



INTENSITY®

Refresh your life



VRF WATER COOLED

MDVS-252(8)W/DDN1, MDVS-280(10)W/DDN1, MDVS-335(12)W/DDN1.

Thank you very much for purchasing our air conditioner,
Before using your air conditioner, please read this manual carefully and keep it for future reference.

Caution: The manual is applicable for the cooling & heating and cooling only main unit. The cooling & heating indoor unit is applicable for the cooling & heating and the cooling only main unit; the heating capacity of the indoor unit will be effective only when the indoor unit connect to the cooling & heating main unit.

INSTALLATION MANUAL



intensity.mx



MAN-I-VRFWC-0216

CONTENTS

PAGE

PRECAUTIONS.....	1
CONSTRUCTION CHECKPOINTS.....	2
ACCESSORIES.....	3
MAIN UNIT INSTALLATION.....	4
WATER SYSTEM INSTALLATION.....	7
REFRIGERANT PIPE.....	12
ELECTRIC WIRING.....	17
TRIAL RUN.....	28

1. PRECAUTIONS

Precautions before reading the Installation manual.

- This Installation manual is for the main unit.
- Refer to the indoor unit Installation manual for indoor parts installation.
- Please read the power source unit Installation manual to install the power source unit.
- Please refer to the refrigerant distributor Installation manual to install the refrigerant distributor.

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.

After completing the installation, make sure that the unit operates properly during the start-up operation. Please instruct the customer on how to operate the unit and keep it trained. Also, inform customers that they should store this Installation manual along with the owner's manual for future reference.



WARNING

- **This air conditioner is a comfortable air conditioner, and it must be installed at indoor, do not place it in the places such as machine room, precise instruments, food, plants, animals or vertu etc.**
- **Be sure only trained and qualified service personnel to install, repair or service the equipment.**
Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.

- **Install according to this installation instructions strictly.**
If installation is defective, it will cause water leakage, electrical shock fire.
- **When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage.**
Contact the place of purchase for more information. Excessive refrigerant in a closed ambient can lead to oxygen deficiency.
- **Use the attached accessories parts and specified parts for installation.**
Otherwise, it will cause the set to fall, water leakage, electrical shock fire.
- **Install at a strong and firm location which is able to withstand the set's weight.**
If the strength is not enough or installation is not properly done, the set will drop to cause injury.
- **The appliance shall be installed in accordance with national wiring regulations**
- **The appliance shall not be installed in the laundry.**
- **Before obtaining access to terminals, all supply circuits must be disconnected.**
- **The appliance must be positioned so that the plug is accessible.**
- **The enclosure of the appliance shall be marked by word, or by symbols, with the direction of the fluid flow.**
- **For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used.**
If electrical circuit capacity is not enough or defect in electrical work, it will cause electrical shock fire.
- **Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal.**
If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
- **Wiring routing must be properly arranged so that control board cover is fixed properly.**
If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
- **If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or similarly qualified person in order to avoid a hazard.**
- **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**
- **When carrying out piping connection, take care not to let air substances go into refrigeration cycle.**
Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
- **Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances.**
Otherwise, it will cause fire or electrical shock.

- **Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes.**
Improper installation work may result in the equipment falling and causing accidents.
- **The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.**
- **The power cord type designation is H07RN-F.**
Equipment complying with IEC 61000-3-12.
- **If the refrigerant leaks during installation, ventilate the area immediately.**
Toxic gas may be produced if the refrigerant comes into the place contacting with fire.
- **After completing the installation work, check that the refrigerant does not leak.**
Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.



CAUTION

- **The cooling & heating indoor unit is applicable for the cooling & heating and the cooling only main unit; the heating capacity of the indoor unit will be effective only when the indoor unit connect to the cooling & heating main unit.**
- **This A/C is a kind of amenity unit. Don't install it at the place where for storing machine, precise instrument, food, plant, animal, artwork or any other special used occasion.**
- **Ground the air conditioner.**
Do not connect the ground wire to gas or water pipes, lightning rod or a telephone ground wire. Incomplete grounding may result in electric shocks.
- **Be sure to install an earth leakage breaker.**
Failure to install an earth leakage breaker may result in electric shocks.
- **Connect the main unit wires , then connect the indoor unit wires.**
You are not allowed to connect the air conditioner with the power source until wiring and piping the air conditioner is done.
- **While following the instructions in this Installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.**
Improper drain piping may result in water leakage and property damage.
- **Install the indoor and main units, power supply wiring and connecting wires at least 1 meter away from televisions or radios in order to prevent image interference or noise.**
Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.
- **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.**

- **Young children should be supervised to ensure that they do not play with the appliance.**
- **Don't install the air conditioner in the following locations:**
 - There is petrolatum existing.
 - There is salty air surrounding (near the coast). If this can't be avoided, choose a anticorrosive model.
 - There is caustic gas (the sulfide, for example) existing in the air (near a hot spring).
 - The Volt vibrates violently (in the factories).
 - In buses or cabinets.
 - In kitchen where it is full of oil gas.
 - There is strong electromagnetic wave existing.
 - There are inflammable materials or gas.
 - There is acid or alkaline liquid evaporating.
 - Other special conditions.
- **The insulation of the metal parts of the building and the air conditioner should comply with the regulation of National Electric Standard.**
- **The space is too narrow. Because there isn't enough space for installation and maintenance.**











2. CONSTRUCTION CHECKPOINTS

- **Acceptance and Unpacking**
 - After the machine arrives, check whether it is damaged during the shipment. If the surface or inner side of the machine is damaged, submit a written report to the shipping company.
 - Check whether the model, specification and quantity of the equipment conform to the contract.
 - After removing the outer package, please keep the operation instructions well and count the accessories.
- **Water pipeline connection**
 - The pressure endurance of the water system pipelines are 1.96 MPa.
 - The outer connecting pipelines of the water system should apply the stainless steel pipes, if not, that may cause corrosion.
 - The cooling water source of the water-ring system should prior to prefer closed cooling tower. The installer and user should make sure the cool and hot water quality which inlet to the water system of the unit (details please refer to Part 4-7).
- **Refrigerant pipe**
 - Check the model and name to avoid mistaken installation.
 - An additionally purchased refrigerant distributor (manifold adapter and manifold pipe) must be used for installing the refrigerant pipes.

- The refrigerant pipes must have the specified diameter. Nitrogen of a certain pressure must be filled into the refrigerant pipe before welding.
 - The refrigerant pipe must undergo heat insulation treatment.
 - After the refrigerant pipe is installed completely, the indoor unit cannot be powered on before performing the airtight test and creating a vacuum. The air-side and liquid-side pipes must undergo the airtight test and vacuum extraction.
- **Airtight test**
The refrigerant pipe must undergo the airtight test [with 3.9 MPa(40kgf/cm²) nitrogen].
- **Creating a vacuum**
Be sure to use the vacuum pump to create a vacuum of the connective pipe at the air side and liquid side concurrently.
- **Refrigerant replenishment**
- According the length & diameter of main & indoor unit (actual), and the refrigerant correction to calculate the refrigerant replenishment quantity. (the specific calculation method refer to the table on the cover of electrical control box)
 - Record the refrigerant replenishment quantity, actual length of pipe and the height difference of the indoor & main unit onto the operation confirmation table of the main unit in advance for future reference.
- **Electric wiring**
- Select the power supply capacity and wire size according to the design manual. The power cable of the air conditioner is generally thicker than the power cable of the motor.
 - In order to prevent misoperation of the air conditioner, do not interleave or entwine the power cable (220V 3N~60Hz) with the connection wires (low-voltage wires) of the indoor/main unit.
 - Power on the indoor unit after performing the airtight test and making a vacuum.
 - Through the ENC1 switch to set the address of main units . Setting Range : 0~2 . 0 is master unit ,the others are slave unit.
 - Setting the quantity of indoor units on the master unit after setting the address. The quantity of indoor units can be setted from S10 and ENC4 ,setting range :0~63 . 0&1 means one indoor unit .The detail information please refer to wiring nameplate.
- **Trial run**
- Perform the trial run only after the main unit has been powered on for over 12 hours.

3. ACCESSORIES

Table.3-1

Name	Qty.	Outline	Function
Main unit installation manual	1		_____
Main unit owner's manual	1		Be sure to deliver it to the customer
Indoor unit owner's manual	1		Be sure to deliver it to the customer
User's guideline	1		Be sure to deliver it to the customer
Bolts bag	1	_____	Stone for service
Toggling flathead screw	1	_____	For toggling of indoor and main units
Water outlet connector	1		For draining the internal condensed water of the unit
Water outlet plug	1		Block a drainage port of the unit chassis which do not need to drainage
Seal ring	2		For avoiding water leakage of the chassis
Seal plug	8	_____	For pipe Cleaning
Y-shape water filter	1		Connect to the side of water inlet pipe
Indoor unit branch pipes installation manual	1	_____	_____
Main unit branch pipes installation manual	1	_____	_____
Connective pipe accessory	1		Connect to the side of liquid pipe
Air side connective pipe	1 or 2		Connect to the side of air pipe (8/10 HP 1pc, 12HP 2pcs)

4. MAIN UNIT INSTALLATION

4.1 Main unit combination

Table.4-1

HP	Mode	Qty.of indoor unit	HP	Mode	Qty.of indoor unit
8	8HP×1	13	24	12HP×2	39
10	10HP×1	16	26	8HP×2+10HP	43
12	12HP×1	19	28	10HP×2+8HP	46
16	8HP×2	23	30	10HP×3	50
18	10HP+8HP	29	32	10HP×2+12HP	53
20	10HP+10HP	33	34	12HP×2+10HP	56
22	10HP+12HP	36	36	12HP×3	59

4.2 Dimension of main unit

(unit:mm)

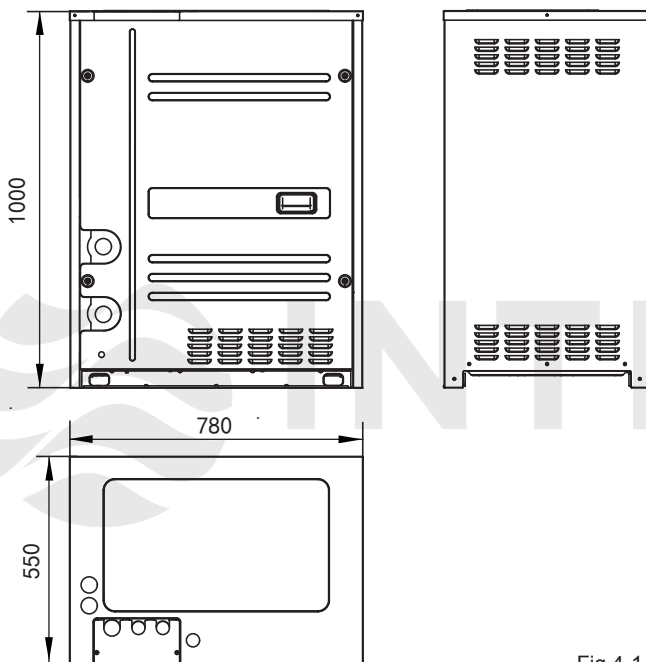


Fig.4-1

4.3 Selecting installation position

- Ensure that the main unit is installed in a place convenient to connect water, refrigerant and electricity.
- Ensure that the noise and exhaust ventilation of the main unit do not affect the neighbors of the property owner or the surrounding ventilation.
- Ensure that the main unit is installed in a well-ventilated place that is possibly closest to the indoor unit.
- Ensure that the main unit is installed in a cool place without direct sunshine exposure or direct radiation of high-temp heat source.
- Do not install the main unit in a dirty or severely polluted place, so as to avoid blockage of the heat exchanger in the main unit.
- Do not install the main unit in a place with oil pollution, salt or high content of harmful gases such as sulfurous gas.

4.4 Hoisting Main Unit

- It is banned to take wooden cork base as the force bearing point of lifting up the unit during hoisting, the correct method is use the braces or lifting ropes which can bear the unit's weight, and go through the lifting holes of the front and back bottom plates in the unit for hoisting.
- It is banned to tear down any packages during hoisting installation; it should use two longer than 4m ropes to lift up the unit with the packages, and keep the unit in balance, lift it up stably. Under transporting the unit with no packages or the package has been damaged, it should use base plate or packaging materials for protection.
- Pay attention to keep the main unit vertical during transportation, hoisting, and make sure the safety during transportation and hoisting.

4.5 Base for main unit

- A solid, correct base can:
 - Avoid the main unit from sinking.
 - Avoid the abnormal noise generated due to base.
- Base types
 - Steel structure base
 - Concrete base (see the figure below for the general making method)

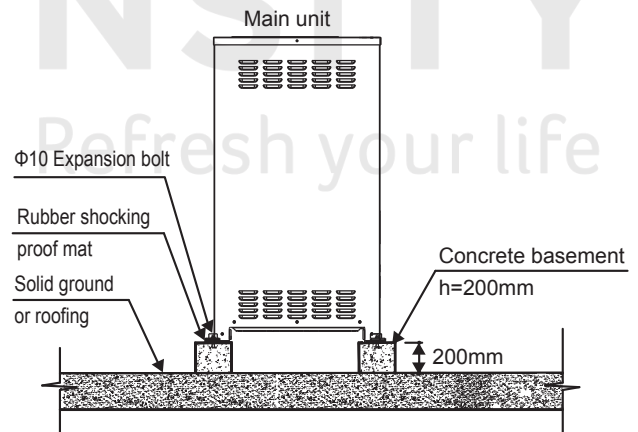


Fig.4-2



CAUTION

- The key points to make basement:
 - The master unit's basement must be made on the solid concrete ground . Refer to the structure diagram to make concrete basement in detail, or make after field measurements.
 - In order to ensure every point can contact equality, the basement should be on completely level.
 - If the basement is placed on the roofing, the detritus layer isn't needed, but the concrete surface must be flat. The standard concrete mixture ratio is cement 1/ sand 2/ carpolite 4, and add Φ10 strenthen reinforcing steel bar, the surface of the cement and sand plasm must be flat, border of the the basement must be chamfer angle.

