NÜVE SANAYİ MALZEMELERİ İMALAT VE TİCARET A.Ş.

# BLOOD BANK REFRIGERATOR

## KN 72 – KN 120

## KN 294 – KN 504

# SERVICE MANUAL

CE 1984

Z14.K 146 Rev. No: 01 Rev. Date: 08/2014

**PLEASE CONTACT WITH AN AUTHORIZED NÜVE AGENT TO SEEK TECHNICAL HELP. NÜVE IS NOT RESPONSIBLE FROM INCORRECT REPAIRS HANDLED BY UNAUTORIZED PERSON.**

**Factory**
Saracalar Mah. Saracalar Kümeevleri No: 4/2 (Eski Esenboğa Yolu 22.km)

Akyurt 06750

**ANKARA / TURKEY**

Tel: (0.312) 399 22 09-399 28 30
Fax: (90.312) 399 21 97
email: nuveservice@nuve.com.tr

# CONTENTS

# 1. INTRODUCTION

## 1.1. PURPOSE OF THE SERVICE MANUAL

This manual includes servicing and maintenance information for KN 72, KN 120, KN 294 and KN 504 Blood Bank Refrigerator. It is prepared to be used by technicians who were formerly trained by Nüve. This manual informs the technicians about the operating principles, diagnosing and repairing methods and spare part replacing.

If any problem is detected which is not identified in this manual, please contact to **Nüve** Servicing Team.

## 1.2. GENERAL PURPOSE OF THE UNIT

Control units are located at the top of the instrument. The air inside is sucked by the fan that is located at the top of the chamber then passes through the evaporator that is located at the top, between the chamber and the body and again enters to the chamber from the openings at the back side of the chamber. The cooling function and the air circulation are provided by this way. The KN series blood bank refrigerators have **N-Smart$_{TM}$** microprocessor controlled units.

# 2. OPERATING PRINCIPLES

KN 72-120-294-504 Blood Bank Refrigerator can be examined in 5 main categories:

- Power supplies
- Control unit
- Cooling unit
- Lightening unit
- Defrost unit

## 2.1. POWER SUPPLY

KN series requires 230 V, 50/60 Hz.

| | Fuses | Power Consumption | Power Supply |
|---|---|---|---|
| KN 72 | 10 A | 330 W | 230 V AC |
| KN 120 | 10 A | 330 W | 230 V AC |
| KN 294 | 10 A | 700 W | 230 V AC |
| KN 504 | 13 A | 1000 W | 230 V AC |

## 2.2. MAIN PCB

The microprocessor controlled main PCB operates on the “On/Off” controlling system and all excluding the circular chart recorder all the control elements are connected to the main PCB. These are;

- Temperature sensor
- Lightening unit terminals
- Keyboard and display PCB
- Cooling group terminals
- Defrost heater terminals
- Circulation motor terminals
- Remote alarm and NC contact inlets

## 2.3. CONTROL PANEL

Figure 1 shows the command and control panel. Functions of F1, F2, F3 and F4 buttons are correspond to the commands on the screen. For further information see the user's manual.

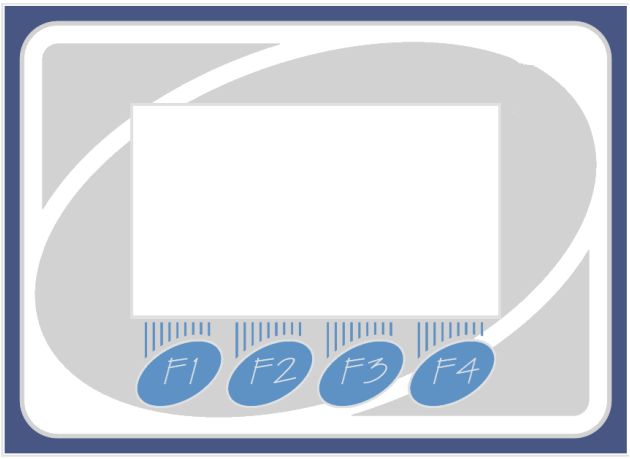
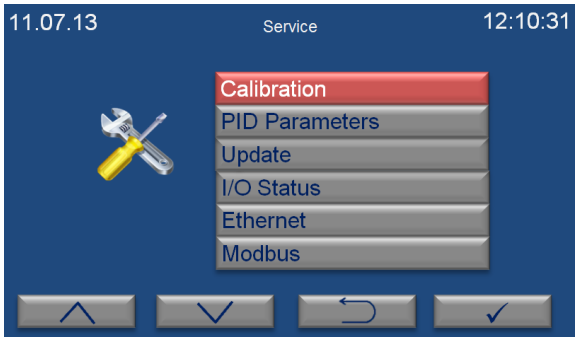



**Figure 1**

### 2.3.1. SERVICE MENU



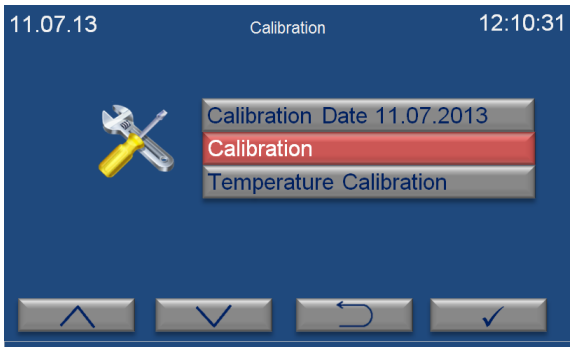

When menu page key (F1) is pushed on the working screen, password query screen appears. After entering password by using increase (F1) and decrease (F2) keys, main menu page appears when the password approved by pushing enter key (F4). After Service menu can be selected by using the value increase (F1) and decrease (F2) keys. Password is required to access the service menu. Service menu includes submenus which are calibration, PID parameters, Update, I/O Status, Ethernet and Modbus.

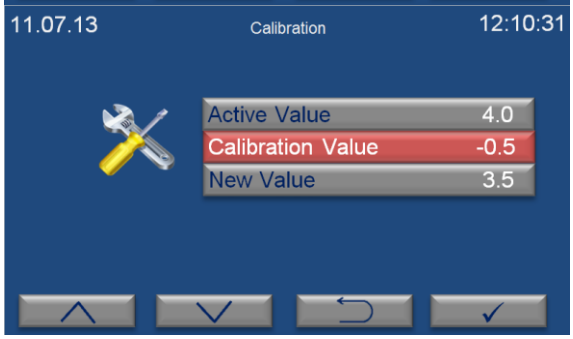
#### 2.3.1.1. CALIBRATION

Before applying the calibration procedure, measure the actual temperature in the chamber.

- Insert the calibrated external sensor in the chamber from the calibration probe entrance at the left side of the unit.
- Immerse the external sensor to white plastic bottle that contains blood-featured liquid.
- Energize the device and enter a set value.
- Please wait approximately 2 hours (after the set temperature) before measuring the actual temperature by the external temperature sensor.
- If there is difference between the equipment's display and the external sensor apply the calibration procedure as below:

1. The screen on the right appears when the “calibration” is selected on service menu by using the value increase (F1) and decrease keys (F2).
2. Last calibration date is seen on the first row of the calibration screen.



