User's Manual

Incu-S Series
Thermostatic Incubator

This Manual applies to:

Incu-50s/80s/120s/160s/270s

Thanks !

Thank you very much for purchasing one of our Incu Series direct heating general purpose incubators, specially designed for you-the lab professional. Your choice indicates that you have very high requirements on style and performance of this type of incubators.

SCIQUIP INCU-S incubators have achieved a good reputation and trust among various clients for its advanced temperature controlling technology, sound framework design, excellent molded exterior and outstanding professional workmanship. These products have been exported through most leading companies into European, American and East Asian markets.

INCU-S incubators have some unique features like programmable control-9 segments and 18 steps, intelligent tracing (graphic monitoring) and solid operating safety items, etc. It also has featured designs of direct heating with air forced circulating system, which effectively avoid the temperature gradients in the traditional direct heating units.

This equipment is specialized to meet the research needs in a great variety of industries, such as medical, pharmaceutical and agricultural. It is widely used for breeding, fermentation, micro-organism cultivation, constant temperature environmental test, denaturation experiments and the storage of culture medium, serum etc.

Since the date of your purchase of this product, after-sale service will always be with you through your dealer and/or the importing company of your region.

No matter what questions happen to you when using your incubator, please do not hesitate to contact us.

SCIQUIP thanks for your trust in its product!

Reminder!

Prior to operation, this manual should be read thoroughly and completely understood-as it might be helpful to master the operation techniques of this unit.

Safety instruction! Please be sure to follow the instructions, they are really important for your safety.	
	**Danger!** **Warning against damage and injury.**

1. The electrical supply circuit to the incubator must confirm to all national and local electric codes. Check the serial-data plate for voltage, cycle, phase and amperage requirements before you connect the unit.

2. Only use grounded power source (outlet) to avoid an electric shock or fire.

3. In case of a problem, do not attempt to repair the product yourself. Do not open the power box to avoid electric shocks.

4. Do not pull out the plug when the unit is in use. Never drag on the wire to unplug the unit.

5. A separate branch circuit is recommended to prevent loss of samples due to overloading or failure of other equipment on the same circuit.

6. A surge protector is recommended to avoid power-related faults.

7. In case of malfunction or burning smell, the unit must be unplugged immediately .Use a circuit breaker to cut off the power supply. Continuance of abnormal state will end up with fire as a result of overheating.

8. The electric power supply must be cut off in following situations:

8.1. When opening the door of electrical power box. Opening the top cover without cutting off power supply might result in electric shock.

8.2. When replacing the fuse. Replacing the fuse without cutting off the power supply will probably result in electric shock.

8.3. When a malfunction occurs, mishandling will result in the further damage of the equipment or accidental injury.

8.4. If you do not use the unit for a long period of time.

9. Never touch the glass door and/or inner chamber when the incubator is hot.

	**Attention!** Instructions for optimal performance

1. The unit must be placed horizontally on a solid, flat floor or table.
2. The incubator needs even heat lost on all surfaces in order to maintain small internal temperature variations. As a result, a minimum of 20 cm must be allowed between the rear and sides of the incubator and any walls, partitions or obstructions to facilitate adequate convection of air around the unit.
3. Do not locate the unit exposed to direct sunlight or near heating /cooling ducts.
4. The unit must be kept away from electromagnetic interference sources.
5. Culture placed inside the incubator should be placed to the extent of which the air flow inside the incubator is not affected to maintain the temperature uniformity in the working chamber.
6. Make sure the shelves inside the chamber are placed horizontally.
7. Slam the door(s) will probably leads to damage of the equipment.
8. When in operation, do not open the door (too much or too long) as this might affect the temperature inside.
9. The incubator must be kept away from volatile, flammable, explosive liquids or gases.
10. Please keep the chamber clean. Regular cleaning is required.

	**Attention!** Apart from the above warnings and instructions, there are several other special notes that need attention. Please read them. Any neglect might cause serious problems, damage, or injury.

