



User's Manual

INCUC series

Economic Cooled
BOD Incubator

This Manual applies to:

Models: INCU-90C, INCU-160C, INCU-270C, INCU-430C



Thanks !

Thank you very much for purchasing one of our INCU-C Series programmable refrigerated BOD 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-C Refrigerated 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-C 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 innovated frost-free refrigeration system and also three-dimensional heating with adjustable air circulation.

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 you 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.

	<p>Danger!</p> <p>Warning against damage and injury.</p>
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1. The electrical supply circuit to the incubator must conform 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.

	<p>Attention!</p> <p>Instructions for optimal performance</p>
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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.
11. After transport of the Incubator – **DO NOT USE IT for at least 24 Hours, unless you are a 100% sure that the unit has been moved in an upright position only.**
12. If the incubator is used continuously at low temperatures, condensate can occur inside of the incubator. You might need to wipe this out, or-if possible-heat up the incubator to evaporate the condensation. There is however on the right side (low) a drain that might be emptied. (see the picture).
13. To extend the compressors life and maintain an excellent performance of your refrigeration system, the condenser of the unit should be cleaned every month.




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

<u>1. Performance Features</u>	6
<u>2. Technical Specifications</u>	7
<u>3. Control Panel</u>	8
<u>4. Preparation and Start-up</u>	11
<u>5. Setting of the Control Mode</u>	12
<u>6. Setting Parameters for Constant Temperature Control Mode</u>	13
<u>7. Setting Parameters for Programmable Control Mode</u>	15
<u>8. Settings of the Other Functions</u>	17
<u>9. Operation and Switch Off</u>	21
<u>10. Electric Inputs & Outputs</u>	22
<u>11. Temperature Calibration</u>	22
<u>12. Trouble Shootings</u>	24

