RS485(B)
6	PK - Pink	pulse (+)
1	WH - White	pulse (-)
3	GN - Green	mA current (-)
5	GY - Gray	mA current (+)

3.2 Dimension & Ranges



Model	Thread Connection	Pipe Diameter	A	B	∅	Effective screw (L)	Measuring Range (liter per min)
FlowM.260-GM-04-PR	G1/4”	DN4	110	60	45	12	0,1-10
FlowM.260-GM-08-PR	G1/2”	DN8	141	74	60	18	0,5-25
FlowM.260-GM-15-PR	G1”	DN15	170	90	70	20	2-100
FlowM.260-GM-25-PR	G1-1/2”	DN25	207	112	78	25	4-200

4.1 Description of panels and keys



Key description

1. Long press the "M " key, the first time traffic related data appears, press again to display alarm information

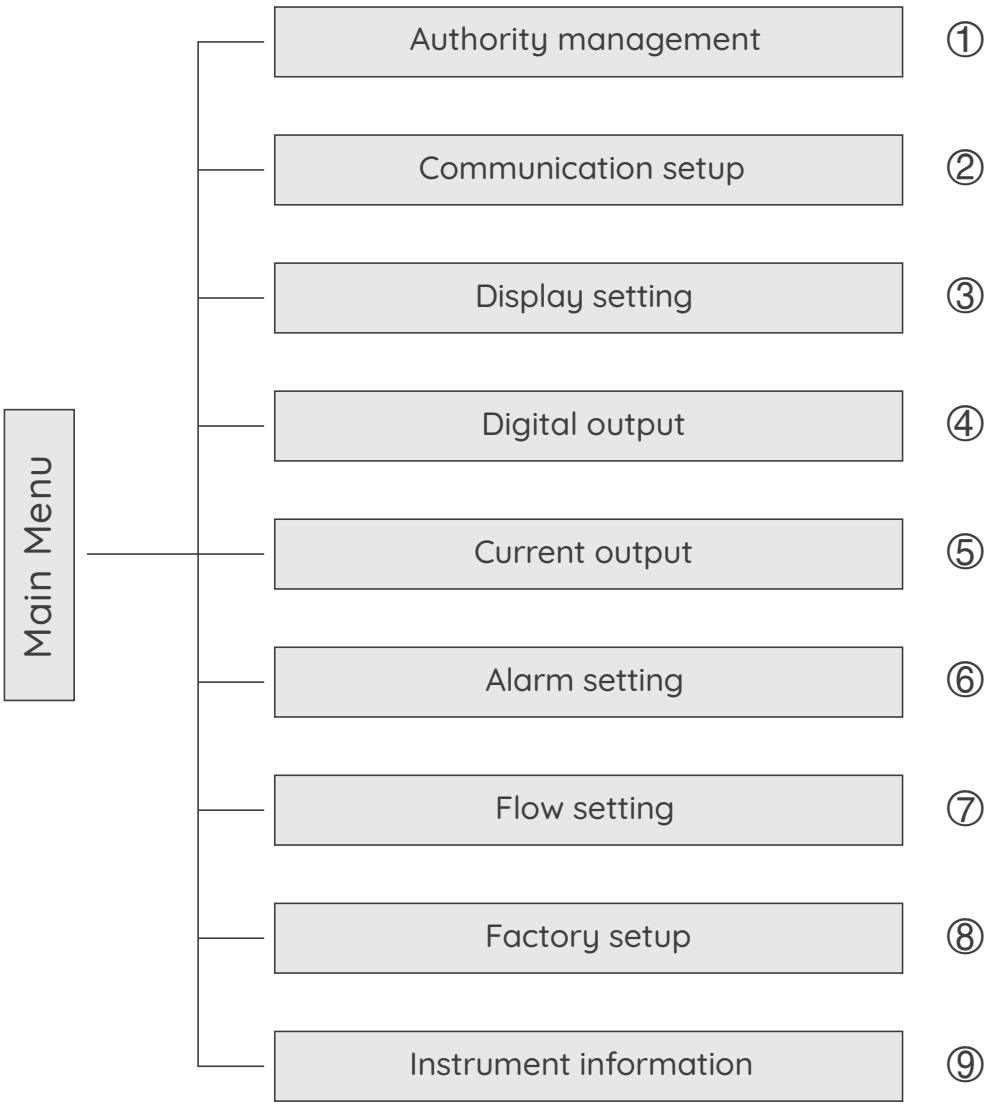
2. Press M and -at the same time to enter the password menu. The maximum permission is 4, and the password is 000000

