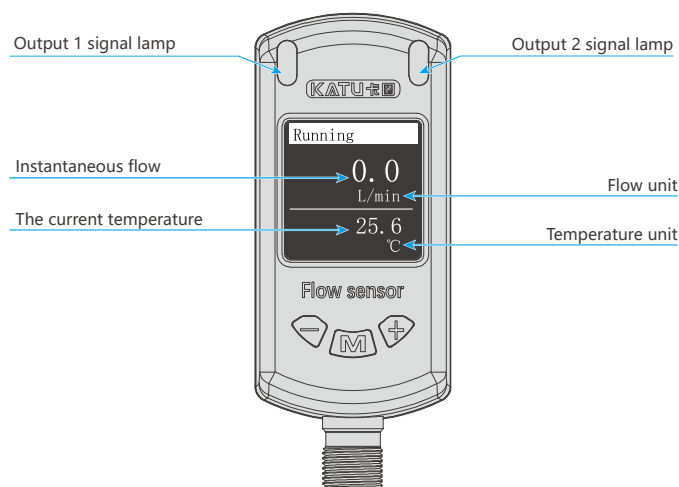




Panel diagram



Product Overview

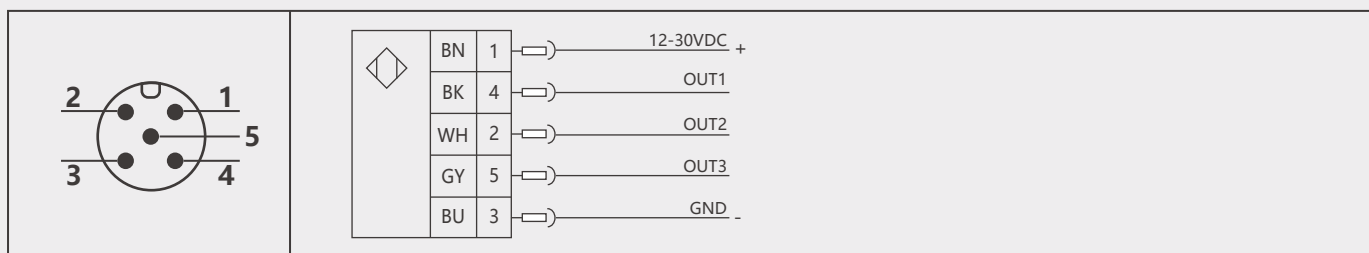
The FM160 electronic turbine flow/temperature sensor is an integrated flow/temperature sensor. It has the advantages of small size, high pressure, easy setting, built-in intelligent circuit, support temperature/flow remote analog output, while supporting temperature/flow alarm function, remote monitoring real-time flow and temperature data, arbitrary setting of full parameters, range migration function, and arbitrary setting of alarm value.

- hydraulic lubrication
- petrochemical industry
- test equipment
- cooling system

Technical specification

◇ Measurement range:	DN6..DN50
◇ Supply voltage:	16...30Vdc
◇ Output type:	Switching quantity (PNP/NPN) / IO-Link / RS485 Analog quantity (4-20mA/1-5v/0-10v) / Pulse / Frequency
◇ Switching load:	<200mA
◇ Response time:	0.1 - 5.0 seconds can be set (factory default is 1.0 seconds)
◇ Switching accuracy:	≤ ± 0.5% of the range
◇ Current-mode analog output:	≤ ± 0.5% of the range
◇ Wiring protection:	Reverse polarity, overload, short circuit protection
◇ Display:	Color LCD screen
◇ Voltage withstand:	400 bar (internal thread type)
◇ Temperature:	
Temperature range:	-20...80°C / Optional -30...180°C
Ambient temperature:	-20...75°C
Storage temperature:	-10...60°C
◇ Accuracy:	≤ ± 1.0% linear
◇ Material:	
Display head housing:	Engineering plastics
Shell:	304L
Turbo:	Duplex steel
Transmission components:	Sliding bearing
◇ Protection class:	IP67
◇ Outlet method:	M12x1 connector
◇ Calibration standard:	46# lubricating oil (25°C)

Wiring diagram



SA: Switch/pulse /IO-Link+ analog (0/4-20mA)

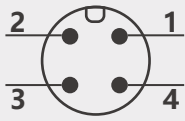
color	stitch	Instructions	color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)	GY	5 (OUT3)	Temperature: 4-20mA (factory default)
BK	4 (OUT1)	Flow switch PNP (Factory default) Flow switch NPN Temperature switch PNP Temperature switch NPN Flow: Linear frequency (full scale 0-100Hz) Flow: Original frequency Flow: Quantitative frequency (full scale 0.5%L/Hz) IO-Link	WH	2 (OUT2)	Flow: 4-20mA (factory default) Flow: 20-4mA Flow: 0-20mA Flow: 20-0mA			Temperature: 20-4mA Temperature: 0-20mA Temperature: 20-0mA

SV1: Switch/pulse /IO-Link+ analog (0/1-5V)

color	stitch	Instructions	color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)	GY	5 (OUT3)	Temperature: 1-5V (factory default)
BK	4 (OUT1)	Flow switch PNP (Factory default) Flow switch NPN Temperature switch PNP Temperature switch NPN Flow: Linear frequency (full scale 0-100Hz) Flow: Original frequency Flow: Quantitative frequency (full scale 0.5%L/Hz) IO-Link	WH	2 (OUT2)	Flow: 1-5V (factory default) Flow: 5-1V Flow: 0-5V Flow: 5-0V			Temperature: 5-1V Temperature: 0-5V Temperature: 5-0V

SV2: Switch/pulse /IO-Link+ analog (0/1-10V)

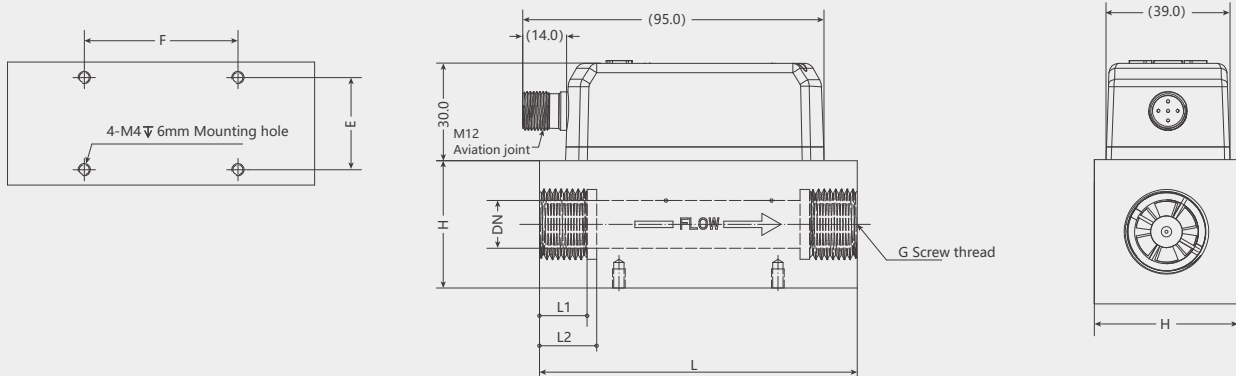
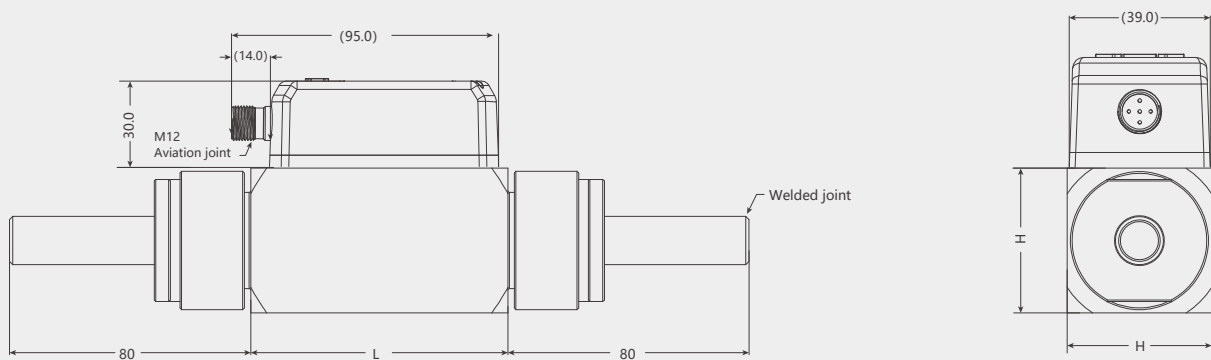
color	stitch	Instructions	color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)	GY	5 (OUT3)	Temperature: 1-10V (factory default)
BK	4 (OUT1)	Flow switch PNP (Factory default) Flow switch NPN Temperature switch PNP Temperature switch NPN Flow: Linear frequency (full scale 0-100Hz) Flow: Original frequency Flow: Quantitative frequency (full scale 0.5%L/Hz) IO-Link	WH	2 (OUT2)	Flow: 1-10V (factory default) Flow: 10-1V Flow: 0-10V Flow: 10-0V			Temperature: 10-1V Temperature: 0-10V Temperature: 10-0V