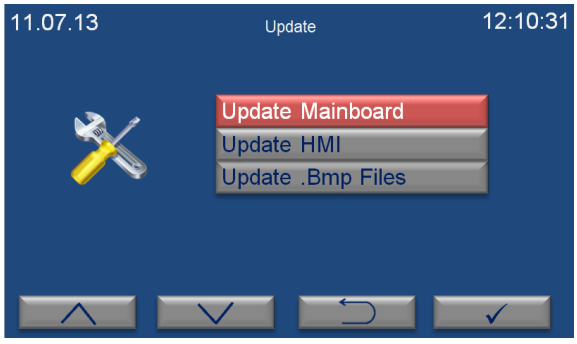




3. When enter key (F4) is pushed to access calibration page, the screen on the right appears.
4. Enter the value to “calibration value” line by using the value increase (F1) and decrease keys (F2). Calibration value is difference between the equipment’s display and external sensor. For example, if the display temperature is 4.0°C and the external sensor measures 4.5°C, enter +0.5°C for calibration value.
   If the set temperature is 4.0°C and the external sensor measures 3.5°C, enter -0.5°C for calibration value.
   **Active Value**: The value is shown on the screen.
   **New Value**: The value to be read on the screen after calibration.

5. After entering calibration value, push the enter key (F4).

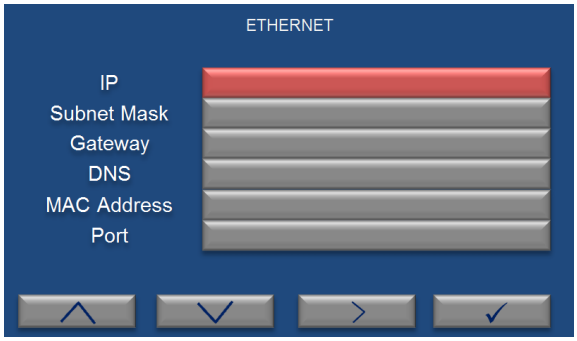
| | |
|---|---|
| ☞ | Manual input – output status are observed by entering temperature calibration menu. Please contact to Nüve Factory Technical Service to use this page. |
| ⚠ | Please do not enter the PT100 Calibration menu which is in the temperature calibration menu. Unintended consequences can be caused while using this page. |

### 2.3.1.2. UPDATE




The screen on the left appears when the “Update” is selected by using the value increase (F1) and decrease keys (F2). When “Update Mainboard” is selected, loading bar appears on the screen. After installation is completed, push the enter key (F4). When “Update HMI” is selected, system restarts after update is completed.

### 2.3.1.3. ETHERNET




The screen on the left appears when the "Ethernet" is selected by using the value increase (F1) and decrease keys (F2). If **NüveCloser**$_{TM}$ software or e-mail feature is used, Ethernet parameters which are on the screen on the left should be adjusted.

After Ethernet settings are completed, turn the device off and on.

## 2.4. COOLING UNIT

The cooling function is obtained by circulating the refrigerant gas within a close circuit system. The elements of this close circuit system are;

- Compressor
- Condenser Cooling Fan
- Condenser
- Dryer
- Capillary Pipe
- Evaporator

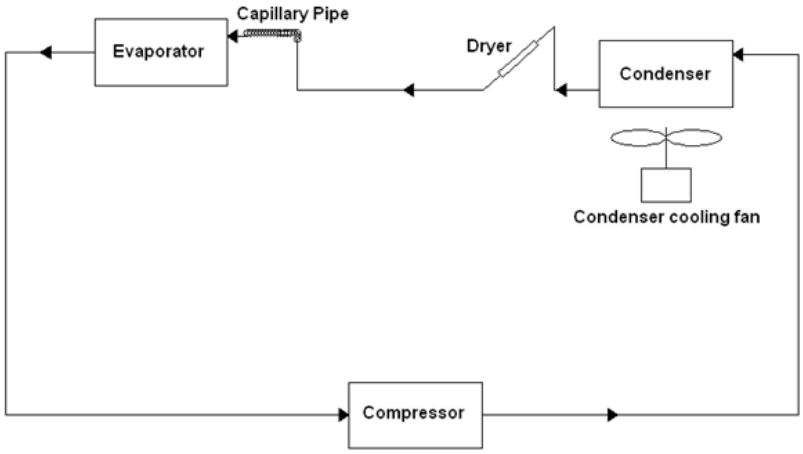



**Figure 2**

## 2.5. LIGHTENING UNIT

Samples can easily be observed by the lightening lamp inside the chamber. Elements of the lightening unit are;

- Lightening switch
- Ballast
- Starter
- Lightening lamp

### 2.6. BATTERY CHARGING UNIT

In case of cut of electricity temperature of the chamber are kept working by the aid of a battery which is charged automatically. Battery charging elements are;

- Battery charging PCB
- Battery
- Transformer

## 3. SERVICING

Before servicing the instrument, please take the necessary precautions for your and environmental health. Please respect to the warnings on the unit.

### 3.1. GENERAL OVERVIEW

The failures which can be encountered with Blood Bank Refrigerators can be fixed with the guidance of the table provided below.

The most of the failures can be determined by multimeter.

The screen return to red and error explanation appears on the bottom line of the screen in case of any error. Push the question mark key (F3) to see detailed description of error. Errors are recorded to device's memory. Date and time of the error with relative error codes can be displayed. Failure history page can be reached by entering "memory" option through the main menu page.

The components on the main PCB or display PCB cannot be replaced even the failure is caused by one of them. In such cases, please send the failed PCB to the factory service along with a note on which the failure explanations are written.

Please make sure that the failure is not caused by weak wire and terminal connections before replacing the PCB or any command and control element.

### 3.2. GENERAL FAILURES

| FAILURE | PROBABLE CAUSES | SOLUTION |
|---|---|---|
| **1)** Power switch is ON but the power led does not lighten and the display is blank. | Power supply inlet failure. | Check whether mains voltage is supplied. |
| | The automatic fuse has blown. | Check the automatic fuse. |
| | Power switch is defective. | Replace the power switch. |
| | Display PCB is defective. | Replace display PCB. |
| | Main PCB is defective. | Replace main PCB. |
| **2)** The power switch is ON but the display is blank or some segments are blank. | Connection cable between the main PCB and display PCB is not connected properly. | Disconnect this connection cable and reconnect it carefully. |
| | Connection cable between the main PCB and display PCB is defective. | Replace the connection cable. |
| | The display PCB is defective. | Replace the display PCB. |
| | The main PCB is defective. | Replace the main PCB. |
| **3)** The fuse has blown permanently. | Short circuit exists. | Check the cooling unit elements (compressor, condenser, fan) or defrost heater for short circuit. If short circuit exists, replace the relevant element. |
| | | Check the electrical terminals and cables for short circuit. |
| **4)** The circulation motor does not work. | The motor cable connection terminals are loose. | Check that all terminals are connected properly. |
| | The motor is defective. | Check motor windings by multimeter. If they are defective, replace them. |
| | The motor shaft is tightened. | Rotate the propeller by hand to loose. If it is not possible to loose, replace the motor. |
| **5)** The lightening lamp does not turn on. | Lightening lamp is defective. | Replace the lamp. |
| | The lightening lamp outlet on the main PCB is defective. | Check whether the lightening lamb is pushed or not. |
| | Cable connections terminals are loose or defective. | Check that they are connected properly. |
| | Starter or ballast defective. | Replace the defective one. |

