



Principle structure

The platinum resistance temperature sensing element is used for temperature measurement, and the signal is converted into a standard industrial electrical signal after processing by a post-processing circuit and displayed. Designed with an integrated injection molded housing, this series of products can be used in a variety of industrial applications. Key setting, easy operation, high-light LED can digitally display real-time measurement values. A variety of connection methods can fully meet a variety of specific installation needs.

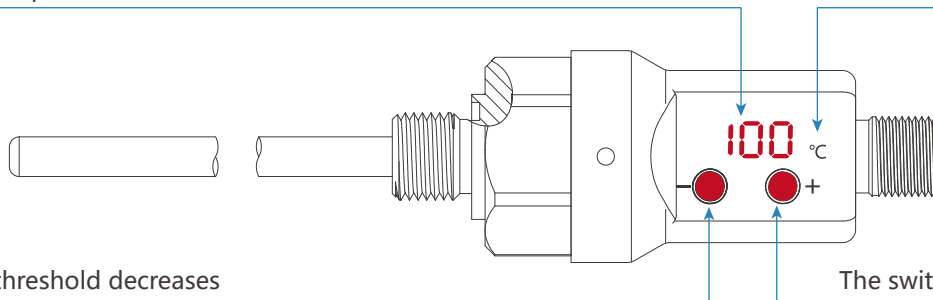
Technical parameter

◇ Supply voltage: 12... 30Vdc	◇ Stability (annual drift) : $\pm 0.3\%$ range
◇ No-load current consumption: maximum 30mA, 24Vdc power supply	◇ Temperature:
◇ Output type: PNP/NPN can be set, normally open/normally closed can be set,	Medium temperature: -200... 250 °C
Switch output current: <200mA	Ambient temperature: -20... 80°C
Response time: <10ms	Storage temperature: -30... 80°C
Switching accuracy: $\pm 0.5\%$ range	◇ Material:
◇ Switch setting mode: button increase/decrease	Medium contact part: stainless steel 304
◇ Switch point return difference: factory default return difference is 0.5% of the set value of the switch (configurable)	Housing: engineering plastic
◇ Connection protection: reverse phase, overload, paragraph protection	◇ Protection grade: IP67
◇ Accuracy: $\pm 1^\circ\text{C}$	◇ Outlet: M12x1 connector

Panel diagram

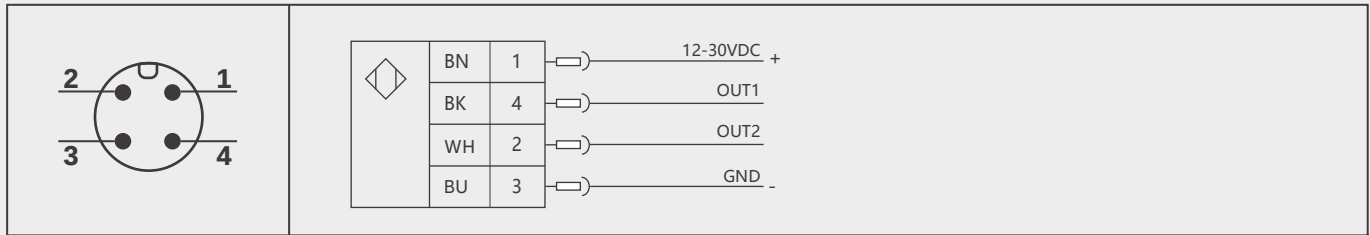
Real-time temperature value

Temperature unit



At the same time, press the Reduce key or the Increase key to enter the secondary menu

Wiring diagram



switch/frequency

color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)
BK	4 (OUT1)	SP1 Switch PNP (Factory default) SP1 Switch NPN Frequency (full scale 100Hz)	WH	2 (OUT2)	/

Analog output: 4-20mA

color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)
BK	4 (OUT1)	4-20mA	WH	2 (OUT2)	/

Analog output: 1-5V

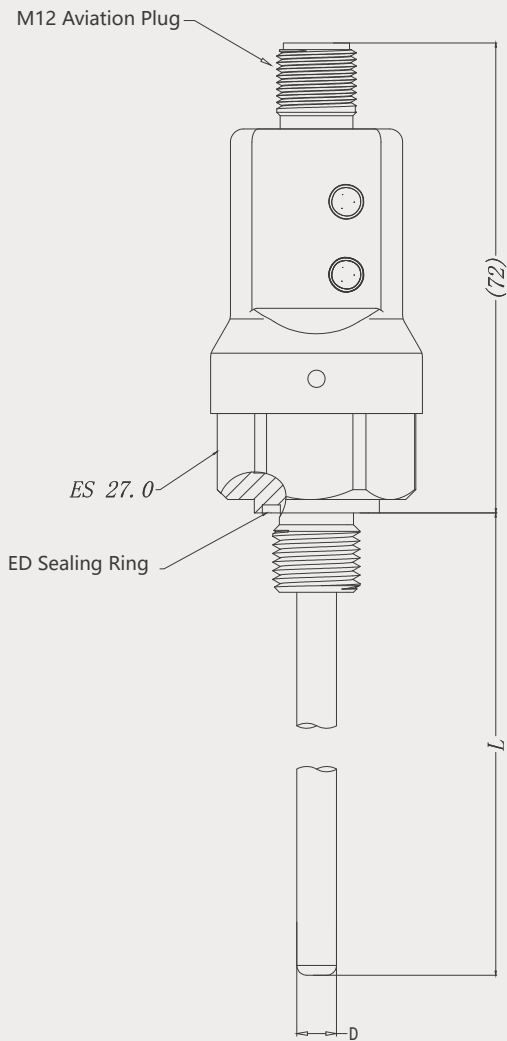
color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)
BK	4 (OUT1)	1-5V	WH	2 (OUT2)	/

