HIRAYAMA

Hot Air Oven

Model: DON-450/V
DON-650/V

SERVICE MANUAL

株式会社 平山製作所

HIRAYAMA

No.

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Model: DON-450/V
DON-650/V

SERVICE MANUAL

IMPORTANT

- Read this manual carefully and follow the instructions to keep the machine in good working condition.

Issued on April 22, 2015

Contents

Chapter 1. Outline of Products

1.1 Specification

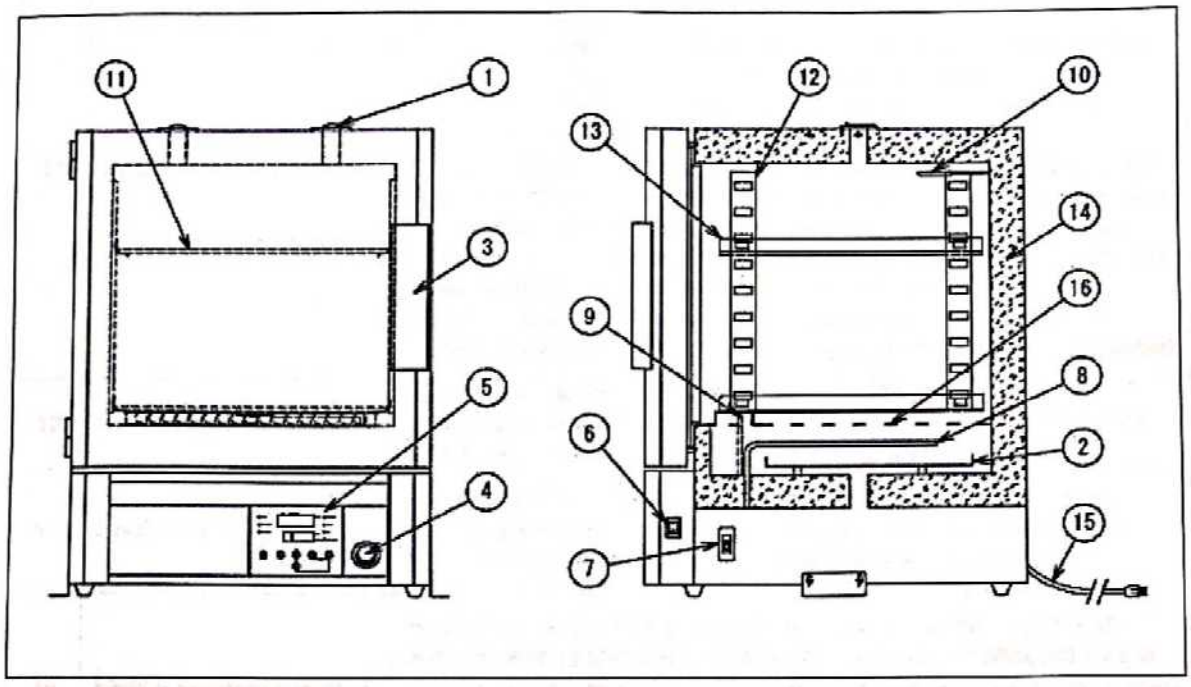
Model	DON-450/V	DON-650/V
Convection method	Natural convection	
Working temperature range ※1	40℃ - 270℃	
Temperature control accuracy ※1	±1℃ at 270℃	
Temperature distribution accuracy※1	±10℃ at 270℃	
Temperature rise time ※1	approx. 50 min. Ambient to 270℃	approx. 60 min. Ambient to 270℃
Operating temperature range ※1	5℃ - 35℃	
Temperature controller	Microprocessor PID Control	
Temperature sensor	Type K Thermocouple	
Operation mode	Fixed value operation, Timer operation (Programmable auto-start and auto-stop. Time range :1min. – 99hours and 59 min.)	
Interior material	Stainless steel 304	
Exterior material	Electrogalvanized steel with a baked melamine finish	
Heater type	Stainless steel sheathed heater	
Heater capacity	1.2 kW	1.4 kW
Door gasket material	Silicon rubber	
Safety devices	• Self diagnosis function for overheat, disconnection of temperature sensor wire, disconnection of heater, short circuit in SSR, CPU abnormalities • Independent overheat prevention device. • Keylock function. • Temperature fuse. • Earth leakage breaker with over-current protection	
Exhaust vent	2 – 28mm in diameter	
Number of shelves, and Adjustable height	9 shelves, in 45mm increments	9 shelves, in 48mm increments
Inside dimension ※2	W460 x D460 x H450 [H418]	W610 x D510 x H500 [H455]
Outside dimension ※3	W590 x D635 x H810	W740 x D685 x H860
Effective volume	95	155
Mass	50 kg	62 kg
Power source	AC120V/220V/230V/240V, 50/60Hz, Single phase	

※1 The indicated values show performance of the equipment measured at ambient temperature of 20℃ and without specimen in the chamber

※2 Number shown in [ ] is usable dimension.

※3 Protruding portions are excluded.

