ComfortStar®
Air Conditioning & Heating Products

# R32 Rotary 60Hz Universal Outdoor 14.3 SEER2 Series Technical Manual

# Content

# Part 1. General Information

# 1. Model Names of Indoor/Outdoor Units

## 1.1 Indoor Units

| Model name | Dimension(W×H×D) (inch) | Power supply |
|---|---|---|
| LUC17-18-15 | 19-5/8×45-3/4×22 | 208/230V-1Ph-60Hz |
| LUC17-24-15 | 19-5/8×45-3/4×22 | 208/230V-1Ph-60Hz |
| LUC17-30-15 | 19-5/8×45-3/4×22 | 208/230V-1Ph-60Hz |
| LUC17-36-15 | 19-5/8×45-3/4×22 | 208/230V-1Ph-60Hz |

## 1.2 Outdoor Units

| Model name | Dimension(W×H×D) (inch) | Power supply |
|---|---|---|
| BAR17-18-15 | 21-4/5×25×21-4/5 | 208/230V-1Ph-60Hz |
| BAR17-24-15 | 21-4/5×25×21-4/5 | 208/230V-1Ph-60Hz |
| BAR17-30-15 | 29-1/7×25×29-1/7 | 208/230V-1Ph-60Hz |
| BAR17-36-15 | 29-1/7×25×29-1/7 | 208/230V-1Ph-60Hz |

# 2. External Appearance

| | | | |
|---|---|---|---|
| | 14.3 SEER2 TDU | | |
| capacity | 1.5/2/Ton | 2.5/3 Ton | |
| pic |  |  | |
| 14.3 SEER2 AHU | | | |
| capacity | 1.5/2/2.5/3 Ton | | |
| pic |  | | |

# 3. Features

3.1 Wide operation range..  Cooling:57-118°F

3.2 Well-known brand GMCC Rotary compressor, reliable quality.

3.3 Condenser coils constructed with copper tubing and enhanced golden fins.

3.4 Use PISTON as expansion device

3.5 DC fan motors, provide selections of air flow to meet desired applications.

3.6 ECM fan motor for air handlers, higher efficiency, lower noise, constant speed.

3.7 24V control, time delay relay, fan relay and transformer included.

3.8 R32 environment friendly refrigerant.

3.9 The air handler unit has a refrigerant leakage sensor, providing safer protection.

3.10 AHRI certification, ETL certification.

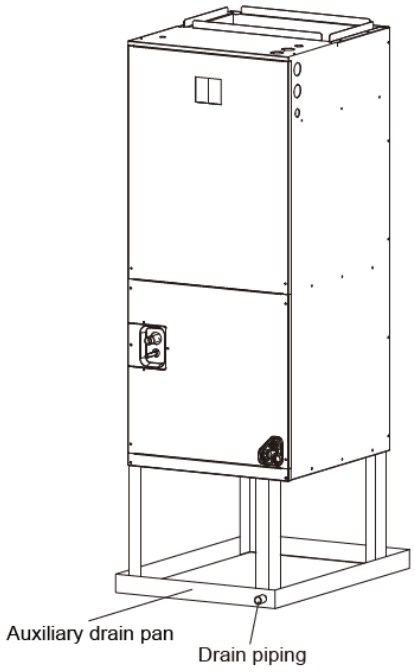
3.11 Refrigerant leakage sensor is configured to detect the refrigerant content in the air

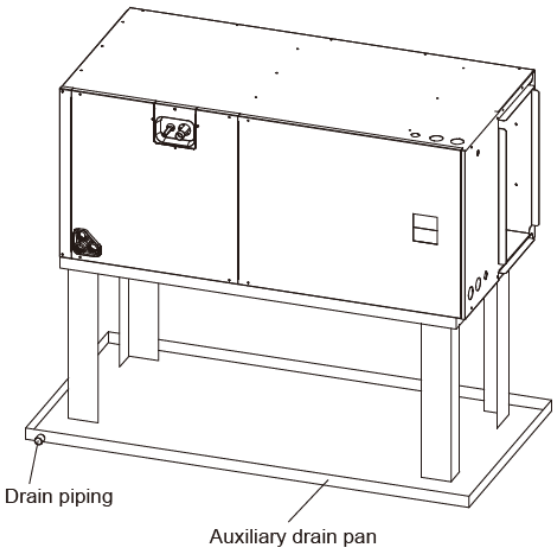
Intelligent oil return program to provide operating life

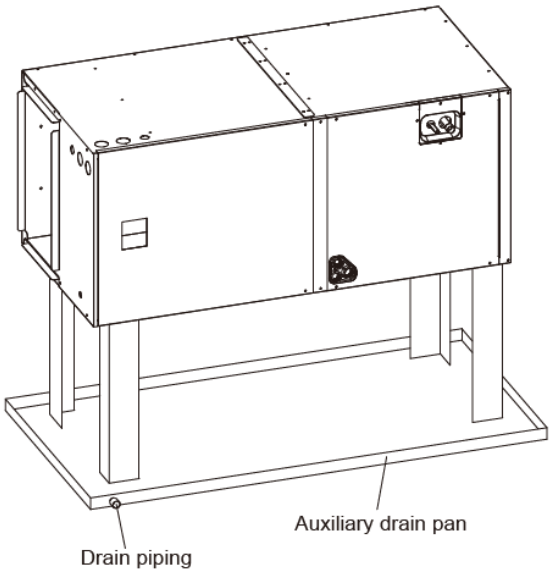
“A” shape coils, constructed with Oxygen-free copper tubing and enhanced aluminum fins

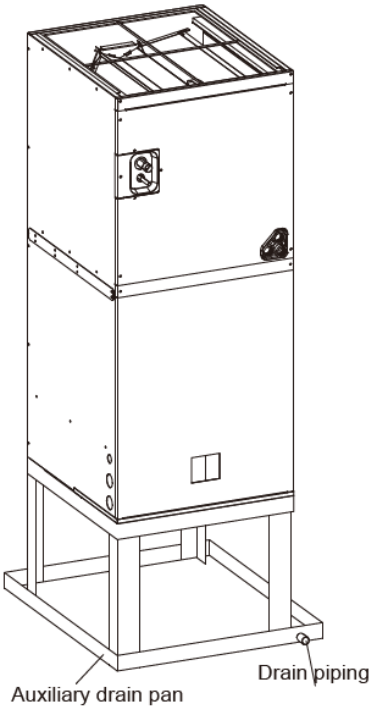
Detachable air filter for cleaning or renewal

Versatile 4-way convertible design. The air can be discharged from four directions.




Auxiliary drain pan
Drain piping


Drain piping
Auxiliary drain pan

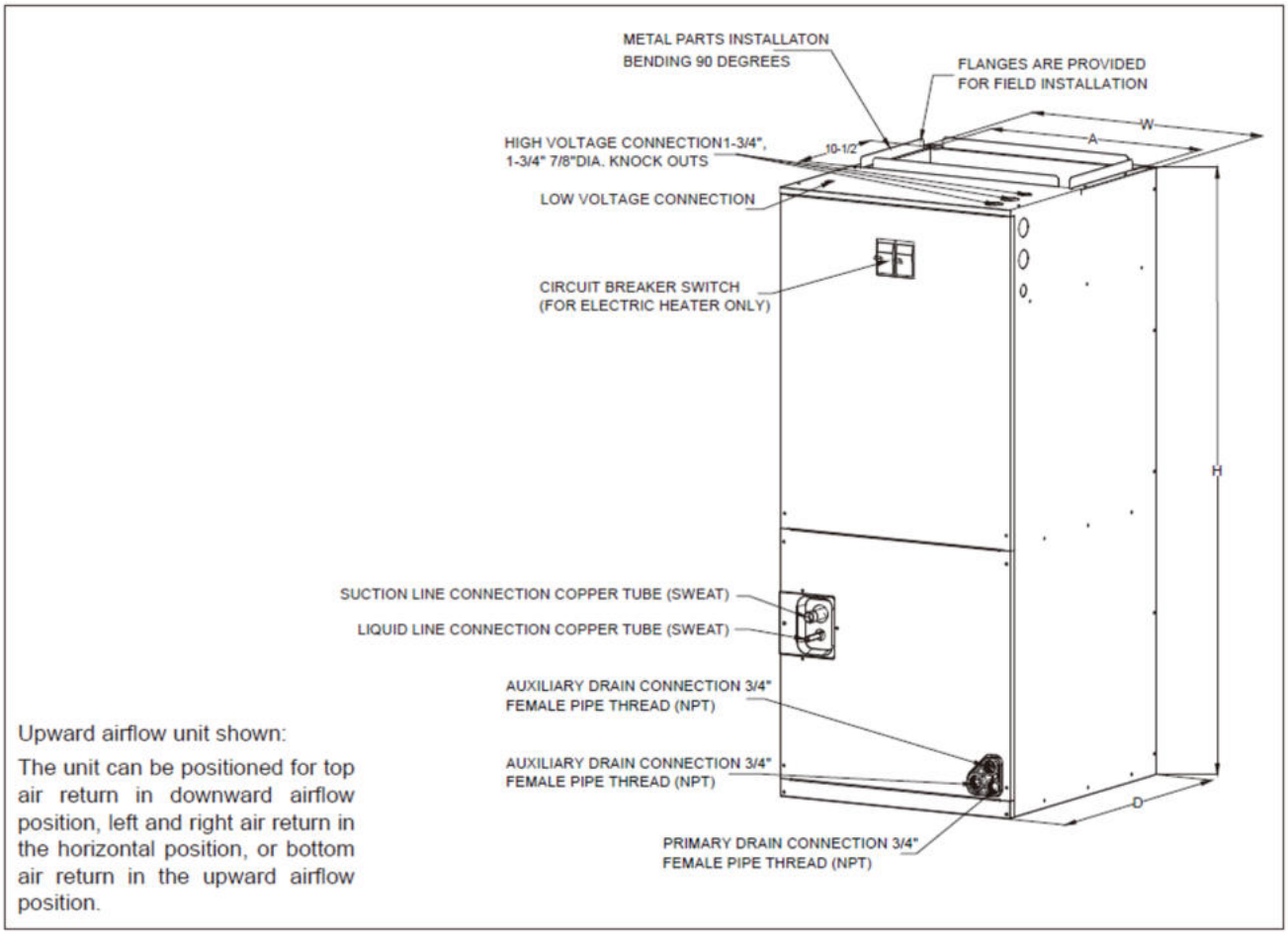
# Part 2. Indoor Unit

# 1.Specification

| Model | | | LUC17-18-15 | LUC17-24-15 | LUC17-30-15 | LUC17-36-15 |
|---|---|---|---|---|---|---|
| Power supply | Rated Voltage | V/Ph/Hz | 208~230V/1ph/60Hz | | | |
| | Min./Max.Voltage | v | 187/253 | | | |
| Cooling | Capacity | Btu/h | 17600 | 22800 | 28000 | 33000 |
| MCA | | A | 4 | 4 | 5 | 5 |
| MOP | | A | 6 | 6 | 6 | 6 |
| Indoor motor | Type | | ECM | ECM | ECM | ECM |
| | Output | W | 249 | 249 | 373 | 373 |
| | Rate current | A | 2.6 | 2.6 | 3.8 | 3.8 |
| Indoor fan | Material | | Metal | | | |
| | Type | | Centrifugal volute | | | |
| | diameter | in | 12 19/67 | 12 19/67 | 12 19/67 | 12 19/67 |
| | width | in | 13 3/95 | 13 3/95 | 13 3/95 | 13 3/95 |
| | Airflow(rated) | CFM | 770 | 785 | 975 | 1030 |
| Indoor coil | Fin material | | Hydrophilic | | | |
| | Tube material | | inner grooved | | | |
| Indoor air flow | | CFM | 770 | 785 | 975 | 1030 |
| Indoor noise level | | dB(A) | 50 | 54 | 56 | 56 |
| Indoor Unit | Unit (WxHxD) | in | 19-5/8×45-3/4×22 | | 19-5/8×45-3/4×22 | |
| | Packing (WxHxD) | in | 22-5/6×47-5/8×25-3/5 | | 22-5/6×47-5/8×25-3/5 | |
| | Net / Gross weight | lbs | 119/133 | 128/140 | 129/141 | 129/141 |
| Throttle type | | | piston | | | |
| Operation temp range | Cooling (℉) | | 57-118 | | | |

Notes:
1. Nominal cooling capacities are based on the following conditions:
Indoor temp: 27°C DB, 19°CWB; Outdoor temp: 35°C DB; Equivalent ref. piping: 5m (horizontal)
2.Actual noise level may differ, depending on the room structure, etc., since these noise values are from an anechoic room.

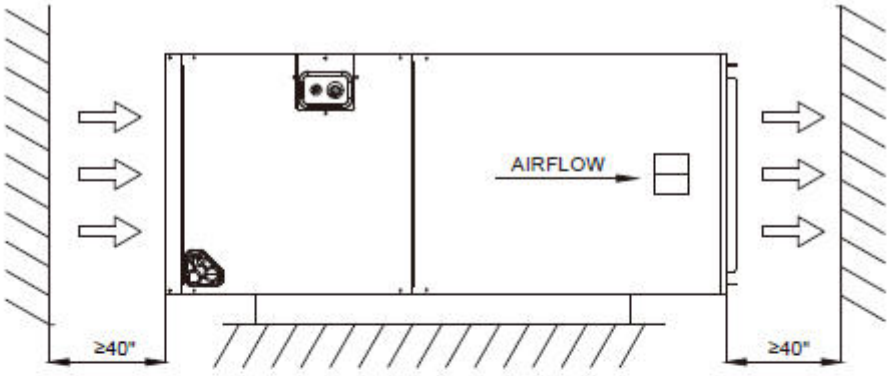
# 2.Dimension



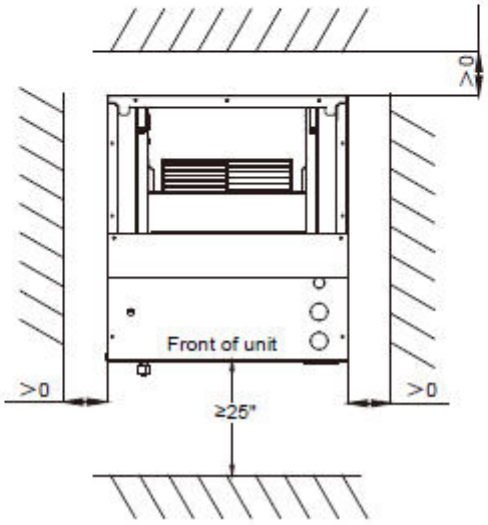

| Fig.1 DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIMENSIONAL DATA | | | | | |
| MODEL SIZE | Dimensions | | | | |
| | UNIT HEIGHT "H"/in （mm） | UNIT WIDTH "W"/in （mm） | UNIT LENGTH "D"/in（mm） | SUPPLY DUCT "A"/in（mm） | LIQUID LINE / VAPOR LINE IN （mm） |
| 18K | 45-3/4 [1162] | 19-5/8 [500] | 22 [560] | 17-7/8 [454] | 3/8 / 3/4 [9.5]/[19] |
| 24K | 45-3/4 [1162] | 19-5/8 [500] | 22 [560] | 17-7/8 [454] | 3/8 / 3/4 [9.5]/[19] |
| 30K | 45-3/4 [1162] | 19-5/8 [500] | 22 [560] | 17-7/8 [454] | 3/8 / 3/4 [9.5]/[19] |
| 36K | 45-3/4 [1162] | 19-5/8 [500] | 22 [560] | 17-7/8 [454] | 3/8 / 3/4 [9.5]/[19] |

# 3.Service Space

The distance between the air outlet or return air and the wall must be at least 40 inches, and the front of the indoor unit must be at least 25 inches away from the wall.




Clearances in the Horizontal Position



# 4.Four-way installation

Horizontal right installation is the default factory configuration for all models. By removing the indoor coil assembly and reinstalling the coil, the vertical up flow position can be converted into a horizontal left position. Rotate the device by 90° to the horizontal left position, with the coil segment on the right and the blower segment on the left. Re-install the indoor coil by rotating 180° from the original position. Ensure that the fixing groove is fully engaged with the coil guide rail. When configured to be placed horizontally above the ceiling and/or living space, it is recommended to use an additional field supplied drain pan.

**Steps to Change Cabinet Direction to Vertical Downward or Horizontal Left Direction**

1. Remove the screws and the front panel, and disconnect the plug of T2 sensor and leak detection sensor wire from the circuit board (Figure 4.1, Step 1).
2. Pull out the coil with sensor wire (do not disconnect T2 sensor and leak detection sensor from the coil). (Figure 4.2, Step 2)
3. Install the coil in the correct direction and fix it in place. Reinsert those sensor wire in PCBA through the gap on the cabinet cover (Figure 4.3, Step 3).

