



**DELTA**

**DC INVERTER COMBO VRF  
OUTDOOR UNITS**

**INSTRUCTION MANUAL**

**WARNING!**

Read and follow all safety precautions in Instruction Manual - improper use can cause serious injury.

## Preface

Delta VRF System adopts the cutting-edge manufacturing technology and takes global acknowledged, environmental-friendly R410A as refrigerant, which is a green product in the 21st century. Please carefully read this manual before installation and operation. Instructions before reading this manual:

- (1) Delta VRF System conforms to design standard: GB/T 18837-2002.
- (2) For guaranteeing personal safety when operating this system, please strictly follow the instructions listed in the manual.
- (3) The total capacity of the indoor units which runs at the same time can not exceed that of the outdoor units; otherwise, the cooling (heating) effect of each indoor unit would be poor.
- (4) Make sure that this manual is kept by operators and serviceman.
- (5) Please contact Delta designated service center immediately when the unit can not run normally.
  - 1) Information on the nameplate (including model, cooling capacity, product number and delivery date).
  - 2) Malfunction (Describe the actual condition before and after the error happens in details).
- (6) Every unit has passed through strictly test and trial run before delivery. In the event of damage to the unit due to improper disassembly, user is not allowed to dismantle and check the unit by themselves. Please contact Delta appointed service center, then Delta professional serviceman will help to check the unit.
- (7) All the information and illustrations shown in this manual are all for reference. Manufacturer reserves the rights of making necessary change at anytime without advance notice owing to design improvement or other reasons.

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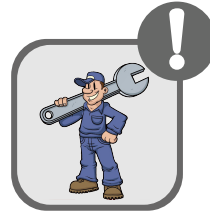
# 1 Safety Precautions

 **Forbidden Items!** It indicates that improper operation might lead to human casualty or severe injury.

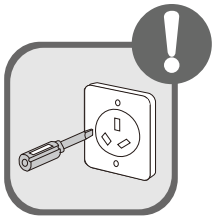
 **Items need to be followed.** It indicates that improper operation might lead to personal injury or property damage.



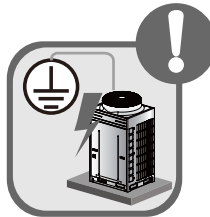
Follow this instruction to complete the installation work. Please carefully read this manual before unit startup and service.



Installation should be conducted by dealer or qualified personnel. Please do not attempt to install the unit by yourself. Improper handling may result in water leakage, electric shock or fire disaster etc.



Before installation, please check if the power supply is in accordance with the requirements specified on the nameplate. And also take care of the power safety.



Make sure the unit can be earthed properly and soundly after plugging into the socket so as to avoid electric shock. Please do not connect the ground wire to gas pipe, water pipe, lightning rod or telephone line.



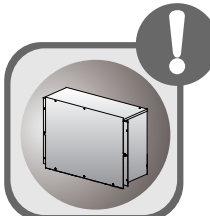
Be sure to use the exclusive accessory and part to prevent the water leakage, electric shock and fire accidents.



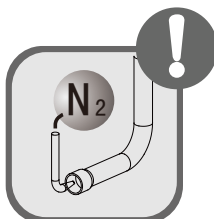
If refrigerant leakage happens during installation, please ventilate immediately. Poisonous gas will emerge if the refrigerant gas meets fire.



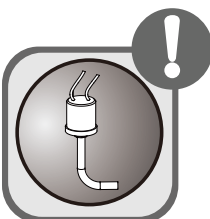
Wire size of power cord should be large enough. The damaged power cord and connection wire should be replaced by exclusive cable.



After connecting the power cord, please fix the electric box cover properly in order to avoid accident.



Never fail to comply with the nitrogen charge requirements. Charge nitrogen when welding pipes.



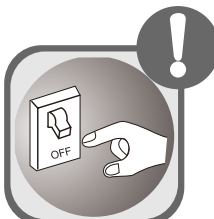
Never short-circuit or cancel the pressure switch to prevent unit damage.



Please firstly connect the wired controller before energization, otherwise wired controller can not be used.



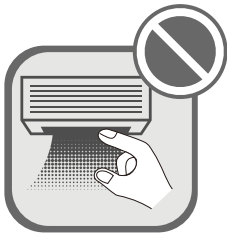
Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc.



Please firstly connect the wired controller before energization, otherwise wired controller can not be used.



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



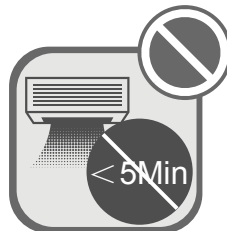
Do not insert fingers or objects into air outlet/inlet grille.



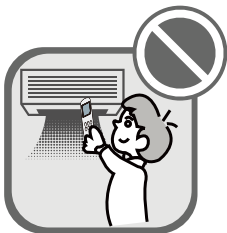
Open the door and window and keep good ventilation in the room to avoid oxygen deficit when the gas/oil supplied heating equipment is used.



Never start up or shut off the air conditioner by means of directly plug or unplug the power cord.



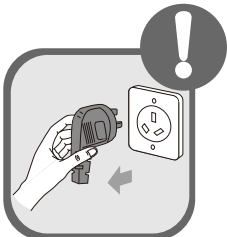
Turn off the unit after it runs at least five minutes; otherwise it will influence oil return of the compressor.



Do not allow children operate this unit.



Do not operate this unit with wet hands.



Turn off the unit or cut off the power supply before cleaning the unit, otherwise electric shock or injury may happen.



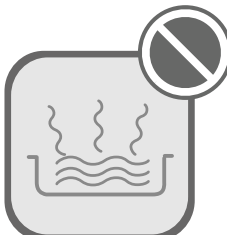
Never spray or flush water towards unit, otherwise malfunction or electric shock may happen.



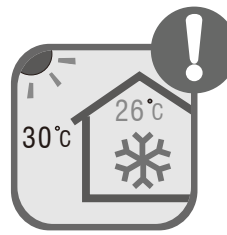
Do not expose the unit to the moist or corrosive circumstances.



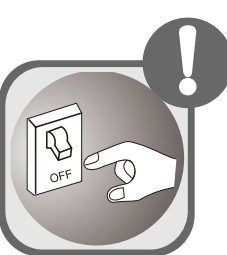
Electrify the unit 8 hours before operation. Please switch on for 8 hours before operation. Do not cut off the power when 24 hours short-time halting (to protect the compressor).



Volatile liquid, such as diluent or gas will damage the unit appearance. Only use soft cloth with a little neutral detergent to clean the outer casing of unit.



Under cooling mode, please don't set the room temperature too low and keep the temperature difference between indoor and outdoor unit within 5°C.



If anything abnormal happens (such as burning smell), please power off the unit and cut off the main power supply, and then immediately contact Delta appointed service center. If abnormality keeps going, the unit might be damaged and lead to electric shock or fire.



User is not allowed to repair the unit. Fault service may cause electric shock or fire accidents. Please contact Delta appointed service center for help.

Delta will not assume responsibility of personal injury or equipment damage caused by improper installation and commission, unnecessary service and incapable of following the rules and instructions listed in this manual.

## 2 Product Introduction

Delta VRF Modular System adopts inverter compressor technology. According to change the displacement of compressor, stepless capacity regulation within range of 10%-100% can be realized. Various product lineup is provided with capacity range from 22.4kW to 180kW, which can be widely used in commercial and working area and especially applicable to the place with variable load change. Delta commercial air conditioner is absolutely your best choice.

### 2.1 Names of Main Parts

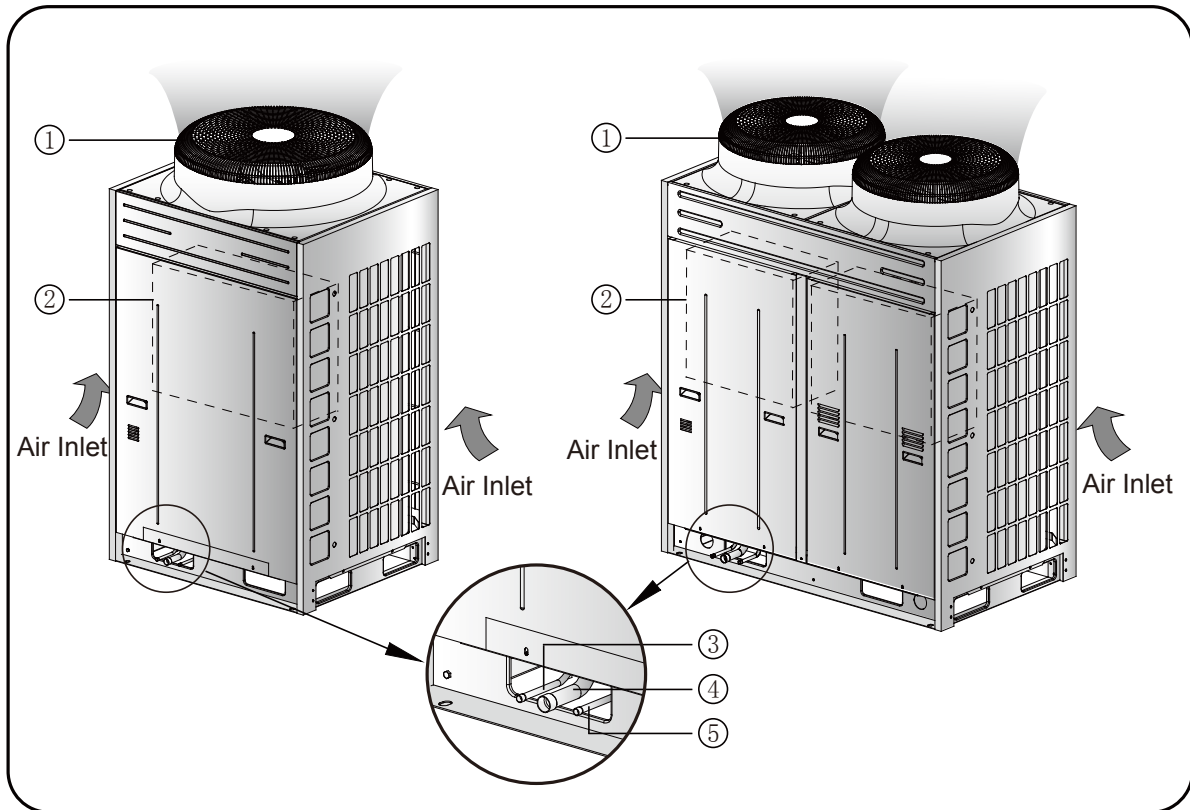


Fig.1

NO.	①	②	③	④	⑤
Name	Air Outlet	Electric Box Assembly	Liquid Pipe	Gas Pipe	Oil Balance Pipe

### 2.2 Combinations of Outdoor Units

Model (Single)	82VC016J34	82VC018J34	82VC019J34
Model (Combined)	82VC007J34 +82VC009J34	82VC009J34 + 82VC009J34	82VC009J34 + 82VC010J34

Model (Single)	82VC021J34	82VC023J34	82VC024J34
Model (Combined)	82VC009J34 + 82VC012J34	82VC009J34 + 82VC014J34	82VC012J34 + 82VC012J34

Model (Single)	82VC026J34	82VC028J34	82VC030J34
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Model (Combined)	82VC012J34 + 82VC014J34	82VC014J34 + 82VC014J34	82VC009J34 + 82VC009J34 + 82VC012J34
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Model (Single)	82VC032J34□□	82VC033J34□□	82VC035J34□□
Model (Combined)	82VC009J34 + 82VC009J34 + 82VC014J34	82VC009J34 + 82VC012J34 + 82VC012J34	82VC009J34 + 82VC012J34 + 82VC014J34

Model (Single)	82VC037J34□□	82VC038J34□□	82VC040J34□□
Model (Combined)	82VC009J34 + 82VC014J34 + 82VC014J34	82VC012J34 + 82VC012J34 + 82VC014J34	82VC012J34 + 82VC014J34 + 82VC014J34

Model (Single)	82VC042J34□□	82VC044J34□□	82VC046J34□□
Model (Combined)	82VC014J34 + 82VC014J34 + 82VC014J34	82VC009J34 + 82VC009J34 + 82VC012J34 + 82VC014J34	82VC009J34 + 82VC009J34 + 82VC014J34 + 82VC014J34

Model (Single)	82VC047J34□□	82VC049J34□□	82VC051J34□□
Model (Combined)	82VC009J34 + 82VC012J34 + 82VC012J34 + 82VC014J34	82VC009J34 + 82VC012J34 + 82VC014J34 + 82VC014J34	82VC009J34 + 82VC014J34 + 82VC014J34 + 82VC014J34

Model (Single)	82VC052J34□□	82VC054J34□□	82VC056J34□□
Model (Combined)	82VC012J34 + 82VC012J34 + 82VC014J34 + 82VC014J34	82VC012J34 + 82VC014J34 + 82VC014J34 + 82VC014J34	82VC014J34 + 82VC014J34 + 82VC014J34 + 82VC014J34

## 2.3 Combinations of Indoor and Outdoor Units

One outdoor unit can be connected up to 16 indoor units.

The total capacity of indoor units should be within 50%~135% of that of outdoor units.

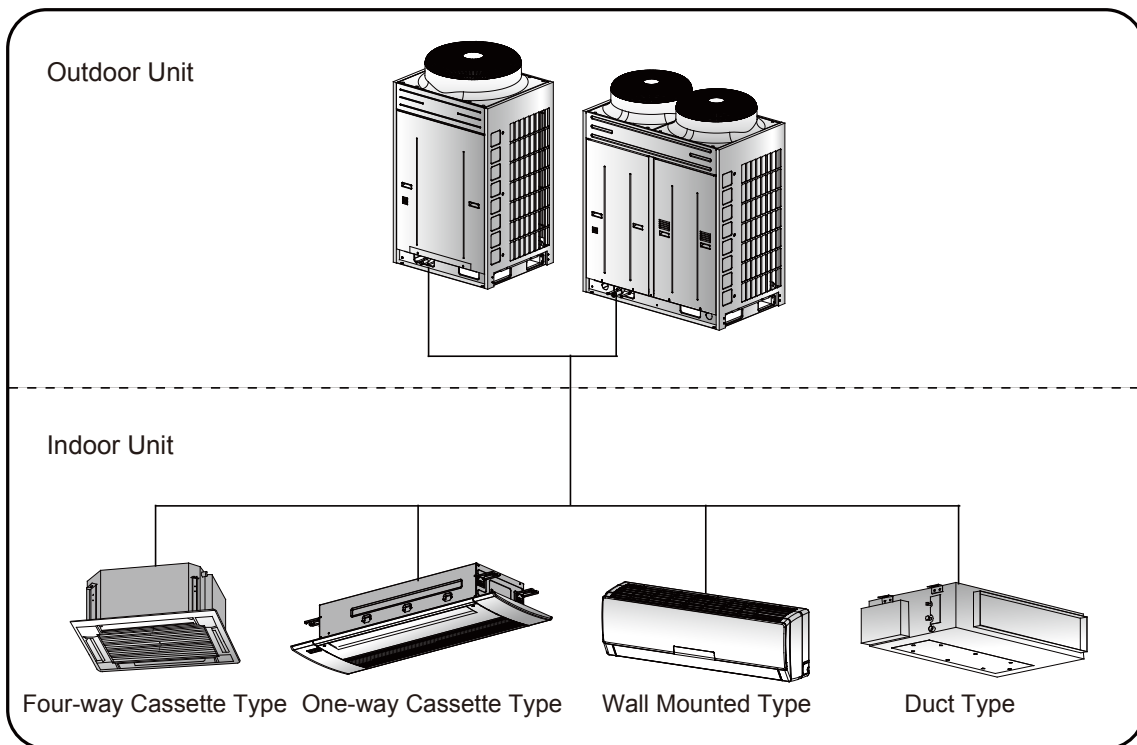


Fig.2

See Fig.2 for combinations of outdoor and indoor Units. Indoor units include cassette type, one-way cassette type, wall mounted type and duct type, etc. When any one of the indoor units receive operating command, outdoor unit will start to run as per required capacity. When all the indoor units stop running, outdoor unit will be shut off.

## 2.4 Rated Working Condition

	Indoor side state		Outdoor side state	
	Dry bulb temp.°C	Wet bulb temp.°C	Dry bulb temp.°C	Wet bulb temp.°C
Rated cooling	27	19	35	24
Rated heating	20	15	7	6

Note:

- ① The following listed cooling /heating capacity and noise is tested before outgoing;
- ② The parameters below are tested under rated working condition. If there is any change to them, please refer to the nameplate;
- ③ The parameters of heating capacity of indoor unit for heat pump excluded that of auxiliary electric heating power.
- ④ The performance parameters below are tested according to standard GB/T18837—2002

## 2.5 The Range of Production Working Temperature

Cooling	Ambient temperature: -5°C~48°C
Heating	Ambient temperature: -20°C~27°C


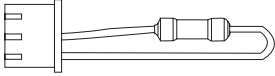




### 3 Preparation before Installation

Note: The picture is only used for reference and the actual product prevails. Unit: mm.

#### 3.1 Standard Parts

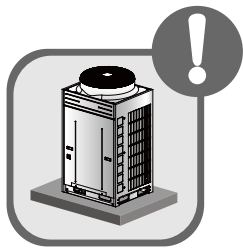
Please use the following standard parts supplied by Delta.

Parts for Outdoor Unit				
Number	Name	Picture	Quantity	Remarks
1	Owner's Manual		1	
2	Wiring (match with resistance)		2	
3	Communication Line		1	Optional for modular unit
4	Communication Line between indoor and outdoor units		1	UL 2835 AWG24#

#### 3.2 Installation Site

 **Forbidden Items!** It indicates that improper operation might lead to human casualty or sever injury.

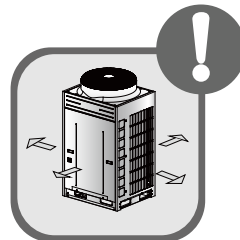
 **Items need to be followed.** It indicates that improper operation might lead to personal injury or property damage.



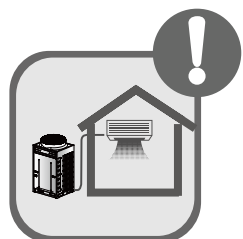
Install the unit at a place where is adequate to withstand the weight of the unit and make sure the unit would not shake or fall off.



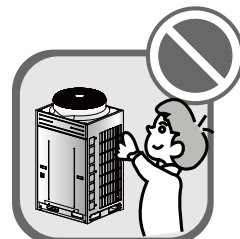
Try to keep the unit away from combustible, inflammable and corrosive gas or exhaust gas.



Leave some space for heat exchanging and servicing so as to guarantee unit normal operation.



Keep the indoor and outdoor units close to each other as much as possible so as to decrease the pipe length and bends.



Never allow children to approach to the unit and take measures to prevent children touching the unit.

3.2.1 When the outdoor unit is totally surrounded by walls, please refer to following figures for space dimension.

3.2.1.1 Space dimension for single-module unit

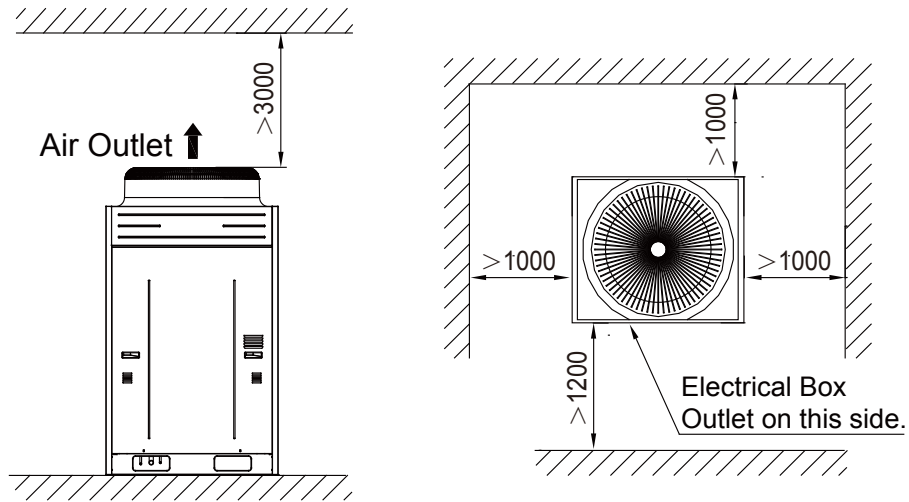


Fig. 3

3.2.1.2 Space dimension for dual-module unit

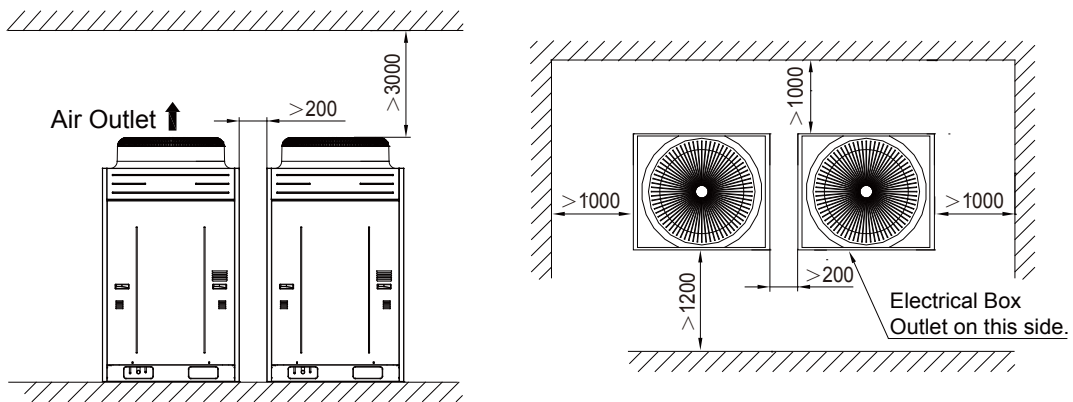


Fig. 4

3.2.1.3 Space dimension for three-module unit

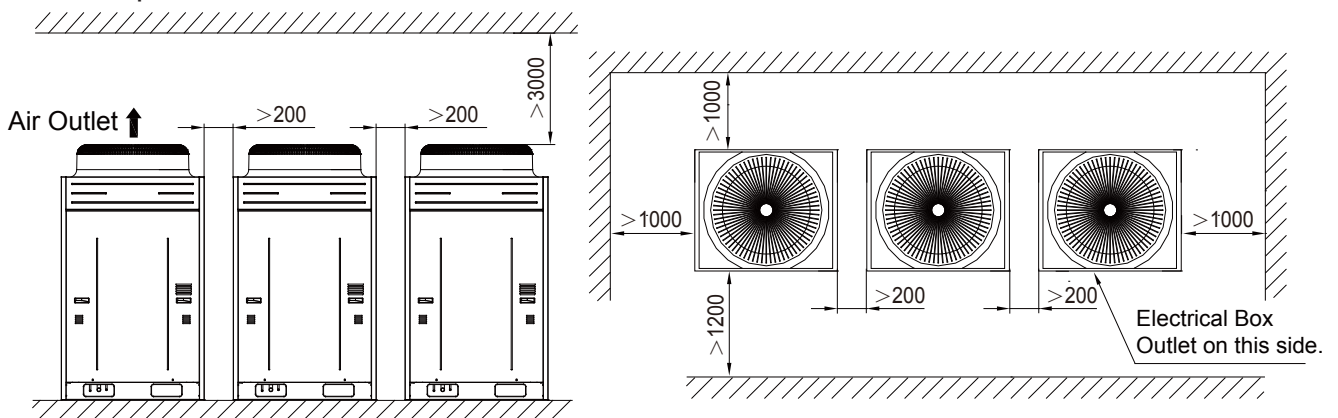


Fig. 5

### 3.2.1.4 Space dimension for four-module unit

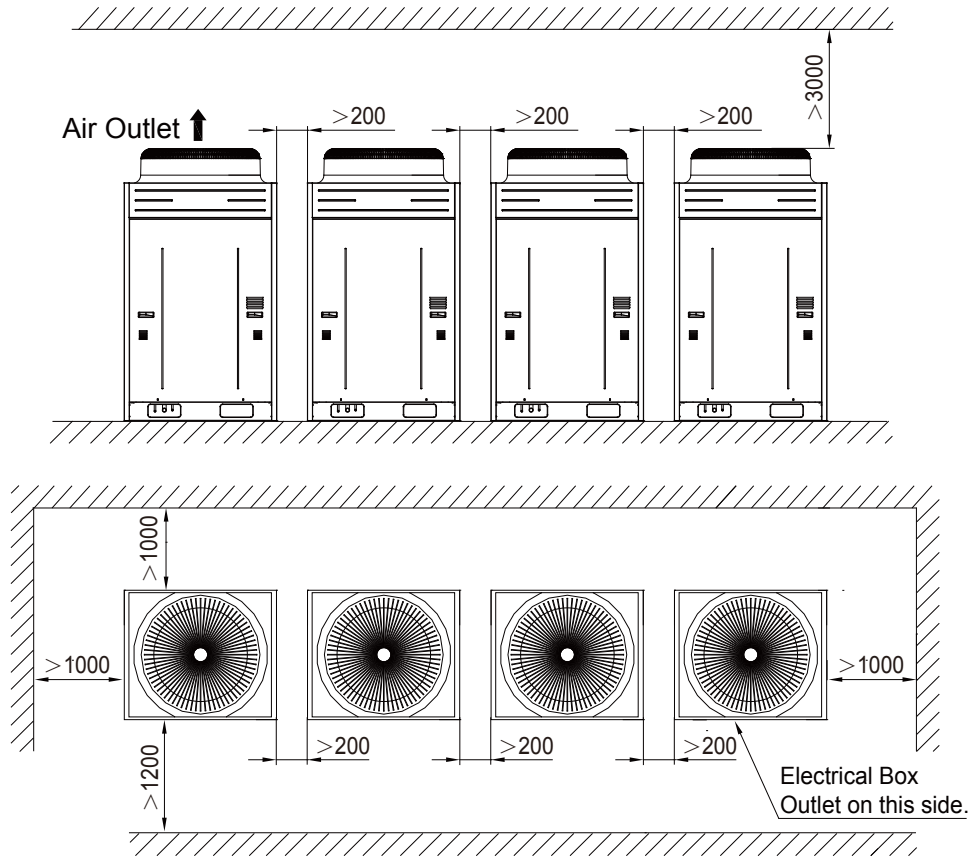


Fig.6

3.2.2 When there is wall (or similar obstruction) above the unit, keep the distance between the unit top and the wall at least 300mm or above. When the unit is located in a totally open space with no obstructions in four directions, keep the distance between the unit top and wall at least 1500mm or above (See Fig.7). When space is limited within 1500mm or the unit is not set in an open space, air return pipe is required to be installed in order to keep good ventilation (See Fig.8).