- Before construct the unit base, please ensure the base is directly supporting the rear and front folding edges of the bottom panel vertically, for the reason of these edges are the actual supported sites to the unit.
- In order to drain off the seeper around the equipment, a discharge ditch must be setup around the basement.
- Please check the affordability of the roofing to ensure the load capacity.

Centering position illustration of each connective pipe (Unit: mm)

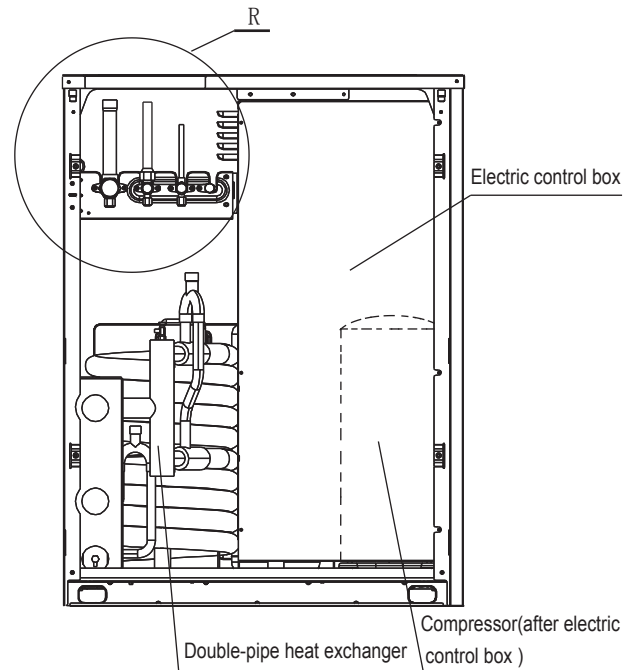


Fig. 4-4

■ Position illustration of screw bolt (Unit: mm)

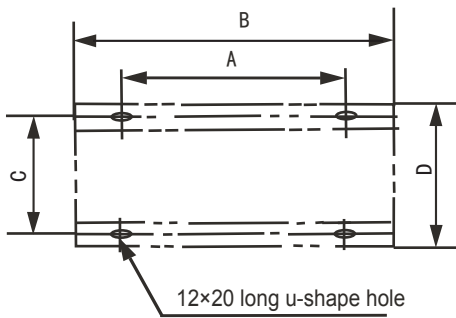


Fig. 4-3

Table.4-2 Unit: mm

HP SIZE	8,10, 12
A	650
B	780
C	518
D	550

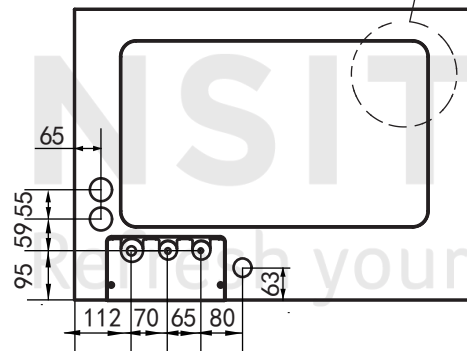


Fig. 4-5

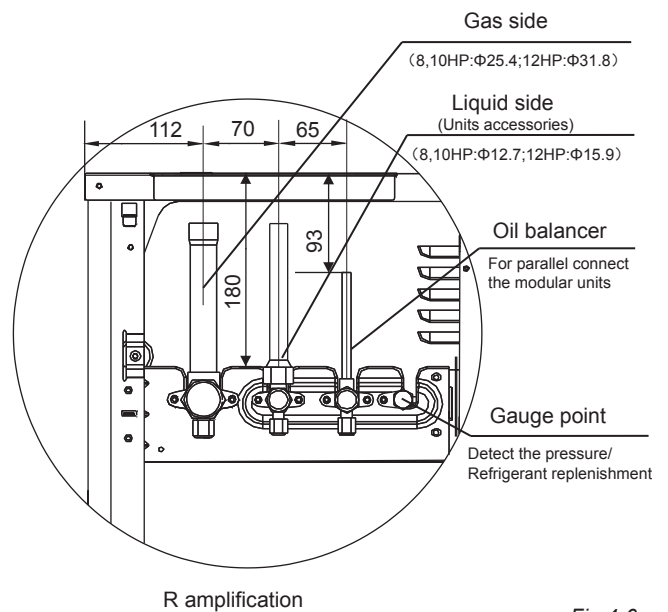


Fig. 4-6

4.6 Main units' placement sequence & master and slave units' settings

A system, which provide with more than two main units, will be set as the followings method: The main units in this system should place sequentially from the large to the small capacity; the largest capacity main unit must be mounted at the first branching site; and set the largest capacity main unit address as the master Unit, while the other setting as the Slave Unit. Take 18HP (composed by 10HP, 8HP) as an example:

- 1) Place the 10HP at a side of the first branching site.
- 2) Place the unit from the large capacity to the small (See the detail placement illustration).
- 3) Set 10HP as the master unit, while the 8HP as the aux. unit.

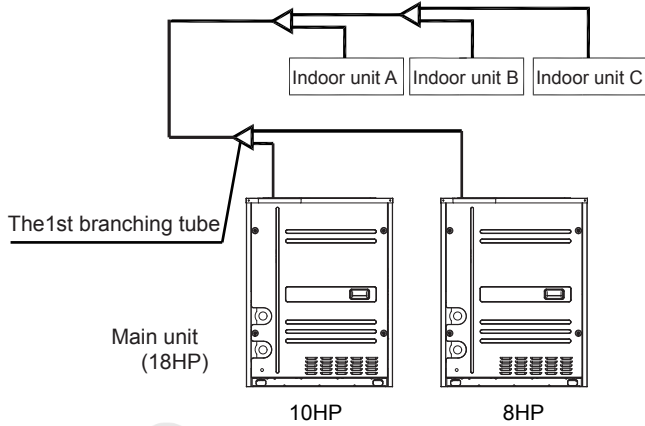


Fig.4-7

4.7 Installation space for main unit

- Ensure enough space for maintenance. The modules in the same system must be on the same height.
- When installing the unit, leave a space for maintenance. Install the power supply at the side of the main unit. For installation procedure, see the power supply device Installation manual.
- Installation space of single main unit

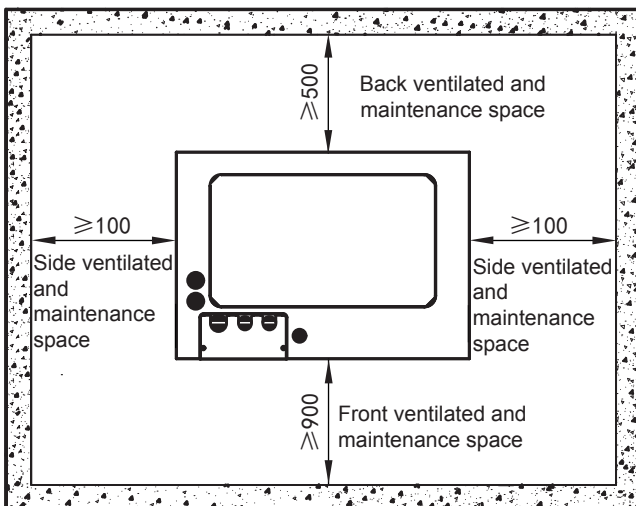


Fig.4-8

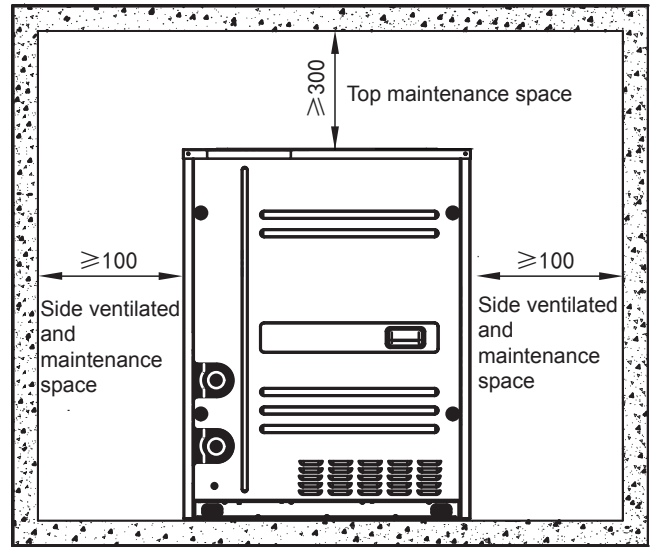


Fig.4-9

■ Installation space of several main units

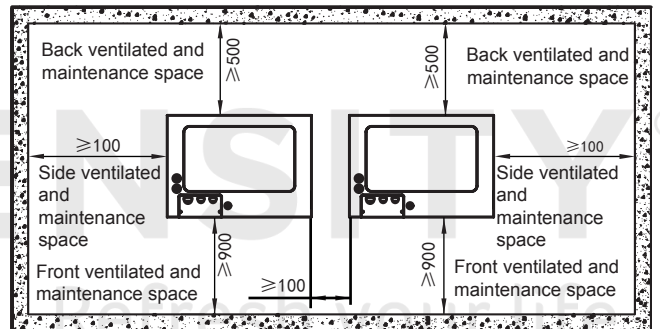


Fig.4-10



CAUTION

When install several main units, please reserve the top maintenance space as the single main unit installation.

5. WATER SYSTEM INSTALLATION

5.1 Basic requirements of connection of chilled water pipes



CAUTION

- After the unit is in place, chilled water pipes can be laid.
- The relevant installation regulations should be abided with when conducting connection of water pipes.
- All water pipes must conform to local rules and regulations of pipeline engineering.
- The size of water pipe should be the same as or larger than the connector size of the unit (DN32).
- The heat exchanger of the unit is double-pipe heat exchanger. There are different operation and maintenance methods between the double-pipe heat exchanger double-pipe heat exchanger and the other heat exchangers.

- 1) All connected water pipes should be thoroughly flushed, and can not be cleaned after connected to the double-pipe heat exchanger of the unit, for in case any impurity been flushed into the heat exchanger. After connection, all the water pipes should be washed down, and no any impurity left.
- 2) Water must enter the double-pipe heat exchanger through the inlet; otherwise the performance of the unit will decline.
- 3) The inlet pipe of each double-pipe heat exchanger in the unit must be provided with a water flow switch, to realize flow-break protection for the unit. Both ends of the water flow switch must be supplied with horizontal straight pipe sections whose diameter is 5 times that of the inlet pipe. The water flow switch must be installed in strict accordance with "Installation & Regulation Guide for Water Flow Switch" (See Section 4-5). The wires of the water flow switch should be led to the electric cabinet through shielded cable (see Electric Wiring section for details). After the pipelines are installed, the water flow switch will be set properly according to the rated water flow of the unit.
- 4) The pump installed in the water system should be equipped with starter and should be controlled by the unit. The unit only supplies the on, off controlling signal of water pump, and do not supply the power for the water pump.
- 5) The pipes and their ports must be independently supported but should not be supported on the unit.
- 6) The pipes and their ports of the double-pipe heat exchanger should be easy to disassemble for operation and cleaning, as well as inspection of port pipes of the evaporator.
- 7) The inlet of the double-pipe heat exchanger should be provided with a water filter with more than 40 meshes per inch (in the accessories). The filter should be installed near to the inlet port as much as possible, and be under heat preservation. Periodically clean the water filter according to the blocking condition of the filter.
- 8) The flexible connectors must be mounted between the double-pipe heat exchangers and the on-site pipes, to reduce transfer of vibration to the building.
- 9) To facilitate maintenance, the inlet and outlet pipes should be provided with thermometer or manometer. The unit is not equipped with pressure and temperature instruments, so they need to be purchased by the user.

- 10) All low positions of the water system should be provided with drainage valves, to drain water in the heat exchanger of water side and the system completely; and all high positions should be supplied with discharge valves, to facilitate expelling air from the pipeline. The discharge valves and drainage valves should not be under heat preservation, to facilitate maintenance.
- 11) All possible water pipes in the system to be chilled should be under heat preservation.
- 12) When the unit will be not used for a long time, water inside the unit should be drained and cut off the power. If the unit is not drained in winter, then the double-pipe heat exchanger and the water pipes system of the unit might be freezing and cracking under low temperature.
- 13) The rated water flow volume of different models are as follow:

Table.5-1

Model	Rated water flow volume(m ³ /h)
8HP	5.4
10HP	6.0
12HP	7.2



WARNING

- The water pipes network including water filters and heat exchangers should be periodically cleaned, otherwise, dreg or dirt may seriously damages the heat exchangers and water pipes.
- The installation persons or the users must ensure the quality of chilled water, and de-icing salt mixtures and air should be excluded from the water system, since they may oxidize and corrode steel parts inside the heat exchanger.

5.2 Positions of water inlet, outlet and drainage port

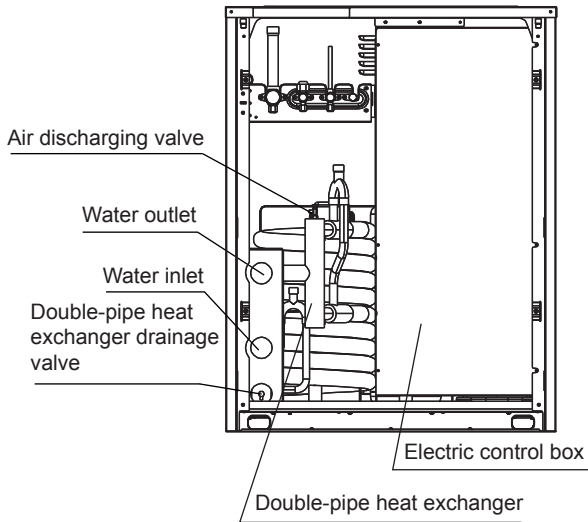


Fig. 5-1

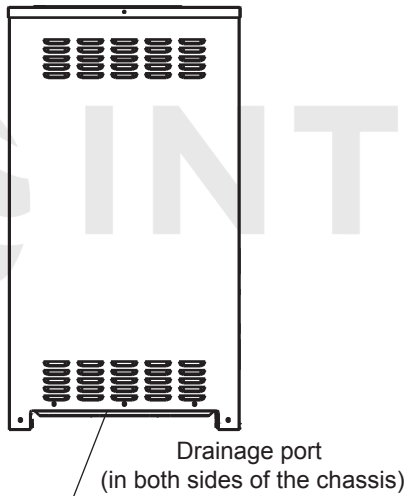


Fig. 5-2

5.3 Installation of drainage port connecting pipes

According to the field installation condition, it is selected the side which is draining easily for installing the drainage port connecting pipes. During installation, the seal ring should be put on the water outlet connector, then install into the drainage hole in the chassis from the bottom of the unit, and then rotate 90°, to make it firmly assembled. And connect a drainage pipe (commercially available) with the water outlet connector, for draining the condensed water of the main unit out to the suitable place.

