



# **Service Manual**

## **Flexaline**



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### Indhold

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## Working safety

This page provides general safety information for servicing the freezer.

The instruction manual includes additional information about security and cleaning of freezer.

## General safety

To prevent personal and equipment damage, the electrical safety / legislation of your country must be observed.

1. Never expose the moving parts of the plant to physical overload.
2. When repairing plant parts, safety concerns must be respected.
3. When using tools, spare parts and equipment, the existing security concerns must be met.
4. Maintenance procedures described in this manual must only be performed by trained personnel.

## Electrical safety

Maintenance procedures may imply a voltage hazard. Follow existing safety instructions, including the low voltage and current EU directives and other directives of your country.

Always disconnect the power to the unit before repair or parts replacement is initiated. Use only electrical equipment which is designed for the freezer.

## Chemical and biological safety

Always observe the requirements for safe handling, as described below.

Read the instruction manual before using, cleaning and servicing the freezer.

Wear eye protection and gloves when working with refrigerants.

Skin contact with liquid refrigerants may cause frostbite.

Good ventilation and air extraction at the work area is required.

Stay in environments with high concentrations of refrigerant vapors is harmful.

Low concentrations may cause narcotic effects.

Symptoms of this may include: headache, shortness of breath, nausea and difficulties in concentration. Possibly: Mobility / consciousness.

Read the safety data sheet section 5d.

## CHAPTER 1: PRODUCT INFORMATION

### 1. FEATURES

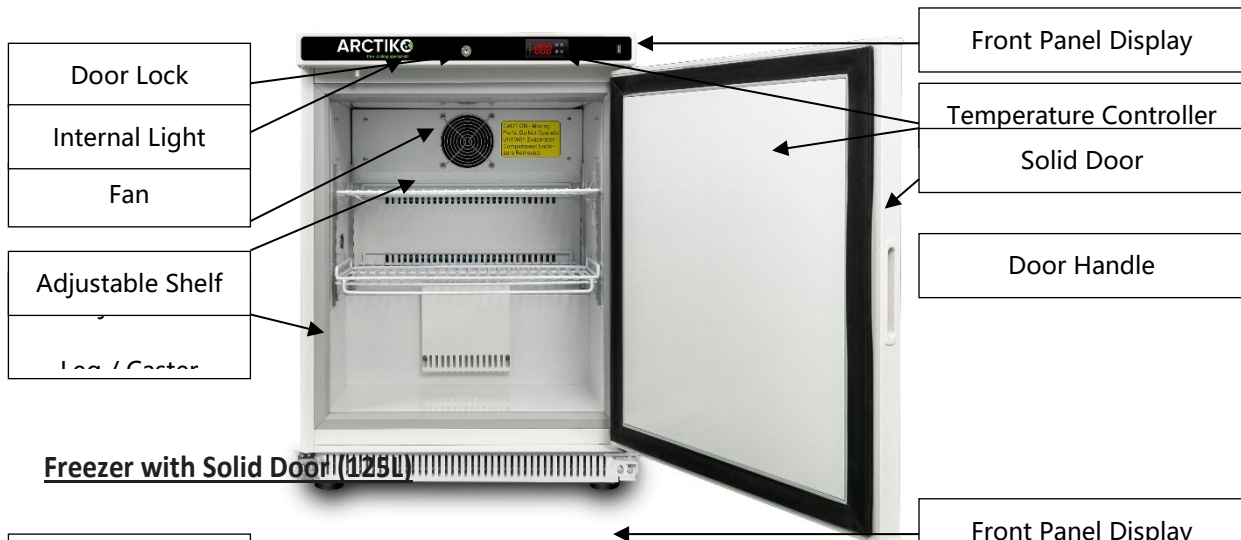
- 1) **Model Name:** PRE / LRE / LFE refers to different models PRE series refer to pharma refrigerator from 60L till 500L,
- 2) **Glass/Solid Doors:** Standard Pharma Fridge models are in glass door or solid door. The glass door is with double layers, high transparency, good insulation performance, impact resistance. Standard Pharma Freezer models are all in solid door.
- 3) **LED Controller:** All models apply an electronic temperature controller, with accurate temperature controlling, data logging function, back-up battery and a full alarming system.
- 4) **Temperature Range:** Temperature range of the fridge is 2°C~8°C. Temperature range of the freezer is -10~-25°C.
- 5) **Design:** Upright design, single door with lock, the design of directing cooling makes the temperature more uniform inside of the cabinet.

### 2. PRODUCT STRUCTURE AND APPEARANCE

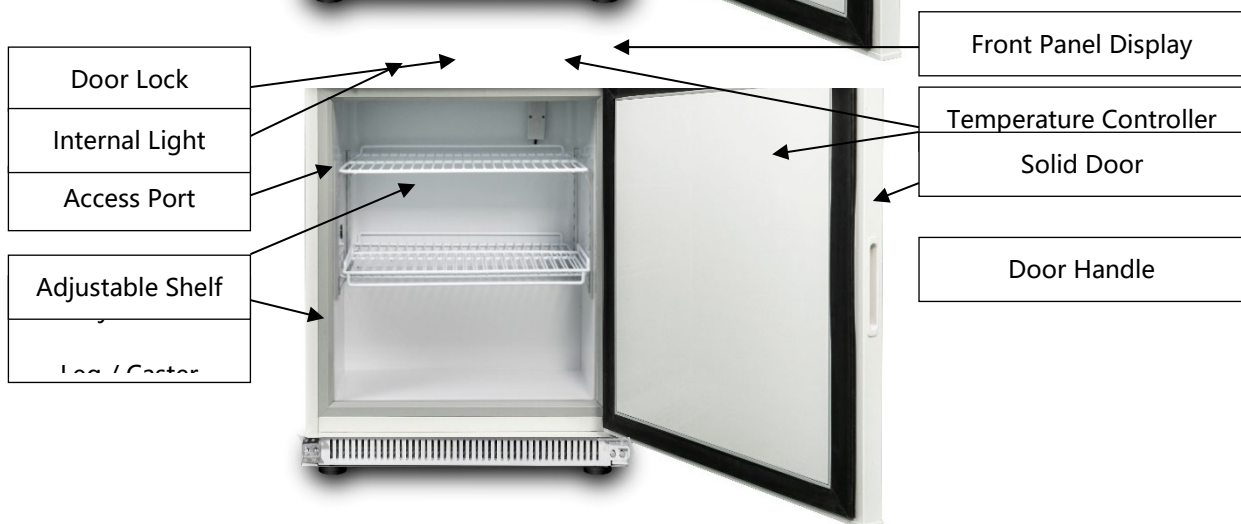
#### Fridge with Glass Door (125L)



