



Instruction Manual

**The Cube Dry Bath Incubator
TCDB-01 TCDB-02**



Packing list

TCDB-01

TCDB-02

- 1 x Single Block The Cube Dry Bath Incubator or
1 x Dual Block The Cube Dry Bath Incubator
- 1 x Power Cord for The Cube Dry Bath Incubator
- 1 x The Cube Dry Bath Incubator Instruction Manual

Signed:

Date:

Table of Contents

Packing list	2
Warning	3
Safety Information	4
Product Specifications	7
Product Description	8
Introduction	9
Overview	9
Controls and Features	9
Installation Instructions	11
Operation Instructions	11
Temperature Calibration	13
Data Log Software Instructions	15
Function Control Software Instructions	18
Troubleshooting Guide	21
Maintenance	21
Ordering information	22
Warranty	24

Warning

The Cleaver Scientific Cube Dry Bath Incubators have been tested and found to comply with the safety limits for CE regulations. These limits are designed to provide reasonable protection against harm when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended for the user to read carefully the following points before this equipment is operated.

1. Read and follow carefully the manual instructions.
2. Do not alter the EQUIPMENT. Failure to adhere to these directions could result in personal and/ or laboratory hazards, as well as invalidate the equipment warranty.
3. Use a properly grounded electrical outlet of correct voltage and current handling capacity.
4. Disconnect from the power source before maintenance and servicing. Refer servicing to qualified personnel.
5. In the event a solution is accidentally spilled into the instrument, disconnect the grounded plug and the user must carry out appropriate procedure or contact their supplier. Replace damaged parts.
6. Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components, which may ignite such materials.
7. Refer maintenance and servicing to qualified personnel.
8. Ensure that the system is connected to the electrical source according to the local and national electrical codes. Failure to properly connect may create a fire or shock hazard.
9. Ensure the appropriate used materials and correct operation to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from the materials being heated.
10. Always use the block lifter to remove hot blocks, and wear appropriate

protection to avoid burning your hand.

11. The unit shall be operated only by qualified personnel.

Safety Information

Use high level precautions against any electrical device.

Before connecting with the electrical supply, check the supply voltage is within the range stated at the rating label, and this device must be earthed.

Place the unit in a safe and dry location not touching any surrounding material.

Follow safety precautions for chemicals and dangerous materials.

If needed, please contact a qualified service representative of your supplier.

Environmental Conditions

Ensure the instrument is installed and operated strictly in the following

conditions: $\leq 95\%$ RH,

75 KPa-106 Kpa,

Altitude not to exceed 2000 meters

Avoiding Electrical Shock

Follow the guidelines below to ensure safe operation of the unit.

The MP power supply series has been designed for use with shielded wires thus minimizing any potential shock hazard to the user. We recommend against the use of unshielded wires.

To avoid electrical shock:

1. In case of spillage, any parts of the cable or power supply must be dried out for a period of time and restored to NORMAL CONDITION before the operation.
3. WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
4. ALWAYS make sure that hands, work area, and instruments are **dry** before making any connections or operating the power supply.
5. ONLY connect the power cord to a properly grounded AC outlet, using the power cord provided with the power supply.

Avoiding Damage to the Instrument

1. Do not attempt to operate the device if damaged.

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2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight etc).
3. For proper ventilation, leave at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Do not operate the dry bath incubator in high humidity environments (> 95%), or where condensation may occur.
5. When the power supply series is taken into a cold room environment, the unit can be operated immediately. However, when the power supply series is removed from the cold room environment, let the unit equilibrate to room temperature for a minimum of 2 hours before using it.
6. Before using any cleaning or decontamination method except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment

Equipment Operation

Follow the guidelines below to ensure safe operation of the unit:

1. Check the displayed temperature figure and external temp. Probe to see if it is over the temperature scale.
2. NEVER access any HAZARDOUS LIVE parts.
3. Do not apply lids or covers on the tube heated inside The Cube Dry Bath Incubator to prevent possible hazards of explosion and damages.

