

## Operating Instructions

High-pressure Steam Sterilizer

### Labo Autoclave

# MLS-3751L MLS-3781L

Thank you for purchasing the Labo Autoclave.

- Please read this Operating Instructions carefully before using the product.
- Please pay particular attention to the “Safety Precautions” section on page 2 to 7.



\* MLS-3751L

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# Safety Precautions

These precautions must be observed without fail.

## For Your Safety

To reduce the risk of injury, loss of life, electric shock, fire, malfunction, and damage to equipment or property, always observe the following safety precautions.

### Explanation of symbol word panels

The following symbol word panels are used to classify and describe the level of hazard, injury, and property damage caused when the denotation is disregarded and improper use is performed.



Denotes a potential hazard that will result in serious injury or death.



Denotes a potential hazard that could result in serious injury or death.



Denotes a hazard that could result in minor injury.

The following symbols are used to classify and describe the type of instructions to be observed.

	This symbol is used to alert users to a specific operating procedure that must not be performed.
	This symbol is used to alert users to a specific operating procedure that must be followed in order to operate the unit safely.
	This symbol is contents which you take care with operation.

## DANGER

**Never introduce inflammables in the product.**

Do not put the following substances specified in Annex 1 of the Occupational Safety and Health Act Enforcement Ordinance into or near the product.

- Explosive substances
- Ignitable substances
- Oxidizing substances
- Flammable substances
- Combustible substances

Failure to observe this warning may result in injury, fire or trouble with the product by possible explosion.

## WARNING

<p><b>Do not put anything that corrodes stainless steel inside the product.</b></p> <p>Do not put culture mediums that corrodes stainless steel inside the product.</p> <p>Failure to observe this warning may result in injury, fire or trouble with the product by possible explosion.</p>	<p><b>Check the cover packing.</b></p> <p>Sterilization of animal oil and fat (e.g., waste generated after BSE inspection) causes premature wear, cracking or breakage of the cover packings. If the product is used with defective packings, steam may escape and cause burns or other accidents.</p>
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# WARNING

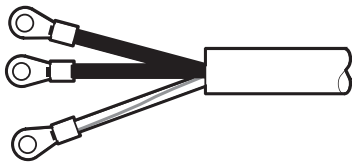
## Ground the product without fail.



Make sure that the product has been properly grounded. Be sure to connect one end of grounding line to the ground and the other end to the grounding terminal.

Failure to observe this warning may result in electric shock.

## Connect power cord of the product to its own dedicated outlet.



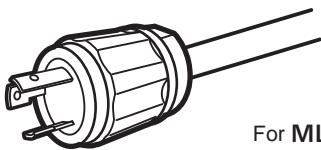
Yellow/Green : Grounding wire

Connect the power cord to a dedicated outlet as shown below.

<MLS-3751L>: Single phase, AC Local Voltage  
<MLS-3781L>: Single phase, AC Local Voltage

Failure to observe this caution may result in ignition or malfunctioning.

## Connect the power cord to the outlet equipped with a ground-fault circuit interrupter (GFCI).

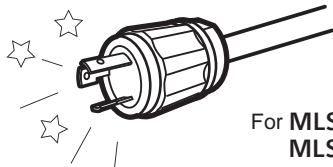


For MLS-3781L-PA  
MLS-3751L-PA only

Connect the power cord to a plug-in receptacle equipped with a GFCI of more than ratings indicated. Avoid multiple loads on a single electrical outlet.

Otherwise, the cord may catch fire or the unit may operate abnormally whereby causing injury. If the unit is used in combination with other equipment, a branched outlet may heat abnormally and catch fire.

## Keep the power cord always clean.

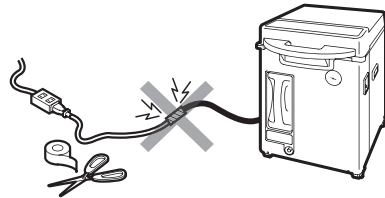


For MLS-3781L-PA  
MLS-3751L-PA only

Wipe off dust or moisture from the power plug blades and the base of the blades.

Dusty or wet blades may cause fire.

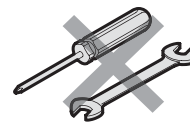
## Do not extend the power cord.



Do not connect the power cord or plug to an extension cord.

Failure to observe this warning may result in electric shock or fire.

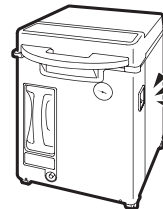
## Do not modify the product.



The product should never be disassembled or repaired by any other person than a qualified service engineer.

Failure to observe this warning may result in fire, malfunction or injury.

## In the event of trouble, stop operation and turn OFF the power.

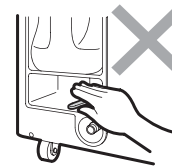


Set my power switch to OFF.

Should trouble (burning smell, etc.) occur, set the power switch to the OFF position, shut down the main power, and contact the dealer from whom you purchased the product.

Continuing to operate the product in anything but proper working order may result in electric shock or fire.

## Do not open the drain valve during operation.



Do not open valve.

Before draining off heating water, open the cover for at least 2 hours after the end of operation.

Failure to observe this warning may cause hot water to gush out, resulting in scald or accident.

( Heating water is water that is poured into the chamber to help the heater in the chamber generate steam for sterilization. )



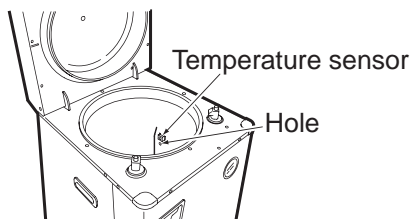
## WARNING

**Do not sterilize objects in a steam impermeable container or bag.**



Failure to observe this warning may result in accident or incomplete sterilization.

**Do not block the holes or temperature sensor in the chamber with objects.**



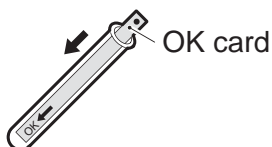
Failure to observe this warning may destabilize control of the product or result in incomplete sterilization.

**When sterilizing only containers such as beakers, flasks and test tubes, place them with their openings facing downward or lay them on their sides.**



If the containers are placed with their openings facing upward, it is hard for air to sufficiently escape from the container and for steam to sufficiently penetrate inside, thus resulting in incomplete sterilization.

**Check the product for sterilization performance.**



The sterilization performance will vary depending on such factors as the type and volume of objects to be sterilized, the arrangement of objects and the type of container. Therefore, use a sterilization indicator such as an "OK" card for checking the performance.

Failure to observe this warning may result in accident or incomplete sterilization.

**Do not seal the object container tightly.**



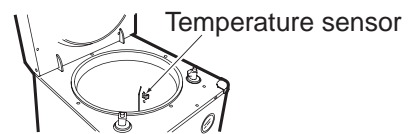
Use a porous cap or loosen the cover sufficiently. Failure to observe this warning may result in accident or incomplete sterilization.

**Do not store the sterilized thing with this product.**



A product does not have a storage function of a sterilization thing. Please be sure to take out a little early, if sterilization of a culture medium and instruments finishes, and to keep it in a storage warehouse for exclusive use. There is fear of re-contamination.

**Do not place objects on the temperature sensor in the chamber.**



Failure to observe this warning may destabilize control of the product or result in incomplete sterilization.

**When sterilizing waste, pour about 300 ml of water into the sterilization bag and sterilize the waste with the bag open.**



Sterilizing without water in the bag or with the bag closed may result in incomplete sterilization.

**When using the sterilization bag, be sure to put it in the stainless steel basket included with the product and set it in the chamber for sterilization.**



If the sterilization bag is put directly in the chamber, it may block the temperature sensor or it may be pinched between the chamber opening and the cover packing, resulting in trouble with the product.



# CAUTION

**Do not plug or unplug the power cord with wet hand.**



May cause electric shock.

**Hold the power plug when plugging or unplugging the power cord.**

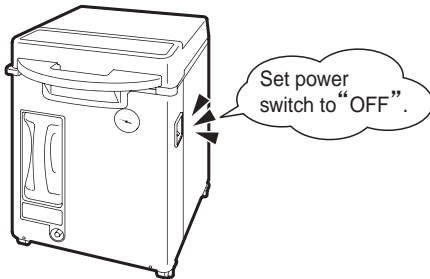


For MLS-3781L-PA  
MLS-3751L-PA only

**Be sure to hold the power plug but not the power cord when unplugging the power cord.**

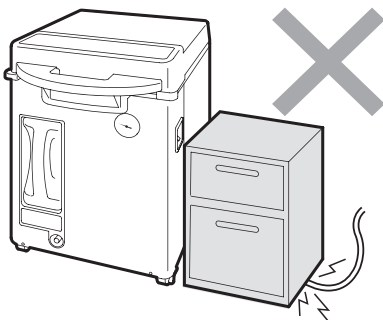
Inobservance of this caution may result in electric shock or short-circuit, resulting in fire.

**Before performing maintenance, set the power switch to the OFF position.**



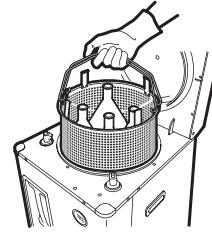
**Set the power switch to "OFF" and sufficiently cool the product before performing maintenance.** Failure to observe this warning may result in electric shock or burns.

**Nothing should be placed on the power cord.**



Failure to observe this caution may overheat the power cord, resulting in fire.

**Use care not to scald yourself when taking out the sterilized objects at the end of operation.**



**Be sure to wear thermally insulated leather gloves. Note that it takes time until liquid is cooled down.** Handling a sterilized object with bare hands immediately after the end of operation may result in burns.

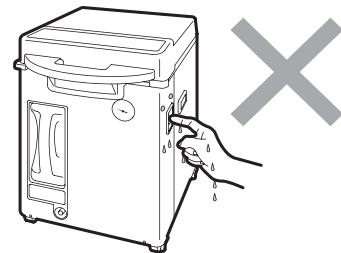
**Do not use a damaged power cord or power plug.**



**Do not use the autoclave if the power cord or power plug is damaged or the outlet socket is loose.**

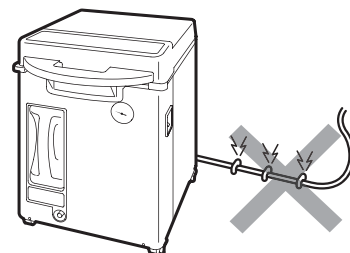
Inobservance of this caution may result in electric shock or short-circuit, resulting in fire.

**Do not touch the power switch with wet hands.**



Failure to observe this caution may result in electric shock.

**Do not use staples or nails to anchor the power cord.**

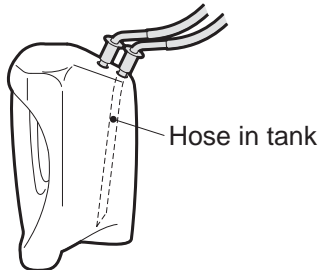


Failure to observe this caution may overheat the power cord, resulting in fire.



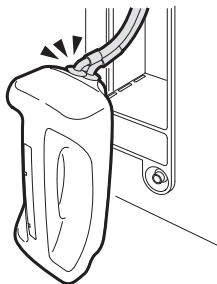
## CAUTION

**Be careful about the position of the exhaust hose insertion holes.**



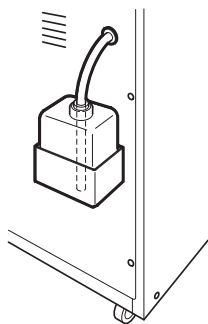
**Be sure to insert the hose in the tank into the holes at the back inside the exhaust tank.**  
Failure to observe this caution may cause large steam leaks from the tank on the rear side.

**When using the exhaust tank attached to the product, insert the exhaust hose packings securely in the holes of the exhaust tank.**



**Be sure to use the exhaust tank attached to the product.**  
If the packings of the exhaust hose have not been inserted sufficiently, steam may escape and result in burns.

**Insert the hose securely.**



**Be sure to insert the hose down to the bottom of the exhaust tank on the rear side.**  
Incomplete hose insertion may cause steam or hot water to spill over the tank.

**Do not allow children to use or play with the product.**



Failure to observe this caution may result in burns, electric shock or injury.

**Keep your head away when opening the cover at the end of operation.**



**Since high-temperature steam will escape when the cover is opened, wait until the steam dissipates. During this time, keep your head away from the product.**

Failure to observe this caution may result in burns.

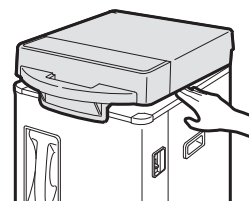
**Keep away from the safety valve vent.**



**Keep your head away from the safety valve vent when steam escapes. Set the power switch to "OFF" position, shut down the main power and contact the dealer from whom you purchased the product.**

Failure to observe this caution may result in burns.

