

# VIVAX

*Made for you*

**ACP-14COFM40AERI R32**  
**ACP-18COFM50AERI R32**  
**ACP-21COFM60AERI R32**  
**ACP-27COFM79AERI R32**  
**ACP-36COFM105AERI R32**  
**ACP-28COFM82AERI R32**  
**ACP-42COFM123AERI R32**  
**ACP-42COFM123AERIs R32**  
**ACP-14COFM40AERIs R32**  
**ACP-18COFM50AERIs R32**  
**ACP-21COFM60AERIs R32**  
**ACP-27COFM79AERIs R32**

**EN**

**Service manual**

**Air conditioning**



W035 22

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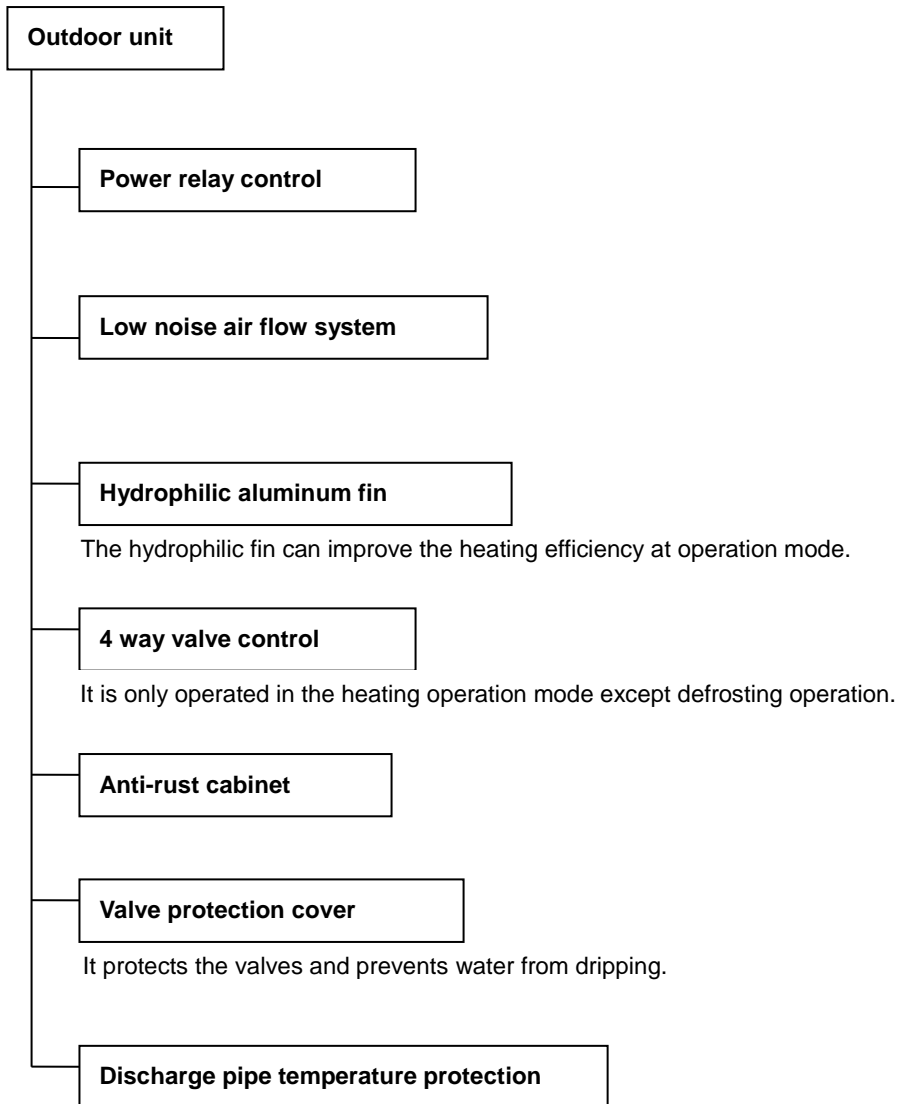


**Caution: Risk of fire/flammable materials**

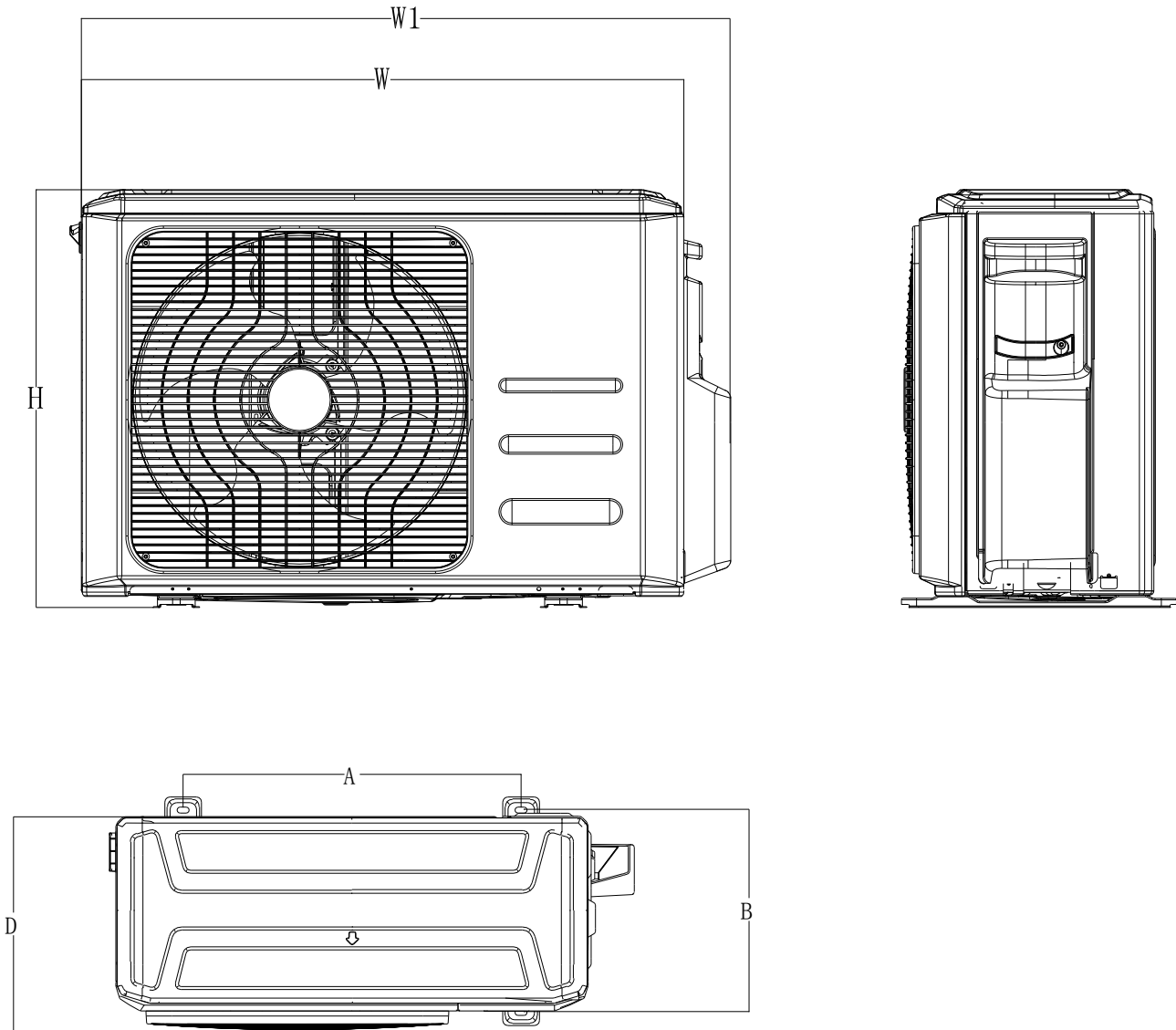
## 1. General information of Outdoor Units

| Model name             | Dimension (mm) | Compressor   |
|------------------------|----------------|--------------|
| ACP-14COFM40AERI R32   | 800x333x554    | KSN140D21UFZ |
| ACP-18COFM50AERI R32   | 800x333x554    | KSM135D23UFZ |
|                        |                |              |
| ACP-21COFM60AERI R32   | 845x363x702    | KSN140D21UFZ |
|                        |                |              |
| ACP-27COFM79AERI R32   | 845x363x702    | KTM240D57UMT |
| ACP-36COFM105AERI R32  | 946x410x810    | KTF310D43UMT |
| ACP-28COFM82AERI R32   | 946x410x810    | KTM240D57UMT |
| ACP-42COFM123AERI R32  | 946x410x810    | KTF310D43UMT |
| ACP-42COFM123AERIs R32 | 946x410x810    | KTF310D43UMT |
| ACP-14COFM40AERIs R32  | 805x330x554    | KSN140D58UFZ |
| ACP-18COFM50AERIs R32  | 805x330x554    | KSN140D58UFZ |
| ACP-21COFM60AERIs R32  | 890x342x673    | KSN140D58UFZ |
| ACP-27COFM79AERIs R32  | 890x342x673    | KTM240D57UMT |

## 2. Features



### 3. Dimensions

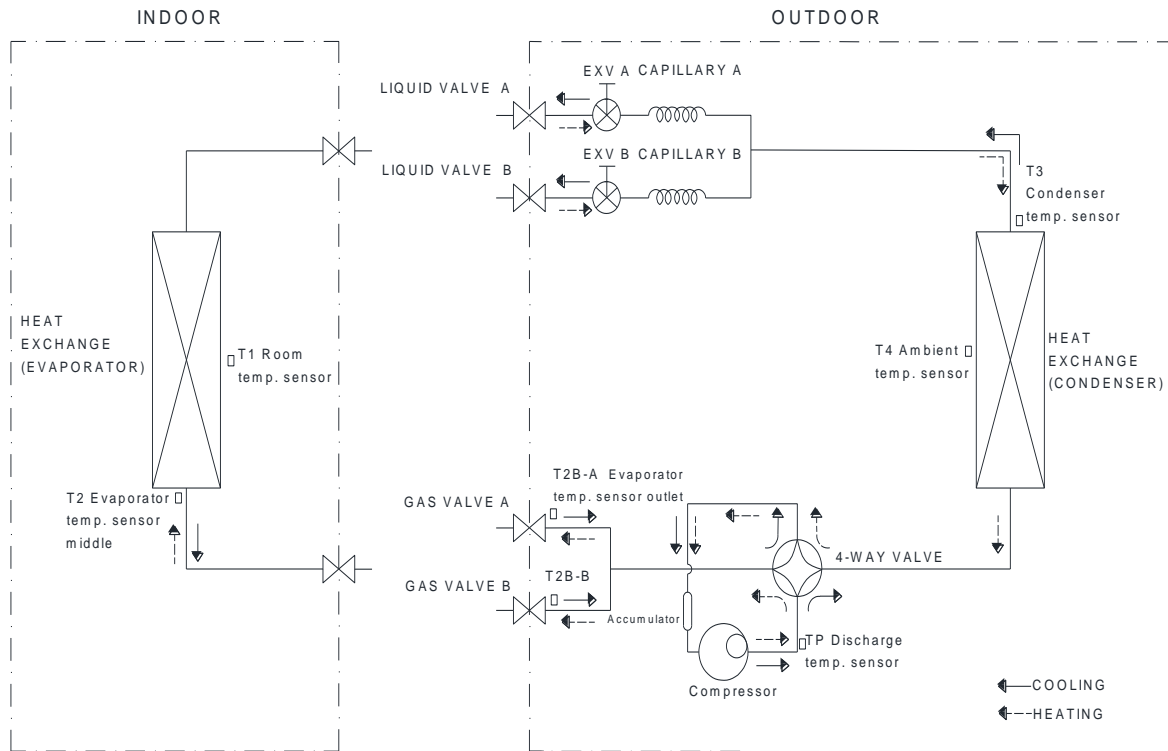


| Model                  | Unit: mm |     |     |        |     |     |
|------------------------|----------|-----|-----|--------|-----|-----|
|                        | W        | D   | H   | W1     | A   | B   |
| ACP-14COFM40AERI R32   | 800      | 333 | 554 | 860    | 514 | 340 |
| ACP-18COFM50AERI R32   | 800      | 333 | 554 | 860    | 514 | 340 |
|                        | 800      | 333 | 554 | 860    | 514 | 340 |
| ACP-21COFM60AERI R32   | 845      | 363 | 702 | 923    | 540 | 350 |
|                        | 845      | 363 | 702 | 923    | 540 | 350 |
| ACP-27COFM79AERI R32   | 845      | 363 | 702 | 923    | 540 | 350 |
| ACP-28COFM82AERI R32   | 946      | 410 | 810 | 1034   | 673 | 403 |
| ACP-36COFM105AERI R32  | 946      | 410 | 810 | 1034   | 673 | 403 |
| ACP-42COFM123AERI R32  | 946      | 410 | 810 | 1034   | 673 | 403 |
| ACP-42COFM123AERIs R32 | 946      | 410 | 810 | 1034   | 673 | 403 |
| ACP-14COFM40AERIs R32  | 805      | 330 | 554 | 877    | 511 | 317 |
| ACP-18COFM50AERIs R32  | 805      | 330 | 554 | 877    | 511 | 317 |
| ACP-21COFM60AERIs R32  | 890      | 342 | 673 | 990.00 | 663 | 354 |
| ACP-27COFM79AERIs R32  | 890      | 342 | 673 | 990.00 | 663 | 354 |

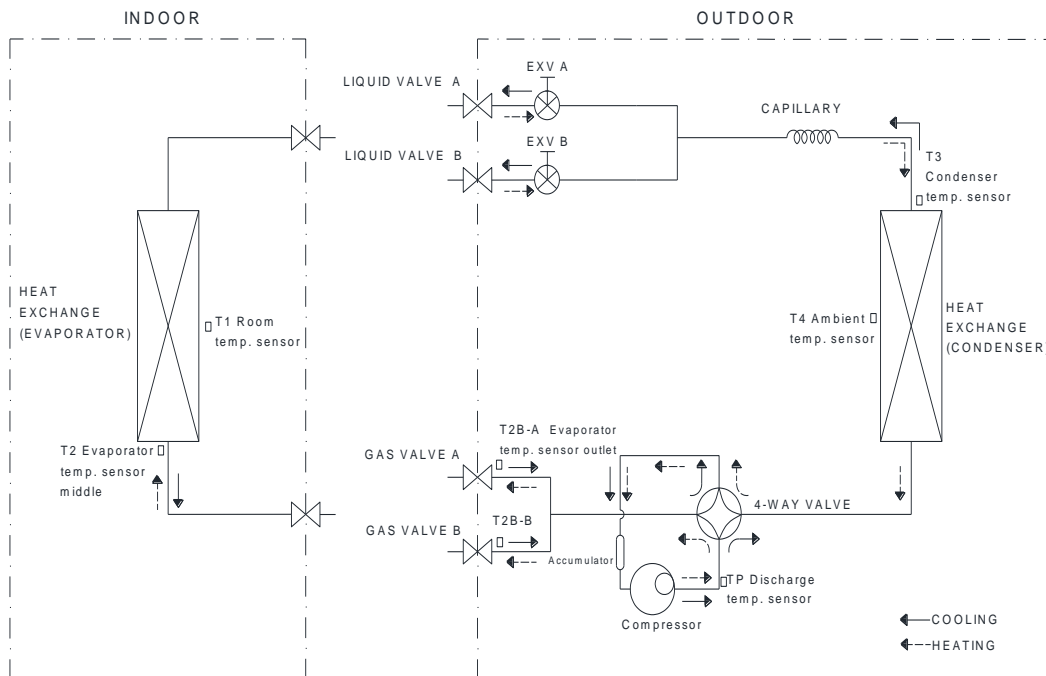
# 4. Refrigeration Cycle Diagram

## 4.1 Refrigeration circuit drawing of inverter 1 drive 2 type ACP-18COFM50AERI R32

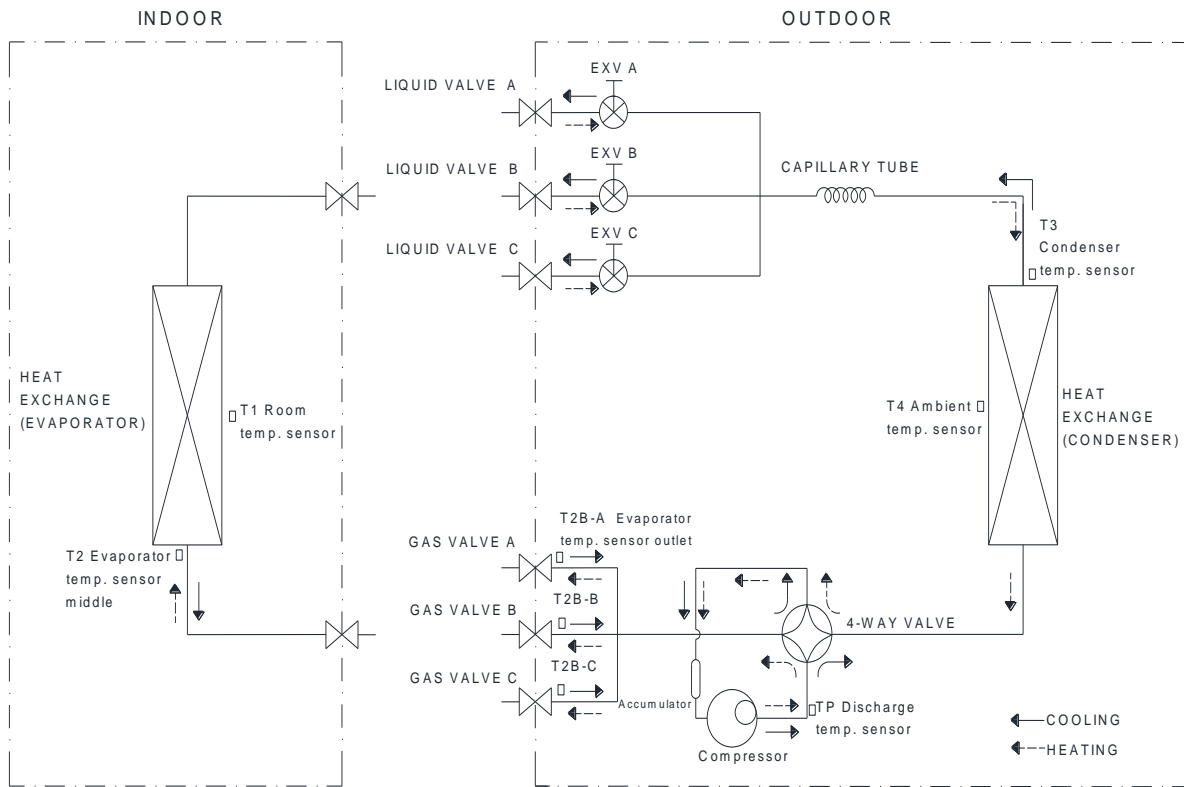
ACP-14COFM40AERI R32



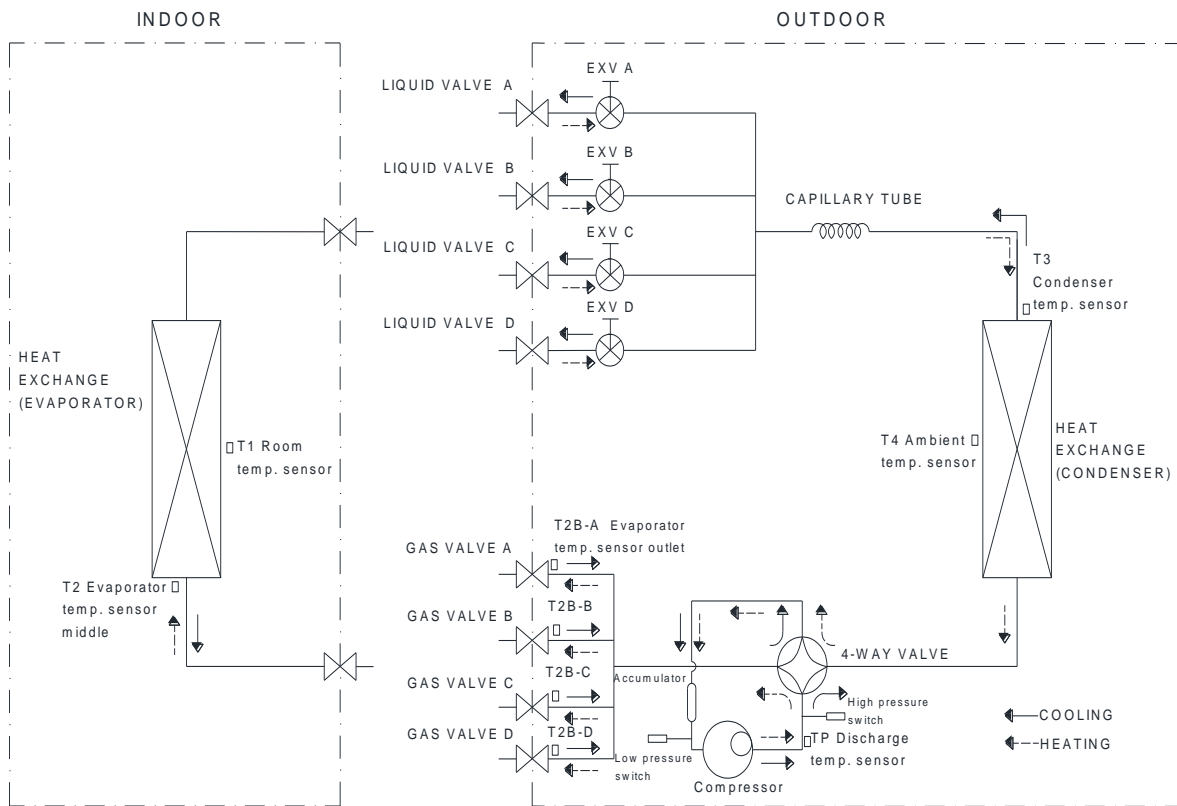
ACP-14COFM40AERIs R32 ACP-18COFM50AERIs R32



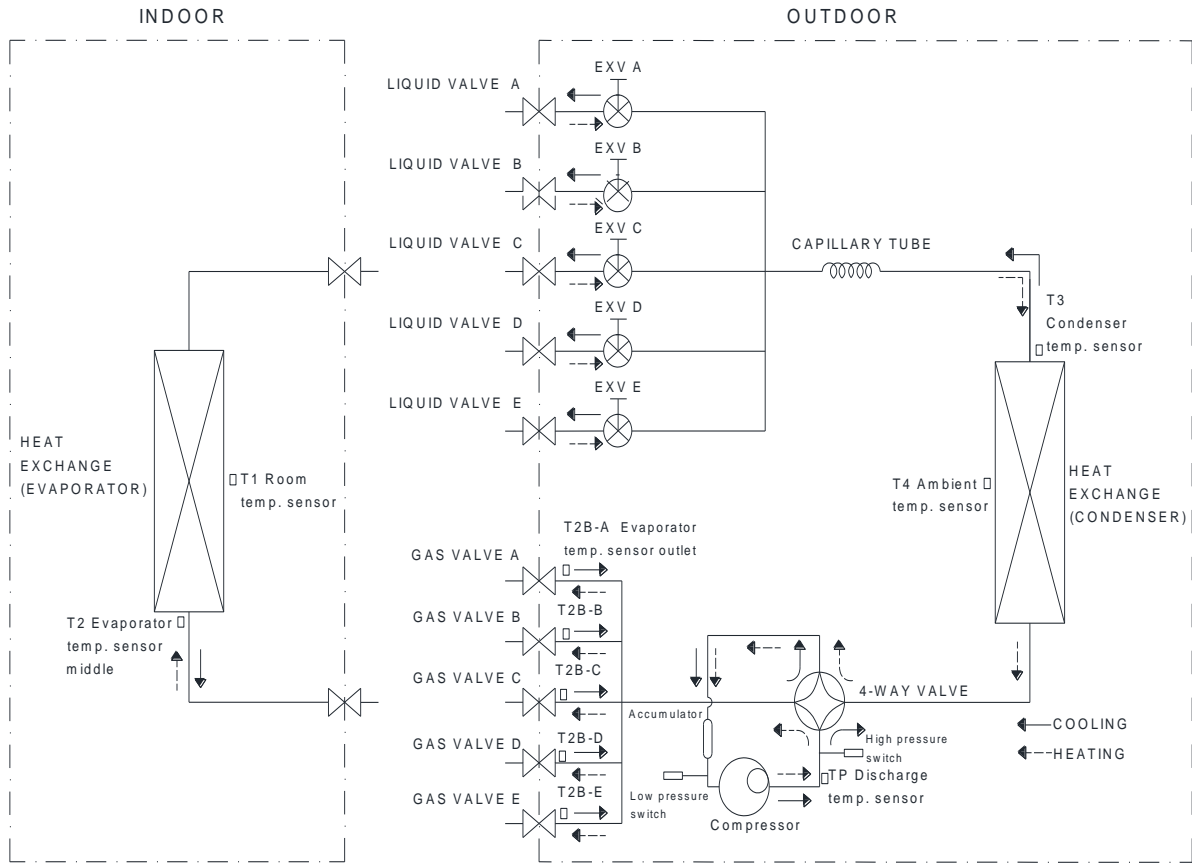
### 4.2 Refrigeration circuit drawing of inverter 1 drive 3 type



### 4.3 Refrigeration circuit drawing of inverter 1 drive 4 type



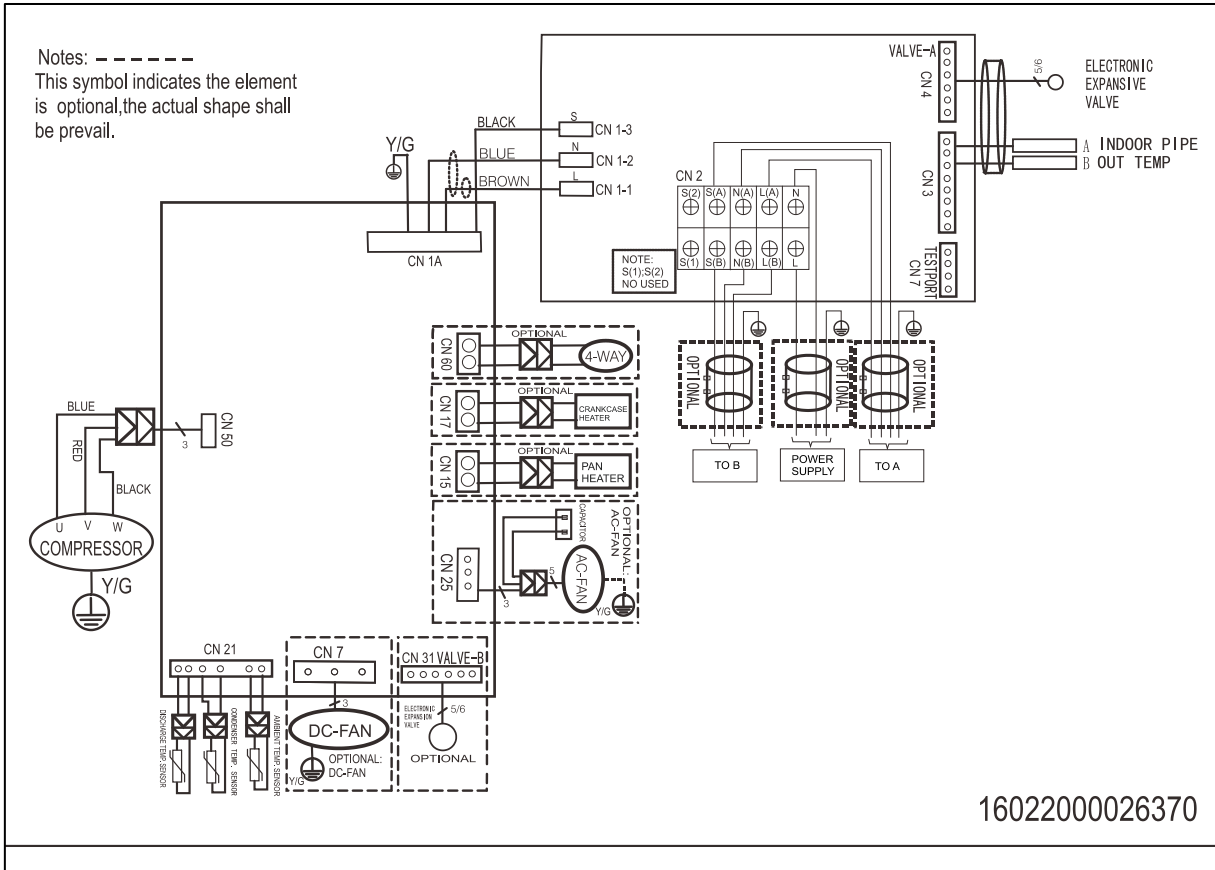
#### 4.4 Refrigeration circuit drawing of inverter 1 drive 5 type



