

# DUST INDICATOR

Model:LD-3B



The LD-3B is an aerosol photometer designed to read the relative mass concentration of aerosol.



Shoulder belt



This displays the LCD CONTRAST and LCD BACKLIGHT menu. Adjust the contrast in the liquid crystal display and setup ON/OFF of the backlight in this mode.



## DUST INDICATOR Model:LD-3B

An Aerosol is a group of particles suspended in air.

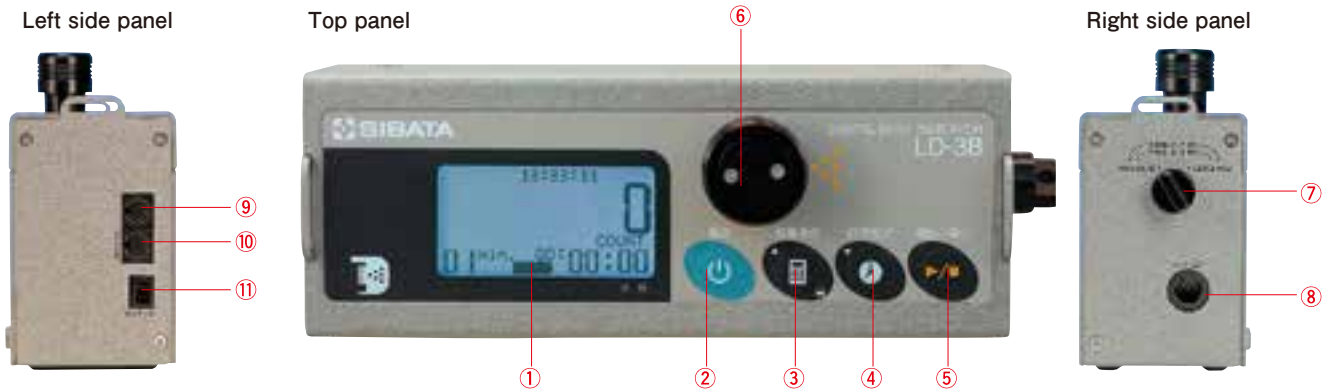
Aerosols can be introduced into the body primarily through the respiratory system. Total dust measurements indicate concentrations that can enter the nose and mouth of a worker as well as that which can settle on the skin while the respirable fraction of dust is that portion which can reach the lower or gas exchange part of the respiratory system. This respirable fraction has been defined for sampling purposes all over the world.

### Features

- The Model LD-3B can easily convert mass concentration of the measured value and display it by pre-setting a conversion factor for mass concentration.
- Equipped with a recording function (logging function) of the measured value.  
※ An optional RS-232C cable with software is required to retrieve data. (Refer to chapter 6)
- The calibrated value is stored even after turning the power supply off. An automatic correction of the measured value of aerosol will be performed by using data of calibrated value.
- Provides 3 types of standard data output: RS232C interface output, voltage output (0-1V) and non voltage pulse output (open collector)  
※ An optional RS232C cable with software is required to use the RS-232C output.

### Theory

This product uses the fact that the amount of scattered light is in proportion to mass concentration when the physical natures of dust particles in the same condition are exposed to light. Therefore mass concentrations of dust particles floating in the air are measured by the strength of scattered light.



## ■ Description of parts

### ① Graphic liquid crystal display

### ② Power switch

### ③ Mass concentration switch

When this switch is pressed, the Model LD-3B converts the measured value to mass concentration value.

### ④ Time setting switch

This switch is used to set measuring time and to change measuring modes.

### ⑤ Start/Stop switch

This switch is used for starting and stopping the measurement and selection of an item in the measuring mode.

### ⑥ Mass concentration switch

When this switch is pressed, the Model LD-3B converts the measured value to mass concentration value.

### ⑦ Measurement / Sensitivity adjusting knob

### ⑧ Exhaust outlet

### ⑨ Digital input/output connector.

### ⑩ Analog output connector

### ⑪ External power source connection connector

By connecting to the AC adapter, the Model LD-3B may be operated by an AC power source.

## ◆ Procedures for measurement

### Down timer measurement

When the Model LD-3B is turned on, the set time displayed at the bottom left of the liquid crystal display is [01 min].

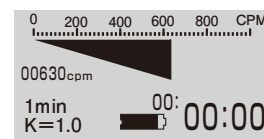
When the start/stop switch is pressed once at this time, a measurement of 1 minute is taken. The length of the measurement will depend on the time that is set and displayed. A down timer is displayed at the bottom right of the liquid crystal display.



### Graph display

When the mass concentration switch is pressed during measurement, the display will change from count to graph display.

