DIGITAL TEMPERATURE SWITCH

—— MANUAL

■ I. NOTICE

1.After receiving the product, please check whether the packaging and appearance are intact, and check whether the product model and specifications match the product you purchased.
2. Install and wire the product correctly and reliably according to the process connection, electrical connection and installation method provided by the product.
3. Please pay attention to the product's technical specifications and usage conditions during use, such as the permissible medium and temperature, overload range, power supply voltage, etc.
4. The temperature switch is a precision device. Please do not disassemble it by yourself when using it, and do not touch the probe rod with hard objects to avoid damage to the product.
5. During installation, pay attention to protecting the product and do not install forcefully or disassemble it, otherwise it is easy to damage the product, especially the installation thread.
6. Please use a suitable wrench when installing or disassembling. Do not forcibly twist the housing by hand to tighten or disassemble, otherwise the damage caused will not be covered by the warranty.
7. After installation and power-on test, it usually takes several minutes for the product to have stable output and normal operation. This is a normal phenomenon.
8. If abnormal phenomena occur during power-on testing after installation, please contact our after-sales technicians.

(!) Product damage caused by non-professional operation that does not follow operating specifications is not covered by the warranty.

■ II. WARNING

1. When the ambient temperature is above 60°C, please use a forced fan or cooler for cooling.
2. The installation, debugging and maintenance of this product should be carried out by qualified engineering and technical personnel.
3. Please ground the product shell reliably to help resist electromagnetic interference and ensure electrical safety.
4. If the fault or abnormality of this product may cause a major accident in the system, please set up an appropriate external protection circuit to prevent accidents.
5. The company is not responsible for any direct or indirect losses other than the product itself.
6. The company reserves the right to change product instructions without notice.

■ III. DESCRIPTION

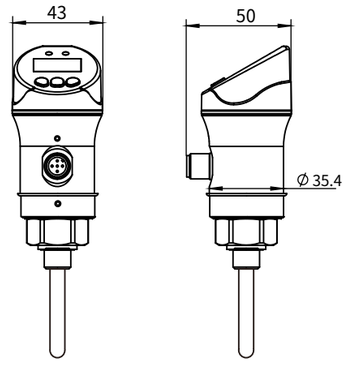
This is a digital temperature switch with OLED screen suitable for temperature measurement environment. The product adopts 304 stainless steel case and plastic case head design, with protection capability up to IP65 level. The product can be used in harsh environment. The product is equipped with a two-stage rotation structure, which can adjust the screen direction to ensure that customers can get a good viewing angle in different installation positions. This temperature switch is equipped with multiple function buttons, and users can quickly set upper and lower limits, hysteresis mode/window mode and other functions. Equipped with a standard 5-core M12 aviation plug cable, users can directly replace the old mechanical switch.

■ IV. SPECIFICATION

Range: (50~300)°C customized available (e.g. -50~100)°C)
Display accuracy【℃】: ± 0.3 + (± 0.1 % MS) (MS = set measurement range value)
Screen display mode :OLED
Supply voltage:(12~28)VDC
Output signal: Output 1: NPN or PNP (switchable)
Output 2: NPN or PNP (switchable)
Output 3: (4-20) mA
(Subject to the output method of the actual product)
Response time: 50ms
Load current:＜200mA
Operating temperature:(-20~65)°C
Electrical connections:M12 plug
Electrical protection:Anti-reverse connection protection, antielectromagnetic interference
Thread port: M20×1.5, G1/4 or customized thread
Metal material: 304 stainless steel
Protection rating: Ip65
Accessories: Standard 5-core M12 aviation plug cable