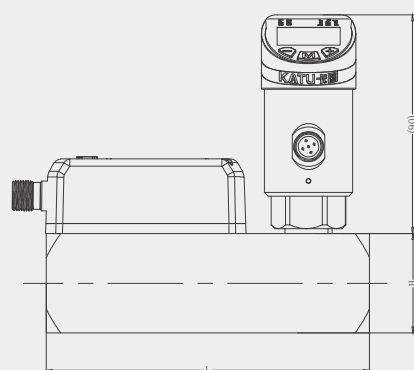
BN	1	12-30VDC +
BK	4	OUT1
WH	2	OUT2
BU	3	GND -

R: RS485 communication

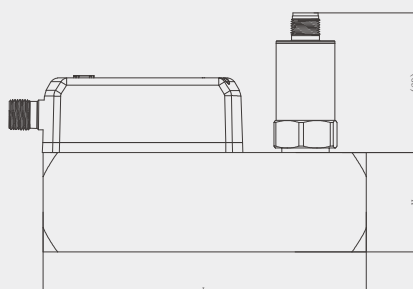
color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)
BK	4 (OUT1)	RS485 (B)	WH	2 (OUT2)	RS485 (A)

Dimension drawing (mm)**Internal thread type****welded**

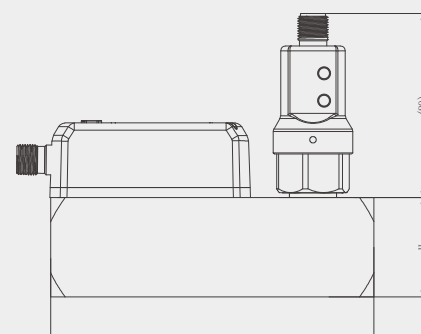
Pressure module type



PS500 Pressure module



PM242 Pressure module



PS200 Pressure module

Dimension table

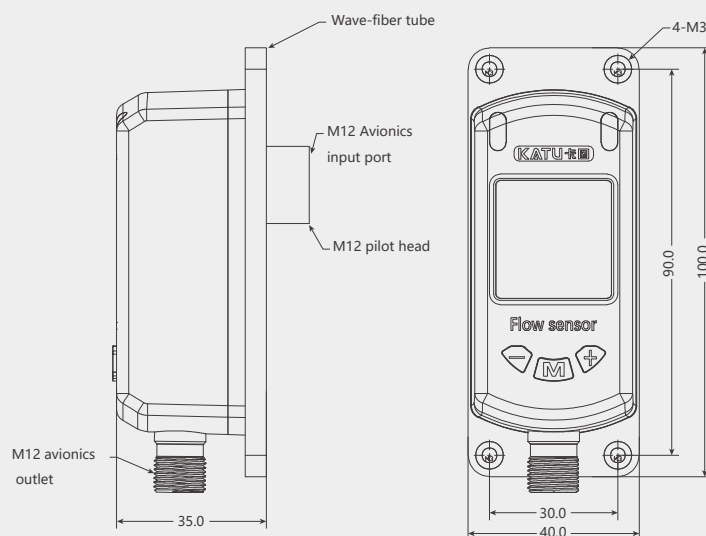
caliber (DN)	Process connection (G)	Body height (H)	Body length (L)		Effective thread length (L1)	Thread length (L2)	Fixed mode (E*F)	Flow range (L/min) (Analog quantity corresponds to 0 starting point)
			Standard	Pressure module				
DN6	1/2"	40	80mm	130mm	12mm	15mm	30×50	0.7...10
DN10	1/2"	40	80mm	130mm	12mm	15mm	30×50	0.8...20
DN12	1/2"	40	80mm	130mm	12mm	15mm	30×50	1...60
DN15	1/2"	45	94mm	141mm	12mm	15mm	35×50	2...100
DN20	3/4"	45	94mm	141mm	16mm	19mm	35×50	5...130
DN25	1"	45	112mm	157mm	18mm	21mm	35×50	6...160
DN32	1-1/4"	55	130mm	163mm	20mm	23mm	45×50	25...250
DN40	1-1/2"	65	150mm	175mm	22mm	25mm	55×50	30...300
DN50	2"	72	182mm	198mm	24mm	27mm	55×50	60...660

Split high temperature type/plate mounted type

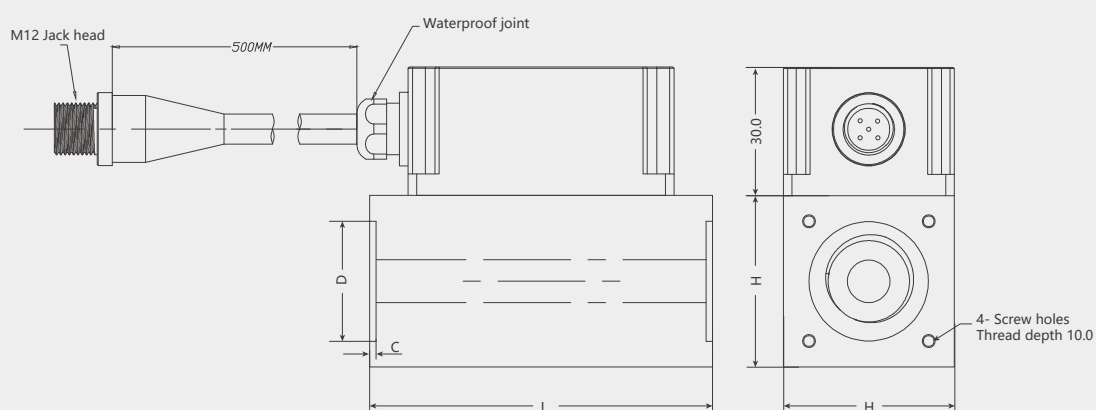
diagram form



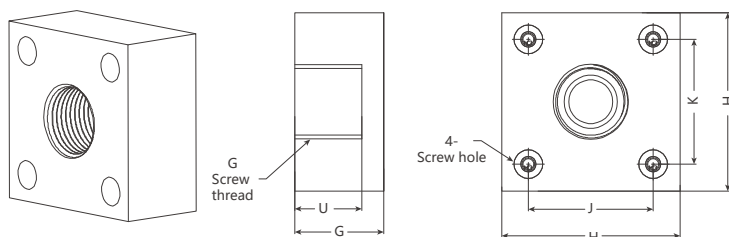
Split table installation dimensions



caliber (DN)	Sealing ring (D×C)
DN6	Outside diameter $\phi 28$ ×2 Wire diameter
DN10	Outside diameter $\phi 28$ ×2 Wire diameter
DN12	Outside diameter $\phi 28$ ×2 Wire diameter
DN15	Outside diameter $\phi 28$ ×2 Wire diameter
DN20	Outside diameter $\phi 38$ ×2.4 Wire diameter
DN25	Outside diameter $\phi 38$ ×2.4 Wire diameter
DN32	Outside diameter $\phi 50$ ×2.4 Wire diameter
DN40	Outside diameter $\phi 55$ ×2.4 Wire diameter
DN50	Outside diameter $\phi 68$ ×2.4 Wire diameter