| FAILURE | PROBABLE CAUSES | SOLUTION |
|---|---|---|
| **6)** The condenser fan does not work | Motor cable connection terminals are loose or broken. | Check that all terminals are connected properly. |
| | Motor windings are broken or burned. | Check them by multimeter. If they are defective, replace them. |
| | The motor shaft is tightened. | Rotate the propeller by hand to loose. If it is not possible to loose, replace the motor. |
| | The cooling terminal on the main PCB does not outlet to the SSR (solid state relay). | Check the outlet with a multimeter. If 12 V dc does not exist, replace the main PCB. |
| | Cooling unit SSR is defective. | Check the SSR is defective. |
| **7)** The compressor does not work. | The compressor cable connection terminals are loose or broken. | Check the cable connection terminals and ensure that they are connected properly. |
| | The cooling terminal on the main PCB does not outlet to the SSR. | Check the outlet with a multimeter. If 12 V DC does not exist, replace the main PCB. |
| | Cooling unit SSR is defective. | Check the SSR is defective. |
| | The compressor protection thermic is defective. | Replace the thermic. |
| | Compressor windings are burned. | Replace the compressor. |
| **8)** Temperature does not decrease the set value. | There is excessive heat loss. | Check whether the door is open and the chamber gasket is tight enough. |
| | The cooling terminal on the main PCB does not outlet to the SSR. | Check the outlet with a multimeter. If 12 V DC does not exist, replace the main PCB. |
| | The cooling unit SSR is defective. | Check that the SSR is defective. |
| | The condenser cooling fan does not work. | See Section 3.2., no 6. |
| | The compressor does not work. | See Section 3.2., no 7. |
| | Leakage exists in the cooling system. | See 3.4.1. |
| | Condenser fins are dusty. | Clean condenser core once every three months. |
| **9)** Temperature drops below the set value. | SSR terminal outlet for cooling on the PCB is defective. | Check cooling and heating terminal outlets with a multimeter. If it shows 12 Vdc, replace the PCB. |
| | SSR regarding cooling is defective. | Check whether cooling SSR is defective. (see Section 3.3) |

| FAILURE | PROBABLE CAUSES | SOLUTION |
|---|---|---|
| **10)** Temperature on the display is different from the actual temperature in the chamber. | Temperature sensor reads incorrectly | Ensure that temperature sensor tip does not touch the chamber surface or samples. |
| | | Replace the temperature sensor. |
| | The main PCB is not calibrated. | Contact to the Nüve Factory Servicing Team for necessary calibration. |
| **11)** The error message "Power Failure" appears on display. | This error code shows power failure. | |
| | Power shutdown on the unit while on-off switch is on. | Check the mains supply. |
| | | Check whether the unit is plugged in. |
| **12)** The error message 'Err 1' appears on display. | Temperature sensor is defective. | |
| | The temperature sensor probe is broken or PCB terminal connections are loose. | Check whether main PCB terminal connections of the temperature sensor are loose. Replace the sensor if they are broken. |
| | Main PCB is defective. | Replace the main PCB. |
| **13)** The error message "Err 2" appears on display. | Communication error between display and main PCB. | |
| | Connection cable between display and main PCB are loose or broken. | Check the cable connection terminals are connected properly. |
| | Main PCB is defective. | Replace the main PCB. |
| | Display is defective. | Replace the display. |
| **14)** The error "door open" appears on display. | Door is kept open for a while. | |
| | Connection cable between door switch and main PCB are loose or broken. | Check the cable connection terminals are connected properly. |
| | Door switch is defective. | Replace the door switch. |
| | Main PCB terminals connections of door switch are loose. | Check whether main PCB terminal connections of the door switch are loose. Replace the sensor if they are broken. |
| **15)** The error "Out of alarm range" appears on display. | Temperature in the chamber is not in the temperature alarm range. | If the temperature is more than set value, see number 8. |
| | | If the temperature is less than set value, see number 9. |
| **16)** The error "Err7" appears on display. | Software version is not compatible | Push the F3 key corresponding to the question mark to see explanation that shows supported version. Update the software according to the version. (See Section 2.3.1.2) |

### 3.3. SSR CONTROL


**Figure 3**

SSR has 4 terminals (Figure 2). Terminal 1 and 2 are used for phase flow, Terminal 3 and 4 are connected to the main PCB. Terminal 3 is connected to the (+) end and terminal 4 is connected to the (-) end. Terminal 1 is the phase inlet and terminal 2 is the phase outlet.

DC voltage supplied by SSR to the Terminal 3 and 4 enable phase flow by causing short circuit on the terminal 1 and 2. If there is no voltage on Terminal 3 and 4, terminal 1 and 2 are open circuit.

Circuit component to be controlled (compressor, solenoid valve, etc.) should be connected to Terminal 2.

Following states indicates the SSR failure:

State - 1: There is voltage on the main card and Terminal 1 and 2 are open circuit,

State - 2: There is no voltage on the main card and Terminal 1 and 2 are short circuit.

At State-1, if a cooling element is connected to Terminal 2, the unit does not cool.

At State-2, If a cooling element is connected to Terminal 2, the unit cannot control cooling and overcooling is observed in the unit.

**Controlling State-1:**

When the device is on the OFF position, disconnect Terminal 1 from the main card. The terminal of the cable must not touch to anywhere, please isolate it.

If the unit does not cool, set it to low temperature and run it. Check Terminal 3 and 4 whether there is DC voltage or not. If there is DC voltage, it means that the main card works properly. In this case, check Terminal 1 and 2 whether there is short circuit. If there is no short circuit but there is open circuit, it means SSR is defective. SSR is not defective when there is DC voltage on Terminal 3 and Terminal 4 and short circuit on Terminal 1 and Terminal 2 or when there is no DC voltage on Terminal 3 and Terminal 4 and open circuit on Terminal 1 and Terminal 2.

**Controlling State-2:**

When the device is on the OFF position, disconnect Terminal 1 from the main card. The terminal of the cable must not touch to anywhere, please isolate it.

If overcooling problem is encountered, set the temperature to a value higher than the displayed one or do your measurements after temperature exceeds the set temperature value. Check whether there is DC voltage on Terminal 3 and 4. If there is no DC voltage, the main card does not work properly. In this case, check Terminal 1 and 2 whether there is open circuit. If there is no open circuit but there is short circuit, then SSR is defective. SSR is not defective when there is DC voltage on Terminal 3 and Terminal 4 and short circuit on Terminal 1 and Terminal 2 or there is no DC voltage on Terminal 3 and Terminal 4 and open circuit on Terminal 1 and Terminal 2.

## 3.4. COOLING SYSTEM FAILURES

Cooling system failures should only be handled by the trained and experienced technicians.

### 3.4.1. CHECKING FOR LEAKAGE IN THE COOLING SYSTEM

- Discharge the gas existing in the cooling system.
- Connect the maximum pressure manometer hose of the gas manifold to the compressor service line (See Figure 4).
- Charge 10 bar nitrogen gas to the system.
- Check the welding points, the gas solenoid valve connection records, the compressor service line valve needle by the gas leakage detector or soap bubble.
- Detect the leakage, discharge the nitrogen gas and repair the leakage.
- Re-charge 10 bar nitrogen gas to the system to see if another leakage exists or not.
- If no leakage exists, discharge the nitrogen.

### 3.4.2. VACUUMING THE SYSTEM

- Connect the maximum pressure hose of the gas manifold to the vacuum pump, the minimum pressure hose to the compressor service line and the gas charge hose to gas charge cylinder.
- Open the minimum and maximum pressure valves.
- Operate the vacuum pump and vacuum the system for at least 60 minutes.
- Stop the vacuum pump after closing the maximum pressure valve.

### 3.4.3. CHARGING GAS TO THE SYSTEM

- Turn on the device and set to 0°C.
- Charge gas to the system by opening the valve on the gas charging cylinder and start the program.
- Close the valve on the gas charging cylinder after R134a gas has been charged.
- Adjust the gas amount while following the cooling performance.

