

# Operation Manual

Low Volume Pump

## LVS-30



- This operation manual describes precautions that are important for preventing accidents as well as procedures used to handle the product.
- To ensure the product is used safely and correctly, read this operation manual thoroughly before using the product.
- After reading this manual, keep it carefully stored in an easily accessible location for future reference.

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# 1 Introduction

## 1.1 Notation Method in this Manual

### 1.1.1 Danger, Warning, Caution, and Note

This product is designed to prioritize operator safety. Nevertheless, some risks could not be eliminated, due to product characteristics. In this manual, the signal words DANGER, WARNING, and CAUTION are used to indicate three levels of seriousness or danger of such risks to humans. The word NOTE is used to indicate product precautions. Be sure to carefully read and thoroughly understand information marked with those words before operating or maintaining the product. The signal words DANGER, WARNING, and CAUTION indicate the seriousness of dangers, in descending order (with DANGER indicating the most serious dangers and CAUTION the least serious). The meaning of each signal word is described below.

 <b>DANGER</b>	Indicates dangerous circumstances that, if not avoided, could result in serious injury or death.
 <b>WARNING</b>	Indicates circumstances that, if not avoided, could potentially result in serious injury or death.
 <b>CAUTION</b>	Indicates circumstances that, if not avoided, could potentially result in minor or moderate injury.
 <b>NOTE</b>	Indicates circumstances that, if not avoided, could potentially result in product failure or damage.




### 1.1.2 Important and Hint

Information that is important or necessary for users, but does not indicate a danger, warning, caution, or note is marked “Important” or “Hint,” as described below.

<b>Important</b>	Indicates important information that needs to be remembered for operation.
<b>Hint</b>	Indicates information useful to remember for operation.

### 1.1.3 Symbols

In this manual, the following symbols are coupled with the words danger, warning, caution, or note to make their meaning easier to understand.

	This symbol indicates risks that could potentially cause harm to the product or people.
	This symbol indicates prohibited actions.
	This symbol indicates required actions.

## 1.2 Checking Package Contents

This product is shipped with the following items included in packaging. After unpacking the unit, make sure all the items are included.

If any items are missing or damaged, contact the distributor where you purchased the product. After unpacking the product, Sibata recommends storing the cushioning materials and boxes for use later when requesting repairs, but if they are discarded, be sure to discard them appropriately in accordance with laws, regulations, regional rules, and local government instructions.

- |   |  |
|---|--|
| <input type="checkbox"/> LVS-30 Main Unit ···· 1 unit   | <input type="checkbox"/> Vinyl Tubing (10 mm I.D. × 14.5 mm O.D. × 2 m long) |
| <input type="checkbox"/> Air Intake Port Jig ····· 1 pc |  |







## 1.3 Definition of Applicable Users

This product should only be operated by operators that, based on their specialized technical knowledge, training, or experience, understand the potential risks involved in operating the product. Operators without training or currently being trained should only operate the product under close supervision by a person that is already trained or has specialized experience.










This operation manual is written assuming the product will be operated by a person that understands the risks involved in operating the product.

## 2 Safety Precautions




The warnings and instructions in this operation manual are provided to ensure that the product is used safely, to prevent injury to the operator and others, and to prevent property damage. All the precautions are important for ensuring safety, so be sure to read, understand, and comply with the precautions before using the product.

 <b>DANGER</b>	
	This product is not designed to be explosion-proof, so do not use it near combustible or flammable materials. Doing so could cause an explosion or fire.
	Do not use any battery packs for the main unit other than the dedicated battery unit (sold separately) designed specifically for that purpose. Doing so could cause a product failure or injury.
	Do not intake gases other than atmospheric air, such as highly combustible or flammable gases, salty air, corrosive gases, or chemical gases. Doing so could cause an explosion or fire.
	Strictly prohibit open flames near the product. Do not burn the product in a fire. Doing so could cause an explosion or fire.
	Only use the dedicated AC adapter (sold separately) and power cord (sold separately) to charge the instrument. Using other methods to charge the battery unit could cause battery leakage, heat generation, or explosion.




## **WARNING**

	Never attempt to connect to connectors using wire or other metal objects, or any other method not specified in this manual. Doing so could cause a burn injury, battery leakage, heat generation, or explosion.
	Do not wash the product with water or otherwise allow water to directly contact the product. Doing so could cause an electric shock or fire.
	Never attempt to disassemble or modify the product. Doing so could cause a product failure or accident.
	Do not operate the product covered with cloth or bedding or enclosed in a box or other packaging. Doing so could cause a fire or malfunction from trapped heat.
	Be sure to only use a single-phase 100 to 240 V AC $\pm 10\%$ power supply. Do not plug the power cord into an outlet shared by multiple devices. Doing so could cause an electric shock or fire. Contact the distributor or your Sibata representative before operating the product at a voltage outside the specified range.
	Do not use the AC adapter cord or power cord if it is damaged or the power outlet connection is loose. Using a damaged or loose cord could result in a fire or electric shock.
	Do not touch the power supply plug or outlet with wet hands. Doing so could result in an electric shock.
	Do not block the exhaust port. Doing so could prevent achieving the required flowrate or cause a failure or fire due to elevated internal temperatures.
	If a problem occurs during operation, immediately stop operating the product, and eliminate the cause. If it is determined that the product caused the problem, contact the distributor or your Sibata representative. Do not operate the product if it is not functioning normally and do not allow it to be disassembled or repaired by anyone other than a qualified service engineer. Doing so could cause a product failure or accident.









## **CAUTION**

	Do not drop the product or otherwise expose it to strong impacts. Doing so could cause a product failure or accident.
	Do not place anything on top of the product. Doing so could tip over or deform the product or cause a product failure or accident.
	Be careful to avoid pinching fingers or other injuries when installing the battery unit.






## CAUTION

	Always grip the plug to unplug the AC adapter and power cord. Pulling on the cord could damage the cord and cause an electric shock or fire.
	Check the AC adapter cord and power cord for cuts or other damage to the cable jacket before operating the product. Operating the product with a cable jacket in an abnormal state could cause a fire, electric shock, or other problems.
	Remove the battery unit before cleaning the product. Not doing so could cause an electric shock, battery leakage, or other problems.

## NOTE

	Do not set up or store the product in strong direct sunlight, in front of a heater, near a fire, or inside an automobile parked in the hot sun. Doing so could cause a malfunction or product failure.
	This product is designed for indoor use. Use it indoors at an altitude of 2000 m or less. Do not use it in an environment where it is exposed to wind and rain. Doing so could cause product failure.
	The product is a pump intended for sampling air. Do not use the product for purposes not indicated in this manual. Doing so could cause a product failure.
	Do not intake liquids, such as water, or gases other than atmospheric air. Doing so could cause a product failure.
	Do not insert screws or other foreign objects into the air intake port or exhaust port. If a foreign object accidentally enters a port, immediately switch the power OFF and contact the distributor or your Sibata representative.
	Keep the product away from sources of noise. Also, do not place it in areas with strong magnetic fields, high dust levels, or high humidity. Doing so could cause device damage or other problems.
	Place the product on a level and stable surface. Not doing so could cause a malfunction or product failure.
	Lithium ion batteries have a limited service life. If the product can only be operated for a short time, then replace the battery unit with a new battery unit. Using the product beyond the recommended replacement period could cause leakage due to battery damage.

## NOTE

	For long periods of disuse, store the product with the battery unit removed and the AC adapter and power cords disconnected, in a location that is preferably cool, dry, and not exposed to direct sunlight.
	Always operate the product with a filter element installed on the air intake port. Also, operate the product with a sampler attached to the air intake port. Intaking air directly from the atmosphere for long periods could cause a product failure.
	The normal operating temperature range of this product is 0 to 40 °C with humidity between 10 and 90 % RH (and no condensation). Operating the product outside these temperature and humidity ranges could reduce performance, shorten the service life, or cause a product failure.
	If any substances are emitted from the sampler, use a downstream trap to eliminate the substances.
	To clean dirty surfaces, wipe with a soft cloth (moistened with a neutral detergent for stubborn dirt).

## Important

Charge the battery unit at least once every six months to prevent excessive discharge, even if the battery unit will not be used for a long time. Doing so can prevent battery degradation.

Note that in the unlikely event a product failure occurs, Sibata accepts no responsibility for paying compensation due to inability to acquire or record sampling results, loss of data or other information, or any other damages directly or indirectly resulting from such losses. Be sure to back up data on a regular basis in case of an accident or failure.\*

\* This product does not include functionality for outputting data. Therefore, backing up data involves transcribing the data or other such process.

Before carrying the product into Europe after it has been used in your home country or other non-European country, verify that it is not contaminated with any regulated substances. Sibata accepts no responsibility for such contamination after the product has been used.



The protective functions built into this product might fail if it is not used as specified by Sibata.

- **Confirming or calibrating the flowrate prior to use is recommended.**



## ■ Caution Labels

Caution labels are affixed to the back of this product. During use, be sure to comply with the cautions noted.

 <b>AVOID SHOCK</b>	<b>AVOID SHOCK</b> Do not drop the product or otherwise expose it to strong impacts. Doing so could cause a product failure or accident.
 <b>KEEP DRY</b>	<b>KEEP DRY</b> Do not touch the power cord, plug, or outlet with wet hands. Also, do not wet the product when cleaning it. Doing so could cause an electric shock, fire, or product failure.

## ■ Pollution Degree and Overvoltage Category

The pollution degree and overvoltage category for this product are as follows.

Pollution Degree 2

Overvoltage Category II

## 3 About this Product

### 3.1 Overview

The LVS-30 low volume pump is a small light-weight portable air sampling pump intended for measurements in working environments or other atmospheric air environments. It includes built-in constant-flowrate functionality that inhibits any decrease in intake flowrate associated with intake pressure increases, such as when collecting dust. Due to the intake flowrate range from 5 to 30 L/min, it can be used as a hazardous substance air sampling pump for a wide range of applications.