3. Press the + key to flip up, and the -key to flip down. Press the M and + keys at the same time to shift.

4. When the menu is displayed, press M and -to return to the previous menu, and hold down M to enter the current menu

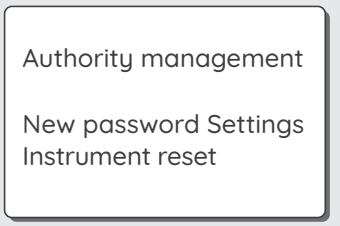
5. Hold down the -and + keys at the same time, and hold down for 5 seconds to rotate the display screen 90 degrees. This operation is limited to the main screen.

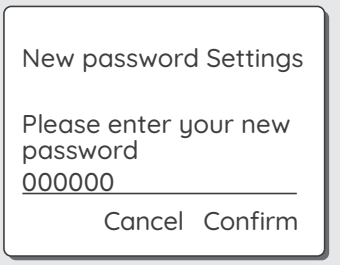
5.1 Main Menu

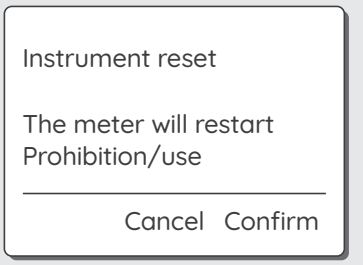

Main Menu
Authority management
①
Communication setup
②
Display setting
③
Digital output
④
Current output
⑤
Alarm setting
⑥
Flow setting
⑦
Factory setup
⑧
Instrument information
⑨

5.2 Menu introduction and operation

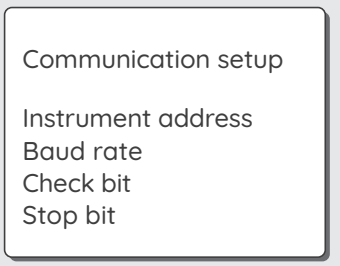
① Rights Management

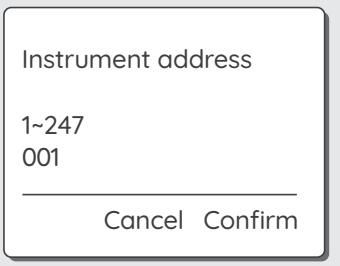


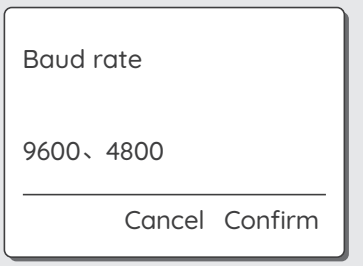


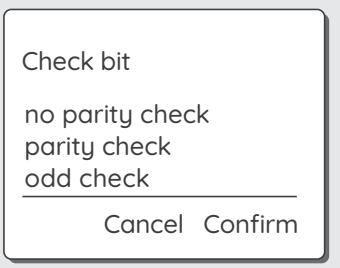


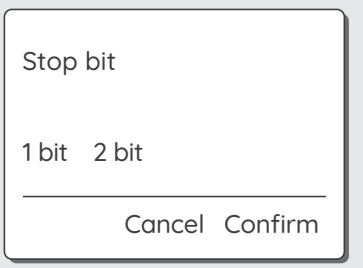
② Communication setup











③ Display setting

Display setting

Accumulator selection
Accumulator decimal place
Accumulator integer bit
Inst. Quantity selection
User coding
Instant. Decimal place
Language
Rotate

Accumulator selection

Accumulator1
Accumulator2

Cancel Confirm

Accumulator decimal Place

3 bit /2 bit /1 bit

Cancel Confirm

Accumulator integer bit

5~15
08

Cancel Confirm

Instantaneous Quantity Selection

Flow rate/Flow rate /percentage of traffic

Cancel Confirm

User coding

Maximum 10 characters
EMF 0001

Cancel Confirm

Instantaneous Decimal Place

2bit/3 bit/4 bit/1 bit/None

Cancel Confirm

Language

Chinese English

Cancel Confirm

Rotate

0” 90“ 180” 270“

Cancel Confirm

④ Digitaloutput

Digital output

Output enable
Output polarity selection
Function selection
Pulse measurement polarity
Pulse equivalent
Pulse width
Frequency measurement polarity
Frequency range
Frequency duty cycle

