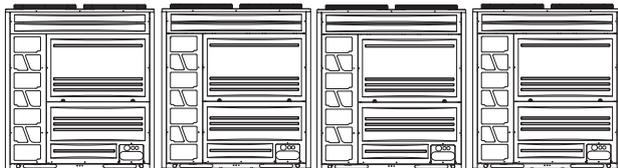
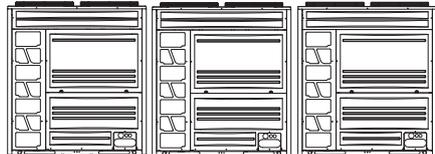
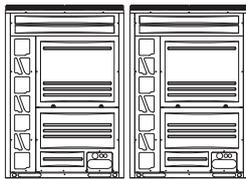
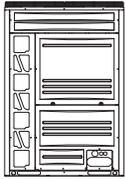


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	修改气密检测要求				P27~P28		
	增加缺失的计算符号				P30		
	更新版本信息				封底		
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Installation Manual

Outdoor Unit



Base Models:

AVWT-76FKFSHA
AVWT-96FKFSHA
AVWT-114FKFSHA
AVWT-136FKFSHA
AVWT-154FKFSHA
AVWT-170FKFSHA
AVWT-190FKFSHA
AVWT-212FKFSHA

Combination Models:

AVWT-228~848FKFSHA

IMPORTANT:

THANK YOU FOR PURCHASING HISENSE CENTRAL AIR CONDITIONERS. READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS AIR CONDITIONERS. KEEP THIS MANUAL FOR FUTURE REFERENCE.

Original Instructions

M00293Q

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Piping Work

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Declaration of Conformity
(Manufacturer's Declaration)



Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. ,
No. 218, Qianwangang Road, Economic & Technical Development Zone, Qingdao, P.R. China
declares under its sole responsibility that the air conditioning models to which this declaration relates:

AVWT-76FKFSHA , AVWT-96FKFSHA, AVWT-114FKFSHA , AVWT-136FKFSHA, AVWT-154FKFSHA,
AVWT-170FKFSHA, AVWT-190FKFSHA, AVWT-212FKFSHA are in conformity with the following
standard(s) or other normative document(s), provided that these are used in accordance with our
instructions:

EN 60335-1
EN 60335-2-40
EN 62233
EN 55014-1
EN 55014-2
EN 61000-6-1
EN 61000-6-3
EN 61000-3-11
EN 61000-3-12
EN 378-2

following the provisions of:

2006/42/EC
2014/30/EU
2012/19/EU
2011/65/EU
2014/35/EU
2014/68/EU *
2014/57/EU
2009/125/EC
2010/30/EU

Directives, as amended.

* as set out by Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. and

judged positively by NB0035 as following:
Conformity Assessment Procedure: module A2

Category: II

Refrigerant: R410A

Maximum allowable pressure (high pressure sides) : 4.15MPa

Maximum allowable pressure (low pressure sides) : 2.21MPa

Manufacturing number and manufacturing year: refer to model Nameplate.

Notes:

This declaration becomes invalid, if technical or operational modifications are introduced without the
manufacturers consent.

Hisense Italia S.r.l. is authorised to Compile the Technical Construction File.

Add. : Via Montefeltro 6A, 20156 Milano.

Hisense

Name, Surname : Li HU

Position/ Title : Director

Date : January,15,2019

Dear user:

Thank you for choosing and using our products. For your better understanding and use of this product, be sure to read and comply with the following related matters before use

IMPORTANT NOTICE

Signal words (danger, warning and caution) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words:

-  **DANGER** : DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
-  **WARNING** :WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
-  **CAUTION** :CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- NOTE** :NOTE is useful information for operation and/or maintenance.

- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.
- This manual gives a common description and information for this air conditioner which you operate as well for other models. HISENSE pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- HISENSE cannot anticipate every possible circumstance that might involve a potential hazard. This air conditioner is designed for standard air conditioning only. Do not use this heat recovery air conditioner for other purpose such as drying clothes, refrigerating foods or for any other cooling or heating process. Do not install the unit in the following places. It may cause a fire, deformation, corrosion or failure.

- * Places where oil (including machinery oil) sprays
- * Places where a lot of sulfide gas drifts such as in hot spring.
- * Places where inflammable gas may generate or flow.
- * Places where strong salty wind blows such as coast regions , or places with an atmosphere of acidity or alkalinity.

- Do not install the unit in the place where silicon gas drifts. If the silicon gas attaches to the surface of heat exchanger, the fin surface repels water. As a result, drain water splashes outside of the drain pan and splashed water runs inside of electrical box. In the end, water leakage or electrical devices failure may occur.
- Do not install the unit in the place where the breeze directly catches the animals and plants. It could adversely affect the animals and plants.
- Installation and service engineering must comply with local standards, laws and regulations.
- As the “public inaccessible appliances”, the indoor units are required to be installed at a height of no lower than 2.5m.
- The installation of the air conditioner can only be carried out by dealer or professional, and self installation by user may cause water leakage, electric shock or fire.
- If you have any questions, contact your dealer or designated service center of HISENSE.
- To prevent the environment, please do not discard the product at will, and HISENSE can provide recycling services in accordance with the relevant provisions of the country and provide replaceable parts in accordance with national standard requirements.
- This air conditioner has been designed for the following temperatures. Operate the air conditioner within this range.

Temperature

(°C)

DX Indoor Unit		Maximum	Minimum
Cooling Operation	Indoor	32DB/23WB	21DB/15WB
	Outdoor	52DB*	-10DB
Heating Operation	Indoor	27DB	15DB
	Outdoor	16.5WB	-25WB**

Water Module		Maximum	Minimum
Cooling Operation	Water Inlet	25	10
	Outdoor	52DB*	10DB
Heating Operation	Water Inlet	54	10
	Outdoor	43DB	-25WB**

NOTES:

- (*) 48°C DB ~ 52°C DB, Operation Control Range
- (**) -20°C WB ~ -25°C WB, Operation Control Range

DB : Dry Bulb, WB : Wet Bulb



DANGER

- Do not perform installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in a water leakage, electric shock or a fire. In case of fire, cut off the power at the first time; do not touch the electrical parts by hand to avoid electric shock hazard.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical failure.
- Do not open the service cover of the indoor or outdoor units without turning OFF the main power supply, otherwise it may cause a serious safety accident. (In any cases, users of the equipment are not allowed to open the service cover).
- Do not touch or adjust safety devices inside the indoor unit or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant R410A for this unit is incombustible, non-toxic and odorless; however if the refrigerant is leaked and is contacted with fire, toxic gas will generate. Also because the R410A is heavier than air, the floor surface will be filled with it, which could cause difficulty with breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases can cause an explosion. It is recommended that nitrogen be used for these types of tests.
- Refrigerant safety leakage standards for construction and operation systems are determined in accordance with local regulations or standards.
- Use an ELB (Earth Leakage Breaker, with an actuation time of 0.1 min or less) at or above medium induction speed, otherwise it may cause an electric shock or a fire.
- For installation, firmly connect the refrigerant pipe before the compressor starts operating.
- For maintenance, relocation and disposal, remove the refrigerant pipe after the compressor stops.
- Do not perform a short-circuit of the protection device such as a pressure switch when operating. It may cause a fire and explosion.



WARNING

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system.
- If circuit breaker is often activated, stop the system and contact your or service contractor. Check that the ground wire is securely connected. If the unit is not correctly grounded, it leads electric shock. Do not connect the ground wiring to gas piping, water piping, lighting conductor or ground wiring for telephone.
- Before performing any brazing work, check to ensure that there is no flammable material around. When filling refrigerant be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and which may lead to a fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- Provide a sufficiently strong foundation. If not, the unit may fall down and it may lead to injuries.
- Perform electrical work according to Installation Manual and all the relevant regulation and standards.
- If the instructions are not followed, an electrical failure and fire may occur due to insufficient capacity and inadequate performance. Use specified cables between units and choose the cables correctly. If not, an electrical failure or fire may occur.
- Ensure that the outdoor unit is not covered with ice and snow before use.
- 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 be made by children without supervision.
- The A-weighted emission sound pressure level at workstations does not exceed 70 dB(A).



CAUTION

- Do not step or put any material on the product.
- Do not put any foreign material on the unit or inside the unit.
- Do not install the indoor unit, outdoor unit, remote control switch and cable within approximately 3 meters from strong electromagnetic wave radiators such as medical equipment.
- Starting the unit after longtime idleness requires the compressor temperature to meet the starting requirements or reach a certain heating time.

NOTE:

- It is recommended that the room will be ventilated every 3 to 4 hours.
- In some cases, the air conditioner may not be operated normally under the following cases.
 - * In case that the power supplied by the power transformer is less than or equal to the electric power of the air conditioner.
 - * In case that the large power-consuming equipment is too close to the power supply wiring for the air conditioner, so that large surge voltage may be inducted in the power supply wiring of the air conditioner.
- The heating capacity of the is decreased according to the outdoor air temperature. Therefore, it is recommended that auxiliary equipment be used in the field when the unit is installed in a low temperature region.
- The repair and maintenance of this air conditioner can only be carried out by professional .

IMPORTANT NOTICE



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage in a written form, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct. The standard utilization of the unit shall be explained in these instructions. Please contact your local agent, as the occasion arises.

HISENSE's liability shall not cover defects arising from the alteration performed by a customer without HISENSE's consent in a written form.

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1. Structure

1.1 Outdoor Unit & Refrigerant Cycle

Regarding structure drawings and refrigerant cycle diagram, please refer to Technical Catalogue.

1.2 Necessary Tools and Instrument List for Installation

Check the design pressure for this product is 4.15MPa.

To avoid accidental mixing of the different refrigerant or different refrigerant oil, the sizes of the charging connections have been changed. It is necessary to prepare the following tools before performing the installation work.

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Copper Pipe Bender	11	Spanner	16	Leveller
2	Phillips Screwdriver	7	Plier	12	Charging Cylinder	17	Clamper for Solderless Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Control Valve	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

Note: Use tools and measuring instruments only for the new refrigerant R410A in case of direct contact with the refrigerant.

DANGER

The pressure of refrigerant R410A is 1.4 times higher than that of conventional refrigerant, impurities such as moisture, oxide film, and grease affect easily R410A. Be sure to remove any moisture, dust, different refrigerant or refrigerant oil from the refrigerant cycle. Therefore, if the specified materials are not used, it may cause explosion, injury, leakage, electrical shock or fire.

○ : Interchangeability is available with current R22 X

■ : only for Refrigerant R410A (No Interchangeability with R22)

× : Prohibited

● : only for Refrigerant R407C (No Interchangeability with R22)

Measuring Instrument and Tool	Interchangeability with R22		Reason of Non-Interchangeability and Attention (★: Strictly Required)	Use
	R407C	R410A		
Pipe Cutter Chamfering Reamer	○	○	—	Cutting Pipe Removing Burrs
Flaring Tool	○	○■	* R410A requires high pressure resistance piping and larger flaring process. In case of material 1/2H, flaring is not available.(The flaring tools for R410A are applicable to R407C)	Flaring for Tubes
Extrusion - Adjustment Gauge		■		Dimensional Control for Ex- truded Portion of Tube after Flaring
Pipe Bender	○	○	* In case of material 1/2H, bending is not available. Use elbow for bend and braze.	Bending
Refrigerant Pipe Expanding Tool	○	○	* In case of material 1/2H, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
Torque Wrench	○	■	* For Φ12.7, Φ15.88 of R410A, spanner size is up 2mm	Connection of Flare Nut
		○	* For Φ6.35, Φ9.53, Φ19.05, spanner size is the same.	
Brazing Tool	○	○	* Perform correct brazing work (adjustable flame, heating method, feeding filler)	Brazing for Tubes
Nitrogen Gas	○	○	* Strict Control against Contamination (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing Air-tight test
Lubrication Oil (for Flare Surface)	●	■	* Use a synthetic oil which is equivalent to the oil used in the refrigeration cycle. * Synthetic oil absorbs moisture quickly.	Applying Oil to the Flared Surface
Refrigerant Cylinder	●	■	* Check the cylinder for the corresponding refrigerant. ★Liquid refrigerant charging is required regarding zeotropic refrigerant.	Refrigerant Charging
Vacuum Pump	○	○	★The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
Adapter for Vacuum PumpReverse flow prevention	●	※■		
Control Valve	●	■	* No interchangeability is available due to higher pressures when compared with R22. Connection diameter is different: R410A: UNF1/2, R407C: UNF7/16 ★Do not use old ones to the different refrigerant. If used, mineral oil will flow into the cycle and cause sludges, resulting in clogging or compressor failure.	Vacuum Pumping, Vacuum Holding, Refrigerant Charg- ing and Check of Pressures
Charging Hose	●	■		
Charging Cylinder		×	* Use the weight scale	Refrigerant Charging
Weight Scale	○	○	—	Measuring Instrument for
Refrigerant Gas Leakage Detector	●	※■	* The current gas leakage detector (R22) is not applicable due to different detecting method.	Refrigerant Charging Gas Leakage Check
	Interchangeability with R410A			

※Interchangeability with R407C

2.Before Installation

Line-Up of Outdoor Unit

【Base Unit】

Capacity kBtu/h(HP)	76(8HP)	96(10HP)	114(12HP)	136(14HP)	154(16HP)
Model	AVWT-76FKFSHA	AVWT-96FKFSHA	AVWT-114FKFSHA	AVWT-136FKFSHA	AVWT-154FKFSHA

Capacity kBtu/h(HP)	170(18HP)	190(20HP)	212(22HP)
Model	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-212FKFSHA

【Combination of Base Unit】 ※

Capacity kBtu/h(HP)	228(24HP)	250(26HP)	272(28HP)	290(30HP)	308(32HP)
Model	AVWT-228FKFSHA	AVWT-250FKFSHA	AVWT-272FKFSHA	AVWT-290FKFSHA	AVWT-308FKFSHA
Combination	AVWT-114FKFSHA	AVWT-136FKFSHA	AVWT-136FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA
	AVWT-114FKFSHA	AVWT-114FKFSHA	AVWT-136FKFSHA	AVWT-136FKFSHA	AVWT-154FKFSHA

Capacity kBtu/h(HP)	324(34HP)	340(36HP)	360(38HP)	380(40HP)	402(42HP)
Model	AVWT-324FKFSHA	AVWT-340FKFSHA	AVWT-360FKFSHA	AVWT-380FKFSHA	AVWT-402FKFSHA
Combination	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190KFSHA	AVWT-190FKFSHA	AVWT-212FKFSHA
	AVWT-154FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA

Capacity kBtu/h(HP)	424(44HP)	444(46HP)	462(48HP)	478(50HP)	494(52HP)
Model	AVWT-424FKFSHA	AVWT-444FKFSHA	AVWT-462FKFSHA	AVWT-478FKFSHA	AVWT-494FKFSHA
Combination	AVWT-212FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA
	AVWT-212FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA	AVWT-170FKFSHA
	-	AVWT-136FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA	AVWT-154FKFSHA

Capacity kBtu/h(HP)	510(54HP)	530(56HP)	550(58HP)	570(60HP)	592(62HP)
Model	AVWT-510FKFSHA	AVWT-530FKFSHA	AVWT-550FKFSHA	AVWT-570FKFSHA	AVWT-592FKFSHA
Combination	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-212FKFSHA
	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA
	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA

Capacity kBtu/h(HP)	614(64HP)	636(66HP)	648(68HP)	664(70HP)	680(72HP)
Model	AVWT-614FKFSHA	AVWT-636FKFSHA	AVWT-648FKFSHA	AVWT-664FKFSHA	AVWT-680FKFSHA
Combination	AVWT-212FKFSHA	AVWT-212FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA
	AVWT-212FKFSHA	AVWT-212FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA
	AVWT-190FKFSHA	AVWT-212FKFSHA	AVWT-154FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA
	-	-	AVWT-154FKFSHA	AVWT-154FKFSHA	AVWT-170FKFSHA

Capacity kBtu/h(HP)	700(74HP)	720(76HP)	740(78HP)	760(80HP)	782(82HP)
Model	AVWT-700FKFSHA	AVWT-720FKFSHA	AVWT-740FKFSHA	AVWT-760FKFSHA	AVWT-782FKFSHA
Combination	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-212FKFSHA
	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA
	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA
	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-170FKFSHA	AVWT-190FKFSHA	AVWT-190FKFSHA

Before
Installation

Capacity kBtu/h(HP)	804(84HP)	826(86HP)	848(88HP)
Model	AVWT-804FKFSHA	AVWT-826FKFSHA	AVWT-848FKFSHA
Combination	AVWT-212FKFSHA	AVWT-212FKFSHA	AVWT-212FKFSHA
	AVWT-212FKFSHA	AVWT-212FKFSHA	AVWT-212FKFSHA
	AVWT-190FKFSHA	AVWT-212FKFSHA	AVWT-212FKFSHA
	AVWT-190FKFSHA	AVWT-190FKFSHA	AVWT-212FKFSHA

※ Combine the specified based units as showed in the table above, and do not use any combination of modules other than those in the above table.

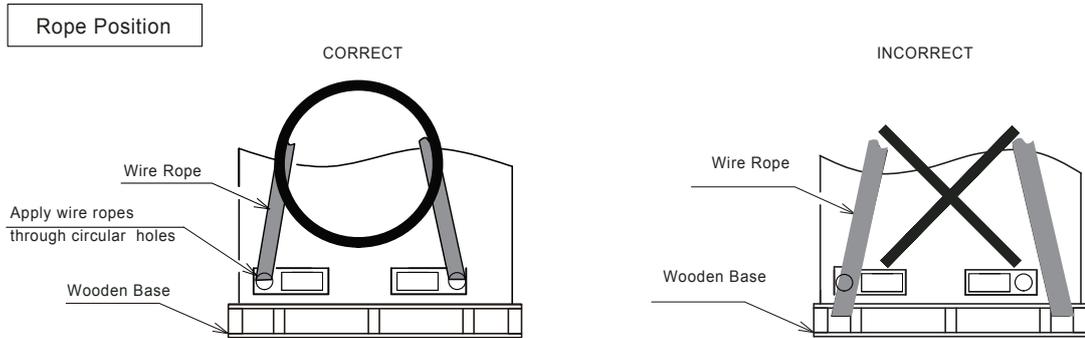
3. Transportation and Handling

3.1 Transportation

Transport the product as close to the installation location as practical before unpacking. When using a crane, hang the unit according to the description of the label attached to the outdoor unit.