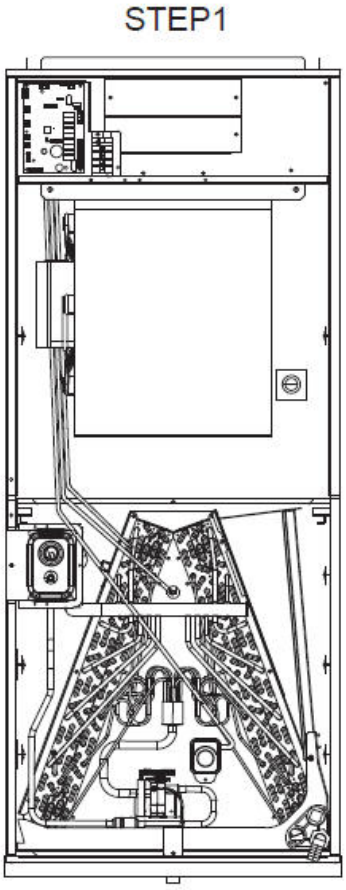



Figure 4.1

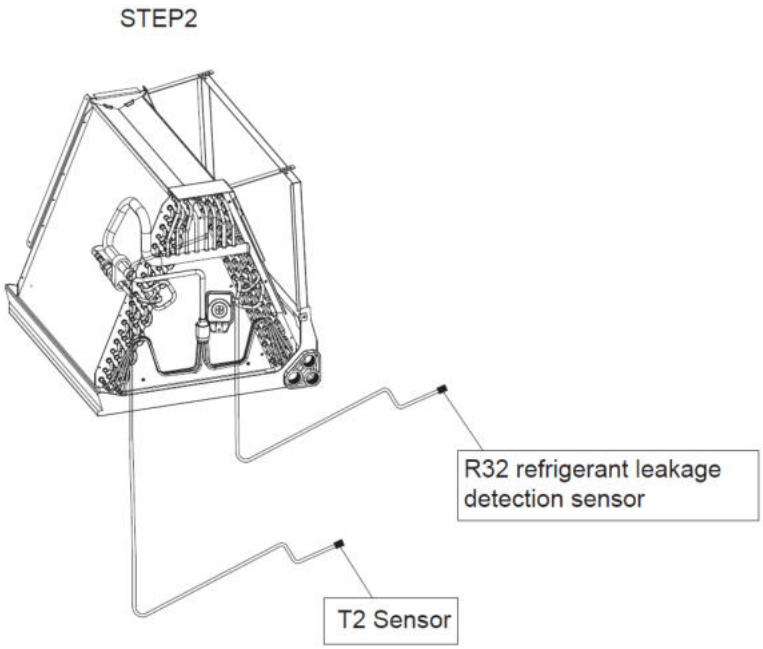



Figure 4.2

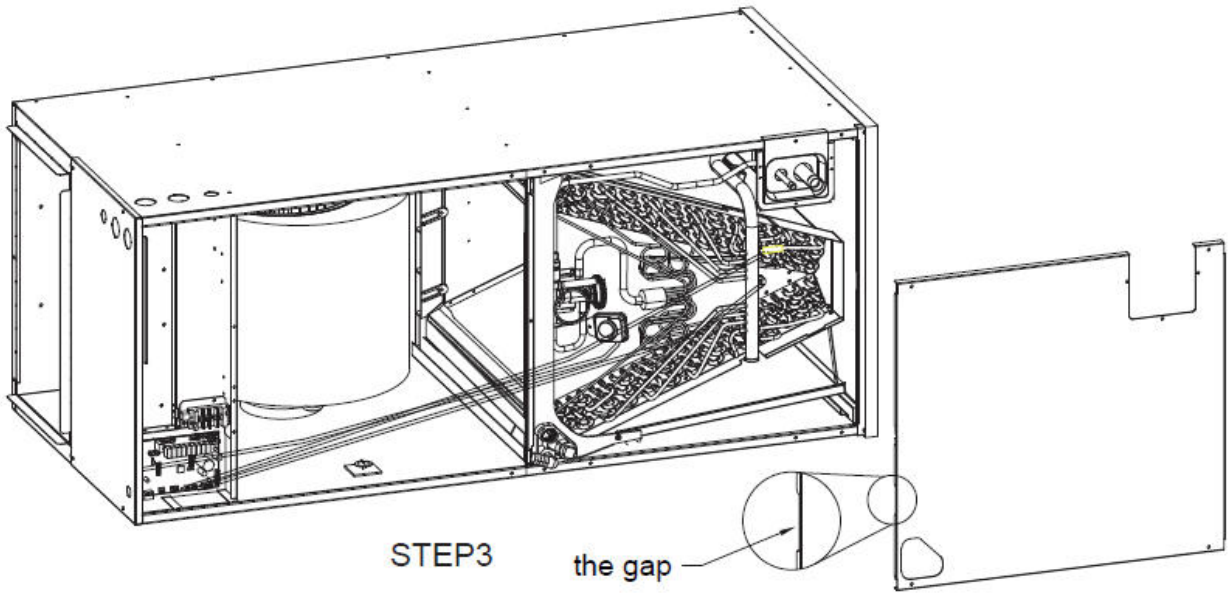



Figure 4.3

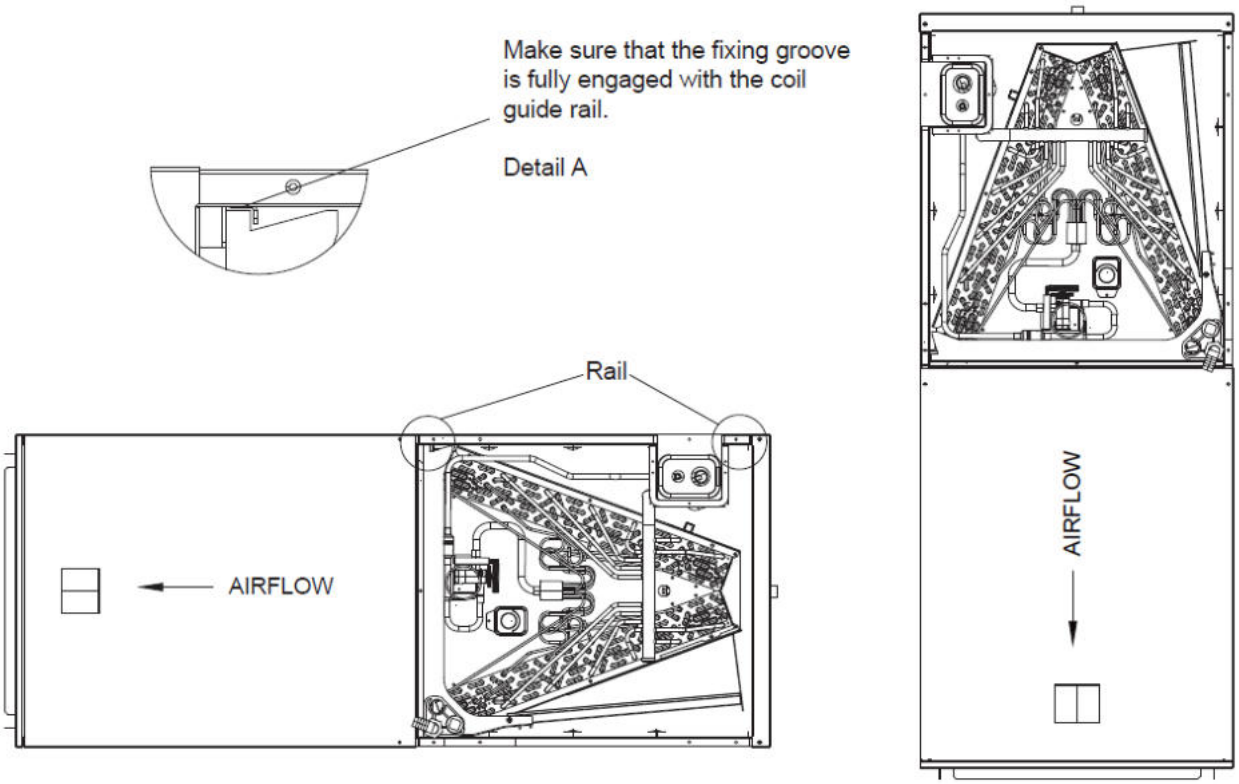
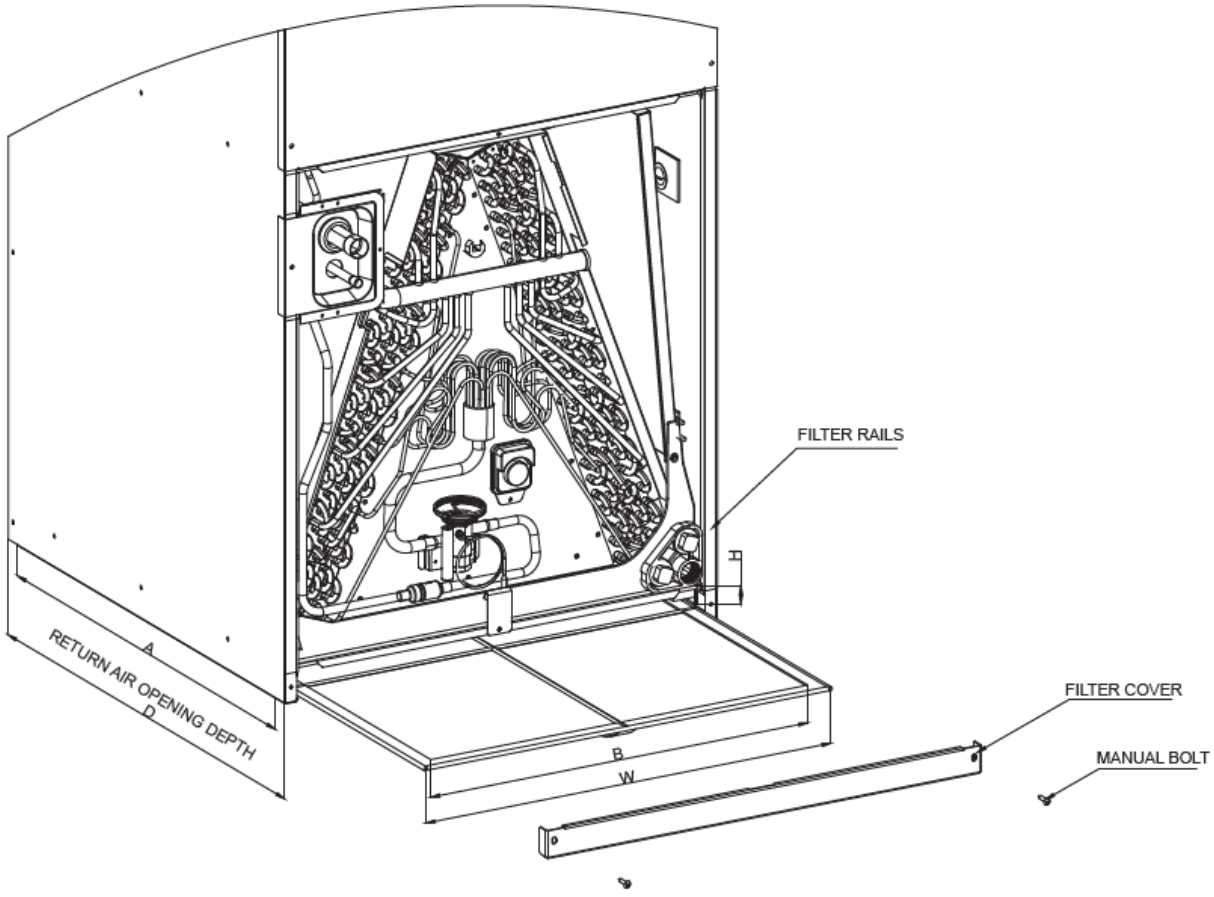



Figure 4.3

# 5.Air Filter (Not Factory Installed)

The filter is not included in the device and must be provided on site.
The size of external filters or other filtering devices must meet the maximum flow rate of 300ft/min or meet the recommended value of filter type.
The application and placement of filter is very important for airflow, which may affect the performance of heating and cooling system. Reduced airflow will shorten the life of the main components of the system, such as motors, components, thermal relays, evaporator coils or compressors. Therefore, we recommend that the return air duct system has only one filter position. For systems without return air filter grids, multiple filter grids can be installed at each return air opening.
If a high-efficiency filter screen or electronic air filtration system is used, it is very important that the air flow rate is not reduced. If the air flow decreases, the overall performance and efficiency of the device will decrease. It is strongly recommended to contact professional installation technicians to ensure the correct installation of such filtration systems.




| Model | Filter size inches [mm] | "W" inches [mm] | "D" inches [mm] | "H" inches [mm] | Return Width "A" inches [mm] | Return Length "B" inches [mm] |
|---|---|---|---|---|---|---|
| 18K/24K/30K/36K | 18×20[457×508] | 18.3 [466] | 21.6 [548] | 1 [25.4] | 20.8 [528] | 16.3 [414] |

# 6.Electric heater

| Heat kit model | AHU model | electric heat(kW) 208/230VAC | Current (A) 208/230VAC | MCA (A) 208/230VAC | MAX. Fuse or Breaker (HACR) Ampacity | | Fan speed | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 208 VAC | 230 VAC | 1 | 2 | 3 | 4 | 5 |
| CHE6-05B | 18K | 3.8/5 | 19.66/21.74 | 25/29 | 30 | 35 | ● | ● | ● | ● | ● |
| CHE6-08B | | 5.6/7.5 | 29.50/32.61 | 37/43 | 40 | 45 | × | × | ● | ● | ● |
| CHE6-05B | 24K | 3.8/5 | 19.66/21.74 | 25/29 | 30 | 35 | ● | ● | ● | ● | ● |
| CHE6-08B | | 5.6/7.5 | 29.50/32.61 | 37/43 | 40 | 45 | × | × | ● | ● | ● |
| CHE6-10B | | 7.5/10 | 39.32/43.48 | 50/57 | 55 | 60 | × | × | × | ● | ● |
| CHE6-05B | 30K | 3.8/5 | 19.66/21.74 | 25/29 | 30 | 35 | ● | ● | ● | ● | ● |
| CHE6-08B | | 5.6/7.5 | 29.50/32.61 | 37/43 | 40 | 45 | × | ● | ● | ● | ● |
| CHE6-10B | | 7.5/10 | 39.32/43.48 | 50/57 | 55 | 60 | × | × | ● | ● | ● |
| CHE6-05B | 36K | 3.8/5 | 19.66/21.74 | 25/29 | 30 | 35 | ● | ● | ● | ● | ● |
| CHE6-08B | | 5.6/7.5 | 29.50/32.61 | 37/43 | 40 | 45 | × | ● | ● | ● | ● |
| CHE6-10B | | 7.5/10 | 39.32/43.48 | 50/57 | 55 | 60 | × | × | ● | ● | ● |
| CHE6-15B | | (5.6+5.6) /(7.5+7.5) | 29.50+29.50/32.61+32.61 | 37+37/43+43 | 40/40 | 45/45 | × | × | × | ● | ● |

● indicates availability, and × indicates unavailability

# 7.Airflow performance

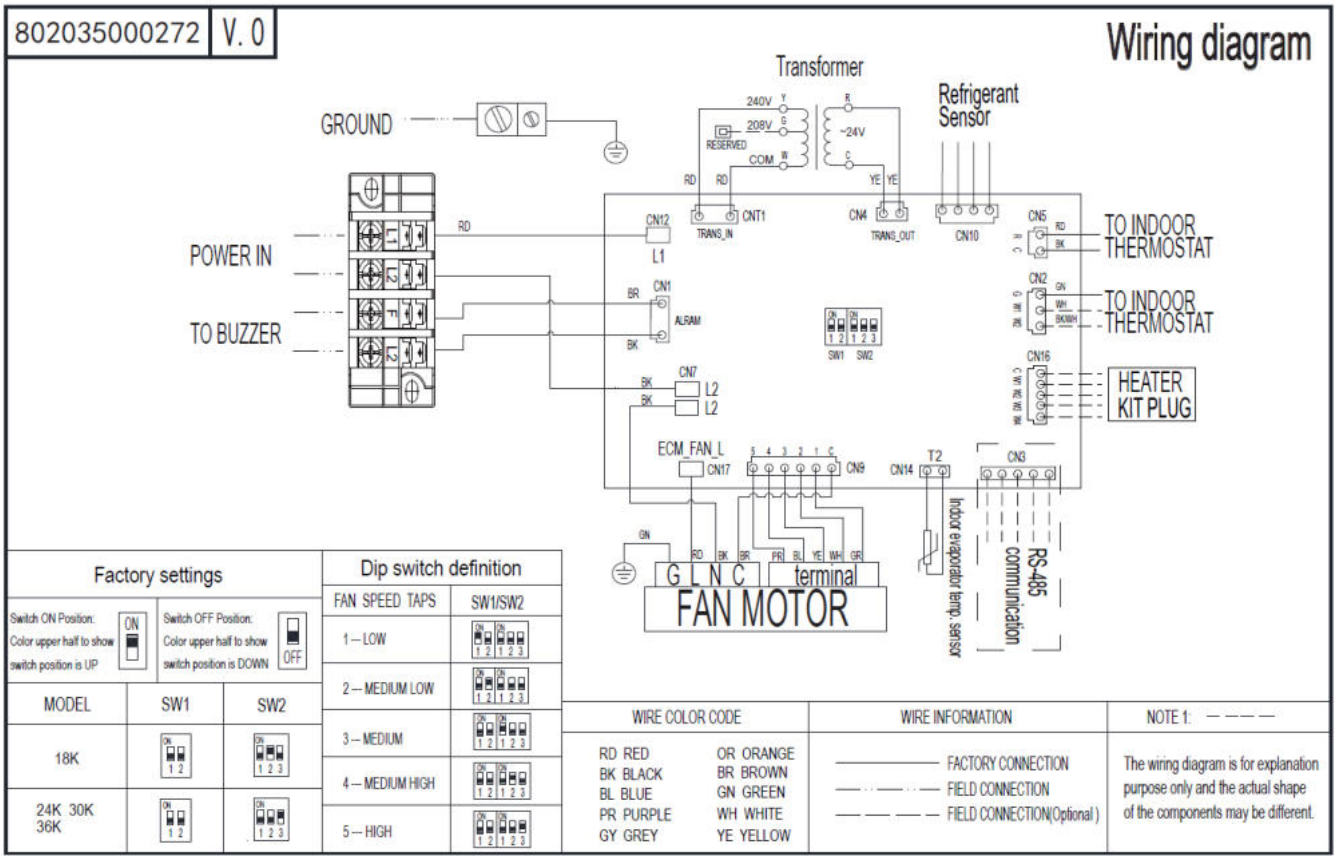
The air flow data is based on the cooling performance of coil and without filter. Performance table, select the appropriate product.
External static pressure ESP should be kept within the minimum and maximum limits shown in the following table to ensure the normal operation of cooling, heating, and electric heating.

| Model size of air processor | Motor speed | | SCFM | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | External Static Pressure-Inch Water Column [kPa] | | | | | | | | |
| | | | 0[0] | 0.1[.025] | 0.2[.050] | 0.3[.075] | 0.4[.100] | 0.5[.125] | 0.6[.150] | 0.7[.175] | 0.8[.200] |
| 18K | Tap (1) | SCFM | 669.9 | 571.8 | 490.9 | 394.3 | 269.5 | - | - | - | - |
| | | Watts | 41 | 47 | 52 | 57 | 61 | - | - | - | - |
| | Tap (2) | SCFM | 792.2 | 708.6 | 615.9 | 548.5 | 474.2 | 371.5 | 265.1 | - | - |
| | | Watts | 59 | 67 | 73 | 77 | 83 | 88 | 93 | - | - |
| | Tap (3) | SCFM | 948.8 | 887.5 | 809.6 | 723.6 | 671.6 | 597.0 | 504.2 | 410.2 | - |
| | | Watts | 96 | 102 | 109 | 115 | 129 | 126 | 132 | 141 | - |
| | Tap (4) | SCFM | 1020.9 | 966.5 | 887.1 | 798.4 | 738.8 | 697.9 | 672.3 | 572.8 | 490.1 |
| | | Watts | 118 | 127 | 136 | 144 | 150 | 156 | 160 | 167 | 177 |
| | Tap (5) | SCFM | 1115.2 | 1059.2 | 995.0 | 906.5 | 842.5 | 791.4 | 727.2 | 707.0 | 652.5 |
| | | Watts | 148 | 157 | 167 | 178 | 186 | 191 | 198 | 205 | 211 |
| 24K | Tap (1) | SCFM | 669.9 | 571.8 | 490.9 | 394.3 | 269.5 | - | - | - | - |
| | | Watts | 41 | 47 | 52 | 57 | 61 | - | - | - | - |
| | Tap (2) | SCFM | 792.2 | 708.6 | 615.9 | 548.5 | 474.2 | 371.5 | 265.1 | - | - |
| | | Watts | 59 | 67 | 73 | 77 | 83 | 88 | 93 | - | - |
| | Tap (3) | SCFM | 948.8 | 887.5 | 809.6 | 723.6 | 671.6 | 597.0 | 504.2 | 410.2 | - |
| | | Watts | 96 | 102 | 109 | 115 | 129 | 126 | 132 | 141 | - |
| | Tap (4) | SCFM | 1020.9 | 966.5 | 887.1 | 798.4 | 738.8 | 697.9 | 672.3 | 572.8 | 490.1 |
| | | Watts | 118 | 127 | 136 | 144 | 150 | 156 | 160 | 167 | 177 |
| | Tap (5) | SCFM | 1115.2 | 1059.2 | 995.0 | 906.5 | 842.5 | 791.4 | 727.2 | 707.0 | 652.5 |
| | | Watts | 148 | 157 | 167 | 178 | 186 | 191 | 198 | 205 | 211 |
| 30K | Tap (1) | SCFM | 955.3 | 897.8 | 839.5 | 739.4 | 655.3 | 575.9 | 511.5 | 432.4 | 392.2 |
| | | Watts | 91 | 96 | 102 | 110 | 115 | 121 | 127 | 138 | 140 |
| | Tap (2) | SCFM | 1080.7 | 1031.5 | 977.4 | 925.6 | 819.4 | 743.8 | 675.5 | 608.7 | 547.1 |
| | | Watts | 125 | 131 | 137 | 143 | 153 | 160 | 166 | 173 | 179 |
| | Tap (3) | SCFM | 1182.2 | 1138.1 | 1089.0 | 1042.9 | 986.9 | 879.5 | 811.4 | 749.5 | 689.2 |
| | | Watts | 158 | 165 | 172 | 177 | 185 | 197 | 203 | 212 | 221 |
| | Tap (4) | SCFM | 1305.6 | 1261.8 | 1220.9 | 1179.5 | 1132.2 | 1086.1 | 984.1 | 914.5 | 856.6 |
| | | Watts | 207 | 214 | 221 | 228 | 236 | 244 | 257 | 266 | 273 |
| | Tap (5) | SCFM | 1386.7 | 1350.0 | 1309.4 | 1274.6 | 1233.1 | 1186.6 | 1137.8 | 1031.5 | 970.0 |
| | | Watts | 245 | 253 | 262 | 270 | 277 | 285 | 295 | 309 | 318 |
| 36K | Tap (1) | SCFM | 955.3 | 897.8 | 839.5 | 739.4 | 65.5 | 575.9 | 511.5 | 432.4 | 392.2 |
| | | Watts | 91 | 96 | 102 | 110 | 115 | 121 | 127 | 138 | 140 |
| | Tap (2) | SCFM | 1080.7 | 1031.5 | 977.4 | 925.6 | 819.4 | 743.8 | 675.5 | 608.7 | 547.1 |
| | | Watts | 125 | 131 | 137 | 143 | 153 | 160 | 166 | 173 | 179 |
| | Tap (3) | SCFM | 1182.2 | 1138.1 | 1089.0 | 1042.9 | 986.9 | 879.5 | 811.4 | 749.5 | 689.2 |
| | | Watts | 158 | 165 | 172 | 177 | 185 | 197 | 203 | 212 | 221 |
| | Tap (4) | SCFM | 1305.6 | 1261.8 | 1220.9 | 1179.5 | 1132.2 | 1086.1 | 984.1 | 914.5 | 856.6 |
| | | Watts | 207 | 214 | 221 | 228 | 236 | 244 | 257 | 266 | 273 |
| | Tap (5) | SCFM | 1386.7 | 1350.0 | 1309.4 | 1274.6 | 1233.1 | 1186.6 | 1137.8 | 1031.5 | 970.0 |
| | | Watts | 245 | 253 | 262 | 270 | 277 | 285 | 295 | 309 | 318 |

The highlighted area indicates the airflow within the required range of 300-450cfm/ton.