Symbols

The symbols used on The Cube Dry Bath Incubator are explained below.



Used on The Cube Dry Bath Incubator to indicate an area where a potential electrical shock hazard may exist.

Used on The Cube Dry Bath Incubator to indicate a warning. Consult the manual to avoid possible personal injury or instrument damage.



ATTENTION: Hot surface!



Used on The Cube Dry Bath Incubator to indicate a disposal instruction.

DO NOT dispose of this unit into commercial waste disposal when this unit has reached the end of its lifetime. To ensure the utmost protection of the global environment and minimize pollution, please recycle this unit.

Product Specifications

Controller	Digital Microprocessor Controller
Display	LCD Display
Heating Power	200W for TCDB-01; 300W for TCDB-02
Power Rating	1.0A for TCDB-01; 1.6A for TCDB -02
Temperature Control Range	5°C above ambient to 150°C
Temperature Increment	0.1°C
Temperature Calibration	Yes
Temperature Uniformity@37°C	± 0.2°C
Temperature Accuracy@37°C	± 0.2°C
Timer	0 ~ 99hrs 59mins
Safety Device	Leak proof heating chamber
Operating Temperature	Ambient ~ 40°C
Heating Chamber Material	Molded Aluminum Alloy Chamber
Block Material	Aluminum
Block Type	Standard and customized are available
Data Log	RS 232 (Max. 2.5 meter long)
Rated Voltages	110V~ or 220V~; 50/60Hz
Unit Dimension	152 x 150 x 135 mm (W x L x H) for TCDB-01 152 x 230 x 135 mm (W x L x H) for TCDB-02
Weight	2.1 kg for TCDB-01; 2.8 kg for TCDB -02

Product Description

Both single and dual block Cube Dry Bath Incubators use interchangeable heating block modules for a variety of biological applications, including restriction enzyme digestion, denaturing DNA, BUN, melting agar, coagulation studies, hybridization and Hot Start thermo-cycled reaction. Due to its molded aluminum alloy chamber, it can also be used as a mini water bath. The Cube Dry Bath series incorporates a PID controller for easy temperature selection, rapid heat up and excellent stability. Temperature may be set in 0.1°C increments from 5°C above ambient to 150°C. A timer may be set from 0 to 99hrs 59mins. In addition to the optional Data Logging software package, another optional Function Control software package is available. This allows control of the dry bath incubator via a computer.

Features:

Microprocessor controller with LCD display

Rapid temperature increase rate

Easy to use temperature calibration

Leak proof molded aluminum alloy heating chamber

RS 232 data log

Single and Dual block modes

Optional Data Logging software package is available

Optional Control software package is available

Introduction

Overview

Single and dual block Cube Dry Bath Incubators offer excellent temperature control and deliver accurate and reliable experimental results from one experiment to another. The Cube Dry Bath Incubators are also space compact instruments with competitive pricing offerings, user friendly with great value. More importantly, The Cube Dry Bath Incubators are RoHS compliant and designed to comply with the CE regulation.



TCDB-01

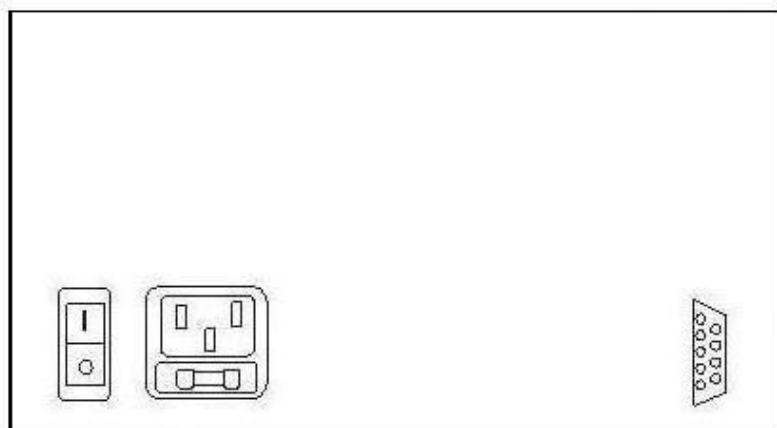
TCDB-02

Controls and Features

Please refer to following page for the location of the following controls and features.