## Fridge with Solid Door (125L)



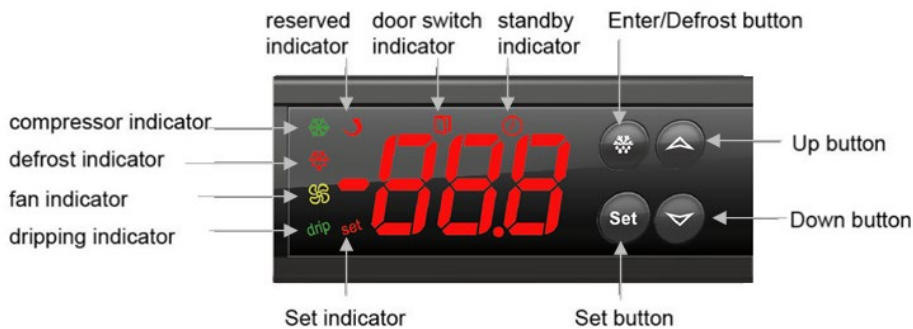
## Freezer with Solid Door (125L)



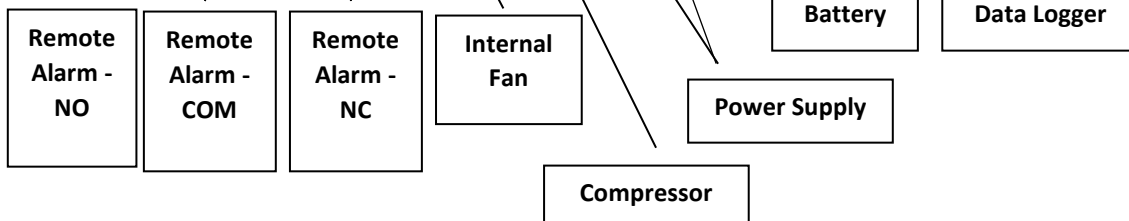
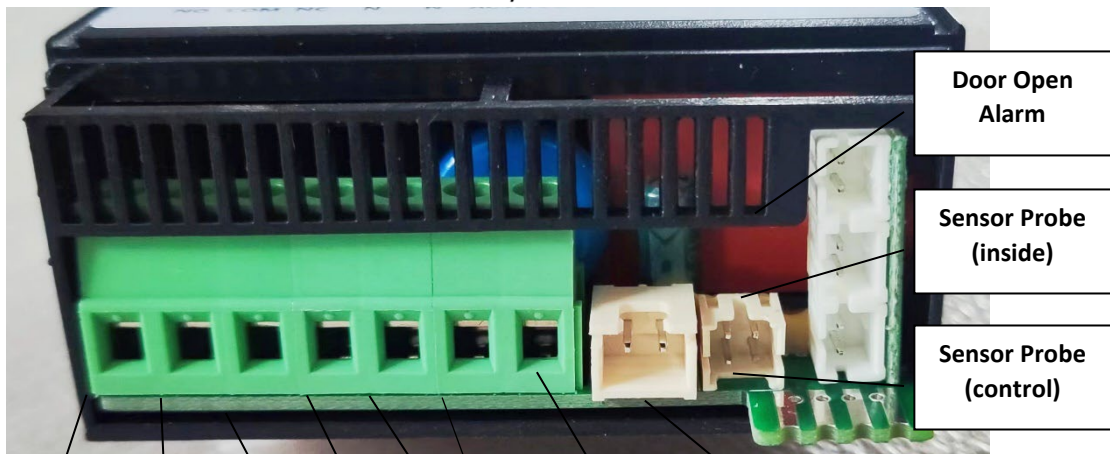
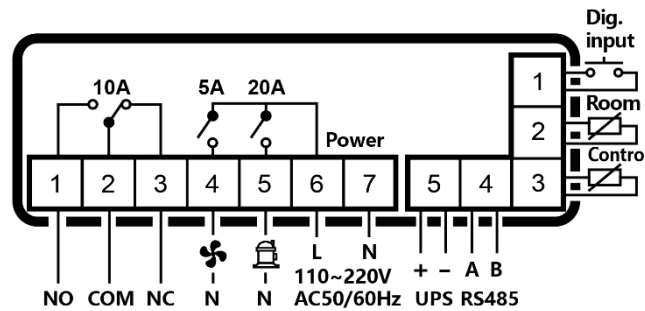
## CHAPTER 2: PRODUCT COMPONENT STRUCTURE & NAME