⚠ DANGER

Do not hang the unit by the ropes at the wooden base.



Transportation and Handling

⚠ CAUTION

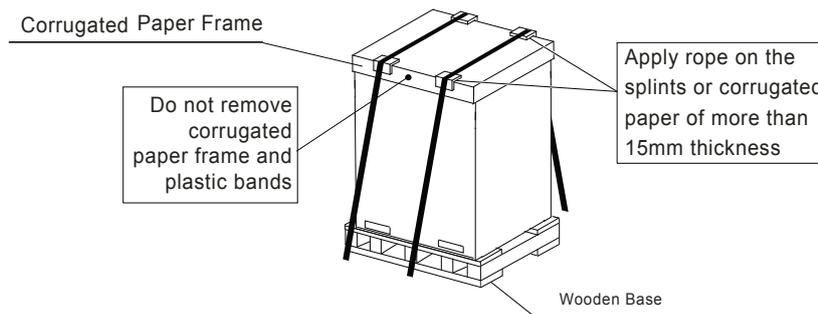
1. Transportation and Storage

The corrugated paper frame is not sufficiently strong, therefore pay attention to the followings in order to prevent the unit deformation.

- Do not step or put any material on the product.
- Apply two lifting wires onto the outdoor unit, when lifting it by crane.
- Do not stack the product when storing.

2. Transportation and Wire Rope

- To protect the unit, do not remove any packing.
- Do not stack or put any material on the product.
- Apply wire ropes on the both side of the unit as shown in the figure.



3.2 Hanging Method

When hanging the unit, ensure a balance of the unit, check safety and lift up smoothly.

- (1) Do not remove any packing materials.
- (2) Hang the unit under packing condition with two (2) wire ropes, as shown in Fig. 3.1.

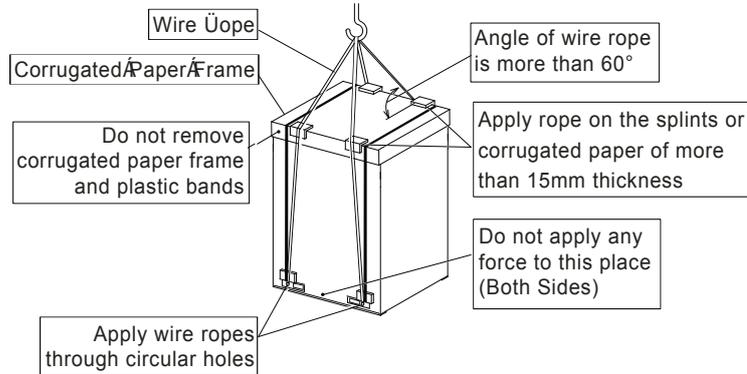


Fig. 3.1 Hanging Work for Transportation

- (3) Hang the unit without wooden base, as shown in Fig.3.2.

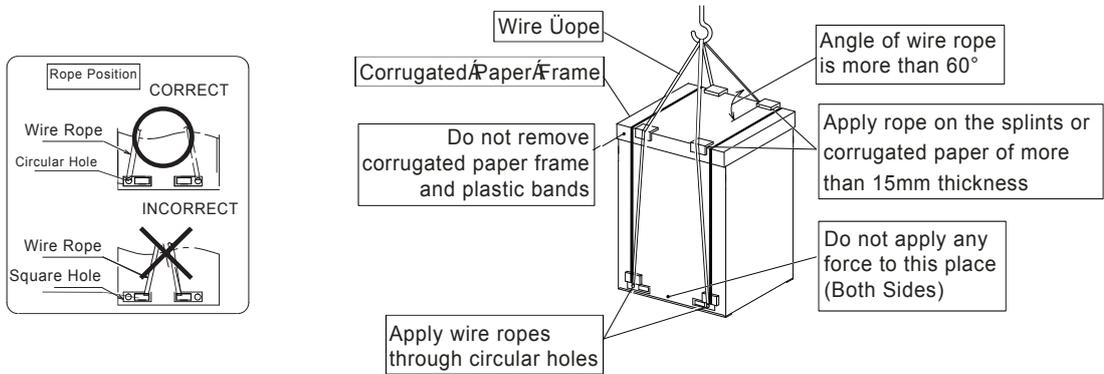
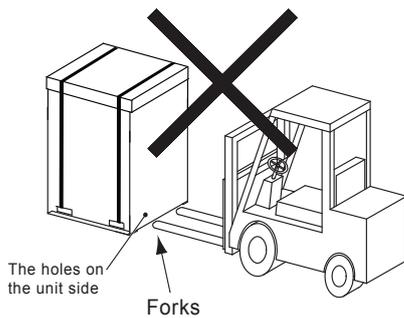


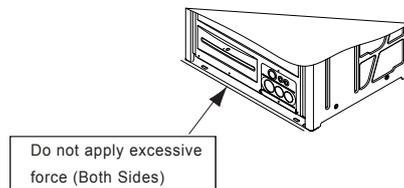
Fig. 3.2 Hanging Work without Wooden Base

When using forklift, do not insert forks into the holes on the unit side. The unit may be damaged.



Do not apply excessive force to the square holes with forks or other materials. The bottom of the unit may be deformed.

- *Do not push the bottom base by fork.
- *Do not use roller.



NOTE

In case of transportation after unpacking, protect the unit with the splints or cloth.



WARNING

Do not put any foreign material into the outdoor unit and check to ensure that none exists in the outdoor unit before the installation and test run. Otherwise, a fire, failure or personal injury, etc. may occur.

4. Outdoor Unit Installation

4.1 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the outdoor unit.

Table 4.1 Factory-Supplied Accessories

Accessory			76	96	114~136	154	170	190	212
Accessory Pipe	(A)	High/Low Pressure Gas Pipe 	 φ22.2→φ15.88	 φ22.2→φ19.05	-	-	-	 φ25.4→φ22.2	-
	(B)	Low Pressure Gas Pipe 	 φ22.2→φ19.05	-	-	-	-	-	-
	(C)	Liquid Pipe 	-	-	-	 φ15.88→φ12.7	-	-	-
Screw (Spare)			 ×3	 ×3	 ×3	 ×3	 ×3	 ×3	 ×3
Installation Manual									

NOTE:

If any of these accessories are not packed with the unit, please contact your contractor.

4.2 Installation

- Install the outdoor unit in a dry well ventilated environment.
- Install the outdoor unit where it is in the shade or it will not be exposed to direct sunshine or direct radiation from high temperature heat source.
- Install the outdoor unit where the sound or the discharge air from the outdoor unit does not affect neighbors or surrounding ventilation.
The operating sound at the rear or right/left sides is 3 to 6dB(A) higher than the value in the catalog at the front side.
- Install the outdoor unit in a space with limited access to general public.
- Check to ensure that the foundation is flat, level and sufficiently strong.
- Do not install the outdoor unit where dust or other contamination could block the outdoor heat exchanger.
- When installing the outdoor unit in snow-covered areas, mount the field-supplied hoods on the top of the outdoor unit and the inlet side of the heat exchanger.
- While heating or defrosting operation, drain water is discharged. Provide adequate drainage around the foundation. If installing the unit on a roof or a veranda, avoid draining in or over walkways to prevent water dripping on people or the formation of ice in winter. In case of installing such a place, provide the additional drainage around the foundation.
- Do not install the outdoor unit in a space where a seasonal wind directly blows to the outdoor heat exchanger or a wind from a building space directly blows to the outdoor fan.

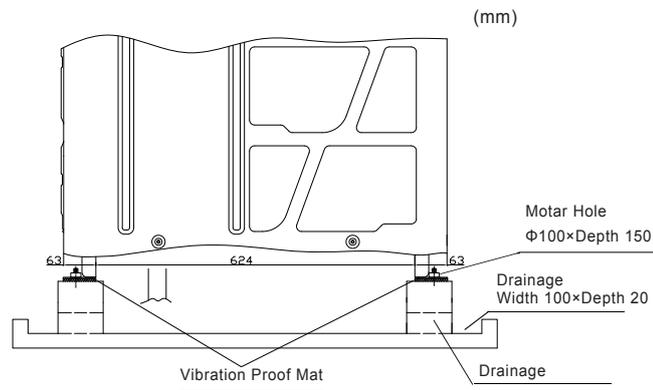
NOTES:

- Do not install the outdoor unit where there is a high level of oil mist, flammable gases, salty air or harmful gases such as sulphur and an acid or alkaline environment.
- Do not install the outdoor unit where the electromagnetic wave is directly radiated to the electrical control box.
- Install the outdoor unit as far as possible, being at least 3 meters from the electromagnetic wave radiator.

4.3 Foundation

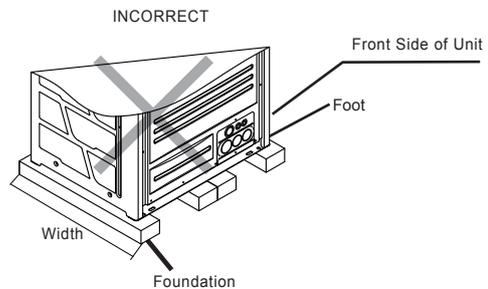
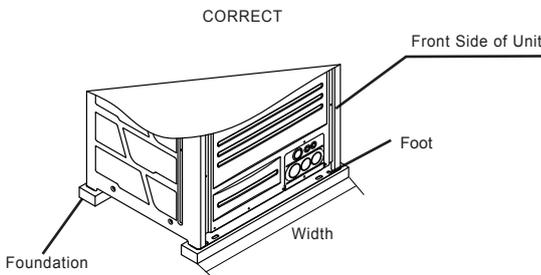
●Concrete Foundations

- (1) The height of the foundation should be 150mm higher than the ground level.
- (2) Install a drainage around foundation for smooth drain.

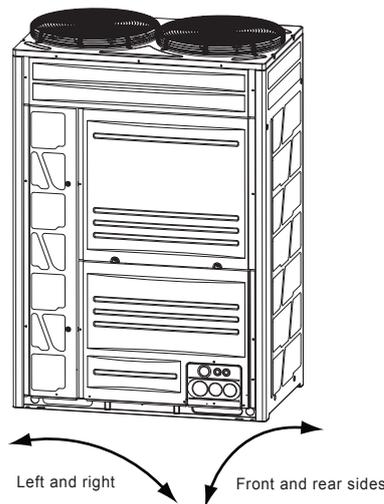


*Provide concrete foundation as shown in the figure.

*Do not provide concrete foundation as shown below. The foot of the outdoor unit may be deformed.

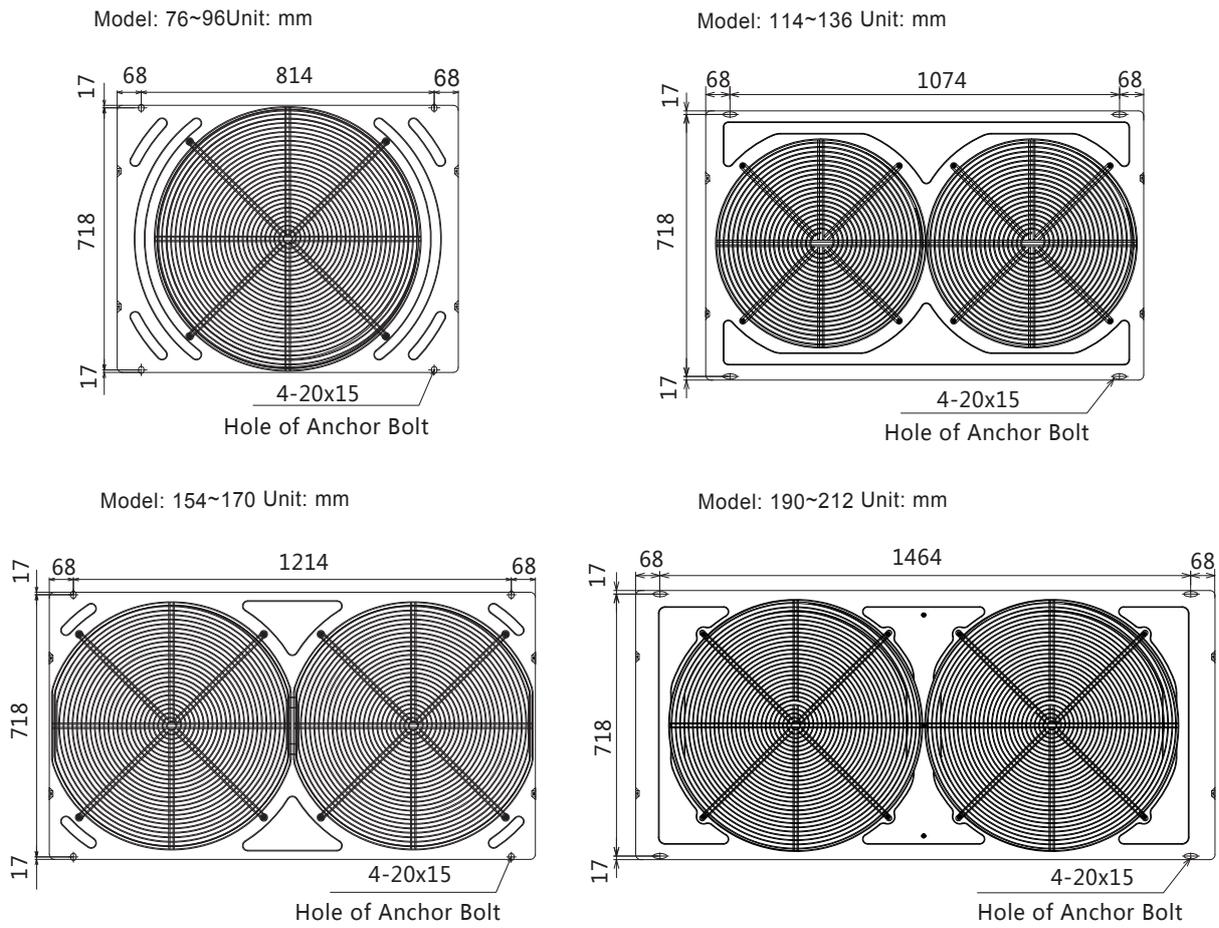


- (3) Install the outdoor unit in the front-rear and right-left direction horizontally. (Use a level gauge.) Check to ensure that the gradient in four directions (front, rear, right and left) is within 10mm.



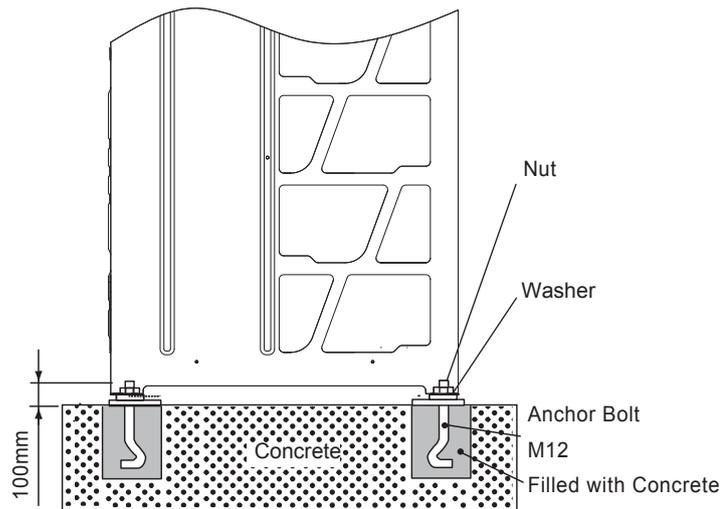
- (4) Provide a strong and correct foundation so that:
 - a. The outdoor unit is not on an incline.
 - b. Abnormal sound does not occur.
 - c. The outdoor unit will not fall down due to a strong wind or earthquake.

(5)When installing the outdoor unit, fix the unit by anchor bolts (field-supplied).



Position of Anchor Bolts

Secure the outdoor unit with the anchor bolts.



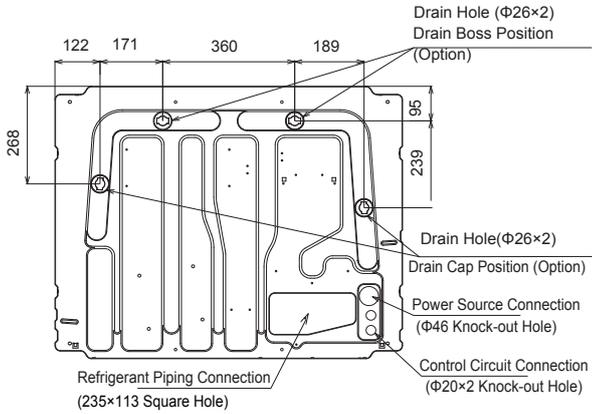
4.4 Drain Water Treatment

Drain water is discharged during heating and defrosting operation. (Rain water is also discharged.)
Pay attention to the followings:

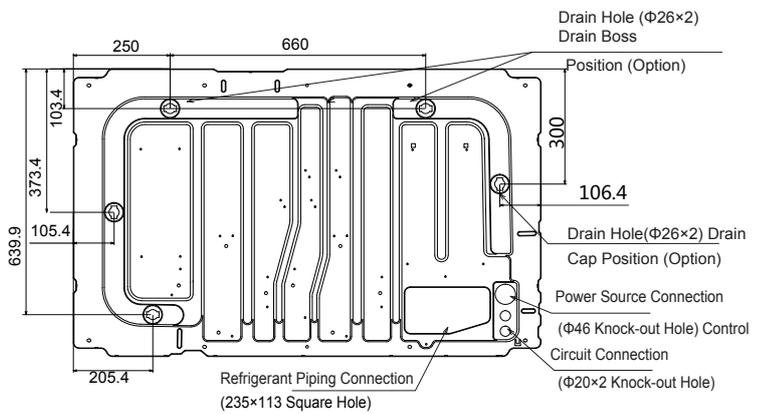
- (1) Choose a place where well drainage is available, or provide a drain ditch.

