

# Yamato



## Labo Cube

### Incubator

ICL300A/300B

ICL310A/310B

Instruction Manual

Ver. 1

- Thank you very much for purchasing this Yamato Scientific Labo Cube Incubator.
- Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a handy place for future reference.

**⚠ Warning:** Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

Yamato Scientific Co., Ltd.

This paper has been printed on recycled paper.



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# 1.Safety precautions

## Explanation of pictograms


### About pictograms


A variety of pictograms are indicated in this operating instruction and on products for safe operation. Possible results from improper operation ignoring them are as follows.

Be sure to fully understand the descriptions below before proceeding to the text.

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 **Warning** Indicates a situation which may result in death or serious injury (Note 1.)

 **Caution** Indicates a situation which may result in minor injury (Note 2) and property damages (Note 3.)

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(Note 1) Serious injury means a wound, an electrical shock, a bone fracture or intoxication that may leave after effects or require hospitalization or outpatient visits for a long time.

(Note 2) Minor injury means a wound or an electrical shock that does not require hospitalization or outpatient visits for a long time.

(Note 3) Property damage means damage to facilities, devices and buildings or other properties.

### Meanings of pictograms



This pictogram indicates a matter that encourages the user to adhere to warning ("caution" included).

Specific description of warning is indicated near this pictogram.



This pictogram indicates prohibitions

Specific prohibition is indicated near this pictogram.



This pictogram indicates matters that the user must perform

Specific instruction is indicated near this pictogram.

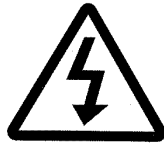
# 1.Safety precautions

## List of symbols

### Warning



General warnings



Danger!: High voltage



Danger!: High temperature



Danger!: Moving part



Danger!: Hazard of explosion

### Caution



General cautions



Electrical shock!



Burning!



Caution for no liquid heating!



Caution for water leak!



For water only



Poisonous material

### Prohibitions



General bans



Fire ban



Do not disassemble



Do not touch

### Compulsions



General compulsions



Connect ground wire



Install levelly



Pull out the power plug



Regular inspection

# 1.Safety precautions

## Warning · Cautions

### **Warning**



#### **Never operate the unit in an atmosphere containing flammable or explosive gas**

Never operate the unit in an atmosphere containing flammable or explosive gas. Otherwise, an explosion or a fire may result since the unit is not explosion-proof. See page 36.



#### **Be sure to connect the ground wire.**

Be sure to connect the ground wire correctly. Otherwise, electrical leak may result and cause an electrical shock or a fire.



#### **Ban on operation when an abnormality occurs**

When a smoke or a unusual odor is seen or sensed, immediately turn the electric leakage breaker on the main unit off and pull out the power plug. A fire or an electrical shock may result.



#### **Never use electrical power cords bundled.**

When these are used bundled, they might overheat causing a fire.



#### **Take care not to damage electrical power cords.**

Avoid tightly bend, pull with a strong force or twist to prevent electrical power cords from damaging. A fire or an electrical shock may result.



#### **Never use an explosive or a flammable material with this unit.**

Never use an explosive material, a flammable material or a material containing them. Otherwise, an explosion or a fire may result. See page 36.



#### **Never try to touch a hot part.**

Some parts of the unit are hot during and immediately after operation. Take special care for possible burning.



#### **Never try to disassemble or alter the unit.**

Never try to disassemble or alter the unit. A malfunction, a fire or an electrical shock may result.



### **Caution**



#### **When a thunder is heard.**

When a thunder is heard, turn the main power off immediately. A malfunction, fire or an electrical shock may result.


## 2. Before operating the unit

### Precautions on installation



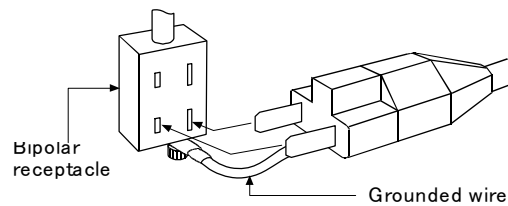
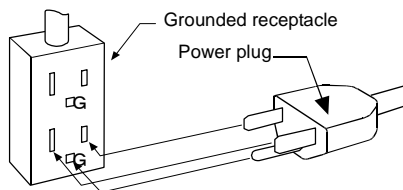
#### 1. Be sure to connect the earth.



- Be sure to connect the earth wire (green core wire of the power cord) to the earth wire or the earth terminal to avoid an electrical shock due to earth leakage.
  - Never connect the earth wire to a gas pipe or a water pipe. Otherwise, a fire may result.
- 
- Never connect the earth wire to the earth terminal for a telephone line or to a lightning conductor. Otherwise, a fire or an electrical shock may result.
  - Never use a branching outlet, which might generate heat and cause a danger.

ICL300A/300B AC100V~120V

We recommend use of a ground type outlet tap.      When a bipolar type outlet tap is used



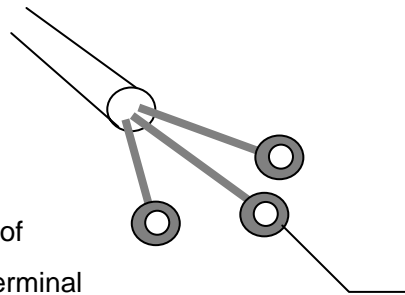
When there is no ground terminal.

In this case, class 3 grounding work is necessary and please consult your dealer or our nearest sales office.

Insert the ground adaptor included as an option, into a power plug confirming the polarity of the outlet. Connect the grounding wire (green) of the ground adaptor to the ground terminal on the power supply equipment.

ICL310A/310B AC200V~240V

Connect the earth wire (green) of the earth adaptor to the earth terminal on the power supply facility side.



The green wire has the earth terminal.

#### 2. Carefully select an installation site.



Take special care not to install the unit at a place described below:

- Uneven surfaces or dirty surfaces
- Where flammable gas or corrosive gas exists
- Where the ambient temperature is 35 °C or more
- Where temperature changes severely
- Where humidity is high
- Where subject to direct sunlight
- Where vibration is severe

## 2. Before operating the unit


### Precautions on installation

#### Warning

3. Never operate the unit in an atmosphere containing flammable or explosive gas.

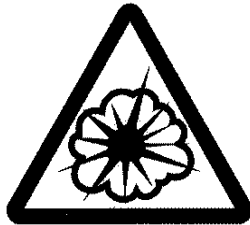
**No flammable matters**

See the section “13. List of dangerous materials” on page 36 for flammable and explosive gases.

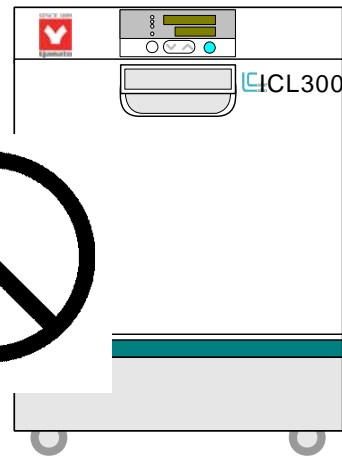
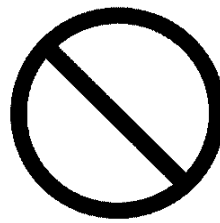
-  Never operate the unit in an atmosphere containing flammable or explosive gas. Since the unit is not explosion-proof, an arc is discharged when switching “ON” and “OFF” and during operation and a fire or an explosion may result.




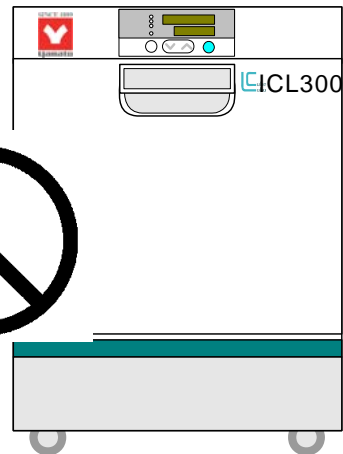
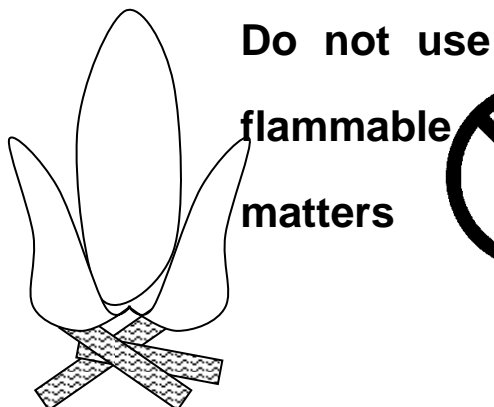
**DO NOT USE**



**Explosive gas**  
**Flammable gas**



-  Do not operate the unit with flammable material inside. Otherwise, a fire may result.