### 1. TEMPERATURE CONTROLLING SYSTEM

#### 1) Display Screen



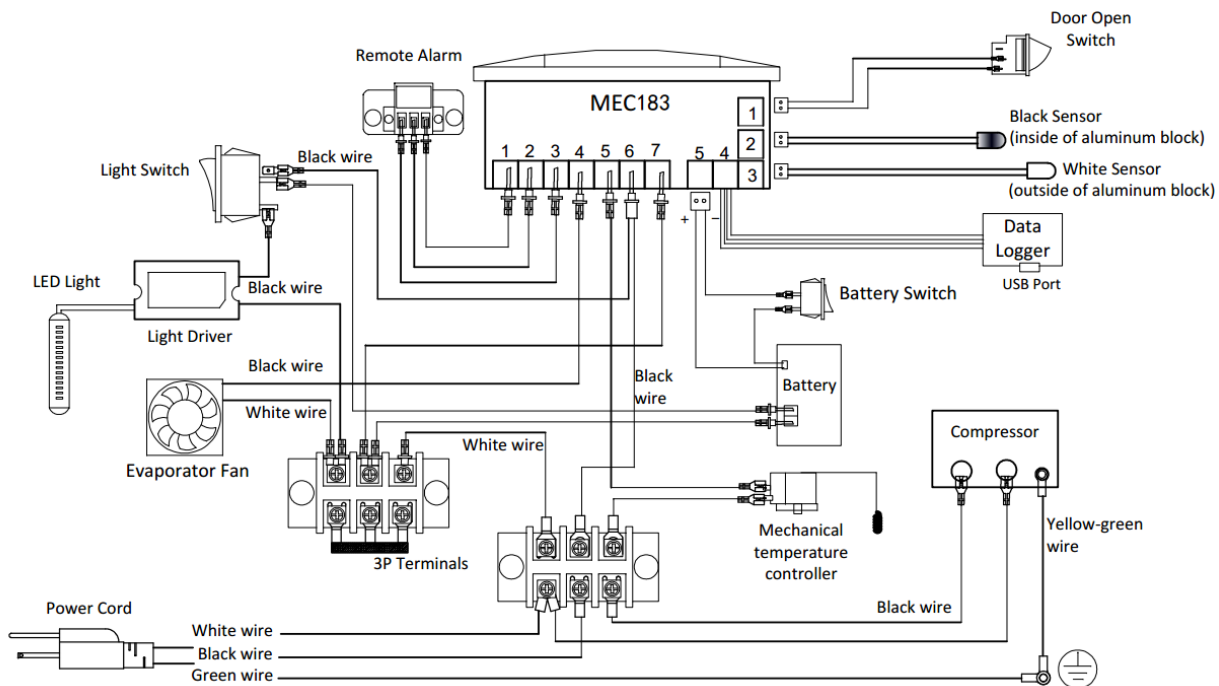
#### 2) Electric Control Interface



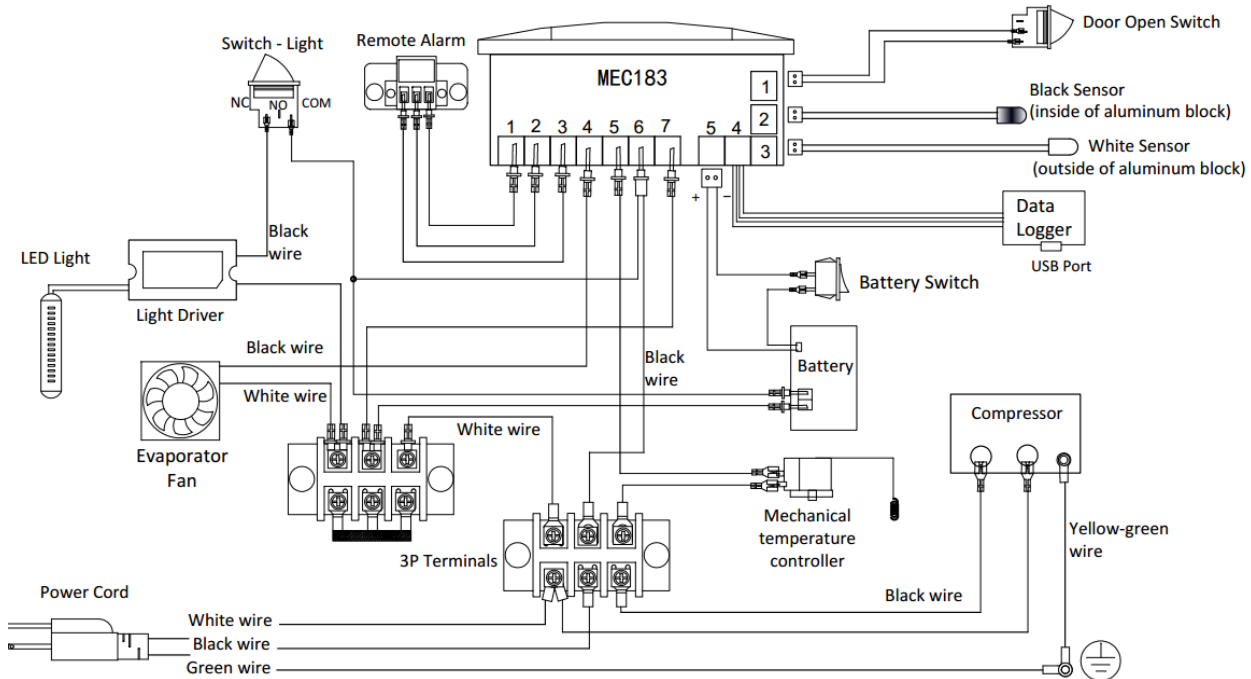
### 3) Electrical Wiring Diagram

The 60L/110L/260L/390L/600L models have the same appearance, same circuit, different compressor and different dimensions.

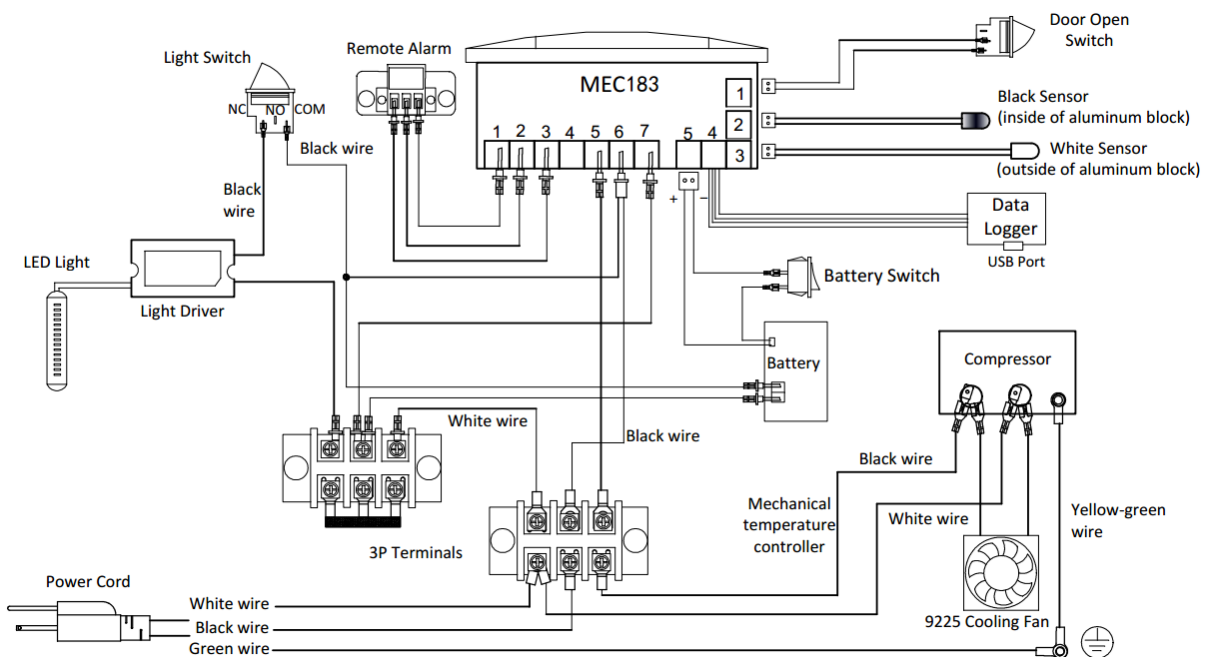
#### Fridge with Glass Door:



## Fridge with Solid Door:



## Freezer with Solid Door:



#### 4) Factory Default Parameters

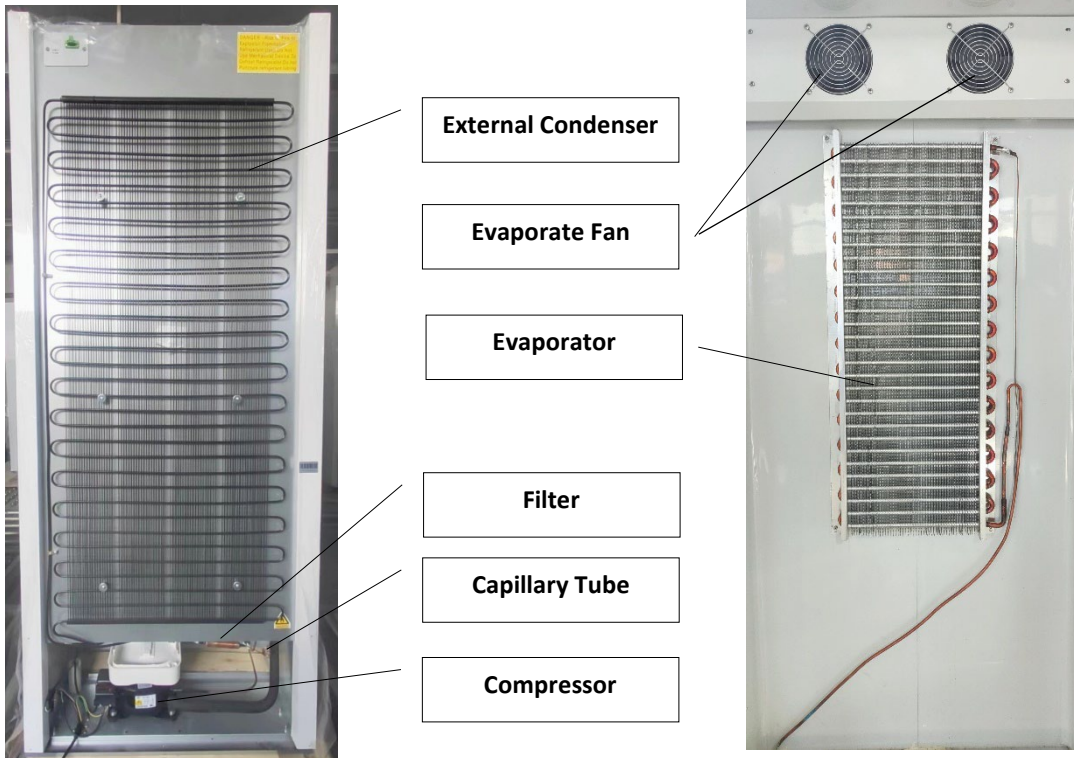
| Menu | Functions                                                      | Setting value |         | Menu | Functions                                                                   | Setting value |         |
|------|----------------------------------------------------------------|---------------|---------|------|-----------------------------------------------------------------------------|---------------|---------|
|      |                                                                | Fridge        | Freezer |      |                                                                             | Fridge        | Freezer |
| St   | Temperature set value                                          | 5             | -25     | F3   | Fan start time delay after defrost                                          | 2             | 2       |
| Po   | Administrator menu password                                    | 55            | 55      | A1   | Compressor run and stop in a proportional time after cabinet sensor failure | 1             | 1       |
| C1   | Hysteresis value                                               | 2             | 2       | A2   | Compressor stop time in the mode of "Run/stop in a proportional time"       | 5             | 5       |
| C2   | Compressor start Min. interval                                 | 3             | 3       | A3   | Compressor running time in the mode of "Run/stop in a proportional time"    | 10            | 30      |
| C3   | Compressor initial start Min. interval                         | 1             | 1       | A4   | Buzzer alarm output switch                                                  | 1             | 1       |
| C4   | Cabinet sensor calibration                                     | -1°C          | 0       | A5   | Cabinet temperature lower limit alarm value                                 | 1             | -30     |
| C5   | Temperature set lower limit                                    | 2             | -30     | A6   | Cabinet temperature upper limit alarm value                                 | 9             | -15     |
| C6   | Temperature set upper limit                                    | 6             | -10     | A7   | Cabinet over temperature alarm time delay                                   | 1             | 1       |
| C7   | Max.standby time after finishing compressor start Min.interval | 0             | 0       | A8   | The initial cabinet over temperature alarm time delay after electrified     | 40            | 40      |
| C8   | Refrigeration Min.running time                                 | 0             | 0       | A9   | Over temperature alarm upper deviation                                      | 10            | 10      |
| C9   | Display sensor                                                 | 1             | 1       | A10  | Over temperature alarm lower deviation                                      | 5             | 5       |
| C10  | Display sensor calibration                                     | 0             | 0       | A11  | Over temperature alarm mode                                                 | 1             | 1       |
| d1   | Evaporator sensor selection                                    | 0             | 0       | A12  | Mute when power failed                                                      | 0             | 0       |

