

	JVOHQ Series	
INSTALLATION&MAINTENANCE MANUAL	New Release	JO2017062E

INVERTER-DRIVEN MULTI-SPLIT SYSTEM HEAT PUMP AIR CONDITIONERS

Models

< Outdoor Units >



JVOH080VPEMBQ	JVOH380VAEMBQ	JVOH680VAEMBQ
JVOH100VPEMBQ	JVOH400VAEMBQ	JVOH700VAEMBQ
JVOH120VPEMBQ	JVOH420VAEMBQ	JVOH720VAEMBQ
JVOH140VPEMBQ	JVOH440VAEMBQ	JVOH740VAEMBQ
JVOH160VPEMBQ	JVOH460VAEMBQ	JVOH760VAEMBQ
JVOH180VPEMBQ	JVOH480VAEMBQ	JVOH780VAEMBQ
JVOH200VPEMBQ	JVOH500VAEMBQ	JVOH800VAEMBQ
JVOH220VPEMBQ	JVOH520VAEMBQ	JVOH820VAEMBQ
JVOH240VPEMBQ	JVOH540VAEMBQ	JVOH840VAEMBQ
JVOH260VAEMBQ	JVOH560VAEMBQ	JVOH860VAEMBQ
JVOH280VAEMBQ	JVOH580VAEMBQ	JVOH880VAEMBQ
JVOH300VAEMBQ	JVOH600VAEMBQ	JVOH900VAEMBQ
JVOH320VAEMBQ	JVOH620VAEMBQ	JVOH920VAEMBQ
JVOH340VAEMBQ	JVOH640VAEMBQ	JVOH940VAEMBQ
JVOH360VAEMBQ	JVOH660VAEMBQ	JVOH960VAEMBQ

P01373Q

Original Instruction

IMPORTANT NOTICE

- The company pursues a policy of continuous improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- The company cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purposes 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).
 - * 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 or with an atmosphere of acidity or alkalinity such as coastal regions.
- 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 the drain pan and splashed water runs into electrical box. In the end, water leakage or electrical devices failure may occur.
- Pay attention to the following points when the unit is installed in a hospital or other facilities where electromagnetic wave generates from medical equipment.
 - * Do not install the unit in the place where the electromagnetic wave is directly radiated to the electrical box, wired controller cable or switch.
 - * Install the unit at least 3 meters away from electromagnetic wave such as a radio.
- Do not install the unit in the place where the breeze directly blows to the animals and plants. It could adversely affect the animals and plants.
- The installation and service engineering should be in accordance with the local laws and regulations.
- If you have any questions, contact your distributor or dealer.
- The installation of this air conditioner can only be carried out by dealers or specialists. If the user installs the air conditioner by himself, it may cause leakage, electric shock or fire.
- This manual gives a common description and information for this heat pump air conditioner and also for other models.
- To protect the environment, do not discard the product at will, the company can provide recycling services as per the relevant provisions of the country, and provide replaceable components as per national standards.
- This manual should be considered as a permanent part of the unit and should remain with it.
- No part of this manual may be reproduced without written permission.
- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the customer should be added safety, caution and operating signs in the native language.
- This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature		(°C)	
Range		Maximum	Minimum
Cooling operation	Indoor	23 WB	15 WB
	Outdoor	52 DB*	-5 DB
Heating operation	Indoor	27 DB	15 DB
	Outdoor	15 WB	-20 WB

DB: Dry Bulb, WB: Wet Bulb

NOTE:

*-5°C~48°C DB is stabilized operation range, 48°C~52°C DB is for interval operation

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage.
Claims for damage, 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. Therefore, the utilization of the unit other than those indicated in these instructions is not recommended. Please contact your local agent as the occasion arises.

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

Contents


1. Safety Instruction.....	1
2. Structure	4
2.1 Outdoor Unit and Refrigerating System	4
2.2 Tools and Instruments Required for Installation	4
3. Prepare Before Installation	6
3.1 Outdoor Model Number	6
3.2 Combination of Indoor Unit and Outdoor Unit	7
4. Transport and Handling	9
4.1 Transport	9
4.2 Lifting Method	10
5. Installation of Outdoor Unit	12
5.1 Factory Accessories	12
5.2 Installation	13
5.3 Maintenance Space.....	14
5.4 Foundation	16
5.5 Condensation Water Treatment.....	18
6. The Refrigerant Piping Construction	19
6.1 Piping Material.....	19
6.2 Flare and Joints.....	22
6.3 Precautions for Installation of Outdoor Unit.....	23
6.4 System Piping Connection	25
7. Electrical Wiring.....	39
7.1 General Check	39
7.2 Wiring	42
7.3 Outdoor Unit Wiring.....	44
7.4 Electrical Wiring for Indoor and Outdoor Unit.....	46
7.5 Outdoor DIP Switch Setting.....	48
8. Additional Refrigerant Charge	53
8.1 Air Tightness Test	53
8.2 Vacuum	54
8.3 Calculating Refrigerant's Additional Charge	54
8.4 Charging Operation	56
9. Test Run	58
9.1 Prerequisites for Test Run	58
9.2 Trial Run	59
10. Compressor Protection.....	64


1.Safety Instruction


<Signal Words>

- Signal words are used to identify levels of hazard seriousness.

Definitions for identifying hazard levels are provided below with their respective signal words.

 : **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 : **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

 : **NOTICE**, 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.

DANGER

- Do not perform installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If performed without following the instructions, it may result in a system leakage, electric shock or a fire.
- 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 shock.
- Do not open the service cover and the PCB for the indoor and outdoor unit without turning OFF the main power supply, this may lead to serious safety accidents.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, serious accidents may occur.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. If a refrigerant leakage is found, immediately turn OFF the main power supply, extinguish any open flame, and then contact the service dealer.
- Make sure to perform air-tight testing.
- The refrigerant R410A used in this product (fluorocarbon) is not flammable, non-toxic, and odourless. If there is refrigerant leakage, exposure to open flame produces toxic gases. Also, the refrigerant gas is heavier than air, if the area is filled with refrigerant gas, it may cause suffocation to the people in the vicinity. When conducting leak detection and air-tight testing, filling with oxygen, acetylene or flammable and toxic gas may cause explosion. Nitrogen is recommended for this test.
- The refrigerant safety leakage standard for construction and operation systems are determined as per local regulations or standards.
- Use a medium induction speed above ELB (Earth Leakage Breaker with action time of 0.1 seconds or less). Otherwise, this may cause electric shock or fire.
- Do not install the product in places where there is high density of oil mist, flammable gas, salt spray, or toxic gases (such as sulphide), and so on.
- During installation, connect the refrigerant pipe firmly before the compressor starts running. For maintenance, stop the compressor before moving, handling and removing the refrigerant pipe.
- Do not short-circuit the protective devices (such as pressure switches and so on) during operation. Otherwise it may cause a fire or explosion.
- The A-weighted emission sound pressure level do not exceeds 70 dB(A).

⚠ WARNING

- Please do not use sprays such as pesticide, oil paint, hair spray or other flammable gases within 1 meter of the unit.
- If the circuit breaker acts or fuse acts frequently, please stop the system operation immediately and contact your local dealer or customer service.
- Ensure that the grounding wire is securely connected. If not, it may cause an electrical failure. Do not connect the grounding wire to the gas pipe, tap water pipe, lightning rod or telephone grounding wire.
- Use fuse of specified capacity.
- While you perform brazing, ensure that there are no combustibles around it. Please wear leather gloves while using refrigerant to prevent freezing.
- Prevent mice and other small animals from damaging the wiring and the electrical components. If unprotected parts are bitten, it may lead to fire.
- Securely connect and fix the wiring, do not apply external force on terminal blocks, this may cause the terminal to loosen and can cause a fire.
- Ensure that the foundation is robust enough to install the unit. If not, the appliance can fall and break.
- Do not install the unit in the presence of large amounts of oil, steam, organic solvents and corrosive gases (ammonia, sulphide and acid, so on). Because corrosion may cause refrigerant leakage, electrical failure, performance degradation and unit damage.
- Please follow the installation manual and all the relevant provisions, standards for electrical construction. Otherwise, electric failure or fire may occur due to insufficient capacity or mismatch of specifications.
- Use specified wiring between the units and select the correct wiring between the appliances. Otherwise, it will cause an electrical malfunction or fire.
- Make sure that the terminals are tightened with the specified torque. Otherwise it will cause a fire or electrical fault at the terminal block.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- If there is fire, please cut-off the power supply immediately.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- Means for disconnection from the supply mains, which have a contact separation in all poles that provide full disconnection under overvoltage category III conditions, must be incorporated in the fixed wiring in accordance with the wiring rules.
- The appliance shall be installed in accordance with national wiring regulations.
- The maximum working pressure is 4.15MPa. This maximum working pressure shall be considered when connecting the outdoor unit to indoor units.
- The refrigerant used in the outdoor unit is R410A. Please refer to "Additional Refrigerant Charge" of this manual for the refrigerant charging.
- The outdoor unit shall only be connected to indoor units suitable for the same refrigerant (R410A).
- The unit is a partial unit air conditioner, complying with partial unit requirements of the International Standard, and must only be connected to other units that have been confirmed as complying with corresponding partial unit requirements of the International Standard.

NOTICE

- Do not tread on the product or place sundries on the product.
- Do not place or put any material on the product or inside the product.
- 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.

NOTE:

- Please do not install indoor unit, outdoor unit, wired controller and wiring within 3m of strong electromagnetic radiation appliance (For example: medical device).
 - After a long time shut down, if you want to restart the appliance, please power the crankcase heating band to work 12 hours prior to operation.
 - Before switching on the outdoor unit, make sure that it is not covered by snow and ice.
 - The heat pump air conditioner may not work properly if:
 - * The power of the transformer which supplies power is equal or less than the electric power of the air conditioner.
 - * Power supply for high-power equipment is too close to the power wire of the air conditioner.
- Device*: (Ex) Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch. It consumes a large quantity of electrical power.
- In the case mentioned above, the power wire of the air conditioner generates a large induced surge voltage due to the abrupt change in the power consumption of the power equipment and the switch action.
- Therefore, to protect the power supply to the system, before performing electric construction, please carefully check the field installation specifications and standards.
 - It is recommended to ventilate the room every 3 to 4 hours.
 - Reduction in heat pump air conditioner heating capacity is observed due to the degradation of outdoor environmental temperature. Therefore, in some low temperature areas, it is recommended to use auxiliary heating device while installing heat pump air conditioner.
 - Only a professional maintenance personnel can perform maintenance work for this air conditioner.

2. Structure

2.1 Outdoor Unit and Refrigerating System

Refer to the technical manual for the structure diagram and system cycle diagram.

2.2 Tools and Instruments Required for Installation

Check that the designed pressure of the machine is 4.15MPa.

To avoid mixing of refrigerant with cooling oil or other refrigerants in the system, the size of the connecting device is changed.

Before installation, it is necessary to have the following tools:

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Pipe Bender	11	Wrench	16	Leveller
2	Screwdriver	7	Vise	12	Charging Cylinder	17	Cutter for Wires
3	Vacuum pump	8	Pipe cutter	13	Manifold valve	18	Hoist (for indoor unit)
4	Charging hose	9	Brazing tools	14	Wire cutter	19	Ammeter
5	Megohmmeter	10	Hex wrench	15	Leakage detector	20	Voltage meter

NOTE:

While touching to refrigerant directly, use special installation tools and instruments for the new refrigerant (R410A).



The pressure of the new refrigerant R410A is 1.4 times that of the conventional refrigerant. Water, oxide, grease and other impurities can easily affect the performance of the refrigerant. Ensure that the moisture, dust, other refrigerants or refrigerating oil in the refrigerating system are removed.

Therefore, if you do not use the specified material and the tool, it may cause an explosion, injury, refrigerant leak, electrical failure or fire.

○: Interchangeability is available with current R22 ■: 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		
Refrigerant Pipe	Pipe cutter, chamfering reamer	○	○	—	Cut pipe, remove burrs
	Flaring tool	○	○	*R410A requires high pressure resistant piping and requires a larger flare for processing. When the hardness of material used is 1/2H, it cannot be flared. (The specific tools of R410A can be directly used for R407C) .	Pipe flaring processing
	Extrusion adjustment gauge	—	■		Calibre management after elbow flaring
	Pipe bender	○	○	*When the hardness of the material is 1/2H, it cannot be bended. Use elbow for bending and brazing.	Pipe bending processing
	Expanding tool	○	○	* If the hardness of the material is 1/2H, the expansion process cannot be performed, and the pipe is connected by a joint.	Pipe expansion processing
	Torque wrench	○	■	*For R410A when flare nut size is Ø12.7 and Ø15.88, spanner size should be larger than 2mm.	Tighten the flare nut
			○	*Can be commonly used in Ø6.35, Ø9.52, Ø19.05.	
	Brazing equipment	○	○	*To ensure the correct brazing (can adjust flame, heating, and add filler).	Brazing connection of refrigerant pipe
	Nitrogen gas	○	○	*To prevent the pipe line is contaminated (brazing blowing nitrogen to prevent oxidation).	Prevent oxidation
Refrigerant charging vacuum drying	Lubricating oil (applied to flaring surface)	●	■	*Use the same lubricating oil as the refrigeration system. *Oil is easy to absorb water.	Lubricate the flaring surface
	Refrigerant cylinder	●	■	*Confirm the corresponding refrigerant in the cylinder. ★ Non-azeotropic mixed refrigerant should be filled in liquid state.	Refrigerant charge
	Vacuum pump	○	○	★ Can use the existing vacuum pump, but the connector should be connected to prevent the mineral oil flow back when vacuum pump stopped.	Vacuum
	Vacuum pump connector (to prevent back flow)	● can be generally used for new refrigerant	✕■ can be generally used for new refrigerant		
	Regulating valve	●	■	*Because the pressure is higher than the R22 standard, it cannot be generally used. The connection diameter is different: R410A: UNF1/2, R407C: UNF7 / 16. ★ It is forbidden to use the old components, otherwise the attached mineral oil will accumulate and may cause the circuit blocked and the compressor to malfunction.	Vacuuming, keep vacuum to charge refrigerant, detect pressure
	Charging hose	●	■		
	Charging cylinder	×	×	*Use weight gauge to charge refrigerant.	Refrigerant charge
	Weighing instrument	○	○	—	Measure the amount of refrigerant charging
	Leakage detector	● can be generally used for new refrigerant	✕■ can be generally used for new refrigerant	*Leakage detector for R22 cannot be generally used due to different detecting method.	Check for gas leakage

✕: Generally used for R407C

3. Prepare Before Installation

3.1 Outdoor Model Number

<Base Module>

HP	8	10	12	14	16
Model	JVOH080VPEMBQ	JVOH100VPEMBQ	JVOH120VPEMBQ	JVOH140VPEMBQ	JVOH160VPEMBQ
HP	18	20	22	24	
Model	JVOH180VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ	

<Combination Module> ※

HP	26	28	30	32	34
Model	JVOH260VAEMBQ	JVOH280VAEMBQ	JVOH300VAEMBQ	JVOH320VAEMBQ	JVOH340VAEMBQ
Combination	JVOH100VPEMBQ	JVOH120VPEMBQ	JVOH140VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ
	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH180VPEMBQ
HP	36	38	40	42	44
Model	JVOH360VAEMBQ	JVOH380VAEMBQ	JVOH400VAEMBQ	JVOH420VAEMBQ	JVOH440VAEMBQ
Combination	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH180VPEMBQ	JVOH200VPEMBQ
	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ
HP	46	48	50	52	54
Model	JVOH460VAEMBQ	JVOH480VAEMBQ	JVOH500VAEMBQ	JVOH520VAEMBQ	JVOH540VAEMBQ
Combination	JVOH220VPEMBQ	JVOH240VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ
	-	-	JVOH180VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ
HP	56	58	60	62	64
Model	JVOH560VAEMBQ	JVOH580VAEMBQ	JVOH600VAEMBQ	JVOH620VAEMBQ	JVOH640VAEMBQ
Combination	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH160VPEMBQ
	JVOH160VPEMBQ	JVOH180VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ
HP	66	68	70	72	74
Model	JVOH660VAEMBQ	JVOH680VAEMBQ	JVOH700VAEMBQ	JVOH720VAEMBQ	JVOH740VAEMBQ
Combination	JVOH180VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ	JVOH160VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH160VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH180VPEMBQ
	-	-	-	-	JVOH240VPEMBQ
HP	76	78	80	82	84
Model	JVOH760VAEMBQ	JVOH780VAEMBQ	JVOH800VAEMBQ	JVOH820VAEMBQ	JVOH840VAEMBQ
Combination	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ
	JVOH160VPEMBQ	JVOH160VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ
	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ
HP	86	88	90	92	94
Model	JVOH860VAEMBQ	JVOH880VAEMBQ	JVOH900VAEMBQ	JVOH920VAEMBQ	JVOH940VAEMBQ
Combination	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ
	JVOH200VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ
	JVOH220VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ
	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ	JVOH240VPEMBQ
HP	96				
Model	JVOH960VAEMBQ				
Combination	JVOH240VPEMBQ				
	JVOH240VPEMBQ				
	JVOH240VPEMBQ				
	JVOH240VPEMBQ				

※ Module combination are specified in above table. Do not use any other combinations beyond table.

