Installation Instructions for the
HPM Series Particle Sensors

Honeywell

32322552
Issue A

General Information

The Honeywell HPM Series Particle Sensor is a laser–based sensor which uses the light scattering method to detect and count particles in the concentration range of 0 µg/m³ to 1,000 µg/m³ in a given environment. A laser light source illuminates a particle as it is pulled through the detection chamber. As particles pass through the laser beam, the light source becomes obscured and is recorded on the photo or light detector. The light is then analyzed and converted to an electrical signal providing particulate size and quantity to calculate concentrations in real time. The Honeywell particle sensor provides information on the particle concentration for given particle concentration range.

Table 1. Specifications

Characteristic	Parameter
Operating principle	laser scattering
Detection[1]	PM2.5 or PM10
Output data[1]	PM2.5 in µg/m³ (PM10 in µg/m³ with additional programming)
Concentration range	0 µg/m³ to 1,000 µg/m³
Accuracy (at 25°C ±5°C): 　0 µg/m³ to 100 µg/m³ 　100 µg/m³ to 1000 µg/m³	 ±15 µg/m³ ±15 %
Response time	6 s
Supply voltage	5 V ±0.2 V
Standby current (at 25°C ±5°C)	<20 mA
Supply curent (at 25°C ±5°C)	<80 mA
Temperature: 　operating 　storage	 -10°C to 50°C [-14°F to 122°F] -30°C to 65°C [-22°F to 149°F]
Humidity (operating and storage)	0 %RH to 95 %RH non-condensing
Output protocol[2]	UART; baud rate: 9600, databits: 8, stopbits: 1, parity: no
Operating time: 　continuous mode 　intermittent mode	 20,000 hr depends on duty cycle
ESD	±4 kV contact, ±8 kV air per IEC 61000-4-2
Radiated immunity	1 V/m (80 MHz to 1000 MHz) per IEC 61000-4-3
Fast transient burst	±0.5 kV per IEC61000-4-4
Immunity to conducted disturbances radiated emissions	3 V per IEC61000-4-6
Radiated emissions	40 dB 30 MHz to 230 MHz; 47 dB 230 MHz to 1000 MHz per CISPR 14
Conducted emissions	0.15 MHz to 30 MHz in compliance with CISPR 14

[1] PM2.5 is particulate matter ≤2.5 µm in diameter; PM10 is particulate matter ≤10 µm in diameter.

[2] Contact Honeywell for other output options.

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Figure 1. Mounting Dimensions (mm /[in] For reference only.)e

Connector: 60511 08 2130J
Mating connector: Molex 51021-0800
Air outlet by fan
Air inlet
43,00 [1.69]
36,00 [1.42]
23,7 [0.93]
15,5 [0.61]
12 [0.48]
1,5 [0.06]
4,5 [0.18]
29,00 [1.14]
36,00 [1.42]
3X Ø1,75 [0.07]
Mount with 3 ST2.2 screws; length determined by customer.
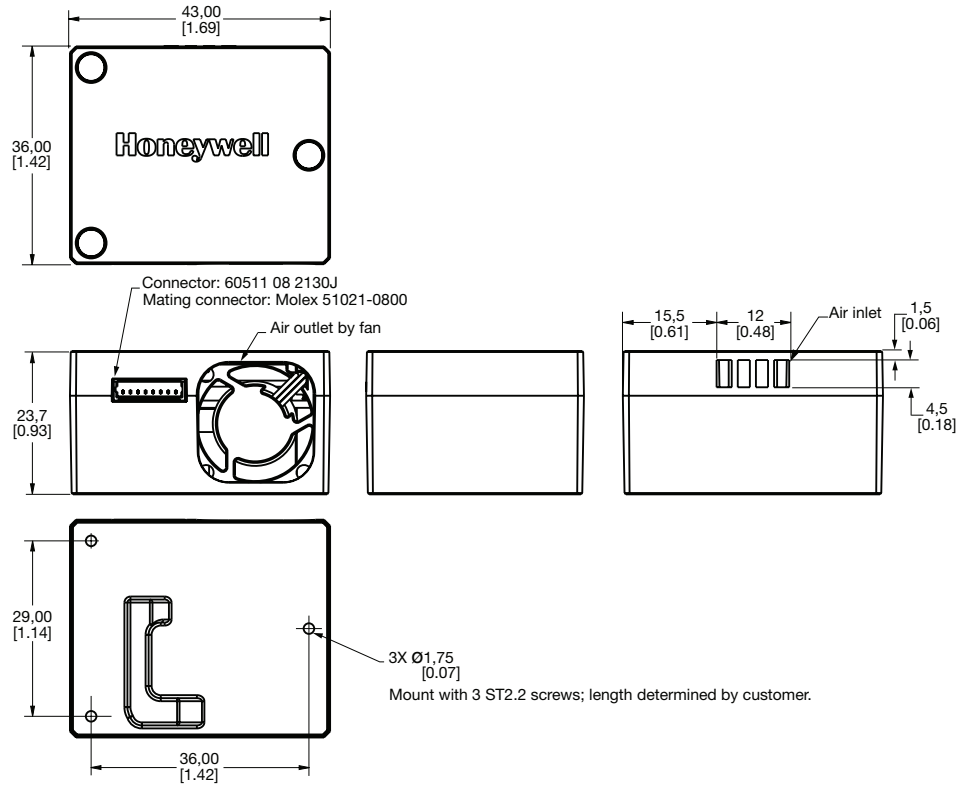
Table 2. Connector Pinout
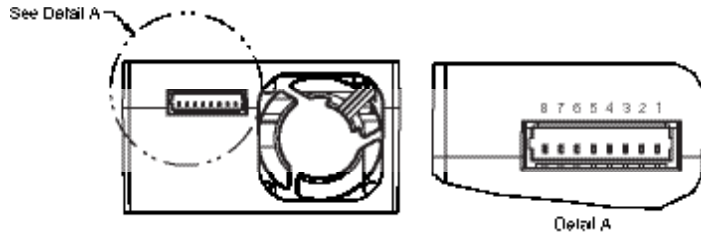
| Pin	Name	Description
1	+3.3 V	power output (+3.3 V/100 mA)
2	5 V	power input (5 V)
3	N/A	N/A
4	N/A	N/A
5	TEST	used for testing (NA)
6	TX	UART TX output (0 – 3.3 V)
7	RX	UART RX input (0 – 3.3 V)
8	GND	power input (ground terminal)