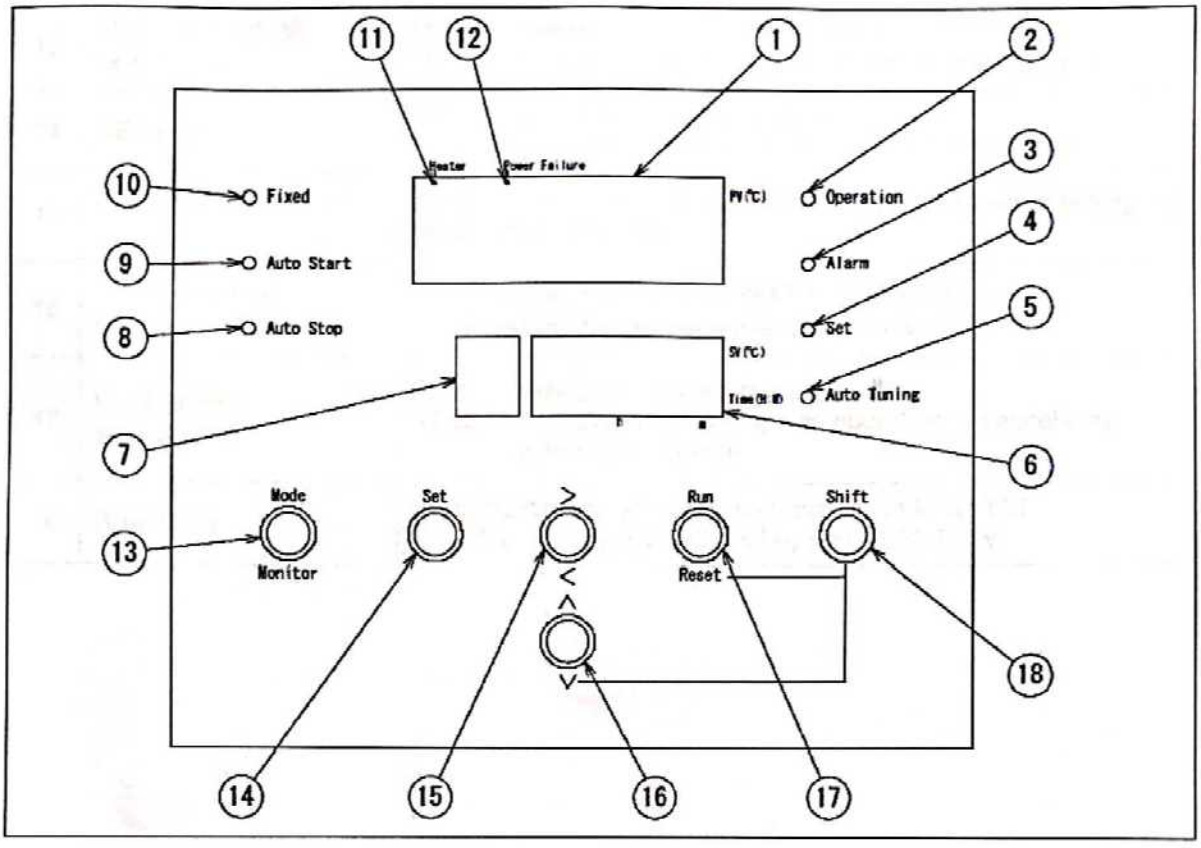
1.2 External View



P/N	Part Name	Purpose, Function or Operation
1	Exhaust vent	An exhaust hole for emitting air that is convected upward by a fan to the outside of the chamber. Open the vent about 1/3 during normal operation.
2	Water tray	A tray for receiving water in the chamber to prevent water from flowing into the lower part of the equipment
3	Door handle	Used for closing and opening the door
4	Overheat prevention knob	Used for setting operating temperature of the independent overheat prevention device. Normally, set the operating temperature to working temperature +30℃
5	Operation panel	Used for setting the chamber temperature and timer operation
6	Power switch	Used for starting or stopping an operation
7	Earth leakage breaker with over-current protection	The device prevents fire or electric shock caused by earth leakage. In addition, when the current exceeding amperage rating flows, the device interrupts the power supply to protect the internal electric parts.
8	Sheathed heater	A heat source to raise the chamber temperature.
9	Sensor for independent overheat prevention device	Liquid expansion type sensor
10	Temperature sensor (Type K thermocouple)	Temperature detecting sensor

P/N	Part Name	Purpose, Function or Operation
11	Shelf	A shelf for putting a test sample. Two shelves are provided as standard accessory. ・One shelf can be put at any step, but, the other is fixed at the bottom step to protect the heat equalizing plate. Putting a thing on the heat equalizing plate can cause fire. Do not move the shelf placed at the bottom step. ・When placing test samples on the shelf, allow the empty space of more than 30% in the shelf. Excess loading of test samples will cause abnormally high temperature in the bottom of the chamber. It may cause fire by ignition of a test sample as well as damage to instruments and test samples. ・When temperature exceeds the set temperature of the independent overheat prevention device, the device is activated
12	Shelf support	A metal part to which a shelf bracket is attached. Adjustable height between shelves : on Model DON-650/V in 48 increments, and on Model DON-450/V in 45 increments.
13	Shelf bracket	A metal bracket which supports a shelf. Attach a bracket by inserting a bracket hook into the square hole of a shelf support . Four shelf brackets are provided as standard accessory.
14	Heat insulating material	Heat insulating material is installed between interior wall and exterior wall so that the temperature inside is not affected by the outside air temperature, while preventing the exterior surface from becoming high temperature. Heat insulating material is made of glass fiber.
15	Power cord	Be sure to connect the power cord to a grounding socket outlet. ・Do not use an extension socket or a plug-in socket outlet. Be sure to use a dedicated socket outlet.
16	Heat equalizing plate	The heat equalizing plate is a partition plate to separate the water tray and sheathed heater from the chamber.

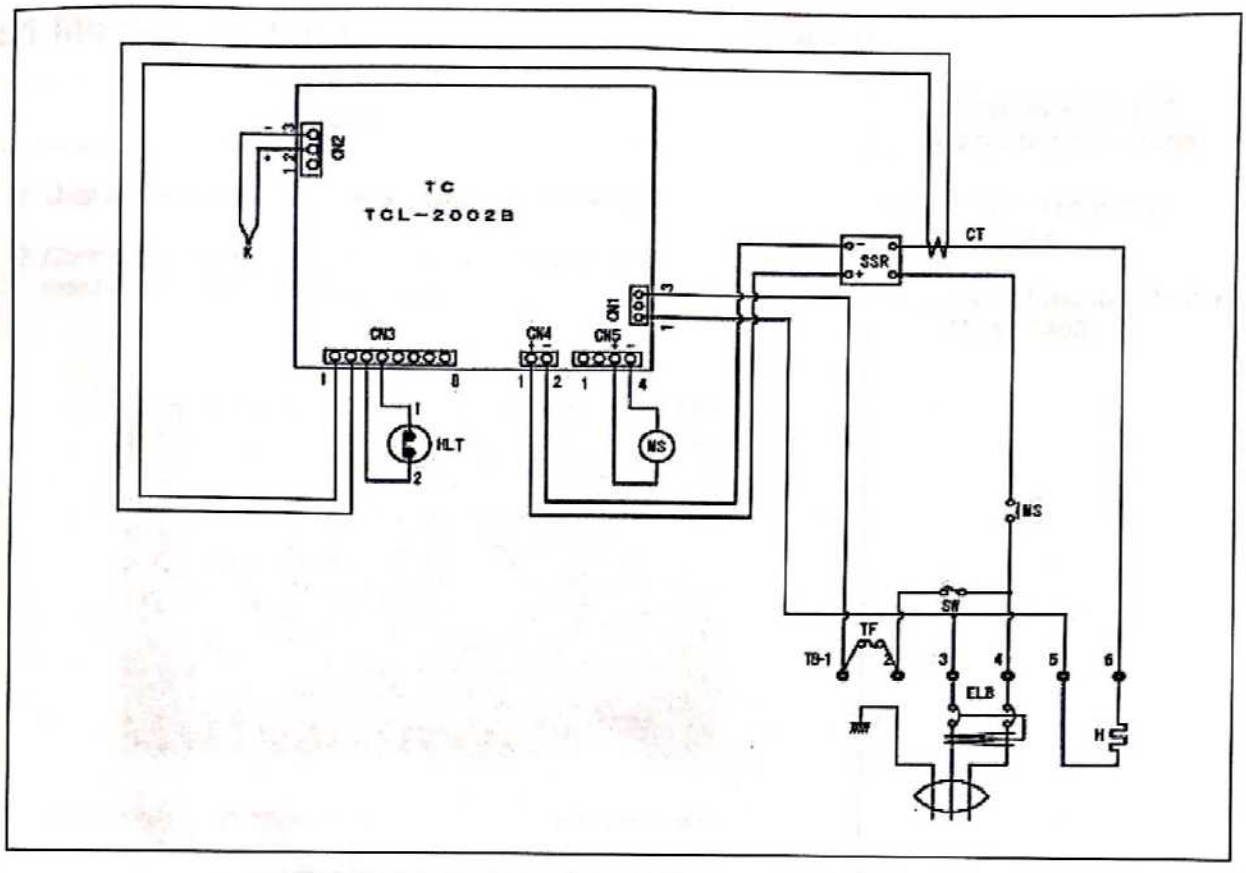
1.3 Operation Panel



P/N	Part Name	Function or Operation
1	PV Display	Chamber temperature is displayed.
2	Operation indicator	The lamp is lit during operation
3	Alarm indicator	The lamp is lit while the independent overheat prevention device is operating.
4	Setting indicator	The lamp blinks when setting the temperature and time.
5	Auto-tuning indicator	The lamp is lit while the auto-tuning is performed.
6	SV Display	The set temperature and time are displayed.
7	Timer operation monitor	Current status of the timer operation is displayed.
8	Auto-stop indicator	The lamp blinks when the auto-stop operation is selected and the lamp is lit when the auto-stop operation is determined.
9	Auto-start indicator	The lamp blinks when the auto-start operation is selected and the lamp is lit when the auto-start operation is determined.
10	Fixed value operation indicator	The lamp blinks when the fixed value operation is selected and the lamp is lit when the fixed value operation is determined.
11	Heater indicator	The lamp is lit when the sheathed heater is turned on.
12	Power failure indicator	The lamp blinks when the power failure occurs during timer operation. To turn off the lamp, press the UP/DOWN key

