GREE
Air comfort for all

XPAC R32

SERVICE MANUAL

Outdoor Unit

MODELS:

GK-H02TC/NhA-D(U)
GK-H03TC/NhA-D(U)
GK-H04TC/NhA-D(U)
GK-H05TC/NhA-D(U)

Thank you for choosing our product.
Please read this Service Manual carefully before operation and retain it for future reference.

To download an electric version of this manual visit
https://www.greecomfort.com/system-documentation/

Contents

PRODUCT

1 MODELS LIST

Model	Product Code	Nominal Capacity (Ton)	Refrigerant	Power Supply	Appearance
GK-H02TC/NhA-D(U)	EJ51100400	2	R32	208/230V ~ 60Hz	
GK-H03TC/NhA-D(U)	EJ51100180	3	R32	208/230V ~ 60Hz	
GK-H04TC/NhA-D(U)	EJ51100410	4	R32	208/230V ~ 60Hz	
GK-H05TC/NhA-D(U)	EJ51100170	5	R32	208/230V ~ 60Hz	

NOTES:

① Above pictures may be different from actual model.

② 1Ton =12000Btu/h = 3.517kW.

2 NOMENCLATURE

GK	—	H	02	T	C	/	Nh	A	—	D	(U)
1	—	2	3	4	5	-	6	7	—	8	9

No.	Description	Options
1	Product Category	GK=GREE Rooftop Packaged Air Conditioners
2	Product Function Code	C = Cooling only type; H = Heat pump type.
3	Cooling/Heating Capacity	02=2Ton; 03=3Ton .....
4	Operating Condition	T=T3 Condition; N=T1 Condition.
5	Airflow Options	H=Horizontal; C=Convertible.

No.	Description	Options
6	Refrigerant Options	Omit =R22; Na=R410A; Nh=R32.
7	Design Code	A,B,C.....
8	Voltage Options	D=208/230V ~ 60Hz
9	Sales Region	U=North America; E=Middle East; L=Latin America.

3 FEATURE

Feature	Description
DC Inverter technology	The Gree Rooftop unit equipped efficient DC compressor and fan motor fusing advanced fuzzy control, can stepless adjust the output capacity according to the space load and significantly reduce power consumption.
Non-polarity communication design	The Gree Rooftop unit are strong anti-interference design, host directly connected to wired controller with two-core unshielded cable, which length can up to 100 meters.
Anti-corrosive and dustproof design	The Gree Rooftop unit equipped with high anti-corrosive coating of outdoor and indoor heat exchanger, triple layer moisture proof painting PCB, IP56 standard outdoor fan motor, hermetically sealed indoor fan motor, which greatly improve the durability of product in the extreme environment.
Multi-protection design	The Gree Rooftop unit build in comprehensive protection such as high/low pressure protection, over current protection, high discharge temperature protection, phase failure&sequence protection, which greatly improve the reliability of product in the extreme environment.
Multi parameter throttling control design	The Gree Rooftop unit EXV control by the MCU fusing high/low pressure, compressor discharge temperature, etc. Maximum optimize the unit operation process.
Dead wind start-up design	The Gree Rooftop unit intergraded exclusive outdoor fan dead wind start-up function, which greatly improve the success rates of fan start-up in the windy circumstances and ensure the unit performance steadily.
Emergency operation design	The Gree Rooftop unit is composed of two independence system. When one system fails, another system continues to operate in emergency during the maintenance period.
Centralized Control	The Gree Rooftop unit support centralized control function. One centralized controller can control up to 36 host.
Remote control function	The Gree Rooftop unit support remote control function, host can be access and control through LAN and WAN (Gateway accessory are required).

4 PRODUCT DATA

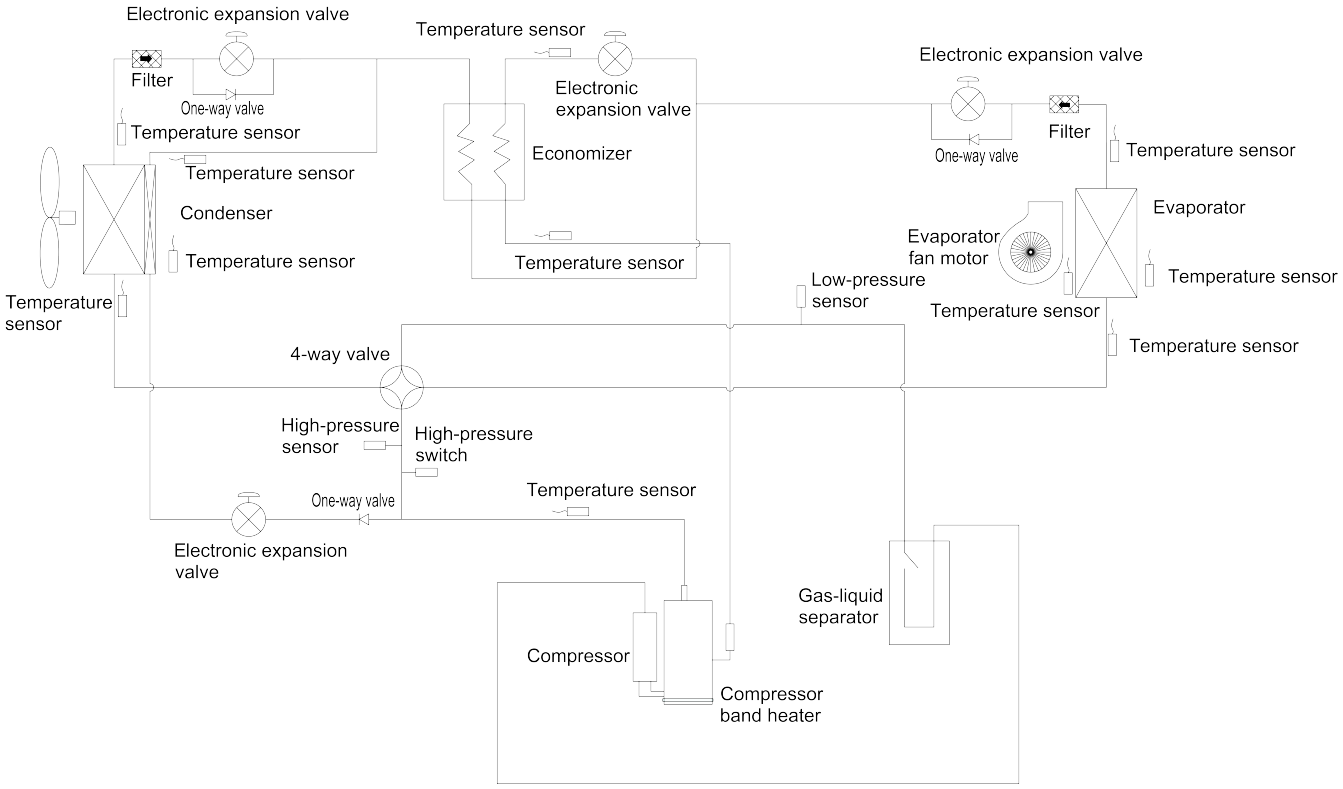
4.1 OPERATION RANGE

Mode	Range of Outdoor Temperature℃(℉)
Cooling	-5(23)～52(125.6)
Heating	-30(-22)～24(75.2)

4.2 ELECTRICAL DATA

Model	Power supply	Fuse capacity(A)	Maximum over-current protection(A)	Minimum circuit ampacity(A)
GK-H02TC/NhA-D(U) GK-H03TC/NhA-D(U)	208/230V ~ 60Hz	40	40	35
GK-H04TC/NhA-D(U) GK-H05TC/NhA-D(U)	208/230V ~ 60Hz	45	45	39.1

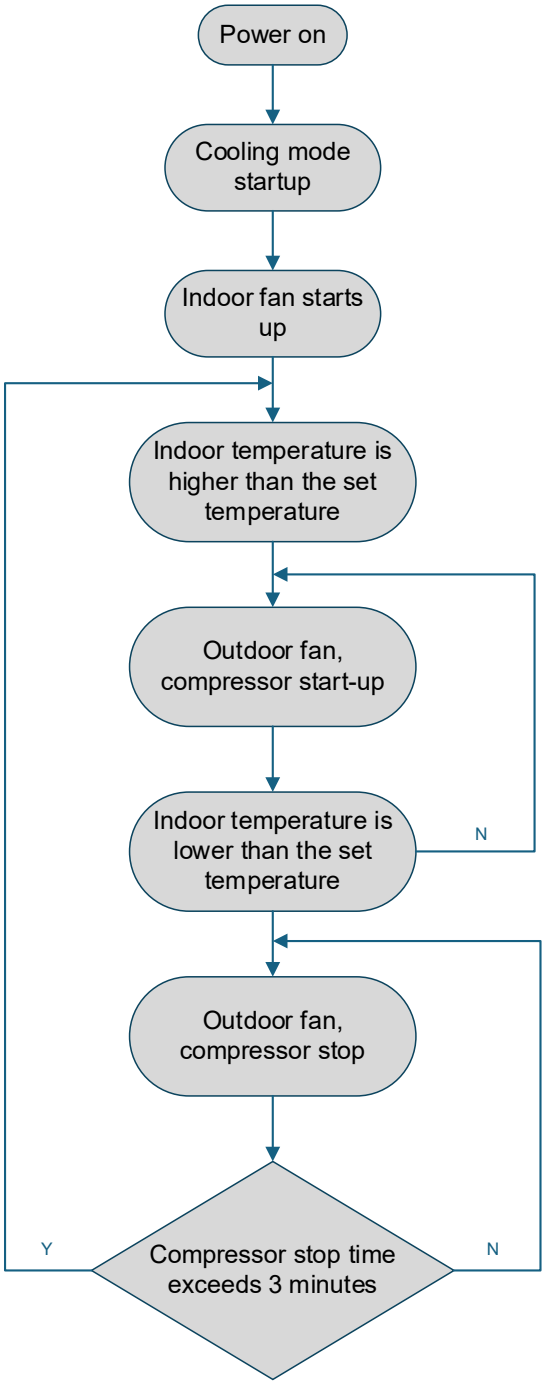
5 PIPING DIAGRAM



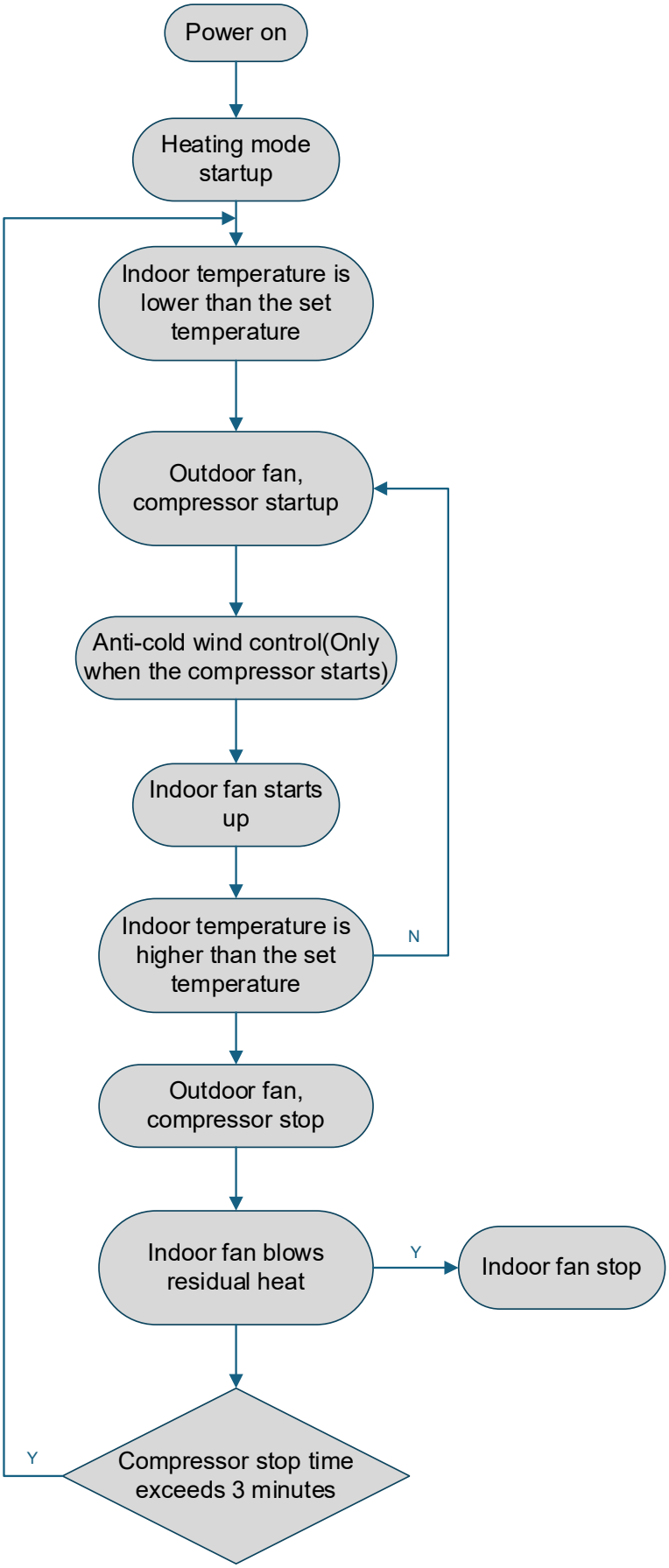
CONTROL

1 OPERATION FLOWCHART

1.1 COOLING OPERATION



1.2 HEATING OPERATION



2 WIRED CONTROLLER

2.1 DISPLAY VIEW

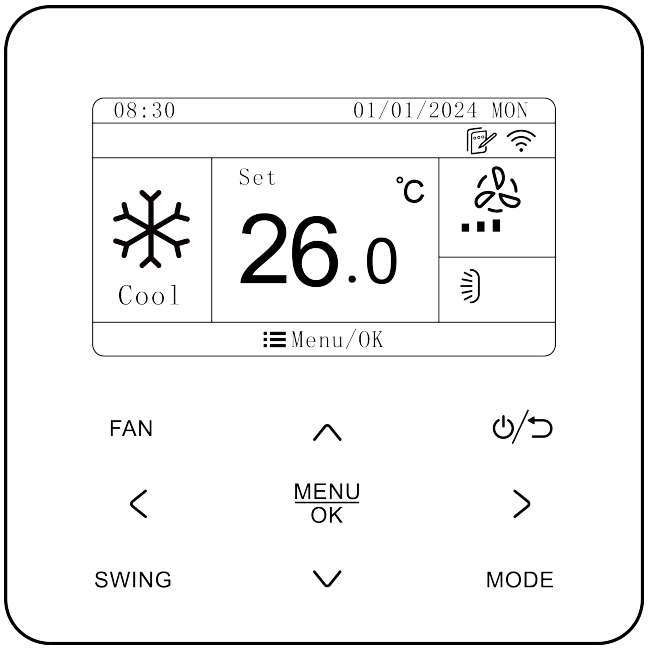


Figure 2-1 Appearance of wired controller

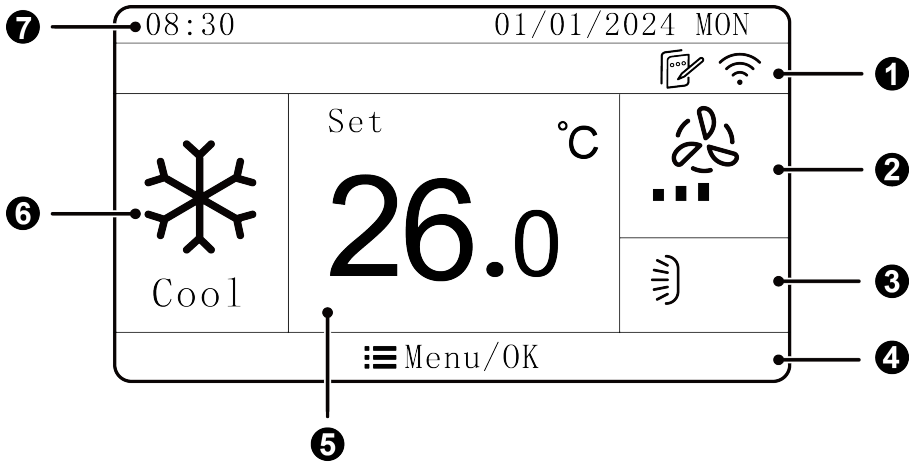


Figure 2-2 LCD display of wired controller

Table 2-1 Instruction to LCD Display

No.	Name	Instruction
1	Status column	Display the icon of function that is turned on
2	Fan speed	It is for displaying the fan speed
3	Swing	It is for displaying the current swing status
4	Button prompt	Display the function of “MENU/OK” button at the current page and the settable cursor
5	Temperature display	It shows the value of temperature (If the wired controller is controlling a fresh air indoor unit, it will display “FAP”).
6	Mode	It shows the operating mode
7	Clock display	It displays the date and the time. When it’s locating the indoor unit, it displays the project No. of current indoor unit.
NOTE: When wired controller is connected with different indoor units, some functions will be different.		

Table 2-2 Instruction of Status Column Icon

No.	Symbols	Name	Instructions
1		Air *	Air status(indoor unit optional function)
2		Remove card	The card for access control is removed
3		Clean	Remind to clean the filter
4		Child lock	Child lock status
5		Error	There are errors for the unit
6		Health *	Health function (indoor unit optional function)
7		Defrosting	Defrosting status of outdoor unit
8		Master	Current wired controller connects the master indoor unit.
9		Power off memory	Memory status (when power recovered, indoor unit will resume previous setting status)
10		Absence	Absence is displayed when this function is turned on.
11		Quiet status	Quiet status (including quiet and auto quiet modes)
12		Energy-saving	Energy-saving status of indoor unit
13		Shield	Shielding status
14		Slave wired controller	Slave wired controller (address of wired controller is 02).
15		Sleep	Sleep status
16		Time	Timer status is displayed
17		X-fan	X-fan is displayed when this function is set.
18		Group control	One wired controller controls multiple indoor units.
19		Valid operation	It’s displayed for valid operation
20		WiFi	WiFi status(If the wired controller has no WiFi function, it displays only when the unit connected to “Unit WiFi”).
21		Independent swing*	Independent swing status
22		Auto clean *	Auto clean status
23		Setback	Setback function status
24		Warning	Warning status
25		Aux. Heat*	Aux. Heat is available
26			Aux. Heat operating
NOTE: When wired controller is connected with different indoor units, some functions will be different.			

2.2 OPERATION VIEW

2.2.1 Silk Screen of Buttons

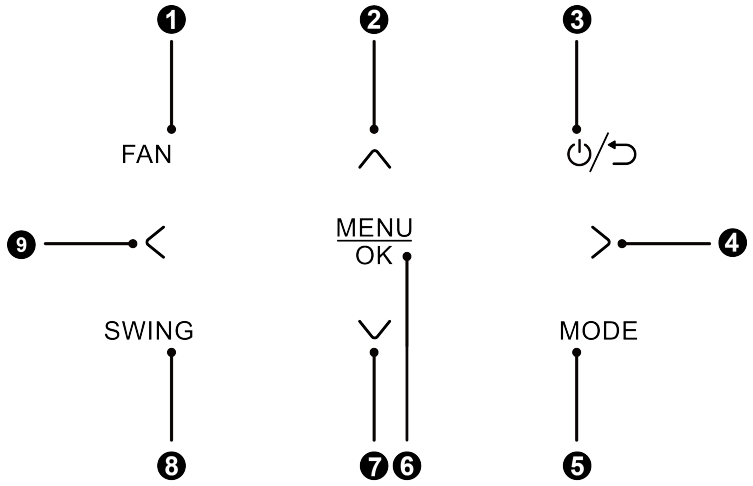


Figure 2-3 Silk screen of buttons

2.2.2 Instruction to Function of Buttons

Table 2-3 Instruction to buttons of wired controller

No.	Name	Function
1	FAN	Switch fan speeds: auto, low, medium-low, medium, Medium-high and high
2	∧	(1) Set operation temperature for the indoor unit. (2) Move cursor. (3) Set and check parameters.
7	∨	
3	⏻/⮌	On/off button for turn on or turn off the unit; back button for return to previous page.
9	<	(1) Turn pages, and switch and select the target; (2) Move the cursor; (3) Set and check parameters.
4	>	
5	MODE	Switch operating modes: Auto, Cool, Dry, Fan, Heat, etc.
6	MENU/OK	Select mode and confirm parameters.
8	SWING	Set the swing status of central air conditioners.

3 INSTALLATION OF WIRED CONTROLLER

3.1 STANDARD ACCESSORIES

Table 3-1 Standard Accessories of Wired Controller

No.	1	2	3	4
Name	Panel of wired controller	Self-tapping screw ST3.9×25 MA	Screw M4×25	Soleplate of wired controller
QTY	1	4	2	1

Unit: mm

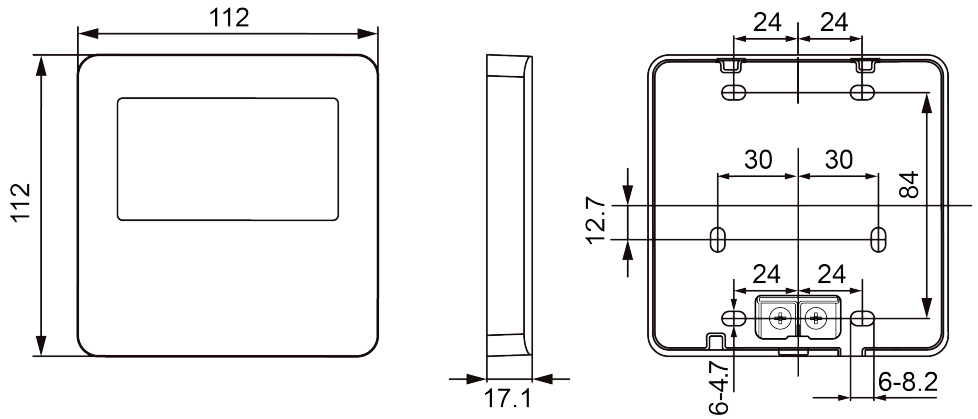


Figure 3-1 Dimension of Wired Controller

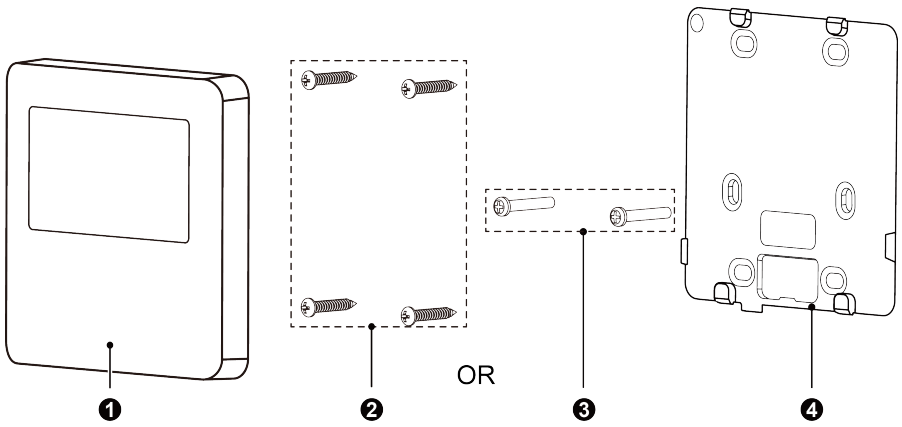


Figure 3-2 Parts and Components of Wired Controller

3.2 INSTALLATION POSITION AND REQUIREMENT

(1) It is not allowed to install the wired controller in the wet place.