|     |                                                      |    |    |      |                                                      |    |    |
|-----|------------------------------------------------------|----|----|------|------------------------------------------------------|----|----|
| d2  | Evaporator sensor calibration                        | 0  | 0  | do1  | Control output of door switch                        | 1  | 1  |
| d3  | Defrost cycle calculation                            | 1  | 1  | do2  | Buzzer response when door open                       | 1  | 1  |
| d4  | Defrost cycle                                        | 6  | 0  | cd1  | Condenser sensor selection                           | 0  | 0  |
| d5  | Defrost status display                               | 3  | 3  | cd2  | Condenser high temperature alarm start value         | 55 | 55 |
| d6  | The maximum time of defrost                          | 8  | 8  | cd3  | Lower hysteresis of condenser high temperature alarm | 5  | 5  |
| d7  | Defrost termination temperature                      | 12 | 12 | u1   | Fahrenheit/Celsius selection                         | 1  | 1  |
| d8  | Dripping time after defrost                          | 2  | 2  | *Adr | Compile address                                      | 1  | 1  |
| d9  | Cabinet temperature display time delay after defrost | 10 | 10 | PAS  | User password                                        | 22 | 22 |
| d10 | Time delay after defrost start                       | 0  | 0  | *r1  | Start recorder function                              | 1  | 1  |
| d11 | Defrost type                                         | 0  | 0  | *r2  | Export PDF Chinese/English                           | 1  | 1  |
| F1  | Fan running mode                                     | 5  | 3  | r3   | Export the latest data time                          | 0  | 0  |
| F2  | Fan initial start time after electrified             | 1  | 1  | *r4  | Recording interval                                   | 60 | 60 |

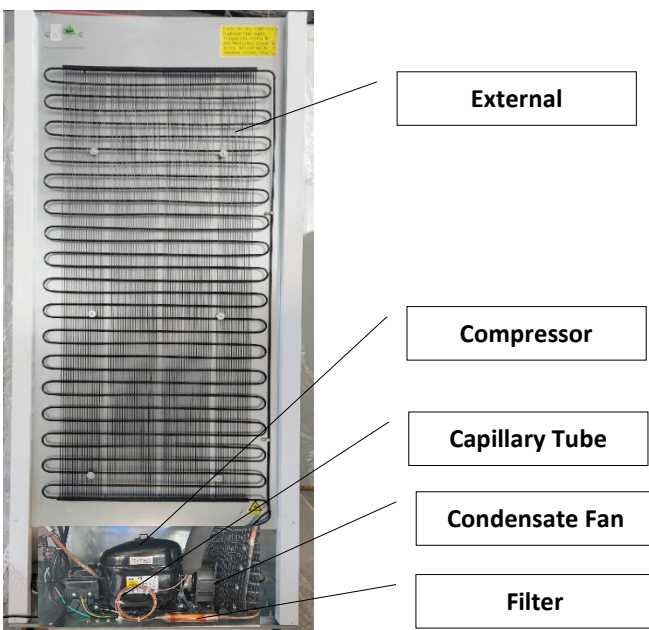
## 2. COOLING SYSTEM

### 1) System Components

#### Fridge:

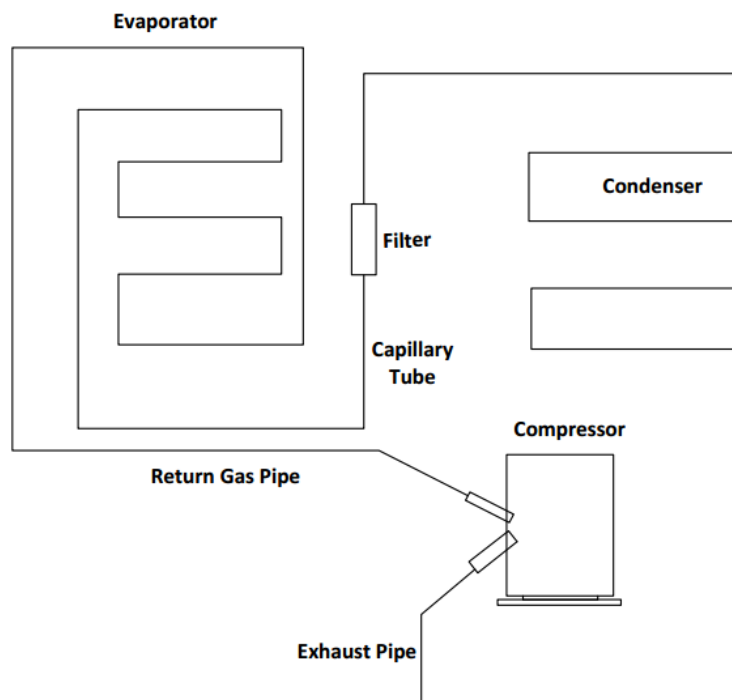


#### Freezer:

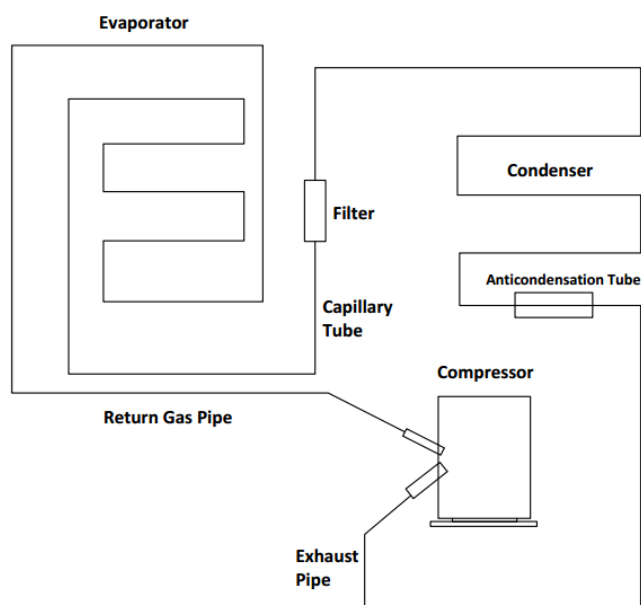


## 2) Refrigeration System Diagram

**Fridge:**



**Freezer:**



### 3) Refrigerant Charging Process

#### 1. Preparation

- 1) Refrigerant (R600a, R290)
- 2) Hansen valve
- 3) Standard electronic scale (error  $\leq \pm 2g$ )
- 4) Vacuum pump ( $\geq 4L$ )
- 5) Pressure gauge (high and low pressures shall be read at the same time)

#### 2. System Cutoff

- 1) Cut off the failure system from the end of the process pipe with a pipe wrench and discharge the refrigerant in the system.
- 2) Finish welding the open pipeline with the pressure gauge in 20min. after the system is cut off.