1. Performance Features

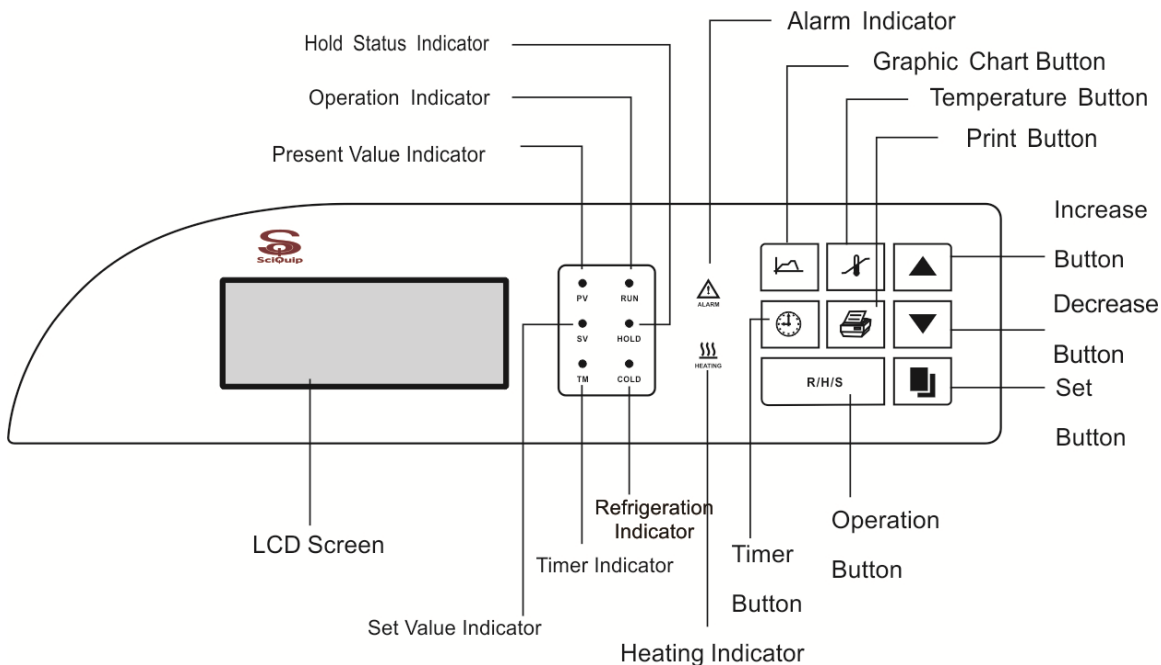
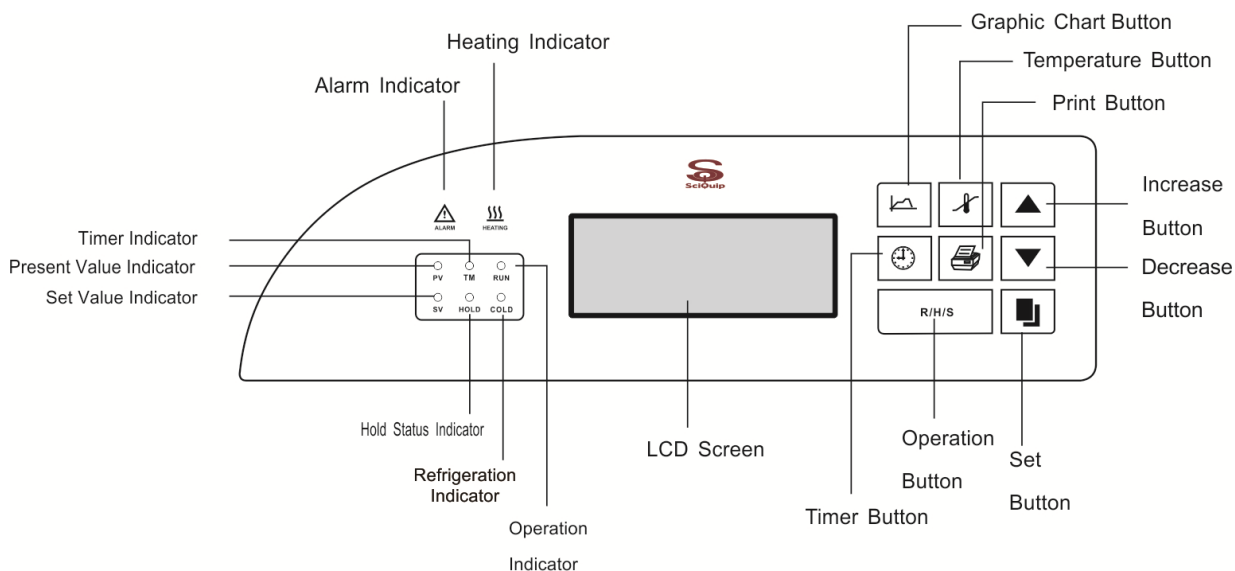
- ★ Both the interior and exterior are made of robust materials for lifetime operations. The inner chamber is made of high quality #304 stainless steel sheets, with 4 round covered corners. All exposed edges are de-burred to insure no sharp edges. The exterior is cold rolled steel finished with powder coated polyurethane finish, which is resistant to most chemicals and easily cleaned with mild household detergents.
- ★ The INCU-C BOD 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 compressor system runs at all times-(except for higher internal temperatures). If cooling is required, a solenoid valve –also driven by the microprocessor-will be activated and cool down the incubator to the required temperature.
- ★ The 3 dimensional air circulation, motor fan speed adjustable in three steps via the controller ensures optimum temperature distribution across the internal chamber.
- ★ 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-ground edges, and seals are tight against a **U**-grooved door rubber gasket.
- ★ A fluorescent light is installed as standard, for medium intensity of illuminating needs in the chamber.
- ★ A magnetic gasket on the outer door helps to insure a tight seal against the cabinet.
- ★ A double-layered observation window comes as standard on every INCU-C Series Incubator.
- ★ 2 grid shelves, 50mm test port, RS232 interface on the side wall as standard, built-in printer, UV light as options available upon request.

2. Technical Specification

Model	INCUC-90C	INCUC-160C	INCUC-270C	INCUC-430C
Volume (L)	90	160	270	430
Door Type	Outer door with observation window, and heat resistance glass inner door			
Temperature Range (°C)	4 to 65			
Temperature Accuracy (°C)	0.1			
Temperature Uniformity (°C)	±1.0 @37°C			
Cooling System	Automated, with R134A Refrigerant			
Alarm	Enabled			
Timer (min)	0-999			
Settings	Digital			
Display	LCD			
Grids Included	2 (Max 11)	2 (Max 15)	2 (Max 18)	2 (Max 25)
Grid Size (mm) (WxD)	310x356	410x456	513x556	555x656
Inner Dimensions (mm) (WxDxH)	400x410x550	500x500x650	600x600x750	700x645x950
Exterior Dimensions (mm) (WxDxH)	550x555x1280	630x740x1380	750x840x1480	840x880x1680
Packing Dimensions (mm) (WxDxH)	620x625x1440	700x810x1540	820x810x1640	910x950x1840
Net/Gross Weight (kg)	68/108	98/145	130/180	180/220
Power (W)	710	860	950	1350
Standard Configuration	Fluorescent lamp, 50 mm Test Port			
Options	Built-in printer, UV Lamp, RS-232 interface			
Electricity	220-240V 50/60 Hz			
Approval	CE, ISO			

