

# Temperature Indicator

## User Manual

### REV4.0

Notice:

Pls install the horn on top of the display!

The number shown on display screen within 2 seconds of power-on is the currently set graduation

1: S 2: B 3: R 4: W

This product is suitable for all high-temperature melts such as molten steel, molten iron, molten copper, molten aluminum, etc.

## Contents

1 <b>Brief Introduction</b> .....	2
2 <b>Function Description</b> .....	2
3 <b>Technical Parameter</b> .....	3
4 <b>Instrument Panel</b> .....	3
5 <b>Indicator and horn control output description</b> .....	4
6 <b>Setting button and dial operation instructions</b> .....	4
7 <b>Inquire historical temperature data</b> .....	7
8 <b>Bottom panel interface description</b> .....	8
9 <b>Overall installation dimension</b> .....	9
10 <b>Fault indication</b> .....	9
11 <b>Technical support and after-sales service</b> .....	9
12 <b>Adjust the date and time of the display</b> .....	10

### Notice:

- 1 Please do not modify the operating parameters
- 2 Factory setting Graduation R

## 1 Brief introduction

The temperature indicator is based on a high-speed 16-bit embedded microprocessor. An automatic calibration circuit is used to measure the cold junction temperature with a precision temperature sensor and software calibration is possible. High-precision AD conversion chip is used in data acquisition, the sampling period is 20ms, and it has strong anti-interference to the power frequency of space.

The temperature indicator can be applied to the temperature measurement of molten metal in steel-making, aluminum smelting, cast iron and other industries, as well as slag temperature.

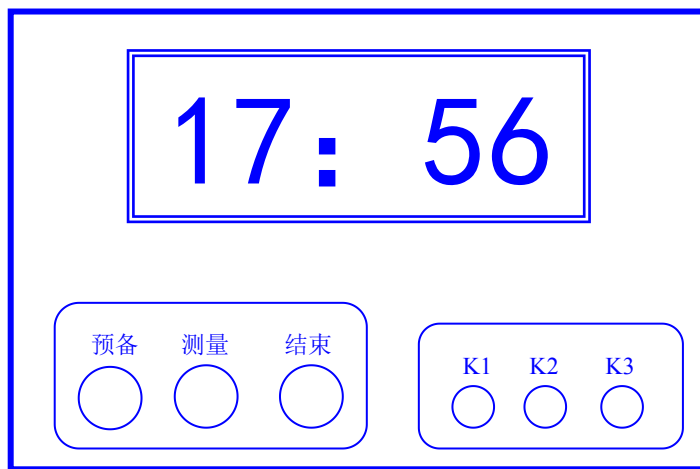
## 2 Function Description

- DC12V active speaker output interface√
- 200 historical test data storage(Special instructions for ordering)
- RS485 or 232 serial communication interface with large display screen (Special instructions for ordering)
- RS485 or 232 serial communication interface with Modbus RTU standard communication protocol (Special instructions for ordering)
- Micro printer interface (Special instructions for ordering)
- Isolated BCD code output interface (Special instructions for ordering)
- Analog 4~20mA output interface √ (Special instructions for ordering)
- Voice report (Special instructions for ordering)
- K type continuous temperature measurement (Special instructions for ordering)

### 3 Technical Parameters

TC Type	S	B	R	WR <sub>e3/25</sub>
Fast temperature range	800~1769℃	800~1820℃	800~1769℃	800~1999℃
Continuous temperature range	200~1769℃	500~1820℃	200~1769℃	200~1999℃
Digital Display	3.5 digit 5 inch highlight red LED and 127mm letter height			
Working Condition	Temperature: 0℃~ +55℃; Relative Humidity: ≤85%			
Power Supply	AC220V/50Hz; Power consumption: about 20W			
External Dimension	400mm×300mm×105mm			
Packing Dimension	560mm×400mm×210mm, gross weight: 7.5kgs			

### 4 Instrument Panel



There are three measuring indicators on the instrument panel: ready, measurement, end; and three setting buttons: K1, K2 and K3.

