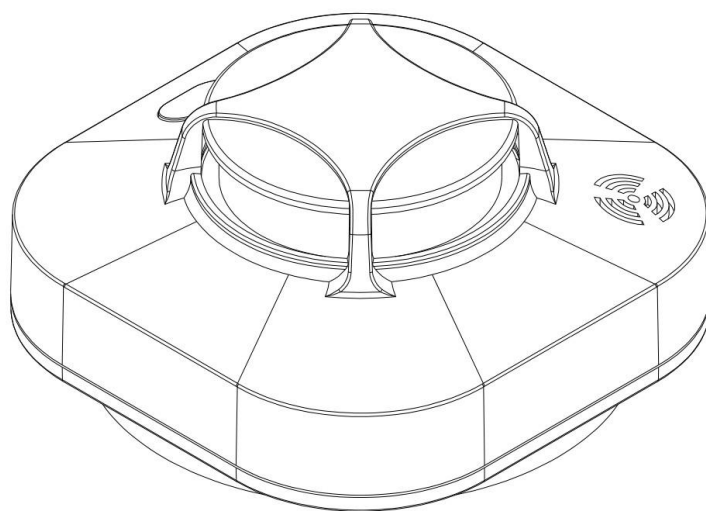


# DIREKTRONIK



## Safe operating guidelines

- ◆ To protect the product and ensure safe operation, please follow this user manual. Our company is not responsible if the product is used improperly or not in accordance with the manual.
- ◆ Please do not disassemble, change internal wiring, or modify this product at will.
- ◆ Do not subject the device to strong shocks and vibrations.
- ◆ Please do not place the product in an environment that does not meet the operating temperature, humidity and other conditions, and keep it away from cold sources, heat sources and open flames .
- ◆ Do not install the battery of the product upside down, otherwise it may cause the product to burn out.

## Product Conformity Statement

The HKT-SD300 series complies with the basic requirements of CE, RoHS and other relevant regulations.



## Disclaimer and Copyright Notice

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## Document revision history

date	Version	describe
20 23.8.18	V 1.0 _ _	first edition

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# 一、 Product introduction

## 1.1 Product introduction

HKT-SD300 smoke alarm is independently developed and designed by Hunan Huakuantong Technology Co., Ltd. It has the characteristics of accurate measurement, sensitive response and high stability; it complies with the fire protection GB4715-2005 standard, adopts ceiling-mounted installation, does not require debugging, and can be used 360 ° Detect fire; the patch technology is used to resist the interference of EMI and RF I. Once the "signal" of a burning object is "captured", the signal will be uploaded to the cloud platform to ensure the continuity of information transmission;

Smoke alarm is an important part of the automatic fire alarm system and plays the role of trigger device and fire alarm device in the system. This product adopts a photoelectric smoke alarm system. The sensor converts light signals into electrical signals and transmits them to the automatic fire alarm system to provide early warning or detect fires, effectively ensuring the safety of life and property.

The product is based on the standard LoRaWAN® IoT protocol, adopts a low-power design, and uses 1 large-capacity battery , which can be used continuously for more than 3 years without replacing the battery. The product is compatible with multiple platforms and supports cloud platform and APP remote real-time monitoring .

HKT-SD300 is compact in size, easy to install and beautiful in appearance. The antennas are built into the device. It is suitable for installation surfaces of different materials and is suitable for office areas, living areas, residential areas and other scenarios .

