



Service Manual

Model: EXM18HV1WE
EXM24HV1WE
(Refrigerant:R410A)

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2. Specifications

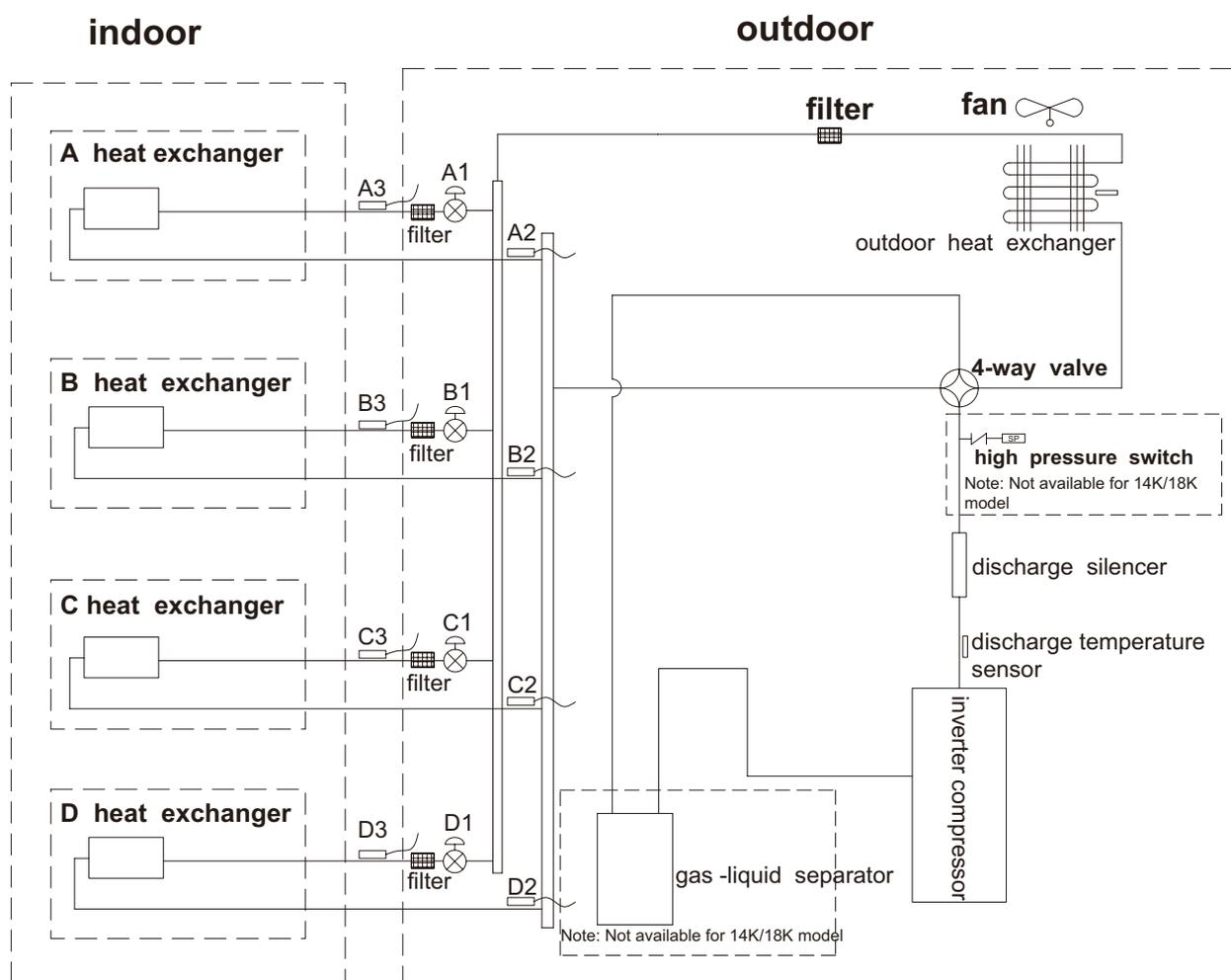
	2013	2013
Model Size	Multi Split Viola 9K+9K	Multi Split Viola 12K+12K
Market	EU	EU
Brand	Electrolux	Electrolux
Gree model	GWHD(18)NK3FO	GWHD(24)NK3FO
Gree product code	CB228W03501	CB228W03301
SYSTEM Number for dev.reference	Outdoor unit	Outdoor unit
Model No.	/	/
INDOOR UNIT MODEL NUMBER	/	/
INDOOR UNIT PNC	/	/
EAN13 CODE	/	/
OUTDOOR UNIT MODEL NUMBER	EXM18HV1WE	EXM24HV1WE
OUTDOOR UNIT PNC	950,006,950	950,006,952
EAN13 CODE	7,332,543,269,785	7,332,543,269,808
Performance:	/	/
Energy Class 2013 (Cooling/Heat pump)	A+/A	A/A
Declared Cooling Capacity (W)	5000	7,000
Actual Cooling Capacity (W)	5,140	7,090
Declared Heating Capacity (W)	5,600	7,700
Actual Heating Capacity (W)	5,700	7,960
Declared Pdh in Average(W)	4,600	5,800
Actual Pdh (W)	4,735	5,937
Tolerance for Capacity in Mass production(MP)	7%	7%
Dehumidification (l/hour)	/	/
Indoor unit setting Temp range (°C)	16-30	16-30
Applicable Ambient Temp in cooling (°C)	18-43	18-43
Applicable Ambient Temp in heating (°C)	-7~+24	-7~+24
Approximately Cool area Sq. M	(12-18)+(12-18)	(16-24)+(16-24)
Declared SEER (W/W)	5.60	5.10
Actual SEER	5.98	5.19
Declared SCOP	3.80	3.8
Actual SCOP	3.86	3.78
Tolerance for SEER/SCOP (MP)	6%	6%
Test standard for Performance	EN14511:2011, EN14825:2012	EN14511:2011, EN14825:2012
Rating Compressor frequency	/	/
Maximum Compressor frequency	/	/
Minimum Compressor frequency	/	/
Electrical:	/	/
Volts/Hertz	220-240V/50Hz	220-240V/50Hz
Amps (Cool)	6.88	10.91
Amps (Heat)	6.88	11.36
Starting Current (A)	5.00	5.00
maximum Current(A)	11.98	20.19
measured Power factor(minimum 0.98)	TBD	TBD
Design pressure H/L(Mpa)	4.3/2.5	4.3/2.5
Number of wires (Outdoor to Indoor)	/	/
Power Cord Gauge Min (mm)	/	/
Power input Watts (Cool) (W)	1,550	2,460
Power input Watts (Heat) (W)	1,550	2,560
Power Cord Supplied	Outdoor	Outdoor
Power Cord Plug	/	/
Connection Wiring (mm)	/	/
Controls system	/	/
Control Panel Location in Indoor unit	/	/
FUSE Type	/	/
Features:	/	/
Memory Function	/	/
Fan Speeds (Cool/Fan/Heat)	/	/

7 fan speed	/	/
Low Voltage Start-up	/	/
1W Standby	/	/
Auto Fan	/	/
Turbo Fan	/	/
Self-diagnose	/	/
Illuminating indoor unit display	/	/
Sleep Mode	/	/
Low Pressure Indicator (Switch)	/	/
Automatic filter check	/	/
24 Hour On/Off Timer	/	/
24 HourTimer ON and Timer OFF	/	/
Air Discharge position on Indoor unit	/	/
Air Direction Control - Horizontal Swin	/	/
Air Direction Control - Vertical Swin	/	/
Filter Type	/	/
Filter Access	/	/
HEPA (Bio) filter	/	/
Active Carbon filter	/	/
Clean Air Ionizer (Ion Generator)	/	/
Cold Plasma	/	/
Silver Ion filter	/	/
Electro-Static dust collector	/	/
Delicate dust filter	/	/
Auto Cleaning(X- FAN)	/	/
8°C heating	/	/
Follow me (I Feel)	/	/
Fresh Air / Exhaust Vent / Closed	/	/
Compressor Heater	/	/
Outdoor unit chassis Heater	/	/
Remote Control holder	/	/
Design and Material	/	/
Indoor unit front design	Viola	Viola
Remote Control Description	Greel	Greel
Front Material	HIPS with Anti-UV	HIPS with Anti-UV
Indoor Color Scheme	Bright white	Bright white
Outdoor unit Color	Grey	Grey
Outdoor unit fan cover	Plastic	Plastic
Cover for connection valves (Outdoor unit)	Yes	Yes
Certifications and Warranty	/	/
Safety Standard	3rd Party EN-reports (EMC, LVD & Standby power)	3rd Party EN-reports (EMC, LVD & Standby power)
Performance Standard	EN14511:2011, EN14825:2012	EN14511:2011, EN14825:2012
Environment Standard	RoHS and RML of Elux	RoHS and RML of Elux
Outdoor Electrical enclosure	IP24	IP24
Warranty	1 year full/5 year sealed system	1 year full/5 year sealed system
Dimensions and Specifications:	/	/
Indoor Sound Pressure Level dB (A)	/	/
Indoor Sound Power Level dB (A)	/	/
Outdoor Sound Pressure Level dB (A)	56	58
Outdoor Sound Power Level dB (A)	63	68
Refrigerant	R410A	R410A
Charge (g)	1400	2000
Liquid Valve/gas Valve dia(mm)	6.35/9.52+6.35/9.52	6.35/9.52+6.35/9.52
Refrigerant piping Liquid side/gas side dia*thickness(mm)	6*0.5/9.52*0.71+6*0.5/9.52*0.71	6*0.5/9.52*0.71+6*0.5/9.52*0.71
Refrigerant piping 100% capacity Length(m)	5	5
Refrigerant piping Max. refrigerant pipe length(m)	20	20
Refrigerant piping Max. Height Difference in level(m)	10	10
Additional Refrigerant(>standard length)(g/m)	15	15
Indoor unit prefilled with Nitrogen	Yes	Yes

Indoor Unit Dimension (W/D/H)(mm)	/	/
Indoor Unit Dimension of Package (W/D/H)(mm)	/	/
Outdoor Unit Dimension (W/D/H)(mm)	955X396X700	980X427X790
Outdoor Unit Dimension of Package (W/D/H)(mm)	1026X455X735	1080X485X840
Indoor Recommended Stack Height	7.00	7.00
Outdoor Recommended Stack Height	4.00	3.00
Stuff Qty of Set (20' GP)	81	44
Stuff Qty of Set (40' GP)	171	96
Stuff Qty of Set (40' HQ)	171	144
Indoor Unit Weight (Kg)		
Indoor Shipping Weight (Kg)		
Outdoor Unit Weight (Kg)	50	63
Outdoor Shipping Weight (Kg)	55	69
Indoor Air Volume (M ³ /Hr)		
Indoor Motor RPM		
Outdoor Motor RPM (High/Low)	630	710
Performance:		
Eco Label Energy Class Cooling/Heating	A+/A	A/A
Declared Pdh (Pdesign) in Heating mode (Average) (W)	4,600	5,800
Declared Pdc (Pdesign) in Cooling mode (W)	5,000	7,000
Back-up heating capacity assumed for calc. SCOP design conditions(Average)	1.50	1.00
Back-up heating capacity assumed for calc. SCOP design conditions(Colder)	/	/
Declared SEER (W/W)(Average)	5.60	5.10
Declared SCOP(W/W)(Average)	3.80	3.80
Declared Pdh (Pdesign) in Heating mode (Colder) (W)	/	/
Declared SCOP(W/W)(Colder)	/	/
Energy Consumption kWh pr. Year (kWh/a), Cooling season	313	481
Energy Consumption kWh pr. Year (kWh/a), Heating season Warm	/	/
Energy Consumption kWh pr. Year (kWh/a), Heating season Average	1,695	2137
Energy Consumption kWh pr. Year (kWh/a), Heating season Cold	/	/
Dimensions and Specifications:	/	/
Specifications:	/	/
Indoor Sound Power Level dB (A) Cooling	55/52/50/47	57/54/51/48
Indoor Sound Power Level dB (A) Heating	/	/
Outdoor Sound Power Level dB (A) Cooling	63	68
Outdoor Sound Power Level dB (A), Heating	/	/
Refrigerant	R410a	R410a
Global Warming Potential, GWP	1975	1975
Note: Declared SEER, SCOP should be rounded to one decimal on energy label		

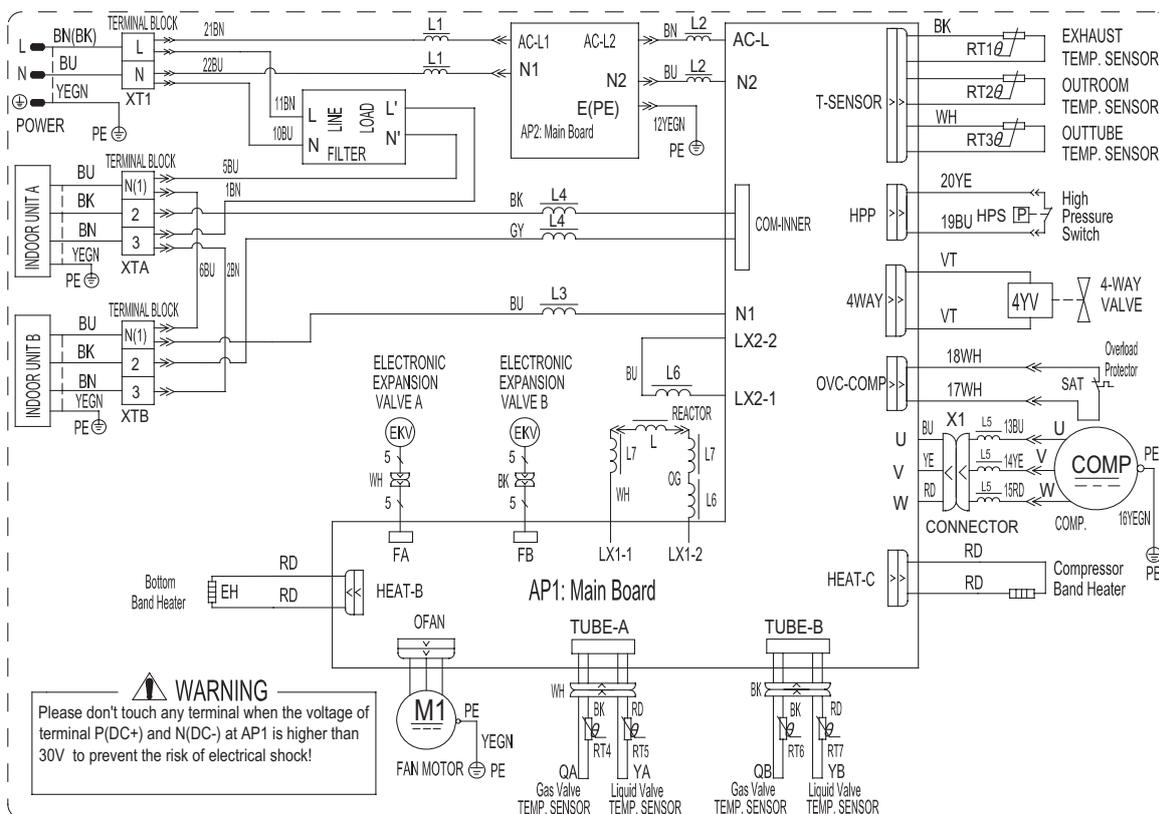
The above data is subject to change without notice. Please refer to the nameplate of the unit.