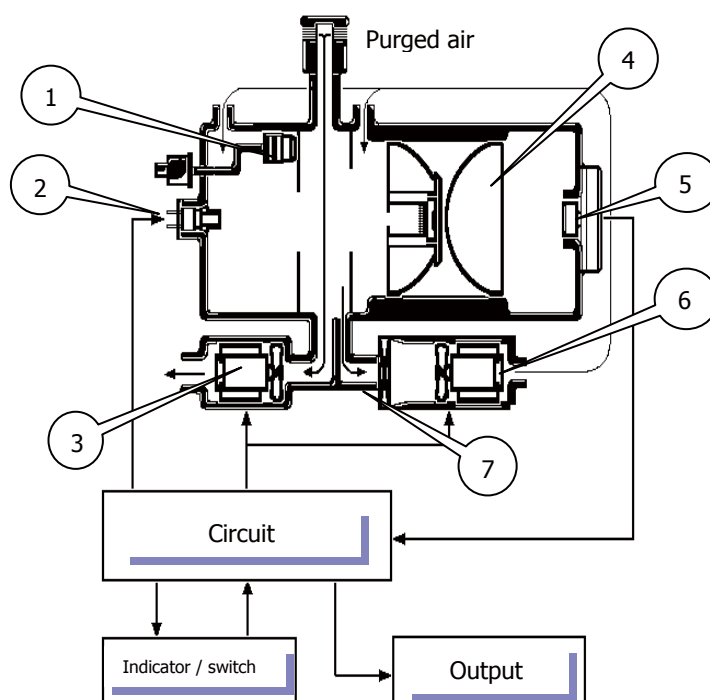
When the mass concentration switch is pressed again, the display will switch back to count.



### Exhaust outlet

This is an exhaust outlet. Be careful not to obstruct this outlet during measurement.

## ◆ Block diagram of the LD-3B



- 1: Light scattering plate
- 2: Laser diode (light emitting part)
- 3: Suction fan
- 4: Optics for receiving light
- 5: Photodiode (for receiving light)
- 6: Circulation fan for purged air
- 7: Fine particle filter for purged air generation

## Specification

Product code	080000-42
Model	Model LD-3B
Measuring theory	Light scattering method
Light source	Laser diode
Measuring accuracy	± 10% of calibrated particles
Measuring sensitivity	1CPM=0.001mg/m <sup>3</sup>
Measuring range	0.001 – 10.00mg/m <sup>3</sup>
Display	Graphic liquid crystal display
Displayed contents	<ol style="list-style-type: none"> <li>1. Measuring time (Down timer)</li> <li>2. Measured value (00000-99999) 5 digits displayed</li> <li>3. Measuring mode</li> <li>4. Remaining battery power</li> <li>5. K factor</li> <li>6. Graph (by pressing the switch during measuring)</li> </ol>
Measuring mode	<ol style="list-style-type: none"> <li>1. Measuring time (Down timer mode) Set measuring time with built in down timer and perform measurement. (Initial time set for measuring when turning the instrument on is 1 min. in down timer mode.) 6 sec., 10 sec., 30 sec., 1 min., 2 min., 3 min., 5 min., and 10 min., are available.</li> <li>2. Manual Manually operate the start and stop of measuring.</li> <li>3. LOG (Logging) Set date to start measurement and measurement length. Measured data will be stored in memory of the Model LD-3B while measurement is taking place.</li> <li>4. Span check The value of the scattering plate may be measured and the adjusted value recorded by inserting the scattering plate for sensitivity calibration.</li> <li>5. BG (Background) Close the air collection opening, fill the detector with purged air and take a measurement. Background value is measured and recorded.</li> </ol>
Data recording points	Max.63488points (Hours data will be kept: 8hours during operation (after charging approx. 5days) Recording cycle 17.6hours in 1second Recording cycle approx. 44days in 1minute
Output	RS-232C/USB output, pulse output, Voltage output: 0-1V (selection of 3 ranges available) ① 0-1000CPM: 0 – 1V /10-10000CPM: 0.1 – 1V Auto range ② 0-1000CPM x 1 fixed range ③ 0-10000CPM x 10 fixed ranges
Operating time using a battery	Alkaline battery : approximately 24hours Nickel hydrogen battery : approximately 12hours
Power source	DC12V (AC adapter), 8pcs of size AA dry cell batteries, Nickel hydrogen battery (optional)
Operating environment	0-40°C 5-90%RH (Provided there is no condensation)
Dimension	185 (W) x 69 (D) x 105 (H) mm (Projections not included)
Weight	Approximately 1.2kg (weight of battery not included)
Accessories	Soft case, shoulder belt, AC adapter (PA-314), dry cell battery box, adapter for tripod*, size AA manganese dry cell battery (for confirming operation) . Operation Manual

\* Use the included tripod adapter if the rubber bottoms of the tripod interfere when putting it on to the main device.

## ■ Spare parts/Options

Shape					
Spare parts/Options	Nickel hydrogen battery <sup>**</sup>	battery charger <sup>**</sup> Model:QC-961	Soft case	Adapter for air suction and exhaust	Communication Cable with Software S-USB
Code	080000-032	080000-033	080000-06	080000-002	080000-415

<sup>\*\*</sup>By connecting to the AC adapter, the Model LD-3B may be operated by an AC power source.  
It is also a connector for the battery charger for the nickel hydrogen storage batteries (optional).

Spare parts/Options	AC Adapter Model:PA-314	Analog output connector	Tripod
Code	080000-314	080000-052	080160-3



Specifications, and appearance described in this document are based on information as of April 10, 2015. They are subject to change without notice for improvement of the product.

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