Service Manual

Model: WMO18MH16S
WMO24MH16S
WMO30MH16S
WMO36MH16S
WMO42MH16S

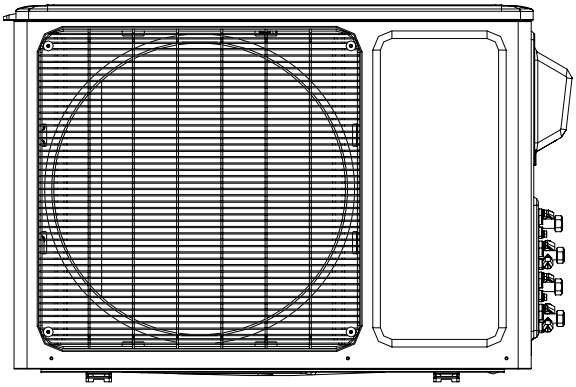
WILLIS AIR CONDITIONING

Table of Contents

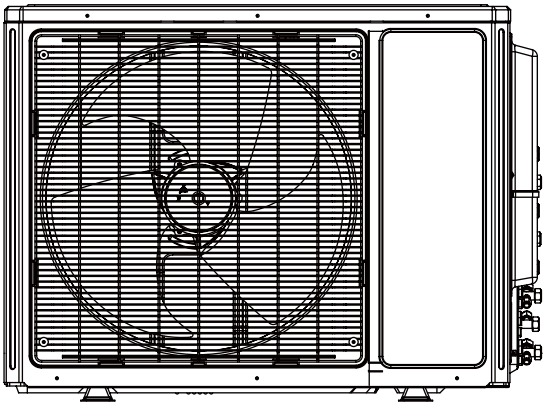
Summary and Features

Outdoor Unit

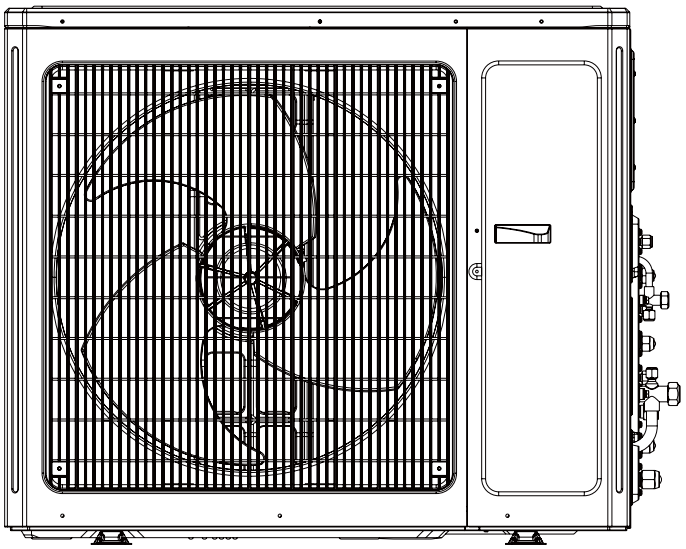
WMO18MH16S



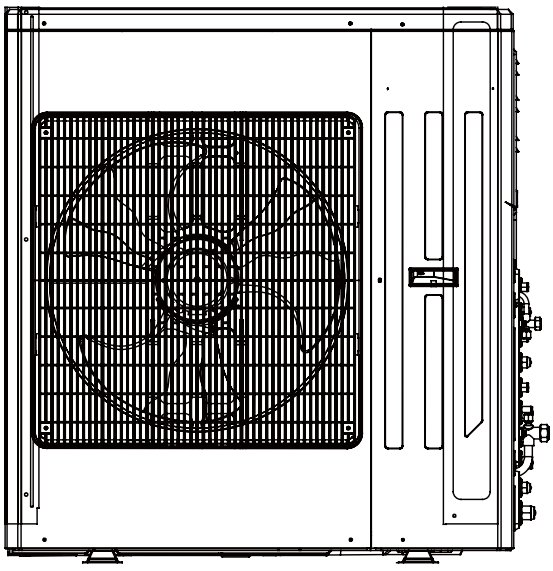
WMO24MH16S
WMO30MH16S



WMO36MH16S



WMO42MH16S



1. Safety Precautions

Installing, starting up, and servicing air conditioner can be hazardous due to system pressure, electrical components, and equipment location, etc.

Only trained, qualified installers and service personnel are allowed to install, start-up, and service this equipment. Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When handling the equipment, observe precautions in the manual and on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses andwork gloves. Keep quenching cloth and fire extinguisher nearby when brazing.

Read the instructions thoroughly and follow all warnings or cautions in literature and attached to the unit. Consult local building codes and current editions of national as well as local electrical codes.

Recognize the following safety information:

⚠ Warning	Incorrect handling could result in personal injury or death.
⚠ Caution	Incorrect handling may result in minor injury,or damage to product or property.

⚠ Warning

All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.

- Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.
- Never supply power to the unit unless all wiring and tubing are completed, reconnected and checked.
- This system adopts highly dangerous electrical voltage. Incorrect connection or inadequate grounding can cause personal injury or death. Stick to the wiring diagram and all the instructions when wiring.
- Have the unit adequately grounded in accordance with local electrical codes.
- Have all wiring connected tightly. Loose connection may lead to overheating and a possible fire hazard.

All installation or repair work shall be performed by your dealer or a specialized subcontractor as there is the risk of fire, electric shock, explosion or injury.

- Make sure the outdoor unit is installed on a stable, level surface with no accumulation of snow, leaves, or trash beside.
- Make sure the ceiling/wall is strong enough to bear the weight of the unit.
- Make sure the noise of the outdoor unit does not disturb neighbors.
- Follow all the installation instructions to minimize the risk of damage from earthquakes, typhoons or strong winds.
- Avoid contact between refrigerant and fire as it generates poisonous gas.
- 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 and other hazards.
- Make sure no refrigerant gas is leaking out when installation is completed.
- Should there be refrigerant leakage, the density of refrigerant in the air shall in no way exceed its limited value, or it may lead to explosion.
- Keep your fingers and clothing away from any moving parts.
- Clear the site after installation. Make sure no foreign objects are left in the unit.
- Always ensure effective grounding for the unit.

⚠ Caution

- Never install the unit in a place where a combustible gas might leak, or it may lead to fire or explosion.
- Make a proper provision against noise when the unit is installed at a telecommunication center or hospital.
- Provide an electric leak breaker when it is installed in a watery place.
- Never wash the unit with water.
- Handle unit transportation with care. The unit should not be carried by only one person if it is more than 20kg.
- Never touch the heat exchanger fins with bare hands.
- Never touch the compressor or refrigerant piping without wearing glove.
- Do not have the unit operate without air filter.
- Should any emergency occur, stop the unit and disconnect the power immediately.
- Properly insulate any tubing running inside the room to prevent the water from damaging the wall.

2. Specifications

Model of Outdoor Unit		WMO18MH16S	WMO24MH16S
Product Code		CB228W01600	CB228W01700
Compressor Manufacturer/trademark		MITSUBISHI ELECTRIC (GUANGZHOU)COMPRESSOR CO. LTD	MITSUBISHI ELECTRIC (GUANGZHOU)COMPRESSOR CO. LTD
Compressor Model		SNB130FGYMC	TNB220FLHMC
Compressor Oil		PVE/FV50S	PVE/FV50S
Compressor Type		Rotary	Rotary
L.R.A.	A	27	45
Compressor RLA	A	8.4	9.7
Compressor Power Input	W	1245	2200
Overload Protector		1NT11L-6578	CS-7C-1595
Throttling Method		Electron expansion valve	Electron expansion valve
Starting Method		Transducer starting	Transducer starting
Cooling Working Temp Range	ºC	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48
Heating Working Temp Range	ºC	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27
Condenser	mm	Aluminum fin-copper tube	Aluminum fin-copper tube
Pipe Diameter	mm	Φ7.94	Φ9.52
Coil length (l) X height (H)Xcoil width (L)	mm	770X38X550	890X44X660
Fan Motor Speed (rpm) (H/M/L)	rpm	830/670/500	690/600/500
Output of Fan Motor	W	60	60
Fan Motor RLA	A	0.54	0.59
Fan Motor Capacitor	μF	3.5	3.5
Air Flow Volume of Outdoor Unit	m^3/h	2600/2300/1600	3300/2900/2400
Fan Type		Axial-flow	Axial-flow
Fan Diameter	mm	Φ445	Φ520
Defrosting Method		Automatic Defrosting	Automatic Defrosting
Climate Type		T1	T1
Isolation		I	I
Moisture Protection		IP24	IP24
Permissible Excessive Operating Pressure for the Discharge Side(MPa)	MPa	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side(MPa)	MPa	2.5	2.5
Sound Pressure Level (H)	dB (A)	56	58
Sound Power Level (H)	dB (A)	66	68
Dimension (WXHXD)	mm	899X596X378	946X700X396
Dimension of Carton Box (LXWXH)	mm	945X417X630	1029X458X750
Dimension of Package (LXWXH)	mm	948X420X645	1032X461X765
Net Weight /Gross Weight	kg	43/48	61/66
Refrigerant Charge	kg	R410A/1.35	R410A/2.2

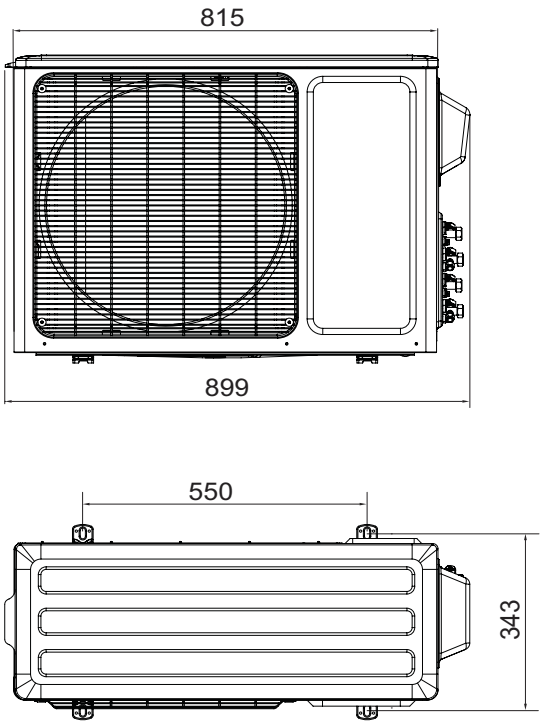
The above data is subject to change without notice. Please refer to the nameplate of the unit.

Model of Outdoor Unit		WMO30MH16S	WMO36MH16S	WMO42MH16S
Product Code		CB228W01800	CN860W0030	CN860W0040
Compressor Manufacturer/trademark		"MITSUBISHI ELECTRIC (GUANGZHOU) COMPRESSOR CO. LTD"	MITSUBISHI ELECTRIC(GUANGZHOU) COMPRESSOR CO.LTD	MITSUBISHI ELECTRIC(GUANGZHOU) COMPRESSOR CO.LTD
Compressor Model		TNB220FLHMC	TNB220FLHMC	TNB306FPGMC
Compressor Oil		PVE/FV50S	PVE/FV50S	PVE(FV50S)
Compressor Type		Rotary	Inverter Scroll	Inverter Scroll
L.R.A.	A	45	/	/
Compressor RLA	A	9.7	21	13.5
Compressor Power Input	W	2200	2200	3010
Overload Protector		CS-7C-1595	internal protect units	CS01F272H01
Throttling Method		Electron expansion valve	Electronic Expansion Valve	Electronic Expansion Valve
Starting Method		Transducer starting	Transducer starting	Transducer starting
Cooling Working Temp Range	ºC	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48	-5 ≤ T ≤ 48
Heating Working Temp Range	ºC	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27	-15 ≤ T ≤ 27
Condenser	mm	Aluminum fin-copper tube	Aluminum fin-copper tube	Aluminum fin-copper tube
Pipe Diameter	mm	Φ9.52	Φ7.94	Φ7.94
Coil length (l) X height (H)Xcoil width (L)	mm	890X44X660	908.4X38.1X748	1022.3X38.1X1056
Fan Motor Speed (H/M/L)	rpm	690/600/500	820	860
Output of Fan Motor	W	60	120	140
Fan Motor RLA	A	0.59	/	1.1
Fan Motor Capacitor	μF	3.5	/	7
Air Flow Volume of Outdoor Unit	m^3/h	3300/2900/2400	3700	5500
Fan Type		Axial-flow	Axial-flow	Axial-flow
Fan Diameter	mm	Φ520	Φ552	Φ570
Defrosting Method		Automatic Defrosting	Automatic Defrosting	Automatic Defrosting
Climate Type		T1	T1	T1
Isolation		I	I	I
Moisture Protection		IP24	IPX4	IPX4
Permissible Excessive Operating Pressure for the Discharge Side(MPa)	MPa	4.3	4.3	4.3
Permissible Excessive Operating Pressure for the Suction Side(MPa)	MPa	2.5	2.5	2.5
Sound Pressure Level (H)	dB (A)	59	59	58
Sound Power Level (H)	dB (A)	69	69	68
Dimension (WXHXD)	mm	946X700X396	920X427X789	1015X440X1103
Dimension of Carton Box (LXWXH)	mm	1029X458X750	1080X485X840	1155X480X1115
Dimension of Package (LXWXH)	mm	1032X461X765	1083X488X855	1158X493X1235
Net Weight /Gross Weight	kg	62/67	69/74	102/112
Refrigerant Charge	kg	R410A/2.2	R410A/2.9	R410A/4.8

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

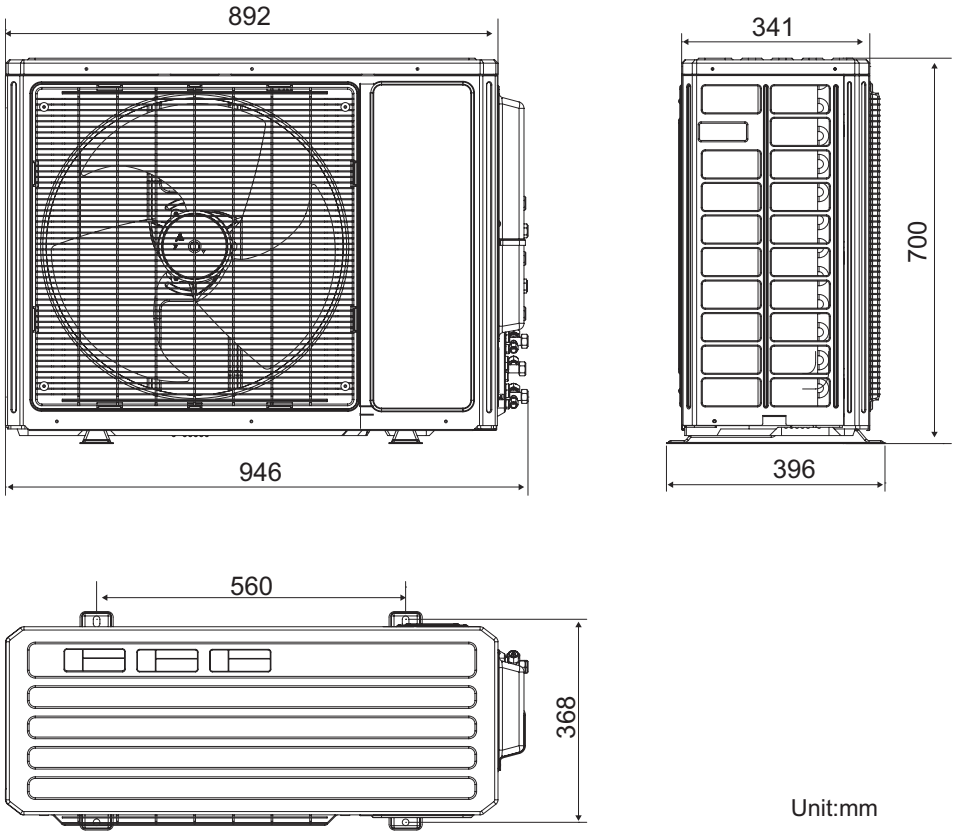
3. Construction Views

WMO18MH16S



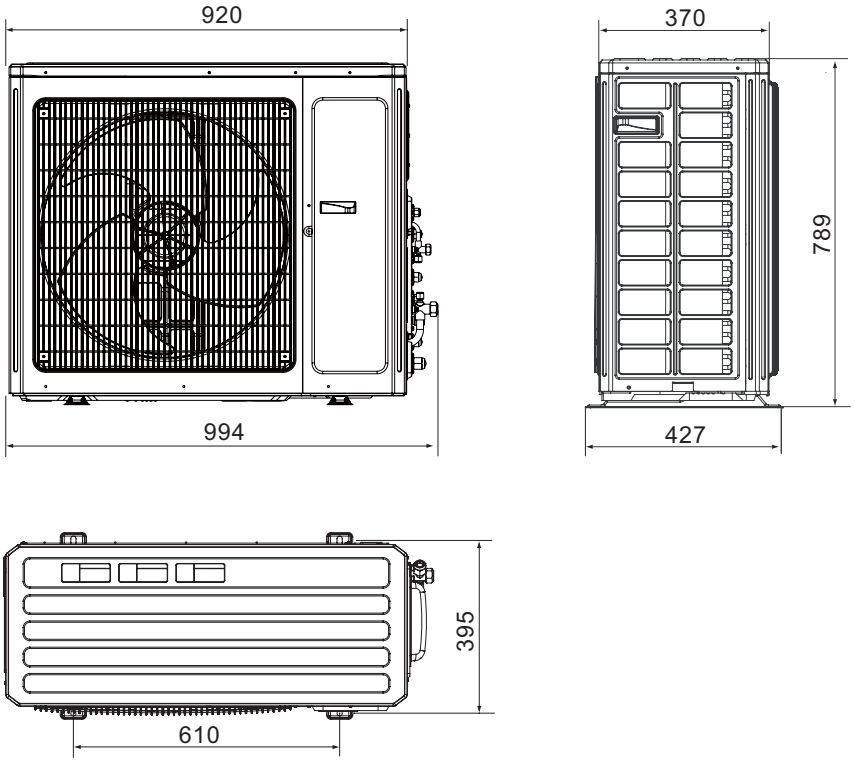
Unit:mm

WMO24MH16S WMO30MH16S



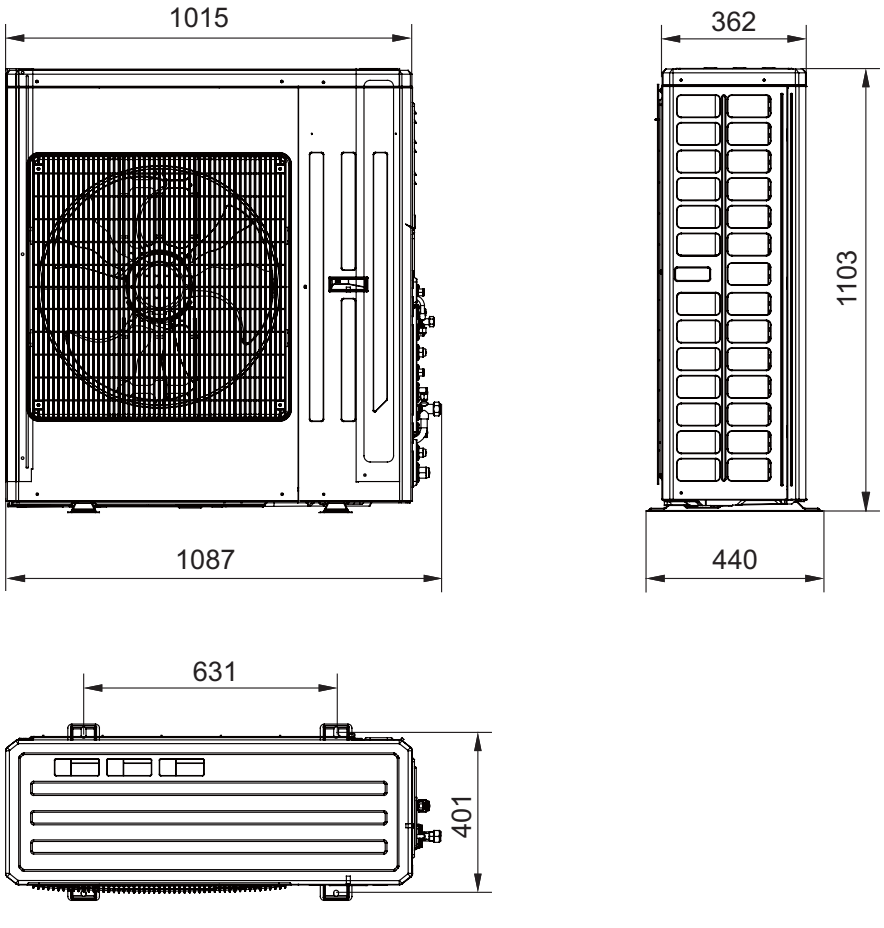
Unit:mm

WMO36MH16S



Unit:mm

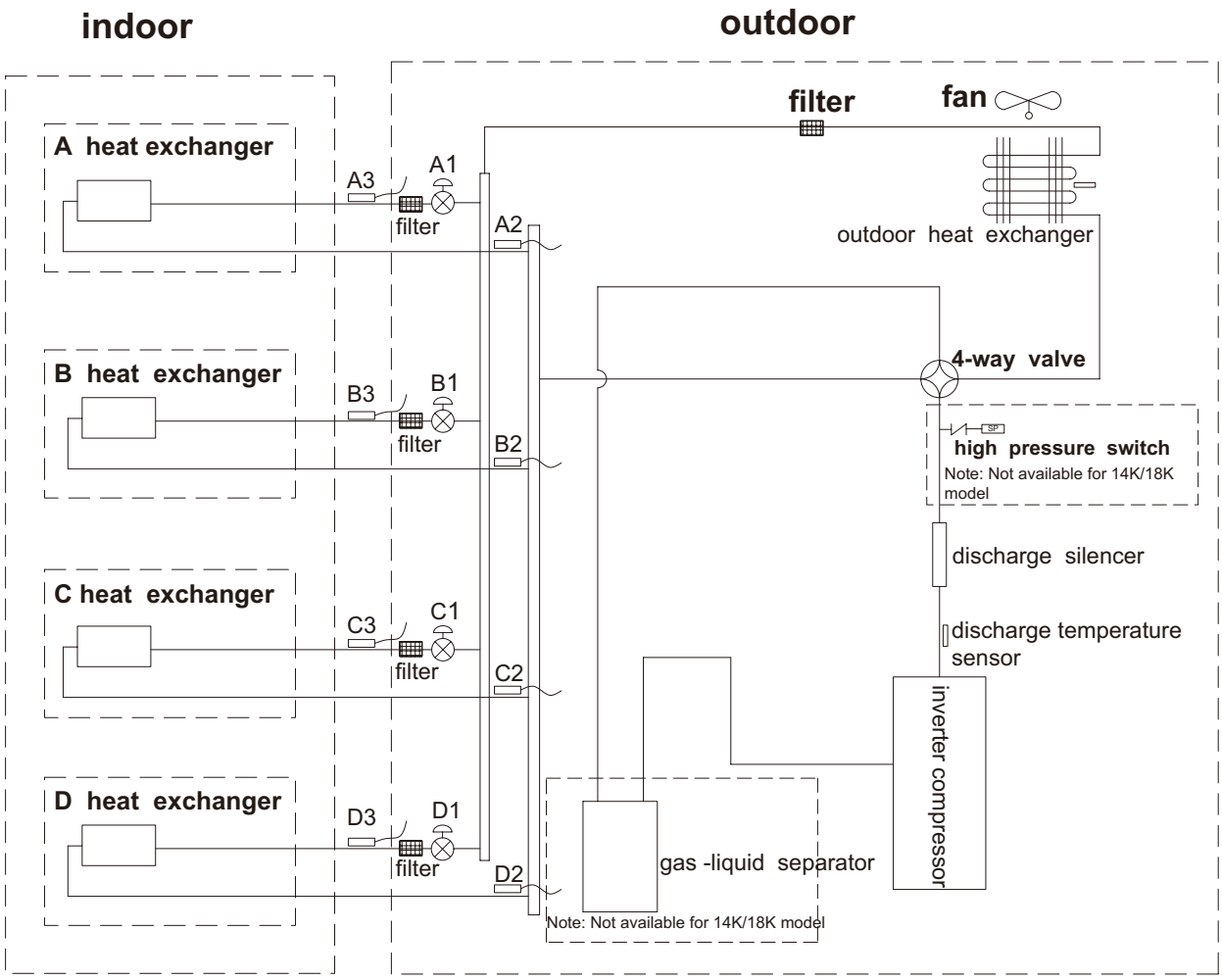
WMO42MH16S



Unit:mm

4. Refrigerant System Diagram

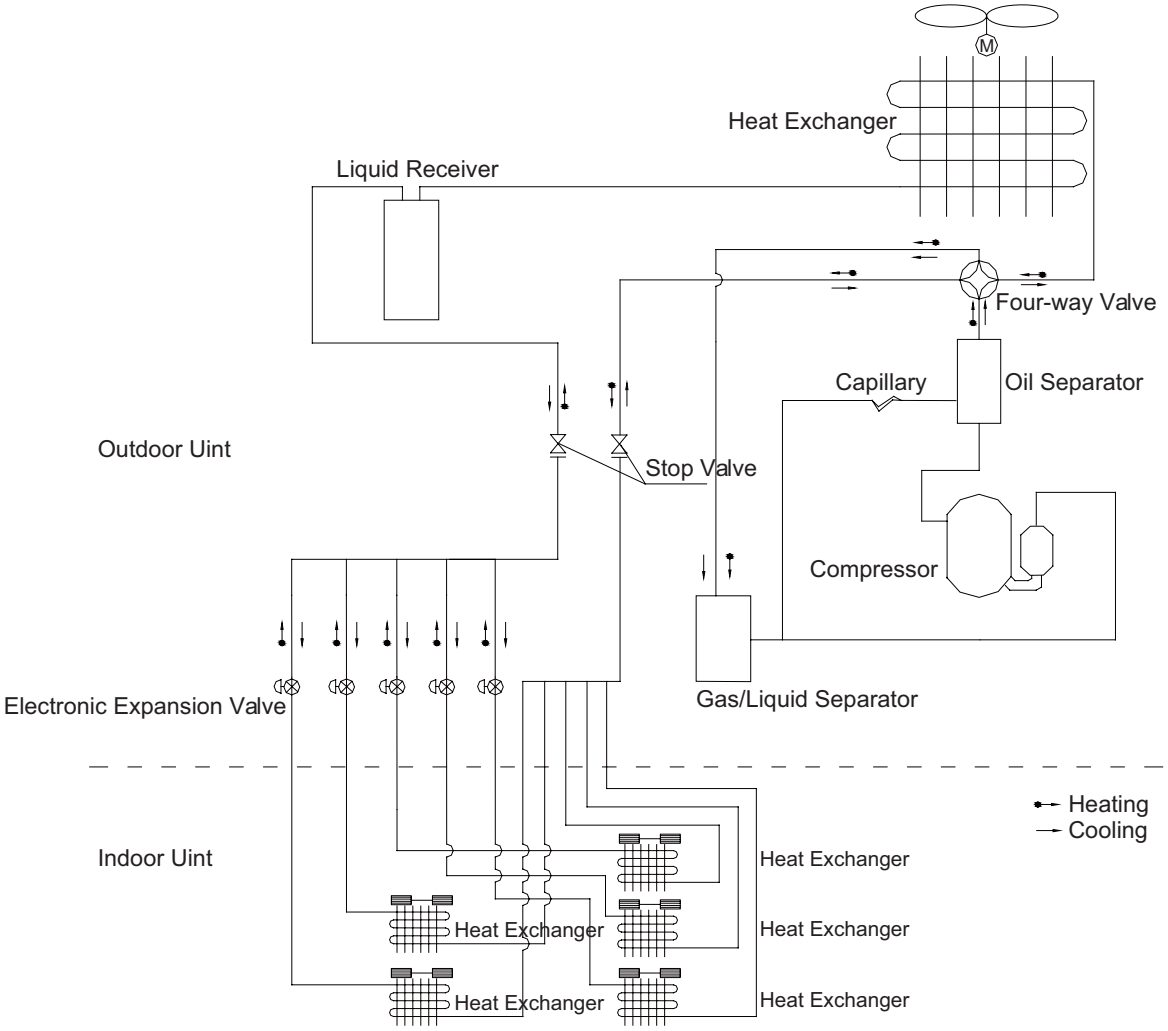
WMO18MH16S WMO24MH16S WMO30MH16S



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

WMO36MH16S WMO42MH16S

Schematic Diagram of Free Match Series Inverter Heat Pump System



Schematic Diagram of Free Match Series Inverter Heat Pump System

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

5. Schematic Diagram

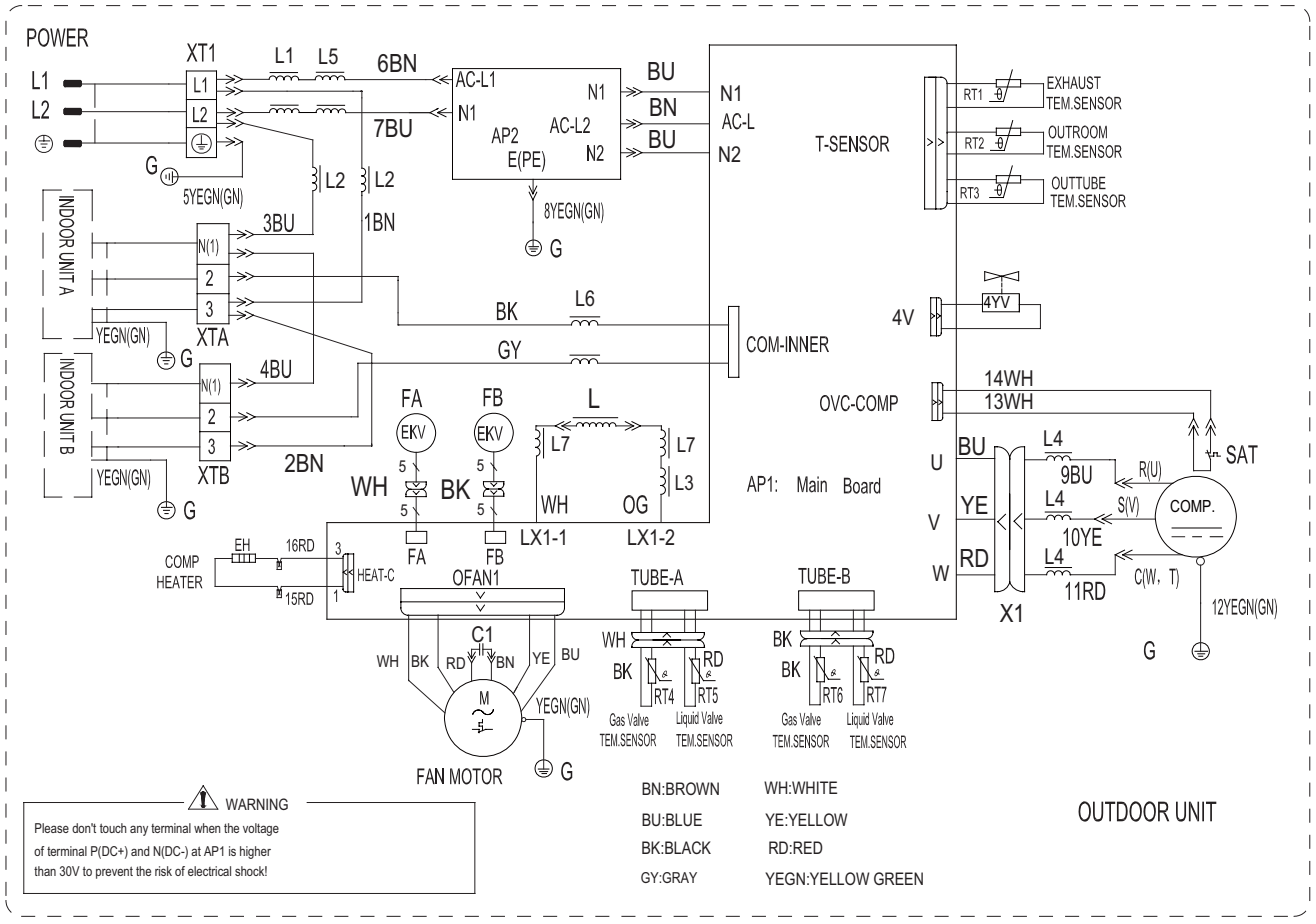
5.1 Electrical Data

Meaning of marks

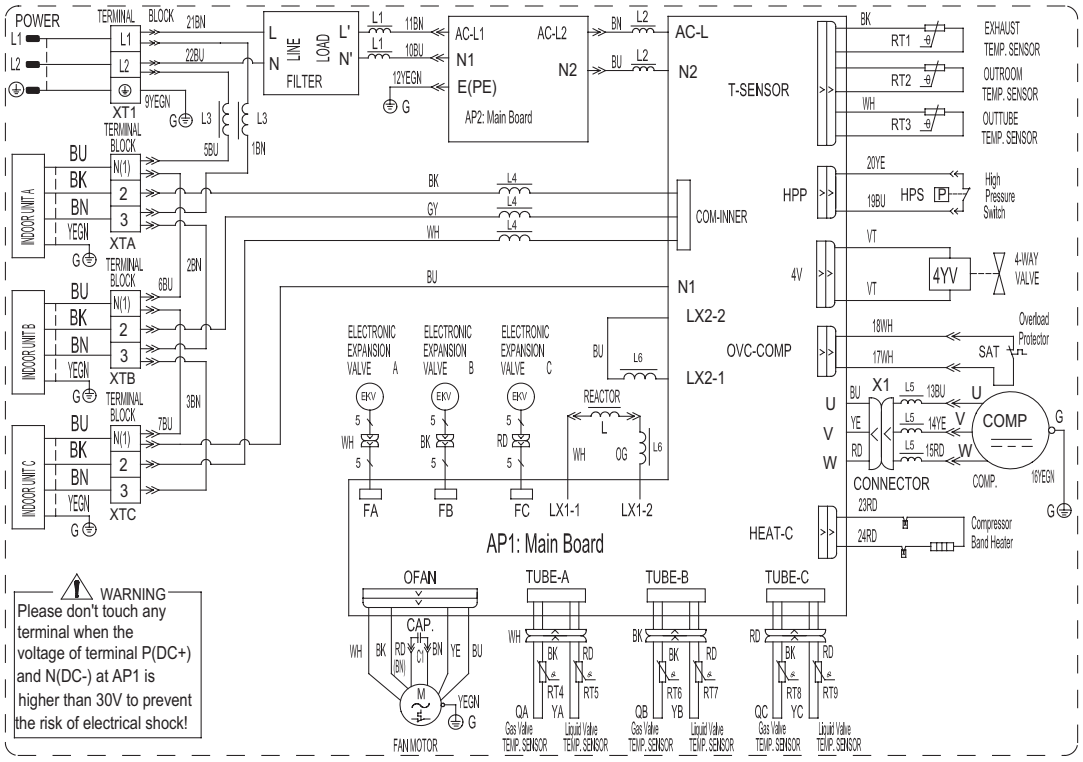
Symbol	Color symbol	Symbol	Color symbol	Symbol	Parts name
WH	WHITE	**GN**	GREEN	**SAT**	OVERLOAD
YE	YELLOW	**BN**	BROWN	**COMP**	COMPRESSOR
RD	RED	**BU**	BLUE	⏚	PROTECTIVE EARTH
YEGN	YELLOW GREEN	**BK**	BLACK	/	/
VT	VIOLET	**OG**	ORANGE	/	/

