Instruction Manual
For
FINE OVEN

Model DF811/DF1011
DH811/DH1011

Version 1

- **Thank you for purchasing “DF/DH Series" of Yamato Scientific Russia, Inc.**

- **To use this unit properly, read this "Instruction Manual" thoroughly before using this unit.**
  Keep this instruction manual around this unit for referring at anytime.

  ⚠ : **WARNING!:**
  Carefully read and thoroughly understand the important warning items described in this manual before using this unit.

YAMATO SCIENTIFIC RUSSIA, INC.

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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.

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.)

（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.

EXPLANATIONS ABOUT SYMBOL MARKS

Symbol mark table

Warning



Warning,
generally



Warning,
high voltage



Warning,
high temperature



Warning,
drive train



Warning,
explosive

Caution



Caution,
generally



Caution,
electrical shock



Caution,
scald



Caution,
no road heating



Caution,
not to drench



Caution,
water only



Caution,
deadly poison

Prohibit



Prohibit,
generally



Prohibit,
inflammable



Prohibit
to disassemble



Prohibit
to touch

Compulsion



Compulsion,
generally



Compulsion,
connect to the
grounding terminal



Compulsion,
install on a
flat surface



Compulsion,
disconnect the
power plug



Compulsion,
periodical
inspection

Warning・Cautions

⚠ WARNING

Prohibit to use in the following locations, where a flammable or explosive gas is present.

Never to use this product in the locations as a flammable or an explosive gas is present.
If not, it may cause a fire or an explosion, because this product is not expansion-proof.

Always connect the protective grounding wire to the ground.

Connect the ground-line correctly. This could cause a fire or an electrical shock due to leakage.

Prohibit to use in unusual operation.

If the smoke or unusual smell come up, turn-off the power switch immediately and disconnect the power plug from the receptacle. This could cause a fire or an electrical shock.

Do not use the power cord tie up in a bundle.

This could cause to a fire from overheating of the power cord.

Do not injure the power cord.

Do not bend or twist or tug the power cord forcibly. This could cause a fire or an electrical shock.

Do not use samples containing a flammable or explosive substance.

Never to use samples containing a flammable or explosive substance. This could cause a fire or an explosion.

Do not disassemble and make modifications this product.

Do not disassemble and make modifications this product. This could cause a failure or a fire or an electrical shock.

Never try to touch a hot part.

Do not touch the door during or immediately after operation. Severe burning injury may be caused due to the high temperature.

⚠ CAUTION

When thunder is coming.

When it thunders, turn off the power switch immediately. This could cause a failure or a fire or an electrical shock.

To install and preparation before using

WARNING

1. Always ground the unit

Be sure to connect the earth wire (the green cable of power cord) to the grounding conductor or ground terminal to prevent accidents caused by electric leakage.

Ask the nearest electrical contractor for the power including the connecting work. The setting (connecting) work is performed following the related electrical equipment technical standard published by the corresponding country to be used this unit.

Electrical specifications of ModelDF811/DF1011 and DH811/DH1011 are 3-phase 220V.

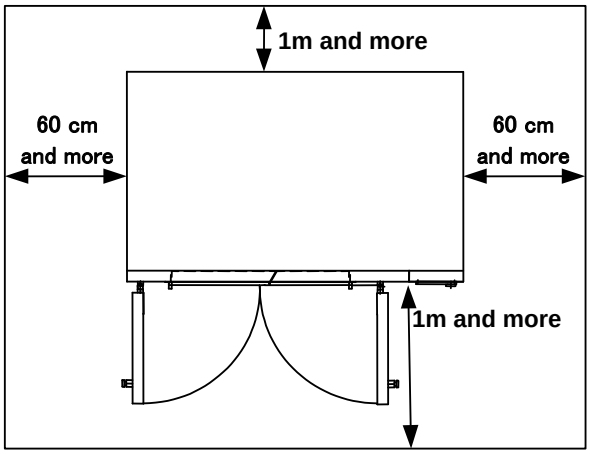
Connect to a distribution board or 220V outlet surely.

2. Choose a proper place for installation.

Do not install the oven in a place where:

- Flammable gas or corrosive gas is generated.
- Ambient temperature exceeds 35℃
- Ambient temperature fluctuates violently.
- There is direct sunlight.
- There is excessive humidity.
- There is a constant vibration.

Keep the following clearance around the oven.



3. Operation with ventilation

When using this machine with ventilation (with Damper opened) it is required to make sure of full ventilation around the place. Without enough ventilation around the machine a hot air from its exhaust opening will raise room temperature or the room can be filled with smoke and gas discharged from its materials. Therefore do not forget to connect an exhaust duct at its exhaust opening in order to discharge a blast wind outside. We can offer exhaust pipe flange and exhaust dust as an option by request.

REQUIREMENTS FOR INSTALLATION

⚠ WARNING

4. Choose a correct power distribution board.

・Choose a correct power distribution switchboard or receptacle that meets the oven's rated electric capacity.

Electric capacity :	**Model DF811**	**AC220V**	**3-phases**	**16.5A**
	Model DF1011	**AC220V**	**3-phases**	**22A**
	Model DH811	**AC220V**	**3-phases**	**24A**
	Model DH1011	**AC220V**	**3-phases**	**33A**

・Do not connect the oven to an outlet that differs from the above specifications because a fire or electrical shock will occur.

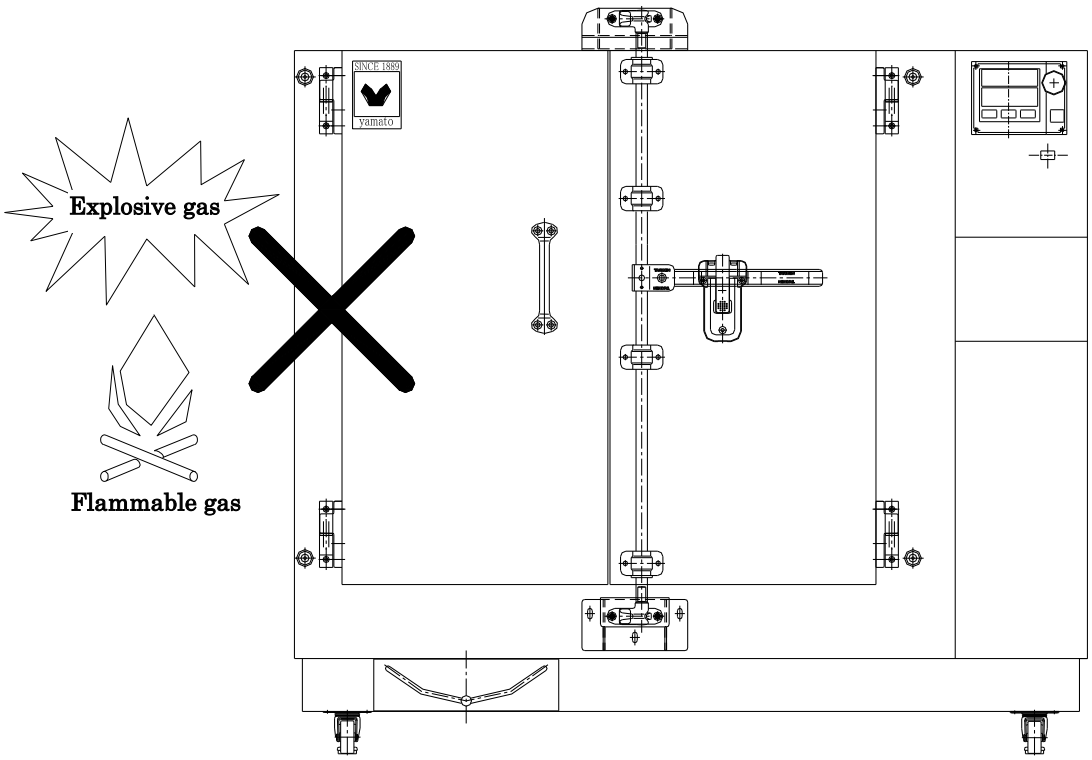
5. Supply connections for the oven

・Request the supply connection for the 3-phases 220V specifications from a licensed electrician.

・Failure to have this operation complete by certified personnel will cause a fire or electrical shock during Oven operations.

6. Do not use the unit in an area where there is flammable or explosive gas.

・Never use the unit in an area where there is flammable or explosive gas. The unit is not explosion-proof. An arc may be generated when the power switch is turned ON or OFF, and fire/explosion may result.



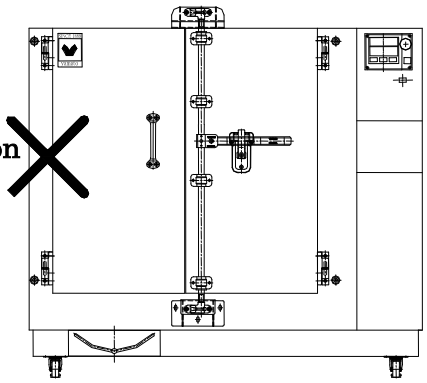
REQUIREMENTS FOR INSTALLATION

WARNING

7. Do NOT make modifications to the product

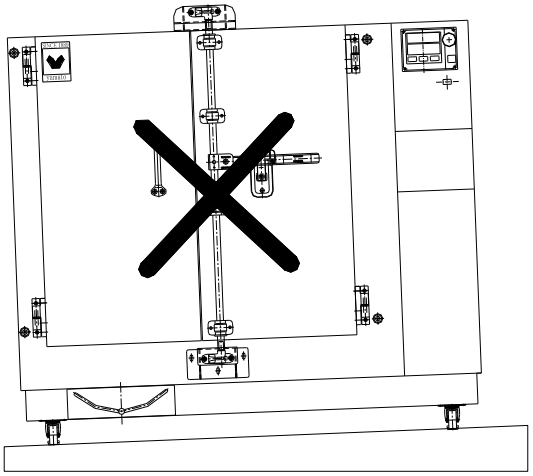
Modification of the product is strictly prohibited. This could cause a failure

Modification



8. Installation on flat surface

Install the product on a flat surface. Unanticipated problems or failures may occur otherwise.



CAUTION

After installed, you should:

It may cause injury to a person if this oven falls down or moves by the earthquake or the impact, etc. To prevent, take measures that the unit cannot fall down.

REQUIREMENTS FOR INSTALLATION

⚠ CAUTION

Handling of power code.

Do not use the power cord if it is bundled or tangled. If it is used in this manner, it can overheat and fire may be caused.

Do not process, bend, wring, or stretch the power cord forcibly. Fire or electrical shock may result.

Do not put the power cord under the desk, chair, etc., or through an object. Fire or electrical shock may be caused.

Do not run the power cord next to heating equipment such as a heater. The cover of the cord may melt and fire or electrical shock may result.

When the power cord is damaged (exposure of the core wires, disconnection, etc.), turn off the power key right immediately, then turn off the circuit breaker and the main power. Contact customer service for a replacement immediately. If this procedure is not followed, fire or electrical shock may be caused.

Connect the power cord to a adequate distribution board or outlet.

Caution for setting shelves

Do not use any shelves but the attached ones.

If it is used in this manner, the oven cannot occasionally regulate temperatures properly.

Put the attached shelves on the shelf brackets fitted to the chamber when you use the oven.

WARNING

Substances that can not be used

Never use explosive substances, flammable substances or substances that include explosive or flammable ingredients in the unit. Explosion or fire may occur. (Please refer to "List of dangerous materials" on page 65.)

Prohibition of use for error

If a smoke or abnormal smell may be occurred, turn off the power switch of the main unit immediately, and turn off the original power source, and finally contact to either the dealer you purchased this unit or our sales office. Leaving the failure may cause the fire or electric shock. Since the repairing of this unit is dangerous for non-specified service person, never repair the unit by the customer himself.

Do not put the foreign substances in the oven

Do not put a foreign substances such as metals or flammable substances in the opening of the unit (ventilation hole, exhaust port, etc.). If this procedure is not followed, fire, electrical shock or burn may result.

If the foreign substances enter the unit, turn off the circuit breaker immediately and contact a service technician for inspection. If this procedure is not followed, fire, electrical shock or burn may result.

Caution for handling samples

During and immediately after operation, the internal surfaces of the chamber and the door are extremely "HOT". To prevent injury, take out the samples when the chamber has cooled down or wear gloves while the chamber is still hot.

When you open the door during working at the high temperature.

Do not touch the internal surfaces of the chamber and the door when you will open the door, because they are extremely hot.

To open the door while the chamber is still hot may cause the malfunction of a fire detector if it is installed near the oven.

Do not touch heated parts.

Do not touch the door and exhaust port during or immediately after operation. Severe burning injury may be caused due to the high temperature

⚠ CAUTION

1. When operating the unit for the first time

⚠ When you use the unit for the first time, a strange odor may generate at a higher temperature. This is due to decomposed binding agent contained in the heat insulator and does not indicate a malfunction of the unit.

2. If you fully open the exhaust duct

⚠ The maximum operating temperature will not be reached if you fully open the exhaust duct.

3. When processing a sample that contains moisture

❗ When you want to process a sample that contains moisture, open the exhaust damper; raise the temperature to remove moisture. When water exists inside the unit, an electric shock or a malfunction of the unit may result.

4. About processing of a sample

❗ To improve temperature distribution within the bath, the unit employs air blow circulation. When processing powder sample or a small sample, make sure that the sample will not scatter. Entering of a flammable material or a metal into the heater assembly may cause a fire or an electric shock.

⚠ Some time may be necessary for the temperature to rise when processing a large amount of sample or a sample with a larger thermal load. Confirm a correct amount as necessary and set the sample. Note that the indicated temperature may become unstable when processing a heat-generating sample [note however, the sample must be free of risk of explosion, firing, or ignition of itself (whose density is less than the explosion limit density).

5. Distribute samples

⃠ The withstand load of each shelf board included with the unit is about 30kg. Do not put any sample that exceeds this load.

Set two or more samples as dispersed as possible.

⃠ If a shelf is congested with samples, the oven occasionally cannot regulate temperatures properly. To ensure the oven's temperature accuracy, there should be open space of at least 30% on each shelf.

6. Do not climb on the oven

⃠ Do not climb on top of the oven because it will fall down and break. Failure to observe this caution may cause injury to a person

⚠ CAUTION

7. Do not put anything on the oven

Do not put anything on top of the oven because they will fall and result in injury to a person.

8. During a thunder storm

During a thunder storm, turn off the power key immediately, then turn off the circuit breaker and main power. If this procedure is not followed, fire or electrical shock may be caused.

9. When having a blackout



Once the power supply is recovered, the oven can resume when it stopped because of having a blackout.

10. About independent overheat preventive unit

Be sure to set the independent overheat preventive unit for safety. Set the temperature of the independent overheat preventive unit to a temperature +15℃ or more higher than that of the temperature controller.

11. About the operating temperature range

Always operate the unit within the specified operating temperature range.

DF811/1011:40 to 200℃

DH11/1011:40 to 300℃

Operating the unit outside the operating temperature range may cause a malfunction or an unexpected accident.

12. About the operating procedures

Always operate the unit following the procedures specified in this operation manual. Operating the unit other than the way indicated in the operation manual may cause a trouble. Note that operating the unit other than the way indicated in the operation manual will void the product warrantee.

⚠ CAUTION

13. Do not place any samples on the bottom of the chamber

Do not place any samples on the bottom of the chamber to heat, because it affects the temperature control of the oven. Always put the samples on the attached shelves. Place sample so that it does not touch the interior wall of the chamber. Set the shelves on the shelf brackets that will accommodate the size of the sample.

14. Never use corrosive samples

Stainless steel is used for major passage of circulating air. However, strong acid occasionally corrodes even stainless steel. Besides this, the silicone rubber packing is also vulnerable to acid, alkali, oil and halogen's solvent.

15. When you open and shut the door



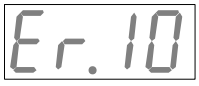
Do not put your hand either face near the door when you open and shut the door. Failure to observe this caution may result in injury because the door hits your hand or face.

16. When using the cable port

When you have inserted a measurement sensor or a probe into the cable port, close the cover to the maximum extent possible and then securely seal it with heat-resistant packing or sealant taking care not to leave any gaps. Insufficient seal will degrade temperature characteristics or other performances.