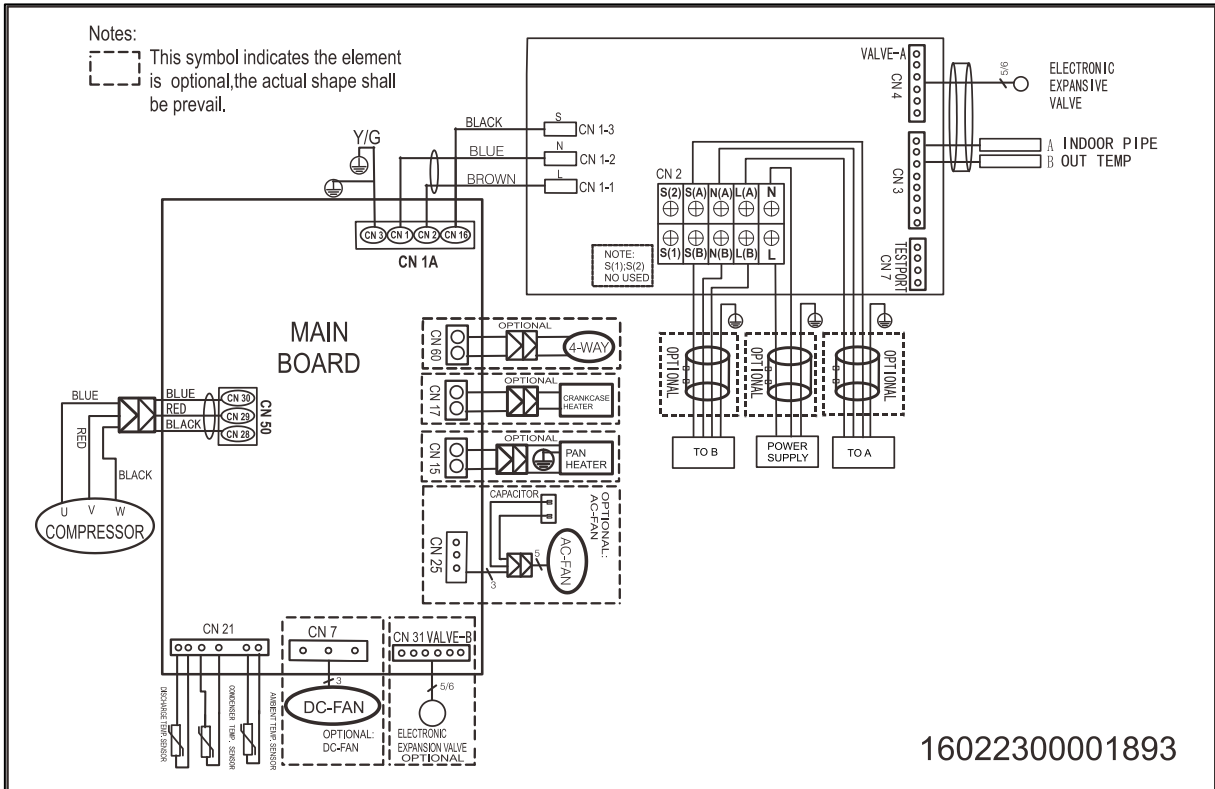


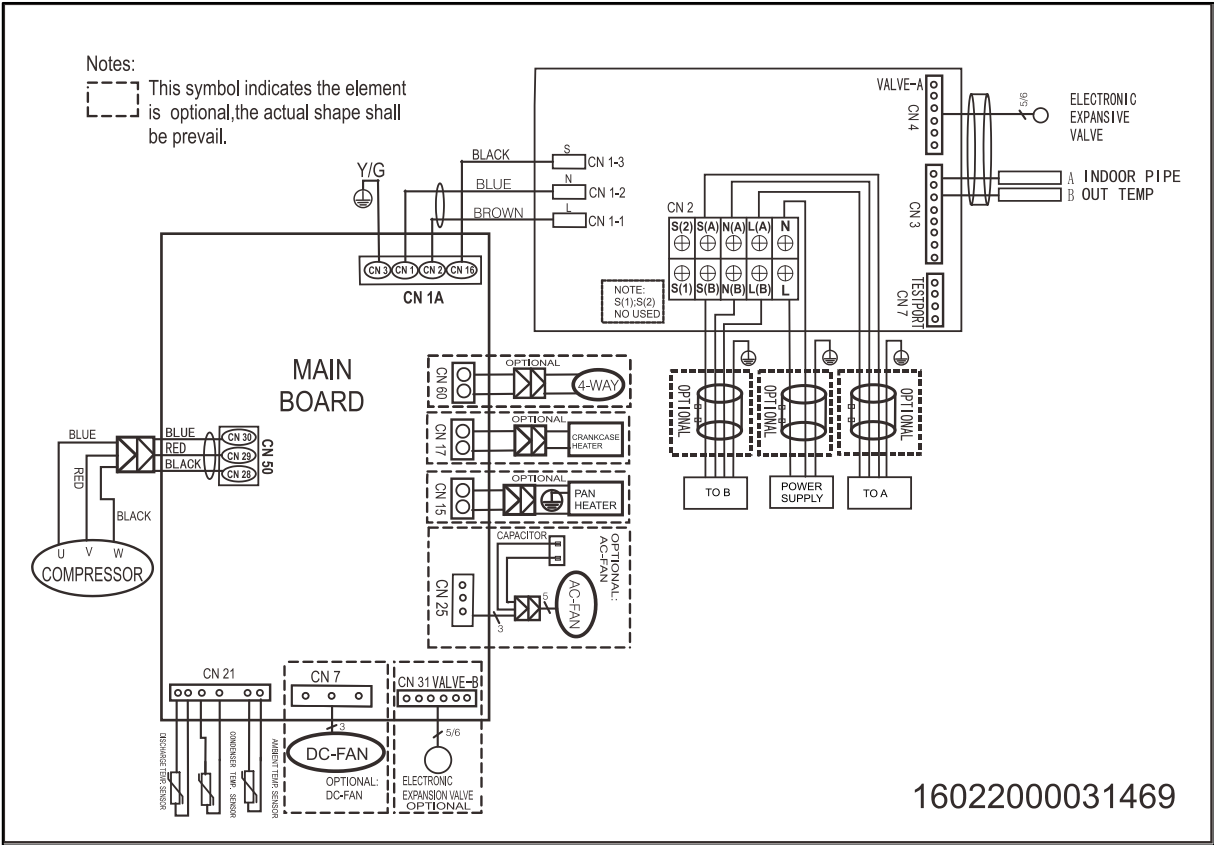
# 5. Wiring diagram

## ACP-18COFM50AERI R32

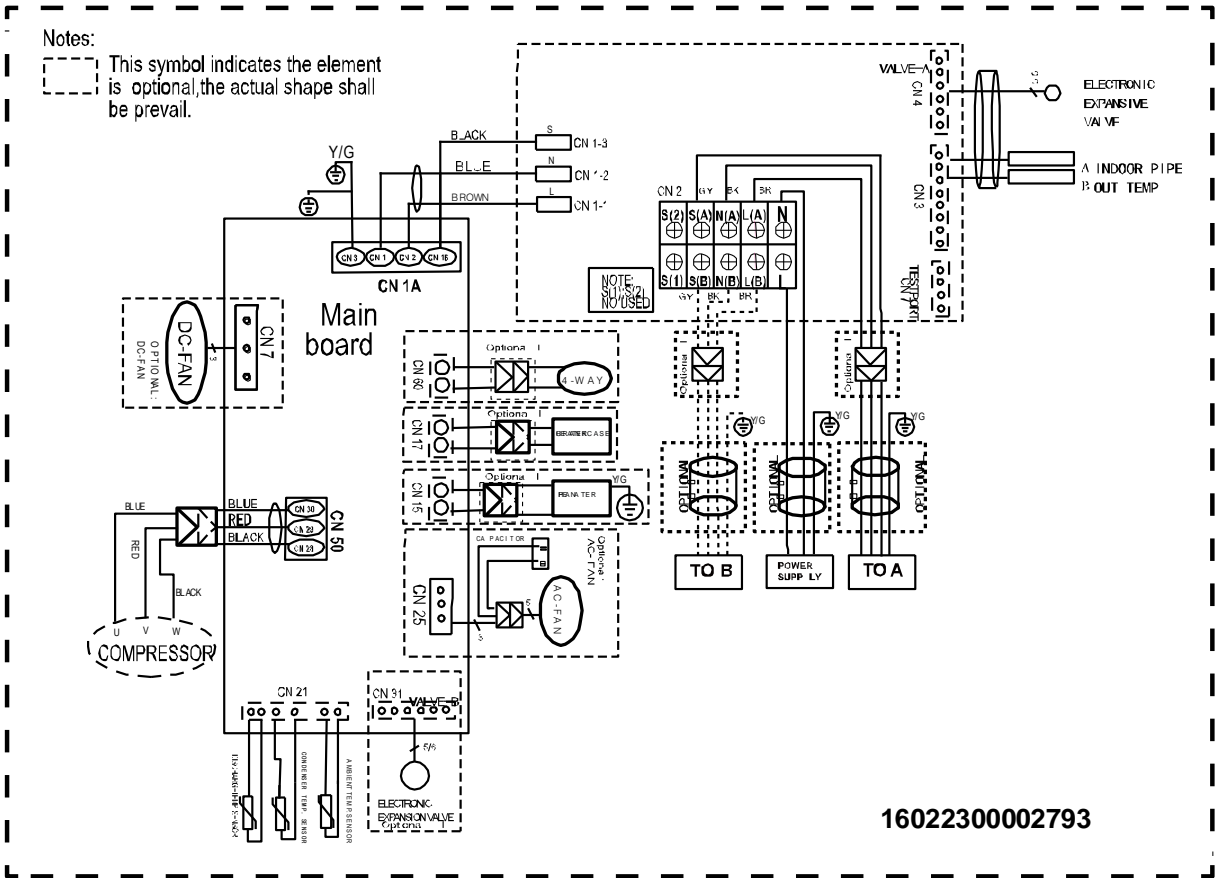


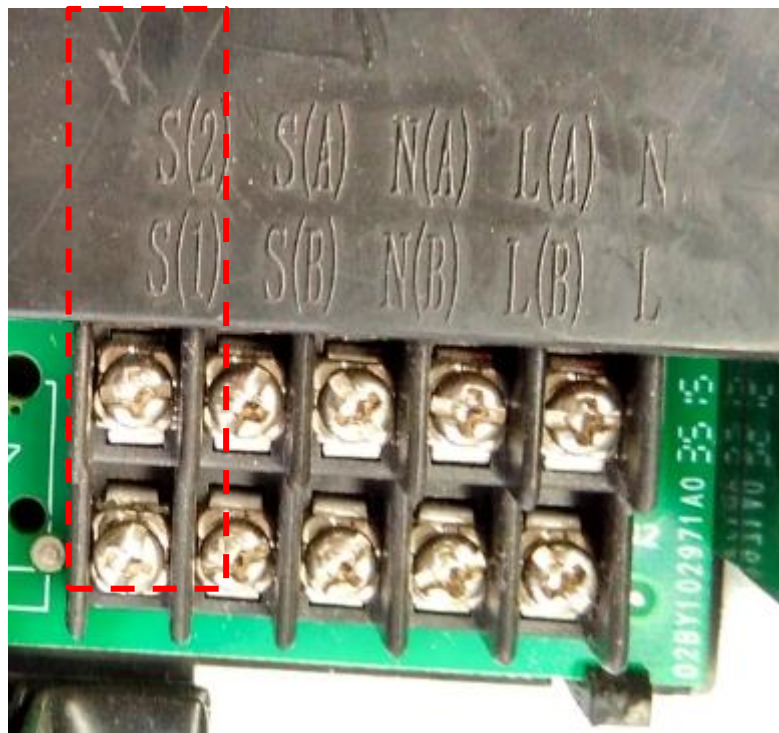
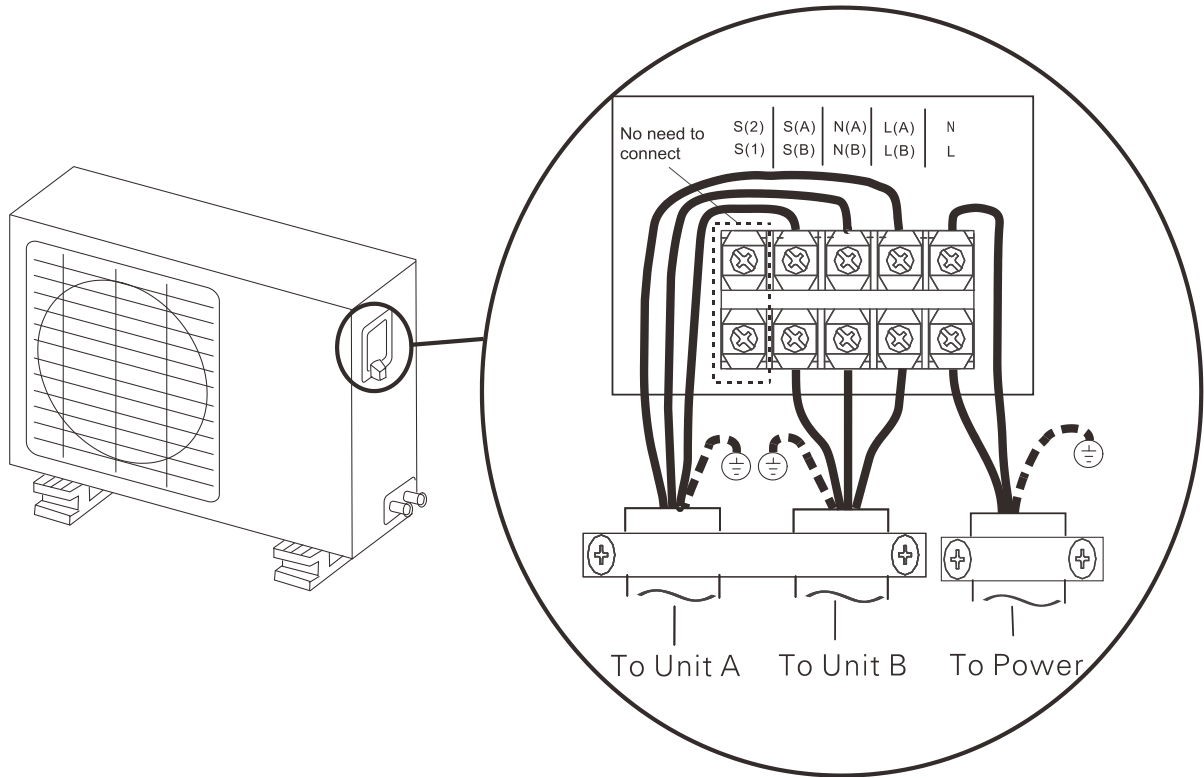
## ACP-14COFM40AERI R32



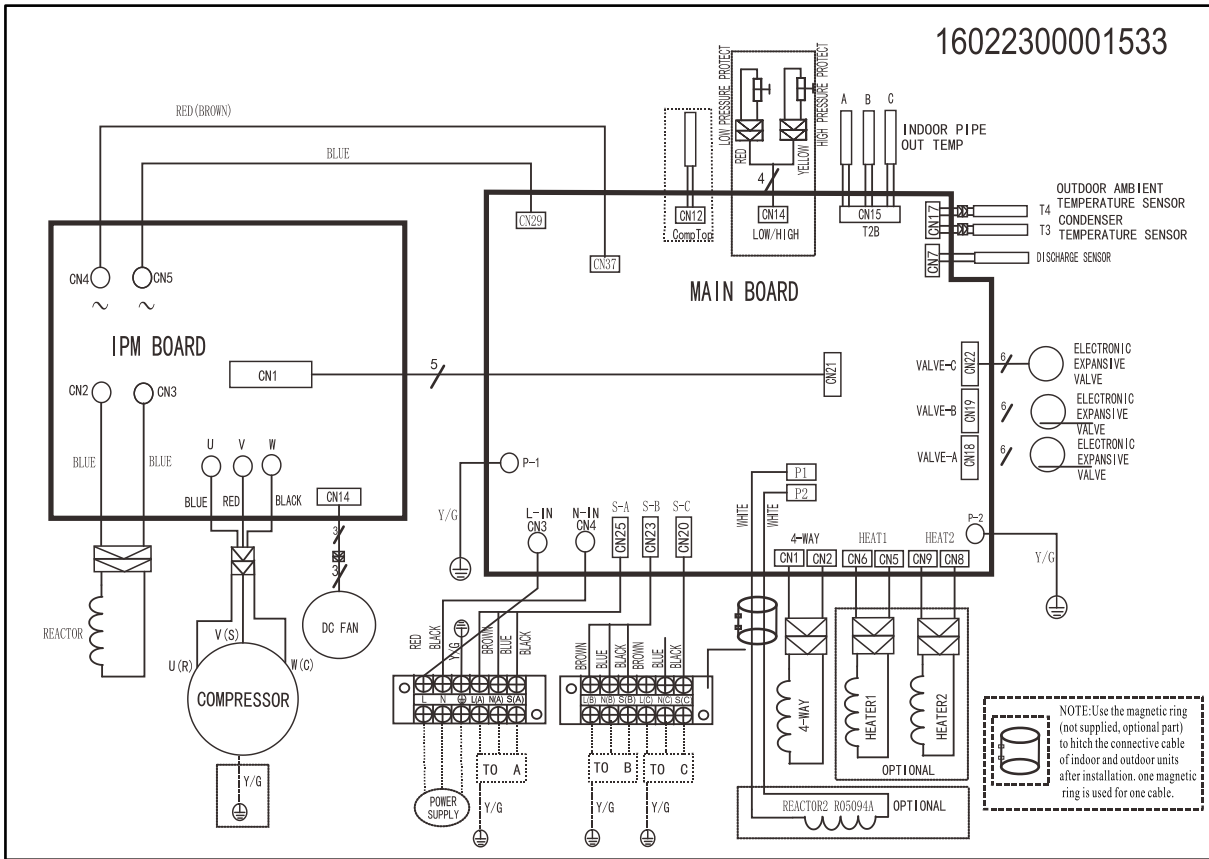


ACP-14COFM40AERIs R32 ACP-18COFM50AERIs R32

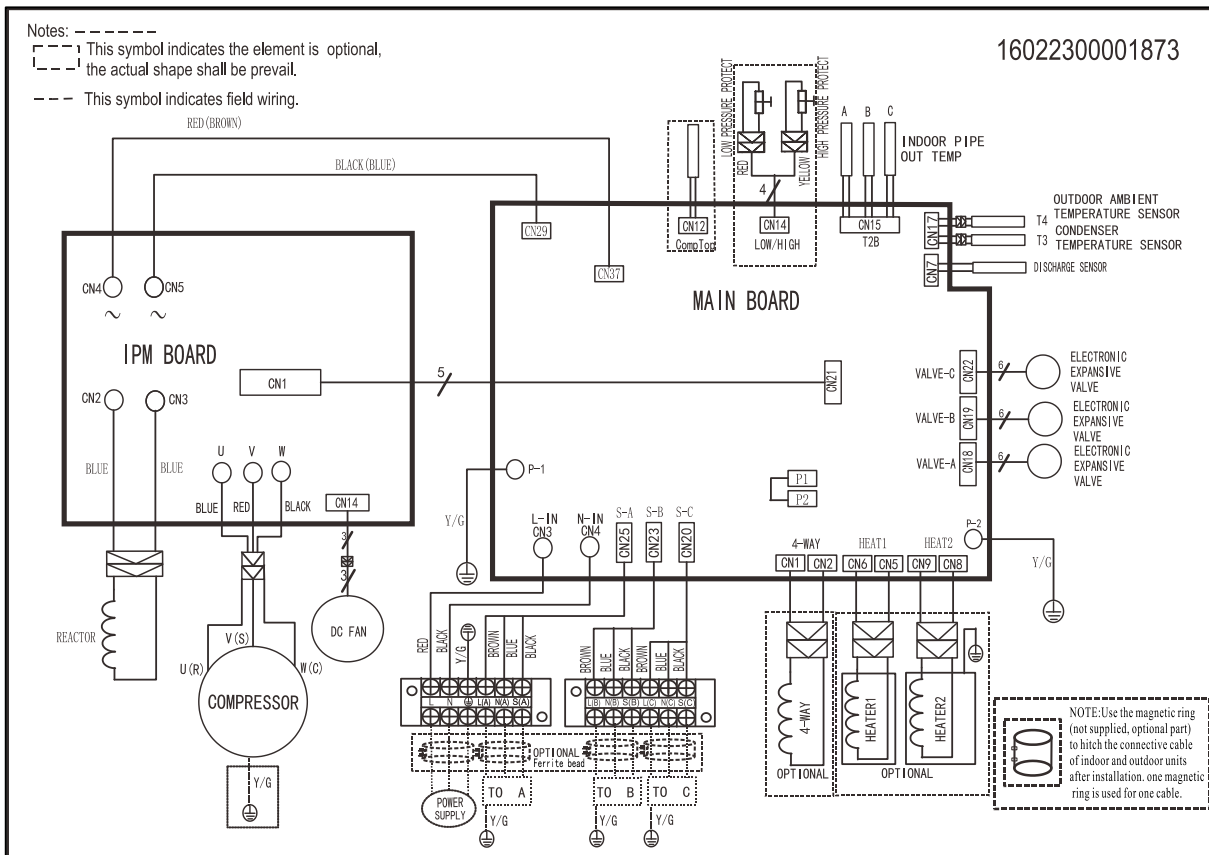




Note: S(1)&S(2) are used in other type of models. They don't need to be connected in multi models.

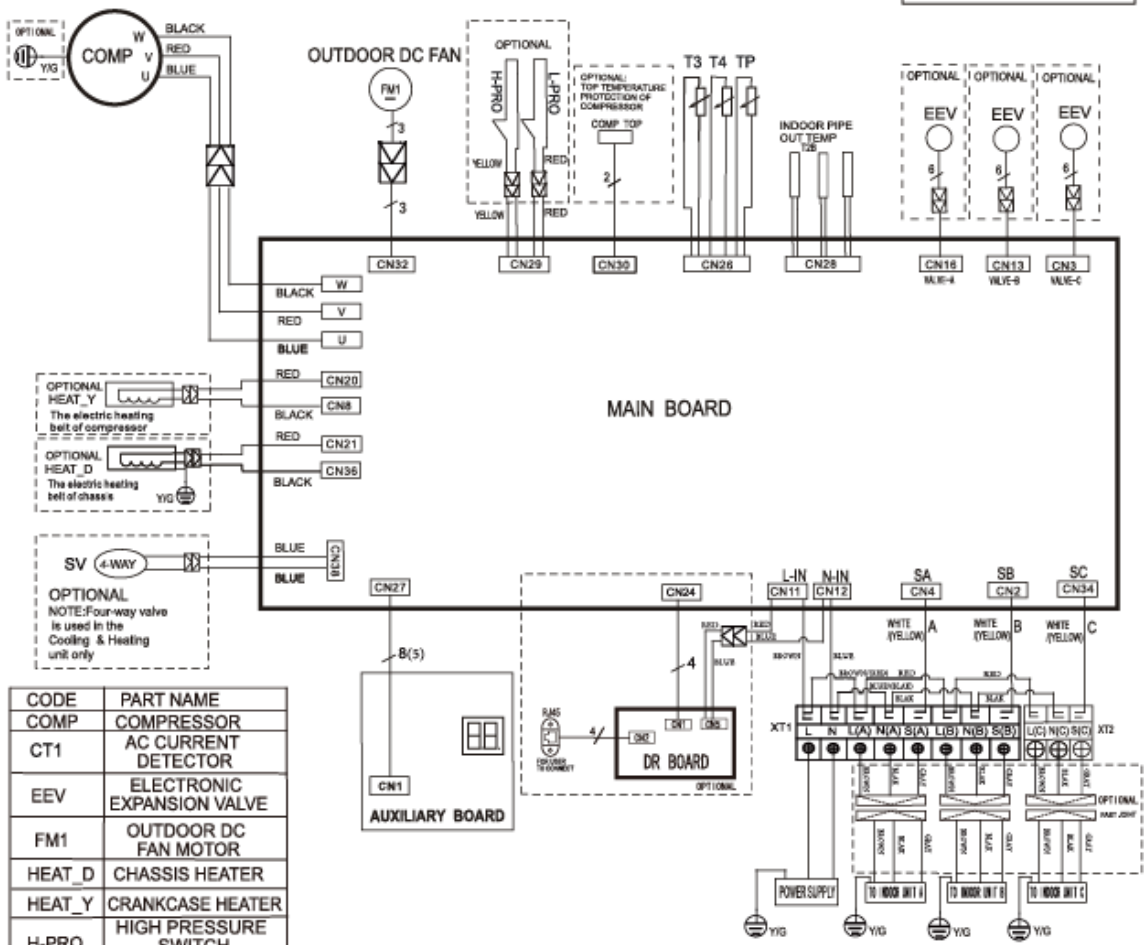


**ACP-21COFM60AERI R32 ACP-27COFM79AERI R32**



ACP-21COFM60AERIs R32 ACP-27COFM79AERIs R32

CODE: 16022000035910



| CODE     | PART NAME                    |
|----------|------------------------------|
| COMP     | COMPRESSOR                   |
| CT1      | AC CURRENT DETECTOR          |
| EEV      | ELECTRONIC EXPANSION VALVE   |
| FM1      | OUTDOOR DC FAN MOTOR         |
| HEAT_D   | CHASSIS HEATER               |
| HEAT_Y   | CRANKCASE HEATER             |
| H-PRO    | HIGH PRESSURE SWITCH         |
| L-PRO    | LOW PRESSURE SWITCH          |
| SV       | REVERSE VALVE                |
| TP       | COMP. DISCHARGE TEMP. SENSOR |
| T3       | COIL TEMP. SENSOR            |
| T4       | OUTDOOR AMBIENT TEMP. SENSOR |
| COMP TOP | COMP. TOP OLP TEMP. SENSOR   |

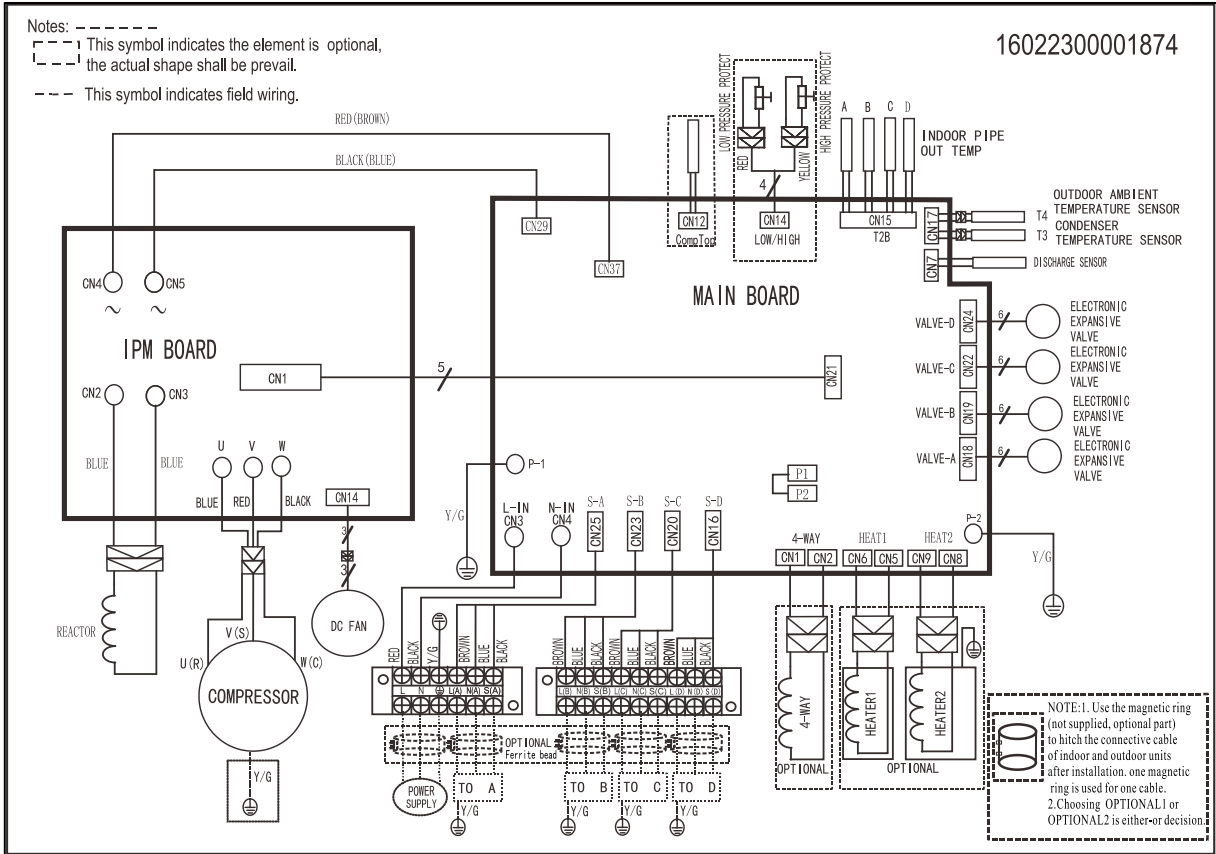
Notes:    
 This symbol indicates the element is optional, the actual shape shall be prevail.

# ACP-28COFM82AERI R32

16022300001874

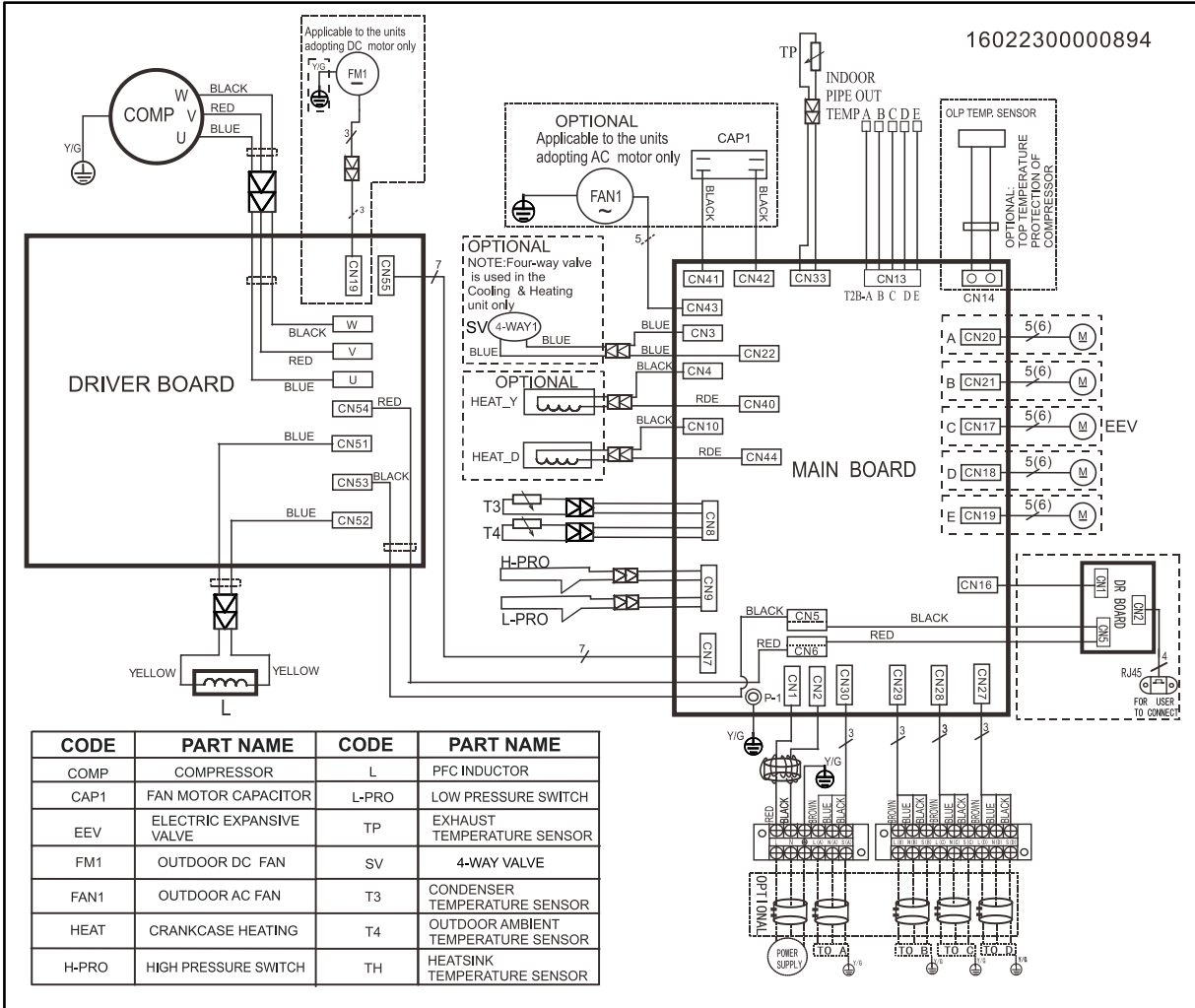
Notes: - - - - -

- ⌈ - - - - - ⌋ This symbol indicates the element is optional,
- ⌈ - - - - - ⌋ the actual shape shall be prevail.
- - - This symbol indicates field wiring.

