



Laboratory Equipment Manufacturer
www.mrclab.com



Medicine stability testing chamber

LE-250B Operation Manual



Please carefully read the Instruction before use so as to maintain the performance of the product and guarantee the safe use of the product

The Company has made the thorough research and analysis on possible dangers in the use and operation of the product. In spite of this, it is still very hard to predict all dangers. Therefore, the Technical Instruction does not necessarily include all dangers and precautions. However, operations in accordance with the methods and requirements stated in the Instruction can enhance the safety of operation to the maximum. In the process of using the product, please pay due attention to the precautions so as to avoid accidents or product failures.

MRC is not liable for any damage of the instrument caused by the fact that users do not comply with the “Environment for the Use of the Instrument” described in the Technical Instruction.

MRC is entitled to modify the Technical Instruction at any time, without making the proper notice.

Users must comply with important safety stipulations stated in the Technical Instruction.

Proceedings and stipulations stated thereafter can make you correctly use the instrument. Please follow the precaution signs and tips so as to prevent users and other people from being injured.

Explanation for warning signs:



Attention: please carefully read the Technical Instruction before using the instrument



Warning: please do not open the door in the status of high-temperature and high-humidity operation



Attention: please do not touch the recycling fans with hands when they are rotating.

Signs on the instrument

There are some warnings and precautions on the instrument, shown as follows:

Warning	Attention
Please do not open the door in high-temperature and high-humidity operation. If the door is opened in the operation, high-temperature steam will blow out from the incubator, thus burning operators, although internal fans do stop. In addition, when the instrument breaks down, please first turn it off (stop) and open the door after confirming the temperature reduction.	Easily hurt Please do not touch cooling fans with bare hands, which might cut your fingers.

Warning	Warning
If the instrument isn't used for long time, the water in it should be drained completely. (When the instrument has been used for long time, there will appear dirt such as water stain, stone, and algae, thus affecting the function of water level sensor, and further leading to problems such as water leakage.)	Before running, make sure that the internal water tank is filled with pure water (tap water is strictly prohibited). In order to ensure normal operation of equipment, it should be cleaned and maintained in use of two months.

	Danger
Protective earthing sign	Explosion danger Please do not place any tinder such as organic solvent into it.

Table of Contents

Safety tips	2
Operating precautions	3
Introduction	9
Parameter	
Product use	12
- Pre-operation setting	
- Temperature, humidity setting	
- Operating overview	
- Operating method	
Failure reasons and countermeasures	16
- Safety function	
- Alarm function	
- Countermeasures	
Warranty commitment	22
After-sale service hotline	23

Safety tips

- Please do not use the instrument outdoors.
- The instrument should be installed on the solid ground. If the ground is not solid, or the installation site is unsuitable, the instrument is likely to overturn, thus hurting operators and other people.
- Please do not install the instrument in humid areas or areas close to water. Otherwise, the insulation performance will decline, thus leading to accident of electricity leakage or electric shock.
- Please use power sockets connected with earth wire in case of electric shock. If power sockets are not connected with earth wire, please ask qualified technicians to connect them with earth wire.
- The instrument can not be earthed through gas supply pipe, water supply pipe, telephone line, or lightning arrester, which is likely to lead to electric shock at their openings.
- Please do not place volatile or flammable articles in the instrument. Otherwise, explosion or fire may occur.
- Please do not insert metal articles such as iron nail or wire into any hole or clearance of the instrument, or into air outlet of internal air recycling ring. Otherwise, electric shock or injury may happen due to the blocking and accidental contact of the above articles.
- The working site of the instrument should have the good ventilation. If the ventilation is restricted, other measures should be adopted to guarantee the safe working environment.
- When placing harmful, toxic, and radioactive articles, please use the instrument within the safe area. Improper use will do harm to human health and the environment.
- Before repairing or maintaining the instrument, please cut off the power supply to avoid electric shock or other injuries.
- Without permission, users can not disassemble, repair, or refit the equipment on their own. Otherwise, fire or personnel injury may take place due to improper operation.
- If the instrument does not function well, please turn off the instrument and pull down the power source. Operation under abnormal situation may lead to electric shock or fire.
- Please do not damage power sockets or power wires. Please do not touch any electric component and switch when your hands are wet, which is likely to result in electric shock.
- Please do not place vessels or articles containing water on the instrument. If the articles fall down, they will hurt operators, and water contained will give rise to electricity leakage or electric shock.
When moved, the instrument can not overturn, in order to prevent damage of the equipment or hurt of operators.
- When the instrument is not used for long time, power pins should be pulled out.
Deterioration of insulators will lead to electric shock, electricity leakage, or fire.