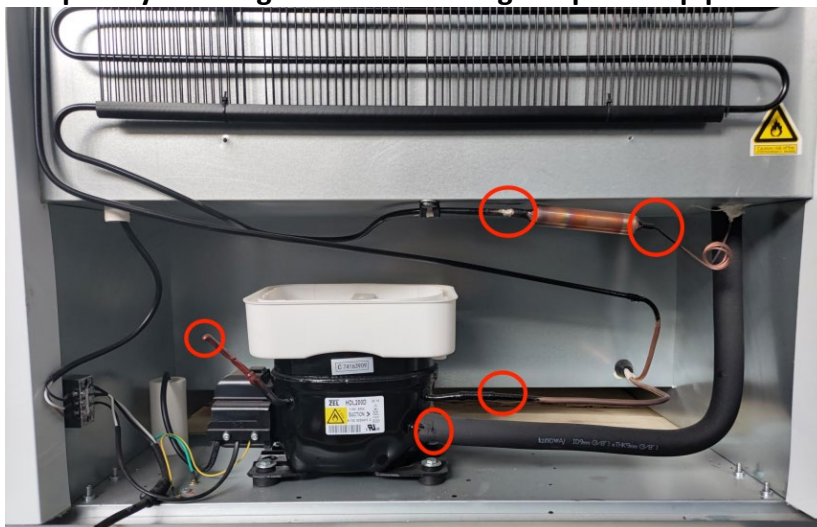
**[Notes]** \*If the humidity in the maintenance workshop or if it is rainy or cloudy, it is forbidden to cut off the system and each pipeline of the system which has been cut off shall be welded well at once

\*Since the machine has the strict requirement for moisture in the system, each pipeline port shall be sealed up with adhesive tape immediately after it is cut off, so as to prevent from air entering the system, and also the pipeline at each port shall be welded completely in 20min.

#### 3. System Leak Detection

The welding process pipe is filled with nitrogen to pick up leakage. Carefully check every solder joint of the high temperature machine with foam water. After finding the leak point, release nitrogen and seal the leak point with gas welding. Charge nitrogen again to check whether there is leakage. After confirming that there is no leakage point, evacuate and fill the refrigerant.

**Note:** the refrigerant is flammable. After opening the system, the refrigerant must be completely discharged before welding the process pipe.





#### 4. Vacuum-pumping

- 1) Connect the vacuum pump adapter with the public adapter in the middle of the pressure gauge.
- 2) Switch on the vacuum pump for vacuum-pumping and the vacuum shall be  $\leq 3$  Pa.
- 3) Continue to keep the machine under the negative state for 1h above continuously, and stop vacuum-pumping and start charging until the pressure does not go up.



#### 5. Charging Refrigerant

- 1) Disconnect the vacuum pump from the pressure gauge;
- 2) Connect the refrigerant tank and pressure gauge, and keep the refrigerant tank on the electronic scale;
- 3) Open the valve of the refrigerant tank, then slowly open the valve of the pressure gauge to discharge the air in the pipe until the refrigerant is sprayed out from the needle valve, then quickly tighten the pressure gauge and then the pipe at the needle valve. (The purpose of this link is to discharge the air in the pipe, which is very important).

**[Notes]**

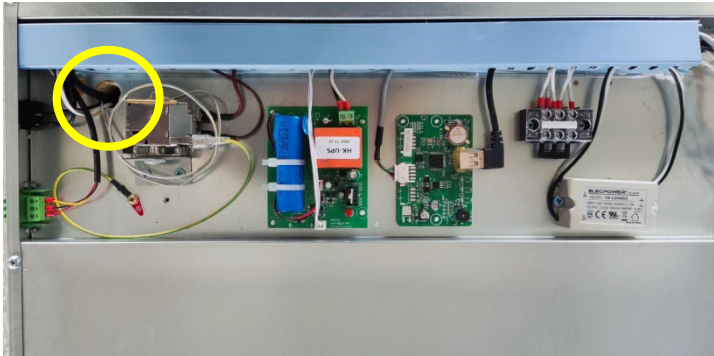
- \* The refrigerant charge must be accurate, because even a tiny little difference may affect the refrigerating effect.**
- \* In order to ensure that the refrigerant is filled accurately, the electronic scale must be used for weighing and charging all refrigerants.**
- \* The requirement for the accuracy of the refrigerant charge (g) of the product is very strict. Must prepare a standard electronic scale with the tolerance of 2g in advance.**

### 3. REPLACEMENT OF SPARE PARTS

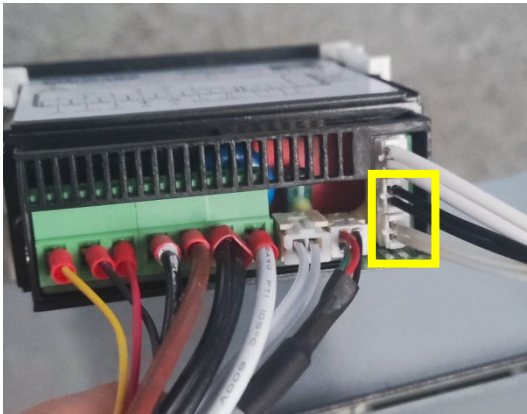
Below are some situations when there is a need to replace the spare parts. **Please note that any replacement of the spare parts should do AFTER powering off the fridge/freezer.**

#### 1) Replacement of the sensor(s)

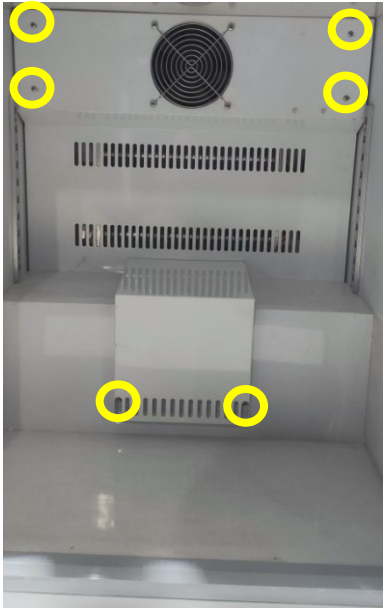
1. Take down the top cover board, and clean the sealant inside of the threading hole (see below)



2. Remove the sensor connector from the controller. If the sensor of controlling the compressor is broken, remove the white one. If the sensor of controlling the display of controller, remove the black one.