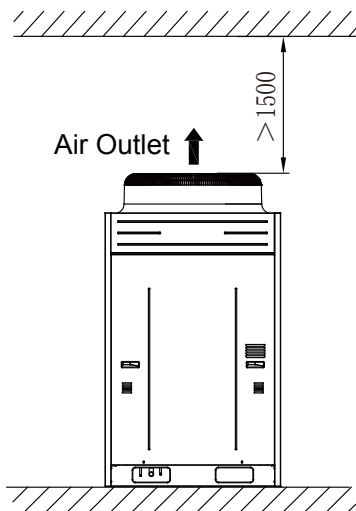


Fig.7

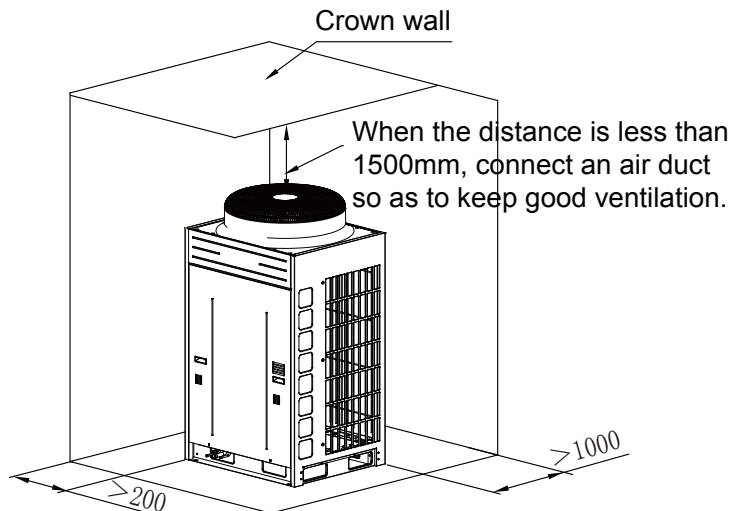


Fig.8

### 3.2.3 Space dimension for multiple-module unit

For keeping good ventilation, make sure there is no obstructions above the unit.

When the unit is located at a half-open space (front and left/right side is open), install the unit as per the same or opposite direction.

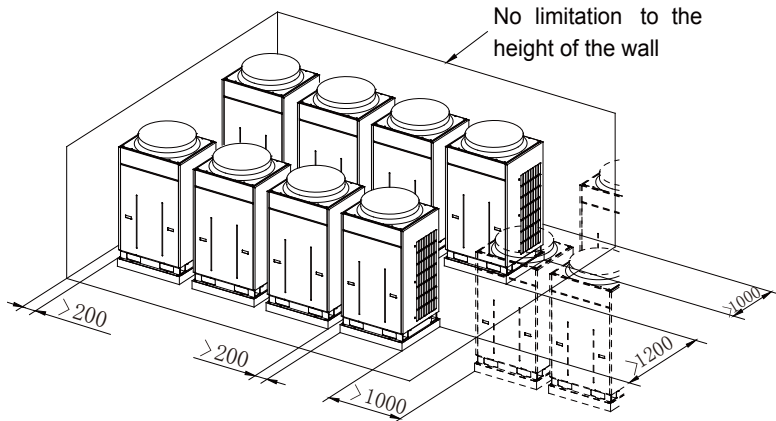


Fig.9

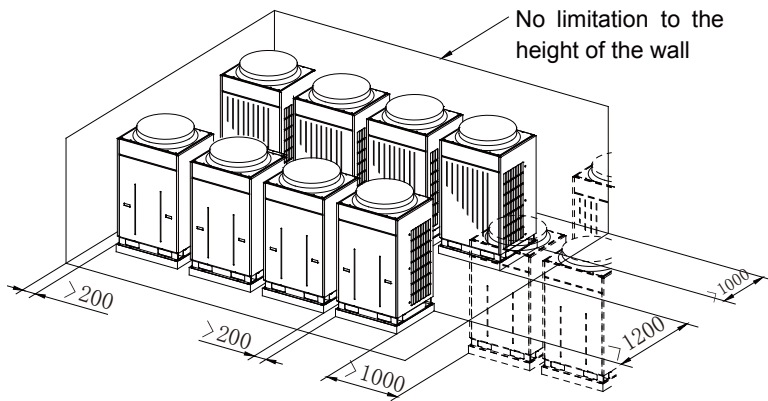
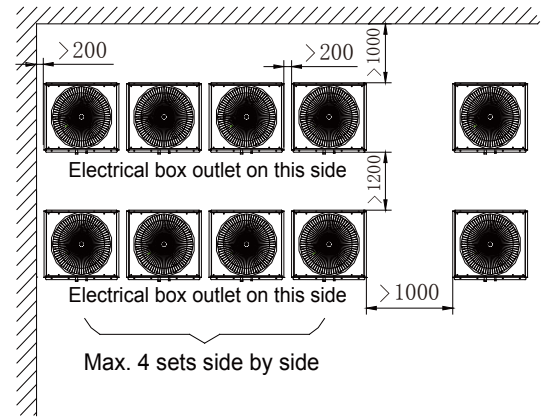
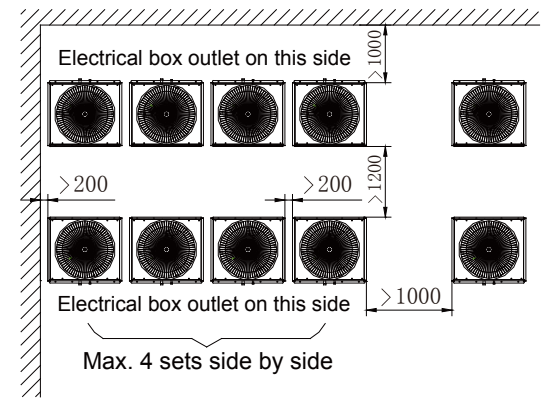


Fig.10



### 3.2.4 Take seasonal wind into consideration when installing the outdoor unit

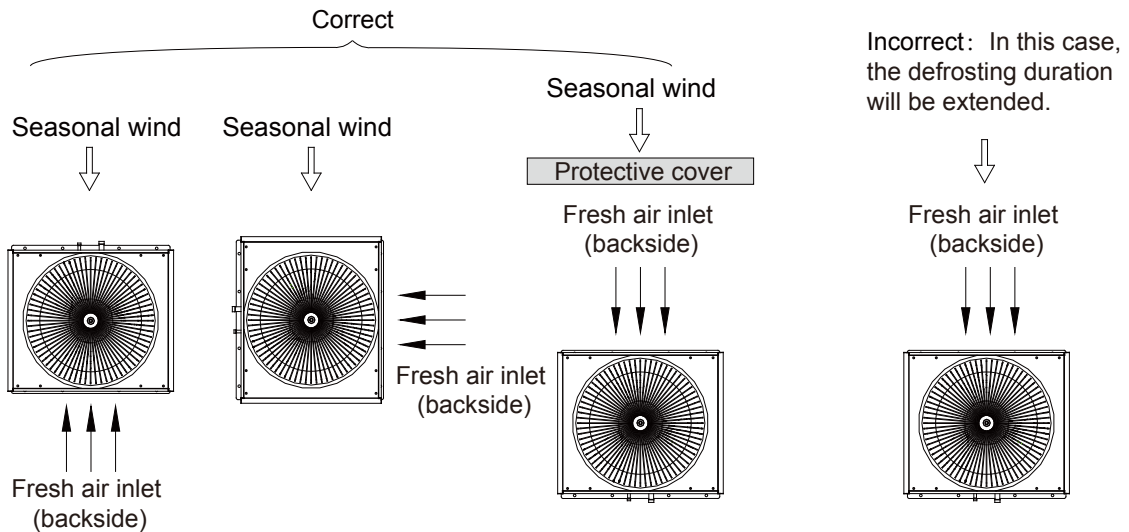


Fig.11

### 3.2.5 Take snow into consideration when installing the outdoor unit

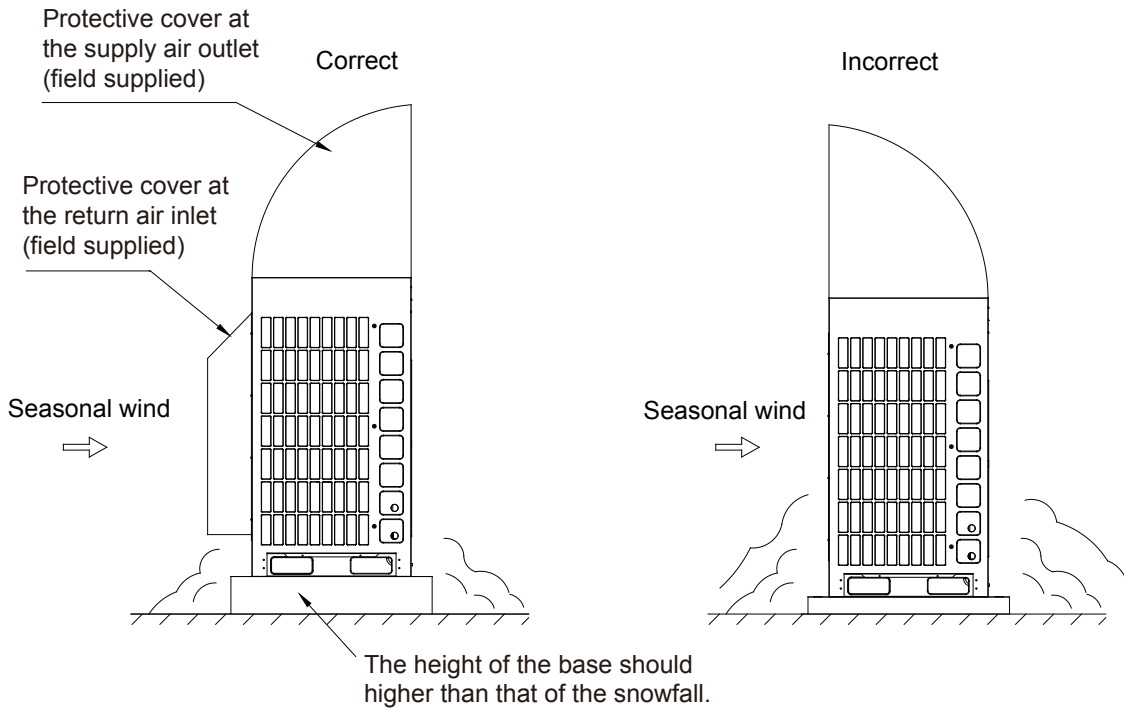


Fig.12

### 3.3 Piping Work Requirements

There should be no fall among outdoor modules. Refer to the table below for piping work requirements.

R410A Refrigerant System		
Outer Diameter (mm/inch)	Wall Thickness (mm)	Type
Φ6.35(1/4)	≥ 0.8	0
Φ9.52(3/8)	≥ 0.8	0
Φ12.70(1/2)	≥ 0.8	0
Φ15.9(5/8)	≥ 1.0	0
Φ19.05(3/4)	≥ 1.0	1/2H
Φ22.2(7/8)	≥ 1.5	1/2H
Φ25.40(1/1)	≥ 1.5	1/2H
Φ28.60(9/8)	≥ 1.5	1/2H
Φ34.90(11/8)	≥ 1.5	1/2H
Φ38.10(12/8)	≥ 1.5	1/2H
Φ41.30(13/8)	≥ 1.5	1/2H
Φ44.5(7/4)	≥ 1.5	1/2H
Φ54.1(17/8)	≥ 1.5	1/2H

	Capacity (C)	Type
Manifold among outdoor modules	504 ≤ C	ML01

## 4 Installation Instruction

### 4.1 Physical Dimension of the Outdoor Unit and Mounting Hole

Outline and Physical Dimension of 82VC007J34 and 82VC009J34 □□ unit.

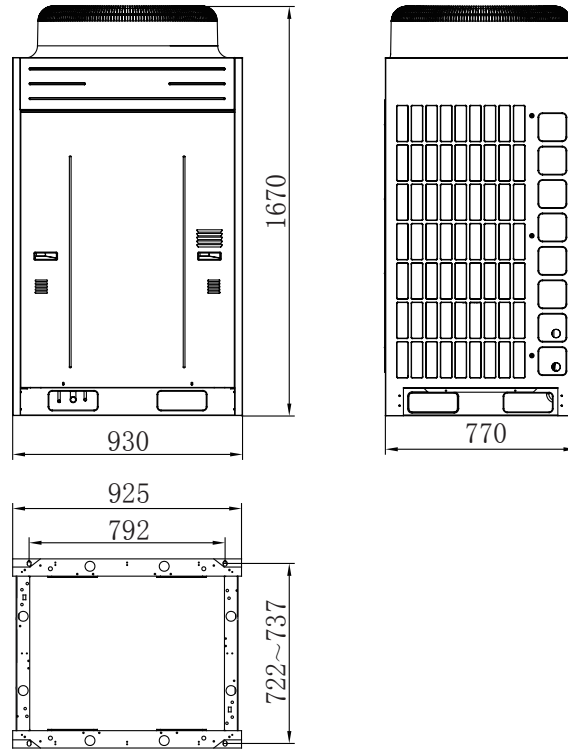


Fig.13

Outline and Physical Dimension of 82VC010J34, 82VC012J34 and 82VC014J34 unit. □□

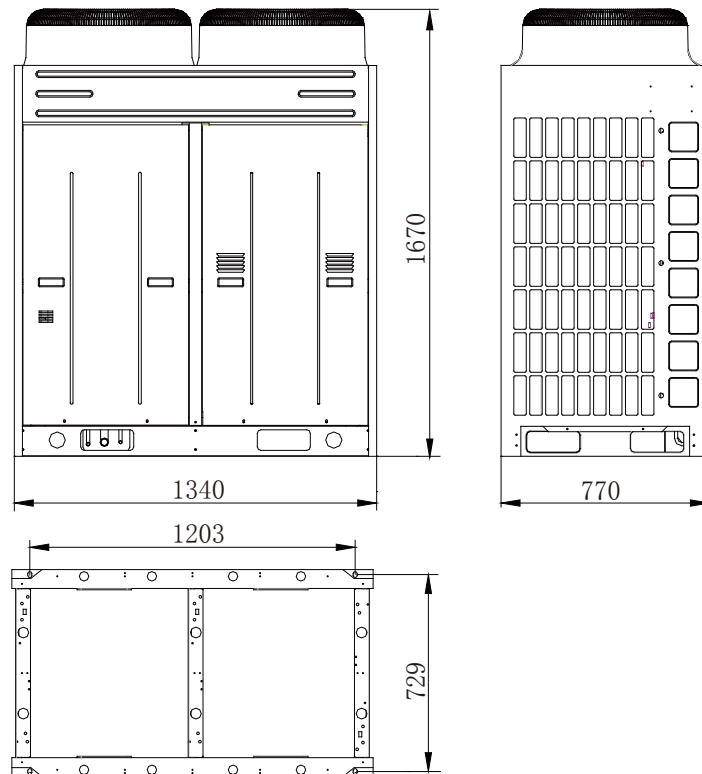


Fig.14

## 4.2 Connection Pipe

### 4.2.1 Schematic Diagram of Piping Connection

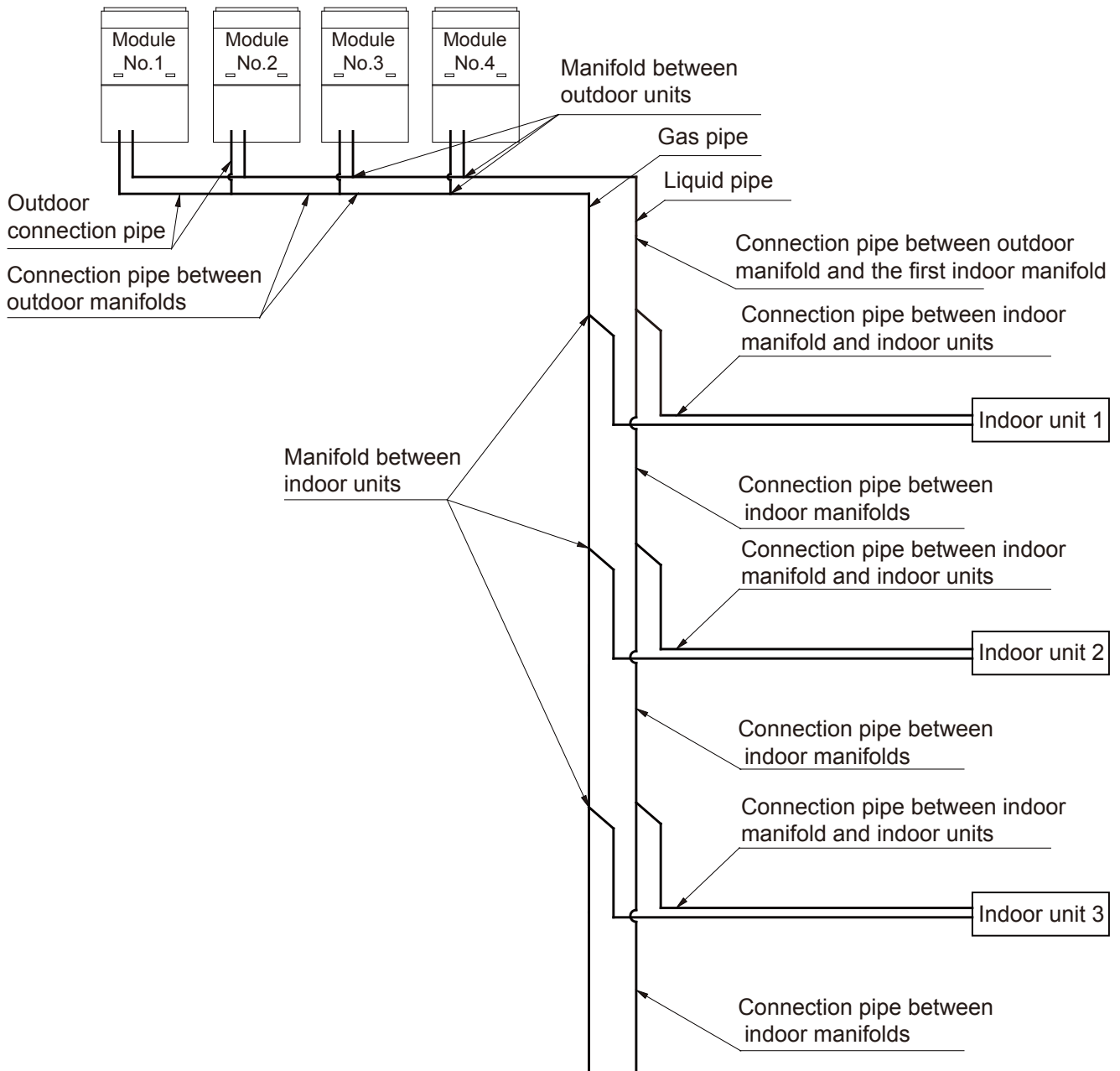


Fig.15

## 4.2.2 Schematic Diagram of Piping Sequence

82VC007J34, 82VC009J34

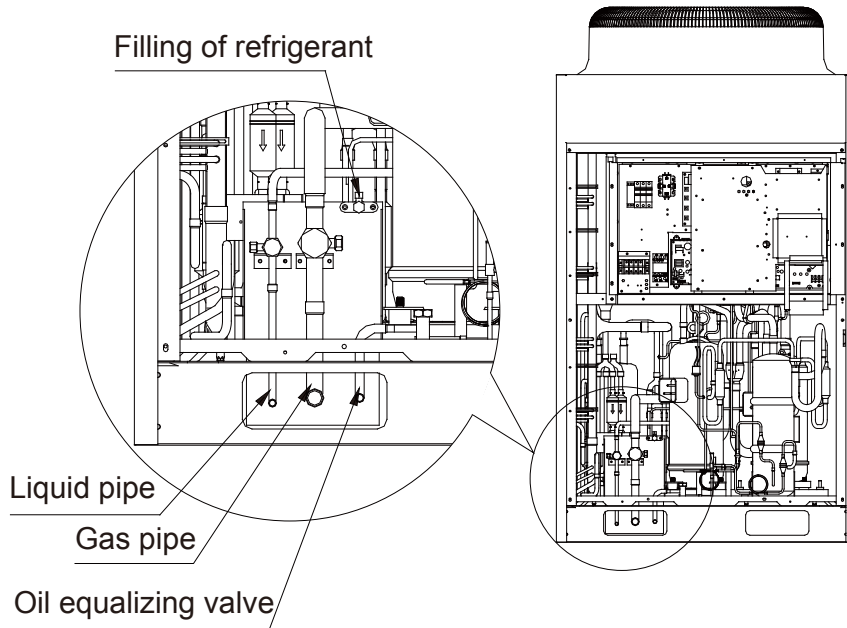


Fig.16

82VC010J34, 82VC012J34, 82VC014J34

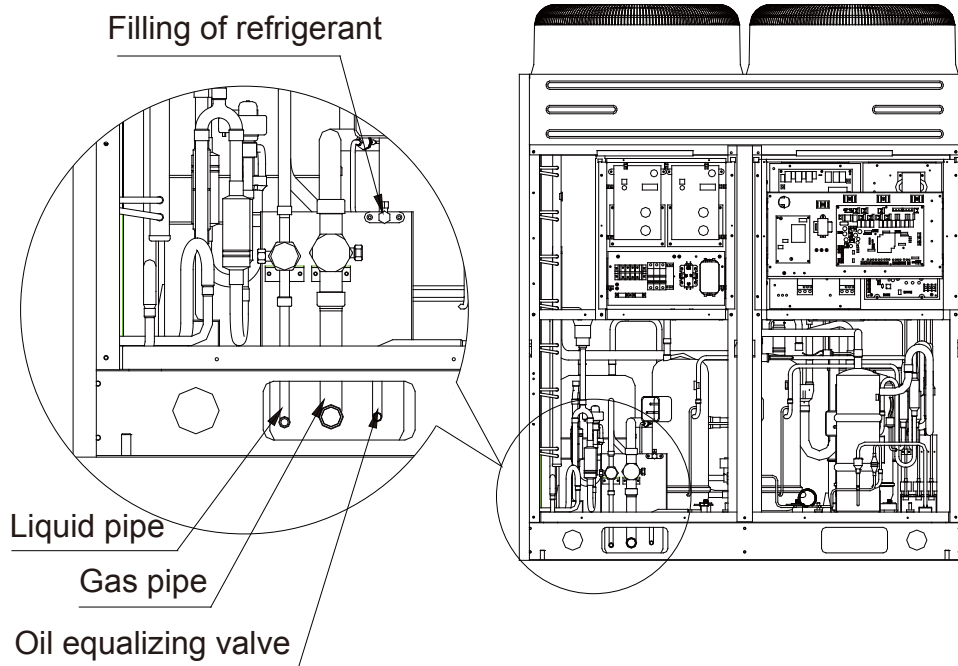


Fig.17



### 4.2.3 Allowable pipe length and drop height among indoor and outdoor units

Y type branch joint is adopted to connect indoor and outdoor units. Connecting method is shown in the figure below.

Remark: Equivalent length of one Y-type manifold is about 0.5m.