Front of Unit



Rear of Unit

1.  **Key** – to increase either temperature or time value
2.  **Key** – to decrease either temperature or time value
3.  **Key** – activate or stop the unit.
4.  **Key** – to select setting of temperature or timer mode
5. **Heating** – This LED light indicates temperature is increasing.
6. **AC Power Switch** – to switch the unit power On/OFF
7. **AC Power Cord and Fuse Holder** – Power Cord Socket and Fuse Holder
8. **RS232 Connected Port** – for Data Log

Installation Instructions

The Cube Dry Bath Incubator is actually an already installed instrument. As long as it is placed on a sturdy and level surface in a safe, dry place, and one or two heating aluminum block(s) is/are inserted into the bath or simply water, as a water bath, it is ready for operation.

Operation Instructions

1. Place The Cube Dry Bath Incubator on a sturdy and level surface in a safe, dry place, away from laboratory traffic.
2. Ensure that the AC power switch is OFF, then plug the three-pronged power cord into a grounded three-prong AC outlet of the appropriate voltage (115V or 220V as indicated on the rating sticker near the AC cord on the back of the unit).
3. Select suitable module block(s) or appropriate water volume and put it / them into the The Cube Dry Bath Incubator.
4. Turn the AC power ON.
5. Run temperature calibration procedure when using the instrument first time (see page 12).

6. Press  Key whilst temperature figure on the LCD display is flashing, and then press  or  Key to adjust the desired temperature.

7. If setting heating time is required, press  Key whilst timer figure on the LCD display is flashing, and then press  Key or  Key to adjust timer in HH:MM format upon your request. Temperature control will stop automatically when timer is up.

8. Press the  Key to start heating.
9. If it is necessary to adjust timer during heating, press  again to deactivate heating.
10. Press  Key again to stop the unit.

Operation Protection Mechanism

Protection Mechanism	Description
Warning : Temperature over 5°C	During operating, if the displayed temp. value is over 5°C than the set temp value, “Warning: Temperature over 5°C” will be displayed with alarm, and the instrument will be shot down automatically.
SSR Failure	If temp. value raises automatically within 1 minute after power on the instrument and without pressing START Key to start heating, “SSR Failure” will be displayed with alarm. This problem is due to SSR.

Temperature Calibration

The Cube Dry Bath Incubator with the optional block(s) has been calibrated as a set. But, the different kinds of block will not have the same result and may have different influences. For optimum accuracy temperature control or while changing with different kinds of block, The Cube Dry Bath Incubator should be calibrated in accordance with the procedure outlined below.

1. Insert a 45 mm calibrated laboratory Thermometer into the thermometer holding port, which is on the block.

2. Please press power OFF/ON key and  Key simultaneously, and don't release until display between 1000 ~ 1500 located on the upper left area of display is presented. Then release  Key immediately; The Cube Dry Bath Incubator is now under Calibrated Mode.

3. Press  Key first to enable the alteration of temperature parameter.
Use  or  Key to preset display value, to the point you want to assess temperature accuracy. And then press  Key.

4. When the temperature reach the setting point. Display will show “Stabling” on lower left area, at the same time, timer will automatically countdown for 30 minutes to make sure the whole system reaching heat balance. When timer is up, the temperature figure become flashing and display shows “Ready for Calibration”.

5. Adjust display value to the same figure as thermometer. And then press  Key.

6. The calibration procedure is finished. Please wait for few more minutes that

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microprocessor will auto adjust temperature.