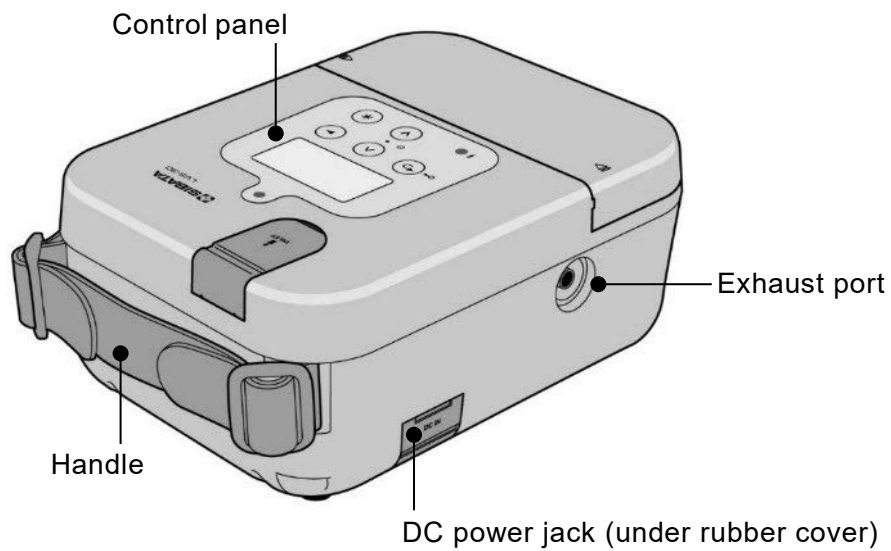
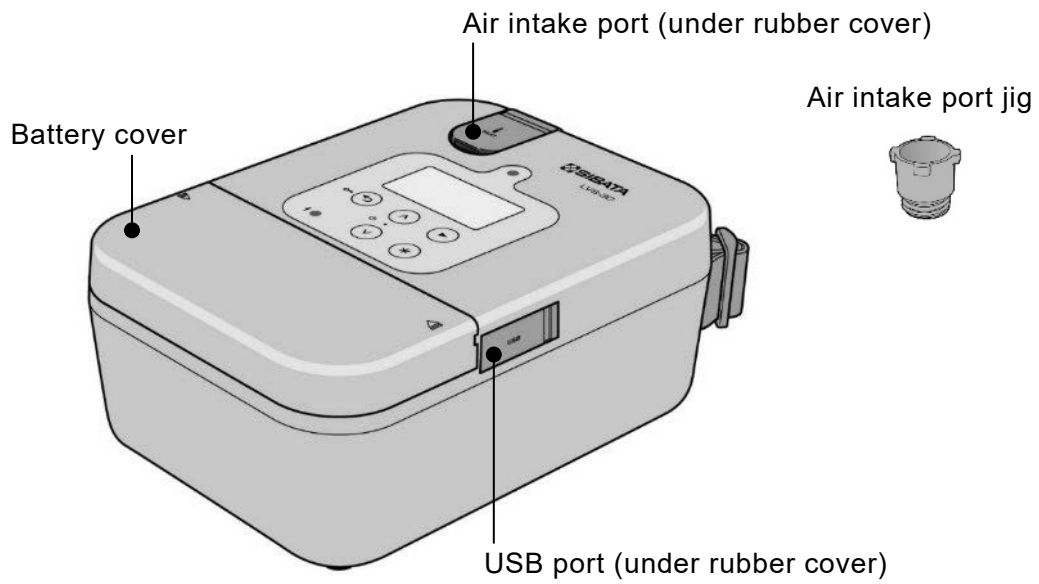
### 3.2 Features

- **Small and Light-Weight**  
Dimensions: W168 × D228 × H111 mm (excluding handle)  
Weight: 2.3 kg (including battery unit)
- **Constant-flowrate functionality is included to inhibit intake flowrate drops associated with intake pressure increases, such as when collecting dust.**
- **Four timer-sampling modes are available (Manual, Clock, Volume, and Run T.).**
- **Compatible with two power sources**
  - **Lithium-ion battery (LI-30 battery unit, sold separately)\***
  - **AC adapter (sold separately) and power cord (sold separately)**

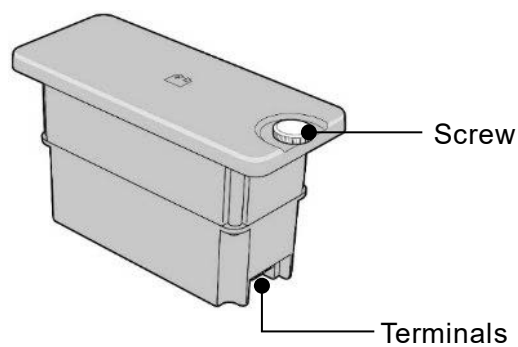
\* The AC adapter (sold separately) and power cord (sold separately) are required for charging.
- **Up to five sets of frequently used sampling parameter settings can be registered for recall.**

### 3.3 Names of Parts

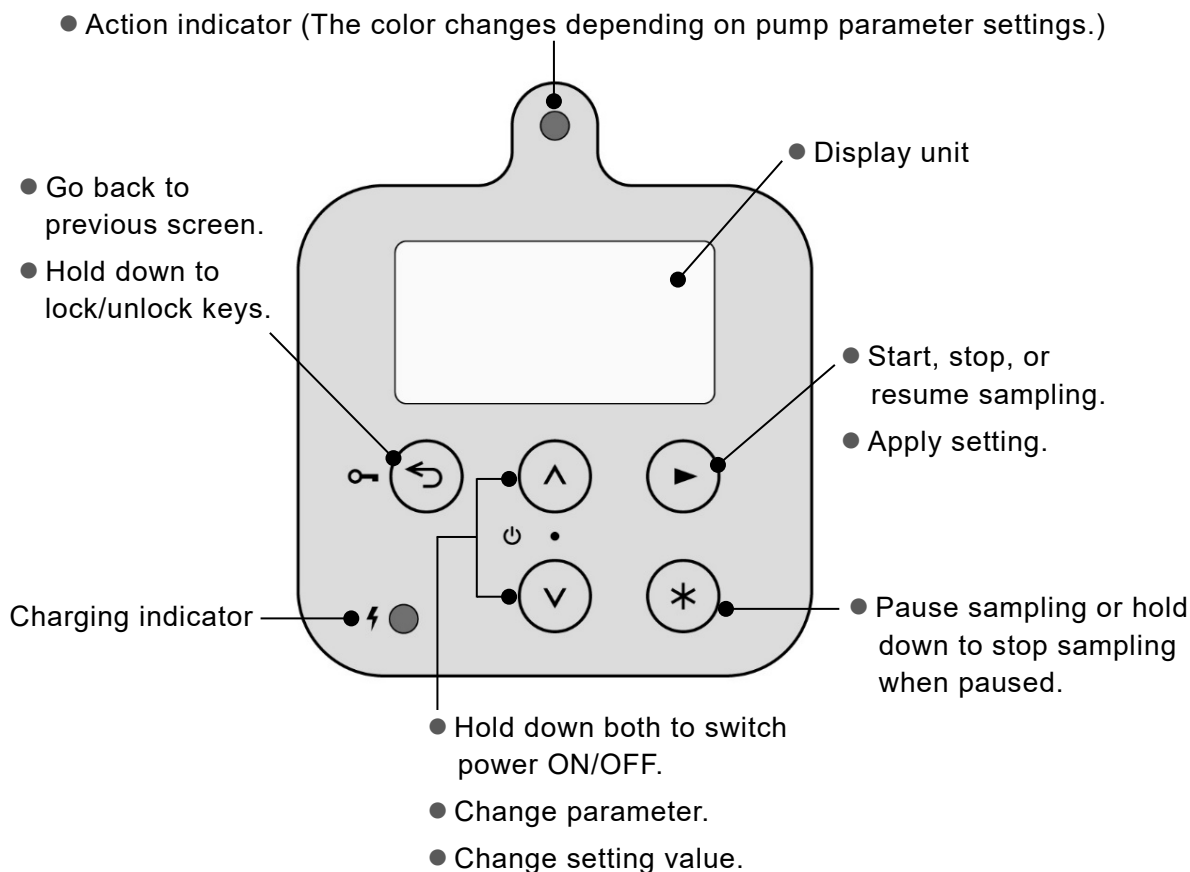
#### 3.3.1 Main Unit



#### 3.3.2 LI-30 Battery Unit (Sold Separately)



### 3.3.3 Control Panel



#### Activity Indicator Modes

Pump Status (Operating Mode)	Indicator Color
During Manual mode operation	White
During Delay mode operation	Yellow
During Clock mode operation	Violet
During Run T. mode operation	Green
During Volume mode operation	Blue
During active errors (with error screen displayed)	Red
During communication	Light blue

#### Charging Indicator Modes

Status	Indicator Color	Steady or Flashing
During charging	Red	Steady illumination
Fully charged	Yellow-green	Steady illumination
Error	Orange (red/yellow-green)	Steady illumination
Battery unit not connected (during AC adapter and power cord use)	Yellow-green	Steady illumination
	Red	Flashing

## 4 Preparation before Use




### 4.1 Preparing the Power Supply



This product can be operated using a separately sold LI-30 battery unit or an AC power supply (AC adapter and power cord).

- **When a battery unit is installed, it can be charged by connecting to an AC power supply.**
- **The battery charging status can be confirmed via the charging indicator on the control panel.**

Follow the instructions described below for connecting the battery unit and using an AC power supply.

#### 4.1.1 Installing/Removing the Battery Unit

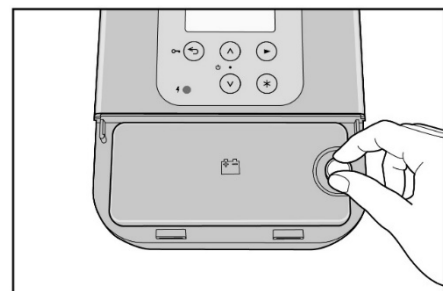
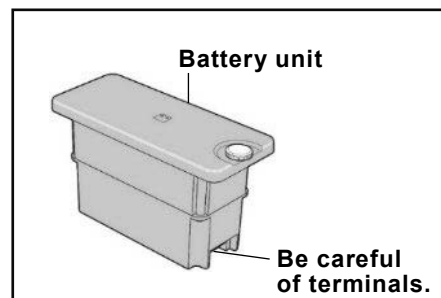
 <b>CAUTION</b>	
	Disconnect the AC adapter from the DC jack before doing the following. Leaving it connected could cause a product failure or electric shock.
	Insert the battery unit slowly into the main unit. Inserting the battery unit too energetically could result in terminal damage.

- (1) Press firmly in both locations indicated with   and slide the battery cover forward.