Optional accessories for split mounting



caliber (DN)	Overall dimension (H)	Pitch of holes (J×K)	Locking screw specifications	Diameter of thread (P)	Joint length (G)	Effective thread depth (U)	Order number
6	40×40	28×28	M3×20	3/8	20	15	KTYLLC29339
10	40×40	28×28	M3×20	1/2	20	15	KTYLLC29340
12	40×40	28×28	M3×20	1/2	20	15	KTYLLC29340
15	40×40	28×28	M3×20	1/2	20	15	KTYLLC29340
20	45×45	32×32	M3×20	3/4	20	17	KTBCP15948
25	45×45	32×32	M3×20	1	20	17	KTBCP15354
32	55×55	45×45	M5×25	0'-1 1/4"	20	20	KTYLLC29341
40	65×65	50×50	M5×25	0'-1 1/2"	25	20	KTYLLC29342
50	75×75	55×55	M5×25	0'-2"	25	20	KTYLLC29343

Selection list

FM160-	015	GK	SA	-	-	-	-	expatiate
FM160-								FM160 Electronic turbine flow temperature integrated sensor
	006							Measuring caliber: DN6
	010							Measuring caliber: DN10
	012							Measuring caliber: DN12
	015							Measuring caliber: DN15
	020							Measuring caliber: DN20
	025							Measuring caliber: DN25
	032							Measuring caliber: DN32
	040							Measuring caliber: DN40
	050							Measuring caliber: DN50
		GK						Process connection: Internal thread connection (G tooth)
		GM						Process connection: External thread connection (G tooth)
		LM						Process connection: customized hydraulic joint
		BS						Process connection: Plate mounting
		RM						Process connection: External thread connection (R teeth)
		HS						Process connection: welded joint type connection
			SA					Output signal: switch/pulse /IO-Link+ analog (0/4-20mA)
			SV1					Output signal: switch/pulse /IO-Link+ analog (0/1-5V)
			SV2					Output signal: switch/pulse /IO-Link+ analog (0/1-10V)
			R					Output signal: RS485 output
				-				Body material: stainless steel 304L
				L				Body material: alumina
					-			Normal form
					H			Split high temperature type: temperature range -30~180°C (Stainless steel only)
						-		Measuring medium: oil (factory default)
						S		Measuring medium: water
							-	No pressure detection hole
							P	With pressure detection hole (G1/4)

Optional accessories - Electrical accessories (M12-5Pin: Factory default ZL05-PC02G)

name	Outline drawing/dimension drawing (mm)	material	model	M12* 1-4pin /5Pin self-connector/size drawing (mm)	model
M12*1-5Pin (2m cable)		PUR	ZL05-PU02G		GL04 (4Pin joint)
M12*1-5Pin (5m cable)			ZL05-PU05G		
			ZL05-PU010G		
M12*1-5Pin (10m cable)		PVC	ZL05-PC02G		GL05 (5Pin joint)
			ZL05-PC05G		
			ZL05-PC010G		

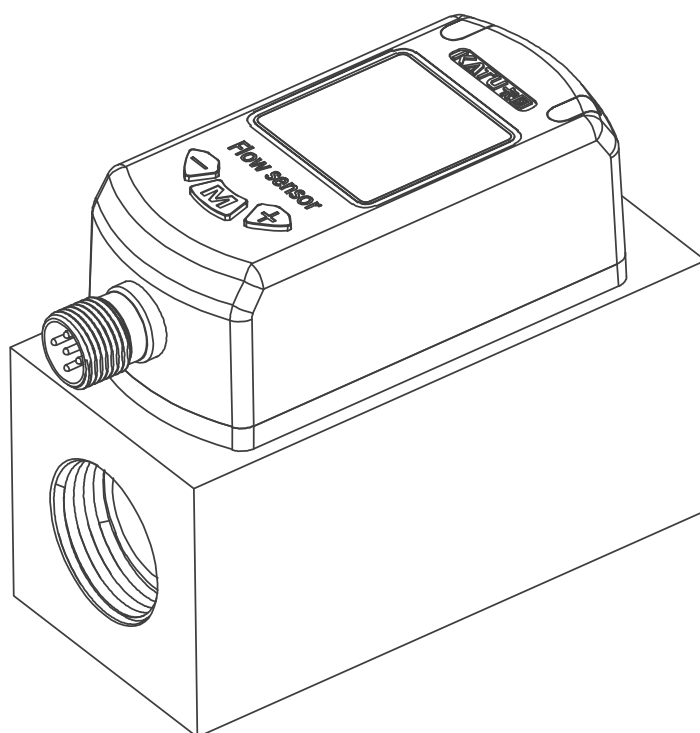
Optional accessories - Electrical accessories (M12-4Pin: Factory default ZL04-PC02G)

name	Outline drawing/dimension drawing (mm)	material	model
M12*1-4Pin (2m cable)		PUR	ZL04-PU02G
			ZL04-PU05G
			ZL04-PU010G
M12*1-4Pin (5m cable)		PVC	ZL04-PC02G
			ZL04-PC05G
M12*1-4Pin (10m cable)			ZL04-PC010G

——— Sensor and controller ———
■ Flow ■ pressure ■ temperature ■ level ■ position



Operation instruction flow temperature sensor FM160 Series



Purpose of product application



danger

The sensor (switch) can only be used in the specified application range.

The temperature range must be within the permissible range. Do not exceed the rated pressure and power load value.

Assembly, commissioning and operation must be carried out in accordance with applicable national and local safety instructions.

The switch is designed to be used as a safety device for pressurizing the system in accordance with "Pressure Equipment Directive 97/23 / EC(PED)".

Standard

The standards applied during development, manufacturing and configuration are listed in the CE Compliance and manufacturer declarations.

Quality assurance

Our scope of delivery and service is subject to legal warranties and warranty periods.

Warranty clause

We guarantee that the functions and materials of the dual pressure switch meet the statutory requirements under normal operation and maintenance conditions.

Security of loss

Such as:

- Incorrect use,
- Incorrect installation
- Incorrect operation or operation in violation of the provisions of this operation manual.

No liability shall be assumed for any damage resulting therefrom or consequential.

Safety instruction

Safety instructions are intended to protect users from dangerous situations and /or prevent material damage.

In the operating instructions, the severity of the potential risk can be indicated by the following signal words:



danger

An imminent danger to the user. Failure to comply may result in fatal injury.



warning

An identifiable hazard.

Failure to comply may result in fatal injury and damage to equipment or plant parts.



caution

It means a danger.

Non-compliance may result in minor injury and material damage to the sensor (switch) and/or plant.



important

Information that is important to the user.

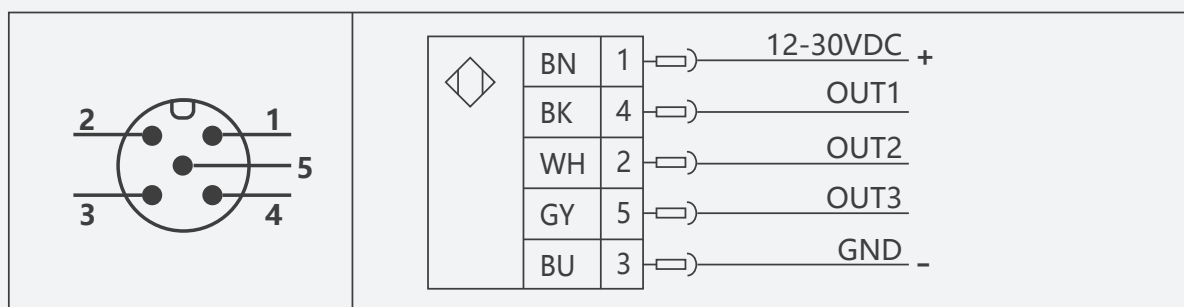


Deal with

Sensors (switches) must be handled correctly in accordance with national or local regulations for electrical/electronic equipment.