P/N	Part Name	Purpose, Function or Operation
13	MODE/MONITOR selector key	MODE : Selection of the operation mode MONITOR : The set time is displayed during timer operation
14	SET key	SET : The operation mode is determined. Set and determination of the temperature and time
15	RIGHT/LEFT key (< / >)	Used to move the input digit to the right and left when setting the temperature and time.
16	UP/DOWN key (∧/∨)	∧ : Pressing the key increases the input value ∨ : Pressing the key decreases the input value
17	RUN/RESET selector key	RUN : Pressing this key starts an operation RESET : Pressing this key stops an operation or cancels the auto-stop operation.
18	SHIFT key	Pressing this key activates the functions of MONITOR, RIGHT/LEFT key, UP/DOWN key and RESET key.

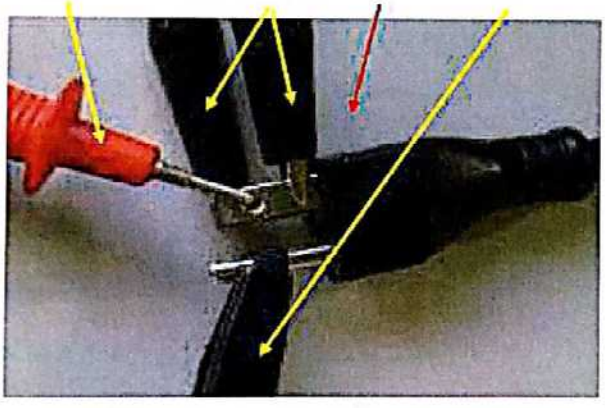
1.4 Wiring Diagram and Electric Parts List



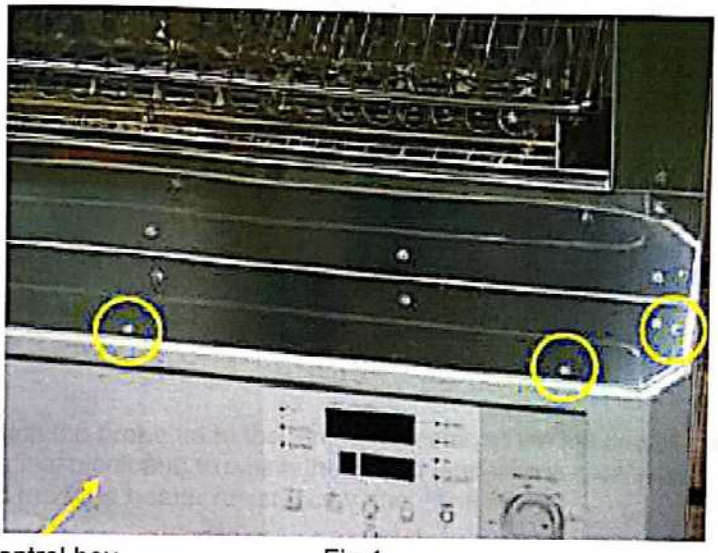
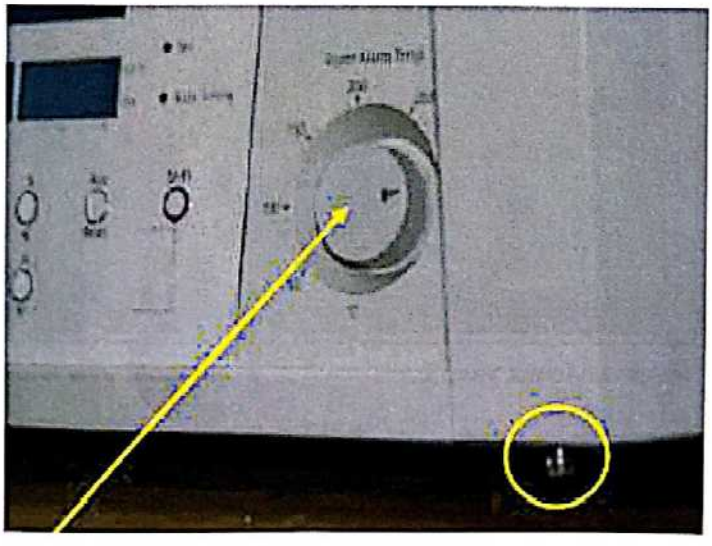
	PART NAMES	Q'TY	TYPE
TC	Temperature controller	1	TCL-2002B
RY	Power relay	1	G4F-11123T DC24V
SSR	Solid state relay	1	C-21 AC100V
CT	Current sensor	1	CTL-6-S
K	Thermocouple sensor	1	ST-19
ELB	Earth leakage breaker with over-current protection	1	NV-L22HC 15A (DON-450/V) NV-L22HC 20A (DON-650/V)
SW	Power supply switch	1	HLS-112A-7
TF	Thermal fuse	1	NO.121 102℃ 2A
HLT	Independent overheat prevention device	1	TY-5
TB (1-6)	Terminal block	1	ML1765-6P
H	Sheathed heater	1	(DON-450/V) 1.2kW (DON-650/V) 1.4kW

Chapter 2. Inspection

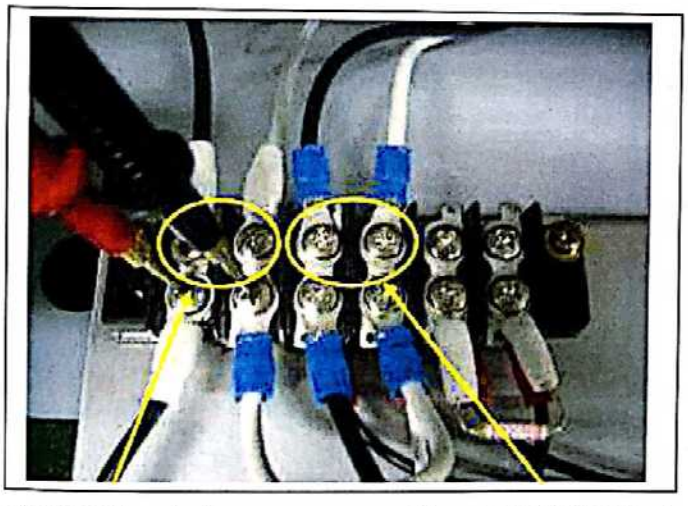
2.1 Measuring the Insulation Resistance Value

Inspection Procedure	Precautions and Acceptance Criteria
1. Unplug the power cord from a grounding socket outlet. 2. Connect a jumper cable then measuring probes of an insulation resistance tester to the power plug.	・An insulation resistance tester is used. e.g. HIOKI Insulation Tester Model 3453
 Line probe Jumper cable Ground probe  Fig.1	
3. Turn the earth leakage breaker with over-current protection and the power supply switch ON 4. Set the dial to the 500V range, and measure the insulation resistance value by raising the MEASURE lever.	The insulation resistance value of this equipment should be 20MΩ or more. **※Take enough precautions to avoid electric shock when working.** **※Do not touch the metal portion of the equipment.**