■ V. DIMENSION

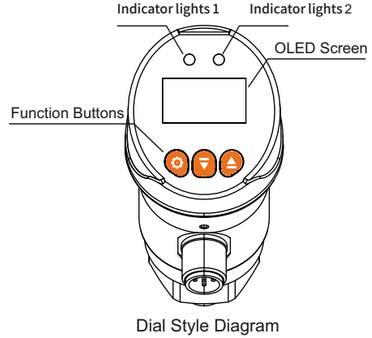
UNIT: mm



Front view and side view

Bottom View

■ VI. DIAL FUNCTION



Dial Style Diagram

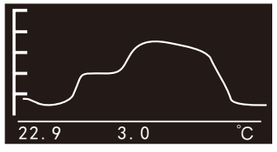
Buttons	Functions	Special Instructions
	Set Button	Short press this button on the main interface to enter the output upper and lower limit settings. It acts as a function switch button and parameter save button in the menu.
	Decrease Button	In the menu, it acts as a number modification and function parameter switching function. Short press to reduce the number.
	Increase Button	In the menu, it acts as a number modification and function parameter switching function. Short press to increase the number.
Indicator lights 1, 2	Action status indicator light	Red light status: action triggered Green light status: no action triggered.

■ Ⅶ. PANEL DIAGRAM

7.1 OLED screen main interface

Interface	Function	Special Instructions
0.0	Real time value	/
℃	Unit	Units can be switched (℃, °F)
0%...100%	Progress bar	Displays the real-time measurement value as a percentage of the range.
	Unlock mode	/
	Lock mode	The main interface is locked and other functions cannot be entered by short pressing the button.
32.7	Historical maximum	The maximum temperature value will be recorded after power-on.
-32.7	Historical minimum	The lowest temperature value will be recorded after power-on.

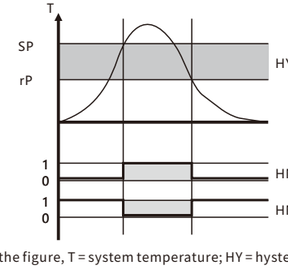
7.2 Line chart interface



Interface	Function	Special Instructions
curve	Real-time numerical display	
℃	Unit	Units can be switched (℃, °F)
	Scale	From low to high is the percentage of the range.
22.9	Historical maximum	The historical maximum temperature value will be recorded after startup.
3.0	Historical minimum	The historical minimum temperature value after startup will be recorded.

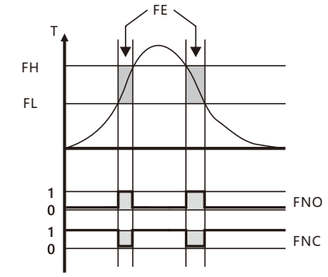
■ Ⅷ. SWITCH OUTPUT FUNCTION

If the displayed value is above or below the set switching limit (SPx, rPx), its switching state changes. The following switching functions can be selected:
※ Hysteresis function normally open: output x = [HNO] (refer to Figure 6)
※ Hysteresis function normally closed: output x = [HNC] (refer to Figure 6)
First set the switching point: (SPx), then set the reset point: (rPx).
If SPx is changed again, the hysteresis will also change.



In the figure, T = system temperature; HY = hysteresis
Figure 6 Schematic diagram of hysteresis function

※ Window function normally open: =[FNO] (refer to Figure 7)
※ Window function normally closed: =[FNC] (refer to Figure 7)
The width of the window can be set by the difference between FHx and FLx
FHx = upper limit, FLx = lower limit.



In the figure, T = system temperature; FE = window
Figure 7 Window function diagram