Output enable

Enable/disable

Cancel Confirm

Output polarity selection

Low/high level

Cancel Confirm

Function selection

Frequency/pulse

Cancel Confirm

Pulse measurement polarity

Forward/reverse/bidirectional

Cancel Confirm

Pulse equivalent

0.0~100000000.0
1.0 L/P

Cancel Confirm

Pulse width

0.05~1000
1.00 ms

Cancel Confirm

Frequency measurement polarity

Forward/reverse/bidirectional
/Absolute value

Cancel Confirm

Frequency range

1~2000
1000 Hz

Cancel Confirm

Frequency duty cycle

10~90
50 %

Cancel Confirm

⑤ Currentoutput

Current output

Output enable
Measurement polarity
Calibrating enable
4mA calibration value
20mA calibration value
The switch alarm was enabled
Output mode

Output enable

Enable/disable

Cancel Confirm

Measurement polarity

Forward/reverse/bidirectional
/absolute value

Cancel Confirm

Calibrating enable

prohibit
20mA/4m calibration
function is enabled

Cancel Confirm

4mA calibration value

Please enable 4mA calibration
first 5.0020mA

Cancel Confirm

20mA calibration value

Please enable 20mA
Calibration first
24.999mA

Cancel Confirm

switch alarm was enabled

Disable/Enable

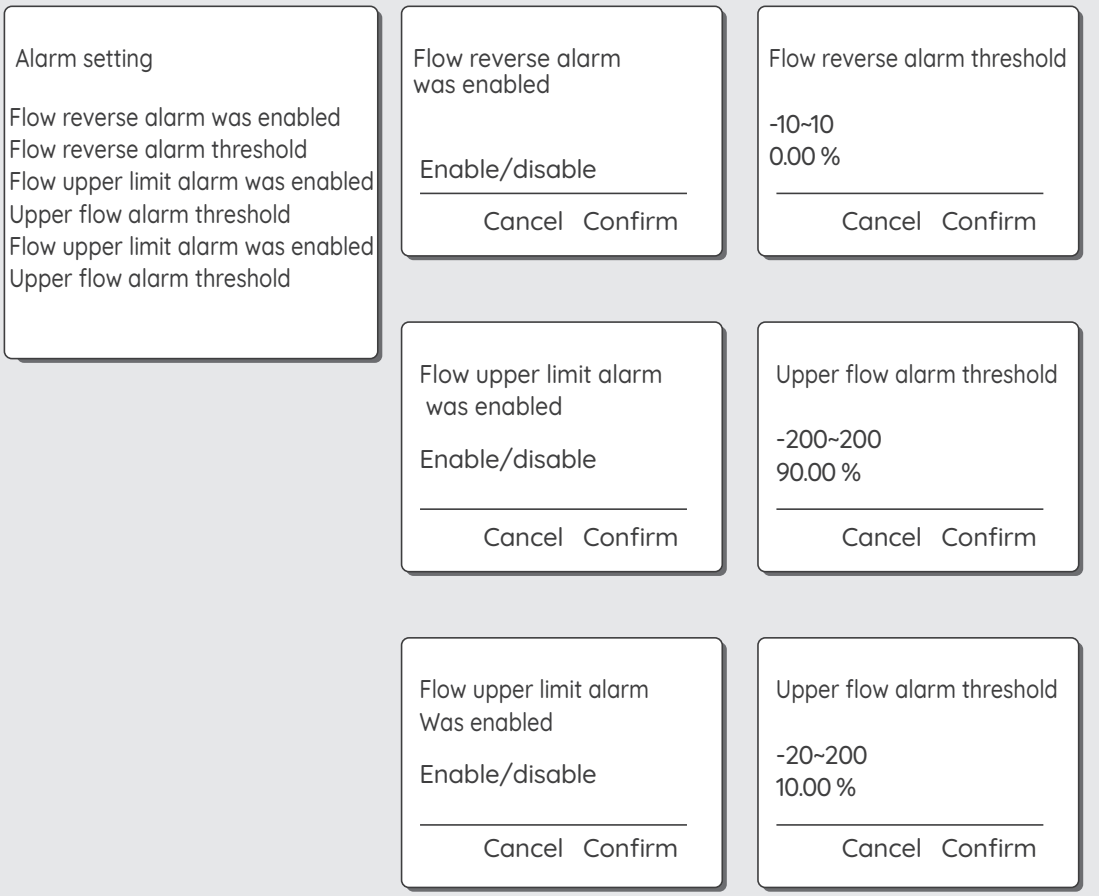
Cancel Confirm

Output mode

4-20mA 0-20mA

Cancel Confirm

⑥ Alarm setting



⑦ Flow setting

Flow setting

Flow

Accumulator 1 unit
Accumulator 1 Unit coefficient
Accumulator 1 function
Accumulator 1 Set
Accumulator 2 unit
Accumulator 2 Unit coefficient
Accumulator 2 function
Accumulator 2 Settings
Flow Unit
Unit coefficient of discharge
Flow range
Low-flow excision
Flow direction setting
Flow reverse measurement was enabled
Filter constant
Subscriber instrument factor
User zero
The ATC detection was enabled.
Atc detection threshold
Excitation alarm enabled

Accumulator 1 unit

Max5 characters
L

Cancel Confirm

Accumulator 1 Unit coefficient

0.000001~1000000
1000.00

Cancel Confirm

Accumulator 1 function

Forwardcumulative
/reversecumulative
/Total/netcumulativedisabled

Cancel Confirm

Accumulator 1 Set

0.001~999999999
0.000 L

Cancel Confirm