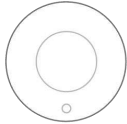
## 1.2 Product Highlights

- Long communication distance: the maximum communication distance can reach 5Km in an open environment
- Ultra-long standby: low power consumption, easy to replace, using 1 large -capacity CR17450 battery, can be used continuously for more than 3 years

- Sensitive sensing: fast alarm response, the longest response time is less than 12 seconds
- The product has rich functions: it has functions such as smoke alarm, high temperature alarm, equipment silencer, self-test, low battery alarm, etc.
- Strong anti-interference ability: anti-white light and anti-strong magnetism functions
- Fire certification: complies with fire protection GB4715-2005 standard
- No wiring required: no wiring, no need to connect electricity, no need to destroy the wall, and reduce the construction time
- Good compatibility: compatible with standard LoRaWAN® gateways and third-party network server platforms
- Integrated management: Quickly connect to Huakuantong LoRaWAN® gateway and cloud platform without additional configuration

## 二、 Product structure introduction

### 2.1 Packing list



1 ×  
HKT-SD300



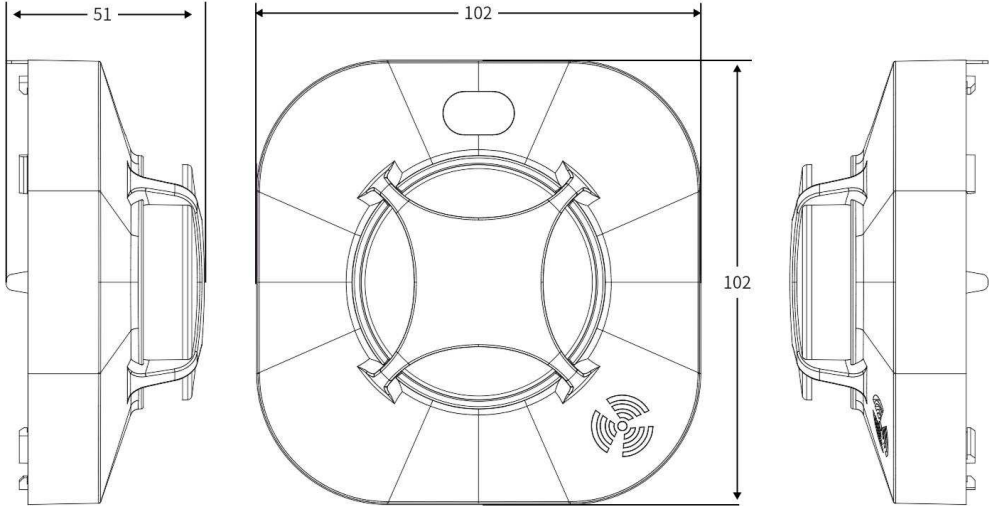
1 ×  
Certificate



1 ×  
Fixing screw  
package

If the above items are damaged or missing, please contact your agent or sales representative in time

### 2.2 Product dimensions



## 三、 Function description

### 3.1 Button&LED&buzzer indication

Function	Action/Event	state
self-test	Press the self-test button in standby mode	Continuous <b>sound and light</b> alarm during key press
silence	Press the silence button in alarm status	The device stops playing the alarm sound and <b>the red light</b> continues to flash.
smoke alarm	The smoke concentration in the environment exceeds the standard	Circular <b>sound and light</b> alarm
High temperature alarm	Ambient temperature exceeds 60 degrees Celsius	Report alarm information immediately
Low battery reminder	The power is lower than 2.6V	<b>The red light</b> flashes twice for 50 seconds and beeps once.

### 3.2 Function description

#### ◆ normal status

- The device automatically detects the smoke concentration in the surrounding environment every 8 seconds;
- The red indicator light flashes every 50 seconds;

#### ◆ Smoke detection

- After the device is powered on, it will wait for 30 seconds for stabilization before starting to read and convert smoke concentration;
- The device performs smoke conversion every 8 seconds. When the smoke concentration exceeds the set threshold, a smoke alarm will be generated. At this time, the red LED will flash quickly and the alarm sound will be played in a loop, and the smoke alarm information will be reported to the cloud platform



immediately; when the smoke concentration When the value is lower than the set threshold, the smoke alarm will automatically stop;

◆ **temperature check**

- The device performs temperature conversion every 8 seconds. When the detected temperature exceeds 60 degrees Celsius, a high temperature alarm will be generated and the current temperature status will be reported to the cloud platform immediately;