# 8.Wiring Diagrams

18-36K AHU




# 9.Electric Characteristics

| Model | Indoor Units | | | | | |
|---|---|---|---|---|---|---|
| | Hz | Voltage | Min. | Max. | MCA | MOP |
| 18K | 60 | 208-230V | 187V | 253V | 4.0 | 6.0 |
| 24K | 60 | 208-230V | 187V | 253V | 4.0 | 6.0 |
| 30K | 60 | 208-230V | 187V | 253V | 5.0 | 6.0 |
| 36K | 60 | 208-230V | 187V | 253V | 5.0 | 6.0 |

# 10.The Specification of Wiring

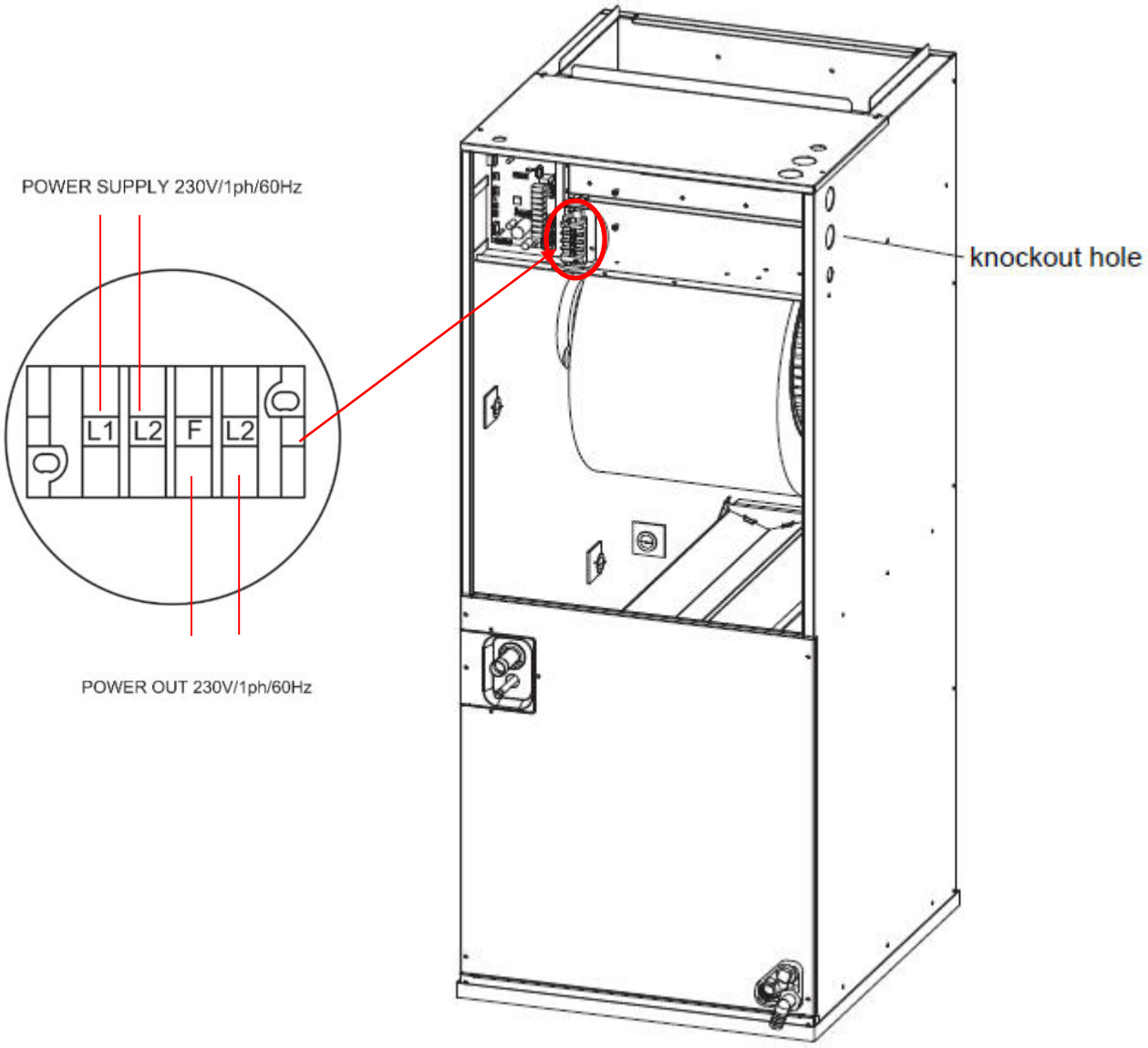
**Note:**
The cross-section areas of wires or lines should not be less than the corresponding ones listed in the table below; Besides, if the power wires is quite long from the unit, please choose the windings with larger cross-section guarantee the normal power supply.

| Model | Indoor power wire /Diameter (AWG) | 24V Signal wire Diameter (AWG) | Outdoor power wire /Diameter (AWG) |
|---|---|---|---|
| 18K | 3*16 | 18 | 3*14 |
| 24K | 3*16 | 18 | 3*14 |
| 30K | 3*16 | 18 | 3*12 |
| 36K | 3*16 | 18 | 3*12 |

# 11.Field Wiring

1. To avoid the electrical shock, please connect the air conditioner with the ground lug.
2. The main power plug in the air conditioner has been joined with the ground wiring, please don't change it freely.
3. The power socket is used as the air conditioner specially.
4. Don't pull the power wiring hard.
5. When connecting the air conditioner with the ground, observe the local codes.
6. If necessary, use the power fuse or the circuit, breaker or the corresponding scale ampere.

**power supply wiring**




During installation, a buzzer or alarm light needs to be installed and connected to the terminal of AHU F/L2. When the AHU detects refrigerant leakage, F/L2 will output 220V voltage. Therefore, the buzzer will receive the signal and respond in time. When the refrigerant concentration reaches the threshold, the indoor airflow will run at the highest gear and the outdoor unit will stop.

## Thermostat wiring

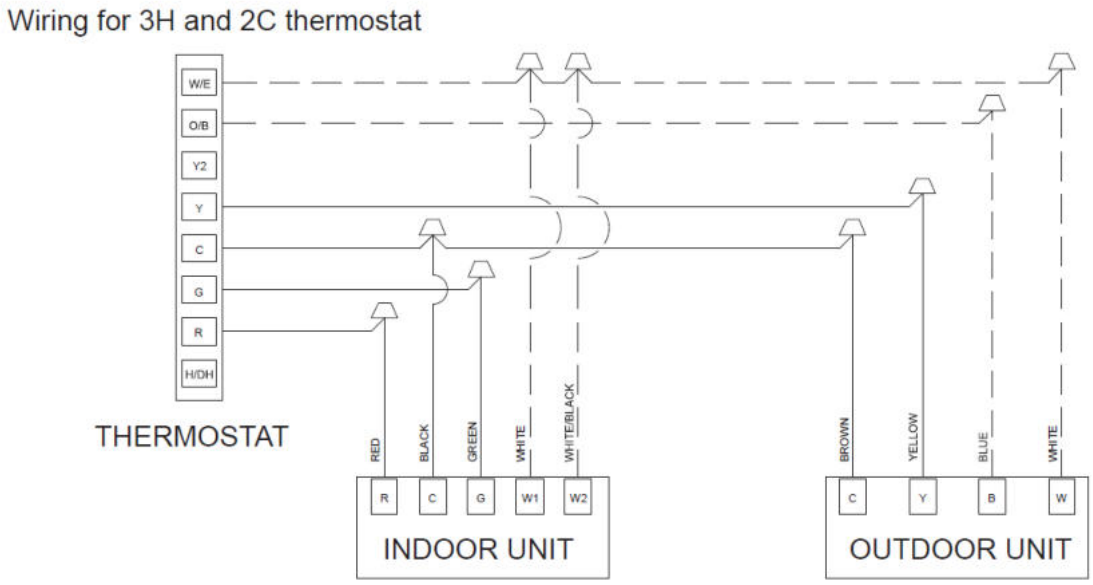



**Figure 11.2 Control Wiring**

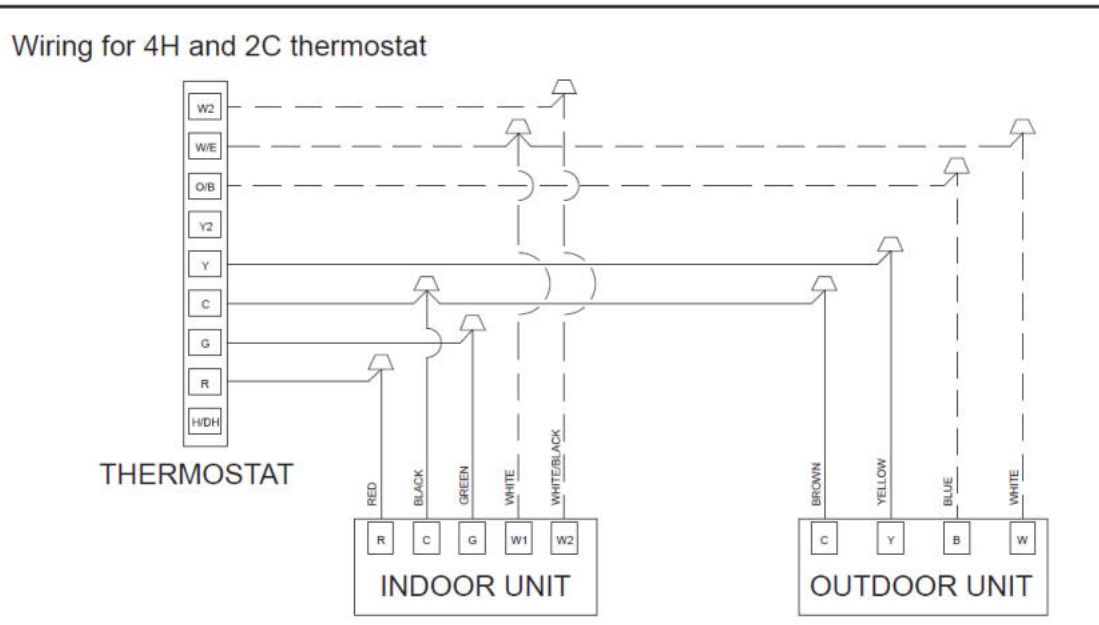



**Figure 11.3 Control Wiring**

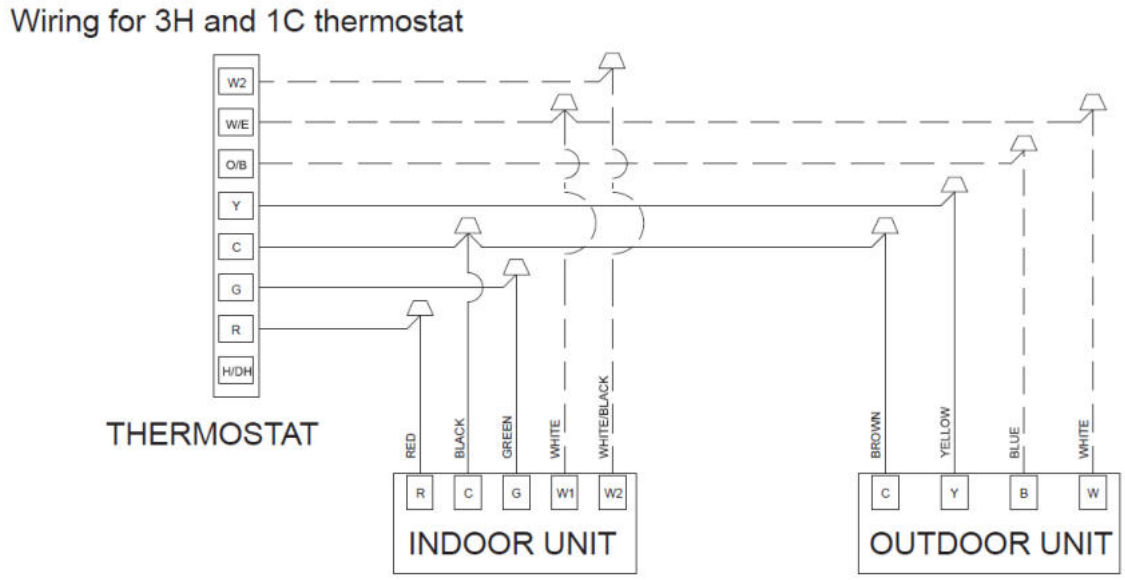



**Figure 11.4 Control Wiring**

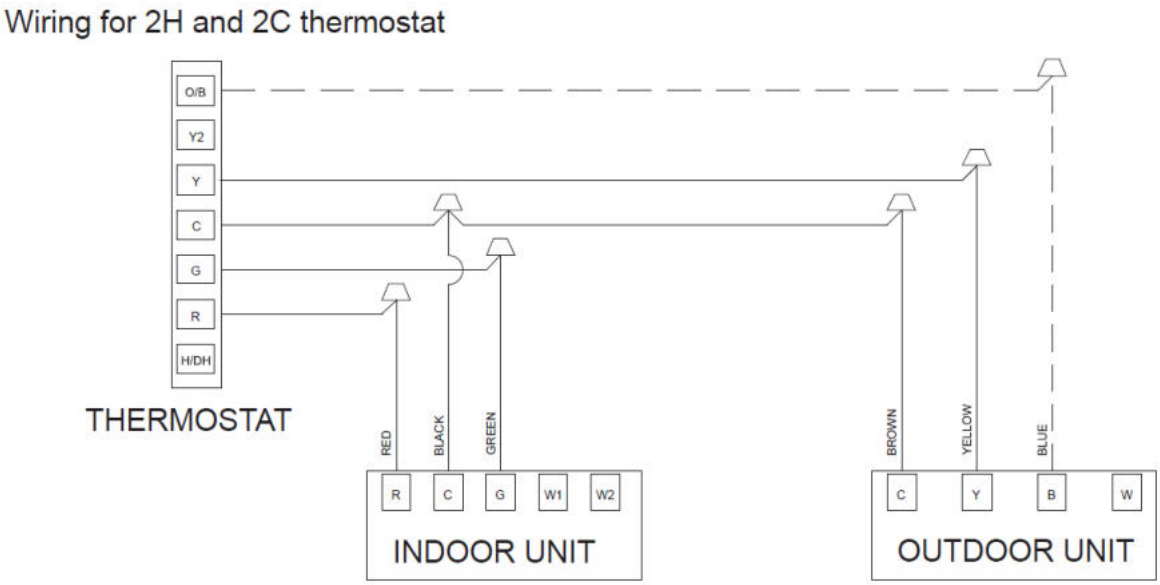



**Figure 11.5 Control Wiring**

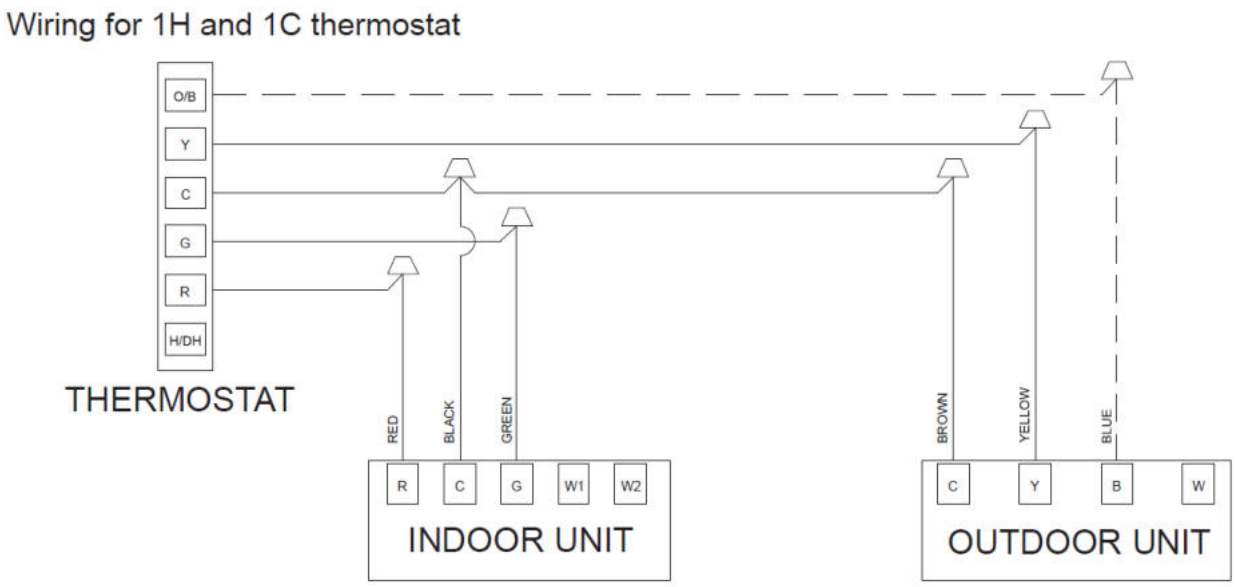



**Figure 11.6 Control Wiring**

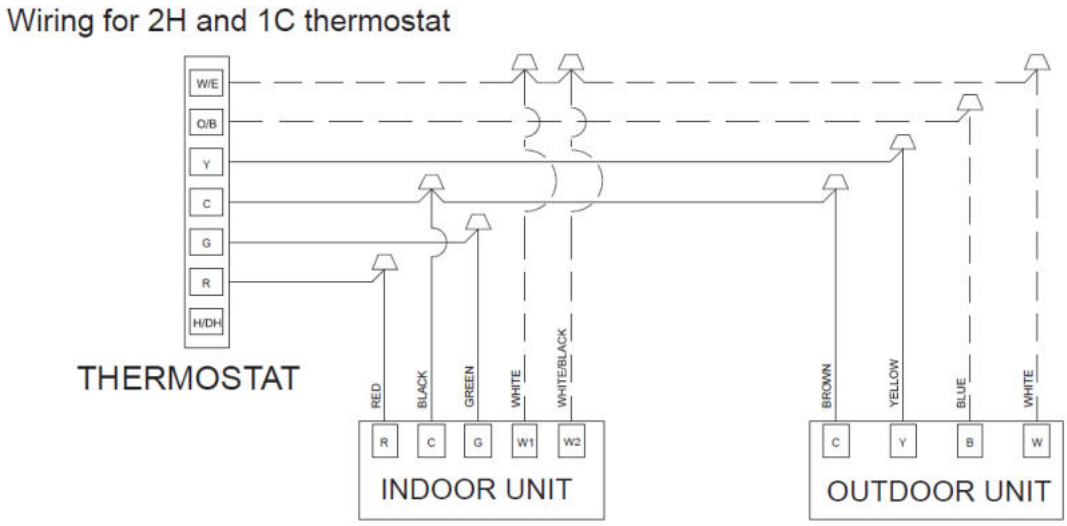
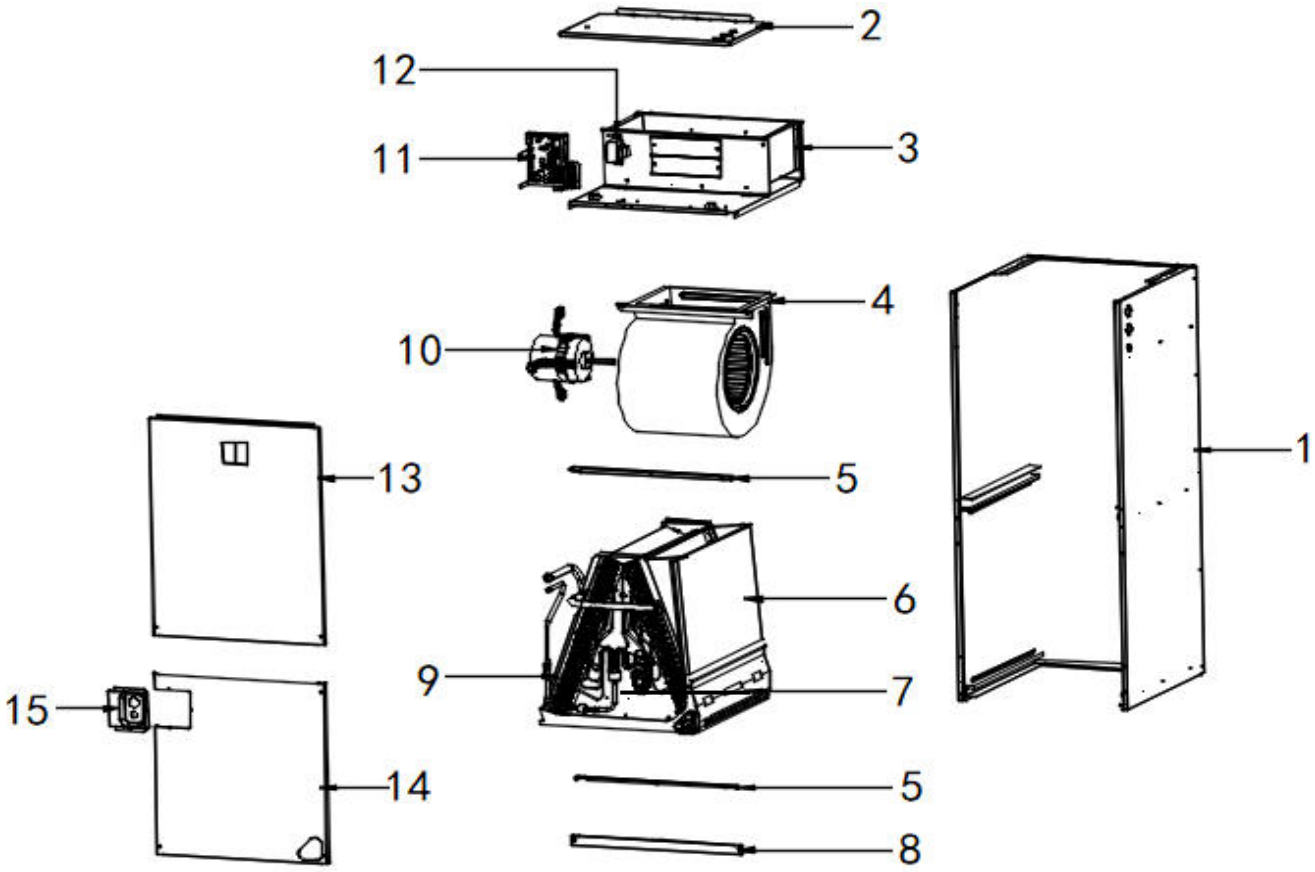