3. Control Panel

Illustration of Control panel





"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 turns.



Time button:

Press the button to display set timer and accumulated time value.



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 indicator:

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 set value.

- PV
Actual Temperature Indicator:
 LCD displays the value of actual temperature

- SV
Graphic Temperature Indicator:
 LCD displays the graphic chart of the set temperature and actual temperature

- TM
Time indicator:
 When the LCD 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. this indicator will light, if the program is entering "hold" step, in another word, the "Hold time" starts counting down.

- 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 the normal control mode-as a one temperature incubator (Fixed value on the display), or in a programmable control mode with 10 segment in 20 steps. (Programme on the display). This program can be repeated - max. 99 times.



Special Attention:

To change the control mode:

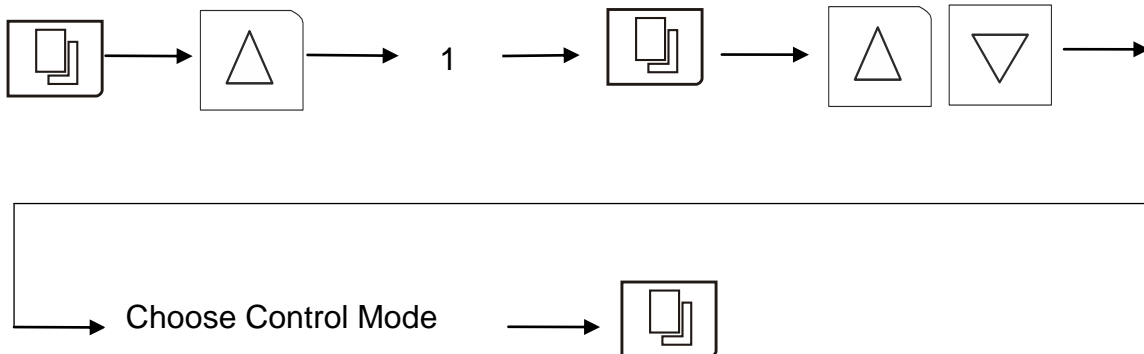
Only if the incubator is in a non-working status.

To set the desired control mode:

Stop current operation by pressing 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 control mode options, press the Increase or Decrease key to select the desired control 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: 4°C to + 65°C (INCUC Series)

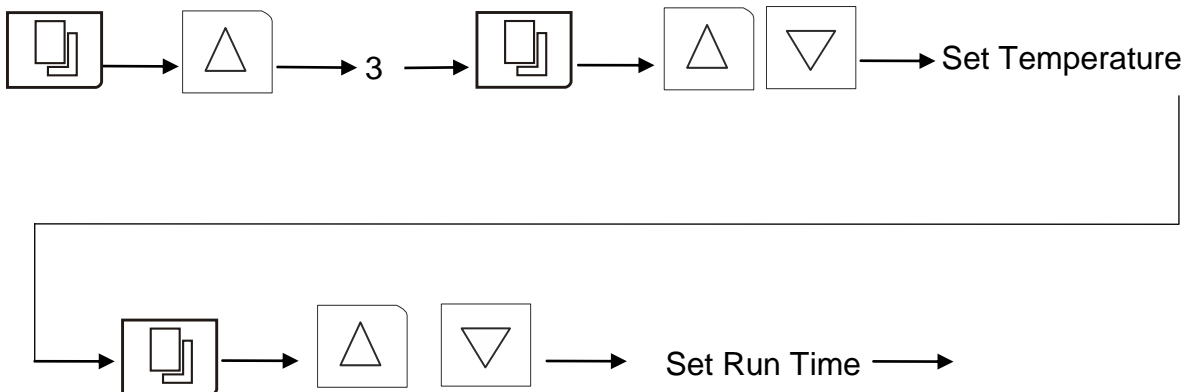
Press SET and enter the password “3”. Press the SET key again to enter the temperature set function. Press the Increase or Decrease key to set the desired temperature.

