Blood Bank Refrigerator

LMBL-A107

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1. Safety Measures

- **Transportation**: The machine should be lifted from the bottom, the slope cannot be greater than 45 degrees, and the machine should be transported and put down lightly.
- Do not catch the door or lining as the force component.
- Remove all packaging components (including the protective foam in the cabinet).
- The blood bank refrigerator can only be operated by trained and authorized personnel.
- The mounting surface must be fixed, horizontal, non-combustible, and can withstand the working weight of the blood bank refrigerator.
- The voltage of the equipment is 220V / 50Hz AC power, if the voltage is less than 187V or higher than 242V, an appropriate automatic voltage regulator needs to be installed.
- A dedicated independent socket must be used, and it needs reliable grounding, the length of the power cord must not be extended deliberately, if the length needs to be extended, 2.5mm^2 above copper wire must be used, cross-sectional area of the copper wire in the wall connected to the power socket must be 4m^2 above.
- Do not connect the neutral wire (N-side) of the socket with the ground wire (E-side), otherwise it will cause the refrigerator to be charged, and an electric shock accident.

2. Introduction

Blood Bank Refrigerator LMBL-A107 is a specialized storage unit designed to store and preserve blood and blood products at optimal conditions to maintain their integrity and usability for medical purposes. Blood bank refrigerators have secureand organized storage compartments with 136L of capacity maintaining a consistent and specific temperature range typically between 4°C to 6°C. Utilizes multiple sensors to ensure precise monitoring and programming for accurate control.

3. Features

- Unibody design with mono-assembly foaming using rigid polyurethane insulation material
- Utilization of a forced air refrigeration system to maintain a constant anduniform inner temperature
- Adjustable shelves to enhance space utilization, with the option forclassifying blood storage baskets
- Installation of individual transparent inner doors to effectively minimize coolair loss during door openings
- Built to be energy-efficient, reducing power consumption while maintaining optimal storage conditions
- Constructed with doors such as electrically heated glass doors, semi-foameddoors with locks, and Acrylic inner door
- Incorporated with Casters: Two universal casters with brakes, two-directionalcaster

4. Specifications

Model	LMBL-A107
Capacity	136 L
Temperature range	4 ± 2 °C
Temperature accuracy	0.1°C
Control system	Microprocessor control
Display	LED display
Audio and visual alarm	High or low temperature , sensor and system failure, door ajar, power failure
Refrigeration type	Forced air refrigeration system
Refrigerant	R13a, CFC-Free
Condenser & Evaporator	High efficiency air cooled condensermade of copper
Defrost	Frostless design
Material	Internal material: Stainless steel External material: Sprayed steel plate
Power consumption	252 W
Power supply	AC 220v ± 10%, 50 Hz
Adjustable shelves	4 pcs
Baskets	12 pcs
Blood bags (450ml)	99 pcs (450ml)
External size (W × D × H)	530 × 660 × 1287 mm
Package size (W × D × H)	672 × 732 × 1501 mm
Gross weight	104kg

5. Applications

Blood bank refrigerators play a vital role in preserving the viability and safety of blood and blood components, ensuring that they remain effective for transfusions,medical procedures, and research purposes in hospitals and research laboratories.