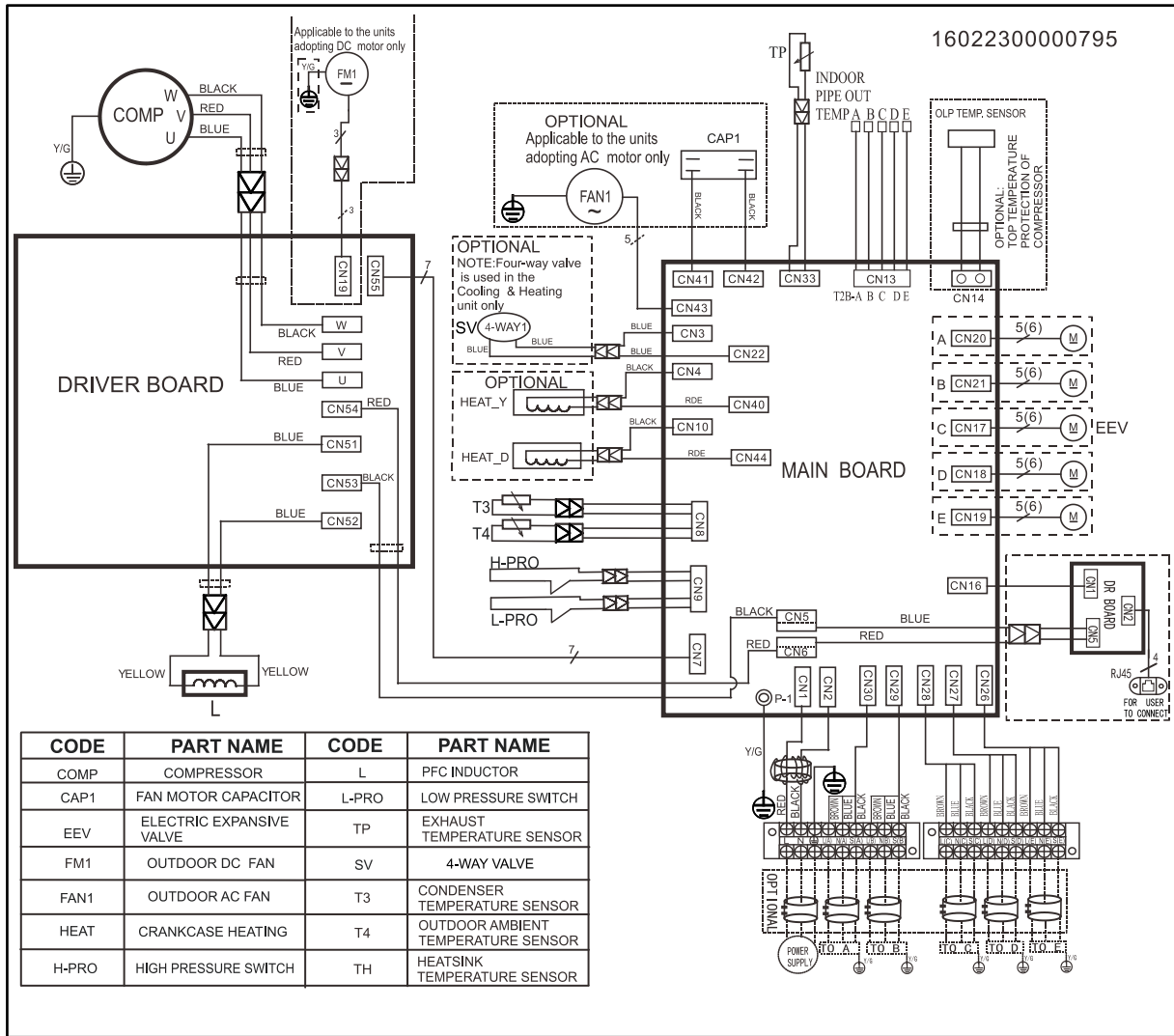


ACP-36COFM105AERI R32

1602230000894



# ACP-42COFM123AERI R32 ACP-42COFM123AERIs R32





## 6. Indoor units combination

### 6.1 Indoor unit combination for ACP-14COFM40AERI R32 M2OH-14HFN8-Q

| One unit | Two unit |      |
|----------|----------|------|
| 7        | 7+7      | 9+9  |
| 9        | 7+9      | 9+12 |
| 12       | 7+12     |      |
| 18       |          |      |

### 6.2 Indoor unit combination for ACP-18COFM50AERI R32&ACP-18COFM50AERIs R32

| One unit | Two unit |       |
|----------|----------|-------|
| 7        | 7+7      | 9+9   |
| 9        | 7+9      | 9+12  |
| 12       | 7+12     | 12+12 |
| 18       |          |       |

### 6.3 Indoor unit combination for M3OE-21HFN8-Q&ACP-21COFM60AERIs R32

| One unit | Two unit |       | Three unit |       |
|----------|----------|-------|------------|-------|
| 7        | 7+7      | 9+9   | 7+7+7      | 7+9+9 |
| 9        | 7+9      | 9+12  | 7+7+9      | 9+9+9 |
| 12       | 7+12     | 9+18  | 7+7+12     |       |
| 18       | 7+18     | 12+12 |            |       |

### 6.4 Indoor unit combination for ACP-27COFM79AERI R32M3OA-27HFN8-Q

| One unit | Two unit |      |       | Three unit |         |          |
|----------|----------|------|-------|------------|---------|----------|
| 7        | 7+7      | 7+18 | 9+18  | 7+7+7      | 7+9+12  | 9+12+12  |
| 9        | 7+9      | 9+9  | 12+12 | 7+7+9      | 7+12+12 | 12+12+12 |
| 12       | 7+12     | 9+12 | 12+18 | 7+7+12     | 9+9+9   |          |
| 18       |          |      |       | 7+9+9      | 9+9+12  |          |

### 6.5 Indoor unit combination for ACP-28COFM82AERI R32

| One unit | Two unit |       |       | Three unit |         |          | Four unit |          |
|----------|----------|-------|-------|------------|---------|----------|-----------|----------|
| 7        | 7+7      | 9+9   | 12+18 | 7+7+7      | 7+9+12  | 9+9+18   | 7+7+7+7   | 7+7+9+12 |
| 9        | 7+9      | 9+12  | 12+24 | 7+7+9      | 7+9+18  | 9+12+12  | 7+7+7+9   | 7+9+9+9  |
| 12       | 7+12     | 9+18  | 18+18 | 7+7+12     | 7+12+12 | 12+12+12 | 7+7+7+12  | 9+9+9+9  |
| 18       | 7+18     | 9+24  |       | 7+7+18     | 9+9+9   |          | 7+7+9+9   |          |
| 24       | 7+24     | 12+12 |       | 7+9+9      | 9+9+12  |          |           |          |

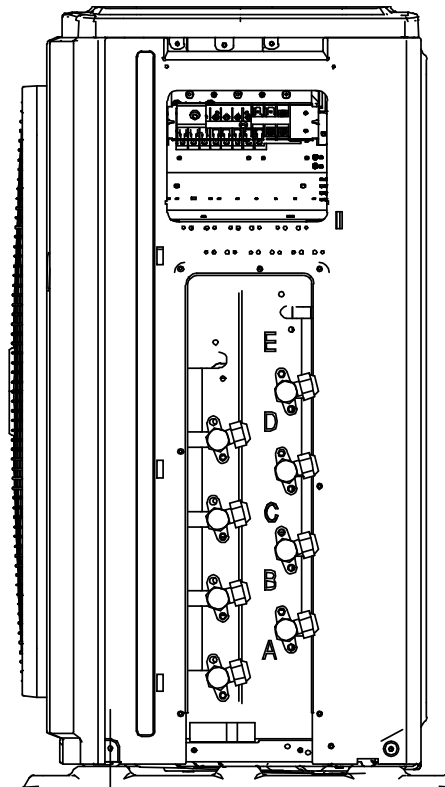
## 6.6 Indoor unit combination for ACP-36COFM105AERI R32

| One unit | Two unit |       | Three unit |         |         |          | Four unit |           |            |             |
|----------|----------|-------|------------|---------|---------|----------|-----------|-----------|------------|-------------|
| 7        | 7+7      | 9+18  | 7+7+7      | 7+9+12  | 7+18+18 | 9+12+18  | 7+7+7+7   | 7+7+9+12  | 7+9+9+12   | 9+9+9+12    |
| 9        | 7+9      | 9+24  | 7+7+9      | 7+9+18  | 9+9+9   | 9+12+24  | 7+7+7+9   | 7+7+9+18  | 7+9+9+18   | 9+9+9+18    |
| 12       | 7+12     | 12+12 | 7+7+12     | 7+9+24  | 9+9+12  | 9+18+18  | 7+7+7+12  | 7+7+12+12 | 7+9+12+12  | 9+9+12+12   |
| 18       | 7+18     | 12+18 | 7+7+18     | 7+12+12 | 9+9+18  | 12+12+12 | 7+7+7+18  | 7+7+12+18 | 7+12+12+12 | 9+12+12+12  |
| 24       | 7+24     | 12+24 | 7+7+24     | 7+12+18 | 9+9+24  | 12+12+18 | 7+7+9+9   | 7+9+9+9   | 9+9+9+9    | 12+12+12+12 |
|          | 9+9      | 18+18 | 7+9+9      | 7+12+24 | 9+12+12 |          |           |           |            |             |
|          | 9+12     |       |            |         |         |          |           |           |            |             |

| One unit | Two unit | Three unit |           | Four unit  |            |              |
|----------|----------|------------|-----------|------------|------------|--------------|
| 7        | 7+ATW    | 7+7+ATW    | 9+12+ATW  | 7+7+7+ATW  | 7+9+12+ATW | 9+12+12+ATW  |
| 9        | 9+ATW    | 7+9+ATW    | 9+18+ATW  | 7+7+9+ATW  | 7+9+18+ATW | 9+12+18+ATW  |
| 12       | 12+ATW   | 7+12+ATW   | 12+12+ATW | 7+7+12+ATW | 9+9+9+ATW  | 12+12+12+ATW |
| 18       | 18+ATW   | 7+18+ATW   | 12+18+ATW | 7+7+18+ATW | 9+9+12+ATW | 12+12+18+ATW |
| ATW      |          | 9+9+ATW    | 18+18+ATW | 7+9+9+ATW  | 9+9+18+ATW |              |

If one of indoor units is ATW,

Note: ATW can only be connected with an A system.

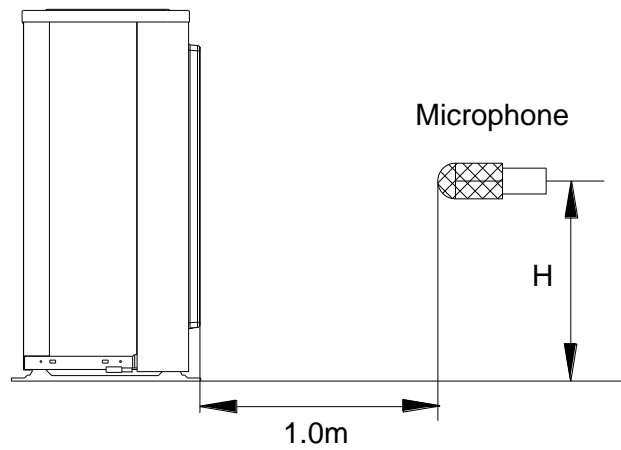


**6.7 Indoor unit combination for ACP-42COFM123AERI R32 ACP-42COFM123AERIs R32**

| One Unit   | Two Unit    |              | Three Unit   |              |         |          |
|------------|-------------|--------------|--------------|--------------|---------|----------|
| 7          | 7+7         | 9+18         | 7+7+7        | 7+9+18       | 9+9+12  | 12+12+12 |
| 9          | 7+9         | 9+24         | 7+7+9        | 7+9+24       | 9+9+18  | 12+12+18 |
| 12         | 7+12        | 12+12        | 7+7+12       | 7+12+12      | 9+9+24  | 12+12+24 |
| 18         | 7+18        | 12+18        | 7+7+18       | 7+12+18      | 9+12+12 | 12+18+18 |
| 24         | 7+24        | 12+24        | 7+7+24       | 7+12+24      | 9+12+18 |          |
|            | 9+9         | 18+18        | 7+9+9        | 7+18+18      | 9+12+24 |          |
|            | 9+12        |              | 7+9+12       | 9+9+9        | 9+18+18 |          |
| Four Unit  |             |              |              |              |         |          |
| 7+7+7+7    | 7+7+9+18    | 7+9+9+12     | 7+12+12+12   | 9+9+12+18    |         |          |
| 7+7+7+9    | 7+7+9+24    | 7+9+9+18     | 7+12+12+18   | 9+9+12+24    |         |          |
| 7+7+7+12   | 7+7+12+12   | 7+9+9+24     | 9+9+9+9      | 9+12+12+12   |         |          |
| 7+7+7+18   | 7+7+12+18   | 7+9+12+12    | 9+9+9+12     | 9+12+12+18   |         |          |
| 7+7+7+24   | 7+7+12+24   | 7+9+12+18    | 9+9+9+18     | 12+12+12+12  |         |          |
| 7+7+9+9    | 7+7+18+18   | 7+9+12+24    | 9+9+9+24     | 12+12+12+18  |         |          |
| 7+7+9+12   | 7+9+9+9     | 7+9+18+18    | 9+9+12+12    |              |         |          |
| Five Unit  |             |              |              |              |         |          |
| 7+7+7+7+7  | 7+7+7+9+18  | 7+7+9+12+12  | 7+9+9+9+18   | 9+9+9+12+12  |         |          |
| 7+7+7+7+9  | 7+7+7+12+12 | 7+7+9+12+18  | 7+9+9+12+12  | 9+9+12+12+12 |         |          |
| 7+7+7+7+12 | 7+7+7+12+18 | 7+7+12+12+12 | 7+9+12+12+12 |              |         |          |
| 7+7+7+7+18 | 7+7+9+9+9   | 7+7+12+12+18 | 9+9+9+9+9    |              |         |          |
| 7+7+7+9+9  | 7+7+9+9+12  | 7+9+9+9+9    | 9+9+9+9+12   |              |         |          |
| 7+7+7+9+12 | 7+7+9+9+18  | 7+9+9+9+12   | 9+9+9+9+18   |              |         |          |

## 7. Sound Levels

Outdoor Unit



**Note:** H= 0.5 × height of outdoor unit

| Model                  | Noise Power dB(A) | Noise level dB(A) |
|------------------------|-------------------|-------------------|
| ACP-14COFM40AERI R32   | 64                | 57                |
| ACP-18COFM50AERI R32   | 56                | 53                |
|                        | 65                | 55.5              |
| ACP-21COFM60AERI R32   | 66                | 57.5              |
|                        | 65                | 59                |
| ACP-27COFM79AERI R32   | 67                | 59.5              |
| ACP-28COFM82AERI R32   | 69                | 61                |
| ACP-36COFM105AERI R32  | 68                | 63                |
| ACP-42COFM123AERI R32  | 71                | 62                |
| ACP-42COFM123AERIs R32 | 70                | 63                |
| ACP-14COFM40AERIs R32  | 65                | 56                |
| ACP-18COFM50AERIs R32  | 65                | 54                |
| ACP-21COFM60AERIs R32  | 66                | 58                |
| ACP-27COFM79AERIs R32  | 67                | 58                |

## 8. Installation Details

### 8.1 Wrench torque sheet for installation

| Outside diameter | Torque          | Additional tightening torque |
|------------------|-----------------|------------------------------|
| mm               | N.cm            | N.cm                         |
| Φ6.35            | 1500(153kgf.cm) | 1600(163kgf.cm)              |
| Φ9.52            | 2500(255kgf.cm) | 2600(265kgf.cm)              |
| Φ12.7            | 3500(357kgf.cm) | 3600(367kgf.cm)              |

### 8.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

| Rated current of appliance | Nominal cross-sectional area (mm <sup>2</sup> ) |
|----------------------------|---|
| >3 and ≤6                  | 0.75  |
| >6 and ≤10                 | 1   |
| >10 and ≤16                | 1.5   |
| >16 and ≤25                | 2.5   |

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

### 8.3 Pipe length and the elevation

#### Maximum piping length and height difference

|  | 1 drive 2 | 1 drive 3 | 1 drive 4 | 1 drive 5 |
|--|-----------|-----------|-----------|-----------|
| Max. length for all rooms (m)                | 40        | 60        | 80        | 80        |
| Max. length for one IU (m)                   | 25        | 30        | 35        | 35        |
| Max. height difference between IU and OU (m) | 15        | 15        | 15        | 15        |
| Max. height difference between IUs (m)       | 10        | 10        | 10        | 10        |

#### Additional refrigerant charge

| Connective Pipe Length(m)                                     | Additional refrigerant                                    |   |
|---|---|---|
|   | Ø 6.35 (1/4")   | Ø 9.52 (3/8")   |
| Liquid Side   |   |   |
| Pre-charge pipe length (ft/m)<br>(pre-charge pipe length xN ) | N/A   |   |
| More than (pre-charge pipe lengthxN) ft/m                     | (Total pipe length - pre-charge pipe lengthxN) x12g/m     | (Total pipe length - pre-charge pipe lengthxN) x24g/m     |
|   | (Total pipe length - pre-charge pipe lengthxN) x0.13oz/ft | (Total pipe length - pre-charge pipe lengthxN) x0.26oz/ft |

Caution:

- Refrigerant pipe diameter is different according to indoor unit to be connected. When using the extension pipe, refer to the tables below.

- When refrigerant pipe diameter is different from that of outdoor unit union (for 18K&24K indoor unit), additional transfer connector needs to be used on outdoor unit union.

| Indoor unit                           |                         | Extension pipe diameter (mm/inch) |              |           |
|---------------------------------------|-------------------------|-----------------------------------|--------------|-----------|
| Model                                 | Pipe diameter (mm/inch) |                                   |              |           |
| 7K9K12K                               | Liquid                  | 6.35(1/4)                         | Liquid       | 6.35(1/4) |
|                                       | Gas                     | 9.52(3/8)                         | Gas          | 9.52(3/8) |
| 18K                                   | Liquid                  | 6.35(1/4)                         | Liquid       | 6.35(1/4) |
|                                       | Gas                     | 12.7(1/2)                         | Gas          | 12.7(1/2) |
| 24K                                   | Liquid                  | 9.52(3/8)                         | Liquid       | 9.52(3/8) |
|                                       | Gas                     | 15.9(5/8)                         | Gas          | 15.9(5/8) |
| Outdoor unit union diameter (mm/inch) |                         |                                   |              |           |
| 1 drive 2                             |                         | Liquid                            | 6.35(1/4) *2 |           |
|                                       |                         | Gas                               | 9.52(3/8) *2 |           |
| 1 drive 3                             |                         | Liquid                            | 6.35(1/4) *3 |           |
|                                       |                         | Gas                               | 9.52(3/8) *3 |           |
| 1 drive 4                             |                         | Liquid                            | 6.35(1/4) *4 |           |
|                                       |                         | Gas                               | 9.52(3/8) *3 |           |
|                                       |                         |                                   | 12.7(1/2) *1 |           |
| 1 drive 5                             |                         | Liquid                            | 6.35(1/4) *5 |           |
|                                       |                         | Gas                               | 9.52(3/8) *4 |           |
|                                       |                         |                                   | 12.7(1/2) *1 |           |

#### 8.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

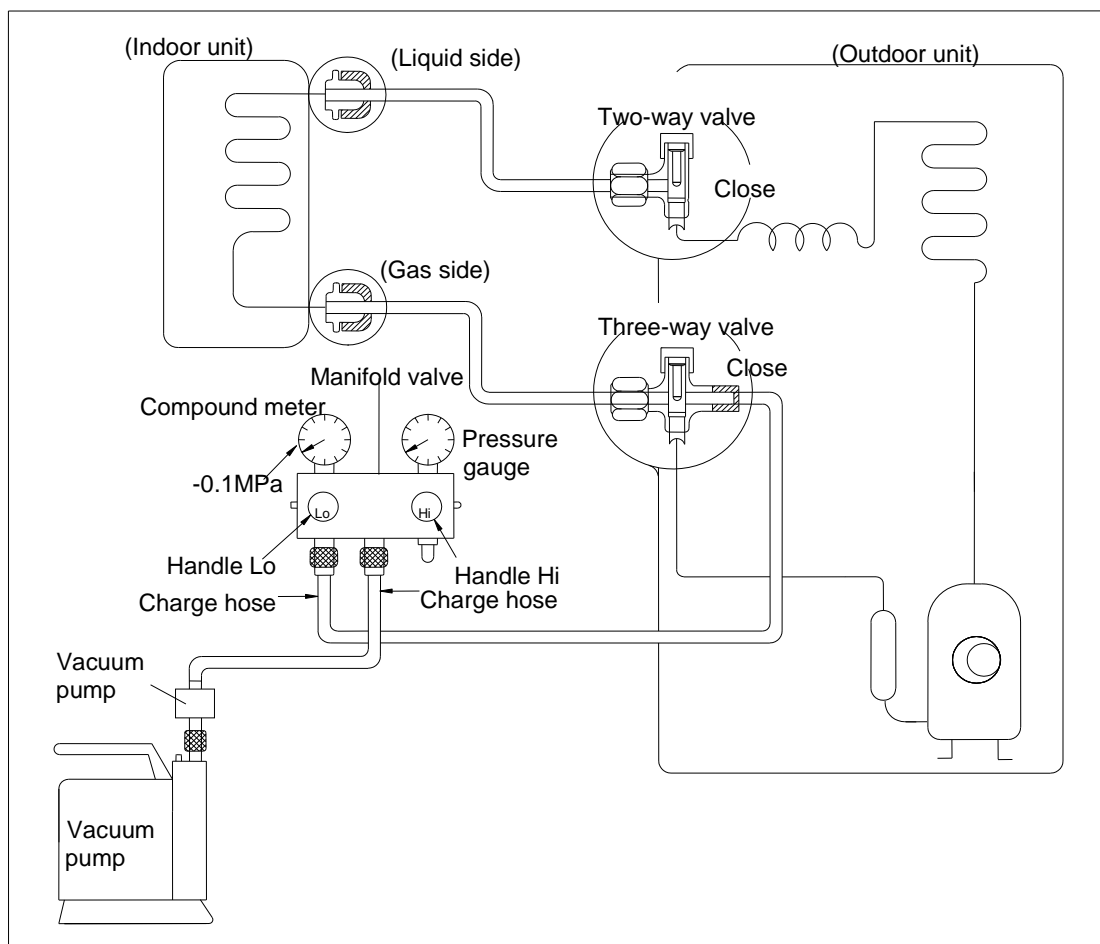
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

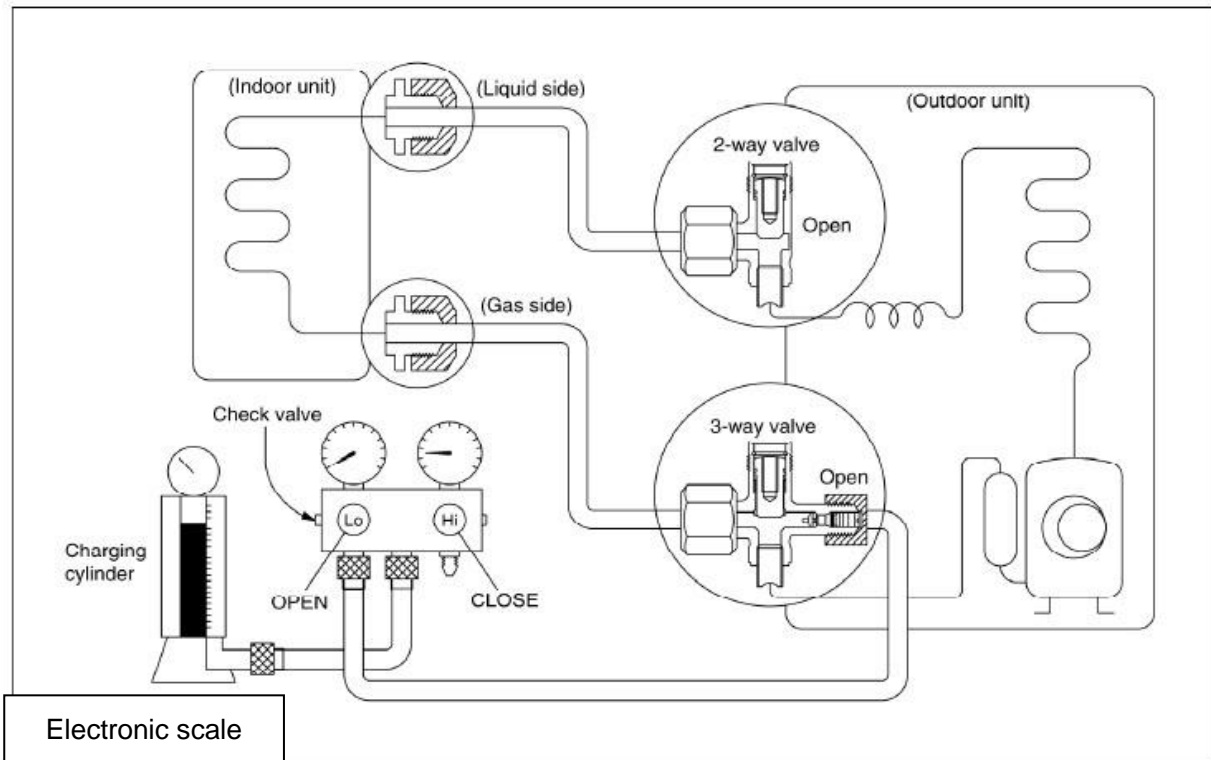
Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

##### 1. Air purging with vacuum pump



- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points. Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.
- 8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

## 2. Adding the refrigerant if the pipe length >5m

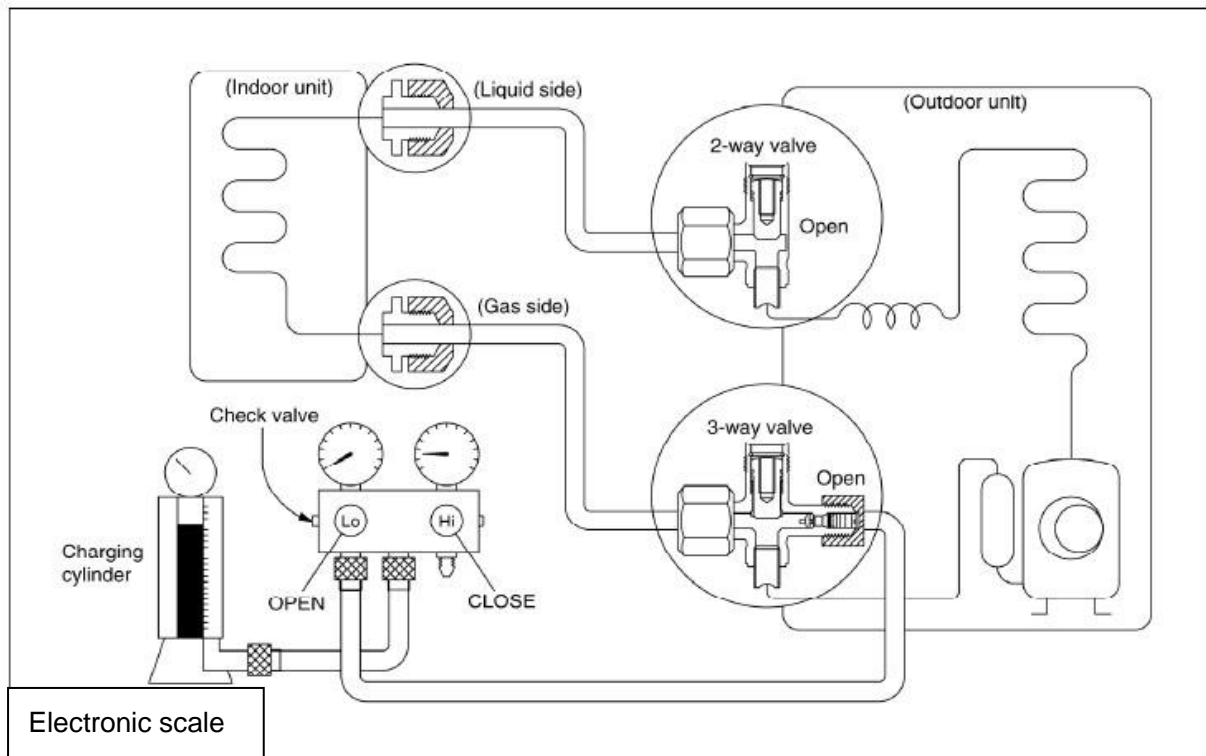


### Procedure:

- 1) Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.  
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.
- 2) Purge the air from the charge hose.  
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.
- 6) When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- 7) Mount the valve stem caps and the service port  
Use torque wrench to tighten the service port cap to a torque of 18N.m.  
Be sure to check for gas leakage.