■ Ⅸ. BASIC FUNCTIONS

9.1 Basic Function Introduction

Name	Introduce
Lock interface	Features: The main interface is locked and other functions cannot be entered by short pressing the button.Prevent accidental touch.
	How to enter: In the main interface, long press ▼ and ▲ buttons for 5 seconds at the same time. The icon will appear 🔒 and enter the lock mode. long press ▼ and ▲ buttons for 5 seconds in the lock mode to cancel the mode.
High and low value settings (SP1/rP1) (FH1/FL1)	Function introduction: Set switch 1 alarm value / set switch 1 reset value in hysteresis mode (SP1/rP1) In window mode, set the upper/lower limit of system temperature when output 1 is turned on (FH1/FL1)
	How to enter: When the first-level menu displays the corresponding letter, short press ○ to enter, long press ▲ or ▼ for 3 seconds to set the corresponding data. ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save
High and low value settings (SP2/rP2) (FH2/FL2)	Function introduction: Set switch 2 alarm value / set switch 2 reset value in hysteresis mode. (SP2/rP2) In window mode, set the upper/lower limit of system temperature when output 2 is turned on. (FH2/FL2)
	How to enter: When the first-level menu displays the corresponding letter, short press ○ to enter, long press ▲ or ▼ for 3 seconds to set the corresponding data. ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save.
Analog output Corresponding point (ASP2) (AEP2)	Function introduction: Configurable analog output starting point (ASP2) of system temperature, Configurable analog output end point (AEP2) of system temperature.
	How to enter: When the first-level menu displays the corresponding letter, short press ○ to enter, long press ▲ or ▼ for 3 seconds to set the corresponding data. ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save.
Secondary menu Mode (EF)	Function introduction: Enter output function, unit switching, action delay, screen setting, zero point calibration and other function settings
	How to enter: In the first level menu setting, after the screen displays "EF", after short pressing ○, the system automatically enters the secondary menu mode.
Switch 1 Output mode switch (OU1)	Function introduction: OU1 outputs the switching signal of the temperature value: hysteresis function or window function, normally open or normally closed setting. Switching signal for temperature value: hysteresis function [H ..] or window function [F ..]Normally open [. NO] or normally closed [. NC]
	How to enter: When the secondary menu (OU1) is displayed, short press ○ to enter, After entering the parameter configuration, short press ▲ or ▼ to switch in sequence. [HNO] or [HNC] or [FNO] or [FNC] Short press ○ to save

