



# Service Manual

Models: GF18M(2-3)E

GF24M2E  
GF24M3E  
GF24M4E

GF36M4E

GF42M5E

(Refrigerant:R410A)

**Multi systems**

**R410A**

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Commercial Air Conditioners



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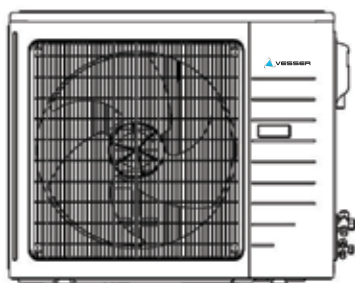
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# Part I : Technical Information

## 1. Summary

### Outdoor Unit

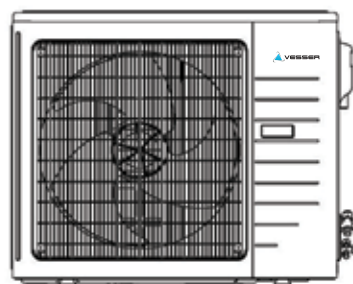
GF18M(2-3)E



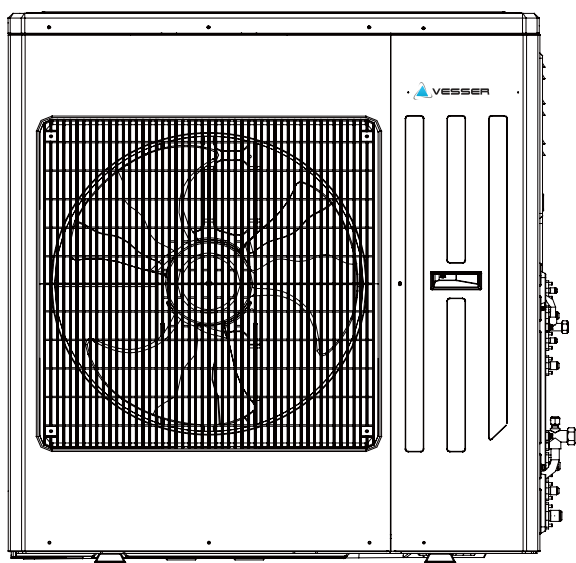
GF24M2E

GF24M3E

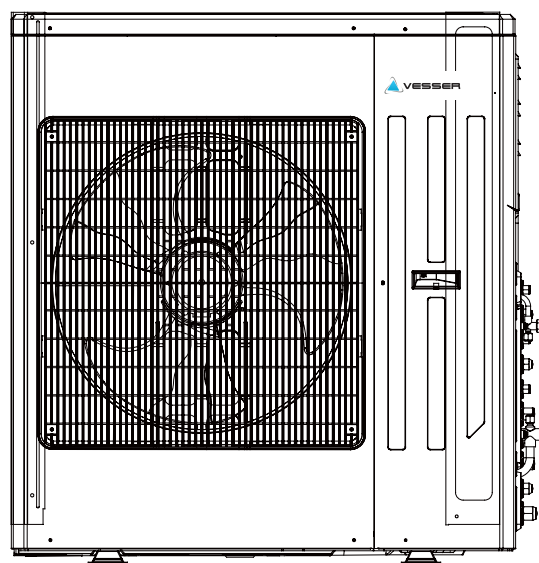
GF28M4E



GF36M4E



GF42M5E



## 2. Specifications

|                              |   |     |                                 |
|------------------------------|---|-----|---------------------------------|
| Model                        |   |     | GF18M(2-3)E                     |
| Product Code                 |   |     | CB228W03500/CB228W03501         |
| Power supply                 | Rated Voltage   | V~  | 220-240V                        |
|                              | Rated Frequency   | Hz  | 50                              |
|                              | Phases  |     | 1                               |
| Cooling capacity(max~min)    |   | W   | 5000(2050~6200)                 |
| Heating capacity(max~min)    |   | W   | 5600(2500~6650)                 |
| Cooling Power Input(max~min) |   | W   | 1550(500~2550)                  |
| Heating Power Input(max~min) |   | W   | 1550(580~2700)                  |
| Cooling Current Input        |   | A   | 6.88                            |
| Heating Current Input        |   | A   | 6.88                            |
| Rated Power Input            |   | W   | 2700                            |
| Rated Current                |   | A   | 11.98                           |
| SEER                         |   | W/W | 5.6                             |
| SCOP                         |   | W/W | 3.8                             |
| Outdoor Unit                 | Compressor Trademark  |     | ZHUHAI LANDA COMPRESSOR CO.,LTD |
|                              | Compressor Model  |     | QXA-B141zF030A                  |
|                              | Compressor Refrigerant Oil Type                                 |     | RB68EP                          |
|                              | Compressor Type   |     | Rotary                          |
|                              | L.R.A   | A   | /                               |
|                              | Compressor Rated Load Amp (RLA)                                 |     | 7.2                             |
|                              | Compressor Power Input  |     | 1440                            |
|                              | Compressor Thermal Protector                                    |     | 1NT11L-6233                     |
|                              | Throttling Method   |     | Electron expansion valve        |
|                              | Cooling Operation Ambient Temperature Range                     |     | °C -15~48                       |
|                              | Heating Operation Ambient Temperature Range                     |     | °C -15~24                       |
|                              | Condenser Material  |     | Aluminum Fin-copper Tube        |
|                              | Condenser Pipe Diameter   |     | mm Φ7                           |
|                              | Rows-Fin Gap(mm)  |     | mm 2-1.4                        |
|                              | Coil length (l) X height (H) X coil width (L)                   |     | mm 851X38.1X660                 |
|                              | Fan Motor Speed (rpm) (H/M/L)                                   |     | rpm 630                         |
|                              | Output of Fan Motor   |     | W 60                            |
|                              | Fan Motor RLA   |     | A /                             |
|                              | Fan Motor Capacitor   |     | μF /                            |
|                              | Air Flow Volume of Outdoor Unit                                 |     | m³/h 3200                       |
|                              | Fan Type-Piece  |     | Axial-flow                      |
|                              | Fan Diameter  |     | mm Φ520                         |
|                              | Defrosting Method   |     | Automatic Defrosting            |
|                              | Climate Type  |     | T1                              |
|                              | Isolation   |     | I                               |
|                              | Moisture Protection   |     | IP24                            |
|                              | Permissible Excessive Operating Pressure for the Discharge Side |     | MPa 4.3                         |
|                              | Permissible Excessive Operating Pressure for the Suction Side   |     | MPa 2.5                         |
|                              | Dimension (W/H/D)   |     | mm 963X700X396                  |
|                              | Dimension of Package (L/W/H)                                    |     | mm 1026X455X735                 |
|                              | Dimension of Package(L/W/H)                                     |     | mm 1029X458X750                 |
|                              | Net Weight  |     | kg 50                           |
|                              | Gross Weight  |     | kg 55                           |
|                              | Refrigerant Charge  |     | R410A                           |
|                              | Refrigerant Charge  |     | kg 1.40                         |



|                 |   |     |                  |
|-----------------|---|-----|------------------|
| Outdoor<br>Unit | Cross-sectional Area of Power Cable Conductor                     | mm2 | 2.50             |
|                 | Recommended Power Cable(Core)                                     | N   | 3                |
|                 | Connection Pipe Connection Method                                 | -   | Flare Connection |
|                 | Not Additional Gas Connection Pipe Length                         | m   | 5                |
|                 | Connection Pipe Gas Additional Charge                             | g/m | 15               |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)                         | mm  | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)                            | mm  | Φ9.52            |
|                 | Connection Pipe Max. Height Distance(indoor and<br>indoor)        | m   | 10               |
|                 | Max. equivalent connection pipe length(outdoor to<br>last indoor) | m   | 20               |
|                 | Connection Pipe Max. Length Distance(total lenght)                | m   | 20               |

The above data is subject to change without notice; please refer to the nameplate of the unit.

|                              |   |                   |                                    |                                    |
|------------------------------|---|-------------------|------------------------------------|------------------------------------|
| Model                        |   |                   | GF24M2E                            | GF24M3E                            |
| Product Code                 |   |                   |                                    |                                    |
| Power supply                 | Rated Voltage   | V~                | 220-240V                           | 220-240V                           |
|                              | Rated Frequency   | Hz                | 50                                 | 50                                 |
|                              | Phases  |                   | 1                                  | 1                                  |
| Cooling capacity(max~min)    |   | W                 | 7000(2200~10000)                   | 7100(2200~10000)                   |
| Heating capacity(max~min)    |   | W                 | 7700(2600~11000)                   | 8500(3600~11000)                   |
| Cooling Power Input(max~min) |   | W                 | 2460(650~4550)                     | 2400(650~4550)                     |
| Heating Power Input(max~min) |   | W                 | 2560(980~3950)                     | 2350(980~3950)                     |
| Cooling Current Input        |   | A                 | 10.91                              | 10.91                              |
| Heating Current Input        |   | A                 | 11.36                              | 11.36                              |
| Rated Power Input            |   | W                 | 4550                               | 4550                               |
| Rated Current                |   | A                 | 20.19                              | 20.19                              |
| SEER                         |   | W/W               | 5.1                                | 5.1                                |
| SCOP                         |   | W/W               | 3.8                                | 3.8                                |
| Outdoor Unit                 | Compressor Trademark  |                   | ZHUHAI LANDA<br>COMPRESSOR CO.,LTD | ZHUHAI LANDA<br>COMPRESSOR CO.,LTD |
|                              | Compressor Model  |                   | QXAS-D23zX090B                     | QXAS-D23zX090B                     |
|                              | Compressor Refrigerant Oil Type                                 |                   | RB68EP                             | RB68EP                             |
|                              | Compressor Type   |                   | Rotary                             | Rotary                             |
|                              | L.R.A   | A                 | /                                  | /                                  |
|                              | Compressor Rated Load Amp (RLA)                                 | A                 | 11.5                               | 11.5                               |
|                              | Compressor Power Input  | W                 | 2550                               | 2550                               |
|                              | Compressor Thermal Protector                                    |                   | 1NT11L-6233                        | 1NT11L-6233                        |
|                              | Throttling Method   |                   | Electron expansion valve           | Electron expansion valve           |
|                              | Cooling Operation Ambient Temperature Range                     | °C                | -15~48                             | -15~48                             |
|                              | Heating Operation Ambient Temperature Range                     | °C                | -15~24                             | -15~24                             |
|                              | Condenser Material  |                   | Aluminum Fin-copper Tube           | Aluminum Fin-copper Tube           |
|                              | Condenser Pipe Diameter   | mm                | Φ7                                 | Φ7                                 |
|                              | Rows-Fin Gap(mm)  | mm                | 2-1.4                              | 2-1.4                              |
|                              | Coil length (l) X height (H) X coil width (L)                   | mm                | 982.2X38.1X748                     | 982.2X38.1X748                     |
|                              | Fan Motor Speed (rpm) (H/M/L)                                   | rpm               | 710                                | 710                                |
|                              | Output of Fan Motor   | W                 | 90                                 | 90                                 |
|                              | Fan Motor RLA   | A                 | /                                  | /                                  |
|                              | Fan Motor Capacitor   | μF                | /                                  | /                                  |
|                              | Air Flow Volume of Outdoor Unit                                 | m <sup>3</sup> /h | 4000                               | 4000                               |
|                              | Fan Type-Piece  |                   | Axial-flow                         | Axial-flow                         |
|                              | Fan Diameter  | mm                | Φ552                               | Φ552                               |
|                              | Defrosting Method   |                   | Automatic Defrosting               | Automatic Defrosting               |
|                              | Climate Type  |                   | T1                                 | T1                                 |
|                              | Isolation   |                   | I                                  | I                                  |
|                              | Moisture Protection   |                   | IP24                               | IP24                               |
|                              | Permissible Excessive Operating Pressure for the Discharge Side | MPa               | 4.3                                | 4.3                                |
|                              | Permissible Excessive Operating Pressure for the Suction Side   | MPa               | 2.5                                | 2.5                                |
|                              | Dimension (W/H/D)   | mm                | 1001X790X427                       | 1001X790X427                       |
|                              | Dimension of Package (L/W/H)                                    | mm                | 1080X485X840                       | 1080X485X840                       |
|                              | Dimension of Package(L/W/H)                                     | mm                | 1083X488X855                       | 1083X488X855                       |
|                              | Net Weight  | kg                | 68                                 | 69                                 |
|                              | Gross Weight  | kg                | 73                                 | 74                                 |
|                              | Refrigerant Charge  |                   | R410A                              | R410A                              |
|                              | Refrigerant Charge  | kg                | 2.00                               | 2.20                               |

|                 |   |                 |                  |                  |
|-----------------|---|-----------------|------------------|------------------|
| Outdoor<br>Unit | Cross-sectional Area of Power Cable Conductor                     | mm <sup>2</sup> | 2.50             | 2.50             |
|                 | Recommended Power Cable(Core)                                     | N               | 3                | 3                |
|                 | Connection Pipe Connection Method                                 | -               | Flare Connection | Flare Connection |
|                 | Not Additional Gas Connection Pipe Length                         | m               | 5                | 5                |
|                 | Connection Pipe Gas Additional Charge                             | g/m             | 15               | 15               |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)                         | mm              | Φ6               | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)                            | mm              | Φ9.52            | Φ9.52            |
|                 | Connection Pipe Max. Height Distance(indoor and<br>indoor)        | m               | 10               | 10               |
|                 | Max. equivalent connection pipe length(outdoor to<br>last indoor) | m               | 20               | 20               |
|                 | Connection Pipe Max. Length Distance(total length)                | m               | 20               | 20               |

The above data is subject to change without notice. Please refer to the nameplate of the unit.

|                              |   |      |                                 |
|------------------------------|---|------|---------------------------------|
| Model                        |   |      | GF28M4E                         |
| Product Code                 |   |      |                                 |
| Power supply                 | Rated Voltage   | V~   | 220                             |
|                              | Rated Frequency   | Hz   | 50                              |
|                              | Phases  |      | 1                               |
| Cooling capacity(max~min)    |   | W    | 8000(2200~10000)                |
| Heating capacity(max~min)    |   | W    | 9300(2800~11000)                |
| Cooling Power Input(max~min) |   | W    | 2490(650~4550)                  |
| Heating Power Input(max~min) |   | W    | 2580(980~3950)                  |
| Cooling Current Input        |   | A    | 11.05                           |
| Heating Current Input        |   | A    | 11.45                           |
| Rated Power Input            |   | W    | 4550                            |
| Rated Current                |   | A    | 20.19                           |
| SEER                         |   | W/W  | 5.1                             |
| SCOP                         |   | W/W  | 3.8                             |
| Outdoor Unit                 | Compressor Trademark  |      | ZHUHAI LANDA COMPRESSOR CO.,LTD |
|                              | Compressor Model  |      | QXAS-D23zX090B                  |
|                              | Compressor Refrigerant Oil Type                                 |      | RB68EP                          |
|                              | Compressor Type   |      | Rotary                          |
|                              | L.R.A   | A    | /                               |
|                              | Compressor Rated Load Amp (RLA)                                 | A    | 11.5                            |
|                              | Compressor Power Input  | W    | 2550                            |
|                              | Compressor Thermal Protector                                    |      | 1NT11L-6233                     |
|                              | Throttling Method   |      | Electron expansion valve        |
|                              | Cooling Operation Ambient Temperature Range                     | °C   | -15~48                          |
|                              | Heating Operation Ambient Temperature Range                     | °C   | -15~24                          |
|                              | Condenser Material  |      | Aluminum Fin-copper Tube        |
|                              | Condenser Pipe Diameter   | mm   | Φ7                              |
|                              | Rows-Fin Gap(mm)  | mm   | 2-1.4                           |
|                              | Coil length (l) X height (H) X coil width (L)                   | mm   | 982.2X38.1X748                  |
|                              | Fan Motor Speed (rpm) (H/M/L)                                   | rpm  | 710                             |
|                              | Output of Fan Motor   | W    | 90                              |
|                              | Fan Motor RLA   | A    | /                               |
|                              | Fan Motor Capacitor   | μF   | /                               |
|                              | Air Flow Volume of Outdoor Unit                                 | m³/h | 4000                            |
|                              | Fan Type-Piece  |      | Axial-flow                      |
|                              | Fan Diameter  | mm   | Φ552                            |
|                              | Defrosting Method   |      | Automatic Defrosting            |
|                              | Climate Type  |      | T1                              |
|                              | Isolation   |      | I                               |
|                              | Moisture Protection   |      | IP24                            |
|                              | Permissible Excessive Operating Pressure for the Discharge Side | MPa  | 4.3                             |
|                              | Permissible Excessive Operating Pressure for the Suction Side   | MPa  | 2.5                             |
|                              | Dimension (W/H/D)   | mm   | 1001X790X427                    |
|                              | Dimension of Package (L/W/H)                                    | mm   | 1080X485X840                    |
|                              | Dimension of Package(L/W/H)                                     | mm   | 1083X488X855                    |
|                              | Net Weight  | kg   | 69                              |
|                              | Gross Weight  | kg   | 74                              |
|                              | Refrigerant   |      | R410A                           |
|                              | Refrigerant Charge  | kg   | 2.20                            |

|                 |   |     |                  |
|-----------------|---|-----|------------------|
| Outdoor<br>Unit | Cross-sectional Area of Power Cable Conductor                     | mm2 | 2.50             |
|                 | Recommended Power Cable(Core)                                     | N   | 3                |
|                 | Connection Pipe Connection Method                                 | -   | Flare Connection |
|                 | Not Additional Gas Connection Pipe Length                         | m   | 5                |
|                 | Connection Pipe Gas Additional Charge                             | g/m | 15               |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)                         | mm  | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)                            | mm  | Φ9.52            |
|                 | Connection Pipe Max. Height Distance(indoor and<br>indoor)        | m   | 10               |
|                 | Max. equivalent connection pipe length(outdoor to<br>last indoor) | m   | 20               |
|                 | Connection Pipe Max. Length Distance(total lenght)                | m   | 20               |

The above data is subject to change without notice. Please refer to the nameplate of the unit.

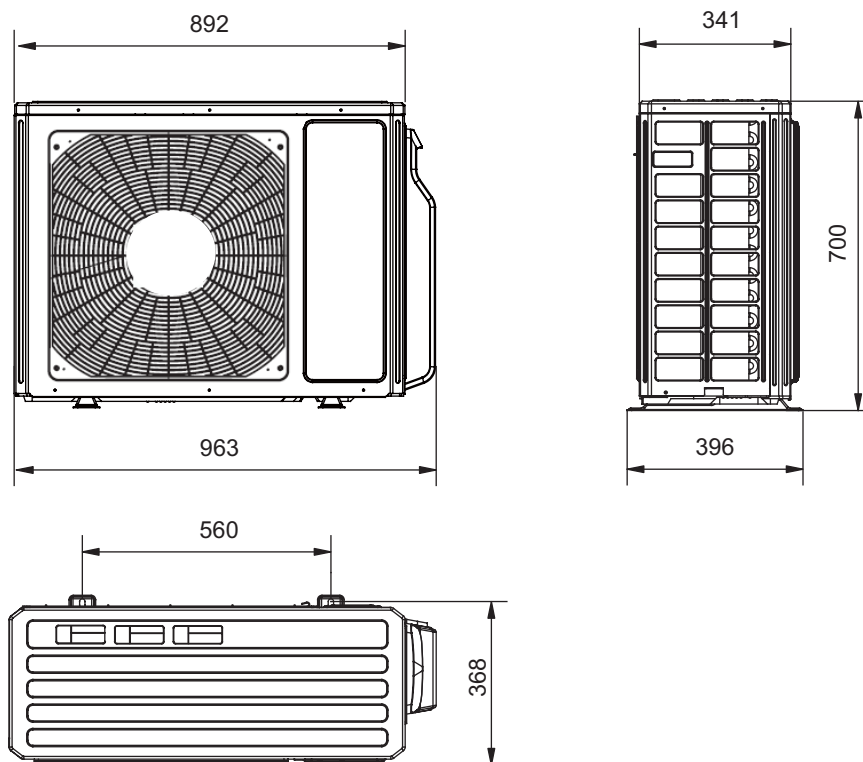
|                           |   |      |                                    |  |
|---------------------------|---|------|------------------------------------|--|
| Model                     |   |      | GF36M4E                            | GF42M5E  |
| Product Code              |   |      |                                    |  |
| Power supply              | Rated Voltage   | V~   | 220-240V                           | 220-240V   |
|                           | Rated Frequency   | Hz   | 50                                 | 50   |
|                           | Phases  |      | 1                                  | 1  |
| Cooling capacity(max~min) |   | W    | 10500(2100~11000)                  | 12100(2100~13600)                                      |
| Heating capacity(max~min) |   | W    | 12000(2600~13000)                  | 13000(2600~14000)                                      |
| Cooling Power Input       |   | W    | 3500                               | 3590   |
| Heating Power Input       |   | W    | 3750                               | 3550   |
| Cooling Current Input     |   | A    | 15.42                              | 16.43  |
| Heating Current Input     |   | A    | 15.20                              | 16.22  |
| Rated Power Input         |   | W    | 4880                               | 5300   |
| Rated Current             |   | A    | 21.65                              | 23.50  |
| SEER                      |   | W/W  | 5.5                                | /  |
| SCOP                      |   | W/W  | 3.8                                | /  |
| Outdoor Unit              | Compressor Trademark  |      | ZHUHAI LANDA<br>COMPRESSOR CO.,LTD | MITSUBISHI<br>ELECTRIC(GUANGZHOU)<br>COMPRESSOR CO.LTD |
|                           | Compressor Model  |      | QXAS-D32zX090A                     | TNB306FPGMC  |
|                           | Compressor Refrigerant Oil Type                                 |      | RB68ER                             | PVE(PV50S)   |
|                           | Compressor Type   |      | Inverter Rotary                    | Inverter Rotary  |
|                           | L.R.A   | A    | /                                  | /  |
|                           | Compressor Rated Load Amp (RLA)                                 | A    | 14                                 | 13.5   |
|                           | Compressor Power Input  | W    | 3300                               | 3010   |
|                           | Compressor Thermal Protector                                    |      | internal                           | internal   |
|                           | Throttling Method   |      | Electron expansion valve           | Electron expansion valve                               |
|                           | Cooling Operation Ambient Temperature Range                     | °C   | -15~48                             | -15~48   |
|                           | Heating Operation Ambient Temperature Range                     | °C   | -15~27                             | -15~27   |
|                           | Condenser Material  |      | Copper tube-Aluminum fin           | Copper tube-Aluminum fin                               |
|                           | Condenser Pipe Diameter   | mm   | Φ7.94                              | Φ7.94  |
|                           | Rows-Fin Gap(mm)  | mm   | 2-1.4                              | 2-1.4  |
|                           | Coil length (l) X height (H) X coil width (L)                   | mm   | 1009.4X38.1X1056                   | 1009.4X38.1X1056                                       |
|                           | Fan Motor Speed (rpm) (H/M/L)                                   | rpm  | 820                                | 840  |
|                           | Output of Fan Motor   | W    | 170                                | 140  |
|                           | Fan Motor RLA   | A    | /                                  | /  |
|                           | Fan Motor Capacitor   | μF   | /                                  | /  |
|                           | Air Flow Volume of Outdoor Unit                                 | m³/h | 5200                               | 5500   |
|                           | Fan Type-Piece  |      | Axial-flow                         | Axial-flow   |
|                           | Fan Diameter  | mm   | Φ570-152                           | Φ570-152   |
|                           | Defrosting Method   |      | Automatic Defrosting               | Automatic Defrosting                                   |
|                           | Climate Type  |      | T1                                 | T1   |
|                           | Isolation   |      | I                                  | I  |
|                           | Moisture Protection   |      | IPX4                               | IPX4   |
|                           | Permissible Excessive Operating Pressure for the Discharge Side | MPa  | 4.3                                | 4.3  |
|                           | Permissible Excessive Operating Pressure for the Suction Side   | MPa  | 2.5                                | 2.5  |
|                           | Dimension (W/H/D)   | mm   | 1015X440X1103                      | 1015X440X1103  |
|                           | Dimension of Package (L/W/H)                                    | mm   | 1155X490X1220                      | 1155X490X1220  |
|                           | Dimension of Package(L/W/H)                                     | mm   | 1158X493X1235                      | 1158X493X1235  |
|                           | Net Weight  | kg   | 94                                 | 102  |
|                           | Gross Weight  | kg   | 104                                | 112  |
|                           | Refrigerant   |      | R410A                              | R410A  |
|                           | Refrigerant Charge  | kg   | 4.3                                | 4.8  |

|                 |   |                 |                  |                  |
|-----------------|---|-----------------|------------------|------------------|
| Outdoor<br>Unit | Cross-sectional Area of Power Cable Conductor                     | mm <sup>2</sup> | 4.0              | 4.0              |
|                 | Recommended Power Cable(Core)                                     | N               | 3                | 3                |
|                 | Connection Pipe Connection Method                                 | -               | Flare Connection | Flare Connection |
|                 | Not Additional Gas Connection Pipe Length                         | m               | 40               | 50               |
|                 | Connection Pipe Gas Additional Charge                             | g/m             | 22               | 22               |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)1                        | mm              | Φ6               | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)1                           | mm              | Φ9.52            | Φ9.52            |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)2                        |                 | Φ6               | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)2                           |                 | Φ9.52            | Φ9.52            |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)3                        |                 | Φ6               | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)3                           |                 | Φ12              | Φ12              |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)4                        |                 | Φ9.52            | Φ6               |
|                 | Outer Diameter of Gas Pipe<br>(Metric)4                           |                 | Φ16              | Φ12              |
|                 | Outer Diameter of Liquid Pipe<br>(Metric)5                        |                 | /                | Φ9.52            |
|                 | Outer Diameter of Gas Pipe<br>(Metric)5                           |                 | /                | Φ16              |
|                 | Connection Pipe Max. Height Distance(indoor and<br>indoor)        | m               | 7.5              | 7.5              |
|                 | Max. equivalent connection pipe length(outdoor to<br>last indoor) | m               | 20               | 25               |
|                 | Connection Pipe Max. Length Distance(total length)                | m               | 70               | 80               |

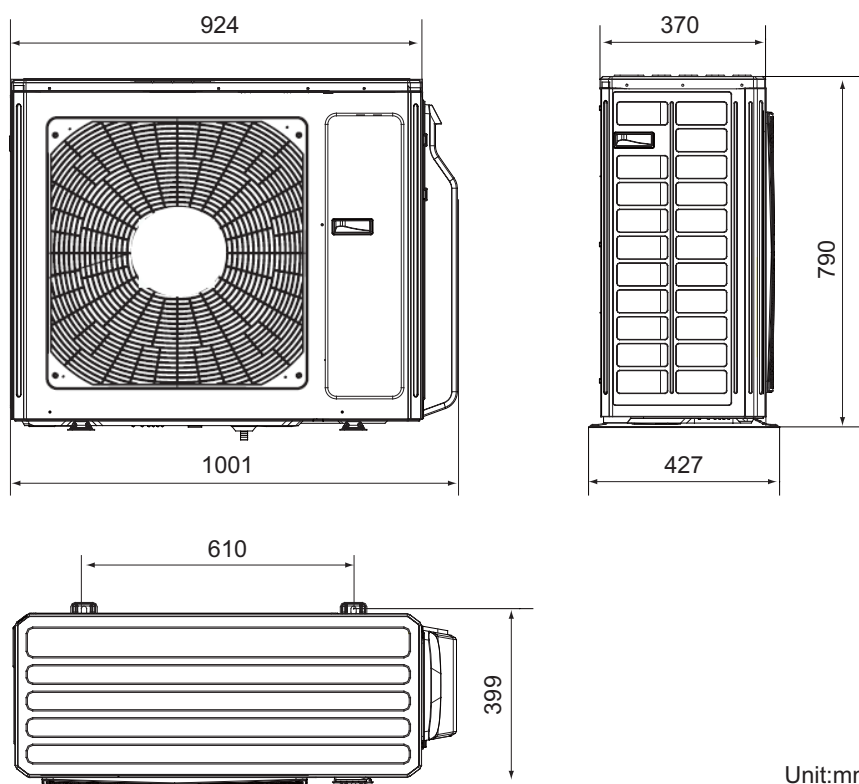
The above data is subject to change without notice. Please refer to the nameplate of the unit.