4. Refrigerant System Diagram



- 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

(2)Model:EXM24HV1WE

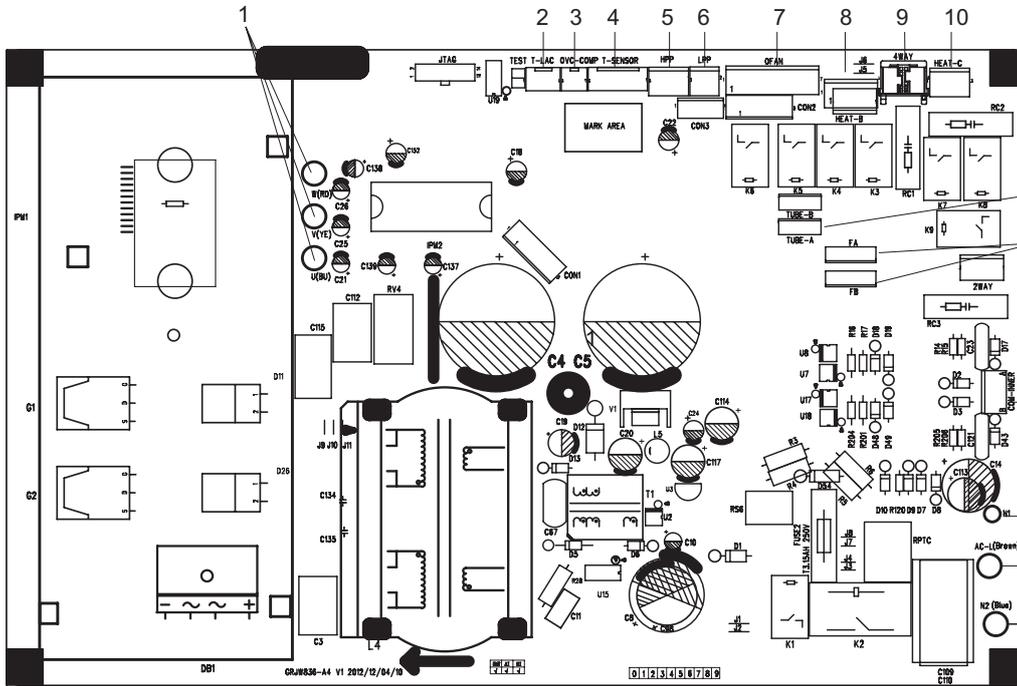


These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

5.2 PCB Printed Diagram

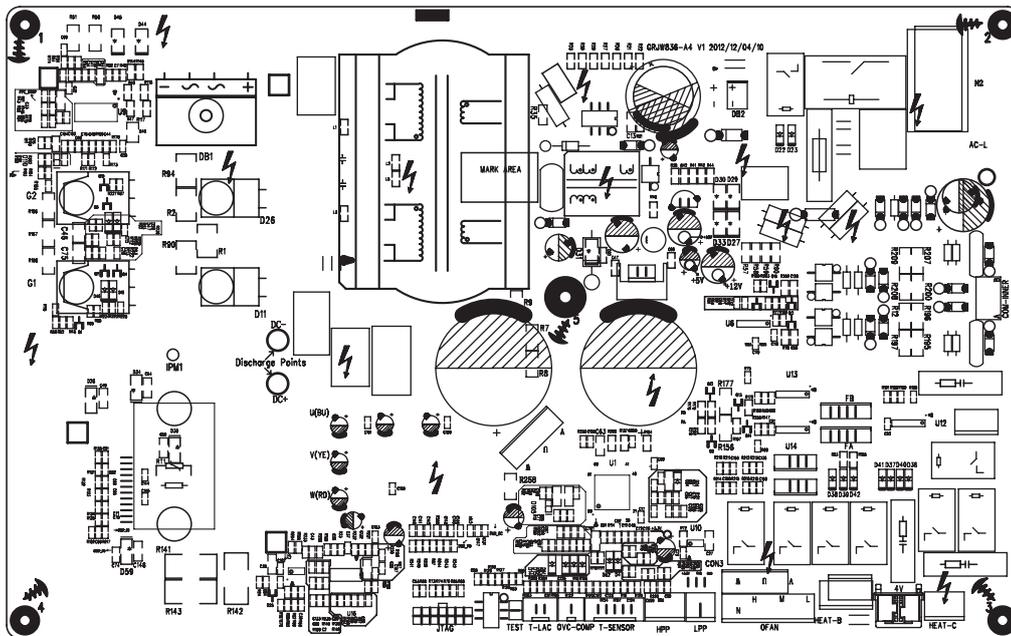
(1) Model: EXM18HV1WE

• TOP VIEW



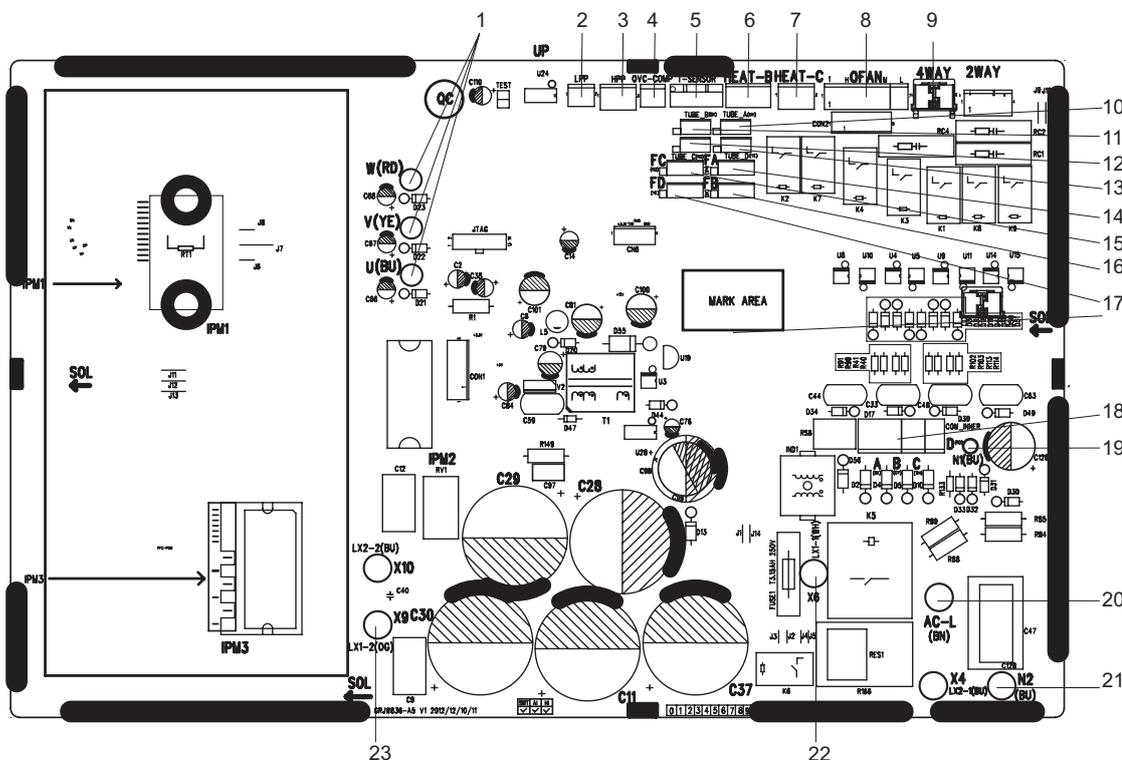
1	Compressor terminal
2	Temperature sensor terminal of low-temperature cooling
3	Overload protection terminal of compressor
4	Temperature sensor terminal of outdoor unit
5	High-pressure protection terminal
6	Low-pressure protection terminal
7	Outdoor fan terminal
8	Electric hating belt terminal of chassis
9	4-way valve terminal
10	Electric heating belt terminal of compressor
11	Temperature sensor wire terminal for gas valve and liquid valve
12	Terminal of electronic expansion valve
13	Communication wire terminal for indoor unit and outdoor unit
14	Terminal of neutral wire for communication
15	Terminal of live wire
16	Terminal of neutral wire

• BOTTOM VIEW



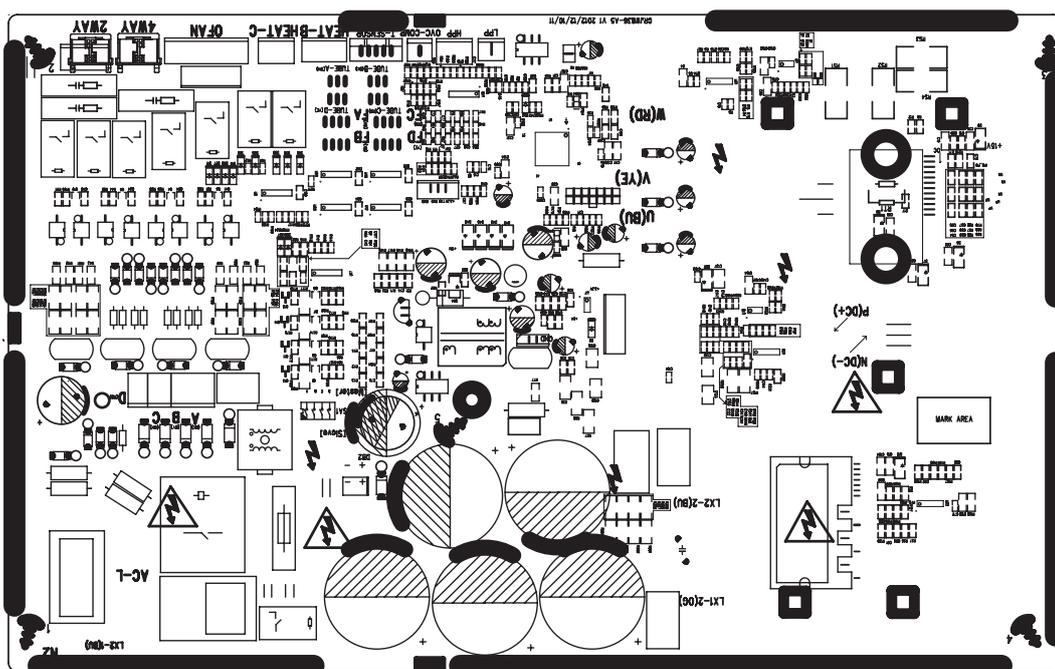
(2)Models:EXM24HV1WE

• TOP VIEW



1	Compressor terminal
2	Temperature sensor terminal of low-temperature cooling
3	Overload protection terminal of compressor
4	Overload protection terminal of compressor
5	Terminal sensor terminal of outdoor unit
6	Electric heating terminal of chassis
7	Electric heating terminal of compressor
8	Outdoor fan terminal
9	4-way valve terminal
10	Temperature sensor of gas valve and liquid valve for unit A
11	Temperature sensor of gas valve and liquid valve for unit B
12	Temperature sensor of gas valve and liquid valve for unit C
13	Temperature sensor of gas valve and liquid valve for unit D
14	Electronic expansion valve for unit A
15	Electronic expansion valve for unit C
16	Electronic expansion valve for unit B
17	Electronic expansion valve for unit D
18	Communication wire connected with indoor unit
19	Neutral wire of communication
20	Live wire
21	Neutral wire
22	Reactor 1
23	Reactor 2

• BOTTOM VIEW



6. Function and Control

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 °C;

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

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

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

1.3 Heating Mode

1.3.1 Cooling conditions and process:

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

1.3.2 Stop in heating operation:

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

1.3.2.2 Some of the indoor units reach the stop condition

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

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

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

1.3.3 Outdoor fan control in heating mode

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

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

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

1.3.4 Defrosting function

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

1.3.5 Oil-returned control in heating mode

1.3.5.1 Oil-returned condition

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

1.3.5.2 Oil-returned process in heating mode

The indoor unit displays "H1"

1.3.5.3 Oil-returned finished condition in heating mode

The duration reaches 5min

1.4 Fan Mode

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

2. Protection Function

2.1 Mode Conflict Protection of indoor unit

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

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

2.2 Overload protection function

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

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

2.3 Discharge Protection Function

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

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

2.4 Communication malfunction

Detection of the quantity of installed indoor units:

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

2.5 Overcurrent Protection

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

2.6 Compressor high-pressure protection

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

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

2.7 Compressor overload protection

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

2.8 Compressor Phase-lacking Protection

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

2.9 IPM Protection

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

2.9.2 IMP module overheating protection

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

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

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

Part II : Installation and Maintenance

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

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



Warnings

Electrical Safety Precautions:

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

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

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

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

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

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

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

Installation Safety Precautions:

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

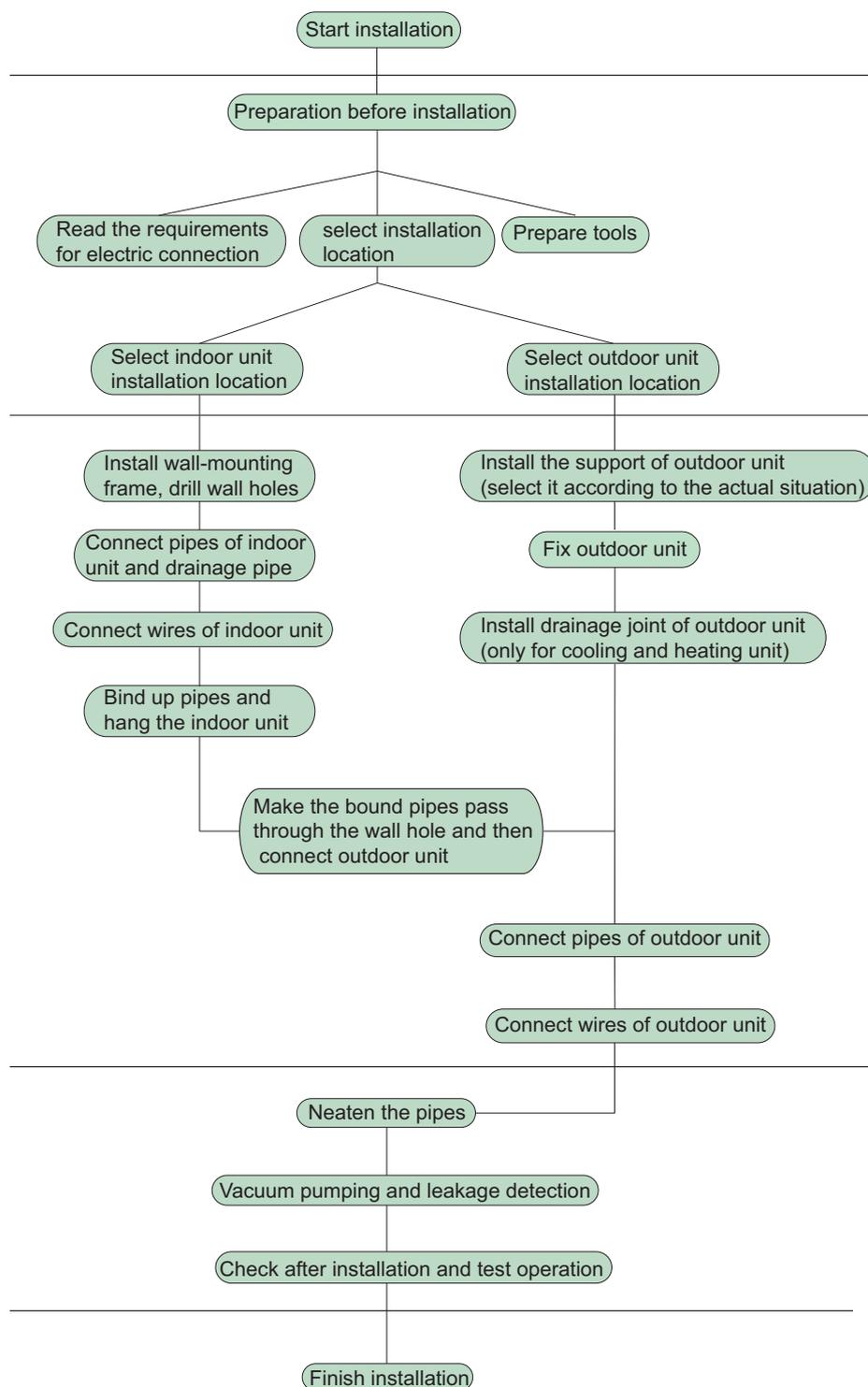
Refrigerant Safety Precautions:

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

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

8. Installation Manual

Installation procedures



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

8.1 Electrical Connections

Models: EXM18HV1WE EXM24HV1WE

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

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

Air-conditioner	Air switch capacity
EXM18HV1WE	25A
EXM24HV1WE	32A

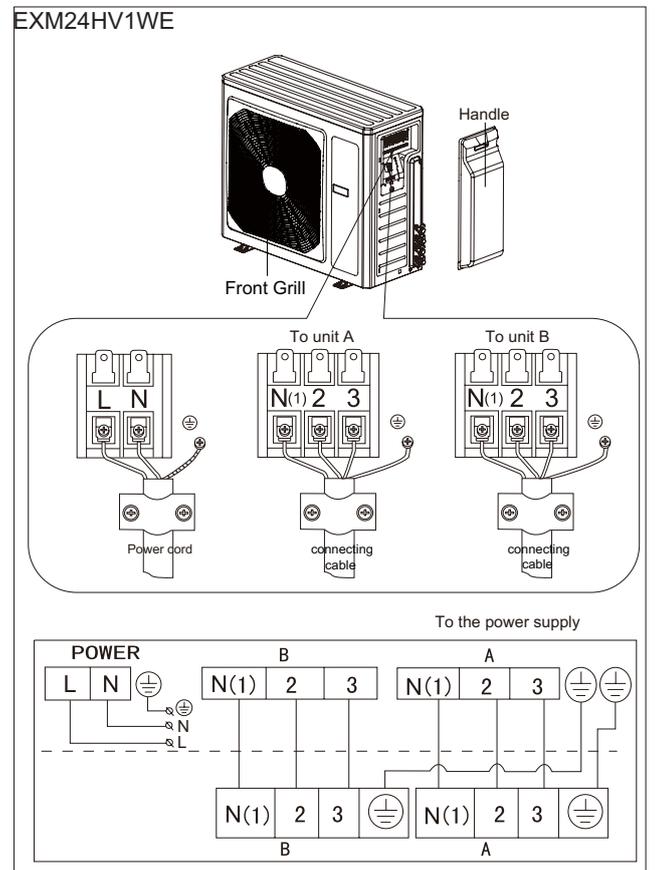
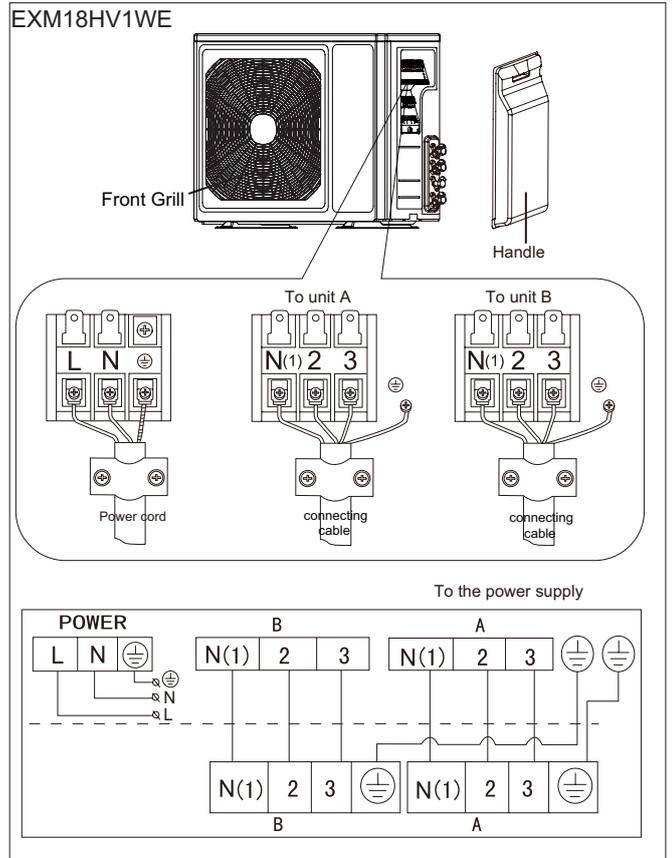
! An all-pole disconnection switch having a contact separation of at least 3mm in all pole should be connected in fixed wiring.

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

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

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

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



8.2 Installing the Outdoor Unit

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

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

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

Models(m)	EXM18HV1WE	EXM24HV1WE
Max. connection pipe length	20	20
Max. connection pipe length(Simple one indoor unit)	10	10

⚠

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

⚠ Wrap all the refrigerant pipes and joints.

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

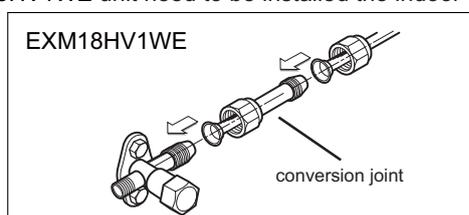
Caution: Installation Must be Performed in Accordance with the NEC/CEC by Authorized Personnel Only.

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

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

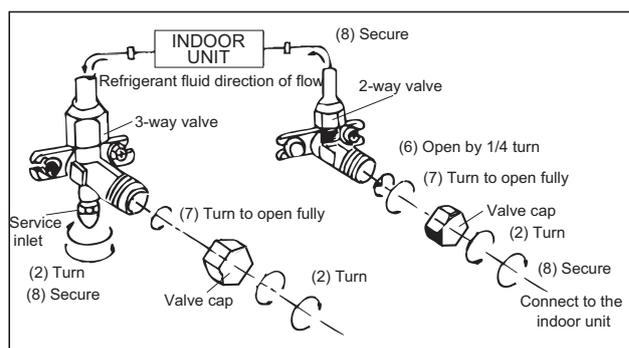
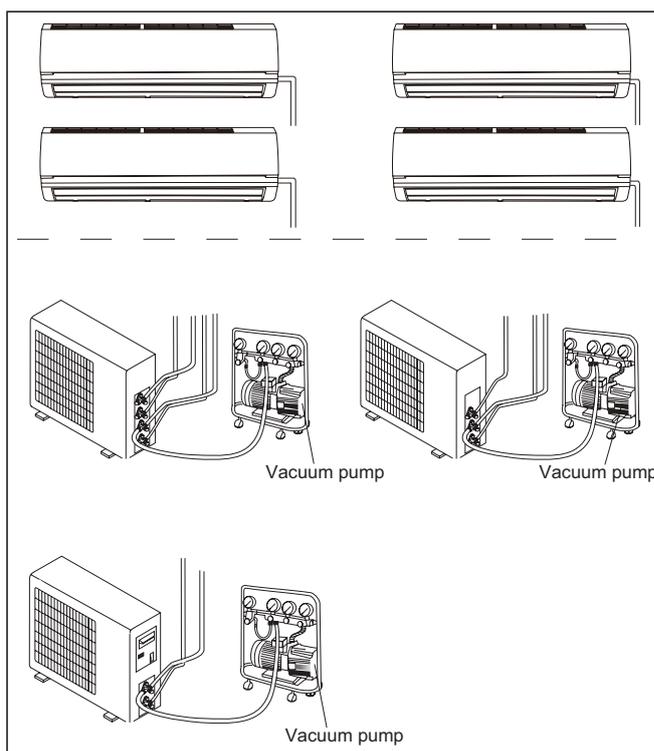
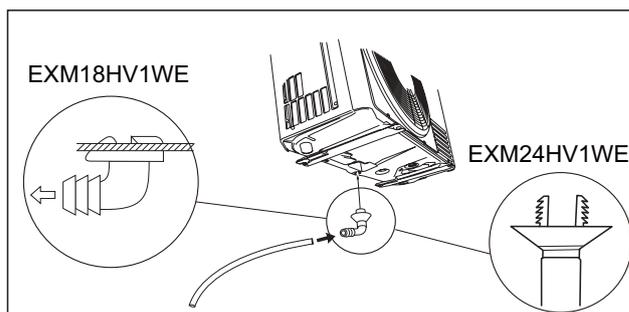
Diameter (mm)	Twisting moment (N.m)
Φ6	15-20
Φ9.52	35-40
Φ16	60-65
Φ12	45-50
Φ19	70-75

EXM18HV1WE unit need to be installed the indoor unit



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

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



8.4 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.

9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

1. Requirement of malfunction display

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

2. Malfunction display method

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

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

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

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

3. Malfunction display control

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

4. Viewing malfunction code through remote controller

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

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

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

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

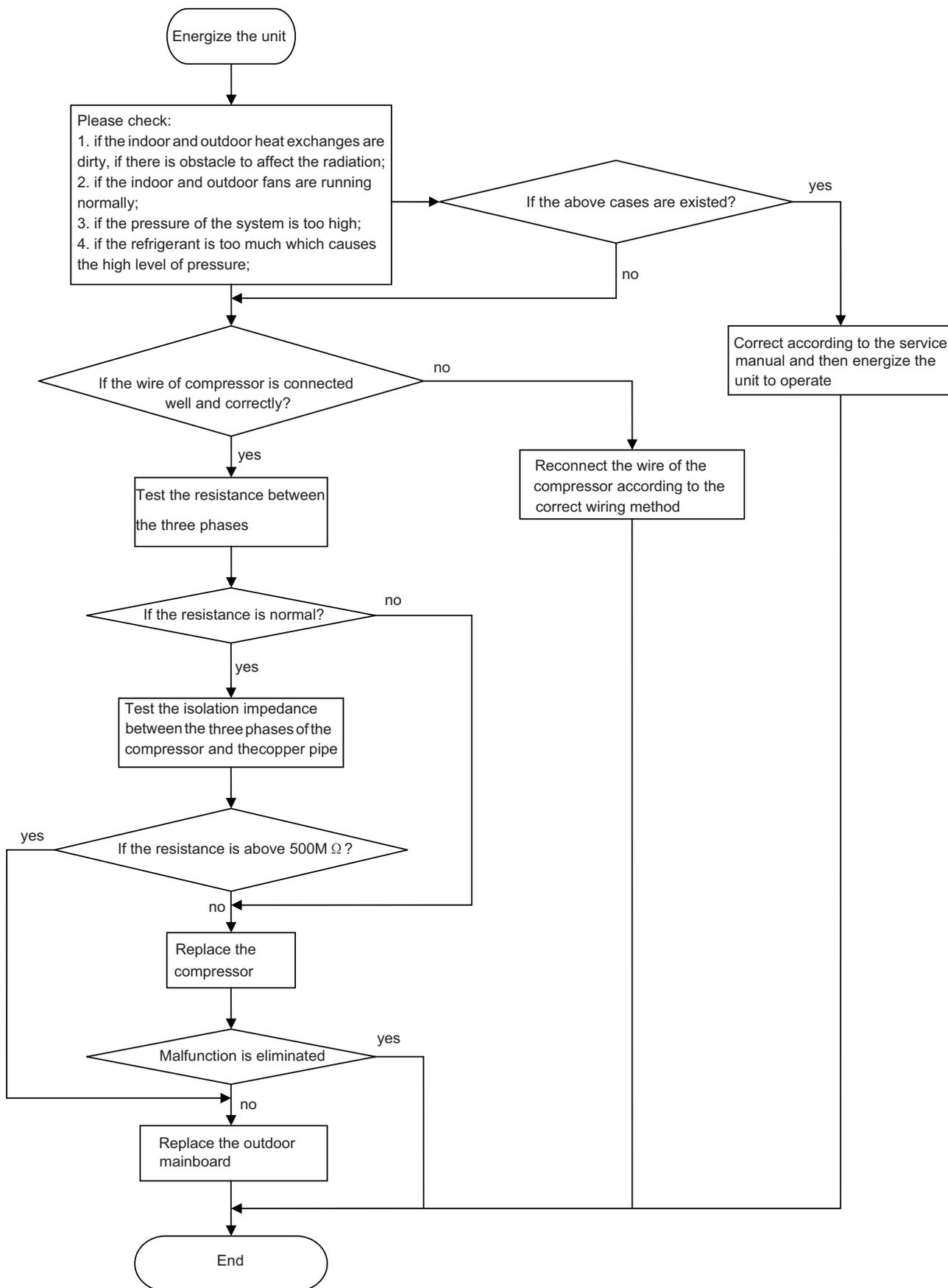
9.3 Malfunction Checking and Elimination

1 IPM protection malfunction:

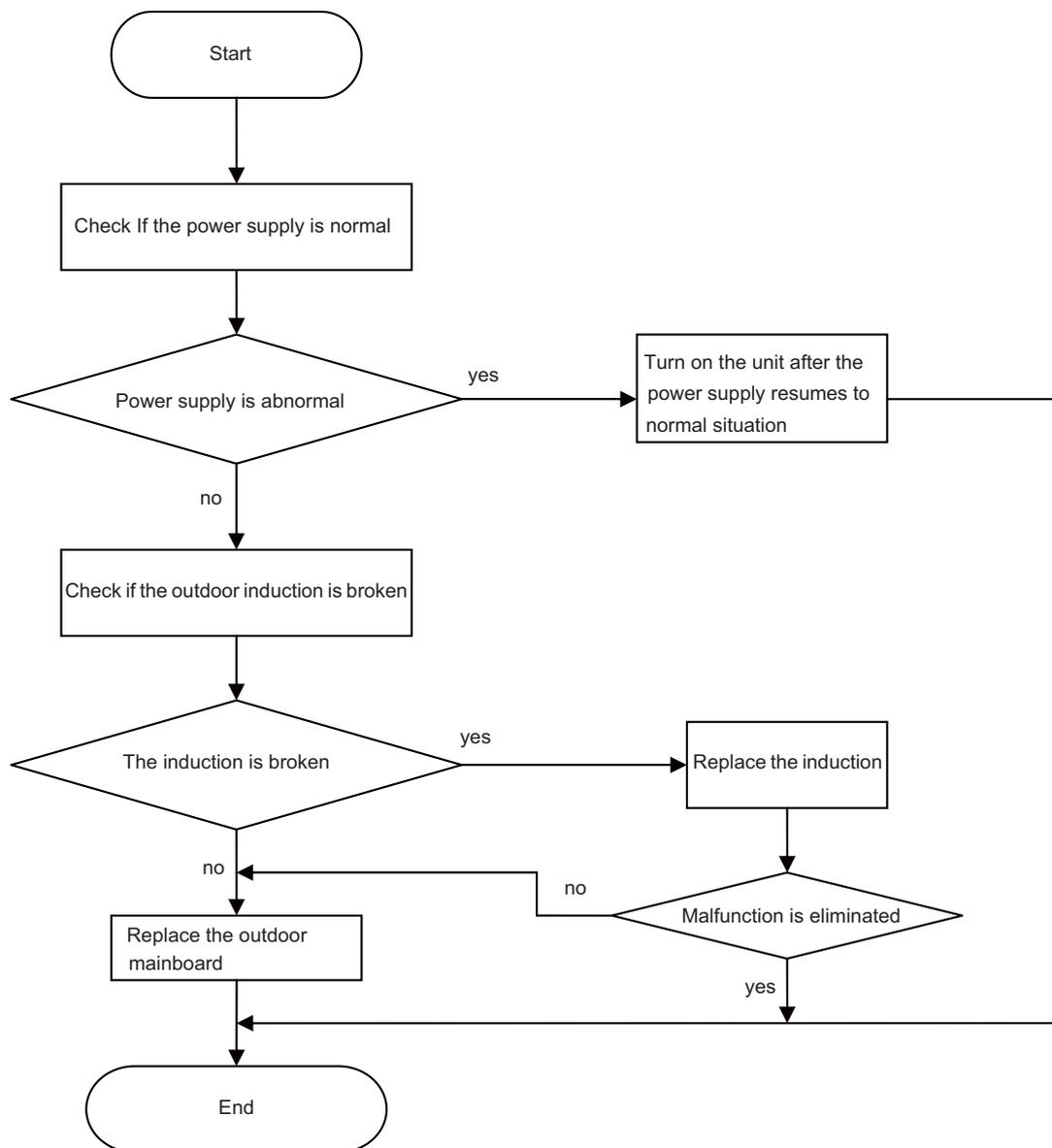
Main checking point:

