

SPECIFICATIONS
PROCESS COUNTER
KS-93



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Outline

The KS-93 is an in-line process counter sensor which detects the size and number of particles floating in gas, using the light-scattering method. Measurement results are output via an interface.

At the time of shipping, the leak rating of gas-contacting parts is 1×10^{-4} Pa·L/s or lower (measured according to the vacuum vessel method). This low-leak construction allows measurement also of particles in toxic or highly reactive gases.

The KS-93 consists of the sensor unit and the power supply unit.

The KS-93 is not explosion-proof, but the particle detector is hermetically sealed and the interior can be purged with inert gas for safety in the event of a leak due to cell damage.

Particles are measured in five size ranges ($\geq 0.1 \mu\text{m}$, $\geq 0.15 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$), and the rated sample flow is 100 mL per minute. As the KS-93 does not incorporate a flow control, the flow rate of the sample gas must be controlled by external means.

A serial interface and a multi-point monitoring system interface are built in as standard. Except for power on/off, all functions are controlled from external equipment. The sensor controller KZ-70 (option) can be connected via the multi-point monitoring system interface, for operation control and display of measurement results.

* All company names and product names mentioned in this specifications are trademarks or registered trademarks of their respective owners.

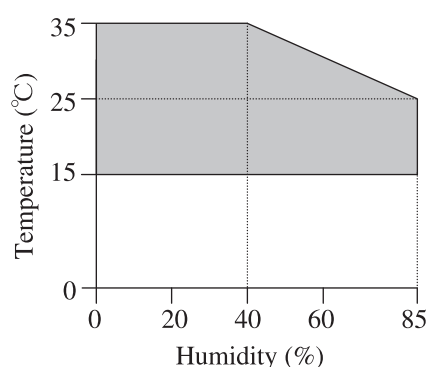
Specifications

Optical System	90° sideway light-scattering method
Light source	Laser diode (rated output : 200 mW, wave length : 830 nm)
Laser product classification	Class 1, IEC 60825-1 (2001) Internal particle detection mechanism uses class 3B laser
Light detector	PIN type photodiode
Sample flow rate	100 mL/min
Sample flow range	50 to 300 mL/min Size conversion tolerance at smallest particle size (0.1 μm) is $\pm 20\%$
Measurable particle size range	0.1 to 2 μm (for polystyrene latex particles with refractive index 1.6 in clean air)

Measurement size range	Five channels ($\geq 0.1 \mu\text{m}$, $\geq 0.15 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$)
Calibration	In clean air with polystyrene latex (PSL) particles, refractive index 1.6 * The PSL spheres are calibrated according to the TEM (transmission electron microscopy) by the supplier, JSR Corporation.
Counting efficiency	$50 \pm 10\%$ (when measuring polystyrene latex particles with about $0.2 \mu\text{m}$ diameter in the $0.1 \mu\text{m}$ range, compared to a reference unit)
Maximum particle number concentration	30,000 particles/min (counting loss 5% for $0.1 \mu\text{m}$ particles)
Materials of parts exposed to sample gas	Synthetic quartz, SUS316L (EP grinding), fluorine rubber
Allowable sample gas types	Gases which will not corrode gas-contacting parts materials
Sample gas temperature range	15 to 35°C
Sample gas pressure range	500 kPa or lower (gauge pressure)
Purge gas pressure range	100 kPa or lower (gauge pressure)
Leak rating	Max. $1 \times 10^{-4} \text{ Pa}\cdot\text{L/s}$ (measured according to vacuum vessel method) Guaranteed value at time of shipping
Warm-up time	10 minutes
Flow system ports	
SAMPLE	Inlet/outlet (2) Male VCR, joint diameter 1/4 inch (6.35 mm)
PURGE	Inlet/outlet (2) Male VCR, joint diameter 1/4 inch (6.35 mm)
Other connectors	
DC IN	DC input for the power supply unit KZ-50
ALARM (1, 2)	Alarm output (2), relay contacts Operating under control by the multi-point system interface The maximum load rating is 30 V DC, 1 A (AC loads are not allowed).
SERIAL	Serial interface connector (D-SUB, 9-pin)
DATA LINK	Multi-point system interface