3.2 Combination of Indoor Unit and Outdoor Unit

JVOHQ Series of outdoor units can be connected to the indoor units shown in below table:

Table 3.1 Indoor Unit

Indoor Unit Model	Standard Capacity (100 W)												
	18	22	25	28	32	36	40	45	50	56	63	71	80
Compact Ducted	○	○	○	○	○	○	○	○	○	○	○	○	
Mid-ESP Ducted		○		○		○	○	○	○	○	○	○	○
High-ESP Ducted		○		○		○	○	○	○	○	○	○	○
Round-way Cassette				○	○	○	○	○	○	○	○	○	○
High Wall		○		○		○	○		○	○	○		
2-way Cassette		○		○		○	○	○	○	○	○	○	○
Floor Concealed				○			○			○		○	
Fresh Air Ducted													

Indoor Unit Model	Standard Capacity (100 W)										
	90	100	112	125	140	160	224	280	335	450	560
Compact Ducted											
Mid-ESP Ducted	○	○	○	○	○	○					
High-ESP Ducted	○	○	○	○	○	○	○	○			
Round-way Cassette	○	○	○	○	○	○					
High Wall											
2-way Cassette	○		○		○	○					
Floor Concealed											
Fresh Air Ducted	○				○		○	○	○	○	○

○ : Allowed

NOTE:

- The number of indoor units that can be connected to the outdoor unit is shown in the table below. Please follow this rule when installing the appliance.
- Indoor unit and outdoor unit connected to the total capacity of indoor units for the outdoor unit rated capacity of 50% to 130%.

Table 3. 2 System Combination

Outdoor Unit	Minimum Unit Operating Capacity (100W)	Maximum Quantity of Indoor Units That Can be Connected	Recommended Number of Indoor Units	Combined Capacity
JVOH080VPEMBQ	18	13	8	50%~130%
JVOH100VPEMBQ		16	10	
JVOH120VPEMBQ		19	10	
JVOH140VPEMBQ		23	16	
JVOH160VPEMBQ		26	16	
JVOH180VPEMBQ		26	16	
JVOH200VPEMBQ		33	18	
JVOH220VPEMBQ		36	20	
JVOH240VPEMBQ		40	26	
JVOH260VAEMBQ		43	26	
JVOH280VAEMBQ		47	32	
JVOH300VAEMBQ		50	32	
JVOH320VAEMBQ		53	32	
JVOH340VAEMBQ		56	32	
JVOH360VAEMBQ		59	32	
JVOH380VAEMBQ		64	38	
JVOH400VAEMBQ		64	38	
JVOH420VAEMBQ		64	38	
JVOH440VAEMBQ		64	38	
JVOH460VAEMBQ		64	38	
JVOH480VAEMBQ		64	38	
JVOH500VAEMBQ		64	38	
JVOH520VAEMBQ		64	38	
JVOH540VAEMBQ		64	38	
JVOH560VAEMBQ		64	38	
JVOH580VAEMBQ		64	38	
JVOH600VAEMBQ		64	38	
JVOH620VAEMBQ		64	38	
JVOH640VAEMBQ		64	38	
JVOH660VAEMBQ		64	38	
JVOH680VAEMBQ		64	38	
JVOH700VAEMBQ		64	38	
JVOH720VAEMBQ		64	38	
JVOH740VAEMBQ		64	38	
JVOH760VAEMBQ		64	38	
JVOH780VAEMBQ		64	38	
JVOH800VAEMBQ		64	38	
JVOH820VAEMBQ		64	38	
JVOH840VAEMBQ		64	38	
JVOH860VAEMBQ		64	38	
JVOH880VAEMBQ		64	38	
JVOH900VAEMBQ		64	38	
JVOH920VAEMBQ		64	38	
JVOH940VAEMBQ		64	38	
JVOH960VAEMBQ		64	38	

NOTE:

In a system, where all the indoor units are running, the capacity of the total indoor units should be less than or equal to the combined capacity of the outdoor unit. Otherwise, the overloading operation may occur in the case of harsh working conditions or in narrow operation range.

For systems where all the indoor units are not running at the same time, the total capacity of the indoor units can be allowed to up to 130% of the total capacity of the outdoor unit.

If the system is used in cold areas (where ambient temperature below -10°C) or high heat load environment, total capacity of the indoor units should be less than the total capacity of outdoor unit, and the total pipe length should be less than 300m.

Indoor unit of model with the type of capacity range of 18~36 have much more air flow per unit cooling capacity than 40 and above models of the unit. If the system uses more indoor units with model of 18~36, user can feel of cold wind blow. At this time, the recommended number of connectable indoor units is a benchmark.

For air conditioner with outdoor fresh air handling, the number of indoor units must be within the recommended number of connectable indoor units.

If the indoor unit capacity exceeds 100%, but less than 130%, please refer to the Technical Bulletin for details.

If the temperature in the installation place of the outdoor unit sustainably exceeds 48°C , the total connection capacity of the indoor units should be less than the total capacity of the outdoor units.

4. Transport and Handling

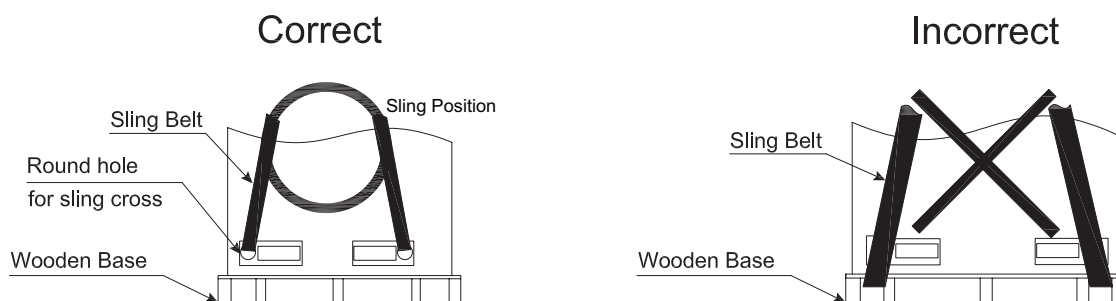
4.1 Transport

Transport the machine to a place as close as possible to the installation site before unpacking the machine.

When handling with a hoist, follow the lifting instructions on the machine package.

DANGER

When hanging, do not route the rope through the wooden base.



NOTICE

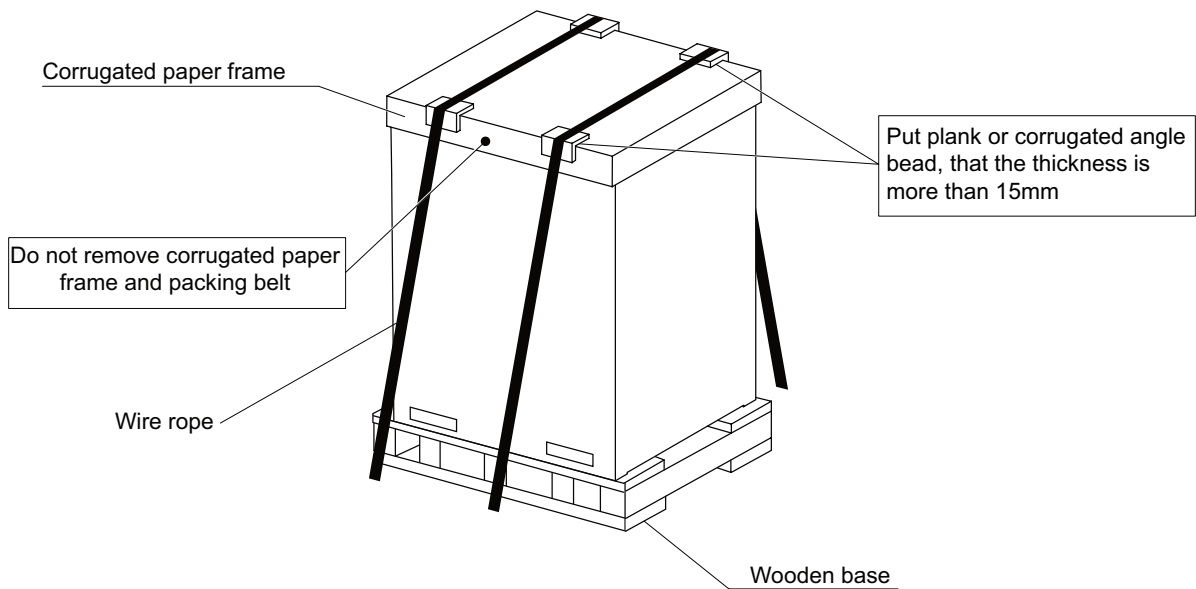
- Transport and storage

Strength of machine packaging cardboard is limited, so please note the following:

- * **It is forbidden to tread on the machine packaging, it is strictly prohibited placing any material on the appliance.**
- * **When lifting with a crane, please use 2 slings for transporting and storing.**
- * **Do not store machines which are stacked up.**

- Transport and packing

- * **To protect the unit, do not remove any packaging.**
- * **It is forbidden to stack up or place any material on the machine.**
- * **Machine is bundled at both sides as shown below:**



4.2 Lifting Method

When lifting the machine, ensure the balance of the machine, confirm the safety and then lift it smoothly.

1. It is strictly forbidden to remove any packing filler.
2. As shown in Figure 4.1, lift the machine with a bundle of two slings.

