

# **MSAN-XMi 80M - 160M**

## **120T - 180T**

Air cooled heat pump outdoor unit



Dear Customer,

We congratulate you on choosing this product

For many years Clivet has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the best solution.

Yours faithfully,

CLIVET Spa

The data contained in this manual is not binding and may be changed by the manufacturer without prior notice.

Reproduction, even in part, is FORBIDDEN © Copyright - CLIVET S.p.A. - Feltre (BL) - Italia

---

<b>Contents</b>	<b>pag</b>
Installation manual .....	5
Owner's manual .....	19
Certifications .....	29

This manual is for VRF SYSTEM.

To get complete and clear information, please also consider following issues:

1. please consider only 50 Hz electric supply mode
2. Installation Manual, Table 4-3 and Table 4-4:  
A = indoor units standard cooling capacity in kW x 10
3. model identification

<b>MSAN-XMi 80M - 180T</b>				
<b>Size</b>	<b>Power supply</b>		<b>Reference kW</b>	<b>Factory code</b>
80M	230V	1-phase	8	MDV-V80W/DN1
105M	230V	1-phase	10.5	MDV-V105W/DN1
120M	230V	1-phase	12	MDV-V120W/DN1
140M	230V	1-phase	14	MDV-V140W/DN1
160M	230V	1-phase	16	MDV-V160W/DN1(B)
120T	400V+N	3-phase	12	MDV-V120W/DRN1
140T	400V+N	3-phase	14	MDV-V140W/DRN1
160T	400V+N	3-phase	16	MDV-V160W/DRN1
180T	400V+N	3-phase	18	MDV-V180W/DRN1

For 1 outdoor unit connected to 1 indoor unit applications please consider the following instructions.

- Schematics refer to multiple indoor unit design:  
for 1 to 1 application please consider the first indoor unit only (first line branch pipe is not needed)
- Installation Manual, Table 4-3 and Table 4-4:  
for 1 to 1 application no branch pipe is needed
- Installation Manual, Table 4-8: only for VRF System  
for 1 to 1 application please consider 45% ÷ 100% indoor capacity range
- Installation Manual, Chapter 4.6: only for VRF System
- Installation Manual, Table 4-11: only for VRF System  
for 1 to 1 application please consider Table 4-10 data
- Owner's Manual, Chapter 1.:  
for 1 to 1 application please consider 45% ÷ 100% indoor capacity range

Page intentionally left blank

# Installation manual

MD14I-049DW

Page intentionally left blank

**CONTENTS****PAGE**

PRECAUTIONS.....	1
ATTACHED FITTINGS.....	2
OUTDOOR UNIT INSTALLATION.....	3
INSTALL THE CONNECTING PIPE.....	4
ELECTRICAL WIRING.....	9
TEST RUNNING.....	12
PRECAUTIONS ON REFRIGERANT LEAKAGE.....	12
TURN OVER TO CUSTOMER.....	12

## 1. PRECAUTIONS

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS " carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
- Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before maintenance the unit .
- Ask the customer that the Installation Manual and the Owner's Manual should be kept together .

**CAUTION**

-----  
New Refrigerant Air Conditioner Installation

**THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT(R410A)WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are; Hydrophilic, oxidizing membrane or oil, and its pressure is approx.1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed ,Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A):

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

**CAUTION**

-----  
Do not connect the Appliance from Main Power Supply.

This unit must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm. The installation fuse must be used for the power supply line of this conditioner.

**WARNING**

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

An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring. The appliance shall be installed in accordance with national wiring regulations.

The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device(RCD)with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.

The power cord type designation is H05RN-R/H07RN-F or above. Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.

Inappropriate installation may result in water leakage, electric shock or fire.

Turn off the main power supply switch or breaker before attempting any electrical work.

Make sure all power switches are off. Failure to do so may cause electric shock.

Connect the connecting cable correctly.

If the connecting cable is connected in a wrong way, electric parts may be damaged.

When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.

If air or any other has is mixed in refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.

Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.

Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.

Do not store it in a wet basement or expose to rain or water.

After unpacking the unit, examine it carefully if there are possible damage.

Do not install in a place that might increase the vibration of the unit.

To avoid personal injury (with sharp edges), be careful when handling parts.

Perform installation work properly according to the Installation Manual.

Inappropriate installation may result in water leakage, electric shock or fire.

When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.

Install the air conditioner securely in a location where the base can sustain the weight adequately.

Perform the specified installation work to guard against an earthquake.

If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.

If refrigerant gas has leaked during the installation work, ventilate the room immediately.

If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.

After the installation work, confirm that refrigerant gas does not leak.

If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.

Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.

An insufficient power supply capacity or inappropriate installation may cause fire.

**Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**

**Be sure to provide grounding.**

Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.

**Conform to the regulations of the local electric company when wiring the power supply.**

Inappropriate grounding may cause electric shock.

**Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**

If a combustible gas leaks, and stays around the unit, a fire may occur.





**Required tools for installation work**

- 1) Philips screw driver
- 2) Hole core drill(65mm)
- 3) Spanner
- 4) Pipe cutter
- 5) Knife

- 6) Reamer
- 7) Gas leak detector
- 8) Tape measure
- 9) Thermometer
- 10) Mega-tester
- 11) Electro circuit tester
- 12) Hexagonal wrench
- 13) Flare tool
- 14) Pipe bender
- 15) Level vial
- 16) Metal saw
- 17) Gauge manifold (Charge hose:R410A special requirement)
- 18) Vacuum pump (Charge hose:R410A special requirement)
- 19) Torque wrench
  - 1/4(17mm)16N•m (1.6kgf•m)
  - 3/8(22mm)42N•m (4.2kgf•m)
  - 1/2(26mm)55N•m (5.5kgf•m)
  - 5/8(15.9mm)120N•m (12.0kgf•m)
- 20) Copper pipe gauge adjusting projection margin
- 21) Vacuum pump adapter

## 2. ATTACHED FITTINGS

Please check whether the following fittings are of full scope. If there are some spare fittings , please restore them carefully.

INSTALLATION FITTINGS	NAME	SHAPE	QUANTITY
	1. Outdoor unit installation manual		1
	2. Outdoor unit owner's manual		1
	3. Indoor unit owner's manual		1
	4.Outflow connecting tube		1

**Refrigerant Piping**

Piping kit used for the conventional refrigerant cannot be used.  
 Use copper pipe with 0.8 mm or more thickness for φ9.5.  
 Use copper pipe with 1.0 mm or more thickness for φ15.9.  
 Use copper pipe with 1.0 mm or more thickness for φ19.0.  
 Flare nut and flare works are also different form those of the conventional refrigerant.take out the flare nut attached to the main unit of the air conditioner, and use it.

**Before installation**

Be careful to the following items before installation.

**Air purge**

For air purge, use a vacuum pump.  
 Do not use refrigerant charged in the outdoor unit for air purge.  
 (The refrigerant for air purge is not contained in the outdoor unit.)

**Electrical cabling**

Be sure to fix the power cables and indoor/outdoor connecting cables with clamps so that they do not contact with the cabinet, etc.

**Installation Place**

- A place which provides a specified space around the outdoor unit.
- A place where the operation noise and discharged air are not given to your neighbors.
- A place that is not exposed to a strong wind.
- A place that does not block a passage.
- When the outdoor unit is installed in an elevated position, make sure it's four feet securely installed.
- There must be sufficient space for carrying in the unit.
- A place where the drain water does not make any problem.

- When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, apply the windproof measures referring to the following examples.
- Install the unit so that its discharge port faces to the wall of the building. Keep a distance of 2000mm or more between the unit and the wall surface.

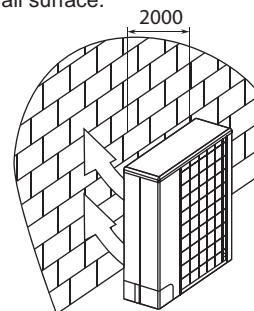


Fig.2-1

- Supposing the wind direction during the operation season of the discharge port is set at right angle to the wind direction.

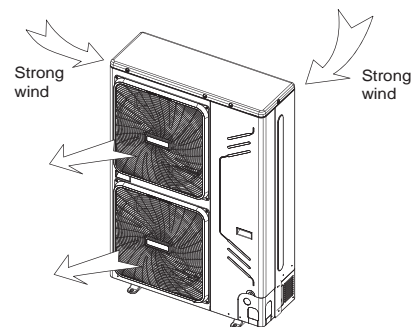


Fig.2-2

### CAUTION

- Install the outdoor unit at a place where discharge air is not blocked.
- When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield.



- Installation in the following places may result in some troubles. Do not install the unit in such places below.
  - A place full of machine oil.
  - A place full of sulphuric gas.
  - A place where high-frequency radio waves are likely to be generated as from audio equipment, welders, and medical equipment.

### 3. OUTDOOR UNIT INSTALLATION

#### 3.1 Installation place

Please keep away from the following place, or malfunction of the machine may be caused:

- There is combustible gas leakage.
- There is much oil (including engine oil) ingredient.
- There is salty air surrounding (near the coast)
- There is caustic gas (the sulfide, for example) existing in the air (near a hot spring)
- A place the heat air expelled out from the outdoor unit can reach your neighbor's window.
- A place that the noise interferes your neighbors every day life.
- A place that is too weak to bear the weight of the unit
- Uneven place.
- Insufficient ventilation place.
- Near a private power station or high Frequency equipment.
- Install indoor unit, outdoor unit, power cord and connecting wire at least 1m away from TV set or radio to prevent noise or picture interference.
- Install the unit in the place that can offer enough space for installation and maintenance. Don't install it in the place that has a high requirement for noise, such as the bedroom.

The insulation of the metal parts of the building and the air conditioner should comply with the regulation of National Electric Standard.



#### CAUTION

Keep indoor unit, outdoor unit, power supply wiring and transmission wiring at least 1 meter away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if 1 meter is kept.)

#### 3.2 Installation space (Unit:mm)

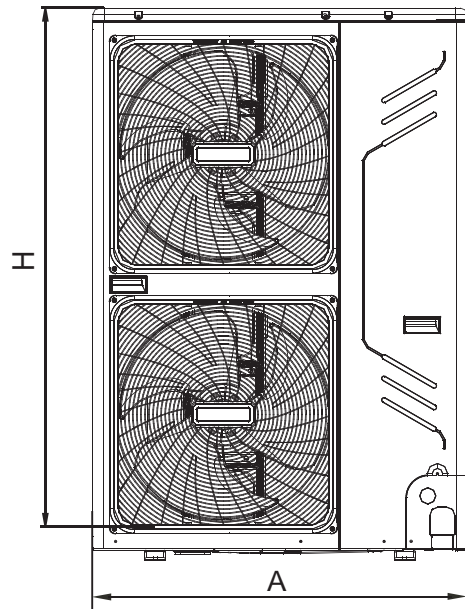
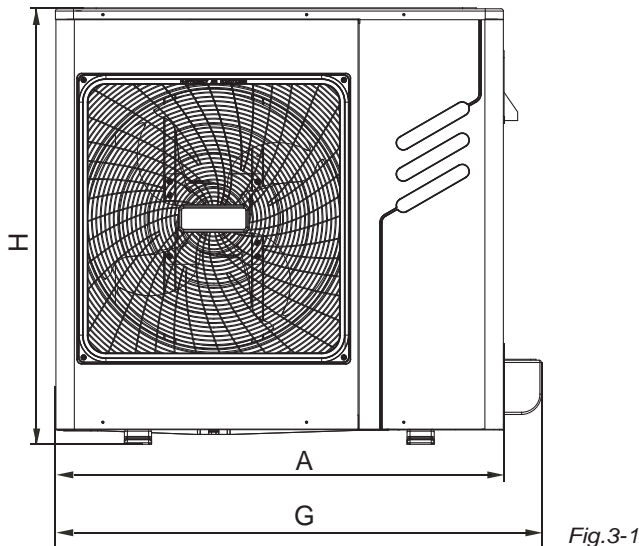


Fig.3-2

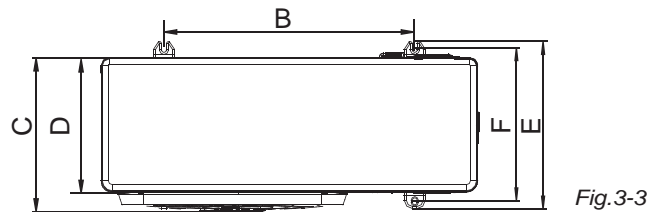


Fig.3-3

Table 3-1 (unit: mm)

MODEL(kW)	A	B	C	D	E	F	G	H	Fig
8/10.5	990	624	380	339	396	366	1073	966	Fig.3-1 Fig.3-3
12/14/16/18	900	600	366	320	400	360	—	1327	Fig.3-2 Fig.3-3

- Single unit installation

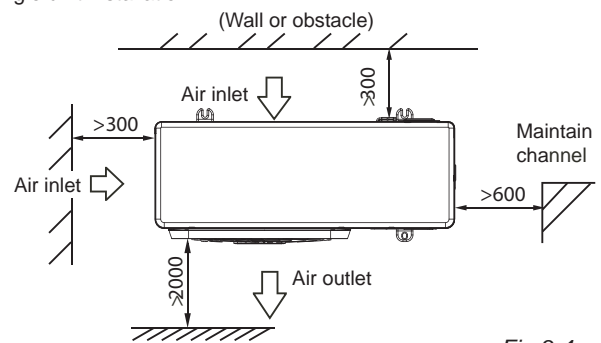


Fig.3-4

- Parallel connect the two units or above

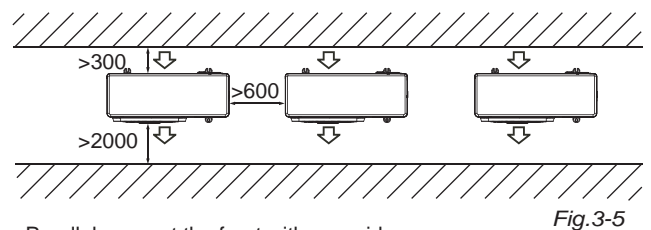


Fig.3-5

- Parallel connect the front with rear sides

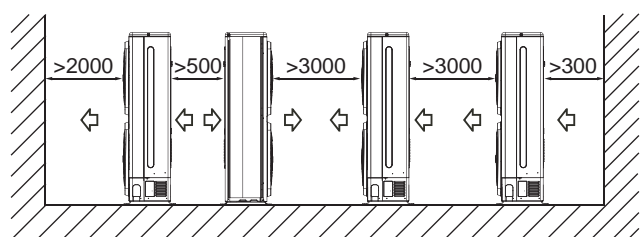


Fig.3-6

### 3.3 Moving and installation

- Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling.
- Never hold the inlet of the outdoor unit to prevent it from deforming.
- Do not touch the fan with hands or other objects.
- Do not lean it more than 45°, and do not lay it sidelong.
- Make concrete foundation according to the specifications of the outdoor units.(refer to Fig.3-7)
- Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind. (refer to Fig.3-7)

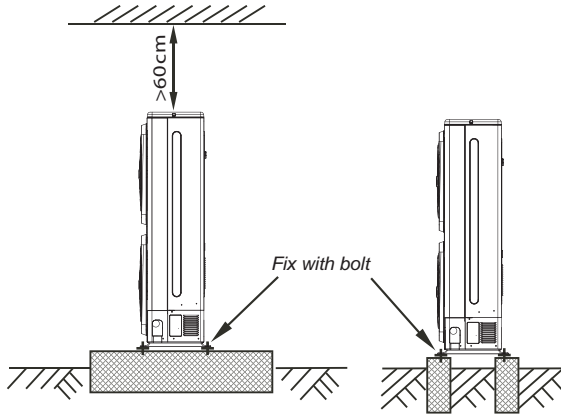


Fig.3-7



#### NOTE

All the pictures in this manual are for explanation purpose only. They may be slightly different from the air conditioner you purchased(depend on model).The actual shape shall prevail.

### 3.4 Water Outlet

Four condensed water outlets on the chassis for selection display as the follow figure:

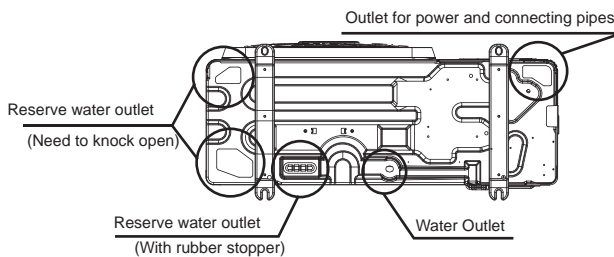


Fig.3-8



#### CAUTION

While installing the outdoor unit, pay attention to the installation place and the drainage pattern; if it's installed at the alpine zone, the frozen condensed water will block up the water outlet, please pull out the rubber stopper of the reserve water outlet. If that still fails to satisfy for the water draining, please knock open the other two water outlets, and keep the water can drain in time. Pay attention to the knock the reserve water outlet from outside to inside, and it will be beyond repair after knocking open, please pay attention to the installation place, lest cause the inconvenience. Please do the moth proofing for the knocked out hole, to avoid the pest processing into and destroy the components.

## 4. INSTALL THE CONNECTING PIPE

Check whether the height drop between the indoor unit and outdoor unit, the length of refrigerant pipe, and the number of the bends meet the following requirements:

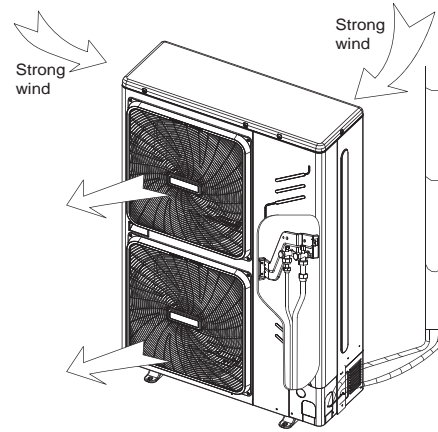


Fig.4-1

### 4.1 Refrigerant piping



#### CAUTION

Please pay attention to avoid the components while connect to the connecting pipes. To prevent the refrigerant piping from oxidizing inside when welding, it is necessary to charge nitrogen, or oxide will chock the circulation system.

#### The indoor and outdoor connecting pipe interface and power line outlet

Vavious piping and viring patterns can be selected,such as out from the front ,the back the side ,and undersurface, etc. (The follow display the locations of several piping and wiring knock-off interfaces )

Table 4-1

Front out pipe	Side out pipe	Back out pipe	Undersurface out pipe



#### CAUTION

Side out pipe: please remove the L-shape metal plate, otherwise can not wiring.

Back out pipe:please wipe off the piping support rubber blanket beside the inner outlet pipe cover of the machine while back side getting out pipes.

Front out pipe: cut the frontal hole of the pipe-outlet plate.The method of the out pipe in the same way of the back out pipe.

Undersurface outlet pipe: the knock out should from inside to outside, and then piping and wiring through this.Pay attention to the piping the fat connecting pipe should out from the largest hole, otherwise the pipes will be rubbed. Please do the moth proofing for the knocked out hole, to avoid the pest processing into and destroy the components.

### 4.2 Leak Detection

Use soap water or leak detector to check every joint whether leak or not (Refer to Fig.4-2).Note:

A is low pressure side stop valve

B is high pressure side stop valve

C and D is connecting pipes interface of indoor and outdoor units

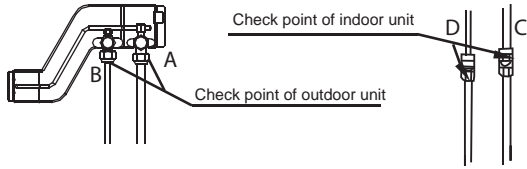


Fig. 4-2

### 4.3 Heat Insulation

Do the heat insulation to the pipes of air side and liquid side separately. The temperature of the pipes of air side and liquid side when cooling, for avoiding condensation please do the heat insulation fully.

- The air side pipe should use closed cell foamed insulation material, which the fire-retardant is B1 grade and the heat resistance over 120°C.
- When the external diameter of copper pipe  $\leq \Phi 12.7\text{mm}$ , the thickness of the insulating layer at least more than 15mm;
- When the external diameter of copper pipe  $\geq \Phi 15.9\text{mm}$ , the thickness of the insulating layer at least more than 20mm.
- Please use attached heat-insulating materials do the heat insulation without clearance for the connecting parts of the indoor unit pipes.

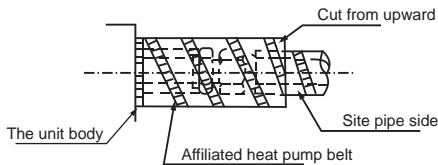


Fig. 4-3

### 4.4 Connecting method

#### ■ Select refrigerant pipe

Table 4-2

Pipe definition	Pipe connect position	Code
Main pipe	The pipe between outdoor unit to the first branch of indoor unit.	L1
The main pipes of indoor unit	The pipe after the first branch do not direct connect with the indoor unit.	L2~L5
The branch pipes of indoor unit	The pipe after the branch connect with the indoor unit.	a, b, c, d, e, f
Indoor unit branch pipes components	The pipes connect with the main pipe, the branch pipe and the the main pipe of indoor unit.	A, B, C, D, E

#### ● The first connect method

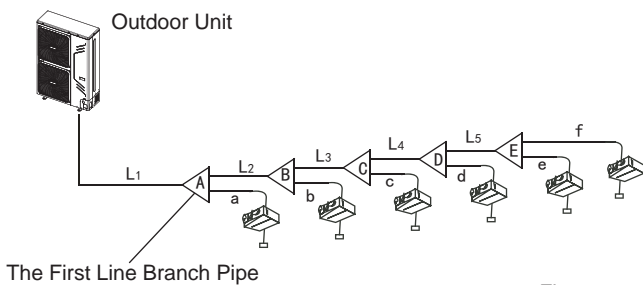


Fig. 4-4

#### ● The second connect method

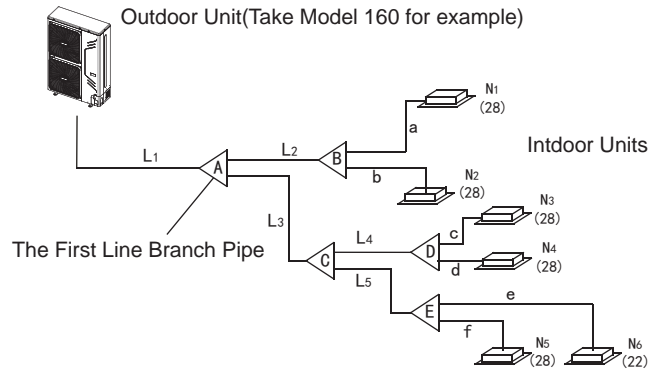


Fig. 4-5



### NOTE

- The distance between the first branch to the last indoor unit is more than 15m, choose the second connect method.
- The pipe between the indoor unit to the closest branch must less than 15m.

### 4.4 Confirmation for the diameters of indoor unit connecting pipes

- Size of main pipe and corresponding branch joint and branch header

- 1) R410A Indoor unit connecting pipes diameters 4-3.
- 2) Example 1: In the Fig.4-5, The downstream inner units of the L2, and its total capacity is  $28 \times 2 = 56$ , refers to the Table 4.4, the air/liquid side of L2 is:  $\Phi 15.9/\Phi 9.5$ .

R410A Indoor unit connecting pipes diameters Table 4-3

Total capacity of the downstream inner units	Main pipe size (mm)		Branch Pipe
	Gas pipe	liquid pipe	
$A < 166$	$\Phi 15.9$	$\Phi 9.5$	FQZHN-01D
$166 \leq A < 230$	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D

### 4.5 Confirmation for the diameters of outdoor unit connecting pipes

R410A outdoor unit connecting pipes diameters Table 4-4

Total capacity of The outdoor units	Main pipe size when the total equivalent piping length of liquid + air side is <90m		Main pipe size when the total equivalent piping length of liquid + air side is $\geq 90\text{m}$			
	Gas side (mm)	liquid side (mm)	The first Line Branch Pipe	Gas side (mm)	liquid side (mm)	The first Line Branch Pipe
$A < 160$	$\Phi 15.9$	$\Phi 9.5$	FQZHN-01D	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D
$160 \leq A < 230$	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D



### NOTE

- The straight distance between copper pipe turning and the contiguous branch pipe is at least 0.5m;

- The straight distance between the contiguous branchpipes is at least 0.5m;
- The straight distance which the branch pipes connected to the indoor unit is at least 0.5m;
- Branch header must be connected with indoor units directly, the further branch connection is not allowed.

● Select branch joint

Select the branch joint according to the total designed capacity of indoor units which it connects to. If this capacity is more than that of the outdoor unit, then select the connection according to the outdoor unit.

- The selection of branch header depends on the quantity of branches it connects to.

■ Connection method

Table 4-5

	Gas side	Liquid side
8kW	Flaring	Flaring
10.5kW	Flaring	Flaring
12kW	Flaring	Flaring
14kW	Flaring	Flaring
16kW	Flaring	Flaring
18kW	Flaring	Flaring
Indoor unit	Flaring	Flaring
Branch pipe	Welding or Flaring	Welding or Flaring

■ Piping sizes at the branch pipe

Table 4-6

Refrigerant	Indoor Unit Capacity A(x100W)	Gas Side (Φ)	Liquid Side (Φ)
R410A	A≤45	12.7(Flaring nut)	6.4(Flaring nut)
	A≥56	15.9(Flaring nut)	9.5(Flaring nut)

■ Pipe diameter of the connector in the outdoor unit's body

Table 4-7

MODEL (kW)	Pipe diameter of outdoor unit's connector(mm)	
	Gas Side	Liquid Side
8	Φ 15.9	Φ 9.5
10.5	Φ 15.9	Φ 9.5
12	Φ 15.9	Φ 9.5
14	Φ 15.9	Φ 9.5
16	Φ 19.1	Φ 9.5
18	Φ 19.1	Φ 9.5

Table 4-8

Outdoor Unit (kW)	Capacity of Outdoor unit (horsepower)	Maximum Quantity of Indoor unit	Sum Capacity of Indoor unit (horsepower)
8	2.5	4	45%~130%
10.5	3	5	45%~130%
12	4	6	45%~130%
14	5	6	45%~130%
16	6	7	45%~130%
18	6.5	9	45%~130%

(The quantity of indoor unit more than or equal to two, each indoor unit of capacity should be not more than 8.0kW.)

When capacity of indoor unit greater than the sum of 100%, capacity of indoor unit will be attenuated.

When capacity of indoor unit greater than or equal to the sum of 120%, in order to ensure the effectiveness of machine, and then try to open the indoor units at different time.

When the capacity of indoor unit is greater than or equal to 16.8kW, the caliber of primary gas pipe should be augmented from Φ16 to Φ19.

Table 4-9

Capacity ranking	Capacity (horsepower)	Capacity ranking	Capacity (horsepower)
18	0.6	80	2.5
22	0.8	10.5	3
28	1	120	4
36	1.25	140	5
45	1.7	160	6
56	2		

■ When the outdoor unit connects one indoor unit

Table 4-10

MODEL (kW)	The max height drop(m)		The length of refrigerant pipe(m)	The number of bends
	When outdoor unit is top	When outdoor unit is bottom		
8	25	20	50	less than 10
10.5	25	20	50	
12	25	20	50	
14	25	20	50	
16	25	20	50	
18	25	20	50	

4.6 Illustration

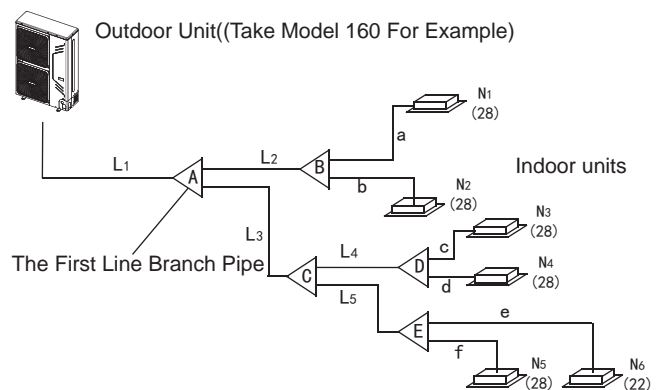


Fig.4-6

Caution: Suppose in the displayed piping system, the total equivalent piping length of air side + liquid side is longer than 90m.

- Indoor unit branch pipe

Inner branch pipes are a-f, the size selection please refers to Table4-6. Note: The max. length of the branch pipe should not longer than 15m.

- The main pipes of indoor unit and the indoor unit branch pipe components
  - The downstream inner units of the main pipe L2 are N1, N2, and its total capacity is  $28 \times 2 = 56$ , the size of pipe L2 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe B should be FQZHN-01D.
  - The downstream inner units of the main pipe L4 are N3, N4, and its total capacity is  $28 \times 2 = 56$ , the size of pipe L4 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe D should be FQZHN-01D.
  - The downstream inner units of the main pipe L5 are N5, N6, and its total capacity is  $28 + 22 = 50$ , the size of pipe L5 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe E should be FQZHN-01D.

- The indoor unit below to the main pipe L3 are N3~N6, and its total capacity is  $28 \times 3 + 22 = 106$ , the size of pipe L3 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe C should be FQZHN-01D.
- The indoor unit below to the main pipe A are N1~N6, and its total capacity is  $28 \times 5 + 22 = 162$ , and the branch pipe should be FQZHN-01D, and because the total piping length of liquid + air side is  $\geq 90m$ , check Table.4-4, and the first branch pipe should apply FQZHN-02D, and according to the principle of maximum value, it should apply FQZHN-02D.

- Main pipe (Please refer to Fig.4-5 and Fig.4-7)

In Fig.4-6, the main pipe L1, the outdoor unit capacity is 16kW, and check the Fig.4-7 to get the size of gas pipe/liquid pipe is  $\Phi 19.1 / \Phi 9.5$ , and also the total equivalent length of liquid side and gas side pipes is  $> 90m$ , then check the Fig.4-4 to get the size of gas pipe/liquid pipe is  $\Phi 22.2 / \Phi 9.5$ , and according to the maximum value principle, it should apply the  $\Phi 22.2 / \Phi 9.5$ .

- Allowable length and altitude difference of refrigerant pipe

table 4-11

		Pimitted value	Piping	
Pipe Length	Total Pipe Length(Actual)	$\leq 100m$	$L1+L2+L3+L4+L5+a+b+c+d+e+f$	
	Maximum Piping(L)	Actual Length	$\leq 45m$ (8kW, 10.5kW) $\leq 60m$ (12kW, 14kW, 16kW, 18kW)	$L1+L2+L3+L4+L5+f$ (The first connect method) or $L1+L3+L5+f$ (The second connect method)
		Equivalent Length	$\leq 50m$ (8kW, 10.5kW) $\leq 70m$ (12kW, 14kW, 16kW, 18kW)	
	Pipe Length(from the first line branch pipe to furthest indoor unit)(m)	$\leq 20m$	$L2+L3+L4+L5+f$ (The first connect method) or $L3+L5+f$ (The second connect method)	
	Pipe Length(from the nearest branch pipe equivalent length(m)	$\leq 15m$	a, b, c, d, e	
Drop Height	Indoor Unit-Outdoor Unit Drop Height(H)	Outdoor Unit up	$\leq 30m$	
		Outdoor Unit Down	$\leq 20m$	
	Indoor Unit to Indoor Unit Drop Heihgt(H)	$\leq 8m$		

Note: When the total equivalent piping length of liquid + gas side is  $\geq 90m$ , it must increase the size of air side main pipe. Besides, according to the distance of refrigerant pipe and the over matched state of inner unit, when the capacity is decreasing it still can increase the gas side main pipe size.