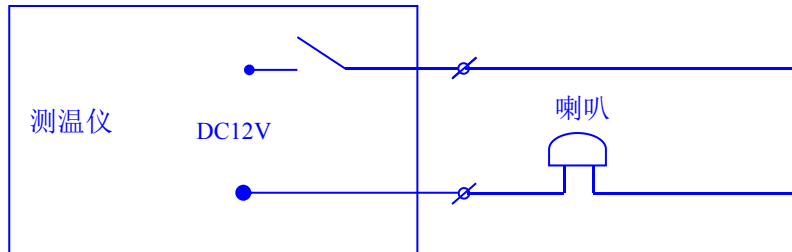
### 5 Indicator and horn control output description

When there is no measurement or no thermocouple insertion, the instrument display screen shows the current time, the three indicators are not on. The green(预备) lights up after inserting the thermocouple, the yellow(测量)lights up after inserting the thermocouple into molten steel, the red(结束) lights up when the measurement finished, and the horn sounds; if the measurement

## Temperature Indicator

failed, the three lights are on.

After the measurement, the result keeps for 180 minutes, horn sounds 5 seconds, and the horn is active DC12V output. Principle wiring is as follows: (with voice report does not have this function)



## 6 Setting button and dial operation instructions

There are three buttons K1, K2 and K3 on the panel to set the date and time and operating parameters. K1 is used to select the item (the item number is shown on the table below), K2 is used to select the digit to be set, and K3 is used to input the specific value.

Item No.	Function	Remarks
1	Correction value of cold junction temperature	Based on 50, larger than 50 will be added, less than 50 will be subtracted
2	Measurement correction value	Based on 50, larger than 50 will be added, less than 50 will be subtracted
3	Selection of temperature lock platform	1: 800 degree; 0: 500 degree
4	Reserved	Factory setting: 50; 4-20mA error correction
5	Reserved	
6	Year setting	
7	Month setting	
8	Date setting	
9	Hour setting	
10	Minute setting	
11	Second setting	
12	Communication address	Adjustable range 1~99
13	Communication baud rate	1:1200 2:2400

## Temperature Indicator

		3:4800 4:9600
14	Reserved	
15	Button modification save function	When it is 0, the button modification operation cannot be saved. When it is turned on, it is 0. When it is set to 1, if there is no button operation within 2 minutes, it will automatically return to 0. Changes to date and time are not subject to this restriction.

If in the status of “Ready” or “Measurement”, the button does not work. When the thermocouple is not inserted, the button can be used for setting operation. Firstly press K1 to enter into setting status. In the setting status, the leftmost digit displays the Item No. and the right two digits display the specific value. Press K3 and K2 to modify the specific value, K3 modifies the value, K2 modifies the digit or ten digits. After setting is completed, press K1 to return to next Item No.

For the four digits displayed on the panel, the leftmost two digits are the setting Item No. The second digit on the left is not displayed, and the third and fourth on the left are specific values to be set.

Item 11: communication address setting, adjustable range 1~99.

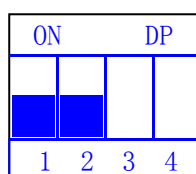
Item 12: communication baud rate setting, adjustable number 1~4, 1 means baud rate bit 1200, 2 means baud rate bit 2400, 3 means baud rate bit 4800, 4 means baud rate bit 9600.

In the setting status, if no button operation within 10 seconds, the system will automatically return to normal operation.

