

Classic ❄️
AIR CONDITIONERS



Service Manual



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2. Specifications

2.1 Specification Sheet

| | | | |
|-----------------------|---------------------------------|-----------------|--|
| Model | | | GWFR09S,GRFR09AS |
| Product Code | | | CB464009000_X29326 |
| Power Supply | Rated Voltage | V~ | 208/230 |
| | Rated Frequency | Hz | 60 |
| | Phases | | 1 |
| Power Supply Mode | | | Outdoor |
| Cooling Capacity | | Btu/h | 9000 |
| Heating Capacity | | Btu/h | / |
| Cooling Power Input | | W | 841 |
| Heating Power Input | | W | / |
| Cooling Power Current | | A | 3.73 |
| Heating Power Current | | A | / |
| Rated Input | | W | 1080 |
| Rated Cooling Current | | A | 5.9 |
| Rated Heating Current | | A | / |
| Air Flow Volume | | CFM | 330/294/277/253/224/194/177 |
| Dehumidifying Volume | | Pint/h | 1.69 |
| EER | | (Btu/h)/W | 10.70 |
| COP | | (Btu/h)/W | / |
| SEER | | | 17.2(SEER) 17.2(SEER2) |
| HSPF | | | / |
| Application Area | | yd ² | 14-22 |
| Indoor Unit | Model of indoor unit | | GWFR09S |
| | Indoor Unit Product Code | | CB464N09000_X29326 |
| | Fan Type | | Cross-flow |
| | Fan Diameter Length(D×L) | | mm Φ98×580 |
| | Cooling Speed | | r/min 1300/1200/1120/1050/920/860/800 |
| | Heating Speed | | r/min / |
| | Fan Motor Power Output | | W 20 |
| | Fan Motor RLA | | A 0.28 |
| | Fan Motor Capacitor | | μF 1 |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | | mm Φ5 |
| | Evaporator Row-fin Gap | | mm 2-1.4 |
| | Evaporator Coil Length (L×D×W) | | mm 584×22.8×266.7 |
| | Swing Motor Model | | MP24AA |
| | Swing Motor Power Output | | W 1.5 |
| | Fuse Current | | A 3.15 |
| | Sound Pressure Level | | dB (A) Cooling: 40/37/35/33/29/27/26 |
| | Sound Power Level | | dB (A) Cooling: 50/47/45/43/39/37/36 |
| | Dimension (W×H×D) | | inch 31 7/64×10 53/64×7 7/8 |
| | Dimension of Carton Box (L×W×H) | | inch 33 15/32×13 11/32×10 5/16 |
| | Dimension of Package (L×W×H) | | inch 33 35/64×13 31/32×10 3/4 |
| Net Weight | | lb 19.8 | |
| Gross Weight | | lb 24.3 | |

| | | | |
|---------------------------------|---|----------------------------|----------------------------------|
| Outdoor Unit | Outdoor Unit Model | | GRFRC09AS |
| | Outdoor Unit Product Code | | CB444W15500_X29326 |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO.,LTD. |
| | Compressor Model | | QXF-A082zC170 |
| | Compressor Oil | | ZE-GLES RB68GX or equivalent |
| | Compressor Type | | Rotary |
| | Compressor LRA | A | / |
| | Compressor RLA | A | 4.7 |
| | Compressor Power Input | W | 756.6 |
| | Compressor Overload Protector | | / |
| | Throttling Method | | Capillary |
| | Set Temperature Range | °F | 61~86 |
| | Cooling Operation Ambient Temperature Range | °F | 0~118 |
| | Heating Operation Ambient Temperature Range | °F | / |
| | Condenser Form | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | Φ5 |
| | Condenser Rows-fin Gap | mm | 1-1.3 |
| | Condenser Coil Length (L×D×W) | mm | 675×11.4×514.4 |
| | Fan Motor Speed | rpm | 850 |
| | Fan Motor Power Output | W | 30 |
| | Fan Motor RLA | A | 0.40 |
| | Fan Motor Capacitor | μF | / |
| | Outdoor Unit Air Flow Volume | CFM | 1070 |
| | Fan Type | | Axial-flow |
| | Fan Diameter | mm | Φ400 |
| | Defrosting Method | | / |
| | Climate Type | | T1 |
| | Isolation | | I |
| | Moisture Protection | | IPX4 |
| | Permissible Excessive Operating Pressure for the Discharge Side | MPa | 4.3 |
| | Permissible Excessive Operating Pressure for the Suction Side | MPa | 2.5 |
| | Sound Pressure Level | dB (A) | 50 |
| | Sound Power Level | dB (A) | 60 |
| Dimension (W×H×D) | inch | 28 13/16×21 27/32×12 63/64 | |
| Dimension of Carton Box (L×W×H) | inch | 31 9/64×14 11/16×23 15/64 | |
| Dimension of Package (L×W×H) | inch | 31 17/64×14 51/64×24 7/32 | |
| Net Weight | lb | 50.7 | |
| Gross Weight | lb | 56.2 | |
| Refrigerant | | R410A | |
| Refrigerant Charge | oz | 18.0 | |
| Connection Pipe | Connection Pipe Length | ft | 24.6 |
| | Connection Pipe Gas Additional Charge | oz/ft | 0.2 |
| | Outer Diameter Liquid Pipe | inch | 1/4 |
| | Outer Diameter Gas Pipe | inch | 3/8 |
| | Max Distance Height | ft | 32.8 |
| | Max Distance Length | ft | 49.2 |
| | Note: The connection pipe applies metric diameter. | | |

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

| | | | |
|-----------------------|---------------------------------|-----------------|--|
| Model | | | GWFR12SA,GRFR12ASA |
| Product Code | | | CB464008900_X29326 |
| Power Supply | Rated Voltage | V~ | 115 |
| | Rated Frequency | Hz | 60 |
| | Phases | | 1 |
| Power Supply Mode | | | Outdoor |
| Cooling Capacity | | Btu/h | 11700 |
| Heating Capacity | | Btu/h | / |
| Cooling Power Input | | W | 1345 |
| Heating Power Input | | W | / |
| Cooling Power Current | | A | 14.6 |
| Heating Power Current | | A | / |
| Rated Input | | W | 1500 |
| Rated Cooling Current | | A | 16.3 |
| Rated Heating Current | | A | / |
| Air Flow Volume | | CFM | 371/294/262/235/218/201/182 |
| Dehumidifying Volume | | Pint/h | 2.96 |
| EER | | (Btu/h)/W | 8.70 |
| COP | | (Btu/h)/W | / |
| SEER | | | 16.5(SEER) 16.5(SEER2) |
| HSPF | | | / |
| Application Area | | yd ² | 19-29 |
| Indoor Unit | Model of indoor unit | | GWFR12SA |
| | Indoor Unit Product Code | | CB464N08900_X29326 |
| | Fan Type | | Cross-flow |
| | Fan Diameter Length(D×L) | | mm Φ98×633.5 |
| | Cooling Speed | | r/min 1350/1200/1100/1000/920/850/800 |
| | Heating Speed | | r/min / |
| | Fan Motor Power Output | | W 20 |
| | Fan Motor RLA | | A 0.31 |
| | Fan Motor Capacitor | | μF 4 |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | | mm Φ5 |
| | Evaporator Row-fin Gap | | mm 2-1.4 |
| | Evaporator Coil Length (L×D×W) | | mm 635×22.8×304.8 |
| | Swing Motor Model | | MP24BA |
| | Swing Motor Power Output | | W 1.5 |
| | Fuse Current | | A 3.15 |
| | Sound Pressure Level | | dB (A) Cooling: 45/42/39/35/32/29/28 |
| | Sound Power Level | | dB (A) Cooling: 55/52/49/45/42/39/38 |
| | Dimension (W×H×D) | | inch 33 17/64×11 3/8×8 15/64 |
| | Dimension of Carton Box (L×W×H) | | inch 35 7/16×13 13/16×10 45/64 |
| | Dimension of Package (L×W×H) | | inch 35 5/8×14 29/64×11 9/64 |
| Net Weight | | lb 22 | |
| Gross Weight | | lb 26.5 | |

| | | | |
|---------------------------------|---|----------------------------|---------------------------------|
| Outdoor Unit | Outdoor Unit Model | | GRFRC12ASA |
| | Outdoor Unit Product Code | | CB444W15100_X29326 |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO.,LTD |
| | Compressor Model | | FTz-AN108ACBD |
| | Compressor Oil | | FW68DA or equivalent |
| | Compressor Type | | Rotary |
| | Compressor LRA. | A | / |
| | Compressor RLA | A | 15 |
| | Compressor Power Input | W | 857 |
| | Compressor Overload Protector | | / |
| | Throttling Method | | Capillary |
| | Set Temperature Range | °F | 61~86 |
| | Cooling Operation Ambient Temperature Range | °F | 0~118 |
| | Heating Operation Ambient Temperature Range | °F | / |
| | Condenser Form | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | Φ5 |
| | Condenser Rows-fin Gap | mm | 1-1.3 |
| | Condenser Coil Length (L×D×W) | mm | 675×11.4×514.4 |
| | Fan Motor Speed | rpm | 900 |
| | Fan Motor Power Output | W | 30 |
| | Fan Motor RLA | A | 0.40 |
| | Fan Motor Capacitor | μF | / |
| | Outdoor Unit Air Flow Volume | CFM | 1148 |
| | Fan Type | | Axial-flow |
| | Fan Diameter | mm | Φ400 |
| | Defrosting Method | | / |
| | Climate Type | | T1 |
| | Isolation | | I |
| | Moisture Protection | | IPX4 |
| | Permissible Excessive Operating Pressure for the Discharge Side | MPa | 4.3 |
| | Permissible Excessive Operating Pressure for the Suction Side | MPa | 2.5 |
| | Sound Pressure Level | dB (A) | 51 |
| | Sound Power Level | dB (A) | 61 |
| Dimension (W×H×D) | inch | 28 13/16×21 27/32×12 63/64 | |
| Dimension of Carton Box (L×W×H) | inch | 31 9/64×14 11/16×23 15/64 | |
| Dimension of Package (L×W×H) | inch | 31 17/64×14 51/64×24 7/32 | |
| Net Weight | lb | 55.1 | |
| Gross Weight | lb | 60.6 | |
| Refrigerant | | R410A | |
| Refrigerant Charge | oz | 19.4 | |
| Connection Pipe | Connection Pipe Length | ft | 24.6 |
| | Connection Pipe Gas Additional Charge | oz/ft | 0.16 |
| | Outer Diameter Liquid Pipe | inch | 1/4 |
| | Outer Diameter Gas Pipe | inch | 3/8 |
| | Max Distance Height | ft | 40 |
| | Max Distance Length | ft | 65.6 |
| | Note: The connection pipe applies metric diameter. | | |

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

| | | | |
|-----------------------|---------------------------------|-----------------|--|
| Model | | | GWFC12S,GRFC12AS |
| Product Code | | | CB464008401_X29326 |
| Power Supply | Rated Voltage | V~ | 208/230 |
| | Rated Frequency | Hz | 60 |
| | Phases | | 1 |
| Power Supply Mode | | | Outdoor |
| Cooling Capacity | | Btu/h | 11700 |
| Heating Capacity | | Btu/h | / |
| Cooling Power Input | | W | 1345 |
| Heating Power Input | | W | / |
| Cooling Power Current | | A | 6 |
| Heating Power Current | | A | / |
| Rated Input | | W | 1500 |
| Rated Cooling Current | | A | 6.6 |
| Rated Heating Current | | A | / |
| Air Flow Volume | | CFM | 371/294/262/235/218/201/182 |
| Dehumidifying Volume | | Pint/h | 2.96 |
| EER | | (Btu/h)/W | 8.70 |
| COP | | (Btu/h)/W | / |
| SEER | | | 17(SEER) 17(SEER2) |
| HSPF | | | / |
| Application Area | | yd ² | 19-29 |
| Indoor Unit | Model of indoor unit | | GWFC12S |
| | Indoor Unit Product Code | | CB464N08401_X29326 |
| | Fan Type | | Cross-flow |
| | Fan Diameter Length(D×L) | | mm Φ98×633.5 |
| | Cooling Speed | | r/min 1350/1200/1120/1050/980/920/850 |
| | Heating Speed | | r/min / |
| | Fan Motor Power Output | | W 20 |
| | Fan Motor RLA | | A 0.31 |
| | Fan Motor Capacitor | | μF 1.5 |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | | mm Φ5 |
| | Evaporator Row-fin Gap | | mm 2-1.4 |
| | Evaporator Coil Length (L×D×W) | | mm 635×22.8×304.8 |
| | Swing Motor Model | | MP24BA |
| | Swing Motor Power Output | | W 1.5 |
| | Fuse Current | | A 3.15 |
| | Sound Pressure Level | | dB (A) Cooling: 45/42/39/37/35/31/30 |
| | Sound Power Level | | dB (A) Cooling: 55/52/49/47/45/41/40 |
| | Dimension (W×H×D) | | inch 33 17/64×11 3/8×8 15/64 |
| | Dimension of Carton Box (L×W×H) | | inch 35 7/16×13 13/16×10 45/64 |
| | Dimension of Package (L×W×H) | | inch 35 5/8×14 29/64×11 9/64 |
| Net Weight | | lb 22.1 | |
| Gross Weight | | lb 26.5 | |

| | | | |
|---------------------------------|---|----------------------------|---------------------------------|
| Outdoor Unit | Outdoor Unit Model | | GRFRC12AS |
| | Outdoor Unit Product Code | | CB444W15000_X29326 |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO.,LTD |
| | Compressor Model | | FTz-AN108ACBD |
| | Compressor Oil | | FW68DA or equivalent |
| | Compressor Type | | Rotary |
| | Compressor LRA | A | / |
| | Compressor RLA | A | 6.80 |
| | Compressor Power Input | W | 857 |
| | Compressor Overload Protector | | / |
| | Throttling Method | | Capillary |
| | Set Temperature Range | °F | 61~86 |
| | Cooling Operation Ambient Temperature Range | °F | 0~118 |
| | Heating Operation Ambient Temperature Range | °F | / |
| | Condenser Form | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | Φ5 |
| | Condenser Rows-fin Gap | mm | 1-1.3 |
| | Condenser Coil Length (L×D×W) | mm | 675×11.4×514.4 |
| | Fan Motor Speed | rpm | 900 |
| | Fan Motor Power Output | W | 30 |
| | Fan Motor RLA | A | 0.40 |
| | Fan Motor Capacitor | μF | / |
| | Outdoor Unit Air Flow Volume | CFM | 1148 |
| | Fan Type | | Axial-flow |
| | Fan Diameter | mm | Φ400 |
| | Defrosting Method | | / |
| | Climate Type | | T1 |
| | Isolation | | I |
| | Moisture Protection | | IPX4 |
| | Permissible Excessive Operating Pressure for the Discharge Side | MPa | 4.3 |
| | Permissible Excessive Operating Pressure for the Suction Side | MPa | 2.5 |
| | Sound Pressure Level | dB (A) | 51 |
| | Sound Power Level | dB (A) | 61 |
| Dimension (W×H×D) | inch | 28 13/16×21 27/32×12 63/64 | |
| Dimension of Carton Box (L×W×H) | inch | 31 9/64×14 11/16×23 15/64 | |
| Dimension of Package (L×W×H) | inch | 31 17/64×14 51/64×24 7/32 | |
| Net Weight | lb | 50.7 | |
| Gross Weight | lb | 56.2 | |
| Refrigerant | | R410A | |
| Refrigerant Charge | oz | 19.4 | |
| Connection Pipe | Connection Pipe Length | ft | 24.6 |
| | Connection Pipe Gas Additional Charge | oz/ft | 0.2 |
| | Outer Diameter Liquid Pipe | inch | 1/4 |
| | Outer Diameter Gas Pipe | inch | 3/8 |
| | Max Distance Height | ft | 32.8 |
| | Max Distance Length | ft | 65.6 |
| | Note: The connection pipe applies metric diameter. | | |

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

| | | | |
|-----------------------|---------------------------------|-----------------|---|
| Model | | | GWFC18S,GRFC18AS |
| Product Code | | | CB464008301_X29326 |
| Power Supply | Rated Voltage | V~ | 208/230 |
| | Rated Frequency | Hz | 60 |
| | Phases | | 1 |
| Power Supply Mode | | | Outdoor |
| Cooling Capacity | | Btu/h | 17100 |
| Heating Capacity | | Btu/h | / |
| Cooling Power Input | | W | 1829 |
| Heating Power Input | | W | / |
| Cooling Power Current | | A | 7.85 |
| Heating Power Current | | A | / |
| Rated Input | | W | 2300 |
| Rated Cooling Current | | A | 9.5 |
| Rated Heating Current | | A | / |
| Air Flow Volume | | CFM | 471//436/406/374/335/312/277 |
| Dehumidifying Volume | | Pint/h | 3.8 |
| EER | | (Btu/h)/W | 9.35 |
| COP | | (Btu/h)/W | / |
| SEER | | | 17(SEER) 17.5(SEER2) |
| HSPF | | | / |
| Application Area | | yd ² | 28-41 |
| Indoor Unit | Model of indoor unit | | GWFC18S |
| | Indoor Unit Product Code | | CB464N08301_X29326 |
| | Fan Type | | Cross-flow |
| | Fan Diameter Length(D×L) | | mm Φ106×706 |
| | Cooling Speed | | r/min 1350/1280/1200/1130/1050/980/900 |
| | Heating Speed | | r/min / |
| | Fan Motor Power Output | | W 35 |
| | Fan Motor RLA | | A 0.3 |
| | Fan Motor Capacitor | | μF 2.5 |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | | mm Φ7 |
| | Evaporator Row-fin Gap | | mm 2-1.4 |
| | Evaporator Coil Length (L×D×W) | | mm 715×25.4×304.8 |
| | Swing Motor Model | | MP35CJ |
| | Swing Motor Power Output | | W 2.5 |
| | Fuse Current | | A 3.15 |
| | Sound Pressure Level | | dB (A) Cooling: 47/45/43/41/39/37/34 |
| | Sound Power Level | | dB (A) Cooling: 57/55/53/51/49/47/44 |
| | Dimension (W×H×D) | | inch 38 3/16×11 13/16×8 55/64 |
| | Dimension of Carton Box (L×W×H) | | inch 40 5/32×14 9/16×11 37/64 |
| | Dimension of Package (L×W×H) | | inch 40 23/64×14 7/8×11 31/32 |
| Net Weight | | lb 29.8 | |
| Gross Weight | | lb 35.3 | |

| | | | | |
|---------------------------------|---|--------|----------------------------------|--------------------------|
| Outdoor Unit | Outdoor Unit Model | | GRFRC18AS | |
| | Outdoor Unit Product Code | | CB444W15700_X29326 | |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO. LTD. | |
| | Compressor Model | | QXF-A108zH170C | |
| | Compressor Oil | | FW68DA or equivalent | |
| | Compressor Type | | Rotary | |
| | Compressor LRA | A | | 17.0 |
| | Compressor RLA | A | | 8.6 |
| | Compressor Power Input | W | | 1000 |
| | Compressor Overload Protector | | | / |
| | Throttling Method | | | Capillary |
| | Set Temperature Range | °F | | 61~86 |
| | Cooling Operation Ambient Temperature Range | °F | | 0~118 |
| | Heating Operation Ambient Temperature Range | °F | | / |
| | Condenser Form | | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | | Φ7 |
| | Condenser Rows-fin Gap | mm | | 2-1.4 |
| | Condenser Coil Length (L×D×W) | mm | | 780×23×514 |
| | Fan Motor Speed | rpm | | 900 |
| | Fan Motor Power Output | W | | 30 |
| | Fan Motor RLA | A | | 0.5 |
| | Fan Motor Capacitor | μF | | / |
| | Outdoor Unit Air Flow Volume | CFM | | 1177 |
| | Fan Type | | | Axial-flow |
| | Fan Diameter | mm | | Φ420 |
| | Defrosting Method | | | / |
| | Climate Type | | | T1 |
| | Isolation | | | I |
| | Moisture Protection | | | IPX4 |
| | Permissible Excessive Operating Pressure for the Discharge Side | MPa | | 4.3 |
| | Permissible Excessive Operating Pressure for the Suction Side | MPa | | 2.5 |
| | Sound Pressure Level | dB (A) | | 54 |
| | Sound Power Level | dB (A) | | 64 |
| Dimension (W×H×D) | inch | | 31 37/64×21 27/32×13 25/32 | |
| Dimension of Carton Box (L×W×H) | inch | | 34 7/32×15 35/64×23 25/64 | |
| Dimension of Package (L×W×H) | inch | | 34 21/64×15 43/64×24 13/32 | |
| Net Weight | lb | | 67.3 | |
| Gross Weight | lb | | 72.8 | |
| Refrigerant | | | R410A | |
| Refrigerant Charge | oz | | 35.3 | |
| Connection Pipe | Connection Pipe Length | ft | 24.6 | |
| | Connection Pipe Gas Additional Charge | oz/ft | 0.1 | |
| | Outer Diameter Liquid Pipe | inch | 1/4 | |
| | Outer Diameter Gas Pipe | inch | 1/2 | |
| | Max Distance Height | ft | 32.8 | |
| | Max Distance Length | ft | 82.0 | |
| | Note: The connection pipe applies metric diameter. | | | |

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

| | | | |
|-----------------------|---------------------------------|-----------------|--|
| Model | | | GWFC24S,GRFC24AS |
| Product Code | | | CB464008102_X29326 |
| Power Supply | Rated Voltage | V~ | 208/230 |
| | Rated Frequency | Hz | 60 |
| | Phases | | 1 |
| Power Supply Mode | | | Outdoor |
| Cooling Capacity | | Btu/h | 22000 |
| Heating Capacity | | Btu/h | / |
| Cooling Power Input | | W | 1896 |
| Heating Power Input | | W | / |
| Cooling Power Current | | A | 8.5 |
| Heating Power Current | | A | / |
| Rated Input | | W | 2500 |
| Rated Cooling Current | | A | 12 |
| Rated Heating Current | | A | / |
| Air Flow Volume | | CFM | 677/588/559/500/471/441/412 |
| Dehumidifying Volume | | Pint/h | 5.28 |
| EER | | (Btu/h)/W | 11.60 |
| COP | | (Btu/h)/W | / |
| SEER | | | 18(SEER) 18(SEER2) |
| HSPF | | | / |
| Application Area | | yd ² | 28-41 |
| Indoor Unit | Model of indoor unit | | GWFC24S |
| | Indoor Unit Product Code | | CB464N08102_X29326 |
| | Fan Type | | Cross-flow |
| | Fan Diameter Length(D×L) | | mm Φ108×830 |
| | Cooling Speed | | r/min 1300/1150/1100/1000/950/900/850 |
| | Heating Speed | | r/min / |
| | Fan Motor Power Output | | W 45 |
| | Fan Motor RLA | | A 0.3 |
| | Fan Motor Capacitor | | μF / |
| | Evaporator Form | | Aluminum Fin-copper Tube |
| | Evaporator Pipe Diameter | | mm Φ7 |
| | Evaporator Row-fin Gap | | mm 2-1.4 |
| | Evaporator Coil Length (L×D×W) | | mm 850×25.4×342.9 |
| | Swing Motor Model | | MP35CJ |
| | Swing Motor Power Output | | W 2.5 |
| | Fuse Current | | A 3.15 |
| | Sound Pressure Level | | dB (A) Cooling: 51/46/45/42/40/38/37 |
| | Sound Power Level | | dB (A) Cooling: 61/56/55/52/50/48/47 |
| | Dimension (W×H×D) | | inch 42 7/16×12 51/64×9 11/16 |
| | Dimension of Carton Box (L×W×H) | | inch 44 1/4×15 3/4×12 61/64 |
| | Dimension of Package (L×W×H) | | inch 44 29/64×16 1/16×13 11/32 |
| Net Weight | | lb 36.4 | |
| Gross Weight | | lb 43.0 | |

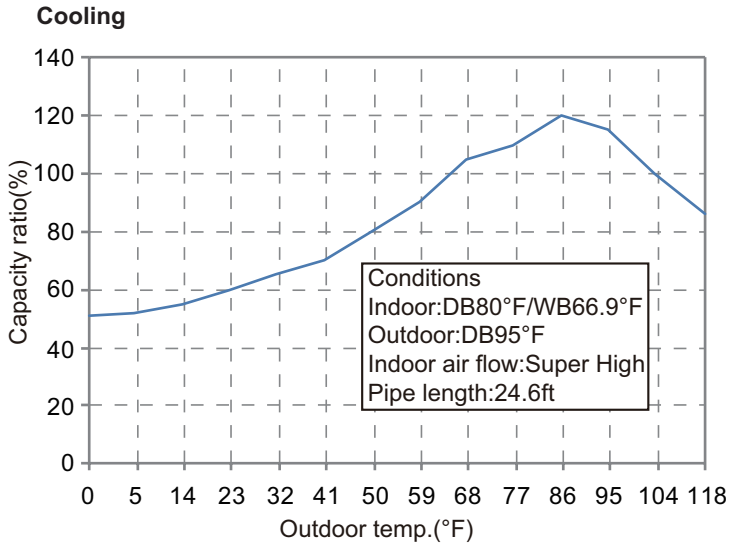
| | | | | |
|---------------------------------|---|--------|----------------------------------|--------------------------|
| Outdoor Unit | Outdoor Unit Model | | GRFRC24AS | |
| | Outdoor Unit Product Code | | CB444W15800_X29326 | |
| | Compressor Manufacturer | | ZHUHAI LANDA COMPRESSOR CO. LTD. | |
| | Compressor Model | | FTz-SM151AXB | |
| | Compressor Oil | | FW68DA or equivalent | |
| | Compressor Type | | Rotary | |
| | Compressor LRA | A | | 35.00 |
| | Compressor RLA | A | | 10.58 |
| | Compressor Power Input | W | | 1330 |
| | Compressor Overload Protector | | | HPC 115/95U1 KSD115°C |
| | Throttling Method | | | Capillary |
| | Set Temperature Range | °F | | 61~86 |
| | Cooling Operation Ambient Temperature Range | °F | | 0~118 |
| | Heating Operation Ambient Temperature Range | °F | | / |
| | Condenser Form | | | Aluminum Fin-copper Tube |
| | Condenser Pipe Diameter | mm | | Φ5 |
| | Condenser Rows-fin Gap | mm | | 2-1.4 |
| | Condenser Coil Length (L×D×W) | mm | | 855×22.8×609.6 |
| | Fan Motor Speed | rpm | | 880 |
| | Fan Motor Power Output | W | | 60 |
| | Fan Motor RLA | A | | 0.73 |
| | Fan Motor Capacitor | μF | | 3.5 |
| | Outdoor Unit Air Flow Volume | CFM | | 1883 |
| | Fan Type | | | Axial-flow |
| | Fan Diameter | mm | | Φ520 |
| | Defrosting Method | | | / |
| | Climate Type | | | T1 |
| | Isolation | | | I |
| | Moisture Protection | | | IPX4 |
| | Permissible Excessive Operating Pressure for the Discharge Side | MPa | | 4.3 |
| | Permissible Excessive Operating Pressure for the Suction Side | MPa | | 2.5 |
| | Sound Pressure Level | dB (A) | | 58 |
| | Sound Power Level | dB (A) | | 68 |
| Dimension (W×H×D) | inch | | 37 23/32×25 63/64×15 53/64 | |
| Dimension of Carton Box (L×W×H) | inch | | 40 33/64×17 53/64×28 5/32 | |
| Dimension of Package (L×W×H) | inch | | 40 5/8×17 61/64×29 1/64 | |
| Net Weight | lb | | 89.3 | |
| Gross Weight | lb | | 99.2 | |
| Refrigerant | | | R410A | |
| Refrigerant Charge | oz | | 42.3 | |
| Connection Pipe | Connection Pipe Length | ft | 24.6 | |
| | Connection Pipe Gas Additional Charge | oz/ft | 0.2 | |
| | Outer Diameter Liquid Pipe | inch | 1/4 | |
| | Outer Diameter Gas Pipe | inch | 5/8 | |
| | Max Distance Height | ft | 32.8 | |
| | Max Distance Length | ft | 82.0 | |
| | Note: The connection pipe applies metric diameter. | | | |

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

2.2 Capacity Variation Ratio According to Temperature

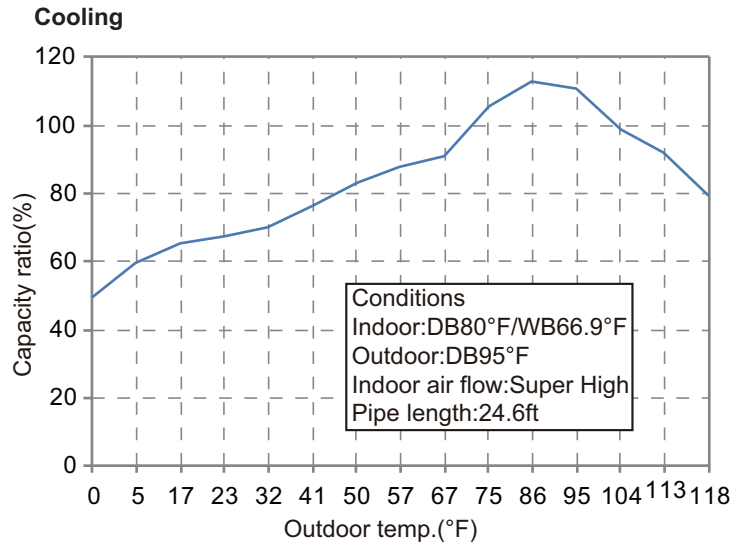
GWFR09S,GRFRC09AS

Cooling operation ambient temperature range is 0°F~118°F.



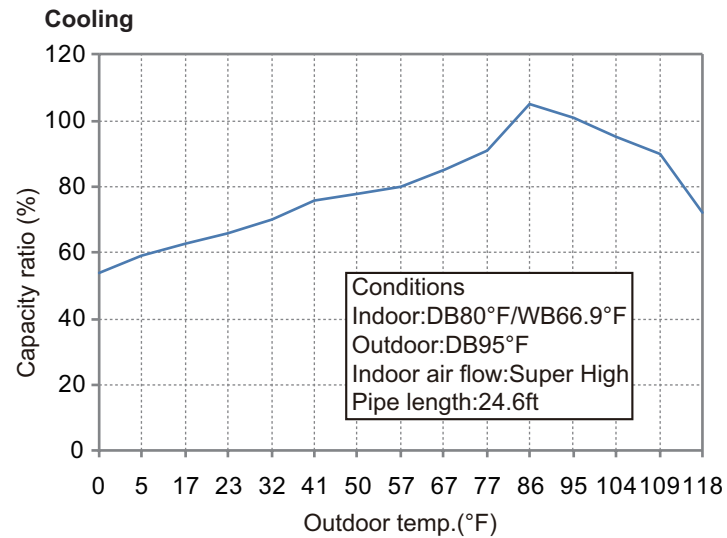
GWFR12SA,GRFRC12ASA GWFR12S,GRFRC12AS

Cooling operation ambient temperature range is 0°F~118°F.



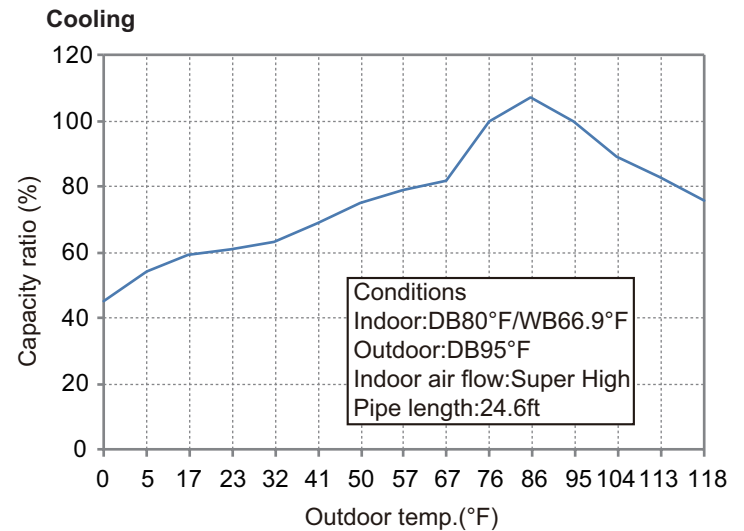
GWFR18S,GRFRC18AS

Cooling operation ambient temperature range is 0°F~118°F.



GWFR24S,GRFRC24AS

Cooling operation ambient temperature range is 0°F~118°F.



2.3 Cooling and Heating Data Sheet in Rated Frequency

Cooling:

| Rated cooling condition(°F) (DB/WB) | | Model | Pressure of gas pipe connecting indoor and outdoor unit | Inlet and outlet pipe temperature of heat exchanger | | Fan speed of indoor unit | Fan speed of outdoor unit |
|--|---------|-------|---|--|--------------------------------|-----------------------------|------------------------------|
| Indoor | Outdoor | | | PSIG | T1 (°F) | | |
| 80/66.9 | 95/- | 09K | 130~142 | in:46.4~51.8 out:51.8~57.2 | in:167~181.4 out:98.6~118.4 | Super High | High |
| 80/66.9 | 95/- | 12K | 130~142 | in:46.4~51.8 out:51.8~57.2 | in:167~181.4 out:98.6~118.4 | Super High | High |
| 80/66.9 | 95/- | 18K | 130~142 | in:46.4~51.8 out:51.8~57.2 | in:167~181.4 out:98.6~118.4 | Super High | High |
| 80/66.9 | 95/- | 24K | 130~142 | in:46.4~51.8 out:51.8~57.2 | in:167~181.4 out:98.6~118.4 | Super High | High |

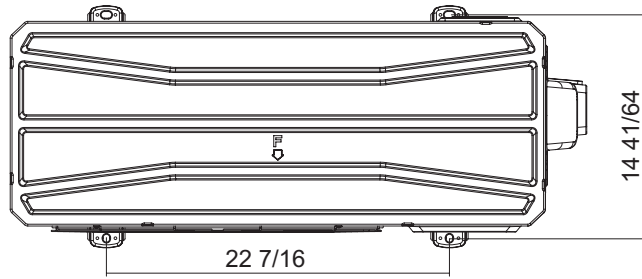
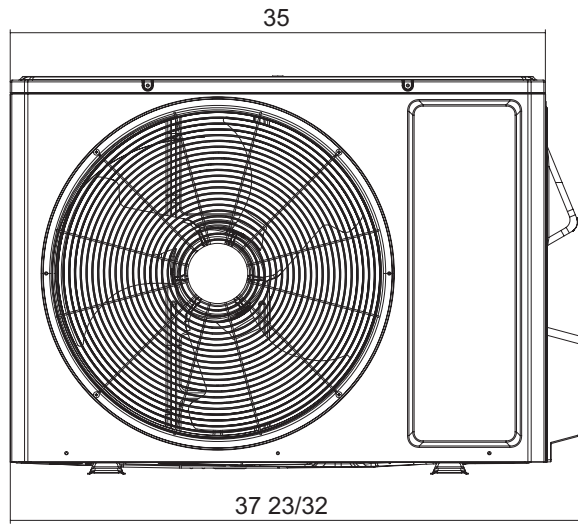
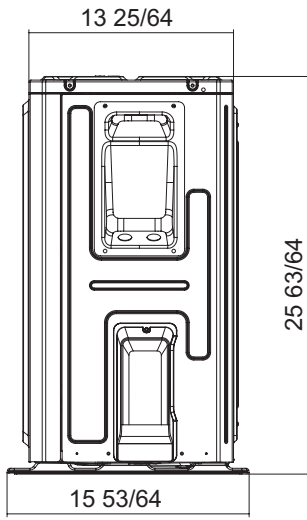
Instruction:

T1: Inlet and outlet pipe temperature of evaporator

T2: Inlet and outlet pipe temperature of condenser

P: Pressure at the side of big valve

Connection pipe length: 16.4/24.6 ft.




