



Non-contact anti-dry probe

(Model: ZMT500-A)

Manual

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Zhengzhou Winsen Electronic Technology Co., Ltd

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Non-contact anti-dry probe

1. Product description

The non-contact anti-dry burning probe (hereinafter referred to as the probe) is a non-contact intelligent anti-dry burning probe based on the principle of infrared temperature measurement. It is mainly used on stoves to prevent fire accidents caused by dry burning of pots. The probe uses advanced infrared temperature measurement technology and algorithms to accurately detect the dry-burning status of the pot and output corresponding signals for early warning. The probe integrates mature optical and circuit design and precision processing technology, and its functions have been verified through a large number of experiments, with superior performance and high reliability.



Figure 1.1 Appearance of anti-dry burning probe

Sensor features

- Non-contact sensor, does not touch the bottom of the pot
- Compatible with saucepans and pots
- Provides a variety of output methods, such as serial port or analog output
- Wide temperature measurement range

Main Application

- Anti-dry burning probe for stoves
- Industrial non-contact temperature

measurement

2. Technical parameters

Table 2.1 Main technical indicators

Specification	Data
Voltage supply (V)	2.7~5
Output interface	Analog
Voltage output range (V)	0~5
Temperature measurement range (°C)	-10~600
Temperature measurement accuracy (°C)	±10
Voltage temperature transmission ratio (mv/°C)	2
Operating temperature (°C)	-30~85
Storage temperature (°C)	-40~95
Operating current (mA)	20(@3.3V Input)
Dimension (mm) (Diameter*Length)	30*110

