

SPECIFICATIONS
PARTICLE COUNTER
KC-20A



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Outline

The particle counter KC-20A is designed to measure the size and number of airborne coarse particles using the light scattering method, to determine the particle number concentration.

In a single measurement, the KC-20A can determine the particle count in five size ranges ($\geq 10 \mu\text{m}$, $\geq 20 \mu\text{m}$, $\geq 30 \mu\text{m}$, $\geq 50 \mu\text{m}$, and $\geq 100 \mu\text{m}$). The flow rate is 30 L/min.

The measurement result can be displayed as cumulative particle count for the measurement time, differential count between particle channels, or particle number concentration (particle count per sample volume). When the particle number concentration is displayed, selectable sample volume are 1 L, 28.3 L or 1000 L. Switching between different display settings during measurement is possible.

And the measurement can be repeated up to 99 times of preset time or volume and calculated average of results.

Printout of measurement results on an internal thermal printer is also possible.

A built-in serial interface allows for communication with a computer.

While the power is off, the measurement parameter settings is memorised automatically. Measurement to be continued with the same settings the next time power is on.

An alarm level can be set to sound a warning tone and control external equipment such as a fan when the particle count exceeds a preset threshold.

The KC-20A can output the measurement results converted into the analog signal with a range of 4 to 20 mA using an optional D/A converter interface, so it can be connected directly to an instrumentation system.

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

Specifications

Sensor

Optical system	70° sideway light scattering method
Light source	Laser diode (wavelength 780 nm, rated output 3 mW)
Laser product class	Class 1, IEC 60825-1:2014 Internal particle detection mechanism uses Class 3B laser
Collecting optics	Spherical lenses (condensing half-angle 40 degrees)
Light detector	PIN type photodiode

Main unit

Air flow method	Purge-air keeps inside of sensor clean
Flow rate	30 L/min
Pump	Rotary carbon vane type (DC brushless motor)
Flow control	Pressure sensing automatic control
Calibration	Glass microsphere particles in clean air (refractive index 1.5)
Minimum detectable particle size	10 µm (for spherical particles with refractive index 1.5)
Particle size ranges	Five channels (≥10 µm, ≥20 µm, ≥30 µm, ≥50 µm, and ≥100 µm)
Maximum particle number concentration	2,000 particles/L (coincidence loss within 5%)
Measurement time	
Arbitrary:	00:00:10 to 02:00:00, and manual
Sample volume:	10 L (20 sec), 28.3 L (57 sec), 100 L (3 min 20 sec), 283 L (9 min 26 sec)
Measurement modes	
Manual measurement	Measurement controlled with START and STOP buttons
Automatic measurement	
Averaging measurement	Repeated measurement up to 99 times of preset time or volume and averaging of results
Periodic measurement	Averaging measurement carried out at each specified time interval (00:00:10 to 24:00:00)
Count display modes	Cumulative, differential, number concentration (unit: 1 L, 28.3 L, 1000 L)

Display	320 × 240 dot matrix type LCD, with backlight
Measurement screen	Measurement value (8 digits, 9999999.9 counts max., single-size display or all-size display), date and time, remaining measurement time, error message, setting and displaying of measurement parameters, etc.
System configuration screen	Date, time, communication parameters, auto print, flow rate and other system settings
LED indicators	
COUNT	Shows measurement status <ul style="list-style-type: none"> • Lit green when counting is in progress • Flashes green when sample air particle number concentration exceeds maximum rating • Off when measurement is stopped
FLOW	Shows sample air flow status <ul style="list-style-type: none"> • Lit green when sample air flow is normal • Flashes green when sample air flow is between -3 to -5% or +3 to +5% outside of rated range • Flashes red when sample air flow is more than ±5% outside of rated range • Off when pump is stopped
LASER	Shows light source (laser diode) status <ul style="list-style-type: none"> • Lit green when light source is operating normally • Flashes red when light source output has fallen below rated level • Off when light source is off
Alarm function	Buzzer sounds and ALARM terminals are closed by relay when particle count in specified channel equals or exceeds specified alarm level.
Alarm level setting	1 to 9,999,999 particles (in 1-particle steps), and off Additional settings in remote mode: 10, 100, 1000, 10000
Maximum load	30 V DC, 1 A

Controls

START button	Starts measurement
STOP button	Stops measurement
PARTICLE SIZE button	Switches particle sizes for display
△, ▽ buttons	Control the cursor movement
FUNCTION buttons F1 to F4	Perform various functions as indicated on display
CONTRAST volume	Adjusts display contrast

Input/output connectors

ALARM	Terminals are closed by relay when the alarm occurs
EXT START/STOP (factory option)	For external measurement start/stop control

Internal interface

SERIAL	For communication with computer
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Communication parameters

Electrical characteristics:

Conforming to JIS X 5101:1982

(JIS X 5101:1982 corresponds to TIA/EIA-232.)