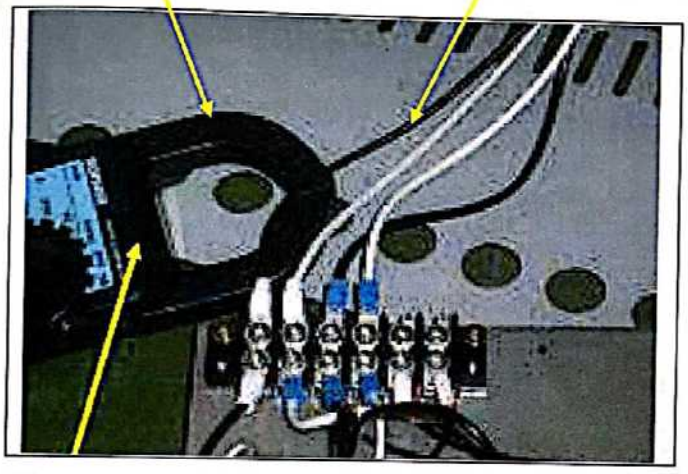
2.2 Measuring the Line Resistance Value of the Heater (1/2)

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet. 2. Take out 5 screws (circled portion) which secure the control box. (See Fig.1)  Control box Fig.1 3. Loosen 2 screws (circled portion) located at the right and left lower portion of the control box with a 7mm spanner. But, no need to remove these screws. (See Fig.2)  Overheat prevention knob Fig.2	**※Take enough precautions to avoid electric shock when working.**

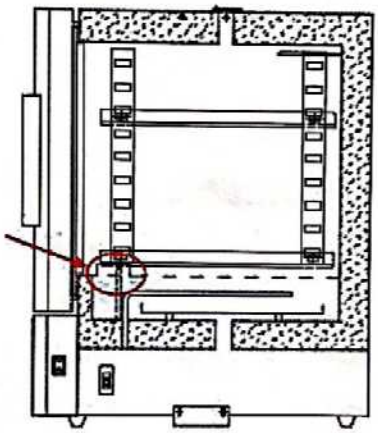
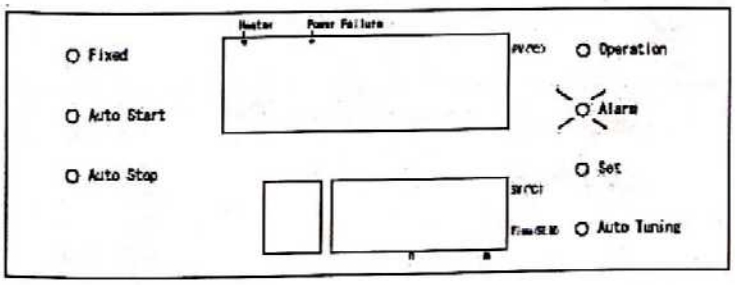
2.2 Measuring the Line Resistance Value of the Heater (2/2)

Inspection Procedure	Precautions and Acceptance Criteria
4. Pull out the control box to the front side. (See Fig.3)  Fig.3	
5. Touch the probe tip to the terminal located at the left end of the terminal block and to which the heater lead wire is connected, and read the heater resistance value. (See Fig.4)  Heater wire terminal Power supply terminal Fig.4	·Heater resistance value DON-450/V : 8.3Ω±10% DON-650/V : 7.1Ω±10%

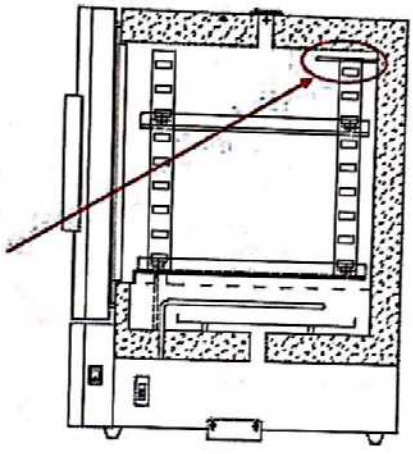
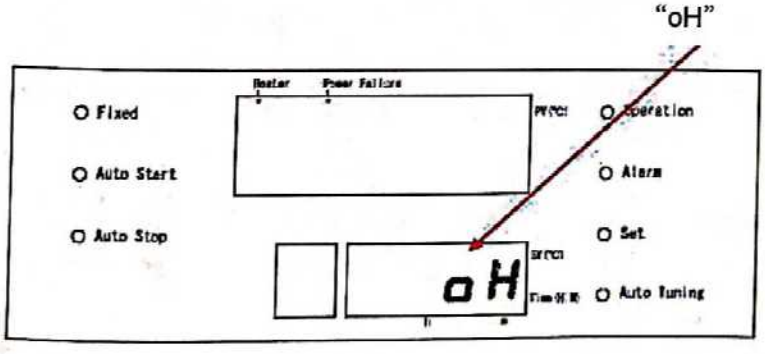
2.3 Measuring the Operating Current Value of the Heater

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet. 2. Open the clamp portion of a clamp meter and close it around the heater lead wire which is connected to the left side terminal. (See Fig.1)	
 Fig.1	
3. Plug the power cord into a power socket if the power cord has been removed from a grounding socket outlet, then turn the earth leakage breaker with over-current protection ON. After confirming the set temperature of the independent overheat prevention device, set the SV (set value) higher than PV (chamber temperature) and start an operation to turn on a heater. (Press the RUN key)	**※Take enough precautions to avoid electric shock when working.**
4. Measure the heater current during a rise in temperature with a clamp meter.	・Heater current value DON-450/V : 12A±10% DON-650/V : 14A±10%

2.4 Operational Check of the Independent Overheat Prevention Device

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection and the power switch ON. (It is not always necessary that the equipment is being in operation.)	
2. Turn the overheat prevention knob located in the right side of the operation panel and set the temperature to 50℃.	
3. A sensor of the independent overheat prevention device is located in the front lower portion of the chamber. Apply hot air directly to this sensor with a dryer and the like, and check if the independent overheat prevention device is activated when temperature reaches the set temperature.	・If hot air can not be applied forcibly with a dryer and the like, you may simulate the operation by setting the temperature lower than 50℃.
	・After confirmation, restore the setting of the overheat prevention device to the working temperature +30℃.
Place to mount the sensor of the independent overheat prevention device 	
4. Confirm that the alarm indicating lamp on the operation panel lights up, all other indicating lamps go out and operation stops. 	
5. After confirmation, restore the setting of the independent overheat prevention device to the normal service temperature and turn the power switch off.	