**Figure 11.7 Control Wiring**

# 12.Exploded View



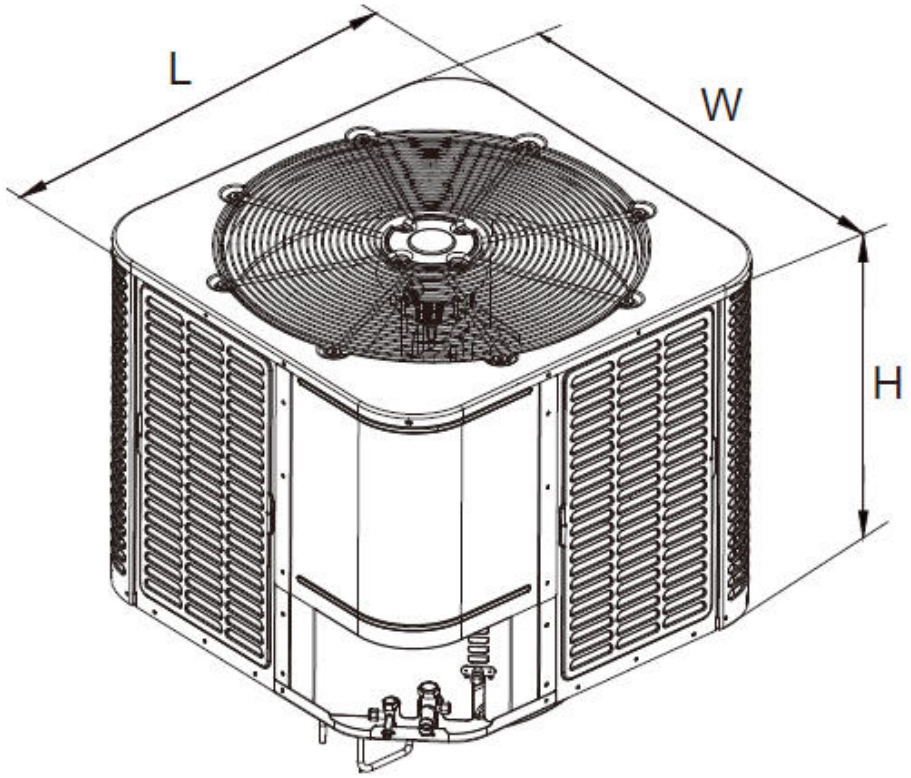

| No. | Part Name | Quantity | No. | Part Name | Quantity |
|---|---|---|---|---|---|
| **1** | Rear Enclosure Assembly | 1 | **9.3** | Evaporator baffle | 2 |
| **2** | Control box cover assembly | 1 | **10** | DC Motor | 1 |
| **3** | Duct assembly | 1 | **11** | Indoor electric control box assembly | 1 |
| **4** | Right Volute Wind Wheel | 1 | **11.1** | Indoor main control board | 1 |
| **5** | Support bar | 2 | **11.2** | Ambient temperature sensor | 1 |
| **6** | Water pan components | 1 | **11.3** | Coil temperature sensor | 1 |
| **7** | Refrigerant leakage sensor | 1 | **12** | Transformers | 1 |
| **8** | Filter Cover plate | 1 | **13** | Upper side plate assembly | 1 |
| **9** | Evaporator components | 1 | **14** | Down side plate assembly | 1 |
| **9.1** | Evaporator output tube assembly | 1 | **15** | Pipe Cover plate assembly | 1 |
| **9.2** | Evaporator input tube assembly | 1 | | | |

# Part 3 Outdoor Unit

# 1. Specification

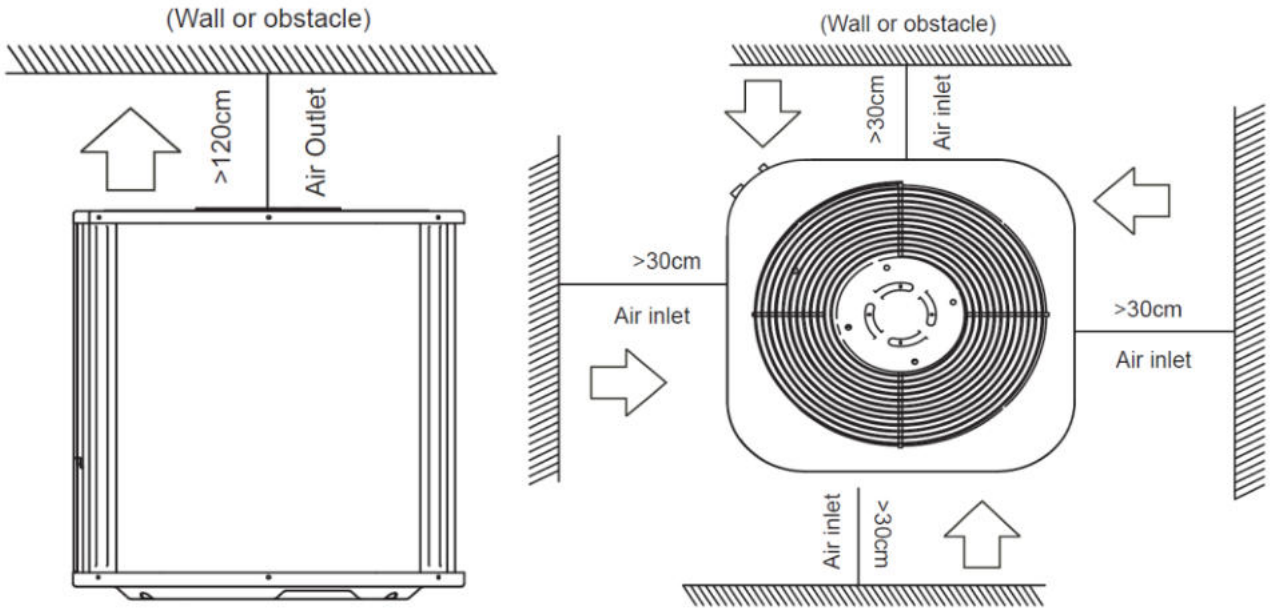
| Model | | BAR17-18-15 | BAR17-24-15 | BAR17-30-15 | BAR17-36-15 |
|---|---|---|---|---|---|
| Outdoor power supply | V/Ph/Hz | 230V/1ph/60HZ | | | |
| **Electrical Data** | Min./Max.Voltage | 187/253 | | | |
| | MCA | 12 | 16 | 18 | 22 |
| | MOP | 15 | 25 | 25 | 35 |
| **Cooling** | Capacity(Btu/h) | 17600 | 22800 | 28000 | 33000 |
| | EER2(Btu/h.W) | 11.7 | 11.7 | 11.7 | 11.7 |
| | SEER2(Btu/h.W) | 14.3 | 14.3 | 14.3 | 14.3 |
| **Compressor** | Type | Rotary | | | |
| | Stage | / | | | |
| | Capacity(Btu/h) | 19073 | 25863 | 24771 | 36440 |
| | Input(W) | 1290.00 | 1740.00 | 2485.00 | 2450.00 |
| | Rated current(RLA)(A) | 7.80 | 11.00 | 12.10 | 15.20 |
| | Locked rotor Amp(LRA)(A) | 39.00 | 55.00 | 58.00 | 72.00 |
| **Outdoor coil** | Fin material | Hydrophilic Aluminium Fin | | | |
| | Tube material | Inner Grooved | | | |
| **Outdoor fan motor** | Type | DC | | | |
| | Output (W) | 120 | 120 | 200 | 200 |
| | Output (HP) | 1/6 | 1/6 | 1/4 | 1/4 |
| | Full Load Amps(FLA)(A) | 1.5 | 1.5 | 2.4 | 2.4 |
| **Outdoor Unit** | Unit (WxHxD) (inch) | 21-4/5×25×21-4/5 | | 29-1/7×25×29-1/7 | |
| | Packing (WxHxD) (inch) | 22-3/5×26×22-3/5 | | 30×26×x30 | |
| | Net / Gross weight(lbs) | 111/116 | | 139/147 | 146/154 |
| **Refrigerant system** | Liquid side (inch) | Φ3/8 | | | |
| | Gas side (inch) | Φ3/4 | | | |
| | Max. refrigerant pipe length (ft) | 131 | | | |
| | Max. difference in level (ft) | 66 | | | |
| | Refrigerant Type | R32 | | | |
| **Operation temp range** | Cooling (°F) | 57-118 | | | |

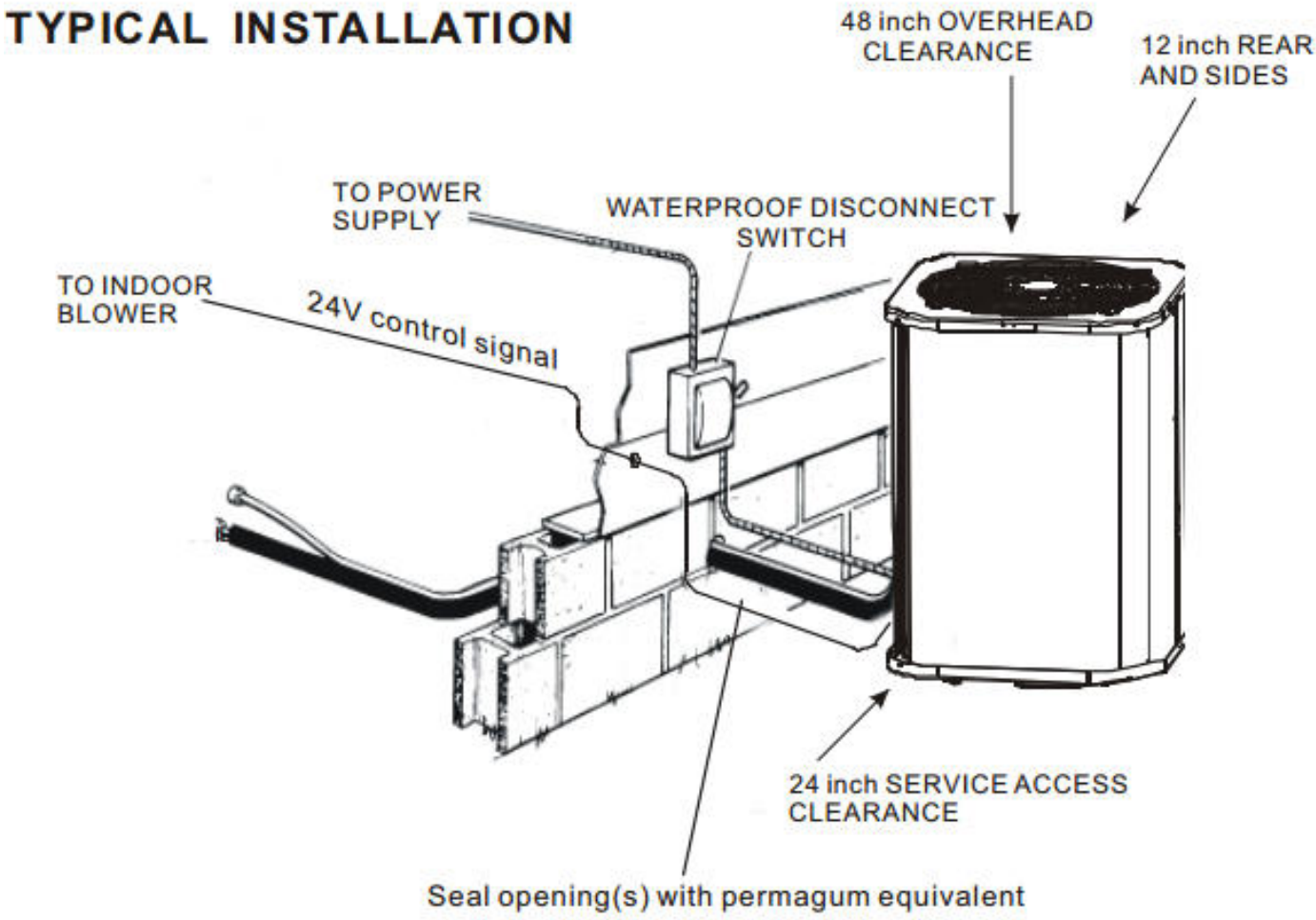
## 2.Dimensions



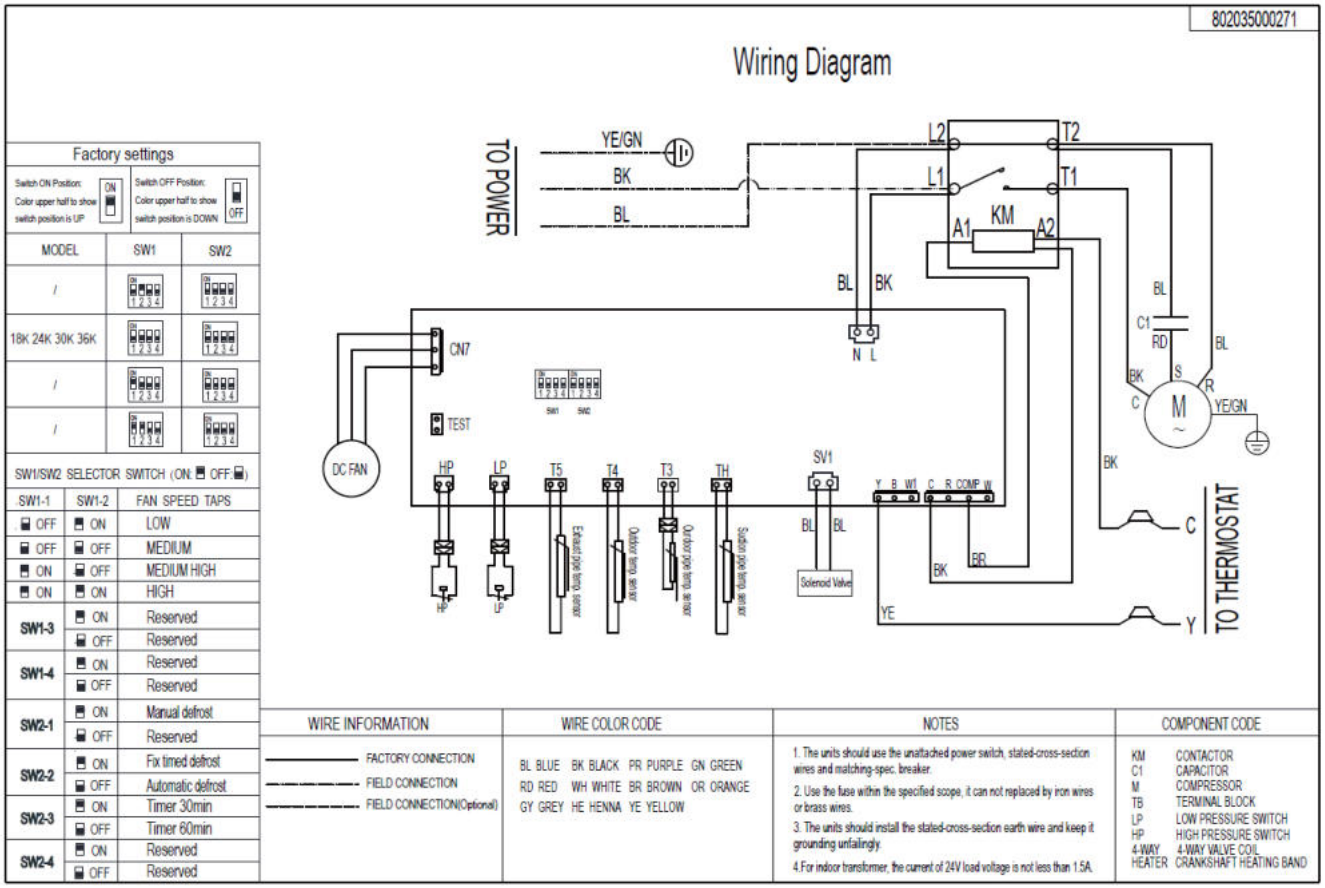

| model | H×W×L (inches) |
|---|---|
| 18K/24K | 25 × 21-4/5 × 21-4/5 |
| 30K/36K | 25 × 29-1/7 × 29-1/7 |

## 3.Service Space



# 4.Wiring Diagrams.




Factory settings

Switch ON Position: Color upper half to show switch position is UP

Switch OFF Position: Color upper half to show switch position is DOWN

| MODEL | SW1 | SW2 |
|---|---|---|
| / | | |
| 18K 24K 30K 36K | | |
| / | | |
| / | | |

SW1/SW2 SELECTOR SWITCH (ON: ■ OFF:□)

| | SW1-1 | SW1-2 | FAN SPEED TAPS |
|---|---|---|---|
| | OFF | ON | LOW |
| | OFF | OFF | MEDIUM |
| | ON | OFF | MEDIUM HIGH |
| | ON | ON | HIGH |
| SW1-3 | | ON | Reserved |
| | | OFF | Reserved |
| SW1-4 | | ON | Reserved |
| | | OFF | Reserved |
| SW2-1 | | ON | Manual defrost |
| | | OFF | Reserved |
| SW2-2 | | ON | Fix timed defrost |
| | | OFF | Automatic defrost |
| SW2-3 | | ON | Timer 30min |
| | | OFF | Timer 60min |
| SW2-4 | | ON | Reserved |
| | | OFF | Reserved |

| WIRE INFORMATION | WIRE COLOR CODE | NOTES | COMPONENT CODE |
|---|---|---|---|
| FACTORY CONNECTION<br>FIELD CONNECTION<br>FIELD CONNECTION(Optional) | BL BLUE BK BLACK PR PURPLE GN GREEN<br>RD RED WH WHITE BR BROWN OR ORANGE<br>GY GREY HE HENNA YE YELLOW | 1. The units should use the unattached power switch, stated-cross-section wires and matching-spec. breaker.<br>2. Use the fuse within the specified scope, it can not replaced by iron wires or brass wires.<br>3. The units should install the stated-cross-section earth wire and keep it grounding unfailingly.<br>4.For indoor transformer, the current of 24V load voltage is not less than 1.5A. | KM CONTACTOR<br>C1 CAPACITOR<br>M COMPRESSOR<br>TB TERMINAL BLOCK<br>LP LOW PRESSURE SWITCH<br>HP HIGH PRESSURE SWITCH<br>4-WAY 4-WAY VALVE COIL<br>HEATER CRANKSHAFT HEATING BAND |

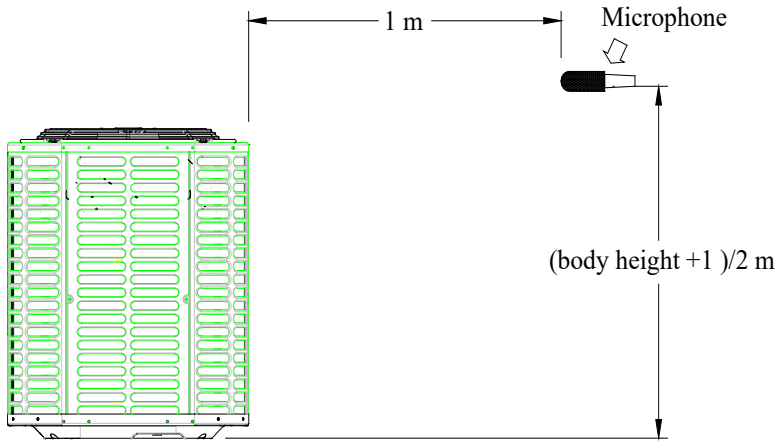
## 5.Electric Characteristics

| Model | Outdoor Unit | | | | | |
|---|---|---|---|---|---|---|
| | Hz | Voltage | Min. | Max. | MCA | MOP |
| 18K | 60 | 208~230V | 187V | 253V | 12 | 15 |
| 24K | 60 | 208~230V | 187V | 253V | 16 | 25 |
| 30K | 60 | 208~230V | 187V | 253V | 18 | 25 |
| 36K | 60 | 208~230V | 187V | 253V | 22 | 35 |

