Air Particle Sensor

ZN-PD-SA

CSM_ZN-PD-SA_DS_E_3_6

Continuously monitor dust fallout and particles which detract from product quality.

- Compact design ideal for continuous monitoring
- Equipped with various interfaces such as a LAN port.

Particle measurement type

Accurately measures airborne particles.

Dust measurement type

One unit for measuring dust fallout and identifying dust sources

⚠ **Be sure to read "Safety Precautions" on page 4.**

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information

Sensor

Appearance	Item (Measured particle diameter)	Model	Power Supply
	Air Particle Sensor Particle measurement type 0.3, 0.5, or 1.0 μm min.	**ZN-PD03-SA**	DC cable
		ZN-PD03C-SA *1	
		ZN-PD03F-SA *1 *2	
	Air Particle Sensor Dust measurement type 5 μm (10 μm), 20 μm (30 μm), 50 μm min. ( ) is selectable.	**ZN-PD50-SA**	
		ZN-PD50C-SA *1	
	Air Thermo Sensor For temperature / humidity measurement	**ZN-TH11-S**	—

• Please choose this form when you buy with the calibration certificate.

*1. Contents of Certificate of Calibration Set: Calibration Certificate, Inspection Result (ZN-PD03C-SA: 0.3 μm inspection data, ZN-PD50C-SA: 5 μm inspection data), and Traceability Chart

*2. For the ZN-PD03F-SA, both 0.3 μm and 0.5 μm inspection data will be given in the Inspection Results.

Options (Order separately)

Air Particle Sensor

Shape	Item (Applicable Standards)	Rated Voltage	Model
	AC adaptor (PSE)	100 to 125 VAC	**ZN9-ACP02-PSE**
	AC adaptor (CCC)	100 to 240 VAC	**ZN9-ACP02-CCC**
	AC adaptor (KC)	100 to 240 VAC	**ZN9-ACP02-KC**
	AC adaptor (CE)	100 to 240 VAC	**ZN9-ACP02-CE**
	AC adaptor (UL)	100 to 125 VAC	**ZN9-ACP02-UL**

Appearance	Item		Model
	Change filter set for Particle measurement type		**ZN9-PF1-S**
	For Dust measurement type	Change filter	**ZN9-PF2-S**
		Change funnel	**ZN9-PG1-S**
	Exhaust tube (4 m)		**ZN9-PT4-S**
	Exhaust tube (8 m)		**ZN9-PT8-S**
	Filter for cleaning		**ZN9-PC1-S**
	DC cable (2 m)	Straight type	**ZN9-ED01-S**
		Right angle type (comes with ZN-PD□□-SA)	**ZN9-ED02-S**

Air Thermo Sensor

Appearance	Item	Model
	Connection cable for air particle sensor (With connectors at both ends, length: 0.1 m)	**ZN9-TL01-S**
	Connection cable for air particle sensor (With connectors at both ends, length: 2 m)	**ZN9-TL20-S**
	Connection cable for external device (With a connector at one end, length: 2 m)	**ZN9-TC20-S**

PC Software

Appearance	Item	Model
	Wave Inspire ES	**ZN-SW11-S**

Note: System requirements OS: Microsoft Windows 10 (32 bit/64 bit)/Microsoft Windows 11 (64 bit)
CPU: compatible Intel processors, 1 GHz or higher.
Memory: 1 GB or more (2 GB or more recommended)
The maximum number of connectable sensors is 95.
(When one PC is connected with a leased line network . The sampling period is set to 10 minutes.)
The number of possible sensor connections changes by a sampling period, connected number of PC or PLC, and the network load situation.
Microsoft and Windows are registered trademark of Microsoft Corporation in the United States and other countries.

Calibration service

Subject to calibration	Content	Model
Air Particle Sensor Particle measurement type	Calibration Certificate, Inspection Result (0.3 µm inspection data), Traceability chart	**ZN9-PD03C-S**
	Calibration Certificate, Inspection Results (0.3 µm and 0.5 µm inspection data), and Traceability Chart	**ZN9-PD03F-S**
Air Particle Sensor Dust measurement type	Calibration Certificate, Inspection Result, Traceability chart	**ZN9-PD50C-S**
Air Thermo Sensor	Calibration Certificate, Inspection Result, Traceability chart	**ZN9-TH11C-S**

Note: 1. If a Certificate of Calibration is required after you purchase the product, use the above model number to order one.
2. It is necessary to ship the product back to OMRON in Japan.
3. When a ZN-PD□□-S-series particle sensor is received for the calibration service, parts with a limited service life will be replaced and adjusted before the sensor is returned.
However, it may be determined that the sensor is not repairable due to internal contamination, board corrosion, or other reasons. If inspection shows that the sensor is not repairable, only a certificate for the inspection results will be issued.
(The same fee as for repairs will apply.)