**Do not stick your fingers in the hinged part of the cover.**

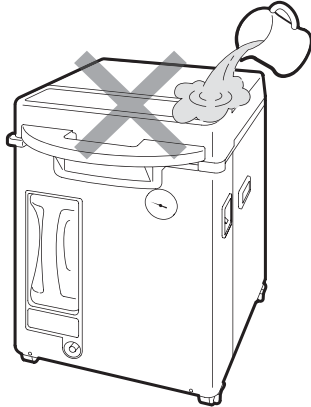


Your fingers may be pinched and injured.



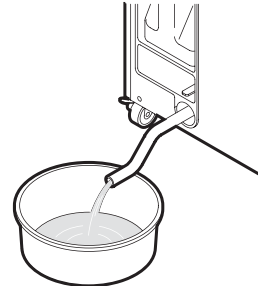
# CAUTION

**Do not wet the product.**



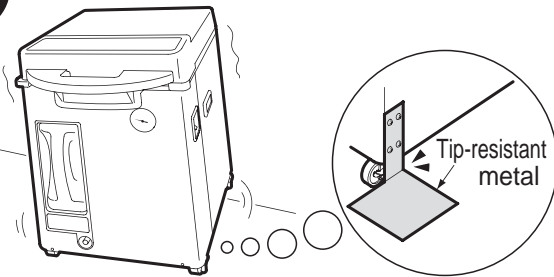
Failure to observe this caution may cause short-circuits in live parts, resulting in electric shock or fire.

**Drain off heating water everyday after use of the product.**



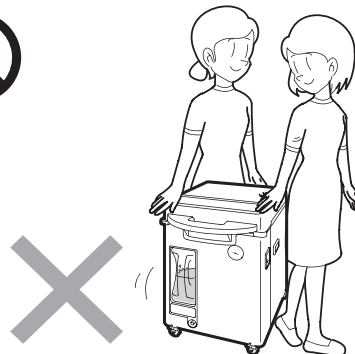
**Insert the attached drain hose in the drain water port and drain water at least 2 hours after operation.** If water is drained out in haste, hot water may splatter, resulting in burns or damage to the floor. Repeated use of the same heating water may corrode the chamber or clog the piping.

**Install the product on a level surface.**



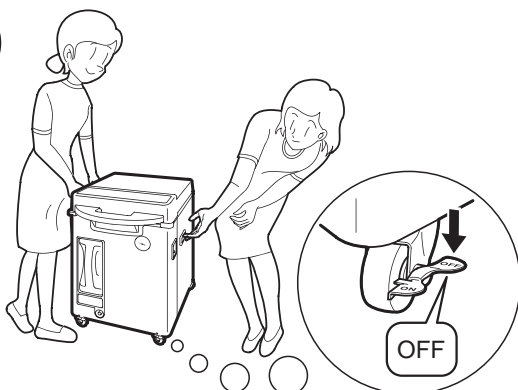
**Anchor the product firmly with the tip-resistant metal attached to the product.** If the product is installed on an inclined surface, hot water in the chamber will spill, resulting in scald or electric shock. Moreover, the product may fall, resulting in injury or damage to the floor.

**Do not move the product with the exhaust tank full of water.**



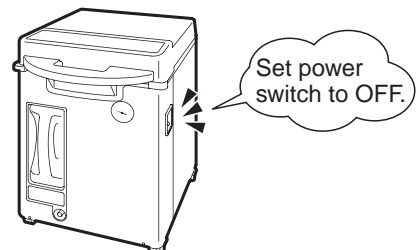
**When moving the product, be sure to discard water in the exhaust tank.** Failure to observe this caution may cause hot water to spill from the exhaust tank, resulting in burns or accident.

**Hold the grips when moving the product.**



**Unlock the casters when moving the product.** Accidentally dropping the product may result in injury

**If trouble is indicated on the process display, set the power switch in the "OFF" position.**



**If the same condition persists even after retrying the operation, set the power switch in the "OFF" position, shut down the main power, and contact the dealer from whom you purchased the product.** Continuing to operate the product anything but proper working order may result in electric shock or fire.

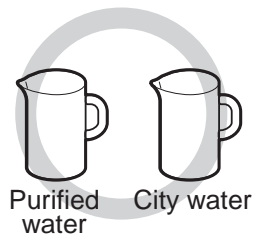
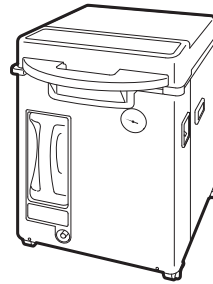
# Precautions in Use

## Intended Use

This equipment is designed for sterilizing laboratory supplies and melting culture media.

### Use purified or city water as heating water.

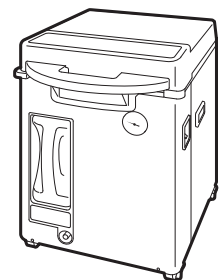
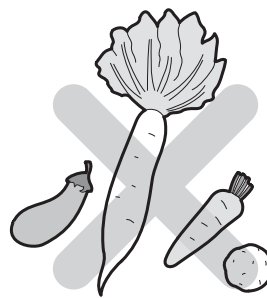
Use of well water, saline water, etc. may cause trouble.



### Prohibition of Use for Other than Intended Purposes

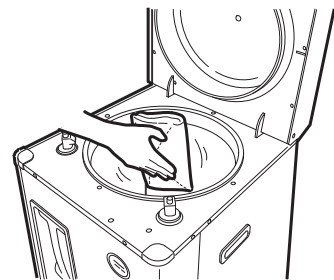
**Do not use the product for anything other than the intended purposes of sterilization, keep warm and melting.**

Failure to observe this caution may corrode the chamber or clog the piping.  
(Do not use the product as a cooking heater.)



### After sterilizing culture mediums that generated sulfide gas or chlorine gas, clean the chamber on the inside without fail.

Corrosion of the chamber may cause premature malfunction of the product.



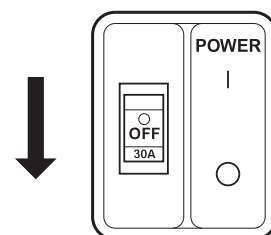
### When using devices made of plastics and glass,

Such devices may deform or melt due to the effects of temperature and pressure.



### Set the power switch in the OFF position everyday after use.

Before leaving the product unused for a long time, be sure to set the power switch in the OFF position and shut down the main power.

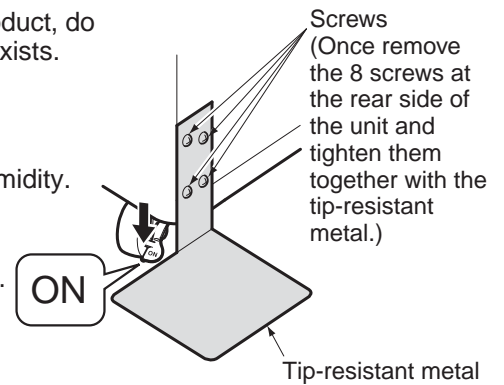
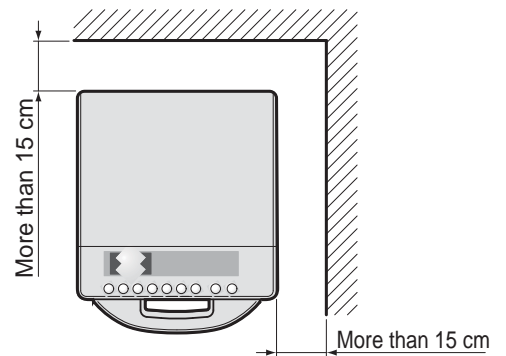




# Before Using the Product

## Installation

- Product environment and conditions of use  
Location : Indoor  
Ambient temperature : 5 °C ~ 40 °C Altitude : 0 m ~ 3000 m  
Relative humidity : 50 % ~ 80 % Voltage fluctuation : ±10 % of nominal voltage
- The boiling point must be set for the product according to the altitude of the location where the product is installed. The boiling point has been set at 100°C at the time of shipment from the factory. Before installing the product in a place 500 m higher than sea level, consult your dealer.
- Do not install the product in the following places. Otherwise, trouble may occur with your product.
  - Places exposed to direct sunlight
  - Places where water splashes
  - Inclined surfaces (It becomes difficult to detect heating without water.)
  - Places exposed to air containing salt, sulfur, etc.
  - Humid places
  - Dusty places
- Since steam is emitted from the exhaust tank on the rear side of the product, do not install the product in places where an electric outlet or equipment exists.
- Leave a clearance of more than 15 cm behind the product and more than 15 cm on the sides of the product. If the product is installed in close proximity to walls, the product may overheat, resulting in trouble.
- Wall surfaces may be marred by venting steam or crack under high humidity.
- **Anchor the product firmly by means of tip-resistant metals (2 pcs. included with the product).**
- Be sure to install the product on a level rigid surface and lock all four casters.
- Be sure to mount the exhaust tank on the rear side of the product and the tank mounting brackets to the rear side of the product.  
(See page 10.)



## Power supply and ground connections

- **The unit's power cord must be connected to its own dedicated and properly wired connection outlet where no other plugs are connected.**  
For 120 V units :  
**MLS-3751L-PA ;**  
The unit should be connected to an appropriate receptacle that is rated 15.8 or greater.  
For 220 V units :  
The 220 V versions of the **MLS-3751L/MLS-3781L** Autoclave are shipped without a plug on the power cord. Use the power-plug when the products is set. The protective grounding conductor of power supply cord must be connected to the contacting member of an attachment plug.

		MLS-3751L	MLS-3781L
Power cord	Wire size	AWG 14	
	Type	SJT	
Plug		250 VAC, 10 A or greater	250 VAC, 20 A or greater

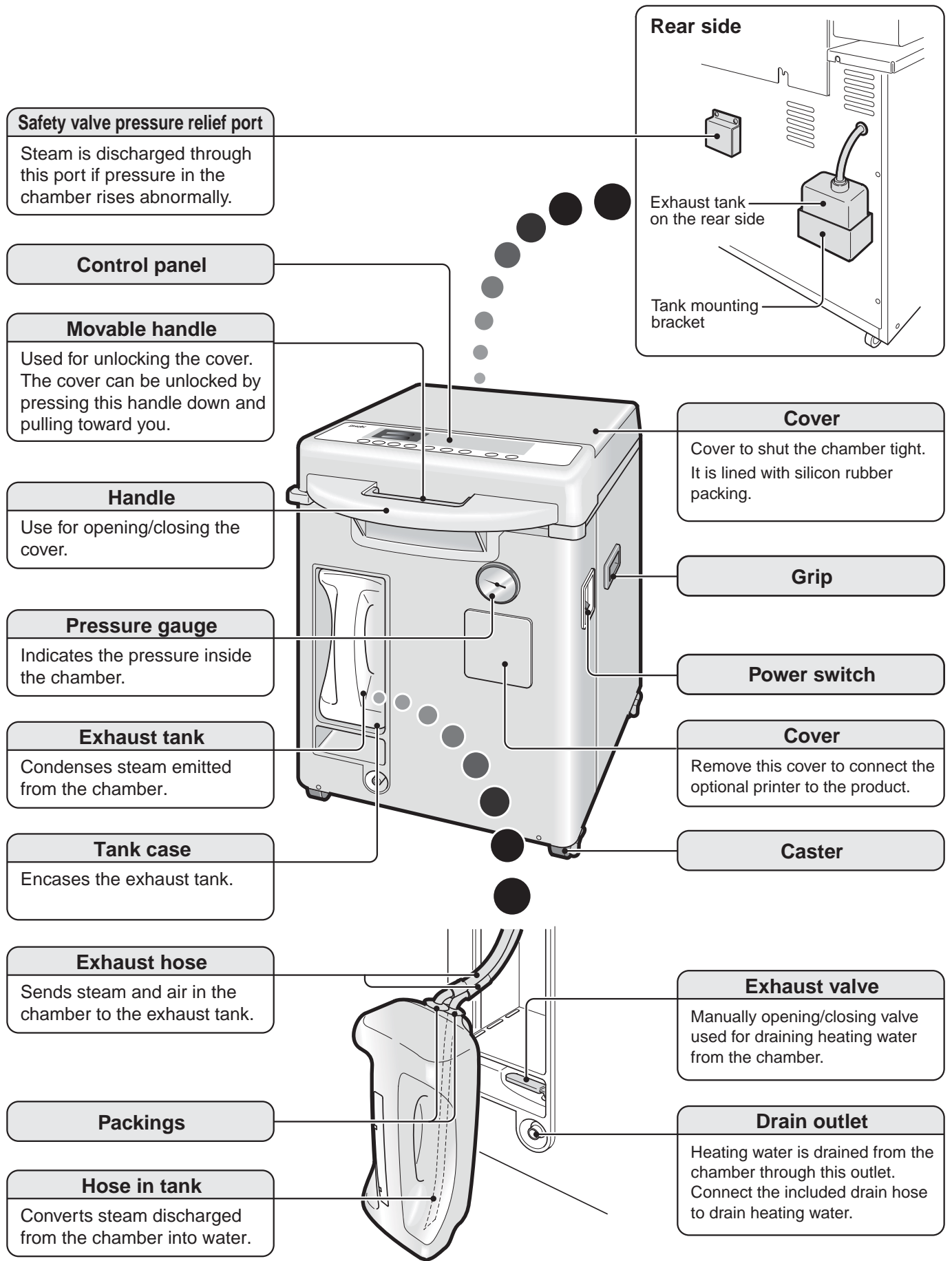
- For 230 V units :  
The 230 V versions of the **MLS-3751L/MLS-3781L** Autoclave are shipped without a plug on the power cord. Use the power-plug which is applied IEC60309 when the products is set. The protective grounding conductor of power supply cord must be connected to the contacting member of an attachment plug.