Table of contents

1. Performance Features

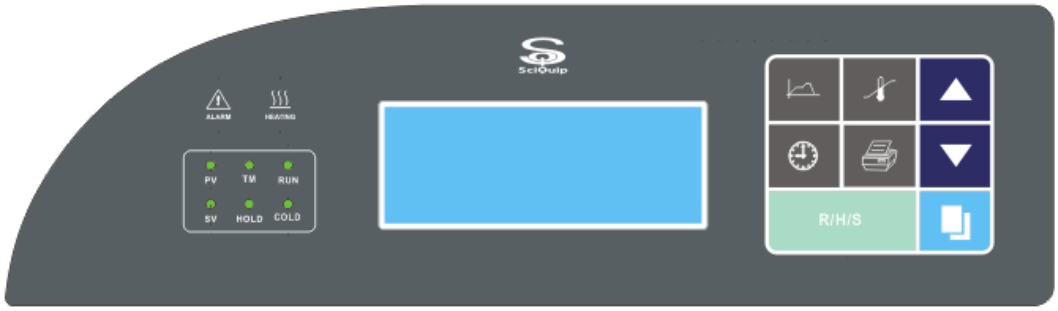
- ✶ Both the interior and exterior are made of robust materials for lifetime operations. The inner chamber is made of high quality #304 stainless steel sheets, with 4 round coved corners. All exposed edges are de-burred to insure no sharp edges. The exterior is cold rolled steel finished with powder coated polyurethane finish, which is resistant to most chemicals and easily cleaned with mild household detergents.
- ✶ The INCU-S direct heating incubator microprocessor temperature control systems all use fast responding PT 100 sensors which commands and executes a special control algorithm that energizes a solid-state switch to supply power to the heaters.
- ✶ The control electronics are protected through a circuit breaker that may trip at 110% of loading rate, but will trip within 1 second at 150% of load rating.
- ✶ Space-age high density material is used to insulate the inner chamber walls.
- ✶ All electrical components are fully accessible after removing the top-cover.
- ✶ The inner glass door is 3/16” tempered with smooth-round edges, and seals are tight against a **U-**grooved door rubber gasket.
- ✶ Inner glass door switch automatically shuts the main heater, and switched on when door is closed.
- ✶ A magnetic gasket on the outer door helps to insure a tight seal against the cabinet.
- ✶ 2 grid shelves, built-in printer on the side wall as standard, RS-232 and UV light as options available upon request.

2. Technical Specification

Model	Incu-50s	Incu-80s	Incu-120s	Incu-160s	Incu-270s
Heat Mode	Direct Heat (With Gentle Circulation)				
Volume(L)	50	80	120	160	270
Temperature	Ambient + 5 to 65 ℃				
Temperature Accuracy	±0.1℃				
Temperature Uniformity	±0.5℃@ 37℃				
Alarm	Enabled				
Timer	0-999 minutes				
Setting	Digital				
Display	LCD				
Grid Included	2(max4)	2(max4)	2(max5)	2(max4)	2(max4)
Grid Size(mm) (WxD)	330*345	380*395	430*445	480*495	530*595
Distance Between Grids (mm)	80	100	110	130	160
Inner Dimensions (mm) (WxDxH)	350*350*410	400*400*500	450*450*600	500*500*650	600*550*820
Exterior Dimensions (mm) (WxDxH)	470*520*785	520*570*880	570*620*980	620*670*1030	740*740*1280
Packing Dimensions (mm) (WxDxH)	540*590*945	590*640*1040	640*690*1140	690*740*1190	810*810*1440
Net Weight (kg)	33/57	40/73	51/85	63/94	90/130
Power (W)	200	250	300	380	550
Electricity	220-240V 50/60Hz				

3. Control Panel

Illustration of Control Panel



For Incu-50S/80S/120S

For Incu-160S/270S

Set Button:
Press this button to change the parameter(s)

Increase Button:
Press this button and the parameter will increase by one digit, the parameter will keep increasing while this button is held.