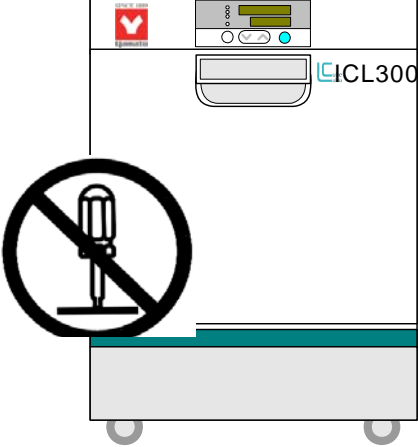
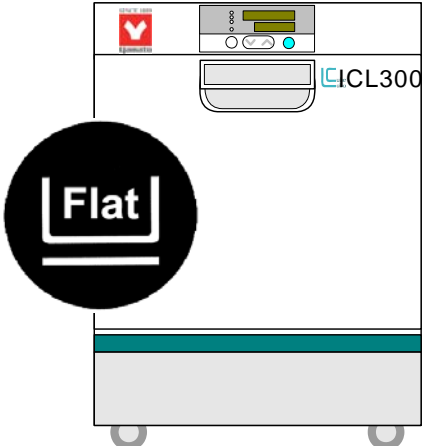



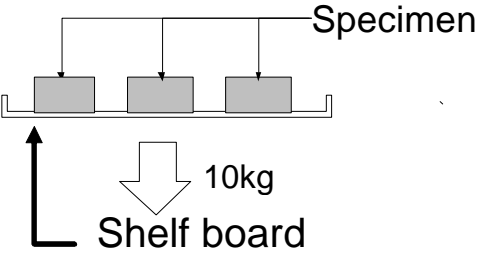
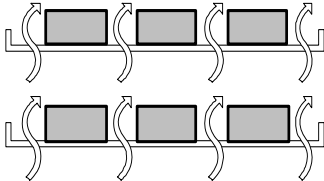




## 2. Before operating the unit

### Precautions on installation

#### Warning

<p><b>4. Do not attempt to alter the unit</b></p>	<p><b>5. Install the unit on a level surface</b></p>
<p> The customer shall never attempt to alter the unit. Otherwise a malfunction may result.</p>	<p> Install the unit on a level surface. Otherwise unexpected troubles or a malfunction may result.</p>
<p></p> <p>No modification</p>	<p></p> <p>Install on a level surface</p>
<h4> Cautions</h4>	
<p><b>6. Do not put too many specimens.</b></p>	<p><b>7. Do not set too many specimens.</b></p>
<p> The withstand load of a shelf board is 10kg when the load is evenly distributed. Put specimens dispersed.</p>	<p> Too many specimens will prevent correct temperature control. In order to assure temperature precision, be sure to use shelf boards and put specimens dispersed, and secure at least 30% of space inside the bath.</p>
<p></p> <p>Specimen</p> <p>10kg</p> <p>Shelf board</p>	<p></p> <p>Secure at least 30% of space</p>

## 2. Before operating the unit

### Precautions on installation



#### Cautions

### 8. Connect the power plug to the dedicated outlet



**Use an outlet that is suited to the electrical capacity.**

Electrical capacity | ICL300A/300B: 1A at AC100V, 1.2A at AC120V  
ICL310A/310B: 0.7A at AC200V, 0.8A at AC240V

When the unit does not start even when power is turned ON, check if main voltage is too low or if the unit is connected to the same power line as other devices. If this is the case, use a different power line from those for other devices as the power supply.

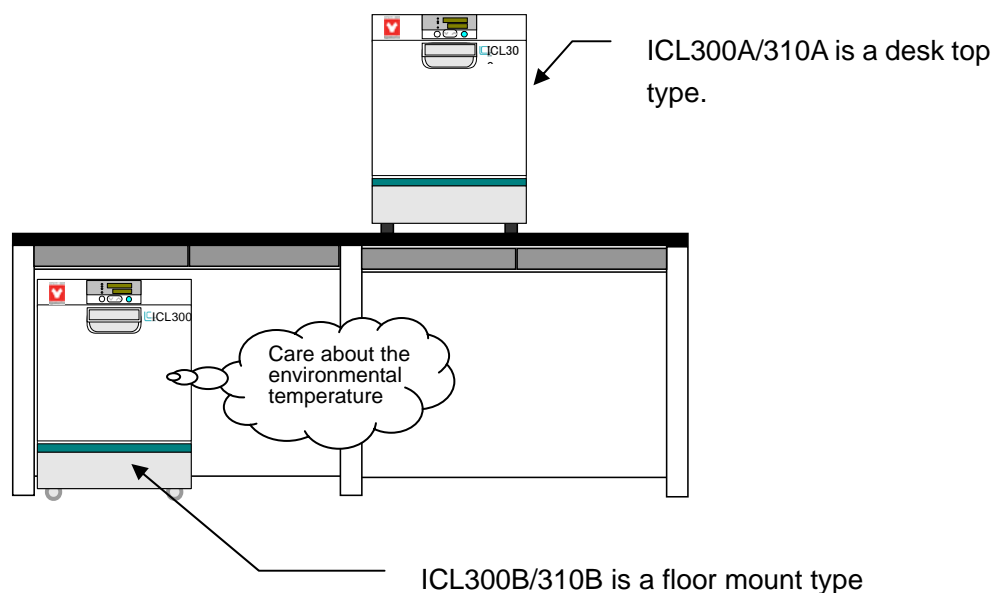
### 9. On installation



The model ICL300A/310A has rubber feet and is designed as a desk-top type.

Model ICL300B/310B has caster wheels (two front wheels have adjusters) and is a floor mount type.

Take care so that the environmental temperature will not exceed 30°C when you use this product on a laboratory table or in a clean bench. Proper temperature control may not be possible if the temperature exceeds 30°C.



An earthquake or a shock may cause the unit fall over or move and personal injuries may result. We recommend exercising safety precautions including selecting an installation place where less people are passing by.

### 10. Installation of shelf boards or specimens



The product includes two shelf boards.

Shelf boards are slide-out type and fixed in the internal bath.

Follow "Installation procedures" on P.9 for changing shelf board positions or adding shelf boards.



The bottom and side surfaces in the bath will become hot. Avoid putting specimens directly on the bottom surface or allow them to touch with the side surface..

## 2. Before operating the unit

### Precautions on installation

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#### 11. Handling of a power cord



Never use electrical power cords bundled. When these are used bundled, they might overheat causing a fire.

Do not convert, forcibly bend, twist or pull the power cord. Otherwise, a fire or an electrical shock may result.

Do not place the power cord under a desk or a chair, or sand between objects to avoid it from being damaged.

Otherwise, a fire or an electrical shock may result.

Do not place the power cord close to a stove or other heat generating device. Sheath of the cord may burn and result in a fire or an electrical shock.



If the power cord should be damaged (exposure of core wire or disconnection), immediately turn the ELB off, pull out the power cord (plug) out of the power supply and ask your dealer to replace the cord. Operating the unit with a damaged power cord may cause a fire or an electrical shock.



Connect the power cord to an appropriate wall outlet.

## 2. Before operating the unit

### Installation procedures

#### How to install shelf boards (shelf pegs)

Shelf boards (shelf pegs) are held with screws. Move or install them when you want to change board positions or add a board as follows.

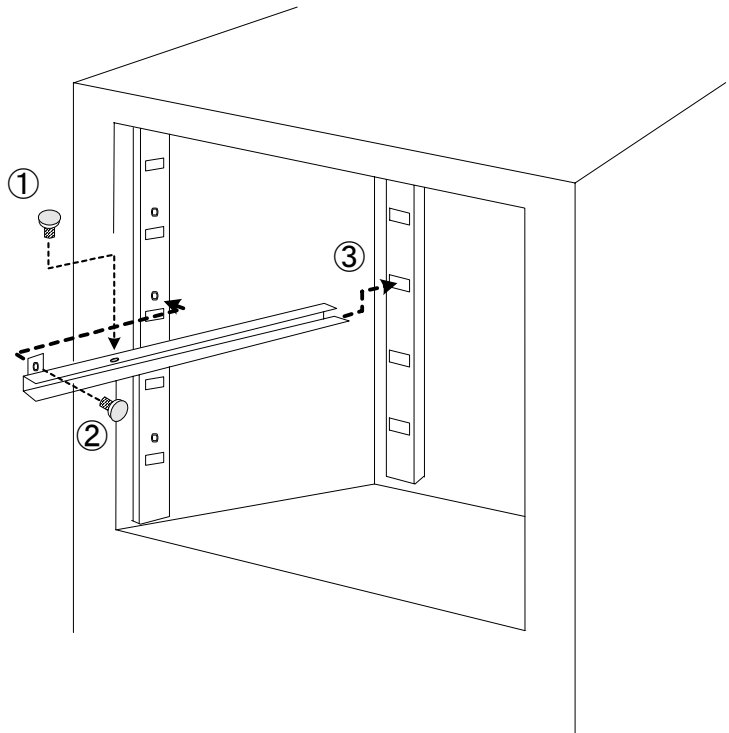
- ① Remove the shelf board holding screw and pull out the board.
- ② Remove the shelf peg holding screw and pull out the peg out of the rear shelf peg groove ③.