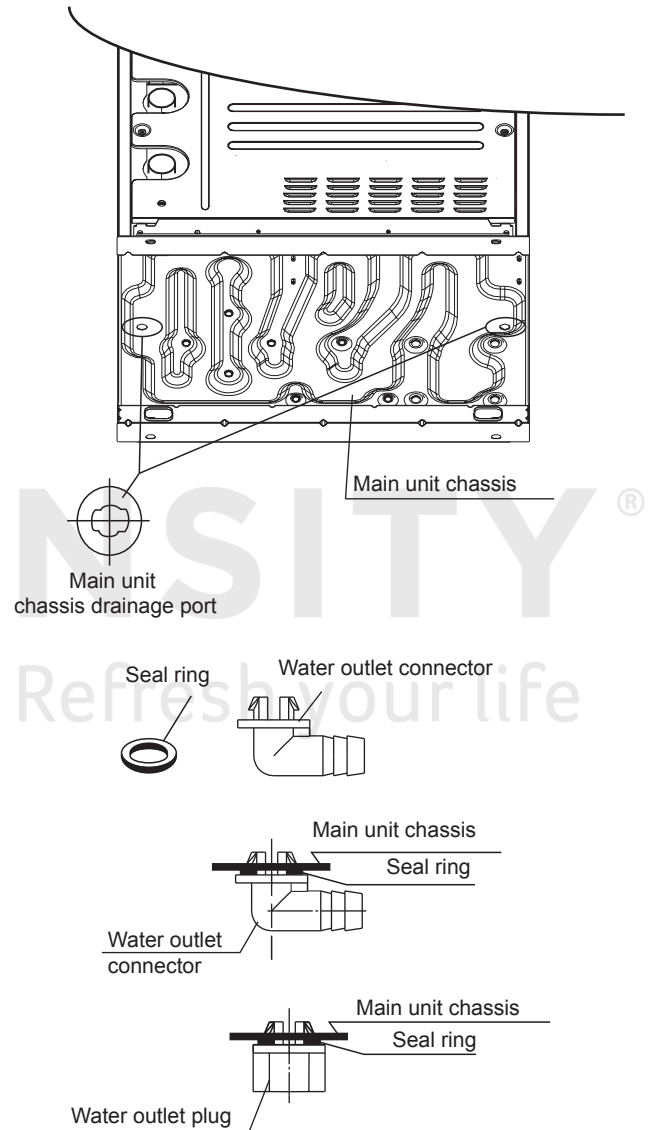


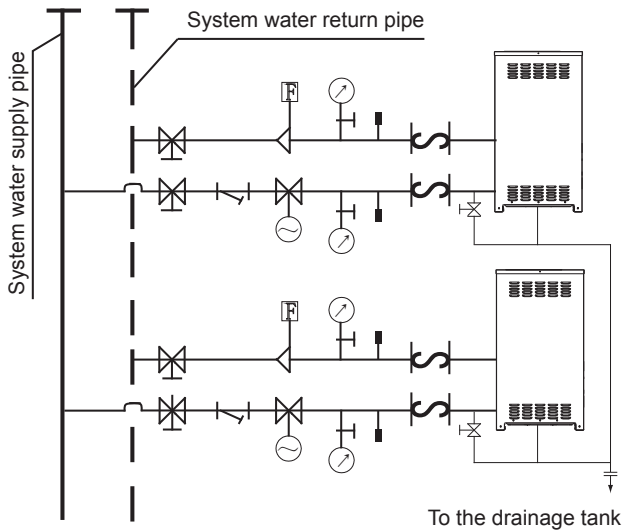
Fig. 5-3



WARNING

It is needed to block the water outlet in the side which do not need to be connected with drainage pipes with water outlet plug and seal ring (see Fig. 5-3), otherwise the condensed water produced during the system operation will drain near the installation place, to cause inconvenience.

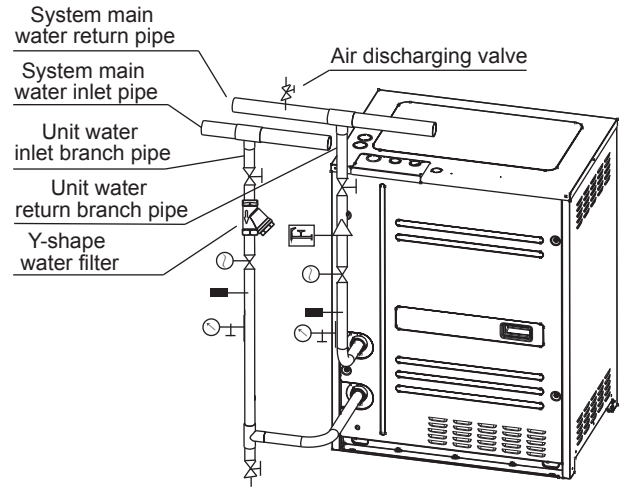
5.4 Installation of the main unit water pipelines



Symbols description:

	Gate valve		Y-shape filter
	Pressure gauge		Thermometer
	Water flow switch		Motorized valve
	Flexible connection		Drainage valve

Fig. 5-4 Main unit side water pipelines connecting figure (Recommended)



Symbols description:

	Gate valve		Thermometer
	Pressure gauge		Motorized valve
	Water flow switch		Drainage valve

Fig.5-6

As the above figure 5-6, when horizontal installing the water system main water inlet pipe and main water return pipe, the water inlet branch pipe and water return branch pipe which connected with the unit must be separate connected from the vertically lower direction of main water inlet pipe and main water return pipe; if connected from the side direction and the top direction will affect the unit performance.

5.5 Installation & regulation guide for water flow switch

5.5.1 Please carefully check flow switches before conducting installation of the water flow switch. Packing should be in good condition, and the appearance should be free of damage and deformation. If any problem, please contact the manufacturer.

5.5.2 Flow switches can be installed in the horizontal pipeline or the vertical pipeline with upward flowing direction but cannot be mounted in the pipeline with downward flowing direction. The inlet water of gravity should be taken into account when flow switches are installed in the pipeline with upward flowing direction.

5.5.3 Water flow switch must be installed on a section of straight-line pipeline, and its both ends must be supplied with straight-line pipes whose length is at least 5 times diameter of the pipe. In the meanwhile, the fluid flowing direction in the pipeline must be consistent with the direction of arrow on the switch. The connection terminal should be located where wiring connection can be easily done. (Fig.5-7).

5.5.4 Pay attention to the following items when conducting installation and wire connection:

- 1) Collision of the wrench with the soleplate of the flow switch is prohibited, since such collision may cause deformation and failure of the flow switch.
- 2) To avoid electric shock and damages to the devices, the power supply should be cut off, when wires are connected or adjustment is done.

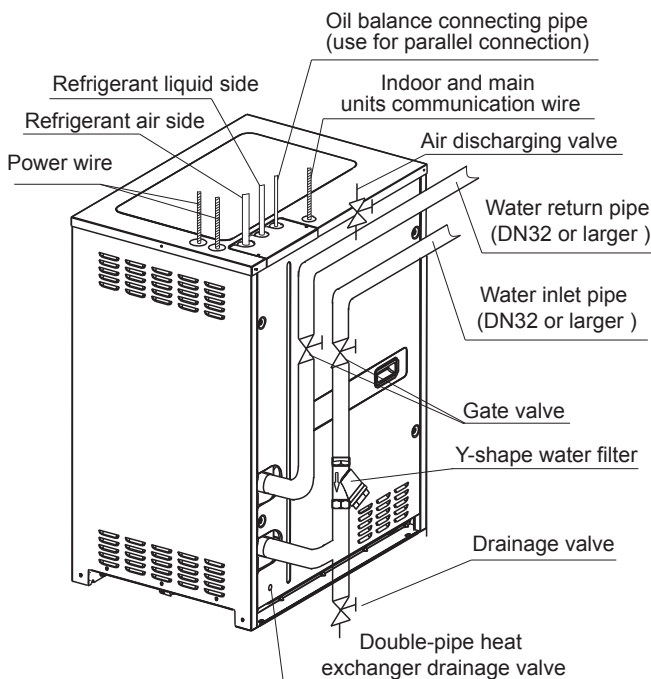


Fig.5-5 Direction schematic diagram of water system pipes

- 3) When wiring connection is conducted, adjustment of other screws except connection terminals of micro switches and ground screws is prohibited. In the meanwhile, over great force should not applied when wires of micro switches are connected, otherwise micro switches may suffer displacement, thus leading to failure of flow switches.
- 4) Special grounding screws should be used for earth connection. Bolts should not be installed or removed at will; otherwise flow switches may suffer deformation and failure.
- 5) Flow switches have been set at minimal flow value prior to ex-factory. They should not be adjusted below the ex-factory setting value, or they may suffer failure. After installing flow switches, please press the flow switch lever several times to check them. When the lever is found not to respond with "clatter", rotate the screw in a clockwise direction, until "clatter" occurs.
- 6) Be sure to determine the model of target slice according to the rated flow of the unit, the diameter of the outlet pipe and the adjustment range of the target slice of the flow switch. Besides, the target slice should not contact with other restrictors in the pipeline or on the inner wall of the pipeline, or the flow switch cannot be reset normally.

5.5.5 Determine whether the flow switch and the system connected with it are in good operation according to the measured value by flow meter, namely, when the measured value on flow meter is less than 50% of rated water flow of the unit, the water flow controller should be cut off and observed for 3 working periods, and it should be covered with flow switch shell timely.

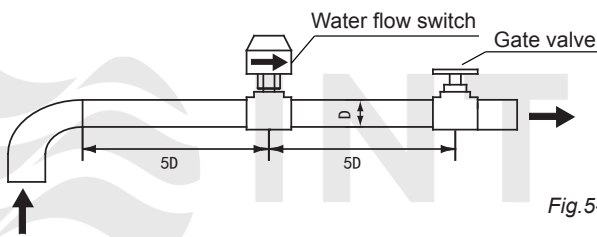


Fig.5-7

5.6 Operations and maintenance of double-pipe heat exchanger

5.6.1 Operations of double-pipe heat exchanger

- 1) Please note that correctly install the water inlet and outlet pipes. The thread of water inlet and outlet are inner thread G1-1/4.
- 2) For the double-pipe heat exchanger is internal thread copper pipe, and for avoiding the impurities enter into and affect the performance then cause corrosion of the double-pipe heat exchanger, it must be installed the water filter (accessory) near the water inlet pipes of the unit.
- 3) Please use water pipes which conform to local rules and regulations of pipeline engineering. The size of water pipe should not smaller than the connector size of the unit (DN32). Periodically clean the water filter according to the water quality situation and the blocking condition of the filter.
- 4) Otherwise, it might damage the filter screen of the water filter because of the abnormal pressure.
When the unit will be not used for a long time in winter, water
- 5) inside the double-pipe heat exchanger and the water pipes should be drained out in case for being frozen. The water inside the double-pipe heat exchanger can be drained out by its drainage valve, the drainage valve position as Fig.5-1 display. The user can take down the front plate and open the drainage valve for water draining, and also can without taking down the front plate then use a straight screwdriver to go through the small hole in the front plate and open the drainage for water draining, the small hole position as Fig.5-5 display.

- 6) According to the different water quality the situations of double-pipe heat exchanger and water system pipelines are different. For removing the scale, it is needed to periodically clean the double-pipe heat exchanger and water system pipelines. It is suggested that set isolating valves in the suitable places during water system installation and it is convenient to connect the cleaning system for cleaning.

5.6.2 Double-pipe heat exchanger cleaning

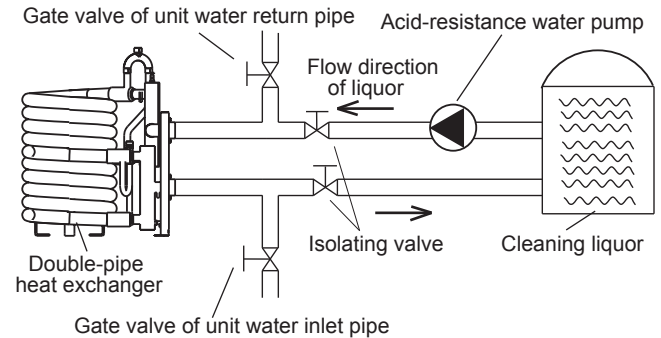


Fig.5-8 Cleaning system schematic diagram of double-pipe heat exchanger

5.6.2.1 Preparation of cleaning liquor

- 1) The material of water side double-pipe is red copper, and for general corrosion situation it is suggested that use the pickle liquor with 5% oxalic acid, 1.2% buffer and 0.8% surfactant, and the temperature should be controlled in 60°C, that will has perfect cleaning effect.
- 2) If use hydrochloric acid as the cleaning liquor, for avoiding to the corrosion and shorten the working life of the heat exchanger, it should limit the concentration of the hydrochloric acid to be 3%~5%, and add corrosion inhibitor with 0.2%~0.3% concentration. When it is cleaning, pay attention to the PH value change, when the PH=8, then stop cleaning immediately. Then change to fresh water for cleaning.