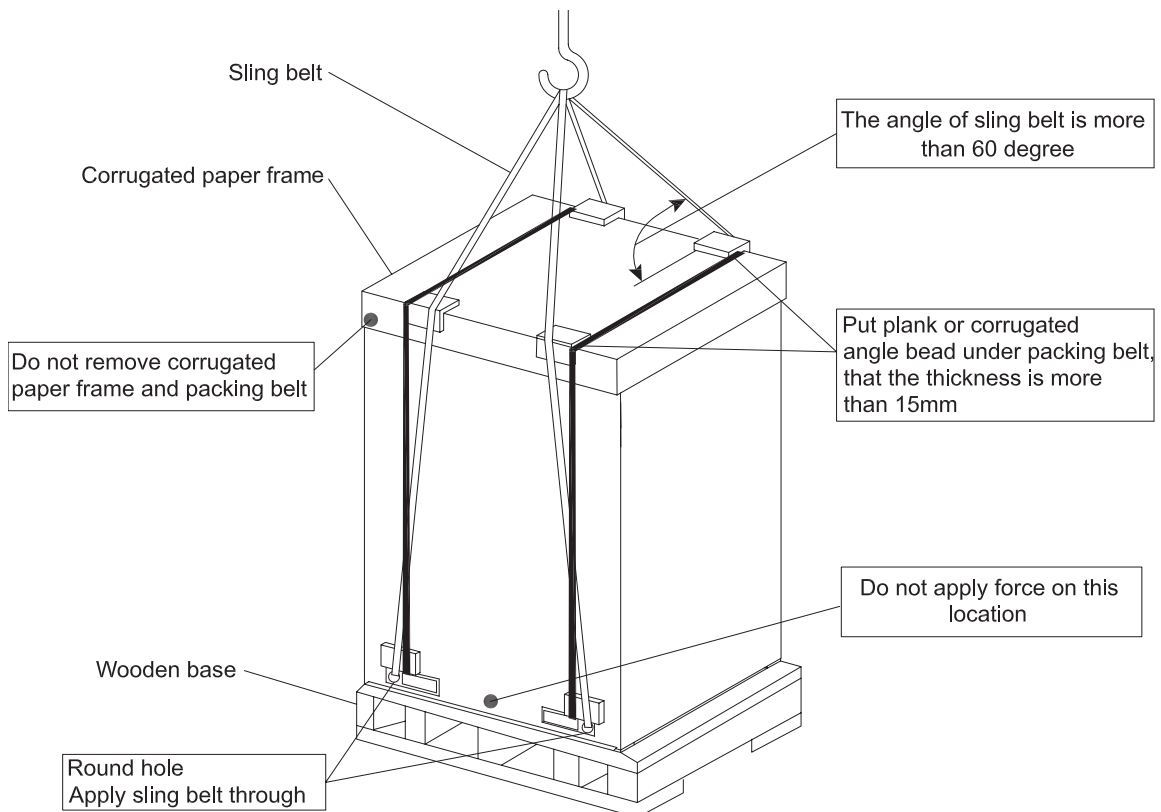


Figure 4.1 Lifting Diagram

3. Lifting/hoisting without wooden base, as shown in Figure 4.2.

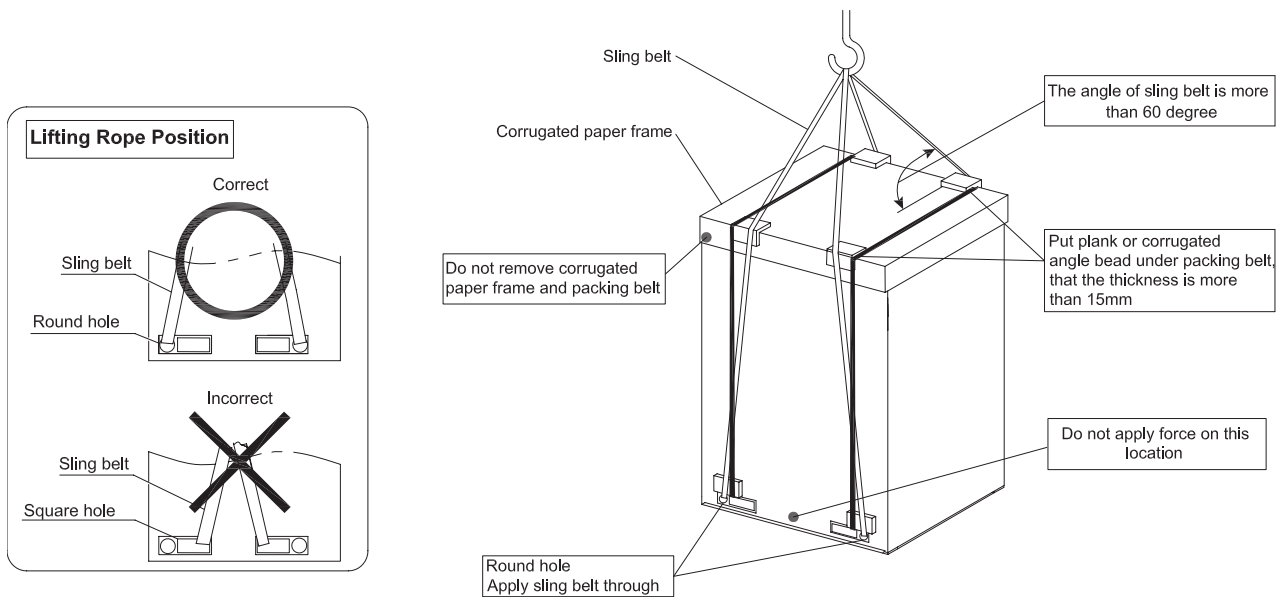


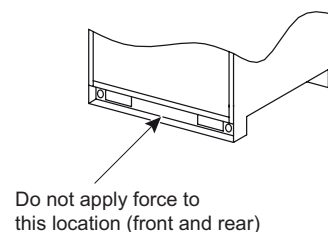
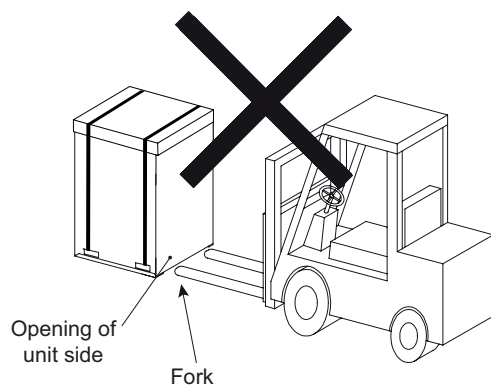
Figure 4.2 Lifting Diagram Without Wooden Base

When handling the machine with a forklift, prohibit to operate a fork on the opening at side of the machine as this may damage the machine.

Prohibit to use the forklift or other tools to operate with excessive force to the square opening at the bottom of the machine. Otherwise, the bottom of the machine maybe deformed.

* Prohibit to use the forklift to push the bottom of the machine.

* Prohibit to use rollers and so on.



NOTE

If you want to carry out transport handling after unpacking, please protect the machine with veneer, fabric and so on.

⚠ WARNING

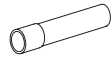

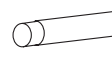
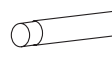
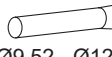
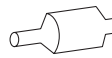
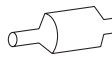

























Before installation and commissioning, do not place additional items inside the machine and ensure that no people is inside the machine. Otherwise, this may lead to fire, fault, injuries so on.

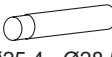
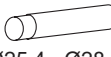
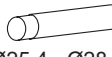
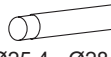
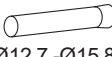











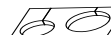
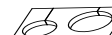









5. Installation of Outdoor Unit

5.1 Factory Accessories

Check for the following components which are outdoor unit accessories before installation:

Table 5.1 Factory Accessories

Accessory		8HP	10HP	12HP	14HP	16HP
Piping Accessories	Gas side Connecting Piping	 Ø22.2 - Ø19.05	—	 Ø22.2 - Ø25.4	 Ø25.4 - Ø28.58	 Ø25.4 - Ø28.58
	Liquid Side Connecting Piping	—	—	 Ø9.52 - Ø12.7	—	—
	Silencer	—	—	—	 Ø28.58	 Ø28.58
Refrigerant Label						
Magnet Ring						
Filter						
Tie						
IOM						

Accessory		18HP	20HP	22HP	24HP	Remarks
Piping Accessories	Gas side Connecting Piping	 Ø25.4 - Ø28.58	 Ø25.4 - Ø28.58	 Ø25.4 - Ø28.58	 Ø25.4 - Ø28.58	
	Liquid Side Connecting Piping	 Ø12.7 - Ø15.88	—	—	—	
	Silencer	—	—	 Ø28.58	 Ø28.58	
Refrigerant Label						
Magnet Ring						
Filter						
Tie						
IOM						

NOTE

More informations about accessories NO, pls refer to the last page.

If the accessories are not shipped with the machine, please contact the dealer.

5.2 Installation

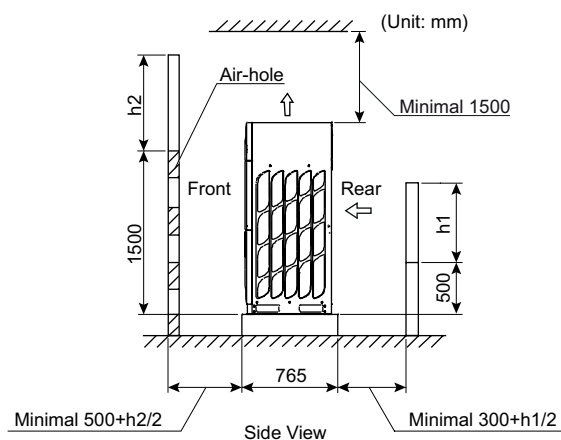
- (1) Outdoor unit should be installed in a dry and well-ventilated environment.
- (2) Outdoor units should be installed in a shaded place, or in a place not exposed to direct sunlight and high temperature heat radiation place.
- (3) The outdoor unit should be installed in a place where the noise and the air flow discharge during operation will not affect the neighbours or the surrounding ventilation. The noise emitted on the rear, left and right sides is 6 to 7 dB (A) higher than the noise measured in the nominal front of the machine.
- (4) The outdoor unit should be installed in the place where it is allowed by the public people.
- (5) Check that the foundation on which the unit is installed is a levelled surface and strong enough to hold the unit firmly.
- (6) Do not install the outdoor unit in a place where dust or other debris can block the outdoor heat exchanger.
- (7) When the outdoor unit is installed in a place where there is heavy snowfall, install the snow cover at the top of the outdoor unit and the inlet of the heat exchanger.
- (8) When performing heating and defrosting operation, the outdoor unit discharges condensate. Provide a suitable drain around the foundation. If the outdoor unit installed on the roof, balcony or corridor and other places, prevent condensate from dropping to the people walking on the road. Otherwise during the winter condensates freezes to ice and can block the road. If the unit is installed in such place, provide an additional drain around the foundation.
- (9) Do not install the outdoor unit in a place where the rain falls directly on the outdoor unit heat exchanger or in the gap formed by the building space.

NOTE:

1. Do not install the outdoor unit in environments where there is high concentration of oil mist, corrosive gases, salt winds, and harmful gases (sulphur, acid, alkaline).
2. Do not install the outdoor unit in places where electromagnetic radiation can directly interfere with the electric box of the outdoor unit.
3. Outdoor unit installation should be as far as possible from the electromagnetic wave generating equipment, the distance between the machine and the equipment should be at least 3 meters.

5.3 Maintenance Space

When you install the outdoor unit, the maintenance space should be reserved as per the following requirements:

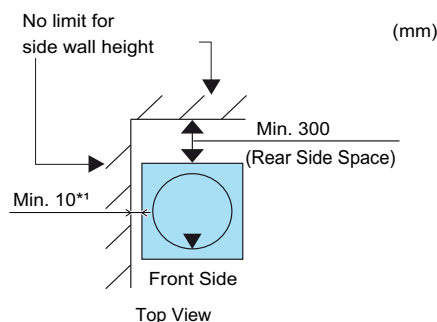


- If there is no wall in the rear and front, installation space requirements are as follows:
 - * Front: 500mm or more
 - * Rear: more than 300mm
 - * Left and right: 10mm or more (If snow protection device is used or air outlet duct is installed, needs 50mm or more)
- If the front wall is more than 1.5 meters high, the front needs at least $(500+h2/2)$ mm
- If the rear wall is more than 0.5m high the rear requires at least $(300+h1/2)$ mm
- If the surrounding is not more than 2 walls, above installation space must be met.
- If the appliance is surrounded by more than 2 walls, ensure to meet the following installation space
- When the upper obstacle and the unit is less than 1.5 meters or no space above the air outlet side of the air duct to prevent short circuit
- When there is an obstacle above, in principle it is required that there are no obstacles around the unit (Front, rear, left, right).

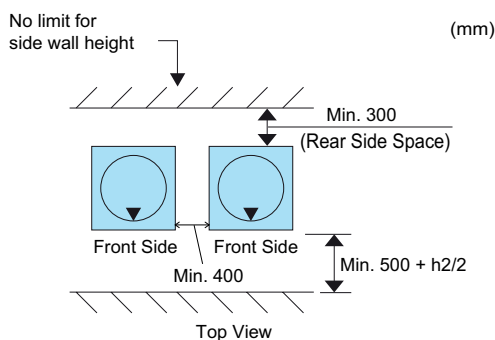
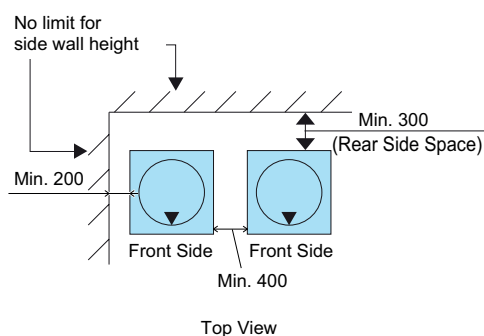
1) When both sides have walls:

If the outdoor unit is installed adjacent to high building, and both sides with walls, the outdoor unit should have a minimum of 300mm maintenance space at rear side.

• Single Installation

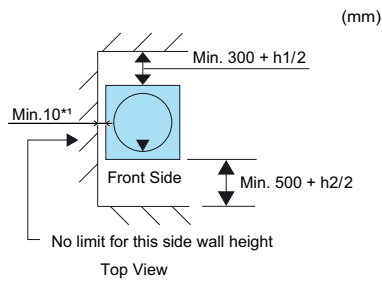


• Multiple / Serial Installation



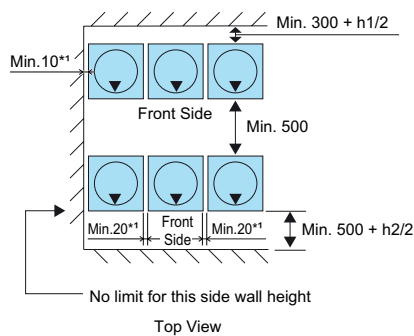
2) When the walls are on 3 sides:

• Single Installation

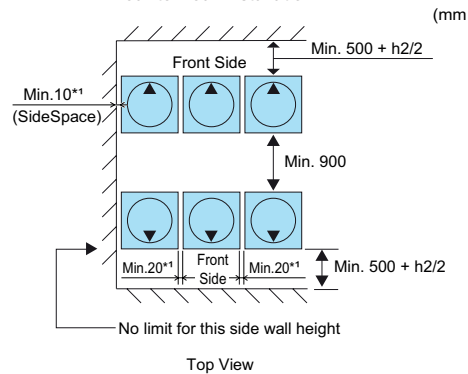


• Multiple / Serial Installation

<Installation in The Same Direction>

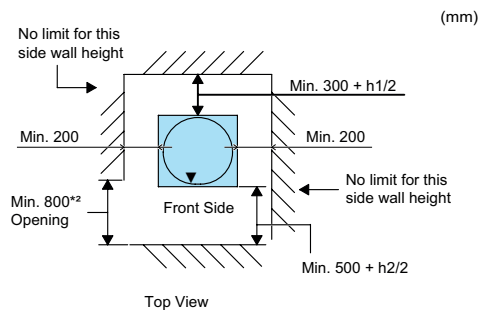


<Rear to Rear Installation>



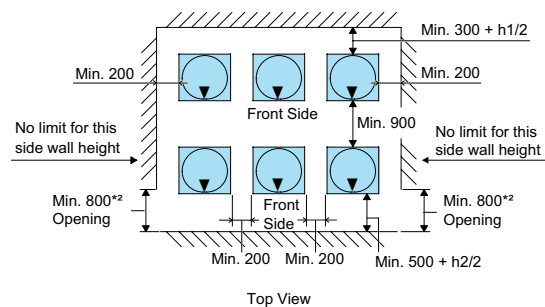
3) When surrounded by walls at 4 sides:

• Single Installation

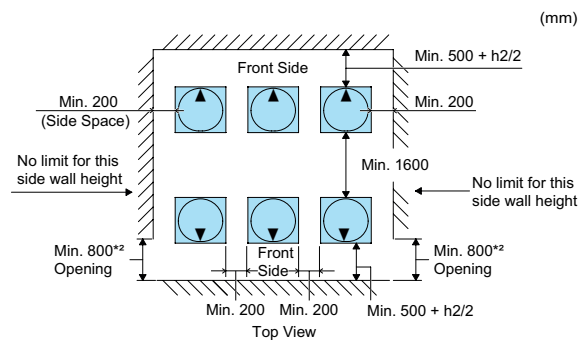


• Multiple / Serial Installation

<Installation in The Same Direction>

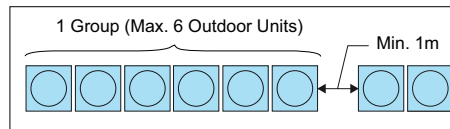


<Rear to Rear Installation>



NOTE:

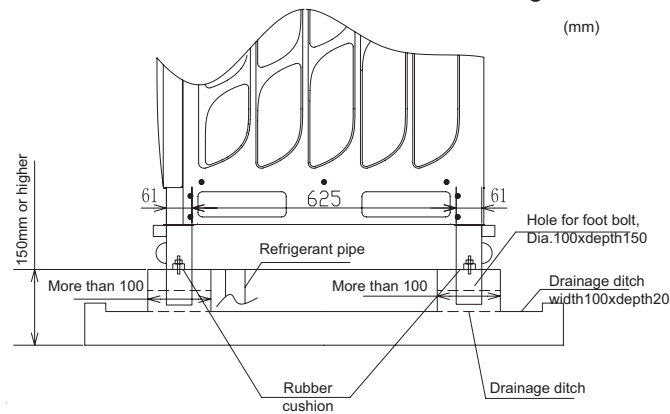
- *1. If the field-supplied snow protection hood or the air flow deflector duct is adopted, the space of minimum 50mm is required.
- *2. Partly open a wall if the unit is surrounded by walls at four sides.
- 3. Keep the top of the outdoor unit without any obstacle to prevent short circuit due to inlet air and outlet air of each outdoor unit.
- 4. The above chart provides sufficient operation and maintenance space for outdoor unit under standard operation conditions.
(operating mode: cooling, ambient temperature: 35 degrees) If the outdoor unit ambient temperature is higher, and there is a outlet air short circuit, adjust the installation size depending on the actual installation conditions, and the calculation of outdoor unit return airflow.
- 5. When multiple outdoor units are installed in the same direction, you can install a maximum of six outdoor units. The minimum distance between two adjacent outdoor units should be at least 1m.



