Block Cooler System
(CB-1)

Installation and Operation Manual

Version 1.0

Item# 03060

This instrument is intended for laboratory use only

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A. Important Notice

Before setting up and operating the instruments of Block Cooler (CB-1) system, please carefully read these instructions to get familiarized with the installation and operation process. Instructions should be read by experienced individuals before operating the instruments.

Any improper usage of the instruments may cause damage. Please refer to the safety notice included with this equipment.

The instruments shall not be modified or altered in any way. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazard. Wealtec is not responsible for any injury or damage caused by using the instruments for any non-intended purpose or injury as a result of modification of the instruments by any person who is not authorized by Wealtec Corp.

A-1. Warranty

Block Cooler system is warranted to be free from defects in materials or workmanship for a period of one year from the original invoice date, under normal usage. Any defects occurring during warranty period, Wealtec Corp. will repair or replace defective products or parts without charge unless the defects arise from conditions outlined below. The defects described below are specially excluded from Wealtec warranty policy.

1. Improper operation of the instrument.
2. Repair or modification by any person who is not authorized by Wealtec Corp.
3. Damage caused by any (in)-direct accident, neglect or misuse.
4. Damage caused by disaster.
5. Damage caused by any improper solvents or samples

A-2. Technical and Service Contact

Most of the operation details are described in this instruction manual to assist and guide operator for an appropriate solution. For any other technical/ service questions, please contact your local representative or contact Wealtec international technical/ service specialist by E-mail: support@wealtec.com.

A-3. Safety Notice

A-3-1. Certification

The block cooler system is designed to meet the international electrical safety standards EN61010-1 and EMC regulations. This product designed to meet CE requirements and if operated according to the guidance of the instruction manual, is certified safe. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazards.

A-3-2. Safety Information

- Do not apply more or lower than the rated voltage specified on the instrument or it may cause damages to the instrument.
- Do not splash water or liquid onto the block cooler system, the spilled water or liquid may cause malfunction to the block cooler system.
- Do not touch or remove the 48-Well aluminum block directly with hand while heating, cooling or when the block is still hot or cold.
- Do not directly pour water/liquid/ice on the high or low temperature heating block to cool down or stabilize the temperature of the block to the room temperature. It may cause damage to the instrument and fast-evaporated water/liquid may be harmful to the operator.

B. Introduction

Block Cooler System (CB-1) is a standard cooling unit for laboratory use. The compact cooling unit temperature ranging 0 – 75℃ allows customizing settings for specific temperatures or utilizing the nine frequently used pre-set temperatures for various molecular biology or chemistry applications. The universal 48-well aluminum block is a single block designed to suit various types of microtubes without the need of the multiple blocks. An applicable samples for block cooler accordingly for various temperatures is given in the table below:

Selectable Temperature Range	Recommended Applications
0 °C	Replace the ice buckets for samples & enzymes storage;
4 °C	Sample cooling & storage during operation – i.e: Store nucleic acid at 4°C in long PCR at final stage, DNA purification kit rinsing and sample with 70% ethanol at 4°C, hybridization process when adding polyA to hold at 4°C in nucleic acid. cDNA synthesis experiment – i.e: Placing oligonucletides or polymerase at 4°C. Pre-thaw the primary antibody for continuous uses – i.e: western blotting procedure. Enzyme reaction – i.e: ligation steps of gene construction. Cell lysis experiment – i.e: Resuspend the protein in lysis buffer at 4°C. General immunoprecipitation procedure.
16 °C	Enzyme reaction – i.e: Restriction enzyme activity for DNA ligation.
25 °C	Biological response assay. Enzyme catalysis activity reaction. In long PCR reaction at final stage “hold”.