Sensors (switches) cannot be disposed of with household waste!

Wiring diagram (standard type)



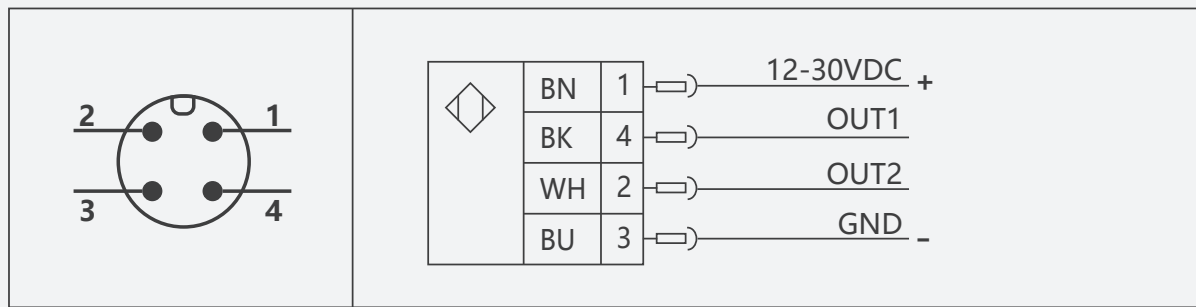
SA: Switch/pulse /IO-Link+ Analog (0/4-20mA)

color	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	Flow PNP (Factory default) Flow NPN Temperature PNP Temperature NPN Flow: Linear frequency (full scale 0-100Hz) Flow: Original frequency (reference factor) Flow: Quantitative frequency (full scale 0.5%L/Hz) IO-Link
WH	2 (OUT2)	Flow: 4-20mA (Factory default) Flow: 20-4mA Flow: 0-20mA Flow: 20-0mA
GY	5 (OUT3)	Temperature: 4-20mA (Factory default) Temperature: 20-4mA Temperature: 0-20mA Temperature: 20-0mA

SV1: Switch/pulse /IO-Link+ analog (0/1-5V)		
color	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	Flow PNP (Factory default) Flow: Linear frequency (full scale 0-100Hz) Flow NPN Flow: Original frequency (reference factor) Temperature PNP Flow: Quantitative frequency (full scale 0.5%L/Hz) Temperature NPN IO-Link
WH	2 (OUT2)	Flow: 1-5V (Factory default) Flow: 5-1V Flow: 0-5V Flow: 5-0V
GY	5 (OUT3)	Temperature: 1-5V (Factory default) Temperature: 5-1V Temperature: 0-5V Temperature: 5-0V

SV2: Switch/pulse /IO-Link+ analog (0/1-10V)		
color	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	Flow PNP (Factory default) Flow: Linear frequency (full scale 0-100Hz) Flow NPN Flow: Original frequency (reference factor) Temperature PNP Flow: Quantitative frequency (full scale 0.5%L/Hz) Temperature NPN IO-Link
WH	2 (OUT2)	Flow: 1-10V (Factory default) Flow: 10-1V Flow: 0-10V Flow: 10-0V
GY	5 (OUT3)	Temperature: 1-10V (Factory default) Temperature: 10-1V Temperature: 0-10V Temperature: 10-0V

Wiring diagram (RS485 communication)



RS485		
color	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	RS485(B)
WH	2 (OUT2)	RS485(A)

Switching function

If the switch is higher or lower than the set switching limit (SP, rP), its switching state is changed.
The following switch functions can be selected:

- Hysteresis function normally open: = [Hno] (→ Figure 1)
- Hysteresis function normally closed: = [Hnc] (→ Figure 1)

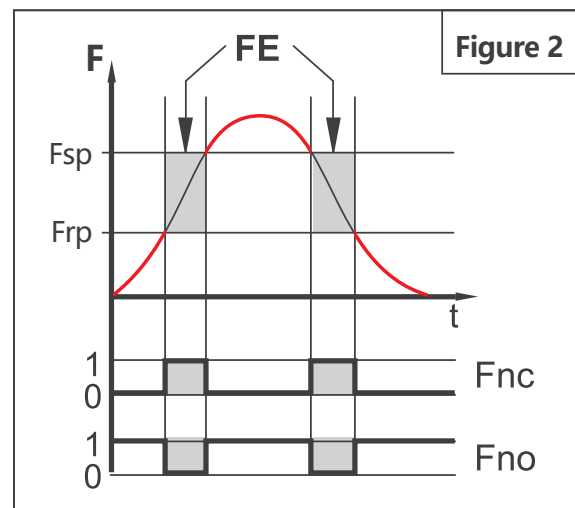
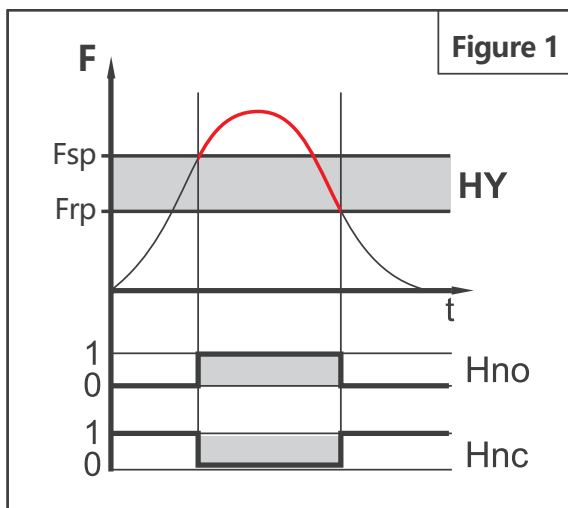
First set the switch point: (SP), Then set the reset point: (rP).

If SP changes again, the hysteresis will change with it.

- Window function usually open: = [Fno] (→ Figure 2)
- Window function normally closed: = [Fnc] (→ Figure 2)

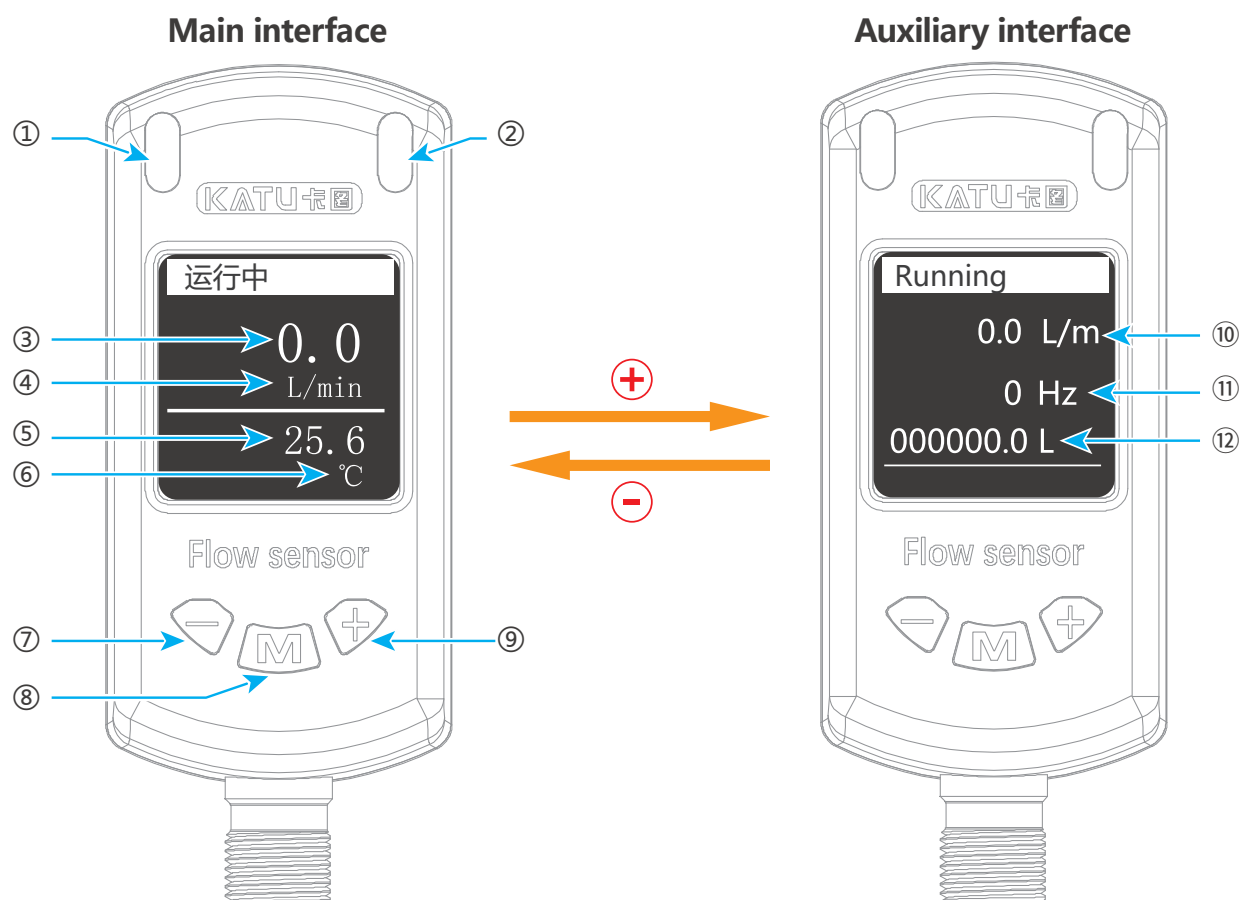
The width of the window can be set by the difference between SP and rP.