Data Log Software Instructions

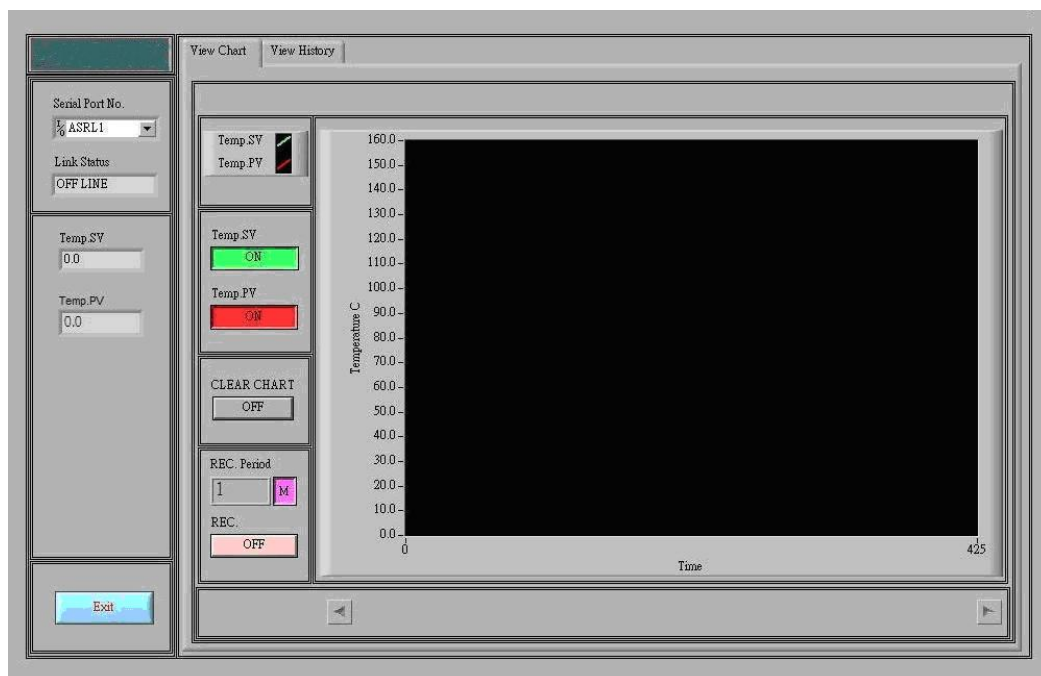
NOTE: All rights reserved by Cleaver Scientificco., Ltd.

Installation Instruction

1. Insert the CD into CD ROM and press the setup.exe in the Installer Folder for installation.
2. Follow up the instructions shown on the computer screen to complete the installation.