Product Installation

Install the product to the desired surface using the screws shown in Figure 2.

> ## NOTICE
> **IMPROPER INSTALLATION**
> Particlate settling or accumulation at the air outlet or air inlet may affect product sensitivity. Ensure the HPM Series Particle Sensor is installed correctly according to Figure 2.
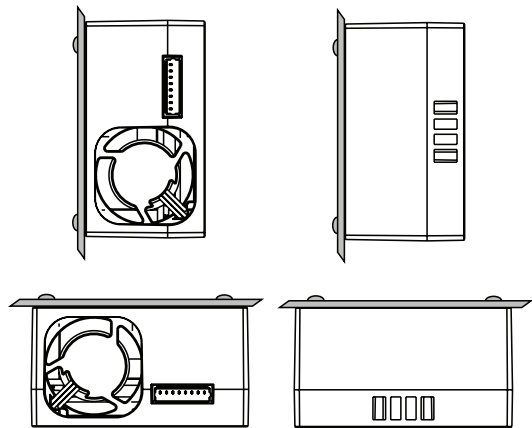
Figure 2. Installation Orientation
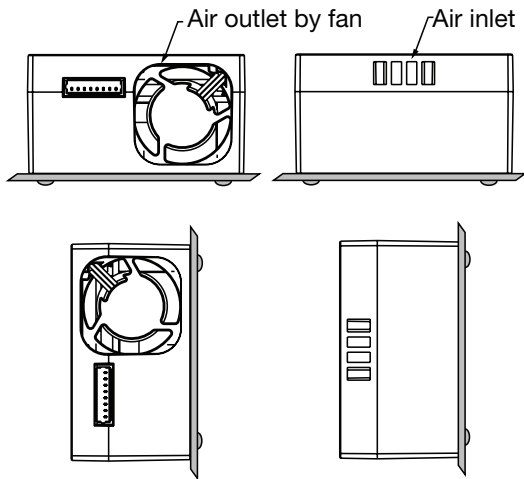
Table 3. Customer Use Protocol

Command Length (Bytes)	HEAD	LEN	CMD	Data	CS	Example
Read Particle Measuring Results						
Send	0x68	0x01	0x04	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 04 93
Response, Pos ACK	0x40	0x05	0X04	"DF1, DF2, DF3, DF4 PM2.5 = DF1 * 256 + DF2 PM10 = DF3 * 256 + DF4"	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	40 05 04 00 30 00 31 56
Response, Neg ACK					0X9696	
Start Particle Measurement						
Send	0x68	0x01	0x04	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 01 96
Response, Pos ACK					0xA5A5	
Response, Neg ACK					0x9696	
Stop Particle Measurement						
Send	0x68	0x01	0x02	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 02 95
Response, Pos ACK					0xA5A5	
Response, Neg ACK					0x9696	
Set Customer Adjustment Coefficient						
Send	0x68	0x02	0x08	DF1: 30 ~ 200 (Default, 100)	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 02 08 64 2A
Response, Pos ACK					0xA5A5	
Response, Neg ACK					0x9696	
Read Customer Adjustment Coefficient						
Send	0x68	0x01	0x10	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 10 87
Response, Pos ACK	0X40	0X02	0X10	DF1: 30 ~ 200 (Default, 100)	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	40 02 10 64 4A
Response, Neg ACK					0x9696	
Stop Auto Send						
Send	0x68	0x01	0x20	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 20 77
Response, Pos ACK					0xA5A5	
Response, Neg ACK					0x9696	
Enable Auto Send						
Send	0x68	0x01	0x40	NA	CS = MOD ((65536-(HEAD+LEN+CMD+DATA)), 256)	68 01 40 57
Response, Pos ACK					0xA5A5	
Response, Neg ACK					0x9696	

[1]Life may vary depending on the specific application in which the sensor is utilized.

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