SPECIFICATIONS

PARTICLE SENSOR

KS-41A

RION CO., LTD.

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No. 05051-5E 21-11 Printed in Japan

Outline

The KS-41A is a sensor which uses the light scattering method for measuring the particle number concentration in photoresist solutions. The particle count is determined for various sizes. Sample fluid contacting parts are made of synthetic quartz and PFA.

By connecting the KS-41A to the controller KE-40B1, a liquid-borne particle counter system with up to ten size ranges can be created.
Using the KE-40B1, it is also possible to freely specify the size ranges 0.15 µm to 0.5 µm for particle detection.
The factory default setting is four channels (≥0.15 µm, ≥0.2 µm, ≥0.3 µm, ≥0.5 µm).

The KS-41A does not have measurement controls or a display for measurement results. It is designed to be used under control of a separate controller KE-40B1 which also supplies power to the KS-41A.
The KS-41A can be connected to the Rion multi-point monitoring system with a multi-point unit KZ-51.
The KS-41A incorporates a leak sensor. If a leak is detected, an alarm output can be activated.
As the KS-41A does not incorporate a flow control circuit for the sample fluid, the flow rate of the sample fluid must be controlled by external means.
The rated sample fluid flow is 10 mL per minute.

Specifications

Optical system	90° sideway light scattering method
Light source	Laser diode (rated output 200 mW; wavelength 830 nm)
Laser product class	Class 1, IEC 60825-1:2014 Internal particle detection mechanism uses Class 3B laser
Light detector	PIN type photodiode
Materials of parts exposed to sample	Synthetic quartz, PFA
Allowable sample type	Fluids which do not corrode the fluid contact materials
Calibration	By polystyrene latex (PSL) particles with refractive index 1.6 in pure water
Minimum detectable particle size	0.15 µm
Measurable particle size range	0.15 µm to 2 µm (with PSL particles of refractive index 1.6 in pure water)

Size range	Freely settable to 0.15 µm to 0.5 µm (Up to 10 channels in 0.01 µm steps can be set with controller KE-40B1. Upper limit for smallest particle size channel (CH 1) is 0.29 µm) *The factory default setting is four channels (≥0.15 µm, ≥0.2 µm, ≥0.3 µm, ≥0.5 µm)
Counting efficiency	50% ±10% (measuring PSL particles in the range of 0.3 µm, using count of 0.2 µm and above for comparison with reference unit)
Flow rate	10 mL/min
Maximum particle number concentration	1,200 particles/mL (coincidence loss 5% for 0.15 µm particles)
Sample temperature range	+15°C to +30°C (no moisture condensation on flow cell)
Sample pressure range	300 kPa or less (gauge pressure)
Warm-up time	About 10 minutes
Sample inlet/outlet	
INLET	Sample inlet, 2 mm × 4 mm dia. flared tube joint
OUTLET	Sample outlet, 2 mm × 4 mm dia. flared tube joint
Purge air port	
PURGE	Purge gas inlet, Rc 1/8 (1/8 PT female)
Indicators	Two color light emitting diode
PARTICLE MONITOR	Briefly flashes green when particles above minimum detectable particle size are detected
LIQUID LEAK	Lit green when leak is not detected within chassis Lit red when leak is detected within chassis
CELL	Lit green during normal operation Lit red when flow cell is contaminated or particle number concentration in sample fluid reached or exceeded maximum particle number concentration Off when light source is off
LASER	Lit green during normal operation Lit red when light source temperature is out of range Flashing red when light source output is the rated level or below Off when light source is off

DATA LINK

When connected to multi-point unit KZ-51

Lit green when the unit exists in the state that can be communicated
Briefly flashes green when communication is being carried out normally
Briefly flashes red when error has occurred during communication
Off when no communication is being carried out, or the unit is not controlled by the controller

When connected to controller KE-40B1

Always off

POWER — Lit green while power to unit is on

Input/output connectors

CONTROLLER — For connection of controller KE-40B1

LIQUID LEAK ALARM

Shorted during normal operation, open when internal leak is detected (M3 screw terminal, accepts either electric wire with a 1.25 mm^2 cross section or spade (Y-type) terminals)
Maximum load: 30 V DC, 1 A or less

ALARM1, ALARM2 terminals

Terminals are closed by relay when the instruction of alarm output is conveyed via the controller of multi-point monitoring system
Maximum load 30 V DC, 1 A

Power — 12 V DC
(supplied via controller KE-40B1 or multi-point unit KZ-51)