## 8.5 Adding the refrigerant after running the system for many years

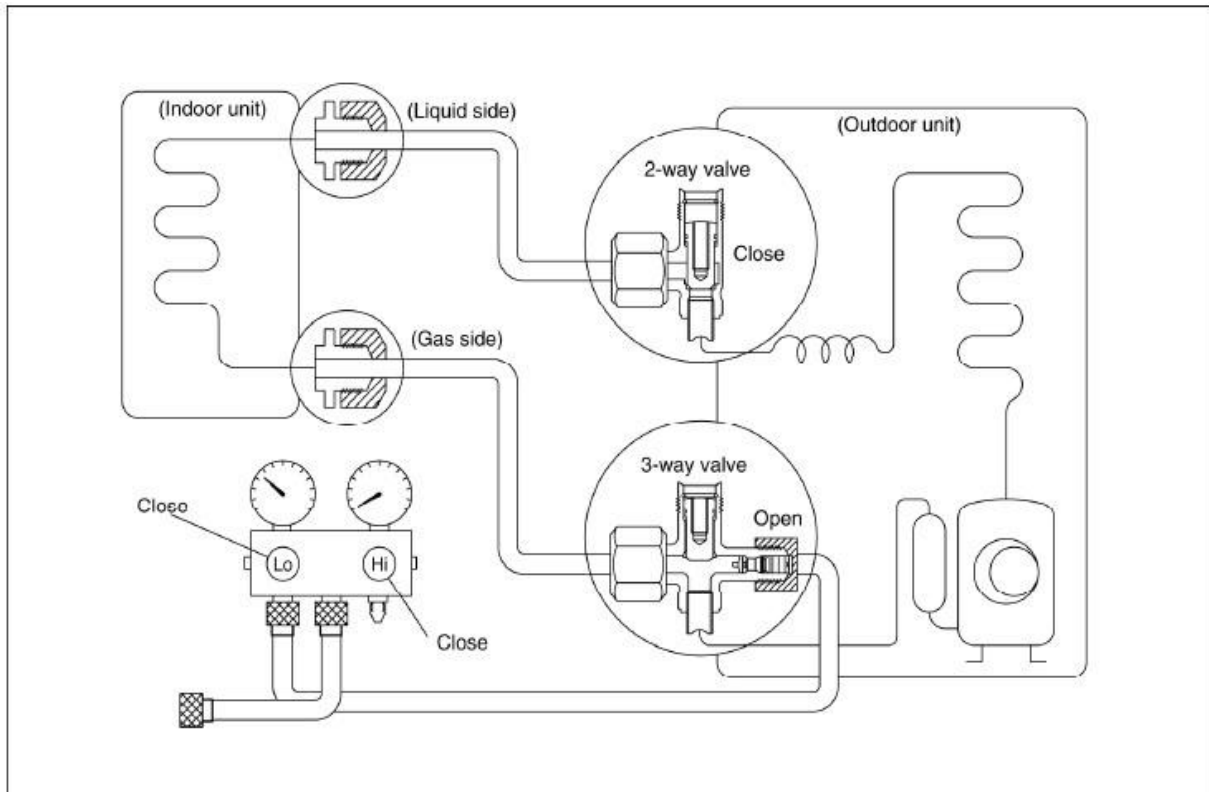


### Procedure:

- 1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve. Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose.  
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.
- 6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- 7). Mount the valve stem caps and the service port  
Use torque wrench to tighten the service port cap to a torque of 18N.m.  
Be sure to check for gas leakage.

## 8.6 Re-installation while the indoor unit need to be repaired

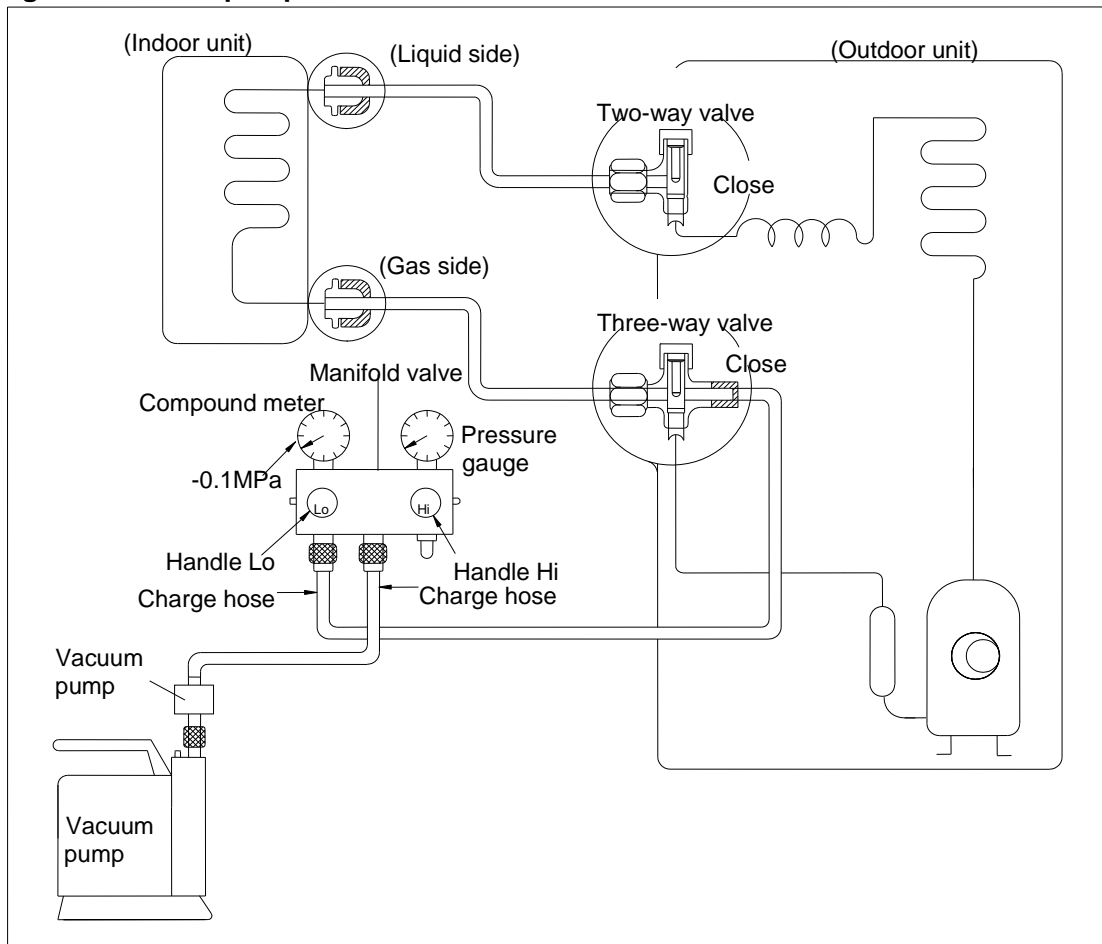
### 1. Collecting the refrigerant into the outdoor unit



#### Procedure

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position  
Remove the valve stem caps and confirm that the valve stems are in the opened position.  
Be sure to use a hexagonal wrench to operate the valve stems.
- 2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.
- 3). Air purging of the charge hose.  
Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.
- 4). Set the 2-way valve to the close position.
- 5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.
- 6). Set the 3-way valve to the closed position immediately  
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.  
Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.  
Use a torque wrench to tighten the 3-way valves service port cap to a torque of 1.8 kgf.m.  
Be sure to check for gas leakage.

## 2. Air purging with vacuum pump

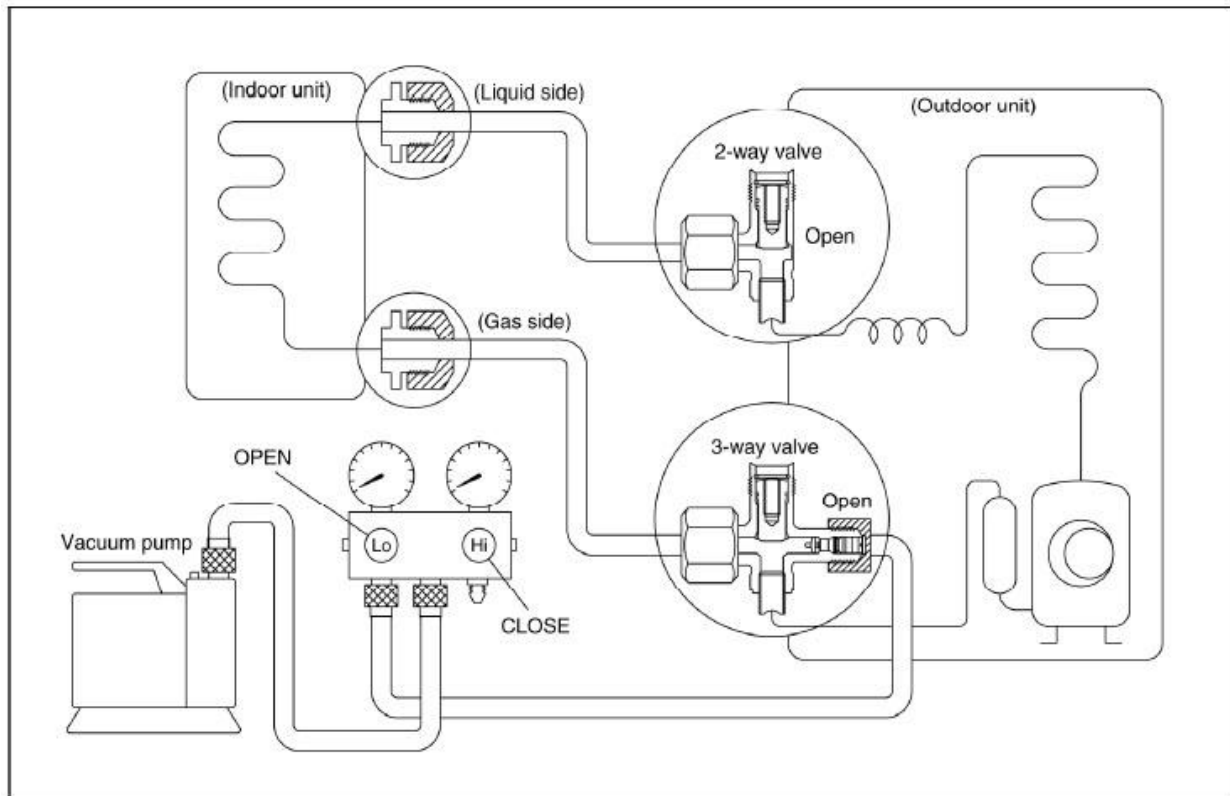


### Procedure:

- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points. Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.
- 8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

## 8.7 Re-installation while the outdoor unit need to be repaired

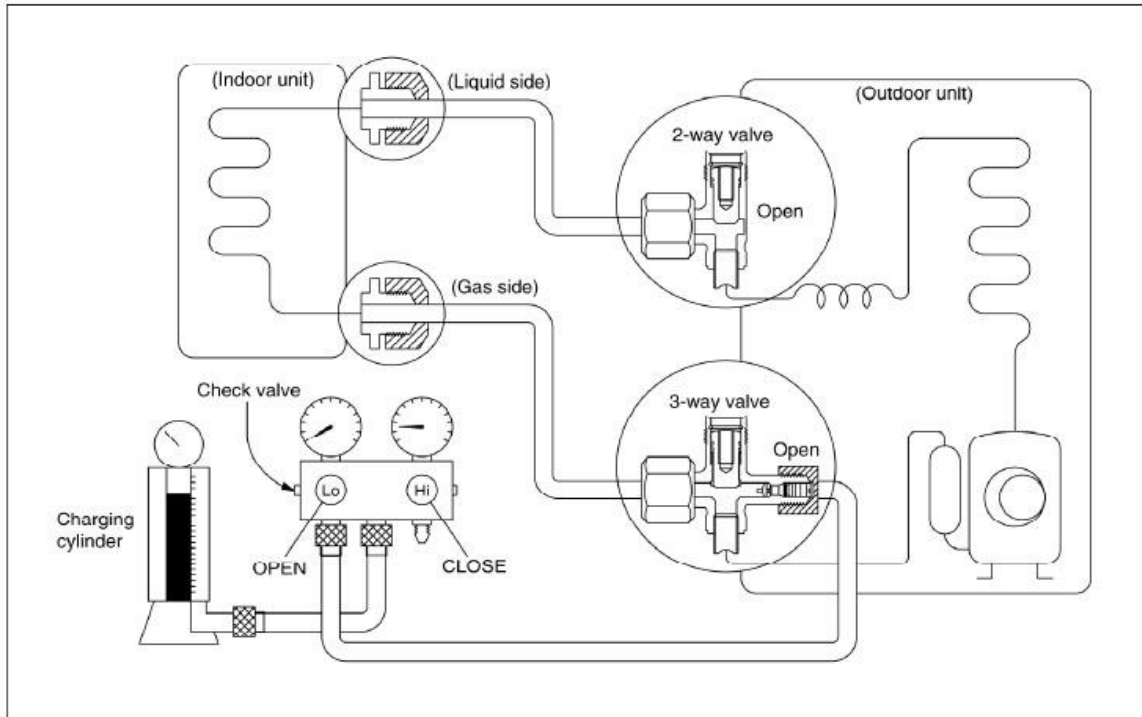
### 1. Evacuation for the whole system



#### Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa.
- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 5). Disconnect the charge hose from the vacuum pump.

## 2. Refrigerant charging



### Procedure:

- 1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve  
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. Make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose  
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant  
If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.
- 5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately  
If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.
- 6). Mounted the valve stem caps and the service port  
Use torque wrench to tighten the service port cap to a torque of 18N.m.  
Be sure to check for gas leakage

## **9. Electronic control function**

### **9.1 Abbreviation**

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet(This sensor is located in outdoor unit)

T3: Coil temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

Ts: Setting temperature

### **9.2 Electric control working environment.**

9.2.1 Input voltage: 198V~264V.

9.2.2 Input power frequency:50Hz.

9.2.3 Indoor fan normal working amp. is less than 1A.

9.2.4 Outdoor fan. normal working amp. is less than 1.5A.

9.2.5 Four-way valve normal working amp. is less than 1A.

### **9.3 Outdoor unit's digital display tube**

There is a digital display tube in outdoor PCB.

Digital display tube display function

- In standby , the LED displays “- -”
- In compressor operation, the LED display the running frequency,
- In defrosting mode, The LED displays “dF” or alternative displays between running frequency and “dF”(each displays 0.5s)
- In compressor pre-heating, The LED displays “PH” or alternative displays between running frequency and “PH”(each displays 0.5s)
- During the oil return process, The LED displays “RO” or alternative displays between running frequency and “RO”(each displays 0.5s)
- In low ambient cooling mode, the LED displays “LC” or alternative displays between running frequency and “LC”(each displays 0.5s)
- In forced cooling mode, the LED displays “FC” or alternative displays between running frequency and “FC”(each displays 0.5s)
- When PFC module protection occurs three times within 15 minutes, the LED displays “E6” or alternative displays between running frequency and “E6”(each displays 0.5s)
- In protection or malfunction, the LED displays error code or protection code.

“PH”, “RO”, “LC”, “E6” are not suitable for ACP-42COFM123AERIs R32

## 9.4 Outdoor unit point check function

A check switch is included on the outdoor PCB.

Push SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 is pushed.

For ACP-21COFM60AERIs R32M3OA-27HFN8-Q

| Number of Presses | Display   | Remark   |         |                       |   |   |   |   |   |   |   |   |   |   |
|-------------------|---|--|---------|-----------------------|---|---|---|---|---|---|---|---|---|---|
| 0                 | Normal display  | Displays running frequency, running state, or malfunction code   |         |                       |   |   |   |   |   |   |   |   |   |   |
| 1                 | Quantity of indoor units with working connection                                  | Actual data <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Display</th> <th>Number of indoor unit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> <tr> <td>5</td> <td>5</td> </tr> </tbody> </table> | Display | Number of indoor unit | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 |
| Display           | Number of indoor unit   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 1                 | 1   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 2                 | 2   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 3                 | 3   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 4                 | 4   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 5                 | 5   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 2                 | Outdoor unit running mode code  | Off: 0, Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4. Forced defrost: A  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 3                 | Indoor unit A capacity  | The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "____"<br>(9K:1HP,12K:1.2HP,18K:1.5HP,24K:2.0HP)   |         |                       |   |   |   |   |   |   |   |   |   |   |
| 4                 | Indoor unit B capacity  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 5                 | Indoor unit C capacity  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 6                 | Indoor unit D capacity  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 7                 | Indoor unit E capacity  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 8                 | Indoor unit A capacity demand code  | Norm code*HP<br>(9K: 1HP,12K: 1.2HP,18K: 1.5HP,24K:2.0HP)  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 9                 | Indoor unit B capacity demand code  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 10                | Indoor unit C capacity demand code  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 11                | Indoor unit D capacity demand code  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 12                | Indoor unit E capacity demand code  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 13                | Outdoor unit amendatory capacity demand code                                      |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 14                | The frequency corresponding to the total indoor units' amendatory capacity demand |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 15                | The frequency after the frequency limit   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 16                | The frequency sending to compressor control chip                                  |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 17                | Indoor unit A evaporator outlet temperature (T <sub>2B</sub> A)                   | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "____"  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 18                | Indoor unit B evaporator outlet temperature (T <sub>2B</sub> B)                   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 19                | Indoor unit C evaporator outlet temperature (T <sub>2B</sub> C)                   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 20                | Indoor unit D evaporator outlet temperature (T <sub>2B</sub> D)                   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 21                | Indoor unit E evaporator outlet temperature (T <sub>2B</sub> E)                   |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 22                | Indoor unit A room temperature (T <sub>1</sub> A)                                 | If the temperature is lower than 0 °C, the digital display shows "0." If the temperature is higher than 50 °C, the digital display shows "50." If the indoor unit is not connected, the digital display shows: "____"  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 23                | Indoor unit B room temperature (T <sub>1</sub> B)                                 |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 24                | Indoor unit C room temperature (T <sub>1</sub> C)                                 |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 25                | Indoor unit D room temperature (T <sub>1</sub> D)                                 |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 26                | Indoor unit E room temperature (T <sub>1</sub> E)                                 |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 27                | Indoor unit A evaporator temperature (T <sub>2</sub> A)                           | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "____"  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 28                | Indoor unit B evaporator temperature (T <sub>2</sub> B)                           |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 29                | Indoor unit C evaporator temperature (T <sub>2</sub> C)                           |  |         |                       |   |   |   |   |   |   |   |   |   |   |
| 30                | Indoor unit D evaporator temperature (T <sub>2</sub> D)                           |  |         |                       |   |   |   |   |   |   |   |   |   |   |

|    |   |   |                                    |   |
|----|---|---|------------------------------------|---|
| 31 | Indoor unit E evaporator temperature (T <sub>2E</sub> ) |   |                                    |   |
| 32 | Condenser pipe temperature (T <sub>3</sub> )            |   |                                    |   |
| 33 | Outdoor ambient temperature (T <sub>4</sub> )           |   |                                    |   |
| 34 | Compressor discharge temperature (TP)                   | The display value is between 30–129 °C. If the temperature is lower than 30 °C, the digital display shows “30.” If the temperature is higher than 99 °C, the digital display shows single and double digits. For example, if the digital display shows “0.5”, the compressor discharge temperature is 105 °C. |                                    |   |
| 35 | AD value of current                                     | The display value is a hex number.<br>For example, the digital display tube shows “Cd”, it means AD value is 205.   |                                    |   |
| 36 | AD value of AC voltage                                  |   |                                    |   |
| 37 | AD value of DC voltage                                  |   |                                    |   |
| 38 | EXV open angle for A indoor unit                        | Actual data/4.<br>If the value is higher than 99, the digital display shows single and double digits.<br>For example, if the digital display shows “2.0”, the EXV open angle is 120×4=480p.   |                                    |   |
| 39 | EXV open angle for B indoor unit                        |   |                                    |   |
| 40 | EXV open angle for C indoor unit                        |   |                                    |   |
| 41 | EXV open angle for D indoor unit                        |   |                                    |   |
| 42 | EXV open angle for E indoor unit                        |   |                                    |   |
| 43 | MVI valve open angle                                    |   |                                    |   |
| 44 | EVI valve open angle                                    |   |                                    |   |
| 45 | Frequency limit symbol                                  | Bit7  | Reserve                            | The display value is a hexadecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1.<br>This means that a frequency limit may be caused by current, IPM or T3. |
|    |   | Bit6  | Frequency limit caused by voltage  |   |
|    |   | Bit5  | Frequency limit caused by current. |   |
|    |   | Bit4  | Reserve.                           |   |
|    |   | Bit3  | Frequency limit caused by IPM.     |   |
|    |   | Bit2  | Frequency limit caused by T5.      |   |
|    |   | Bit1  | Frequency limit caused by T3       |   |
|    |   | Bit0  | Frequency limit caused by T2       |   |
| 46 | T2B fault   | 00:No fault,01:T2B-A fault, ,02:T2B-B fault ,03:T2B-C fault,04:T2B-D fault, 05:T2B-E fault, 06:T2B-F fault(The display priority is A-B-C-D-E-F)   |                                    |   |
| 47 | Average value of T2                                     | (Sum T2 value of all indoor units)/(number of indoor units in good connection)( The heating is the average value of T2, and the cooling is the average value of T2B)  |                                    |   |
| 48 | Outdoor unit fan motor state                            | Off: 0, Super ultra high speed:1, Super high speed:2, High speed:3, Med speed: 4, Low speed: 5, Breeze:6, Super breeze: 7   |                                    |   |
| 49 | Reason of stop  |   |                                    |   |

For ACP-36COFM105AERI R32

| Number of Presses | Display  | Remark  |         |                       |   |   |   |   |   |   |   |   |
|-------------------|--|---|---------|-----------------------|---|---|---|---|---|---|---|---|
| 0                 | Normal display                                   | Displays running frequency, running state, or malfunction code  |         |                       |   |   |   |   |   |   |   |   |
| 1                 | Quantity of indoor units with working connection | Actual data <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Display</th> <th>Number of indoor unit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> </tbody> </table> | Display | Number of indoor unit | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| Display           | Number of indoor unit                            |   |         |                       |   |   |   |   |   |   |   |   |
| 1                 | 1  |   |         |                       |   |   |   |   |   |   |   |   |
| 2                 | 2  |   |         |                       |   |   |   |   |   |   |   |   |
| 3                 | 3  |   |         |                       |   |   |   |   |   |   |   |   |
| 4                 | 4  |   |         |                       |   |   |   |   |   |   |   |   |
| 2                 | Outdoor unit running mode code                   | Off: 0,Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4. Forced defrosting :A, DHW:C, Heating and DHW: d  |         |                       |   |   |   |   |   |   |   |   |
| 3                 | Indoor unit A capacity                           | The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: “——”<br>(9K:1HP,12K:1.2HP,18K:1.5HP)  |         |                       |   |   |   |   |   |   |   |   |
| 4                 | Indoor unit B capacity                           |   |         |                       |   |   |   |   |   |   |   |   |
| 5                 | Indoor unit C capacity                           |   |         |                       |   |   |   |   |   |   |   |   |
| 6                 | Indoor unit D capacity                           |   |         |                       |   |   |   |   |   |   |   |   |
| 7                 | Indoor unit E capacity                           |   |         |                       |   |   |   |   |   |   |   |   |
| 8                 | Indoor unit A capacity demand code               | Norm code*HP  |         |                       |   |   |   |   |   |   |   |   |



|      |   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
|------|---|---|------|---|------|-------------------------------|------|--|------|--|------|--|------|--|------|-----------------------------------|------|-----------------------------------|--|
| 9    | Indoor unit B capacity demand code  | (9K: 1HP,12K: 1.2HP,18K: 1.5HP)   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 10   | Indoor unit C capacity demand code  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 11   | Indoor unit D capacity demand code  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 12   | Indoor unit E capacity demand code  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 13   | Outdoor unit amendatory capacity demand code                                      |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 14   | The frequency corresponding to the total indoor units' amendatory capacity demand |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 15   | The frequency after the frequency limit   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 16   | The frequency sending to compressor control chip                                  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 17   | Indoor unit A evaporator outlet temperature (T <sub>2B</sub> A)                   | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "____"   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 18   | Indoor unit B evaporator outlet temperature (T <sub>2B</sub> B)                   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 19   | Indoor unit C evaporator outlet temperature (T <sub>2B</sub> C)                   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 20   | Indoor unit D evaporator outlet temperature (T <sub>2B</sub> D)                   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 21   | Indoor unit E evaporator outlet temperature (T <sub>2B</sub> E)                   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 22   | Indoor unit A room temperature (T <sub>1</sub> A)                                 | If the temperature is lower than 0 °C, the digital display shows "0." If the temperature is higher than 50 °C, the digital display shows "50." If the indoor unit is not connected, the digital display shows: "____"   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 23   | Indoor unit B room temperature (T <sub>1</sub> B)                                 |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 24   | Indoor unit C room temperature (T <sub>1</sub> C)                                 |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 25   | Indoor unit D room temperature (T <sub>1</sub> D)                                 |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 26   | Indoor unit E room temperature (T <sub>1</sub> E)                                 |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 27   | Indoor unit A evaporator temperature (T <sub>2</sub> A)                           | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "____"   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 28   | Indoor unit B evaporator temperature (T <sub>2</sub> B)                           |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 29   | Indoor unit C evaporator temperature (T <sub>2</sub> C)                           |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 30   | Indoor unit D evaporator temperature (T <sub>2</sub> D)                           |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 31   | Indoor unit E evaporator temperature (T <sub>2</sub> E)                           |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 32   | Condenser pipe temperature (T <sub>3</sub> )                                      |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 33   | Outdoor ambient temperature (T <sub>4</sub> )                                     |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 34   | Compressor discharge temperature (TP)   | The display value is between 30–129 °C. If the temperature is lower than 30 °C, the digital display shows "30." If the temperature is higher than 99 °C, the digital display shows single and double digits. For example, if the digital display shows "0.5", the compressor discharge temperature is 105 °C.   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 35   | AD value of current   | The display value is a hex number.<br>For example, the digital display tube shows "Cd", it means AD value is 205.   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 36   | AD value of voltage   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 37   | EXV open angle for A indoor unit  | Actual data/4.<br>If the value is higher than 99, the digital display shows single and double digits.<br>For example, if the digital display shows "2.0", the EXV open angle is 120x4=480p.   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 38   | EXV open angle for B indoor unit  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 39   | EXV open angle for C indoor unit  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 40   | EXV open angle for D indoor unit  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 41   | EXV open angle for E indoor unit  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 42   | Frequency limit symbol  | <table border="1"> <tr> <td>Bit7</td> <td>Frequency limit caused by IGBT radiator</td> </tr> <tr> <td>Bit6</td> <td>Frequency limit caused by PFC</td> </tr> <tr> <td>Bit5</td> <td>Frequency limit caused by T<sub>4</sub>.</td> </tr> <tr> <td>Bit4</td> <td>Frequency limit caused by T<sub>2</sub>.</td> </tr> <tr> <td>Bit3</td> <td>Frequency limit caused by T<sub>3</sub>.</td> </tr> <tr> <td>Bit2</td> <td>Frequency limit caused by T<sub>5</sub>.</td> </tr> <tr> <td>Bit1</td> <td>Frequency limit caused by current</td> </tr> <tr> <td>Bit0</td> <td>Frequency limit caused by voltage</td> </tr> </table> | Bit7 | Frequency limit caused by IGBT radiator | Bit6 | Frequency limit caused by PFC | Bit5 | Frequency limit caused by T <sub>4</sub> . | Bit4 | Frequency limit caused by T <sub>2</sub> . | Bit3 | Frequency limit caused by T <sub>3</sub> . | Bit2 | Frequency limit caused by T <sub>5</sub> . | Bit1 | Frequency limit caused by current | Bit0 | Frequency limit caused by voltage | The display value is a hexadecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused by T <sub>4</sub> , T <sub>3</sub> , or the current. |
| Bit7 | Frequency limit caused by IGBT radiator   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit6 | Frequency limit caused by PFC   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit5 | Frequency limit caused by T <sub>4</sub> .  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit4 | Frequency limit caused by T <sub>2</sub> .  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit3 | Frequency limit caused by T <sub>3</sub> .  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit2 | Frequency limit caused by T <sub>5</sub> .  |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit1 | Frequency limit caused by current   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| Bit0 | Frequency limit caused by voltage   |   |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |
| 43   | Average value of T <sub>2</sub>   | (Sum T <sub>2</sub> value of all indoor units)/(number of indoor units in good connection)  |      |   |      |                               |      |  |      |  |      |  |      |  |      |                                   |      |                                   |  |

|    |  |   |  |  |
|----|--|---|--|--|
| 44 | Outdoor unit fan motor state   | Off: 0, Super high speed:1, High speed:2, Med speed: 3, Low speed: 4, Breeze:5, Super breeze: 6   |  |  |
| 45 | The last error or protection code  | 00 means no malfunction and protection  |  |  |
| 46 | F indoor unit capacity   |   |  |  |
| 47 | F indoor unit capacity demand code   |   |  |  |
| 48 | F indoor unit evaporator outlet temperature (T <sub>25</sub> F)                  | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "——" |  |  |
| 49 | F indoor unit room temperature (T <sub>1</sub> F)                                |   |  |  |
| 50 | F indoor unit evaporator temperature (T <sub>2</sub> F)                          |   |  |  |
| 51 | EXV open angle for F indoor unit   |   |  |  |
| 52 | Type of machine A  | 1:ATW; 0:Air conditioner  |  |  |
| 53 | Water inlet temperature of heat exchanger (TW <sub>in</sub> )                    | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "——" |  |  |
| 54 | Water outlet temperature of heat exchanger (TW <sub>out</sub> )                  |   |  |  |
| 55 | Water outlet temperature(TW1)  |   |  |  |
| 56 | Gas pipe temperature(TR <sub>out</sub> )   |   |  |  |
| 57 | Liquid pipe temperature(TR <sub>in</sub> )                                       |   |  |  |
| 58 | Water temperature of the water tank(Tk)  |   |  |  |
| 59 | Backwater temperature of the water Tank(TWH)                                     |   |  |  |
| 60 | Total outlet temperature of hydraulic module system (after expansion tank)(TW1B) |   |  |  |
| 61 | Indoor unit status   | Bit7  | Reserve  | The display value is a decimalism number. For example, the digital display show 07, then Bit2=1, Bit1=1, and Bit0=1. |
|    |  | Bit6  | Reserve  |  |
|    |  | Bit5  | Reserve  |  |
|    |  | Bit4  | Reserve  |  |
|    |  | Bit3  | Reserve  |  |
|    |  | Bit2  | Protection from falling off of water inlet and outlet temperature sensor |  |
|    |  | Bit1  | Anti-freeze protection   |  |
|    |  | Bit0  | Water pump 1: On 0: Off  |  |
| 62 | Running mode of ATW  | 1: Machine A is a ATW, displaying the running mode sent by machine A<br>2: Machine A is not ATW, and it displays "--"   |  |  |
| 63 | Setting temperature after correct (TD)   |   |  |  |
| 64 | Setting temperature by controller(TS)  |   |  |  |
| 65 | Setting temperature after water tank (TksD)                                      | Machine A is not ATW, and it displays "--"  |  |  |
| 66 | Setting temperature(Tks)   | Machine A is not ATW, and it displays "--"  |  |  |