Unit:inch

5. Electrical Part

5.1 Wiring Diagram

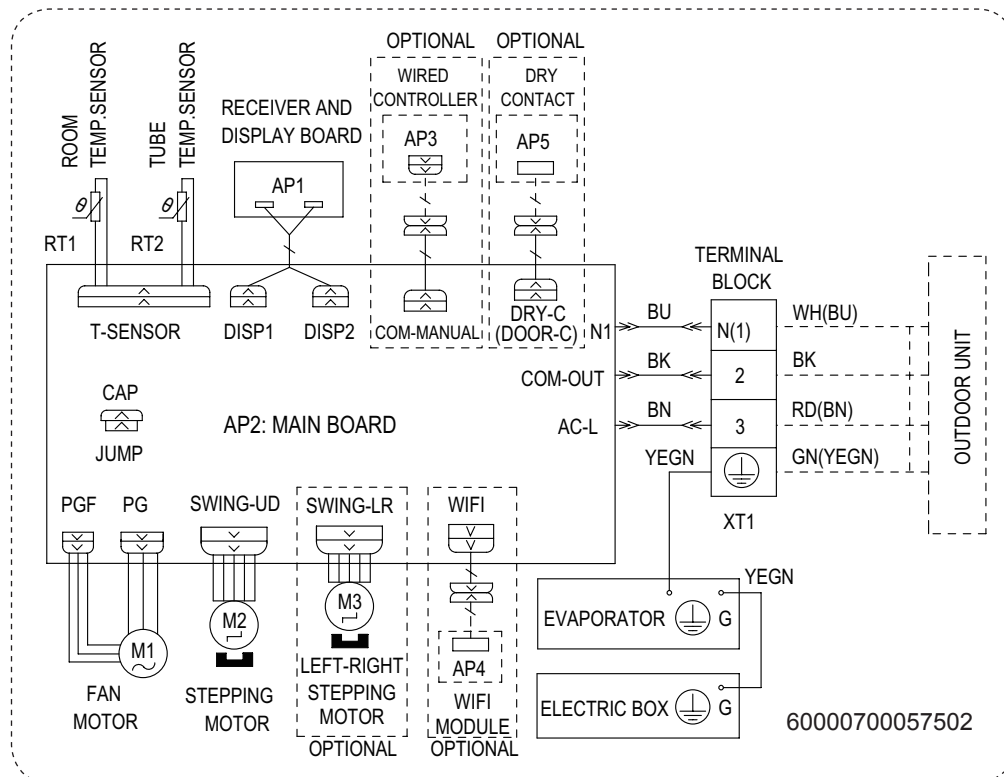
• Instruction

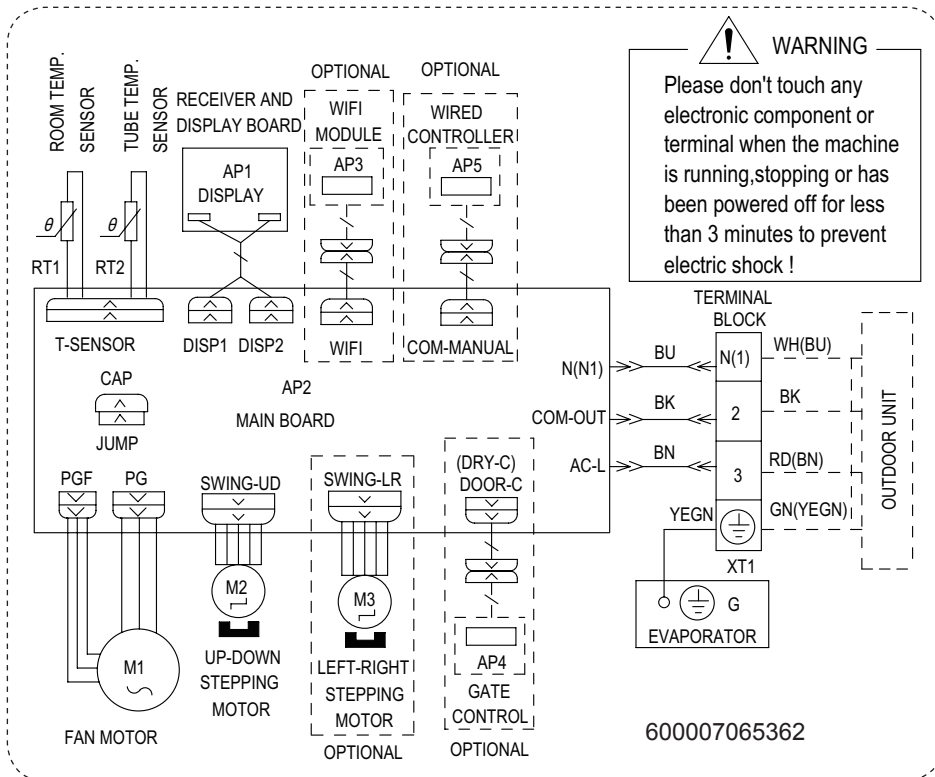
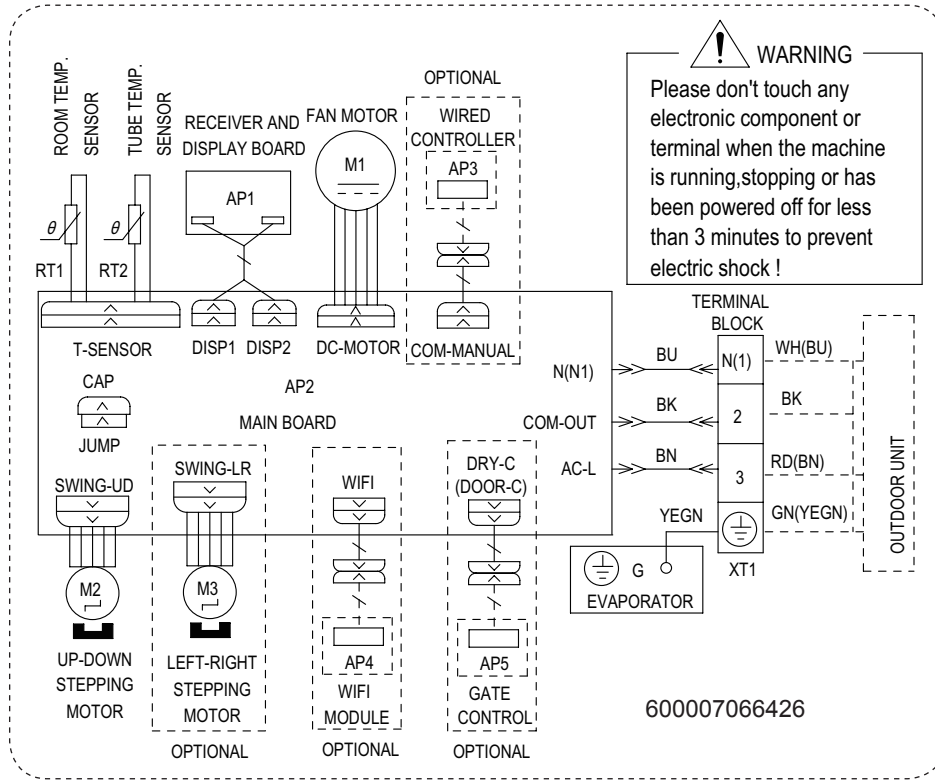
| Symbol | Symbol Color | Symbol | Symbol Color | Symbol | Name |
|--------|--------------|--------|--------------|---|----------------|
| WH | White | GN | Green | CAP | Jumper cap |
| YE | Yellow | BN | Brown | COMP | Compressor |
| RD | Red | BU | Blue |  | Grounding wire |
| YEGN | Yellow/Green |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

Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

• Indoor Unit

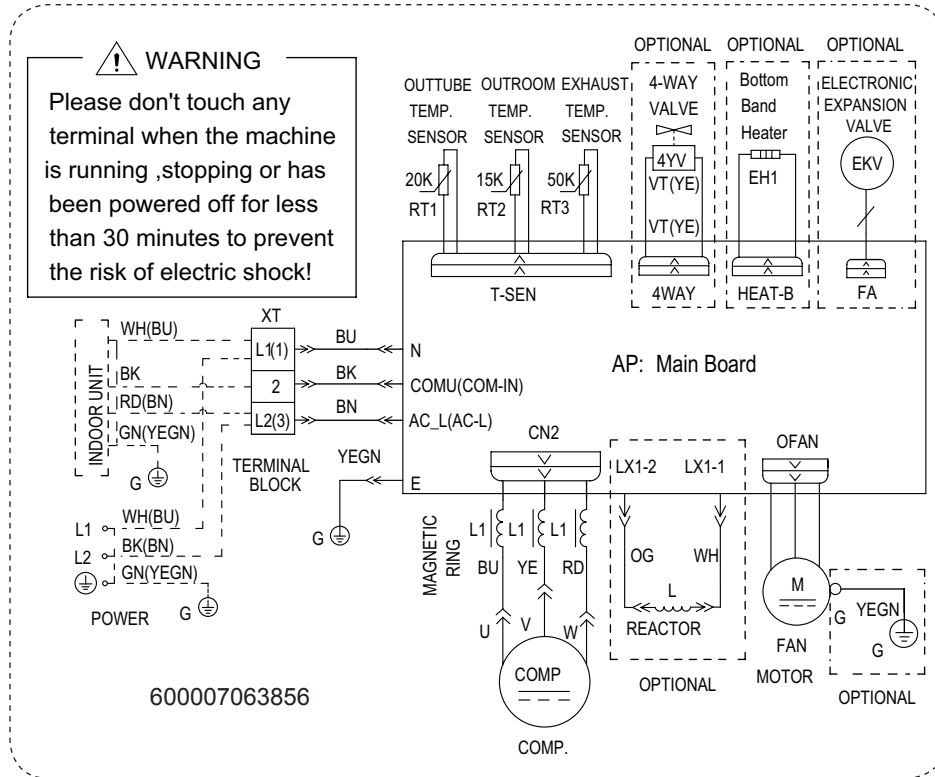
GWFR09S GWFR12SA GWFR12S



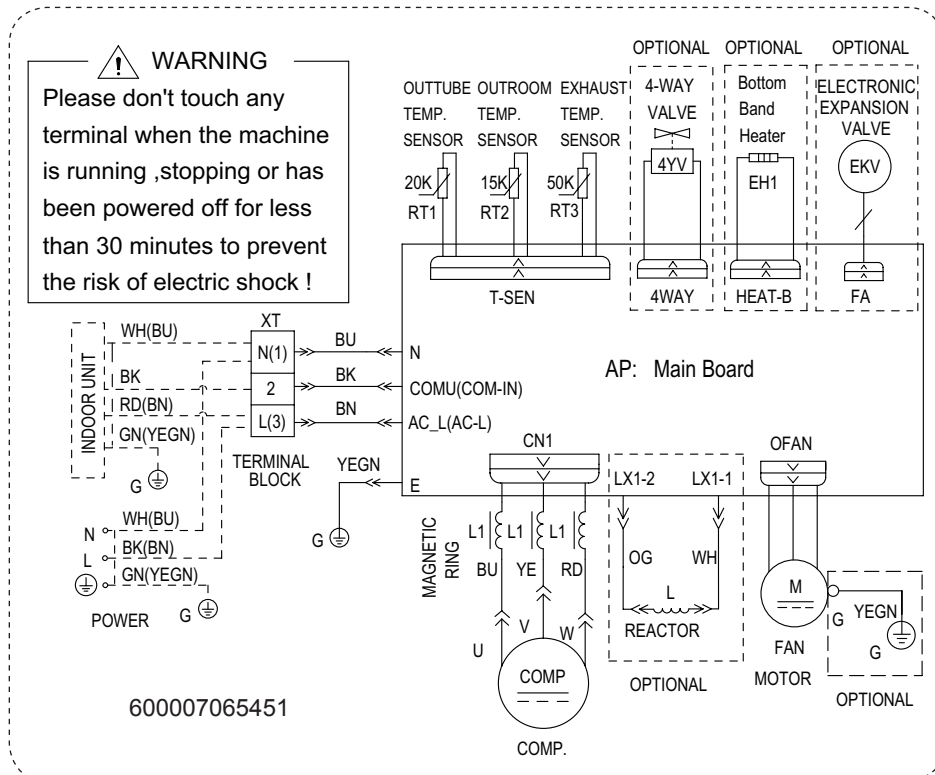


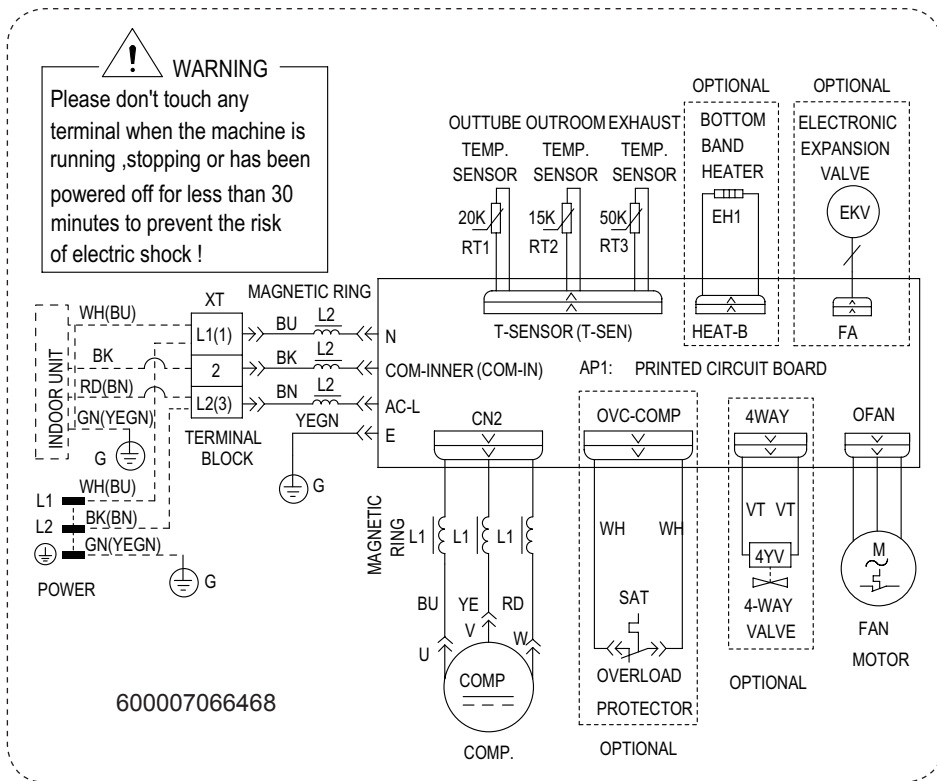
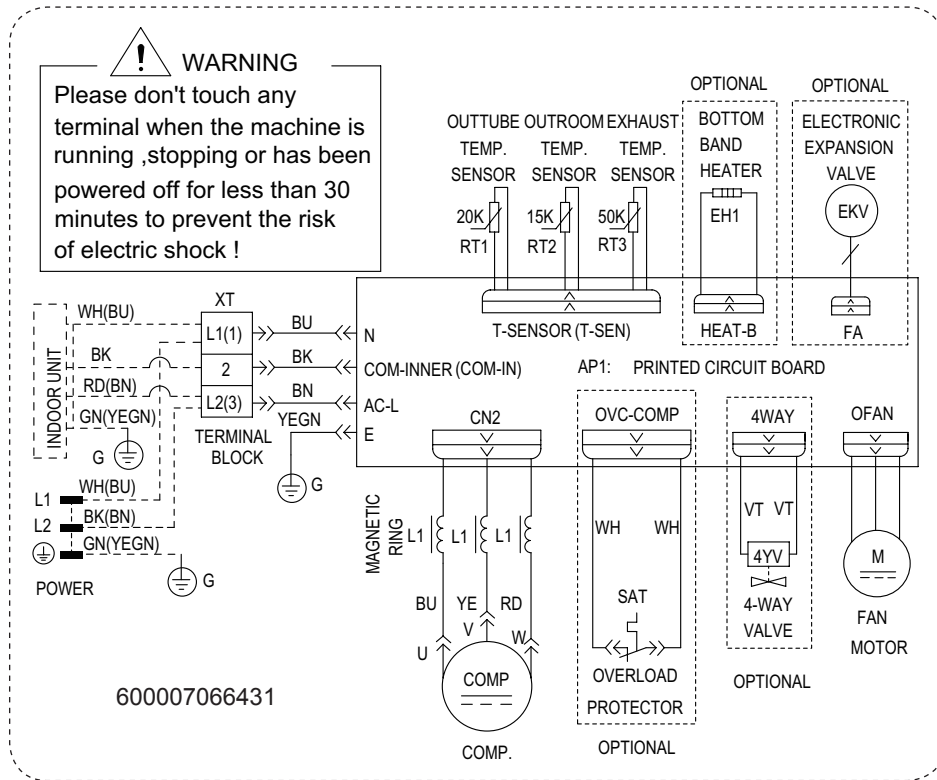
● Outdoor Unit

GRFRC09AS GRFRC12AS



GRFRC12ASA



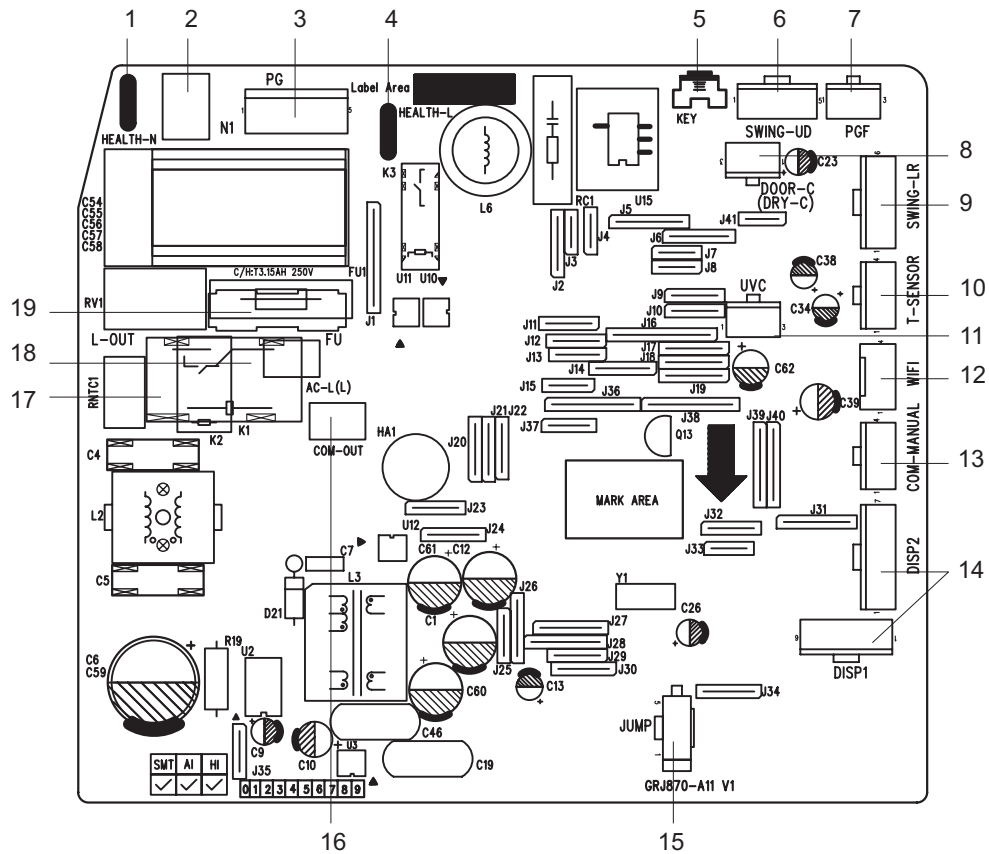


These wiring diagrams are subject to change without notice; please refer to the one supplied with the unit.

5.2 PCB Printed Diagram

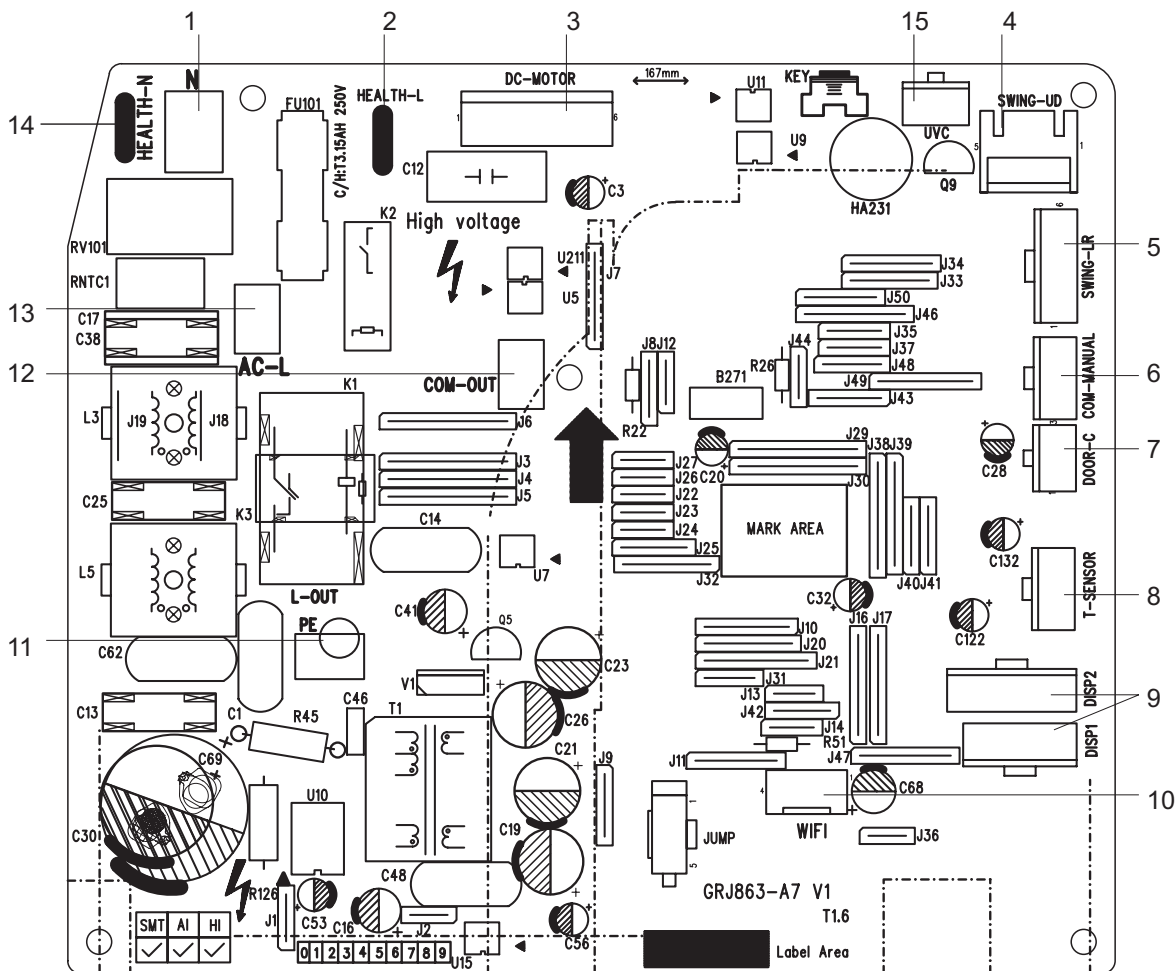
Indoor Unit

GWFR09S
GWFR12SA
GWFR12S
GWFR18S



| No. | Name |
|-----|---|
| 1 | Interface of health function neutral wire |
| 2 | Neutral wire terminal |
| 3 | Motor terminal |
| 4 | Interface of health function live wire |
| 5 | Auto button |
| 6 | Up&down swing terminal |
| 7 | Interface of Motor feedback |
| 8 | Interface of gate-control |
| 9 | Left&right swing terminal |
| 10 | Terminal of temperature sensor |

| No. | Name |
|-----|---|
| 11 | UVC terminal |
| 12 | WIFI terminal |
| 13 | Wired controller terminal |
| 14 | Interface of display board |
| 15 | Jumper cap |
| 16 | Communication terminal for indoor unit and outdoor unit |
| 17 | Terminal of live wire used for supplying power for outdoor unit |
| 18 | Live wire terminal |
| 19 | Fuse |

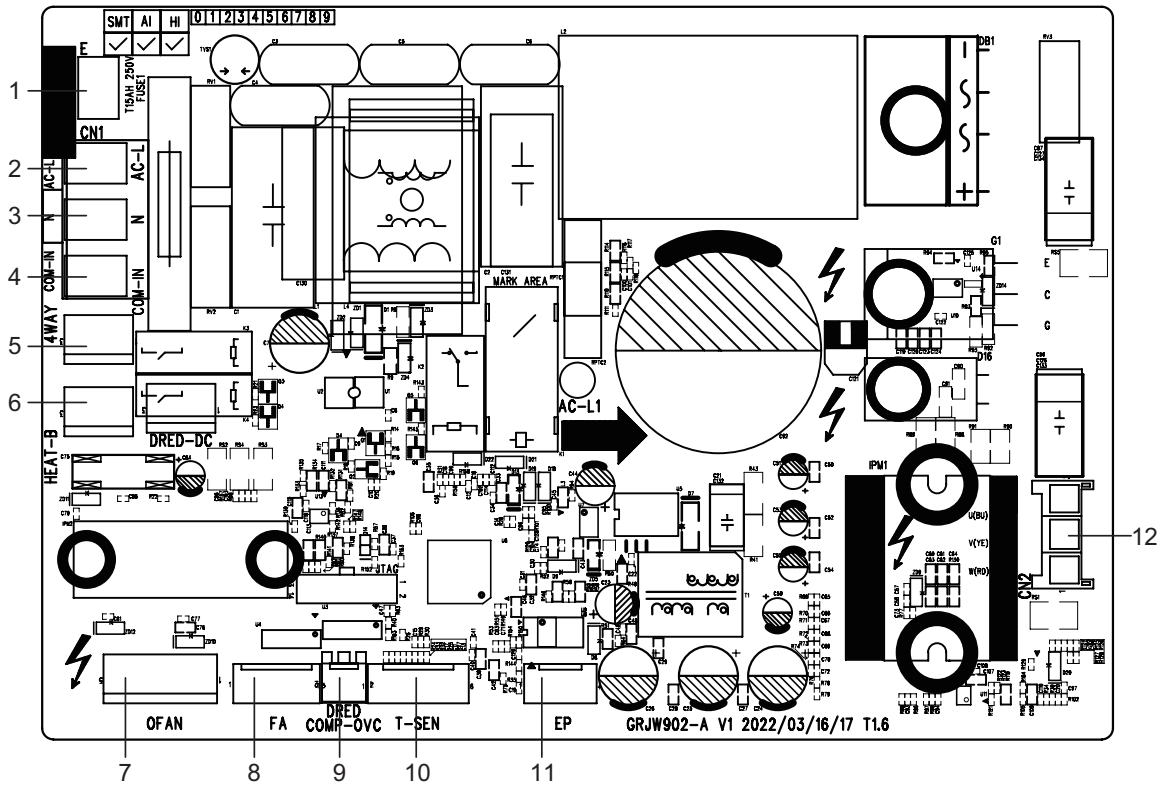


| No. | Name |
|-----|--|
| 1 | Neutral wire |
| 2 | Interface of health function live wire |
| 3 | DC fan interface |
| 4 | Up&down swing interface |
| 5 | Left&right swing interface |
| 6 | Interface of wired controller |
| 7 | Interface of gate control |
| 8 | Interface of temperature sensor |

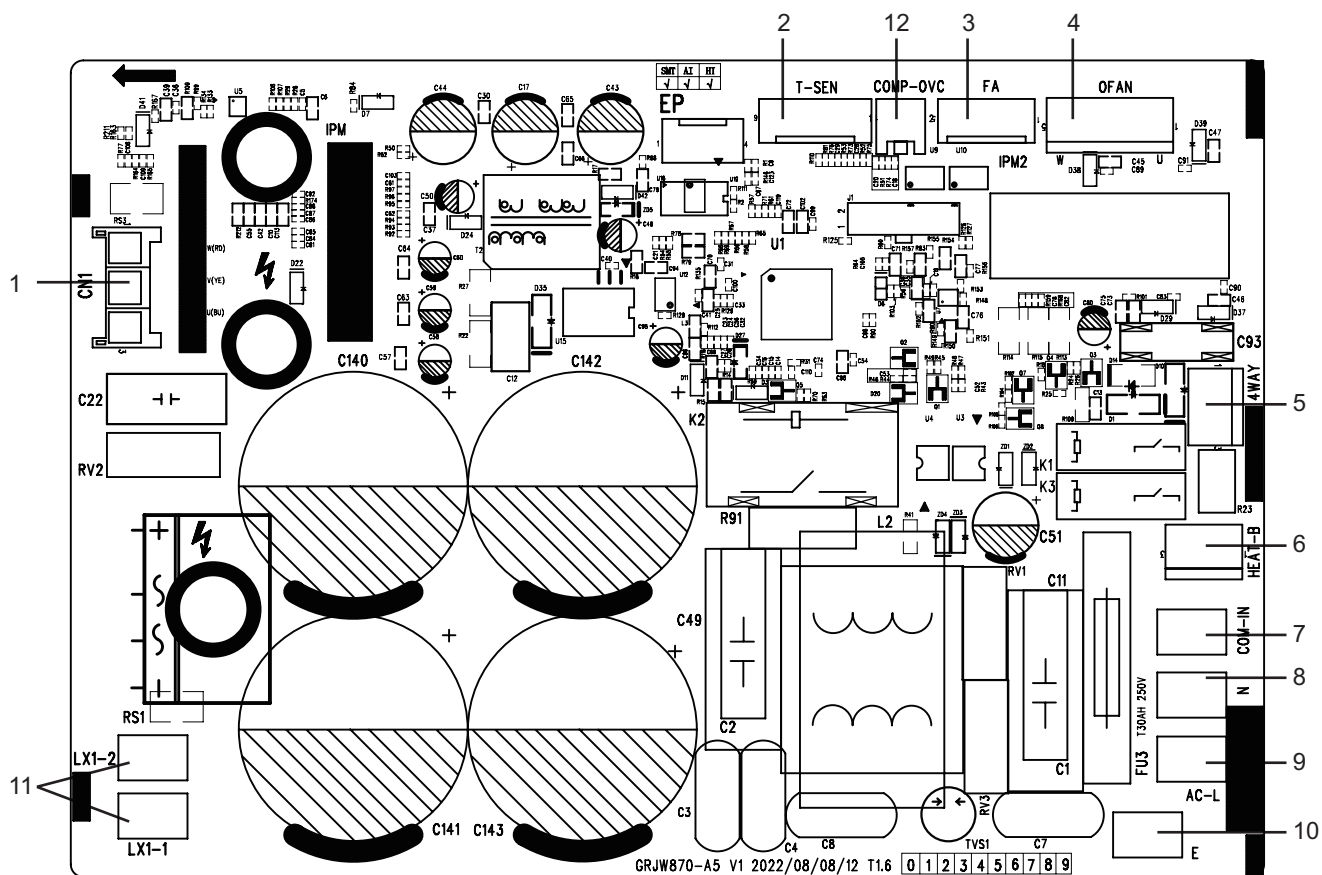
| No. | Name |
|-----|---|
| 9 | Display interface |
| 10 | WIFI interface |
| 11 | Grounding wire |
| 12 | Terminal with outdoor unit communication wire |
| 13 | Live wire interface |
| 14 | Interface of health function neutral wire |
| 15 | Interface of ultraviolet clean |

Outdoor Unit

GRFRC09AS GRFRC12AS

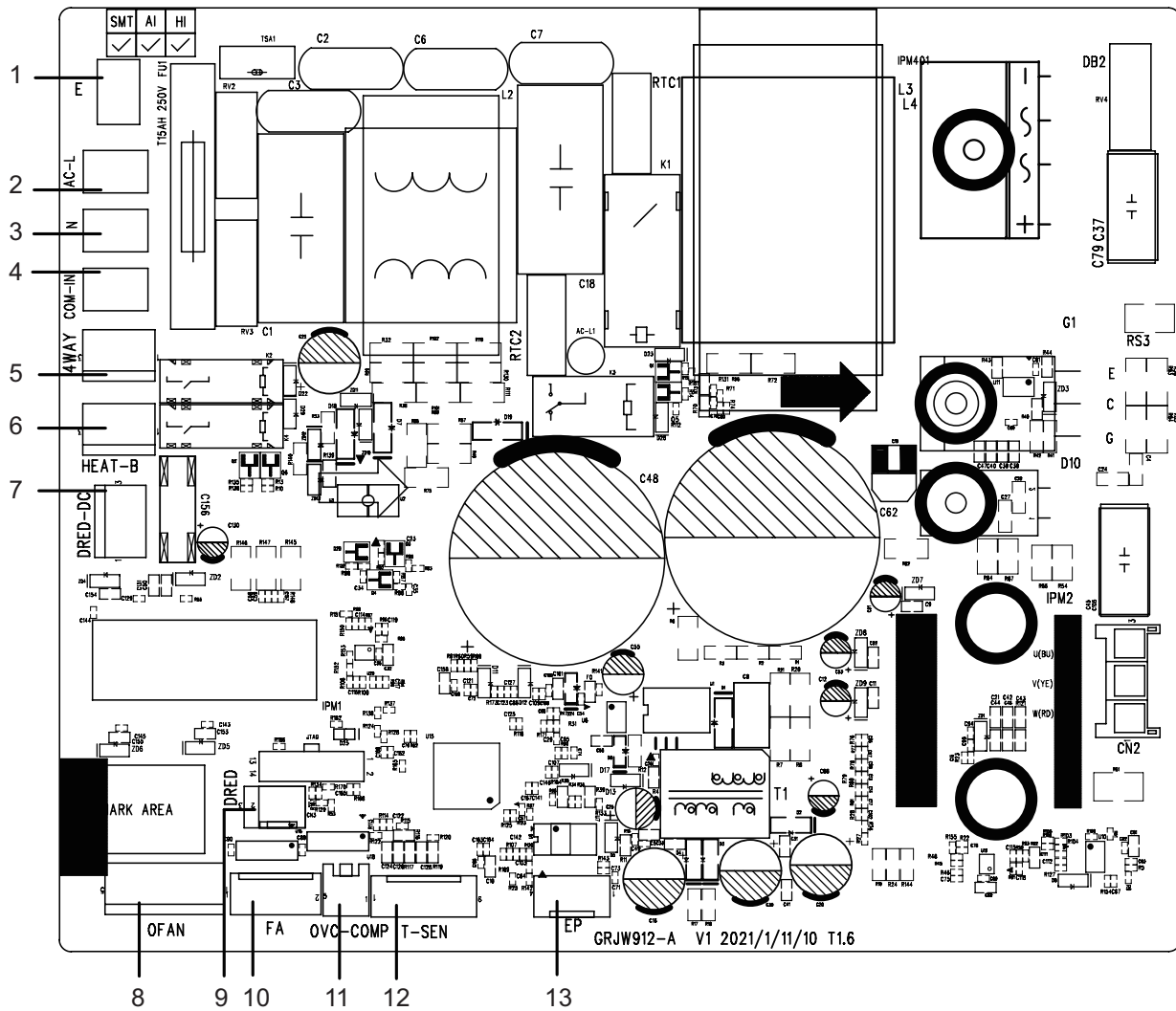


| No. | Name | No. | Name |
|-----|-----------------------------|-----|------------------------------------|
| 1 | Earthing wire | 7 | Outdoor fan |
| 2 | Live wire | 8 | Electronic expansion valve |
| 3 | Neutral wire | 9 | Compressor Overload |
| 4 | Communication wire | 10 | Temperature sensor |
| 5 | 4-way valve | 11 | E disk |
| 6 | Electric heating of chassis | 12 | Three-phase terminal of compressor |



| No. | Name |
|-----|------------------------------------|
| 1 | Three-phase terminal of compressor |
| 2 | Temperature sensor |
| 3 | Electronic expansion valve |
| 4 | Outdoor fan |
| 5 | 4-way valve |
| 6 | Electric heating of chassis |

| No. | Name |
|-----|--------------------------------|
| 7 | Terminal of communication wire |
| 8 | Neutral wire |
| 9 | Live wire |
| 10 | Earthing wire |
| 11 | Interface of reactor |
| 12 | Compressor Overload |

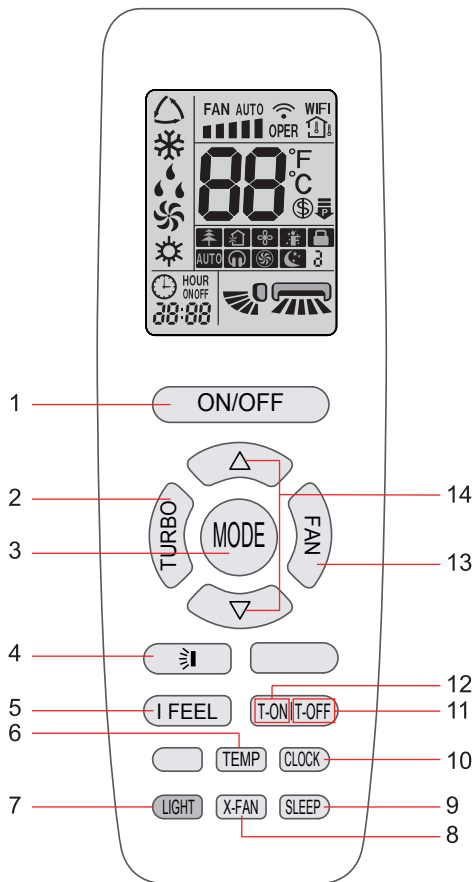


| No. | Name | No. | Name |
|-----|-----------------------------|-----|----------------------------|
| 1 | Earthing wire | 8 | Outdoor fan |
| 2 | Live wire | 9 | DRED(Reserved) |
| 3 | Neutral wire | 10 | Electronic expansion valve |
| 4 | Communication wire | 11 | Compressor Overload |
| 5 | 4-way valve | 12 | Temperature sensor |
| 6 | Electric heating of chassis | 13 | Compressor |
| 7 | DRED-DC(Reserved) | | |

6. Function and Control

6.1 Remote Controller Introduction

Buttom name and function intruduction



| No. | Button name | Function |
|-----|-------------|--|
| 1 | ON/OFF | Turn on or turn off the unit |
| 2 | TURBO | Set turbo function |
| 3 | MODE | Set operation mode |
| 4 | | Set up&down swing status |
| 5 | I FEEL | Set I FEEL function |
| 6 | TEMP | Switch temperature displaying type on the unit's display |
| 7 | LIGHT | Set light function |
| 8 | X-FAN | Set X-FAN function |
| 9 | SLEEP | Set sleep function |
| 10 | CLOCK | Set clock of the system |
| 11 | TOFF | Set timer off function |
| 12 | TON | Set timer on function |
| 13 | FAN | Set fan speed |
| 14 | | Set temperature and time |

Preparation before operation

When using the remote controller for the first time or after replacing the batteries, please set the time of the system according to current time in the following steps:

- (1). Pressing CLOCK button, ☀ is blinking.
- (2). Pressing Δ or ∇ button, the clock time will increase or decrease rapidly.
- (3). Press CLOCK button again to confirm the time and return to display current time.