- The first cennet method

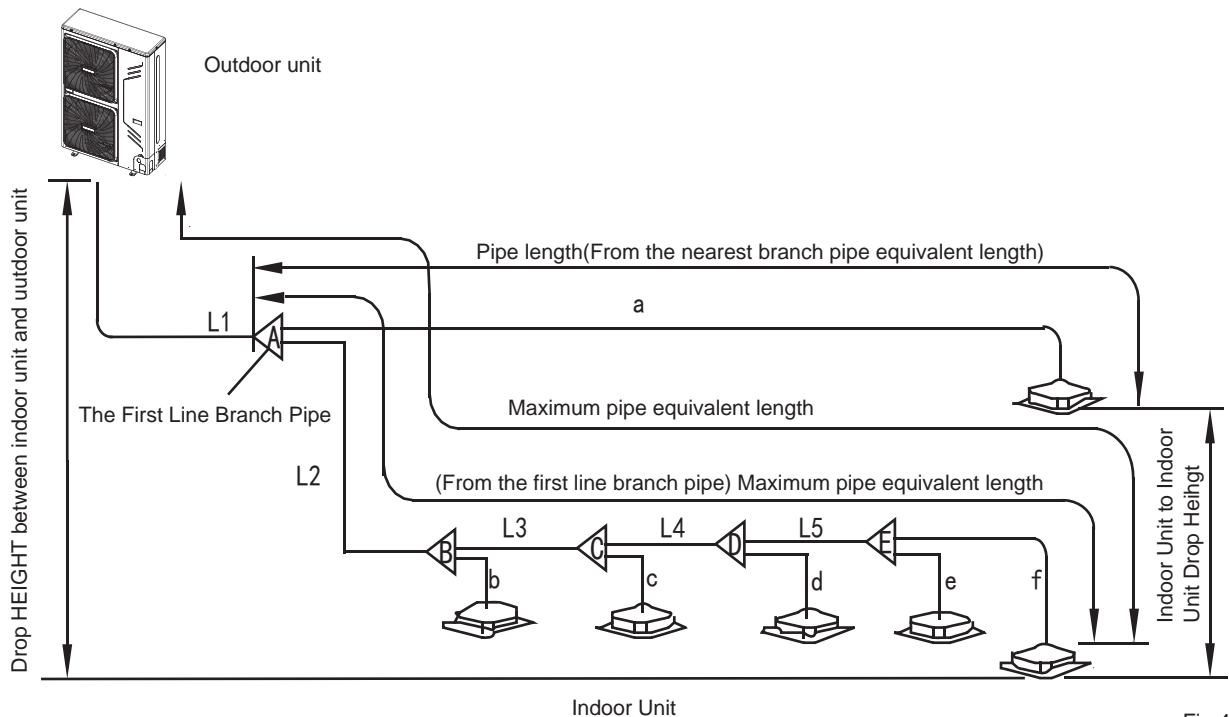


Fig.4-7

- The second connect method

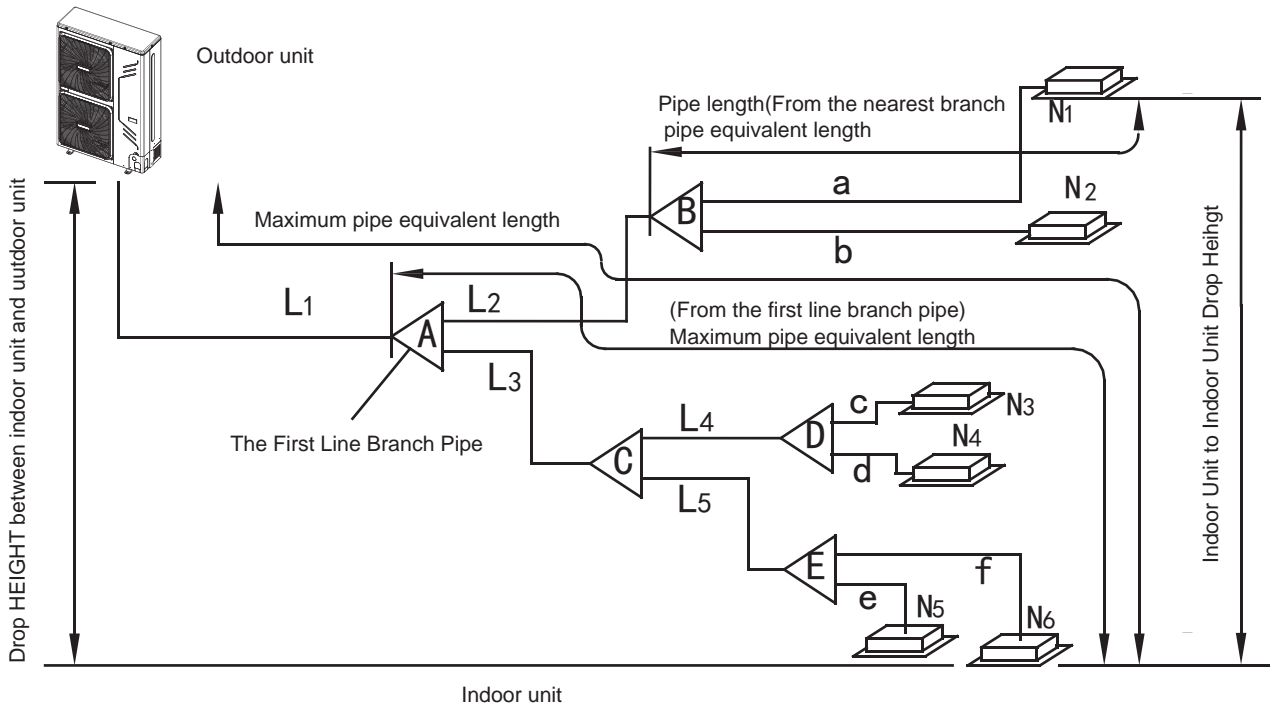


Fig.4-8

#### 4.7 Remove Dirt or Water in the Piping

Make sure there is no any dirt or water before connecting the piping to the outdoor units.

Wash the piping with high pressure nitrogen, never use refrigerant of outdoor unit.

#### 4.8 Airtight Test

Charge pressured nitrogen after connecting indoor/outdoor unit piping to do airtight test.



#### CAUTION

1. Pressured nitrogen [ 4.3MPa (44kg/cm<sup>2</sup>) for R410A] should be used in the airtight test.
2. Tighten high pressure/low pressure valves before applying pressured nitrogen.
3. Apply pressure from air vent mouth on the high pressure/low pressure valves.
4. The high pressure/low pressure valves are closed when applying pressured nitrogen.
5. The airtight test should never use any oxygen, flammable gas or poisonous gas.

#### 4.9 Air Purge with Vacuum Pump

- Using vacuum pump to do the vacuum, never using refrigerant to expel the air.
- Vacuuming should be done from both liquid side and gas side simultaneously.

#### 4.10 Refrigerant Amount to be Added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection.

- When the outdoor unit connects 1 indoor unit:

Table 4-12

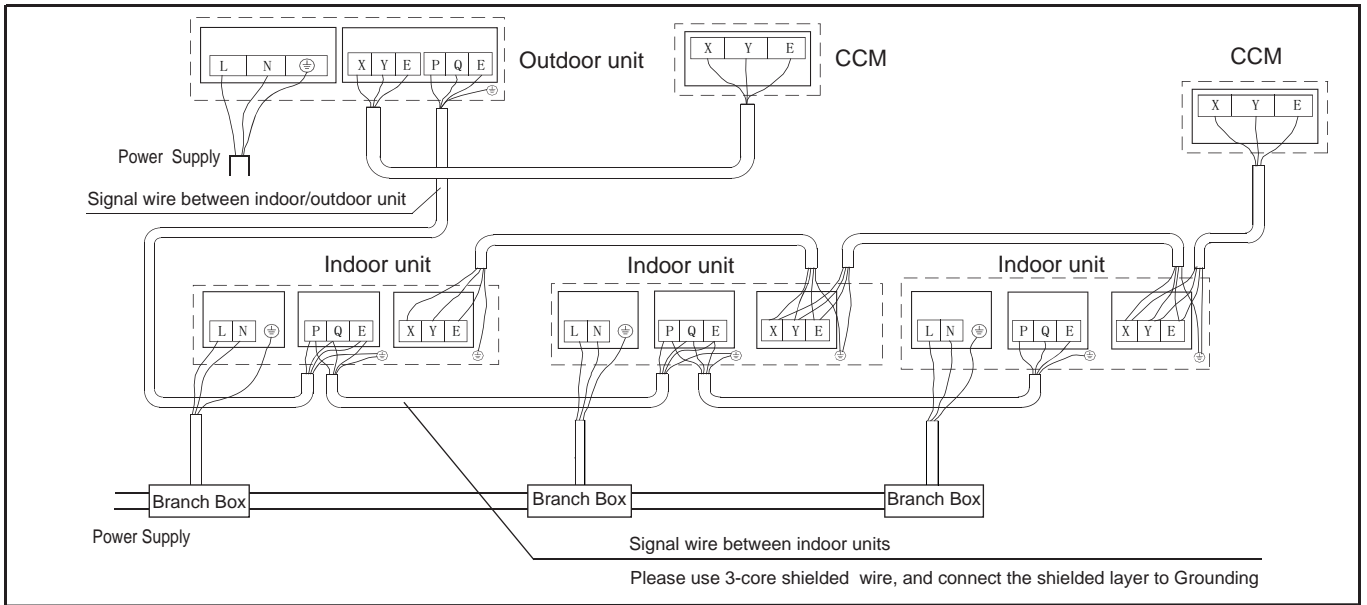
Liquid Side Piping Diameter	Refrigerant to be Added Permeter Piping
Φ6.4	0.022kg
Φ9.5	0.054kg
Φ12.7	0.110kg
Φ15.9	0.170kg
Φ19.1	0.260kg
Φ22.2	0.360kg



#### NOTE

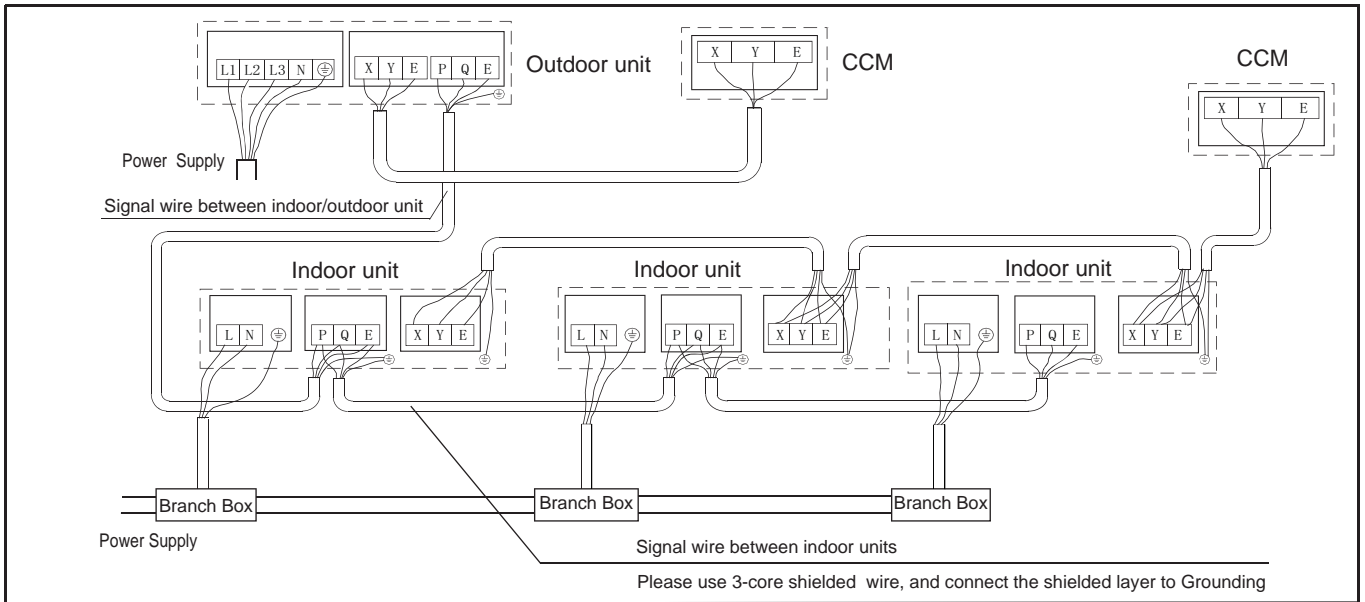
Additional refrigerant volume of divergent pipe is 0.1kg per item (Consider the liquid side of divergent pipe only)

# 5. ELECTRICAL WIRING



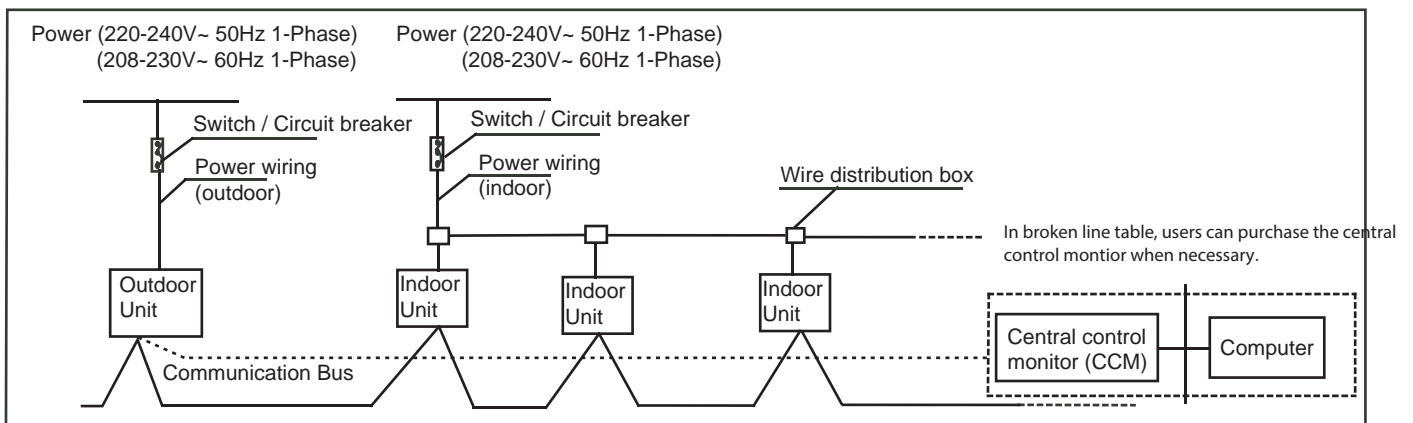
For 8~18kw(1-Phase)

Fig. 5-1



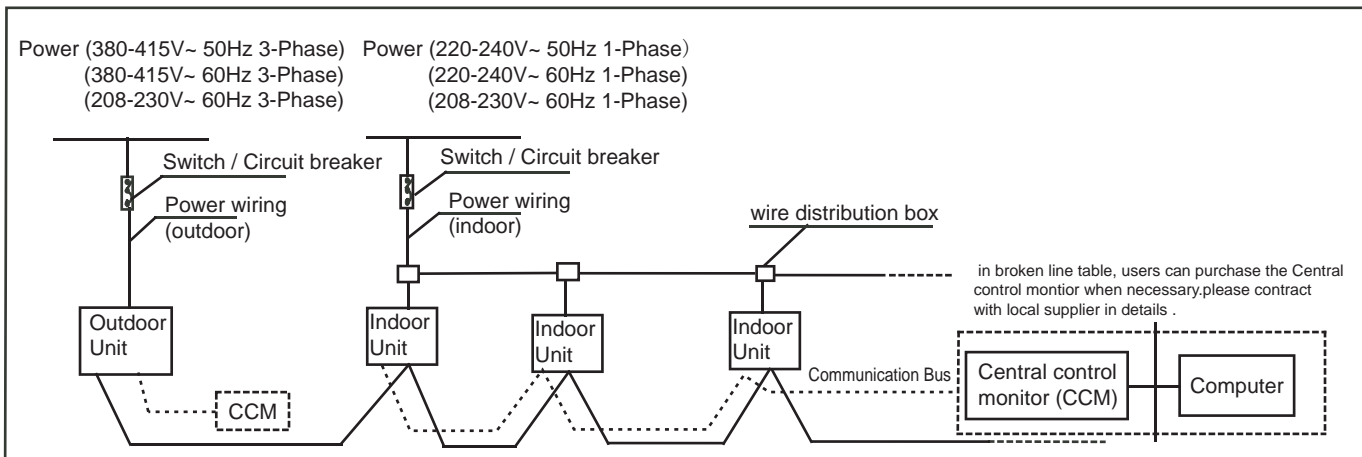
For 10.5~18kw(3-Phase)

Fig. 5-2



For 8~18kw

Fig. 5-3



For 10.5~18kw

Fig. 5-4



### CAUTION

- Please select power source for indoor unit and outdoor unit respectively
- The power supply has specified branch circuit with leakage protector and manual switch.
- The outdoor unit model which corresponding to different outdoor unit power supply should refer to the nameplate.(Please set all the

indoor unit power of one system into the same branch circuit.)

- Please put the connective wire system between indoor unit and outdoor unit with the refrigerant system together.
- Use 3-core shielded wire as indoor unit and outdoor unit signal wire.
- The installation should comply with local electric standard.
- Power wiring should be engaged by specialized electrician.

## 5.1 Outdoor Unit Wiring

### ■ The Specification of Power

Table 5-1

Power Source		220-240V~ 1Ph 50Hz					208-230V~ 1Ph 60Hz				380-415V 3Ph~ 50Hz			380-415V 3Ph~ 60Hz		
Model	Capacity(kW)	8	10.5	12	14	16	10.5	12	14	16	12	14	16	12	14	16
Power Supply	Hz	50	50	50	50	50	60	60	60	60	50	50	50	60	60	60
	Voltage	220-240	220-240	220-240	220-240	220-240	208-230	208-230	208-230	208-230	380-415	380-415	380-415	380-415	380-415	380-415
	Min.(V)	198	198	198	198	198	187	187	187	187	342	342	342	342	342	342
	Max.(V)	264	264	264	264	264	253	253	253	253	456	456	456	456	456	456
	MCA	26.25	27.5	31.25	36.25	36.25	27.5	31.25	36.25	36.25	15	16.25	17.5	15	16.25	17.5
	TOCA	24	24	30	30	30	24	30	30	30	15	15	15	15	15	15
	MFA	25	32	32	40	40	32	40	40	40	25	25	25	25	25	25
Compressor	MSC	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	RLA	9.7	9.7	13.5	13.5	16.1	9.7	13.5	13.5	16.1	9.3	9.3	12	9.3	9.3	12
OFM	kW	0.17	0.17	2x0.1	2x0.1	2x0.1	0.17	2x0.1	2x0.1	2x0.1	2x0.1	2x0.1	2x0.1	2x0.1	2x0.1	2x0.1
	FLA	1.7	1.7	2x0.9	2x0.9	2x0.9	1.7	2x0.9	2x0.9	2x0.9	2x0.9	2x0.9	2x0.9	2x0.9	2x0.9	2x0.9



### CAUTION

Equipment complying with IEC 61000-3-12.  
A disconnection device having an air gap contact separation in all active conductors should be incorporated in the fixed wiring according to the National Wiring Regulation.



### CAUTION

The reserved function is indicated in broken line table,users can select it when necessary.

#### Indoor/Outdoor Unit Signal Wire

Connect the wire according to their numbers.



Wrong connection may cause malfunction .

**Wiring Connection**

Seal the wiring connection with the insulation material , or the condensing dew will be caused.



**NOTE**

The air-conditioners can connect with Central Control Monitor (CCM). Before operation, please wiring correctly and set system address and network address of indoor units

**5.2 Indoor Unit Wiring**

● Power Supply

Table 5-2

Capacity(kW)		1.8~16
Indoor Unit Power	Phase	1-Phase
	Voltage and Frequency	220-240V~ 50Hz 208-230V~ 60Hz
	Power Wiring Size	Wire size must comply with local codes
Circuit Breaker (A)		16
Indoor Unit /Outdoor Unit Signal Wire (mm <sup>2</sup> ) (Weak electric signal)		3-core shielded wire 3X0.75

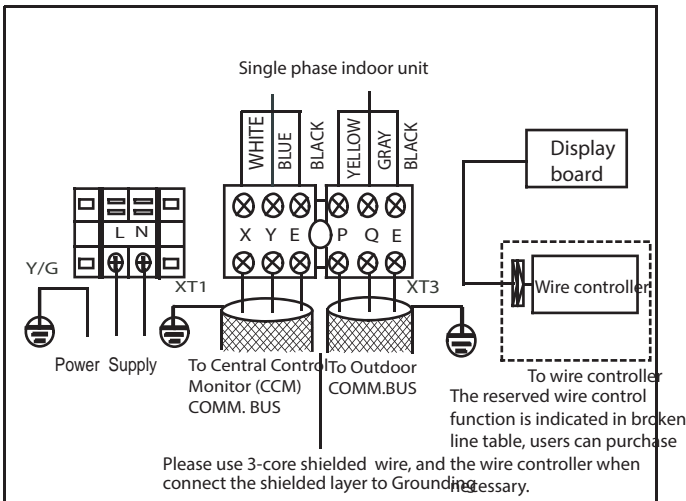


Fig. 5-5

1. Signal wire is 3-core, polarized wire. Use 3-core shield wire to prevent interference. The grounding method now is grounding the closed end of the shield wire and opening (insulating) at the end. Shield is to be grounded.
2. The control between outdoor unit and indoor unit is BUS type. Addresses is set on field during the installation.



**CAUTION**

Indoor/Outdoor unit signal wire is low voltage circuit. Do not let it touch the high voltage power wire and put it to gather with power cord in the same wire distribution pipe.



**NOTE**

The wire diameter and continuous length is under the condition that the voltage vibration is within 2%. If the continuous length is exceed showing value, choose the wire diameter follow relevant regulation.

**Indoor unit power supply wiring**

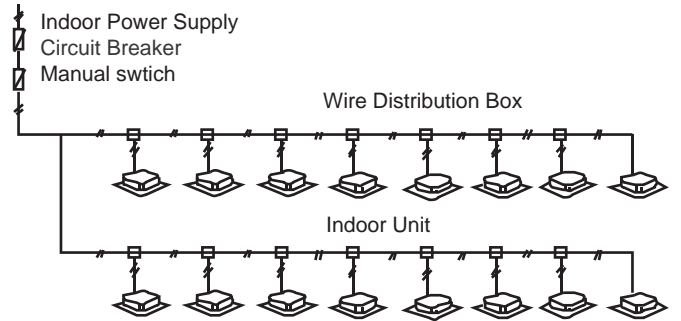


Fig. 5-6



**CAUTION**

1. Refrigerant piping system, indoor unit-indoor unit connection signal wires and indoor unit-outdoor unit connection signal wire are in the same system.
2. When power cord is parallel with signal wire, please put them into separate wire distribution pipes, and leave a proper distance. (Reference distance: It is 300mm when current capacity of power cord is less than 10A, or 500mm when 50A).

- Please use shield wire as indoor unit/outdoor unit signal wire.

**Indoor/Outdoor unit signal wire wiring**

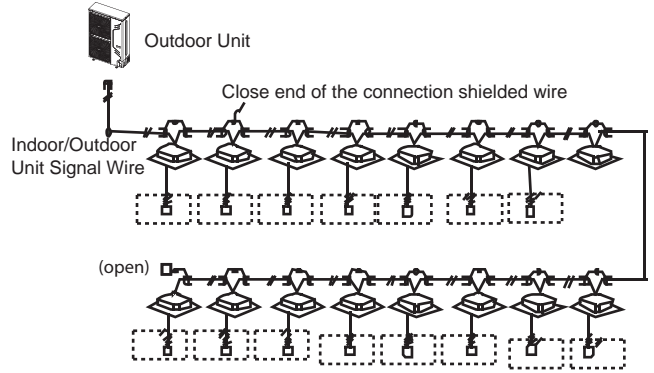


Fig. 5-7

**5.3 Function setting dial switches instructions**

- SW3(SW-1) definition: Auto Addressing Dial

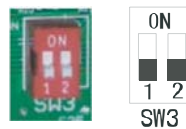


Table 5-3

SW3 (SW-1)		
1	ON	Obtain network address automatically
	OFF	Obtain network address manually
2	ON	Revocation indoor unit network address
	OFF	/

## 6. TEST RUNNING

Operate according to "gist for test running" on the electric control box cover.

### CAUTION

- Test running can not start until the outdoor unit has been connected to the power for 12hr.
- Test running can not start until all the valves are affirmed open.
- Never make the forced running. (Or the protector sits back, danger will occur.)

## 7. PRECAUTIONS ON REFRIGERANT LEAKAGE

This air conditioner(A/C) adopts innocuous and nonflammable refrigerant. The locating room of the A/C should big enough that any refrigerant leakage is unable to reach critical thickness. So certain essential action can be taken on time.

- Critical thickness-----the Max. thickness of Freon without any harm to person.
- Refrigerant critical thickness: 0.44[kg/m<sup>3</sup>] for R410A.

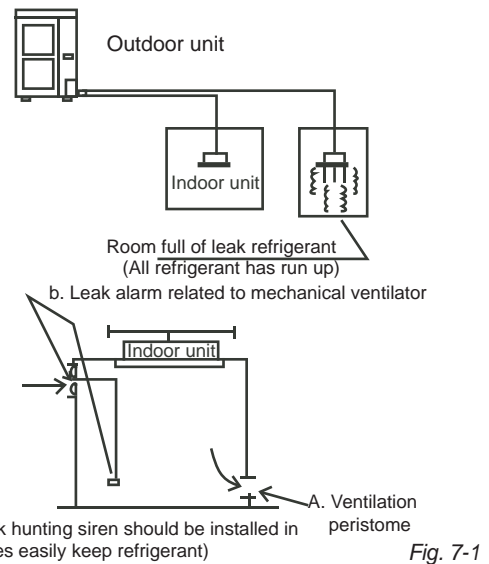
Confirm the critical thickness through follow steps, and take necessary actions.

1. Calculate the sum of the charge volume (A[kg]) Total Refrigerant volume of 10HP=factory refrigerant volume + superaddition
2. Calculate the indoor cubage (B[m<sup>3</sup>]) (as the minimum cubage.
3. Calculate the refrigerant thickness

$$\frac{A[\text{kg}]}{B[\text{m}^3]} \leq \text{critical thickness}$$

Counter measure against over high thickness

1. Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly)
2. Install leak alarm facility related to mechanical ventilator if you can not regularly ventilate.



### NOTE

Please press "constraint cool" button to carry out refrigerant recycling process. Keep the low pressure above 0.2MPa, other wise compressor may be burnt out.

## 7.1 Important information for the used refrigerant

This product has the fluorinated gas which is listed in kyoto protocol it is forbidden to release to air.

Refrigerant type: R410A; Volume of GWP: 2088;  
GWP=Global Warming Potential

Model	Factory charge	
	Refrigerant/kg	tonnes CO <sub>2</sub> equivalent
8kW	2.95	6.16
10.5kW	2.95	6.16
12kW	3.30	6.89
14kW	3.90	8.14
16kW	3.90	8.14
18kW	4.50	9.40

### Attention:

Frequency of Refrigerant Leak Checks

- 1) For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO<sub>2</sub> equivalent or more, but of less than 50 tonnes of CO<sub>2</sub> equipment, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
- 2) For equipment that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO<sub>2</sub> equivalent or more, but of less than 500 tonnes of CO<sub>2</sub> equipment, at least every six months, or where a leakage detection system is installed, at least every 12 months.
- 3) For equipment that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO<sub>2</sub> equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.
- 4) Non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to the end user where evidence is provide that the installation is to be carried out by an undertaking certified person.
- 5) Only certificated person is allowed to do installation, operation and maintenance.

## 8. TURN OVER TO CUSTOMER

The owner's manual of indoor unit and owner's manual of outdoor or unit must be turned over to the customer. Explain the contents in the owner's manual to the customers in details.

# Owner's manual

MD14U-025AW

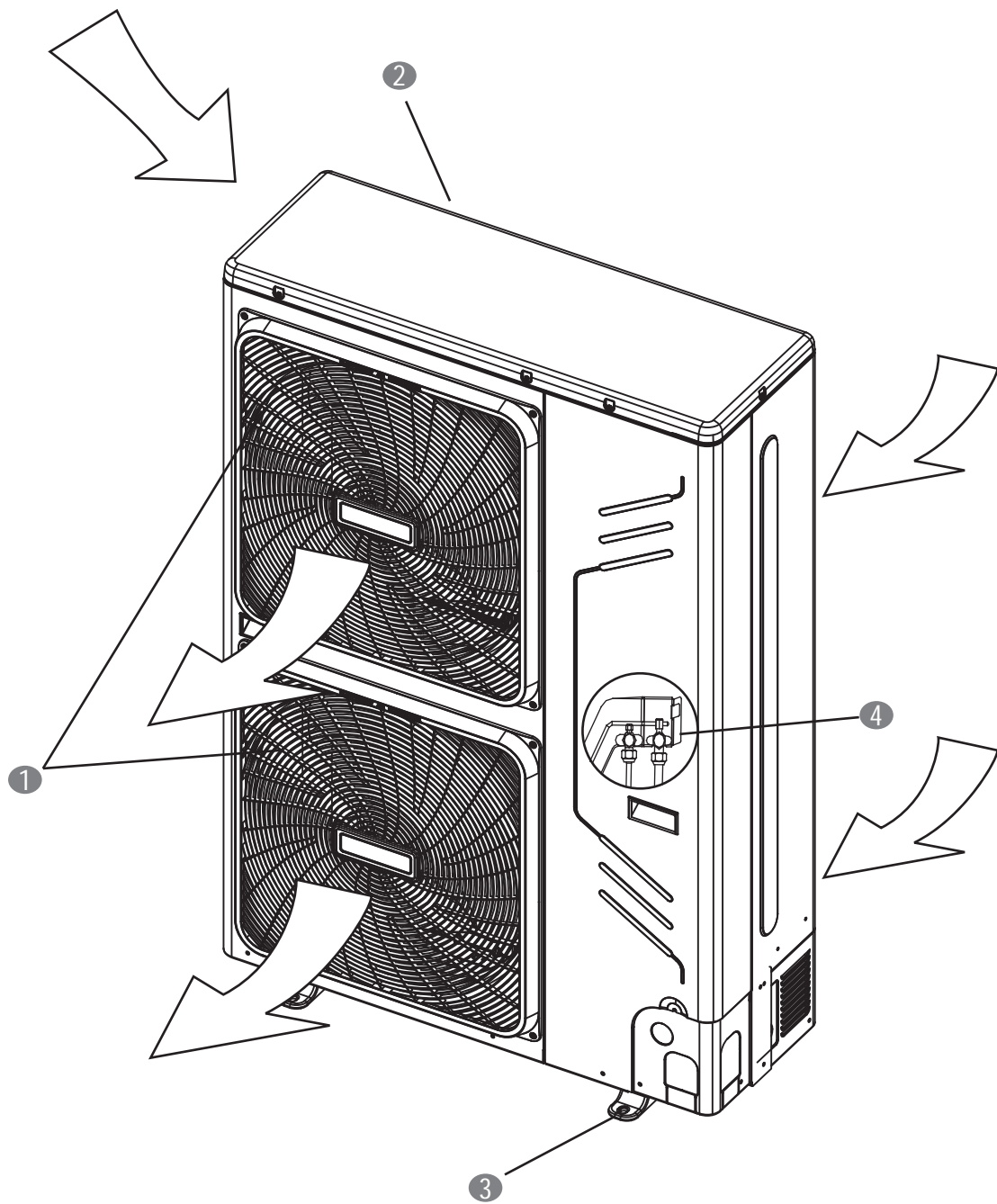


Fig.1

- ① air outlet
- ② air inlet

- ③ Fix leg
- ④ Refrigerant piping connection part (connection part in side)



**NOTE**

All the pictures in this manual are for explanation purpose only. They may be slightly different from the air conditioner you purchased(depend on model). The actual shape shall prevail.

16kW complying with IEC 61000-3-12.

CONTENTS	PAGE
IMPORTANT SAFETY INFORMATION.....	1
PARTS NAMES.....	2
OPERATION RANGE.....	3
OPERATION AND PERFORMANCE.....	3
MALFUNCTION CODE OF OUTDOOR UNIT.....	4
FOLLOWING SYMPTOMS ARE NOT AIR CONDITIONER TROUBLES.....	6
TROUBLESHOOTING.....	6

## 1. IMPORTANT SAFETY INFORMATION

To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.



### WARNING

Failure to observe a warning may result in death. The appliance shall be installed in accordance with national wiring regulations.



### CAUTION

Failure to observe a caution may result in injury or damage to the equipment.



### WARNING

The appliance should not be used by children without supervision.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

**Ask your dealer for installation of the air conditioner.**  
Incomplete installation performed by yourself may result in a water leakage, electric shock, and fire.

**Ask your dealer for improvement, repair, and maintenance.**  
Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.

**In order to avoid electric shock, fire or injury, or if you detect any abnormality such as smell of fire, turn off the power supply and call your dealer for instructions.**

**Never let the indoor unit or the remote controller get wet.**  
It may cause an electric shock or a fire.

**Never press the button of the remote controller with a hard, pointed object.**  
The remote controller may be damaged.

**Never replace a fuse with that of wrong rated current or other wires when a fuse blows out.**  
Use of wire or copper wire may cause the unit to break down or cause a fire.

**It is not good for your health to expose your body to the air flow for a long time.**

**Do not insert fingers, rods or other objects into the air inlet or outlet.**  
When the fan is rotating at high speed, it will cause injury.

**Never use a flammable spray such as hair spray, lacquer or paint near the unit.**  
It may cause a fire.

**Never touch the air outlet or the horizontal blades while the swing flap is in operation.**  
Fingers may become caught or the unit may break down.

**Never put any objects into the air inlet or outlet.**  
Objects touching the fan at high speed can be dangerous.

**Never inspect or service the unit by yourself.**  
Ask a qualified service person to perform this work.

**Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.**



Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the connection systems available.

**If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the ground and get into the food chain, damaging your health and well-being.**

**To prevent refrigerant leak, contact your dealer.**  
When the system is installed and runs in a small room, it is required to keep the concentration of the refrigerant, if by any chance coming out, below the limit. Otherwise, oxygen in the room may be affected, resulting in a serious accident.

**The refrigerant in the air conditioner is safe and normally does not leak.**  
If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

**Turn off any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.**

Do not use the air conditioner until a service person confirms that the portion where the refrigerant leaks is repaired.