For other models,

| Number of Presses | Display  | Remark  |         |                       |   |   |   |   |   |   |   |   |
|-------------------|--|---|---------|-----------------------|---|---|---|---|---|---|---|---|
| 0                 | Normal display                                   | Displays running frequency, running state, or malfunction code  |         |                       |   |   |   |   |   |   |   |   |
| 1                 | Quantity of indoor units with working connection | Actual data <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Display</th> <th>Number of indoor unit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>4</td> </tr> </tbody> </table> | Display | Number of indoor unit | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| Display           | Number of indoor unit                            |   |         |                       |   |   |   |   |   |   |   |   |
| 1                 | 1  |   |         |                       |   |   |   |   |   |   |   |   |
| 2                 | 2  |   |         |                       |   |   |   |   |   |   |   |   |
| 3                 | 3  |   |         |                       |   |   |   |   |   |   |   |   |
| 4                 | 4  |   |         |                       |   |   |   |   |   |   |   |   |
| 2                 | Outdoor unit running mode code                   | Off: 0,Fan only: 1, Cooling: 2, Heating: 3, Forced cooling: 4. Forced defrosting :A, DHW:C, Heating and DHW: d  |         |                       |   |   |   |   |   |   |   |   |
| 3                 | Indoor unit A capacity                           | The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "——"<br>(9K:1HP,12K:1.2HP,18K:1.5HP)  |         |                       |   |   |   |   |   |   |   |   |
| 4                 | Indoor unit B capacity                           |   |         |                       |   |   |   |   |   |   |   |   |

|    |   |   |   |   |
|----|---|---|---|---|
| 5  | Indoor unit C capacity  |   |   |   |
| 6  | Indoor unit D capacity  |   |   |   |
| 7  | Indoor unit E capacity  |   |   |   |
| 8  | Indoor unit A capacity demand code  | Norm code*HP<br>(9K: 1HP,12K: 1.2HP,18K: 1.5HP)   |   |   |
| 9  | Indoor unit B capacity demand code  |   |   |   |
| 10 | Indoor unit C capacity demand code  |   |   |   |
| 11 | Indoor unit D capacity demand code  |   |   |   |
| 12 | Indoor unit E capacity demand code  |   |   |   |
| 13 | Outdoor unit amendatory capacity demand code                                      |   |   |   |
| 14 | The frequency corresponding to the total indoor units' amendatory capacity demand |   |   |   |
| 15 | The frequency after the frequency limit   |   |   |   |
| 16 | The frequency sending to compressor control chip                                  |   |   |   |
| 17 | Indoor unit A evaporator outlet temperature (T <sub>2B</sub> A)                   | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "——"   |   |   |
| 18 | Indoor unit B evaporator outlet temperature (T <sub>2B</sub> B)                   |   |   |   |
| 19 | Indoor unit C evaporator outlet temperature (T <sub>2B</sub> C)                   |   |   |   |
| 20 | Indoor unit D evaporator outlet temperature (T <sub>2B</sub> D)                   |   |   |   |
| 21 | Indoor unit E evaporator outlet temperature (T <sub>2B</sub> E)                   |   |   |   |
| 22 | Indoor unit A room temperature (T <sub>1</sub> A)                                 | If the temperature is lower than 0 °C, the digital display shows "0." If the temperature is higher than 50 °C, the digital display shows "50." If the indoor unit is not connected, the digital display shows: "——"   |   |   |
| 23 | Indoor unit B room temperature (T <sub>1</sub> B)                                 |   |   |   |
| 24 | Indoor unit C room temperature (T <sub>1</sub> C)                                 |   |   |   |
| 25 | Indoor unit D room temperature (T <sub>1</sub> D)                                 |   |   |   |
| 26 | Indoor unit E room temperature (T <sub>1</sub> E)                                 |   |   |   |
| 27 | Indoor unit A evaporator temperature (T <sub>2</sub> A)                           | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "——"   |   |   |
| 28 | Indoor unit B evaporator temperature (T <sub>2</sub> B)                           |   |   |   |
| 29 | Indoor unit C evaporator temperature (T <sub>2</sub> C)                           |   |   |   |
| 30 | Indoor unit D evaporator temperature (T <sub>2</sub> D)                           |   |   |   |
| 31 | Indoor unit E evaporator temperature (T <sub>2</sub> E)                           |   |   |   |
| 32 | Condenser pipe temperature (T3)   |   |   |   |
| 33 | Outdoor ambient temperature (T4)  |   |   |   |
| 34 | Compressor discharge temperature (TP)   | The display value is between 30–129 °C. If the temperature is lower than 30 °C, the digital display shows "30." If the temperature is higher than 99 °C, the digital display shows single and double digits. For example, if the digital display shows "0.5", the compressor discharge temperature is 105 °C. |   |   |
| 35 | AD value of current   | The display value is a hex number.<br>For example, the digital display tube shows "Cd", it means AD value is 205.   |   |   |
| 36 | AD value of voltage   |   |   |   |
| 37 | EXV open angle for A indoor unit  | Actual data/4.<br>If the value is higher than 99, the digital display shows single and double digits.<br>For example, if the digital display shows "2.0", the EXV open angle is 120x4=480p.   |   |   |
| 38 | EXV open angle for B indoor unit  |   |   |   |
| 39 | EXV open angle for C indoor unit  |   |   |   |
| 40 | EXV open angle for D indoor unit  |   |   |   |
| 41 | EXV open angle for E indoor unit  |   |   |   |
| 42 | Frequency limit symbol  | Bit7  | Frequency limit caused by IGBT radiator | The display value is a hexadecimal number. For example, the digital display show 2A, then Bit5=1, Bit3=1, and Bit1=1. This means that a frequency limit may be caused |
|    |   | Bit6  | Frequency limit caused by PFC           |   |
|    |   | Bit5  | Frequency limit caused by T4.           |   |
|    |   | Bit4  | Frequency limit caused by T2.           |   |
|    |   | Bit3  | Frequency limit caused by T3.           |   |
|    |   | Bit2  | Frequency limit caused by T5.           |   |
|    |   | Bit1  | Frequency limit caused by current       |   |

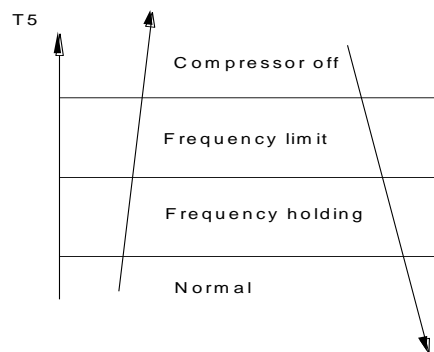
|    |   | Bit0  | Frequency limit caused by voltage | by T4, T3, or the current. |
|----|---|---|-----------------------------------|----------------------------|
| 43 | Average value of T2   | (Sum T2 value of all indoor units)/(number of indoor units in good connection)  |                                   |                            |
| 44 | Outdoor unit fan motor state                                    | Off: 0, Super high speed:1, High speed:2, Med speed: 3, Low speed: 4, Breeze:5, Super breeze: 6   |                                   |                            |
| 45 | The last error or protection code                               | 00 means no malfunction and protection  |                                   |                            |
| 46 | F indoor unit capacity  |   |                                   |                            |
| 47 | F indoor unit capacity demand code                              |   |                                   |                            |
| 48 | F indoor unit evaporator outlet temperature (T <sub>2B</sub> F) | If the temperature is lower than -9 °C, the digital display shows "-9." If the temperature is higher than 70 °C, the digital display shows "70." If the indoor unit is not connected, the digital display shows: "____" |                                   |                            |
| 49 | F indoor unit room temperature (T <sub>1</sub> F)               |   |                                   |                            |
| 50 | F indoor unit evaporator temperature (T <sub>2</sub> F)         |   |                                   |                            |
| 51 | EXV open angle for F indoor unit                                |   |                                   |                            |
| 52 | Reason for shutdown(for some models)                            |   |                                   |                            |

## 9.5 Protection

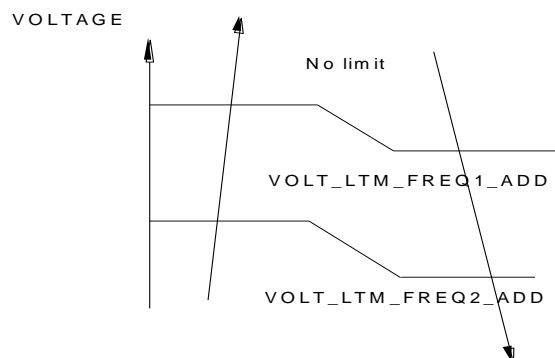
### 9.5.1 Three minutes delay at restart for compressor.

### 9.5.2 Temperature protection of compressor discharge.

When the compressor discharge temperature is getting higher, the running frequency will be limited as below rules:



### 9.5.3 Low voltage protection

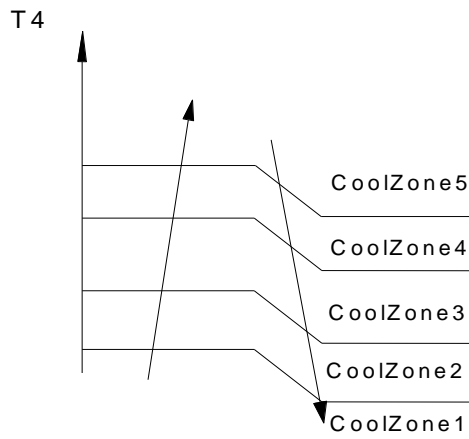


Note: if the low voltage protection occurs and not resumes within 3 minutes, it will keep the protection always after restart the machine.

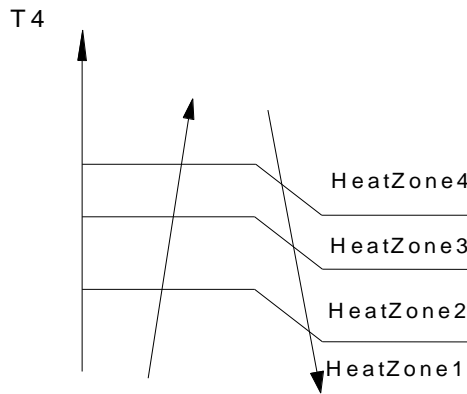
### 9.5.4 Compressor current limit protection

Temperature interval of current limit is same as range of T4 limited frequency.

**Cooling mode:**



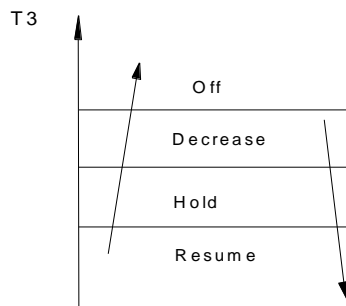
**Heating mode:**



**9.5.5 Indoor / outdoor units communication protection**

If the indoor units cannot receive the feedback signal from the outdoor units for 2 minutes, or If the outdoor units cannot receive the feedback signal from any of the indoor units for 3 minutes, the unit ceases operation and displays the failure.

**9.5.6 High condenser coil temperature protection.**



**9.5.7 Outdoor unit anti-freezing protection**

When  $T_2 < 4^\circ\text{C}$  for 250 seconds or  $T_2 < 0^\circ\text{C}$ , the indoor unit capacity demand will be zero and resume to normal when  $T_2 > 8^\circ\text{C}$  and the time of protection is no less than 3 minutes.

**9.5.8 Oil return**

**Running rules:**

1. If the compressor frequency keeps lower than setting frequency for setting time, the AC rises the frequency to setting frequency for setting time and then resume to former frequency.
2. The EXV will keep 300p while the indoor units will keep the current running mode.

If the outdoor ambient is higher than setting frequency during the oil return, the AC quit oil return.

### **9.5.9 Low outdoor ambient temperature protection**

When compressor is off, T4 is be lower than  $-35^{\circ}\text{C}$ .for 10s, the AC will stop and display “LP” or “PC 0L”.

When compressor is on, T4 is be lower than  $-40^{\circ}\text{C}$ .for 10s, the AC will stop and display “LP” or “PC 0L”.

When T4 is no lower than  $-32^{\circ}\text{C}$ .for 10s, the unit will exit protection.

## 10. Troubleshooting

### 10.1 Indoor unit error code explanation:

For Aurora type ,All Easy type, Forest type, Four-way cassette type (compact), A6 Duct:

| Malfunction   | Error Code | Timer Lamp | Operation Lamp (flashes) |
|---|------------|------------|--------------------------|
| Indoor EEPROM malfunction                                       | E0         | X          | 1                        |
| Communication malfunction between indoor and outdoor units      | E1         | X          | 2                        |
| Indoor fan speed has been out of control                        | E3         | X          | 4                        |
| Open or short circuit of T1 temperature sensor                  | E4         | X          | 5                        |
| Open or short circuit of T2 temperature sensor                  | E5         | X          | 6                        |
| Refrigerant leakage detection                                   | EC         | X          | 7                        |
| Water level alarm   | EE         | X          | 8                        |
| Overcurrent protection (For some units)                         | F0         | O          | 1                        |
| Open or short circuit of T4 temperature sensor                  | F1         | O          | 2                        |
| Open or short circuit of T3 temperature sensor                  | F2         | O          | 3                        |
| Open or short circuit of T5 temperature sensor                  | F3         | O          | 4                        |
| Outdoor EEPROM malfunction (For some units)                     | F4         | O          | 5                        |
| Outdoor fan speed is out of control                             | F5         | O          | 6                        |
| Open or short circuit of T2B temperature sensor                 | F6         | O          | 7                        |
| Communication malfunction between indoor two chips(For A6 Duct) | FA         | O          | 11                       |
| IPM module malfunction  | P0         | ☆          | 1                        |
| Over voltage or over low voltage protection                     | P1         | ☆          | 2                        |
| Too low ambient temperature protection                          | P3         | ☆          | 4                        |
| Inverter compressor drive protection                            | P4         | ☆          | 5                        |
| Indoor units mode conflict                                      | --         | ☆          | 6                        |
| Low pressure protection of compressor                           | P6         | ☆          | 7                        |
| <b>O (on) X(off) ☆(flash at 2Hz)</b>                            |            |            |                          |

**For Mission2 type and Ultimate Comfort type:**

| Malfunction  | Error Code |
|--|------------|
| Indoor unit EEPROM parameter error                                       | E0/EA      |
| Indoor / outdoor units communication error                               | E1         |
| Indoor fan speed is operating outside of the normal range                | E3         |
| Indoor room temperature sensor T1 open circuit or short circuit          | E4         |
| Evaporator coil temperature sensor T2 open circuit or short circuit      | E5         |
| Communication error between the indoor PCB and display board             | Eb/EH 0b   |
| Refrigerant leakage detection  | EC         |
| Overload current protection  | F0         |
| Outdoor ambient temperature sensor T4 open circuit or short circuit      | F1         |
| Condenser coil temperature sensor T3 open circuit or short circuit       | F2         |
| Compressor discharge temperature sensor T5 open circuit or short circuit | F3         |
| Outdoor unit EEPROM parameter error                                      | F4         |
| Outdoor fan speed is operating outside of the normal range               | F5         |
| IPM malfunction or IGBT over-strong current protection                   | P0         |
| Over or low voltage protection   | P1         |
| High temperature protection of IPM module                                | P2         |
| Inverter compressor drive error  | P4         |
| Indoor units mode conflict   | --         |

**For Xtreme type, Infini type and All Easy Pro type:**

| Running Lamp | Timer Lamp | Display     | Error Information  |
|--------------|------------|-------------|--|
| 1 time       | OFF        | EH 00/EH 0A | Indoor unit EEPROM parameter error   |
| 2 times      | OFF        | EL 01       | Indoor/outdoor unit communication error  |
| 3 times      | OFF        | EH 02       | Zero-crossing signal detection error   |
| 4 times      | OFF        | EH 03       | The indoor fan speed is operating outside of the normal range  |
| 5 times      | OFF        | EC 51       | Outdoor unit EEPROM parameter error  |
| 5 times      | OFF        | EC 52       | Condenser coil temperature sensor T3 is in open circuit or has short circuited                                       |
| 5 times      | OFF        | EC 53       | Outdoor room temperature sensor T4 is in open circuit or has short circuited   |
| 5 times      | OFF        | EC 54       | Compressor discharge temperature sensor TP is in open circuit or has short circuited                                 |
| 5 times      | OFF        | EC 56       | Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units) |
| 6 times      | OFF        | EH 60       | Indoor room temperature sensor T1 is in open circuit or has short circuited  |



|          |       |       |   |
|----------|-------|-------|---|
| 6 times  | OFF   | EH 61 | Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited                            |
| 12 times | OFF   | EC 07 | The outdoor fan speed is operating outside of the normal range  |
| 9 times  | OFF   | EH 0b | Indoor PCB/Display board communication error  |
| 8 times  | OFF   | EL 0C | Refrigerant leakage detection   |
| 7 times  | FLASH | PC 00 | IPM malfunction or IGBT over-strong current protection  |
| 2 times  | FLASH | PC 01 | Over voltage or over low voltage protection   |
| 3 times  | FLASH | PC 02 | Top temperature protection of compressor or High temperature protection of IPM module or High pressure protection |
| 5 times  | FLASH | PC 04 | Inverter compressor drive error   |
| 1 time   | FLASH | PC 08 | Current overload protection   |
| 7 times  | FLASH | PC 03 | High pressure protection or low pressure protection   |
| 1 time   | ON    | --    | Indoor units mode conflict  |

**MCA3U-07HRFNX-QRD0W(GA), MCA3U-09HRFNX-QRD0W(GA),  
MTIU-07HWFNX-QRD0W(GA), MTIU-09HWFNX-QRD0W(GA):**

| Running Lamp | Timer Lamp | Display     | Error Information  |
|--------------|------------|-------------|--|
| 1 time       | OFF        | EH 00/EH 0A | Indoor unit EEPROM parameter error   |
| 2 times      | OFF        | EL 01       | Indoor/outdoor unit communication error  |
| 3 times      | OFF        | EH 02       | Zero-crossing signal detection error   |
| 4 times      | OFF        | EH 03       | The indoor fan speed is operating outside of the normal range  |
| 5 times      | OFF        | EC 51       | Outdoor unit EEPROM parameter error  |
| 5 times      | OFF        | EC 52       | Condenser coil temperature sensor T3 is in open circuit or has short circuited                                       |
| 5 times      | OFF        | EC 53       | Outdoor room temperature sensor T4 is in open circuit or has short circuited   |
| 5 times      | OFF        | EC 54       | Compressor discharge temperature sensor TP is in open circuit or has short circuited                                 |
| 5 times      | OFF        | EC 55       | IGBT temperature sensor TH is in open circuit or has short circuited   |
| 5 times      | OFF        | EC 56       | Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units) |
| 6 times      | OFF        | EH 60       | Indoor room temperature sensor T1 is in open circuit or has short circuited  |
| 6 times      | OFF        | EH 61       | Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited                               |
| 12 times     | OFF        | EC 07       | The outdoor fan speed is operating outside of the normal range   |
| 9 times      | OFF        | EH 0b       | Communication error between indoor two chips(For A6 Duct)  |

|          |       |       |   |
|----------|-------|-------|---|
| 13 times | OFF   | EH 0E | Water-level alarm malfunction   |
| 8 times  | OFF   | EL 0C | Refrigerant leakage detection   |
| 7 times  | FLASH | PC 00 | IPM malfunction or IGBT over-strong current protection  |
| 2 times  | FLASH | PC 01 | Over voltage or over low voltage protection   |
| 3 times  | FLASH | PC 02 | Top temperature protection of compressor or High temperature protection of IPM module or High pressure protection |
| 5 times  | FLASH | PC 04 | Inverter compressor drive error   |
| 1 time   | FLASH | PC 08 | Current overload protection   |
| 7 times  | FLASH | PC 03 | High pressure protection or low pressure protection   |
| 1 time   | ON    | --    | Indoor units mode conflict  |

## 10.2 Outdoor unit error code explanation:

For ACP-21COFM60AERIs R32 ACP-27COFM79AERIs R32 ACP-42COFM123AERIs R32

| Display | LED STATUS   |
|---------|--|
| EC 51   | Outdoor EEPROM malfunction   |
| EL 01   | Indoor / outdoor units communication error   |
| PC 40   | Communication malfunction between IPM board and outdoor main board                   |
| PC 08   | Outdoor overcurrent protection   |
| PC 10   | Outdoor unit low AC voltage protection   |
| PC 11   | Outdoor unit main control board DC bus high voltage protection                       |
| PC 12   | Outdoor unit main control board DC bus high voltage protection /341 MCE error        |
| PC 00   | IPM module protection  |
| PC 0F   | PFC module protection  |
| EC 71   | Over current failure of outdoor DC fan motor   |
| EC 72   | Lack phase failure of outdoor DC fan motor   |
| EC 07   | Outdoor fan speed has been out of control  |
| PC 43   | Outdoor compressor lack phase protection   |
| PC 44   | Outdoor unit zero speed protection   |
| PC 45   | Outdoor unit IR chip drive failure   |
| PC 46   | Compressor speed has been out of control   |
| PC 49   | Compressor overcurrent failure   |
| PC 30   | High pressure protection (For ACP-42COFM123AERIs R32                                 |
| PC 31   | Low pressure protection (For ACP-42COFM123AERIs R32                                  |
| PC 0A   | High temperature protection of condenser   |
| PC 06   | Temperature protection of compressor discharge                                       |
| PC 0L   | Low ambient temperature protection   |
| PC 02   | Top temperature protection of compressor   |
| EC 52   | Condenser coil temperature sensor T3 is in open circuit or has short circuited       |
| EC 53   | Outdoor room temperature sensor T4 is in open circuit or has short circuited         |
| EC 54   | Compressor discharge temperature sensor T5 is in open circuit or has short circuited |

|       |   |
|-------|---|
| EC 56 | Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited |
| EC 50 | Open or short circuit of outdoor unit temperature sensor(T3,T4.T5)                      |

**For other models,**

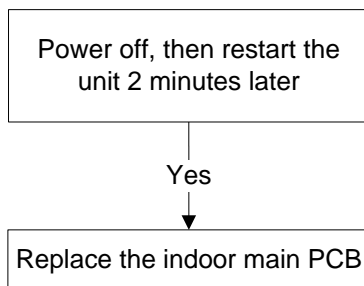
| <b>Display</b> | <b>LED STATUS</b>   |
|----------------|---|
| E0             | Outdoor EEPROM malfunction  |
| E2             | Indoor / outdoor units communication error  |
| E3             | Communication malfunction between IPM board and outdoor main board                    |
| E4             | Open or short circuit of outdoor unit temperature sensor(T3,T4.T5)                    |
| E5             | Voltage protection  |
| E6             | PFC module protection   |
| E8             | Outdoor fan speed has been out of control or compressor speed has been out of control |
| F1             | No A Indoor unit coil outlet temperature sensor or connector of sensor is defective   |
| F2             | No B Indoor unit coil outlet temperature sensor or connector of sensor is defective   |
| F3             | No C Indoor unit coil outlet temperature sensor or connector of sensor is defective   |
| F4             | No D Indoor unit coil outlet temperature sensor or connector of sensor is defective   |
| F5             | No E Indoor unit coil outlet temperature sensor or connector of sensor is defective   |
| P0             | Top temperature protection of compressor  |
| P1             | High pressure protection (For ACP-36COFM105AERI R32 ACP-42COFM123AERI R32             |
| P2             | Low pressure protection (For ACP-36COFM105AERI R32 ACP-42COFM123AERI R32              |
| P3             | Current protection of compressor  |
| P4             | Temperature protection of compressor discharge  |
| P5             | High temperature protection of condenser  |
| P6             | IPM module protection   |
| E9             | 24k indoor unit wiring error  |
| LP             | Low ambient temperature protection  |

Note: Once these error codes display, they will disappear in at least 30 seconds if the unit come back to normal.(Except E2&E3)

## 10.3 Trouble shooting

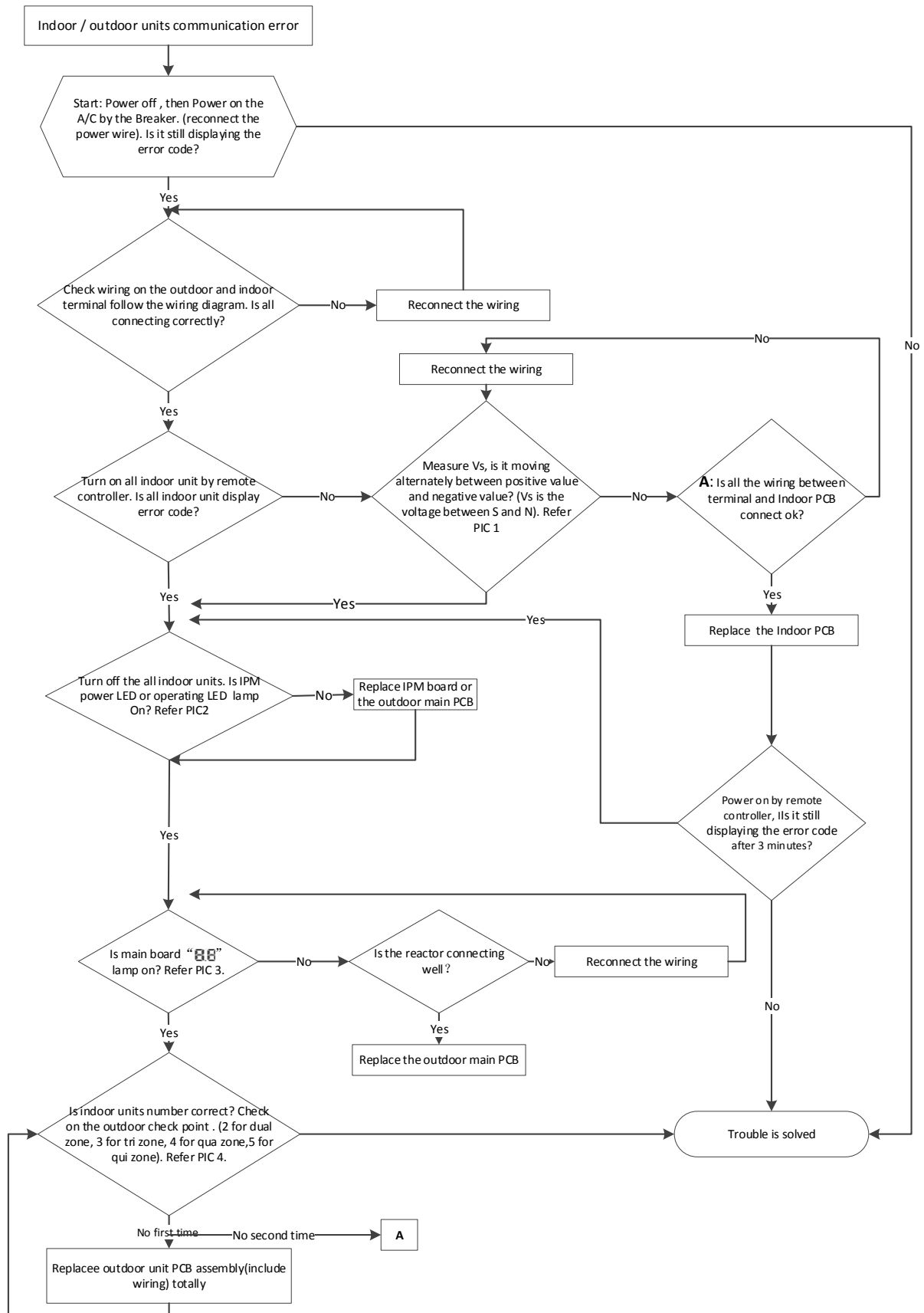
### 10.3.1 For the indoor unit

#### 10.3.1.1 Indoor EEPROM malfunction (IDU E0/EA/EH 00/EH 0A)



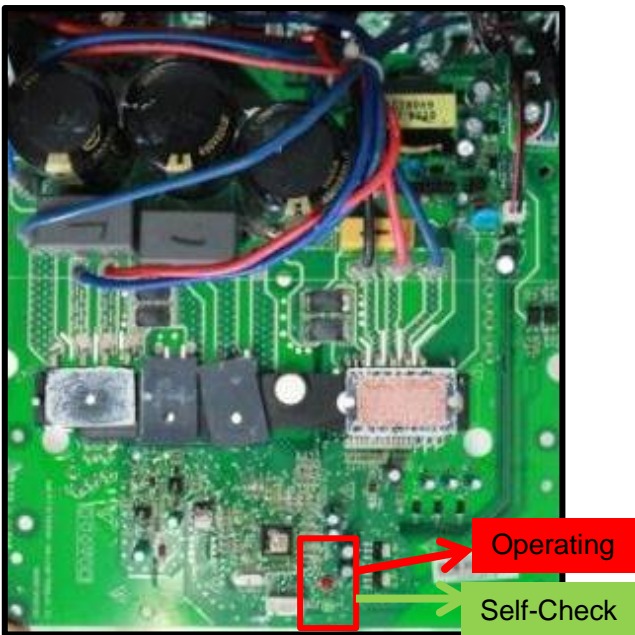
EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

### 10.3.1.2 Indoor / outdoor units communication error(E1(IDU)/ E2(ODU)/ EL 01(IDU/ODU))

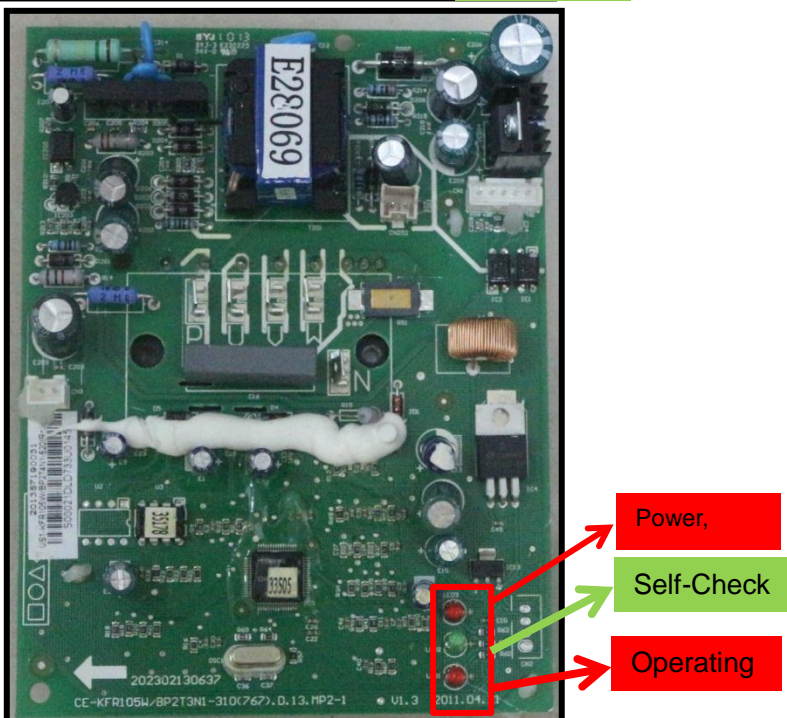




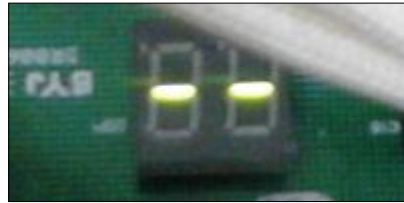
Pic 1: check the voltage of N to S (Vs), is it moving alternately between positive value and negative value?



