

SPECIFICATION

Product: Heating and Dehumidifying Apparatus for Outdoor
Particle Sensor

Model: PMHT01

Version: V0.1

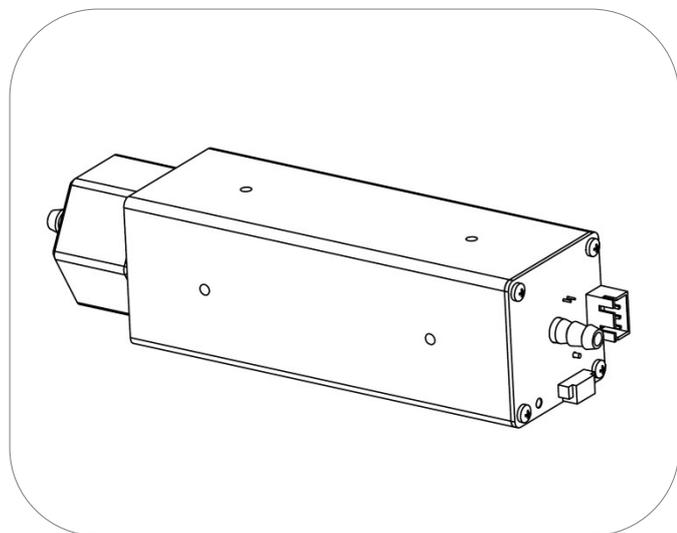
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Revision

No.	Version	Content	Reviser	Date
1	V0.1	Revision on first edition	Wei.Yang	30.3.2020

Heating and Dehumidifying Apparatus for Laser Particle Sensor PMHT01



ambient temperature

- ✧ Can set different heating temperature
- ✧ 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 public air quality monitoring
- ✧ Road raised dust online monitoring

Description

Heating and dehumidifying apparatus for outdoor particle sensor, works through filtration and heating 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; Homothermal 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.

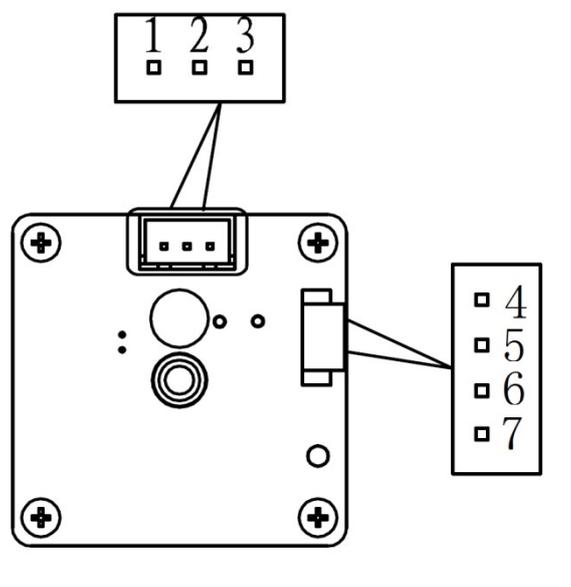
Features

- ✧ All-metal built, elegant shape
- ✧ Uniform heat conduction, slight influence by

Table 1: Specification

Specification of heating and dehumidifying apparatus	
Heating stabilization time	5min (default heating temperature 45°C)
Data refresh time	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)
Standby current	<25mA
Communication	UART (TTL_3.3V)
Dimensions	W145*H35*D35 mm
Lifespan	>3 years

Structure and PIN Definition



Picture 1 Connector drawing

Table 2. Pin definition table

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

Table 3. 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

Upper computer transmit format

Start Symbol	Length	Command	Data 1		Data n	Checksum
HEAD	LEN	CMD	DATA1	...	DATAN	CS
11H	XXH	XXH	XXH	...	XXH	XXH

Detailed instruction of protocol format

Protocol Format	Detailed explanation
Start symbol	Upper computer transmit 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	Function Description
1	temperature setting	0x2A	
2	parameter reading	0x2B	

Communication Protocol

4 Detailed description of protocol

4.1 Heating temperature setting

Transmit: 11 06 2A 09 00 00 DF1 DF2 [CS]

Response: 16 02 2A 09 B5

Function: set heating temperature of heating tube

Explanation:

Set heating temperature of heating tube $T = DF1 * 256 + DF2$.

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

4.2 Parameter reading

Transmit: 11 02 2B DF0 [CS]

Response: 16 22 2B DF0 DF1... DF20 [CS]