37 °C	In cell culture procedure to dissociate the cell with Typsine/DNAase I solution in HBSS medium or resuspend with DNase I solution only in DMEM medium. The denature DNA steps in DNA extraction kit. DNA/RNA probe preparing. The incubation steps in cDNA synthesis. Bacteria culture incubation or purification. Enzyme reaction – i.e: Restriction enzyme reaction and RNAase reaction by DNA extraction or Flow cytometry of Apoptosis. Incubate the plug at 37°C in Pulsed Field Gel Electrophoresis. For gel digestion pre-treatment before MALDI-TOF MS analysis.
42 °C	The reverse transcription temperature by RT-PCR. Enzyme reaction – i.e: DNA ligase gene reaction for thermosensitive mutant application. The incubation procedure of phage purification. Gene transformation incubation – i.e: Transfer gene to E. Coli strain for expression.
55 °C	The steps required on cDNA synthesis. Chemical reaction – i.e: The gentle heating steps by DNA extraction kit solution. Enzyme reaction – i.e: RNAase reaction. Gel digestion – i.e: The oligonucleotides purify from SDS-PAGE gel.

65 °C	In RT-PCR experiment, continuous to hydrolysis steps. Inactivate enzyme reaction – i.e: Inactivate the proteinase K reaction in DNA/RNA probe preparing. The incubation temperature in Bacteriophage DNA purification procedure. Keep the melted Agar / Agarose medium warm to extract nucleic acid.
72 °C	Chemical / enzyme reactions – i.e: Inactivate enzyme reaction. Sample dissolving in solution – i.e: Agarose dissolving. Denatured sample – i.e: Pre-heating protein molecules before SDS-PAGE running.
Customize Temperature Between 0-75 °C	Specific incubation temperatures for chemistry / molecular biology experiment requirements. Sample & chemical dissolving.