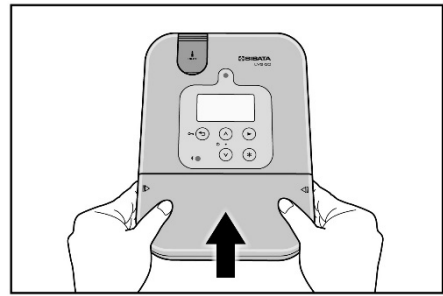


- (2) Then slowly insert the battery unit (sold separately) into the main unit and fasten it with the screw.

To remove the battery unit, loosen the screw and lift the battery unit upward.



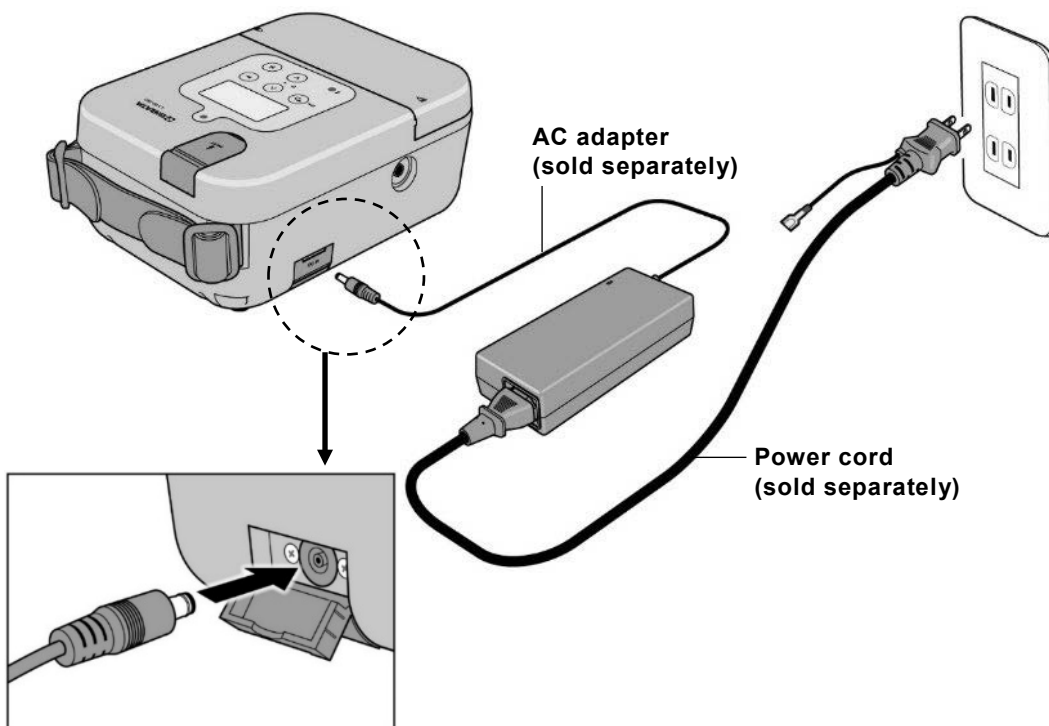
- (3) While pressing the battery cover against the top of the main unit, push the cover straight forward. A click sound is emitted when installed properly.



#### 4.1.2 Connecting the AC Adapter and Power Cord

<b>⚠ CAUTION</b>	
<b>!</b>	The AC adapter (sold separately) can be used with power supplies ranging from 100 to 240 V, but the power cord (sold separately) is designed specifically for 100 V power supplies. To use the product with other voltages, use a power cord compliant with regulations in the applicable country.
<b>!</b>	Charge the battery unit (if installed) in a location with an ambient temperature between 5 and 35 °C.
<b>!</b>	Use the AC adapter in a location with an ambient temperature between 5 and 40 °C.

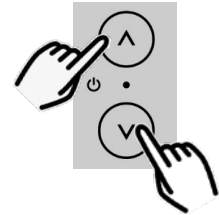
Connect the AC adapter to the main unit. Then connect the power cord to the AC adapter and plug the power cord into the power outlet. In this case, be sure to connect the grounding wire to the grounding terminal.



## 4.2 Switching the Power ON/OFF

To switch the power ON or OFF, simultaneously hold down  $\odot^{\wedge}$  and  $\odot^{\vee}$  for at least 2 seconds.

When switching the power OFF, the operation corresponding to either  $\odot^{\wedge}$  or  $\odot^{\vee}$  may be inadvertently executed, but continue to hold down both buttons.

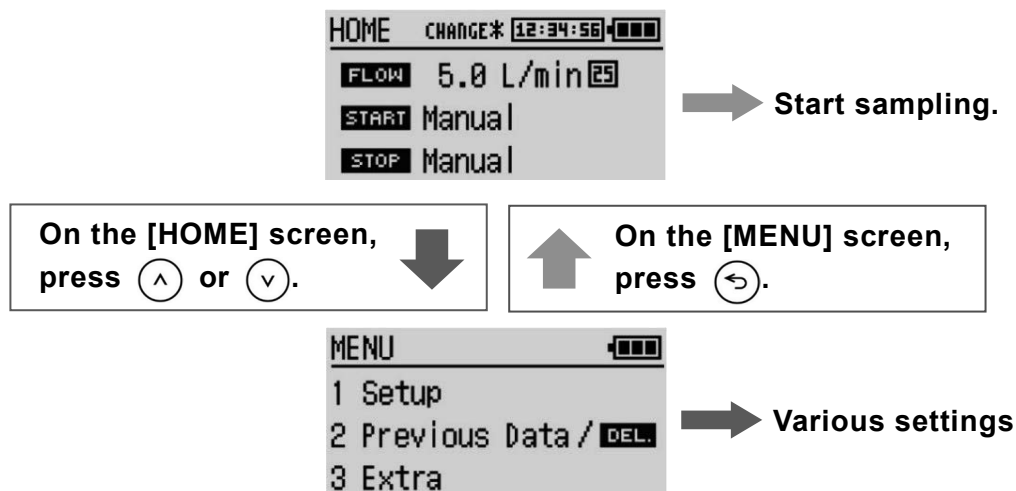


## 4.3 [HOME] and [MENU] Screens

When the power is switched ON, the [HOME] screen is displayed.

The [HOME] screen is used to start/stop sampling and the [MENU] screen to specify various settings. The following describes how to switch between [HOME] and [MENU] screens.

### ■ Switching between [HOME] and [MENU] Screens



- The [HOME] screen can be used to check flowrate, flowrate conversion temperature, sampling start/stop condition settings, or to check the current time or battery charge level. It can also be used to select preregistered sampling parameter settings.

- The following various settings can be specified on the [MENU] screen.

The setting value for the flashing parameter can be changed by pressing  $\odot^{\wedge}$  or  $\odot^{\vee}$ .

**1 Setup** ----- Sets intake flowrate, flowrate conversion, sampling start, and sampling stop parameter settings. -> Refer to p. 20.

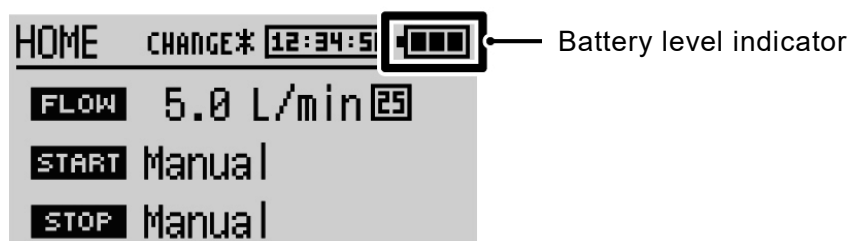
**2 Previous Data/DEL.** ----- Displays or deletes sampling results.  
-> Refer to p. 24 and 30.

### 3 Extra ----- Settings for 14 parameters

Setting Parameter	Description	Page
1 Interval Timer	Sets the interval timer.	p. 25
2 Passcode	Sets passcode for operating or unlocking keys.	p. 28
3 Save Setup	Sets or deletes settings for up to five sets of sampling parameter settings.	p. 26
4 LED	Sets the activity indicator brightness level from 0 to 10.	p. 34
5 User Calibration	Performs user calibration.	p. 31
6 User Cal.History	Displays a history of user calibrations.	p. 33
7 Data & Time	Sets the date and time.	p. 17
8 Stop Error	Sets whether to stop or continue sampling when an error occurs.	p. 36
9 Units	Sets (fixes) the units for temperature and pressure values.	—
10 Contrast	Sets the brightness level of the display unit.	p. 34
11 Operating Time	Displays the cumulative motor operating hours.	p. 41
12 Temp.Sensor	Sets (fixes) external temperature sensor settings.	—
13 Record Mode	Sets settings for saving sampling results.	p. 30
14 Factory Default	Restores all settings to factory default values.	p. 38

## 4.4 Checking the Battery Charge Level

The battery charge level can be confirmed by checking the indicator in the upper right corner of the [HOME] screen.



### ■ Battery Level Indicator

	Battery voltage is 15.2 V or higher.
	Battery voltage is at least 14.0 V, but less than 15.2 V.
	Battery voltage is at least 13.0 V, but less than 14.0 V.
	Battery voltage is less than 13.0 V. This indicates the pump will stop within about 30 minutes. However, the remaining time can vary significantly depending on usage conditions, so the battery needs to be charged immediately.



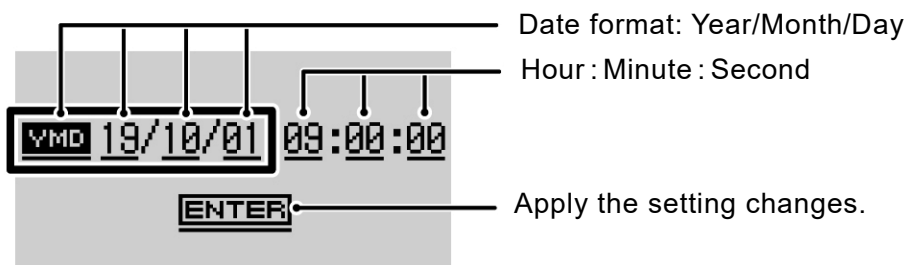
## 4.5 Checking and Setting Date and Time Values

The date and time values can be set on this product. Because this information is recorded together with sampling results, it is recommended that these values be checked and specified in advance.