5.6.2.2 Cleaning method:

- 1) Before connecting to the cleaning system, it must stop the unit operation, close the circulating water pump of water system, and close the gate valves in inlet and outlet water return pipes.
- 2) Correctly connect the cleaning system as the above figure 5-8, make the cleaning liquor counter flush the double-pipe heat exchanger (opposite the general flow direction).
- 3) Acid cleaning: After make sure it will not leak water, and then open the water pump to make the double-pipe heat exchanger fill with acid liquor, and close the water pump, and then let the double-pipe heat exchanger static state for 2h. And open the water pump continuously dynamic loop for 3~4h. During that every 0.5h, it is done both side alternative cleaning. During the acid cleaning, it should timely do sampling test for acid concentration, if the continuous twice testing concentration difference is lower than 0.2%, which means the acid cleaning finish reaction. Put the waste liquor to the waste liquor tank.
- 4) Neutralization: After acid cleaning, use NaOH, Na₃PO₄ and soften liquid mixed accord to some proportion, and use dynamic loop to alkali cleaning for the heat exchanger, in order to alkalis counteract acids. Drain the waste liquor to the waste liquor tank.
- 5) Water cleaning: After alkali cleaning, use clean soften liquor repeatedly wash the heat exchanger for 0.5h, thoroughly wash the heat exchanger. Then drain the waste liquor to the waste liquor tank.
- 6) Passivating treatment : Expose the double-pipe heat exchanger in the air for 3~4h, or blow for 2h with high pressure air. Make the pipe surface form a oxidation passivating layer.

- 7) After cleaning, close the isolating valve, and take down the cleaning system devices and keeping properly for backup.
- 8) Please contact the waste liquor treating company to treat the collected waste liquor.
- 9) Connect the unit water system as the state before cleaning, thoroughly check the unit and assist devices whether work normally. Make sure there is no abnormal situation then re-operates the unit.



WARNING

- The cleaning liquor flow direction must be correctly connected.
- Because different water quality and different using situations of the heat exchanger, the cleaning period and method will be big different, the above method is only for reference.
- The double-pipe heat exchanger is internal thread red copper pipe, so that it can not use nitric acid as cleaning agent!
- The cleaning liquor and neutralization will be irritated and corrosive to human eyes and skin, so please do well protection measurements during the cleaning.
- It is strongly suggested that the user calls for professional cleaning company to do component analysis of the water quality and scale, and make a effective cleaning solution and method, then do the cleaning.

5.7 System water quality requirements and management

- 5.7.1 The unit water system must select the closed cooling tower.
- 5.7.2 Circulating Chilled Water Processing Design Standard, other index also should meet with the Table.5.2.
- 5.7.3 It should periodically to detect and handle the chilled water quality in the water system. When handling the water, please make sure with the water dealing person to confirm that use any water scale inhibitor and antiseptic agent etc. will not have corrosion to the stainless steel and copper products.

Table.5-2

ITEMS	CONCENTRATION (mg/L)
Chromaticity	≤15, and can not display other colors
Turbidity NTU	≤1
Smell	None
Visible objects	None
PH Value	7.5~9
Total hardness (Take CaCO ₃ for calculation)	≤200
Fe	<0.5
AL	<0.2
Mn	<0.1
Cu	<0.2
Zn	≤0.1
Alkalinity concentration(HCO ₃ ⁻)	70~300
Sulfate radical (SO ₄ ²⁻)	<70
HCO ₃ ⁻ /SO ₄ ²⁻	>1
Conductivity	10~500 μs/cm(20°C)
NH ₃	<0.1
CL ⁻	<100
Chlorine	<1
H ₂ S	<0.05
Free carbon dioxide (CO ₂)	<5
Nitrate radical (NO ₃ ⁻)	<100
Suspended matter	≤20
Soluble solid	500~1000
Oxygen consumption (Take O ₂ for calculation)	≤3
Ammonium ion (NH ₄ ⁺)	<1
SiO ₂ (Ion state)	<50

6. REFRIGERANT PIPE

6.1 Length and drop height permitted of the refrigerant piping

Table.6-1

		Permitted value	Piping
Pipe length	Total pipe length (Actual)	300m (Note1)	$L1+(L2+L3+L4+L5+L6+L7+L8+L9) \times 2+a+b+c+d+e+f+g+h+i+j$
	Maximum piping (L1)	Actual length	$L1+L5+L8+L9+j$
		Equivalent length	150m
Piping (farthest from the first line pipe branch) equivalent length(L2)		40m(90m,Note2)	$L5+L8+L9+j$
Drop height	Indoor unit-main unit drop height	Main unit up	H=50m
		Main unit down	H=40m
	Indoor unit to indoor unit drop height	h=30m	—

Note: 1.Reduced length of the branching tube is the 0.5m of the equivalent length of the pipe.

2. When the conditions following as table. 6-2 are all metted, the allowable length can be extended to 90m.

Table.6-2

No.	Permitted value	Examples	Piping
1	The size of indoor unit main pipe should be bigger than the indoor unit aux. pipe. The indoor unit main pipe needn't increase when it is equal to main pipe .	L2~L9 need to increase the pipe diameter . $\phi 9.52 \rightarrow \phi 12.7$ $\phi 12.7 \rightarrow \phi 15.9$ $\phi 15.9 \rightarrow \phi 19.1$ $\phi 19.1 \rightarrow \phi 22.2$ $\phi 22.2 \rightarrow \phi 25.4$ $\phi 25.4 \rightarrow \phi 28.6$ $\phi 28.6 \rightarrow \phi 31.8$ $\phi 31.8 \rightarrow \phi 38.1$ $\phi 38.1 \rightarrow \phi 41.3$	
2	The length of indoor unit aux. pipe is no longer than 40m.	a,b,.....j $\leq 40m$.	
3	The distance difference between [the main unit to the farthest indoor unit] and [the main unit to the nearest indoor unit] is $\leq 40m$.	If the farrest indoor unit is N10, the nearest indoor unit is N1, i.e.(L1+L5+L8+L9+j) - (L1+L2+L3+a) $\leq 40m$.	Reference Fig.6-1 .

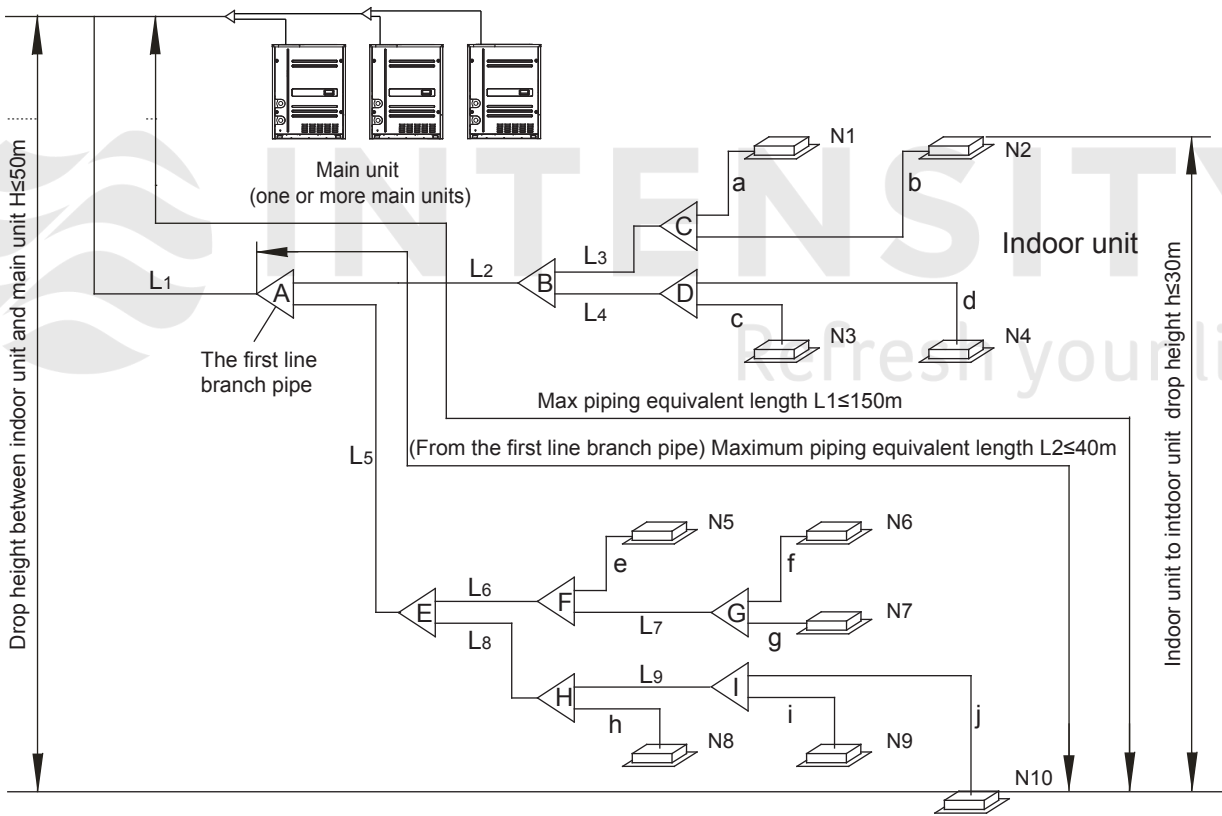


Fig.6-1

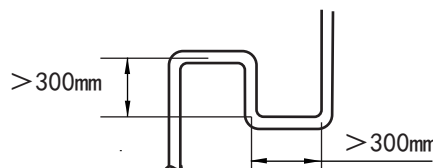


Fig.6-2



CAUTION

- Indoor units should be placed as equally as possible at the both sides of the U-shape branch pipe.
- When the main unit is over 20m from the above places, it is recommended to set a return oil bending every 10m of the air pipe in the main pipe, the return oil bending specification is as Fig. 6-2.

6.2 Select the refrigerant piping type

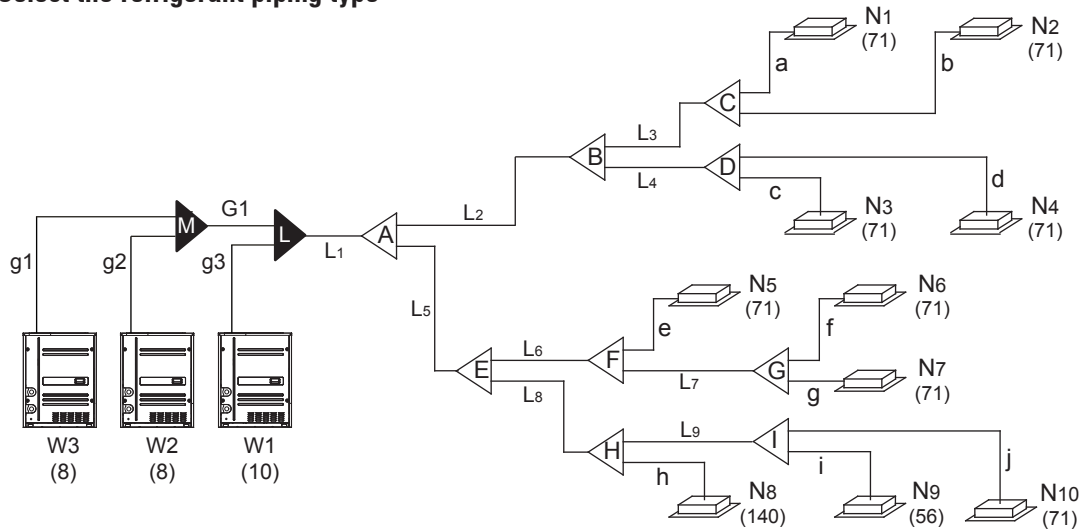


Fig.6-3

Table.6-3

Pipe name	Code (As per the Fig. 6-2)
Main pipe	L1
Indoor unit main pipe	L2~L9
Indoor unit aux. pipe	a, b, c, d, e, f, g, h, i, j
Indoor unit branching pipe assembly	A, B, C, D, E, F, G, H, I
Main unit branching pipe assembly	L, M
Main unit connective pipe	g1, g2, g3, G1

6.4 Size of joint pipes for main unit

Base on the following tables, select the diameters of the main unit connective pipes. In case of the main accessory pipe large than the main pipe, take the large one for the selection.

Example: parallel connect with the three main units 10+10+8 (the total capacity is 28HP), all indoor units total capacity is 812, provided that the equivalent length of all pipes are $\geq 90\text{m}$, according to the Table 6-6 the main pipe diameter are $\Phi 31.8/\Phi 22.2$; in according to all indoor unit capacity 1360, we could find out the master unit diameter is $\Phi 31.8/\Phi 19.1$ base on Table 6-3. Take the large one for the selection, we final confirm the main pipe diameter is $\Phi 38.1/\Phi 22.2$.

6.3 Size of joint pipes for indoor unit

Table.6-4 Size of joint pipes for 410A indoor unit

Capacity of indoor unit (A)	Size of main pipe(mm)		Available branching pipe
	Gas side	Liquid side	
$A < 166$	$\Phi 15.9$	$\Phi 9.5$	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
$330 \leq A < 460$	$\Phi 28.6$	$\Phi 12.7$	FQZHN-03D
$460 \leq A < 660$	$\Phi 28.6$	$\Phi 15.9$	FQZHN-03D
$660 \leq A < 920$	$\Phi 31.8$	$\Phi 19.1$	FQZHN-03D
$920 \leq A < 1350$	$\Phi 38.1$	$\Phi 19.1$	FQZHN-04D

e.x.1: Refer to Fig.6-2, the capacity of downstream units to L2 is $71 \times 4 = 284$, i.e. the gas pipe for L2 is $\Phi 22.2$, liquid pipe is $\Phi 9.5$.