(2) It is not allowed to install the wired controller in the place with direct sunlight.

(3) It is not allowed to install the wired controller near the high-temperature object or the place is likely to be spattered with water.

3.3 INSTALLATION OF WIRED CONTROLLER

First to select the right signal wire of wired controller: 2–core signal wire (wire diameter≥0.75mm, length<30m, recommendable length is 8m).

For installation steps of wired controller please refer to the following sketch map, brief instructions are as below:

(1) Before installation, please cut off the power supply of the unit, it is not allowed to operate with power supply;
(2) Pull out the 2-core twisted pair inside the installation hole in the wall, and thread the wire through the hole in the back of soleplate of wired controller;
(3) Stick the soleplate of wired controller on the wall, and use self-tapping screw ST3.9×25 MA or screw M4×25 to fix the soleplate with the installation hole of wall;
(4) Connect the 2-core twisted pair to wiring terminal “H1” and “H2”, and then tighten the screw;
(5) Arrange the wires in the back of panel, and then buckle the panel of wired controller with the soleplate of wired controller.

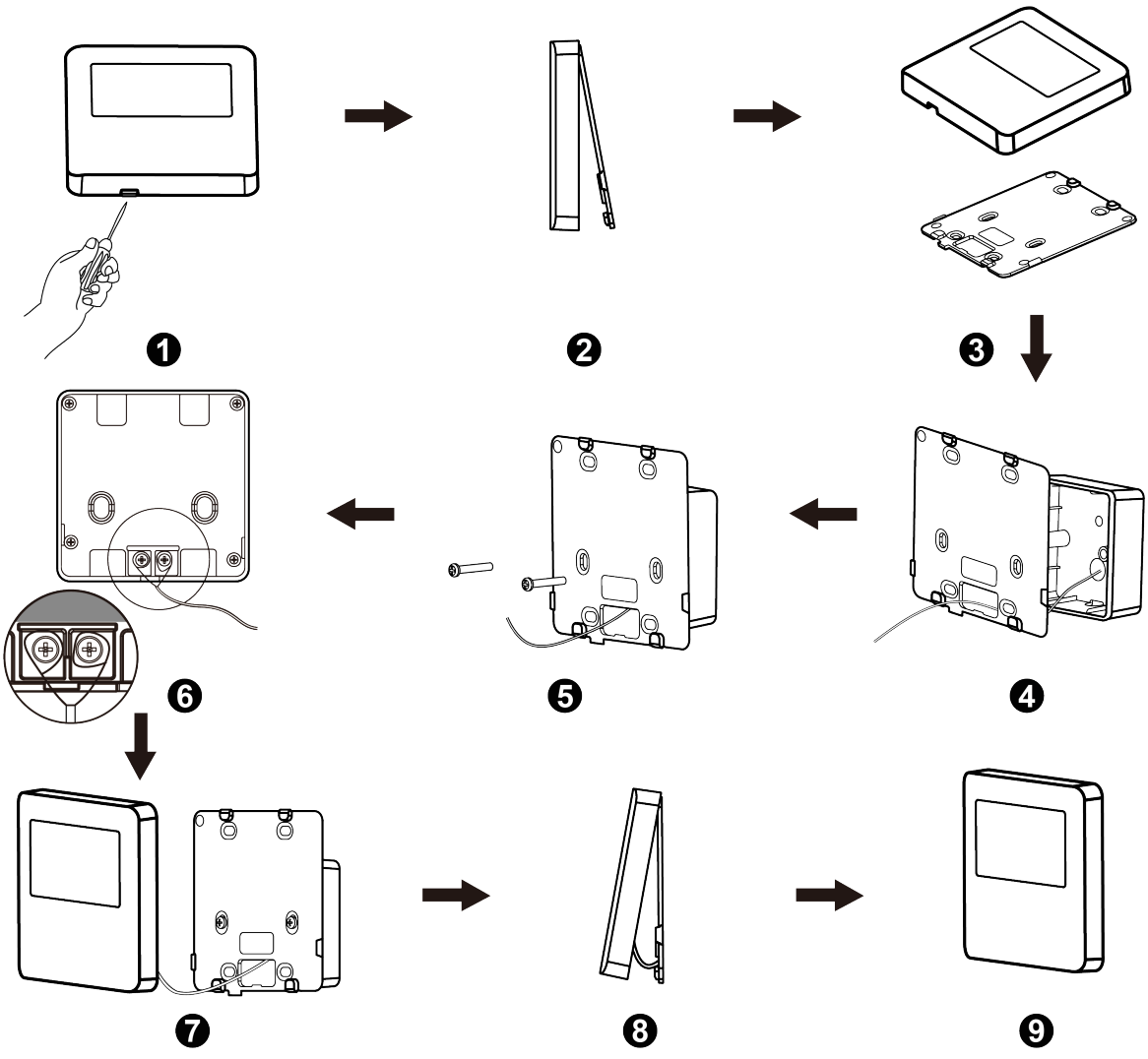


Figure 3-3 Installation of wired controller

3.4 REMOVAL OF WIRED CONTROLLER

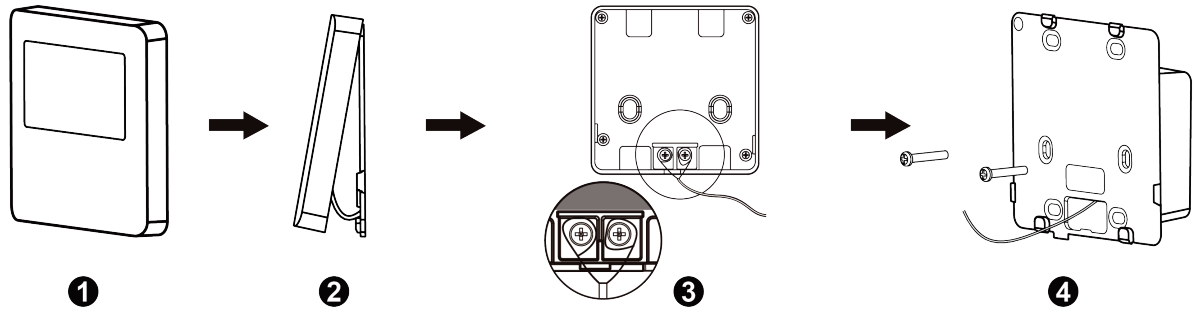


Figure 3-4 Removal of wired controller

4 OPERATION INSTRUCTION

4.1 ON/OFF

Press "⏻/⮌" button to turn on the air conditioner.

Press "⏻/⮌" button again to stop operation.

"ON" and "OFF" interfaces are shown as below:

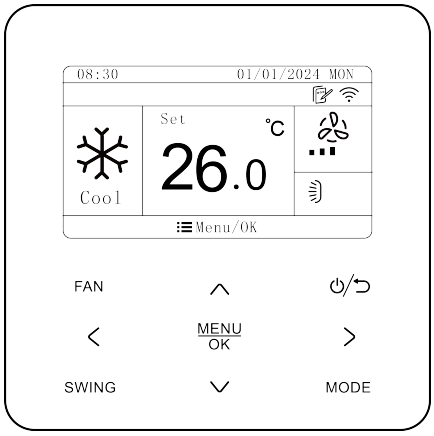


Figure 4-1 "ON" interface

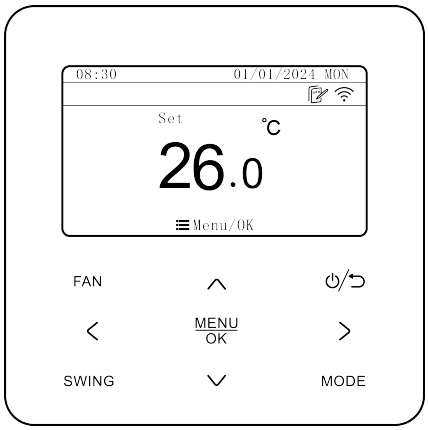
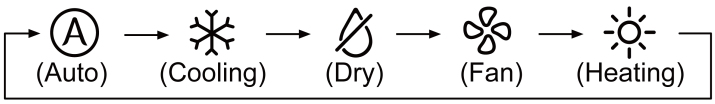


Figure 4-2 "OFF" interface

4.2 MODE SETTING

Under "ON" status, pressing "MODE" button can set modes circularly:



NOTES:

① The available modes are different for different models. The wired controller will automatically select mode setting range according to the model of indoor unit.

② Under Auto mode, if the indoor unit is cooling, the icons "Ⓐ" and "❄" will light up; if the indoor unit is

heating, the icons "Ⓐ" and "☼" will light up.

4.3 TEMPERATURE SETTING

Press "∧" or "∨" button under on status to increase or decrease set temperature by 0.5℃/1℃ or 1℉; hold "∧" or "∨" button to increase or decrease set temperature by 0.5℃/1℃ or 1℉ every 0.3s. Please refer to the setting method of the temperature setting interval in Celsius.

NOTE: Only when the wired controller controls packaged unit indoor units, the setting temperature can be adjusted by pressing "∧" or "∨" under Auto mode.

4.4 FAN SETTING

Under "ON" status, pressing "FAN" button can set fan speeds circularly as:

NOTES:

① Under Dry mode, fan speed is low and can't be adjusted.

② If indoor unit's fan speed is set auto, indoor unit will change fan speed automatically according to room temperature in order to make the room temperature more stable and comfortable.

4.5 FUNCTION SETTING

Press "MENU/OK" button on the homepage to enter menu page and then select "Function" to go to function page. See the figure as below.

Figure 4-3 Function page

Press "∧" or "∨" button to switch the items; press "<" and ">" button to turn on or turn off corresponding function. "ON" indicates the function is turned on; "OFF" indicates the function turned off; press "⏻/⮌" button to turn back to previous page.

Some functions are with more parameters and “MENU/OK” button can be used for setting detailed parameters.

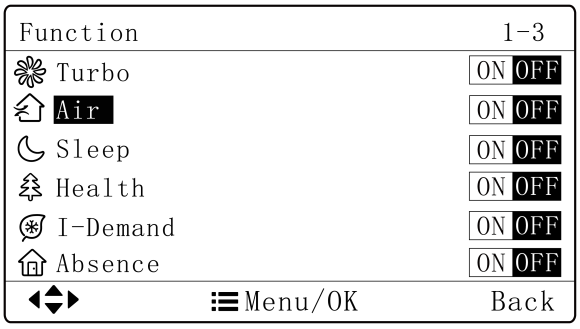


Figure 4-4 Function with detailed setting

As for some functions, only the on/off status is displayed at the switch button. It needs to press “MENU/OK” button to enter into detailed setting:

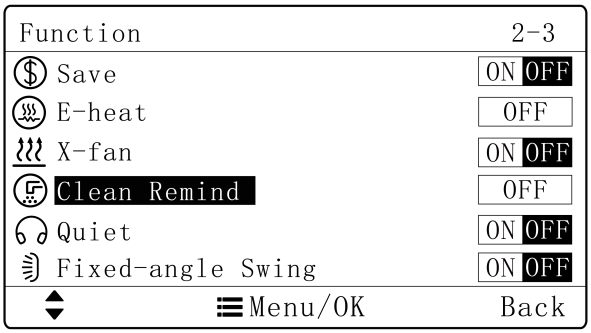


Figure 4-5 Functions whose on/off status is only displayed

NOTE:

The function under some circumstances is invalid and displayed in grey. Press “∧” or “∨” button to skip this function.

4.5.1 Turbo Setting

Turbo fan Function: Turn on the highest fan speed, and then turbo fan will be displayed on the homepage.

Turn on turbo fan Function: Under on status, select turbo fan on the function page and press “<” or “>” button to turn on or turn off the turbo fan. When turbo fan is turned on, “turbo fan” will be displayed at the fan speed area on the homepage.

Cancel turbo fan Function: Same as the method used for turning on the turbo Fan Function.

You can also press “FAN” button on the home page to cancel the turbo fan and then switch to the auto fan.

NOTES:

① Under Dry mode, fan speed is low and can't be adjusted.

② If indoor unit's fan speed is set auto, indoor unit will change fan speed automatically according to room temperature in order to make the room temperature more stable and comfortable.

4.5.2 Save Setting

Save function: Air conditioner can be operated in small temperature range by setting the minimum temperature under Cooling and Dry modes and setting maximum temperature under Heating mode. Thus, energy saving can be realized.

Turn on save mode: Under on status, select save function on the function page and press "<" or ">" button to turn on or turn off the save function.

Cancel save mode: Same as the method used for turning on the save function.

When selecting save function on the function page, press "MENU/OK" button to set temperature for save function. The display is as below:

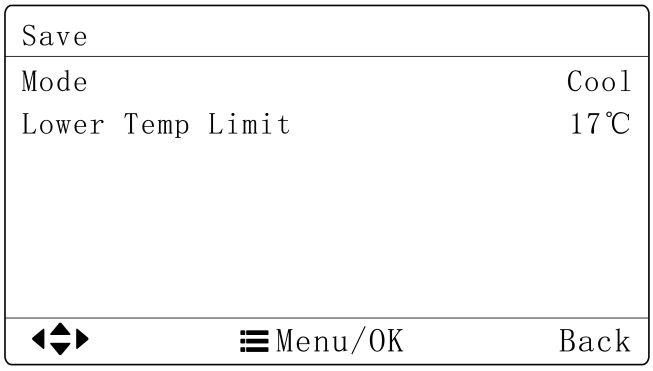


Figure 4-6 Temperature setting for save function

Press "∧" or "∨" button to switch items. When selecting the first item, press "<" or ">" button to switch modes; when selecting the second item, press "<" or ">" button to switch temperature lower limit and upper limit value. Press "MENU/OK" button to save the setting and then turn back to the previous page.

When save function is turned on, icon "Ⓢ" is displayed under all modes at on and off statuses.

NOTE:

When the save function is turned on and then set temperature exceeds the limit value for save function, "Ⓢ" icon blinks three times and then buzzer will give out two sounds successively.

4.5.3 Filter Clean Reminder Setting

Filter Clean Reminder Function: The unit will remember its own operating time. When the setting time is over, this function will remind you to clean the filer. A dirty filter will result in bad heating and cooling

performance, abnormal protection, bacteria gathering, etc.

Select “Clean Remind” on the function page and press “MENU/OK” button to go to filter clean reminder setting page. Refer to the figure as below:

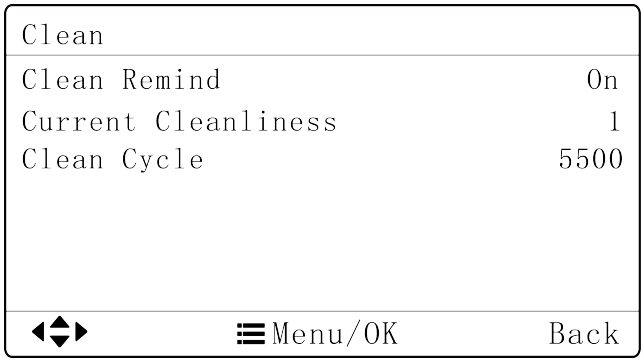


Figure 4-7 Filter clean reminder setting

Press “∧” or “∨” button to switch items. When selecting the first item, press “<” or “>” button to turn on or turn off this function; when selecting the second item, press “<” or “>” button to switch current environmental cleanliness (switch among level 1, level 2 and level 3. There are for good, general and bad cleanliness); when selecting the third item, press “<” or “>” button to adjust the cleaning period . Press “MENU/OK” button to save the setting and then turn back to the previous page.

There are four circumstances while cleaning period Setting:

Turn off clean reminder;

Light pollution: When current cleanliness is “1”, the setting range for the clean cycle is 5500h-10000h. After each pressing of “>” button, the accumulated time will increase 500h. When the time exceeds the maximum value, it will turn back to the minimum value.

Medium pollution: When current cleanliness is “2”, the setting range for the clean cycle is 1400h-5000h. After each pressing of “>” button, the accumulated time will increase 400h. When the time exceeds the maximum value, it will turn back to the minimum value.

Serious pollution: When current cleanliness is “3”, the setting range for the clean cycle is 100h-1000h. After each pressing of “>” button, the accumulated time will increase 100h. When the time exceeds the maximum value, it will turn back to the minimum value.

NOTE:

When clean time is reached, icon “㊣” at the status column will be displayed. The reminding will pop up at the home page to remind users to clean the filter. Click “Done” or “Skip” to cancel the display. At the same time, the accumulated time for “filter clean reminder” will be cleared and the time will be counted again.

4.6 UNIVERSAL SETTING

Press “MENU/OK” button on the homepage to go to the menu page and then select “Set” to enter into set page; please refer to the figure as below:

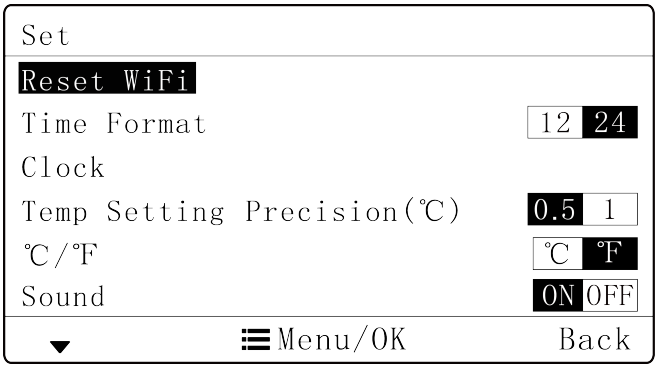


Figure 4-8 Set page

Below parameters can be set on the set page.

4.6.1 Time Format Setting

Users can set 12-hour time format or 24-hour time format. Press “∧”or “∨” button on the setting page to select “Time Format” and then press “<” or “>” button to select 12-hour time format or 24-hour time format.

4.6.2 System Time Setting

Select “Clock” item on the setting page and then press “MENU/OK” button to go to time setting page. See the figure as below:

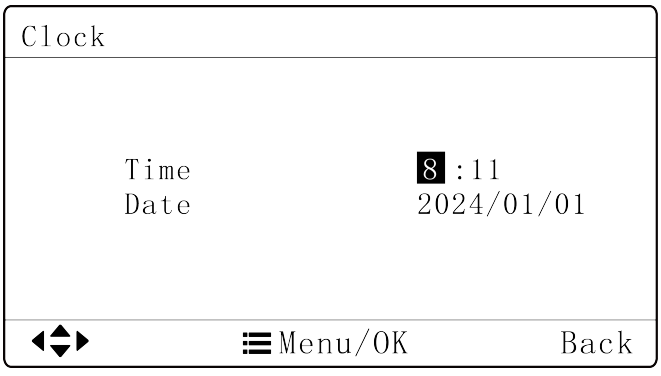


Figure 4-9 Clock setting page

Press “<” or “>” button to select setting items: hour, minute, year, month and day; press “∧” or “∨” button to set the value. When setting is finished, press “MENU/OK” button to save the setting.

4.6.3 Temperature Setting Precision(℃)

Users can set the temperature precision as 0.5℃ or 1℃. Press "∧"or "∨" button to select "Temp Setting Precision(℃)" on the setting page and then press "<" or ">" button to select two different temperature precision.

4.6.4 Temperature Unit Setting

Users can set the temperature unit on the wired controller as ℃ or ℉. Press "∧"or "∨" button to select "℃/℉" on the setting page; press "<" or ">" button to select ℃ or ℉.

4.6.5 Display Language Setting

Users can select the language on the setting page. Press "∧" or "∨" button to select "Language Selection"; press "MENU/OK" button to go to language setting page. Press "∧"or "∨" button to select the required language item. Finally, press "MENU/OK" button to save the setting.

4.7 TIMER SETTING

The wired controller can set four times of timer: daily timer, weekly timer, two-week timer and timer off. Users select the timer icon on the menu page and then press "∧" or "∨" button to select the timer. Press "<" or ">" button to turn on or turn off this timer. Press "MENU/OK" button to go to corresponding timer setting page. The figure is as below:

Figure 4-10 Timer setting page

4.7.1 Daily Timer Setting

As for the daily timer setting, users can set four independent timer periods. Only when the timer period is turned on, it is valid. As for each timer period, it can set time, on/off, working mode, set temperature and fan speed. See the figure as below:

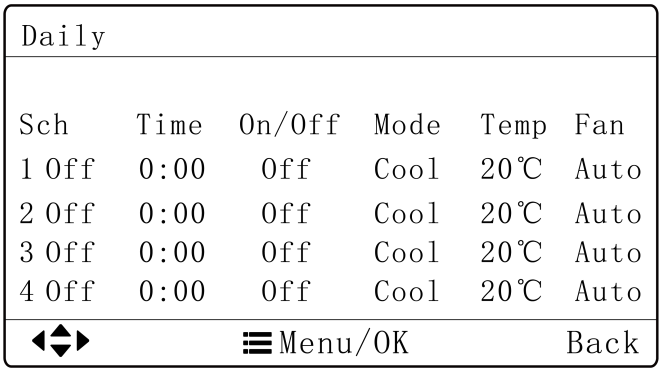
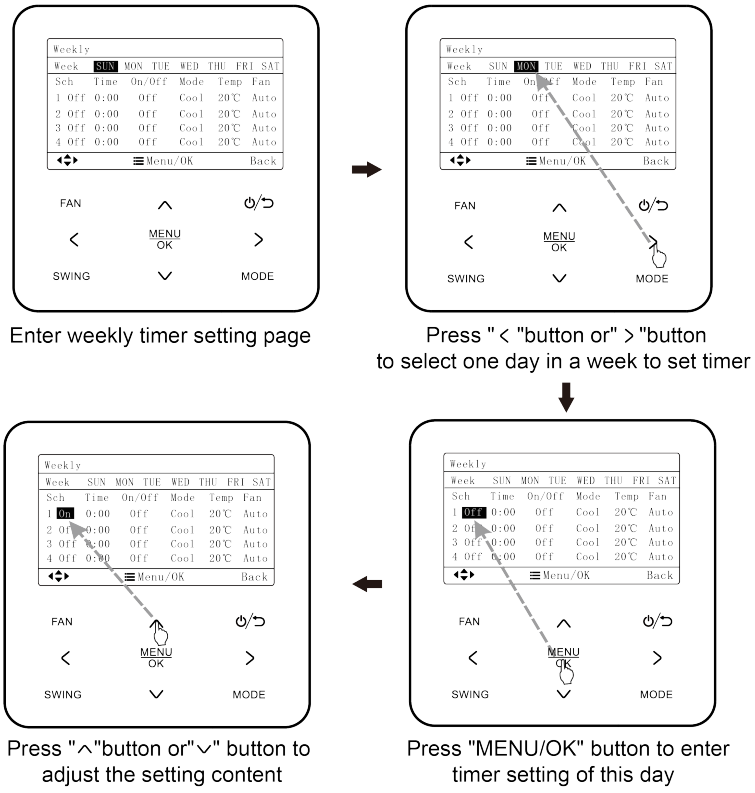


Figure 4-11 Daily timer setting page

When entering to daily timer setting page, press “<” or “>” button to select the setting item, press “∧” or “∨” button to set the value and then press “MENU/OK” button to save the setting.