### CAUTION

**Do not use the air conditioner for other purposes.**  
In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.

**Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.**  
Otherwise, an electric shock and injury may result.

**In order to avoid electric shock or fire, make sure that an earth leak detector is installed.**

**Be sure the air conditioner is grounded.**  
In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.

**In order to avoid injury, do not remove the fan guard of the outdoor unit.**

**Do not operate the air conditioner with a wet hand.**  
An electric shock may happen.

**Do not touch the heat exchanger fins.**

These fins are sharp and could result in cutting injuries.

**Do not place items which might be damaged by moisture under the indoor unit.**

Condensation may form if the humidity is above 80%, the drain outlet is blocked or the filter is polluted.

**After a long use, check the unit stand and fitting for damage.**

If damaged, the unit may fall and result in injury.

**To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner.**

**Arrange the drain hose to ensure smooth drainage.**  
Incomplete drainage may cause wetting of the building, furniture etc.

**Never touch the internal parts of the controller.**  
Do not remove the front panel. Some parts inside are dangerous to touch, and a machine trouble may happen.

**Never expose little children, plants or animals directly to the air flow.**  
Adverse influence to little children, animals and plants may result.

**Do not allow a child to mount on the outdoor unit or avoid placing any object on it.**  
Falling or tumbling may result in injury.

**Do not operate the air conditioner when using a room fumigation - type insecticide.**  
Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals.

**Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit.**  
It may cause incomplete combustion or deformation of the unit due to the heat.

**Do not install the air conditioner at any place where flammable gas may leak out.**  
If the gas leaks out and stays around the air conditioner, a fire may break out.

**The appliance is not intended for use by young children or infirm persons without supervision.**

**Young children should be supervised to ensure that they do not play with the appliance.**

**When capacity of indoor unit greater than the sum of 100%, capacity of indoor unit will be attenuated.**

**When capacity of indoor unit greater than or equal to the sum of 120%, in order to ensure the effectiveness of machine, and then try to open the indoor units at different time.**

**The outdoor unit window-shades should be periodic cleaning in case of being jammed.**

This window-shapes is heat dissipation outlet of components, if being jammed will cause the components shorten their service life spans because of overheated for a long time.

**The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.**

## 2. PARTS NAMES

The air conditioner consists of the indoor unit, the outdoor unit, the connecting pipe and the remote controller. (see Fig.1)

### Force Cooling Control

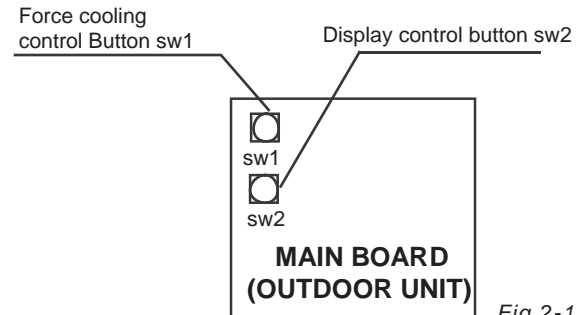


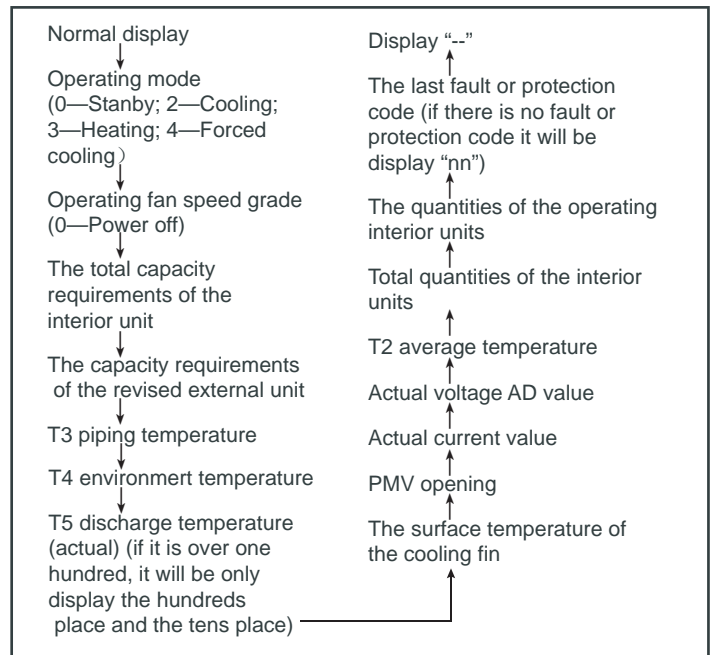
Fig.2-1

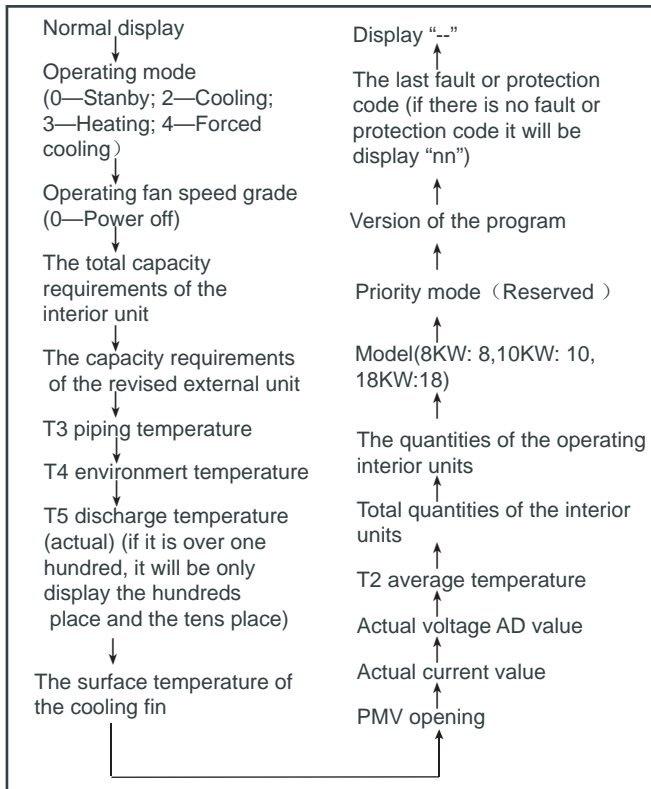
### Force Cooling Control

Force cooling control of outdoor unit be pressed once that a order to force cooling in indoor unit. When the frequency of outdoor unit change to 44Hz and then running it; indoor fan run in high speed. Press the button again will exit the Force Cooling Control.

### Display function

The function of text run circulate as fowlling(12/14/16KW) .





**NOTE**

- 12 hours preheating is imperative after turn on the power switch. Please do not shut down the power when the unit is supposed to stop running in 24h or shorter time. (This is to warm the crankcase heat box to avoid compulsive start of condenser.)
- Pay attention not to block the air inlet and outlet. Blocks may decrease the efficiency of the unit or startup the protector, which will stop running.

### 3. OPERATION RANGE

Use the system in the following temperature for safe and effective operation. The Max operation temperature for the air conditioner. (Cooling/Heating)

Table 3-1

Temperature Mode	Outdoor temperature	Room temperature
Cooling operation	-15°C~43°C	17°C~ 32°C
Heating operating	-15°C~27°C	≤27°C

**NOTE**

- 1 If air conditioner is used outside the above conditions, it may cause the unit to function abnormally.
- 2 The phenomenon is normal that the surface of air conditioning may condense water when the relative larger humidity in room, please close the door and window.  
  
Optimum performance will be achieved within these
- 3 operating temperature range.

## 4. OPERATION AND PERFORMANCE

### 4.1 Protection Equipment

This Protection Equipment will enable the Air Conditioner to stop when the Air Conditioner is to be directed running compulsively.

When the Protection Equipment is activated, the Operation Indicator still lights while the Air Conditioner is not running. But the Check Indicator Lights.

The protection equipment may be activated in following conditions:

#### ■ Cooling Operation

- The air inlet or air outlet of outdoor unit is blocked.
- Strong wind is Continuously blowing to the air outlet of the outdoor unit.

#### ■ Heating Operation

- Too much dust and rubbish adhere to the dust filter in the indoor unit
- The air outlet of indoor unit is choked

**NOTE**

When the protection equipment starts, please shut down the manual power switch, and restart operation after problem is solved.

### 4.2 About power cut

- If power is cut during operation, stop all the operation immediately.
- Power comes again. The lamp on the display panel of indoor unit flashes. And then unit will auto-restart.
- Mishandling in operation:  
If mishandling happens because of lighting or mobile wireless, please shut off the manual power switch, and turn on again, then push the ON/OFF button.

### 4.3 Heating capacity

- The heating operation is a heat-pump process that heat will be absorbed from outdoor air and released in doors. Once the outdoor temperature is decreased, heating capacity decreased correspondingly.
- Other heating equipment is suggested to be used together when outdoor temperature is too low.
- In some extreme cold upland that buy another indoor unit equipped electrical heater will obtain better performance.(Refer to indoor unit owner's manual for details)

**NOTE**

1. The motor in Indoor Unit will continue running for 20~30 seconds for to remove residual heat when the Indoor Unit receiving OFF command during heating operation.
2. If the air conditioner malfunction occurs because of disturb, please reconnect the air conditioner to power, then turn on it again.

### 4.4 Three-minute protection feature

- A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it restarts immediately after operation.

## 4.5 Cooling and heating operation

- The indoor unit of the intelligent inverter centralized air conditioner can be controlled solely, but the indoor unit in the same system can not run cooling and heating at the same time.
- When the Cooling and Heating operation confront with each other, the Indoor Unit which are running on Cooling Mode would stop and there will be Standby or No Priority displayed in the Control Panel. Those Indoor Units which are running on Heating Mode will run continuously.
- If the Air Conditioner Administrator has set running mode, then the air conditioner can not run on modes other than the presetted. Standby or No Priority will be displayed in the Control Panel.

## 4.6 Features of heating operation

- Warm air will not be blown out immediately at the beginning of the heating operation, 3~5 minutes ago (depends on the indoor and outdoor temperature), until the indoor heat exchanger become hot, then blows out warm air.

- During operation, the fan motor in the outdoor unit may stop running under high temperature.

- During Fan Operation, if other Indoor Units are running on Heating Mode, the fan may stop in order to prevent sending heat wind.

## 4.7 Defrost in the heating operation

- During heating operation, outdoor unit sometimes will frost. To increase efficiency, the unit will start defrosting automatically (about 2~10 minutes), and then water will be drained out from outdoor unit.
- During defrosting, both the fan motors in the outdoor unit and indoor unit will stop running.

# 5 MALFUNCTION CODE OF OUTDOOR UNIT

Table 5-1 (12/14/16KW)

Display	Malfunction or Protection
H0	M_Home unmatching ( Reserve )
E0	EEPROM Fault
E2	Communication fault of the outdoor chip and the indoor chip
E3	Communication error between Main board and IR341
E4	Outdoor unit sensor fault
E5	Voltage protection fault
E6	Direct-current fan fault
E7	Heating fan fault in the area A lasts for 5 minutes
E8	There are two times E6 fault in 10 minutes (recovery will be after power off)
P0	The cooling fin high temperature protection
P1	High pressure protection
P2	Low pressure protection
P3	Compressor current protection
P4	Discharge temperature protection
P5	Outdoor condenser high temperature protection
P6	IPM modules protection
P7	Evaporator high temperature protection
P8	Typhoon protection

### Display Function Instruction:

1. When stand by, LED displaying the amount of indoor units online which communicate with outdoor units.
2. When operation, LED displaying frequency value of compressor.
3. When defrost, LED displaying "dF".



Table 5-2 (8/10.5/18kW)

Display	Malfunction or Protection
E2	Communication malfunction between indoor/outdoor units
E4	T3&T4 temperature sensor malfunction
E5	Power voltage protection
E6	Fan Protection
E7	Compressor discharge temperature sensor malfunction
E9	EEPROM malfunction
EA	A fan in the Aregion run for more than 5 minutes in Heat mode
Eb	2 times of E6 protection in 10 minutes
H0	Communication malfunction between IR341/main board
P1	Hi-pressure protection
P2	Low-pressure protection
P3	Input current protection
P4	Compressor discharge protection temperature
P5	Condenser high temperature protection
P6	Inverter module protection
P8	Typhoon protection
PE	Indoor evaporator hi-temp protection
L0	Module malfunction
L1	DC generatrix low voltage protection
L2	DC generatrix high voltage protection
L3	Reserved
L4	MCE malfunction/simultaneously/cycle loop
L5	Zero speed protection
L6	Reserved
L7	Wrong phase protection
L8	Speed difference>15Hz protection between the front and the back clock
L9	Speed difference>15Hz protection between the real and the setting speed

### Display Function Instruction:

1. When stand by, LED displaying the amount of indoor units online which communicate with outdoor units.
2. When operation, LED displaying frequency value of compressor.
3. When defrost, LED displaying "dF".

## 6. FOLLOWING SYMPTOMS ARE NOT AIR CONDITIONER TROUBLES

### Symptom 1: The system does not operate

- The air conditioner does not start immediately after the ON/OFF button on the remote controller is pressed. If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the air conditioner starts 3 minutes after it is turned ON.
- If the operation lamp and the "PRE-DEF indicator(cooling and heating type) or fan only indicator(cooling only type)" light, it means you choose the heating model. When just starting, if the compressor has not started, the indoor unit appears "anti cold wind" protection because of its overflow outlet temperature.

### Symptom 2: Change into the fan mode during cooling mode

- In order to prevent the indoor evaporator frosting, the system will change into fan mode automatically, restore to the cooling mode after soon.
- When the room temperature drops to the set temperature, the compressor goes off and the indoor unit changes to fan mode; when the temperature rises up, the compressor starts again. It is same in the heating mode.

### Symptom 3: White mist comes out of a unit

#### Symptom 3.1: Indoor unit

- When humidity is high during cooling operation If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your dealer for details on cleaning the unit. This operation requires a qualified service person

#### Symptom 3.2: Indoor unit, outdoor unit

- When the system is changed over to heating operation after defrost operation Moisture generated by defrost becomes steam and is exhausted.

### Sptom 4: Noise of air conditionerscooling

#### Symptom 4.1: Indoor unit

- A continuous low "shah" sound is heard when the system is in cooling operation or at a stop. When the drain pump (optional accessories) is in operation, this noise is heard.
- A "pishi-pishi" squeaking sound is heard when the system stops after heating operation. Expansion and contraction of plastic parts caused by temperature change make this noise.

#### Symptom 4.2: Indoor unit, outdoor unit

- A continuous low hissing sound is heard when the system is in operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound which is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow stop or flow change.

#### Symptom 4.3: Outdoor unit

- When the tone of operating noise changes. This noise is caused by the change of frequency.

### Symptom 5: Dust comes out of the unit

- When the unit is used for the first time in a long time. This is because dust has gotten into the unit.

### Symptom 6: The units can give off odours

- The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.

### Symptom 7: The outdoor unit fan does not spin.

- During operation. The speed of the fan is controlled in order to optimize product operation.

## 7. TROUBLESHOOTING

### 7.1. Troubles and causes of air conditioner

**If one of the following malfunctions occur, stop operation, shut off the power, and contact with your dealer.**

- The operation lamp is flashing rapidly (twice every second) This lamp is still flashing rapidly after turn off the power and turn on again.
- Remote controller receives malfunction or the button does not work well.
- A safety device such as a fuse, a breaker frequently actuates.
- Obstacles and water enter the unit.
- Water leaks from indoor unit.
- Other malfunctions.

**If the system does not properly operate except the above mentioned cases or the above mentioned malfunctions is evident, investigate the system according to the following procedures. (see in Table 7-1)**

Table 7-1

Symptoms	Causes	Solution
Unit does not start	<ul style="list-style-type: none"> <li>Power failure.</li> <li>Power switch is off.</li> <li>Fuse of power switch may have burned.</li> <li>Batteries of remote controller exhausted or other problem of controller.</li> </ul>	<ul style="list-style-type: none"> <li>Wait for the comeback of power.</li> <li>Switch on the power.</li> <li>ReplLocation:</li> <li>Replace the batterises or check the controller.</li> </ul>
Air flowing normally but completely can't cooling	<ul style="list-style-type: none"> <li>Temperature is not set correctly.</li> <li>Be in 3 minutes protection of compressor.</li> </ul>	<ul style="list-style-type: none"> <li>Set the temperature properly.</li> <li>Wait.</li> </ul>
Units start or stop frequently	<ul style="list-style-type: none"> <li>Refrigerant is too little or too much.</li> <li>Air or no concreting gas in the refrigerating circuit.</li> <li>Compressor is malfunction.</li> <li>Voltage is too high or too low.</li> <li>System circuit is blocked.</li> </ul>	<ul style="list-style-type: none"> <li>Check leakage, and rightly recharge refrigerant.</li> <li>Vacuum and recharge refrigerant.</li> <li>Maintenance or change compressor.</li> <li>Install manostat.</li> <li>Find reasons and solution.</li> </ul>
Low cooling effect	<ul style="list-style-type: none"> <li>Outdoor unit and indoor unit heat exchanger is dirty.</li> <li>The air filter is dirty.</li> <li>Inlet/outlet of indoor/outdoor units is blocked.</li> <li>Doors and windows are open</li> <li>Sunlight directly shine.</li> <li>Too much heat resource.</li> <li>Outdoor temp. is too high.</li> <li>Leakage of refrigerant or lack of refrigerant.</li> </ul>	<ul style="list-style-type: none"> <li>Clean the heat exchanger.</li> <li>Clean the air filter.</li> <li>Eliminate all dirties and make air smooth.</li> <li>Close doors and windows.</li> <li>Make curtains in order to shelter from sunshine.</li> <li>Reduce heat source.</li> <li>AC cooling capacity reduces (normal).</li> <li>Check leakage and rightly recharge refrigerant.</li> </ul>
Low heating effect	<ul style="list-style-type: none"> <li>Outdoor temperature is lower than 7°C</li> <li>Doors and windows not completely closed.</li> <li>Leakage of refrigerant or lack of refrigerant.</li> </ul>	<ul style="list-style-type: none"> <li>Use heating device.</li> <li>Close doors and windows.</li> <li>Check leakage and rightly recharge refrigerant.</li> </ul>

## 7.2 Troubles and causes of remote controller

Before asking for serving or repairing , check the following points.

(see in Table 7-2)

Table 7-2

Symptoms	Causes	Solution
The fan speed can not be changed.	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is "AUTO"</li> </ul>	When the automatic mode is selected, the air conditioner will automatically change the fan speed.
	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is "DRY"</li> </ul>	When dry operation is selected, the air conditioner automatically change the fan speed. The fan speed can be selected during "COOL" , "FAN ONLY", and "HEAT"
The remote controller signal is not transmitted even when the ON/OFF button is pushed.	<ul style="list-style-type: none"> <li>Check whether the batteries in the remote controller are exhausted.</li> </ul>	The power supply is off.
The TEMP. indicator does not come on.	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is FAN ONLY</li> </ul>	The temperature cannot be set during FAN mode.
The indication on the display disappears after a lapse of time.	<ul style="list-style-type: none"> <li>Check whether the timer operation has come to an end when the TIMER OFF is indicated on the display.</li> </ul>	The air conditioner operation will stop up to the set time
The TIMER ON indicator goes off after a lapse of certain time.	<ul style="list-style-type: none"> <li>Check whether the timer operation is started when the TIMER ON is indicated on the display.</li> </ul>	Up to the set time, the air conditioner will automatically start and the appropriate indicator will go off.
No receiving tone sounds from the indoor unit even when the ON/OFF button is pressed.	<ul style="list-style-type: none"> <li>Check whether the signal transmitter of the remote controller is properly directed to the infrared signal receiver of the indoor unit when the ON/OFF button is pressed.</li> </ul>	Directly transmit the signal transmitter of the remote controller to the infrared signal receiver of the indoor unit, and then repeatedly push the ON/OFF button twice.

# Certifications

Page intentionally left blank



# DECLARATION OF CONFORMITY UE

DICHIARAZIONE DI CONFORMITÀ EU  
KONFORMITÄTSEKTLÄRUNG UE  
DECLARATION DE CONFORMITE UE  
DECLARACIÓN DE CONFORMIDAD UE

## WE DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE MACHINE

DICHIARIAMO SOTTO LA NOSTRA SOLA RESPONSABILITÀ CHE LA MACCHINA  
WIR ERKLÄREN EIGENVERANTWORTLICH, DASS DIE MASCHINE  
NOUS DÉCLARONS SOUS NOTRE SEULE RESPONSABILITÉ QUE LA MACHINE  
EL FABRICANTE DECLARA BAJO SU EXCLUSIVA RESPONSABILIDAD QUE LA MÁQUINA

CATEGORY	<b>CONDENSING UNITS - Heat pump</b>
CATEGORIA	<b>MOTOCONDENSANTI - Pompa di calore</b>
KATEGORIE	<b>VERFLÜSSIGUNGSEINHEITEN - Wärmepumpe</b>
CATEGORIE	<b>GROUPES DE CONDENSATION - Pompe à chaleur</b>
CATEGORIA	<b>MOTOCONDENSADORAS - Bomba de calor</b>

## TYPE / TIPO / TYP / TYPE / TIPO

MODEL	MODEL
MSAN-XMi 80M	MSAN-XMi 120T
MSAN-XMi 105M	MSAN-XMi 140T
MSAN-XMi 120M	MSAN-XMi 160T
MSAN-XMi 140M	MSAN-XMi 180T
MSAN-XMi 160M	

- **COMPLIES WITH THE FOLLOWING EC DIRECTIVES, INCLUDING THE MOST RECENT AMENDMENTS, AND THE RELEVANT NATIONAL HARMONISATION LEGISLATION CURRENTLY IN FORCE:**
- RISULTA IN CONFORMITÀ CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE CE, COMPRESSE LE ULTIME MODIFICHE, E CON LA RELATIVA LEGISLAZIONE NAZIONALE DI RECEPIMENTO:
- DEN IN DEN FOLGENDEN EG-RICHTLINIEN VORGESEHENEN VORSCHRIFTEN, EINSCHLIEßLICH DER LETZTEN ÄNDERUNGEN, SOWIE DEN ANGEWANDTEN LANDESGESETZEN ENTSPRICHT:
- EST CONFORME AUX DIRECTIVES CE SUIVANTES, Y COMPRIS LES DERNIÈRES MODIFICATIONS, ET À LA LÉGISLATION NATIONALE D'ACCUEIL CORRESPONDANTE:
- ES CONFORME A LAS SIGUIENTES DIRECTIVAS CE, INCLUIDAS LAS ÚLTIMAS MODIFICACIONES, Y A LA RELATIVA LEGISLACIÓN NACIONAL DE RECEPCIÓN:

- 2006/42/EC** **machinery directive**  
direttiva macchine  
Maschinenrichtlinie  
directive sur les machines  
directiva máquinas
- 2014/30/UE** **electromagnetic compatibility**  
compatibilità elettromagnetica  
Elektromagnetische Verträglichkeit  
compatibilité électromagnétique  
compatibilidad electromagnética
- 2009/125/UE** **Ecodesign** /Progettazione ecocompatibile / Ecodesign / Éco-conception / Ecodiseño
- 2011/65/UE** **RoHs**

-Unit manufactured and tested according to the followings Standards:	EN 60335-1 :2012/A11 :2014 EN 60335-2-40:2003/A13 :2012 EN 62233 :2008
-Unità costruita e collaudata in conformità alle seguenti Normative:	EN 55014-1 :2006/A2 :2011 EN 55014-2 :1997/A2 :2008
-Unité construite et testée en conformité avec les Réglementations suivantes	EN 61000-3-2 :2014 EN 61000-3-3 :2013
-Unidad construida y probada de acuerdo con las siguientes Normativas	EN 61000-3-12 :2011 EN 61000-3-11 :2000
-Gebautes und geprüftes Gerät nach folgenden Normen	EN 62321-1 :2013 EN 62321-2 :2014 EN 62321-3-1 :2014 EN 62321-4 :2014 EN 62321-5 :2015 EN 62321-6 :2015 EN 62321 :2009

**-Responsible to constitute the technical file is the company n°.00708410253 and registered at the Chamber of Commerce of Belluno Italy**  
 -Responsabile a costituire il fascicolo tecnico è la società n° 00708410253 registrata presso la Camera di Commercio di Belluno Italia  
 -Verantwortliche für die technischen Unterlagen zusammenstellen n°.00708410253 ist das Unternehmen bei der Handelskammer von Belluno Italien registriert  
 -Responsable pour compiler le dossier technique est la société n°00708410253 enregistrée à la Chambre de Commerce de Belluno en Italie  
 -Encargado de elaborar el expediente técnico es la empresa n° 00708410253 registrada en la Cámara de Comercio de Belluno Italia

NAME / NOME / VORNAME / PRÉNOM / NOMBRE  
SURNAME / COGNOME / ZUNAME / NOM / APELLIDOS

STEFANO  
BELLO

FELTRE, 29/06/2018

COMPANY POSITION / POSIZIONE / BETRIEBSPOSITION / FONCTION / CARGO **AMMINISTRATORE DELEGATO**

CLIVET S.P.A. - Via Camp Lonc, 25 - Z.I. VILLAPAIERA - 32030 FELTRE (BL) - ITALIA

Cap.Soc. Eur 20.000.000 i.v. C.F. e Reg.Impr. BL n°.00708410253 - R.E.A. n°.66577 - P.I. /VAT:IT 00708410253

Tel. +39 0439 3131 - Fax +39 0439 313300 -Web: [www.clivet.it](http://www.clivet.it) Mail: [info@clivet.it](mailto:info@clivet.it) PEC: [amministrazione.clivet@pec.it](mailto:amministrazione.clivet@pec.it) - Registro A.E.E. IT0802000001697

**CLIVET SPA**

Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy  
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

**CLIVET UK LTD (Sales)**

4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom  
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - info@clivet-uk.co.uk

**CLIVET AIRCON LTD (Service and Maintenance Division)**

Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom  
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - info@clivetaircon.co.uk

**CLIVET ESPAÑA COMERCIAL S.L. (Sales)**

Calle Gurb, 17 1º 1ª - 08500 Vic, Barcelona - España  
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivetcomercial.com

**CLIVET ESPAÑA S.A.U. (Service and Maintenance Division)**

Calle Real de Burgos Nº 12 - 28860 Paracuellos del Jarama, Madrid - España  
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

**CLIVET GmbH**

Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany  
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

**CLIVET RUSSIA**

Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia  
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

**CLIVET MIDEAST FZCO**

Dubai Silicon Oasis (DSO), High Bay Complex, Ind Unit No. 3, PO BOX 342009, Dubai, UAE  
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

**CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED**

4BA, Gundecha Onclave, Kherani Road - Sakinaka, Andheri (East) - Mumbai 400 072 - India  
Tel. +91 22 6193 7000 - Fax +91 22 6193 7001 - info.in@clivet.com

---

[www.clivet.com](http://www.clivet.com)  
[www.clivetlive.com](http://www.clivetlive.com)

A Group Company of





# MSAN-XMi 200T - 260T

Air cooled heat pump outdoor unit



Dear Customer,

We congratulate you on choosing this product

For many years Clivet has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the best solution.

Yours faithfully,

CLIVET Spa

The data contained in this manual is not binding and may be changed by the manufacturer without prior notice.

Reproduction, even in part, is FORBIDDEN © Copyright - CLIVET S.p.A. - Feltre (BL) - Italia

---

<b>Contents</b>	<b>pag</b>
Installation manual .....	5
Owner's manual .....	19

This manual is for VRF SYSTEM.

To get complete and clear information, please also consider following issues:

1. please consider only 50 Hz electric supply mode
2. Installation Manual, Table 4-3 and Table 4-4:  
A = indoor units standard cooling capacity in kW x 10
3. model identification

<b>MSAN-XMi 200T - 260T</b>				
<b>Size</b>	<b>Power supply</b>		<b>Reference kW</b>	<b>Factory code</b>
200T	400V+N	3-phase	20	MDV-V200W/DRN1
224T	400V+N	3-phase	22.4	MDV-V224W/DRN1
260T	400V+N	3-phase	26	MDV-V260W/DRN1

For 1 outdoor unit connected to 1 indoor unit applications please consider the following instructions.

- Schematics refer to multiple indoor unit design:  
for 1 to 1 application please consider the first indoor unit only (first line branch pipe is not needed)
- Installation Manual, Table 4-3 and Table 4-4:  
for 1 to 1 application no branch pipe is needed
- Installation Manual, Table 4-8: only for VRF System  
for 1 to 1 application please consider 50% ÷ 100% indoor capacity range
- Installation Manual, Chapter 4.6: only for VRF System
- Installation Manual, Table 4-11: only for VRF System  
for 1 to 1 application please consider Table 4-10 data
- Owner's Manual, Chapter 1.:  
for 1 to 1 application please consider 50% ÷ 100% indoor capacity range

Page intentionally left blank

# Installation manual

MD14I-050EW

Page intentionally left blank

CONTENTS	PAGE
PRECAUTIONS.....	1
ATTACHED FITTINGS.....	2
OUTDOOR UNIT INSTALLATION.....	3
INSTALL THE CONNECTING PIPE.....	4
ELECTRICAL WIRING.....	9
TEST RUNNING.....	11
PRECAUTIONS ON REFRIGERANT LEAKAGE.....	12
TURN OVER TO CUSTOMER.....	12

## 1. PRECAUTIONS

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS" carefully before Installation. The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
- Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before maintenance the unit.
- Ask the customer that the Installation Manual and the Owner's Manual should be kept together.



### CAUTION

New Refrigerant Air Conditioner Installation

**THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT(R410A)WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are; Hydrophilic, oxidizing membrane or oil, and its pressure is approx.1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle. To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A):  
For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.



### CAUTION

Do not connect the Appliance from Main Power Supply.

This unit must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm. The installation fuse must be used for the power supply line of this conditioner.



### WARNING

Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.

Inappropriate installation may result in water leakage, electric shock or fire.

**Turn off the main power supply switch or breaker before attempting any electrical work.**

Make sure all power switches are off. Failure to do so may cause electric shock.

**Connect the connecting cable correctly.**

If the connecting cable is connected in a wrong way, electric parts may be damaged.

**When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**

If air or any other gas is mixed in refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly cause pipe burst and injuries on persons.

**Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**

**Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**

Do not store it in a wet basement or expose to rain or water.

**After unpacking the unit, examine it carefully if there are possible damage.**

**Do not install in a place that might increase the vibration of the unit.**

**To avoid personal injury (with sharp edges), be careful when handling parts.**

**Perform installation work properly according to the Installation Manual.**

Inappropriate installation may result in water leakage, electric shock or fire.

**When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**

**Install the air conditioner securely in a location where the base can sustain the weight adequately.**

**Perform the specified installation work to guard against an earthquake.**

If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.

**If refrigerant gas has leaked during the installation work, ventilate the room immediately.**

If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.

**After the installation work, confirm that refrigerant gas does not leak.**

If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.

**Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**

An insufficient power supply capacity or inappropriate installation may cause fire.

**Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**

**Be sure to provide grounding.**

Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.

**Conform to the regulations of the local electric company when wiring the power supply.**

Inappropriate grounding may cause electric shock.

**Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**

If a combustible gas leaks, and stays around the unit, a fire may occur.






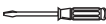




**Required tools for installation work**

- 1) Philips screw driver
- 2) Hole core drill(65mm)
- 3) Spanner
- 4) Pipe cutter
- 5) Knife

- 6) Reamer
- 7) Gas leak detector
- 8) Tape measure
- 9) Thermometer
- 10) Mega-tester
- 11) Electro circuit tester
- 12) Hexagonal wrench
- 13) Flare tool
- 14) Pipe bender
- 15) Level vial
- 16) Metal saw
- 17) Gauge manifold (Charge hose:R410A special requirement)
- 18) Vacuum pump (Charge hose:R410A special requirement)
- 19) Torque wrench
  - 1/4(17mm)16N•m (1.6kgf•m)
  - 3/8(22mm)42N•m (4.2kgf•m)
  - 1/2(26mm)55N•m (5.5kgf•m)
  - 5/8(15.9mm)120N•m (12.0kgf•m)
- 20) Copper pipe gauge adjusting projection margin
- 21) Vacuum pump adapter

## 2. ATTACHED FITTINGS

Please check whether the following fittings are of full scope. If there are some spare fittings , please restore them carefully.

	NAME	SHAPE	QUANTITY
INSTALLATION FITTINGS	1. Outdoor unit installation manual		1
	2. Outdoor unit owner's manual		1
	3. Indoor unit owner's manual		1
	4. Installation Instructions: Indoor Unit Manifold		1
	5. Water outlet connection pipe		1
	6. Straight screwdriver		1
	7. Sealing ring		1
	8. Waterproof chassis cover		2
	9. Connection pipe(26kW)		1
	10. Curved connection pipe(26kW)		1

### Refrigerant Piping

Piping kit used for the conventional refrigerant cannot be used.

Use copper pipe with 0.8 mm or more thickness for φ9.5.

Use copper pipe with 1.0 mm or more thickness for φ15.9.

Use copper pipe with 1.0 mm or more thickness for φ19.0.

Flare nut and flare works are also different from those of the conventional refrigerant. take out the flare nut attached to the main unit of the air conditioner, and use it.

### Before installation

Be careful to the following items before installation.

#### Air purge

For air purge, use a vacuum pump.