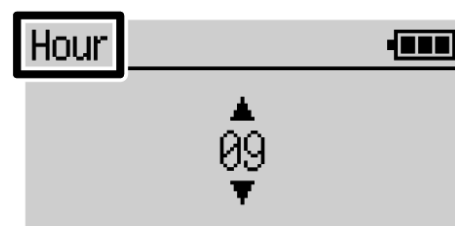
- (1) After switching the power ON, press  $\uparrow$  or  $\downarrow$ .
- (2) On the [MENU] screen, press  $\uparrow$  or  $\downarrow$  to select [3 Extra], and press  $\rightarrow$  and  $\downarrow$  to select [7 Date & Time]. Then press  $\rightarrow$ .
  - The current date and time values are displayed with [SET] flashing.

- (3) Press  $\rightarrow$ .
  - The screen for changing the date and time settings is displayed.



- (4) Press  $\uparrow$  or  $\downarrow$  to select the setting to be changed. Then press  $\rightarrow$ .

- Select [Date format] and then press  $\rightarrow$  to display settings for the YMD (year/month/day) format, DMY (day/month/year) format, or MDY (month/day/year) format.
- Press  $\rightarrow$  to select the [Year], [Month], [Day], [Hour], [Minute], and [Second] parameter so that it is flashing and then press  $\rightarrow$  to display the name and current setting value for the selected parameter in the upper left corner of the screen.



- (5) Press  $\uparrow$  or  $\downarrow$  to change or select the setting and then press  $\rightarrow$ .
  - Date format: Press  $\rightarrow$  to change the year, month, and day order displayed.
  - Date/time parameter: Press  $\rightarrow$  to display the changed value.
- (6) Press  $\uparrow$  or  $\downarrow$  to select [ENTER] and then press  $\rightarrow$ .
  - The setting changes are applied.
  - Press  $\leftarrow$  twice to display the [MENU] screen again.

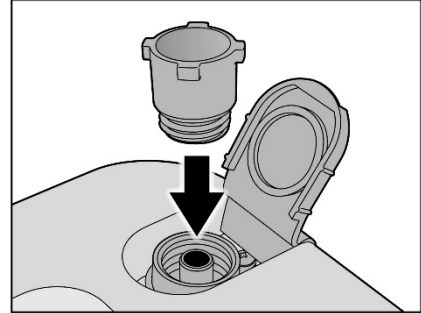
## 4.6 Attaching/Detaching the Air Intake Holder

### NOTE

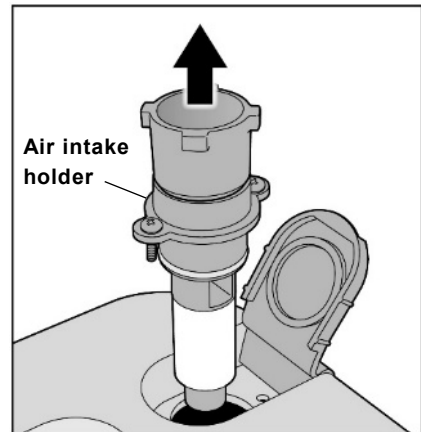


To prevent accidents caused by intaking foreign matter or fine dust, always attach a filter element to the air intake holder.

- (1) Open the air intake port cover and screw in an air intake port jig into the air intake port.

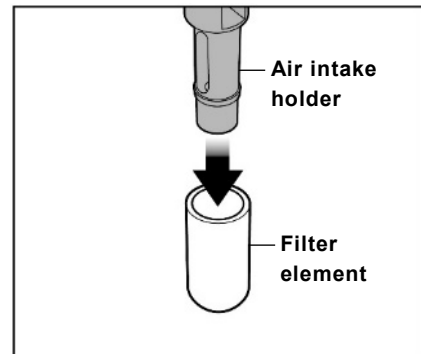


- (2) Remove the two screws that fasten the air intake holder.

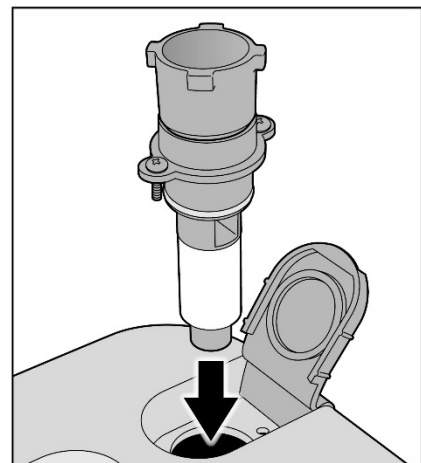


- (3) Lift up the air intake port jig and visually check the filter element contamination level.
- If the filter element drops inside, use tweezers or other means to pull it out.
  - If the filter element is dirty, replace it with a new filter element.

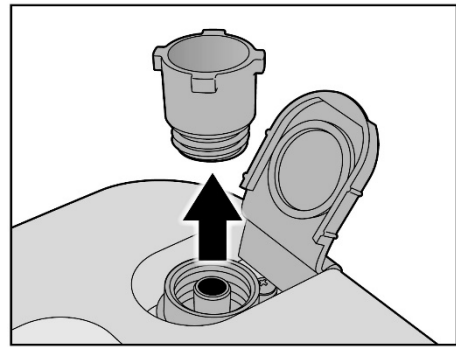
- (4) Gently pull out the filter element and replace it.



- (5) Return the air intake holder to its original position and fasten it with the two screws.



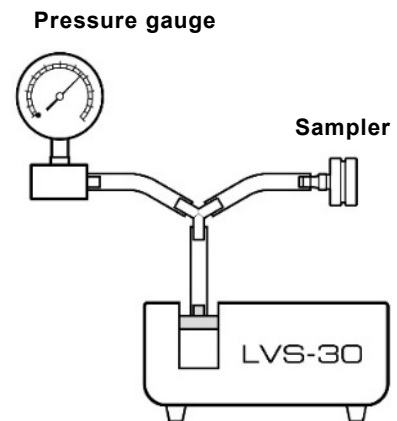
(6) Remove the air intake port jig.



## 4.7 Connecting a Sampler to the Pump

### 4.7.1 Checking the Intake Pressure

Attaching a filter paper holder or other sampler to the air intake port results in a pressure loss that depends on the sampler. This product has a specified constant-flowrate operating range. (-> Refer to p. 39.) Exceeding that specified range could cause a product failure, so it is recommended that the sampler pressure loss be measured in advance.

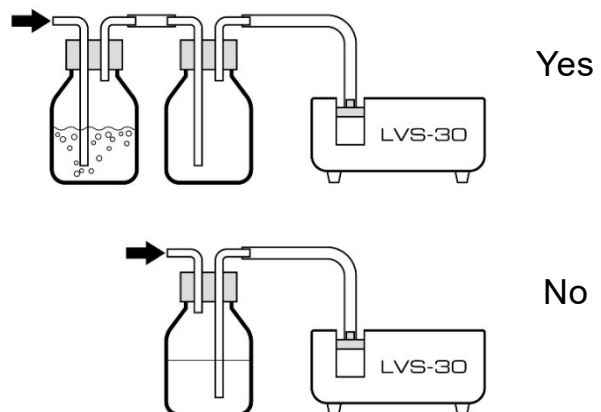


### 4.7.2 Liquid Collection

Connecting tubing incorrectly for liquid collection could result in intaking liquid and causing a product failure.

Configure tubing so that liquid is not aspirated directly into the product, as illustrated in the upper drawing.

Trapping in multiple stages with the trap oriented toward the pump is recommended.



## NOTE




Never configure tubing so that liquid is aspirated directly into the product, as illustrated above.

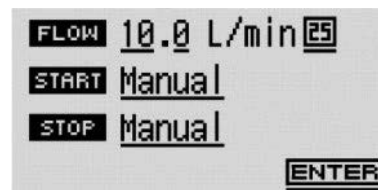


If any substances are emitted from the sampler, use a downstream trap to eliminate the substances.

## 5 Specifying Sampling Parameter Settings

On the [MENU] screen, select [1 Setup] and then press .

On the [Setup] screen, the sampling flowrate, flowrate conversion temperature, and sampling start/stop conditions can be specified.






[Setup] Screen

  : Select     : Apply     : Back

### 5.1 [FLOW]



Press  or  to select the flashing number portion of the sampling flowrate setting and then press .

Press  or  to display the setting value or parameter and then press  to apply the setting.






The sampling flowrate can be set between 5.0 and 30.0 L/min.







The flowrate conversion temperature setting can be specified to one of the following.

Display	Setting
25	Converted to 25 °C at one atmosphere
20	Converted to 20 °C at one atmosphere
0	Converted to 0 °C at one atmosphere

### 5.2 [START]

Press  or  to select the flashing parameter and then press .

Press  or  to display the setting value or parameter and then press  to apply the setting.

Display	Setting
	Press  to start sampling.
	Press  to start sampling at the specified date/time. Set the year/month/day and hour:minute. Note: Set a time later than the current time. Setting a time before the current time will result in a "Clock Error."
	Press  to start sampling after the specified elapsed time. Time settings from 000h:01m to 999h:59m can be specified.

## 5.3 [STOP]

Press  $\uparrow$  or  $\downarrow$  to select the flashing parameter and then press  $\rightarrow$  .  
 Press  $\uparrow$  or  $\downarrow$  to display the setting value or parameter and then press  $\rightarrow$  to apply the setting.

Display	Setting
<b>STOP Manual</b>	Press $\rightarrow$ to stop sampling.
<b>STOP C</b> <b>Clock</b>	<b>Sampling stops at the specified date/time.</b> Set the year/month/day and hour:minute. Note: Set a time later than the current time and the [START] clock setting. Not doing so will result in a "Clock Error."
<b>STOP Vol.</b> <b>Volume</b>	<b>Sets the air volume aspirated between sampling start and stop times.</b> The volume is calculated based on the flowrate conversion temperature. Volume values from 000.001 m <sup>3</sup> to 999.999 m <sup>3</sup> can be specified.
<b>STOP Run T.</b> <b>Run Time</b>	<b>Sets the time between the sampling start and stop times.</b> Time settings from 000h:01m to 999h:59m can be specified.

### Hint

Sampling parameter settings can be saved by selecting [3 Extra]-[3 Save Setup] on the [MENU] screen. -> Refer to p. 26.

After making all parameter setting changes, select [ENTER] and then press  $\rightarrow$  to apply the changes.

### Important






After selecting [ENTER], if  $\leftarrow$  is pressed before pressing  $\rightarrow$ , then the [MENU] screen is displayed again without any changes applied.