4.7.2 Weekly Timer Setting

Users can set the timer for each day in a week, and they can also set 4 timer periods for each day. The unit will execute corresponding timer setting on weekly basis circularly. When entering weekly timer setting page, press “<” or “>” button to select one day in a week, press “MENU/OK” button to go to its timer setting, press “<” or “>” button to select the item, press “∧” or “∨” button again to adjust the setting content and then press “MENU/OK” button to save the setting. When all timer settings have been saved, press “⏻/⮌” button to exit from this page. Please refer to the figure as below:



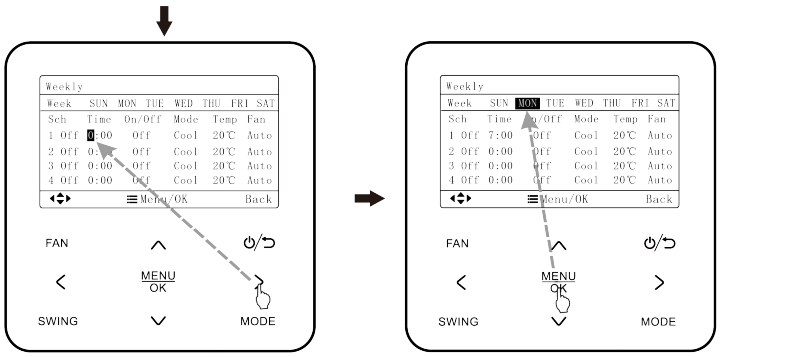


Figure 4-12 Weekly timer setting

When entering to weekly timer setting page, press “<” or “>” button to select the setting item, press “∧” or “∨” button to set the value and then press “MENU/OK” button to save the setting.

4.7.3 Two-week Timer Setting

Users can set the timer for each day in two weeks and they can also set 4 timer periods for each day. The unit will execute corresponding timer setting on two-week circularly. Select “Two Week” on the timer interface and then press “MENU/OK” button to enter into two-week timer menu. Please refer to the figure as below.

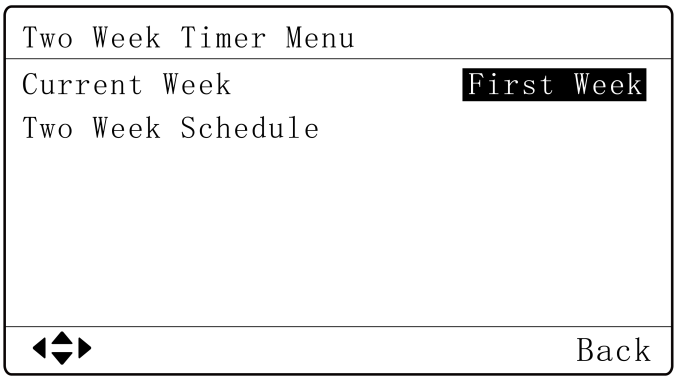


Figure 4-13 Two-week timer menu

Select the item of “Two Week Schedule”, press “MENU/OK” button to enter into its setting page, select the item of “Current Week” and then press “<” or “>” button can set the current week as the first week or the second week.

When entering two-week timer page, users can press “∧” or “∨” button to select the setting items for two-week time, and then press “MENU/OK” button to go to two-week timer setting page. When entering two-week timer setting page, press “<” or “>” button to select one day in two weeks, press “MENU/OK” button to go to its timer setting, press “<” or “>” button to select the item, press “∧” or “∨” button again to

adjust the setting content and then press “MENU/OK” button to save the setting. Press “⏻/⮌” button to exit from this page. Please refer to the figure as the “Weekly timer setting”.

4.7.4 Timer OFF Setting

As for “Timer OFF”, the unit will be turned off after operating for “x” hours. If the timer off has been set, when the unit has been turned on every time, it will be turned off automatically after operation for “x” hours.

When entering “Timer OFF” page, press “⋀” or “⋁” button to set the time for “Timer OFF”, set the time change at the interval of 0.5h and then press “MENU/OK” button to save the setting. If not save the setting, press “⏻/⮌” button turn it back. Please refer to the figure as below.

Figure 4-14 Timer OFF Setting Page

NOTE: The time is 12-hour format. The time on the timer setting page is displayed by 12-hour format.

5 ERROR DISPLAY

When there is error during operation, the temperature display zone on the wired controller will show the error code. If several errors happen at the same time, error codes will show on the display repeatedly.

NOTE: If error occurs, please turn off the unit and ask for professionals to repair it.

For example, E1 means system high pressure protection during operation.

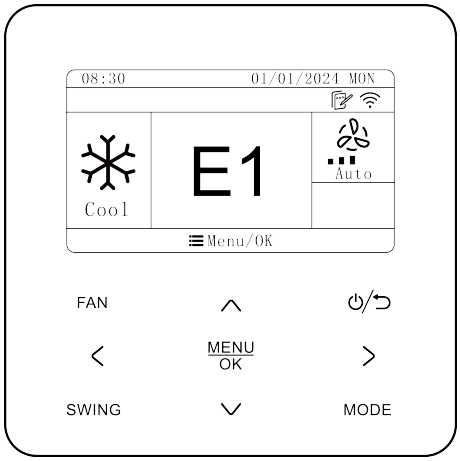


Figure 5-1 Display of Outdoor Unit High Pressure Protection

5.1 TABLE OF CODES OF UNIT

Code	Content
00	Standby Status (Main-board display, wired controller does not display)
08	Defrosting Status (Main-board display, wired controller does not display)
09	Oil Return Status (Main-board display, wired controller does not display)
oN	Operation Status (Main-board display, wired controller does not display)
A1	Outdoor Fan IPM Module Protection
A5	Outdoor Condenser Inlet Pipe Temperature Sensor Error
A6	Malfunction from Fan Driving Part to Main-control Communication
A8	Overheat Protection of Fan Radiator
A9	Fan Radiator Sensor Malfunction
AA	Fan AC Current Protection (input side)
Ab	Fan Drive Board Module Reset
Ac	Outdoor Fan Startup Failure
Ad	Outdoor Fan Out-of-phase Protection
AE	Outdoor Fan Current Detecting Circuit Error
AF	Fan PFC Abnormality
AH	Fan DC Busbar over Voltage Protection
AJ	Outdoor Fan Non-synchronism Protection
AL	Fan DC Busbar under Voltage Protection
An	Fan Drive Storage Chip Malfunction
AP	Fan AC Input Voltage Abnormality
Ar	Fan Driver Board Environment Temperature Sensor Malfunction
AU	Fan Charge Circuit Malfunction
b2	Subcooler Gas Inlet Temperature Sensor Error
b3	Subcooler Gas Outlet Temperature Sensor Error
b4	Subcooler Liquid Outlet Temperature Sensor Error
C0	Communication Error between Indoor Unit and Wired Controller
C1	Indoor Ambient Temperature Sensor Error
C2	Indoor Evaporator Middle Temperature Sensor Error
C3	Outdoor Condenser Middle Pipe Temperature Sensor Error
C4	ODU Jumper Cap Error
C6	Discharge Temperature Sensor Error
C7	Outdoor Pipe Middle Sensor Error
C8	Compressor DIP Switch/Jumper Cap Error
C9	Compressor Drive Storage Chip Error
CA	Inlet Pipe Temperature Sensor of Evaporator Error
Cb	Outlet Pipe Temperature Sensor of Evaporator Error
Cd	Abnormal Electrical Level of Selected Port
CE	Wired Controller Temperature Sensor Error
d1	DRED operation mode 1
d2	DRED operation mode 2
d3	DRED operation mode 3
dJ	AC Phase Sequence Protection (phase loss or phase reversal)

Code	Content
E0	Indoor Fan Error
E1	System High Pressure Protection
e1	High Pressure Sensor Error
E2	Freeze Protection
e3	Low Pressure Sensor Error
E3	Refrigerant Lacking Protection or System Low Pressure Protection
E4	Discharge Protection
EA	Refrigerant Leakage
EE	Memory Chip Read and Write Error
EH	Electric Heater Operation Error
EL	Emergency Operation Stop
F3	Outdoor Ambient Temperature Sensor Error
FE	Malfunction of Refrigerant Sensor
FJ	Air Outlet Temperature Sensor Error
H5	Module Current Protection
H7	Compressor Non-synchronism
HC	PFC Overcurrent Error
L3	Outdoor Fan 1 Error
L4	Wired Controller Power Supply Circuit Failure
L5	Wired Controller Power Supply Overcurrent Protection
L6	Group-controlled IDU Quantity Inconsistency
LA	Outdoor Fan 2 Error
Lc	Startup Failure
LE	Compressor Stalling
LF	Overspeed
oE	Other Error of Compressor
P0	Drive Module Reset
P5	Overcurrent of Compressor Phase Current
P6	Drive Board Communication Error
P7	Module Temperature Sensor Circuit Error
P8	Module Temperature Protection
P9	AC Contactor Protection
PA	ODU AC Current Protection
Pd	Sensor Connection Protection (current sensor hasn’t been connected to corresponding U phase or V phase)
PE	Temperature Shifting Protection
PF	Drive Board Ambient Temperature Sensor Error
PH	High Voltage Protection of DC Bus
PL	Low Voltage Protection of DC Bus
PP	DC Input Voltage Error
PU	Capacitor Charging Error
q0	Low Voltage Protection or Voltage Drop Error of Inverter Indoor Fan Drive DC Bus
q1	High Voltage Protection of Inverter Indoor Fan Drive DC Bus
q2	Inverter Indoor Fan AC Current Protection (input side)
q3	Inverter Indoor Fan Drive IPM Module Protection

Code	Content
q4	Inverter Indoor Fan Drive PFC Protection
q5	Inverter Indoor Fan Startup Failure
q6	Inverter Indoor Fan Out-of-phase Protection
q7	Inverter Indoor Fan Drive Module Reset
q8	Inverter Indoor Fan Overcurrent Protection
q9	Inverter Indoor Fan Power Protection
qA	Inverter Indoor Fan Drive Current Detecting Circuit Error
qb	Inverter Indoor Fan Non-synchronism Protection
qC	Main Control and Inverter Indoor Fan Drive Communication Error
qd	Inverter Indoor Fan Drive Module High Temperature Protection
qE	Inverter Indoor Fan Drive Module Temperature Sensor Error
qF	Inverter Indoor Fan Drive Storage Chip Error
qH	Inverter Indoor Fan Drive Charging Circuit Error
qL	Inverter Indoor Fan Drive AC Input Voltage Abnormal Protection
qo	Inverter Indoor Fan Drive Electric Box Temperature Sensor Error
qp	Inverter Indoor Fan Drive AC Input Zero-crossing Protection
U1	Compressor Phase Current Circuit Detecting Error
U2	Compressor Phase Loss/Phase Reversal/Out of Phase
U3	DC Bus Voltage Drop Error
U5	Current Detecting Error of Complete Unit
U7	4-way Valve Commutation Error
U9	Fan AC Contractor Protection or Input Zero Crossing Error
UL	Outdoor Fan Overcurrent Protection
UP	Fan Power Protection

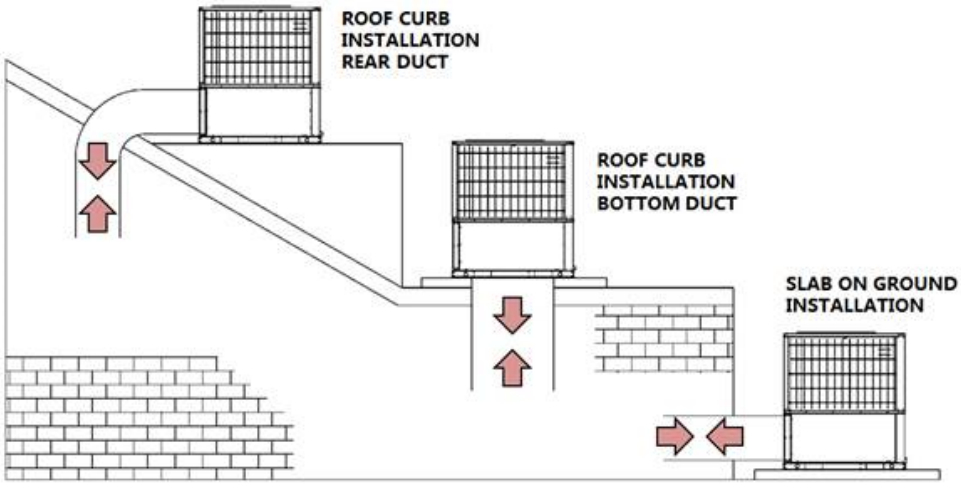
INSTALLATION

1 UNITS INSTALL

1.1 INSTALLATION POSITIONS

To ensure the unit in proper function, selection of installation location must be in accordance with following principles.

(1) Unit shall be installed so that the air discharged by outdoor fan will not return and that sufficient space for repair shall be provided around the unit.
(2) The installation site must have good ventilation, so that the unit can take in and exhaust enough air.
(3) Place of installation shall be strong enough to support the weight of unit, and it shall be able to insulate noise and prevent vibration. Ensure that the wind and noise from the unit will not affect your neighbors.
(4) Avoid direct sunshine over the unit. It is better to set up a sun shield as the protection.
(5) Place of installation must be able to drain the rainwater and defrosting water.
(6) Place of installation must ensure the unit will not subject to the influence of rubbish or oil fog.
(7) The installation site must be at a place where the air exhaust outlet does not face strong wind.
(8) Unit must be fixed on stable and solid surface of floor.



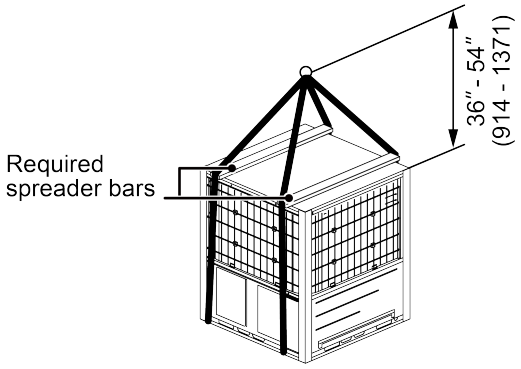
1.2 MATTERS NEED ATTENTION

1.2.1 Lifting Method

Do not remove the unit's package materials before installation. Keep unit upright and do not drop. Rig the unit by attaching chain or cable slings to the lifting holes in base rails.

Place the unit on roof curb and maintain the clearance between the roof curb and the base rail inside at 1/4inch. (6.4mm). After unit is position, remove rigging skids and package materials.

Unit: inch(mm)



NOTICE	
(1)	Spreader bars must required in order to prevent rigging straps from damaging unit.
(2)	All panels must be in place when rigging.
(3)	The height between the top of unit and the rigging cables' connection point should be 36-54inch (914-1371mm).

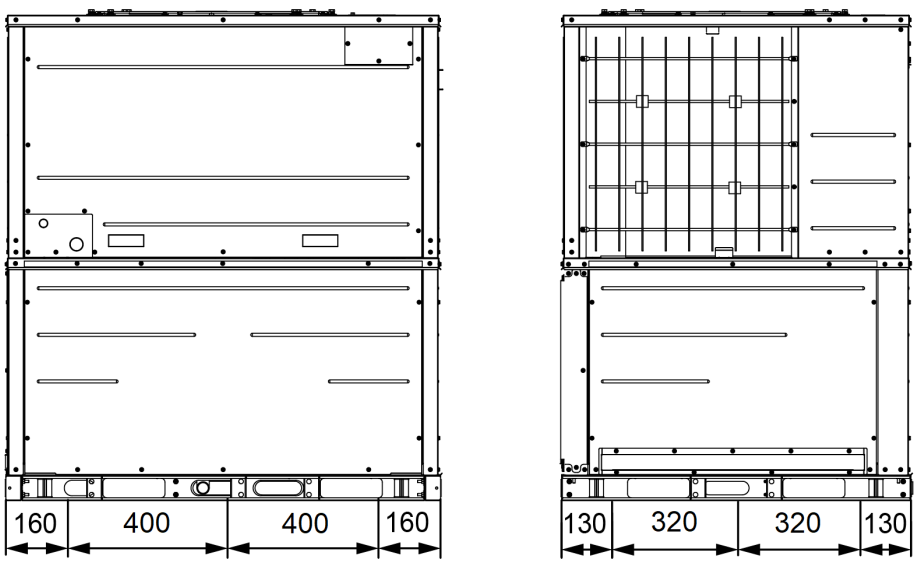
1.2.2 Installation Pedestal

The unit must be laid on horizontal pedestal that is rigid. It is advised that pedestal is made of concrete.

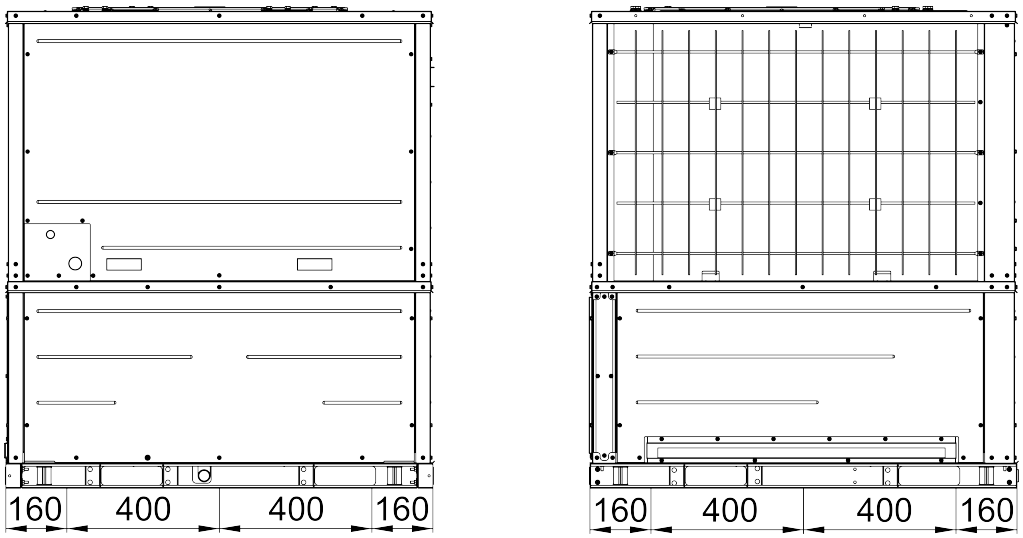
The high dimension of the pedestal must larger than the dimension that needed for drainpipe installation. And the unit must be fixed on the pedestal with bolt. The location of pedestal must be able to support the weight of the unit. If not, the unit may be overturning, declining or falling off in an extreme circumstance (just like earthquake, typhoon).

The unit installation holes size is as show as below:

Unit: mm



GK-H02TC/NhA-D(U), GK-H03TC/NhA-D(U)



GK-H04TC/NhA-D(U), GK-H05TC/NhA-D(U)

NOTES:

① The diagram may be different from actual model. The diagram is for pedestal made of concrete.

② The high dimension of the pedestal must be enough to install drainpipe.

1.2.3 Duct work

The design and installation of air ducts must be in conformity with the relevant local engineering criteria.

Ductwork is to be constructed in a manner that limits restrictions and maintains suitable air velocity.

The air supply duct, the air intake duct must be covered with a layer of thermal insulation, so as to avoid thermal leakage and condensation.

The air supply ducts and the air intake ducts shall be fixed by the prefabricated boards of the ceiling by using iron supports. The joints of the ducts must be sealed by glue so as to avoid leakage.

The edge of the air intake duct must be at least 150mm away from the wall.

Silencing and shock absorption shall be considered in the design and installation of the air ducts. Additionally, the noise source must be far away from where people stay. The air intake shall not be located above the place where users stay (offices and rest places, etc.).

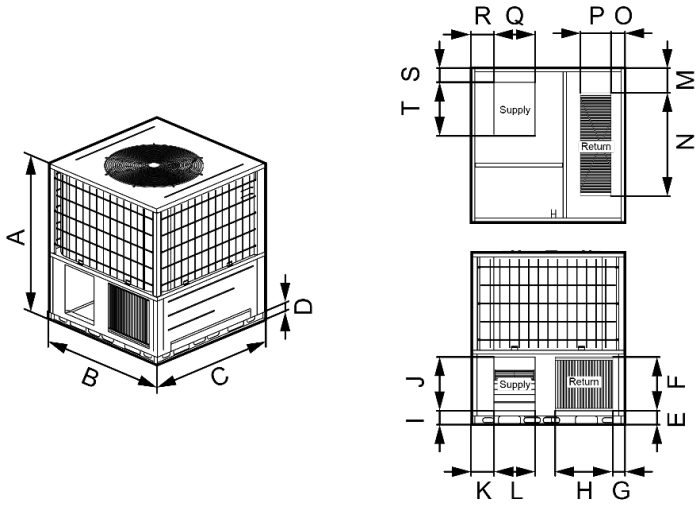
Do not terminate the air return duct in an area that can introduce toxic or objectionable fumes/odors into the ductwork.

Each installation must include a return air filter. This filtering may be performed at the unit or externally such as a return air filter grille.

Building condition and maintenance convenience should be taken into consideration when selecting the installation method.