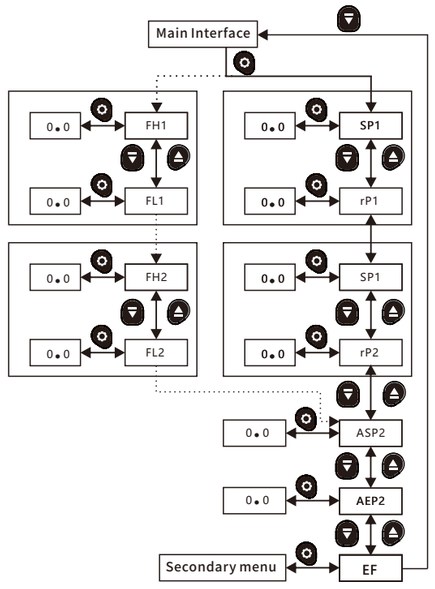
Name	Introduce
Switch 2 Output mode switch (OU2)	Function introduction: OU2 outputs switching signals for temperature values: hysteresis function or window function, normally open or normally closed setting Switching signal for temperature value: hysteresis function [H ..] or window function [F ..] Normally open [. NO] or normally closed [. NC]
	How to enter: When the secondary menu (OU2) is displayed, short press ○ to enter, After entering the parameter configuration, short press ▲ or ▼ to switch in sequence [HNO] or [HNC] or [FNO] or [FNC] Short press ○ to save
Output 3 Output mode switch (OU3)	Function introduction: OU3 output temperature value corresponds to analog signal: (4~20)mA or(20~4)mA.
	How to enter: When the secondary menu (OU3) is displayed, short press ○ to enter, After entering the parameter configuration, short press ▲ or ▼ to switch in sequence [4-20] or [20-4], short press ○ to save
Action delay (dr1) (dr2) (ds1) (ds2)	Function introduction: Adjust the action delay parameters of OU1/OU2
	How to enter: When the secondary menu displays (dr1/2) or (ds1/2), short press ○ to enter, long press ▲ or ▼ for 3 seconds to set the corresponding data. A value between 0 and 50 seconds can be set. ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save
Unit switch (UNIT)	Function introduction: Setting the standard measurement unit for system temperature displayed on the screen
	How to enter: When the secondary menu (UNIT) is displayed, short press ○ to enter, Can be set in °C or °F,Short press ▲ or ▼ to switch in sequence, short press ○ to save.
Switch output logic (P-n)	Function introduction: Switching output logic can be switched to PNP/NPN
	How to enter: When the secondary menu (P-n) is displayed, short press ○ to enter,can be set to PNP or NPN Short press ▲ or ▼ to switch in sequence, short press ○ to save
Switching point Damping adjustment (dAP)	Function introduction: The larger the parameter is, the longer it takes for the displayed pressure value to remain stable. The smaller this parameter is, the faster the displayed pressure data will stabilize.
	How to enter: When the secondary menu (dAP) is displayed, short press ○ to enter, long press ▲ or ▼ for 3 seconds to set the corresponding data.The parameter configuration range is 1~1000. ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save.
Zero point calibration (coF)	Function introduction: Offset the output value of the digital signal source.
	How to enter: When the secondary menu (coF) is displayed, short press ○ to enter, long press ▲ or ▼ 3 seconds, it can set the corresponding data. The setting range is ±10.0 ▲▼ Short press to add or subtract, long press to add or subtract quickly, short press ○ to save
Restore to factory defaults (rES)	Function introduction: The product settings are restored to default settings (default settings are shown in Table 1).
	How to enter: When the secondary menu (rES) is displayed, short press ○ to enter,when displaying (WRAN),long press ▲ or ▼ for 3 seconds,until the display (ing) returns to the main interface automatically, at this time, all parameters of the product are restored to the default parameters.
Display direction (DIS)	Function introduction: The screen display direction can be rotated 180°
	How to enter: When the secondary menu (DIS) is displayed, short press ○ to enter. The ON character indicates the positive direction of the screen, and the OFF character indicates the screen is rotated 180° Short press ▲ or ▼ to switch screen states in sequence, short press ○ to save
Line chart mode	Function introduction: Used to record short-term fluctuations in values. See 9.2 for details.
	How to enter: In the main interface, short press ▲ to enter
Exit parameters, do not apply settings	Press ▲ and ▼ at the same time. The parameters are not saved and the interface returns to the previous menu.
Exit menu	Press ▲ and ▼ at the same time. The interface returns to the previous menu.

9.2 Basic Function Introduction

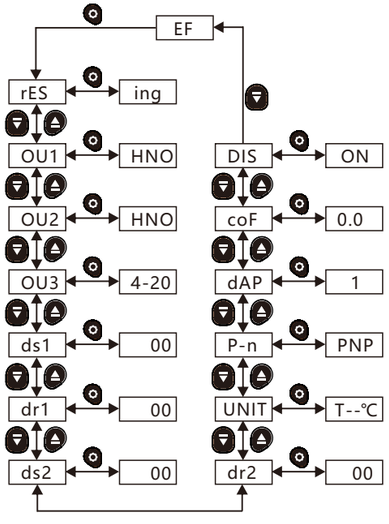
Name	Factory setting parameters	Name	Factory setting parameters
Sp1	40%FS	UNIT	℃
rP1	20%FS	P-n	NPN
Sp2	80%FS	dAP	01
rP2	60%FS	coF	10
ASP2	Lower limit of range	DIS	ON *
AEP2	Upper limit of range	UNIT	℃
Ou1	HNO		
Ou2	HNO		
Ou3	4-20		
ds1	00		
dr1	00		
ds2	00		
dr2	00		

Note: The parameters marked with * are affected by the actual range of the selected model. The default parameters are subject to the actual product received.