Purposes and Operations of Safety Device and Counter-measures

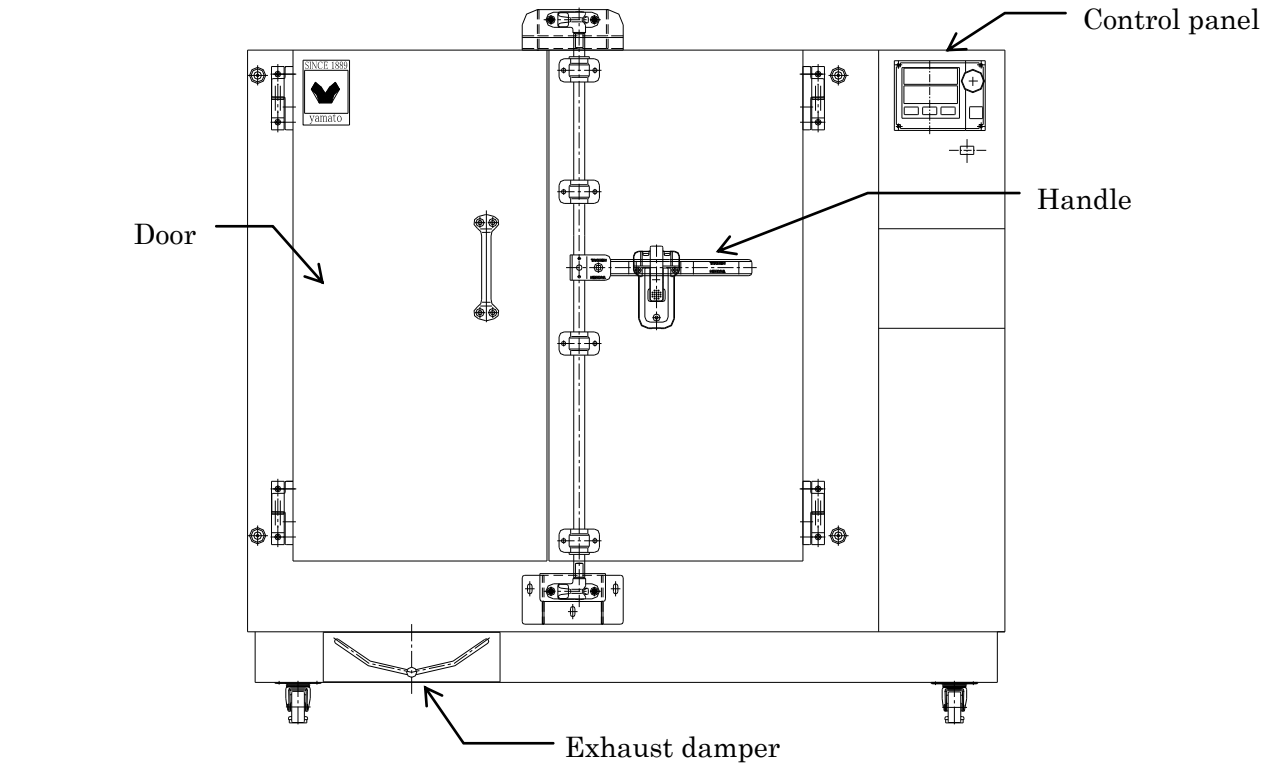
When an abnormal condition occurs, an error code is displayed in the main display. Immediate action should be taken according to the specific counter-measures.

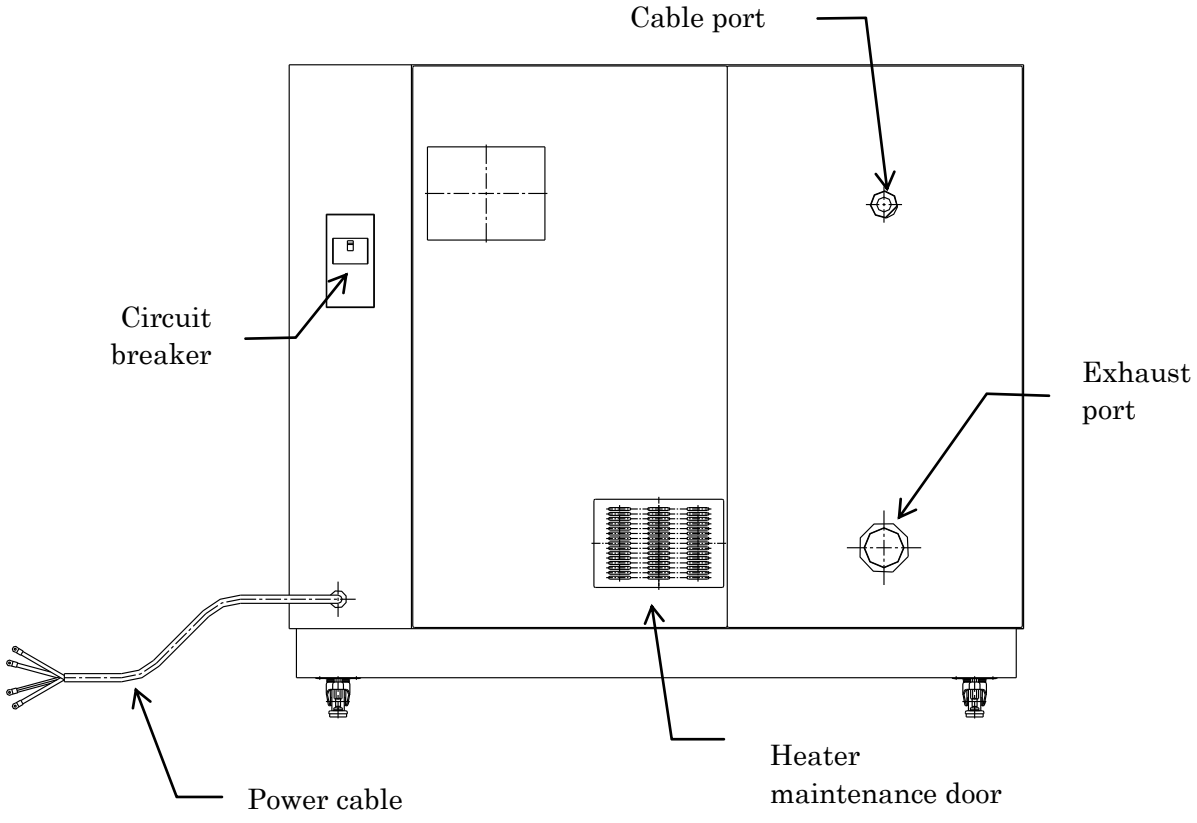
Er. No	Error name	Main Display	Sub display
Er.00	Communication Er		Communication Er Ex a connection
Er.01	Sensor Error		Sensor Error Calls a service
Er.02	SSR Error		SSR Error Calls a service
Er.03	Heat Error		Heat Error Calls a service
Er.04	Fan Error		Fan Error Calls a service
Er.05	Auto-damper Er		Auto-damper Er Calls a service
Er.07	Overheat Error		Overheat Error Calls a service
Er.08	Controller Er		Controller Er Calls a service
Er.10	Main relay Er		Main relay Er Calls a service
Er.14	RAM Error		Controller Er Calls a service
Er.15	EEPROM Error		Controller Er Calls a service

How to manage

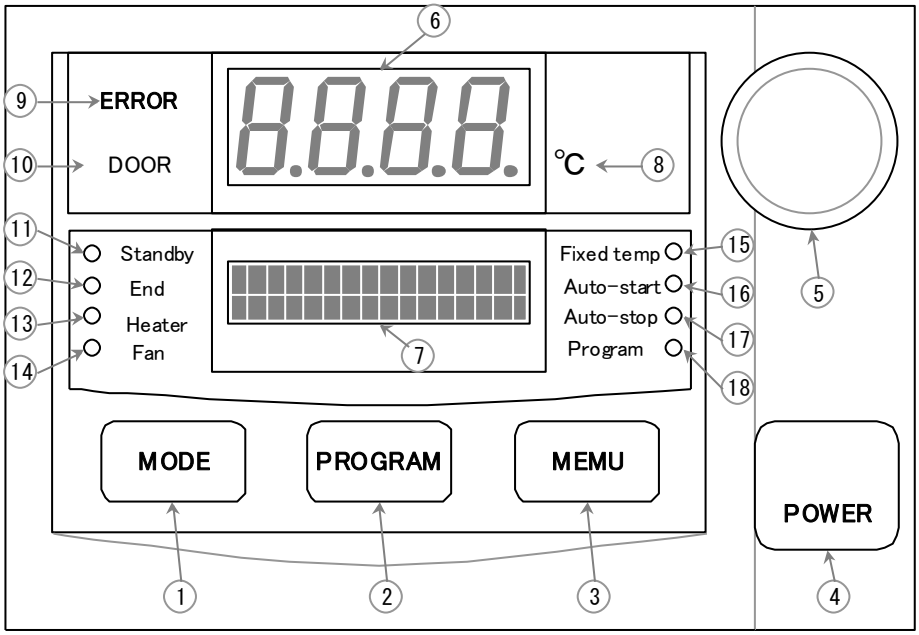
- In case these error code mentioned above is displayed, recode the error code and shut off the power immediately.
- In case "Er14" is displayed, once turn off a circuit breaker. Then, after more than 30 seconds, turn on the breaker again. In case "Er14" is still displayed even after the breaker is turned on, then contact a customer support center.
- In case any abnormal condition occurs, parts replacement or device inspection should be taken. Contact a customer support center. In contacting, never fail to inform of error number. Refer to P 57 (AFTER SERVICE AND WARRANTY).

Main unit


Control panel
Handle
Door
Exhaust damper


Cable port
Circuit breaker
Exhaust port
Power cable
Heater maintenance door

Control Panel



No.	Name	Description
1	MODE key	Key to select a function from program input, edit,delete modes,hour/time setting, change-over mode, and other functions.
2	PROGRAM key	Starting/Closing of program menus
3	MENU key	Key to select the operation mode. Each mode of fixed temprature, auto-start,auto-stop and program operation can be selected.
4	POWER key	Key to change over the controller from the standby mode to the operation mode or from the operation mode to the standby mode.
5	Jog dial	Key to select menu items, compile parameters, etc.
6	Main Display	It displays temperatyre measurements,set values (temperature, time, hour, etc.), program information, error information, etc.
7	Sub Display	It displays set temperture, remaining time, current hour and execution segment No. etc.
8	℃ lamp	It comes ON when displaying temperature of the inside of tank at main display
9	ERROR lamp	It comes ON when any trpuble within equiment.
10	DOOR lamp	It comes ON to indicate that door is being opened. (not provided on this unit).
11	STANDBY lamp	It comes ON in the standby mode and blinks in the preoperational state.
12	END lamp	It blinks at the end of auto-stop/program operation.
13	HEAT lamp	The lamp comes ON when the heater is energized.
14	FAN lamp	The lamp comes ON when the fan is energized.
15	FIXED-TEMP	It comes ON while it is operated at fixed temperature. It blinks when operation mode is selected.
16	AUTO-START	It comes ON to indicate that auto start is carried out. It blinks when operation mode is selected.
17	AUTO-STOP	It comes ON to indicate that auto stop is carried out. It blinks when operation mode is selected.
18	PROGRAM lamp	It comes ON to indicate that program operation is carried out. It blinks when operation mode is selected.

⚠ Warning

Never fail to connect earth (green core wire of power supply code) with your grounding wire or grounding terminal part in order to avoid electric shock.

- Don't connect earth to gas pipe or water main.
- Don't use forked plug receptacle since it can cause heat generation etc.
- Don't install it at place where inflammable gas or corrosive gas breaks out.

⚠ Caution

Plug receptacle check

- Connect power supply code to proper switch board or plug receptacle.

Safety check

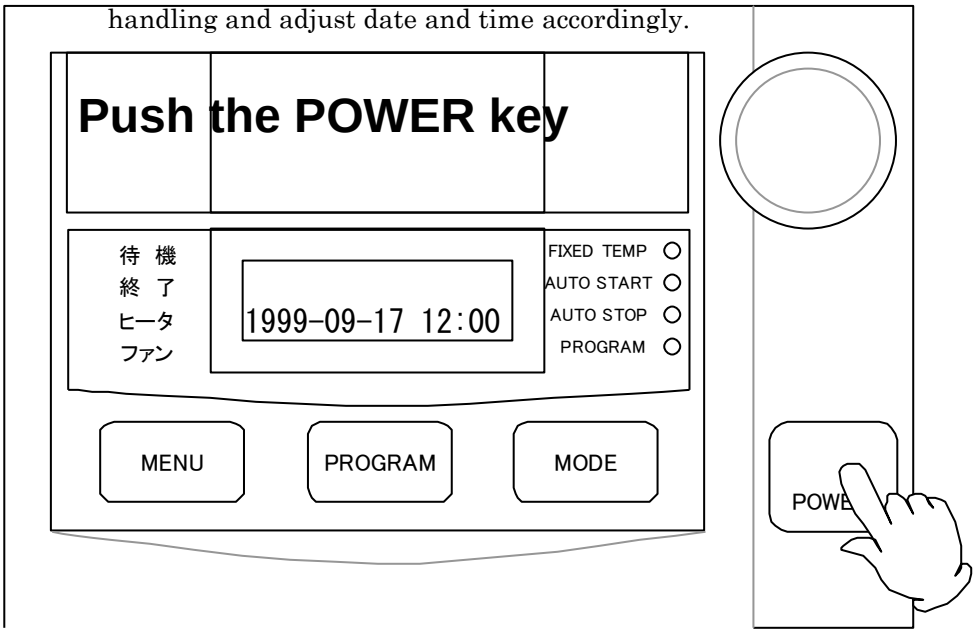
- Make sure that independent overheat prevention is set 15℃ higher than the temperature of its inside to be used.

Charge check

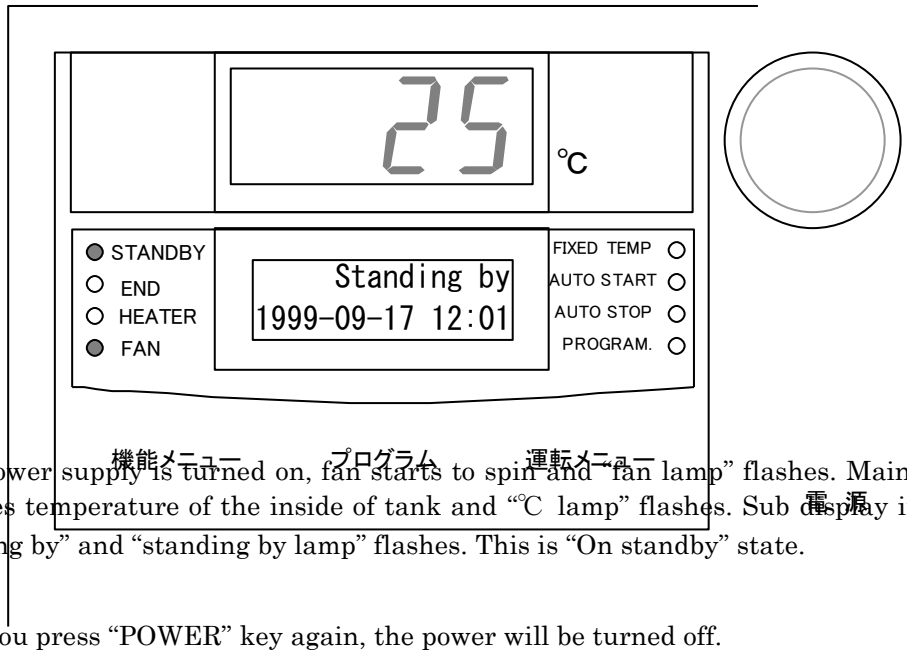
- In order to charge battery for date back-up, in case of new installment or circuit breaker is off for many hours, turn on the breaker and keep the equipment with electricity on and have it for more than 25 hours.

Turn the circuit breaker on.

- When power supply is off, present date and time are shown on sub display.
  ※Clock is not set correctly when it is forwarded from factory. Refer to page 49 for handling and adjust date and time accordingly.



- After short sound of beep, power supply is turned on.



- After power supply is turned on, fan starts to spin and "fan lamp" flashes. Main display indicates temperature of the inside of tank and "℃ lamp" flashes. Sub display indicates "standing by" and "standing by lamp" flashes. This is "On standby" state.

- When you press "POWER" key again, the power will be turned off.

- In case of first use, power supply of the equipment is still off. If you turn off short circuit breaker while using or main power supply is shut out because of power failure, it will be restored to the condition which main power supply is yet to be shut out. This is "Instantaneous suspension recovery function".

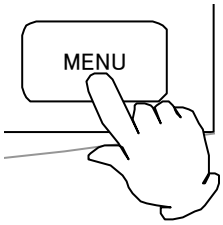
Four kinds of “Operation modes” as follows

No.	Operation mode	Function
1	FIXED-TEMP	It is a operation method to bring the oven to the desired temperature and keep it steady.
2	AUTO-START	It is a operation method to start a fixed temperature operation when reached the set time or hours.
3	AUTO-STOP	It is a operation method to stop the fixed temperature operation when reached the set time or hours.
4	PROGRAM	It is a operation method that can start or stop a operation either when reached the set time or hours. Moreover, it can change the temperature when reached time and repeat to do that.

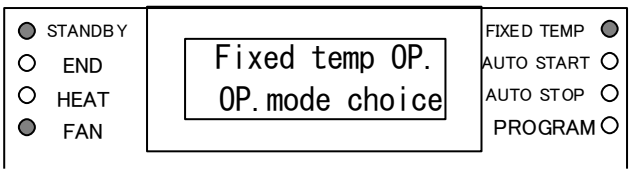
Selection of operation mode

・Confirm that a power supply is on.