Decrease Button:
Press this button and the parameter will decrease by one digit, the parameter will keep decreasing while this button is held.

Graphic Chart Display Button:
Press this button to display a temperature graph.

Temperature Button:
Press the button to display the actual temperature and set temperature in succession.

Time Button:
Press the button to display timer SET and Process value.

R/H/S

Operating Button:
Under fixed value mode, press the button to start the unit. Press the button again to stop.
In the Programmable mode, press the button to start running the unit. Press it again to enter the "Hold" status. Press this button for more than 3 seconds to abort programming.

Print Button:
Press the button to print the time and temperature (Printer is optional upon request.)

Temperature Alarm Indicator:
When the temperature inside the chamber deviates more than the "over temperature alarm value" from the set point, this indicator will flash and an audible alarm is activated as well. See 8-1 for more information of "Over Temperature Alarm Value".

Heating Indicator:
This indicator lights when the heater is connected with power supply. This indicator will twinkle when the actual temperature is approaching the preset value.

PV **Actual Temperature Indicator:**
Display the value of actual temperature

SV **Set Temperature Indicator:**
Display the graphic chart of the set temperature and actual temperature

TM **Time Indicator:**
When the screen displays the operating time, this indicator will light, it twinkles when the screen displays the preset time.

RUN **Operating Status Indicator:**
When the unit operates as normal, this indicator will light up.

HOLD **Status Hold Indicator:**
Indicator of "Hold" step in program control mode. When the unit reaches the pre-set temperature, this indicator will light, and "Hold" step is activated..

COLD **Refrigeration Indicator**
Lights "ON" when solenoid valve is "Open" to cool down the incubator

4. Preparation and Start-up

Clean the chamber of incubator before you put it into use and on a regular base. The interior should be wiped down with an appropriate disinfectant, such as 70 % ISOPROPYL ALCOHOL or equivalent.


DO NOT USE ANY CHLORINATED OR HALOGEN MATERIAL- AS THIS IS HARMFUL TO THE POLISHED STAINLESS STEEL!!!

4.1 Connect the plug of power supply of the equipment with an independent jack socket.

4.2 Turn on the master switch on the right side of the equipment, power is applied to the unit, and the LCD displays the following in turn:

Time Function

Preset Temperature/Measured Temperature

5. Setting the Control Mode

The unit can be used either in fixed value mode-as a one temperature incubator (Fixed value on the display), or in a programmable control mode with 9 segment in 18 steps.

(Programme on the display). This program can be repeated - max. 99 times.

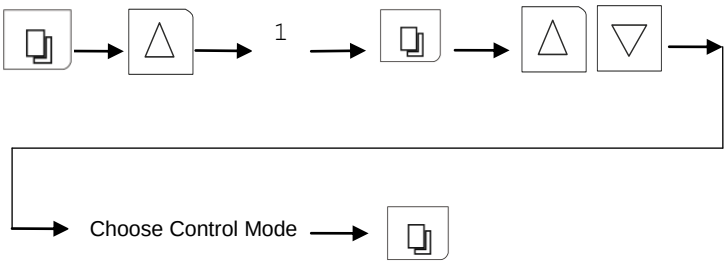
Special Attention:
To change the control mode:
Only if the incubator is in a non-working status.

To set the desired run mode:

Switch OFF the “Run” mode (through the Operation button: R/H/S) Press the SET key and enter the password “1”. Press the SET key again until the LCD display shows the run mode options, press the Increase or Decrease key to select the desired run mode: **Fixed or Programme**

To confirm the new settings press the SET key again.