- MLS-3781L-PA ;**  
The unit should be connected to an appropriate receptacle that is rated 17.4 or greater. rating ;

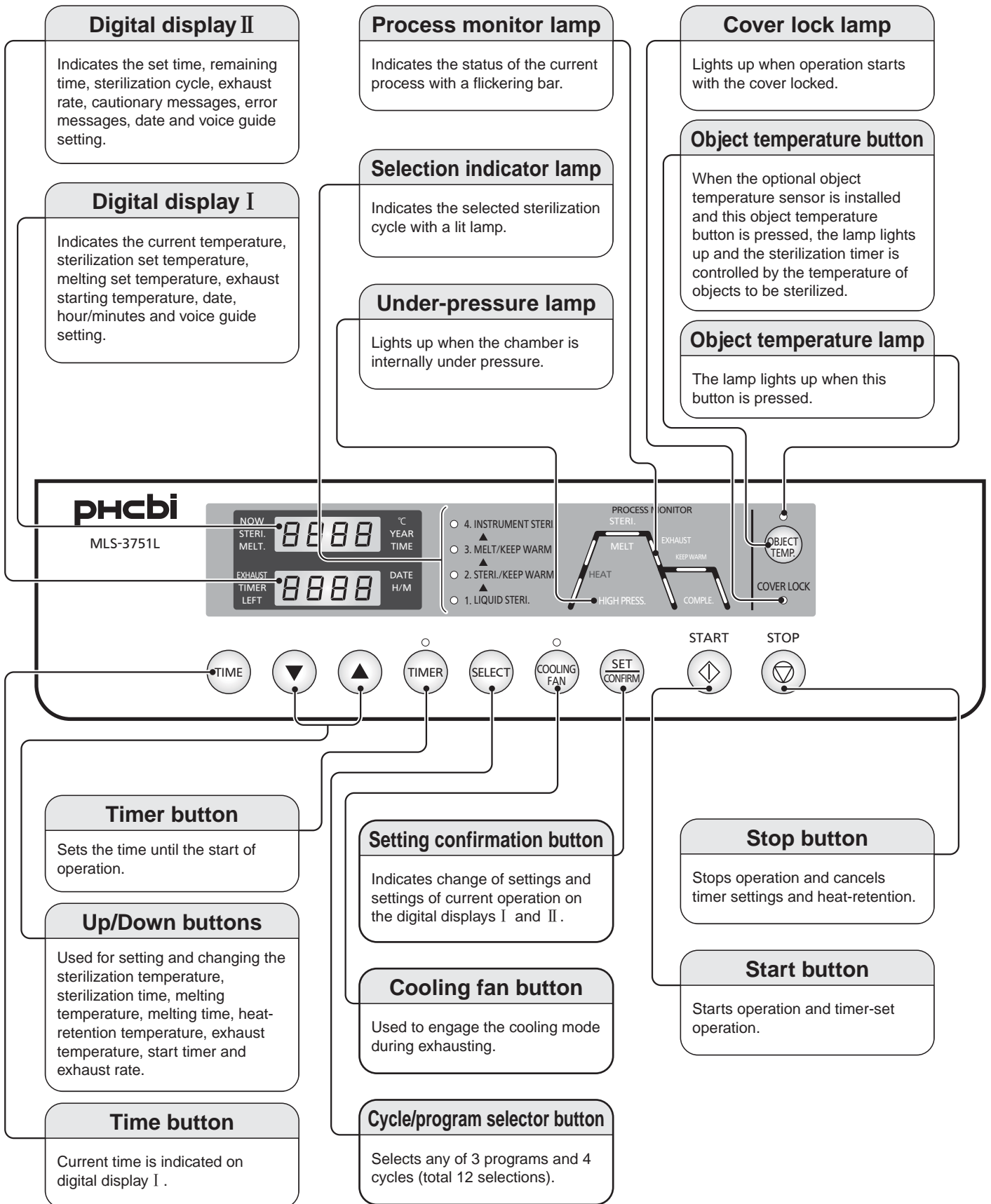
		MLS-3751L	MLS-3781L
Power cord	Wire size	AWG 14	
	Plug	250 VAC, 10 A or greater	250 VAC, 20 A or greater

- **The unit must be connected straight to ground.**  
The green / yellow conductor of the power cord is the grounding wire. You must ask your dealer or a qualified electrician to do the grounding work involved.

# Names and Functions of Parts



# Control panel



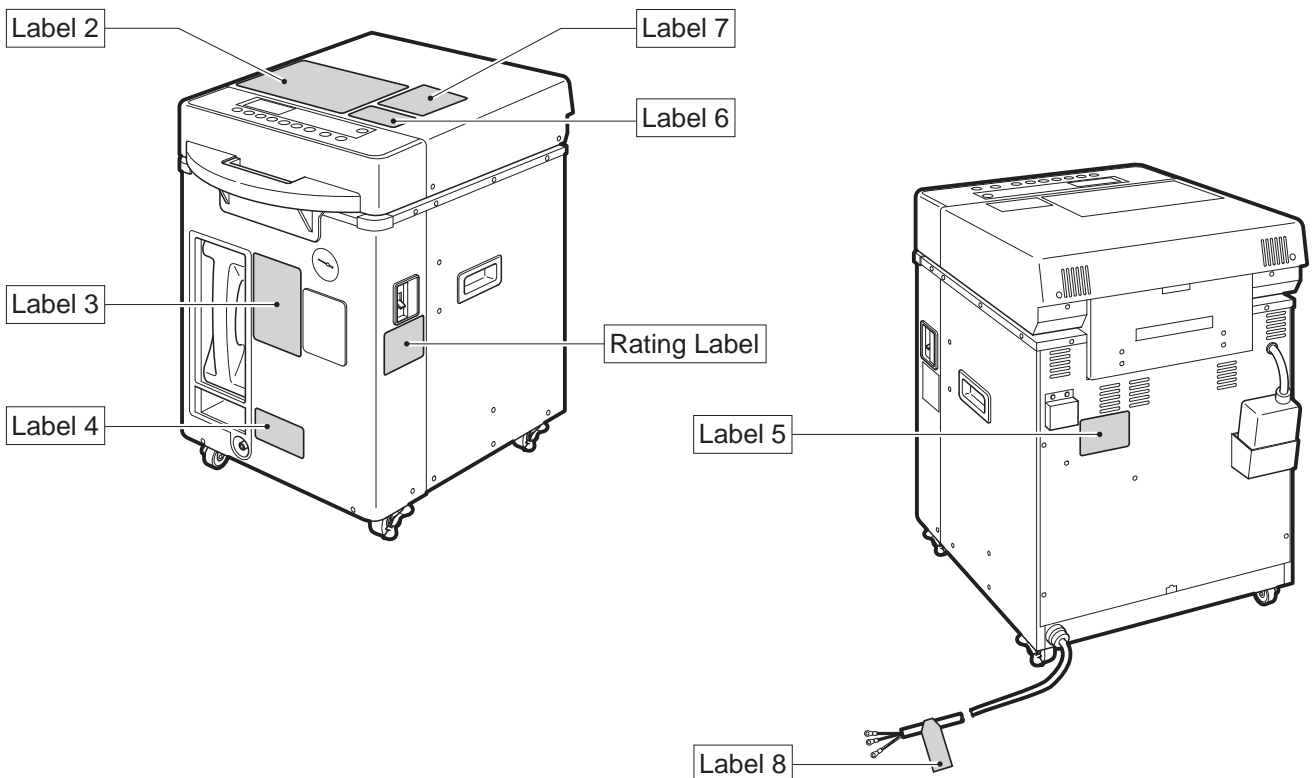
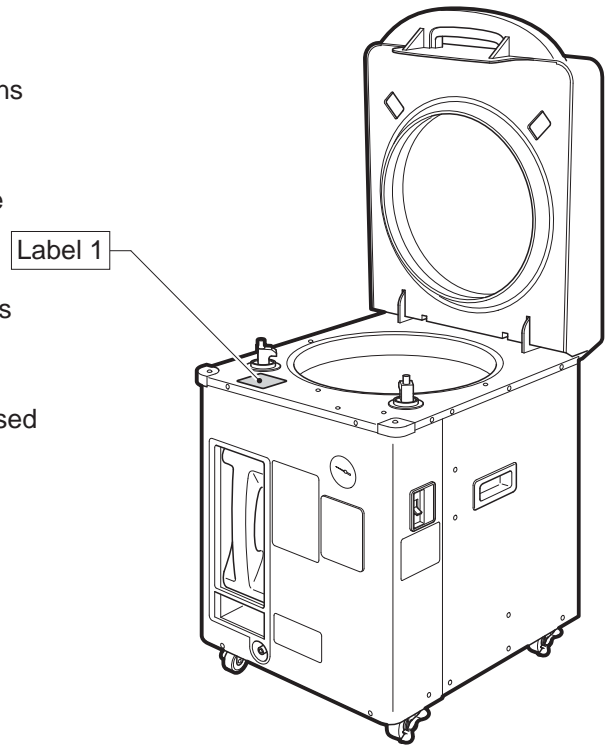
# Explanation of Labels

## Rating label

This label indicates the ratings of the product.

## Warning labels

- **Label 1;**  
This label warns of burns if the operator touches the cover, its periphery or sterilized objects immediately after the end of sterilization.
- **Label 2;**  
This label explains the meanings of “DANGER”, “WARNING” and “CAUTION”. It also explains the precautions for opening and closing the cover.
- **Label 3;**  
This label explains how to install the exhaust tank and precautions of use.
- **Label 4;**  
This label warns against burns that may occur when draining the heating water.
- **Label 5;**  
This label warns against burns that may occur when steam blows from the pressure safety valve.
- **Label 6;**  
This label warns against deterioration of the cover packings caused by sterilization objects.
- **Label 7;**  
This label explains the attention when the lid is operated.
- **Label 8;**  
This label warns of the values of voltage and current.  
(MLS-3751L-PK/MLS-3781L-PK only)



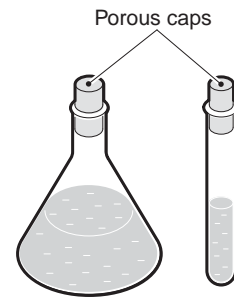
# Sterilization Objects



## WARNING

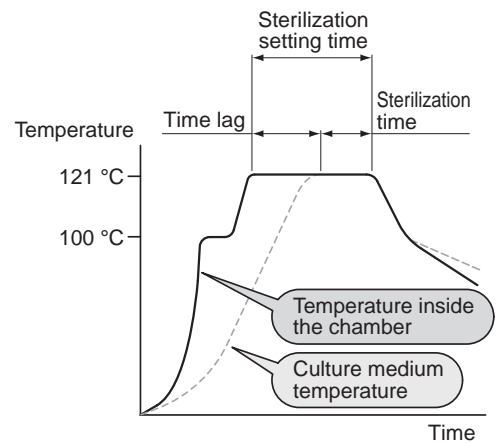


- **Do not sterilize objects in a steam impermeable container or bag.**  
Failure to observe this warning may result in accident or incomplete sterilization.
- **Do not seal the object container tightly. Use a porous cap or loosen the cover sufficiently.**  
Failure to observe this warning may result in accident or incomplete sterilization.
- **Do not block the holes or temperature sensor in the chamber with objects.**  
Failure to observe this warning may destabilize control of the product or result in incomplete sterilization.



## Sterilization and melting of liquids such as culture mediums, etc.

- **Capacity of culture mediums and containers**  
Pour less liquid in the container than the specified volume. Excessive liquid will spill when heated.
- **Sterilization of large volume culture mediums**  
There is a **time lag** between when the temperature in the chamber reaches the sterilization temperature and when the temperature of the whole culture medium reaches the sterilization temperature. For this reason, this time lag has been included in the sterilization time in advance. Therefore, take the time lag into account when setting the sterilization time.



