Electron
Microscopy
Sciences

INSTRUCTION MANUAL
CAT. 87029-08, 87029-09
EMS MyTemp™ Mini CO$_2$

Contents

General information and precautions

Safety symbols

Warning Caution Compliance Prohibition No disassemble Remove plug Ground

Precautions related to the power cable

Always have at least 3cm between the power cable and the back wall to ensure that the power cable is not pressed firmly against the power inlet.

Always use the power supply and plug that was supplied with this product.

Never make contact with the power cord with wet hands—this can result in electric shock.

Never use a damaged power cord or outlet.

In the event of smoke or a burning smell, immediately remove the power cord from the outlet.
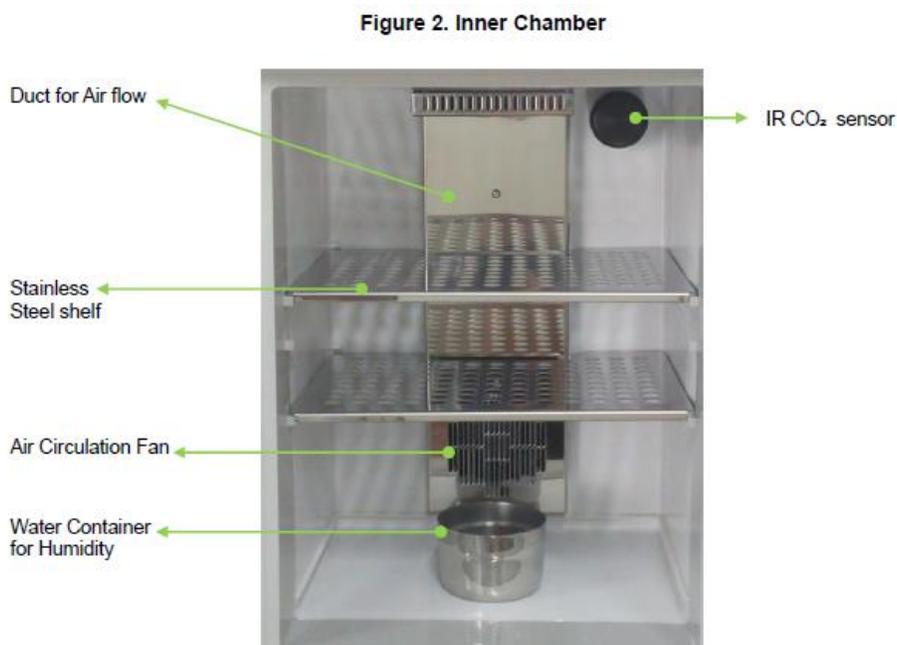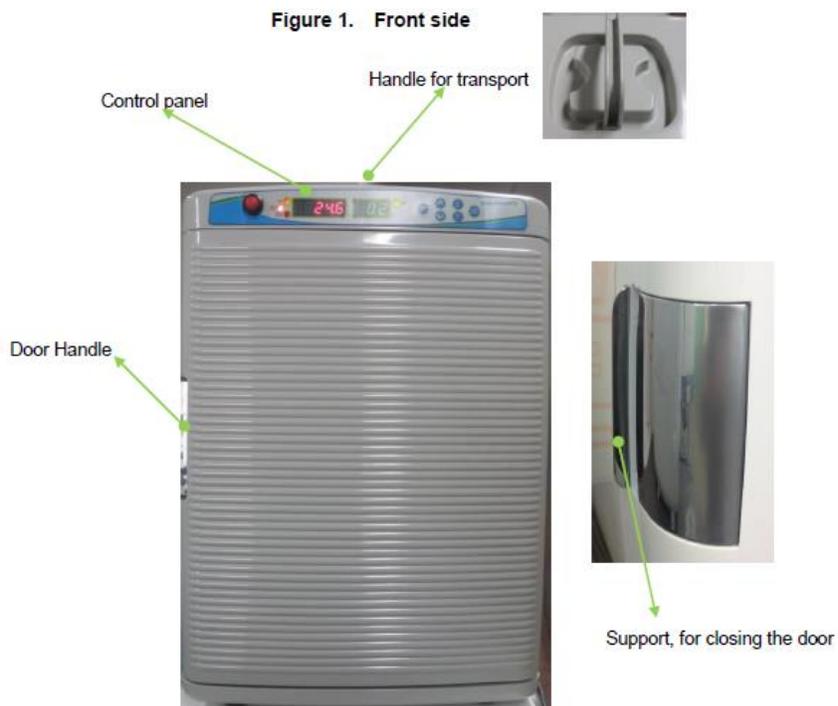
Precaution for use