Operating Precautions

1. The instrument should be installed on level and solid ground.
2. The instrument should not be installed in areas exposed to direct sunshine or heat source.
3. Keep smooth air flow indoor
4. Before the start of operation, please make sure that the water tank is filled with purified water (tap water is forbidden).
5. Clean and maintain the instrument every three months to ensure the long-term operation.
6. If the instrument isn't used for long time, the water in it should be drained completely. (When the instrument has been used for long time, there will appear dirt such as water stain, stone, and algae, thus affecting the function of water level sensor, and further leading to problems such as water leakage.)

Environmental Conditions

1. Indoor use
2. There are no flammable solid, liquid, and gas nearby.
3. The temperature of the working environment is 5℃-30℃.
4. Power transient voltage is Grade II.
5. Power voltage fluctuation does not exceed $\pm 10\%$ of the rated voltage.
6. Pollution grade is Grade II.
7. Level and solid ground.
8. Areas without dew.
9. Areas not exposed to direct sunshine.
10. Areas with good ventilation.

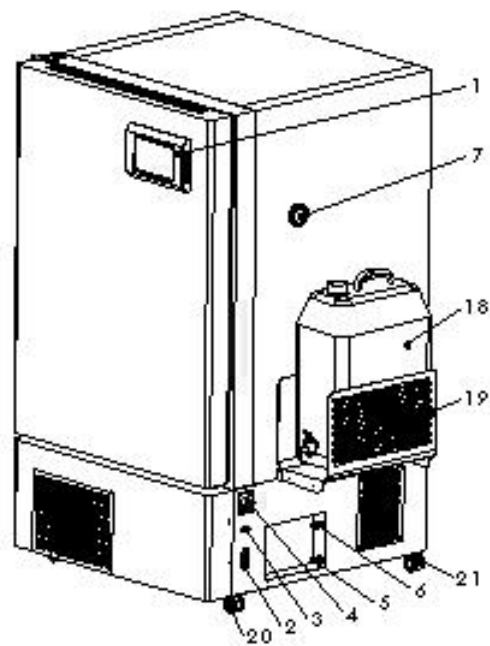
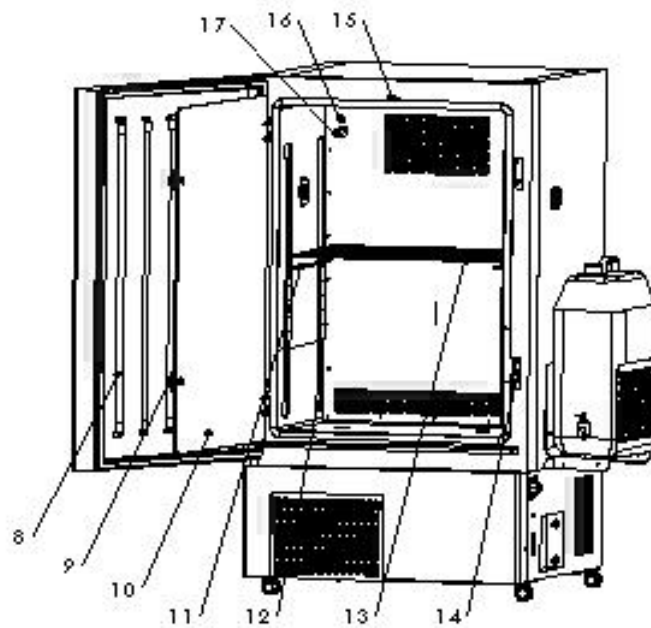
Simplified operating instruction for LE-250B constant temperature & humidity

Delivery setting: □——37□ %——75%

Please comply with the following procedures:

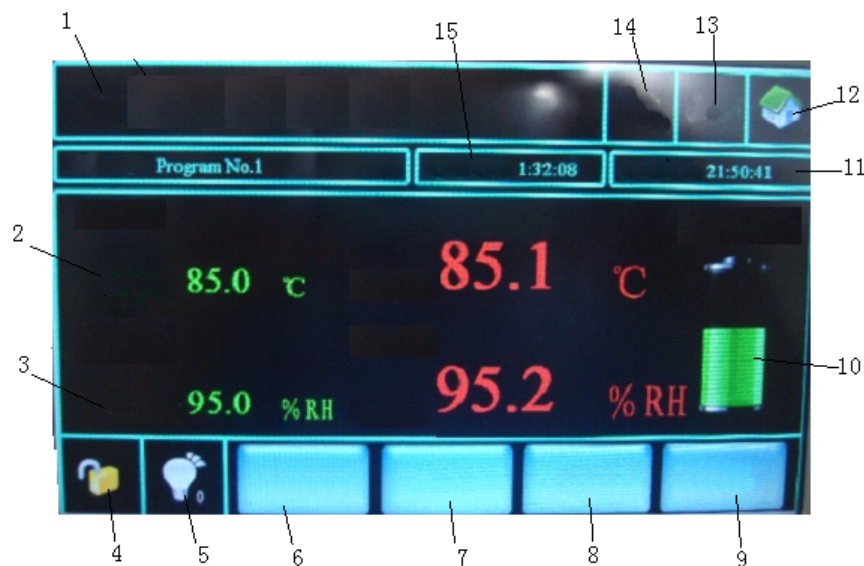
1. Please switch on electricity leakage protector.
2. Set the over-temperature protector. The temperature should be 20□ higher than the set temperature.
3. Connect external water tank with the water inlet of the instrument and turn on the water faucet (the tank cover should be opened).
4. Press the power button on the operating manual, and enter the display interface five seconds later. The panel will display the water level is too low, and the buzzer will buzz. The buzzer can stop buzzing after users press any key, but the alarm indicator will not go off. When the water reaches a given level, the indicator will go off.
5. Press MODE key→ enter program selection.
 - Program I: ordinary mode
 - Program II: delay and timing mode
 - Program III—Program V: program mode (ten steps for each program running in turn)
 - Program VI: combined mode
6. Press up/down keys→ select program
7. Press ENTER key→ confirm program
8. Press left/right keys to move the cursor and press up/down keys to adjust the value.
9. Run the menu and select YES/NO
(Set 1 for YES, and run the program; Set 0 for NO, and not run the program)
10. Press ENTER key to confirm after the setting, save the setting, and press MODE key to return to the main interface.
11. Press RUN/STOP key → instrument on/off.
12. Turn off the instrument after the completion of the test, and exhaust all the water in the instrument.

Structure



1. Operating panel: setting and display value.
2. Leakage protector: the main switch will cut off the power in the case of over-current or short circuit.
3. RS232 interface: used for connecting computer test and printer.
4. Over-temperature protector: The temperature should be 20 °C higher than the set temperature. When the temperature exceeds the set value of the over-temperature protector, it will cut off the power automatically.
5. Water outlet: internal water outlet of the instrument.
6. Water inlet: internal water inlet of the instrument.
7. Test hole: be for the convenience of user observation, and configured with silica gel plug internally.
8. Tube.
9. Glass door handle.
10. Internal glass
11. Shelf support: the support should be taken down after the shelf is removed.
12. Side support: supports at the two sides can be taken down.
13. Shelf: be adjusted and removed easily.
14. Gate lock.
15. Door switch: when the door is opened, the fan stops operation, and all programs stop working.

Control panel



1. Liquid display area

The area is used for the display of temperature and humidity measuring values, and also the corresponding setting process;

When “ALARM” indicator lights up, the alarm content will be displayed in the area in scroll.

2. “TANKWATERLEVEL” indicator

Display the water level of internal water tank in terms of four sections.

3. “REFRIGERATOR” indicator

The indicator lights up, which means that the system is refrigerating so as to reach the set value of the temperature.

4. “NORMAL MODE” indicator

The indicator lights up, which means that the system enters the normal mode.

5. “TEMP HEATER” indicator

The indicator lights up, which means that the system is heating.

6. “HUMI HEATER” indicator

The indicator lights up, which means that the system is humidifying.

7. “PROGRAM MODE” indicator

The indicator lights up, which means that the system enters the program mode.

8. “ALARM” indicator

When the instrument breaks down, the indicator lights up and reminds users that the instrument is in abnormal status. After all problems are eliminated, the indicator goes off.

9. “DEFROST” key and indicator

The key is used for compulsory defrost. When the indicator lights up, the system is defrosting.

The defrosting will stop three minutes later.

10. “MANUAL DRAIN” key and indicator

The key is used for water drainage. When the indicator lights up, the system is draining water.

After the completion of water drainage, the drainage can be closed with a press of the key again.

11. “KEY LOCK” key and indicator
The key is used for avoiding wrong operation. When the indicator lights up, the system is being locked. If the instrument does not receive any operation within two minutes, the key will lock the system automatically. To unlock the system, users just need to press the key again.
12. “MODE” key
The key is used for the switch between ordinary mode and program mode.
13. “SCREEN” key
The key is used for the switch between Temperature Graph and Humidity Graph (optional).
14. “RUN/STOP” key and indicator
The key is used for turning on and turning off the instrument. When the indicator lights up, the system is turned on.
When the indicator goes off, the system is turned off.
15. “INT DEFROST” key and indicator
The key is used for automatic defrosting. When the indicator lights up, the system is defrosting.
16. “SET” key
The key is used for modifying parameters. The operation requires password (Please consult for details).
17. 19. 20. 21. “   ” key
“Up, Down, Left, Right” keys are used for the movement of the cursor and the setting of parameters. The click of the key will automatically increase or decrease the number progressively. When setting parameters, users just need to select the corresponding options.
18. “ENTER” key
The key is used for confirming parameter setting and instrument operation.
22. “” key and indicator
Power key: when the indicator lights up, the system is running or standby. When the indicator goes off, the system is stopped.