- (2) Do not install the unit over the walkways. Condensation water may fall on people.
In case of installing the unit in such a place, provide the additional drain pan.
- (3) When drain piping is necessary for the outdoor unit, use the drain boss set (Optional, DC-01Q).
Do not use drain boss and drain pan kit in the cold area. The drain water in the drain pipe may be frozen and then the drain pipe may crack
- (4) When installing the unit on a roof or a veranda, drain water sometimes turns to ice on a cold morning. Therefore, avoid draining into an area where people often use because it is slippery.

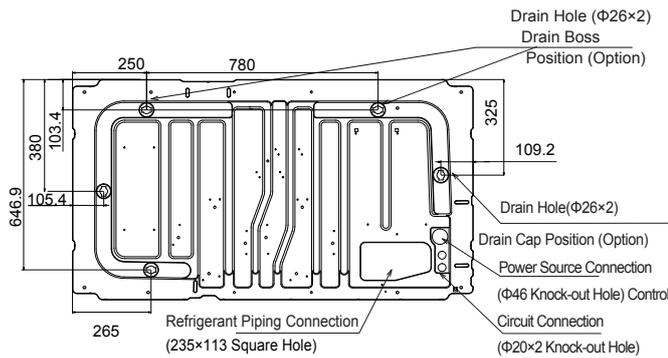
Model: 76~96 Unit: mm



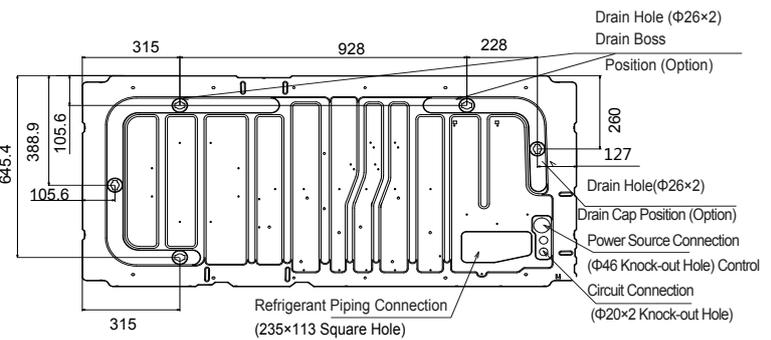
Model: 114~136 Unit: mm



Model: 154~170 Unit: mm



Model: 190~212 Unit: mm



● Drain Boss (Optional Parts)

The drain boss is for the drain pipe connection in order to use outdoor unit bottom base as a drain pan.

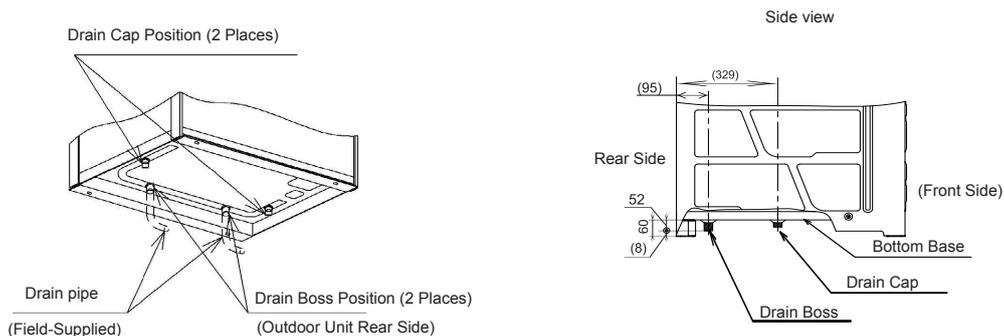
Name	Model
Drain Boss	DC-01Q

Component Formation of Drain Boss

Model	Parts Name	Material / Color	Q'ty	Application
DC-01Q	Drain Boss	PP/Black	1	Connecting for Drain Piping
	Drain Cap	PP/Black	1	Embolization for Drain Hole
	Rubber Cap	CR/Black	4	Sealing for Boss and Cap

Installation Position

Example: Model 76~96



5.Refrigerant Piping Work

⚠ DANGER

- Use refrigerant R410A in the refrigerant cycle.
Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen be used for these types of tests.
- Check to ensure that no pressure exists inside the stop valve before removing the flange

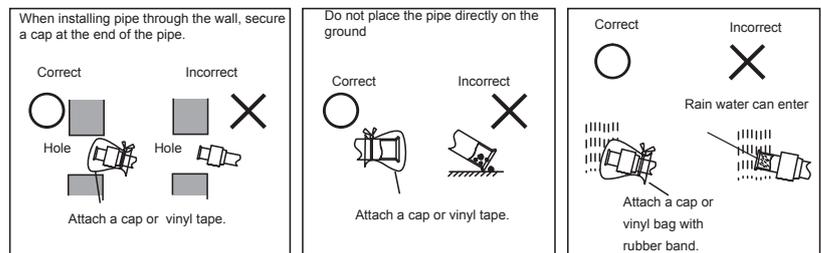
⚠ CAUTION

Ensure to connect the piping among the units in the same refrigerant cycle.

5.1 Piping Materials

- (1) Prepare locally-supplied copper pipes.
- (2) Select the piping size from the Technical Catalog.
- (3) Select clean copper pipes. Make sure there is no dust and moisture inside of the pipes. Blow the inside of the pipes with nitrogen or dry air, to remove any dust or foreign materials before connecting pipes. Do not use any tools which produce a lot of swarf such as a saw or a grinder.

•Cautions for Refrigerant Pipe Ends



•Cautions for Piping Connection Work

- (1) Connect the indoor/outdoor units with refrigerant pipes. Fix the pipes and pay attention not to contact with weak materials such as ceiling. (Otherwise, abnormal sound may be heard due to the vibration of the piping.)
- (2) Apply refrigerant oil slightly on the sheet surface of the pipe and flare nut before the flaring work. And then tighten the flare nut with the specified tightening torque using two spanners. Perform the flaring work on the liquid piping side before the gas piping side. Check the gas leakage after the flaring work



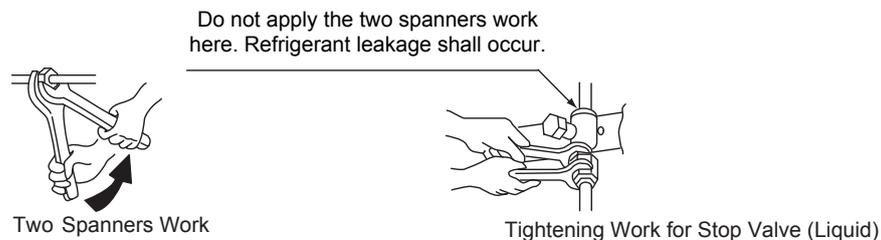
NOTE:

Refrigerant oil is field-supplied.

【Model: FVC68D】

- (3) In case that temperature and humidity inside the ceiling exceed 27°C/RH80%, apply additional insulation (approx. 10mm thickness) to the accessory insulation. It prevents dew condensation on the surface of the insulation (refrigerant pipe only).
- (4) Perform the air-tight test (4.15MPa for the test pressure).
- (5) Perform cold insulation work by insulating and taping the flare connection and reducer connection. Also insulate all the refrigerant pipes.

- When tightening the flare nut, use two spanners.



⚠ WARNING

Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to aged deterioration and refrigerant leakage may occur. Use the specified tightening torque.

- Piping Thickness and Material
Use the pipe as below.

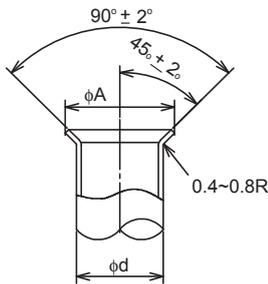
(mm)

Diameter	R410A	
	Thickness	Material
Φ6.35	0.8	O material
Φ9.53	0.8	O material
Φ12.7	0.8	O material
Φ15.88	1.0	O material
Φ19.05	1.0	1/2H material
Φ22.2	1.0	1/2H material
Φ25.4	1.0	1/2H material
Φ28.6	1.0	1/2H material
Φ31.75	1.1	1/2H material
Φ38.1	1.35	1/2H material
Φ41.3	1.45	1/2H material
Φ44.5	1.55	1/2H material
Φ50.8	2.0	1/2H material
Φ53.98	2.0	1/2H material

5.2 Flaring and Joint

- Flaring Dimension

Perform the flaring work as shown below.



(mm)

Diameter (Φd)	A ⁺⁰ _{-0.4}
	R410A
6.35	9.1
9.53	13.2
12.7	16.6
15.88	19.7
19.05	(*)

(*)It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare)

- Joint Selection

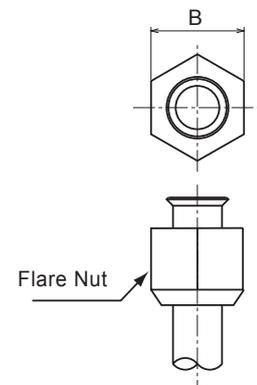
If you use 1/2H material, you can not perform the flaring work. In this case, use a joint selected from the chart below.

<Minimum Thickness of Joint (mm)>

Diameter	R410A
Φ6.35	0.5
Φ9.53	0.6
Φ12.7	0.7
Φ15.88	0.8
Φ19.05	0.8
Φ22.2	0.9
Φ25.4	0.95
Φ28.6	1.0
Φ31.75	1.1
Φ38.1	1.35
Φ41.3	1.45
Φ44.5	1.55
Φ50.8	2.0
Φ53.98	2.0

<Flare Nut Dimension B (mm)>

Diameter	R410A
Φ6.35	17
Φ9.53	22
Φ12.7	26
Φ15.88	29
Φ19.05	36

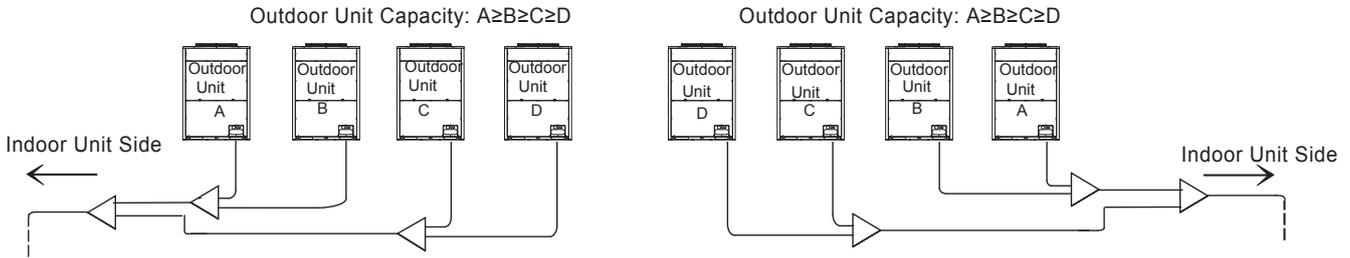


5.3 Caution about Outdoor Unit Installation

Outdoor Unit Alignment

Taking four-module combination of outdoor unit for example.

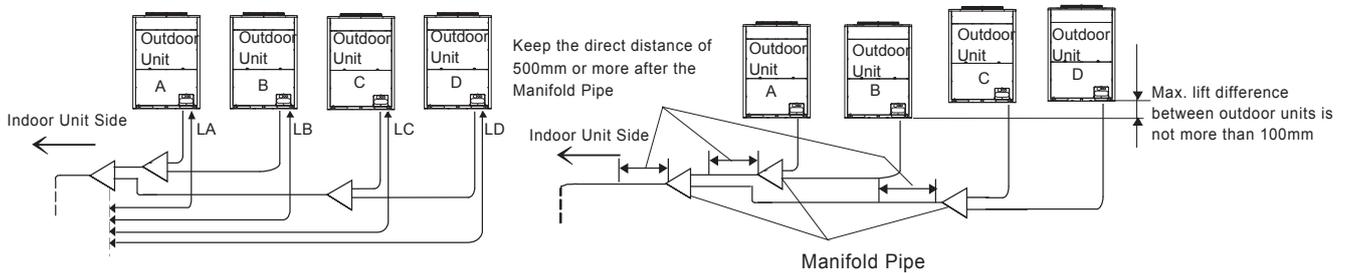
Align the outdoor unit from large capacity as $A > B > C > D$, and outdoor Unit "A" should be located at the indoor unit side.



Piping Work between Outdoor Units

(1) Piping Length between Manifold Pipe (at outdoor unit side) and outdoor unit should be $LA < LB < LC < LD < 10m$.

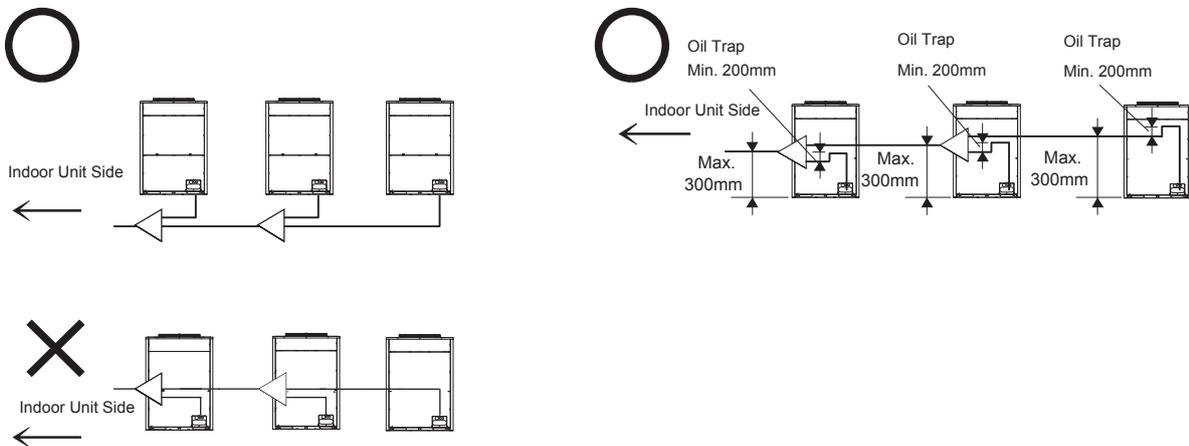
Outdoor Unit Capacity: $A \geq B \geq C \geq D$



(2) Taking three-module combination of outdoor unit for example.

Place the Manifold Pipe lower than the outdoor unit piping connection.

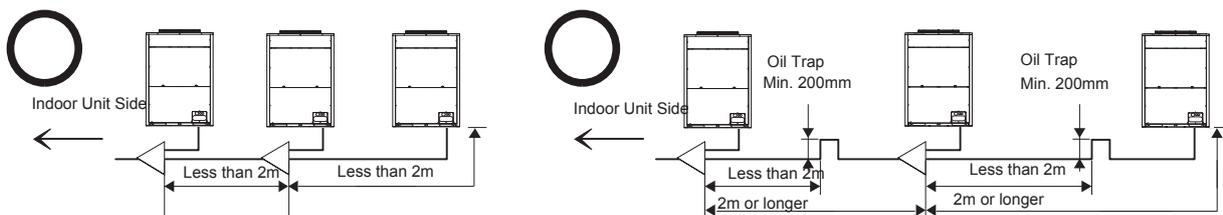
In case that the Manifold Pipe is placed higher than the outdoor unit piping connection, keep 300mm(max.) between the Manifold Pipe and the bottom of the outdoor unit. Also, provide the oil trap (Min. 200mm) between the Manifold Pipe and the bottom of the outdoor unit.



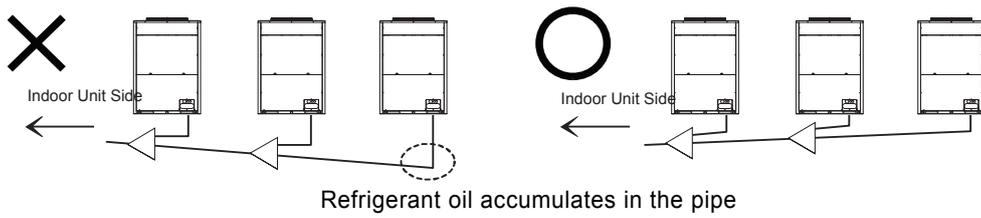
(3) In case the piping length between the outdoor is 2m or more, the oil trap should be provided for the gas pipe so that the accumulation of the refrigerant may not occur.

* Less than 2m

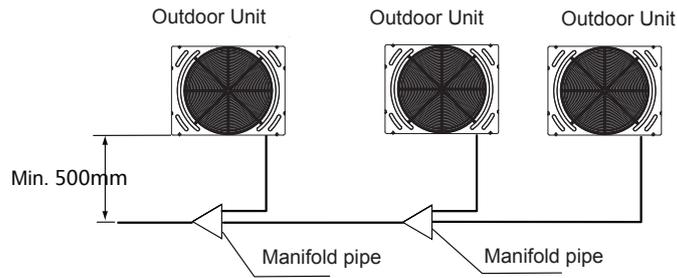
* 2m or longer



(4) Place the outdoor unit pipe horizontally or with down gradient toward indoor unit side, or refrigerant oil may accumulate in the pipe.

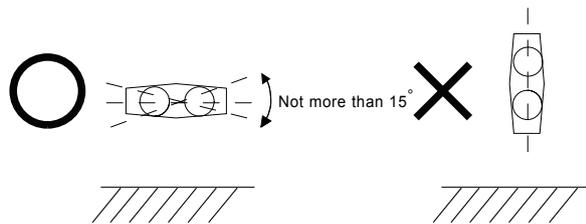


(5) For servicing, in case that the pipe is placed frontward of the outdoor unit, secure Min 500mm between the outdoor unit and the Manifold Pipe. (when the compressor is replaced, a space of Min.500mm is required.)



(6) Direction of Manifold Pipe

Place the Manifold Pipe vertically toward the ground (whithn $\pm 15^\circ$) as shown in the figure.



5.4 Piping Connection

Perform the piping connection work for each outdoor unit.