RS485

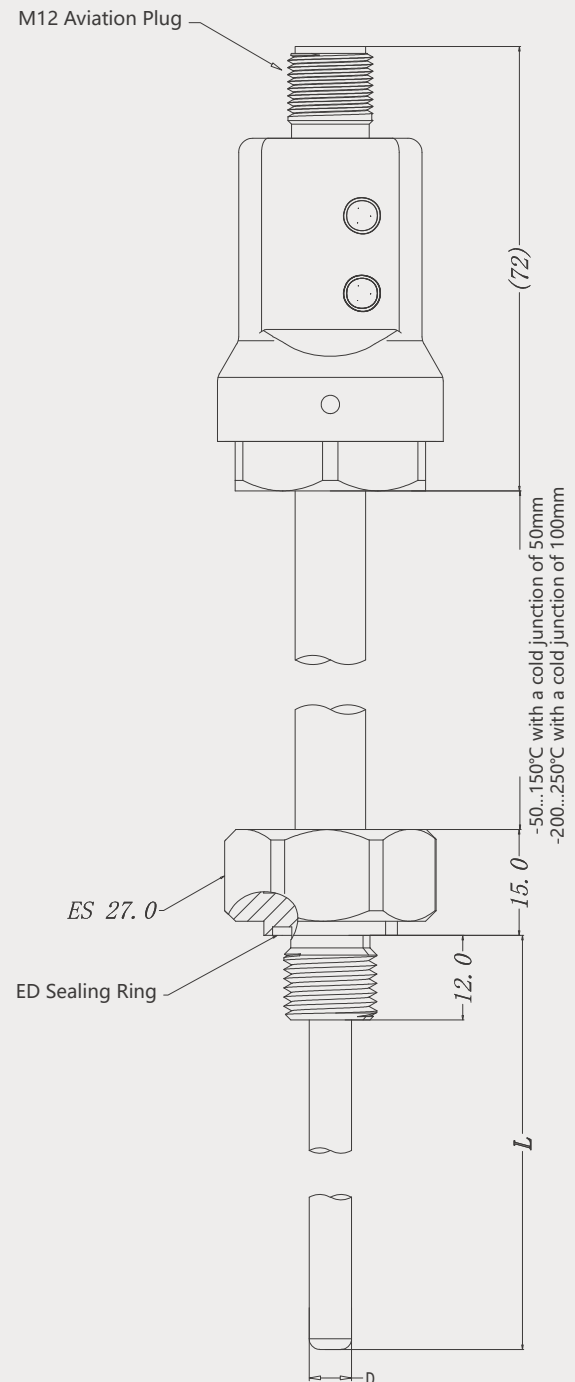
color	stitch	Instructions	color	stitch	Instructions
BN	1	power supply (+)	BU	3	power supply (-)
BK	4 (OUT1)	RS485(B)	WH	2 (OUT2)	RS485(A)

Dimension drawing (mm)