Introduction

Medicine stability testing chamber application scope: drug stability test box is used for pharmacy, medicine, biotechnology, food industry, electronics industry and life science etc.

□ Features:

1. The tank of the product is manufactured with the imported numerical control machine tool through laser processing technology. The external tank is made of Baosteel 1.0mm cold-rolled sheet, which is resistant to rust. The liner is made of 0.8mm, 304 # stainless plate.
2. Tank caster is the imported product from Japan. The direction can be freely adjusted and locked. The external tank is processed with powder spray coating of American Dupont.
3. There are observation holes of 45mm in diameter at the two sides of the tank for the convenience of monitoring, which are equipped with special dies. Two silica gel plugs are provided internally. In the case of no test, the plugs should be filled tightly.
4. Heat preservation material of the tank is produced with fluoride-free polyurethane through the one-time foaming technology of Germany Bayer, which greatly enhances the heat-preservation performance and lowers the energy consumption. The product can greatly lift the test stability and precision, saving above 30% of energy over similar products. The tank is of high intensity as a whole.
5. Adopt the reasonable air channel structure and balanced control way. The instrument employs special motor and fan blade to make the temperature and humidity distributed more evenly, thus greatly enhancing the tank test precision and evenness of temperature and humidity.
6. Water melted from frost in the tank flows into the internal water tank through the connection tube so as to protect the environment.
7. The instrument possesses the programmable intelligent program mode. High-brightness and super-large liquid crystal screen is adopted for the control part, and fuzzy logic PID control is applied to enable the instrument more human-oriented.
8. Possess the functions such as over-temperature deviation protection, leakage protection, door opening alarm, power failure alarm, and sensor alarm, which can greatly enhance the using safety. The instrument is also designed with automatic startup, automatic stop, timed operation, clock display, automatic operation after power recovery, and memory functions.
9. The instrument adopts the refrigeration compressor of international brands and Germany EBM condenser blower, and environmental protection fluoride-free refrigerant, which are in accordance with the international trend.

◆ Parameters:

Product model	LE-250B
Convection way	Compulsory convection
Control way	Balanced
Temperature control scope	No illumination -15℃ ~ +85℃ With illumination 10℃ ~ 85℃
Humidity control scope	20 ~ 98%Rx
Temperature resolution	0.1
Temperature fluctuation	±0.1℃
Temperature evenness	±1.0℃ (65℃)
Humidity fluctuation	Within ±1.5% (65℃)
Working environment temperature	5 ~ 35℃
Illumination intensity	0-6000LX adjustable
Illumination error	≤±300LX
Heat preservation material	Overall foaming of polyurethane
Program control	Fuzzy logic P.I.D control way, ordinary operating mode/program operating mode
External dimension (mm)	W765×D773×H1490
Liner size (mm)	W640×D440×H890
Product weight	About 137kg
Effective cubage	250L
Overall power of heating and humidification	2000W
Refrigeration power ·refrigerant	270W·R134a
Water supply capacity	Internal:10L External:25L
Power voltage	AC-220V 50Hz/60Hz
Tray (standard configuration)	Three levels

- Performance parameter test under the condition of zero load: environmental temperature is 20℃; environmental humidity is 50%RH.
- Product dimension and parameters are subject to change without prior notice.

Set Temperature and Humidity

What are shown in the following table are the basic programs for setting temperature and humidity. The table also records the setting way of over-temperature protector.

Users should carry out operation in accordance with the order and operating keys stated in the table. The example in the table is based on the temperature of 037.0°C and humidity of 075.0%.

Attention: the values of the equipment are set in the factory, with the temperature being 037.0°C and humidity 075.0%.

Basic operating program (example: temperature: 37.0°C; humidity: 075.0%; program: Mode 1)

	Operating description	Operating key	Interface display after operation
1	Adjust over-temperature protector (the protector should be adjusted 20°C above the set temperature)		
2	Switch on leakage protector (ON OFF)		
3	Press the switch key of power source		Program 1 Actually measured temperature : 037.0°C (037.0°C) Actually measured humidity: 075.0% (075.0%) Low water level alarm
4	Press the MODE key	MODE	※※※program mode※※※ Program 1——Program 6
5	Press the ENTER key	ENTER	※※※Program 1※※※ Operating 1 (0 stands for non-operation 1 stands for operation) Setting: 037.0°C075.0%RH
6	For example: press the digit moving key and number increasing key to set the temperature at 037.0°C or humidity at 075.0%		Press the key to move the value rightward and leftward
			Press the key to increase and decrease the value
7	Press ENTER key	ENTER	Store the set temperature and humidity Press MODE to return to the current interface

◆ Operating Overview

There are ordinary mode and program mode. Ordinary is divided into two categories (Program 1: uninterruptible control operation; Program 2: timed control operation). Program mode refers to sequential control operation (Program 3~ Program 6).