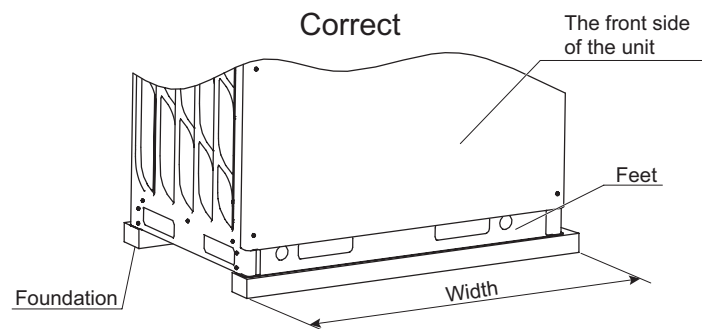
5.4 Foundation

• Concrete Foundation:

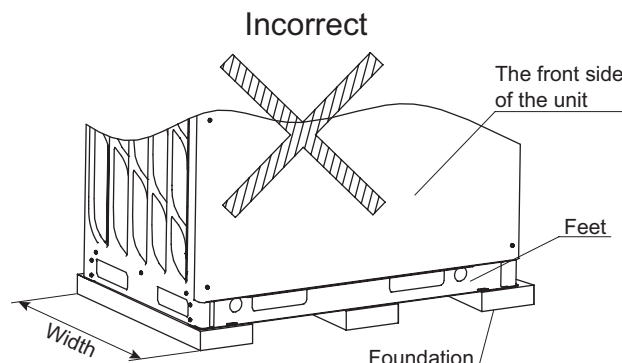
- (1) The foundation should be 150 mm higher than the ground.
- (2) Set the drain ditch around the base to ensure smooth drainage.



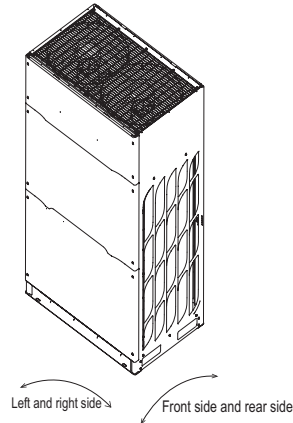
* Please set the concrete base as shown below:



* Do not setup the concrete foundation as shown below. Otherwise, the foot of the machine may be deformed:



- (3) Install the outdoor unit horizontally in whole plane direction using level gauge to check that the slope in the four directions (front, rear, left, and right) tilt does not exceed 10mm.



- (4) Please provide a firm and correct foundation to ensure:

The outdoor unit is on a horizontal plane.

The outdoor unit does not make abnormal sound.

The outdoor unit does not get toppled by earthquake or strong winds.

- (5) When installing the outdoor unit, use the field-supplied anchor bolts to mount the machine. Refer to Figure 5.1 to confirm the position of mounting hole.

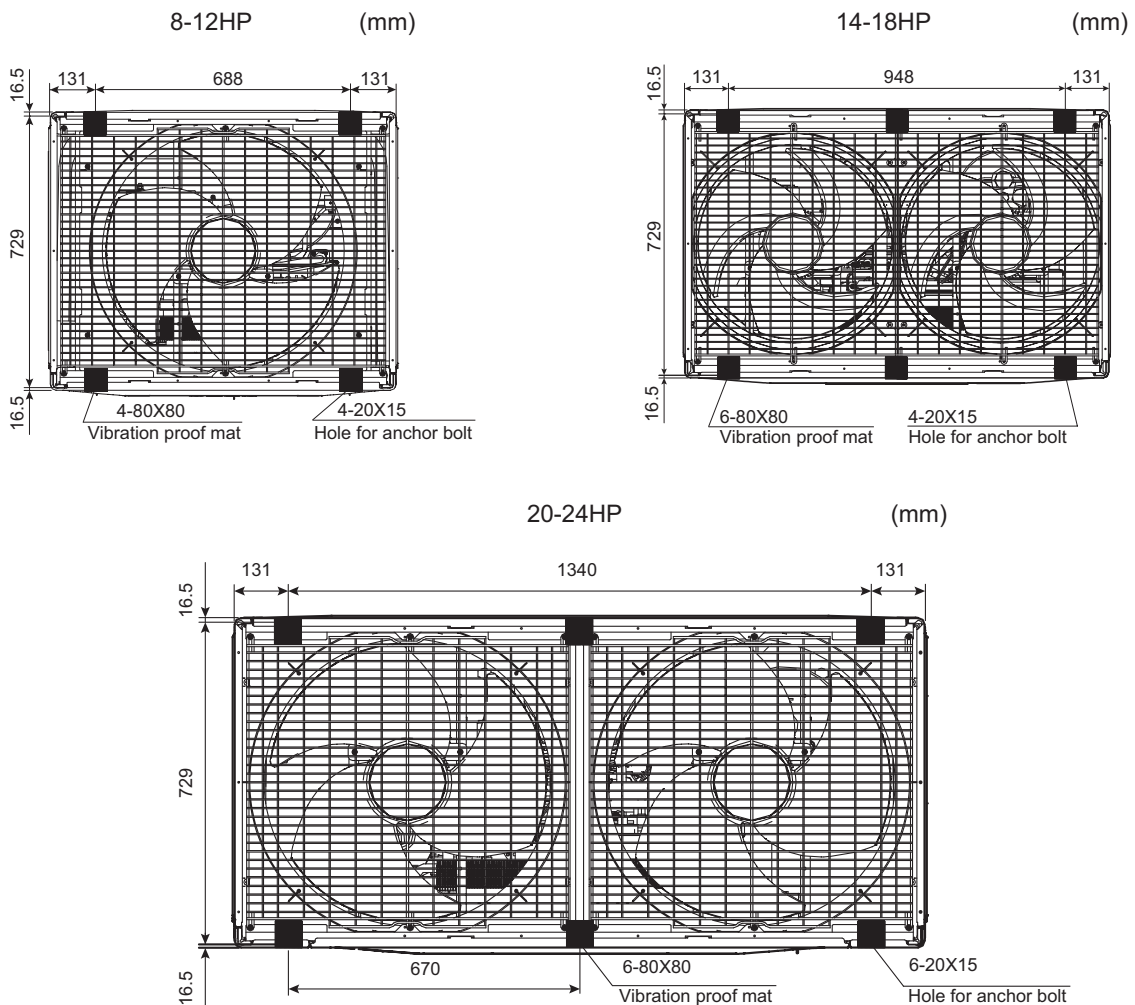
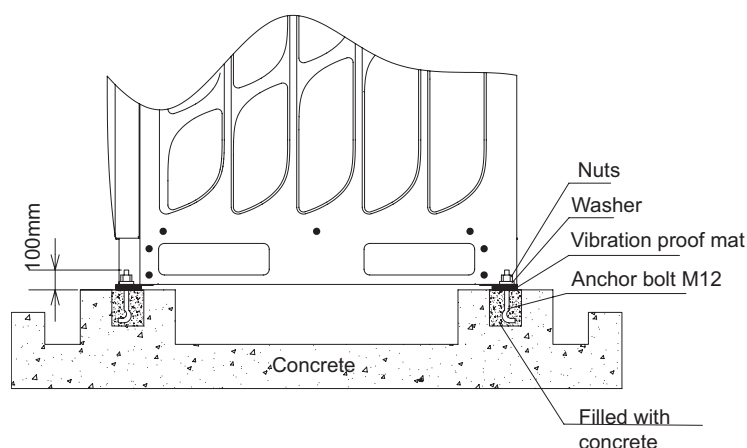


Figure 5.1 The Hole Position Diagram for Foot Bolt Fixing

Make sure that the outdoor foot bolts are securely tightened.



- (6) When you install outdoor unit on the roof or the balcony, ice may easily accumulate around the drain ditch in the winter morning, hence do not drain the area where the staff often pass.
- (7) When the outdoor unit needs a drain pipe, use a drain pipe joint device (optional, model DC-01Q). In cold areas, do not use the drain pipe on the water tray as the condensed water may freeze inside the pipe resulting in drain pipe burst.

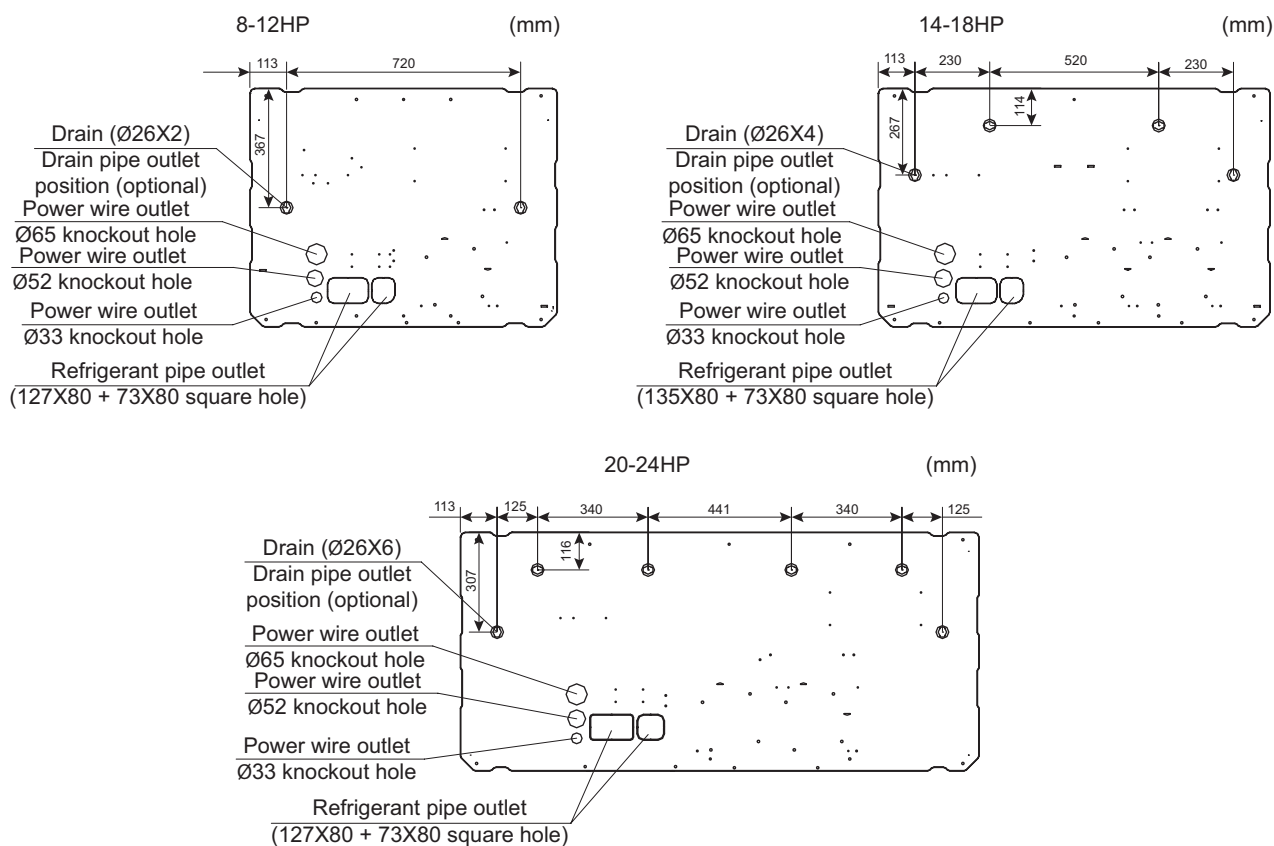
5.5 Condensation Water Treatment

The outdoor unit discharges condensed water during heating and defrosting. (Rainwater can also be discharged through it) Please pay attention to the following:

- (1) Select a place where you can easily set up an effective drain pipe or drain.
- (2) Do not install the outdoor unit above the sidewalk, the condensed water may drip onto the pedestrian.

Setup an additional water tray if you have to install it in such places.

- (3) When the outdoor unit needs a drain pipe, use a drain pipe joint device (optional, model DC-01Q). In cold areas, do not use the drain pipe on the water tray as the condensed water may freeze inside the pipe resulting in drain pipe burst.



- Drain Pipe Joint

Drain pipe joint is a drain connection device when using outdoor unit chassis as a water tray.

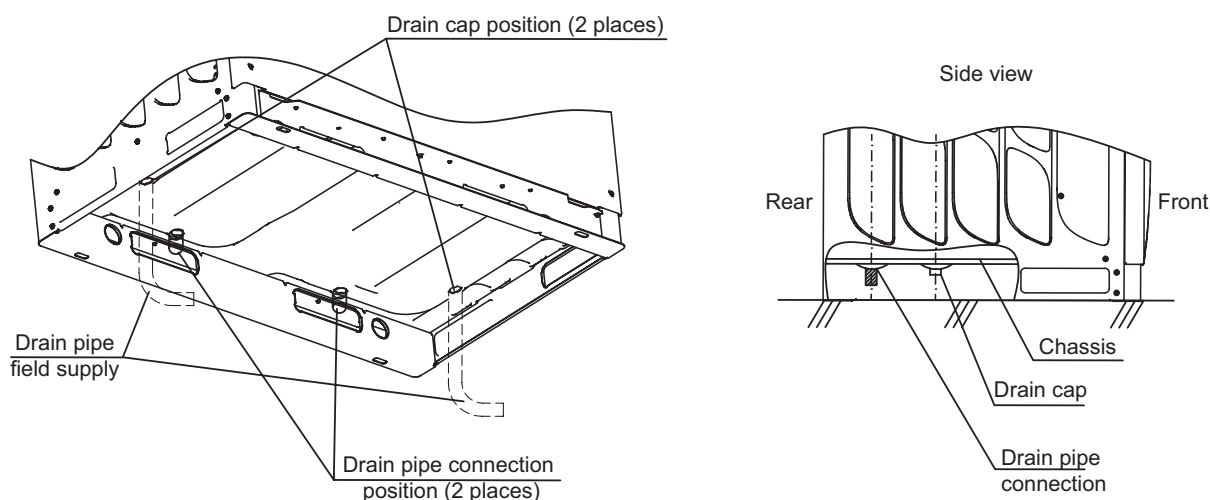
Drain pipe connection components:

Name	Model
Drain pipe joint	DC-01Q

Model	Part Name	Material / Color	Quantity	Usage
DC-01Q	Drain pipe joint	PP / black	1	Connect the drain connection
	Drain pipe cap	PP / black	1	Blocking the water pipe mouth
	Rubber cap	CR / black	4	Sealed drain connection and drain cap

Installation location

For example, JVOH140VPEMBQ models:



6. The Refrigerant Piping Construction

⚠ DANGER

- Refrigerant R410A is used in the refrigerant circulation system. Do not allow oxygen, acetylene or other flammable and toxic gases to fill the refrigerant pipe during leakage and air tightness test. These gases are very dangerous and may cause an explosion. It is recommended to use nitrogen.
- Ensure that there is no pressure inside the stop valve when removing the cap on the stop valve.