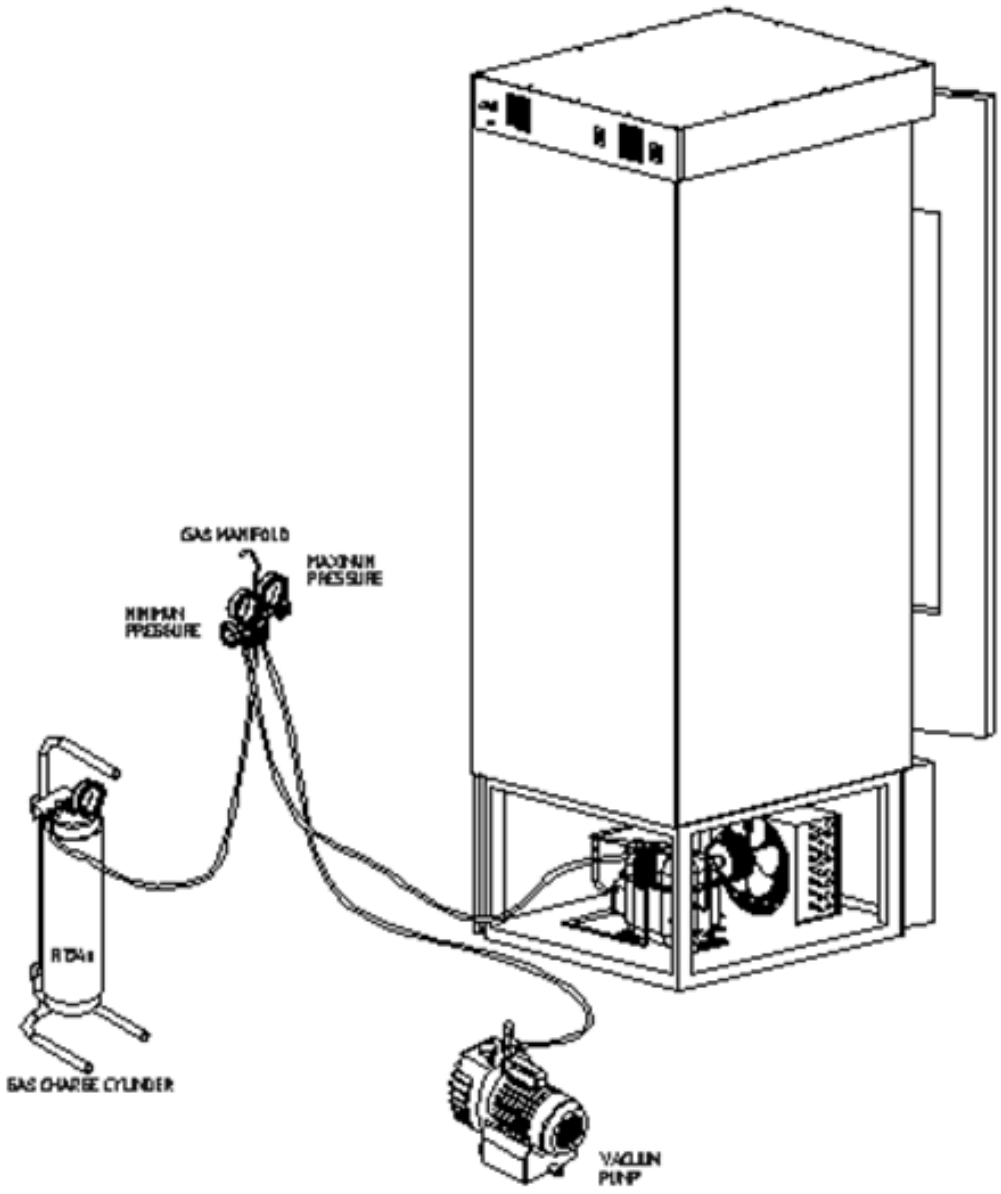

GAS MANIFOLD
MANIFOLD PRESSURE
MANIFOLD PRESSURE
R134a
GAS CHARGE CYLINDER
VACUUM PUMP

**Figure 4**

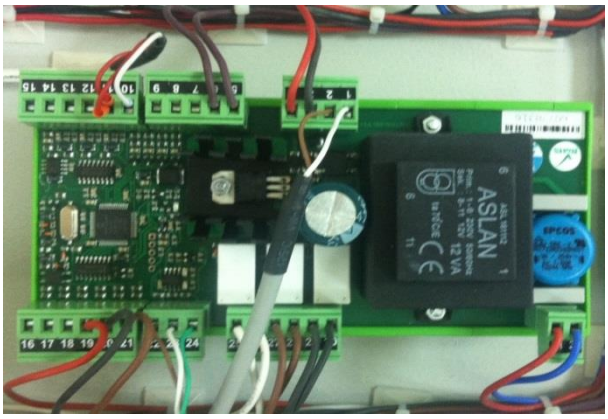
# 4. SPARE PART REPLACEMENT

Unplug the unit before replacing any part.

## 4.1. ACCESS TO COMMAND AND CONTROL UNIT

- Remove the screws of protection sheet on the backside of the device.
- Pull off the protection sheet.

## 4.2. REPLACING MAIN PCB

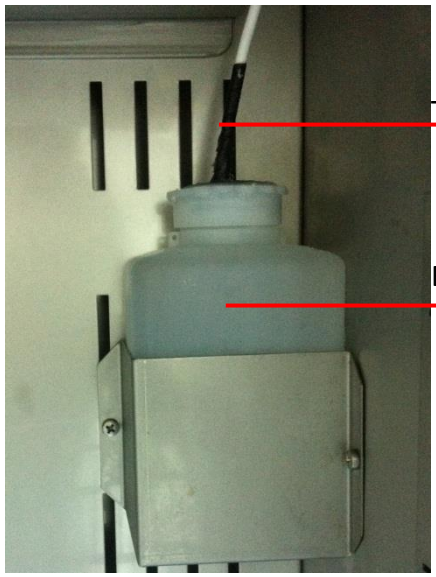



- Before replacing main PCB(22), apply Section 4.1.
- Disconnect the connection cable between temperature display PCB and main PCB from the main PCB.
- Remove all the terminals (ie. SSR, temperature sensor) connected to terminals of main PCB.
- Remove platform (25) on which main PCB is located by using 4 connection screws.
- Remove platform (25) on which main PCB is located by using 4 connection screws.
- Remove the main PCB from the metal slide by using clips.
- Place a new main PCB on the metal slide.
- After placing main PCB, place the platform and insert connection screws.
- Make all connections according to the electric diagram provided in Section 5.

## 4.3. REPLACING DISPLAY PCB

- Before replacing the display PCB, apply Section 4.1.
- Disconnect the display PCB / main PCB connection cable from the display PCB.
- Loosen 2 connection screws and pull out the display PCB from the front side.
- Place a new display PCB on the protection sheet and assemble it.
- Connect the connection cable.

## 4.4. REPLACING TEMPERATURE SENSOR




- Disconnect the temperature sensor endings from the main PCB.
- Clean the silicon from top of the bottle is immersed sensor
- Remove the back cover sheet of the device.
- Remove the insulation material enough to pull the temperature sensor.
- Pull the temperature sensor and place the new sensor.
- Immerse the sensor to the bottle and apply silicone to top of the bottle hermetically.
- Place the insulation material and connect the temperature sensor cable to the main PCB.

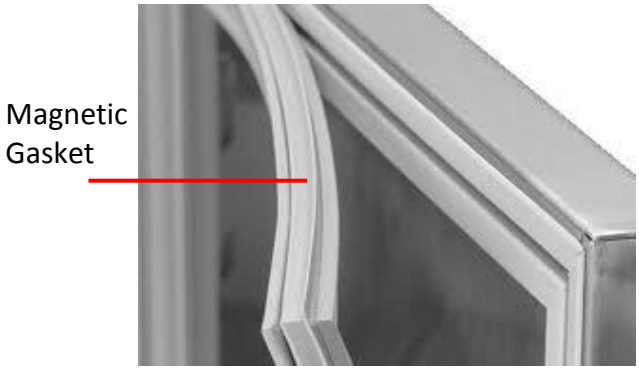
## 4.5. REPLACING SSR


- Disconnect all cables from SSR.
- Remove 2 screws located on the SSR.
- Take SSR out and place the new one.
- Make the terminal connections according to the electrical diagram (See Section 5.)