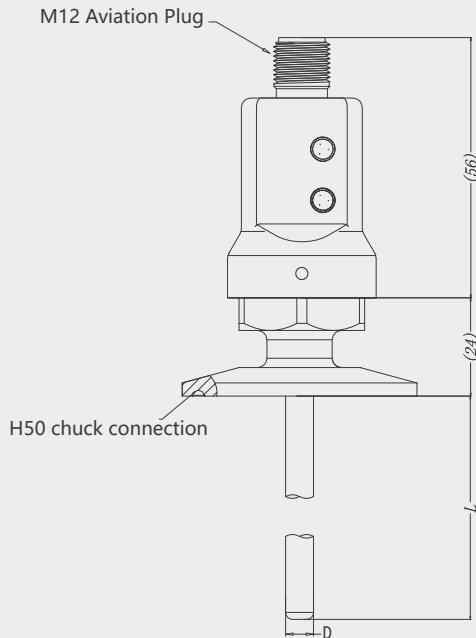
standard type



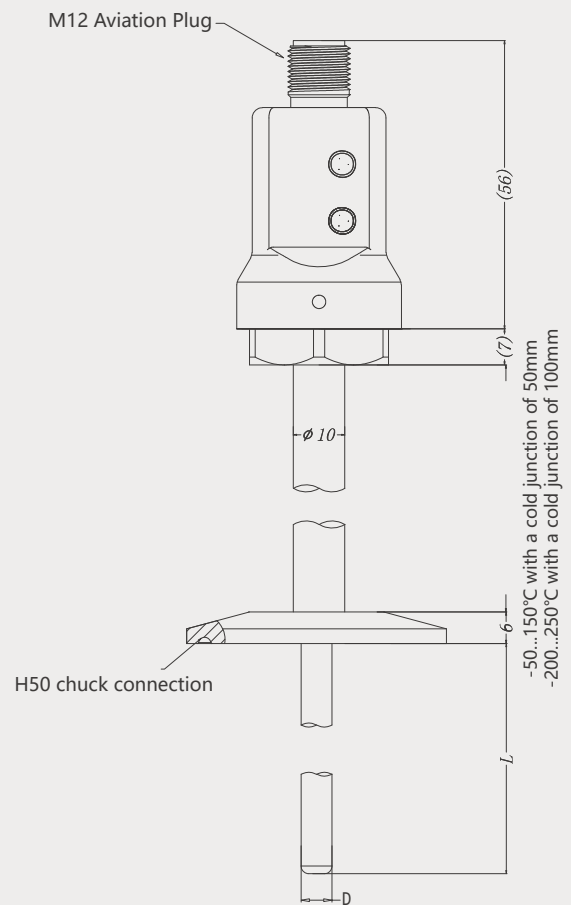
High low temperature type



Chuck type connection



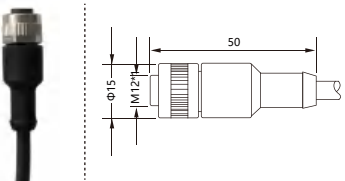
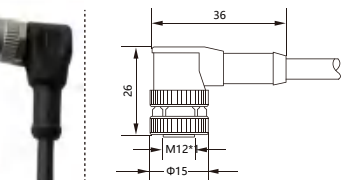
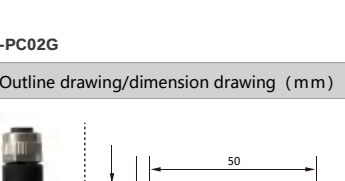
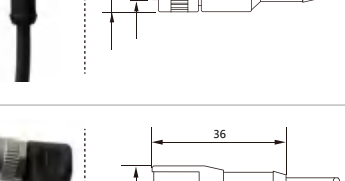
Chuck type connecting high and low temperature type

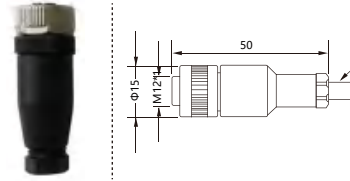
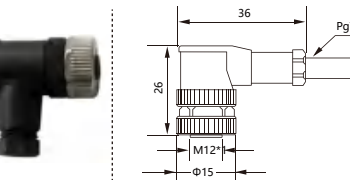


Selection list

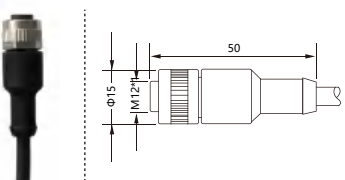
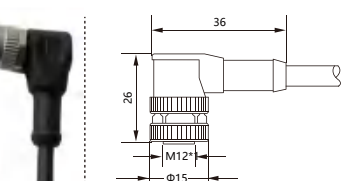
TS200-	C20100	D6	L25	G14M	-	expatiate
TS200-						TS200 Electronic Temperature Switch (Sensor)
	C0100					Range: 0...100°C
	C2080					Range: -20...80°C
	C20100					Range: -20... 100 °C
	C50150					Range: -50... 150 °C
	C200250					Range: -200... 250 °C
		D6				The probe diameter is 6
		D8				The probe diameter is 8
			L25			Probe length: L= 25mm with thread
			L50			Probe length: including thread L= 50mm
			L75			Probe length: including thread L= 75mm
			L100			Probe length: including thread L= 100mm
			--			L =XXXmm: Probe length can be customized
				G14M		Process connection: G1/4 external thread
				G12M		Process connection: G1/2 external thread
				H50		Process connection: Sanitary chuck 50.5
					-	Output signal: switch/frequency(3-core cable)
					A	Output signal: analog 4-20mA(3-core cable)
					V	Output signal: analog 1-5V(3-core cable)
					RS	Output signal: RS485(4-core cable)

Factory standard:ZL03-PC02G

name	Outline drawing/dimension drawing (mm)	material	model
M12*1-4Pin (2m cable)		PUR	ZL03-PU02G
M12*1-4Pin (5m cable)			ZL03-PU05G
M12*1-4Pin (10m cable)			ZL03-PU010G
M12*1-4Pin (2m cable)		PVC	ZL03-PC02G
M12*1-4Pin (5m cable)			ZL03-PC05G
M12*1-4Pin (10m cable)			ZL03-PC010G
M12*1-4Pin (2m cable)		PUR	ZL03-PU02W
M12*1-4Pin (5m cable)			ZL03-PU05W
M12*1-4Pin (10m cable)			ZL03-PU010W
M12*1-4Pin (2m cable)		PVC	ZL03-PC02W
M12*1-4Pin (5m cable)			ZL03-PC05W
M12*1-4Pin (10m cable)			ZL03-PC010W

M12* 1-4pin self-connector/size drawing (mm)	model
	GL04 (4Pin joint)
	WL04 (4Pin joint)