◆ **button**

- The device has a button and has both self-check and silence functions;
- When the device is in non-alarm state, pressing the button will continuously sound and light alarm;
- When the device is in the alarm state, press the button and the device will stop broadcasting the alarm. After the silence state remains for about 85 seconds, the alarm will automatically exit the silence state. If there is still smoke at this time, the alarm will start the alarm again;
- The red LED will keep flashing when in alarm state;

◆ **Low voltage alarm**

- The device will start to detect battery power information as soon as it is powered on. When the battery voltage is detected to be lower than 2.6v, a low-voltage alarm will be generated. At this time, the red LED will flash twice every 50 seconds and the horn will beep once;
- When the alarm reminds you of undervoltage, the battery should be replaced in time, otherwise it will affect the normal operation of the alarm;

◆ **Access the network**

- The device will connect to the network as soon as it is powered on. If it attempts to connect to the network more than 3 times and still fails (3 minutes), it will automatically enter sleep mode and wait for a period of time before making another network access request;

◆ **Data reporting**

- The device establishes a connection with the platform based on LoRaWAN communication method and reports the collected data. The default reporting

interval is 24 hours (the reporting interval can be configured through the platform);

◆ **Working frequency**

- The device supports LoRa domestic and foreign multi-band wireless communication capabilities. The following are the working frequency bands supported by the device.

CN470\IN865\EU868\US915\AU915\AS923 (please contact the supplier if you need to customize the frequency band) .

◆ **Anti-drop mechanism**

- The device will detect whether the data packets are successfully delivered according to the reporting interval, and will re-enter the network after a certain number of failed transmissions.

Hardware parameters	led	1 LED light (red)
	trumpet	1
	button	1 self-test button
Functional performance	Effective range	30m <sup>3</sup>
	Alarm volume	≥80dB (3 meters directly in front)
	Alarm delay	<12 seconds
	Alarm mode	Audible alarm
Wireless parameters	letter of agreement	Standard LoRaWAN <sup>® 1.0.2</sup> protocol
	Working frequency	EU868 (optional CN470\IN865\US915\AU915\AS923)
	Transmit power	18.5±1dBm ( max )
	Ultra-high receiving sensitivity	-13 5±1 dBm @ SF=12
	Network access/working mode	OTAA/ABP Class A
Configuration	Configuration method	server
	Software function	Smoke/low pressure/high temperature alarm
physical properties	Power supply	1 CR17450 battery 2400mAh _
	Battery life *	>3 years (3 data reports/day)
	Operating temperature	-20°C ~60°C
	Working humidity	≤90% (no condensation)
	size	102*102*51mm
	Installation method	Screw fixed installation
	Installation suggestions	Installed indoors without obstruction

\* : The test data are all from laboratory conditions, and there may be errors due to changes in the objective environment

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during actual use.

**Notice:**

(1) If you purchase a large amount of equipment, you can contact Hunan Huakuantong to obtain equipment EUI and other parameter tables.

(2) If you need a random App Key, please contact Hunan Hua Kuantong before purchasing.

(3) If you use cloud management for HKT-SD300 series devices, please use OTAA to access the network.

(4) The LoRa frequency band used to send data must generally match the frequency band used by the LoRaWAN® gateway.

(5) Frequent false alarms: excessive dust accumulation in the sensor, use a vacuum cleaner to clean the maze (outer black plastic part)

(6) During use, if you encounter any malfunction, please contact the supplier as soon as possible and do not disassemble and repair it without permission to avoid accidents.

(7) If it is not used for a long time, the alarm must be removed, the battery must be taken out, put into the packaging box, and stored in a ventilated and dry place.

(8) Transport and storage shall be carried out in accordance with the provisions of GB/T15464-1995 "General Technical Conditions for Packaging of Instruments".

(9) During transportation and storage, the original packaging and seals of the manufacturer must be kept intact, and the product must not be subject to severe impact.

(10) Drastic changes in ambient temperature should be avoided.

(11) The stacking height after packing shall not exceed 6 layers, and the stacking height of a single piece after unpacking shall not exceed 5 layers.