NOTE:

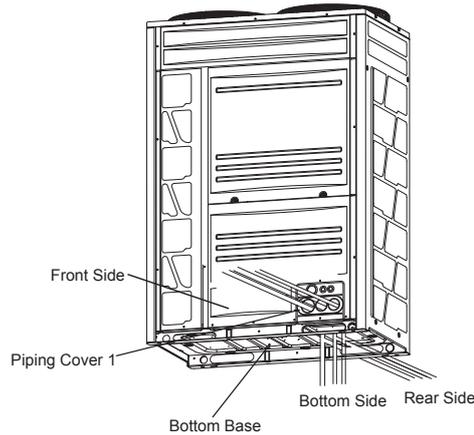
Ensure that the refrigerant pipe should be connected to the same refrigerant cycle unit.

- Prepare the refrigerant pipe in the field for the piping work.
- Piping Direction
Fix the pipes adequately in order to avoid vibration and excessive force to the valve

(1) The pipes are available to connect in three directions from the bottom base.

Front side: gash the piping cover 1 with a boxcutter and connect directly through the service lid at the front unit

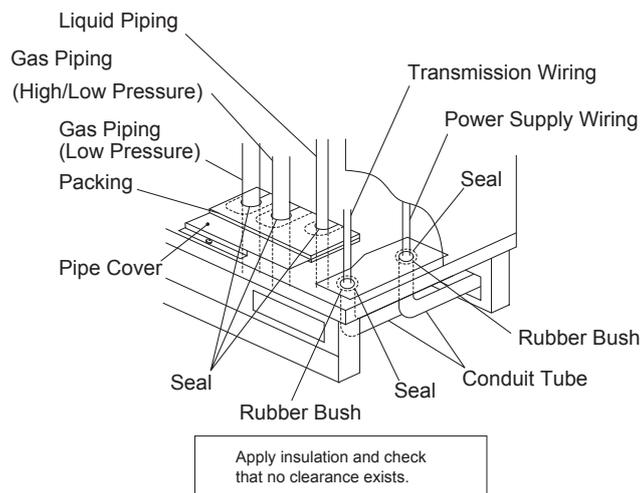
Bottom side: connect directly from the piping cover 2 on the bottom base
Rear side: connect from the piping cover 2 on the bottom base, then pass through the bottom base to open a hole and connect



(2) Operation of the stop valve should be performed according to Item 5.4.1.

(3) If the piping connected from the front side, completely seal the connecting piping with insulation pipe in order to prevent water or snow from entering the conduit.

(4) If the piping connected from the bottom or rear side, completely seal the penetration part of the bottom pipe with insulation pipe in order to prevent water or snow from entering the conduit.



5.4.1 Stop Valve

<Gas Valve>

- (1) Make sure that the all the stop valves are closed completely;
- (2) Connect the charging hose to the service port and release gas from the gas pipe;
- (3) Cut the end of the closing pipe ($\Phi 6.35$) and check that no gas exists inside the gas pipe;
- (4) Remove the stop valve cover;
- (5) Remove the closing pipe from the brazing portion by using a burner. Pay attention to the flame from the burner not to burn the stop valve body.

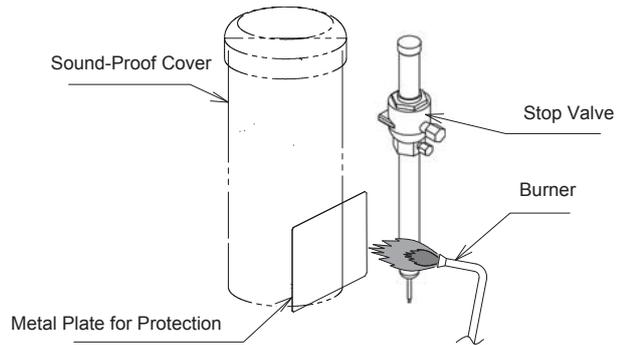
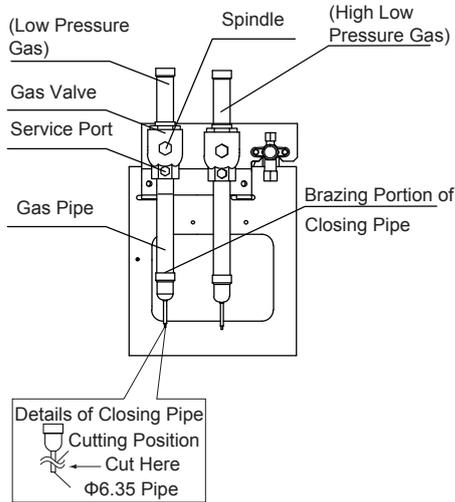


Fig. 5.2

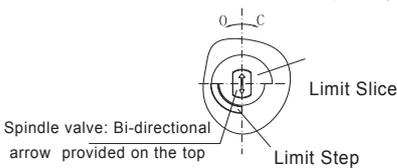
⚠ CAUTION

- Ensure that there is no gas inside the pipe when removing the closing pipe. Otherwise, the pipe may be blown out and it may lead to injury.
- Protect the return oil pipe and sound-proof cover of the compressor with the metal plate when using a burner.

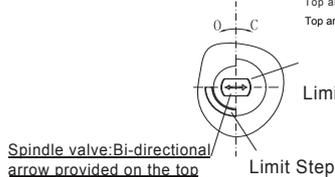
- Stop valve is detailed below:

Ball Valve Switching Sketch

K side: ball valve is completely open

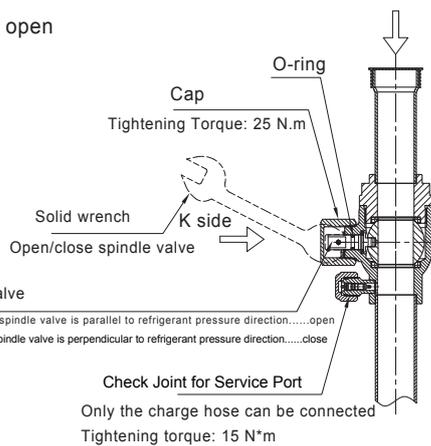


K side: ball valve is completely close, and full-close angel deviation is $\pm 5^\circ$



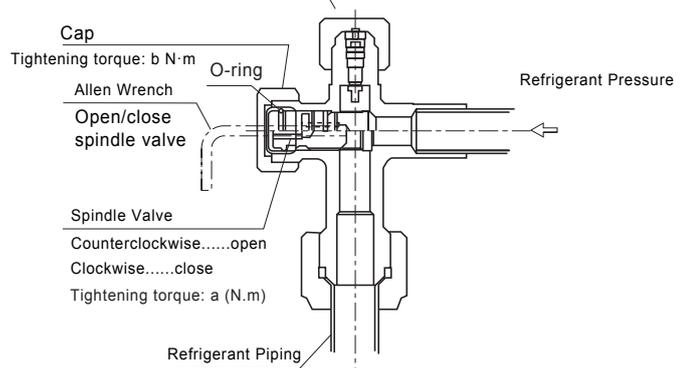
<Gas Valve>

Refrigerant Pressure



<Liquid Valve>

Check Joint for Service Port
Only the charge hose can be connected
Tightening torque: 15 N*m



Liquid Valve

Model	Torque a(N.m)	Torque b(N.m)
76~96	7	25
114~136	10	30
154~212	13	35

⚠ CAUTION

- Do not apply an abnormal big force to the spindle valve at the end of opening, otherwise the stop valve will be damaged.
- At the test run, fully open the spindle. If not fully opened, the devices will be damaged.

5.4.2 Piping Connection

- (1) Make sure that the stop valves are closed completely.
- (2) Protect the compressor and sound-proof cover with metal plate when brazing the gas pipe as shown in Fig. 5.2. Pay attention to the flame from the burner not to burn the stop valve body.
- (3) Connect the indoor unit and the outdoor unit with refrigerant piping. Prevent the refrigerant piping from touching weak parts of the building such as wall, ceiling, etc. (Abnormal sound may occur due to the vibration of the piping.)
- (4) As for the flaring work of the field pipe, use the specified tightening torque in Table 5.3. Put nitrogen gas into the pipe when brazing.
- (5) Insulate the gas pipe and liquid pipe completely.
- (6) Mount the piping cover equipped with the outdoor unit after the piping connection. If not, the unit may be damaged due to entering snow or rain water

Table 5.3 Tightening Work of Flare Nut
Required Tightening Torque EN 378-2

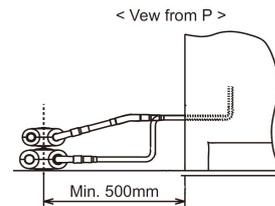
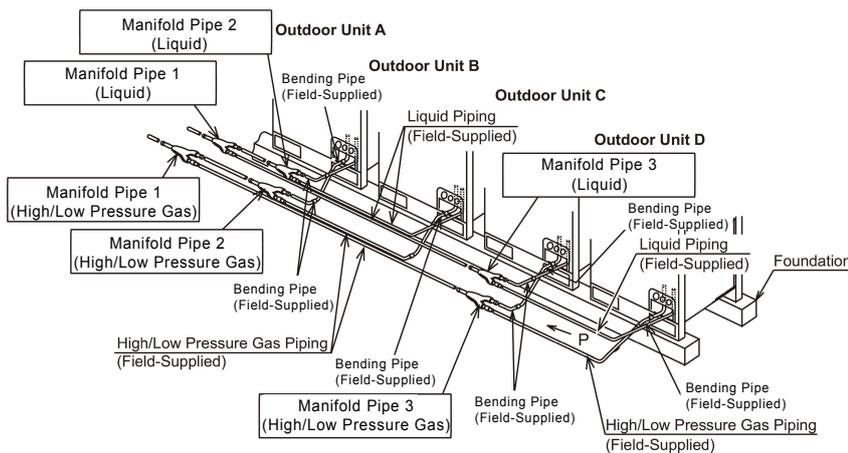
Pipe Size	Tightening Torque
Φ6.35 (1/4)	14 ~ 18 (N . m)
Φ9.53 (3/8)	34 ~ 42 (N . m)
Φ12.7 (1/2)	50~62 (N . m)
Φ15.88 (5/8)	63~ 77 (N . m)
Φ19.05 (3/4)	90 ~110 (N . m)

NOTES:

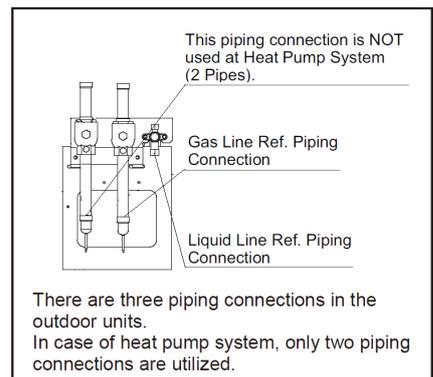
1. Ensure that the closing pipe of the gas stop valve(1 place) is removed firstly.
2. Refer to the item 5.2 for the flaring work.

Construction Example

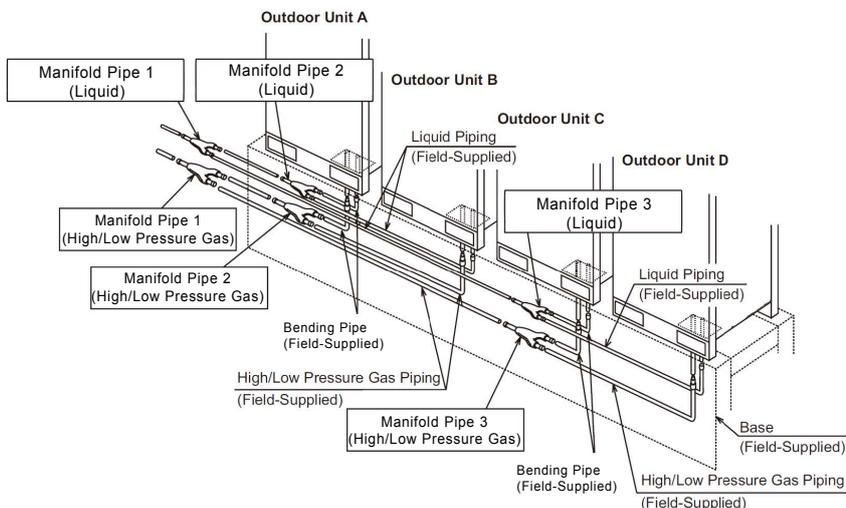
< Heat Pump System >



NOTE:

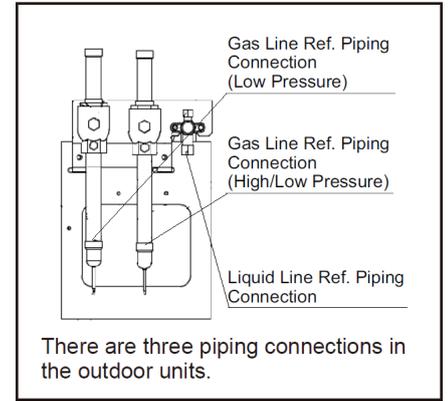
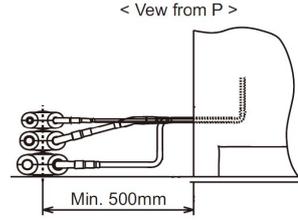
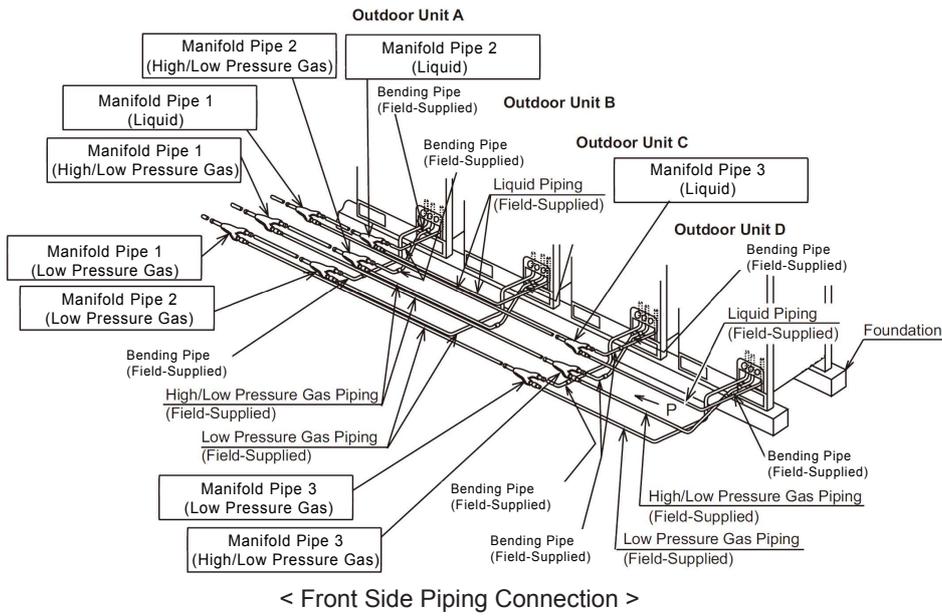


< Front Side Piping Connection >

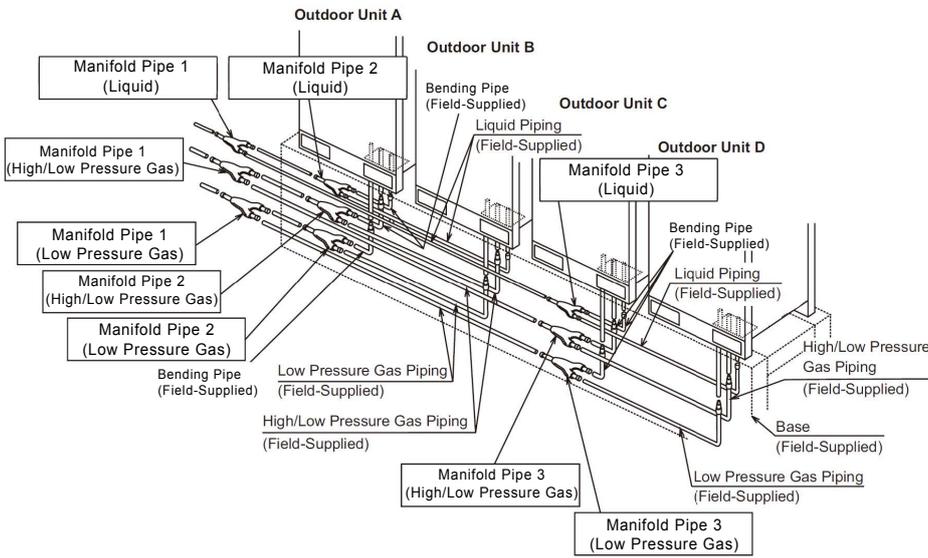


< Downward Piping Connection >

< Heat Recovery System >



Refrigerant Piping Work



NOTE:

The figure shows the case that the refrigerant pipes are pulled out from the front side piping cover. They can be also pulled out from the bottom base hole.

Piping Size For Outdoor Unit

Model (kBTu/h)		76	96	114	136	154	
Piping Size (φmm)	a	Low Pressure Gas	19.05	22.2	25.4	25.4	28.6
		High/Low Pressure Gas	15.88	19.05	22.2	22.2	22.2
		Liquid	9.53	9.53	12.7	12.7	12.7

Model (kBTu/h)		170	190	212	
Piping Size (φmm)	a	Low Pressure Gas	28.6	28.6	28.6
		High/Low Pressure Gas	22.2	22.2	25.4
		Liquid	15.88	15.88	15.88

6. Electrical Wiring



- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and which may lead to a fire.
- Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit. If not do, the wires will be damaged and at the worst, a fire will occur.
- Use a medium sensing speed type ELB (Earth Leakage Breaker, activation speed of 0.1 sec. or less). If not used, it will cause an electric shock or a fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- It is forbidden to use the terminal block of air conditioner power supply to connect the power cable. Use the power distribution box to extend the power supply wiring on the inner side of the air conditioner. Pay attention to the wiring capacity calculation, otherwise, the wiring capacity is too small and the fire may be easily caused.
- Tighten screws according to the following torque.
 - M4: 1.0 ~ 1.3 N. m
 - M5: 2.0 ~ 2.4 N. m
 - M6: 4.0 ~ 5.0 N. m
 - M8: 9.0 ~ 11.0 N. m
 - M10: 18.0 ~ 23.0 N. m

6.1 General Check

(1) Make sure that the field-selected electrical components (main power switches, fuse, wires, conduit connectors and wire terminals) comply with National Electrical Code (NEC).