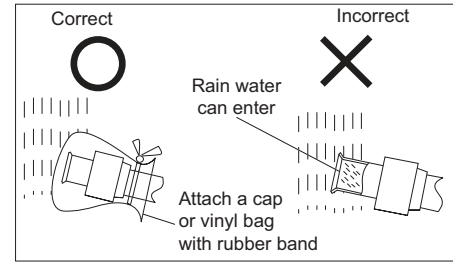
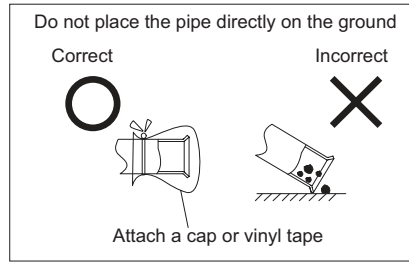
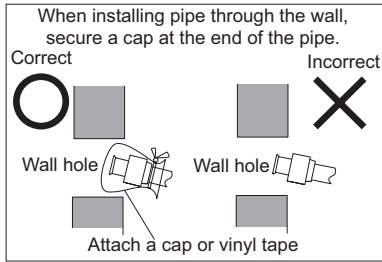
⚠ CAUTION

Make sure that the refrigerant piping is connected in the same refrigeration system.

6.1 Piping Material

- (1) Prepare copper pipe for on-site construction.
- (2) Follow the instructions in Table 6.1 and Table 6.2. Select the copper pipe specifications.
- (3) Choose clean copper pipes. Make sure that there is no dust and moisture inside the copper pipe inner wall. Before performing piping connection, use dry air or nitrogen to blow the inside of the copper pipe to remove internal dust or impurities. Do not cut the copper pipe with tools such as saws and grinding wheels that can produce metal debris.

- Notice for piping end



- Piping connection construction precautions

- (1) Connect the indoor unit and the outdoor unit with a refrigerant pipe.
Pay attention to the pipeline do not touch the ceiling and other weakness places. (Otherwise, the you will hear sound of piping vibration).
- (2) Apply a layer of refrigerant oil gently to the inner surface of the piping flaring area before performing flare piping connection.
Use specified torque value with a double wrench operation, to tighten the flare nut.
First tighten the flare nut for liquid pipe, and then tighten the flare nut for gas pipe.
After the job is completed, check for leakages.

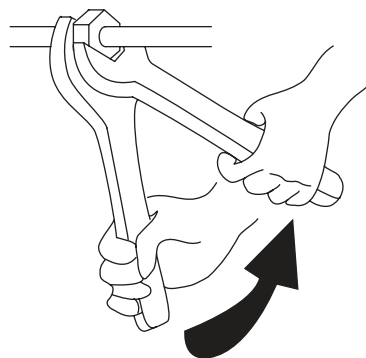


NOTE:

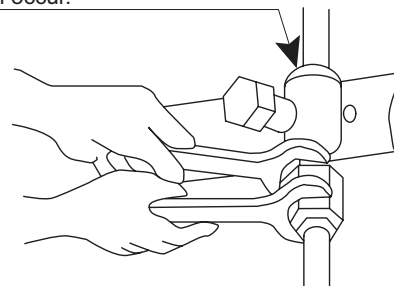
Refrigeration oil should be supplied on-site. [Model: FV68H].

- (3) If the temperature and relative humidity inside the ceiling are more than 27°C / 80%, apply a layer of insulation pipe (about 10 mm in thickness) to the outer surface of the original insulation pipe. The insulation pipe attached to the refrigerant pipe to prevent the formation of condensed water on the surface of the refrigerant pipe. (Refrigerant pipe only).
- (4) Apply a pressure of 4.15MPa to test the air tightness of the refrigerant pipe.
- (5) Cover the refrigerant pipe junction, reducing pipe connection and all the outer surface of the refrigerant piping with the insulation tube, and then pack the insulation tube with teflon tape.

- Use double wrench while tightening the flare nut.



Do not apply the two wrenches work here. Refrigerant leakage shall occur.



WARNING

Do not apply excessive force when tightening flare nut. Otherwise, the flare connection may break and cause refrigerant to leak. Please follow the specified torque requirements.

Table 6.1 Outdoor Unit Piping Specifications

(mm)

HP	Outdoor Unit Model	Gas Pipe	Liquid Pipe	HP	Outdoor Unit Model	Gas Pipe	Liquid Pipe
8	JVOH080VPEMBQ	19.05	9.52	54	JVOH540VAEMBQ	38.1	19.05
10	JVOH100VPEMBQ	22.2	9.52	56	JVOH560VAEMBQ	44.45	19.05
12	JVOH120VPEMBQ	25.4	12.7	58	JVOH580VAEMBQ	44.45	19.05
14	JVOH140VPEMBQ	25.4	12.7	60	JVOH600VAEMBQ	44.45	19.05
16	JVOH160VPEMBQ	28.58	12.7	62	JVOH620VAEMBQ	44.45	19.05
18	JVOH180VPEMBQ	28.58	15.88	64	JVOH640VAEMBQ	44.45	19.05
20	JVOH200VPEMBQ	28.58	15.88	66	JVOH660VAEMBQ	44.45	19.05
22	JVOH220VPEMBQ	28.58	15.88	68	JVOH680VAEMBQ	44.45	22.2
24	JVOH240VPEMBQ	28.58	15.88	70	JVOH700VAEMBQ	44.45	22.2
26	JVOH260VAEMBQ	31.75	19.05	72	JVOH720VAEMBQ	44.45	22.2
28	JVOH280VAEMBQ	31.75	19.05	74	JVOH740VAEMBQ	50.8	22.2
30	JVOH300VAEMBQ	31.75	19.05	76	JVOH760VAEMBQ	50.8	22.2
32	JVOH320VAEMBQ	31.75	19.05	78	JVOH780VAEMBQ	50.8	22.2
34	JVOH340VAEMBQ	31.75	19.05	80	JVOH800VAEMBQ	50.8	22.2
36	JVOH360VAEMBQ	38.1	19.05	82	JVOH820VAEMBQ	50.8	22.2
38	JVOH380VAEMBQ	38.1	19.05	84	JVOH840VAEMBQ	50.8	22.2
40	JVOH400VAEMBQ	38.1	19.05	86	JVOH860VAEMBQ	50.8	22.2
42	JVOH420VAEMBQ	38.1	19.05	88	JVOH880VAEMBQ	50.8	22.2
44	JVOH440VAEMBQ	38.1	19.05	90	JVOH900VAEMBQ	50.8	25.4
46	JVOH460VAEMBQ	38.1	19.05	92	JVOH920VAEMBQ	50.8	25.4
48	JVOH480VAEMBQ	38.1	19.05	94	JVOH940VAEMBQ	50.8	25.4
50	JVOH500VAEMBQ	38.1	19.05	96	JVOH960VAEMBQ	50.8	25.4
52	JVOH520VAEMBQ	38.1	19.05				

Table 6.2 Indoor Unit Piping Specifications (mm)

Indoor Unit Type	Indoor Unit Model	Gas Pipe	Liquid Pipe
Compact Ducted Indoor Unit Medium ESP Ducted Indoor Unit High ESP Ducted Indoor Unit Floor Concealed Indoor Unit	18~45	12.7	6.35*
	50~56	15.88	6.35*
	63~160	15.88	9.52
Round-way Cassette Indoor Unit 2-way Cassette Indoor Unit High Wall Indoor Unit	22~63	12.7	6.35*
	71~160	15.88	9.52
Fresh Air Ducted Indoor Unit	65,108	15.88	9.52
	168	19.05	9.52
	210	22.2	9.52
	300,400	25.4	12.7
	500,600	28.58	15.88

- Piping wall thickness and material

Piping specification is as shown in below table:

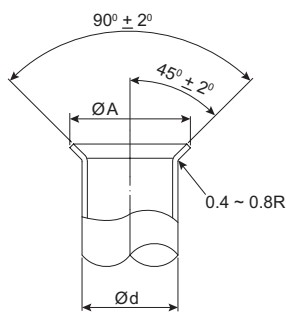
(mm)

Outer Diameter of Piping	R410A	
	Wall Thickness	Hardness Grade
6.35mm	0.8	O material
9.52mm	0.8	O material
12.7mm	0.8	O material
15.88mm	1	O material
19.05mm	1	1 / 2H material
22.2mm	1	1 / 2H material
25.4mm	1	1 / 2H material
28.58mm	1	1 / 2H material
31.75mm	1.1	1 / 2H material
38.1mm	1.35	1 / 2H material
44.45mm	1.55	1 / 2H material
50.8mm	2	1 / 2H material

6.2 Flare and Joints

- Flare size

Flare as shown in the table below:



(mm)

Diameter (Ød)	A
	+0 -0.4 R410A
6.35	9.1
9.52	13.2
12.7	16.6
15.88	19.7
19.05	(*)

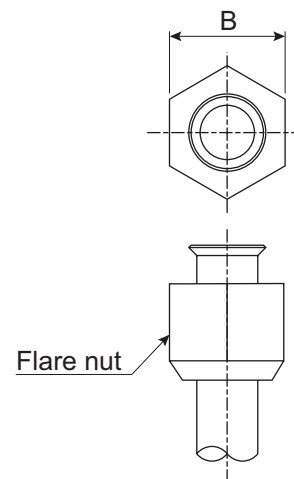
(*) It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare).

- Joint selection

If you use 1/2H material pipe, it cannot be flared. In this case, the joints shown in the table below can be used.

Minimum wall thickness of the joint (mm)	
	R410A
Ø 6.35	0.5
Ø 9.52	0.6
Ø 12.7	0.7
Ø 15.88	0.8
Ø 19.05	0.8
Ø 22.2	0.9
Ø 25.4	0.95
Ø 28.58	1.0
Ø 31.75	1.1
Ø 38.1	1.35
Ø 41.3	1.45
Ø 44.45	1.55
Ø 50.8	2.0
Ø 53.98	2.0

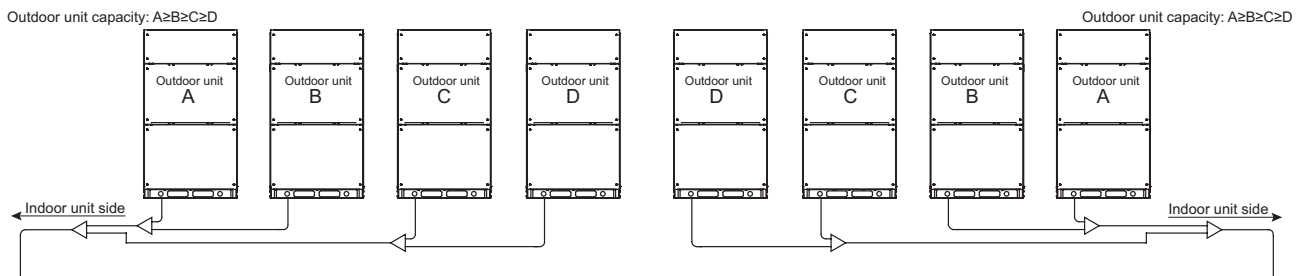
Flare nut Size B (mm)	
	R410A
Ø 6.35	17
Ø 9.52	22
Ø 12.7	26
Ø 15.88	29
Ø 19.05	36



6.3 Precautions for Installation of Outdoor Unit

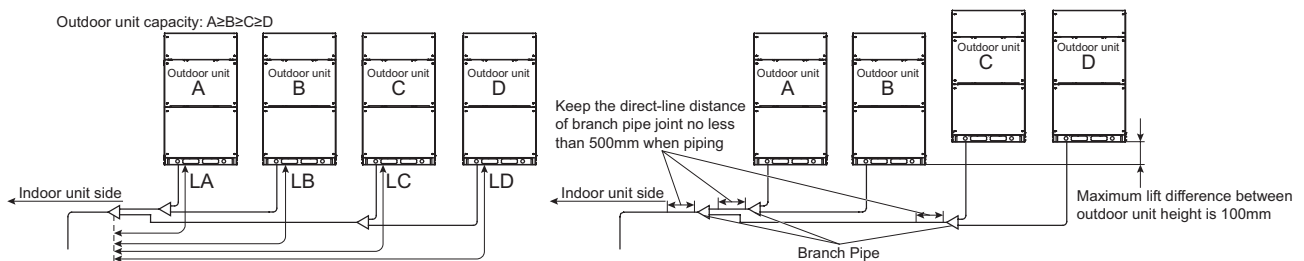
Outdoor unit arrangement

Take the 4-module combination as an example. The outdoor unit is arranged as per the order of A, B, C and D and the outdoor unit A should be installed near the indoor unit side.



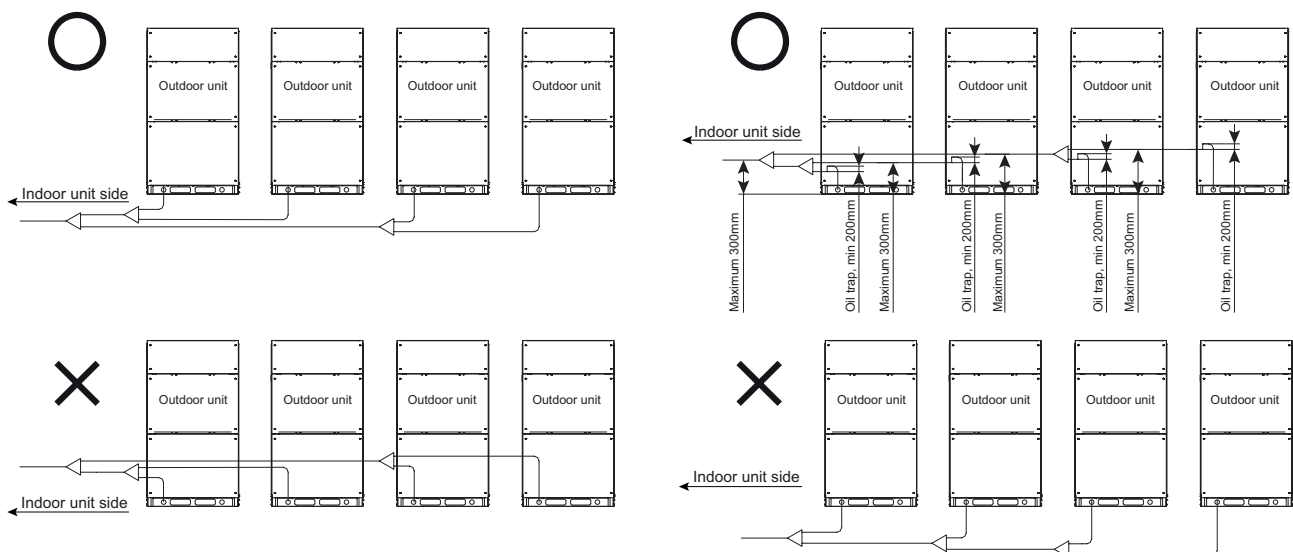
Piping construction between outdoor units

- (1) The length of the piping between the outdoor unit side branch pipe and the outdoor unit shall be $LA \leq LB \leq LC \leq LD \leq 10m$.