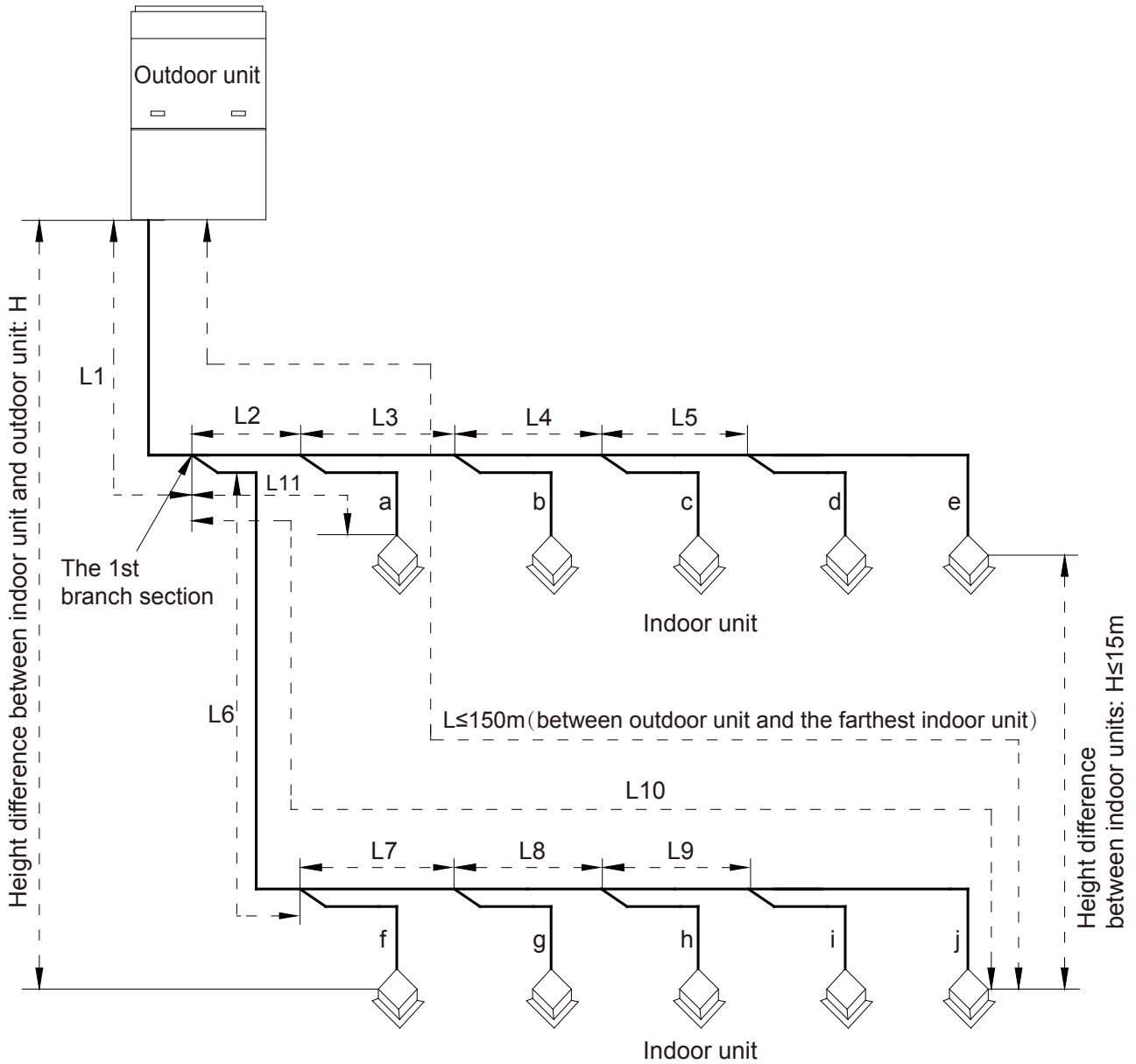


Fig.18

20kW ≤ Unit capacity < 60kW

R410A Refrigerant System		Allowable Value	Fitting Pipe
Total length (actual length) of fitting pipe		≤ 300m	L1+L2+L3+L4+...+L9+a+b+...+i+j
Length of farthest fitting pipe(m)	Actual length	≤ 100m	L1+L6+L7+L8+L9+j
	Equivalent length	≤ 125m	
Equivalent length from the first branch to the furthest piping L10(m)		40m	L6+L7+L8+L9+j
Height difference between outdoor unit and indoor unit	Outdoor unit at upper	50m	—
	Outdoor unit at lower	40m	—
Height difference between indoor units (m)		15m	—
Maximum length of Main pipe(1)		90m	L1

Unit capacity  $\geq$  60kW

R410A Refrigerant System		Allowable Value	Fitting Pipe
Total length (actual length) of fitting pipe		$\leq$ 500m	L1+L2+L3+L4+...+L9+a+b+...+i+j
Length of farthest fitting pipe(m)	Actual length	$\leq$ 150m	L1+L6+L7+L8+L9+j
	Equivalent length	$\leq$ 175m	
Equivalent length from the first branch to the furthest piping L10(m)		40m	L6+L7+L8+L9+j
Height difference between outdoor unit and indoor unit	Outdoor unit at upper	50m	—
	Outdoor unit at lower	40m	—
Height difference between indoor units (m)		15m	—
Maximum length of Main pipe(1)		90m	L1

Note:

① When maximum distance between outdoor unit and the first branch joint of indoor unit  $\geq$  90m, main pipe size (both liquid and gas side) should be adjusted as per the following table.

② For the capacity of indoor unit is less than 5.0kW, when pipe length between indoor unit and its closest manifold is larger than 10m, the pipe size at liquid side should be enlarged.

Outdoor Model	Gas Pipe Size (mm)	Liquid Pipe Size (mm)
82VC007J34□□	No need to enlarge pipe size	No need to enlarge pipe size
82VC009J34□□	No need to enlarge pipe size	Φ12.7
82VC010J34□□	No need to enlarge pipe size	Φ15.9
82VC012J34□□	Φ31.8	Φ15.9
82VC014J34□□	Φ31.8	Φ15.9
82VC016J34□□	Φ34.9	Φ19.05
82VC018J34□□	Φ34.9	Φ19.05
82VC019J34□□	Φ34.9	Φ19.05
82VC021J34□□	No need to enlarge pipe size	Φ19.05
82VC023J34□□	Φ38.1	Φ22.2
82VC024J34□□	Φ38.1	Φ22.2
82VC026J34□□	Φ38.1	Φ22.2
82VC028J34□□	Φ38.1	Φ22.2
82VC030J34□□	Φ41.3	Φ22.2
82VC032J34□□	Φ44.5	Φ22.2
82VC033J34□□	Φ44.5	Φ22.2
82VC035J34□□	Φ44.5	Φ22.2
82VC037J34□□	Φ44.5	Φ22.2
82VC038J34□□	Φ44.5	Φ22.2
82VC040J34□□	Φ44.5	Φ22.2
82VC042J34□□	Φ44.5	Φ22.2
82VC044J34□□	Φ54.1	Φ25.4
82VC046J34□□	Φ54.1	Φ25.4
82VC047J34□□	Φ54.1	Φ25.4
82VC049J34□□	No need to enlarge pipe size	No need to enlarge pipe size
82VC051J34□□	No need to enlarge pipe size	No need to enlarge pipe size

82VC052J34□□	No need to enlarge pipe size	No need to enlarge pipe size
82VC054J34□□	No need to enlarge pipe size	No need to enlarge pipe size
82VC056J34□□	No need to enlarge pipe size	No need to enlarge pipe size

#### 4.2.4 Connection Pipe among Outdoor Modules

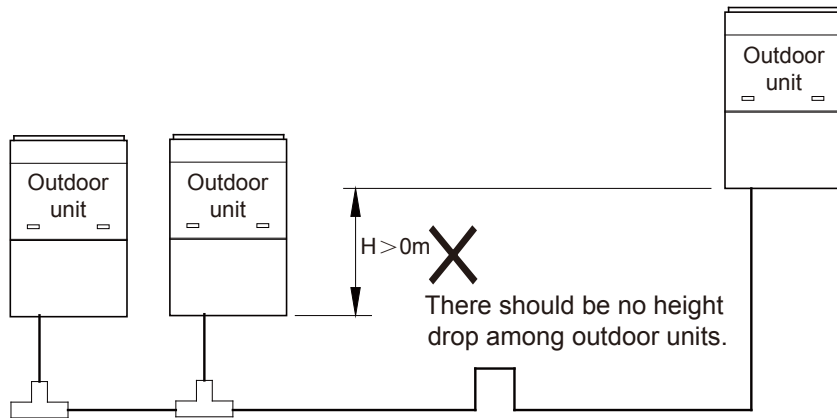


Fig.19

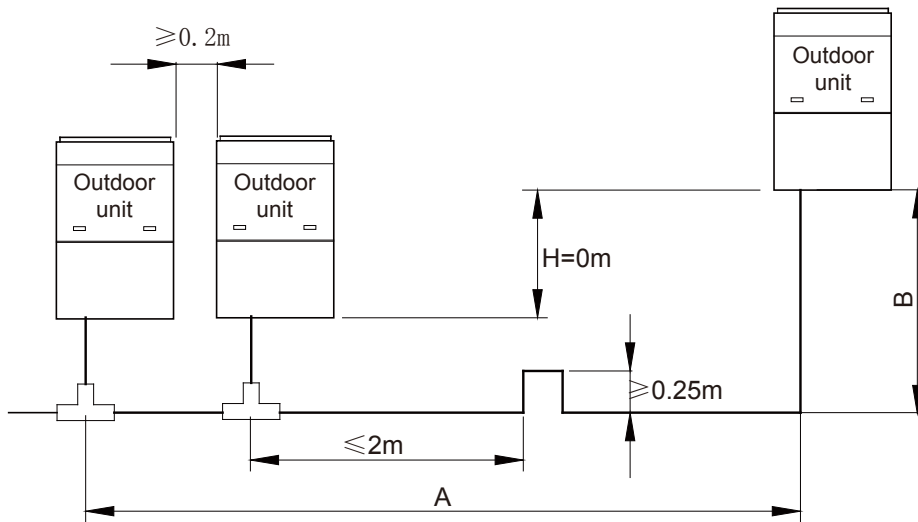


Fig.20

Note: When the distance between outdoor units exceeds 2000mm, U-type oil trap should be added at low-pressure gas pipe.  $A+B \leq 10m$ .

#### 4.2.5 Fitting pipe between Outdoor Unit and the First Manifold

4.2.5.1 For single module system, pipe size (between outdoor unit and the first manifold) is determined by that of outdoor unit.

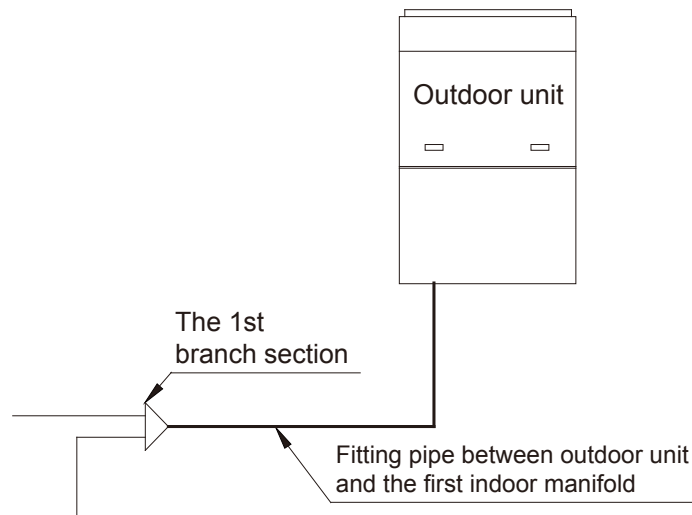


Fig.21

Pipe size of basic outdoor module is shown as follows:

Basic Module	Pipe Size	
	Gas Pipe(mm)	Liquid Pipe(mm)
82VC007J34□□	Φ22.2	Φ9.52
82VC009J34□□	Φ22.2	Φ9.52
82VC010J34□□	Φ28.6	Φ12.7
82VC012J34□□	Φ28.6	Φ12.7
82VC014J34□□	Φ28.6	Φ12.7

4.2.5.2 For multi-module unit, select appropriate manifold connected to outdoor module as per the pipe size of basic module. Pipe size of basic outdoor module is shown as follows:

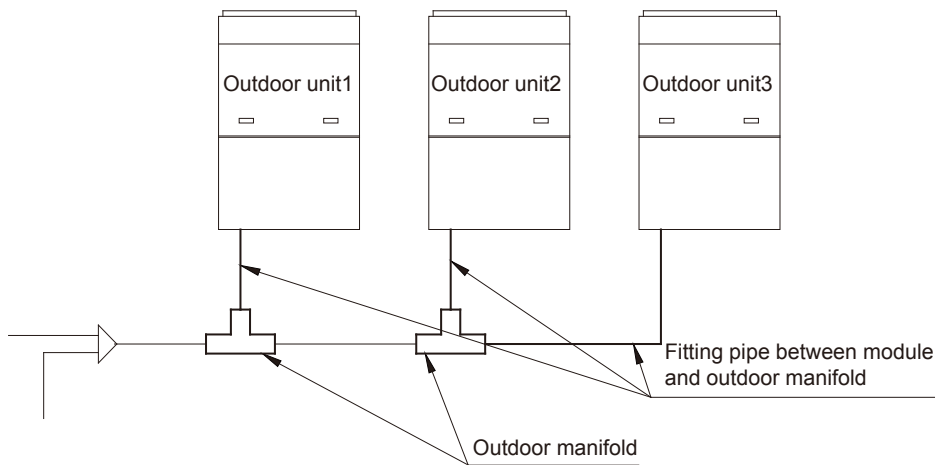


Fig.22

Basic Module	Pipe Size	
	Gas Pipe(mm)	Liquid Pipe(mm)
82VC007J34□□	Φ22.2	Φ9.52
82VC009J34□□	Φ22.2	Φ9.52
82VC010J34□□	Φ28.6	Φ12.7
82VC012J34□□	Φ28.6	Φ12.7
82VC014J34□□	Φ28.6	Φ12.7

#### 4.2.5.3 Fitting pipe between two manifolds from basic modules

Pipe size (between two manifolds from basic modules) is based on the total capacity of upstream modules.

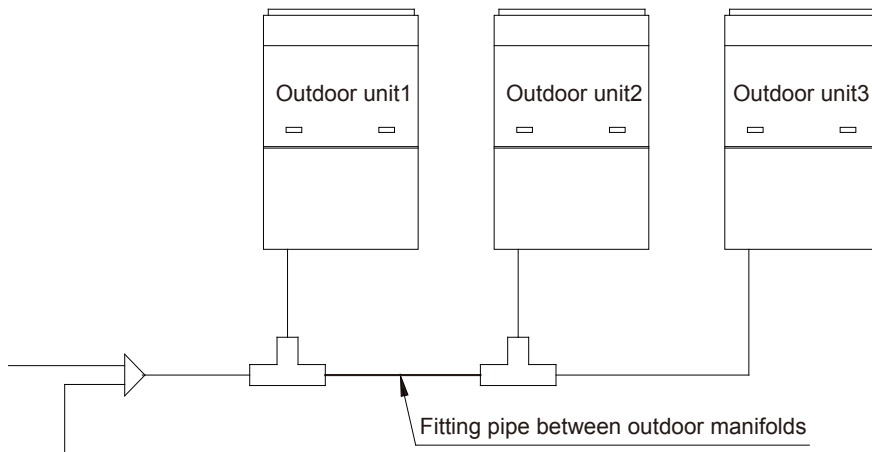


Fig.23

Total capacity of upstream modules Q(kW)	Pipe size between manifolds	
	Gas Pipe(mm)	Liquid Pipe(mm)
$28.0 \geq Q$	Φ22.2	Φ9.52
$45.0 \geq Q > 28.0$	Φ28.6	Φ12.7
$67.0 \geq Q > 45.0$	Φ28.6	Φ15.9
$95.0 \geq Q > 67.0$	Φ34.9	Φ19.05
$135.0 \geq Q > 95.0$	Φ41.3	Φ19.05
$Q > 135.0$	Φ54.1	Φ22.2

#### 4.2.5.4 Fitting pipe between the first manifold from indoor unit and the end manifold from outdoor unit

Single module unit

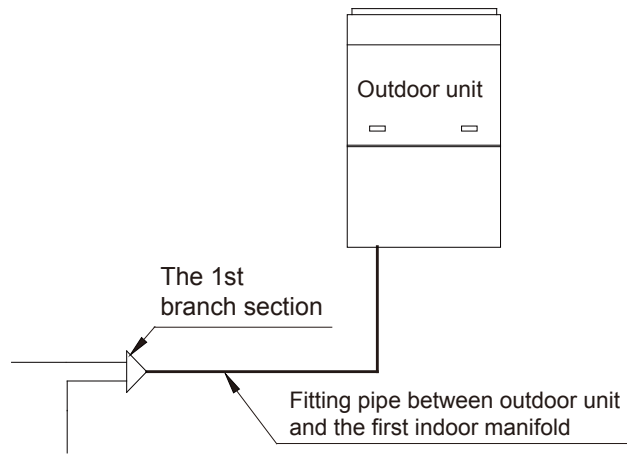


Fig.24

Basic Module(single module)	Pipe Size	
	Gas Pipe(mm)	Liquid Pipe(mm)
82VC007J34□□	Φ22.2	Φ9.52
82VC009J34□□	Φ22.2	Φ9.52
82VC010J34□□	Φ28.6	Φ12.7
82VC012J34□□	Φ28.6	Φ12.7
82VC014J34□□	Φ28.6	Φ12.7

Multi-module unit

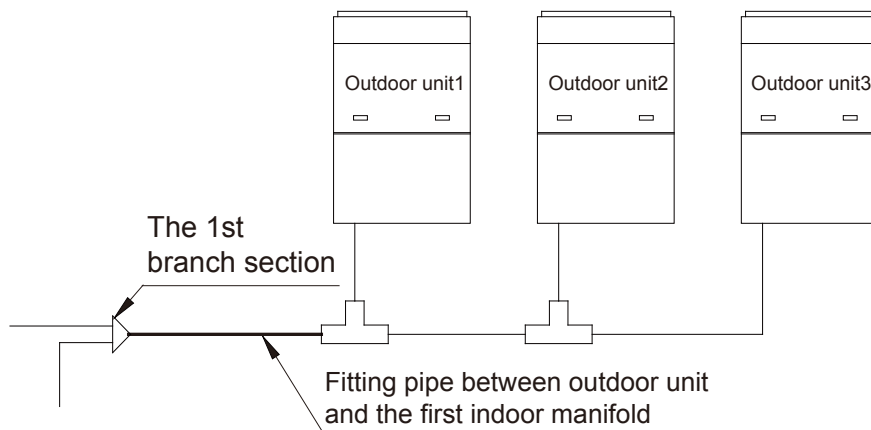


Fig.25

Multi-module System Total capacity of outdoor units C(kW)	Pipe Size	
	Gas Pipe(mm)	Liquid Pipe(mm)
$C \leq 50.4$	Φ28.6	Φ15.9
$50.4 < C \leq 67.0$	Φ28.6	Φ15.9
$67.0 < C \leq 95.0$	Φ34.9	Φ19.05
$95.0 < C \leq 135.0$	Φ41.3	Φ19.05
$135.0 < C \leq 160.0$	Φ44.5	Φ22.2
$160.0 < C$	Φ54.1	Φ25.4

#### 4.2.5.5 Manifold at indoor unit side

Manifold at indoor unit side can be selected as per total capacity of downstream indoor unit(s). Refer to the following table.

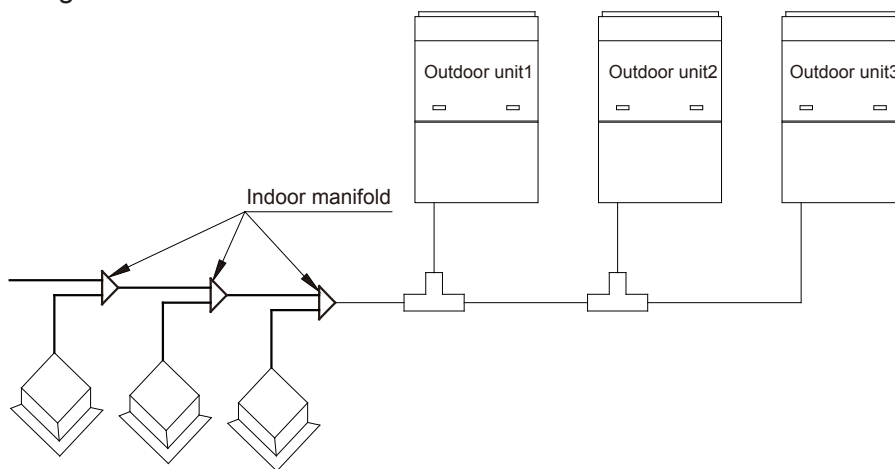


Fig.26

R410A Refrigerant System	Total capacity of downstream indoor unit(s) C (kW)	Model
Y-type Manifold	$C \leq 20.0$	89BPK-0970
	$20.0 < C \leq 30.0$	89BPK-1102
	$30.0 < C \leq 70.0$	89BPK-2240
	$70.0 < C \leq 135.0$	89BPK-3460
	$135.0 < C$	89BPK-4900

#### 4.2.5.6 Fitting pipe between manifolds

Pipe size (between two manifolds at indoor unit side) is based on the total capacity of upstream indoor unit(s).

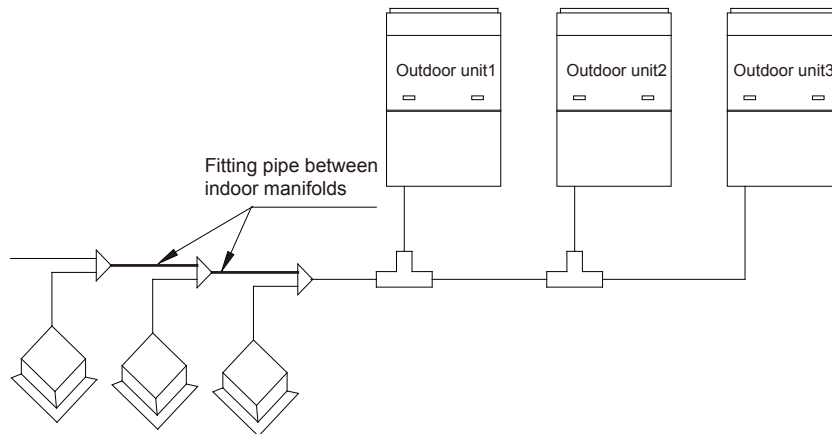


Fig.27

Total capacity of downstream indoor unit(s) C(kW)	Gas Pipe(mm)	Liquid Pipe(mm)
$C \leq 5.6$	$\Phi 12.7$	$\Phi 6.35$
$5.6 < C \leq 14.2$	$\Phi 15.9$	$\Phi 9.52$
$14.2 < C \leq 22.0$	$\Phi 19.05$	$\Phi 9.52$
$22.0 < C \leq 30.0$	$\Phi 22.2$	$\Phi 9.52$
$30.0 < C \leq 45.0$	$\Phi 28.6$	$\Phi 12.7$
$45.0 < C \leq 67.0$	$\Phi 28.6$	$\Phi 15.9$
$67.0 < C \leq 95.0$	$\Phi 34.9$	$\Phi 19.05$
$95.0 < C \leq 135.0$	$\Phi 41.3$	$\Phi 19.05$
$135.0 < C \leq 160.0$	$\Phi 44.5$	$\Phi 22.2$
$160.0 < C$	$\Phi 54.1$	$\Phi 25.4$

#### 4.2.5.7 Fitting pipe between indoor unit and manifold

Manifold should be matched with fitting pipe of indoor unit.

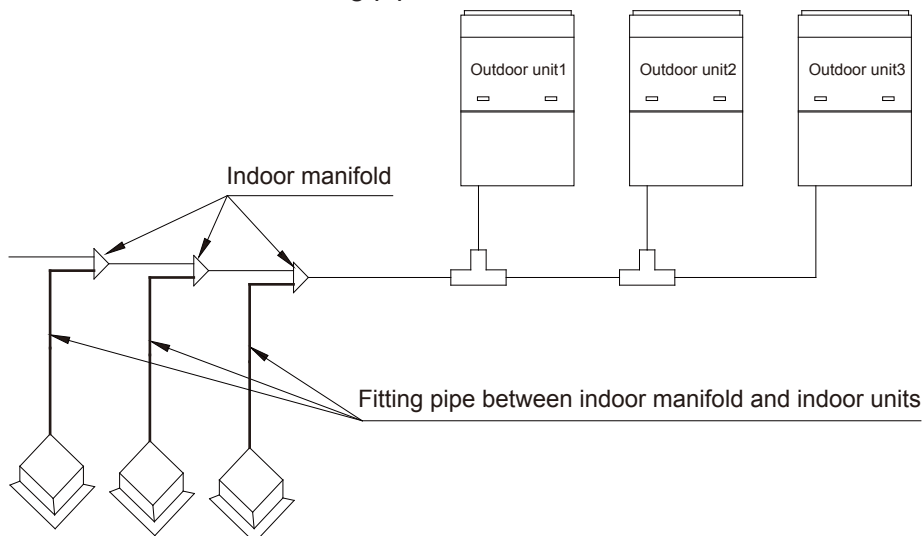


Fig.28

Rated capacity of indoor unit C(kW)	Gas Pipe(mm)	Liquid Pipe(mm)
$C \leq 2.8$	$\Phi 9.52$	$\Phi 6.35$
$2.8 < C \leq 5.0$	$\Phi 12.7$	$\Phi 6.35$
$5.0 < C \leq 14.0$	$\Phi 15.9$	$\Phi 9.52$

14.0 < C ≤ 16.0	Φ19.05	Φ9.52
16.0 < C ≤ 28.0	Φ22.2	Φ9.52

## 4.3 Oil Loop

### 4.3.1 Objective of setting oil loop

When large drop height exists in the system, oil loop is required to be set on the vertical pipeline so as to guarantee effective oil return to compressor.

### 4.3.2 Principle of setting oil loop

When large drop height exists between indoor and outdoor units, oil loop is required to be set on the vertical pipeline for every X m from the top down.

Oil loop can be made by two U-type bends or one return-type bend. Pipe height is 3-5 times of pipe size. Note: X is decided by position of indoor and outdoor units. Outdoor unit is above: X=6m; Outdoor unit is below: X=10m.