Table.6-5 Size of joint pipes for 410A main unit

Model	When the equivalent length of all liquid pipes $< 90\text{m}$, the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branching pipe
8HP	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D
10HP	$\Phi 22.2$	$\Phi 9.5$	FQZHN-02D
12HP	$\Phi 25.4$	$\Phi 12.7$	FQZHN-02D
16HP	$\Phi 28.6$	$\Phi 12.7$	FQZHN-03D
18~22HP	$\Phi 28.6$	$\Phi 15.9$	FQZHN-03D
24HP	$\Phi 28.6$	$\Phi 15.9$	FQZHN-03D
26~32HP	$\Phi 31.8$	$\Phi 19.1$	FQZHN-03D
34~36HP	$\Phi 38.1$	$\Phi 19.1$	FQZHN-04D

Table.6-6 Size of joint pipes for 410A main unit

Model	When the equivalent length of all liquid pipes $\geq 90m$, the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branching pipe
8HP	$\Phi 22.2$	$\Phi 12.7$	FQZHN-02D
10HP	$\Phi 25.4$	$\Phi 12.7$	FQZHN-02D
12HP	$\Phi 28.6$	$\Phi 15.9$	FQZHN-03D
16HP	$\Phi 31.8$	$\Phi 15.9$	FQZHN-03D
18~22HP	$\Phi 31.8$	$\Phi 19.1$	FQZHN-03D
24HP	$\Phi 31.8$	$\Phi 19.1$	FQZHN-03D
26~32HP	$\Phi 38.1$	$\Phi 22.2$	FQZHN-04D
34~36HP	$\Phi 38.1$	$\Phi 22.2$	FQZHN-04D

6.5 Branch pipes for main unit

Table.6-7

Model	Main unit pipe connective opening dimension(mm)	
	Gas side	Liquid side
8HP, 10HP	$\Phi 25.4$	$\Phi 12.7$
12HP	$\Phi 31.8$	$\Phi 15.9$

6.6 Branch pipes for indoor unit

Base on Table 6-8 and Table 6-9 select the multi connecting pipes of main unit. Before installation, please read the Main Unit Branching Pipe Installation Manual carefully.

Table.6-8 Main unit multi-connective pipe assembly (Illustration)

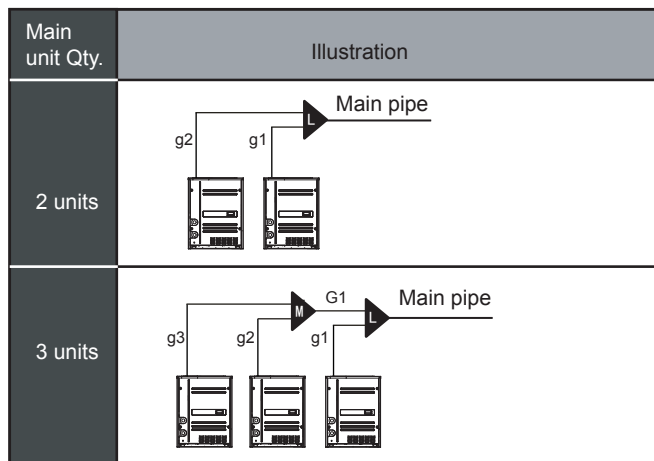


Table.6-9 Main unit multi-connective pipe assembly

Main unit Qty.	Main unit connective pipe diameter	Parallel connect with the branching pipes	Main pipe
2 units	g1, g2: 8, 10HP: $\Phi 25.4/\Phi 12.7$; 12HP: $\Phi 31.8/\Phi 15.9$	L: FQZHW-02N1D	Refer to Table 6-5 for main pipe dimension
3 units	g1, g2, g3: 8, 10HP: $\Phi 25.4/\Phi 12.7$; 12HP: $\Phi 31.8/\Phi 15.9$; G1: $\Phi 38.1/\Phi 19.1$	L+M: FQZHW-03N1D	

Note: The pipe assemblies in above table is special for this model, must be purchased separately.

6.7 Example

- 1) Take (10+8+8) HP that composed by three modules as an example to clarify the pipe selection.
- 2) Take Fig.6-4 as an example. Provided that the equivalent length of all pipes in this system is larger than 90m.

Table.6-8

Unit: mm

Indoor unit capacity A($\times 100W$)	When branching pipe's length $\leq 10m$		When branching pipe's length $> 10m$	
	Gas side	Liquid side	Gas side	Liquid side
$A \leq 45$	$\Phi 12.7$	$\Phi 6.4$	$\Phi 15.9$	$\Phi 9.5$
$A \geq 56$	$\Phi 15.9$	$\Phi 9.5$	$\Phi 19.1$	$\Phi 12.7$

- A The branching pipe at the inside of the unit.
There are a-j branching pipes at the inside of the unit, the branching pipe diameter should be select as per Table 6-10.
- B Main pipe at the inside the unit (Refer to Table 6-4)
- 1) The main pipe L3 with N1, N2 downstream indoor units that total capacity is $71 \times 2 = 142$, the pipe L3 diameter is $\Phi 15.9/\Phi 9.5$, thus select FQZHN-01D for the branching pipe C.
 - 2) The main pipe L4 with N3, N4 downstream indoor units that total capacity is $71 \times 2 = 142$, the pipe L3 diameter is $\Phi 15.9/\Phi 9.5$, thus select FQZHN-01D for the branching pipe D.
 - 3) The main pipe L2 with N1~N4 downstream indoor units that total capacity is $71 \times 4 = 284$, the pipe L2 diameter is $\Phi 22.2/\Phi 9.5$, thus select FQZHN-02D for the branching pipe B.
 - 4) The main pipe L7 with N6, N7 downstream indoor units that total capacity is $56 + 71 = 127$, the pipe L7 diameter is $\Phi 15.9/\Phi 9.5$, thus select FQZHN-01D for the branching pipe G.
 - 5) The main pipe L6 with N5~N7 downstream indoor units that total capacity is $56 + 71 \times 2 = 282$, the pipe L6 diameter is $\Phi 19.1/\Phi 9.5$, thus select FQZHN-01D for the branching pipe F.
 - 6) The main pipe L9 with N9, N10 downstream indoor units that total capacity is $56 \times 2 = 112$, the pipe L9 diameter is $\Phi 15.9/\Phi 9.5$, thus select FQZHN-01D for the branching pipe I.

- 7) The main pipe L8 with N8~N10 downstream indoor units that total capacity is $112+56\times 2=224$ the pipe L8 diameter is $\Phi 19.1/\Phi 9.5$, thus select FQZHN-01D for the branching pipe H.
 - 8) The main pipe L5 with N5~N10 downstream indoor units that total capacity is $112+56\times 3+71\times 2=366$, the pipe L5 diameter is $\Phi 28.6/\Phi 12.7$, thus select FQZHN-03D for the branching pipe E.
 - 9) The main pipe A with N1~N10 downstream indoor units that total capacity is $56\times 3+71\times 6+112=706$, thus select FQZHN-03D for the branching pipe A.
- C Main pipe (Refer to Table 6-4, Table 6-5, Table 6-6):
Main pipe L1 in the Fig.6-2, which upstream main units total capacity is $10+8+8=26$ HP, base on table 6-5, the gas/liquid pipe diameter are $\Phi 38.1/\Phi 22.2$, total capacity of the downstream indoor unit is $56\times 3+71\times 6+112=706$, base on table 6-4, the gas/liquid pipe diameter are $\Phi 31.8/\Phi 19.1$, take the large one for your selection, final confirm the main pipe diameter is: gas/liquid pipe $\Phi 38.1/\Phi 22.2$.
- D Parallel connect the main units
- 1) The main unit linked by Pipe g1 is 8HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size is $\Phi 25.4/\Phi 12.7$, The main unit linked by Pipe g2 is 8HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size is $\Phi 25.4/\Phi 12.7$, The main unit linked by Pipe g3 is 10HP, parallel connects with main unit. the connective pipe diameter to be selected according to its connector size is $\Phi 25.4/\Phi 12.7$.
 - 2) The upstream of G1 is the two parallel connected main units, refer to Table 6-9 select the three parallel connected main unit, the pipe diameter is $\Phi 38.1/\Phi 19.1$.
 - 3) Parallel connect the three main units, refer to Table 6-7 should select FQZHW-03N1D for main unit connective pipes (L+M).

6.8 Remove dirt or water in the piping

- Make sure there is no any dirt or water before connecting the piping to the main units.
- Wash the piping with high pressure nitrogen, never use refrigerant of the main unit.

6.9 Gas tight test

- 1) Upon set up the indoor unit pipeline, please connect the Hi-pressure pipe with shut-off valve firstly.
- 2) Weld the pipe at the low pressure side to the meter connector.
- 3) Use the vacuum pump discharging air inside the liquid side shut-off valve and meter connector, until to the -0.1 MPa.
- 4) Close the vacuum pump, charge 3.9MPa nitrogen gas from the piston of shut-off valve and from the meter connector. Pressure inside should be maintained at there no less than 24 hrs.

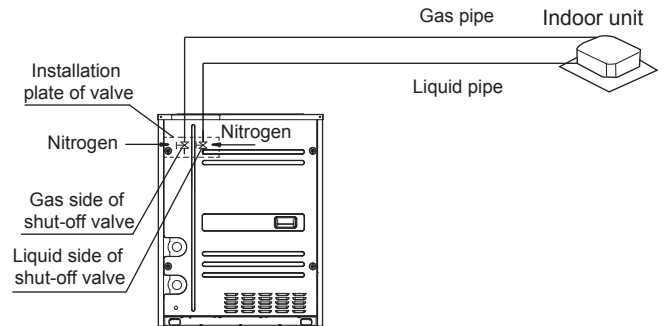


Fig.6-5



CAUTION

- Pressurized nitrogen (3.9MPa) is used for airtightness test.
- It is not allow to use oxygen, combustible gas or toxic gas to conduct the airtightness test.
- When welding, please use wet cloth insulating the low pressure valve for protection.
- For avoid the equipment be damaged, the pressure maintainedtime should not last too long.

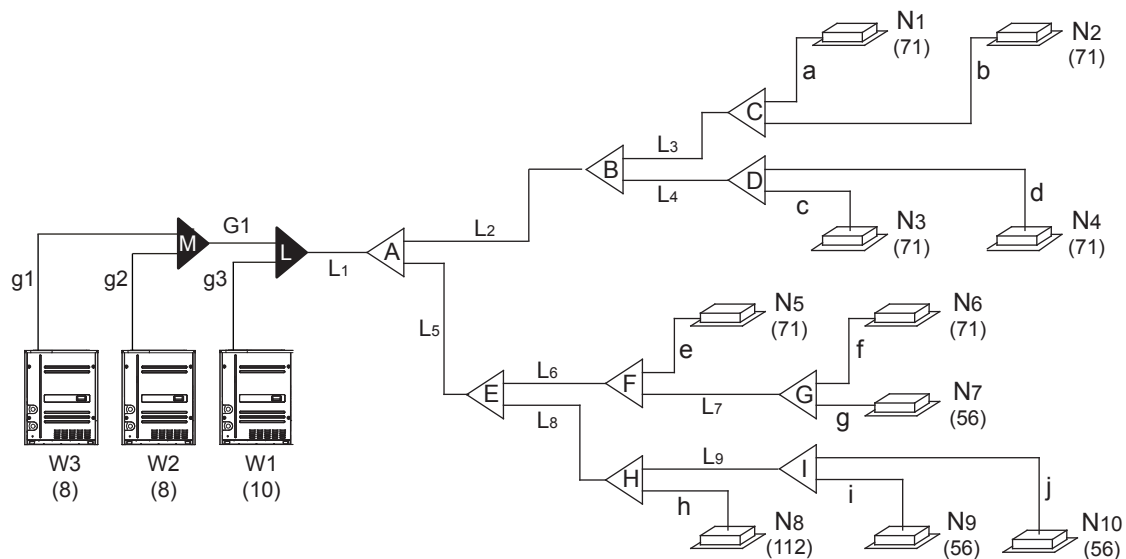


Fig.6-4

6.10 Vacuum with vacuum pump

- 1) Use the vacuum pump which vacuum level lower than -0.1MPa and the air discharge capacity above 40L/min.
- 2) The main unit is not necessary to vacuum, don't open the main unit gas and liquid pipe shut-off valves.
- 3) Make sure the vacuum pump could result as -0.1MPa or below after 2 hrs or above operation. If the pump operated 3 hrs or above could not achieve to -0.1MPa or below, please check whether water mix or gas leak inside of the pipe.

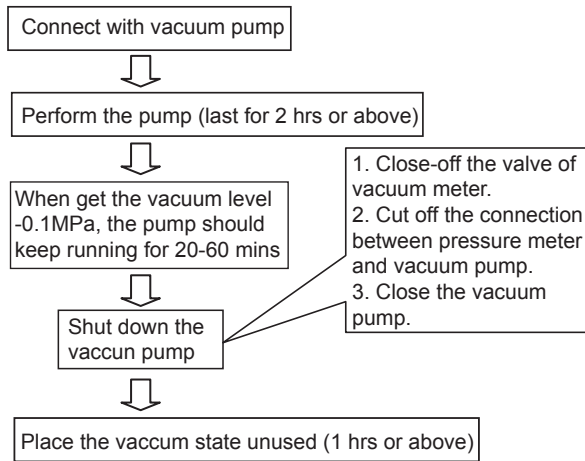


Fig.6-6



CAUTION

- Don't mix up the different refrigerants or abuse the tools and measurements which directly contact with refrigerants.
- Don't adopt refrigerant gas for air vacuuming.
- If vacuum level could not get to -0.1MPa, please check whether resulted by leakage and confirm the leakage site. If no leakage, please operate the vacuum pump again 1 or 2 hrs.

6.11 Refrigerant amount to be added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the Main/indoor unit connection. The refrigerant is R410A.