Electric power consumption

11 VA (at room temperature), 14 VA (maximum)

Installation inclination angle

Max. 2°

Environmental Requirements

Operation Environments

Indoor Use Only

Altitude — Up to 2000 m

Overvoltage Category — Ⅱ (when connected to controller KE-40B1 or multi-point unit KZ-51)

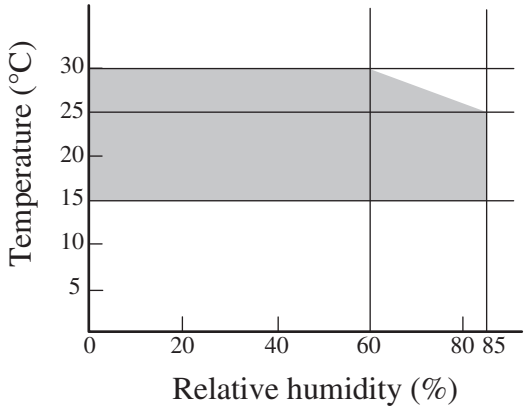
Pollution Degree — 2

Protection Class — Ⅰ

Environmental conditions for operation

+15°C to +30°C, 85% RH or less

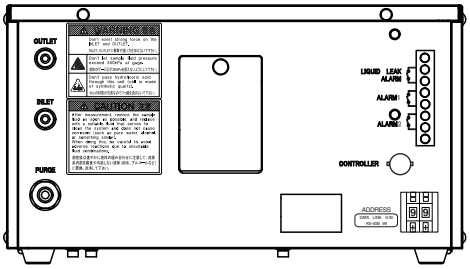
Exactly, shaded section ▭ in the following graph (no condensation)



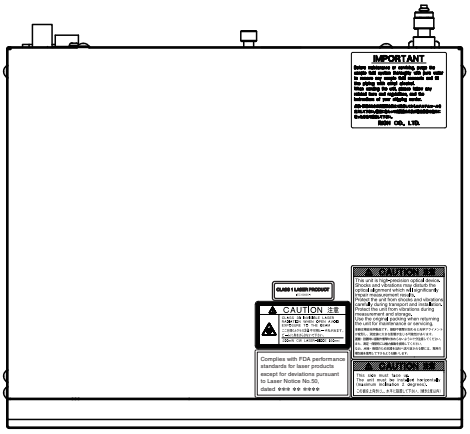
Environmental conditions for storage

−10°C to +50°C, 90% RH or less (no condensation and no freezing in internal piping)

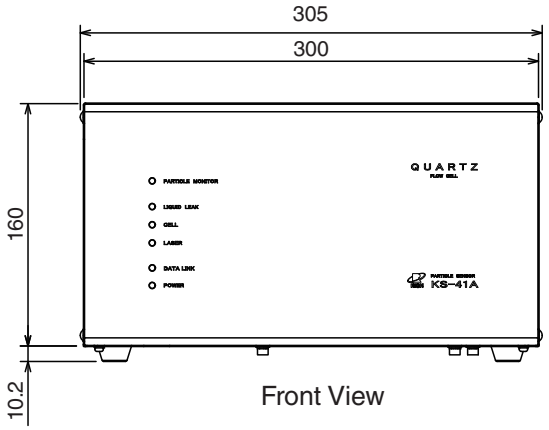
Dimensions	170.2 mm (H) × 305 mm (W) × 279 mm (D) (maximum) 160 mm (H) × 300 mm (W) × 251 mm (D) (excluding protruding parts)	
Weight	Approx. 7.5 kg	
Supplied Accessories	Tube A vacuum pack	1
	(2 mm × 4 mm dia., 1.5 m flared PFA tube 2, union joint 1)	
	Connection cable A (1 m) KS-42-121	1
	Cleaning brush set	1
	Instruction manual	1
	Instruction sheet for “Transport and Installation”	1
	Liquid-borne particle counter usage precautions	1
	Inspection certificate	1
Options	Multi-point unit	KZ-51
	Connection cable B (5 m)	KS-42-123



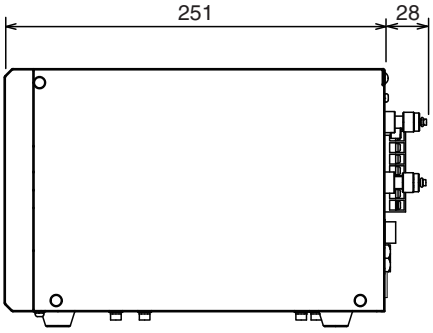
Rear View



Top View



Front View



Right Side View

Unit: mm

Dimensional Drawings

Specifications subject to change without notice