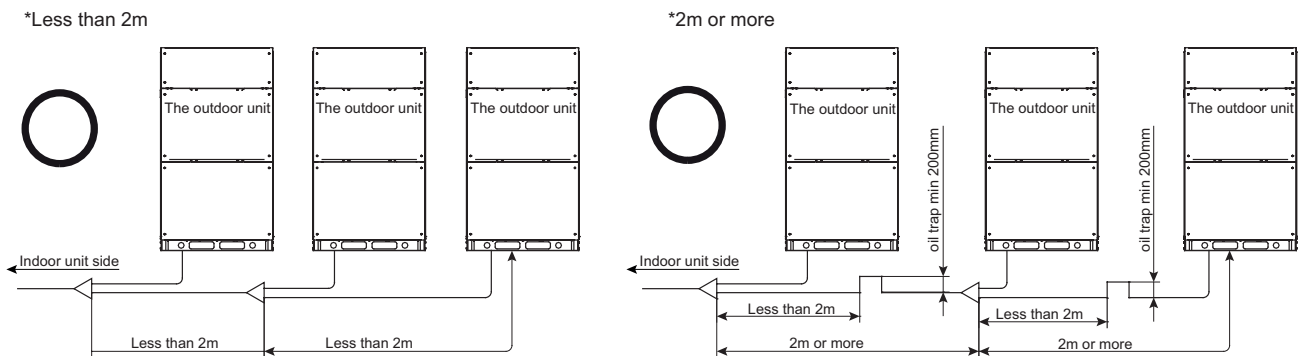


- (2) Take 4-module combination of outdoor units as an example:

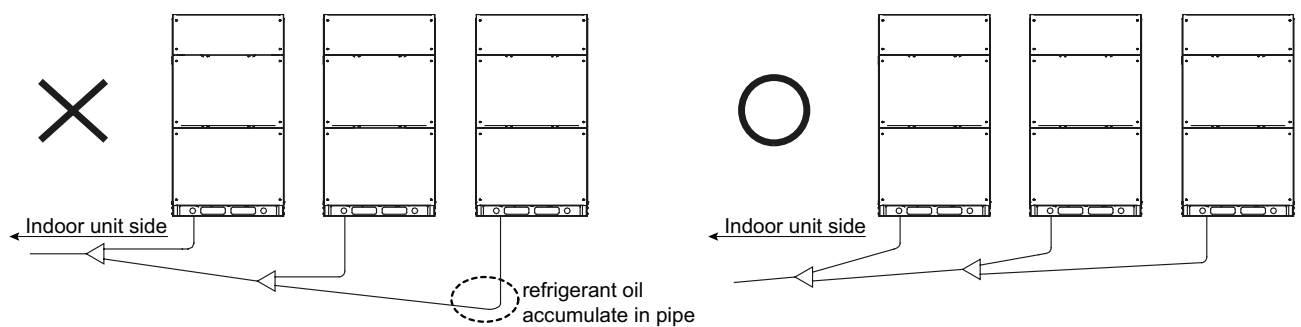
Installation position of branch pipe at outdoor unit side should be lower than the position of outdoor unit piping outlet. If the installation position of the branch pipe is higher than the position of outdoor unit piping outlet, distance from the branch pipe to the bottom of outdoor unit should be kept as no less than 300mm. Meanwhile, oil resistance bay needs to be set between outdoor unit and branch pipe (Minimum 200mm).



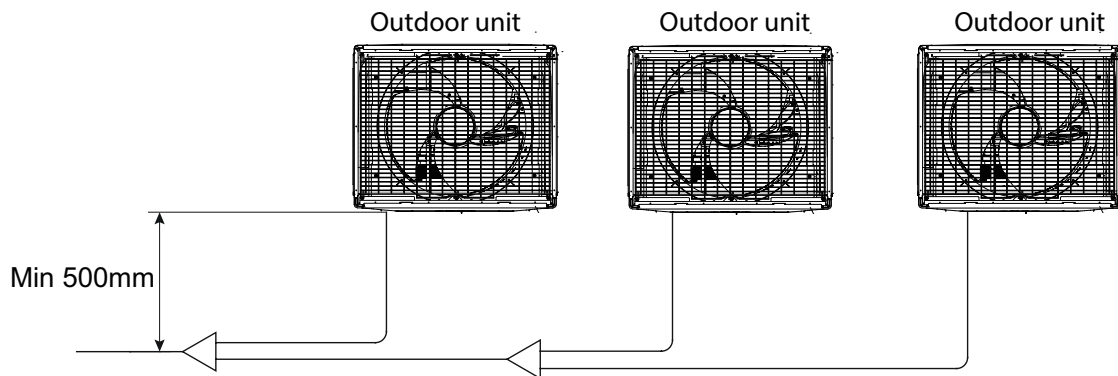
- (3) Take 3-module combination of outdoor units as an example: If the piping length between the outdoor unit is no less than 2m, set the oil pool so that oil pool can prevent the accumulation of cooling oil accumulation inside individual outdoor unit.



- (4) Take 3-module combination of outdoor units as an example: Install the outdoor unit piping in a horizontal plane, or with the indoor side of the pipe connected to the downward tilt state, otherwise, the system may accumulate cooling oil in the pipeline.

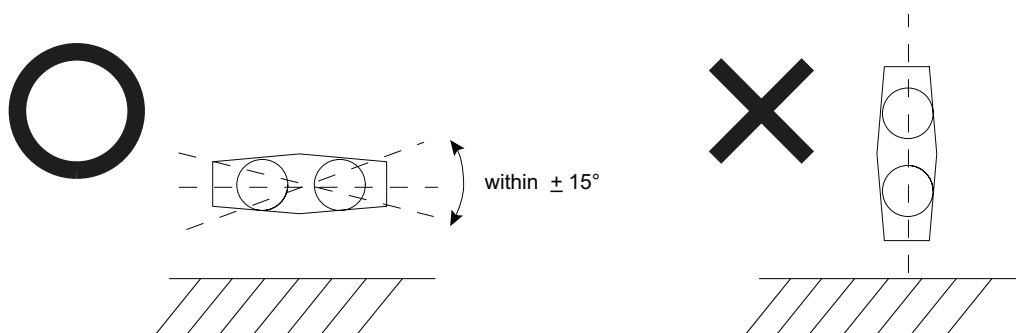


- (5) Take 3-module combination of outdoor units as an example: For maintenance, if the piping is installed in front of the outdoor unit, ensure that the minimum vertical distance between the outdoor unit and the branch pipe is 500mm. (During the replacement of the compressor, keep a minimum of 500mm maintenance space).



- (6) Branch pipe direction

The direction of the branch pipe is as shown below, install the branch pipe closer to the ground (with an horizontal inclination angle ≤ 15 degrees):



6.4 System Piping Connection

Piping connection must be carried out for each outdoor unit.

NOTE:

Verify that the refrigerant piping is connected in the same refrigerant circulation system.

- Site preparation for the use of refrigerant piping.

Refer to the position as shown in Figure 6.1 when you connect the pipes

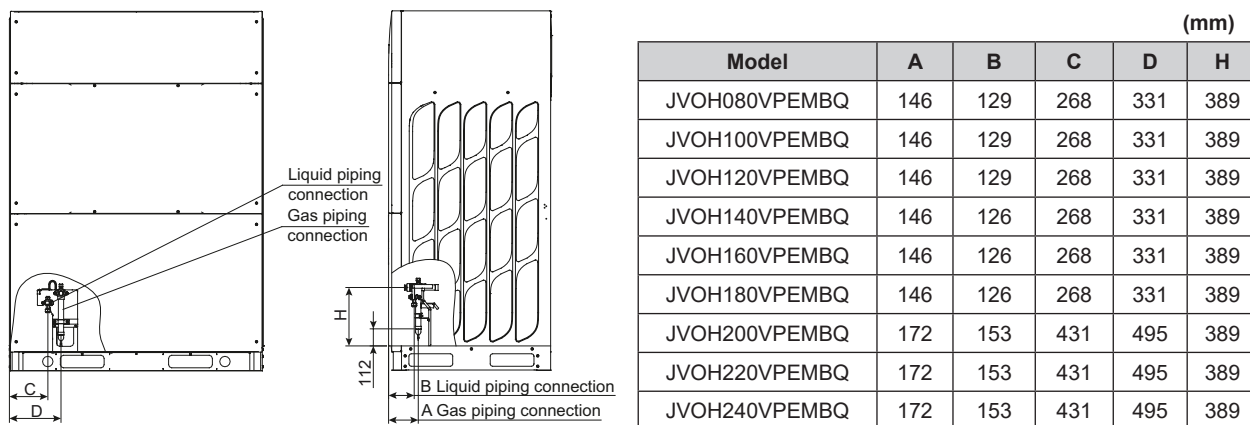


Figure 6.1 Refrigerant Piping Connection

- Refrigerant piping directions.

Fix the refrigerant piping properly to avoid vibration and external force on the stop valve.

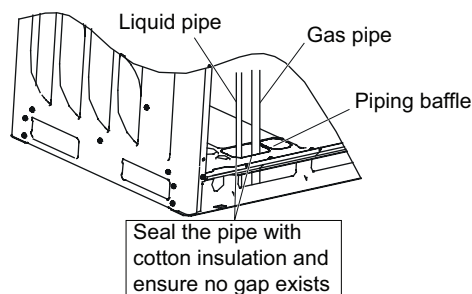
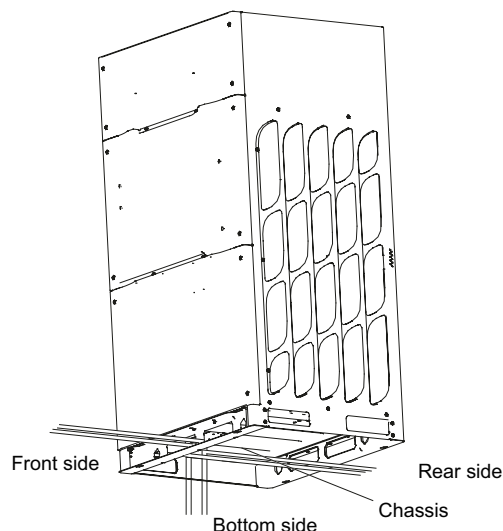
- (1) Refrigerant piping can be connected in three directions of the outdoor unit:

Front: Connect the piping from the piping entrance at the unit chassis and then run it through the front opening of the chassis.

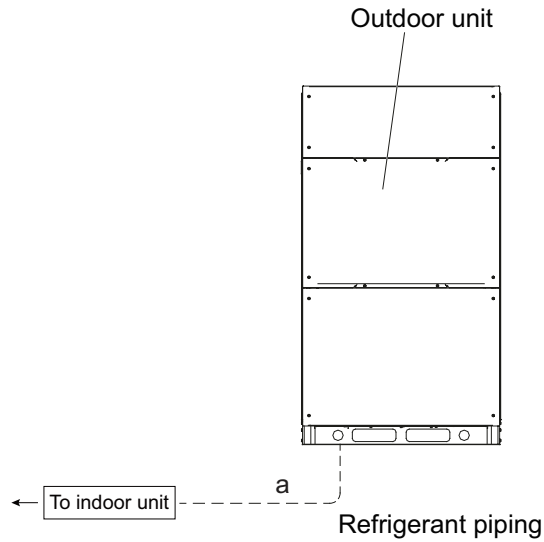
Bottom: Directly connect the piping from the piping entrance at the unit chassis.

Rear: Connect the piping from the piping entrance at the unit chassis and then run it through the rear opening of the chassis.

- (2) Operate the stop valve as per Clause 6.4.5.
- (3) Refer to section 5.1 and "Installation and maintenance manual" for piping connection.
- (4) If the piping is connected from the front side of the unit, the connection piping of the unit should be sealed completely with thermal insulation tube so as to prevent water or snow from entering into the unit.
- (5) If the piping is connected from the bottom or rear side of the unit, need apply thermal insulation tube to the piping which is going through the bottom of the unit, so as to prevent water or snow from entering into the unit.



6.4.1 JVOH080VPEMBQ~JVOH240VPEMBQ Piping Specifications (Base Module)

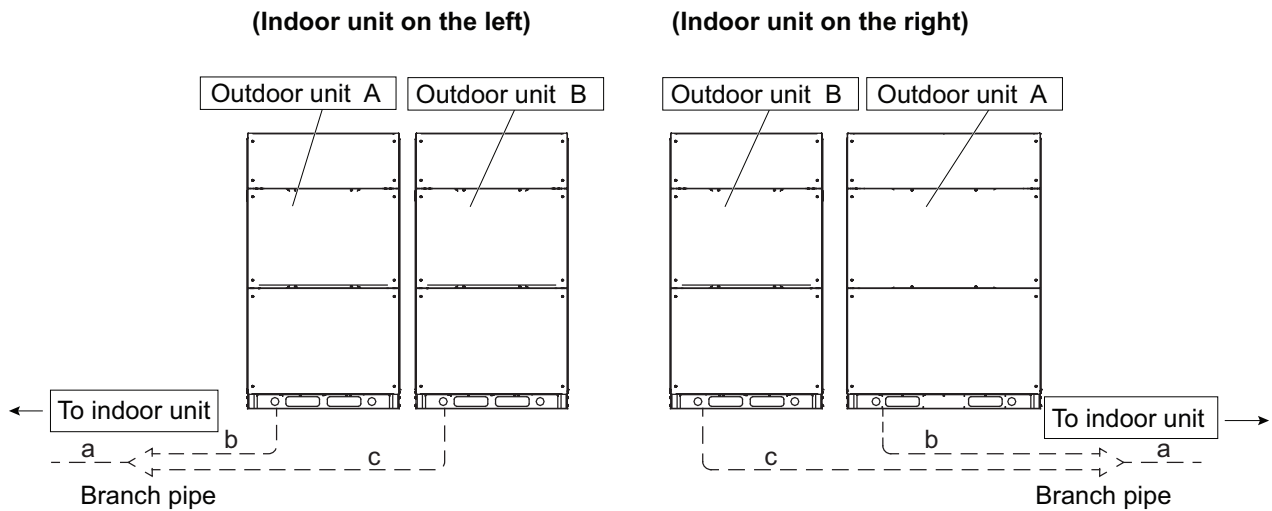


(Ømm)

Model			JVOH080VPEMBQ	JVOH100VPEMBQ	JVOH120VPEMBQ	JVOH140VPEMBQ
Pipe size	a	Gas pipe	19.05 19.05~22.2	22.2 22.2~25.4	25.4 25.4~28.58	25.4 25.4~28.58
		Liquid pipe	9.52 9.52~12.7	9.52 9.52~12.7	12.7 12.7~15.88	12.7 12.7~15.88

Model			JVOH160VPEMBQ	JVOH180VPEMBQ	JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ
Pipe size	a	Gas pipe	28.58 28.58~31.75	28.58 28.58~31.75	28.58 28.58~31.75	28.58 28.58~31.75	28.58 28.58~31.75
		Liquid pipe	12.7 12.7~15.88	15.88 15.88~19.05	15.88 15.88~19.05	15.88 15.88~19.05	15.88 15.88~19.05

6.4.2 JVOH260VAEMBQ~JVOH480VAEMBQ Piping Specifications (2-Module Combinations)



2-Module Combination Table

(Ømm)

Model		JVOH260 VAEMBQ	JVOH280 VAEMBQ	JVOH300 VAEMBQ	JVOH320 VAEMBQ	JVOH340 VAEMBQ	JVOH360 VAEMBQ
Combination Mode	The outdoor unit A	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH180 VPEMBQ	JVOH200 VPEMBQ
	The outdoor unit B	JVOH100 VPEMBQ	JVOH120 VPEMBQ	JVOH140 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ
Branch Pipe		JM-30SNQ					JM-46SNQ
Piping Size	a	Gas pipe	31.75 31.75~38.1	31.75 31.75~38.1	31.75 31.75~38.1	31.75 31.75~38.1	38.1 38.1~44.45
		Liquid pipe	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2
	b	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	12.7	15.88	15.88
	c	Gas pipe	22.2	25.4	25.4	28.58	28.58
		Liquid pipe	9.52	12.7	12.7	12.7	12.7