Factory standard:ZL04-PC02G

name	Outline drawing/dimension drawing (mm)	material	model
M12*1-4Pin (2m cable)		PUR	ZL04-PU02G
M12*1-4Pin (5m cable)			ZL04-PU05G
M12*1-4Pin (10m cable)			ZL04-PU010G
M12*1-4Pin (2m cable)		PVC	ZL04-PC02G
M12*1-4Pin (5m cable)			ZL04-PC05G
M12*1-4Pin (10m cable)			ZL04-PC010G
M12*1-4Pin (2m cable)		PUR	ZL04-PU02W
M12*1-4Pin (5m cable)			ZL04-PU05W
M12*1-4Pin (10m cable)			ZL04-PU010W
M12*1-4Pin (2m cable)		PVC	ZL04-PC02W
M12*1-4Pin (5m cable)			ZL04-PC05W
M12*1-4Pin (10m cable)			ZL04-PC010W

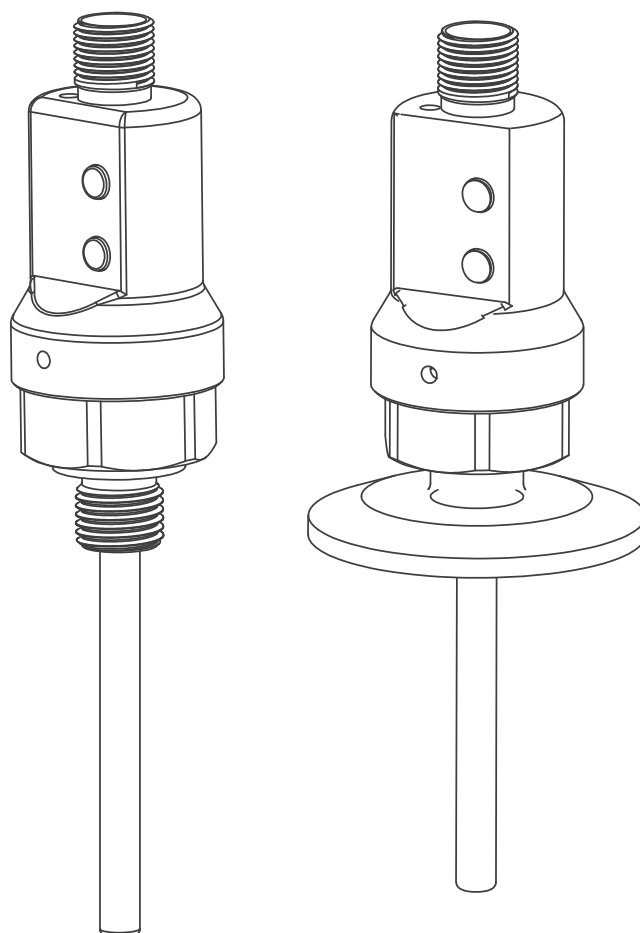
—— Sensor and controller ——
■ Flow ■ pressure ■ temperature ■ level ■ position

KATU 卡图

Operation instruction

Electronic temperature switch

TS200 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.

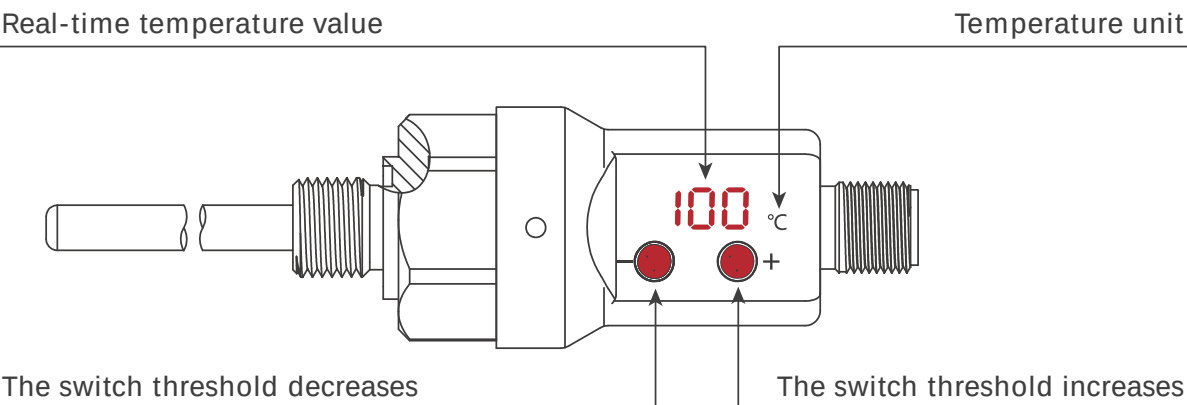


Deal with

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

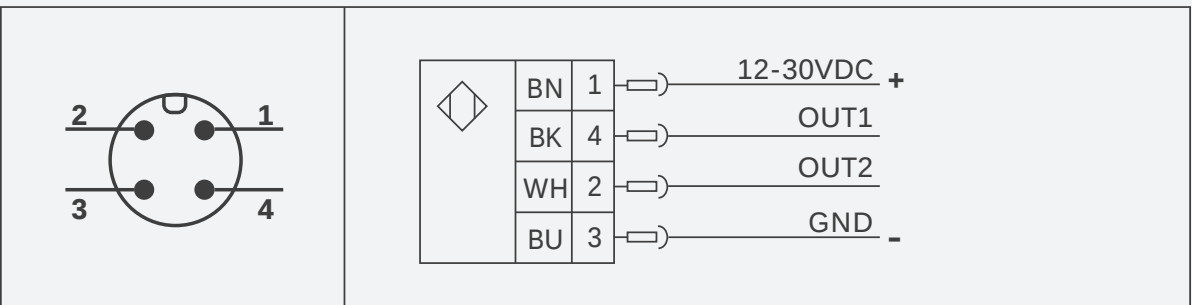
Sensors (switches) cannot be disposed of with household waste!

