SPECIFICATIONS

PARTICLE SENSOR

KA-05

RION CO., LTD.

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No. 14006E 18-07 Printed in Japan

Outline

The KA-05 uses the light scattering principle to detect airborne particles. The unit measures particle size and particle count and is designed to be used as a particle sensor in a multi-point monitoring system.
The unit incorporates the proprietary Rion multi-point system interface which allows connection to a multi-point monitoring system.
Because the unit does not include a power supply, pump, and display, these functions must be provided through connection to external equipment.

The unit has two measurable particle size ranges (≥0.5 µm and ≥5.0 µm) and the flow rate is 28.3 L/min. Because the unit does not include controls or indicators for measurement, it must be controlled by software (such as RP Monitor EVO or similar) used for operation of a multi-point monitoring system.

By using the D/A converter interface available as a factory option, the measured particle count can be converted into a 4 to 20 mA current for direct output to an instrumentation system. The values for the two measurable particle size ranges (≥0.5 µm and ≥5.0 µm) are provided as separate outputs. Factory options are products that can be installed in the unit before the unit is shipped.

Specifications

Optical system	90° sideway light scattering method
Light source	Laser diode (wavelength 785 nm, rated output 70 mW)
Laser product class	Class 1, IEC 60825-1 (2014)
	Internal particle detection mechanism uses Class 3B laser
Light detector	Silicon photodiode
Collecting optics	Spherical mirror
Allowable measurement sample types	
	Air
Sample pressure	Atmospheric pressure
Calibration	By polystyrene latex (PSL) particles with refractive index 1.6 in clean air
Minimum detectable particle size	
	0.5 µm (for spherical particles with refractive index 1.6)
Size range	Two channels (≥0.5 µm, ≥5.0 µm)

Counting efficiency	50% ± 20% (measuring PSL particles in the range of 0.5 µm)
	100% ± 10% (measuring PSL particles in the range with 1.5 to 2 times larger than 0.5 µm)
Size resolution	15% or less (in the vicinity of 0.5 µm PSL particles)
Error of size range threshold value	
	±10% or less
Responsivity	0.5% or less
Maximum particle number concentration	
	28,000,000 particles/m^3 (coincidence loss within 10%)
False count rate	7 particles/m^3 or less (95% confidence interval)
Flow rate	28.3 L/min
Flow control	Flow rate controlled by critical orifice connected to vacuum source of -60 kPa (gauge pressure) or lower
Maximum tube length	
INLET	5 m (when connecting 6 mm inner diameter tube)
OUTLET	30 m (when connecting 12 mm inner diameter tube)
Warm-up time	10 minutes or less
LED Indicators	
POWER	Serves to indicate the status of the power
SENSOR	Serves to indicate the status of the particle detector section
Internal interface	
Multi-point system interface	
	Protocol For RION multi-point system
Inputs/outputs	
Modular connector RJ-45	
	For connection of DC power and control equipment compatible with multi-point system interface
USB mini-B	For connection of control equipment compatible with serial interface
Sample inlet/outlet	
INLET	Outer diameter 1/4-inch (approx. 6.35 mm)
OUTLET	Outer diameter 1/2-inch (approx. 12.7 mm)
Power	9 V to 28 V DC (max. 100 mA at 24 V)

Environmental Requirements

Operation Environments	
	Indoor Use Only
Altitude	Up to 2000 m
Supply Voltage Fluctuations	
	9 V to 28 V DC (max. 100 mA at 24 V)
Overvoltage Category	
	Ⅰ
Pollution Degree	2
Protection Class	Ⅲ
Environmental conditions for operation	
	+15˚C to +40˚C, 85% RH or less (no condensation)
Environmental conditions for storage	
	–10˚C to +50˚C, 90% RH or less (no condensation)
Dimensions	Approx. 90 mm (H) × 130 mm (W) × 56 mm (D)
	(without protruding parts)
	Approx. 127 mm (H) × 130 mm (W) × 56 mm (D) (maximum)
Weight	Approx. 650 g