Ambient conditions for operation

Shaded section  in graph below (no condensation)



Ambient conditions for storage

-10 to +50°C, 85% RH or less (no condensation)

Power requirements Supplied via power supply unit KZ-50 (90 to 250 V AC, 50/60 Hz)
(supplied power cord only for use in Japan, 100 V AC)
Power consumption: Max. 40 VA (including power supply unit)

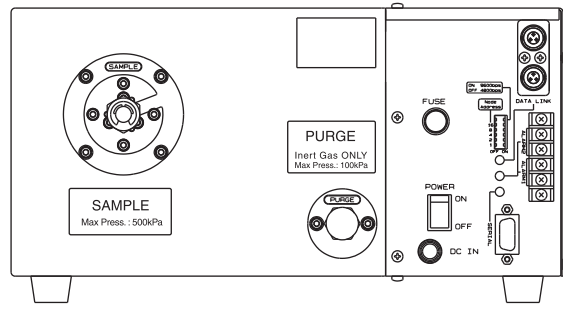
Dimensions and weight

Main unit (KS-93): 152 (H) × 284 (W) × 249 (D) mm (maximum)
135 (H) × 280 (W) × 150 (D) mm (excluding protruding parts)
Approx. 6.5 kg

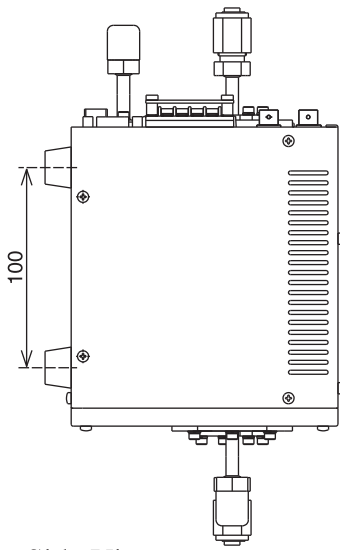
Power supply unit (KZ-50):
130 (H) × 71 (W) × 200 (D) mm (maximum)
112 (H) × 71 (W) × 185 (D) mm (excluding protruding parts)
Approx. 0.8 kg

Supplied Accessories	Power cord (2.5 m)	1
	(Only for use in Japan, 100 V AC)	
	DC cable (2 m)	1
	Power supply unit KZ-50	1
	Slow-blow fuse (2A)	1
	Instruction manual	1
	Inspection certificate	1

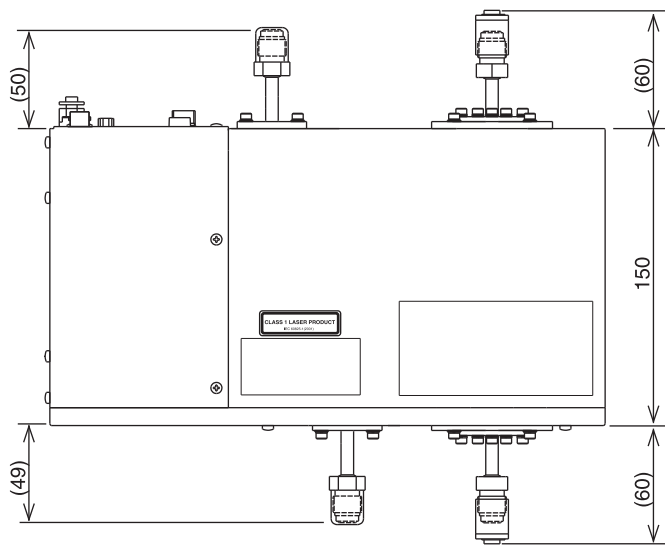
Options	Interface cable	CC-61
	(For connection to DTE with 25-pin female D-sub connector)	
	Interface cable	CC-61A
	(For connection to equipment with 9-pin male D-sub connector)	
	Sensor controller	KZ-70