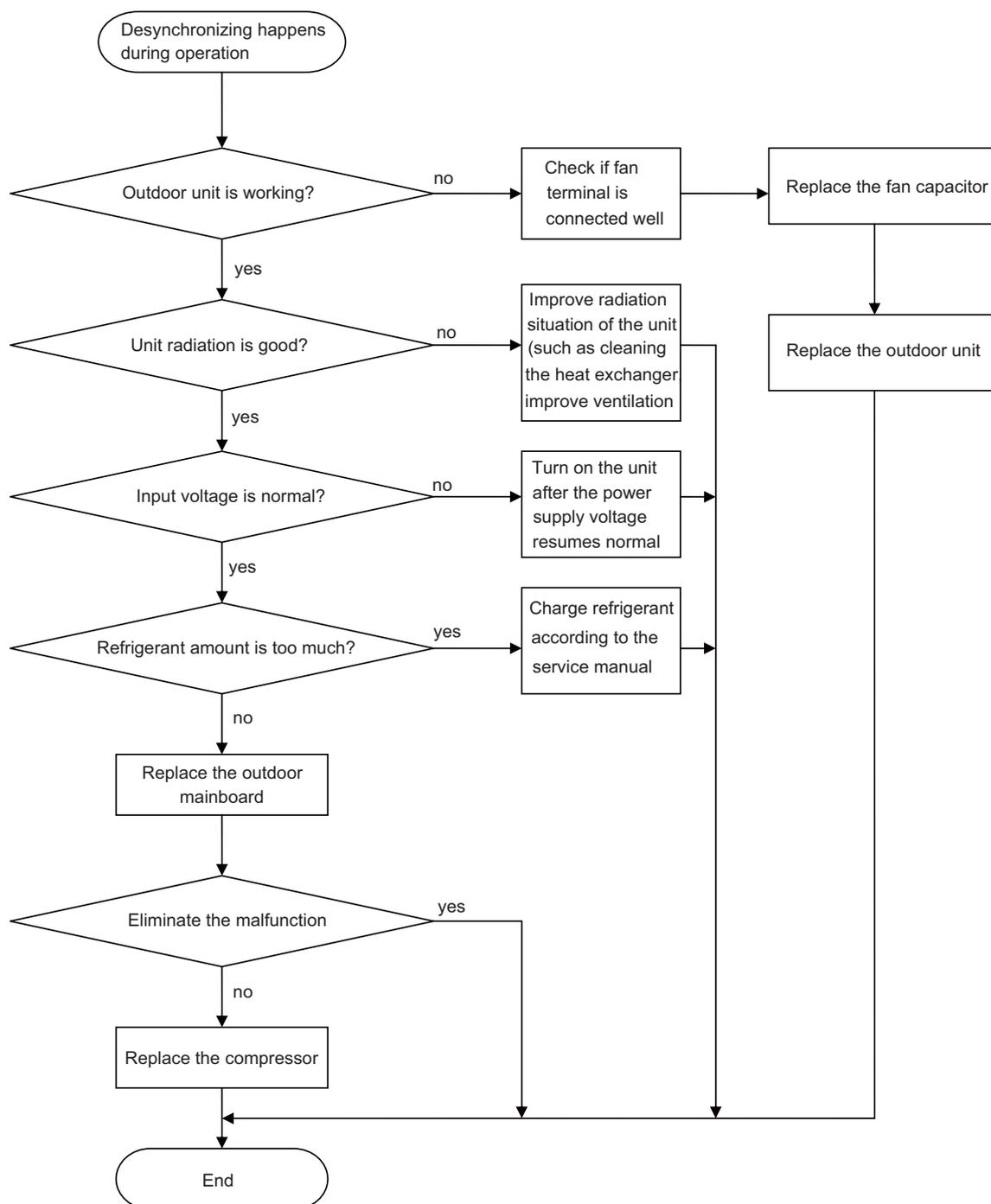
- If the input voltage of the unit is within normal range?
- If the connection wire of compressor is connected well? Is it loose? If the connection sequence is correct?
- If the resistance of compressor coil is normal? If the isolation of compressor coil with copper pipe is good?
- If the unit is overloaded?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

Flow chart:



For EXM24HV1WE



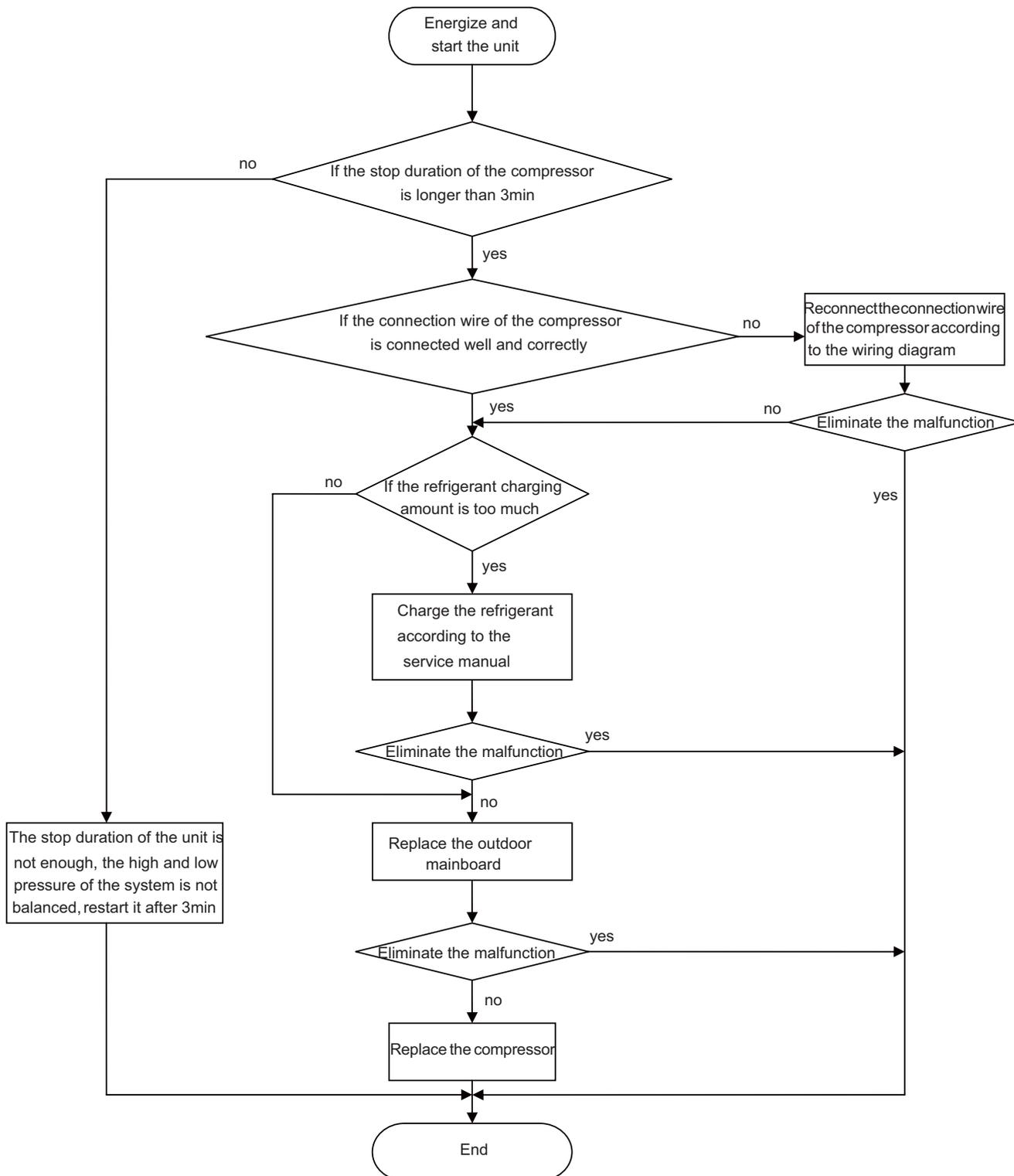


5. Start failure malfunction

Main checking points:

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

Flow chart:

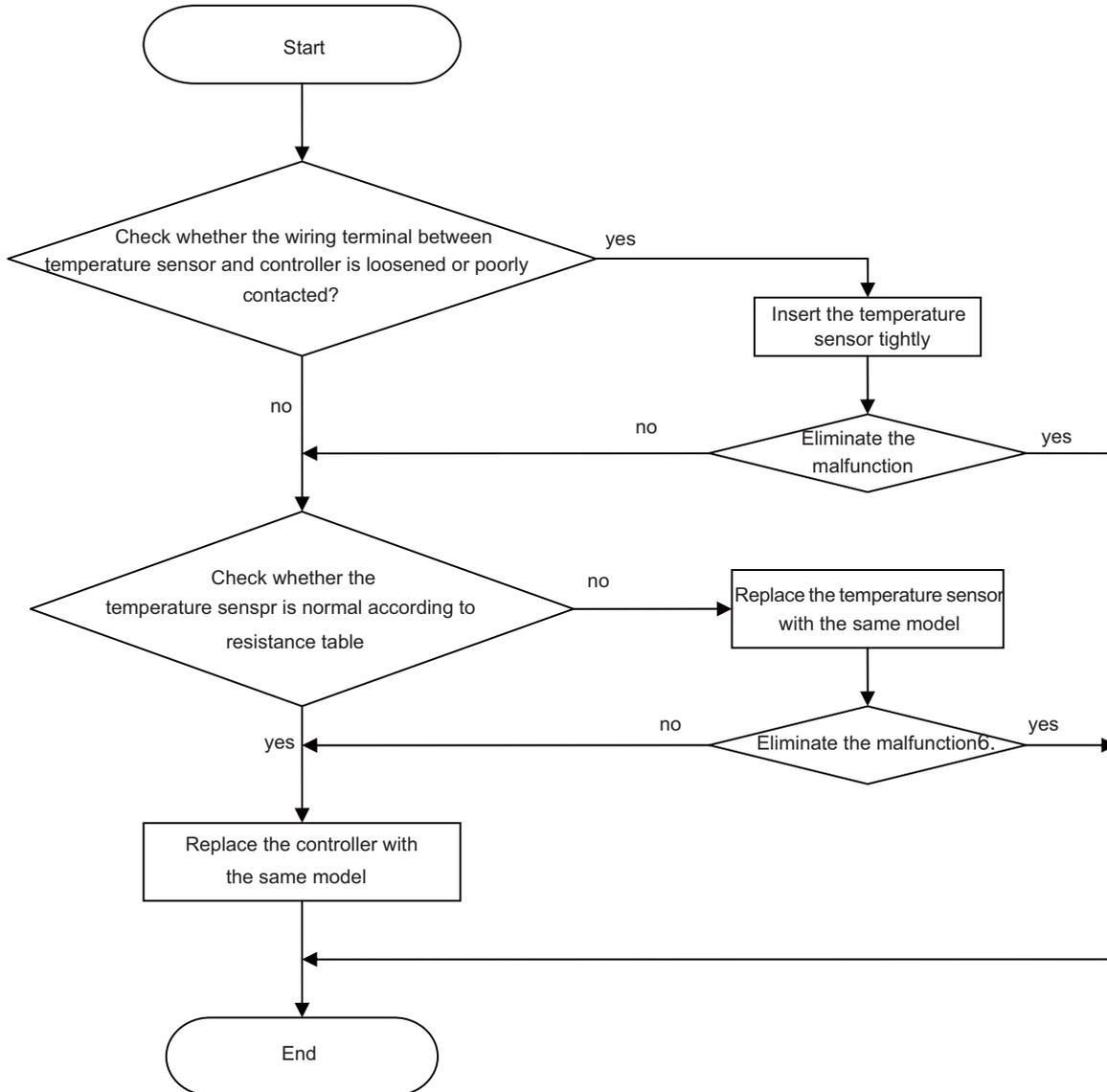


6. Temperature sensor malfunction

Main checking points:

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

Flow chart:

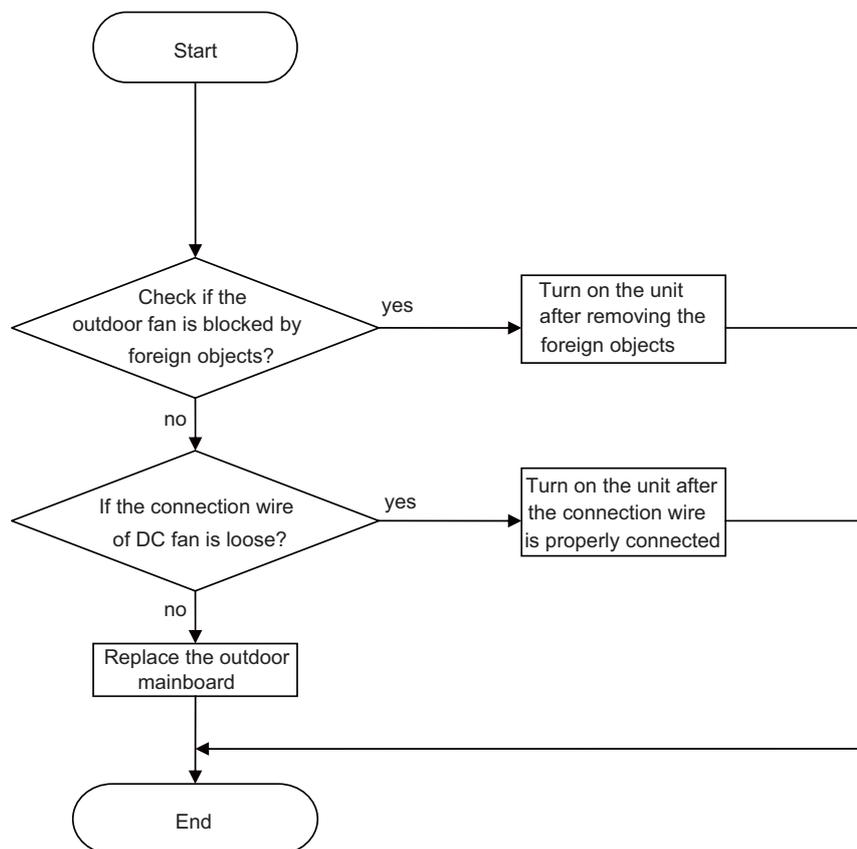


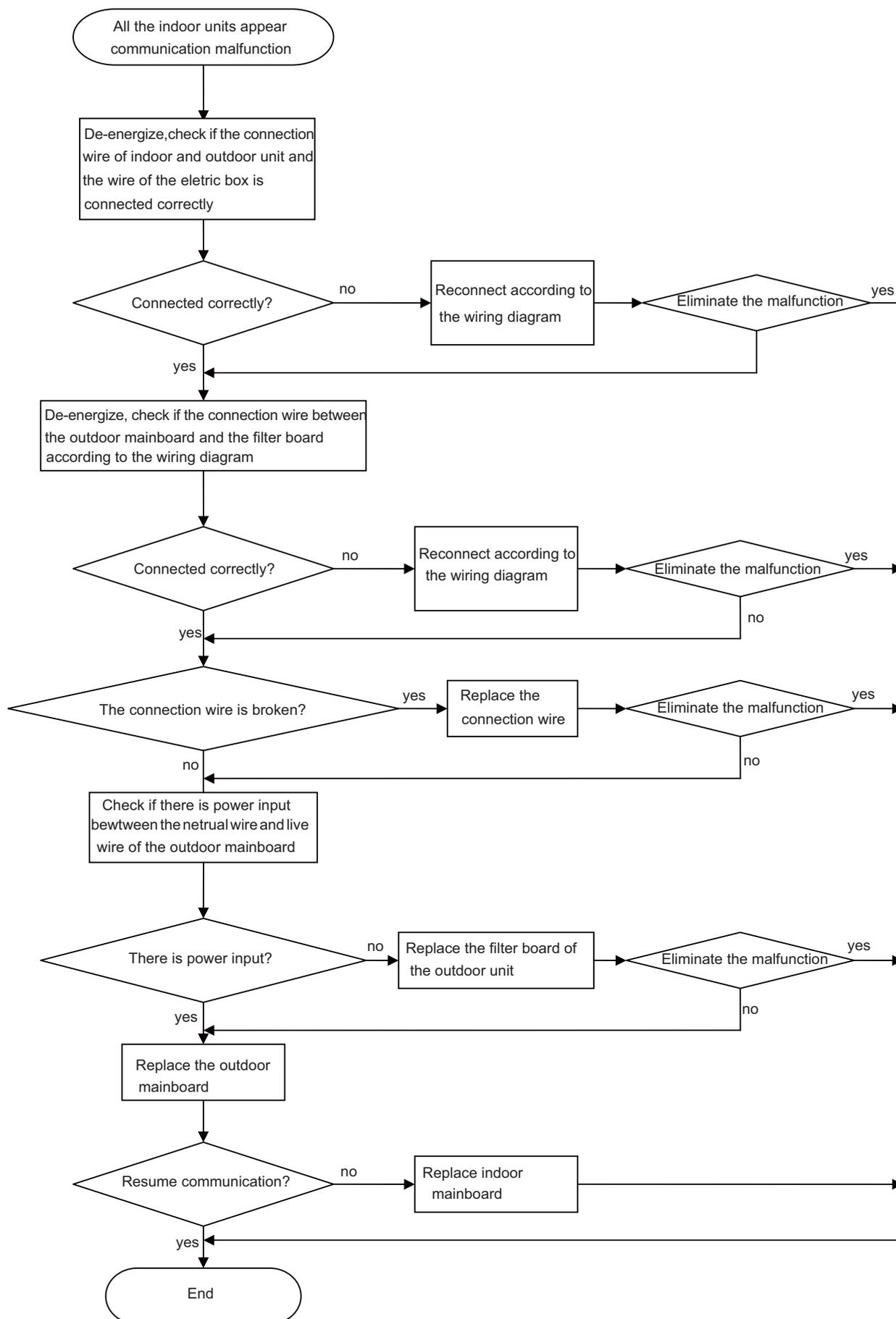
7. DC fan malfunction

Main checking points:

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

Flow chart:





9.4 Maintenance Method for Normal Malfunction

1. Air Conditioner Can't be Started Up

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

2. Poor Cooling (Heating) for Air Conditioner

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

3. Horizontal Louver Can't Swing

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

4. ODU Fan Motor Can't Operate

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

5. Compressor Can't Operate

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

6. Air Conditioner is Leaking

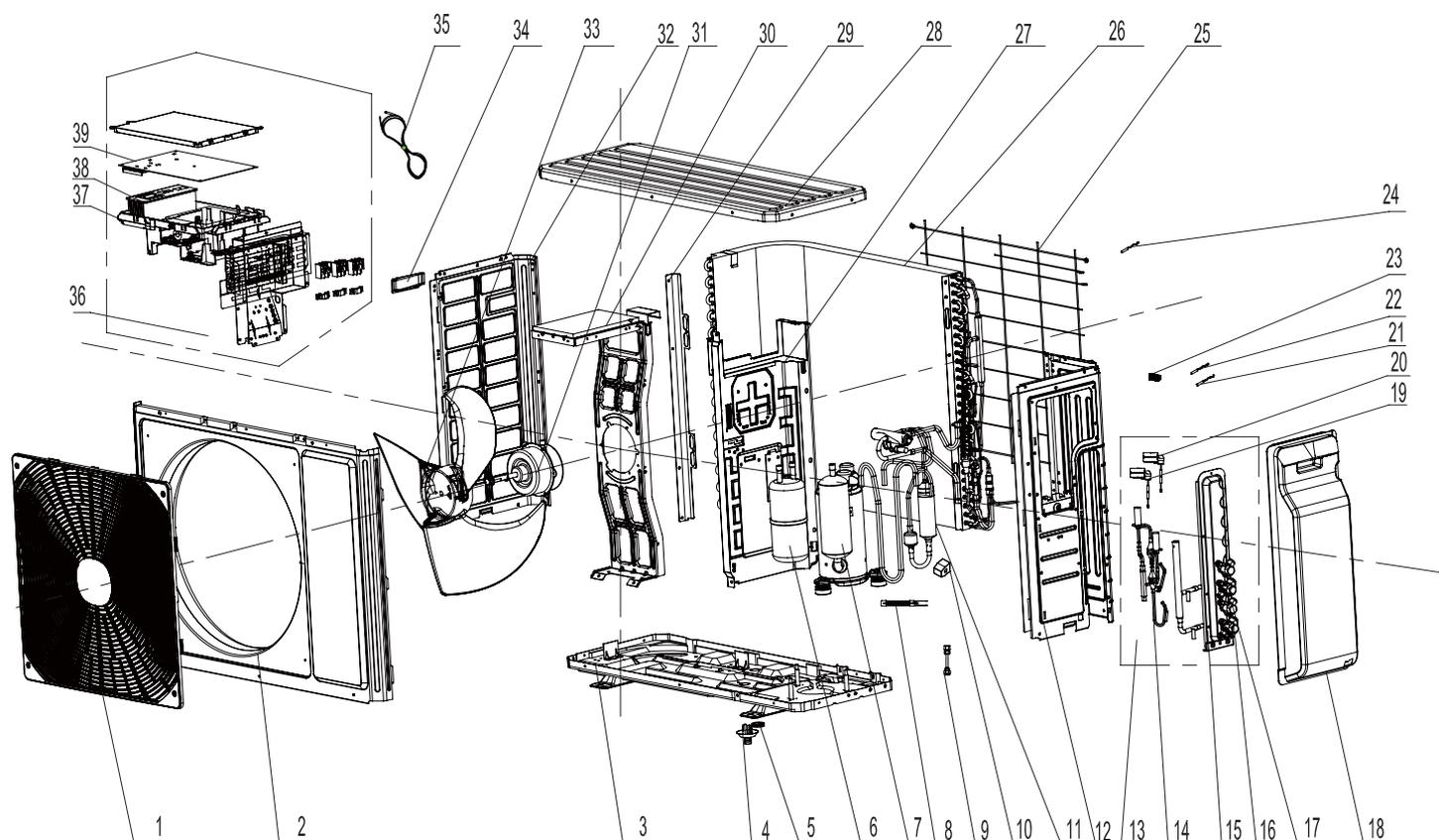
Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Drain pipe is blocked	Water leaking from indoor unit	Eliminate the foreign objects inside the drain pipe
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	Water leaking from the pipe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

7. Abnormal Sound and Vibration

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

10. Exploded View and Parts List

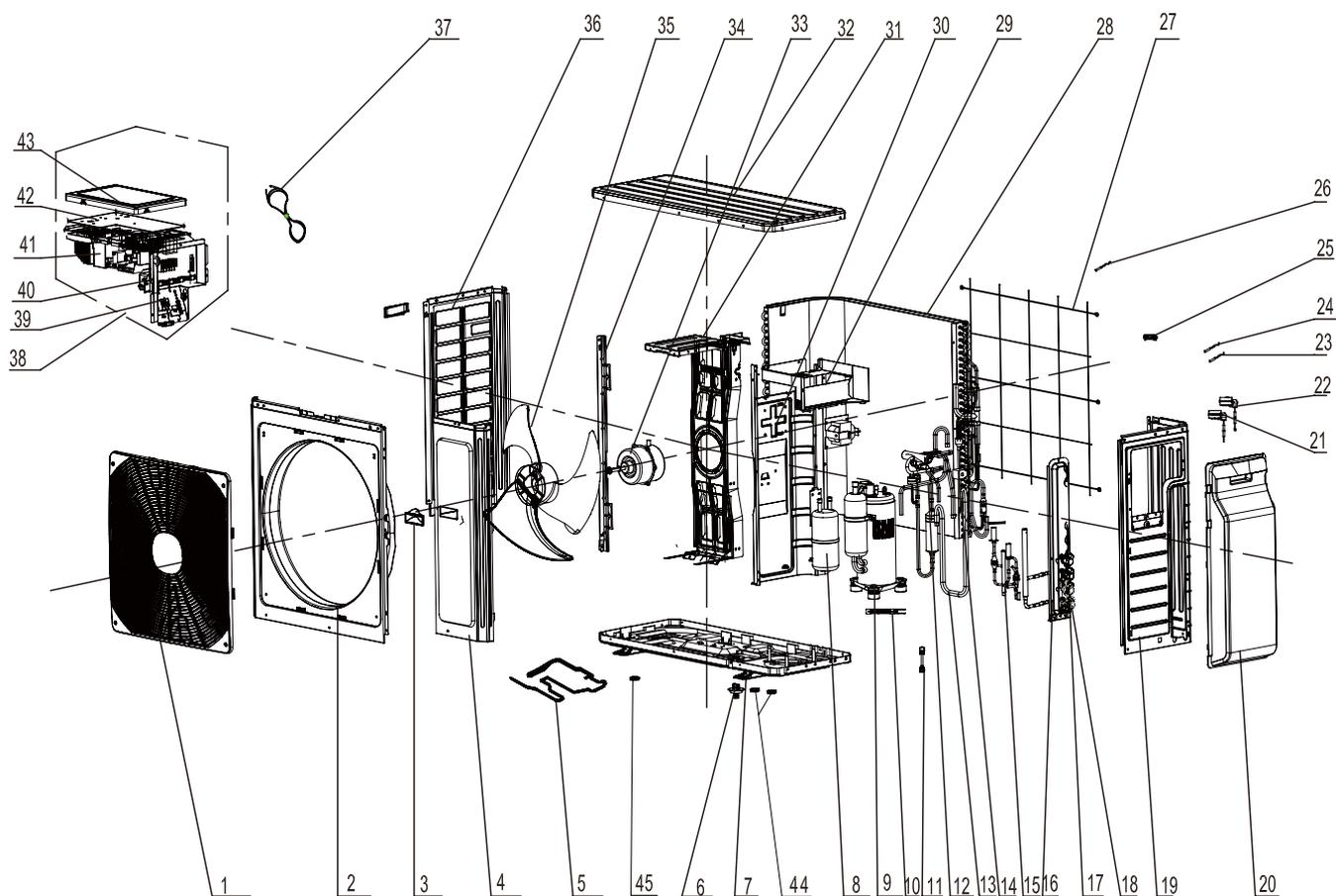
(1) Model:EXM18HV1WE



NO.	Description	Part Code	Qty
		EXM18HV1WE	
	Product Code	CB228W03501_K97386	
1	Front Grill	22413033	1
2	Front Panel	01535013P	1
3	Chassis Sub-assy	02803263P	1
4	Drainage Connector	06123401	1
5	Drainage hole Cap	06813401	3
6	Gas-liquid Separator Assy	07225017	1
7	Compressor and Fittings	00105249G	1
8	Electric Heater(Compressor)	32003001	1
9	Tube Connector Sub-assy	/	0
10	Magnet Coil	4300040033	1
11	4-Way Valve Assy	03073156	1
12	Right Side Plate	01303268P	1
13	Valve Support Assy	07133845	1
14	Electronic Expansion Valve assy	07133846	1
15	Valve Support Sub-Assy	0171312802P	1
16	Cut off Valve	071302391	1
17	Cut off Valve	07130239	1
18	Valve Cover	20123029	1
19	Electric Expand Valve Fitting	43000084	1
20	Electric Expand Valve Fitting	4300008401	1
21	Temperature Sensor	39000073	1
22	Temperature Sensor	3900007301	1
23	Wiring Clamp	26115004	1
24	Temperature Sensor	3900030901	1
25	Rear Grill	01473043	1
26	Condenser Assy	01163938	1
27	Clapboard Assy	0123315301	1
28	Coping	01255005P	1
29	Supporting Board(Condenser)	01795010	1
30	Motor Support Sub-Assy	01705036	1
31	Fan Motor	1501506402	1
32	Left Side Plate	01305093P	1
33	Axial Flow Fan	10335008	1
34	Left Handle	26235401	1
35	Connecting Cable	4002054026	0
36	Electric Box Assy	02613683	1
37	Electric Box	20113027	1
38	Radiator	49010252	1
39	Main Board	30148897	1