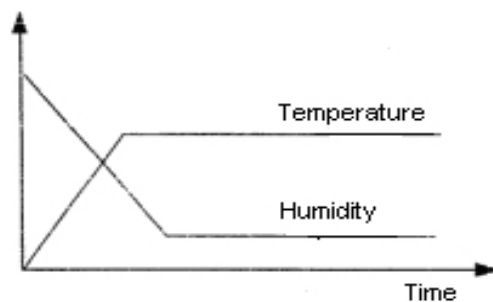
Ordinary mode:

Program 1—set the temperature and humidity for continuous and constant operation.

Temperature setting scope: $-15\text{---}+85^{\circ}\text{C}$

Humidity setting scope: 10%—98%RH.

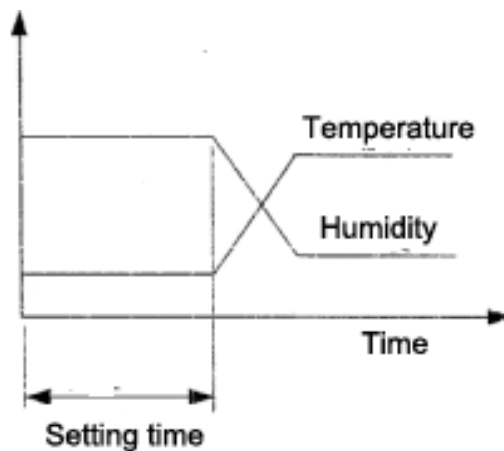
No matter ordinary mode or program mode, the setting scope is the same.



(Program 1)

Program 2—Set control temperature, humidity, and startup time at will. After the setting time comes, startup program will work.

Time setting scope: 1min~99 days 23 hours 59 min



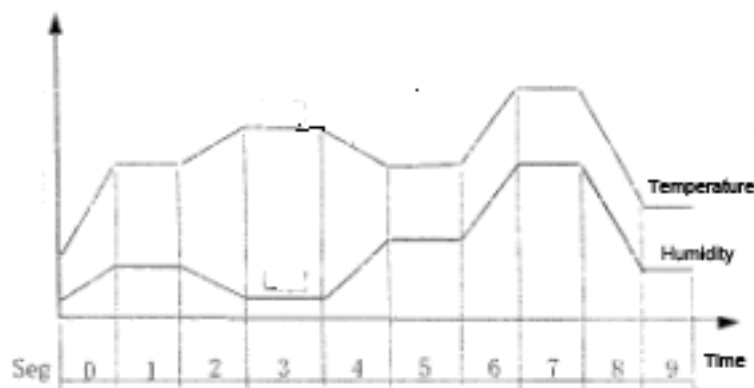
(Program 2)

Program mode:

Program 3~5: set temperature, humidity, time, and repeated times at will for sequential program operation. One user program is composed of ten procedures (0~9). Each procedure can set its own temperature, humidity, and time.

Repeated times can be set separately in user program (program 3~5).

Time setting scope: 1min~99 days 23 hours 59 min



(program 3~5)

Program 6—this is the arbitrary user combination program (Program 1~5)

Set the start of repeated times.

Combine ordinary mode at last.

Combine five modes at most (including ordinary mode).

The system can not start operation until repeated times of user program (Program 3~5) is consistent with that of Program 6.

◆ Operating method

Due to the difference between the set temperature and surrounding environment, there will be dew formation on the inner side of the incubator, at the bottom of the incubator, and on the edge of the seal ring. But the dew does not affect the performance and function of the instrument.

There are two water outlets at the bottom of the incubator for the drainage of condensed water.

(Attention: the water level will drop when the humidifying tray is over-inclined)

When the program is running on ramps, the refrigerator should be switched, leading to the instability of temperature and humidity. When the indoor temperature is changed due to reasons such as air-conditioner, the temperature and humidity will become instable as well.

◆ About frosting:

When the temperature is set below 30 ~ 40°C, there will be frost due to the operation of cooler.

The instrument is designed with two defrosting modes: intermittent defrosting operation (automatic defrosting operation) and defrosting operation (compulsory defrosting operation). Please select the suitable mode according to the actual situation.