## 6.Operation Limits

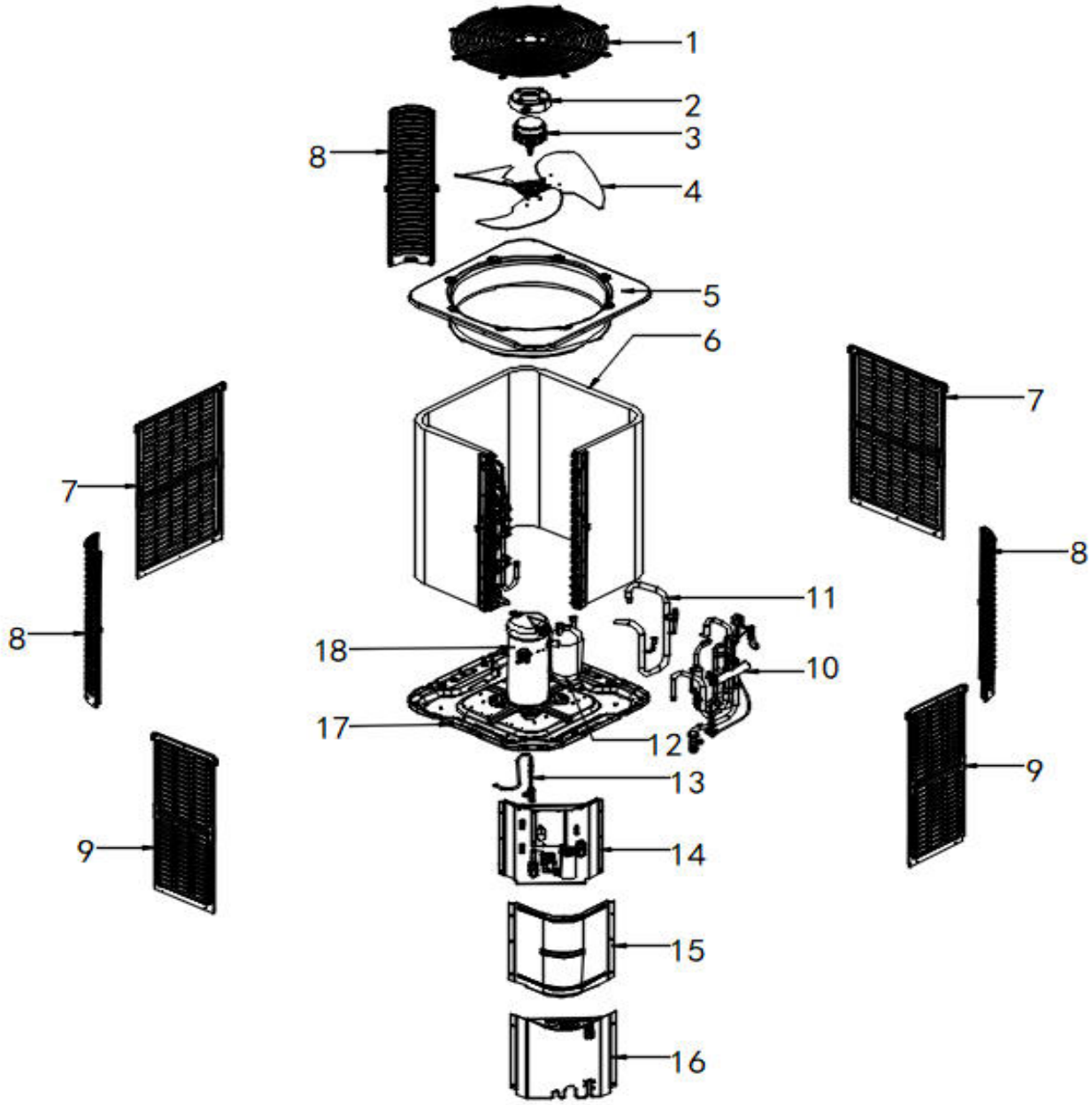
| Operation mode | Outdoor temperature(°F) | Room temperature(°F) |
|---|---|---|
| Cooling operation | 57—118 | 61—90 |

## 7.Sound Levels




Note: Sound level is measured at a point 1 m in front of the unit, at a height of (Unit body height +1)/2 m.

# 8.Exploded View




| No. | Part Name | Quantity | No. | Part Name | Quantity |
|---|---|---|---|---|---|
| 1 | Cover net | 1 | 14 | electric control box components | 1 |
| 2 | DC Motor Mount | 1 | 14.1 | Electronic control board | 1 |
| 3 | Outdoor motor | 1 | 13.2 | High pressure switch | 1 |
| 4 | Axial-flow fan | 1 | 13.3 | Low pressure switch | 1 |
| 5 | Top cover assembly | 1 | 13.4 | Condenser temperature sensor (T3) | 1 |
| 6 | Condenser assembly | 1 | 13.5 | Ambient temperature sensor (T4) | 1 |
| 6.1 | Condenser inlet pipe assembly | 1 | 13.6 | Exhaust temperature sensor (T5) | 1 |
| 6.2 | Condenser output pipe assembly | 1 | 13.7 | Return temperature sensor (TH) | 1 |
| 7 | Rear side-panel | 2 | 13.8 | Solenoid valve | 1 |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Support board | 3 | 13.9 | AC contactor | 1 |
| 9 | Left side-panel | 2 | 13.10 | Compressor capacitor | 1 |
| 10 | Four way valve assembly | 1 | 15 | Top panel | 1 |
| 11 | Suction air pipe weld assembly | 1 | 16 | Bottom side panel | 1 |
| 12 | Gas-liquid separator | 1 | 17 | Chassis assembly | 1 |
| 13 | High pressure valve assembly | 1 | 18 | Compressor | 1 |

# 9.Troubleshooting

## 9.1 Error code

### Indoor unit

| | LED Status | System status |
|---|---|---|
| Model | LED light always on | Runing Mode |
| System warning | LED light 1 Flash/Cycle | R454B refrigerant leak Protection |
| | LED light 2 Flash/Cycle | Anti-freezed Protection |
| | LED light 3 Flash/Cycle | Evaporator Temperature Sensor Error |
| | LED light 4 Flash/Cycle | R454B refrigerant sensor Error |
| | LED light 5 Flash/Cycle | ECM motor Error |

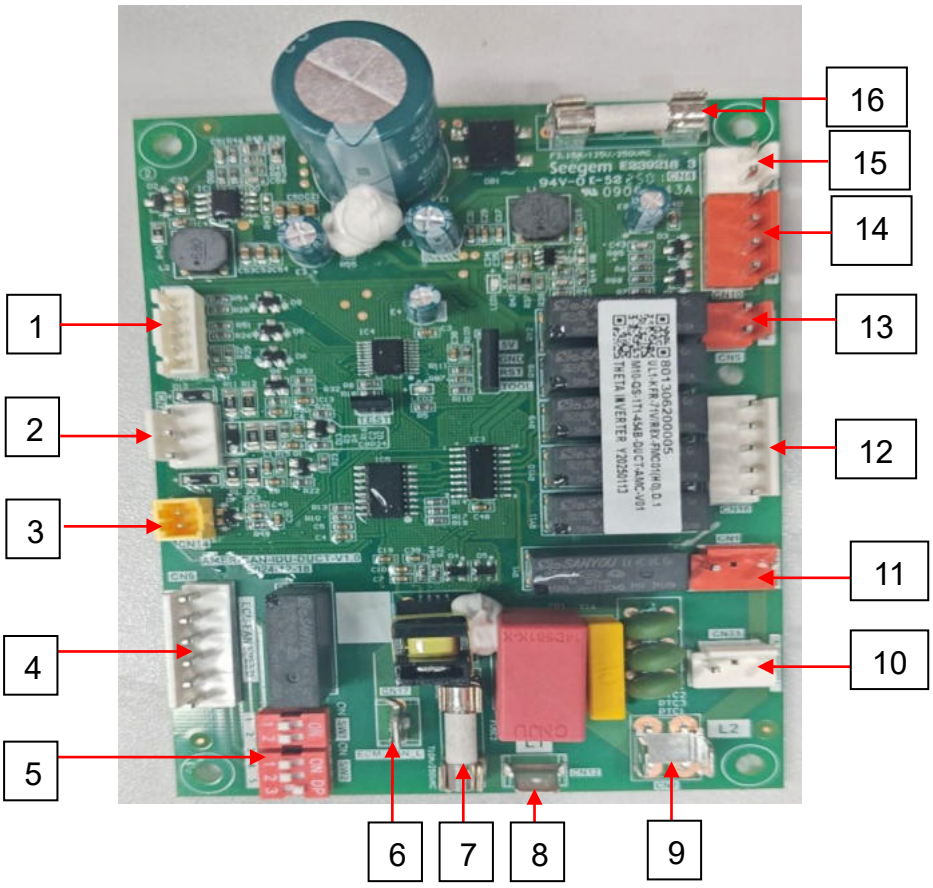
### Outdoor unit

| | Digital tube display content | System status |
|---|---|---|
| Model | 0 | Standby Mode |
| | 1 | Cooling Mode |
| | 2 | Heating Mode |
| System warning | 3 | T3 Sensor Error |
| | 4 | T4 Sensor Error |
| | 5 | T5 Sensor Error |
| | 6 | Low Pressure Protection |
| | 7 | High Pressure Protection |
| | 8 | Outdoor Fan Error |
| | 9 | T3 High Temperature Protection |
| | A | T4 Ambient Temperature Protection |
| | C | T5 High Compressor Discharge Temperature Protection |
| | E | TH Sensor Error |
| | F | TH Anti-freezed Protection |
| | L | Low Voltage Protection |

| | | |
|---|---|---|
| System lock | 6. | 6 times Low Pressure Protection within 60 minutes |
| | 7. | 6 times High Pressure Protection within 60 minutes |
| | 8. | 4 times Outdoor Fan Error within 60 minutes |
| | C. | 3 times High Compressor Discharge Temperature Protection within 60 minutes |
| | L. | 2 times Low Voltage Protection within 120 minutes |

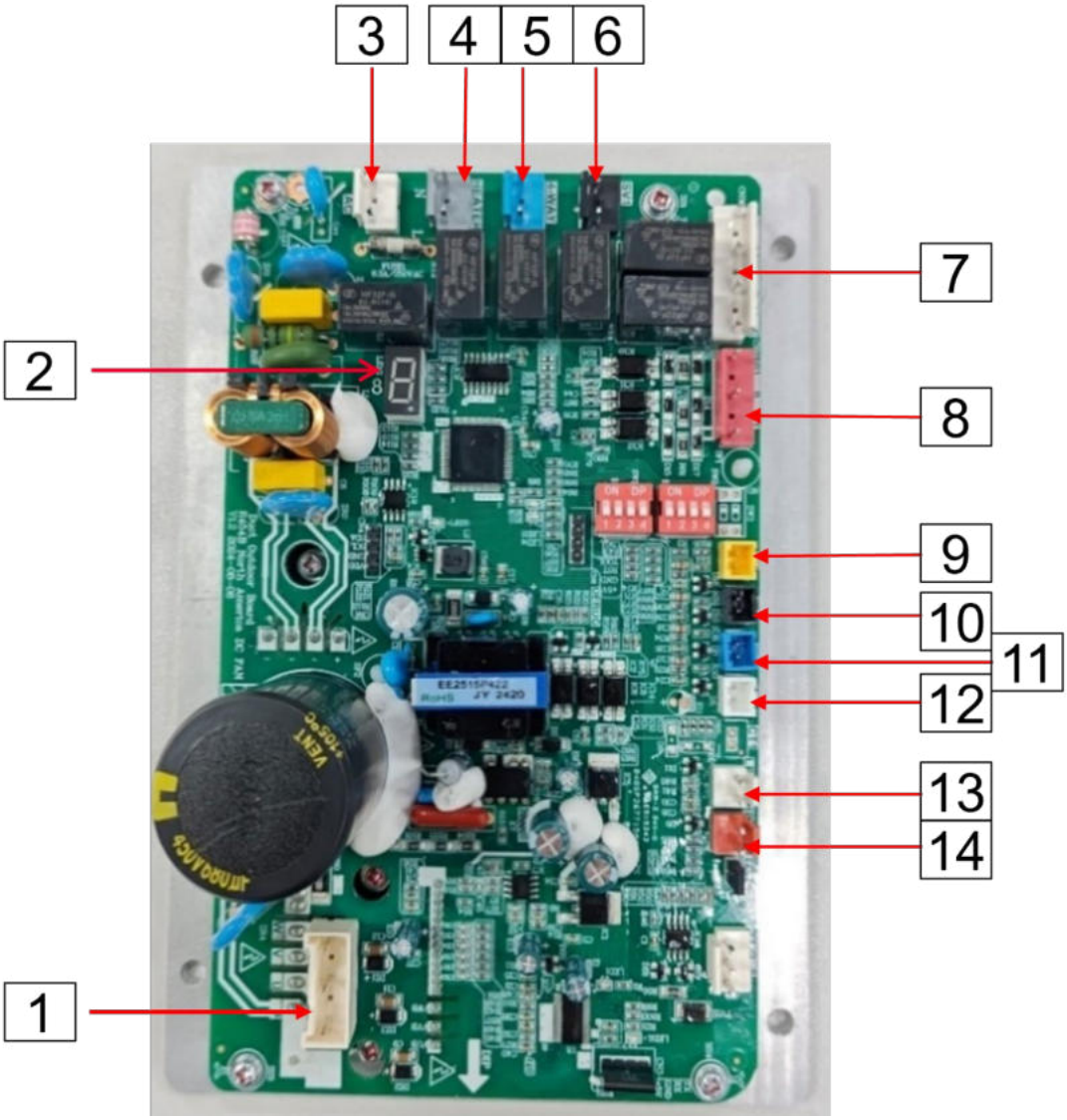
## 9.2 Indoor unit control board

**18-36k**




| NUM | Port definition | NUM | Port definition |
|---|---|---|---|
| 1 | Reserve | 9 | Power supply L2 |
| 2 | 24V terminal connected to 24V thermostat | 10 | Transformer input(230v) |
| 3 | T2 sensor | 11 | Alarm output (230V) |
| 4 | ECM motor | 12 | Electric heater port (connected to electric heater) |
| 5 | Function switch | 13 | 24V thermostat power supply R, C |
| 6 | Power supply of motor | 14 | Refrigerant leakage sensor |
| 7 | Fuse | 15 | Transformer output(24v) |
| 8 | Power supply L1 | 16 | Fuse |

## 9.3 Outdoor unit control board



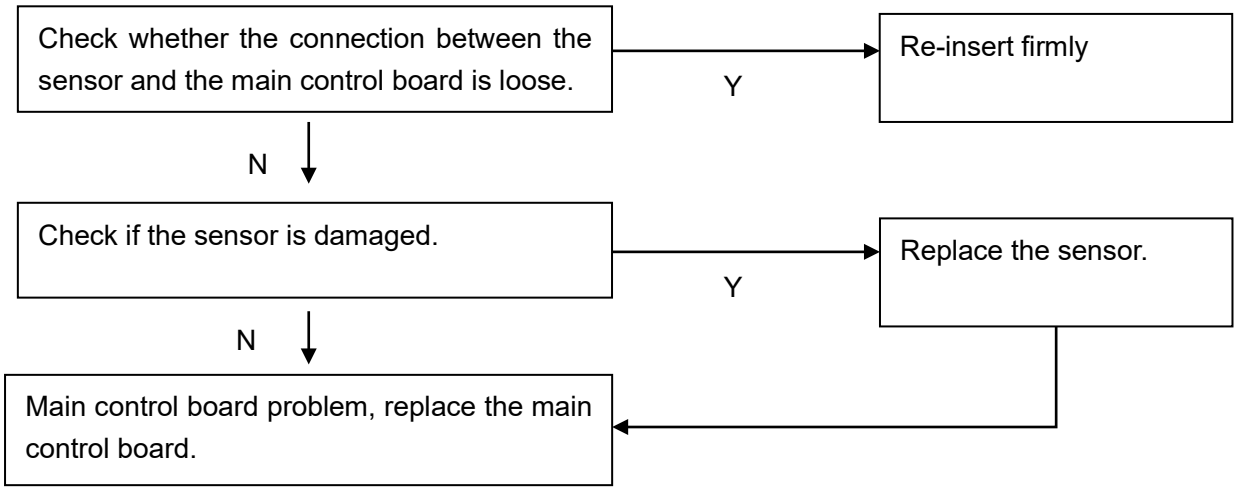

| NUM | Port definition | NUM | Port definition |
|---|---|---|---|
| 1 | DC motor communicate port | 8 | 24V communication (Y/B) |
| 2 | Digital display tube | 9 | Return air temperature sensor |
| 3 | Power supply | 10 | Condenser temperature sensor |
| 4 | Crankshaft heating belt | 11 | ambient temperature sensor |
| 5 | Four-way valve | 12 | Exhaust temperature sensor |
| 6 | Solenoid valve | 13 | Low pressure switch |
| 7 | 24V communication (W/C) | 14 | High pressure switch |

## 9.4 Troubleshooting guide

### 9.4.1 T1/T2/ sensor fault, R32 sensor fault (Indoor unit sensor failure)

### 9.4.2 T3/T4/T5 sensor fault (Outdoor unit sensor failure)

**Reason: Sensor reading error**




- Confirm whether the sensor is firmly connected and check the sensor connector to ensure it is firmly connected.
- Unplug the sensor and use a multimeter to measure the resistance to check whether it is open circuit or short circuit. If so, replace the sensor; if not, replace the main control board.

- Sensor resistance table see Appendix 1

### 9.4.3 Refrigerant leakage fault

**Reason: Refrigerant leakage detected**

- Firstly, open windows for ventilation and extinguish indoor open flames.
- Then check if there is any leakage in the copper pipe. If it is confirmed to be leaking, the pipe needs to be repaired by welding.
- If no leakage is found, it may be a false alarm fault on the main control board. Replace the indoor board first. If the fault is not resolved, replace the refrigerant sensor.

### 9.4.4 Indoor control board chip failure

**Reason: The indoor control board chip is broken**

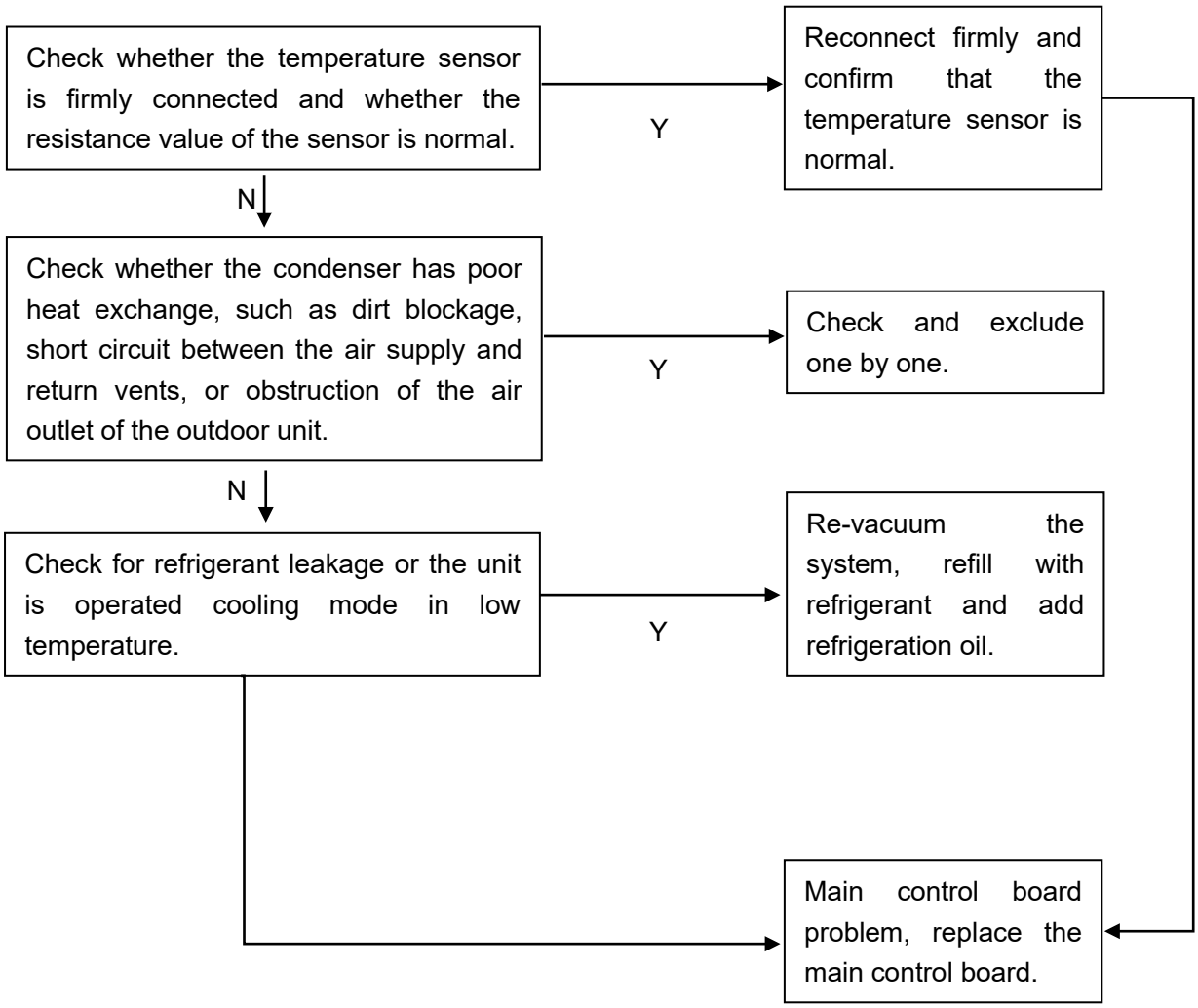
- **Replace the indoor control board.**

### 9.4.5 Anti-freeze protection

**Reason:**

**Indoor unit: The T2 sensor detects that the evaporator temperature is too low**(T2＜0℃)

**Outdoor unit: The TH sensor detects that the gas return temperature is too low**(T2＜0℃)




- Check if the actual temperature of the evaporator is very low or even frozen.
- If the evaporator is frozen, please check if the air conditioning system is blocked or if the refrigerant is leaking, etc. If no, then you need to clean the pipes, re-evacuate, and recharge refrigerant.
- If the evaporator is not frozen, use a multi-meter to measure whether the resistance of the temperature sensor is normal (see the appendix for the R-T table). If it is not normal, you need to replace the sensor.
- If the sensor resistance is normal, then you need to replace the main control board of the indoor unit.