Panel description



At the same time, click the Reduce key or the Increase key to enter the secondary menu

Electrical connection



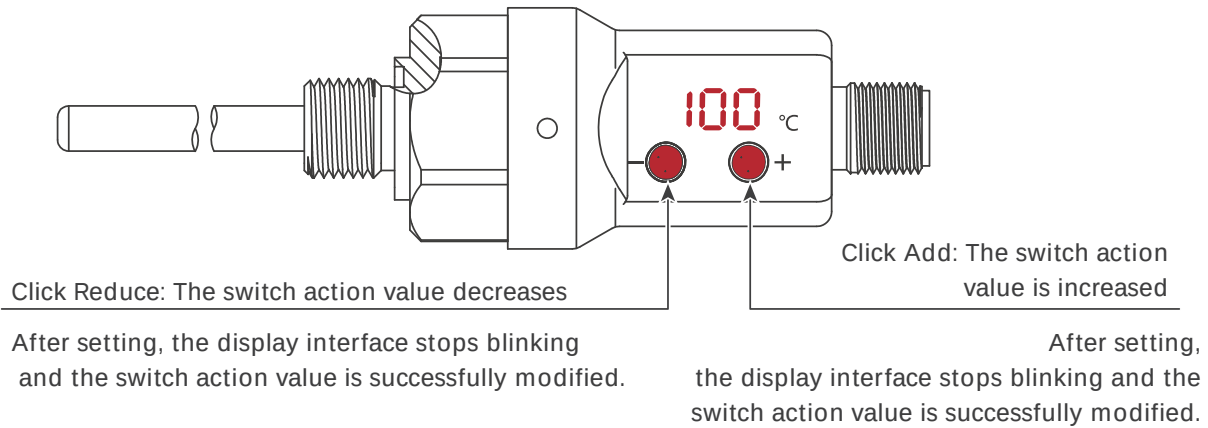
Switch/frequency		
colour	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	SP1 switch PNP (factory default) SP1 switch NPN Frequency (full scale 100Hz)

Analog output: 4-20mA		
colour	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	4-20mA

Analog output: 1-5V		
colour	stitch	Instructions
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	1-5V

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

■ Switch action point convenient operation mode



LED display status description: When the LED display blinks, the switch setting value is displayed. When the display is not blinking, the current measurement value is displayed.

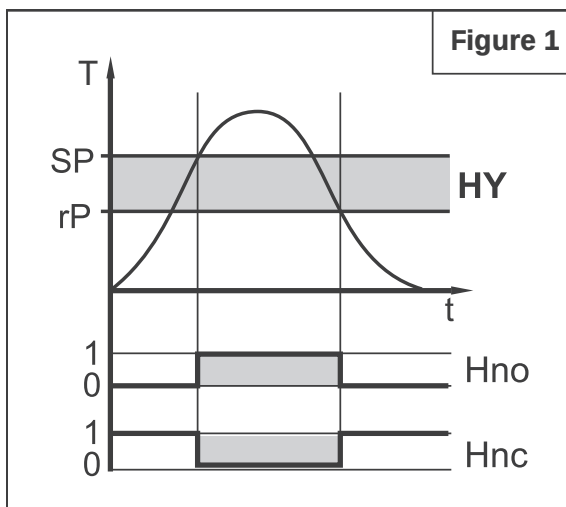
■ Switching function

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)