### 3. Outline Dimension Diagram

(1) Model: GF18M(2-3)E



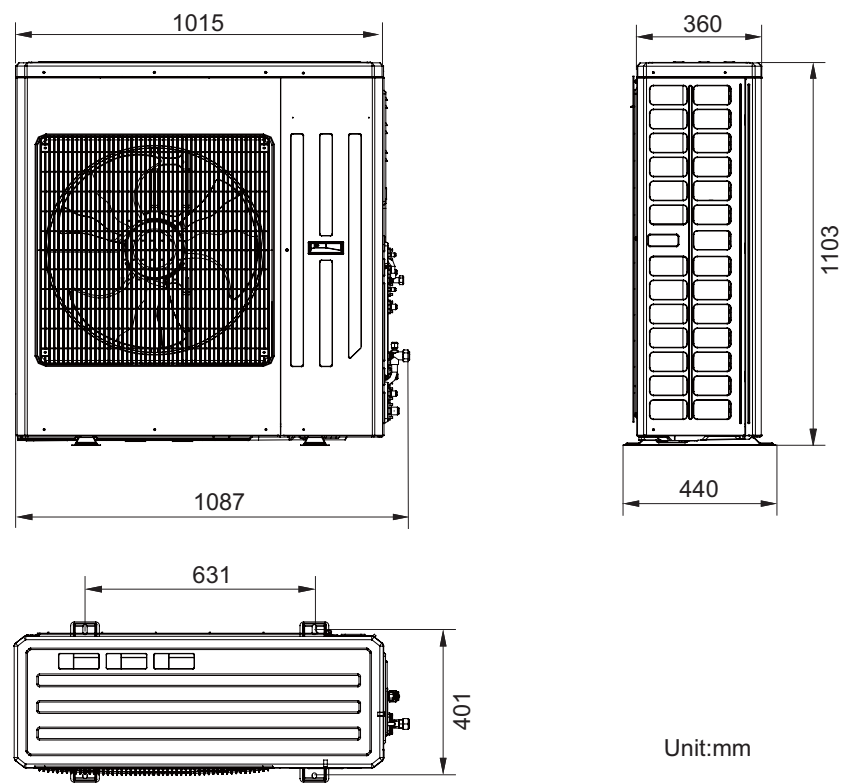
(2) Models: GF24M2E GF24M3E GF28M4E



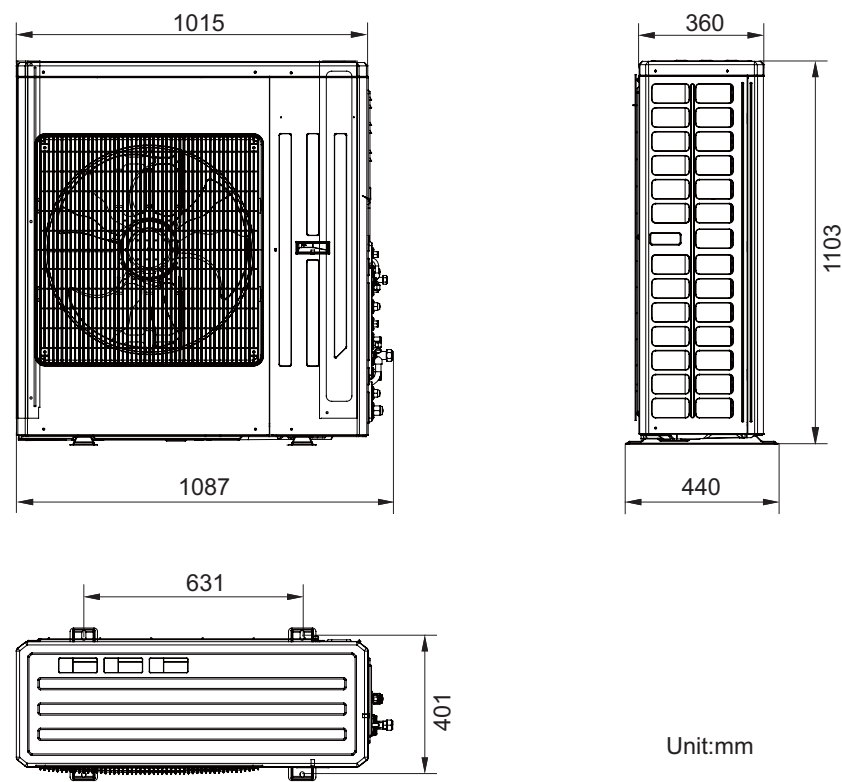
Unit:mm



(3)Model:GF36M4E

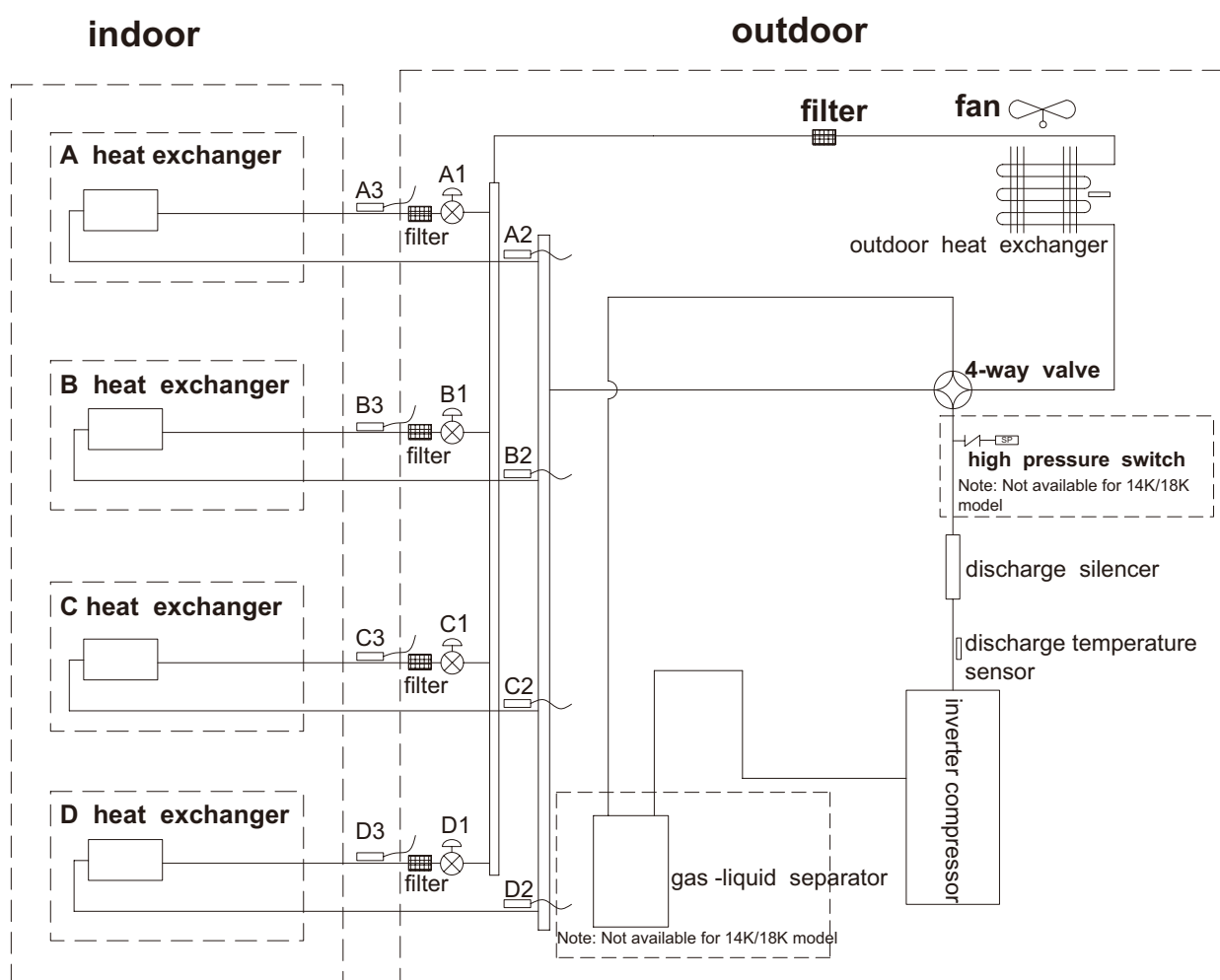


(4)Model:GF42M5E



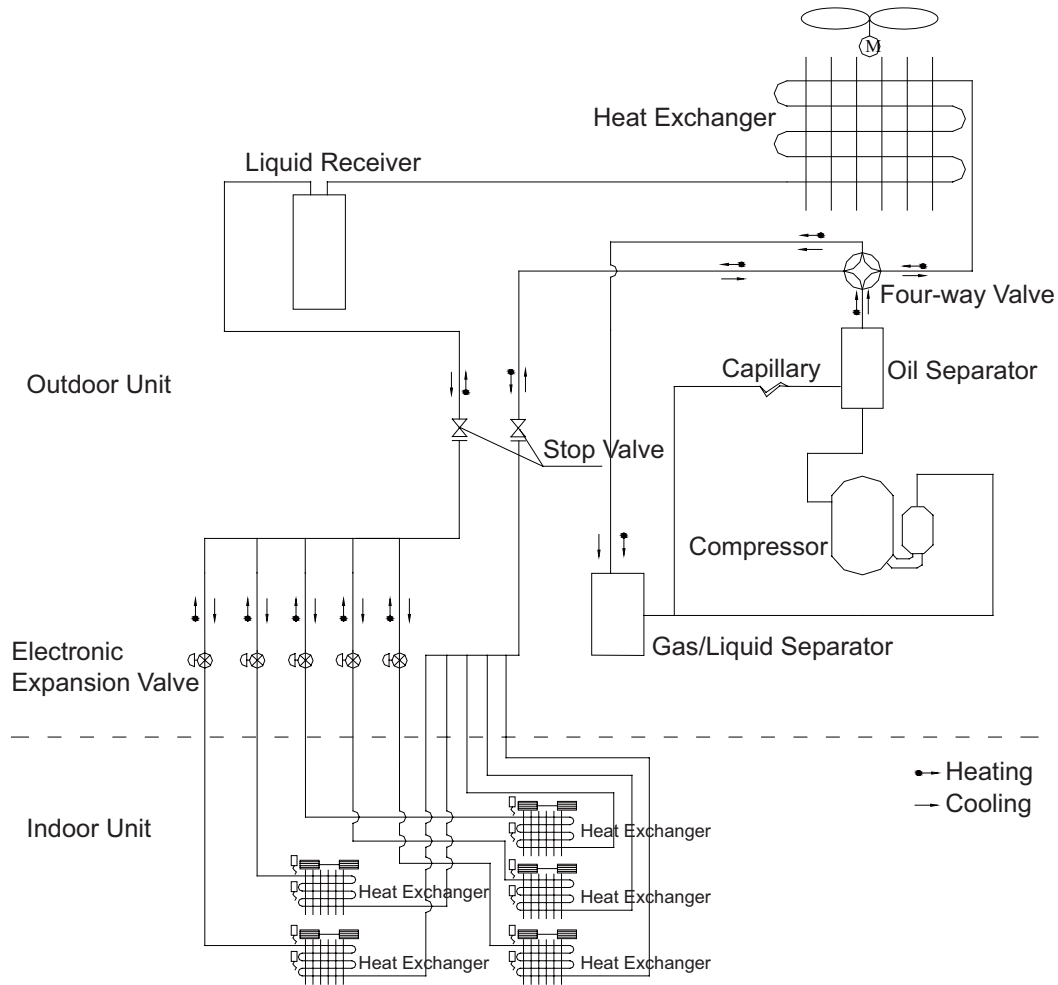
## 4. Refrigerant System Diagram

Models: GF18M(2-3)E GF24M2E GF24M3E GF28M4E



**A1:A-unit electronic expansion valve    B1:B-unit electronic expansion valve**  
**C1:C-unit electronic expansion valve    D1:D-unit electronic expansion valve**  
**A2:A-unit gas pipe temperature sensor    B2:B-unit gas pipe temperature sensor**  
**C2:C-unit gas pipe temperature sensor    D2:D-unit gas pipe temperature sensor**  
**A3:A-unit liquid pipe temperature sensor    B3:B-unit liquid pipe temperature sensor**  
**C3:C-unit liquid pipe temperature sensor    D3:D-unit liquid pipe temperature sensor**

Models:GF36M4E,GF42M5E



The outdoor and indoor units start to work once the power is switched on. During the cooling operation, the low temperature, low pressure refrigerant gas from the heat exchanger of each indoor unit gets together and then is taken into the compressor to be compressed into high temperature, high pressure gas, which will soon go to the heat exchanger of the outdoor unit to exchange heat with the outdoor air and then is turned into refrigerant liquid. After passing through the throttling device, the temperature and pressure of the refrigerant liquid will further decrease and then go the main valve. After that, it will be divided and go to the heat exchanger of each indoor unit to exchange heat with the air which needs to be conditioned. Consequently, the refrigerant liquid become low temperature, low pressure refrigerant gas again. Such a refrigeration cycle goes round and round to achieve the desired cooling purpose. During the heating operation, the four-way valve is involved to make the refrigeration cycle run reversely. The refrigerant radiates heat in the heat exchanger of the indoor unit (so do the electric heating devices) and absorb heat in the heat exchanger of the outdoor unit for a heat pump heating cycle so as to achieve the desired heating purpose.

## 5. Electrical Part

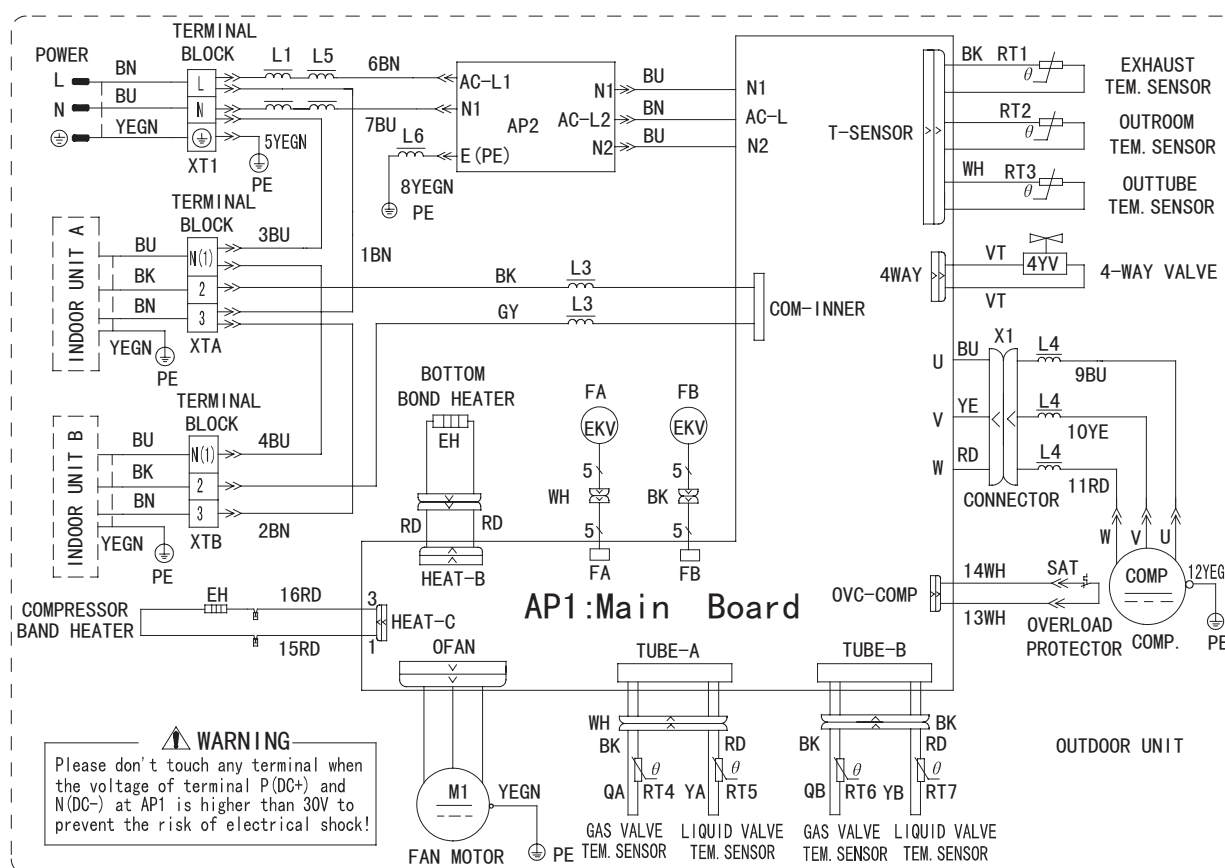
### 5.1 Wiring Diagram

#### ● Instruction

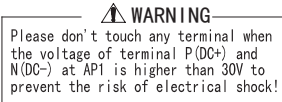
| Symbol | Symbol Color | Symbol | Symbol Color | Symbol  | Name           |
|--------|--------------|--------|--------------|---|----------------|
| WH     | White        | GN     | GREEN        | COMP  | Compressor     |
| YE     | Yellow       | BN     | Brown        |  | Grounding wire |
| RD     | Red          | BU     | Blue         |   |                |
| YEGN   | Yellow/Green | BK     | Black        |   |                |
| VT     | Violet       | OG     | Orange       |   |                |

#### ● Indoor Unit

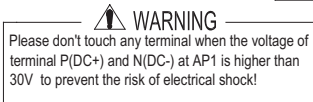
(1) Model: GF18M(2-3E)