**Sterilization Setting Time = Sterilization Time + Time Lag**

Liquid Volume	Time Lag	
Agar media in 500 ml flask x 1~21, or Agar media in 1000 ml flask x 1~12	<b>MLS-3751L</b>	<b>MLS-3781L</b>
	8 min.	11 min.

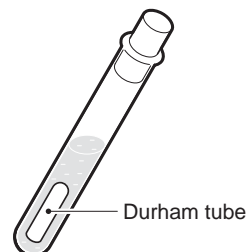
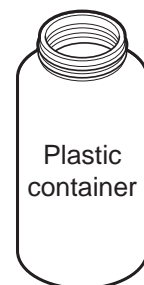
### Recommendation

An “**Object temperature sensor**” that detects the temperature of objects to be sterilized and controls sterilization time is available as an option. Even after this sensor has been installed, control can be switched over to the product’s own sensor by pressing the object temperature ON/OFF button. Use this optional sensor to ensure sterilization is more reliable. For details, contact your dealer.

- **Sterilization with the use of plastic containers**  
Prolong the sterilization setting time even more. Otherwise, poor heat conduction of the container may cause incomplete sterilization.
- **Melting of solidified general agar mediums**  
Refer to the below table to set the melting time (per flask).

Capacity	Melting Temperature	Melting Time
2 L	100 °C	60 min.
1 L		45 min.

- **Test of Durham tube**  
Air remaining in the Durham tube can be purged by setting the exhaust temperature and exhaust rate to appropriate levels.



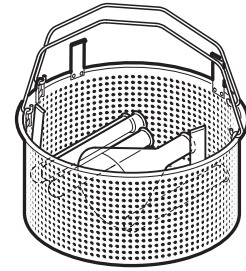
### Sterilization of equipment, etc.

#### **WARNING**

When sterilizing only containers such as beakers, flasks and test tubes, place them with their openings facing downward or lay them on their sides.



If the containers are placed with their openings facing upward, it is hard for air to sufficiently escape from the container and for steam to sufficiently penetrate inside, thus resulting in incomplete sterilization.



### Sterilization for waste disposal

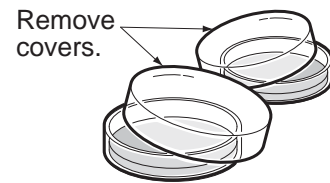
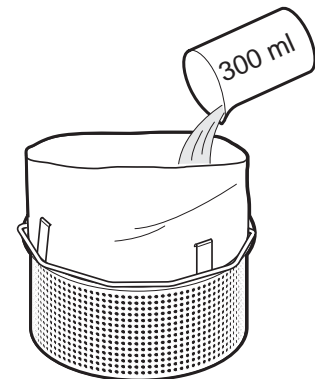
#### **WARNING**

When sterilizing waste, pour about 300 ml of water into the sterilization bag and sterilize the waste with the bag open.



Sterilizing without water in the bag or with the bag closed may result in incomplete sterilization.

- An error message may appear due to expansion of the air remaining in the bag. If the container containing the sterilization objects is broken and the content spills over, sterilize them in the same manner as stated above before discarding.
- When sterilizing the culture medium in petri dish for disposal, uncover the petri dish. If the sterilization is performed with covered petri dish, an error message may appear due to expansion of air remaining in the petri dish.



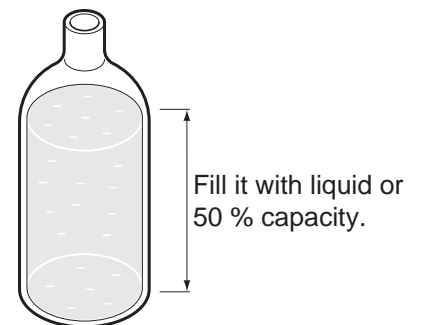
### Sterilization using container with large capacity (10 L or more) and narrow mouth

#### **Advisory Note**

When sterilizing liquid in a container with large capacity (10 L or more) and narrow mouth, fill the container 50 % or more of its capacity.

When a small amount of liquid is sterilized in a container with large capacity and narrow mouth, the pressure builds up during sterilization and steam may burst out from the pressure safety valve.

For sterilization of small amount, use a container with large capacity and large mouth or replace it with a small-capacity container suitable for the quantity of liquid.



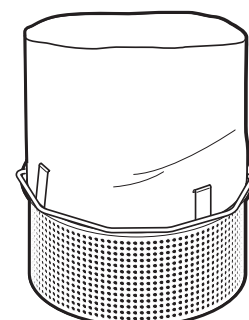
### On sterilization bag

#### **WARNING**

When using the sterilization bag, be sure to put it in the stainless steel basket included with the product and set it in the chamber for sterilization.



If the sterilization bag is put directly in the chamber, it may block the temperature sensor or it may be pinched between the chamber opening and the cover packing, resulting in trouble with the product.



# How to Use

## Basic operating procedure

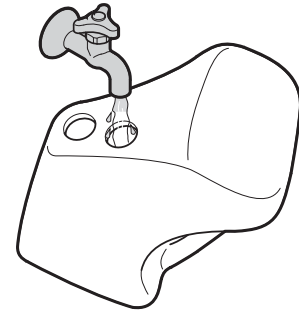
1. Liquid sterilization cycle	2. Sterilization/Keep warm cycle	3. Melt/Keep warm cycle	4. Instrument sterilization cycle	Reference page
	↓			
	1. Install the exhaust tank.			16
	↓			
	2. Set the power switch to ON.			17
	↓			
	3. Open the cover.			17
	↓			
	4. Pour the heating water.			18
	↓			
	5. Place sterilization objects inside.			18
	↓			
	6. Close the cover.			18
	↓			
	7. Press the cycle/program selector button.			19
	8. Change the settings (for program operation).			20 25
	↓			
	9. Press the start button.			21
↓	↓		↓	
	Sterilization/Melting			
Sterilization	↓		Sterilization	
	Keep warm			
↓	↓		↓	
	10. Operation is completed.			22
	↓			
	11. Open the cover.			22
	↓			
	12. Take out the sterilization objects.			23
	↓			
	13. Set the power switch to OFF.			23
	↓			
	14. Drain off the heating water (for program operation).			23 25

## 1. Install the exhaust tank.

- 1) Take out the exhaust tank from the product and remove the packings.

### Advisory note

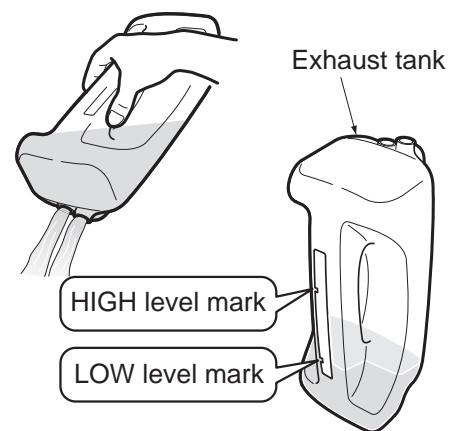
Do not pull out the exhaust tank by force from the product with the exhaust hose being connected. Otherwise, trouble may be caused.



- 2) Pour water up to the LOW (minimum) level mark, insert the packings to the holes of the product and connect the exhaust hoses.

### Memo

The water in the exhaust tank increases in each sterilizing operation. If it will increase up to the HIGH (maximum) level mark, once discard the water and fill the tank with fresh water up to the LOW level mark.



- 3) Make sure that the exhaust hose packings have been inserted completely in the holes of the exhaust tank.



### CAUTION

- When using the exhaust tank attached to the product, insert the exhaust hose packings securely in the holes of the exhaust tank.

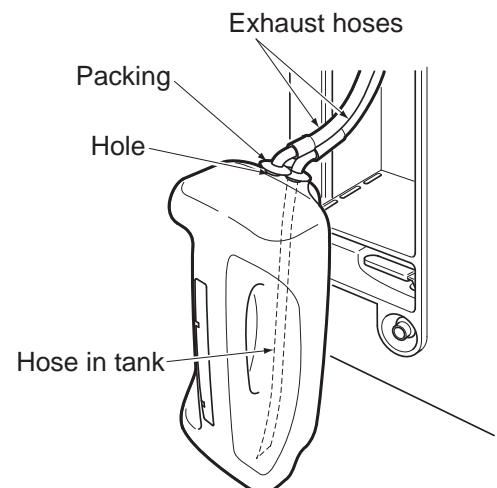


**Be sure to use the exhaust tank attached to the product.**  
If the packings of the exhaust hose have not been inserted sufficiently, steam may escape and result in burns.

- Be careful about the position of the exhaust hose insertion holes.

**Be sure to insert the hose in the tank into the holes at the back inside the exhaust tank.**

Failure to observe this caution may cause large steam leaks from the tank on the rear side.



### Advisory note

Insert the packings up to the hilt while turning them clockwise and counterclockwise. If they are turned in only one direction, the exhaust hoses will be twisted to cause trouble.

- 4) Stow the exhaust tank inside the product.

Make sure that the exhaust hoses are not bent or twisted. If they are so, air in the chamber is hard to escape and an error message may appear.



## 2. Set the power switch to ON

- The digital display of the control panel lights up. (The boiling point setting temperature appears on the digital display I and “- - -” appears on the digital display II for the first 2 seconds.)



The figure shown above is for the case when the boiling point set temperature is 100 °C.

### Digital display

#### ■ Cover being CLOSE

Settings (set temperature and sterilization time/cycle) are indicated.  
 Digital display I : Sterilization temperature  
 Digital display II : Sterilization time and cycle indicated alternately  
 This status is referred to as “Standby Status”.



To check the temperature inside the chamber, Press the and buttons simultaneously. The current temperature is indicated while these buttons are kept pressed.



Digital display I : Temperature inside the chamber  
 Digital display II : Temperature of heating water  
 If the temperature is lower than 25 °C, “Lo” appears.

#### ■ Cover being OPEN

The current temperature of the heating water in the chamber is indicated.



The figure shown above is for the case when the temperature of the heating water in the chamber is 30 °C.

## 3. Open the cover. (The cover can not be opened unless the power switch is turned ON)

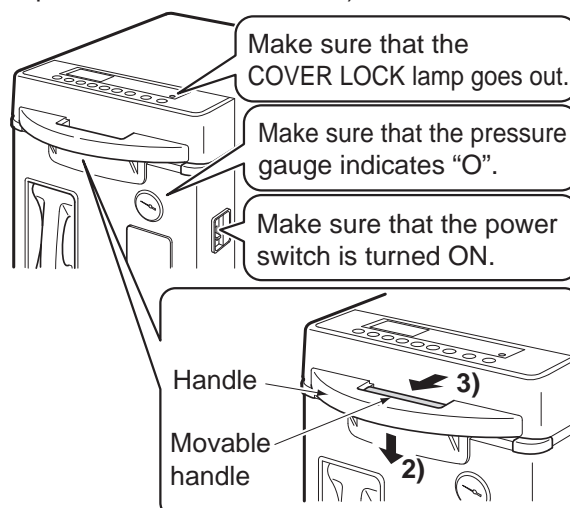
### 1) Be sure to check the following points before opening the cover.

If you attempt to open the cover by force, trouble may be caused with the product.

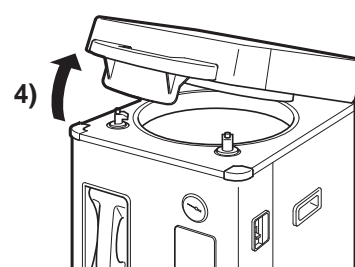
- Power switch is turned ON.
- Pressure gauge indicates 0 MPa.
- COVER LOCK lamp goes out.

- While pressing down the handle,
- Pull the movable handle toward you.

The cover can not be unlocked unless the handle is pressed down.



### 4) Open the cover.



## 4. Pour the heating water.

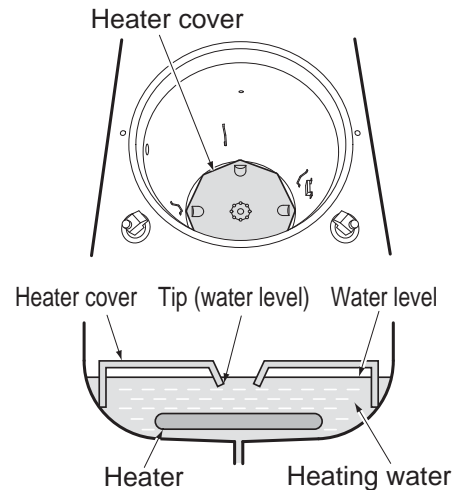
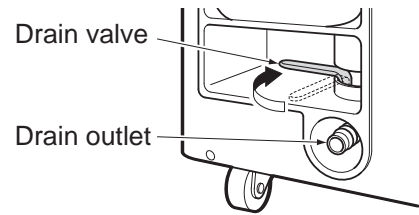
- Make sure that the drain valve is closed.
- Set the heater cover in the chamber.
- Pour the water until the tip of the water level bracket of the heater cover is immersed in the water. Since the amount of water decreases with every sterilizing operation, check the water level ahead of operation.