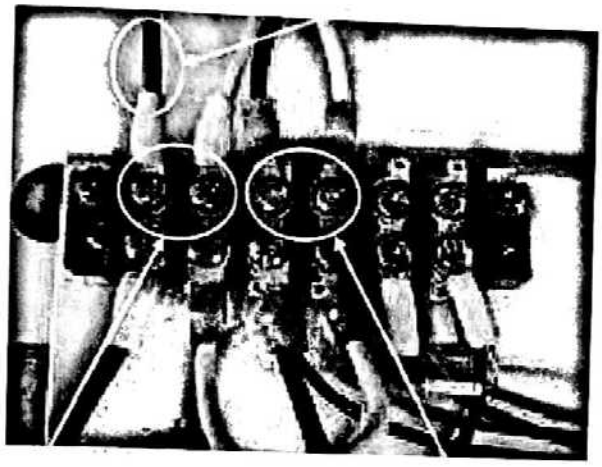
2.5 Operational Check of the Self Diagnosis Function (Overheat)

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection and the power switch ON, then start an operation by pressing the RUN key.	・The self diagnosis function for overheat is a upper-limit deviation alarm. ・The factory setting is SV+10℃
2. Apply hot air with a dryer and the like to the chamber sensor installed in the upper right portion of the back of the chamber, and check if the self diagnosis function (overheat) is activated. Place to mount the chamber sensor 	・When checking the function, keep the chamber temperature same as the room temperature as much as possible. Set the SV to 20℃. ・If hot air can not be applied forcibly with a dryer and the like, warm the sensor by hand to activate it.
3. Confirm that when the PV value reaches SV value +10℃, "oH" is displayed on the SV display of the operation panel and operation stops. "oH" 	

2.6 Operational Check of the Heater Disconnection Alarm

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet.	
2. Open the control box and disconnect the heater wire (black) which is connected to the left end terminal of the terminal block. (See Fig.1)	※Exercise caution so that the removed heater wire does not touch the metal portion.

Heater lead wire (Black)



Heater lead wire terminal Power supply terminal

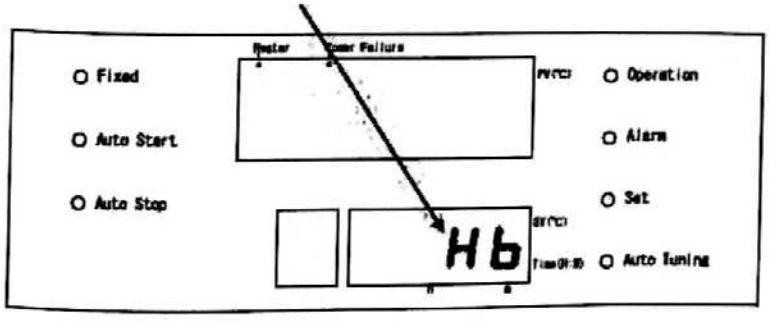
Fig.1

3. Turn the earth leakage breaker with over-current protection and the power supply switch ON.

4. Set the SV value higher than PV value so that the heater is turned on and press the RUN key.

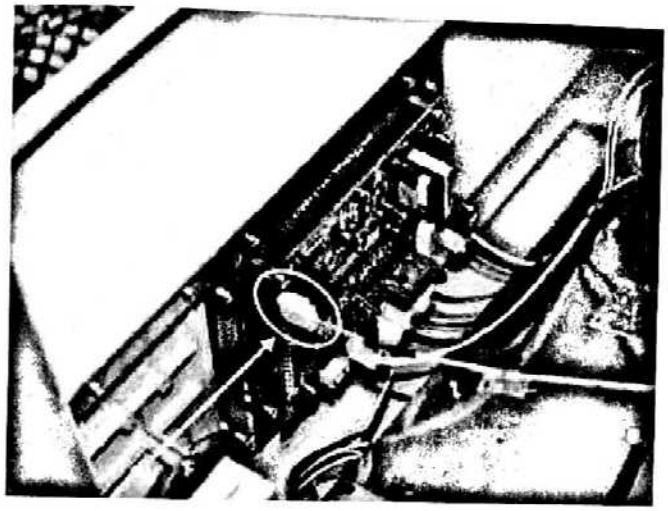
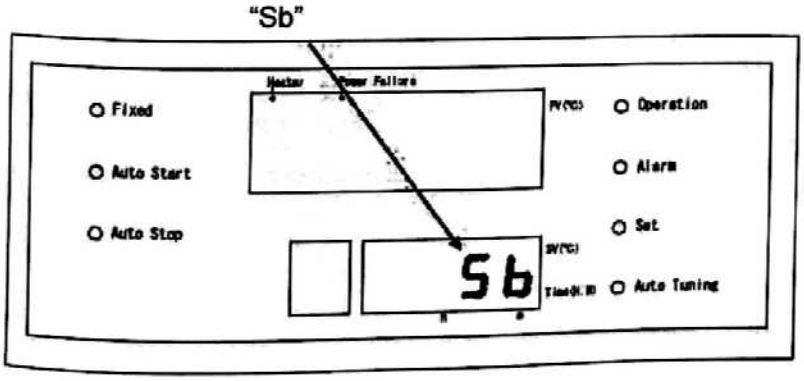
5. Confirm that "Hb" is displayed on the SV display.

"Hb"



6. Turn the earth leakage breaker with over-current protection OFF. Reconnect the heater lead wire and check the screw of a terminal for looseness.

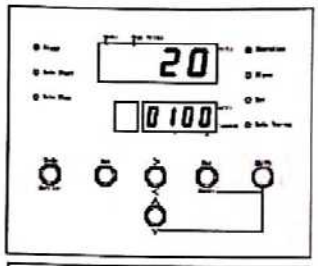
2.7 Operational Check of the Sensor Wire Disconnection Alarm

Inspection Procedure	Precautions and Acceptance Criteria
1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet. 2. Open the control box and remove the temperature sensor connected to the temperature controller located at the rear of the control box. (See Fig.1) ※When removing a connector, pull it out not with a wire but with a connector.  Temperature sensor connector Fig.1 3. Turn the earth leakage breaker with over-current protection and the power supply switch ON 4. Press the RUN key. 5. Confirm that "Sb" is displayed on the SV display. "Sb"  	※**Take enough precautions to avoid electric shock when working.**

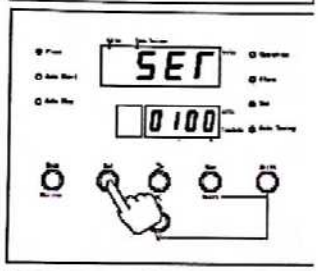
2.8 Confirming the Initial Data

1. Turn the earth leakage breaker with over-current protection ON.

※It is not possible to go to the initial data mode from the program operation mode. Switch to the fixed value operation mode first when the program operation mode is selected.

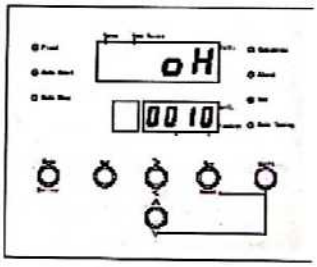


2. When the SET key is pressed for 5 seconds a mode is switched to the initial data mode.



3. "oH" is displayed on the SV display.

- Every time the SET key is pressed, the setting item changes in turn as described in the table below.
- Change the set value displayed on the SV display by pressing the UP/DOWN (∧ / ∨) key.



Initial Data Table (Factory setting)

NO.	PV Display		SV Display	
			DON-450/V	DON-650/V
1	oH	Overheat alarm temperature	10	
2	LCb	Compensation temperature of lower temperature side	25	
3	LoF	Compensation value of lower temperature side	0	
4	HCb	Compensation temperature of higher temperature side	270	
5	HoF	Compensation value of higher temperature side	To be individually set before shipment	
6	ATU	Auto-tuning	0	
7	P1 (p2)	Proportional band	8 (8)	
8	I1 (12)	Integral time	700 (640)	
9	D1 (d2)	Derivative time	70.0 (80.0)	
10	oPE	Stop function	1	

※PID controller indicates the set temperature values as follows.
- SV < 138℃: P1, I1, D1
- SV ≧ 138℃: P2, I2, D2

※Do not change the initial data frequently.