## 6 Sampling

### 6.1 Starting Sampling

#### Important


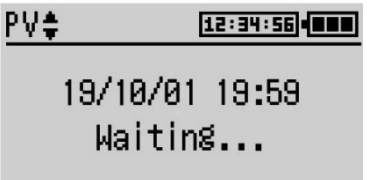
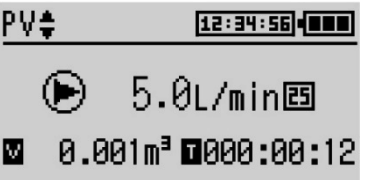
Specified performance levels might not be achievable immediately after switching the power ON. Warm up the system (with the power switched ON) for a few minutes before sampling.

- (1) Display the [HOME] screen. (-> Refer to p. 15.)
- (2) Check the displayed setting values and then press .
  - Press  to stop sampling.
  - Press  to pause sampling.
  - When paused, press  to resume sampling or hold down  to stop sampling.

### 6.2 Screen Information during Sampling

During sampling the sampling status information ([PV] screen) is displayed.

If the Delay or Clock mode is specified for the start condition, then the remaining time until sampling starts or the start date/time setting is displayed until sampling starts.

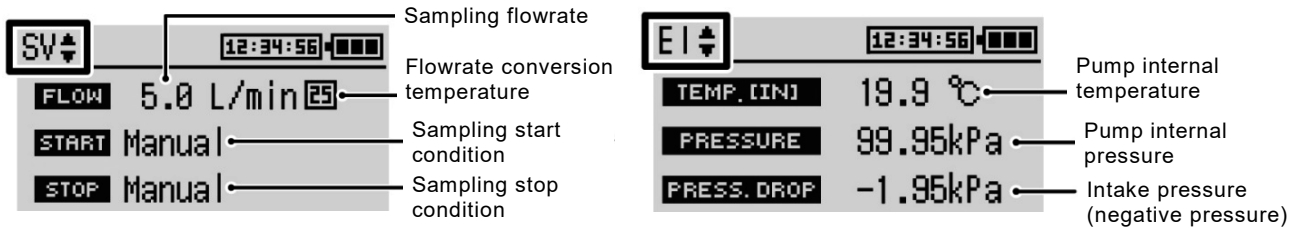
		
<p><b>When a Delay mode start condition is specified:</b></p> <p>Countdown of time remaining until measurement starts is displayed.</p>	<p><b>When a Clock mode start condition is specified:</b></p> <p>Specified measurement start time is displayed.</p>	<p><b>During sampling:</b></p> <p>Instantaneous flowrate*, volume, and time values are displayed.</p>

\* 0.0 L/min is displayed for flowrates less than 1.0 L/min and the instantaneous flowrate value is displayed flashing for flowrates from 1.0 to less than 4.0 L/min.

During sampling, the volume and time values are displayed as shown below for the sampling stop condition setting.

Stop Condition	Volume Display	Time Display
Manual	Accumulated flowrate since sampling started	Accumulated time since sampling started
Run T.	Accumulated flowrate since sampling started	Remaining time until sampling is stopped
Volume	Remaining volume until sampling is stopped	Accumulated time since sampling started
Clock	Accumulated flowrate since sampling started	Accumulated time since sampling started
Interval Timer	Accumulated time since sampling started	Accumulated time since sampling started (not including wait time)

When the sampling status ([PV] screen) is displayed, the sampling parameters ([SV] screen) or environmental conditions ([EI] screen) can be displayed by pressing  $\uparrow$  or  $\downarrow$ .



### 6.2.1 Exceeding the Maximum Displayable Instantaneous Flowrate

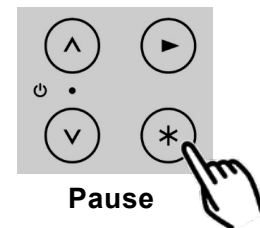
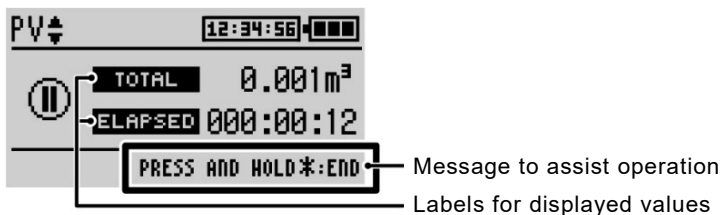
Sudden intake pressure changes during sampling, such as due to a finger blocking or unblocking the air intake port, can cause the instantaneous flowrate value to exceed the maximum display value of 40.0 L/min. **If the instantaneous flowrate exceeds the maximum value, "OVER" is displayed above the instantaneous flowrate.**

### 6.2.2 Exceeding the Maximum Displayable Accumulated Flowrate or Sampling Time

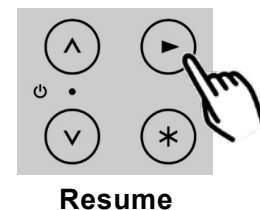
If the sampling stop condition is set to Manual, the maximum accumulated flowrate value is 999.999 m<sup>3</sup> and the maximum sampling time value is 999 hours, 59 minutes, and 59 seconds. Sampling will continue even if the accumulated flowrate or sampling time value exceeds the maximum value, but the corresponding display value will remain fixed to the maximum value and flash.

## 6.3 Pausing, Resuming, or Stopping Sampling

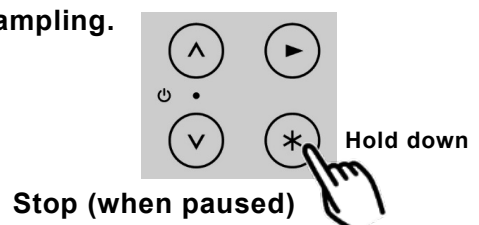
During sampling, sampling can be paused by pressing  $*$  on the control panel. The following is displayed when paused.



When sampling is paused, press  $\rightarrow$  to resume sampling.



When sampling is paused, hold down  $*$  to stop sampling.



## 6.4 Checking Sampling Results

After sampling is finished, sampling results can be checked as follows.

Up to 15 sets of sampling data can be saved. For instructions on saving data, refer to p. 30.



Switch pages by pressing or .

Page	Display Content
	<p>Total accumulated flowrate            Sampling time            Key lock count (Select [SHOW], press , press  or  to select the number, and then press  to display details.)            Pause count (Select [SHOW], press , press  or  to select number, and then press  to display details.)</p>
	<p>Check flowrate setting and flowrate conversion condition.            Average intake flowrate</p>
	<p>Check sampling start condition setting.            Check sampling stop condition setting.            Check interval timer setting.</p>
	<p>Check error status. (Select [SHOW], press , press  or  to select number, and then press  to display details.)            For information about errors, refer to p. 35.</p>
	<p>Display pressure (inside pump case).            Display max., min., and average values.</p>
	<p>Display intake pressure.            Display max., min., and average values.</p>
	<p>Display pump internal temperature.            Display max., min., and average values.</p>

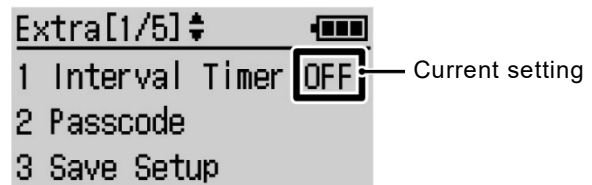


# 7 Useful Functionality

## 7.1 Interval Timer

### 7.1.1 Overview of Actions

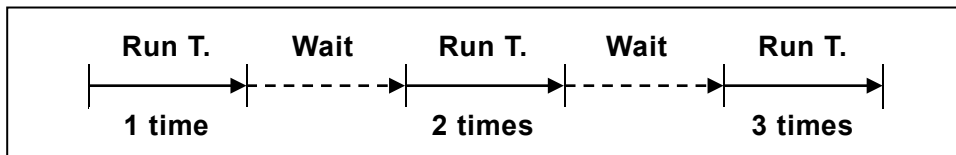
Interval timer settings enable performing actions at specified intervals by alternating between specified run and wait times.



### 7.1.2 Interval Timer Settings

Any start condition can be specified.

Set the [STOP] sampling stop condition to [Run T.]. (-> Refer to p. 21.)



(1) On the [MENU] screen, select [3 Extra]-[1 Interval Timer] and then press >.

(2) Press ^ or v to select [SET] and then press >.

- The interval timer parameter settings screen is displayed.



← Sets the number of repeats.

← Sets a wait time between 00h:01m and 99h:59m.

← Applies the settings.

Interval Timer Parameter Settings Screen

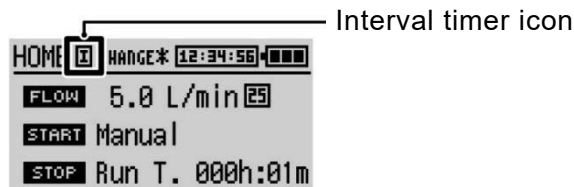
(3) After setting the number of repeats and wait time, select [ENTER] and press >.

- That applies the settings and displays the screen in step (1) with [▶ON] selected.

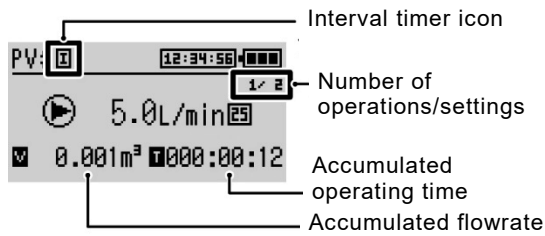
<b>Important</b>	After selecting [ENTER], if < is pressed before pressing >, then the previous screen is displayed again without applying any changes.
------------------	---

(4) Press > or < to display the [Extra] screen again.

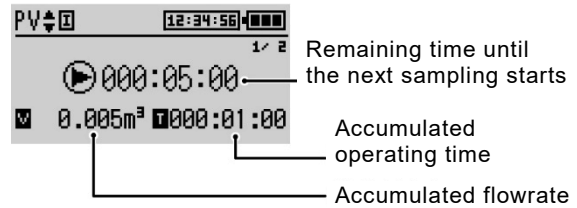
- The [1 Interval Timer] setting is set ON.