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 operation timer.

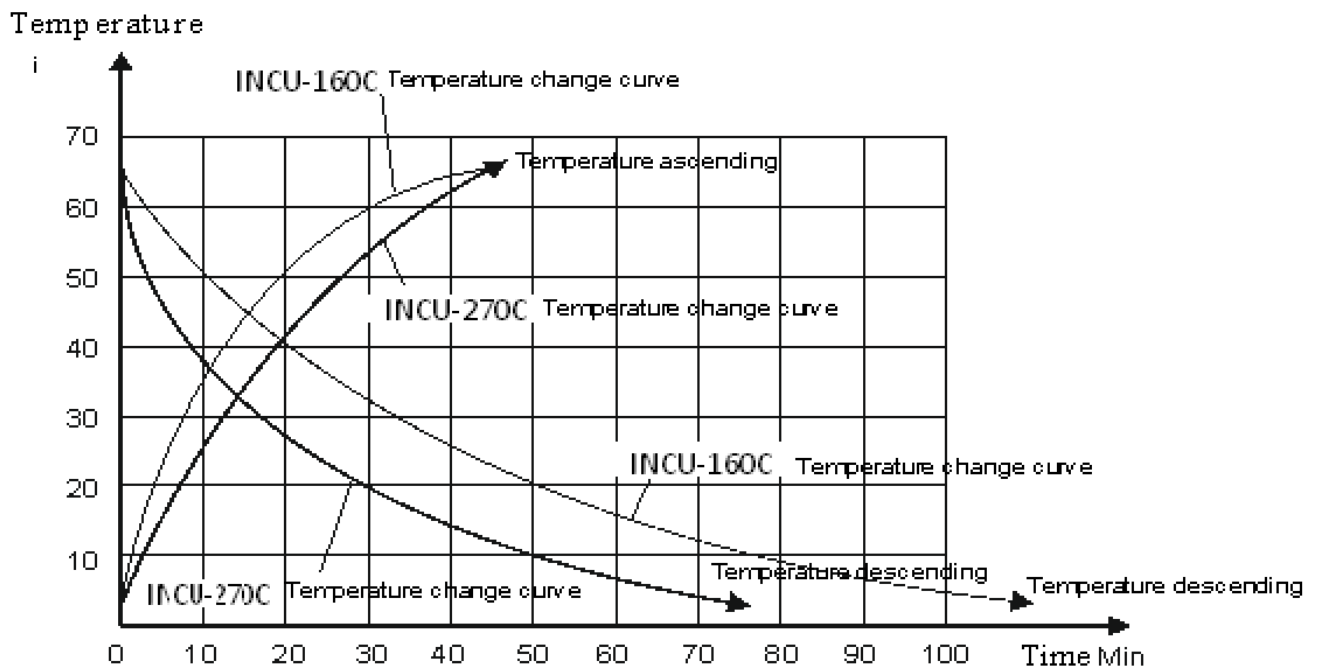
Press the Set key to confirm/store the new settings.

Simplified instruction on the setting of control mode



6.3 Pull down Time

As below, it is a graph showing a cooling down/heating up temperature control mode (model INCU-160C & INCU-270C) for time and temperature at an ambient of about 25°C. This will help you to set the parameters in the “Programme” mode (chapter 7). Other models may have slightly different pull down time from INCU-160C & INCU-270C shown in this graph.