1.3 DIMENSION

1.3.1 Dimension of Units



Unit: inch(mm)

Dimension	A	B	C	D
	49-1/4 (1250)	44 (1120)	35-7/16 (900)	2-1/2 (65)

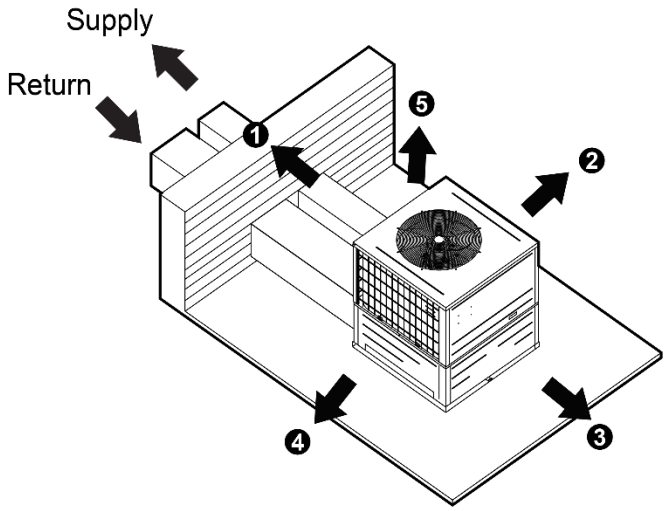
	Side air vents							
	E	Size of air return		G	I	Size of air supply		K
		F	H			J	L	
GK-H02TC/NhA-D(U) GK-H03TC/NhA-D(U)	4-7/16 (113)	17-8/16 (445)	16-9/16 (420)	3-7/16 (87)	3-15/16 (101)	15-6/16 (390)	11-13/16 (300)	6-3/16 (157)
	Buttom air vents							
	M	Size of air return		O	R	Size of air supply		S
		N	P			Q	T	
	5-14/16 (149)	23-1/16 (586)	8-10/16 (219)	3-11/16 (93)	6-3/16 (156)	11-14/16 (302)	13-12/16 (350)	3-10/16 (92)

Dimension	A	B	C	D
	49-1/4 (1250)	44 (1120)	44 (1120)	2-1/2 (65)

	Side air vents							
	E	Size of air return		G	I	Size of air supply		K
		F	H			J	L	
GK-H04TC/NhA-D(U) GK-H05TC/NhA-D(U)	4 (101)	15-3/8 (390)	16-1/2 (420)	3-3/8 (87)	4 (101)	15-3/8 (390)	11-3/4 (300)	6-1/2 (166)
	Buttom air vents							
	M	Size of air return		O	R	Size of air supply		S
		N	P			Q	T	
	7-7/8 (199)	28 (711)	9 (228)	3-3/4 (96)	6-1/2 (166)	11-3/4 (300)	15-3/8 (390)	4 (103)

NOTE: Above diagrams may be different from actual model.

1.3.2 Installation Clearance Data



Installation clearances		
Dimension(minimum)	mm	inch
A	600	24
B	1100	43
C	860	34
D	1100	43
E	1524	60

NOTE: Above diagrams may be different from actual mode.

2 DRAIN PIPING WORK

2.1 INSTALLATION PROCEDURE

After the unit is installed, it is required to check the level of the whole unit. The unit must be placed horizontally to ensure the unit in proper function.

When shipped out from factory, both the condensate outlets are blocked by rubber plug. So before installation, please take the rubber plug out. Condensate removal is performed by attaching a PVC pipe to the drain pan and terminated in accordance with local or state Plumbing/HVAC codes.

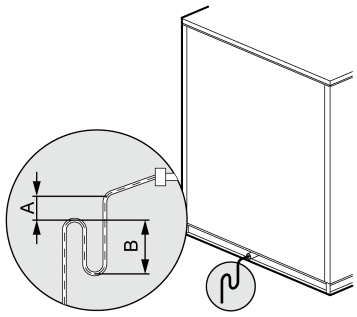
The indoor coil condensate drain ends with a threaded 3/4” (NPT) or 1-1/5" stub tube. A trap must be built for proper condensate drainage and to prevent debris from being drawn into the unit.

2.2 MATTERS OF ATTENTION

The condensate pipe shall be installed with an inclining angel of 5~10°, so as to facilitate the drainage of condensate.

As the inside of the unit is in the negative pressure status, it is required to set up a backwater elbow. The requirement is: A=B≥P/10+20(mm), P is the absolute pressure inside the unit. The unit of the pressure is Pa.

After the electrical installation is completed, carry out the testing of the drainage system.



NOTE: Above diagrams may be different from actual mode.

Drain connection size(inch)	3/4"(NPT)

3 ELECTRIC WIRING WORK

3.1 WIRING PRINCIPLE

3.1.1 Precautions

(1) Before connecting lines, read the unit nameplate for message about voltages, circuit ampacity, capacity, and so on. Then carry out line connection according to the schematic diagram.

(2) The air-conditioning unit shall have special power supply line which shall be equipped with electricity leakage switch and air switch, so as to deal with overload conditions. Moreover, leakage switch must be tested for availability in each month (press TEST button on the switch to test).

(3) The air-conditioning unit must have grounding to avoid hazard owing to insulation failure.

(4) Lay out power cords through cable trough or wiring pipe. Make power cord connect into electric box through the cable-cross loop to avoid scratch of it by edges of sheet metal.

(5) Keep distance between power line and low voltage connections above 150mm.

(6) All line connections must conform to the schematic diagram. Wrong connection may cause abnormal operation or damage of the air-conditioning unit.

(7) Do not let any cable contact the refrigerant pipe, the compressor and moving parts such as fan.

(8) Do not change the internal line connections inside the air-conditioning unit. The manufacturer shall not be liable for any loss or abnormal operation arising from wrong line connections.

(9) If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

(10) All the supplied components, material, and electric operation should be accorded with the local principles.

3.1.2 Connect Wiring to the Terminals

CAUTIONS:

Please note the following items before installing the electric appliance.

(1) Check if the power supply accords with its value on the nameplate.

(2) The capacity of the power supply must be large enough.

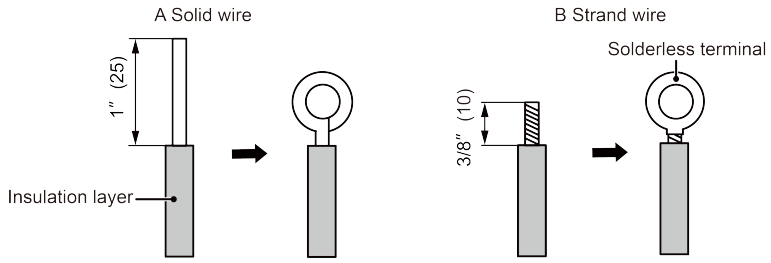
(3) The circuit should be installed by the professional technician.

(4) In fixed circuit, there must be electricity leakage protection switch of enough power capacity and air switch with space between its electrode contacts ≥ 3mm.

(5) Single wire connection.
1) Peel off the insulation for 25mm with pliers.
2) Remove the screw from the terminal board.
3) Bend the peeled wire into circle with pliers.
4) Screw crosses the circle and fix it on the terminal board.

(6) Strand wires connection.
1) Peel off the insulation for 10mm with pliers.
2) Remove the screw from the terminal board.
3) Clamp a round terminal of the peeled wires.
4) Screw crosses the circle and fix it on the terminal board.

Unit: mm



3.1.3 Electrical Connections-supply Voltage:

(1) Air-conditioning unit with single-phase power supply.
1) Remove the electric box cover of the unit.
2) Pass the cable through rubber ring.
3) Connect the power supply cable to the terminals and the grounding screw.
4) Use cable fastener to bundle and fix the cable.

(2) Low Voltage Connections

Low voltage wiring is to be copper conductors. The wire size of the communication line should be no less than 0.75mm^2 .

1) Remove the electric box cover of the unit.
2) Pass the signal cable of the wire controller through rubber ring.

3) Connect the signal cable to the “H1”, “H2” terminals.

4) Use cable fastener to bundle and fix the cable.

CAUTIONS:

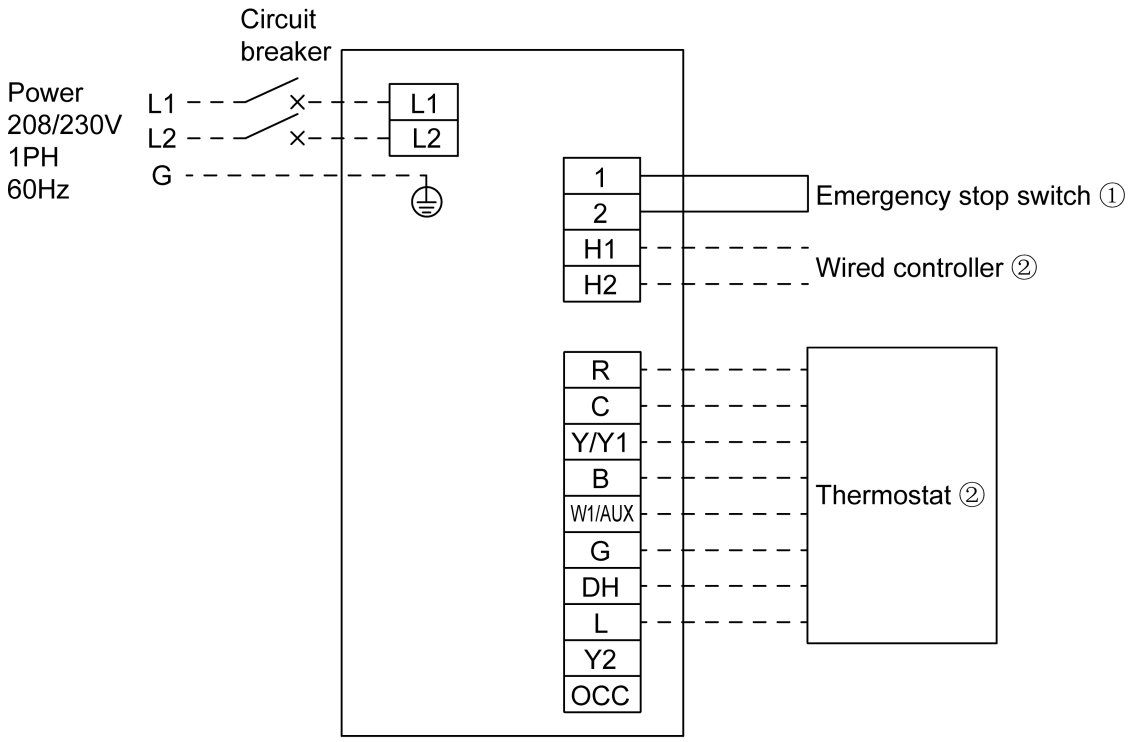
Take great care when carrying out the following connections, so as to avoid malfunction of the air-conditioning unit because of electromagnetic interference.

The signal line of the wire controller must be separated from the power line.

In case the unit is installed in a place vulnerable by electromagnetic interference, it is better to use shielded cable or double-twisted cable as the signal line of the wire controller.

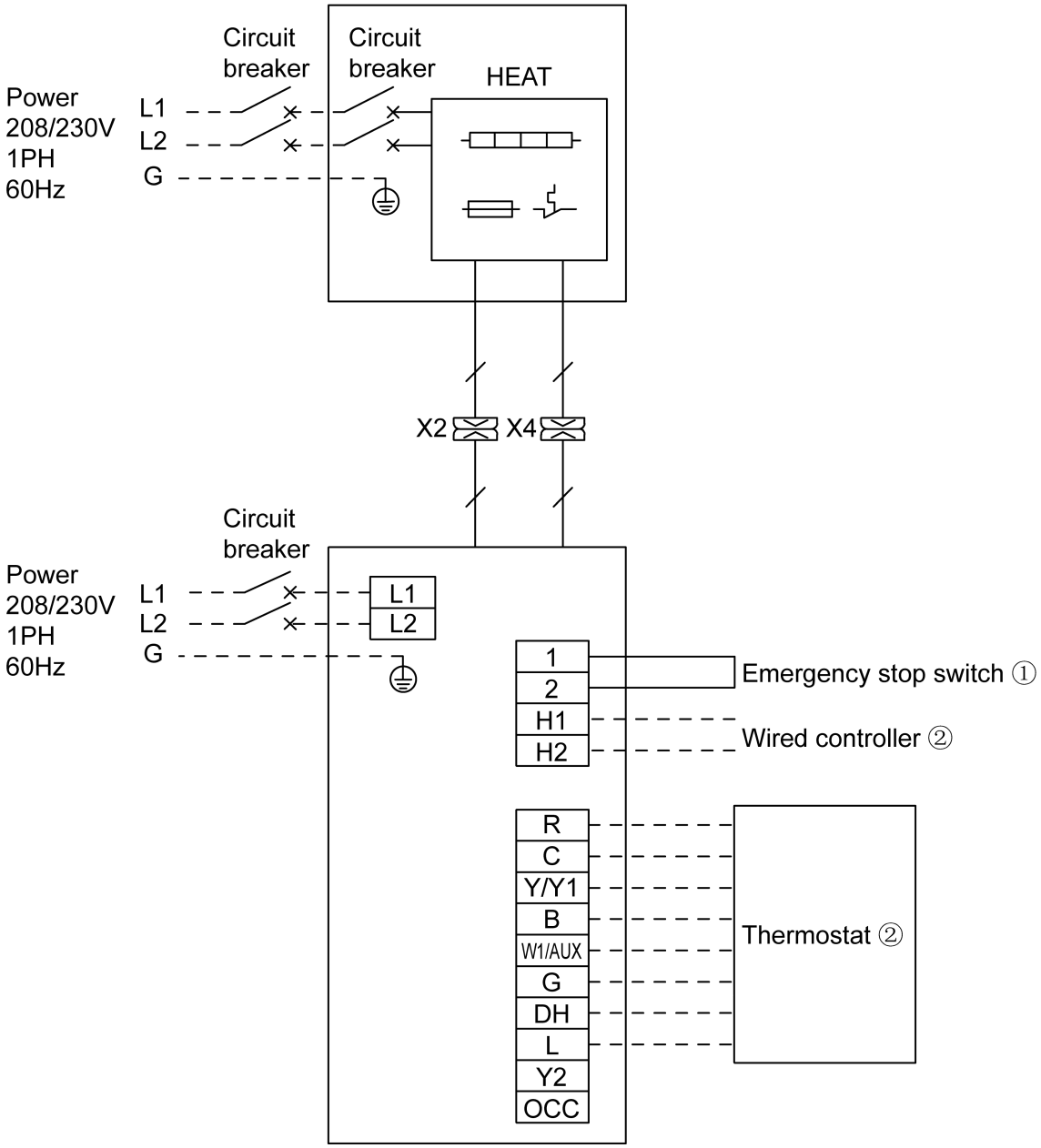
3.2 ELECTRIC WIRING DESIGN

Without electric heater：



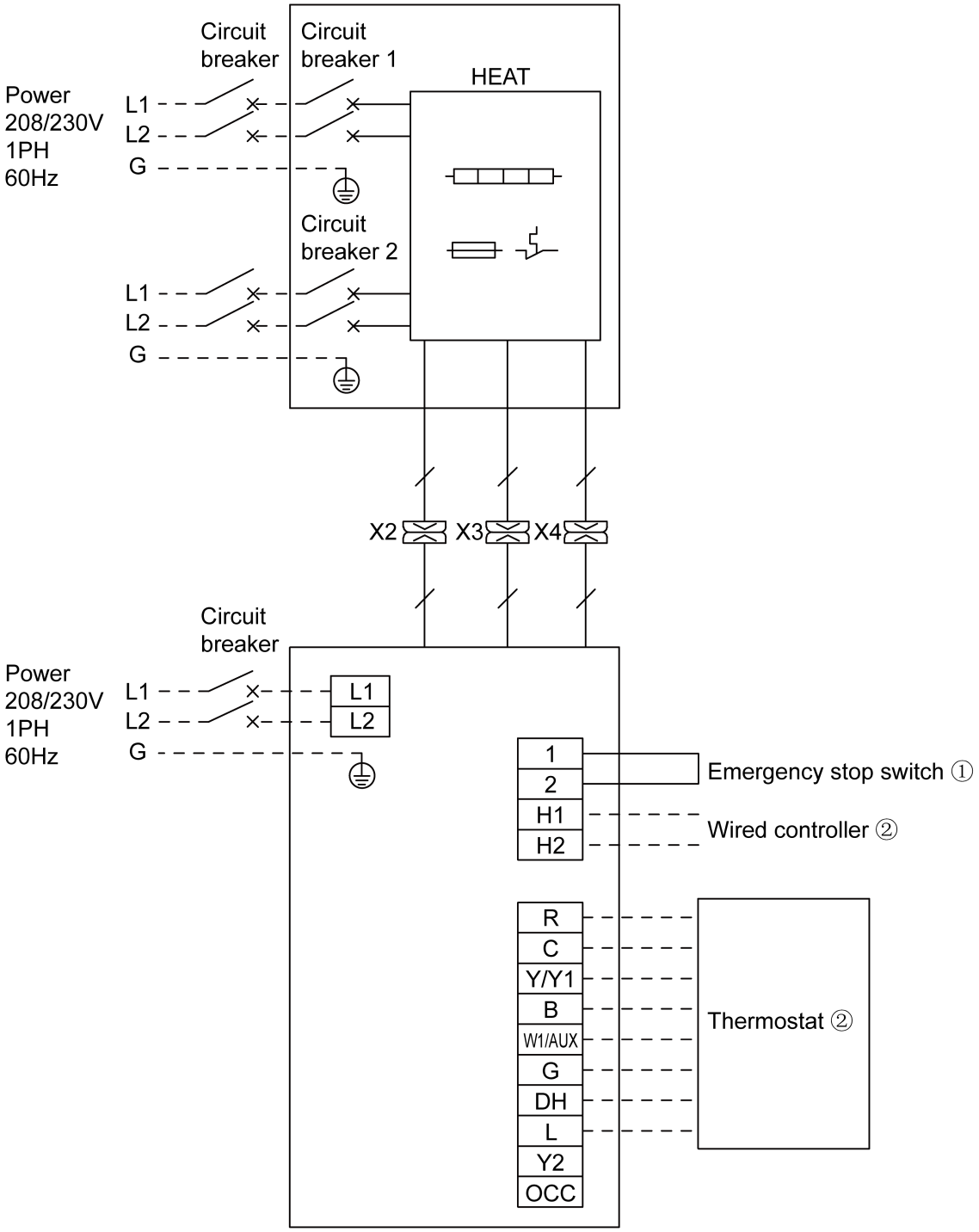
Note:
①. The factory has been short-circuited, when the user needs to connect the emergency stop switch, please remove the corresponding short-circuit wire.
②. The unit can only be connected to a thermostat or wire controller.

With electric heater：



Note:
①. The factory has been short-circuited, when the user needs to connect the emergency stop switch, please remove the corresponding short-circuit wire.
②. The unit can only be connected to a thermostat or wire controller.

Figure with LYQ-08-F



Note:
①. The factory has been short-circuited, when the user needs to connect the emergency stop switch, please remove the corresponding short-circuit wire.
②. The unit can only be connected to a thermostat or wire controller.