1. Push the MENU key



・Operation menu starts and becomes an Operation mode choice screen.

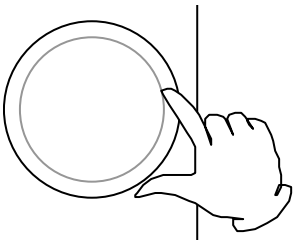


・On operation mode choice screen, you can see blinking display at sub display which indicates the name of operation mode currently selected, and operation lamp blinks correspondingly.

※ When the equipment is used for the first time, fixed temperature operation mode is already selected. Other than that case, the operation mode that is carried out in the last use will be selected.

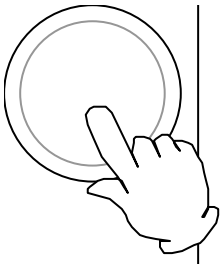
No.	Operation mode	Indicate lamp	Sub display
1	Fixed temp OP.	Fixed temp Lamp	Fixed temp OP. OP. mode choice
2	Auto-start OP.	Auto start Lamp	Auto-start OP. OP. mode choice
3	Auto-stop OP.	Auto stop Lamp	Auto-stop OP. OP. mode choice
4	Program OP.	Program OP. Lamp	Program OP. OP. mode choice

2. Turn the jog dial



・Use the jog dial to change the displayed setting to the operation mode.

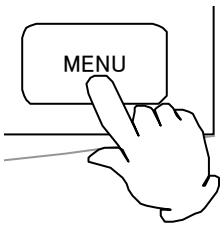
3. Press the jog dial



・Operation mode was decided. Next, appears input screen of each operation mode

4. Method of cancellation

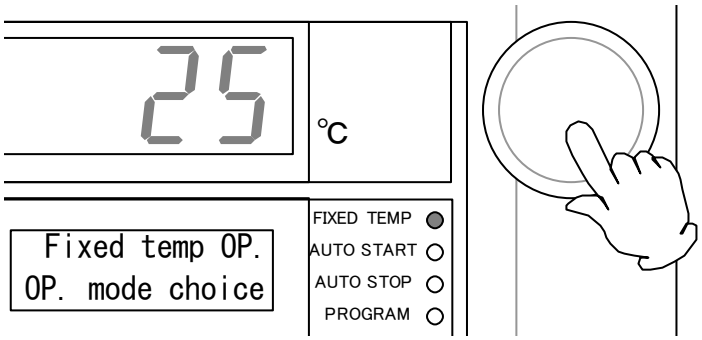
・Press “MENU” key again if you want to cancel the operation menu halfway.



FIXED TEMPERATURE OPERATION INSTRUCTION

1. Chose the "Operation at the constant"

・It is made to indicate "Fixed temp OP." at operation mode choice screen and push the jog dial.



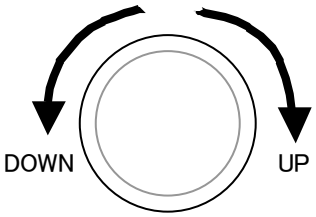
2. Set up temperature

・Next it moves to input screen of setup temperature, sub display indicates "Setup Temp" and the number which indicates the temperature blinks.

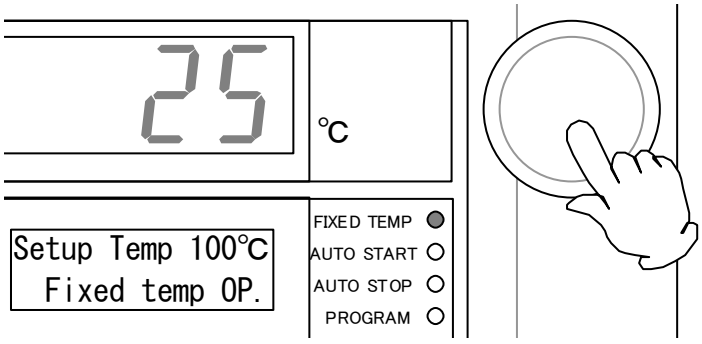
Setup Temp 0 ℃
Fixed temp OP.

(setup temperature input screen)

・Turn the jog dial and setup temperature should be indicated.

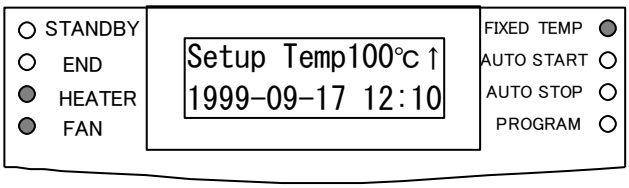


3. Push the jog dial



・Set up temperature is decided and the fixed temperature operation starts

・When fixed temperature operation starts, heater will work on and off according to setup temperature. When heater is on, “HEATER” lamp flashes. “FIX TEMP” lamp will change from blink to flash.



・During fixed temperature operation, sub display indicates temperature and you can see blinking display of arrow sign, which indicates the condition of temperature control. The direction of arrow sign will be as follows according to the relationship between setup temperature when fixed temperature operation starts and temperature of the inside of chamber.

Setup Temp　　１００℃↑
１９９９－０９－１７　１２：１５

（When setup temperature is higher than that of the inside of chamber）

Setup Temp　　１００℃↓
１９９９－０９－１７　１２：１５

（When setup temperature is lower than that of the inside of chamber）

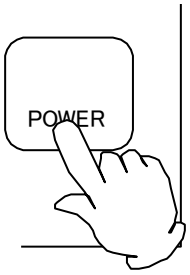
・The direction of arrow sign will be as follows when temperature of the inside of chamber becomes higher or lower by 2.5℃ that setup temperature.

Setup Temp　　１００℃→
１９９９－０９－１７　１２：３０

（When temperature of the inside of chamber reaches setup temperature）

4. How to “Stop”

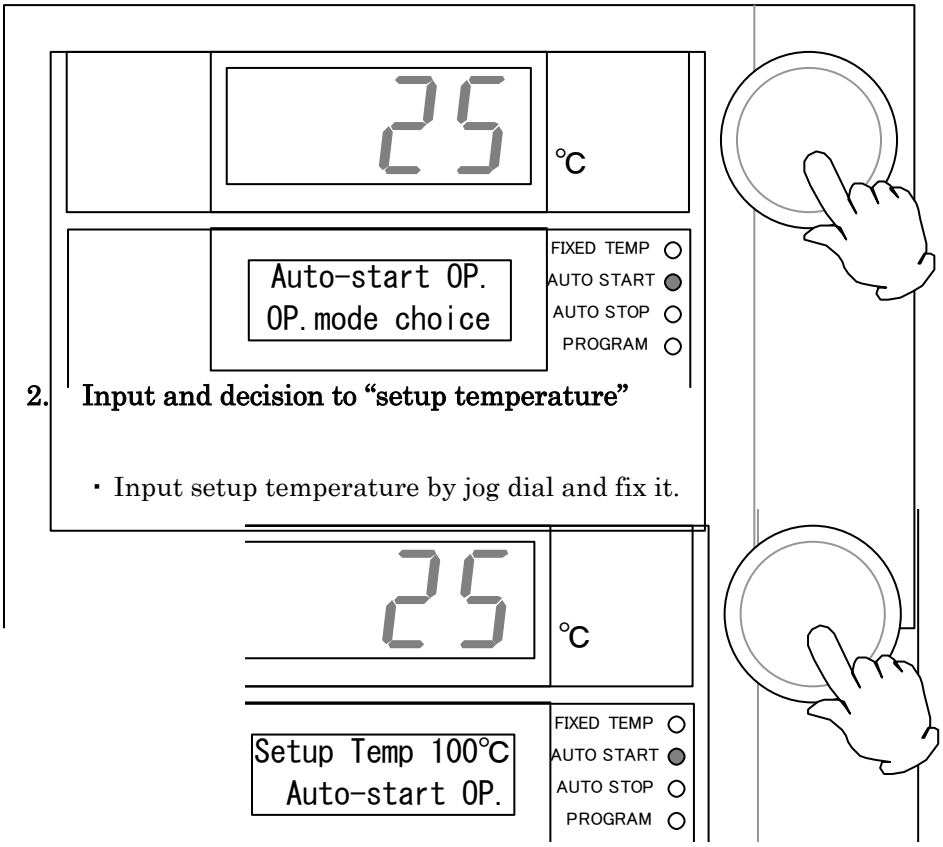
・Press “POWER” key to stop operation.



AUTO START OPERATION INSTRUCTION

1. Choose "Auto Start Mode"

・ Indicate "Auto start" at operation mode and press jog dial.



2. Input and decision to "setup temperature"

・ Input setup temperature by jog dial and fix it.

3. Input "Wait Time to operate / Start time"

・ After setup temperature is decided, input screen for wait time to operate or start time appears. When timer mode setup indicates "Wait Time", you can input wait time to operate and when "Start Time" is indicated, you can input start time to operate.
※ When it is forwarded from factory, "Wait Time" is selected. Concerning timer mode, refer to page 43.

Wait Time 30min
Auto-start OP.

(Input screen for wait time)

Start Time 0:00
Auto-start OP.

(Input screen for start time)

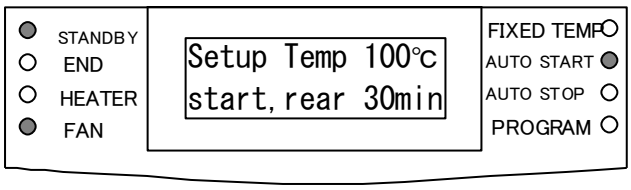
・Time range for inputting wait time to operate to be displayed changes according to the range.

Range	Indication
0 min～５９min	０ｍｉｎ～５９ｍｉｎ
1 hour～９９hours５９min	１ｈ００ｍ～９９ｈ５９ｍ
１００hours～９９９hours	１００ｈｒ～９９９ｈｒ

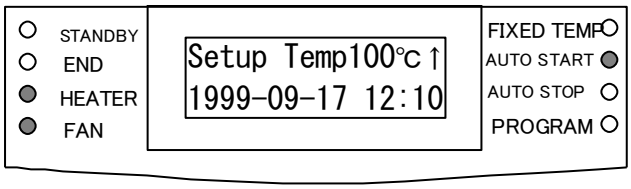
・Turn the jog dial indicate to hoping hour or time.

4. Press ”Jog dial”

・After wait time/start time is decided, it will go into wait time for auto start mode operation. “Auto start lamp” will change from blink to flash and “Standby lamp” will blink. Sub display indicates setup temperature and remaining time for startup.

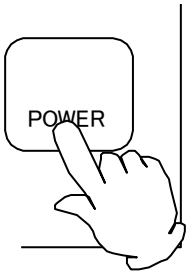


・When remaining time becomes 0, operation begins. When operation begins, “Standby Lamp” goes out and sub display indicates the same display as is shown in fixed temperature operation.



5. How to “Stop”

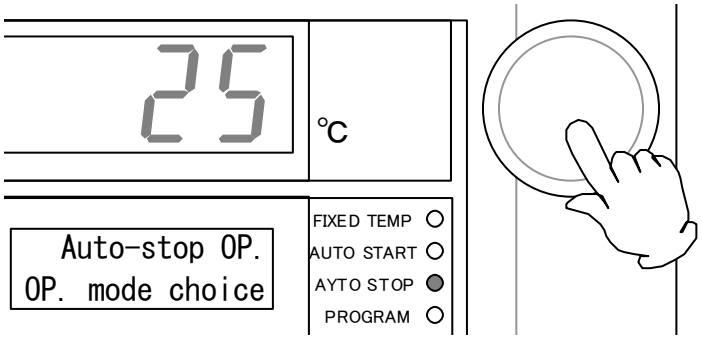
・If you want to suspend the state of operation waiting or stop operation halfway, press “POWER” key.



AUTO STOP OPERATION METHOD

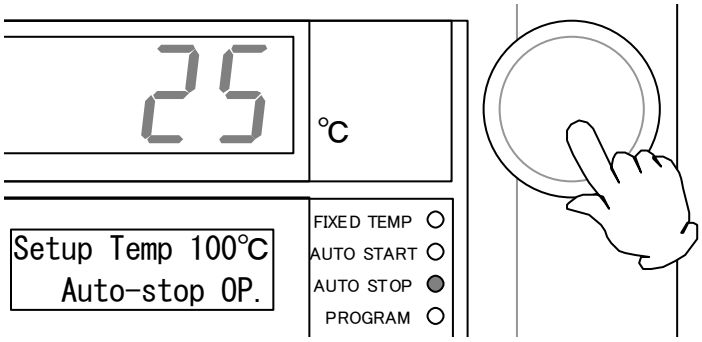
1. Choose “Auto stop”

・ Have “Auto stop” display on operation mode choice screen and press jog dial.



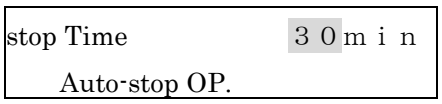
2. Input “Setup temperature” and fix it

・ Input setup temperature by jog dial and fix it.



3. Input and fix operation time / operation stop hour

・ When setup temperature is fixed, input screen for operation time or Auto stop operation appears. If timer mode setup indicates “Time”, it is to input operation time. If it indicates “Hour”, it is to input the hour to stop operation.



(Edit screen for operation time)



(Edit screen for operation stop hour)

・ Turn jog dial to have designated time or hour display and press the jog dial.

4. To choose and fix “Wait function”.

- Choice screen for wait function is displayed only when it is set as “Time” of timer mode. It is not displayed when it is set as “Hour” of timer mode, so proceed to the next stage “Choice of fan”.
- Turn jog dial to choose either “On” or “Off” and press the jog dial to fix it.



(Wait function choice screen)

5. Choose “Fan”.

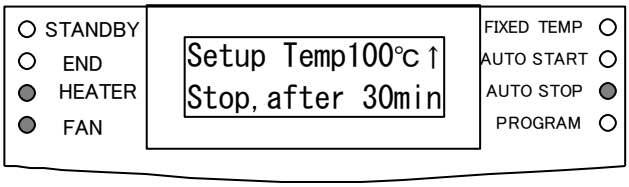
- Turn jog dial to choose either “On” or “Off” and press the jog dial to fix it.



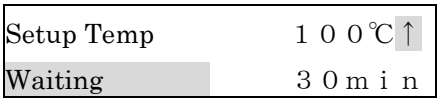
(Fan choice screen)

6. Press Jog dial.

- Fan function is fixed and auto stop mode operation starts. “Auto stop lamp” will change from blink to flash and sub display indicates temperature and remaining time toward operation stoppage.

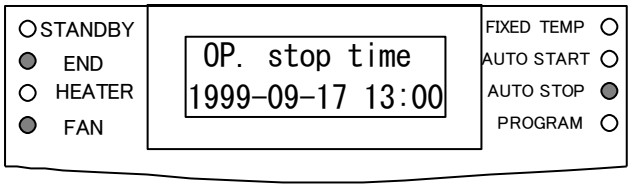


- While wait function is “On”, when temperature of the inside of chamber is lower by 3℃ or more, or higher by 6℃ or more than setup temperature, timer countdown will be suspended for a while and sub display indicates blinking sign of “Waiting”.



(Indication in wait)

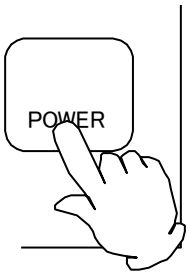
- When remaining time is up, operation stops. When operation stops, “End lamp” blinks and sub display indicates operation stop time.



- When you choose “Off” on fan function, fan will stop at the same time that operation stops.

7. How to stop

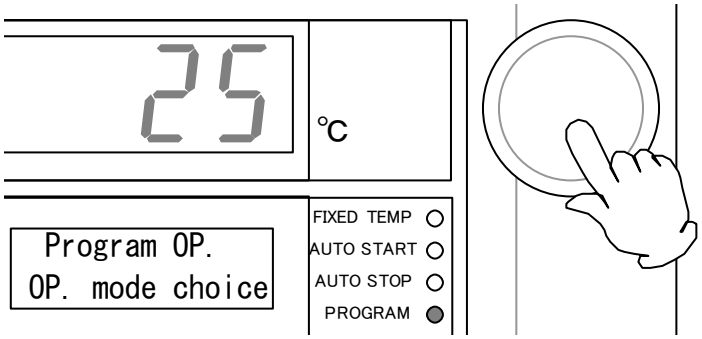
- Press “POWER” key if you want to suspend operation.



・To carry out program operation, register program at the beginning through program menu.