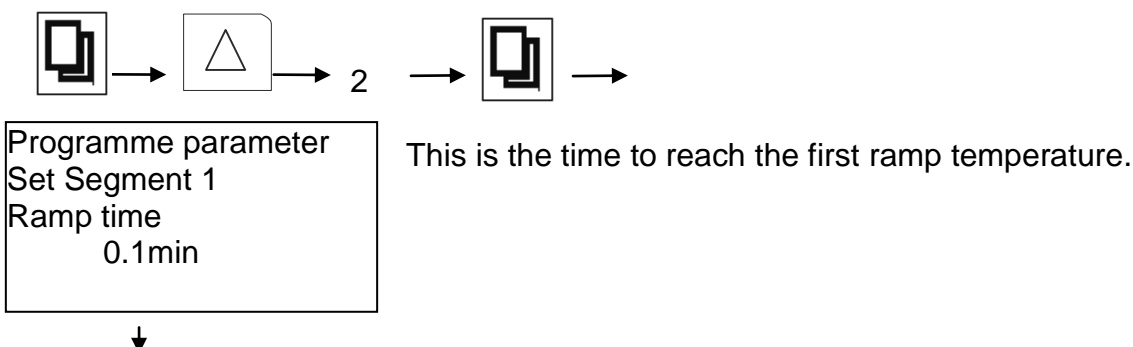


Graph 1

7. Setting Parameters for Programmable Control Mode

This INCU-C incubator can operate according to stored program to meet various requirements of professional experiments. Under programmable control mode, It is possible to program up to 10 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 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 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. If it’s set as “0”, “Hold Time” will start counting down as soon as the “Ramp Time” dues. Otherwise, the "Hold Time" will remain on hold until the temperature reaches the value of "Ramp End Temperature"+/- "Hold Deviation".
- 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 end
temperature

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.

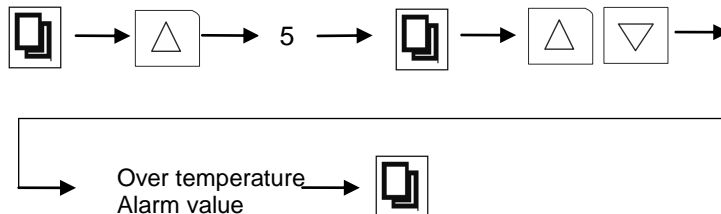
To continue press the again “R/H/S” key to run it again from the start.

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.

Alarm can be muted by pressing the Temperature button.



Attention:

1. When this ADT value is set on “0”, the alarm function is deactivated.
2. Changing the set (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.

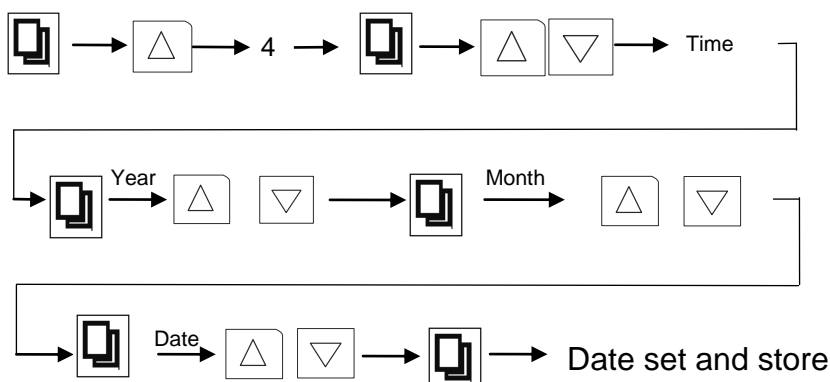
8.2 Real time clock setting

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 Cooling System & Defrosting Settings

-Cooling Control Setting

The cooling system can be set to run automatically, continuously on , or off for the best performance of temperature control. The factory default setting is "AUTO", but can be changed to "ON", or "OFF" if needed.

-Auto Defrosting Setting

This unit is equipped with automatic and manual defrosting functions.

For automatic defrost, it is effective only when the cooling system is in operation, and the actual temperature value is lower than 15°C. The unit will run auto defrosting cycle according to the following two parameters settings,

Defrost Timer—Auto Defrost Cycle

This function indicates the time interval between two defrosting cycles. The set range is between "0-240" hours. Set it as "0" to disable the auto defrosting function. Once the "defrost timer" is set, the unit will automatically perform the defrosting cycle accordingly.

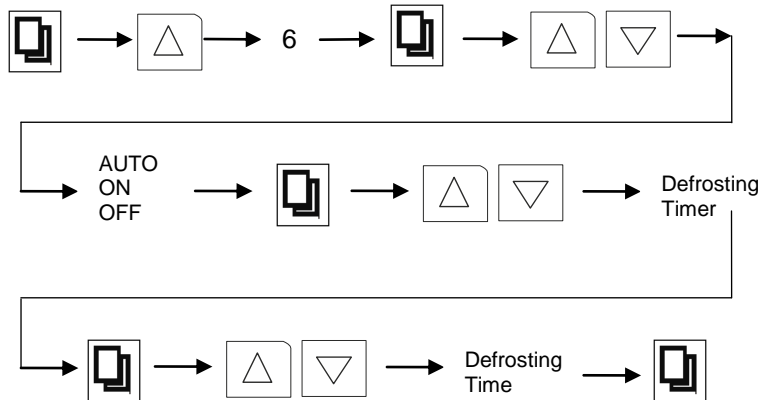
To find out the suitable "defrost timer" setting, the frosting time duration should be counted from start of the low-temperature operation to the point that the actual temperature start bouncing up due to the frosting inside the evaporation chamber. Then set the "defrost timer" as somewhere between 1/10-1/5 of the frosting time duration. For example, if the frosting time duration is 20 hours, the "defrost timer" can be set from 2-4 hours. High relative humidity will require more frequent defrosting cycle.