Follow the procedures ① and ② above in the reversed order to install a shelf board.

You can install up to five shelf boards.

#### Caution

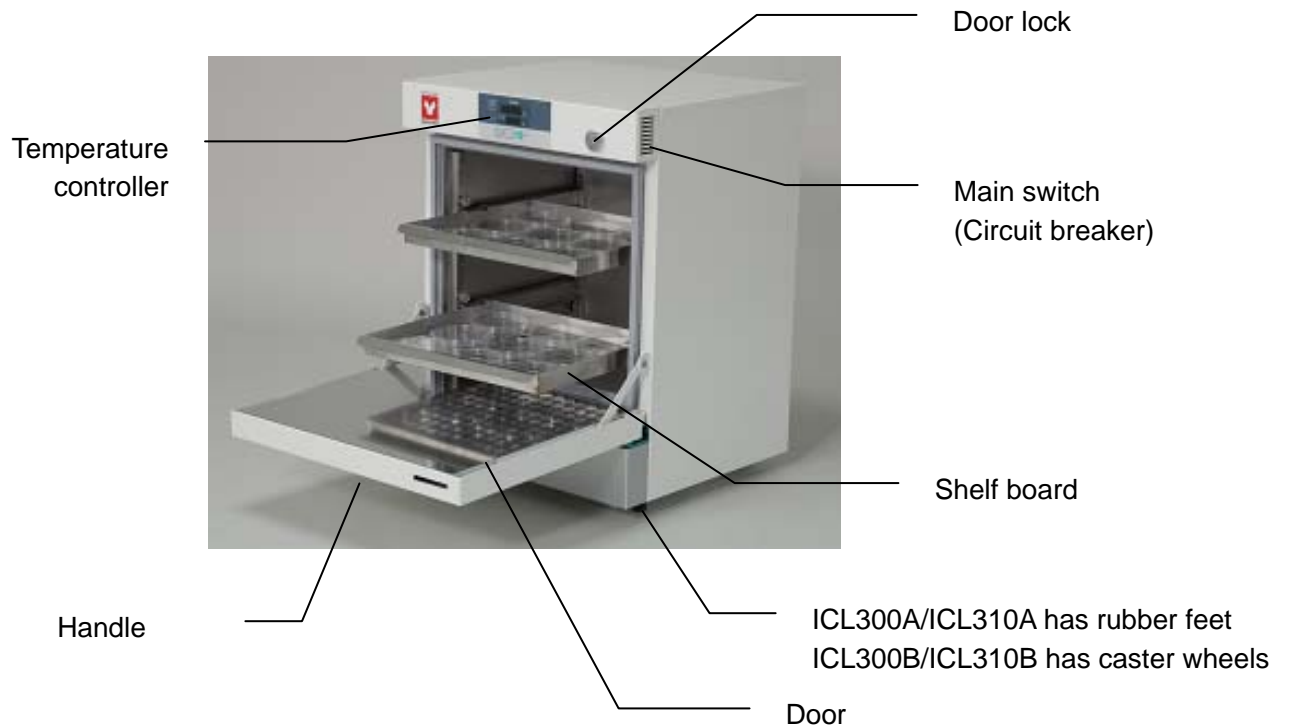
If you do not need shelf boards, be sure to always install the lower most board. When installing, take care for hot bottom surface and walls of the internal bath.



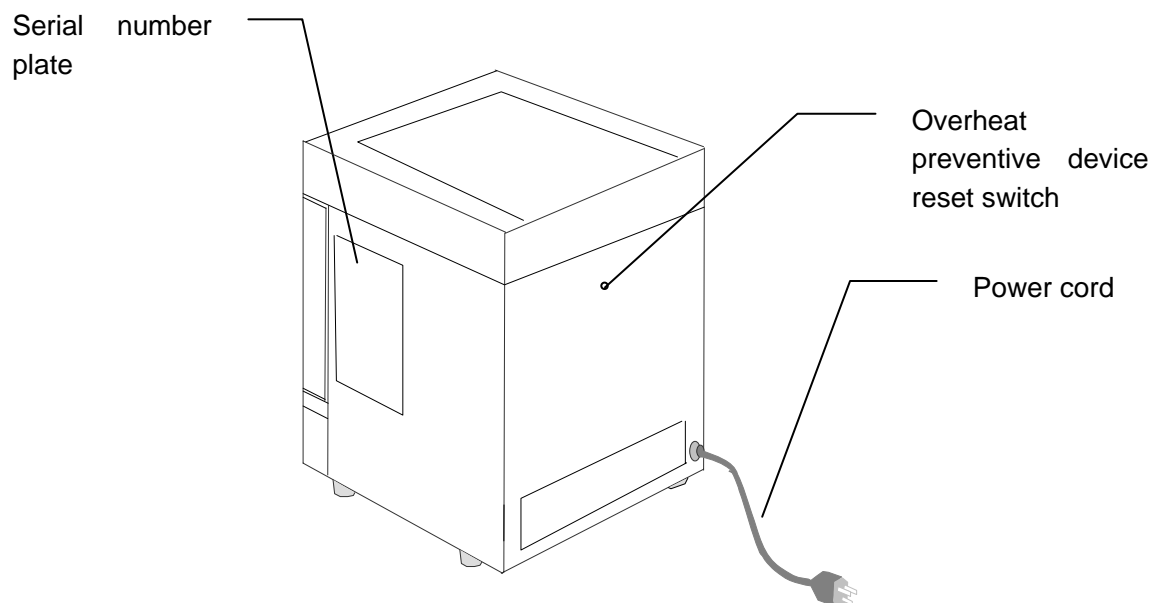
# 3.Names and Functions of Parts

## Main unit

### Front view

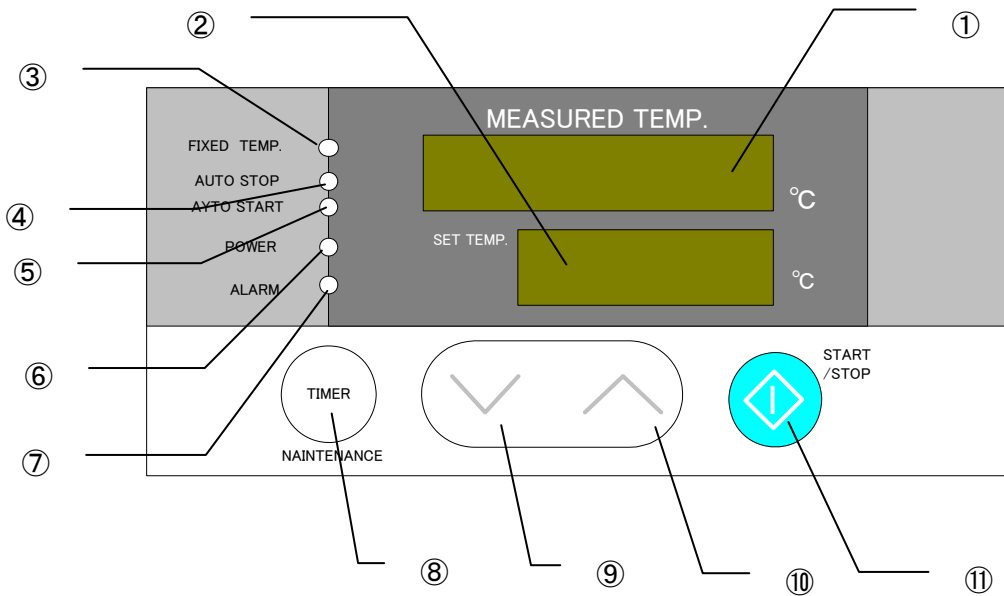


### Rear view



# 3. Names and functions of each part

## Operation panel





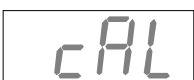



No.	Name	Operation/action
①	MEASURED TEMP. indicator	Indicates the measured temperature in the bath, set characters, and error information.
②	SET TEMP. indicator	Indicates set temp., functional settings, timer settings, and remaining time of the timer.
③	FIXWD TEMP. operation indication lamp	This lamp comes on when fixed temp operation is started.
④	AUTO STOP lamp	This lamp stays on during auto stop operation or quick auto stop operation.
⑤	AUTO START lamp	This lamp comes on when auto start operation is activated.
⑥	POWER lamp	This lamp comes on when power is supplied to the heater.
⑦	ALARM lamp	This lamp flashes when an error has occurred.
⑧	TIMER key	Used for timer operation of quick auto stop, auto stop, and auto start.
	MAINTENANCE key	Pressing the TIMER longer enters the maintenance mode. This key is used to select and set various sub-functions.
⑨	Down key	The key is used to select a setting. Used to increment the setting.
⑩	Up key	The key is used to select a setting. Used to decrement the setting.
⑪	START/STOP key	The key is used to start or stop operation.