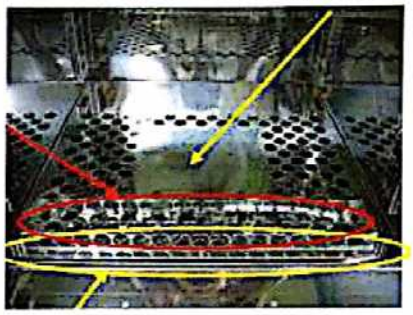
Chapter 3. Replacement Procedure

3.1 Replacing the Heater (1/2)

1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet.

Heat equalizing plate

Safety guard



2. Take out three screws which secure the safety guard located in the chamber front. (See Fig.1)

※If the screw is seized, do not rotate it by force.
Apply a small amount of lubricant to threads then remove the screw.
(Be sure to get approval from the customer)

Screw position Fig.1

3. Remove the sensor of the independent overheat prevention device from the sensor holder, and take out three screws located at the back of the chamber and securing the heat equalizing plate. (See Fig.2)

Screw position

Sensor holder (the shape of letter L)

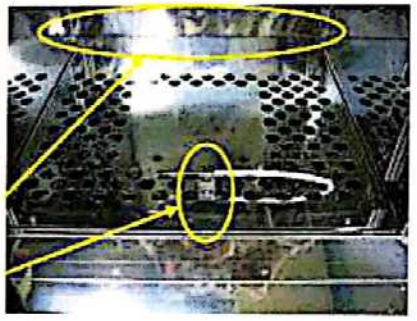
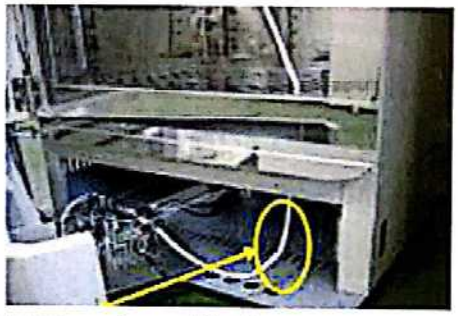


Fig.2

4. Pull out the control box to the front side and put the sensor of the independent overheat prevention device under the heat equalizing plate. (Pull the sensor from the underside of the equipment). Pull out the heat equalizing plate to the front side and remove the sensor. (See Fig.3)

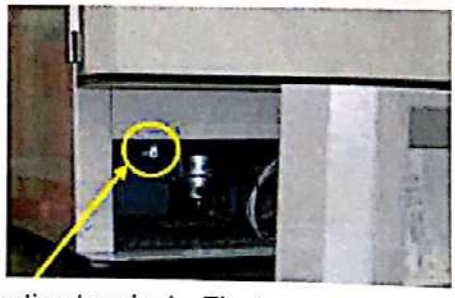
※Refer to the "ITEM NO.2-2 Measuring the Line Resistance of the Heater" for the way to pull out the control box.
※Do not rapidly bend or cut the capillary tube of the sensor.



Pull the sensor downward Fig.3

5. Remove the heater lead wire from the heater connection terminal located in the lower part of the equipment. (See Fig.4)

There are two heater connection terminals at the right and left side of the equipment.



Heater connection terminal Fig.4

3.1 Replacing the Heater (2/2)

6. Take out screws (4-screw x 2) which secure the heater flange in the chamber, and remove the heater by lifting it. (See Fig.5)

※If a screw is seized, do not rotate it by force.
Apply a small amount of lubricant to threads then remove the screw.
(Be sure to get approval from the customer)

Remove screws Fig.5

7. Install a new heater and fix it with screws. (See Fig.5 and 6)

※When the heater has been touched with bare hands, wipe oil stain with a cloth.

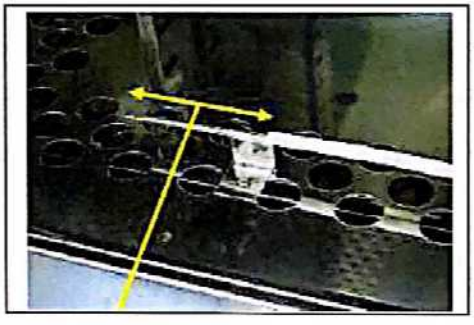
※If there is a glass chip, dust or dirt inside, clean them out.

Fig.6

8. Fix with a screw the heater lead wire of the control box side to the heater connection terminal.
(See Fig.4 on the previous page)

9. Attach the heat equalizing plate and put the sensor of the independent overheat prevention device back.

(Pull the sensor tip about 100mm out of the glass tube, and secure it with a sensor holder. See Fig.7)

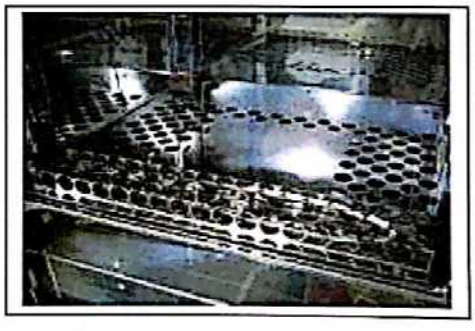


Protrude the sensor about 100mm Fig.7

10. Install the safety guard and the control box.

※Check if the capillary tube does not touch a terminal of electric parts.

※Do not rapidly bend the capillary tube of the sensor.



3.2 Replacing the Temperature Controller and Electric Parts (1/3)

1. Replacing the Temperature Controller

1-1 Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet.

1-2 Pull out the control box to the front side and take out 2 screws (circled portion) which secure the control box and the control board. (See Fig.1)

※Refer to the "ITEM NO.2-2 Measuring the Line Resistance of the Heater" for the way to pull out the control box.

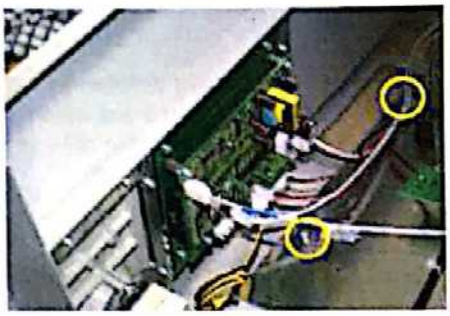


Fig.1

1-3 Disconnect all the wiring for the temperature controller installed at the rear of the control box, and take out the right and left 4 screws (circled portion) which secure the temperature controller bracket. (See Fig.2)

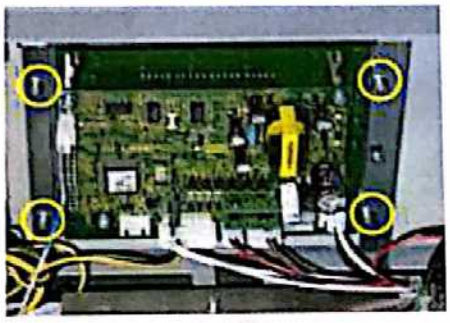


Fig.2

1-4 Remove the temperature controller from the operation panel plate (AL), and take out 4 screws (circled portion) which secure the temperature controller. Install the new temperature controller. (See Fig.3)

※After installation, check if the operation panel keys can be pressed properly. (Check if a click sound is heard.)