### 4.3.3 Precautions for oil loop installation

- (1) Oil loop can be set as U-type or O-type;
- (2) When the outdoor unit is at lower position, oil loop is required to be set on the vertical pipeline for every 10m from the down top. And also set oil loop at the lowest and highest position.
- (3) When the outdoor unit is at higher position, oil loop is required to be set on the vertical pipeline for every 6m from the down top. And also set oil loop and one-way trap at the lowest and highest position.

### 4.3.4 Indoor unit is at higher position:

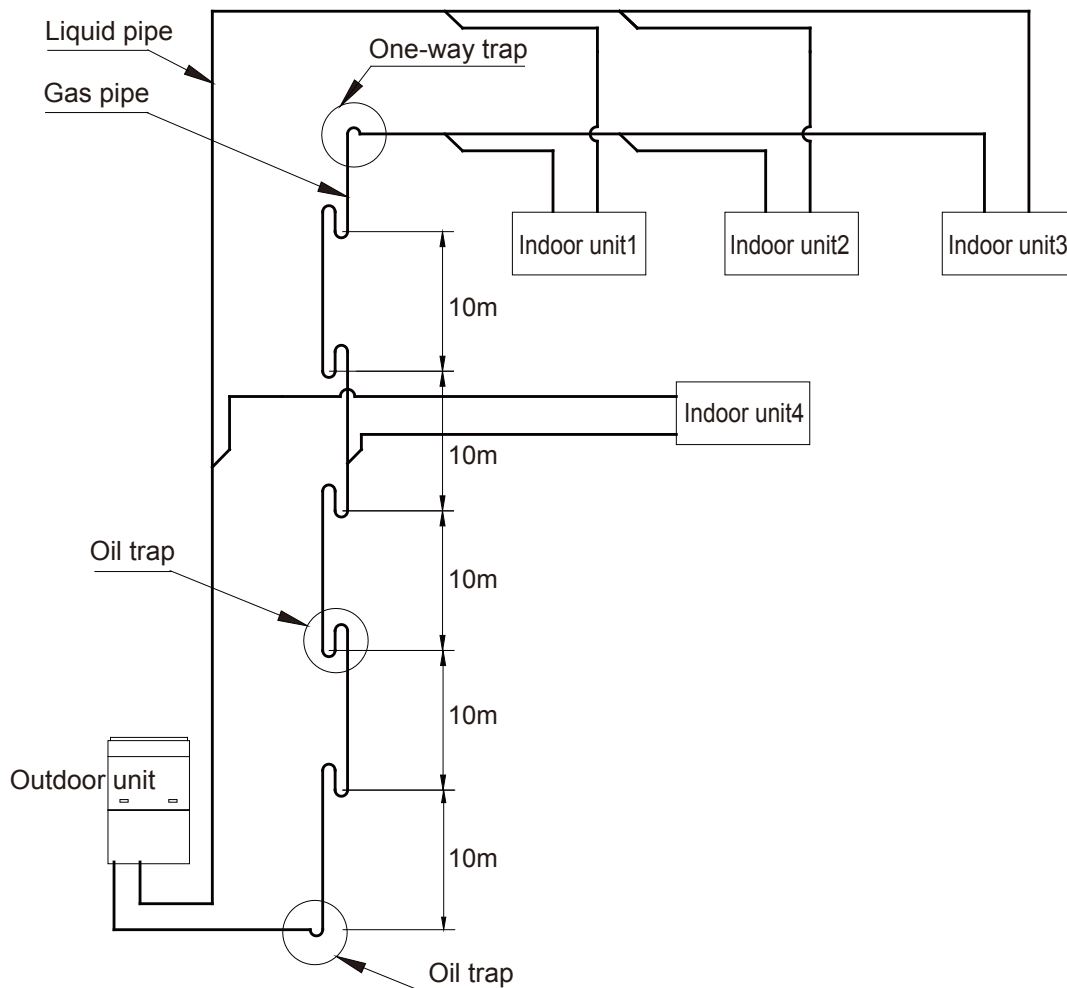


Fig.29



4.3.5 Outdoor unit is at higher position:

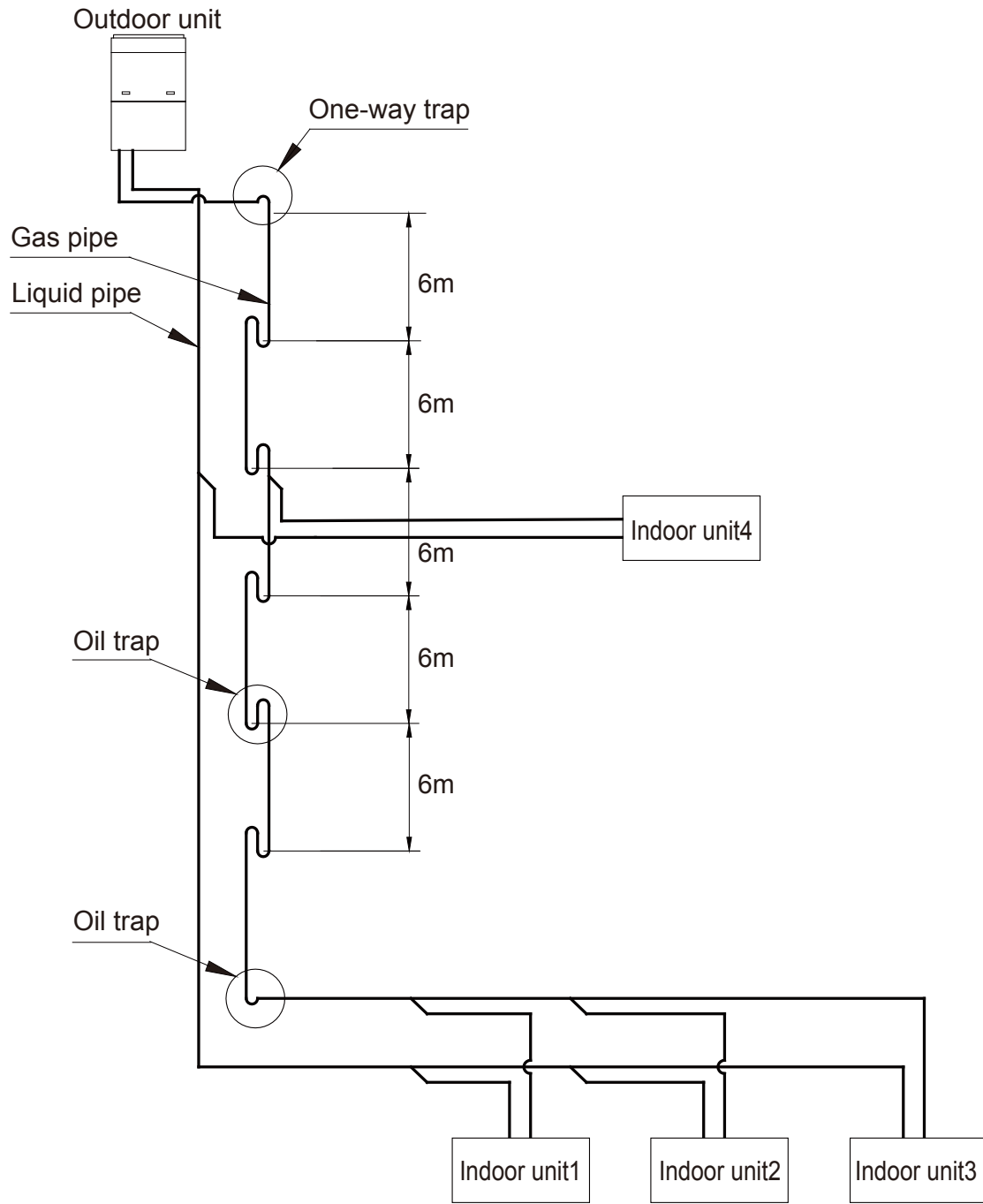


Fig.30

4.3.6 Oil loop and one-way trap

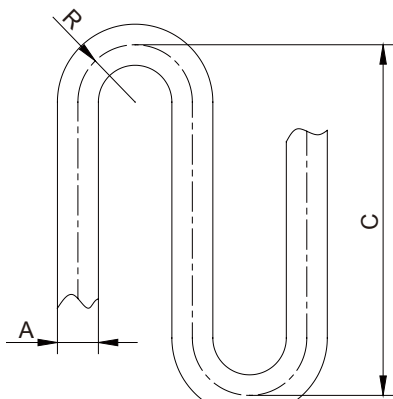


Fig.31 Oil loop

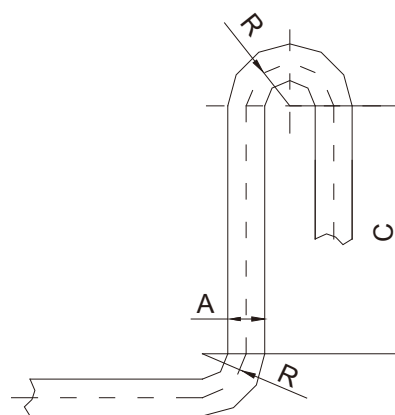


Fig.32 One-way Trap

In case of not damage the pipe, please check the following table for size of oil loop and one-way trap.

A		R(mm)	C(mm)
mm	inch		
Φ22.2	7/8	≥ 31	≤ 150
Φ25.4	1/1	≥ 45	≤ 150
Φ28.6	9/8	≥ 45	≤ 150
Φ34.9	11/8	≥ 60	≤ 250
Φ38.1	12/8	≥ 60	≤ 350
Φ41.3	13/8	≥ 80	≤ 450
Φ44.45	7/4	≥ 80	≤ 500
Φ54.1	17/8	≥ 90	≤ 500

## 4.4 Installation of the Connection Pipe

### 4.4.1 Precautions when installing the connection pipe

- (1) Conform to the following principles during piping connection: Connection pipeline should be as short as possible. The height difference between indoor and outdoor units should be as short as possible. Keep number of bends as little as possible. The radius of curvature should be as large as possible.
- (2) Weld the connection pipes between indoor and outdoor unit. Please strictly conform to the requirements for welding process. Rosin joints and pin holes are not allowable.
- (3) When laying the pipes, be careful not to deform them. The radius of bending parts should be more than 200mm. The pipes can not be repeatedly bent or stretched, otherwise the material will get harden. Do not bend or stretch the pipe over three times at the same position.
- (4) Please use a torque wrench to connect union nut on the indoor unit. See Fig. 33.

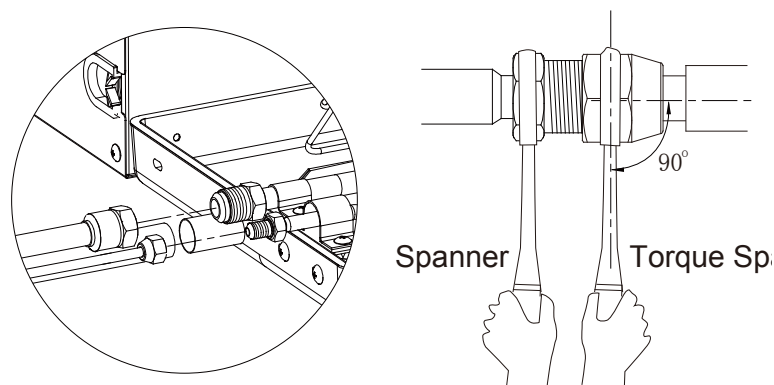
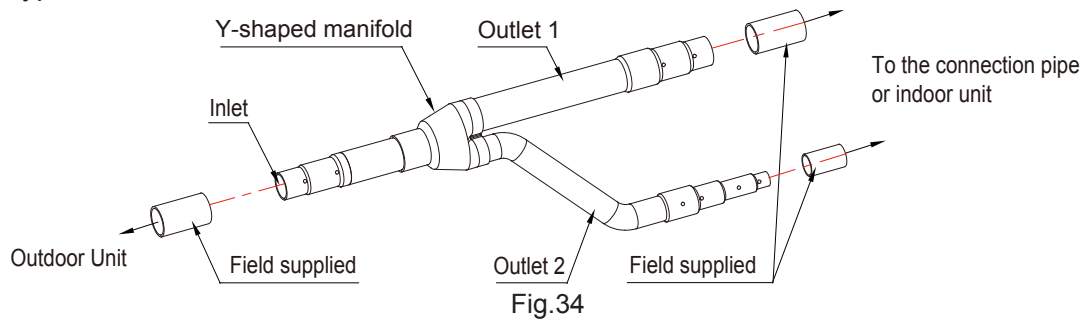


Fig.33

- 1) Align the expansion end of copper pipe with the center of threaded joint. Tighten the flare nuts with your hands.
- 2) Tighten the flare nuts with torque wrench until you hear "click" sound.
- 3) Use sponge to wrap the connecting pipe and joints without thermal insulation and tie it up with plastic tape.
- 4) A mounting support for the connection pipe is required.
- 5) The curvature degree of connection pipe should not be small, otherwise the pipe might crack. Installation personnel should use tube bender when bending the pipe.
- 6) Don't forcibly stretch the pipe joint, otherwise indoor capillary or other pipes might be damaged and lead to refrigerant leakage.

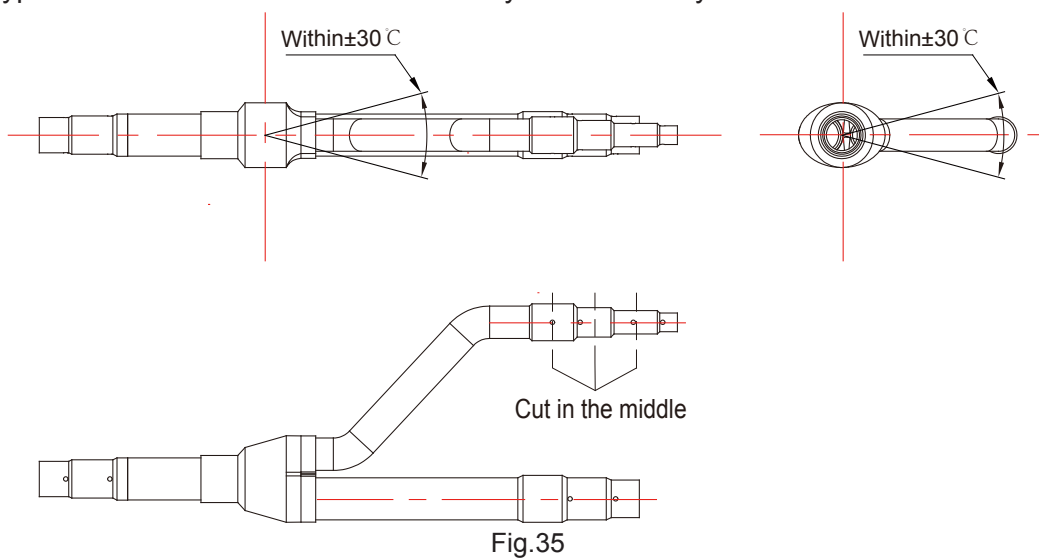
## 4.4.2 Y-type manifold

### (1) Y-type manifold



(2) Y-type manifold has several pipe sections with different pipe size, which facilitates to match with various copper pipe. Use pipe cutter to cut in the middle of the pipe section with different pipe size and deburr as well. See Fig.35.

(3) Y-type manifold must be installed vertically or horizontally.



Y-type manifold	Total capacity of downstream indoor unit(s) (X)	Model
	$X \leq 200$	89BPK-0970
	$200 < X \leq 300$	89BPK-1102
	$300 < X \leq 700$	89BPK-2240
	$700 < X \leq 1350$	89BPK-3460
	$1350 < X$	89BPK-4900

(4) Manifold is isolated by insulating material that can bear 120°C or higher temperature. Manifold attached foam can not be taken as insulating material.

#### 4.4.3 Thermal insulation for pipeline

- (1) For VRF system, every copper pipe should be labeled so as to avoid misconnection.
- (2) At the manifold inlet, at least leave 500mm straight pipe section, and for FQ04 manifold, keep it at least 800mm.
- (3) Every 6m drop height between indoor and outdoor units, one oil loop should be set on gas pipe so as to keep normal oil return.
- (4) Thermal insulation for pipeline
  - 1) To avoid condensate or water leakage on connecting pipe, the gas pipe and liquid pipe must be wrapped with thermal insulating material and adhesive pipe for insulation from the air.
  - 2) For heat pump unit, liquid pipe should bear 70°C or above, and gas pipe should bear 120°C or above. For cooling only unit, both liquid pipe and gas pipe should bear 70°C or above. Example: Polyethylene foam can bear 120°C above and foaming polyethylene can bear 100°C above.
  - 3) Joints at indoor and outdoor units should be wrapped with insulating material and leave no clearance between pipe and wall. See Fig.36.

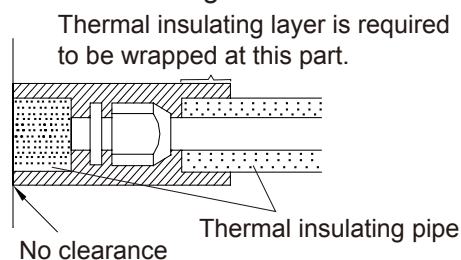


Fig.36

- 4) Manifold attached foam can not be taken as insulating material.
- 5) When wrapping the tape, the later circle should cover half of the former one. Don't wrap the tape so tightly, otherwise the insulation effect will be weakened.
- 6) After wrapping the pipe, adopt sealing material to completely fill the hole so as to prevent wind and rain from entering the room.

#### 4.4.4 Support and protection for pipeline

- (1) Support should be made for hanging connection pipe. Distance between each support can not be over 1m.
- (2) Protection towards accidental damage should be made for outdoor pipeline. When the pipeline exceeds 1m, a pinch board should be added for protection.

## 4.5 Air Purging and Refrigerant Charge

### 4.5.1 Air purging

- (1) Confirm outdoor liquid and gas valves are closed. Air purging from the nozzle located on liquid and gas valves by vacuum pump. See Fig.37.
- (2) When there are more than 2 outdoor units, air purging from the nozzle located on the oil balance valve. Confirm outdoor oil balance valves are closed. See Fig.38.

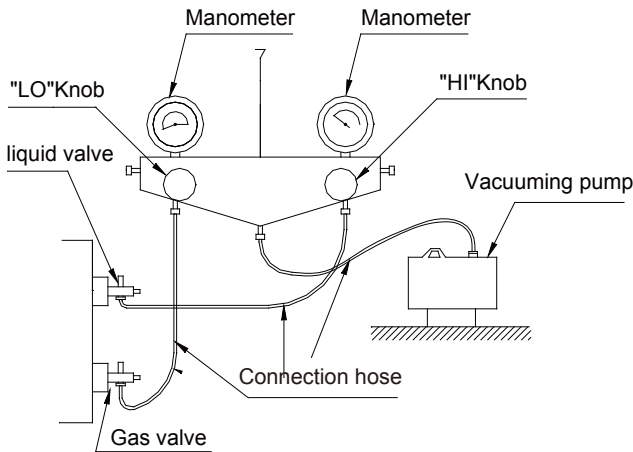


Fig.37

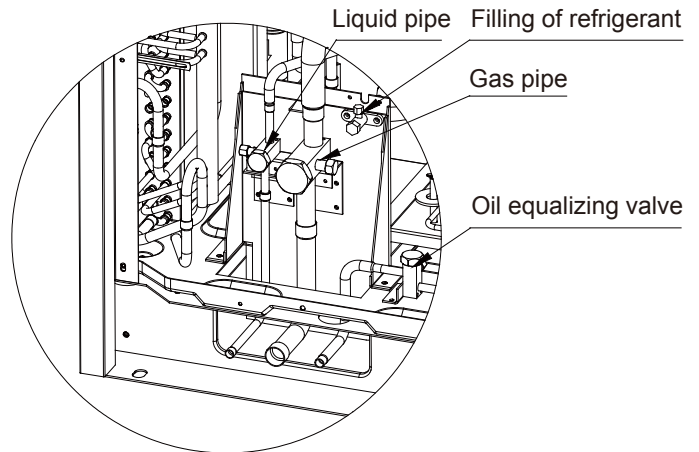


Fig.38

### 4.5.2 Additional refrigerant charging

Outdoor unit has been charged refrigerant before delivery.

Charge additional refrigerant for field-installed connecting pipe. If the pipeline is longer than 1m, please refer to the following table for charging amount of refrigerant. (Liquid pipe prevails)

Refrigerant charging amount =  $\sum$  liquid pipe length  $\times$  refrigerant charging amount of every 1m liquid pipe

Diameter of liquid pipe (mm)	Φ28.6	Φ25.4	Φ22.2	Φ19.0	Φ15.9	Φ12.7	Φ9.52	Φ6.35
kg/m	0.680	0.520	0.350	0.250	0.170	0.110	0.054	0.022

After confirming that there is no leakage from the system, when the compressor is not in operation, charge additional R410A with specified amount to the unit through the filling opening of the liquid pipe valve of the outdoor unit. If required additional refrigerant can not be quickly filled for increase of pressure in the pipe, set the unit at cooling startup and then fill the refrigerant from gas valve of outdoor unit. If ambient temperature is low, the unit can't be set to cooling mode but heating mode.

## 4.6 Electric Wiring

### 4.6.1 Wiring precautions

- ◆ Wiring should conform to national rules. All the parts, materials, electric work should be in accordance with local codes.
- ◆ Rated voltage and exclusive power supply should be used.
- ◆ Power cord should be fixed soundly and reliable. Never forcibly pull the power cord.
- ◆ Wire size of power cord should be large enough. The damaged power cord and connecting wire should be replaced by exclusive cable.
- ◆ All the electrical work should be performed by professional personnel as per local law, regulation and this manual.
- ◆ Connect the unit to the special earthing device and make sure the unit is earthed soundly.
- ◆ Air switch and circuit breaker is required to be set. Air switch should have both magnetic trip and thermal trip functions so as to protect the unit when short-circuit and overload happens. D-type breaker is advised to be used.
- ◆ Wiring diagram attached on the unit is prevailed.

### 4.6.2 Wiring of power cord

Every unit should have corresponding short-circuit and overload protection. And also a main switch is required to control power supply or disconnection. See Fig.39.

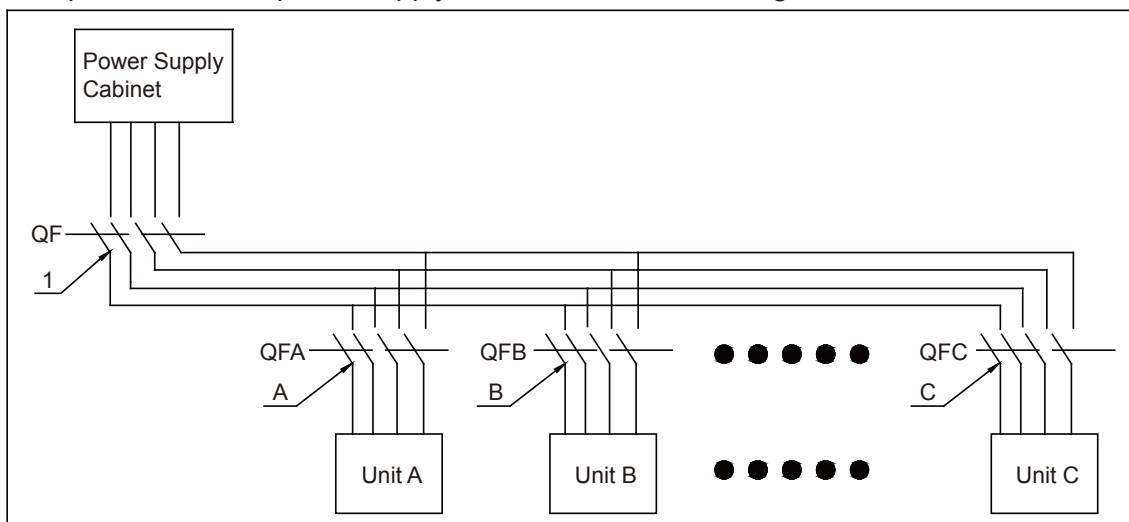


Fig.39

Please refer to the following table for circuit breaker and air switch for modular outdoor units. 5-core cable is used and the wire size unit is mm<sup>2</sup>.