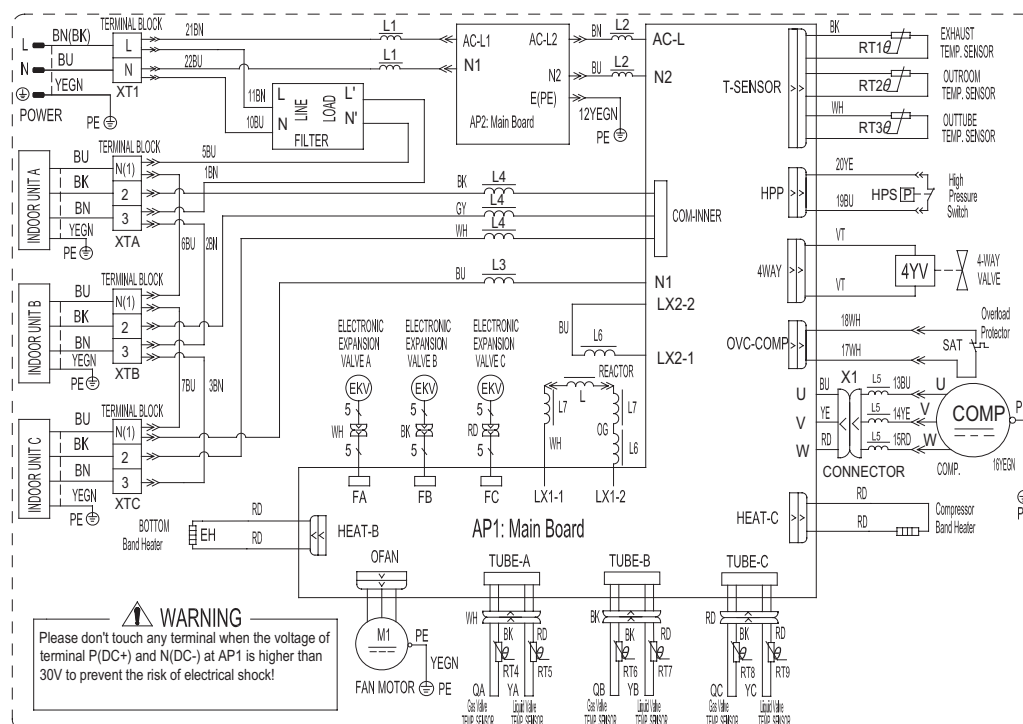
(2)Model:GF18M(2-3)E



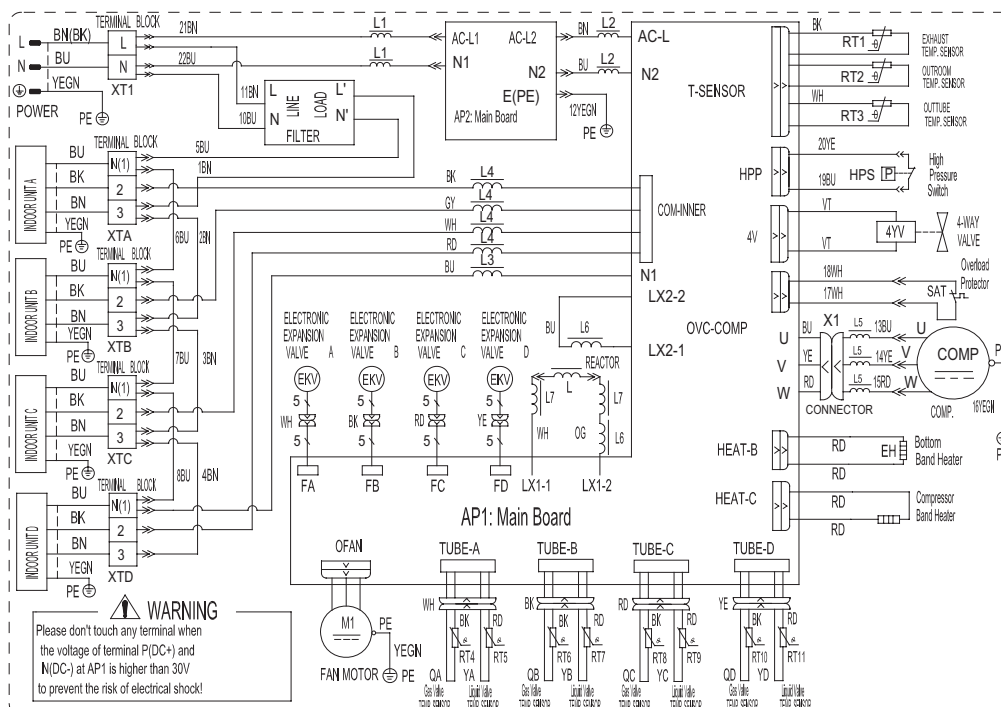
(3)Model:GF24M2E



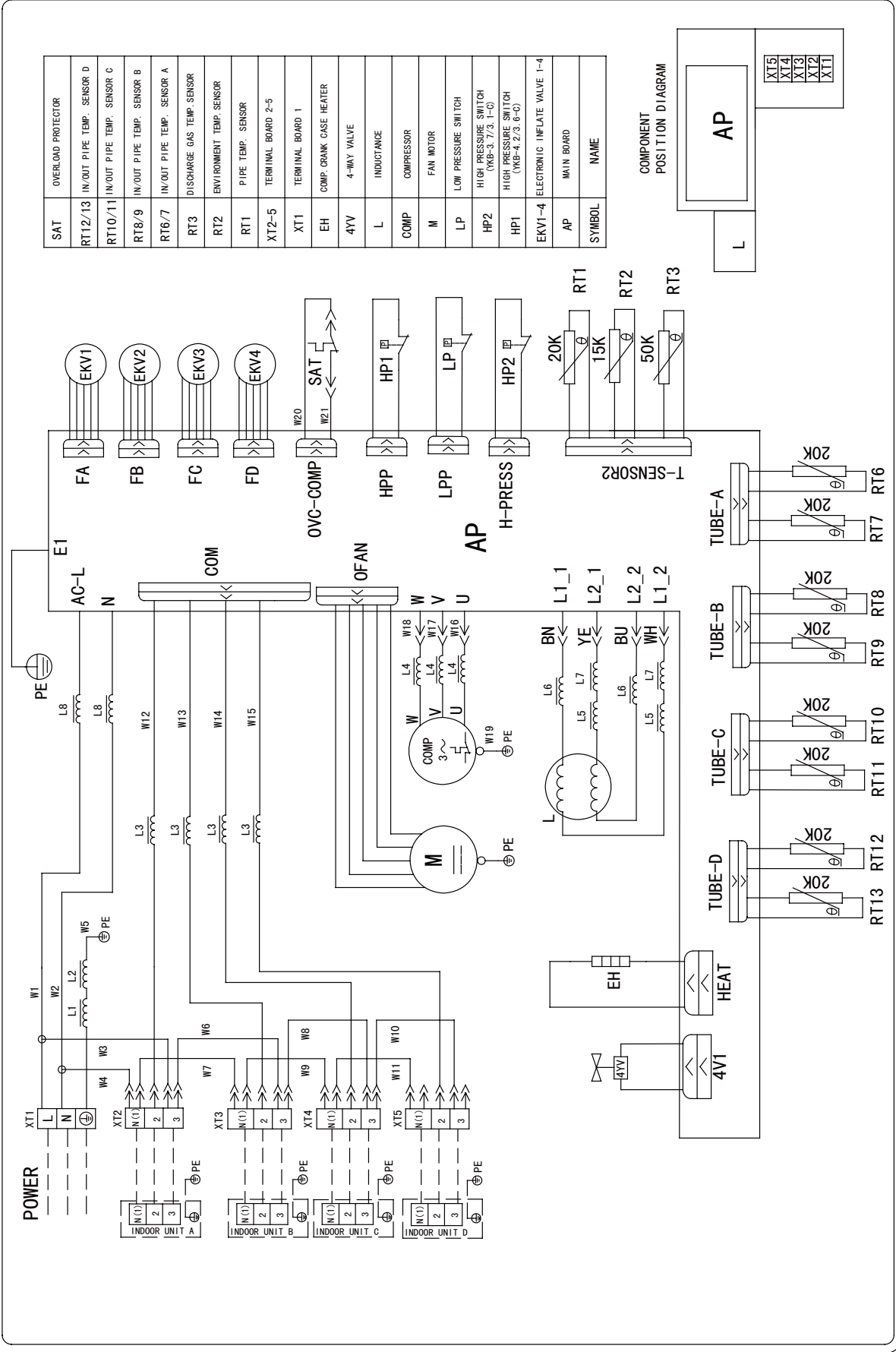
## (4) Model: GF24M3E



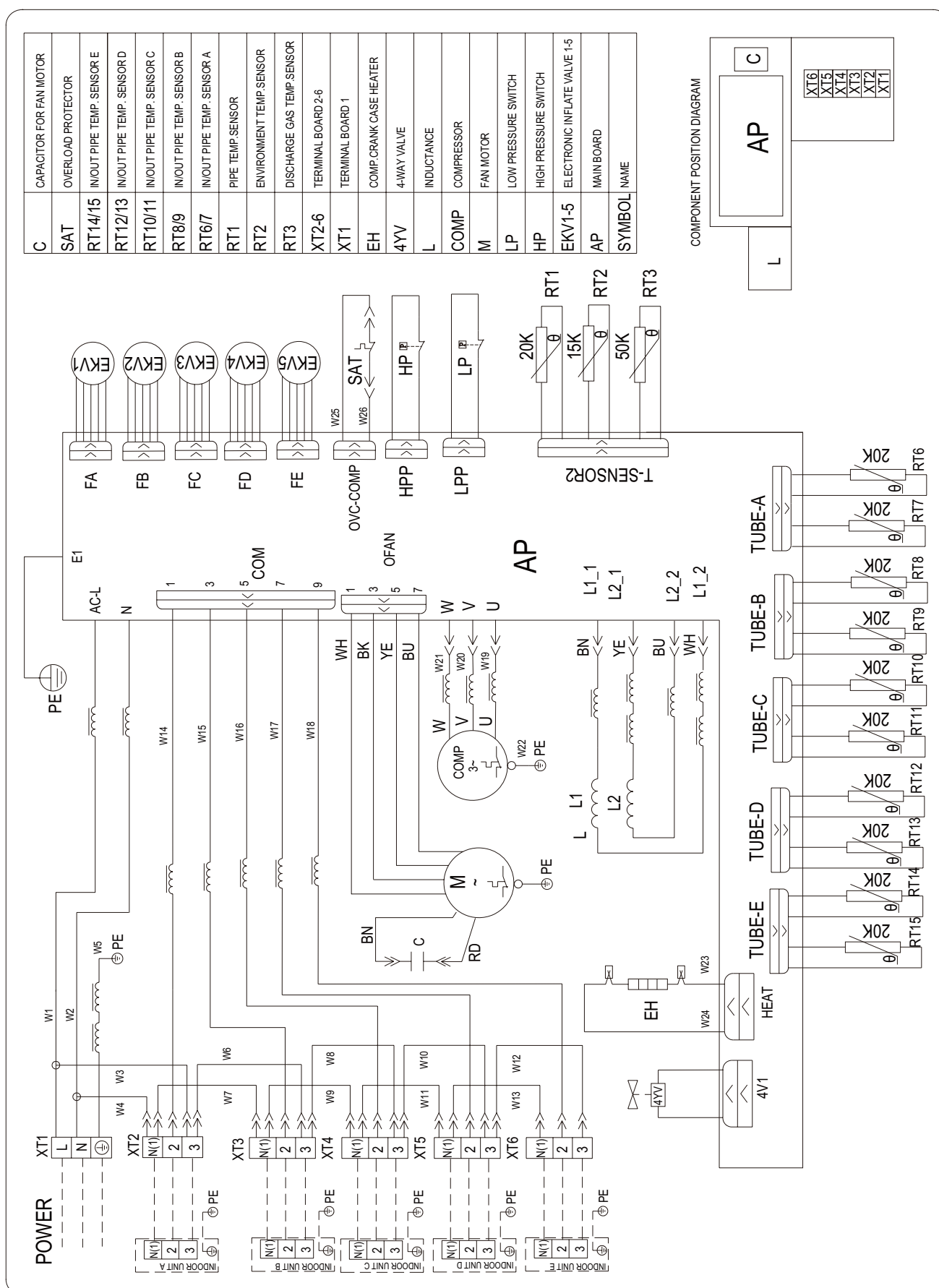
## (5) Model: GF28M4E



(6)Model:GF36M4E



## (7) Model:GF42M5E

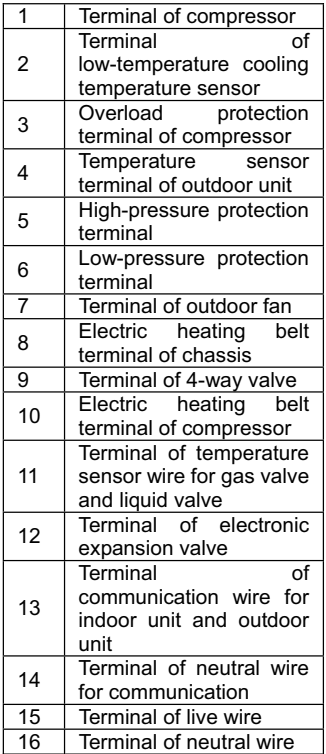


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.



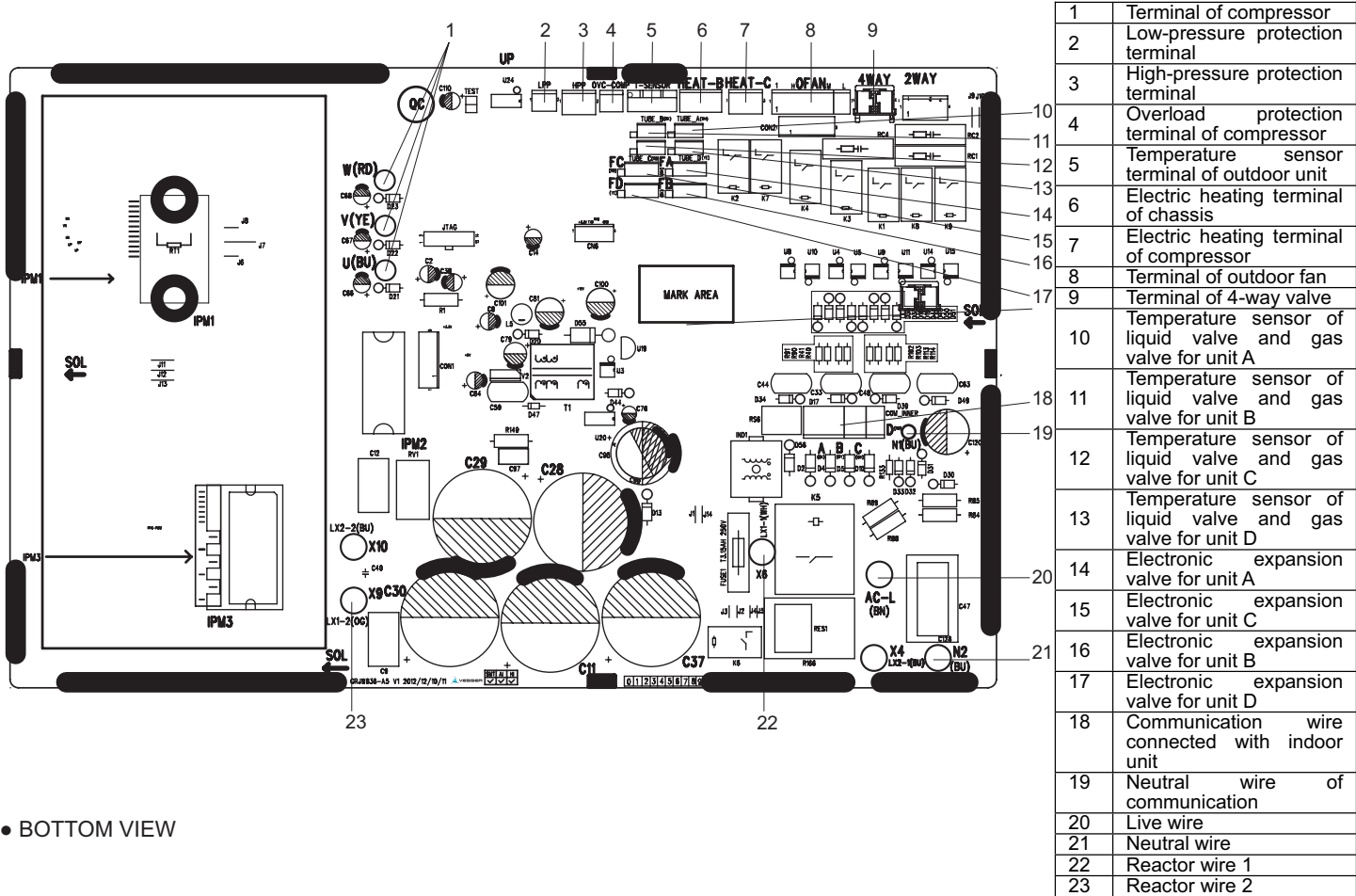
(1)Model:GF18M(2-3)E

- TOP VIEW

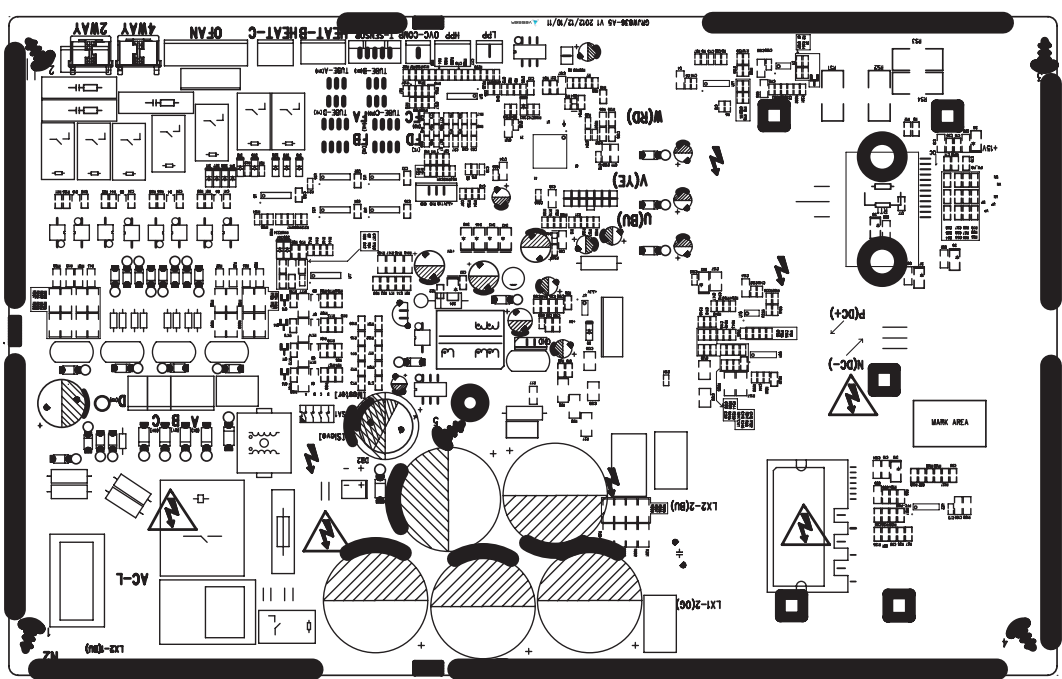


(2)Models:GF24M2E GF24M3E GF28M4E

• TOP VIEW



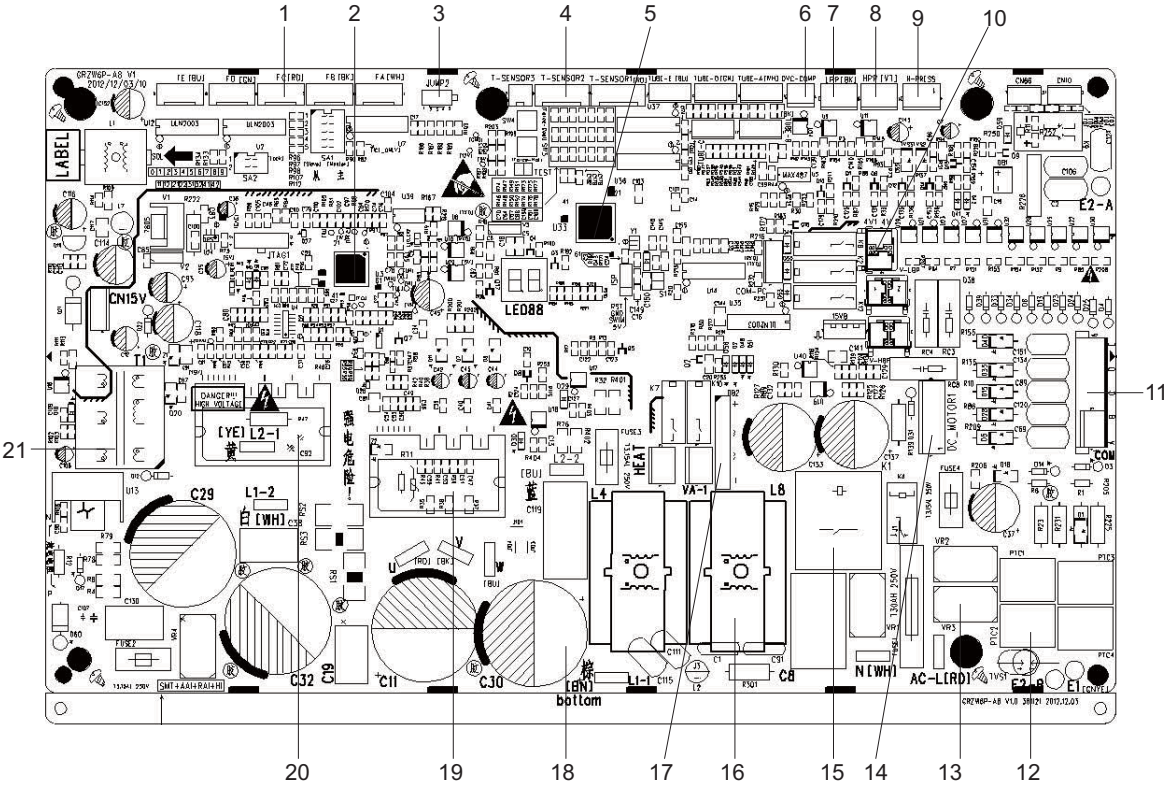
• BOTTOM VIEW



1 Terminal of electronic expansion valve

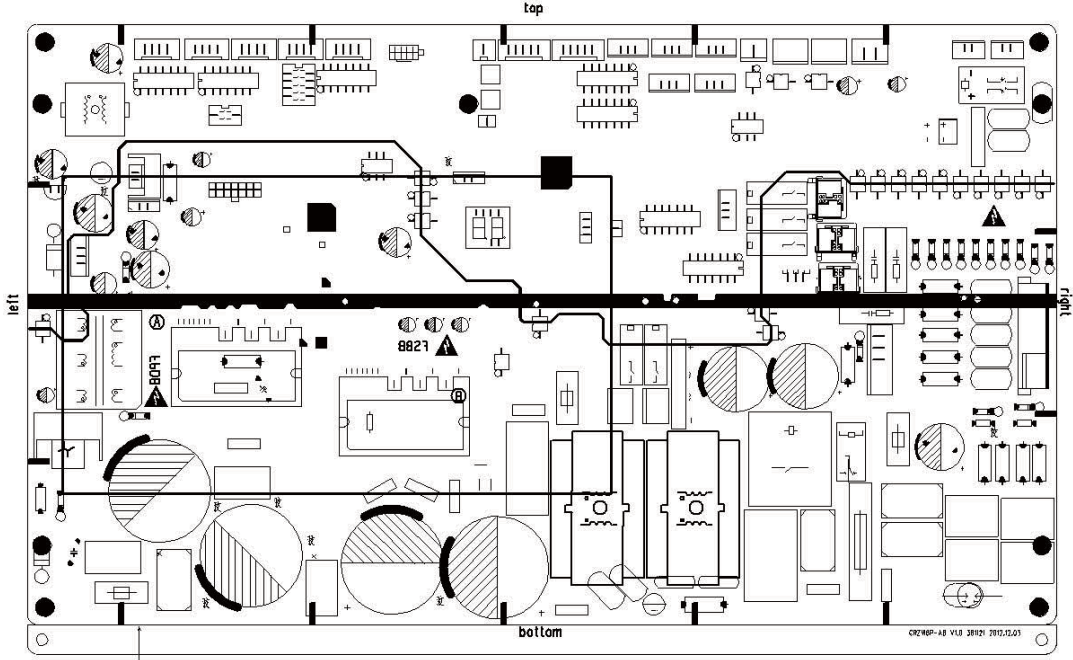
(3)Model:GF36M4E

• TOP VIEW



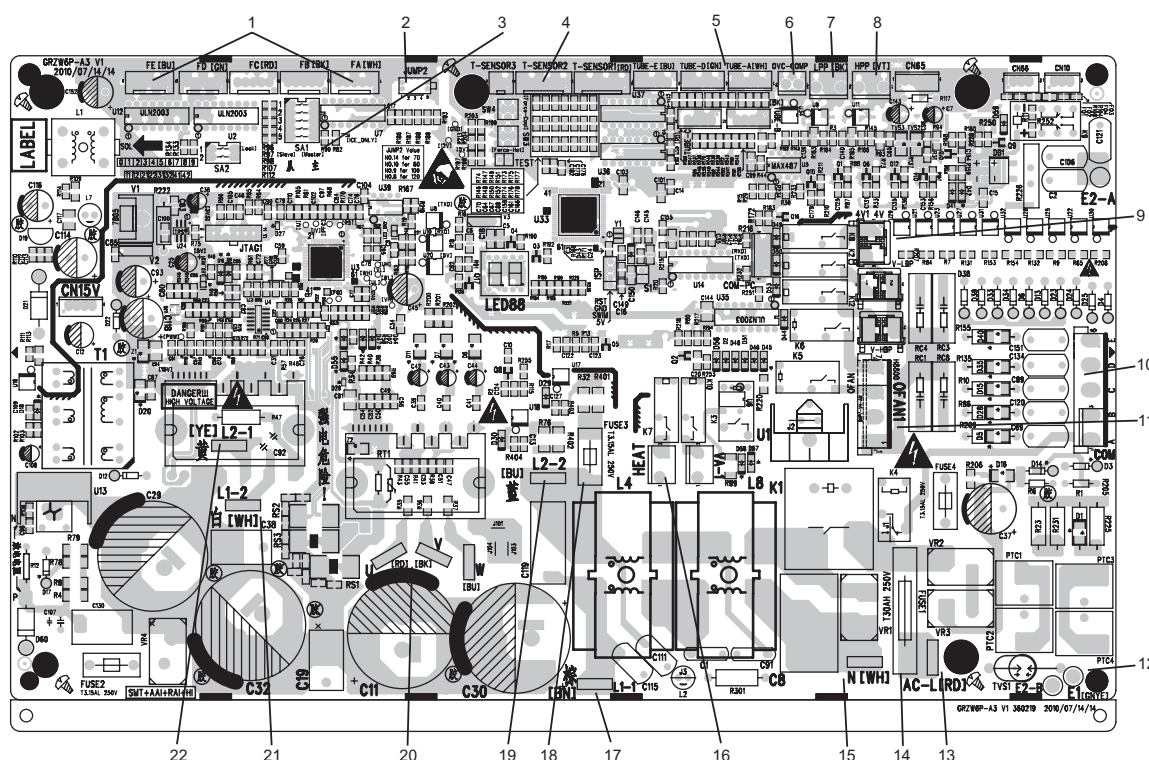
|    |  |
|----|--|
| 1  | Terminal of electronic expansion valve                   |
| 2  | G-MatrikII chip  |
| 3  | Jumper cap   |
| 4  | Terminal of temperature sensor                           |
| 5  | STM8S207 chip  |
| 6  | Overload protection terminal of compressor               |
| 7  | Low-pressure protection terminal                         |
| 8  | High-pressure switch 1                                   |
| 9  | High-pressure switch 2                                   |
| 10 | Terminal of 4-way valve                                  |
| 11 | Communication interface for indoor unit and outdoor unit |
| 12 | PTC resistance   |
| 13 | Piezoresistor  |
| 14 | DC fan terminal  |
| 15 | Relay  |
| 16 | Common-mode induction                                    |
| 17 | Rectifier  |
| 18 | Electrolytic capacitor                                   |
| 19 | IPM module   |
| 20 | PFC module   |
| 21 | Transformer  |

• BOTTOM VIEW

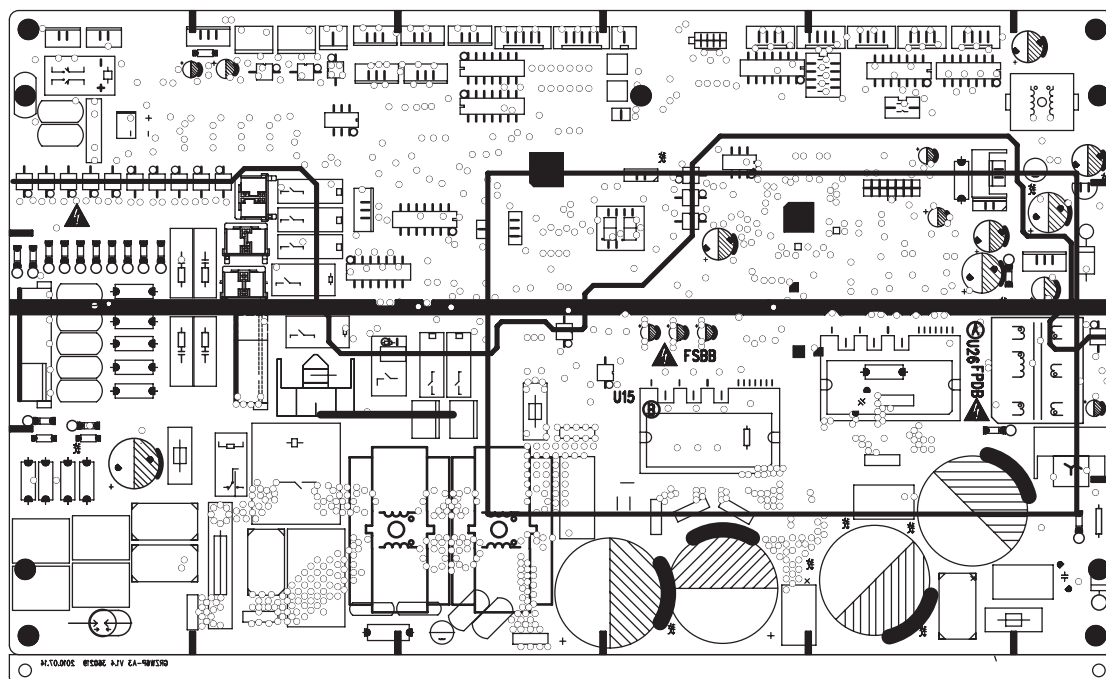


(4)Model:GF42M5E

## • TOP VIEW



## • BOTTOM VIEW



|    |  |
|----|--|
| 1  | FA-FE: Terminals of EXV(Electronic expansion Valve)  |
| 2  | JUMP2:the code of capacity                           |
| 3  | SA1: Master select switch                            |
| 4  | T-SENSOR2:Terminals of temperature sensor            |
| 5  | TUBE-A - TUBE-E:Terminals of tube temperature sensor |
| 6  | OVC-COMP:Terminals of overload protector             |
| 7  | LPP:Terminals of low pressure switch                 |
| 8  | HPP:Terminals of high pressure switch                |
| 9  | 4V1:Terminals of 4-way valve                         |
| 10 | COM:Terminals of communication                       |
| 11 | OFAN1:Terminals of fan                               |
| 12 | E1:Terminals of Earth                                |
| 13 | AC-L:Terminals of line wire                          |
| 14 | FUSE1: Fuse  |
| 15 | N:Terminals of neureal wire                          |
| 16 | HEAT:Terminals of compressor band heater             |
| 17 | L1-1:Terminals of reactor's brown wire               |
| 18 | FUSE3: Fuse of fan                                   |
| 19 | L2-2:Terminals of reactor's blue wire                |
| 20 | U/V/W:Terminals of compressor                        |
| 21 | L1-2:Terminals of reactor's white wire               |
| 22 | L2-1:Terminals of reactor's yellow wire              |



## 6. Function and Control

### For 18/24/28K

#### 1 Basic functions of the system

##### 1.1 Cooling Mode

###### 1.1.1 Cooling conditions and process:

If the compressor is in stop status and start the unit for cooling operation, when one of the indoor units reaches the cooling operation condition, the unit start cooling operation; in this case, the electronic expansion valve, the outdoor fan and the compressor start operation.

###### 1.1.2 Stop in cooling operation

###### 1.1.2.1 Compressor stops

The compressor stops immediately, the outdoor fan stops after 1min.

###### 1.1.2.2 Some of the indoor units reach the stop condition (the compressor does not stop)

The compressor operates immediately according to the required frequency. For the indoor unit with no requirement, the corresponding electronic expansion valve is closed to OP.

###### 1.1.3 Cooling mode transfers to heating mode

When the unit transfers to heating mode, the 4-way valve is energized after the compressor stops for 2min. The other disposals are the same as stopping in cooling mode.

###### 1.1.4 4-way valve: in this mode, the 4-way valve is closed.

###### 1.1.5 Outdoor fan control in cooling mode

The outdoor fan starts before 5s of the starting of compressor. The outdoor fan will run in high speed for 3min after starting and then it will run in set speed. The fan shall run at every speed for at least 80s. (When the quantity of running indoor unit is changed, the unit will enter the control described in 1.3.5.1 and 1.3.5.2);

When the compressor stops, the outdoor fan runs at present speed and stops after 1min.

##### 1.2 Dry Mode

###### 1.2.1 The dry conditions and process are the same as those in cooling mode;

###### 1.2.2 The status of 4-way valve: closed;

###### 1.2.3 The temperature setting range: 16 ~ 30℃;

###### 1.2.4 Protection function: the same as those in cooling mode;

###### 1.2.5 In dry mode, the maximum value A of the capacity requirement percentage of single unit is 90% of that in cooling mode.

The open condition of the electronic expansion valve, outdoor fan and compressor is the same as those in cooling mode.

##### 1.3 Heating Mode

###### 1.3.1 Cooling conditions and process:

When one of the indoor units reaches the heating operation condition, the unit starts heating operation.

###### 1.3.2 Stop in heating operation:

###### 1.3.2.1 When all the indoor units reach the stop condition, the compressor stops and the outdoor fan stops after 1min;

###### 1.3.2.2 Some of the indoor units reach the stop condition

The compressor reduces the frequency immediately and operates according to the required frequency;

###### 1.3.2.3 Heating mode transfers to cooling mode(dry mode), fan mode

a. The compressor stops; b. the power of 4-way valve is cut off after 2min; c. the outdoor fan stops after 1min; d. the status of 4-way valve: energized;

### 1.3.3 Outdoor fan control in heating mode

The outdoor fan starts before 5s of the starting of compressor and then it will run in high speed for 40s;

The fan shall run at every speed for at least 80s;

When the compressor stops, the outdoor fan stops after 1min.

### 1.3.4 Defrosting function

When the defrosting condition is met, the compressor stops; the electronic expansion valve of all indoor units open in big angle; the outdoor fan stops after 40s of the stop of compressor, meanwhile, the 4-way valve reverses the direction; after the 4-way valve reverses the direction, the compressor starts; then begin to calculate the time of defrosting, the frequency of the compressor rises to reach the defrosting frequency.