6. Instrument Introduction

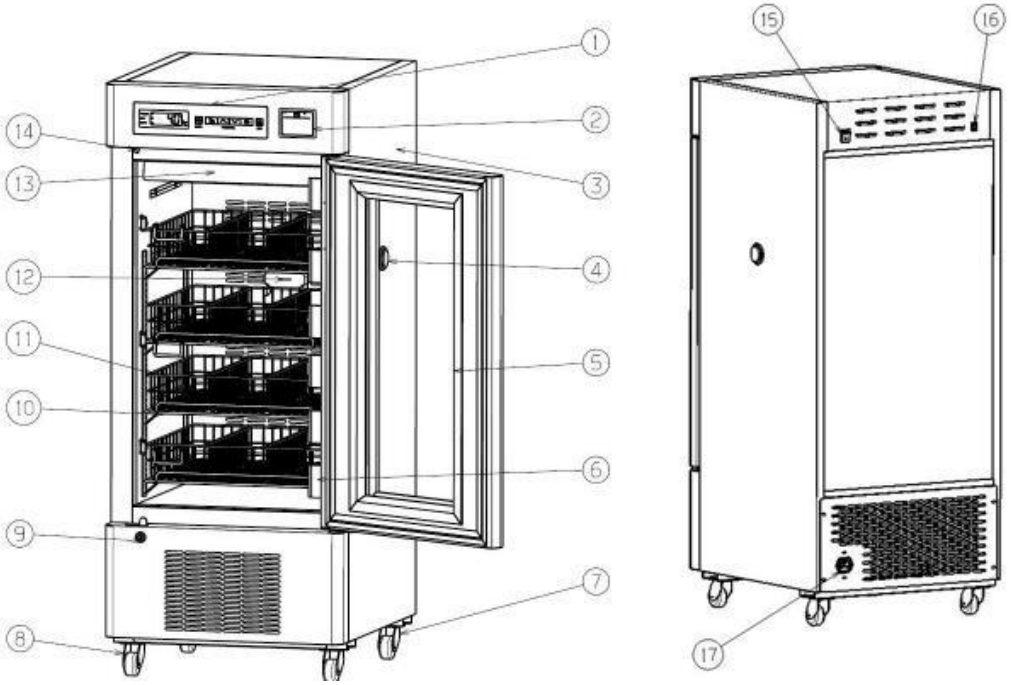


Figure.1

1. Thermostat
2. Thermal Printer
3. Cabinet
4. Test Hole
5. Outdoor
6. Inner door
7. Directional Wheel
8. Universal Wheel with brake
9. Door lock
10. Shelf
11. Blood Storage Basket
12. Temperature-sensitive basket
13. Shade with rear basket
14. Door alarm switch
15. Main power switch
16. Battery switch
17. Power cord interface

7. Installation

Environmental requirement

- The mounting surface must be fixed, horizontal, non-combustible, and can withstand the working weight of the blood bank refrigerator
- It should be placed in a place not exposed to direct sunlight and awayfrom the heat source, the environment temperature is not higher than 32℃.
- Indoor use
- For the surrounding of the blood bank refrigerator,30cm is required to beleft for ventilation
- It cannot be placed in an environment with a temperature below 0℃
- It cannot be placed in an environment with heavy moisture or subject tosplash

Normal working conditions

Environment temperature: 10℃ to 32℃

- Relative moisture: ≤80％
- The surroundings have no strong vibration or corrosive gas
- The equipment must not be affected by direct sunlight and other cold andheat sources

8. Operations

For first-time use

- After the package is removed, the blood bank refrigerator should be placed well to meet the requirements of the environment.
- Set the thermostat of the blood bank refrigerator to 4 ° C, turn **ON** the power,press the main power switch and the battery switch on the upper part of the cabinet's back to turn on the controller indicator, then start on the compressor after 3 minutes. After 30 minutes, the temperature in the blood bank refrigerator will decrease dramatically, indicating that the cooling system is working properly, and the test of the machine is over.
- If we use it for the first time it is recommended that the temperature inside the refrigerator should be decreased to the temperature of use and then place the itemsto be stored in it.
- If there are many items to be stored, it is recommended to store them threetimes. The storage time for the next time should be after the temperature in the refrigerator decreases to the set time.
- If the user stores too many items at one time, the items may be damagedbecause the refrigerator cannot be decreased to the set time for a long period.

8.1 Temperature adjustment

8.1.1 Button functions

An electronic thermostat is installed in the control panel of the blood bank refrigerator. After the power is turned **ON** the digital display can display the actual temperature inside the refrigerator.