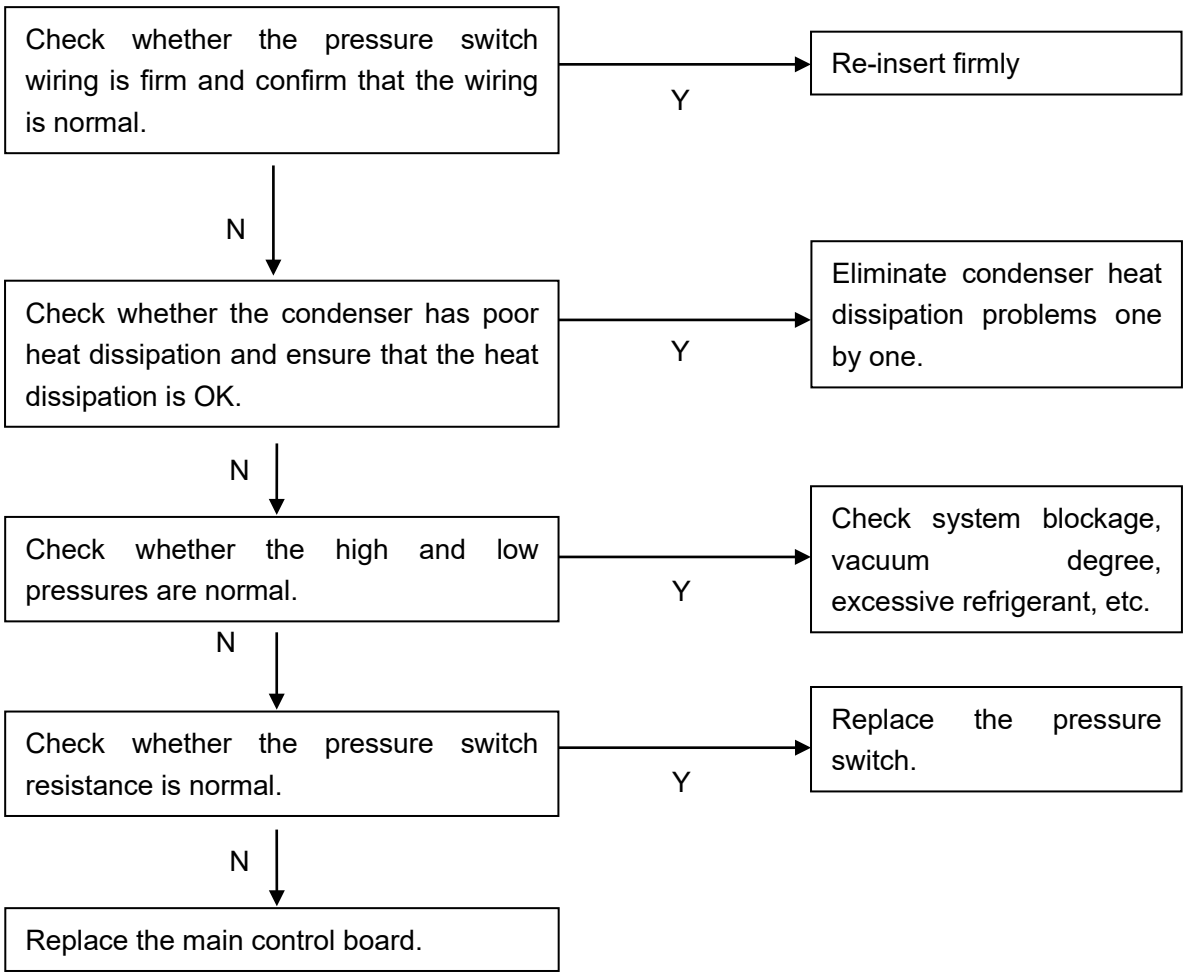
### 9.4.6 Indoor fan protection

**Reason: The DC fan motor of the indoor unit has issue**

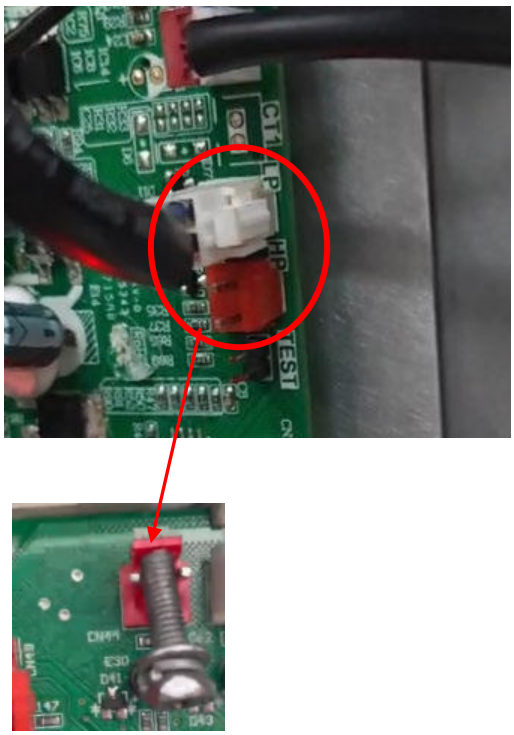
- Replace the control board of the indoor unit.
- If not resolved, replace the motor.

### 9.4.7 High /Low pressure protection

**Cause: The high and low-pressure switch is continuously in the disconnected state**



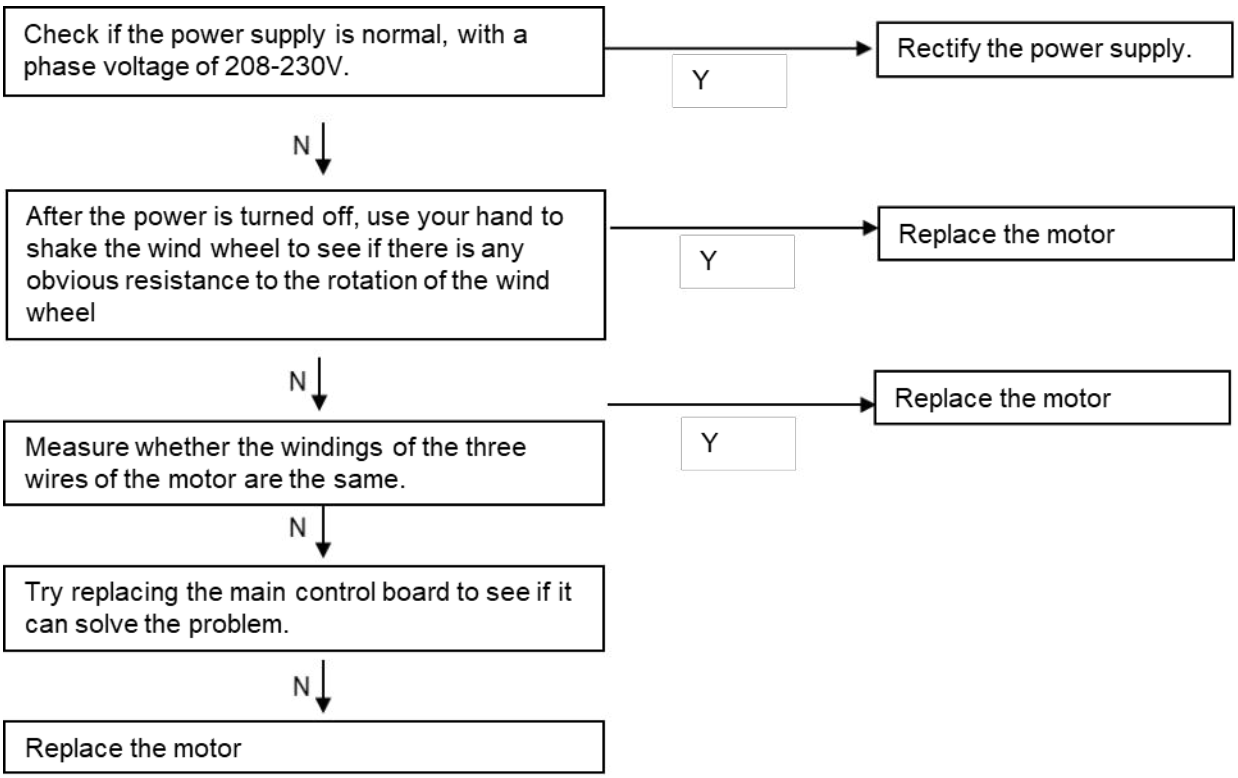

- Then turn off the power of the machine and then turn on the power, and use the controller to start the machine.
- If the machine fails after running for a while, there may be a problem with the refrigerant system and the system needs to be checked.
- If the machine fails as soon as it is powered on, there may be a problem with the pressure switch or the outdoor main board.
- Use a jump cap or metal short-circuit to connect the pressure switch port of the electronic control board, then turn off the power and restart the machine, and observe whether the fault disappears.
- If the fault is resolved, replace the pressure switch.
- If the fault is not resolved, replace the main control board.



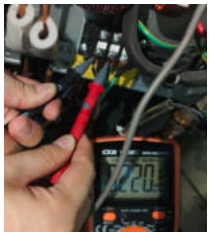
**The high-pressure switch port can be short circuited by using a screw clamped between two pins.**

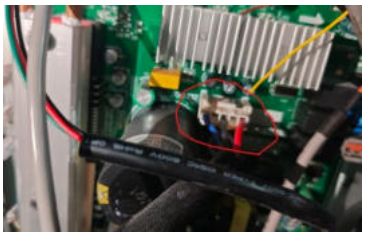
### 9.4.8 DC fan malfunction

Cause：Abnormal detection of fan motor.



- Check if the power supply is normal, with a phase voltage of 208-230V, and confirm that the power supply is functioning properly.

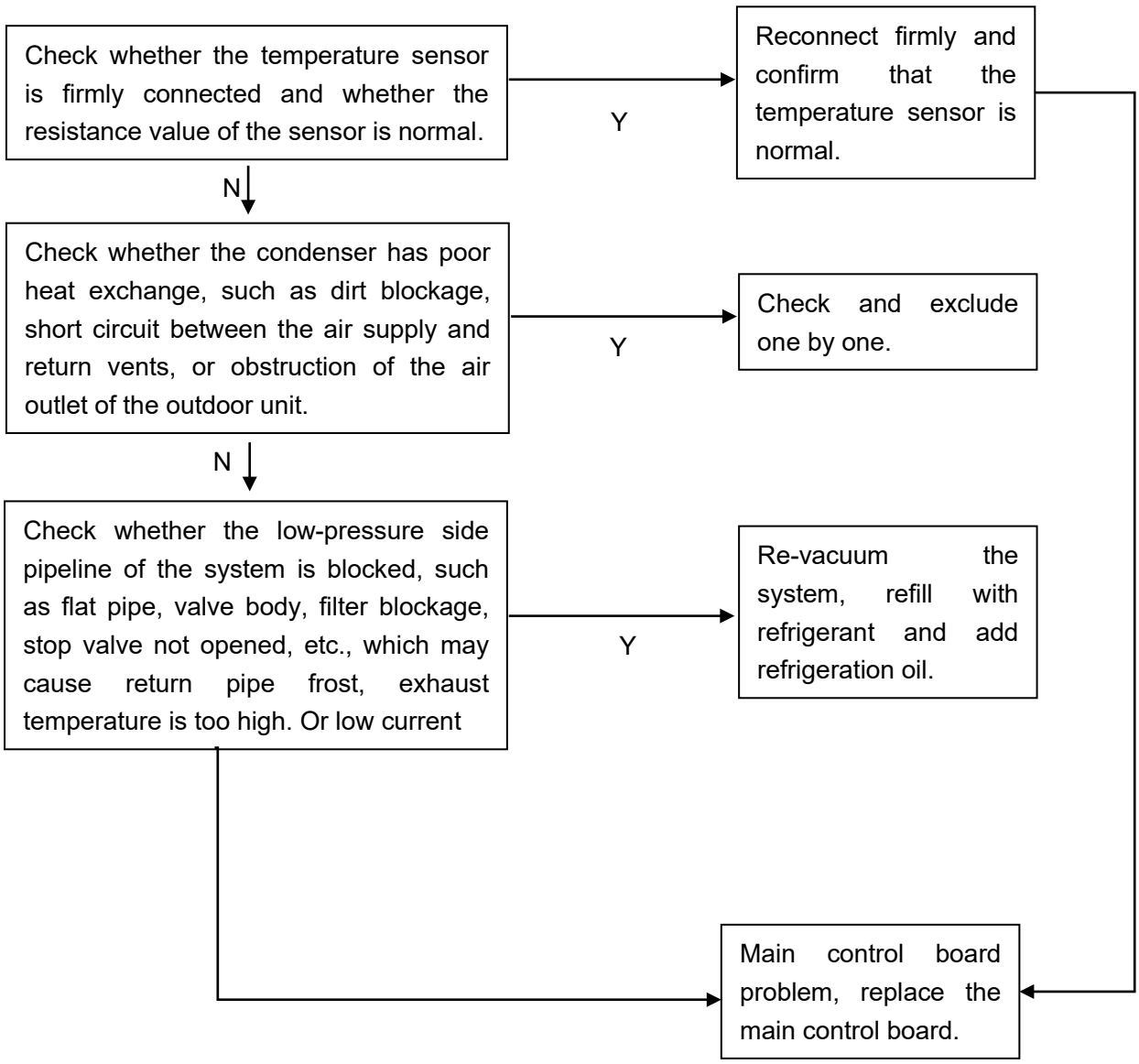




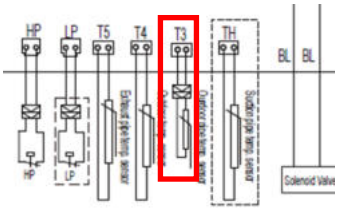
- After the power is turned off, use your hand to shake the wind wheel to see if there is any obvious resistance to the rotation of the wind wheel. If you find that the wind wheel does not rotate smoothly when you turn it by hand, replace the motor, otherwise proceed to the next step.
- Measure whether the windings of the three wires of the motor are the same. If the winding cannot be measured, or the measured resistance is different, replace the motor.
- Try replacing the main control board to see if it can solve the problem.
- Replace the motor.

### 9.4.9 Outdoor coil temperature over-high protection (cooling mode) T3＞60℃

Cause: The condenser temperature sensor detected that the temperature was too high




- Check if the heat dissipation of the condenser is normal, ensuring that there are no dirty blockages, short circuits in the air supply and return ports, etc.
- Measure the resistance of the temperature sensor and check whether it drifts by comparing it with the resistance table. If it drifts, replace the sensor. Please see the appendix for R-T table



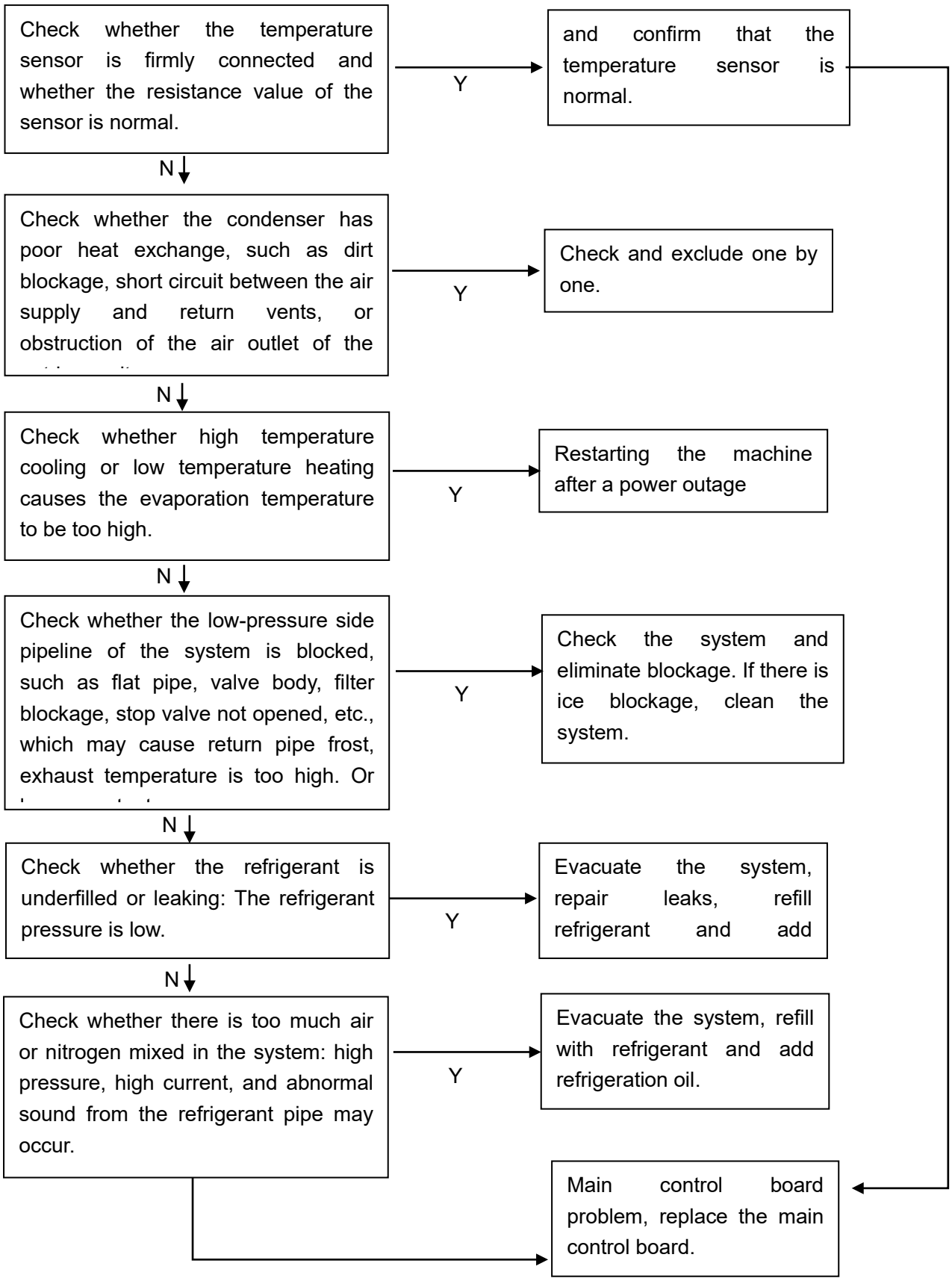

- If the temperature sensor resistance is normal, check the exhaust temperature in item 8 and compare it with the actual exhaust temperature (use a infrared thermometer to measure the exhaust temperature). If the temperature of the main control board is unreasonable, replace

the main control board.

- If the above steps are normal, check whether the refrigerant system is normal, such as return air blockage, poor evaporation, compressor wear, etc.

### 9.4.10 Exhaust temperature too high protection ＞120℃

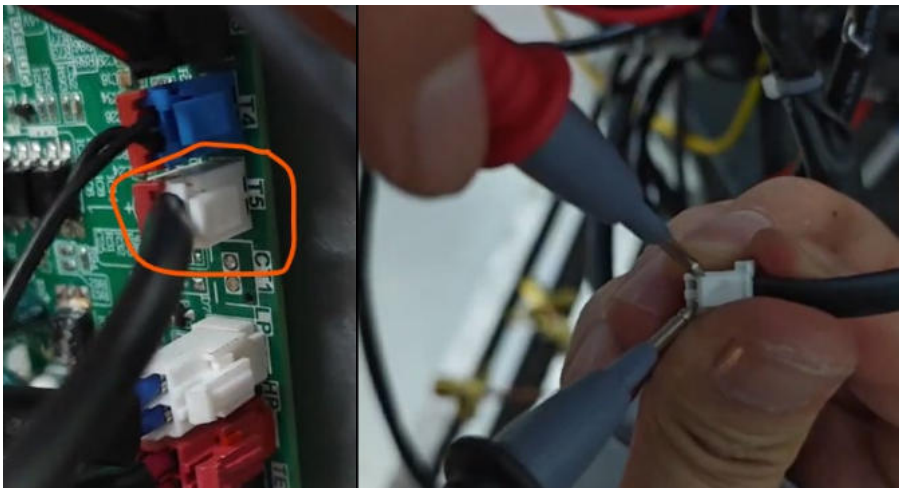
Cause: The exhaust temperature sensor reads a temperature that is too high



- Connect a pressure gauge to measure whether the return gas pressure is too low (normally 0.7-0.9MPa). If the pressure is too low, add refrigerant.