### 1.3.5 Oil-returned control in heating mode

#### 1.3.5.1 Oil-returned condition

The whole unit is operating in low frequency for a long time

#### 1.3.5.2 Oil-returned process in heating mode

The indoor unit displays "H1"

#### 1.3.5.3 Oil-returned finished condition in heating mode

The duration reaches 5min

## 1.4 Fan Mode

The compressor, the outdoor fan and the 4-way valve are closed; temperature setting range is 16~30℃.

## 2. Protection Function

### 2.1 Mode Conflict Protection of indoor unit

When the setting mode is different of different indoor unit, the unit runs in below status:

- a. The mode of the first operating indoor unit is the basic mode, then compare the mode of the other indoor units to see if there is a conflict. Cooling mode (dry mode) is in conflict with heating mode.
- b. Fan mode is in conflict with heating mode and the heating mode is the basic mode. No matter which indoor unit operates first, the unit will run in heating mode.

### 2.2 Overload protection function

When the tube temperature is a little low, the compressor raises the operation frequency; when the tube temperature is a little high, the compressor frequency is restricted or lows down the operation frequency; when the tube temperature is too high, the compressor protection stops running.

If the discharge temperature protection continuously appears for 6 times, the compressor can't resume running. The compressor can resume running after cutting off the power and then putting through the power. (if the running time of the compressor is longer than 7min, the protection times record will be cleared)

### 2.3 Discharge Protection Function

When the discharge temperature is a little low, the compressor raises the operation frequency; when the discharge temperature is a little high, the compressor frequency is restricted or lows down the operation frequency; when the discharge temperature is too high, the compressor protection stops running.

If the discharge temperature protection continuously appears for 6 times, the compressor can't resume running. The compressor can resume running after cutting off the power and then putting through the power. (if the running time of the compressor is longer than 7min, the protection times record will be cleared)

## 2.4 Communication malfunction

Detection of the quantity of installed indoor units:

After 3min of energizing, if the outdoor unit does not receive the communication data of certain indoor unit, the outdoor unit will judge that indoor unit is not installed and will treat it as it is not installed. If the outdoor unit receives the communication data of that indoor unit later, the outdoor unit will treat that unit as it is installed.

## 2.5 Overcurrent Protection

a. Overcurrent protection of complete unit; b. phase wire current protection; c. compressor phase current protection

## 2.6 Compressor high-pressure protection

2.6.1 When the high-pressure switch is detected cut off for 3s continuously, the compressor will enter high-pressure protection as it stops when reaching set temperature. Meanwhile, the outdoor unit will send the signal of "high-pressure protection" to the indoor units;

2.6.2 After the appearance of high-pressure protection, when the high-pressure switch is detected closed for 6s continuously, the compressor can resume running only after cutting off the power and then putting through the power.

## 2.7 Compressor overload protection

If the compressor overload switch is detected having movement, the indoor unit will display the corresponding malfunction as it stops when the indoor temperature reaching set temperature. When the compressor stops for more than 3min and the compressor overload switch is reset, the unit will resume operation status automatically. If the protection appears for more than 6 times (if the running time of the compressor is longer than 30min, the protection times record will be cleared), the unit can not resume operation status automatically, but can resume running only after cutting off the power and then putting through the power.

## 2.8 Compressor Phase-lacking Protection

When the compressor starts, if one of the three phases is detected open, the compressor will enter phase-lacking protection. The malfunction will be cleared after 1min, the unit will restart and then detect if there is still has phase-lacking protection. If the phase-lacking protection is detected for 6 times continuously, the compressor will not restart but can resume running only after cutting off the power and then putting through the power. If the running time of the compressor is longer than 7min, the protection times record will be cleared.

## 2.9 IPM Protection

2.9.1 When the IMP module protection is detected, the unit will stop as the indoor temperature reaching set temperature, PFC is closed, display IMP protection malfunction. After the compressor stops for 3min, the unit will resume operation status automatically; if the IMP protection is detected for more than 6 times continuously (If the running time of the compressor is longer than 7min, the protection times record will be cleared), the system will stop and send the signal of module protection to indoor unit. The unit can not resume operation status automatically, but can resume running only after cutting off the power and then putting through the power.

2.9.2 IMP module overheating protection

2.9.2.1 When  $T_{IMP} > 85^{\circ}\text{C}$ , prohibit to raise frequency;

2.9.2.2 When  $T_{IMP} \geq 90^{\circ}\text{C}$ , the operation frequency of compressor lows down by 15% every 90s according to the present capacity requirement of the complete unit. It will keep 90s after lowering down the frequency. After lowering down the frequency, if  $T_{IMP} \geq 90^{\circ}\text{C}$ , the unit will circulate the above movement until reaching the minimum frequency; if  $85^{\circ}\text{C} < T_{IMP} < 90^{\circ}\text{C}$ , the unit will run at this frequency; when  $T_{IMP} \leq 85^{\circ}\text{C}$ , the unit will run at the frequency according to the capacity requirement;

2.9.2.3 When  $T_{IMP} \geq 95^{\circ}\text{C}$ , the compressor stops. After the compressor stops for 3min, if  $T_{IMP} < 85^{\circ}\text{C}$ , the compressor and the outdoor fan will resume operation.

## For 36K/42K

### 1.Function Control

#### 1) Cooling mode

- a. Turning on the unit for cooling operation, and if any one of the indoor units satisfy the cooling operation condition, the system will start for cooling operation; and the electronic expansion valve, the outdoor fan and the compressor start operation.
- b. When some of the indoor units satisfy the stop-condition while some indoor units does not satisfy the stop-condition, the compressor does not stop, the compressor adjust the frequency according to demand. For the indoor unit with stop-condition satisfies, the corresponding electronic expansion valve will be closed.
- c. Change Cooling mode to heating mode

When change the unit to heating mode from cooling mode, the whole system will stop first. Then the system will restart in heating mode after the compressor stops.

#### d. 4-way valve

In this mode, the 4-way valve is closed.

#### e. Outdoor fan control in cooling mode

The outdoor fan starts before 5s of the starting of compressor. The outdoor fan will run in middle speed after starting and then it will run in set speed.

#### 2) Dry mode (dehumidification mode)

this mode is the same as cooling mode;

#### 3) Heating mode

- a. Turning on the unit for heating operation, If any one of the indoor unit satisfy the heating condition, the system will start to run in heating mode
  - b. If all the indoor units satisfy the stop-condition, the compressor stops and the outdoor fan stops after 1min;
  - c. If only part of the indoor units satisfy the stop-condition, the compressor decrease the frequency immediately and operates according to demand.
  - d. Change Heating mode to cooling mode or dehumidification mode, the whole system will stop first, then restart under the required mode.
  - e. Defrosting function
- When the defrosting condition is satisfied, the 4-way valve reverses the direction, the outdoor fan stop. After the 4-way valve reverses the direction, the frequency of compressor rises, and the unit will start defrosting under cooling cycle.
- f. Oil-return control in heating mode
- a) If the whole system runs in low frequency for a long time, the system will run a oil-return operation in high frequency, the indoor unit displays "H1", the oil-return operation will runs for 3 minutes.

#### 4) Fan mode

Only indoor fan run. Compressor, outdoor fan and 4-way valve are closed .

### 2.Protection Function

#### 1) Mode conflict protection of indoor units

When the setting mode is different of different indoor unit, the unit runs in below status:

- a. The system mode is determined by the first turning on indoor unit except indoor unit is in fan mode. Cooling mode (dry mode) is in conflict with heating mode.
- b. If the first turning on unit is fan mode, and the second turning on unit is cooling or heating mode, then the system will run in cooling or heating mode

#### 2) Overload protection

If the tube temperature at the high pressure side is higher than normal, the compressor frequency is restricted or decreased to normal operation frequency.

#### 3) High exhaust temperature protection

If the exhaust temperature is higher than protection value, the compressor stops running.

If the exhaust temperature protection continuously appears for 6 times, the compressor can't resume running. In this case, only by cutting off the power and then reenergize that the compressor can restart. If the running duration of the compressor is longer than 7min, the protection times will be cleared to zero time.

#### 4) Communication malfunction



Detection of the quantity of installed indoor units: after 3min of energizing, if the outdoor unit does not receive the communication data of certain indoor unit, the outdoor unit will judge that indoor unit is not installed. If the outdoor unit receives the communication data of that indoor unit later, the communication malfunction will be cleared.

### 5) System high-pressure protection

- When the high-pressure switch detects the system pressure higher than limit ,then the high-pressure switch cuts off, the system will stop to run.
- If high-pressure protection is detected for two times within one hour, only by cutting off the power and then reenergize that the compressor can restart.

### 6)System low-pressure protection

- When the low-pressure switch detects the system pressure lower than limit ,then the los-pressure switch cuts off , the system will stop to run.
- If low-pressure protection is detected for two times within one hour, only by cutting off the power and then reenergize that the compressor can restart.

### 7) Compressor overload protection

No matter the compressor is on or off, when the compressor overload switch is detected activated, the system will stop and indoor unit will display H3. If the compressor overload protection appears for more than 6 times, in this case, only by cutting off the power and then reenergize that the compressor can restart. If the running duration of the compressor is longer than 30min, the protection times will be cleared to zero.

## 3.Other function

### 1) Refrigerant Recovery

When the unit is powered on and runs under the COOL mode, it is available within five minute to go the refrigerant recovery mode by pressing three times the "LIGHT" button on the wireless controller in three seconds with "Fo" displayed.

How to quit the refrigerant recovery:

When the refrigerant recovery has started, it will quit when there is a signal from the wireless controller or it has run for ten minutes.

### 2) Setting function of master/slave indoor unit

Picture of DIP switch on outdoor mainboard :

SA1(5-bit): dial-switch for master/slave indoor unit,

SA2(2-bit): dial-switch for mode locking (not for wall mounted indoor units)



5-bit dial-switch to set master/slave indoor unit: it is corresponding to indoor units of no.1 to no.5. Dial the switch to ON(master side. Right side) to set that indoor unit as master indoor unit , and dial the switch to slave side(left side) to set indoor unit as slave indoor unit. There can be only one master unit in a system, If more than one indoor units are set as master unit, the unit with smallest number is the master unit. (smallest number here means number 1 to number 5 on the switch)

2-bit dial-switch to set mode locking

(note:

1.only use no.1 bit. no.2 bit is for future use

2.this function is only for duct and cassette unit, not for wall mounted unit:

Locked mode: Switch no.1 bit to "ON"side(lock side, or right side on the picture): even the master indoor unit is off, the system will run according to the mode before the master unit off.

Unlocked mode: Switch no.1 bit to left side on the picture: If the master indoor unit is off , the system will not care what the master unit mode was, it will run according to the mode of the first turning on slave indoor unit.

Note: For wall-mounted indoor unit, unlocked model is default, and locked mode is invalid.

# Part II : Installation and Maintenance

## 7. Notes for Installation and Maintenance

### Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

- The installation or maintenance must accord with the instructions.
- Comply with all national electrical codes and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- All installation and maintenance shall be performed by distributor or qualified person.
- All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
- Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.



### Warnings

#### Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.
2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4. Make sure each wiring terminal is connected firmly during installation and maintenance.
5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8. The power cord and power connection wires can't be pressed by hard objects.
9. If power cord or connection wire is broken, it must be replaced by a qualified person.

10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.

11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3m.

12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.

13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.

14. Replace the fuse with a new one of the same specification if it is burnt down; don't replace it with a cooper wire or conducting wire.

15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

#### Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 20kg.
3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
4. Wear safety belt if the height of working is above 2m.
5. Use equipped components or appointed components during installation.
6. Make sure no foreign objects are left in the unit after finishing installation.

#### Refrigerant Safety Precautions:

1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
3. Make sure no refrigerant gas is leaking out when installation is completed.
4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

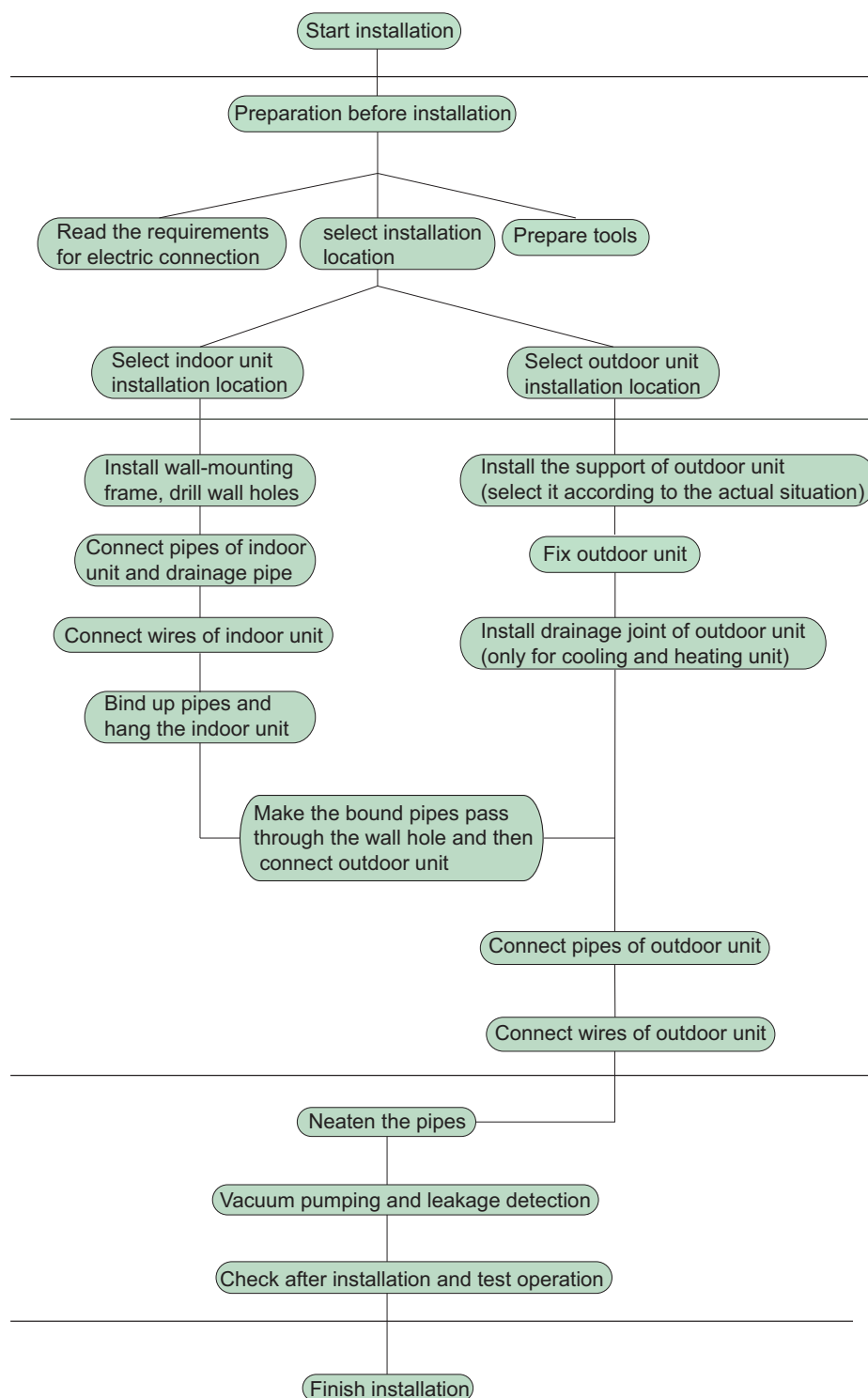
Improper installation may lead to fire hazard, explosion, electric shock or injury.

# Main Tools for Installation and Maintenance

|   |  |   |
|---|--|---|
| <div>1. Level meter, measuring tape</div> <div></div>  | <div>2. Screw driver</div> <div></div>                  | <div>3. Impact drill, drill head, electric drill</div> <div></div>              |
| <div>4. Electroprobe</div> <div></div>                 | <div>5. Universal meter</div> <div></div>               | <div>6. Torque wrench, open-end wrench, inner hexagon spanner</div> <div></div> |
| <div>7. Electronic leakage detector</div> <div></div> | <div>8. Vacuum pump</div> <div></div>                 | <div>9. Pressure meter</div> <div></div>                                      |
| <div>10. Pipe pliers, pipe cutter</div> <div></div>  | <div>11. Pipe expander, pipe bender</div> <div></div> | <div>12. Soldering appliance, refrigerant container</div> <div></div>        |

## 8. Installation Manual

### Installation procedures



Note: this flow is only for reference; please find the more detailed installation steps in this section.

8.1 Electrical Connections

GF18M(2-3)E GF24M2E

- 1. Remove the handle at the right side plate of the outdoor unit (one screw).
- 2. Remove the cable clamp, connect the power connection cable with the terminal at the row of connection and fix the connection. The fitting line distributing must be consistent with the indoor unit. terminal of line bank. Wiring should meet that of indoor unit.
- 3. Fix power connection wire by wire clamp.
- 4. Ensure wire has been fixed well.
- 5. Install the handle.

⚠ Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

| Air-conditioner | Air switch capacity |
|-----------------|---------------------|
| GF18M(2-3)E     | 20A                 |
| GF24M2E         | 25A                 |

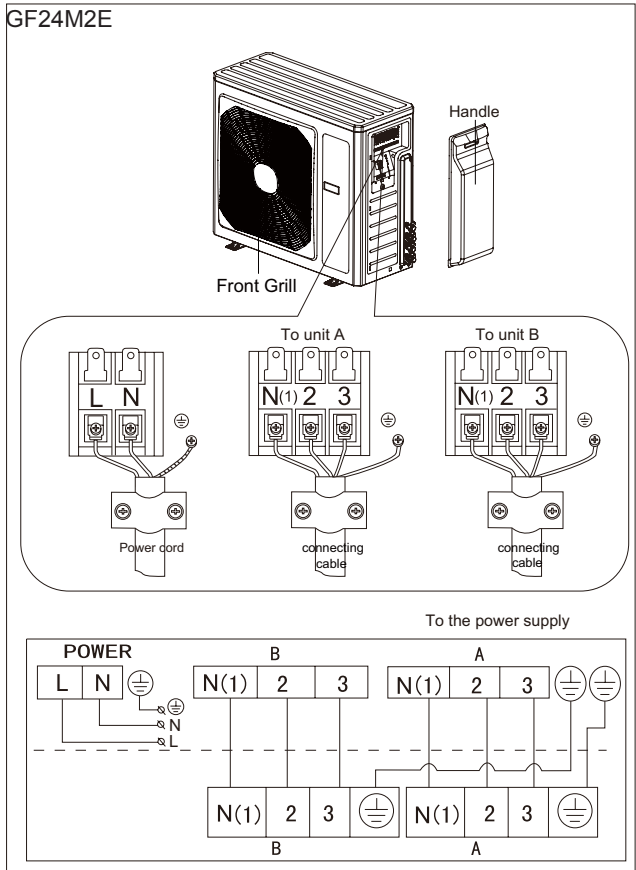
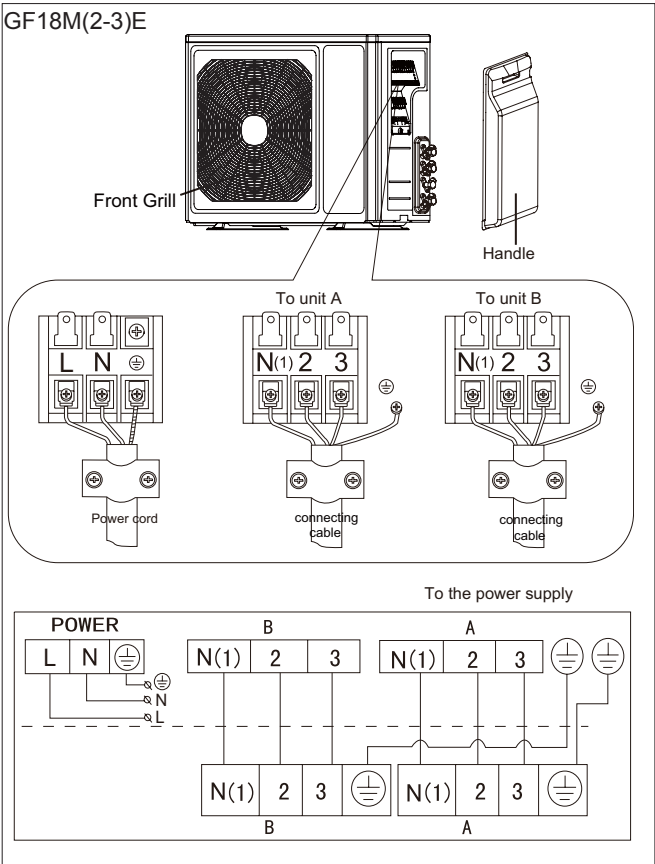
⚠ An all-pole disconnection switch having a contact separation of at least 3mm in all pole should be connected in fixed wiring.

⚠ Wrong wire connection may cause malfunction of some electric components. After fixing cable, ensure that leads between connection to fixed point have some space.

⚠ The connection pipes and the connecting wirings of the unit A and unit B must be corresponding to each other respective.

⚠ The appliance shall be installed in accordance with national wiring regulations.

Note: the above figures are only intended to be a simple diagram of the appliance and may not correspond to the appearance of the units that have been purchased.



## GF24M3E

1. Remove the handle at the right side plate of the outdoor unit (one screw).
2. Remove the cable clamp, connect the power connection cable with the terminal at the row of connection and fix the connection. The fitting line distributing must be consistent with the indoor unit. terminal of line bank. Wiring should meet that of indoor unit.
3. Fix power connection wire by wire clamp.
4. Ensure wire has been fixed well.
5. Install the handle.

**!** Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

| Air-conditioner | Air switch capacity |
|-----------------|---------------------|
| GF24M3E         | 25A                 |

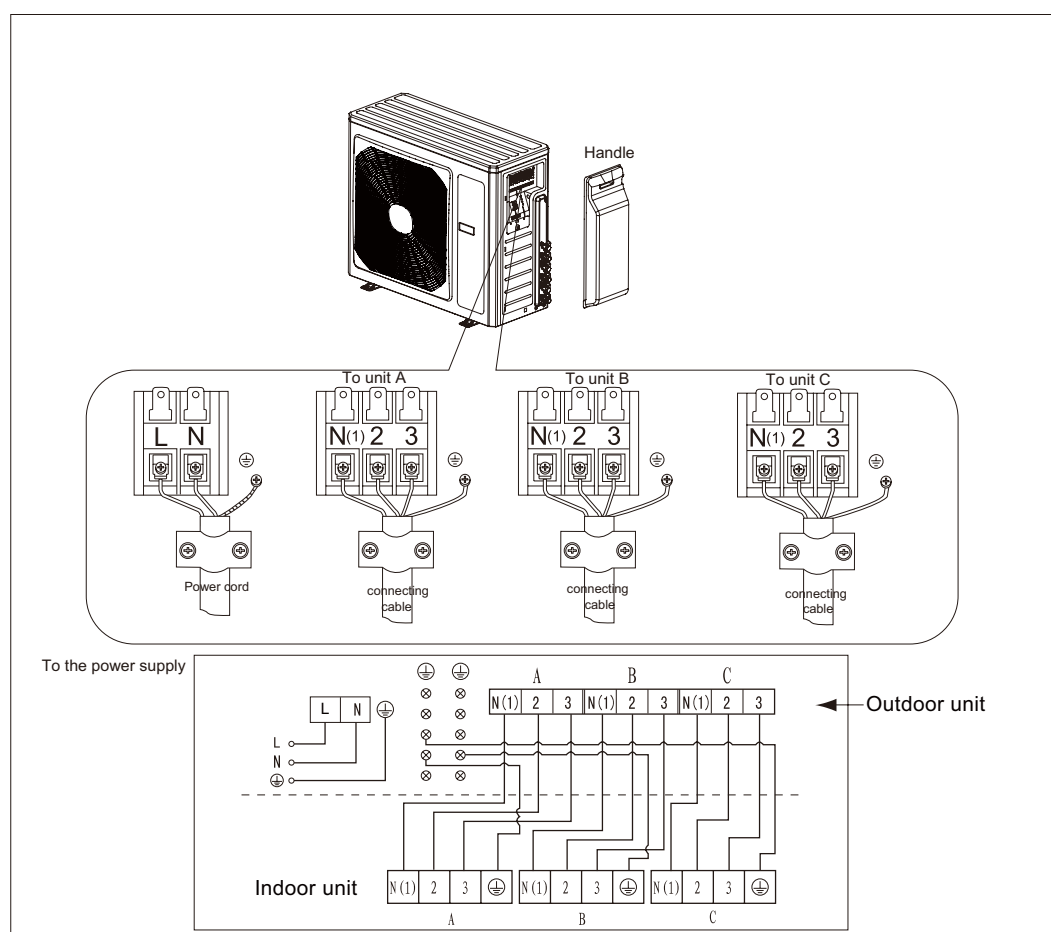
**!** An all-pole disconnection switch having a contact separation of at least 3mm in all pole should be connected in fixed wiring.

**!** Wrong wire connection may cause malfunction of some electric components. After fixing cable, ensure that leads between connection to fixed point have some space.

**!** The connection pipes and the connecting wirings of the unit A, unit B, unit C and unit D must be corresponding to each other respective.

**!** The appliance shall be installed in accordance with national wiring regulations.

Note: The above figures are only intended to be a simple diagram of the appliance and may not correspond to the appearance of the units that have been purchased.