### 3. Names and functions of parts

#### Description of characters

Character codes used for the controller will be described below.

Character codes	Descriptor	Name	Application
	AS <sub>t</sub> P	Auto Stop setting	Used for setting quick auto stop or auto stop operation.
	AS <sub>t</sub> r	Auto Start setting	Used for setting auto start operation.
	End	Time up	Displayed when auto stop timer operation finishes. See P.17 and 19.
	Pon	Power failure compensation setting	You can select whether operation shall continue automatically when recovered from a power failure or operation shall remain stopped. See P.23.
	cAL	Calibration offset setting	Used for inputting a calibration offset temperature. See P.24 "Using the calibration offset function".
	Lock	Key lock of a setting	Locks keys to prevent changes of settings. See P.25.

※For operation modes and function character codes, see P.15 "Operation mode, function setting keys and character codes".

# 4. Operating procedures

## List of operation modes and functions

Operation modes of this unit are as follows.

No.	Name	Description	Page
1	Fixed value operation	Operates continuously at the set temperature from start to stop of operation. After turning the main switch ON, use the ▼▲ keys to set the temperature. Press the <b>START/STOP</b> key to start operation and press the <b>START/STOP</b> key again to stop operation.	P.16
2	Quick auto stop operation	Used to “stop operation after several hours in the middle of operation”. Press the <b>TIMER</b> key during fixed value operation and select <b>ASTP</b> . You can set a time until operation stops.  Select <b>ASTP</b> and set a time using the ▼▲ keys. Press the <b>START/STOP</b> key to start quick auto stop operation, the timer starts in the middle of operation to automatically stop operation after the set time.	P.17
3	Auto stop operation	Used to “set auto stop before starting operation”. First set a temperature with the ▼▲ keys.  Then press the <b>TIMER</b> key to select <b>ASTP</b> and set a time you want with the ▼▲ keys. Press the <b>START/STOP</b> key to start auto stop operation.	P.19
4	Auto start operation ※	Used to “start auto start automatically after certain hours”. First set a temperature with the ▼▲ keys.  Then press the <b>TIMER</b> key to select <b>ASTr</b> and set a time you want with the ▼▲ keys. Press the <b>START/STOP</b> key to start auto start operation.	P.21
<p>※You cannot switch the operation mode to 3 auto stop operation nor 4 auto start operation while the unit is in operation. First stop operation when you want to change the operation mode.</p>			



## 4. Operating procedures

### List of operation modes and functions

Operation functions of the unit are as follows.

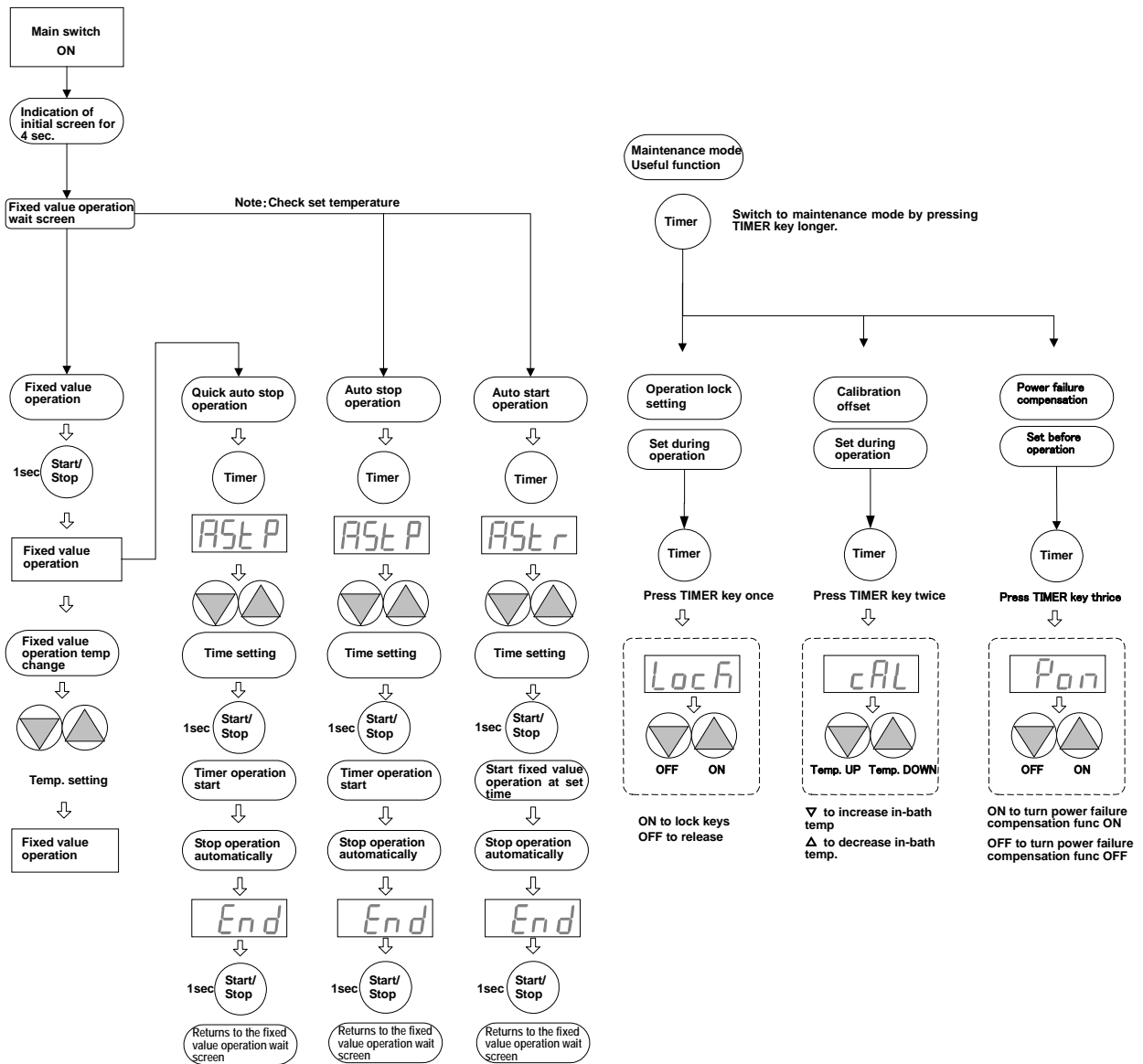
No.	Name	Description	Page
1	Overheat prevention function	<p>Automatic overheat prevention function :</p> <p>The function is set to activate automatically (automatically return) at a temperature 6°C above that in the bath when it has risen together with the unit set temperature.</p> <p>Overheat preventive device :</p> <p>A bimetal overheat preventive device of manual recovery type is installed. (Set at 80°C)</p> <p>If the overheat preventive device has activated, the unit will stop and will not recover until the recovery button of the device is pressed. (Manual recovery)</p> <p>Call for service when the overheat preventive device is activated.</p>	—
2	Power failure compensation function	<p>When a power failed during operation, operation resumes at the state immediately before the power failure. (The unit may remain stopped in the timer operation mode.)</p> <p>If you want to keep operation stopped when recovering from a power failure, cancel the power failure compensation function (OFF).</p>	P.23
3	Calibration offset function	<p>The calibration offset function is a function that compensates errors by 1 °C between the set temperature and the controlled temperature (indicated temperature) when the temperature in the bath is controlled to a value different from the set temperature.</p> <p>Compensation can be made for plus or minus side.</p>	P.24
4	Setting lock function	<p>This function locks the set status currently in operation.</p> <p>You can set or cancel the function with the <span style="border: 1px solid black; padding: 2px;">MAINTENANCE</span> key.</p>	P.25

1. Customer cannot change the setting of the item 1.
2. Functions in the items 2, 3, and 4 can be set using the maintenance function (MAINTENANCE key).

# 4. Operating procedures

## Operation mode, function setting keys and character codes

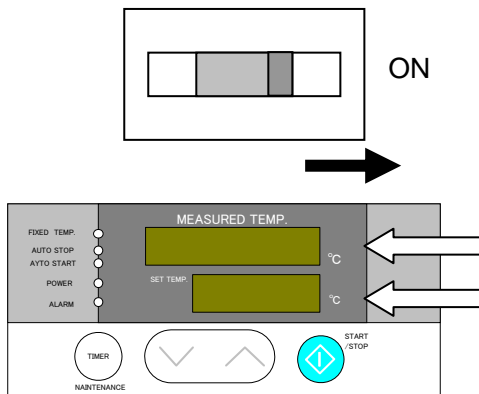
Operation modes and functions require the following key operations and character codes below for setting.