● Supply electrical power to each outdoor unit. An ELB, fuse and main switch should be used for each outdoor unit. If not, it will be cause of fire or electrical shock.

● The power supply for the indoor unit and outdoor unit should be provided separately.
Connect a power supply wiring to each indoor unit group to be connected to the same outdoor unit.

(2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
If the power supply voltage is too low, the system cannot be started due to the voltage drop.

(3) Check the size of the electrical wires.

(4) In some cases, the air conditioner may not be operated normally under the following cases.

● In case that the air conditioner is supplied with the same power transformer as the device with high electricity consumption*

● In case that the power source wires for the device* and the air conditioner are located close to each other.

*Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch. For the cases mentioned above, induction surge of the power supply wiring for the packaged air conditioner may occur due to a rapid change in electricity consumption of the device and an activation of switch. Therefore check the field regulations and standards before performing electrical work in order to protect the power supply wiring for the packaged air conditioner.

(5) Check to ensure that the earth wire of the outdoor unit is connected.

6.2 Electrical Wiring Connection



The ELB (earth leakage breaker), FUSE and S (main switch) must be installed to the each power source of outdoor unit. If not, it may cause of electrical shock or fire.

NOTE:

Supply the power source of outdoor units and indoor units respectively.

(1) Power Source Wiring

Supply the power sources to the each outdoor unit respectively. Power source wiring is fundamentally according to this method.

(2) The recommended wiring, ELB, switching capacity are shown as Table 6.1

Table 6.1 Field Minimum Wire Sizes for Power Source

Model(KBtu/h)	Power Supply	Max Operating Current (A)	Power Supply Line (Φmm)	Transmission Supply Line (Φmm)	ELB		Fuse (A)
					Rated Current (A)	Current Sensitivity (mA)	
76	380-415V 3N~50/60Hz	17.2	4	0.75	25	30	25
96		22.5	4	0.75	32	30	32
114		28.6	6	0.75	40	30	40
136		33.6	10	0.75	40	30	40
154		38.8	10	0.75	50	30	50
170		44.2	16	0.75	63	30	63
190		50.7	16	0.75	80	30	63
212		54.0	16	0.75	80	30	80

ELB: Earth Leakage Breaker

NOTES:

- (1) Follow local codes and regulations when selecting field wires.
- (2) The wire sizes marked with *1 in the above table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord (code designation H05RN-F).
- (3) Use a shielded cable for the transmitting circuit and connect it to ground.
- (4) In the case that power cables are connected in series, add each unit maximum current and select wires below

Table 6.2 Power Wire Selection Basis

Current (A)	Wire Size (mm ²)
$i \leq 6$	2.5
$6 < i \leq 10$	2.5
$10 < i \leq 16$	2.5
$16 < i \leq 25$	4
$25 < i \leq 32$	6
$32 < i \leq 40$	10
$40 < i \leq 63$	16
$63 < i$	※1

※1 In the case that current exceeds 63A, do not connect cables in series.

⚠ CAUTION

Install a multi-pole main switch with a space of 3.5mm or more between each phase.

NOTES:

- 1) When the power supply wiring is longer, select the minimum wiring size of which the voltage drop is within 2%.
- 2) Power supply voltage should be satisfied with the followings:
 Supply Voltage: Rated Voltage within +10%
 Starting Voltage: Rated Voltage within -15%
 Operating Voltage: Rated Voltage within +10%
 Imbalance between Phases: within 3%
- 3) Do not connect the earth wire to the gas pipe, water pipe, lightning conductor.
 Gas Pipe: An explosion and ignition may occur when gas leaks.
 Water Pipe: There is no effect of earth wire when a hard vinyl pipe is used.
 Lightning Conductor: The earth electric potential abnormally increases when a lightning conductor is used.

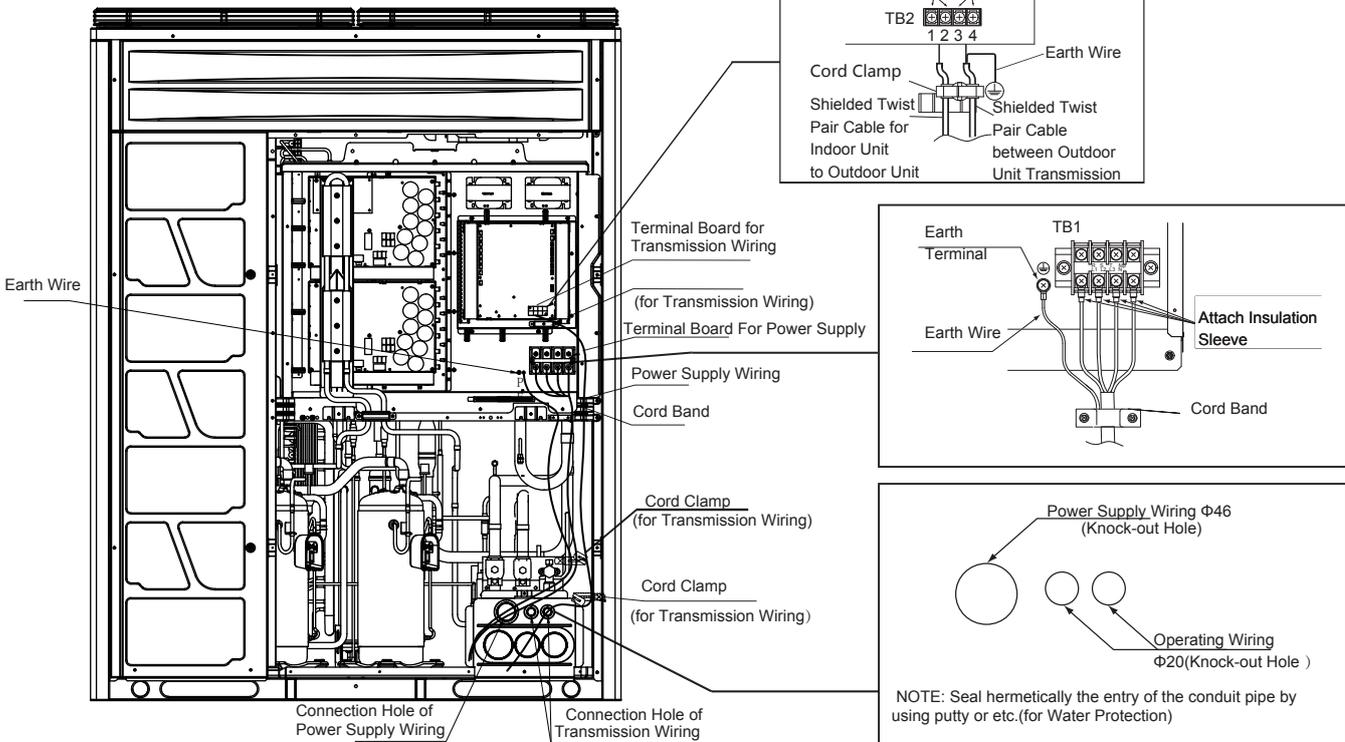
6.3 Electrical Wiring Connection

Connect the electrical wirings according to the following figure.

- (1) Connect the power supply wires to L1, L2, L3, and N (for 380-415V) for the three phase power source on the terminal board TB1 and earth wire to the terminal in the electrical control box.
- (2) Connect the transmission wires between the outdoor and indoor units to the TB2 terminals 1 and 2 on the PCB1. As for the transmission wires between outdoor units in the same refrigerant cycle, connect them to the TB2 terminals 3 and 4 on the PCB1.
- (3) Tighten screws for the terminal board according to the following table.

<Tighten screws for the terminal board according to the following table.>

Size	Tightening Torque
M4	1.0 ~ 1.3 N . m
M5	2.0 ~ 2.4 N . m
M6	4.0 ~ 5.0 N . m
M8	9.0 ~ 11.0 N . m
M10	18.0 ~ 23.0 N . m



Electrical Wiring

⚠ CAUTION

Pay attention to the followings to run through the cables under the unit using conduit tube. (The pipe cover is required to remove before performing piping and wiring works.)

NOTES:

1. Do not lead the power supply wiring and transmission wiring through the same conduit tube. Moreover, keep at least 5cm between the power supply wiring and transmission wiring
2. Cut cross line at rubber bush and securely attach it to the knock-out hole for cable protecting.
3. Attach the pipe cover to avoid entrance of rats or other small animals into the unit.
4. Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit.
5. Completely seal the end of conduit tube with sealing materials to avoid entrance rain into the conduit tube.
Make a drain hole at the lowest part of the conduit tube.



CAUTION

Tightly secure the power source wiring using the cord clamp inside the unit.

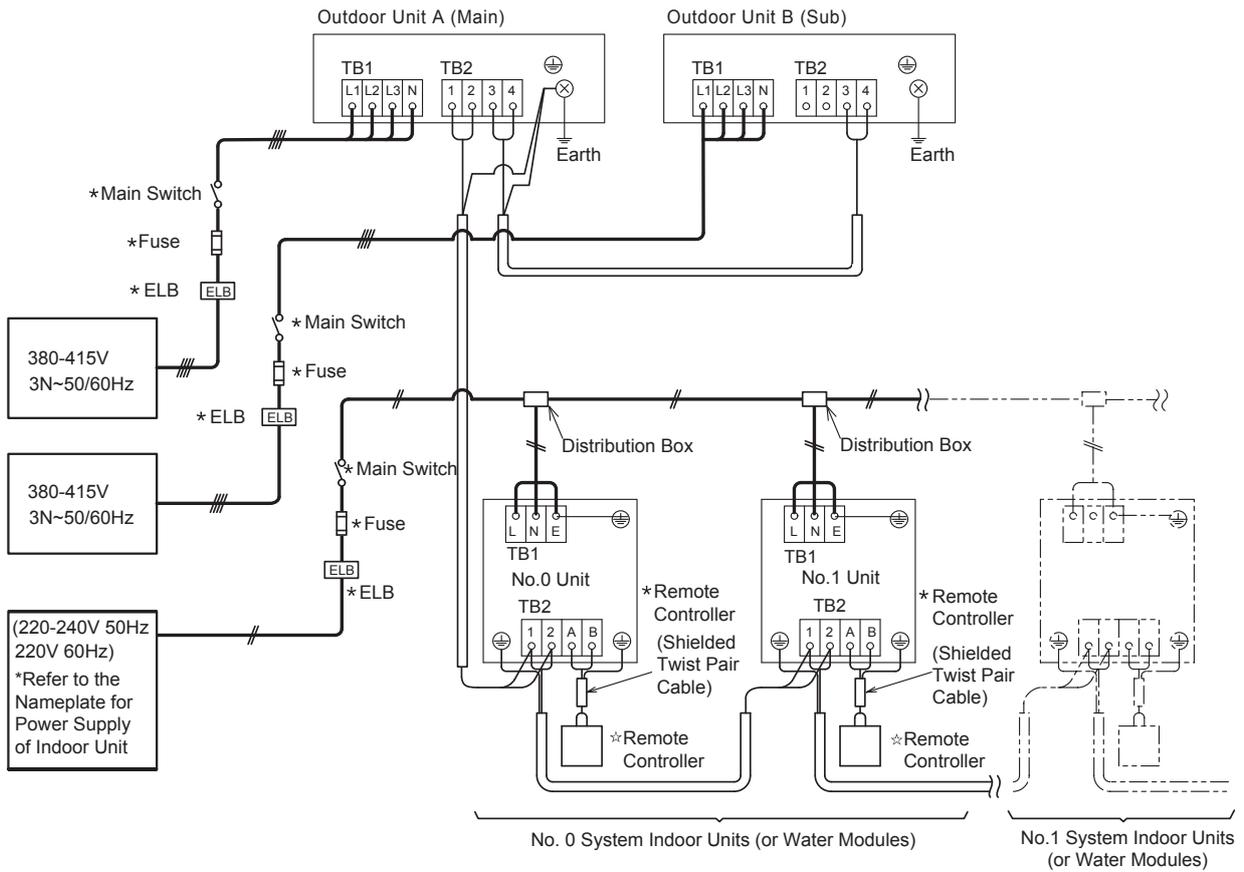
Electrical Wiring Connection of The System

- (1) Connect a power supply wiring to each outdoor unit. Connect an ELB, fuse and main switch (S) to each outdoor unit.
- (2) Connect a power supply wiring to each indoor unit group to be connected to the same outdoor unit. Connect an ELB, fuse and main switch (S) to each indoor unit group.
- (3) Connect the transmission wiring between indoor units and outdoor units, as shown in figure below.
- (4) Connect the transmission wiring in the same refrigerant cycle unit. (In case that the refrigerant pipe of indoor unit is connected to the outdoor unit, connect the transmission wiring to the same indoor unit.) Connecting the refrigerant pipe and transmission wiring to the different refrigerant cycle systems may lead to malfunction.
- (5) Use 2-Core lead wires such as shielded twist pair cable for the transmission wiring. (Do not use 3-Core or over.)
- (6) Use the same kind of cables for the Hi-NET system of the same refrigerant cycle.
- (7) The transmission wiring is required to be separated from the power supply wiring. Keep at least 5cm between the transmission wiring and the power supply wiring, and also min. 1.5m between the transmission wiring and power supply wiring for other electrical device. If the above is not secured, put the power supply wiring into the metal conduit tube to separate from other wirings.
- (8) Connect the following transmission wiring to the terminals 1 and 2 of TB2 in the outdoor unit A (main unit).
 - between outdoor unit and indoor unit
 - between outdoor unit and indoor unit in other refrigerant cycles
- (9) Do not connect the power supply wiring to the terminal board for transmission wiring (TB2). Printed circuit board may be damaged.
- (10) Connect the earth wire for the outdoor/indoor. The earth wiring work under the condition of 100 ohms (max.) ground resistance should be performed by the qualified person.

NOTES:

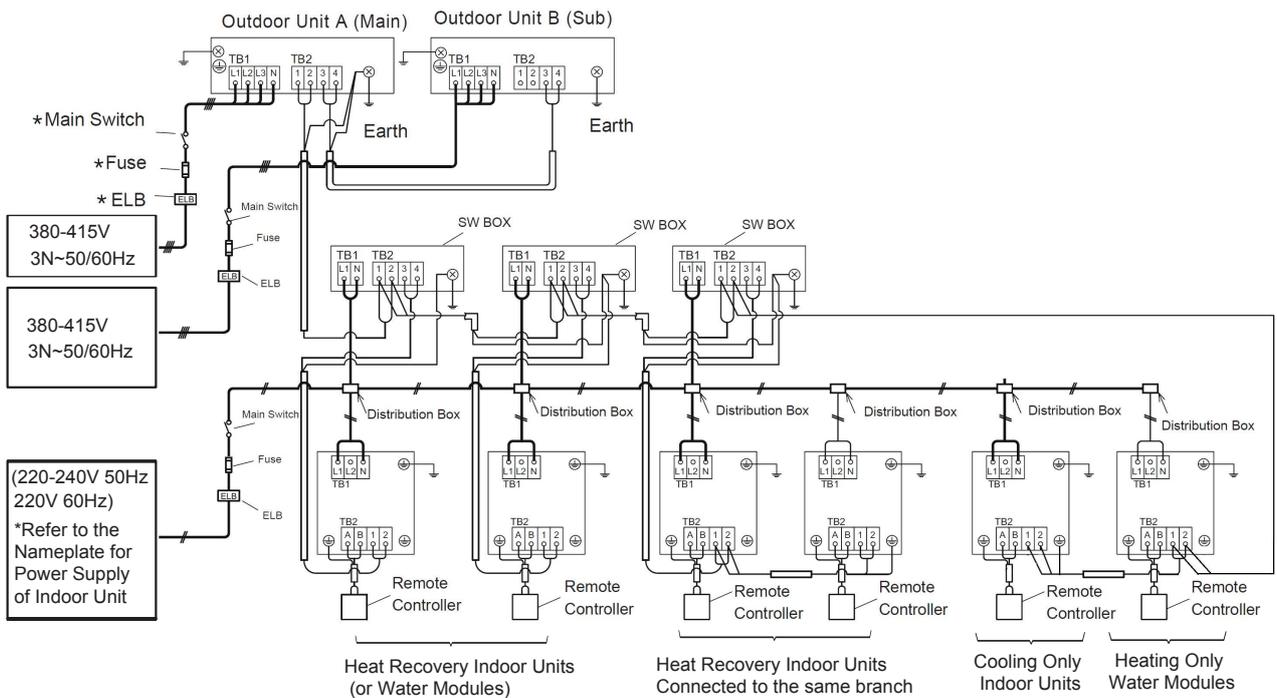
1. For the combination units (228~848kbtu/h), DSW settings of Main and Sub are required.
2. Alarm occurs if the transmission wires between outdoor units are connected to the terminals 1 and 2 for Hi-NET.
3. In case that alarm is indicated on the LCD of Main outdoor unit, follow the "7-segment" indication of the Main outdoor unit checking.
4. Perform function setting from Main outdoor unit.