### MEMO

The amount of heating water is 3.5 liters.

### Advisory note

Purified water is best suited as heating water. If it is unavailable, use city water instead.



## 5. Place the sterilization objects inside.

- When using the attached stainless steel baskets in pile, be sure to place the small basket on the top.
- Set the baskets gently along the guides in the chamber.
- Bring down the grip.



### WARNING

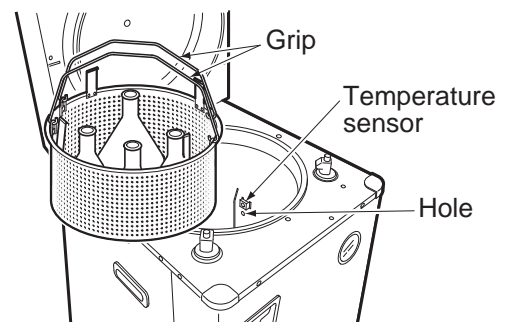
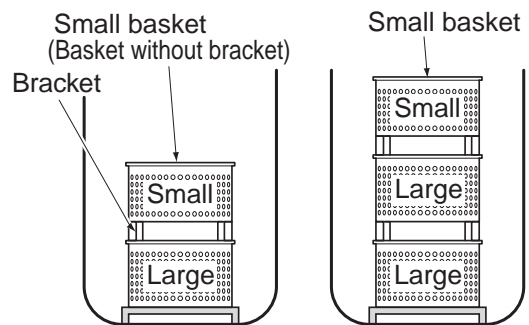
- Do not place objects on the temperature sensor in the chamber.
- Do not block the holes or temperature sensor in the chamber with objects.



Failure to observe this warning may destabilize control of the product or result in incomplete sterilization.

### MEMO

Before, starting operation, check again how to place the sterilization objects in reference to the “On Sterilization Objects” (page 13 ~ 14).



## 6. Close the cover.

- 1) Make sure on the digital display I that the temperature inside the chamber is under 60 °C  
 (“L” appears when the temperature is under 25 °C)

### MEMO

If the cover is closed when the temperature inside the chamber is over 60 °C due to continuous operation, etc., the air inside the chamber will expand suddenly to make it difficult to open and close the cover. In this case, wait until the temperature will lower below 60 °C.

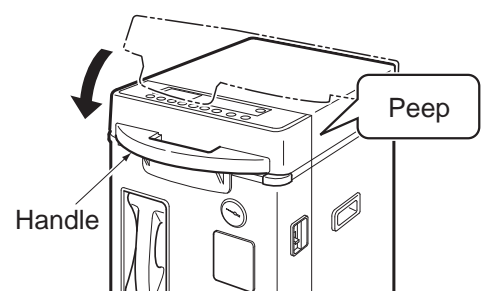
- 2) Check → to see whether or not the cover packings and the chamber opening are free from dirt or dust

If they are dirty or dusty, steam may leak to cause trouble. Keep them always clean.




(Cover packings and chamber opening → See page 27.)





- 3) Close the cover while bringing down the handle.

Then, a peep sound is heard, and the sterilization set temperature appears on the digital display I and the sterilization time or the sterilization time and cycle appear alternately on the digital display II.



## 7. Press the cycle/program selector button

- 4 cycles of sterilization can be selected according to the purpose of use. 3 settings can be memorized for each cycle according to the condition of use. The settings can be changed by  or  button.
- Programmed settings can be changed. Change them if necessary. (\*Refer to the changeable range.)  
**Change the settings**  See page 20.
- The product has been set at the values as shown in the table below at the time of shipment.

Cycle/Program		Steriliz. Temp.	Steriliz. Time	Heat-retent. Temp.	Exhaust Temp.※	Exhaust Rate※	Application/Function
 1. Liquid Steriliz.	1 - 1	121 °C	27 min	—	Boiling Point + 0 °C	1	For sterilization of liquids such as water, culture medium and test liquid. After the completion of sterilization process, the sterilization objects are gradually cooled naturally, and when the temperature reaches the exhaust set temperature, the exhaust valve opens.
	1 - 2	121 °C	27 min	—	Boiling Point + 0 °C		
	1 - 3	121 °C	2 min	—	Boiling Point + 0 °C		
	* Changeable range	115 °C } 135 °C	1 min. } 5 hrs.	—	Boiling Point + 0 °C } 45 °C	1~5	
 2. Steriliz./ Keep Warm.	2 - 1	121 °C	27 min	50 °C	Boiling Point + 0 °C	1	For sterilization of liquids such as water, culture medium and test liquid. Like in the liquid sterilization cycle, this cycle starts with sterilization process followed by exhaust and the temperature is kept at the preset keep warm temperature.
	2 - 2	121 °C	27 min	50 °C	Boiling Point + 0 °C		
	2 - 3	121 °C	27 min	50 °C	Boiling Point + 0 °C		
	* Changeable range	115 °C } 135 °C	1 min. } 5 hrs.	45 °C } 60 °C	Boiling Point + 0 °C } 45 °C	1~5	
 3. Melting/ Keep Warm.	3 - 1	Melting temp.100 °C	Melting time 30 min	50 °C	—	1	For melting and keep warm of culture medium. <ul style="list-style-type: none"> <li>• Simply to keep the culture warm, set the melting time to “0”.</li> <li>• Melting temperature setting is not needed.</li> <li>• When the operation is stopped or the cycle is completed, the cycle/program will be set automatically to 1-1 program.</li> </ul>
	3 - 2	Melting temp.100 °C	Melting time 30 min	50 °C	—		
	3 - 3	Melting temp.100 °C	Melting time 30 min	50 °C	—		
	* Changeable range	Melting temp.60 °C } 114 °C	Melting time 0 min. } 5 hrs.	45 °C } 60 °C	—	1~5	
 4. Instrument Steriliz.	4 - 1	135 °C	3 min.	—	—	5	For sterilization of equipment such as flasks, beakers, etc. which can withstand a sudden pressure drop at the exhaust stage. After the completion of sterilization process, the exhaust valve opens at the temperature below 135 °C, and the sterilized objects are cooled down. <ul style="list-style-type: none"> <li>• Liquids may boil over when they are sterilized.</li> </ul>
	4 - 2	135 °C	3 min.	—	—		
	4 - 3	135 °C	3 min.	—	—		
	* Changeable range	115 °C } 135 °C	1 min. } 5 hrs.	—	—	1~5	

※ Keep warm time is fixed at 72 hours. To cancel it on way, press the  button.

※ The exhaust temperature means the temperature for opening the exhaust valve after the completion of sterilization process and discharging steam from the chamber. Change the setting when using a Durham tube, etc.

(The temperature shown on the digital display is the temperature to be added to the boiling point.)

※ The exhaust rate means that the exhaust valve is opened/closed in regular intervals in the exhaust process and the steam in the chamber is discharged. The exhaust time can be shortened as compared to natural cooling according to the exhaust rate selected. Too much exhaust rate may cause boiling out depending on the kind and quantity of the objects to be sterilized. Use due care for selection of exhaust rate.

### Rough Standard of Exhaust Rate


Figure Indicated	1	2	3	4	5
Exhaust Rate %	Full close	←—————→			Full open

## 8. Change the settings

- It is possible to change the settings (sterilization temperature, sterilization time, melting temperature, melting time, keep warm temperature, exhaust temperature and exhaust rate) according to need.



The settings that have been changed are saved in memory even when the power switch is turned OFF. (Once the operation is started, the settings of the sterilization temperature and melting temperature can not be changed. The sterilization time, etc. can be changed but not saved in memory.)

(Changeable range: See page 18.)

- 1) Press the  button. Beep  
Setting menu flicker.  
The setting menu moves each time this button is pressed.

- 2) Press the  or  button to change the setting.

### MEMO

The setting value is incremented or decremented each time the  or  button is pressed.


If the button is kept pressed, the value is rapidly incremented or decremented and it stops finally at the maximum or minimum value.

- 3) Press the  button to flicker the next menu. Beep  
Press the  or  button to change the setting.

Press the  button.

↑↓ Repeat this procedure.

Press the  or  button to change the setting.

For setting menu to be left unchanged, simply press the  button.

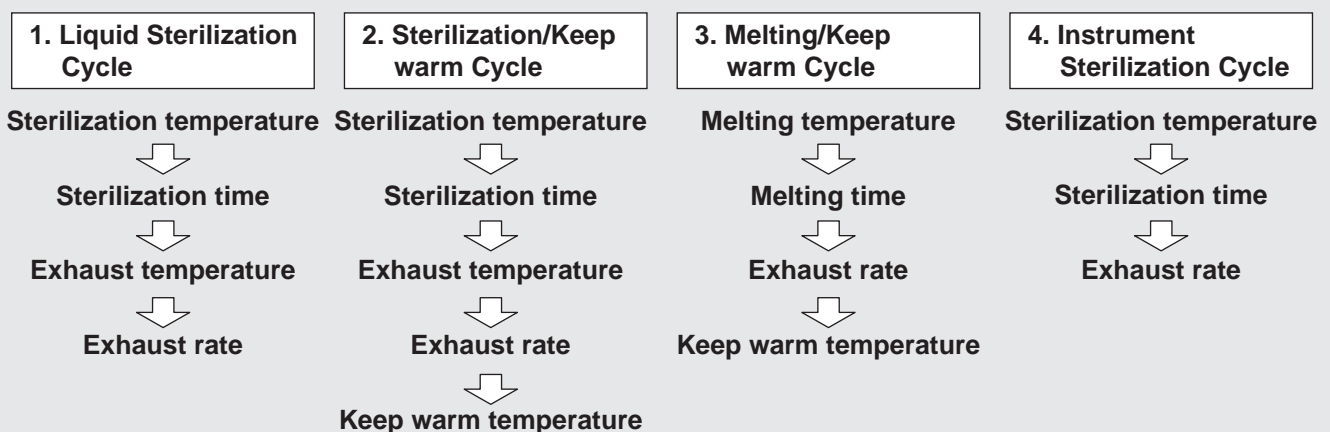
- 4) Finally, press the  button.

When the setting menu is entered, a buzzer sound is heard and the changed setting is saved in the program.

※The flickering status is left standing for 1min., the changed setting is not updated and the product turns to be standby status.  
(Standby status : See page 16.)



Each time the  button is pressed, the setting menus flicker one by one in the sequence as follows:



9. Press the  button.

**In the case when the operation is started after selection of liquid sterilization cycle, sterilization/keep warm cycle or instrument sterilization cycle**

• When the sterilization setting time is longer than the heat-retention time shown in the table below,

1) Press the  button. 

※The process starts.  
The cooling fan is operated automatically after the completion of sterilization.  
If the cooling fan operation not needed, press the cooling fan button to turn OFF.



• On sterilization setting time

The sterilization time is based on Japanese Pharmacopeia and the standards of JIS T 7324-2005 Small-sized High-pressure Steam Sterilizer for Medical Use and it does not guarantee the sterilization.  
Be sure to confirm the sterilization by sterilization indicator.

• When the sterilization setting time is shorter than the heat-retention time shown in the table below,

1) Press the  button. 

The sterilization setting temperature appears on the digital display I and the sterilization setting time and cycle appear alternately on the digital display II.  
Confirm the setting.

2) Press the  button. 

The process starts.

Sterilization Setting Temperature (°C)	Liquid Sterilization Heat-retention Time	Instrument Sterilization Heat-retention Time
115	37 min.	30 min.
121	27 min.	20 min.
126	22 min.	15 min.
132	12 min.	5 min.
135	10 min.	3 min.

**In the case when the operation is started after selection of melting/keep warm cycle**

1) Press the  button. 

The melting setting temperature appears on the digital display I and the sterilization setting time and cycle appear alternately on the digital display II.

2) Press the  button. 

The process starts.  
• When the cover is opened after the completion of process, the cycle/program is set automatically at the 1-1 program of the liquid sterilization cycle.  
※When the temperature inside the chamber reaches the melting setting temperature, the temperature inside the chamber appears on the digital display I and the sterilization remaining time or melting remaining time appears on the digital display II.



Temperature inside chamber




Sterilization remaining time or melting remaining time (after the temperature reaches the sterilization temperature or melting temperature)



Cover is not closed.

**Advisory note**


If the cover is not closed completely, "L id" (cautionary message) appears on the digital display II. In this case, bring down the handle again and press the  button when the buzzer sounds.

• The COVER LOCK lamp lights up after starting.  
When the lamp is lit, the movable handle is locked to make it impossible to open the cover.

## To stop operation

See page 23

## To check the settings during operation

Press the  button.  
The settings are indicated when this button is pressed.

## To change the settings during operation

The settings of sterilization time, melting time, keep warm temperature, exhaust temperature, exhaust rate, exhaust fan operation start/stop can be changed. However, the changes will not be saved in memory. When changing the settings, see page 19.  
※The sterilization temperature can not be changed during operation.