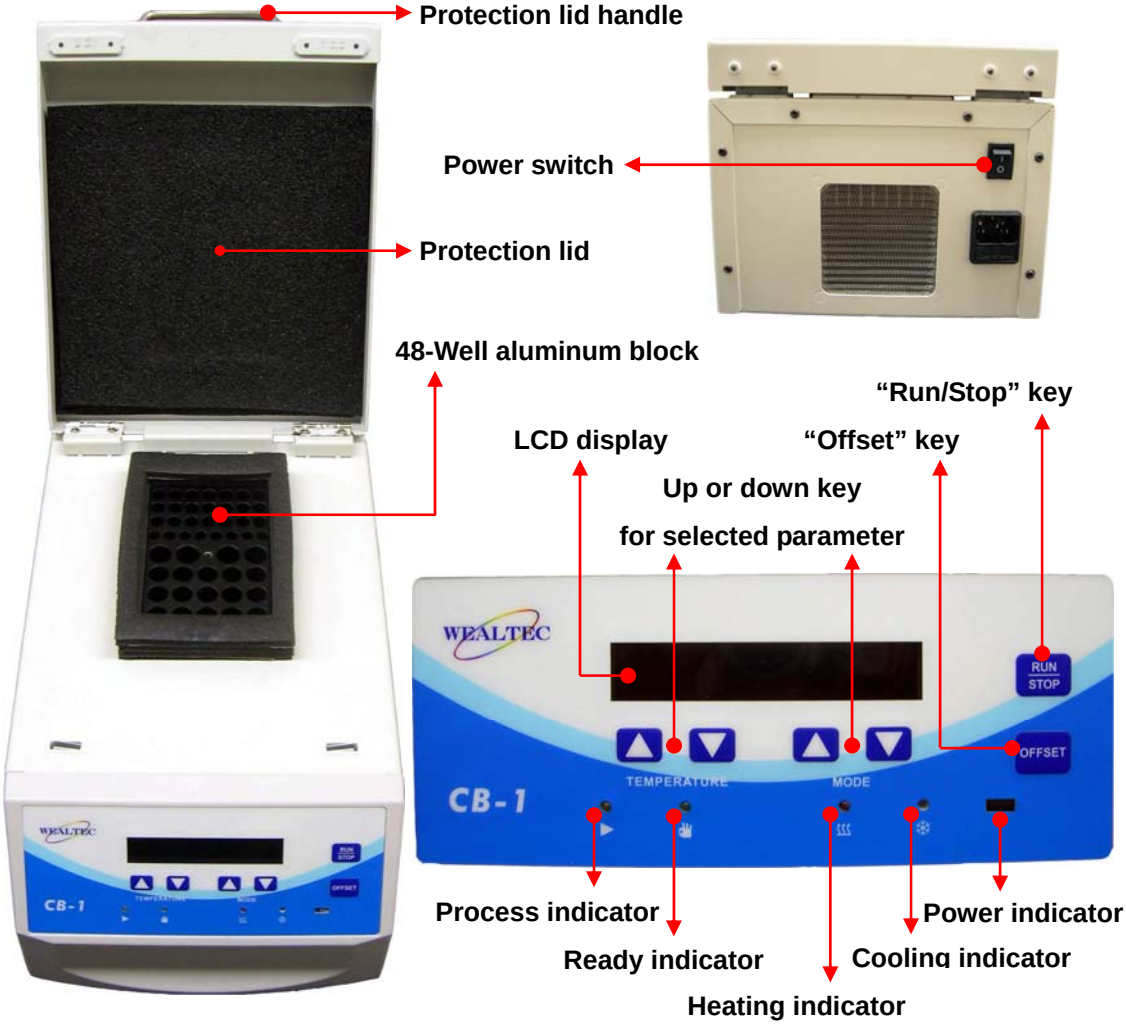
B-1. Specifications

Temperature range	0 – 75℃
Number of pre-set temperature	9 Points (0, 4, 16, 25, 37, 42, 55, 65 and 72℃)
Temperature accuracy	+/- 0.1℃ (Full temperature range except at 25℃)
Cooling performance	35 minutes (From 25℃ to 0℃)
Temperature controller	Microprocessor with PID algorithm
Temperature control mode	Digital
Temperature calibration	Built-in
Display type	LCD display

Heating / Cooling element	Peltier			
Heating power (Watt)	75 max.			
Over temperature cutoff	100℃			
Power	90–264 VAC, 47–63 Hz			
Dimension (L x W x H)	200x304x184 mm (7.87”x11.97”x7.24”)			
Weight (With block)	Net~6.5kg (14.3 pounds) Gross~7.5kg (16.5 pounds)			
Block capacity	1			
Operating conditions	Temperature : 0 – 26 ℃ Humidity : 10% to 90% R.H. Non-condensing			
Aluminum block				
Block type	48-Well aluminum block			
Well type	8 x 0.2 ml	21 x 0.5 ml	15 x 1.5 ml	4 x 2.0 ml
Number of holes	8	21	15	4
Tube type	0.2 ml microtube	0.5 ml microtube	1.5 ml microtube	2.0 ml microtube
Hole diameter (mm)	6.5	8	11	13
Hole depth (mm)	20	29	34.5	34.5
Block material	Solid anodized aluminum			
Dimension (L x W x H)	107x71x38 mm (4.22”x2.8”x1.5”)			

B-2. Product Description

B-2-1. Block Cooler System Hardware Overview



Control panel

- "RUN/STOP" key – Press this button in order to run or stop the block cooler.
- "OFFSET" key – Press this button and adjust the offset value in order to alter the temperature of the block cooler system to the desired temperature as per to users

calibrated thermometer.

- Power indicator will turn on if the block cooler system is turned on.
- “  ” – Cooling indicator will turn on if the system is desired to cool down.
- “  ” – Heating indicator will turn on if the system is desired to heat up. In the other word when the set temperature equals to the actual block temperature.
- “  ” – Ready indicator will turn on if the system has reached the desired temperature. In the other word when the set temperature equals to the actual block temperature.
- “  ” – Process indicator will turn on while the system is progressing to the desired temperature.
- “  ” & “  ” – Up and down key is used to adjust the desired temperature value and the desired mode of the temperature.
- LCD display – Displays the temperature value and the mode settings. LCD display allows for easy system setting operation and monitoring.