# 4. Operating procedures

## Operating procedures (fixed value operation)

### Procedures for fixed value operation

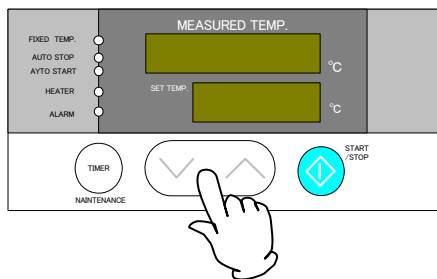


#### 1. Turn the circuit breaker on.

Turning the circuit breaker on the right side of the main body ON will display the initial values for about four seconds, then the screen will change to the initial setting screen and indicators show the current in-bath temperature and the last set temperature.

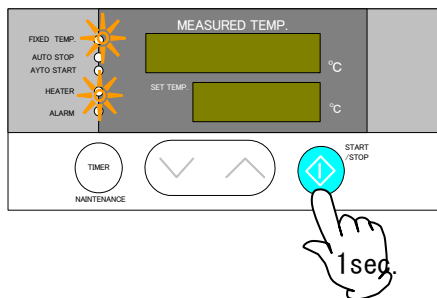
MEASURED TEMP. screen : Displays the current temperature in the bath

SET TEMP screen : Displays the last set temperature



#### 2. Setting the temperature

Set the temperature you want using the ▼▲ keys. Set temperature appears on the SET TEMP screen.



#### 3. Starting operation

Press the **START/STOP** key for one second.

The fixed value operation will start and the FIXED TEMP lamp and the POWER lamp will come on.

The POWER lamp will blink when the temperature becomes stable.

Set temperature and measured temperature are displayed on the FIXED TEMP screen and MEASURED TEMP screen respectively.

#### 4. Stopping operation

Press the **START/STOP** key for one second.

The operation will stop, the POWER lamp will go off and the screen will change to the initial setting screen.

### Changing the temperature

You can change the set temperature by simply pressing the ▼▲ keys.

Pressing the ▼▲ keys during operation immediately brings you to the setting mode where you can change the temperature.

After setting a new temperature, wait a while until the new temperature will be active and then the screen returns to the previous one.

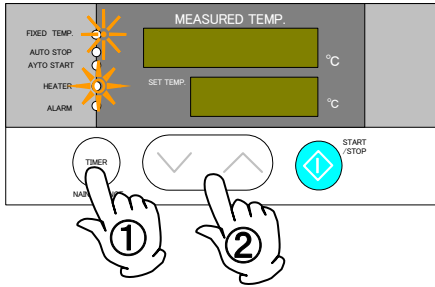
# 4. Operating procedures

## Operating procedures (Quick auto stop operation)

This is used to “stop operation automatically after several hours in the middle of the fixed value operation”.

The quick auto stop operation allows setting of auto stop timer during operation.

### How to start auto stop operation

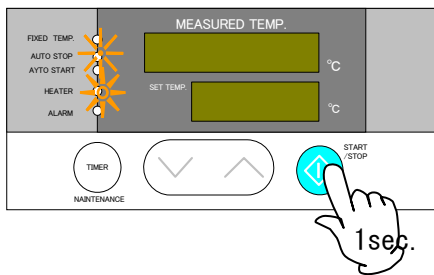


#### 1. Setting time before stop during fixed value operation

- ① Confirm that the FIXED TEMP and POWER lamps are on, which indicates the unit is in fixed temp. operation. Press the **TIMER** key. The auto stop lamp flashes and the set time flashes in the SET TEMP screen.
- ② Use the **▼▲** keys to set the time you want.

### About the timer function

The maximum settable time of the timer is 999 hours 50 minutes. You can set time in the unit of minutes up to 99 hours 59 minutes. Time of 100 hours or longer shall be set in the unit of 10 minutes. You can continuously change the set time and find the time you want quickly by keeping the **▼▲** keys pressed. To fine adjust the time, press the **▼▲** keys for one digit at a time.

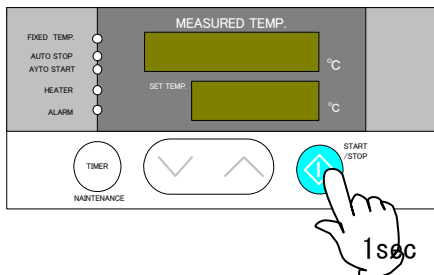


#### 2. Starting the timer operation

When you have set the time you want, press the **START/STOP** key again for one second while it is flashing. The **AUTO STOP** lamp will come on and timer operation will start.

Note : Timer counting starts when the temperature in the bath reaches the set temperature.

When the timer starts counting, the SET TEMP screen will switch to the remaining time indication.



#### 3. Stopping/finishing the timer operation

When the set time has passed, the timer will stop automatically but the character **End** flashes in the SET TEMP screen to indicate that operation has finished.

To return to the initial setting screen, press the **START/STOP** key longer for about one second to finish the timer operation mode.

The screen will return to the initial setting screen.

## 4. Operating procedures

### Operating procedures (quick auto stop operation)


#### To change the set temperature or the set time

Pressing the ▼▲ keys during operation immediately brings you to the setting mode where you can change the temperature.

Pressing the **TIMER** key during operation immediately brings you to the setting mode where you can change the set time.

In this case, you need to set a time obtained by adding time that has already passed to time you want to add.

After you have changed time, press the **START/STOP** key to finish.

The remaining time indication  indicates count down while its dot is flashing.

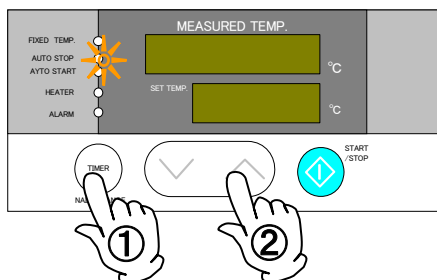
When the dot stays on, it indicates the wait status (temperature is increasing or decreasing to the set temperature) during which timer count is stopped.

# 4. Operating procedures

## Operating procedures (auto stop operation)

The timer is set from the start of fixed value operation and the operation is automatically stopped when the set temperature comes.

### How to start auto stop operation



#### 1. Setting the stop time

- ① Confirm that the temperature you want is set and then press the **TIMER** key.

The character **ASTP** **ASEP** that indicates the auto stop operation appears in the **MEASURED TEMP.** and the set time flashes in the **SET TEMP** screen.

- ② Use the **▼▲** keys to set the time you want.

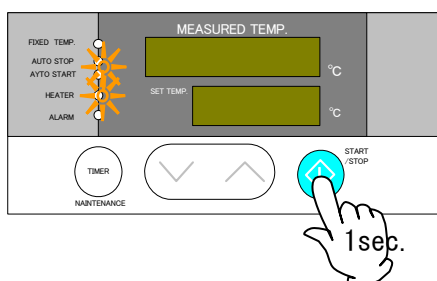
### About the timer function

The maximum settable time of the timer is 999 hours 50 minutes.

You can set time in the unit of minutes up to 99 hours 59 minutes.

Time of 100 hours or longer shall be set in the unit of 10 minutes.

You can continuously change the set time and find the time you want quickly by keeping the **▼▲** keys pressed. To fine adjust the time, press the **▼▲** keys for one digit at a time.



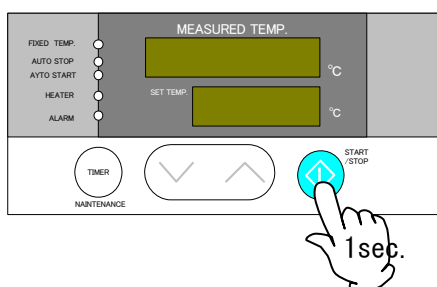
#### 2. Starting the timer operation

When you have set the time you want, press the **START/STOP** key longer for about one second.

The lamp flashes and the timer operation starts.

Note : Timer counting starts when the temperature in the bath reaches the set temperature.

When the timer starts counting, the **SET TEMP** screen will switch to the remaining time indication.



#### 3. Stopping/finishing the timer operation

When the set time has passed, the unit will stop operation automatically.

The character **End** **End** flashes in the **SET TEMP** screen to indicate that operation has finished.

Press the **START/STOP** key longer for about one second to finish the timer operation mode. The screen will switch to the initial setting screen.


## 4. Operating procedures

### Operating procedures (auto stop operation)

**To change the set temperature or the set time** Pressing the ▼▲ keys during operation immediately brings you to the setting mode where you can change the temperature.

Pressing the **TIMER** key during operation immediately brings you to the setting mode where you can change the set time.

In this case, you need to set a time obtained by adding time that has already passed to time you want to add.