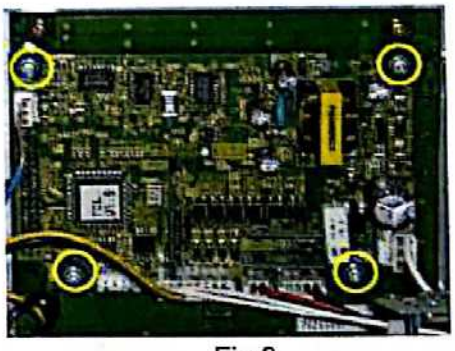
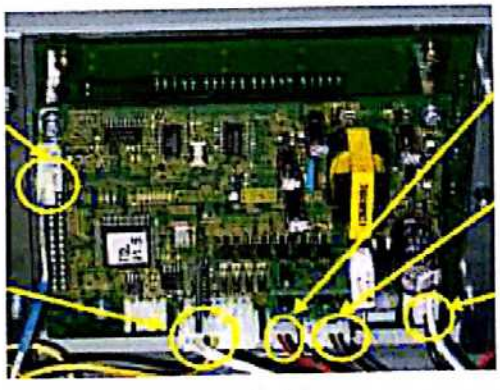


Fig.3

1-5 Install the temperature controller in the control box. After installing the control board, connect the wiring. (See Fig.4 and the wiring diagram on page 7)
※Check if the connectors have been inserted firmly.

Temperature sensor (CN2)

Current sensor for independent overheat prevention device (CN3)



SSR (CN4)

Power relay (CN5)

Power supply (CN1)

Fig.4

1-6 Install the control box.

2. Replacing the Electric parts

2-1 Replacement procedure for the electric parts are omitted, because all electric parts mounted on the control board are secured with screws. When the electric parts are exchanged after removing the control box, be sure to turn the earth leakage breaker with over-current protection OFF, or unplug the power cord from a socket outlet.

※See Fig.1 for the electric parts layout.
※When exchanging the SSR board, apply a heat-conductive oil compound between the SSR board and the control board.

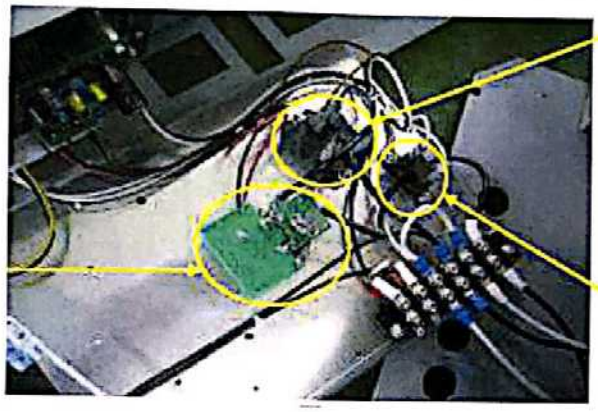


Fig.1

3. Replacing the Thermostat for the Independent Overheat Prevention Device

3-1 Remove the overheat prevention knob, disconnect the wiring of the thermostat for the independent overheat prevention device, and take out 3 screws (circled portion) which secure the device. (See Fig.2. See the ITEM NO.2.2 for the location of the overheat prevention knob)

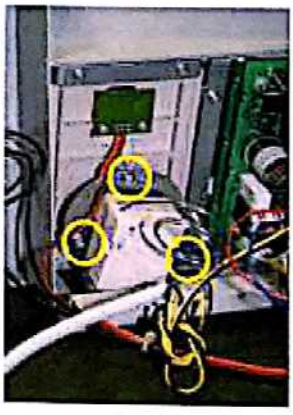


Fig.2

3-2 Take out screws which secure the safety guard. Referring to the ITEM NO.3.1, pull out the sensor from the underside of the equipment. (See Fig.3)

※Do not rapidly bend or cut the capillary tube of a sensor.

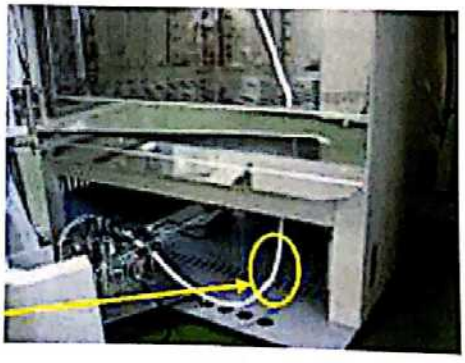


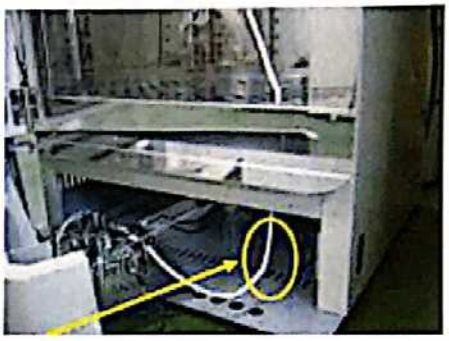
Fig.3

3.2 Replacing the Temperature Controller and Electric Parts (3/3)

3-3 Insert the sensor for the independent overheat prevention device which is protected by the glass tube into the chamber from the underside of the equipment. (See Fig.4)

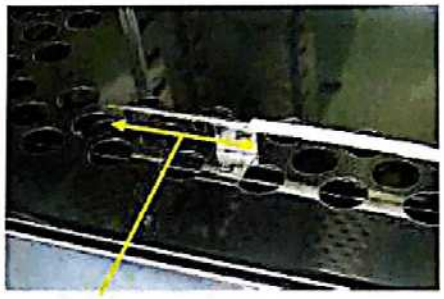
(Removing the heat equalizing plate makes the work more efficient. See procedure Nos.1-3 of the ITEM NO.3.1 for the way to remove the heat equalizing plate.)

※Do not rapidly bend or cut the capillary tube of a sensor.



Insert the sensor from the underside Fig.4

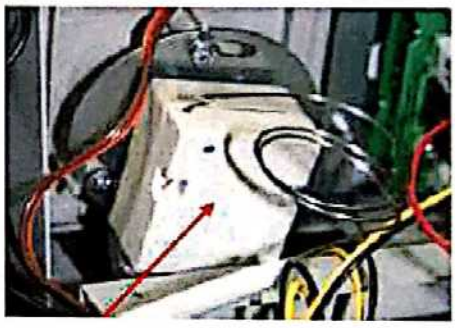
3-4 Pull the sensor tip about 100mm out of the glass tube, and fasten the sensor with a sensor holder. (See Fig.5)



Protrude the sensor tip about 100mm Fig.5

3-5 After wiring, loosely tighten screws which fasten the thermostat housing. Attach the knob and press it into the back. (See Fig.6)

3-6. Turn the earth leakage breaker with over-current protection ON, and check the displayed temperature. Turn the knob and when the equipment stops with a click sound, turn the earth leakage breaker with over-current protection OFF or unplug the power cord from a grounding socket outlet.

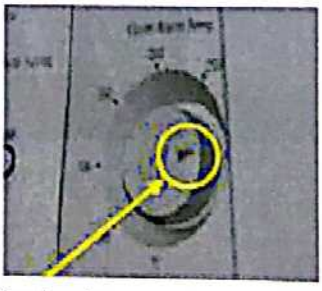


Thermostat housing Fig.6

3-7. Move the thermostat housing located in the rear of the control box so that the arrow of the knob comes to the position of the displayed temperature. (See Fig.6 and Fig.7)

3-8. Retighten screws which secure the thermostat housing to fix it firmly.