Do not use refrigerant charged in the outdoor unit for air purge.

(The refrigerant for air purge is not contained in the outdoor unit.)

#### Electrical cabling

Be sure to fix the power cables and indoor/outdoor connecting cables with clamps so that they do not contact with the cabinet, etc.

### Installation Place

A place which provides a specified space around the outdoor unit.

A place where the operation noise and discharged air are not given to your neighbors.

A place that is not exposed to a strong wind.

A place that does not block a passage.

When the outdoor unit is installed in an elevated position, make sure it's four feet securely installed.

There must be sufficient space for carrying in the unit.

A place where the drain water does not make any problem.



### CAUTION

- Install the outdoor unit at a place where discharge air is not blocked.
- When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield.



- When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, apply the windproof measures referring to the following examples.
- Install the unit so that its discharge port faces to the wall of the building. Keep a distance 3000mm or more between the unit and the wall surface.
- Do not mount the outdoor unit on a wall.

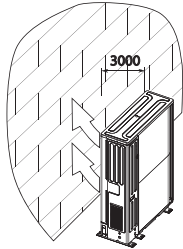


Fig.2-1

- Supposing the wind direction during the operation season of the discharge port is set at right angle to the wind direction.

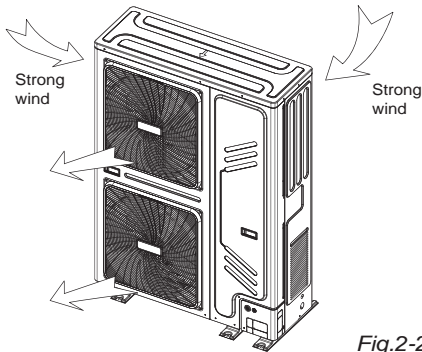


Fig.2-2

- Installation in the following places may result in some troubles. Do not install the unit in such places below.
  - A place full of machine oil.
  - A place full of sulphuric gas.
  - A place where high-frequency radio waves are likely to be generated as from audio equipment, welders, and medical equipment.

### 3. OUTDOOR UNIT INSTALLATION

#### 3.1 Installation place

Please keep away from the following place, or malfunction of the machine may be caused:

- There is combustible gas leakage.
- There is much oil (including engine oil) ingredient.
- There is salty air surrounding (near the coast)
- There is caustic gas (the sulfide, for example) existing in the air (near a hot spring)
- A place the heat air expelled out from the outdoor unit can reach your neighbor's window.
- A place that the noise interferes your neighbors every day life.
- A place that is too weak to bear the weight of the unit
- Uneven place.
- Insufficient ventilation place.
- Near a private power station or high Frequency equipment.
- Install indoor unit, outdoor unit, power cord and connecting wire at least 1m away from TV set or radio to prevent noise or picture interference.

The insulation of the metal parts of the building and the air conditioner should comply with the regulation of National Electric Standard.



#### CAUTION

Keep indoor unit, outdoor unit, power supply wiring and transmission wiring at least 1 meter away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if 1 meter is kept.)

#### 3.2 Installation space (Unit:mm)

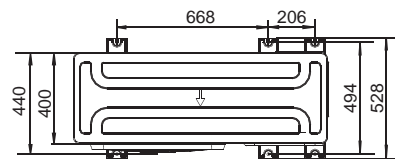
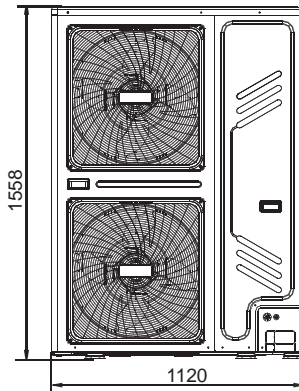


Fig.3-1

- Single unit installation

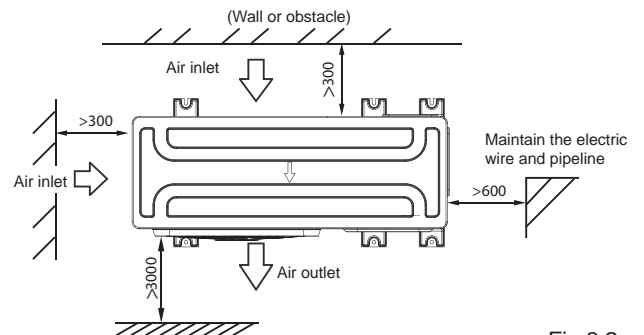


Fig.3-2

- Parallel connect the two units or above

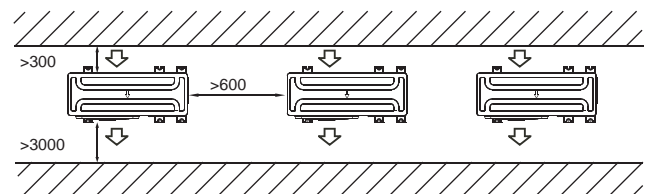


Fig.3-3

- Parallel connect the front with rear sides

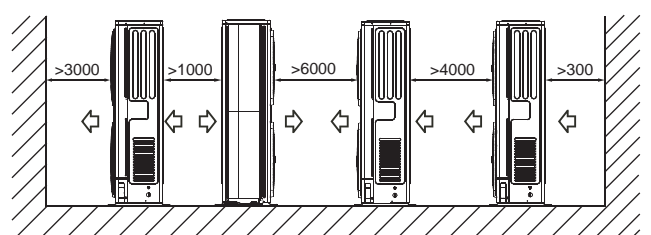


Fig.3-4

### 3.3 Moving and installation

- Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling.
- Never hold the inlet of the outdoor unit to prevent it from deforming.
- Do not touch the fan with hands or other objects.
- Do not lean it more than 45°, and do not lay it sidelong.
- Make concrete foundation according to the specifications of the outdoor units.(refer to Fig.3-5)
- Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind. (refer to Fig.3-5)

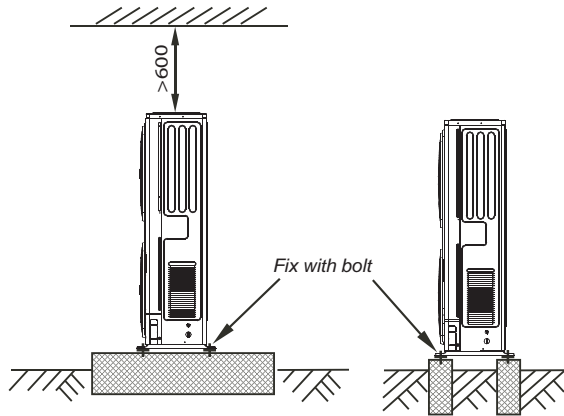


Fig.3-5



#### NOTE

All the pictures in this manual are for explanation purpose only. They may be slightly different from the air conditioner you purchased(depend on model).The actual shape shall prevail.

### 3.4 Centralized Chassis Drainage

When the outdoor unit requires centralized drainage, install the chassis and two waterproof covers for the chassis, as shown in Figure 3-6. Install the water outlet union pipe and sealing ring on the chassis, and then connect the drainage pipe to complete centralized drainage installation.

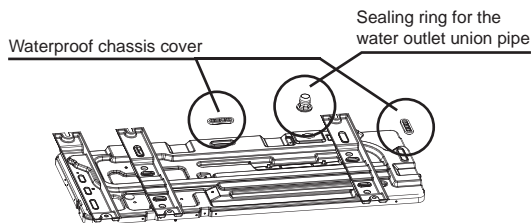


Fig.3-6



#### CAUTION

While installing the outdoor unit, pay attention to the installation place and the drainage pattern; if it's installed at the alpine zone, the frozen condensed water will block up the water outlet, please pull out the rubber stopper of the reserve water outlet. If that still fails to satisfy for the water draining, please knock open the other two water outlets, and keep the water can drain in time.

Pay attention to the knock the reserve water outlet from outside to inside, and it will be beyond repair after knocking open, please pay attention to the installation place, lest cause the inconvenience. Please do the moth proofing for the knocked out hole, to avoid the pest processing into and destroy the components.

## 4. INSTALL THE CONNECTING PIPE

Check whether the height drop between the indoor unit and outdoor unit, the length of refrigerant pipe, and the number of the bends meet the following requirements:

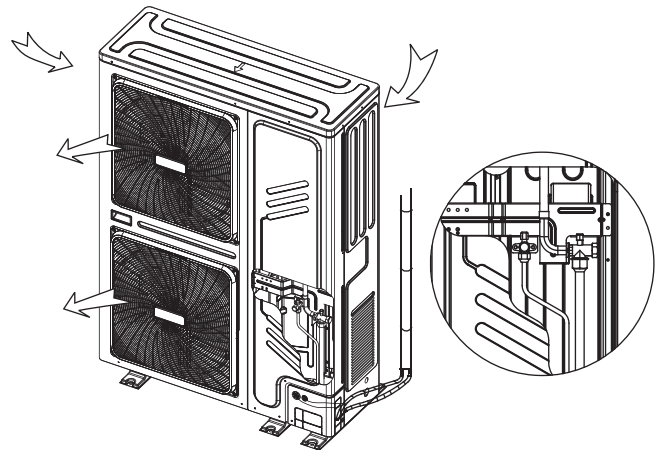


Fig.4-1

### 4.1 Refrigerant piping



#### CAUTION

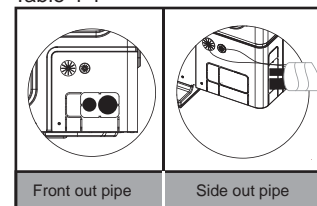
Please pay attention to avoid the components while connect to the connecting pipes.

To prevent the refrigerant piping from oxidizing inside when welding, it is necessary to charge nitrogen, or oxide will chock the circulation system.

#### The indoor and outdoor connecting pipe interface and power line outlet

Various piping and wiring patterns can be selected,such as out from the front ,the back the side ,and undersurface, etc. (The follow display the locations of several piping and wiring knock-off interfaces)

Table 4-1



#### CAUTION

1. Side out pipe: cut the side hole of the pipe-outlet plate selectively. It is suggested to cut a piece of metal plate below to avoid the mouse come and destroy the machine wiring body.
2. Front out pipe: cut the frontal hole of the pipe-outlet plate selectively. It is suggested to cut a piece of metal plate right side to avoid the mouse come and destroy the machine wiring body.
3. Wiring of power cord: the strong and weak electrical wire should be out through the two plastic holes of the pipe-outlet plate, and binded with gas and liquid pipe together.

### 4.2 Leak Detection

Use soap water or leak detector to check every joint whether leak or not (Refer to Fig.4-2).Note:

A is low pressure side stop valve

B is high pressure side stop valve

C and D is connecting pipes interface of indoor and outdoor units

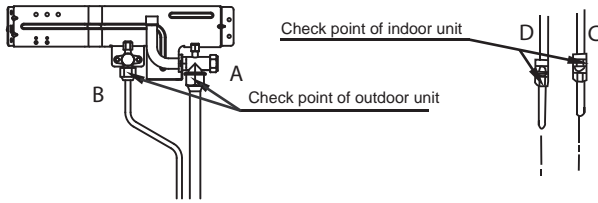


Fig. 4-2

### 4.3 Heat Insulation

Do the heat insulation to the pipes of air side and liquid side separately. The temperature of the pipes of air side and liquid side when cooling, for avoiding condensation please do the heat insulation fully.

- The air side pipe should use closed cell foamed insulation material, which the fire-retardant is B1 grade and the heat resistance over 120°C.
- When the external diameter of copper pipes  $\leq \Phi 12.7\text{mm}$ , the thickness of the insulating layer at least more than 15mm;
- When the external diameter of copper pipe  $\geq \Phi 15.9\text{mm}$ , the thickness of the insulating layer at least more than 20mm.
- Please use attached heat-insulating materials do the heat insulation without clearance for the connecting parts of the indoor unit pipes.

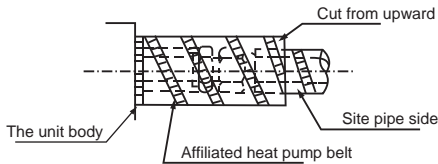


Fig. 4-3

### 4.4 Connecting method

#### ■ Select refrigerant pipe

Table 4-2

pipe definition	pipe connect position	code
main pipe	The pipe between outdoor unit to the first branch of indoor unit.	L1
The main pipes of indoor unit	The pipe after the first branch do not direct connect with the indoor unit.	L2~L5
The branch pipes of indoor unit	The pipe after the branch connect with the indoor unit.	a, b, c, d, e, f
Indoor unit branch pipes components	The pipes connect with the main pipe, the branch pipe and the the main pipe of indoor unit.	A, B, C, D, E

#### ● The first connect method

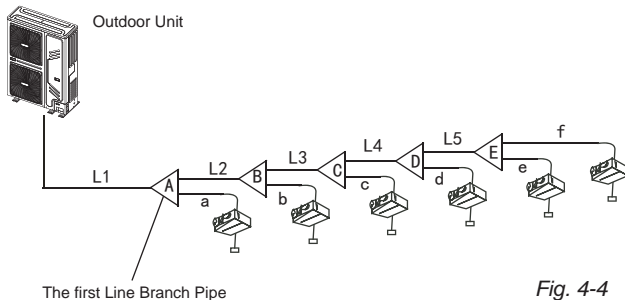


Fig. 4-4

#### ● The second connect method

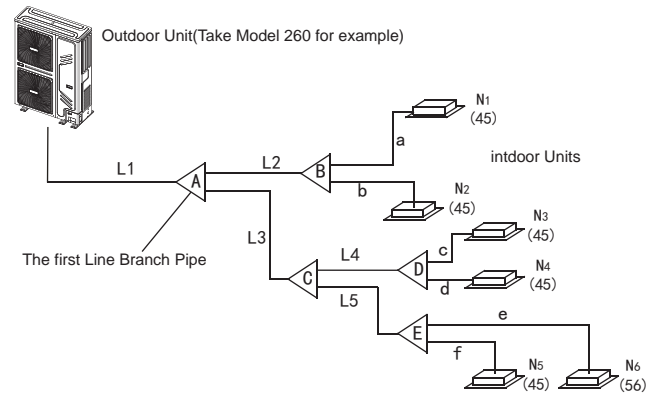


Fig. 4-5



### NOTE

- The distance between the first buranch to the last indoor unit is more than 15m,choose the second connect method.
- The pipe between the indoor unit to the closest branch must less than 15m.

### 4.4 Confirmation for the diameters of indoor unit connecting pipes

#### ■ Size of main pipe and corresponding branch joint and branch header

- 1) R410A Indoor unit connecting pipes diameters 4-3.
- 2) Example 1: In the Fig.4-5,The downstream inner units of the L2,and its total capacity is  $45 \times 2 = 90$ , refers to the Table 4.4,the air/liquid side of L2 is:  $\Phi 15.9/\Phi 9.5$ .

R410A Indoor unit connecting pipes diameters Table 4-3

Capacity of the downstream indoor unit	Main pipe size (mm)		Applicable manifold
	Gas pipe	Liquid pipe	
$A < 166$	$\Phi 15.9$	$\Phi 9.5$	FQZHN-01D
$166 \leq A < 230$	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D
$230 \leq A < 330$	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D
$330 \leq A$	$\Phi 28.6$	$\Phi 12.7$	FQZHN-03D

### 4.5 Confirmation for the diameters of outdoor unit connecting pipes

R410A outdoor unit connecting pipes diameters Table 4-4

Total capacity of The outdoor units	Main pipe size when the total equivalent piping length of liquid + air side is $< 90\text{m}$			Main pipe size when the total equivalent piping length of liquid + air side is $\geq 90\text{m}$		
	Gas side (mm)	Liquid side (mm)	The first Line Branch Pipe	Gas side (mm)	Liquid side (mm)	The first Line Branch Pipe
$A < 160$	$\Phi 15.9$	$\Phi 9.5$	FQZHN-01D	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D
$160 \leq A < 230$	$\Phi 19.1$	$\Phi 9.5$	FQZHN-01D	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D
$230 \leq A < 330$	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D	$\Phi 25.4$	$\Phi 9.5$	FQZHN-02D



### NOTE

- The straight distance between copper pipe turning and the contiguous branch pipe is at least 0.5m;
- The straight distance between the contiguous branchpipes is at least 0.5m;
- The straight distance which the branch pipes connected to the indoor unit is at least 0.5m;

- Branch header must be connected with indoor units directly, the further branch connection is not allowed.

- Select branch joint

Select the branch joint according to the total designed capacity of indoor units which it connects to. If this capacity is more than that of the outdoor unit, then select the connection according to the outdoor unit.

- The selection of branch header depends on the quantity of branches it connects to.

■ Connection method

Table 4-5

	Air side	Liquid side
20kW	Welding or Flaring	Welding or Flaring
22.4kW	Welding or Flaring	Welding or Flaring
26kW	Welding or Flaring	Welding or Flaring
Indoor unit	Flaring	Flaring
Branch pipe	Welding or Flaring	Welding or Flaring

■ Piping sizes at the branch pipe

Table 4-6

(A: the total capacity of indoor units)

Refrigerant	A (TYPE)	Air Side (Φ)	Liquid Side (Φ)
R410A	Wall mounted 22~45	12.7(Flaring nut)	6.4(Flaring nut)
	Wall mounted 56	15.9(Flaring nut)	9.5(Flaring nut)
	Four-sided air outlet 28~45	12.7(Flaring nut)	6.4(Flaring nut)
	Four-sided air outlet 56~80	15.9(Flaring nut)	9.5(Flaring nut)
	One-sided air outlet 18~45	12.7(Flaring nut)	6.4(Flaring nut)
	One-sided air outlet 56	15.9(Flaring nut)	9.5(Flaring nut)
	Low static pressure 18~45	12.7(Flaring nut)	6.4(Flaring nut)
	Low static pressure 56	15.9(Flaring nut)	9.5(Flaring nut)
	Thin duct type 71	15.9(Flaring nut)	9.5(Flaring nut)
	A5 duct type 22~45	12.7(Flaring nut)	6.4(Flaring nut)
	A5 duct type 56~140	15.9(Flaring nut)	9.5(Flaring nut)
	Four-way Cassette Type 15~45	12.7(Flaring nut)	6.4(Flaring nut)
	Console Type 22~45	12.7(Flaring nut)	6.4(Flaring nut)
	Tow-way Cassette Type 22~45	12.7(Flaring nut)	6.4(Flaring nut)
	Tow-way Cassette Type 56~71	15.9(Flaring nut)	9.5(Flaring nut)
	Ceiling And Floor Type 36~45	12.7(Flaring nut)	6.4(Flaring nut)
Ceiling And Floor Type 56~160	15.9(Flaring nut)	9.5(Flaring nut)	
Expose And Concealed Floor-standing type 22~45	12.7(Flaring nut)	6.4(Flaring nut)	
Expose And Concealed Floor-standing type 56~80	15.9(Flaring nut)	9.5(Flaring nut)	

■ Pipe diameter of the connector in the outdoor unit's body

Table 4-7

Model(kW)	Pipe diameter of outdoor unit's connector(mm)	
	Gas Side	Liquid Side
20	Φ19.1	Φ9.5
22.4	Φ19.1	Φ9.5
26	Φ22.2	Φ9.5

Table 4-8

Outdoor Unit (kW)	Capacity of Outdoor unit (horsepower)	Maximum Quantity of Indoor unit	Sum Capacity of Indoor unit (horsepower)
20	7	10	50%~130%
22.4	8	11	50%~130%
26	9	12	50%~130%

When capacity of indoor unit greater than the sum of 100%, capacity of indoor unit will be attenuated.

When capacity of indoor unit greater than or equal to the sum of 120%, in order to ensure the effectiveness of machine, and then try to open the indoor units at different time.



**NOTE**

- The indoor unit capacity total can not exceed 130% of the outdoor unit load.
- Overloading reduces the corresponding capacity.

Table 4-9

Capacity ranking	Capacity (horsepower)	Capacity ranking	Capacity (horsepower)
18	0.6	80	2.8
22	0.8	90	3.2
28	1	100	3.5
36	1.3	112	4
45	1.6	120	4.3
56	2	125	4.5
71	2.5	140	5

■ When the outdoor unit connects one indoor unit

Table 4-10

MODEL (kW)	The max height drop(m)		The length of refrigerant pipe(m)	The number of bends
	When outdoor unit is top	When outdoor unit is bottom		
20	25	20	50	less than 10
22.4	25	20	50	
26	25	20	50	

**4.6 Illustration**

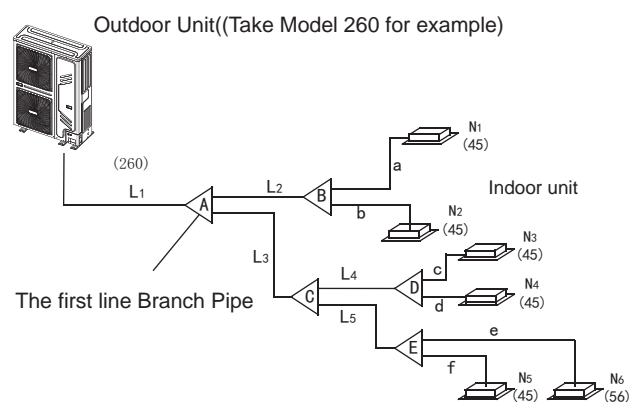


Fig.4-6

Caution: Suppose in the displayed piping system, the total equivalent piping length of air side + liquid side is longer than 90m.

- Indoor unit branch pipe
  - Inner branch pipes are a-f, the size selection please refers to Table4-6. Note: The max. length of the branch pipe should not longer than 15m.
- The main pipes of indoor unit and the indoor unit branch pipe components
  - The downstream inner units of the main pipe L2 are N1, N2, and its total capacity is  $45 \times 2 = 90$ , the size of pipe L2 is  $\Phi 15.9/\Phi 9.5$ , and the branch pipe B should be FQZHN-01D.
  - The downstream inner units of the main pipe L4 are N3, N4, and its total capacity is  $45 \times 2 = 90$ , the size of pipe L4 is  $\Phi 15.9/\Phi 9.5$ , and the branch pipe D should be FQZHN-01D.
  - The downstream inner units of the main pipe L5 are N5, N6, and its total capacity is  $45 + 56 = 101$ , the size of pipe L5 is  $\Phi 15.9/\Phi 9.5$ , and the branch pipe E should be FQZHN-01D.
- The indoor unit below to the main pipe L3 are N3~N6, and its total capacity is  $45 \times 3 + 56 = 191$ , the size of pipe L3 is  $\Phi 19.1/\Phi 9.5$ , and the branch pipe C should be FQZHN-01D.
- The indoor unit below to the main pipe A are N1~N6, and its total capacity is  $45 \times 5 + 56 = 281$ , and the branch pipe should be FQZHN-02D, and because the total piping length of liquid + air side is  $\geq 90m$ , check Table.4-4, and the first branch pipe should apply FQZHN-02D, and according to the principle of maximum value, it should apply FQZHN-02D.
- Main pipe (Please refer to Fig.4-6 and Table 4-4)
  - In Fig.4-6, the main pipe L1, the outdoor unit capacity is 26kW, and check the Fig.4-6 to get the size of gas pipe/liquid pipe is  $\Phi 22.2/\Phi 9.5$ , and also the total equivalent length of liquid side and gas side pipes is  $> 90m$ , then check the Table 4-4 to get the size of gas pipe/liquid pipe is  $\Phi 25.4/\Phi 9.5$ , and according to the maximum value principle, it should apply the  $\Phi 25.4/\Phi 9.5$ .

● Allowable length and altitude difference of refrigerant pipe

table 4-11

		Permitted value	Piping
Pipe Length	Total Pipe Length(Actual)	$\leq 120m$	$L1+L2+L3+L4+L5+a+b+c+d+e+f$
	Maximum Piping(L)	Actual Length	$\leq 60m$
		Equivalent Length	$\leq 70m$
	Pipe Length(from the first line branch pipe to furthest indoor unit)(m)	$\leq 20m$	$L2+L3+L4+L5+f$ (The first connect method) or $L3+L5+f$ (The second connect method)
	Pipe Length(from the nearest branch pipe equivalent length(m)	$\leq 15m$	a, b, c, d, e, f
Drop Height	Indoor Unit-Outdoor Unit Drop Height(H)	Outdoor Unit up	$\leq 30m$
		Outdoor Unit Down	$\leq 20m$
	Indoor Unit to Indoor Unit Drop Height(H)	$\leq 8m$	

Note: When the total equivalent piping length of liquid + gas side is  $\geq 90m$ , it must increase the size of air side main pipe. Besides, according to the distance of refrigerant pipe and the over matched state of inner unit, when the capacity is decreasing it still can increase the gas side main pipe size.

● The first connect method

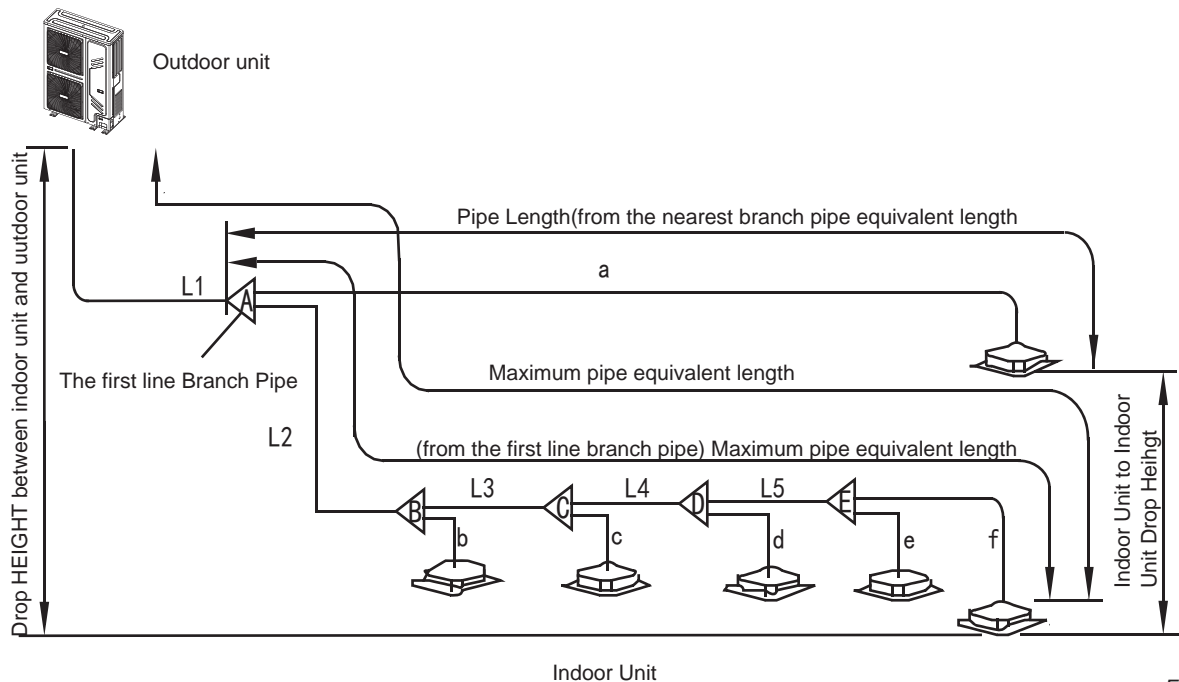


Fig.4-7

- The second connect method

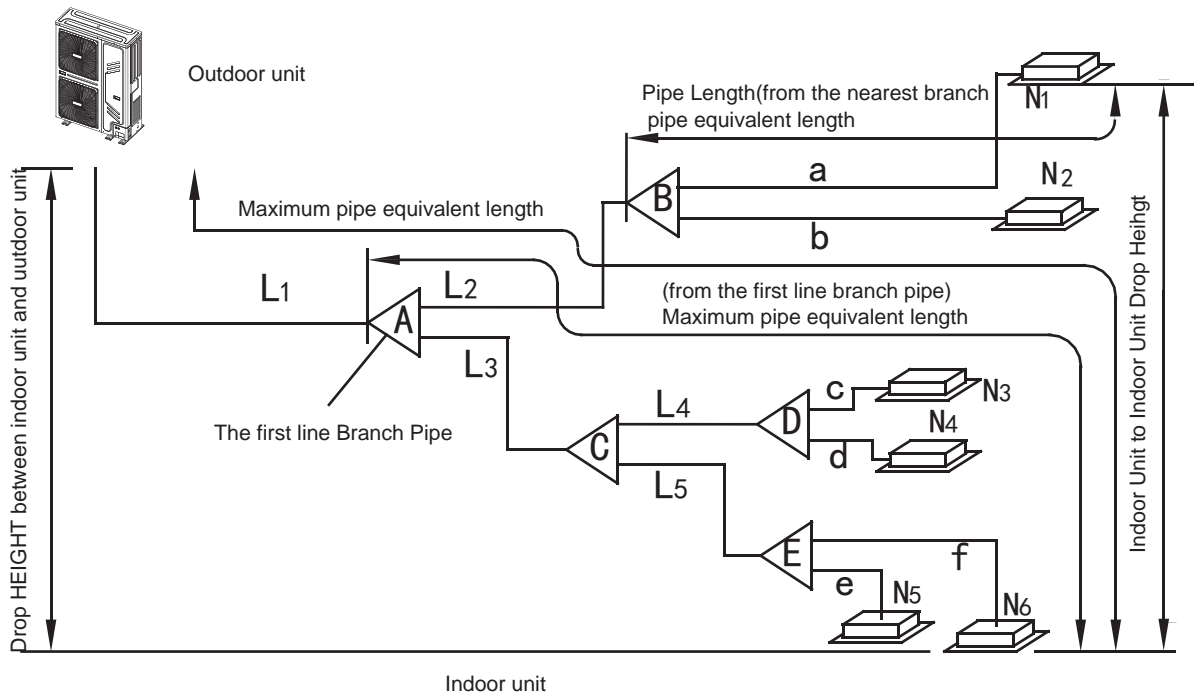


Fig.4-8

#### 4.7 Remove Dirt or Water in the Piping

Make sure there is no any dirt or water before connecting the piping to the outdoor units.

Wash the piping with high pressure nitrogen, never use refrigerant of outdoor unit.

#### 4.8 Airtight Test

Charge pressured nitrogen after connecting indoor/outdoor unit piping to do airtight test.

#### CAUTION

1. Pressured nitrogen [ 4.3MPa (44kg/cm<sup>2</sup>) for R410A] should be used in the airtight test.
2. Tighten high pressure/low pressure valves before applying pressured nitrogen.
3. Apply pressure from air vent mouth on the high pressure/low pressure valves.
4. The high pressure/low pressure valves are closed when applying pressured nitrogen.
5. The airtight test should never use any oxygen, flammable gas or poisonous gas.

#### 4.9 Air Purge with Vacuum Pump

- Using vacuum pump to do the vacuum, never using refrigerant to expel the air.
- Vacuuming should be done from both liquid side and gas side simultaneously.

#### 4.10 Refrigerant Amount to be Added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection.

- When the outdoor unit connects 1 indoor unit:

Table 4-12

Liquid Side Piping Diameter	Refrigerant to be Added Per meter Piping
Φ6.4	0.022kg
Φ9.5	0.057kg(>22.4kW)
	0.054kg(≤22.4kW)
Φ12.7	0.110kg
Φ15.9	0.170kg
Φ19.1	0.260kg
Φ22.2	0.360kg



#### NOTE

Additional refrigerant volume of divergent pipe is 0.1kg per item (Consider the liquid side of divergent pipe only)

## 5. ELECTRICAL WIRING



### CAUTION

- Design a dedicated power supply for the indoor unit and outdoor unit.
- If the power supply uses a branch loop, install an electricity leakage protector and a manual switch.
- The power supply, electric leakage protectors, and manual switches of the indoor units that connect to the same outdoor unit must be universal. Use the same loop for the indoor unit power connect to the same outdoor unit must be universal. Use the same loop for the indoor unit power supplies in the same system. Power on/off at the same time.
- Incorporate the outdoor unit and indoor unit connection wiring system and refrigerant pipe system for the same system.
- To reduce interference, use a three-core shielded twisted pair as the outdoor unit signal cable. Do not use a multi-core cable.
- Complete wiring according to national electrical standards.
- Employ an electrical engineer for wiring.