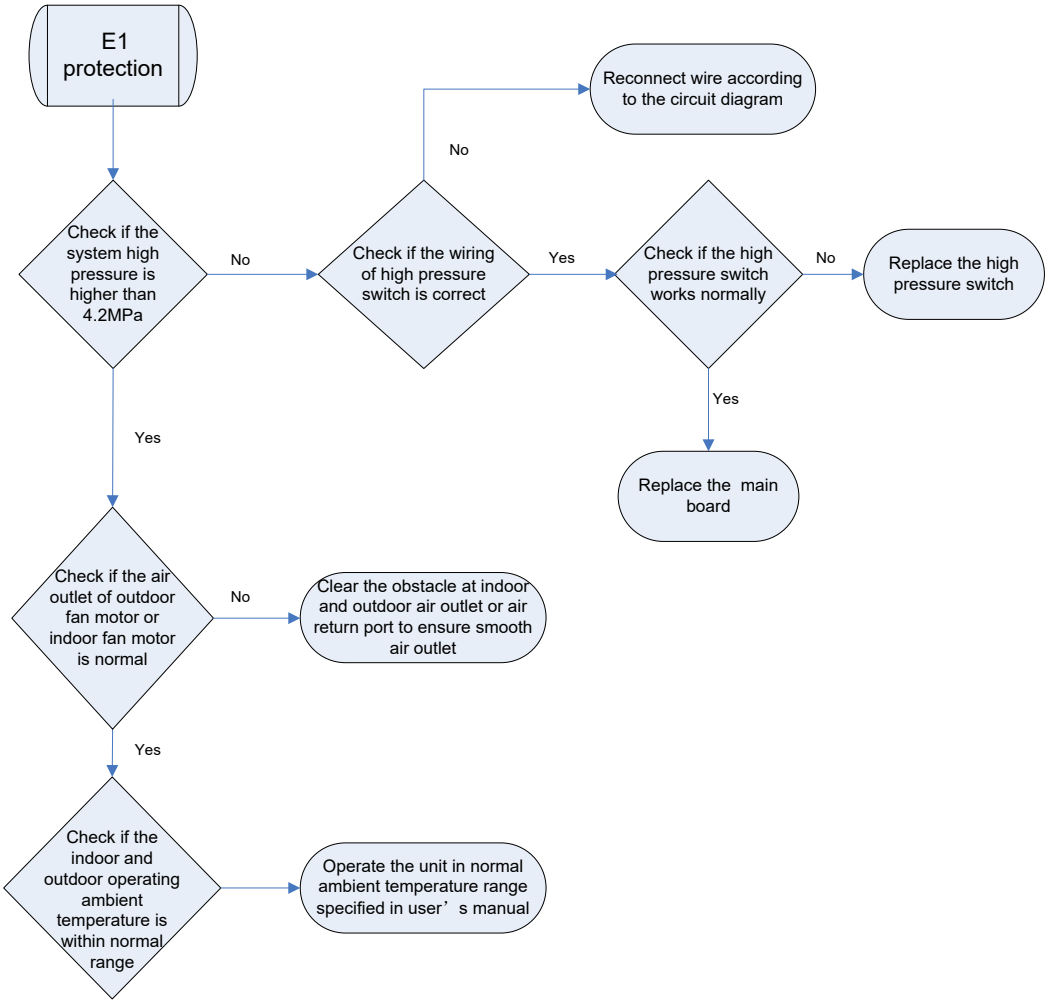
Figure with LYQ-08-G, LYQ-08-H

MAINTENANCE

1 FLOW CHART OF TROUBLESHOOTING

1.1 TROUBLESHOOTING FLOW CHART OF MAIN CONTROL MALFUNCTION

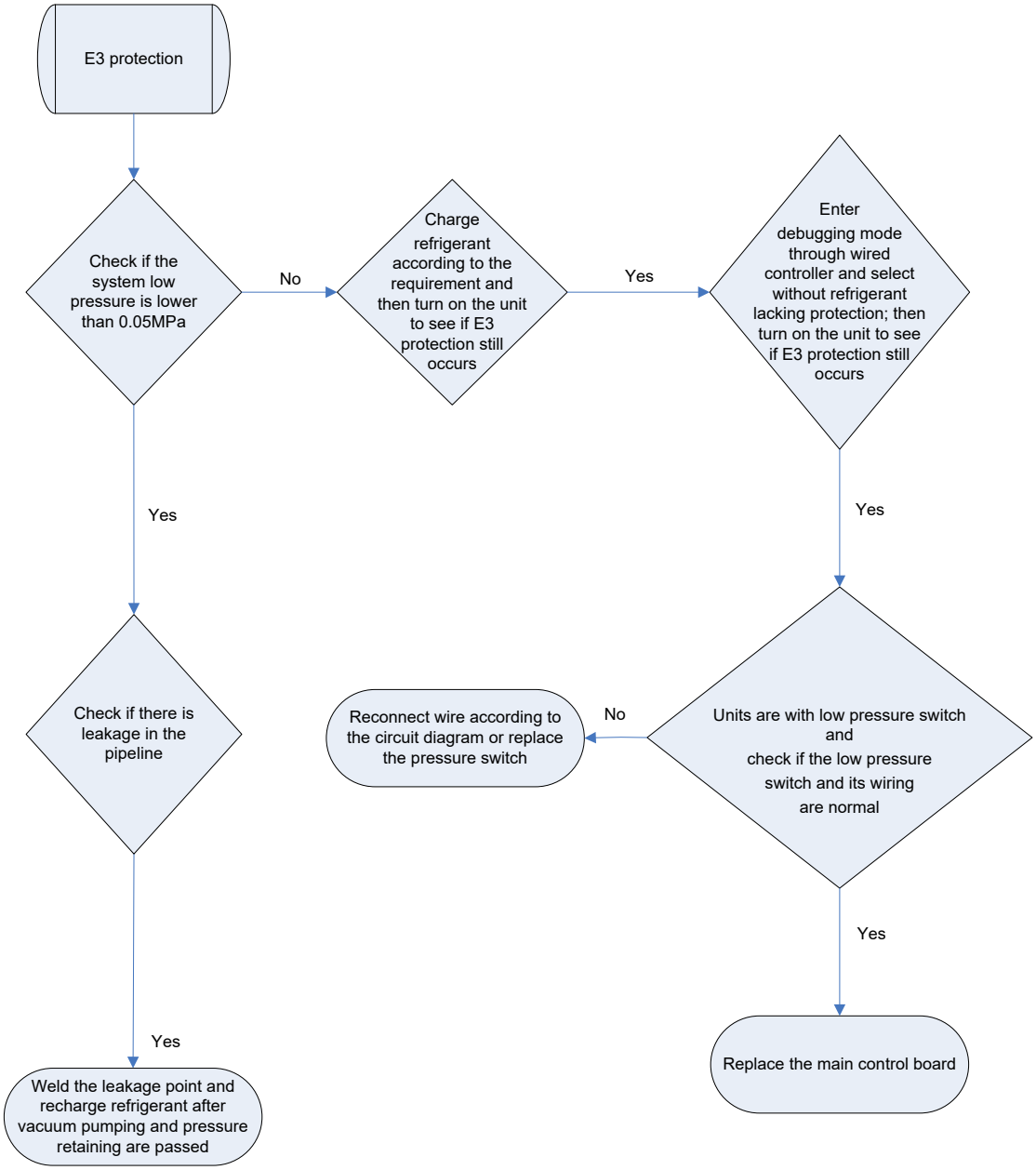
◆ **E1 System High Pressure Protection**



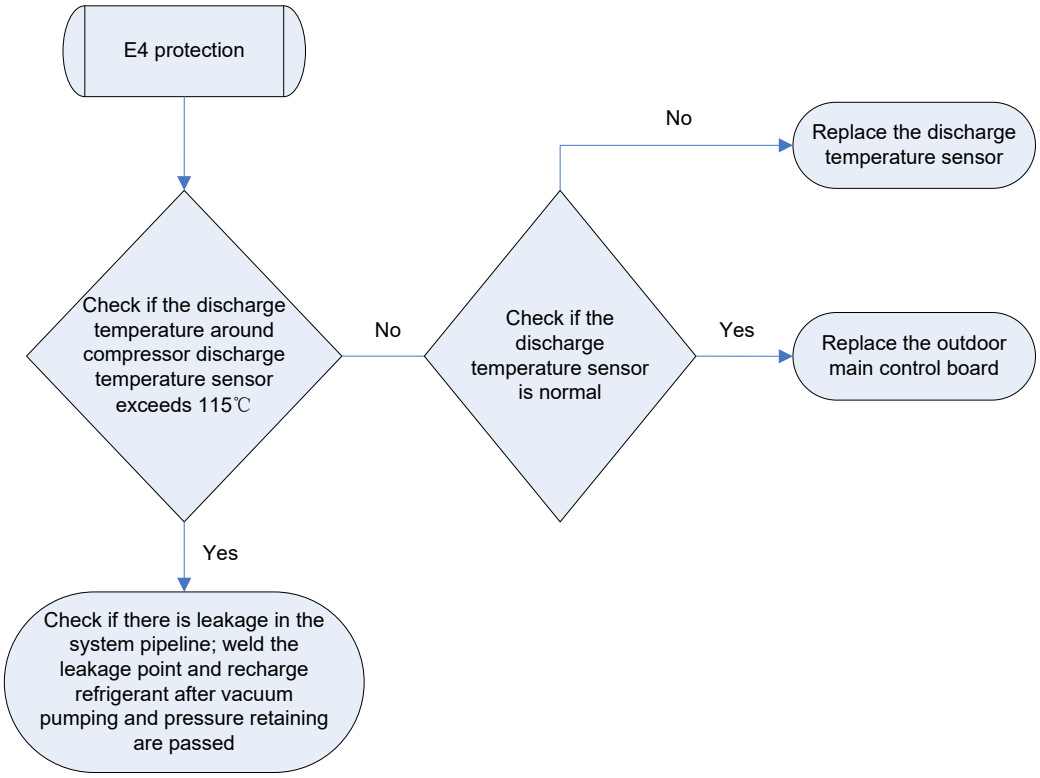
◆ **E2 Freeze Protection**

Freeze protection is normal protection but not abnormal malfunction. If freeze protection occurs frequently during operation, please check if the indoor filter is with filth blockage or if the indoor air outlet is abnormal. The user is required to clean the filter, check the air outlet and air return pipe periodically to ensure smooth air return and air outlet.

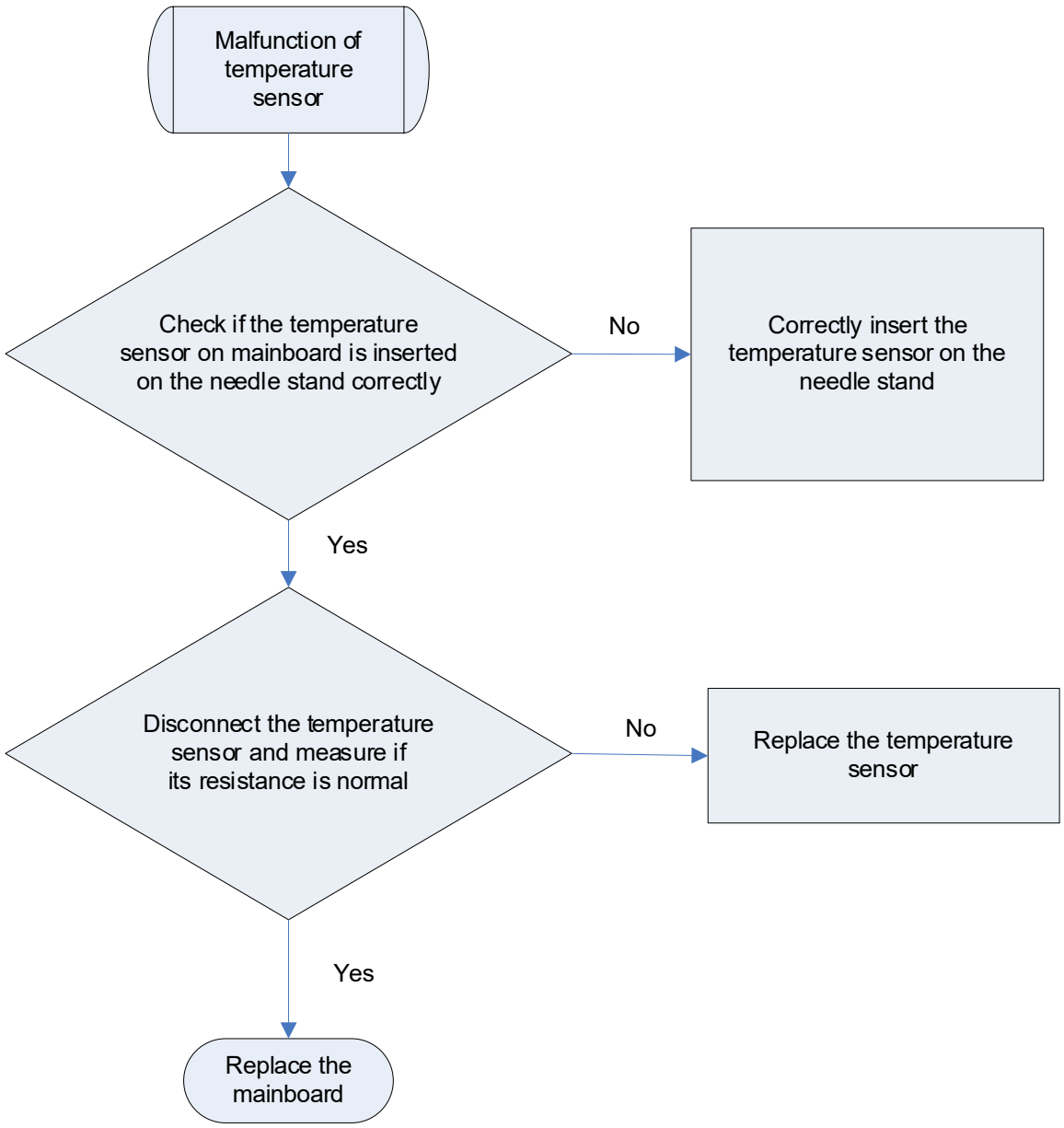
◆ E3 Refrigerant Lacking Protection or System Low Pressure Protection



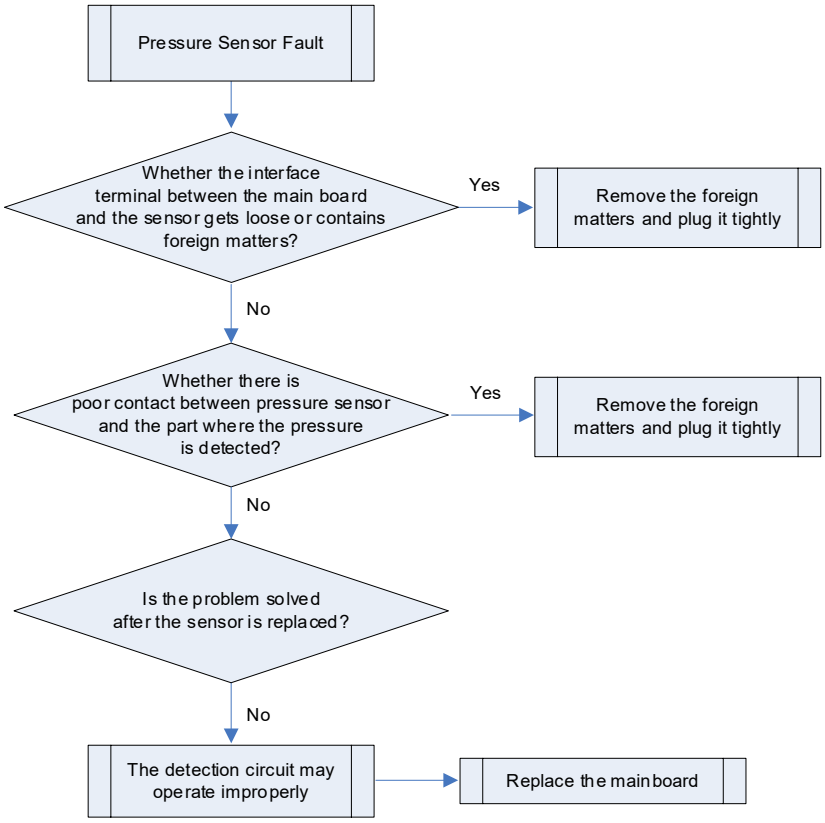
◆ E4 Discharge Protection



- **A5 Outdoor Condenser Inlet Pipe Temperature Sensor Error**
- **A7 Outdoor Condenser Outlet Pipe Temperature Sensor Error**
- **b2 Subcooler Gas Inlet Temperature Sensor Error**
- **b3 Subcooler Gas Outlet Temperature Sensor Error**
- **b4 Subcooler Liquid Outlet Temperature Sensor Error**
- **C1 Indoor Ambient Temperature Sensor Error**
- **C6 Discharge Temperature Sensor Error**
- **CA Inlet Pipe Temperature Sensor of Evaporator Error**
- **Cb Outlet Pipe Temperature Sensor of Evaporator Error**
- **F3 Outdoor Ambient Temperature Sensor Error**
- **FJ Air Outlet Temperature Sensor Error**



- **e1 High Pressure Sensor Error**
- **e3 Low Pressure Sensor Error**



- **EA Refrigerant Leakage**

Fault diagnosis:

The unit is equipped with a refrigerant sensor. When the sensor detects refrigerant leak, the mainboard or wired controller displays error code “EA”, and emits an alarm sound. And the fan of the indoor unit will be forced to open, stop the outdoor unit.

Possible causes:

The piping system has a refrigerant leak. It could be the piping, or it could be the heat exchanger.

Troubleshooting:

Find the leak on the unit, complete the leak repair, and re-evacuate and recharge the refrigerant.

- **FE Malfunction of Refrigerant Sensor**

Fault diagnosis:

The unit is equipped with a refrigerant sensor. The sensor has a lifetime of 15 years. At the end of lifetime or when the sensor fault, the mainboard or wired controller displays error code "FE", and emits an alarm sound. And the fan of the indoor unit will be forced to open, stop the outdoor unit.

Possible causes:

Refrigerant sensor life has ended or sensor error, or the sensor communication cable is not properly connected.

Troubleshooting:

Check the sensor wiring. If it cannot be resolved, replace with a new sensor.

◆ **E0 Indoor Fan Error**

Fault diagnosis:

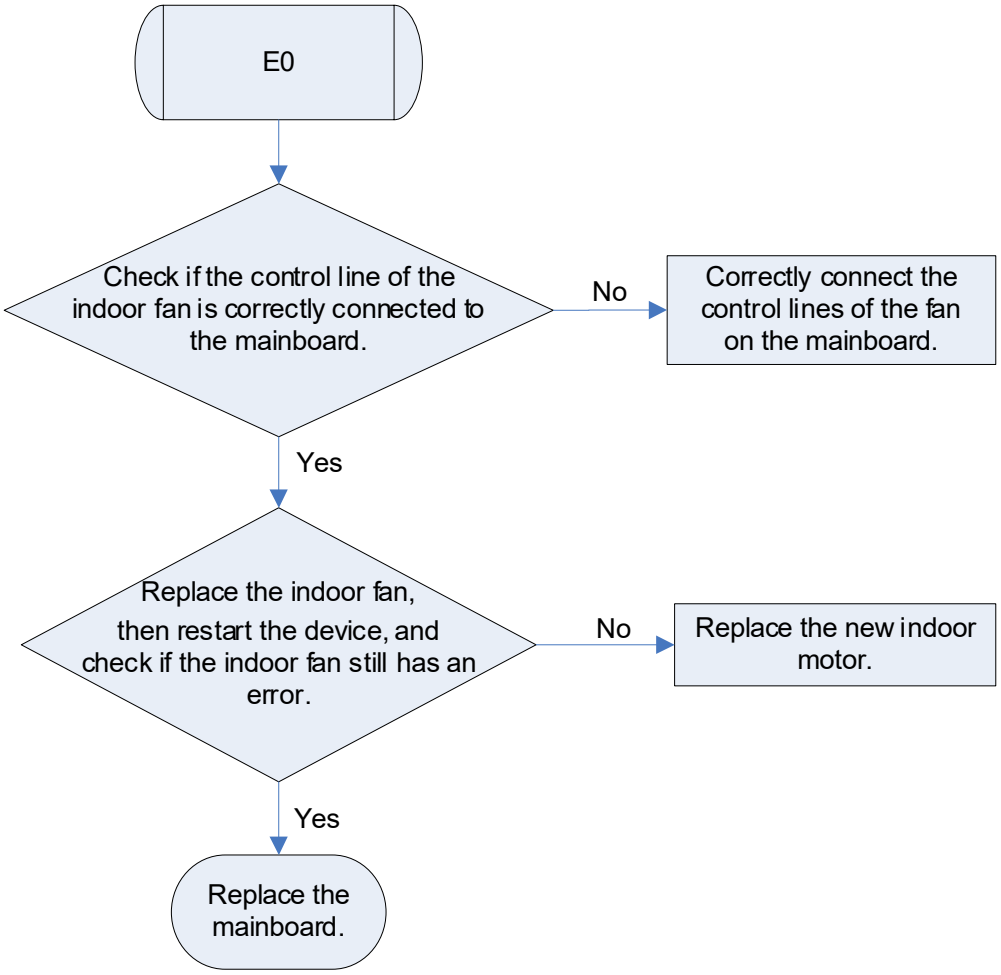
Check if the rotating speed of indoor fan is too slow, or stops, or protection signal of indoor fan is transferred. If yes, it is judged that indoor fan protection occurs.

Possible reason:

■ Motor stops operation or it is blocked.

■ Mainboard is abnormal.

Troubleshooting:



1.2 TROUBLESHOOTING FLOW CHART OF DRIVE MALFUNCTION

◆ **P0 Drive Module Reset**

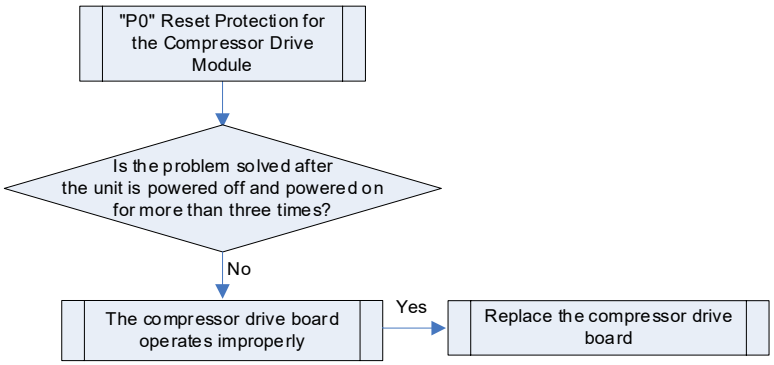
Fault diagnosis:

If the fault code displayed on the unit's mainboard or wired controller displays is “P0”, it indicates the reset protection for the compressor drive board.

Possible causes:

The compressor drive operates improperly.

Troubleshooting:



◆ **P7 Module Temperature Sensor Circuit Error**

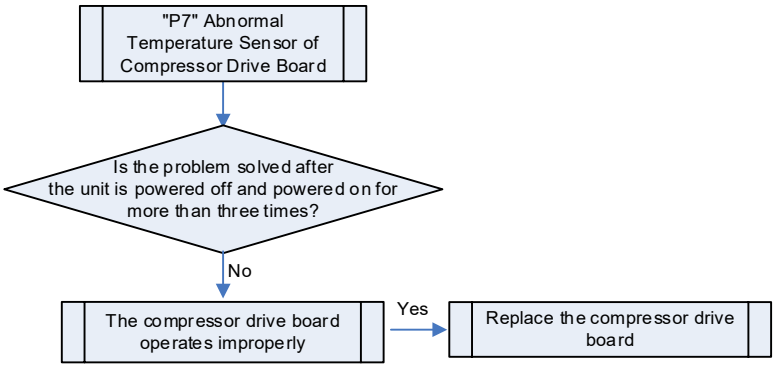
Fault diagnosis:

If the fault code displayed on the unit's mainboard or wired controller is “P7”, it indicates the abnormal temperature sensor of compressor drive board.

Possible causes:

The compressor drive board operates improperly.

Troubleshooting:



◆ **PH High Voltage Protection of DC Bus**

Fault diagnosis:

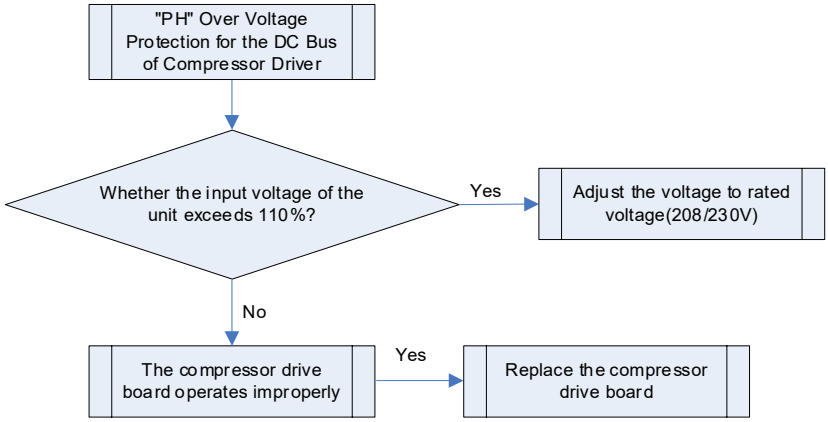
When the input power cable of the main board has a voltage over 110%, the unit triggers protection against faults.

Possible causes:

■ The unit's input power cable has a voltage exceeding 110%;

■ The compressor drive board operates improperly.

