

# SPECIFICATION

Product: Particle Sensor Heater

Model: PMHT01

Version: V0.2

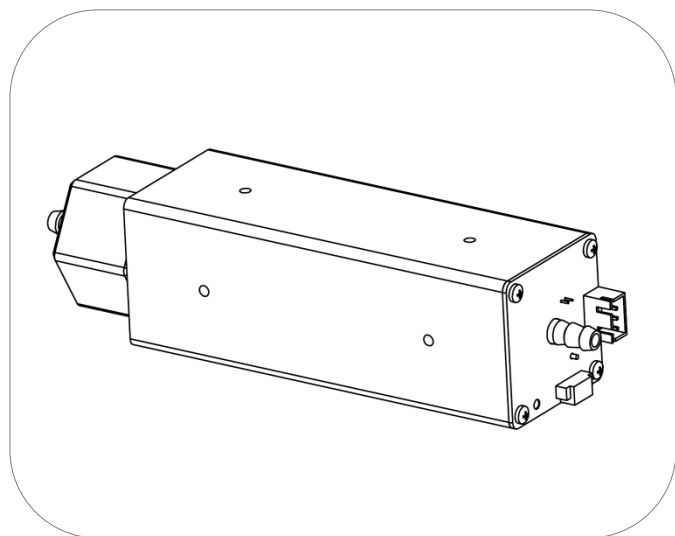
Date: March 12<sup>th</sup>, 2021

# Revision

No.	Version	Content	Date
1	V0.1	First version	2020.03.30
2	V0.2	Update protocol	2021.03.12

# Particle Sensor Heater

## PMHT01



### Description

Particle sensor heater is designed for outdoor particle sensor to effectively prevent the water mist impact in rainy and hot weather conditions, which helps particle sensors to have best performance in all outdoor conditions.

### Principle

Through built-in sponge interlayer, the floating water drops generated from splashing rain can be effectively blocked, chemothermal heating pipe can heat and evaporate the water mist passed through sponge interlayer, to avoid the misidentification caused by water mist entering gas detection area. Combination of the two ways can effectively prevent the impact on sensor accuracy caused by weather and humidity conditions.

### Features

- All-metal built, delicate shape
- Uniform heat conduction, anti-interference to ambient temperature
- Different heating temperature setting mode
- Precise monitoring data on tube temperature, real-time temperature control
- Simple structure, easy to install

### Applications

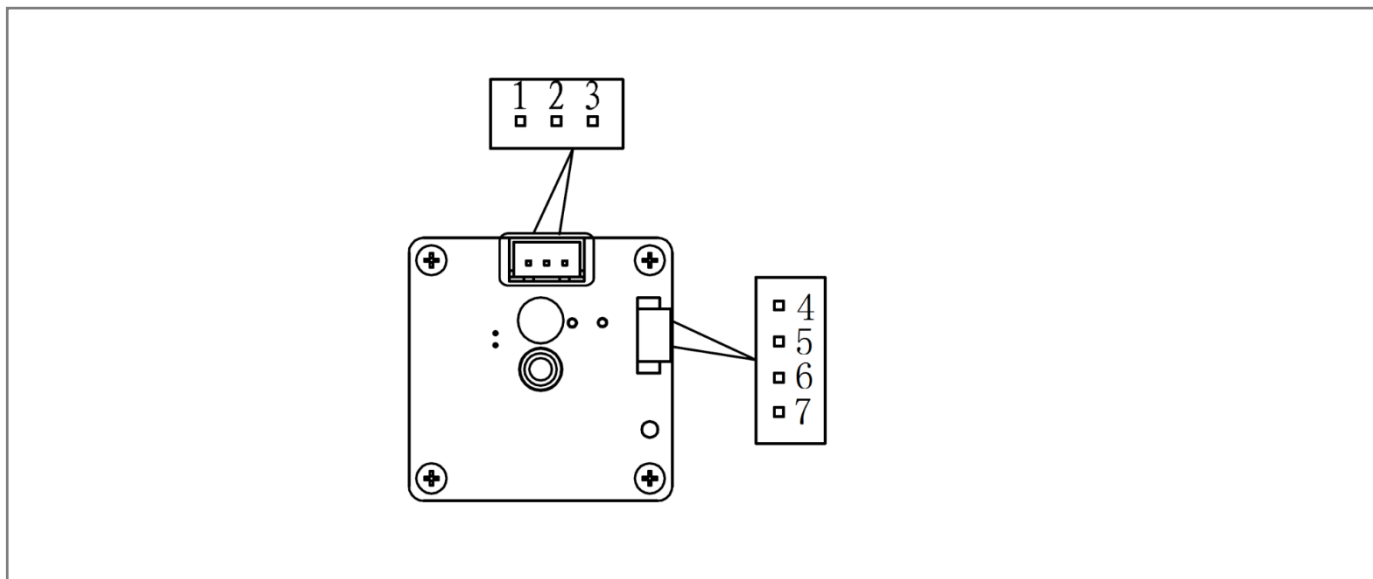
- Monitoring and early warning system for atmospheric environment
- Outdoor air quality monitoring
- Road raised dust online monitoring