5.2 Electrical Wiring

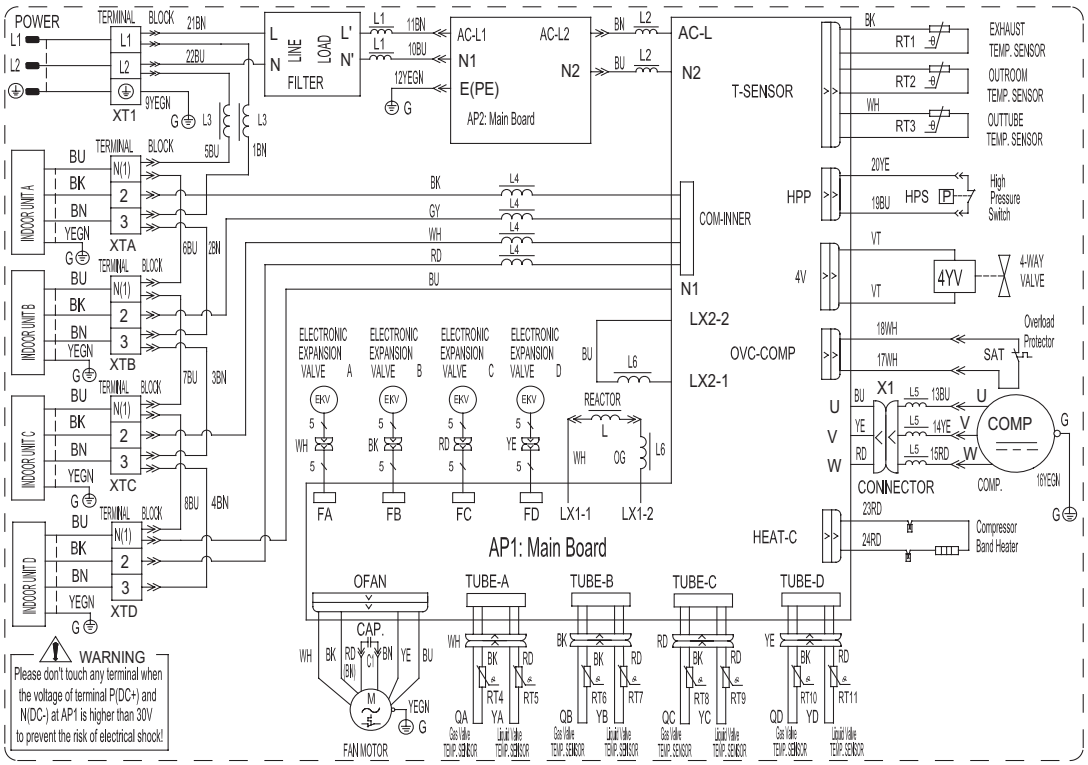
WMO18MH16S



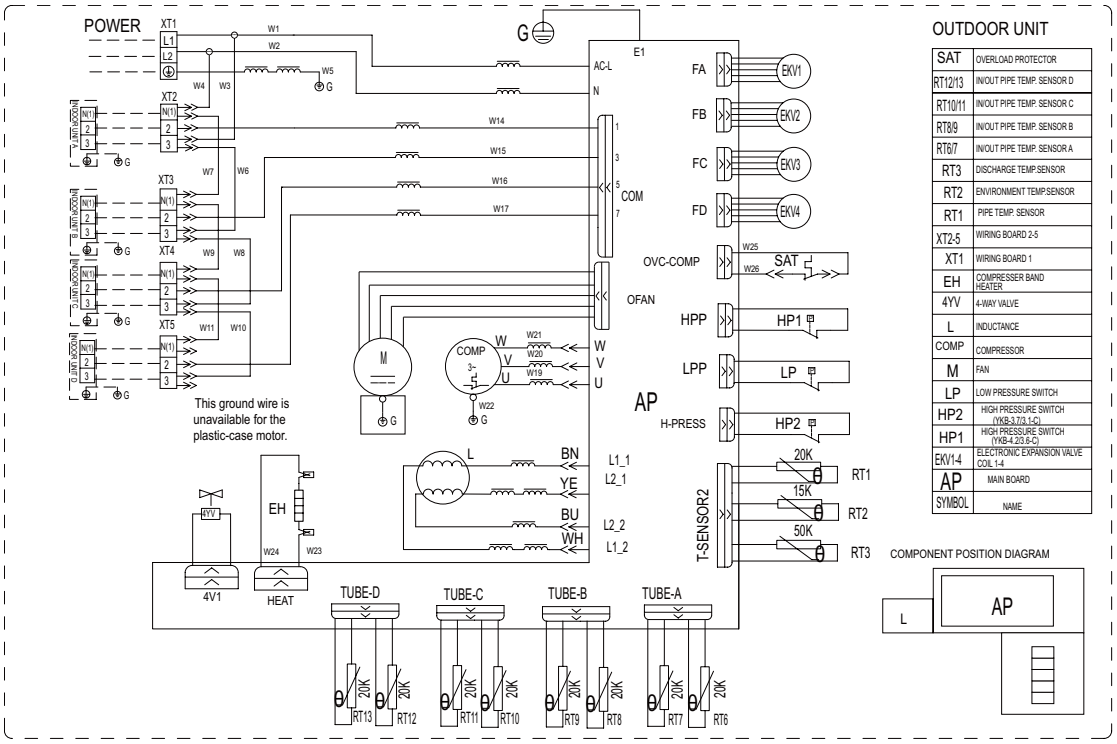
WMO24MH16S



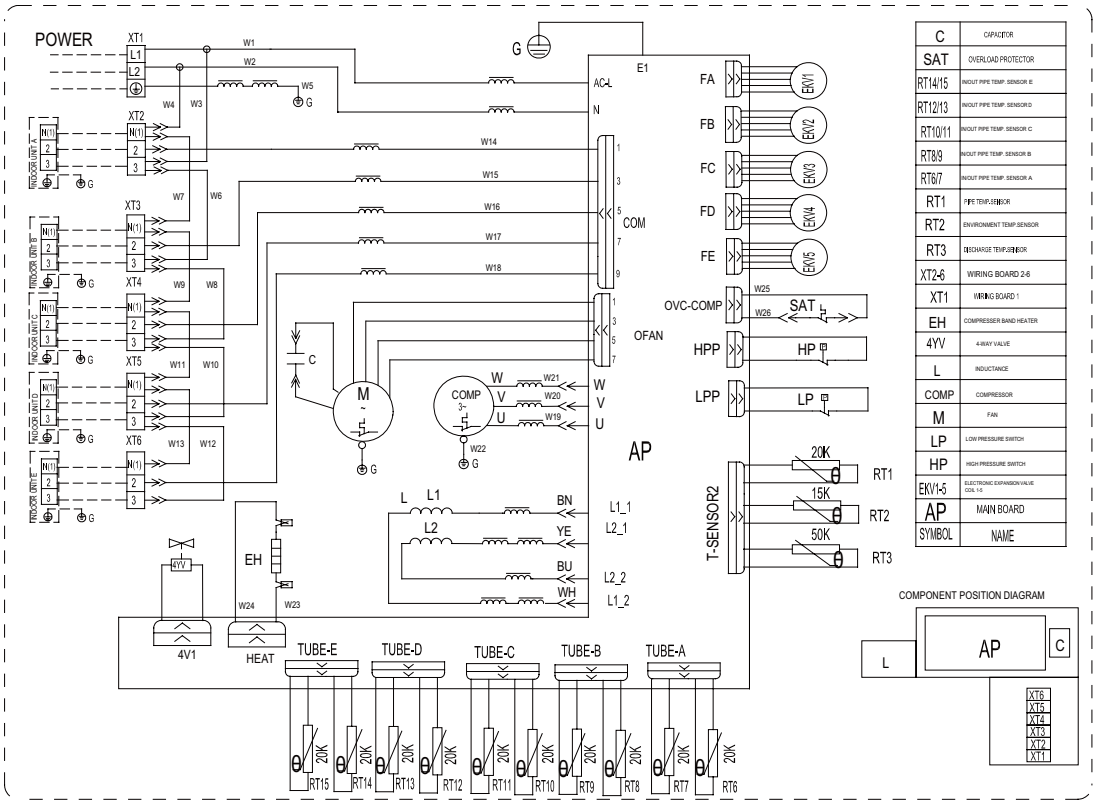
WMO30MH16S



WMO36MH16S



WMO42MH16S

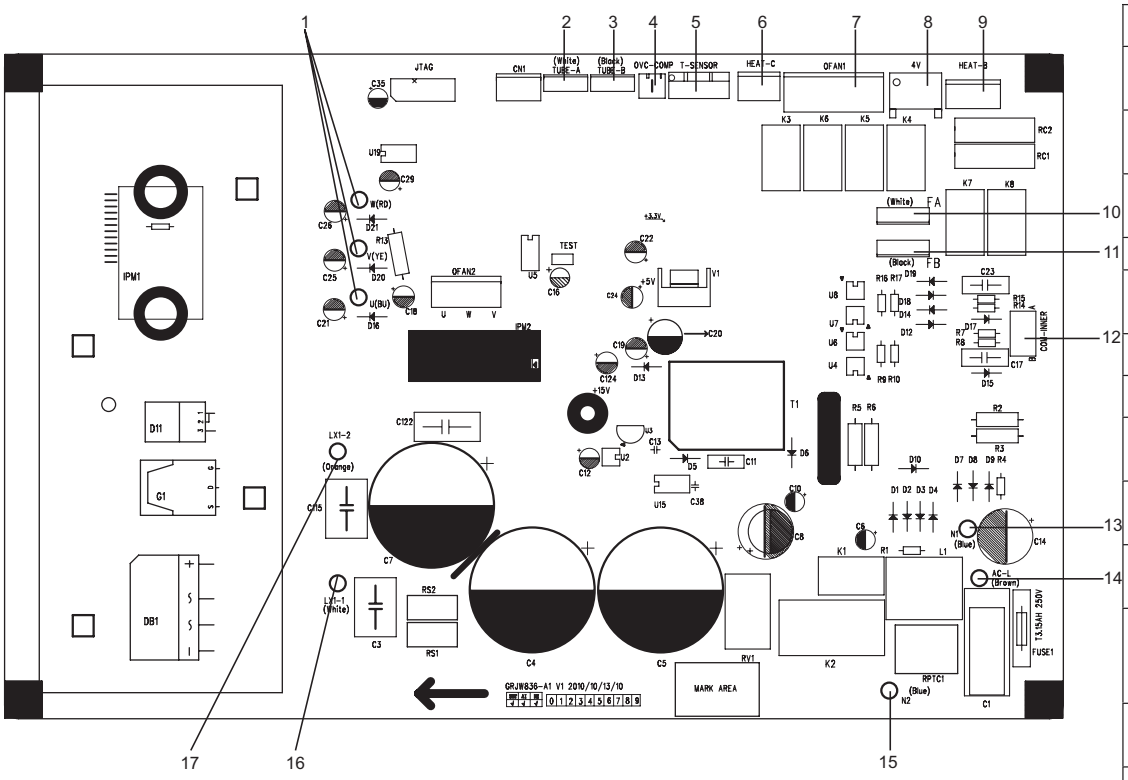


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

5.3 Printed Circuit Board

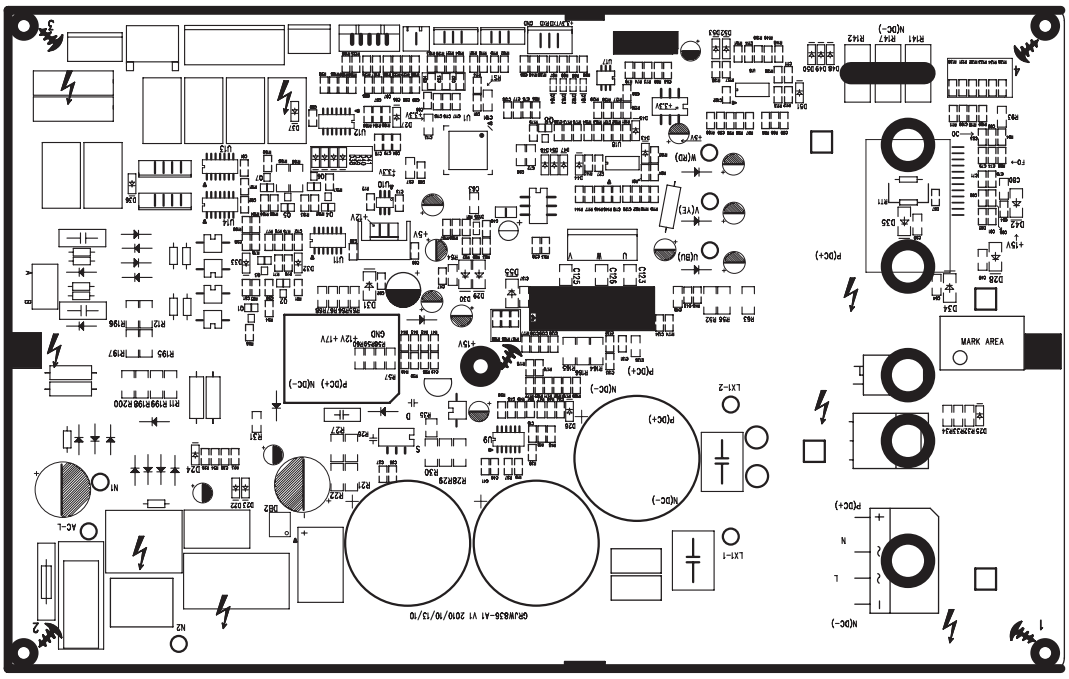
WMO18MH16S

● TOP VIEW



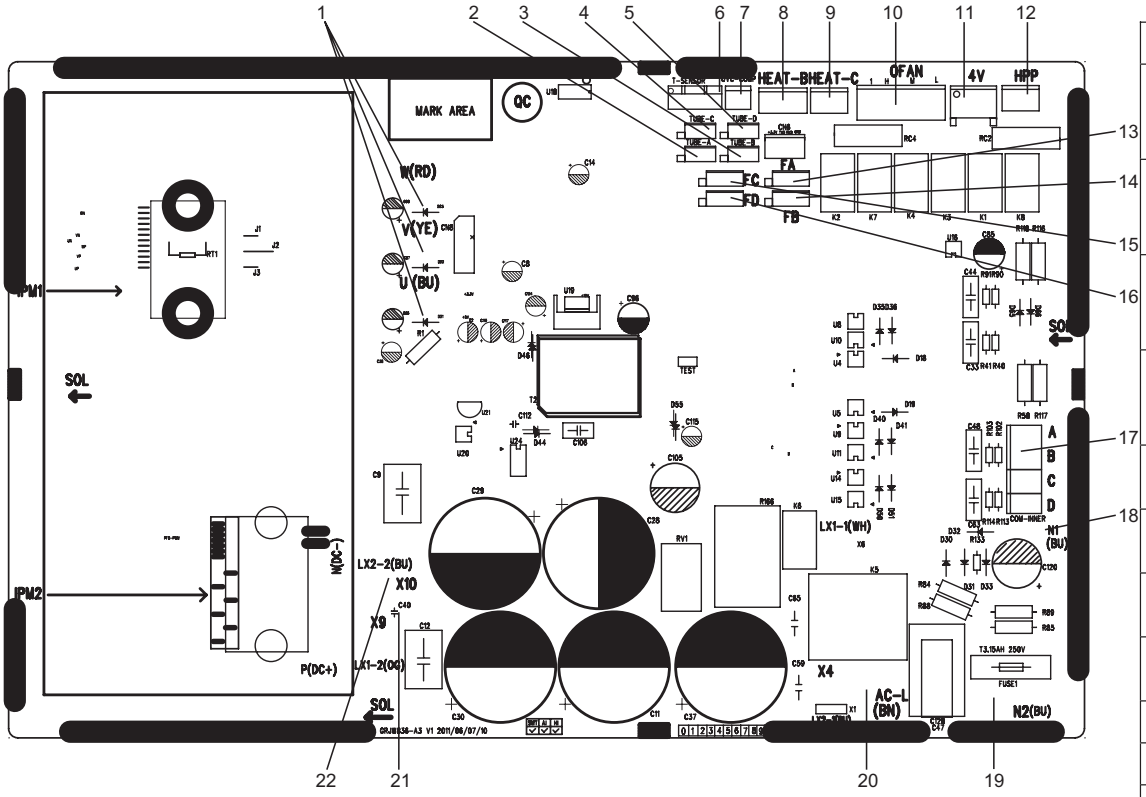
1	Compressor interface
2	Unit A liquid valve and gas valve
3	Unit B liquid valve and gas valve
4	Compressor overload protector
5	Temperature sensor
6	Compressor electric heater
7	Outdoor fan
8	4-way valve
9	Chassis electric heater (reserved)
10	Unit A electronic expansion valve
11	Unit B electronic expansion valve
12	Communication interface with indoor unit
13	Communication neutral wire
14	Live wire of power supply
15	Neutral ire of power supply
16	Reactor interface1
17	Reactor interface2

● BOTTOM VIEW



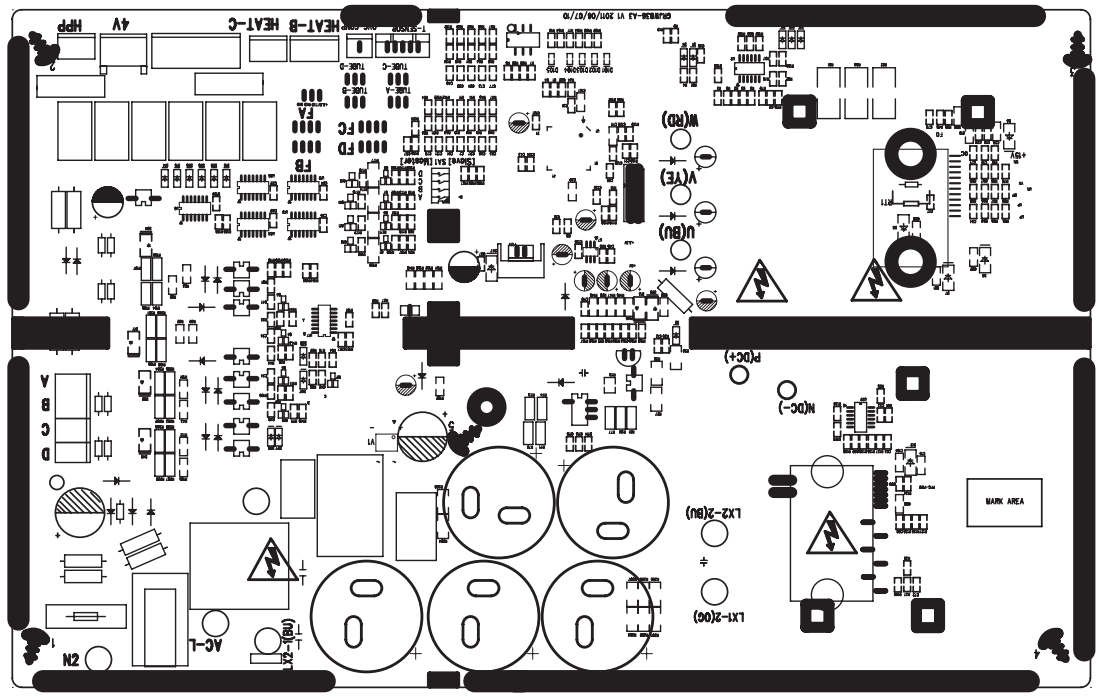
WMO24MH16S

● TOP VIEW



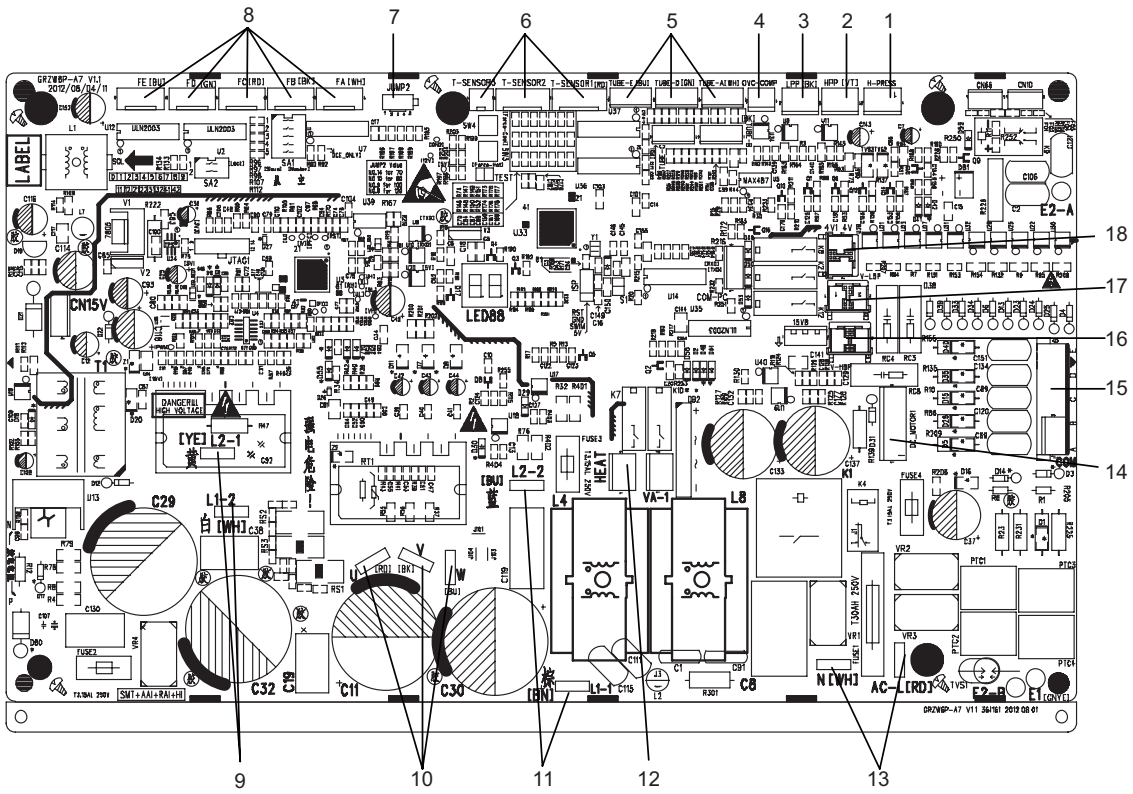
1	Compressor interface
2	Temperature sensor interface of unit A liquid valve and gas valve
3	Temperature sensor interface of unit B liquid valve and gas valve
4	Temperature sensor interface of unit C liquid valve and gas valve
5	Temperature sensor interface of unit D liquid valve and gas valve
6	Temperature sensor interface
7	Interface of compressor overload protector
8	Interface of chassis electric heater
9	Interface of compressor electric heater belt
10	Outdoor fan interface
11	4-way valve interface
12	High voltage protection interface
13	Interface of electronic expansion valve A
14	Interface of electronic expansion valve B
15	Interface of electronic expansion valve C
16	Interface of electronic expansion valve D
17	Communication wire interface
18	Communication neutral wire interface
19	Input neutral wire interface
20	Input live wire interface
21	PFC input live wire interface
22	PFC input neutral wire interface

● BOTTOM VIEW



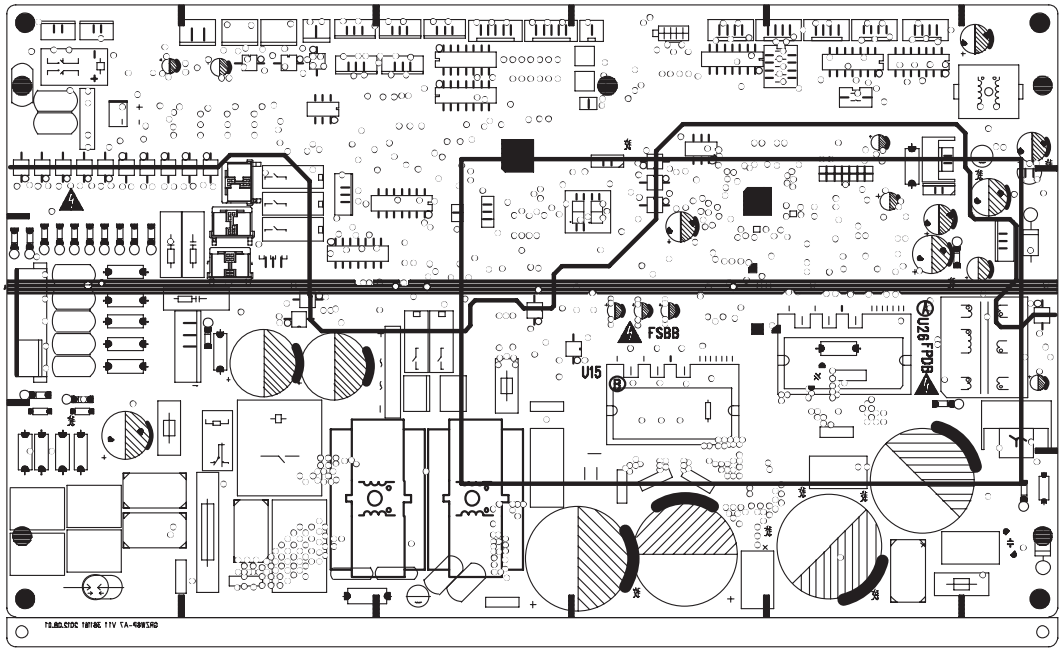
WMO36MH16S

● TOP VIEW



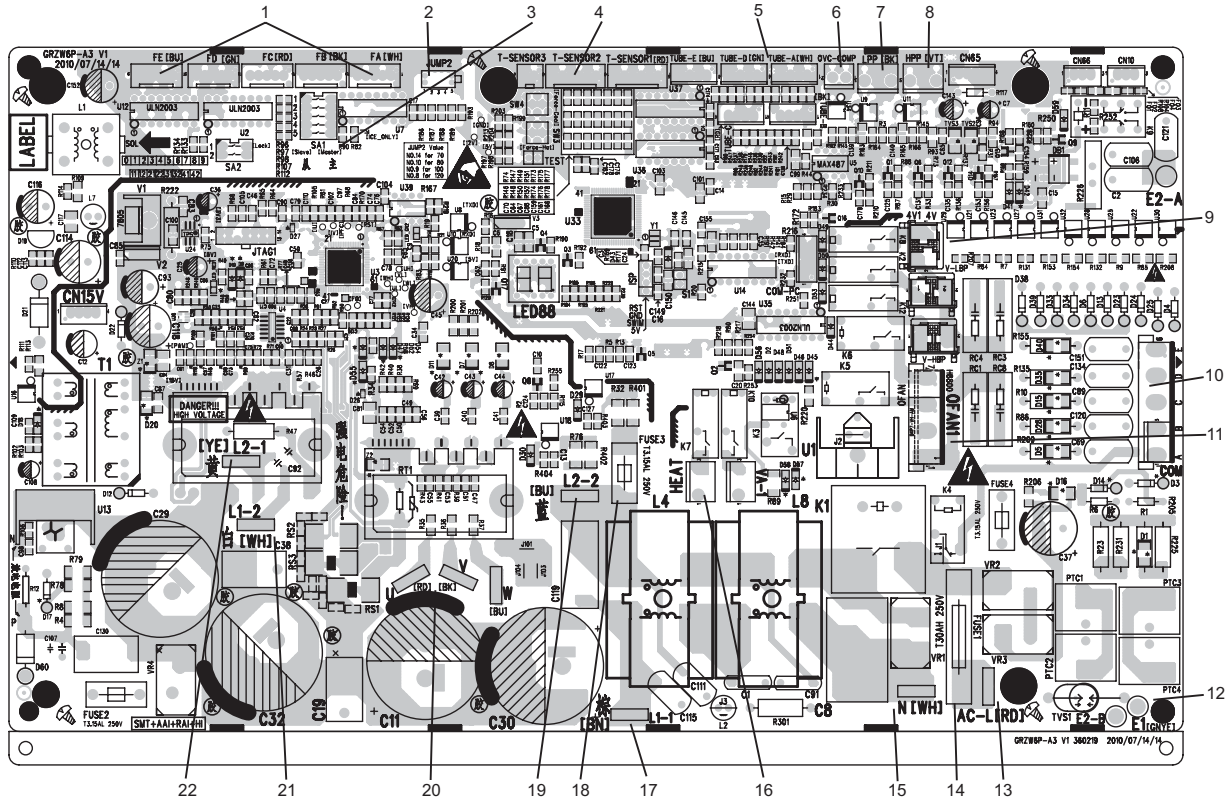
1	High-pressure protection 1
2	High-pressure protection 2
3	Low-pressure protection
4	Overload protection
5	Temperature sensor
6	Temperature sensor
7	Jumper cap
8	Electronic expansion valve
9	Yellow and white wires of PFC induction
10	Compressor wire
11	Brown and blue wires of PFC induction
12	Chassis electric heating of compressor
13	Neutral wire and live wire
14	Wiring terminal of DC fan
15	Communication of neutral wire and live wire
16	Gas by-pass valve
17	Liquid by-pass valve
18	4-way valve

● BOTTOM VIEW



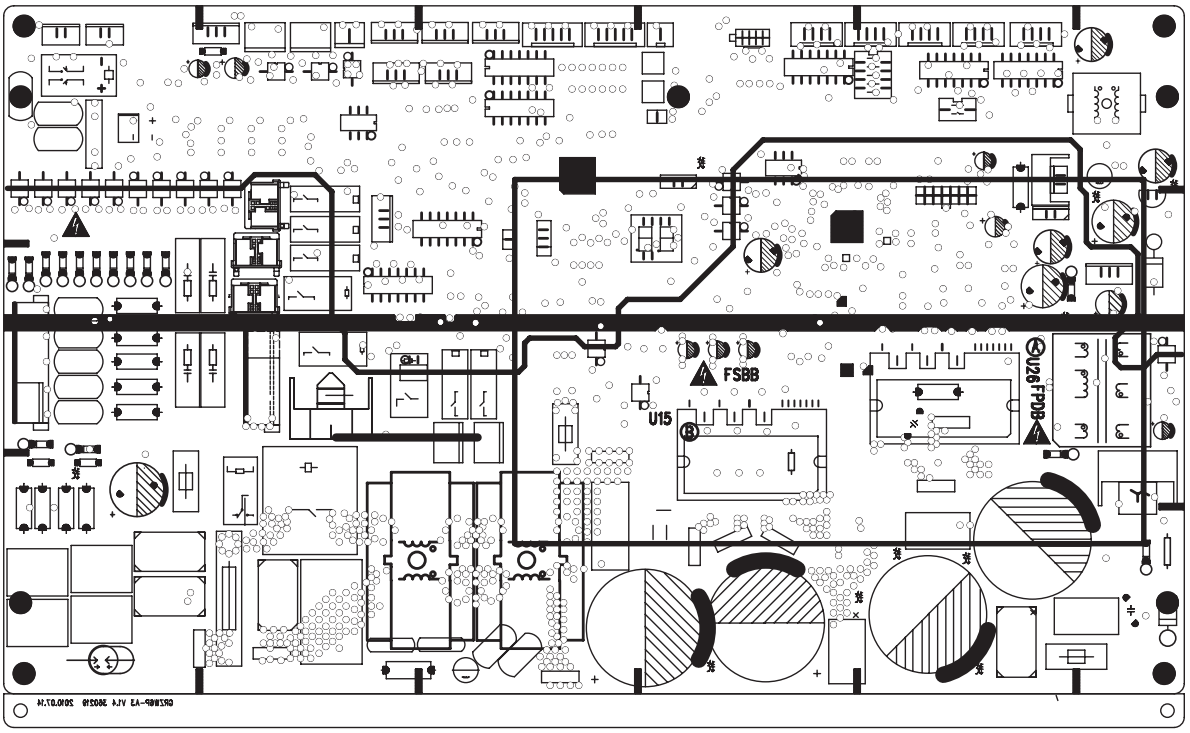
WMO42MH16S

- **TOP VIEW**



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

● **BOTTOM VIEW**



6. Function and Control

WMO18MH16S WMO24MH16S WMO30MH16S

1 Basic functions of the system

1.1 Cooling Mode

1.1.1 Cooling conditions and process:

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

1.1.2 Stop in cooling operation

1.1.2.1 Compressor stops

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

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

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

1.1.3 Cooling mode transfers to heating mode

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

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

1.1.5 Outdoor fan control in cooling mode

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

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

1.2 Dry Mode

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

1.2.2 The status of 4-way valve: closed;

1.2.3 The temperature setting range: 16 ~ 30℃;

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

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

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

1.3 Heating Mode

1.3.1 Cooling conditions and process:

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

1.3.2 Stop in heating operation:

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

1.3.2.2 Some of the indoor units reach the stop condition

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

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

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

1.3.3 Outdoor fan control in heating mode

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

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

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

1.3.4 Defrosting function

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

1.3.5 Oil-returned control in heating mode

1.3.5.1 Oil-returned condition

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

1.3.5.2 Oil-returned process in heating mode

The indoor unit displays “H1”

1.3.5.3 Oil-returned finished condition in heating mode

The duration reaches 5min

1.4 Fan Mode

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

2. Protection Function

2.1 Mode Conflict Protection of indoor unit

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

a. The mode of the first operating indoor unit is the basic mode, then compare the mode of the other indoor units to see if there is a conflict. Cooling mode (dry mode) is in conflict with heating mode.

b. Fan mode is in conflict with heating mode and the heating mode is the basic mode. No matter which indoor unit operates first, the unit will run in heating mode.

2.2 Overload protection function

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

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

2.3 Discharge Protection Function

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

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

2.4 Communication malfunction

Detection of the quantity of installed indoor units:

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

2.5 Overcurrent Protection

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

2.6 Compressor high-pressure protection

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

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

2.7 Compressor overload protection

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

2.8 Compressor Phase-lacking Protection

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

2.9 IPM Protection

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

2.9.2 IPM module overheating protection

2.9.2.1 When $T_{IPM} > 85℃$, prohibit to raise frequency;

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

2.9.2.3 When $T_{IPM} \geq 95℃$, the compressor stops. After the compressor stops for 3min, if $T_{IPM} < 85℃$, the compressor and the outdoor fan will resume operation.

WMO36MH16S WMO42MH16S

1.Function Control

1) Cooling mode

a. Turning on the unit for cooling operation, and if any one of the indoor units satisfy the cooling operation condition, the system will start for cooling operation; and the electronic expansion valve, the outdoor fan and the compressor start operation.
b. When some of the indoor units satisfy the stop-condition while some indoor units does not satisfy the stop-condition, the compressor does not stop, the compressor adjust the frequency according to demand. For the indoor unit with stop-condition satisfies, the corresponding electronic expansion valve will be closed.
c. Change Cooling mode to heating mode
When change the unit to heating mode from cooling mode, the whole system will stop first. Then the system will restart in heating mode after the compressor stops.
d. 4-way valve
In this mode, the 4-way valve is closed.
e. Outdoor fan control in cooling mode
The outdoor fan starts before 5s of the starting of compressor. The outdoor fan will run in midlle speed after starting and then it will run in set speed.

2) Dry mode (dehumidification mode)

this mode is the same as cooling mode;

3) Heating mode

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

4) Fan mode

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

2.Protection Function

1) Mode conflict protection of indoor units

When the setting mode is different of different indoor unit, the unit runs in below status:
a. The system mode is determined by the first turning on indoor unit except indoor unit is in fan mode. Cooling mode (dry mode) is in conflict with heating mode.
b. If the first turning on unit is fan mode, and the second turning on unit is cooling or heating mode, then the system will run in cooling or heating mode

2) Overload protection

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

3) High exhaust temperature protection

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

4) Communication malfunction

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

5) System high-pressure protection

a. When the high-pressure switch detects the system pressure higher than limit ,then the high-pressure switch cuts off, the system will stop to run.

b.If high-pressure protection is detected for two times within one hour, only by cutting off the power and then reenergize that the compressor can restart.

6)System low-pressure protection

a. When the low-pressure switch detects the system pressure lower than limit ,then the los-pressure switch cuts off , the system will stop to run.

b. If low-pressure protection is detected for two times within one hour, only by cutting off the power and then reenergize that the compressor can restart.

7) Compressor overload protection

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

3.Other function

1) Refrigerant Recovery

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

How to quit the refrigerant recovery:

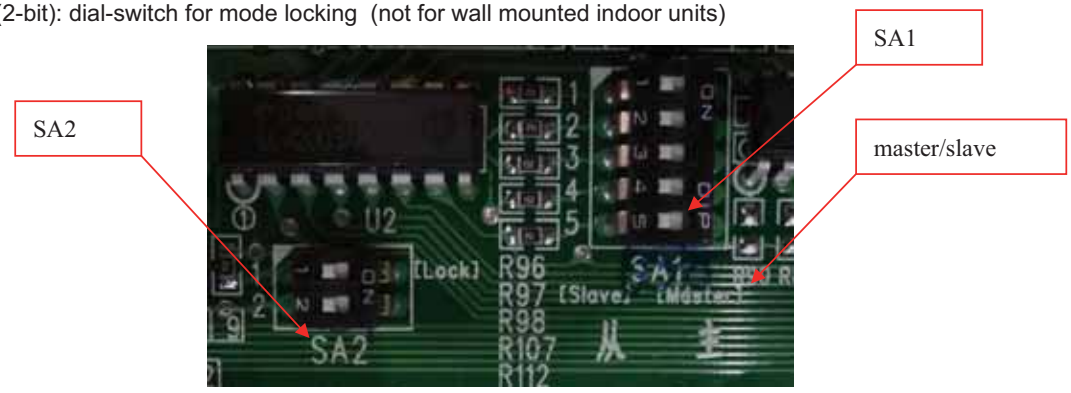
When the refrigerant recovery has started, it will quit when there is a signal from the wireless controller or it has run for ten minutes.

2) Setting function of master/slave indoor unit

Picture of DIP switch on outdoor mainboard :

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

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



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

2-bit dial-switch to set mode locking

(note:

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

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

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

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

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

7. Installation Manual

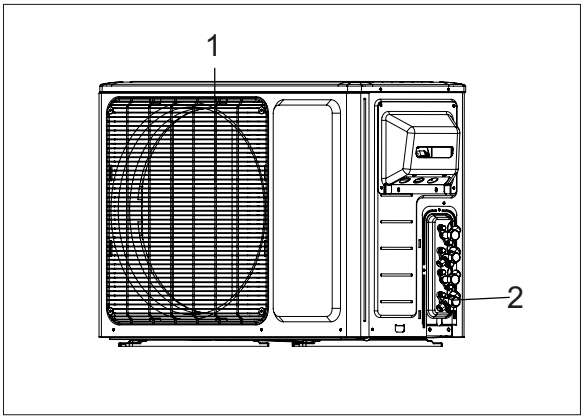
7.1 Installation Dimension Diagram

WMO18MH16S

Warning

- Be sure to cut off the power supply before cleaning the air conditioner; otherwise electric shock might happen.
- Wetting of air conditioner may cause the risk of electric shock. Make sure not to wash your air conditioner in any case.
- Volatile liquids such as thinner or gasoline will cause damage to the appearance of air conditioner. (Only use soft dry cloth moist cloth clean the air conditionercabinet).
- This product must not be disposed together with the domestic waste.This product has to be disposed at an authorized place for recycling of electrical and electronic appliances.
- The temperature of refrigerant circuit will be high,please keep the interconnection cable away from the copper tube.

OUTDOOR UNIT	
No.	Description
1	Air outlet grille
2	Valve



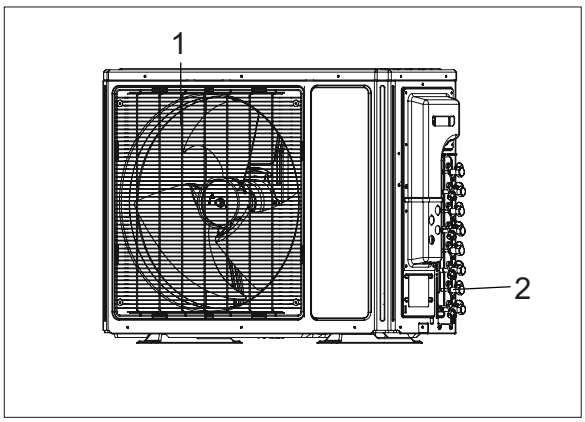
Note:the above figures are only intended to a simple diagram of theappliance and may not correspond to the appearance of the units that have been purchased.

WMO24MH16S WMO30MH16S

Warning

- If the supply cable is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- Be sure to cut off the power supply before cleaning the air conditioner;otherwise electric shock might happen.
- Wetting of air conditioner may cause the risk of electric shock. Make sure not to wash your air conditioner in any case.
- Volatile liquids such as thinner or gasoline will cause damage to the appearance of air conditioner. (Only use soft dry cloth moist cloth clean the air conditioner cabinet).
- Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.
- The temperature of refrigerant circuit will be high,please keep the interconnection cable away from the copper tube.