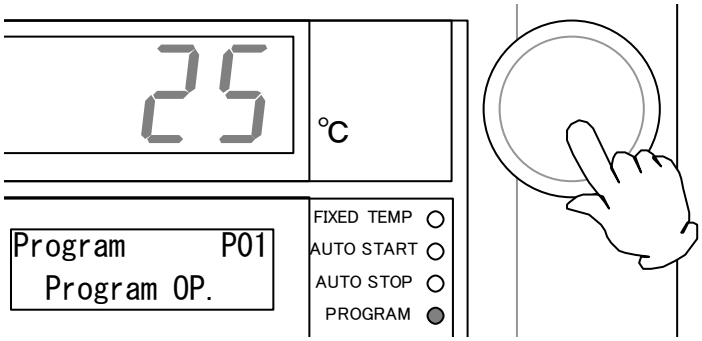
1. To choose "Program operation mode"

・To have "Program operation" display on operation mode choice screen and press jog dial.



2. To choose "Program number" and fix it.

・Choose program number by jog dial and fix it.



・In case no program is registered, after beep sound of buzzer and sub display indicates message. In that case register the program again and do it over from the beginning on "Program menu".

A program isn't Registered

(Indication in no program)

3. To edit operation wait time / hour

- When program number is fixed, edit screen for wait time or start time appears. When timer mode setup indicates “Wait Time”, it is to edit wait time to operate and when “Start Time” is indicated, it is to edit start time to operate.

Wait Time	３０ｍｉｎ
Program OP.	

(Edit screen for wait time to operation)

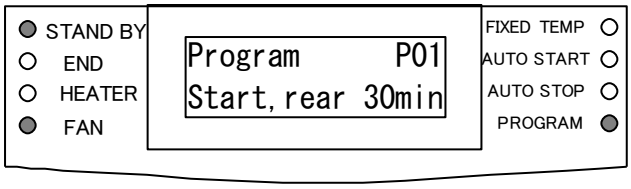
Start time	０：００
Program OP.	

(Edit screen for start time for operation)

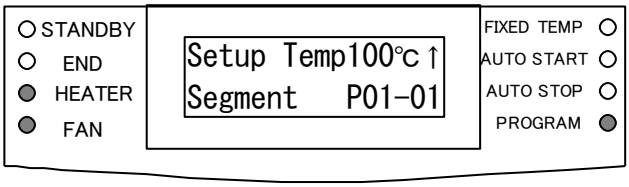
- Turn jog dial and have designated time or hour display.

4. To press jog dial

- Wait time / Start time will be fixed and it will go into operation standby of program operation mode. While operation is in the state of waiting,” Program lamp” changes from blink to flash and “Standby lamp” blinks. Sub display indicates program number and remaining time toward operation startup.



- When remaining time becomes 0, program operation begins. When operation begins, “Standby Lamp” goes out and sub display indicates segment number which is being carried out and setup temperature.



- While lamp is turned on, segment number and remaining time of Ramp time are displayed alternately.

Setup Temp	１００℃↑
Segment	Ｐ０１－０１

(Segment number during the practice)

↓

Setup Temp	１００℃↑
Ramp after	３０ｍｉｎ

(The rest time of the Ramp time)

・During Soak operation, segment number and rest time of Soak time are displayed alternately. However in case of waiting the blinking message “Waiting” is shown.

Setup Temp	１００℃↑
Segment	Ｐ０１－０１

(Segment number during the practice)

↓

Setup Temp	１００℃↑
Soak , after	３０ｍｉｎ

(The rest time of the Soak time)

Setup Temp	１００℃↑
Waiting	３０ｍｉｎ

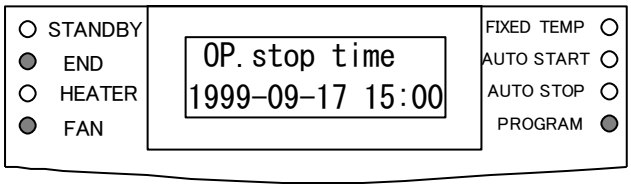
(A case during the wait)

・While segment of repeat section is being carried out, segment number and the rest number of repeat times are displayed alternately.

Setup Temp	１００℃↑
Rep. rest	１０

(The rest number of times of the repeat)

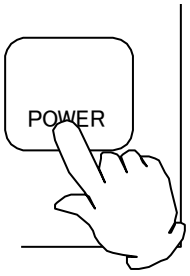
・When program operation ends, “END” lamp blinks and sub display indicates the time when the operation ends.



・When you choose “Off” in setting fan-spinning speed of program segment, fan will stop at the same time that operation ends.

5. How to stop

・If you want to suspend the state of operation standby or stop program operation halfway, press “POWER” key.



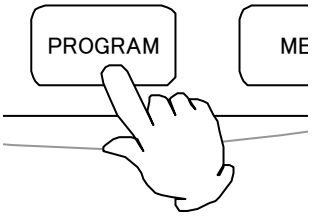
Program menus are three kinds.

No.	Function name	Contents
1	New program making	Function to make new program and register
2	Program editing	Function to edit and check registered program
3	Program deletion	Function to delete registered program

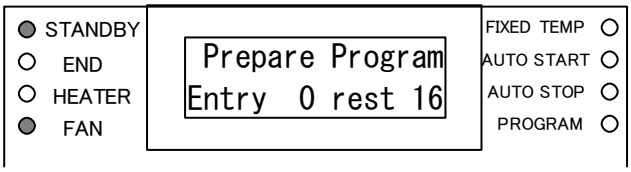
To choose program menu function

・Make sure that power is ON.

1. Press "PROGRAM" key



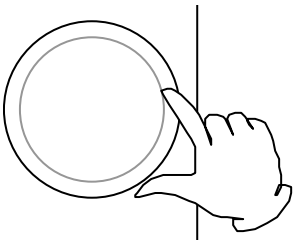
・Program menu starts up and function choice screen appears.



・Sub display indicates the number of registered program, the number of remaining segment and also blinking display of function name which is being chosen.

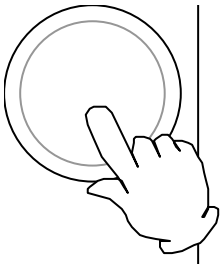
No.	Function name	Sub display
1	Prepare Program	Prepare Program Entry 0 rest 16
2	Edit Program	Edit Program Entry 0 rest 16
3	Delete Program	Delete Program Entry 0 rest 16

2. Turn “Jog dial”



・Function name is replaced by turns.

3. Press “Jog dial”



・Kind of function is fixed and input screen of each function appears.

4. How to cancel

・If you want to cancel program menu halfway, press “PROGRAM” key again.

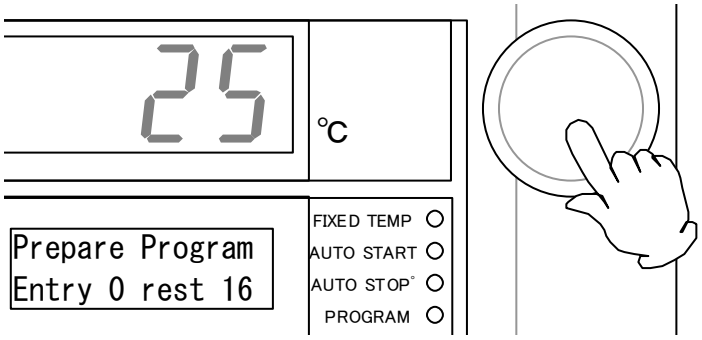


TO MAKE OUT NEW PROGRAM

・First of all, make sure that the number of remaining segment is not 0. In case the number is 0, delete either registered program before making new one.

1. To choose "Prepare Program"

・On function choice screen in program menu, have "Prepare Program" display and press jog dial.



2. To choose "Program number"

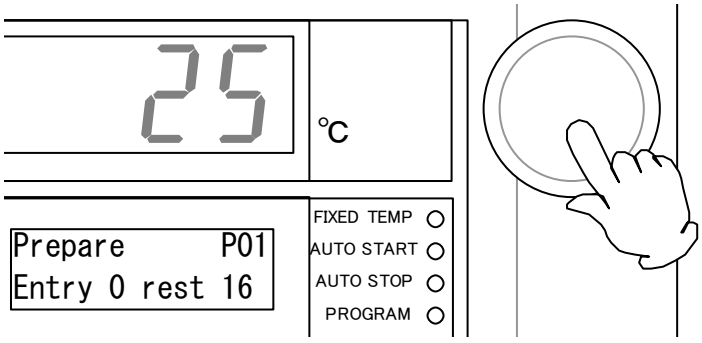
・Program number choice screen appears, sub display indicates "Prepare" and the number which indicates program number blinks. Turn jog dial to have the program number which you need display from "P01～P99".

＊ However program number which is already registered is not displayed.

Prepare			P 0 1
Entry	0	rest	1 6

(Program number choice screen)

3. Press "Jog dial"



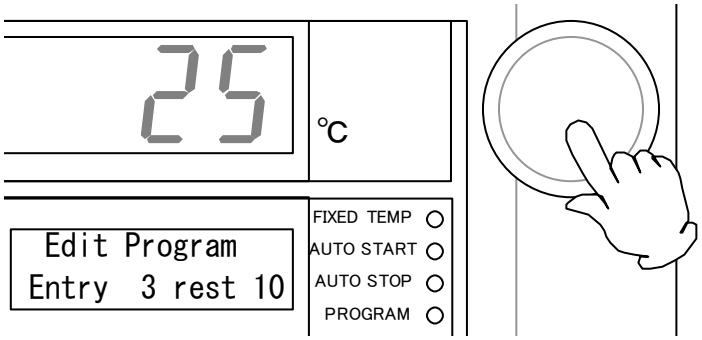
・This fixes program number. When program number is decided, "Edit Program" screen appears, so that you proceed to page 33.

TO EDIT PROGRAM

・First of all, make sure that program is already registered.

1. To choose "Edit Program"

・On function choice screen in program menu, have "Edit Program" display and press jog dial.



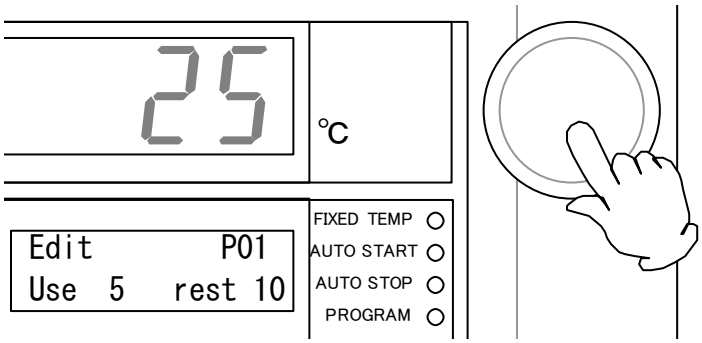
2. To choose "Program Number"

・Program number choice screen appears and sub display indicates "Editing" and the number which indicates program number blinks. Turn jog dial and have program number which you want to edit display among registered program. Sub display indicates the number of segment which chosen program uses and also the number of remaining segment on lower berth.

Editing	P 0 1
Use 5	rest 1 0

(Program number choice screen)

3. Press "Jog dial"



・This fixes program number. When program number is fixed, "Edit Segment" screen appears, so that you proceed to page 33.

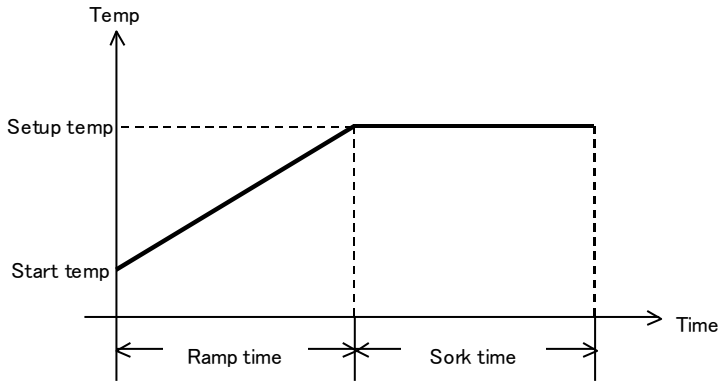
TO EDIT SEGMENT

・There are 12 kinds of setup items of 1 segment.（Full option installation）

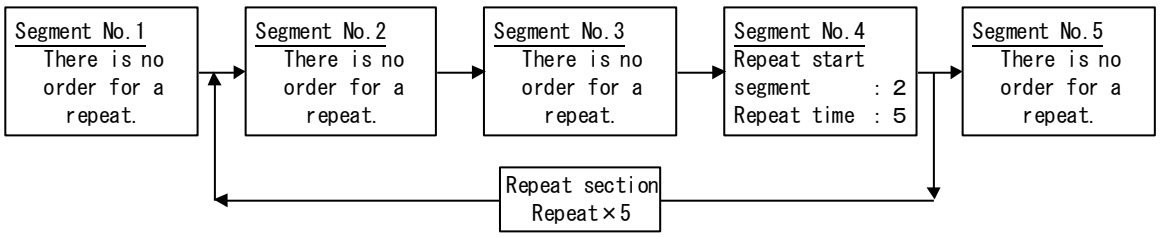
No.	Name	Setup range	Option
1	Ramp time	Step、1 min ～ 999 hr, End	
2	Setup temp	A setup temperature range by the model	
3	Soak time	0 min ～ 999 hr, Hold	
4	Wait mode	OFF, ON	
5	Fan	OFF, 1～10（or ON）※	○
6	Damper	0%, 25%, 50%, 75%, 100%	○
7	Event 1	OFF, ON	○
8	Event 2	OFF, ON	○
9	Event 3	OFF, ON	○
10	Event 4	OFF, ON	○
11	Rep. start segment	No, Segment number that 1 - 16 have been registered	
12	Rep count	1～9999, Infinity	

※ In case “Wind velocity variable device” option is not equipped, you can choose “On” or “Off” of fan only by “End segment”

・Concept of segment is shown as below. However “Start temp” corresponds to “Temperature of the inside of chamber” when you carry out segment number 1 just after program starts. Other than that case it will be “Setup temp” of segment, which is carried out most recently.



・Concept of repeat is shown as below. The number of repeat times does not include the first practice of repeat section.



1. To choose “Setup item”

・When program number is fixed by “Prepare Program” or “Edit Program”, setup item choice screen appears. Sub display indicates the name of item. Turn jog dial to choose one.

No.	NAME	Sub display
1	Ramp time	Ramp time ▶３０ｍｉｎ Ｐ０１－０１ rest １０
2	Setup temp	Setup temp ▶１００℃ Ｐ０１－０１ rest １０
3	Soak time	Soak time ▶３０ｍｉｎ Ｐ０１－０１ rest １０
4	Wait mode	Wait ▶OFF Ｐ０１－０１ rest １０
5	Fan	Fan ▶１０ Ｐ０１－０１ rest １０
6	Damper	Damper ▶０％ Ｐ０１－０１ rest １０
7	Event 1	Event 1 ▶OFF Ｐ０１－０１ rest １０
8	Event 2	Event 2 ▶OFF Ｐ０１－０１ rest １０
9	Event 3	Event 3 ▶OFF Ｐ０１－０１ rest １０
10	Event 4	Event 4 ▶OFF Ｐ０１－０１ rest １０
11	Rep. start segment	Rep. start ▶Ｓ０１ Ｐ０１－０１ rest １０
12	Rep count	Rep. count ▶９９９９ Ｐ０１－０１ rest １０
13	Append seg	Append seg. Ｐ０１－０１ rest １０
14	Program End	Program End Ｐ０１－０１ rest １０

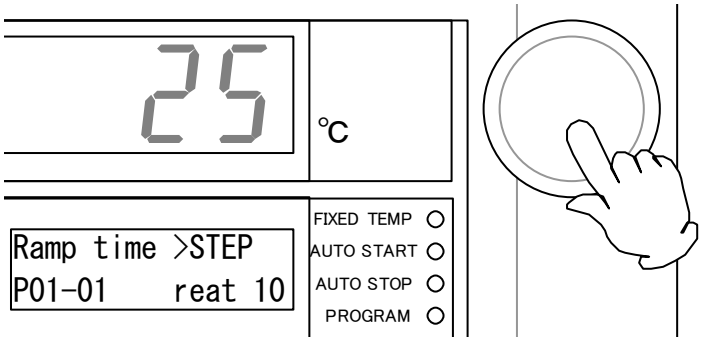
※ Sub display indicates program number and segment numbers which are being edited and also the number of remaining segment. If you turn jog dial, contents of all registered segment will be displayed. However items of “Append seg” and “Program End” are displayed after contents of final segment is displayed.

・Among setup items, some don't make any sense or of no effect according to conditions. Those will not be displayed as the setup item (in the cases mentioned below.)

Item name	Case of not displayed
Ramp time	It is constantly displayed.
Setup temp	It is not displayed when ramp time indicates "End".
Soak time	It is not displayed when ramp time indicates "End".
Wait mode	It is not displayed when ramp time indicates "End" and Soak time shows "Hold".
Fan	When "Wind velocity variable device" option is equipped it is constantly displayed. In case the option is not equipped it is displayed only when ramp time indicates "End".
Damper	While "Auto damper" option is equipped, it is constantly displayed. In case it is not equipped, it is not displayed.
Event 1～4	While "Event output" option corresponding to event function 1～4 is equipped, it is constantly displayed. When the option is not equipped, it is not displayed.
Rep. start segment	While ramp time indicates "End" and Soak time indicates "Hold", it is not displayed. It is not displayed also when it is inserted between repeat sections designated by other segment.
Rep count	It is not displayed when repeat start segment is not displayed and "Nothing".
Append seg	It is not displayed when ramp time indicates "End" and Soak time indicates "Hold".