3-9. Check if the ALARM indicating lamp is lit when the earth leakage breaker with over-current protection and the power supply switch are turned on and the overheat prevention knob is turned in the direction of 0℃ and operation is stopped.



Arrow of the knob Fig.7

3-10.Install the safety guard and the control box.

3.3 Adjusting the Door Latch

1. Adjust the door latch by loosening screws which secure a latch strike attached to the main body. .(See Fig.1)

※As a thread-locking adhesive is applied to screws to prevent loosening, turn a screw firmly so that a screw head is not damaged by slipping of a screw driver.

Loosen screws for a latch strike

Fig.1

2. If the door does not close though it is pushed, move a latch strike in the direction of the door in order to loosen the latch engagement, then secure it with screws. (See Fig.2, move it in the direction of an arrow)

3. If there is backlash and play when the door is closed, or if there is a gap between the door gasket and the main body, move the latch strike in the direction of the main body in order to tighten the latch engagement, then secure it with screws. (See Fig.3, move it in the direction of an arrow)

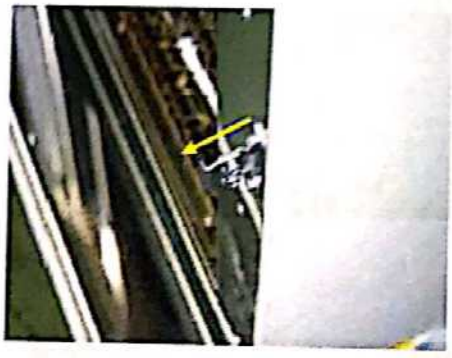


Fig.2

4. Retighten the securing screws after positioning of the latch strike.

5. For verifying the sealing performance of the door gasket, check that there is no gap between the door and the main body by inserting a paper or the like into the right and left or top and bottom of the door

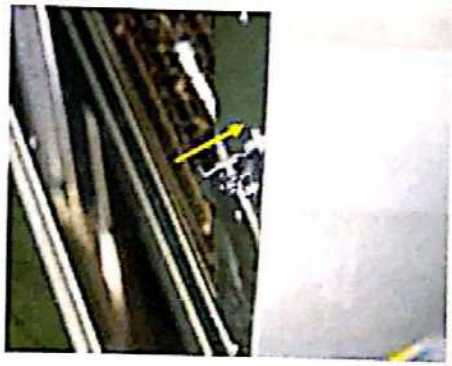


Fig.3

4 Replacing the Temperature sensor

1. Turn the earth leakage breaker with over-current protection OFF, or, unplug the power cord from a grounding socket outlet.

Fig.1

2. Remove the rear panel and pull out the temperature sensor which is installed in the upper right portion of the chamber from the rear side of the equipment.
(A glass tube is put there as it is.)

Or, make a slit and remove the heat insulating material and pull out the temperature sensor. (See Fig.2),

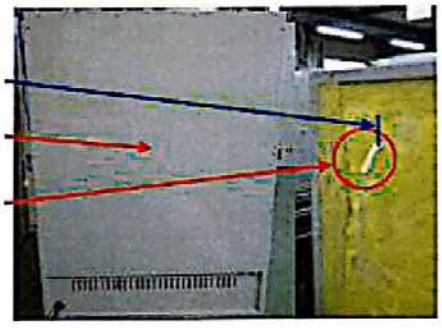


Fig.2

3. Pull out the control box to the front side and remove the temperature sensor connector from the temperature controller located in the rear of the control box.
(Do not pull a connector with wiring when removing.)

※Refer to the "ITEM NO.2-2 Measuring the Line Resistance of the Heater" for the way to pull out the control box.

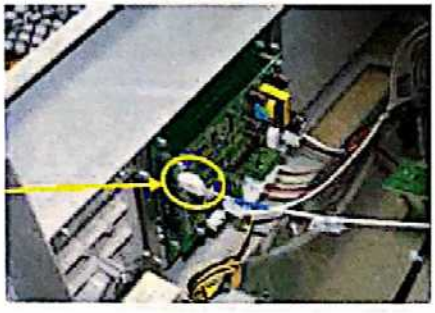


Fig.3

4. Insert the temperature sensor connector to be replaced into the temperature controller connector, then, insert the temperature sensor into the chamber from the rear side of the equipment.

5. Insert the temperature sensor into the sensor holder, and protrude the sensor tip about 20mm from the sensor holder.

6. Install the control box and the rear panel.

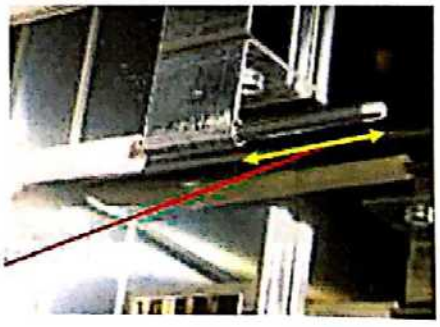
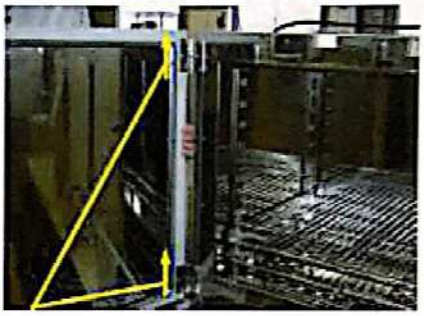


Fig.4

3.5 Replacing the Door Gasket (1/2)

1. Pull up the door while pulling a door side hinge out of the hinge shaft which is attached to the main body. Put the door on a blanket or a cardboard which has almost same thickness as the height of a door handle so that the door is not damaged. (See Fig.1)



Pull up the door

Fig.1

2. Take out screws (circled portion) which secure the gasket and remove the gasket.

Fig.2

Central portion of the hinge side doorframe

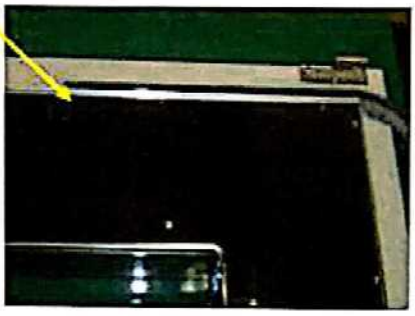


Fig.3

3. Insert a new gasket in the middle part of the hinge side inner plate. Install a gasket and secure it with screws so that a gasket closely contacts with the inner plate of the door. (SeeeFig.3)

※When installing a gasket in each corner of the inner plate of the door, make a triangular cut in each corner of a gasket before installing. (See Fig.4)

Fig.4

3.5 Replacing the Door Gasket (2/2)

4. After installing a gasket, leave a gasket 1 to 2cm and cut it. Then, loosen 2 screws located in the hinge side and temporarily fix a gasket. (See Fig.5)

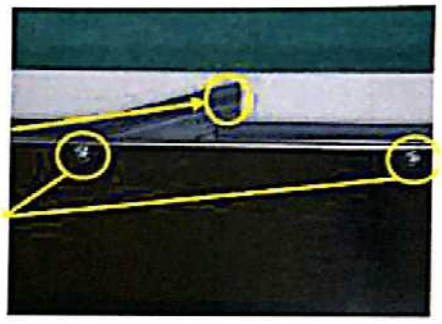


Fig.5

5. Join a gasket by applying adhesive to the cut section, then insert it in the inner plate and tighten the slacked screws. (See Fig.6)

6. Retighten all screws which secure a gasket.

7. Install the door.

Fig.6

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