Table.6-11

Pipe size on liquid side	Refrigerant to be Added per meter
Φ6.4	0.022kg
Φ9.5	0.057kg
Φ12.7	0.110kg
Φ15.9	0.170kg
Φ19.1	0.260kg
Φ22.2	0.360kg
Φ25.4	0.520kg
Φ28.6	0.680kg

6.12 The Installation key points of connective pipes between main units

- 1) Connect the pipes between main units, the pipes should place horizontally (Fig.6-7, Fig.6-8), it is not allow the concave at junction site and set longer than 200mm bending pipes for saving oil.
- 2) All connective pipes between the main units are not allowed to over than the height of every outlets of the pipes (Refer to Fig.6-9, Fig.6-10).

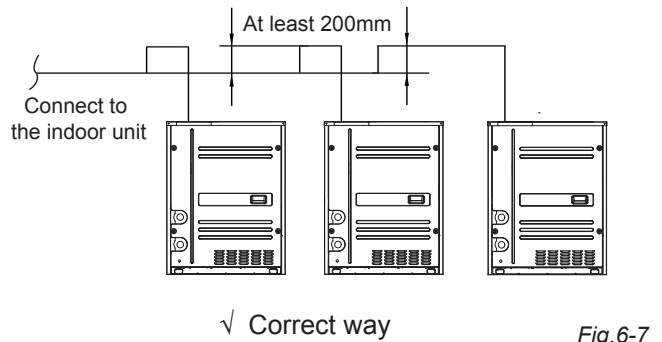


Fig.6-7

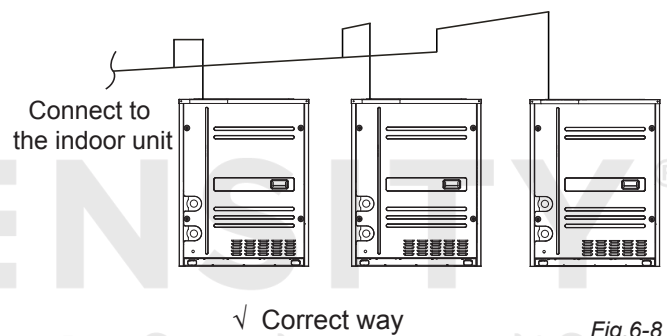


Fig.6-8

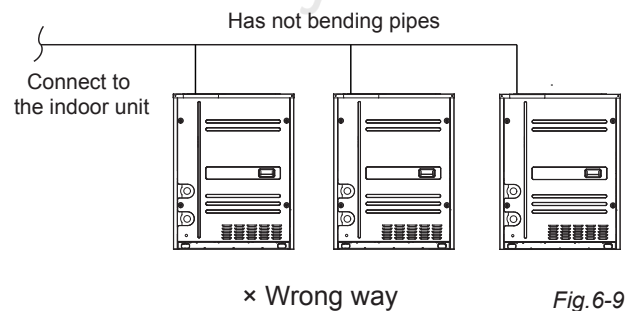


Fig.6-9

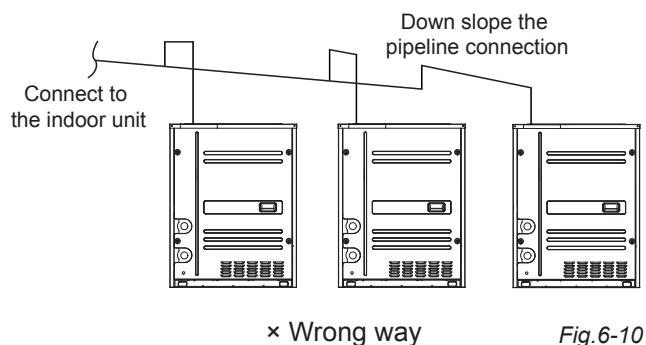


Fig.6-10

- 3) The branching pipe must be installed horizontally, error angle of it should not large than 10°. Otherwise, malfunction will be caused.

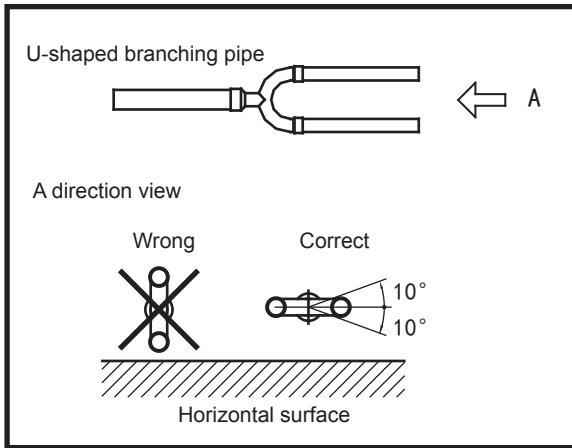


Fig.6-11

7. ELECTRIC WIRING

7.1 Sw1 query instructions

Table.7-1

No.	Display content (Normal display)	Note
1	Main unit address	0, 1, 2, 3
2	Main unit capacity	8, 10, 12
3	Modular main unit qty.	Available for main unit
4	Total capacity of main unit	Capacity requirement
5	Total capacity requirement of indoor unit	Available for main unit
6	Total corrected capacity requirement of main unit	Available for main unit
7	Operation mode	0, 2, 3, 4
8	The actual operation capacity of this main unit	Capacity requirement
9	Water flow switch state	0-Open 1-Close
10	T2B/T2 average temp.	Actual value
11	T5 inverter module temp.	Actual value
12	T7 discharge temp. of inverter compressor	Actual value
13	TSJ water inlet temp.	Actual value
14	TSC1 water outlet temp. of upper pipe.	Actual value
15	TSC2 water outlet temp. of lower pipe	Actual value
16	Current 1 of inverter compressor	Actual value
17	Current 2 of inverter compressor	Actual value
18	High pressure	Display value × 0.1MPa
19	Low pressure	Display value × 0.01MPa
20	Opening angle of EXV A	Display value × 8
21	Opening angle of EXV B	Display value × 8
22	Priority mode	0,1,2,3,4
23	Qty. of communicating Indoor units	Actual value
24	Qty. of installed indoor units	Actual value
25	The last time malfunction or the protective code	Without protection or error display code 00
26	— —	Check end

The display contents as followings:

- 1) Normal display: When in standby, it displays the qty. of indoor units that can communicate with the main unit. When it is operating, it will display the rotation frequency of the compressor.
- 2) Operation mode: 0—OFF/Fan, 2—Cooling, 3—Heating (Cooling only type without), 4—Constraint cooling.
- 3) Water flow switch state: 0—Open, 1—Close.
- 4) Priority mode: 0—Heating Priority Mode, 1—Cooling Priority Mode, 2—Priority Mode, 3—Only Respond The Heating Mode, 4—Only Respond The Cooling Mode.
- 5) EXV opening angle: pulse count = display value × 8.
- 6) ENC1: Main unit address setting switch,
ENC2: Main unit capacity setting switch,
ECN3: Network address setting switch,
S10, ENC4: combination setting the qty. of the installed indoor units.
SW1: Query button; SW2: Constraint cooling.

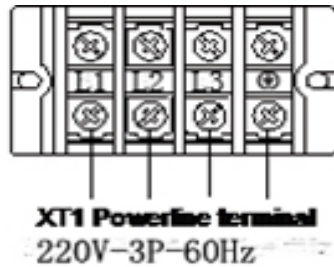
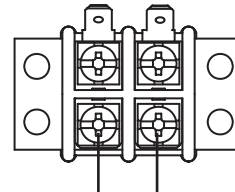
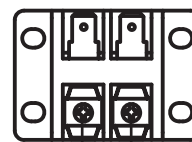


Fig.7-2



XT2 water flow switch ON/OFF signal input terminal
(Must be connected to weak current control circuit !)

Fig.7-3



XT3 Water pump ON/OFF signal output terminals
(Dry contact)

Fig.7-4

NOTE

Setting 0 or 1, all mean install 1 set indoor unit.

7.2 Terminal base function

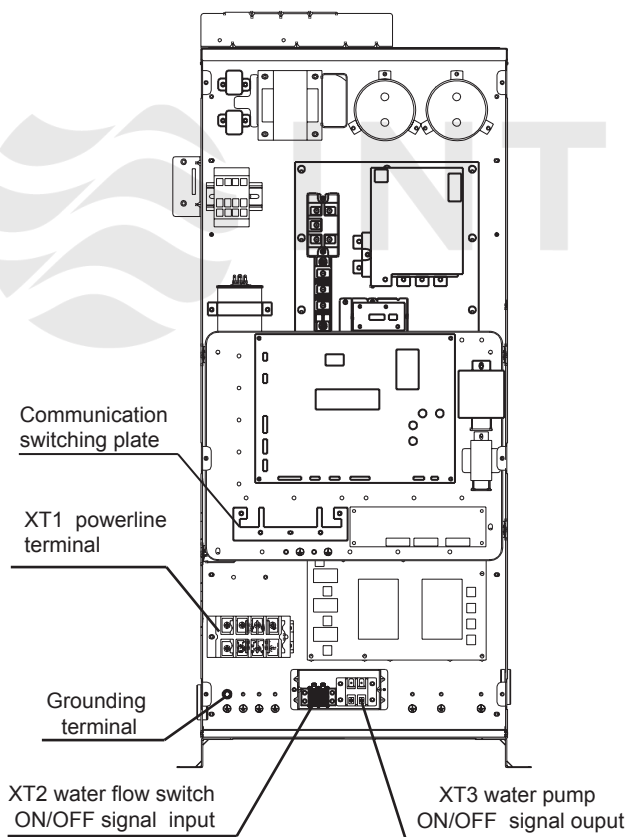


Fig.7-1 Electric control box diagram

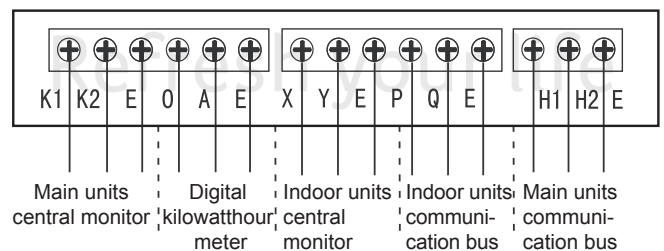


Fig.7-5



WARNING

Never apply line voltage to communication switching plate and XT2 water flow switch ON/OFF signal input !

7.3 Explanation of main board

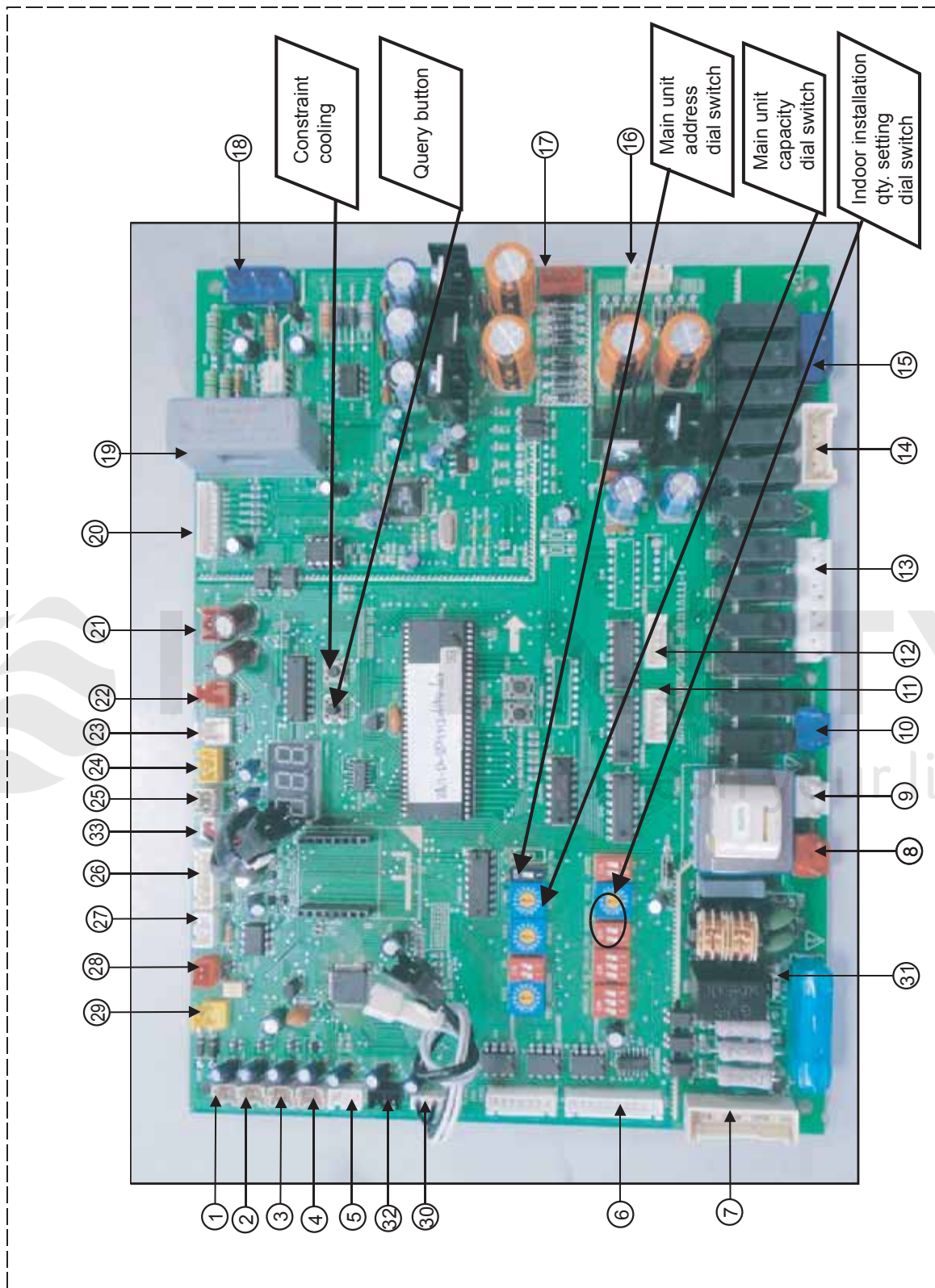


Fig.7-6

■ Explanation of main board

Table.7-2

No.	Content
1	Reserve
2	Reserve
3	Air discharge temp. sensed port 2 of inverter compressor
4	Air discharge temp. sensed port 1 of inverter compressor
5	Power supply connected port of Mid-terminal base
6	Wiring port for communication between indoor and main units, indoor unit network, main network and network accounting
7	Phase inspection port
8	Power input of the No.1 transformer
9	Power input of the No.2 transformer
10	Loading output terminal
11	EXV A driving port
12	EXV B driving port
13	Loading output terminal
14	Loading output terminal
15	Loading output terminal
16	Power output of the No.1 transformer
17	Power output of the No.2 transformer
18	Port for inverter module voltage inspection
19	Mutual inductor for DC current inspection
20	Activation port of inverter module
21	Power supply connected port of the main control panel
22	ON/OFF signal input port for system low pressure inspection
23	ON/OFF signal input port for system high pressure inspection
24	Input port for system high pressure inspection
25	Temp. sensed port of the inverter module
26	Current inspection port of phase B and C
27	Communication port among main units
28	Reserve
29	ON/OFF signal input port for water flow switch
30	Input port of water outlet temp. sensor 1 and sensor 2
31	C phase power supply
32	Input port for system low pressure inspection
33	Water inlet temp. sensed port