3. Unscrew ALL the screws fixing the ventilate back fence per below:



4. **IMPORTANT STEP: DISASSEMBLE THE CONNECTOR OF THE FAN, AND THEN TAKE DOWN THE VENTILATE BACK FENCE.**



5. Unscrew the screws fixing the probe aluminum block

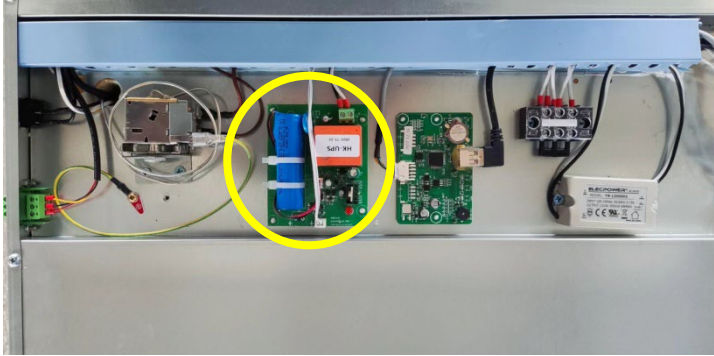


6. Locate the correct sensor line (white/black) to replace.

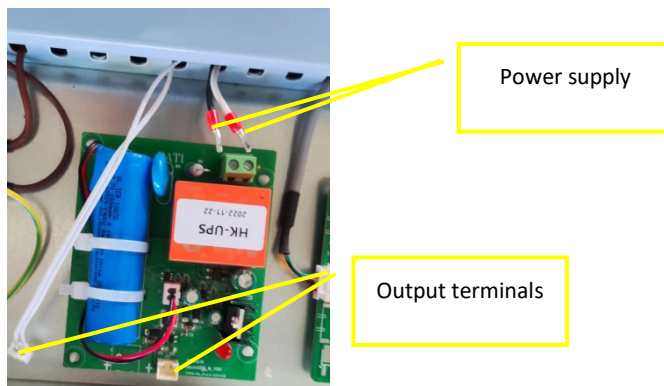


## 2) Replacement of the back-up battery

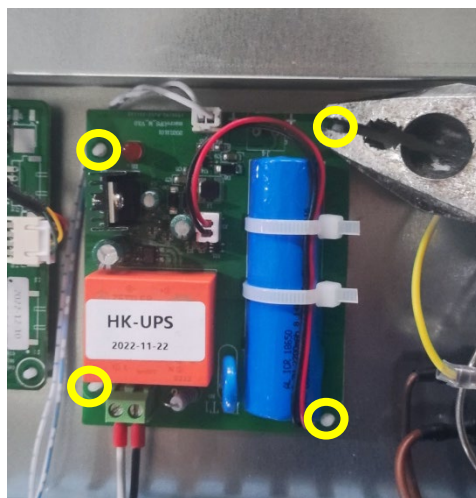
1. Take down the top cover board, and locate the back-up battery.



2. Unplug the output terminal (see below), and then remove the power supply cable with a flat-head screwdriver.



3. Remove the four fixing bar and take off the whole back-up battery. Please note to replace the battery with the same model.



### 3) Replacement of the LED light

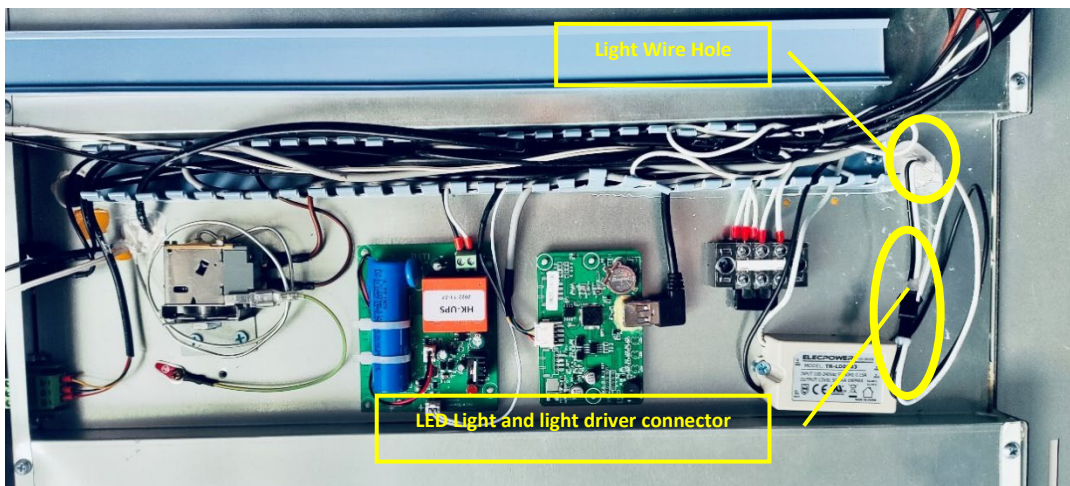
1. Unscrew the two screws as below to take off the light cover.