Defrost Period/Time

This function indicates the time duration for each single defrost cycle both under auto and manual operations. The set range is between "1-24" mins Set it as "0" to disable the defrosting function.

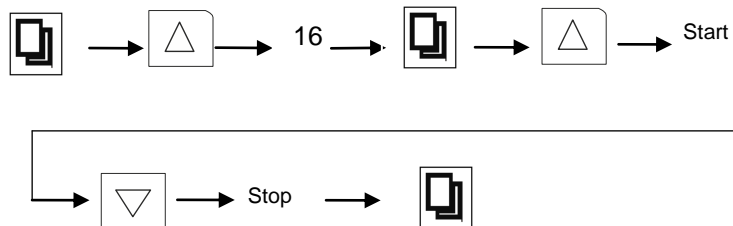
When the ambient temperature is higher than 25°C, like in summer, the recommended setting is 30 seconds, otherwise, 1 min is considered as adequate. As ambient conditions may vary, therefore, always try to find the most appropriate settings for your own particular ambient condition.

Simplified instruction for Cooling system and Auto Defrosting settings



Manual Defrosting

Alternatively, if the set temperature is not so low as critical, in most cases, manual defrosting will be adequate. During the operation, enter password "16", press "Set" key, then press "Up" button to start the manual defrosting cycle for the "Defrosting Time" set in the "Auto Defrosting setting", Or it can be terminated manually by pressing the "Down" button. Minimum time interval between two manual defrost cycles is 1 min.



Attention:

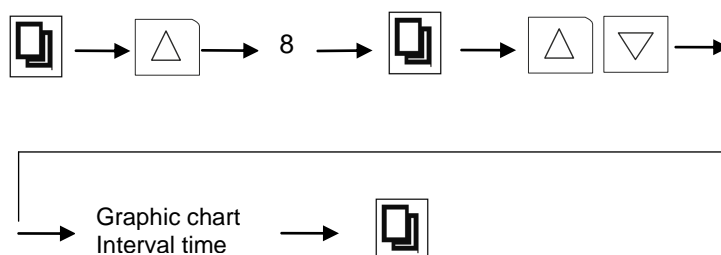
1. The cooling system keeps running during defrosting cycle, while the motor fan stops.
2. The temperature will silently overshoot during defrosting, and then be stabilized when defrosting terminates.
3. **For better temperature control during continuous low temperature operations, for example, below 10.0°C, the following operations are recommended:**
Set Defrost Timer: "4" hr, Defrost Period: "1" min;
Weekly maintenance: Open the door and wipe off the condensation, set the temperature at top value "65°C" and let it run for at least 1 hour to further evaporate the condensations inside the chamber.

8.5 Graphic chart display interval time.

This is the parameter to set the time interval between two temperature value records to be shown on the screen graph.

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 interval time for chart display. Press the Set key to confirm/store new setting.

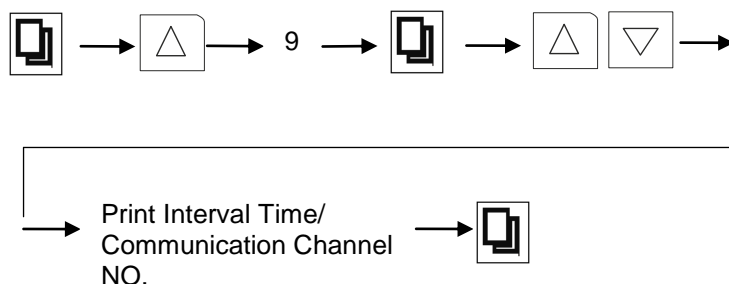
Simplified instruction for the Graphic Chart recording time



8.6 Print timer/ Communication Channel NO. (Option)

Press the SET key to enter the password “9”, Press the Set key again to enter print-time/Communication channel NO. set function. Press the Increase or Decrease key to modify the print-timer/Communication channel NO. Press the Set key to confirm/store the new setting.