Ratings and Specifications

Air Particle Sensor

Item \ Model	Particle measurement type	Dust measurement type
	ZN-PD03-SA	ZN-PD50-SA
Measurement method	90° sideways light-scattering method	
Light source	Semiconductor laser	
Measured particle diameter	0.3, 0.5, or 1.0 μm min.	5 μm (10 μm), 20 μm (30 μm), 50 μm min. *1
Counting efficiency	Error of ±30% maximum with a standard measurement instrument for 0.3 μm reference particles	Error of ±35% maximum with a standard measurement instrument for 0.5 μm reference particles
Particle concentration	0 to 100,000 particles/cf (Recommended application environment: Class 1,000 to 100,000)	0 to 50,000 particles/cf
Sample flow rate	More than 2.8 Liter/min	More than 6.0 Liter/min
Status outputs (2 outputs)	Photocoupler output (Status outputs linked with clean levels)	
System error status output		
Trigger Input	Photocoupler input	
Communications interface	Ethernet (10BASE-T, 100BASE-TX)	
Communications protocol	Socket (TCP), original protocol	
Indicators	Clean Level: 4 steps display according to clean level (adjustable) 7-segment main display (red): Measurement value (For particle count, the three type displays are selectable; particles/cf, particles/liter and particles/measurement time, With ZN-TH11-S; temperature, humidity and dew point) 7-segment sub-display (green): Threshold particle diameter, With ZN-TH11-S; t (temperature), rh (humidity), dp (dew point)	
Measure mode	Real-time mode (by second) / Cycle mode (by set cycle) / Trigger mode (by trigger)	
Power supply voltage	18 to 25 VDC AC adapter: 100 to 240 V / 50 to 60 Hz *2	
Current consumption	1A MAX	
Ambient temperature range	Operating: 0 to 35°C	Operating: 0 to 40°C
	Storage: −15 to +50°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no icing or condensation)	
Insulation resistance	20 MΩ min. at 500 VDC	
Withstand voltage	1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance	110 to 55 Hz, 0.3 mm double amplitude, 50 min	
Materials	ABS	
Degree of protection	IP20	
Installation method	DIN track mount / Self standing	
Weight (Packed state)	Approx. 1.7 kg	
Accessories	Instruction Sheet, Air-intake tube (Tubing ID: 10 dia., Length 1 m) x1, DC cable (Right angle type), Ferrite core	Instruction Sheet, Air filter x1, Funnel x1 DC cable (Right angle type), Ferrite core

*1. ( ) is selectable.
The maximum particle diameter that can be measured is approximately 200 μm. (When the pre-filter is attached.)
*2. AC adaptor is not bundled.

Air Thermo Sensor

Item	Model	ZN-TH11-S
Supply voltage		12 to 24 VDC ±10% Ripple (p-p): 10% max.
Current consumption		40 mA max.
Temperature	Range *1	−25 to +60°C
	Measurement accuracy *3	±0.3°C (at 25°C)
	Resolution	0.1°C
	Long-term drift *4	0.1°C or less / year
Humidity	Range *2	0% to 99%
	Measurement accuracy *3	±2.5% (at 25°C, 10% to 85%)
	Resolution	0.1%
	Long-term drift *4	1.0% or less / year
Recommended storage temperature range *5		10 to 50°C (with no condensation or icing)
Recommended storage humidity range *5		20 to 60% (with no condensation or icing)
Indicator		Alarm LED on the body
Alarm threshold		Threshold can be set for temperature, humidity or dew point.
Data update cycle		10 s
Serial communication standard		RS-422 (Compoway/F)

Note: 1. Power is supplied from the Air Particle Sensor.
2. Connection cable (Type ZN9-TL□□) is needed to connect with ZN-PD-S.
3. If the following sticker is affixed to the connection port on the top of the Air Particle Sensor, the Air Thermo Sensor cannot be connected. "ZN-RD11-S dedicated port; cannot be used to connect to a PC." The Air Thermo Sensor can be connected if the sticker states "Option unit connection port; do not use to connect to a PC." (This corresponds to products shipped starting in November 2009.)