GF28M4E

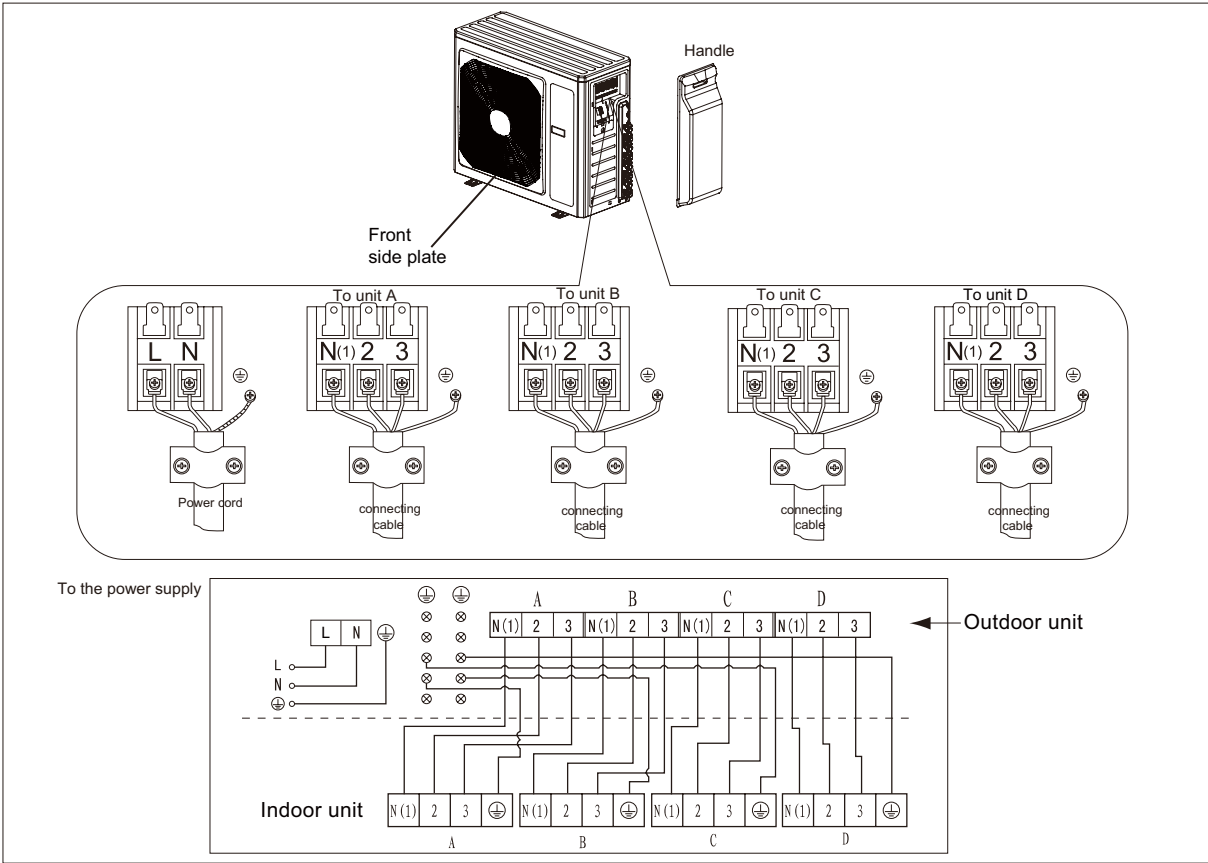
- 1. Remove the handle at the right side plate of the outdoor unit (one screw).
- 2. Remove the cable clamp, connect the power connection cable with the terminal at the row of connection and fix the connection. The fitting line distributing must be consistent with the indoor unit. terminal of line bank. Wiring should meet that of indoor unit.
- 3. Fix power connection wire by wire clamp.
- 4. Ensure wire has been fixed well.
- 5. Install the handle.

⚠ Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

| Air-conditioner | Air switch capacity |
|-----------------|---------------------|
| GF28M4E         | 25A                 |

- ⚠ An all-pole disconnection switch having a contact separation of at least 3mm in all pole should be connected in fixed wiring.
- ⚠ Wrong wire connection may cause malfunction of some electric components. After fixing cable, ensure that leads between connection to fixed point have some space.
- ⚠ The connection pipes and the connecting wirings of the unit A, unit B, unit C and unit D must be corresponding to each other respective.
- ⚠ The appliance shall be installed in accordance with national wiring regulations.

Note: The above figures are only intended to be a simple diagram of the appliance and may not correspond to the appearance of the units that have been purchased.





## 8.2 Installing the Outdoor Unit

**!** Use bolts to secure the unit to a flat, solid floor. When mounting the unit on a wall or the roof, make sure the support is firmly secured so that it cannot move in the event of intense vibrations or a strong wind.

Do not install the outdoor unit in pits or air vents  
Installing the pipes

**!** Use suitable connecting pipes and equipment for the refrigerant R410A.



| Models(m)   | 18K | 24K | 24K | 28K |
|---|-----|-----|-----|-----|
| Max. connection pipe length                         | 20  | 20  | 60  | 70  |
| Max. connection pipe length(Simple one indoor unit) | 10  | 10  | 20  | 20  |



The refrigerant pipes must not exceed the maximum heights 10m.



Wrap all the refrigerant pipes and joints.



Tighten the connections using two wrenches working in opposite directions.

Caution: Installation Must be Performed in Accordance with the NEC/CEC by Authorized Personnel Only.

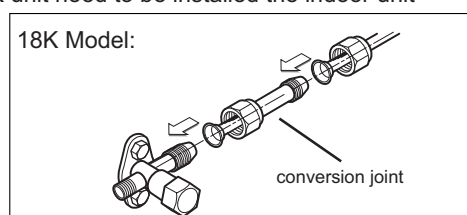
Humid air left inside the refrigerant circuit can cause compressor malfunction. After having connected the indoor and outdoor units, bleed the air and humidity from the refrigerant circuit using a vacuum pump.

1. Unscrew and remove the caps from the 2-way and 3-way valves.
2. Unscrew and remove the cap from the service valve.
3. Connect the vacuum pump hose to the service valve.
4. Operate the vacuum pump for 10-15 minutes until an absolute vacuum of 10 mm Hg has been reached.
5. With the vacuum pump still in operation, close the low-pressure knob on the vacuum pump coupling. Stop the vacuum pump.
6. Open the 2-way valve by 1/4 turn and then close it after 10 seconds. Check all the joints for leaks using liquid soap or an electronic leak device.
7. Turn the body of the 2-way and 3-way valves. Disconnect the vacuum pump hose.
8. Replace and tighten all the caps on the valves.

| Diameter (mm) | Twisting moment (N.m) |
|---------------|-----------------------|
| Φ6            | 15-20                 |
| Φ9.52         | 35-40                 |
| Φ16           | 60-65                 |
| Φ12           | 45-50                 |
| Φ19           | 70-75                 |

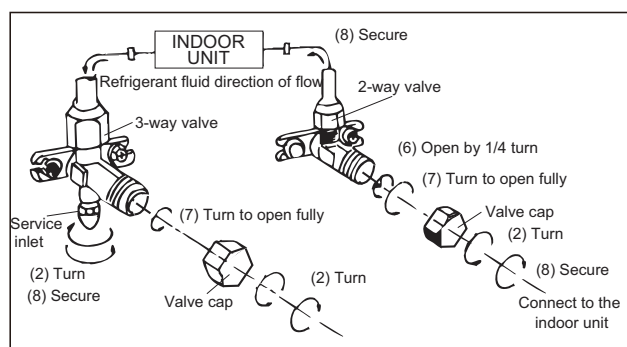
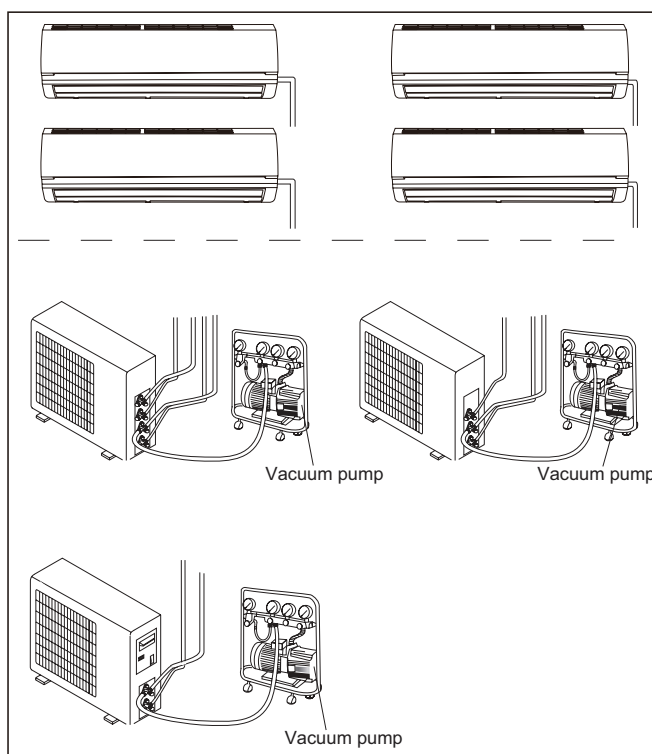
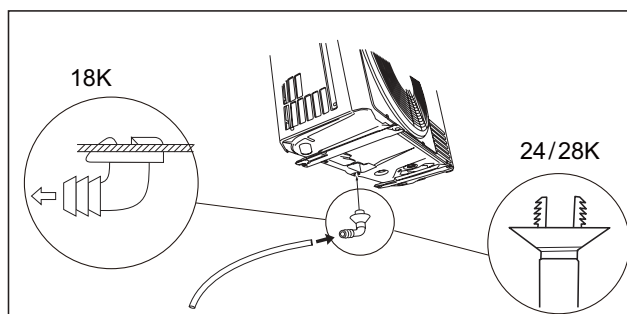
18K unit need to be installed the indoor unit

18K Model:



Install the drain fitting and the drain hose (for model with heat pump only)

Condensation is produced and flows from the outdoor unit when the appliance is operating in the heating mode. In order not to disturb neighbours and to respect the environment, install a drain fitting and a drain hose to channel the condensate water. Install the drain fitting and rubber washer on the outdoor unit chassis and connect a drain hose to it as shown in the figure.





## 8.3 Installation Dimension Diagram

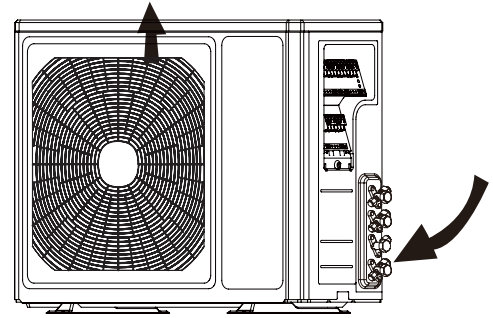


Use suitable instruments for the refrigerant R410A.

- Do not use any other refrigerant than R410A.



Do not use mineral oils to clean the unit.



The installation must be done by trained and qualified service personnel with reliability according to this manual.



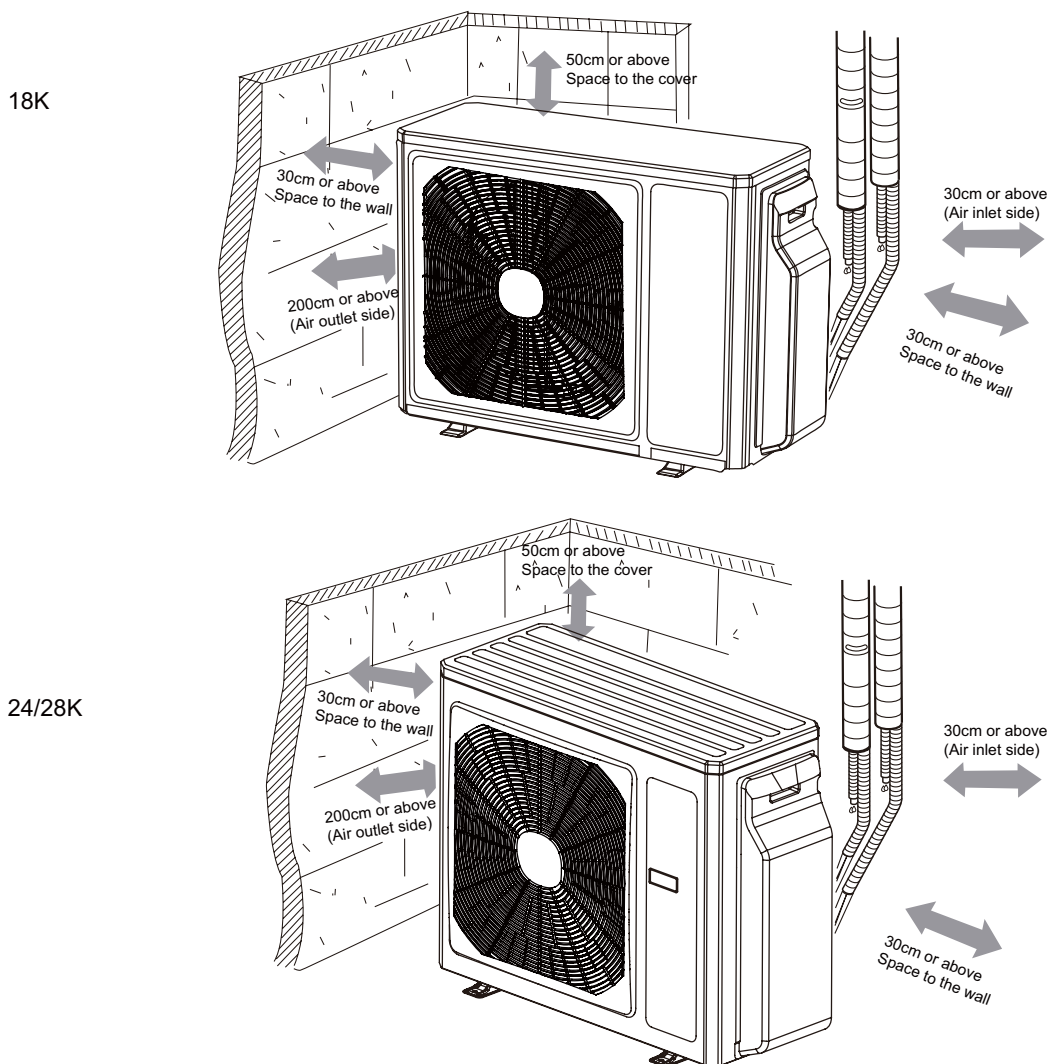
Contact service center before installation to avoid the malfunction due to unprofessional installation.



When picking up and moving the units, you must be guided by trained and qualified person.



Ensure that the recommended space is left around the appliance.



## 8.4 Check after Installation


| Check Items   | Problems Owing to Improper Installation                     |
|---|---|
| Is the installation reliable?   | The unit may drop, vibrate or make noises                   |
| Has the gas leakage been checked?   | May cause unsatisfactory cooling (heating) effect           |
| Is the thermal insulation of the unit sufficient?                                       | May cause condensation and water dropping                   |
| Is the drainage smooth?   | May cause condensation and water dropping                   |
| Does the power supply voltage accord with the rated voltage specified on the nameplate? | The unit may bread down or the components may be burned out |
| Are the lines and pipelines correctly installed?  | The unit may bread down or the components may be burned out |
| Has the unit been safely grounded?  | Risk of electrical leakage                                  |
| Are the models of lines in conformity with requirements?                                | The unit may bread down or the components may be burned out |
| Are there any obstacles near the air inlet and outlet of the indoor and outdoor units?  | The unit may bread down or the components may be burned out |
| Have the length of refrigerating pipe and refrigerant charge amount been recorded?      | It is not easy to decide the charge amount of refrigerant.  |

## 36K and 42K

### Safety Precautions

Please read this manual carefully before using and operating correctly as instructed in this manual.  
Please especially take notice of the following two symbols:

 **Warning!** It indicates improper operation which will lead to human casualty or severe injury.

 **Caution!** It indicates improper operation which will lead to injury or property damage.

 **Warning!**

- ◆ The installation should be committed to the appointed service center; otherwise it will cause water leakage, electric shock or fire etc.

- ◆ Please install the unit in a place where is strong enough to withstand the weight of the unit; otherwise, the unit would fall down and cause injury or death.

- ◆ The drain pipe should be installed as instructed in the manual to guarantee the proper drainage; meanwhile it should be insulated to prevent condensing; otherwise the improper installation would cause water leakage and then wet the household wares in the room.

- ◆ Do not use or place any inflammable or explosive substance near the unit.

- ◆ Under the occurrence of an error (like burning smell etc.), please cut off the main power supply of the unit.

- ◆ Keep good ventilation in the room to avoid oxygen deficit.

- ◆ Never insert your finger or any other object into the air outlet/inlet grille.

- ◆ Please take notice of the supporting frame of the unit to see if it is damaged over the long time period of use.

- ◆ Never refit the unit and contact the sales agent or the professional installation personnel for the repair or relocation of the unit.

- ◆ Non-professional personnel are prohibited to dismantle the electric box owing to the high voltage of the outdoor unit.

**An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.**

 **Caution!**

- ◆ Before installation, please check if the power supply corresponds with the requirement specified on the nameplate and also check its security.

- ◆ Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc.

- ◆ The main power supply must be earthed to avoid the hazard of electric shock and never connect this earth wire to the gas pipe, running water pipe, lightening rod or phone cable's earth lead.

- ◆ Turn off the unit after it runs at least five minutes; otherwise its service life will be shortened.

- ◆ Do not allow children operate this unit.

- ◆ Do not operate this unit with wet hands.

- ◆ Cut off the main power supply prior to the cleaning of the unit or the replacement of the air filter.

- ◆ When the unit is not to be used for a long time, please cut off the main power supply of the unit.

- ◆ Do not expose the unit to the moist or corrosive circumstances.

- ◆ Never step on the unit or place any object on it.

- ◆ It is suggested to have a power-on test annually.

### 8.5.1 Installation Location and Matters Needing Attention

The installation of the unit must comply with the national and local safety regulations. The installation quality directly affects the normal use, so the user should not carry out the installation personally, instead, the installation and debugging should be done by technician according to this manual. Only after that, can the unit be energized.

- a. How to select the installation location for the indoor unit
  - 1) Where there is no direct sunlight.
  - 2) Where the top hanger, ceiling and the building structure are strong enough to withstand the weight of the unit.
  - 3) Where the drain pipe can be easily connected to outside.
  - 4) Where the flow of the air inlet/outlet is not blocked.
  - 5) Where the refrigerant pipe of the indoor unit can be easily led to outside.
  - 6) Where there is no inflammable, explosive substances or their leakage.
  - 7) Where there is no corrosive gas, heavy dust, salt mist, smog or moisture.
- b. How to select the installation location for the outdoor unit
  - 1) The outdoor unit must be installed where the bearing surface is stable and secure enough.
  - 2) The outdoor unit and indoor unit should be placed as close as possible to minimize the length and bends of the refrigerant pipe.
  - 3) Do not install the outdoor unit under the window or between the buildings to prevent the normal running noise entering the room.
  - 4) Where the flow of the air inlet/outlet is not blocked.
  - 5) The outdoor unit should be installed where ventilation is in good condition so that the unit can take in and discharge enough air.
  - 6) Do not install the unit where there are inflammable and explosive substances and where there is heavy dust, salt fog and other severely polluted air.

No air guiding pipe is allowed to be installed at the air inlet/outlet of the outdoor unit. Under the heating mode, the condensate water would drip down from the base frame and would be frozen when the outdoor ambient temperature is lower than 0°C (32 °F) . Besides, the installation of the outdoor unit should not affect the heat radiation of the unit.

#### **⚠CAUTION!**

The unit installed in the following places is likely to run abnormally. If unavoidable, please contact the professional personnel at the VESSER appointed service center. ① where is full of oil; ② alkaline soil off the sea; ③ where there is sulfur gas (like sulfur hot spring) ; ④ where there are devices with high frequency (like wireless devices, electric welding devices, or medical equipments); ⑤ special circumstances.

- c. Electric Wiring
  - 1) The installation must be done in accordance with the national wiring regulations.
  - 2) Only the power cord with the rated voltage and exclusive circuit for the air conditioning can be used.
  - 3) Do not pull the power cord by force.
  - 4) The electric installation should be carried out by the professional personnel as instructed by the local laws, regulations and also this manual.
  - 5) The diameter of the power cord should be large enough and once it is damaged it must be replaced by the dedicated one.
  - 6) The earthing should be reliable and the earth wire should be connected to the dedicated device of the building by the professional personnel. Besides, the air switch coupled with the leakage current protection switch must be equipped, which is of enough capacity and of both magnetic and thermal tripping functions in case of the short circuit and overload.

Table 1

| Models | Power Supply   | Capacity of the Air Switch | Recommended Cord<br>(pieces×<br>sectional area) |
|--------|----------------|----------------------------|---|
| 36/42K | 220-240V~ 50Hz | 32A                        | 4mm <sup>2</sup> ×3                             |

d. Earthing Requirements

- 1) The air conditioner is classified into the Class I appliances, so its earthing must be reliable.
- 2) The yellow-green line of the air conditioner is the earth line and can not be used for other purpose, cut off or fixed by the tapping screw; otherwise it would cause the hazard of electric shock.
- 3) The reliable earth terminal should be provided and the earth wire can not be connected to any of the following places.
  - ① Running water pipe;
  - ② Coal gas pipe;
  - ③ Sewage pipe;
  - ④ Other places where the professional personnel think unreliable.

GF36M4E

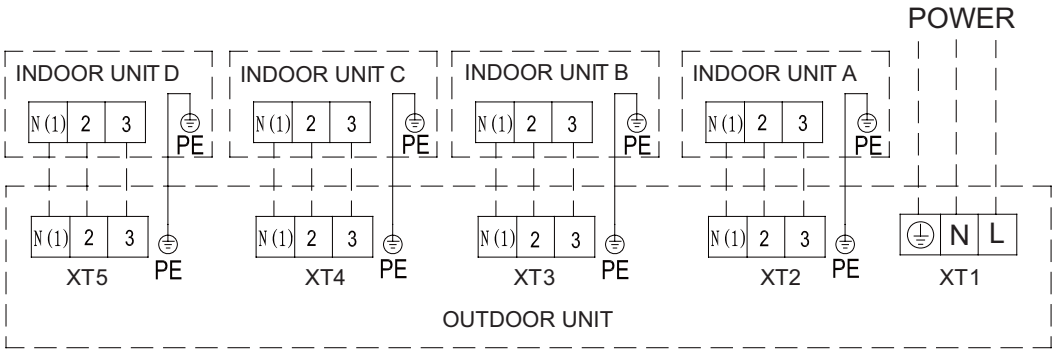


Fig.1

GF42M5E

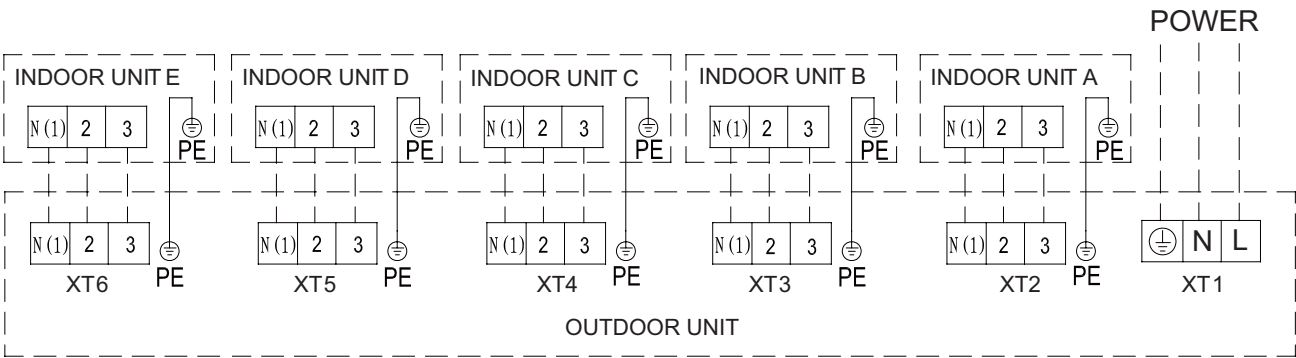


Fig.2

#### a. Noise Precautions

- 1) The air conditioning unit should be installed where ventilation is in good condition, otherwise the working capability of the unit would be reduced or working noise would be increased.
- 2) The air conditioning unit should be installed on the base frame which is stable and secure enough to withstand the weight of the unit; otherwise it would incur vibration and noise.
- 3) During the installation, a consideration should be taken that the produced hot air or noise should not affect neighbors or surroundings.
- 4) Do not stack obstacles near the air outlet of the outdoor unit; otherwise it would reduce the working capability of the unit or increase the working noise.
- 5) In the event of the occurrence of abnormal noise, please contact the sales agent as soon as possible.

#### b. Accessories for Installation

Refer to the packing list for the accessories of the indoor and outdoor units respectively.

### 8.5.2 Installation of the Outdoor Unit

#### a. Precautions for the Installation of the Outdoor Unit

The following rules should be followed when the installation location is being considered so as to let the unit run well enough.

- 1) The discharged air from the outdoor unit won't return back and enough space should be left for maintenance around the unit.
- 2) The installation location should be in good condition so that the unit is able to take in and discharge enough air. Besides, make sure there is no obstacle at the air inlet/outlet of the unit. If there is, remove it.
- 3) The unit must be installed where it is secure enough to support the weight of the unit and capable of reducing to some extent noise and vibration to make sure they do not bother your neighbors.
- 4) The designated lifting hole must be used for lifting the unit and protect the unit carefully during lifting to prevent damaging the metal sheet which would result in rusting in future.
- 5) The unit should be installed where there is as little as direct sunlight.
- 6) The unit must be installed where the rain water and defrosting water can be drained.
- 7) The unit must be installed where the unit won't be covered by the snow and won't be affected by rubbish and oil fog.
- 8) Rubber or spring shock absorbers should be used during the installation of the outdoor unit to meet the noise and vibration requirements.
- 9) The installation dimensions should meet the requirement covered in this manual and the outdoor unit must be fixed securely.
- 10) For the Free Match system, Do not install only one indoor unit for the outdoor unit.
- 11) The installation should be carried out by the professionally skilled personnel.

#### b. Installation of the Outdoor Unit

- 1) Outline dimension of the outdoor unit.

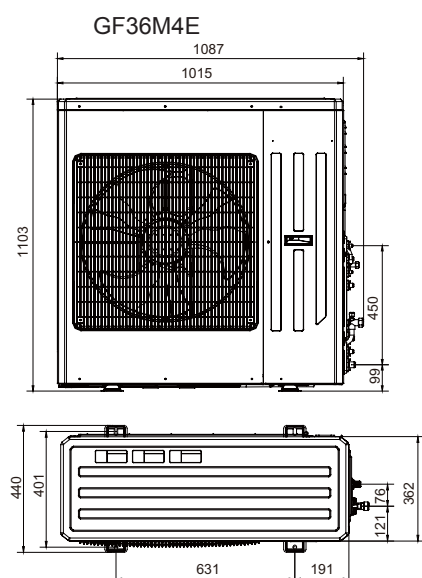


Fig.3

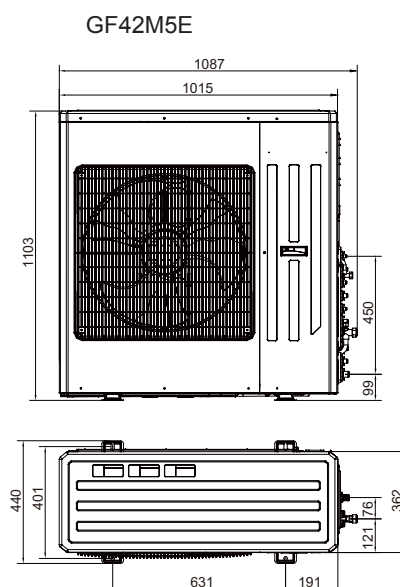


Fig.4

- 2) During the transportation of the outdoor unit, two lifting ropes long enough must be used in four directions and the included angle must be less than 40° prevent the center of unit deviating.
- 3) During the installation, M12 screws should be used to fix the support leg and base frame of the unit.
- 4) The unit should be installed on a concrete base frame with a height of 10cm.
- 5) The installation space of the unit should be as required in Fig.5.

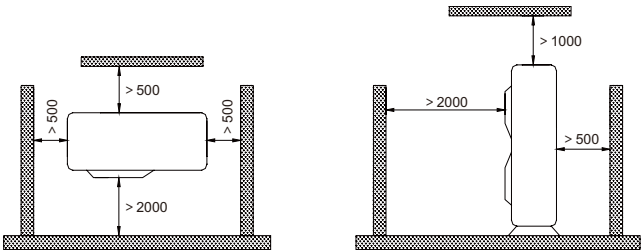


Fig.5

8.5.3 Connection between Indoor and Outdoor Units

a. Wiring of the Power Cord

**CAUTION!**

A breaker must be installed, capable of cutting off the power supply for the whole system.