3. Structure and dimensions

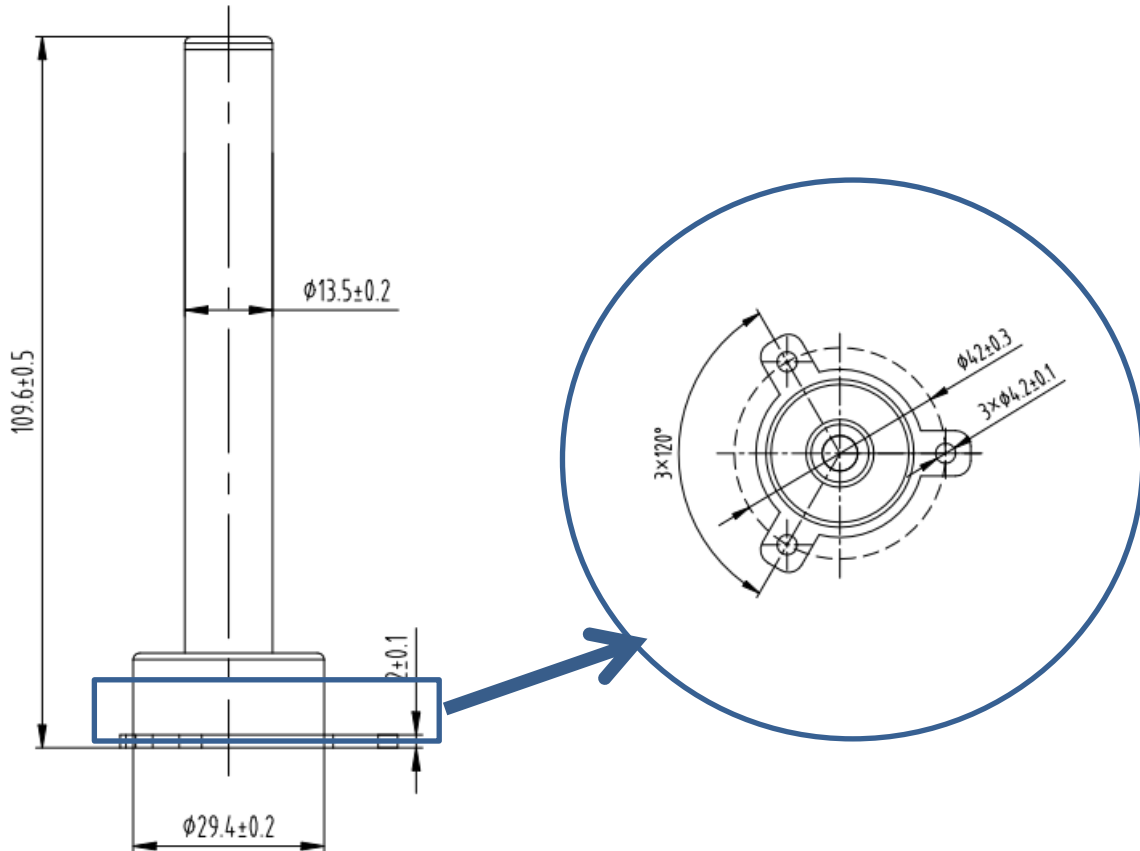


Figure 3.1 Overall dimensions and mounting hole dimensions

4. Product installation method

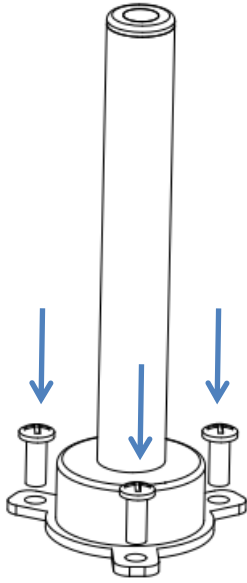


Figure 4.1 Installation method



Figure 4.2 Example of distance from burner installation

1. Use M3 screws to fix the probe to the bottom plate of the stove in the direction of the arrow.
2. The probe is installed upright in the middle of the burner of the stove;

5. Product wiring harness pin definition

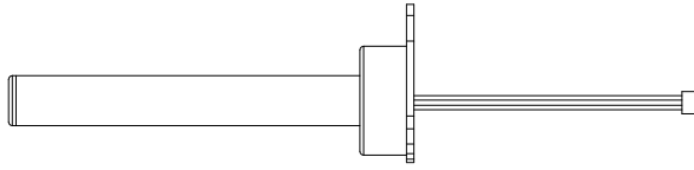


Figure 5.1 Non-contact anti-dry burning probe wiring harness diagram

Pin definition

Table 5.1 Probe output harness definition

Red wire	Yellow wire	White wire	Black wire
Power supply	Transmission voltage	Internal temperature	GND

Pin specification

Table 5.2 Definition of probe output signal

Pin	Definition	Description
Red wire	Power supply	Probe input power supply
Yellow wire	Transmission voltage	The analog signal of the collected temperature signal is output by voltage conversion
White wire	Internal temperature	Internal temperature output
Black wire	GND	Probe input negative pole