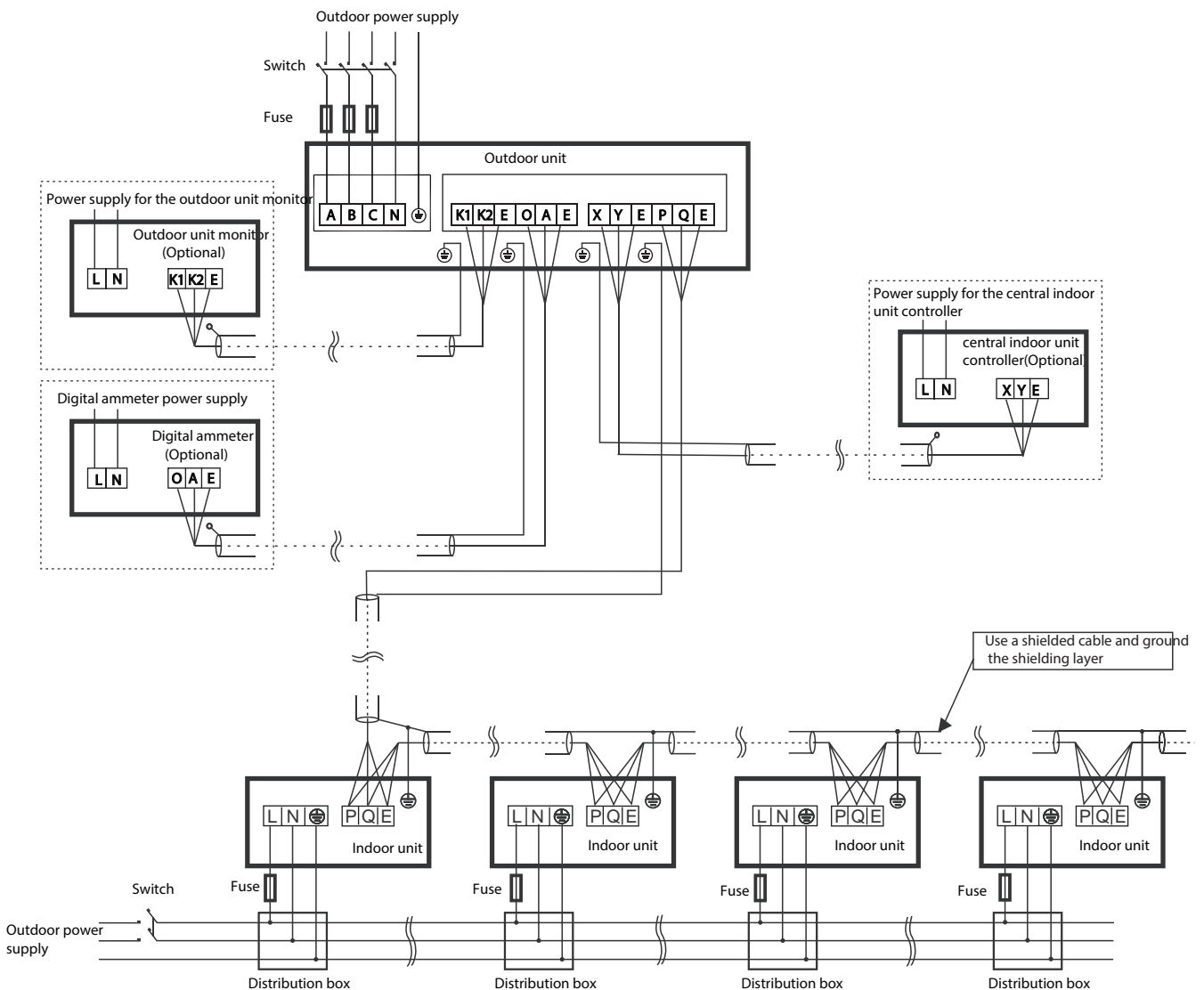


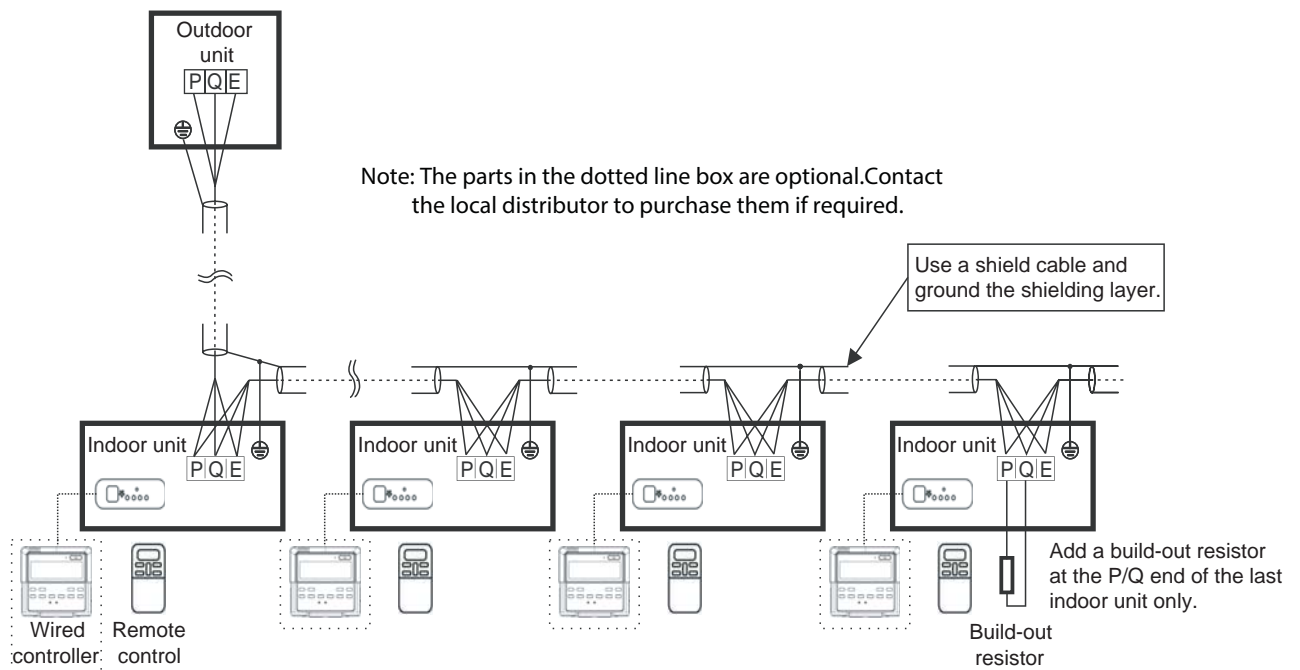
Fig.5-1

200/224/260 Three-phase electrical control system connection of the outdoor unit



### CAUTION

- An incorrect connection configuration may damage the compressor or other components.
- PQE is a signal cable, which must be connected to a weak current. Do not connect it to strong current.
- All wiring terminals must be securely fixed. The grounding wire must be grounded as required.
- After connecting to the connector base, the power cable must be securely fixed.
- After all wires are connected, check the correctness all components before powering on.



Wiring the indoor unit and outdoor unit control

Fig. 5-2



### CAUTION

- When the power cable is parallel to the signal cable, insert electric wires in their respective electric wire pipes and reserve a proper inter-wire distance. (distance between power cables: lower than 10 A – 300 mm; lower than 50 A – 500 mm)
- Use a three-core shielded cable as the indoor/outdoor unit signal cable, and ground the shielding layer as required.
- The display box, remote control, and build-out resistor are accessories for the indoor unit. The wired controller is optional. To purchase a wired controller, contact your local distributor.

## 5.1 Outdoor Unit Wiring

Functions of Outdoor Unit Wiring Terminals

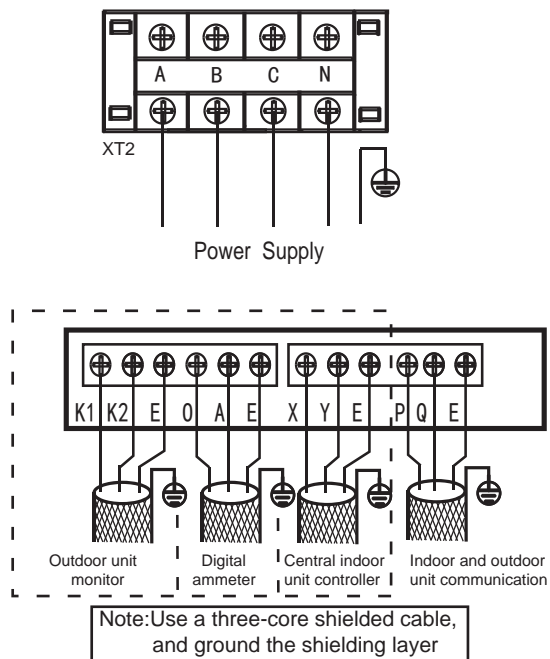


Fig. 5-3

The Specification of Power

Table 5-1

Power Source		380-415V 3Ph~ 50Hz		
Model	Capacity(kW)	20	22.4	26
Power Supply	Hz	50	50	50
	Voltage	380-415	380-415	380-415
	Min.(V)	342	342	342
	Max.(V)	456	456	456
	MCA	18.75	25	26.25
	TOCA	18	23	23
	MFA	25	25	32
Compressor	MSC	/	/	/
	RLA	12	15.4	15.4
OFM	kW	2×0.17	2×0.17	2×0.17
	FLA	2.1+1.7	2.1+1.7	2.1+1.7



### CAUTION

- Equipment complying with IEC 61000-3-12. A disconnection device having an air gap contact separation in all active conductors should be incorporated in the fixed wiring according to the National Wiring Regulation.
- The reserved function is indicated in broken line table, users can select it when necessary.

#### Indoor/Outdoor Unit Signal Wire

Connect the wire according to their numbers.



Wrong connection may cause malfunction .

**Wiring Connection**

Seal the wiring connection with the insulation material , or the condensing dew will be caused.



**NOTE**

The air-conditioners can connect with Central Control Monitor (CCM). Before operation, please wiring correctly and set system address and network address of indoor units

**5.2 Indoor Unit Wiring**

● Power Supply

Table 5-2

Capacity(kW)		1.8~16
Indoor Unit Power	Specifications	220-240V~ 50Hz
		208-230V~ 60Hz
	Power Wiring Size(mm <sup>2</sup> )	3x2.5
Circuit Breaker (A)		16
Indoor Unit /Outdoor Unit Signal Wire (mm <sup>2</sup> ) (Weak electric signal)		Three-core shielded wire 3x0.75

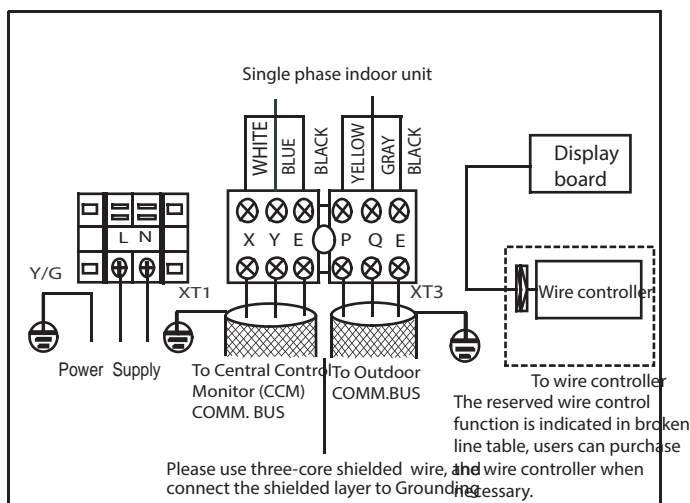


Fig. 5-4

1. Signal wire is three-core, polarized wire. Use three-core shield wire to prevent interference. The grounding method now is grounding the closed end of the shield wire and opening (insulating) at the end. Shield is to be grounded.
2. The control between outdoor unit and indoor unit is BUS type. Addresses is set on field during the installation.



**CAUTION**

Indoor/Outdoor unit signal wire is low voltage circuit. Do not let it touch the high voltage power wire and put it to gather with power cord in the same wire distribution pipe.



**NOTE**

The wire diameter and continuous length is under the condition that the voltage vibration is within 2%. If the continuous length is exceed showing value, choose the wire diameter follow relevant regulation.

**Indoor unit power supply wiring**

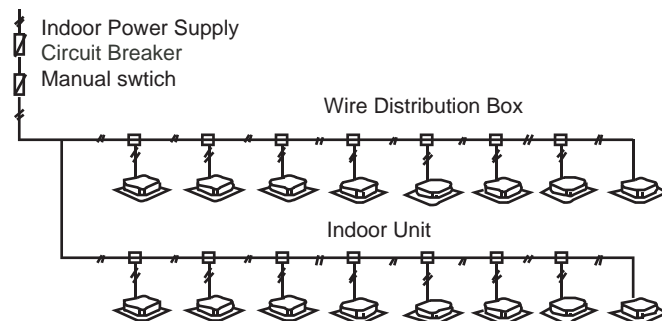


Fig. 5-5



**CAUTION**

1. Refrigerant piping system, indoor unit-indoor unit connection signal wires and indoor unit-outdoor unit connection signal wire are in the same system.
2. When power cord is parallel with signal wire, please put them into separate wire distribution pipes, and leave a proper distance. (Reference distance: It is 300mm when current capacity of power cord is less than 10A, or 500mm when 50A).

- Please use shield wire as indoor unit/outdoor unit signal wire.

**Indoor/Outdoor unit signal wire wiring**

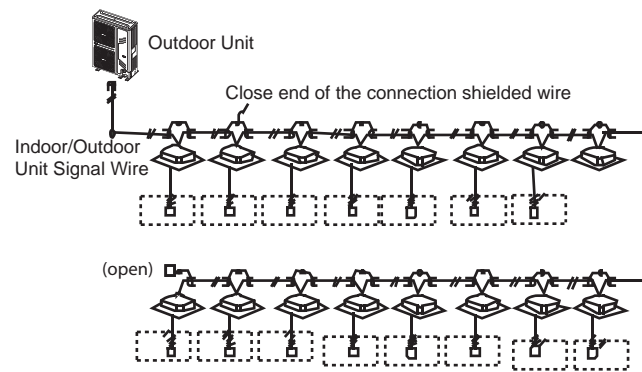


Fig. 5-6

**6. TEST RUNNING**

Operate according to "gist for test running" on the electric control box cover.

**CAUTION**

- Test running can not start until the outdoor unit has been connected to the power for 12hr.
- Test running can not start until all the valves are affirmed open.
- Never make the forced running. (Or the protector sits back, danger will occur.)

## 7. PRECAUTIONS ON REFRIGERANT LEAKAGE

This air conditioner(A/C) adopts innocuous and nonflammable refrigerant. The locating room of the A/C should big enough that any refrigerant leakage is unable to reach critical thickness. So certain essential action can be taken on time.

- Critical thickness-----the Max. thickness of Freon without any harm to person.
- Refrigerant critical thickness:  $0.44[\text{kg}/\text{m}^3]$  for R410A.

Confirm the critical thickness through follow steps, and take necessary actions.

1. Calculate the sum of the charge volume (A[kg]) Total Refrigerant volume of 10HP=factory refrigerant volume + superaddition
2. Calculate the indoor cubage (B[m<sup>3</sup>]) (as the minimum cubage.
3. Calculate the refrigerant thickness

$$\frac{A[\text{kg}]}{B[\text{m}^3]} \leq \text{critical thickness}$$

Counter measure against over high thickness

1. Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly)
2. Install leak alarm facility related to mechanical ventilator if you can not regularly ventilate.

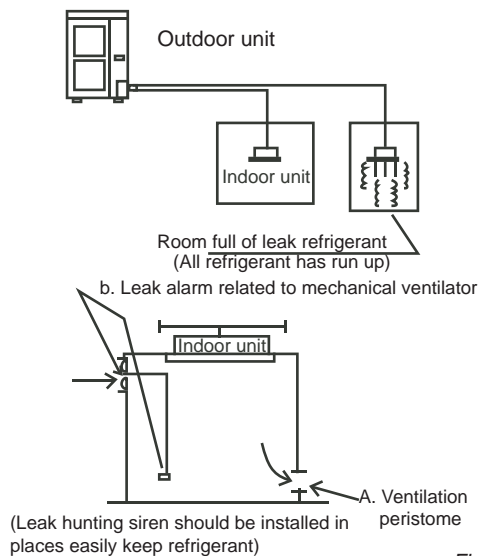


Fig. 7-1

### 7.1 Important information for the used refrigerant

This product has the fluorinated gas which is listed in kyoto protocol it is forbidden to release to air.

Refrigerant type: R410A; Volume of GWP: 2088; GWP=Global Warming Potential

Model	Factory charge	
	Refrigerant/kg	tonnes CO <sub>2</sub> equivalent
20kW	4.80	10.02
22.4kW	6.20	12.95
26kW	6.20	12.95

#### Attention:

Frequency of Refrigerant Leak Checks

- 1) For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO<sub>2</sub> equivalent or more, but of less than 50 tonnes of CO<sub>2</sub> equipment, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
- 2) For equipment that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO<sub>2</sub> equivalent or more, but of less than 500 tonnes of CO<sub>2</sub> equipment, at least every six months, or where a leakage detection system is installed, at least every 12 months.
- 3) For equipment that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO<sub>2</sub> equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.
- 4) Non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to the end user where evidence is provide that the installation is to be carried out by an undertaking certified person.
- 5) Only certificated person is allowed to do installation, operation and maintenance.

## 8. TURN OVER TO CUSTOMER

The owner's manual of indoor unit and owner's manual of outdoor or unit must be turned over to the customer. Explain the contents in the owner's manual to the customers in details.



### NOTE

Please press "constraint cool" button to carry out refrigerant recycling process. Keep the low pressure above 0.2MPa, other wise compressor may be burnt out.

# Owner's manual

MD14U-026AW



CONTENTS	PAGE
IMPORTANT SAFETY INFORMATION.....	1
PARTS NAMES.....	2
OPERATION RANGE.....	3
OPERATION AND PERFORMANCE.....	3
MALFUNCTION CODE OF OUTDOOR UNIT .....	4
FOLLOWING SYMPTOMS ARE NOT AIR CONDITIONER TROUBLES.....	5
TROUBLESHOOTING.....	5

## 1. IMPORTANT SAFETY INFORMATION

To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.



### WARNING

Failure to observe a warning may result in death. The appliance shall be installed in accordance with national wiring regulations.



### CAUTION

Failure to observe a caution may result in injury or damage to the equipment.



### WARNING

**Ask your dealer for installation of the air conditioner.**  
Incomplete installation performed by yourself may result in a water leakage, electric shock, and fire.

**Ask your dealer for improvement, repair, and maintenance.**  
Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.

**In order to avoid electric shock, fire or injury, or if you detect any abnormality such as smell of fire, turn off the power supply and call your dealer for instructions.**

**Never let the indoor unit or the remote controller get wet.**  
It may cause an electric shock or a fire.

**Never press the button of the remote controller with a hard, pointed object.**  
The remote controller may be damaged.

**Never replace a fuse with that of wrong rated current or other wires when a fuse blows out.**  
Use of wire or copper wire may cause the unit to break down or cause a fire.

**It is not good for your health to expose your body to the air flow for a long time.**

**where oil gas, salty air (near the coast), caustic gas (the sulfide in hot spring) exist, otherwise it may damage the unit and shorten the life span of the machine. If the situations above can't be avoided, choose a anticorrosive model.**

**Do not insert fingers, rods or other objects into the air inlet or outlet.**

When the fan is rotating at high speed, it will cause injury.

**Never use a flammable spray such as hair spray, lacquer or paint near the unit.**

It may cause a fire.

**Never touch the air outlet or the horizontal blades while the swing flap is in operation.**

Fingers may become caught or the unit may break down.

**Never put any objects into the air inlet or outlet.**

Objects touching the fan at high speed can be dangerous.

**Never inspect or service the unit by yourself.**

Ask a qualified service person to perform this work.

**Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.**

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.



Contact your local government for information regarding the connection systems available.

**If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the ground and get into the food chain, damaging your health and well-being.**

**To prevent refrigerant leak, contact your dealer.**

When the system is installed and runs in a small room, it is required to keep the concentration of the refrigerant, if by any chance coming out, below the limit. Otherwise, oxygen in the room may be affected, resulting in a serious accident.

**The refrigerant in the air conditioner is safe and normally does not leak.**

If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

**Turn off any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.**

Do not use the air conditioner until a service person confirms that the portion where the refrigerant leaks is repaired.

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



### CAUTION

**Do not use the air conditioner for other purposes.**

In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.

**Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.**

Otherwise, an electric shock and injury may result.

**In order to avoid electric shock or fire, make sure that an earth leak detector is installed.**

**Be sure the air conditioner is grounded.**

In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.

**In order to avoid injury, do not remove the fan guard of the outdoor unit.**

**Do not operate the air conditioner with a wet hand.**  
An electric shock may happen.

**Do not touch the heat exchanger fins.**  
These fins are sharp and could result in cutting injuries.

**Do not place items which might be damaged by moisture under the indoor unit.**

Condensation may form if the humidity is above 80%, the drain outlet is blocked or the filter is polluted.

**After a long use, check the unit stand and fitting for damage.**

If damaged, the unit may fall and result in injury.

**To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner.**

**Arrange the drain hose to ensure smooth drainage.**

Incomplete drainage may cause wetting of the building, furniture etc.

**Never touch the internal parts of the controller.**

Do not remove the front panel. Some parts inside are dangerous to touch, and a machine trouble may happen.

**Never expose little children, plants or animals directly to the air flow.**

Adverse influence to little children, animals and plants may result.

**Do not allow a child to mount on the outdoor unit or avoid placing any object on it.**

Falling or tumbling may result in injury.

**Do not operate the air conditioner when using a room fumigation - type insecticide.**

Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals.

**Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit.**

It may cause incomplete combustion or deformation of the unit due to the heat.

**Do not install the air conditioner at any place where flammable gas may leak out.**

If the gas leaks out and stays around the air conditioner, a fire may break out.

**This appliance can be used by children age from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved, children should not play with This appliance. Cleaning and user maintenance should not be made by children without supervision.**

**When capacity of indoor unit greater than the sum of 100%, capacity of indoor unit will be attenuated.**

**When capacity of indoor unit greater than or equal to the sum of 120%, in order to ensure the effectiveness of machine, and then try to open the indoor units at different time.**

**The outdoor unit window-shades should be periodic cleaning in case of being jammed.**

This window-shapes is heat dissipation outlet of components, if being jammed will cause the components shorten their service life spans because

of overheated for a long time.

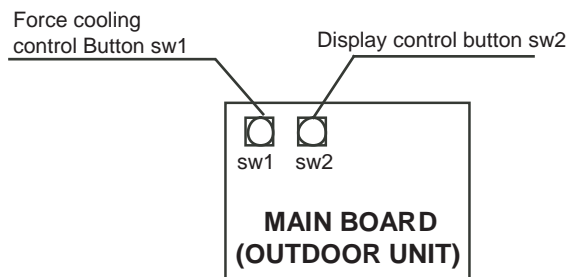
The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

**5. Poor environmental conditions, the appliance should be maintained a month and a half or so; if the environment condition is good, may be extended appropriately maintenance cycle.**

## 2. PARTS NAMES

The air conditioner consists of the indoor unit, the outdoor unit, the connecting pipe and the remote controller. (see Fig.1)

### Force Cooling Control



Force Cooling Control

Fig.2-1

Force cooling control of outdoor unit be pressed once that a order to force cooling in indoor unit. When the frequency of outdoor unit change to 62Hz and then running it; indoor fan run in high speed. Press the button again will exit the Force Cooling Control.

### Display function

SW2 on the main control board of outdoor unit is the point inspection function button (as shown in Figure 2-1). Pressing this button once displays the first parameter of the digital pipe in the main control board.

Additional button presses will display other parameters following the sequence shown in Table 2-1.

Table 2-1

Sequence	Displayed Content	Normal display
		Current frequency
1	0--	Local capacity of outdoor units
2	1--	Total capacity requirements of outdoor units
3	2--	Total requirements of outdoor units corrected capacity
4	3--	Operating mode
5	4--	Operating FAN speed and FAN grade
6	5--	T2B/T2 average temperature
7	6--	T3 pipe temperature
8	7--	T4 environment temperature
9	8--	Inverter exhaust temperature
10	9--	Non-inverter exhaust temperature (reserved)
11	0--	Heat dissipator surface temperature (reserved)
12	1--	Electronic expansion valve aperture
13	2--	Inverter input current
14	3--	Non-inverter input current
15	4--	Exhaust pressure (reserved)
16	5--	Priority mode
17	6--	Indoor unit quantity
18	7--	Working indoor unit quantity
19	8--	Last fault or protection code
20	9--	--



#### NOTE

- 12 hours preheating is imperative after turn on the power switch. Please do not shut down the power when the unit is supposed to stop running in 24h or shorter time. (This is to warm the crankcase heat box to avoid compulsive start of condenser.)
- Pay attention not to block the air inlet and outlet. Blocks may decrease the efficiency of the unit or startup the protector, which will stop running.

### 3. OPERATION RANGE

Use the system in the following temperature for safe and effective operation. The Max operation temperature for the air conditioner. (Cooling/Heating)

Table 3-1

Temperature Mode	Outdoor temperature	Room temperature
Cooling operation	-15°C~46°C	21°C~32°C
Heating operating	-15°C~24°C	0°C~28°C



#### NOTE

1. If air conditioner is used outside the above conditions, it may cause the unit to function abnormally.
2. The phenomenon is normal that the surface of air conditioning may condense water when the relative larger humidity in room, please close the door and window.
3. Optimum performance will be achieved within these operating temperature range.
4. The A-weighted sound pressure level is below 70 dB.

## 4 OPERATION AND PERFORMANCE

### 4.1 Protection Equipment

This Protection Equipment will enable the Air Conditioner to stop when the Air Conditioner is to be directed running compulsively.

When the Protection Equipment is activated, the Operation Indicator still lights while the Air Conditioner is not running. But the Check Indicator Lights.

The protection equipment may be activated in following conditions:

#### ■ Cooling Operation

- The air inlet or air outlet of outdoor unit is blocked.
- Strong wind is Continuously blowing to the air outlet of the outdoor unit.

#### ■ Heating Operation

- Too much dust and rubbish adhere to the dust filter in the indoor unit
- The air outlet of indoor unit is choked



#### NOTE

When the protection equipment starts, please shut down the manual power switch, and restart operation after problem is solved.

### 4.2 About power cut

- If power is cut during operation, stop all the operation immediately.
- Power comes again. The lamp on the display panel of indoor unit flashes. And then unit will auto-restart.
- Mishandling in operation:  
If mishandling happens because of lighting or mobile wireless, please shut off the manual power switch, and turn on again, then push the ON/OFF button.

### 4.3 Heating capacity

- The heating operation is a heat-pump process that heat will be absorbed from outdoor air and released in doors. Once the outdoor temperature is decreased, heating capacity decreased correspondingly.
- Other heating equipment is suggested to be used together when outdoor temperature is too low.
- In some extreme cold upland that buy another indoor unit equipped electrical heater will obtain better performance.(Refer to indoor unit owner's manual for details)



#### NOTE

1. The motor in Indoor Unit will continue running for 20~30 seconds for to remove residual heat when the Indoor Unit receiving OFF command during heating operation.
2. If the air conditioner malfunction occurs because of disturb, please reconnect the air conditioner to power, then turn on it again.

### 4.4 Five-minute protection feature

- A protection feature prevents the air conditioner from being activated for approximately 5 minutes when it restarts immediately after operation.

### 4.5 Cooling and heating operation

- The indoor unit of the intelligent inverter centralized air conditioner can be controlled solely, but the indoor unit in the same system can not run cooling and heating at the same time.
- When the Cooling and Heating operation confront with each other, the Indoor Unit which are running on Cooling Mode would stop and there will be Standby or No Priority displayed in the Control Panel. Those Indoor Units which are running on Heating Mode will run continuously.
- If the Air Conditioner Administrator has set running mode, then the air conditioner can not run on modes other than the presetted. Standby or No Priority will be displayed in the Control Panel.

### 4.6 Features of heating operation

- Warm air will not be blown out immediately at the beginning of the heating operation, 3~5 minutes ago (depends on the indoor and outdoor temperature), until the indoor heat exchanger become hot, then blows out warm air.

- During operation, the fan motor in the outdoor unit may stop running under high temperature.
- During Fan Operation, if other Indoor Units are running on Heating Mode, the fan may stop in order to prevent sending heat wind.

#### 4.7 Defrost in the heating operation

- During heating operation, outdoor unit sometimes will frost. To increase efficiency, the unit will start defrosting automatically (about 2~10 minutes), and then water will be drained out from outdoor unit.
- During defrosting, both the fan motors in the outdoor unit and indoor unit will stop running.

## 5 MALFUNCTION CODE OF OUTDOOR UNIT

Table 5-1

No.	Failure or Protection Type	Recovery Mode	Fault Code
1	COMM.Fault between DSP and chip	Recoverable	H0
2	COMM.Fault between communication chip and main chip	Recoverable	H1
3	3 times of P6 protection in 30 minutes	Irrecoverable	H4
4	3 times of P2 protection in 30 minutes	Irrecoverable	H5
5	The number of indoor units decreases	Recoverable	H7
6	Reserved	Recoverable	H8
7	M-HOME for the indoor and outdoor units does not match	Irrecoverable	HF
8	Reserved	Recoverable	E1
9	Communication fault between the outdoor and indoor units	Recoverable	E2
10	T3 & T4 temperature sensor fault	Recoverable	E4
11	Voltage protection fault or a lack of Phase B , Phase N	Recoverable	E5
12	DC fan motor fault	Recoverable	E6
13	Discharge temperature sensor fault	Recoverable	E7
14	A fan in the A region run for more than 5 minutes in heat mode	Recoverable	EA
15	2 times of E6 protection in 10 minutes	Irrecoverable	EB
16	Inverter compressure top high temperature protection	Recoverable	P0
17	High pressure protection or exhaust temperature switch protection	Recoverable	P1
18	Low pressure protection	Recoverable	P2
19	Outdoor input current protection	Recoverable	P3
20	Compressor discharge high protection	Recoverable	P4
21	Outdoor condenser high temperature protection	Recoverable	P5
22	Inverter module protection	Recoverable	P6
23	Typhoon protection	Recoverable	P8
24	Evaporator high temperature protection	Recoverable	PE

#### Display Function Instruction

1. When stand by, LED displaying the amount of indoor units online which communicate with outdoor units.
2. When operation, LED displaying frequency value of compressor.
3. When defrost, LED displaying "dF".
4. The power cord type designation is H07RN-F.



## 6. FOLLOWING SYMPTOMS ARE NOT AIR CONDITIONER TROUBLES

### Symptom 1: The system does not operate

- The air conditioner does not start immediately after the ON/OFF button on the remote controller is pressed. If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the air conditioner starts 5 minutes after it is turned ON.
- If the operation lamp and the "PRE-DEF indicator (cooling and heating type) or fan only indicator (cooling only type)" light, it means you choose the heating model. When just starting, if the compressor has not started, the indoor unit appears "anti cold wind" protection because of its overflow outlet temperature.

### Symptom 2: Change into the fan mode during cooling mode

- In order to prevent the indoor evaporator frosting, the system will change into fan mode automatically, restore to the cooling mode after soon.
- When the room temperature drops to the set temperature, the compressor goes off and the indoor unit changes to fan mode; when the temperature rises up, the compressor starts again. It is same in the heating mode.

### Symptom 3: White mist comes out of a unit

#### Symptom 3.1: Indoor unit

- When humidity is high during cooling operation. If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your dealer for details on cleaning the unit. This operation requires a qualified service person.

#### Symptom 3.2: Indoor unit, outdoor unit

- When the system is changed over to heating operation after defrost operation. Moisture generated by defrost becomes steam and is exhausted.

### Sptom 4: Noise of air conditioners cooling

#### Symptom 4.1: Indoor unit

- A continuous low "shah" sound is heard when the system is in cooling operation or at a stop. When the drain pump (optional accessories) is in operation, this noise is heard.
- A "pishi-pishi" squeaking sound is heard when the system stops after heating operation. Expansion and contraction of plastic parts caused by temperature change make this noise.

#### Symptom 4.2: Indoor unit, outdoor unit

- A continuous low hissing sound is heard when the system is in operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound which is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow stop or flow change.

#### Symptom 4.3: Outdoor unit

- When the tone of operating noise changes. This noise is caused by the change of frequency.

### Symptom 5: Dust comes out of the unit

- When the unit is used for the first time in a long time. This is because dust has gotten into the unit.

### Symptom 6: The units can give off odours

- The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.

### Symptom 7: The outdoor unit fan does not spin.

- During operation. The speed of the fan is controlled in order to optimize product operation.

## 7. TROUBLESHOOTING

### 7.1. Troubles and causes of air conditioner

If one of the following malfunctions occur, stop operation, shut off the power, and contact with your dealer.

- The operation lamp is flashing rapidly (twice every second). This lamp is still flashing rapidly after turn off the power and turn on again.
- Remote controller receives malfunction or the button does not work well.
- A safety device such as a fuse, a breaker frequently actuates.
- Obstacles and water enter the unit.
- Water leaks from indoor unit.
- Other malfunctions.