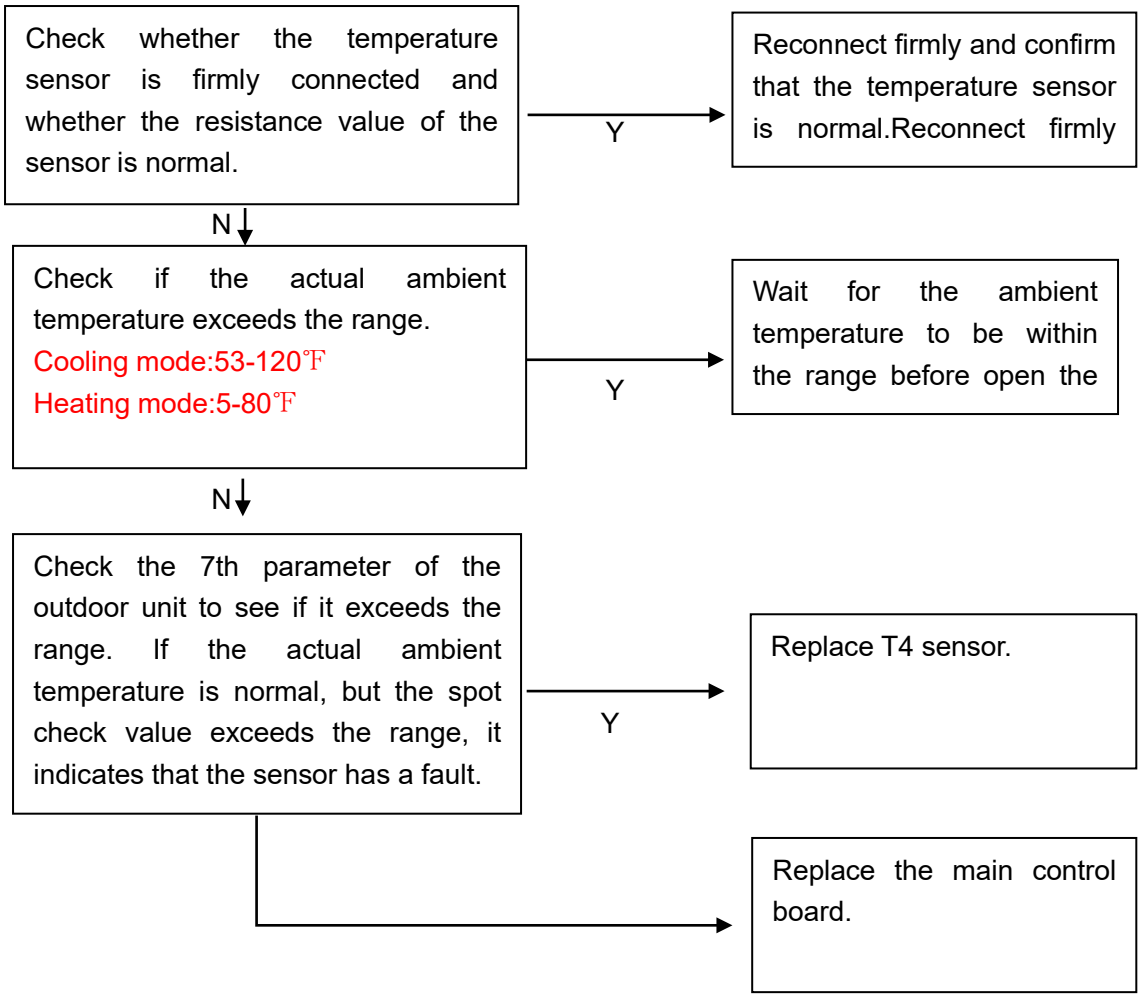
- Measure the resistance of the temperature sensor and check whether it drifts by comparing it with the resistance table. If it drifts, replace the sensor. Please see the appendix for R-T table

- If the above steps are normal, check whether the refrigerant system is normal, such as return air blockage, poor evaporation, compressor wear, etc.



### 9.4.11 Overtemperature protection

Cause: Outdoor sensor T4 detects that the ambient temperature exceeds the range



# Part 4 Function introduction

# 1.Electrical Components Description

**Temperature Sensor**

**T2: Indoor Coil Temperature**

— Anti-Cold Air Function (heating mode)

— Anti-Freezing Function

**T3: Outdoor Coil Temperature**

— High/Low temperature protection

—Outdoor fan control (cooling mode)

— Defrost control (heating mode)

**T4: ODU Ambient Temperature**

— Operating condition permission

— Defrosting condition (heating mode)

— Outdoor fan control (heating mode)

**T5: Compressor Discharge Temperature**

— High temperature / Low super heat protection

— Electronic Expansion Valve (EEV) control

**TH: Gas side return Temperature**

— Anti-freeze protection

# 2.Outdoor gas return temperature Anti-Freezing Function

The function utilizes the Outdoor gas return temperature (TH) to determine whether the indoor coil is freezing or not. The feature prevents the unit running at low evaporating temperature as well as low suction super heat.

Only valid in cooling mode and after the compressor has been running for 3 minutes.

When the gas return temperature TH≤TH1 for “t” minutes, or the gas return temperature TH≤TH2, the compressor and the outdoor fan will be stopped, and the anti-freezing protection will be reported

| | TH1 | TH2 | t |
|---|---|---|---|
| T4≤8℃ | -1 | -4 | 0 |
| 8℃<T4≤16℃ | -1 | -4 | 20+5*(T4-12) |
| 16℃＜T4≤35℃ | -1+0.15*(T4-16) | -4+0.3*(T4-16) | 40 |
| T4＞35℃ | 2+0.2*(T4-35) | 2+0.1*(T4-35) | 40 |

When the return air temperature is greater than 10 degrees or the shutdown time reaches 6 minutes, start the compressor and external fan (the minimum start interval is 5 minutes).

## 3.R32 Leakage Detection Function

The function utilizes a R32 refrigerant sensor to detect the R32 concentration. Terminal F/L2 is reserved for connecting buzzer if needed.
When R32 leakage occur in the indoor coil and the concentration is above 6.7%LEF, the unit will perform as the following:
A. Cut off power to thermostat to stop compressor operation.
B. Electric Heat kit will be turned off.
C. High voltage will be output between terminal F and terminal L2.
D. The indoor fan is running at high wind speed, and at the same time, the fault light on the indoor main board is flash.

## 4.Indoor Coil Anti-Freezing Function

The function utilizes the indoor coil sensor(T2) to determine whether the indoor coil is freezing or not. The feature prevents the unit running at low evaporating temperature as well as low suction super heat.
When all the following conditions are met, the Anti-Freezing Function will activate，and the compressor will be turned off.
A. T2＜32℉ Duration exceeding 1 minute.
B. T2≤26.6℉ Duration exceeding 30 seconds.
when T2≥42.8℉, the Anti-Freezing Function will deactivate:

# Part 5 Installation

# 1.Precaution on Installation

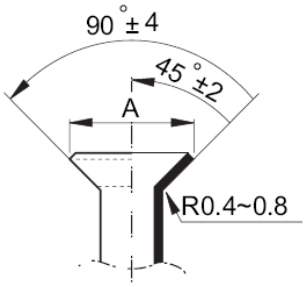
### 1.1. Measure pipe length

Measure the necessary length of the connecting pipe and make it by the following way.
Connect the indoor unit at first, then the outdoor unit.
Bend the tubing in proper way.
Please refer to the table below for the length dimensions of the connection pipe

**Table 1.1.1**

| Refrigerant Piping | | Capacity (Btu/h) | | | |
|---|---|---|---|---|---|
| | | 18K | 24K | 30K | 36K |
| Liquid-Vapor | In. | 3/8-3/4 | 3/8-3/4 | 3/8-3/4 | 3/8-3/4 |
| Max. Refrigerant Line Length* | Ft. | 131 | | | |
| Max. Vertical Lift | Ft. | 66 | | | |

CAUTIONS:
Daub the surfaces of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds With hands before fasten the flare nuts.
Be sure to use two wrenches simultaneously when you connect or disconnect the pipes.

| Pipe gauge | Tightening torque | Flare dimension A Min (mm) | Max | Flare shape |
|---|---|---|---|---|
| Φ6.35 | 15～16N.m (153～163 kgf.cm) | 8.3 | 8.7 |  |
| Φ9.52 | 25～26N.m (255～265kgf.cm) | 12.0 | 12.4 | |
| Φ12.7 | 35～36N.m (357～367kgf.cm) | 15.4 | 15.8 | |
| Φ15.9 | 45～47N.m (459～480 kgf.cm) | 18.6 | 19.1 | |
| Φ19.1 | 65～67N.m (663～684kgf.cm) | 22.9 | 23.3 | |



The stop value of the outdoor unit should be closed absolutely (as original state). Every time you connect it, first loosen the nuts at the part of stop value, then connect the flare pipe immediately (in 5 minutes). If the nuts have been loosened for a long time, dusts and other impurities may enter the pipe system and may cause malfunction later. So please expel the air out of the pipe with refrigerant before connection.
Expel the air after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the repair-points.

**1.2. Locate The Pipe**

Drill a hole in the wall (suitable just for the size of the wall conduit), then set on the fittings such as the wall conduit and its cover.

Bind the connecting pipe and the cables together tightly with binding tapes. Do not let air in, which will cause water leakage by condensation.

Pass the bound connecting pipe through the wall conduit from outside. Be careful of the pipe allocation to do no damage to the tubing.

**1.3. Connect the pipes.**

**1.4. Then, open the stem of stop values of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow.**

**1.5. Be sure of no leakage by checking it with leak detector or soap water.**

**1.6. Cover the joint of the connecting pipe to the indoor unit with the soundproof / insulating sheath (fittings), and bind it well with the tapes to prevent leakage.**

## 2. Oil return bend installation

Note that the length of the connecting line from the outdoor unit to the indoor unit cannot exceed 131 feet.

● If all long lines are in a horizontal state, no additional measures are required;

● If there is a vertical height difference in the long line, it needs to be installed according to the following

requirements:

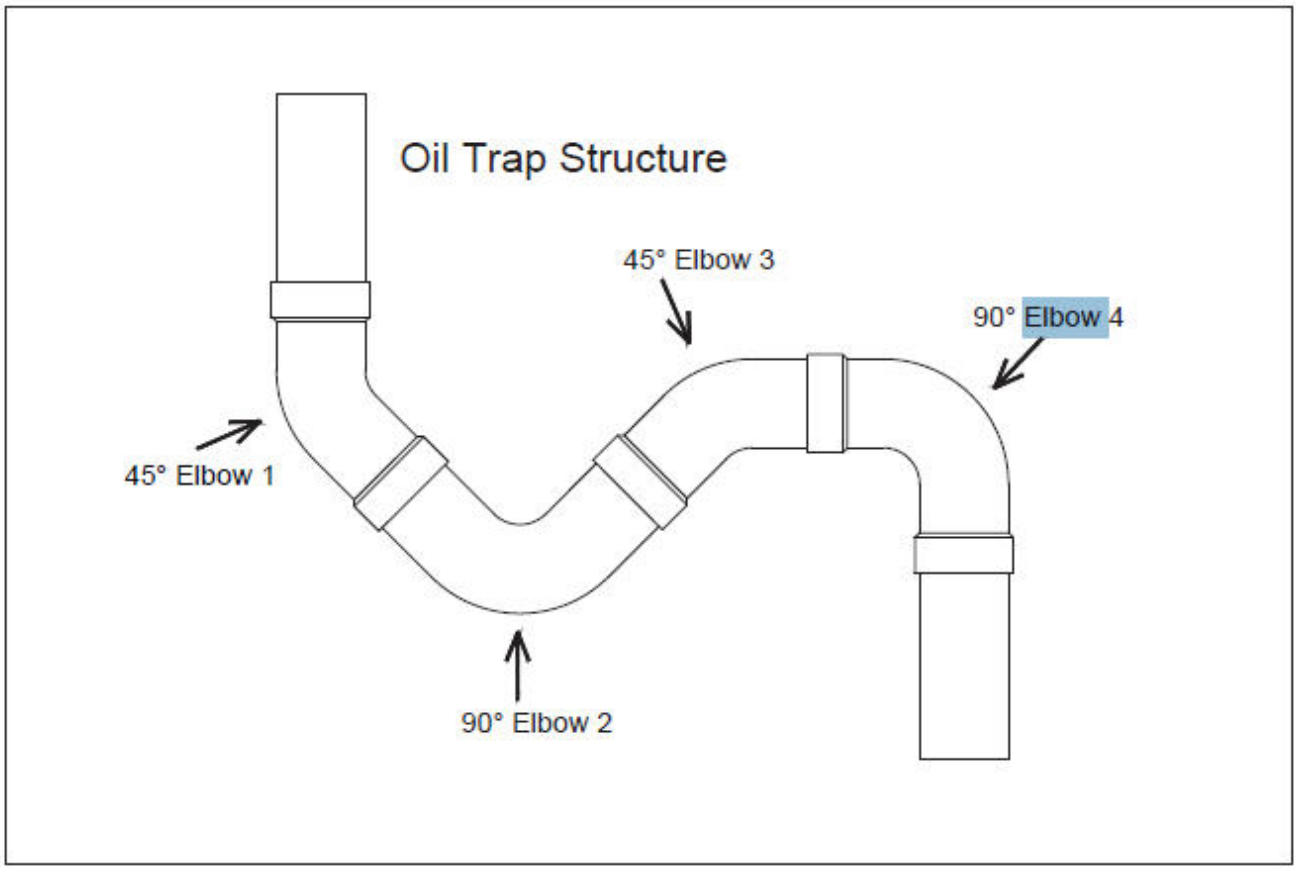
● When the outdoor unit is below the indoor unit, no additional measures are required;

● When the outdoor unit is below the indoor unit , and the vertical height difference is h＜40feet, no additional measures are required.

● When the outdoor unit is below the indoor unit , and the vertical height difference is h＞40feet. An oil return bend needs to be added.

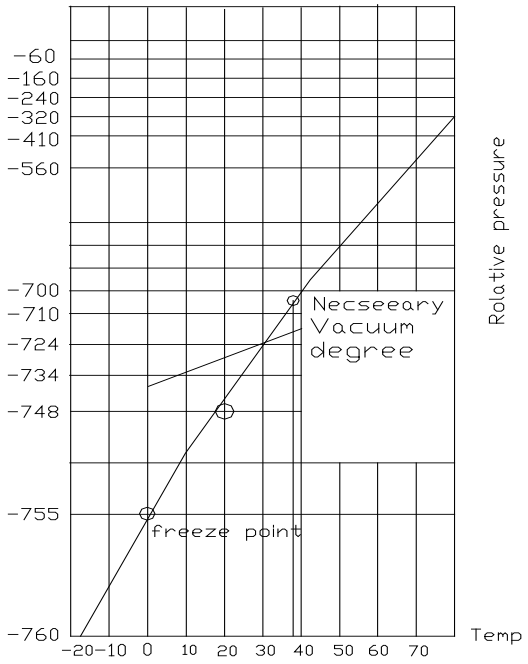
**NOTE**: The vertical height difference between the outdoor unit and the indoor unit cannot exceed 66 feet.

The following is the connection method of the oil return bend.



# 3.Vacuum Dry and Leakage Checking

**3.1 Vacuum Dry:** use vacuum pump to change the moisture (liquid) into steam (gas) in the pipe and discharge it out of the pipe to make the pipe dry. Under one atmospheric pressure, the boiling point of water(steam temperature) is 100℃. Use vacuum pump to make the pressure in the pipe near vacuum state, the boiling point of water falls relatively. When it falls under outdoor temperature, the moisture in the pipe will be vaporized.




**3.2 Vacuum dry procedure**

There are two methods of vacuum dry due to different construction environment: common vacuum dry, special vacuum dry.

**①. Common vacuum dry procedure**

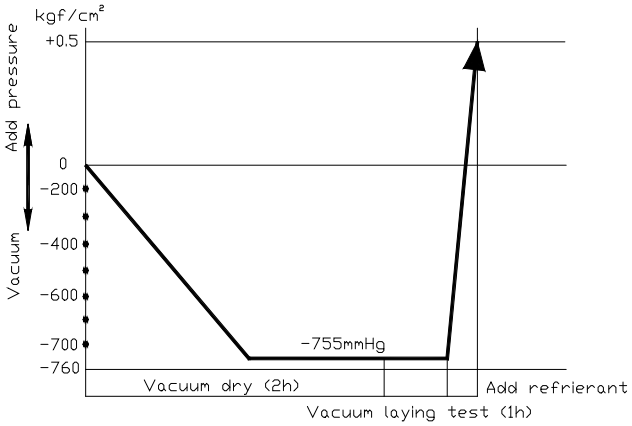
Vacuum dry (for the first time) ---connect the all-purpose detector to the inlet of liquid pipe and gas pipe, and run the vacuum pump more than two hours (the vacuum pump should be below -755mmHg) If the pump can't achieve below -755mmHg after pumping 2 hours, moisture or leakage point will still exist in the pipe. At this time, it should be pumped 1 hour more.

If the pump can't achieve -755mmHg after pumping 3 hours, please check if there are some leakage points.

Vacuum placement test: place 1 hour when it achieves -755mmHg, pass if the vacuum watch shows no rising. If it rises, it shows there's moisture or leakage point.

Vacuuming from liquid pipe and gas pipe at the same time.

Sketch map of common vacuum dry procedure.




**② Special vacuum dry procedure**

a. Vacuum dry for the first time 2h pumping

b. Fill nitrogen to 0.5Kgf/cm2

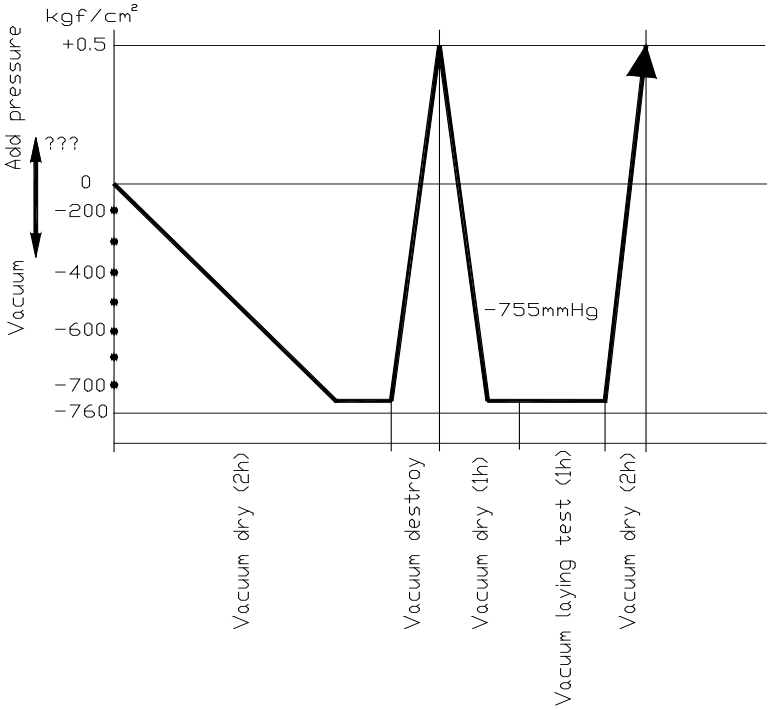
Because nitrogen is for drying gas, it has vacuum drying effect during vacuum destroy. But if the moisture is too much, this method can't dry thoroughly. So, please pay more attention to prevent water entering and forming condensation water.

c. Vacuum dry for the second time for 1h pumping

If -755mmHg can't be achieved in 2h, repeat procedure "b" and "c".

d. Vacuum placing test …… 1h

e. Sketch map of special vacuum dry procedure



# 4.Additional Refrigerant Charge

Caution

● Refrigerant cannot be charged until field wiring has been completed.

● Refrigerant may only be charged after performing the leak test and the vacuum pumping.

● When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.

● Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant is charged.

● Refrigerant containers shall be opened slowly.

● Always use protective gloves and protect your eyes when charging refrigerant.

**Weigh-In Method**

The factory charge in the outdoor unit is sufficient for 15 feet of standard size interconnecting liquid line. Additional 0.47 oz/ft refrigerant is needed when length of pipe is more than 25 feet.

Additional Refrigerant Guidelines

| Piping length (ft)/(m) | Additional charge (oz)/(kg) |
|---|---|
| 15/4.57 | 0 |
| 25/7.62 | 4.73/0.13 |
| 75/22.86 | 28.39/0.80 |
| 100/30.48 | 40.21/1.14 |
| 131/39.93 | 54.88/1.56 |

**Charging and Refrigerant Adjustment in Cooling Mode**

**Check the outdoor ambient temperature**

Check the ambient temperature. Subcooling method (cooling mode) is only for outdoor temperature between 57°F and 118°F, and indoor temperature between 68°F and 89°F. For temperature out of the range, use the weight-in method mentioned above.