Model	Basic models	Air switch capacity (A)	Air switch capacity for combined units (A)	Wire size of power supply (mm <sup>2</sup> )	Wire size of combined uni (mm <sup>2</sup> )
82VC007J34□□	007	50	50	10.0	10.0
82VC009J34□□	009	50	50	10.0	10.0
82VC010J34□□	010	80	80	16.0	16.0
82VC012J34□□	012	80	80	16.0	16.0
82VC014J34□□	014	80	80	16.0	16.0
82VC016J34□□	007+009	100	50+50	35.0	10.0+10.0
82VC018J34□□	009+009	100	50+50	35.0	10.0+10.0
82VC019J34□□	009+010	125	50+80	50.0	10.0+16.0
82VC021J34□□	009+012	125	50+80	50.0	10.0+16.0
82VC023J34□□	009+014	125	50+80	50.0	10.0+16.0
82VC024J34□□	012+012	160	80+80	70.0	16.0+16.0
82VC026J34□□	012+014	160	80+80	70.0	16.0+16.0
82VC028J34□□	014+014	160	80+80	70.0	16.0+16.0
82VC030J34□□	009+009+012	200	50+50+80	70.0	10.0+10.0+16.0
82VC032J34□□	009+009+450	200	50+50+80	70.0	10.0+10.0+16.0
82VC033J34□□	009+012+012	200	50+80+80	95.0	10.0+16.0+16.0
82VC035J34□□	009+012+014	200	50+80+80	95.0	10.0+16.0+16.0
82VC037J34□□	009+014+014	200	50+80+80	95.0	10.0+16.0+16.0
82VC038J34□□	012+012+014	250	80+80+80	120.0	16.0+16.0+16.0
82VC040J34□□	012+014+014	250	80+80+80	120.0	16.0+16.0+16.0
82VC042J34□□	014+014+014	250	80+80+80	120.0	16.0+16.0+16.0
82VC044J34□□	009+009+012+014	250	50+50+80+80	120.0	10.0+10.0+16.0+16.0
82VC046J34□□	009+009+014+014	250	50+50+80+80	120.0	10.0+10.0+16.0+16.0
82VC047J34□□	009+012+012+014	320	50+80+80+80	150.0	10.0+16.0+16.0+16.0
82VC049J34□□	009+012+014+014	320	50+80+80+80	150.0	10.0+16.0+16.0+16.0
82VC051J34□□	009+014+014+014	320	50+80+80+80	150.0	10.0+16.0+16.0+16.0
82VC052J34□□	012+012+014+014	320	80+80+80+80	185.0	16.0+16.0+16.0+16.0
82VC054J34□□	012+014+014+014	320	80+80+80+80	185.0	16.0+16.0+16.0+16.0
82VC056J34□□	014+014+014+014	320	80+80+80+80	185.0	16.0+16.0+16.0+16.0

Please refer to the following table for circuit breaker and air switch for indoor units. Breaker listed in the table represents total capacity of breaker in one system.

Total capacity of indoor units	Capacity of circuit breaker (A)	Min. sectional area of power cord (mm <sup>2</sup> )	Min. sectional area of grounding wire (mm <sup>2</sup> )
Below10A	10	1.5	1.5
16~10A	16	1.5	1.5
20~16A	20	2.5	2.5
32~20A	32	4.0	4.0
40~32A	40	6.0	6.0
50~40A	50	10.0	10.0
63~50A	63	16.0	16.0

80~63A	80	25.0	16.0
100~80A	100	35.0	16.0
125~100A	125	50.0	25.0

Breaker capacity and power cord specification for every indoor unit

Indoor unit	Capacity of circuit breaker (A)	Min. sectional area of grounding wire (mm <sup>2</sup> )	Min. sectional area of power cord (mm <sup>2</sup> )
Wall-mounted type	6	1.0	1.0
Duct type unit (heat pump)	6	1.0	1.0
Cassette type unit (heat pump)	6	1.0	1.0
One-way cassette type unit	6	1.0	1.0

If indoor unit is equipped with auxiliary electric heater, select capacity of circuit breaker as per auxiliary electric heater, which requires special setting.

Indoor unit models (with auxiliary electric heater)	Capacity of circuit breaker (A)	Min. sectional area of grounding wire (mm <sup>2</sup> )	Min. sectional area of power cord (mm <sup>2</sup> )
22,25,28,32,36 duct type unit	6	1.0	1.0
40,45,50 duct type unit	10	1.0	1.0
56,63,71,80 duct type unit	16	1.5	1.5
90,100,112,25,140 duct type unit	10	1.0	1.0
28,36,45,50 cassette type unit	6	1.0	1.0
56,63,71 cassette type unit	10	1.0	1.0
80,90,112,125,140 cassette type unit	10	1.0	1.0
22,25,28,32,36 slim duct type unit	6	1.0	1.0
40,45,50 slim duct type unit	10	1.0	1.0
56,63,71 slim duct type unit	16	1.5	1.5

 Note:

- ① Power supply should adopt copper cable and the working temperature should not be larger than specified value.
- ② If the power cable length is larger than 15m, please enlarge the sectional area of cable to avoid accident due to overload.
- ③ Select power cable and air switch as per actual condition.
- ④ Selection of circuit breaker and power cord is based upon maximum power (maximum current). The power cable can be used at 40°C ambient temperature. The multi-core copper cable can be used at 90°C ambient temperature. When the working condition changes, please adjust as per national standard. The circuit breaker can be used at 40°C ambient temperature. When the working condition changes, please adjust in accordance with breaker specification.
- ⑤ Rated value of air switch should be larger than maximum working current and less than carrying capacity of lower wire gage.
- ⑥ In some special condition, such as parallel installation, take poor heat exchanging or high ambient temperature into consideration due to capacity reduction of air switch.
- ⑦ Carry capacity is related to wiring manner, ambient temperature, material or heat-resisting



level. Reconfirm the wire gage when above factors changes.

### 4.6.3 Connection of power cord

- (1) Pass the cable through rubber ring and connect the power cable to terminal “L1” “L2”“L3” and the grounding screw.
- (2) Fix the power cable by wire clamp.
- (3) As air-conditioning unit is of Class 1 electrical appliance, reliable grounding measures must be taken for it.
- (4) The double color (yellow and green) cable inside the unit is specially used for grounding, so it shall not be used for other purposes nor can it be cut. Do not tighten with tapping screws; otherwise it might cause risk of electric shock.
- (5) The ground resistance shall be in conformity with the requirements of state standard GB 17790-2008.
- (6) The user power supply shall have reliable grounding terminal. It is prohibited to connect the grounding wire to the following items:

① Water Supply Pipe; ② Gas Pipe; ③ Sewage Pipe; ④ Other positions that are considered to be unreliable by professionals.

## 4.7 System Communication

### 4.7.1 Communication system include:

- (1) Communication between indoor and outdoor units
- (2) Communication among indoor units
- (3) Communication among outdoor units (modular combination)
- (4) Communication between patchboards(if applicable)
- (5) Communication schematic diagram

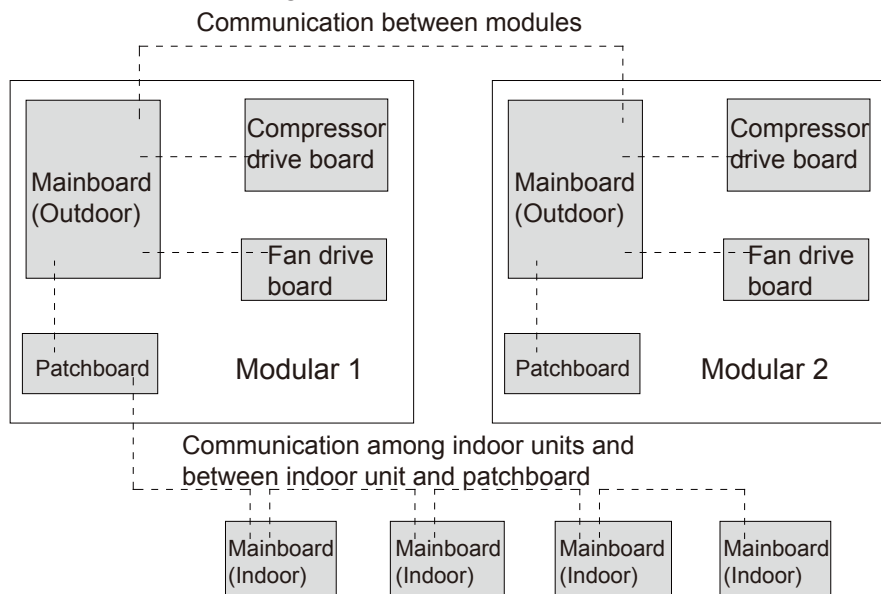


Fig.40

### 4.7.2 Communication method

- (1) 485 communication method is used in the system.
- (2) Indoor network: outdoor patchboard $\longleftrightarrow$ indoor unit $\longleftrightarrow$ 2-core twisted pair line with 3-core XH pins for indoor communication (Using 2-bit and 3-bit)
- (3) Outdoor network: module $\longleftrightarrow$ 2-core twisted pair line with 4-core XH pins for outdoor communication (Using 2-bit and 3-bit)

### 4.7.3 Address setting

Setting of communication address include: address setting of indoor unit, wired controller, outdoor unit, quantity of outdoor modules and patchboard.

### 4.8 DIP Switch Setting

Note: DIP switch setting will take effect after a cycle of power on and off.

82VC007J34, 82VC009J34

82VC010J34, 82VC012J34, 82VC014J34

DIP switch setting of outdoor main board/patchboard

Module No.	Setting of quantity code SW2				Setting of address code SW3				Setting of address code S2			
	Module No.1	Module No.2	Module No.3	Module No.4	Module No.1	Module No.2	Module No.3	Module No.4	Module No.1	Module No.2	Module No.3	Module No.4
1 Fitting pipe		—	—	—		—	—	—		—	—	—
2 Communication line between modules Fitting pipe			—	—			—	—			—	—
3 Communication line between modules Fitting pipe				—				—				—
4 Communication line between modules Fitting pipe												

Warnings:

- The DIP switch only can be set when the unit is de-energized. For modular unit, communication line should be connected among modules.
- The modular unit should conform to the DIP switch setting method mentioned above.
- Every patchboard can only connect to 16 indoor units.
- The unit might be seriously damaged if above items are not followed.
- The black part in the diagram presents the toggle.
- The factory-set DIP switch is not allowed to be changed; otherwise errors might happen to the unit.
- The DIP switch setting can be taken into effect only after the unit is re-energized.

Picture

Schematic of DIP switch setting

Fig.41

### 4.8.1 Network diagram

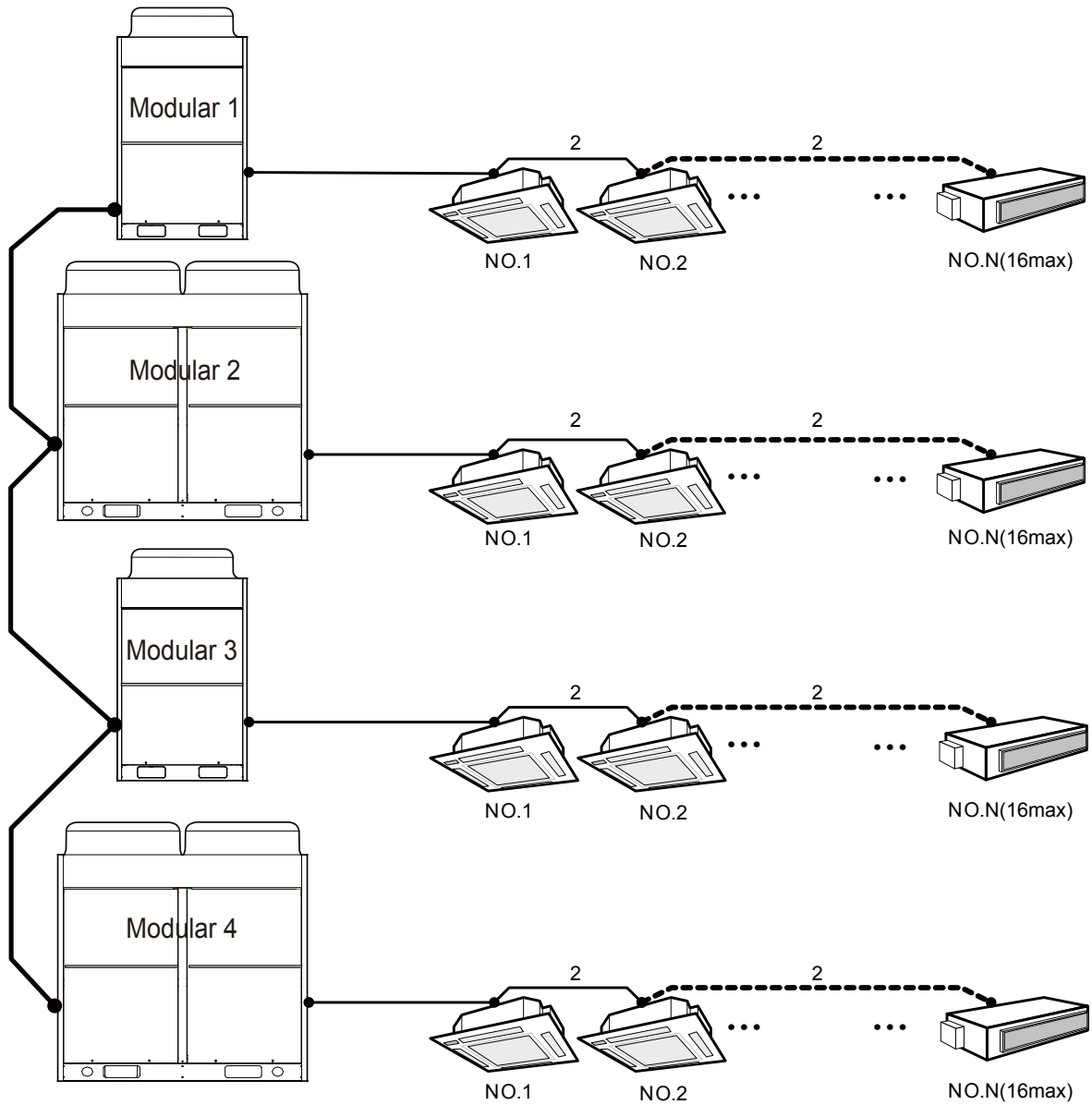


Fig.42

Note:

- ① The network of four modules is shown in above diagram.
- ② Address code is set as per some sequence or direction.

#### 4.8.2. Part of electric box

Electric box has various types because the unit has different capacities with one or two fans.

Enlarged view of electric box for 82VC007J34 and 82VC009J34 units is shown in Fig.43.

It presents the relative position of mainboard and patchboard, and that of terminals and DIP switch.

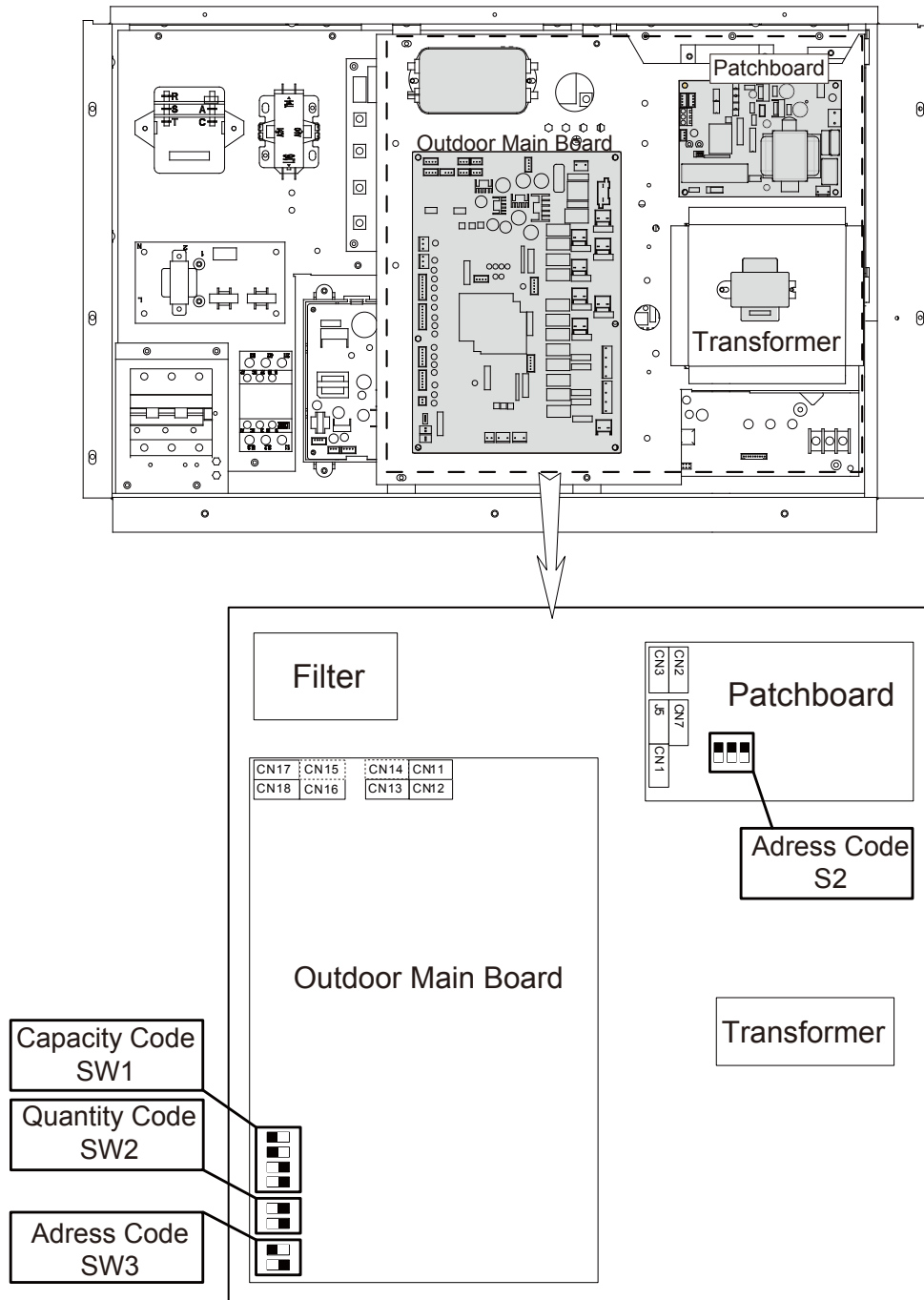


Fig.43

Enlarged view of electric box for 82VC010J34, 82VC012J34 and 82VC014J34 units   is shown in Fig.44. It presents the relative position of mainboard and patchboard, and that of terminals and DIP switch.

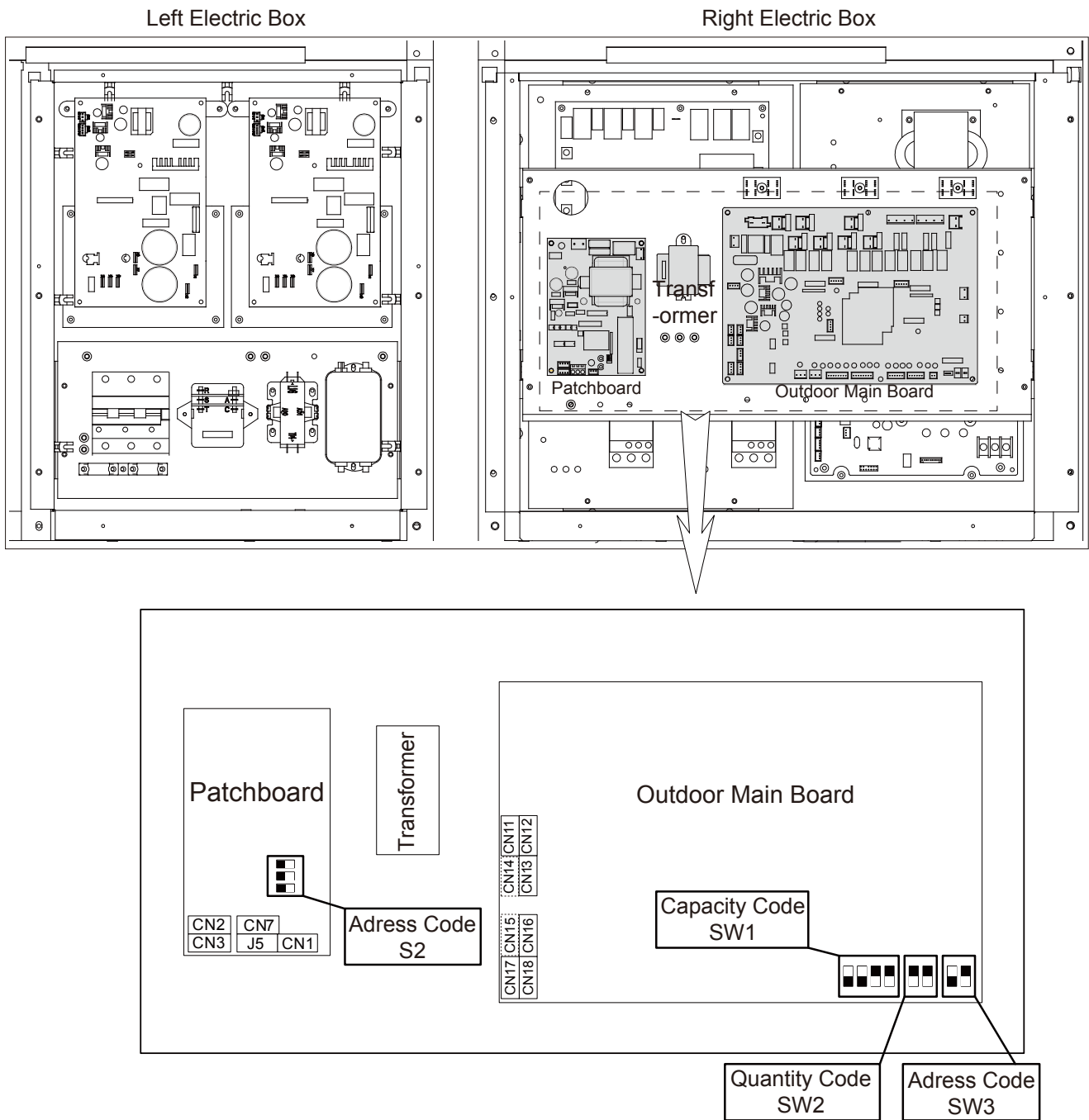


Fig.44

Note:

- ① "Mainboard" and "pathboard" metioned in the following section represents the mainboard and patchboard in the outdoor unit.
- ② Capacity DIP switch SW1 is not allowed to be modified by user. Quantity DIP switch SW2 and address DIP switch SW3, S2 are set as per actual condition. Specific DIP switch setting is shown as follows.

### 4.8.3 Setting method of DIP switch

#### 4.8.3.1 For single-module unit

First step: Reliably connect the communication line between indoor units.

Second step: Connect indoor units with outdoor unit. Connect communication line from one indoor unit with the CM, a 3-core white terminal on the patchboard. Refer to the following figure.

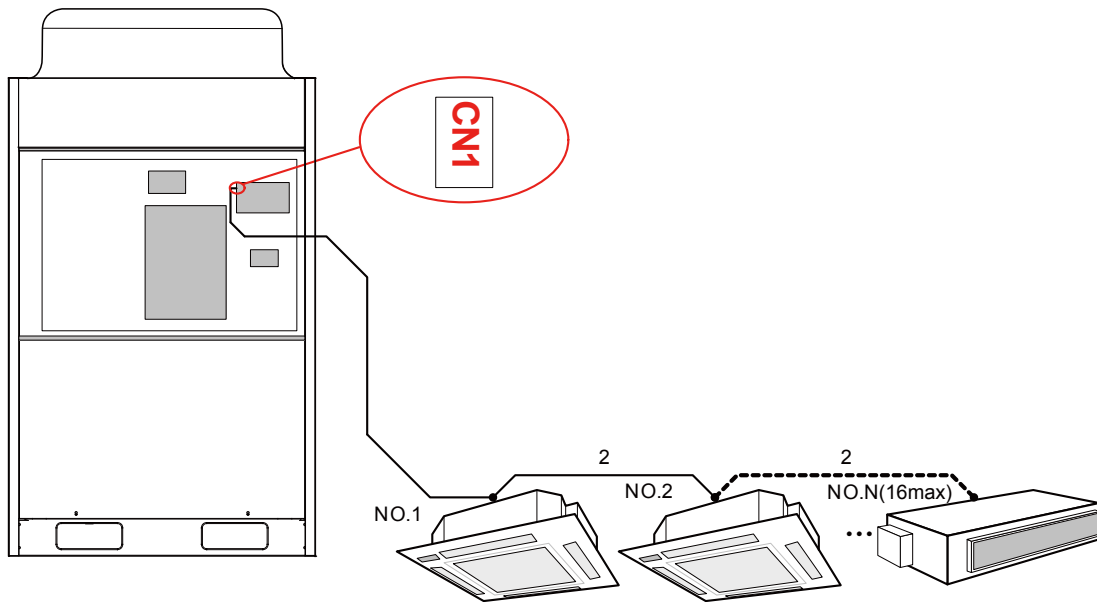


Fig.45

Third step: DIP switch setting

After communication line has been connected, set the DIP switch of SW2, SW3 on the mainboard and S2 on the patchboard. (Black part presents the toggle.)

Mainboard		Patchboard
SW2	SW3	S2

#### 4.8.3.2 For dual-module unit:

First step: Connect the CM8 on the mainboard with CM7 on the next outdoor module.

Second step: Take 16 indoor units as a group and reliably connect the communication line between indoor units.

Third step: Connect indoor units with outdoor units. Connect every group of indoor units with the CM, a 3-core white terminal on a patchboard from one outdoor module by a 3-core communication line. Refer to the following figure.