Supplied accessories

Hook-and-loop fastener	8
Inlet cap	1
Outlet cap	1
Concise manual	1
Inspection certificate	1
2 pins connector plug (for factory option KA-05-S21)	1
3 pins connector plug (for factory option KA-05-S21)	2

Options

Zero count filter	KA-05-S23
Isokinetic probe (aluminium)	KA-05-S24
Isokinetic probe (stainless-steel)	KA-05-S25
DIN rail set	KA-05-S26
Stand	KA-05-S27
USB cable (A to mini-B)	
Instruction manual (printed)	

Consumable parts

Laser diode, O ring of outlet

Recommended calibration interval

One year

Factory option

D/A converter interface KA-05-S21

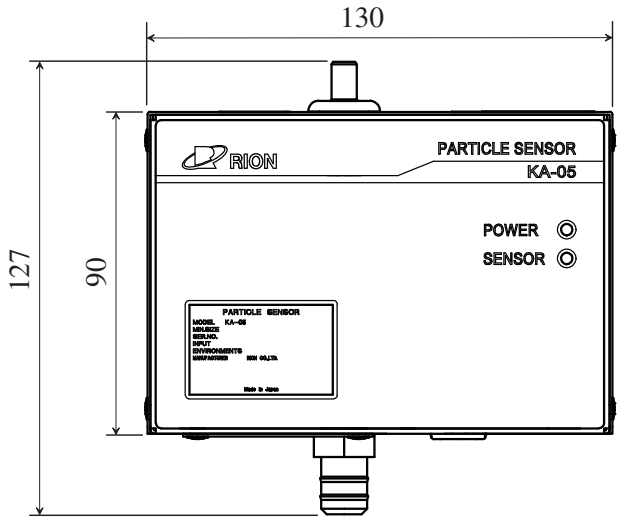
Converts the particle count in a selected channel into 4 mA to 20 mA DC current.

Two independent output sources available

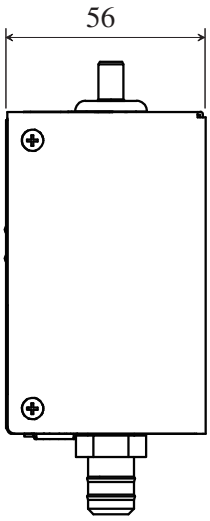
Output range	Select one from 0 to 1, 0 to 10, 0 to 100, 0 to 1,000, 0 to 10,000, 0 to 100,000, 0 to 16, 0 to 256, 0 to 4,096, 0 to 40,960, 0 to 409,600
Load resistance	0 Ω to 500 Ω (including the resistance of the connection cable)
Output precision	±1%
Power	15 V to 28 V DC (max. 140 mA at 24 V)
Inputs/outputs	POWER terminal strip: For input DC power Output terminal strip: For output 4 mA to 20 mA DC current

Software (downloaded from RION website)

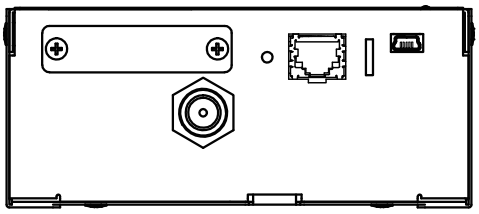
SETUP Application	Configures parameters of multi-point system interface and D/A converter interface using set up mode of the unit.



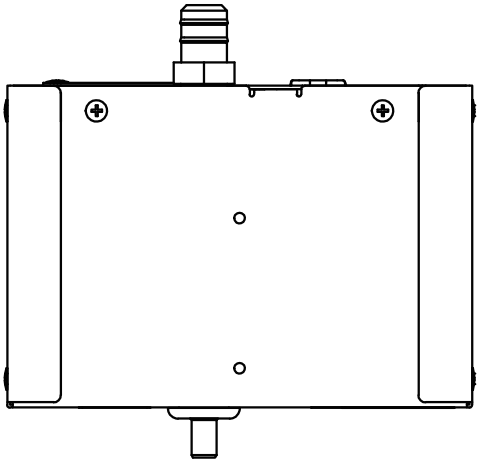
Front view



Right side view



Bottom view



Back side view

Unit: mm

Dimensional Drawings

Specifications subject to change without notice