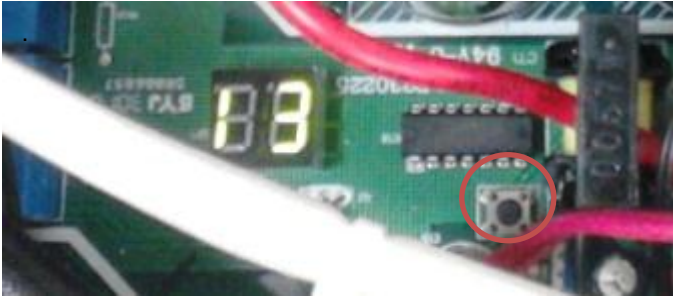
Pic 2: IPM or outdoor main PCB



Pic 2: IPM or outdoor main PCB



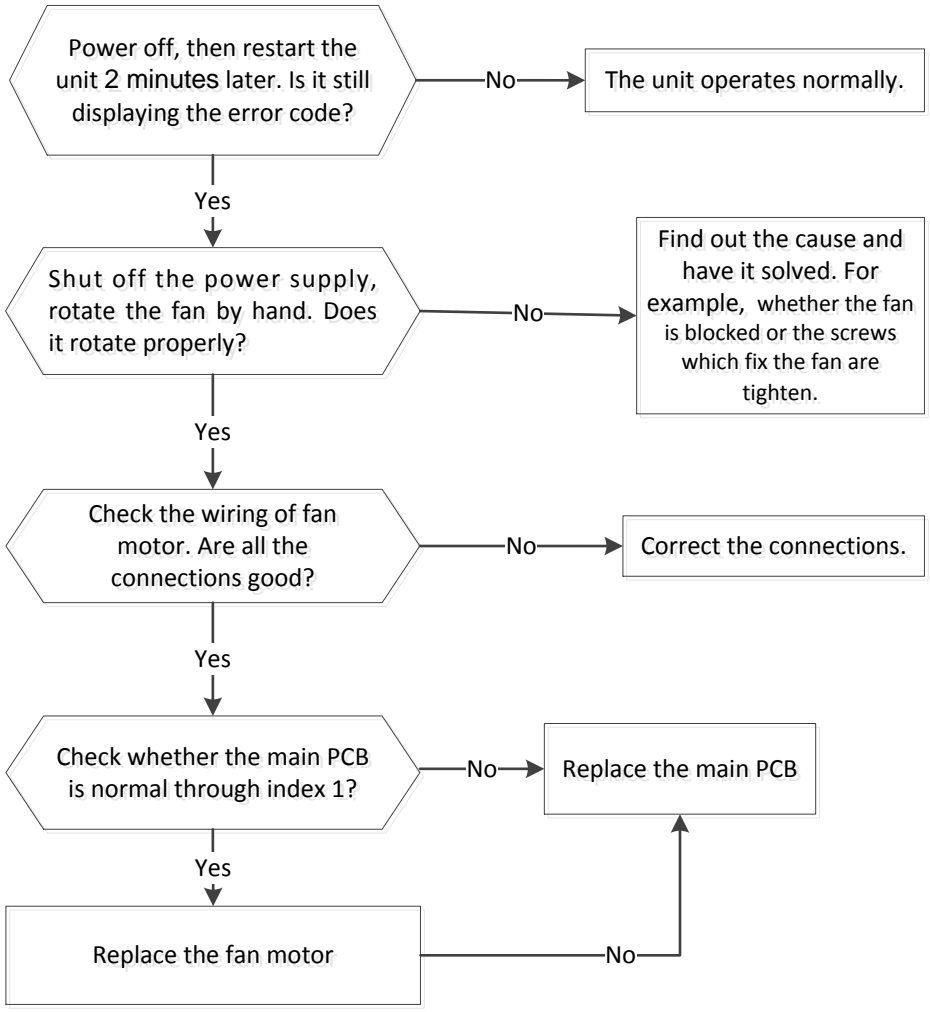
PIC3 :Main board LED when power on and unit standby.



PIC 4: check point button,  
Press 1 time for check how many indoor units are connected



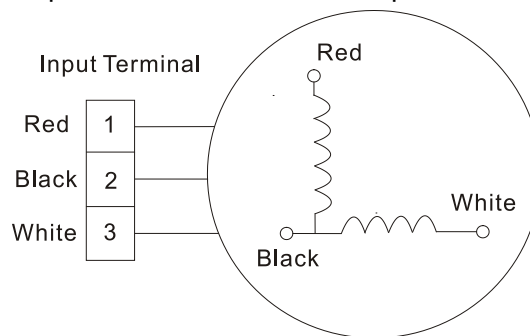
### 10.3.1.3 Indoor fan speed has been out of control (IDU E3/ EH 03)



Index 1:

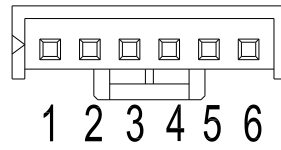
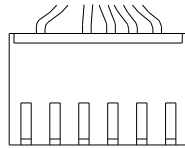
#### 1: Indoor AC fan motor

Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply) or 50V(115V power supply), the PCB must have problems and need to be replaced.



#### 2. Indoor DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



### DC motor voltage input and output

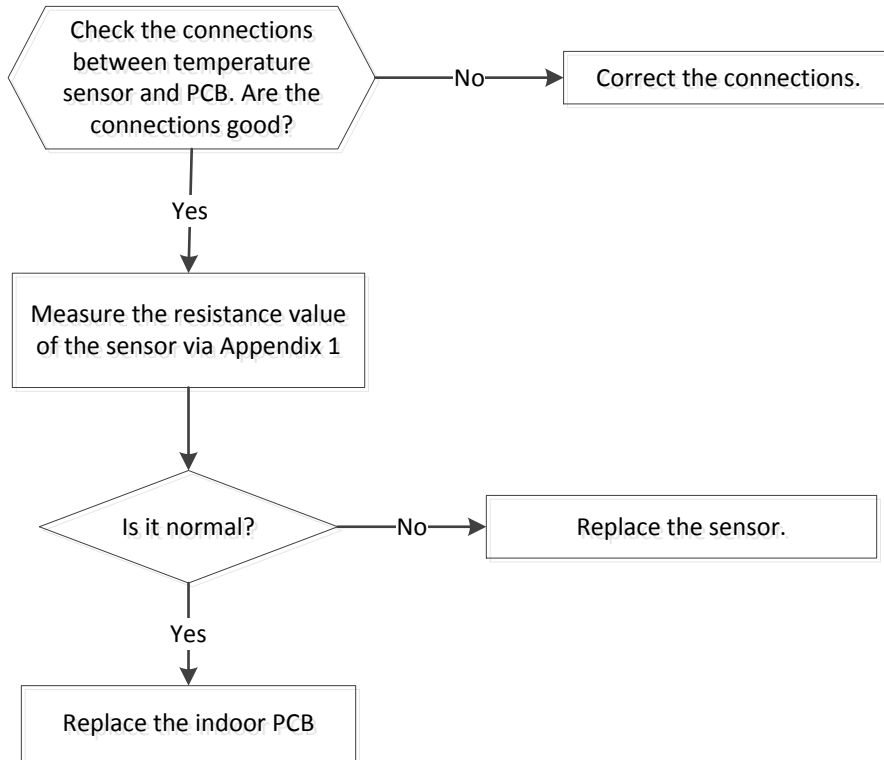
For split type:

| NO. | Color  | Signal | Voltage   |
|-----|--------|--------|-----------|
| 1   | Red    | Vs/Vm  | 280V~380V |
| 2   | ---    | ---    | ---       |
| 3   | Black  | GND    | 0V        |
| 4   | White  | Vcc    | 14-17.5V  |
| 5   | Yellow | Vsp    | 0~5.6V    |
| 6   | Blue   | FG     | 14-17.5V  |

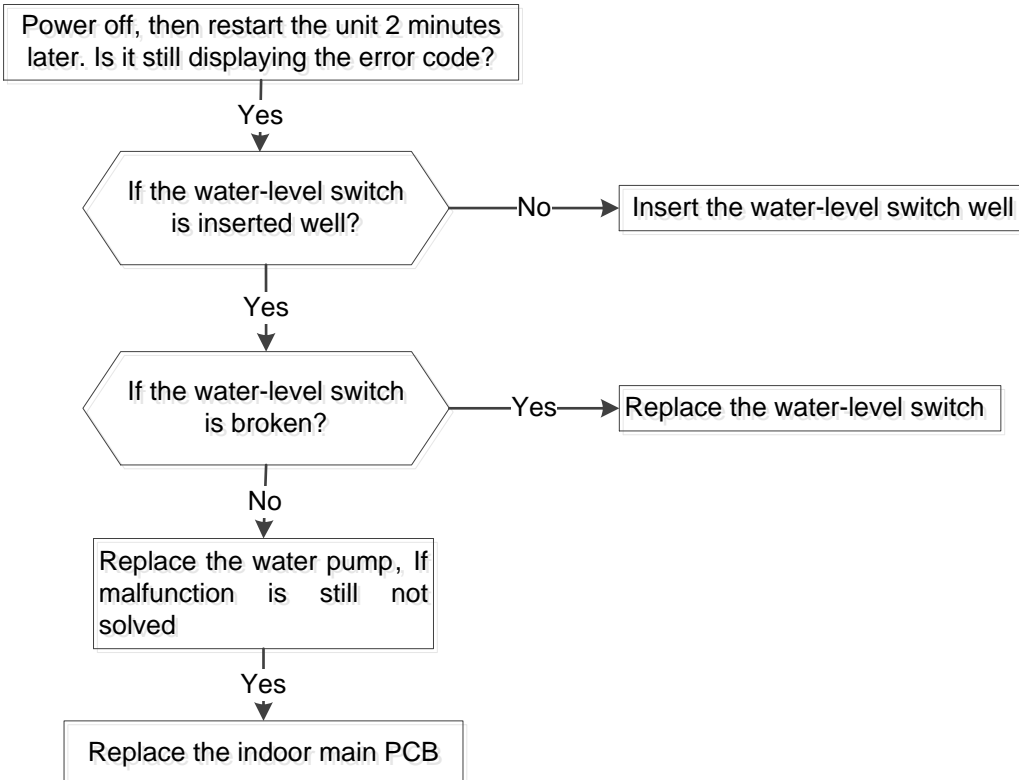
For other types:

| NO. | Color  | Signal | Voltage    |
|-----|--------|--------|------------|
| 1   | Red    | Vs/Vm  | 192V~380V  |
| 2   | ---    | ---    | ---        |
| 3   | Black  | GND    | 0V         |
| 4   | White  | Vcc    | 13.5-16.5V |
| 5   | Yellow | Vsp    | 0~6.5V     |
| 6   | Blue   | FG     | 13.5-16.5V |

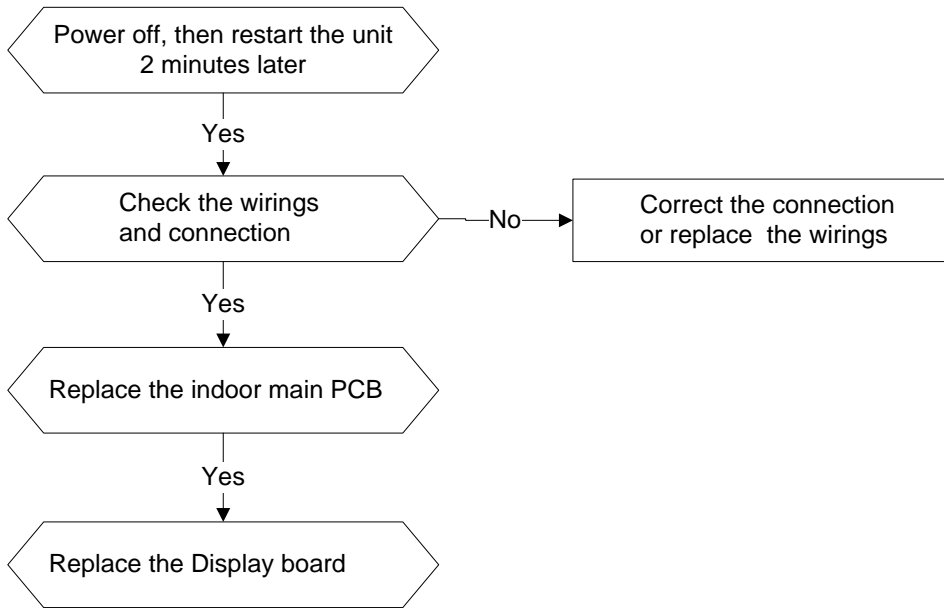
### 10.3.1.4 Open or short circuit of temperature sensor(IDU E4/E5/EH 60/EH 61)



### 10.3.1.5 Water-level alarm malfunction(IDU EE)



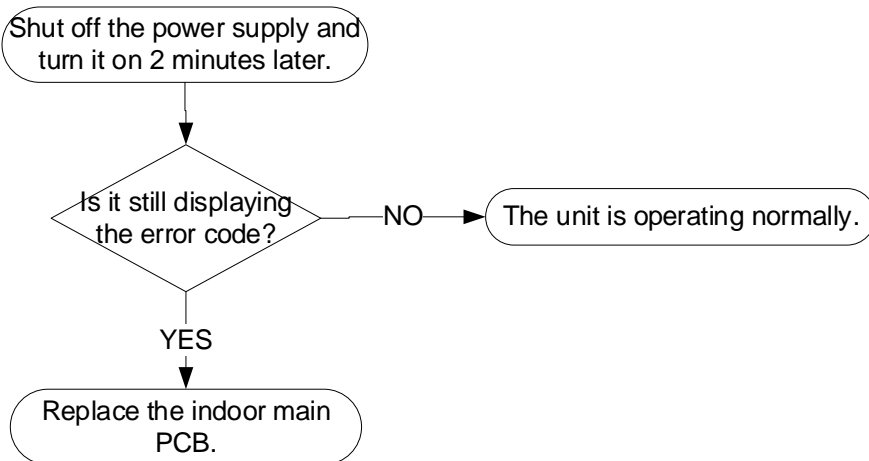
### 10.3.1.7 Communication error between the indoor PCB and display board(IDU Eb/EH 0b)



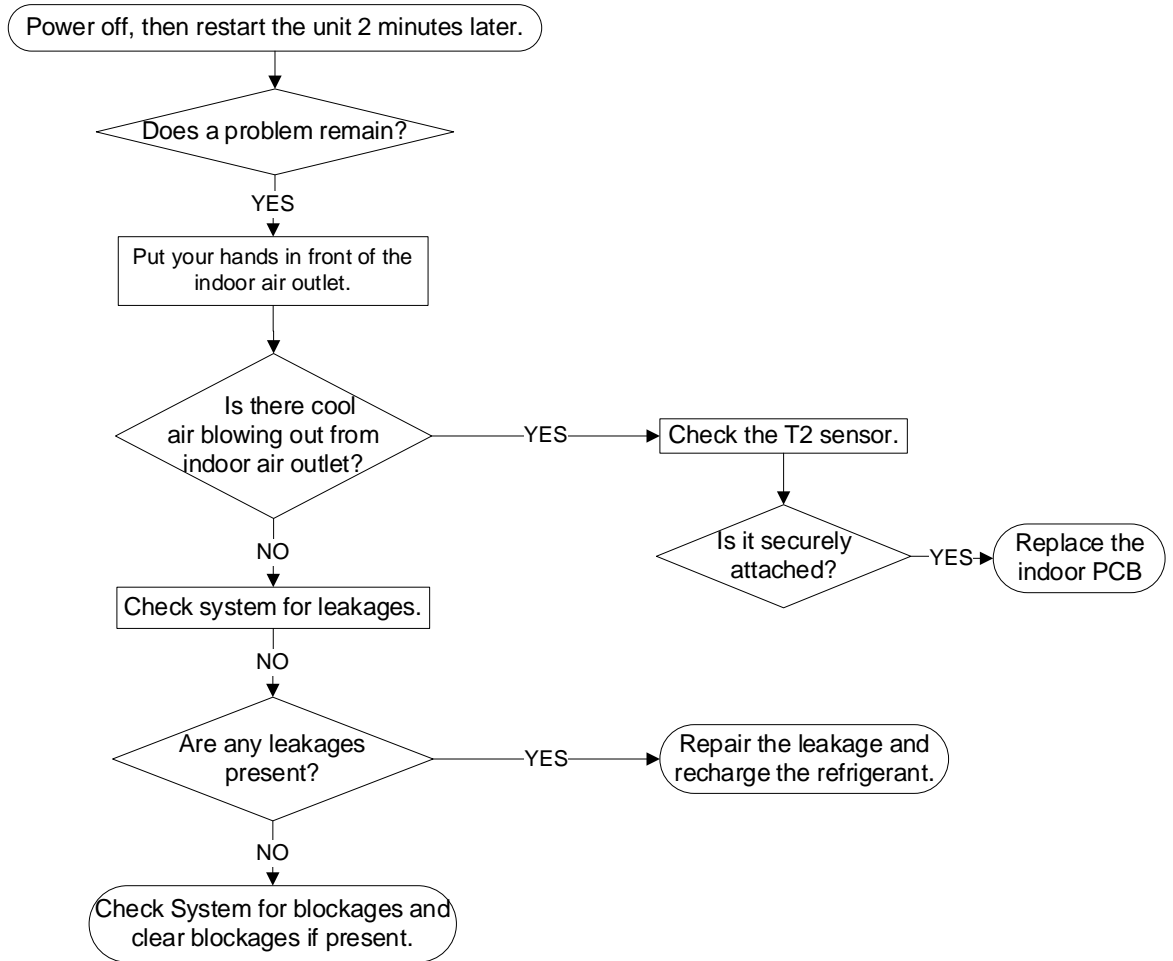
### 10.3.1.8 Inverter compressor drive malfunction(IDU P4/ PC04)

The trouble shooting is same with IPM module protection.

### 10.3.1.9 Communication malfunction between indoor two chips (IDU FA/EH 0b)

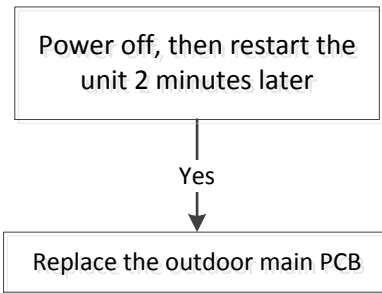


### 10.3.1.10 Refrigerant Leakage Detection(IDU EC/ EL 0C)



### 10.3.3 For the outdoor unit

#### 10.3.3.1 Outdoor EEPROM malfunction(ODU E0/EC 51)



EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

#### 10.3.3.2 Condenser coil temperature sensor T3 is in open circuit or has short circuited(EC 52)

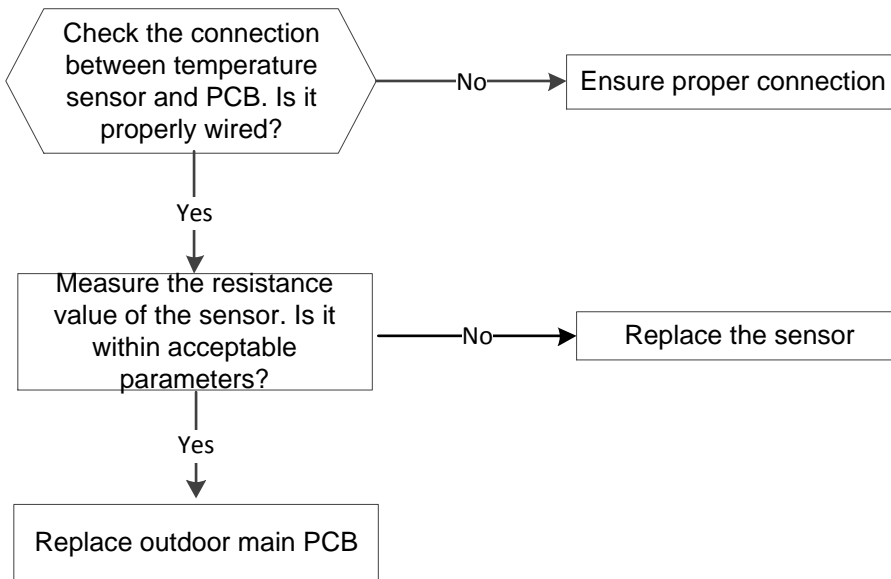
#### Outdoor room temperature sensor T4 is in open circuit or has short circuited(EC 53)

#### Compressor discharge temperature sensor T5 is in open circuit or has short circuited(EC 54)

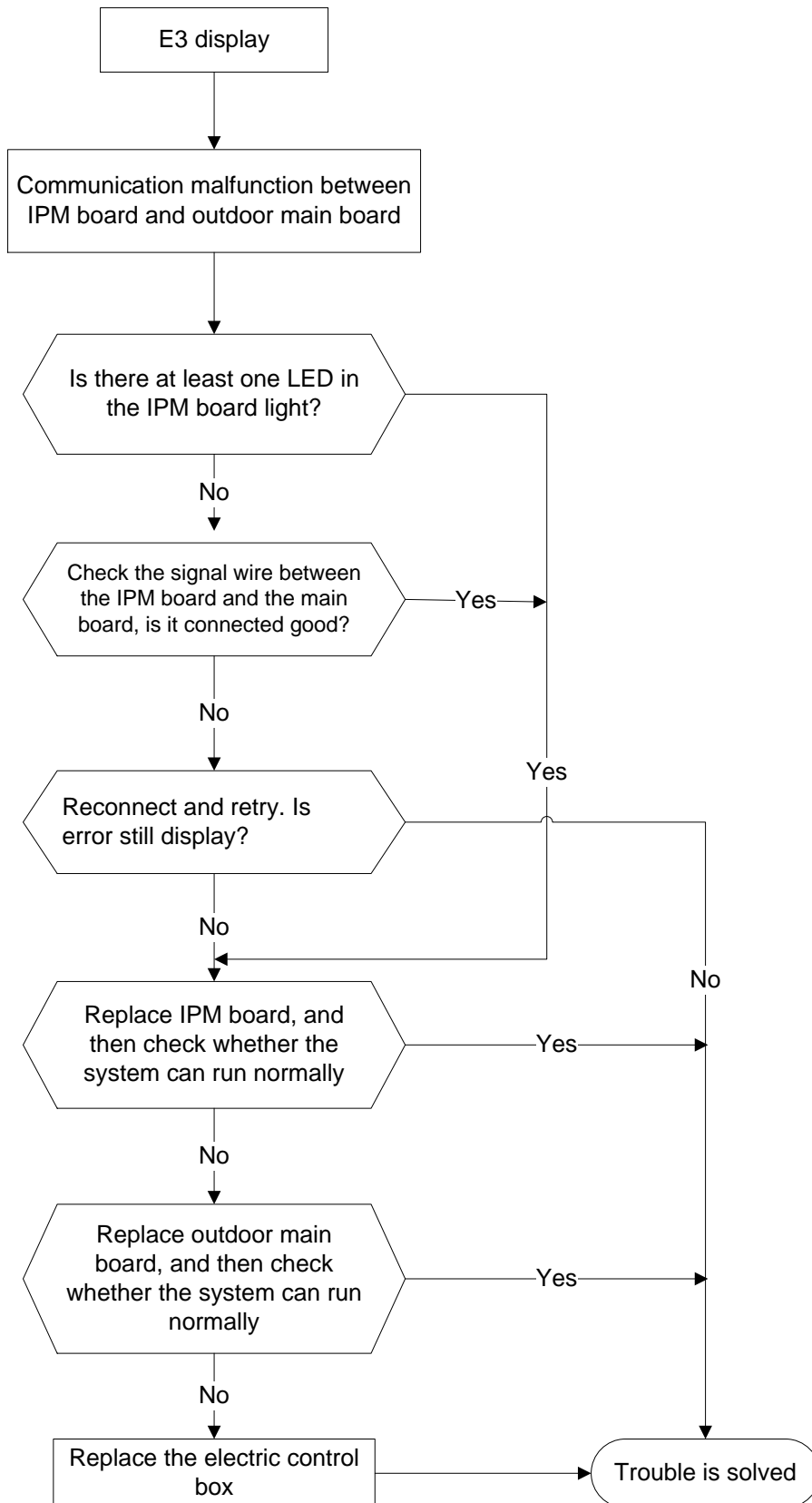
#### Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(EC 56)

#### IGBT temperature sensor TH is in open circuit or has short circuited(EC 55)

#### Open or short circuit of outdoor unit temperature sensor(T3,T4.T5)(E4/ EC 50)



### 10.3.3.3 Communication malfunction between IPM board and outdoor main board(ODU E3/PC 40)

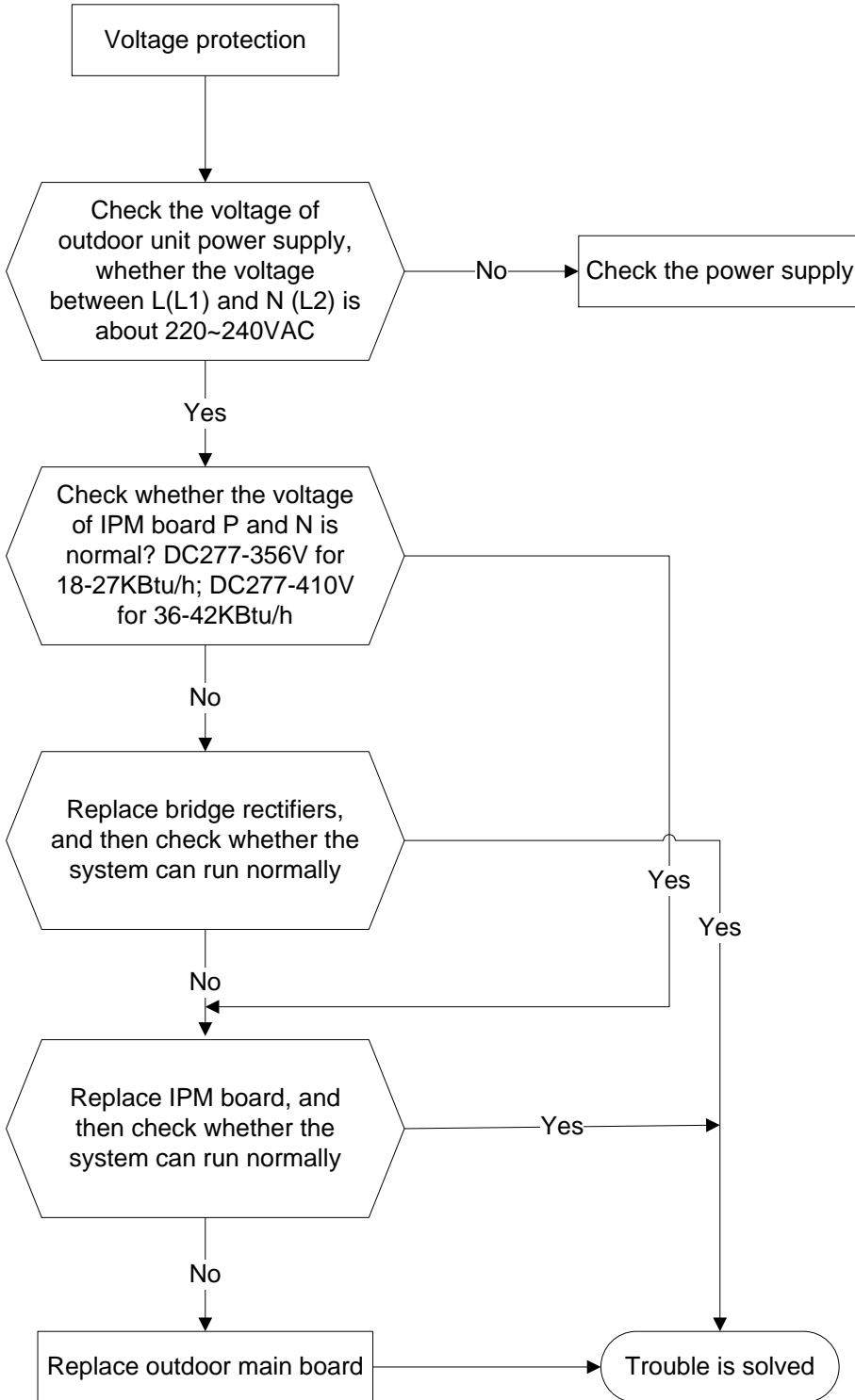


### 10.3.3.4 Voltage protection(ODU E5)

#### Outdoor unit low AC voltage protection(PC10)

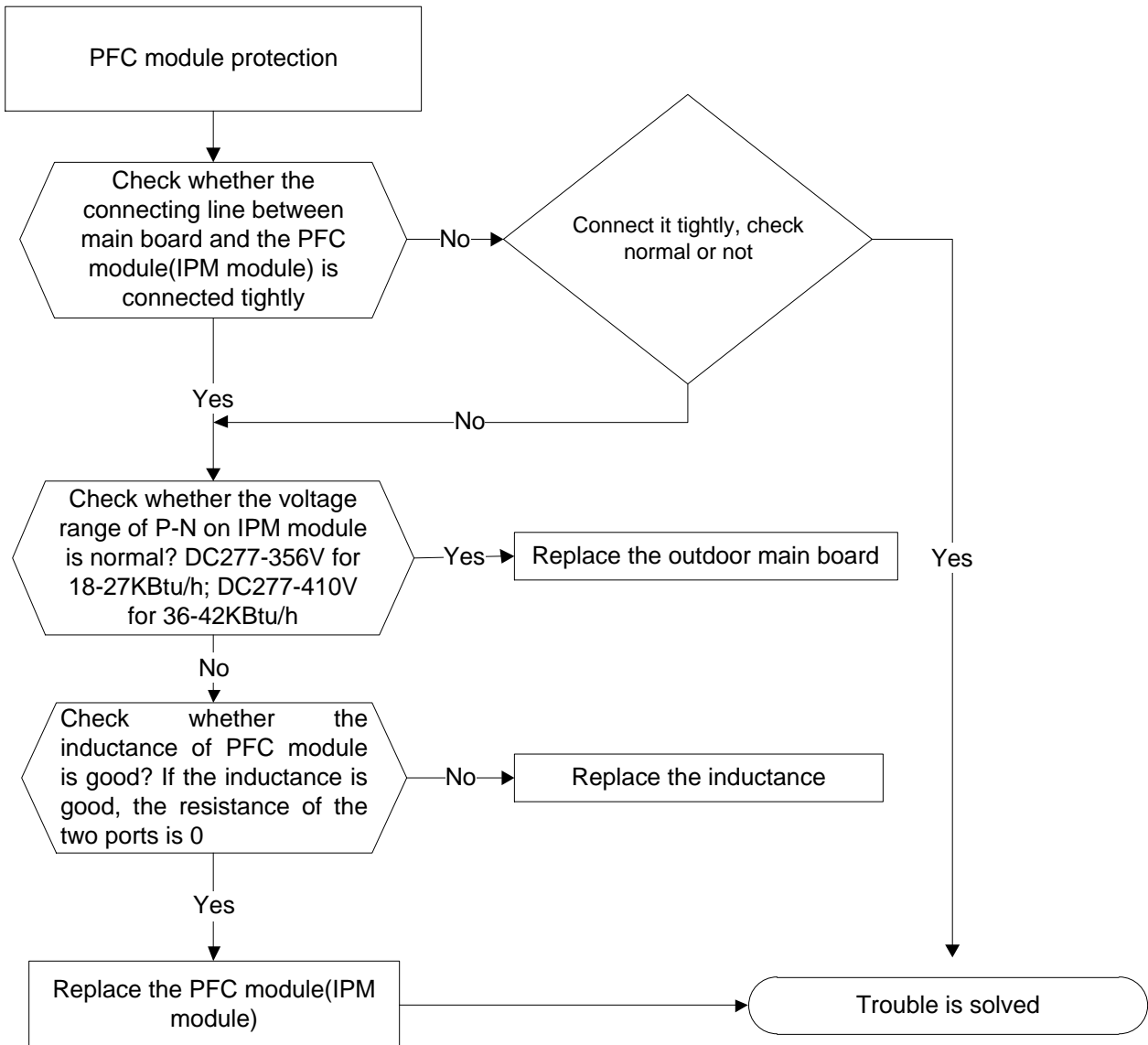
#### Outdoor unit main control board DC bus high voltage protection(PC11)