✻1. Condensation may occur if the device is transferred quickly between locations with significant temperature differences. The device may not be able to measure humidity accurately if condensation occurs. If the product becomes wet due to condensation, allow the product to dry in a dry, room-temperature environment before use.
✻2. The device may not be able to measure humidity accurately if moisture is present on the sensor surface after being exposed to high humidity for an extended period. In this situation, allow the product to dry in a dry environment at room temperature and humidity before use.
✻3. Measurement precision may deteriorate due to the adhesion of impurities, contaminants, organic chemical substances, or other environmental matter on the sensor surface during use. Periodic calibration is recommended to check the measurement precision.
✻4. Long-term drift values are based on continuous usage or storage at a temperature of 25°C and a humidity of 20 to 60% within the warranty period of the product. Continuous usage or storage in an environment that exceeds these conditions may result in a drift value greater than the stated value.
✻5. Measurement precision deterioration may occur while the product is in storage. To maintain the original product performance, ensure a storage environment within the recommended temperature and humidity ranges. Storage in an environment that exceeds the specified conditions may cause deterioration of the measurement precision.

Safety Precautions

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.

For technical information and product FAQs, refer to the "Technical Guide" on your OMRON website.

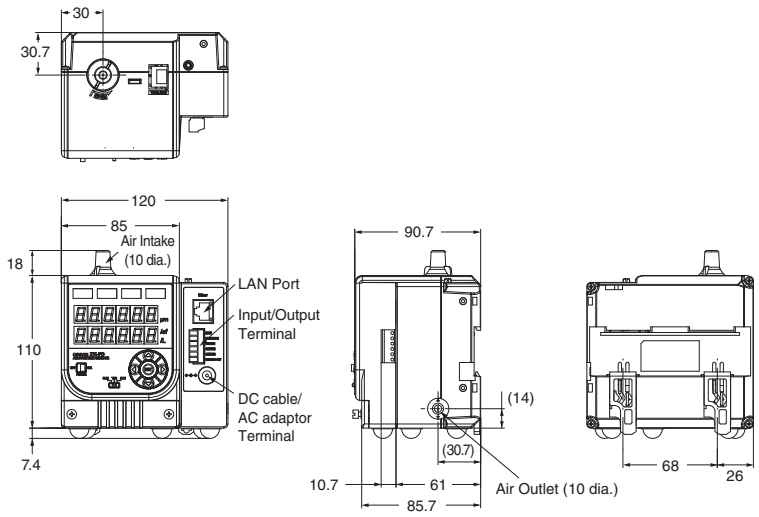
Dimensions

(Unit: mm)

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

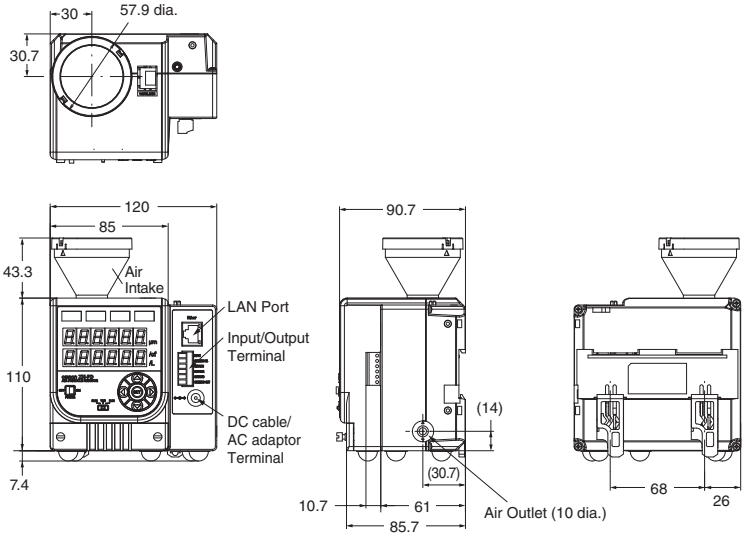
Air Particle Sensor (Particle measurement type)

ZN-PD03-SA



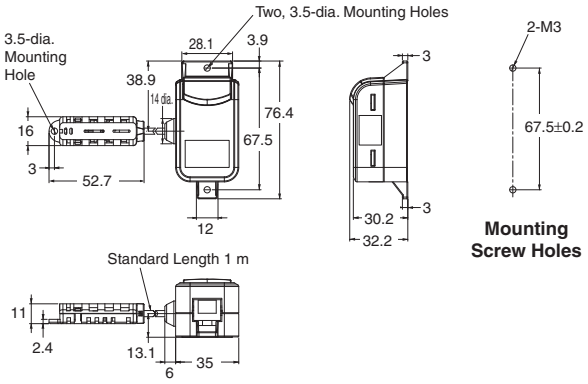
Air Particle Sensor (Dust measurement type)

ZN-PD50-SA



Air Thermo Sensor

ZN-TH11-S



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