◆ Intermittent defrosting operation (automatic defrosting operation):

Intermittent defrosting operation (automatic defrosting operation) is set with the [Int.Defrost] key. When the temperature is set below 40°C, the frost will be removed every three hours automatically in case of the decline of cooling function.

Steam is exhausted to the cooler in intermittent defrosting operation (automatic defrosting operation), so there will be ten minutes of changes of internal temperature and humidity every three hours.

(Changing range varies according to the using condition).

Please apply the setting when the temperature is set at 5 ~ 15°C for above one day or 15 ~ 25°C for above one week in the occasion of continuous operation.

Frosting varies according to the using condition.

In intermittent defrosting operation, the defrosting capability is declining when the indoor temperature is too low.

◆ Defrosting operation (compulsory defrosting operation):

Cooler frosting may lead to the following phenomenon. Users should periodically observe and confirm the frosting, and carry out the corresponding manual defrosting (compulsory defrosting operation).

1. Operation under the set temperature of 30 ~ 40°C;
2. Intermittent defrosting operation (automatic defrosting operation) under the set temperature of 5°C;
3. Intermittent defrosting operation (automatic defrosting operation) in the low surrounding environment;
4. Surrounding environment with high humidity.

◆ Start defrosting operation (compulsory defrosting operation):

In operation or operation stop, please press [Manual Drain] key (compulsory water drain) to turn on the switch.

Press the (Defrost) key to start compulsory defrosting operation at the set temperature, no matter ordinary mode or program mode.

1. Refrigerator indicator lights up;
2. Defrost Running indicator lights up;
3. Temp Heater indicator lights up (according to internal temperature)

◆ Defrost (compulsory deforest) operation

Deforest will last three minutes, and end automatically. The system will return to the set temperature, or continue the operation before Deforest. When the refrigerator just stops, namely the start of compulsory defrosting operation, there will be steam exhausted to the cooler about 80 minutes (refrigerator protection timer) from the stop to the start of the refrigerator.

◆ Humidifying method:

1. Please open the valve of external water tank.
2. Please confirm the water level of internal water tank.

Please use **【Tank Level】** of control panel to confirm the status of water supply.

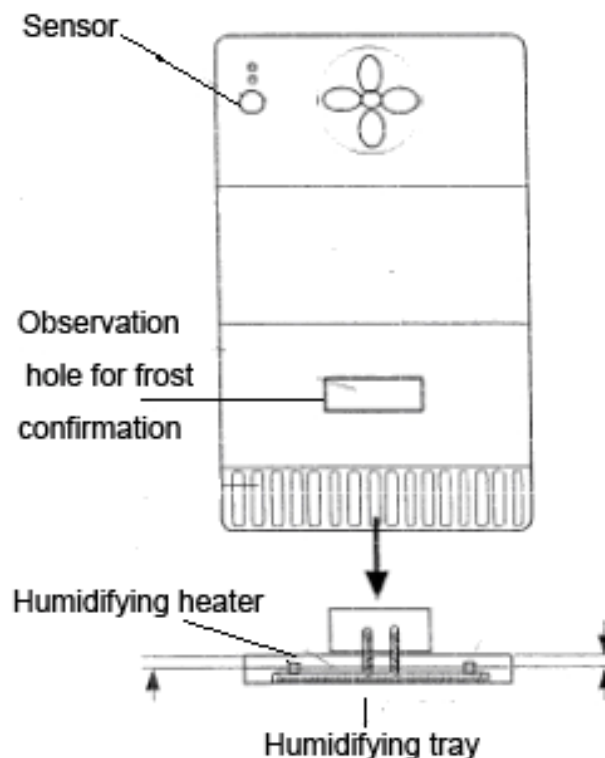
According to the water level, **【Tank Level】** metering instrument lights up after changing from [Empty] low level to section 1 ~ 3 [Full] high level indicator.

3. When electromagnetic pump does not make any sound, please turn off the [Run\Stop] key, and open the incubator door to confirm whether there is water in the humidifying tray.
4. Turn off **【Run\Stop】** key to run the instrument.

◆ End—please turn off the [Run\Stop] key at the end. After the operation is stopped, please turn off power switch and leakage breaker in turn.

◆ Treatment after the use.

1. When the instrument is not used for long time, please turn on the **【Manual Drain】** key to drain the water in the humidifying tray.
2. Drain the water in internal and external water tanks.
3. Turn off power switch and leakage breaker in turn, and pull off power pins from sockets at last.



Failure reason and countermeasures
◆ Safety—Alarm function

The product is designed with the following safety function and alarm function. In the case of abnormalities, please refer to Failure Reason and Countermeasures for proper treatment.