< Heat Pump System & Heat Recovery System Without Switch Box >

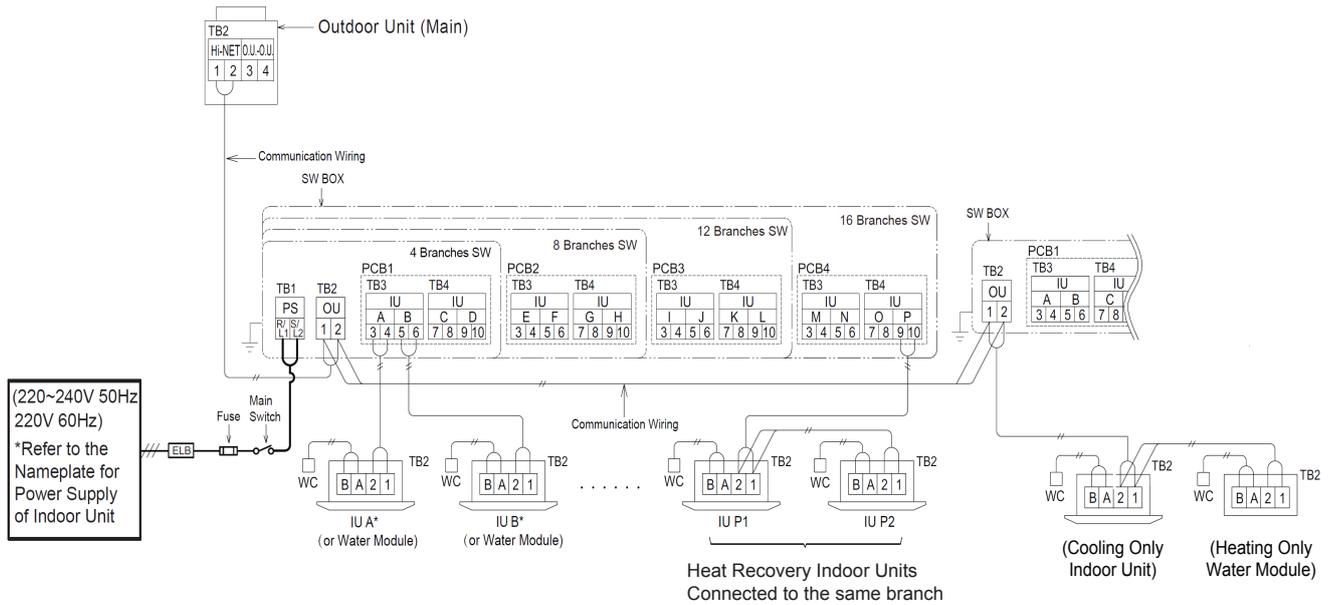


< Heat Recovery System with Switch Box >

For Single Branch SW BOX



For Multi Branch SW BOX



NOTES:

- When multiple indoor units are connected to the same single SW BOX, they are controlled with the same operation mode.
- When multiple indoor units are connected to the same branch of the multi SW BOX, they are controlled with the same operation mode.
- Do not apply excessive voltage to the communication cable DC5V (non-polarity) between the outdoor unit and the SW BOX, between the SW BOX and the indoor unit or between SW BOXES.
- Use 2-Conductor shielded communication cable for the communication cable. (Do not use 3-Conductor cable or over.)
- Connect the communication cable for the outdoor unit to terminals "1" and "2" on TB2 in the SW BOX.
- Connect the communication cable for the cooling only indoor unit or heating only water module to the terminal "1" and "2" on TB2 in the SW BOX.
- For a SW BOX in the same refrigerant cycle, an electrical power supply can be supplied by one main switch.
- Do not connect the power supply line to the terminal block for transmission line.
- Connect the ground wiring for the outdoor/indoor units and SW BOX. When ground resistance is less than 100 ohms, ground wiring work should be performed by the qualified electrician.
- Do not run the communication cables along with power supply wirings in the SW BOX. Separate communication cables from the power supply wirings.
- Water module should be connected to an exclusive branch of the SW BOX.

6.4 Dip Switch Setting of Outdoor Unit

TURN OFF all power sources before setting.

Without turning OFF, the switches do not work and the contents of the setting are invalid. However, DSW4-No.1, 2, 4 can be operated during power source is ON. The mark of "I" indicates the position of dip switches.

NOTE

- By using switch DSW4, the unit is started or stopped after 10 to 20 seconds after the switch is operated.
- Number this outdoor unit to distinguish from other outdoor units for service and maintenance.
And write the number in the space right.



- **Setting for Transmitting**

It is required to set the outdoor unit Nos., refrigerant cycle Nos. and end terminal resistance for this Hi-NET system.

- **Setting of Outdoor Unit No. In case of the combination of base unit, set DSW6 as shown below.**

Base Unit (Before Shipment)	Combination of Base Unit			
	Outdoor Unit A (No.0) (Main)	Outdoor Unit B (No.2)	Outdoor Unit C (No.3)	Outdoor Unit D (No.4)
ON OFF 1 2 3 4	ON OFF 1 2 3 4	ON OFF 1 2 3 4	ON OFF 1 2 3 4	ON OFF 1 2 3 4

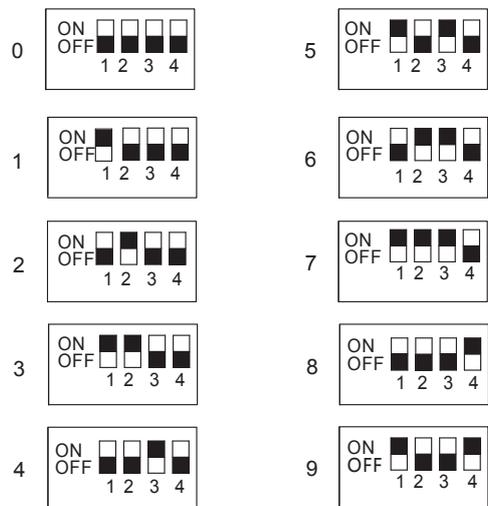
- **Setting of Refrigerant Cycle No.**

In the same refrigerant cycle, set the refrigerant cycle No. for the outdoor units as shown below.

NOTE: In the same refrigerant cycle, set the same refrigerant cycle No. for the outdoor unit and the indoor unit.

Outdoor Unit	Setting Switch	
	10 digit DSW1	1 digit DSW8
	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4

0~9 Binary System Dip Setting Method for DSW8



Ex: In Case of Setting Refrigerant Cycle No. 25



Turn ON No. 2 pin.

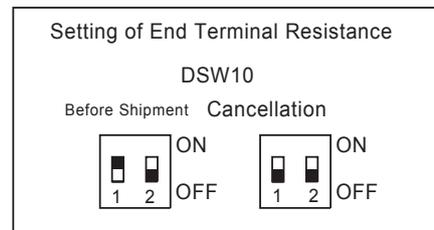
Turn ON No. 1 and No. 3 pins
(The settings in binary system shall be only valid for 0~9 and it will alarm once exceeding.)

DSW1 and DSW8 setting before shipment is 0.

Maximum in setting refrigerant cycle No. is 63.

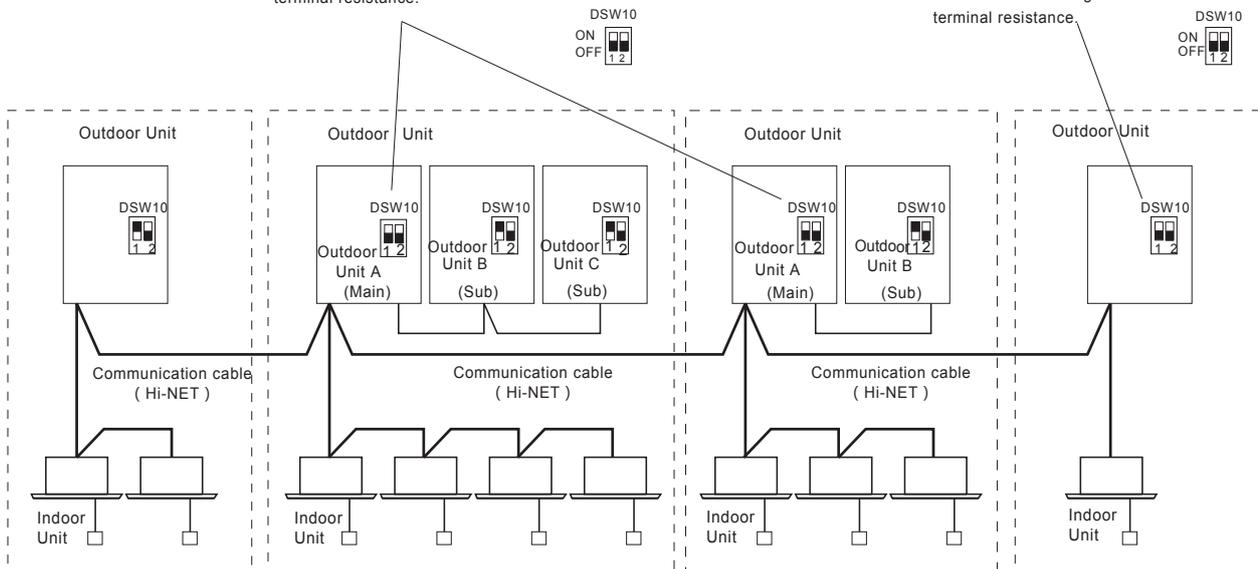
- **Setting of End Terminal Resistance**

Before shipment, No.1 pin of DSW10 is set at the "ON" side. In the case that the outdoor units quantity in the same Hi-NET is 2 or more, set No. 1 pin of DSW10 at the "OFF" side from the 2nd refrigerant group outdoor unit. If only one outdoor unit is used, no setting is required.



Set Position 1 on DSW10 to OFF to cancel setting of terminal resistance.

Set Position 1 on DSW10 to OFF to cancel setting of terminal resistance.



● Function Setting

External Input/Output and Function Setting

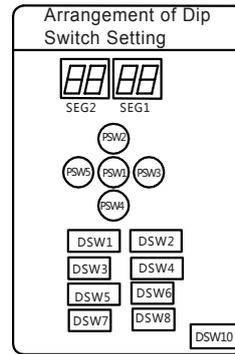
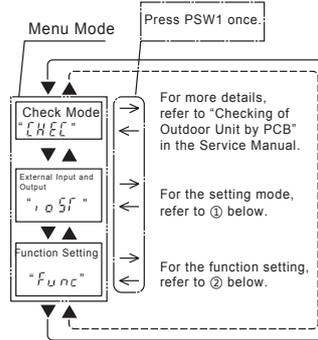
■ Start of Setting

Turn ON DSW4-No.4.
Press PSW1 for 3 seconds or more.
"Menu Mode" will be indicated.

■ End of Setting

Press PSW1 for 3 seconds or more.
The display indication become to normal indication.
Turn OFF DSW4-No.4.

NOTE:
Release "Menu Mode" after the setting is completed.
Otherwise, the air conditioner may not operate appropriately.



① [External Input and Output Setting]

By pressing the push-switches PSW3 (▶) and PSW5 (◀), the function No. can be selected.
PSW4 (▼): forward, PSW2 (▲): backward

Fill out the selected function setting No. in the space of the table as shown.

Item	SEG2	SEG1	SET
1 Input Setting 1 CN17[1-2 pin]	1	1	
2 Input Setting 2 CN17[2-3 pin]	2	2	
3 Input Setting 3 CN18[1-2 pin]	3	3	
4 Input Setting 1 CN16[1-2 pin]	1	1	
5 Input Setting 2 CN16[1-3 pin]	2	2	

(Setting before shipment)

Before shipping, the input/output terminal function settings are specified to each input/output terminal according to above table.

Setting External Input/Output Functions

Function No.	Input	Output
1	Fixing Heating Operation Mode	OperationSignal
2	Fixing Cooling Operation Mode	Warning signal
3	Demand Stoppage	Compressor ON Signal
4	Outdoor Fan Motor Start/Stop	frost Signal
5	Forced Stoppage	-
6	Demand Current Control 40%	-
7	Demand Current Control 60%	-
8	Demand Current Control 70%	-
9	Demand Current Control 80%	-
10	Demand Current Control 100%	-
11	Low Noise Setting 1	-
12	Low Noise Setting 2	-
13	Low Noise Setting 3	-
0	No set	No set

The same input/output function setting can not be set to different input/output terminals.
If set, a setting of larger function number is became invalid.

② [Function Setting]

By pressing the push-switches PSW3 (▶) and PSW5 (◀), the setting can be changed.
PSW4 (▼): forward, PSW2 (▲): backward

Refer to the Technical Catalog for more details.

Fill out the selected function setting No. in the space of the table as shown.

Item	SEG2	SEG1	SET	Item	SEG2	SEG1	SET
1 Fan Intermittent Operation during Heating Thermo-OFF	FR	0		17 Sound Reduced Function	db	0	
2 Night-Shift	n1	0		18 Demand Function Setting	dE	0	
3 Cancellation of Outdoor Ambient Temperature Limit	OS	0		19 Wave Function Setting	WE	0	
4 Defrost for Cold Area (Change of Defrost Condition)	Jo	0		20 Protection of Decrease in Outlet Temperature for Cooling	Fb	0	
5 SLo (Fan Speed) Defrost Setting	bU	0		21 Reserved	FR	0	
6 Cancellation of Hot Start	Hf	0		22 Adjustment of Fan Rotation (for multiple installation)	Fo	0	
7 Priority Capacity Mode	nU	0		23 Min. Indoor Exp-Valve Opening Setting at Heating Functions SW-OFF	F1	0	
8 Frequency Control (Control Target Value for Cooling Compressor)	Hc	0		24 Snow Model Setting	F4	0	
9 Frequency Control (Control Target Value for Heating)	Hh	0		25 Indoor VIP Function	U1~U5	0	
10 Indoor Expansion Valve (Control Target Value for Cooling)	Sc	0		26 Automatic Night-Shift	nb	0	
11 Indoor Expansion Valve (Control Target Value for Heating)	SH	0		27 Height Difference Setting	Hd	0	
12 Indoor Expansion Valve (Opening during Heating Operation Stoppage)	Si	0		28 Economic Fuction Setting	Ec	0	
13 Indoor Expansion Valve Opening during Heating Thermo-OFF	So	0		29 Quantity of Water Module Connected	n3	0	
14 Indoor Expansion Valve Initial Opening during Heating Thermo-ON	ci	0		30 Type of Water Module	H4	0	
15 Indoor Expansion Valve Initial Opening for Cooling	cb	0		31 Performance Balance between Indoor Unit and Water Module	U1	0	
16 Outdoor Expansion Valve Initial Opening for Heating	ch	0					

Note:

(1)The function setting of "n3" must be set to correct value according to the quantity of water module connected, otherwise, ALARM 37 may be triggered. (For example, in case of the quantity of water module in a system is three, then the value of "n3" should be set to "3".)

(2)The function setting of "H4" must be set to correct value according to the type of water module connected:
H4=0 (default) : water module should be used in a three pipes heat recovery system.
H4=2: water module should be used in a two pipes heat pump system.

(2)The function setting of "U1" can be set according to application requirement:
U1=0 (default) : Performance balance between indoor unit and water module.
U1=1: Indoor unit will have priority on performance.

7. Additional Refrigerant Charge

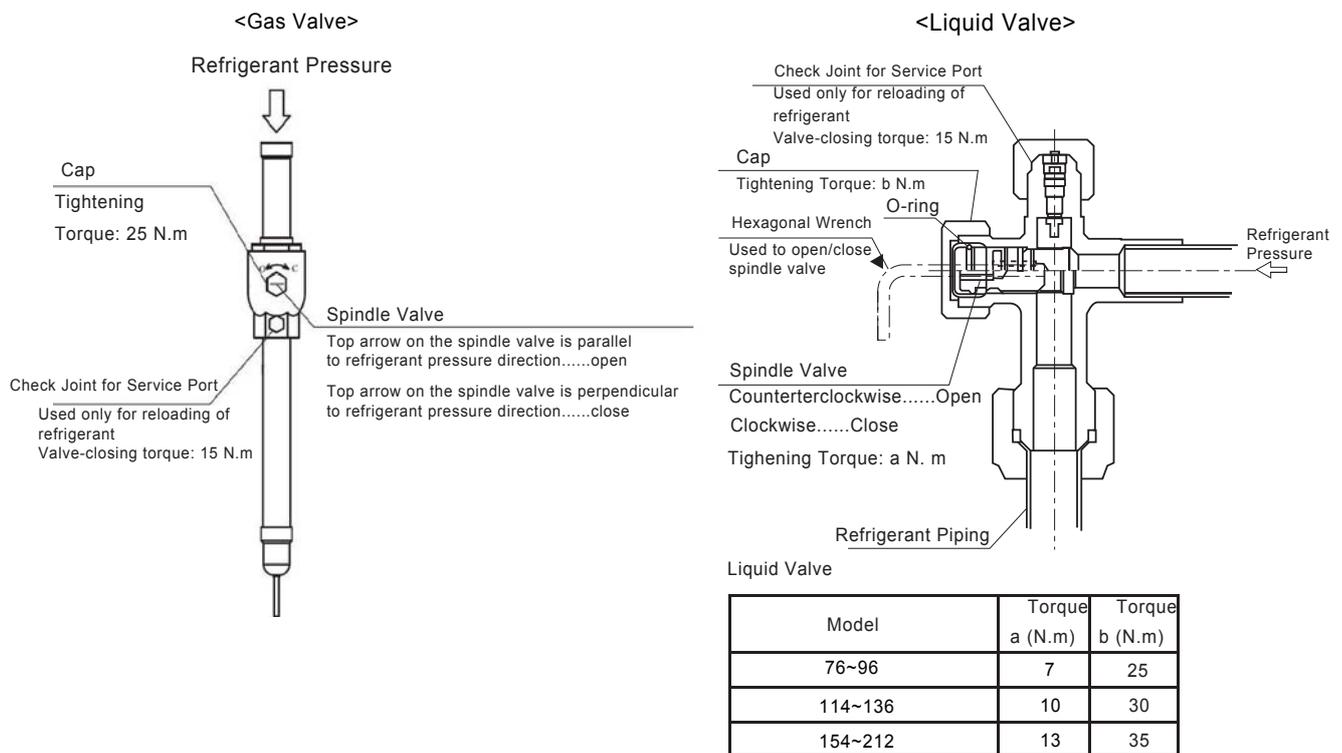
7.1 Air-Tight Test

(1) Check to ensure that the stop valves are closed completely before air-tight test.

<Tightening Check of Stop Valves>

After connecting the pipe, remove the cap of stop valve for liquid.

Do not connect the low-pressure pipe, high/low pressure pipe and relevant stop valve at first. Seal the low-pressure pipe and high/low pressure pipe with sealing cap prepared on the field.



(2) Connect the indoor units and the outdoor unit with field-supplied refrigerant piping.