Troubleshooting:



◆ **PL Low Voltage Protection of DC Bus**

Fault diagnosis:

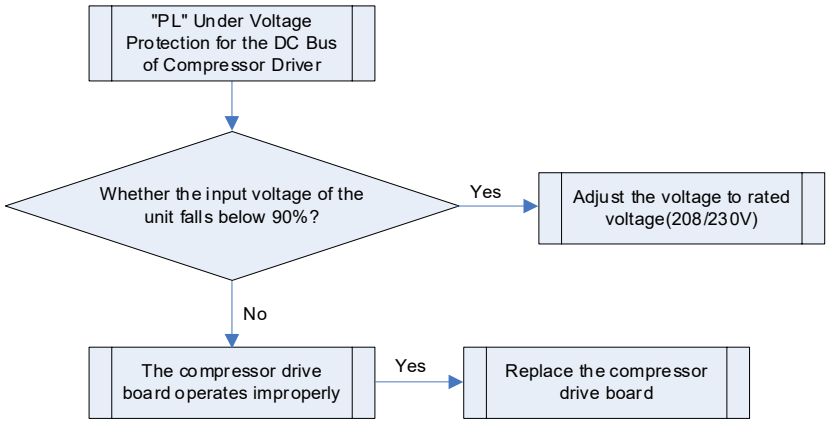
When the input power cable of the main board has a voltage below 90%, the unit triggers protection against faults.

Possible causes:

■ The unit's input power cable has a voltage below 90%;

■ The compressor drive board operates improperly.

Troubleshooting:



◆ **P6 Drive Board Communication Error**

Fault diagnosis:

When the unit fails to detect inverter compressor driver for 30 consecutive seconds, the fault is generated.

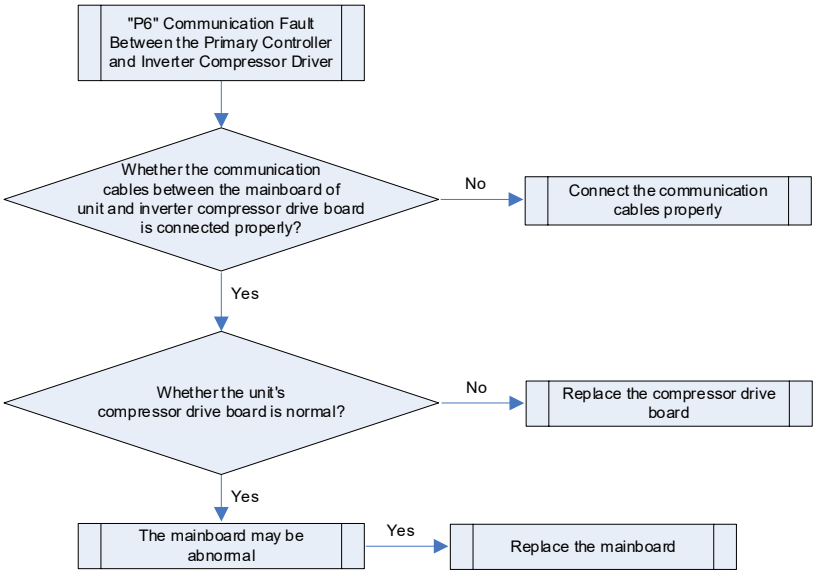
Possible causes:

■ The communication cables between the mainboard of unit and inverter compressor driver inside the module are connected improperly;

■ The inverter compressor driver operates improperly;

■ The mainboard operates improperly.

Troubleshooting:



◆ **Lc Compressor Startup Failure**

Fault diagnosis:

If the fault code displayed on the the unit's mainboard or wired controller is “Lc”, it indicates the inverter compressor startup failure.

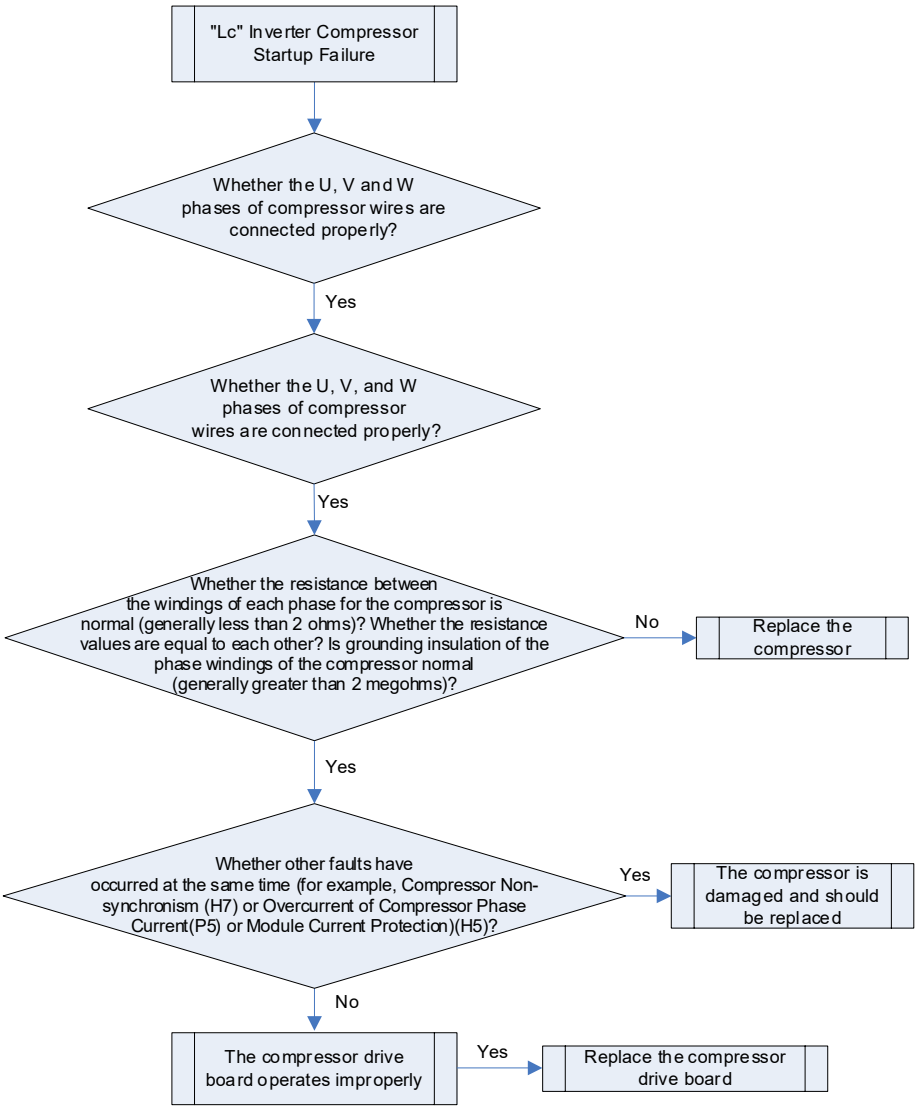
Possible causes:

■ Poor contact of compressor's UVW cables;

■ The compressor is damaged;

■ The compressor drive board operates improperly.

Troubleshooting:



- **H5 Module Current Protection**
- **P8 Module Temperature Protection**

Fault diagnosis:

If the fault code displayed on the the unit's mainboard or wired controller is “H5”, it indicates the module current protection.

If the fault code displayed on the the unit's mainboard or wired controller is “P8”, it indicates the module temperature protection.

Possible causes:

■ Poor contact of compressor's UVW cables;

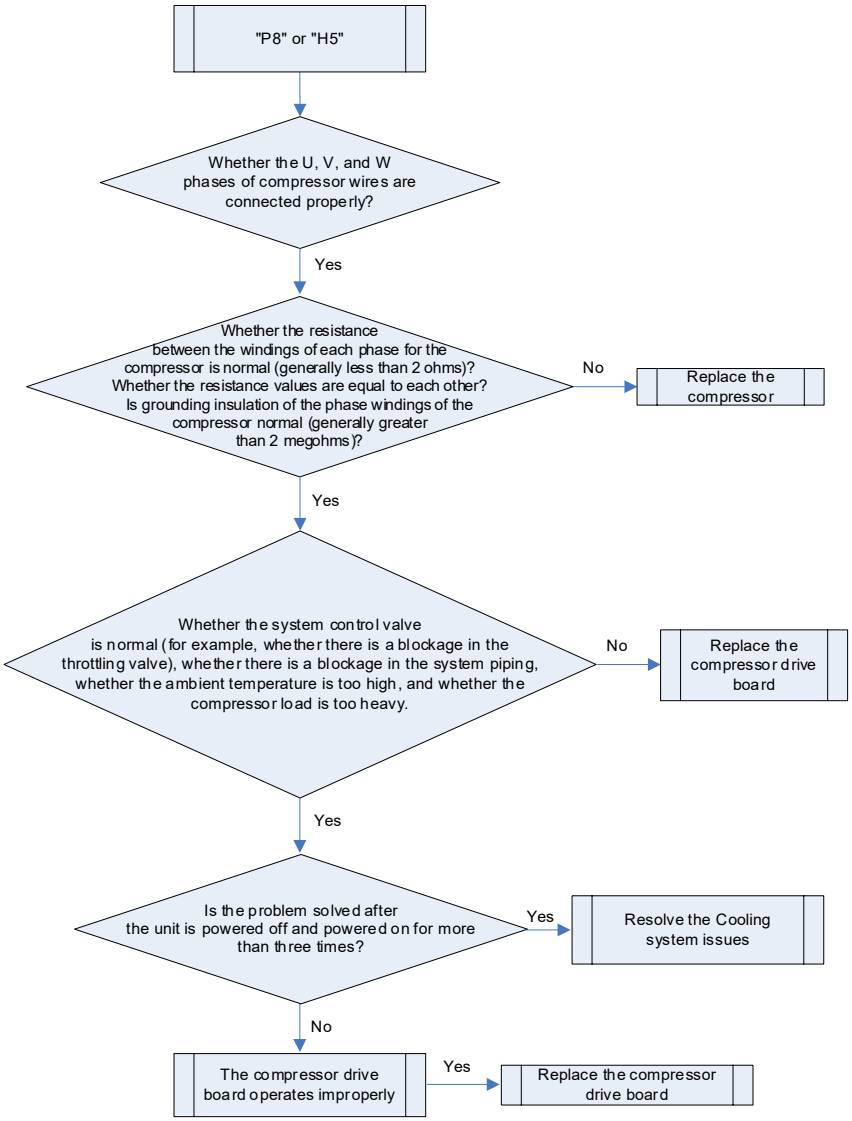
■ The compressor's UVW cables are wrongly connected;

■ The compressor is damaged;

■ The system is blocked;

■ IPM module of the compressor drive board is damaged.

Troubleshooting:



◆ **L3 Outdoor Fan 1 Error**

◆ **LA Outdoor Fan 2 Error**

Fault diagnosis:

Mainboard doesn't receive the signal of outdoor fan within 30s after the outdoor fan starts up.

Possible reason:

■ Outdoor fan wiring terminal is not correctly connected to the mainboard.

■ Outdoor fan is damaged.

■ If it is a new unit or a new motor has been replaced in the unit and the wire connection is correct, then probably it is the program that goes wrong.

◆ **A1 Outdoor fan IPM module protection**

Fault diagnosis:

When power is connected and drive chip received IPM lead F0 that is of low level, than it is IPM module malfunction. System will shut down for protection.

Possible reason:

■ Outdoor fan 3-phase wire connection is lack of phase or phase-reversed.

■ System is overloaded and outdoor fan current is too large.

■ Drive board IPM module is damaged.

■ Drive board IPM module's 15V power supply is lower than 13.5V.

■ Drive board 6-line PWM signal and the corresponding element are abnormal.

■ Drive board outdoor fan current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.

■ Compressor is damaged.

◆ **AJ Outdoor Fan Non-synchronism Protection**

Fault diagnosis:

During operation, it can't detect the rotor position and stops output. Or the actual running speed differs too much from the set running speed. In each case, outdoor fan runs out of step and system stops for protection.

Possible reason:

■ Outdoor fan 3-phase wire connection is lack of phase or phased-reversed.

■ Outdoor fan phase wire connection is bad.

■ System is blocked, short of refrigerant or compressor oil.

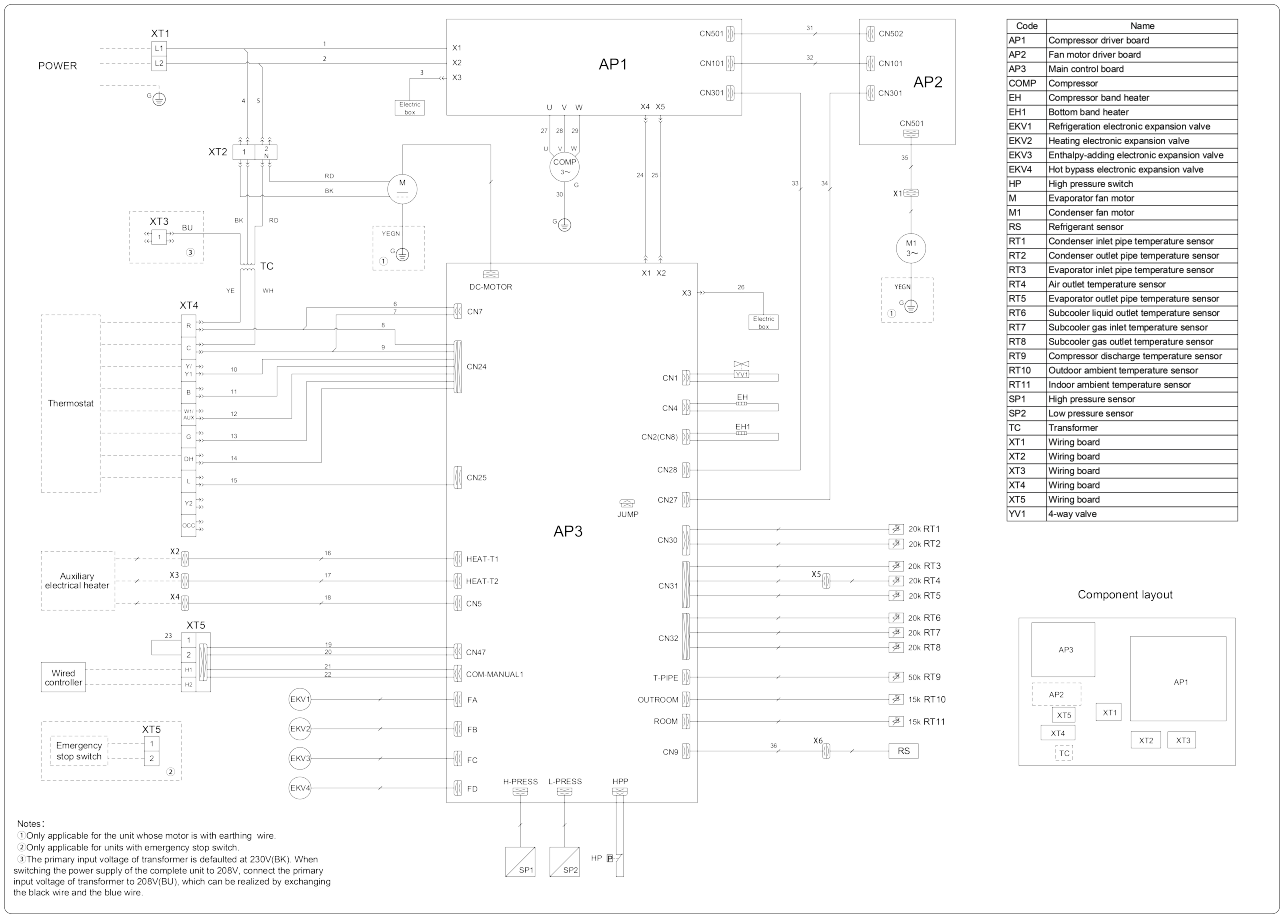
■ Drive board IPM module is damaged.

■ Drive board outdoor fan current sampling circuit element is damaged or drive chip current sampling AD terminal is abnormal.

■ Outdoor fan is damaged.

2 WIRING DIAGRAM

The actual wiring should always refer to the wiring diagram of the unit.



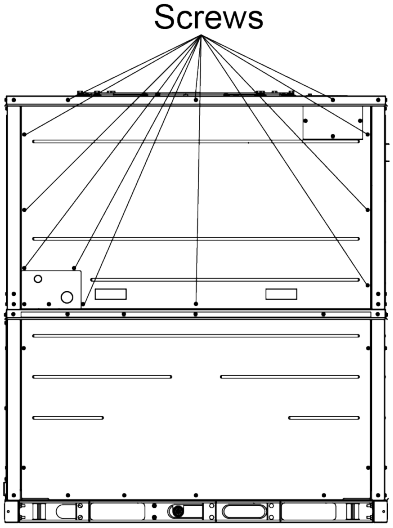
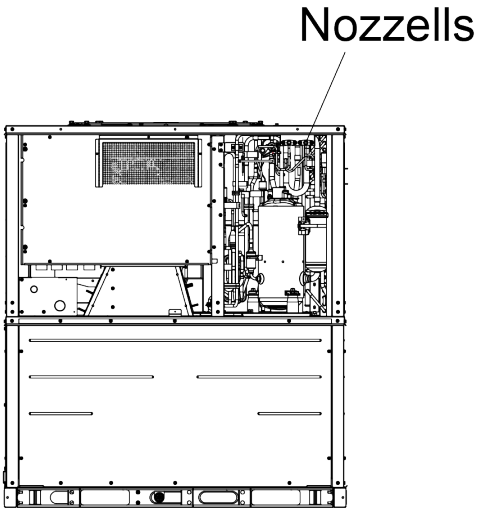
Code	Name
AP1	Compressor driver board
AP2	Fan motor driver board
AP3	Main control board
COMP	Compressor
EH	Compressor band heater
EH1	Bottom band heater
EKV1	Refrigeration electronic expansion valve
EKV2	Heating electronic expansion valve
EKV3	Enthalpy-adding electronic expansion valve
EKV4	Hot bypass electronic expansion valve
HP	High pressure switch
M	Evaporator fan motor
M1	Condenser fan motor
RS	Refrigerant sensor
RT1	Condenser inlet pipe temperature sensor
RT2	Condenser outlet pipe temperature sensor
RT3	Evaporator inlet pipe temperature sensor
RT4	Air outlet temperature sensor
RT5	Evaporator outlet pipe temperature sensor
RT6	Subcooler liquid outlet temperature sensor
RT7	Subcooler gas inlet temperature sensor
RT8	Subcooler gas outlet temperature sensor
RT9	Compressor discharge temperature sensor
RT10	Outdoor ambient temperature sensor
RT11	Indoor ambient temperature sensor
SP1	High pressure sensor
SP2	Low pressure sensor
TC	Transformer
XT1	Wiring board
XT2	Wiring board
XT3	Wiring board
XT4	Wiring board
XT5	Wiring board
YV1	4-way valve

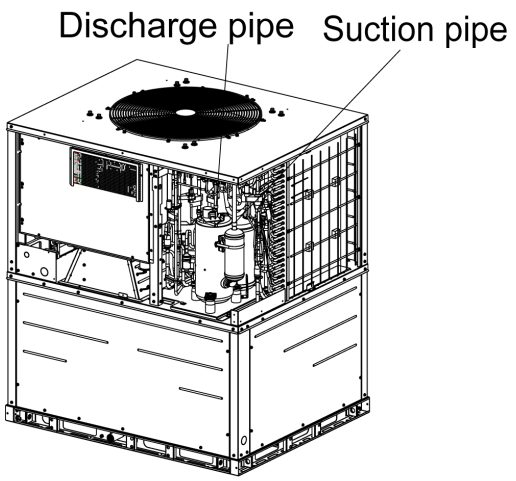
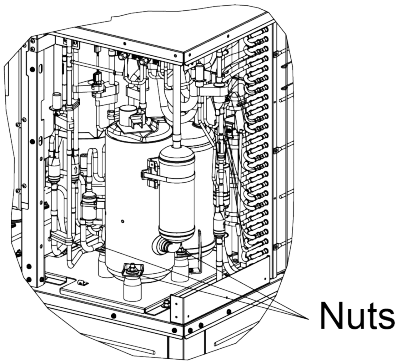
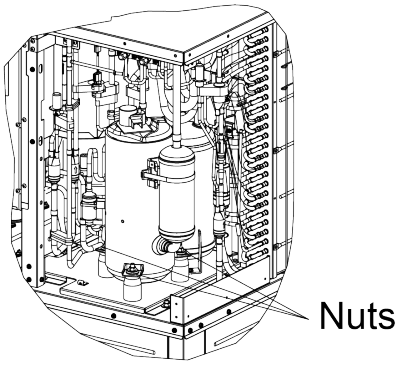
Component layout

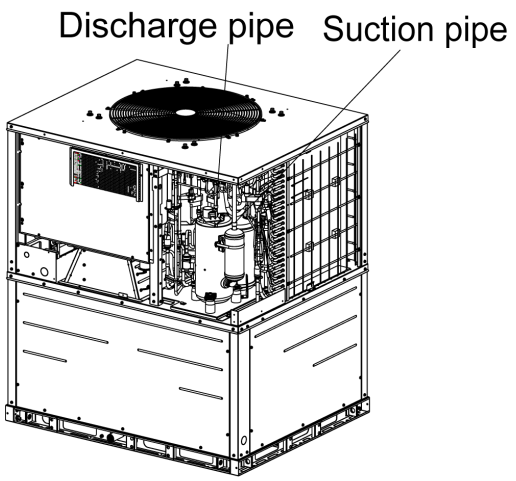
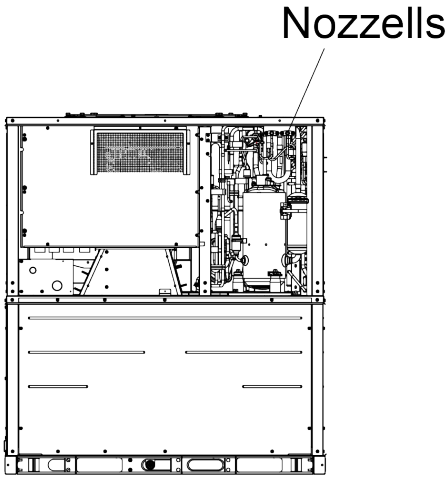
NOTE: Above data is subject to change without notice.