Introduction of operation function

(1). Selecting operation mode
In unit on status, press MODE button to select operation mode in following sequence:



(2). Setting temperature
In unit on status, press Δ button to increase setting temperature and press ∇ button to decrease setting temperature. The range of temperature is from 16°C to 30°C.

Note: Under auto mode, manual adjustment of temperature is not needed.

(3). Adjusting fan speed
In unit on status, press FAN button to adjust fan speed in following

sequence:



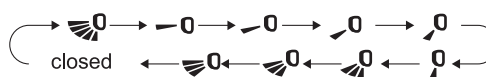
Notes:

- ① When operation mode changes, fan speed is memoried;
- ② Under dry mode, fan speed is low and can not be adjusted.

(4). Setting swing function

Setting up&down swing

- 1). Under simple swing status, press button to adjust up&down swing status;
- 2). Under fixed-angle swing status, press button to adjust up&down swing angle circularly as below:



(5). Setting turbo function

Under cool or heat mode, press TURBO button to set turbo function.

When is displayed, turbo function is on.

When is not displayed, turbo function is off.

When turbo function is on, the unit operates in super high speed to achieve quick cooling or heating. When turbo function is off, the unit operates in setting fan speed.


(6). Setting light function


The light on the receiver light board will display present operation


status. If you want to turn off the light, please press LIGHT button. Press this button again to turn on the light.

(7). Viewing ambient temperature

In unit on status, receiver light board or wired controller is defaulted to display setting temperature. Press TEMP button to view indoor or outdoor ambient temperature.

When  is displayed, it means the displayed temperature is setting temperature.


When  is displayed, it means the displayed temperature is indoor ambient temperature.

When  is displayed, it means the displayed temperature is outdoor ambient temperature.

Note: setting temperature is always displayed in Remote Controller.

(8). Setting X-FAN function

In cool or dry mode, press X-FAN button to set X-FAN function.

When  is displayed, X-FAN function is on.

When  is not displayed, X-FAN function is off.

When X-FAN function is on, the water on the evaporator will be blown away until turning off the unit to avoid mildew.

(9). Setting sleep function

In unit on status, press SLEEP button to turn on or turn off sleep function.

① When  is displayed, sleep function is on.

② When  is not displayed, sleep function is off.

Notes:

① Sleep function can not be set in auto and fan mode;

② When turning off the unit or switching mode, sleep function is cancelled;

(10). Setting I FEEL function

In unit on status, press I FEEL button to turn on or turn off I FEEL function.

When  is displayed, I FEEL function is on.

When  is not displayed, I FEEL function is off.

When I FEEL function is turned on, the unit will adjust temperature according to the temperature detected by the remote controller to achieve the best air-conditioning effect. In this case, you should place the remote controller within the valid receiving range.



(11). Setting timer

You can set the operation time of unit as you need. You can also set timer on and timer off in combination.

Before setting, check if the time of the system is the same as the current time. If not, please set the time according to current time.

(12). Setting timer off

① Pressing TOFF button, "OFF" is blinking and time displaying zone displays the timer time of last setting.

② Press  or  button to adjust the timer time.

③ Press TOFF button again to confirm setting. OFF is displayed and time displaying zone resumes to display current time.

4. Press TOFF button again to cancel timer and OFF is not displayed.

13). Setting timer on

① Pressing TON button, "ON" is blinking and time displaying zone displays the timer time of last setting.




② Press  or  button to adjust the timer time.



③ Press TON button again to confirm setting. ON is displayed and time displaying zone resumes to display current time.


④ Press TON button again to cancel timer and ON is not displayed.

Introduction of special functions


(1). Setting child lock

Press  and  button simultaneously to lock the buttons on remote controller and is  displayed.

Press  and  button simultaneously again to unlock the buttons on remote controller and is not displayed.


If the buttons are locked,  blinks 3 times when pressing the button and any operation on the button is invalid.


(2). Switching temperature scale

In unit off status, press MODE button and  button simultaneously to switch temperature scale between °C and °F.

(3). Setting energy-saving function

In unit on status and under cool mode, press CLOCK and TEMP button simultaneously to enter energy-saving mode.


• When  is displayed, energy-saving function is on.

• When  is not displayed, energy-saving function is off.

If you want to turn off the energy-saving function, press CLOCK and TEMP button and is not displayed.

Note: energy-saving function is only available in cooling mode and it will be exited when switching mode or setting sleep function.

(4). Absence function

In unit on status and under heat mode, press CLOCK and TEMP button simultaneously to enter absence function. Temperature displaying zone displays 8 and is  displayed.

Press CLOCK and TEMP button simultaneously again to exit absence function. Temperature displaying zone resumes previous display and is not displayed.

In winter, absence function can keep the indoor ambient temperature above 0°C to avoid freezing.

Note: Absence function is only available in heating mode and it will be exited when switching mode or setting sleep function.

Replacing batteries in remote controller and notes

(1). Lift the cover along the direction of arrow (as shown in Fig 1 ①).

(2). Take out the original batteries (as shown in Fig 1 ②).

(3). Place two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar is correct (as shown in Fig 2 ③).

(4). Reinstall the cover (as shown in Fig 2 ④).

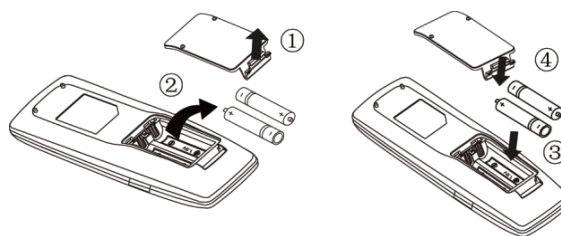


Fig.1


Fig.2

Notes:

① The remote controller should be placed 1m away from the TV set or stereo sound sets.

② The operation of remote controller should be performed within its receiving range.

③ If you need to control the main unit, please point the remote controller at the signal receiving window of the main unit to improve the receiving sensibility of main unit.

④ When the remote controller is sending signal, " " icon will be blinking for 1 second. When the main unit receives valid remote control signal, it will give out a sound.

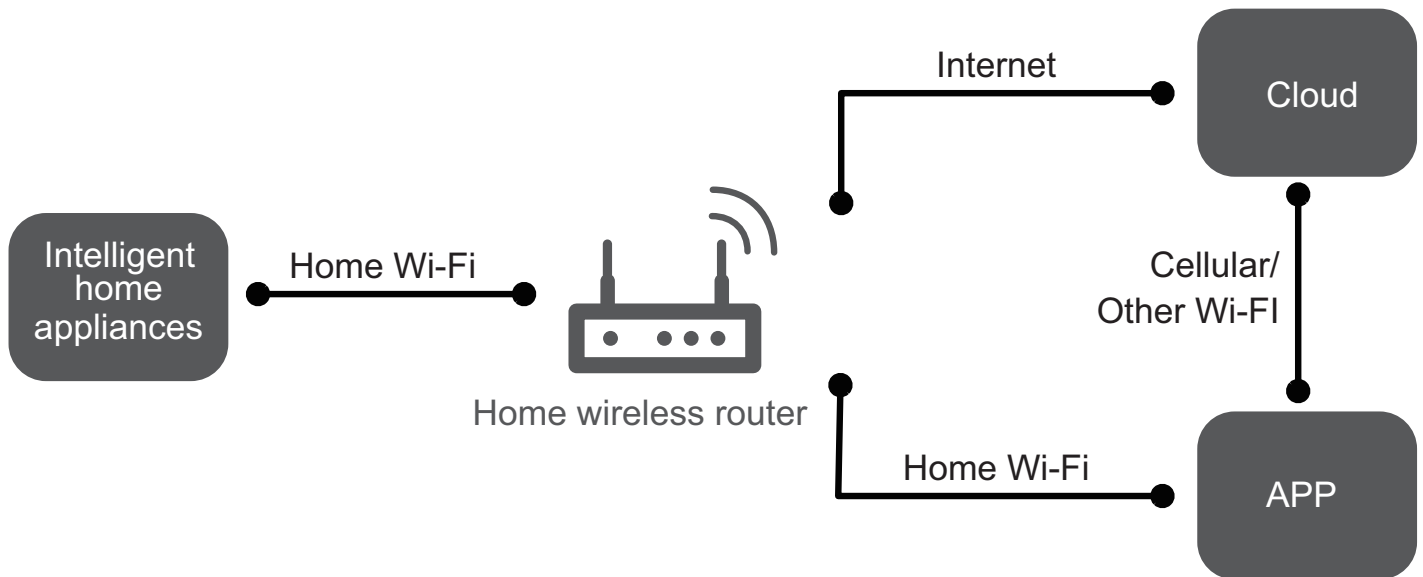
⑤ If the remote controller does not operate normally, please take the batteries out and reinsert them after 30 seconds. If it still can't operate properly, replace the batteries.

⑥ When replacing the batteries, do not use old or different types of batteries, otherwise, it may cause malfunction.

⑦ When you won't use the remote controller for a long time, please take out the batteries.

6.2 Ewpe Smart App Operation Manual

Control Flow Chart



Operating Systems

Requirement for User's smart phone:



iOS system
Support iOS7.0 and
above version



Android system
Support Android 4.4 and
above version

Download and installation



App Download Linkage

Scan the QR code or search "Ewpe Smart" in the application market to download and install it. When "Ewpe Smart" App is installed, register the account and add the device to achieve long-distance control and LAN control of smart home appliances.

For more information, please refer to "Help" in App.

6.3 Brief Description of Modes and Functions

● Indoor Unit

1. Basic function of system

(1) Cooling mode

(1) Under this mode, fan and swing operates at setting status. Temperature setting range is 60.8~86.0°F.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(2) Drying mode

(1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 60.8~86.0°F.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(3) Protection status is same as that under cooling mode.

(4) Sleep function is not available for drying mode.

(3) Heating mode

(1) Under this mode, Temperature setting range is 60.8~86.0°F.

(2) Working condition and process for heating mode:

When turn on the unit under heating mode, indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been started up just now, the unit enters into residual heat-blowing status.

(4) Working method for AUTO mode:

1. Working condition and process for AUTO mode:

a. Under auto mode set temperature can be adjusted. The unit switch mode automatically according to ambient temperature.

2. Protection function

a. During cooling operation, protection function is same as that under cooling mode.

b. During heating operation, protection function is same as that under heating mode.

3. Display: Set temperature is the set value under each condition. Ambient temperature is (Tamb.-Tcompensation) for heat pump unit and Tamb. for cooling only unit.

4. If there's I feel function, Tcompensation is 0. Others are same as above.

(5) Fan mode

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 60.8~86.0°F.

2. Other control

(1) Buzzer

Upon energization or availablely operating the unit or remote controller, the buzzer will give out a beep.

(2) Auto button

If press this auto button when turning off the unit, the complete unit will operate at auto mode. Indoor fan operates at auto fan speed and swing function is turned on. Press this auto button at ON status to turn off the unit.

(3) Auto fan

Heating mode: During auto heating mode or normal heating mode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

(4) Sleep function

After setting sleep function for a period of time, system will adjust set temperature automatically.

(5) Timer function

General timer and clock timer functions are compatible by equipping remote controller with different functions.

(6) Memory function

Memorize compensation temperature, off-peak energization value. Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer can't be memorized). After power recovery, the unit will be turned on automatically according to memory content.

(7) Health function

During operation of indoor fan, set health function by remote controller. Turn off the unit will also turn off health function.

Turn on the unit by pressing auto button, and the health is defaulted ON.

(8) I feel control mode

After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

(9) Compulsory defrosting function

a. Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 60.8°F. Press “ Δ , ∇ , Δ , ∇ , Δ , ∇ ” button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.

b. Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

(10) Refrigerant recovery function:

a. Enter refrigerant recycling function

Within 5min after energizing (unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; Fo is displayed and refrigerant recycling function is started. At this moment, the maintenance people closes liquid valve. After 5min, stick the thimble of maintenance valve with a tool. If there is no refrigerant spraying out, close the gas valve immediately and then turn off the unit to remove the connection pipe.

b. Exit refrigerant recycling function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically. If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

(11) Ambient temperature display control mode

a. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.

b. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01,11), controller will display indoor ambient temperature for 3s and then turn back to display set temperature.

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 60.8~86.0°F.

(12) Off-peak energization function:

Adjust compressors minimum stop time. The original minimum stop time is 180s and then we change to:

The time interval between two start-ups of compressor can't be less than $180+T$ s ($0 \leq T \leq 15$). T is the variable of controller. That's to say the minimum stop time of compressor is 180s~195s. Read-in T into memory chip when refurbish the memory chip each time. After power recovery, compressor can only be started up after $180+T$ s at least.

(13) SE control mode

The unit operates at SE status.

(14) X-fan mode

When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

(15) 46.4°F heating function

Under heating mode, you can set 46.4°F heating function by remote controller. The system will operate at 46.4°F set temperature.

(16) Turbo fan control function

Set turbo function under cooling or heating mode to enter into turbo fan speed. Press fan speed button to cancel turbo wind.

No turbo function under auto, dry or fan mode.

(17) Auto cleaning function (only available on some models)

The automatic cleaning function of the indoor heat exchanger can be dedusted and sterilized by the condensation, frosting, defrosting and high temperature stages of the evaporator.

1. Under the power off, press and hold the "Internal Clean" button for 3 seconds while holding down the "MODE" and "FAN" buttons for 5 seconds to turn on the Auto Clean function. After the function is turned on, the air conditioner displays "CL".

2. The evaporator will be rapidly cooled or heated during the automatic cleaning process. There may be noise or even noise. The noise generated by the plastic parts due to thermal expansion and contraction is normal. During the cleaning and disinfection process, the room temperature may increase slightly, please keep the room well ventilated.

Tips:

The automatic cleaning function can only be started under normal environmental conditions. If the indoor environment is easy to dust, it is recommended to clean it once a month. If the indoor environment is not so dusty, it is recommended to clean it once every three months.

After turning on the automatic cleaning mode, the user can leave the room. When cleaning is complete, the unit will automatically enter standby mode.

● Outdoor Unit

09/12K

1. Cooling mode:

Working condition and process of cooling mode:

- ① When Tindoor ambient temperature $\geq T_{\text{preset}}$, unit enters into cooling mode. Indoor fan, outdoor fan and compressor start operation. Indoor fan operates according to set fan speed.
- ② When Tindoor ambient temperature $\leq T_{\text{preset}} - 2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later. Indoor fan operates according to set fan speed.
- ③ When $T_{\text{preset}} - 2^{\circ}\text{C} < \text{Tindoor ambient temperature} < T_{\text{preset}}$, unit operates according to the previous status.

Under cooling mode, 4-way valve is not energized. Temperature setting range is $16 \sim 30^{\circ}\text{C}$. If compressor stops because of malfunction in cooling mode, indoor fan and swing motor will work according to the original status.

2. Drying mode

(1) Working condition and process of drying mode

- ① When Tindoor ambient temperature $> T_{\text{preset}}$, unit will be in drying mode. Outdoor fan and compressor start operation while indoor fan will operate at low fan speed.
- ② When $T_{\text{preset}} - 2^{\circ}\text{C} \leq \text{Tindoor ambient temperature} \leq T_{\text{preset}}$, unit operates according to the previous status.
- ③ When Tindoor ambient temperature $< T_{\text{preset}} - 2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later.

(2) Under drying mode, 4-way valve is not energized. Temperature setting range is $16 \sim 30^{\circ}\text{C}$.

(3) Protection function: same as in cooling mode.

3. Fan mode

(1) Under this mode, indoor fan can select different fan speed (except Turbo) or auto fan speed. Compressor, outdoor fan and 4-way valve all stop operation.

(2) In fan mode, temperature setting range is $16 \sim 30^{\circ}\text{C}$.

4. Heating mode

Working condition and process of heating mode:

- ① When $T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) \geq 1^{\circ}\text{C}$, unit enters into heating mode. Compressor, outdoor fan and 4-way valve start operation.
- ② When $-2^{\circ}\text{C} < T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) < 1^{\circ}\text{C}$, unit operates according to the previous status.
- ③ When $T_{\text{preset}} - (\text{Tindoor ambient temperature} - T_{\text{compensation}}) \leq -2^{\circ}\text{C}$, compressor stops operation and outdoor fan will stop 30s later. Indoor fan will be in residual-heat blowing status.
- ④ When unit is turned off under heating mode or changed to other modes from heating mode, 4-way valve will be power-off 2min after compressor stops working (compressor is in operation status under heating mode).

⑤ When Toutdoor ambient temperature $> 30^{\circ}\text{C}$, compressor stops operation immediately. Outdoor fan will stop 30s later.

⑥ Under the condition that compressor is turned on, when unit is changed to heating mode from cooling or drying mode, 4-way valve will be energized in 2~3mins delay.

Note: Tcompensation is determined by IDU and ODU. If IDU controls the compensation temperature, then Tcompensation is determined according to the value sent by IDU to ODU; If IDU does not control the compensation temperature, then Tcompensation will default to 3°C by the ODU.

5. Freon recovery mode

After the Freon recovery signal from IDU is received, cooling at rated frequency will be forcibly turned on to recover Freon.

Indoor unit will display Fo. If any signal from remote controller is received, unit will exit from Freon recovery mode and indoor unit stops displaying Fo.

6. Compulsory defrosting

If unit is turned on under heating mode and set temperature is 16°C (by remote controller), press " $\Delta, \nabla, \Delta, \nabla, \Delta, \nabla$ " within 5s, unit will enter into compulsory defrosting mode and send the signal to ODU. When the compulsory defrosting signal from ODU is received, IDU will exit from the compulsory defrosting mode and stop sending the signal to ODU.

After ODU receives the compulsory defrosting code, it will start compulsory defrosting. Defrosting frequency and opening angle will be the same as in normal defrosting mode. When compulsory defrosting is finished, the complete unit resumes original status.

7. Auto mode

Auto mode is determined by controller of IDU. See IDU logic for details.

8. 8°C heating

Set temperature is 8°C . Display board of IDU displays 8°C . Under this mode, "Cold air prevention" function is shielded.

If compressor is operating under this mode, fan speed will adjust according to auto fan speed; if compressor stops operation under this mode, indoor fan will be in residual-heat blowing status.

When power on, communication light will be blinking in a normal way (after receiving a group of correct signals, blinking stops for 0.2s~0.3s). If theres no communication, communication light will be always on. If other ODU has malfunction, communication light will be on for 1s and off for 1s in a circular way.

18/24K

1. Input Parameter Compensation and Calibration

(1) Check the ambient temperature compensation function Indoor ambient temperature compensation function.

a. In cooling mode, the indoor ambient temperature participating in computing control = (T_{indoor ambient temperature} - Δ T_{cooling indoor ambient temperature compensation})

b. In heating mode, the indoor ambient temperature participating in computing control = (T_{indoor ambient temperature} - Δ T_{heating indoor ambient temperature compensation})

(2) Check effective judgment controls of parameters

Effective judgment function of the outdoor exhaust temperature thermo-bulb When conditions a and b are satisfied, the outdoor exhaust temperature thermo-bulb is judged not to be connected into place, the mainboard of outer units will display failure of the outdoor exhaust temperature thermo-bulb (not connected into place), stop the machine for repairing, and resume the machine by remote controls of ON/OFF.

a. Judgment of exhaust detection temperature change:

After the compressor starts up and runs for 10 minutes, if the compressor frequency $f \geq 40\text{Hz}$, and the rising value T_{exhaust} (T_{exhaust} (after start-up for 10 minutes) - T_{exhaust} (before start-up)) $< 35.6^\circ\text{F}$, the outdoor exhaust temperature thermo-bulb can be judged not to be connected into place (judging once when the power is on the first time).

b. Comparative judgment of exhaust detection temperature and condenser detection temperature ($T_{\text{pipe temperature}} = T_{\text{outdoor pipe temperature in cooling mode}}$, $T_{\text{pipe temperature}} = T_{\text{indoor pipe temperature in heating mode}}$):

After the compressor starts up and runs for 10 minutes, if the compressor frequency $f \geq 40\text{Hz}$, and $T_{\text{pipe temperature}} \geq (T_{\text{exhaust}} + 37.4)$, the outdoor exhaust temperature thermobulb can be judged not to be connected into place (judging once when power is on the first time).

2. Basic Functions

(1) Cooling Mode

1. Conditions and processes of cooling operation:

(1) If the compressor is shut down, and $[T_{\text{setup}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})] \leq 32.9^\circ\text{F}$, start up the machine for cooling, the cooling operation will start;

(2) During operations of cooling, if $32^\circ\text{F} \leq [T_{\text{setup}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})] < 35.6^\circ\text{F}$, the cooling operation will be still running;

(3) During operations of cooling, if $35.6^\circ\text{F} \leq [T_{\text{setup}} - (T_{\text{indoor ambient temperature}} - \Delta T_{\text{cooling indoor ambient temperature compensation}})]$, the cooling operation will stop after reaching the temperature point.

2. Temperature setting range

(1) If $T_{\text{outdoor ambient temperature}} \geq [T_{\text{low-temperature cooling temperature}}]$, the temperature can be set at: 60.8~86°F (Cooling at room temperature);

(2) If $T_{\text{outdoor ambient temperature}} < [T_{\text{low-temperature cooling temperature}}]$, the temperature can be set at: 77~86°F (Cooling at low temperature),

that is, the minimum setting temperature for outer units judgment is 77°F .

(2) Dehumidifying Mode

1. Conditions and processes of dehumidifying operations: Same as the cooling mode;

2. The temperature setting range is: 60.8~86°F;

(3) Air-supplying Mode

1. The compressor, outdoor fans and four-way valves are switched off;

2. The temperature setting range is: 60.8~86°F.

(4) Heating Mode

1. Conditions and processes of heating operations: (T_{indoor ambient temperature} is the actual detection temperature of indoor environment thermo-bulb, T_{heating indoor ambient temperature compensation} is the indoor ambient temperature compensation during heating operations)

(1) If the compressor is shut down, and $[(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{setup}}] \leq 32.9^\circ\text{F}$, start the machine to enter into heating operations for heating;

(2) During operations of heating, if $32^\circ\text{F} \leq [(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{setup}}] < 35.6^\circ\text{F}$, the heating operation will be still running;

(3) During operations of heating, if $35.6^\circ\text{F} \leq [(T_{\text{indoor ambient temperature}} - \Delta T_{\text{heating indoor ambient temperature compensation}}) - T_{\text{setup}}]$, the heating operation will stop after reaching the temperature point.

2. The temperature setting range in this mode is: 60.8~86°F .

3. Special Functions

Defrosting Control

① Conditions for starting defrosting

After the time for defrosting is judged to be satisfied, if the temperature for defrosting is satisfied after detections for continuous 3minutes, the defrosting operation will start.

② Conditions of finishing defrosting

The defrosting operation can exit when any of the conditions below is satisfied:

③ $T_{\text{outdoor pipe temperature}} \geq (T_{\text{outdoor ambient temperature}} - [T_{\text{temperature 1 of finishing defrosting}}])$;

④ The continuous running time of defrosting reaches [t_{max. defrosting time}].

4. Control Logic

(1) Compressor Control

Start the compressor after starting cooling, heating, dehumidifying operations, and the outer fans start for 5s; When the machine is shutdown, in safety stops and when switching to air-supplying mode, the compressor will stop immediately. In all modes: once the compressor starts up, it will not be allowed to stop until having run for the [t_{min. compressor running time}] (Note: including cases of shutdown when the temperature point is reached; except the cases requiring stopping the compressor such as fault protection, remote shutdown, mode switching etc.); In all modes: once the compressor stops, it will be allowed be restart after 3-minute delay (Note: The indoor units have a function of power memory,

the machine can be restarted after remote shutdown and powering up again without delay).

1. Cooling mode

Start the machine to enter into cooling operation for cooling, the compressor is switched on.

2. Dehumidifying mode

Same as the cooling mode.

3. Air-supplying mode

The compressor is switched off.

4. Heating mode

(1) Start the machine to enter into heating operation for heating, the compressor is switched on.

(2) Defrosting:

a. Defrosting starts: the compressor is shut down, and restarts it after 55-second delay.

b. Defrosting ends: the compressor stops, then starts it after 55-second delay.

(2) Outer Fans Control

Notes:

Only the outer fans run for at least 80s in each air flow speed can the air flow be switched;

After the outer fans run compulsively in high speed for 80s when the machine starts up, control the air flow according to the logic.

After remote shutdown, safety stops, and when the machine stops after reaching the temperature point, as well as after the compressor stops, extend 1 minute, the outer fans will stop (During the period in the 1 minute, the air flow of outer fans can be changed according to the outdoor ambient temperature changes); When running with force, the outdoor fans shall run in the highest air flow.

(3) 4-way valve control

1. The 4-way valve control under the modes of Cooling, dehumidification and supplying air: closing;

2. The status of 4-way valve control under the heating mode: getting power;

(1) 4-way valve power control under heating mode

a. Starts the machine under heating mode, the 4-way valve will get power immediately.

(2) 4-way valve power turn-off control under heating mode

a. When you should turn off the power or switch to other mode under heating mode, the power of 4-way valve will be cut after 2 minutes of the compressor stopped.

b. When all kinds of protection stops, the power of 4-way valve will be cut after delaying 4 minutes.

(3) Defrosting control under heating mode:

a. Defrosting begins: The power of 4-way valve will be cut after 50s of entering into the defrosting compressor.

b. Defrosting stops: The 4-way valve will get power after 50s of exiting the defrosting compressor.

(4) Evaporator frozen-preventing protection function

At the mode of Cooling, dehumidifying:

Evaporator frozen-preventing protection function is allowed to

begin after 6 min of starting the compressor.

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{\text{inner pipe}} > [T_{\text{frozen-preventing frequency-limited temperature}}$ (the temperature of hysteresis is 35.6°F), the machine is only allowed to start for operating, otherwise it should not be started, and should be stopped to treat according to the frozen-preventing protection: Clear the trouble under the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited

$[T_{\text{frozen-preventing normal speed frequency-reducing temperature}}] \leq [T_{\text{inner pipe}} T_{\text{frozen-preventing frequency-limited temperature}}]$, you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed:

If $[T_{\text{frozen-preventing high speed frequency-reducing temperature}}] \leq [T_{\text{inner pipe}} T_{\text{frozen-preventing normal speed frequency-reducing temperature}}]$, you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit;

4. Reducing frequency at high speed:

If $[T_{\text{frozen-preventing power turn-off temperature}}] \leq T_{\text{inner pipe}} [T_{\text{frozen-preventing high speed frequency-reducing temperature}}]$ you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit;

5. Power turn-off:

If the $T_{\text{inner pipe}} < [T_{\text{frozen-preventing power turn-off temperature}}]$, then frozen-preventing protect to stop the machine; If $T_{\text{frozen-preventing frequency-limited temperature}} < T_{\text{inner pipe}}$, and the compressor has stopped working for 3 minutes, the whole machine should be allowed to operate.

6. If the frozen-preventing protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the $t_{\text{evaporator frozen-preventing protection times zero clearing time}}$, the times of frozen-preventing power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, mode transferring will not clear it).

(5) Overload protection function

Overload protection function at the mode of Cooling and dehumidifying

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{\text{outer pipe}} < [T_{\text{Cooling overload frequency-limited temperature}}]$ (the temperature of hysteresis is 35.6°F), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the overload protection: Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.

2. Frequency limited

If $[T_{\text{Cooling overload frequency-limited temperature}}] \leq [T_{\text{outer pipe}} T_{\text{Cooling overload frequency reducing temperature at normal speed}}]$, you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and power turn-off:

If $[T_{\text{Cooling overload frequency reducing temperature at high speed}}] \leq T_{\text{outer pipe}} < [T_{\text{Cooling}}$

overload power turn-off temperature] , you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if [T_{Cooling overload frequency reducing temperature at normal speed}] ≤ T_{outer pipe}, then Cooling overload protects machine stopping;

4. Reducing frequency at high speed and stop machine:

If [T_{Cooling overload frequency reducing temperature at high speed}] ≤ T_{outer pipe} [T_{Cooling overload power turn-off temperature}], you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if [T_{Cooling overload frequency reducing temperature at normal speed}] ≤ [T_{outer pipe}], then Cooling overload protects machine stopping;

5. Power turn-off:

If the [T_{Cooling overload power turn-off temperature}] ≤ T_{outer pipe}, then Cooling overload protects machine stopping; If [T_{outer pipe}] < [T_{Cooling overload frequency-limited temperature}] and the compressor has been stopped working for 3 minutes, the machine should be allowed to operate.

6. If the Cooling overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the t_{overload protection times zero clearing time} , the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it).

Overload protection function at the mode of heating

Starting estimation :

After the compressor stopped working for 180s, if T_{inner pipe} T_{heating overload frequency-limited temperature} (the temperature of hysteresis is 35.6°F), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the overload protection:

Clear the trouble at the mode of power turn-off / heating, and the protection times are not counted.

1. Frequency limited

If [T_{heating overload frequency-limited temperature}] ≤ T_{inner pipe} < [T_{heating overload frequency reducing temperature at normal speed}] , you should limit the frequency raising of compressor.

2. Reducing frequency at normal speed and stopping machine:

If [T_{heating overload frequency reducing temperature at normal speed}] ≤ T_{inner pipe} < [T_{heating overload frequency reducing temperature at high speed}], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if T_{heating overload frequency reducing temperature at normal speed} ≤ T_{inner pipe}, then overload protects machine stopping;

3. Reducing frequency at high speed and power turn-off:

If [T_{heating overload frequency reducing temperature at high speed}] ≤ T_{inner pipe} < [T_{heating overload power turn-off temperature}], you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if T_{heating overload frequency}

reducing temperature at normal speed ≤ T_{outer pipe}, then Cooling overload protects machine stopping;

4. Power turn-off:

If the [T_{heating overload power turn-off temperature}] ≤ T_{inner pipe}, then overload protects machine stopping; If T_{inner pipe} T_{heating overload frequency-limited temperature} and the compressor has been stopped working for 3 minutes, the machine should be allowed to operate.

5. If the overload protection power turn-off continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume if the fault keeps on. During the process of running, if the running time of compressor exceeds the t_{overload protection times zero clearing time} , the times of overload protection power turn-off should be cleared to recount. The mode of stopping the machine or transferring to supply air will clear the trouble times immediately (if the trouble can not be resumed, transferring mode will not clear it). Protective function for discharge temperature of compressor

1. Starting estimation:

After the compressor stopped working for 180s, if T_{Discharge} < T_{Discharge limited temperature} (the temperature of hysteresis is 35.6°F), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the discharge temperature:

The machine should be stopped or transferred to supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited

If [T_{Limited frequency temperature during discharging}] ≤ T_{Discharge} < [T_{frequency reducing temperature at normal speed during discharging}] , you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and stopping machine:

If [T_{frequency reducing temperature at normal speed during discharging}] ≤ T_{Discharge} < [T_{frequency reducing temperature at high speed during discharging}], you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if [T_{frequency reducing temperature at normal speed during discharging}] ≤ T_{Discharge}, you should discharge to protect machine stopping;

4. Reducing frequency at high speed and power turn-off:

If [T_{frequency reducing temperature at high speed during discharging}] ≤ T_{Discharge} < [T_{Stop temperature during discharging}], you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if [T_{frequency reducing temperature at normal speed during discharging}] ≤ T_{Discharge}, you should discharge to protect machine stopping;

5. Power turn-off:

If the [T_{Power turn-off temperature during discharging}] ≤ T_{Discharge}, you should discharge to protect machine stopping; If [T_{Discharge}] < [T_{Limited frequency temperature during discharging}] and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If the discharging temperature protection of compressor continuously occurs for six times, it should not be resumed

automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the $t_{\text{Protection times clearing of discharge}}$, the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

7. Frequency limited

If $[I_{\text{Limited frequency when overcurrent}}] \leq [I_{\text{AC Electric current}}] < [I_{\text{frequency reducing when overcurrent}}]$, you should limit the frequency raising of compressor.

8. Reducing frequency:

If $[I_{\text{Frequency reducing when overcurrent}}] \leq [I_{\text{AC Electric current}}] \text{ I Power turn-off when overcurrent}$, you should reduce the compressor frequency till the lower limit or exit the frequency reducing condition;

9. Power turn-off:

If $[I_{\text{Power turn-off machine when overcurrent}}] \leq [I_{\text{AC Electric current}}]$, you should carry out the overcurrent stopping protection; If $I_{\text{AC Electric current}} < [T_{\text{Limited frequency when overcurrent}}]$ and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

10. If the overcurrent protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the $[t_{\text{Protection times clearing of over current}}]$, the discharge protection is cleared to recount.

(6) Voltage sag protection

After start the compressor, if the time of DC link Voltage sag $[U_{\text{Sagging protection voltage}}]$ is measured to be less than $t_{\text{Voltage sag protection time}}$, the machine should be stop at once, hand on the voltage sag trouble, reboot automatically after 30 minutes.

(7) Communication fault

When you have not received any correct signal from the inner machine in three minutes, the machine will stop for communication fault. When you have not received any correct signal from driver IC (aim to the controller for the separating of main control IC and driver IC), and the machine will stop for communication fault. If the communication is resumed, the machine will be allowed to operate.

(8) Module protection

Testing the module protective signal immediately after started, once the module protective signal is measured, stop the machine with module protection immediately. If the module protection is resumed, the machine will be allowed to operate. If the module protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. If the running time of compressor exceeds the $[t_{\text{Protection times clearing of module}}]$, the module protection is cleared to recount.

(9) Module overheating protection

1. Starting estimation:

After the compressor stopped working for 180s, if $T_{\text{Module}} < [T_{\text{Module frequency limited temperature}}]$ (the temperature of hysteresis is 35.6°F), the machine is allowed to start, otherwise it should not be started, and should be stopped to treat according to the module overheating protection: The machine should be stopped or transferred to

supply air, the trouble should be cleared immediately, and the protection times are not counted.

2. Frequency limited

If $[T_{\text{Limited frequency temperature of module}}] \leq T_{\text{Module}} < [T_{\text{frequency reducing temperature at normal speed of module}}]$, you should limit the frequency raising of compressor.

3. Reducing frequency at normal speed and power turn-off:

If $[T_{\text{frequency reducing temperature at normal speed of module}}] \leq T_{\text{Module}} < [T_{\text{frequency reducing temperature at high speed of module}}]$, you should adjust the compressor frequency by reducing 8Hz/90s till the lower limit; After it was running 90s at the lower limit, if $[T_{\text{frequency reducing temperature at normal speed of module}}] \leq T_{\text{Module}}$, you should stop the machine for module overheating protection;

4. Reducing frequency at high speed and power turn-off:

If $[T_{\text{frequency reducing temperature at high speed of module}}] \leq T_{\text{Module}} < [T_{\text{Power turn-off temperature of module}}]$ you should adjust the compressor frequency by reducing 30Hz/90s till the lower limit; After it was running 90s at the lower limit, if $[T_{\text{frequency reducing temperature at normal speed of module}}] \leq T_{\text{Module}}$, you should stop the machine for module overheating protection;

5. Power turn-off:

If the $[T_{\text{Power turn-off temperature of module}}] \leq T_{\text{Module}}$, you should stop the machine for module overheating protection; If $T_{\text{Module}} < [T_{\text{Limited frequency temperature of module}}]$ and the compressor has been stopped for 3 minutes, the machine should be allowed to operate.