## **五、 Product installation**

For general places, when the space height is less than 6m, the protected area of the alarm is 60m<sup>2</sup>. The alarm should be installed on the ceiling. Specific parameters should be based on the "Design Code for Automatic Fire Alarm Systems" (GB50116). Make sure to maintain a distance of at least 30cm from the light fixture.

**installation method:**

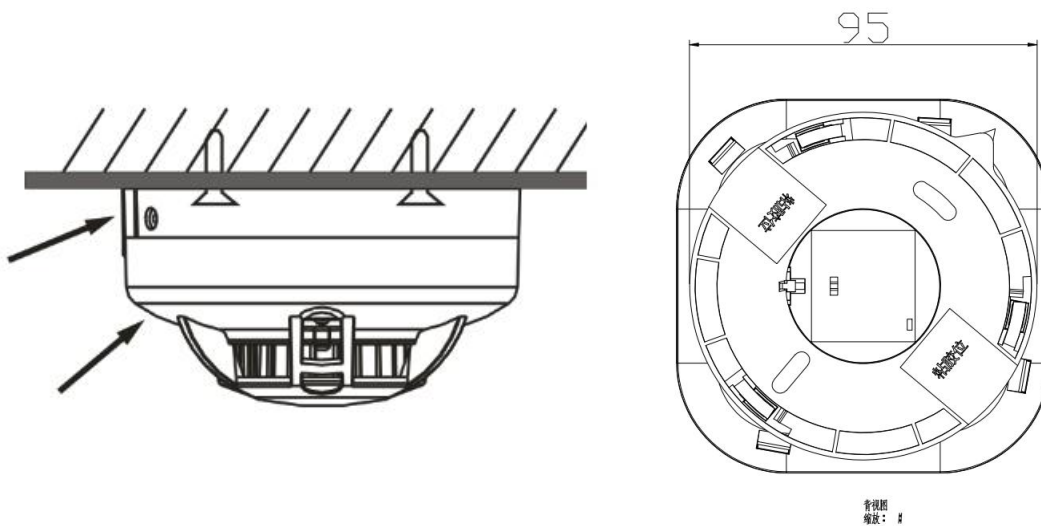
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1. Drill two installation holes on the ceiling 68mm ~ 83mm apart, and use expansion plugs and self-tapping screws to fix the base of the alarm.

2. Press a 3V battery into the battery compartment correctly according to the marked direction. Note: If the battery is connected in the opposite direction, the alarm will not work properly and may be damaged.

3. Press and hold the self-test button, the alarm indicator light will light up and an alarm sound will sound, indicating that the alarm is working normally. If it is abnormal, you should check whether the battery is installed correctly or the voltage is too low (less than 2.6V).

4. After the alarm is tested, insert the alarm into the base according to the installation mark on the base. Rotate the alarm clockwise. When you hear a "click" or rotate to the lock mark, it means the alarm is installed in place.



Alarm installation diagram

To ensure that the product can correctly monitor the environment, please follow the following precautions:

- It is recommended that the equipment be installed at a distance of  $\geq 1.5\text{m}$  from the ground;
- Do not install the device in an environment beyond the operating temperature range or in an environment with large temperature changes;
- Do not install the device in a location with large changes in airflow, such as directly opposite a window, vent, air conditioner or fan;
- Do not install the device with the vent facing downward;

- 
- It is not recommended to install the device near a door or window. If it is installed near a window, please close the curtains as much as possible;
  - It is recommended to install the device in a location where there are no large obstacles within the infrared sensing range.