Simplified instructions for choosing the control mode



6. Setting Parameters for Constant Temperature Control Mode (Fixed Mode)

6.1 Set Temperature

Temperature Range: Rt +5 to + 65°C (INCU-S Series)

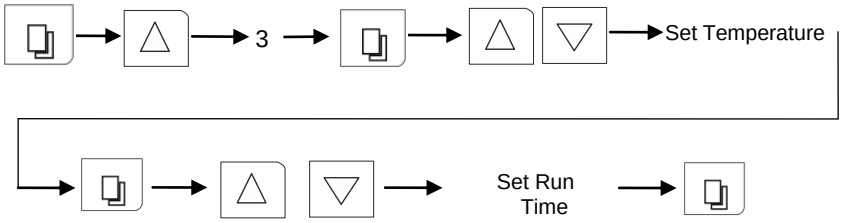
Press SET and enter the password “3”. Press the SET key again to enter the temperature set function. Press the Increase or Decrease key to set the desired temperature.

6.2 Set Timer

Only if you want to run the incubator on the Timer, otherwise, just leave it as “0”. To set timer, press the Set key to enter the timer set function. Press the Increase or Decrease key to set the desired run time.

Press the Set key to confirm/store the new settings.

Simplified instruction on the setting of control mode



Special Attention:
The unit has a timer range of 1-999 minutes. When the timer parameter is set as “0”, the unit will run continuously until manually stopped.

7. Setting Parameters for Programmable Control Mode

This INCU-S incubator can operate according to stored program to meet various requirements of professional experiments. Under programmable control mode, it is possible to program up to10 different segments, each with their own Ramp Time, desired Temperature and Hold Time. Please follow the procedures below to get your incubator work according to your personalized program:

7.1 Press R/S/H to stop the current operation.
7.2 Enter **programme** control mode, (See Section 5)
7.3 Press SET key and enter the password “2” followed by SET and enter into the setting of program parameters.
7.4 The screen displays: Programme and asks for a “Ramp Time” in Segment 1. Press the “Increase” and / or “Decrease” button to set the desired time.
7.5 Every time the “Set” button is pressed, the programmed value of the parameter is stored and the next item is asked for, so the next parameter is the (Ramp End) Temperature that the incubator has to reach for in the first segment (S1).
7.6 Press the “Decrease” or “Increase” button to set this temperature parameter for segment 1.
7.7 Press SET to store and to set the “Temperature Hold” time. (The length of time that

the incubator has to maintain the (Ramp End) Temperature for this Segment 1); Use the “decrease” and/ or “increase” buttons.

7.8 Press SET to store and enter the next segment (S2) setting process.

7.9 Press increase or decrease button to enter the second Ramp Time (S2)
And so on…….

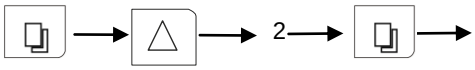
7.10 You can terminate the program setting by choosing “end” or “cycle” in any of the 10 segments. To do so, press the Decrease key- Lower than (below) 0.00 in the “Hold Time” of designated segment.

✶ “**End”**. First the screen asks: “end”, which means the whole program terminates here and the unit stops working.

✶ “**Cycle**”. If you keep pressing the Decrease (key) again, it will ask for: “cycle” that means this is the end of the program and unit will restart the whole program.

7.11 After the last segment, the display asks for the “Hold Segment Deviation”. This is the temperature deviation that the incubator may have at the end of each” Ramp” before starting the Hold Time, in another word, the difference between actual temperature and desired “Ramp End Temperature”, which activates the Hold Time.

7.12 The last parameter is called “Cycle” meaning the number of programmed cycles the incubator must repeat. (max. 99 times). If “Cycle” is set to 1, the run is repeated 1 time, so a total of 2 times!



Programme parameter
Set Segment 1
Ramp time
0.1min

This is the time to reach the first ramp temperature.

Programme parameter
Set Segment 1
Ramp end
temperature
37.0°C

End temperature of the first segment.

Programme parameter
Set Segment 1
Hold time
10.0 min

Retaining time for the programmed temperature in the first step segment

Programme parameter
Set Segment 2
Ramp time
0.1min

Setting for segment 2. Follow the same procedure for each of the following segments (10 in total).