If the system does not properly operate except the above mentioned cases or the above mentioned malfunctions is evident, investigate the system according to the following procedures. (see in Table 7-1)

Table 7-1

Symptoms	Causes	Solution
Unit does not start	<ul style="list-style-type: none"> <li>Power failure.</li> <li>Power switch is off.</li> <li>Fuse of power switch may have burned.</li> <li>Batteries of remote controller exhausted or other problem of controller.</li> </ul>	<ul style="list-style-type: none"> <li>Wait for the comeback of power.</li> <li>Switch on the power.</li> <li>ReplLocation:</li> <li>Replace the batterises or check the controller.</li> </ul>
Air flowing normally but completely can't cooling	<ul style="list-style-type: none"> <li>Temperature is not set correctly.</li> <li>Be in 3 minutes protection of compressor.</li> </ul>	<ul style="list-style-type: none"> <li>Set the temperature properly.</li> <li>Wait.</li> </ul>
Units start or stop frequently	<ul style="list-style-type: none"> <li>Refrigerant is too little or too much.</li> <li>Air or no concreting gas in the refrigerating circuit.</li> <li>Compressor is malfunction.</li> <li>Voltage is too high or too low.</li> <li>System circuit is blocked.</li> </ul>	<ul style="list-style-type: none"> <li>Check leakage, and rightly recharge refrigerant.</li> <li>Vacuum and recharge refrigerant.</li> <li>Maintenance or change compressor.</li> <li>Install manostat.</li> <li>Find reasons and solution.</li> </ul>
Low cooling effect	<ul style="list-style-type: none"> <li>Outdoor unit and indoor unit heat exchanger is dirty.</li> <li>The air filter is dirty.</li> <li>Inlet/outlet of indoor/outdoor units is blocked.</li> <li>Doors and windows are open</li> <li>Sunlight directly shine.</li> <li>Too much heat resource.</li> <li>Outdoor temp. is too high.</li> <li>Leakage of refrigerant or lack of refrigerant.</li> </ul>	<ul style="list-style-type: none"> <li>Clean the heat exchanger.</li> <li>Clean the air filter.</li> <li>Eliminate all dirties and make air smooth.</li> <li>Close doors and windows.</li> <li>Make curtains in order to shelter from sunshine.</li> <li>Reduce heat source.</li> <li>AC cooling capacity reduces (normal).</li> <li>Check leakage and rightly recharge refrigerant.</li> </ul>
Low heating effect	<ul style="list-style-type: none"> <li>Outdoor temperature is lower than 7°C</li> <li>Doors and windows not completely closed.</li> <li>Leakage of refrigerant or lack of refrigerant.</li> </ul>	<ul style="list-style-type: none"> <li>Use heating device.</li> <li>Close doors and windows.</li> <li>Check leakage and rightly recharge refrigerant.</li> </ul>

## 7.2 Troubles and causes of remote controller

Before asking for servicing or repairing , check the following points.

(see in Table 7-2)

Table 7-2

Symptoms	Causes	Solution
The fan speed can not be changed.	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is "AUTO"</li> </ul>	When the automatic mode is selected, the air conditioner will automatically change the fan speed.
	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is "DRY"</li> </ul>	When dry operation is selected, the air conditioner automatically change the fan speed. The fan speed can be selected during "COOL", "FAN ONLY", and "HEAT"
The remote controller signal is not transmitted even when the ON/OFF button is pushed.	<ul style="list-style-type: none"> <li>Check whether the batteries in the remote controller are exhausted.</li> </ul>	The power supply is off.
The TEMP. indicator does not come on.	<ul style="list-style-type: none"> <li>Check whether the MODE indicated on the display is FAN ONLY</li> </ul>	The temperature cannot be set during FAN mode.
The indication on the display disappears after a lapse of time.	<ul style="list-style-type: none"> <li>Check whether the timer operation has come to an end when the TIMER OFF is indicated on the display.</li> </ul>	The air conditioner operation will stop up to the set time
The TIMER ON indicator goes off after a lapse of certain time.	<ul style="list-style-type: none"> <li>Check whether the timer operation is started when the TIMER ON is indicated on the display.</li> </ul>	Up to the set time, the air conditioner will automatically start and the appropriate indicator will go off.
No receiving tone sounds from the indoor unit even when the ON/OFF button is pressed.	<ul style="list-style-type: none"> <li>Check whether the signal transmitter of the remote controller is properly directed to the infrared signal receiver of the indoor unit when the ON/OFF button is pressed.</li> </ul>	Directly transmit the signal transmitter of the remote controller to the infrared signal receiver of the indoor unit, and then repeatly push the ON/OFF button twice.

**CLIVET SPA**

Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy  
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

**CLIVET UK LTD (Sales)**

4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom  
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - info@clivet-uk.co.uk

**CLIVET AIRCON LTD (Service and Maintenance Division)**

Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom  
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - info@clivetaircon.co.uk

**CLIVET ESPAÑA COMERCIAL S.L. (Sales)**

Calle Gurb, 17 1º 1ª - 08500 Vic, Barcelona - España  
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivetcomercial.com

**CLIVET ESPAÑA S.A.U. (Service and Maintenance Division)**

Calle Real de Burgos Nº 12 - 28860 Paracuellos del Jarama, Madrid - España  
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

**CLIVET GmbH**

Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany  
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

**CLIVET RUSSIA**

Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia  
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

**CLIVET MIDEAST FZCO**

Dubai Silicon Oasis (DSO), High Bay Complex, Ind Unit No. 3, PO BOX 342009, Dubai, UAE  
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

**CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED**

4BA, Gundecha Onclave, Kherani Road - Sakinaka, Andheri (East) - Mumbai 400 072 - India  
Tel. +91 22 6193 7000 - Fax +91 22 6193 7001 - info.in@clivet.com

---

[www.clivet.com](http://www.clivet.com)  
[www.clivetlive.com](http://www.clivetlive.com)

A Group Company of



# MSAN-XMi 400T - 450T

Air cooled heat pump outdoor unit



Dear Customer,

We congratulate you on choosing this product

For many years Clivet has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the best solution.

Yours faithfully,

CLIVET Spa

The data contained in this manual is not binding and may be changed by the manufacturer without prior notice.

Reproduction, even in part, is FORBIDDEN © Copyright - CLIVET S.p.A. - Feltre (BL) - Italia

---

<b>Contents</b>	<b>pag</b>
Installation manual .....	5
Owner's manual .....	23

This manual is for VRF SYSTEM.

To get complete and clear information, please also consider following issues:

1. please consider only 50 Hz electric supply mode
2. Installation Manual, Table 5-4 and Table 5-5: A = indoor unit standard cooling capacity in kW x 10
3. model identification

<b>MSAN-XMi 400T - 450T</b>				
<b>Size</b>	<b>Power supply</b>		<b>Reference kW</b>	<b>Factory code</b>
400T	400V+N	3-phase	40	MDV-V400W/DRN1(A)
450T	400V+N	3-phase	45	MDV-V450W/DRN1(A)

For 1 outdoor unit connected to 1 indoor unit applications please consider the following instructions. .

- Schematics refer to multiple indoor unit design:  
for 1 to 1 application please consider the first indoor unit only (first line branch pipe is not needed)
- Installation Manual, Table 5-4 and Table 5-5:  
for 1 to 1 application no branch pipe is needed
- Installation Manual, Table 4-8: only for VRF System  
for 1 to 1 application please consider an indoor capacity range between 50% ÷ 100% the outdoor capacity
- Installation Manual, Chapter 5.5: only for VRF System
- Owner's Manual, Chapter 1.:  
for 1 to 1 application please consider 50% ÷ 100% indoor capacity range

Page intentionally left blank



# Installation manual

MD13I-052EW(DZD)

Page intentionally left blank

CONTENTS

PAGE

PRECAUTIONS.....	1
ATTACHED FITTINGS.....	2
CONSTRUCTION INSPECTION.....	2
OUTDOOR UNIT INSTALLATION.....	3
INSTALL THE CONNECTING PIPE.....	5
ELECTRICAL WIRING.....	10
PRECAUTIONS ON REFRIGERANT LEAKAGE.....	15
TEST RUNNING.....	15
TURN OVER TO CUSTOMER.....	16

# 1. PRECAUTIONS

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS " carefully before Installation. The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
- Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before maintenance the unit .
- Ask the customer that the Installation Manual and the Owner's Manual should be kept together .



## CAUTION

### New Refrigerant Air Conditioner Installation

**THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A)WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are; Hydrophilic, oxidizing membrane or oil, and its pressure is approx.1.6 times higher than that of refrigerant R22.Accompanied with the new refrigerant, refrigerating oil has also been changed ,Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle. To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are changed from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A):  
For connecting pipes, use new and clean piping designed for R410A,and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.



## CAUTION

### Do not connect the Appliance from Main Power Supply.

This unit must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm. The installation fuse must be used for the power supply line of this conditioner.  
If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.  
An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring. The appliance shall be installed in accordance with national wiring regulations.  
The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.  
The power cord type designation is H05RN-R or above/H07RN-F.



## WARNING

**Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**

Inappropriate installation may result in water leakage,electric shock or fire.

**Turn off the main power supply switch or breaker before attempting any electrical work.**

Make sure all power switches are off.Failure to do so may cause electric shock.

**Connect the connecting cable correctly.**

If the connecting cable is connected in a wrong way, electric parts may be damaged.

**When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**

If air or any other has is mixed in refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.

**Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**

**Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**

Do not store it in a wet basement or expose to rain or water.

**After unpacking the unit, examine it carefully if there are possible damage.**

**Do not install in a place that might increase the vibration of the unit.**

**To avoid personal injury (with sharp edges), be careful when handling parts.**

**Perform installation work properly according to the Installation Manual.**

Inappropriate installation may result in water leakage, electric shock or fire.

**When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**

**Install the air conditioner securely in a location where the base can sustain the weight adequately.**

**Perform the specified installation work to guard against an earthquake.**

If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.

**If refrigerant gas has leaked during the installation work, ventilate the room immediately.**

If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.

**After the installation work, confirm that refrigerant gas doer not leak.**

If refeigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.

**Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**

An insufficient power supply capacity or inappropriate installation may cause fire.

**Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**

**Be sure to provide grounding.**

Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.

**Conform to the regulations of the local electric company when wiring the power supply.**

Inappropriate grounding may cause electric shock.

**Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**

If a combustible gas leaks, and stays around the unit, a fire may occur.

**Required tools for installation work**





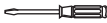


- 1) Philips screw driver
- 2) Hole core drill(65mm)
- 3) Spanner
- 4) Pipe cutter
- 5) Knife

- 6) Reamer
- 7) Gas leak detector
- 8) Tape measure
- 9) Thermometer
- 10) Mega-tester
- 11) Electro circuit tester
- 12) Hexagonal wrench
- 13) Flare tool
- 14) Pipe bender
- 15) Level vial

- 16) Metal saw
- 17) Gauge manifold (Charge hose:R410A special requirement)
- 18) Vacuum pump (Charge hose:R410A special requirement)
- 19) Torque wrench
  - 1/4(17mm)16N•m (1.6kgf•m)
  - 3/8(22mm)42N•m (4.2kgf•m)
  - 1/2(26mm)55N•m (5.5kgf•m)
  - 5/8(15.9mm)120N•m (12.0kgf•m)
- 20) Copper pipe gauge adjusting projection margin
- 21) Vacuum pump adapter

## 2. ATTACHED FITTINGS

Please check whether the following fittings are of full scope. If there are some spare fittings , please restore them carefully.

INSTALLATION FITTINGS	NAME	SHAPE	QUANTITY
	1. Outdoor unit installation manual		1
	2. Outdoor unit owner's manual		1
	3. Indoor unit owner's manual		1
	4. Installation Instructions: Indoor Unit Manifold		1
	5. Straight screwdriver		1
	6. Connection pipe		1
	7. Curved connection pipe		1

## 3. CONSTRUCTION INSPECTION

### 3.1 Unpacking installation

1. After unpacking, check if there's transportation injuries. Declare to the transportation agent immediately in written form.
2. Check if the models, specifications and quantity are conform to the content in the contract.
3. Keep the operation manual and check the accessories when unpacking.

### 3.2 Refrigerant pipe

1. Use the central air-conditioner specified refrigerant pipe.
2. Refrigerant pipe with specified diameters and thickness should be used.
3. Nitrogen blanket protection should be applied when welding copper pipes. Fill nitrogen of 0.2kgf/cm<sup>2</sup> before welding. Cut off nitrogen when the copper pipe completely cooled after welding.
4. Heat preservation process should be applied to refrigerant pipe.
5. After installing refrigerant pipe, indoor unit can't be powered on before tightness test and vaccumizing.

### 3.3 Tightness test

After installing refrigerant pipe, fill 40kgf/cm<sup>2</sup>(3.9MPa) nitrogen from both gas and liquid sides to process a 24-hour tightness test.

### 3.4 Vaccumizing

Vaccumizing from both gas and liquid sides after tightness test. (Pressure of vacuum should be -0.1MPa )

### 3.5 Refrigerant adding

1. Calculating refrigerant adding amount according to the diameters and length(actual length) of indoor/outdoor unit liquid side pipes.
2. Mark refrigerant adding amount, pipe diameters of pipe, length (actual length) and height difference between indoor and outdoor unit on the usage confirm form of outdoor unit(on electronic control box plate) in advance, in order to further use.

### 3.6 Electric wiring

1. Please choose the power supply capacity, diamters of wires according to the design manual. Power supply cables of air-conditioner should be thicker than cables used in normal electric motor.
2. To prevent air-conditioner from malfunctioning, don't entwine power supply wires (380V 3N~)and connecting wires of indoor and outdoor unit(low voltage wires).
3. Power on indoor unit after tightness test and vaccumizing.
4. For function dial code, please refer to dial code instruction table usage.

### 3.7 Trial running

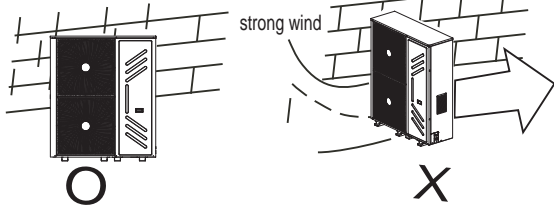
Trial running can be processed after 12-hour (or above) preheating of outdoor unit, otherwise it could damage the system.

## 4. OUTDOOR UNIT INSTALLATION



### WARNING

- Ask an authorized dealer or qualified installation professional to install maintain the air conditioner. Inappropriate installation may result in water leakage, electric shock or fire.
- Do not expose the unit directly to sunlight and other sources of heat. Add a cover if necessary to prevent the unit from direct sunlight.
- A place that is even and strong enough to bear the weight of the unit.
- Do not install in a place that might increase the vibration of the unit.
- Install the unit at a place where noise and hot air couldn't bother your neighbour.
- Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas. If a combustible gas leaks, and stays around the unit, a fire may occur.
- Remove obstacles around the unit in order to leave enough space for air circulation.
- Install the unit near to the indoor unit as far as possible under certain installation conditions.
- When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, use a baffle when necessary.
- Install the unit so that its discharge port faces to the wall of the building. Keep a distance of 4000mm or more between the unit and the wall surface. Keep strong wind from blowing back inside.
- Do not mount the outdoor unit on a wall.



### 4.1 Installation place

Please keep away from the following place, or malfunction of the machine may be caused:

- There is combustible gas leakage.
- There is much oil (including engine oil) ingredient.
- There is salty air surrounding (near the coast)
- There is caustic gas (the sulfide, for example) existing in the air (near a hot spring)
- A place the heat air expelled out from the outdoor unit can reach your neighbor's window.
- A place that the noise interferes your neighbors every day life.
- A place that is too weak to bear the weight of the unit
- Uneven place.
- Insufficient ventilation place.
- Near a private power station or high Frequency equipment.
- Install indoor unit, outdoor unit, power cord and connecting wire at least 1m away from TV set or radio to prevent noise or picture interference.

Installation space (Unit:mm), see Fig.4-1,4-2,4-3,4-4.

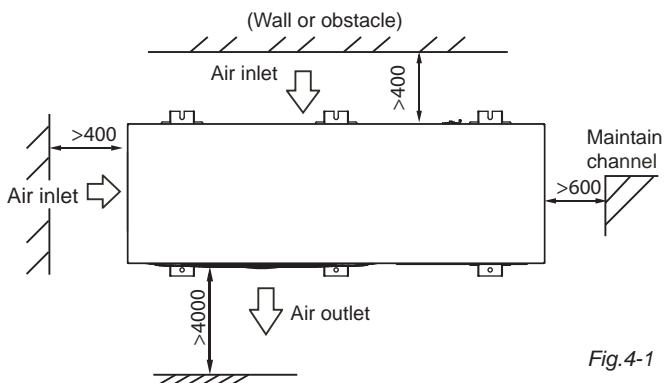


Fig.4-1

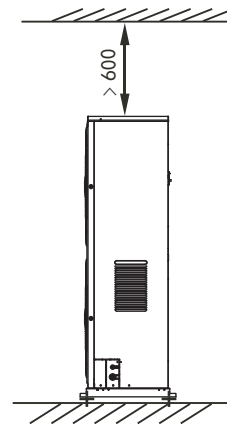


Fig.4-2

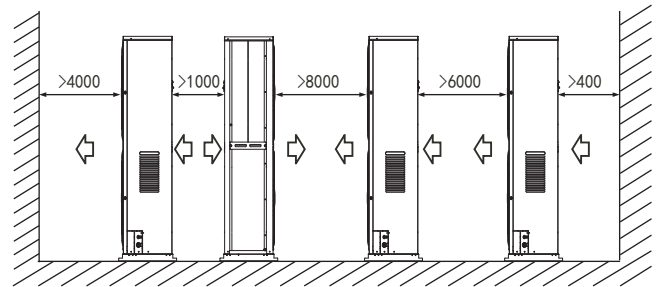


Fig.4-3

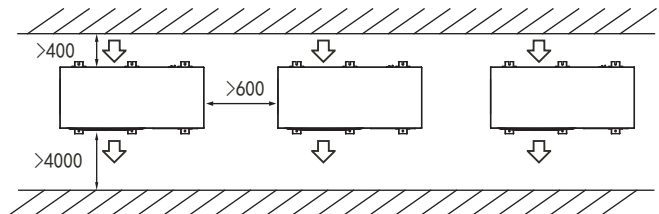


Fig.4-4

### 4.2 Handling

- 1) Do not unpacking the unit when handling. Use two ropes whose lengths are more than 8m to handle the unit. Keep balance of the unit, when lifting stably. Use a padding plate or packing materials for protection if the package has been destroyed or no package.
- 2) Keep the unit vertical when moving and handling. If the unit barycenter is not at the center of the unit, do not lean it more than 30°. Refer to Fig.4-5. Be careful during moving and lifting .
- 3) Never hold the inlet of the outdoor unit to prevent it from deforming.
- 4) Do not touch the fan with hands or other objects.
- 5) Do not lean it more than 45°, and do not lay it sidelong.

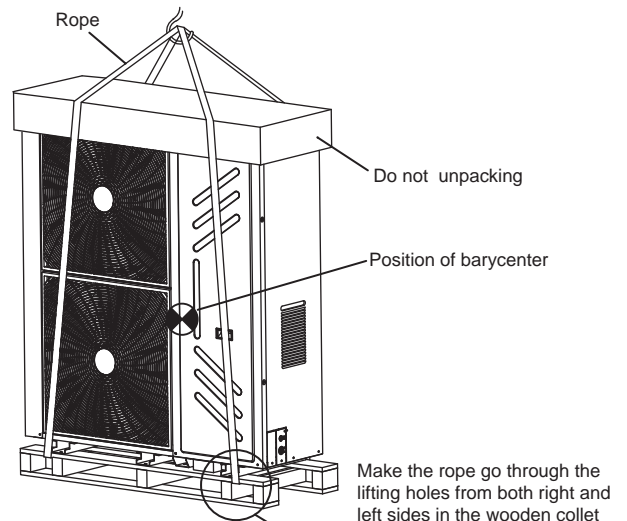


Fig.4-5

### 4.3 Outdoor unit basement

1) Advantages of a strong and correct basement :

- ① Outdoor unit won't subside
- ② Outdoor unit won't generate abnormal noise caused by improper basement.

2) Basement types

- ① Steel-frame basement
- ② Concrete basement(See Fig.4-6 for common practice)

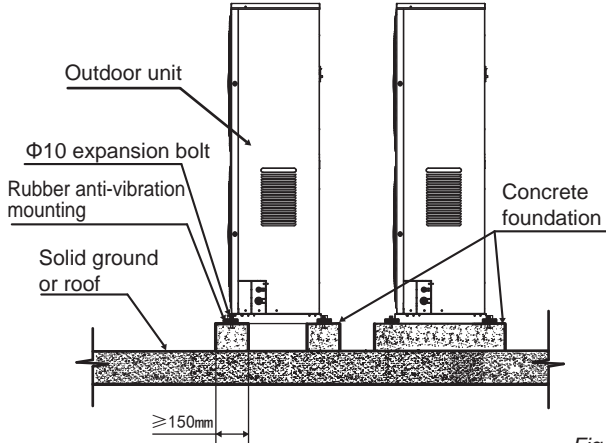


Fig.4-6

Points of making a basement:

- ① Host unit basement should be made in strong concrete ground, See Fig 3.6 for common practice or start after field measurement
- ② The basement should be completely horizontal and make sure all the contactors can contact symmetrically.
- ③ Ensure the the basement supports the vertical foldings of the front and back bottom plates directly, since its the actual bearing place.
- ④ Macadam base is unnecessary. But concrete surface should be roughed. The proportions used in mixing the concrete should be cement 1/sand 2/ pebble 4, including Φ10reinforced rebar. Even the surface of concrete. The edge of the basement should be chamfered.
- ⑤ Drainage ditch should be arranged around the basement in order to drainage water around the unit.
- ⑥ Please check endurance of the roof to ensure loading capacity could bear the weight.

### 4.4 Dimension(Unit: mm)

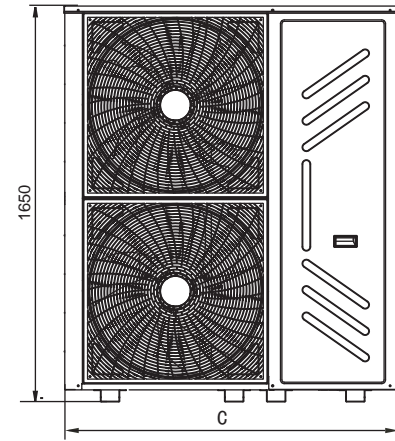


Fig.4-7

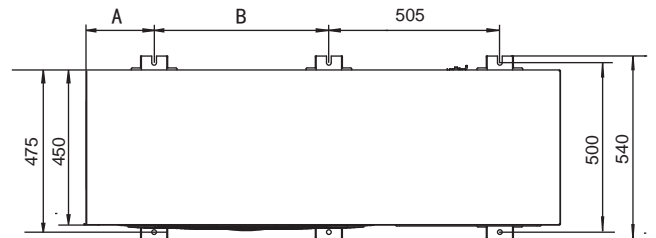


Fig.4-8

Table 4-1

Model \ Size	A	B	C
33.5kW/40kW	175	505	1360
45kW	225	555	1460

### 4.5 Pipe connection

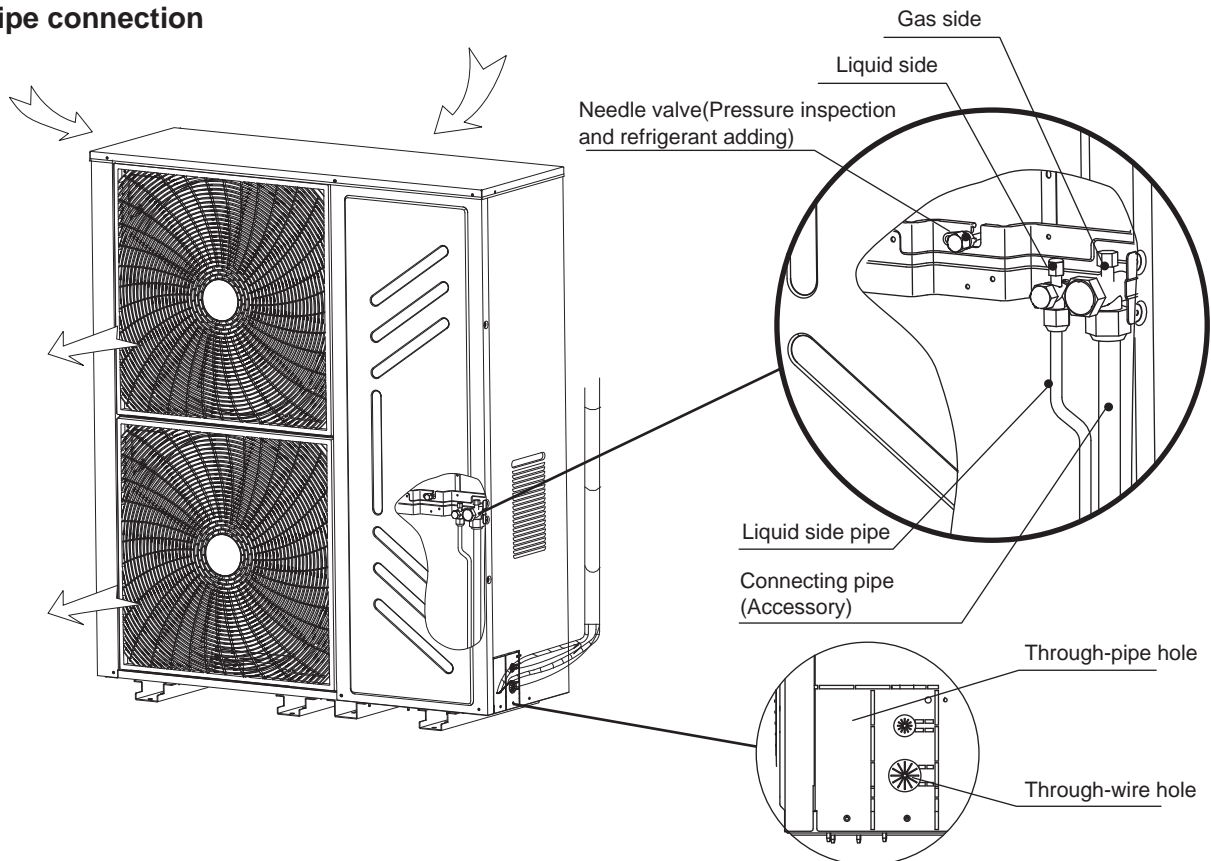


Fig.4-9

## 5. INSTALL THE CONNECTING PIPE

### 5.1 Refrigerant pipes

#### 1. Flare

- 1) Cut the pipe with a knife. (See Fig.5-1)
- 2) Fit the pipe to the flare of connecting nut (Table 5-1)

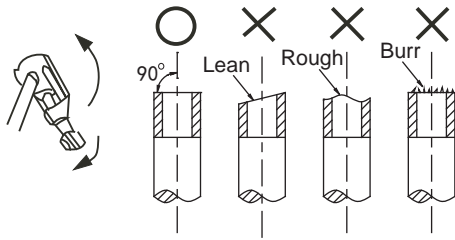


Fig.5-1

Table 5-1

OD (mm)	A (mm)	
	Max.	Min.
φ 6.4	8.7	8.3
φ 9.5	12.4	12.0
φ 12.7	15.8	15.4
φ 15.9	19.0	18.6
φ 19.1	23.3	22.9
φ 22.2	27.3	27.0

#### 2. Fastening the nut

Align the connecting pipe and fastening the nut and then fasten it with a wrench. (See Fig.5-2)

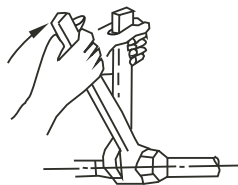


Fig.5-2

Table 5-2

Pipe dimensions	Tightening torque N.m
φ 6.4	14.2~17.2 N.m (144~176 kgf.cm)
φ 9.5	32.7~39.9 N.m (333~407 kgf.cm)
φ 12.7	49.5~60.3 N.m (504~616 kgf.cm)
φ 15.9	61.8~75.4 N.m (630~770 kgf.cm)
φ 19.1	97.2~118.6 N.m (990~1210 kgf.cm)
φ 22.2	109.5~133.7 N.m (1115~1364 kgf.cm)



### CAUTION

When welding the refrigerant pipes, nitrogen flushing operation should be applied otherwise the oxidation crumbs will block the cooling system which will result in damage.

Large torque will destroy the flare, small torque will result in gas leakage because of loose. Please refer to Table 5-2 for the tightening torque.

## 5.2 Pipe types

### Refrigerant settings

Table 5-3

Names	Piping position	Code
Main pipe	Pipe between the outdoor unit and indoor-side first manifold	L1
Indoor unit main pipe	Pipe which doesn't connect directly with the indoor unit the indoor-side first manifold	L2~L5
Outdoor unit main pipe	Piping components among main connecting pipe, main piping, and branch piping	a,b,c,d,e,f
Indoor unit manifold components	Pipe which connects directly with the indoor unit behind the manifold	A,B,C,D,E

#### • Connecting method 1

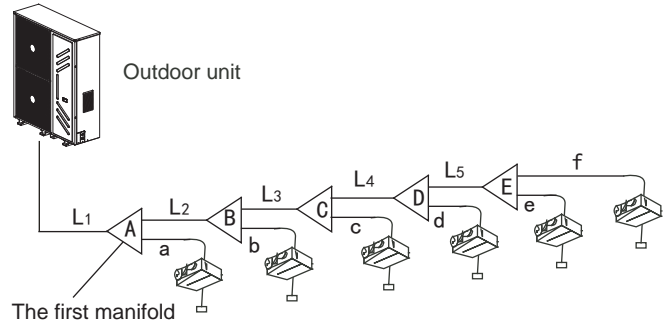


Fig.5-3

#### • Connecting method 2

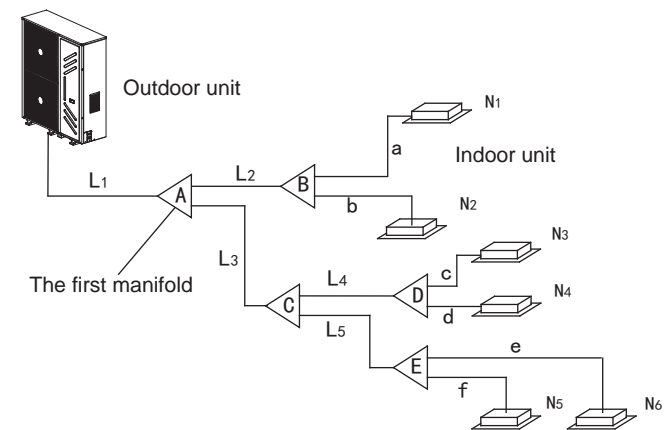


Fig.5-4



### CAUTION

All the manifolds used should be specialized ones designated by our company. Fail to follow the requirements could lead to system error.

If the distance between the first manifold and the last one exceeds 15m, please apply the 2nd connecting way.

Distance between the indoor unit and the nearest manifold should be less than 15m.

## 5.3 Diameters of indoor unit connecting pipe

- 1) Diameter reference table 4-4 of R410A indoor unit connecting pipe.
- 2) E.g. 1: The downstream connecting indoor unit capacity of L2 is  $45 \times 2 = 90$ , the diameter of gas pipe and liquid pipe will be φ15.9/φ9.5 after checking.

Reference table of R410A indoor unit connecting pipe Table 5-4

Downstream indoor unit capacity	Main pipe dimensions		Applicable manifolds
	Gas pipe	Liquid pipe	
A < 166	Φ15.9	Φ9.5	FQZHN-01C
166 ≤ A < 230	Φ19.1	Φ9.5	FQZHN-01C
230 ≤ A < 330	Φ22.2	Φ9.5	FQZHN-02C
330 ≤ A < 460	Φ25.4	Φ12.7	FQZHN-02C
460 ≤ A	Φ25.4	Φ12.7	FQZHN-02C

## 5.4 Diameters of outdoor unit connecting pipe

Reference table of R410A outdoor unit connecting pipe Table 5-5

Outdoor unit capacity	Main pipe dimensions when equivalent length of liquid side and gas side pipe is < 90m			Main pipe dimensions when equivalent length of liquid side and gas side pipe is ≥ 90m		
	Gas side (mm)	Liquid side (mm)	Indoor unit first manifold	Gas side (mm)	Liquid side (mm)	Indoor unit first manifold
33.5kW 40kW	Φ22.2	Φ12.7	FQZHN-02C	Φ25.4	Φ12.7	FQZHN-02C
45kW	Φ25.4	Φ12.7	FQZHN-02C	Φ28.6	Φ12.7	FQZHN-03C



### CAUTION

The horizontal straight pipe distance between angle branch and its adjacent manifold should be at least 0.5m

The horizontal straight pipe distance between 2 adjacent manifold should be at least 0.5m

The horizontal straight pipe distance that connects to indoor unit behind the manifold should be at least 0.5m

Use the maximum indoor and outdoor connecting pipe diameter.