### Specification

Particle Sensor Heater PMHT01 Specification	
Heating stabilization time	5min (default heating temperature 45°C)
Data refresh cycle	1s
Working condition	-30~70°C, 5~95%RH
Storage condition	-40~85°C, 0~95%RH (non-condensing)
Working voltage	DC 12V±0.5V
Average working current	2.8A @12V DC
Standby current	<25mA
Communication	UART_TTL(3.3V)
Dimension	W145*H35*D35 (mm)
Lifetime	≥3 years

## Structure and PIN Definition

### Connector Drawing



### Pin Definition

No.	Pin	Description
1	+12V	Power Input (+12V)
2	GND	Power Ground (GND)
3	CTRL	Suspended: normal working, Ground: cease heating
4	NC	Suspended and not connected
5	TX	Transmit Data TX (@3.3V)
6	RX	Receive Data RX (@3.3V)
7	GND	Power Ground (GND)

Remark: can work by connecting only 1 and 2

### Connector specification

Model	Pin Pitch
XH-3	2.5 mm pitch
A1251WR-S-4P	1.25mm pitch

# Communication Protocol

## UART protocol

### 1. Protocol Description

- 1) The data of this protocol are based on Hexadecimal, e.g. "46" is [70] in Hexadecimal;
- 2) [xx] is single-byte data (unsigned, 0-255); Double-byte data with high byte ahead, low byte behind;
- 3) Baud rate: 9600, DataBits: 8, StopBits: 1, Parity: No.
- 4) The setting mode is not conserved after power down. Power up default continuous mode.

### 2. Serial Communication Protocol Format

Sending format

Start Symbol	Length	Command	Data 1		Data n	Checksum
HEAD	LEN	CMD	DATA1	...	DATA <sub>n</sub>	CS
11H	XXH	XXH	XXH	...	XXH	XXH

Detailed instruction of protocol format

Protocol Format	Detailed explanation
Start symbol	Upper computer transmits fixed value[11H], module response fixed value [16H]
Length	Frame byte length=data length+1(including CMD+DATA)
Command number	Instruction number
Data	Read data or write data, length variable
Checksum	Data cumulate sum = 256-(HEAD+LEN+CMD+DATA)

### 3. Serial protocol command number table

No.	Function Name	Command number
1	Temperature setting	0x2A
2	Parameter reading	0x2B

## Communication Protocol

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### 4. Detailed descriptions of protocol

#### 4.1 Heating temperature setting

**Send:** 11 06 2A 09 DF1 DF2 DF3 DF4 [CS]

**Response:** 16 02 2A 09 B5

**Function:** set heating temperature of heating tube

**Explanation:**

Set heating temperature of heating tube  $T = (DF3 * 256 + DF4) / 10$ .

**Note:** Factory default heating temperature 45°C, it's the optimum temperature we recommend after testing in our laboratory.