Operation Instruction

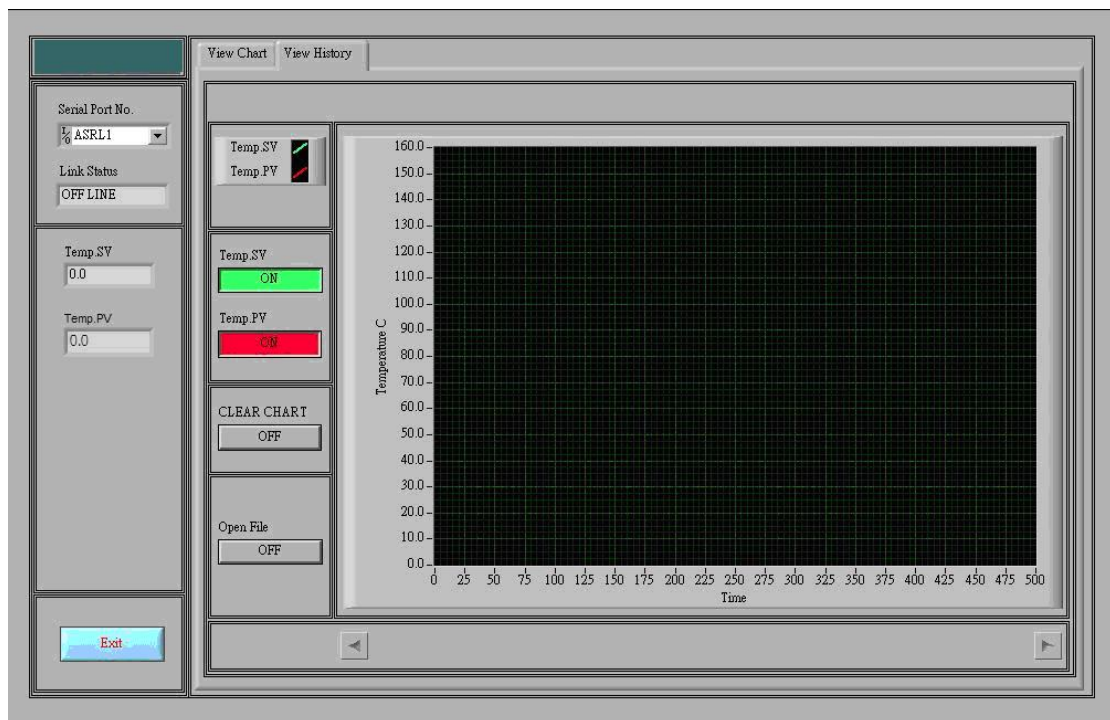
1. Start TCDB-01-LOG software program and then the below screen will be shown. There are two main sections, View Chart, and View History in this software.



2. View Chart Section:

Serial Port No.	Communication port selections between computer and The Cube Dry Bath Incubator
Link Status	Indication whether The Cube Dry Bath Incubator is linked with computer or not
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
REC. period	To set up how frequent the operation data is recorded
REC. period ON / OFF	To start or stop recording
CLEAR CHART OFF	To clear up the curves in the table

3. View History Section:



Serial Port No.	Communication port selections between computer and The Cube
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	Dry Bath Incubator
Link Status	Indication whether The Cube Dry Bath Incubator is linked with computer or not
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
CLEAR CHART OFF	To clear up the curves in the table
Open File	ON: to view historic record data OFF: No historic record data is shown

Function Control Software Instructions

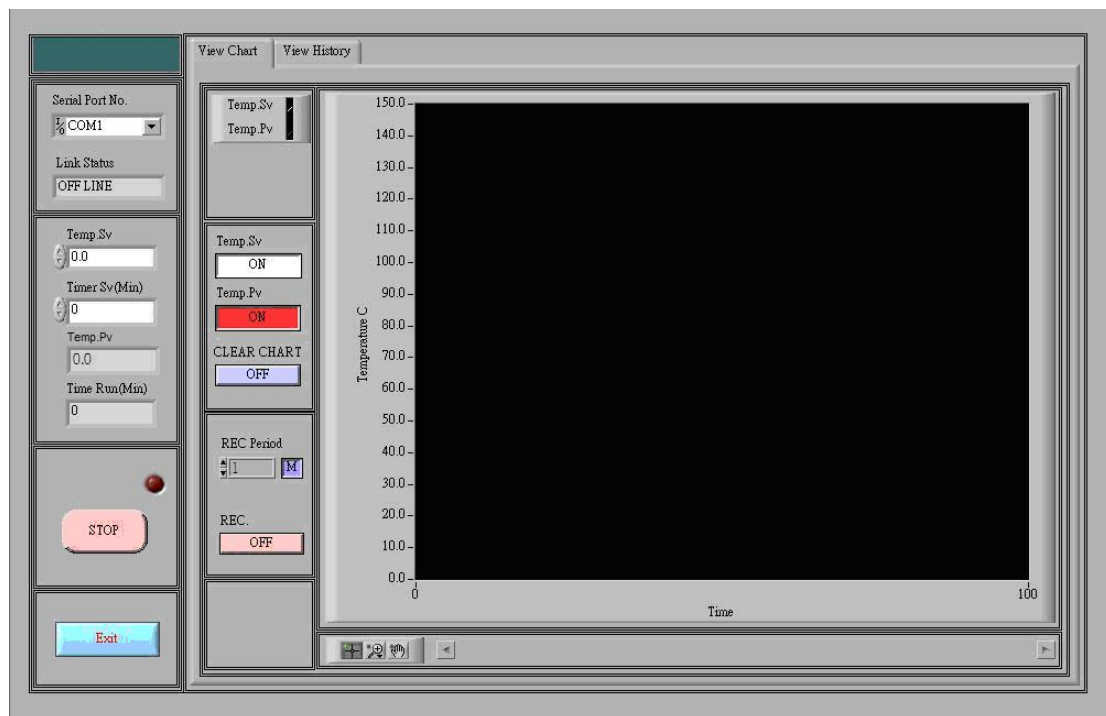
NOTE: All rights reserved by Cleaver Scientificco., Ltd.