**[HOME] Screen with Interval Timer Settings Specified**



**[PV] Screen during Interval Timer Action**



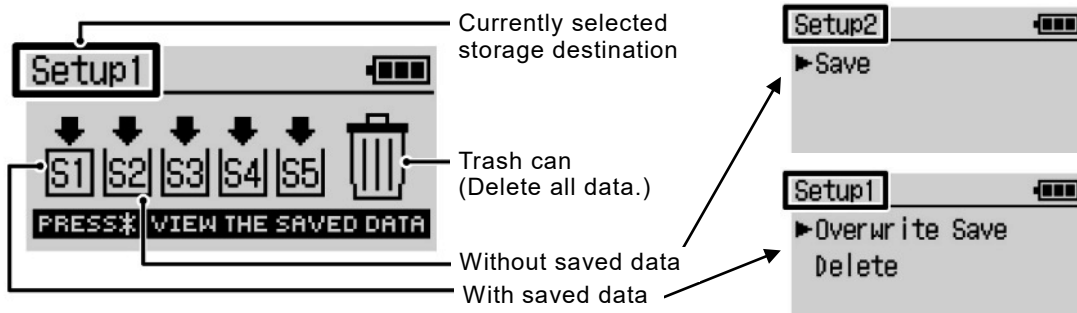
**Standby Screen**

## 7.2 Registering and Recalling Sampling Parameter Settings

This product enables five sets of sampling parameter settings to be registered and then recalled from the [HOME] screen.

### 7.2.1 Registering Settings

On the [MENU] screen, select [3 Extra]-[3 Save Setup] and then press

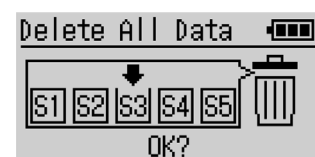


**Screen for Registering/Deleting Sampling Parameter Settings**

Select a box without saved data, press , select [Save], press , and then configure sampling parameter settings as described in Specifying Sampling Parameter Settings (p. 20).

To change parameter settings in a box with saved data, select the box, press , and select [Overwrite Save]. Then press and specify the new parameter settings.

To delete all saved data, select the trash can. To delete data in specific boxes, select the specific box. Then press , select [Delete], and press . When is pressed again, "Complete !!" is displayed.



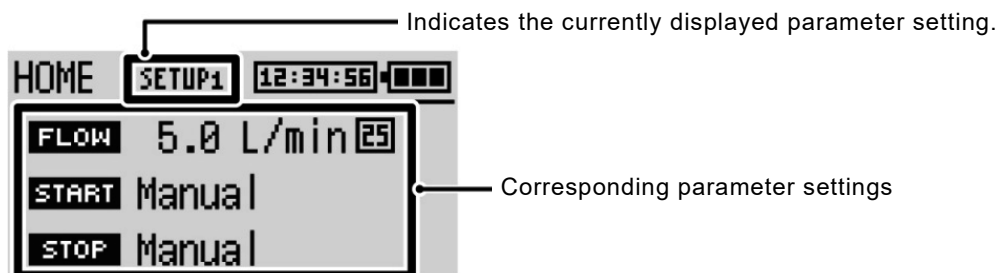
## 7.2.2 Recalling Settings

To recall registered sampling parameter settings, on the [HOME] screen, press  $\odot$  and select a box number.

- Registered sampling parameter settings are displayed.
- Each press of the  $\odot$  button switches between indicating the currently displayed parameter setting and displaying the corresponding registered parameter settings.

“CHANGE \*” -> Saved data (SETUP 1 to 5) -> “CHANGE \*”

- If there are no registered sampling parameter settings, then “no DATA” is displayed to indicate that no settings are registered.



## 7.3 Replacing the Battery Unit while Sampling is Paused

If sampling is paused, the paused state remains even after switching the power OFF, so that sampling can be resumed the next time the power is switched ON. Therefore, the battery unit can be replaced when the power is switched OFF.

- (1) Unless the measurement process is in the standby mode (the measurement start condition setting is Delay or Clock), press  $\odot$  to pause sampling actions.
- (2) Simultaneously hold down  $\wedge$  and  $\vee$  for about two seconds to switch OFF the power.
- (3) Replace the battery unit.
- (4) Simultaneously hold down  $\wedge$  and  $\vee$  for about two seconds to switch ON the power.
- (5) Since the pause state in step (1) is restored, press  $\blacktriangleright$  to resume the measurement.




### Important

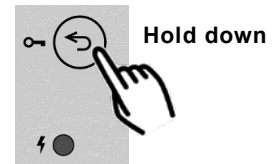
After switching the power ON in step (4), be sure to press  $\blacktriangleright$  to resume the measurement.  
Sampling cannot be resumed automatically.  
In step (5), if the power is switched OFF without resuming and stopping the measurement, the measurement is aborted and sampling results are not saved. Therefore, be sure to resume and stop measurements.

## 8 Preventing Inadvertent Operations during Sampling

### 8.1 Locking the Keys

After  is pressed to start sampling, keys can be locked by holding down .

- If the keys are locked, then all key actions are disabled during sampling, except the  and  keys or holding down  to unlock the keys. When sampling is finished, operations on the [Results] screen are enabled.



Keys can be unlocked by holding down .

- A passcode can be set for unlocking keys.



### 8.2 Setting a Passcode

Two types of passcodes (Key Lock and Restricted Mode) are available, which are subject to the following restrictions.

Passcode	Restrictions
Key Lock	A passcode must be entered to unlock keys.
Restricted	A passcode must be entered to switch from the [HOME] screen to the [MENU] screen.

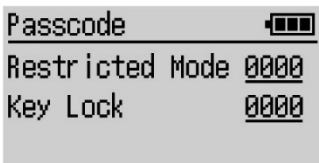













- The initial passcode setting value is “0000.”
- If the passcode is “0000,” the function is disabled.

Important	If the key lock passcode is forgotten, it could prevent unlocking keys for certain parameter settings. If a passcode is specified, be sure to manage it carefully.
-----------	---

Important	If a Restricted Mode passcode is forgotten, it will prevent switching from the [HOME] screen to the [MENU] screen. If a passcode is specified, be sure to manage it carefully.
-----------	---


Set passcodes as follows.



On the [MENU] screen, select [3 Extra]-[2 Passcode] and then press .

Screen Display	Description of Operations
	<p><b>Select [Restricted Mode] or [Key Lock] and then press .</b></p> <p>The following operations are the same for both the Restricted Mode and Key Lock passcodes. Screen names are displayed as [Restricted Mode] or [Key Lock], respectively.</p>
	<p><b>Enter the currently specified passcode.</b></p> <p>If the passcode is the initial "0000" setting value, this screen is not displayed. Press  or  to switch parameters or change parameter setting values and then press  to apply the changes.</p> <p><b>Select [ENTER] and then press .</b></p>
	<p><b>Enter the new passcode.</b></p> <p>Press  or  to switch parameters or change parameter setting values and then press  to apply the changes.</p> <p><b>Select [ENTER] and then press .</b></p>
	<p><b>The new passcode setting has been entered. If OK, then press .</b></p>

## 9 Saving Sampling Results

Up to 15 sets of sampling results can be saved. Either [Over Write] or [One Time] can be specified as the saving method. Specify the method as follows.

On the [MENU] screen, select [3 Extra]-[13 Record Mode] and then press . Record Mode settings are described below.

Record Mode	Description of Actions
<p><b>Over Write</b></p>	<p>Saves up to 15 sets of data. When 15 or more sets are saved, saving settings will result in deleting the oldest data and saving the newest 15 sets.</p>
<p><b>One Time</b></p>	<p>Saves up to 15 sets of data. If a 16th set of sampling actions is attempted, "Memory is full !!" is displayed and measurement does not start.</p> <div data-bbox="1075 665 1380 813" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Memory is full!!</p> <p>▶Delete    Skip</p> </div> <p>To perform a measurement, [Delete] must be selected on the screen where "Memory is full !!" is displayed.</p> <p>If [Skip] is selected and then  is pressed when "Memory is full !!" is displayed, attempting a sampling action by pressing  again will result in displaying the "Memory Error" message.</p> <div data-bbox="1075 958 1380 1106" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Memory Error</p> <p>Please press any key</p> </div> <p><b>To perform a measurement, delete data by selecting [2 Previous Data/DEL.]-[DEL] on the [MENU] screen.</b></p> <div data-bbox="1075 1178 1380 1326" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Delete All Data</p> <p>OK?</p> </div>

# 10 Increasing Measurement Precision

## 10.1 Performing User Calibration

To measure samples more precisely, perform calibration with a sampler or other device attached to the air intake port.

User calibration can be performed automatically by using a separately sold FC-L1 flow calibrator (supported from ver. 1.20).

<b>Important</b>	<b>User calibration can cause flowrate to fluctuate due to other parameter settings (the flowrate setting or the sampler used during calibration). Consequently, performance might not be consistent with standard specifications for parameters not calibrated.</b>
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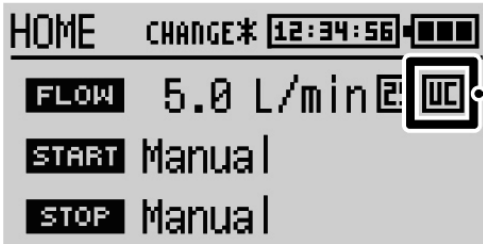
### 10.1.1 Automatic User Calibration

Calibration can be performed more easily by using a separately sold FC-L1 flow calibrator (supported from ver. 1.20), because it can perform manual user calibration steps **(2) Measure** and **(3) Enter results** automatically. For more information, refer to the FC-L1 flow calibrator operation manual.

### 10.1.2 Manual User Calibration

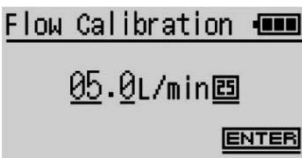

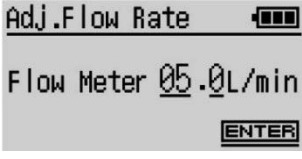


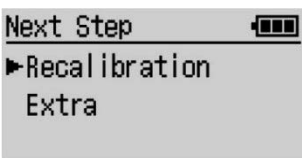
Manual user calibration involves the following four steps.

- (1) Specify settings.** Specify calibration parameter settings (conversion temperature and flowrate).
- (2) Measure.** Measure the flowrate.
- (3) Enter results.** Enter measurement results.
- (4) Check.** Check calibration results (recalibrate if necessary).