## 4.6. REPLACING CIRCULATION MOTOR

- Remove the connection screws of the motor (15) protection cover which is at the top.
- Disconnect the circulation motor terminal connection cables.
- Pull the motor protection cover with motor.
- Remove the circulation motor that is assembled to top sheet by screwing off.
- Place new circulation motor.

## 4.7. REPLACING MAGNETIC GASKET



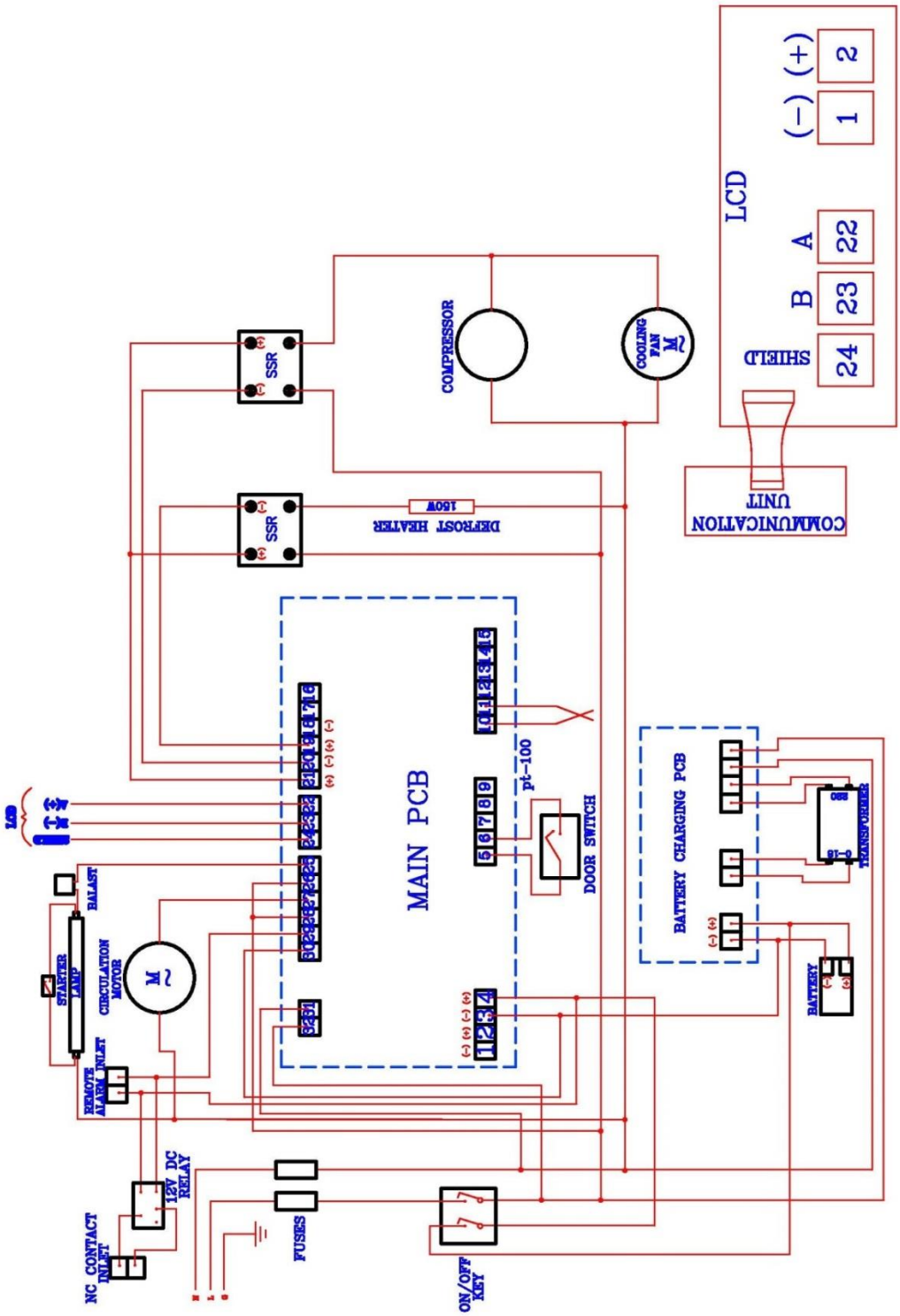

- Remove the connection screws on the magnetic gasket inner surface.
- Separate the magnetic gasket and door inner sheet by pulling.
- Assembly new magnetic gasket on the door inner sheet.
- Place the door inner sheet to its place on the back of the door and screw it.

## 4.8. REPLACING CONDENSER COOLING FAN MOTOR

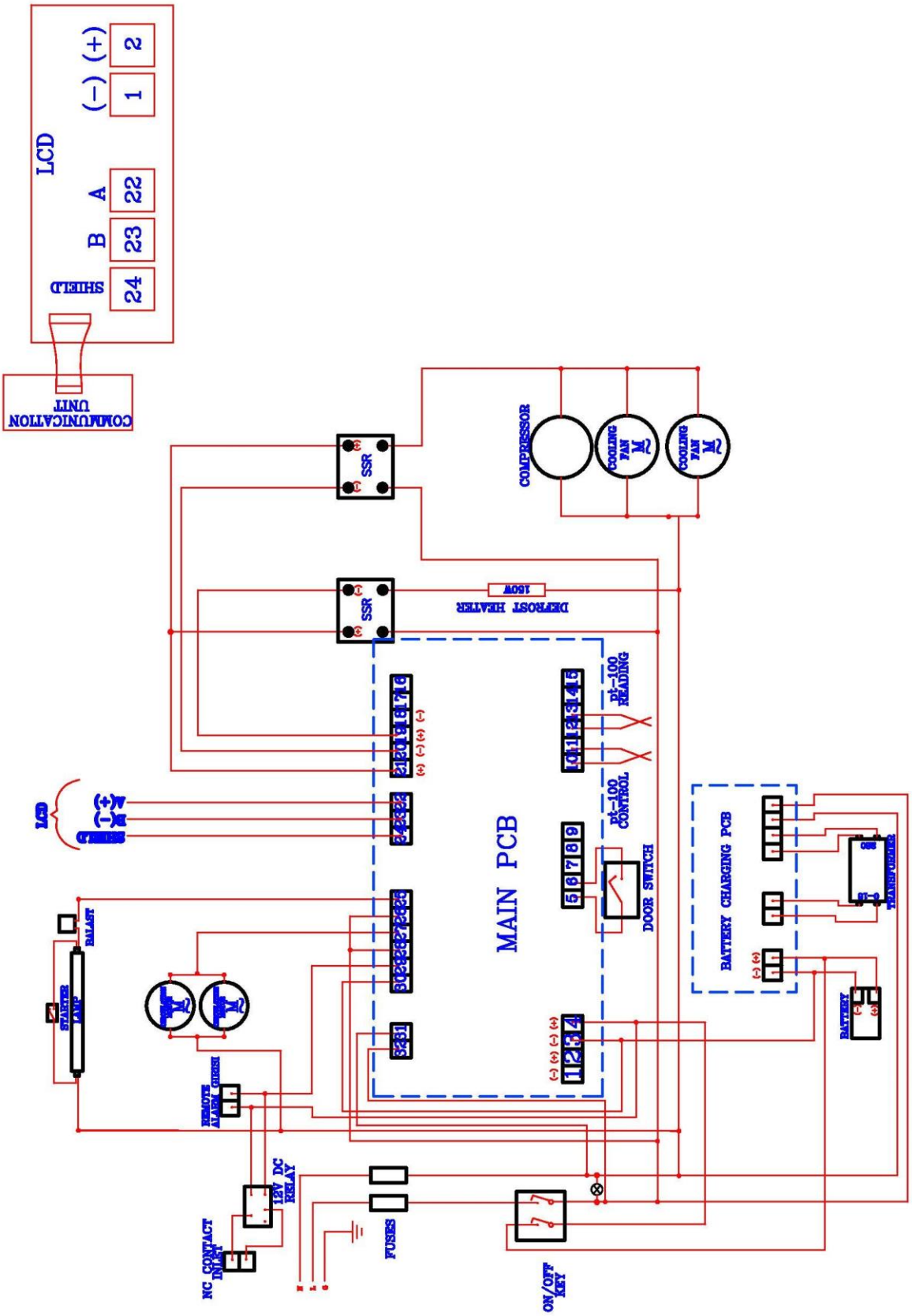
- Disconnect the fan motor cable connections.
- Remove the condenser connection screws (3 pieces) of the fan motor and pull the fan motor away.
- Remove the assembly pedestals which support the fan motor and assemble to the new fan motor.
- Assemble the new fan motor to condenser and make the cable connections.