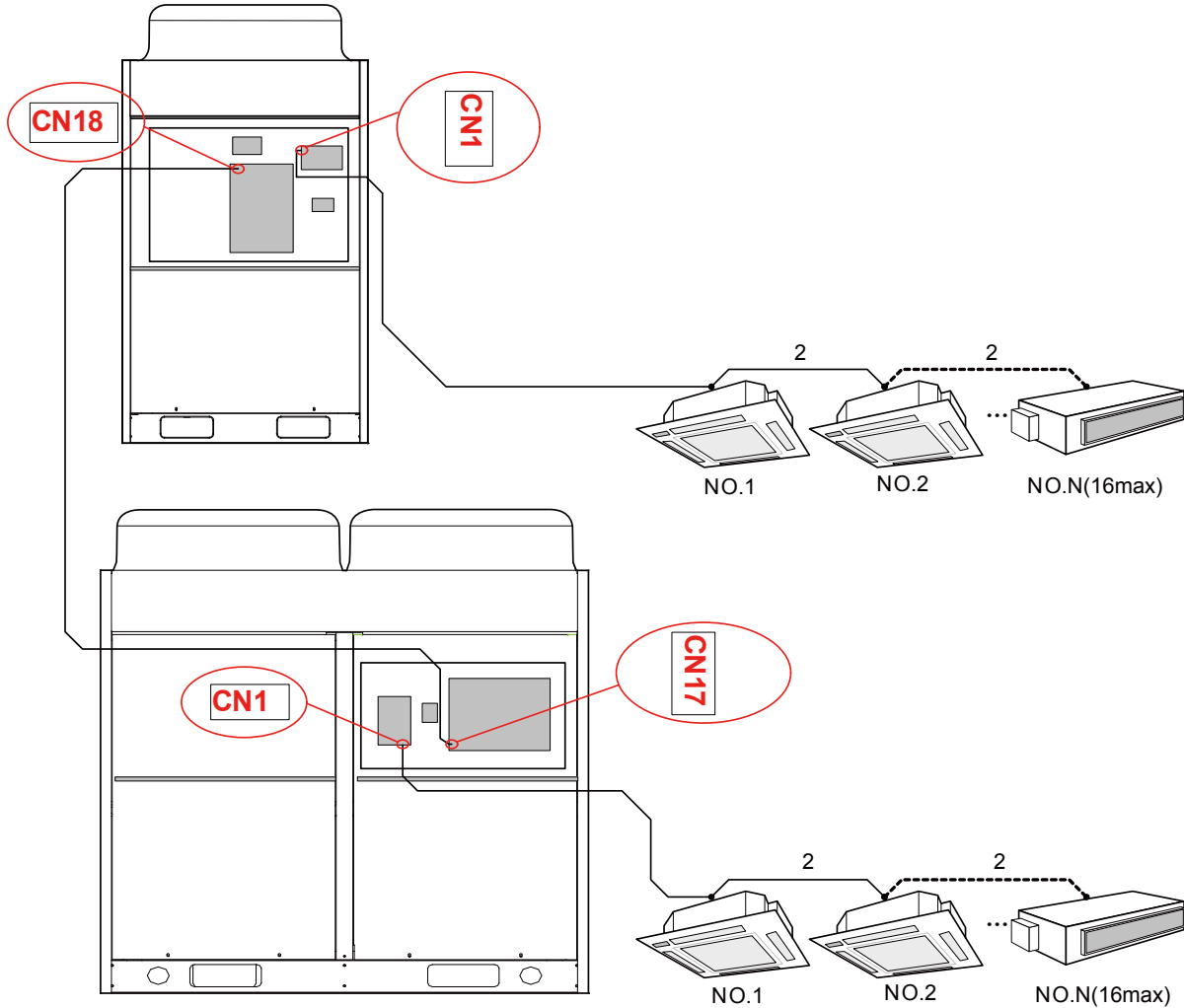


Fig.46

Forth step: DIP switch setting

After communication line has been connected, set the DIP switch of SW2, SW3 on the mainboard and S2 on the patchboard. (Black part presents the toggle.)

	Mainboard		Patchboard
Module No.1	SW2	SW3	S2
Module No.2	SW2	SW3	S2

#### 4.8.3.3 For three-module unit:

First step: Connect the CM8 on the mainboard with CM7 on the next outdoor module.

Second step: Take 16 indoor units as a group and reliably connect the communication line between indoor units.

Third step: Connect indoor units with outdoor units. Connect every group of indoor units with the CM, a 3-core white terminal on a patchboard from one outdoor module by a 3-core communication line. Refer to the following figure.

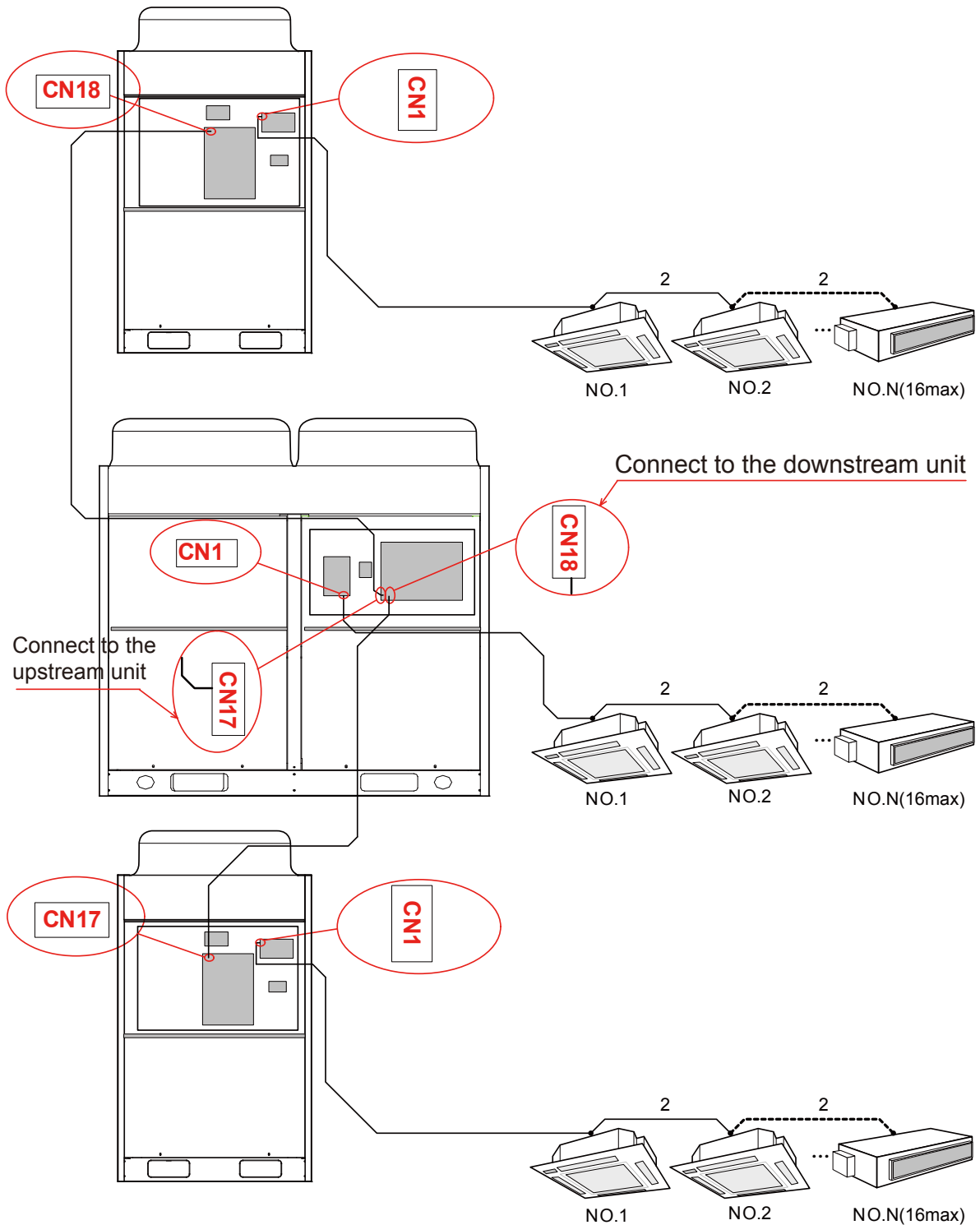
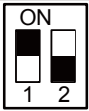
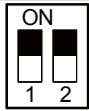

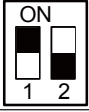
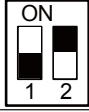
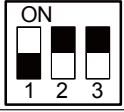
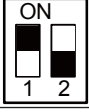
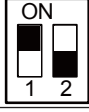
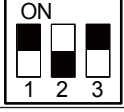


Fig.47



Forth step: DIP switch setting

After communication line has been connected, set the DIP switch of SW2, SW3 on the mainboard and S2 on the patchboard. (Black part presents the toggle.)

	Mainboard		Patchboard
	SW2	SW3	S2
Module No.1			
Module No.2			
Module No.3			

#### 4.8.3.4 For four-module unit:

First step: Connect the CM8 on the mainboard with CM7 on the next outdoor module.

Second step: Take 16 indoor units as a group and reliably connect the communication line between indoor units.

Third step: Connect indoor units with outdoor units. Connect every group of indoor units with the CM, a 3-core white terminal on a patchboard from one outdoor module by a 3-core communication line. Refer to the following figure.

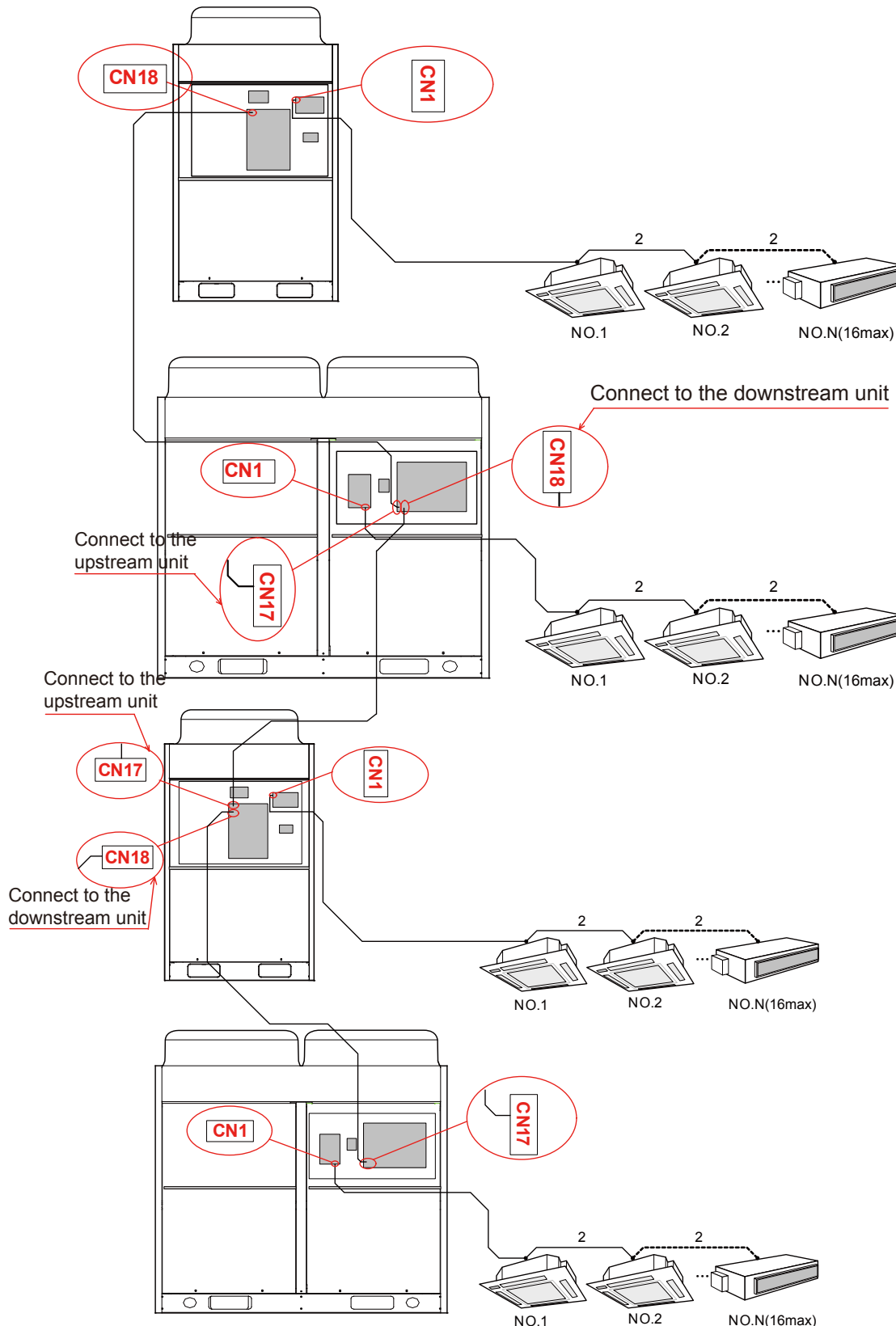


Fig.48

Forth step: DIP switch setting

After communication line has been connected, set the DIP switch of SW2, SW3 on the mainboard and S2 on the patchboard. (Black part presents the toggle.)

	Mainboard		Patchboard
	SW2	SW3	S2
Module No.1			
Module No.2			
Module No.3			
Module No.4			

Note:














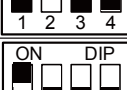
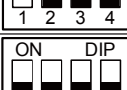
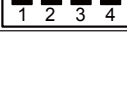
- ① When the outdoor module doesn't need to be connected with indoor unit, "E6" will be shown on the patchboard after the unit is energized, which will not effect normal operation of the unie.
- ② Once the setting of DIP switch has been modified, it will only take effect after a cycle of power on and off.

4.8.4 Every indoor unit will have capacity DIP switch and address DIP switch. The capacity DIP switch has been factory-set, while the address DIP switch should be set as per actual condition. Setting principles are shown below:

The addresses of indoor units connected on the same patchboard can be set from 1 to 16 and address repetition is not allowable.

The addresses of indoor units connected on different patchboards can be repetitive

Please refer to the indoor unit manual for specific setting method.

Type of DIP switch	Setting method					Address
	DIP1	DIP2	DIP3	DIP4		
Address code of indoor unit	ON	ON	ON	ON		No.1
	OFF	ON	ON	ON		No.2
	ON	OFF	ON	ON		No.3
	OFF	OFF	ON	ON		No.4
	ON	ON	OFF	ON		No.5
	OFF	ON	OFF	ON		No.6
	ON	OFF	OFF	ON		No.7
	OFF	OFF	OFF	ON		No.8
	ON	ON	ON	OFF		No.9
	OFF	ON	ON	OFF		No.10
	ON	OFF	ON	OFF		No.11
	OFF	OFF	ON	OFF		No.12
	ON	ON	OFF	OFF		No.13
	OFF	ON	OFF	OFF		No.14
	ON	OFF	OFF	OFF		No.15
	OFF	OFF	OFF	OFF		No.16

Note: Black part presents the toggle.

4.8.5 When the indoor unit is controlled by wired controller, the address DIP switch of wired controller should be set as the same as that of indoor mainboard, otherwise, communication error will happen with "E6" displayed.

Note: Communication line between indoor unit and wired controller is factory-set in the indoor unit. (Standard wiring length is 8m. Except duct type indoor unit with standard wired controller, wired controllers for other types of indoor unit are optional.)

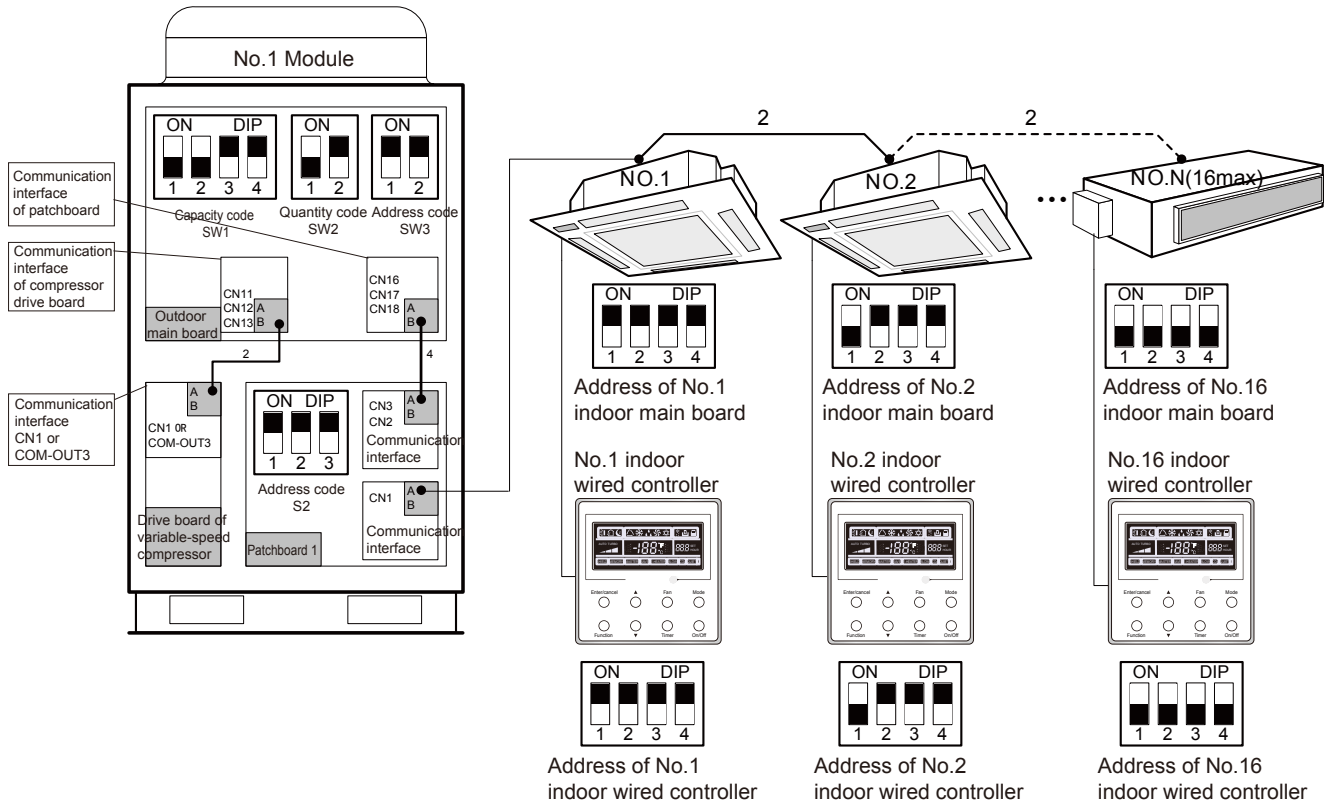

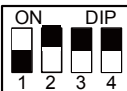






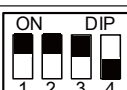









Fig.49

Remarks:

Set the DIP switch as per indoor unit manual when the touch-screen wired controller is used. Refer to the following table for the setting of other types of wired controller.

Type of DIP switch	Setting method					Address
	DIP1	DIP2	DIP3	DIP4		
Address code of wired controller	ON	ON	ON	ON		No.1
	OFF	ON	ON	ON		No.2
	ON	OFF	ON	ON		No.3
	OFF	OFF	ON	ON		No.4
	ON	ON	OFF	ON		No.5
	OFF	ON	OFF	ON		No.6
	ON	OFF	OFF	ON		No.7
	OFF	OFF	OFF	ON		No.8
	ON	ON	ON	OFF		No.9
	OFF	ON	ON	OFF		No.10
	ON	OFF	ON	OFF		No.11
	OFF	OFF	ON	OFF		No.12
	ON	ON	OFF	OFF		No.13
	OFF	ON	OFF	OFF		No.14
	ON	OFF	OFF	OFF		No.15
	OFF	OFF	OFF	OFF		No.16

Note: Black part presents the toggle.

## 4.9 Wiring Connection

### 4.9.1 Thress steps for communication wiring:

- (1) During installation, communication line can not be wired with power cord. The minimum distance between communication line and power cord should be more than 20cm, otherwise unit malfunction may happen.
- (2) About connection between indoor units and connection between outdoor modules, please refer to Fig.50
  - 1) Communication between indoor and outdoor units: insert one end of indoor 2-core 3-pin wiring into outdoor 3-pin socket CM. The other end is inserted into 3-pin socket CM7 or CM8 on the indoor main board.
  - 2) Communication between outdoor modules: For multi-module system, insert one end of 2-core 4-pin wiring into 4-pin socket CM7 or CM8 on mainboard. The other end is inserted into 4-pin socket CM7 or CM8 on the outdoor main board.

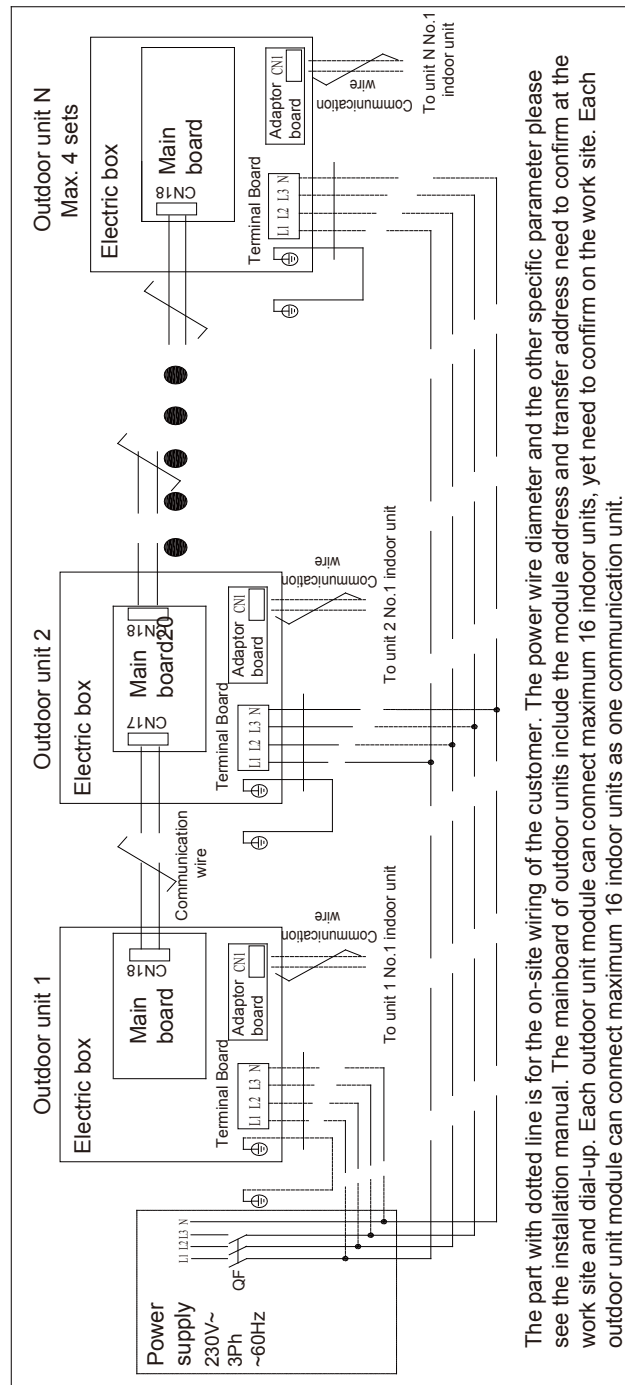


Fig.50

- 3) Each outdoor module can connect up to 16 sets of indoor unit. When the quantity of indoor units is less than 16, all the indoor units connected to the same outdoor module, but also allow some of the indoor units to connect with different outdoor modules. When the system contains the quantity of indoor units is from 16 to 32, indoor units can be connected to two or more outdoor modules. When the quantity of indoor units is from 32 to 48, the indoor units can be connected to three or more outdoor modules; and so on. The different outdoor modules need address code and transit address code for distinction, please refer to "outdoor-DIP switch setting" for more reference.
- (3) Connection between indoor units
- 1) Open the electric box of outdoor unit. Pass wiring (communication line) through the hole on side plate and then through the rubber ring of electric box. Insert the communication line into 3-pin socket CM7 or CM8 on main board of outdoor unit.
  - 2) Pass wiring (communication line on wired controller) through the hole on side plate and then through the rubber ring of electric box. Insert the communication line into 4-pin socket CM9 on circuit board of indoor unit.
  - 3) Fix the wiring (communication line) properly by tie wire. Put back the junction cover plate and tighten the screws. Cover the panel.

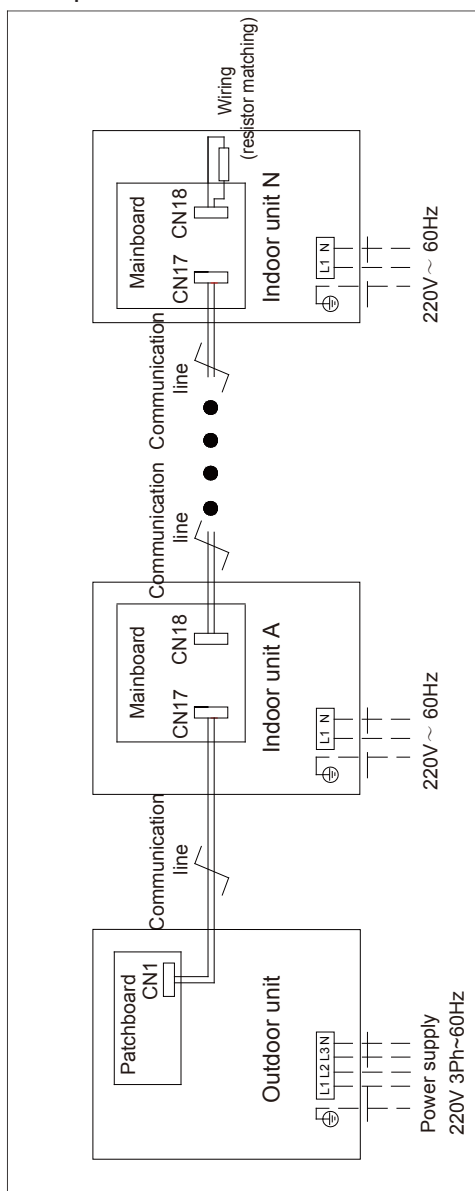


Fig.51

Remarks: The final indoor unit requires communication line (match with resistance). Communication line is connected in series. See Fig.53 for connection of communication line.