Do not attempt to disassemble this product. If service is required, please contact Electron Microscopy Sciences at 1-800-523-5874.

Never operate a flammable spray near the product—this can result in a fire hazard.

Always use caution when using flammable substances such as benzene, alcohol, and LP gas—failure to do so can result in a fire hazard.

Make sure to prevent foreign substances from getting into the sealing silicon of the door—the inflow of outside air can cause the change of temperature in chamber and discoloration of the packing part by a foreign substance.

Permissible ambient temperature range for transport: 10°C to 60°C.

Over-voltage and/or under-voltage can damage the product and poor performance.

When you install the product, you have to put the distance of at least 30cm from the wall. To completely separate the unit from the power supply, power plug must be disconnected. Install the unit in the way that the power plug is easily accessible and can be easily pulled in case of danger.

⊘ Install the unit at a flat surface, free from vibration and in a well-ventilated location. If the ground is not flat, it can cause and excessive vibration of the product.

⊘ Excessive CO_2 is harmful to humans when in high concentrations. Any excess amount of CO_2 has to be led out via ventilation or by connection to a suitable exhaust system.

Configuration

Figure 1. Front side
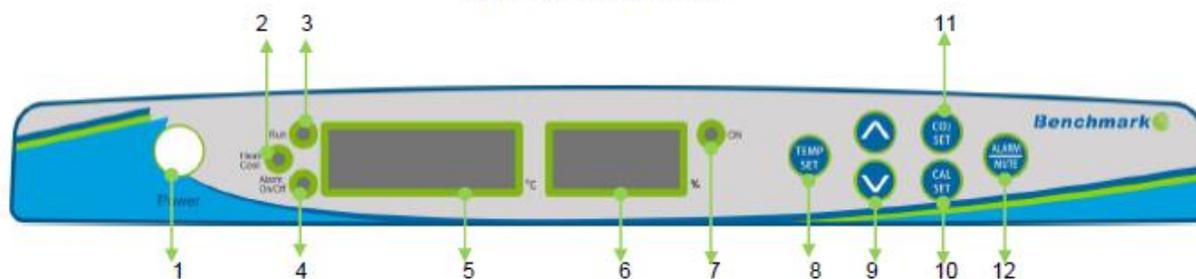
Control panel

Handle for transport

Door Handle

Support, for closing the door

Figure 2. Inner Chamber

Duct for Air flow

IR CO₂ sensor

Stainless
Steel shelf

Air Circulation Fan

Water Container
for Humidity

Figure 3. Back of Incubator

- Ventilation Fan
- CO₂ Sample Port
- Serial Label
- CO₂ Inlet Port
- DC12V Power Inlet
- Non-Slip Rubber Feet

Do not fuse CO_2 inlet port and sample port. Tube from gas cylinder must be connected to CO_2 inlet port. Sample port is used to check the CO_2 density with an external analyzer.