Simplified instructions for the print timer (Option)



Special Attention:



This function is subject to your chosen option of either printer or RS485 option.

This will be used for
 -printing interval timer setting, if printer is installed,
 -communication channel NO. setting, if RS485 interface is installed.

8.7 Motor fan speed adjustment

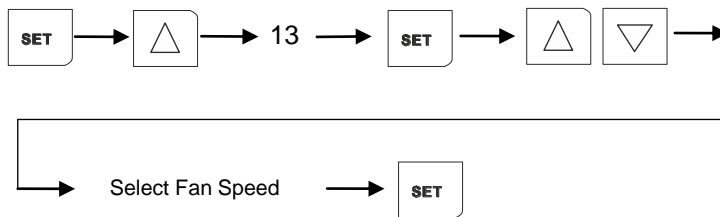
Forced air convection may destroy the protective layer from moist air that is generated during incubation over the samples. This would result in dehydration of the culture. Provided the chamber is fully loaded and forced air circulation is required, this unit is installed with main ventilating fan speed adjusting option, to provide further flexibility for various applications.

The speed can be adjusted by 3 levels, High (Factory Default), Medium and Low.


To set the ventilator speed:

Press the SET key and enter the password “13”. Press the SET key again until the LCD display shows the fan speed menu, press the Increase or Decrease key to select the desired speed level. To confirm the new settings press the SET key again.

Simplified instructions for adjusting fan speed



Speed Level	Description	Fan Speed	Power Output
H	High	2000rpm	220V-240V
M	Medium	1400rpm	175V
L	Low	1000rpm	150V



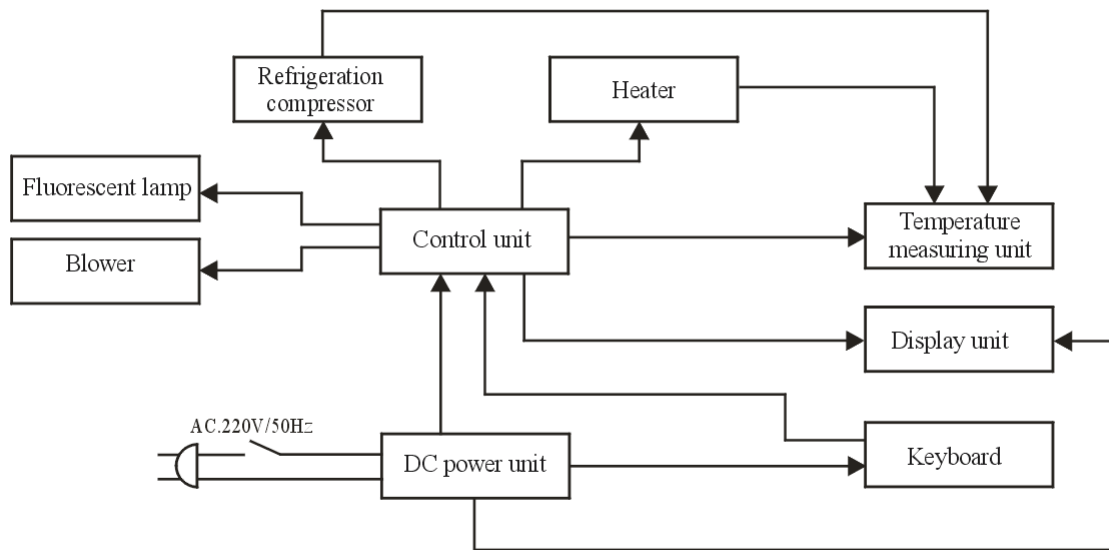
Special Attention:

Fan Speed Adjustment may slightly affect the temperature uniformity across the working chamber.
 The fan speed can be further adjusted upon request, please contact us or your local agent for more information.

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, or a lower point, for example, 8.0°C and let the incubator run for at least 1 hour– until the temperature is constant, and let the temperature inside of the chamber 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 6°C, difference would be 6-8= -2°C, while if reading is 9°C, the difference would be 9-8=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 8°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