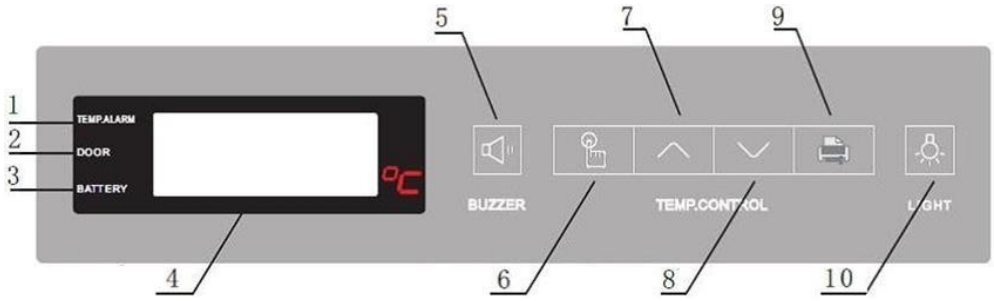


Figure-2

1. Temperature alarm mask
2. Battery status
3. Inside temperature display
4. Mute
5. Set
6. Up
7. Down
8. Print button

- Under the normal use state, it is recommended not to adjust the set temperature deliberately otherwise it will lead to a high temperature (AH) or constant temperature (AL) alarm at this time adjust the alarm values of thehigh temperature and constant temperature (AH, AL) at the same time.
- **Mute button**: When the user needs to cancel the alarm sound prompt, the usercan press the mute button to cancel the sound prompt, but the alarm indicator and alarm code will continue to display until the alarm state is released.

Print button

- Under the normal working state, press the print button for about greater than 5 seconds, the user can print the current temperature
- Under normal working state, press the and simultaneously for 3 seconds to view the time
- When the time is being viewed, press the and simultaneously for 1 second to return to the normal display state

8.2 Parameter Setting Method

When the instrument is powered **ON** the display screen displays the current temperature of the refrigerator and if the set time needs to be adjusted e.g. ifthe originally set temperature is 2°C but now it needs to be adjusted to 4°Cfollow the below steps

No	Button Operation	Display
1.		Display the temperature in the refrigerator
2.	Press the set buttonfor 3 seconds	Display the initially set value 2°C， andflashing
3.	Press the increase button	The digital is increased
4.	Press the decrease button	The Digit is decreased
5.		The temperature is 4°C
6.	Press the set button for 3 seconds	Save the setting, display the temperaturein the refrigerator

8.2.1 Mistake display

- When the cabinet temperature display probe has a short circuit, open circuit, failure, or the connection is not correct, the display screen shalldisplay "E0" when the cabinet temperature control probe has a short circuit, open circuit, failure, or the connection is not correct, the displayscreen shall display "E1".At the same time, the thermostat buzzer will sound an alarm, and the display will show the corresponding alarm parameters (E0, E1).
- After the power is turned **OFF** the control function of the controller is disabled the controller backup power supply can provide a power failure alarm.

9. Maintenance

9.1 Cleaning of refrigerator

- The instrument should be cleaned once a month regularly cleaning can keep the appearance of the refrigerator new
- Use dry cloth to wipe away the dust on the shell, inside, and all accessories of the refrigerator. If the blood bank refrigerator is dirty, use neutral detergent to clean it and then wipe the detergent with a cloth soaked in water
- Do not pour water on the shell, or inside of the refrigerator, otherwise it may damage the electrical insulation and cause a malfunction
- In the rainy season, the surface of the glass door makes it easy to condense water vapor, or dripping phenomenon dry with a dry cloth at the appropriate time, the above-mentioned phenomena cannot affect normal use.