Flow lowerlimit alarm
was enabled

Max5 characters
L

Cancel Confirm

Accumulator 2 Unit coefficient

0.000001~1000000
1000.00

Cancel Confirm

Accumulator 2 function

Disable
/Forwardaccumulation/reverse
Cumulativeto/total/net

Cancel Confirm

Accumulator 2 Set

0.001~999999999
0.000 L

Cancel Confirm

Flow unit

Max8 characters
L/min

Cancel Confirm

Coefficient of flow unit

0.000001~1000000
16.6667

Cancel Confirm

Flow range

0.0001~999999
100.000 L/min

Cancel Confirm

Small signal excision

0.0001~1.0000
0.0050 m/s

Cancel Confirm

Flow direction setting

Forward/reverse

Cancel Confirm

Flow reverse measurement was enabled

Enable/disable

Cancel Confirm

Filter constant

0~10
00

Cancel Confirm

Subscriber instrument factor

0.5~1.5
1.0000

Cancel Confirm

User zero

-0.01~0.01
0.00000 m/s

Cancel Confirm

ATC detection was enabled .Procedure

Enable/disable

Cancel Confirm

Atc detection threshold

2.0~200.0
40.0 KΩ

Cancel Confirm

Excitation alarm enabled

Enable/disable

Cancel Confirm

⑧ Factory setup

Factory setup

Caliber
Converter coefficient
Sensor coefficient
Sensor zero correction
Electrode impedance 200KΩ Cal. value
Electrode impedance 0KΩ Cal. value
System forward accumulator is set
System reverse accumulator Settings
Temperature 0 Resistor Cal. value
Temperature 1K resistance Cal. value
Non-linear corrected flowrate1
Non-linear corrected flowrate1 Coef.
Non-linear corrected flowrate2
Non-linear corrected velocity2 Coef.
Non-linear corrected flowrate3
Non-linear corrected flowrate3 Coef.
Non-linear corrected flowrate4
Non-linear corrected velocity4 Coef.
Non-linear corrected flowrate5
Non-linear correction velocity5 Coef.

caliber

8~300
015 mm

Cancel Confirm

Converter coefficient

0.01~10.0
1.0000

Cancel Confirm

Sensor coefficient

0.01~10.0
1.0000

Cancel Confirm

Sensor zero correction

-0.2~0.2
0.00000 m/s

Cancel Confirm

Electrode impedance 200Kohm Calibration value

- Please separate the two signal electrodes to the ground
- Don't connect the 200Kohm resistor 021.6Kohm