The remaining time indication  indicates count down while its dot is flashing.

When the dot stays on, it indicates the wait status (temperature is increasing or decreasing to the set temperature) during which timer count is stopped.

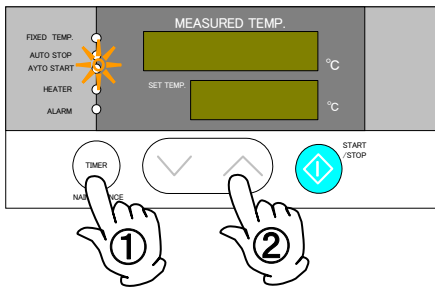
# 4. Operating procedure

## Operating procedures (auto start operation)

The mode starts operation automatically after the time set with the timer has passed.

Note that the operation will not stop automatically but must be stopped manually in this mode.

### To start auto start operation



### 1. Setting the operation start time

① Confirm that the temperature you want has been set and press the **TIMER** key.

The character AStr **ASTr** that indicates the auto start operation appears in the MEASURED TEMP. screen and the set temperature flashes in the SET TEMP. screen.

② Use the **▼▲** keys to set the time you want.

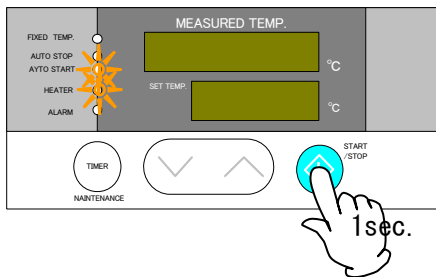
### About the timer function

The maximum settable time of the timer is 999 hours 50 minutes.

You can set time in the unit of minutes up to 99 hours 59 minutes.

Time of 100 hours or longer shall be set in the unit of 10 minutes.

You can continuously change the set time and find the time you want quickly by keeping the **▼▲** keys pressed. To fine adjust the time, press the **▼▲** keys for one digit at a time.



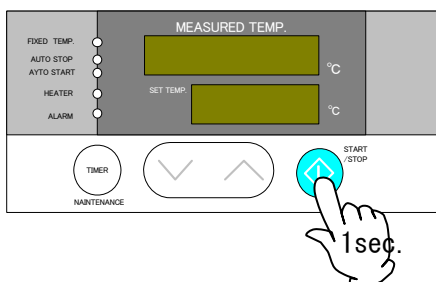
### 2. Starting the timer operation

When you have set the time you want, press the **START/STOP** key longer for about one second. The **AUTO START** lamp will come on.

Timer counting starts when the **START/STOP** key is pressed.

The MEASURED TEMP. screen switches indication from the set time to the remaining time.

Operation starts automatically when the set time comes.



### 3. Stopping/finishing the timer operation

To stop operation, press the **START/STOP** key longer for about one second to finish the timer operation mode. The screen will switch to the initial setting screen.



## 4. Operating procedures

### Operating procedures (auto start operation)

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To change the set temperature or the set time

If you want to change the set temperature or the set time during operation, press the **TIMER** key during operation and set the temperature or time for auto start operation using the ▼▲ keys.

However, to change the set time, you need to set a time obtained by adding time that has already passed to time you want to add.

Note : You cannot change time once the auto start time has passed and operation has started. Since the operation mode is fixed value, first stop operation using the **START/STOP** key and make settings from the beginning.

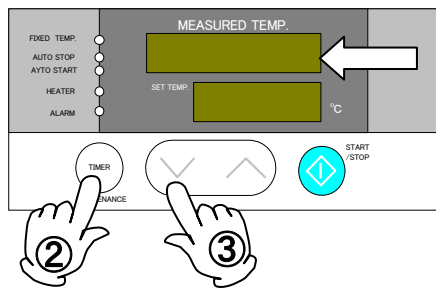
## 4. Operating procedures

### Useful functions (power failure compensation function)

When a power failure occurs in the middle of operation, the unit resumes operation in the state immediately before the power failure after recovering from the power failure.

(The unit may remain stopped in the case of timer operation.)

If you want to keep the unit stopped when recovering from a power failure, release the power failure compensation function (OFF).



- ① Operate the unit with the initial screen status.
- ② Press the **TIMER** key longer to switch to the MAINTENANCE menu mode. (You are already in the MAINTENANCE menu mode if LOCK **Loch** indication appears.)  
Press the **TIMER** key several times to select the character Pon **Pon** that indicates the power failure compensation function.
- ③ Turn “on” in the MEASURED TEMP. screen to “off” using the ▼ key and you have finished setting.

## 4. Operating procedures

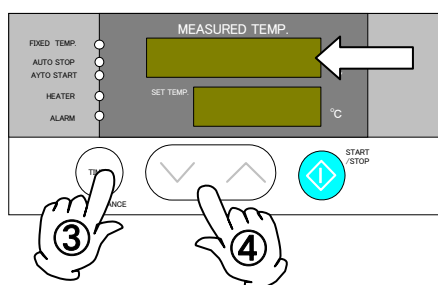
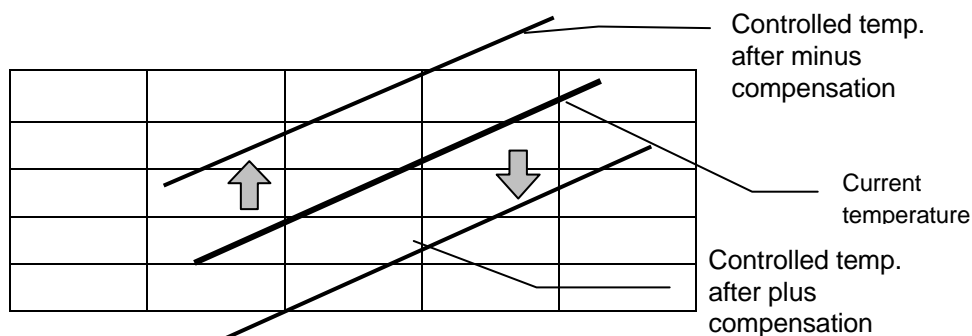
### Useful functions (calibration offset function)

#### Using the calibration offset function

The calibration offset function is a function that compensates differences that may be generated between the temperature in the bath and the set temperature.

This function can make parallel compensation to the plus or minus side for the entire temperature range. You can set/release using the **MAINTENANCE** key (pressing **TIMER** key longer).

The offset is set at "0" at the time of shipping from the factory.



- ① Start operation at the target set temperature, and after the temperature has become stable, check the temperature in the bath with a temperature recorder.
- ② Check difference between the set temperature and the temperature in the bath.
- ③ Press the **TIMER** key longer to switch to the **MAINTENANCE** menu mode. (You are already in the **MAINTENANCE** menu mode if **LOCK** **LocF** indication appears.)

Press the **TIMER** key several times to select the character **cAL** **cAL** that indicates the calibration offset function.

- ④ Enter the difference between the set temperature and the temperature in the bath using the **▼▲** keys to complete setting.

※ Offset temperature may be set to either of + or – side. Setting to the – side will decrease the displayed measured temperature by the offset amount while the temperature in the bath will increase by the same amount.

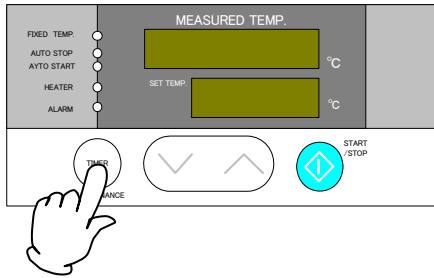
Setting to the + side will increase the displayed measured temperature by the offset amount while the temperature in the bath will decrease by the same amount.

Note : Temperature in the bath changes tentatively immediately after placing a specimen. Therefore, wait until the temperature in the bath become stable before checking for a temperature difference.

# 4. Operating procedures

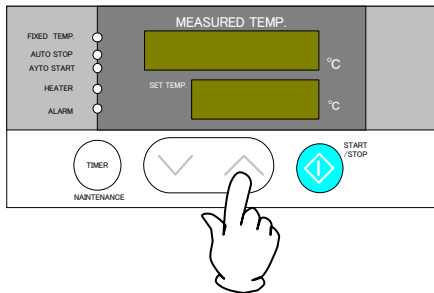
## Useful functions (setting key lock function)

The function is to lock the settings during operation for safety. You can set or release this function with the **MAINTENANCE** key.

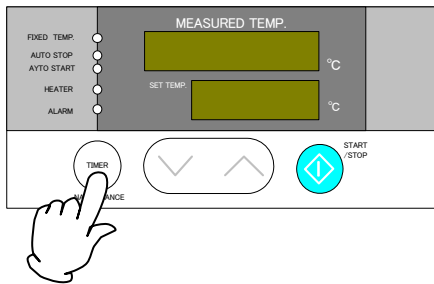


- ① Press the **TIMER** key longer to switch to the MAINTENANCE menu mode.