2-Module Combination Table

(Ømm)

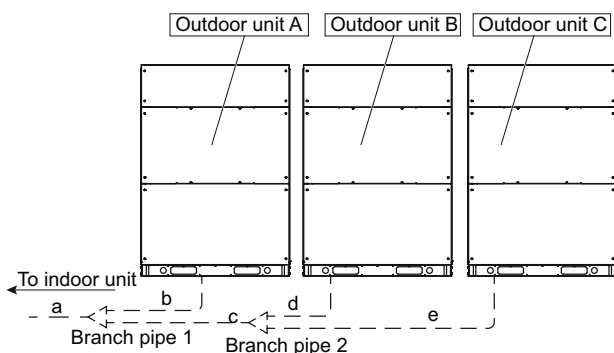
Model		JVOH380 VAEMBQ	JVOH400 VAEMBQ	JVOH420 VAEMBQ	JVOH440 VAEMBQ	JVOH460 VAEMBQ	JVOH480 VAEMBQ
Combination Mode	The outdoor unit A	JVOH220 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ
	The outdoor unit B	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH180 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH240 VPEMBQ
Branch Pipe		JM-46SNQ					
Piping Size	a	Gas pipe	38.1 38.1~44.45	38.1 38.1~44.45	38.1 38.1~44.45	38.1 38.1~44.45	38.1 38.1~44.45
		Liquid pipe	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2
	b	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	c	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

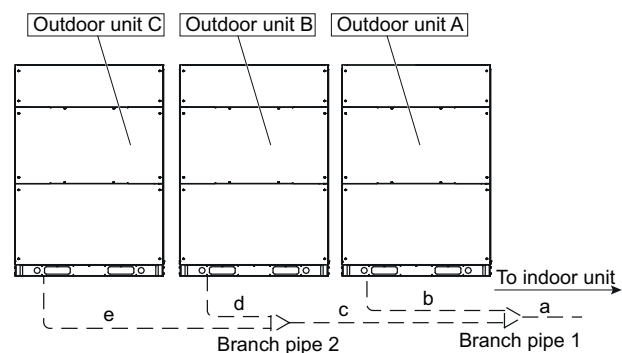
Refer to the table above for the outdoor model to select the branch pipe type and pipe diameter.

6.4.3 JVOH500VAEMBQ~JVOH720VAEMBQ Piping Specifications (3-Module Combinations)

(Indoor unit on the left)



(Indoor unit on the right)



3-Module Combination Table

(Ømm)

Model			JVOH500 VAEMBQ	JVOH520 VAEMBQ	JVOH540 VAEMBQ	JVOH560 VAEMBQ	JVOH580 VAEMBQ	JVOH600 VAEMBQ
Combination Mode	The outdoor unit A	JVOH180 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	
	The outdoor unit B	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH180 VPEMBQ	JVOH200 VPEMBQ	
	The outdoor unit C	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	
Branch Pipe 1		JM-46SNQ				JM-68SNQ		
Branch Pipe 2		JM-30SNQ				JM-30SNQ		
Piping Size	a	Gas pipe	38.1 38.1~44.45	38.1 38.1~44.45	38.1 38.1~44.45	44.45 44.45~50.8	44.45 44.45~50.8	44.45 44.45~50.8
		Liquid pipe	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~22.2	19.05 19.05~25.4	19.05 19.05~25.4	19.05 19.05~25.4
	b	Gas pipe	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88	15.88
	c	Gas pipe	31.75	31.75	31.75	31.75	31.75	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05	19.05
	d	Gas pipe	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	12.7	12.7	15.88	15.88
	e	Gas pipe	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	12.7	12.7	12.7	12.7

3-Module Combination Table

(Ømm)

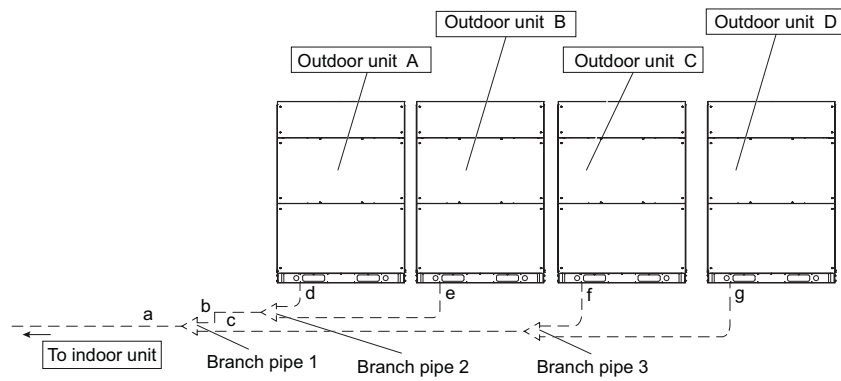
Model		JVOH620 VAEMBO	JVOH640 VAEMBO	JVOH660 VAEMBO	JVOH680 VAEMBO	JVOH700 VAEMBO	JVOH720 VAEMBO
Combination Mode	The outdoor unit A	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO
	The outdoor unit B	JVOH220 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO	JVOH240 VPEMBO
	The outdoor unit C	JVOH160 VPEMBO	JVOH160 VPEMBO	JVOH180 VPEMBO	JVOH200 VPEMBO	JVOH220 VPEMBO	JVOH240 VPEMBO
Branch Pipe 1		JM-68SNQ					
Branch Pipe 2		JM-30SNQ					
Piping Size	a	Gas pipe	44.45 44.45~50.8	44.45 44.45~50.8	44.45 44.45~50.8	44.45 44.45~50.8	44.45 44.45~50.8
		Liquid pipe	19.05 19.05~25.4	19.05 19.05~25.4	19.05 19.05~25.4	22.2 22.2~25.4	22.2 22.2~25.4
	b	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	c	Gas pipe	38.1	38.1	38.1	38.1	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05
	d	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	e	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	15.88	15.88	15.88

* Connect the pipes according to the above requirements of the outdoor unit.

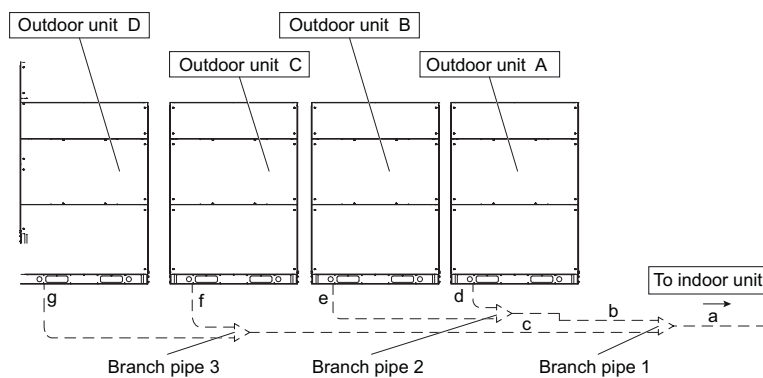
Refer to outdoor unit model that mentioned in above table, to select the branch pipe type and piping diameter.

6.4.4 JVOH740VAEMBQ~JVOH960VAEMBQ Piping Specifications (4-Module Combinations)

(Indoor unit on the left)



(Indoor unit on the right)



4-Module Combination Table

(Ømm)

Model		JVOH740 VAEMBQ	JVOH760 VAEMBQ	JVOH780 VAEMBQ	JVOH800 VAEMBQ	JVOH820 VAEMBQ	JVOH840 VAEMBQ
Combination Mode	The outdoor unit A	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH240 VPEMBQ
	The outdoor unit B	JVOH180 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ
	The outdoor unit C	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ
	The outdoor unit D	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH160 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ
Branch Pipe 1		JM-68SNQ					
Branch Pipe 2		JM-30SNQ					
Branch Pipe 3		JM-30SNQ					
Piping Size	a	Gas pipe	50.8	50.8	50.8	50.8	50.8
		Liquid pipe	22.2 22.2~25.4	22.2 22.2~25.4	22.2 22.2~25.4	22.2 22.2~25.4	22.2 22.2~25.4
	b	Gas pipe	38.1	38.1	38.1	38.1	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05
	c	Gas pipe	31.75	31.75	31.75	38.1	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05
	d	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	e	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	f	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	12.7	15.88	15.88
	g	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	12.7	12.7	12.7	15.88	15.88

(Ømm)

Model		JVOH860 VAEMBQ	JVOH880 VAEMBQ	JVOH900 VAEMBQ	JVOH920 VAEMBQ	JVOH940 VAEMBQ	JVOH960 VAEMBQ
Combination Mode	The outdoor unit A	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ
	The outdoor unit B	JVOH220 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ
	The outdoor unit C	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ	JVOH240 VPEMBQ
	The outdoor unit D	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH200 VPEMBQ	JVOH220 VPEMBQ	JVOH240 VPEMBQ
Branch Pipe 1		JM-68SNQ					
Branch Pipe 2		JM-30SNQ					
Branch Pipe 3		JM-30SNQ					
Piping Size	a	Gas pipe	50.8	50.8	50.8	50.8	50.8
		Liquid pipe	22.2 22.2~25.4	22.2 22.2~25.4	25.4 25.4~28.58	25.4 25.4~28.58	25.4 25.4~28.58
	b	Gas pipe	38.1	38.1	38.1	38.1	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05
	c	Gas pipe	38.1	38.1	38.1	38.1	38.1
		Liquid pipe	19.05	19.05	19.05	19.05	19.05
	d	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	e	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	f	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88
	g	Gas pipe	28.58	28.58	28.58	28.58	28.58
		Liquid pipe	15.88	15.88	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

Refer to the table above for the outdoor model to select the branch pipe type and pipe diameter.

6.4.5 Stop Valve

- (1) Ensure that the valve is completely closed.
- (2) Connect the fluorine hose to stop the valve check joint, and release the refrigerant gas in the gas-side stop valve pipe.
- (3) Cut off the thin (Ø6.35) at the end of stop valve cap to ensure no gas existed in the stop valve.
- (4) Remove the stop valve cap with welding at the welding position of the stop valve cap, ensure that the flame does not touch valve body during welding to prevent valve damage due to welding sparks.

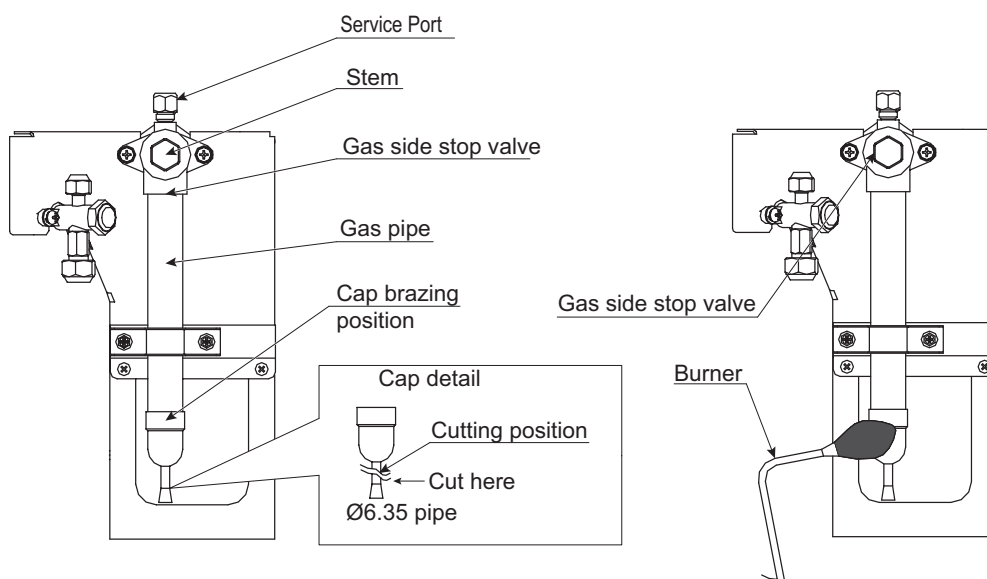
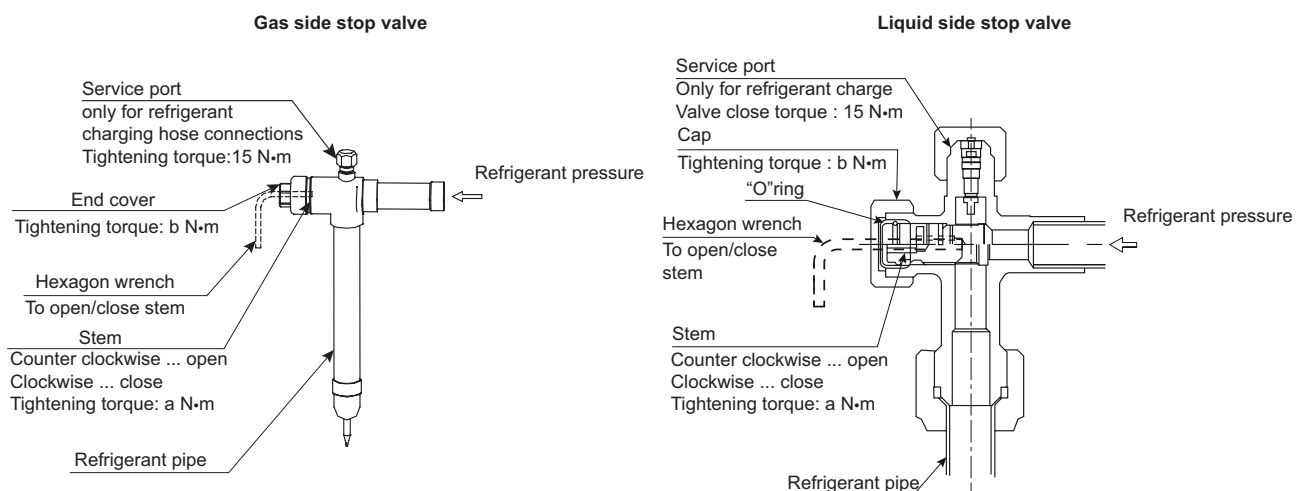


Figure 6.2 Gas Pipe Welding

! 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.
- Do not expose surrounding parts and the oil return pipe of the compressor to flames when torch is used. If the oil return piping is exposed to the fire, high temperature oil will spurt and cause a fire or injury.



Stop Valve Torque

Outdoor Unit Model	Liquid Side Stop Valve		Gas Side Stop Valve	
	Torque a (N ● m)	Torque b (N ● m)	Torque a (N ● m)	Torque b (N ● m)
JVOH080VPEMBQ	7~9	33~42	18~22	49~58
JVOH100VPEMBQ	7~9	33~42	18~22	49~58
JVOH120VPEMBQ	7~9	33~42	18~22	49~58
JVOH140VPEMBQ	7~9	33~42	25~31	49~58
JVOH160VPEMBQ	7~9	33~42	25~31	49~58
JVOH180VPEMBQ	7~9	33~42	25~31	49~58
JVOH200VPEMBQ	9~11	50~62	25~31	49~58
JVOH220VPEMBQ	9~11	50~62	25~31	49~58
JVOH240VPEMBQ	9~11	50~62	25~31	49~58

NOTICE

- After you fully open the stop valve, do not force the stem back again, otherwise it damages the stop valve.
- When you run the test, fully open the stem. If stem is not completely open, it may damage the unit.