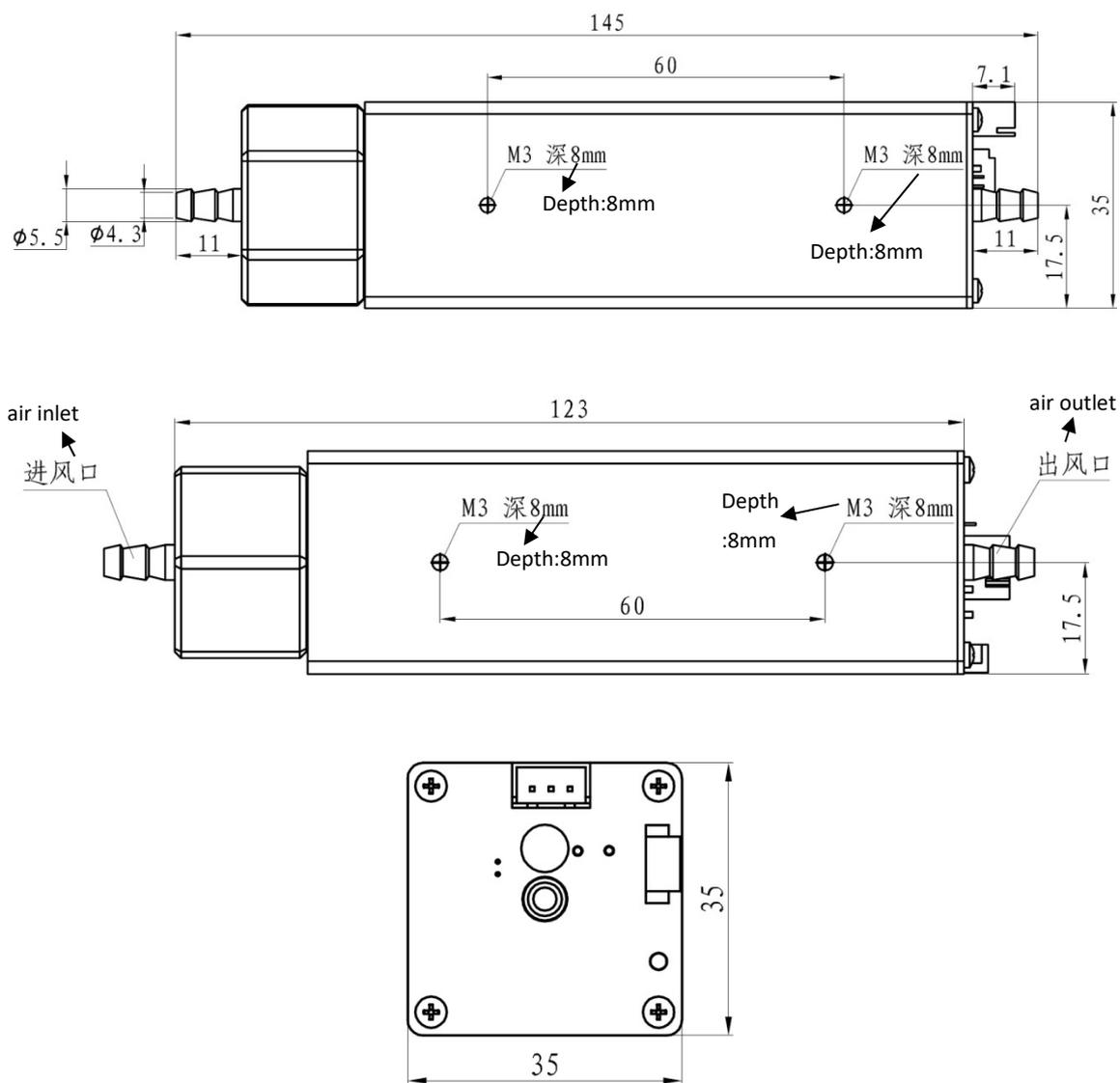
Function: read heating setting and current temperature

Explanation:

DF0 = 1, read current temperature of heating tube $T = DF9 * 256^3 + DF10 * 256^2 + DF11 * 256 + DF12$.

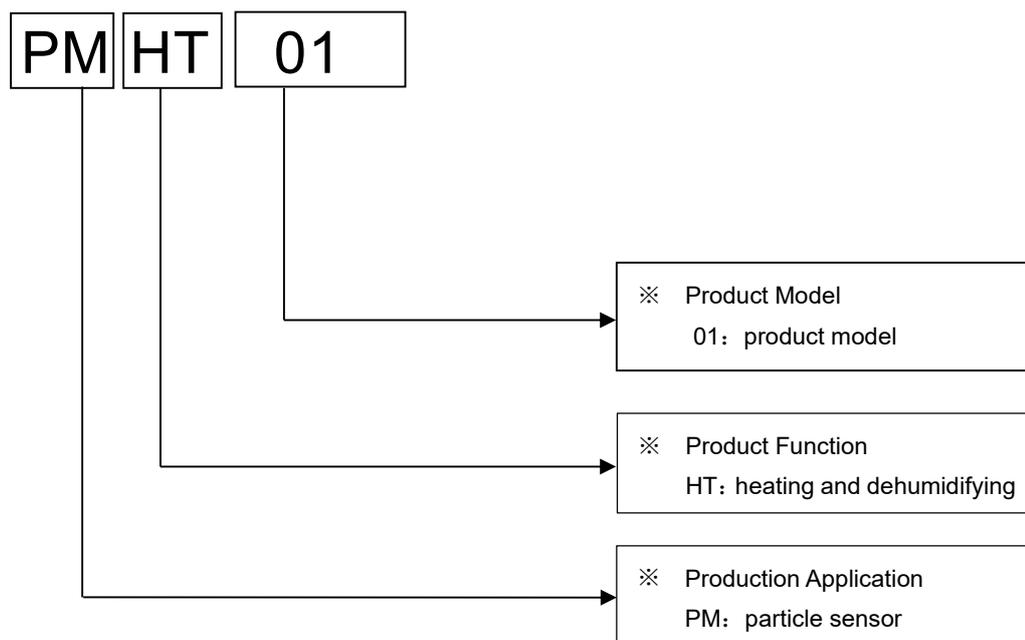
DF0 = 3, setting temperature of heating tube $T = DF9 * 256^3 + DF10 * 256^2 + DF11 * 256 + DF12$.

Sensor Drawings



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

Product Code Description



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