**Superheat Method in Cooling for Piston Matchups**

Calculate super heat value in Cooling for Piston Matchups. Calculate super heat value with measured vapor line temperature and pressure according to Table 4.1. If calculated super heat value is lower than the design super heat value of Table 4.2, refrigerant should be recovered. If calculated super heat value is higher than the value of Table 4.2, refrigerant should be added.

| Suction Temp (°F) | Superheat Value (°F) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
| | Suction Gauge Pressure (PSI) | | | | | | | | |
| 40 | 107 | 103 | 99 | 95 | 91 | 87 | 84 | 80 | 77 |
| 42 | 112 | 107 | 103 | 99 | 95 | 91 | 87 | 84 | 80 |
| 44 | 116 | 112 | 107 | 103 | 99 | 95 | 91 | 87 | 84 |
| 46 | 121 | 116 | 112 | 107 | 103 | 99 | 95 | 91 | 87 |
| 48 | 126 | 121 | 116 | 112 | 107 | 103 | 99 | 95 | 91 |
| 50 | 131 | 126 | 121 | 116 | 112 | 107 | 103 | 99 | 95 |
| 52 | 136 | 131 | 126 | 121 | 116 | 112 | 107 | 103 | 99 |
| 54 | 141 | 136 | 131 | 126 | 121 | 116 | 112 | 107 | 103 |
| 56 | 146 | 141 | 136 | 131 | 126 | 121 | 116 | 112 | 107 |
| 58 | 151 | 146 | 141 | 136 | 131 | 126 | 121 | 116 | 112 |
| 60 | 157 | 151 | 146 | 141 | 136 | 131 | 126 | 121 | 116 |
| 62 | 162 | 157 | 151 | 146 | 141 | 136 | 131 | 126 | 121 |
| 64 | 168 | 162 | 157 | 151 | 146 | 141 | 136 | 131 | 126 |
| 66 | 174 | 168 | 162 | 157 | 151 | 146 | 141 | 136 | 131 |
| 68 | 180 | 174 | 168 | 162 | 157 | 151 | 146 | 141 | 136 |
| 70 | 186 | 180 | 174 | 168 | 162 | 157 | 151 | 146 | 141 |
| 72 | 193 | 186 | 180 | 174 | 168 | 162 | 157 | 151 | 146 |

**Table 4.1**

| Outdoor DB (°F) | Indoor DB/WB (°F) | | | | |
|---|---|---|---|---|---|
| | 90/75 | 85/71 | 80/67 | 75/63 | 70/58 |
| 110 | 8±2 | 8±2 | 5±2 | 5±2 | 5±2 |
| 100 | 10±2 | 9±2 | 7±2 | 5±2 | 5±2 |
| 90 | 10±2 | 9±2 | 8±2 | 5±2 | 5±2 |
| 80 | 12±2 | 10±2 | 7±2 | 7±2 | 5±2 |
| 70 | 10±2 | 8±2 | 8±2 | 5±2 | 5±2 |
| 60 | 9±2 | 7±2 | 5±2 | 5±2 | 5±2 |

* For 30K/36K, add 6℉ of super heat.

**Table 4.2**

# 5.Insulation Work

## 5.1 Insulation material and thickness

5.1.1. Insulation material

Insulation material should adopt the material which is able to endure the pipe's temperature: no less than 70℃ in the high-pressure side, no less than 120℃ in the low-pressure side(For the cooling type machine, no requirements at the low-pressure side.)

Example: Heat pump type----Heat-resistant Polyethylene foam (withstand above 120℃)

Cooling only type----Polyethylene foam (withstand above 100℃)

5.1.2. Thickness choice for insulation material

Insulation material thickness is as follows:

| | Pipe diameter (mm) | Adiabatic material thickness |
|---|---|---|
| Refrigerant pipe | Φ6.4—Φ25.4 | 10mm |
| | Φ28.6—Φ38.1 | 15mm |
| Drainage pipe | Inner diameterΦ20—Φ32 | 6mm |

5.2 Refrigerant pipe insulation

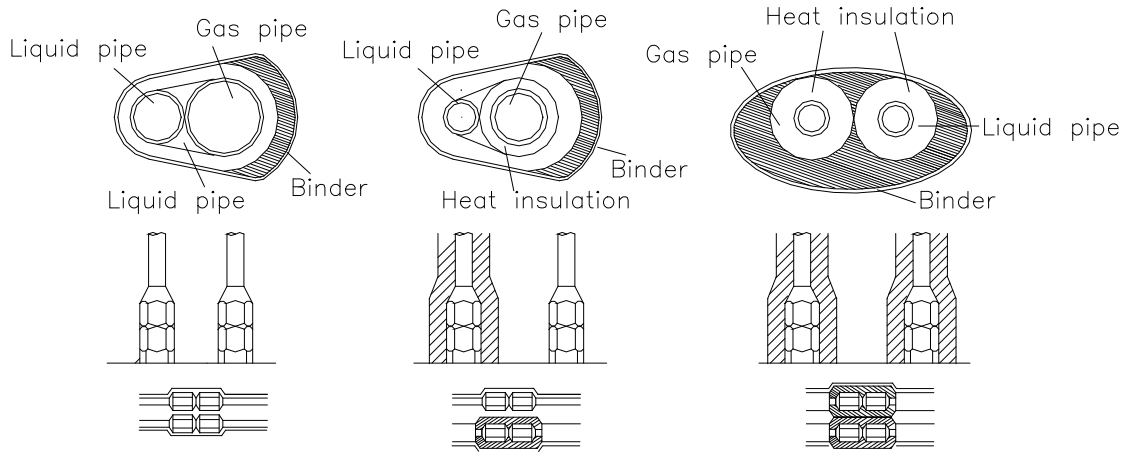
5.2.1. Work Procedure

① Before laying the pipes, the non-jointing parts and non-connection parts should be heat insulated.

② When the gas proof test is eligible, the jointing area, expanding area and the flange area should be heat insulated.

5.2.2. Insulation for non-jointing parts and non-connection parts

| wrong | right | |
|---|---|---|
| Gas pipe and liquid pipe should not be put together to insulate | Insulate the gas pipe (cooling only) | Insulate the gas pipe and liquid pipe |

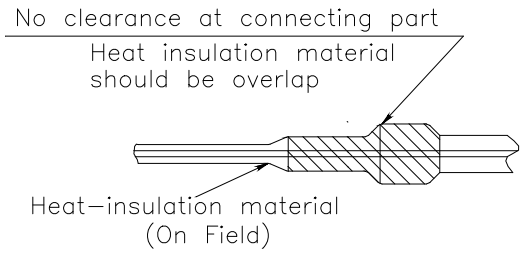


For construction convenience, before laying pipes, use insulation material to insulate the pipes to be deal with, at the same time, at two ends of the pipe, remain some length not to be insulated, in order to be welded and check the leakage after laying the pipes.

5.2.3. Insulate for the jointing area, expanding area and the flange area

① Insulate for the jointing area, expanding area and the flange area should be done after checking leakage of the pipes

② Make sure there's no clearance in the joining part of the accessorial insulation material and local preparative insulation material.




5.3 Drainage pipe insulation

The connection part should be insulated, or else water will be condensing at the non-insulation part.

5.4 Note

5.4.1 The jointing area, expanding area and the flange area should be heat insulated after passing the pressure test.

5.4.2 The gas and liquid pipe should be heat insulated individually, the connecting part should be heat insulated individually.

5.4.3 Use the attached heat-insulation material to insulate the pipe connections (pipes' tie-in, expand nut) of the indoor unit.

# 6.Test Operation

(1) The test operation must be carried out after the entire installation has been completed.
(2) Please confirm the following points before the test operation.
The indoor unit and outdoor unit are installed properly.
Tubing and wiring are correctly completed.
The refrigerant pipe system is leakage-checked.
The drainage is unimpeded.
The ground wiring is connected correctly.
The length of the tubing and the added stow capacity of the refrigerant have been recorded.
The power voltage fits the rated voltage of the air conditioner.
There is no obstacle at the outlet and inlet of the outdoor and indoor units.
The gas-side and liquid-side stop values are both opened.
The air conditioner is pre-heated by turning on the power.
(3) According to the user's requirement, install the 24v thermostat
(4) Test operation
Set the air conditioner under the mode of "COOLING" with the thermostat.
, and check the following points.
Indoor unit
Whether the fan motor operate normally.
Whether the room temperature is adjusted well.
Whether the indicator lights of indoor board normally.
Whether the drainage is normal.
Whether there is vibration or abnormal noise during operation.
Outdoor unit
Whether there is vibration or abnormal noise during operation.
Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
Whether any of the refrigerant is leaked.

## Appendix：R-T table

### 5K: Applicable T1/T2/T3/T4 temperature sensor

| T (ºC) | Rmin (KΩ) | Rnom (KΩ) | Rmax (KΩ) | T (ºC) | Rmin (KΩ) | Rnom (KΩ) | Rmax (KΩ) |
|---|---|---|---|---|---|---|---|
| -30 | 51.159 | 52.84 | 54.521 | 26 | 4.771 | 4.821 | 4.871 |
| -29 | 48.659 | 50.232 | 51.805 | 27 | 4.599 | 4.649 | 4.699 |
| -28 | 46.299 | 47.772 | 49.248 | 28 | 4.434 | 4.485 | 4.535 |
| -27 | 44.071 | 45.452 | 46.832 | 29 | 4.277 | 4.327 | 4.377 |
| -26 | 41.968 | 43.261 | 44.554 | 30 | 4.126 | 4.176 | 4.226 |
| -25 | 39.981 | 41.193 | 42.405 | 31 | 3.981 | 4.031 | 4.081 |
| -24 | 38.102 | 39.238 | 40.375 | 32 | 3.842 | 3.892 | 3.942 |
| -23 | 36.326 | 37.391 | 38.457 | 33 | 3.709 | 3.759 | 3.808 |
| -22 | 34.646 | 35.645 | 36.645 | 34 | 3.581 | 3.631 | 3.68 |
| -21 | 33.055 | 33.993 | 34.931 | 35 | 3.495 | 3.508 | 3.557 |
| -20 | 31.55 | 32.43 | 33.31 | 36 | 3.34 | 3.389 | 3.438 |
| -19 | 30.097 | 30.923 | 31.748 | 37 | 3.226 | 3.275 | 3.323 |
| -18 | 28.722 | 29.497 | 30.271 | 38 | 3.117 | 3.165 | 3.213 |
| -17 | 27.42 | 28.147 | 28.873 | 39 | 3.012 | 3.06 | 3.107 |
| -16 | 26.186 | 26.868 | 27.55 | 40 | 2.912 | 2.959 | 3.006 |
| -15 | 25.017 | 25.657 | 26.297 | 41 | 2.815 | 2.861 | 2.908 |
| -14 | 23.908 | 24.509 | 25.11 | 42 | 2.722 | 2.768 | 2.814 |
| -13 | 22.857 | 23.421 | 23.985 | 43 | 2.633 | 2.678 | 2.724 |
| -12 | 21.859 | 22.389 | 22.918 | 44 | 2.547 | 2.592 | 2.637 |
| -11 | 20.912 | 21.409 | 21.907 | 45 | 2.464 | 2.509 | 2.553 |
| -10 | 20.013 | 20.48 | 20.917 | 46 | 2.385 | 2.429 | 2.473 |
| -9 | 19.116 | 19.584 | 20.023 | 47 | 2.308 | 2.352 | 2.395 |
| -8 | 18.322 | 18.734 | 19.146 | 48 | 2.235 | 2.278 | 2.231 |
| -7 | 17.54 | 17.927 | 18.314 | 49 | 2.164 | 2.207 | 2.249 |
| -6 | 16.797 | 17.16 | 17.524 | 50 | 2.096 | 2.138 | 2.18 |
| -5 | 16.09 | 16.431 | 16.733 | 51 | 2.03 | 2.071 | 2.112 |
| -4 | 15.418 | 15.739 | 16.06 | 52 | 1.966 | 2.006 | 2.047 |
| -3 | 14.779 | 15.08 | 15.382 | 53 | 1.904 | 1.944 | 1.984 |
| -2 | 14.17 | 14.454 | 14.737 | 54 | 1.844 | 1.884 | 1.923 |
| -1 | 13.591 | 13.857 | 14.124 | 55 | 1.787 | 1.826 | 1.865 |
| 0 | 13.04 | 13.29 | 13.54 | 56 | 1.732 | 1.77 | 1.809 |
| 1 | 12.505 | 12.739 | 12.974 | 57 | 1.679 | 1.717 | 1.754 |
| 2 | 11.995 | 12.215 | 12.436 | 58 | 1.628 | 1.665 | 1.702 |
| 3 | 11.509 | 11.717 | 11.924 | 59 | 1.579 | 1.615 | 1.652 |
| 4 | 11.047 | 11.241 | 11.436 | 60 | 1.531 | 1.567 | 1.603 |
| 5 | 10.606 | 10.789 | 10.971 | 61 | 1.485 | 1.521 | 1.556 |
| 6 | 10.186 | 10.357 | 10.529 | 62 | 1.441 | 1.476 | 1.511 |
| 7 | 9.785 | 9.945 | 10.107 | 63 | 1.399 | 1.433 | 1.467 |
| 8 | 9.403 | 9.554 | 9.705 | 64 | 1.357 | 1.391 | 1.425 |
| 9 | 9.038 | 9.18 | 9.322 | 65 | 1.318 | 1.351 | 1.384 |
| 10 | 8.69 | 8.823 | 8.956 | 66 | 1.279 | 1.312 | 1.344 |
| 11 | 8.357 | 8.482 | 8.607 | 67 | 1.242 | 1.274 | 1.306 |
| 12 | 8.04 | 8.157 | 8.274 | 68 | 1.206 | 1.237 | 1.269 |
| 13 | 7.736 | 7.816 | 7.957 | 69 | 1.171 | 1.202 | 1.233 |
| 14 | 7.446 | 7.55 | 7.653 | 70 | 1.137 | 1.168 | 1.199 |
| 15 | 7.169 | 7.266 | 7.363 | 71 | 1.105 | 1.135 | 1.165 |
| 16 | 6.9 | 6.991 | 7.082 | 72 | 1.074 | 1.103 | 1.133 |
| 17 | 6.644 | 6.729 | 6.814 | 73 | 1.043 | 1.072 | 1.101 |
| 18 | 6.398 | 6.478 | 6.558 | 74 | 1.014 | 1.043 | 1.071 |
| 19 | 6.163 | 6.238 | 6.313 | 75 | 0.986 | 1.014 | 1.042 |
| 20 | 5.938 | 6.008 | 6.078 | 76 | 0.959 | 0.986 | 1.014 |
| 21 | 5.723 | 5.789 | 5.854 | 77 | 0.932 | 0.959 | 0.986 |
| 22 | 5.517 | 5.578 | 5.64 | 78 | 0.907 | 0.933 | 0.96 |
| 23 | 5.32 | 5.377 | 5.484 | 79 | 0.882 | 0.908 | 0.934 |
| 24 | 5.131 | 5.185 | 5.238 | 80 | 0.858 | 0.884 | 0.91 |
| 25 | 4.95 | 5 | 5.05 | | | | |

## 50K：Applicable exhaust temperature sensor（T5/TP）

| T (ºC) | Rmin (KΩ) | Rnom (KΩ) | Rmax (KΩ) | T (ºC) | Rmin (KΩ) | Rnom (KΩ) | Rmax (KΩ) |
|---|---|---|---|---|---|---|---|
| 0 | 157.7 | 161.2 | 164.7 | 56 | 14.16 | 14.48 | 14.81 |
| 1 | 150.2 | 153.4 | 156.7 | 57 | 13.65 | 13.96 | 14.28 |
| 2 | 142.9 | 145.9 | 148.9 | 58 | 13.15 | 13.46 | 13.77 |
| 3 | 136.1 | 138.9 | 141.7 | 59 | 12.69 | 12.99 | 13.30 |
| 4 | 129.7 | 132.3 | 134.9 | 60 | 12.23 | 12.53 | 12.83 |
| 5 | 123.6 | 126.0 | 128.4 | 61 | 11.80 | 12.09 | 12.39 |
| 6 | 117.8 | 120.0 | 122.3 | 62 | 11.39 | 11.67 | 11.96 |
| 7 | 112.2 | 114.3 | 116.4 | 63 | 10.98 | 11.26 | 11.54 |
| 8 | 107.1 | 109.0 | 111.0 | 64 | 10.60 | 10.87 | 11.15 |
| 9 | 102.1 | 103.9 | 105.7 | 65 | 10.23 | 10.50 | 10.77 |
| 10 | 97.42 | 99.08 | 100.8 | 66 | 9.880 | 10.14 | 10.41 |
| 11 | 92.97 | 94.51 | 96.06 | 67 | 9.537 | 9.792 | 10.05 |
| 12 | 88.74 | 90.17 | 91.61 | 68 | 9.211 | 9.460 | 9.715 |
| 13 | 84.73 | 86.05 | 87.38 | 69 | 8.897 | 9.141 | 9.391 |
| 14 | 80.92 | 82.14 | 83.37 | 70 | 8.595 | 8.834 | 9.078 |
| 15 | 77.29 | 78.42 | 79.56 | 71 | 8.306 | 8.539 | 8.778 |
| 16 | 73.84 | 74.89 | 75.95 | 72 | 8.028 | 8.256 | 8.490 |
| 17 | 70.57 | 71.54 | 72.51 | 73 | 7.759 | 7.983 | 8.212 |
| 18 | 67.46 | 68.35 | 69.25 | 74 | 7.501 | 7.720 | 7.944 |
| 19 | 64.49 | 65.32 | 66.15 | 75 | 7.254 | 7.468 | 7.687 |
| 20 | 61.68 | 62.44 | 63.20 | 76 | 7.016 | 7.225 | 7.440 |
| 21 | 59.00 | 59.70 | 60.40 | 77 | 6.786 | 6.991 | 7.201 |
| 22 | 56.44 | 57.09 | 57.74 | 78 | 6.565 | 6.765 | 6.971 |
| 23 | 54.02 | 54.61 | 55.20 | 79 | 6.352 | 6.548 | 6.749 |
| 24 | 51.70 | 52.25 | 52.80 | 80 | 6.147 | 6.339 | 6.536 |
| 25 | 49.50 | 50.00 | 50.50 | 81 | 5.950 | 6.138 | 6.331 |
| 26 | 47.37 | 47.87 | 48.37 | 82 | 5.761 | 5.944 | 6.133 |
| 27 | 45.34 | 45.84 | 46.34 | 83 | 5.578 | 5.757 | 5.942 |
| 28 | 43.41 | 43.91 | 44.41 | 84 | 5.401 | 5.577 | 5.758 |
| 29 | 41.59 | 42.08 | 42.57 | 85 | 5.231 | 5.403 | 5.580 |
| 30 | 39.84 | 40.33 | 40.82 | 86 | 5.069 | 5.237 | 5.410 |
| 31 | 38.18 | 38.66 | 39.15 | 87 | 4.912 | 5.076 | 5.245 |
| 32 | 36.59 | 37.07 | 37.55 | 88 | 4.760 | 4.921 | 5.087 |
| 33 | 35.07 | 35.55 | 36.03 | 89 | 4.615 | 4.772 | 4.934 |
| 34 | 33.64 | 34.11 | 34.58 | 90 | 4.474 | 4.628 | 4.787 |
| 35 | 32.27 | 32.73 | 33.20 | 91 | 4.338 | 4.489 | 4.645 |
| 36 | 30.95 | 31.41 | 31.87 | 92 | 4.207 | 4.354 | 4.506 |
| 37 | 29.70 | 30.15 | 30.61 | 93 | 4.081 | 4.225 | 4.374 |
| 38 | 28.50 | 28.95 | 29.40 | 94 | 3.958 | 4.099 | 4.245 |
| 39 | 27.37 | 27.81 | 28.25 | 95 | 3.840 | 3.978 | 4.121 |
| 40 | 26.29 | 26.72 | 27.16 | 96 | 3.726 | 3.861 | 4.001 |
| 41 | 25.24 | 25.67 | 26.10 | 97 | 3.616 | 3.748 | 3.885 |
| 42 | 24.25 | 24.67 | 25.09 | 98 | 3.509 | 3.639 | 3.773 |
| 43 | 23.31 | 23.72 | 24.14 | 99 | 3.407 | 3.534 | 3.665 |
| 44 | 22.41 | 22.81 | 23.22 | 100 | 3.308 | 3.432 | 3.560 |
| 45 | 21.53 | 21.93 | 22.33 | 101 | 3.212 | 3.333 | 3.459 |
| 46 | 20.71 | 21.10 | 21.50 | 102 | 3.119 | 3.238 | 3.361 |
| 47 | 19.92 | 20.30 | 20.69 | 103 | 3.030 | 3.146 | 3.267 |
| 48 | 19.16 | 19.54 | 19.92 | 104 | 2.942 | 3.056 | 3.174 |
| 49 | 18.44 | 18.81 | 19.18 | 105 | 2.858 | 2.970 | 3.086 |
| 50 | 17.75 | 18.11 | 18.48 | 106 | 2.778 | 2.887 | 3.000 |
| 51 | 17.08 | 17.44 | 17.80 | 107 | 2.699 | 2.806 | 2.917 |
| 52 | 16.44 | 16.79 | 17.14 | 108 | 2.623 | 2.728 | 2.837 |
| 53 | 15.84 | 16.18 | 16.53 | 109 | 2.549 | 2.652 | 2.758 |
| 54 | 15.26 | 15.59 | 15.93 | 110 | 2.479 | 2.579 | 2.683 |
| 55 | 14.69 | 15.02 | 15.35 | | | | |