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(2) Model:EXM24HV1WE



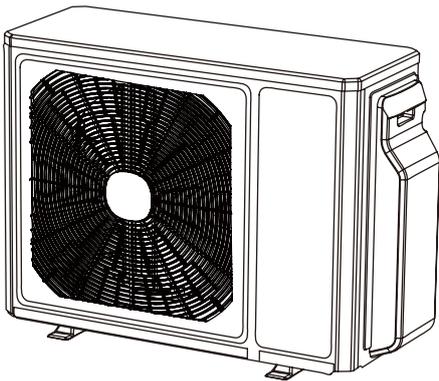
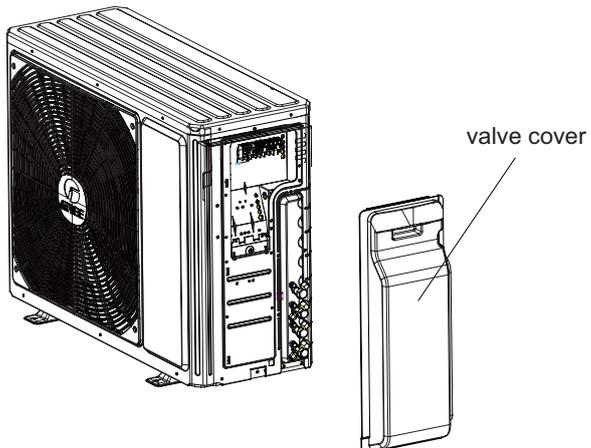
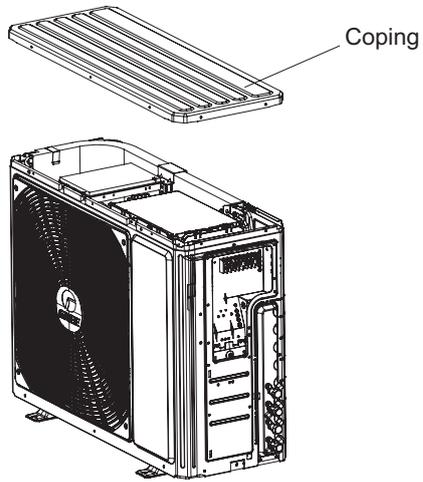
NO.	Description	Part Code	Qty
		EXM24HV1WE	
		Product Code	
		CB228W03301_K97386	
1	Front Grill	22413034	1
2	Cabinet	01435004P	1
3	Left Handle	26235401	2
4	Front Side Plate	01305086P	1
5	Electrical Heater (Chassis)	7651000411	1
6	Drainage Connector	06123401	1
7	Chassis Sub-assy	02803280P	1
8	Gas-liquid Separator Assy	07225017	1
9	Compressor and Fittings	0010524501G	1
10	Electric Heater(Compressor)	7651873215	1
11	Tube Connector Sub-assy	06643008	1
12	4-Way Valve Assy	03073181	1
13	Connection Pipe	05113723	1
14	Magnet Coil	4300040045	1
15	Electronic Expansion Valve assy	0713385802	1
16	Valve Support Assy	0713385702	1
17	Cut off Valve	07130239	1
18	Cut off Valve	071302391	1
19	Right Side Plate	01314100009P	1
20	Valve Cover	26904100012	1
21	Electric Expand Valve Fitting	43000084	1
22	Electric Expand Valve Fitting	4300008401	1
23	Temperature Sensor	3900007304	1
24	Temperature Sensor	3900007305	1
25	Wiring Clamp	26115004	1
26	Temperature Sensor	3900030901	1
27	Rear Grill	01574100003	1
28	Condenser Assy	01163980	1
29	Electric Box (Fireproofing)	01413426	1
30	Clapboard Sub-Assy	01233190	1
31	Motor Support Sub-Assy	01705025	1
32	Coping	01255006P	1
33	Fan Motor	1501403402	1
34	Condenser Support Plate	01175092	1
35	Axial Flow Fan	10335014	1
36	Left Side Plate	01305043P	1
37	Connecting Cable	4002054026	0
38	Electric Box Assy	02613684	1
39	Terminal Board	420111041	2
40	Connection Support	01703211	1
41	Electric Box	20113015	1
42	Main Board	30148903	1
43	Electric Box Cover Sub-Assy	02603217	1
44	Drainage hole Cap	7671301802	2
45	Drainage hole Cap	681340101	1

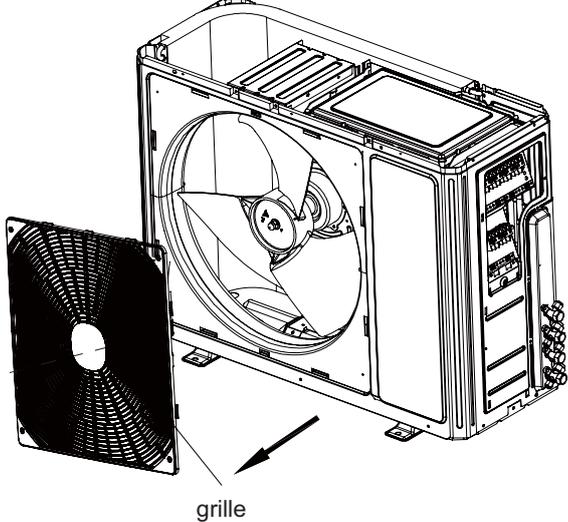
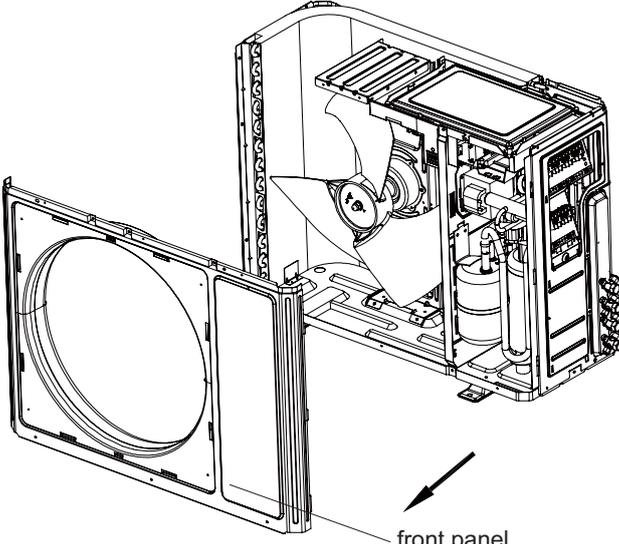
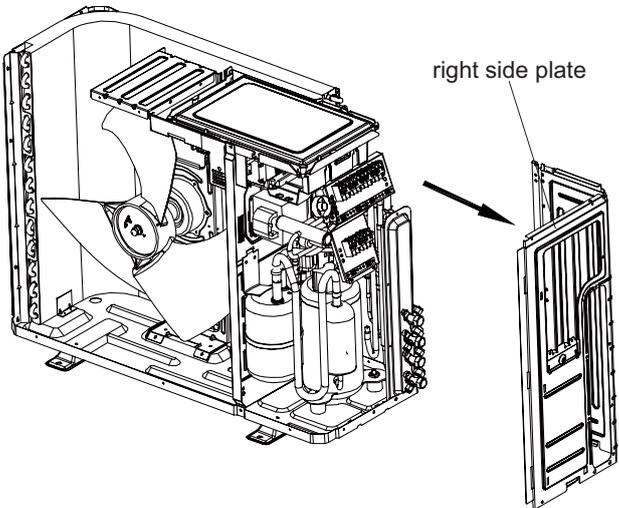
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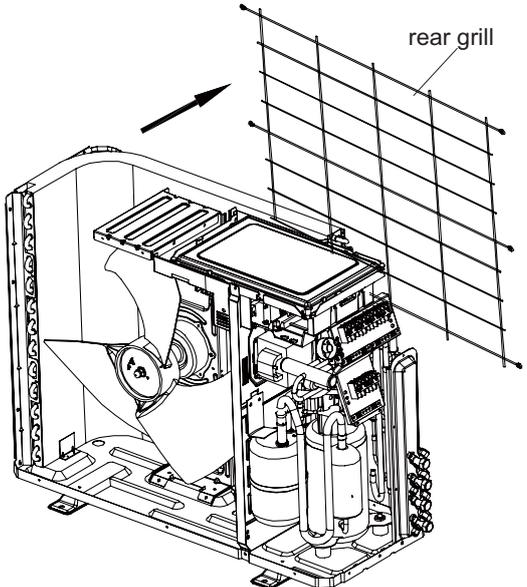
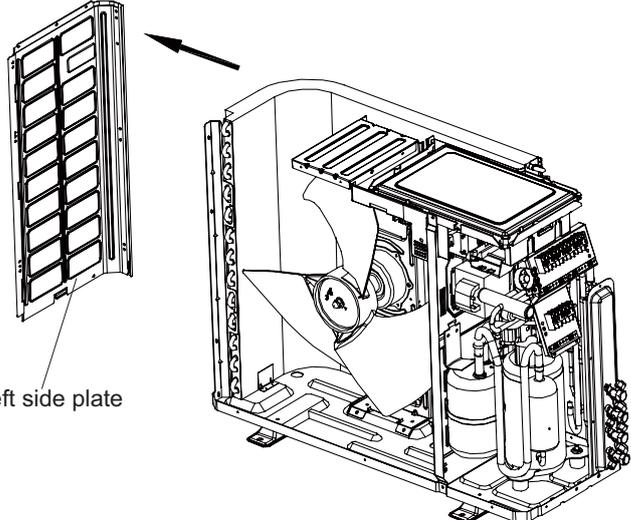
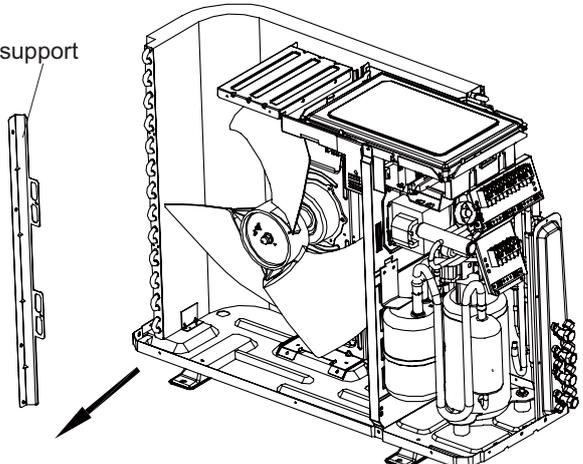
11. Removal Procedure

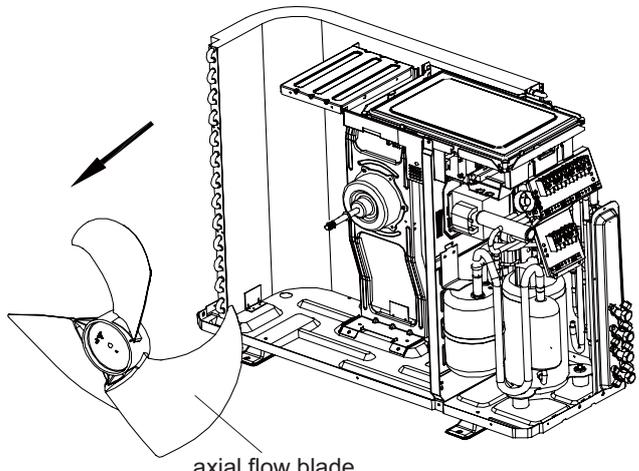
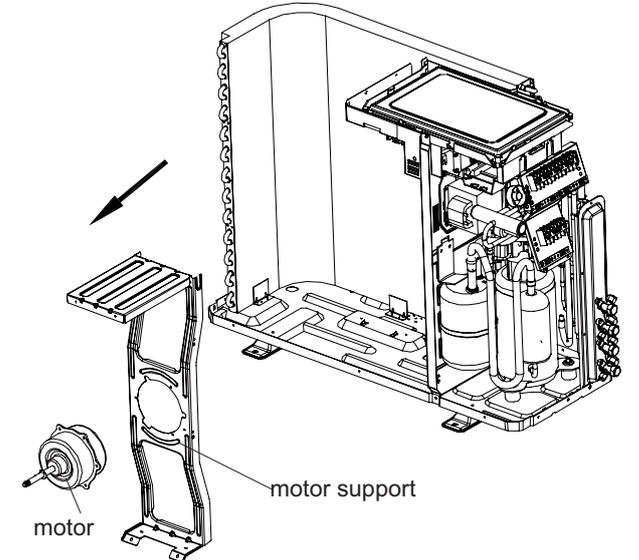
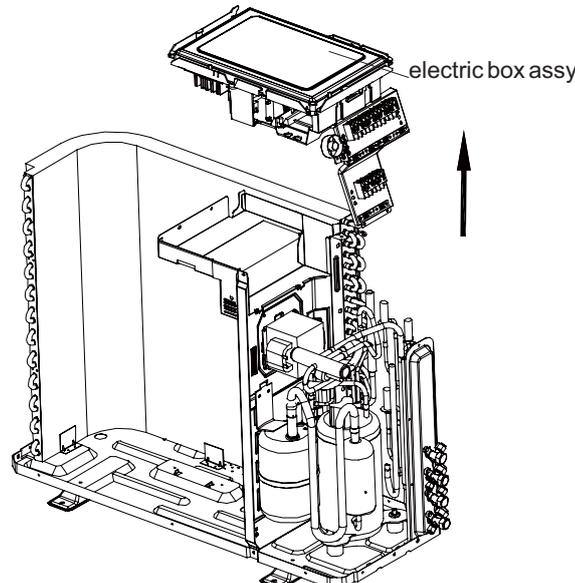
 Warning: Be sure to wait for a minimum of 20 minutes after turning off all power supplies and discharge the refrigerant completely before removal.

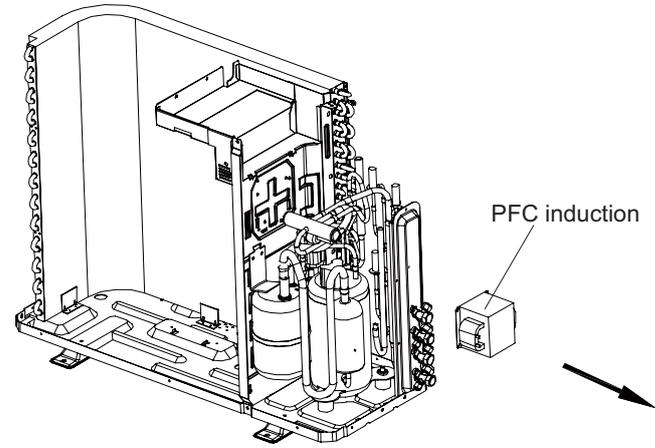
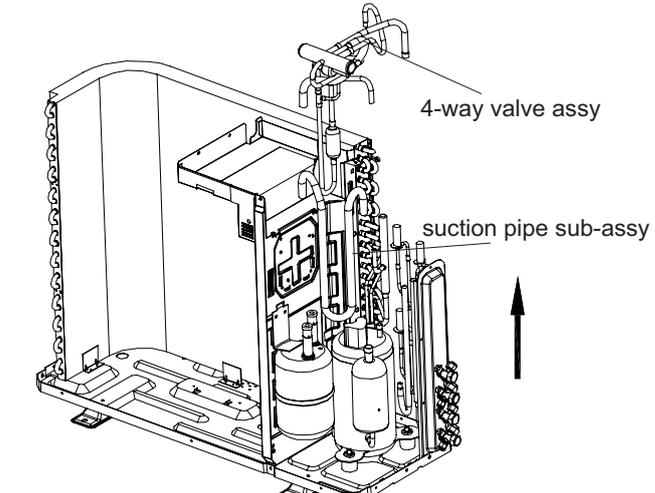
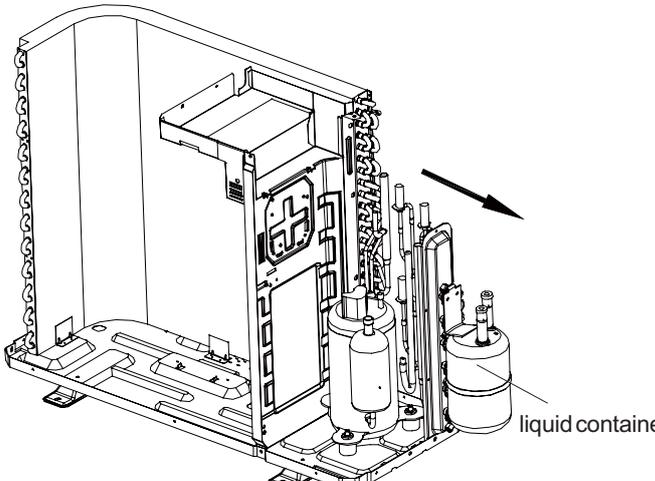
(1) Model: EXM18HV1WE