## 10. Operation is completed.

### • Liquid sterilization cycle or instrument sterilization cycle

The buzzer sounds and the completion of cycle is indicated on the digital display II.

- In the liquid sterilization cycle, the completion of cycle is indicated at 64 °C
- In the equipment sterilization cycle, the completion of cycle is indicated at 74 °C

### • Sterilization/Keep warm cycle or melting/keep warm cycle

When the heat-retention cycle starts, the buzzer sounds and the bar sign of "Heat-retention" of the process indicator lamps flickers. The heat-retention elapsed time is indicated on the digital display II. After the heat-retention has been continued for 72 hours, the operation is completed, the buzzer sounds and the completion of cycle is indicated on the digital display II.



Indication of completion

## 11. Open the cover.

### 1) Be sure to check the following points before opening the cover.

Forcible opening of the door may cause trouble.

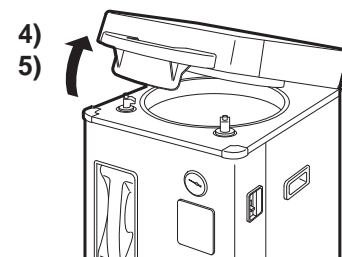
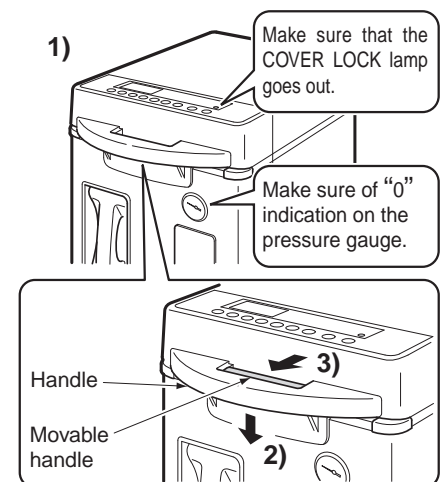
- Pressure is lowered to 0 MPa.
- COVER LOCK lamp is lit.

When the COVER LOCK lamp is lit, the temperature or pressure inside the chamber rises to make it impossible to pull the movable handle toward you.

### 2) While bringing down the handle,

### 3) Pull the movable handle toward you to unlock the cover.

### 4) Pull up the handle to slightly open the cover and wait until no steam comes out.



## CAUTION

Keep your head away when opening the cover at the end of operation.



Since high-temperature steam will escape when the cover is opened, wait until the steam dissipates. During this time, keep your head away from the product. Failure to observe this caution may result in burns.

### 5) Open the cover slowly.

Sudden opening of the door may break the container of sterilization objects and cause the culture medium to spill over.

## 12. Take out the sterilization objects.

- Take out the sterilization objects when steam has been purged completely from the chamber.




### CAUTION

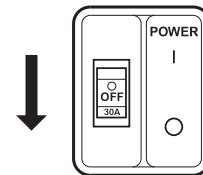
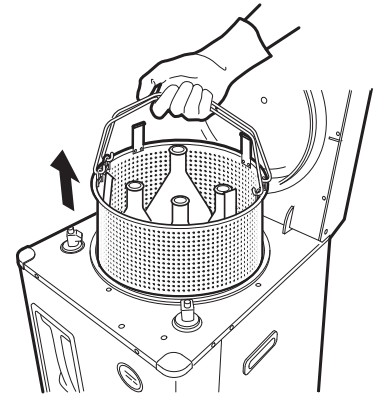
Use care not to scald yourself when taking out the sterilized objects at the end of operation.



Be sure to wear thermally insulated leather gloves. Note that it takes time until liquid is cooled down. Handling a sterilized object with bare hands immediately after the end of operation may result in burns.

### When taking out the sterilization objects (objects to be melted) during heat-retention.

- To suspend the heat-retention, press the  button. The heat-retention is suspended. In the case of the melting/heat-retention cycle, the cycle/program is set at this time automatically to the 1-1 program of the liquid sterilization cycle. If the  button is not pressed, the heat-retention continues for 72 hours.
- For simple heat-retention, change the melting time to "0" in the "melting/heat-retention cycle" and press the  button.



## 13. Set the power switch to OFF.

- Set the power switch to OFF at the end of daily use.

## 14. Drain off the heating water.

- 1) Open the cover.
- 2) Open the drain valve.
- 3) After draining water, close the drain valve without fail.

### CAUTION

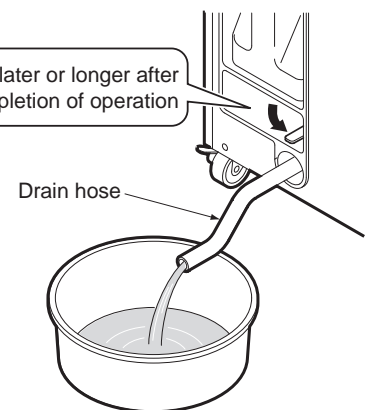
Drain off heating water everyday after use of the product.



Insert the attached drain hose in the drain water port and drain water at least 2 hours after operation.

If water is drained out in haste, hot water may splatter, resulting in burns or damage to the floor. Repeated use of the same heating water may corrode the chamber or clog the piping.

2 hours later or longer after the completion of operation



### Advisory note


Repeated use of the same heating water may corrode the chamber and clog the piping.

## For continuous use

- When using the product consecutively, make sure on the digital display I that the temperature inside the chamber is below 60 °C.

### Memo

If the cover is closed when the temperature inside the chamber is raised due to continuous operation, etc., the air inside the chamber will rapidly expand, making it difficult to open/close the cover. Wait until the temperature lowers below 60 °C.

- To check the current temperature inside the chamber in standby status, press the  and  buttons simultaneously. (See page 15.)



When the temperature inside the chamber is 59

## To stop the operation

- 1) Press the  button. 
  - The product is in standby status.

- 2) Check the following points before opening the cover.
  - Pressure is lowered to 0 MPa.
  - COVER LOCK lamp goes out.




When the COVER LOCK lamp is lit, the temperature or pressure inside the chamber rises to make it impossible to pull the movable handle toward you. Sterilization objects, wear heat-resistant leather gloves for prevention of scald.

### To open the cover immediately

- Lower the pressure and temperature inside the chamber forcibly in the procedure as follows:

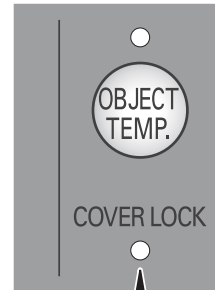
(If liquid boils over in liquid sterilization, clean the inside of the chamber.)

Inside of the chamber : See page 26.

- 1) Press the  button while pressing the  button.
- 2) To stop the exhaust, press the  button again.
- 3) Check the following points before opening the cover.

- Pressure is lowered to 0 MPa.
- COVER LOCK lamp goes out.

When the COVER LOCK lamp is lit, the temperature or pressure inside the chamber rises to make it impossible to pull the movable handle toward you.



Lamp goes out.

## CAUTION

Use care not to scald yourself when taking out the sterilized objects at the end of operation.



Be sure to wear thermally insulated leather gloves. Note that it takes time until liquid is cooled down. Handling a sterilized object with bare hands immediately after the end of operation may result in burns.

## For timer operation



The operation can be programmed up to at 23:59 of 7 days later from the current date and time.

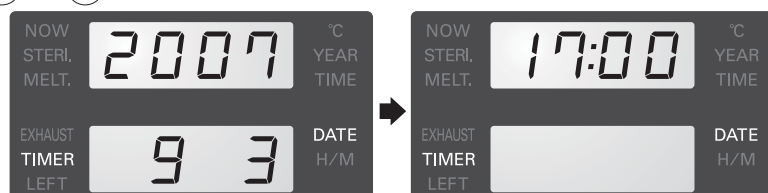
- 1) Press the  button.

The lamp above the timer button lights up and the timer lamp on the digital display II lights up, and the current date and time flicker.



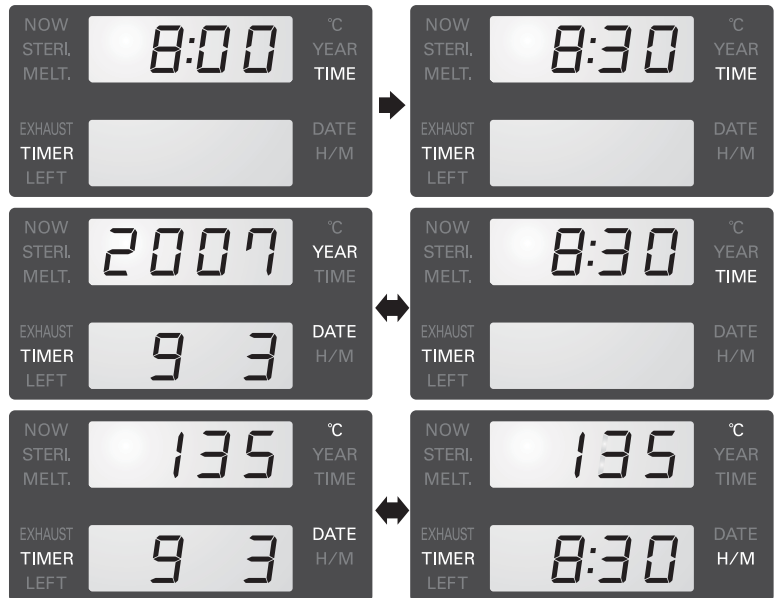
- 2) Press the  and  buttons to set the operation starting day and press the  button.

- The figures change quickly when the  or  button is kept pressed.
- The time on the digital display I flickers.





3) Similarly, set the hour and minute in turn.



4) Press the  button. (Timer operation starts.)

The sterilization temperature appears on the digital display I and the date and time appear alternately on the digital display II.






※To cancel the timer operation, press the

 button.


### Timer setting

Year, month, day, hour and minute have been set at the time of shipment.

If the timer setting is needed anew after replacement of parts, etc., set it in the procedure as follows:

When the pushbuttons  and then  are pressed, the Christian year entry appears and flickers. Enter Christian year by  and  buttons and press the  button.

Enter the month, day, hour and minute in the same manner.

When setting the minute, press the  button to set exact time by time signal.

## On Power Failure

- In power failure, all of the control panel displays are cleared.
- When power failure occurs or when the power switch has been set to OFF, the safety device works to lock the cover, making it impossible to open the cover.

### To use the product after restoration of power

- When the power is restored, the control panel displays are in standby status.

#### 1) Check the following points before opening the cover.

- Pressure is lowered to 0 MPa.
- COVER LOCK lamp goes out.

When the COVER LOCK lamp is lit, the temperature or pressure inside the chamber rises to make it impossible to pull the movable handle toward you.

#### 2) Take out the sterilization objects

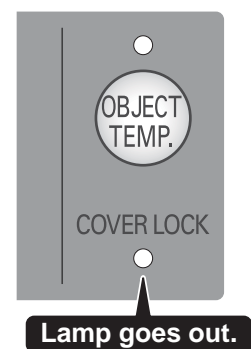
If liquid boils over in liquid sterilization, clean the inside of the chamber.

Inside of the chamber : See page 26.

#### 3) Check the sterilization by sterilization indicator.

Objects can not be sterilized in some cases.

#### 4) If objects can not be sterilized, repeat the operation.



### CAUTION

Use care not to scald yourself when taking out the sterilized objects at the end of operation.

Be sure to wear thermally insulated leather gloves. Note that it takes time until liquid is cooled down.



Handling a sterilized object with bare hands immediately after the end of operation may result in burns.

# On Voice Guide

- The voice guide of the product is nothing but an auxiliary function. For safe use this function, please read the precautions and instructions for use in this manual.
- The voice guide of this product can be set to either “Standard Mode” or “Warning Mode”.  
The voice guide has been set at “Standard Mode” at the time of shipment.

## Standard Mode

- For safe use of the product, precautions and operating instructions are informed in voice.

[Example of Liquid Sterilization]

When the cover is closed	Did you check the water level in the chamber?
Press the cycle selector button.	This is the liquid sterilization programme.
Press the set./confirm. button.	Please set the sterilization temperature.
Press the start button.	The liquid sterilization programme is running.
Operation is completed.	The liquid sterilization programme is finished.

## Warning Mode



- Points to be confirmed and checked when the safety device worked to stop the operation of the product will be guided in voice.


[Example of Liquid Sterilization]


The product starts with the cover being open.	The lid is not completely closed.
When opening the cover	Please be careful of hot steam when opening the lid.
In E5 (Heating without water) only	A safety device has been activated. Please check the water level in the chamber.
In CH checking	It is time for scheduled maintenance. Please check the unit for proper operation.


\*In the Standard Mode, the messages of the Warning Mode are informed also by voice guide.