SP = Upper limit value, rP = Lower limit value.



F = System flow; HY = lag; FE = window

Panel diagram



number	Instructions	number	Instructions
①	Output 1 signal lamp	⑦	Up/Reduce key
②	Output 2 signal lamp	⑧	Enter/exit save key
③	Instantaneous flow	⑨	Down/increase key
④	Flow unit	⑩	Instantaneous flow
⑤	The current temperature	⑪	frequency
⑥	Temperature unit	⑫	Cumulative flow

Debugging/Operation (Standard)

Main interface

Running
0.0 L/min
30.0 °C

Auxiliary interface

Running
0.0 L/m
0 Hz
000000.0 L



Level 1 menu

Setting
OUT1 Hno
OUT2 4-20mA
OUT3 4-20mA
EF >>
▲ ↻ ▼



OUT1
Item Flow
Tvpe Hno
Fsp 0.0
Frp 0.0
▲ ↻ ▼



Press" + " or" - " to switch

Flow/temperature mode
can be switched



OUT1
Item Flow
Tvpe Hno
Fsp 0.0
Frp 0.0
▲ ↻ ▼



Press" + " or" - " to switch

Hno: Hysteresis NO
Hnc: Hysteresis NC
Fno: Window NO
Fnc: Window NC
Fre: Original frequency Flow only mode
Fre-L: Linear frequency (0-100Hz)
Fre-R: Quantitative frequency (0.5%L/Hz)
IOLink



OUT1
Item Flow
Tvpe Hno
Fsp 0.0
Frp 0.0
▲ ↻ ▼

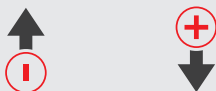


Press" + " or" - " to change
the action value
(hysteresis mode)

Press" + " or" - " to modify
the upper limit
(Window mode)

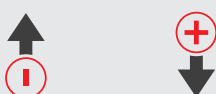


Setting	
OUT1	Hno
OUT2	4-20mA
OUT3	4-20mA
EF	>>
▲ ↻ ▼	



Setting	
OUT1	Hno
OUT2	4-20mA
OUT3	4-20mA
EF	>>
▲ ↻ ▼	

Setting	
OUT1	Hno
OUT2	4-20mA
OUT3	4-20mA
EF	>>
▲ ↻ ▼	



Setting	
OUT1	Hno
OUT2	4-20mA
OUT3	4-20mA
EF	>>
▲ ↻ ▼	

OUT1	
Item	Flow
Tvpe	Hno
Fsp	0.0
Frp	0.0
▲ ↻ ▼	

OUT2	
Item	Flow
Tvpe	4-20mA
▲ ↻ ▼	

OUT2	
Item	Flow
Tvpe	4-20mA
▲ ↻ ▼	

OUT3	
Item	Temp
Tvpe	4-20mA
▲ ↻ ▼	

Press" +" or" -" to change the action value (hysteresis mode)

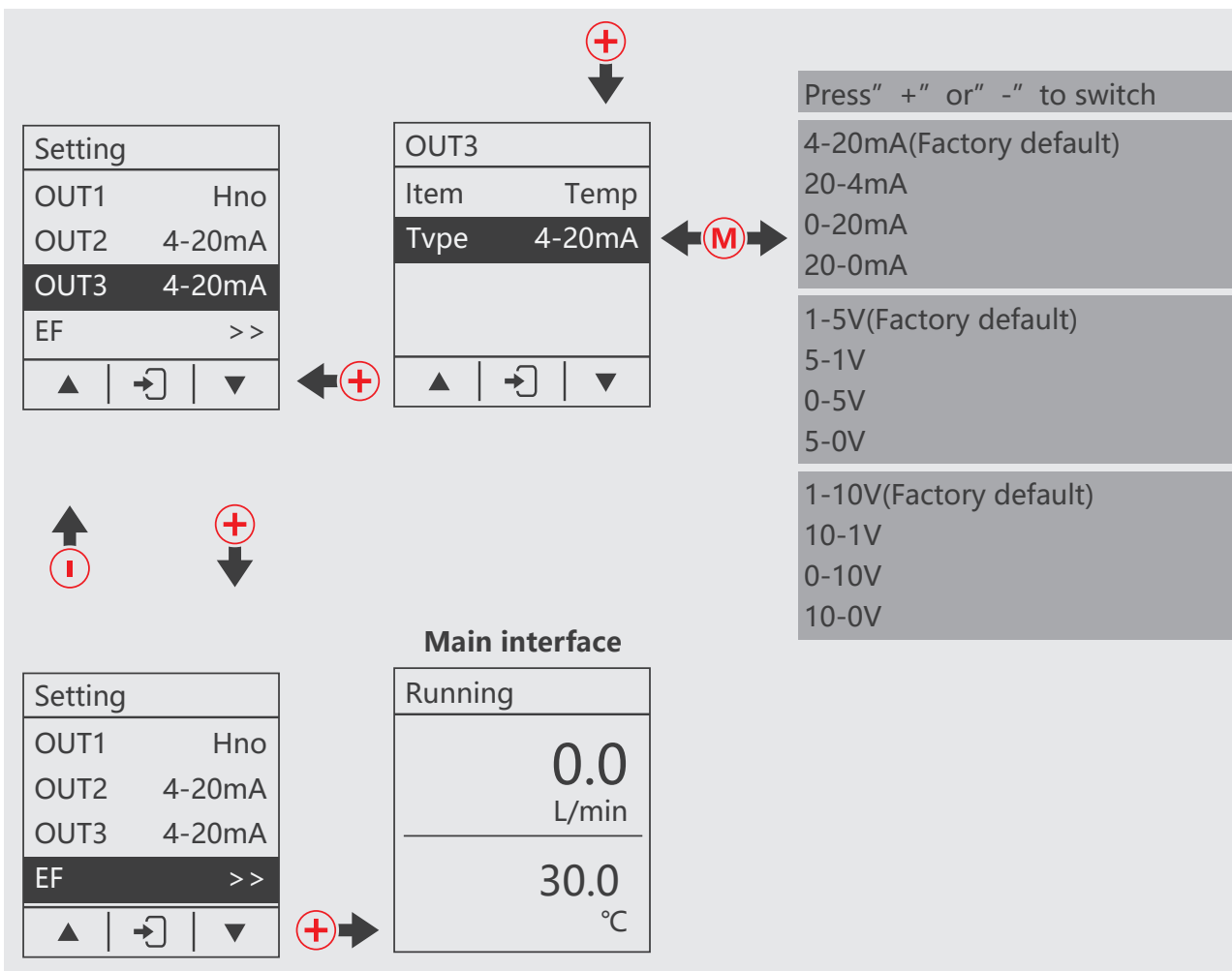
Press" +" or" -" to modify the upper limit (Window mode)