OUTDOOR UNIT	
No.	Description
1	Air outlet grille
2	Valve



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

7.2 Installing The Outdoor Unit

Location

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

● Do not install the outdoor unit in pits or air vents

Installing the pipes

⚠ Use suitable connecting pipes and equipment for the refrigerant R410A.

⚠ The refrigerant pipes must not exceed the maximum lengths .

Models(m)	18K	24K/30K
Max.connection pipe length	20	70
Max.connection pipe length (Simple one indoor unit)	10	20

The refrigerant pipes must not exceed the maximum heights 5m(18K) 10m(24K/30K).

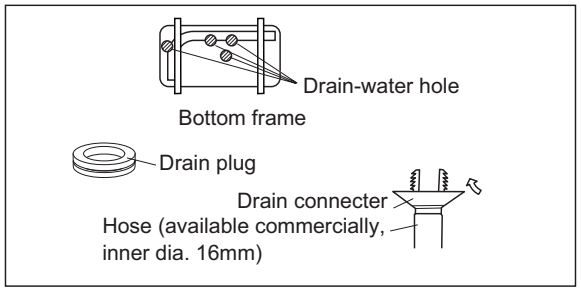
⚠ Wrap all the refrigerant pipes and joints.

⚠ Tighten the connections using two wrenches working in opposite directions.

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

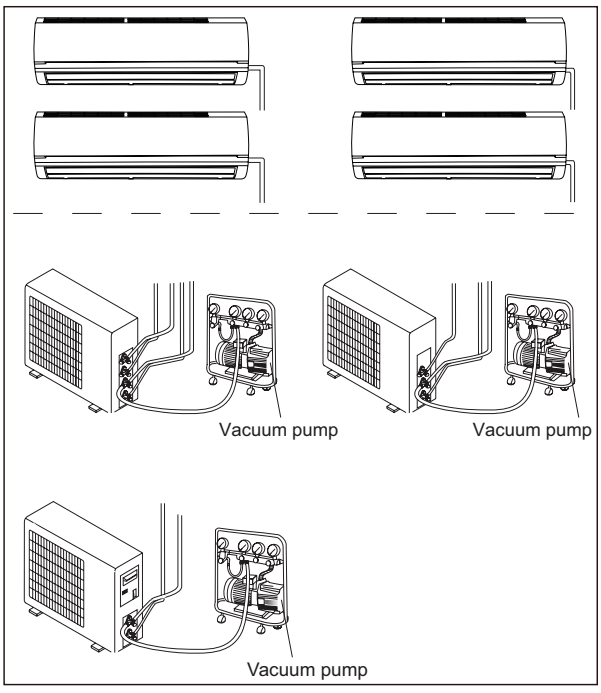
Install the drain fitting and the drain hose (for model with heat pump only)

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



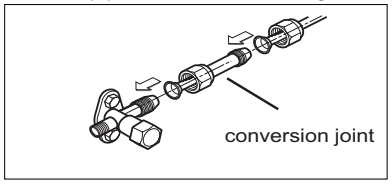
Humid air left inside the refrigerant circuit can cause compressor malfunction. After having connected the indoor and outdoor units, bleed the air and humidity from the refrigerant circuit using a vacuum pump.

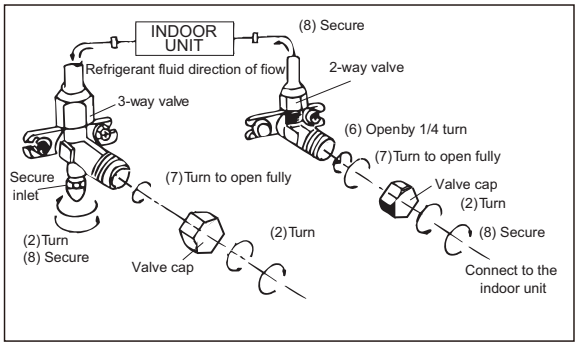
(1) Unscrew and remove the caps from the 2-way and 3-way valves.
(2) Unscrew and remove the cap from the service valve.
(3) Connect the vacuum pump hose to the service valve.
(4) Operate the vacuum pump for 10-15 minutes until an absolute vacuum of 10 mm Hg has been reached.
(5) With the vacuum pump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



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

(9) If the specification of outdoor unit gas valve is 3/8″ , but curstomer needs to install 1/2″ indoor unit so that it is need to use a “pipe joint subassembly” (Code 06643008) to make a conversion joint with outdoor unit gas valve and connection pipe, as show in following.

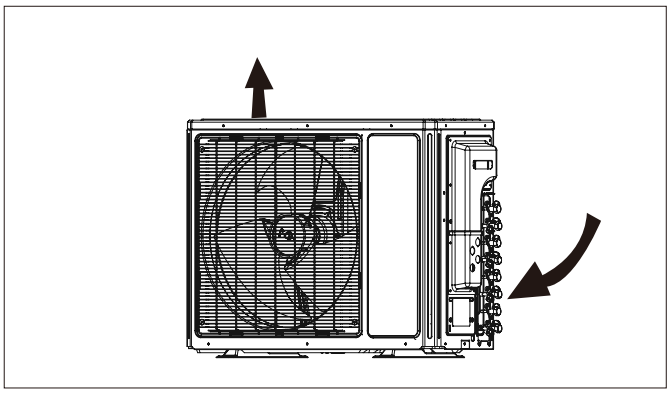




⚠ Use suitable instruments for the refrigerant R410A.

● Do not use any other refrigerant than R410A.

⚠ Do not use mineral oils to clean the unit.



INSTALLATION DIMENSION DIAGRAM

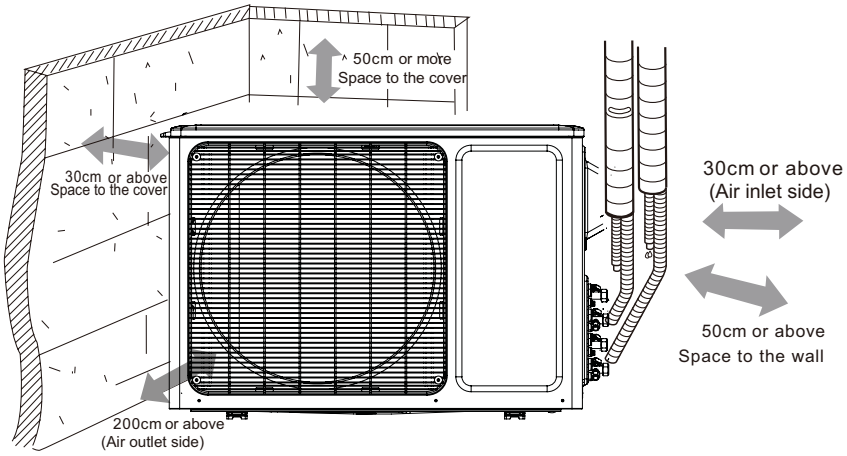
⚠ The installation must be done by trained and qualified service personnel with reliability according to this manual.

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

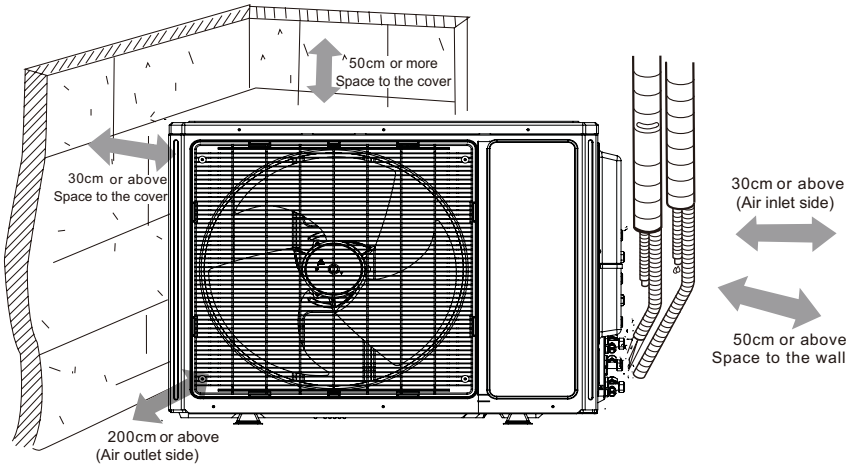
⚠ When picking up and moving the units, you must be guided by trained and qualified person.

⚠ Ensure that the recommended space is left around the a ppliance .

WMO18MH16S



WMO24MH16S WMO30MH16S

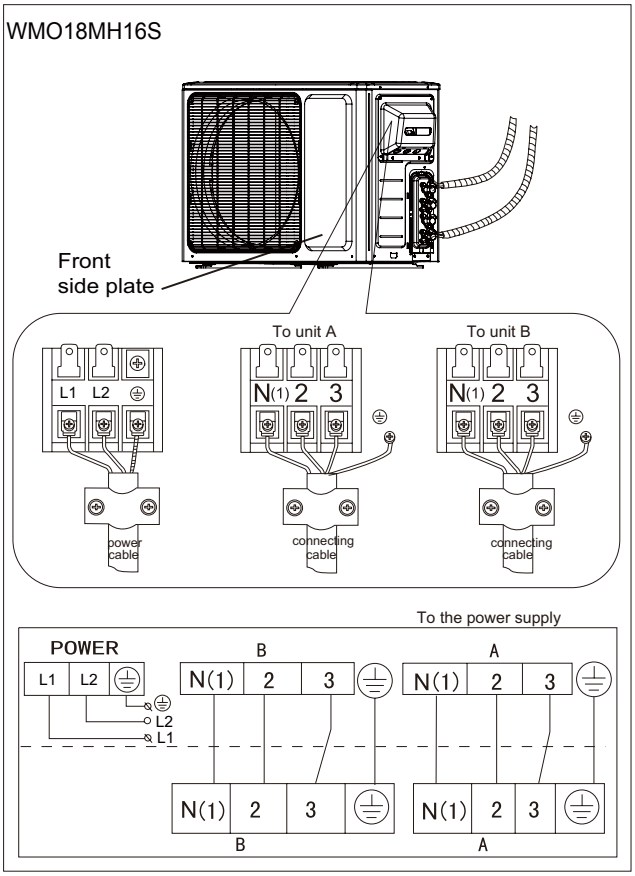


This is just the schematic plan, please refer to the actual product.

7.3 Electrical Connections

WMO18MH16S

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



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

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

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

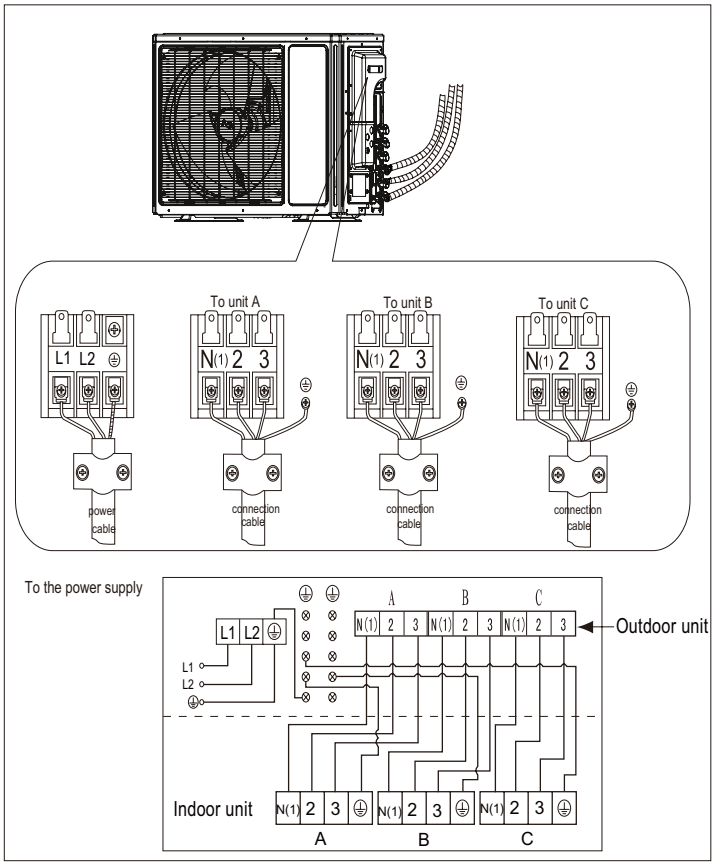
⚠ The appliance shall be installed in accordance with national wiring regulations.

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

All power cables and connection cables must be protected with conduits.

WMO24MH16S

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



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

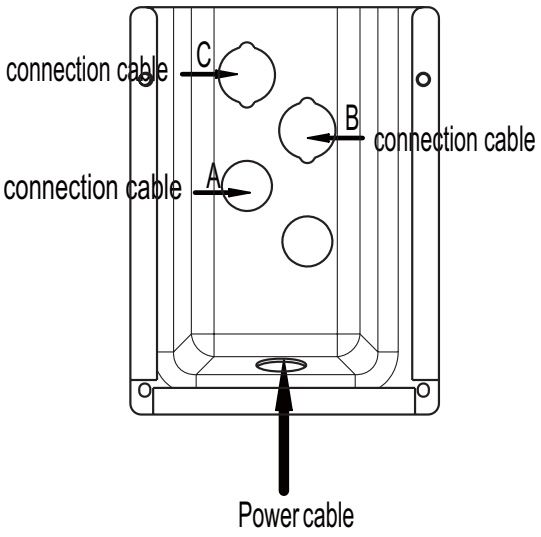
⚠ Wrong wire connection may cause malfunction of some electric components.After fixing cable, ensure that leads between connection to fixed point have some space.

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

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

⚠ Do not install the outdoor unit where it is exposed to the sunlight.

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

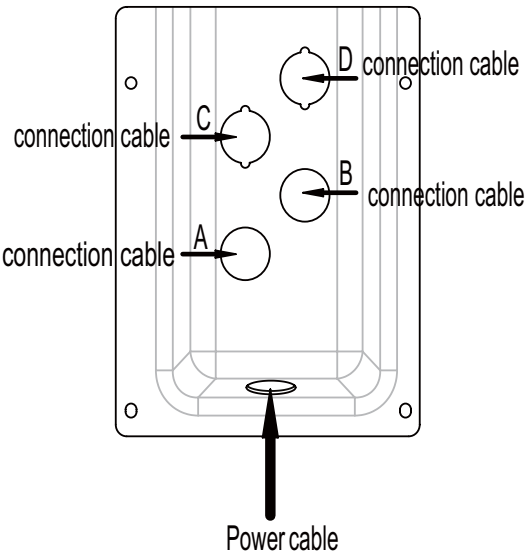


1) The power cable should be put in from the hole under connection cable cover.
2) If connecting with two indoor units, the connection cable should be put in from hole A and hole B.
3) If connecting with three indoor units, the connection cable should be put in from hole A , B and C.
4) If connecting with four indoor units, the connection cable should be put in from hole A, B , C and D.

All power cables and connection cables must be protected with conduits.

WMO30MH16S

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



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

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

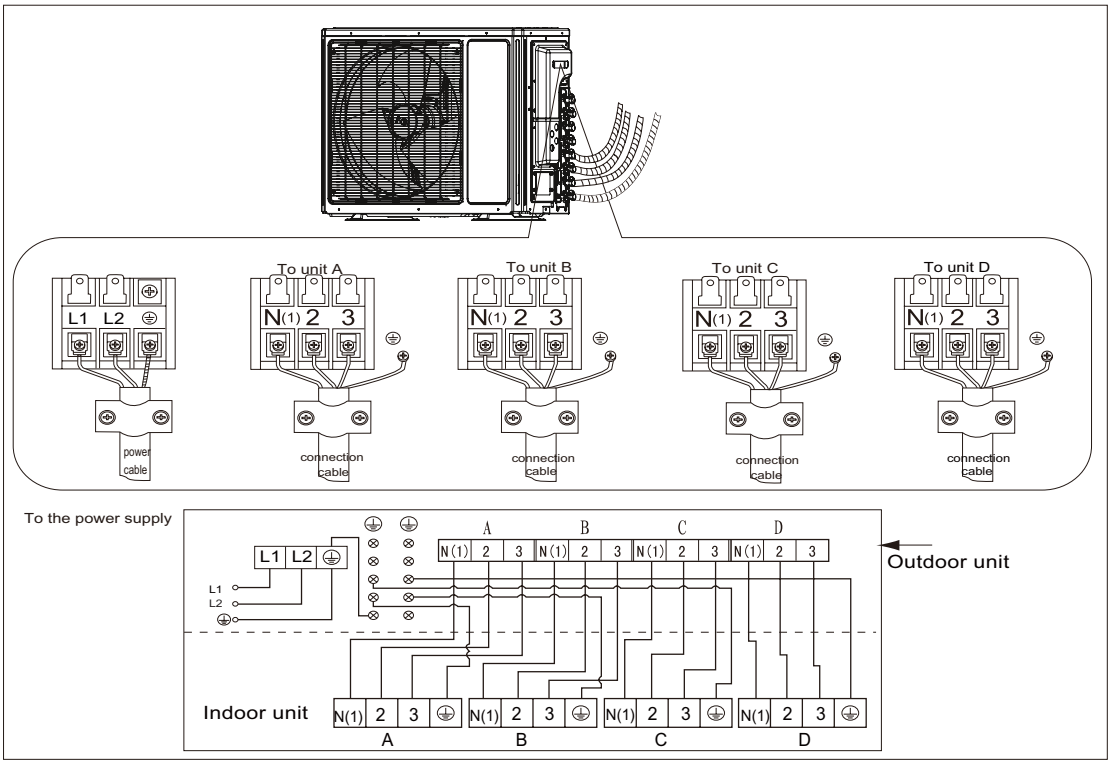
⚠ The connect ion pipes and the connectiong wirings of the unit A ,unit B,unit C and unit D must be corresponding to each other respective.

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

⚠ Do not install the outdoor unit where it is exposed to the sunlight.

1) The power cable should be put in from the hole under connection cable cover.
2) If connecting with two indoor units, the connection cable should be put in from hole A and hole B
3) If connecting with three indoor units, the connection cable should be put in from hole A , B and C
4) If connecting with four indoor units, the connection cable should be put in from hole A, B , C and D.

All power cables and connection cables must be protected with conduits.



HANDLING

⚠ After having removed the packaging, check that the contents are intact and complete.
The outdoor unit must always be kept up right.

⚠ Handling must be done by suitablye quipped qualified technical personnel using equipment that is suitable for the weight of the appliance.

7.4 Check after Installation

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

7.5 Models:36/42K

Safety Precautions

Please read this manual carefully before using and operating correctly as instructed in this manual.

Please especially take notice of the following two symbols:

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

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

⚠ Warning!

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

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

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

◆ Do not use or place any inflammable, combustible or any noxious substance next to the unit.

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

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

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

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

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

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

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

⚠ Caution!

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

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

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

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

◆ Do not allow children to operate this unit.

◆ Do not operate this unit with wet hands.

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

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

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

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

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

7.5.1 Installation Location and Matters Needing Attention

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

(1). How to select the installation location for the indoor unit

1). Where there is no direct sunlight.

2). Where the top hanger, ceiling and the building structure are strong enough to withstand the weight of the unit.

3). Where the drain pipe can be easily connected to outside.

4). Where the flow of the air inlet/outlet is not blocked.

5). Where the refrigerant pipe of the indoor unit can be easily led to outside.

6). Where there is no inflammable, explosive substances or their leakage.

7). Where there is no corrosive gas, heavy dust, salt mist, smog or moisture.

(2). How to select the installation location for the outdoor unit

1). The outdoor unit must be installed where the bearing surface is stable and secure enough.

2). The outdoor unit and indoor unit should be placed as close as possible to minimize the length and bends of the refrigerant pipe.

3). Do not install the outdoor unit under the window or between the buildings to prevent the normal running noise entering the room.

4). Where the flow of the air inlet/outlet is not blocked.

5). The outdoor unit should be installed where ventilation is in good condition so that the unit can take in and discharge enough air.

6). Do not install the unit where there are inflammable and explosive substances and where there is heavy dust, salt fog and other severely polluted air.

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

⚠ CAUTION!

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

(3). Electric Wiring

1). The installation must be done in accordance with the national wiring regulations.

2). Only the power cord with the rated voltage and exclusive circuit for the air conditioning can be used.

3). Do not pull the power cord by force.

4). The electric installation should be carried out by the technician as instructed by the local laws, regulations and also this manual.

5). The diameter of the power cord should be large enough and once it is damaged it must be replaced by the dedicated one.

6). The earthing should be reliable and the earth wire should be connected to the dedicated device of the building by the technician. Besides, the air switch coupled with the leakage current protection switch must be equipped, which is of enough capacity and of both magnetic and thermal tripping functions in case of the short circuit and overload.

Table 1

Models	Power Supply	MCA	MOP
WMO36MH16S	208/230V~ 60Hz	28A	45A
WMO42MH16S	208/230V~ 60Hz	29A	50A

Notes:

①.The specifications of the breaker and power cable listed in the table above are determined based on the maximum power (maximum amps) of the unit.

② .The specifications of the power cable listed in the table above are applied to the conduit-guarded multi-wire copper cable (like, YJV copper cable, consisting of PE insulated wires and a PVC cable jacket) used at 40 ℃ and resistible to 90 ℃ . If the working condition changes, they should be modified according to the related national standard.

③ .The specifications of the breaker listed in the table above are applied to the breaker with the working temperature at 40℃ . If the working condition changes, they should be modified according to the related national standard.

(4). Earthing Requirements

1). The air conditioner is classified into the Class I appliances, so its earthing must be reliable.

2). The yellow-green line of the air conditioner is the earth line and can not be used for other purpose, cut off or fixed by the tapping screw; otherwise it would cause the hazard of electric shock.

3). The reliable earth terminal should be provided and the earth wire can not be connected to any of the following places.

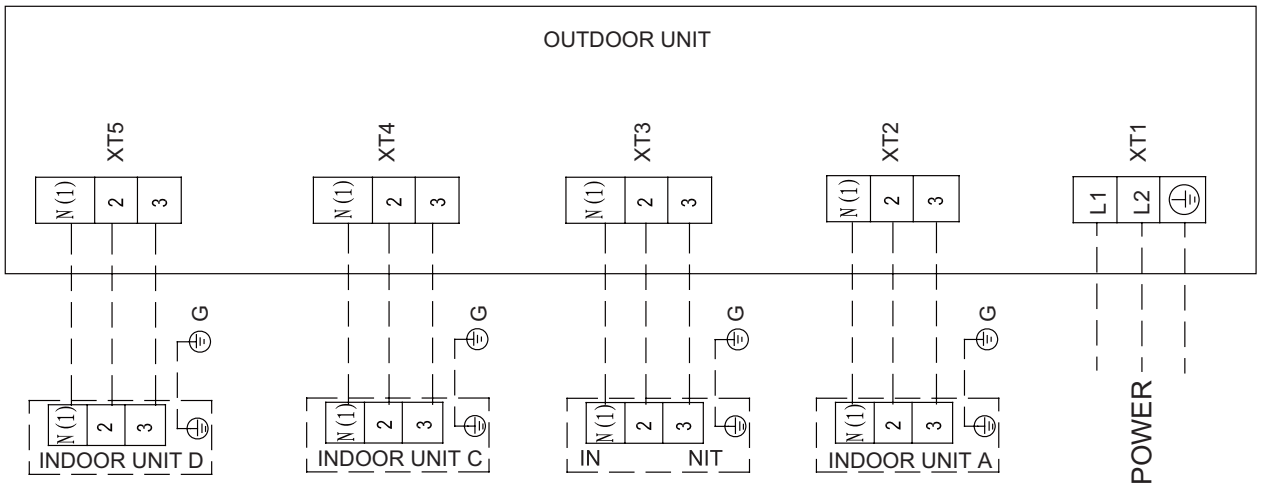
a. Running water pipe.

b. Coal gas pipe.

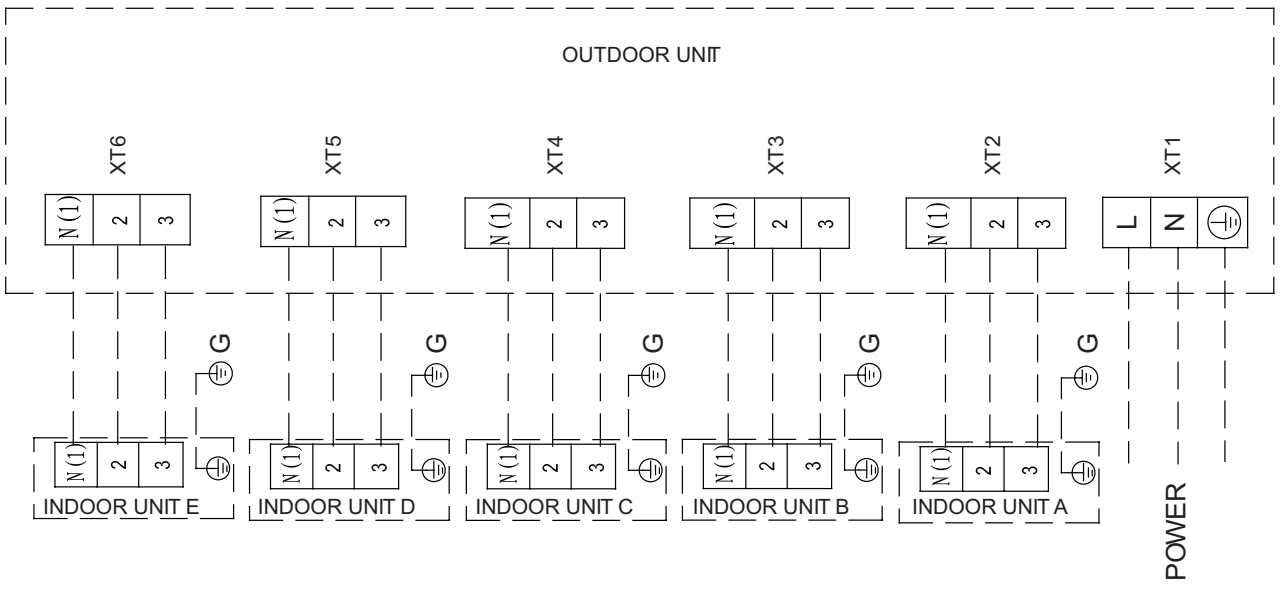
c. Sewage pipe.

d. Other places where the professional personnel think unreliable.

WMO36MH16S



WMO42MH16S



(5). Noise Precautions

1). The air conditioning unit should be installed where ventilation is in good condition, otherwise the working capability of the unit would be reduced or working noise would be increased.

2). The air conditioning unit should be installed on the base frame which is stable and secure enough to withstand the weight of the unit; otherwise it would incur vibration and noise.

3). During the installation, a consideration should be taken that the produced hot air or noise should not affect neighbors or surroundings.

4). Do not stack obstacles near the air outlet of the outdoor unit; otherwise it would reduce the working capability of the unit or increase the working noise.

5). In the event of the occurrence of abnormal noise, please contact the sales agent as soon as possible.

(6). Accessories for Installation

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

7.5.2 Installation of the Outdoor Unit

(1). Precautions for the Installation of the Outdoor Unit

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

1). The discharged air from the outdoor unit won't return back and enough space should be left for maintenance around the unit.

2). The installation location should be in good condition so that the unit is able to take in and discharge enough air. Besides, make sure there is no obstacle at the air inlet/outlet of the unit. If there is, remove it.

3). The unit must be installed where it is secure enough to support the weight of the unit and capable of reducing to some extent noise and vibration to make sure they do not bother your neighbors.

4). The designated lifting hole must be used for lifting the unit and protect the unit carefully during lifting to prevent damaging the mental sheet which would result in rusting in future.

5). The unit should be installed where there is as little as direct sunlight.

6). The unit must be installed where the rain water and defrosting water can be drained.

7). The unit must be installed where the unit won't be covered by the snow and won't be affected by rubbish and oil fog.

8). Rubber or spring shock absorbers should be used during the installation of the outdoor unit to meet the noise and vibration requirements.

9). The installation dimensions should meet the requirement covered in this manual and the outdoor unit must be fixed securely.

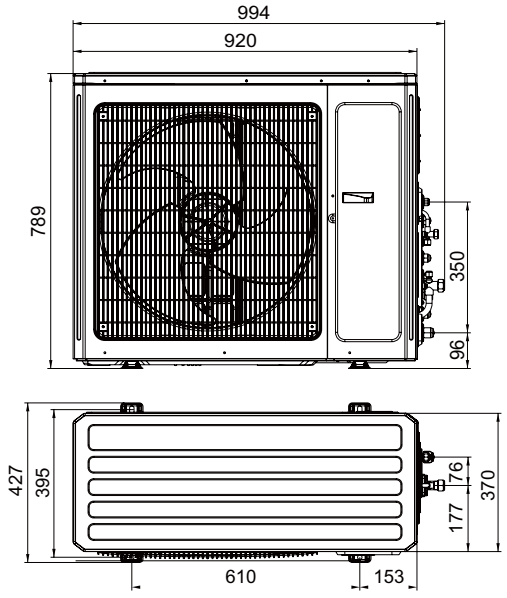
10).Do not install only one indoor unit for the outdoor unit.

11). The installation should be carried out by the technician.

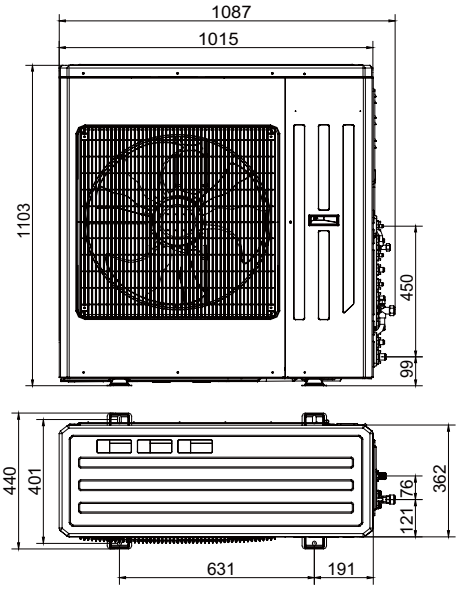
(2). Installation of the Outdoor Unit

1). Outline dimension of the outdoor unit.

WMO36MH16S



WMO42MH16S



Unit:mm

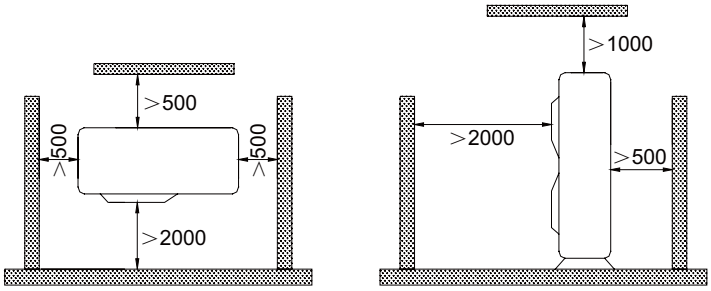
2). During the transportation of the outdoor unit, two lifting ropes long enough must be used in four directions and the separation included angle must be less than 40°prevent the center of unit deviating.

3). During the installation, M12 screws should be used to fix the support leg and base frame of the unit.

4). The unit should be installed on a concrete base frame with a height of 10cm.

5). The installation space of the unit should be as required in Fig.3.

Installation Space Requirements of the Outdoor Unit:



7.5.3 Connection between Indoor and Outdoor Units

⚠ Wiring of the Power Cord

CAUTION!

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

1). Open the side plate.

2). Let the power cord go through the rubber ring.

3). Connect the power card to the terminals “L”, “N” and also the earthing bolt, and then connect the wiring terminals “N(1),2,3” of the indoor unit to those of the outdoor unit correspondingly.

4). Fix the power cord with wire clips.

(2). Energy Level and Capacity Code of the Indoor and Outdoor Units

Table 2

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

1). The outdoor unit with Energy level 42 can drive up to five sets of indoor units.

2). The sum of the capacity codes of the indoor units should be among 50%-150% of that of the outdoor unit.

(3). Allowable Length and Height Fall of the Refrigerant Pipe

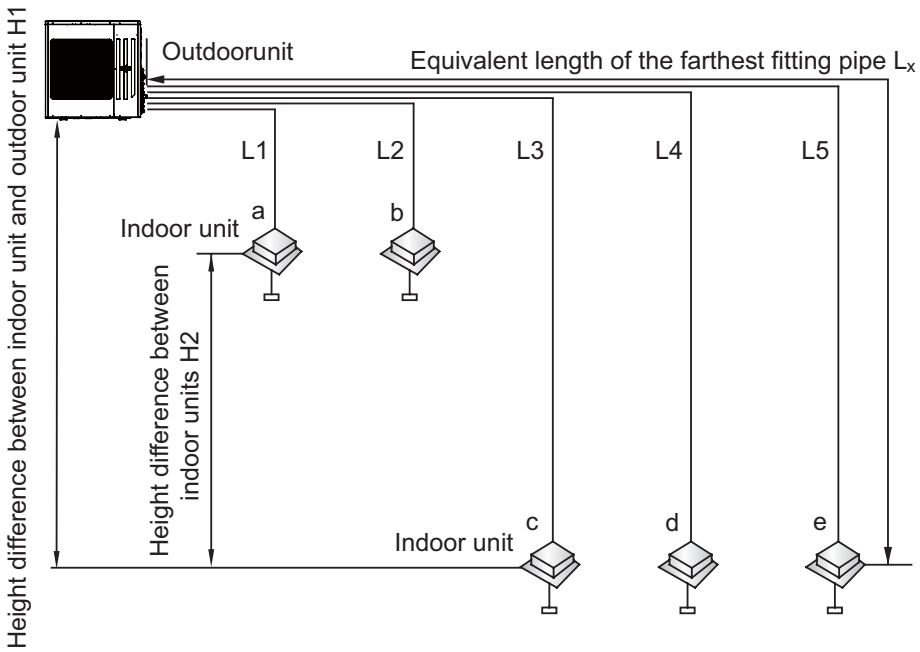


Table 3

		Allowable Length WMO36MH16S	Allowable Length WMO42MH16S	Refrigerant Pipe
Total Length(m)		70	80	$L_1+L_2+L_3+L_4+L_5$
Max. Length for Single Unit(m)		25	25	L_X
Max. installation altitude	Outdoor unit and indoor unit(m)	15	15	H1
	Indoor unit and indoor unit(m)	7.5	7.5	H2

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

unit: mm

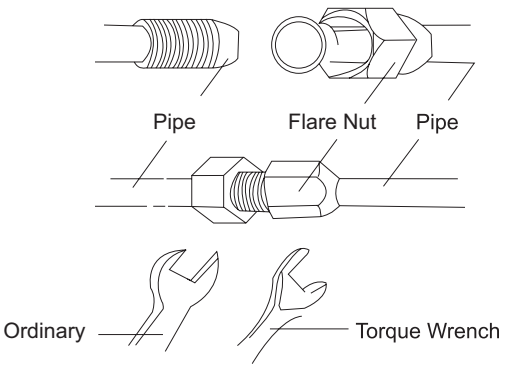
Capacity Level of the Indoor Unit	Gas Pipe	Liquid Pipe
09,12	Φ9.52	Φ6.35
18	Φ12.7	Φ6.35
21,24	Φ15.9	Φ9.52

(4). Piping between the Indoor and Outdoor Units

1). Refer to Fig.4 for the moments of torque for tightening screws.

2). Let the flare end of the copper pipe point at the screw and then tighten the screw by hand.

3). After that, tighten the screw by the torque wrench unit it clatters (as shown in Fig.4).



4). The bending degree of the pipe can not be too small; otherwise it will crack. And please use a pipe tube bender to bend the pipe.

5). Wrap the exposed refrigerant pipe and the joints by sponge and then tighten them with the plastic tape.

Table 5: Moments of Torque for Tightening Screws

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

⚠ CAUTION!

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

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

⚠ CAUTION!

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

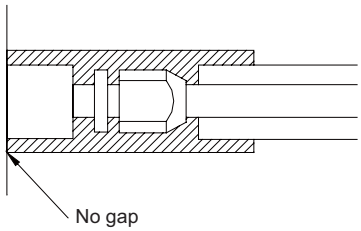
(5). Installation of the Protection Layer of the Refrigerant Pipe

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

2). The joints of the indoor unit should be wrapped with the insulating material and no gap is allowed on the joint of the indoor unit, as shown in Fig.5.

the joint of the indoor unit.

Fig.5



⚠ CAUTION!

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

(6). Wrap the Pipe with Tape

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

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

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

⚠ CAUTION!

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

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

7.5.4 Refrigerant Charging and Trial Running

(1). Refrigerant Charging

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

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

3). As shown in the following figure (Fig.6), expel the gas inside the indoor unit and refrigerant pipe out by the vacuum pump.

2 purposes of outdoor unit's main valve:1).vacuum pumping 2).Control the on /off of outdoor unit refrigerant

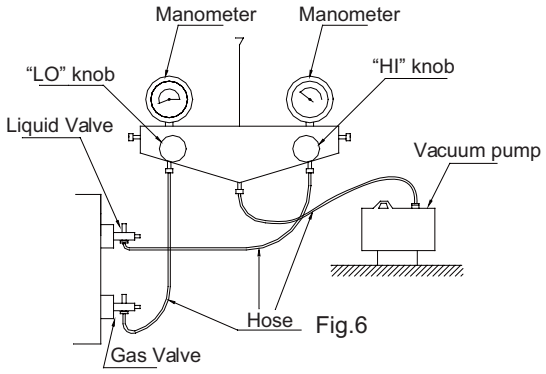


Fig.6

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

(2). Calculation of the Additional Refrigerant Chargeing

1). Refrigerant Charge in the Outdoor Unit before Shipment

Table 6

Model	WMO36MH16S	WMO42MH16S
Refrigerant Charge (kg)	2.9	4.8

Notes：

① . The refrigerant charge mentioned in the table 6 is not included those charged additionally in the indoor unit and the refrigerant pipe.

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

③ . Record the additional refrigerant charge for future maintenance.

2). Calculation of the Additional Refrigerant Charge

If the total refrigerant pipe length (liquid pipe) is smaller than that listed in the table 7, no additional refrigerant will be charged.