# 5. ELECTRICAL CIRCUIT DIAGRAM

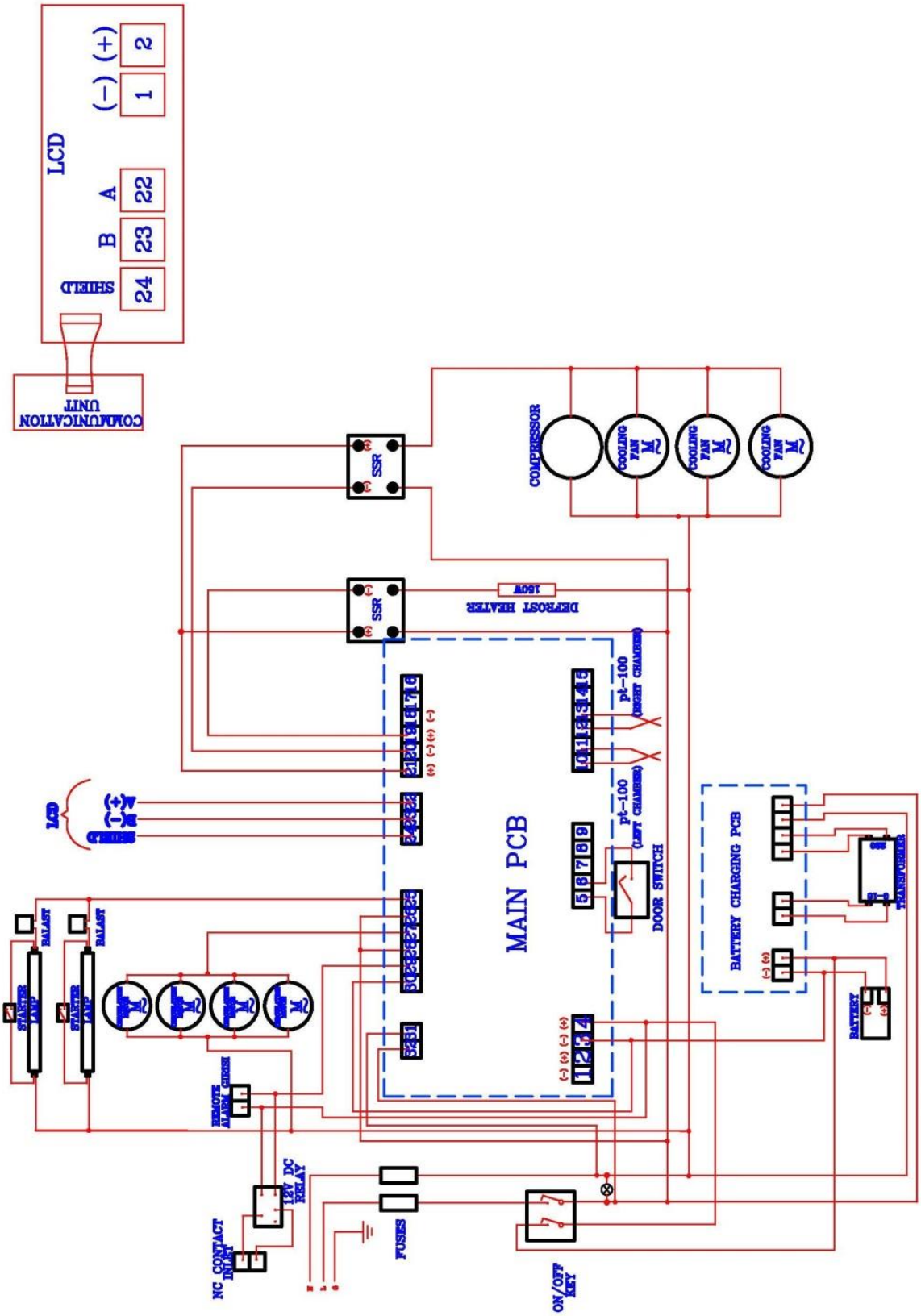
## 5.1. KN 72 AND KN 120 ELECTRICAL CIRCUIT DIAGRAM