6. If protection continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the $[t_{\text{Protection times clearing of module}}]$, the discharge protection is cleared to recount. Stopped or transferred to supply air mode will clear the trouble times immediately (if the trouble can not be resumed, mode transferring also will not clear it).

(10) Compressor overloads protection

If you measure the compressor overload switch action in 3s, the compressor should be stopped for overloading. The machine should be allowed to operate after overload protection was measured to resume. If the overloading protection continuously occurs for three times, it should not be resumed automatically, and you should press the ON/OFF button to resume. The protection times of compressor is allowed to clear after the compressor run $[t_{\text{Protection times clearing of compressor overloading}}]$ 30 minutes.

(11) Phase current overcurrent protection of compressor

During the running process of compressor, you could measure the phase current of the compressor, and control it according to the following steps:

1. Frequency limited

If $[I_{\text{Limited frequency phase current}}] \leq [I_{\text{Phase current T frequency reducing phase current}}]$, you should limit the frequency raising of compressor.

2. Reducing Frequency

If $[I_{\text{Frequency Reducing Phase Current}}] \leq [I_{\text{Phase Current}}] < [I_{\text{Power Turn-Off Phase Current}}]$, the compressor shall continue to reduce frequency till the lowest frequency limit or out of the condition of reducing frequency;

3. Power turn-off

If $[I_{\text{Phase Current}}] \geq [I_{\text{Power Turn-Off Phase Current}}]$, the compressor phase current shall stop working for overcurrent protection; if $[I_{\text{Phase Current}}] \leq [I_{\text{Phase Current}}]$

Frequency Reducing Phase Current], and the compressor have stopped working for 3 min, the machine shall be allowed to operate;

4. If the overcurrent protection of compressor phase current continuously occurs for six times, it should not be resumed automatically, and you should press the ON/OFF button to resume. During the process of running, if the running time of compressor exceeds the [t_{Clearing Time of Compressor Phase Current Times}], the overcurrent protection is cleared to recount.

(12) Starting-up Failure Protection for Compressor

Stop the compressor after its starting-up fails, restart it after 20s if the fault doesn't show, and if they are all failing for the successive start 3 times, it shall be reported as Starting-up Failure, and then restart up it after 3 min. When it still not be able to operate through carry out the above process for 5 times, it is available if press ON/OFF. And the compressor should be cleared the times after it run 2 min.

(13) Out-of-Step Protection for Compressor

The out-of-step protection signal should be detected immediately after starting-up compressor, and once find the out-of-step protection signal, the out-of-step protection shall be stopped; if it can run for lasting power turn-off 3 min, the machine shall be allowed to operate. If it still can't run automatically when the out-of-step protection for compressor happens to stop working for 6 times in succession, it needs to press ON/OFF to operate. And if the running time is more than 10 min, the power turn-off times for out-of-step protection shall be cleared and recounted.

(14) Voltage Abnormity Protection for DC Bus

To detect voltage abnormity protection for dc bus after completing the pre-charge:

1. Over-High Voltage Protection for DC Bus:

If it found the DC bus voltage $U_{DC} > [U_{DC}^{Jiekuangchun\ Protection}]$, turn off PFC and stop the compressor at once, and it shall show the DC over-high voltage failure; it should clear out the failure when the voltage dropped to $U_{DC} < [U_{DC}^{Jiekuangchun\ Recovery}]$ and the compressor stopped for 3 min.

2. Over-Low Voltage Protection for DC Bus:

If it found the DC bus voltage $U_{DC} < [U_{DC}^{Wantuochun\ Protection}]$, turn off PFC and stop the compressor at once, and it shall show the DC over-low voltage; and it should clear out the failure when the voltage raised to $U_{DC} > [U_{DC}^{Wantuochun\ Recovery}]$ and the compressor stopped for 3 min.

3. To detect voltage abnormity protect for DC bus when getting electricity:

If it found the DC bus voltage $U_{DC} > [U_{DC}^{Over-High\ Voltage}]$, turn off the relay at once, and shows voltage abnormity failure for DC Bus. And the failure can't recover except to break off and get the electricity.

(15) Abnormity Protection for Four-way Valve

Under the model of heating operation in good condition: the compressor is detected $[T_{Inner\ Tube} < (T_{Inner\ Ring} - T_{Abnormity\ Temperature\ Difference})]$, during the running, it should be regarded as four-way valve reversion abnormity. And then it can run if stop the reversion abnormity protection for four-way valve 3 min; and

if it still can't run when the reversion abnormity protection for four-way valve happens to stop working for 3 times in succession, it is available if presses ON/OFF.

Attention: the protection shall be shielded during the testing mode and defrosting process, and it shall be cleared out the failure and its times immediately when turning off or delivering wind / cooling / dehumidifying mode conversed (the inverted mode don't clear out the failure when it can't recover to operate).

(16) PFC Protection

1. After start up the PFC, it should detect the protection signal of PFC immediately; under the condition of PFC protection, it should turn off the PFC and compressor at one time;

2. It shows the failure is cleared out if PFC Protection stopped working 3 min and recovers to run automatically;

3. If it still can't run when it occurs PFC protection for 3 times in succession, it is available if presses ON/OFF; and clear the PFC Protection times when start up PFC for 10min.

(17) Failure Detection for Sensor

1. Outdoor Ambient Sensor: detect the failure of sensor at all times.

2. Outdoor Tube Sensor: You should not detect the failure of outdoor tube sensor within 10 minutes heating operation compressor except the defrosting, and you could detect it at other time.

3. Outdoor Exhaust Sensor:

(a) The compressor only detect the sensor failure after it start up 3 min in normal mode;

(b) It should detect the exhaust sensor failure immediately in the testing mode.

4. Module Temperature Sensor:

(a) Short-Circuit Detection: the compressor should be detected immediately when the module temperature sensor occurs short-circuits;

(b) Open-Circuit Detection: the compressor should be detected on open-circuit when it runs 3min (it needn't 30s avoiding the module over-heated).

(c) Detect the sensor failure at all times in the testing mode.

5. Disposal for Sensor Protection

(1) When the short-circuit of sensor is detected within 30s, It is regarded as the temperature of sensor over-high (or infinitely high), and now according to the over-high sensor, the machine should carry out the corresponding protection to stop working, and show the corresponding temperature shutdown protection and sensor failure at the same time (for example: the compressor stops immediately when the outdoor tube sensor short-circuit, and the machine shall show the overload protection and outdoor tube sensor failure).

(2) When the open-circuit of sensor is detected within 30s, The protection shall be stopped and it shall show the corresponding sensor failure.

6. Electric Heating Function of Chassis

(1) When $T_{outdoor\ amb} \leq 32^{\circ}F$, the electric heating of chassis will operate;

(2) When Toutdoor amb.>35.6°F , the electric heating of chassis will stop operation;

(3)When 32°F <Toutdoor amb.≤35.6°F, the electric heating of chassis will keep original status.

7. Electric Heating Function of Compressor

(1) When Toutdoor amb.≤23°F , compressor stops operation, while the electric heating of compressor starts operation;

(2) When Toutdoor amb.>28.4°F , the electric heating of compressor stops operation;

(3) When 23°F <Toutdoor amb.≤28.4°F , the electric heating of compressor will keep original status.

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

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

Please follow the instructions below.

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



WARNINGS

Electrical Safety Precautions:

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

wire by yourself.

11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.
12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.
13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
14. Replace the fuse with a new one of the same specification if it is burnt down; Don't replace it with a cooper wire or conducting wire.
15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

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

Refrigerant Safety Precautions:

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

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

Safety Precautions for Installing and Relocating the Unit:

To ensure safety, please be mindful of the following precautions.

WARNINGS

1. When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.

Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.

2. When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.

Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.

3. When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode. Then, fully close the valve at high pressure side (liquid valve). About 30-40 seconds later, fully close the valve at low pressure side (gas valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recovery should not exceed 1 minute.

If refrigerant recovery takes too much time, air may be sucked in and cause pressure rise or compressor rupture, resulting in injury.

4. During refrigerant recovery, make sure that liquid valve and gas valve are fully closed and power is disconnected before detaching the connection pipe.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

5. When installing the unit, make sure that connection pipe is securely connected before the compressor starts running.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

6. Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas.

If there leaked gas around the unit, it may cause explosion and other accidents.

7. Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.

Poor connections may lead to electric shock or fire.

8. Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.

Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

Main Tools for Installation and Maintenance



Level meter



Measuring tape



Screw driver



Impact drill



Drill head



Electric drill



Electroprobe



Universal meter



Torque wrench



Open-end wrench



Inner hexagon spanner



Electronic leakage detector



Vacuum pump



Pressure meter



Pipe pliers



Pipe pliers



Pipe cutter



Pipe expander



Pipe bender



Soldering appliance



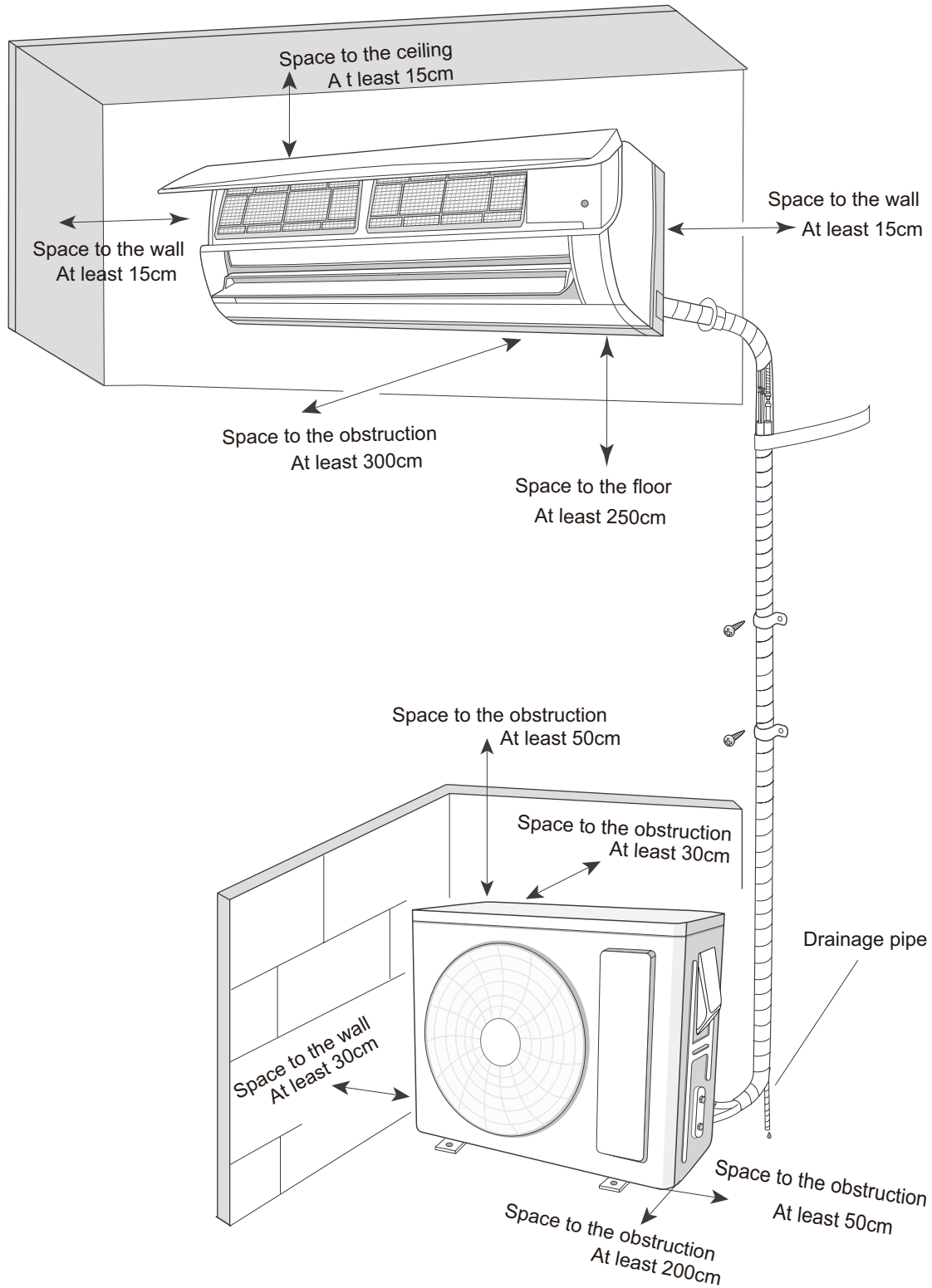
Refrigerant container



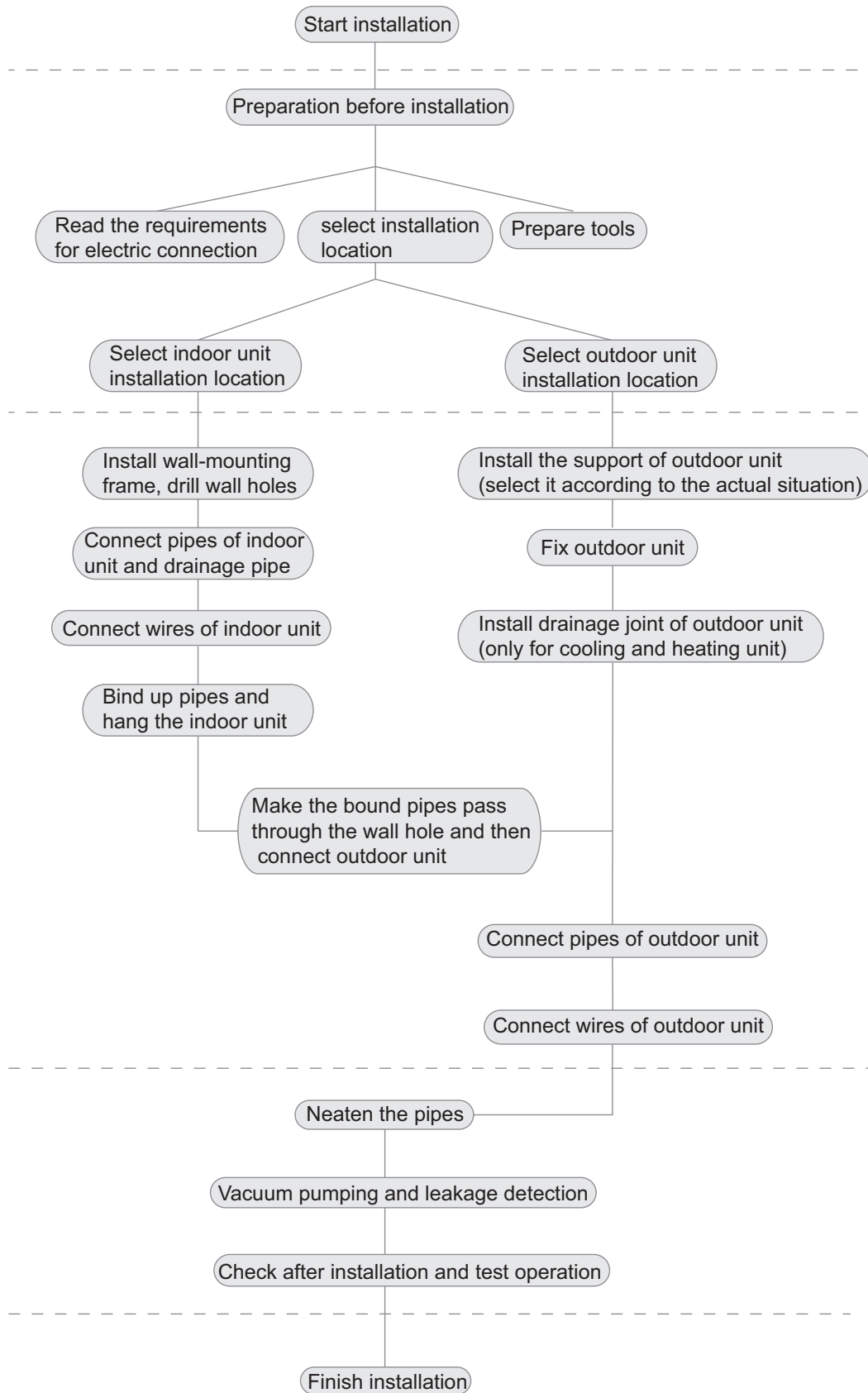
Electronic scale

8. Installation

8.1 Installation Dimension Diagram



Installation Procedures



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

8.2 Installation Parts-checking

| No. | Name |
|-----|---|
| 1 | Indoor unit |
| 2 | Outdoor unit |
| 3 | Connection pipe |
| 4 | Drainage pipe |
| 5 | Wall-mounting frame |
| 6 | Connecting cable(power cord) |
| 7 | Wall pipe |
| 8 | Sealing gum |
| 9 | Wrapping tape |
| 10 | Support of outdoor unit |
| 11 | Fixing screw |
| 12 | Drainage plug(cooling and heating unit) |
| 13 | Owners manual, remote controller |

⚠ Note:

- 1.Please contact the local agent for installation.
- 2.Don't use unqualified power cord.

8.3 Selection of Installation Location

1. Basic Requirement:

Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:

- (1) The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
- (2) The place with high-frequency devices (such as welding machine, medical equipment).
- (3) The place near coast area.
- (4) The place with oil or fumes in the air.
- (5) The place with sulfured gas.
- (6) Other places with special circumstances.
- (7) The appliance shall not be installed in the laundry.
- (8) It's not allowed to be installed on the unstable or motive base structure (such as truck) or in the corrosive environment (such as chemical factory).

2. Indoor Unit:

- (1) There should be no obstruction near air inlet and air outlet.
- (2) Select a location where the condensation water can be dispersed easily and won't affect other people.
- (3) Select a location which is convenient to connect the outdoor unit and near the power socket.
- (4) Select a location which is out of reach for children.
- (5) The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
- (6) The appliance must be installed 2.5m above floor.
- (7) Don't install the indoor unit right above the electric appliance.
- (8) Please try your best to keep way from fluorescent lamp.

3. Outdoor Unit:

- (1) Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood.
- (2) The location should be well ventilated and dry, in which the

- outdoor unit won't be exposed directly to sunlight or strong wind.
- (3) The location should be able to withstand the weight of outdoor unit.
 - (4) Make sure that the installation follows the requirement of installation dimension diagram.
 - (5) Select a location which is out of reach for children and far away from animals or plants. If it is unavoidable, please add fence for safety purpose.

8.4 Electric Connection Requirement

1. Safety Precaution

- (1) Must follow the electric safety regulations when installing the unit.
- (2) According to the local safety regulations, use qualified power supply circuit and air switch.
- (3) Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
- (4) Properly connect the live wire, neutral wire and grounding wire of power socket.
- (5) Be sure to cut off the power supply before proceeding any work related to electricity and safety.
- (6) Do not put through the power before finishing installation.
- (7) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- (8) The appliance shall be installed in accordance with national wiring regulations.

2. Grounding Requirement:

- (1) The air conditioner is I class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
- (2) The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
- (3) The grounding resistance should comply with national electric safety regulations.
- (4) The appliance must be positioned so that the plug is accessible.
- (5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

8.5 Installation of Indoor Unit

1. Choosing Installation location

Recommend the installation location to the client and then confirm it with the client.

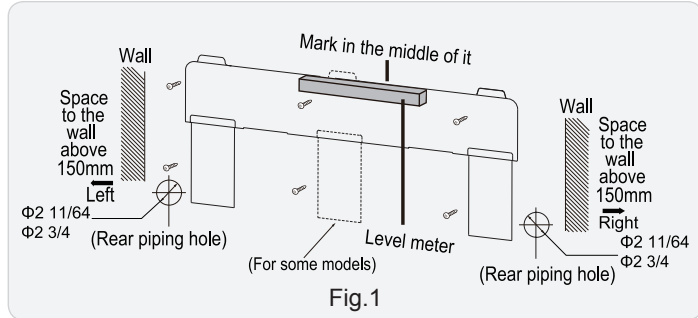
2. Install Wall-mounting Frame

- (1) Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
- (2) Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles in the holes.

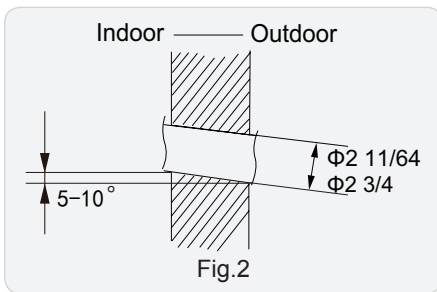
(3) Fix the wall-mounting frame on the wall with tapping screws and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

3. Drill Piping Hole

(1) Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame. (As show in Fig.1)



(2) Drill a piping hole with the diameter of $\Phi 2 \frac{3}{4}$ or $\Phi 2 \frac{11}{64}$ on the selected outlet pipe position. In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of $5-10^\circ$. (As show in Fig.2)



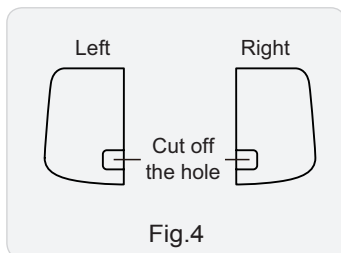
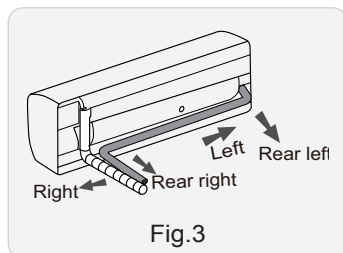
⚠ Note:

Pay attention to dust prevention and take relevant safety measures when drilling the hole.

4. Outlet Pipe

(1) The pipe can be led out in the direction of right, rear right, left or rear left. (As show in Fig.3)

(2) When selecting leading out the pipe from left or right, please cut off the corresponding hole on the bottom case. (As show in Fig.4)



5. Connect the Pipe of Indoor Unit

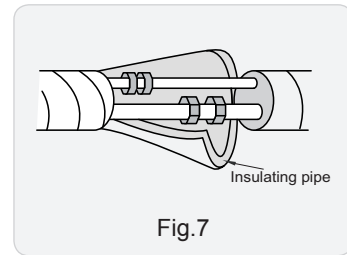
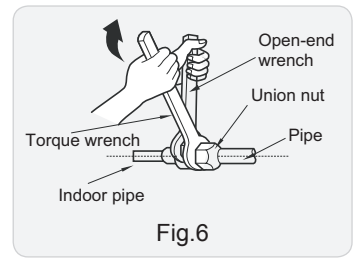
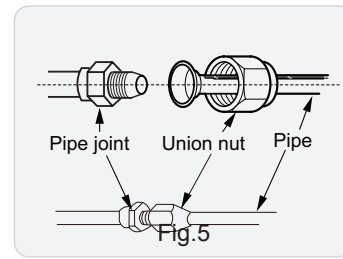
(1) Aim the pipe joint at the corresponding bellmouth. (As show in Fig.5)

(2) Pretightening the union nut with hand.

(3) Adjust the torque force by referring to the following sheet. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque

wrench. (As show in Fig.6)

(4) Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape. (As show in Fig.7)



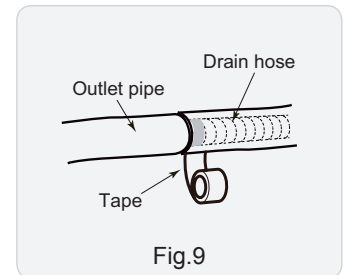
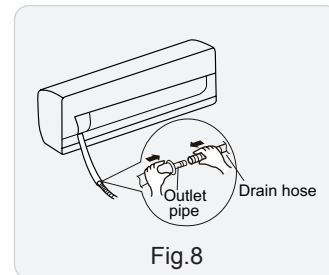
Refer to the following table for wrench moment of force:

| Piping size (inch) | Tightening torque (N·m) |
|--------------------|-------------------------|
| 1/4 | 15~20 |
| 3/8 | 30~40 |
| 1/2 | 45~55 |
| 5/8 | 60~65 |
| 3/4 | 70~75 |

6. Install Drain Hose

(1) Connect the drain hose to the outlet pipe of indoor unit. (As show in Fig.8)

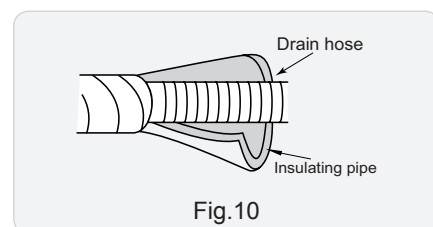
(2) Bind the joint with tape. (As show in Fig.9)



⚠ Note:

(1) Add insulating pipe in the indoor drain hose in order to prevent condensation.

(2) The plastic expansion particles are not provided. (As show in Fig.10)



7. Connect Wire of Indoor Unit

(1) Open the panel, remove the screw on the wiring cover and then take down the cover. (As show in Fig.11)

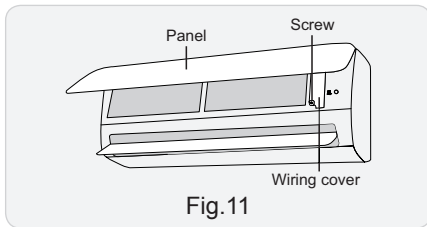


Fig.11

(2) Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side. (As show in Fig.12)

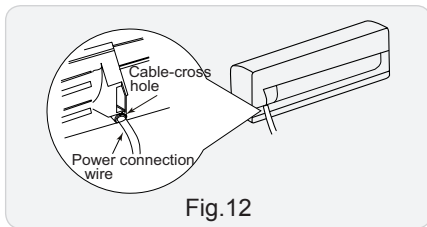


Fig.12

(3) Remove the wire clip; connect the power connection wire/signal control wire (only for cooling and heating unit) to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip. (As show in Fig.13)

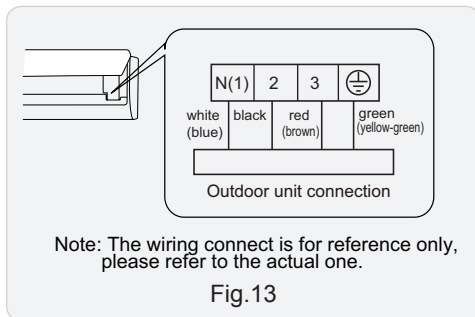


Fig.13

(4) Put wiring cover back and then tighten the screw.
(5) Close the panel.

⚠ Note:

- (1) All wires of indoor unit and outdoor unit should be connected by a professional.
- (2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
- (3) For the air conditioner with plug, the plug should be reachable after finishing installation.
- (4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

8. Bind up Pipe

(1) Bind up the connection pipe, power cord and drain hose with the band. (As show in Fig.14)

(2) Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose. (As show in Fig.15)

(3) Bind them evenly.

(4) The liquid pipe and gas pipe should be bound separately at the end.

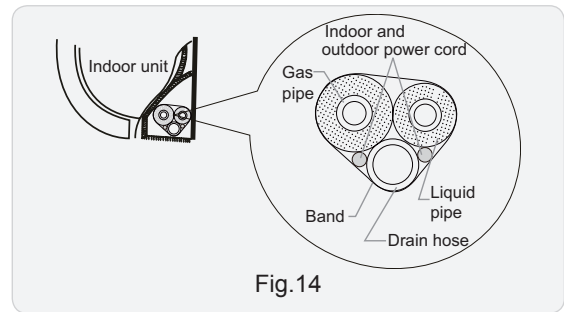


Fig.14

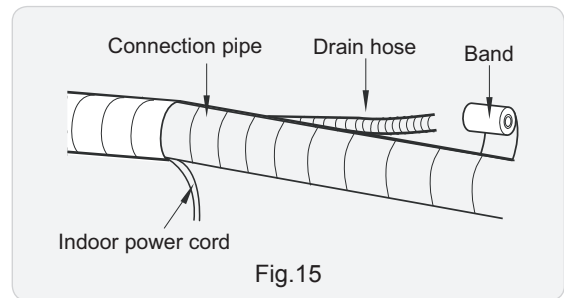


Fig.15

⚠ Note:

- (1) The power cord and control wire can't be crossed or winding.
- (2) The drain hose should be bound at the bottom.

9. Hang the Indoor Unit

(1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.

(2) Hang the indoor unit on the wall-mounting frame.

(3) Stuff the gap between pipes and wall hole with sealing gum.

(4) Fix the wall pipe. (As show in Fig.16)

(5) Check if the indoor unit is installed firmly and closed to the wall. (As show in Fig.17)

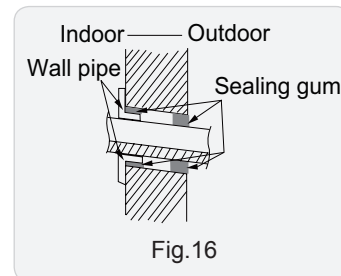


Fig.16

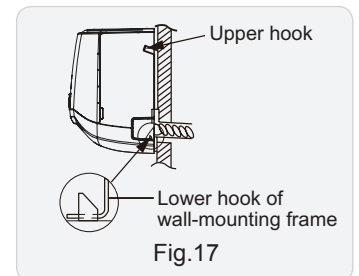


Fig.17

⚠ Note:

Do not bend the drain hose too excessively in order to prevent blocking.

8.6 Installation of Outdoor Unit

1. Fix the Support of Outdoor Unit(Select it according to the actual installation situation)

(1) Select installation location according to the house structure.

(2) Fix the support of outdoor unit on the selected location with expansion screws.

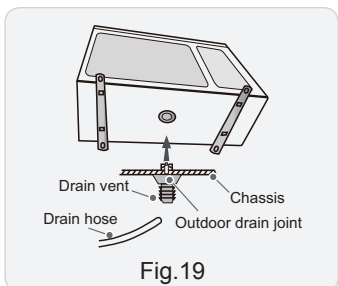
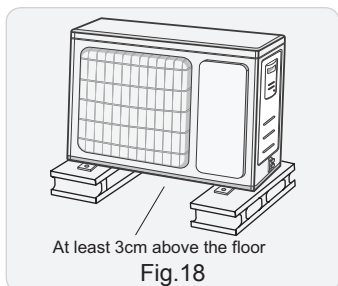
⚠ Note:

(1) Take sufficient protective measures when installing the outdoor unit.

(2) Make sure the support can withstand at least four times the unit weight.

(3) The outdoor unit should be installed at least 3cm above the floor in order to install drain joint.(As show in Fig.18)

(4) For the unit with cooling capacity of 2300W~5000W, 6 expansion screws are needed; for the unit with cooling capacity of 6000W~8000W, 8 expansion screws are needed; for the unit with cooling capacity of 10000W~16000W, 10 expansion screws are needed.

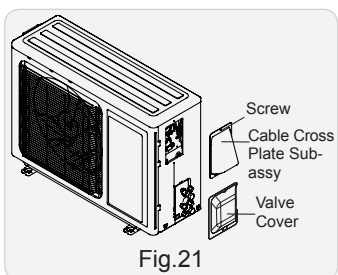
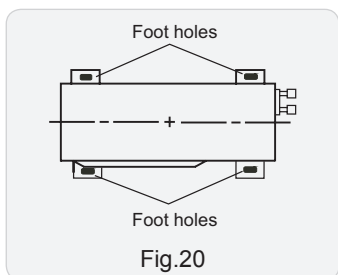


2. Install Drain Joint(Only for cooling and heating unit)

- (1) Connect the outdoor drain joint into the hole on the chassis.
- (2) Connect the drain hose into the drain vent.(As show in Fig.19)

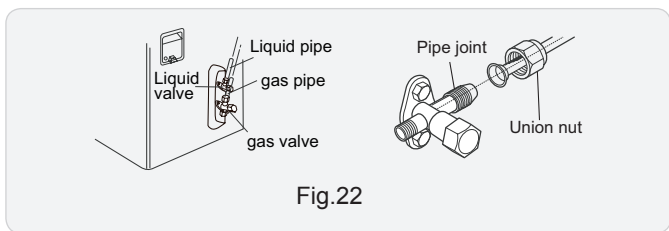
3. Fix Outdoor Unit

- (1) Place the outdoor unit on the support.
- (2) Fix the foot holes of outdoor unit with bolts.(As show in Fig.20)



4. Connect Indoor and Outdoor Pipes

- (1) Remove the screw on the right handle of outdoor unit and then remove the handle. (As show in Fig.21)
- (2) Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.22)



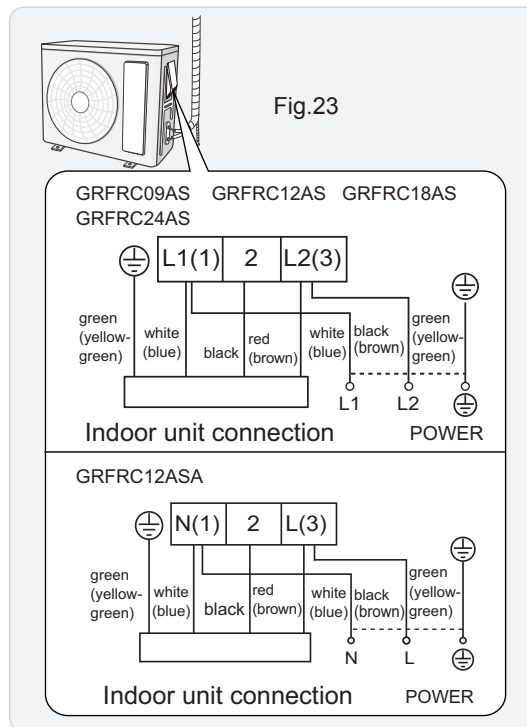
- (3) Pretightening the union nut with hand.
- (4) Tighten the union nut with torque wrench .

Refer to the following table for wrench moment of force :

| Piping size (inch) | Tightening torque (N·m) |
|--------------------|-------------------------|
| 1/4 | 15~20 |
| 3/8 | 30~40 |
| 1/2 | 45~55 |
| 5/8 | 60~65 |
| 3/4 | 70~75 |

5. Connect Outdoor Electric Wire

- (1) Remove the wire clip; connect the power connection wire and signal control wire (only for cooling and heating unit) to the wiring terminal according to the color; fix them with screws. (As show in Fig.23)

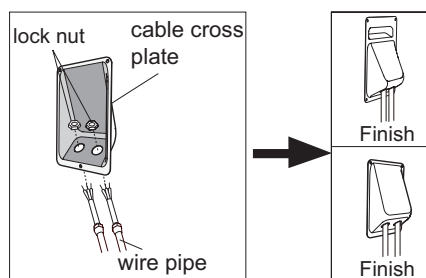


Note: the wiring connect is for reference only, please refer to the actual one.

⚠ Note:

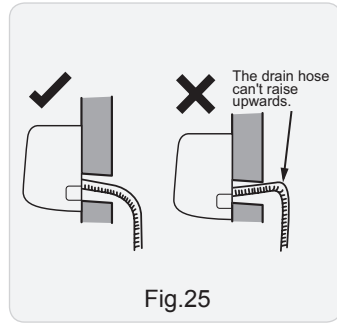
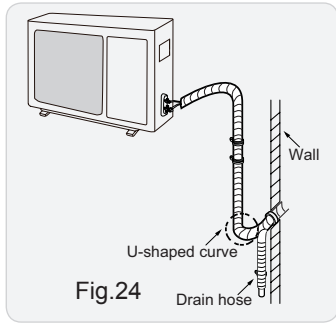
- (1) After tightening the screw, pull the power cord slightly to check if it is firm.
- (2) Never cut the power connection wire to prolong or shorten the distance.
- (3) The connecting wire and connection pipe cannot touch each other.
- (4) Top cover of outdoor unit and electric box assembly should be fixed by the screw. Otherwise, it can cause a fire, or short circuit caused by water or dust.

Install the over line pipe



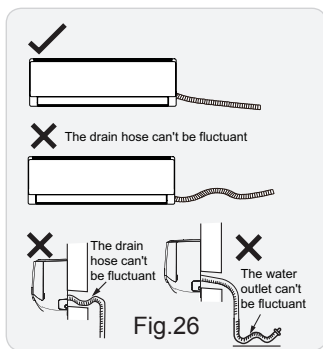
6. Neaten the Pipes

- (1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10cm.
- (2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room. (As show in Fig.24)



⚠ Note:

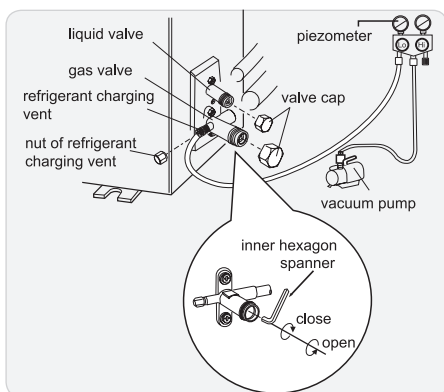
- (1) The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit.(As show in Fig.25)
- (2) Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc.(As show in Fig.26)
- (3) The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.27)



8.7 Vacuum Pumping and Leak Detection

1. Use vacuum pump

- 1.Remove the valve caps on the liquid valve and gas valve and the nut of refrigerant charging vent.
2. Connect the charging hose of piezometer to the refrigerant charging vent of gas valve and then connect the other charging hose to the vacuum pump.
3. Open the piezometer completely and operate for 10-15min to check if the pressure of piezometer remains in -0.1MPa.
4. Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer remains in -0.1MPa. If the pressure decreases, there may be leakage.
5. Remove the piezometer, open the valve core of liquid valve and gas valve completely with inner hexagon spanner.
6. Tighten the screw caps of valves and refrigerant charging vent.
7. Reinstall the handle.