Installation Instruction

1. Insert the CD into CD ROM and press the setup.exe in the Installer Folder for installation.
2. Follow up the instructions shown on the computer display screen to complete the installation.

Operation Instruction

1. Start TCDB-01 software program and then the below screen will be shown.
There are two main sections, View Chart, and View History in this software.

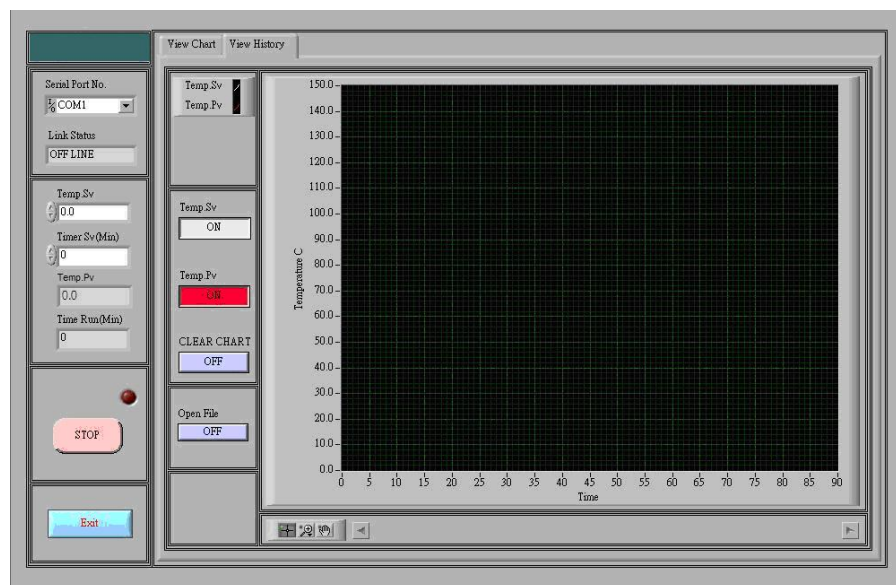


2. View Chart Section:

Serial Port No.	Communication port selections between computer and The Cube Dry Bath Incubator
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Link Status	Indication whether The Cube Dry Bath Incubator is linked with computer or not
STOP	For The Cube Dry Bath Incubator ON / OFF control
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Timer SV (Min)	To set operation time
Time RUN (Min)	To indicate how many minutes The Cube Dry Bath Incubator is being operated
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
REC. period	To set up how frequent the operation data is recorded
REC. period ON / OFF	To start or stop recording
	Enlarge the record table
	Move the record table