Figure 4. Control Panel

1. Main Power Key
2. HOT/COOL LED Indicator : RED(heating) BLUE(Peltier – cooling)
3. RUN LED Indicator: Normal – Slow flashing   Failed – Fast flashing
4. Alarm LED Indicator :   RED – Alarm Off   No Light – Alarm On
5. Temperature display
6. CO₂ Display
7. CO₂ Injecting Indicator
8. Temperature Set Key
9. Up & Down Key (for setting the temperature and CO2 percentage)
10. Calibration Mode Key
11. CO₂ Set Key
12. ALARM/MUTE Key: Press and hold for 3 seconds to switch Alarm on or off.   (Press quickly to temporarily deactivate the alarm)

Features and specifications

Features

- Light weight, compact and portable

- Precise temperature control (ambient -10°C, lowest temperature, is 15°C at 25°C RT)

- Advanced air circulation for improved uniformity

- Natural humidification system with included water tray

- 12V vehicle adapter for use in cars or boats

Specifications

Item	Specification
Chamber volume	20L
Temperature range	15°C ~ 60°C at ambient 25°C
Temperature uniformity	±0.25°C (at 37°C)
Temperature accuracy(display)	±1°C
CO2 range	0~20%
CO2 sensor	Dual beam IR sensor
CO2 accuracy	±0.1% (at 5%)
Humidity	70 to 80%
Gas inlet pressure	1 bar
Display	LED display
Cooling & Heating	By peltier elements
Shelf	2 each, stainless steel
In & Outside material	
Interior	10.3 x 9.3 x 12.8 in. / 26 x 23.5 x 32.5 cm
Exterior	13.2 x 14.5 x 18.7 in. / 33.5 x 37 x 47.5 cm
Weight	8.5kg
Power	DC12V/5A, AC100 ~ 240V, 50Hz~60Hz
Power consumption	Hot : 75W / Cool : 75W

Installation

Before beginning the installation, always inspect the packaging for damage—when the instrument is received, inspect the item carefully to check any transit damage. In the event of damage, always report to the shipping carrier and your local representative immediately.

Included in the package:

- Stainless steel perforated shelf (2 pcs)

- Power cord (1 pc)
- Main power adapter 12V DC (100 ~ 230V, 50~60Hz) (1 pc)
- 12V DC car jack (1 pc)
- Stainless steel water container for humidity (1 pc)
- CO_2 gas tubing with in-line CO_2 gas filter (1 pc)
- Instruction manual (1 pc)

The above parts are packed inside the incubator. When received, open the door of the incubator and remove all parts to check confirm receipt.

Cleaning before use

Before conducting cell culture in this mini incubator, it is recommended to clean up the entire chamber and shelves and water container by using a soft cloth with at least 70% ethanol mixed of 30% distilled water. Do not make hot air or H_2O_2 or UV decontamination in this plastic housing incubator.

Installation procedure

1. Place the incubator at the desired location. Always avoid placing the incubator in an area near equipment generating heat or cold air to incubator; in direct sunlight; on an uneven surface or table; in a place with heavy vibration; or in a place with little air ventilation space behind the incubator.

2. Place the shelves and water container as shown in "*Configuration*". If desired, place the stainless steel water container at the bottom of the chamber toward the back of the incubator in order to get it to be close to the circulation fan—this increases the humidity.

Distilled water is recommended in order to avoid contamination and corrosion. If possible, use warm distilled water for immediate humidification.

3. Connect the CO_2 gas supply. The Gas tubes are combined with 4mm (diameter) and 6mm (diameter) tube. Insert the 4mm edge of tube to gas inlet port and connect the 6mm edge of tube to gas regulator, which is installed on the cylinder or gas line in your lab.

Do not connect the gas supply to CO_2 "Sample port".

Turn on the gas supply with the pressure set to 1 bar (14.5 psi).

NOTE: To confirm that there are no leaks in the CO_2 connections, a "bubble check" is recommended. Apply soapy water to each fitting and check if any bubbles are generated. If so, readjust the fitting.

4. Connect the power cord. This incubator is provided with a 12V DC adapter, which is available at the range of voltage from 100 to 240V. Plug the connector to power receptacle and back of the incubator. Plug the power plug to the outlet.

Operation

Power switch on

- The digital LED will display current temperature and CO_2% in the chamber.