Table 7

Model	WMO36MH16S	WMO42MH16S
Total Liquid Pipe Length (a+b+c+d+e)	≤ 40m	≤ 50m

Additional Refrigerant Charge2=ΣExtra Liquid Pipe Length×22g/m(liquid pipe).

Note:

If the total refrigerant pipe length is larger than that listed in the table 7, the additional refrigerant for the extra length of the pipe needs to be charged as per 22g/m.

3). Example : WMO42MH16S

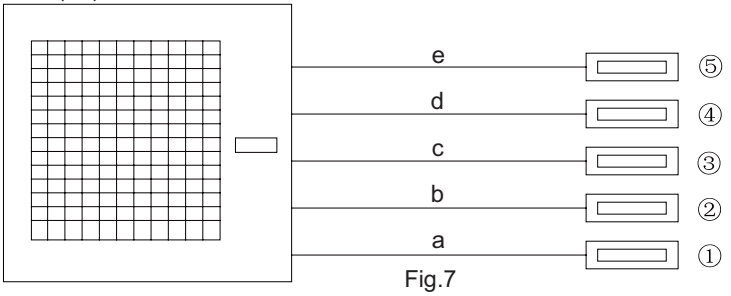


Fig.7

Table 8: Indoor Unit

Serial No.	Model
Indoor Unit ⑤	Ducted Type GFH(09)EA-D3DNA1A/I
Indoor Unit ④	Ducted Type GFH(09)EA-D3DNA1A/I
Indoor Unit ③	Ducted Type GFH(09)EA-D3DNA1A/I
Indoor Unit ②	Ducted Type GFH(09)EA-D3DNA1A/I
Indoor Unit ①	Ducted Type GFH(18)EA-D3DNA1A/I

Table 9: Liquid Refrigerant Pipe

Serial No.	e	d	c	b	a
Diameter	φ6.35	φ6.35	φ6.35	φ6.35	φ9.52
Length	20m	20m	15m	5m	5m

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

4). Additional Refrigerant Charge Record

Table 10: Indoor Unit

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

Table 11: Refrigerant Pipe

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

(3). Items to be checked after the Installation

Table 12

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

(4). Trial Running

1). Check before the Trial Running

a. Check if the appearance of the unit and the piping system are damaged during the transportation.

b. Check if the wiring terminals of the electronic component are secure.

c. Check if the rotation direction of the fan motor is right.

d. Check if all valves in the system are fully opened.

2). Trial Running

a. The trial running should be carried out by the professionally skilled personnel on the premise that all items listed above are in normal conditions.

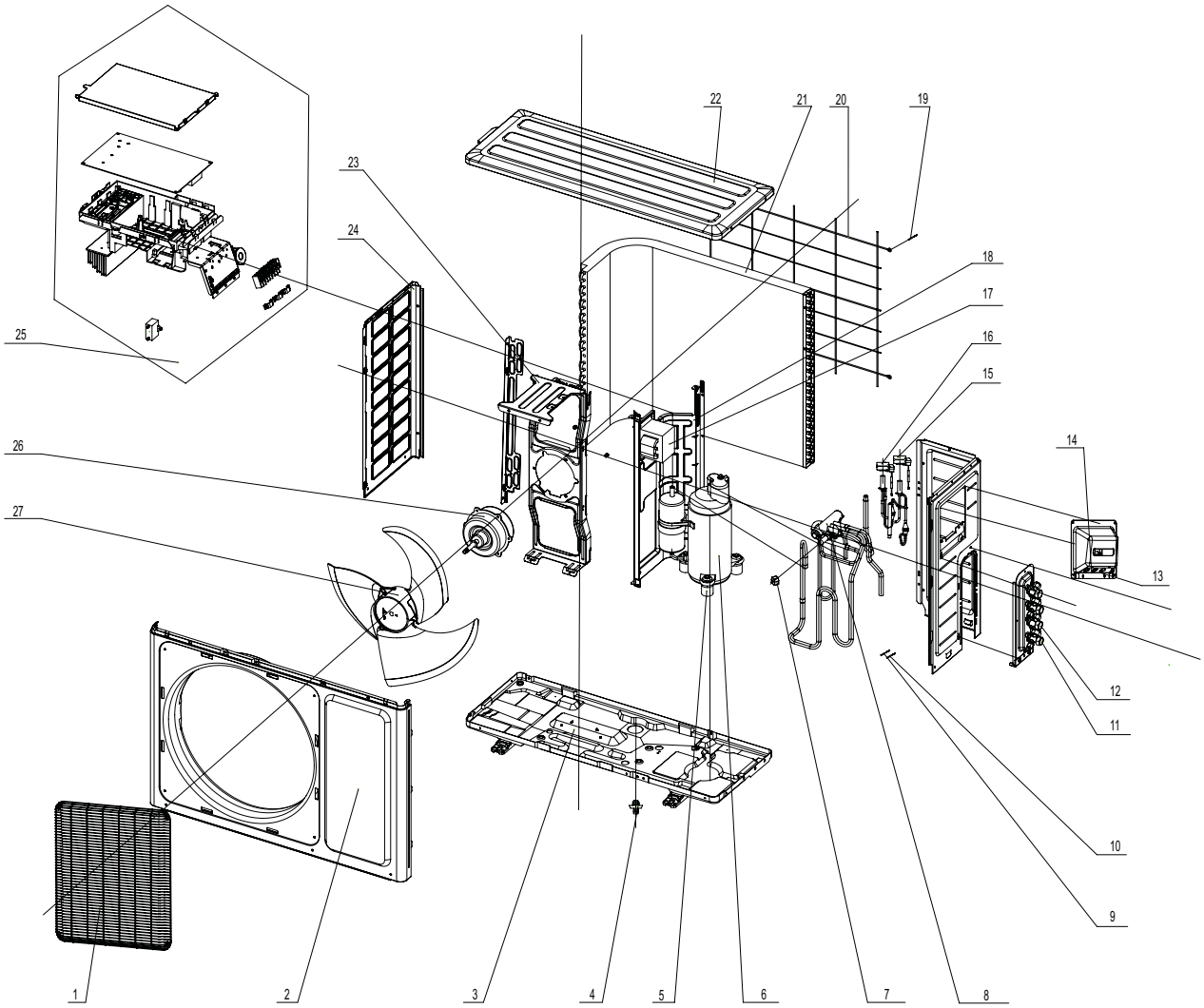
b. Let the unit energized and switch the wired controller or the remoter controller to “ON”.

c. The fan motor and compressor of the outdoor unit will run automatically in one minute.

d. If there is some unusual sound after the compressor is started, turn off the unit for an immediate check.

8. Exploded Views and Parts List

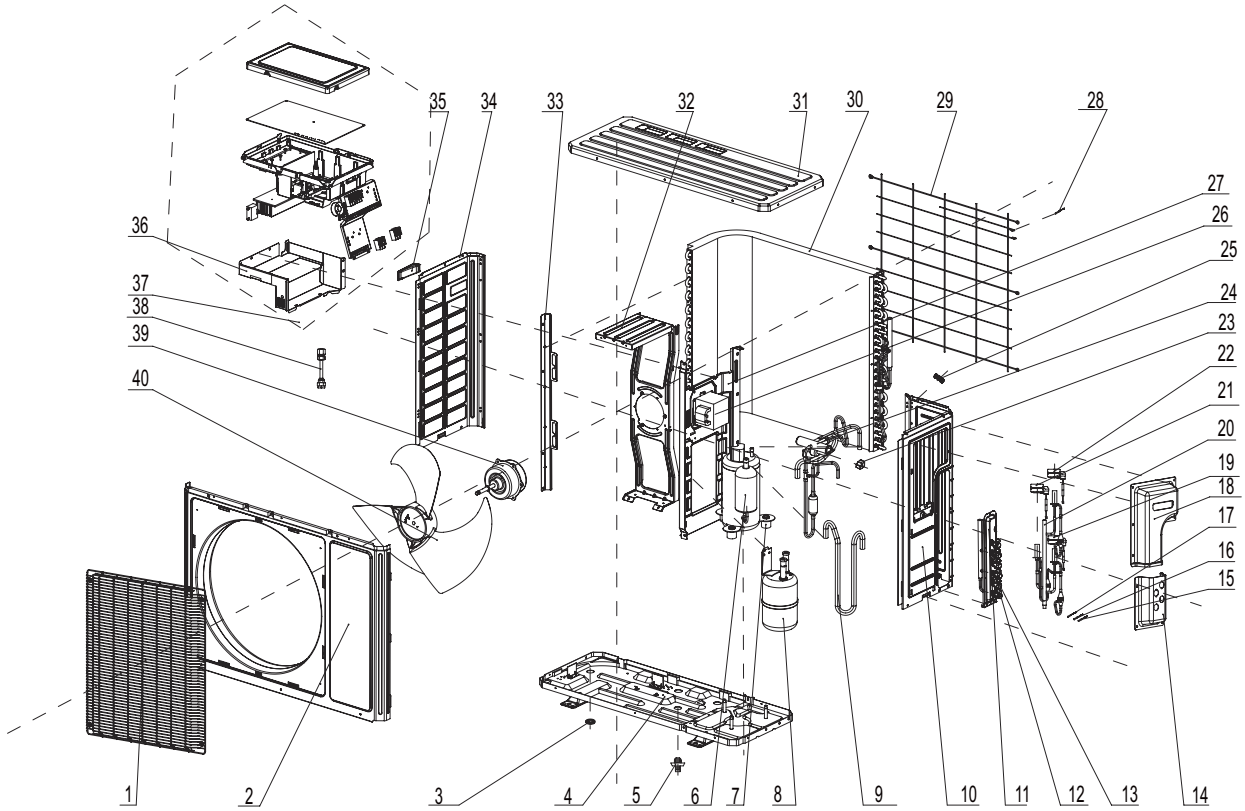
WMO18MH16S



NO.	Description	Part Code	Qty
		WMO18MH16S	
	Product code	CB228W01600	
1	Front Grill	01473065	1
2	Cabinet	01433055P	1
3	Chassis Sub-assy	01205168P	1
4	Drainage Joint	26113009	1
5	Compressor Gasket	76815215	3
6	Compressor and fittings	00205262	1
7	Magnet Coil	4300040033	1
8	4-way Valve Assy	03123438	1
9	Temperature Sensor	3900007301	1
10	Temperature Sensor	39000073	1
11	Cut-off Valve	071302391	1
12	Cut-off Valve	07133185	1
13	Block	02113040P	1
14	Handle Assy	02113041	1
15	Electric expand valve fitting	4300008401	1
16	Electric expand valve fitting	43000084	1
17	PFC Inductance	43120130	1
18	Clapboard Sub-Assy	01233117	1
19	Temperature Sensor	3900030901	1
20	Rear Grill	01475019	1
21	Condenser Assy	01163066	1
22	Top Cover	01253034P	1
23	Motor Support Sub-Assy	0170339802	1
24	Left Side Plate	01303169P	1
25	Electric Box Assy	02603707	1
26	Fan Motor	1501316201	1
27	Axial Flow Fan	10333016	1

The data above are subject to change without notice.

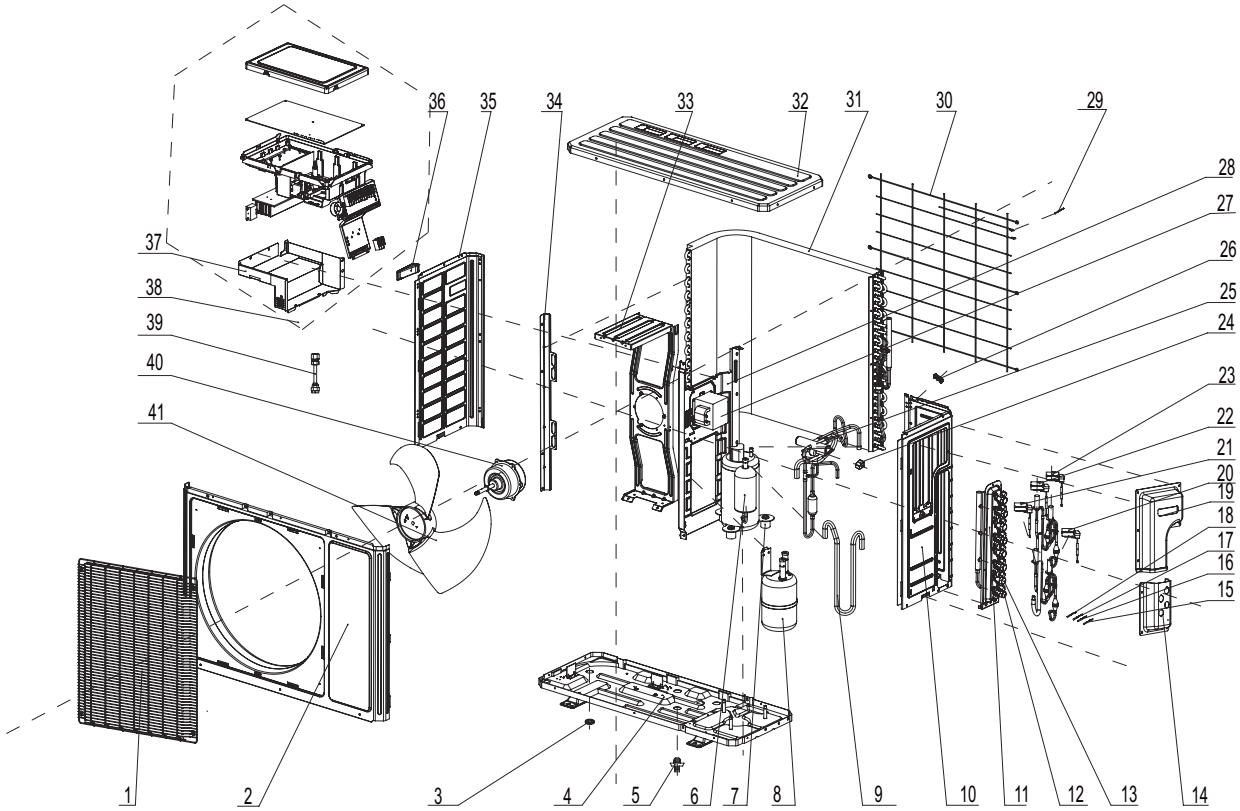
WMO24MH16S


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

NO.	Description	Part Code	Qty
		WMO24MH16S	
	Product code	CB228W01700	
1	Front Grill	01473049	1
2	Cabinet	01433047P	1
3	Drainage Plug	06813401	3
4	Chassis Sub-assy	01203942P	1
5	Drainage Connecter	06123401	1
6	Compressor and Fittings	00105036	1
7	Compressor Gasket	76710207	3
8	Gas-liquid Separator Assy	07225017	1
9	Inhalation Tube	03723455	1
10	Right Side Plate	0130319401P	1
11	Valve Support Assy	0710306603	1
12	Cut off Valve	07130239	1
13	Cut off Valve	07133185	1
14	big handle Assy	02113043	1
15	Terminal cover Sub-Assy	01253057	1
16	Temperature Sensor	39000073	1
17	Temperature Sensor	3900007301	1
18	Temperature Sensor	3900007302	1
19	Electric Expand Valve Fitting	4300008402	1
20	Electronic Expansion Valve assy	07133456	1
21	Electric Expand Valve Fitting	43000084	1
22	Electric Expand Valve Fitting	4300008401	1
23	Magnet Coil	4300040033	1
24	4-Way Valve Assy	03123415	1
25	Wiring clamp	26115004	1
26	PFC 电感	43120129	1
27	Clapboard Assy	01233420	1
28	Temperature Sensor	3900030901	1
29	Rear Grill	01473043	1
30	Condenser Assy	01113710	1
31	Top Cover	01255005P	1
32	Motor Support Sub-Assy	0170512001	1
33	Condenser Support Plate	01173415	1
34	Left Side Plate	01305041P	1
35	Left Handle	26235401	1
36	Electric Box (Fireproofing)	01413148	1
37	Electric Box Assy	0260370301	1
38	Tube Connector Sub-assy	06643008	2
39	Fan Motor	1501506304	1
40	Axial Flow Fan	10335008	1

The data above are subject to change without notice.

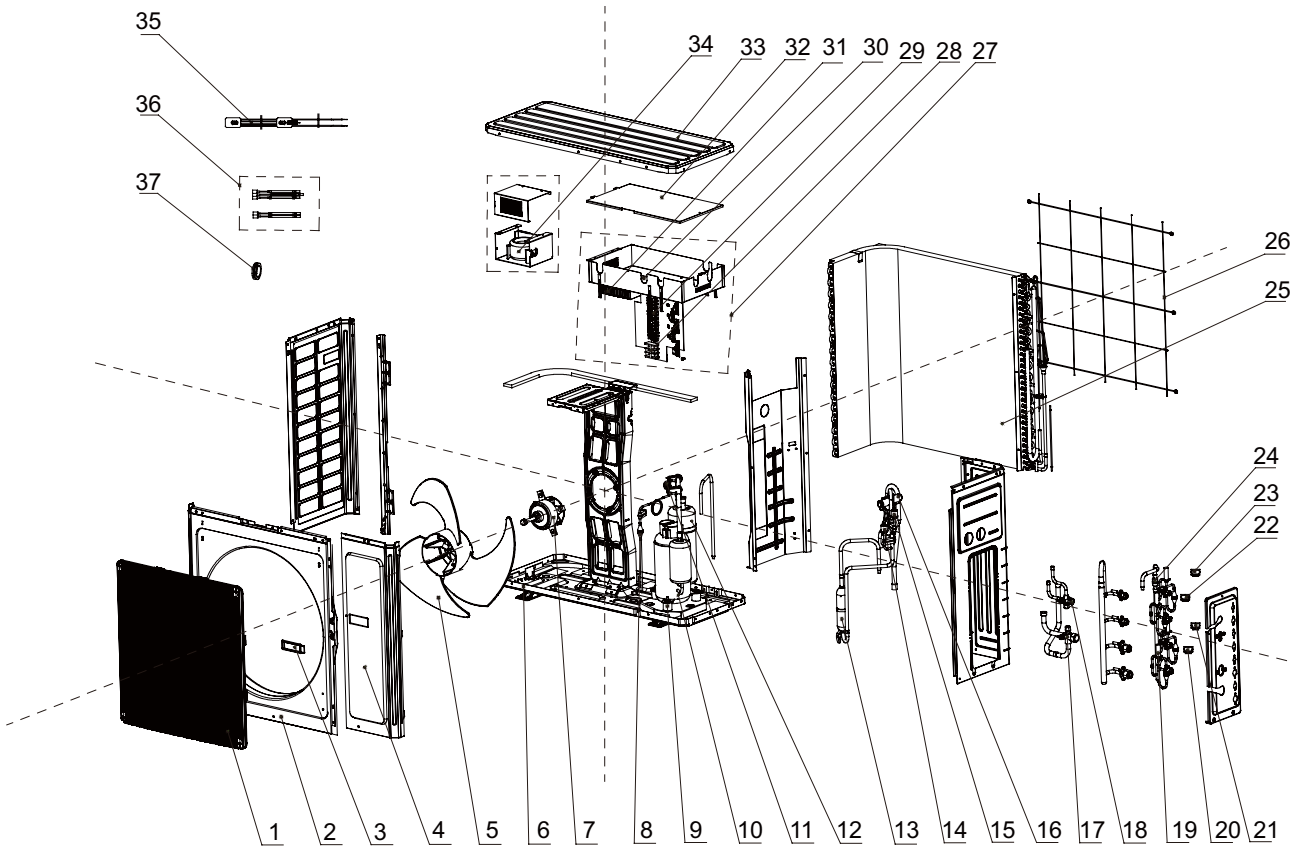
WMO30MH16S


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

NO.	Description	Part Code	Qty
		WMO30MH16S	
	Product code	CB228W01800	
1	Front Grill	01473049	1
2	Cabinet	01433047P	1
3	Drainage Plug	06813401	3
4	Chassis Sub-assy	01203942P	1
5	Drainage Connecter	06123401	1
6	Compressor and Fittings	00105036	1
7	Compressor Gasket	76710207	3
8	Gas-liquid Separator Assy	07225017	1
9	Inhalation Tube	03723455	1
10	Right Side Plate	0130319401P	1
11	Valve Support Assy	0710306604	1
12	Cut off Valve	07130239	1
13	Cut off Valve	07133185	1
14	Terminal cover Sub-Assy	01253057	1
15	Temperature Sensor	39000073	1
16	Temperature Sensor	3900007301	1
17	Temperature Sensor	3900007302	1
18	Temperature Sensor	3900007303	1
19	big handle Assy	02113043	1
20	Electric Expand Valve Fitting	43000084	1
21	Electric Expand Valve Fitting	4300008401	1
22	Electric Expand Valve Fitting	4300008402	1
23	Electric Expand Valve Fitting	4300008403	1
24	Magnet Coil	4300040033	1
25	4-Way Valve Assy	03123415	1
26	Wiring clamp	26115004	1
27	PFC 电感	43120129	1
28	Clapboard Assy	01233116	1
29	Temperature Sensor	3900030901	1
30	Rear Grill	01473043	1
31	Condenser Assy	01113710	1
32	Top Cover	01255005P	1
33	Motor Support Sub-Assy	0170512001	1
34	Condenser Support Plate	01173415	1
35	Left Side Plate	01305041P	1
36	Left Handle	26235401	1
37	Electric Box (Fireproofing)	01413148	1
38	Electric Box Assy	02603703	1
39	Tube Connector Sub-assy	06643008	2
40	Fan Motor	1501506304	1
41	Axial Flow Fan	10335008	1

The data above are subject to change without notice.

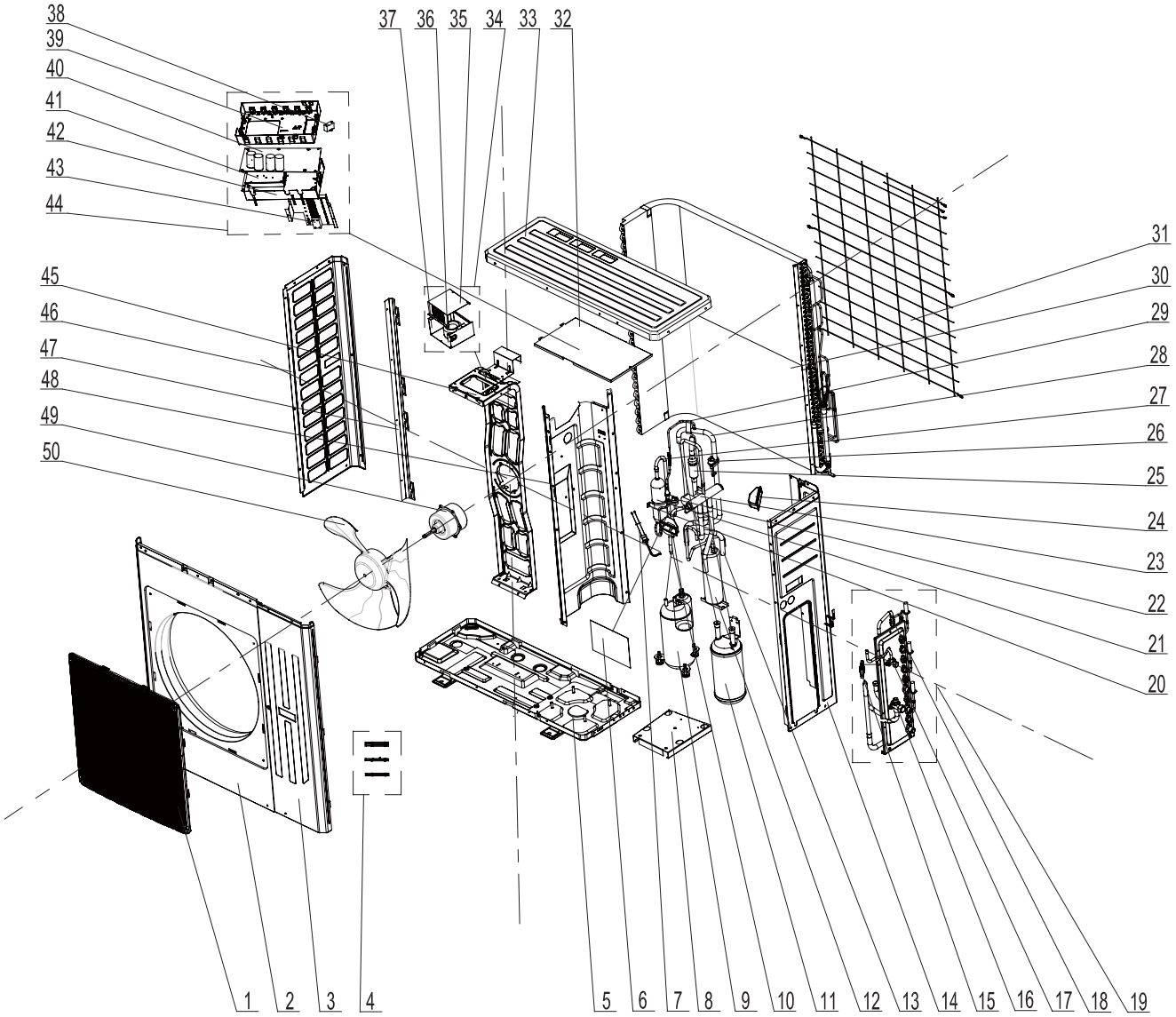
WMO36MH16S


35
36
37
34
33
32
31
30
29
28
27
26
25
24
23
22
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

NO.	Description	Part Code	Qty
		WMO36MH16S	
	Product code	CN860W0030	
1	Front Grill	22415003	1
2	Cabinet	01435004P	1
3	Left Handle	26235401	1
4	Front Side Plate	01305086P	1
5	Axial Flow Fan	10335005	1
6	Chassis Sub-assy	01203769P	1
7	Fan Motor	15702802	1
8	StrainerA	07210022	3
9	Compressor Gasket	76710207	3
10	Compressor and Fittings	00105036	1
11	Pressure Protect Switch	4602001555	1
12	Gas-liquid Separator	07225015	1
13	Oil Separator	07424118	1
14	Pressure Protect Switch	4602001573	1
15	Pressure Protect Switch	4602000902	1
16	4-Way Valve	43000411	1
17	Cut-off Valve	07334403	1
18	Cut-off Valve	07334402	1
19	Electronic Expansion Valve	07130369	4
20	Electric Expand Valve Fitting	4300876710	1
21	Electric Expand Valve Fitting	4300876709	1
22	Electric Expand Valve Fitting	4300876708	1
23	Electric Expand Valve Fitting	4300876707	1
24	Strainer	07212121	1
25	Condenser Assy	01024100016	1
26	Rear Grill	01574100003	1
27	Electric Box Assy	01394100014	1
28	Terminal Board	42011242	1
29	Terminal Board	420111041	4
30	Main Board	30226000025	1
31	Radiator	49018029	1
32	Electric Box Cover	01424263	1
33	Top Cover	01255006P	1
34	PFC Inductance	43120011	1
35	electrical heater	76518732	1
36	Sensor Sub-assy	39008072	1
37	Magnet Coil	4300040045	1

The data above are subject to change without notice.

WMO42MH16S



NO.	Description	Part Code	Qty
		WMO42MH16S	
	Product code	CN860W0040	
1	Front Grill	22415005	1
2	Cabinet	01435007P	1
3	Front Side Plate Sub-Assy	01305508	1
4	Sensor sub-assy	39008066	1
5	Chassis Sub-assy	01194141P	1
6	Insulated board (cover of electric box)	20113003	1
7	Pressure Protect Switch	4602000902	1
8	Compressor Mounting Plate Sub-Assy	01324238	1
9	Compressor and fittings	00205230	1
10	Connection Pipe	05034302	1
11	Gas-liquid Separator Sub-Assy	07225018	1
12	Bidirection Accumulator	07228741	1

13	connecting pipe of "U"shape	05034290	1
14	Right Side Plate Sub-Assy	01314304	1
15	StrainerA	07210022	1
16	Cut-off Valve	07334403	1
17	Cut-off Valve	07334402	1
18	StrainerA	07210022	1
19	Valve support assy	01804238	1
20	Oil Separator	07228302	1
21	Tube Clip	0214000521	1
22	StrainerA	07210022	1
23	4-way Valve	43000338	1
24	Handle	26235253	2
25	4-way Valve Assy	04144185	1
26	Pressure Protect Switch	4602001555	1
27	Discharge Tube Sub-Assy	04634310	1
28	Inhalation Tube Sub-Assy	04674230	1
29	Capillary Sub-Assy(Oil Separator)	04104239	1
30	Condenser Assy	01124179	1
31	Rear Grill	01475012	1
32	Electric Box Cover	01424263	1
33	Top Cover	01255009	1
34	Reactor Sub-Assy	02404111	1
35	Cover of Reactor box	01424260	1
36	PFC Inductance	43128003	1
37	Reactor Box	01424258	1
38	Capacitor	33010009	1
39	Electric Box	26905211	1
40	Main Board	30226254	1
41	Radiator	49018112	1
42	Electric Box Sub-Assy	02404112	1
43	Terminal Board	42010270	1
44	Electric Box Assy	02404113	1
45	Motor Support Sub-Assy	01805402	1
46	Left Side Plate	01305064P	1
47	Condenser support plate	01895309	1
48	Clapboard	01244141	1
49	Fan Motor	1570522801	1
50	Axial Flow Fan	10335010	1

The data above are subject to change without notice.

9. Troubleshooting

9.1 Malfunction Indicator

WMO18MH16S WMO24MH16S WMO30MH16S

Note: ○: off ●: on ◎: blink

When several malfunctions occur at the same time, they will be displayed in circulation and every malfunction is displayed for 5s.

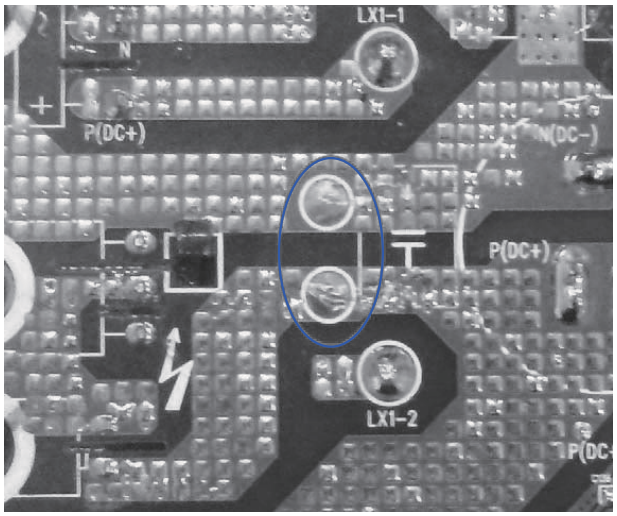
NO	Malfunction description	LED1	LED2	LED3	LED4
0	Normal stop	○	○	○	○
1	Compressor run	●	○	○	○
2	Compressor overload protection	◎	○	○	○
3	Discharge protection	○	●	○	○
4	Outdoor unit overload protection	●	●	○	○
5	High pressure protection	◎	●	○	○
6	Over current protection	○	◎	○	○
7	IMP protection	●	◎	○	○
8	IMP over heating protection	◎	◎	○	○
9	PFC protection (including PFC overheating protection)	○	○	●	○
10	Phase current protection	●	○	●	○
11	Over voltage protection	◎	○	●	○
12	Insufficient voltage protection	○	●	●	○
13	Start failure	●	●	●	○
14	Compressor desynchronizing	◎	●	●	○
15	Compressor phase-lacking protection	○	◎	●	○
16	Compressor phase current detection malfunction	●	◎	●	○
17	Memory chip mistake	◎	◎	●	○
18	DC power supply circuit-short	○	○	◎	○
19	Defrosting	●	○	◎	○
20	Oil return	◎	○	◎	○
21	Complete unit frequency restriction protection	○	●	◎	○
22	Complete unit frequency dropping protection	●	●	◎	○
23	Unit A frequency restriction or frequency dropping protection	◎	●	◎	○
24	Unit B frequency restriction or frequency dropping protection	○	◎	◎	○
25	Unit C frequency restriction or frequency dropping protection	●	◎	◎	○
26	Unit D frequency restriction or frequency dropping protection	◎	◎	◎	○
27	Outdoor ambient temperature sensor protection	○	○	○	●
28	Outdoor tube temperature sensor protection	●	○	○	●
29	Discharge temperature sensor protection	◎	○	○	●
30	IPM thermal resistance malfunction	○	●	○	●
31	Unit A liquid pipe temperature sensor malfunction	●	●	○	●
32	Unit A gas pipe temperature sensor malfunction	◎	●	○	●
33	Unit B liquid pipe temperature sensor malfunction	○	◎	○	●
34	Unit B gas pipe temperature sensor malfunction	●	◎	○	●
35	Unit C liquid pipe temperature sensor malfunction	◎	◎	○	●
36	Unit C gas pipe temperature sensor malfunction	○	○	●	●
37	Unit D liquid pipe temperature sensor malfunction	●	○	●	●
38	Unit D gas pipe temperature sensor malfunction	◎	○	●	●
39	Unit A mode conflict	○	●	●	●
40	Unit B mode conflict	●	●	●	●
41	Unit C mode conflict	◎	●	●	●
42	Unit D mode conflict	○	◎	●	●

43	Communication failure with Unit A	●	◎	●	●
44	Communication failure with Unit B	◎	◎	●	●
45	Communication failure with Unit C	○	○	◎	●
46	Communication failure with Unit D	●	○	◎	●
47	Unit A freeze protection	◎	○	◎	●
48	Unit B freeze protection	○	●	◎	●
49	Unit C freeze protection	●	●	◎	●
50	Unit D freeze protection	◎	●	◎	●
51	Unit A overheating prevention protection	○	◎	◎	●
52	Unit B overheating prevention protection	●	◎	◎	●
53	Unit C overheating prevention protection	◎	◎	◎	●
54	Unit D overheating prevention protection	○	○	○	◎
55	Unit A communication wire misconnection or expansion valve malfunction	●	○	○	◎
56	Unit B communication wire misconnection or expansion valve malfunction	◎	○	○	◎
57	Unit C communication wire misconnection or expansion valve malfunction	○	●	○	◎
58	Unit D communication wire misconnection or expansion valve malfunction	●	●	○	◎

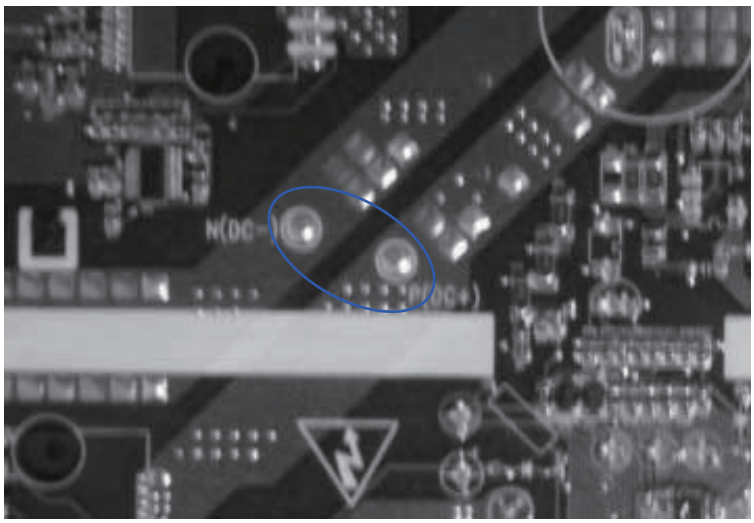
9.2 Malfunction Checking and Elimination

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

18K:



24/30K:

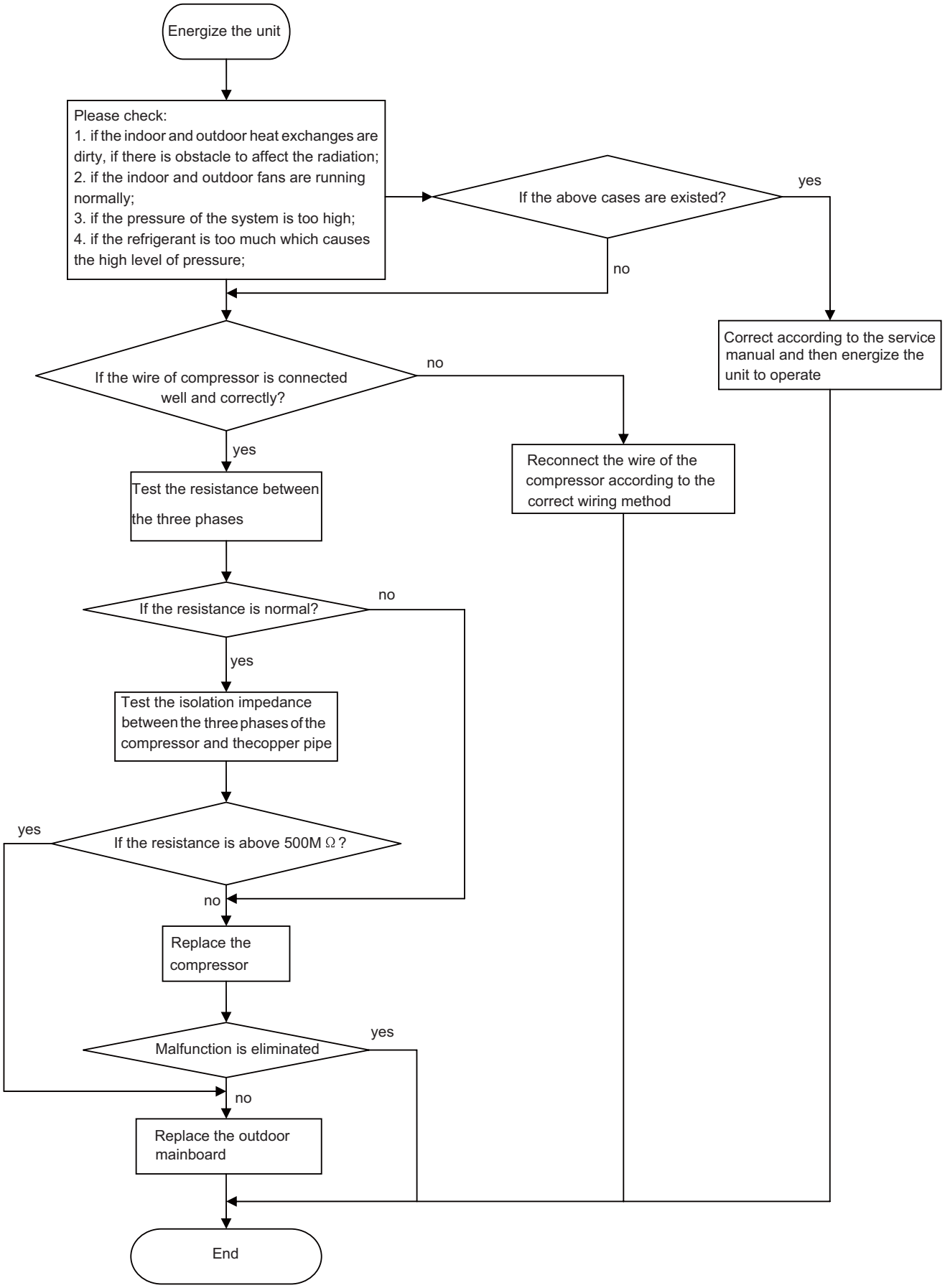


(1) IPM protection malfunction:

Main checking point:

- If the input voltage of the unit is within normal range?
- If the connection wire of compressor is connected well? Is it loose? If the connection sequence is correct?
- If the resistance of compressor coil is normal? If the isolation of compressor coil with copper pipe is good?
- If the unit is overloaded? If the heat radiation of the unit is good?
- If the refrigerant charge is suitable?