Special attention:

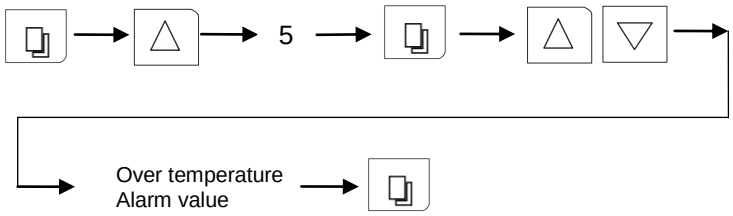
To pause the current program, press “R/H/S” key, and press again to resume.
To abort the program any time press the “R/H/S” key for 3 seconds.
To continue press the again “R/H/S” key to run it again from the start.

8. Setting of the Other Functions

8.1 Setting of over temperature alarm value. (Alarm Deviation Temperature)

Press the Set key and enter password “5”. Press the Set key again to enter into the over temperature alarm value. Press the Increase or Decrease key to change the required value of temperature deviation. Press the Set key again to confirm and store the new settings.

Simplified instructions for over temperature alarm settings (ADT)



When the temperature exceeds this over temperature alarm set point, the alarm sounds continuously and the LED alarm indicator on the control panel lights, while the heater is automatically cut off.

Alarm can be silenced by pressing the Temperature button.

Attention:

1. When this ADT value is set on “0”, the alarm function is deactivated.
2. Changing the required (PV) temperature value, may immediately activate the alarm if as a result, the adjustment makes the difference exceed the deviation limit.
3. When the actual temperature is back within limit(s), the unit automatically stops the temperature alarms.

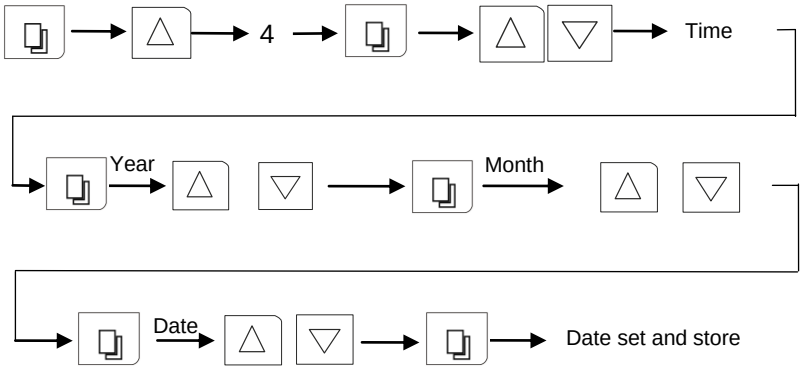
8.2 Real time clock setting

Press the SET key and enter the password “4”.Press the SET key again to enter into time set menu. Press Increase or Decrease key to set the right time of day.

Press the SET key again, the display shows the year, press the Increase or Decrease button to change it to the actual year. Press the SET key once more, the display shows the month, press the Increase or Decrease button to change it to the actual month, press the SET key one more time to the day of the month, press the Increase or Decrease button to the right date.

Press SET key to store and return to normal display

Simplified instructions for Clock settings.



8.3 Power-off Recovery

This unit has power-off recovery function. When after a power failure, the equipment will automatically recover to run according to the originally designed program.

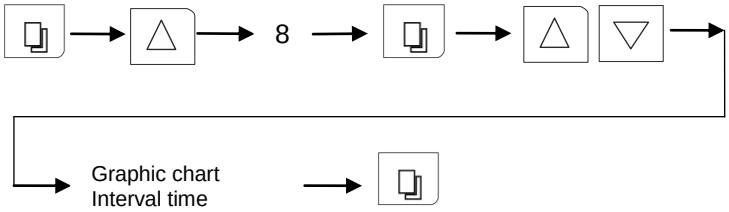
No setting is required

8.4 Graphic chart display interval time.

This is the parameter to set the time interval that the screen graph will use to store and show the temperature values.