- 1) Open the side plate.
  - 2) Let the power cord go through the rubber ring.
  - 3) Connect the power card to the terminals “L”, “N” and also the earthing bolt, and then connect the wiring terminals “N(1),2,3” of the indoor unit to those of the outdoor unit correspondingly.
  - 4) Fix the power cord with wire clips.
- b. Energy Level and Capacity Code of the Indoor and Outdoor Units

Table 2

|              | Energy Level | Capacity Code |
|--------------|--------------|---------------|
| Indoor Unit  | 09           | 25            |
|              | 12           | 35            |
|              | 18           | 50            |
|              | 21           | 60            |
|              | 24           | 71            |
| Outdoor Unit | 36           | 100           |
|              | 42           | 120           |

- 1) The outdoor unit with energy level 36 can drive up to four sets of indoor units, while the outdoor unit 42 can drive up to five.
  - 2) The sum of the capacity codes of the indoor units should be among 50%-150% of that of the outdoor unit.
- c. Allowable Length and Height Fall of the Refrigerant Pipe

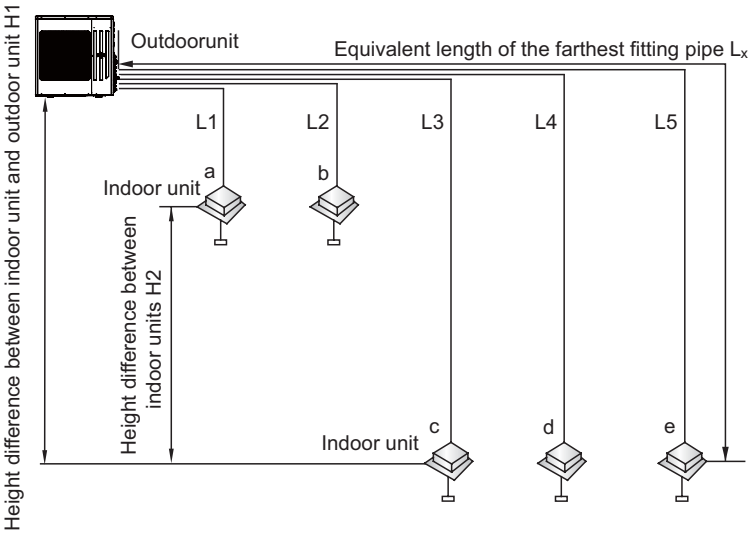


Table 3

|                                |                              | Allowable Length |     | Refrigerant Pipe  |                       |
|--------------------------------|------------------------------|------------------|-----|-------------------|-----------------------|
|                                |                              | 36               | 42  | 36                | 42                    |
| Total Length(m)                |                              | 70               | 80  | $L_1+L_2+L_3+L_4$ | $L_1+L_2+L_3+L_4+L_5$ |
| Max. Length for Single Unit(m) |                              | 20               | 25  | $L_x$             |                       |
| Max. installation altitude     | Outdoor unit and indoor unit | 15               | 15  | H1                |                       |
|                                | Indoor unit and indoor unit  | 7.5              | 7.5 | H2                |                       |

Table 4: Dimension of the Refrigerant Pipe of the Indoor Unit unit: mm

| Capacity Level of the Indoor Unit | Gas Pipe | Liquid Pipe |
|-----------------------------------|----------|-------------|
| 09,12                             | Φ9.52    | Φ6.35       |
| 18                                | Φ12.7    | Φ6.35       |
| 21,24                             | Φ15.9    | Φ9.52       |

## d. Piping between the Indoor and Outdoor Units

- 1) Refer to Fig.6 for the moments of torque for tightening screws.
- 2) Let the flare end of the copper pipe point at the screw and then tighten the screw by hand.
- 3) After that, tighten the screw by the torque wrench unit it clatters (as shown in Fig.6).
- 4) The bending degree of the pipe can not be too small; otherwise it will crack. And please use a pipe tube bender to bend the pipe.
- 5) Wrap the exposed refrigerant pipe and the joints by sponge and then tighten them with the plastic tape.

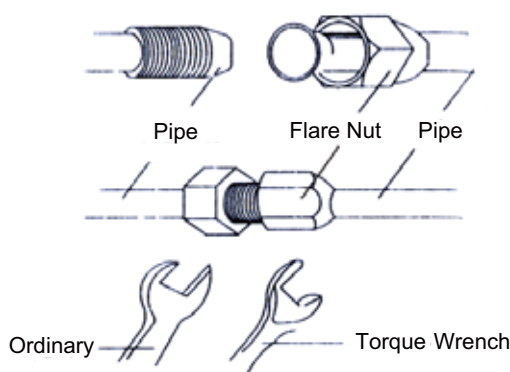
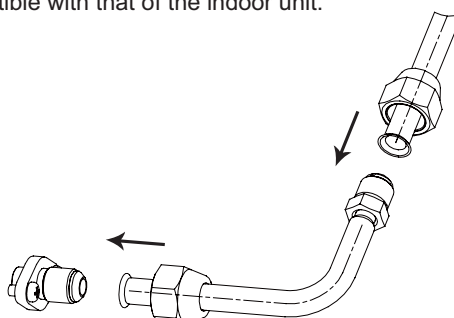


Fig.6

Table 5: Moments of Torque for Tightening Screws

| Diameter | Wall Thickness (mm) | Moment of Torque |
|----------|---------------------|------------------|
| Φ6.35mm  | ≥0.5                | 15-30(N·m)       |
| Φ9.52mm  | ≥0.71               | 30-40(N·m)       |
| Φ12.7mm  | ≥1                  | 45-50(N·m)       |
| Φ15.9mm  | ≥1                  | 60-65(N·m)       |

If the specification of the outdoor unit pipe joint does not conform to that of the indoor unit, then the joint specification of the outlet pipe of the indoor unit takes precedence. A reducing nipple shall be installed at the joint of the outdoor unit so as to make the joint of the outdoor unit compatible with that of the indoor unit.





**⚠CAUTION!**

① During the connection of the indoor unit and the refrigerant pipe, never pull any joints of the indoor unit by force; otherwise the capillary pipe or other pipe may crack, which then would result in leakage.

② The refrigerant pipe should be supported by brackets, that is, don't let the unit withstand the weight of it.

**⚠CAUTION!**

For the Free match system, each pipe should be labeled to tell which system it belongs to avoid mistaken inaccurate piping.

e. Installation of the Protection Layer of the Refrigerant Pipe

1) The refrigerant pipe should be insulated by the insulating material and plastic tape in order to prevent condensation and water leakage.

2) The joints of the indoor unit should be wrapped with the insulating material and no gap is allowed on the joint of the indoor unit, as shown in Fig.7.

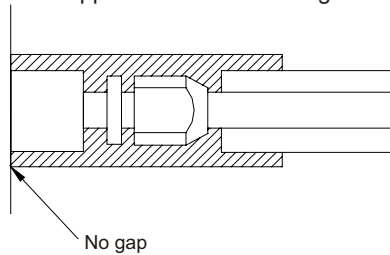


Fig.7

**⚠CAUTION!**

After the pipe is protected well enough, never bend it to form a small angle; otherwise it would crack or break.

f. Wrapping the Pipe with Tape

1) Bundle the refrigerant pipe and electric wire together with tape, and separate them from the drain pipe to prevent the condensate water overflowing.

2) Wrap the pipe from the bottom of the outdoor unit to the top of the pipe where it enters the wall. During the wrapping, the later circle should cover half of the former one.

3) Fix the wrapped pipe on the wall with clamps.

**⚠CAUTION!**

① Do not wrap the pipe too tightly; otherwise the insulation effect would be weakened. Additionally, make sure the drain hose is separated from the pipe.

② After that, fill the hole on the wall with sealing material to prevent wind and rain coming into the room.

### 8.5.4 Refrigerant Charging and Trial Running

a. Refrigerant Charging

1) The refrigerant has been charged into the outdoor unit before shipment, while additional refrigerant still need be charged into the refrigerant pipe during the field installation.

2) Check if the liquid valve and the gas valve of the outdoor unit are closed fully.

3) As shown in the following figure (Fig.8), expel the gas inside the indoor unit and refrigerant pipe out by the vacuum pump. (2 purposes of outdoor unit's main valve: 1. vacuum pumping 2. Control the on /off of outdoor unit refrigerant)

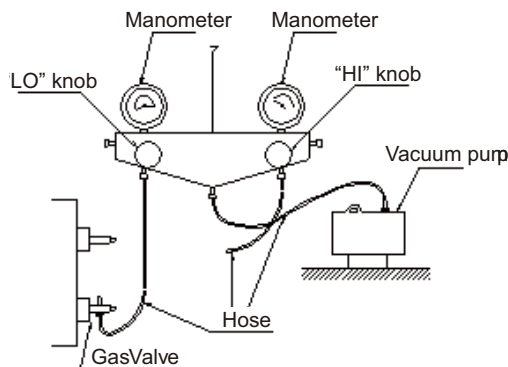


Fig.8

4) Make sure the system has no leakage. When compressor is not working, fill a set amount of R410a refrigerant into the unit through outdoor unit's liquid valve. If the inner tube pressure rises and the set amount of refrigerant can't be filled inside quickly, you can turn on the unit to make it start cooling, then fill the refrigerant inside through outdoor unit's gas valve.

a. **Calculation of the Additional Refrigerant Charging**

1) Refrigerant Charge in the Outdoor Unit before Shipment

Table 6

| Model                   | GF36M4E | GF42M5E |
|-------------------------|---------|---------|
| Refrigerant Charge (kg) | 4.2     | 4.8     |

Notes:

① The refrigerant charge mentioned in the table above is not included those charged additionally in the indoor unit and the refrigerant pipe.

② The amount of the additional refrigerant charge is dependent on the diameter and length of the liquid refrigerant pipe which is decided by the actual yield installation requirement.

③ Record the additional refrigerant charge for future maintenance.

2) Calculation of the Additional Refrigerant Charge

If the total refrigerant pipe length (liquid pipe) is smaller than that listed in the table below, no additional refrigerant will be charged.

Table 7

| Model   | Total Liquid Pipe Length (a+b+c+d+e) |
|---------|--------------------------------------|
| GF36M4E | ≤40m                                 |
| GF42M5E | ≤50m                                 |

Additional Refrigerant Charge<sub>2</sub>=ΣExtra Liquid Pipe Length×22g/m(liquid pipe 1/4").

Note: if the total refrigerant pipe length is larger than that listed in the table above, the additional refrigerant for the extra length of the pipe needs to be charged as per 22g/m.

3) Example : GF42M5E

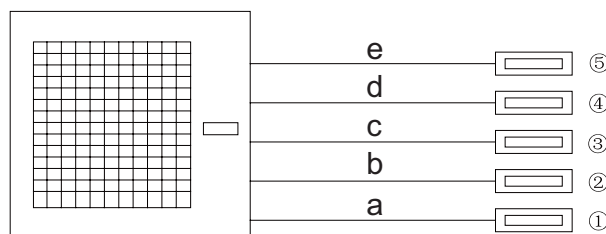


Fig.9

Table 9 Liquid Refrigerant Pipe

| Serial No. | e     | d     | c     | b     | a     |
|------------|-------|-------|-------|-------|-------|
| Diameter   | Φ6.35 | Φ6.35 | Φ6.35 | Φ6.35 | Φ9.52 |
| Length     | 20m   | 20m   | 15m   | 5m    | 5m    |

The total length of each liquid refrigerant pipe is: e+d+c+b+a=20+20+15+5+5=65m. Thus, the minimum additional refrigerant charge=(65-50)×0.022=0.33kg (Note: no additional refrigerant is needed for the liquid pipe within 50m).

## 4) Additional Refrigerant Charge Record

Table 10 Indoor Unit

| No.   | Indoor Unit Model | Additional Refrigerant Charge(kg) |
|-------|-------------------|-----------------------------------|
| 1     |                   |                                   |
| 2     |                   |                                   |
| ..... |                   |                                   |
| N     |                   |                                   |
| Total |                   |                                   |

Table 11 Refrigerant Pipe

| Diameter | Total Length(m) | Additional Refrigerant Charge(kg) |
|----------|-----------------|-----------------------------------|
| Φ15.9    |                 |                                   |
| Φ12.7    |                 |                                   |
| Φ9.52    |                 |                                   |
| Φ6.35    |                 |                                   |
| Total    |                 |                                   |

## c. Items to be checked after the Installation

Table 12

| Items to be Checked   | Possible Errors  | Check Results |
|---|--|---------------|
| Has each part and component of the unit been installed securely?                  | The unit may fall off, vibrate or generate noise.            |               |
| Has the gas leakage test been taken?  | The cooling (heating) capacity may be poor.                  |               |
| Is the thermal insulation sufficient?   | Dews and water drops may be generated.                       |               |
| Does the drainage go well?  | Dews and water drops may be generated.                       |               |
| Is the actual power voltage in line with the value marked on the nameplate?       | The unit may break down or some components may be burnt out. |               |
| Are the wiring and the piping correct?  | The unit may break down or some components may be burnt out. |               |
| Has the unit been earthed reliably?   | There may be a danger of electric shock.                     |               |
| Does the wire meet the regulated requirement?                                     | The unit may break down or the component may be burnt out.   |               |
| Is there any obstacle at the air inlet/outlet of the indoor/outdoor unit?         | The cooling (heating) capacity may be poor                   |               |
| Have the length of the refrigerant pipe and the refrigerant charge been recorded? | It may be hard to know the exact refrigerant charge.         |               |

## d. Trial Running

## 1) Check before the Trial Running

- ① Check if the appearance of the unit and the piping system are damaged during the transportation.
- ② Check if the wiring terminals of the electronic component are secure.
- ③ Check if the rotation direction of the fan motor is right.
- ④ Check if all valves in the system are fully opened.

## 2) Trial Running

- ① The trial running should be carried out by the professionally skilled personnel on the premise that all items listed above are in normal conditions.
- ② Let the unit energized and switch the wired controller or the remoter controller to "ON".
- ③ The fan motor and compressor of the outdoor unit will run automatically in one minute.
- ④ If there is some unusual sound after the compressor is started, turn off the unit for an immediate check.

## 9. Maintenance

### 9.1 Precautions before Performing Inspection or Repair

There are high-capacity electrolytic capacitors on the outdoor mainboard. Thus, even the power is cut off, there is high voltage inside the capacitors and it needs more than 20min to reduce the voltage to safety value. Touching the electrolytic capacitor within 20min after cutting the power will cause electric shock. If maintenance is needed, follow the steps below to discharge electricity of electrolytic capacitor after power off.

(1) Open the top cover of outdoor unit and then remove the cover of electric box.

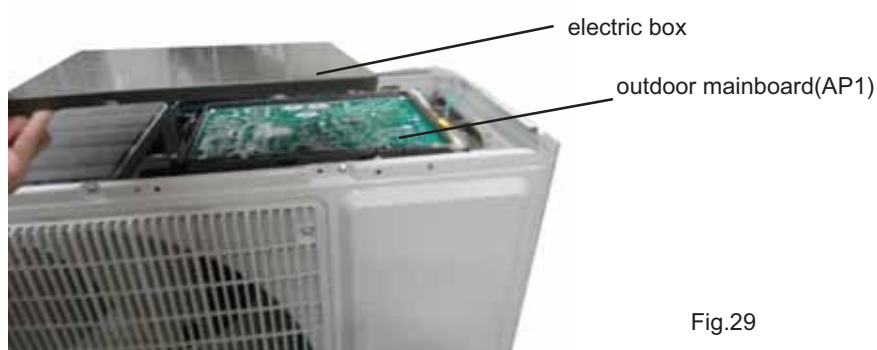


Fig.29

(2) As shown in the fig below, connect the plug of discharge resistance (about 100ohm, 20W) (if there is no discharge resistance, you can use the plug of soldering iron) to point A and B of electrolytic capacitor. There will be sparks when touching them. Press them forcibly for 30s to discharge electricity of electrolytic capacitor.

outdoor mainboard(AP1)



Fig.30

(3) After finish discharging electricity, measure the voltage between point A and B with universal meter to make sure if electricity discharging is completed, in order to prevent electric shock. If the voltage between the two points is below 20V, you can perform maintenance safely.

## 9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

### 1. Requirement of malfunction display

When several malfunctions happen at the same time, malfunction codes will be displayed circularly.

### 2. Malfunction display method

(1) Hardware malfunction: it will be displayed immediately, please refer to "Malfunction status sheet";

(2) Operation status: it will be displayed immediately, please refer to "Malfunction status sheet";

(3) Other malfunction: It will be displayed after the compressor has been stopped for 200s, please refer to "Malfunction status sheet".

(Note: when the compressor starts up again, malfunction display waiting time (200s) will be cleared.)

### 3. Malfunction display control

Indoor unit displays malfunction code as shown in the sheet below. ODU communication light will be off for 1s and then blink for 1s circularly.

### 4. Viewing malfunction code through remote controller

Enter viewing malfunction code: pressing light button for 6 times within 3S to view malfunction code;

Exit viewing malfunction code: pressing light button for 6 times within 3S or after the malfunction code is displayed for 5min.

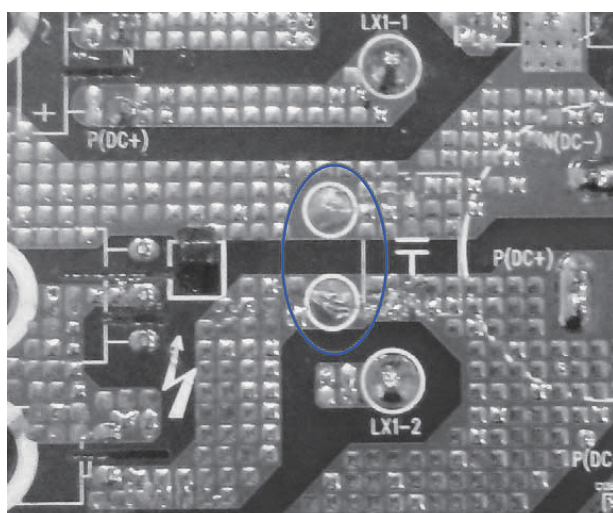
| Malfunction status sheet   |  |            |
|--|--|------------|
| Malfunction name   | Malfunction type   | Nixie tube |
| Zero cross detection circuit malfunction   | Hardware malfunction   | U8         |
| Malfunction protection of jumper cap   | Hardware malfunction   | C5         |
| Feedback of without IDU motor  | Hardware malfunction   | H6         |
| Indoor ambient temperature sensor is open/short circuited                                | Hardware malfunction   | F1         |
| Indoor evaporator temperature sensor is open/short circuited                             | Hardware malfunction   | F2         |
| Liquid valve temperature sensor is open/short circuited                                  | Hardware malfunction   | b5         |
| Gas valve temperature sensor is open/short circuited                                     | Hardware malfunction   | b7         |
| Modular temperature sensor is open/short circuited                                       | Hardware malfunction   | P7         |
| Outdoor ambient temperature sensor is open/short circuited                               | Hardware malfunction   | F4         |
| Outdoor condenser inlet pipe temperature sensor is open/short circuited (commercial)     | Hardware malfunction   | A5         |
| Outdoor condenser middle pipe temperature sensor is open/short circuited                 | Hardware malfunction   | F4         |
| Outdoor condenser outlet pipe temperature sensor is open/short circuited (commercial)    | Hardware malfunction   | A7         |
| Outdoor discharge temperature sensor is open/short circuited                             | Hardware malfunction   | F5         |
| Communication malfunction  | Hardware malfunction   | E6         |
| Malfunction of phase current detection circuit for compressor                            | Hardware malfunction   | U1         |
| Compressor demagnetization protection  | Viewing malfunction code through remote controller within 200s; displayed directly on nixietube after 200s | HE         |
| Malfunction of voltage dropping for DC bus-bar   |  | U3         |
| Module high temperature protection   |  | P8         |
| Refrigerant lacking or blockage protection of system (not available for residential ODU) |  | F0         |
| Charging malfunction of capacitor  | Hardware malfunction   | PU         |
| High pressure protection of system   | Hardware malfunction   | E1         |
| Low pressure protection of system (reserved)   | Hardware malfunction   | E3         |

|   |  |    |
|---|--|----|
| Compressor overload protection  | Viewing malfunction code through remote controller within 200s; displayed directly on nixietube after 200s | H3 |
| Indoor unit and outdoor unit do not match   | Hardware malfunction   | LP |
| Malfunction of memory chip  | Hardware malfunction   | EE |
| Wrong connection of communication wire or malfunction of electronic expansion valve                     | Hardware malfunction   | dn |
| Malfunction of complete units current detection   | Hardware malfunction   | U5 |
| Malfunction protection of outdoor fan 1   | Hardware malfunction   | L3 |
| Detection status of wrong connection of communication wire or malfunction of electronic expansion valve | Operation status   | dd |
| Mode conflict   | Operation status   | E7 |
| Refrigerant recycling mode  | Operation status   | Fo |
| X-fan   | Operation status   | AL |
| Defrosting or oil return in heating mode  | Operation status   | H1 |
| Start failure of compressor   | Viewing malfunction code through remote controller within 200s; displayed directly on nixietube after 200s | Lc |
| High discharge temperature protection of compressor   |  | E4 |
| Overload protection   |  | E8 |
| Whole unit overcurrent protection   |  | E5 |
| Compressor phase current protection   |  | P5 |
| Compressor desynchronizing  |  | H7 |
| Compressor phase-lacking/phase-inverse protection   |  | Ld |
| IPM modular protection  |  | H5 |
| DC bus-bar low voltage protection   |  | PL |
| DC bus-bar high voltage protection  |  | PH |
| PFC protection  |  | HC |
| The four-way valve is abnormal  |  | U7 |

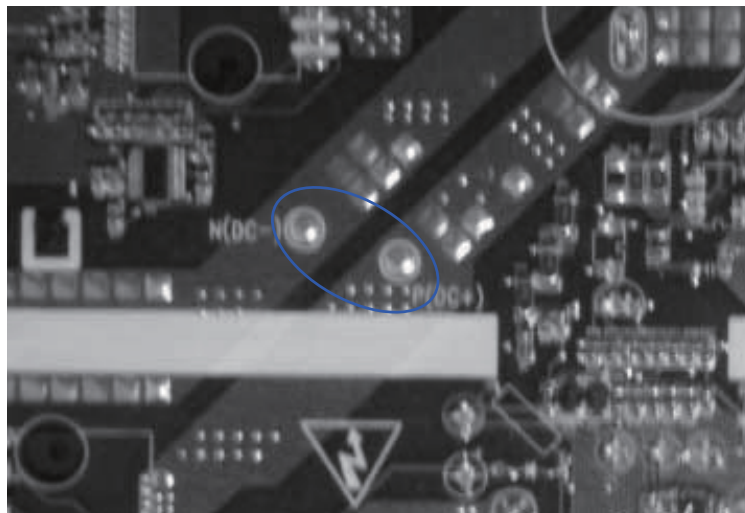
### 9.3 Malfunction Checking and Elimination

Note: discharge the position in below pictures with discharge resistance after open the top cover and check if the voltage is below 20V with universal meter, then begin to check.

14/18K:



24/28K:



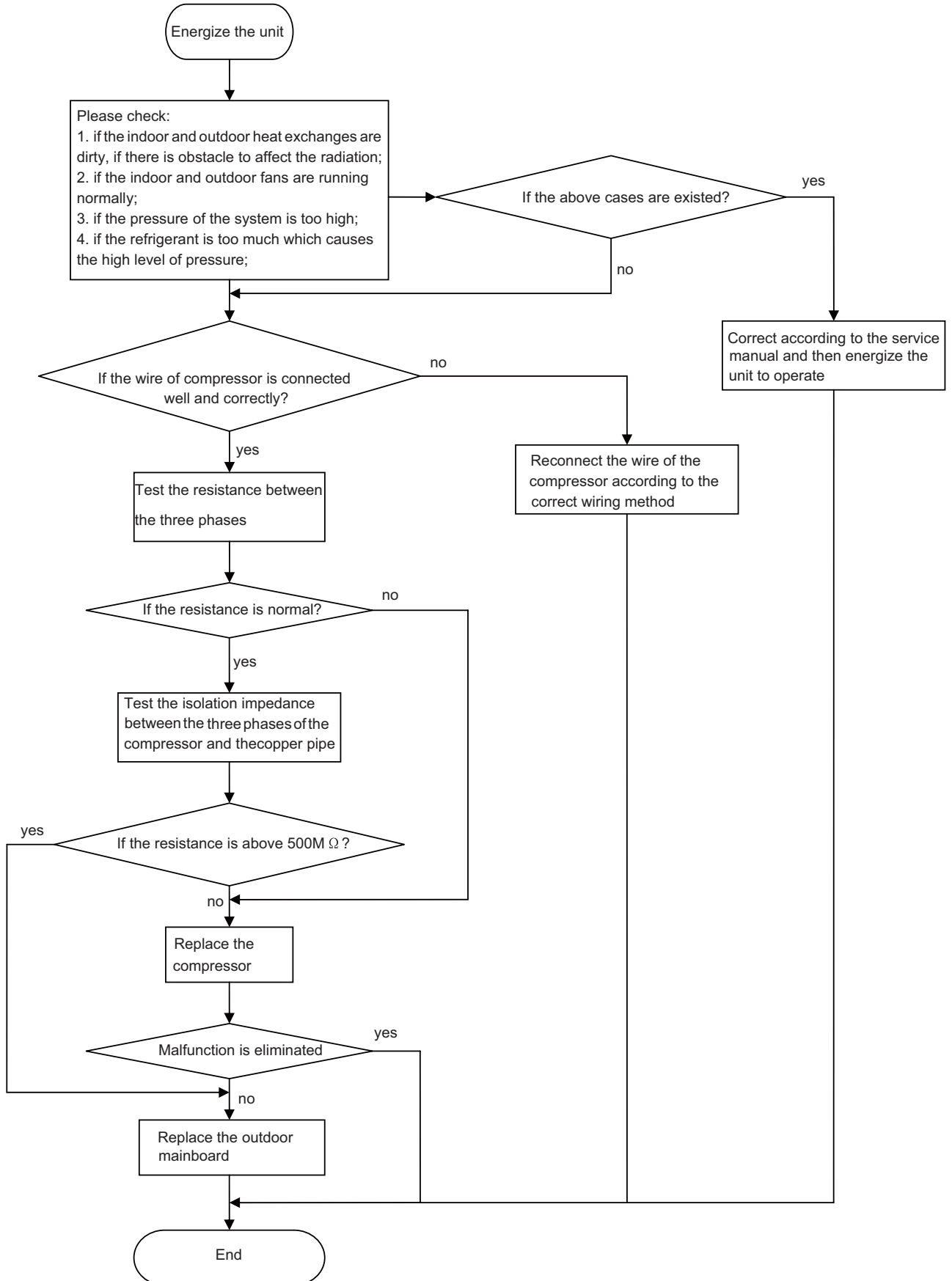
1 IPM protection malfunction:

Main checking point:

- If the input voltage of the unit is within normal range?
- If the connection wire of compressor is connected well? Is it loose? If the connection sequence is correct?