## To change the voice guide settings


- 1) Press the  button for longer than 2 sec. while pressing the  button in standby status.


 appears on the digital display I .


 appears on the digital display II .

The  is the message that is used only for setting the optional printer.

- 2) Press the  button.

 appears on the digital display I .

 appears on the digital display II .

- 3) Press the  and  buttons to change the figure on the digital display II .

Display II	Mode	Sound Volume
3	Standard Mode	High
2		Middle
1	Warning Mode	High

- 4) Press the  button for setting.

Voice guide starts in set mode.



# Maintenance



## CAUTION

Before performing maintenance, set the power switch to the OFF position.



Set the power switch to "OFF" and sufficiently cool the product before performing maintenance.

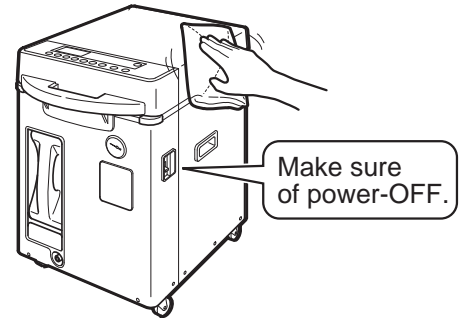
Failure to observe this warning may result in electric shock or burns.

Do not use thinner, benzene, etc. that may give damage to the product.

## Product

Soak soft cloth with water or neutral detergent, squeeze the cloth well and wipe off dirt.

(Standard frequency of cleaning: Once a month)



## Exhaust tank/Exhaust tank at rear side

If the inside of the exhaust tank becomes dirty, pour hot water mixed with neutral detergent into the tank and shake it well to remove dirt, and rinse it thoroughly with water.

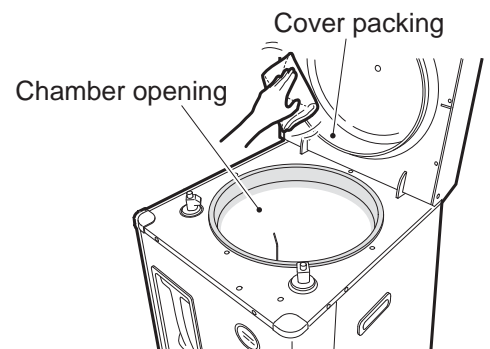
(Standard frequency of cleaning: Once a month)



## Cover packings and chamber opening

Wipe them carefully with soft cloth impregnated water. Contaminated cover packings and chamber opening may cause steam leakage.

(Standard frequency of cleaning: Once a day)



## Chamber inside

- Chamber inside
- Wipe the chamber inside with soft cloth impregnated water or neutral detergent. If it is difficult to get the dirt out of the chamber, wipe it well with nylon scrubber impregnated with neutral detergent and then rinse it with running water.
- In the case of liquid sterilization, wash away the dirty liquid with water when it is boiling over.

(Standard frequency of cleaning: Once a month)

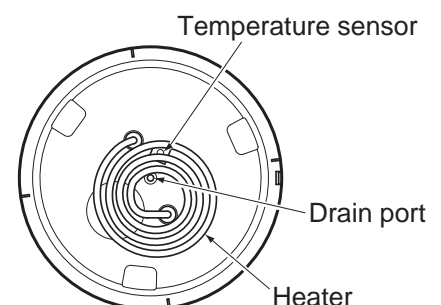
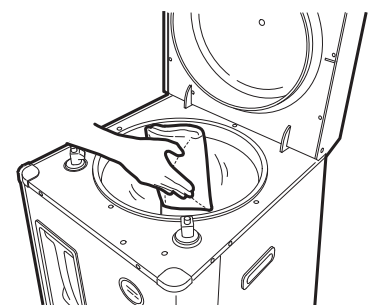
- ※When sterilizing the medium that generates sulfide, chlorine gas, be sure to clean the inside of the chamber. Corrosion may cause premature failure.

(Standard frequency of cleaning: Once a day)

- Bottom of chamber inside
- Remove the heater cover and wash the bottom carefully by means of a hand brush paying attention so as not to give damage to the sensor.

(Standard frequency of cleaning: Once a month)

- As for the cleaning of heavy soil, please consult your dealer.



(Plan of bottom of chamber inside)

# Troubleshooting

If any trouble arises during use, check out the following points and take the suggested remedy.

## Before asking for servicing

Trouble	Checking Point	Remedy	See page
<b>Power is not supplied.</b>	<ul style="list-style-type: none"> <li>Is the power supply of the dedicated connection outlet turned ON?</li> <li>Is there a power failure?</li> </ul>	• Turn ON the power supply.	–
		• Wait until the power is restored.	–
<b>Cover will not close.</b>	<ul style="list-style-type: none"> <li>Is the temperature inside the chamber below 60 °C</li> </ul>	• Wait until the temperature lowers below 60 °C	18
<b>Operation will not start.</b>	<ul style="list-style-type: none"> <li>Is the power switch turned ON?</li> <li>Was the buzzer sound heard when the handle retaining cover closed?</li> <li>Is the timer lamp on the digital display lit?</li> </ul>	• Turn ON the power switch.	17
		• Press down the handle by force to close the cover until the buzzer sounds.	18
		• Press the stop button to cancel the timer operation.	25
<b>Temperature will not be raised in heating process. (It does not reach the sterilization temperature.)</b>	<ul style="list-style-type: none"> <li>Is the exhaust hose bent?</li> <li>Is the selection of cycle wrong? (Has the melting cycle been selected?)</li> <li>Is the boiling point set suitably for altitude? Check the boiling point temperature.</li> </ul>	• Straighten the exhaust hose.	16
		• Select the right cycle.	17
		• If the boiling point is not set suitably for altitude, please contact your dealer.	9 • 17
<b>Steam leaks from the safety valve vent. (Pressure for sterilization is abnormally high.) Sterilization time is long.</b>	<ul style="list-style-type: none"> <li>Is the temperature sensor inside the chamber blocked by sterilization objects?</li> <li>Is a small amount of liquid sterilized in a container with large capacity (10 L or more) and narrow mouth?</li> <li>Are beakers, etc. sterilized with their openings facing upward? (Sterilization of container only)</li> </ul>	• Stop the operation and set the sterilization objects apart from the temperature sensor.	18
		• Fill the container with 50 % of the liquid or transfer the liquid into a container with large mouth.	14
		• Direct the openings downward or lay them down.	14
<b>Cover will not open.</b>	<ul style="list-style-type: none"> <li>Is the power switch turned ON?</li> <li>Is there a power failure?</li> <li>Is the inside of the chamber still high in temperature and pressure? (COVER LOCK lamp is lit.)</li> </ul>	• Turn ON the power switch.	17
		• Wait until the power is restored.	25
		• Wait until the COVER LOCK lamp goes out.	17 • 22

## The following symptoms are not troubles.


Symptom	Explanation
<b>A buzzing noise is heard from the product.</b>	• Operating sound of solenoid valves that discharges air and steam from the chamber inside.
<b>The upper left side of the product is heated.</b>	• Operating heat of solenoid valves that discharges air and steam from the chamber inside.
<b>Cramping sound is heard from the exhaust tank.</b>	• This sound is heard when air and steam are discharged from the chamber inside.
<b>Steam is discharged from the exhaust tank at the rear side.</b>	• This steam is generated when steam is discharged in heating process and exhaust process.

## If any cautionary message or error sign appears and flickers on the digital display.

- If any cautionary message appears and flickers during use, check out the following points and take the suggested remedy.

Cautionary Message	Meaning	Remedy	See page
<i>L id</i>	Cover is not closed completely.	Press down the handle by Force to close the cover until the buzzer sounds.	21
<i>Hot</i>	When the start button is pressed, the temperature inside the chamber is 5 °C higher than the preset temperature.	When the temperature inside the chamber has lowered, press the start button,	-
<i>HOSE</i>	The exhaust hose is bent.	Take out the exhaust tank and straighten the exhaust hose. After the exhaust hose has been straightened, cautionary message may appear several times. If the product can not be restored, press the stop button and do it over again. If the product will not return to the normal status, Contact the dealer from whom you purchased the product.	16
<i>door</i>	Door opening/closing can not be confirmed	Open the door once and then close and start the operation	-

- If an error arises during use, the error sign appears and flickers and at the same time buzzer sounds intermittently, and the safety device works to stop the operation automatically. Check the following points and take appropriate measure.

How to rest the error sign: Keep pressing the  button or set the power switch to OFF.

Error Sign	Meaning	Remedy	See page
<i>E 1</i> <i>E 2</i>	Trouble with the temperature sensor.	Contact the dealer from whom you purchased the product.	-
<i>E 3</i>	The over-temperature prevention device in the chamber is working.		
<i>E 4</i>	The temperature of the object temperature sensor (optional) rises abnormally high.		
<i>E 5</i>	Heating water is scarce or depleted.	Supply heating water in the chamber.	18
<i>E 6</i>	The movable handle lock can not be unlocked	Contact the dealer from whom you purchased the product.	-
<i>E 7</i>	The movable handle lock is not working. The cover lock is not working.	<ul style="list-style-type: none"> <li>• Contact the dealer from whom you purchased the product.</li> <li>• The cover can not be opened despite that the pressure gauge shows "0" and the COVER LOCK lamp is not lit. Open the cover after the temperature inside the chamber lowers cool enough to be able to open the door.</li> </ul>	22
<i>E 8</i>	The pressure rises abnormally high. <ul style="list-style-type: none"> <li>• The exhaust hose is bent.</li> </ul>	<ul style="list-style-type: none"> <li>• Take out the exhaust tank and straighten the exhaust hose. After the exhaust hose has been straightened, cautionary message may appear several times. If the product can not be restored, press the stop button and do it over again. If the product will not return to the normal status, contact the dealer From whom you purchased the product.</li> </ul>	16
	<ul style="list-style-type: none"> <li>• The mouth of the sterilization bag is closed.</li> <li>• No water in the sterilization bag</li> <li>• Boiling point is not set suitably to the altitude.</li> </ul>	<ul style="list-style-type: none"> <li>• Open the mouth of the sterilization bag.</li> <li>• Fill the sterilization bag with 300 ml of water.</li> <li>• Ask your dealer to set the boiling point suitably to the altitude.</li> </ul>	14 14 9
<i>E 9</i>	Boiling point is set at low level and the pressure is not raised normally.	Contact the dealer from whom you purchased the product.	-
<i>E 10</i> <i>E 13</i> <i>E 14</i>	Trouble with control device.		

※If the product will not operate normally even after taking the above-mentioned remedy, stop the operation immediately and contact your dealer.

# Specifications

Product Designation	Labo Autoclave (High-pressure Steam Sterilizer)		
Model Designation	MLS-3751L-PK	MLS-3751L-PA	MLS-3751L-PE
Power supply	220 V unit : 220 VAC (50 Hz/60 Hz),9.1 A	120 V unit : 120 VAC (50 Hz/60 Hz),15.8 A	230 V unit : 230 VAC (50 Hz/60 Hz),8.7 A
Power Consumption	2 kW	1.9 kW	2 kW
External Dimensions	478 mm(W) x 632 mm(D) x 748 mm(H)		
Weight	Approx. 61 kg		
Internal Capacity	57 L		
Effective Internal Capacity	50 L		
Chamber Dimensions	370 mm(dia.) x 415 mm(D) (Effective depth including cover: 463 mm)		
Safety Valve Releasing Pressure	235 kPa (34.1 psi, 2.35 bar)		248 kPa (2.48 bar)
Allowable pressure range			0 kPa - 248 kPa (0 bar - 2.48 bar)
Allowable temperature range			10 °C - 138.8 °C
Model Designation	MLS-3781L-PK	MLS-3781L-PA	MLS-3781L-PE
Power supply	220 V unit : 220 VAC (50 Hz/60 Hz),18.2 A	230 V unit : 230 VAC (50 Hz/60 Hz),17.4 A	
Power Consumption	4 kW		
External Dimensions	478 mm(W) x 632 mm(D) x 965 mm(H)		
Weight	Approx. 71 kg		
Internal Capacity	80 L		
Effective Internal Capacity	75 L		
Chamber Dimensions	370 mm(dia.) x 630 mm(D) (Effective depth including cover: 688 mm)		
Safety Valve Releasing Pressure	235 kPa (34.1 psi, 2.35 bar)		248 kPa (2.48 bar)
Allowable pressure range			0 kPa - 248 kPa (0 bar - 2.48 bar)
Allowable temperature range			10 °C - 138.8 °C

	MLS-3751L	MLS-3781L
Chamber Material	SUS304 (Austenitic stainless steel)	
Sterilization Temperature	115 °C ~ 135 °C	
Melting Temperature	60 °C ~ 114 °C	
Heat-retention Temperature	45 °C ~ 60 °C	
Thermometer	Thermistor, digital display (25 °C ~ 141 °C)	
Pressure Gauge Range	-0.1 MPa ~ 0.4 MPa	
Timer	Sterilization	1 min. ~ 5 hrs.
	Melting	1 min. ~ 5 hrs.
	Heat-retent	72 hrs. fixed
	Timer	1 week (Designation: Year, month, day, hour and minute)
Exhaust Tank	2 liter Polyethylene tank	
Warning and Safety Functions	Pressure safety valve, Overheat prevention device, Dry-scorch prevention, Cover interlock, Excessive pressure prevention, Earth leakage breaker	
Sound Pressure Level	Max. 75 dB (A)	
Accessories	Stainless steel baskets - Large: 1, small: 1   Stainless steel baskets - Large: 2, small: 1	
	Drain hose: 1	
	Exhaust tank (1), Exhaust tank at rear side (1), Tank mounting bracket (1), Tip-resistant metals (2)	
Optional Accessories	Object temperature sensor, External temperature sensor, Printer, Stainless steel basket (large), Stainless steel basket (small), Punching basket, Sterilization can *Please consult us about the model number, price, delivery date, etc. including other optional accessories than shown as above.	