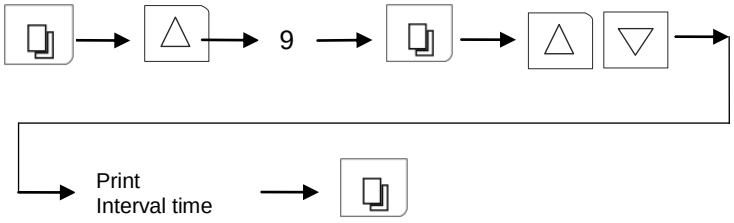
Press the SET key to enter the password “8”, Press the Set key again to enter record-time function. Press the Increase or Decrease key to modify the print-timer. Press the Set key to confirm/store new setting.

Simplified instruction for the Graphic Chart recording time



8.5 Print timer

Simplified instructions for the print timer

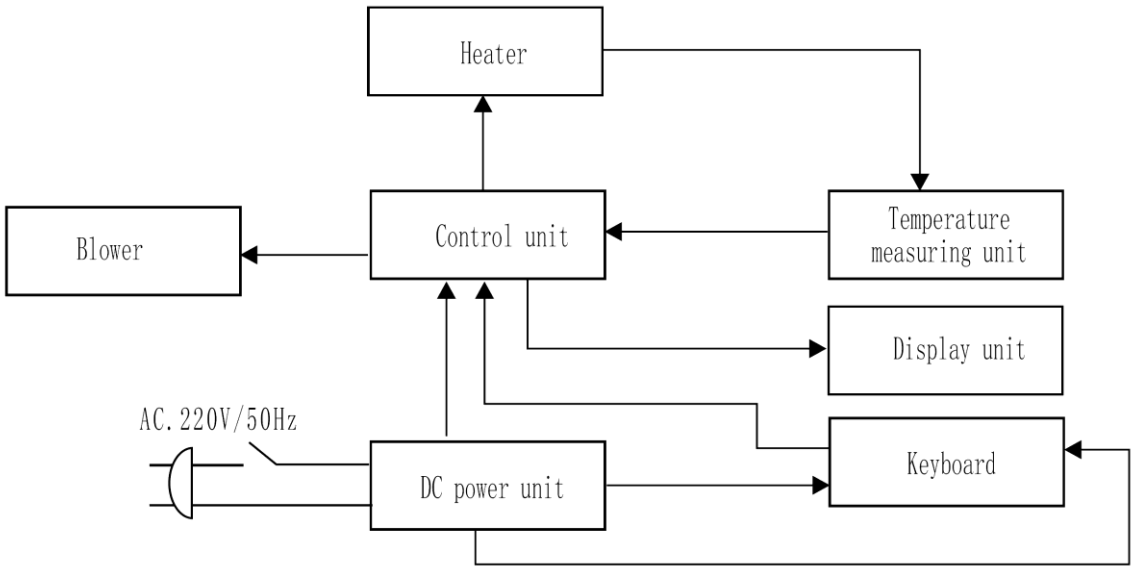


Press the SET key to enter the password “9”, Press the Set key again to enter print-time function. Press the Increase or Decrease key to modify the print-timer. Press the Set key to confirm/store the new setting.

9. Operation and Switch Off

9.1 When all the above settings are done, press the “R/H/S” button and the equipment will start running according to the program settings.
9.2 If pressing the “R/H/S” button while the unit is running, the timer will pause until the “R/H/S” button is pressed again.
9.3 If the “R/H/S” button is held for 3 seconds, the remaining run time will be cleared to zero. Press the “R/H/S” button once more, and the unit will start again to count down from the preset operation time.
9.4 While the unit is in use, the current remaining operating time cannot be changed. If however changed at this time, it is invalid with the current operation. Only when the current operation time is elapsed- or stopped and activated again according to the above instructions, the new changed value will be effective.
9.5 The incubator can be turned off with the main Power switch on the right side of the unit to end operation completely.

10. Electric Inputs & Outputs



11 Temperature Calibration.

Attention:

1. The unit is delivered with calibration done in the factory, so please perform the calibration only if necessary. It's recommended the unit is calibrated once a year or two years.
2. If the unit is running at one set point in most time, perform one point calibration as 11.2.
3. To get a linear temperature in the chamber, a 2 point calibration must be executed.