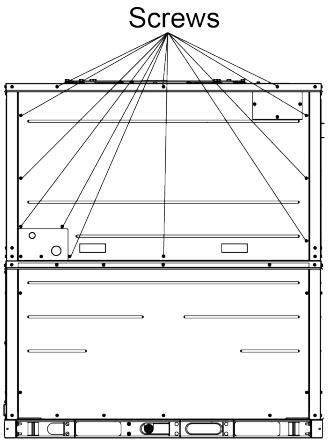
3 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

3.1 Model: GK-H02TC/NhA-D(U), GK-H03TC/NhA-D(U)

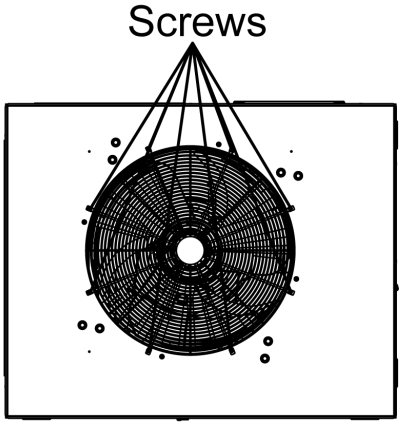
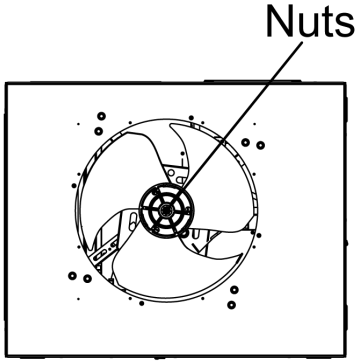
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
1. Open the front-panel.		● Unscrew the bolts (indicated by arrows).
2. Disconnect the power cord and condenser fan motor wires.	/	● Disconnect the power cord and condenser fan motor wires after remove the side plate. **NOTE:** Earmark the color of wire corresponding to the terminal when removing the wire to avoid mistakes when renewing wire connection.
3. Recover refrigerant in the system.		● Connect vacuum recovery tank with nozzle for adding freon for recovery of refrigerant. **NOTE:** Recovery work must be complete because refrigerant is badly hurtful to environment and animals.

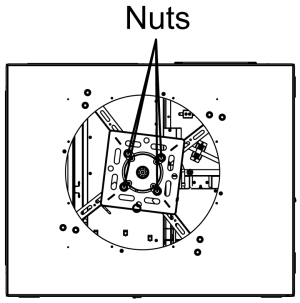
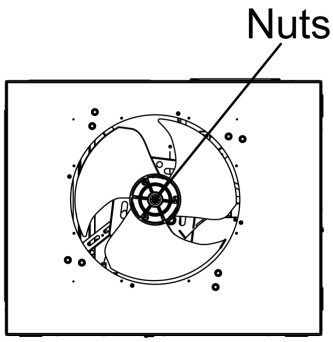
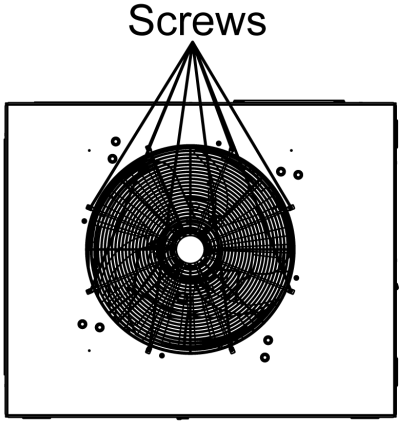
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
4. Remove the suction and discharge pipes.		● Heat the connection pipes indicated by arrows with fired heater and then draw out them. **NOTE:** Pay attention to things around to avoid burning out.
5. Remove the compressor from the chassis.		● Unscrew the nuts on compressor base with a wrench and then remove compressor from the base. **NOTE:** Keep compressor level and vertically out. Never invert it.
6. Install a new compressor on the chassis.		● Put the new compressor on the chassis as the direction during removing, and then screw down fixing nut on compressor base with a wrench. **NOTE:** Keep compressor level and vertically on to the base. Never incline or invert it.

Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
7. Connect the suction and discharge pipes of the compressor with system pipes.		● Heat the connection pipes indicated by arrows and then weld them with unit pipes together. **NOTE:** Pay attention to things around to avoid burning out.
8. Reconnect power cord of compressor.	/	● Reconnect the power cord into compressor according to the procedure of disconnecting power cord. The line connection must accord to the schematic diagram. **NOTE:** The connection box of compressor must be re-covered to resisting water. All cable cannot contact the pipe and moving parts such as fan.
9. Recharge refrigerant.		● Connect refrigerant tank with nozzle of low pressure (indicated by the maker) for recharging refrigerant. **NOTE:** Check the leak after finishing the connection pipes. Charge amount should be consistent with nameplate.

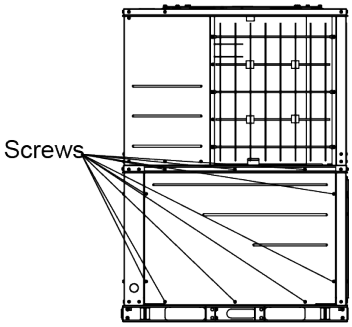
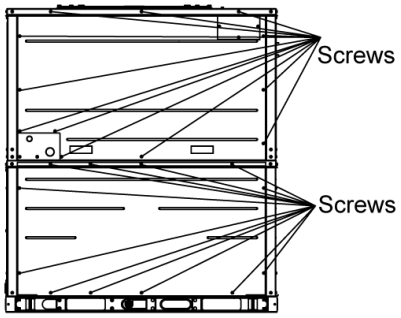
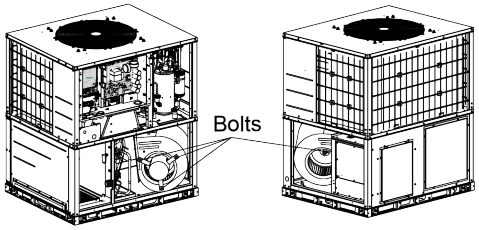
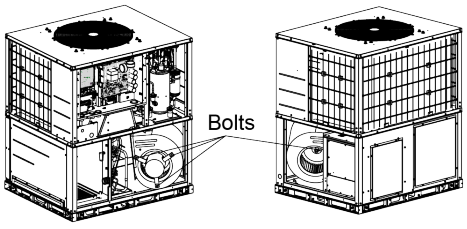
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
10. Close the front-panel.		● Tighten the bolts.

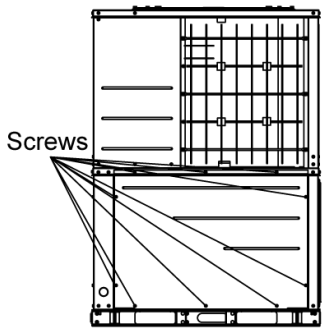
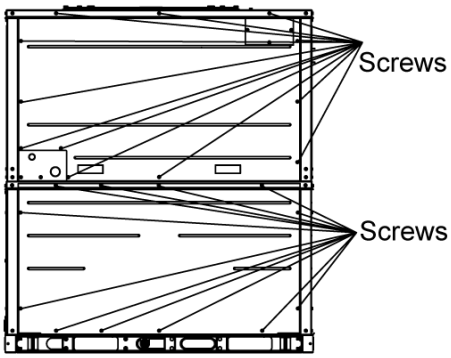
NOTE: Above diagrams may be different from actual model.

Disassembly and Assembly of Condenser Fan Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
1. Disconnect the electrical source wire.	/	● Disconnect all connection lines between condenser fan motor and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of condenser fan motor.
2. Remove the Rear Grill.		● Unscrew the screws fixing rear Grill(indicated by arrows) to remove it.
3. Remove the fan.		● Unscrew the screw (indicated by the arrow) fixing fan to remove the fan. **NOTE:** Fix the fan when unscrew the holding bolt to avoid fan from rotating and thereby injury to people is caused.

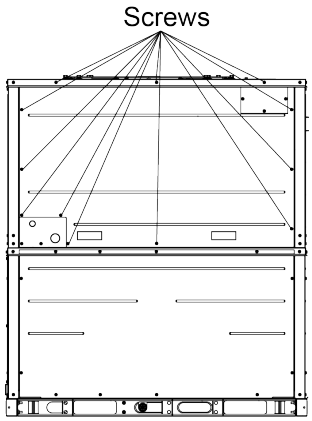
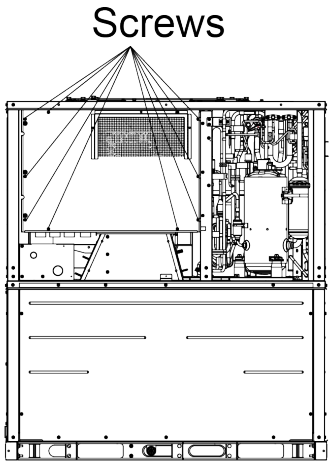
Disassembly and Assembly of Condenser Fan Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
4. Remove the motor from the bracket.	/	● Remove the holding bolt of motor firstly and then remove motor from bracket. **NOTE:** Loosen power cord fixed by bundles before removing motor.
5. Fix the new motor on to the bracket.		● Put the repaired or replaced motor onto bracket as the direction during removing. Then screw down the holding bolt with a wrench. **NOTE:** Please keep the motor level and vertical during installation. After that, fix the power cord with bundles at original locations.
6. Install and fix fan blade.		● Re-install fan blade and screw down the holding bolt indicated by the arrow with a wrench **NOTE:** Moment of force should be within 8-12N during screwing down bolt. After that, please charge glue into gap between bolt and hole to avoid loose of it.
7. Re-install the Rear Grill.		● Put the rear Grill back and tighten the screws.
8. Re-connect power cord.	/	● Re-connect power cord according to circuit mark adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. Close the cover plate of electric box hermetically. All cable cannot contact the pipe and moving parts such as fan.

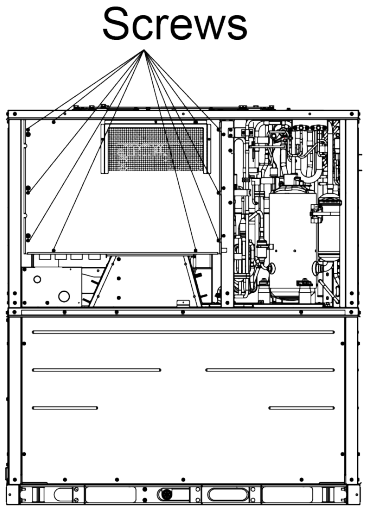
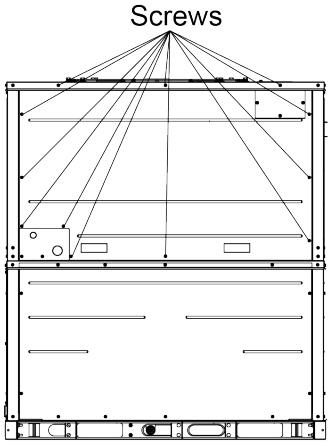
NOTE: Above diagrams may be different from actual model.

Disassembly and Assembly of Supply Blower Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
1. Remove the side plate.		● Unscrew the screws fixing side plate (indicated by arrows) to remove it.
2. Remove the front plate.		● Unscrew the screws fixing cover plate (indicated by arrows) to remove it.
3. Disconnect all connection lines.	/	● Disconnect all connection lines between motor and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of supply blower motor.
4. Remove the motor.		● Unscrew the nuts (indicated by arrows) to loosen the connection between motor and bracket.
5. Re-install the motor.		● Re-assemble repaired or replaced motor. Installation direction is the same as that during disassembly. Then screw down the holding bolts with a wrench.

Disassembly and Assembly of Supply Blower Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
6. Re-connect power cord.	/	● Re-connect power cord according to wiring diagram adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. All cable cannot contact the pipe and moving parts such as fan. Close the cover plate of electric box hermetically.
7. Re-install the side and front plate.	 	● Put pulleys onto shaft and then put taper sleeve. After that, cover the pulleys onto taper sleeve. Clockwise screw down the 2 bolts. **NOTE:** The sleeve has taper, so pulleys must be installed first. Ensure the coplanarity of pulleys, and adjust the tightness level of belt.

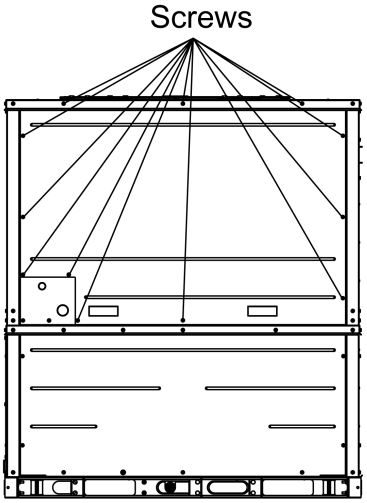
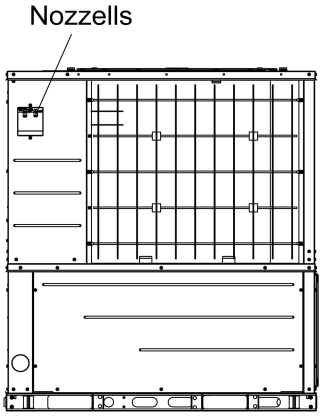
NOTE: Above diagrams may be different from actual model.

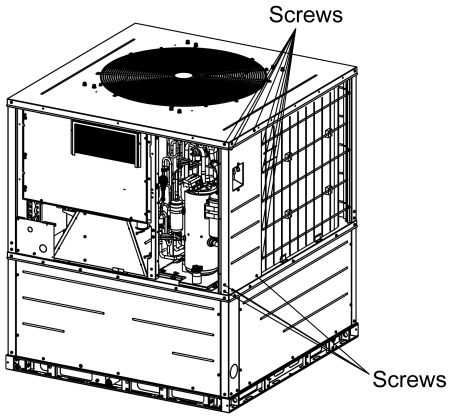
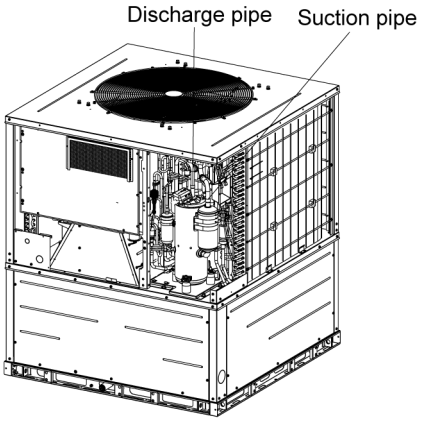
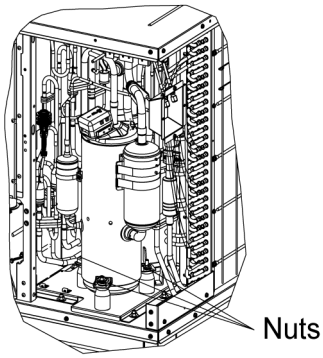
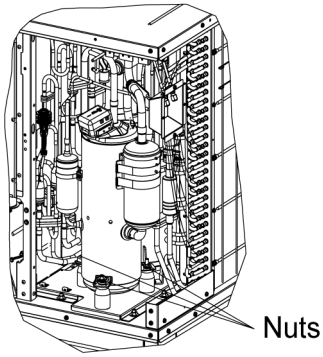
Disassembly and Assembly of Electric Box		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal.		
Step	Illustration	Handling Instruction
1. Take down the front plate.		● Unscrew the screws fixing front plate. Lift the handles, slightly pulling it outwards and downwards to remove the side plate.
2. Disconnect the power cord.	/	● Pull out power cord or disconnect the power cord after unscrewing the screws. **NOTE:** Earmark the color of wire corresponding to the terminal when removing the wire to avoid mistakes when renewing wire connection.
3. Remove the electric box cover.		● Unscrew the screws fixing cover (indicated by the arrows). Then remove the cover.
4. Disconnect all connection lines.	/	● Disconnect all connection lines between exterior electric component and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of motor.
5. Remove the main board.	/	● Unscrew the screws (indicated by the arrows), and then take down the main board. **NOTE:** Power cord may be fixed by bundles, so loose the bundles before removing the main board.

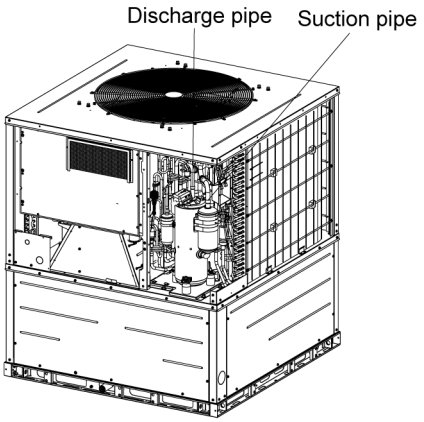
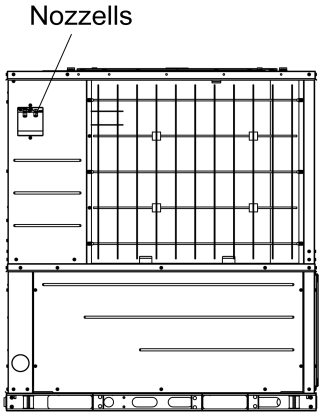
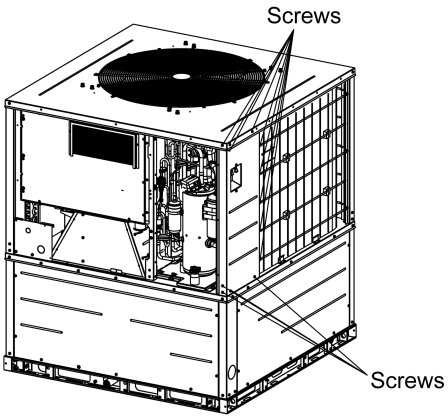
Disassembly and Assembly of Electric Box		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal.		
Step	Illustration	Handling Instruction
6. Re-install the main board.	/	● Put the main board back and tighten the screws. Then reconnect all connection lines that had been take down, and refix the Power cord with bundles at original locations. **NOTE:** The line connection must accord to the schematic diagram. All cable cannot contact the pipe and moving parts such as fan.
7. Re-connect power cord.	/	● Re-connect power cord according to wiring diagram adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. All cable cannot contact the pipe and moving parts such as fan. Close the cover plate of electric box hermetically.
8. Re-install the electric box cover.		● Screw the screws fixing cover (indicated by the arrows).
9. Re-install the front plate.		● Put the side plate back and tighten the screws.

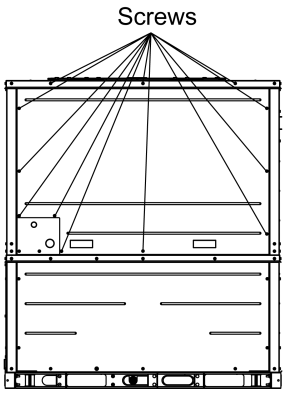
NOTE: Above diagrams may be different from actual model.

3.2 Model: GK-H04TC/NhA-D(U), GK-H05TC/NhA-D(U)

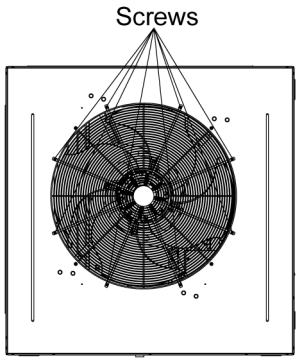
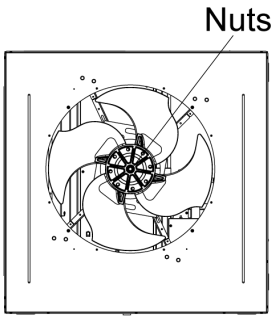
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
1. Open the front-panel.		● Unscrew the bolts (indicated by arrows).
2. Disconnect the power cord and condenser fan motor wires.	/	● Disconnect the power cord and condenser fan motor wires after remove the side plate. **NOTE:** Earmark the color of wire corresponding to the terminal when removing the wire to avoid mistakes when renewing wire connection.
3. Recover refrigerant in the system.		● Connect vacuum recovery tank with nozzle for adding freon for recovery of refrigerant. **NOTE:** Recovery work must be complete because refrigerant is badly hurtful to environment and animals.

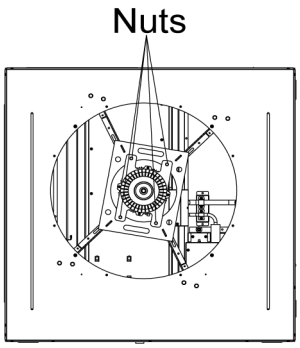
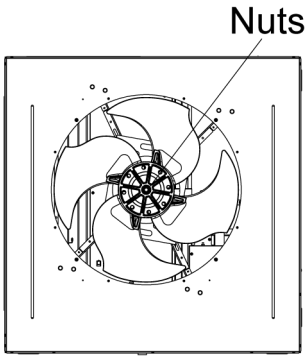
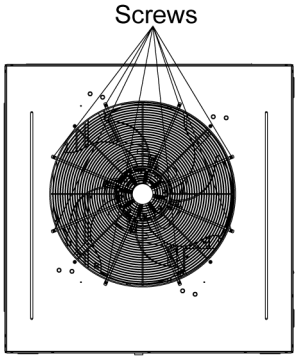
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
4. Open the side-panel.		● Unscrew the bolts (indicated by arrows).
5. Remove the suction and discharge pipes.		● Heat the connection pipes indicated by arrows with fired heater and then draw out them. **NOTE:** Pay attention to things around to avoid burning out.
6. Remove the compressor from the chassis.		● Unscrew the nuts on compressor base with a wrench and then remove compressor from the base. **NOTE:** Keep compressor level and vertically out. Never invert it.
7. Install a new compressor on the chassis.		● Put the new compressor on the chassis as the direction during removing, and then screw down fixing nut on compressor base with a wrench. **NOTE:** Keep compressor level and vertically on to the base. Never incline or invert it.

Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
8. Connect the suction and discharge pipes of the compressor with system pipes.		● Heat the connection pipes indicated by arrows and then weld them with unit pipes together. **NOTE:** Pay attention to things around to avoid burning out.
9. Reconnect power cord of compressor.	/	● Reconnect the power cord into compressor according to the procedure of disconnecting power cord. The line connection must accord to the schematic diagram. **NOTE:** The connection box of compressor must be re-covered to resisting water. All cable cannot contact the pipe and moving parts such as fan.
10. Recharge refrigerant.		● Connect refrigerant tank with nozzle of low pressure (indicated by the maker) for recharging refrigerant. **NOTE:** Check the leak after finishing the connection pipes. Charge amount should be consistent with nameplate.
11. Close the side-panel.		● Tighten the bolts.