Cancel Confirm

Electrode impedance 0Kohm Calibration value

Please put the two signal electrodes Short connect to ground

Cancel Confirm

System forward accumulator is set

0.001~999999999
00000000.000 m3

Cancel Confirm

System reverse accumulator Settings

0.001~999999999
00000000.000 m3

Cancel Confirm

Temperature 0 Resistor calibration value

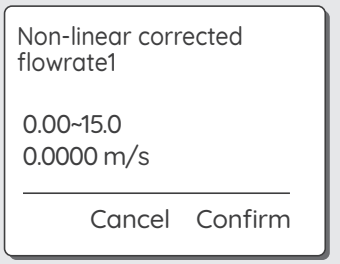
-50.0~50.0
0.00 ohm

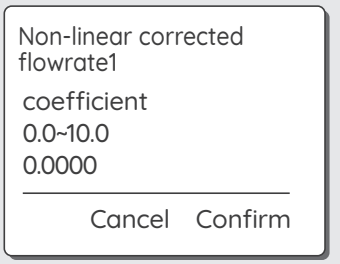
Cancel Confirm

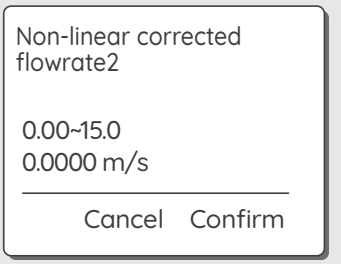
Temperature 1K resistance calibration value