◆ Safety function:

Safety device	Working content	Working reason
Leakage breaker	Switch off and cut off the power	Electricity leakage or current overload
Over-temperature protector for internal temperature	The alarm indicator lights up when the temperature rises to the set temperature of the over-temperature protector	- Set temperature of over-temperature protector is too low - Temperature regulator and fans break down, thus exceeding the set temperature of over-temperature protector
Air burn protector for humidifying tray	The alarm indicator lights up when there is no water in the humidifying tray, thus being in the air burn status	- There is no water in the humidifying tray. - Water level of humidifying tray is too low. - Temperature regulator exceeds the set temperature of over-temperature protector

□ Alarm function:

In the light of the importance of alarm reasons, there are two processing ways, namely continuous implementation operation and stop operation. In addition, restart of circuit is also programmed and inserted according to the lost of control of CPU checked by self-diagnosis function.

Alarm name	Alarm display and action content	Reason for alarm
Over-temperature alarm of the incubator	• Indicator stays lit • Alarm display	Over-temperature protector of the incubator is started up
Over-temperature alarm of humidifying heater	• Indicator stays lit • Alarm display	Air-burn protector of humidifying tray is started up
Open circuit alarm of temperature heater	• Indicator stays lit • Alarm display	Breakdown of temp heater
Open circuit alarm of humidifying heater	• Indicator stays lit • Alarm display	Breakdown of humidifying heater
Malfunction alarm of humid ball temperature sensor	• Indicator stays lit • Alarm display	Breakdown or short circuit of humid ball temperature sensor 。
Incubator door alarm	• Indicator stays lit • Stop incubator fan, temperature/humidifying heater. • Alarm display	Incubator door is opened in the process of operation
Low level alarm of water supply tank	• Indicator stays lit • Alarm display	Internal water supply tank is in the 「Empty」 status, and the status lasts above one minute.
Abnormity alarm of level sensor of water level tank	• Indicator stays lit • Alarm display	Level sensor of internal water supply tank breaks down.
Water supply abnormity alarm	• Indicator stays lit • Alarm display	Although the pump is supplying water, but the humidifying tray does not store water.

Alarm name	Alarm display and action content	Reason for alarm
Temperature upper limit malfunction alarm	• Indicator stays lit • Alarm display	The status of the measured humidity reaching 100% or below 0% lasts above 15 minutes.
Over-temperature alarm	• Indicator stays lit • Alarm display	The measured temperature continues to rise above 5°C after reaching the set value.
Over-cooling alarm	• Indicator stays lit • Alarm display	The measured temperature continues to decrease by 5°C after reaching the set value.
Humidity control malfunction alarm	• Indicator stays lit • Alarm display	The measured humidity deviates from the set value by $\pm 20\%$ RH.
Ramp temperature malfunction alarm	• Indicator stays lit • Alarm display	In ramp control, the measured temperature deviates from the target temperature by $\pm 5^{\circ}\text{C}$.
Monitor alarm	※ Display disappears, and do not receive key operation. • Stop all operations	The noise wave checked leads to the lost of control of the temperature regulator, thus switching off the computer.

□ Countermeasures

Phenomenon	Reason	Countermeasures
Switch on the leakage breaker, but the switch returns to the position of OFF.	Electricity leakage	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby
	Current overload	
Even though power switch is at the position of ON, the display still does not work.	Power pins are removed from the sockets, or are not inserted actually.	Please switch off leakage breaker and power, and insert power pins into sockets solidly.
	Power failure	Please switch ON the breaker of adapter.
	Leakage breaker is not switched to the ON position	Please switch ON the leakage breaker
	Leakage breaker breaks down.	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby
	Power switch breaks down.	
	Temperature regulator base plate breaks down.	
Refrigerator does not work	Refrigerator breaks down.	
	Protection circuit startup of overload relay of refrigerator	Please reduce the heat load of refrigerator
		When the environmental temperature is too high, please lower the indoor temperature to below 35□
No refrigeration		When power voltage is too high, please use suitable special power voltage sockets
	The set temperature is incorrect	Please confirm the set temperature
	The refrigerator does not work.	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby
	Gas leakage	
	Fans of the refrigerator break down.	
Refrigeration difference	Internal recycling fans break down.	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby
	Gas leakage	
	The environmental temperature is above 35□.	When the environmental temperature is too high, please lower the indoor temperature to below 35□
	There are too many samples/vessels in the incubator. And the heat in the incubator can not go through convection.	To improve incubator convection, please reduce the quantity of samples/vessels.
	Frosting on the cooler	Please observe the frosting, and carry out [Defrost] periodically.
	The filter is stuck with dust.	Please clean the filter.
There is temperature difference in the incubator	The air outlet is blocked.	Please remove the obstacles in front of the air outlet.
	There are too many samples/vessels in the incubator. And the heat in the incubator can not go through convection.	To improve incubator convection, please reduce the quantity of samples/vessels.
	Internal recycling fans break down.	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby