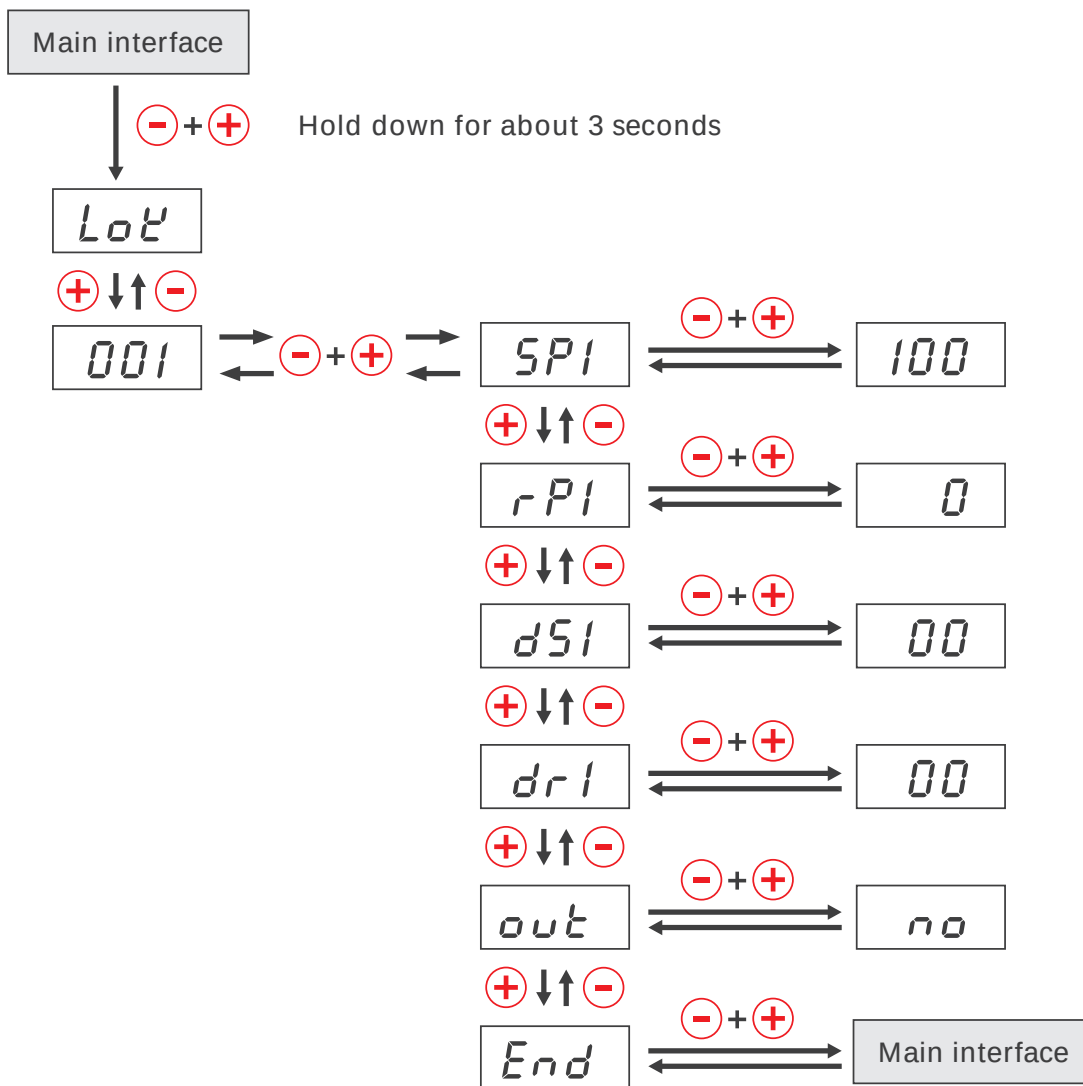
First set the switch point: (SP), Then set the reset point: (rP).

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



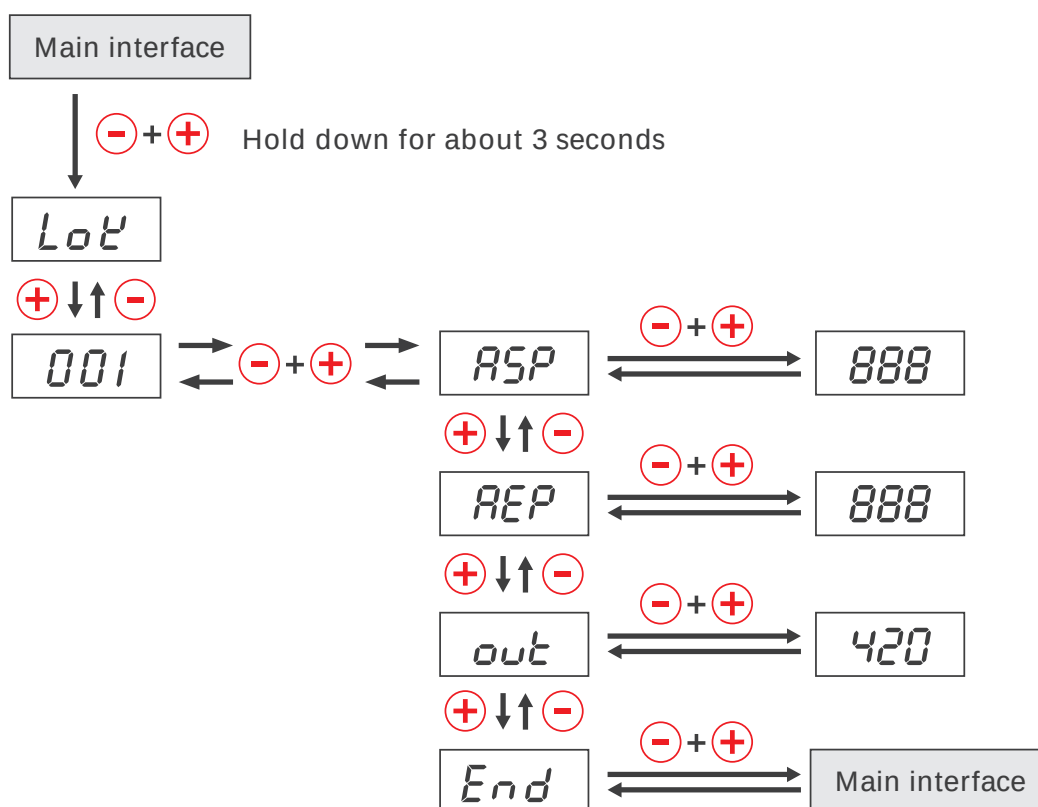
001 menu	
sp1	Switch alarm value (factory default value is 0.2% of the range)
rp1	Switch reset value (factory default is SP1-0.5%)
ds1	OUT1 turn-on delay (factory default is 0s)
dr1	OUT1 shutdown delay (factory default is 0s)
out	Switch output signal: Normally open (no)/Normally closed (nc)
end	Confirm to save and exit