※ The specifications may be subject to change for improvement without prior notice.

# Disposal of Unit

(English)

## Disposal of Old Equipment and Batteries

Only for European Union and countries with recycling systems



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.



For more information about collection and recycling, please contact your local municipality.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

### Note for the battery symbol (bottom symbol):

This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

(German)

## Entsorgung von Altgeräten und Batterien

Nur für die Europäische Union und Länder mit Recyclingsystemen



Dieses Symbol, auf den Produkten, der Verpackung und/oder den Begleitdokumenten, bedeutet, dass gebrauchte elektrische und elektronische Produkte sowie Batterien nicht in den allgemeinen Hausmüll gegeben werden dürfen.

Bitte führen Sie alte Produkte und verbrauchte Batterien zur Behandlung, Aufarbeitung bzw. zum Recycling gemäß den gesetzlichen Bestimmungen den zuständigen Sammelpunkten zu. Endnutzer sind in Deutschland gesetzlich zur Rückgabe von Altbatterien an einer geeigneten Annahmestelle verpflichtet. Batterien können im Handelsgeschäft unentgeltlich zurückgegeben werden.



Indem Sie diese Produkte und Batterien ordnungsgemäß entsorgen, helfen Sie dabei, wertvolle Ressourcen zu schützen und eventuelle negative Auswirkungen auf die menschliche Gesundheit und die Umwelt zu vermeiden.

Für mehr Informationen zu Sammlung und Recycling, wenden Sie sich bitte an Ihren örtlichen Abfallentsorgungsdienstleister.

Gemäß Landesvorschriften können wegen nicht ordnungsgemäßer Entsorgung dieses Abfalls Strafgebühren verhängt werden.

### Hinweis für das Batteriesymbol (Symbol unten):

Dieses Symbol kann in Kombination mit einem chemischen Symbol abgebildet sein. In diesem Fall erfolgt dieses auf Grund der Anforderungen derjenigen Richtlinien, die für die betreffende Chemikalie erlassen wurden.

(French)

## L'élimination des équipements et des batteries usagés

Applicable uniquement dans les pays membres de l'Union européenne et les pays disposant de systèmes de recyclage.



Apposé sur le produit lui-même, sur son emballage, ou figurant dans la documentation qui l'accompagne, ce pictogramme indique que les piles, appareils électriques et électroniques usagés, doivent être séparés des ordures ménagères.



Afin de permettre le traitement, la valorisation et le recyclage adéquats des piles et des appareils usagés, veuillez les porter à l'un des points de collecte prévus, conformément à la législation nationale en vigueur.



En les éliminant conformément à la réglementation en vigueur, vous contribuez à éviter le gaspillage de ressources précieuses ainsi qu'à protéger la santé humaine et l'environnement.

Pour de plus amples renseignements sur la collecte et le recyclage, veuillez vous renseigner auprès des collectivités locales.

Le non-respect de la réglementation relative à l'élimination des déchets est passible d'une peine d'amende.

### Note relative au pictogramme à apposer sur les piles (pictogramme du bas) :

Si ce pictogramme est combiné avec un symbole chimique, il répond également aux exigences posées par la Directive relative au produit chimique concerné.

(Spanish)

## Eliminación de Aparatos Viejos y de Pilas y Baterías

Solamente para la Unión Europea y países con sistemas de reciclado.



Estos símbolos en los productos, su embalaje o en los documentos que los acompañen significan que los productos eléctricos y electrónicos y pilas y baterías usadas no deben mezclarse con los residuos domésticos.



Para el adecuado tratamiento, recuperación y reciclaje de los productos viejos y pilas y baterías usadas llévelos a los puntos de recogida de acuerdo con su legislación nacional. En España, los usuarios están obligados a entregar las pilas en los correspondientes puntos de recogida. En cualquier caso, la entrega por los usuarios será sin coste alguno para éstos. El coste de la gestión medioambiental de los residuos de pilas, acumuladores y baterías está incluido en el precio de venta.



Si los elimina correctamente ayudará a preservar valiosos recursos y evitará potenciales efectos negativos sobre la salud de las personas y sobre el medio ambiente.

Para más información sobre la recogida u reciclaje, por favor contacte con su ayuntamiento.

Puede haber sanciones por una incorrecta eliminación de este residuo, de acuerdo con la legislación nacional.

### Nota para el símbolo de pilas y baterías (símbolo debajo):

Este símbolo puede usarse en combinación con el símbolo químico. En este caso, cumple con los requisitos de la Directiva del producto químico indicado.



**(Portuguese)**

## **Eliminação de Equipamentos Usados e Baterias**

**Apenas para a União Europeia e países com sistemas de reciclagem**



Estes símbolos nos produtos, embalagens, e/ou documentos que os acompanham indicam que os produtos elétricos e eletrônicos e as baterias usados não podem ser misturados com os resíduos urbanos indiferenciados.

Para um tratamento adequado, reutilização e reciclagem de produtos e baterias usados, solicitamos que os coloque em pontos de recolha próprios, em conformidade com a respetiva legislação nacional.



Ao eliminar estes produtos corretamente estará a ajudar a poupar recursos valiosos e a prevenir quaisquer potenciais efeitos negativos sobre o ambiente e a saúde humana.

Para mais informações acerca da recolha e reciclagem, por favor contacte a sua autarquia local.

De acordo com a legislação nacional podem ser aplicadas contraordenações pela eliminação incorreta destes resíduos.

### **Nota para o símbolo da bateria (símbolo na parte inferior):**

Este símbolo pode ser utilizado conjuntamente com um símbolo químico. Neste caso estará em conformidade com o estabelecido na Diretiva referente aos produtos químicos em causa

**(Italian)**

## **Smaltimento di vecchie apparecchiature e batterie usate**

**Solo per Unione Europea e Nazioni con sistemi di raccolta e smaltimento**



Questi simboli sui prodotti, sull'imballaggio e/o sulle documentazioni o manuali accompagnanti i prodotti indicano che i prodotti elettrici, elettronici e le batterie usate non devono essere buttati nei rifiuti domestici generici.

Per un trattamento adeguato, recupero e riciclaggio di vecchi prodotti e batterie usate vi invitiamo a portarli negli appositi punti di raccolta secondo la legislazione vigente nel vostro paese.



Con uno smaltimento corretto, contribuirete a salvare importanti risorse e ad evitare i potenziali effetti negativi sulla salute umana e sull'ambiente.

Per ulteriori informazioni su raccolta e riciclaggio, vi invitiamo a contattare il vostro comune.

Lo smaltimento non corretto di questi rifiuti potrebbe comportare sanzioni in accordo con la legislazione nazionale.

### **Note per il simbolo batterie (simbolo sotto):**

Questo simbolo può essere usato in combinazione con un simbolo chimico. In questo caso è conforme ai requisiti indicati dalla Direttiva per il prodotto chimico in questione.

## (Dutch)

### Het ontdoen van oude apparatuur en batterijen.

Enkel voor de Europese Unie en landen met recycle systemen.



Deze symbolen op de producten, verpakkingen en/of begeleidende documenten betekenen dat gebruikte elektrische en elektronische producten en batterijen niet samen mogen worden weggegooid met de rest van het huishoudelijk afval.



Voor een juiste verwerking, hergebruik en recycling van oude producten en batterijen, gelieve deze in te leveren bij de desbetreffende inleverpunten in overeenstemming met uw nationale wetgeving.



Door ze op de juiste wijze weg te gooien, helpt u mee met het besparen van kostbare hulpbronnen en voorkomt u potentiële negatieve effecten op de volksgezondheid en het milieu.

Voor meer informatie over inzameling en recycling kunt u contact opnemen met uw plaatselijke gemeente.

Afhankelijk van uw nationale wetgeving kunnen er boetes worden opgelegd bij het onjuist weggooien van dit soort afval.

#### Let op: het batterij symbool (Onderstaand symbool).

Dit symbool kan in combinatie met een chemisch symbool gebruikt worden. In dit geval volstaan de eisen, die zijn vastgesteld in de richtlijnen van de desbetreffende chemische stof.

## (Swedish)

### Avfallshantering av produkter och batterier

Endast för Europeiska Unionen och länder med återvinningssystem



Dessa symboler på produkter, förpackningar och/eller medföljande dokument betyder att förbrukade elektriska och elektroniska produkter och batterier inte får blandas med vanliga hushållssopor.



För att gamla produkter och använda batterier ska hanteras och återvinnas på rätt sätt ska dom lämnas till passande uppsamlingsställe i enlighet med nationella bestämmelser.

Genom att ta göra det korrekt hjälper du till att spara värdefulla resurser och förhindrar eventuella negativa effekter på människors hälsa och på miljön.



För mer information om insamling och återvinning kontakta din kommun.

Olämplig avfallshantering kan beläggas med böter i enlighet med nationella bestämmelser.

#### Notering till batterisymbolen (nedanför):

Denna symbol kan användas i kombination med en kemisk symbol. I detta fall uppfyller den de krav som ställs i direktivet för den aktuella kemikalien.

## For the State of California, USA Only:

This product contains a CR Coin Cell Lithium Battery which contains Perchlorate Material – special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate).



\* Label indication is obliged to comply with Taiwanese battery regulation.

# About Checking

## Daily Inspection

Check the cover packing for any crack or flaw. If any crack or flaw is found, immediately stop use of the product and ask your dealer for replacement.



## WARNING



### Check the cover packing.

Sterilization of animal oil and fat (e.g., wastes generated after BSE inspection) causes premature wear, crack or breakage of the cover packings. If the product is used with defective packings, steam may burst out resulting in burn and other accidents.

## Safety Inspection


This product incorporates the inspection display circuit.

This circuit is to display the time to ask your dealer for inspection when the product is used in a certain number of times.

(As for details about inspection including cost, etc., please consult the dealer from whom you purchased the product.)

### Operation of the inspection display is as follows:

- The frequency of use of this product reaches the preset number of times, “ $\square H$ ” appears and flickers on the digital display I and at the same time the buzzer sounds to tell that the time for safety inspection comes when the power switch is set to ON. At this moment, it is impossible to operate other buttons than the stop button.

- To delete the inspection display temporarily, press the  button. However, in the standby status, the inspection display appears again. This condition will go on unless the safety inspection is implemented.

Ask your dealer for the safety inspection ahead of time.

## If something unusual should happen during operation

Stop using the unit immediately, and ask your dealer to inspect and repair it. It is dangerous for the customer to attempt to disassemble and repair the unit. Special technology is required for repair.

## Questions concerning after-sales service

Direct any questions or queries concerning repair service or the unit itself to your dealer or to the manufacturer's customer service representative.

# Concerning After-sales Service

## 1. After-sales service

In the unlikely event that something should appear to go wrong with the unit, first check out whether trouble is indicated by following the instructions in "Troubleshooting Guide" on pages 28 and 29. If the trouble persists, stop using the unit, and contact your dealer with the following details.

- (1) Product designation : Labo Autoclave
- (2) Model number : **MLS-**
- (3) Date of purchase
- (4) Description of trouble (in as much detail as possible)
- (5) Serial number (located on ratings nameplate)
- (6) User's name, address and telephone number
- (7) Date on which the unit was installed

## 2. Concerning the autoclave's consumables

Some parts will deteriorate as the autoclave is used. Refer to the suggested timeframes given below for replacing these parts, and consult your dealer.

- Chamber door packing -- suggested replacement period : 1 year

== **Important customer information** == Please fill out the details below at the time of purchase. They will be useful if you ever need to request repairs.

<b>Dealer's name</b>		<b>Date of Purchase</b>	__(month)/__(day)/
	<b>TEL.</b>		20__(year)
<b>Nearest outlet</b>		<b>Model number</b>	<b>MLS-</b>
	<b>TEL.</b>	<b>Serial number</b>	

< **Manufactured for** >

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< **EU countries only** >



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