#### ● Joint dimension

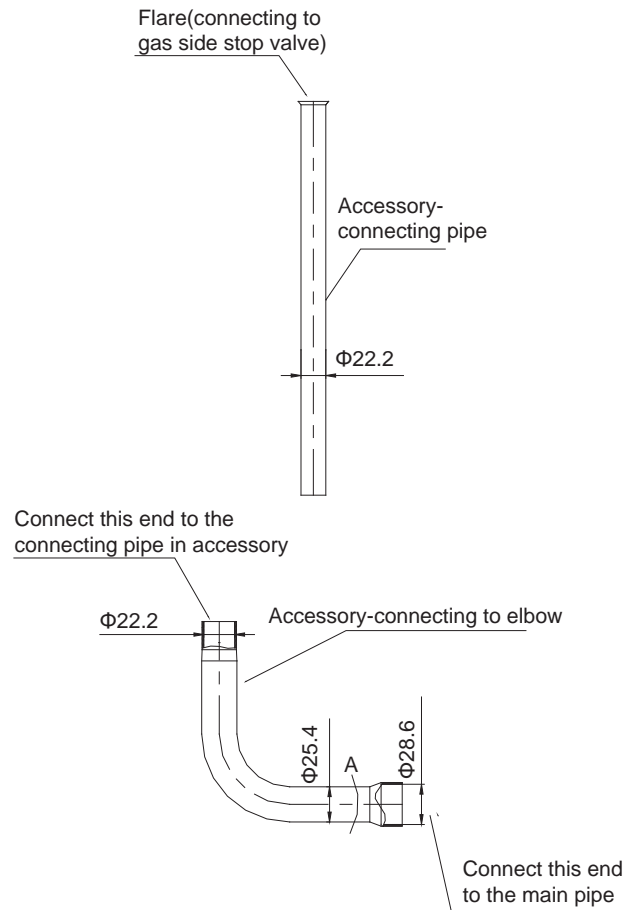
Pipe diameters of the indoor unit joint Table 5-6

Refrigerant	Model	Gas side	Liquid side
R410A	Wall mounting 22~45	Φ12.7(Flare)	Φ6.4(Flare)
	Wall mounting 56	Φ15.9(Flare)	Φ9.5(Flare)
	Four-side air outlet 28~45	Φ12.7(Flare)	Φ6.4(Flare)
	Four-side air outlet 56~80	Φ15.9(Flare)	Φ9.5(Flare)
	Single-side air outlet 18~45	Φ12.7(Flare)	Φ6.4(Flare)
	Single-side air outlet 56	Φ15.9(Flare)	Φ9.5(Flare)
	Low static pressure 18~45	Φ12.7(Flare)	Φ6.4(Flare)
	Low static pressure 56	Φ15.9(Flare)	Φ9.5(Flare)
	Thin duct 71	Φ15.9(Flare)	Φ9.5(Flare)
	A5 Duct 22~45	Φ12.7(Flare)	Φ6.4(Flare)
	A5 Duct 56~80	Φ15.9(Flare)	Φ9.5(Flare)
	A5 Duct 90~140	Φ15.9(Flare)	Φ9.5(Flare)

Pipe diameters of the outdoor unit joint Table 5-7

Model	Pipe diameters of the outdoor unit joint	
	Gas side	Liquid side
33.5kW/40kW	Φ22.2	Φ12.7
45kW	Φ25.4	

## Dimensions of connecting pipe diameters in accessory



Elbow connecting instruction	
Main pipe diameters of connecting pipes	Connecting pipe bending process
Φ22.2	Cut the pipe at A, insert the main pipe and weld
Φ25.4	Cut the pipe at A, flare and weld
Φ28.6	Insert main pipe directly and weld

Table 4-8

Outdoor Unit (kW)	Capacity of Outdoor unit (kW)	Maximum Quantity of Indoor unit	Sum Capacity of Indoor unit
33.5kW	33.5	14	20000~44000
40kW	40	14	20000~52000
45kW	45	15	22000~58000



### CAUTION

Capacity of indoor unit shouldn't be greater than the sum of 130% of outdoor unit loading.

When running with oversized bearings, attenuation will happen correspondingly.

Table 5-9

Classification of power	22	28	36	45	56	71
HP	0.8	1	1.2	1.7	2	2.5
Classification of power	80	90	100	112	125	140
HP	3	3.2	3.7	4	4.5	5



## 5.5 Examples

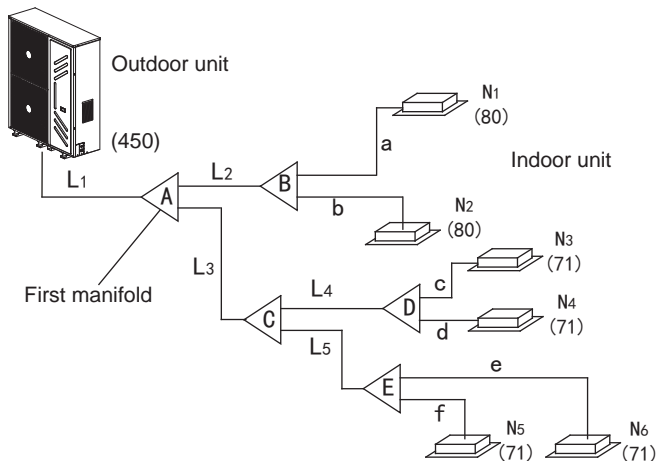


Fig.5-5

- The downstream inner units of the main pipe L2 are N1, N2, and its total capacity is  $80 \times 2 = 160$ , the size of pipe L2 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe B should be FQZHN-01C.
- The downstream inner units of the main pipe L4 are N3, N4, and its total capacity is  $71 \times 2 = 142$ , the size of pipe L4 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe D should be FQZHN-01C.
- The downstream inner units of the main pipe L5 are N5, N6, and its total capacity is  $71 \times 2 = 142$ , the size of pipe L5 is  $\Phi 15.9 / \Phi 9.5$ , and the branch pipe E should be FQZHN-01C.
- The indoor unit below to the main pipe L3 are N3~N6, and its total capacity is  $71 \times 4 = 284$ , the size of pipe L3 is  $\Phi 22.2 / \Phi 9.5$ , and he branch pipe C should be FQZHN-02C.
- The indoor unit below to the main pipe A are N1~N6, and its total capacity is  $71 \times 4 + 80 \times 2 = 444$ , and the branch pipe should be FQZHN-02C, and because the total piping length of liquid + air side is  $\geq 90\text{m}$ , check Table.5-5, and the first branch pipe should apply FQZHN-03C, and according to the principle of maximum value, it should apply FQZHN-03C.

### 3. Main pipe (please refer to Table 5-5 and Table 5-7)

In Fig.5-5, main pipe L1, its outdoor unit capacity is 45kW. Its gas/liquid pipe diameter is  $\Phi 25.4 / \Phi 12.7$  according to Table 5-7. Because total piping length of liquid + air side is  $\geq 90\text{m}$ , according to Table 5-5, its gas/liquid side is  $\Phi 28.6 / \Phi 12.7$ . By maximum principle, adopt  $\Phi 28.6 / \Phi 12.7$ .



## CAUTION

Suppose in the displayed piping system, the total equivalent piping length of gas side + liquid side is longer than 90m.

### 1. Indoor unit branch pipe

Inner branch pipes are a~f, the size selection please refers to Table 5-6. Note: The max. length of the branch pipe should not longer than 15m.

### 2. The main pipes of indoor unit and the indoor unit branch pipe components

### ● Connecting method

Table 5-10

	Gas side	Liquid side
Outdoor unit 33.5kW/40kW	Flare/welding	Flare/welding
Outdoor unit 45kW	Flare/welding	Flare/welding
Indoor unit	Flare	Flare
Manifold	Flare/welding	Flare/welding

### ● Allowable length and altitude difference of refrigerant pipe

Table 5-11 (Liquid side pipe only)

		Pimited value	Piping		
33.5 kW 40 kW 45 kW	Pipe Length	Total Pipe Length(Actual)	$\leq 250\text{m}$	$L1+L2+L3+L4+L5+a+b+c+d+e+f$	
		Maximum Piping(L)	Actual Length	$\leq 100\text{m}$	$L1+L2+L3+L4+L5+f$ (The first connect method) or $L1+L3+L5+f$ (The second connect method)
			Equivalent Length	$\leq 120\text{m}$	
	Pipe Length(from the first line branch pipe to the furthest indoor unit)(m)	$\leq 40\text{m}$	$L2+L3+L4+L5+f$ (The first connect method) or $L3+L5+f$ (The second connect method)		
	Pipe Length(from the nearest branch pipe equivalent length)(m)	$\leq 15\text{m}$	a,b,c,d,e,f		
Drop Height	Indoor Unit-Outdoor Unit Drop Height(H)	Outdoor Unit up	$\leq 30\text{m}$	—————	
		Indoor Unit Down	$\leq 20\text{m}$	—————	
	Indoor Unit to Indoor Unit Drop Height(H)	$\leq 8\text{m}$	—————		



## CAUTION

When the total equivalent piping length of liquid + gas side is  $\geq 90\text{m}$ , it must increase the size of air side main pipe. Besides, according to the distance of refrigerant pipe and the over matched state of inner unit, when the capacity is decreasing it still can increase the gas side main pipe size.

- The first connecting method

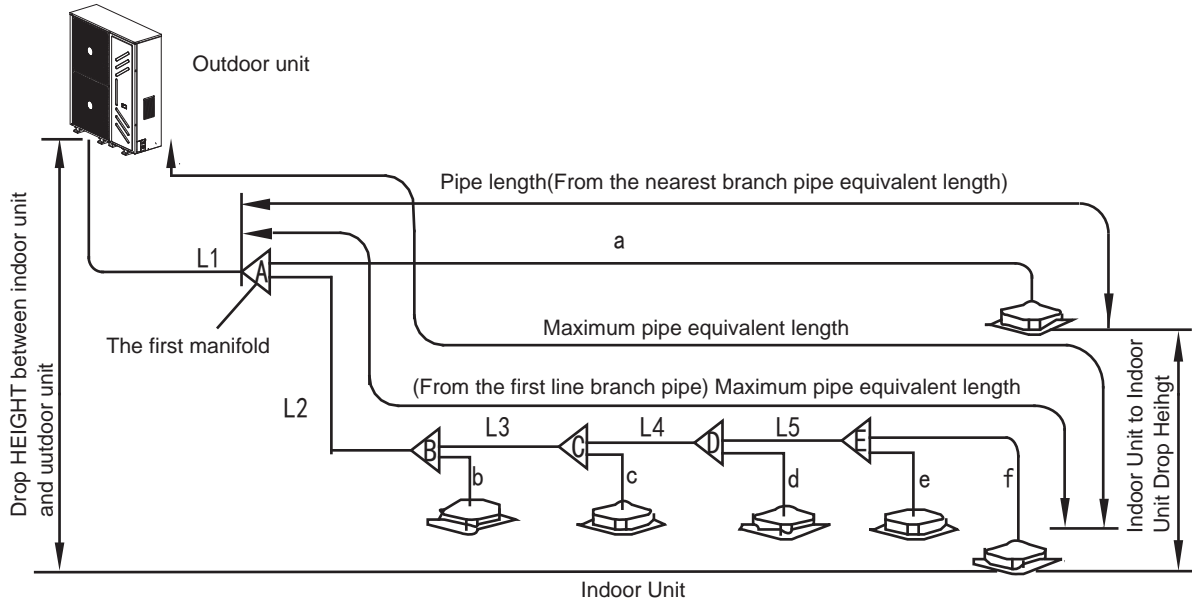


Fig.5-6

- The second connecting method

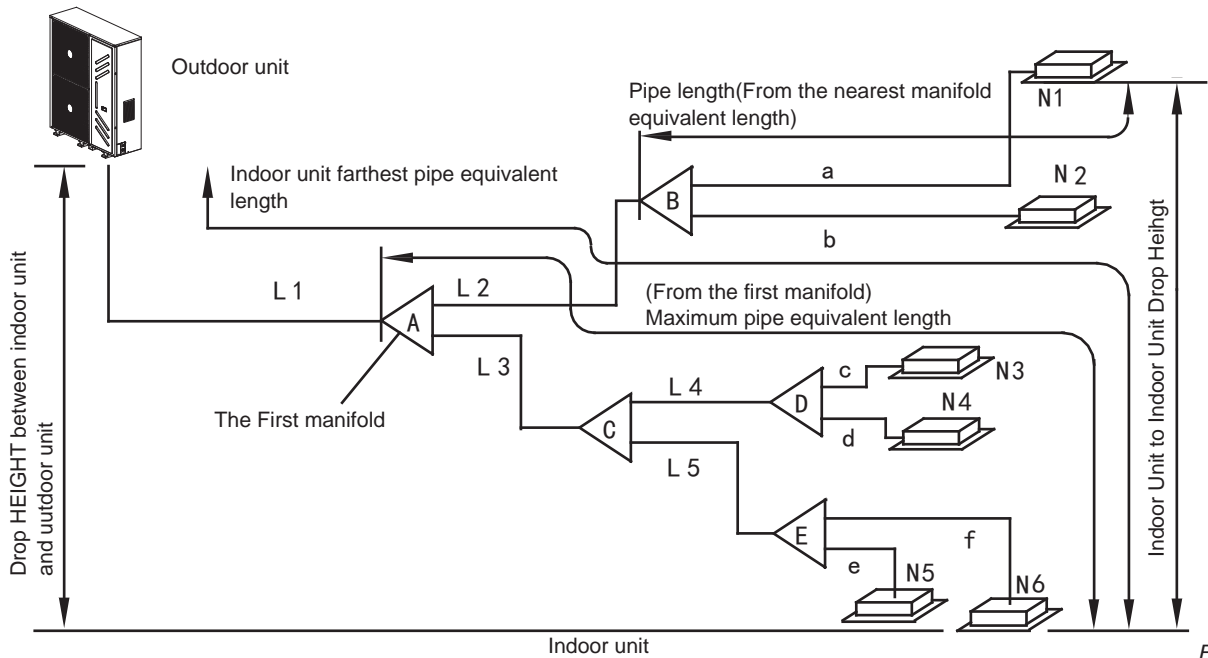


Fig.5-7

## 5.6 Remove Dirt or Water in the Pipe

1. Make sure there is no any dirt or water before connecting the pipe to the outdoor units.
2. Wash the pipe with high pressure nitrogen, never use refrigerant of outdoor unit.

## 5.7 Airtight Test

1. Connect the high pressure side pipe and liquid side stop valve after connecting indoor unit pipes.
2. Weld low pressure side pipe and meter connector.
3. Use vacuum pump to discharge air from valve core of liquid side stop valve and meter connector until the pressure reaches to  $-1\text{kgf/cm}^2$ .
4. Close the vacuum pump and fill nitrogen  $40\text{kgf/cm}^2$ .
5. At the end of air tightness test, the gas side stop valve and the low pressure side piping should be welded.

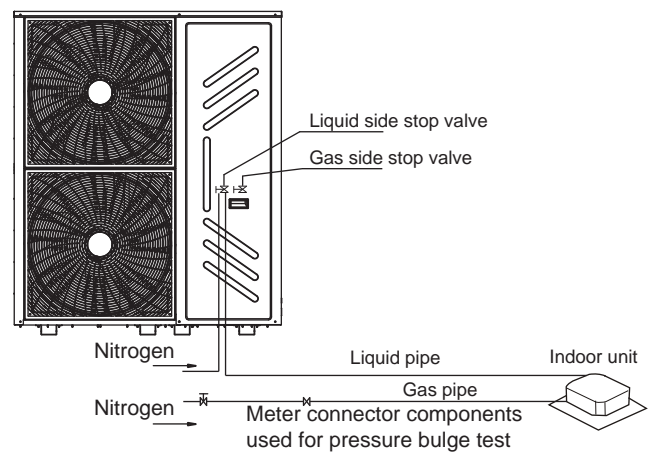


Fig.5-8



## CAUTION

- Pressured nitrogen (3.9MPa (44kgf/cm<sup>2</sup>) for R410A] should be used in the airtight test.
- DO NOT pressure to the stop valve directly.(See Fig.5-8)
- The airtight test should never use any oxygen,flammable gas or poisonous gas.
- Wrap the low pressure valve with a wet cloth for protection when welding.
- In case of damage, the holdup time shouldn't be too long.

## 5.8 Air Purge with Vacuum Pump

1. Use the vacuum pump with the relative vacuum degree of -0.1MPa, vacuum-pump efficiency of 40L/min
2. Outdoor unit needn't to be vacuumized. Do not open liquid/gas side stop valves of the outdoor unit.
3. Be sure when vacuum pump works for more than 2 hours, the relative vacuum degree is under -0.1MPa. If the degree is still under -0.1MPa for more than 3 hours, it demonstrate there's moisture leakage. Check the pump.

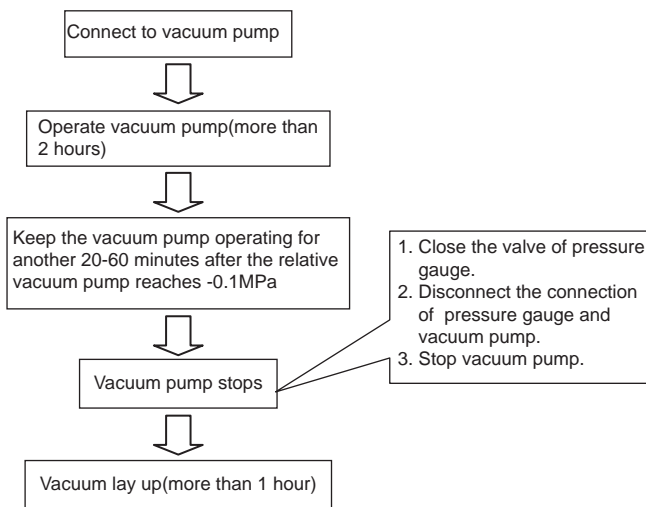


Fig.5-9



## CAUTION

- Do not mixedly use tools used for different refriferant, tools and measuring instrument that directly contact refriferant. DO NOT use refriferant gas to air discharge.
- When vacuum degree can't reach -0.1MPa, consider if it leaks. If no leakage, please keep the vacuum pump working for another 1 to 2 hours.

## 5.9 Outdoor unit stop valve

- **Outdoor unit stop valve**
  1. Before using stop valve, get familiar with every part of the valve, as shown in Fig.4-10. The stop valve is closed when leaving the factory.
  2. Please use a proper tool. Because the stop valve in this unit is not a flare-seal type, if dismantling forcibly, it may cause valve damage. Please use hosepipe to fill in when maintenance.
  3. When cooling in the outside in a low temperature, operation pressure will be low. Use silicone encapsulant to seal in case of freezing of flare nut of stop valve gas side.
  4. Make sure if there is refrigerant leakage after fastening the bonnet.
- **Operational approach of closing the valve**  
Prepare a hexagonal wrench(specification 6mm)

Open approach:

1. Insert a hexagonal wrench into the valve rod and spin anticlockwise.
2. When the valve rod can't be spinned any more, the valve is open.

Close approach:

Insert a hexagonal wrench into the valve rod and spin clockwise.

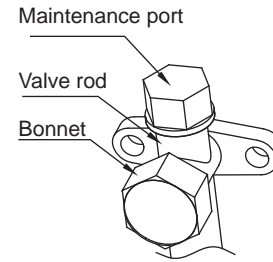


Fig.5-10

- **Bonnet caution**  
Tightening the bonnet after valve operation.
- **Main tenance port caution**  
Please operate with a filling hosepipe with a compression bar. Tightening the valve after operating.

Stop valve specification Table 5-12

Model	33.5kW/40kW	45kW
Liquid side stop valve	Φ12.7	Φ12.7
Gas side stop valve	Φ22.2	Φ25.4

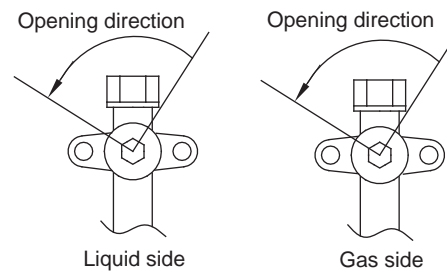


Fig.5-11

## 5.10 Leakage inspection

Inspect each joint to check if it leaks by using a leak detector or suds.(Fig.5-12)

NOTE: A liquid side stop valve  
B gas side stop valve  
C and D are the joint of the indoor unit connecting pipe.

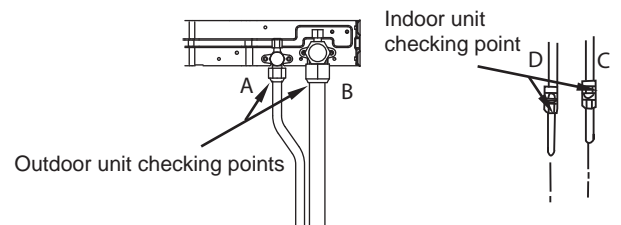


Fig.5-12

## 5.11 Heat Insulation

Do the heat insulation to the pipes of air side and liquid side separately. The temperature of the pipes of air side and liquid side when cooling, for avoiding condensation please do the heat insulation fully.(Fig.5-13)

1. The air side pipe should use closed cell foamed insulation material, which the fire-retardant is B1 grade and the heat resistance over 120°C.
2. When the external diameter of copper pipe $\leq\Phi 12.7$ mm, the thickness of the insulating layer at least more than 15mm;  
When the external diameter of copper pipe $\geq\Phi 15.9$ mm, the thickness of the insulating layer at least more than 20mm.

3. Please use attached heat-insulating materials do the heat insulation without clearance for the connecting parts of the indoor unit pipes.

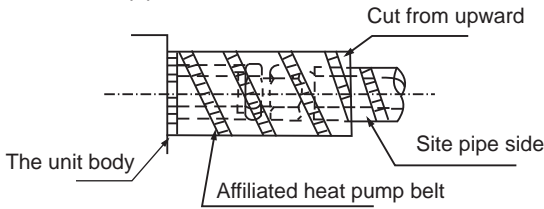


Fig.5-13

### 5.12 Refrigerant Amount to be Added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection. Calculate the refrigerant adding amount, adding refrigerant R410A.

Liquid Side Piping Diameter	Refrigerant to be Added Permeter Piping
Φ6.4	0.022kg
Φ9.5	0.057kg
Φ12.7	0.110kg
Φ15.9	0.170kg

NOTE: R410A refrigerant should be added in liquid quantifiedly by electronic scale.

### 5-13 Manifold installation key points

Install it in a horizontal level, error angle should less than 10°. It may result in damage if installing in a wrong way

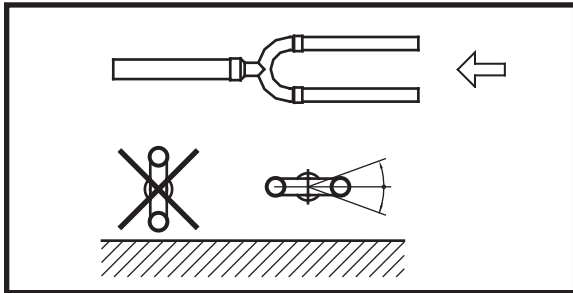


Fig.5-14

## 6. ELECTRICAL WIRING



### CAUTION

- Please select power source for indoor unit and outdoor unit respectively.
- The power supply has specified branch circuit with leakage protector and manual switch.
- The outdoor unit model which corresponding to different outdoor unit power supply should refer to the nameplate.(Please set all the indoor unit power of one system into the same branch circuit.)
- Please put the connective wire system between indoor unit and outdoor unit with the refrigerant system together.
- Use 3-core shielded wire as indoor unit and outdoor unit signal wire.
- The installation should comply with local electric standard.
- Power wiring should be engaged by specialized electrician.

## 6.1 Outdoor unit wiring terminal instructions

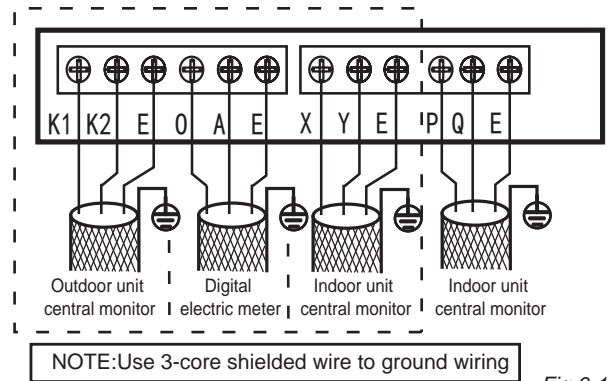


Fig.6-1

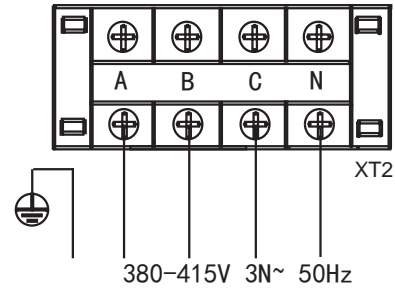


Fig.6-2

NOTE: Outdoor unit central monitor, digital electric meter, indoor unit central monitor are all optional components in the dotted box, if necessary, please contact to the local dealer to buy those.

## 6.2 Indoor unit system wiring

1. Individual power supply (without power supply device)  
(See the table below)

Table 6-1

Item	Power Source	Thinnest electric wire diameter(mm <sup>2</sup> ) (Metal tube synthetic resin wiring)			Hand switch		Leakage protector
		Under 20m	Under 50m	Ground wire	Breaker	Fuse	
Model							
33.5kW 40kW	380-415V 3N~ 50Hz	4x6mm <sup>2</sup>	4x10mm <sup>2</sup>	6mm <sup>2</sup>	40	40	Under 100mA 0.1 sec
45kW	380-415V 3N~ 50Hz	4x10mm <sup>2</sup>	4x16mm <sup>2</sup>	10mm <sup>2</sup>	50	50	Under 100mA 0.1 sec



### CAUTION

Wiring diameters and continuous lengths in the table are the situation that voltage decrease degree is within 2%, when the wiring continuous length exceeds the values in the table, choose the wire diameter according to regulations

### 6.3 Outdoor unit main control board

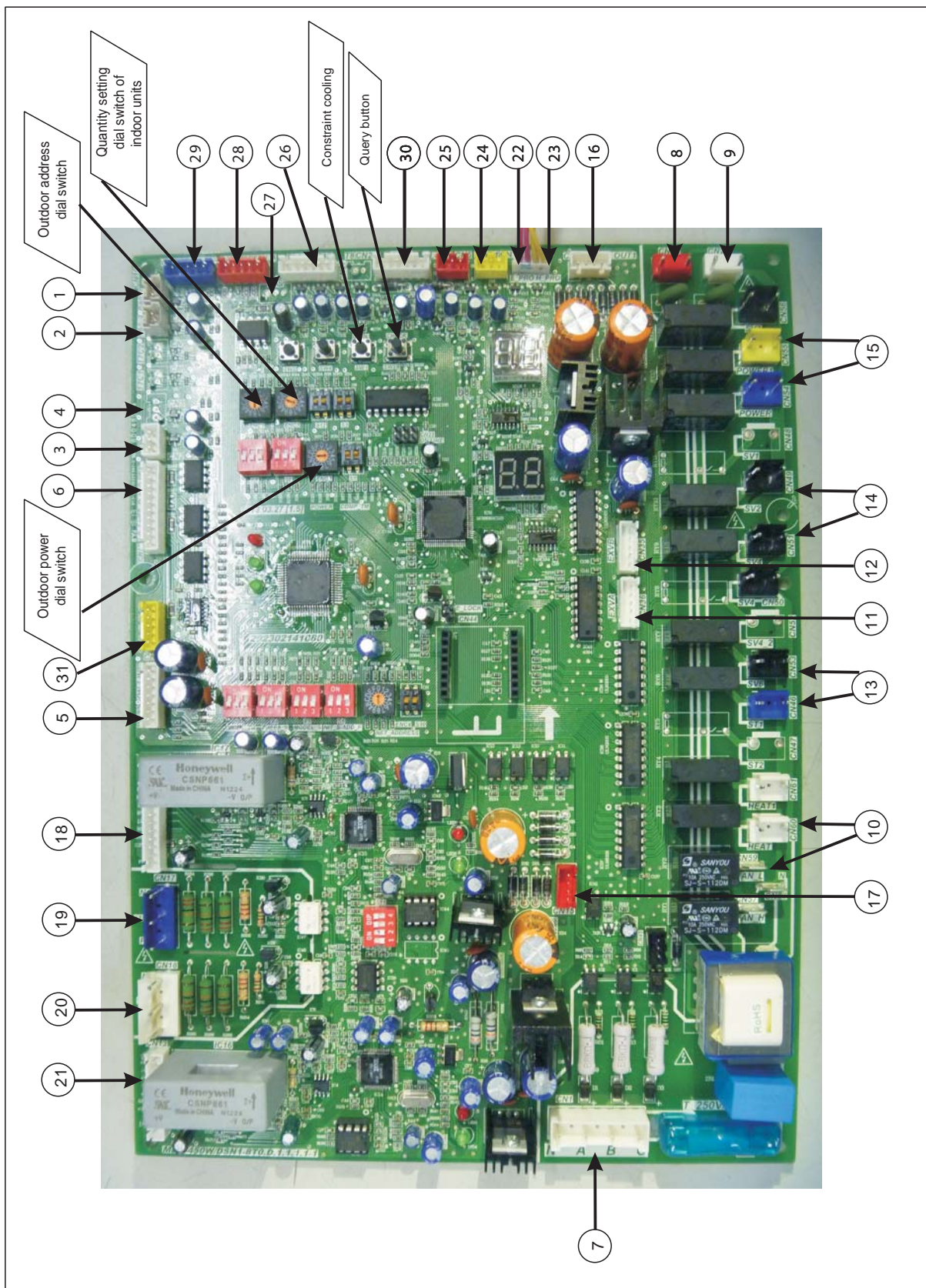


Fig.6-3

## 6.4 Outdoor main control board instructions

Table 6-3

NO.	Contents	NO.	Contents
1	Discharge temp. sensed port of the inverter compressor A	17	Power output of the No.2 transformer
2	Discharge temp. sensed port of the inverter compressor A or B	18	Activation port of inverter module B
3	Ttemp. sensed port of the inverter module radiator	19	Port for inverter module B voltage inspection
4	Reserved	20	Port for inverter module A voltage inspection
5	Reserved	21	Activation port of inverter module A
6	Wiring port for communication between indoor and out-door units, indoor unit network and network accounting	22	ON/OFF signal input port for system low pressure inspection
7	Phase inspection port	23	ON/OFF signal input port for system high pressure inspection
8	Power input of the No.1 transformer	24	Reserved
9	Power input of the No.2 transformer	25	Reserved
10	Loading output terminal	26	Inspection port for outdoor ambient temp. and condensator coil
11	EXV A driving port	27	Reserved
12	EXV B driving port	28	Control port of DC fan A
13	Loading output terminal	29	Control port of DC fan B
14	Loading output terminal	30	Current inspection port of the inverter compressor A and B
15	Loading output terminal	31	Power supply connected port of the main control panel
16	Power output of the No.1 transformer		--

## 6.5 Dial indication sign instructions

ENC3 and S12 definition:

		Set the number of indoor units to 0-15
		Set the number of indoor units to 16-31
		Set the number of indoor units to 32-47
		Set the number of indoor units to 48-63

ENC1 definition:

	Reserve
--	---------

ENC2 definition:

	Outdoor unit capacity setting switch 4 : 12HP(335)/14HP(400) 5 : 16HP(450) 6 : 20HP(500)
--	---

ENC4 definition:

	Outdoor unit net address dial code 0-F valid represents 0-15
--	--

S1 definition only for 33.5kW40kW:

	Starting time is set about 5 minutes
	Starting time is set about 12 minutes (Default the Factory Set)

S2 definition only for 33.5kW40kW:

	Night time selection is 6h/10h (Default the Factory Set)
	Night time selection is 6h/12h
	Night time selection is 8h/10h
	Night time selection is 8h/12h





S1 definition only for 45kW:

	Reserve
--	---------





S2 definition only for 45kW:

	Reserve
--	---------






S3 definition:

ON 	Night Silent mode (Default the Factory Set)
ON 	Silent mode
ON 	Reserve
ON 	None Silent mode




S4 definition:

ON 	Static pressure mode is 0 MPa(Default the Factory Set)
ON 	Static pressure mode is low pressure(Reserve position, use for customized unit)
ON 	Static pressure mode is medium pressure(Reserve position, use for customized unit)
ON 	Static pressure mode is high pressure(Reserve position, use for customized unit)



S5 definition:

ON 	Heating priority mode (Default the Factory Set)
ON 	Cooling priority mode
ON 	Number 63 & the more operating mode first
ON 	Only respond the heating mode
ON 	Only respond the cooling mode


S6 definition:

ON 	Automatic search address
ON 	Nonautomatic search address (The communication way of the original digital indoor units )
ON 	Clean the indoor unit address (Effective to automatic searching new digital indoor unit )


S7 fdefinition:

ON 	Off Qty. setting of indoor units (Default the Factory Set)
ON 	On Qty. setting of indoor units


S8 definition only for 33.5kW/40kW:

ON 	Reserve
--	---------



S8 definition only for 45kW:

ON 	Default the Factory Set
--	-------------------------

S10 function definition:

ON 	Reserve
--	---------

S11 function definition:

ON 	6-10HP Outdoor unit settings
ON 	12-18HP Outdoor unit settings



**CAUTION**

Code dialing must be operated after the power supply is cut off.

## 6.7 Electric system and installation

### Electric wiring Notes

1. Please use private indoor and outdoor unit power supplies.
2. Power supply should apply specialized duplexure and should install RCCB and manual switch.
3. Power supply, RCCB and manual switch used for a same indoor unit should have universality.(Indoor unit power supply for the same unit should use the same circuit and ON/OFF simultaneously, or it could seriously affect the system service life and the unit may fail to power on).
4. Consider the indoor and outdoor unit connecting wiring system and refrigerant piping as a same system.
5. Suggest to use 3-core shield cable for outdoor unit signal wire to decrease noise disturb, don't use multi-core cable without shield.
6. Operate according to the relative electric national regulations.
7. Power supply wiring must be operated with a specialized person.