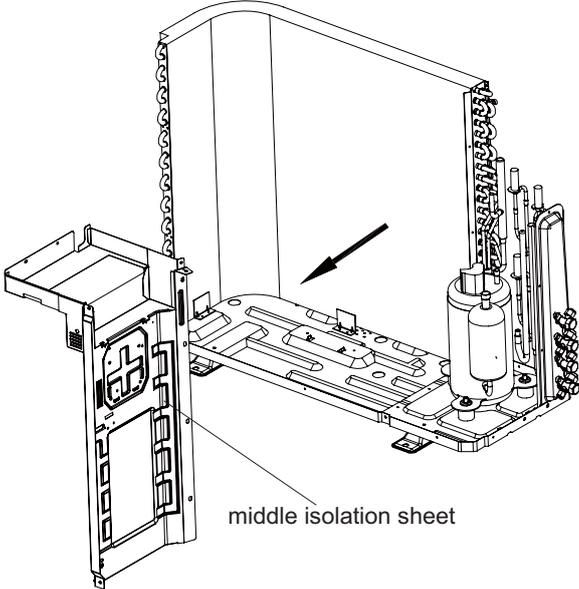
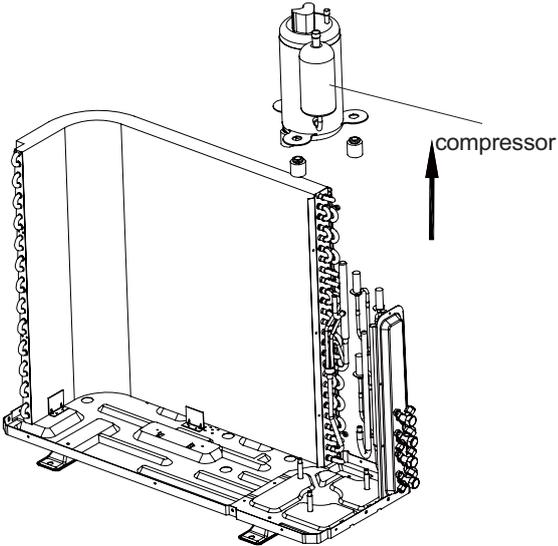
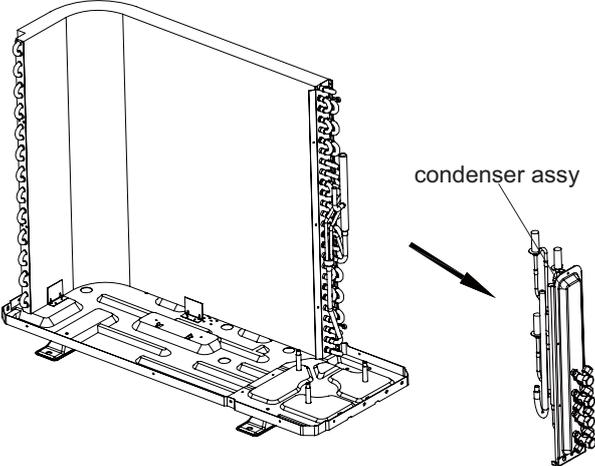
Steps	Procedure
1. Before disassembly	<p>Complete axonometric drawing.</p> 
2. Remove valve cover	<p>Remove the connection screw fixing the valve cover and then remove the valve cover.</p> 
3. Remove Copping	<p>Remove the connection screws connecting the top panel with the right side plate and the left side plate, and then remove the Copping.</p> 

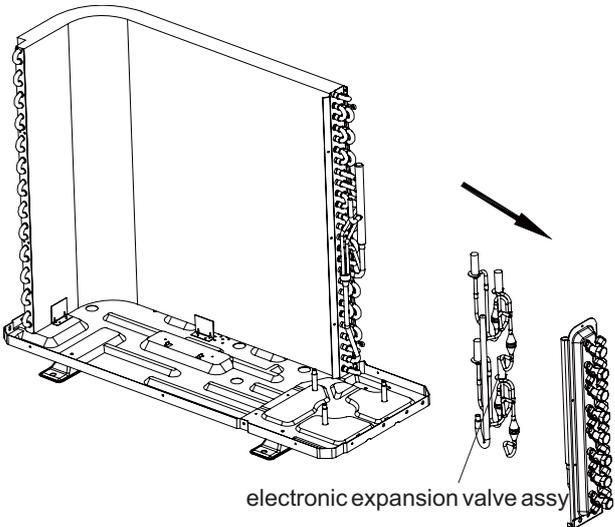
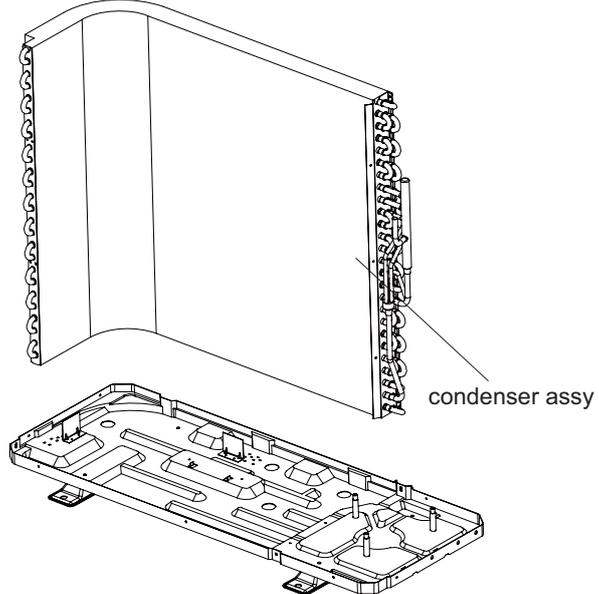
Steps	Procedure
4. Remove front grille	<p>Remove the connection screws connecting the front grille and the front panel, and then loosen the clasp to remove the front grille.</p> 
5. Remove front panel	<p>Remove the screws connecting the front panel and then remove the front panel.</p> 
6. Remove right side plate	<p>Remove the screws connecting the right side plate with the chassis and the valve support. Then remove the right side plate.</p> 

Steps	Procedure	
7. Remove rear grill	Remove the screws connecting the rear grill and the left side plate, and then remove the rear grill.	 <p>Diagram illustrating the removal of the rear grill. The rear grill is shown being lifted away from the unit's chassis. The label 'rear grill' points to the grid-like structure.</p>
8. Remove left side plate	Remove the screws fixing the left side plate with the chassis and the condenser support, and then remove the left side plate.	 <p>Diagram illustrating the removal of the left side plate. The left side plate is shown being lifted away from the unit's chassis. The label 'left side plate' points to the vertical panel.</p>
9. Remove condenser support	Remove the connection screws connecting the condenser support and the chassis, and then remove the condenser support.	 <p>Diagram illustrating the removal of the condenser support. The condenser support is shown being lifted away from the unit's chassis. The label 'support' points to the vertical component.</p>

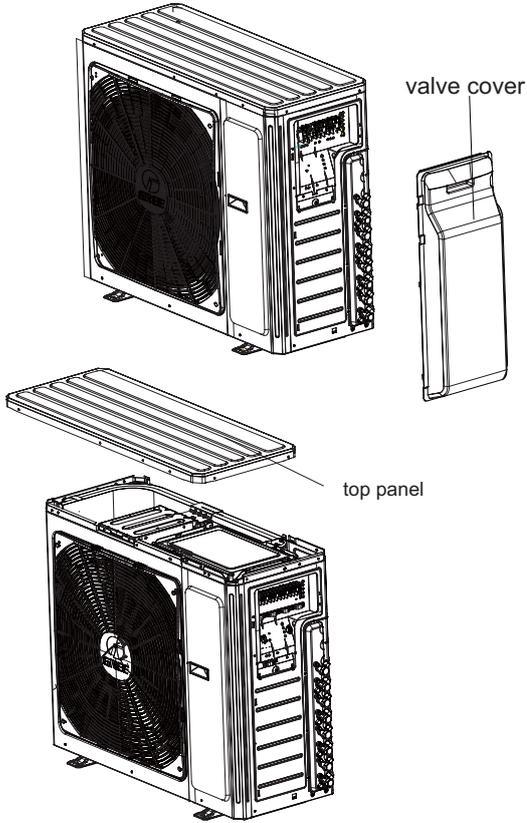
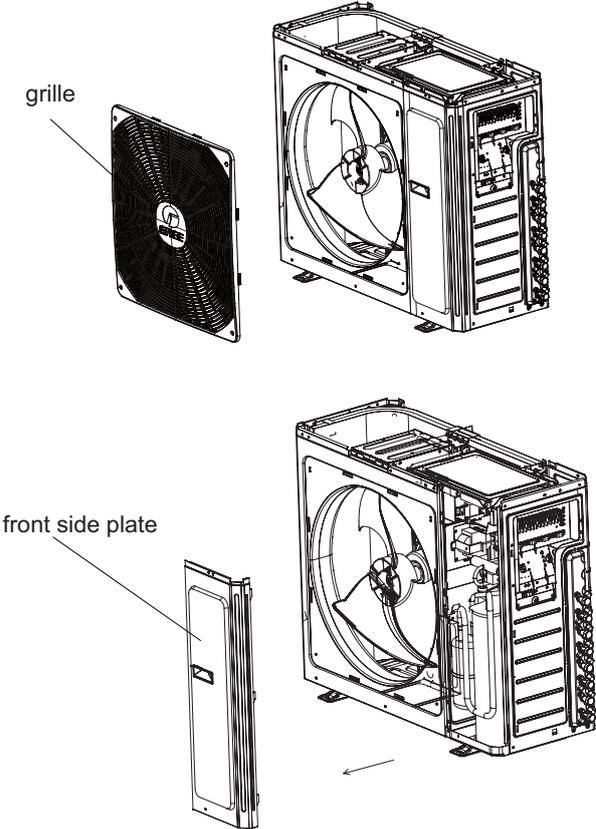
Steps	Procedure
10. Remove axial flow blade	<p>Remove the nut on the blade and then remove the axial flow blade.</p>  <p>axial flow blade</p>
11. Remove motor and motor support	<p>Remove the 4 tapping screws fixing the motor and disconnect the leading wire insert of the motor. Then remove the motor. Remove the 2 tapping screws fixing the motor support and chassis, and then lift the motor support to remove it.</p>  <p>motor support</p> <p>motor</p>
12. Remove electric box assy	<p>Remove the screws fixing the electric box assy and the middle isolation sheet, and then lift the electric box assy to remove it.</p>  <p>electric box assy</p>

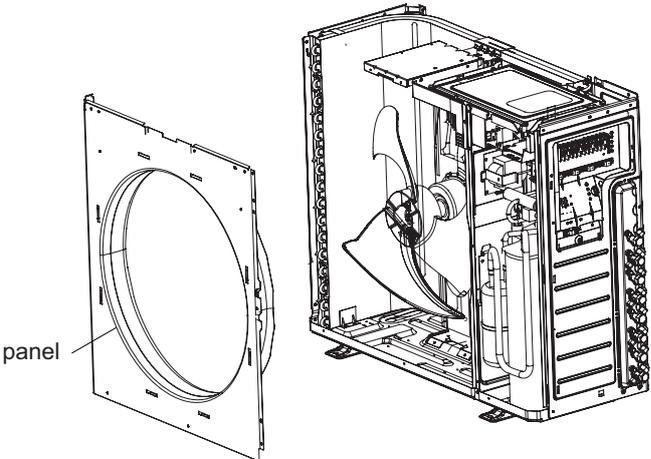
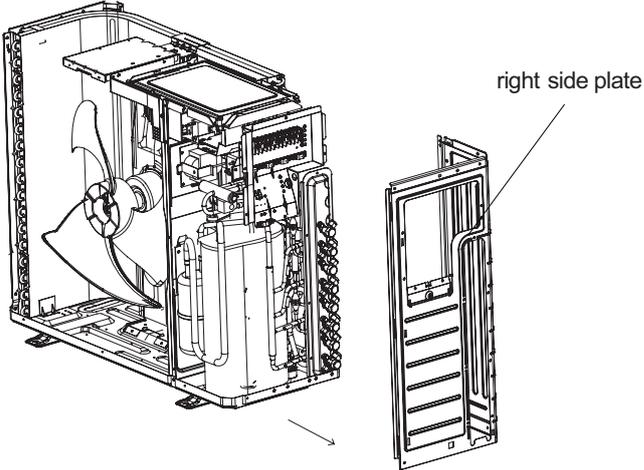
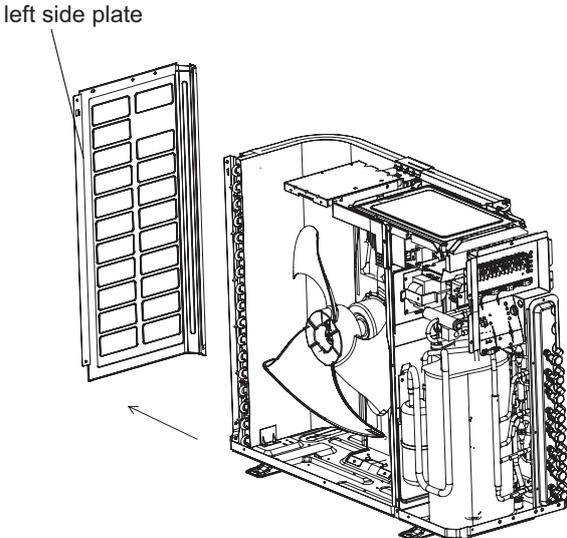
Steps	Procedure
<p>13. Remove PFC induction</p>	<p>Remove the screw connecting the PFC induction and middle isolation sheet, and then remove the PFC induction.</p>  <p>The diagram shows a 3D cutaway view of the unit's internal components. A small rectangular component labeled 'PFC induction' is shown being removed from the main assembly, with an arrow pointing away from the unit.</p>
<p>14. Remove 4-way valve assy and suction pipe sub-assy</p>	<p>Unsolder the welding joint connecting the 4-way valve assy with compressor suction and discharge port, the valve with the outlet pipe of condenser. Then lift the 4-way valve assy to remove it. (NOTE: Discharge the refrigerant completely before unsoldering.) Unsolder the welding joint connecting the suction pipe sub-assy with compressor and liquid container, and then remove the suction pipe sub-assy.</p>  <p>The diagram shows a 3D cutaway view of the unit's internal components. Two components are labeled: '4-way valve assy' and 'suction pipe sub-assy'. Arrows indicate their removal from the unit.</p>
<p>15. Remove liquid container</p>	<p>Remove the screws connecting the isolation plate sub-assy and the liquid container, and then lift the liquid container to remove it.</p>  <p>The diagram shows a 3D cutaway view of the unit's internal components. A cylindrical component labeled 'liquid container' is shown being lifted out of the unit, with an arrow pointing upwards.</p>