2. Leakage Detection

(1) With leakage detector:

Check if there is leakage with leakage detector.

(2) With soap water:

If leakage detector is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position, There's a leakage.

8.8 Check after Installation and Test Operation

1. Check after Installation

Check according to the following requirement after finishing installation.

| NO. | Items to be checked | Possible malfunction |
|-----|--|---|
| 1 | Has the unit been installed firmly? | The unit may drop, shake or emit noise. |
| 2 | Have you done the refrigerant leakage test? | It may cause insufficient cooling (heating) capacity. |
| 3 | Is heat insulation of pipeline sufficient? | It may cause condensation and water dripping. |
| 4 | Is water drained well? | It may cause condensation and water dripping. |
| 5 | Is the voltage of power supply according to the voltage marked on the nameplate? | It may cause malfunction or damage the parts. |
| 6 | Is electric wiring and pipeline installed correctly? | It may cause malfunction or damage the parts. |
| 7 | Is the unit grounded securely? | It may cause electric leakage. |
| 8 | Does the power cord follow the specification? | It may cause malfunction or damage the parts. |
| 9 | Is there any obstruction in air inlet and air outlet? | It may cause insufficient cooling (heating) capacity. |
| 10 | The dust and sundries caused during installation are removed? | It may cause malfunction or damaging the parts. |
| 11 | The gas valve and liquid valve of connection pipe are open completely? | It may cause insufficient cooling (heating) capacity. |
| 12 | Is the inlet and outlet of piping hole been covered? | It may cause insufficient cooling(heating) capacity or waster eletricity. |

2. Test Operation

(1) Preparation of test operation

- The client approves the air conditioner installation.
- Specify the important notes for air conditioner to the client.

(2) Method of test operation

- Put through the power, press ON/OFF button on the remote controller to start operation.
- Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.
- If the ambient temperature is lower than 16°C , the air conditioner can't start cooling.

9. Maintenance

9.1 Error Code List

| Error code | Malfunction name | AC status | Possible causes |
|------------------|--|---|---|
| C5 | Malfunction of jumper cap | The complete unit stops operation | 1. Jumper cap is not installed in control panel; 2. Poor contact of jumper cap; 3. Jumper cap is damaged; 4. The tested circuit of jumper cap on control panel is abnormal. |
| E6 | Communication malfunction between indoor unit and outdoor unit | Cool: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | See "Communication malfunction" |
| H5 | IPM protection | Cool/Dry: compressor stops operation, while indoor fan operates. Heat: all loads stops operation. | See "IPM protection, over-phase current of compressor" |
| L3 LA | Malfunction of outdoor fan/ malfunction of DC motor | Cool/Dry: all loads stops operation except indoor fan. Heat: all loads stops operation. | 1. Outdoor condenser, air inlet and air outlet are blocked by filth or dirt; 2. Fan is blocked or loosened; 3. Motor or connection wire of motor is damaged; 4. Main board of outdoor unit is damaged; (As for dual-outdoor fan, L3 indicates fan 1; LA indicates fan 2) |
| H3 | Overload protection of compressor | Cool/Dry: compressor stops operation, while indoor fan operates. Heat: all loads stops operation. | 1. Overload wire of compressor is loose; 2. The overload protector is damaged. Under normal circumstances, the resistance between both ends of terminal is less than 1ohm. 3. See "Overload protection of compressor , High discharge temperature protection of compressor" |
| F0 | Refrigerant insufficient protection, cut-off protection of refrigerant | Cool: compressor and outdoor fan stops operation, while indoor fan operates; Heat: Compressor, outdoor fan and indoor fan stops operation. | 1. Is system cooling under high humidity environment, thus temperature difference of heat transfer is small; 2. Check whether the big valve and small valve of outdoor unit are opened completely; 3. Is the temperature sensor of evaporator of indoor unit loose? 4. Is the temperature sensor of condenser of outdoor unit loose? 5. Is the capillary or the electronic expansion valve blocked? 6. Is refrigerant leaking? |
| F1 | Indoor ambient temperature sensor is open/short-circuited | Cool/Dry: indoor fan operates, while compressor and outdoor fan stops operation; Heat: all loads stops operation. | 1. Temperature sensor is not well connected; 2. Temperature sensor is damaged 3. Main board of indoor unit is damaged. |
| F2 | Indoor evaporator temperature sensor is open/short-circuited | Cool/Dry: indoor fan operates, while compressor and outdoor fan stops operation; Heat: all loads stops operation. | 1. Temperature sensor is not well connected; 2. Temperature sensor is damaged 3. Main board of indoor unit is damaged. |
| H6 | No feedback from indoor unit's motor | The complete unit stops operation | 1. Is the fan blocked? 2. Is the motor terminal loose? 3. Is the connection wire of motor damaged? 4. Is the motor damaged? 5. Is the main board of indoor unit damaged? |
| LP | Indoor unit and outdoor can be matched with each other | Heat: compressor, outdoor unit and indoor fan stops operation. | Capacity of indoor unit and outdoor unit can't be matched. |
| C4 | Malfunction of jumper cap of outdoor unit | Heat: all loads are stopped; other modes: outdoor unit stops operation. | Jumper cap of outdoor unit hasn't been installed. |
| b7 | Gas valve temperature sensor is ON / short-circuited | | 1. Temperature sensor is not well connected or damaged; 2. The wire of temperature sensor is damaged, causing short circuit to copper pipe or outer casing; 3. Main board of outdoor unit is damaged. |

| Error code | Malfunction name | AC status | Possible causes |
|------------|--|--|--|
| b5 | Liquid valve temperature sensor is ON / short-circuited | | <ol style="list-style-type: none"> 1. Temperature sensor is not well connected or damaged; 2. The wire of temperature sensor is damaged, causing short circuit to copper pipe or outer casing; 3. Main board of outdoor unit is damaged. |
| E1 | High pressure protection of system | Cool/Dry: all loads stops operation except indoor fan; Heat: all loads stops operation. | <ol style="list-style-type: none"> 1. Heat exchange of outdoor unit is too dirty, or it blocked the air inlet/outlet; 2. Is power voltage normal; (three-phase unit) 3. Ambient temperature is too high; 4. Wiring of high pressure switch is loose or high pressure switch is damaged; 5. The internal system is blocked; (dirt blockage, ice blockage, oil blockage, angle valve is not completely opened) 6. Main board of outdoor unit is damaged; 7. Refrigerant is too much. |
| E3 | Low pressure/low system pressure protection/ compressor low pressure protection | Cool: compressor, outdoor fan and indoor fan stop operation; Heat: compressor and outdoor fan stop operation at first. About 1min later, indoor fan stops operation; 2mins later, the 4-way valve stop operation. | <ol style="list-style-type: none"> 1. Low pressure switch is damaged; 2. Refrigerant inside the system is insufficient. |
| E4 | High discharge temperature protection of compressor | Cool/Dry: compressor and outdoor fan stops operation, while indoor fan operates; Heat: all loads stops operation. | See "Overload protection of compressor , High discharge temperature protection of compressor" |
| E5 | AC overcurrent protection | Cool/Dry: compressor and outdoor fan stops operation, while indoor fan operates; Heat: all loads stops operation. | <ol style="list-style-type: none"> 1. Power voltage is unstable; 2. Power voltage is too low; 3. System load is too high, which leads to high current; 4. Heat exchange of indoor unit is too dirty, or it blocked the air inlet/outlet; 5. Fan motor operation is abnormal; the fan speed is too low or not functioning; 6. Compressor is blocked; 7. The internal system is blocked; (dirt blockage, ice blockage, oil blockage, angle valve is not completely opened) 8. Main board of outdoor unit is damaged. See "AC overcurrent protection" |
| E7 | Mode shock/sysmte mode shock | Load of indoor unit stops operation (indoor fan, E-heater, swing) | Malfunction of one-to-more system; there may be two indoor units which has set the shock mode, such as one is cooling and the other is heating. |
| E8 | High temperature prevention protection | Cool: compressor stops operation while indoor fan operates; Heat: all loads stops operation. | See "High temperature prevention protection; high power; system isabnormal" |
| EE | Malfunction of EEPROM | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | Main board of outdoor unit is damaged. |
| F0 | Refrigerant-recovery mode | Cool/Dry: compressor and outdoor fan stops operation, while indoor fan operates. | Refrigerant recovery. The maintenance personnel operate it when he is maintaining the unit. |
| F3 | Outdoor ambient temperature is open/short-circuited | Cool/Dry: compressor and outdoor fan stop operation, while indoor fan operates; Heat: all loads stops operation. | <ol style="list-style-type: none"> 1. Temperature sensor is not connected well or damaged; 2. Temperature sensor wire of outdoor unit is damaged; short circuit between the temperature sensor and copper pipe or outer case 3. Main board of outdoor unit is damaged; |

| Error code | Malfunction name | AC status | Possible causes |
|------------|--|--|---|
| F4 | Outdoor condenser temperature sensor is open/short-circuited | Cool/Dry: compressor and outdoor fan stop operation, while indoor fan operates; Heat: after operating for 3mins, all loads stops operation. | 1. Temperature sensor is not connected well or damaged; 2. Temperature sensor wire of outdoor unit is damaged; short circuit between the temperature sensor and copper pipe or outer case; 3. Main board of outdoor unit is damaged. |
| F5 | Outdoor air discharge temperature is open/short-circuited | Complete unit stops operation; motor of sliding door is cut off power. | 1. The exhaust temperature sensor is not connected well or damaged. 2. Temperature sensor wire of outdoor unit is damaged; short circuit between the temperature sensor and copper pipe or outer case 3. Main board of outdoor unit is damaged; |
| FC | Malfunction of micro switch | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | 1. The sliding door is blocked; 2. Malfunction of the photoelectric inspection panel of sliding door; |
| H4 | System is abnormal | Cool/Dry: all loads stops operation except indoor fan; Heat: all loads stops operation. | See "High temperature prevention protection; high power; system is abnormal" |
| H7 | Desynchronizing of compressor | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | See "Desynchronization diagnosis for compressor" |
| HC | PFC protection | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | 1. The power grid quality is bad; AC input voltage fluctuates sharply; 2. Power plug of air conditioner or wiring board or reactor is not connected reliably; 3. Indoor and outdoor heat exchanger is too dirty, or air inlet/outlet is blocked; 4. Main board of outdoor unit is damaged. |
| HE | Demagnetization protection of compressor | Cool: compressor and outdoor fan stop operation; Heat: compressor and outdoor fan stop operation at first; about 1min later, indoor fan stops operation. | 1. The main board of outdoor unit is damaged; 2. Compressor is damaged; |
| UF | Communication malfunction between indoor unit and inspection board | Normal operation | 1. Poor connection between the indoor unit and the inspection board. 2. The main board of indoor unit is damaged; 3. The inspection board is damaged; |
| L1 | Malfunction of humidity sensor | Compressor, outdoor fan and indoor fan stop operation; | The inspection board is damaged. |
| L9 | High power protection | Cool: compressor and outdoor fan stops operation, while indoor fan operates. | See "High temperature prevention protection; high power; system is abnormal" |
| Lc | Start-up failed | Cool/Dry: compressor stops, while indoor fan operates; Heat: all loads stops operation. | See "Malfunction diagnosis for failure startup" |
| Ld | Lost phase | Cool: compressor and outdoor fan stop operation; Heat: compressor and outdoor fan stop operation at first; about 1min later, indoor fan stops operation. | 1. The main board of outdoor unit is damaged; 2. The compressor is damaged; 3. The connection wire of compressor is not connected well. |
| PS | Over-phase current protection of compressor | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | See "Overload protection of compressor , High discharge temperature protection of compressor" |

| Error code | Malfunction name | AC status | Possible causes |
|------------|--|--|---|
| OE | Undefined outdoor unit error | Cool: compressor and outdoor fan stops operation, while indoor fan operates; Heat: compressor, outdoor fan and indoor fan stop operation. | 1. Outdoor ambient temperature exceeds the operation range of unit (eg: less than -20°C or more than 60°C for cooling; more than 30°C for heating); 2. Are wires of compressor not connected tightly? 3. Failure startup of compressor? 4. Is compressor damaged? 5. Is main board damaged? |
| PE | Communication malfunction between the drive board and the main board | Cool: compressor and outdoor fan stops operation; Heat: compressor and outdoor fan stop at first; about 1min later, indoor fan stops operation; | 1. The drive board is damaged; 2. The main board of outdoor unit is damaged; 3. The drive board and the main board is not connected well. |
| PF | Circuit malfunction of module temperature sensor | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | Replace outdoor control board |
| PE | Module overheating protection | Cool: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | 1. Air inlet / air outlet of outdoor unit are blocked by filth or dirt; 2. Condenser of outdoor unit is blocked by filth or dirt; 3. IPM screw of main board is not tightened; 4. Main board of outdoor unit is damaged; |
| PF | Malfunction of ambient temperature sensor of drive board | Cool: compressor, outdoor fan and indoor fan stop operation; Heat: compressor and outdoor fan stop operation at first; about 1min later, indoor fan stops operation. | 1. The ambient temperature sensor of the drive board is not connected well; 2. Malfunction of the ambient temperature sensor of drive board. |
| PH | DC bus voltage is too high | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | 1. Measure the voltage between position L and position N on the wiring board (XT). If it's higher than 265 VAC, please turn on the unit until the power voltage is decreased to the normal range; 2. If the AC input is normal, please replace the outdoor control board. |
| PL | DC bus voltage is too low | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | 1. Measure the voltage between position L and position N on the wiring board (XT). If it's lower than 150 VAC, please turn on the unit until the power voltage is increased to the normal range; 2. If the AC input is normal, please replace the outdoor control board. |
| PU | Charging malfunction of capacitor | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | See "Charging malfunction of capacitor" |
| RF | Malfunction of RF module | Cool: compressor and outdoor fan stop operation; Heat: compressor and outdoor fan stop operation at first; about 1min later, indoor fan stops operation. | 1. The connection wire of RF module is not connected well. 2. Malfunction of RF module; |
| U1 | Phase current detection circuit malfunction of | Cool: compressor and outdoor fan stops operation, while indoor fan operates; Heat: compressor, outdoor fan and indoor fan stops operation. | The control board is damaged |
| U2 | Lost phase protection of compressor | Cool: compressor and outdoor fan stop operation; Heat: compressor and outdoor fan stop operation at first; about 1min later, indoor fan stops operation. | 1. The main board of outdoor unit is damaged; 2. The compressor is damaged; 3. The connection wire of compressor is not connected well. |

| Error code | Malfunction name | AC status | Possible causes |
|------------|--|--|--|
| U3 | DC bus voltage drop malfunction | Cool/Dry: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | The power voltage is unstable. |
| U5 | Current detection malfunction of unit | Cool: compressor and outdoor fan stops operation, while indoor fan operates; Heat: compressor, outdoor fan and indoor fan stops operation. | 1. Is the complete unit lacking of refrigerant? 2. There's malfunction for the circuit of control board of outdoor unit. Replace the control board of outdoor unit. |
| U7 | 4-way valve is abnormal | This malfunction occurs when the unit is heating. All loads stops operation. | 1. Power voltage is lower than AC175V; 2. Wiring terminal of 4-way valve is loose or broken;3. 4-way valve is damaged. Replace the 4-way valve. |
| U8 | Malfunction of zero-crossing signal of indoor unit | Compressor, outdoor fan and indoor fan stop operation. | 1. The power is abnormal; 2. Main board of indoor unit is damaged. |
| U9 | Zero-crossing malfunction of outdoor unit | Cool: compressor stops operation, while indoor fan operates; Heat: all loads stops operation. | Replace the control board of outdoor unit. |
| E2 | Evaporator anti-freezing protection | | Not error code, it is the status code in cooling process |
| E9 | Anti cold air protection | | Not error code, it is the status code in cooling process |
| | Defrosting | Heat indicator Flash once/10s | Not error code, it is the status code in cooling process |

Analysis or processing of some of the malfunction display:

1. Compressor discharge protection

Possible causes: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible cause: Sudden drop of supply voltage.

3. Communication malfunction

Processing method: Check if communication signal cable is connected reliably.

4. Sensor open or short circuit

Processing method: Check whether sensor is normal, connected with the corresponding position on the controller and if damage of lead wire is found.

5. Compressor over load protection

Possible causes: insufficient or too much refrigerant; blockage of capillary and increase of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrigerant amount; replace the capillary; replace the compressor; use universal meter to check if the contactor of compress or is fine when it is not overheated, if not replace the protector.

6. System malfunction

i.e. overload protection. When tube temperature (Check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high, protection will be activated.

Possible causes: Outdoor temperature is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.

please refer to the malfunction analysis in the previous section for handling method .

7. IPM module protection

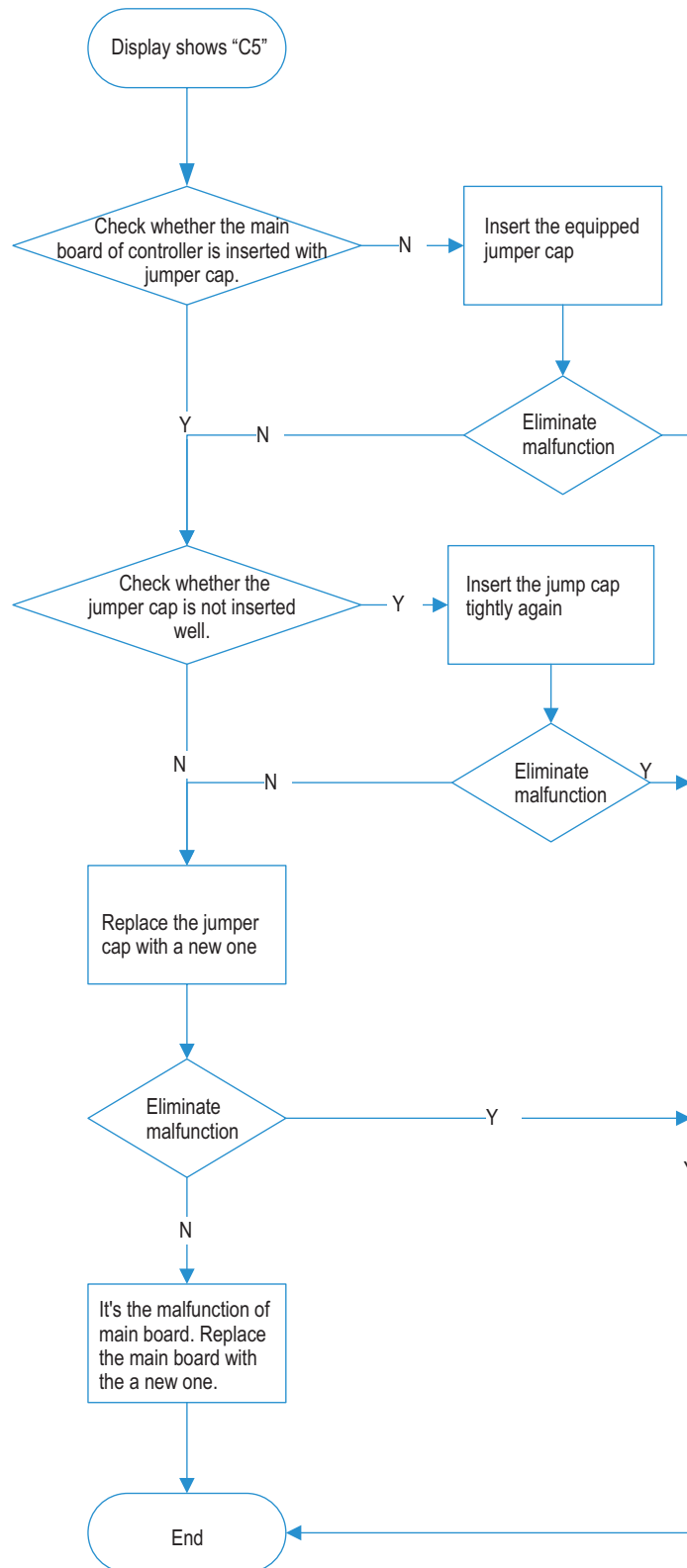
Processing method: Once the module malfunction happens, if it persists for a long time and can not be self-canceled, cut off the power and turn off the unit, and then re-energize the unit again after about 10 min. After repeating the procedure for several times, if the malfunction still exists, replace the module.

9.2 Procedure of Troubleshooting

1. Troubleshooting for jumper cap C5

Main check points:

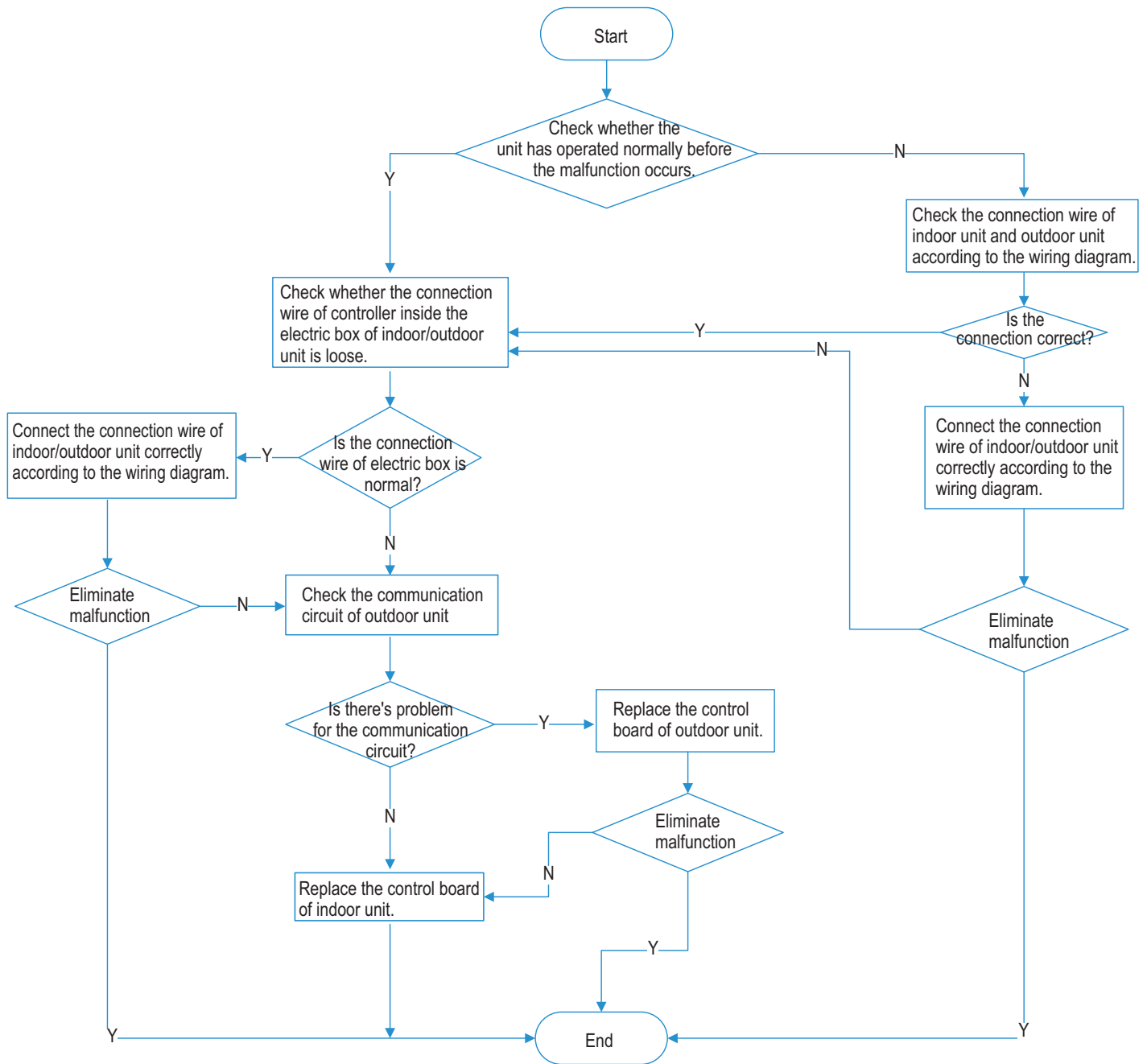
- (1) jumper cap
- (2) control board of indoor unit



2. Communication malfunction E5

Main check points:

- (1) Connection wire between indoor unit and outdoor unit
- (2) Wiring inside the unit
- (3) Communication circuit of control board of indoor unit
- (4) Communication circuit of control board of outdoor unit

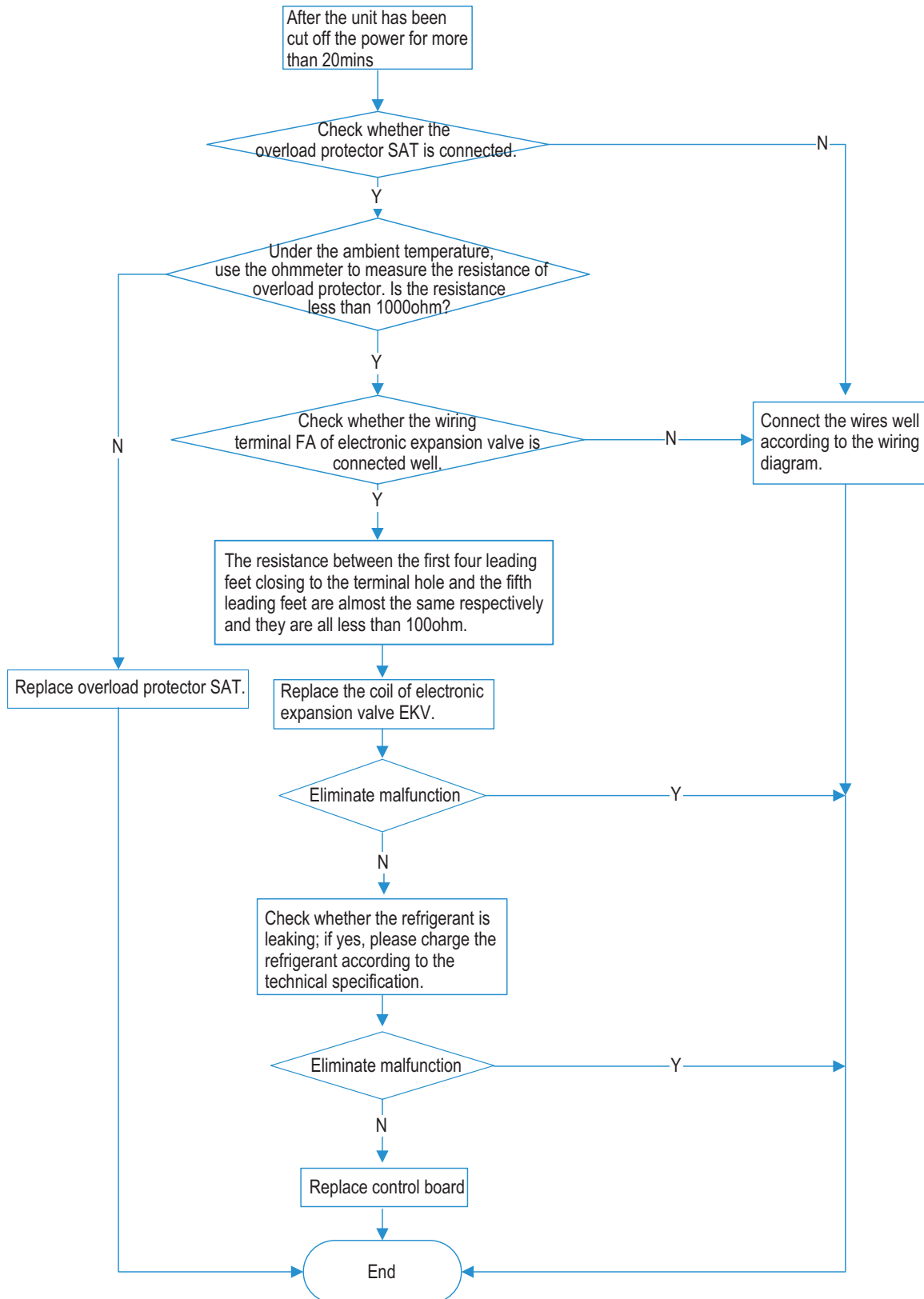


4. Overload protection of compressor H3, high discharge temperature, protection of compressor E4

Main check points:

- (1) electronic expansion valve
- (2) expansion valve terminal
- (3) charging amount of refrigerant
- (4) overload protector

NOTE: The control board as below means the control board of outdoor unit.

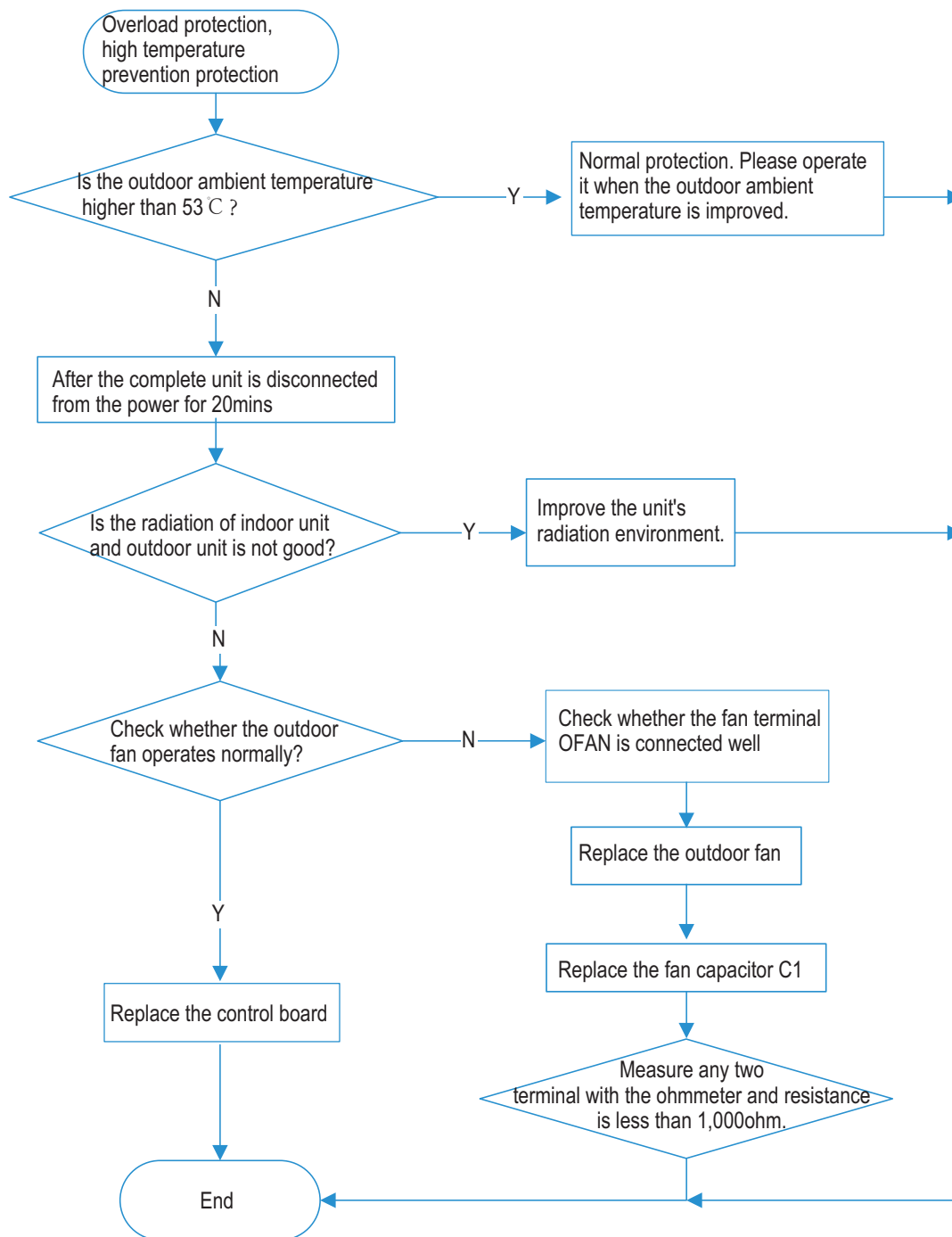


6.High temperature prevention protection E8 ; high power L9 ; system is abnormal H4

Main check points:

(1) outdoor temperature (2) fan (3)air inlet and air outlet of indoor/outdoor unit

NOTE:The control board as below means the control board of outdoor unit.

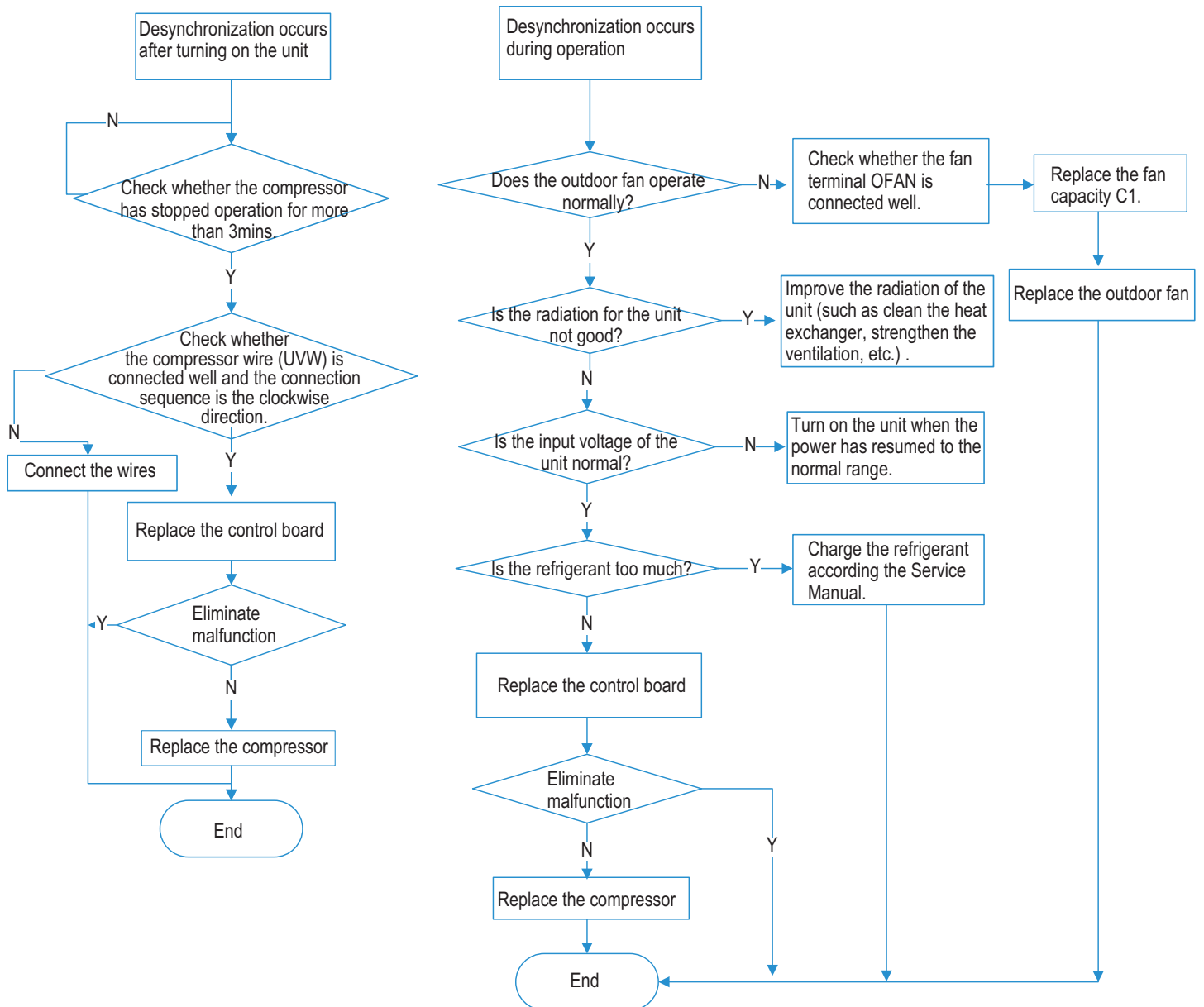


7.Desynchronization diagnosis for compressor H7

Main check point:

(1) system pressure (2) power supply voltage

NOTE:The control board as below means the control board of outdoor unit.