#### 4.2 Parameter reading

**Send:** 11 02 2B DF0 [CS]

**Response:** 16 34 2A DF0 DF1... DF20... [CS]

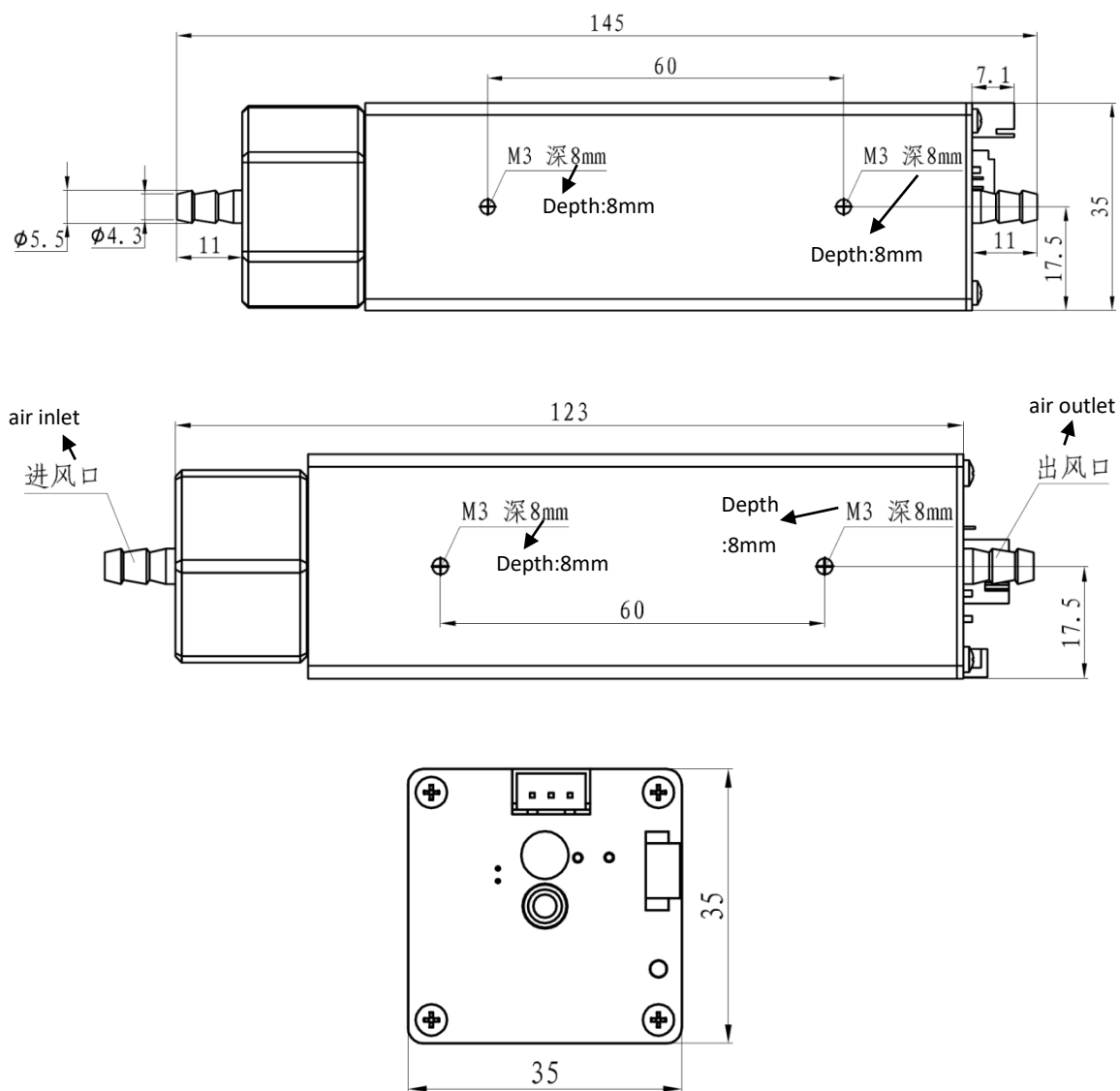
**Function:** read heating setting and current temperature

**Explanation:**

DF0 = 1, read current temperature of heating tube  $T = (DF7 * 256 + DF8) / 10$ .

DF0 = 3, setting temperature of heating tube  $T = (DF11 * 256 + DF12) / 10$ .

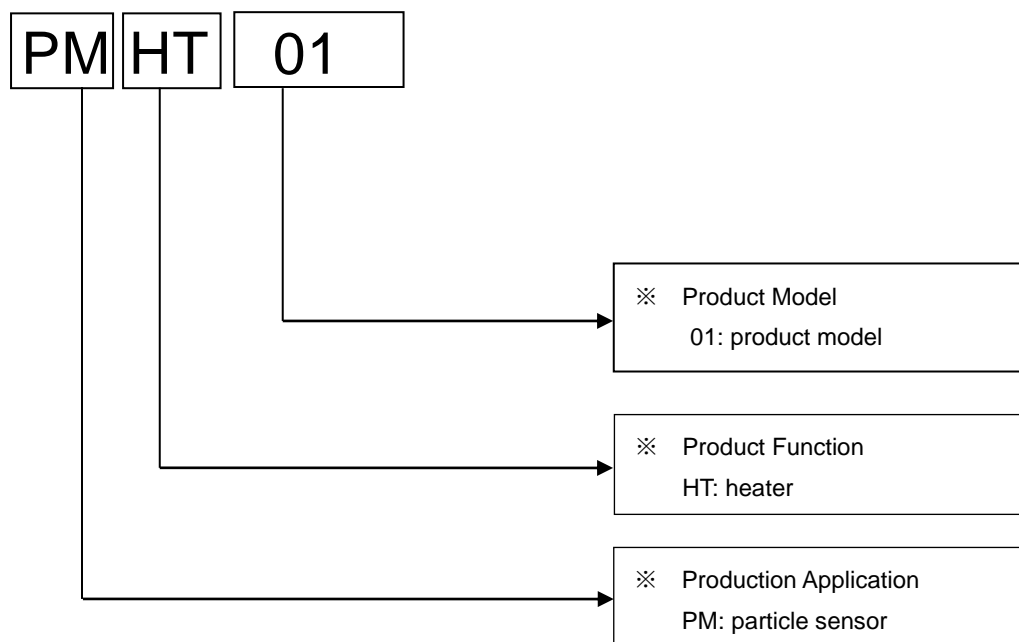
# Product Drawing



**Picture 3** Outline Dimensional Drawing (unit: mm, tolerance:  $\pm 0.2$ mm)

## Product Code Description

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## After-Sales Services and Consultancy

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