Protection lid

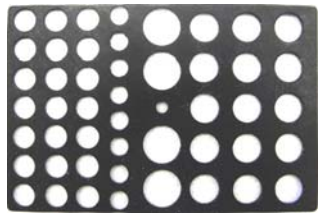
Protection lid design avoids possible contaminations and environmental heat transfer. This indirectly helps to keep and maintain the desired temperature of the block cooler system which could be influenced from the environment. Protection lid handle provides easy handling of the protection lid.

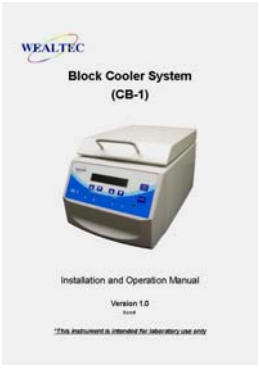
48-Well aluminum block

48-Well aluminum block is a single block suitable for various types of microtubes which includes 4 x 0.2ml, 21 x 0.5ml, 15 x 1.5ml and 4 x 2.0ml.

C. Installation of Block Cooler System (CB-1)

C-1. Package List

Item	Quantity
Block cooler system (CB-1) 	1
48-Well aluminum block 	1
Block protection rubber 	1
Block extractor 	1

Power cable 	1
Instruction manual 	1

C-2. Installation of Block Cooler System

C-2-1 Installation Procedure

1. Carefully pull the block cooler system out of the package box and place it at the work bench. The work bench should provide the space with the minimum size of 200mm (L) x 304mm (W) x 184mm (H) [7.87” x 11.97” x 7.24”].

2. Place the 48-well aluminum block into the block cooler system and place the block protection rubber on top of the block.

3. The AC inlet socket is located at the rear side of the block cooler system. Connect the power cable to the AC inlet socket and plug it into main power source.

4. Turn on the rear power switch and ensure the power indicator and the LCD display is on and functional.

D. Operation

1. Turn on the block cooler system power switch (Black switch located at the rear side of the block cooler system). The power indicator will turn on and the LCD display will show zero temperature on the control panel.

2. Open the block cooler system protection lid and place the desired microtubes on the 48-well aluminum block accordingly on its appropriate holes.

3. Close the block cooler system protection lid and select any of the targeted frequently used temperature for application by using the mode up and down key.

4. If you would like to customize settings for specific temperature, then use the temperature up and down key to select the desired temperature.

5. Upon setting the temperature parameter press “Run/Stop” key once to start running the block cooler.

   Note: In general the block cooler system will require several minutes to achieve the desired temperature on the block. This can be easily monitored from the “Process indicator” on the front control panel if the system is processing as in cooling or heating to the desired temperature or from the “Ready indicator” if the block has achieved the desired temperature.

6. After several minutes when the block achieved the desired temperature (When the “Ready indicator” is on) user may leave it run for the required time or for incubation and storage purpose.

7. Press “Run/Stop” key once to stop the block cooler system from operation and turn off the rear power switch when it is not in use.

8. Open the block cooler system protection lid and remove the microtubes from the block.

9. Microtubes are ready for further analysis.

E. OFFSET Function

OFFSET function can be utilized by operator to re-adjust the block cooler system temperature if it is necessary. Due to the reason every block cooler system has been properly calibrated with the calibrated digital thermometer before product delivery; operator is **ONLY** recommended to use the OFFSET function as for the followings.

- Operator have the offset kit
- Operator have a standard calibrated thermometer
- Operator wish to alter the block cooler temperature as per to their external mercury thermometer in order to follow a specific standard experimental conditions.
  Note! General laboratory mercury thermometer is not calibrated accordingly to international standard thermometer. Some temperature variation may occur with the usage of the different non calibrated thermometers.

⚠**Caution!** Maximum adjustable offset range is ±12.5℃. In any case if an operator notices the system requiring more than the allowable offset range please contact your local Wealtec representative.