- If the resistance of compressor coil is normal? If the isolation of compressor coil with copper pipe is good?
- If the unit is overloaded? If the heat radiation of the unit is good?
- If the refrigerant charge is suitable?

Flow chart:





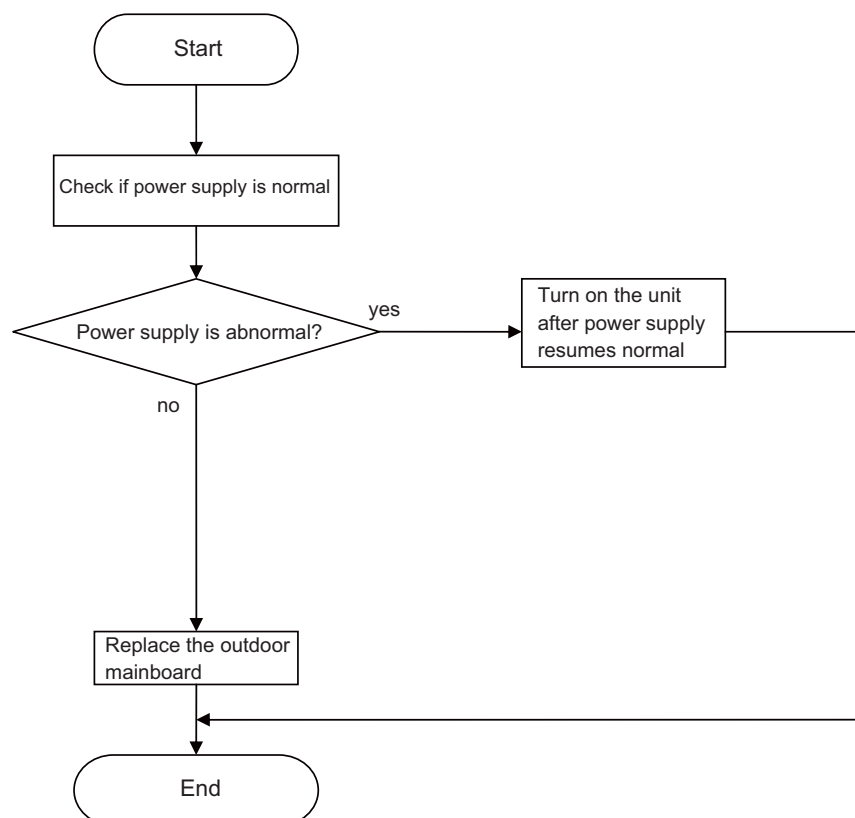
## 2. PFC protection malfunction, capacity charging malfunction

Main checking points:

- If the wiring of the induction is connected well and if the induction is broken;
- If the mainboard is broken;

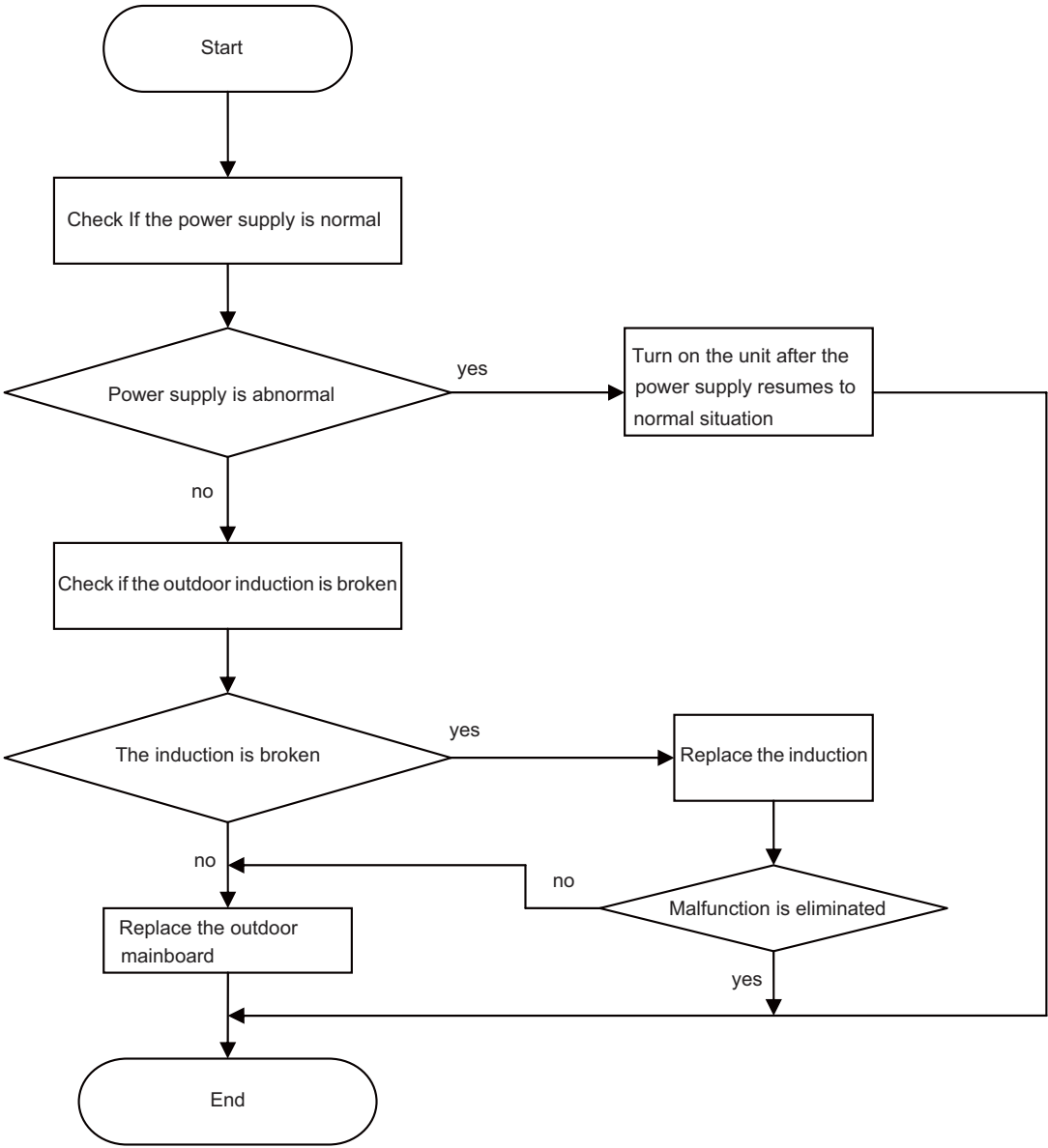
Flow chart:

For 18K





For 24/28K

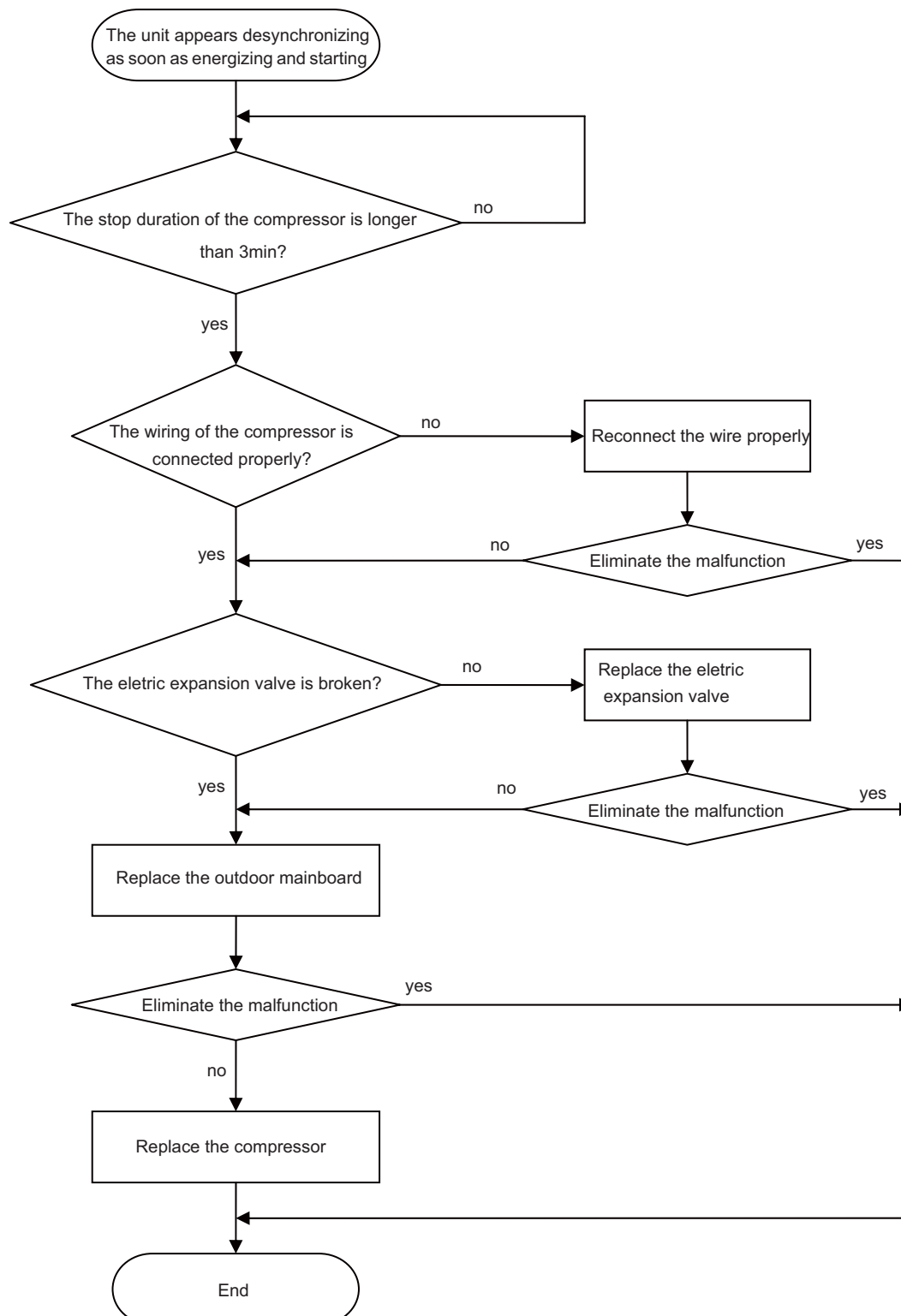


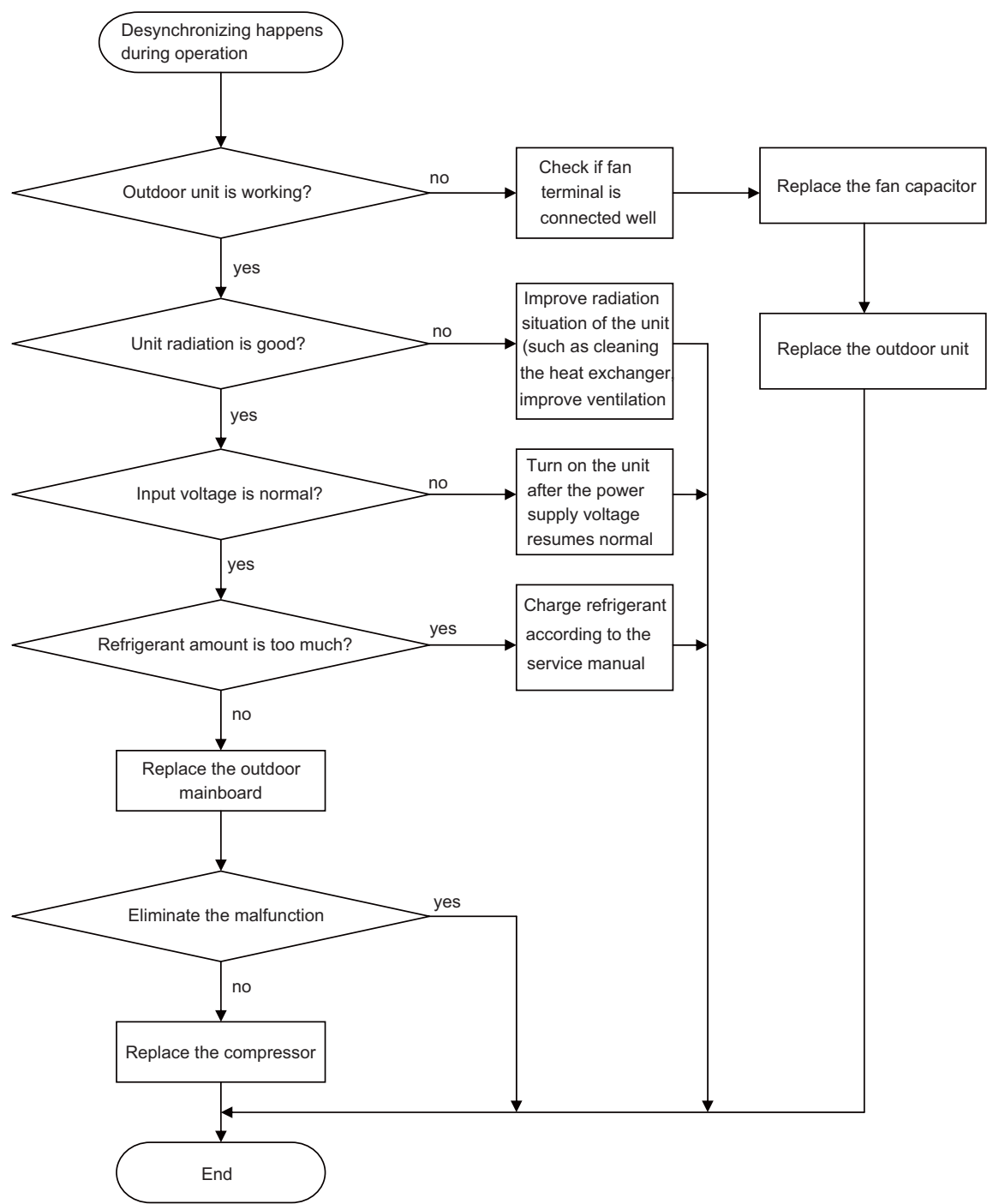
## 3. Compressor desynchronizing malfunction

Main checking points:

- If the pressure of the system is too high;
- If the electric expansion valve is working normally or it is broken;
- If the radiation of the unit is good;

Flow chart:



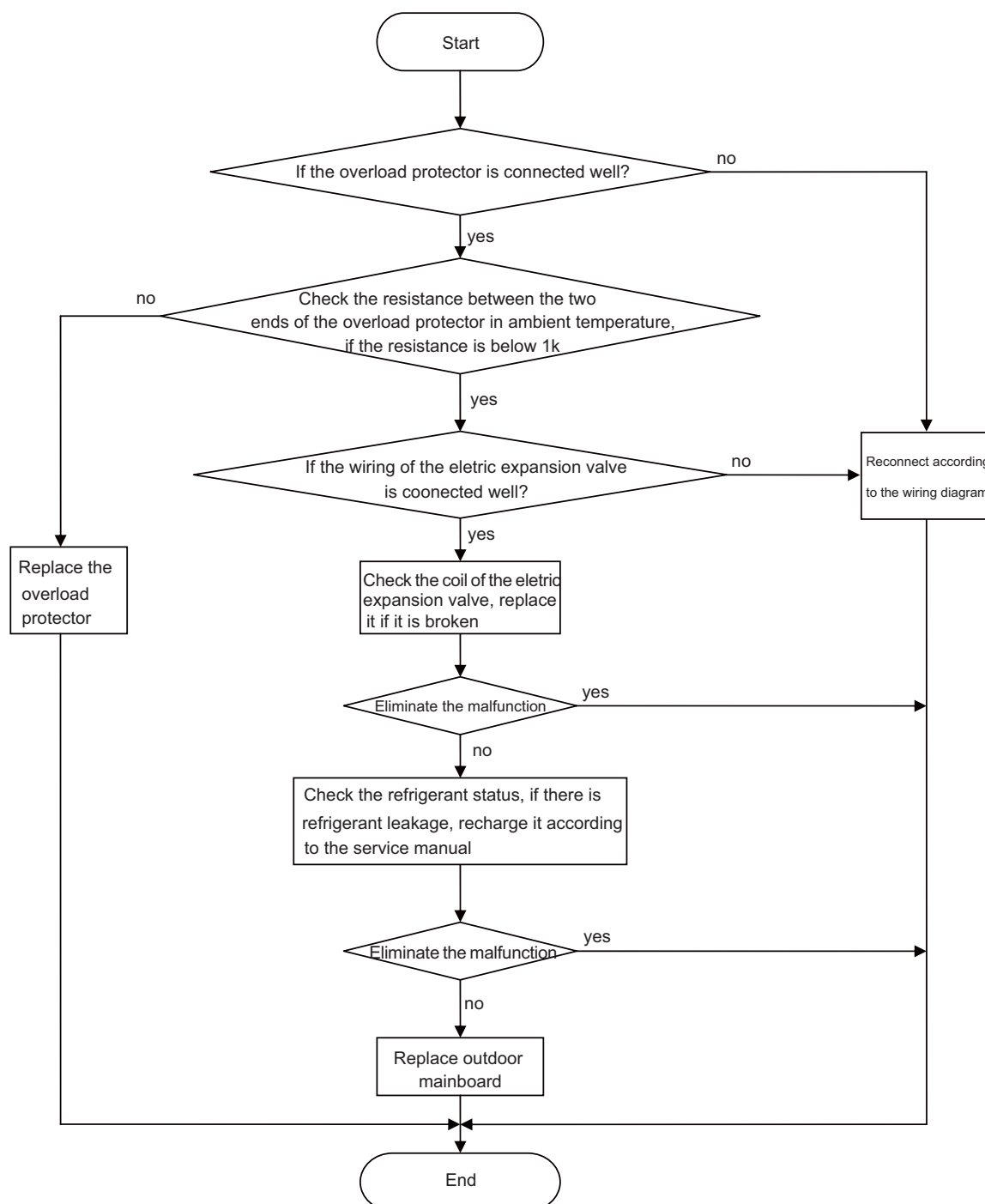


## 4. Compressor overload, discharge protection malfunction

Main checking points:

- If the electric expansion valve is connected well or it is broken;
- If there is refrigerant leakage;
- If the overload protector is broken;

Flow chart:



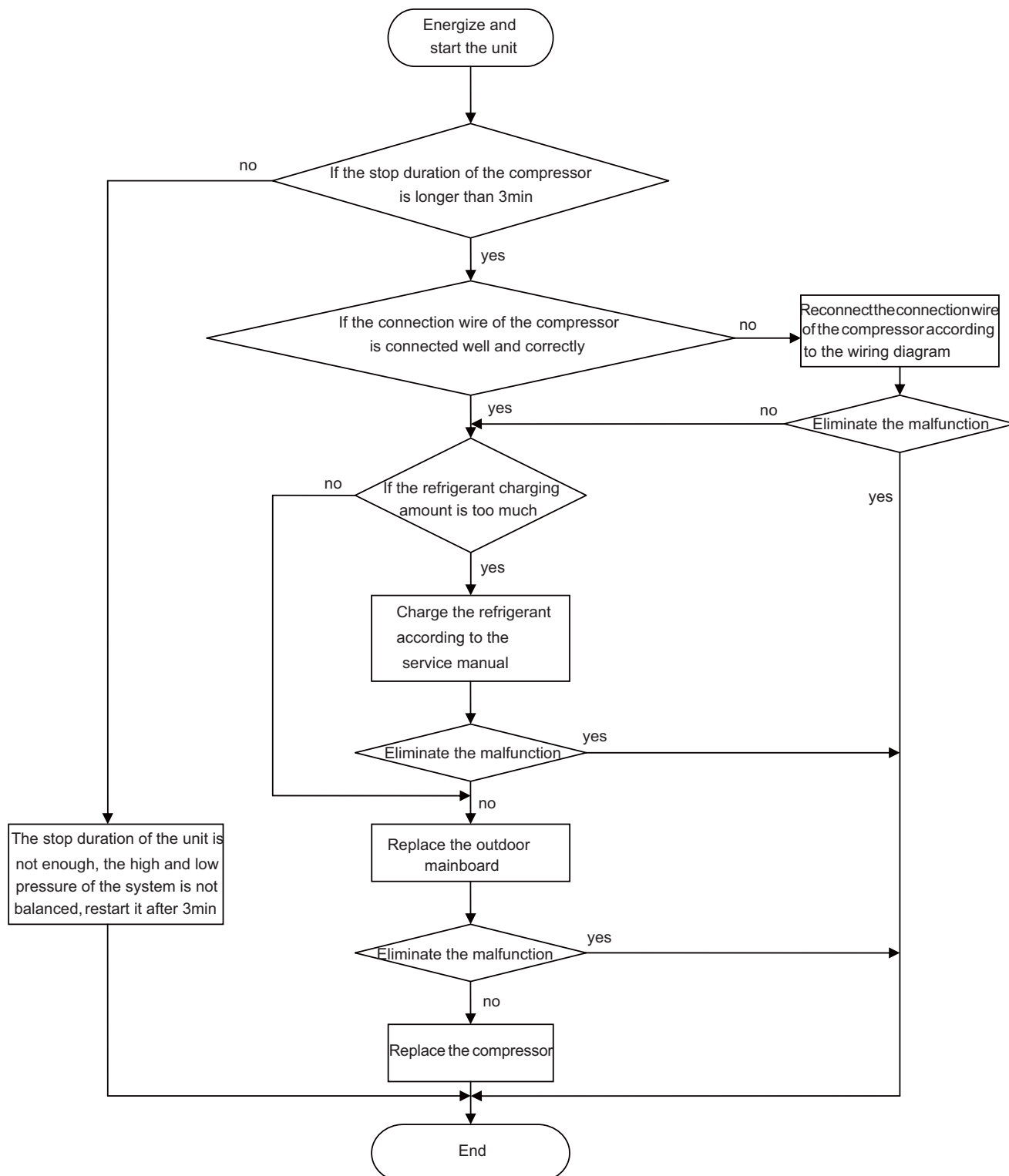
Note: the detection method of the coil of the electric expansion valve: there is five pieces of coil of the electric expansion valve, the resistance of one of them (the leftmost or the rightmost one) is almost the same as the resistance of other terminal (within 100  $\Omega$ ). Judge the condition of the electronic expansion valve through detecting these resistance.

## 5. Start failure/malfunction

Main checking points:

- If the connection wire of the compressor is connected properly;
- If the stop duration of the compressor is sufficient;
- If the compressor is broken;
- If the refrigerant charging amount is too much;

Flow chart:

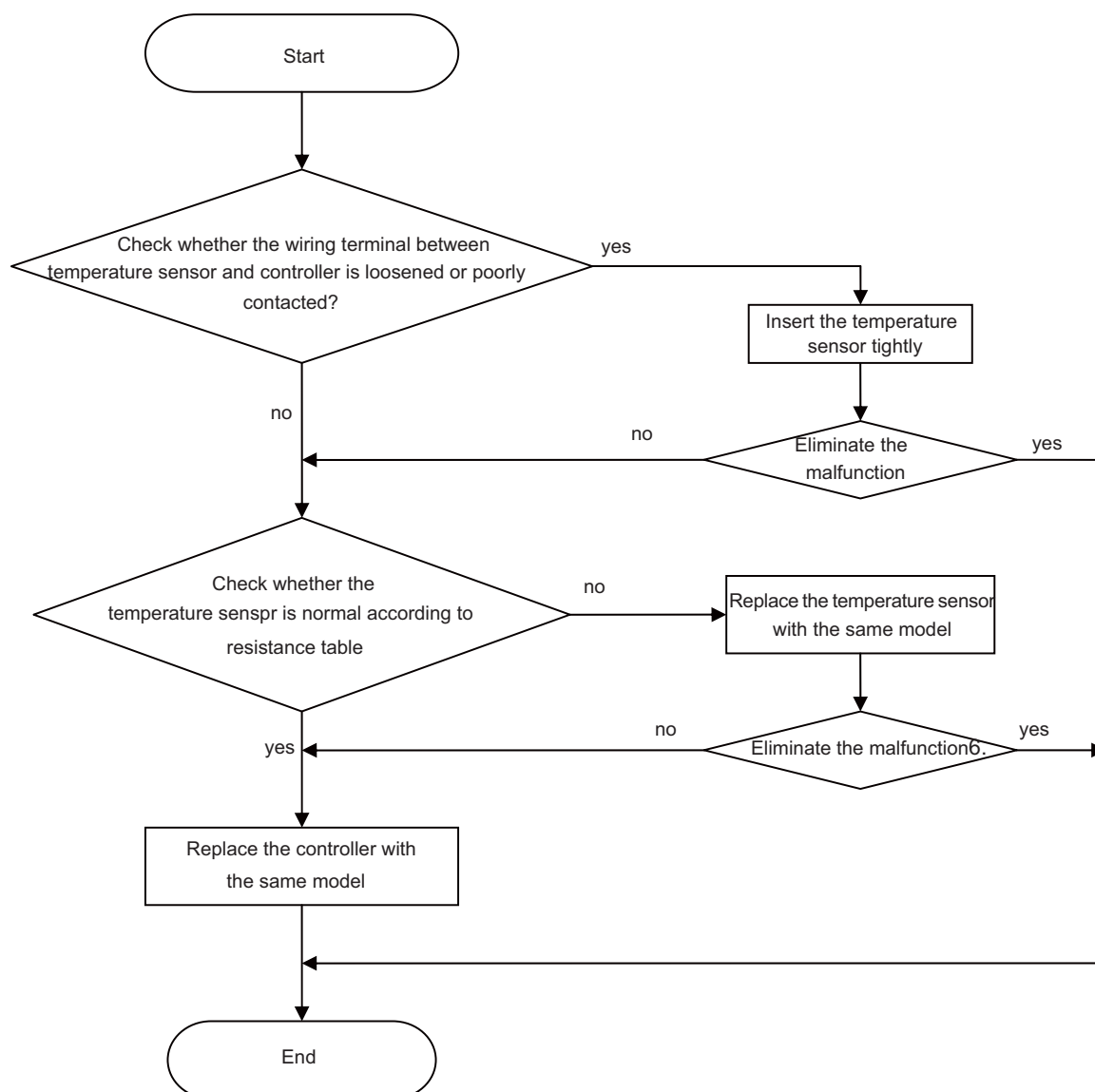


## 6. Temperature sensor malfunction

Main checking points:

- If the temperature sensor is damaged or broken
- If the terminal of the temperature sensor is loosened or not connected;
- If the mainboard is broken;

Flow chart:

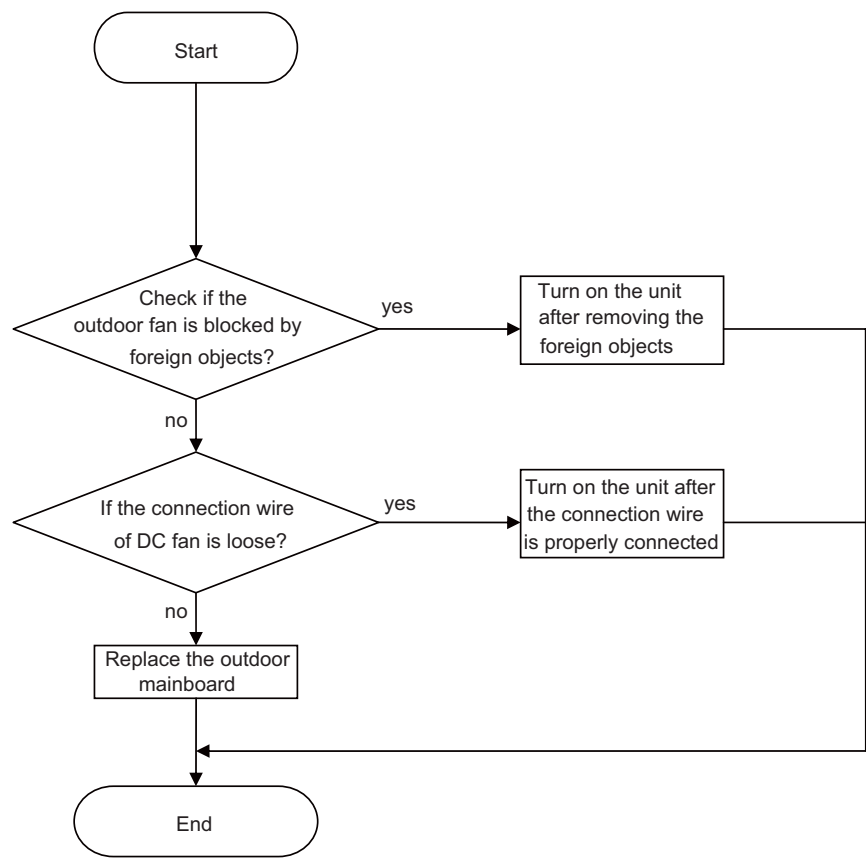


7. DC fan malfunction

Main checking points:

- If the outdoor fan is blocked by foreign objects;
- The connection wire of DC fan is connected reliably? If it is loose?