6. Signal calculation example

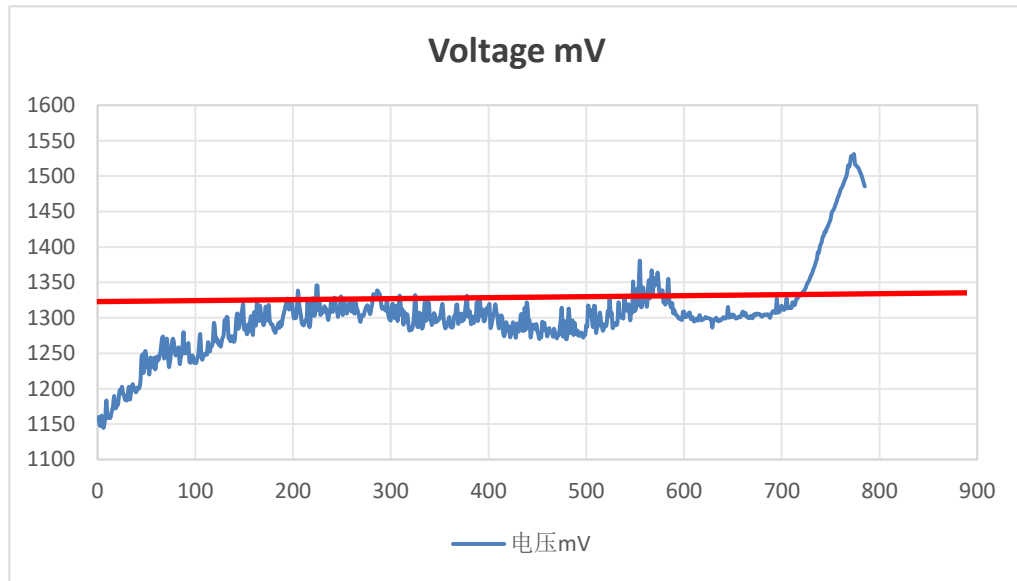


Figure 6.1 Normal water boiling process

In the normal boiling process, the output voltage value is the corresponding temperature value can be obtained by the following formula:

$$T_m = \frac{V_t - V_b}{R} + T_b$$

T_m	---	Calculated temperature value
T_b	---	The basic temperature value is usually the temperature value output at the beginning, such as 27°C
V_b	---	Reference voltage value, usually around 1150
V_t	---	Output voltage value
R	---	Pressure and temperature transmission ratio, constant is 2

For example, the output voltage value is 1300mv, the base value is 1160mv, and the base temperature value is 27°C. The corresponding temperature value calculated through the formula is 97°C;

Therefore, the temperature value at the position marked by the red line is 97°C.

7. Accessory

Introduction to collection tooling system

The acquisition tooling system is mainly aimed at evaluating and displaying the probe.

Instructions

The non-contact anti-dry burning probe converts the analog signal into a digital signal through the acquisition module and transmits it to the personal computer through a USB cable. The personal computer is equipped with non-contact anti-dry burning related software to display and save the probe data.

Collection test tooling

The collection tooling includes a collection module and a set of collection display software.

Connection method

The acquisition module communicates with the personal computer through a USB cable, and the other end is connected to a non-contact anti-dry burning sensor.

Precautions

1. It is recommended to connect an acquisition module when evaluating the probe.
2. The probe does not come with an acquisition and evaluation module when it leaves the factory and needs to be purchased separately.
3. Please follow the operating instructions when using the collection module. Non-professionals cannot operate alone without authorization or training.

Pin definitions for connecting non-contact probes to acquisition modules

Position	Color	Signal specification
First left	Black	GND
Second left	White	Collect analog signals of internal temperature
Third left	Yellow	Collect the voltage value output by the probe
Forth left	Red	Power supply

Figure A.1 Connection diagram of acquisition module

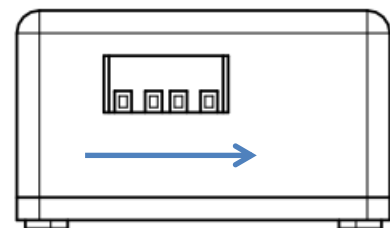


Figure A.2 Probe connection end

Connect the acquisition module to PC

The acquisition module is connected to the PC through a USB cable.

Requirements for USB wiring harnesses

1. The length of the wire harness shall not be less than 1m;
2. The USB interface meets USB2.0 or is compatible with USB2.0 transmission protocol;
3. The wiring harness is USB B-type cable;
4. To ensure the integrity of the signal, it is recommended not to use wire harnesses with exposed outer skin;



Figure A.3 USB port

8. Precautions

- During the welding, installation, and use of the sensor, the probe head should be prevented from being damaged by external impact.
- If the sensor needs to be placed in a small space, try to avoid getting too close to the inner wall of the burner and keep a certain distance.
- After the sensor alarm action is completed, it is recommended to cool down for half an hour in order to avoid making a second action in a short period of time.
- Sensors should be maintained regularly, and the maintenance cycle is recommended to be no more than 6 months.
- To ensure that the sensor can work normally, the power supply voltage must be maintained in the DC (2.7~5)V range, and the power supply current must be no less than 20mA. If it is not within this range, the sensor may malfunction, the sensor output voltage may be low, or the sensor may not work properly.

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