9.2 Defrosting

- The blood bank refrigerator is an air-cooled frost-free refrigerator, and defrosting is not needed
- In summer, when the humidity is serious, the opening frame part may have a condensation phenomenon, which is normal, and it is recommended to dry it with a dry cloth

9.3 Maintenance

- Do not place heavy objects on the door or top cover of the blood bank refrigerator, to prevent the door or top cover from being deformed.
- After a period, the blood bank refrigerator should be cleaned and maintained.
- Wipe the inner and outer surfaces of the blood bank refrigerator with warm,wet, and soft cloth.
- When the dirt is serious, you can use utensil-used neutral detergent towipe, and then wipe the water stains with a cleaned soft cloth.
- Once the refrigerator is used, it is recommended to use it continuously.

10. Troubleshooting

Failure	Causes and Solutions
The blood bank refrigerator does notwork	• Whether the power plug have power? • Whether the power plugs on or loosened? • Whether the power fuse disconnected? • Whether the power supply voltage is too high ortoo low?
The compressor does not run	• Whether the temperature setting, correct?
The temperature continues to drop after reaching the expected value	• Whether the temperature setting, correct?
The temperature doesnot reach the set value	• Whether the fun has stopped running • Whether the door is closed well or the numberto open the door is too many? • Whether the items placed at one time are toomany and the air duct is blocked. • Whether the environment temperature too high?
The noise is too loud	• Whether the refrigerator placed on flat ground? • Whether the refrigerator touch the walls? • Whether the refrigerator immediately enter operation state after it is started?

11. Accessories

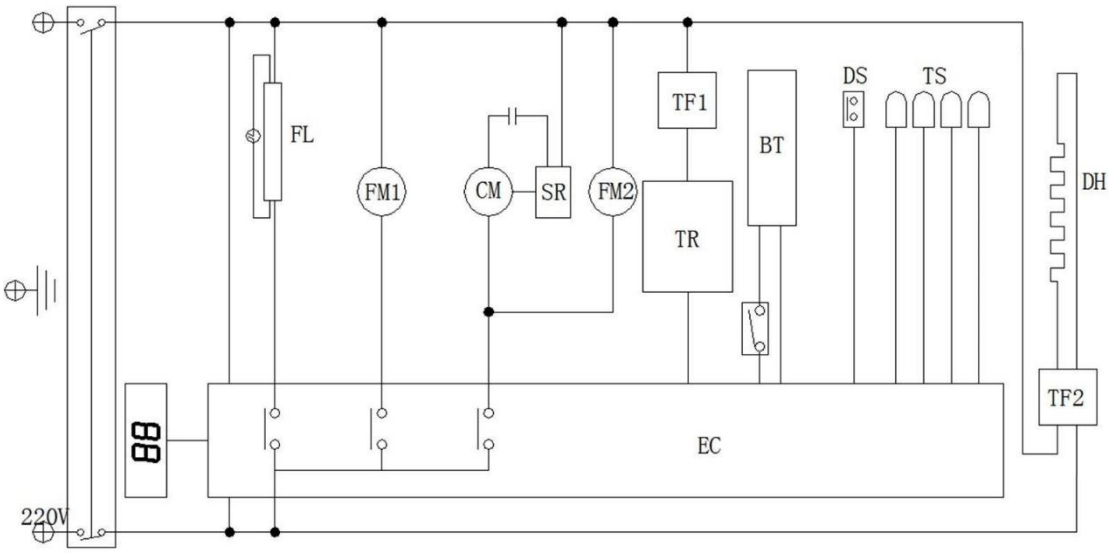
11.1 Standard Accessories

Accessories	Quantity
Thermal Printer	1
LED Lamp	1
The Temperature Test Box	1
Probe Access Port	1
Door Key	1

11.2 Optional Accessories

Temperature Recorder

12. Circuit Diagram



1. FL= Fluorescent Lamp
2. FM1= Evaporative Fan
3. CM= Compressor
4. SR= Starting relay
5. FM2= Condensing Fan
6. EC= Control CircuitPanel
7. TF1=Adapter
8. DS= Door Switch
9. TF2= Transformer
10. TR= Printer
11. TS= Temperature Probe
12. BT= Battery
13. DH= Door Heating Film