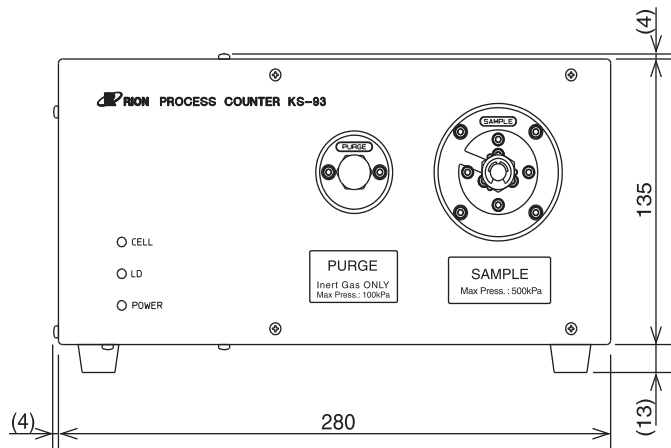
Rear View



Side View



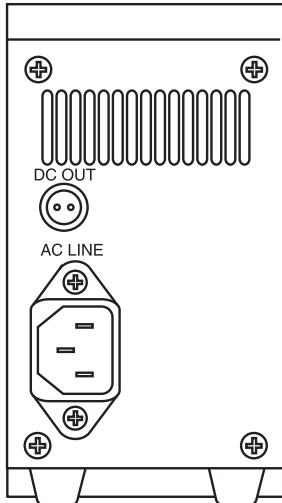
Top View



Front View

Unit: mm

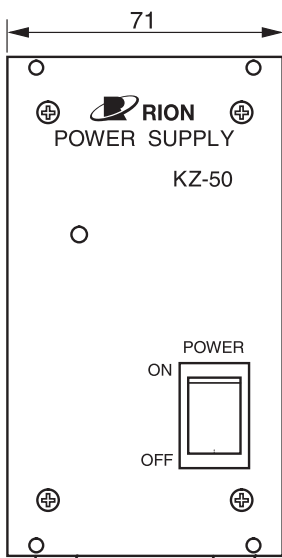
Dimensional drawings of main unit



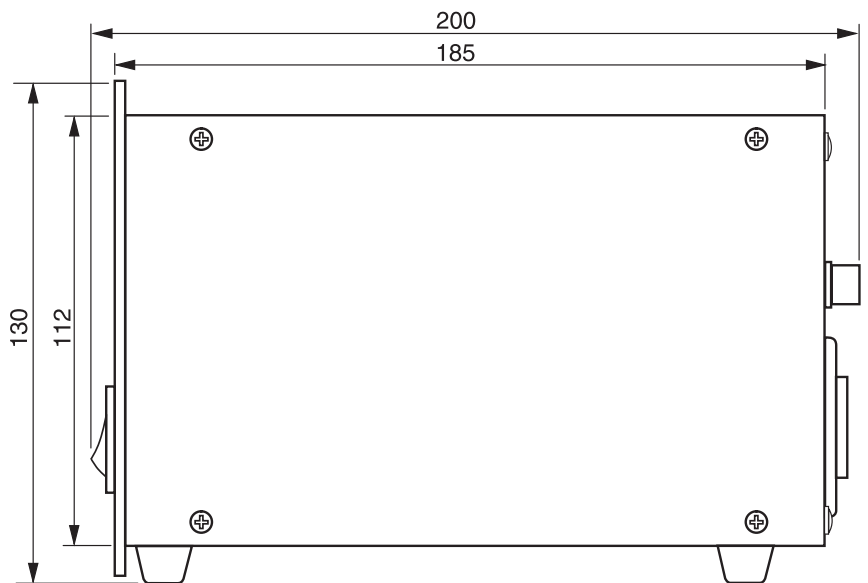
Rear view



Top view



Front view



Side view

Unit: mm

Dimensional drawings of power supply unit

Specifications subject to change without notice