Transmission configuration:

Full-duplex, asynchronous

Baud rate: 4800 or 9600 bps

Data word length:

7 bits or 8 bits

Parity: Even, odd, or none

Stop bits: 2 or 1

Terminator: <CR LF> or <CR>

Connector type: 9-pin male D-sub connector

D/A converter interface (factory option)

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

Particle count range

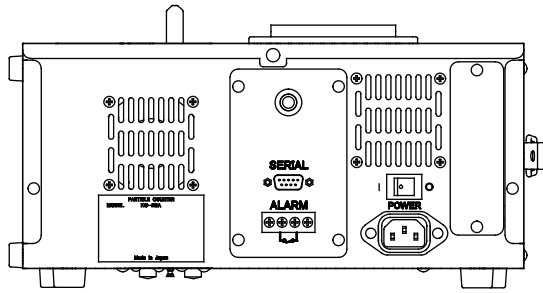
0 to 10, 0 to 100, 0 to 1000, 0 to 10000, 0 to 100000, 0 to 16, 0 to 256, 0 to 4096, 0 to 40960, 0 to 409600 (selectable)

Internal printer

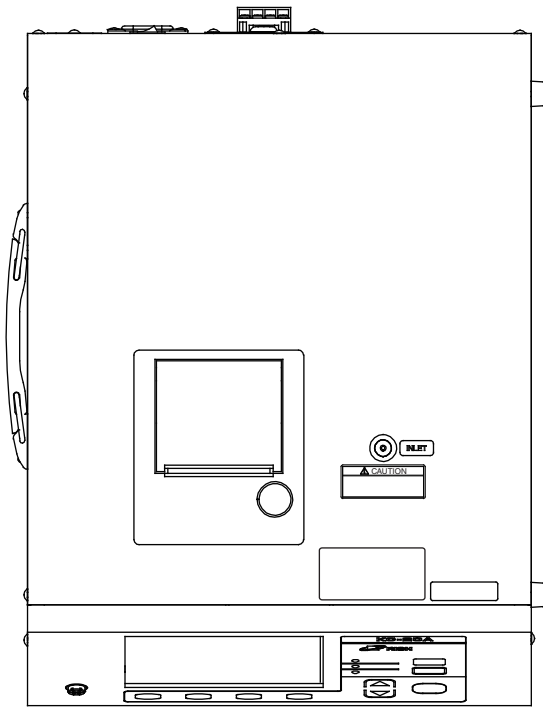
Printing method	Thermal
Print width	48 mm

Inlet	For sample air input	
Outlet (factory option)	For sample air output	
Power Requirements	100 to 240 V AC, 50/60 Hz, Approx. 160 VA	
Environmental Requirements		
Operation Environments		
	Indoor Use Only	
Altitude	Up to 2000 m	
Supply Voltage Fluctuations		
	100 to 240 V AC \pm 10%	
Overvoltage Category	II	
Pollution Degree	2	
Protection Class	I	
Environmental conditions for operation		
	0°C to +35°C, 20% to 85% RH (no condensation, no sudden temperature and humidity change) Using internal printer, however, 30% to 80% RH	
Sample air temperature and humidity range		
	0°C to +35°C, 20% to 85% RH (no condensation)	
Environmental conditions for storage		
	-10°C to +50°C, 90% RH or less (no condensation)	
Dimensions		
	Approx. 158 (H) \times 321 (W) \times 417 (D) mm (max.) Approx. 135 (H) \times 300 (W) \times 401 (D) mm (without protruding parts)	
Weight	Approx. 11.6 kg	
Supplied accessories		
	Sampling pipe	1
	Sampling tube (Vinyl tube with 11 \times 7 dia., 1 m)	1
	Tube joint	1
	Power cord	1
	Thermosensitive paper TP-08	2
	Mesh filter	2
	Instruction manual	1
	Inspection certificate	1

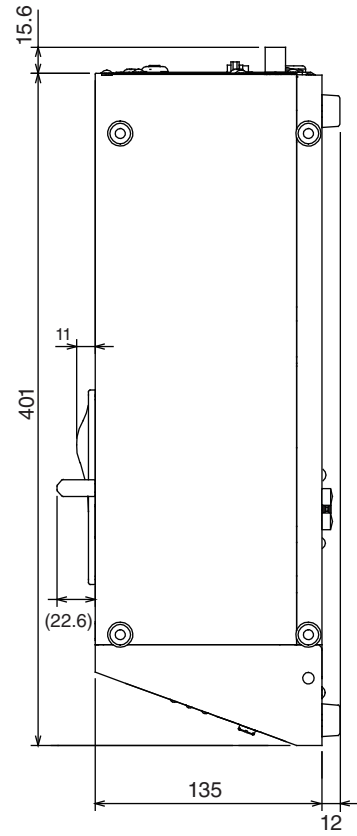
Factory options	EXT START/STOP (Connector ER05-P5F is supplied)
	Outlet
	D/A converter interface
Options	Interface cable CC-61 (For connection to DTE with 25-pin female D-sub connector)
	Interface cable CC-61A (For connection to DTE with 9-pin male D-sub connector)
	Carrying case
	Air filter
	Mesh filter
	Thermosensitive paper TP-08 (6 rolls set)
	Lint-free thermosensitive paper TP-10 (6 rolls set)



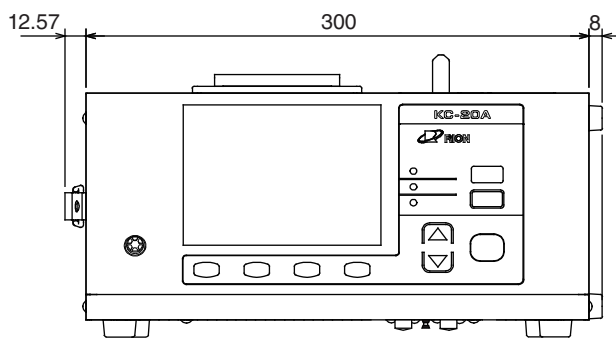
Rear view



Top view



Right side view



Front view

Unit: mm

Dimensional Drawings

Specifications subject to change without notice