## 六、 data communication protocol

### 6.1 Communication protocol data structure

All data are represented in HEX format

<b>Sync header</b>	<b>special type</b>	<b>Packet serial number</b>	<b>type of data</b>	<b>data n</b>	<b>N (data type + data)</b>
<b>3 bytes</b>	<b>1bytes</b>	<b>1 bytes</b>	<b>1bytes</b>	<b>bytes</b>	<b>1+n+1+n+...</b>

### 6.2 Communication protocol analysis

<b>Protocol field name</b>	<b>illustrate</b>
<b>Sync header</b>	The synchronization header is fixed 3 bytes length data (0x68 0x6B 0x74), taken from "hkt".
<b>special type</b>	The special type is data with a fixed length of 1 bytes , and represents a specific function in the form of BIT bits; BIT0: used to tell the device or server whether a response or confirmation packet is required (0: no response required 1: response required); BIT1~BT17: Function to be determined.
<b>Packet serial number</b>	The packet sequence number is fixed 1 bytes length data , used to identify the packet sequence number .
<b>type of</b>	The data type is fixed 1 bytes length data, which is mainly used to identify

<b>data</b>	different functional types of data of the device.
<b>data</b>	The data is n bytes variable-length data, and the length of the data content is confirmed according to different data types.

### 6.3 Data type table

type of data	Function	Remark
0x01	Device software and hardware version	<p>The data length is fixed at 2 bytes, and it will automatically synchronize uplink after power-on. Only uplink is supported.</p> <p>The first 1 bytes represents the hardware version, and the last 1 bytes represents the software version.</p> <p>Example: Synchronized hardware version 1, software version 5: 68 6B 74 00 01 01 01 05</p>
0x0 9	temperature	<p>The data length is fixed at 3 bytes and only supports uplink.</p> <p>Unit: Celsius, data magnification 1000 times uploaded</p> <p>When the data is a negative value, the highest bit is 1</p> <p>Example: Upload temperature: 25.23 degrees Celsius: 68 6B 74 00 01 0 9 00 62 8E</p>



		Upload temperature: -25.23 degrees Celsius: 68 6B 74 00 01 0 9 80 62 8E
0x27	smoke alarm status	The data length is fixed at 1 bytes and only supports uplink. 0 = Alarm recovery 1 = triggers smoke alarm  Example: Trigger smoke alarm: 68 6B 74 00 01 27 01
0x28	High temperature alarm	The data length is fixed at 1 bytes and only supports uplink. 0 = Alarm recovery 1 = trigger high temperature alarm  Example: Trigger smoke alarm: 68 6B 74 00 01 28 01
0x80	Synchronize system time	The upstream data bits are invalid, and the downstream time format is: year, month, day, hour, minute, and second.  When the device uploads this command, it is requesting a command. At this time, the server should download the correct time to the device.  Example: Request the server to synchronize the system time: 68 6B 74 01 01 80 Server      downstream      synchronization      system      time (2022/03/28/12:00): 68 6B 74 00 08 80 16 02 1C 0C 00
0x85	Restore default factory settings	Downstream command, upstream command is invalid  1 = Factory reset the device  Example: The server goes down to restore the device to factory settings: 68 6B 74 00 01 85 01

0x86	Data synchronization cycle	<p>Synchronize device status to the server at intervals, the data length is fixed at 2 bytes, and supports uplink and downlink.</p> <p>Unit: minutes</p> <p>Value range: 10-1440 (10 minutes to 24 hours), the default is 24 hours, and when set to 0, data will not be actively synchronized.</p> <p>Example: Set the data synchronization interval to 1440 minutes: 68 6B 74 00 01 86 05 A0</p>
0x89	battery status	<p>The data length is fixed at 1 bytes and only supports uplink .</p> <p>0 Under voltage alarm 1 Battery is normal</p> <p>Example: The device reports normal power information: 68 6B 74 00 01 89 01</p>

---

## 6.4 Example

Device synchronization software and hardware version information

68 6B 74 00 01 01				
Sync header	special type	Packet serial number	type of data	data
68 6B 74 (sync header)	00 (No need to confirm the package)	01	0 1	01 05 (Hardware version 1 Software 5)

**Notice:**

- (1) Device information is reported once when connecting to the network or restarting;
- (2) For data parser examples, please refer to: "sd-300.js " .

<https://github.com/HKT-SmartHard/decode> .

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