<b>Hint</b>	<p>After user calibration, a "UC" indicator is displayed on the right side of [HOME] and [SV] screens.</p>  <p>The screenshot shows a monochrome LCD screen with the following text: 'HOME' at the top left, 'CHANGE*' at the top center, a digital display '12:34:56' with a battery level indicator to its right, and three menu items: 'FLOW 5.0 L/min', 'START Manual', and 'STOP Manual'. A small square icon containing the letters 'UC' is located to the right of the 'FLOW' line. A line points from the text 'Icon for user calibration' to this 'UC' icon.</p>
-------------	--

⬆️ ⬇️ : Select    ⬆️ : Apply    ⬅️ : Back

On the [MENU] screen, select [3 Extra]-[5 User Calibration]-[Flow] and then press ⬆️.

Step	Screen Display	Description of Operations
(1) Specify settings.		Connect the flowmeter. Specify the calibration flowrate and flowrate conversion temperature. Select [ENTER] and then press ⬆️ to start the pump.
(2) Measure.		Wait one minute until actions stabilize. “Wait” is displayed in the upper left corner of the screen. After one minute elapses, “OK !!” is displayed. After using the flowmeter to measure flowrate, press ⬆️ to stop the pump.
(3) Enter results.		Enter the value indicated on the flowmeter, select [ENTER], and then press ⬆️. Note: Enter the flowmeter correction value based on the flowrate conversion setting.
		To check the calibration, select [Check FLOW MEASUREMENT] and then press ⬆️.
(4) Check.		Check the calibration results from using the flowmeter. After checking the calibration, press ⬆️ to stop the pump.
		When the calibration is finished, select [Extra] and press ⬆️. To perform calibration again, select [Recalibration] and then press ⬆️.

<b>Important</b>	<p>Calibration is not finished until “Complete !!” is displayed. Calibration is canceled if the power is switched OFF before calibration is finished or if ⬅️ is pressed to return to the [HOME] screen.</p>
------------------	--

If the results from checking the flowrate after calibration does not show any improvement from before calibration, then repeating calibration (recalibration) is recommended. If recalibration does not improve performance, have the product repaired, because the pump capacity may have decreased or a product failure may have occurred.




## 10.2 Checking the User Calibration History

This product can display a history of previous user calibrations. That makes it easy to identify pumps that are not user calibrated. It can also be used as an indicator for performing user calibration on a regularly scheduled basis.



**On the [MENU] screen, select [3 Extra]-[6 User Cal.History]-[Flow] and then press** .

- The history displays the date calibration was performed, the calibration value (SET), and the entered value (INPUT).
- Press  to display the previous screen again.

# 11 Pump Functionality and Customization

## 11.1 Adjusting the Activity Indicator Brightness

⬆️ ⬇️ : Select    ⬆️ : Apply    ⬅️ : Back

On the [MENU] screen, select [3 Extra]-[4 LED] and then press ⬆️.

- Adjust the indicator brightness by pressing ⬆️ or ⬇️. There are ten brightness levels.
- The indicator remains OFF if set to "00."
- After adjusting the brightness, press ⬆️ to apply the setting.



## 11.2 Adjusting the Display Unit Brightness

⬆️ ⬇️ : Select    ⬆️ : Apply    ⬅️ : Back

On the [MENU] screen, select [3 Extra]-[10 Contrast] and then press ⬆️.

- Adjust the display unit brightness by pressing ⬆️ or ⬇️. There are ten adjustment levels.
- After adjusting the level, press ⬆️ to apply the setting.



## 11.3 Errors Displayed

If an error occurs during sampling, this product stops sampling.\*1

Also, the corresponding error is displayed on the screen and the activity indicator flashes red.

For some errors, actions can be specified to continue if the error occurs.

**Flow Error**  
Please press any key

### 11.3.1 Types of Errors

No.	Display/Status	Cause	Remedy
E1	<b><u>Flow Error</u></b> The instantaneous flowrate value differed from the flowrate setting value by 20 % or more for 60 consecutive seconds.	High intake pressure due to heavy load	Use with a lighter load.
E2	<b><u>Power Error</u></b> Power supply voltage dropped below 12.5 V.*2	Battery is depleted or almost depleted.	Charge the battery.
E3	<b><u>Current Error</u></b> Motor current exceeded 2.5 A for 10 consecutive seconds.	High intake pressure due to heavy load	Use with a lighter load.
E4	<b><u>Temperature Error</u></b> Sensor ambient temperature exceeded 70 °C for 10 consecutive seconds.	Temperature exceeded operating temperature range.	Wait for the temperature to decrease before using the product.
E5	<b><u>Pressure Error</u></b> Atmospheric pressure was below 60 kPa for 10 consecutive seconds.	The altitude is high.	Use the product at a lower altitude.
E6	<b><u>Fan Error</u></b>	An overcurrent or circuit break occurred.	Request repairs.

\*1: Excludes cases where actions are continued even when the error occurs, due to the action specified for when the error occurs. (-> Refer to p. 36.)

\*2: If a power error occurs, it can switch OFF the pump power supply itself. If the power switches OFF, the error is not displayed the next time the power is switched ON, but the time the error occurred can be confirmed from sampling results or log data. (-> Refer to p. 24.)

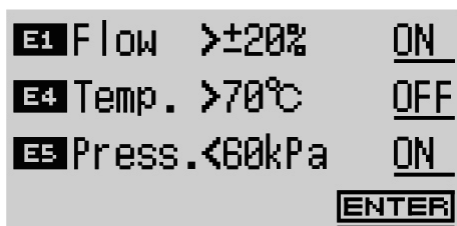
### 11.3.2 Setting Actions for when an Error Occurs

For flow errors, temperature errors, and pressure errors, settings can be specified to continue current actions even if those errors occur.

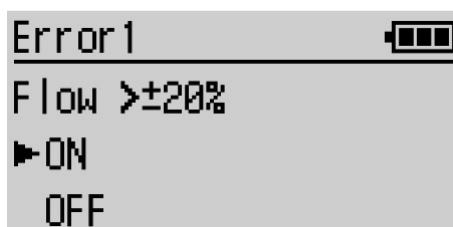


On the [MENU] screen, select [3 Extra]-[8 Stop Error] and then press .

Whether to stop or continue actions can be switched ON or OFF for each error.



ON	Stops pump action if the error occurs.
OFF	Continues pump action if the error occurs.



Example of Stop Error Setting Screen (Flow)

Important	<p>If used with this setting disabled (OFF), variability or other problems with flowrate precision are not covered by the warranty, so be sure to understand that risk before changing the setting. Leave the setting enabled (ON) unless unavoidable, such as in an emergency.</p>
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## 12 Troubleshooting

### 12.1 Troubleshooting Based on Symptoms

Symptom	Cause	Remedy
<b>Nothing is displayed after switching the power ON or disappears after a few seconds.</b>	The battery unit is not installed.	Install the battery unit. -> Refer to p. 13.
	Battery unit voltage capacity decreased.	Use an AC adapter and power cord to charge the battery. -> Refer to p. 14.
	Ⓐ and Ⓥ kept being pressed after the power supply switched ON.	Release Ⓐ and Ⓥ after "SIBATA" appears on the screen. -> Refer to p. 15.
	The AC adapter or power cord became disconnect while using an AC power supply.	Check the plug status to make sure it is connected properly. -> Refer to p. 14.
	The lithium ion battery reached its service life.	Purchase a replacement LI-30 battery unit or have it repaired.
<b>The pump functions, but does not reach the specified flowrate or stabilize.</b>	Liquid was aspirated.	Have it repaired or adjusted.
	Filter element is clogged.	Replace the filter element. -> Refer to p. 18.
	The sampling tube is flattened.	Replace the tube or change how it is connected.
	Pressure loss exceeds the specified range.	Make sure pressure loss is within the specified range. -> Refer to p. 39.
	The pump diaphragm failed. (Flowrate does not increase at all.)	Have it repaired or adjusted.
<b>Pump stopped during sampling.</b>	Resulted in error status.	Check the error cause and remedy. -> Refer to p. 35. If the indicated remedy does not resolve the problem, contact the distributor or your Sibata representative.
<b>Activity indicator does not flash.</b>	Activity indicator setting is set to not flash.	Change the setting. -> Refer to p. 34.

## 12.2 Restoring Factory Settings (Initialization)

### Important

This operation will restore all setting values to factory settings, including measurement data, user calibration results, and other past setting changes. Once the operation is executed, it cannot be undone.

(1) On the [MENU] screen, press  $\uparrow$  or  $\downarrow$  to select [3 Extra], and press  $\rightarrow$  and  $\uparrow$  to select [14 Factory Default]. Then press  $\rightarrow$ .

- An initialization confirmation screen is displayed.
- Press  $\leftarrow$  to display the [Extra] screen again without initializing settings.

(2) Press  $\rightarrow$ .

- After initialization is finished and “Complete !!” is displayed, the [Extra] screen is displayed again.

### ■ Setting Values after Initialization

No.	Parameter	Value after Initialization
1	Flowrate Setting	10.0 L/min
2	Conversion Temperature (icon)	25 °C at 1 atm
3	Sampling Start Condition	Manual
4	Sampling Stop Condition	Manual
5	Delay	000h:01m
6	Clock (Start)	YY/MM/DD and current time
7	Run. T	000h:10m
8	Volume	000.100 m <sup>3</sup>
9	Clock (Stop)	YY/MM/DD and current time
10	Previous Data	NO DATA
12	Interval Timer Settings	OFF, 2 times, and 1 minute
13	Passcode	Restricted Mode: 0000 Key Lock: 0000
14	Save Setup (saved setting values)	None
15	LED	01 (ON)
16	User Calibration	No user calibration correction values
17	User Cal. History	No user calibration history
18	Date & Time	Y/M/D and current time
19	Stop Error (enable/disable stopping on error)	All ON
20	Units (for temperature and pressure values)	°C and kPa
21	Contrast	05 (10 levels available)
22	Record Mode	Over Write

## 13 Specifications

### 13.1 Specifications

The performance levels indicated below might not be achievable immediately after switching the power ON. Warm up the system for a few minutes before sampling.