### 4.9.2 Outdoor main board interface

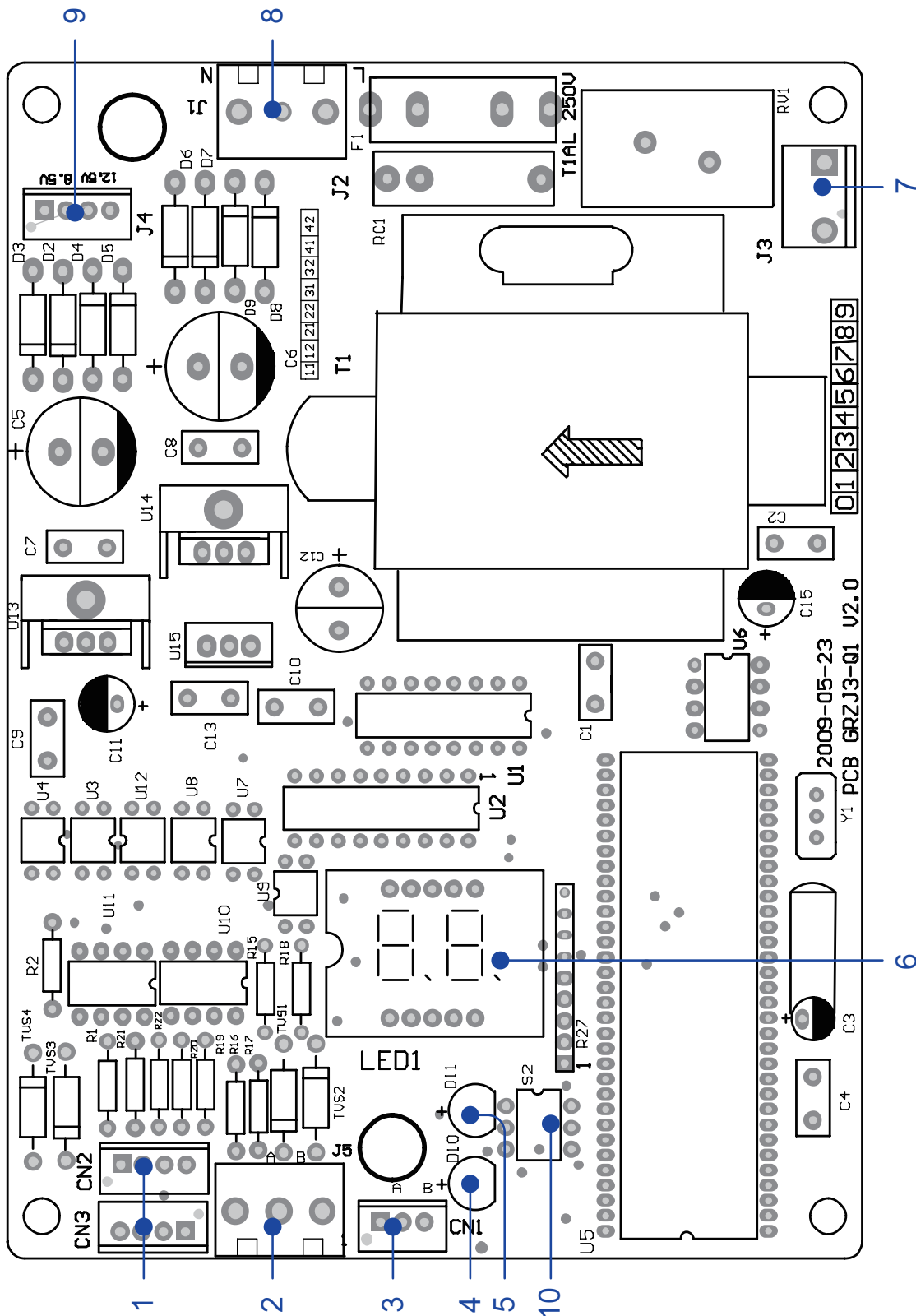


Fig.52 Patchboard

#### Patchboard interface

1-Main board communication port	2-Not Used	3-Indoor communication port	4-Status indicator (red)	5-Status indicator (green)
6-Digitron for indicating status	7-Transformer input	8-Patchboard power supply	9-Transformer output	10-Address code(S2)

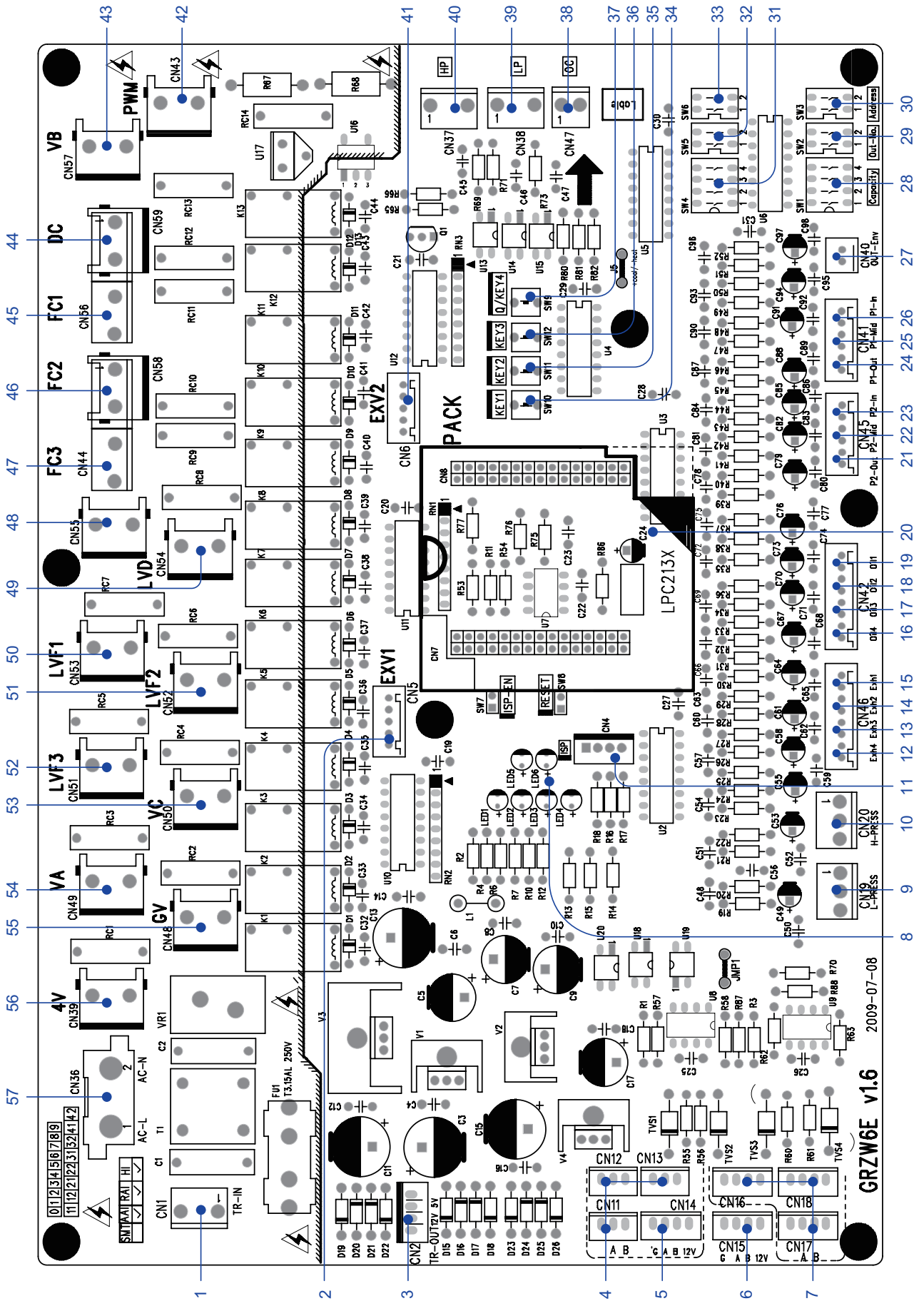


Fig.53 Mainboard

Definition of main board interface

1-Transformer input	2-Electronic expansion valve	3-Transformer output	4-Communication ports for drive plate
5-Not Used	6-Not Used	7- Communication port of patchboard	8-LED indicator for module state
9-Low-pressure sensor	10-High-pressure sensor	11-Not Used	12-Not Used
13-Air discharge for fixed frequency compressor 2	14-Air discharge for fixed frequency compressor 1	15-Air discharge for variable frequency compressor	16-Not Used
17-Top of fixed frequency compressor 2	18-Top of fixed frequency compressor 1	19-Top of variable frequency compressor	20- CPU board
21- Not Used	22-Not Used	23- Not Used	24- Outlet pipe temp sensor
25- Middle tube temp sensor	26- Inlet pipe temp sensor	27-Outdoor ambient temp sensor	28- Capacity code (SW1)
29-Quantity code of modules (SW2)	30-Module address code (SW3)	31-Not Used	32- Not Used
33- Not Used	34- Not Used	35- Not Used	36- Not Used
37- Not Used	38-Overcurrent protection switch	39-Not Used	40-High-pressure switch
41- Not Used	42- Not Used	43-Solenoid valve of capillary	44- Not Used
45-Fixed frequency compressor 1	46- Fixed frequency compressor 2	47-Not Used	48- Not Used
49- Liquid by-pass valve	50- Not Used	51- Not Used	52- Not Used
53- Oil balance valve	54- Refrigerant valve A	55- Gas by-pass valve	56- 4-way valve
57- Power supply			

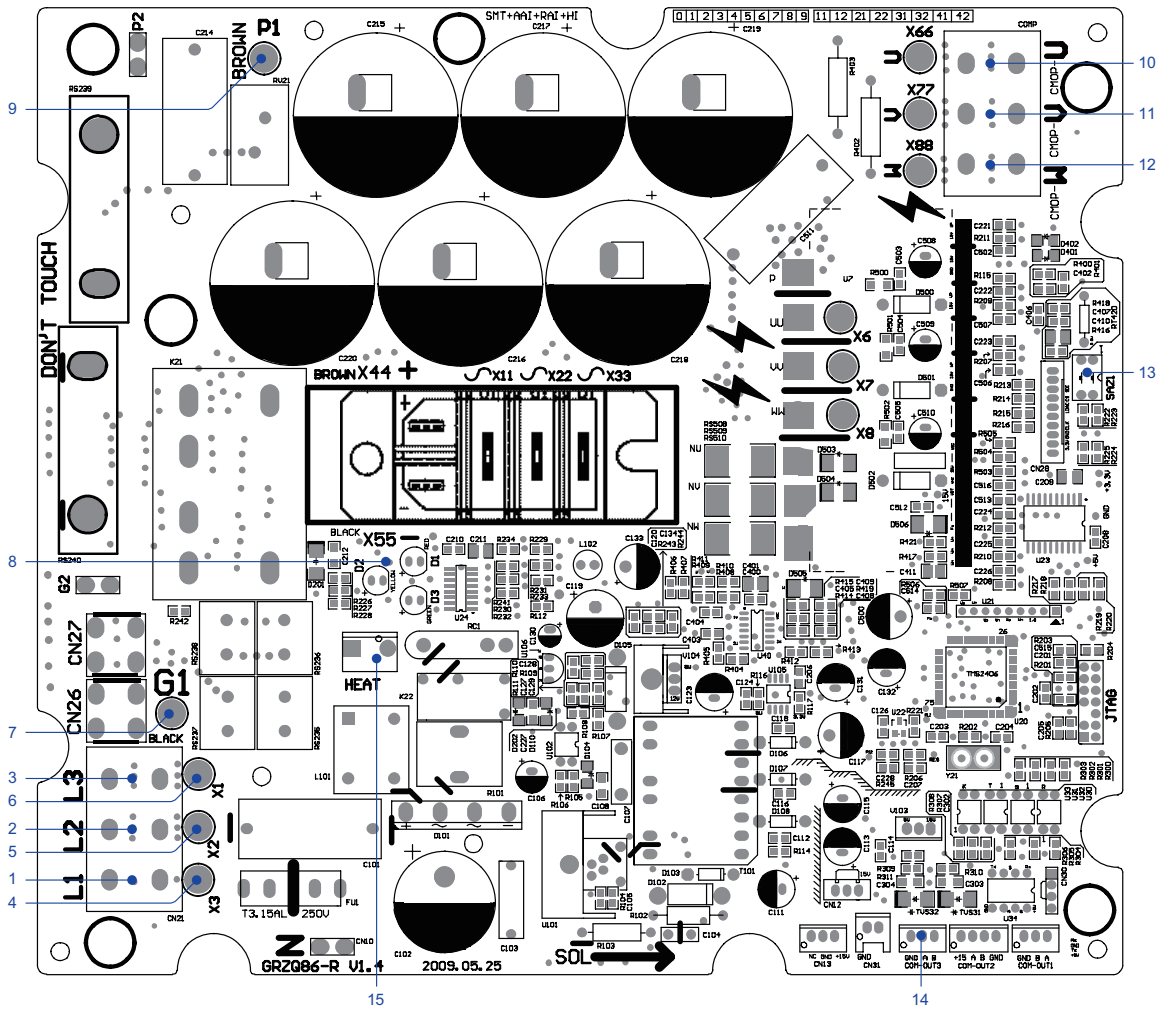


Fig.54 Drive board of compressor

Interface of compressor drive board

1- L1 phase power input	2- L2 phase power input	3- L3 phase power input	4-to rectifier - X33
5- to rectifier ~ X22	6- to rectifier ~ X11	7- to rectifier - X55	8- LED indicator
9- to rectifier ~ X44	10- U phase port of Compressor	11- V phase port of Compressor	12- W phase port of Compressor
13- Code	14- Communication interface	15- Interface of compressor heater	

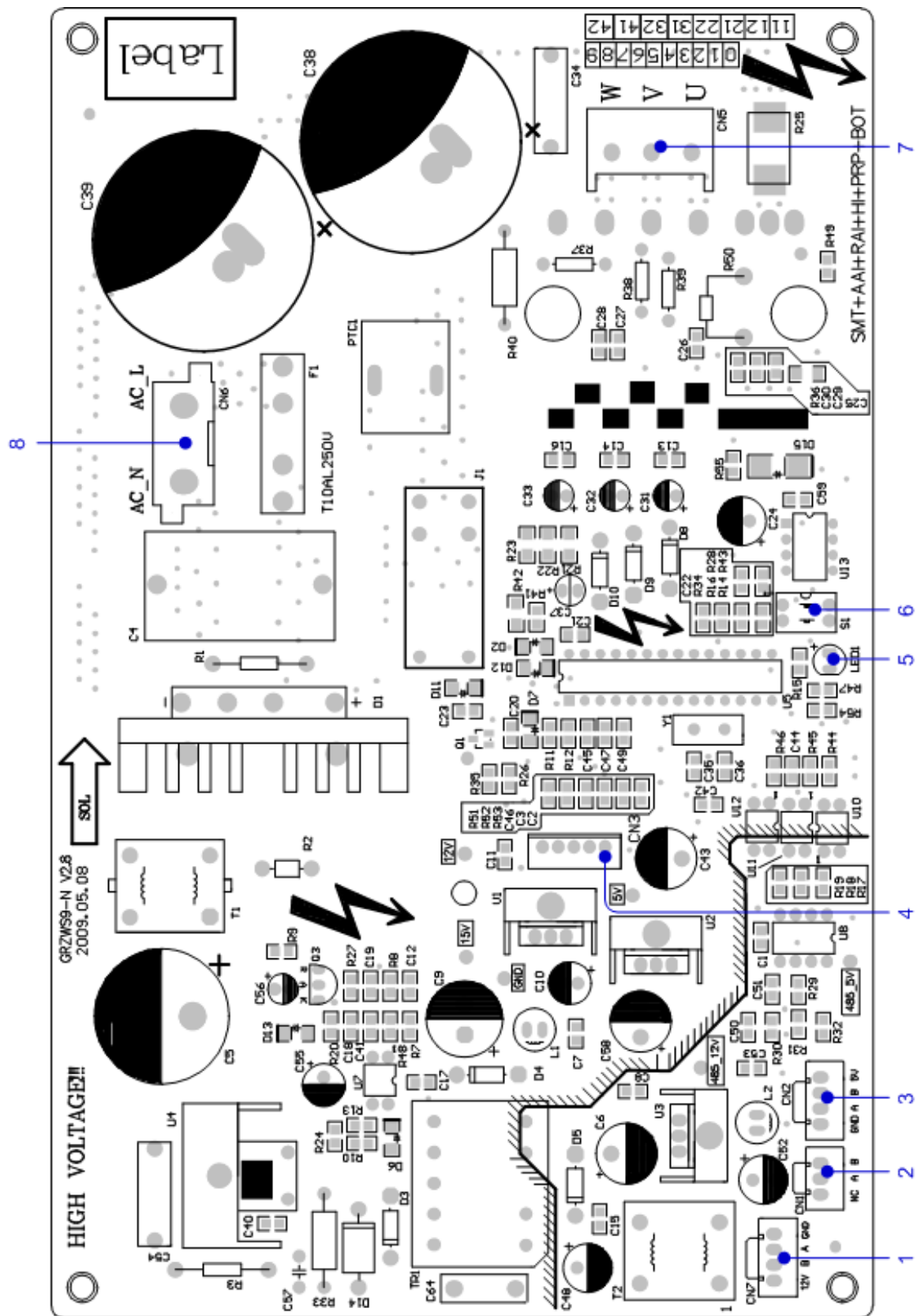


Fig.55 Drive board of DC fan motor

Interface of drive board of DC fan motor

1- Communication port (12V)	2- Communication port	3- Communication port (5V)	4- Feedback signal
5-LED indicator	6- Address code	7- U/V/W-phase port of DC fan	8- Power input

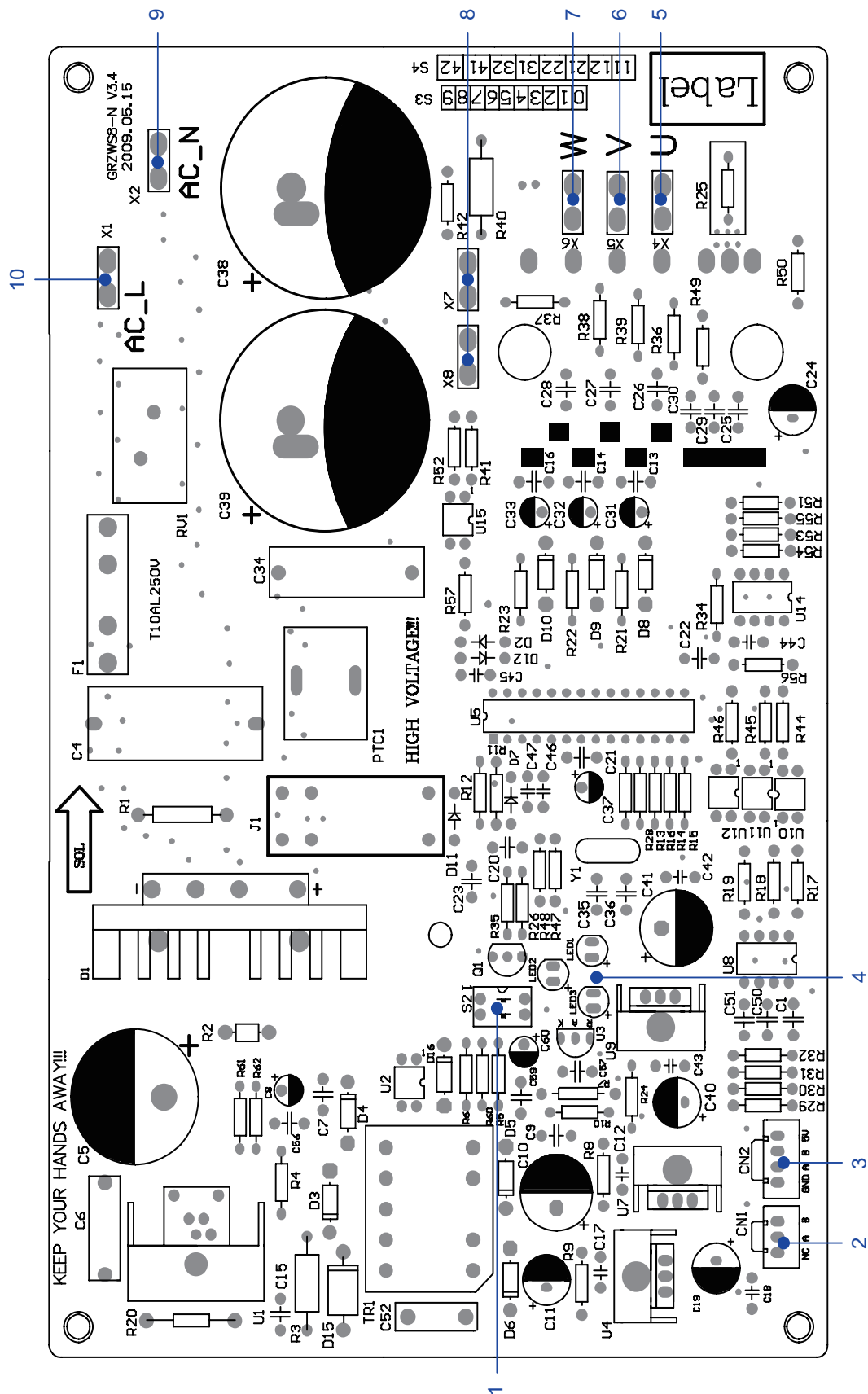


Fig.56 Drive board of AC fan motor

Interface of drive board of AC fan motor

1- Address code	2- Communication port	3- Communication port (12V)	4- LED indicator	5- U-phase port of fan
6- V-phase port of fan	7- W-phase port of fan	8-Feedback signal	9- Power supply N	10- Power supply L

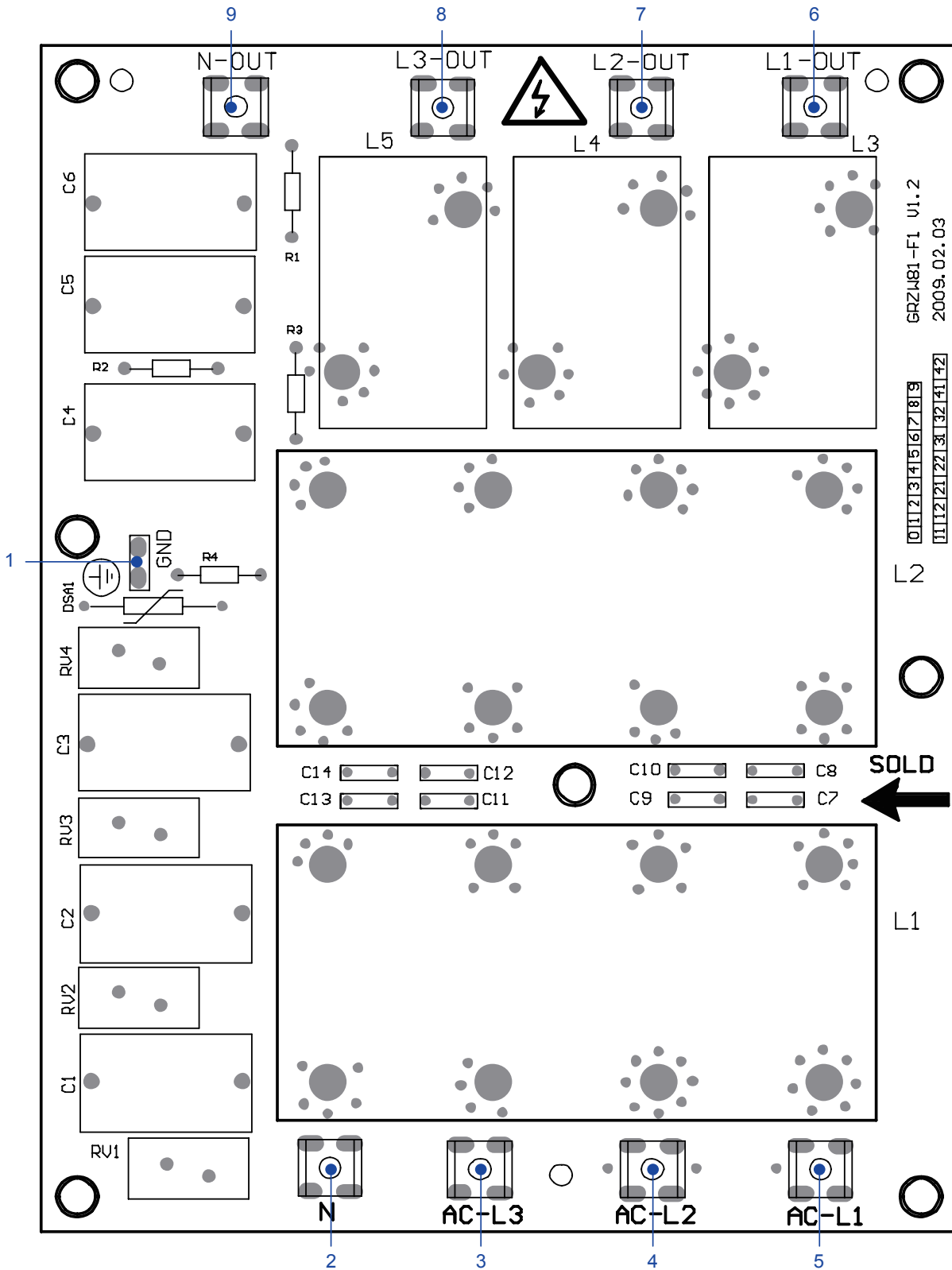


Fig.57 Filter board

Filter board interface

1-GND	2-Input N	3- Input L3	4- Input L2	5- Input L1
6- Output L1	7- Output L2	8- Output L3	9- Output N	

## 5 Check Items after Installation and Trial Run

### 5.1 Check Items after Installation

Check Items	Conditions Might Happen	Check
Has the unit been fixed firmly?	The unit may drop, shake or emit noise.	
Have you done the gas leakage test?	It may cause insufficient cooling/heating capacity.	
Is the unit get proper thermal insulation?	It may cause condensation and dripping.	
Does the unit drain well?	It may cause condensation and dripping.	
Is the voltage in accordance with the rated voltage specified on the nameplate?	It may cause malfunction or damage the part.	
Is the electric wiring and piping connection installed correctly and securely?	It may cause malfunction or damage the part.	
Has the unit been earthed securely?	It may cause electrical leakage.	
Is the power cord specified?	It may cause malfunction or damage the part.	
Has the inlet and outlet been blocked?	It may cause insufficient cooling/heating capacity.	
Has the pipe length and refrigerant charging amount been recorded?	The refrigerant charging amount is not accurate.	
Is the address code of outdoor modules correct?	The unit can not run normally. Communication malfunction might happen.	
Is the address code of indoor units and wired controller correct?	The unit can not run normally. Communication malfunction might happen.	
Has the communication line been connected correct?	The unit can not run normally. Communication malfunction might happen.	
Is the piping connection and valve status right?	The unit can not run normally.	