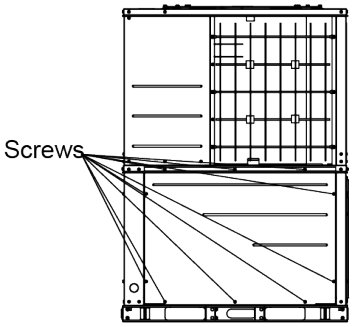
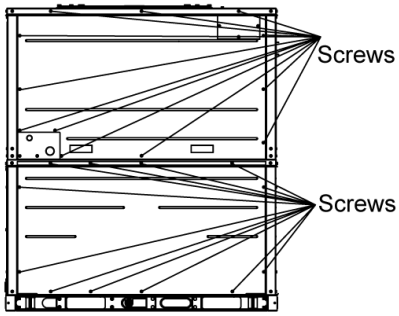
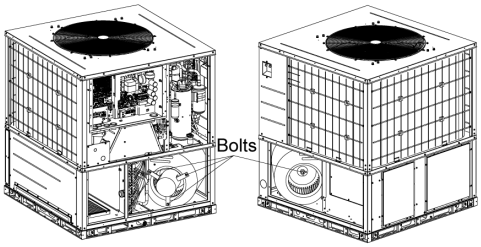
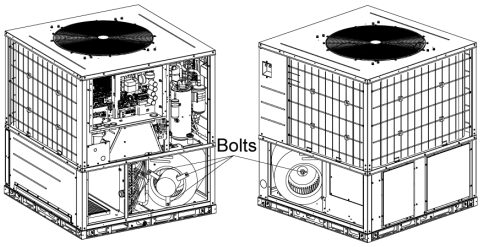
Disassembly and Assembly of Compressor		
Remark: Make sure there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Step	Illustration	Handling Instruction
12. Close the front-panel.		● Tighten the bolts.

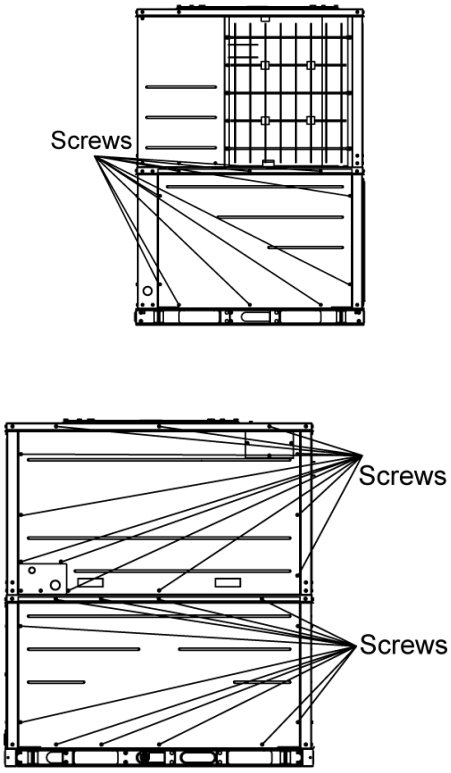
NOTE: Above diagrams may be different from actual model.

Disassembly and Assembly of Condenser Fan Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
1. Disconnect the electrical source wire.	/	● Disconnect all connection lines between condenser fan motor and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of condenser fan motor.
2. Remove the Rear Grill.		● Unscrew the screws fixing rear Grill (indicated by arrows) to remove it.
3. Remove the fan.		● Unscrew the screw (indicated by the arrow) fixing fan to remove the fan. **NOTE:** Fix the fan when unscrew the holding bolt to avoid fan from rotating and thereby injury to people is caused.
4. Remove the motor from the bracket.	/	● Remove the holding bolt of motor firstly and then remove motor from bracket. **NOTE:** Loosen power cord fixed by bundles before removing motor.

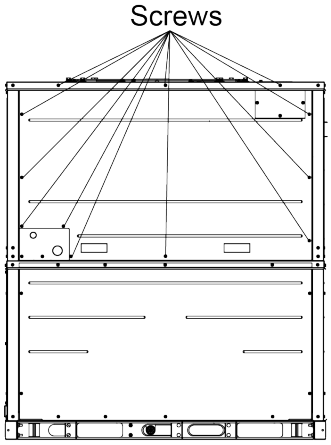
Disassembly and Assembly of Condenser Fan Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
5. Fix the new motor on to the bracket.		● Put the repaired or replaced motor onto bracket as the direction during removing. Then screw down the holding bolt with a wrench. **NOTE:** Please keep the motor level and vertical during installation. After that, fix the power cord with bundles at original locations.
6. Install and fix fan blade.		● Re-install fan blade and screw down the holding bolt indicated by the arrow with a wrench **NOTE:** Moment of force should be within 8-12N during screwing down bolt. After that, please charge glue into gap between bolt and hole to avoid loose of it.
7. Re-install the Rear Grill.		● Put the cover rear Grill and tighten the screws.
8. Re-connect power cord.	/	● Re-connect power cord according to circuit mark adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. Close the cover plate of electric box hermetically. All cable cannot contact the pipe and moving parts such as fan.

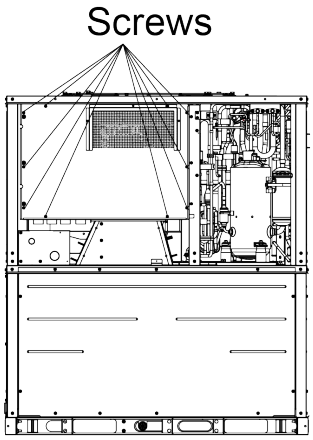
NOTE: Above diagrams may be different from actual model.

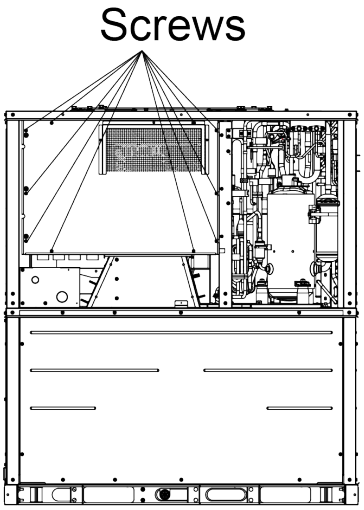
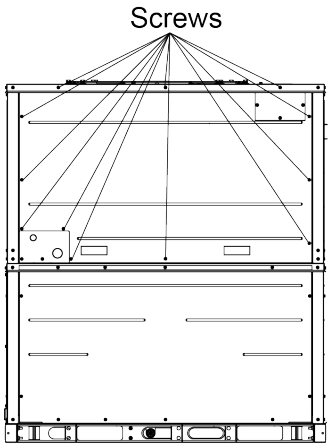
Disassembly and Assembly of Supply Blower Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
1. Remove the side plate.		● Unscrew the screws fixing side plate (indicated by arrows) to remove it.
2. Remove the front plate.		● Unscrew the screws fixing cover plate (indicated by arrows) to remove it.
3. Disconnect all connection lines.	/	● Disconnect all connection lines between motor and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of supply blower motor.
4. Remove the motor.		● Unscrew the nuts (indicated by arrows) to loosen the connection between motor and bracket.
5. Re-install the motor.		● Re-assemble repaired or replaced motor. Installation direction is the same as that during disassembly. Then screw down the holding bolts with a wrench.
6. Re-connect power cord.	/	● Re-connect power cord according to wiring diagram adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. All cable cannot contact the pipe and moving parts such as fan. Close the cover plate of electric box hermetically.

Disassembly and Assembly of Supply Blower Motor		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal of the motor.		
Step	Illustration	Handling Instruction
7. Re-install the side and front plate.		● Put pulleys onto shaft and then put taper sleeve. After that, cover the pulleys onto taper sleeve. Clockwise screw down the 2 bolts. **NOTE:** The sleeve has taper, so pulleys must be installed first. Ensure the coplanarity of pulleys, and adjust the tightness level of belt.

NOTE: Above diagrams may be different from actual model.

Disassembly and Assembly of Electric Box		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal.		
Step	Illustration	Handling Instruction
1. Take down the front plate.		● Unscrew the screws fixing front plate. Lift the handles, slightly pulling it outwards and downwards to remove the side plate.
2. Disconnect the power cord.	/	● Pull out power cord or disconnect the power cord after unscrewing the screws. **NOTE:** Earmark the color of wire corresponding to the terminal when removing the wire to avoid mistakes when renewing wire connection.

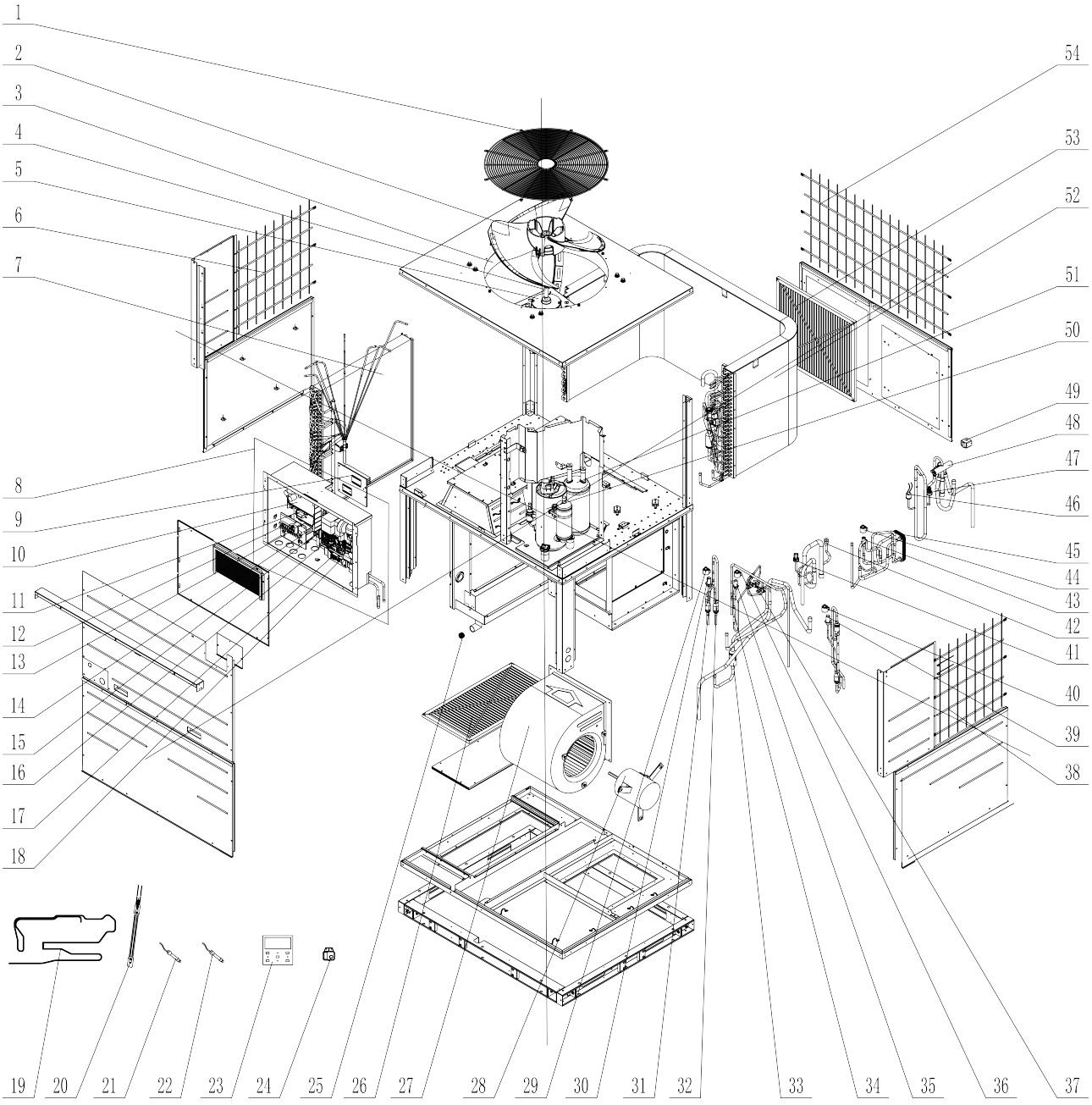
Disassembly and Assembly of Electric Box		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal.		
Step	Illustration	Handling Instruction
3. Remove the electric box cover.		● Unscrew the screws fixing cover (indicated by the arrows) Then remove the cover.
4. Disconnect all connection lines.	/	● Disconnect all connection lines between exterior electric component and elements in electric box. **NOTE:** Please refer to the schematic diagram which adhered on electric box for disconnection of connection lines of motor.
5. Remove the main board.	/	● Unscrew the screws (indicated by the arrows), and then take down the main Board. **NOTE:** Power cord may be fixed by bundles, so loose the bundles before removing the main board.
6. Re-install the main board.	/	● Put the Main Board back and tighten the screws. Then reconnect all connection lines that had been take down, and refix the Power cord with bundles at original locations. **NOTE:** The line connection must accord to the schematic diagram. All cable cannot contact the pipe and moving parts such as fan.
7. Re-connect power cord.	/	● Re-connect power cord according to wiring diagram adhered on electric box. **NOTE:** After connection, arrange leading wires and refix them with bundles at original locations. All cable cannot contact the pipe and moving parts such as fan. Close the cover plate of electric box hermetically.

Disassembly and Assembly of Electric Box		
Remark: Make sure that the unit is stopped running and power supply is cut off before removal.		
Step	Illustration	Handling Instruction
8. Re-install the electric box cover.		● Screw the screws fixing cover (indicated by the arrows).
9. Re-install the front plate.		● Put the side plate back and tighten the screws.

NOTE: Above diagrams may be different from actual model.

4 EXPLODED VIEWS AND SPARE PART LIST

4.1 Model: GK-H02TC/NhA-D(U), GK-H03TC/NhA-D(U)

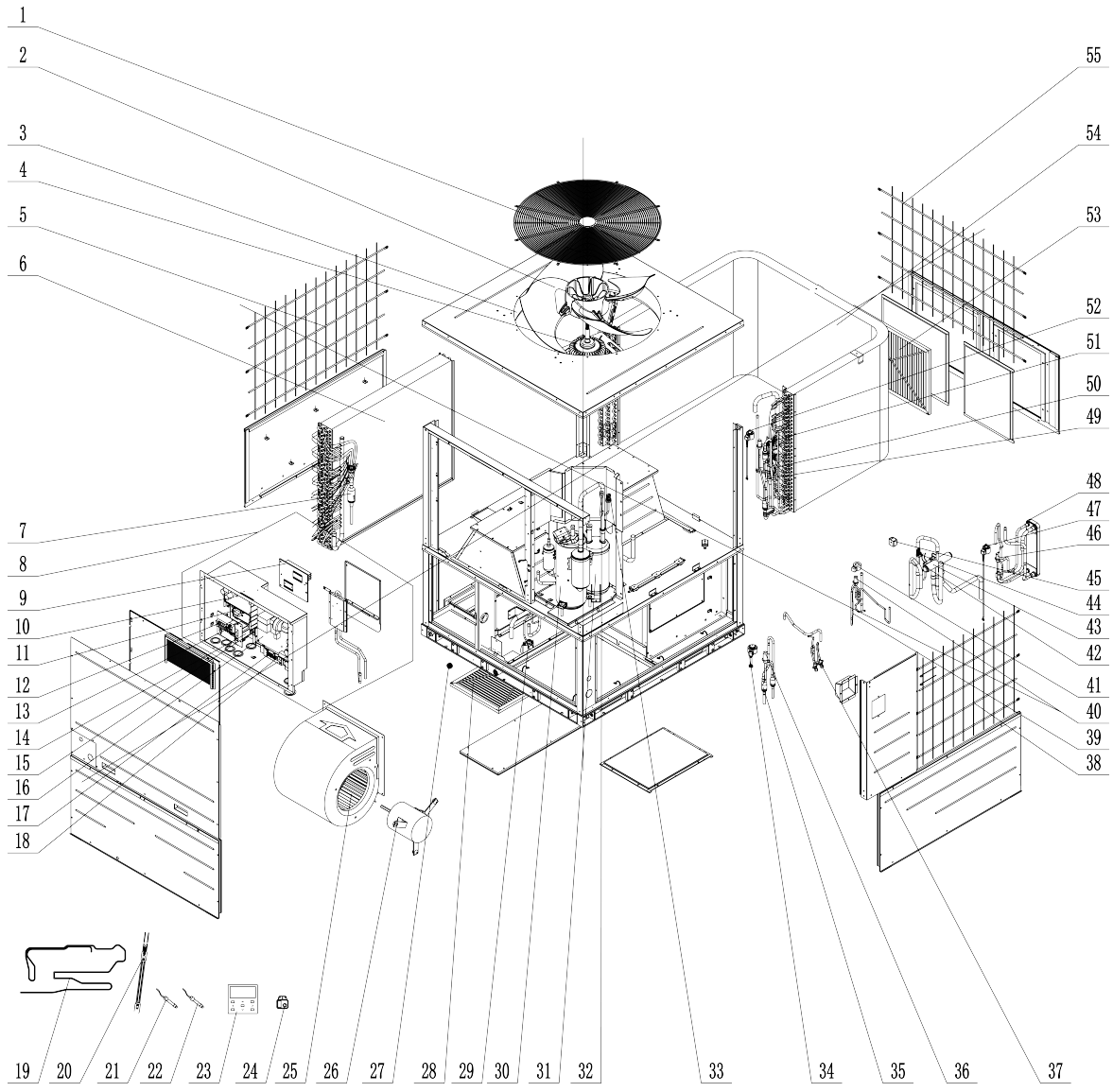


No.	Name	Code	Quantity
1	Rear Grill	01600106015001	1
2	Axial Flow Fan	103002060011	1
3	Diversion Circle	01523901P	1
4	Axial Flow Fan Nesting	02204102	1
5	Brushless Dc Motor (Outdoor Fan)	150104060129	1
6	Rear Grill	01600106009701	1
7	Evaporator Assy	011001062845	1

No.	Name	Code	Quantity
8	Electric Box Assy	100002083053	1
9	Radiator	43003406003306	1
10	Main Board	300027063815	1
11	Fan Drive Board	300094000060	1
12	Terminal Board (10-points (Communication Dedicated))	42200006020701	1
13	Terminal Board (4-points (Communication Dedicated))	42200006005405	1
14	Transformer	43110286	1
15	Power Terminal Board	42200006001202	1
16	Main Board	300027063166	1
17	Terminal Board	42011103	1
18	Terminal Board	42011147	1
19	Electrical Heater(Chassis)	7651000425	1
20	Electrical Heater(Compressor)	7651521215	1
21	Sensor Sub-Assy	390002060572	1
22	Temperature Sensor	390001060085	1
23	Display Board	300001061780	1
24	Gas Sensor	34002406001501	1
25	Choke Plug	76718209	1
26	Filter Sub-Assy (Bottom Return Air)	111001060417	1
27	Centrifugal Fan Housing	1570220302	1
28	Brushless Dc Motor (Indoor Fan)	15010400001404	1
29	Electric Expand Valve Fitting (Cooling)	07200206002342	1
30	Electronic Expansion Valve (Cooling)	072009060018	1
31	One Way Valve	071001060011	2
32	Strainer	035021060018	2
33	Gas Tube Filter	072190512	2
34	One Way Valve	07338000112	1
35	Electronic Expansion Valve (Bypass)	072009060086	1
36	Electric Expand Valve Fitting (Bypass)	4300034407	1
37	Nozzle For Adding Freon	06135201	2
38	Rear Grill	01600106009901	1
39	Electronic Expansion Valve (Heating)	072009000018	1
40	Electric Expand Valve Fitting (Heating)	07200206002341	1
41	Low Pressure Sensor	43004400001603	1

No.	Name	Code	Quantity
42	Fusible Plug	035222000004	1
43	Electronic Expansion Valve (Enthalphy-adding)	072009060033	1
44	Electric Expand Valve Fitting (Enthalphy-adding)	4304413256	1
45	Plate-Type Heat Exchanger	010007060010	1
46	Pressure Protect Switch	46020015149	1
47	High Pressure Sensor	43004400001504	1
48	4-Way Valve	4300008201	1
49	4 Way Valve Coil	07201006000601	1
50	Compressor And Fittings	009001061206	1
51	Gas-Liquid Separator	035027060001	1
52	Condenser Assy	011002062645	1
53	Filter Sub-Assy (Side Return Air)	111001060292	1
54	Rear Grill	01600106009601	1

4.2 Model: GK-H04TC/NhA-D(U), GK-H05TC/NhA-D(U)



No.	Name	Code	Quantity
1	Rear Grill	016001060151	1
2	Axial Flow Fan	103002000007	1
3	Diversion Circle	012193060010P01	1
4	Brushless DC Motor (Outdoor Fan)	1570411901	1
5	Rear Grill	01600106012301	1
6	Evaporator Assy	011001062607	1
7	Gas Tube Filter	072190512	1
8	Electric Box Assy	100002083054	1
9	Radiator	43003406003306	1
10	Main Board	300027063815	1
11	Fan Drive Board	300094000052	1
12	Terminal Board (10-points (Communication Dedicated))	42200006020701	1
13	Terminal Board (4-points (Communication Dedicated))	42200006005405	1
14	Transformer	43110286	1
15	Power Terminal Board	42200006001202	1
16	Compressor Drive Board	300027063061	1
17	Terminal Board	42011103	1
18	Terminal Board	42011147	1
19	Electrical Heater (Chassis)	7651000425	1
20	Electrical Heater(Compressor)	7651521216	1
21	Sensor Sub-Assy	390002060572	1
22	Temperature Sensor	390001060085	1
23	Display Board	300001061780	1
24	Gas Sensor	34002406001501	1
25	Centrifugal Fan Housing	1570220302	1
26	Brushless DC Motor (Indoor Fan)	15010400001305	1
27	Choke Plug	76718209	1
28	Filter Sub-Assy (Bottom Return Air)	111001060370	1
29	Cut-off Valve	07130239	1
30	Compressor and Fittings	009001060980	1
31	Gas-liquid Separator	035027060001	1
32	Fusible Plug	035222000004	1
33	Pressure Sensor	43004400001603	1
34	Electric Expand Valve Fitting (Cooling)	4300034501	1
35	Strainer	035021060018	4
36	Electronic Expansion Valve (Cooling)	43005018	1

No.	Name	Code	Quantity
37	Nozzle for Adding Freon	06135201	2
38	Rear Grill	01600106022001	1
39	One Way Valve	07338000112	1
40	Electronic Expansion Valve (Bypass）	072009060086	1
41	Electric Expand Valve Fitting (Bypass）	4300034407	1
42	Pressure Protect Switch	46020015149	1
43	4-Way Valve	43000338	1
44	Pressure Sensor	43004400001504	1
45	4 Way Valve Coil	07201006000601	1
46	Electronic Expansion Valve (Enthalphy-adding)	072009060033	1
47	Electric Expand Valve Fitting (Enthalphy-adding)	4304413256	1
48	Plate-type Heat Exchanger	00904100004	1
49	One Way Valve	071001060011	2
50	Bidirection Strainer	0721004401	1
51	Electronic Expansion Valve (Heating)	072009000018	1
52	Electric Expand Valve Fitting (Heating)	4304413227	1
53	Filter Sub-Assy(Side Return Air)	111001060400	1
54	Condenser Assy	000100060897	1
55	Rear Grill	01600106012101	1

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