Press" +" or" -" to switch

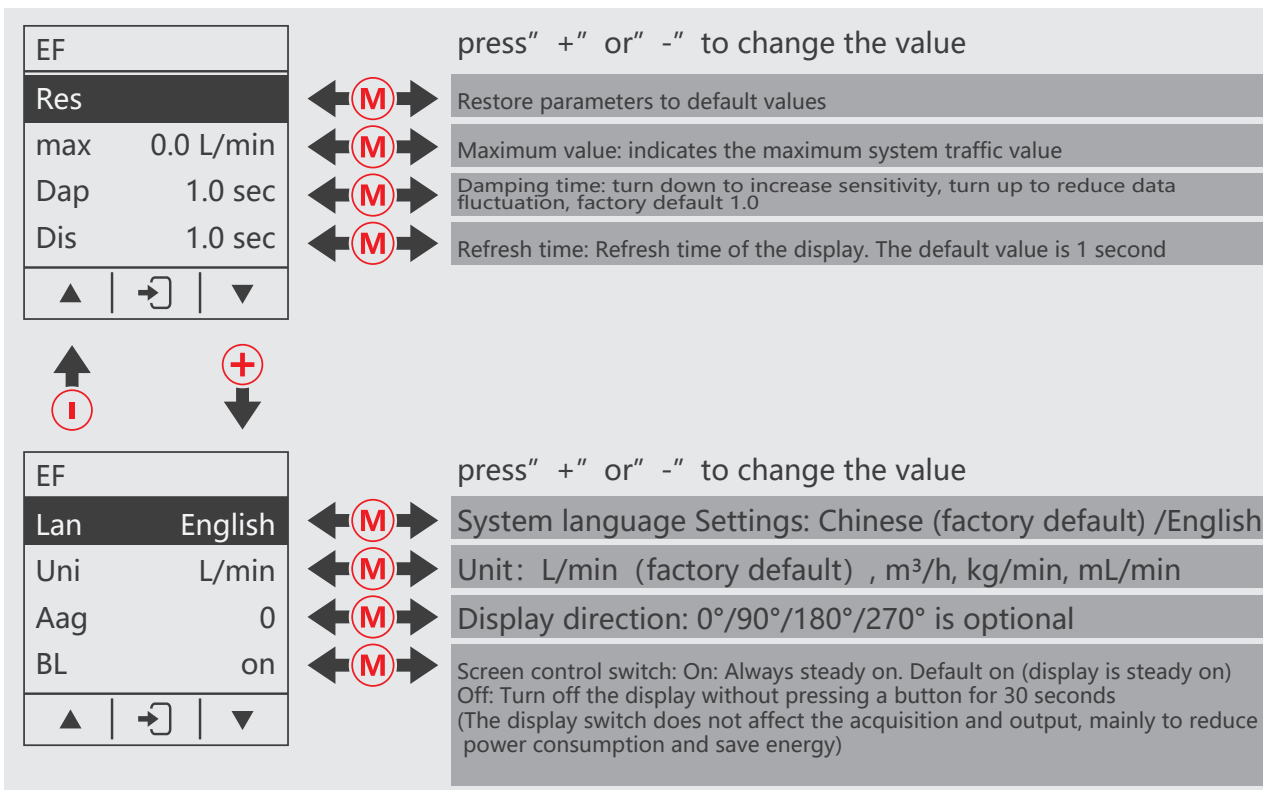
4-20mA(Factory default)
20-4mA
0-20mA
20-0mA

1-5V(Factory default)
5-1V
0-5V
5-0V

1-10V(Factory default)
10-1V
0-10V
10-0V



Level 2 menu



EF
Den 1.00
 Zer 0.2
 Tem-H 80.0
 Tem-L -20.0

▲
↺
▼

press" +" or" -" to change the value

Density value: Factory default 1.00
Zero excision value: Factory default 0.2
Temperature Upper limit: Factory default 80.0
Lower temperature limit: Factory default -20.0

EF
F-R 20.0
 T-A 0.0
 Addr 1
 Baud 9600

▲
↺
▼

press" +" or" -" to change the value

Flow range: Factory default 20.0
Temperature compensation: temperature = original temperature + warm compensation
Address book: Factory default 1
Address book baud rate: : Factory default 9600

Main interface

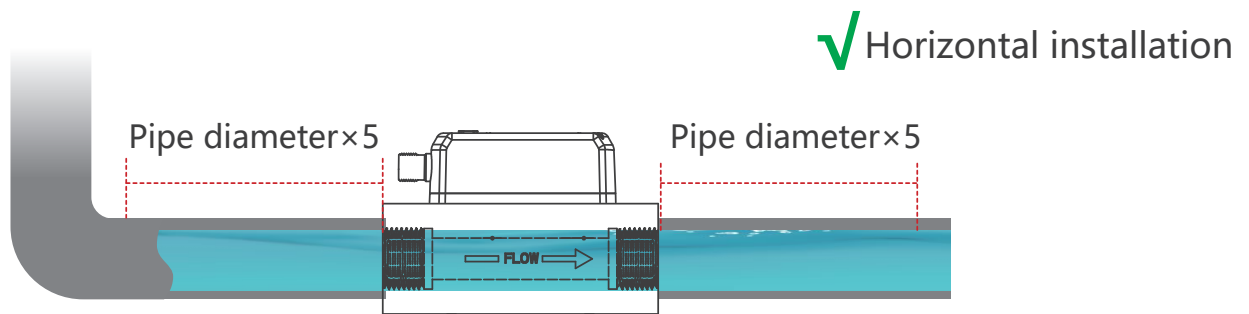
Running

0.0

L/min

30.0

°C



1. Pipeline slope control:

When installing the straight pipe section horizontally, the slope of the pipe should be strictly controlled to ensure that the fluid can successfully fill the entire pipe and avoid local air pockets or liquid accumulation.

2. Exhaust and drainage device:

Install a suitable exhaust valve and drain valve to remove gas and fluid from the pipe before system start-up, ensuring that the pipe is always full during measurement.

3. Inspection of pipeline tightness:

Strengthen the inspection of the tightness of pipe joints and valves to prevent fluid leakage and failure to fill the pipe.

4. Selection and optimization of installation location:

Avoid installing straight pipe sections in locations that may cause unsatisfied pipe, such as undulating sections of pipe or areas where siphoning may occur.

5. Fluid characteristics:

According to the physical properties of the fluid, such as viscosity, density, etc., reasonable design of pipe diameter and flow rate to ensure full pipe measurement.

6. Pipeline cleaning:

Before installation, make sure that the inside of the straight pipe section is clean and free of debris, dirt or residual welding slag. These impurities can damage turbine blades or affect the stability of fluid flow.

7. Debugging after installation:

After the installation is completed, the system debugging is carried out, the flow rate is gradually increased, the measurement data of the sensor and the full pipe situation of the pipeline are observed, and the problem is discovered and solved in time.

8. Regular maintenance and inspection:

Perform regular maintenance and inspection of pipes and sensors to remove debris that may clog pipes and ensure long-term stability of full tube measurements.

Maintenance/cleaning

Sensors (switches) do not require maintenance.



warning

Periodically check whether the switch is working properly.

If the switch does not work properly, stop the operation immediately.



caution

Use of improper cleaning agent may damage the switch.

The following cleaning agents can be used to clean polycarbonate: mild soap or detergent Isopropyl alcohol

Immediately after cleaning, rinse with water. Do not leave cleaner on the surface of the product. Do not clean products in high heat or direct sunlight.