3. View History Section:



Serial Port No.	Communication port selections between computer and The Cube Dry Bath Incubator
Link Status	Indication whether the The Cube Dry Bath Incubator is linked with

	computer or not
STOP	To stop the software and instrument
EXIT	To exit this software
Temp. SV	The set temperature value
Temp. PV	The real temperature value being measured
Timer SV (Min)	To set operation time
Time RUN (Min)	To indicate how many minutes The Cube Dry Bath Incubator is being operated
Temp. SV ON / OFF	To show the temp set value on the table or not
Temp. PV ON / OFF	To show the real time temp value on the table or not
CLEAR CHART OFF	To clear up the curves in the table
Open File	ON: to view historic record data OFF: No historic record data is shown
	Enlarge the record table
	Move the record table

Troubleshooting Guide

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, please contact our SERVICE DEPARTMENT or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Recommendations
LED does not light up	Check the FUSE
	Ensure that the AC power switch is ON
	Check the three-pronged power cord are properly plugged into a grounded three-prong AC outlet of the appropriate voltage

Maintenance

The Cube Dry Bath Incubator may be cleaned with a moist cloth containing a mild soap solution. The chamber and blocks are aluminum and may be cleaned with any of the commercial aluminum cleaners on the market.

Ordering Information

Cat. No.	Description
TCDB-01	THE CUBE Dry Bath Incubator (single block unit); without block
TCDB-02	THE CUBE Dry Bath Incubator (dual block unit); without block

ACCESSORIES

MD-MP01-S	For Microplate; Titerplate (Plane bottom for single block unit only)
MD-MP02-S	For 96 wells Deep Microplate or PCR plate (for single block unit only)
MD-MP01-D	For Microplate; Titerplate (for dual block unit only)
MD-MP02-D	For 96 wells Deep Microplate or PCR Plate (for dual block unit only)
MD-B0.2	For 0.2 ml tube, 64 wells (or 0.2 ml PCR Strip tube for 8 wells x 8)
MD-B0.5	For 0.5 ml tube, 20 wells
MD-B1.5	For 1.5 or 2.0 ml tube, 20 wells
MD-B1.5V	For 1.5 V-shaped tube only, 20 wells
MD-B0.5/1.5	Double Side Block: One side for 1.5 or 2.0 ml tube, 20 wells; another side for 0.5 ml tube, 30 wells on the opposite side
MD-B0.5+1.5.	Combination: 1.5 or 2.0 ml tube, 12 well and 0.5 ml tube, 12 wells (On the same side)
MD-B13	Well size: 13 mm, 20 wells
MD-B17	Well size: 17 mm, for 15 ml centrifuge tube, 12 wells
MD-B20	Well size: 20 mm, 12 wells
MD-B25	Well size: 25 mm, 6 wells
MD-B29	For 50 ml Centrifuge tube, 4 wells
MD-RS232	RS 232 cable
MD-P01	Thermocouple
EL-DLSW	Data Logging software package
EL-PCSW	Function Control software package
EL-DLSW-R	Data Logging software package, including a RS 232
EL-PCSW-R	Function Control software package, including a RS 232
MS-BL95	Block Lifter

Note:

1. Dimension of Standard Aluminum Block is approximately W104 x L79 x D50 mm.
2. Customized Aluminum block is also available.



Warranty

The Cleaver Scientific Ltd. products have a warranty against manufacturing and material faults of twelve months from date of customer receipt.

If any defects occur during this warranty period, CSL will repair or replace the defective parts free of charge.

This warranty does not cover defects occurring by accident or misuse or defects caused by improper operation.

Units where repair or modification has been performed by anyone other than CSL or an appointed distributor or representative are no longer under warranty from the time the unit was modified.

Units which have accessories or repaired parts not supplied by CSL or its associated distributors have invalidated warranty.

CSL cannot repair or replace free of charge units where improper solutions or chemicals have been used. For a list of these please see the Care and Maintenance subsection.

If a problem does occur then please contact your supplier or CSL on:-

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