Flow chart:

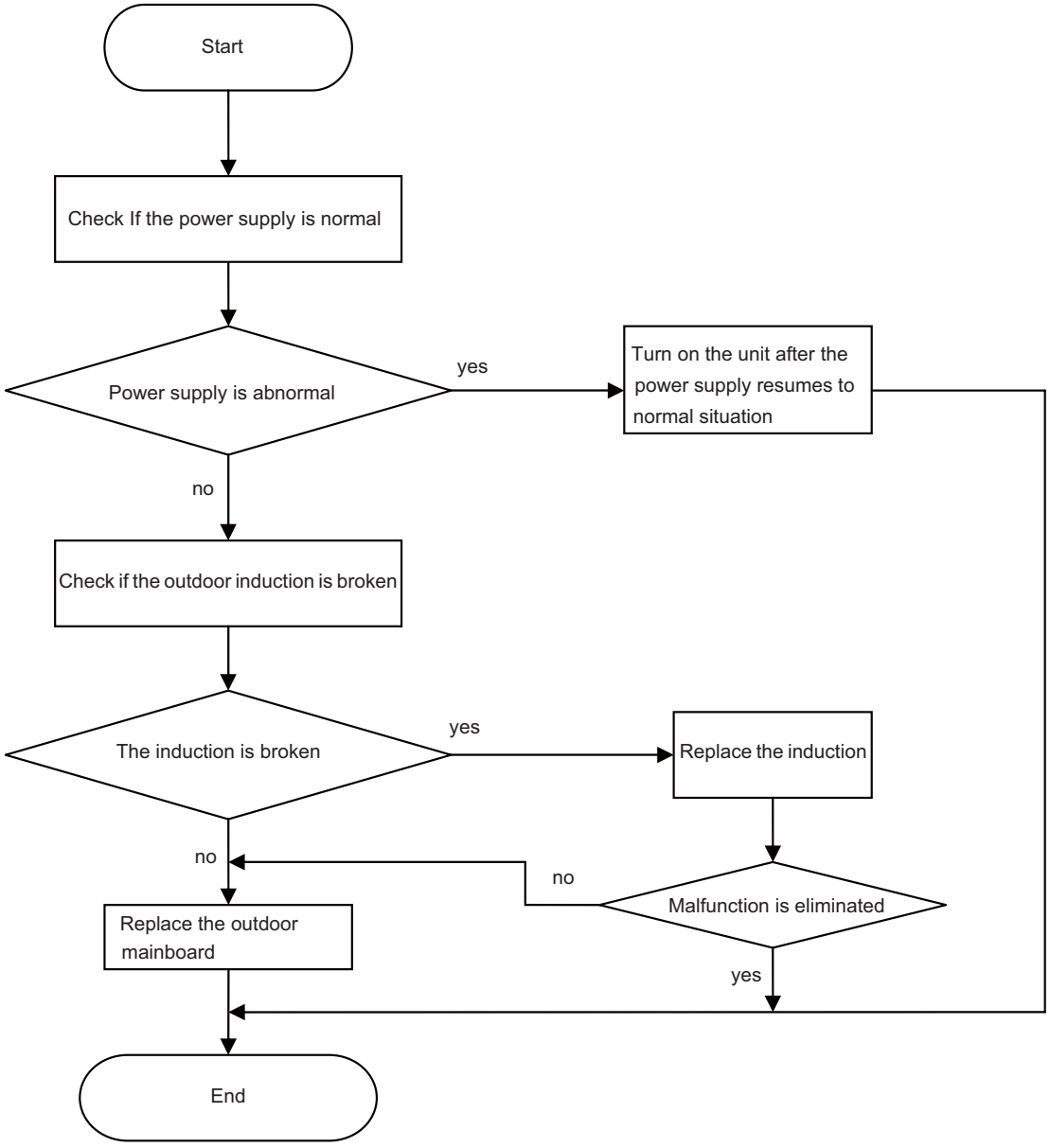

Energize the unit
Please check:
1. if the indoor and outdoor heat exchanges are dirty, if there is obstacle to affect the radiation;
2. if the indoor and outdoor fans are running normally;
3. if the pressure of the system is too high;
4. if the refrigerant is too much which causes the high level of pressure;
If the above cases are existed?
yes
no
Correct according to the service manual and then energize the unit to operate
If the wire of compressor is connected well and correctly?
no
yes
Reconnect the wire of the compressor according to the correct wiring method
Test the resistance between the three phases
If the resistance is normal?
no
yes
Test the isolation impedance between the three phases of the compressor and thecopper pipe
If the resistance is above 500M Ω ?
yes
no
Replace the compressor
Malfunction is eliminated
yes
no
Replace the outdoor mainboard
End

(2) PFC protection malfunction

Main checking points:

- If the power supply is normal;
- Check if the connection wire of induction is connected well and if the induction is broken;

Flow chart:

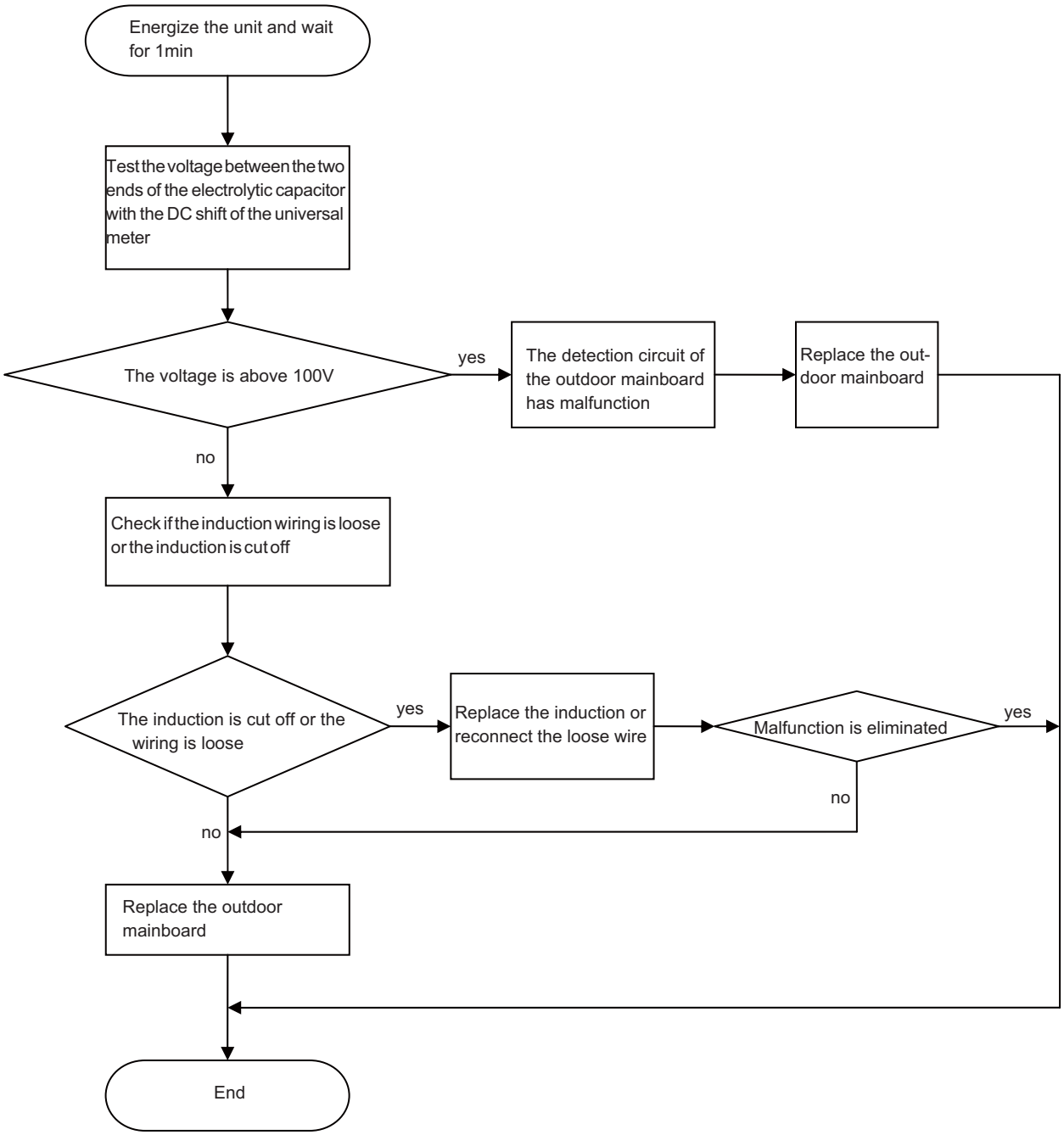


(3) Capacity charging malfunction

Main checking points:

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

Flow chart:

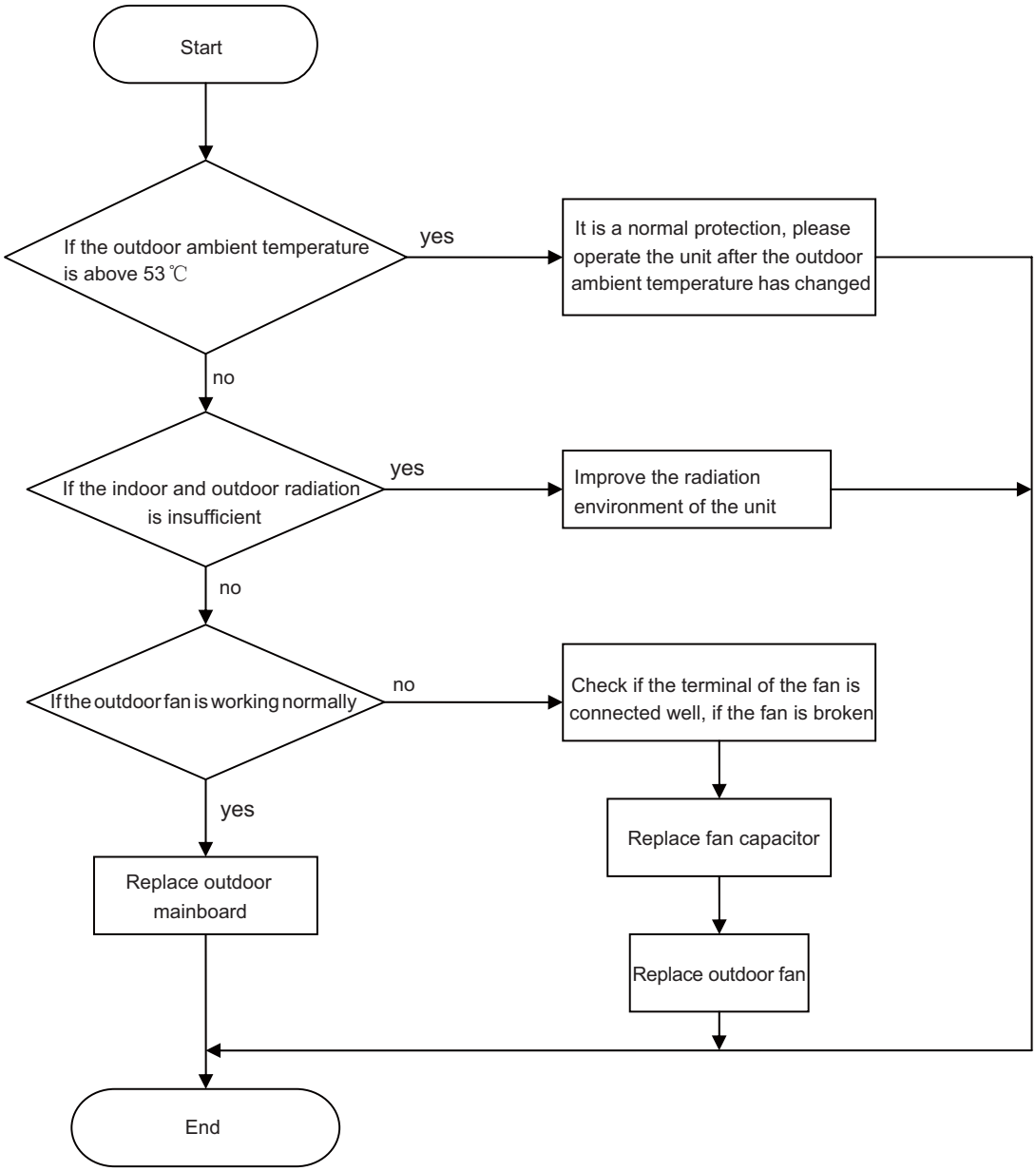


(4) Anti-high temperature and overload malfunction

Main checking points:

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

Flow chart:

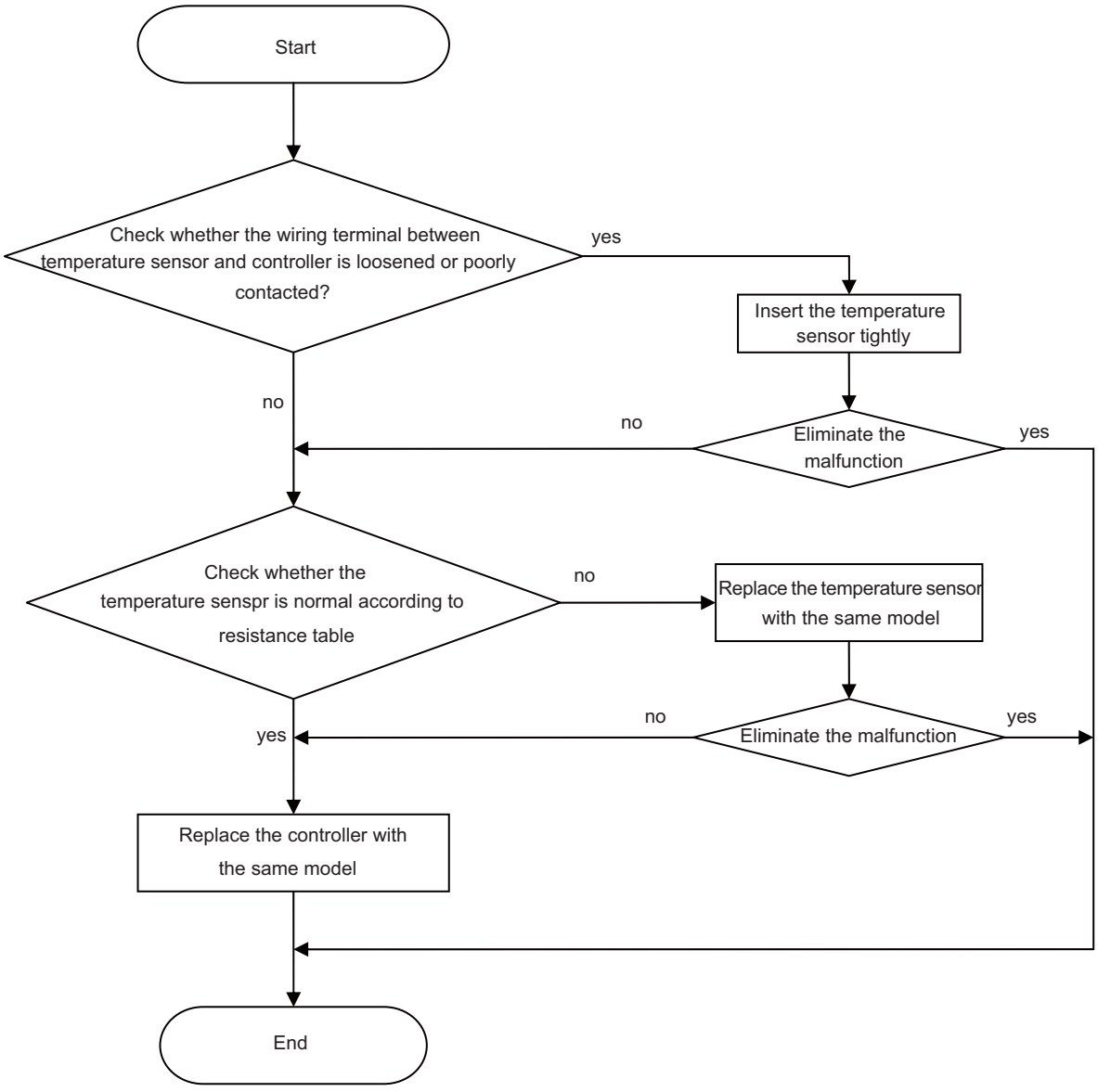


(5) Temperature sensor malfunction

Main checking points:

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

Flow chart:

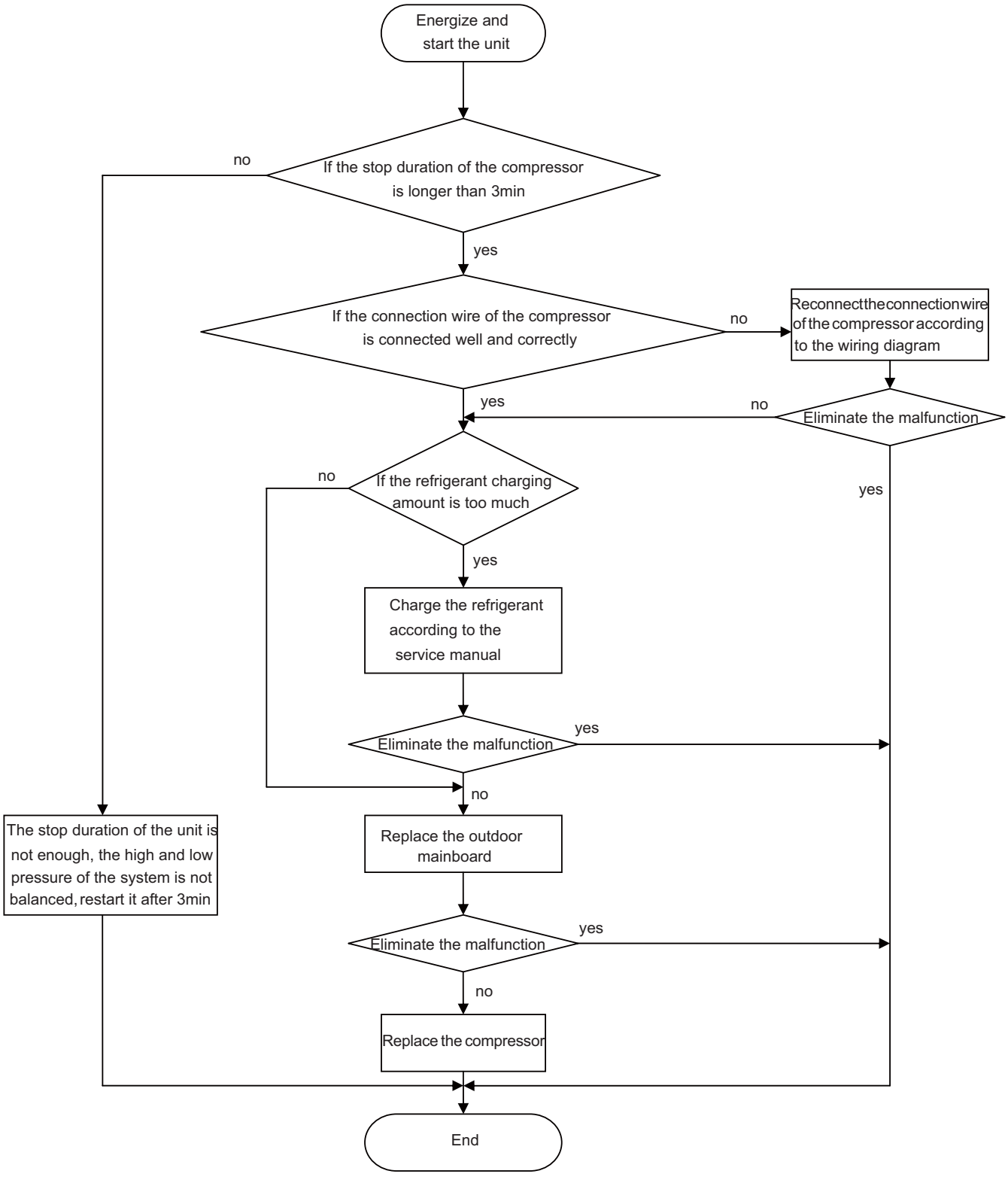


(6) Start failure malfunction

Main checking points:

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

Flow chart:

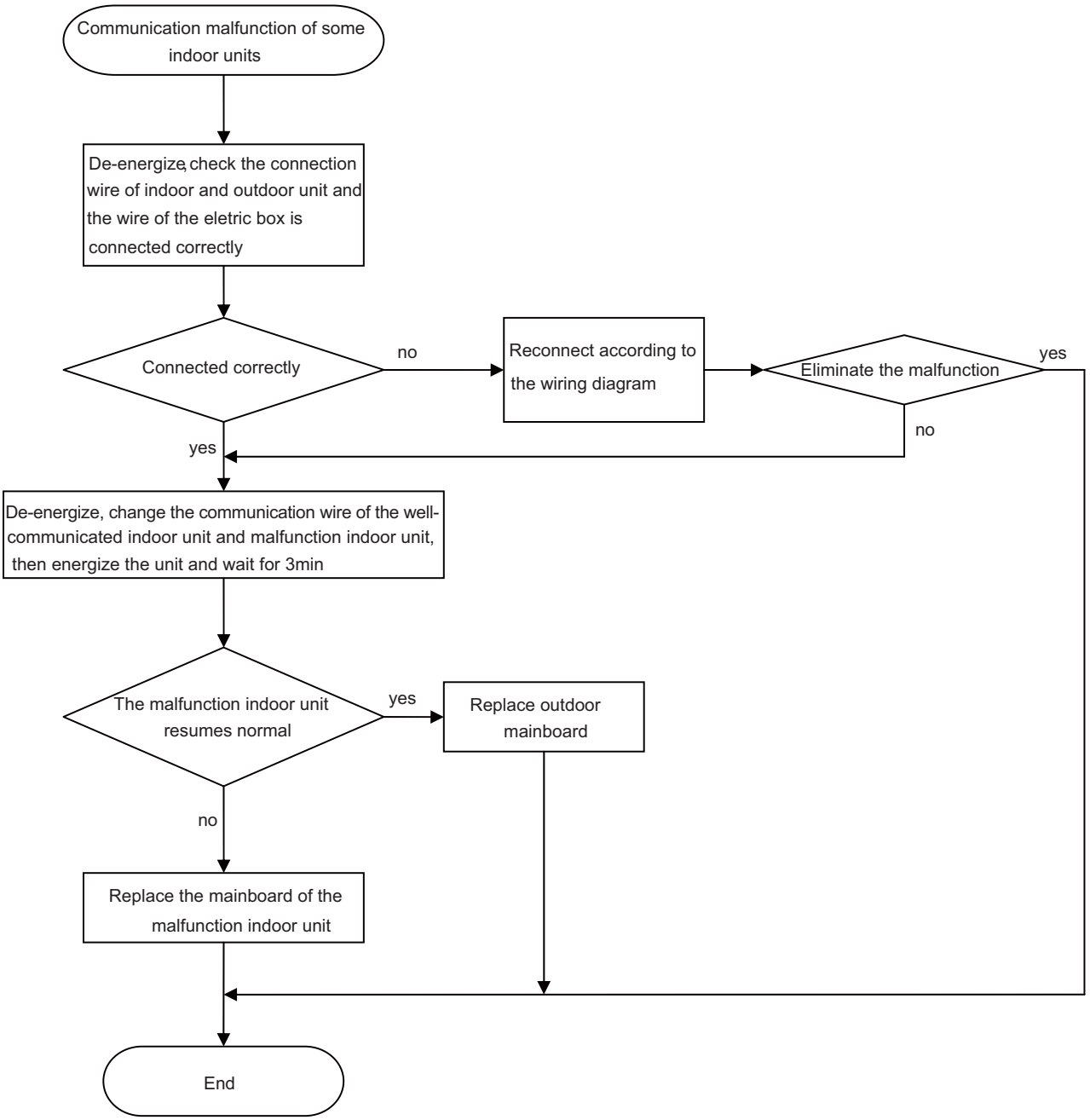


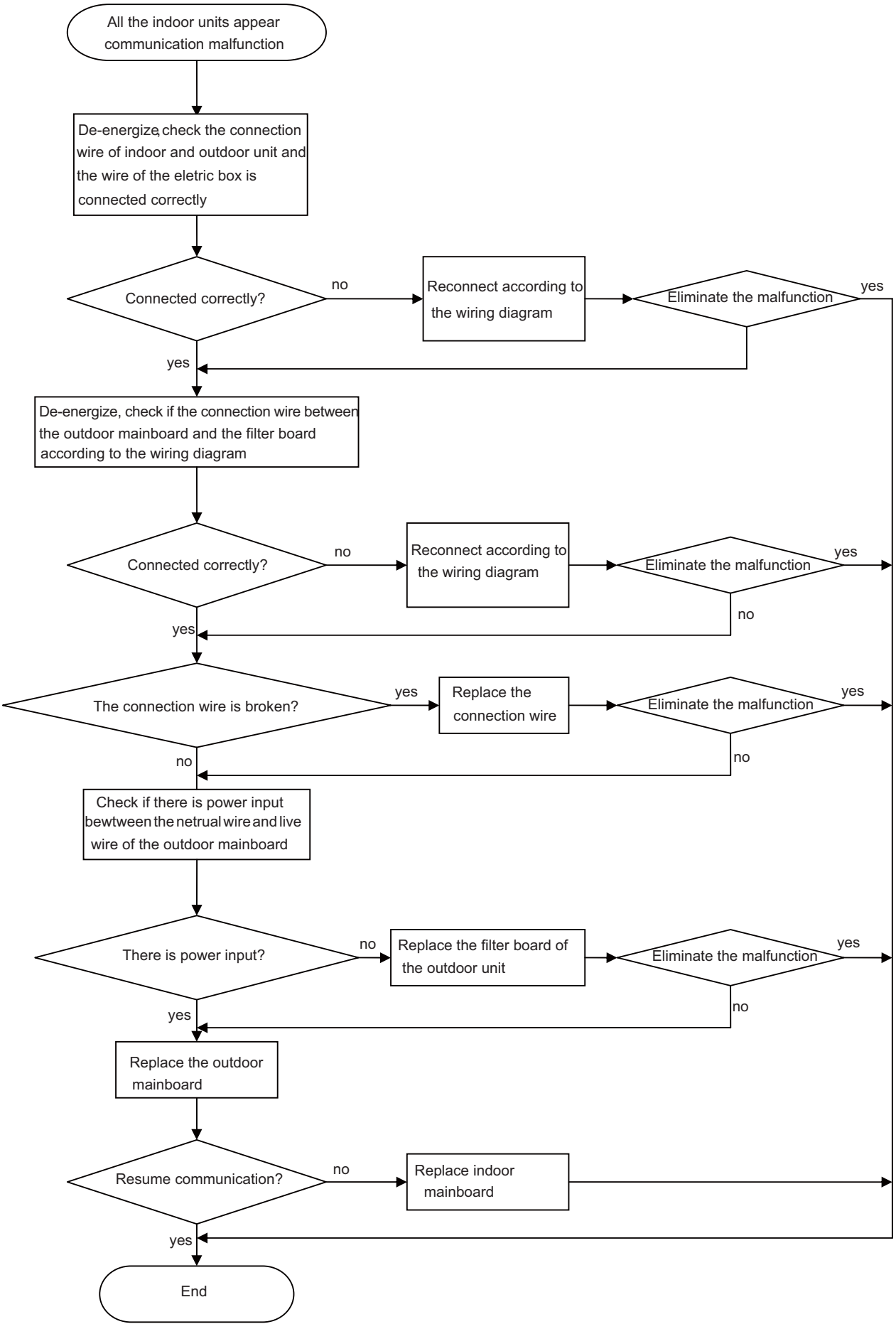
(7) Communication malfunction

Main checking points:

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

Flow chart:



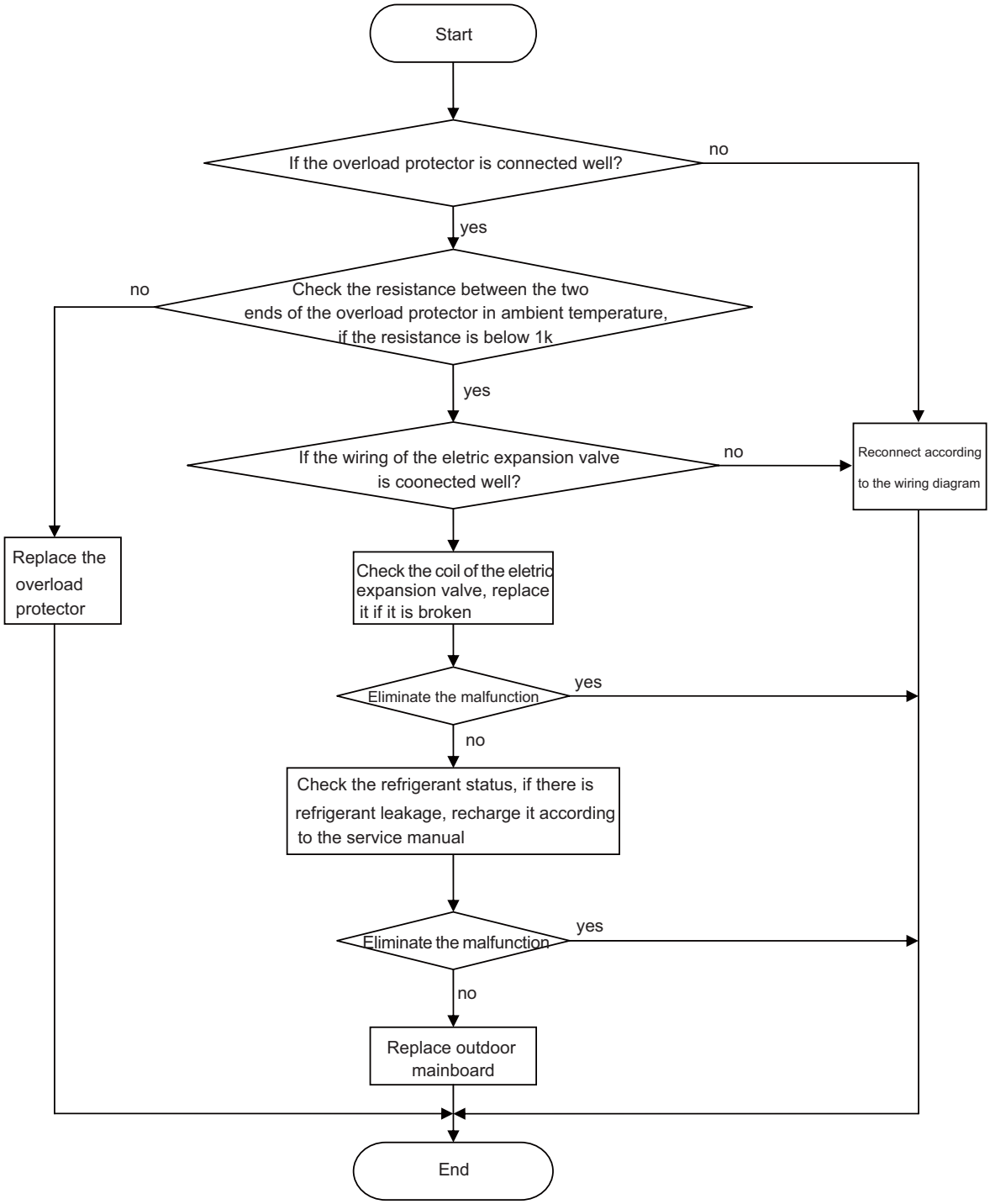

All the indoor units appear communication malfunction
De-energize, check the connection wire of indoor and outdoor unit and the wire of the eletric box is connected correctly
Connected correctly?
no
Reconnect according to the wiring diagram
Eliminate the malfunction
yes
yes
De-energize, check if the connection wire between the outdoor mainboard and the filter board according to the wiring diagram
Connected correctly?
no
Reconnect according to the wiring diagram
Eliminate the malfunction
yes
no
yes
The connection wire is broken?
yes
Replace the connection wire
Eliminate the malfunction
yes
no
no
Check if there is power input bewtween the netrual wire and live wire of the outdoor mainboard
There is power input?
no
Replace the filter board of the outdoor unit
Eliminate the malfunction
yes
no
yes
Replace the outdoor mainboard
Resume communication?
no
Replace indoor mainboard
yes
End

(8) Compressor overload, diacharge protection malfunction

Main checking points:

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

Flow chart:



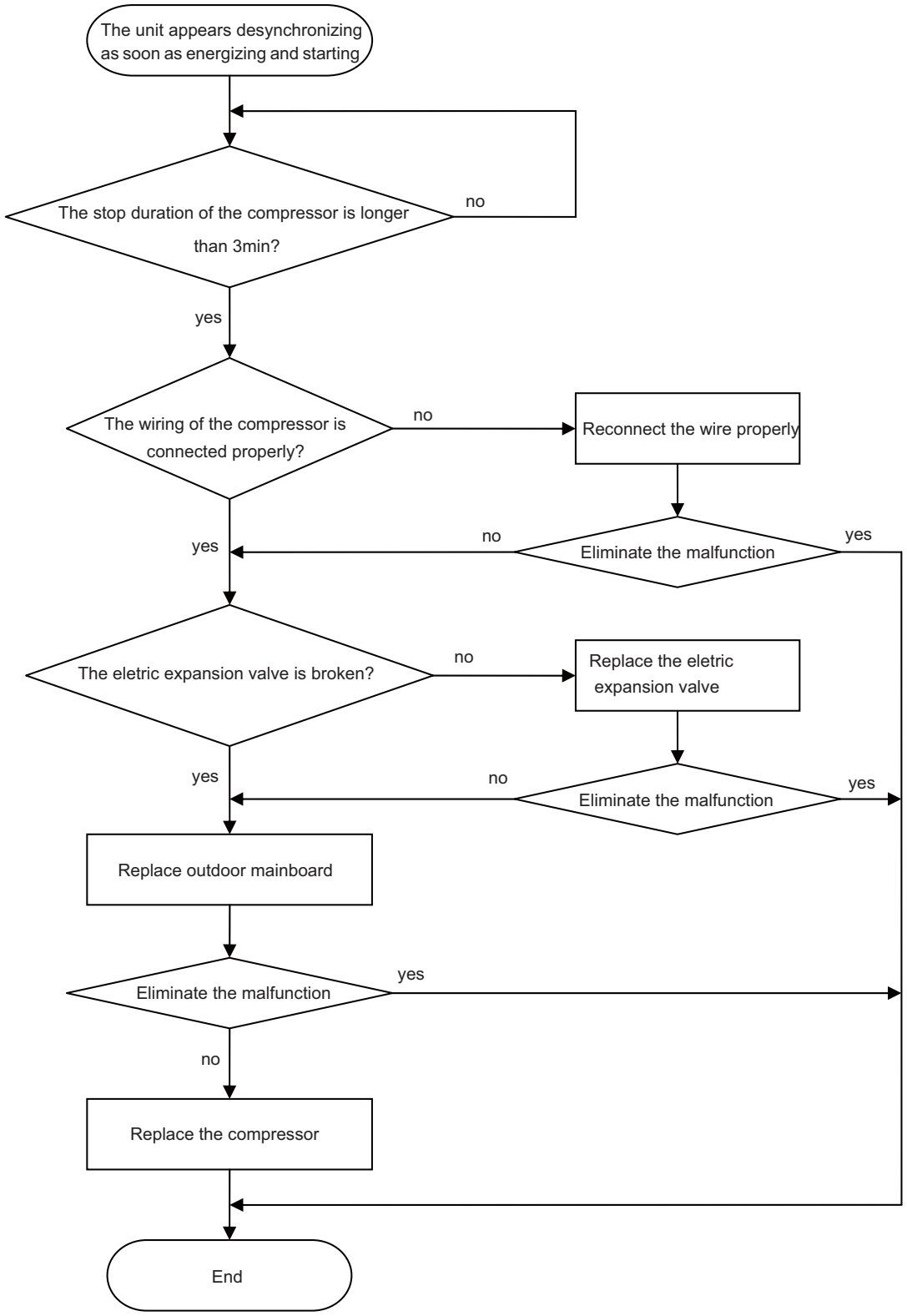
Noted: the detection method of the coil of the eletric expansion valve: there is five pieces of the coil of the eletric expansion valve, the resistance of one of them (the leftmost or the rightmost one) is almost the same as the resistance of other terminal (within 100 Ω). Judge the condition of the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

(9) Compressor desynchronizing malfunction

Main checking points:

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

Flow chart:



WMO36MH16S WMO42MH16S

⚠ WARNING!

①. In the event of abnormal conditions (like, stinky smell), please shut off the main power supply immediately and then contact the WILLIS appointed service center; otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc.

② . Do not repair the air conditioning personally but instead contact the professionally skilled personnel at the WILLIS appointed service center, as the incorrect repair would cause electric shock or fire hazard etc.