Press the **TIMER** key to select the character Lock **Loch** that indicates the settings lock.



- ② "oFF" will appear in the SET TEMP screen. You can switch this to "on" with the ▲ key to lock the settings.




- ③ If you want to cancel lock, press the **TIMER** key longer again and select the character Lock **Loch** that indicates the setting lock using the ▼▲ keys. Selecting "oFF" with the ▼ key releases the lock.

※While the lock function is "on", any keys other than the **START/STOP** key and **TIMER** key are locked.


## 5. Handling precautions



### 1. About materials that cannot be used


-  Never use an explosive material, a flammable material, or a material that contains such materials for this unit. They may cause an explosion or a fire. (See P.36 “List of dangerous materials”.)

### 2. About banning of operation/solutions when an abnormality occurs


-  When smoke or strange odor is generated from this unit for some reason, immediate turn power of the unit off, shut the power supply off and ask inspection to your dealer, one of our sales offices, or the customer center. Leaving the unit as it is may cause a fire or an electrical shock. The user must not attempt a repair, which may cause a danger.




### 1. Do not put any object on the unit

-  Do not put any object on the unit. It might fall off and cause a personal injury.


### 2. During a thunder storm

-  When a thunder begins, immediately turn power of the unit off, shut the power supply off. Leaving the unit as it is might cause a malfunction or a fire from lightening.


### 3. When opening or closing the door

-  When opening or closing the door, do not put your hands or face close to the area (space) where the door moves.  
The door might hit the hand or the face and cause an injury.


### 4. Banning of use of corrosive materials

-  Although inside the bath is made of SUS304 stainless steel, it might corrode from a strong acid. The door packing is made of silicone rubber. Take care it might corrode with acid, alkaline, oil, or halogen based solvent.

### 5. Operate the unit at an appropriate temperature

-  The operational temperature range is **+5°C~70°C room temperature**.  
Never operate the unit at a temperature out of the operational temperature range.

### 6. Placement of specimen

-  The withstand load of a shelf board is 10kg. Do not put a specimen exceeding this limit.  
Put two or more specimens dispersed.  
Putting too many specimens may cause imperfect transmission of heat to them and prevent even heating. Make sufficient spaces between specimens.

## 5.Handling precautions

 Caution

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### 7. About recovery from a power failure



When power is recovered after stoppage from power failure during operation, the unit automatically returns to the state immediately before power failure and resume operation. Set the power failure compensation function of the sub menu functions OFF if you do not want to allow the unit to automatically resume operation. See P.23.

### 8. About stacking in two layers



Never stack the units in two or more layers.

### 9. After installation



An earthquake or a shock may cause the unit fall over or move and personal injuries may result. Implement appropriate fall-over preventive measures for safety.

## 6. Maintenance procedures

### Daily inspection/maintenance

#### **Warning**

- Be sure to pull out the power cord unless necessary before trying to do inspection and maintenance works.
- Start these works after the device has returned to the normal temperature.
- Never try to disassemble the unit.

#### **Caution**

- Wipe off any dirt with a tightly wrung soft cloth. Never try to clean the unit with benzene, thinner or scouring powder, or rub with a scrubbing brush. Deformation, degradation or discoloration may result.

# 7. When the unit is not to be used for a long time or when disposing

## When the unit is not to be used for a long time or when disposing



### Caution

When the unit is not going to be used for a long time

- Turn the power to off and pull out the power cord.



### Warning

When disposing the unit

- Do not leave the unit in the area where children may have access.
- Be sure to remove handles before disposing the unit to prevent the doors from locking.
- In general, dispose the unit as a bulky waste.

## Notes about disposition

Always pay attention to the preservation of the global environment.

- We highly recommend taking the unit apart as far as possible for separation or recycling to contribute to the preservation of the global environment. Major components and materials for the unit are as follows:

Names of major components	Major materials
<b>Major components</b>	
Chassis	Steel sheet iron, melamine resin baking finish
Interior	Stainless steel SUS304
Insulating material	Glass wool
Door packing	PVC made magnetic packing
Nameplates	Polyethylene (PET) resin film
<b>Major electric parts</b>	
Heater	ICL300A/B: Cord heater with silicon cladding ICL310A/B: Nichrome heater
Boards	Resin, board, condenser, resistor, transformer, or other composite parts
Power cord & wiring materials, etc.	Wiring materials with resin cladding





## 8. When a trouble occurs

### Safety device and error codes

The table below shows the possible causes and solutions for a trouble and a safety device has activated.

[Error code]

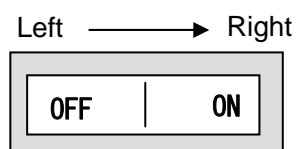
When an operational abnormality or a malfunction occurs, "MALFUNCTION" sign and an error code will appear on the operation panel. When a malfunction occurs, note the error code and immediately stop operation.

Safety device	Symptom	Possible causes and solutions
Wrong temperature input	Alarm lamp on  indication	<ul style="list-style-type: none"> <li>Abnormal temperature input circuit</li> <li>Disconnection or malfunction of the temperature sensor</li> <li>The measured temperature is out of the display range.</li> </ul> Contact the customer service center.
Malfunction of memory	Alarm lamp on  indication	<ul style="list-style-type: none"> <li>Abnormal settings in memory</li> </ul> Contact the customer service center.
Abnormal measured temperature	No indication	<ul style="list-style-type: none"> <li>When the automatic overheat preventive device activated due to abnormal increase in temperature in the bath.</li> </ul> Contact the customer service center.
Abnormal measured temperature	All function stop	<ul style="list-style-type: none"> <li>When the independent overheat preventive device activated due to abnormal increase in temperature in the bath.</li> </ul> Contact the customer service center.

### About the activation of the circuit breaker (main switch)

The unit is equipped with a circuit breaker.

When excessive current flows through the unit for some reason, the circuit breaker will turn OFF and shut the power off. To recover, first remove the causes and then turn the switch ON again.



When the breaker activates, the switch returns from ON to OFF.

## 8. When a trouble occurs

### If a malfunction is suspected

In the following cases

Symptom	Possible Causes
The unit will not start even if power is turned on.	<ul style="list-style-type: none"><li>● Power plug is not connected to the receptacle correctly.</li><li>● Power failure.</li></ul>
Temperature changes during operation.	<ul style="list-style-type: none"><li>● Too many specimens are placed.</li><li>● Air from an air conditioner is blowing directly against.</li><li>● Outside temperature is too low.</li><li>● Changes in the environmental temperature are too large.</li><li>● Specimen may contain too much water.</li><li>● Source voltage may be too low.</li></ul>
There is a difference between the set temperature and the temperature in the bath.	<ul style="list-style-type: none"><li>● The temperature compensation value of the calibration offset <input type="text" value="cAL"/> may be too small or too large. Set the compensation to <math>\pm 0</math> once and wait until the temperature in the bath becomes stable (after about two hours), reenter the correct compensation value. (See P.24.)</li></ul>

- ◆When the symptom does not correspond to any of the above, immediately turn the power switch off, pull out the power plug and contact your dealer, one of our sales offices, or our customer service center.

## 9. After sales service and warranty

### When requesting a repair

#### When requesting a repair

If any trouble occurs, immediately stop operation, turn the power switch off, pull out the power plug and contact your dealer, our sales office or our customer service center.

Information necessary for requesting a repair

- Model name of the product
  - Serial number
  - Date (y/m/d) of purchase
  - Description of trouble (as in detail as possible)
- } See the warranty card or the nameplate on the unit.  
(See P.10)

Be sure to indicate the warranty card to our service representative.

#### Warranty card (attached separately)

- Warranty card is given by your dealer or one of our sales offices and please fill in your dealer, date of purchase and other information and send it to our customer service center by Facsimile (03-3231-6523). Then, store it securely.
- Warranty period is one full year from the date of purchase. Repair service for free is available according to the conditions written on the warranty card.
- For repairs after the warranty period consult your dealer, one of our sales offices or our customer service center.  
Paid repair service is available on your request when the product's functionality can be maintained by repair.

#### Minimum holding period of repair parts

The minimum holding period of repair parts for this product is seven years after end of production. Repair parts here refer to parts necessary for maintaining performance of the product.