Flow chart:

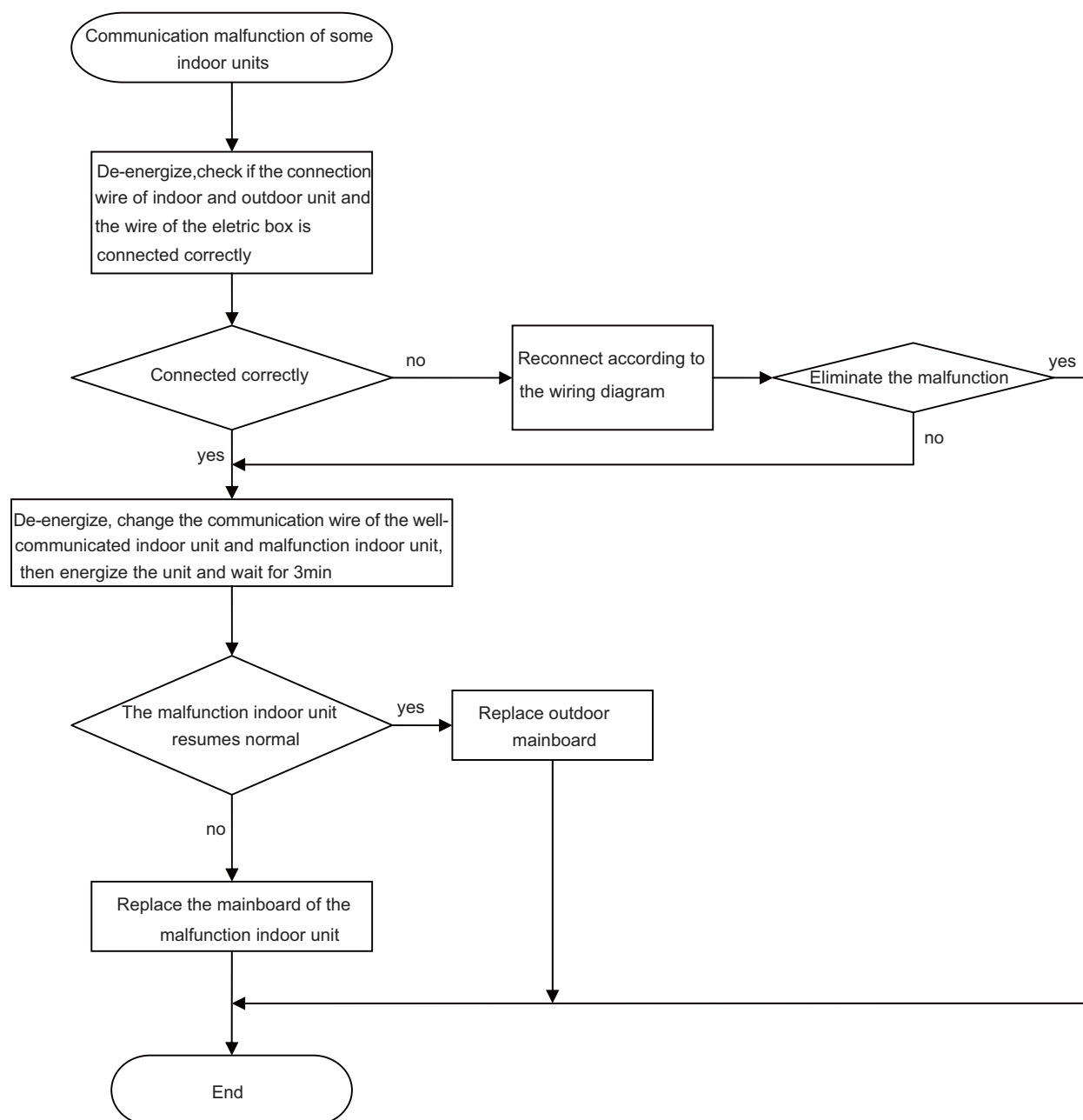


## 8. Communication malfunction

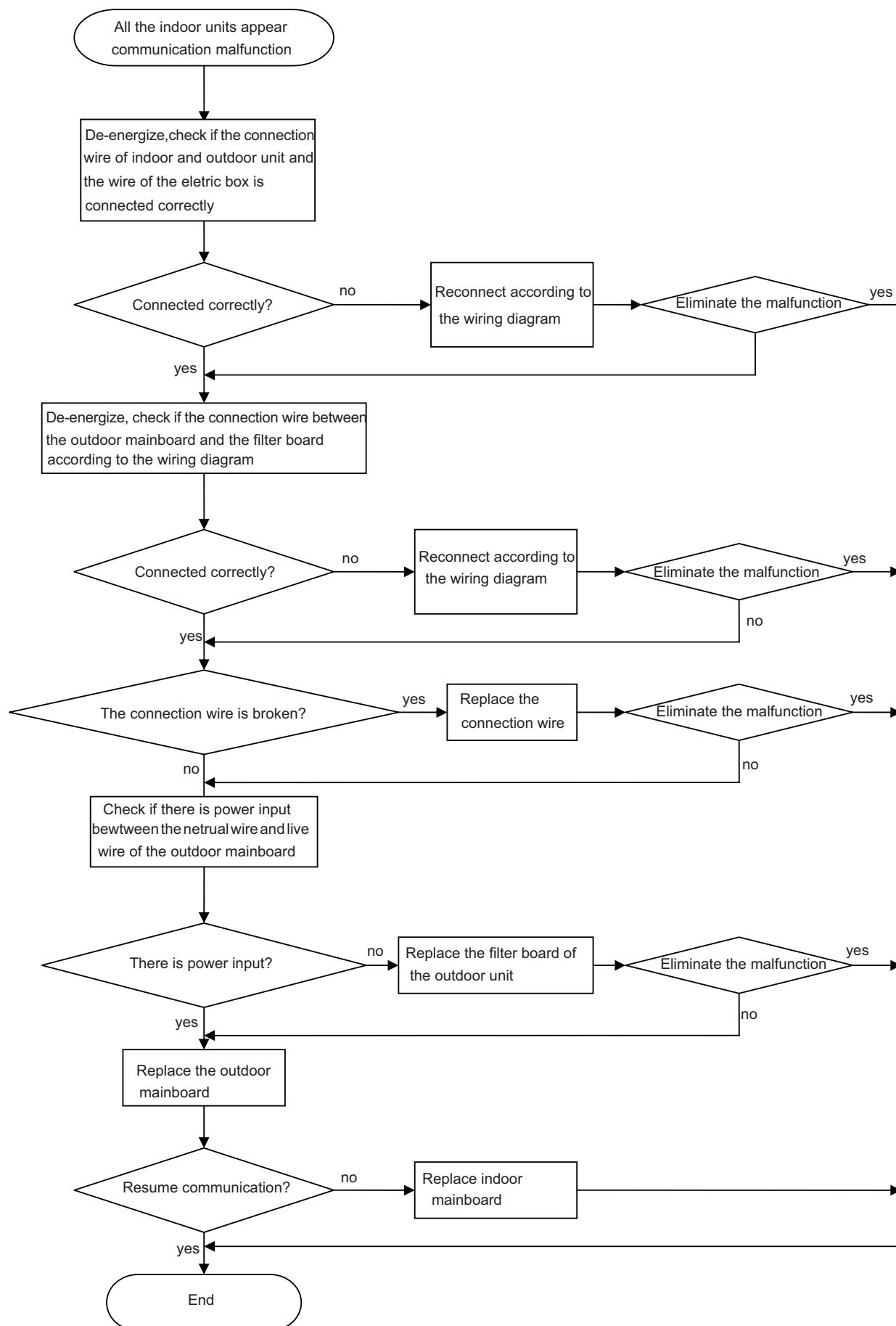
Main checking points:

- If the connection wire between the indoor unit and outdoor unit is connected well, if the wires inside the unit is connected well;
- If the indoor mainboard or outdoor main board is broken;

Flow chart:





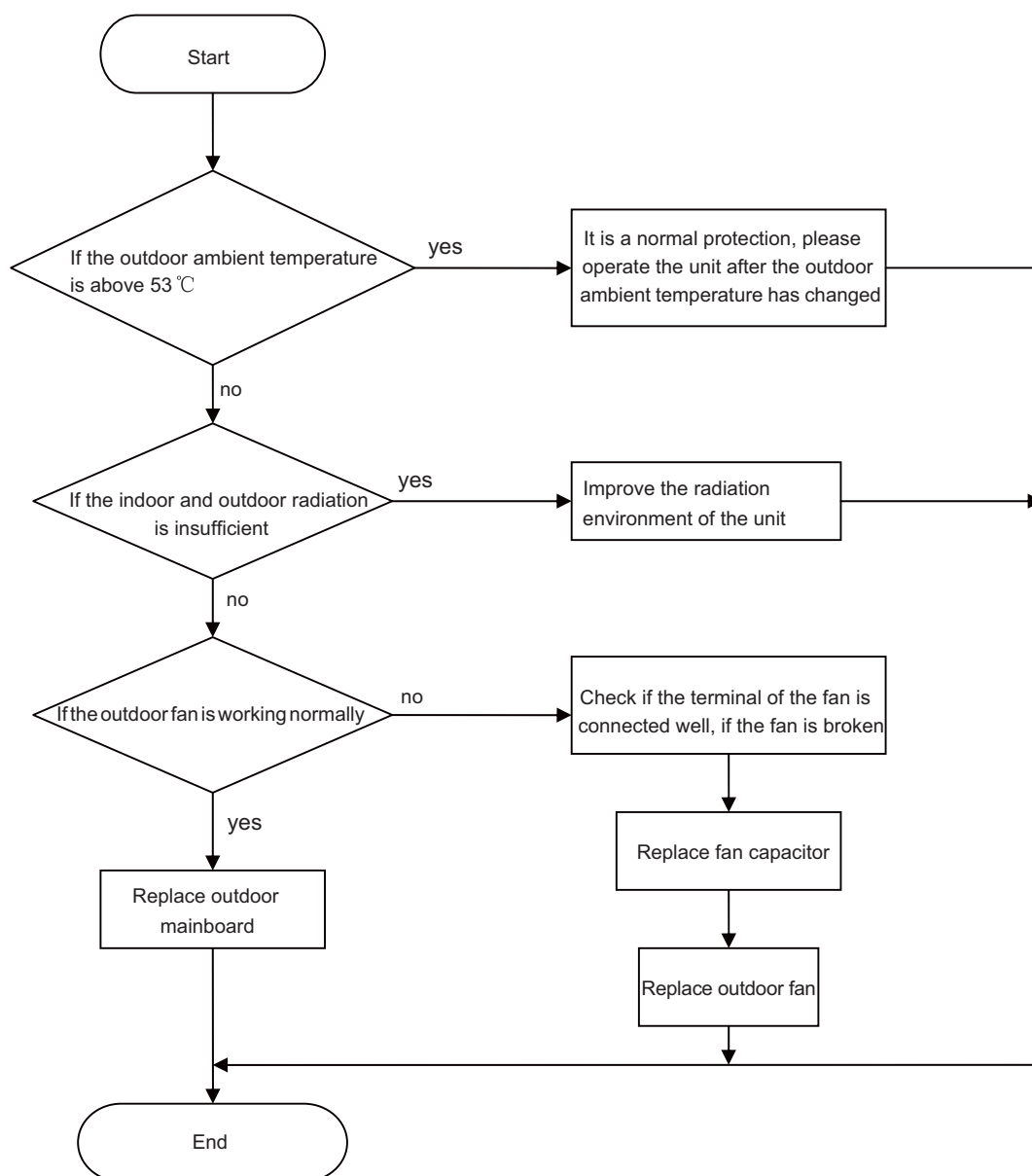


## 9. Anti-high temperature and overload malfunction

Main checking points:

- If the outdoor ambient temperature is within the normal range;
- If the indoor fan and outdoor fan are running normally;
- If the indoor and outdoor radiation environment is good;

Flow chart:



## Models:36K and 42K

## 1. Trouble Table

**⚠ WARNING!**

a. In the event of abnormal conditions (like, stinky smell), please shut off the main power supply immediately and then contact Vidicon appointed service center; otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc.

b. Do not repair the air conditioning personally but instead contact the professionally skilled personnel at the Vidicon appointed service center, as the incorrect repair would cause electric shock or fire hazard etc.

## 1.1 Check before Contacting Service Center

Please check the following items before contacting the maintenance serviceman.

| Conditions                          | Causes  | Corrective Actions                                    |
|-------------------------------------|---|---|
| The unit does not run               | Broken fuse or opened breaker                           | Change the fuse or close the breaker                  |
|                                     | Power off   | Restart the unit when power on                        |
|                                     | Loosened power supply plug.                             | Plug the power supply properly.                       |
|                                     | Insufficient batteries voltage of the remote controller | Change new batteries                                  |
|                                     | Remoter controller out of the control scope             | Keep the control distance within 8 meters.            |
| The unit stops soon after it starts | Clogged inlet/outlet of the indoor/outdoor unit         | Clear the obstacle                                    |
| Cooling/Heating is abnormal         | Clogged inlet/outlet of the indoor/outdoor unit         | Clear the obstacle                                    |
|                                     | Improperly set temperature                              | Adjust the setting of the remote or wired controller. |
|                                     | Too low set fan speed                                   | Adjust the setting of the remote or wired controller. |
|                                     | Improper airflow direction                              | Adjust the setting of the remote or wired controller. |
|                                     | Opened door and window                                  | Close the door and window                             |
|                                     | Direct sunlight   | Hang a curtain or blinds over the window.             |
|                                     | Too much people in the room                             |   |
|                                     | Too much heat sources in the room                       | Reduce the heat sources                               |
|                                     | Dirty filter screen                                     | Clean the filter screen                               |

Table 1

Note: If the air conditioner still runs abnormally after the above check and handling, please contact the maintenance serviceman at the local appointed service center and also give a description of the error occurred as well as the model of the unit


## 1.2 Problem Handling

The conditions listed below are not classified into errors.

| Conditions               | Causes   |
|--------------------------|--|
| The unit does not run    | When restart the unit soon after it is stopped.              |
|                          | As soon as power is on.                                      |
| The unit blows out mist  | When the cooling operation starts.                           |
| The unit generates noise | The unit "clatters" as soon as it starts running.            |
|                          | The unit "swishes" during the cooling operation.             |
|                          | The unit "swishes" when it is started or stopped.            |
|                          | The unit "swishes" when it is in and after the running.      |
|                          | The unit "squeaks" when it is in and after the running.      |
| The unit blows out dust. | When the unit restarts after it is not used for a long time. |
| The unit emits odors.    | When the unit is running.                                    |

Table 2

## 1.3 Error Description

If some error occurs when the unit is running, the error code will be displayed on the wired controller and the main board  of the outdoor unit. See the table below for more details about the meaning of each error.


| Error Item   | Outdoor Unit 88 Display | Indicating LED Flashing Times |                |                | 88 Display | Wired Controller Display  | Error Type       |
|--|-------------------------|-------------------------------|----------------|----------------|------------|---|------------------|
|  |                         | Running LED                   | Cooling LED    | Heating LED    |            |   |                  |
| High Pressure Protection   | E1                      | Flash once                    | /              | /              | E1         | E1  | Outdoor          |
| Shutdown for Whole Unit Anti-Freeze Protection                         | E2                      | Flash twice                   | /              | /              | E2         | E2  | System Error     |
| Low Pressure Protection  | E3                      | Flash 3 times                 | /              | /              | E3         | E3  | Outdoor          |
| High Discharge Temp Protection   | E4                      | Flash 4 times                 | /              | /              | E4         | E4  | Outdoor          |
| Communication Error  | E6                      | Flash 6 times                 | /              | /              | E6         | E6  | Outdoor & Indoor |
| Indoor Unit Water Full Error   | E9                      | Flash 9 times                 | /              | /              | E9         | E9  | Indoor           |
| Refrigerant Recovery Mode  | Fo                      | Quick Flashing                | Quick Flashing | /              | Fo         | Fo  | Special Mode     |
| Outdoor Ambient Temp Sensor Error                                      | F3                      | /                             | Flash 3 times  | /              | F3         | F3  | Outdoor          |
| Outdoor Mid-Coil Temp Sensor Error                                     | F4                      | /                             | Flash 4 times  | /              | F4         | F4  | Outdoor          |
| Outdoor Discharge Air Temp Sensor Error                                | F5                      | /                             | Flash 5 times  | /              | F5         | F5  | Outdoor          |
| Oil Return for Cooling   | F7                      | /                             | /              | /              | /          | /   | Special Mode     |
| Forced Defrosting  | H1                      | Quick Flashing                | /              | /              | H1         | H1  | Special Mode     |
| Oil Return for Heating or Defrosting                                   | H1                      | /                             | /              | Flash once     | H1         |  | Special Mode     |
| Compressor Overheat Protection   | H3                      | /                             | /              | Flash 3 times  | H3         | H3  | Drive Error      |
| IPM Protection   | H5                      | /                             | /              | Flash 5 times  | H5         | H5  | Drive Error      |
| Motor Desynchronizing  | H7                      | /                             | /              | Flash 7 times  | H7         | H7  | Drive Error      |
| PFC Error  | Hc                      | /                             | /              | Flash 6 times  | Hc         | Hc  | Drive Error      |
| Startup Failure  | Lc                      | /                             | /              | Flash 11 times | Lc         | Lc  | Drive Error      |
| DC Fan motor Error   | LA                      | /                             | /              | /              | /          | /   | Outdoor          |
| No indoor fan motor  | H6                      | Flash 11 times                | /              | /              | /          | /   | Indoor           |
| Compressor phase circuit detection error                               | U1                      | /                             | /              | Flash 12 times | /          | /   | Outdoor          |
| DC link voltage drop error   | U3                      | /                             | /              | Flash 20 times | /          | /   | Outdoor          |
| Zero detection circuit error   | U8                      | Flash 17 times                | /              | /              | /          | /   | Outdoor          |
| Phase Loss   | Ld                      | Flash 3 times                 | Flash 3 times  | Flash 3 times  | Ld         | Ld  | Drive Error      |
| Compressor Stalling  | LE                      | Flash 3 times                 | Flash 3 times  | Flash 3 times  | LE         | LE  | Drive Error      |
| Over-Speed   | LF                      | Flash 3 times                 | Flash 3 times  | Flash 3 times  | LF         | LF  | Drive Error      |
| IPM Reset  | P0                      | Flash 3 times                 | Flash 3 times  | Flash 3 times  | P0         | P0  | Drive Error      |
| Compressor Current Protection  | P5                      | /                             | /              | Flash 15 times | P5         | P5  | Drive Error      |
| Communication Error between the Inverter Drive and the Main Controller | P6                      | Flash 16 times                | /              | /              | P6         | P6  | Drive Error      |
| Radiator Temp Sensor Error   | P7                      | /                             | /              | Flash 18 times | P7         | P7  | Drive Error      |
| Radiator Overheat Protection   | P8                      | /                             | /              | Flash 19 times | P8         | P8  | Drive Error      |

Table 3

|   |             |               |                |                |    |    |             |
|---|-------------|---------------|----------------|----------------|----|----|-------------|
| AC Contactor Protection   | P9          | Flash 3 times | Flash 3 times  | Flash 3 times  | P9 | P9 | Drive Error |
| Current Sensor Error  | Pc          | /             | /              | Flash 12 times |    | U1 | Drive Error |
| Sensor Connection Protection  | Pd          | Flash 3 times | Flash 3 times  | Flash 3 times  | Pd | Pd | Drive Error |
| Over Voltage Protection   | PH          | /             | Flash 11 times | /              | PH | PH | Drive Error |
| Low Voltage Protection  | PL          | /             | /              | Flash 21 times | PL | PL | Drive Error |
| Temp Drift Protection   | PE          | Flash 3 times | Flash 3 times  | Flash 3 times  | PE | PE | Drive Error |
| Drive Board Ambient Temp Sensor Error                               | PF          | Flash 3 times | Flash 3 times  | Flash 3 times  | PF | PF | Drive Error |
| AC Current Protection   | PA          | Flash 5 times | /              | /              | E5 | E5 | Drive Error |
| Charging Circuit Error  | PU          | /             | /              | Flash 17 times | PU | PU | Drive Error |
| AC Input Voltage Anomaly  | PP          | Flash 3 times | Flash 3 times  | Flash 3 times  | PP | PP | Drive Error |
| Unit communication error  | See Table 5 | Flash 6 times | /              | /              | E6 | E6 | Indoor      |
| Unit n indoor pipe midway temperature sensor error                  | See Table 5 | /             | Flash twice    | /              | E2 | E2 | Indoor      |
| Indoor Evaporator Temp Sensor Short/Open-Circuit                    | See Table 5 | /             | Flash twice    | /              | F2 | F2 | Indoor      |
| (Air Valve) Unit n indoor unit pipe outlet temperature sensor error | See Table 5 | /             | Flash 22 times | /              | b7 | b7 | Indoor      |
| (Liquid Valve) Unit n indoor pipe inlet temperature sensor error    | See Table 5 | /             | Flash 19 times | /              | b5 | b5 | Indoor      |
| Unit n mode conflict  | See Table 5 | /             | Flash once     | /              | F1 | F1 | Indoor      |
| Mode Conflict   | See Table 5 | Flash 7 times | /              | /              | E7 | E7 | Indoor      |

The error codes for wall mounted type unit are shown in the following tableb):

| Error Item                                     | Outdoor Unit 88 Display | Indicating LED Flashing Times |             |             | 88 Display | Wired Controller Display | Error Type   |
|--|-------------------------|-------------------------------|-------------|-------------|------------|--------------------------|--------------|
|  |                         | Running LED                   | Cooling LED | Heating LED |            |                          |              |
| High Pressure Protection                       | E1                      | Flash once                    | /           | /           | E1         | E1                       | Outdoor      |
| Shutdown for Whole Unit Anti-Freeze Protection | E2                      | Flash twice                   | /           | /           | E2         | E2                       | System Error |
| Low Pressure Protection                        | E3                      | Flash 3 times                 | /           | /           | E3         | E3                       | Outdoor      |


|  |    |                |               |                |    |   |                  |
|--|----|----------------|---------------|----------------|----|---|------------------|
| High Discharge Temp Protection   | E4 | Flash 4 times  | /             | /              | E4 | E4  | Outdoor          |
| Communication Error  | E6 | Flash 6 times  | /             | /              | E6 | E6  | Outdoor & Indoor |
| Indoor Unit Water Full Error   | E9 | Flash 9 times  | /             | /              | E9 | E9  | Indoor           |
| Refrigerant Recovery Mode  | Fo | Flash once     | Flash once    | /              | Fo | Fo  | Special Mode     |
| Outdoor Ambient Temp Sensor Error                                      | F3 | /              | Flash 3 times | /              | F3 | F3  | Outdoor          |
| Outdoor Mid-Coil Temp Sensor Error                                     | F4 | /              | Flash 4 times | /              | F4 | F4  | Outdoor          |
| Outdoor Discharge Air Temp Sensor Error                                | F5 | /              | Flash 5 times | /              | F5 | F5  | Outdoor          |
| Oil Return for Cooling   | F7 | /              | Flash 7 times | /              | /  | /   | Special Mode     |
| Forced Defrosting  | H1 | Quick Flashing | /             | /              | H1 | H1  | Special Mode     |
| Oil Return for Heating or Defrosting                                   | H1 | /              | /             | Flash once     | H1 |  | Special Mode     |
| Compressor Overheat Protection   | H3 | /              | /             | Flash 3 times  | H3 | H3  | Drive Error      |
| IPM Protection   | H5 | /              | /             | Flash 5 times  | H5 | H5  | Drive Error      |
| Motor Desynchronizing  | H7 | /              | /             | Flash 7 times  | H7 | H7  | Drive Error      |
| PFC Error  | Hc | /              | /             | Flash 6 times  | Hc | Hc  | Drive Error      |
| Startup Failure  | Lc | /              | /             | Flash 11 times | Lc | Lc  | Drive Error      |
| DC Fan motor Error   | LA | Flash 24 times | /             | /              | LA | LA  | Outdoor          |
| Phase Loss   | Ld | /              | /             | /              | Ld | Ld  | Drive Error      |
| Compressor Stalling  | LE | /              | /             | /              | LE | LE  | Drive Error      |
| Over-Speed   | LF | /              | /             | /              | LF | LF  | Drive Error      |
| IPM Reset  | P0 | /              | /             | /              | P0 | P0  | Drive Error      |
| Compressor Current Protection  | P5 | /              | /             | Flash 15 times | P5 | P5  | Drive Error      |
| Communication Error between the Inverter Drive and the Main Controller | P6 | Flash 16 times | /             | /              | P6 | P6  | Drive Error      |
| Radiator Temp Sensor Error   | P7 | /              | /             | Flash 18 times | P7 | P7  | Drive Error      |
| Radiator Overheat Protection   | P8 | /              | /             | Flash 19 times | P8 | P8  | Drive Error      |
| AC Contactor Protection  | P9 | /              | /             | /              | P9 | P9  | Drive Error      |
| Sensor Connection Protection   | Pd | /              | /             | /              | Pd | Pd  | Drive Error      |
| Low Voltage Protection   | PL | /              | /             | Flash 21 times | PL | PL  | Drive Error      |

Table 4