1.Check before Contacting Service Center

Please check the following items before contacting the maintenance serviceman.

Table 13

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

Note:

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

2.Problem Handling

The conditions listed below are not classified into errors.

Table 14

Conditions		Causes
The unit does not run	When restart the unit soon after it is stopped.	The overload protection switch of the unit let the startup delayed for three minutes.
	As soon as power is on.	The unit will stand by for approximate one minute.
The unit blows out mist	When the cooling operation starts.	The hi-humidity air indoor is cooled quickly.
The unit generates noise	The unit “clatters” as soon as it starts running.	It is the sound generated during the initialization of the electronic expansion valve.
	The unit “swishes” during the cooling operation.	It is the sound when the refrigerant gas runs inside the unit.
	The unit “swishes” when it is started or stopped.	It is the sound when the refrigerant gas stops running.
	The unit “swishes” when it is in and after the running.	It is the sound when the draining system is operating.
	The unit “squeaks” when it is in and after the running.	It is the sound of frication generated by the skin plate etc which swells due to the temperature change.
The unit blows out dust	When the unit restarts after it is not used for a long time.	The dust inside the unit is blown out again.
The unit emits odors	When the unit is running.	The odors absorbed in are blown out again.

3.Error Description

If some error occurs when the unit is running, the error code will be displayed on the wired controller and the main board  of the outdoor unit.Check for more details about the meaning of each error, as shown in table 15(a) and 15(b).

The error codes for duct, cassette and floor ceiling type unit are shown in the following table 15(a):

Table 15(a)

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

High Discharge Temp Protection	E4	Flash 4 times	/	/	E4	E4	Outdoor
Communication Error	E6	Flash 6 times	/	/	E6	E6	Outdoor & Indoor
Indoor Unit Water Full Error	E9	Flash 9 times	/	/	E9	E9	Indoor
Refrigerant Recovery Mode	Fo	Quick Flashing	Quick Flashing	/	Fo	Fo	Special Mode
Outdoor Ambient Temp Sensor Error	F3	/	Flash 3 times	/	F3	F3	Outdoor
Outdoor Mid-Coil Temp Sensor Error	F4	/	Flash 4 times	/	F4	F4	Outdoor
Outdoor Discharge Air Temp Sensor Error	F5	/	Flash 5 times	/	F5	F5	Outdoor
Oil Return for Cooling	F7	/	/	/	/	/	Special Mode
Forced Defrosting	H1	Quick Flashing	/	/	H1	H1	Special Mode
Oil Return for Heating or Defrosting	H1	/	/	Flash once	H1		Special Mode
Compressor Overheat Protection	H3	/	/	Flash 3 times	H3	H3	Drive Error
IPM Protection	H5	/	/	Flash 5 times	H5	H5	Drive Error
Motor Desynchronizing	H7	/	/	Flash 7 times	H7	H7	Drive Error
PFC Error	Hc	/	/	Flash 6 times	Hc	Hc	Drive Error
Startup Failure	Lc	/	/	Flash 11 times	Lc	Lc	Drive Error
DC Fan motor Error	LA	/	/	/	/	/	Outdoor
Phase Loss	Ld	Flash 3 times	Flash 3 times	Flash 3 times	Ld	Ld	Drive Error
Compressor Stalling	LE	Flash 3 times	Flash 3 times	Flash 3 times	LE	LE	Drive Error
Over-Speed	LF	Flash 3 times	Flash 3 times	Flash 3 times	LF	LF	Drive Error
IPM Reset	P0	Flash 3 times	Flash 3 times	Flash 3 times	P0	P0	Drive Error
Compressor Current Protection	P5	/	/	Flash 15 times	P5	P5	Drive Error
Communication Error between the Inverter Drive and the Main Controller	P6	Flash 16 times	/	/	P6	P6	Drive Error
Radiator Temp Sensor Error	P7	/	/	Flash 18 times	P7	P7	Drive Error
Radiator Overheat Protection	P8	/	/	Flash 19 times	P8	P8	Drive Error
AC Contactor Protection	P9	Flash 3 times	Flash 3 times	Flash 3 times	P9	P9	Drive Error
Current Sensor Error	Pc	/	/	Flash 12 times		U1	Drive Error
Sensor Connection Protection	Pd	Flash 3 times	Flash 3 times	Flash 3 times	Pd	Pd	Drive Error
Over Voltage Protection	PH	/	Flash 11 times	/	PH	PH	Drive Error

Low Voltage Protection	PL	/	/	Flash 21 times	PL	PL	Drive Error
Temp Drift Protection	PE	Flash 3 times	Flash 3 times	Flash 3 times	PE	PE	Drive Error
Drive Board Ambient Temp Sensor Error	PF	Flash 3 times	Flash 3 times	Flash 3 times	PF	PF	Drive Error
AC Current Protection	PA	Flash 5 times	/	/	E5	E5	Drive Error
Charging Circuit Error	PU	/	/	Flash 17 times	PU	PU	Drive Error
AC Input Voltage Anomaly	PP	Flash 3 times	Flash 3 times	Flash 3 times	PP	PP	Drive Error
Unit n communication error	See Table 16	Flash 6 times	/	/	E6	E6	Indoor
Unit n indoor pipe midway temperature sensor error	See Table 16	/	Flash twice	/	E2	E2	Indoor
Indoor Evaporator Temp Sensor Short/ Open-Circuit	See Table 16	/	Flash twice	/	F2	F2	Indoor
(Air Valve) Unit n indoor unit pipe outlet temperature sensor error	See Table 16	/	Flash 22 times	/	b7	b7	Indoor
(Liquid Valve) Unit n indoor pipe inlet temperature sensor error	See Table 16	/	Flash 19 times	/	b5	b5	Indoor
Unit n mode conflict	See Table 16	/	Flash once	/	F1	F1	Indoor
Mode Conflict	See Table 16	Flash 7 times	/	/	E7	E7	Indoor

The error codes for wall mounted type unit are shown in the following table:Table 15(b):

Table 15(b)

Error Item	Outdoor Unit 88 Display	Indicating LED Flashing Times			88 Display	Wired Controler Display	Error Type
		Running LED	Cooling LED	Heating LED			
High Pressure Protection	E1	Flash once	/	/	E1	E1	Outdoor
Shutdown for Whole Unit Anti-Freeze Protection	E2	Flash twice	/	/	E2	E2	System Error
Low Pressure Protection	E3	Flash 3 times	/	/	E3	E3	Outdoor
High Discharge Temp Protection	E4	Flash 4 times	/	/	E4	E4	Outdoor
Communication Error	E6	Flash 6 times	/	/	E6	E6	Outdoor & Indoor
Indoor Unit Water Full Error	E9	Flash 9 times	/	/	E9	E9	Indoor
Refrigerant Recovery Mode	Fo	Flash once	Flash once	/	Fo	Fo	Special Mode

Outdoor Ambient Temp Sensor Error	F3	/	Flash 3 times	/	F3	F3	Outdoor
Outdoor Mid-Coil Temp Sensor Error	F4	/	Flash 4 times	/	F4	F4	Outdoor
Outdoor Discharge Air Temp Sensor Error	F5	/	Flash 5 times	/	F5	F5	Outdoor
Oil Return for Cooling	F7	/	Flash 7 times	/	/	/	Special Mode
Forced Defrosting	H1	Quick Flashing	/	/	H1	H1	Special Mode
Oil Return for Heating or Defrosting	H1	/	/	Flash once	H1		Special Mode
Compressor Overheat Protection	H3	/	/	Flash 3 times	H3	H3	Drive Error
IPM Protection	H5	/	/	Flash 5 times	H5	H5	Drive Error
Motor Desynchronizing	H7	/	/	Flash 7 times	H7	H7	Drive Error
PFC Error	Hc	/	/	Flash 6 times	Hc	Hc	Drive Error
Startup Failure	Lc	/	/	Flash 11 times	Lc	Lc	Drive Error
DC Fan motor Error	LA	Flash 24 times	/	/	LA	LA	Outdoor
Phase Loss	Ld	/	/	/	Ld	Ld	Drive Error
Compressor Stalling	LE	/	/	/	LE	LE	Drive Error
Over-Speed	LF	/	/	/	LF	LF	Drive Error
IPM Reset	P0	/	/	/	P0	P0	Drive Error
Compressor Current Protection	P5	/	/	Flash 15 times	P5	P5	Drive Error
Communication Error between the Inverter Drive and the Main Controller	P6	Flash 16 times	/	/	P6	P6	Drive Error
Radiator Temp Sensor Error	P7	/	/	Flash 18 times	P7	P7	Drive Error
Radiator Overheat Protection	P8	/	/	Flash 19 times	P8	P8	Drive Error
AC Contactor Protection	P9	/	/	/	P9	P9	Drive Error
Sensor Connection Protection	Pd	/	/	/	Pd	Pd	Drive Error
Over Voltage Protection	PH	/	Flash 11 times	/	PH	PH	Drive Error
Low Voltage Protection	PL	/	/	Flash 21 times	PL	PL	Drive Error
Temp Drift Protection	PE	/	/	/	PE	PE	Drive Error
Drive Board Ambient Temp Sensor Error	PF	/	/	/	PF	PF	Drive Error
Charging Circuit Error	PU	/	/	Flash 17 times	PU	PU	Drive Error
Unit n communication error	See Table 16	Flash 6 times	/	/	E6	E6	Indoor

Unit n indoor pipe midway temperature sensor error	See Table 16	/	Flash twice	/	E2	E2	Indoor
Indoor Evaporator Temp Sensor Short/ Open-Circuit	See Table 16	/	Flash twice	/	F2	F2	Indoor
(Air Valve) Unit n indoor unit pipe outlet temperature sensor error	See Table 16	/	Flash 22 times	/	b7	b7	Indoor
(Liquid Valve) Unit n indoor pipe inlet temperature sensor error	See Table 16	/	Flash 19 times	/	b5	b5	Indoor
Unit n mode conflict	See Table 16	/	Flash once	/	F1	F1	Indoor
Mode Conflict	See Table 16	Flash 7 times	/	/	E7	E7	Indoor

Table 16

Error Code	Error Description	Error Code	Error Description	Error Code	Error Description
13	Unit A indoor unit pipe outlet temperature sensor error	23	Unit B indoor unit pipe outlet temperature sensor error	33	Unit C indoor unit pipe outlet temperature sensor error
14	Unit A indoor pipe inlet temperature sensor error	24	Unit B indoor pipe inlet temperature sensor error	34	Unit C indoor pipe inlet temperature sensor error
15	Unit A indoor ambient temperature sensor error	25	Unit B indoor ambient temperature sensor error	35	Unit C indoor ambient temperature sensor error
16	Unit A mode conflict	26	Unit B mode conflict	36	Unit C mode conflict
17	Unit A anti-freezing protection	27	Unit B anti-freezing protection	37	Unit C anti-freezing protection
41	Unit D communication error	46	Unit D mode conflict	54	Unit E indoor pipe inlet temperature sensor error
42	Unit D indoor pipe midway temperature sensor error	47	Unit D anti-freezing protection	55	Unit E indoor ambient temperature sensor error
43	Unit D indoor unit pipe outlet temperature sensor error	51	Unit E communication error	56	Unit E mode conflict
44	Unit D indoor pipe inlet temperature sensor error	52	Unit E indoor pipe midway temperature sensor error	57	Unit E anti-freezing protection
45	Unit D indoor ambient temperature sensor error	53	Unit E indoor unit pipe outlet temperature sensor error	C5	Jumper terminal error

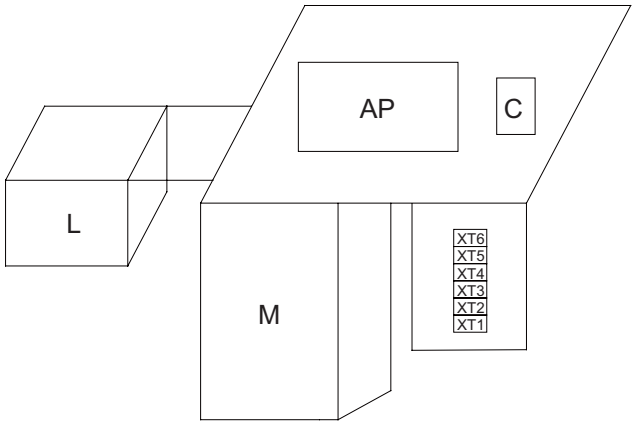


Fig.10 Outdoor Unit: WMO36MH16S WMO42MH16S

(Note: Refer to the real products for the exact position of each component.)

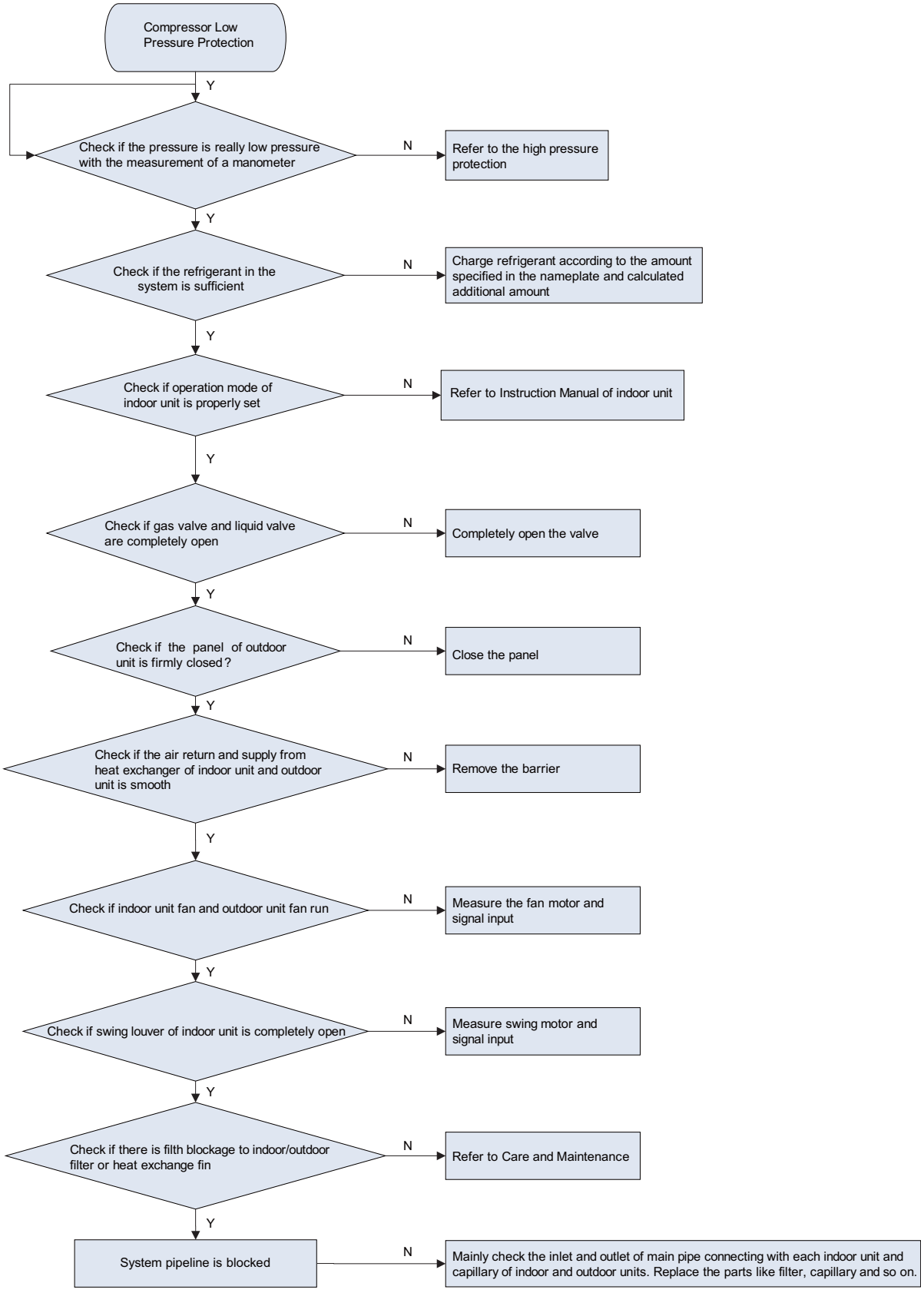
Once errors are displayed on the controller, please shut off the air conditioning unit and contact the professionally skilled personnel for troubleshooting.

4.After-Sales Service

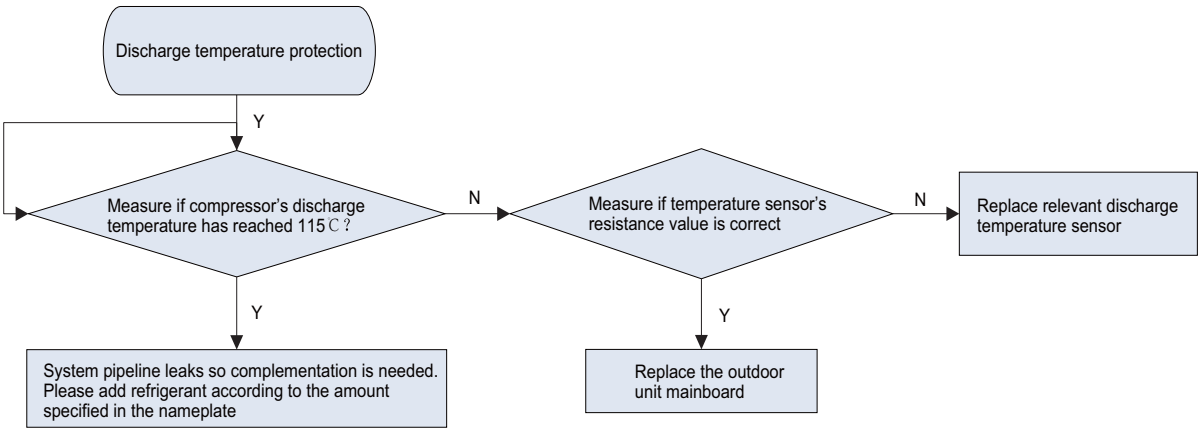
If there is any quality or other issue, place contact the WILLIS after-sales service center.

◆ Malfunction display: E1 Compressor High Pressure Protection

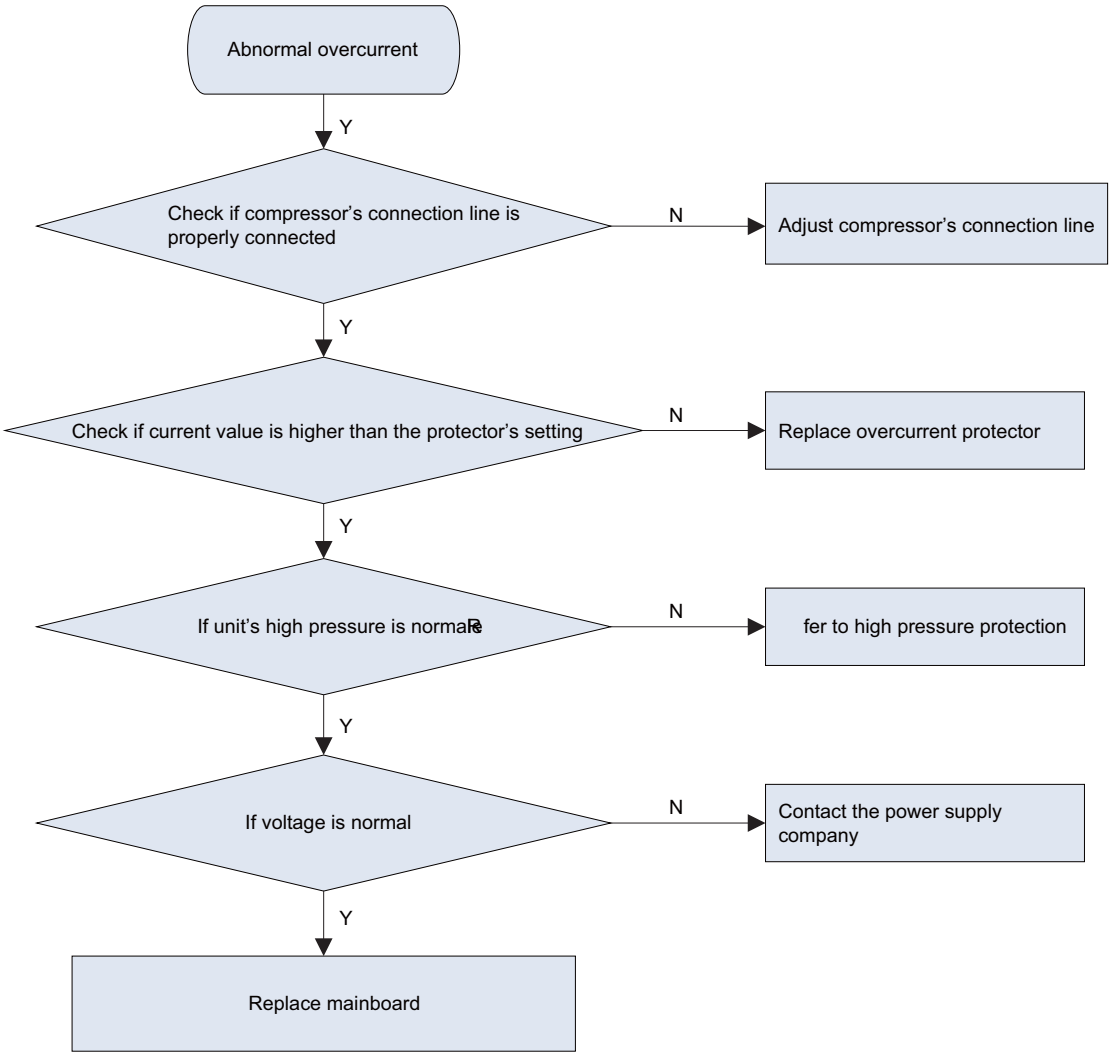
◆ Malfunction display: E3 Compressor Low Pressure Protection



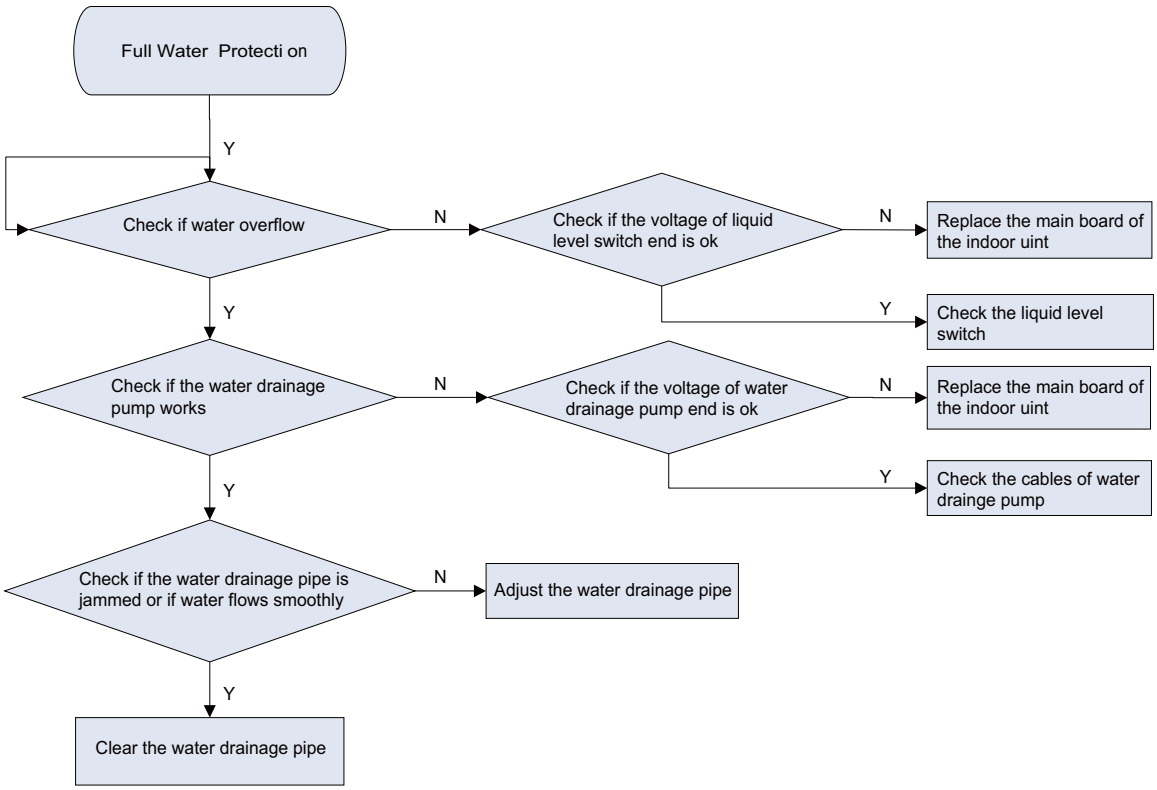
◆ Malfunction display: E4 Compressor Exhaust High Temperature Protection



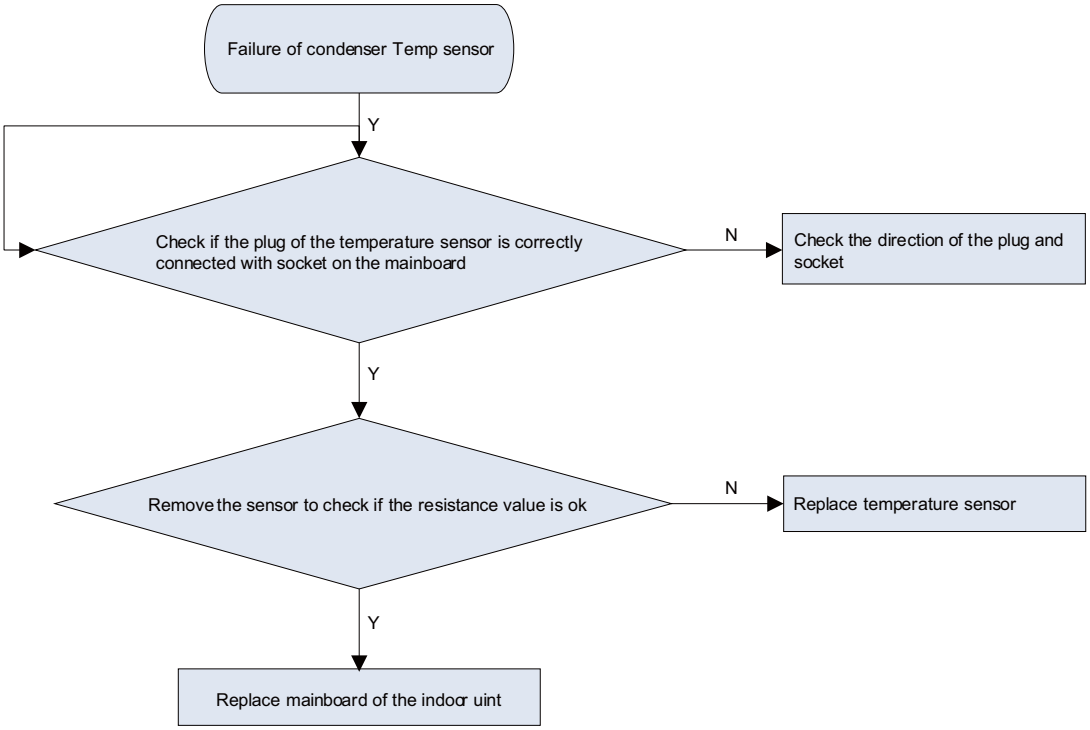
◆ Malfunction display: E5 Compressor Overheat



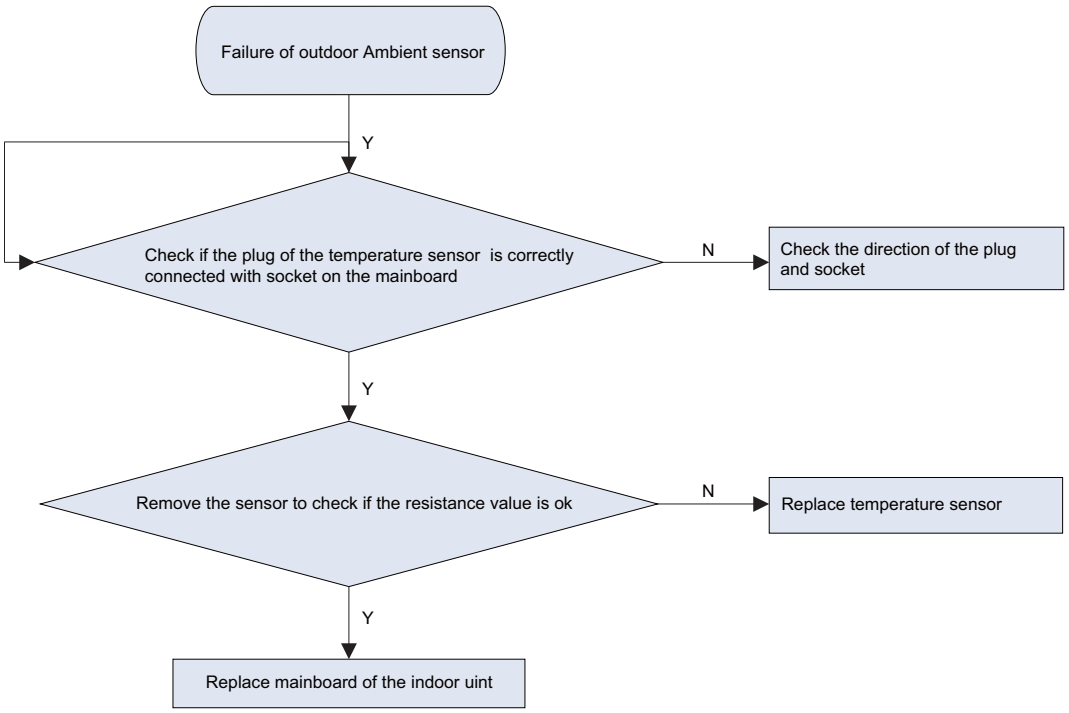
◆ Malfunction display: E9 Full Water Protection



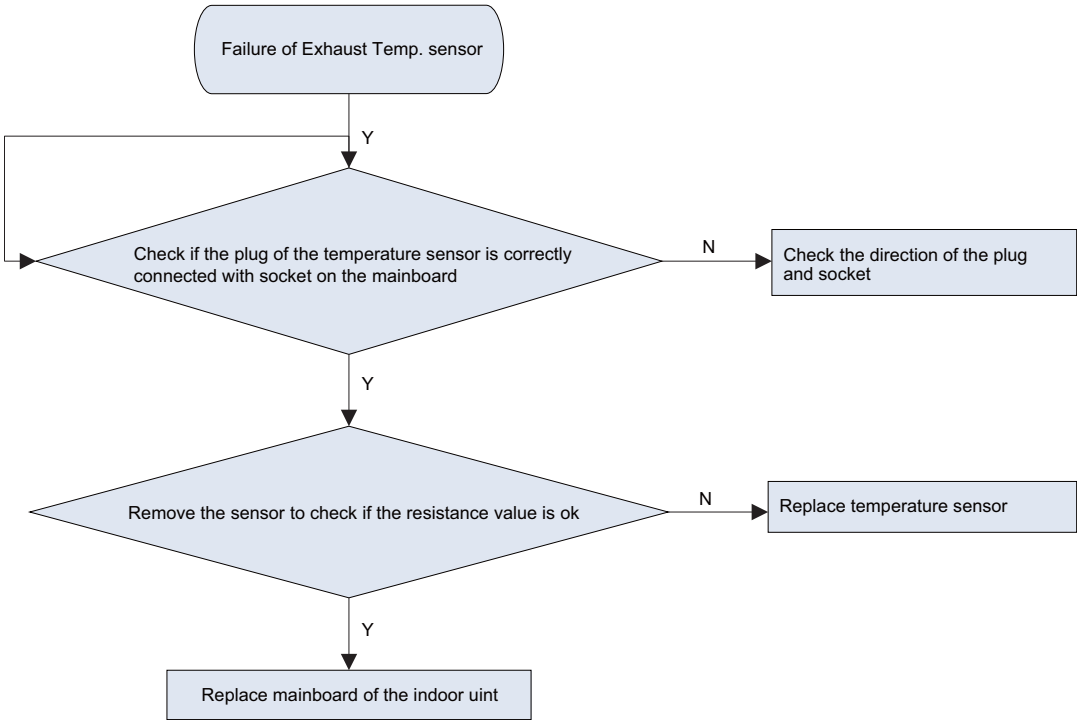
◆ Malfunction display: F2 Failure of Evaporator Temp. Sensor



◆ Malfunction display: F3 Failure of Outdoor Ambient Sensor



◆ Malfunction display: F5 Failure of Exhaust Temp. Sensor



Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-19	138.1		20	18.75		59	3.848		98	1.071
-18	128.6		21	17.93		60	3.711		99	1.039
-17	121.6		22	17.14		61	3.579		100	1.009
-16	115		23	16.39		62	3.454		101	0.98
-15	108.7		24	15.68		63	3.333		102	0.952
-14	102.9		25	15		64	3.217		103	0.925
-13	97.4		26	14.36		65	3.105		104	0.898
-12	92.22		27	13.74		66	2.998		105	0.873
-11	87.35		28	13.16		67	2.896		106	0.848
-10	82.75		29	12.6		68	2.797		107	0.825
-9	78.43		30	12.07		69	2.702		108	0.802
-8	74.35		31	11.57		70	2.611		109	0.779
-7	70.5		32	11.09		71	2.523		110	0.758
-6	66.88		33	10.63		72	2.439		111	0.737
-5	63.46		34	10.2		73	2.358		112	0.717
-4	60.23		35	9.779		74	2.28		113	0.697
-3	57.18		36	9.382		75	2.206		114	0.678
-2	54.31		37	9.003		76	2.133		115	0.66
-1	51.59		38	8.642		77	2.064		116	0.642
0	49.02		39	8.297		78	1.997		117	0.625
1	46.6		40	7.967		79	1.933		118	0.608
2	44.31		41	7.653		80	1.871		119	0.592
3	42.14		42	7.352		81	1.811		120	0.577
4	40.09		43	7.065		82	1.754		121	0.561
5	38.15		44	6.791		83	1.699		122	0.547
6	36.32		45	6.529		84	1.645		123	0.532
7	34.58		46	6.278		85	1.594		124	0.519
8	32.94		47	6.038		86	1.544		125	0.505
9	31.38		48	5.809		87	1.497		126	0.492
10	29.9		49	5.589		88	1.451		127	0.48
11	28.51		50	5.379		89	1.408		128	0.467
12	27.18		51	5.197		90	1.363		129	0.456
13	25.92		52	4.986		91	1.322		130	0.444
14	24.73		53	4.802		92	1.282		131	0.433
15	23.6		54	4.625		93	1.244		132	0.422
16	22.53		55	4.456		94	1.207		133	0.412
17	21.51		56	4.294		95	1.171		134	0.401
18	20.54		57	4.139		96	1.136		135	0.391
19	19.63		58	3.99		97	1.103		136	0.382

Appendix 2: Resistance Table of Outdoor and Indoor Tube Temperature Sensors(20K)

Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-19	181.4		20	25.01		59	5.13		98	1.427
-18	171.4		21	23.9		60	4.948		99	1.386
-17	162.1		22	22.85		61	4.773		100	1.346
-16	153.3		23	21.85		62	4.605		101	1.307
-15	145		24	20.9		63	4.443		102	1.269
-14	137.2		25	20		64	4.289		103	1.233
-13	129.9		26	19.14		65	4.14		104	1.198
-12	123		27	18.13		66	3.998		105	1.164
-11	116.5		28	17.55		67	3.861		106	1.131
-10	110.3		29	16.8		68	3.729		107	1.099
-9	104.6		30	16.1		69	3.603		108	1.069
-8	99.13		31	15.43		70	3.481		109	1.039
-7	94		32	14.79		71	3.364		110	1.01
-6	89.17		33	14.18		72	3.252		111	0.983
-5	84.61		34	13.59		73	3.144		112	0.956
-4	80.31		35	13.04		74	3.04		113	0.93
-3	76.24		36	12.51		75	2.94		114	0.904
-2	72.41		37	12		76	2.844		115	0.88
-1	68.79		38	11.52		77	2.752		116	0.856
0	65.37		39	11.06		78	2.663		117	0.833
1	62.13		40	10.62		79	2.577		118	0.811
2	59.08		41	10.2		80	2.495		119	0.77
3	56.19		42	9.803		81	2.415		120	0.769
4	53.46		43	9.42		82	2.339		121	0.746
5	50.87		44	9.054		83	2.265		122	0.729
6	48.42		45	8.705		84	2.194		123	0.71
7	46.11		46	8.37		85	2.125		124	0.692
8	43.92		47	8.051		86	2.059		125	0.674
9	41.84		48	7.745		87	1.996		126	0.658
10	39.87		49	7.453		88	1.934		127	0.64
11	38.01		50	7.173		89	1.875		128	0.623
12	36.24		51	6.905		90	1.818		129	0.607
13	34.57		52	6.648		91	1.736		130	0.592
14	32.98		53	6.403		92	1.71		131	0.577
15	31.47		54	6.167		93	1.658		132	0.563
16	30.04		55	5.942		94	1.609		133	0.549
17	28.68		56	5.726		95	1.561		134	0.535
18	27.39		57	5.519		96	1.515		135	0.521
19	26.17		58	5.32		97	1.47		136	0.509

Appendix3: Resistance Table for Outdoor Discharge Temperature Sensor (50K)