Setting the temperature

- To set the temperature, press the "TEMP SET" key, then the LED screen will flash and display current programmed temperature.
- Set up the desired temperature by pressing the up or down keys.
- Press "TEMP SET" key after adjustment. The "SAVE" message is shown on the display.

NOTE: If you do not press "SET" key after set-up, the new set-up value will not be saved.

Setting CO$_2$

- Press "CO_2 SET" key, then the LED screen will flash.
- Input the desired value of CO_2 density by adjusting the up or down keys.
- Press "SET" key again after input. "SAVE" is displayed on the LED screen.

NOTE: If you do not press "CO_2 SET" key after set-up, the new set-up value will not be saved.

Calibration for temperature and CO$_2$

In the event that recalibration is required for the temperature or CO_2 percentage, please follow the procedure below:

Measure CO_2 density and temperature after incubator is stabilized (after 2 hours of having reached the desired settings).

Press and hold "CAL" key for 10 seconds. Then, the LED will be flickering as shown below:

Channel one refers to the temperature condition. To adjust, press the up key to increase the setting by as much as the difference between the measured value and the displayed value. Press the down key to decrease the setting by as much as the difference between the measured value and the displayed value.

Ex: If the measured temperature is 38°C and the display shows 37°C, press the up key once to reach 38°C.

NOTE: Calibration range for temperature is ±5°C. To go to the next channel, press "CAL/SET" button. After the 5th channel, the LED is back to the temperature display.

Channel 2 does not refer to an adjustable function. Please skip this channel by pressing the set button once.

Channel 3 does not refer to an adjustable function. Please skip this channel by pressing the set button once.

- The 4th channel is the "CAL SET" → CO_2 density calibration.

Channel 4 is at CO_2 density calibration stage. Press the up key to increase the setting by as much as the difference between the measured value and the displayed value. Press the down key to decrease the setting by as much as the difference between the measured value and the displayed value.
Ex: If measured CO_2 is 5% and the display shows 4%, the press the up key once.

- Channel 5 does not refer to an adjustable function. Please skip this channel by pressing the set button once.

- Channel 6 does not refer to an adjustable function. Please skip this channel by pressing the set button once.

- When all 6 channels have been passed, press the SAVE button to save all adjusted values.

Humidity

Mini incubator adopts natural humidity system using a water tray/container. For adding humidity, fill with distilled water up to the water line. With the door closed, this should result in a proper humidity level at about 80% during operation of the incubator. Place the water container close to the back of the chamber so that the container is more exposed to heated air from the fans and element.

<mark>NOTE</mark>: IT is not recommended to transport the incubator without emptying the water container first. In the case that humidity is necessary during transportation, ensure the water container to be securely held at the bottom of the chamber (i.e. with tape).

Alarms

- Turn on alarm system by pressing the alarm button for about 5 seconds. When switching alarm on or off, a short audible alarm will come out for notice and the pilot lamp of alarm will either flash or not. When alarm is armed, alarm pilot lamp is not lighting. When alarm system is disarmed, LED lamp of alarm is lighting to indicate the user to be noted.

- When the alarm system is switched on, or after any valves have been reprogrammed, the alarm system is inactive until the set point values (±1) are achieved and maintained for more than 3 minutes, after which the alarm system is armed. This is to activate alarm after stabilization of temperature and CO_2 percentage.

- If an alarm occurs, a beep will be heard and a fast flashing will occur on the RUN lamp indicator.

- If temperature deviated more than ±1°C from set point for more than 8 minutes, the alarm will occur.

- Pressing the mute button once will temporarily deactivate (10 minute delay). If the temperature is not recovered in this delay time, the alarm occurs again.

- Alarm will automatically stop once the temperature is recovered into tolerance range (±1°C).

- If CO_2 deviates more than ±1% from set point for 8 minutes, the alarm will occur.

- If the door is left open for + 30 seconds, the alarm will occur.

- If the door is closed during alarming, the alarm will stop immediately.

- Pressing the mute button when the door is open will temporarily delay the alarm for 3 minutes.