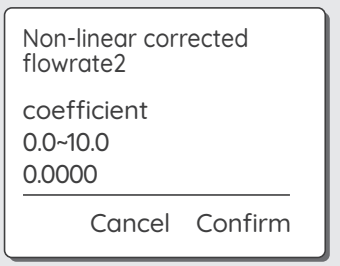
950.0~1050.0
1000.00 ohm

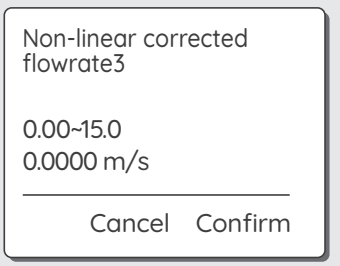
Cancel Confirm

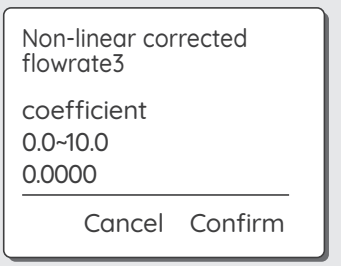

Non-linear corrected flowrate1
0.00~15.0
0.0000 m/s
Cancel Confirm

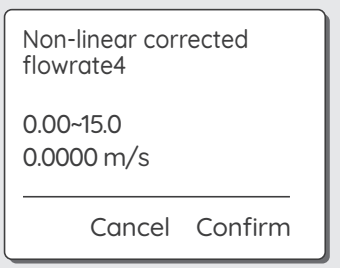

Non-linear corrected flowrate1
coefficient
0.0~10.0
0.0000
Cancel Confirm

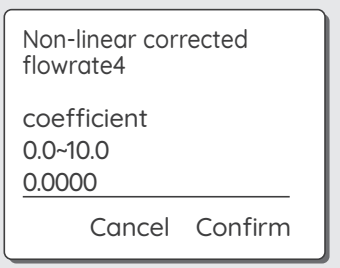

Non-linear corrected flowrate2
0.00~15.0
0.0000 m/s
Cancel Confirm

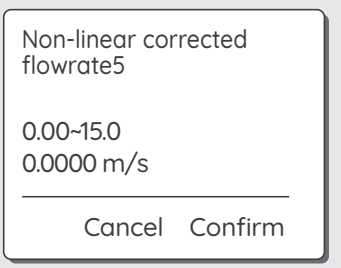

Non-linear corrected flowrate2
coefficient
0.0~10.0
0.0000
Cancel Confirm

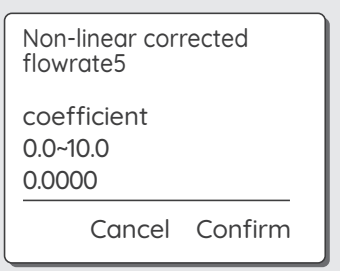

Non-linear corrected flowrate3
0.00~15.0
0.0000 m/s
Cancel Confirm


Non-linear corrected flowrate3
coefficient
0.0~10.0
0.0000
Cancel Confirm

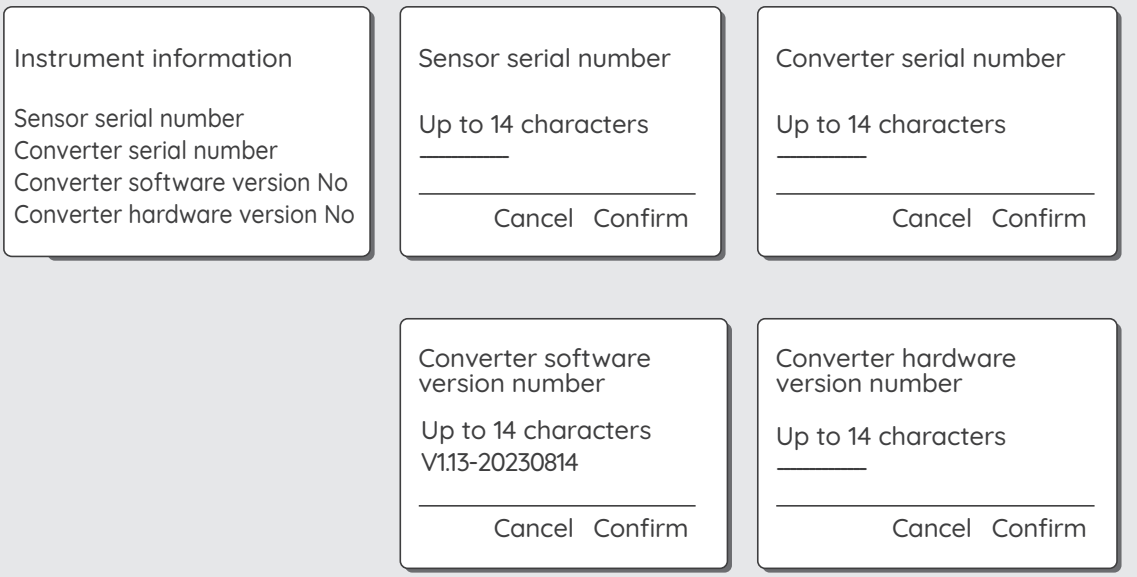

Non-linear corrected flowrate4
0.00~15.0
0.0000 m/s
Cancel Confirm


Non-linear corrected flowrate4
coefficient
0.0~10.0
0.0000
Cancel Confirm


Non-linear corrected flowrate5
0.00~15.0
0.0000 m/s
Cancel Confirm


Non-linear corrected flowrate5
coefficient
0.0~10.0
0.0000
Cancel Confirm

⑨ Instrument information



6.1、Modbus Register address table

MODBUS register	Number of registers	data type	Channel Name	unit	Access authority	Description
0	2	float	Velocity	m/s	R	Update once per measurement cycle
2	2	float	Volume flow	Same user unit	R	
4	2	float	Percentage of flow	%	R	Volume flow as a percentage of full scale
6	4	double	User accumulator 1	Same user unit	R/W	Change scan be made with the multi-register write command
10	4	double	User accumulator 2	Same user unit	R/W	
14	4	double	System forward accumulator	m3	R	—
18	4	double	System reverse accumulator	m3	R	—
22	2	float	temperature	℃	R	—
24	2	uint32_t	Give an alarm	-	R	0x0000:None 0x0001: Air flow control alarm 0x0002: Flow reverse alarm 0x0004: Flow upper limit alarm 0x0008: Flow lower limit alarm 0x0010: Excitation coil alarm 0x0020: Storage exception alarm 0x0040: Low electrode resistance alarm 0x0080: Temperature upper limit alarm 0x0100: Temperature lower limit alarm 0x0200: Current open circuit alarm
26	1	uint16_t	Flow direction	–	R	0：forward 1： reverse
27	2	float	Electrode	ohm	R	—
29	2	float	PT1000 resistance value	ohm	R	