Item Code	080800-0300	
Model	LVS-30	
Variable Flowrate Range* <sup>1</sup>	5.0 to 30.0 L/min	
Instantaneous Flowrate Display Range	0.0 to 40.0 L/min	
Constant Flowrate Operating Range* <sup>1</sup>	5.0 L/min: 0 to 30 kPa 10.0 L/min: 0 to 20 kPa 20.0 L/min: 0 to 16 kPa 30.0 L/min: 0 to 8 kPa	
Constant Flowrate Precision* <sup>1</sup>	Max. $\pm 5$ %	
Accumulated Flowrate Setting and Display Range	0.001 to 999.999 m <sup>3</sup>	
Time Setting and Display Range	000:01 to 999:59 (h:m) displayed in 1 second increments YY/MM/DD/hh/mm (year/month/day/hour/minute)	
Built-in Flowmeter	Differential pressure type	
Pump Type	Diaphragm pump	
Display Unit	Organic EL	
Air Intake Port Diameter	11 mm and 8 mm O.D. (two diameters) (for tubes with about 10 mm or 7 mm I.D.)	
Ambient Temperature, Humidity, and Altitude Range	0 to 40 °C, 10 to 90 % RH (with no condensation), 2000 m max.	
Power Supply	LI-30 Battery Unit (sold separately)	Lithium ion battery, 14.4 V DC, 6700 mAh, 96 Wh
	AC Adapter (sold separately) and Power Cord (sold separately)	Input: 100 to 240 V AC $\pm 10$ % at 50/60 Hz and 1.2 A (max.) Output: 24 V DC at 3.75 A (max.)
Continuous Operating Time* <sup>2</sup>	At 20 L/min using 25 mm dia. TF98, 1 pc and NW-354: About 8 hrs At 9.6 L/min using 25 mm dia. TF98, 1 pc and C-30: About 18 hrs At 10 L/min using 47 mm dia. membrane filter, 1 pc: About 13 hrs At 5 L/min using 25 mm dia. membrane filter: About 15 hrs	
Dimensions	W168 × D228 × H111 mm (not including handle)	
Weight	2.3 kg (including LI-30 battery unit)	
Pollution Degree	2	
Overvoltage Category	II	

\*1: The variable flowrate range, constant flowrate operating range, and constant flowrate precision specification values indicated above assume 25 °C ambient temperature at 1 atmosphere of pressure. The performance levels indicated above might not be achievable at high altitudes with lower air pressure.

\*2: The continuous operating time value is provided for reference purposes assuming a 25 °C ambient temperature. Actual operating times will vary depending on the ambient temperature, usage history, and other factors.

Note: Due to product improvements, the product shape, dimensions, specifications, and other product information are subject to change without notice, to the extent that they do not affect product applicability or functionality.

## 13.2 List of Materials Used

Component		Material
Case		PC
Pump and Flow Channels	Plastic	PC, ABS, and POM
	Rubber	EPDM, Si, NBR, and CR
	Metal	A5052 and SUS304
Internal Parts		PC and A5052
Built-in Battery for Clock		Lithium ion button cell battery
Other		Electronic parts, C3604BD, and Fe

## 13.3 Consumables, Products Sold Separately, and Related Products

### ■ Consumables

Item Code	Product Name
080860-001	Filter Element, VFE-3, Set of 5

### ■ Products Sold Separately

Item Code	Product Name
080800-0310	Battery Unit, LI-30
080800-032	AC Adapter, ATS090-P240
080800-0321	Power Cord, ATS090-P240 (for Japan)

### ■ Related Products

Item Code	Product Name
080050-155	Filter Paper Holder, Type A
080050-255	Filter Paper Holder, Type B
080050-3553	Filter Paper Holder, Type C-30 (including multi-stage particle size separator)
080120-354	Holder for Inertial Impact Particle Size Separator, PM4, NW-354
080150-3	Fiberglass Filters, AP2005500, 55 mm dia., Set of 100
080130-098035	PTFE Binder Filters, TF98R, 35 mm dia., Set of 100
080130-098055	PTFE Binder Filters, TF98R, 55 mm dia., Set of 100
080160-4	Twin Plates for Sampler
080800-0311	Battery Charger, Three-Port, QC-30
080800-044	Flowrate Indicator FI-10N
080800-0301	Flowrate Indicator Support Bracket for LVS-30



## 14 Maintenance

### 14.1 Replacing Filter Elements

Periodically visually check the filter element contamination level. If the contamination level is severer or the filter element begins to darken, replace the element.

-> Refer to p. 18.

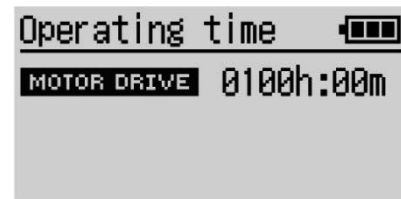
### 14.2 Checking the Motor Operating Time

The motor operating time (pump operating time) can be checked as follows.

(1) On the [MENU] screen, press  $\uparrow$  or  $\downarrow$  to select [3 Extra], press  $\rightarrow$  and  $\uparrow$  to select [11 Operating Time]. Then press  $\rightarrow$ .

(2) Press  $\leftarrow$ .

- The [Extra] screen is displayed again.



### 14.3 Periodic Inspections

To maintain the flowrate precision of this pump, periodic inspections (service fee charged) are recommended.

It is recommended that you contact the distributor or your Sibata representative to make arrangements for an annual inspection.

## 15 Warranty and Repairs

If a Sibata product fails within one year from date of purchase, it will be repaired free of charge.

To request repairs, be sure to contact the distributor where you purchased the product. However, the warranty excludes consumable parts included with the product, products without the purchase date or distributor information recorded, and products for which warranty information was revised. A repair service fee is charged in the following cases.

- Failures or damage caused by usage methods
- Failures or damage resulting from repairs or modifications not performed by Sibata
- Failures caused by abuse or inadequate maintenance
- Failures or damage resulting from fires, earthquakes, acts of nature, or other unavoidable events
- Failures or damage due to transportation, relocation, falling, vibration, or other such events after purchase
- Failures or damage resulting from using consumables not specified by Sibata
- Failures or damage that occur after disabling the action setting when an error occurs

## ■ Disclaimers

Sibata shall not be responsible for providing compensation for data that was not successfully acquired or recorded, or for incidental damages (such as loss of profits or interruption of business operations) resulting from any problem that occurred for any reason while using the product.

Under certain conditions, Sibata will repair product problems under the warranty, but Sibata will not provide compensation in the event of loss or damage to recorded data. Therefore, always make a backup of necessary data before requesting repairs or other service work by Sibata. If you ignore the precautions in this manual or fail to create a backup, Sibata shall not be responsible for any damages resulting from lost or damaged data.

\* This product does not include functionality for outputting data. Therefore, backing up data involves transcribing the data or other such process.

## ■ Repairs after the Warranty Period

For more information regarding repairs after the warranty period, contact the distributor where you purchased the product. Sibata offers repair services on a fee basis for products for which Sibata determines that repairing the product could restore normal performance levels and that those levels could be maintained, provided the specified operating methods are used. When shipping the product for repairs, fill out a Problem Report Form and include it with the shipment. -> Refer to p. 44.

## ■ Requesting Repairs for Products Exposed to Asbestos

To prevent exposing customers and Sibata service personnel to asbestos, use the following method to request repairs.

- (1) Fully remove all asbestos from the product before requesting repairs. After removing the asbestos, seal the product and its accessories in two layers of sturdy, water-resistant, transparent bags. Then pack the bags in a box. When sealing the items in the bags, make sure the serial number of the product being repaired and the number of accessories included are visible from the exterior of the bags.
  - (2) Be sure to enter "AS" in the "Fault and Request Details" field on the "Repair Request Slip." Alternatively, explicitly indicate that the product was used for measuring asbestos. If neither is entered for the product, a Sibata sales representative might contact the user to confirm whether or not it was exposed to asbestos.
  - (3) If a courier service is used to ship the product to the distributor or your Sibata representative, in addition to the product model number, enter "AS" in the "Remarks" or "Description" field of the shipping form. The purpose is to prevent damaging the sealed bags with a box cutter when unpacking the delivery.
- The above request applies to all similar products involved in measuring asbestos.

## 16 Product Disposal

Dispose of this product in accordance with local disposal requirements. (Refer to p. 40 regarding the parts used.)

### ■ If Product was Exposed to Asbestos

The product may contain asbestos or other hazardous substances after use. Therefore, dispose of it as specially-controlled industrial waste, in accordance with disposal methods specified for asbestos waste (dispersible asbestos waste) in Japan's Waste Management and Public Cleansing Act.

### ■ Disposal of the LI-30 Battery Unit (sold separately)

This product uses a lithium ion battery. Lithium ion batteries are a valuable resource that can be recycled. In accordance with the Act on the Promotion of Effective Utilization of Resources, a notification from Japan's Ministry of Economy, Trade and Industry, the manufacturer is obliged to recover and recycle such items. The product is not designed for disassembly or lithium ion battery removal directly by the user. To dispose of the battery unit, contact the distributor where you purchased the product or your Sibata representative.

## 17 Contact Information

For questions, clarifications, or requests regarding the product, please contact the distributor where you purchased the product or your Sibata representative.

## 18 Problem Report Form

Use the Problem Report Form on the next page to provide information necessary for ensuring problem inspection and repair processes can be performed smoothly. Copy the Problem Report Form and complete it in as much detail as possible.

Include the completed form with the product when requesting repairs, double-check the precautions for shipping items for repair, and be sure to clean items before shipping.

### Check List for Requesting Repairs

- Fill out a copy of the Problem Report Form and include it inside the shipping box.
- If there is a chance that a hazardous substance was aspirated into the product, place the form in an envelope affixed to the shipping box exterior. Be sure to include a note that indicates that risk.

# Problem Report Form

If a problem occurs, fill out a copy of this Problem Report Form and contact the distributor where you purchased the product or your Sibata representative.

Date completed: \_\_\_\_\_ (yyyy/mm/dd)

## Product Operating Circumstances

Serial No.	
Purchase Date	(yyyy/mm/dd)
Date of First Use	(yyyy/mm/dd)
Frequency of Use	<input type="checkbox"/> Daily <input type="checkbox"/> ___ days per week <input type="checkbox"/> ___ days per month
Hours of Use per Day	
Ambient Temperature during Use	_____ to _____ °C
Number of Units Owned	
Applications	

## Problem Description

Frequency of Problem	
Timing of Problem	
Symptoms	

## Check List (Circle applicable response.)

When the power is switched ON, (something / nothing) is displayed on the screen.
The filter element is (dirty / not dirty).
Water or other liquid (has / has never been) aspirated into the product.
The product (has / has not) been dropped or exposed to a strong impact.



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