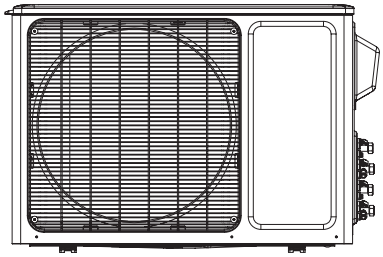
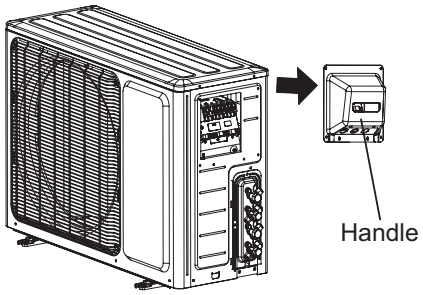
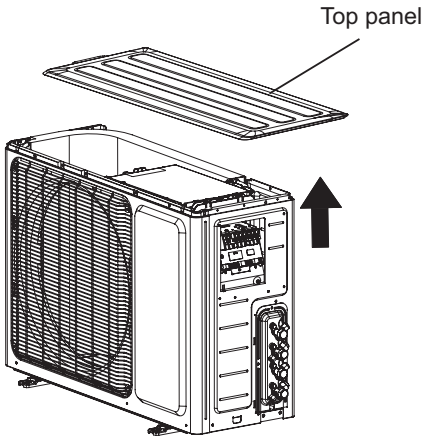
Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)		Temp(℃)	Resistance(kΩ)
-29	853.5		10	98		49	18.34		88	4.75
-28	799.8		11	93.42		50	17.65		89	4.61
-27	750		12	89.07		51	16.99		90	4.47
-26	703.8		13	84.95		52	16.36		91	4.33
-25	660.8		14	81.05		53	15.75		92	4.20
-24	620.8		15	77.35		54	15.17		93	4.08
-23	580.6		16	73.83		55	14.62		94	3.96
-22	548.9		17	70.5		56	14.09		95	3.84
-21	516.6		18	67.34		57	13.58		96	3.73
-20	486.5		19	64.33		58	13.09		97	3.62
-19	458.3		20	61.48		59	12.62		98	3.51
-18	432		21	58.77		60	12.17		99	3.41
-17	407.4		22	56.19		61	11.74		100	3.32
-16	384.5		23	53.74		62	11.32		101	3.22
-15	362.9		24	51.41		63	10.93		102	3.13
-14	342.8		25	49.19		64	10.54		103	3.04
-13	323.9		26	47.08		65	10.18		104	2.96
-12	306.2		27	45.07		66	9.83		105	2.87
-11	289.6		28	43.16		67	9.49		106	2.79
-10	274		29	41.34		68	9.17		107	2.72
-9	259.3		30	39.61		69	8.85		108	2.64
-8	245.6		31	37.96		70	8.56		109	2.57
-7	232.6		32	36.38		71	8.27		110	2.50
-6	220.5		33	34.88		72	7.99		111	2.43
-5	209		34	33.45		73	7.73		112	2.37
-4	198.3		35	32.09		74	7.47		113	2.30
-3	199.1		36	30.79		75	7.22		114	2.24
-2	178.5		37	29.54		76	7.00		115	2.18
-1	169.5		38	28.36		77	6.76		116	2.12
0	161		39	27.23		78	6.54		117	2.07
1	153		40	26.15		79	6.33		118	2.02
2	145.4		41	25.11		80	6.13		119	1.96
3	138.3		42	24.13		81	5.93		120	1.91
4	131.5		43	23.19		82	5.75		121	1.86
5	125.1		44	22.29		83	5.57		122	1.82
6	119.1		45	21.43		84	5.39		123	1.77
7	113.4		46	20.6		85	5.22		124	1.73
8	108		47	19.81		86	5.06		125	1.68
9	102.8		48	19.06		87	4.90		126	1.64

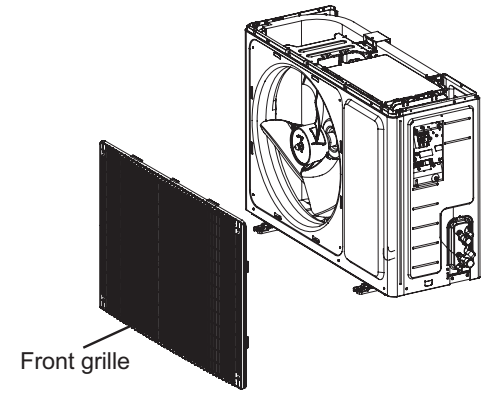
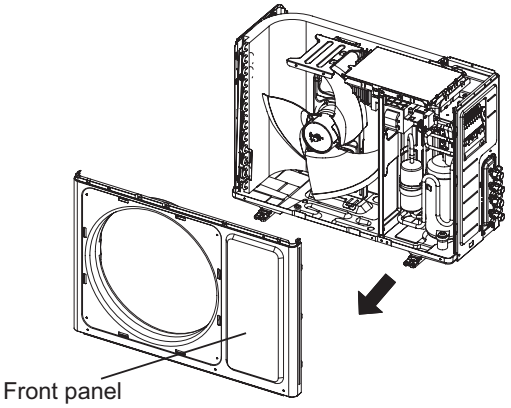
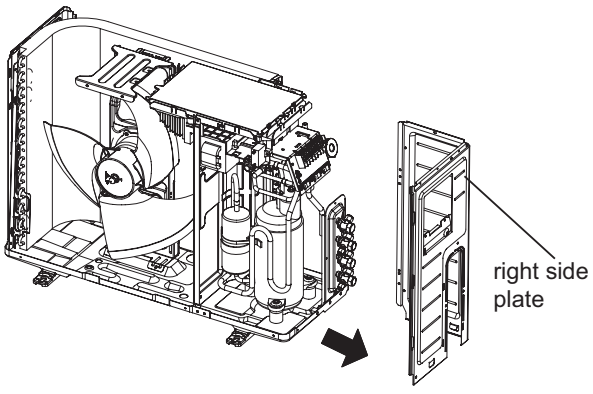
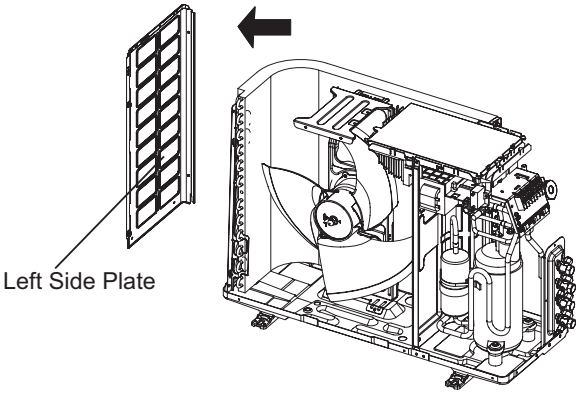
Note: The information above is for reference only.

10. Removal Procedure

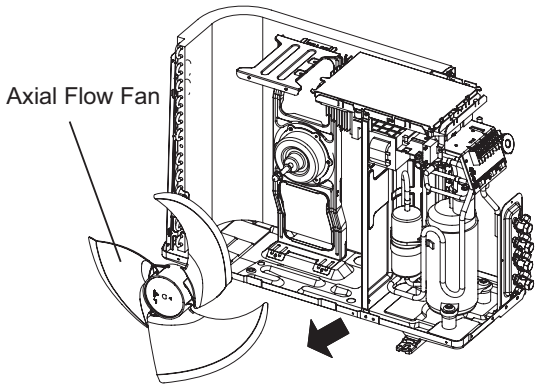
⚠ Warning Be sure to wait for a minimum of 10 minutes after turning off all power supplies before disassembly.

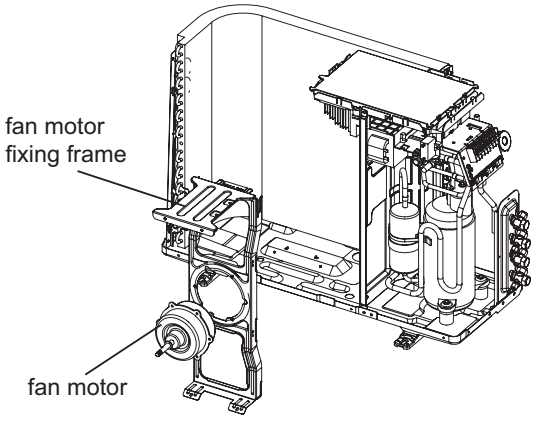
10.1 Removal Procedure(18K)

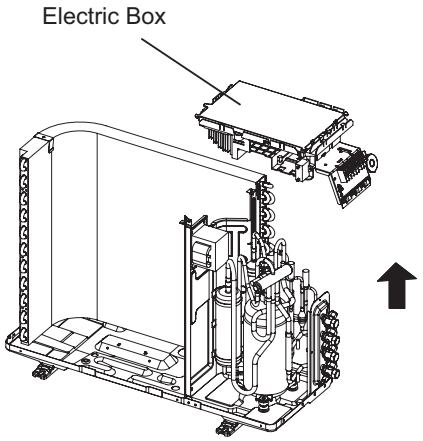
Steps	Procedure	
1. Remove top cover and handle		
1	Before disassembly.	
2	Twist off the screws used for fixing the handle, pull the handle upward to remove it.	
3	Twist off the screws used for fixing the top cover, pull the top cover upward to remove it.	

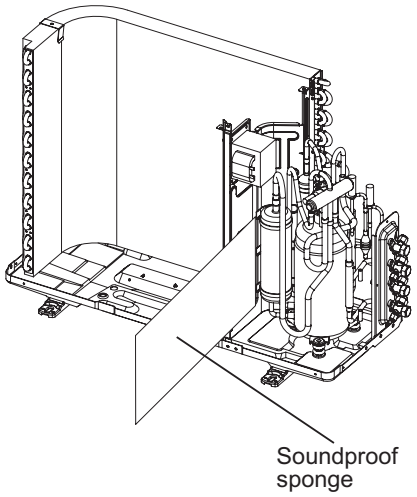
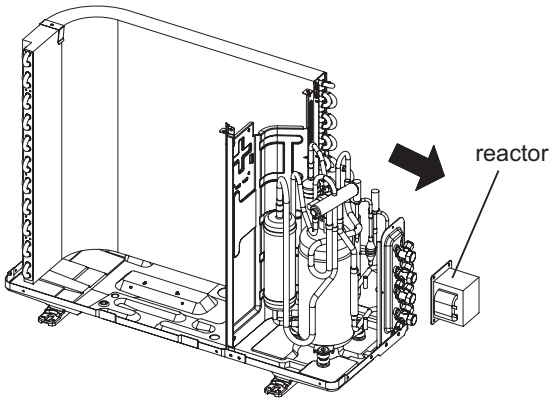
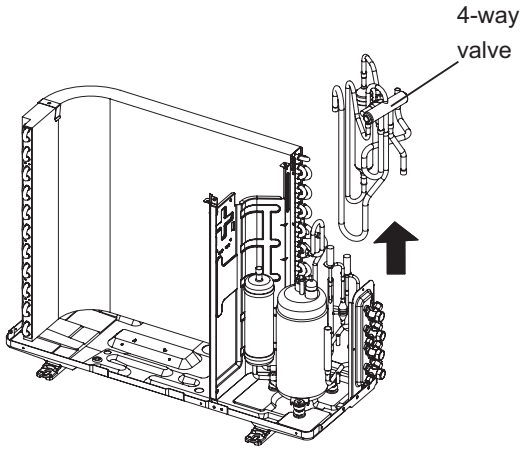
Steps	Procedure
2.Remove front grille and front panel	
1	Remove the screws connecting the front grille and the front panel. Remove the front grille.
2	Twist off the screws fixing the panel, pull it upward,loosen the clasp on the right side, rotate it to the left and then remove the front panel. 
3.Remove right side plate	
1	Remove the screws connecting the right side plate with the chassis, the valve support and the electric box, and then remove the right side plate assy.
2	Remove the screws connecting the left side plateand the chassis, and then remove the left side plateassy 

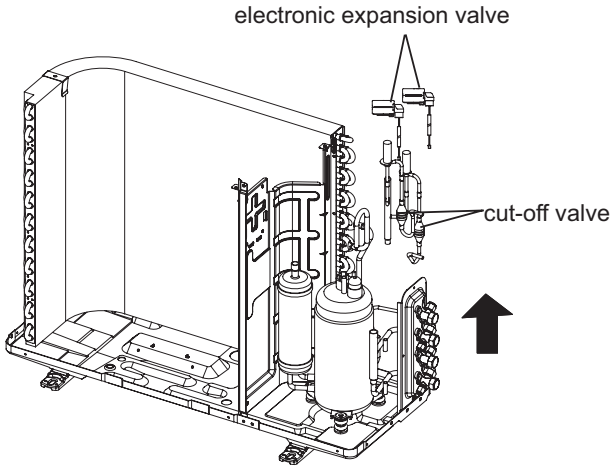
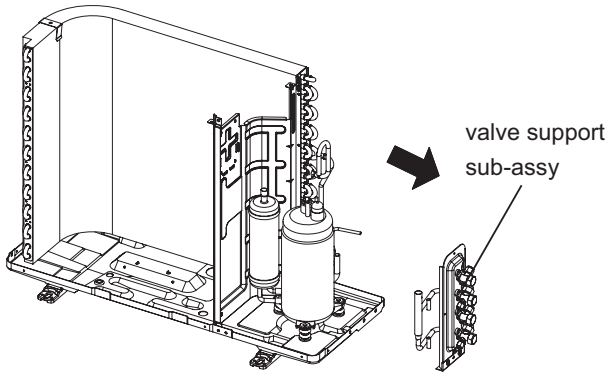
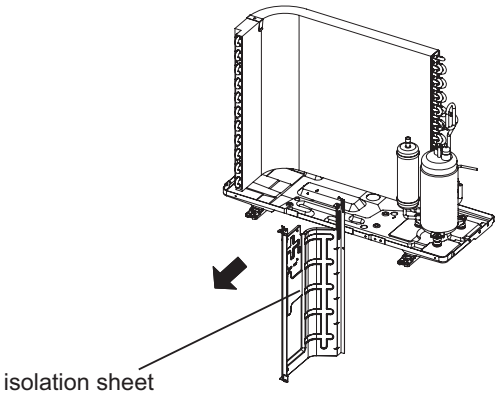
Steps	Procedure
4.Remove the axial flow fan	
1	Remove the nuts fixing the blade and thenremove the axial flow fan.
2	Remove the 4 tapping screws fixing the motor; disconnect the leading wire insert of the motor and then remove the motor.Remove the 2 tapping screws fixing the motor support and then pull the motor support upwards to remove it.
5.Remove Electric Box Assy	
	Remove the screws fixing the electric box sub-assy; loosen the wire bundle; pull out the wiring terminals and then pull the electric box upwards to remove it.



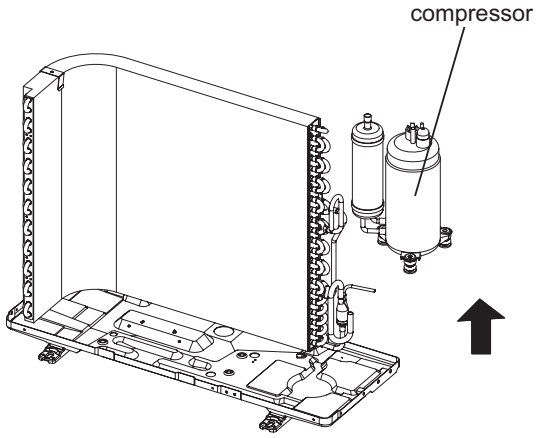


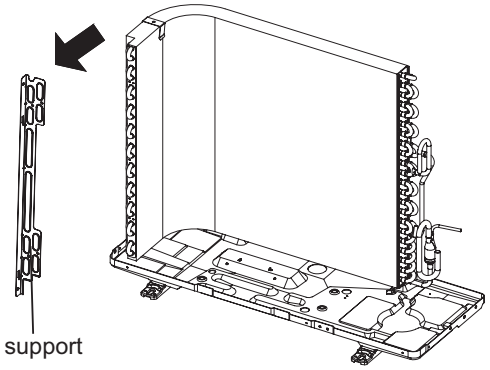


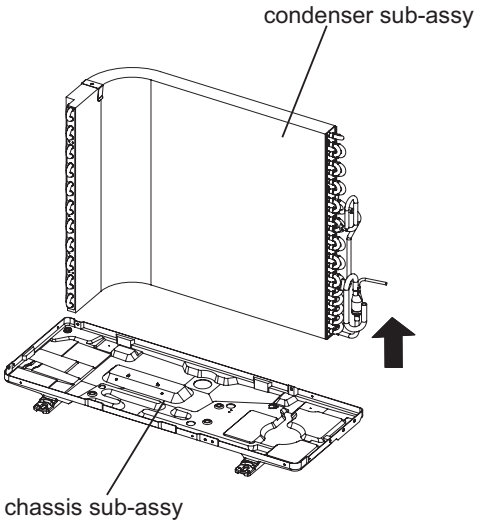
Steps	Procedure	
6. Remove soundproof sponge		
	Tear up the soundproof sponge carefully.	
7. Remove reactor		
	Remove screws connecting reactor and middle isolation sheet, and then remove the reactor.	
8. Remove 4-way valve		
	Discharge the refrigerant completely;unsolder the pipelines connecting the compressor and the condenser assy, and then remove the 4-way valve assy.	

Steps	Procedure
9. Remove electronic expansion valve and cut-off valve	
	Remove electronic expansion valve and cut-off valve Unsolder the spot weld between electronic expansion valve and cut-off valve as well as the spot weld of connection pipe for condenser, and then remove the expansion valve. Meanwhile, rotate out the electronic coil, and then pull it upwards to remove it.
	
10. Remove valve support sub-assy	
	Remove screws fixing valve support and chassis, and then remove the valve support sub-assy.
	
11. Remove isolation sheet	
	Remove screws fixing isolation sheet and then remove the isolation sheet.
	

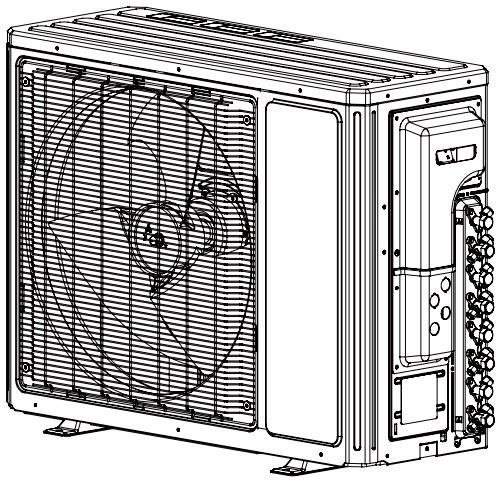
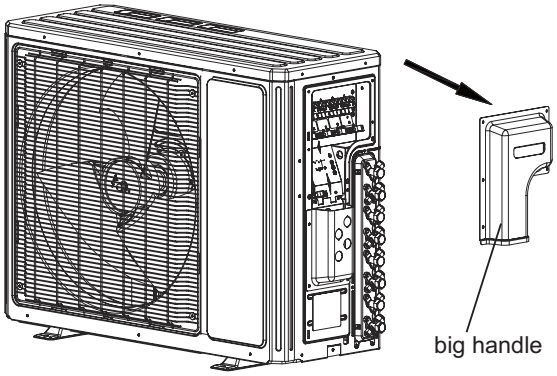
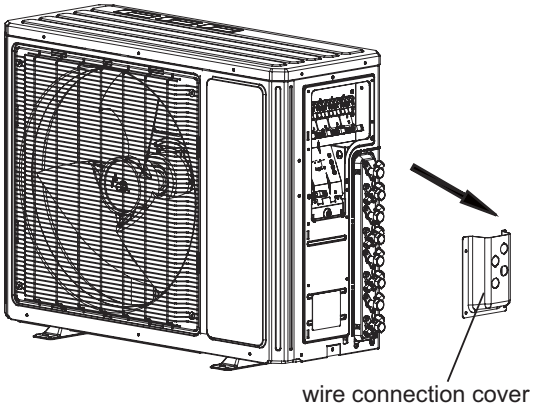
Steps	Procedure
12. Remove compressor	
	Twist off the three foot nuts on compressor and then remove the compressor.
13. Remove condenser sub-assy	
1	Remove the screws connecting the support (condenser) and condenser assy,and then remove the support (condenser).
2	Dissemble the chassis sub-assy and condenser sub-assy.

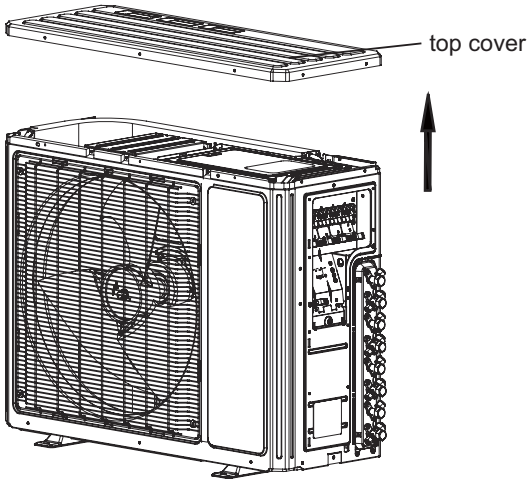
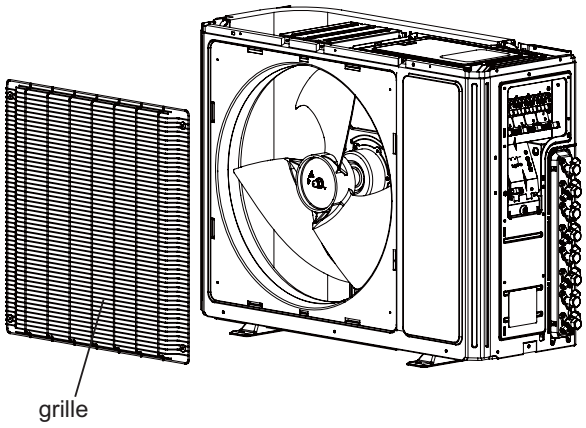
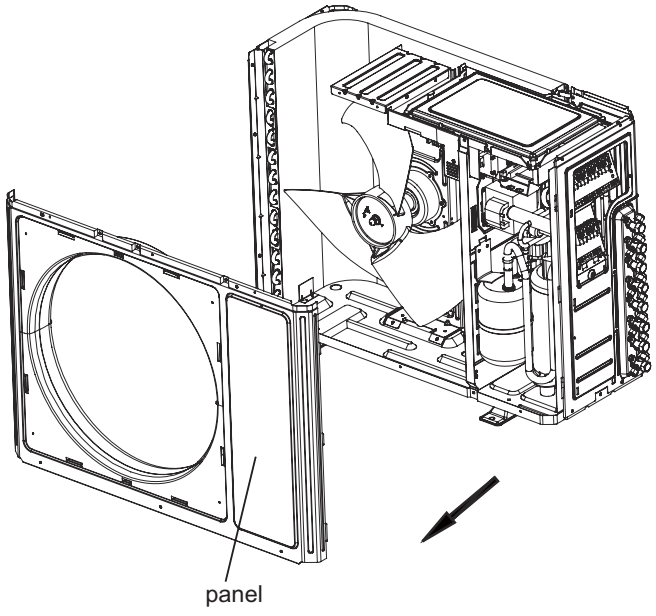


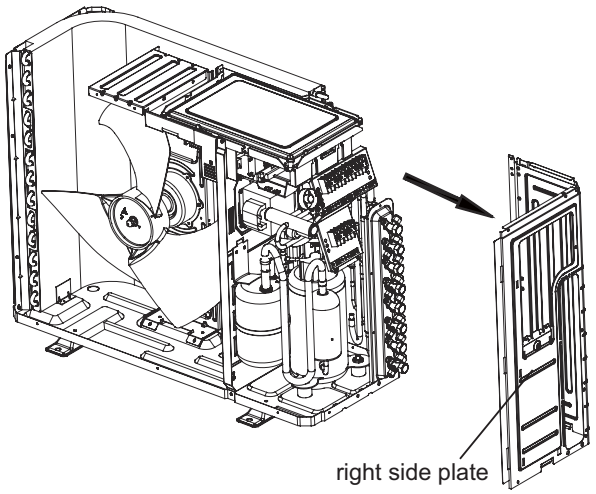
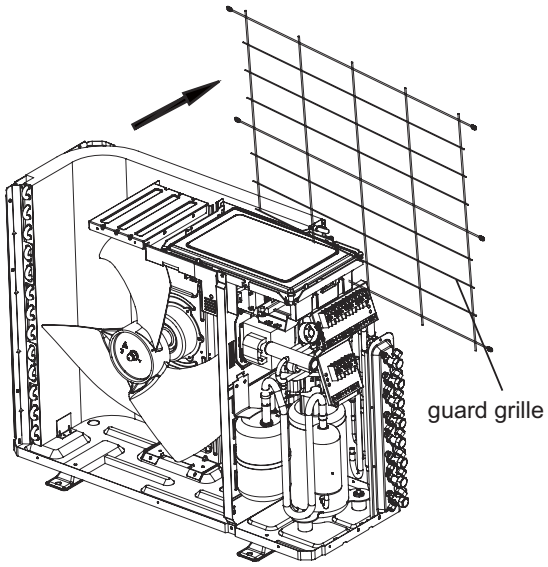
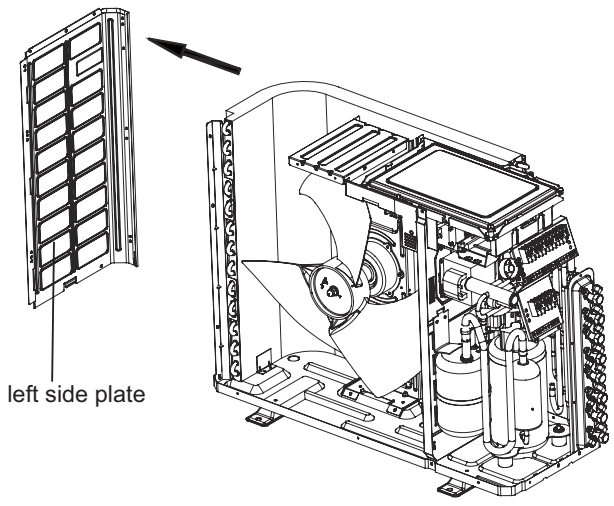


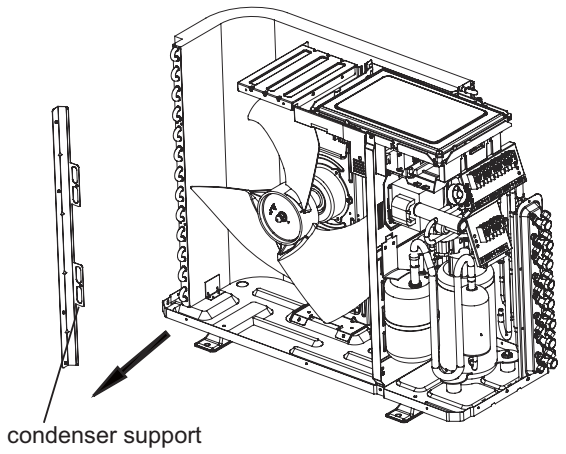
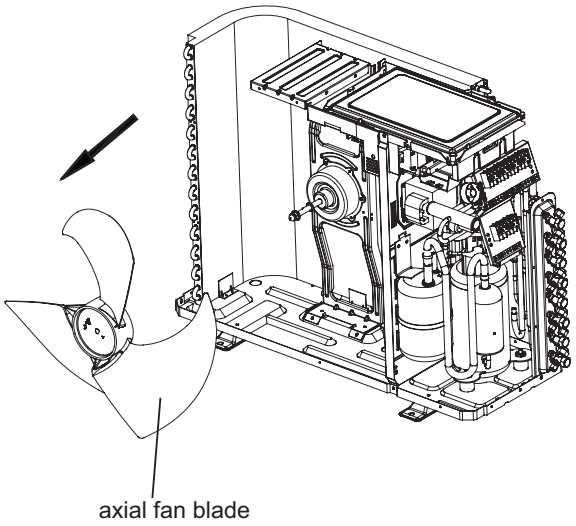
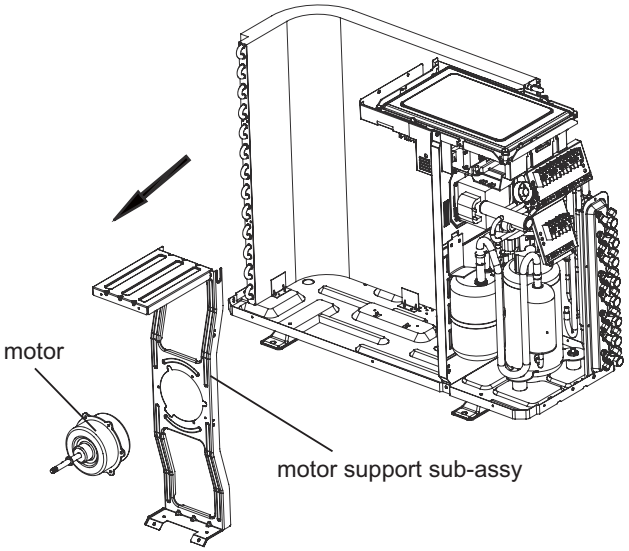


10.2 Removal Procedure(24K/30K)

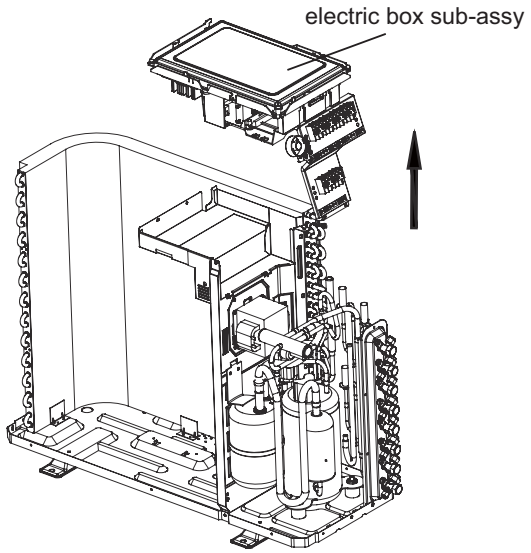
Steps	Procedure
1.Remove big handle and wire connection cover	
Before disassembly	
Remove the screws fixing big handle and right side plate to remove the big handle.	
Remove the screws fixing wire connection cover and right side plate to remove the wire connection cover.	

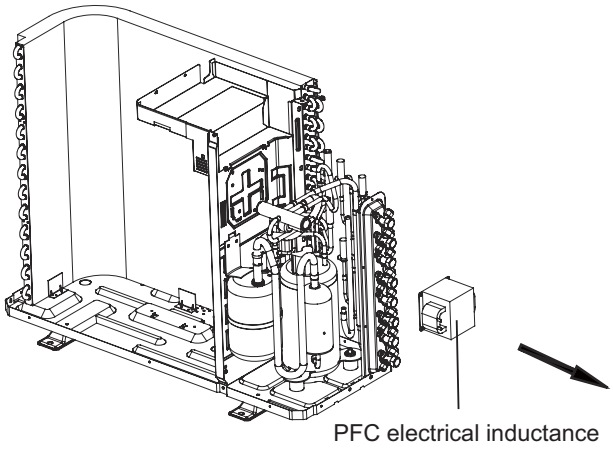
Steps	Procedure
2.Remove top cover	
Remove the screws fixing top cover, panel and left & right side plate, to remove top cover.	
3.Remove grille	
Remove the screws fixing grille and panel, to remove the grille on the panel.	
4.Remove panel	
Remove the screws fixing panel, chassis and motor support, to remove the panel.	

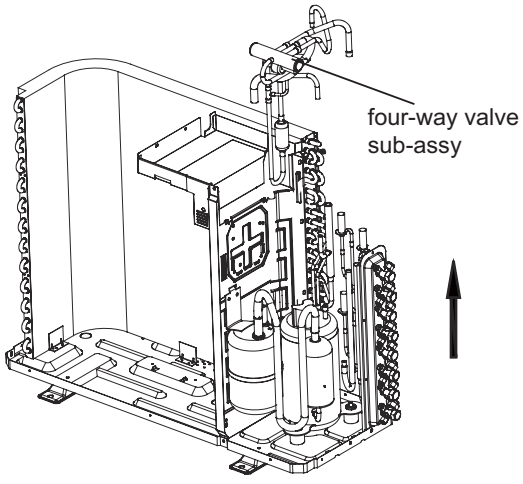
Steps	Procedure
5.Remove right side plate	
Remove the screws fixing right side plate, valve support and guard grille, to remove the right side plate.	
6.Remove guard grille	
Remove the screws fixing guard grille and left side plate to remove guard grille.	
7.Remove left side plate	
Remove the screws fixing chassis and condenser support, to remove the left side plate.	

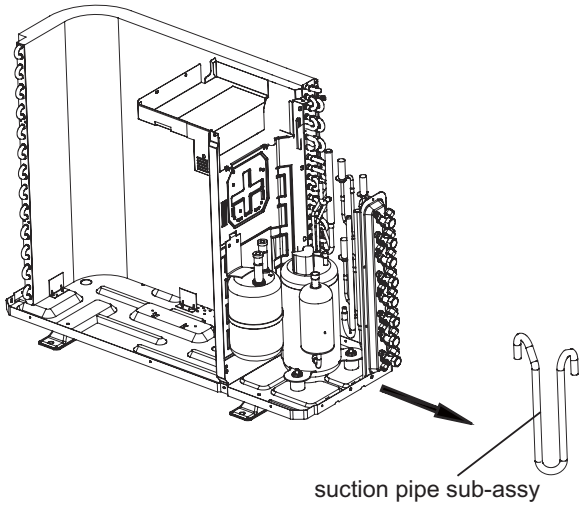
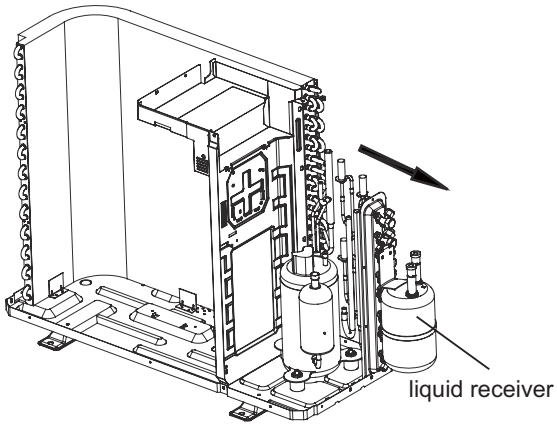
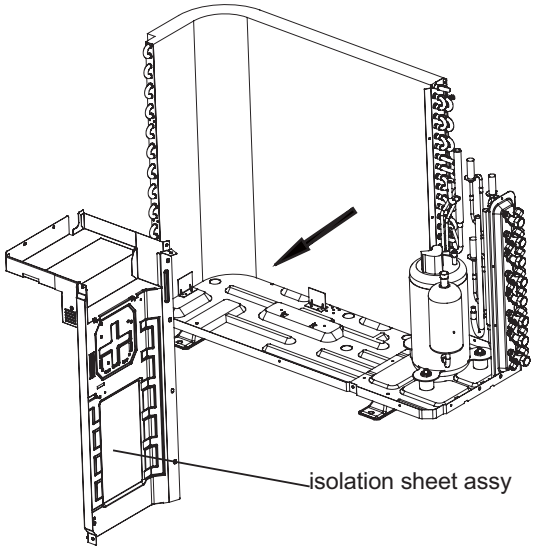
Steps	Procedure
8.Remove condenser support	
Remove the screws fixing support and chassis, to remove the condenser support.	
9.Remove axial fan blade	
Remove the screw nuts fixing fan blade with spanner, to remove the fan blade.	
10.Remove motor and motor support sub-assy	
Remove the tapping screws fixing motor, pull out the pin of leading wire for motor and remove the screws fixing motor support and chassis, to remove the motor and motor support sub-assy.	