Suspend the refrigerant piping at specified points and prevent the refrigerant piping from touching weak parts of the building such as wall, ceiling, etc. (Abnormal sound may occur due to the vibration of the piping. Pay special attention in case of short piping length.)

(3) Connect the gauge manifold to a vacuum pump or a nitrogen cylinder and the check joint of the liquid stop valves with charging hoses.

(4) Apply nitrogen gas pressure of 4.15MPa.
Do not open the stop valves.

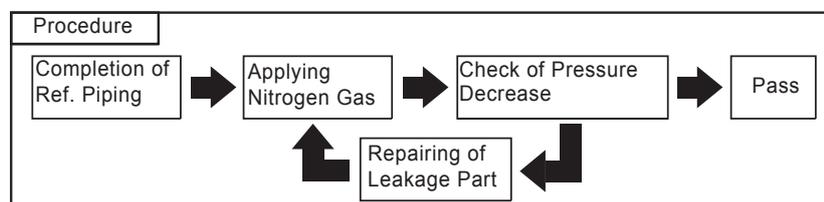
⚠ DANGER

Be sure to use Nitrogen Gas for air-tight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

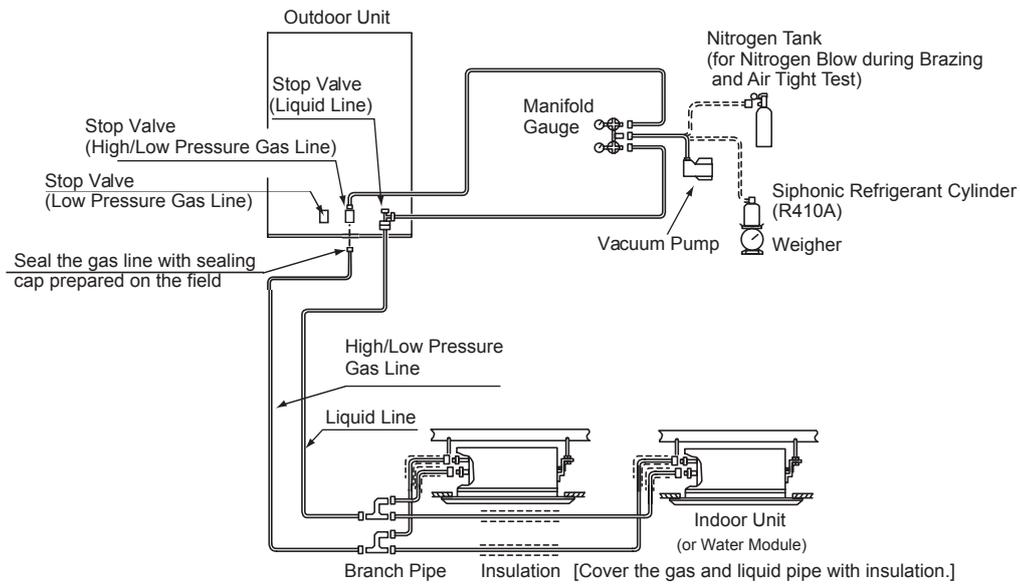
(5) Check for any gas leakage at the flare nut connections, or brazed parts by gas leakage tester or by use of a foaming agent or gas leak detector.

(6) After the air-tight test, release the nitrogen, remove the gas pipe sealing cap, then braze the gas pipe with the gas valve.

(7) Mount the piping insulation materials after connecting the pipe.



< Heat Pump System >



< Heat Recovery System >

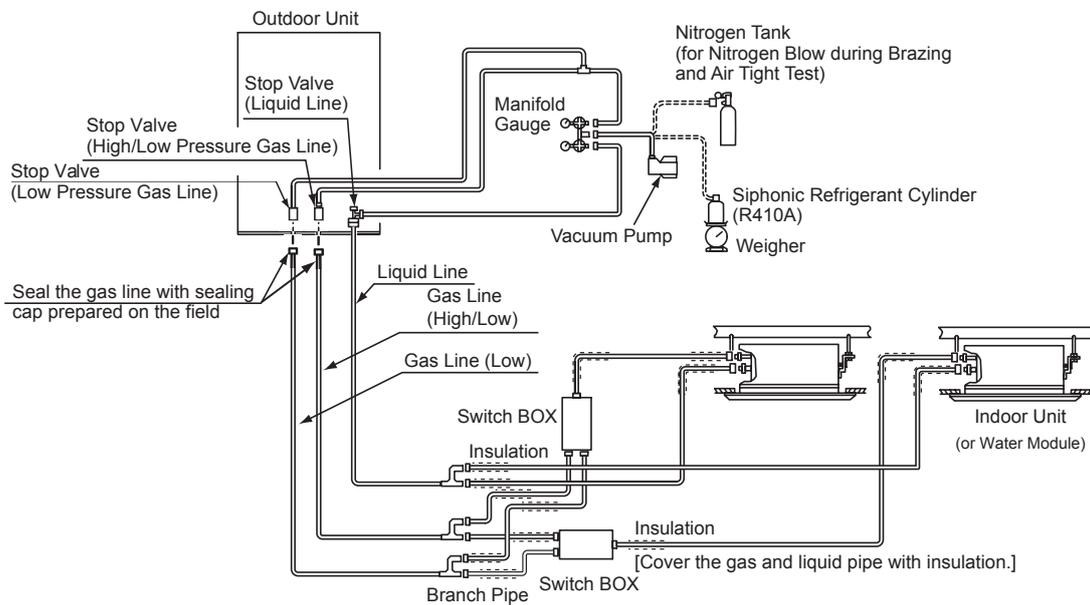


Fig. 7.1 Air-Tight Test



CAUTION

- The gas valve must be isolated and protected, and direct pressure on gas valve is absolutely forbidden (see Fig. 7.1)
- It is necessary to confirm that the electronic expansion valve of the indoor unit is open and ensure that the piping and indoor unit are connected.
- The air-tight test is not available for brazing point between low pressure gas valve, high/low pressure gas valve and gas pipe, confirm whether there is any leakage, and be cautious in brazing operation and pay attention to brazing joint quality.

7.2 Vacuuming

- (1) Connect control valve and vacuum pump to the check joints.
- (2) Continue vacuum pumping work until the pressure reaches -0.1MPa (-756mmHg) or lower for one to two hours.
After vacuum pumping work, stop the valve of manifold gauge, stop the vacuum pump and leave it for one hour. Check to ensure that the pressure in the manifold gauge does not increase.
- (3) Tighten the cap of check joint after the vacuum pumping work.

NOTES:

1. If tools or measuring instruments come into contact with the refrigerant, use the tools or the measuring instruments exclusive for R410A.
2. If vacuum degree of -0.1MPa (-756mmHg) is not available, it is considered that there is a gas leakage. Check for any gas leakage once again. If no leakage exists, operate the vacuum pump for one to two hours.



CAUTION

- Insulate the refrigerant pipes as shown in Fig.7.2. After connecting the refrigerant piping, seal the refrigerant pipes by using the field-supplied insulation material. Insulate the unions and flare nuts at the piping connections completely. Insulate the liquid piping and gas piping completely to avoid decreasing of performance and dewing on the surface of the pipe.

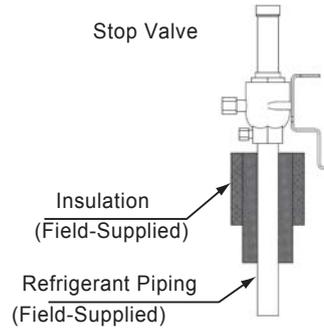


Fig. 7.2 Insulation on Pipes

7.3 Charging Work

After vacuum pumping work, check that the gas and liquid stop valve is fully closed.

Charge the additional refrigerant from the check joint of liquid stop valve (Charging Refrigerant Amount Tolerance: 0.5kg).

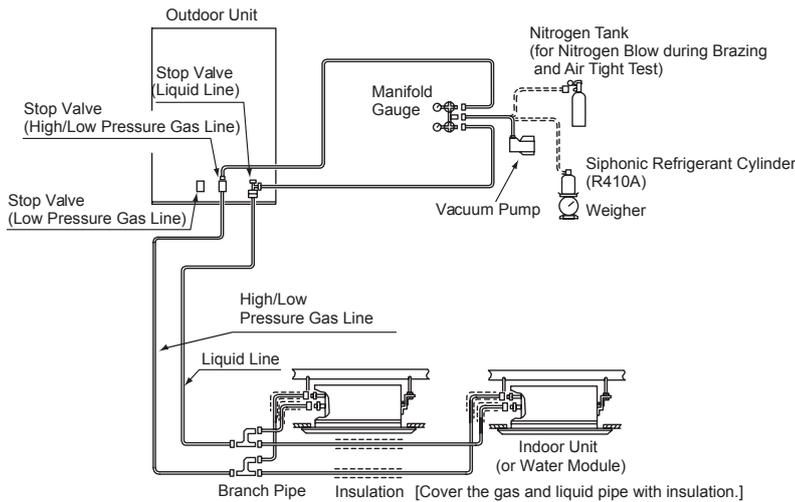
If the specified refrigerant quantity can not be charged, follow the procedure below.

(1) Fully open the stop valve for gas side (In case of heat recovery system, fully open the stop valve for high/low pressure and low pressure gas).

(2) Operate the compressor at the cooling mode and add the refrigerant from the check joint of the liquid stop valve. At this time, the liquid stop valve is slightly opened (Charging Refrigerant Amount Tolerance: 0.5kg).

(3) After refrigerant charge, fully open the stop valve for both liquid and gas sides.

< Heat Pump System >



Charge the correct refrigerant quantity . If not, a compressor may be damaged due to an excess or insufficient refrigerant charge.

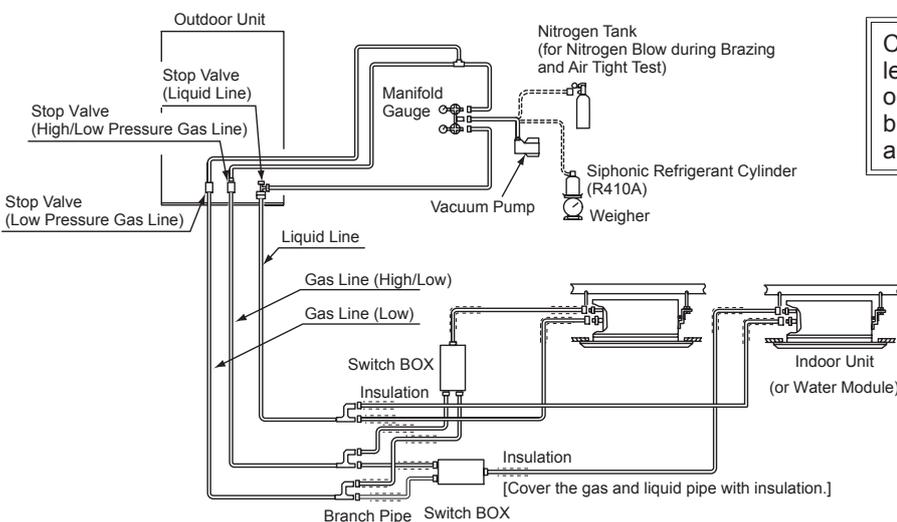
Refrigerant charge from check joint of gas stop valve may lead to compressor failure. Be sure to charge refrigerant from the check joint of liquid stop valve.

Insulate the liquid piping and gas piping completely to avoid decreasing of performance and dewing on the surface of the pipe.

Insulate the flare nut and union of the piping connection with insulation.

Check to ensure that there is no gas leakage. If a large refrigerant leakage occurs, it will cause difficulty with breathing or harmful gases would occur if a fire was being used in the room

< Heat Recovery System >



Additional Refrigerant Charge

- Special Attention Regarding Refrigerant Gas Leakage

Pay attention to the critical gas concentration to avoid accidental refrigerant gas leakage before installing air conditioning systems.

$$\frac{\text{Totally Charged Refrigerant Quantity in System}}{\text{Room Space for each Indoor Unit (m}^3\text{)}} \leq \text{Critical Concentration (kg/m}^3\text{)}$$

↑
0.3kg/m³

* In case of KHK S 0010 (High Pressure Gas Protection Association in Japan), this value should be decided according to the each country's regulation such as ISO5149 and EN378. In the case that the calculated critical concentration is higher than 0.3kg/m³, take the following actions:

- 1) Provide a gas leakage detector and exhaust fan(s) controlled by its gas leakage detector.
- 2) Provide each effective opening at the wall or door for ventilation to next door so that the critical gas concentration can be maintained lower than the above value. (Provide an opening more than 0.15% of floor surface at the lower part of a door.)

 **CAUTION**

1. Maximum Permissible Concentration of HFC GAS R410A

The refrigerant R410A is an incombustible and non-toxic gas.

However, if leakage occurs and gas fills a room, it may cause suffocation.

The maximum permissible concentration of HFC gas, R410A in air is 0.3kg/m³, according to the refrigeration and air conditioning facility standard (KHK S 0010) by the KHK (High Pressure Gas Protection Association) Japan. Therefore, some effective measure must be taken to lower the R410A concentration in air below 0.3kg/m³, in case of leakage.

2. Calculation of Refrigerant Concentration

- (1) Calculate the total quantity of refrigerant R (kg) charged in the system connecting all the indoor units of objective rooms.
- (2) Calculate the room space where this unit is to be installed V (m³) of each objective room.
- (3) Calculate the refrigerant concentration C (kg/m³) of the room according to the following equation.

$$\frac{\text{R: Total Quantity of Charged Refrigerant (kg)}}{\text{V: Room Space Where This Unit Is to Be Installed (m}^3\text{)}} = C \quad : \text{ Refrigerant Concentration} \leq 0.3 \text{ (kg/m}^3\text{)}$$

If local codes or regulations are specified, follow them.

<Example> Japanese Standard KHKS 0010 C=0.3 (kg/m³)

8. Test Run

Test run should be performed according to the Item 8.2. And use the Table 8.1 for recording test run.



WARNING

- Do not operate the system until all the check points have been cleared.

As for the test run of indoor unit and water module, check "Installation & Maintenance Manual" attached to the indoor unit and water module.

8.1 Before Test Run

(1) Check to ensure that the refrigerant piping and transmission between outdoor unit, SW BOX, indoor units or water modules are connected to the same refrigerant cycle. If not, it will cause an abnormal operation and a serious accident. Check that the dip switch setting of the refrigerant cycle number and the unit number for the indoor units and water modules apply to the system. Confirm that the dip switch setting on the printed circuit board of the indoor units, water modules and the outdoor units are correct. Especially, pay attention to the setting of lift between indoor units and outdoor unit, the refrigerant No. and the end terminal resistance.

(2) Check to ensure that the electrical resistance is more than $1M\Omega$, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired (Refer to "Caution for Insulation Resistance" for details.). Do not impress the voltage on the terminals for transmission.

(3) Check to ensure that each wire, L1, L2, L3 and N is correctly connected at the power source. If incorrectly connected, the unit will not operate and the remote control switch will indicate the alarm code "05". In this case, check and change the phase of the power source according to the attached sheet on the reverse side of the service cover.

(4) Check to ensure that the switch on the main power source has been ON for more than 4 hours, to warm the compressor oil by the oil heater. When powered, the outdoor units will not operate (Stoppage Code d1-22) immediately if it is in protection status due to low compressor oil temperature. In case of operating within 2 hours, release the protection control as follows:

1. Supply power to the outdoor unit.
2. Wait for 30 seconds
3. Push PSW5 on the outdoor PCB more than 3 seconds in order to release the d1-22.
4. In case of using remote control switch for release, push "Air Flow" and "Auto Louver" switch simultaneously for 3 seconds.

(5) Main Unit Label

In case of the combination of base units, attach the main unit label on a visible spot of the main unit (outdoor unit A), so that the outdoor unit A can be identified easily. Do not attach the main label on the sub unit (outdoor unit B, C and D).

(6) Water circuit check before test run (In case of the water module is utilized in the system)

(A) Before the test run, please check again if all the water pipe construction is in the proper state.

(B) Inject water into the water module and make sure that the plate type heat exchanger is filled with cycle water; open the water pump and exhaust valve and make sure that air in the unit and pipeline is already exhausted.

(C) Force the running of the water pump, read the value on the pressure gauge and confirm the action of the flow switch to check if the water cycle system is properly installed. (Refer to installation manual of water module)

(D) After the initial test run, please clean the water filter and make sure that the filter mesh is clean and free of impurities.



CAUTION

Caution for Insulation Resistance:

If total unit insulation resistance is lower than $1M\Omega$, the compressor insulation resistance may be low due to retained refrigerant in the compressor. This may occur if the unit has not been used for long periods.

1. Disconnect the cables to the compressor and measure the insulation resistance of the compressor itself. If the resistance value is over $1M\Omega$, then insulation failure has occurred for other electrical parts.
2. If the insulation resistance is less than $1M\Omega$, disconnect the compressor cable from the inverter PCB. Then, turn on the main power to apply current to the crankcase heater. After applying current for more than 3 hours, measure insulation resistance again. (Depending on the air conditions, pipe length or refrigerant conditions, it may be necessary to apply the current for a longer period of time.) Check the insulation resistance and reconnect the compressor.

If the leakage breaker is activated, check the recommended size shown in Table 6.1.



CAUTION

1. Confirm that field-supplied electrical components (main switch fuse, fuse-free breaker, earth leakage breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in the Technical Catalog of the unit and ensure that the components comply with national and local codes.
2. Use shielded wires (>0.75mm²) for field wiring to protect electrically noise obstacle. (total length of shielded wire shall be less than 1000m, and size of shielded wire shall comply with local codes.)
3. ("N" to "N" of each terminal board is 380-415V) is correct. If not, some component will be damaged. Check to ensure that the terminal for power source wiring (the voltage of terminals "L1" to "L1" and of shielded wire shall comply with local codes.)