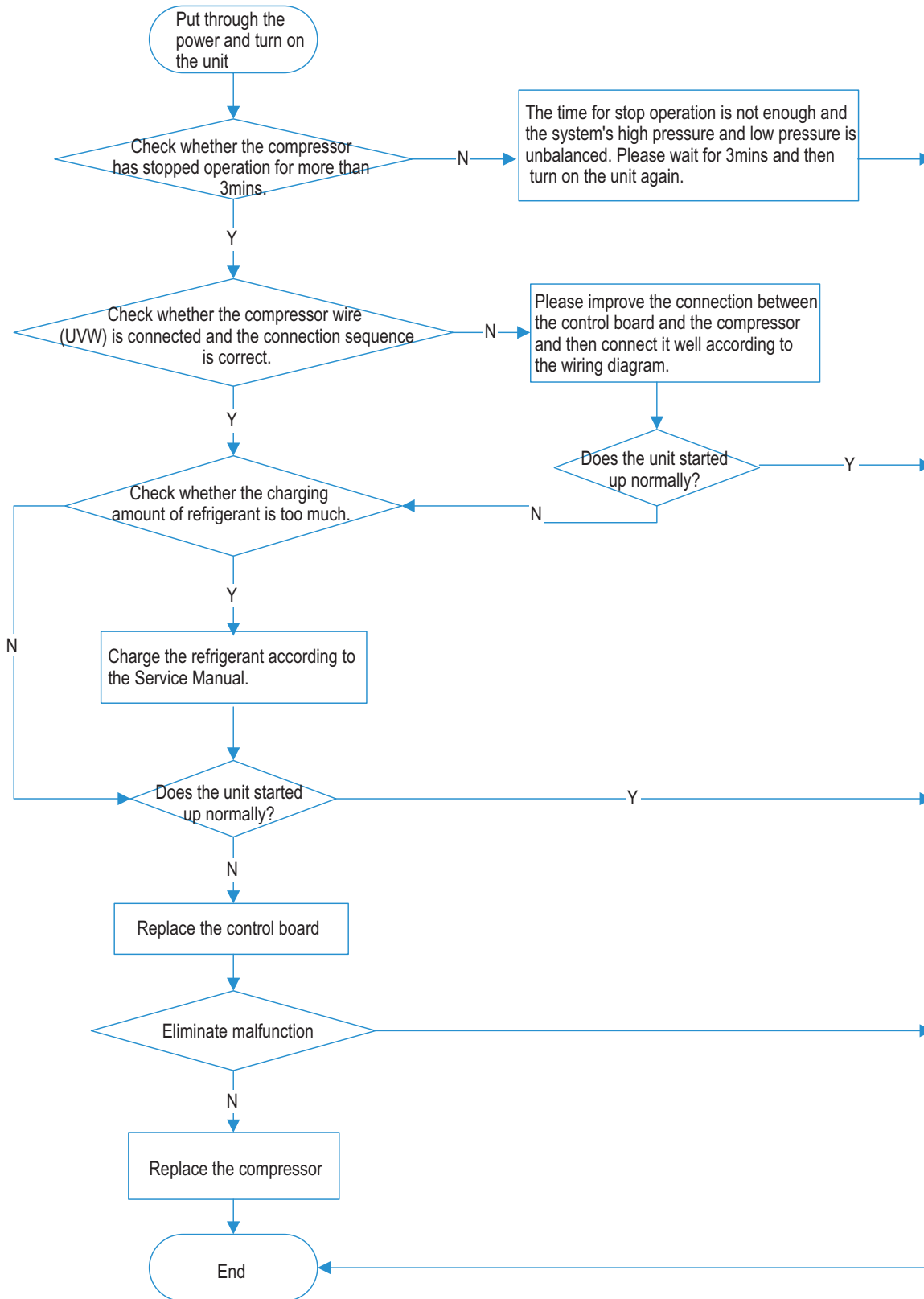


8. Malfunction diagnosis for failure startup Lc

Main check points:

(1) compressor wire (2) compressor (3) charging amount of refrigerant

NOTE: The control board as below means the control board of outdoor unit.

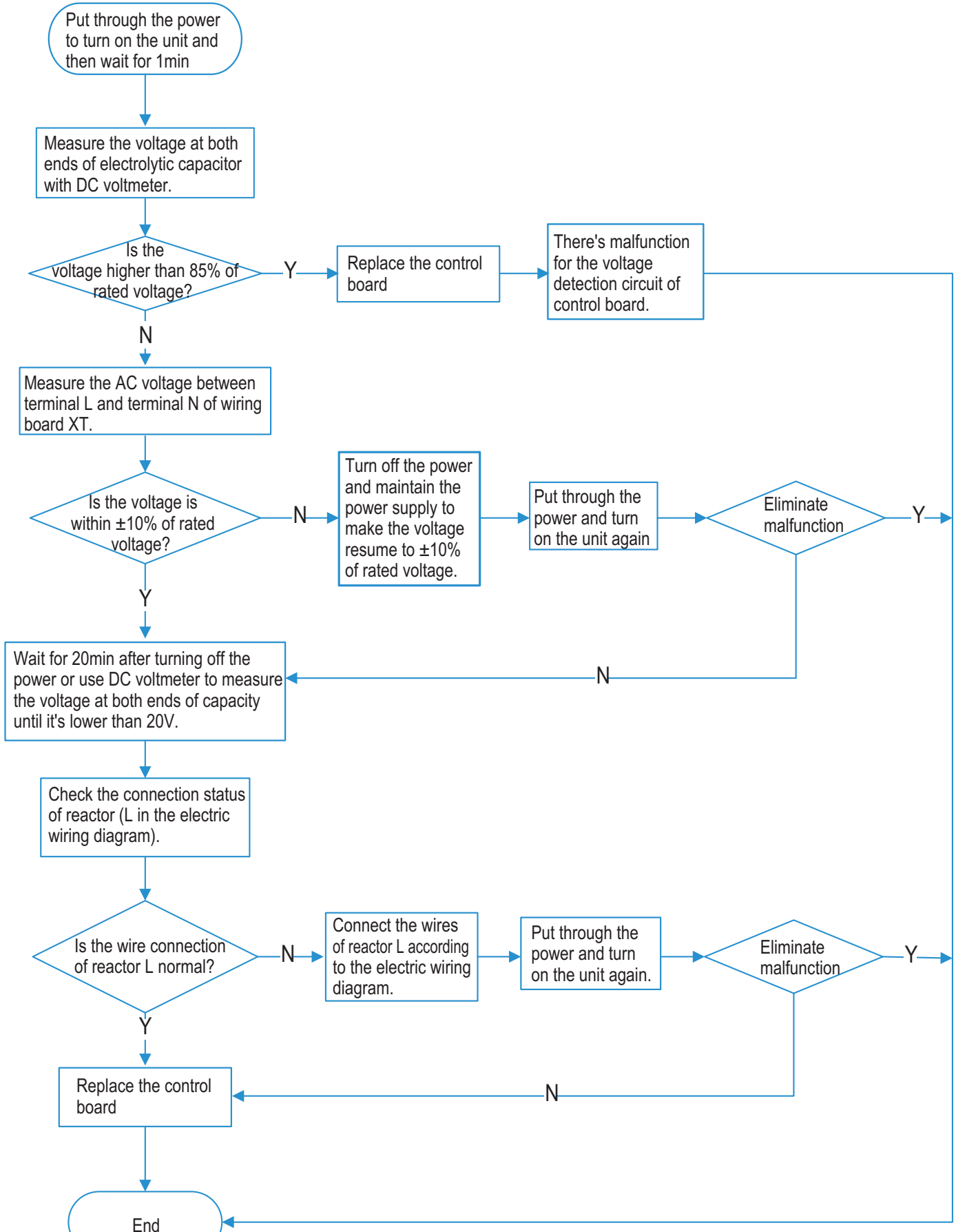


9. Charging malfunction of capacitor PU

Main check points:

(1) wiring board XT (2) reactor

NOTE: The control board as below means the control board of outdoor unit.

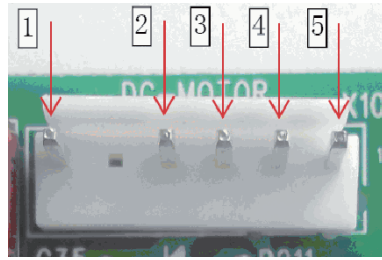
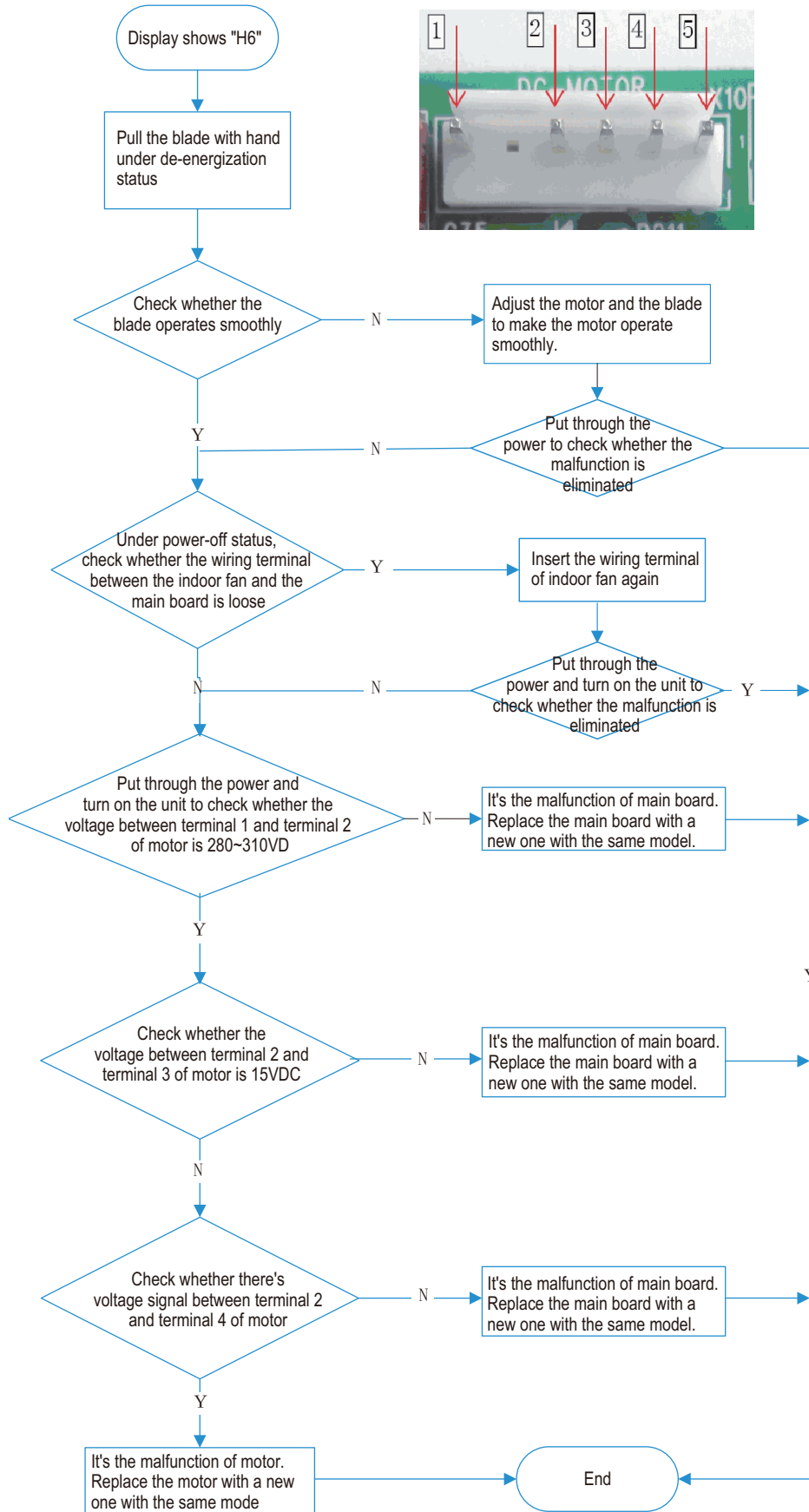


10. Troubleshooting-motor(indoor fan) doesn't operate H6

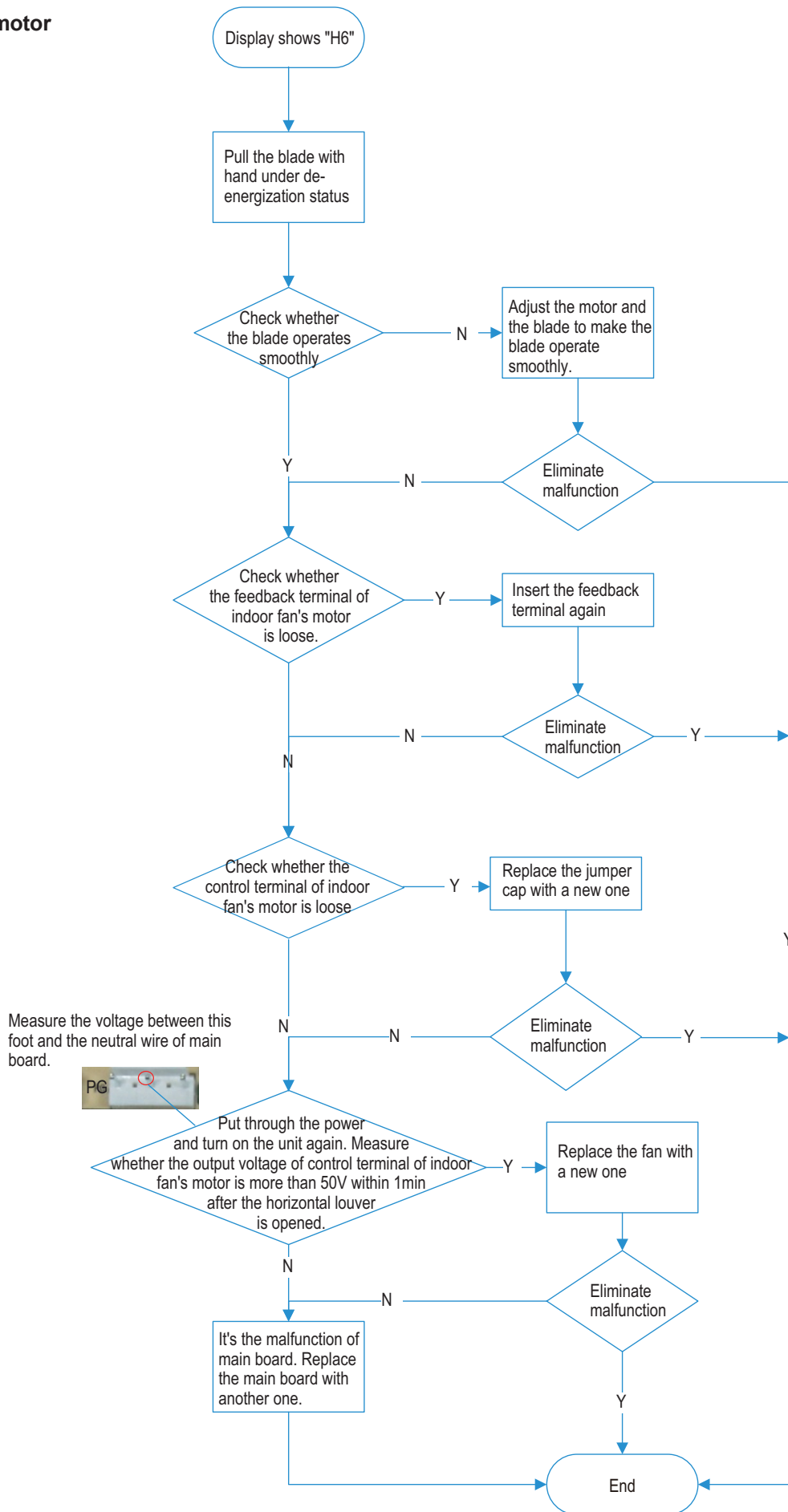
Main check points:

(1) connection terminal (2) motor (3) control board AP1 of indoor unit (4) blade

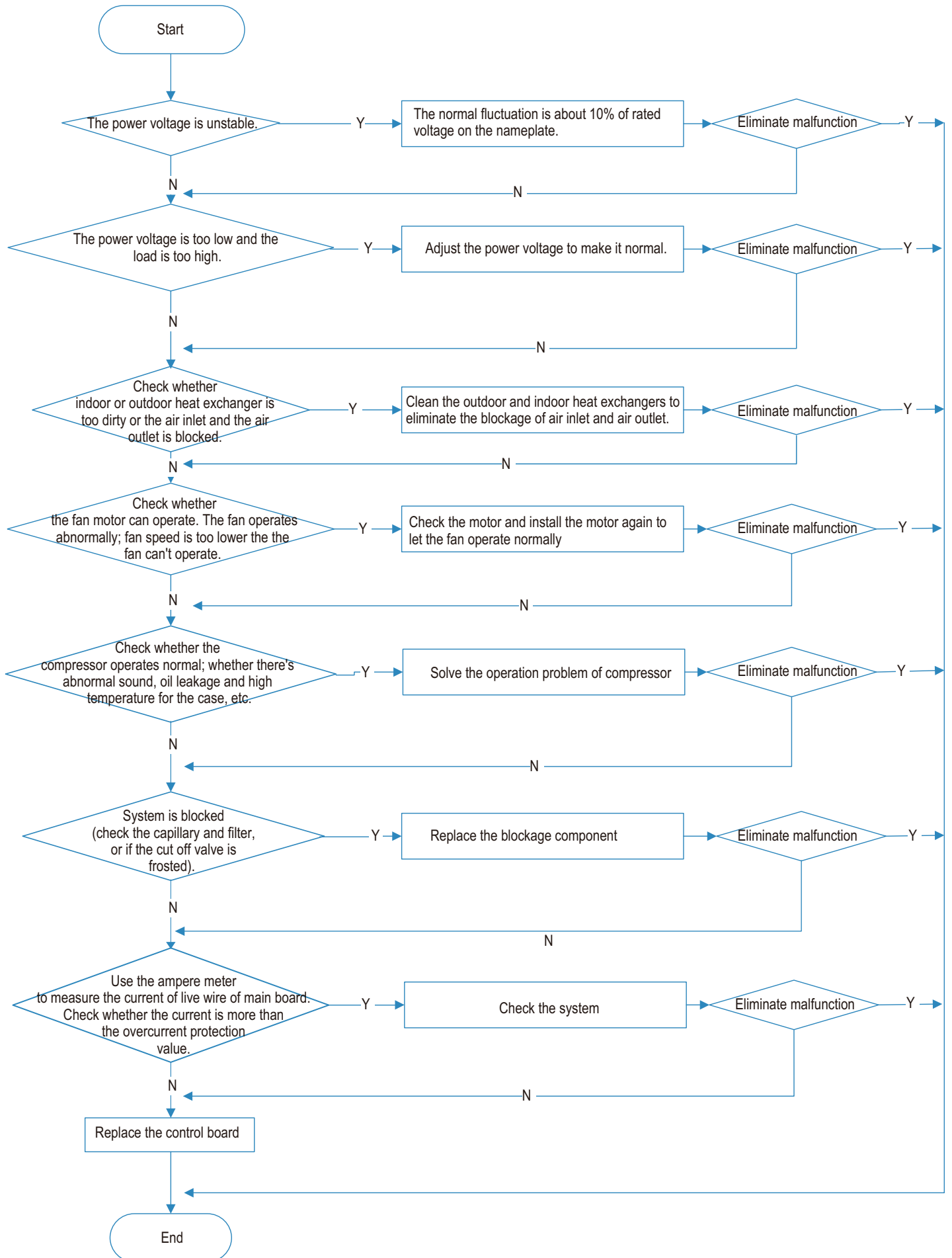
10.1 DC motor



10.2 PG motor



11. AC overcurrent protection E5



9.3 Troubleshooting for Normal Malfunction

1. Air Conditioner can't be Started Up

| Possible Causes | Discriminating Method (Air conditioner Status) | Troubleshooting |
|---|---|--|
| No power supply, or poor connection for power plug | After energization, operation indicator isn't bright and the buzzer can't give out sound | Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well. |
| Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals | Under normal power supply circumstances, operation indicator isn't bright after energization | Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly |
| Electric leakage for air conditioner | After energization, room circuit breaker trips off at once | Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord. |
| Model selection for air switch is improper | After energization, air switch trips off | Select proper air switch |
| Malfunction of remote controller | After energization, operation indicator is bright, while no display on remote controller or buttons have no action. | Replace batteries for remote controller Repair or replace remote controller |

2. Poor Cooling (Heating) for Air Conditioner

| Possible Causes | Discriminating Method (Air conditioner Status) | Troubleshooting |
|--|--|---|
| Set temperature is improper | Observe the set temperature on remote controller | Adjust the set temperature |
| Rotation speed of the IDU fan motor is set too low | Small wind blow | Set the fan speed at high or medium |
| Filter of indoor unit is blocked | Check the filter to see its blocked | Clean the filter |
| Installation position for indoor unit and outdoor unit is improper | Check whether the installation position is proper according to installation requirement for air conditioner | Adjust the installation position, and install the rainproof and sunproof for outdoor unit |
| Refrigerant is leaking | Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Units pressure is much lower than regulated range | Find out the leakage causes and deal with it. Add refrigerant. |
| Malfunction of 4-way valve | Blow cold wind during heating | Replace the 4-way valve |
| Malfunction of capillary | Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked | Replace the capillary |
| Flow volume of valve is insufficient | The pressure of valves is much lower than that stated in the specification | Open the valve completely |
| Malfunction of horizontal louver | Horizontal louver can't swing | Refer to point 3 of maintenance method for details |
| Malfunction of the IDU fan motor | The IDU fan motor can't operate | Refer to troubleshooting for H6 for maintenance method in details |
| Malfunction of the ODU fan motor | The ODU fan motor can't operate | Refer to point 4 of maintenance method for details |
| Malfunction of compressor | Compressor can't operate | Refer to point 5 of maintenance method for details |

3. Horizontal Louver can't Swing

| Possible Causes | Discriminating Method (Air conditioner Status) | Troubleshooting |
|---|--|--|
| Wrong wire connection, or poor connection | Check the wiring status according to circuit diagram | Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly |
| Stepping motor is damaged | Stepping motor can't operate | Repair or replace stepping motor |
| Main board is damaged | Others are all normal, while horizontal louver can't operate | Replace the main board with the same model |

4. ODU Fan Motor can't Operate

| Possible causes | Discriminating method (air conditioner status) | Troubleshooting |
|---|---|--|
| Wrong wire connection, or poor connection | Check the wiring status according to circuit diagram | Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly |
| Capacity of the ODU fan motor is damaged | Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor. | Replace the capacity of fan |
| Power voltage is a little low or high | Use universal meter to measure the power supply voltage. The voltage is a little high or low | Suggest to equip with voltage regulator |
| Motor of outdoor unit is damaged | When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat. | Change compressor oil and refrigerant. If no better, replace the compressor with a new one |

5. Compressor can't Operate

| Possible causes | Discriminating method (air conditioner status) | Troubleshooting |
|---|---|--|
| Wrong wire connection, or poor connection | Check the wiring status according to circuit diagram | Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly |
| Capacity of compressor is damaged | Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor. | Replace the compressor capacitor |
| Power voltage is a little low or high | Use universal meter to measure the power supply voltage. The voltage is a little high or low | Suggest to equip with voltage regulator |
| Coil of compressor is burnt out | Use universal meter to measure the resistance between compressor terminals and it's 0 | Repair or replace compressor |
| Cylinder of compressor is blocked | Compressor can't operate | Repair or replace compressor |

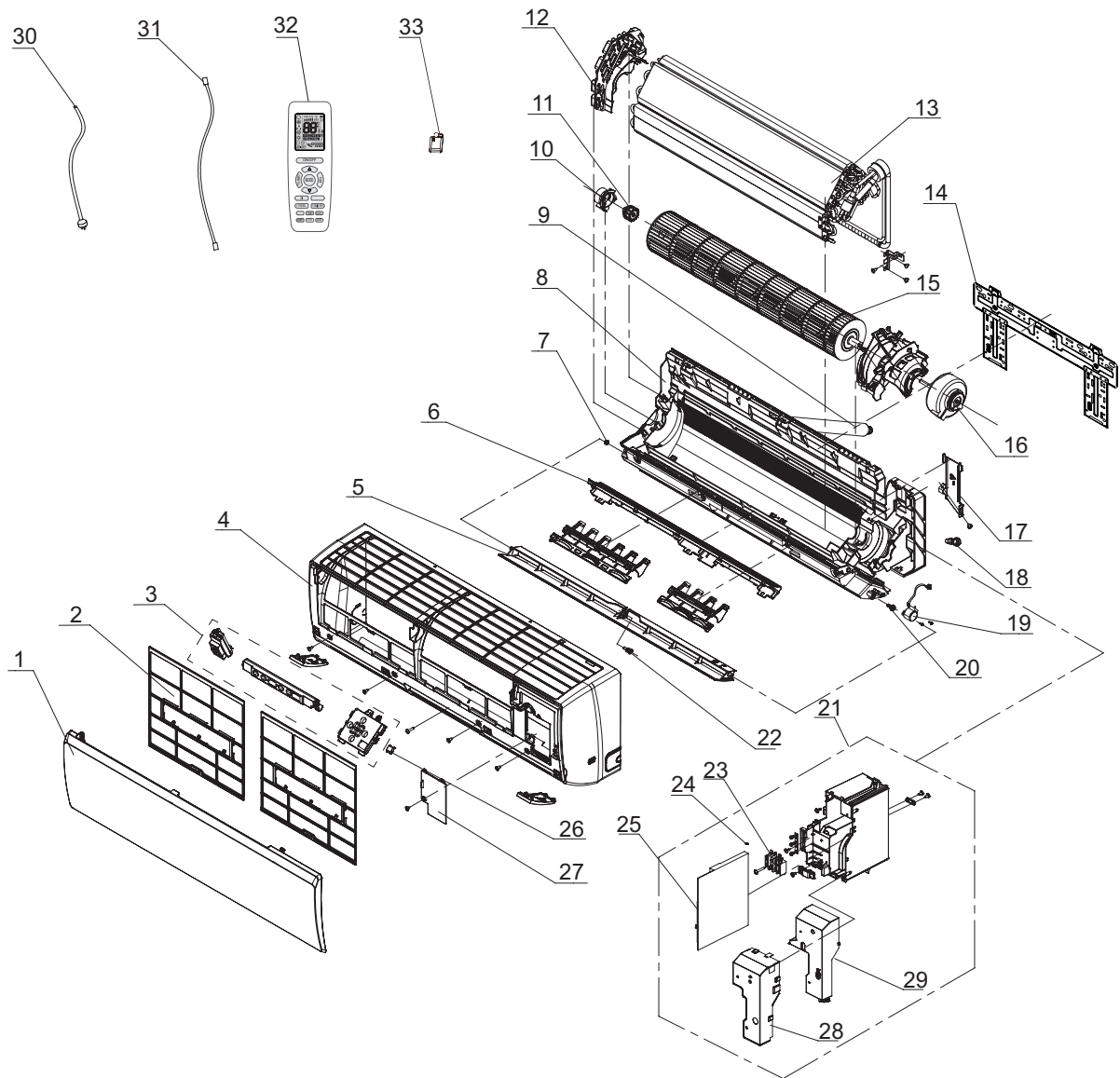
6. Air Conditioner is Leaking

| Possible causes | Discriminating method (air conditioner status) | Troubleshooting |
|-----------------------|---|---|
| Drain pipe is blocked | Water leaking from indoor unit | Eliminate the foreign objects inside the drain pipe |
| Drain pipe is broken | Water leaking from drain pipe | Replace drain pipe |
| Wrapping is not tight | Water leaking from the pipe connection place of indoor unit | Wrap it again and bundle it tightly |

7. Abnormal Sound and Vibration

| Possible causes | Discriminating method (air conditioner status) | Troubleshooting |
|--|--|---|
| When turn on or turn off the unit, the panel and other parts will expand and theres abnormal sound | Theres the sound of "PAPA" | Normal phenomenon. Abnormal sound will disappear after a few minutes. |
| When turn on or turn off the unit, theres abnormal sound due to flow of refrigerant inside air conditioner | Water-running sound can be heard | Normal phenomenon. Abnormal sound will disappear after a few minutes. |
| Foreign objects inside the indoor unit or therere parts touching together inside the indoor unit | Theres abnormal sound fro indoor unit | Remove foreign objects. Adjust all parts position of indoor unit, tighten screws and stick damping plaster between connected parts |
| Foreign objects inside the outdoor unit or therere parts touching together inside the outdoor unit | Theres abnormal sound fro outdoor unit | Remove foreign objects. Adjust all parts position of outdoor unit, tighten screws and stick damping plaster between connected parts |
| Short circuit inside the magnetic coil | During heating, the way valve has abnormal electromagnetic sound | Replace magnetic coil |
| Abnormal shake of compressor | Outdoor unit gives out abnormal sound | Adjust the support foot mat of compressor, tighten the bolts |
| Abnormal sound inside the compressor | Abnormal sound inside the compressor | If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances. |

GWFC12SA GWFC12S



The component picture is only for reference; please refer to the actual product.

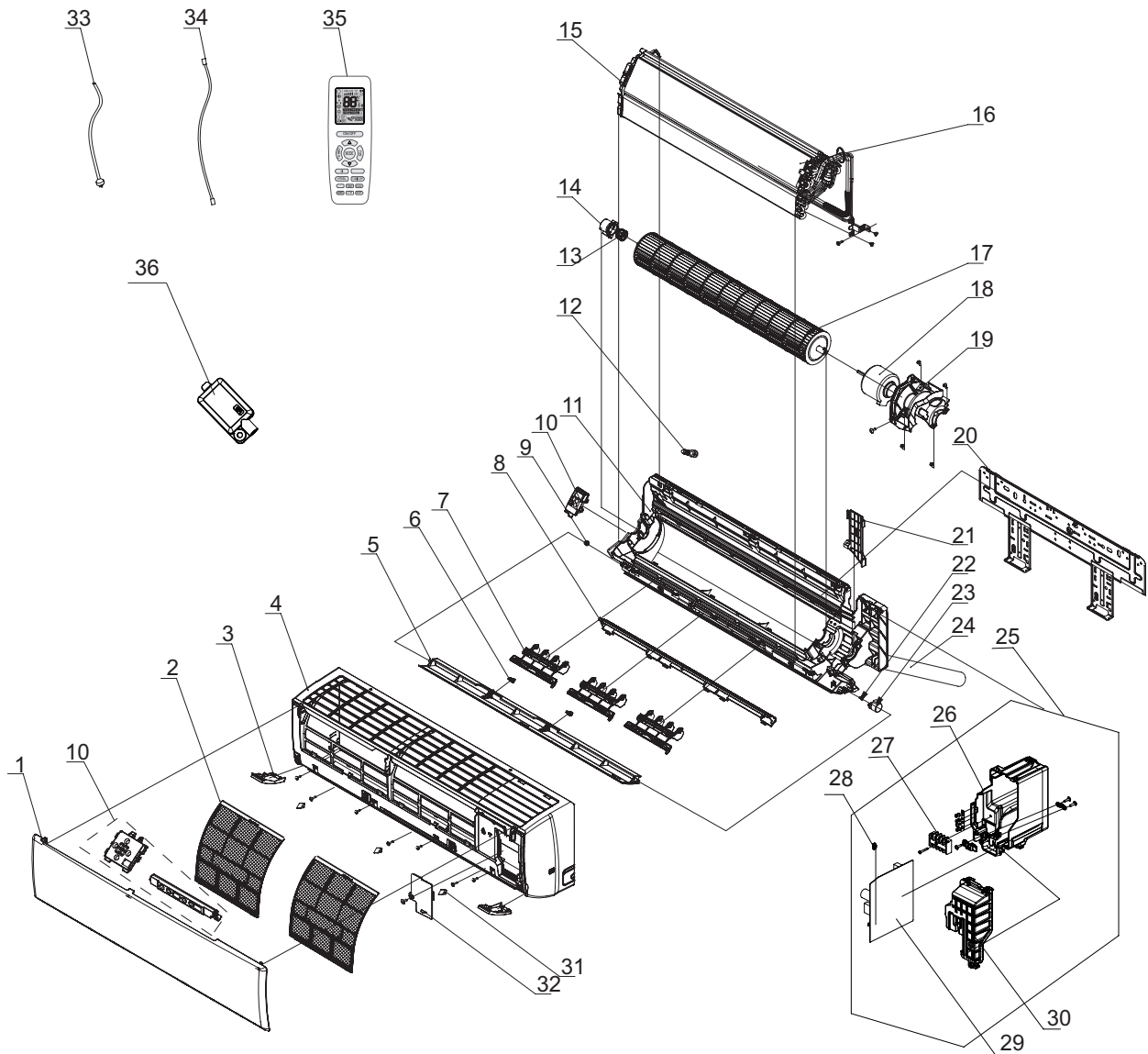
| NO. | Description |
|-----|------------------------------|
| 1 | Front Panel |
| 2 | Filter Sub-Assy |
| 3 | Display Board |
| 4 | Front Case Assy |
| 5 | Guide Louver |
| 6 | Helicoid Tongue |
| 7 | Left Axile Bush |
| 8 | Rear Case assy |
| 9 | Drainage Hose |
| 10 | Ring of Bearing |
| 11 | O-Gasket sub-assy of Bearing |
| 12 | Evaporator Supper |

| NO. | Description |
|-----|--------------------------|
| 13 | Evaporator Assy |
| 14 | Wall Mounting Frame |
| 15 | Cross Flow Fan |
| 16 | Fan Motor |
| 17 | Connecting pipe clamp |
| 18 | Rubber Plug (Water Tray) |
| 19 | Stepping Motor |
| 20 | Crank |
| 21 | Electric Box Assy |
| 22 | Axile Bush |
| 23 | Terminal Board |
| 24 | Jumper |

| NO. | Description |
|-----|------------------------------------|
| 25 | Main Board |
| 26 | Screw Cover |
| 27 | Electric Box Cover Sub-Assy |
| 28 | Shield Cover of Electric Box Cover |
| 29 | Electric Box Cover |
| 30 | Power Cord |
| 31 | Connecting Cable |
| 32 | Remote Controller |
| 33 | Detecting Plate(WIFI) |

Some models may not contain some parts, please refer to the actual product.

GWFCR18S



The component picture is only for reference; please refer to the actual product.