## 5.2. KN 294 ELECTRICAL CIRCUIT DIAGRAM



## 5.3. KN 504 ELECTRICAL CIRCUIT DIAGRAM



## 6. SPARE PARTS LIST

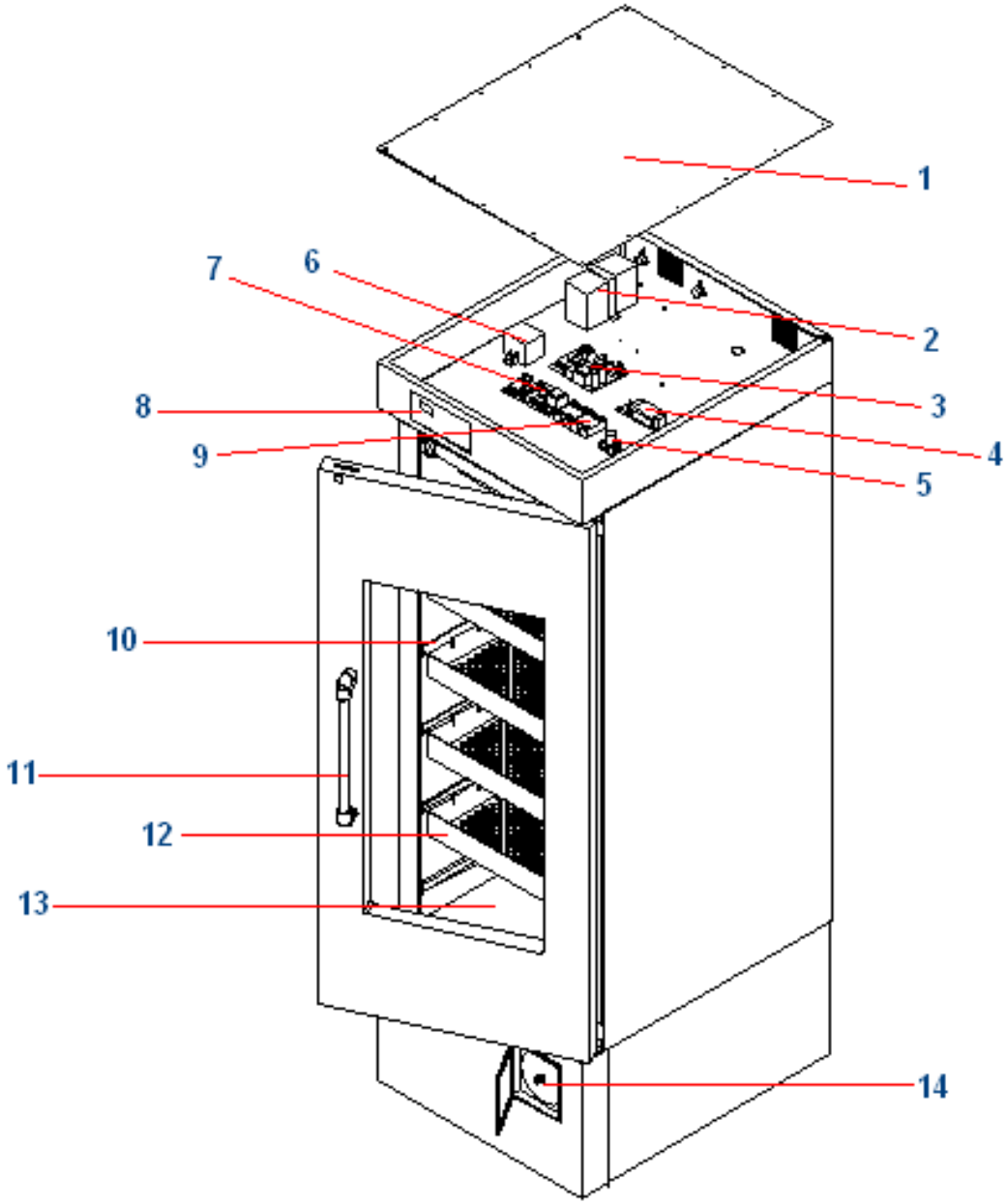



**Figure 5**

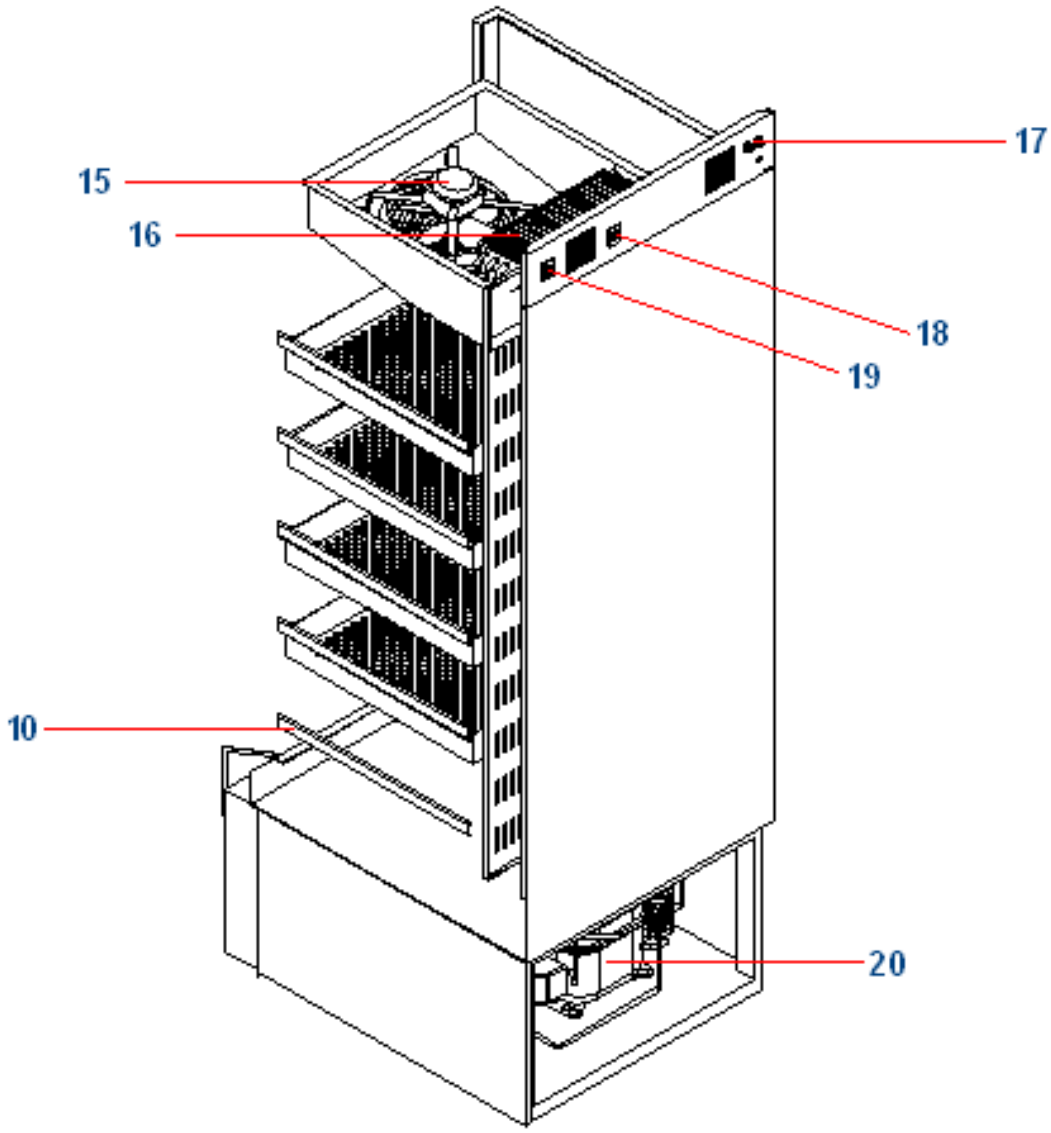



**Figure 6**

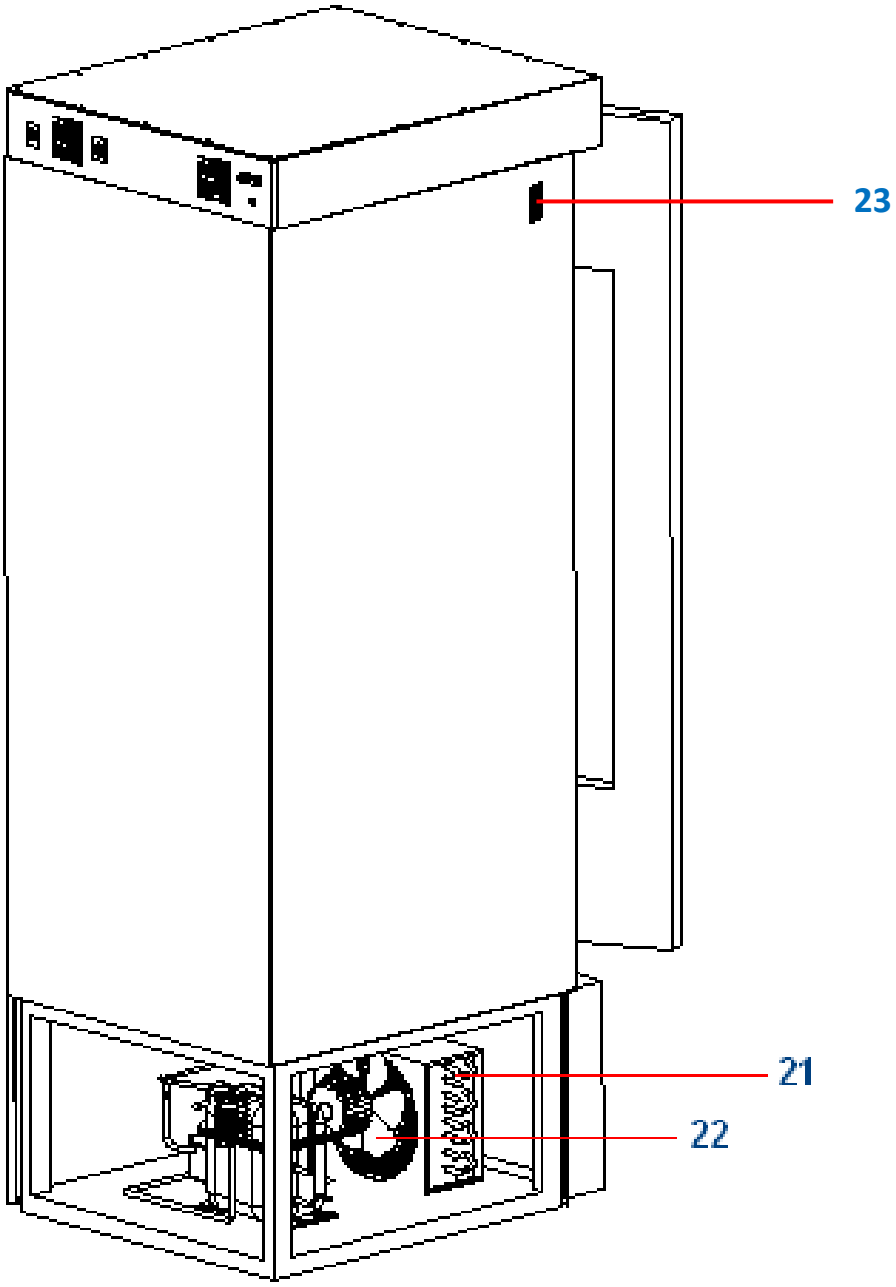



**Figure 7**

## 6.1. SPARE PART LIST

| NO | MATERIAL NAME | KN 72 | KN 120 | KN 294 | KN 504 | QTY | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Outer body upper sheet | Z11.G 04 217/d3 | Z11.G 04 217/d3 | Z11.G 04 260/d4 | Z11.G 04 274/d3 | 1 | 1 | 1 | 1 |
| 2 | Battery | Z12.A 10 001 | Z12.A 10 001 | Z12.A 10 001 | Z12.A 10 001 | 1 | 1 | 1 | 1 |
| 3 | Battery Charging PCB | Z15.E 05 061 | Z15.E 05 061 | Z15.E 05 061 | Z15.E 05 061 | 1 | 1 | 1 | 1 |
| 4 | Ballast | Z12.F 05 004 | Z12.F 05 004 | Z12.F 05 017 | Z12.F 05 017 | 1 | 1 | 1 | 1 |
| 5 | Starter | Z12.F 05 002 | Z12.F 05 002 | Z12.F 05 002 | Z12.F 05 002 | 1 | 1 | 1 | 1 |
| 6 | Transformer | Z15.T 18 006 | Z15.T 18 006 | Z15.T 18 006 | Z15.T 18 006 | 1 | 1 | 1 | 1 |
| 7 | Main PCB | Z15.E 05 060 | Z15.E 05 060 | Z15.E 05 060 | Z15.E 05 079 | 1 | 1 | 1 | 1 |
| 8 | Display PCB | Z15.G 05 059 | Z15.G 05 059 | Z15.G 05 059 | Z15.G 05 059 | 1 | 1 | 1 | 1 |
| 9 | SSR (solid state relay) | Z12.R 07 013 | Z12.R 07 013 | Z12.R 07 013 | Z12.R 07 013 | 2 | 2 | 2 | 2 |
| 10 | Shelf Carrier | Z11.K 23 055<br>Z11.K 23 056 | Z11.K 23 055<br>Z11.K 23 056 | Z11.K 23 053<br>Z11.K 23 054 | Z11.K 23 053<br>Z11.K 23 054 | 3<br>3 | 5<br>5 | 6<br>6 | 12<br>12 |
| 11 | Door Handle | Z12.K 15 012 | Z12.K 15 012 | Z12.K 15 012 | Z12.K 15 012 | 1 | 1 | 1 | 2 |
| 12 | Shelf | Z11.R 01 081 | Z11.R 01 081 | Z11.R 01 097 | Z11.R 01 119 | 3 | 5 | 6 | 12 |
| 13 | Door Glass | Z15.C 01 058 | Z11.C 01 029 | Z15.C 01 039 | Z15.C 01 047 | 1 | 1 | 1 | 1 |
| 14 | Chart Recorder | Z12.I 01 055 | Z12.I 01 055 | Z12.I 01 055 | Z12.I 01 055 | 1 | 1 | 1 | 1 |