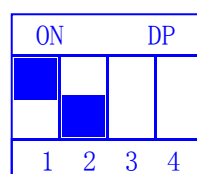
### Internal dial setting instructions

Four dials: SET1, SET2, SET3 and SET4 on the circuit board inside, as follows: (ON/OFF)

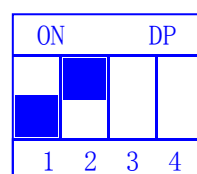
SET1: Digit 1 and 2 are graduation number setting



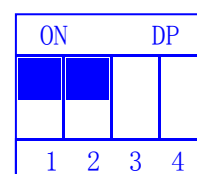
S 分度



B 分度



R 分度



W 分度

## Temperature Indicator

---

SET1: Digit 3: 4-20mA output switch

SET1: Digit 4: fast/continuous measurement setting; 4=ON: fast temperature measurement status

SET2: Temperature fluctuation value  $\Delta T$  setting

Digit 1: 1; Digit 2: 2; Digit 3: 4; Digit 4: 8

For example:

Set the fluctuation value to 12 °C as follows:

1 = OFF    2 = OFF    3 = ON    4 = ON

Set the fluctuation value to 8 °C as follows:

1 = OFF    2 = OFF    3 = OFF    4 = ON

SET3: Platform fluctuation effective time setting, the unit: 1/6 second

Digit 1: 1; Digit 2: 2; Digit 3: 4; Digit 4: 8

For example:

set the fluctuation value to 3/6 seconds as follows:

1=ON 2=ON 3=OFF 4=OFF

set the fluctuation value to 4/6 seconds as follows:

1=OFF 2=OFF 3=ON 4=OFF

SET4: Reserved

### **Important Notice:**

**When dial setting is changed, we must turn off the power and restart the temperature indicator, the new dial setting will be effective.**

## **7 Inquire historical temperature data**

In the non-set state, press K2 to enter into historical temperature data inquiry state. If there is no historical measurement data, the screen displays “---”; otherwise, the historical temperature data is displayed, and the first temperature data is the latest measurement, each time K2 is pressed, the next temperature data is refreshed. If K2 is pressed again when the oldest historical temperature is displayed, the latest history is displayed again, that is, the loop display.

Press K3 to exit the historical temperature data inquiry state and return to normal operation.

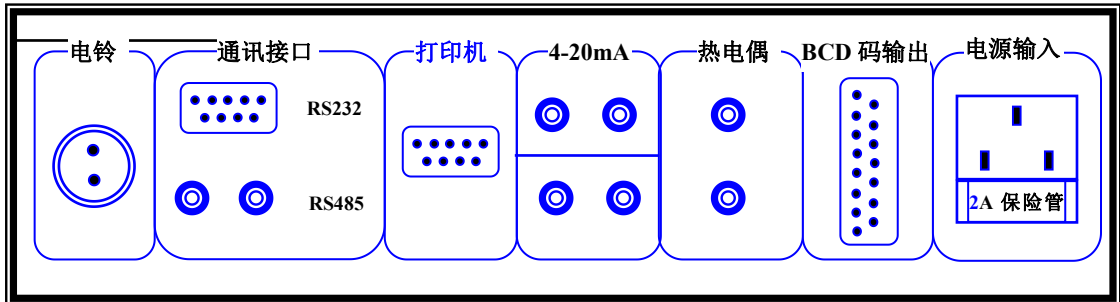
Note: Each measurement data will display on three screens. The first screen(green“预备” lights up) displays the month and date, the second screen(yellow “测量” lights up) displays the hour and

# Temperature Indicator

minute, and the third screen (red “结束” lights up) displays the temperature value. Each screen keeps 2 seconds then automatically switches to the next screen.

In the inquiry state, if no button operation within 10 minutes, the system automatically returns to normal operation.

## 8 Bottom panel interface description

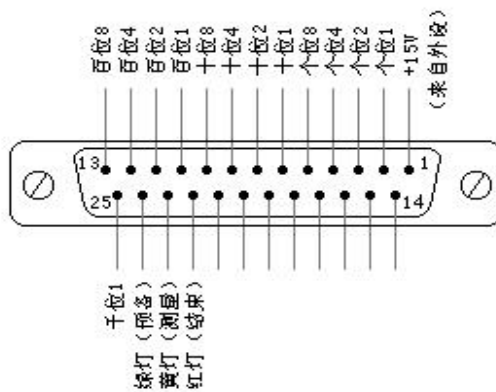


The horn output is DC12V/1A active output. The micro printer is the PORT9 interface, the second pin is A, and the third pin is B.