# 10. Specifications

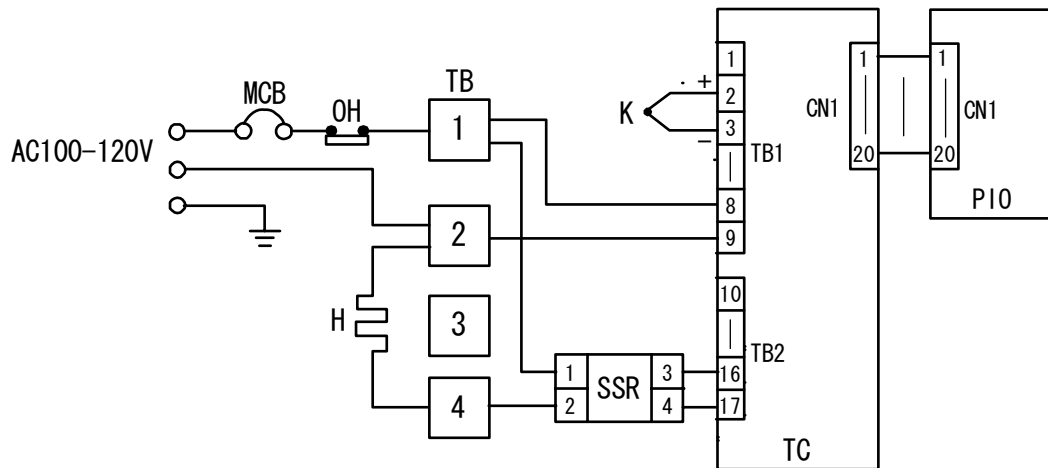
## Specification of the main unit

Product name		Incubator	
Model		ICL300A/B	ICL310A/B
System		Internal bath wall heating natural convection system	Heater heating air jacket system
Const- ruction	Exterior material	Steel plate, melamine baked finishing	
	Interior material	Stainless steel	
	Heater	Silicon code heater:120V 145W	Nichrome heater: 240V 180W
Performance	Operation temperature range	Room temperature +5°C~70°C	
	Temperature control precision	±0.5°C (at37°C)	
	Temperature distribution precision	±1.0°C (at37°C)	
Control	Controller	PID control, digital setting	
	Temperature sensor	K-thermocouple	
	Temperature control system	PID control by micro computer	
	Temperature setting system	Up/Down key	
	Timer resolution	1 minute (0 hour 00min—99 hours 59mins) Setting by 1 minute up to 99 hours 59mins Setting by 10 minutes from 100 hours	
Safety function	Temp. controller alarm function	Automatic overheat prevention function : Set temperature +6°C main relay shut-off (Auto recovery)	
	Overheat prevention unit	Manual recovery bimetal (80°C)	
	Main switch	Circuit breaker(locker switch type)	
Operation function		Operation functions: fixed value, quick auto stop, auto stop, auto start Functions: operation key lock, calibration offset, power failure compensation	
Standard	External dimension	450W × 400D × 600H	
	Internal dimension	350 × 300 × 330	
	Capacity	34.7 L	
	Power supply	AC100V~120V 50/60Hz 1.2A	AC200V~240V 50/60Hz 0.8A
	Power cord	3P cord with plug	Round terminal3Pcord
	Weight	Approx.22kg	Approx.23kg
Accessories		2 sets of shelf boards (fixed in the bath), two keys for the door, operating instruction, warranty card	

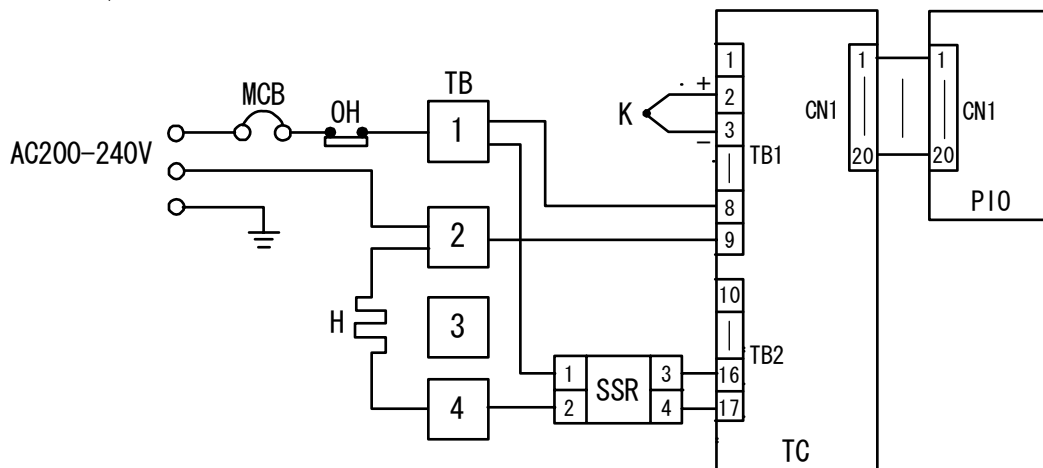
- \* The operation temperature range of the unit is 5°C~35°C. Note that a lower environmental temperature may prolong temperature attainment time or enlarge difference between set temperature and that in the bath. We recommend using the unit at the environmental temperature of 18°C~30°C.

# 11. Wiring Diagram

Wiring diagram  
ICL300A/300B



ICL310A/310B



Symbol	Part name	Symbol	Part name
MCB	Circuit protector	TC	Control board for temperature controller
H	Heater	K	Control sensor
TB	Terminal block	OH	Overheat preventive bimetal
PIO	Display board for temperature controller	SSR	Contact less relay

## 12. List of replacement parts

### Replacement parts

#### Common parts

Part Name	Specification	Manufacturer	Code No.
Control board for temperature controller	TTM00B—YH-IC	Yamato Scientific	LT00023453
display board for temperature controller	TTM00B—YH-IC	Yamato Scientific	LT00023454
Control sensor	φ 0.32 K-thermocouple, with protective tube	Yamato Scientific	LT00009502
SSR	TRS5225	Toho Denshi	2160000035
Circuit protector	3130F110P7TIW029 10A	Yamato Scientific	LT00001299
Overheat preventive bimetal	Manual recovery type 23PNA68 80°C	Matsuo electric	LT00023455
Terminal block	MO11-0FX-4P	Toyogiken	2070230001
Door packing	ICL300-40100 S packing	Yamato Scientific	LT00023456

#### Replacement parts for ICL300A/B

Cord heater	Silicon cord heater 120V145W	Yamato Scientific	LT00023457
Power cord kit	1.25sq3Pwith plug 2m	Yamato Scientific	LT00001745

#### Replacement parts for ICL310A/B

Nichrome heater	Nichrome heater 240V180W	Yamato Scientific	LT00023458
Power cord	1.25sq 3Pwith round terminal 2m	Yamato Scientific	LT00023459

# 13. List of dangerous materials



Never use an explosive substance a flammable substance or a substance containing them for this device.

Explosive substance	Explosive substance	① Nitroglycol, glycerine trinitrate, cellulose nitrate and other explosive nitrate esters
		② Trinitrobenzen, trinitrotoluene, picric acid and other explosive nitro compounds
		③ Acetyl hydroperoxide, methyl ethyl ketone peroxide, benzoyl peroxide and other organic peroxides
Flammable substances	Explosive substances	Metal "lithium", metal "potassium", metal "natrium", yellow phosphorus, phosphorus sulfide, red phosphorus, celluloids, calcium carbide (a.k.a, carbide), lime phosphide, magnesium powder, aluminum powder, metal powder other than magnesium and aluminum powder, sodium dithionous acid (a.k.a., hydrosulphite)
	Oxidizing substances	① Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates
		② Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates
		③ Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides
		④ Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates
		⑤ Sodium chlorite and other chlorites
		⑥ Calcium hypochlorite and other hypochlorites
	Flammable substances	① Ethyl ether, gasoline, acetaldehyde, propylene chloride, carbon disulfide, and other substances with ignition point at a degree 30 or more degrees below zero.
		② n-hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone and other substances with ignition point between 30 degrees below zero and less than zero.
		③ Methanol, ethanol, xylene, pentyl acetate, (a.k.a.amyl acetate) and other substances with ignition point between zero and less than 30 degrees.
		④ Kerosene, light oil, terebinth oil, isopenthyll alcohol(a.k.a. isoamyl alcohol), acetic acid and other substances with ignition point between 30 degrees and less than 65 degrees.
Combustible gas	Hydrogen, acetylene, ethylene, methane, ethane, propane, butane and other Substance which is a flammable gas at 15°C, one air pressure.	

(Quoted from the separate table 1 in Article 6, the enforcement order of the Industrial Safety and Health Law

## Limited liability

**Be sure to use the unit strictly following the handling and operating instructions in this operating instruction.**

**Yamato Scientific Co.,Ltd. assumes no responsibility for an accident or a malfunction caused by use of this product in any way not specified in this operating instruction.**

**Never attempt to perform matters prohibited in this operation instruction.**

**Otherwise, an unexpected accident may result.**

## Notice

- Descriptions in this operating instruction are subject to change without notice.
- We will replace a manual with a missing page or paging disorder.

Operation Manual

Labo Cube Incubator

ICL300A/300B

ICL310A/310B

First Edition May 14, 2007

Revised February 22, 2012


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