※ It is impossible to change contents of program when it is in operation. In that case cursor "►" is not displayed on setup item choice screen. You can only check the contents.

2. Press "Jog dial"



・If you choose setup time and press jog dial, "Step Edit" screen appears. Blinking cursor "►" disappears and Step starts to blink.

Ramp time	►STEP
P 0 1 － 0 1	rest 1 0

(Choice screen)

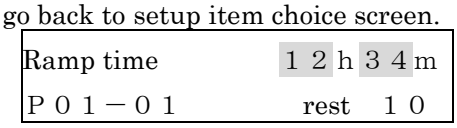
↓

Ramp time	STEP
P 0 1 － 0 1	rest 1 0

(Edit screen)

3. Input Step and fix

・Turn jog dial to have setup contents display and press jog dial.
After Step is fixed, you go back to setup item choice screen.



（Fix input content）

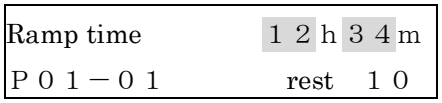
↓



（Choice screen）

4. How to cancel

・If you want to cancel the input of Step halfway, press “PROGRAM” key. Contents which are being input are cancelled and you go back to setup item choice screen.



（Cancel input content）

↓

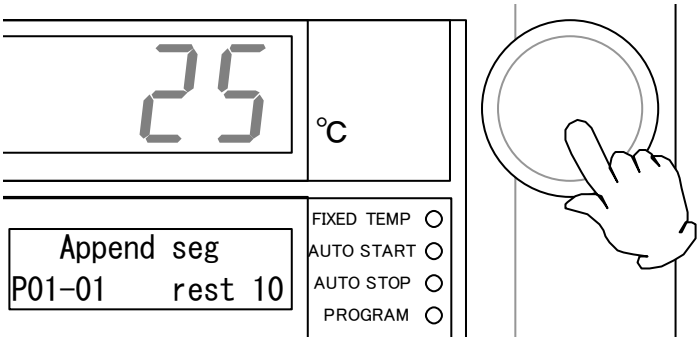


（Choice screen）

TO ADD SEGMENT

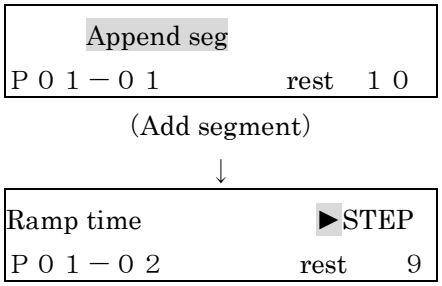
1. To choose "Append seg"

・On setup item choice screen, have "Append seg" display and press jog dial.



※ "Append seg" is not displayed when ramp time of last segment number indicates "End", sort time indicates "Hold" and the number of repeat times is "limitless". It is not displayed when key lock mode is "on" and program which is being edited is in operation.

・Segment number increases by one, while remaining segment number decreases by one. Then you go back to setup item choice screen and ramp time of appended segment number is displayed.



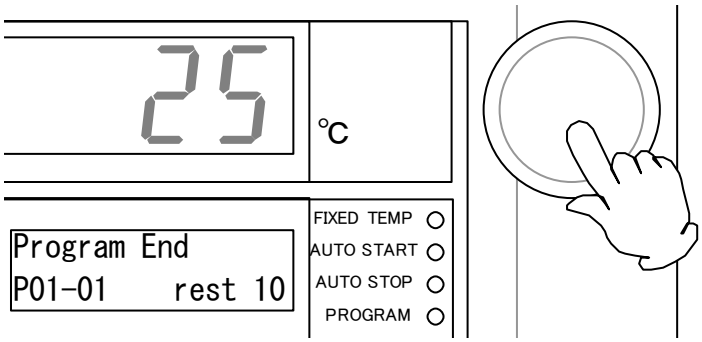
・Contents which are initially set up with appended segment are as follows. Segment which is carried out at the stage of program preparation has the same contents.

Item name	Initial value	Remarks
Ramp time	Step	
Setup temp	0℃	
Soak time	Hold	
Wait function	Off	Wait function is of no effect since Soak time indicates "Hold".
Fan spinning	10	It is effective only when option is installed.
Damper opening	0%	It is effective only when option is installed.
Event 1～4	Off	It is effective only when option is installed.
Repeat start segment	No	Repeat start segment is of no effect since Soak time indicates "Hold".
The number of repeat times	Infinity	The number of repeat times is of no effect since repeat start segment is of no effect.

TO FINISH PROGRAM EDITING

1. To choose "Program End"

・On setup item choice screen have "Program End" display and press jog dial.



※ You can end by pressing "PROGRAM" key on setup item choice screen, too.

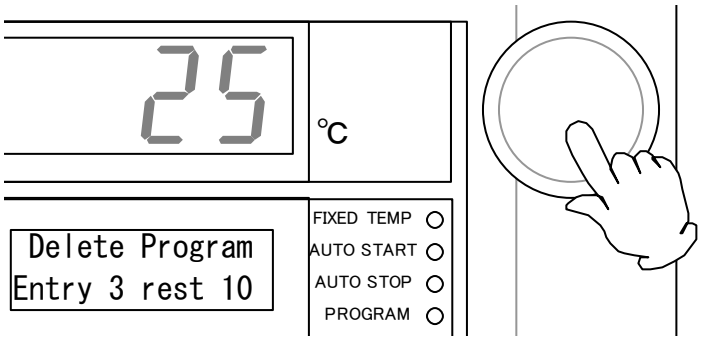
TO DELETE PROGRAM

・First of all, make sure that program is registered.

※ You can not delete program which is in operation.

1. To choose "Delete program"

・On function choice screen in program menu, have "Delete Program" display and press jog dial.



2. To choose "Program number"

・Program number choice screen appears. Have program number which you want to delete display and press jog dial.

Delete	P 0 1
Use 5	rest 1 0

(Choice screen for program number)

3. To confirm and choose "Yes"

・Confirmation screen to delete program appears. Check if it indicates the right program number to delete. Then choose "Yes" by jog dial and press it.

Delete it ?	No
Delete	P 0 1

↓

Delete it ?	Yes
Delete	P 0 1

※ You can cancel if you choose "No" at this stage or press "PROGRAM" key.

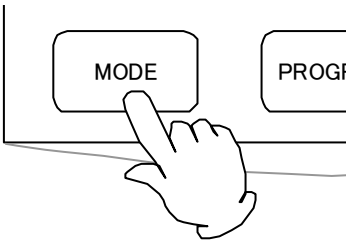
・ Function menu has following 9 items of function (Full option installation).

No.	Name	Function	Option
1	Timer mode	Timer mode setup	
2	Key lock mode	Key lock mode setup	
3	Buzzer mode	Buzzer mode setup	
4	Calibration offset	Calibration offset temperature setup	
5	Acc. Time	Accumulated operation time setup	
6	Date time	Date time setup	
7	Fan spinning	Fan spinning speed setup	○
8	Damper opening	Damper opening degree setup	○
9	Comm. Lockout off	Communication lockout mode setup	○

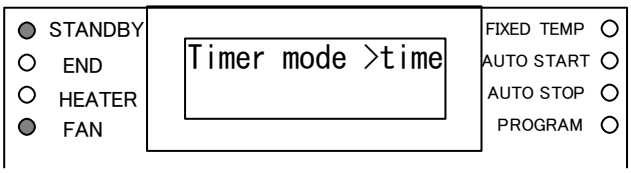
To select function menu item

・ Make sure that power is on.

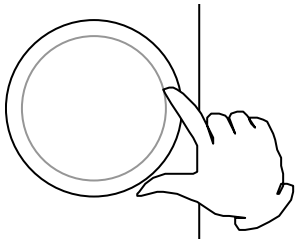
1. **Press "MODE" key**



・ Function menu starts up and item choice screen appears.



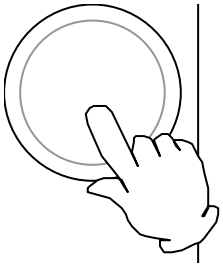
2. Turn “Jog dial”



・ Sub display shows name of item. Turn jog dial to choose one.

No.	Name	Sub display
1	Timer mode	Timer mode ▶time
2	Key lock mode	Key lock mode ▶OFF
3	Buzzer mode	Buzzer mode ▶ON
4	Calibration Offset	Calibrate ▶±０℃
5	Acc. time	Acc. time ４９９９９ｈｒ
6	Date/Time	Date ▶１９９９－１２－３１ Time ２３：５９
7	Fan	Fan ▶１０
8	Damper	Damper ▶０％
9	Comm. Lockout	Comm. Lockout ▶OFF

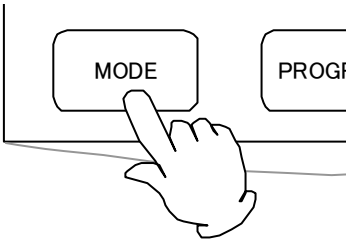
3. Press “Jog dial”



- Either input screen for each item or operation screen appears.

4. How to cancel

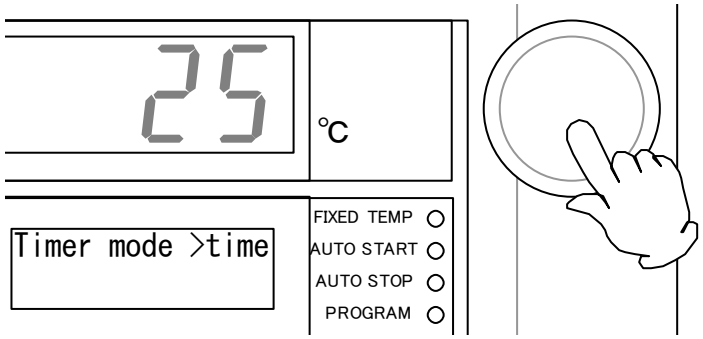
- If you want to cancel item choice halfway, press “MODE” key again.



※ It is impossible to change contents of operating timer mode when auto start mode is setup in wait time, auto stop is in operation and program operation mode is set up in wait time.

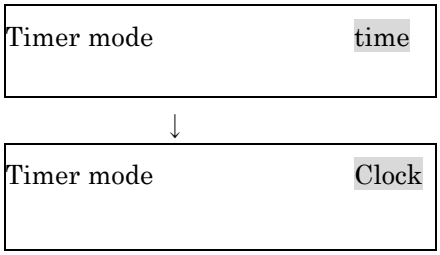
1. To choose the "Timer mode"

・ On item choice screen in function menu, have "Timer mode" display and press jog dial.

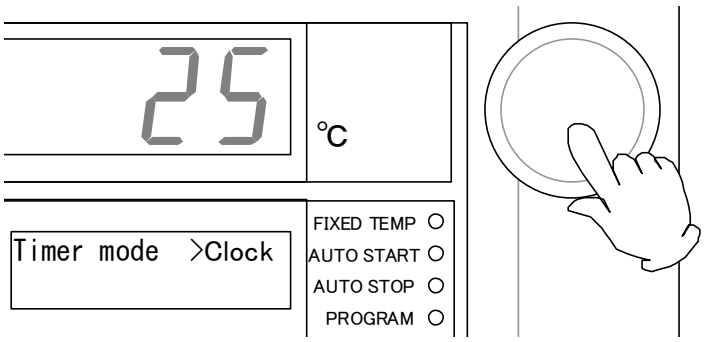


2. To choose "mode"

・ "►" cursor disappears and current mode blinks. Turn jog dial and have either "Time" or "Clock" display.



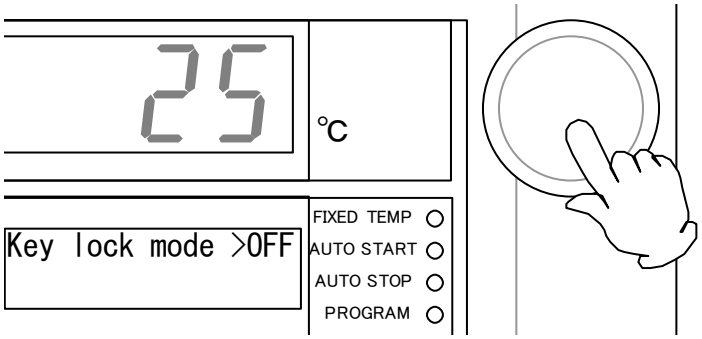
3. Press "Jog dial"



・ Timer mode is fixed and it goes back to item choice screen in function menu.

1. To choose “Key lock mode”

・ On item choice screen in function menu, have “Key lock mode” display and press jog dial.



2. To choose “Mode”

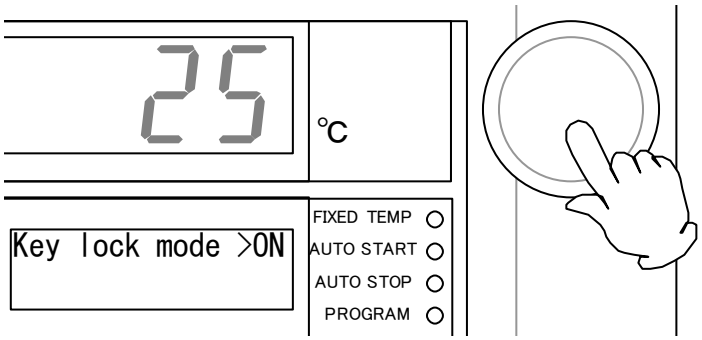
・ “►” cursor disappears and current mode blinks. Turn jog dial to have either “On” or “Off” display.

Key lock mode	OFF

↓

Key lock mode	ON

3. Press “Jog dial”



・ Key lock mode is fixed and it goes back to item choice screen in function menu.

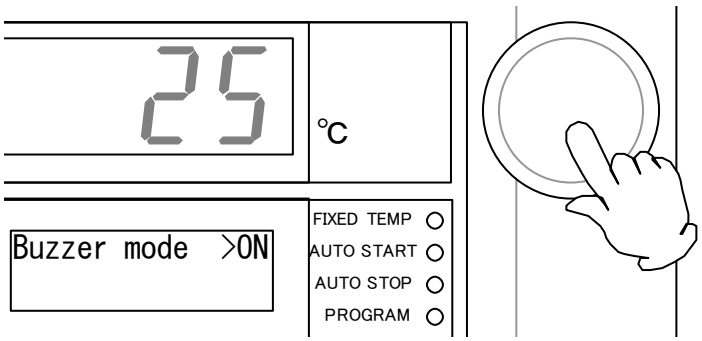
※ If you turn on “Key lock mode”, you cannot change content of program and setup content of some function menu. Sub display indicates “Key being locked”.

Setup temp.	１００℃↑
Key being locked	

（Ex. In case of fixed temperature）

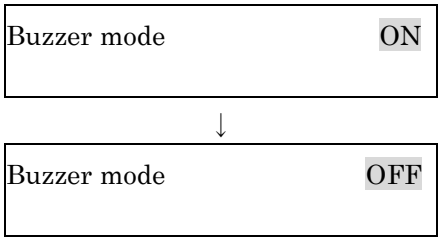
1. To choose “Buzzer mode”

・ On item choice screen in function menu, have “Buzzer mode” display and press jog dial.

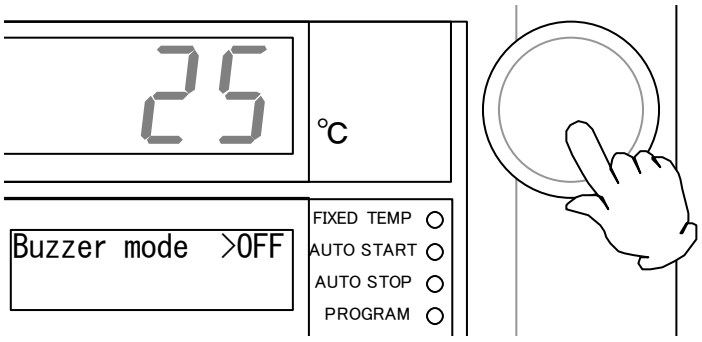


2. Choice of “Mode”

・ “►” Cursor disappears and current mode blinks. Turn jog dial to have either “On” or “Off” display.



3. Press “Jog dial”



・ Buzzer mode is fixed and it goes back to item choice screen in function menu.

※ If buzzer mode is “Off”, alarm buzzer in the abnormal, auto stop buzzer and program operation end buzzer don’t ring.