■ 001 Menu debugging (non-professional personnel do not operate)



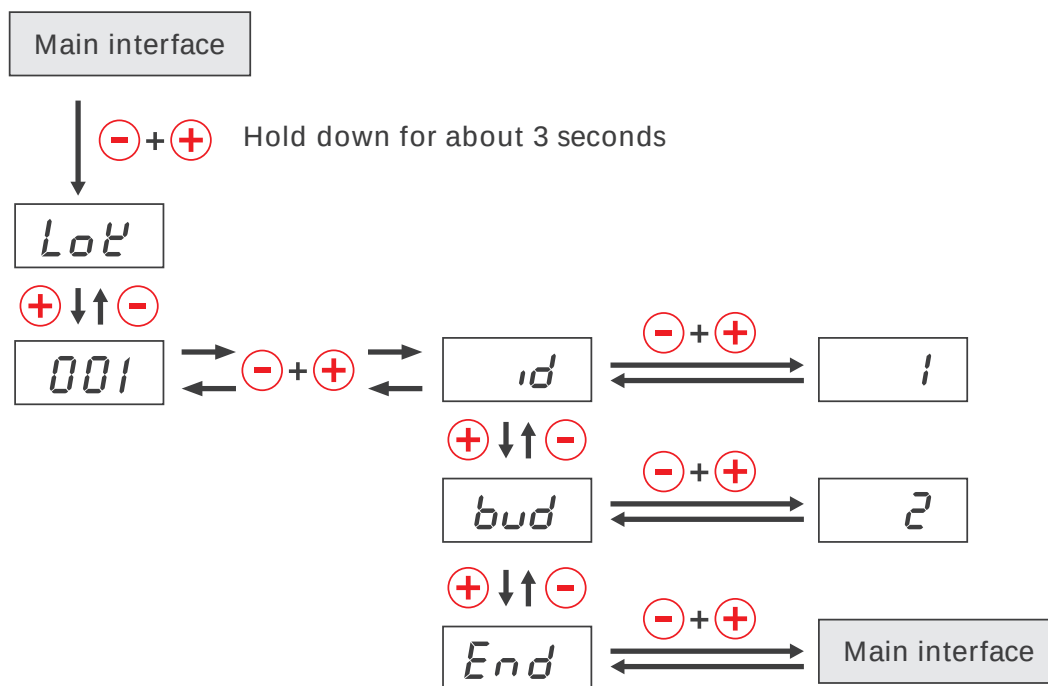
001 Menu	
ASP	Lower limit of analog range
AEP	Upper limit of analog range
OUT	Analog output signal (factory default 420)
	420: 4-20mA
	020: 0-20mA
	204: 20-4mA
	200: 20-0mA
end	Confirm to save and exit

■ 001 Menu debugging - Analog (non-professional personnel do not operate)



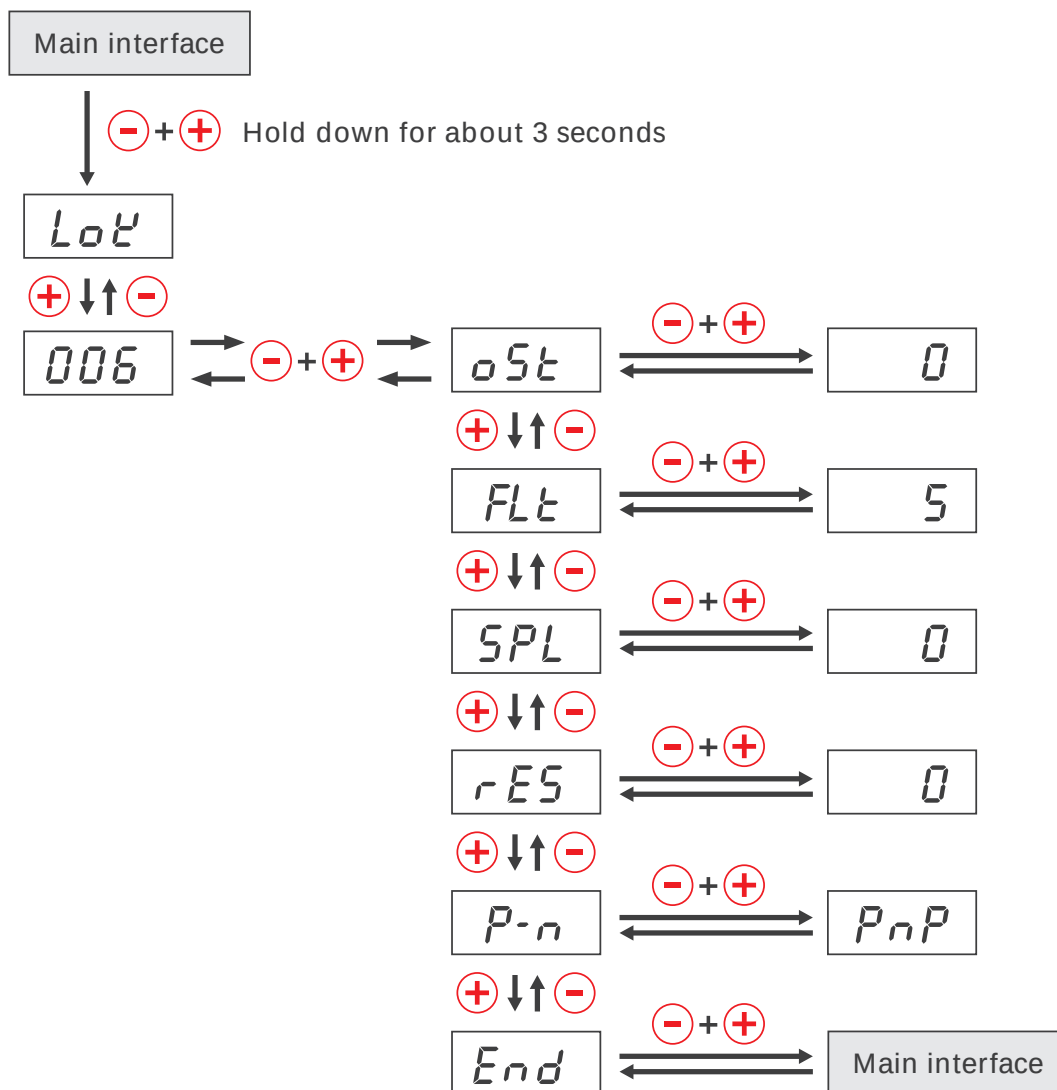
001 Menu	
id	Meter address (Factory default 1)
bud	Baud rate (Factory default 2)
	0: 2400
	1: 4800
	2: 9600
	3: 19200
	4: 115200
end	Confirm to save and exit