11.1 Take a certified calibrated thermometer in a small bottle with glycerin and place that in the geometrical center of the incubator.

Low Temperature Point Correction (0.0)

11.2 Change the set point to the value that the unit is most frequently used for, like 37C, or a lower point, for example, 5.0°C above ambient and let the incubator run for at least 1 hour– until the temperature is constant, and let the temperature inside of the chamber uniform.

11.3 Open the outer door and read the temperature on the thermometer through the inner glass door; calculate the difference with actual displayed temperature. for example, if reading is 35°C, difference would be 35-37= -2°C, while if reading is 38°C, the difference would be 38-37=1°C

11.4 Press the SET button and go with the up arrow to code “47”.

11.5 Press the SET again, to enter the Step 1. "Low Temperature Point Correction (0.0)", the display shows the "Temperature Correction" with "0.0" and the "Current Correction Value". Use the up and/or down key to make a further adjustment on the current correction value by the temperature difference calculated above, for "-2°C ", decrease by 2, for "1°C ", increase by 1.

11.6 Keep pressing "SET" button, skip the " High Temperature Point Correction (100.0)" setting, save and exit.

11.7 The displayed temperature should have changed due to the calibration. Waiting for another one hour to let the temperature stabilize again at 37°C, and check the thermometer value again, and calculate the new difference.

11.8 if necessary, perform the calibration again until the actual display value equals to the calibrated thermometer value. Thus the Step 1. "Low Temperature Point Correction (0.0)" is completed.

High Temperature Point Correction (100.0)

11.9 If the incubator is to be used for more than one temperature setting, and "High Temperature Point Correction (100.0)" needs to be performed as well.

11.10 Change the set point to a higher temperature point as required, for example 60.0°C and let the incubator run for at least 1 hour– until the temperature is constant, and let the temperature inside of the chamber is uniformed

11.11 Change the enter the code "47" again and press "SET" skip the "0.0", and enter the "100.0" page.

11.12 Repeat the same procedure, like the "Low Temperature Point Correction", to correct the high temperature point, until the display value equals to the actual thermometer value. Then the "Step 2 High Temperature Point Correction (100.0)" is completed.

12 Trouble Shootings

If there is a need to access the (top) control panel, use an Allen wrench of 6mm (Included). Push the Allen screw in and turn at the same time. The cover will be raised a little – enough to lift it and take it out.

Observed symptoms	Possible cause	Corrections
Incubator does not work / No display	1.Power supply is not connected	Check supply system to see if there is power on the outlet.
	2. The power switch has not been switched on.	Turn on the power switch on the right side of the incubator
	3. The (inside) fuse is broken	Replace fuse with new one of same specification
	4. Malfunction of power box circuit occurs	Notify distributor to repair the unit.
Incubator temperature alarm	1.Unit has not yet reached the required (constant) temperature	Keep waiting and observe for a while
	2. Setting of the alarm parameter is wrong.	Refer to the operating procedure and change or re-set alarm parameter
	3. Malfunction of heating system.	Notify your distributor for repair
Real temperature (PV) is lower than the set (SV) temperature. This activates low temperature alarm	1. Equipment has not yet entered into the state of constant temperature	Keep waiting and observe for a while
	2. Temperature deviation alarm value is too small	Reset the alarm value
	3. Abnormal conditions occur with the heater.	Notify your distributor for repair
	4. In the programme mode, the difference between preset value and measured value keeps changing.	In the programme mode, turning off the alarm function is strongly recommended.
Screen display shows nothing or just strokes and or distortions	1. Equipment is disturbed by high frequency.	Eliminate the source of disturbance and restart the operation.
	2. Microprocessor failure	Notify your distributor for repair
Fluorescent lamp does not work	1. The lamp tube is broken.	Replace the lamp tube
	2. The starter is loose or broken.	Check or replace the starter