Outline of Function

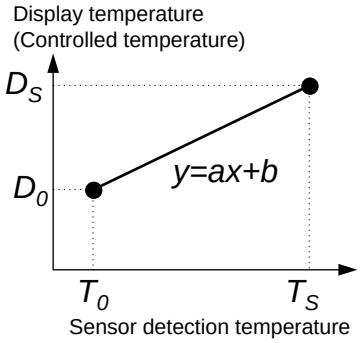


Fig. 1

In the Hi-tech IV controller, the relationship between the temperature T detected by the sensor and the display temperature of the operation panel D is expressed by the equation of the line which passes the two points (T_0, D_0) and (T_S, D_S) shown in Fig. 1.

Here, T_0 is the sensor detecting temperature when the chamber central temperature becomes the zero adjusting temperature (normally room temperature is adopted) D_0 at the time of no load, T_S is the sensor detecting temperature when the chamber central temperature becomes the span adjustment temperature (normally working maximum temperature is adopted) D_S at the time of no load in the same way.

As it is clear from the facts above, conforming of the chamber central temperature and the display temperature is guaranteed only when there is no load and at two points shown above. In other words, it is possible for a temperature measured at a point in the chamber does not conform to the display temperature of the operation panel at a voluntary temperature without load.

This is the function to move the line which passes above two points to the Y axis direction in parallel (increase or decrease y intercept of the line). The parallel movement amount including a sign is defined as the calibration offset. This function can conform the display temperature of the operation panel to the measurement temperature of a voluntary point in the chamber at a voluntary temperature.

Calibration Offset

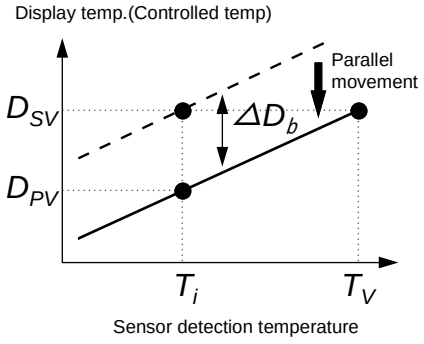


Fig. 2

In Fig 2, D_{SV} is a display temperature of the operation panel under the condition that the temperature in the chamber is constant for a set temperature. It is natural to say that this value is equal to the target set temperature. D_{PV} is a measurement temperature of a voluntary point in the chamber under this condition. The difference between D_{PV} and D_{SV} including the sign is defined as the calibration offset. Therefore offset is shown as below.

$$\triangle D_b = D_{PV} - D_{SV} \qquad \text{Equation 1}$$

In Fig. 2, $\triangle D_b$ becomes the negative value since the target set temperature D_{SV} is larger than the actually measured temperature D_{PV}.

In order to conform the display temperature to the actually measured temperature, let the controller to recognize that the temperature in the chamber differs from the target set temperature by $\triangle D_b$.

NOTE: The setting tolerance of the calibration offset is ±10°C in model DF811/1011 and ±16°C in model DH811/1011. Initial offset value is set at 0°C

《Example for Reference》 When fixed value operation was started with the target setting temperature of 100℃, and we waited for sufficient time after the temperature displayed on the control panel had reached 100℃, then we measured temperature at one point within the chamber using a thermometer, which was 97℃.

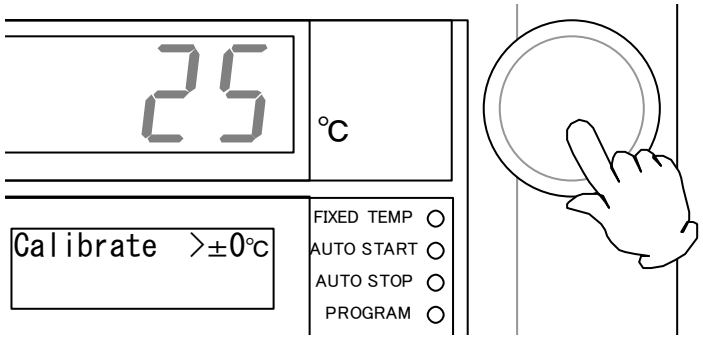
Then adjust the control panel so that the temperature displayed on it will be the same as the specified, i.e., 97℃, using the calibration offset function.

The calibration offset $\triangle D_b$ is calculated with the formula 1、 (" actual measured temperature" —" displayed temperature") as shown below:

$\triangle D_b$: 97℃—100℃＝－3℃

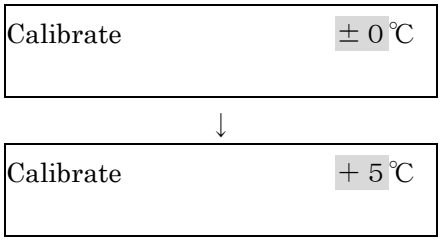
1. To choose "Calibration offset"

・On item choice screen in function menu, have "Calibrate" display and press jog dial.

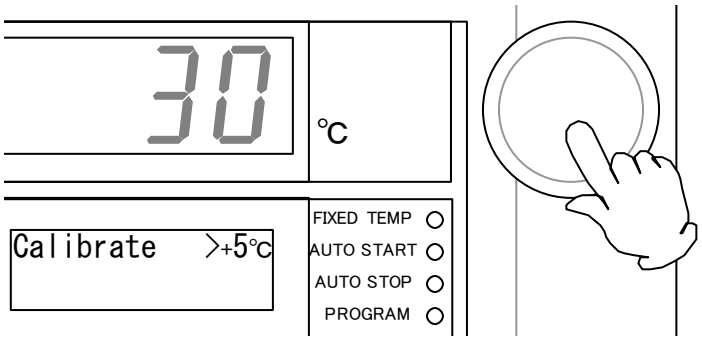


2. Input of "Offset temperature"

・"►" cursor disappears and current offset temperature blinks. Turn jog dial to set temperature and have it display.



3. Press "Jog dial"

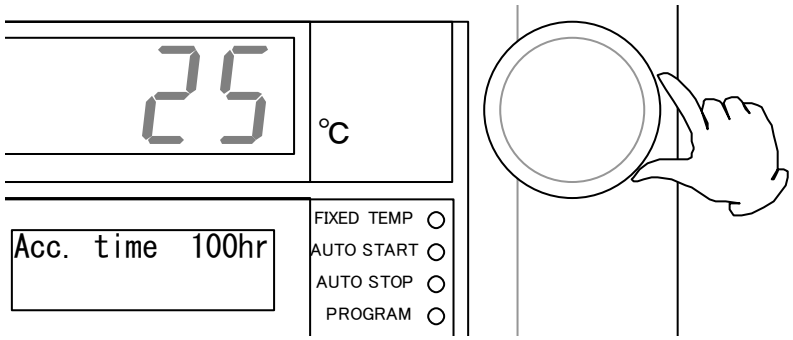


・Calibration offset temperature is fixed and it returns to item choice screen in function menu.

※ ”Accumulated operation time” is the function to check operation time of device. It is impossible to change its content

1. To have “Accumulated operation time” display

・ On item choice screen in function menu, turn jog dial and have “Acc. Time” display.



・ It displays accumulated operation time from factory shipment to the present.

Acc. time	１００ｈｒ

※ Accumulated operation time is accumulation of time during which power is not off. Standby time, wait time and operation end time are also accumulated as operation time.

2. Press “MODE” key

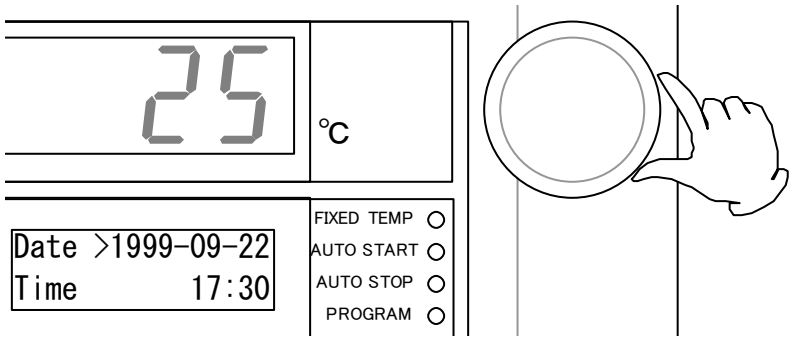
・ After checking content, press “MODE” key to cancel function menu.

※ At the time of factory shipment, clock is not set correctly. Adjust it according to time signal etc. before using.

※ When timer mode is set for "Time", if auto start mode is set, auto stop mode is in operation and program operation mode is set for wait time, it is impossible to change its setup content of clock. Try again after pressing "Power key and stop operation.

1. To have "Date/Time" display

・ On item choice screen in function menu, turn jog dial and have "Date" and "Time" display.



・ Current date and time are displayed.

Date	▶1999－09－22
Time	17：30

2. To choose "Setup item"

・ If you turn jog dial, "▶" cursor moves from "Year", "Month", "Day", "Hour" and "Minute" in order. Choose item which you want to set and press jog dial.

Date	▶1999－12－31
Time	23：59

↓

Date	1999▶12－31
Time	23：59

↓

Date	1999－12▶31
Time	23：59

↓

Date	1999－12－31
Time	▶23：59

↓

Date	1999－12－31
Time	23▶59

3. Input of “Setup figure”

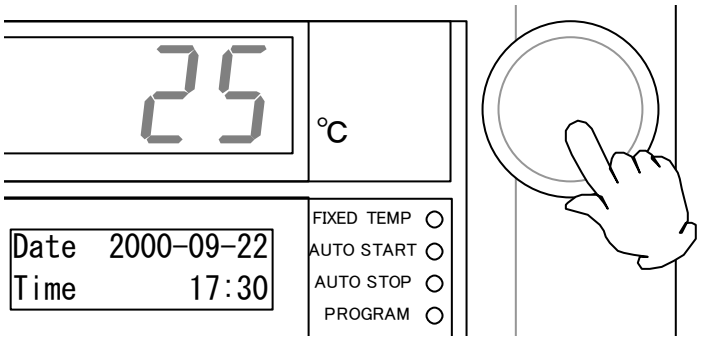
- “►” cursor disappears and current setup figure blinks. Turn jog dial to change the figure.

Date	１９９９－０９－２２
Time	１７：３０

↓

Date	２０００－０９－２２
Time	１７：３０

4. Press “Jog dial”



- Setup figure of clock is fixed and it returns to item choice screen in function menu.

※ In the following cases setup figure of fan speed by each operation mode is displayed and is impossible to change it.

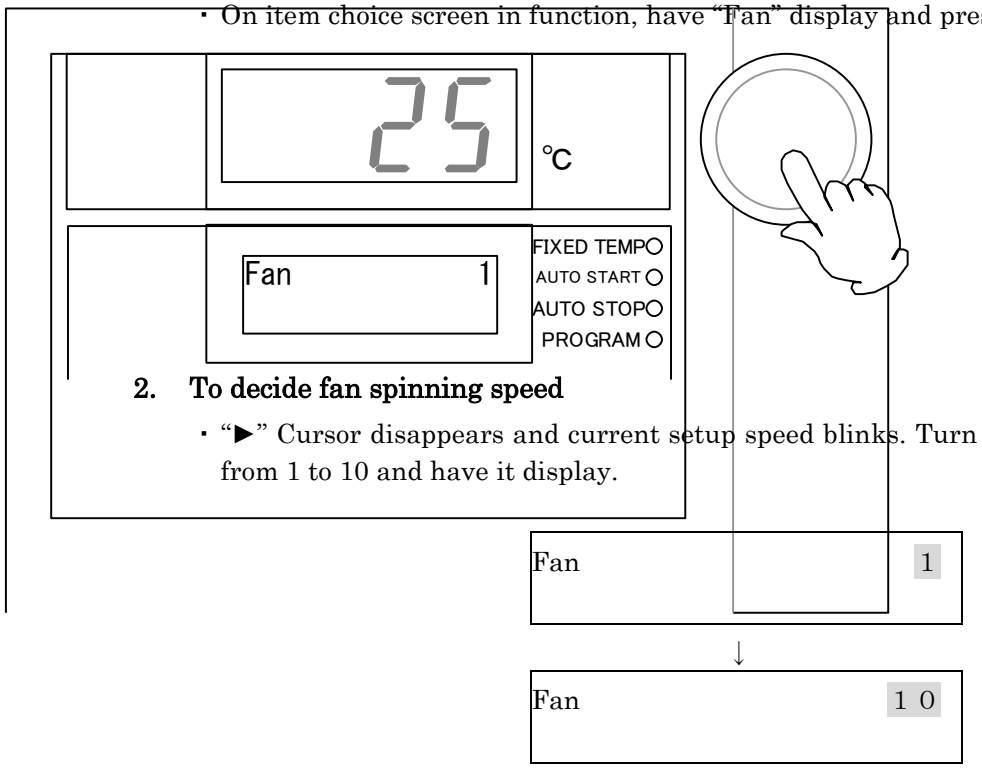
ⅰ〕 When operation ends by auto stop operation mode and function parameter is off

ⅱ〕 While program operation mode is in operation or it stops after operation.

ⅲ〕 In case of remote operation mode.

1. To have "Fan" display

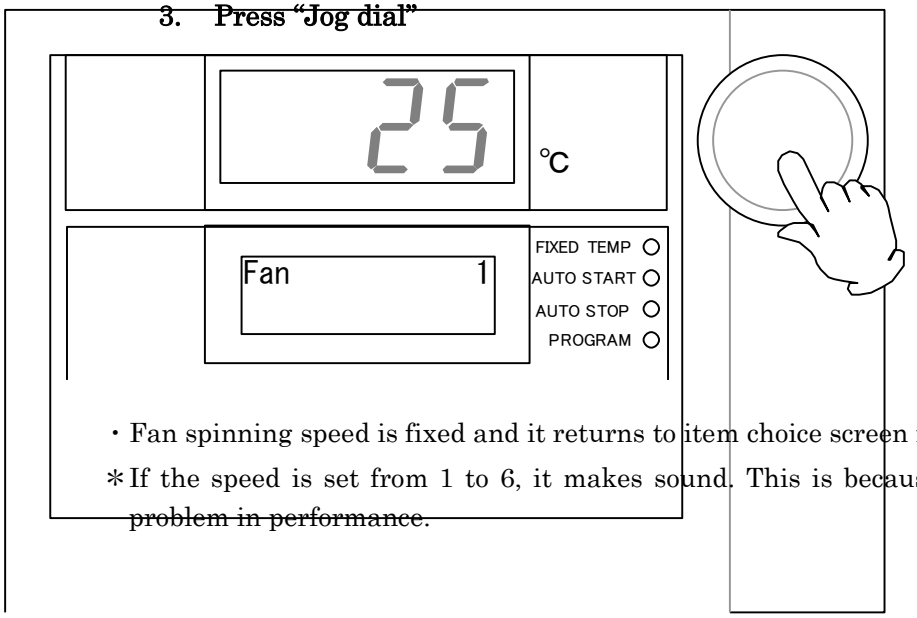
・On item choice screen in function, have "Fan" display and press jog dial.



2. To decide fan spinning speed

・"►" Cursor disappears and current setup speed blinks. Turn jog dial to decide the speed from 1 to 10 and have it display.

3. Press "Jog dial"



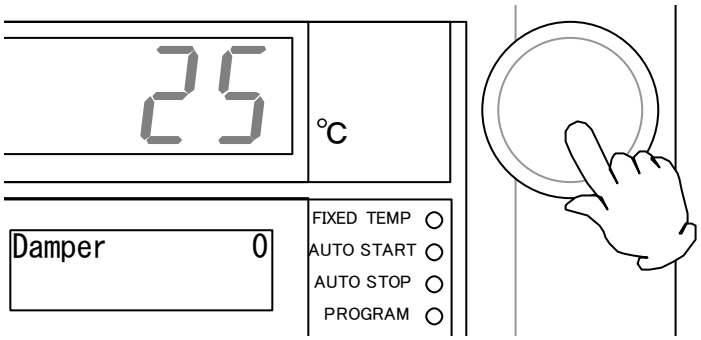
・Fan spinning speed is fixed and it returns to item choice screen in function menu.

＊If the speed is set from 1 to 6, it makes sound. This is because of wind control and there is no problem in performance.

※ It is impossible to change the content while it is in program operation, after the operation ends or when it is in remote operation mode.

1. To have "Damper" display

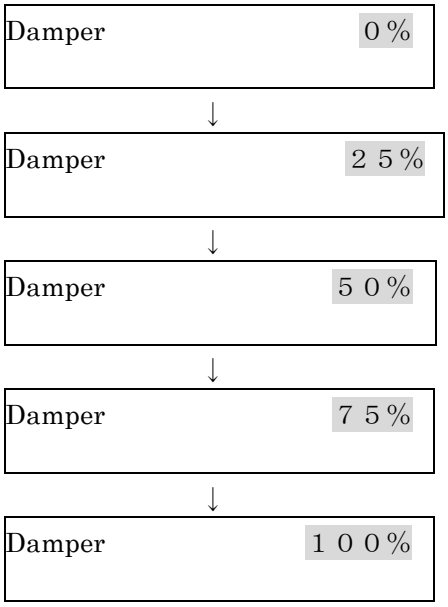
・On item choice screen in function menu, have "Damper" display and press jog dial.