In the case of performing any adjustments in the field, please follow the procedure below:

a. Open the protection lid and place the offset kit on top of the block cooler. Then place the calibrated thermometer into the appropriate hole on the offset kit.

b. Switch on the block cooler system. Select the temperature parameter to 4℃.

c. Start the block cooler system.

d. Wait (~30 minutes) until the system achieves the desired temperature and stabilized. (Ready indicator turned on)

e. When the ready indicator turned on, stop the block cooler system.

f. Press the “Offset” key and by using temperature up and down key adjust the desired offset value (The difference between block cooler system temperature and the user’s calibrated thermometer). Upon setting the offset value press the “Offset” key again

Note: The maximum adjustable offset range is ±12.5℃.
While the system is in the offset function user will not be able to start the system. User will need to press the “Offset” key again to quit the offset function and back to main menu (Block Cooler CB-1 Set Temp.).

g. Start the block cooler system. Wait (~15 minutes) until the system achieves the desired temperature (4℃) and stabilized (Ready indicator turned on).

h. When the ready indicator turned on ensure the temperature reading on the users calibrated thermometer is as per to the previously entered offset value or else repeat step (e) – (h).

Example: Assume upon stabilizing the block cooler system temperature, user’s calibrated thermometer temperature displays 6.5℃ and the block cooler LCD displays 4℃. The offset value that user needed to enter is -2.5℃. Operator shall stop the system and press offset key and press temperature down key to -2.5℃ (6.5℃-2.5℃= 4℃) then press the “Offset” key again to quit the offset mode. Then start the block cooler system and wait until the system temperature stabilize and ensure the reading temperature value on the user’s calibrated thermometer is as per to the offset adjustment value previously made.

F. Troubleshooting

Note: If you notice any malfunction in your block cooler system or it operates in an unusual way you may initially attempt to solve the problem by following the general symptoms or error messages, this is when the system encounters a known problem and the corrective action or solutions given in the following tables below in this section.

Any other than the given solution such as servicing attempts will void the warranty, void the regulatory certifications and create potential safety hazard. Please contact your local WEALTEC representative if you are unable to solve the problem.

F-1. General symptom

Symptom	Action and possible solution
Fan is not spinning LED & Display do not light up Front panel power on indicator off	Check main AC power source Replace a new same configuration fuse and try again. Check if power switch malfunction. Check if the system displays any errors. Contact your local Wealtec representative.
Fan is not spinning LED & Display do not light up Front panel power on indicator off	Check the main AC power source. Check if the system displays any errors. Contact your local Wealtec representative.
Fan is not spinning LED & Display do not light up Front panel power on indicator on	Contact your local Wealtec representative.
Intermittent fan, LED or display	Contact your local Wealtec representative.
Requires higher offset value (More or less than ±12.5℃)	Contact your local Wealtec representative.
Fuse blown	Change a new same configure fuse and try again. Contact your local Wealtec representative.

F-2. Error messages

Error Code	Explanation	Possible Solution
Fan Error	Fan is not working	∗ Check all connections ∗ Contact your local Wealtec representative
Overheat Error	The block cooler system is overheated during a run, temperature of the system exceeded more than 100°C	∗ Ensure the block cooler system operating condition temperature 0 – 26 ℃ ∗ Contact your local Wealtec representative
Sensor Error	Sensor faulty	Contact your local Wealtec representative
Any other error code		Contact your local Wealtec representative

G. Care and Maintenance

- Block cooler unit can be cleaned with pre-moistened soft tissue soaked with clean water. Organic solvents or strong detergents may damage the instrument and should not be used.

- 48-Well aluminum block should be protected from organic solvents and detergents and it should be cleaned with pre-moistened soft tissues after every usage to avoid all possible contaminations and damages to the instruments.

H. Order Information

Block Cooler System

Item #	Description
1093001	CB-1 Block Cooler System with block extractor, 48-well aluminum block and block protection rubber, 100~240VAC – 50/60Hz

Optional Accessories

Item #	Description
1093101	48-Well aluminum block for CB-1
1093201	Block protection rubber for CB-1
1092104	Block extractor

03060

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