| 15 | Circulation Fan | Z12.F 04 016 | Z12.F 04 016 | Z12.M 06 042 | Z12.M 06 042 | 1 | 1 | 2 | 3 |
| 16 | Evaporator | Z15.S 11 039 | Z15.S 11 039 | Z15.S 11 040 | Z15.S 11 045 | 1 | 1 | 1 | 2 |
| 17 | Glass Fuses | Z14.S 02 025 | Z14.S 02 025 | Z14.S 02 025 | Z14.S 02 030 | 2 | 2 | 2 | 2 |
| 18 | NC Contact Inlet | Z12.F 07 021 | Z12.F 07 021 | Z12.F 07 021 | Z12.F 07 021 | 1 | 1 | 1 | 1 |
| 19 | Remote Alarm Inlet | Z12.F 07 020 | Z12.F 07 020 | Z12.F 07 020 | Z12.F 07 020 | 2 | 2 | 2 | 2 |
| 20 | Compressor | Z12.E 03 021 | Z12.E 03 021 | Z12.E 03 023 | Z12.E 03 027 | 1 | 1 | 1 | 1 |
| 21 | Condenser | Z15.K 20 006 | Z12.K 20 009 | Z15.K 20 013 | Z15.K 20 018 | 1 | 1 | 1 | 1 |
| 22 | Condenser Cooling Fan Motor | Z12.M 06 075 | Z12.M 06 042 | Z12.M 06 042 | Z12.M 06 042 | 1 | 1 | 2 | 3 |
| 23 | Communication Unit | Z15.E 05 114 | Z15.E 05 114 | Z15.E 05 114 | Z15.E 05 114 | 1 | 1 | 1 | 1 |
| | Socket Cable | Z15.K 01 165 | Z15.K 01 165 | Z15.K 01 165 | Z15.K 01 165 | 1 | 1 | 1 | 1 |
| | Magnetic Gasket | Z15.C 03 191 | Z15.C 03 139 | Z15.C 03 152 | Z15.C 03 164 | 1 | 1 | 1 | 1 |
| | Door Lock | Z12.K 27 041 | Z12.K 27 041 | Z12.K 27 041 | Z12.K 27 077 | 1 | 1 | 1 | 2 |
| | Door Hinge (upper) | Z11.M 03 059 | Z11.M 03 059 | Z11.M 03 049/D2 | Z11.M 03 049/D2 | 1 | 1 | 2 | 2 |
| | Door Hinge (lower) | Z11.M 03 058 | Z11.M 03 058 | Z11.M 03 049/D1 | Z11.M 03 049/D1 | 1 | 1 | 2 | 2 |
| | Temperature Sensor | Z15.I 01 062 | Z15.I 01 062 | Z15.I 01 062 | Z15.I 01 062 | 1 | 1 | 1 | 2 |
| | Seperator | Z15.P 17 008 | Z15.P 17 008 | Z15.P 17 010 | Z15.P 17 016 | 15 | 25 | 36 | 72 |
| | Fluorescent Lamp | Z12.F 05 025 | Z12.F 05 039 | Z12.F 05 035 | Z12.F 05 035 | 1 | 1 | 1 | 2 |
| | Electronic Relay | Z12.R 07 020 | Z12.R 07 020 | Z12.R 07 020 | Z12.R 07 020 | 1 | 1 | 1 | 1 |
| | Defrost Heater | Z15.I 02 133 | Z15.I 02 133 | Z15.I 02 138 | Z15.I 02 146 | 1 | 1 | 1 | 2 |