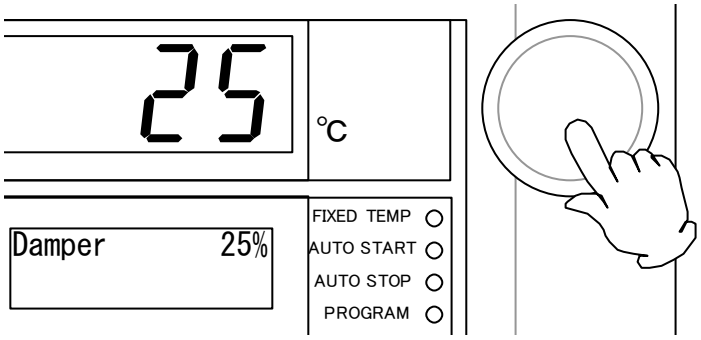
2. To decide damper opening degree.

・"►" cursor disappears and current damper opening degree blinks.
(At the time of shipment from factory, it is entirely closed.)

Turn jog dial to choose one from among five degrees, "0", "25", "50", "75", or "100" and have it display.



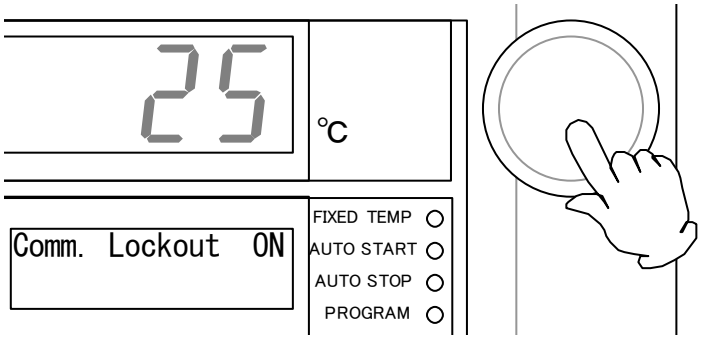
3. Press “Jog dial”



・ Damper opening degree is fixed and it returns to item choice screen in function menu.

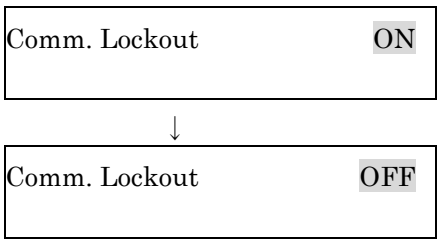
1. To choose “Comm. Lockout”

- On item choice screen in function menu, have “Comm. Lockout” display and press jog dial.

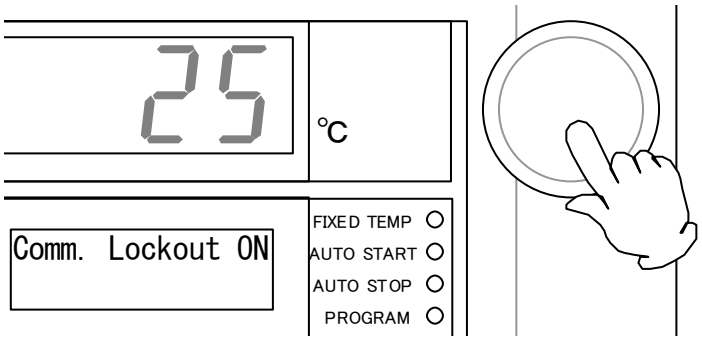


2. To choose “Comm. Lockout”

- “►” cursor disappears and current mode blinks. Turn jog dial and have either “On” or “Off” display.



3. Push the Jog dial



- Communication lockout is set and it returns to item choice screen in function menu.

INDEPENDENT OVERHEAT PREVENTION

There are two safety devices in this unit: the auto-overheating preventive function of the controller (automatic recovery) and the independent overheating prevention (manual recovery). Circuits and sensor that are independent from the controller configure them. These safety devices for the temperature overheating prevention protect the instrument in a fail-safe method.

●Setting the Temperature Range and Function

Setting Temperature:	0 to 399℃
Input Method:	Three integer digital switch. Turn the drum of each column and set the desired value. The first integer can only be from 0 to 3 for hundred columns.
Function:	Heater output is cut off when the measured temperature gets higher than the set temperature of the independent overheating prevention. The function is active when the earth leakage breaker is ON. When the independent overheating prevention is activated, is flashing on the main display with the **TROUBLE** lamp flashes. When the independent overheat prevention is active while the heater is in the temperature rising process, etc., and flash alternately on the display.

●Activation/Setting Method

① Set the independent overheating prevention 15°C higher than the set temperature of the main unit.

② When setting the proper value to protect the sample, be sure it is well above room temperature, and set it at least 15°C higher than the maximum temperature set value of the temperature pattern of the program.

③ When the independent overheating prevention is activated improperly by changing the setting of the independent overheating prevention lower than the internal temperature or by continuing operation when the setting on the unit is too low, turn off the earth leakage breaker to reset the unit and perform the setting again. If it is activated by another reason, see chapter of Safety Devices and Error Codes on page 12.

●Precautions

① When you have set any number other than 0～3 to the hundredth place on the digital switch, that digit will be invalid. Note, for example, if you set a temperature to 450℃, the actual setting will be 50℃.

② Set temperature can change by touching the setter when cleaning. Always confirm that the set temperature is correct after cleaning or before operation.

Daily check/care

⚠ WARNING

- Before starting inspection or maintenance, disconnect the power plug from the receptacle.
- Conduct inspection and maintenance only after the oven has cooled down.
- Never attempt to disassemble devices.

⚠ Caution

- Wipe off any dirt with a well wrung out soft cloth. Never use benzene, thinner, or scorching powder or rub with a hard brush. Otherwise, deformation, deterioration, or discoloration may result.

Monthly servicing

●Examine short circuit breaker function.

- Put power supply code in and test it with electricity turned on.
- First, turn on short circuit breaker.
- Next, press red test button on short circuit breaker by using the point of ballpoint pen etc. If short circuit is turns off, then it is normal.

●Check the operation of the independent overheat preventive device.

- After executing the fixed temperature operation at the set temperature 0℃, set the operation temperature of the Independent Temperature Overheating Prevention Device to 0℃.
- Under normal circumstances, the heater circuit is cut off in a few seconds and the TROUBLE lamp and E-07 flashes at the same time, and the alarm buzzer sounds if the alarm buzzer function is ON.

※ Be sure to perform operation check for the electric leakage breaker and the independent overheat preventive device before a long time operation or unmanned operation during nighttime.

When you do not use the oven for a long period of time

⚠ CAUTION

Long Storage and Disposal

●Disconnect the power plug from the receptacle.

⚠ WARNING

When you dispose of the oven

●Do not leave it where children can access. Remove the knob and hinges of the door to disable the door locking system.

AFTER SERVICE AND WARRANTY

If a Service Call is required

If any error should occur, record the error message and stop operation immediately. Turn OFF power supply and unplug the power cord from the receptacle. Then contact the shop from which you have purchased the product or our office.

(Data necessary for information)

- Model of your oven;
- Serial product number of your oven;
- Date of purchase
- Check to find the date in the guarantee card or the nameplate attached to the unit.
- Problem with your oven (as detailed as possible)
- Be sure to present the guarantee card when our service personnel visits your site.

Warranty Card (attached to your Oven)

- Please fill out completely and return the bottom portion of the warranty card when the unit is received. The completed top portion is your Registration Card that should be retained for your records.
- Warranty period is one (1) year after the date of your purchase. During this warranty period, we will offer free repair service on the basis of the conditions provided on the warranty card.
- If you need repair service after expiration of the warranty period, contact our sales or service representative in your vicinity or service office for advice.

Minimum Inventory Period of Repair Parts

Repair parts will be available for at least 7 years after termination of our production of DF・DH Fain Oven Series. Repair parts mean the parts that are necessary to maintain the performance of the ovens.

TROUBLESHOOTING

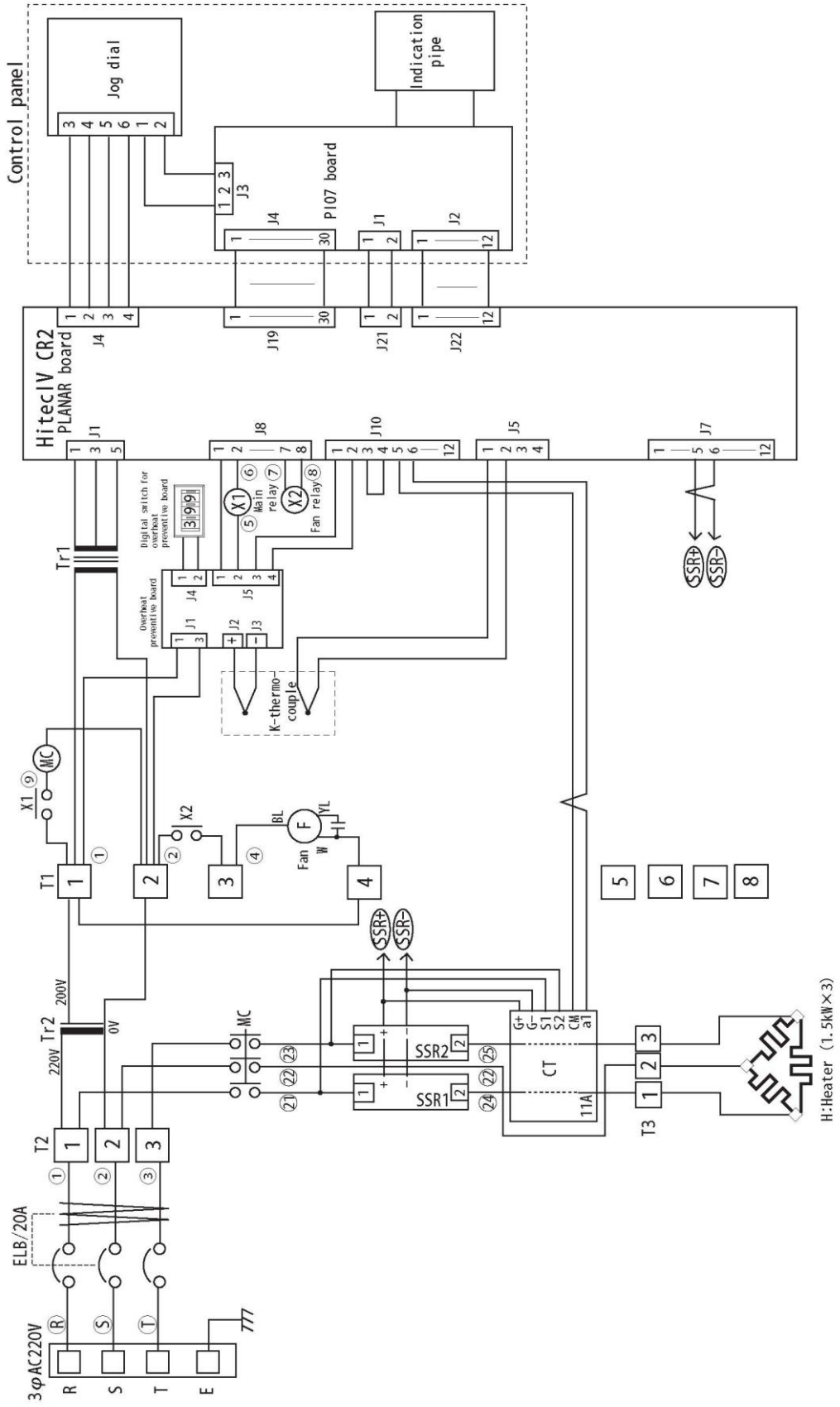
Symptom	Please check
Even if the electric leakage breaker is turned on, the current time will not appear on the sub display.	●Is the power cord securely connected to the outlet or to the switch board? ●Is power not failed?
Temperature fluctuates during operation.	●Check if you have put too much sample. ●Is change in environmental temperature too much?
The specified temperature cannot be attained.	●Check if you have put too much sample.

Model		DF811	DF1011	DH811	DH1011
Performance	Operating temperature	+40～200℃		+40～300℃	
	Temperature stability*1	±0.2℃ (at 200℃)		±0.3℃ (at 300℃)	
	Temperature uniformity*1	±3.0℃ (at 200℃)		±5.0℃ (at 300℃)	
	Time to reach mix. temp.*1	Approx. 60 min (to 200℃)		Approx. 60 min (to 300℃)	
Function / structure	Temperature control method	PID control by microprocessor			
	Temperature / timer setting method	Digital setting and display by jog dial			
	Temperature indicating method	Digital indication by green LED			
	Other indication	Text display by fluorescent display that indicates function information			
	Timer	1 min. to 99 hrs. 59 min. or 100 hrs to 999 hrs			
	Operation function	Fixed temperature operation、Auto-start/Auto-stop operation Program operation (Max. 16 segments, repeat, ramp operation, etc.)			
	Additional function	Calendar timer function (actual hr. timer within 24 hrs.) Integrating time function (Integrated hr. up to 49999 hrs. can be measured.) Calibration offset function Time indication(The present time is indicated)			
	Safety device	Self-diagnostic function (Temp. sensor abnormality, heater disconnection, Triac short circuit detection, automatic temperature over-rise prevention), Key lock function, Independent Temperature Overheat Prevention device, Short circuit breaker			
	Sensor	K-thermocouple (double sensor)			
	Heater	Stainless steel pipe heater with fan			
	Heater nominal capacity (kW)	4.5	6.0	6.9	9.0
	Blower fan motor	Shaft current fan (Condenser 20W, ×2 for model 1011)			
	Cable port	Inner diameter 30 mm (rear face)			
	Insulation	Glass wool		Glass wool + Ceramic fiber	
	Other additional structure	Exhaust damper（Manual operation）			
Standards	Internal dimensions*2 (W×D×H mm)	800×800×800	1000×1000×1000	800×800×800	1000×1000×1000
	External dimensions*2 (W×D×H mm)	1500×1015×1330	1700×1215×1530	1500×1015×1330	1700×1215×1530
	Capacity (l)	512	1000	512	1000
	Shelf board weight capacity	Approx 30 (kg)			
	Shelf brackets	10			
	Shelf brackets pitch	76	98	76	98
	Power Requirements 50/60Hz	AC220V 3-phase 16.5A	AC220V 3-phase 22A	AC220V 3-phase 24A	AC220V 3phase 33A
	Weights (kg)	Approx. 180	Approx. 250	Approx. 180	Approx. 250
Accessories		Shelf board（Stainless steel wire）			
		3 (Shelf bracket 6)	3 (Shelf bracket 6)	3 (Shelf bracket 6)	3 (Shelf bracket 6)

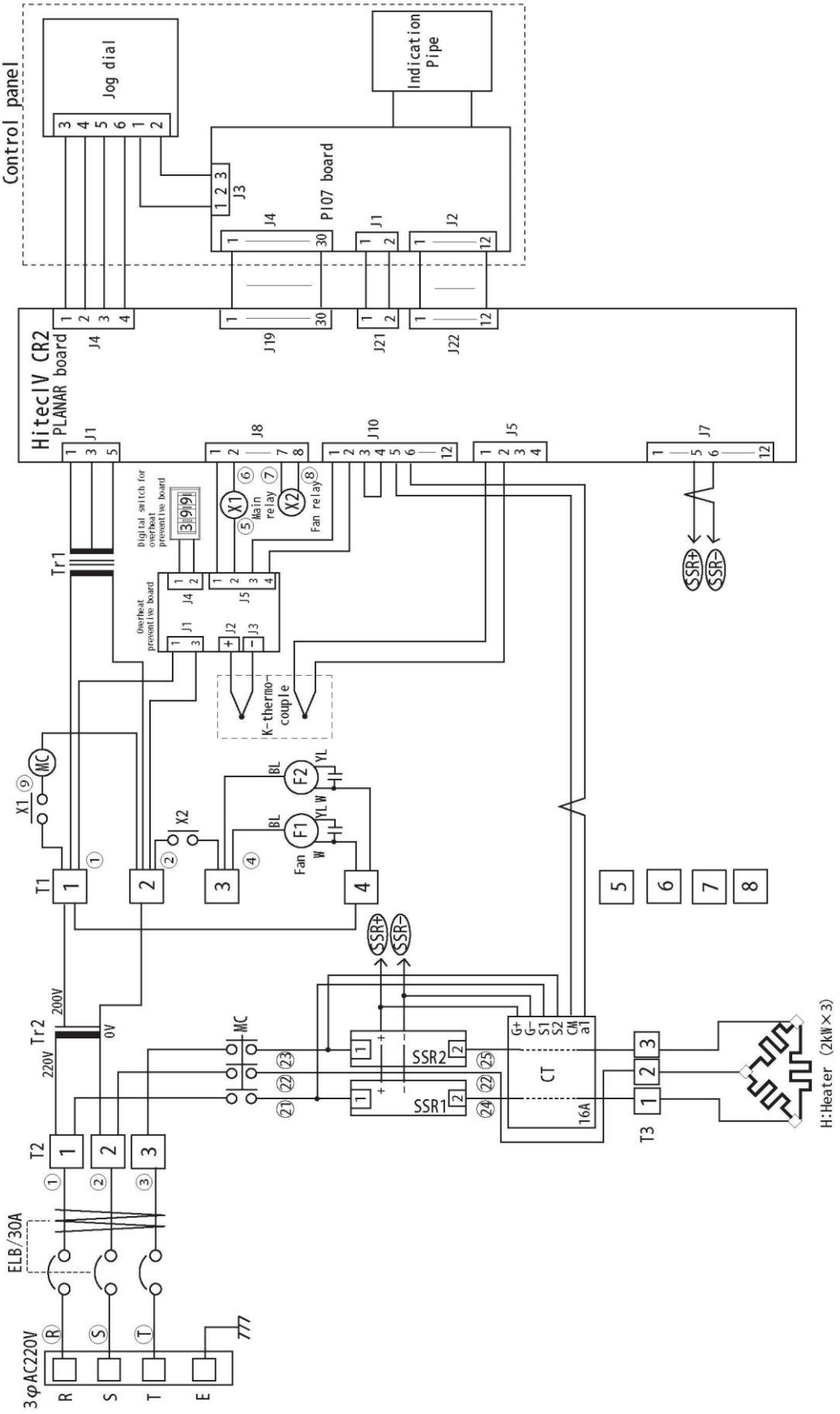
※1 The performance value is in the condition of circulation operation (Damper is entirely closed), room temperature 23℃±5℃, humidity 65% RH ±20% and no load.