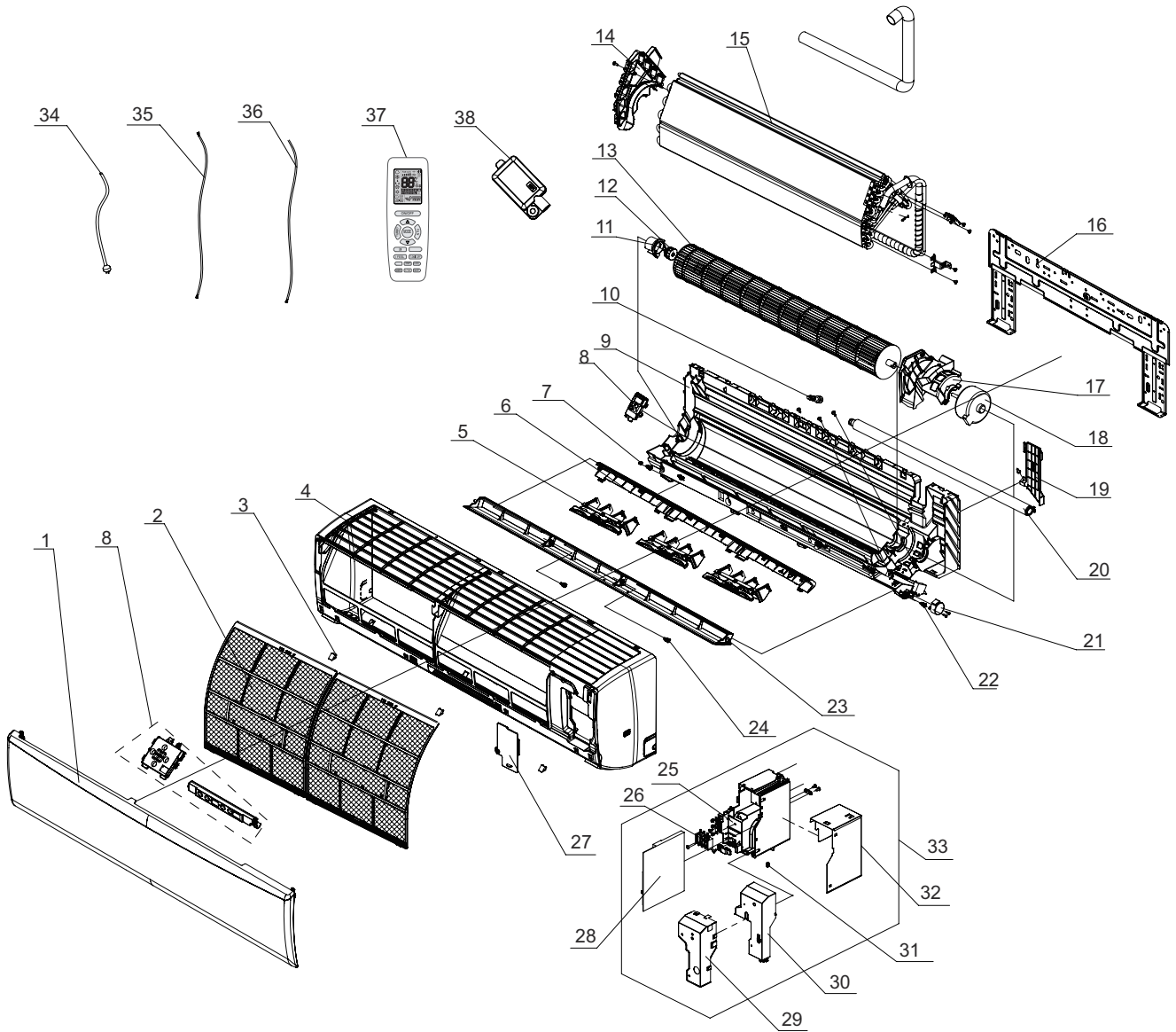
| NO. | Description |
|-----|----------------------------------|
| 1 | Front Panel |
| 2 | Filter Sub-Assy |
| 3 | Decoration board(left and right) |
| 4 | Front Case |
| 5 | Guide Louver |
| 6 | Axile Bush |
| 7 | Air Louver(Manual) |
| 8 | Helicoid Tongue |
| 9 | Left Axile Bush |
| 10 | Display Board |
| 11 | Rear Case assy |
| 12 | Rubber Plug (Water Tray) |

| NO. | Description |
|-----|-------------------------------|
| 13 | O-Gasket sub-assy of Bearing |
| 14 | O-Gasket of Cross Fan Bearing |
| 15 | Evaporator Support |
| 16 | Evaporator Assy |
| 17 | Cross Flow Fan |
| 18 | Fan Motor |
| 19 | Motor Press Plate |
| 20 | Wall Mounting Frame |
| 21 | Connecting pipe clamp |
| 22 | Crank |
| 23 | Stepping Motor |
| 24 | Drainage Hose |

| NO. | Description |
|-----|-----------------------|
| 25 | Electric Box Assy |
| 26 | Electric Box |
| 27 | Terminal Board |
| 28 | Jumper |
| 29 | Main Board |
| 30 | Electric Box Cover |
| 31 | Screw Cover |
| 32 | Electric Box Cover2 |
| 33 | Power Cord |
| 34 | Connecting Cable |
| 35 | Remote Controller |
| 36 | Detecting plate(WIFI) |

Some models may not contain some parts, please refer to the actual product.

GWFR24S



The component picture is only for reference; please refer to the actual product.

| NO. | Description |
|-----|------------------------------|
| 1 | Front Panel |
| 2 | Filter Sub-Assy |
| 3 | Screw Cover |
| 4 | Front Case |
| 5 | Air Louver(Manual) |
| 6 | Helicoid Tongue |
| 7 | Left Axile Bush |
| 8 | Display Board |
| 9 | Rear Case assy |
| 10 | Rubber Plug (Water Tray) |
| 11 | Ring of Bearing |
| 12 | O-Gasket sub-assy of Bearing |
| 13 | Cross Flow Fan |

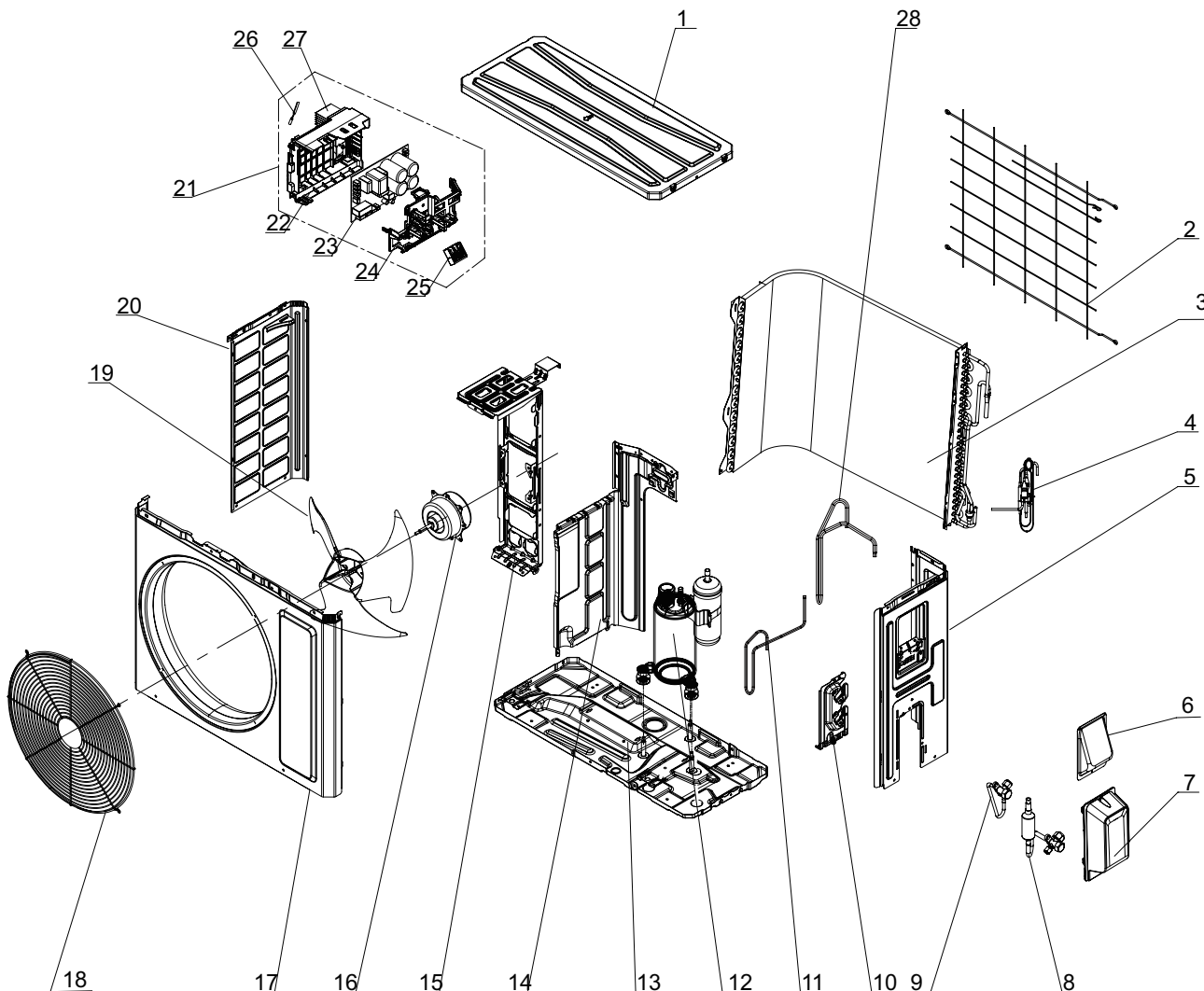
| NO. | Description |
|-----|-----------------------|
| 14 | Evaporator Support |
| 15 | Evaporator Assy |
| 16 | Wall Mounting Frame |
| 17 | Motor Press Plate |
| 18 | Fan Motor |
| 19 | Connecting pipe clamp |
| 20 | Drainage Hose |
| 21 | Stepping Motor |
| 22 | Crank |
| 23 | Guide Louver |
| 24 | Axile Bush |
| 25 | Electric Box |
| 26 | Terminal Board |

| NO. | Description |
|-----|------------------------------|
| 27 | Electric Box Cover2 |
| 28 | Main Board |
| 29 | Shield Cover of Electric Box |
| 30 | Electric Box Cover |
| 31 | Jumper |
| 32 | Lower Shield of Electric Box |
| 33 | Electric Box Assy |
| 34 | Power Cord |
| 35 | Connecting Cable |
| 36 | Temperature Sensor |
| 37 | Remote Controller |
| 38 | Detecting plate(WIFI) |

Some models may not contain some parts, please refer to the actual product.

10.2 Outdoor Unit

GRFRC09AS GRFRC12ASA GRFRC12AS



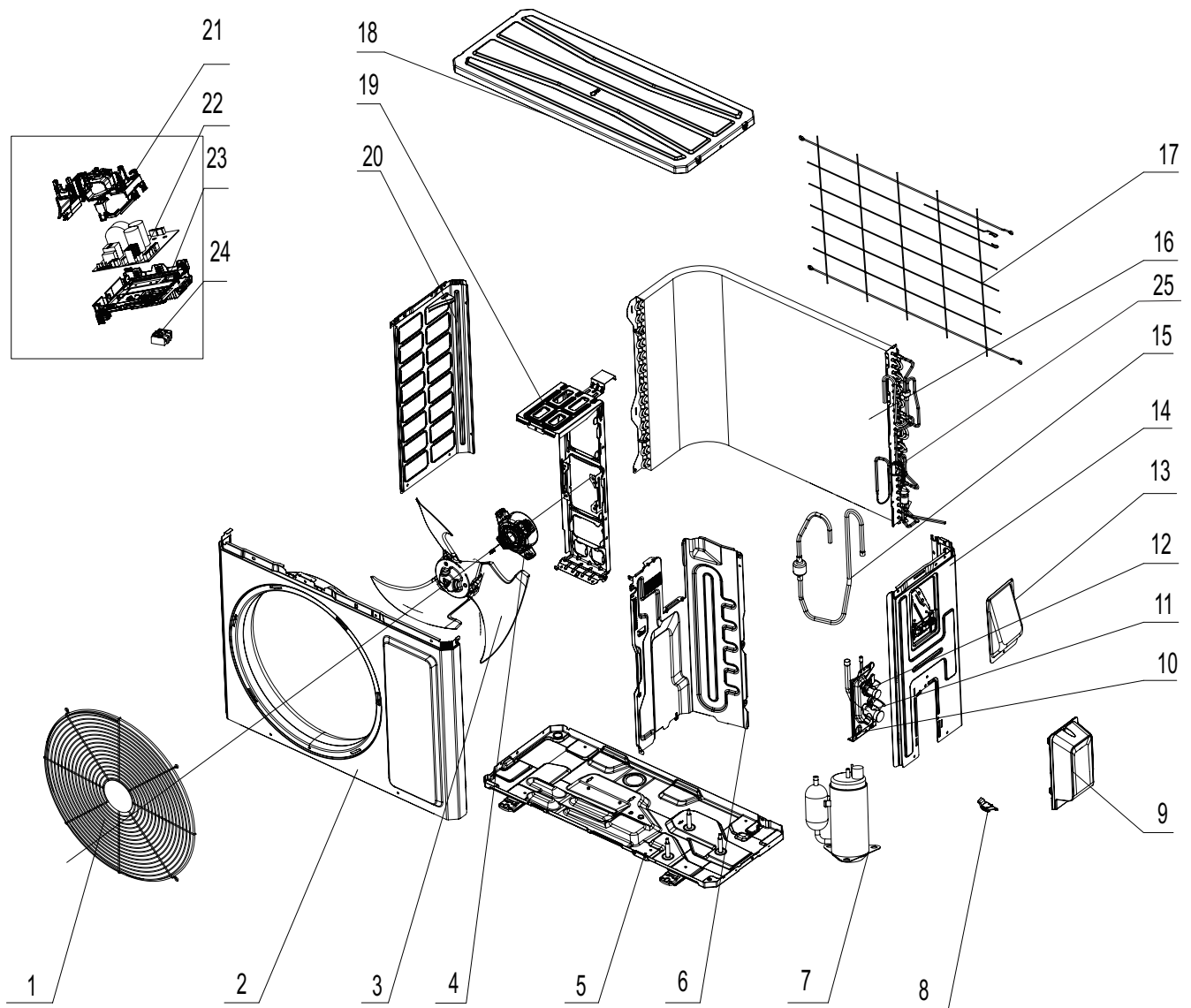
The component picture is only for reference; please refer to the actual product.

| NO. | Description |
|-----|------------------------|
| 1 | Coping |
| 2 | Rear Grill |
| 3 | Condenser Assy |
| 4 | Capillary Sub-Assy |
| 5 | Right Side Plate |
| 6 | Cover of Pass Wire |
| 7 | Valve Cover |
| 8 | Cut-off valve Sub-Assy |
| 9 | Cut-off valve |
| 10 | Valve Support |

| NO. | Description |
|-----|-------------------------|
| 11 | Discharge Tube |
| 12 | Compressor and Fittings |
| 13 | Chassis Sub-Assy |
| 14 | Clapboard |
| 15 | Motor Support |
| 16 | Brushless DC Motor |
| 17 | Cabinet |
| 18 | Front Grill |
| 19 | Axial Flow Fan |
| 20 | Left Side Plate |

| NO. | Description |
|-----|--------------------|
| 21 | Electric Box Assy |
| 22 | Electric Box |
| 23 | Main Board |
| 24 | Electric Box Cover |
| 25 | Terminal Board |
| 26 | Temperature Sensor |
| 27 | Radiator |
| 28 | Inhalation Tube |

Some models may not contain some parts, please refer to the actual product.



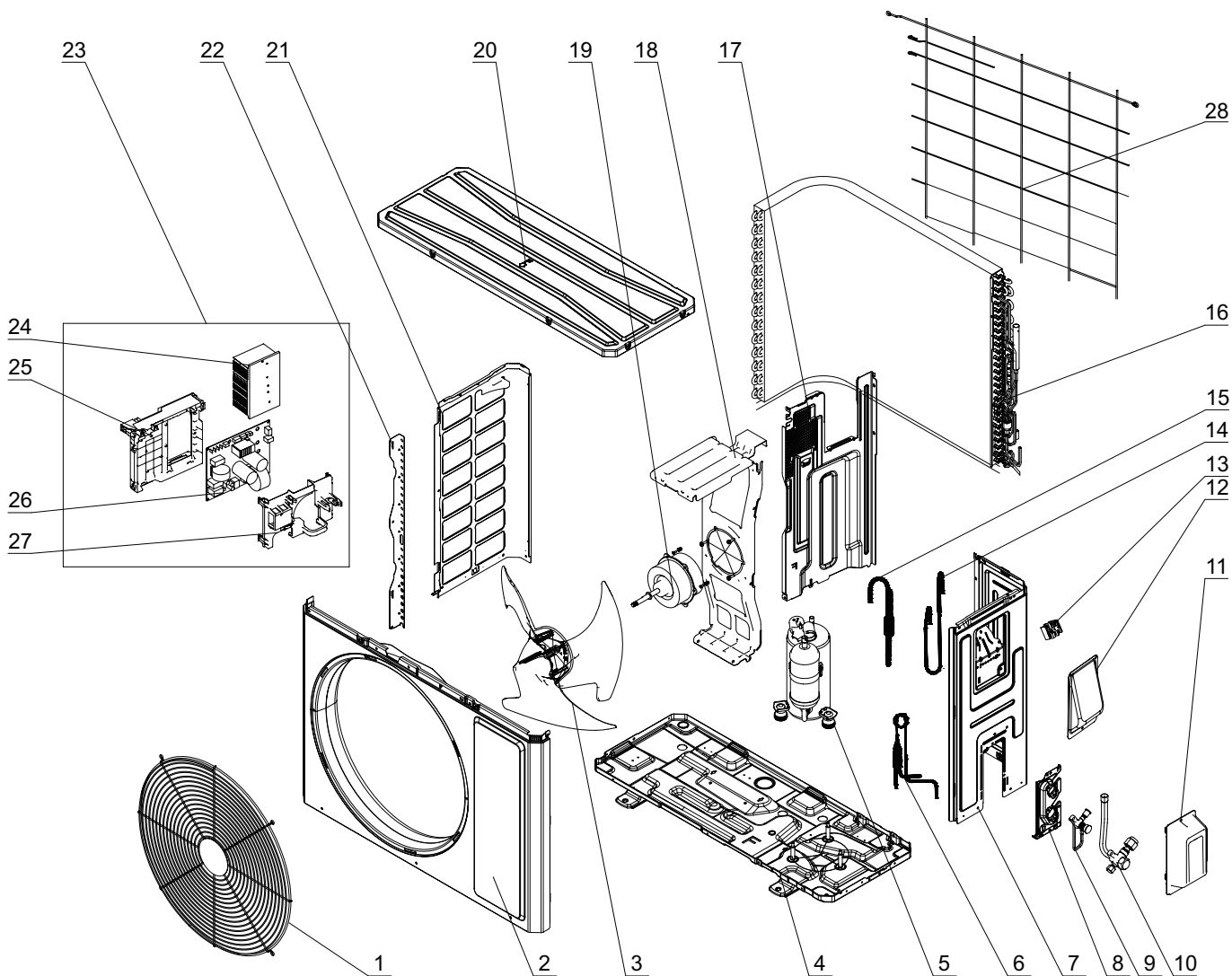
The component is only for reference; please refer to the actual product

| NO. | Description |
|-----|-------------------------|
| 1 | Front Grill |
| 2 | Cabinet |
| 3 | Axial Flow Fan |
| 4 | Brushless DC Motor |
| 5 | Chassis Sub-assy |
| 6 | Clapboard |
| 7 | Compressor and Fittings |
| 8 | Valve Support Block |
| 9 | Valve Cover |
| 10 | Valve Support |
| 11 | Cut-off valve 1/2(N) |
| 12 | Cut-off valve 1/4(N) |
| 13 | Cover of Pass Wire |

| NO. | Description |
|-----|--------------------------|
| 14 | Right Side Plate |
| 15 | Inhalation Tube Sub-assy |
| 16 | Condenser Assy |
| 17 | Rear Grill |
| 18 | Coping |
| 19 | Motor Support |
| 20 | Left Side Plate |
| 21 | Electric Box Cover |
| 22 | Main Board |
| 23 | Electric Box |
| 24 | Terminal Board |
| 25 | Capillary Sub-assy |

Some models may not contain some parts, please refer to the actual product.

GRFRC24AS



The component is only for reference; please refer to the actual product

| NO. | Description |
|-----|-------------------------|
| 1 | Front Grill |
| 2 | Front Panel |
| 3 | Axial Flow Fan |
| 4 | Chassis Sub-assy |
| 5 | Compressor and Fittings |
| 6 | Capillary Sub-assy |
| 7 | Right Side Plate |
| 8 | Valve Support |
| 9 | Cut-off valve 1/4(N) |
| 10 | Cut-off valve 1/2(N) |
| 11 | Valve Cover |
| 12 | Cover of Pass Wire |
| 13 | Terminal Board |
| 14 | Suction Tube-Assy |

| NO. | Description |
|-----|-----------------------------|
| 15 | Discharge Tube-Assy |
| 16 | Condenser Assy |
| 17 | Clapboard |
| 18 | Motor Support |
| 19 | Motor |
| 20 | Top Cover Assy |
| 21 | Left Side Plate |
| 22 | Condenser Left Border Plate |
| 23 | Electric Box Assy |
| 24 | Radiator |
| 25 | Electric Box |
| 26 | Main Board |
| 27 | Electric Box Cover |
| 28 | Rear Grill |

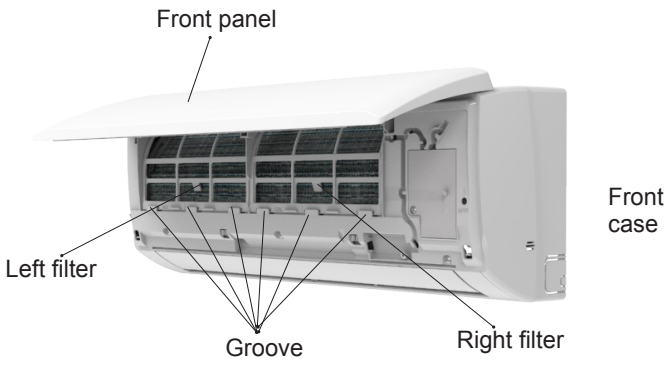
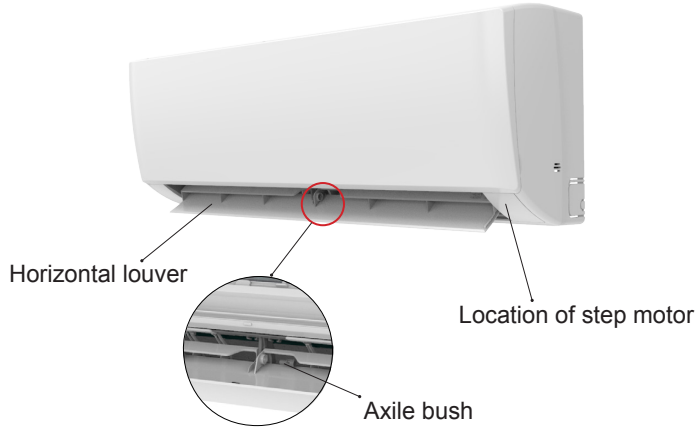
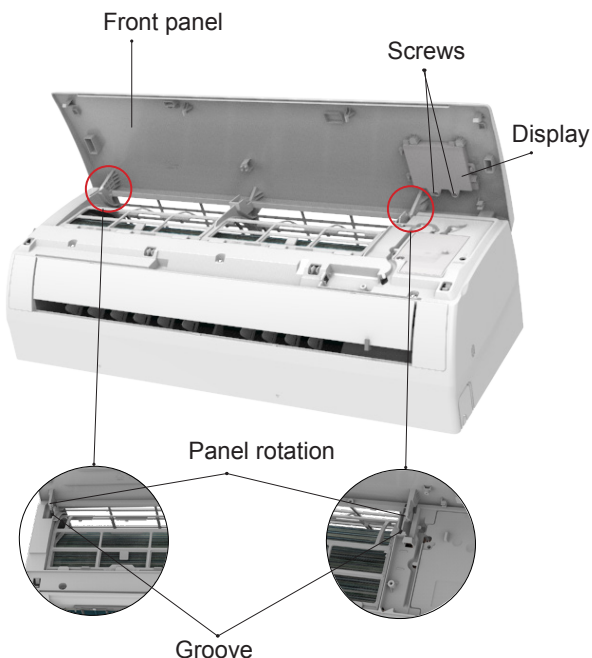
Some models may not contain some parts, please refer to the actual product.

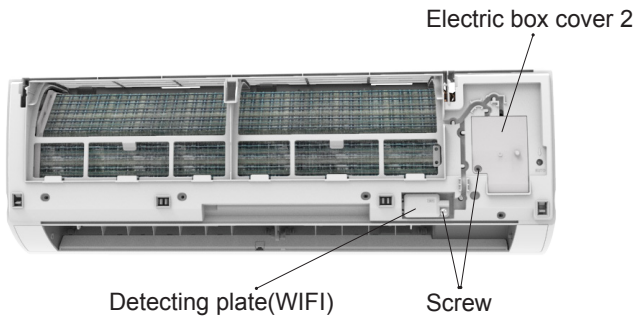
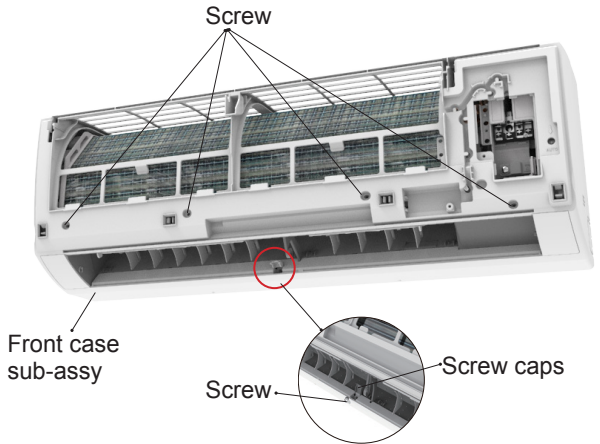
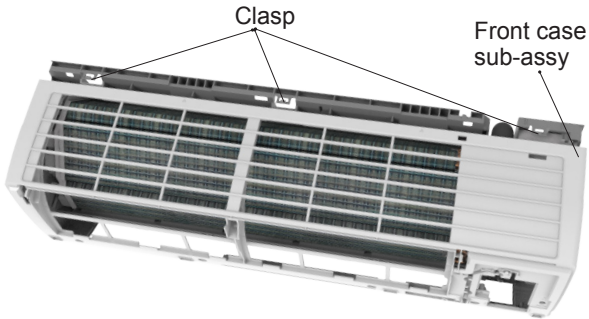
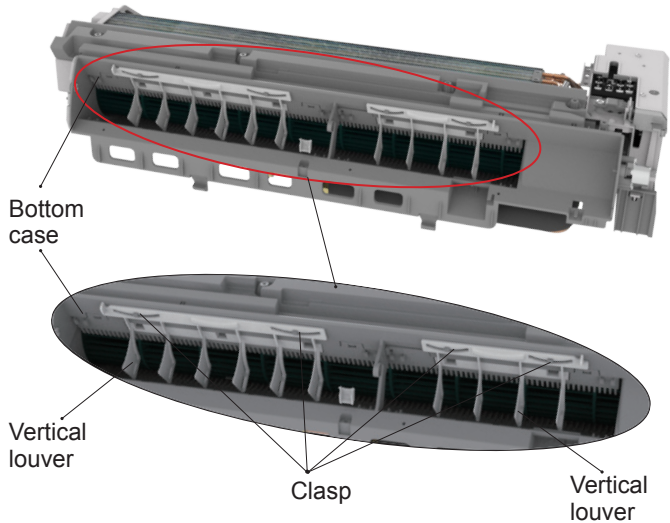
11. Removal Procedure

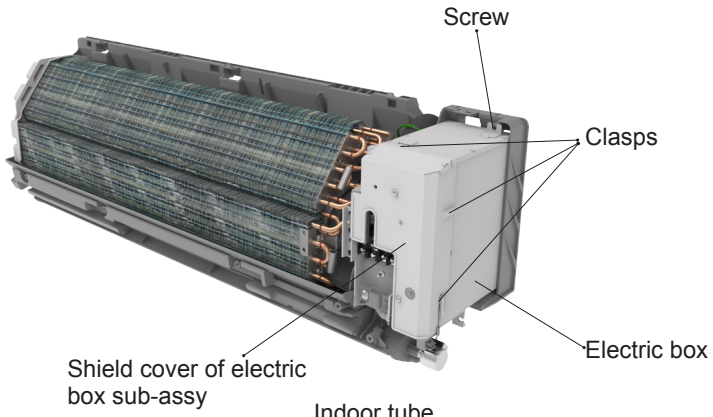
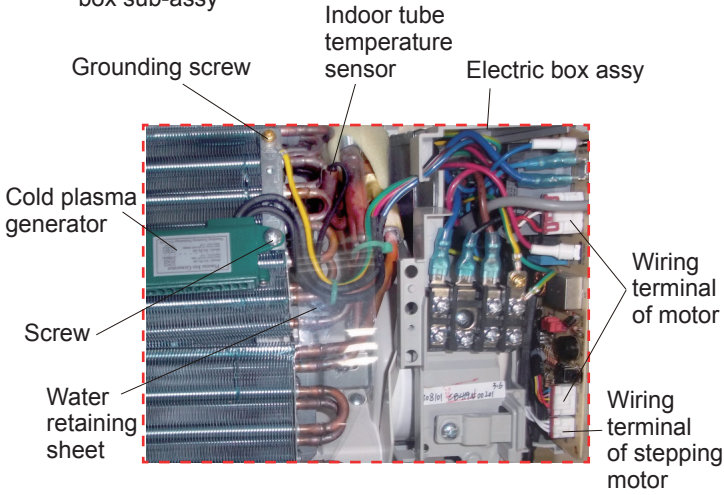
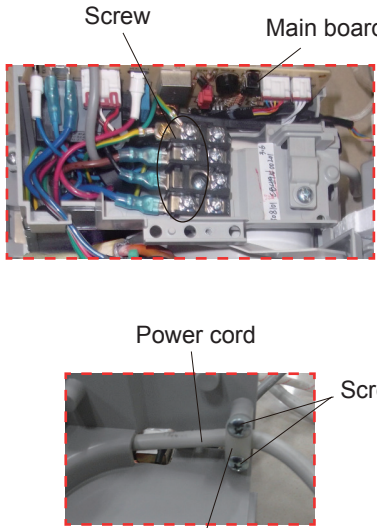
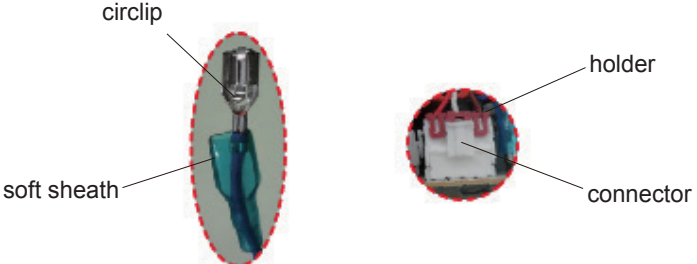
11.1 Removal Procedure of Indoor Unit

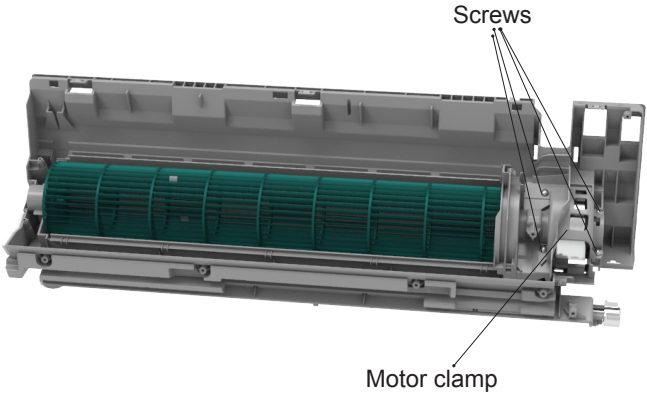
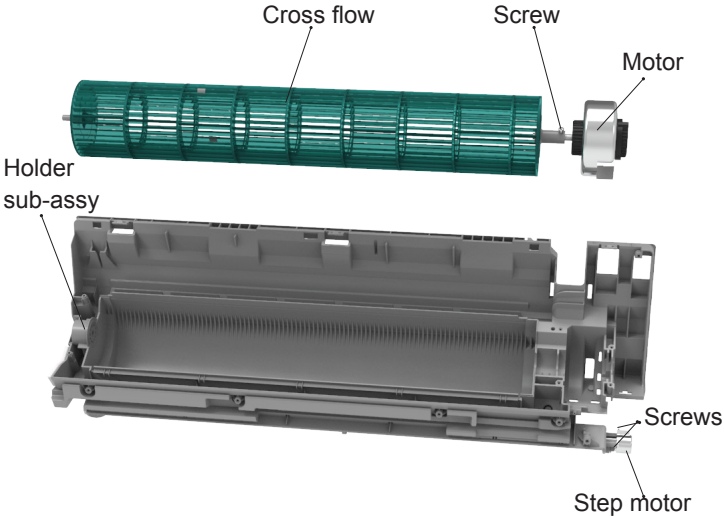


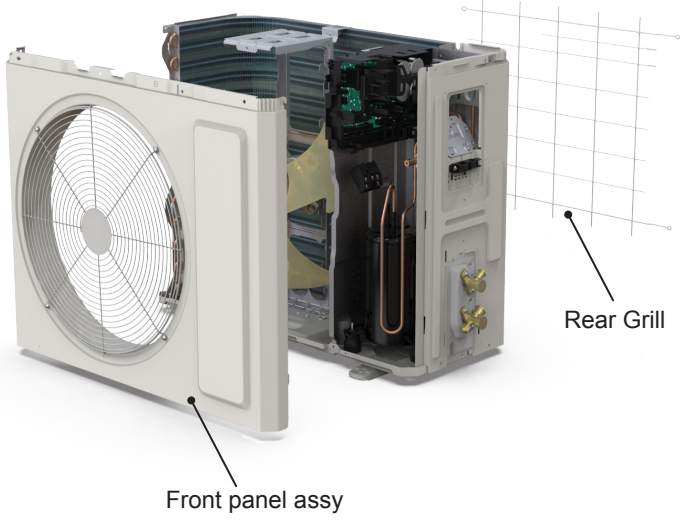
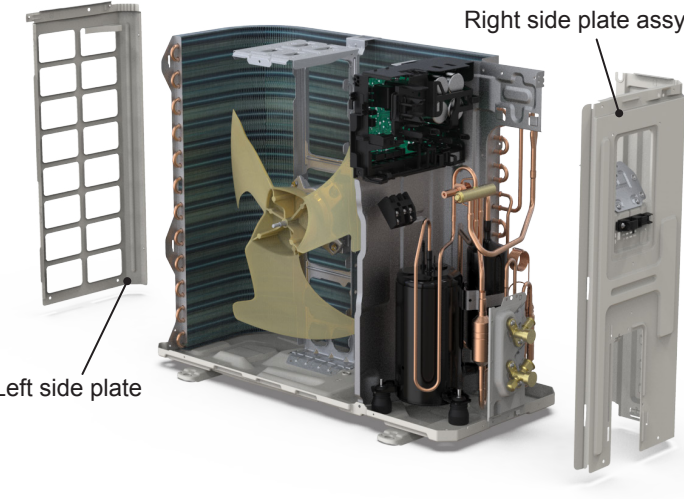
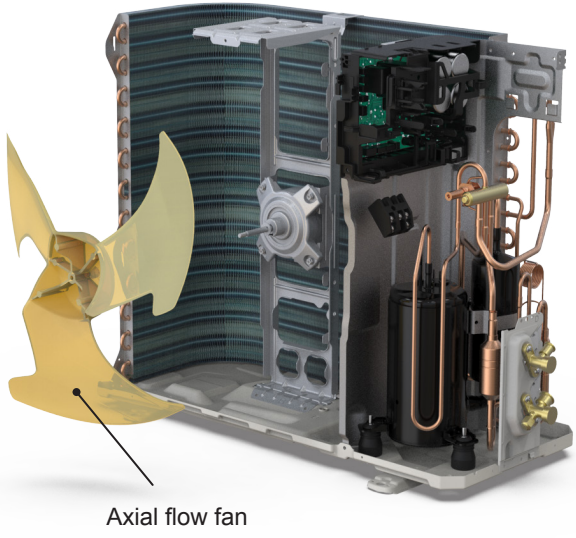
Caution: discharge the refrigerant completely before removal.