## 6.6 Electric control system wiring diagram

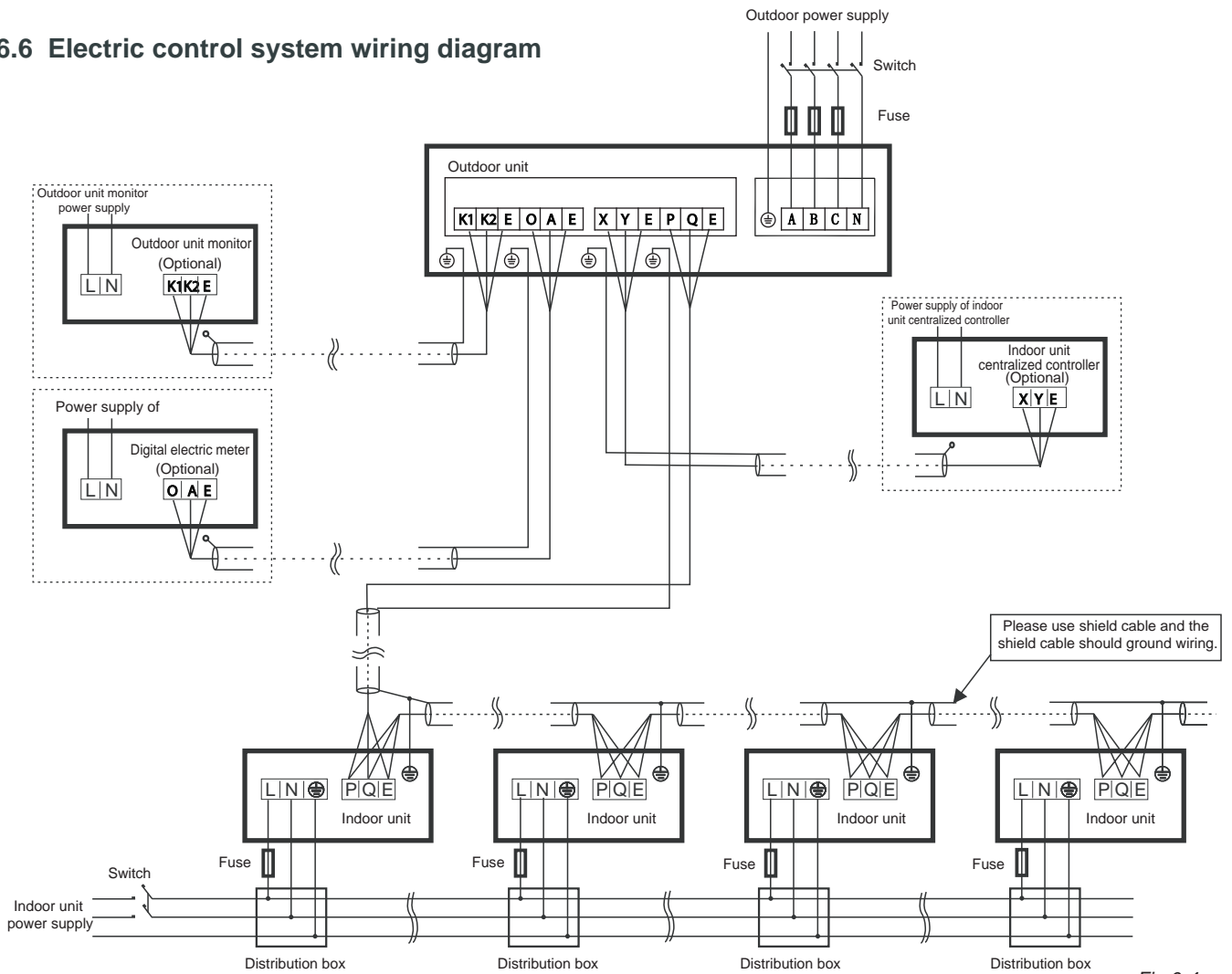


Fig.6-4



### CAUTION

- Wrong wiring may damage compressor and other components.
- PQE connects to weak current signal wire, don't connect it to strong current. All the connecting terminal should be fastened reliably, ground wire should be grounded correctly.
- Use wiring terminal power supply wire with a torus. After power supply wire has been connected to the wiring base, it needs to be reliably fastened.
- Power on after a careful inspection and make sure there's no mistakes.

## 6.7 Indoor and outdoor unit control wiring

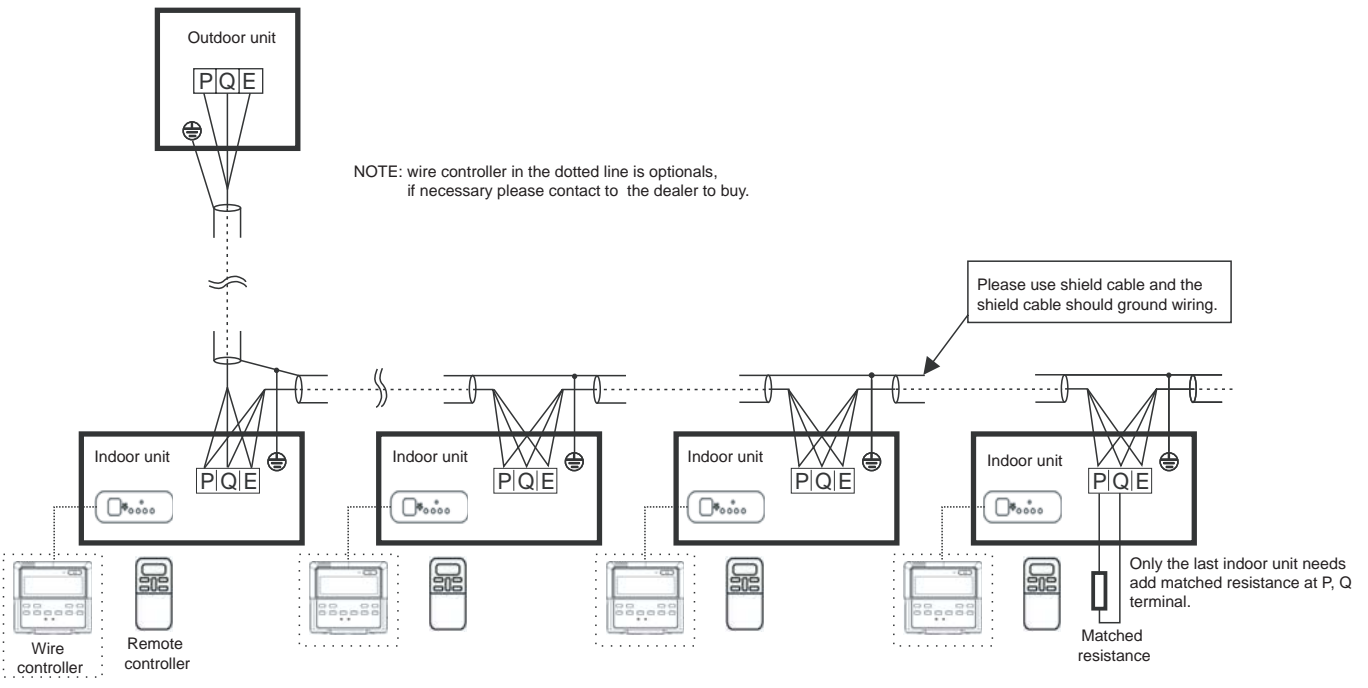


Fig.6-5





## CAUTION

- Signal wire is 3-core, polarized wire. Use 3-core shield wire to prevent interference. The grounding method now is grounding the closed end of the shield wire and opening (insulating) at the end. Shield is to be grounded. (Reference distance: It is 300mm when current capacity of power cord is less than 10A, or 500mm when 50A).
- When power cord is parallel with signal wire, please put them into separate wire distribution pipes, and leave a proper distance.
- Display box, remote controller, and matched resistance are the accessories of indoor unit; wire controller is optional, if necessary please contact to the dealer to buy.

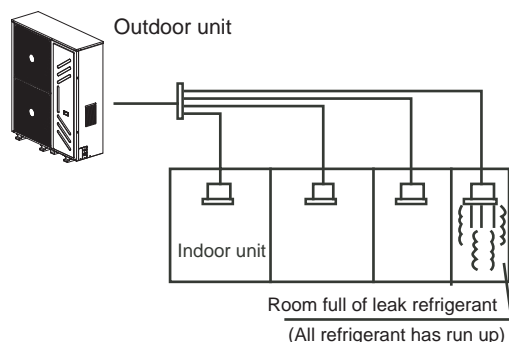
## 7. PRECAUTIONS ON REFRIGERANT LEAKAGE

This air conditioner(A/C) adopts innocuous and nonflammable refrigerant of R22,R410A,407C. The locating room of the A/C should big enough that any refrigerant leakage is unable to reach critical thickness. So certain essential action can be taken on time. Critical thickness-----the Max. thickness of Freon without any harm to person.

Refrigerant critical thickness: 0.3[kg/m<sup>3</sup>] for R22

Refrigerant critical thickness: 0.35[kg/m<sup>3</sup>] for R470C

Refrigerant critical thickness: 0.44[kg/m<sup>3</sup>] for R410A.



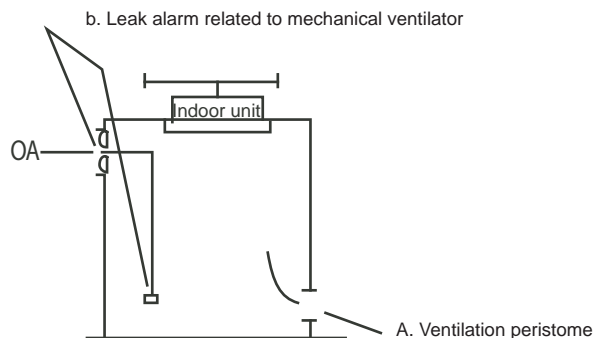
Confirm the critical thickness through follow steps, and take necessary actions.

1. Calculate the sum of the charge volume (A[kg]).  
Total refrigerant volume of 10HP=factory refrigerant volume + super addition.
2. Calculate the indoor cubage (B[m]) (as the minimum cubage).
3. Calculate the refrigerant thickness.

$$\frac{A \text{ [kg]}}{B \text{ [m}^3\text{]}} \leq \text{Critical thickness}$$

Counter measure against over high thickness

1. Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly).
2. Install leak alarm facility related to mechanical ventilator if you can not regularly ventilate.



(Leak hunting siren should be installed in places easily keep refrigerant)

## 7.1 Important information for the used refrigerant

This product has the fluorinated gas which is listed in kyoto protocol it is forbidden to release to air.

Refrigerant type: R410A; Volume of GWP: 2088;  
GWP=Global Warming Potential

Model	Factory charge	
	Refrigerant/kg	tonnes CO <sub>2</sub> equivalent
40kW	9.00	18.79
45kW	12.00	25.06

### Attention:

- 1) For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO<sub>2</sub> equivalent or more, but of less than 50 tonnes of CO<sub>2</sub> equivalent, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
- 2) For equipment that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO<sub>2</sub> equivalent or more, but of less than 500 tonnes of CO<sub>2</sub> equivalent, at least every six months, or where a leakage detection system is installed, at least every 12 months.
- 3) For equipment that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO<sub>2</sub> equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.
- 4) Non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to the end user where evidence is provided that the installation is to be carried out by an undertaking certified person.
- 5) Only certified person is allowed to do installation, operation and maintenance.

## 8. TEST RUNNING

### 8.1 Check points before test running

1. If indoor and outdoor units have been installed properly.
2. Whether piping and wiring is correct.
3. Whether has taken leakage inspection to the refrigerant pipe system.
4. Whether heat insulation has been properly applied.
5. If ground wire has been correctly connected.
6. Whether take a record of the piping length or refrigerant adding amount.
7. Whether the power supply voltage is equal with the rated voltage.
8. If there's barriers around air inlet/outlet.
9. Open gas side and liquid side stop valve.
10. Connect to power supply and pre-heat the AC.

## 8.2 Testing running

Control A/C to process cooling operation with remote controller, check the following points respectively, if it fails, please debug according to operation manual.

### 1. Indoor unit

- If the remote controller is normal.
- Whether each function keys is normal in the remote controller.
- If the air deflector operates normally .
- Whether room temp. adjustment is normal.
- Whether indicator lights up normally.
- If manual keys are normal.
- If water drainage is normal.
- If there's vibration and abnormal noise when operating.
- Test if heating function works normally for heating and cooling A/C.

### 2. Outdoor unit

- If there's vibration and abnormal noise when operating.
- Whether the wind and noise and condenser water could influence your neighbour.
- If there's refrigerant leakage.



### CAUTION

When electrified, start the unit immediately or reboot after shutdown, A/C has protection function, compressor will start 5min delay.

---

## 9. TURN OVER TO CUSTOMER

1. The owner's manual of indoor unit and owner's manual of outdoor or unit must be turned over to the customer.
2. Explain the contents in the owner's manual to the customers in details.

# Owner's manual

Page intentionally left blank

CONTENTS	PAGE
IMPORTANT SAFETY INFORMATION.....	1
OPERATION METHOD.....	2
REINSTALLATION.....	4
MAINTENANCE.....	5

## 1. IMPORTANT SAFETY INFORMATION

To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.



### WARNING

Failure to observe a warning may result in death. The appliance shall be installed in accordance with national wiring regulations.



### CAUTION

Failure to observe a caution may result in injury or damage to the equipment.



### WARNING

**Ask your dealer for installation of the air conditioner.**

Incomplete installation performed by yourself may result in a water leakage, electric shock, and fire.

**Ask your dealer for improvement, repair, and maintenance.**

Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.

**In order to avoid electric shock, fire or injury, or if you detect any abnormality such as smell of fire, turn off the power supply and call your dealer for instructions.**

**Never let the indoor unit or the remote controller get wet.** It may cause an electric shock or a fire.

**Never press the button of the remote controller with a hard, pointed object.**

The remote controller may be damaged.

**Never replace a fuse with that of wrong rated current or other wires when a fuse blows out.**

Use of wire or copper wire may cause the unit to break down or cause a fire.

**It is not good for your health to expose your body to the air flow for a long time.**

**Do not insert fingers, rods or other objects into the air inlet or outlet.**

When the fan is rotating at high speed, it will cause injury.

**Never use a flammable spray such as hair spray, lacquer or paint near the unit.**

It may cause a fire.

**Never touch the air outlet or the horizontal blades while the swing flap is in operation.**

Fingers may become caught or the unit may break down.

**Never put any objects into the air inlet or outlet.**

Objects touching the fan at high speed can be dangerous.

**Never inspect or service the unit by yourself.**

Ask a qualified service person to perform this work.

**Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.** Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.



Contact your local government for information regarding the connection systems available.

**If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.**

**To prevent refrigerant leak, contact your dealer.**

When the system is installed and runs in a small room, it is required to keep the concentration of the refrigerant, if by any chance coming out, below the limit. Otherwise, oxygen in the room may be affected, resulting in a serious accident.

**The refrigerant in the air conditioner is safe and normally does not leak.**

If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

**Turn off any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.**

Do not use the air conditioner until a service person confirms that the portion where the refrigerant leaks is repaired.

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



### CAUTION

**Do not use the air conditioner for other purposes.**

In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.

**Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.**

Otherwise, an electric shock and injury may result.

**In order to avoid electric shock or fire, make sure that an earth leak detector is installed.**

**Be sure the air conditioner is grounded.**

In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.

**In order to avoid injury, do not remove the fan guard of the outdoor unit.**

**Do not operate the air conditioner with a wet hand.**

An electric shock may happen.

**Do not touch the heat exchanger fins.**

These fins are sharp and could result in cutting injuries.

**Do not place items which might be damaged by moisture under the indoor unit.**

Condensation may form if the humidity is above 80%, the drain outlet is blocked or the filter is polluted.

**After a long use, check the unit stand and fitting for damage.**

If damaged, the unit may fall and result in injury.

**To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner.**

**Arrange the drain hose to ensure smooth drainage.**

Incomplete drainage may cause wetting of the building, furniture etc.

**Never touch the internal parts of the controller.**

Do not remove the front panel. Some parts inside are dangerous to touch, and a machine trouble may happen.

**Never expose little children, plants or animals directly to the air flow.**

Adverse influence to little children, animals and plants may result.

**Do not allow a child to mount on the outdoor unit or avoid placing any object on it.**

Falling or tumbling may result in injury.

**Do not operate the air conditioner when using a room fumigation - type insecticide.**

Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals.

**Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit.**

It may cause incomplete combustion or deformation of the unit due to the heat.

**Do not install the air conditioner at any place where flammable gas may leak out.**

If the gas leaks out and stays around the air conditioner, a fire may break out.

**This appliance can be used by children age from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved, children should not play with This appliance. Cleaning and user maintenance should not be made by children without supervision.**

**When capacity of indoor unit greater than the sum of 100%, capacity of indoor unit will be attenuated.**

**When capacity of indoor unit greater than or equal to the sum of 120%, in order to ensure the effectiveness of machine, and then try to open the indoor units at different time.**

**The outdoor unit window-shades should be periodic cleaning in case of being jammed.**

This window-shapes is heat dissipation outlet of components, if being jammed will cause the components shorten their service life spans because of overheated for a long time.

**The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.**

**Poor environmental conditions, the appliance should be maintained a month and a half or so; if the environment condition is good, may be extended appropriately maintenance cycle.**

**The A-weighted sound pressure level is below 70dB.**

## 1.1 Electrical safety requirements

1. Wiring job must be done by the certified electrician.
2. Wiring work must comply to electrical safety specifications.
3. Be sure the air conditioner is grounded well which means the main power switch of air-conditioner grounded with reliable grounded wire.
4. Make sure the min. space between PTC electrical heating elements and flammable surface is >12mm.
5. Apply separate power which meet the rated parameters for the air-conditioner

## 1.2 Electrical performance requirements

Table 1-1

Model	Fuse(A)	Power supply specification
33.5kW/40kW	40A	380-415V 3N~ 50Hz
45kW	50A	



### CAUTION

Under any situations, it can not break off the ground wire of the main power switch.

Can not use broken power wire, if there is any broken wire then change it immediately.

First use the unit or the unit under the power off state for a long time, power on and pre-heat the unit at least 12 hours before using.

## 2. OPERATION METHOD

### 2.1 Operation conditions under each mode

Use the unit in the following temperature for safe and effective operation.

Table 2-1

Cooling operation	Indoor temp. : 21°C to 32°C
	Outdoor temp.: -5°C to 48°C
Heating operation	Indoor temp. : under 28°C, above 0°C
	Outdoor temp.: -15°C to 24°C



### CAUTION

- Protection device may start if running the unit outside the above condition, which will prevent the unit from operation.
- Under "Cool" operation, room relative humidity should be less than 80%. If higher than 80%, the surface of indoor unit may be condensed or the condensate will be blown from air outlet.  
If less than 80%, please move the air leading bar to the largest air outlet position (which is vertical direction), and set the fan speed to be "High".

## 2.2 Constraint Cooling

### 1.Constraint Cooling

Outdoor unit main control board has constraint cooling key: SW1 (see Fig.2-1). One press will send constraint cooling signal to all the indoor unit. Constrain all the indoor unit to constraint cooling operation. Outdoor units operate as the fixed frequency shown in Table 2-2. Indoor unit fan operate at a high speed and press the key again to log out constraint cooling mode.

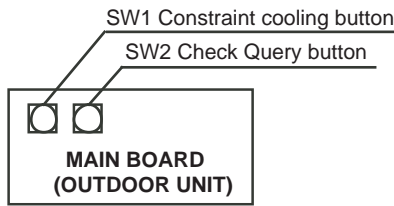


Fig.2-1

Table of force cooling frequency

Table 2-2

Mode	Force cooling rate(Hz)
33.5kW/40kW	62
45kW	48

### 2. Spot check

Check in the outdoor main control panel is the spot check button (refer to Fig.2-1), and press this button, the digital pipe of the main control panel will circulating display the parameters (display one parameter every press this button) as the following table 2-3 sequence.

SW2 Query instructions

Table 2-3

NO.	Normal display	Display content	Note
1	0. --	Outdoor unit address	0
2	1. --	Outdoor unit itself capacity	8, 10, 12, 14, 16, 18
3	2. --	Moduler outdoor unit Qty	Reserve
4	3. --	Qty.setting of indoor units	Available for main unit
5	4. --	Total capacity of outdoor unit	Reserve
6	5. --	Total requirement of indoor unit capacity	Available for main unit
7	6. --	Total requirement of main unit corrected capacity	Available for main unit
8	7. --	Operation mode	0, 2, 3, 4
9	8. --	This outdoor unit actual operation capacity	Capacity requirement
10	9. --	Speed of fan A	0, 1, ....., 9, 10
11	10. --	Speed of fan B	0, 1, ....., 9, 10
12	11. --	T2B/T2 average Temp.	Actual value
13	12. --	T3/T3A pipe Temp.	Actual value
14	13. --	T4 ambient Temp	Actual value
15	14. --	Discharge Temp.of Inverter compressor A	Actual value
16	15. --	Discharge Temp.of Inverter compressor B	Actual value
17	16. --	Radiator temperature	
18	17. --	Current of inverter compressor A	Actual value
19	18. --	Current of inverter compressor B	Actual value
20	19. --	Opening angle of EXV A	
21	20. --	Opening angle of EXV B	
22	21. --	High pressure	Reserve
23	22. --	T3B	Reserve for 33.5kW/40kW
24	23. --	Qty. of Indoor units	That can communicate with indoor units
25	24. --	Qty. of the working Indoor units	Actual value
26	25. --	Priority mode	0, 1, 2, 3, 4
27	26. --	Night noise control mode	0, 1, 2, 3
28	27. --	Static pressure mode	Reserved
29	28. --	DC voltage A	Actual value±10
30	29. --	DC voltage B	Actual value±10
31	30. --	Version of the program	
32	31. --	The last error or protection code	Without error or protection,display code 8.8.
33	32. --	---	Check end

The display contents as followings:

Normal display:When standby, the high position displays the address of the outdoor unit, and the low position displays the Qty. of indoor units that can communicate with outdoor unit. When it is operating, it will display the rotation frequency of the compressor.

- 1) Operation mode: 0-OFF; 2-Cooling; 3-Heating; 4-Constraint cooling;
- 2) Fan speed: 0-stop; 1~10: speed increase sequentially, 10 is the max. fan speed.
- 3) EXV opening angle: Pulse count=display value\*8;
- 4) Priority mode: 0-heating priority mode; 1-cooling priority mode; 2-open the priority mode first; 3-respond the heating mode only; 4-respond the cooling mode only.
- 5) Night noise control mode: 0-Night noise control mode; 1-silent mode; 2-reserve; 3-no priority.

### 2.3 5-minute protection feature

- A protection feature prevents the air conditioner from being activated for approximately 5 minutes when it restarts immediately after operation.

### 2.4 Cooling, Heating, operation of DC speed regulation central A/C

- The indoor unit can be controlled separately, but indoor units in the same system can not simultaneously operate the cooling and heating.
- If there is conflict between cooling mode and heating mode, the indoor unit under cooling operation will stop and the operating panel will display "Non-priority" or "Standing-by" code. The indoor unit under heating operation will operate normally.
- If the administrator has fixed set the cooling or heating operation, it can not do the operations beyond the setting. When do the operations beyond the setting, the operating panel will display "Non-priority" or "Standing-by" code and the unit stops.

### 2.5 Features of heating operation

- Warm air will not be blown out immediately at the beginning of the heating operation, 3~5 minutes later (depends on the indoor and outdoor temperature), until the indoor heat exchanger become hot, then blows out warm air.
- During operation, the fan motor in the outdoor unit may stop running under high temperature.

### 2.6 Defrosting in heating operation

- During heating operation, outdoor unit sometimes will frost. To increase efficiency, the unit will start defrosting automatically (about 2~10 minutes), and then water will be drained out from outdoor unit.
- During defrosting, both the fan motors in the outdoor unit and indoor unit will stop running.

### 2.7 Heating capacity

- The heating operation is a heat-pump process that heat will be absorbed from outdoor air and released in doors. Once the outdoor temperature is decreased, heating capacity decreased correspondingly.
- Other heating equipment is suggested to be used together when outdoor temperature is too low.
- In alpine region where the temperature is extremely low, heating effect will be better if users can buy an additional E-heat device.

### 2.8 About protection equipment

- This Protection Equipment will enable the Air Conditioner to stop when the Air Conditioner is to be directed running compulsively. When the Protection Equipment is activated, the Operation Indicator still lights while the Air Conditioner is not running.  
The protection equipment may be activated in following conditions:
- Under cooling operation, the air inlet or air outlet of outdoor unit is blocked. Strong wind is continuously blowing to the air outlet of the outdoor unit.
- Under heating operation, too much dust and rubbish adhere to the dust filter in the indoor unit. The air outlet of indoor unit is choked.



## CAUTION

- When the protection equipment starts, please shut down the manual power switch, and restart operation after problem is solved.

## 2.9 Mishandling in operation

If mishandling happens because of lighting or mobile wireless, please shut off the manual power switch, and turn on again, then push the ON/OFF button.

## 2.10 About power cut

- If power is cut during operation, stop all the operation immediately.
- Power comes again. The lamp on the display panel of indoor unit flashes. And then unit will auto-restart.

## 3. REINSTALLATION



## CAUTION

- A/C installation should comply with the regulations in GB17790-2008 and the requirements in Installation manual.
- When moving the A/C to another place, install the unit according to Installation manual by a specialized person.
- Improper installation could lead to electric shock or fire.



### 3.1 Users' instruction

1. Users should use the certified power supply corresponding to the A/C nameplate, actual voltage should be within 90%~110% of the rated voltage.
2. RCCB and air switch should be installed in the power supply circuit, the capacity should be 1.5 times of A/C maximum current value. Be sure to use specialized circuit.
3. Use specified fuse or RCCB under installation manual.
4. Wiring operations should be applied by electricians, and must comply with electrical appliance safety regulations.
5. Make sure the A/C has been grounded wiring properly. The main switch of A/C must reliably ground wiring.
6. If the power supply cable needs to be change, please contact our A/C customer service center or special technology service department to operate by a specialized person.

### 3.2 Installation position

#### 1. Do not install the unit in such places

- 1) Don't install it in the place where TV, stereo phonographs and radio distance the unit less than 1m, noise made by A/C could affect those appliances.
- 2) Don't install high frequency equipment near the unit, (e.g. commercial sewing machine or massager), or the A/C may fail.
- 3) Do not place items which might be damaged by moisture under the indoor unit.
- 4) Don't install it in a salty place, such as nearby the sea.
- 5) Do not install the air conditioner at any place where flammable gas may leak out.
- 6) Don't install it in the place where there's strong wind, e.g. seashore, roof or high floor of a tall building.
- 7) Don't install it nearby a hot spring where sulfur gas leaks.
- 8) Don't install it in the ship or a moving crane.

#### 2. For the detailed requirements, please go over Installation Manual

For the detailed information, please refer to Installation manual.



## CAUTION

- Please install the unit securely or abnormal noise and vibration will be heard.
- Install the outdoor unit where operation noise and discharged air couldn't affect neighbours.



## 4. MAINTENANCE

### 4.1 Confirmation before operating

1. Make sure if the ground wire is broken or fall off.
2. Make sure if a air strainer has been installed.
3. Start the power supply switch 12 hours before operating.

### 4.2 NON-A/C errors

1. For common protections, please refer to indoor unit operation manual.
2. For NON-A/C errors, please refer to indoor unit operation manual.

### 4.3 Error information and code

If the following situation happens, please stop the unit and cut off the power supply and contact with local customer service center.

Table 4-1

Display	Code	Malfunction or Protection	Remarks
1	E0	Outdoor unit COMM.Error	
2	E1	Phase protection	
3	E2	COMM.Error with indoor unit	In or after 20min,communication breaks 2 times for the first time to electrified
4	E4	Outdoor Temp. sensor error	
5	E5	Voltage protection	
6	E7	Discharge sensor error	If discharge temp. is below 15°C for 5 min after 10 minutes operating, displays E7, when GAS is higher than 25°C, it recovers
7	E8	Outdoor unit address error	
8	xE9	Wrong drive model	X represents in which system, 1 is system A, 2 is system B
9	EA	5-min protection in A zone(heating fan)	
10	xH0	COMM. Error between IR341 and main chip	X represents in which system, 1 is system A, 2 is system B
11	H1	COMM. Error between 0537 and main chip	
12	xH4	3 times of P6 protection in 60 munites	X represents in which system, 1 is system A, 2 is system B, Not recoverable until re-power on
13	H5	3 times of P2 protection in 60 munites	Not recoverable until re-power on
14	H6	3 times of P4 protection in 100 munites	Not recoverable until re-power on
15	H7	Qty.of indoor units decreases error	Indoor unit lost for over 3 munites; not recoverable,until the unit qty. recover
16	H9	3 times of P9 protection in 60 minutes	Not recoverable until re-power on
17	dF	Defrosting	
18	d0	Oil returning	
19	P1	High pressure protection or discharge temperature switch protection	
20	P2	Low pressure protection	
21	xP3	Compressor current protection	X represents in which system, 1 is system A, 2 is system B
22	P4	High discharge Temp.Protection	
23	P5	High condenser Temp.Protection	
24	xP6	Inverter module protection	X represents in which system, 1 is system A, 2 is system B
25	P9	DC fan protection	
26	PE	Evaporator T2 high temp. protection	
27	PL	The Temp.protection of inverter module	
28	C7	3 times of PL protection in 90 minutes	Not recoverable until re-power on
29	xL0	DC compressor module error	X represents in which system, 1 is system A, 2 is system B
30	xL1	DC bus low pressure protection	X represents in which system, 1 is system A, 2 is system B
31	xL2	DC bus high voltage protection	X represents in which system, 1 is system A, 2 is system B
32	xL4	MCE malfunction/simultaneously/cycle loop	X represents in which system, 1 is system A, 2 is system B
33	xL5	Zero speed protection	X represents in which system, 1 is system A, 2 is system B
34	xL7	Compressor wrong phase protection	X represents in which system, 1 is system A, 2 is system B
35	xL8	Compressor speed difference in one second more than 15rps	X represents in which system, 1 is system A, 2 is system B
36	xL9	Compressor speed difference between setting speed and running speed more than 15rps	X represents in which system, 1 is system A, 2 is system B

If the problem still existing, please contact the sales distributor or the service center, tell us your model No. and the detail of the error.



## CAUTION

---

Please do not change the power supply by yourself in case of danger; and do not fix the air-conditioner by yourself.

---

### 4.4 Cleaning



## WARNING

---

- Stop the unit and cut off the power before cleaning for safety's sake.
  - Pay attention to T1 thermal bulb when cleaning. DO NOT drop T1 thermal bulb cable, or dismantle it before cleaning and reinstall after cleaning.
- 

#### 1. Outdoor units

- 1) Some metal edges and condenser blades are very sharp, improper operation could lead injury. Therefore, be extremely careful when cleaning these parts.
- 2) Inspect outdoor unit air outlet and inlet regularly, to check if they are blocked by dirt or lampblack.
- 3) Window-shade at right bottom side and back side are heat dissipation air inlet of electric control components, clean it regularly to avoid super hot in the components.

2. For detailed information about cleaning, please refer to Indoor unit operation manual.

### 4.5 Maintenance



## CAUTION

---

After leaving unused for a long time, inspect the air inlet and air outlet port of indoor and outdoor unit. See if it has been blocked, if it is blocked, do cleaning immediately

---

**Before a long-time idling, please do the following work:**

1. Choose "air supply mode" and leave the indoor unit operates for a while for drying.
2. Cut off the power supply and stop the RCCB. Take battery out of the remote control.
3. Outdoor unit internal components should be inspected and cleaned regularly, please contact the service center or technical services department.

### 4.6 After-sale service

When the air-conditioner can't operate normally, please stop the unit and cut off the power supply. Please contact the service center or technical services department. For the detailed items, please refer to Users' guide in accessory.

Page intentionally left blank

**CLIVET SPA**

Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy  
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

**CLIVET UK LTD (Sales)**

4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom  
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - info@clivet-uk.co.uk

**CLIVET AIRCON LTD (Service and Maintenance Division)**

Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom  
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - info@clivetaircon.co.uk

**CLIVET ESPAÑA COMERCIAL S.L. (Sales)**

Calle Gurb, 17 1º 1ª - 08500 Vic, Barcelona - España  
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivetcomercial.com

**CLIVET ESPAÑA S.A.U. (Service and Maintenance Division)**

Calle Real de Burgos Nº 12 - 28860 Paracuellos del Jarama, Madrid - España  
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

**CLIVET GmbH**

Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany  
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

**CLIVET RUSSIA**

Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia  
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

**CLIVET MIDEAST FZCO**

Dubai Silicon Oasis (DSO), High Bay Complex, Ind Unit No. 3, PO BOX 342009, Dubai, UAE  
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

**CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED**

4BA, Gundecha Onclave, Kherani Road - Sakinaka, Andheri (East) - Mumbai 400 072 - India  
Tel. +91 22 6193 7000 - Fax +91 22 6193 7001 - info.in@clivet.com

---

[www.clivet.com](http://www.clivet.com)  
[www.clivetlive.com](http://www.clivetlive.com)

A Group Company of