The following cleaning agents are known to affect the integrity of polycarbonate components and should not be used: ZEP Fast 505, Pinesol, Formula 409

Halogenated solvents (benzene, gasoline, acetone or carbon tetrachloride)

Strong alkalinity

Methyl ethyl ketone

Abrasive substance

disassemble



danger

Only remove the switch in case of power failure (electrical, hydraulic/pneumatic).

Switch disconnection from pressure and power supply must be performed by trained or directed personnel in accordance with the most advanced standards.



warning

Be aware that the surface of the shell may become very hot if the operating temperature is higher!

FM160-RS485

Flowmeter Communication Protocol (MODBUS-RTU)

1. RTU Data Format Description

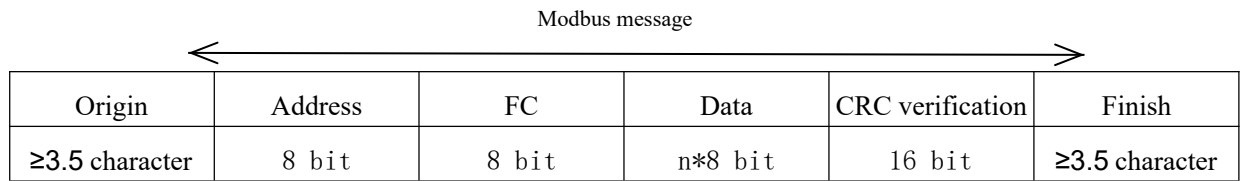
1.1 Communication Mode

The instrument adopts MODBUS RTU format, and the protocol is used for master-slave query mode data communication.

1.2 Data Format

In RTU mode, each byte (11 bits) is formatted as follows: the encoding system is 8-bit binary.

Each byte consists of: 1 start bit, 8 data bits (with the least significant bit sent first), no parity bit, and 1 stop bit. The baud rate is selectable: 2400,4800,9600,19200, or 115200.



- pour :
- (1) In RTU mode, idle intervals lasting at least 3.5 character time are used to separate message frames.
 - (2) The whole frame must be sent as a continuous character stream.
 - (3) The idle interval between two characters should not exceed 1.5 character time.

1.3 Address

The protocol specifies that the instrument addresses range from 0 to 255, with 0 reserved for broadcast (which this protocol does not support), and the remaining addresses are reserved.

2. Command Description

2.1 This Instrument Utilizes Two Commands from the MODBUS Protocol:

Command 03	Read single hold register
Command 06	Write single hold register

The Format of Command 03 Is as Follows (read Register Command):

MODBUS request

Instrument address	1 BYTE	01-255
FC	1 BYTE	0x03
Start address	2 BYTE	00-06
Read count	2 BYTE	1-7
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

MODBUS response

Instrument address	1 BYTE	01-255
FC	1 BYTE	0x03
Byte count	1 BYTE	02-0E
Input mode	N*2 BYTE	
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

The format of command 03 is as follows (read register command):

MODBUS request

Instrument address	FC	Start address	Read count	CRC low-order	CRC high-order
1 BYTE	1 BYTE	2 BYTE	2 BYTE	1 BYTE	1 BYTE
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

MODBUS response

Instrument address	FC	DL	Data	CRC low-order	CRC high-order
1 BYTE	1 BYTE	1 BYTE	2 BYTE	1 BYTE	1 BYTE
0x01	0x03	0x02	0x00 0x56		

Instance :

Read instantaneous flow

Read temperature

Host request: 01 03 00 00 00 01 84 0A

Host request: 01 03 00 02 00 01 25 CA

Slave return: 01 03 02 00 00 B8 44 // Flow: 0 Slave return: 01 03 02 01 04 B8 17 // Temperature 26.0

Send a read command to the 01 sensor to read 5 registers

MODBUS request

Instrument address (default)	FC	Register address	Read count	CRC verification
01	03	00 00	00 05	85 C9

MODBUS response

Instrument address	FC	Return the number of bytes	Register 1	Register 2	Register 3	Register 4 and 5	CRC verification
01	03	0A	02 03	00 00	01 0F	00 00 09 4D	02 39

Explanation: 01 The sensor responds to the read command and returns 10 bytes.

02 03: The decimal value is 515, indicating a flow rate of 51.5 L/min;

00 00: The decimal value is 0, indicating a positive temperature.

01 0 F: The decimal value is 271, which corresponds to a temperature of 27.1°C;

00 00 09 4 D: The decimal value is 2381, indicating a cumulative flow of 238.1 liters.

Flow rate: 51.5 L/min Temperature: 27.1°C Total flow: 238.1 L

The command 06 format is as follows (write register command):

MODBUS request

Instrument address	FC	Register address	Register value	CRC low-order	CRC high-order
1 BYTE	1 BYTE	2 BYTE	2 BYTE	1 BYTE	1 BYTE
01-255	0x06				

MODBUS response

Instrument address	FC	Register address	Register value	CRC low-order	CRC high-order
1 BYTE	1 BYTE	2 BYTE	2 BYTE	1 BYTE	1 BYTE
01-255	0x06				

The register value can be modified by writing the 06 instruction.

Instance :

Set address 01

Set baud rate to 9600

Host request: 01 06 00 10 00 01 49 CF

Host request: 01 06 00 11 00 02 58 0 E

Slave return: 01 06 00 10 00 01 49 CF

From slave return: 01 06 00 11 00 02 58 0 E

Clear cumulative traffic

Host request: 01 06 00 12 00 00 29 CF

From slave return: 01 06 00 12 00 00 29 CF

Clear accumulated count: Write register value 0 to register address 0x12(18)

MODBUS request

Instrument address (default)	FC	Register address	Read-in data	CRC verification
01	06	00 12	00 00	29 CF

MODBUS response

Instrument address (default)	FC	Register address	Read-in data	CRC verification
01	06	00 12	00 00	29 CF

Configuration description:

The Parity Bit Is Fixed Without Parity Check, and the Stop Bit Is Fixed at 1 and Cannot Be Changed.

Order	Explain	Short-cut process
Address (id)	1(Factory default)	1-255
Baud rate	2(Factory default)	0-4 Baud=0 r485_baud=2400 Baud=1 r485_baud=4800 Baud =2 r485_baud =9600 Baud =3 r485_baud = 19200 Baud=4 r485_baud=115200

3. Data Item Definition

10 The 16 modbus register is a different notation of the same parameter, and the notation varies by host software. If one is not recognized, try another.

There are 2 kinds.

(Recommended polling interval: more than 100ms. Wait 100ms after reading the previous sensor before reading this one)

03H

Instruction

10 address in base	16 address in base	Modbus address	Register data type	Read/Write Type	Explain
0	0	40001	16 unsigned integer	Read only	Instantaneous flow rate (displayed as *0.1 L/min when one decimal place)
1	1	40002	16 unsigned integer	Read only	Temperature (positive: 0, negative: 1)
2	2	40003	16 unsigned integer	Read only	Current temperature (°C, 1 decimal place)
3	3	40004	16 unsigned integer	Read only	Cumulative flow rate 16 bits
4	4	40005	16 unsigned integer	Read only	The cumulative flow is 16 bits, and the two addresses together form a 32-bit unsigned integer (L, read value*0.1)
.....					
16	10	40017	16 unsigned integer	Write only	485 Slave address (1-250)
17	11	40018	16 unsigned integer	Write only	485 Communication baud rate (0 ~ 5) 0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 115200 bps
18	12	40019	16 unsigned integer	Write only	Clear cumulative flow (write value must be 0)