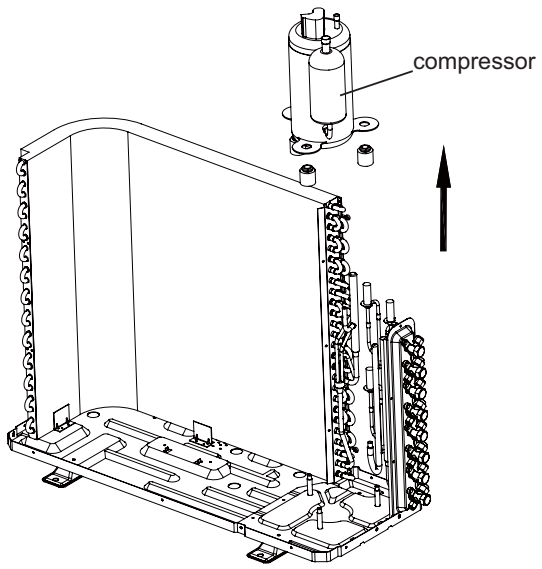
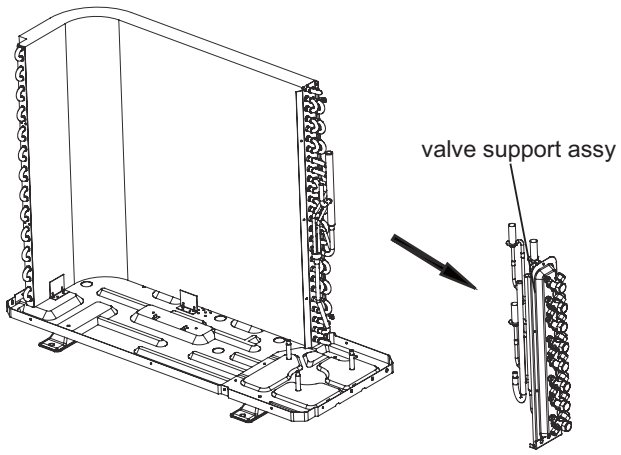
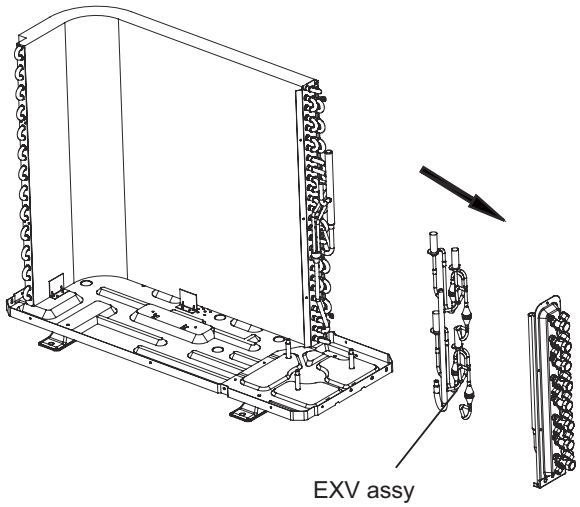
Steps	Procedure
11.Remove electric box sub-assy	
	Remove the tapping screws fixing isolation sheet, loosen the wire binds, pull out the terminal, lift to remove the electric box sub-assy.
12.Remove PFC electrical inductance	
	Remove the screws fixing PFC electrical inductance and isolation sheet, to remove the PFC electrical inductance.
13.Remove four-way valve sub-assy	
	Welding cut the welding point jointing the four-way valve with blowtorch to remove the four-way valve sub-assy. (Note: please make sure there's no refrigerant in the unit before remove any tube or compressor)



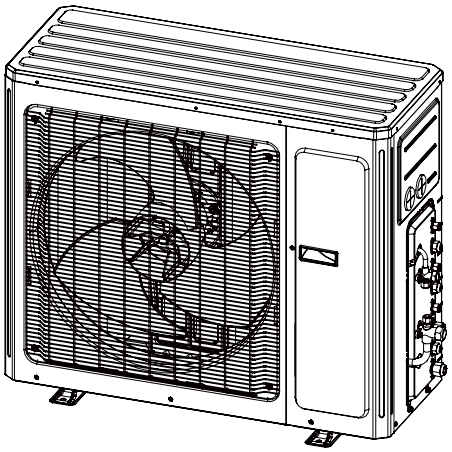
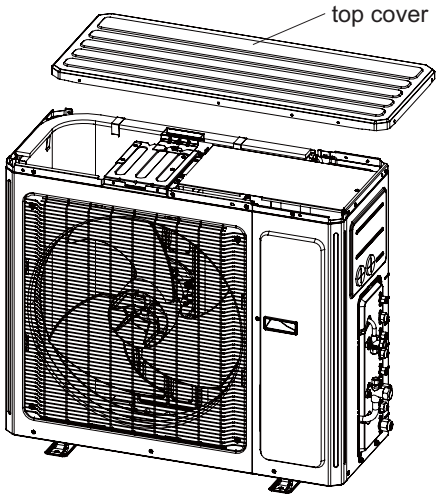
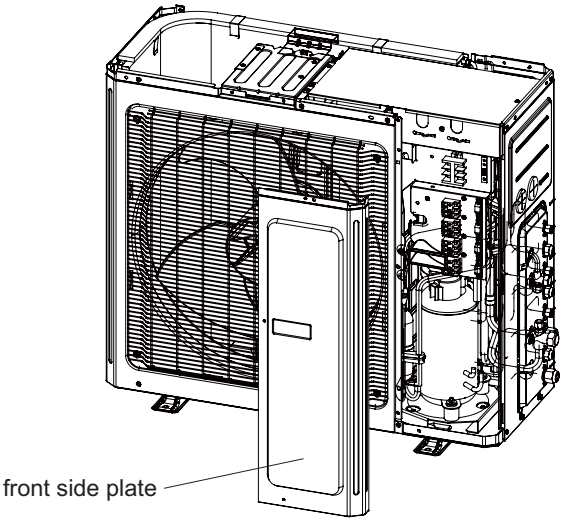


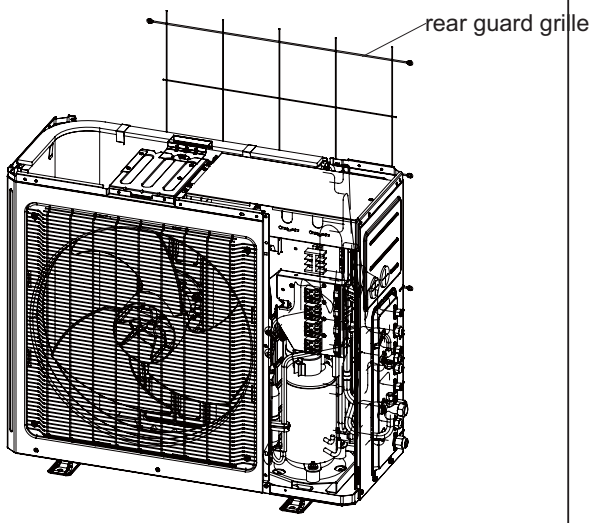
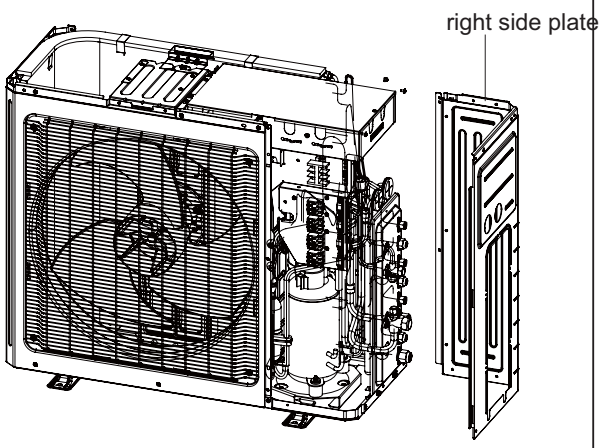
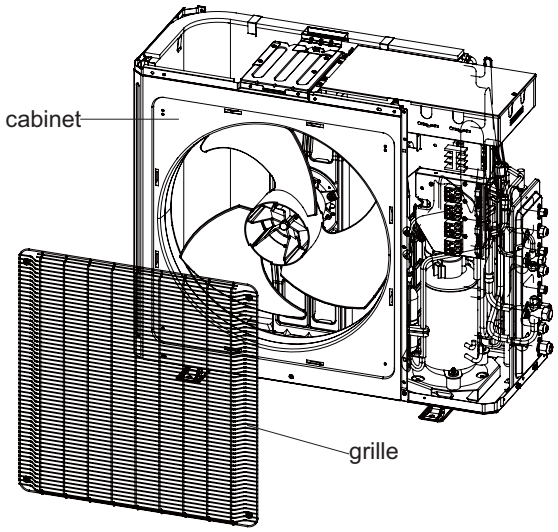


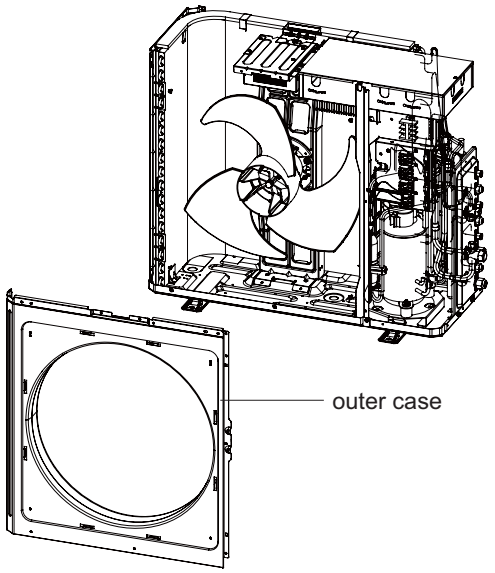
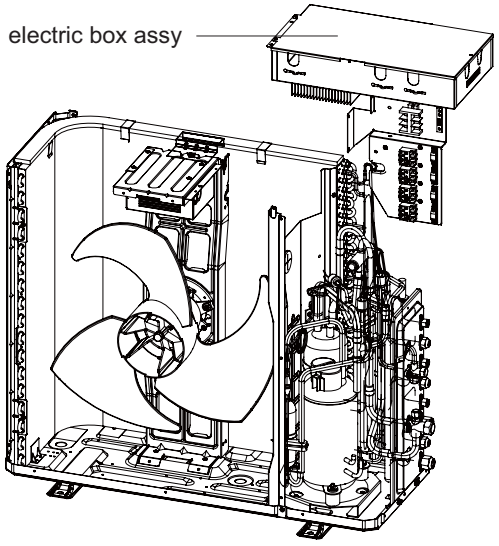
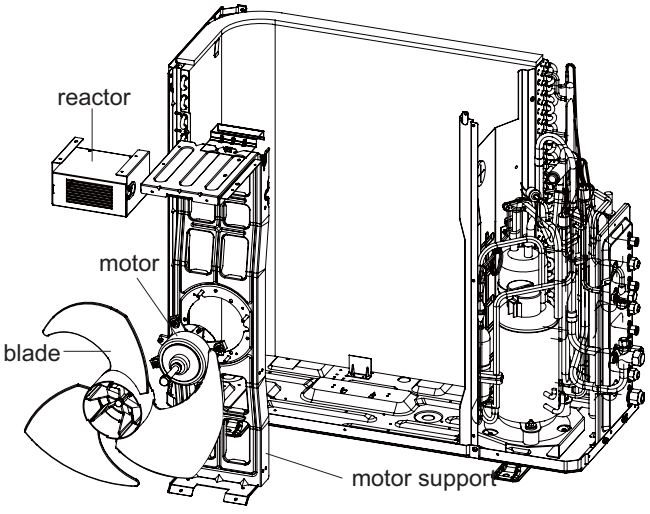
Steps	Procedure
14.Remove suction pipe sub-assy	
Welding cut the welding point jointing the suction pipe sub-assy, compressor and liquid receiver, to remove the suction pipe sub-assy.	
15.Remove liquid receiver	
Remove the screws fixing isolation sheet and liquid receiver and lift to remove the liquid receiver.	
16.Remove the isolation sheet assy	
Remove the screws fixing isolation sheet and condenser side plate, to remove the isolation sheet assy.	

Steps	Procedure
17.Remove compressor	
Remove the screw nuts fixing compressor foots and chassis with spanner, as well as the foot cushion, to remove the compressor.	
18.Remove valve support assy	
Remove the screws fixing valve support assy and chassis sub-assy, to remove the valve support assy.	
19.Remove EXV assy	
Welding cut the welding point jointing EXV sub-assy and refrigerant collection pipe, to remove the EXV assy. (Note: fully pack the big valve with wet cloth when welding cutting, to avoid high temperature damage of valve)	

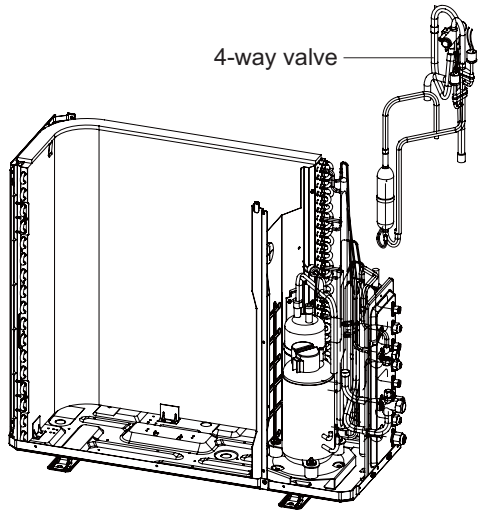
10.3 Removal Procedure(36K)

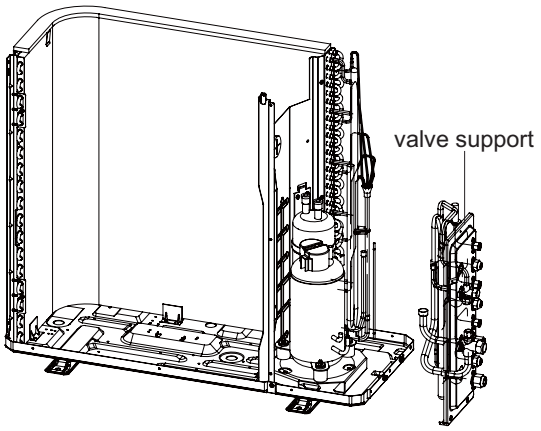
Steps	Procedure
1. Before disassembly	
2. Remove top cover Remove the screws connecting the top cover with outer case, right side plate and left side plate; lift the top cover upwards to remove it.	
3.Remove front side plate Remove the screws connecting the front side plate with chassis and middle isolation sheet,and then remove the front side plate	

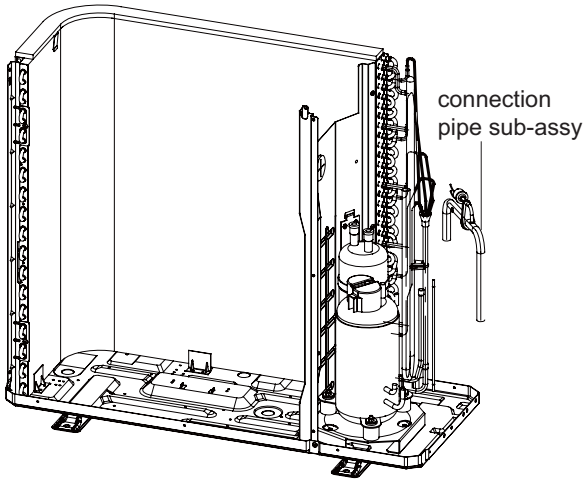
Steps	Procedure
4.Remove rear guard grille	
Remove the 6 screws connecting the grille with right side plate and left side plate, and then remove the rear guard grille.	
5.Remove right side plate	
Remove the screws connecting the right side plate with electric box assy, valve support, chassis and condenser side plate, and then remove the right side plate.	
6.Remove grille and cabinet	
Remove the 4 screws connecting the grille and outer case, and then remove the panel grille.	

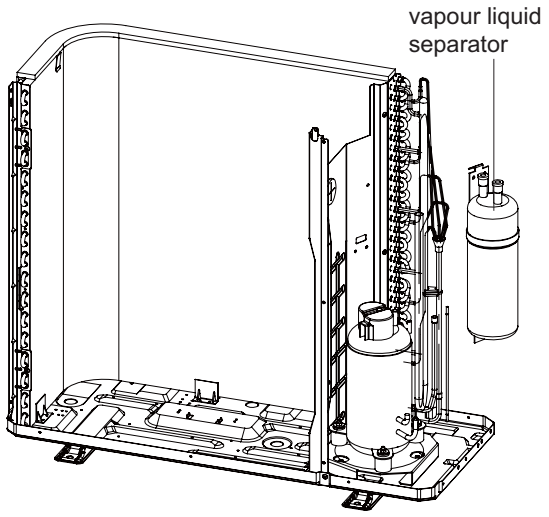
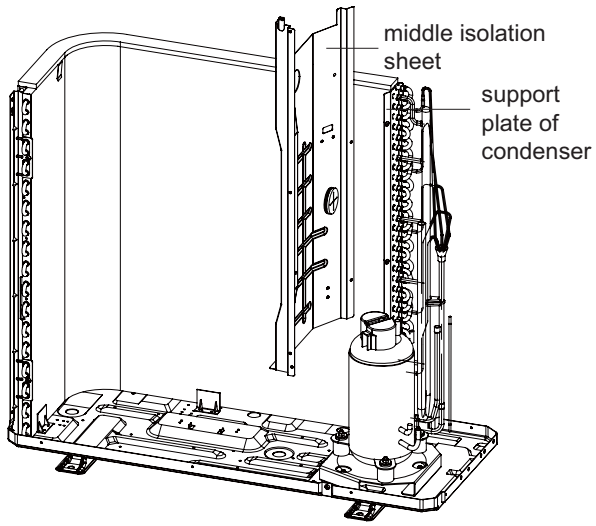
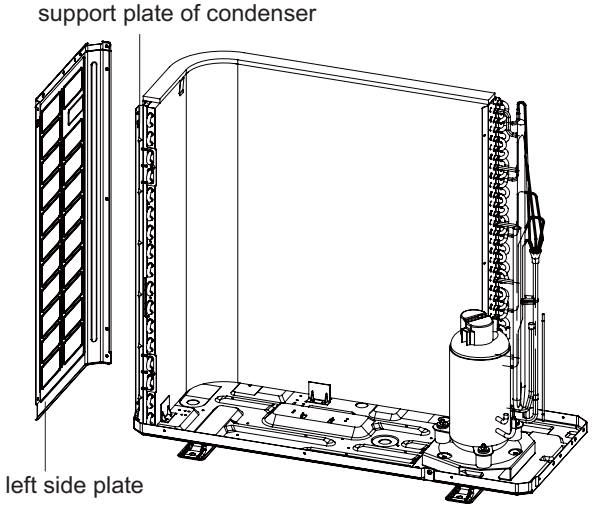
Steps	Procedure
7. Remove outer case	
Remove screws connecting outer case and motor support, middle isolation sheet and chassis, pull the outer case upwards slightly, loosen clasps between outer case and right side plate, left side plate, and then remove the outer case.	
8. Remove electric box assy	
1.Remove the grounding wire screw on the electric box assy and then remove the grounding wire. 2.Disconnect the wiring terminals of reactor, compressor, high and low pressure switch, compressor overload protector, temperature sensor, outdoor fan motor and 4-way valve. (See fig 2) Note: keep pressing the circlip when disconnecting the wiring terminal of reactor; keep pressing the retainer when disconnecting other wiring terminals. 3.Remove the wire inside the wiring groove.	
9. Remove blade, motor, motor support, reactor	
1.Remove nuts fixing axial flow blade with wrench, and then remove the axial flow blade. 2.Remove 2 screws connecting motor support and chassis, loosen damper block and then remove the motor support. 3.Remove 4 screws fixing motor,and then remove the motor 4.Remove 4 screws fixing reactor sub-assy and motor support, and then remove the reactor sub-assy.	

Steps	Procedure
10 Remove 4-way valve	
	Unsolder the spot weld between 4-way valve and vapour liquid separator, compressor cut-off valve sub-assy and condenser, and then remove the 4-way valve. Note: When unsoldering the spot weld, wrap the 4-way valve with wet cloth completely to avoid damage to valve due to high temperature.
11. Remove valve support	
	Unsolder all spot welds connected with valve support and then remove the valve support. Note:When unsoldering the spot weld, wrap the gas valve and liquid valve with wet cloth completely to avoid damage to valve due to high temperature.
12. Remove connection pipe sub-assy	
	Remove all spot welds connected with connection pipe, and then remove the connection pipe sub-assy.

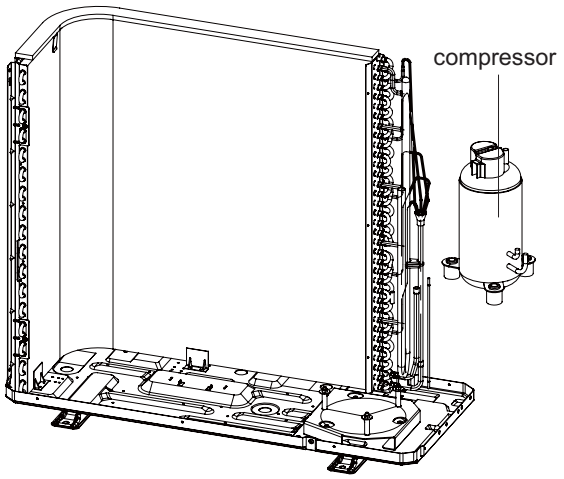


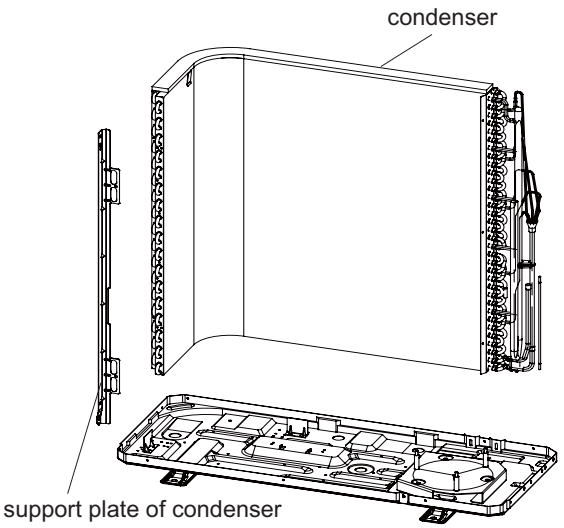




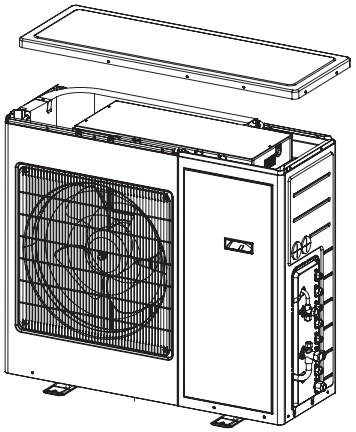
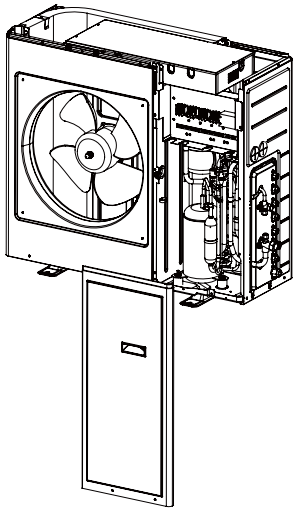
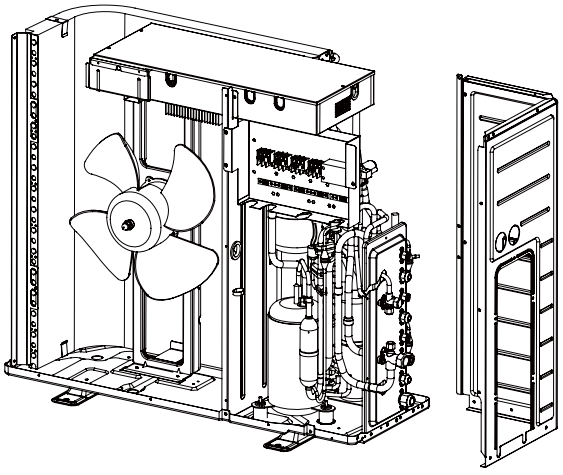
Steps	Procedure
13. Remove vapour liquid separator	
Unsolder spot welds connected with vapour liquid separator, remove screws connected vapour liquid separator and middle isolation sheet, and then remove the vapour liquid separator.	
14. Remove middle isolation sheet	
Remove screws connecting middle isolation sheet and support plate of condenser, chassis, and then remove the middle isolation sheet.	
15. Remove left side plate	
Remove screws connecting left side plate and support plate of condenser, chassis, and then remove the left side plate.	

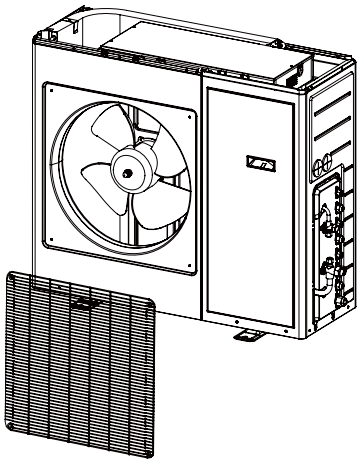
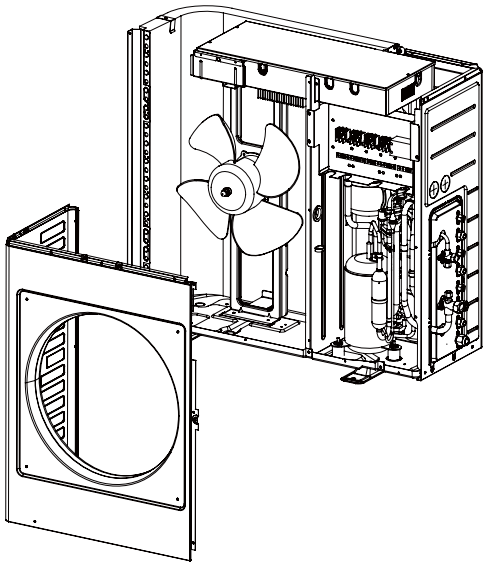
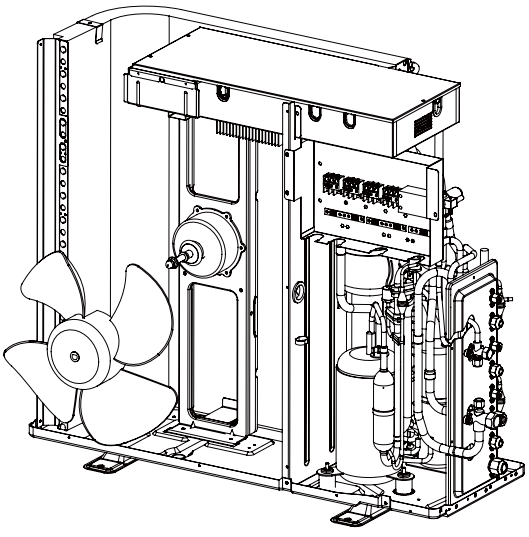
Steps	Procedure
16.Remove compressor	
	Remove the 3 foot nuts fixing compressor and then lift the compressor upwards to remove the compressor and damping cushion. Note: Keep the ports of discharge pipe and suction pipe from foreign objects.
17. Remove condenser	
	Remove 5 screws connecting condenser and chassis, and then remove the condenser. Remove 2 screws connecting support plate of condenser and condenser, and then remove the support plate of condenser.

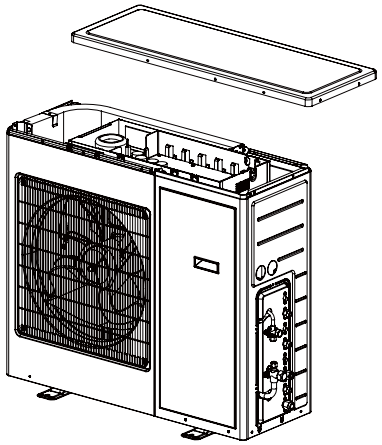


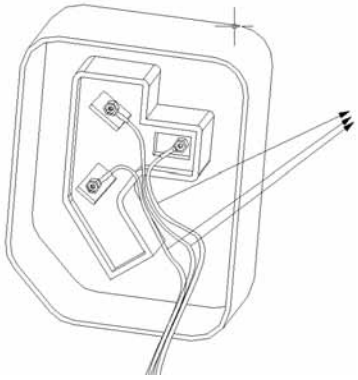
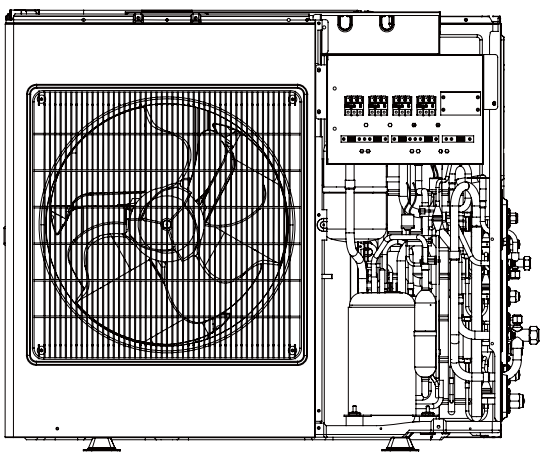


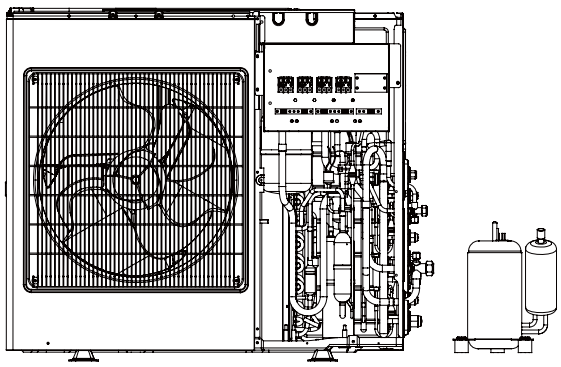
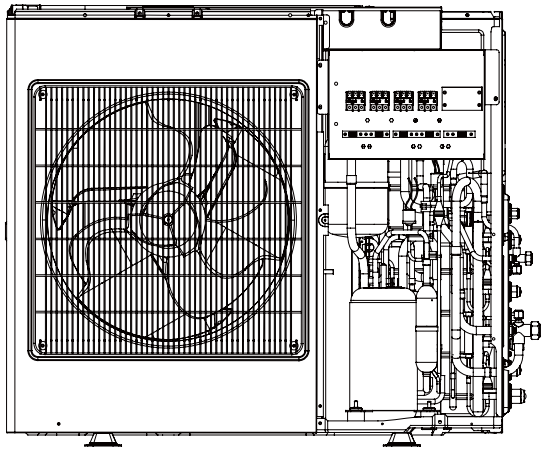
10.4 Removal Procedure(42K)

Disassembly and Assembly of Outer Casing		
Steps	**Procedure**	
1. Disassemble the cover plate		
	① Remove the fixed screws on the cover plate by using a screwdriver. ② Remove the cover plate.	
2. Disassemble the front panel		
	① Remove the fixed screws on the front panel by using a screwdriver. ② Remove the front panel.	
3. Disassemble the panel on the right side		
	① Remove the fixed screws on the panel by using a screwdriver. ② Remove the panel on the right side.	

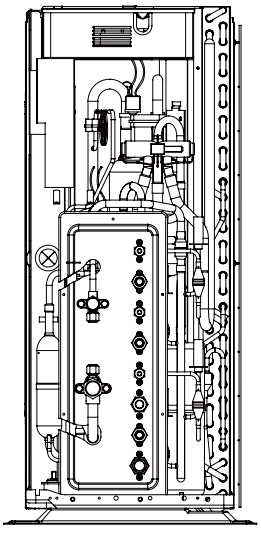
Steps	Procedure
4. Dismount the grille	
① Remove the fixed screws on the grille by using a screwdriver. ② Remove the grille.	
5. Disassemble the outer casing	
① Remove the fixed screws on the outer casing by using a screwdriver. ② Remove the outer casing.	
6. Disassemble the fan blades	
① Remove the fixed screws on the fan blades by using a spanner. ② Remove the fan blades.	

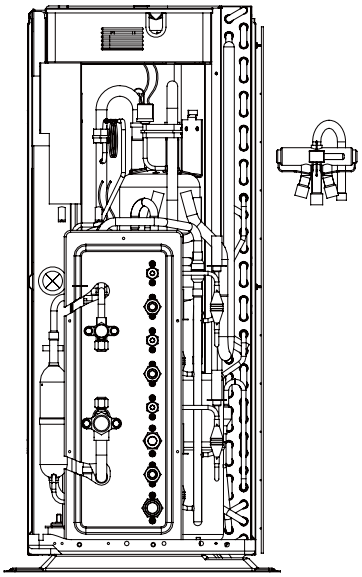
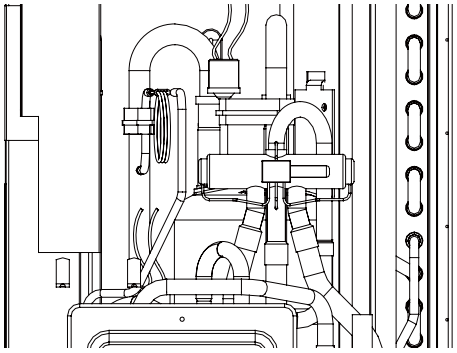
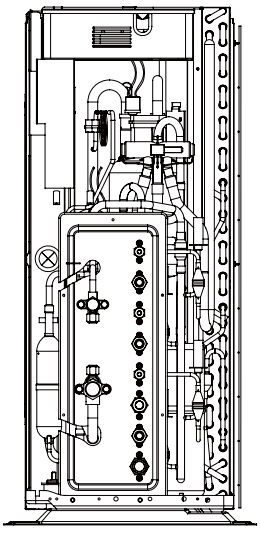
Steps	Procedure
7. Assemble the disassembled main parts as per the reverse disassembly order mentioned above	
Assemble the disassembled main parts as per the reverse disassembly order mentioned above and energize the unit for trial test.	

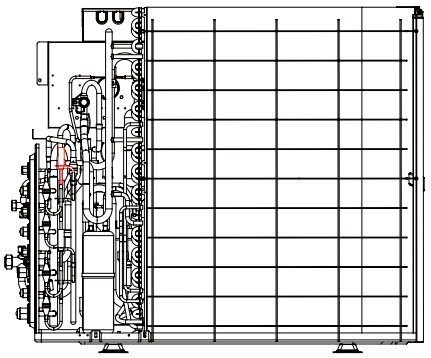
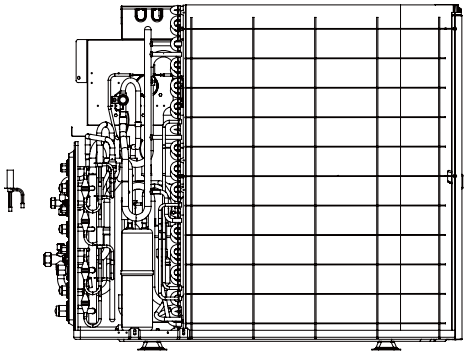
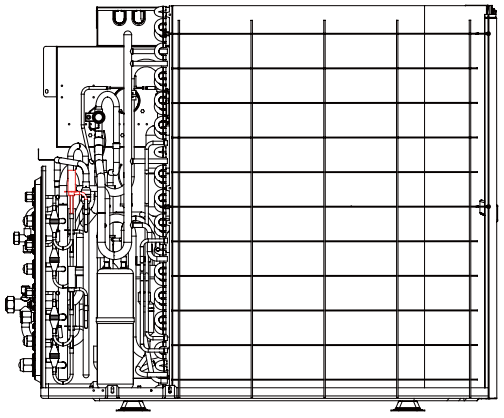
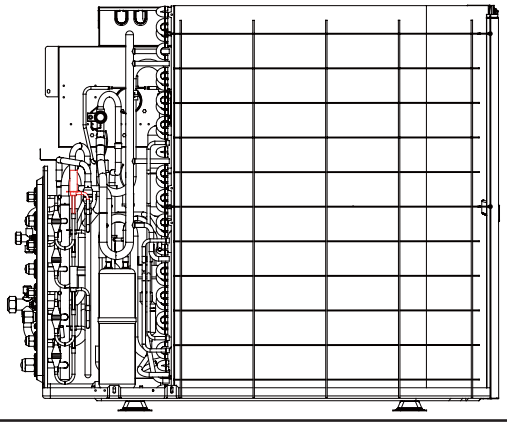
Disassembly and Assembly of Compressor	
Remark: Make sure that there is no refrigerant in pipe system and the power supply is cut off before disassembling the compress or.	
Steps	**Procedure**
1. Disconnect the power cord	 Note the colour of each power cord and also the corresponding terminal
① Remove the fixed screws on the power cord by using a screwdriver. ② Draw out the power cord; Note: Please note the color of each power cord and also the corresponding terminal number when removing the power cord in case of misconnection.	
2. Disassemble the pipeline connected with compressor	
Disconnect the pipeline connected with compressor.	

Steps	Procedure
3. Take down the bad compressor	
① Remove the bolts on the compressor by using a tool. ② Take down the bad compressor from the bottom plate.	
4. Place the new compressor on the bottom plate and connect the suction inlet and discharge outlet with the pipe system	
① Place the compressor on the bottom plate. ② Tighen the nuts by using a tool.	

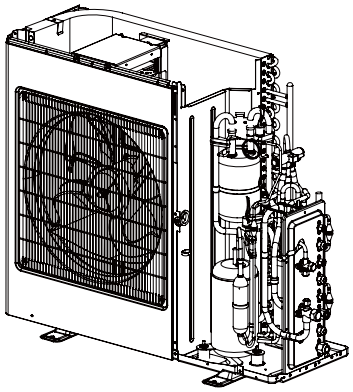
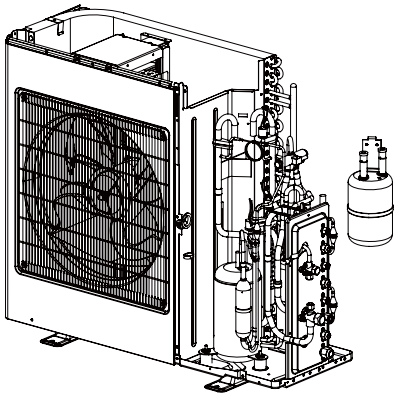
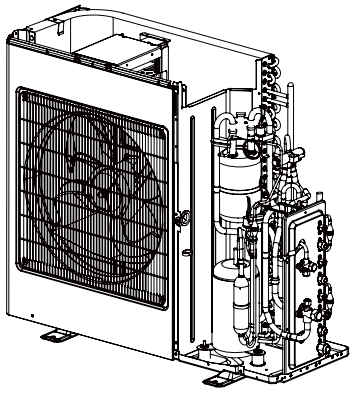
Disassembly and Assembly of 4-way Valve

Steps	Procedure
1. Remove the 4-way valve coil	
① Remove the screws on the fixed coil by using a screwdriver. ② Remove the 4-way valve coil.	

Steps	Procedure
2. Disconnect the 4-way valve and the connected pipe by soldering. Take down the bad 4-way valve.	
Disconnect the 4-way valve and the connected pipe by a welding gun. Take down the bad 4-way valve.	
3. Replace the 4-way valve and reconnect it with the pipeline.	
① Place the new 4-way valve in the right place. ② Rewelding the new 4-way valve with the pipeline.	
4. Install the 4-way valve coil	
① Set the 4-way valve coil soundly. ② Tighten the screws by a screwdriver.	

Disassembly and Assembly of Electronic Expansion Valve	
Steps	**Procedure**
1. Remove the electronic expansion valve coil	
	Remove the electronic expansion valve coil by rotating it until the lock is unfixed.
2. Disconnect the electronic expansion valve and the connected pipe by soldering	
	Disconnect the electronic expansion valve and the connected pipe by a welding gun.
3. Replace the electronic expansion valve	
	Place the new electronic expansion valve in the right place.
4. Reconnect the electronic expansion valve with the pipeline	
	Reconnect the electronic expansion valve with the pipeline by welding.
5. Install the electronic expansion valve coil	
	Set the electronic expansion valve coil on the valve body and adjust the lock to the right place.

Disassembly and Assembly of Vapour Liquid Separator

Steps	Procedure
1. Disconnect the liquid separator and the connected pipeline	
Disconnect the liquid separator and the connected pipeline.	
2. Remove the liquid separator	
① Remove the bolt fixing the liquid separator by a tool. ② Remove the liquid separator from the middle baffle.	
3. Fix the new liquid separator and connect it with the pipeline	
① Fix the new liquid separator on the middle baffle soundly. ② Tighten the bolt by tool and reconnect the new liquid separator with the pipeline by welding.	

For continuous improvement in the products, WILLIS reserves the right to modidy the product specification and appearance in this manual without notice and without incurring any obligations.

Willis Air Conditioning
Add:2105 chemin de la cote de liesse,
Montréal, QC H4N 2M5
Canada.
Tel: 514 735 7147