#### Outdoor unit main control board DC bus high voltage protection /341 MCE error(PC12)



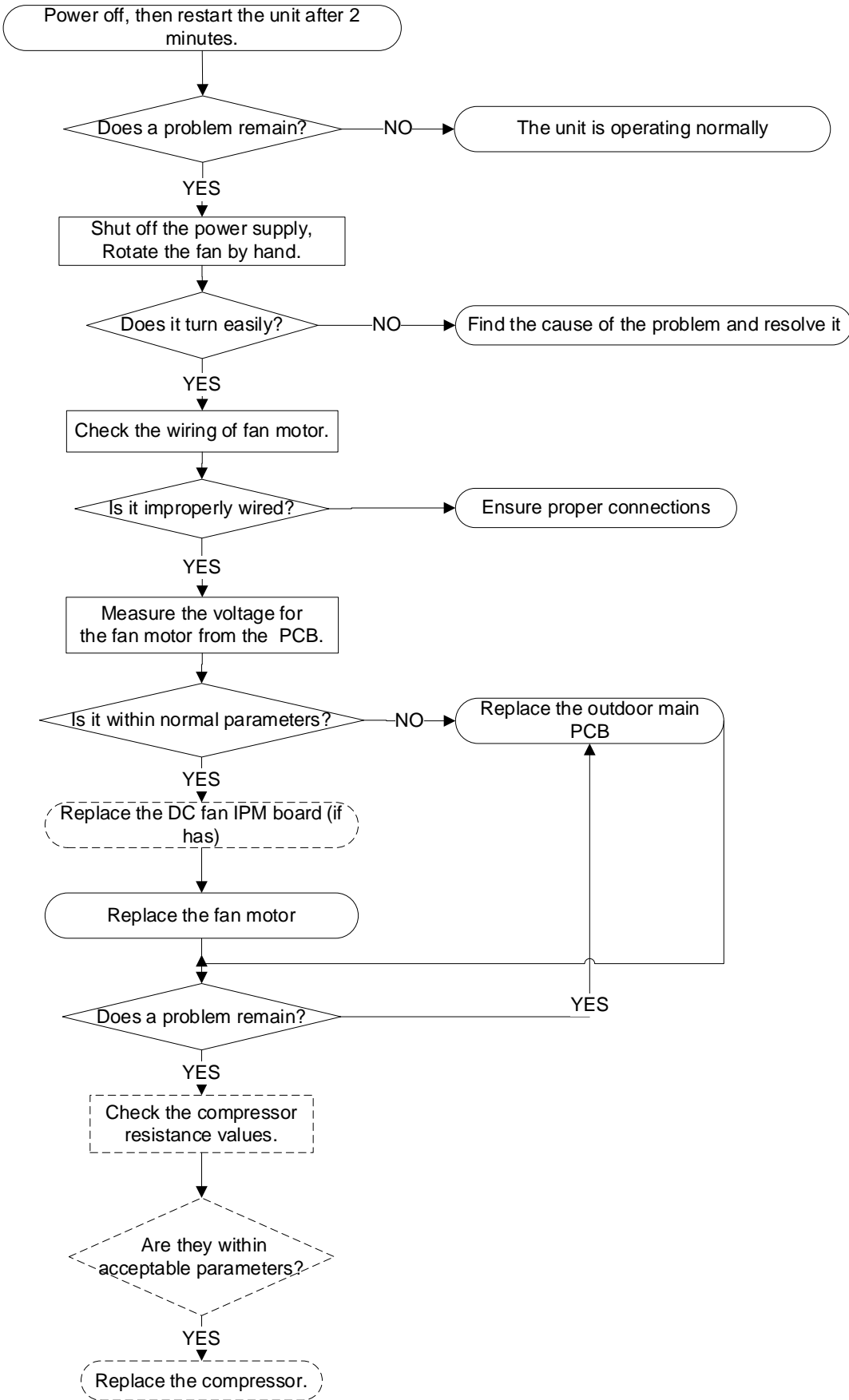


### 10.3.3.5 PFC module protection (ODU E6/PC 0F)



**10.3.3.6 Outdoor fan speed has been out of control or compressor speed has been out of control (ODU E8/EC 07)**

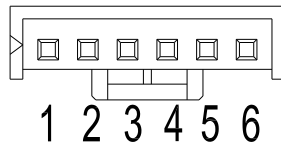
**Over current failure of outdoor DC fan motor (ODU EC71)**



Index 1:

1. Outdoor DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.

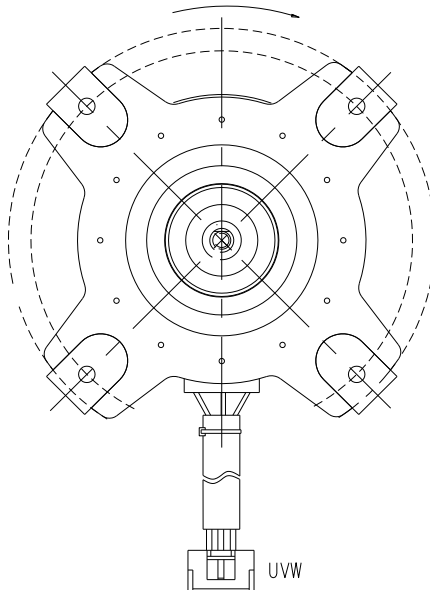


DC motor voltage input and output

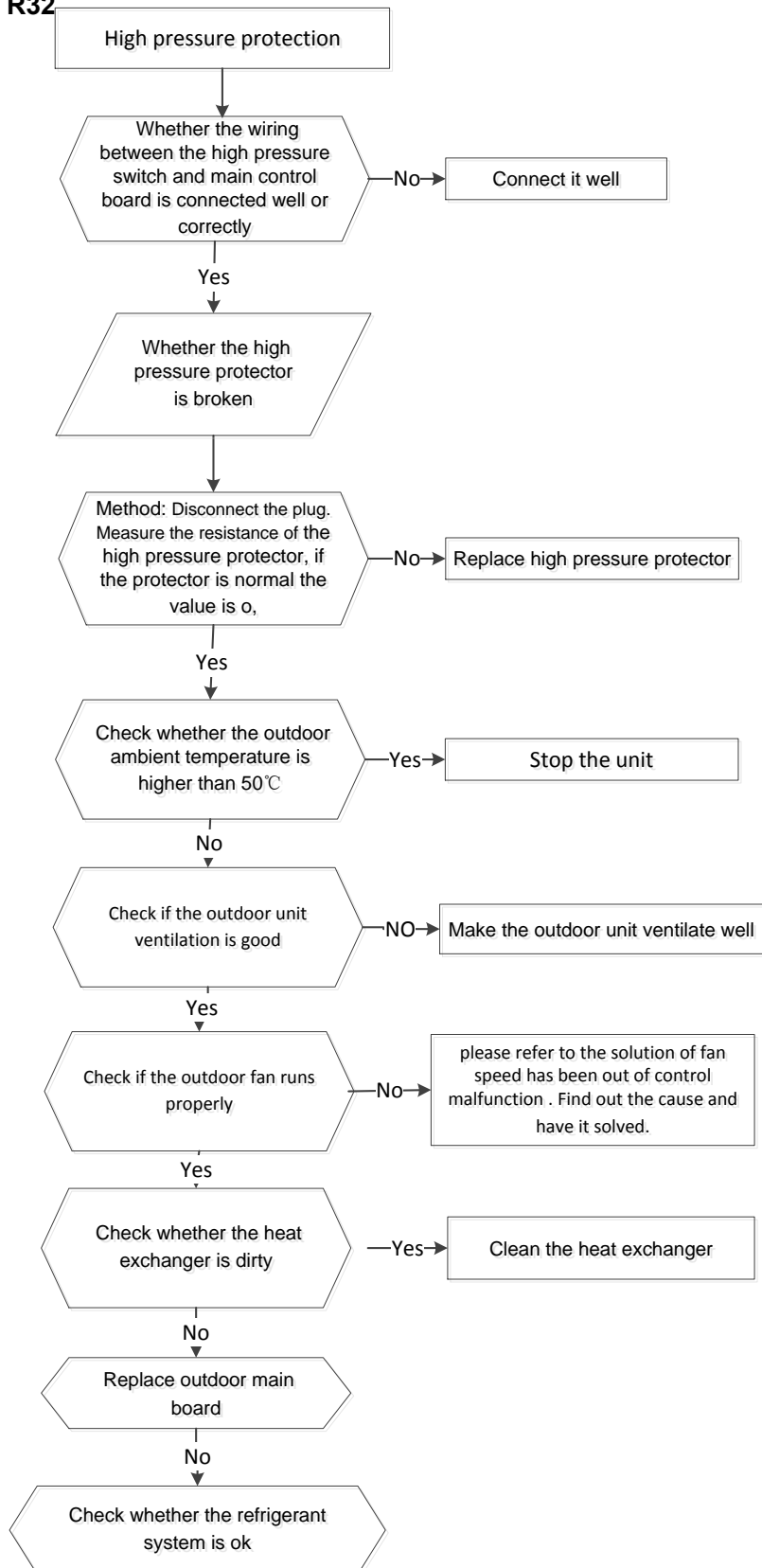
| NO. | Color  | Signal | Voltage    |
|-----|--------|--------|------------|
| 1   | Red    | Vs/Vm  | 140V~380V  |
| 2   | ---    | ---    | ---        |
| 3   | Black  | GND    | 0V         |
| 4   | White  | Vcc    | 13.5-16.5V |
| 5   | Yellow | Vsp    | 0~6.5V     |
| 6   | Blue   | FG     | 15V        |

2. Indoor or outdoor DC Fan Motor (control chip is in PCB)

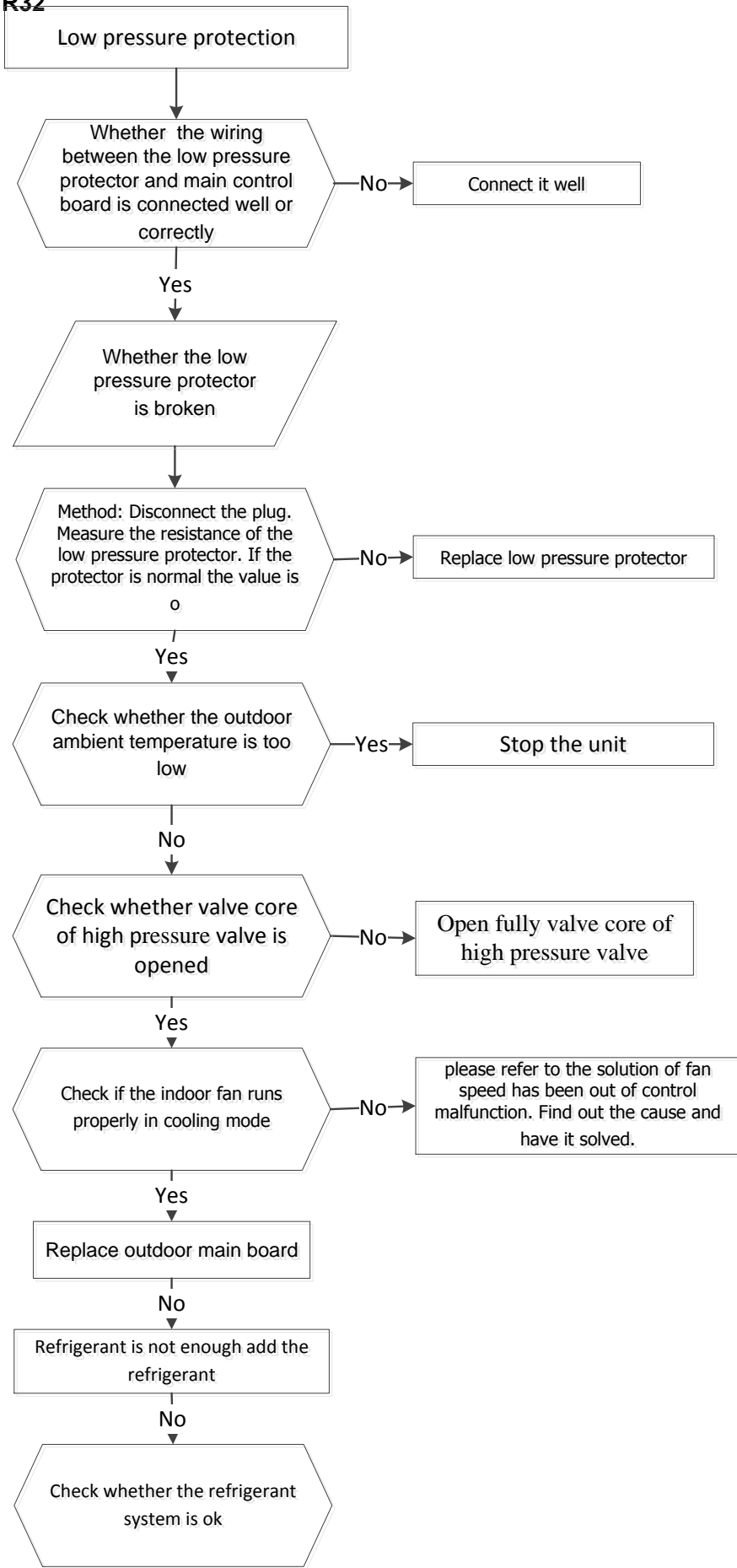
Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistances are not equal to each other, the fan motor may be experiencing problems and need to be replaced. Otherwise, the PCB must has problems and need to be replaced.



**10.3.3.7 High pressure protection (ODU P1/PC 30)(For ACP-36COFM105AERI R32 ACP-42COFM123AERI R32**



**10.3.3.8 Low pressure protection (ODU P2/PC 31) (For ACP-36COFM105AERI R32 ACP-42COFM123AERI R32)**

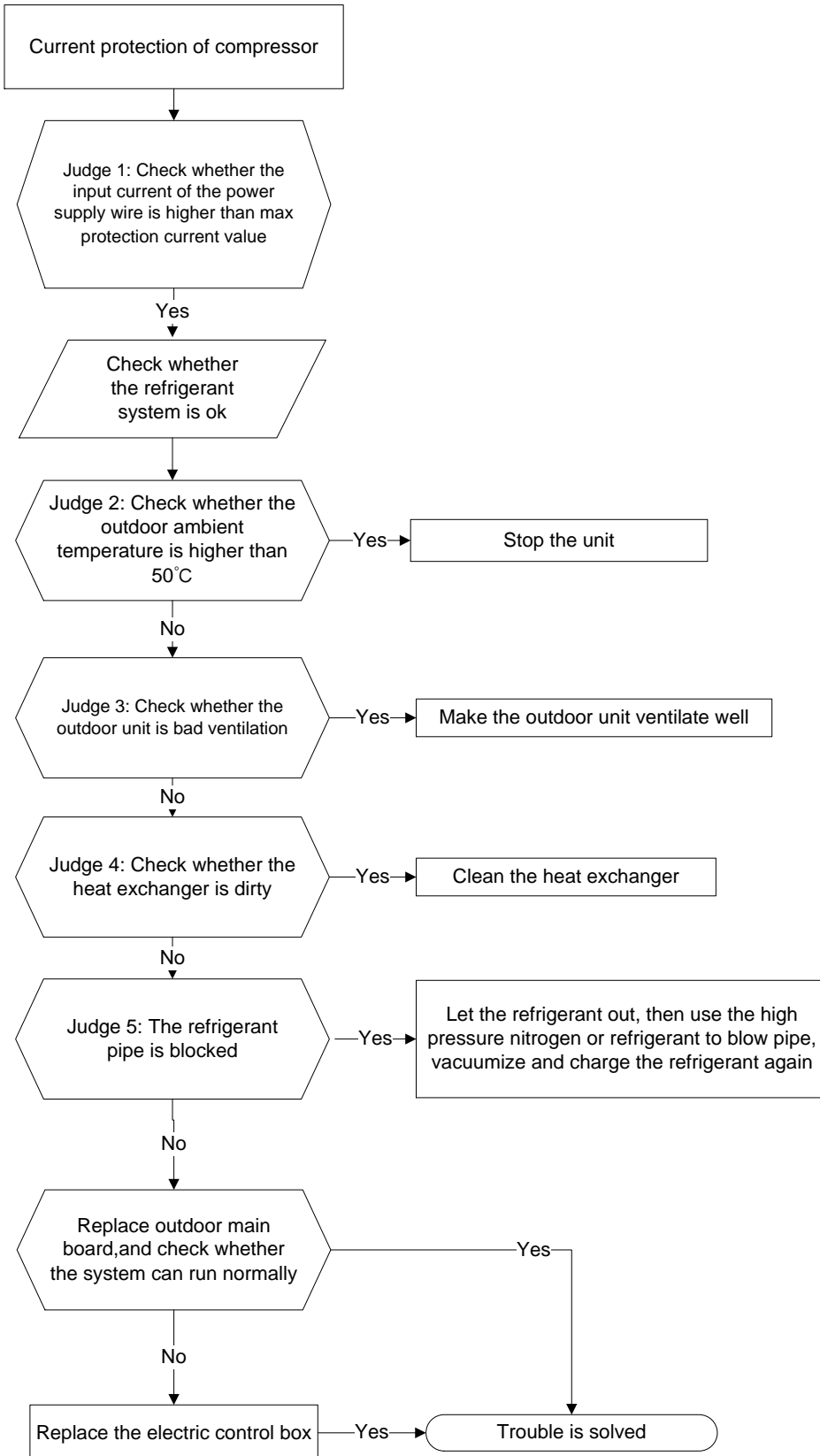


10.3.3.9 Current protection of compressor (ODU P3/PC 08)

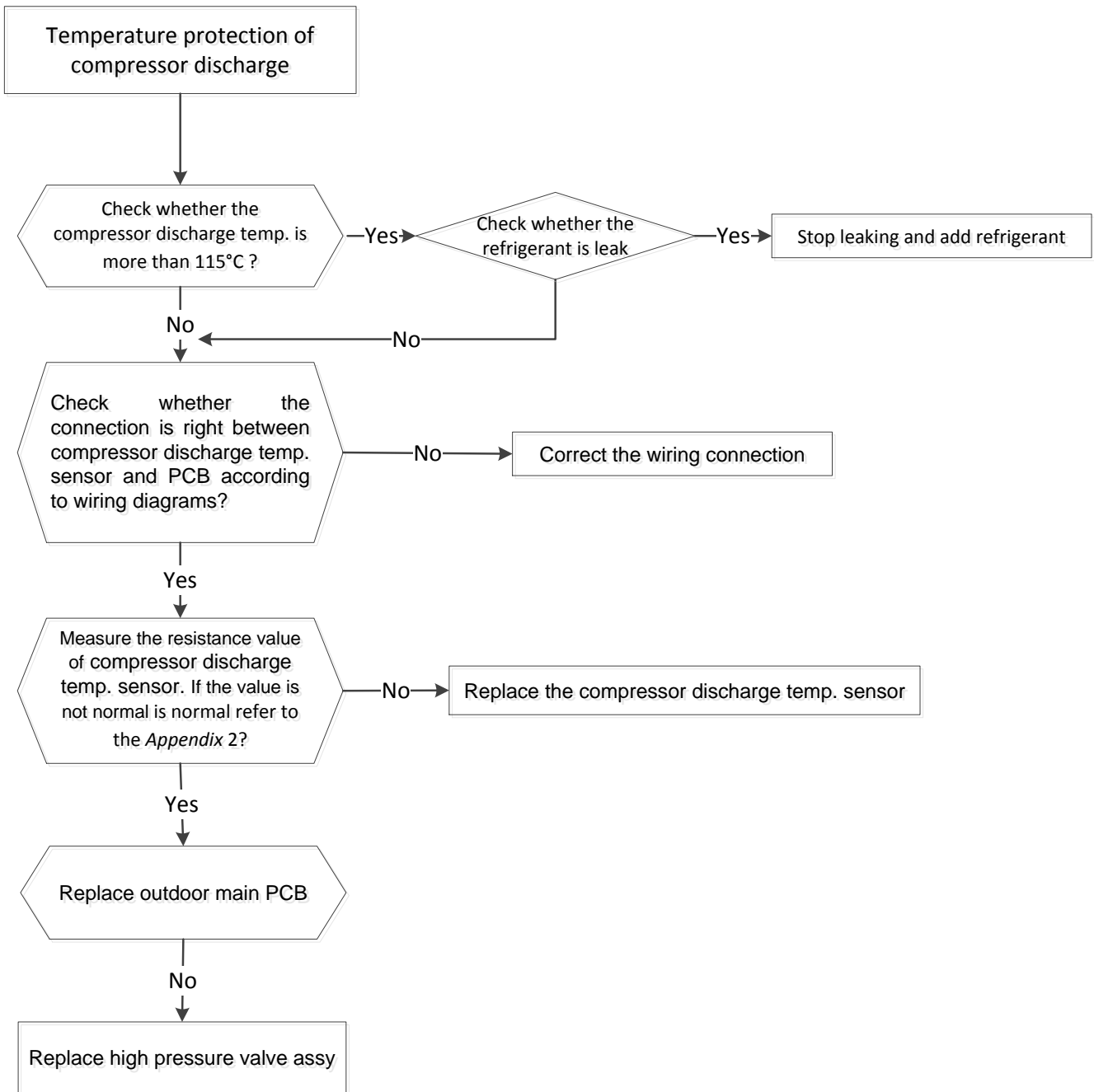
Outdoor unit zero speed protection(ODU PC44)

Compressor speed has been out of control(ODU PC46)

Compressor overcurrent failure(ODU PC49)

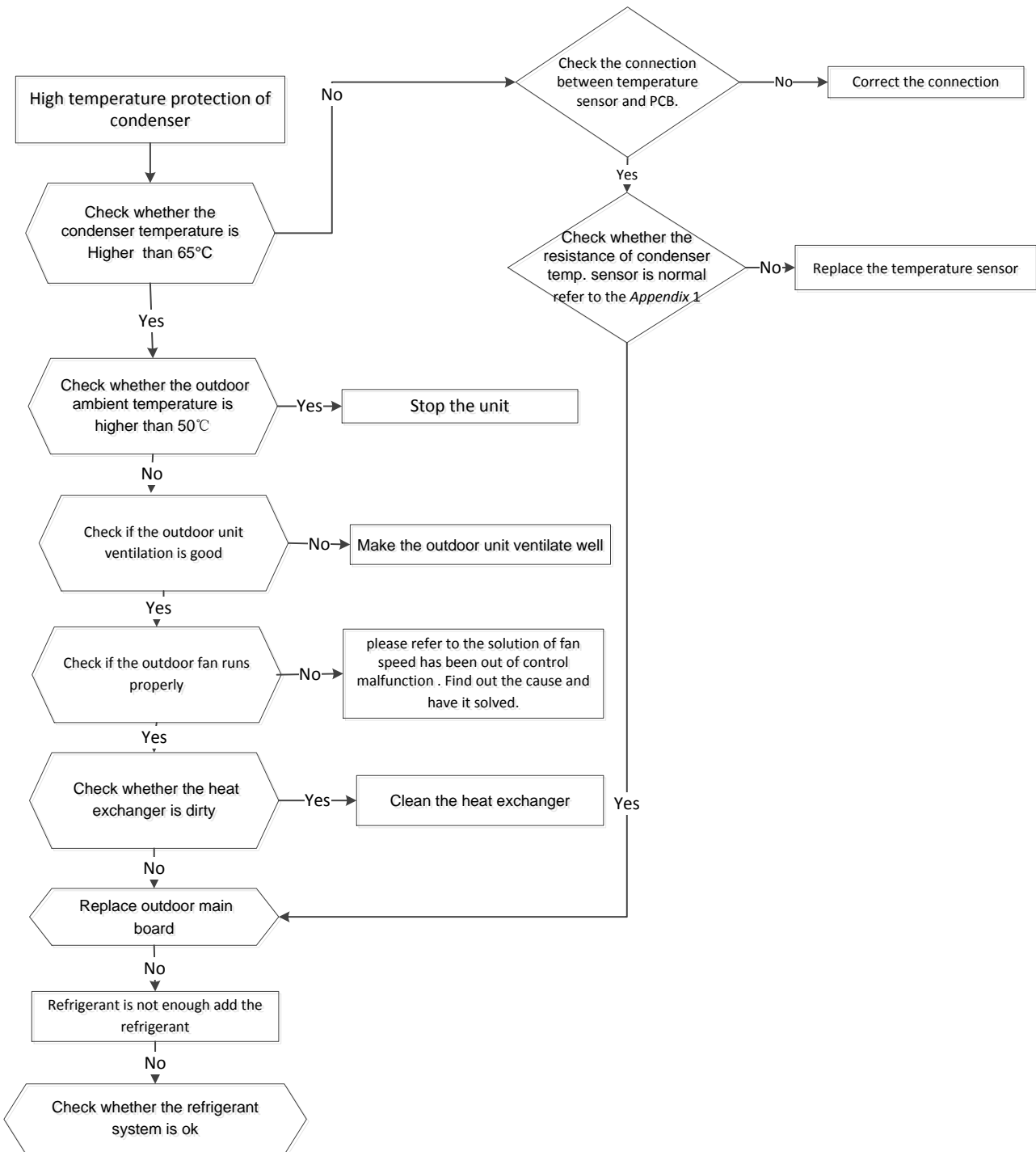


### 10.3.3.10 Temperature protection of compressor discharge (ODU P4/ PC 06)



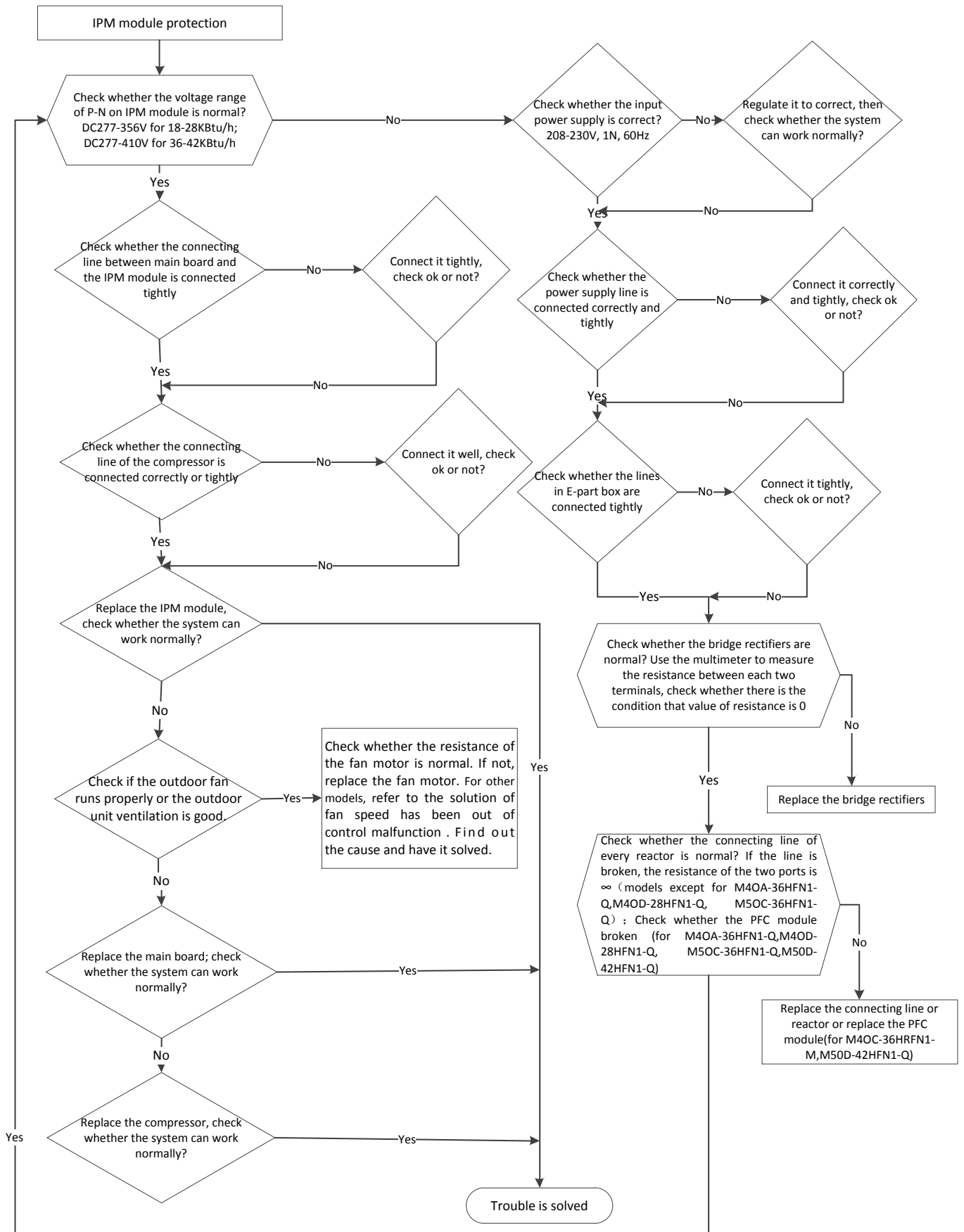
### 10.3.3.11 High temperature protection of condenser (ODU P5/ PC 0A)

When outdoor pipe temperature is more than 65°C, the unit will stop, and unit runs again when outdoor pipe temperature less than 52°C.