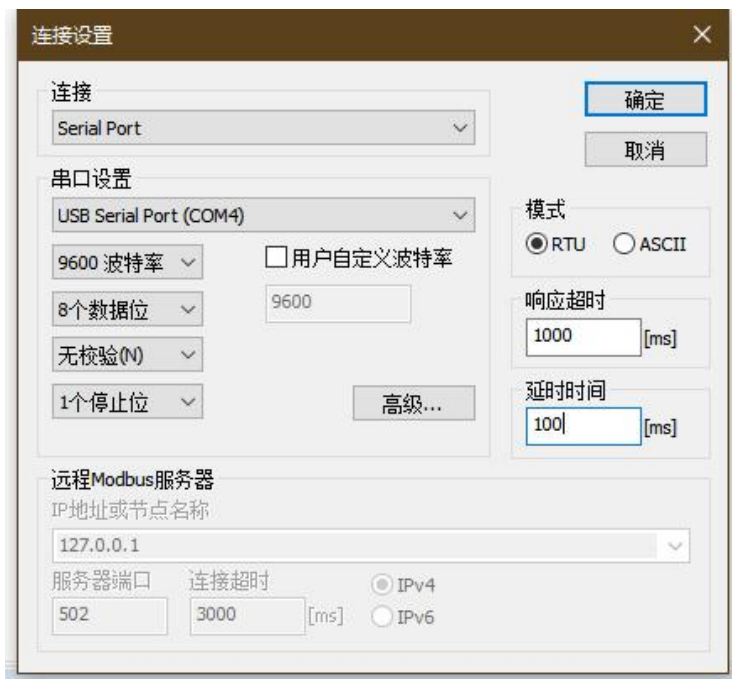
4. Modbus Poll Communication Reference

- (1) Open modbus-poll, select Settings> Read/Write Configuration in the menu, set the slave ID to 1, function to 03 Read, address to 0, and quantity to 5.



- (2) Click Menu> Connect-Connect

Connection method: Serial Port (select serial port), baud rate 9600, 8-bit data, no parity, 1-bit stop bit, RTU mode, delay time 100ms.



(3) You Can See the Current Read Value

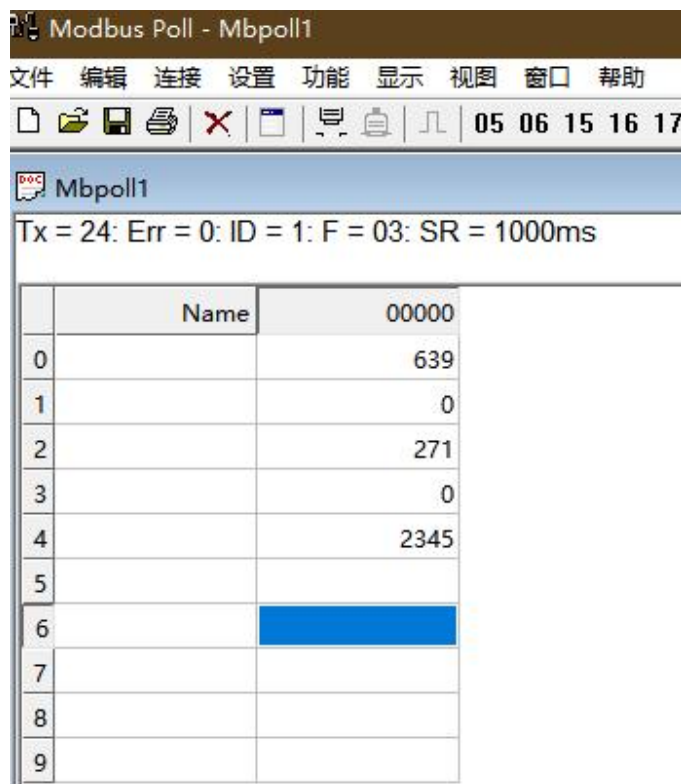
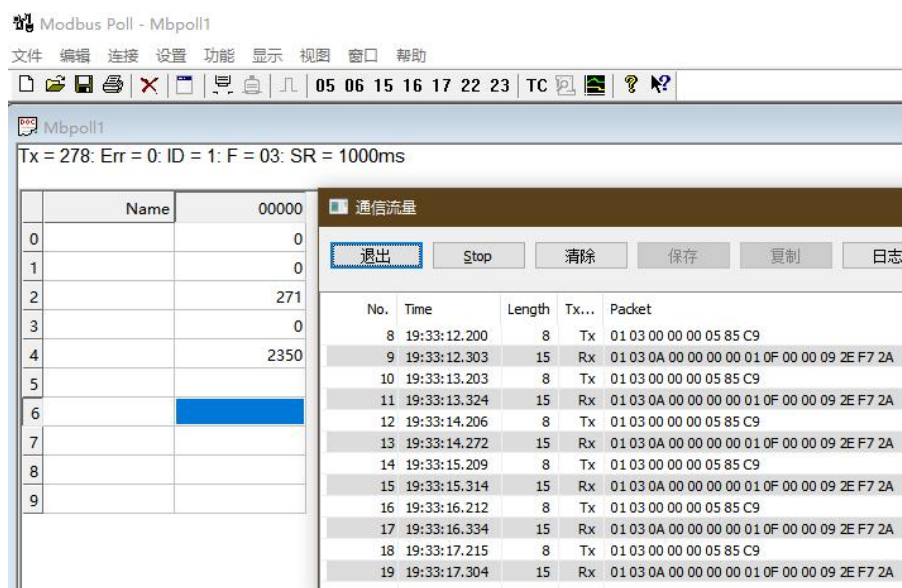
Address 0 is 0, and the current flow rate is 63.9 L/min.

Address 1 is 0, and the temperature is positive.

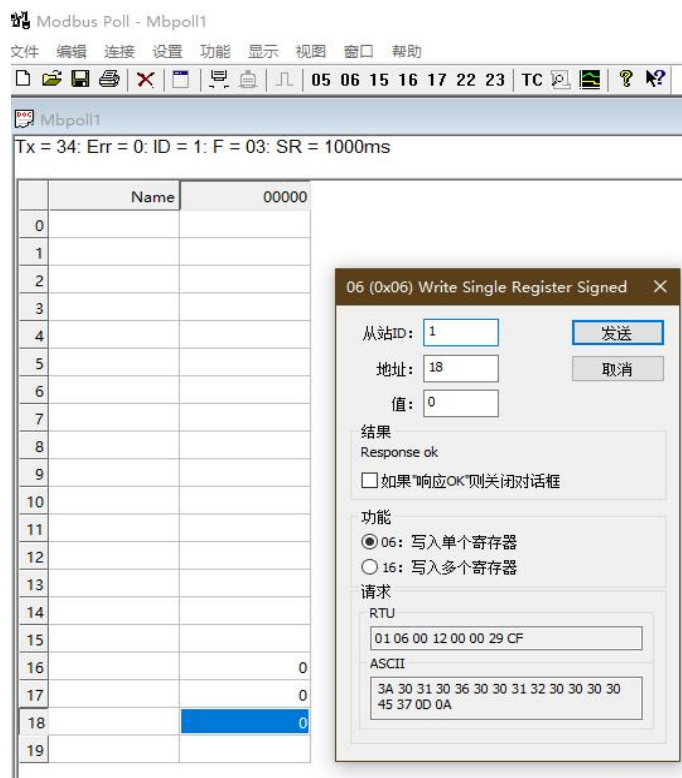
Address 2 is 271, and the temperature is 27.1°C;

Address 3 is 0,

Address 4 is 2345. Address 3 and Address 4 together form a 32-bit unsigned integer, with a cumulative flow of 234.5 L.

**(4) Click the Communication Menu to View Real-Time Command Sending and Receiving.**

(5) Double-Click Address 0x 12 (18), Change the Value to 0, and Click Send to Reset the Accumulated Traffic to Zero.



Frequently Asked Questions:

1. No response to communication
- 1 1. Check if the device is functioning properly. 2. Verify that the baud rate is set correctly and the read address matches the device's address.
- 2: Sometimes it disconnects, sometimes it reconnects.
- The baud rate may be too fast. The recommended reading speed is no more than 10Hz.
3. The cumulative traffic reset has no response.

To clear the cumulative flow, the value must be 0 to execute the operation.

File revision history

Revise	Description	Date
V1.0	Initial version	
V1.1	Add 4. Modbus-poll communication reference	2025.12.24

The company reserves the right to modify the specifications contained herein without prior notice.

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