Phenomenon	Reason	Countermeasures
Be unable to reach the set temperature	There are too many samples/vessels in the incubator. And the heat in the incubator can not go through convection.	To improve incubator convection, please reduce the quantity of samples/vessels.
	Over-temperature protector starts up	The set temperature of the temperature regulator is between -15℃ and 85℃. But the set temperature for over-temperature protector should be +10℃ above the value. When the regulator exceeds the set temperature, please twist the knob to the position of right side (120℃).
	Environmental temperature is below 5℃.	When the environmental temperature is too low, please reduce the indoor temperature below 5℃.
Fail to supply water to internal water tank (Water supply level monitor does not rise)	There is no purified water in external water tank.	Please supplement purified water.
	Installation position of external water tank is too low.	Please use external water tank rack (accessories)
	Residual air in the water supply soft tube.	Please release the air.
There is water at the bottom of the incubator from the humidifying tray.	The machine is too inclined.	Please lower the rear part by around 5mm through the level regulator at the bottom of the instrument.
Be unable to humidify	The humidity setting is at the status of 0.0%RH	Please set the humidity.
	Switch on the 「Manual Drain」 key (be in the status of compulsory drainage)	Please do not turn off the 「Manual Drain」 key
	There is no purified water in internal water tank.	Please inject purified water in internal water tank.
Dew formation of observation window	Due to different conditions of setting temperature/environmental temperature/ environmental humidity/incubator humidity, there will be dew formation.	Please sweep the dew with soft cloth gently.

Phenomenon	Reason	Countermeasures
Water can not flow from the spillway of humidifying tray and drainage tube at the bottom of the incubator	Bending of drainage soft tube.	Please configure the tube properly in case of blocking.
	Front end of drainage soft tube is dipped.	
	Drainage tube filter at the bottom of incubator is blocked	Please clean the tube system
	Water barrel receiving water is higher than the drainage outlet.	Please lower the barrel under the drainage outlet of the instrument
Instable humidity	Humid ball wick is not fully soaked.	Please soak the whole humid ball wick.
	Be beyond the humidity control scope	Please set the humidity within the control scope
	Instable power voltage	Please use special sockets with stable voltage
	Instable indoor temperature due to reasons such as air-conditioner	Please use the instrument in areas without air-conditioner
Abnormal sound	Motor of internal recycling fan breaks down	Stop the operation immediately, and contact the shop where you bought it or the maintenance center nearby
	Motor of condenser fan breaks down	
	Refrigerator breaks down	
	Electromagnetic valve startup	「creak—」 is the unique sound of electromagnetic valve. It will be fine if the sound is not too high.

Warranty commitment	
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7-1 Conditions for free repair

1. The Company shall repair products and spare parts provided by us free of charge within the one-year warranty period from the date of invoice issuance if there are problems with their materials or design as well as manufacturing.
2. After the expiration of the warranty period, the Company shall repair products and spare parts provided by us if the failures arising from our design and manufacturing. But we will collect cost fee and door-to-door service fee.

7-2. The repair fee shall be charged in the warranty period in any of the following cases.

1. Failure caused by users' wrong use or operation.
 2. Failure caused by improper change of parameters of product and instrument.
 3. Failure caused by natural disasters such as flood, fire, and earthquake, instable voltage, and other special force majeure.
 4. Failure caused by operations not conforming to stipulations in the operation manual or by improper handling.
 5. Failure caused by the transportation of the product to other countries without noticing the Company.
 6. Failure occurring in the process of transportation.
 7. Clients are required to make periodic check and maintenance.
 8. Failure caused by the unauthorized reassembly or refitting of the product at will without noticing the Company.
- ※ If the product breaks down after the expiration of the warranty period, the Company shall, in principle, repair it at the cost price.
- ※ If the same part breaks down again within three months after the paid repair, the Company shall make act at its discretion according to the requirement of users.

7-3. Period check and maintenance

When clients require periodic check or maintenance, they can specify the time and content of periodic check and maintenance on the feedback bill, and post the feedback bill to the technical service center of the Company within the warranty period. The Company shall post a bill voucher additionally. After receiving the remittance from clients, the Company shall arrange the specific time for periodic check and maintenance.

★ After-sale service hotline:

- ★ The Company is entitled to change the performance of the instrument in real time, without any prior notice.**
- ★ In the case of any problem with your instrument, please contact MRC engineers, and you will receive satisfactory services.**

MRC CO.,Ltd is the owner of MRC trademark.

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