7.4 Dial codes definition

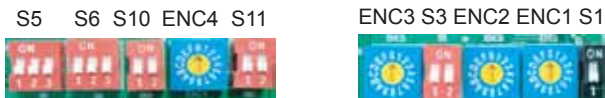


Fig.7-7

S1 definition

	Starting time is set about 10 minutes
	Starting time is set about 12 minutes (Default the Factory Set)

S3 definition

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

S5 definition(For cooling&heating type)

	Heating priority mode (Default the Factory Set)
	Cooling priority mode
	Open the priority mode first
	Only Respond the heating mode
	Only Respond the cooling mode

S6 definition

	Automatic search address.
	Nonautomatic search address. (The communication way of the original digital indoor unit) (Default the Factory Set)
	Clean the indoor unit addresses
	Reserve
	Reserve

S10 definition

	Combined with ENC4 to set the qty.of the indoor unit to be 1-15
	Combined with ENC4 to set the qty.of the indoor unit to be 16-31
	Combined with ENC4 to set the qty.of the indoor unit to be 32-47
	Combined with ENC4 to set the qty.of the indoor unit to be 48-63

S11 definition

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



NOTE

Please shut off the power when setting the switch.



CAUTION

- Set refrigerant piping system, signal wires between indoor-indoor unit, and that between main-main unit into one system.
- Power must unified supply to all indoor units in the same system.
- Please do not put the signal wire and power wire in the same wire tube; keep distance between the two tubes. (Current capacity of power supply: less than 10A--300mm, less than 50A--500mm.)
- Make sure to set address of main unit in case of parallel multi-main units.

7.5 Electric wiring system and installation

Outdoor unit power wiring

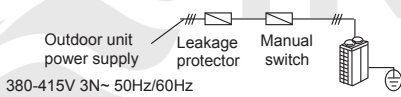


Fig.7-8

Indoor power supply

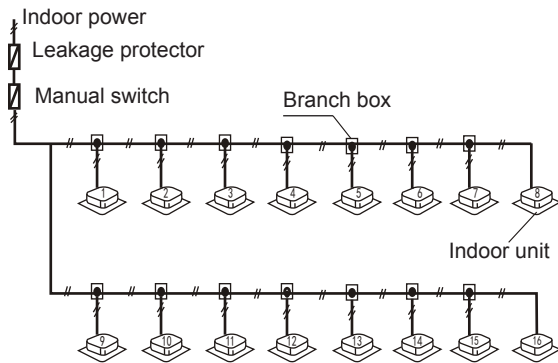


Fig.7-9

Refresh your life

7.6 Electric parameter form of outdoor unit

Table.7-3

System	Outdoor Unit				Power Current			Compressor		OFM	
	Voltage	Hz	Min.	Max.	MCA	TOCA	MFA	MSC	RLA	KW	FLA
8HP	220	60	196	244	32.2	35	40	-	21.4	-	-
10HP	220	60	196	244	33.4	35	40	-	23.8	-	-
12HP	220	60	196	244	34.5	35	40	-	26.2	-	-

Notes:

1. The current value of combination unit is the total value of each basic model (refer to Table.7-3)

For example: 34HP=10HP+12HP*2

Power supply: MCA=33.4+34.5*2=102.4

TOCA=35+35*2=105

MFA=40+40*2=120

Compressor: RLA=23.8+26.2*2=76.2

2. RLA is based on the following conditions, Indoor temp. 27°C DB/19°C WB, Outdoor temp. 35°C DB
3. TOCA means the total value of each OC set.
4. MSC means the Max. current during the starting of compressor.
5. Voltage range units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.
6. Maximum allowable voltage variation between phase is 2%
7. Selection wire size based on the larger value of MCA or TOCA
8. MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

Remark:

MCA: Min. Current Amps. (A)

MFA: Max. Fuse Amps. (A)

RLA: Rated Locked Amps. (A)

FLA: Full Load Amps. (A)

TOCA: Total Over-current Amps. (A)

MSC: Max. Starting Amps. (A)

OFM: Outdoor Fan Motor.

KW: Rated Motor Output (KW)

7.7 Control system and Installation

- The control line should be shielded wire. Using other wiring shall create signal interference.
- The shielded nets at the two sides of shielded wires are either grounded to the earth, or connected with each other and jointed to the sheet metal along to the earth.
- Control wire could not be bound together with refrigerant pipeline and power wire. When power wire and control wire is distributed in parallel form, keep gap between them above 300mm so as to preventing signal interference.
- Control wire could not form closed loop.
- Control wire has polarity, so be careful when connecting.



NOTE

The shield net should be grounded at the wiring terminal of main unit. The inlet and outlet wire net of indoor communication wire should be connected directly and could not be grounded, and form open circuit at the shield net of final indoor unit.

7.8 Signal wire of indoor/main units

- Signal wire of indoor/main unit adopts 3-core shielded wire ($\geq 0.75\text{mm}^2$) which has polarity, please connect it correctly.(see Fig.7-14)

7.9 Electric wiring of water pipelines

7-9-1 Water flow switch ON/OFF signal wiring

- Water flow switch should be wired during the installation. Each unit must be configured a water flow switch, and it can not operate without a water flow switch.
- The signal wire should apply 0.75mm^2 shielding wire, and connected to the XT2 terminal in the electric control box (see Fig.7-12).

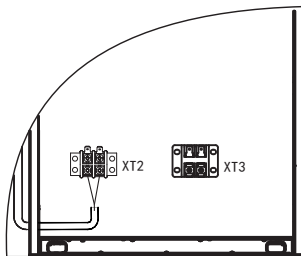


Fig.7-10 Water flow ON/OFF signal input

7-9-2 Water pump ON/OFF signal wiring

- Each unit has configured a dry contact terminal for central control of the water pump (see Fig.7-13), this terminal can not be connected to power terminal of the water pump directly, only should be connected to the control terminal of the water pump stater.
- When the water pump ON/OFF signal wire has been connected to strong current, it should be wired the signal wires along with other strong current wires; when it has been connected to weak current, it should be wired the signal wires along with the weak current wires.
- When the water pipeline has a single system, the water pump ON/OFF signal wire should be connected to the XT3 terminals in the main unit electric control box. When the water pipeline has several systems, the water pump ON/OFF signal should be controlled by the main unit centralized controller. The wiring of main unit centralized controller see the Fig.7-15.

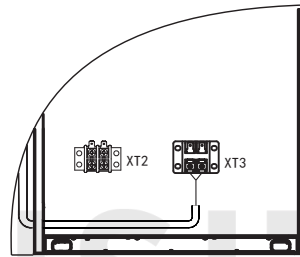
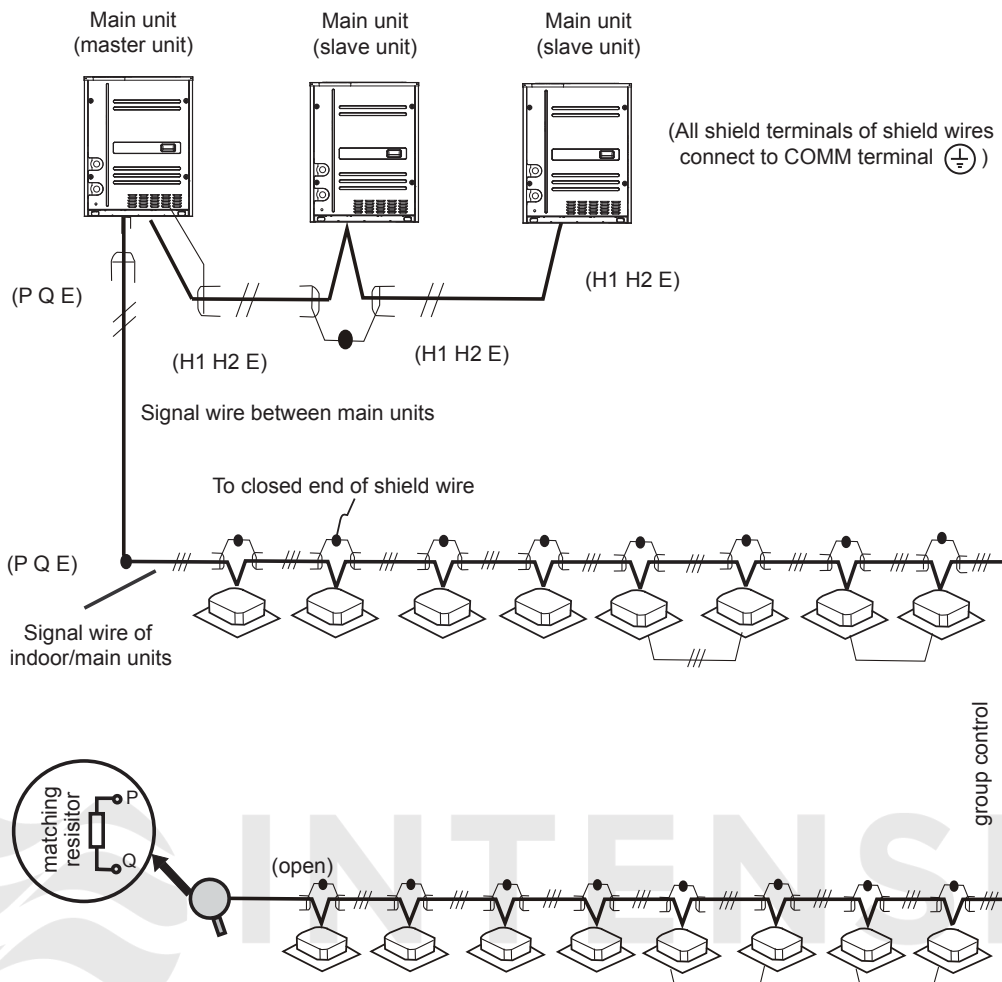


Fig.7-11 Water pump ON/OFF signal output



The indoor unit at the terminal of communication system should parallel connect a impedance between port P and port Q.

Fig.7-12

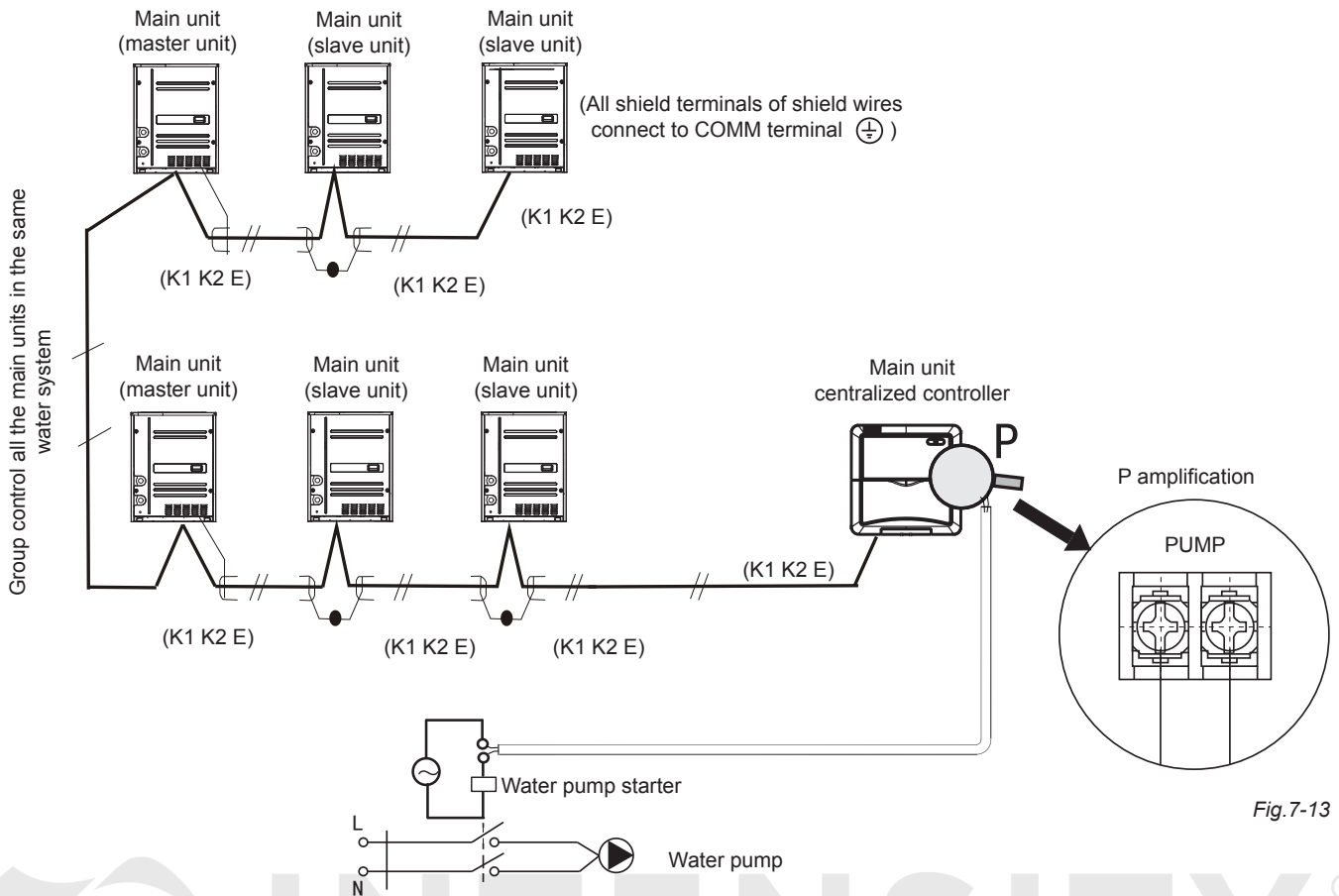


Fig.7-13



CAUTION Refresh your life

The signal wire of the main unit centralized controller should apply three-core shielding wire (larger or equal to 0.75mm²), and has polarity. It should be correctly connected.