8.2 Test Run

- (1) Check to ensure that the stop valves of the outdoor unit are fully opened and then start the system. (In case of the combination of base units, check that the stop valves of all the connected outdoor units are fully opened.) NOTE: Low pressure gas is used for heat recovery system only.
 - (2) Perform the test run of indoor units one by one sequentially and then check accordance of the refrigerant piping system and electrical wiring system. (If the multiple indoor units are operated simultaneously, the system can not be checked for the system accordance.)
 - (3) Perform the test run according to the following procedure. Ensure that the test run is carried out without any problem.
- NOTE: In case of 2-remote control switch (main and sub), firstly perform the test run of the main remote control switch.

- a) Set the "TEST RUN" mode by pressing the "MODE" and "CHECK" switch of controller simultaneously for at least 3 seconds.

→ "TEST RUN" is displayed on the LCD.

The total number of the indoor units connected is indicated on the LCD.

05

unit

Example when 5 indoor units are connected.

- Regarding other optional remote control switch (wireless remote control or half-size remote control), follow "Installation & Maintenance Manual" attached to each optional remote control switch and perform the test run.
- In case that the multiple indoor units are operated simultaneously controlled by one remote control switch, check the connected number of indoor unit is indicated on LCD.
In case that the indicated number is not correct, the auto-address function is not performed correctly due to incorrect wiring, the electric noise or etc. Turn OFF the power supply and correct the wiring after checking the following points; (Do not repeat turning ON and OFF within 10 seconds.)
 - * Power Supply for Indoor Unit is Not Turned ON or Incorrect Wiring.
 - * Incorrect Connection of Connecting Cable between Indoor Units or Incorrect Connection of Controller Cable
 - * Incorrect Setting of Rotary Switch and Dip Switch (The setting is overlapped.) on the Indoor Units PCB.
- b) Set the operation mode by pressing "MODE" switch.
- c) Press "RUN/STOP" switch.

→ The operation lamp will be turned ON before the test run starts.

2-hour OFF Timer will be set automatically, and "OFF Timer" and "2HR" will be indicated LCD. Although the air flow initial setting is "HI", the setting can be changed.

- Check the operation range according to page I.
 - * Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C.
 - * DO NOT PUSH THE BUTTON OF THE MAGNETIC SWITCH(ES). It will cause a serious accident.
 - Do not touch any electrical components for at least 3 minutes after turning OFF the main switch.
 - Check that the refrigerant piping setting and electrical wiring setting are for the same system, by operating the indoor unit one by one.
- d) Depress "AUTO LOUVER" switch and check that the louver is activated normally without abnormal sound. Depress "AUTO LOUVER" again so that the louver will stop. If abnormal sound is heard, remove the panel and adjust the fitting condition of connection parts in the panel corner cove. Ensure that the panel is mounted correctly to the unit body, otherwise the panel may be deformed.
- e) The temperature control will be invalid though the protection device will be activated during the test run. If alarm occurs, find out the cause of abnormality according to Technical Catalog. And again perform the test run after solving the problems.
- f) According to the label "Checking of Outdoor Unit by 7-segment Display on PCB1" attached to the rear side of the front cover of the outdoor unit, inspect temperature, pressure, operation frequency, and connected indoor unit numbers by the 7-segment displays.
- g) To end the test run, wait for 2 hours or push "RUN/STOP" switch again.

Table 8.1 Test Run and Maintenance Record

MODEL:	SERIAL. No.	COMPRESSOR MFG. No.
CUSTOMER'S NAME AND ADDRESS:		DATE:
THE RESULT OF ALL PERIODIC ROUTINE TESTS:		
1. Is the rotation direction of the indoor fan correct?		<input type="checkbox"/>
2. Is the rotation direction of the outdoor fan correct?		<input type="checkbox"/>
3. Are there any abnormal compressor sounds?		<input type="checkbox"/>
4. Has the unit been operated at least twenty (20) minutes?		<input type="checkbox"/>
5. Check Room Temperature:		
Inlet: No. 1 DB /WB °C,	No. 2 DB/WB °C,	No. 3 DB/WB °C,
No. 4 DB/WB °C		
Outlet: DB /WB °C,	DB /WB °C,	DB /WB °C,
DB /WB °C,	DB /WB °C,	DB /WB °C,
Inlet: No. 5 DB /WB °C,	No. 6 DB/WB °C,	No. 7 DB/WB °C,
No. 8 DB/WB °C		
Outlet: DB /WB °C,	DB /WB °C,	DB /WB °C,
DB /WB °C,	DB /WB °C,	DB /WB °C,
6. Check Outdoor Ambient Temperature:		
Inlet: DB °C,	WB °C	
Outlet: DB °C,	WB °C	
7. Check Refrigerant Temperature:		8. Check Pressure:
Liquid Temperature: _____ °C	Discharge Pressure: _____ MPa	
Discharge Gas Temperature: _____ °C	Suction Pressure: _____ MPa	
9. Check Voltage:		
Rated Voltage: _____ V		
Operating Voltage: L ₁ -L ₂ _____ V,	L ₁ -L ₃ _____ V,	L ₂ -L ₃ _____ V
Starting Voltage: _____ V		
Phase imbalance $1n - \frac{V}{V_m} =$ _____		
10. Check Compressor Input Running Current:		
Input: _____ kW		
Running Current: _____ A		
11. Is the refrigerant charge adequate?		<input type="checkbox"/>
12. Do the operation control devices operate correctly?		<input type="checkbox"/>
13. Do the safety devices operate correctly?		<input type="checkbox"/>
14. Has the unit been checked for refrigerant leakage?		<input type="checkbox"/>
15. Is the unit clean inside and outside?		<input type="checkbox"/>
16. Are all cabinet panels fixed?		<input type="checkbox"/>
17. Are all cabinet panels free from rattles?		<input type="checkbox"/>
18. Is the filter clean?		<input type="checkbox"/>
19. Is the heat exchanger clean?		<input type="checkbox"/>
20. Are the stop valves open?		<input type="checkbox"/>
21. Does the drain water flow smoothly from the drain pipe?		<input type="checkbox"/>
22. Do the components of the system change and replace?		<input type="checkbox"/>

*Check the installation manual of water module for additional items should be recorded in case of water module is utilized.

9. Technical Parameters

Model(s):AVWT-76FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	22.4	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	343.8	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	21.6	kW	Tj = 35 °C	EERd	4.56	—
Tj = 30 °C	Pdc	16.6	kW	Tj = 30 °C	EERd	6.57	—
Tj = 25 °C	Pdc	10.5	kW	Tj = 25 °C	EERd	10.01	—
Tj = 20 °C	Pdc	5.0	kW	Tj = 20 °C	EERd	13.94	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.03	kW
heating							
Rated heating capacity	$P_{rated,h}$	22.4	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	161.6	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	14.1	kW	Tj = - 7 °C	COPd	2.59	—
Tj = 2 °C	Pdh	9.3	kW	Tj = 2 °C	COPd	3.87	—
Tj = 7 °C	Pdh	6.3	kW	Tj = 7 °C	COPd	6.34	—
Tj = 12 °C	Pdh	4.0	kW	Tj = 12 °C	COPd	6.31	—
Tj = bivalent temperature	Pdh	14.1	kW	Tj = bivalent temperature	COPd	2.59	—
Tj = operating limit	Pdh	12.1	kW	Tj = operating limit	COPd	2.30	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.03	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.03	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		10980	m3/h
Sound power level , indoor/outdoor measured	LWA	-/84	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-96FKFSHA

Outdoor side heat exchanger of air conditioner/heat pump:air

Indoor side heat exchanger of air conditioner/heat pump:air

Type: compressor driven vapour compression

Driver of compressor:electric motor

Indication if the heater is equipped with a supplementary heater:no

Parameters shall be declared for the average heating season

Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	28.0	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	311.9	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	26.9	kW	Tj = 35 °C	EERd	3.91	—
Tj = 30 °C	Pdc	19.5	kW	Tj = 30 °C	EERd	5.74	—
Tj = 25 °C	Pdc	12.0	kW	Tj = 25 °C	EERd	9.82	—
Tj = 20 °C	Pdc	6.3	kW	Tj = 20 °C	EERd	11.56	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.03	kW
heating							
Rated heating capacity	$P_{rated,h}$	28.0	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	165.3	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	20.0	kW	Tj = - 7 °C	COPd	2.78	—
Tj = 2 °C	Pdh	11.7	kW	Tj = 2 °C	COPd	3.62	—
Tj = 7 °C	Pdh	9.5	kW	Tj = 7 °C	COPd	7.12	—
Tj = 12 °C	Pdh	8.8	kW	Tj = 12 °C	COPd	9.02	—
Tj = bivalent temperature	Pdh	20.0	kW	Tj = bivalent temperature	COPd	2.78	—
Tj = operating limit	Pdh	17.7	kW	Tj = operating limit	COPd	2.50	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.03	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.03	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		10980	m3/h
Sound power level , indoor/outdoor measured	LWA	-85	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-114FKFSHA

Outdoor side heat exchanger of air conditioner/heat pump:air

Indoor side heat exchanger of air conditioner/heat pump:air

Type: compressor driven vapour compression

Driver of compressor:electric motor

Indication if the heater is equipped with a supplementary heater:no

Parameters shall be declared for the average heating season

Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	33.5	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	339.2	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	32.9	kW	Tj = 35 °C	EERd	4.27	—
Tj = 30 °C	Pdc	24.1	kW	Tj = 30 °C	EERd	6.34	—
Tj = 25 °C	Pdc	14.8	kW	Tj = 25 °C	EERd	10.32	—
Tj = 20 °C	Pdc	8.3	kW	Tj = 20 °C	EERd	13.39	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.03	kW
heating							
Rated heating capacity	$P_{rated,h}$	33.5	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	166.8	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	20.5	kW	Tj = - 7 °C	COPd	2.85	—
Tj = 2 °C	Pdh	12.1	kW	Tj = 2 °C	COPd	4.00	—
Tj = 7 °C	Pdh	8.3	kW	Tj = 7 °C	COPd	5.95	—
Tj = 12 °C	Pdh	5.5	kW	Tj = 12 °C	COPd	6.62	—
Tj = bivalent temperature	Pdh	20.5	kW	Tj = bivalent temperature	COPd	2.85	—
Tj = operating limit	Pdh	17.1	kW	Tj = operating limit	COPd	2.43	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.03	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.03	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.03	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		12000	m3/h
Sound power level , indoor/outdoor measured	LWA	-/86	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-136FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	40.0	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	331.2	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	40.8	kW	Tj = 35 °C	EERd	4.23	—
Tj = 30 °C	Pdc	32.4	kW	Tj = 30 °C	EERd	6.32	—
Tj = 25 °C	Pdc	18.9	kW	Tj = 25 °C	EERd	9.12	—
Tj = 20 °C	Pdc	9.7	kW	Tj = 20 °C	EERd	16.36	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.05	kW
heating							
Rated heating capacity	$P_{rated,h}$	40.0	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	150.1	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	23.7	kW	Tj = - 7 °C	COPd	2.48	—
Tj = 2 °C	Pdh	13.9	kW	Tj = 2 °C	COPd	3.33	—
Tj = 7 °C	Pdh	9.9	kW	Tj = 7 °C	COPd	6.26	—
Tj = 12 °C	Pdh	4.3	kW	Tj = 12 °C	COPd	6.68	—
Tj = bivalent temperature	Pdh	23.7	kW	Tj = bivalent temperature	COPd	2.48	—
Tj = operating limit	Pdh	19.7	kW	Tj = operating limit	COPd	2.06	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.05	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.05	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		12000	m3/h
Sound power level , indoor/outdoor measured	LWA	-/86	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-154FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	45.0	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	316.3	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	41.9	kW	Tj = 35 °C	EERd	3.67	—
Tj = 30 °C	Pdc	32.1	kW	Tj = 30 °C	EERd	5.48	—
Tj = 25 °C	Pdc	19.8	kW	Tj = 25 °C	EERd	9.32	—
Tj = 20 °C	Pdc	9.8	kW	Tj = 20 °C	EERd	15.73	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.05	kW
heating							
Rated heating capacity	$P_{rated,h}$	45.0	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	150.3	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	26.7	kW	Tj = - 7 °C	COPd	2.35	—
Tj = 2 °C	Pdh	15.7	kW	Tj = 2 °C	COPd	3.46	—
Tj = 7 °C	Pdh	10.7	kW	Tj = 7 °C	COPd	6.01	—
Tj = 12 °C	Pdh	4.7	kW	Tj = 12 °C	COPd	6.81	—
Tj = bivalent temperature	Pdh	26.7	kW	Tj = bivalent temperature	COPd	2.35	—
Tj = operating limit	Pdh	22.2	kW	Tj = operating limit	COPd	2.00	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.05	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.05	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		16020	m3/h
Sound power level , indoor/outdoor measured	LWA	-87	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-170FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	50.0	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	318.2	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	47.6	kW	Tj = 35 °C	EERd	3.67	—
Tj = 30 °C	Pdc	34.8	kW	Tj = 30 °C	EERd	5.54	—
Tj = 25 °C	Pdc	22.3	kW	Tj = 25 °C	EERd	9.52	—
Tj = 20 °C	Pdc	10.2	kW	Tj = 20 °C	EERd	15.05	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.05	kW
heating							
Rated heating capacity	$P_{rated,h}$	50.0	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	160.9	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	28.6	kW	Tj = - 7 °C	COPd	2.30	—
Tj = 2 °C	Pdh	16.8	kW	Tj = 2 °C	COPd	3.80	—
Tj = 7 °C	Pdh	11.0	kW	Tj = 7 °C	COPd	6.30	—
Tj = 12 °C	Pdh	4.9	kW	Tj = 12 °C	COPd	8.02	—
Tj = bivalent temperature	Pdh	28.6	kW	Tj = bivalent temperature	COPd	2.30	—
Tj = operating limit	Pdh	26.3	kW	Tj = operating limit	COPd	2.19	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	Back-up heating capacity (*)	elbu	0	kW
thermostat-off mode(heating)	P_{TO}	0.05	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.05	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		17760	m3/h
Sound power level , indoor/outdoor measured	LWA	-87	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-190FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	56.0	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	305.6	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	53.4	kW	Tj = 35 °C	EERd	3.62	—
Tj = 30 °C	Pdc	39.7	kW	Tj = 30 °C	EERd	5.28	—
Tj = 25 °C	Pdc	25.5	kW	Tj = 25 °C	EERd	9.08	—
Tj = 20 °C	Pdc	11.6	kW	Tj = 20 °C	EERd	14.35	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.05	kW
heating							
Rated heating capacity	$P_{rated,h}$	56.0	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	160.1	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	32.0	kW	Tj = - 7 °C	COPd	2.29	—
Tj = 2 °C	Pdh	18.8	kW	Tj = 2 °C	COPd	3.78	—
Tj = 7 °C	Pdh	12.3	kW	Tj = 7 °C	COPd	6.26	—
Tj = 12 °C	Pdh	5.5	kW	Tj = 12 °C	COPd	7.98	—
Tj = bivalent temperature	Pdh	32.0	kW	Tj = bivalent temperature	COPd	2.29	—
Tj = operating limit	Pdh	29.5	kW	Tj = operating limit	COPd	2.18	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	Back-up heating capacity (*)	eibu	0	kW
thermostat-off mode(heating)	P_{TO}	0.05	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.05	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		21000	m3/h
Sound power level , indoor/outdoor measured	LWA	-/90	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

Model(s):AVWT-212FKFSHA							
Outdoor side heat exchanger of air conditioner/heat pump:air							
Indoor side heat exchanger of air conditioner/heat pump:air							
Type: compressor driven vapour compression							
Driver of compressor:electric motor							
Indication if the heater is equipped with a supplementary heater:no							
Parameters shall be declared for the average heating season							
Item	Symbol	Value	Unit	Item	Symbol	Value	unit
cooling							
Rated cooling capacity	$P_{rated,c}$	61.5	kW	Seasonal space cooling energy efficiency	$\eta_{s,c}$	299.1	%
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
Tj = 35 °C	Pdc	58.6	kW	Tj = 35 °C	EERd	3.43	—
Tj = 30 °C	Pdc	43.6	kW	Tj = 30 °C	EERd	5.64	—
Tj = 25 °C	Pdc	28.0	kW	Tj = 25 °C	EERd	8.61	—
Tj = 20 °C	Pdc	12.8	kW	Tj = 20 °C	EERd	13.21	—
co-efficient for air conditioners(*)	Cdc	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	crankcase heater mode	P_{CK}	0	kW
thermostat-off mode(cooling)	P_{TO}	0	kW	standby mode	P_{SB}	0.05	kW
heating							
Rated heating capacity	$P_{rated,h}$	61.5	kW	Seasonal space heating energy efficiency	$\eta_{s,h}$	158.3	%
Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	34.4	kW	Tj = - 7 °C	COPd	2.26	—
Tj = 2 °C	Pdh	20.2	kW	Tj = 2 °C	COPd	3.73	—
Tj = 7 °C	Pdh	13.2	kW	Tj = 7 °C	COPd	6.19	—
Tj = 12 °C	Pdh	5.9	kW	Tj = 12 °C	COPd	7.89	—
Tj = bivalent temperature	Pdh	34.4	kW	Tj = bivalent temperature	COPd	2.26	—
Tj = operating limit	Pdh	31.7	kW	Tj = operating limit	COPd	2.15	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	-7	°C	heating/Average	Tol	-10	°C
heating/Warmer	Tbiv	—	°C	heating/Warmer	Tol	—	°C
heating/Colder	Tbiv	—	°C	heating/Colder	Tol	—	°C
Degradation co-efficient heat pumps(**)	Cdh	0.25					
Power consumption in modes other than 'active mode'							
off mode	P_{OFF}	0.05	kW	Back-up heating capacity (*)	eibu	0	kW
thermostat-off mode(heating)	P_{TO}	0.05	kW	Type of energy input			
crankcase heater mode	P_{CK}	0	kW	standby mode	P_{SB}	0.05	kW
Other items							
Capacity control	variable			air flow rate, outdoor measured		21000	m3/h
Sound power level , indoor/outdoor measured	LWA	-/90	dB(A)				
Global warming potential	GWP	2088	kgCO ₂ eq.				
Note	The above performance data is obtained on the basis of the performance of this outdoor unit, with a 100%-combination of ceiling ducted type indoor units.						
Contact details	Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, P.R. China						

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