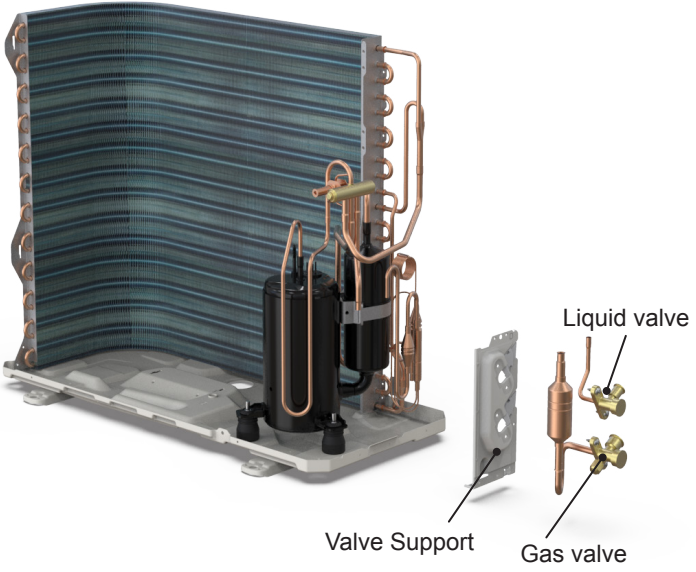
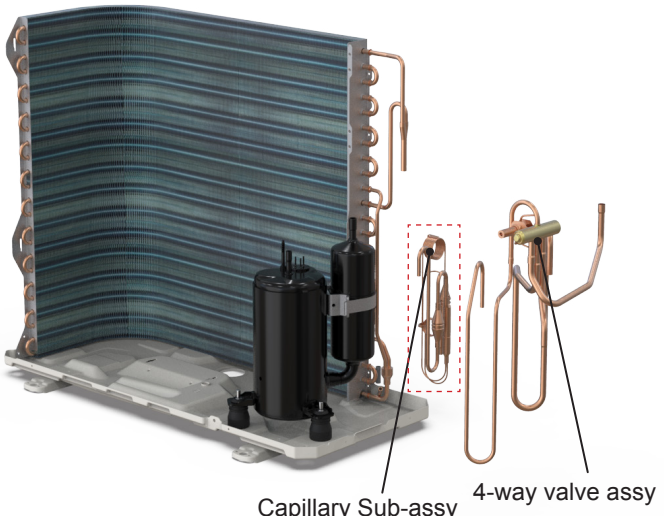
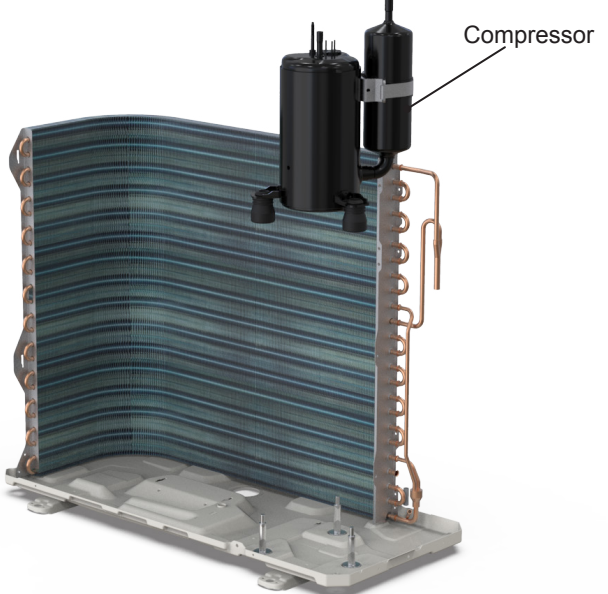
| Step | Procedure |
|---|---|
| <p>1.Remove filter assembly</p> | <p>Open the front panel. Push the left filter and right filter until they are separate from the groove on the front panel. Remove the left filter and right filter respectively.</p>  |
| <p>2. Remove horizontal louver</p> | <p>Push out the axle bush on horizontal louver. Bend the horizontal louver with hand and then separate the horizontal louver from the crankshaft of step motor to remove it.</p>  |
| <p>3. Remove panel</p> | <p>a</p> <ul style="list-style-type: none"> ① A1/B6/C2/C4 display: Screw off the 2 screws that are locking the display board. Separate the display board from the front panel. ② A2/A3 display: Screw off the 2 screws that are locking the display board. This display can be disassembled only after removing the front case (refer to step 5 of disassembly). ③ A5/B2/B4/B8/C6/D2 display: Screw off the 2 screws that are locking the display board. <p>b</p> <p>Separate the panel rotation shaft from the groove fixing the front panel and then removes the front panel.</p>  |

| Step | Procedure |
|---|--|
| <p>4. Remove detecting plate(wifi) and electric box cover2</p> | <p>Remove the screws fixing detecting plate and remove detecting plate(wifi).</p> <p>Remove the screws fixing electric box cover 2 and remove electric box cover 2.</p>  |
| <p>5. Remove front case sub-assy</p> <p>a</p> | <p>Remove the screws fixing front case.</p> <p>Note:</p> <ol style="list-style-type: none"> 1.Open the screw caps before removing the screws around the air outlet. 2.The quantity of screws fixing the front case sub-assy is different for different models.  |
| <p>b</p> | <p>Loosen the connection clasps between front case sub-assy and bottom case. Lift up the front case sub-assy and take it out.</p>  |
| <p>6. Remove vertical louver</p> | <p>Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.</p>  |


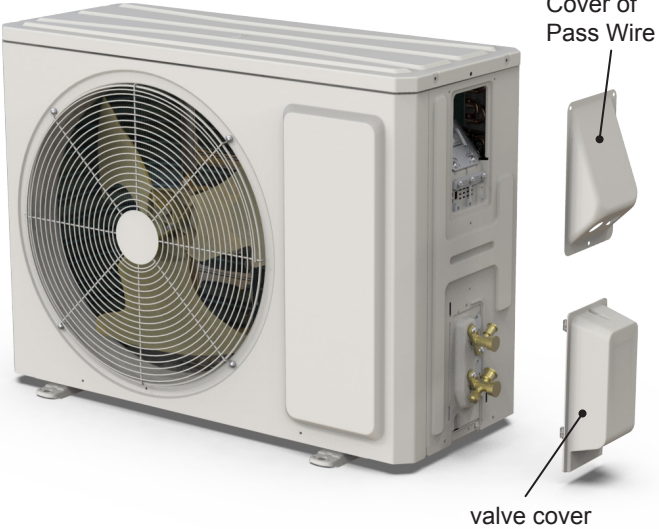

| Step | Procedure |
|------------------------------------|--|
| 7. Remove electric box assy | |
| a | <p>Loosen the connection clasps between shield cover of electric box sub-assy and electric box, and then remove the shield cover of electric box sub-assy. Remove the screw fixing electric box assy .</p>  |
| b | <p>① Take off the water retaining sheet. Remove the cold plasma generator by screwing off the locking screw on the generator. ② Take off the indoor tube temperature sensor. ③ Screw off 1 grounding screw. ④ Remove the wiring terminals of motor and stepping motor. ⑤ Remove the electric box assy.</p>  |
| c | <p>Twist off the screws that are locking each lead wire and rotate the electric box assy. Twist off the screws that are locking the wire clip. Loosen the power cord and remove its wiring terminal. Lift up the main board and take it off.</p>  |
| d | <p>Instruction: Some wiring terminal of this product is with lock catch and other devices. The pulling method is as below: 1.Remove the soft sheath for some terminals at first, hold the circlip and then pull out the terminals. 2.Pull out the holder for some terminals at first (holder is not available for some wiring terminal), hold the connector and then pull the terminal.</p>  |

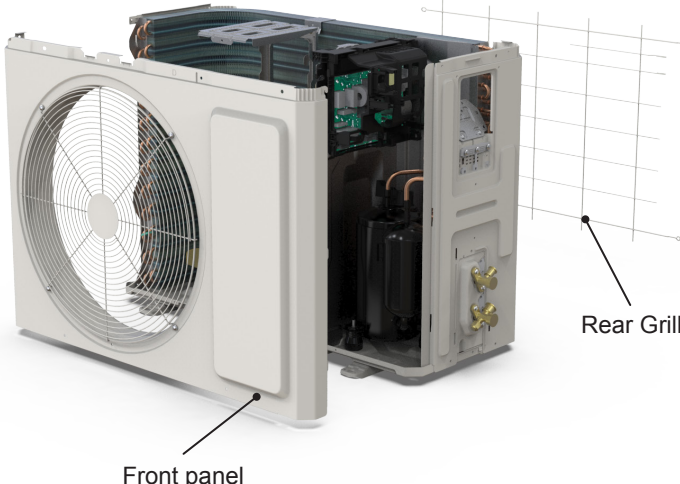

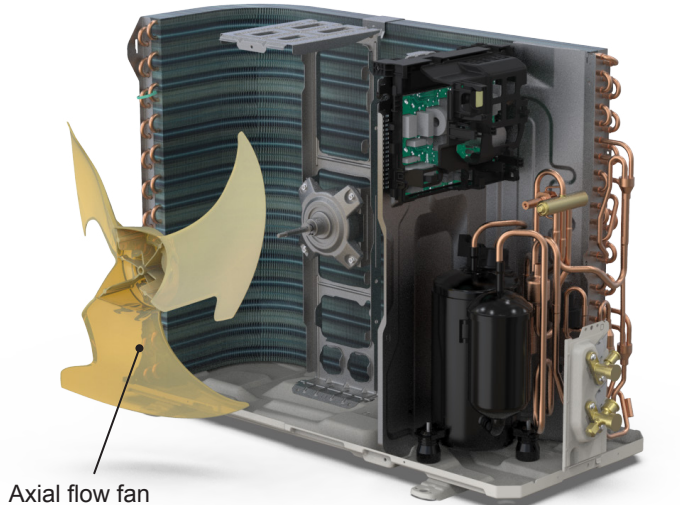
| Step | Procedure |
|---|--|
| 9. Remove motor and cross flow blade | |
| a | <p>Remove the screws fixing motor clamp and then remove the motor clamp.</p>  |
| b | <p>Remove the screws at the connection place of cross flow blade and motor; lift the motor and cross flow blade upwards to remove them. Remove the bearing holder sub-assy. Remove the screw fixing step motor and then remove the step motor.</p>  |

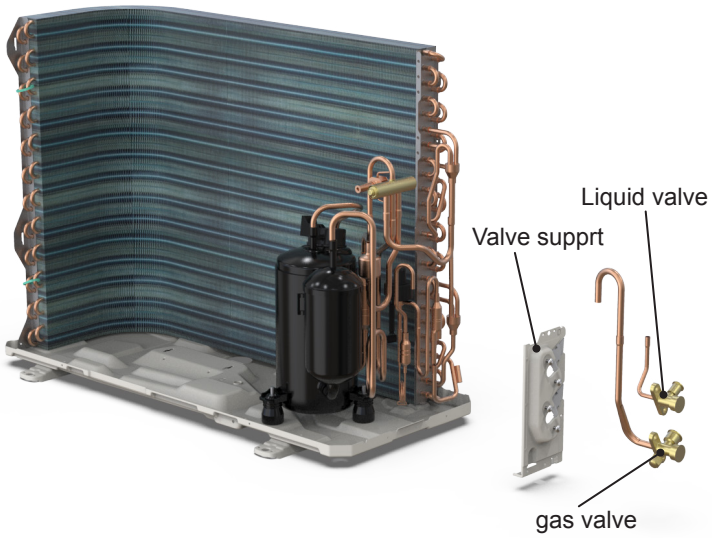
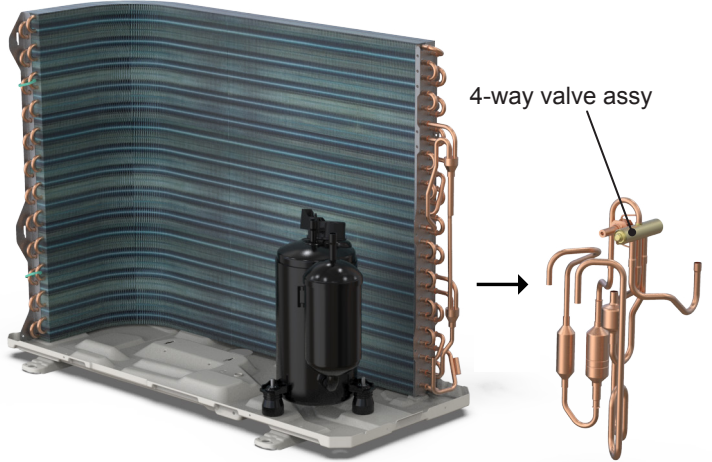
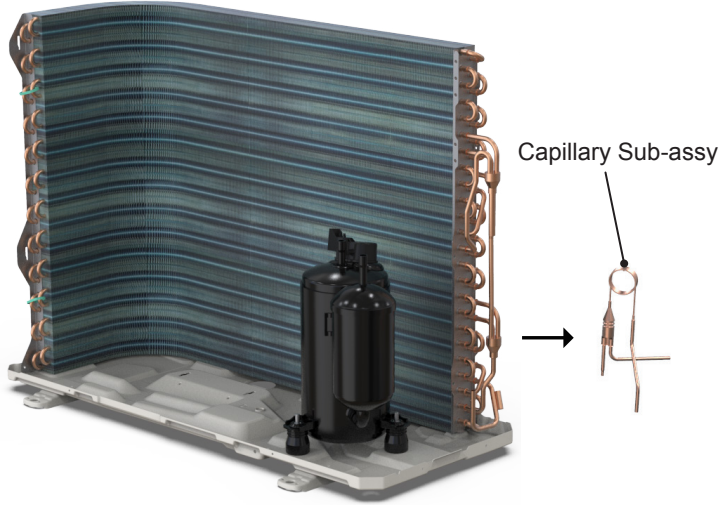
| Step | Procedure |
|---|--|
| <p>4. Remove front panel assy and Rear Grill</p> | <p>Remove connection screws connecting the front panel assy and Rear Grill, and then remove the front panel assy and Rear Grill.</p>  |
| <p>5. Remove right side plate assy and left side plate</p> | <p>Rescrew the ground screws, remove the ground wires, loosen the screws fixing terminal board, remove the terminal board, rescrew the screws fixing the right side plate, and remove the right side plate assy. Rescrew the screws fixing the left side plate, and remove the left side plate assy.</p>  |
| <p>6. Remove axial flow fan</p> | <p>Remove the nut on the fan and then remove the axial flow fan.</p>  |

| Step | Procedure |
|---|--|
| <p>10. Remove gas valve and liquid valve</p> <p>Remove the valve support block, remove the screws fixing the gas valve and the liquid valve, unsolder the welding joint connecting the gas valve and the liquid valve, remove them.</p> <p>Note: Discharge the refrigerant completely before unsoldering; when unsoldering, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p> |  <p>Valve Support Liquid valve Gas valve</p> |
| <p>11. Remove 4-way valve and capillary Sub-assy</p> <p>Unsolder the welding joints connecting capillary Sub-assy, and then remove it.</p> <p>Unsolder the welding joints connecting the 4-way valve assy with capillary sub-assy, compressor and condenser; remove the 4-way valve and capillary Sub-assy. Cooling only unit removes Discharge Tube and Inhalation Tube.</p> <p>Note: Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p> |  <p>Capillary Sub-assy 4-way valve assy</p> |
| <p>12. Remove compressor</p> <p>Remove the 3 foot nuts on the compressor and then remove the compressor.</p> |  <p>Compressor</p> |






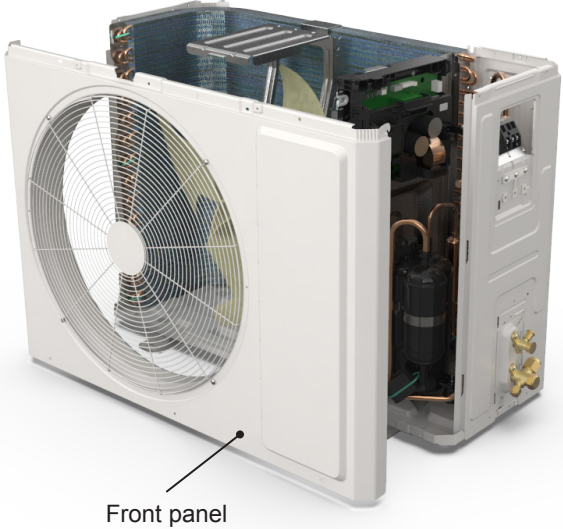
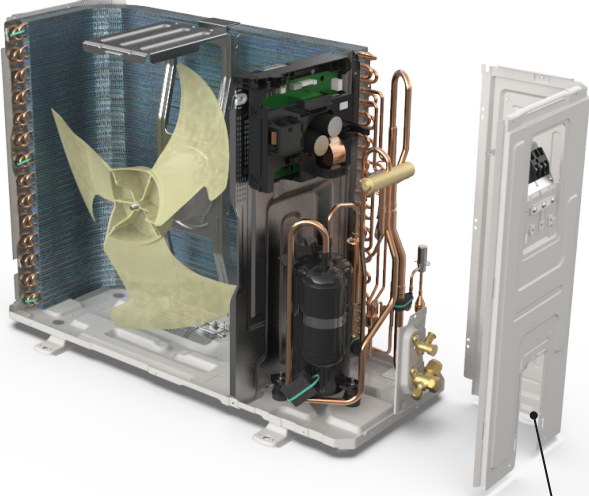
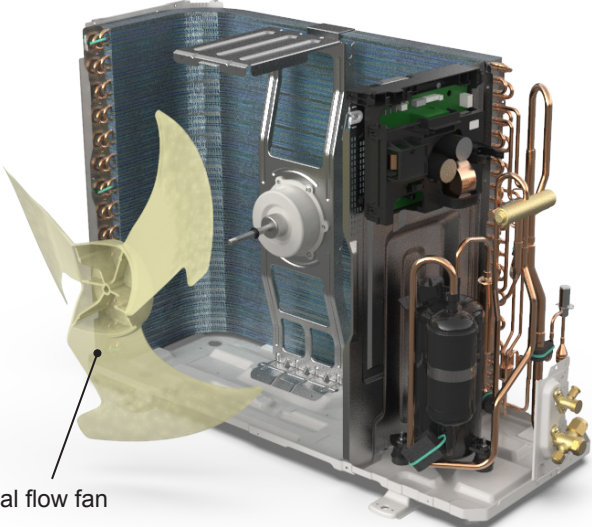
| Step | Procedure |
|--|---|
| <p>1. Before disassembly</p> |  |
| <p>2. Remove Cover of Pass Wire and valve cover</p> | <p>Remove the screws fixing Cover of Pass Wire, valve cover and then remove them.</p>  |
| <p>3. Remove top cover</p> | <p>Remove the screws fixing top panel and then remove the top panel.</p>  |

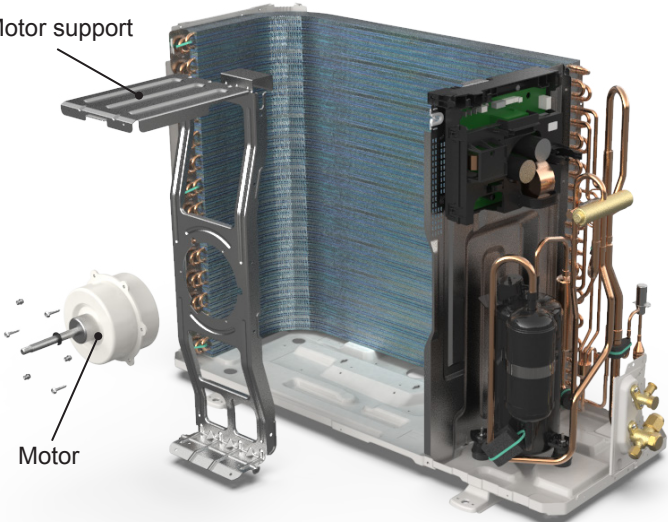

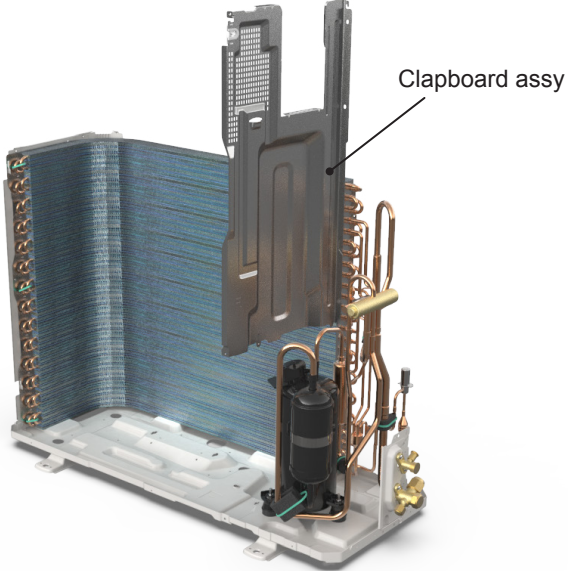
| Step | Procedure |
|---|--|
| <p>4. Remove front panel assy and Rear Grill</p> | <p>Remove connection screws connecting the front panel assy and Rear Grill, and then remove the front panel assy and Rear Grill.</p>  |
| <p>5. Remove right side plate assy and left side plate</p> | <p>Rescrew the ground screws, remove the ground wires, loosen the screws fixing terminal board, remove the terminal board, rescrew the screws fixing the right side plate, and remove the right side plate assy. Rescrew the screws fixing the left side plate, and remove the left side plate assy.</p>  |
| <p>6. Remove axial flow fan</p> | <p>Remove the nut on the fan and then remove the axial flow fan.</p>  |

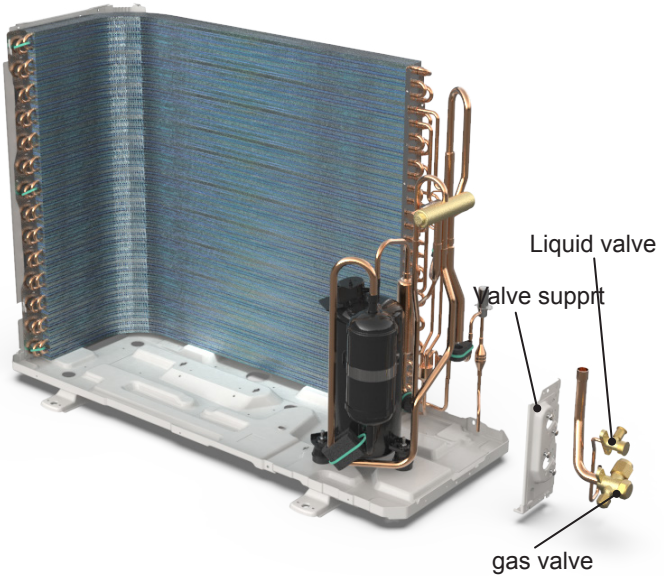
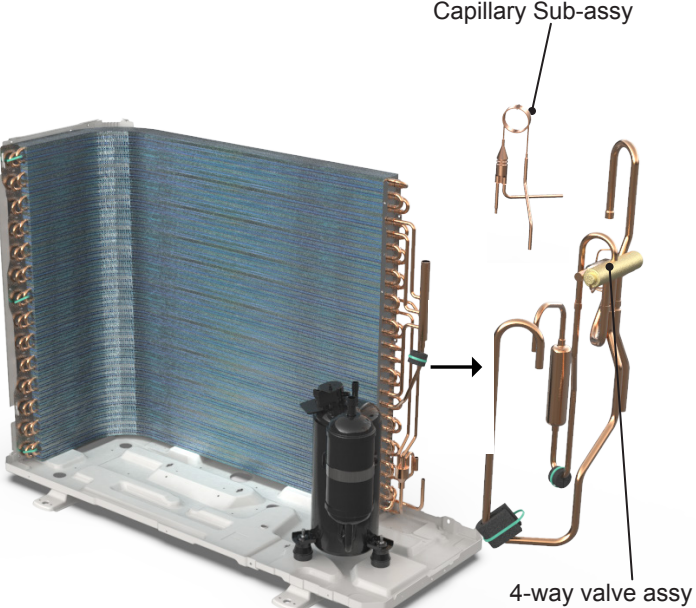
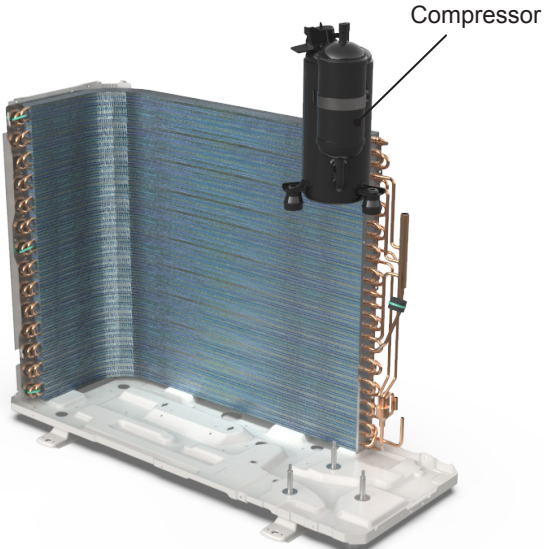
| Step | Procedure |
|--|--|
| <p>10. Remove gas valve, liquid valve and valve support</p> | <p>Remove the valve support block, remove the screws fixing the gas valve and the liquid valve, unsolder the welding joint connecting the gas valve and the liquid valve, remove them.</p> <p>Note: Discharge the refrigerant completely before unsoldering; when unsoldering, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature. Remove the screws fixing valve support, then remove the valve support.</p>  |
| <p>11. Remove 4-way valve assy</p> | <p>Unsolder the welding joints connecting the 4-way valve assy, remove the 4-way valve.</p> <p>Note: Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p>  |
| <p>12. Remove Capillary Sub-assy</p> | <p>Unsolder the spot weld of Capillary Sub-assy and condenser, and then remove the Capillary Sub-assy.</p> <p>Note: When unsoldering the spot weld, wrap the Capillary Sub-assy with wet cloth completely to avoid damaging the valve due to high temperature.</p>  |

**Caution: discharge the refrigerant completely before removal.**

| Step | Procedure |
|--|---|
| <p>1. Before disassembly</p> |  |
| <p>2. Remove Cover of Pass Wire and valve cover</p> | <p>Remove the screws fixing Cover of Pass Wire, valve cover and then remove them.</p>  |
| <p>3. Remove top cover</p> | <p>Remove the screws fixing top panel and then remove the top panel.</p>  |

| Step | Procedure |
|---|--|
| <p>4. Remove front panel assy</p> | <p>Remove connection screws connecting the front panel assy, and then remove the front panel assy.</p>  |
| <p>5. Remove right side plate assy</p> | <p>Rescrew the ground screws, remove the ground wires, loosen the screws fixing terminal board, remove the terminal board, rescrew the screws fixing the right side plate, and remove the right side plate assy.</p>  |
| <p>6. Remove axial flow fan</p> | <p>Remove the nut on the fan and then remove the axial flow fan.</p>  |

| Step | Procedure |
|---|--|
| <p>7. Remove motor and motor support</p> | <p>Remove the screws fixing the motor and then remove the motor. Remove the screws fixing the motor support and lift the motor support to remove it.</p>  |
| <p>8. Remove electric box assy</p> | <p>Remove the terminals, lift up and rotate the electrical box assy to the right so that the snaps on the clapboard are removed and the electrical box assy are removed.</p>  |
| <p>9. Remove clapboard assy</p> | <p>Remove the screws fixing the clapboard assy and then remove the clapboard assy.</p>  |

| Step | Procedure |
|--|---|
| <p>10. Remove gas valve, liquid valve and valve support</p> | <p>Remove the valve support block, remove the screws fixing the gas valve and the liquid valve, unsolder the welding joint connecting the gas valve and the liquid valve, remove them.</p> <p>Note: Discharge the refrigerant completely before unsoldering; when unsoldering, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p> <p>Remove the screws fixing valve support, then remove the valve support.</p>  |
| <p>11. Remove 4-way valve assy, Capillary Sub-assy</p> | <p>Unsolder the welding joints connecting the 4-way valve assy, remove the 4-way valve.</p> <p>Unsolder the spot weld of Capillary Sub-assy and condenser, and then remove the Capillary Sub-assy.</p> <p>Note: Before unsoldering the welding joint, wrap the 4-way valve with a wet cloth completely to avoid damage to the valve caused by high temperature.</p>  |
| <p>13. Remove compressor</p> | <p>Remove the 3 foot nuts on the compressor and then remove the compressor.</p>  |

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: $T_f = T_c \times 1.8 + 32$

Set temperature

| Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) | Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) | Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) |
|-------------------------------------|-----------------|--------------|-------------------------------------|-----------------|--------------|-------------------------------------|-----------------|--------------|
| 61 | 60.8 | 16 | 69/70 | 69.8 | 21 | 78/79 | 78.8 | 26 |
| 62/63 | 62.6 | 17 | 71/72 | 71.6 | 22 | 80/81 | 80.6 | 27 |
| 64/65 | 64.4 | 18 | 73/74 | 73.4 | 23 | 82/83 | 82.4 | 28 |
| 66/67 | 66.2 | 19 | 75/76 | 75.2 | 24 | 84/85 | 84.2 | 29 |
| 68 | 68 | 20 | 77 | 77 | 25 | 86 | 86 | 30 |

Ambient temperature

| Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) | Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) | Fahrenheit display temperature (°F) | Fahrenheit (°F) | Celsius (°C) |
|-------------------------------------|-----------------|--------------|-------------------------------------|-----------------|--------------|-------------------------------------|-----------------|--------------|
| 32/33 | 32 | 0 | 55/56 | 55.4 | 13 | 79/80 | 78.8 | 26 |
| 34/35 | 33.8 | 1 | 57/58 | 57.2 | 14 | 81 | 80.6 | 27 |
| 36 | 35.6 | 2 | 59/60 | 59 | 15 | 82/83 | 82.4 | 28 |
| 37/38 | 37.4 | 3 | 61/62 | 60.8 | 16 | 84/85 | 84.2 | 29 |
| 39/40 | 39.2 | 4 | 63 | 62.6 | 17 | 86/87 | 86 | 30 |
| 41/42 | 41 | 5 | 64/65 | 64.4 | 18 | 88/89 | 87.8 | 31 |
| 43/44 | 42.8 | 6 | 66/67 | 66.2 | 19 | 90 | 89.6 | 32 |
| 45 | 44.6 | 7 | 68/69 | 68 | 20 | 91/92 | 91.4 | 33 |
| 46/47 | 46.4 | 8 | 70/71 | 69.8 | 21 | 93/94 | 93.2 | 34 |
| 48/49 | 48.2 | 9 | 72 | 71.6 | 22 | 95/96 | 95 | 35 |
| 50/51 | 50 | 10 | 73/74 | 73.4 | 23 | 97/98 | 96.8 | 36 |
| 52/53 | 51.8 | 11 | 75/76 | 75.2 | 24 | 99 | 98.6 | 37 |
| 54 | 53.6 | 12 | 77/78 | 77 | 25 | | | |

Appendix 2: Configuration of Connection Pipe

- Standard length of connection pipe (More details please refer to the specifications.)
- Min length of connection pipe for the unit with standard connection pipe of 16.4ft, there is no limitation for the min length of connection pipe. For the unit with standard connection pipe of 24.6ft and 26.2ft, the min length of connection pipe is 9.8ft.
- Max. length of connection pipe and max. high difference. (More details please refer to the specifications.)
- The additional refrigerant oil and refrigerant charging required after prolonging connection pipe
 - After the length of connection pipe is prolonged for 32.8ft at the basis of standard length, you should add 5ml of refrigerant oil for each additional 16.4ft of connection pipe.
 - The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):
 - Basing on the length of standard pipe, add refrigerant according to the requirement as shown in the table. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.
 - Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

| Additional refrigerant charging amount for R22, R407C, R410A and R134a | | | |
|--|--------------|-----------------------|--------------------------|
| Diameter of connection pipe | | Outdoor unit throttle | |
| Liquid pipe | Gas pipe | Cooling only(g/m) | Cooling and heating(g/m) |
| 1/4" | 3/8" or 1/2" | 15 | 20 |
| 1/4" or 3/8" | 5/8" or 3/4" | 15 | 50 |
| 1/2" | 3/4" or 7/8" | 30 | 120 |
| 5/8" | 1" or 1 1/4" | 60 | 120 |

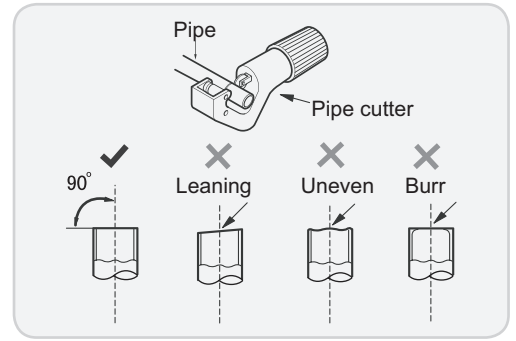
Appendix 3: Pipe Expanding Method

⚠ Note:

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

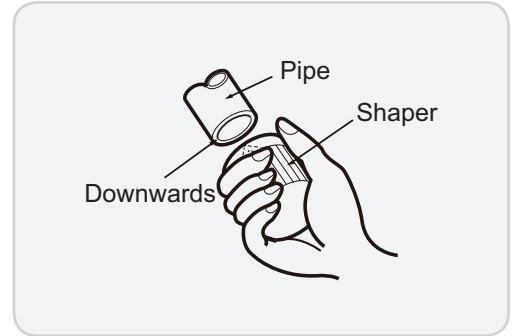
A: Cut the pipe

- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B: Remove the burrs

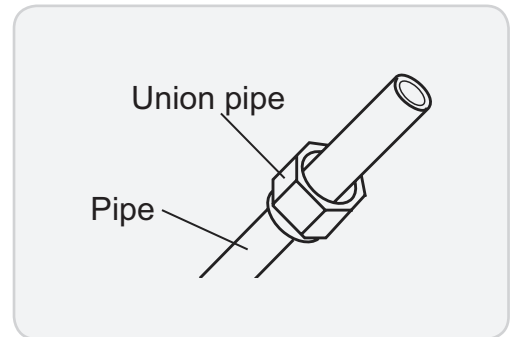
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C: Put on suitable insulating pipe.

D: Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



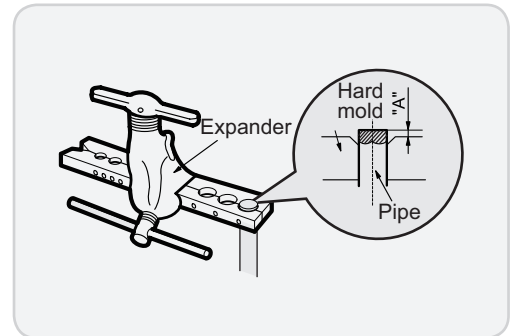
E: Expand the port

- Expand the port with expander.

⚠ Note:

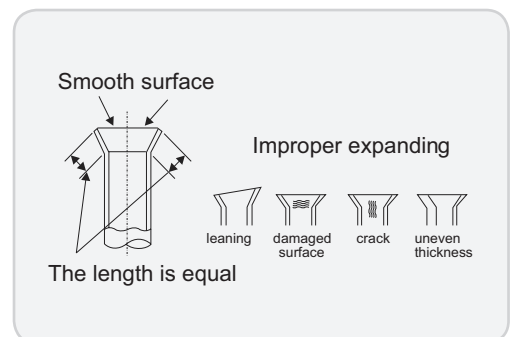
- "A" is different according to the diameter, please refer to the sheet below:

| Outer diameter(mm) | A(mm) | |
|--------------------|-------|-----|
| | Max | Min |
| Φ6 - 6.35 (1/4") | 1.3 | 0.7 |
| Φ9.52 (3/8") | 1.6 | 1.0 |
| Φ12 - 12.70 (1/2") | 1.8 | 1.0 |
| Φ16 - 15.88 (5/8") | 2.4 | 2.2 |



F: Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



Appendix 4: List of Resistance for Temperature Sensor

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| -19 | 138.10 |
| -18 | 128.60 |
| -16 | 115.00 |
| -14 | 102.90 |
| -12 | 92.22 |
| -10 | 82.75 |
| -8 | 74.35 |
| -6 | 66.88 |
| -4 | 60.23 |
| -2 | 54.31 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 0 | 49.02 |
| 2 | 44.31 |
| 4 | 40.09 |
| 6 | 36.32 |
| 8 | 32.94 |
| 10 | 29.90 |
| 12 | 27.18 |
| 14 | 24.73 |
| 16 | 22.53 |
| 18 | 20.54 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 20 | 18.75 |
| 22 | 17.14 |
| 24 | 15.68 |
| 26 | 14.36 |
| 28 | 13.16 |
| 30 | 12.07 |
| 32 | 11.09 |
| 34 | 10.20 |
| 36 | 9.38 |
| 38 | 8.64 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 40 | 7.97 |
| 42 | 7.35 |
| 44 | 6.79 |
| 46 | 6.28 |
| 48 | 5.81 |
| 50 | 5.38 |
| 52 | 4.99 |
| 54 | 4.63 |
| 56 | 4.29 |
| 58 | 3.99 |

Resistance Table of Tube Temperature Sensors for Indoor and Outdoor (20K)

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| -19 | 181.40 |
| -15 | 145.00 |
| -10 | 110.30 |
| -5 | 84.61 |
| 0 | 65.37 |
| 5 | 50.87 |
| 10 | 39.87 |
| 15 | 31.47 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 20 | 25.01 |
| 25 | 20.00 |
| 30 | 16.10 |
| 35 | 13.04 |
| 40 | 10.62 |
| 45 | 8.71 |
| 50 | 7.17 |
| 55 | 5.94 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 60 | 4.95 |
| 65 | 4.14 |
| 70 | 3.48 |
| 75 | 2.94 |
| 80 | 2.50 |
| 85 | 2.13 |
| 90 | 1.82 |
| 95 | 1.56 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 100 | 1.35 |
| 105 | 1.16 |
| 110 | 1.01 |
| 115 | 0.88 |
| 120 | 0.77 |
| 125 | 0.67 |
| 130 | 0.59 |
| 135 | 0.52 |

Resistance Table of Discharge Temperature Sensor for Outdoor(50K)

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| -30 | 911.400 |
| -25 | 660.8 |
| -20 | 486.5 |
| -15 | 362.9 |
| -10 | 274 |
| -5 | 209 |
| 0 | 161 |
| 5 | 125.1 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 10 | 98 |
| 15 | 77.35 |
| 20 | 61.48 |
| 25 | 49.19 |
| 30 | 39.61 |
| 35 | 32.09 |
| 40 | 26.15 |
| 45 | 21.43 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 50 | 17.65 |
| 55 | 14.62 |
| 60 | 12.17 |
| 65 | 10.18 |
| 70 | 8.555 |
| 75 | 7.224 |
| 80 | 6.129 |
| 85 | 5.222 |

| Temp(°C) | Resistance(kΩ) |
|----------|----------------|
| 90 | 4.469 |
| 95 | 3.841 |
| 100 | 3.315 |
| 105 | 2.872 |
| 110 | 2.498 |
| 115 | 2.182 |
| 120 | 1.912 |
| 125 | 1.682 |



JF00305472

For product improvement, specifications and appearance in this manual are subject to change without prior notice.