■ 001 Menu debugging -RS485 (non-professional personnel do not operate)



006 menu	
ost	Display value compensation, the default is 0, increase and decrease the value, the actual display value corresponds to the increase or decrease of the corresponding value
flt	The filter coefficient is adjustable from 0 to 100. The default value is 5
spL	Display value The reaction rate increases/decreases
res	factory data reset.
p-n	PNP/NPN switchover
end	Confirm to save and exit

■ 006 Menu debugging (non-professional personnel do not operate)



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!

200 Series Temperature -RS485 Communication Protocol (MODBUS-RTU)

1.RTU data format description

1.1 Communication mode

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

1.2 data format

The format of each byte in RTU mode is:

The encoding system is: 8-bit binary

Bits per byte: 1 start bit, 8 data bits (least significant bit sent first), 1 stop bit

Five baud rates are available: 2400, 4800, 9600, 19200, 115200

start	address	Function code	data	CRC check	end
≥3.5 character	8 bit	8 bit	n*8 bit	16 bit	≥3.5 character

note:

- (1) in RTU mode, an idle interval of at least 3.5 characters separates the packet frames.
- (2) The entire message frame must be sent in a continuous stream of characters.
- (3) The idle interval between two characters should not exceed 1.5 character time.

1.3 address

In the protocol, the address of the instrument is "0-255", and the "0" address is used for broadcasting, and the other addresses are reserved.

2. Command description

2.1 This instrument uses two instructions in the MODBUS protocol:

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

2.2 data format

The data format in the protocol is: floating-point number. Modbus sends the most significant word first. The protocol data encoding sequence is 3412, decoding sequence is 1234.

32 single-precision floating-point number the single format is IEEE754, equivalent to 4 bytes and the sequence is 3-4-1-2.

After decoding into the 1-2-3-4 sequence, the 31st, 30th, 29th, ..., and 0 bits from the highest to the lowest are respectively.

The 31 bits are the sign bits(S), where 1 means the number is negative and 0 is positive; 30-23 bits, a total of 8 bits is the level code; 22-0 digits, a total of 23 digits is mantissa.

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

note:

MODBUS request

Instrument address	1 BYTE	01-255
Function code	1 BYTE	0x03
Start address	2 BYTE	0-FFFF
Read quantity	2 BYTE	1-12
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

MODBUS response

Instrument address	1 BYTE	01-255
Function code	1 BYTE	0x03
Byte count	1 BYTE	
Input state	N*2 BYTE	
CRC low-order	1 BYTE	
CRC high-order	1 BYTE	

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

Clears the value of total accumulated traffic

MODBUS request

Instrument address	1 BYTE	01-255	
Function code	06	0x06	
Byte count	1 BYTE		

MODBUS response

Instrument address	1 BYTE	01-255	
Function code	06	0x06	
Byte count	1 BYTE		

Description of communication:

Configuration instructions (power off and then power on after changing the address or baud rate)

sequence	Explain	value
Address (id)	Address(default is 1,can be modified)	example: 0001
baud	9600 (revisibility)	2400-115200

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

Data item definition (485 scan speed should not be less than 200ms)

sequence	Instructions
40001	Plus or minus (0 is positive, 1 is negative)
40002	Display the Temperature value
40003	Number of decimal points in Temperature value

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