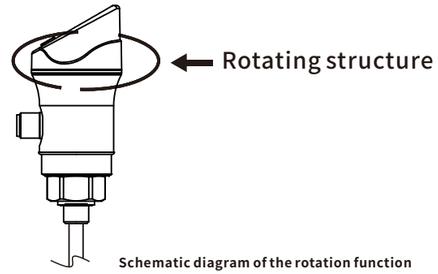
9.3 First level menu setting flow chart



9.4 Secondary menu setting flow chart



■ X. INSTALL



Schematic diagram of the rotation function

1. This product supports a dual-stage rotation structure, both supporting 330° rotation.
2. This product must be tightened with a wrench during installation. The dial can be rotated only after installation is complete.
3. Before installing the device, please confirm whether the installation space can accommodate the product.
4. During installation, please fully tighten the screws to ensure air tightness.
5. The recommended torque range of the wrench is (25~35) N · m
6. After the equipment is installed, you can adjust the M12 connector and dial direction.
(Note! When adjusting the direction, the rotation direction should be consistent with the screw thread installation direction to prevent the screw thread from loosening when adjusting the direction.)
7. The dial has a certain rotation range. When the rotation reaches the maximum range, do not continue to rotate to avoid equipment failure.

■ XI. Wiring Definition

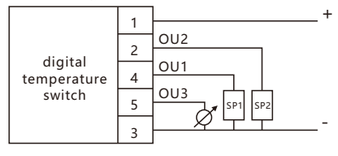
1)Cable sequence

2-way switch (PNP/NPN) +4~20mA

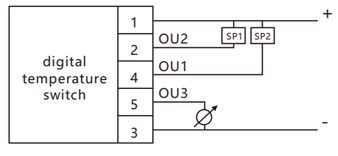
1	BROWN---V+
2	WHITE----OUT2
3	BLUE------V-
4	BLACK----OUT1
5	GRAY-----4~20mA

2)Circuit Diagram

2 PNP+1 analog



2 NPN+1 analog



■ XII. PROBLEMS&SOLUTIONS

NO.	PROBLEM	REASON	SOLUTION
1	No display on the screen	Insufficient supply voltage	1. Check the power supply 2. Confirm the wiring is normal or not
2	Buttons not responding	buttons blocked	1. confirm the button is damaged or not 2. Return to factory for repair
3	Temperature does not change	1. The sensor is damaged 2. The sensor wiring is damaged	1. Restart the device 2. Return to the factory for repair
4	Display E--H	1. Temperature out of range 2. The sensor is damaged	1. Be careful not to exceed the range 2. Return to the factory for repair

■ XIII. AFTER-SALES SERVICE

After-sales service and warranty terms

1.The product warranty period is 12 months from the date of delivery. If our company's products fail during normal use within 7 days from the date of sale, consumers can choose refunds, exchanges, maintenance and other services. After consumers purchase our company's products, if there is a failure that is not caused by human damage within one year, they can be repaired free of charge. For consumers who do not meet the free replacement or free warranty service, our company still provides technical services.The purchase time is based on the invoice or receipt date issued by the dealer
2.The products are mainly divided into housing, control components and pressure sensing components
1) The outer shell is not covered by warranty due to normal wear and tear, and the outer shell will not be replaced
2) We are not responsible for warranty if the circuit board is damaged due to wiring errors or excessive load on the control components
3) The warranty is not responsible for damage to the sensor element caused by over-range use or touching the diaphragm with hard objects
3.Those who have any of the following circumstances cannot enjoy the "Three Guarantees" service
1) Failures and damages caused by human factors, use in abnormal working environment, use not in accordance with the instructions, or use in an environment not in accordance with the instructions, etc
2) Without the consent of our company, users dismantle, repair, or modify the product without permission.
3) Damage caused by poor transportation after purchasing our company's products
4) Damage caused by other force majeure (such as floods, lightning strikes, earthquakes, abnormal voltage)
5) Normal used old, tear, cracks and stains, etc.
6) Products that do not belong to our company (such as fakes)
7) Failure to provide valid shopping receipt, no warranty card, etc.