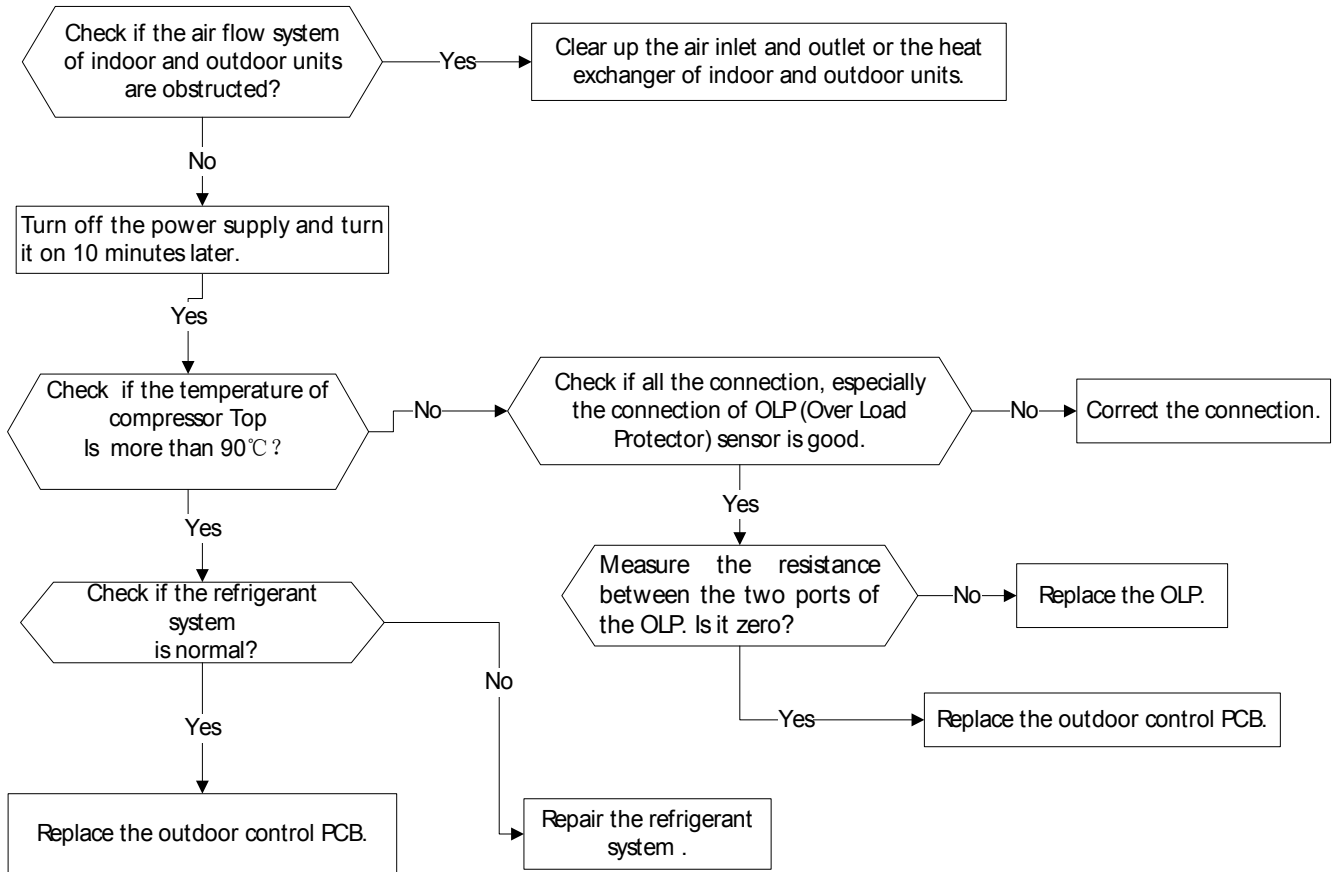




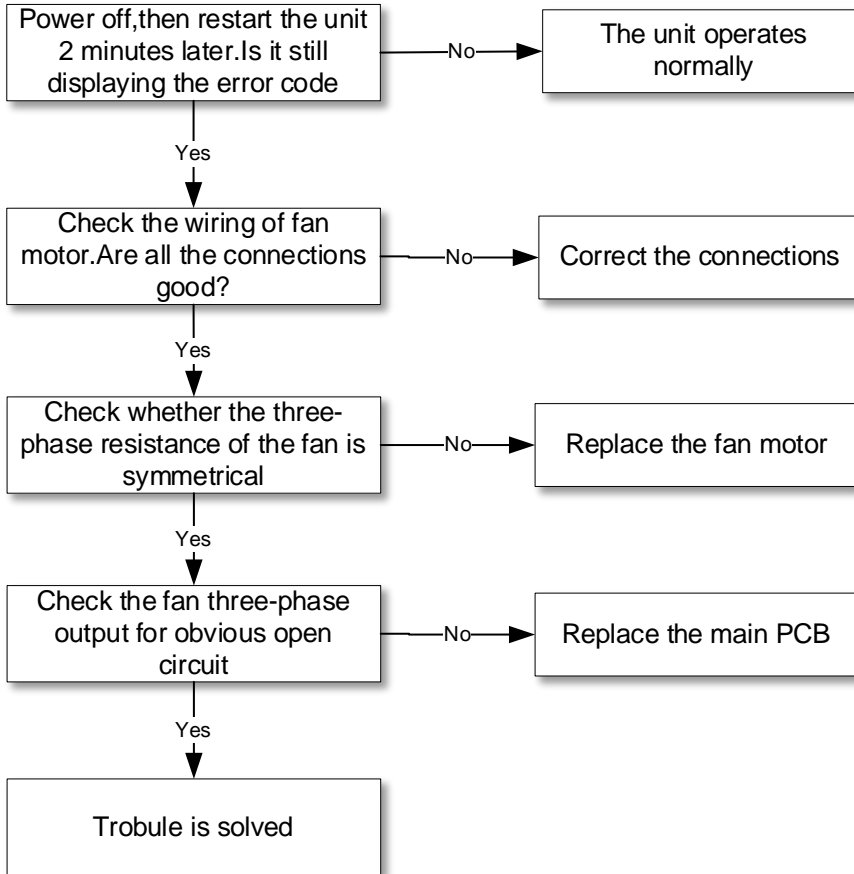
### 10.3.3.12 IPM module protection (ODU P6/PC 00)



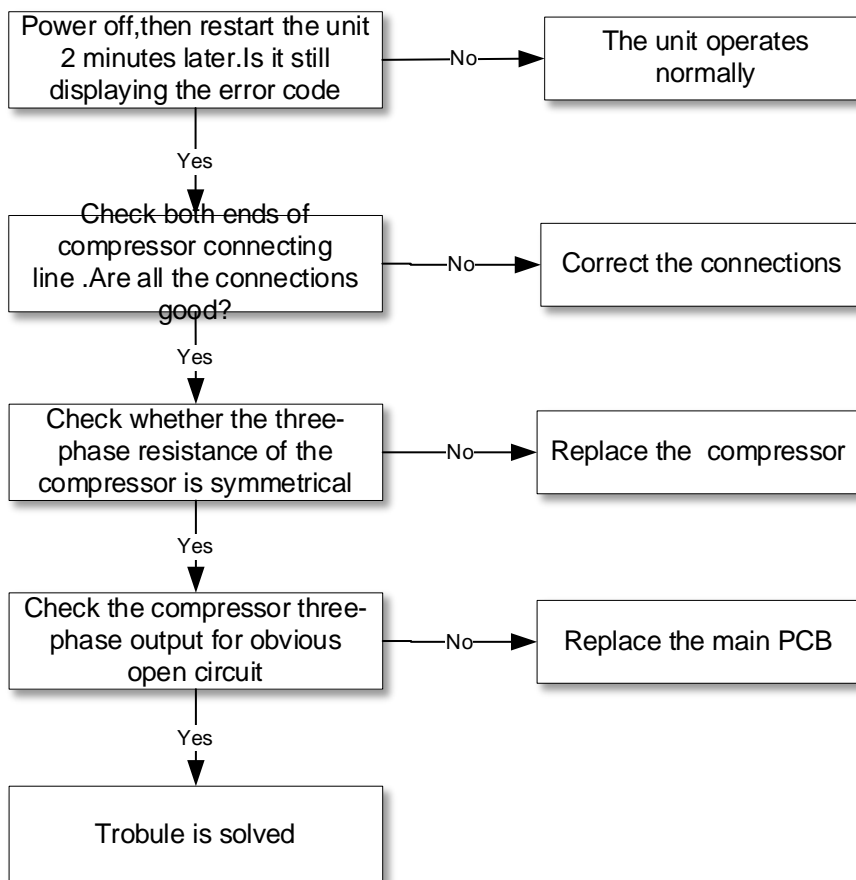
### 10.3.3.13 Top temperature protection of compressor (ODU P0/ PC 02)



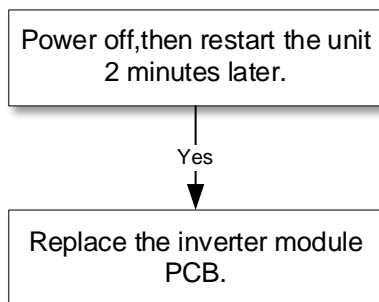
### 10.3.3.14 Lack phase failure of outdoor DC fan motor(EC72)



### 10.3.3.15 Outdoor compressor lack phase protection(PC43)



### 10.3.3.16 Outdoor unit IR chip drive failure(PC45)



### 10.3.3.17 The cooling operation or heating operation does not operate.

#### Potential causes

- Faulty 4-way valve

Check of 4-way, please refer to part 4 in 10.4 Trouble Criterion Of Main Parts.

### 10.3.3.18 When cooling, heat exchanger of non-operating indoor unit frosts.

When heating, non-operating indoor unit get warm.

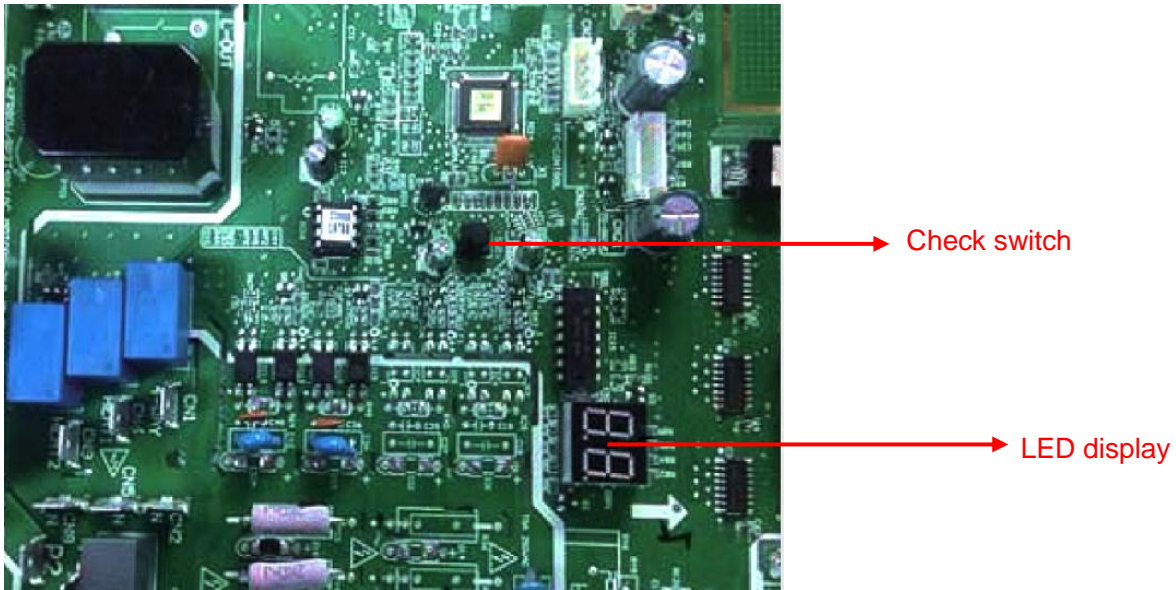
#### Potential causes

- Faulty EXV
- Wire and piping connected in reverse.

Check of EXV, please refer to part 5 in 10.4 Trouble Criterion Of Main Parts.

### 10.3.3.19 Automatic correction of wiring/piping error:

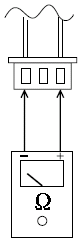
Press the "check switch" on the outdoor unit PCB board 5 seconds until LED display "CE", which mean this function is working, Approximately 5-10 minutes after the switch is pressed, the "CE" disappear the wiring/piping error will be corrected, and wiring/piping is properly connected.



## 10.4 Main parts check

### 1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temperature(T1) sensor,

Indoor coil temperature(T2) sensor,

Outdoor coil temperature(T3) sensor,

Outdoor ambient temperature(T4) sensor,

Compressor discharge temperature(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

**Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4,T2B (°C--K)**

| °C  | K Ohm   | °C | K Ohm   | °C | K Ohm   | °C  | K Ohm   |
|-----|---------|----|---------|----|---------|-----|---------|
| -20 | 115.266 | 20 | 12.6431 | 60 | 2.35774 | 100 | 0.62973 |
| -19 | 108.146 | 21 | 12.0561 | 61 | 2.27249 | 101 | 0.61148 |
| -18 | 101.517 | 22 | 11.5000 | 62 | 2.19073 | 102 | 0.59386 |
| -17 | 96.3423 | 23 | 10.9731 | 63 | 2.11241 | 103 | 0.57683 |
| -16 | 89.5865 | 24 | 10.4736 | 64 | 2.03732 | 104 | 0.56038 |
| -15 | 84.2190 | 25 | 10.0000 | 65 | 1.96532 | 105 | 0.54448 |
| -14 | 79.3110 | 26 | 9.55074 | 66 | 1.89627 | 106 | 0.52912 |
| -13 | 74.5360 | 27 | 9.12445 | 67 | 1.83003 | 107 | 0.51426 |
| -12 | 70.1698 | 28 | 8.71983 | 68 | 1.76647 | 108 | 0.49989 |
| -11 | 66.0898 | 29 | 8.33566 | 69 | 1.70547 | 109 | 0.48600 |
| -10 | 62.2756 | 30 | 7.97078 | 70 | 1.64691 | 110 | 0.47256 |
| -9  | 58.7079 | 31 | 7.62411 | 71 | 1.59068 | 111 | 0.45957 |
| -8  | 56.3694 | 32 | 7.29464 | 72 | 1.53668 | 112 | 0.44699 |
| -7  | 52.2438 | 33 | 6.98142 | 73 | 1.48481 | 113 | 0.43482 |
| -6  | 49.3161 | 34 | 6.68355 | 74 | 1.43498 | 114 | 0.42304 |
| -5  | 46.5725 | 35 | 6.40021 | 75 | 1.38703 | 115 | 0.41164 |
| -4  | 44.0000 | 36 | 6.13059 | 76 | 1.34105 | 116 | 0.40060 |
| -3  | 41.5878 | 37 | 5.87359 | 77 | 1.29078 | 117 | 0.38991 |
| -2  | 39.8239 | 38 | 5.62961 | 78 | 1.25423 | 118 | 0.37956 |
| -1  | 37.1988 | 39 | 5.39689 | 79 | 1.21330 | 119 | 0.36954 |
| 0   | 35.2024 | 40 | 5.17519 | 80 | 1.17393 | 120 | 0.35982 |
| 1   | 33.3269 | 41 | 4.96392 | 81 | 1.13604 | 121 | 0.35042 |
| 2   | 31.5635 | 42 | 4.76253 | 82 | 1.09958 | 122 | 0.3413  |
| 3   | 29.9058 | 43 | 4.57050 | 83 | 1.06448 | 123 | 0.33246 |
| 4   | 28.3459 | 44 | 4.38736 | 84 | 1.03069 | 124 | 0.32390 |
| 5   | 26.8778 | 45 | 4.21263 | 85 | 0.99815 | 125 | 0.31559 |
| 6   | 25.4954 | 46 | 4.04589 | 86 | 0.96681 | 126 | 0.30754 |
| 7   | 24.1932 | 47 | 3.88673 | 87 | 0.93662 | 127 | 0.29974 |
| 8   | 22.5662 | 48 | 3.73476 | 88 | 0.90753 | 128 | 0.29216 |
| 9   | 21.8094 | 49 | 3.58962 | 89 | 0.87950 | 129 | 0.28482 |
| 10  | 20.7184 | 50 | 3.45097 | 90 | 0.85248 | 130 | 0.27770 |
| 11  | 19.6891 | 51 | 3.31847 | 91 | 0.82643 | 131 | 0.27078 |
| 12  | 18.7177 | 52 | 3.19183 | 92 | 0.80132 | 132 | 0.26408 |
| 13  | 17.8005 | 53 | 3.07075 | 93 | 0.77709 | 133 | 0.25757 |
| 14  | 16.9341 | 54 | 2.95896 | 94 | 0.75373 | 134 | 0.25125 |
| 15  | 16.1156 | 55 | 2.84421 | 95 | 0.73119 | 135 | 0.24512 |
| 16  | 15.3418 | 56 | 2.73823 | 96 | 0.70944 | 136 | 0.23916 |
| 17  | 14.6181 | 57 | 2.63682 | 97 | 0.68844 | 137 | 0.23338 |
| 18  | 13.9180 | 58 | 2.53973 | 98 | 0.66818 | 138 | 0.22776 |
| 19  | 13.2631 | 59 | 2.44677 | 99 | 0.64862 | 139 | 0.22231 |

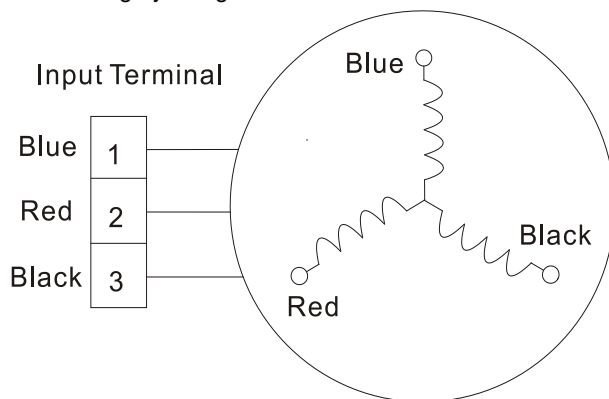
**Appendix 2** Temperature Sensor Resistance Value Table for T5 (°C--K)

| °C  | K Ohm | °C | K Ohm | °C | K Ohm | °C             | K Ohm |
|-----|-------|----|-------|----|-------|----------------|-------|
| -20 | 542.7 | 20 | 68.66 | 60 | 13.59 | 100            | 3.702 |
| -19 | 511.9 | 21 | 65.62 | 61 | 13.11 | 101            | 3.595 |
| -18 | 483   | 22 | 62.73 | 62 | 12.65 | 102            | 3.492 |
| -17 | 455.9 | 23 | 59.98 | 63 | 12.21 | 103            | 3.392 |
| -16 | 430.5 | 24 | 57.37 | 64 | 11.79 | 104            | 3.296 |
| -15 | 406.7 | 25 | 54.89 | 65 | 11.38 | 105            | 3.203 |
| -14 | 384.3 | 26 | 52.53 | 66 | 10.99 | 106            | 3.113 |
| -13 | 363.3 | 27 | 50.28 | 67 | 10.61 | 107            | 3.025 |
| -12 | 343.6 | 28 | 48.14 | 68 | 10.25 | 108            | 2.941 |
| -11 | 325.1 | 29 | 46.11 | 69 | 9.902 | 109            | 2.86  |
| -10 | 307.7 | 30 | 44.17 | 70 | 9.569 | 110            | 2.781 |
| -9  | 291.3 | 31 | 42.33 | 71 | 9.248 | 111            | 2.704 |
| -8  | 275.9 | 32 | 40.57 | 72 | 8.94  | 112            | 2.63  |
| -7  | 261.4 | 33 | 38.89 | 73 | 8.643 | 113            | 2.559 |
| -6  | 247.8 | 34 | 37.3  | 74 | 8.358 | 114            | 2.489 |
| -5  | 234.9 | 35 | 35.78 | 75 | 8.084 | 115            | 2.422 |
| -4  | 222.8 | 36 | 34.32 | 76 | 7.82  | 116            | 2.357 |
| -3  | 211.4 | 37 | 32.94 | 77 | 7.566 | 117            | 2.294 |
| -2  | 200.7 | 38 | 31.62 | 78 | 7.321 | 118            | 2.233 |
| -1  | 190.5 | 39 | 30.36 | 79 | 7.086 | 119            | 2.174 |
| 0   | 180.9 | 40 | 29.15 | 80 | 6.859 | 120            | 2.117 |
| 1   | 171.9 | 41 | 28    | 81 | 6.641 | 121            | 2.061 |
| 2   | 163.3 | 42 | 26.9  | 82 | 6.43  | 122            | 2.007 |
| 3   | 155.2 | 43 | 25.86 | 83 | 6.228 | 123            | 1.955 |
| 4   | 147.6 | 44 | 24.85 | 84 | 6.033 | 124            | 1.905 |
| 5   | 140.4 | 45 | 23.89 | 85 | 5.844 | 125            | 1.856 |
| 6   | 133.5 | 46 | 22.89 | 86 | 5.663 | 126            | 1.808 |
| 7   | 127.1 | 47 | 22.1  | 87 | 5.488 | 127            | 1.762 |
| 8   | 121   | 48 | 21.26 | 88 | 5.32  | 128            | 1.717 |
| 9   | 115.2 | 49 | 20.46 | 89 | 5.157 | 129            | 1.674 |
| 10  | 109.8 | 50 | 19.69 | 90 | 5     | 130            | 1.632 |
| 11  | 104.6 | 51 | 18.96 | 91 | 4.849 |                |       |
| 12  | 99.69 | 52 | 18.26 | 92 | 4.703 |                |       |
| 13  | 95.05 | 53 | 17.58 | 93 | 4.562 |                |       |
| 14  | 90.66 | 54 | 16.94 | 94 | 4.426 |                |       |
| 15  | 86.49 | 55 | 16.32 | 95 | 4.294 | B(25/50)=3950K |       |
| 16  | 82.54 | 56 | 15.73 | 96 | 4.167 |                |       |
| 17  | 78.79 | 57 | 15.16 | 97 | 4.045 | R(90°C)=5KΩ±3% |       |
| 18  | 75.24 | 58 | 14.62 | 98 | 3.927 |                |       |
| 19  | 71.86 | 59 | 14.09 | 99 | 3.812 |                |       |



## 2.Compressor checking

Measure the resistance value of each winding by using the tester.



| Position   | Resistance Value |              |              |
|------------|------------------|--------------|--------------|
|            | KSM135D23UFZ     | KTF235D22UMT | KTF310D43UMT |
| Blue - Red | 1.72Ω(20℃)       | 0.75Ω(20℃)   | 0.65Ω(20℃)   |



### 3. IPM continuity check

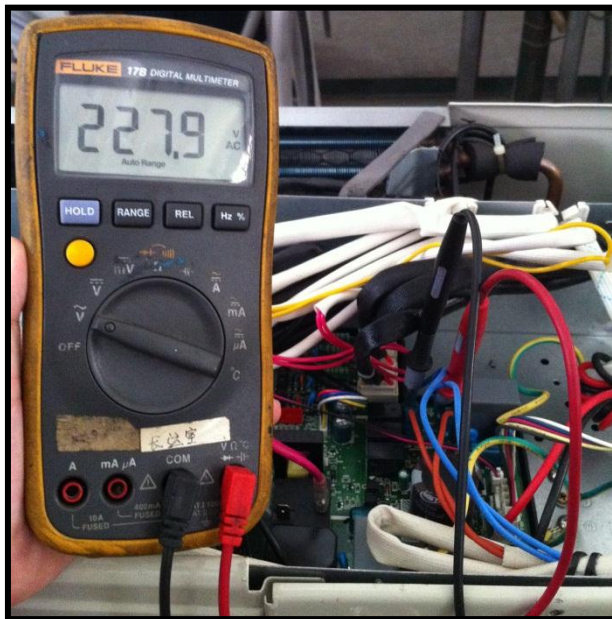
Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

| Digital tester |          | Normal resistance value | Digital tester |          | Normal resistance value |
|----------------|----------|-------------------------|----------------|----------|-------------------------|
| (+)Red         | (-)Black |                         | (+)Red         | (-)Black |                         |
| P              | N        | ∞<br>(Several MΩ)       | U              | N        | ∞<br>(Several MΩ)       |
|                | U        |                         | V              |          |                         |
|                | V        |                         | W              |          |                         |
|                | W        |                         | (+)Red         |          |                         |

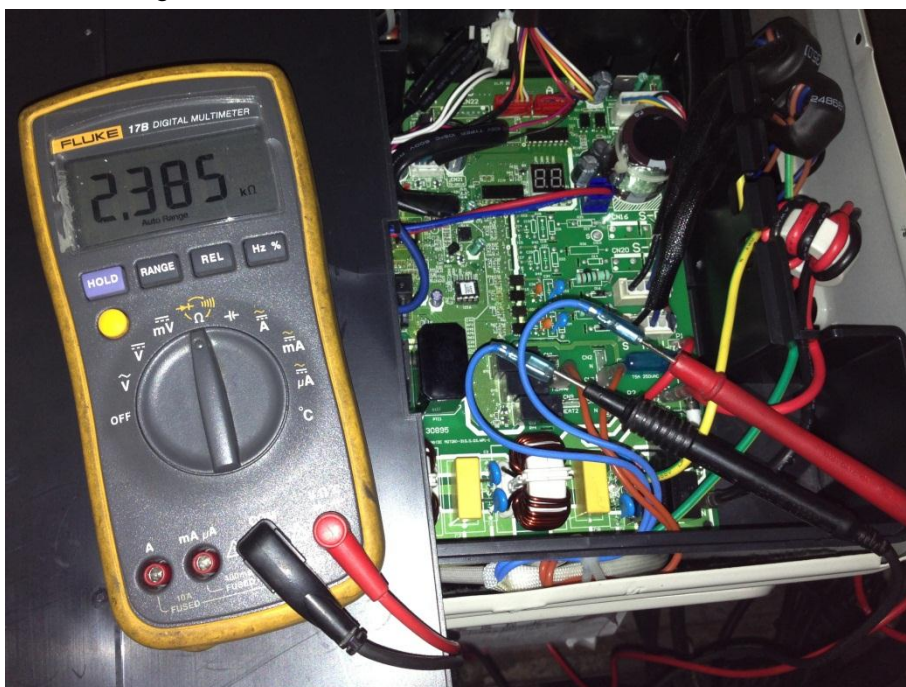
### 4.4-way valve

1. Power on, use a digital tester to measure the voltage, when the unit operates in cooling, it is 0V. When the unit operates in heating, it is about 230VAC.

If the value of the voltage is not in the range, the PCB must have problems and need to be replaced.

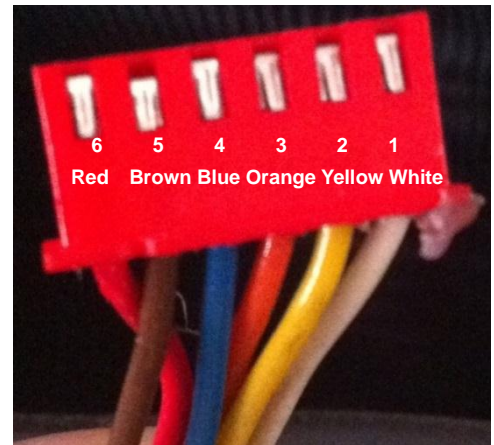
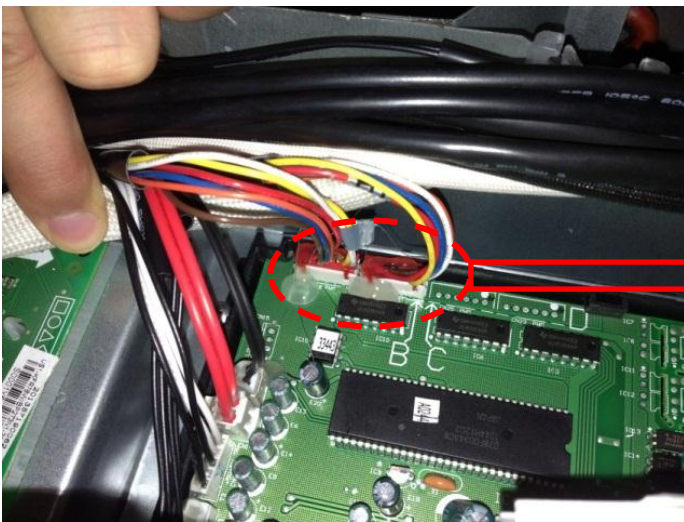
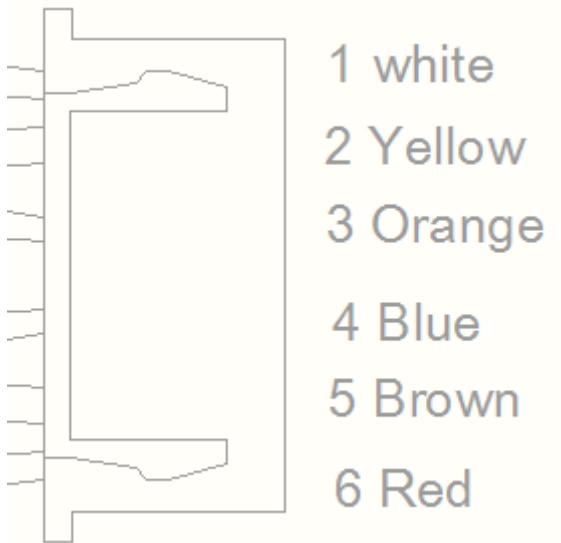


2 Turn off the power, use a digital tester to measure the resistance. The value should be 1.8~2.5 KΩ.



**5.EXV check**

**Disconnect the connectors.**



**Resistance to EXV coil**

| Color of lead wire | Normal Value |
|--------------------|--------------|
| Red- Blue          | About 50Ω    |
| Red - Yellow       |              |
| Brown-Orange       |              |



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