※2 Internal and external dimensions do not include protruding parts.

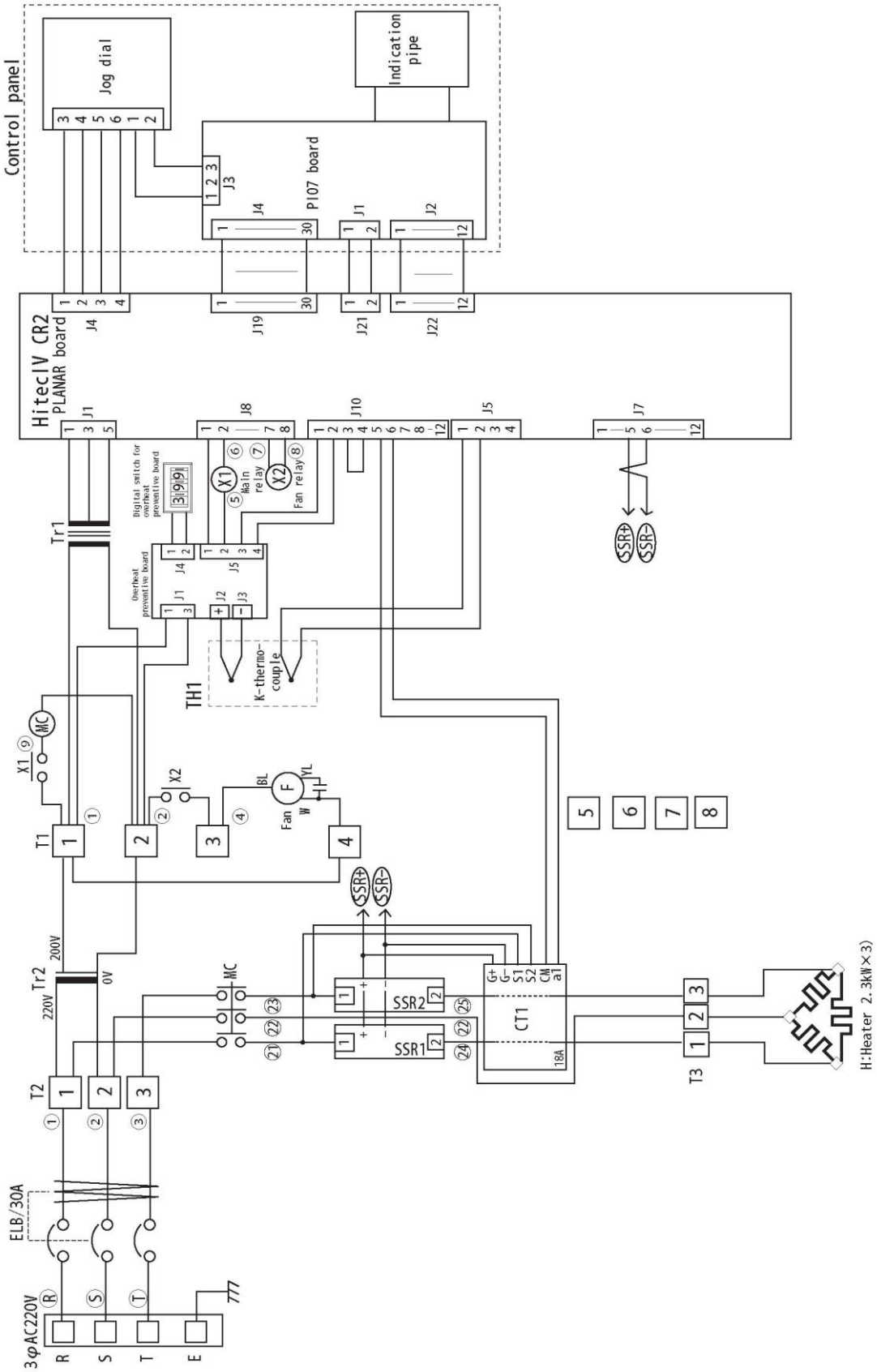
DF811


Control panel
Jog dial
Indication pipe
P107 board
J3
J4
J1
J2
HitecIV CR2
PLANAR board
J19
J21
J22
J8
J10
J5
J7
Digital switch for overheat preventive board
Main relay
Fan relay
Tr1
Overheat preventive board
K-thermo couple
MC
X1
X2
T1
Fan
BL
YL
W
SSR+
SSR-
Tr2
200V
0V
220V
SSR2
SSR1
CT
11A
T2
T3
ELB/20A
3φAC220V
R
S
T
E
H:Heater (1.5kW×3)

DF1011


Control panel
Jog dial
Indication Pipe
P107 board
J3
J4
J1
J2
Hitec IV CR2
PLANAR board
J19
J21
J22
J8
J10
J5
J7
Digital switch for overheat preventive board
Main relay
Fan relay
Tr1
Overheat preventive board
K-thermo-couple
MC
X1
X2
T1
F1
F2
Fan
BL
YL
W
SSR+
SSR-
Tr2
200V
0V
220V
SSR1
SSR2
CT
16A
T3
H:Heater (2kW×3)
T2
ELB/30A
3φAC220V
R
S
T
E

DH811


Control panel
Jog dial
Indication pipe
P107 board
J3
J4
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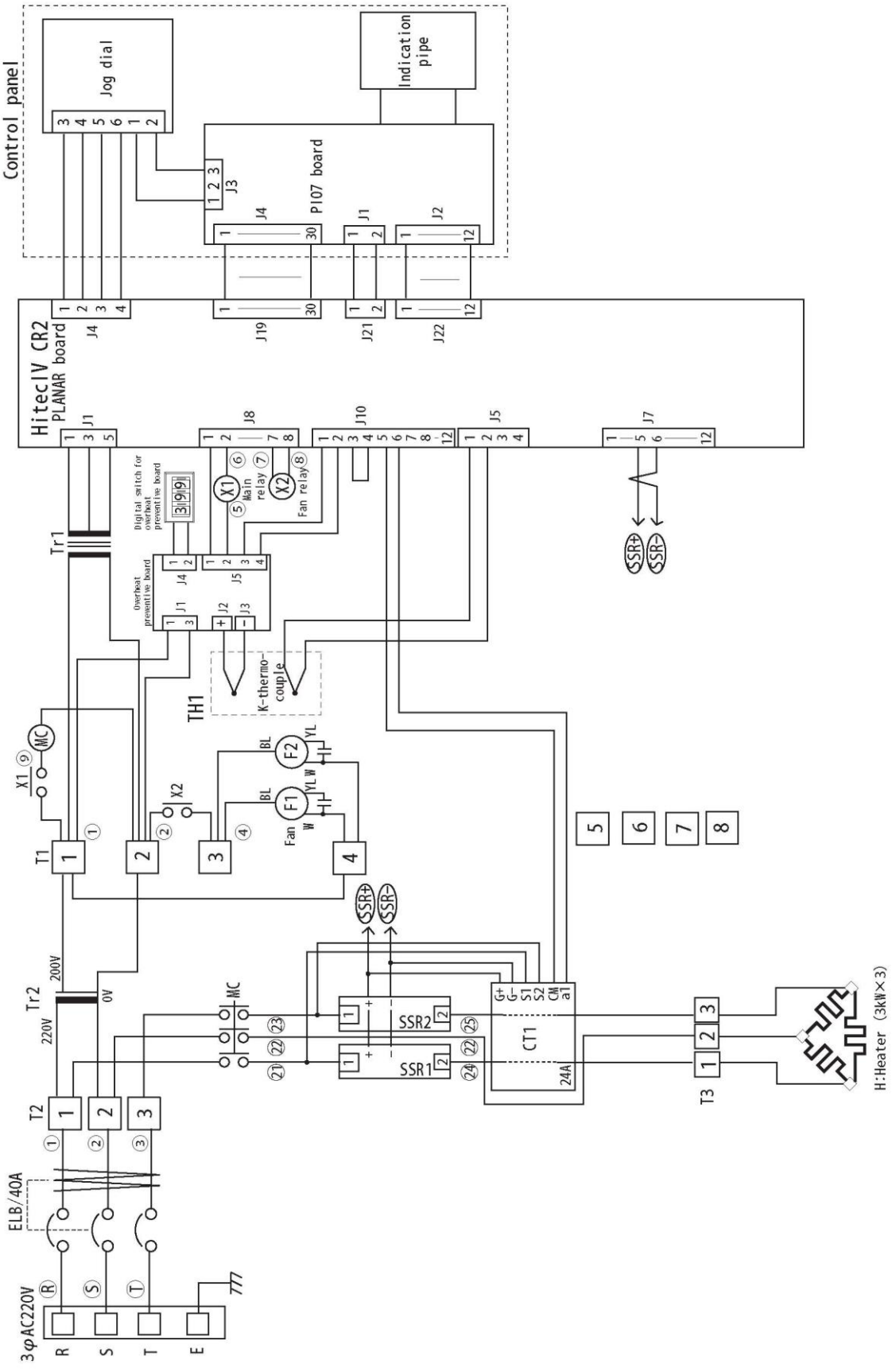
Hitec IV CR2
PLANAR board
J19
J21
J22
J8
J10
J5
J7
Digital switch for overheat preventive board
Main relay
Fan relay
Tr1
Overheat preventive board
TH1
K-thermo-couple
MC
X1
X2
T1
Fan
BL
WL
W
SSR+
SSR-
Tr2
200V
220V
0V
SSR2
SSR1
CT1
18A
T2
T3
H:Heater 2.3kW×3)
ELB/30A
3φAC220V
R
S
T
E

DH1011


Control panel
Jog dial
Indication pipe
P107 board
J3
J4
J1
J2
HitecIV CR2
PLANAR board
J19
J21
J22
J8
J10
J5
J7
Digital switch for overheat preventive board
Main relay
Fan relay
Tr1
Overheat preventive board
TH1
K-thermo couple
MC
F2
F1
Fan
T1
Tr2
200V
220V
0V
SSR2
SSR1
CT1
T2
T3
ELB/40A
3φAC220V
R
S
T
E
H:Heater (3kW×3)

DF811

Symbol	Part Name	Code No.	Specifications
CT	Current Transformer	Y7	K2CU-F20A-EGS
ELB	Circuit breaker	Y7	BKW3203
F1	Motor	2-14-001-0027	BKREK74L-4, AC200V
H1,2	Heater	DF811-48020	AC200V 1500W
	PIO7 board	1-24-000-0084	
	PLANAR board	1-24-000-0120	Hitec CR2
	Independent overheat prevention	1-24-000-0093	TB31-04R-Z07
SSR	SSR	Y7	G3PA-220B-VD DC5-24V
Tr1	Transformer	2-18-000-0042	200V　CR
SW	Digital switch	2-01-010-0005	For 4 type OH
X1,2	Relay	Y7	G2R-1A-T DC6V
T1	Terminal base	2-07-023-0003	M011-OFX-8P
MC	Magnetic contactor	Y7	BMFT61042N
Tr2	Transformer		220/200V
TH1	K-thermocouple	1-16-001-0052	Thermocouple (double sensor)

DF1011

Symbol	Part Name	Code No.	Specifications
CT	Current Transformer	Y7	K2CU-F20A-EGS
ELB	Circuit breaker	Y7	BKW3303
F1,2	Motor	2-14-001-0027	BKREK74L-4, AC200V
H1,2	Heater	DH102-40880S	AC200V 2000W
	PIO7 board	1-24-000-0084	
	PLANAR board	1-24-000-0120	Hitec CR2
	Independent overheat prevention	1-24-000-0093	TB31-04R-Z07
SSR	SSR	Y7	G3PA-240B-VD DC5-24V
Tr1	Transformer	2-18-000-0042	200V　CR
SW	Digital switch	2-01-010-0005	For 4 type OH
X1,2	Relay	Y7	G2R-1A-T DC6V
T1	Terminal base	2-07-023-0003	M011-OFX-8P
MC	Magnetic contactor	LT00017805	BMFT61842N
Tr2	Transformer		220/200V
TH1	K-thermocouple	1-16-001-0052	Thermocouple (double sensor)

DH811

Symbol	Part Name	Code No.	Specifications
CT	Current Transformer	Y7	K2CU-F20A-EGS
ELB	Circuit breaker	Y7	BKW3303
F1	Motor	2-14-001-0027	BKREK74L-4, AC200V
H	Heater	DH811-40010S	AC200V 2300W
	PIO7 board	1-24-000-0084	
	PLANAR board	1-24-000-0120	Hitec CR2
	Independent overheat prevention	1-24-000-0093	TB31-04R-Z07
SSR	SSR	Y7	G3PA-240B-VD DC5-24V
Tr1	Transformer	2-18-000-0042	200V　CR
SW	Digital switch	2-01-010-0005	For 4 type OH
X1,2	Relay	Y7	G2R-1A-T DC6V
T1	Terminal base	2-07-023-0003	M011-OFX-8P
MC	Magnetic contactor	Y7	BMFT61842N
Tr2	Transformer		220/200V
TH1	K-thermocouple	1-16-001-0052	Thermocouple (double sensor)

DH1011

Symbol	Part Name	Code No.	Specifications
CT	Current Transformer	Y7	K2CU-F20A-EGS
ELB	Circuit breaker	Y7	BKW3403
F1,2	Motor	2-14-001-0027	BKREK74L-4, AC200V
H	Heater	DH102-40880	AC200V 3000W
	PIO7 board	1-24-000-0084	
	PLANAR board	1-24-000-0120	Hitec CR2
	Independent overheat prevention	1-24-000-0093	TB31-04R-Z07
SSR	SSR	Y7	G3PA-240B-VD DC5-24V
Tr1	Transformer	2-18-000-0042	200V　CR
SW	Digital switch	2-01-010-0005	For 4 type OH
X1,2	Relay	Y7	G2R-1A-T DC6V
MC	Magnetic contactor	Y7	BMF6252N
T1	Terminal base	2-07-023-0003	M011-OFX8P
Tr2	Transformer		220/200V
TH1	K-thermocouple	1-16-001-0052	Thermocouple (double sensor)

Explosive substance	Explosive substance	①Nitroglycol, glycerine trinitrate, cellulose nitrate and other explosive nitrate esters
		②Trinitrobenzen, trinitrotoluene, picric acid and other explosive nitro compounds
		③Acetyl 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	①Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates
		②Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates
		③Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides
		④Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates
		⑤Sodium chlorite and other chlorites
		⑥Calcium hypochlorite and other hypochlorites
	Flammable substances	①Ethyl ether, gasoline, acetaldehyde, propylene chloride, carbon disulfide, and other substances with ignition point at a degree 30 or more degrees below zero.
		②n-hexane, ethylene oxide, acetone, benzene, methyl ethyl ketone and other substances with ignition point between 30 degrees below zero and less than zero.
		③Methanol, ethanol, xylene, pentyl acetate, (a.k.a.amyl acetate) and other substances with ignition point between zero and less than 30 degrees.
		④Kerosene, light oil, terebinth oil, isopenthyl 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 gases combustible at 15℃ at one air pressure.

(Extract from Japanese Government ordinance)

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.

Instruction Manual
FINE OVEN
DF811/DF1011
DH811/DH1011
First edition Jan 8, 2008
Revised Feb. 15, 2012

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