RS485 communication interface: red terminal is A, black terminal is B

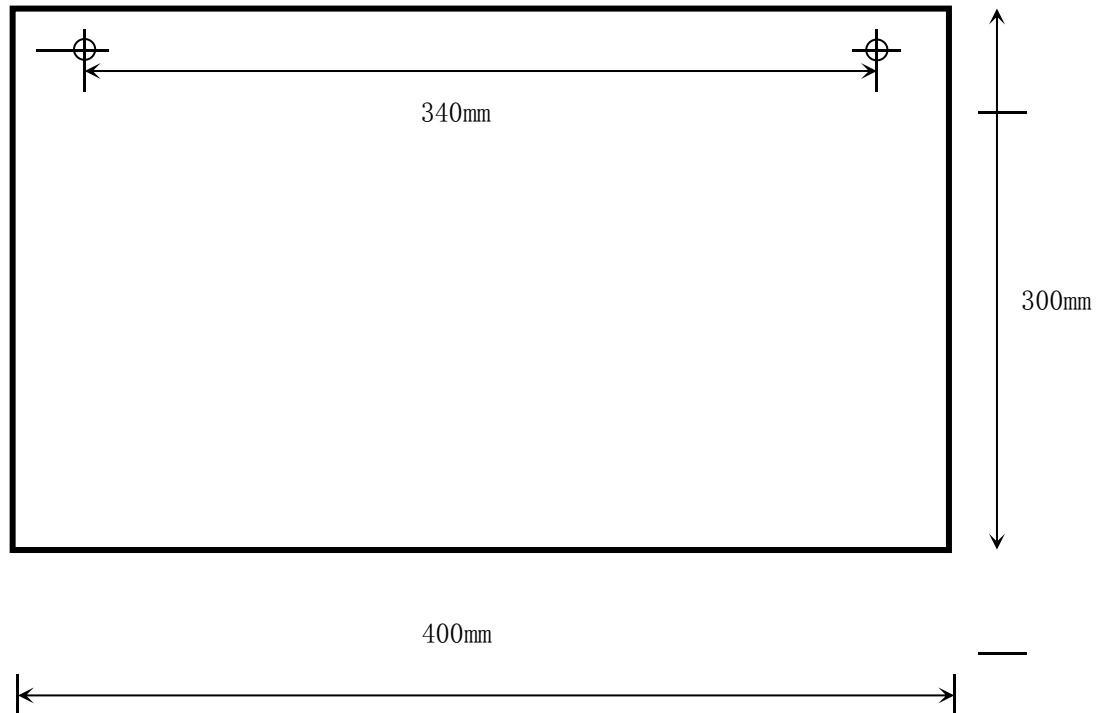
4-20mA interface: red terminal is positive, black terminal is negative, output 4mA-20mA corresponds to 1200-1800 (factory setting) or 800-2000

The BCD code output is a 25-pin parallel output, as specified below:





## 9 Overall installation dimension



## 10 Fault indication

In abnormal operating state, the instrument will prompt the current fault type in specific number.

The specific fault number is as follows:

- 1: Cold junction temperature exceeds 55 °C
- 2: Thermocouple potential over-range

## 11 Technical support and After-sales Service

Our company provides good technical support; and provides one-year warranty and lifetime maintenance after-sales service.

## 12 Adjust the date and time of the display

Adjust the time with the three buttons(K1, K2 and K3) on the panel:

K1: Select item, K3: Input the modified value, K2: Choose digit or ten digits

Details as follows:

## Temperature Indicator

---

Item	Function
6	Year setting
7	Month setting
8	Date setting
9	Hour setting
10	Minute setting
11	Second setting

The specific operation is as follows:

Press K1 to adjust the number on the left to 9 (Hour setting), the two digits on the right show the specific value of the hour, then press K3 and K2 to modify the value, K3 modifies the value, K2 modifies the digit or ten digits.

When hour setting is completed, press K1 to set minute.

When minute setting is completed, press K1 several times to return to the normal operation.