7.10 Example for power wire connection

7.10.1 A water circuit for single system wiring

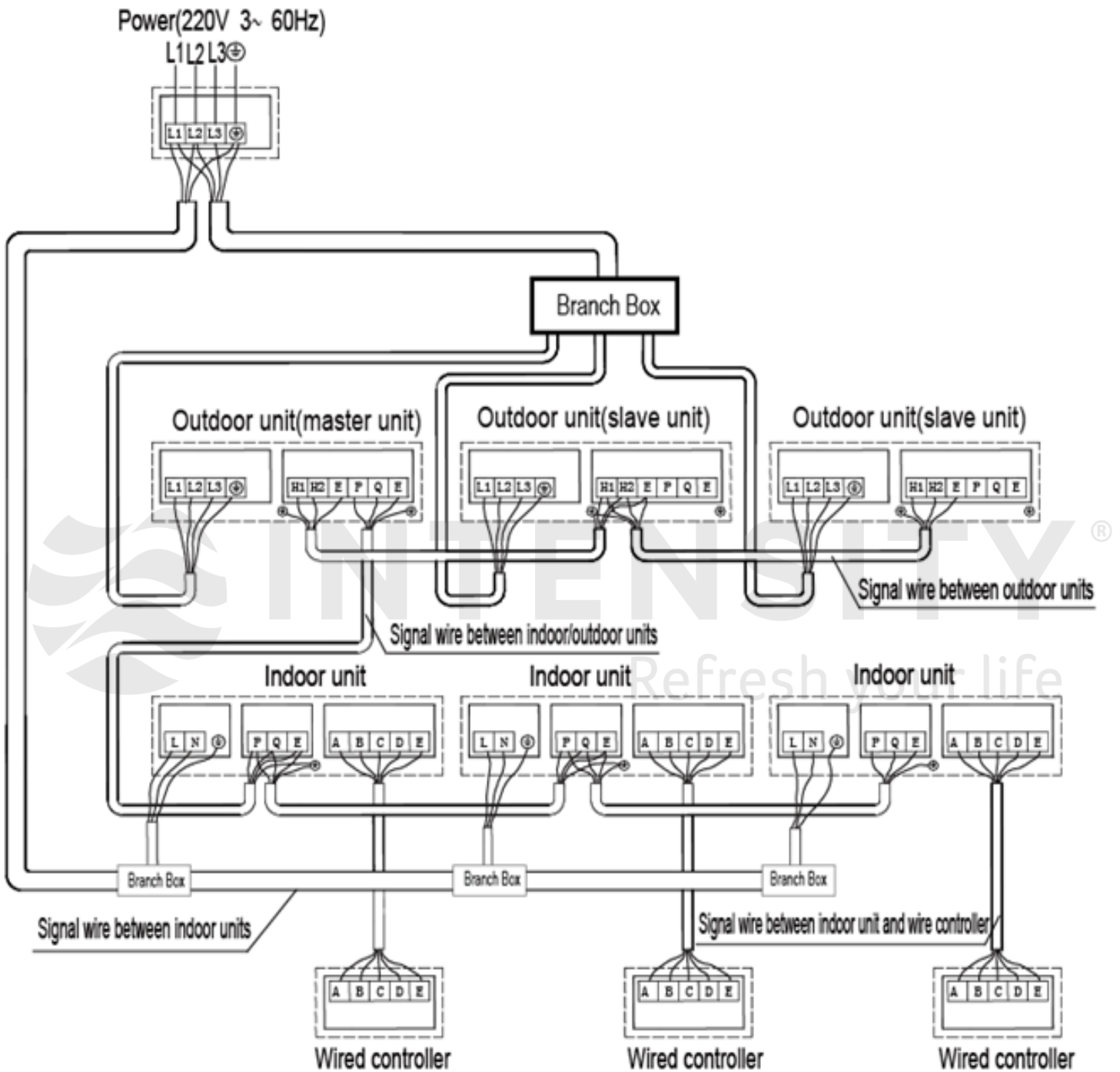


Fig.7-14

7.10.2 A water circuit for several systems wiring

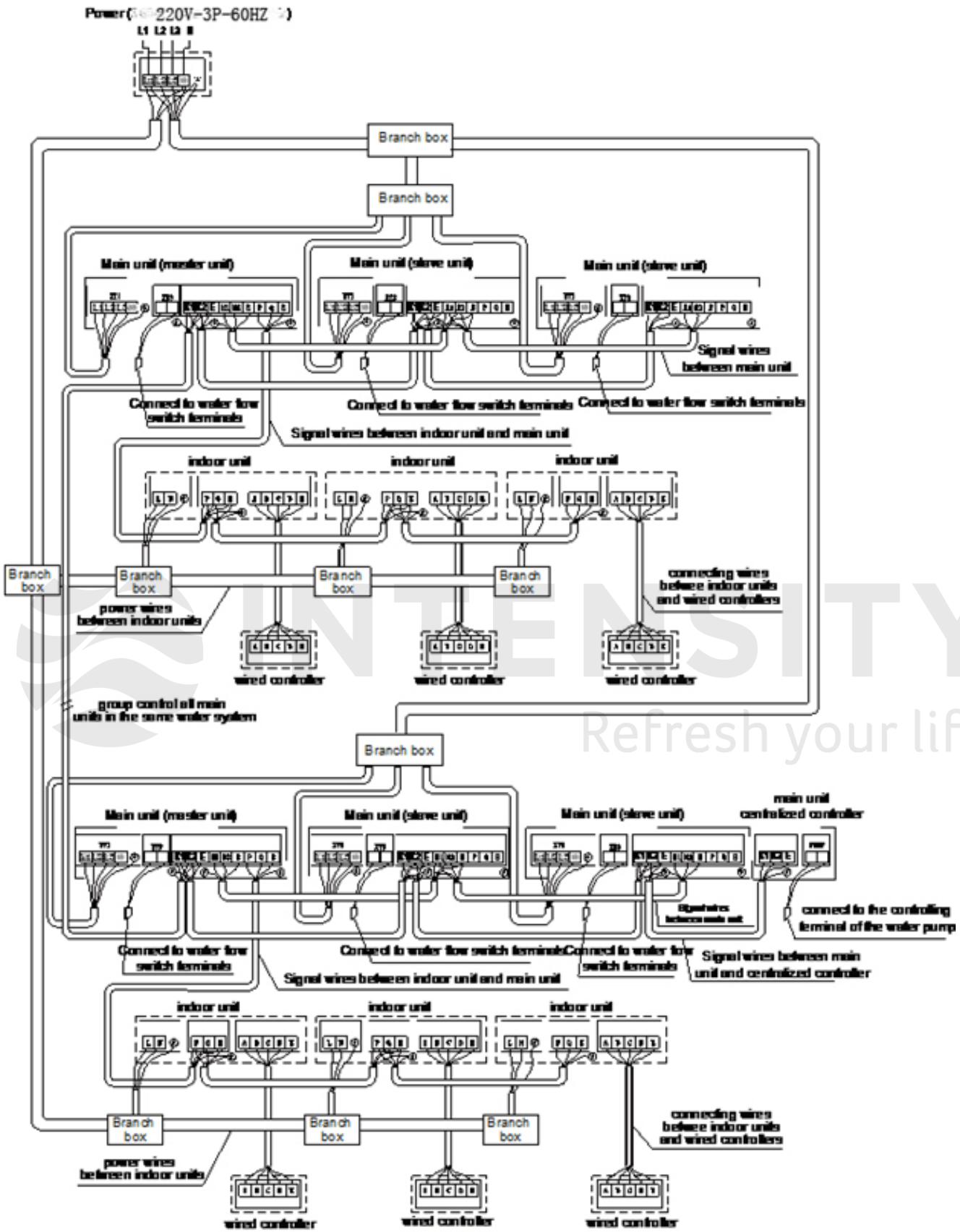


Fig.7-15

8. TRIAL RUN

8.1 Inspection and confirmation before commissioning

- 1) Check and confirm that refrigeration pipe line and communication wire with indoor and main unit have been connected to the same refrigeration system. Otherwise, operation troubles shall happen.
- 2) Power voltage is within $\pm 10\%$ of rated voltage.
- 3) Check and confirm that the power wire and control wire are correctly connected.
- 4) Before powering on, confirm there is no short circuit to each line.
- 5) Check whether all units have passed nitrogen pressure-keeping test for 24 hours with R410A: $40\text{kg}/\text{cm}^2$.
- 6) Confirm whether the system to debugging has been carried out vacuum drying and packed with refrigeration as required.
- 7) Make sure all the water pipelines are correct, including the installation directions of water filter and water flow switch.
- 8) Check whether the water filter has been blocked, and clean the filter screen. If it is seriously blocked, then it should be checked whether the water quality has meet the requirements.
- 9) Open the gate valve, make sure the double-pipe heat exchanger have been filled with circulating water, and open the water pump and air discharge valve, after make sure the air in the water pipelines and unit has been drain out and then close the air discharge valve.
- 10) Check whether the pressure meters in the water inlet and water return pips of the unit, thermometer, water flow switch etc. work normally, and make sure the water pipelines system operate normal, and the water flow is suitable.

8.2 Preparation before debugging

- 1) Calculating the additional refrigerant quantity for each set of unit according to the actual length of liquid pipe.
- 2) Keep required refrigerant ready.
- 3) Keep system plan, system piping diagram and control wiring diagram ready.
- 4) Record the setting address code on the system plan.
- 5) Turn on power switches main unit in advance, and keep connected for above 12 hours so that heater heating up refrigerant oil in compressor.
- 6) Turn on air pipe stop valve, liquid pipe stop valve, oil balance valve and air balance valve totally. If the above valves do not be turned on totally, the unit should be damaged.
- 7) Check whether the power phase sequence of main unit is correct.
- 8) All dial switch to indoor and main unit have been set according to the Technical Requirement of Product.

8.3 Fill the name of connected system

To clearly identify the connected systems between two or more indoor units and main unit, select names for every system and record them on the nameplate on the main electric control box cover.

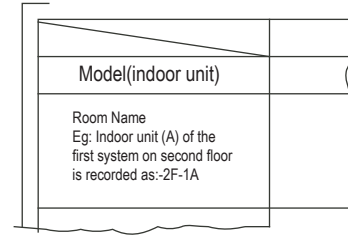


Fig.8-1

8.4 Caution on refrigerant leakage

- 1) This air conditioner adopts R410A as refrigerant, which is safe and noncombustible.
- 2) The room for air conditioner should be big enough that refrigerant leakage can not reach the critical thickness. Besides this, you can take some action on time.
- 3) Critical thickness-----the max thickness of Freon without any harm to person. R410A critical thickness: $0.3 [\text{kg}/\text{m}^3]$

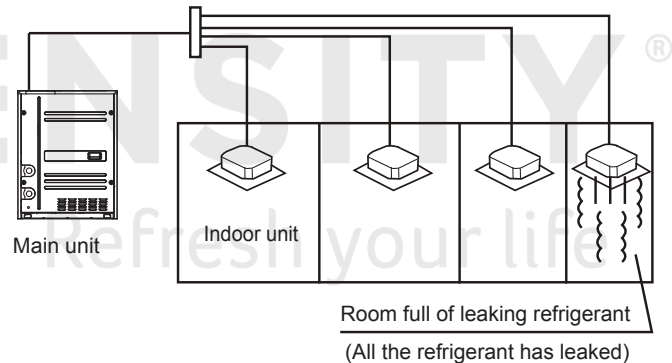


Fig.8-2

- 4) Calculate the critical thickness through following steps, and take necessary actions.
 - Calculate the sum of the charge volume (A[kg])
Total refrigerant volume=refrigerant volume when delivered(nameplate)+superaddition
 - Calculate the indoor cubage (B[m³]) (as the minimum cubage)
 - Calculate the refrigerant thickness.
- 5) Countermeasure against overhigh thickness
 - Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly)
 - Install leakage detector alarming device related to mechanical ventilator if you can not regularly ventilate.

$$\frac{A [\text{kg}]}{B [\text{m}^3]} \leq \text{Critical thickness: } 0.3 [\text{kg}/\text{m}^3]$$

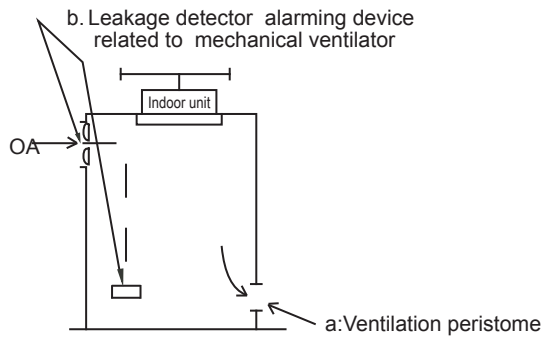


Fig. 8-3

8.5 Turn over to customer

Be sure to deliver the Installation Manual of the indoor unit, and the main unit to the user.