### 5.2 Trial Run

#### 5.2.1 Preparation before trial run

- (1) The power supply should be turned on only after finishing all the installation.
- (2) All the control wires and cables are connected correctly and safely. Completely open the gas and liquid valves.
- (3) All the objects like metal filing, thrum and clip should be cleared after installation.
- (4) Check if the unit appearance and piping system is damaged or not due to transportation.
- (5) Check if the terminals of electrical element is loose and the phase sequence is correct or not.
- (6) Check the valve: For single-module unit, fully open the gas and liquid valve and close oil balance valve; For dual/three module unit, fully open the gas, liquid valve and oil balance valve.

#### 5.2.2 Trial run

- (1) Only after above items have been checked, trial run can be performed by professional personnel.
- (2) Switch on power supply and press the ON/OFF button to start operation.
- (3) In 1 minute, outdoor fan motor and compressor will automatically start to run. Check if the phase sequence of indoor motor is correct or not.
- (4) After the compressor starts to run, shut off the unit immediately when abnormal sound happens.
- (5) Select COOL, HEAT and FAN mode respectively and check if the unit runs normally.



(6) During trial run, set variable capacities of indoor unit, which can at least guarantee normal trial run of different combinations, such as single-module, dual-module and three-module units.

## 6 Common Malfunction and Troubleshooting

Check the following items before contacting for repair.

Phenomenon	Reason	Measure
The unit doesn't run.	Without power supply	Connect to power supply
	Voltage is too low	Check if the voltage is within rating range
	Broken fuse or breaker trips off	Replace fuse or connect breaker
	Insufficient energy of remote controller	Replace new battery
	Remote controller is out of control scope	Control scope is within 8m
Unit runs but stop immediately	Air intake or outlet of indoor or outdoor unit is blocked	Remove obstruction
Abnormal cooling or heating	Air intake or outlet of indoor or outdoor unit is blocked	Remove obstruction
	Improper temperature setting	Adjust setting at wireless remote controller or wired controller
	Fan speed is set too low	Adjust setting at wireless remote controller or wired controller
	Wind direction is not correct	Adjust setting at wireless remote controller or wired controller
	Door or windows are opened	Close the door or windows
	Direct sunshine	Draw curtain or louver
	Too many people in the room	
	Too many heat resources in the room	Reduce heat resources
	Filter is blocked for dirt	Clean the filter

Note: If problem can not be solved after checking the above items, please contact Delta service center and show phenomena and models.

Following circumstance are not malfunction.

"Malfunction"		Reason
Unit doesn't run	When unit is started immediately after it is just turned off	Overload protection switch makes it run after 3 minutes delay
	When power is turned on	Standby operating for about 1 minute
Mist comes from the unit	Under cooling	Indoor high humidity air is cooled rapidly
Noise is emitted	Slight cracking sound is heard when just turned on	It is noise when electronic expansion valve initialization
	There is consecutive sound when cooling	That's sound for gas refrigerant flowing in unit
	There is sound when unit starts or stops	That's sound for gas refrigerant stops to flow
	There is slight and consecutive sound when unit is running or after running	That's sound for operation of drainage system
	Cracking sound is heard when unit is operating and after operating	That's sound caused by expansion of panel and other parts due to temperature change
The unit blows out duct	When unit runs after no operation for a long period	Dust in indoor unit is blew out

The unit emits odor	Operating	The room odor absorbed by the unit is blew out again
Indoor unit still runs after switch off	After every indoor unit receive "stop" signal, fan will keep running	Indoor fan motor will keep running 20-70s so as to take good use of excess cooling and heating and prepare for next operation
Mode conflict	COOL or HEAT mode can not be operated	When the indoor operating mode conflicts with that of outdoor unit, indoor fault indicator will flash and conflict will be shown on the wired controller after 5 minutes. Indoor unit stops to run and meanwhile change outdoor operating mode as the same as that of indoor unit, then the unit will go back to normal. COOL mode doesn't conflict with DRY mode. FAN mode doesn't conflict with any mode.

## 7 Error Indication

Note: ○ indicates flash, ● indicates dark, ◉ indicates light

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution		
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times							
ON	○	●	●	●	○	○	◉	●	●		1	Red	Yellow	Green	/	/	
E5	◉	○	◉	○	◉	○	◉	○	◉			-	-	-	Overload protection of variable-speed compressor (Drive board detects that the instantaneous current exceeds the limited value set in the software.)	1) Phase loss or reversal happens to the compressor. 2) Abnormal resistance exists in the compressor. 3) The compressor is worn or lack of oil. The system is blocked. 4) Check if the bridge arms of each module are damaged. 5) Drive board of compressor is damaged.	1) Check if there is phase loss or reversal. 2) Measure and check if resistance is abnormal (When the resistance exceeds 10Ω, it indicates the compressor is abnormal.) and check if short circuit happens to the grounding resistance. 3) Check if the compressor is worn or lack of oil. And if the system is blocked. 4) When the unit is powered off, use a universal meter to test the positive pressure drop of diode inside the module. If the pressure drop ranges from 0.3V to 0.7V, it means the module is normal; if it shows 0V, it means the module is damaged. 5) Replace the drive board when all the checking items above are normal.
E5	○	◉	●	●	○	○	-	-	-			-	-	-	Flood back protection	1) Excessive refrigerant exists in the system. 2) The discharge or top temperature sensor of variable-speed compressor is abnormal.	1) Release some refrigerant. 2) Replace the discharge or top temperature sensor of variable-speed compressor.

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red)	LED2 (Yellow)	LED3 (Green)			
E5	○	◎	○	●	◎	○	-	-	-	-	-	-	The discharge temperature of fixed-speed compressor 1 or 2 is low.	1) Excessive refrigerant exists in the system. 2) The discharge temperature sensor of fixed-speed compressor is abnormal. 3) The main board shows the fixed-speed compressor is activated while actually not. 4) The fixed-speed compressor is damaged.	1) Release some refrigerant. 2) Replace the discharge temperature sensor of fixed-speed compressor. 3) Check the signal output on the main board or check the AC contact or. 4) Replace the fixed-speed compressor.
E5	●	●	◎	●	◎	○	-	-	-	-	-	-	Overload protection of fixed-speed compressor 1 or 2	1) The fixed-speed compressor 1 or 2 is overloaded (larger than 9.3A), as a result, the compressor might be damaged. 2) The overcurrent device is invalid with erroneous signal transmitted.	1) Replace the fixed-speed compressor. 2) Replace the overcurrent device.
E5	◎	○	○	○	◎	○	○	◎	○	-	-	-	Radiating fin with high temperature (temperature exceeds the setting value)	1) The bolts on the rectifier or IPM module are not screwed tightly. 2) The radiating paste under the IPM module is dried up. 3) The radiating fin of IPM module is clogged. 4) The compressor drive board is abnormal.	1) Tightly screw up the bolts. 2) Smear some radiating paste. 3) Clear the sundries on the radiating fin. 4) The compressor shows "error" before power on the unit, which indicates the compressor drive board is abnormal. Then replace the drive board.

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red	Yellow			
E5	○	○	○	◎	◎	○	◎	●	◎	-	-	-	Abnormal IPM (Protection caused by overload, interference or other abnormal conditions)	1) Phase loss or reversal happens to the compressor. 2) Abnormal resistance exists in the compressor. 3) The compressor is worn or lack of oil. The system is blocked. 4) Check if the bridge arms of each module are damaged. 5. Drive board of compressor is damaged.	1) Check if there is phase loss or reversal. 2) Measure and check if resistance is abnormal (When the resistance exceeds 10Ω, it indicates the compressor is abnormal.) and check if short circuit happens to the grounding resistance. 3) Check if the compressor is worn or lack of oil. And if the system is blocked. 4) When the unit is powered off, use a universal meter to test the positive pressure drop of diode inside the module. If the pressure drop ranges from 0.3V to 0.7V, it means the module is normal; if it shows 0V, it means the module is damaged. 5. Replace the drive board when all the checking items above are normal.
E5	○	○	◎	○	○	○	●	◎	○	-	-	-	Sensor on the radiating fin is abnormal (Temperature sensor and its resistance is short-circuit or open-circuit.)	1) The compressor drive board is abnormal.	1) Replace the compressor drive board.(Use a universal meter to detect if the temperature sensor is short-circuit or open-circuit.) If the problem can not be solved after electrify the unit for more than three times, then replace the drive board.

Shown on the Patchboard	LEDs on the Outdoor Main Board					Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution	
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red				Yellow
E5	○	●	●	●	○	○	●	○	○	-	-	-	Communication error between drive board and main board	<p>1) Communication line is loose.</p> <p>2) Communication line is disconnected.</p> <p>3) Communication line is poorly contacted.</p> <p>4) Wired controller is abnormal.</p>	<p>1) Check if the communication line between drive board and main board is loose, if so, fix it well.</p> <p>2) Check if the communication line between drive board and main board is cut off, if so, replace the communication line.</p> <p>3) Check if the communication line between drive board and main board is poorly contacted.</p> <p>4) Try to replace the main board, if trouble disappears, it means the main board is broken. Try to replace the drive board, if trouble disappears, it means the drive board is broken.</p>
E5	○	○	○	○	○	○	○	●	-	-	-	-	High DC input voltage (when the bus voltage exceeds 720VDC)	<p>1) High input voltage on the drive board</p> <p>2) Abnormal drive board</p>	<p>1) Check if the input voltage on the drive board is normal. Normal range: 320VAC-460VAC</p> <p>2) If the input voltage is within the normal range, replace the drive board.</p>
E5	○	○	○	○	○	○	○	○	○	-	-	-	Low DC input voltage (when the bus voltage is lowered than 370VDC)	<p>1) Low input voltage on the drive board</p> <p>2) The 3-phase power supply is loose.</p> <p>3) Abnormal drive board</p>	<p>1) Check if the input voltage on the drive board is normal. Normal range: 320VAC-460VAC</p> <p>2) Use a universal meter to check if the voltage between live line and neutral line equals to that of each live line (±10V), if not, it means phase loss. Or use an amperemeter to detect the current among every live line, no current indicates phase loss.</p> <p>3) If the input voltage is within the normal range, replace the drive board.</p>

Shown on the Patchboard	LEDs on the Outdoor Main Board					Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution	
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red				Yellow
E5	●	●	○	●	◎	○	◎	○	○	-	-	-	-	IPM module is damaged.	Replace the compressor drive board, if the trouble disappears, it means the drive board is broken; if the trouble exists, it means the system is blocked or the compressor is damaged, which requires system check and compressor replacement.
E5	◎	●	○	●	◎	○	○	○	○	-	-	-	-	1) Phase loss of the variable-speed compressor 2) Abnormal drive board	1) Check if the winding of compressor is contacted/connected well with the output terminal of drive board. 2) If it's well-contacted, please replace the drive board.
E5	○	●	◎	○	◎	○	◎	○	○	-	-	-	-	The drive board of compressor is abnormal.	Use a universal meter to detect if the temperature sensor is short-circuit or open-circuit. If the problem can not be solved after electrify the unit for more than three times, then replace the drive board.

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Yellow	Green			
E5	○	○	○	●	◎	○	○	◎	●	-	-	-	Startup failure(The compressor can not be started normally.)	1) The compressor is damaged. Slugging and seizing of crankcase happens to the compressor. 2) Phase loss or reversal, or erroneous parameter of compressor 3) Abnormal drive board	1) Check if the compressor is damaged. And if slugging and seizing of crankcase happens to the compressor. 2) Check if the winding of compressor is contacted/connected well with the output terminal of drive board. 3) Replace the drive board.
E5	○	●	○	●	◎	○	-	-	-	-	-	-	Reset of drive module	Abnormal chip or abnormal power supply of chip	If the problem can not be solved after electrify the unit for more than three times, then replace the drive board.
E5	○	○	●	○	◎	○	-	-	-	◎	●	◎	Fan module protection (Protection caused by overload, interference or other abnormal conditions)	1) The fan is damaged. 2) The fan is short-circuit when grounding 3) Check if the bridge arm of module is short-circuit or damaged. 4) The fan drive board has errors.	1) Use a universal meter to check if the resistance of every fan winding equals to each other, if not, replace the fan. 2) Use a universal meter to check the grounding resistance of fan winding, if it shows 0 Ω or less than 2 Ω, please replace the fan. 3) When the unit is powered off, use a universal meter to test the positive pressure drop of diode inside the module. If the pressure drop ranges from 0.3V to 0.7V, it means the module is normal; if it shows 0V, it means the module is damaged. 4) Replace the fan drive board.
E5	●	○	●	○	□	○	-	-	-	◎	◎	●	Fan voltage protection (When the voltage on the DC bus deviates from the setting value)	1) The voltage between the live line and neutral line exceeds 290V. 2) The fan drive board is abnormal.	1) Use a universal meter to detect the power supply connected to the unit, if the voltage between live line and neutral line exceeds 290V, please lower the input voltage. 2) If the voltage is normal, please replace the fan drive board.



Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red	Yellow			
E5	○	○	●	○	○	○	-	-	-	3	○	○	○	<p>Fan current protection (Drive board detects that the instantaneous current exceeds the limited value set in the software.)</p> <p>1) The fan is damaged. 2) The fan is short-circuit when grounding. 3) Check if the bridge arm of module is short-circuit or damaged. 4) The fan drive board has errors.</p>	<p>1) Use a universal meter to check if the resistance of every fan winding equals to each other, if not, replace the fan. 2) Use a universal meter to check the grounding resistance of fan winding, if it shows 0 Ω or less than 2 Ω, please replace the fan. 3) When the unit is powered off, use a universal meter to test the positive pressure drop of diode inside the module. If the pressure drop ranges from 0.3V to 0.7V, it means the module is normal; if it shows 0V, it means the module is damaged. 4) Replace the fan drive board.</p>
E5	○	●	●	○	○	○	-	-	-	6	○	○	○	<p>Fan module overheat protection (Protection happens when the temperature of radiating fin exceeds the setting value)</p> <p>1) The two bolts on the IPM module are not screwed tightly. 2) The radiating paste under the IPM module is dried up. 3) The radiating fin of IPM module is clogged. 4) The compressor drive board is abnormal.</p>	<p>1) Tightly screw up the bolts. 2) Smear some radiating paste. 3) Clear the sundries on the radiating fin. 4. The fan shows "error" before power on the unit, which indicates the fan drive board is abnormal.</p>
E5	●	●	●	○	○	○	-	-	-	-	○	○	●	<p>Fan motor overheat protection</p> <p>1) Overload protection line of the fan is not connected with the terminal X7 and X8 located on the drive board. (Applicable to dual-fan unit) 2) The fan is damaged. 3) The fan drive board is abnormal.</p>	<p>1) Connect the overload protection line with the terminal X7 and X8 located on the drive board. (Applicable to dual-fan unit) 2) Use a universal meter to detect the overload protection line. If it is short-circuit, it means the motor is normal; if it is open-circuit, it means the fan is damaged and replace the fan. (Applicable to dual-fan unit) 3) Replace the fan drive board.</p>

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red	Yellow			
E5	○	○	○	●	○	○	-	-	-	5	●	○	○	1) Communication line is loose. 2) Communication line is disconnected. 3) Communication line is poorly contacted. 4) The DIP switch of fan drive board is wrongly set. (For dual-fan unit) 5) Wired controller is abnormal.	1) If the communication line between the drive board and main board is loose, please fix it well. 2) If the communication line between the drive board and main board is disconnected, replace the communication line. 3) Check if the communication line between main board and fan drive board is connected well. 4) For dual-fan unit, the DIP switch of those two fan drive boards should be set the same. 5) Try to replace the main board, if trouble disappears, it means the main board is broken. Try to replace the drive board, if trouble disappears, it means the drive board is broken.
E5	○	○	○	○	○	○	○	○	-	-	-	-	-	The compressor drive board is abnormal.	Replace the compressor drive board.
-	○	●	○	●	○	○	-	-	-	-	-	-	-	1) Master module or slave module is abnormal.(check if the unit is electrified.) 2) The address code of main board doesn't match with the quantity code. 3) Communication line is poorly contacted with the main board. 4) Communication line is damaged.	1) Check if the master module and slave modules are normally electrified. 2) Check if the address code and the quantity code is set correctly. 3) Check if the communication line is connected well with the main board. 4) Check if the communication line is completely alright, replace the communication line if necessary.

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Red	Yellow			
-	○	●	○	●	○	○	-	-	-	-	-	-	-	The capacity code of SW1 is wrongly set.	Check if the SW1 is wrongly set.
E3	●	○	○	○	○	○	-	-	-	-	-	-	-	1) The refrigerant almost completely leaks out. 2) The refrigerant is fake.	1) Check where the leakage point locates and recharge the refrigerant. 2) Release the refrigerant. Recharge the real R410A refrigerant.
E3	●	○	●	●	○	○	-	-	-	-	-	-	-	1) Refrigerant deficiency is blocked. 2) The system is blocked. 3) The electronic expansion valve can not be operated or it is clogged. 4) The low pressure sensor is abnormal.	1) Use a manometer to detect the system pressure and supplement some refrigerant. 2) Check the location where the system is blocked. 3) Check the electronic expansion valve and its coil. 4) Replace the low pressure sensor and check the interface of main board.
E4	○	○	●	●	○	○	-	-	-	-	-	-	-	1) Refrigerant deficiency temperature sensor is abnormal. 2) The discharge temperature sensor is abnormal.	1) Supplement some refrigerant. 2) Check the discharge temperature sensor or exchange it with other compressor temperature sensor, replace the sensor if it is broken. (Use the computer or debugger to check which compressor discharge temperature is high.)

Shown on the Patchboard	LEDs on the Outdoor Main Board						Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red) continuously flashing times	Yellow	Green			
E1	○	●	●	●	○	○	-	-	-	-	-	-	Compressor high pressure protection (The unit requires stop protection when the high pressure reaches the setting value.)	1) Excessive refrigerant exists in the system, which leads to high pressure in the system. 2) The system is blocked. 3) The electronic expansion valve can not be operated or it is clogged. 4) The high pressure sensor is abnormal. 5) The high pressure switch is abnormal.	1) Release some refrigerant. 2) Check the location where the system is blocked. 3) Check the electronic expansion valve and its coil. 4) Replace the high pressure sensor and check the interface of main board. 5) When the unit is powered off, use a universal meter to detect the voltage values of high pressure switch, if it doesn't show 12V, it means the pressure switch is disconnected.
E6	●	○	○	●	○	○	-	-	-	-	-	-	Communication error between indoor and outdoor units	Communication line between indoor and outdoor units is abnormal.	Check if the communication line is disconnected or damaged.
F4	●	●	●	○	○	○	-	-	-	-	-	-	Ambient temperature sensor error	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F5	○	●	●	○	○	○	-	-	-	-	-	-	Coil inlet temperature sensor error	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F6	●	○	●	○	○	○	-	-	-	-	-	-	Coil midway temperature sensor error	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F7	○	○	●	○	○	○	-	-	-	-	-	-	Coil outlet temperature sensor error	Abnormal temperature sensor	Check if the temperature sensor is damaged.

Shown on the Patchboard	LEDs on the Outdoor Main Board					Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution	
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red)	LED2 (Yellow)				LED3 (Green)
F8	●	●	○	○	○	○	-	-	-	-	-	-	Discharge temperature sensor error of fixed-speed compressor 1	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F8	○	●	○	○	○	○	-	-	-	-	-	-	Discharge temperature sensor error of fixed-speed compressor 2	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F9	○	●	○	○	○	○	-	-	-	-	-	-	Discharge temperature sensor error of variable-speed compressor	Abnormal temperature sensor	Check if the temperature sensor is damaged.
F9	○	●	●	○	○	○	○	○	○	-	-	-	Top Temperature sensor error of variable-speed compressor	Abnormal temperature sensor	Check if the temperature sensor is damaged.
Fc	○	○	○	○	○	○	-	-	-	-	-	-	High pressure sensor error	Abnormal sensor	Check if the sensor is damaged.
Fd	○	○	○	○	○	○	-	-	-	-	-	-	Low pressure sensor error	Abnormal sensor	Check if the sensor is damaged.
-	○	○	●	○	○	○	○	○	○	-	-	-	Top temperature sensor error of fixed-speed compressor 1	Abnormal temperature sensor	Check if the temperature sensor is damaged.
-	●	○	●	○	○	○	○	○	○	-	-	-	Top temperature sensor error of fixed-speed compressor 2	Abnormal temperature sensor	Check if the temperature sensor is damaged.

Shown on the Patchboard	LEDs on the Outdoor Main Board					Compressor Drive Board			Fan Drive Board			Trouble	Possible Cause	Referenced Solution	
	LED1	LED2	LED3	LED4	LED5	LED6	LED1 (Red)	LED2 (Yellow)	LED3 (Green)	LED1 (Red)	LED2 (Yellow)				LED3 (Green)
-	○	○	○	●	◎	○	-	-	-	-	-	-	The number of module doesn't accord with that of the DIP switch.	The number of module doesn't accord with that of the DIP switch SW2.	Check if the DIP switch is set right.
-	●	○	◎	●	◎	○	-	-	-	-	-	-	Errors of other modules	Other modules have "error" displayed.	
-	◎	◎	◎	●	◎	○	-	-	-	-	-	-	Defrosting	Normal	
-	◎	○	◎	◎	◎	○	-	-	-	-	-	-	Oil Returning	Normal	
-	○	◎	◎	◎	◎	○	-	-	-	-	-	-	Oil Balancing	Normal	

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## 8 Maintenance and Care

Regular check, Maintenance and care should be performed by professional personnel, which will prolong the unit life span.

### 8.1 Outdoor Heat Exchanger

Outdoor heat exchanger is required to be cleaned once every two months. Use vacuum cleaner with nylon brush to clean up dust and sundries on the surface of heat exchanger. Blow away dust by compressed air if it is available. Never use water to wash the heat exchanger.

### 8.2 Drain Pipe

Regularly check if the drain pipe is clogged in order to drain condensate smoothly.

### 8.3 Notice before Seasonal Use

- (1) Check if the inlet/outlet of the indoor/outdoor unit is clogged.
- (2) Check if the ground wire is earthed reliably.
- (3) Check if battery of remote wireless controller has been replaced.
- (4) Check if the filter screen has been set soundly.
- (5) After long period of shutdown, open the main power switch 8 hours before reoperating the unit so as to preheat the compressor crankcase.
- (6) Check if the outdoor unit is installed firmly. If there is something abnormal, please contact the Delta appointed service center.

### 8.4 Maintenance after Seasonal Use

- (1) Cut off main power supply of the unit.
- (2) Clean filter screen and indoor and outdoor units.
- (3) Clean the dust and sundries on the indoor and outdoor units.
- (4) In the event of rusting, use the anti-rust paint to stop spreading of rust.

### 8.5 Parts Replacement

Purchase parts from Delta appointed service center or dealer if necessary.

Note:

During airtight and leakage test, never mix oxygen, ethyne and other dangerous gas into refrigeration circuit. In case of hazard, it's better to use nitrogen or refrigerant to accomplish such test.

## 9 After-sales Service

In case the air-conditioning unit you bought has any quality problem or you have any inquiry, please contact the local after-sales service agency designated by Delta.

**Warranty should meet the following requirements:**

- (1) First run of the unit should be operated by professional personnel from Delta appointed service center.
- (2) Only Delta manufactured accessories can be used on the machine.
- (3) All the instructions listed in this manual should be followed.
- (4) Warranty will be automatically invalid if fails to obey any item mentioned above.

Thank you for Choosing



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[www.delta-dct.com](http://www.delta-dct.com)



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