2. Unscrew the screws fixing the LED light.



3. Take down the top cover board, locate the light wire hole, and clean the sealant inside of this wire hold.

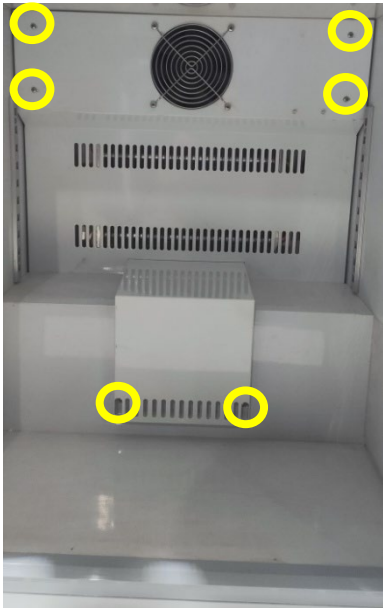


4. Disassemble the connector between the light driver and the LED light. Remove the broken LED light from the inside of the cabinet, and follow the same way to replace with a new one.

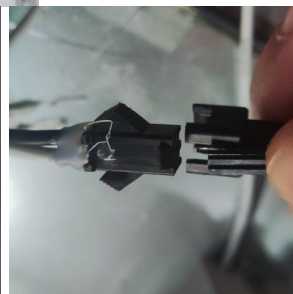


#### 4) Replacement of the evaporator fan

1. Take off the shelves, plastic snappers and Shelving Strip.
2. Unscrew ALL the screws fixing the ventilate back fence per below:



3. **IMPORTANT STEP: DISASSEMBLE THE CONNECTOR OF THE FAN, AND THEN TAKE DOWN THE VENTILATE BACK FENCE.**



4. Unscrew the four fixing the fan with the back fence. Remove the broken fan and replace with a new one.



## 5) Replacement of the door seal

1. First disassemble one corner of the door seal



2. Slowly remove the door seal, taking care not to tear the door seal



3. Take out a new door seal and install one of the corners and fix it. Then fix the other three corners. Press the other parts of the door seal in turn to make sure no fall off.



## 6) Replacement of the condenser fan

1. Open the Engine Room Rear Guard and locate the condenser fan.
2. Unscrew the screws fixing the fan



3. Cut off the cable ties holding the fan wire.



4. Remove the terminal at one end of the fan cable, and then take off the broken fan.



## 4. TROUBLESHOOTING

In the below table are listed the most common faults, the possible causes and the action to be taken.

| DESCRIPTION<br>FAILURE / ICON                    | POSSIBLE CAUSE                                                             | SOLUTION                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appliance does not switch on                     | Controller set to "Stand-by"<br>Power failure<br>Faulty controller         | <ul style="list-style-type: none"> <li>✓ Switch on the controller.</li> <li>✓ Check plug, socket, fuses, electrical line.</li> <li>✓ Contact service department.</li> </ul>                                                                                                                                                    |
| Equipment is not cooling                         | Faulty cooling system                                                      | <ul style="list-style-type: none"> <li>✓ Contact service department.</li> </ul>                                                                                                                                                                                                                                                |
| The refrigerator is noisy                        | Appliance not levelled<br>Moving parts touching guards<br>Screws unscrewed | <ul style="list-style-type: none"> <li>✓ Check that the appliance is levelled</li> <li>✓ Check that fans or piping is not in touch with other parts.</li> <li>✓ Fix the screws.</li> <li>✓ Search for vibrations of metallic parts/piping.</li> <li>✓ If the problem persists, contact service department.</li> </ul>          |
| Water or ice stagnation in the drip tray         | Drain outlet is clogged<br>Appliance not levelled.                         | <ul style="list-style-type: none"> <li>✓ Clean drain and drain outlet and check that the appliance is levelled.</li> <li>✓ If the problem persists, contact service department.</li> </ul>                                                                                                                                     |
| Presence of ice on evaporator or on stored goods | Improper use of the equipment<br>Door seals are not efficient              | <ul style="list-style-type: none"> <li>✓ Limit door openings at the minimum.</li> <li>✓ Turn off the appliance and disconnect it from mains until a complete defrosting is obtained and turn on the equipment again.</li> <li>✓ Check door gaskets.</li> <li>✓ If the problem persists, contact service department.</li> </ul> |
| Refrigerator doesn't reach the set temperature   | Ambient temperature is too high or cooling unit is out of gas              | <ul style="list-style-type: none"> <li>✓ Bring ambient temperature to the pre-defined ones (see climatic class on the technical data plate).</li> <li>✓ Contact service department.</li> </ul>                                                                                                                                 |
| High/Low temperature alarms frequently repeated  | Wrong High/Low alarm limits                                                | <ul style="list-style-type: none"> <li>✓ Check the set limits with reference to the working setpoint.</li> </ul>                                                                                                                                                                                                               |
| Evaporator been iced                             | The evaporator fan is stuck                                                | <ul style="list-style-type: none"> <li>✓ Check the evaporator fan placed inside the equipment. If the fan works, turn off the unit and disconnect the refrigerator from</li> </ul>                                                                                                                                             |

|                    |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                 | <p>the mains, as long as the ice won't have melted completely. Switch on the unit again.</p> <p>✓ If problem persists, contact service department.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| COMPRESSOR WORK    | <p>Continuous working of compressor for 24hours</p> <p>Too hot ambient temperature</p> <p>Leakage of cooling gas</p> <p>Wrong use of equipment, i.e. too many door openings</p> | <p>✓ Check that the equipment is placed in an ambient with a suitable air circulation and with a correct temperature/humidity level (see climatic class on technical data plate).- The air cooling grids should not be covered anyhow (our equipment is not meant to be embedded in other type of furniture).</p> <p>✓ Check the correct working of the condenser fan and its possible obstruction.</p> <p>✓ If the above mentioned conditions are absent, disconnect the unit from the mains for a few seconds and switch it on again.</p> <p>✓ If the problem persists, contact service department.</p> |
| Temperature sensor | Failure prob                                                                                                                                                                    | <p>✓ Contact Service department.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| DOOR ALARM         | Possible faulty door switch                                                                                                                                                     | <p>✓ Check if the message is correct by opening and closing the door. If the message is wrong, switch off the unit, disconnect it from the mains, and then turn it on again.</p> <p>✓ If the problem persists, contact service department.</p>                                                                                                                                                                                                                                                                                                                                                            |



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