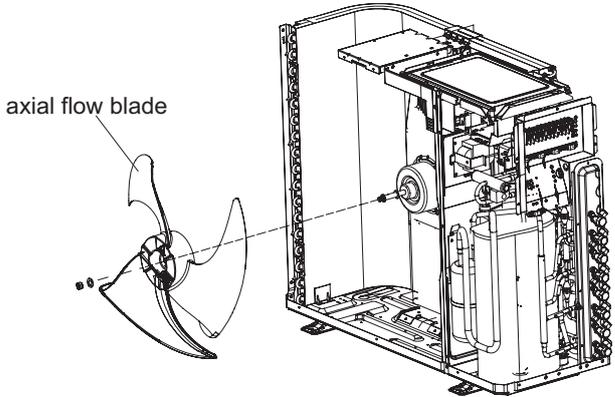
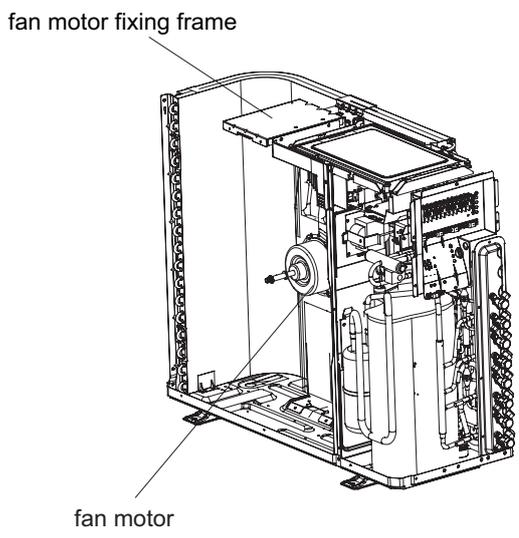
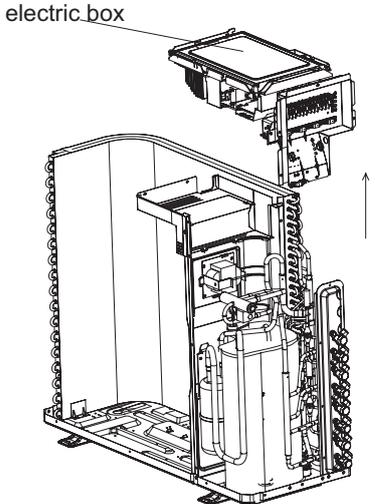
Steps	Procedure
<p>16. Remove middle isolation sheet</p>	<p>Remove the screws connecting the middle isolation sheet with the chassis assy and the condenser assy, and then remove the middle isolation sheet.</p>  <p>The diagram shows a perspective view of the appliance's internal chassis and condenser assembly. A black arrow points to the middle isolation sheet, which is a long, thin metal plate with a decorative patterned edge. A label 'middle isolation sheet' with a leader line points to this component. The condenser coils and compressor are visible on the right side of the chassis.</p>
<p>17. Remove compressor</p>	<p>Remove the 3 foot nuts fixing the compressor and then remove the compressor.</p>  <p>The diagram shows the same chassis and condenser assembly. A black arrow points upwards to the compressor, which is a cylindrical component mounted on the chassis. A label 'compressor' with a leader line points to this component. The three foot nuts mentioned in the text are also indicated by small circles near the compressor's base.</p>
<p>18. Remove valve support sub-assy</p>	<p>Remove the screw connecting the valve support assy and the chassis sub-assy, and then remove the valve support assy.</p>  <p>The diagram shows the chassis and condenser assembly with the compressor removed. A black arrow points to the valve support sub-assembly, which is a vertical metal component located between the condenser coils and the chassis. A label 'condenser assy' with a leader line points to the condenser coils, and another label 'valve support sub-assy' with a leader line points to the vertical component.</p>

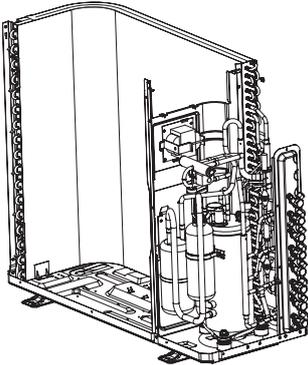
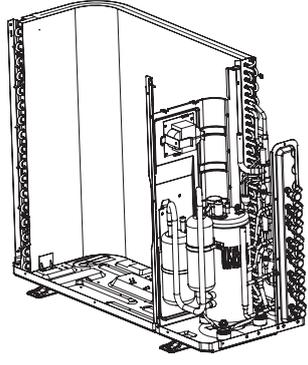
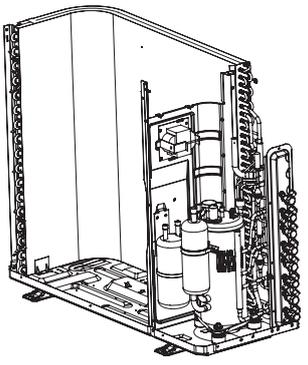
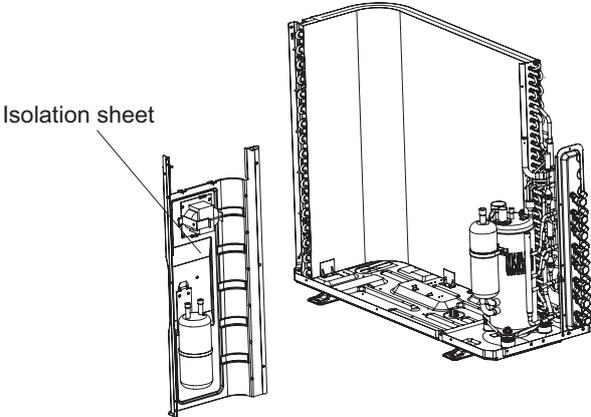
Steps	Procedure
<p>19. Remove electronic expansion valve assy</p>	<p>Unsolder the welding joint connecting the electronic expansion valve sub-assy with the gas collection pipe, and then remove the electronic expansion valve assy. (Note: when unsoldering, wrap the gas valve with a wet cloth completely to avoid damage to the valve caused by high temperature).</p>  <p>electronic expansion valve assy</p>
<p>20. Remove condenser assy</p>	<p>Remove the screws connecting the condenser assy and the chassis assy, and then remove the condenser assy.</p>  <p>condenser assy</p>

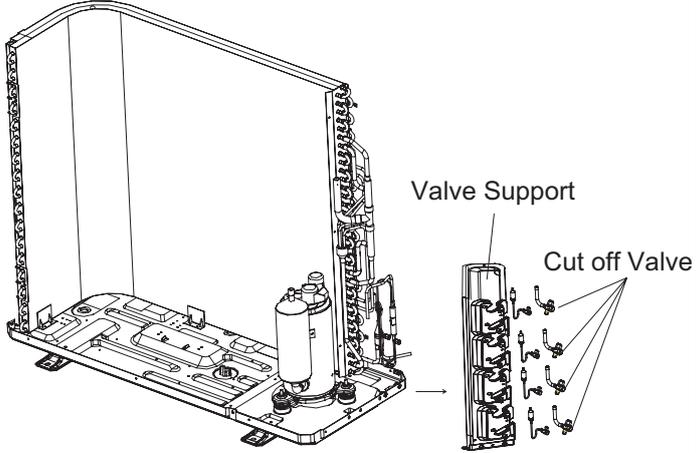
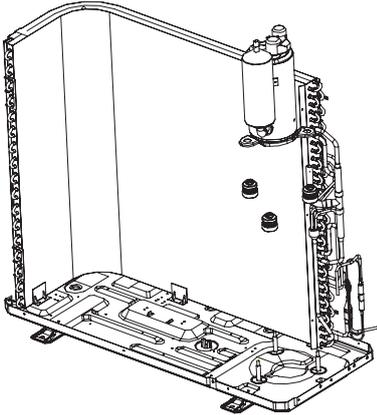
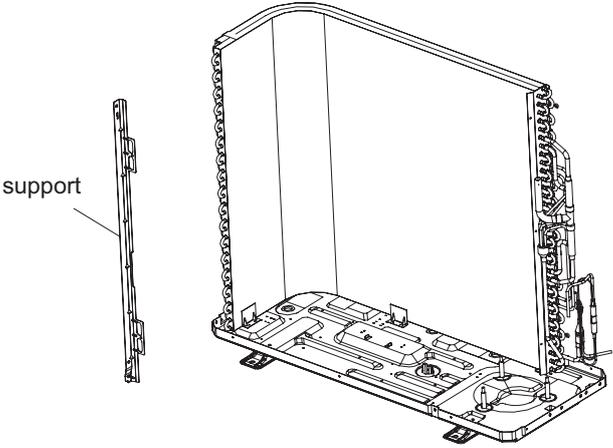
(2)Models:EXM24HV1WE

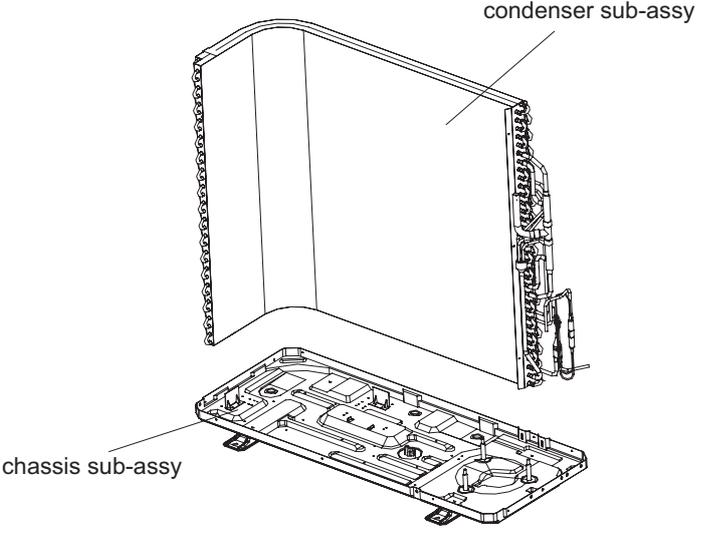
Steps	Procedure
<p>1. Remove valve cover and top panel</p>	 <p>1 Twist off the screws used for fixing and valve cover, pull valve cover up ward to remove it.</p> <p>2 Remove the 3 screws connecting the top panel with the front panel and the right side plate, and then remove the top panel.</p>
<p>2. Remove grille,front side plate and panel.</p>	 <p>1 Remove the 2 screws connecting the grille and the panel, and then remove the grille.</p> <p>2 Remove the 1 screw connecting the front side plate and the panel, and then remove the front side plate.</p>

Steps	Procedure	
3	<p>Remove the 5 screws connecting the panel with the chassis and the motor support, and then remove the panel.</p>	 <p>panel</p>
3. Remove right side plate and left side plate		
1	<p>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.</p>	 <p>right side plate</p>
2	<p>Remove the screws connecting the left side plate and the chassis, and then remove the left side plate assy.</p>	 <p>left side plate</p>

Steps	Procedure	
4. Remove fan motor and axial flow blade		
1	Remove the nuts fixing the blade and then remove the axial flow blade.	 <p>axial flow blade</p>
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.	 <p>fan motor fixing frame</p> <p>fan motor</p>
5. Remove electric box		
	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.	 <p>electric box</p>

Steps	Procedure	
6.Remove soundproof sponge and 4-way valve assy		
1	Since the piping ports on the soundproof sponge are torn easily, remove the soundproof sponge carefully	 <p>soundproof sponge</p>
2	Discharge the refrigerant completely;unsolder the pipelines connecting the compressor and the condenser assy,and then remove the 4-way valve assy.	 <p>4-way valve assy</p>
		 <p>Connection Pipe</p>
7. Remove Isolation sheet		
	Remove the 3 screws fixing the isolation sheet and then remove the Isolation sheet.	 <p>Isolation sheet</p>

Steps	Procedure	
8. Remove Cut off Valve and Valve Support	<p>Remove the 2 bolts fixing the valve subassemblies. Unsolder the welding joint connecting the gas valve and the return air pipe. Remove the gas valve. (Note: When unsoldering the soldering joint, wrap the gas valve with wet cloth completely to avoid damage to the valve caused by high temperature.) Unsolder the welding joint connecting the liquid valve and the connecting pipe. Remove the liquid valve. Remove screws fixing valve support and then remove the valve support; remove the screw fixing the condenser and then pull the condenser upwards to remove it.</p>	
9. Remove compressor	<p>Remove the 3 foot nuts fixing the compressor and then remove the compressor.</p>	
10. Remove support	<p>1 Remove the screws connecting the support and condenser assy, and then remove the support.</p>	

Steps		
11.Remove condenser sub-assy		
	<p>Remove the chassis sub-assy and condenser sub-assy.</p>	

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

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

Set temperature

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

Ambient temperature

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

Appendix 2: Configuration of Connection Pipe

- Standard length of connection pipe
 - 16.4ft, 24.6ft, 26.2ft.
- Min. length of connection pipe is 9.84ft.
- Max. length of connection pipe and max. high difference.
- The additional refrigerant oil and refrigerant charging required after prolonging connection pipe
 - After the length of connection pipe is prolonged for 32.8ft at the basis of standard length, you should add 5ml of refrigerant oil for each additional 16.4ft of connection pipe.
 - The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	49.2 ft	16.4 ft
7000 Btu/h(2051 W)	49.2 ft	16.4 ft
9000 Btu/h(2637 W)	49.2 ft	32.8 ft
12000 Btu/h(3516 W)	65.6 ft	32.8 ft
18000 Btu/h(5274 W)	82.0 ft	32.8 ft
24000 Btu/h(7032 W)	82.0 ft	32.8 ft
28000 Btu/h(8204 W)	98.4 ft	32.8 ft
36000 Btu/h(10548 W)	98.4 ft	65.6 ft
42000 Btu/h(12306 W)	98.4 ft	65.6 ft
48000 Btu/h(14064 W)	98.4 ft	65.6 ft

- When the length of connection pipe is above 16.4ft, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.
- Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(inch)	Gas pipe(inch)	Cooling only(oz/ft)	Cooling and heating(oz/ft)
Φ0.23	Φ0.37 or Φ0.47	0.53	0.71
Φ0.23 or Φ0.37	Φ0.63 or Φ0.75	0.53	0.71
Φ0.47	Φ0.75 or Φ0.84	1.06	4.23
Φ0.63	Φ1.0 or Φ1.25	2.12	4.23
Φ0.75	/	8.82	8.11
Φ0.84	/	12.34	12.34

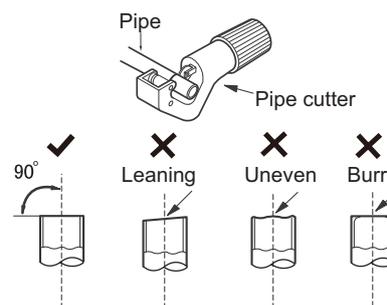
Appendix 3: Pipe Expanding Method

⚠ Note:

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

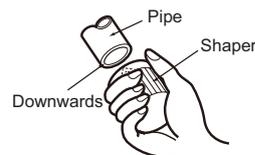
A: Cut the pip

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



B: Remove the burrs

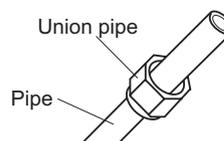
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C: Put on suitable insulating pipe

D: Put on the union nut

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



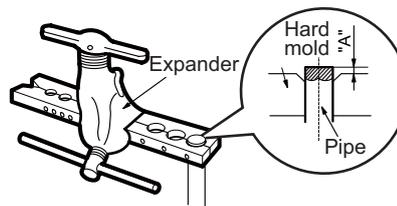
E: Expand the port

- Expand the port with expander.

⚠ Note:

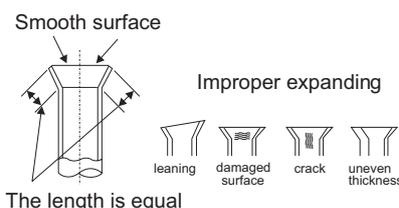
- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(inch)	A(inch)	
	Max	Min
Φ0.23 - 0.25 (1/4")	0.051	0.028
Φ9.52 (3/8")	0.063	0.039
Φ0.37 - 0.5 (1/2")	0.071	0.039
Φ0.63 (5/8")	0.095	0.087



F: Inspection

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



Appendix 4: List of Resistance for Ambient Temperature Sensor

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

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	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

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(20K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	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

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