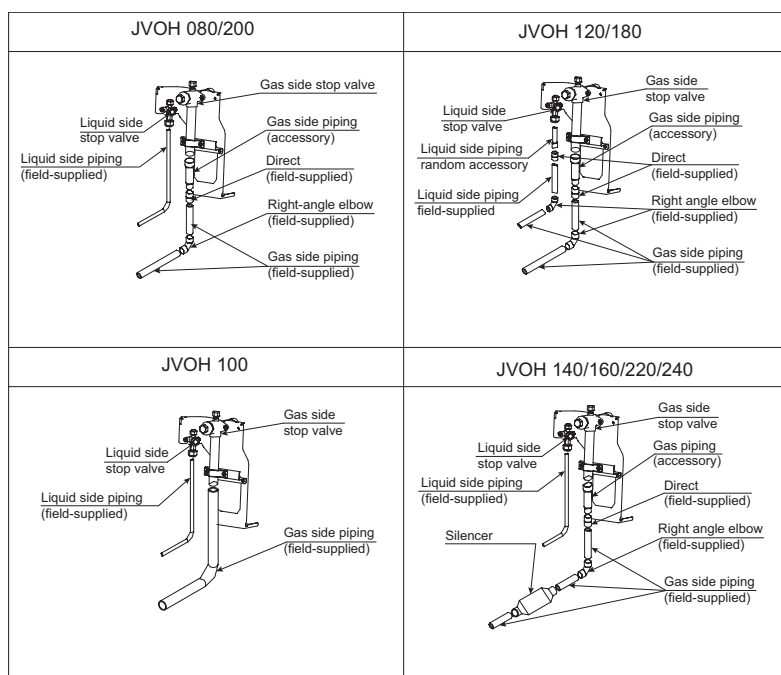
6.4.6 Piping Connection

- (1) Confirm that the stop valve is fully closed.
- (2) As shown in Figure 6.2, when you weld the gas side pipe, use a metal plate to protect the compressor and the sound insulation cover of the compressor. The welding sparks should not burn the valve body.
- (3) Connect the indoor unit and the outdoor unit with the refrigerant piping and make sure the refrigerant piping does not contact with the weak parts of the facility (wall, false ceiling, etc.). Otherwise, you can hear a noise due to the vibration of the pipe.
- (4) When tightening the flare nut, tighten it with the torque specified in Table 6.3. During the welding operation, the pipe interiors should be filled with nitrogen for protection.
- (5) Apply thermal insulation to the gas & liquid pipes when performing assembling work.
- (6) After connecting the pipes, install a pipe baffle on the unit. If not, snow, rain, and so on can damage the unit.

Table 6.3 Tightening the Flare Nut

Nominal outside diameter (according to EN 12735-1 and EN 12735-2)			Minimum wall Thickness (mm)	Tightening torque (N·m)
Metric series (mm)	Imperial series			
	(mm)	(in)		
6			0,8	14 -- 18
	6,35	1/4	0,80	14 -- 18
	7,94	5/16	0,80	33 -- 42
8			0,80	33 -- 42
	9,52	3/8	0,80	33 -- 42
10			0,80	33 -- 42
12			0,80	50 -- 62
	12,7	1/2	0,80	50 -- 62
15			0,80	63 -- 77
	15,88	5/8	0,95	63 -- 77
18			1,00	90 -- 110
	19,06	3/4	1,00	90 -- 110

• Pipe valve connection details.



NOTE:

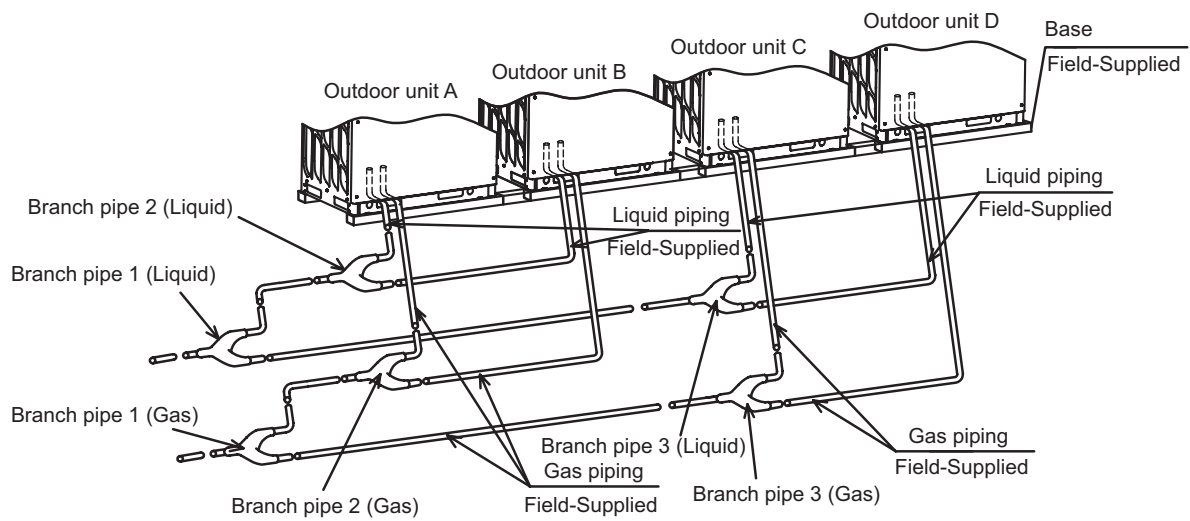
1. Ensure to remove the cap (1) of the high pressure gas stop valve.
2. Perform flare machining according to the sketch in section 6.2.

- Module combination branch pipe type:

Item	Model	Outdoor Combination		Branch Pipe Type	Remarks
		Outdoor Unit Capacity	Number of Outdoor Units		
Piping Connection Kit	JVOH260VAEMBQ ~JVOH960VAEMBQ	26HP~34HP	2	JM-30SNQ	
		36HP~48HP	2	JM-46SNQ	
		50HP~54HP	3	JM-46SNQ+JM-30SNQ	
		56HP~72HP	3	JM-68SNQ+JM-30SNQ	
		74HP~96HP	4	JM-68SNQ+JM-30SNQ +JM-30SNQ	

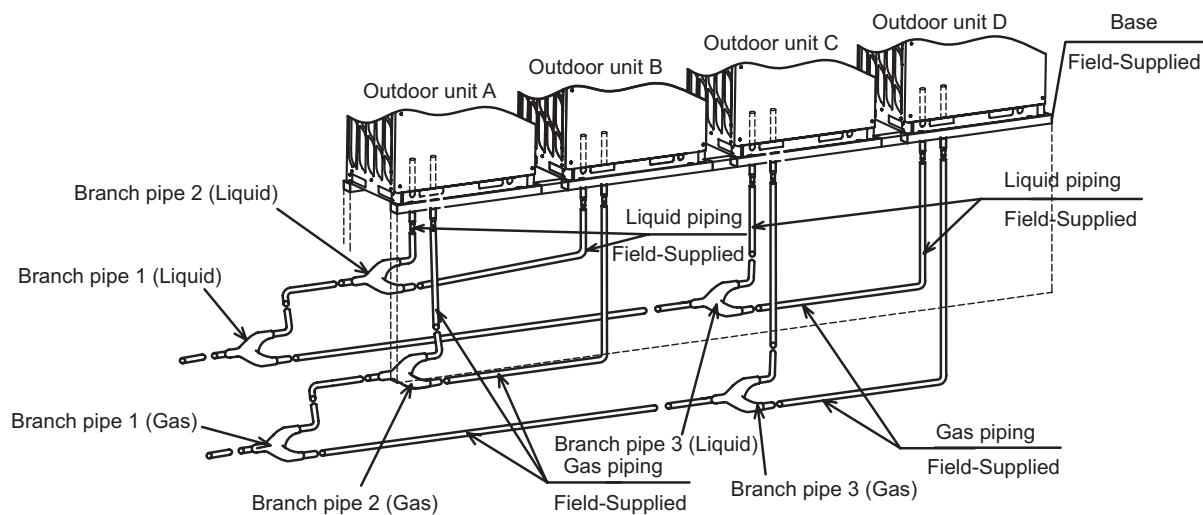
- The assembly of JVOH740VAEMBQ is illustrated below:

(For Piping from Front or Rear Side)



Note: Branch piping should be installed with the ground level (horizontal tilt angle ≤ 15 degrees)

(For Piping from Lower Side)



Note: Branch piping should be installed with the ground level (horizontal tilt angle ≤ 15 degrees)

● Branch pipe (Optional)

"Branch pipe"

The first branch pipe:

Max piping length<100m		Max piping length≥100m	
Outdoor Unit Capacity	Multi-kit Type	Outdoor Unit Capacity	Multi-kit Type
8~10HP	JE-102SN	8HP	JE-162SN
12~16HP	JE-162SN	10HP	JE-162SN
18~24HP	JE-242SN	12~14HP	JE-242SN
26~54HP	JE-302SN	16~24HP	JE-302SN
56~72HP	JE-462SN	26~54HP	JE-462SN
74~96HP	JE-682SN	56~96HP	JE-682SN

Piping Connection from the 1st Branch Pipe to the Indoor Unit

Downstream Indoor Unit Capacity (kW)	Gas Pipe (mm)	Liquid Pipe (mm)	Multi-kit Type
Q≤15.9	15.88	9.52	JE-102SN
16≤Q<25	19.05	9.52	
25≤Q<33.5	22.2	9.52	
33.5≤Q<45	25.4	12.7	JE-162SN
45≤Q<50	28.58	12.7	
50≤Q<72.9	28.58	15.88	JE-242SN
72.9≤Q<100.8	31.75	19.05	JE-302SN
100.8≤Q<156.8	38.1	19.05	
156.8≤Q<190.4	44.45	19.05	JE-462SN
190.4≤Q<207.2	44.45	22.2	
207.2≤Q<252	50.8	22.2	JE-682SN
252≤Q<274.4	50.8	25.4	
274.4≤Q<349.5	50.8	28.58	

Piping size (Φ mm)

① Outdoor unit piping diameter

Outdoor Unit Model	Gas Pipe	Liquid Pipe
8HP	19.05	9.52
10HP	22.2	9.52
12HP	25.4	12.7
14HP	25.4	12.7
16HP	28.58	12.7
18HP	28.58	15.88
20HP	28.58	15.88
22HP	28.58	15.88
24HP	28.58	15.88

② Piping size for the main pipeline

Main Pipe (branch pipe 1 to first branch pipe)

The first branch (②)

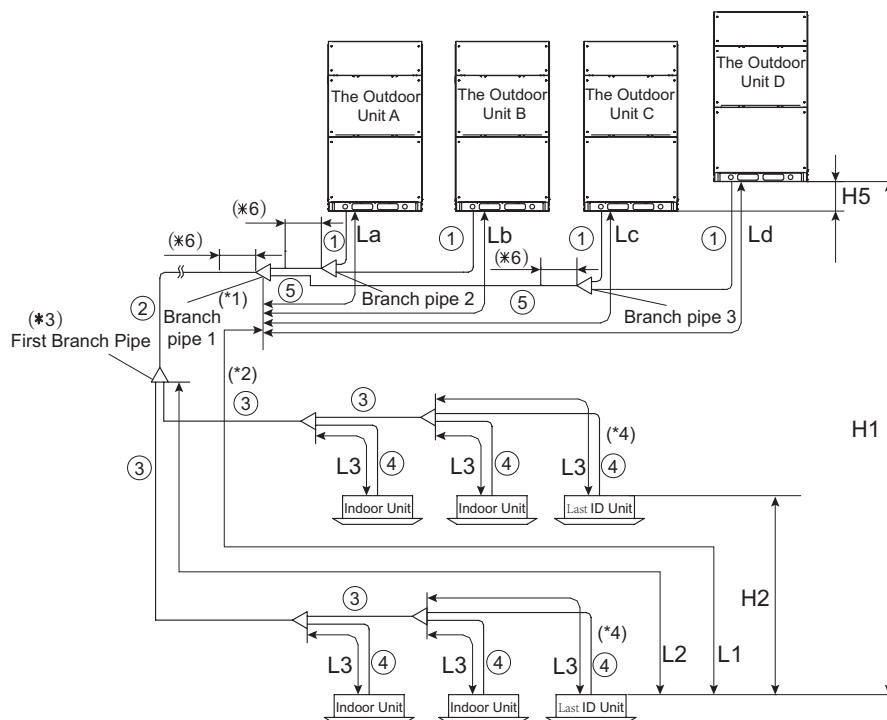
HP	Capacity (kW)	Main piping size			
		Gas Pipe (L1<100)	Liquid Pipe (L1<100)	Gas Pipe (L1≥100)	Liquid Pipe (L1≥100)
8	22.4	19.05	9.52	22.2	12.7
10	28.0	22.2	9.52	25.4	12.7
12	33.5	25.4	12.7	28.58	15.88
14	40.0	25.4	12.7	28.58	15.88
16	45.0	28.58	12.7	31.75	15.88
18	50.0	28.58	15.88	31.75	19.05
20	56.0	28.58	15.88	31.75	19.05
22	61.5	28.58	15.88	31.75	19.05
24	68.0	28.58	15.88	31.75	19.05
26	73.0	31.75	19.05	38.1	22.2
28	78.5	31.75	19.05	38.1	22.2
30	85.0	31.75	19.05	38.1	22.2
32	90.0	31.75	19.05	38.1	22.2
34	95.0	31.75	19.05	38.1	22.2
36	101.0	38.1	19.05	44.45	22.2
38	106.5	38.1	19.05	44.45	22.2
40	113.0	38.1	19.05	44.45	22.2
42	118.0	38.1	19.05	44.45	22.2
44	124.0	38.1	19.05	44.45	22.2
46	129.5	38.1	19.05	44.45	22.2
48	136.0	38.1	19.05	44.45	22.2
50	140.0	38.1	19.05	44.45	22.2
52	146.0	38.1	19.05	44.45	22.2
54	151.5	38.1	19.05	44.45	22.2
56	158.0	44.45	19.05	50.8	25.4
58	163.0	44.45	19.05	50.8	25.4
60	169.0	44.45	19.05	50.8	25.4
62	174.5	44.45	19.05	50.8	25.4
64	181.0	44.45	19.05	50.8	25.4
66	186.0	44.45	19.05	50.8	25.4
68	192.0	44.45	22.2	50.8	25.4
70	197.5	44.45	22.2	50.8	25.4
72	204.0	44.45	22.2	50.8	25.4
74	208.0	50.8	22.2	50.8	25.4
76	214.0	50.8	22.2	50.8	25.4
78	219.5	50.8	22.2	50.8	25.4
80	224.0	50.8	22.2	50.8	25.4
82	229.5	50.8	22.2	50.8	25.4
84	236.0	50.8	22.2	50.8	25.4
86	241.5	50.8	22.2	50.8	25.4
88	248.0	50.8	22.2	50.8	25.4
90	253.5	50.8	25.4	50.8	28.58
92	260.0	50.8	25.4	50.8	28.58
94	265.5	50.8	25.4	50.8	28.58
96	272.0	50.8	25.4	50.8	28.58

③ Diameter of the piping from the 1st branch pipe and indoor unit.(③)

Downstream Indoor Unit Capacity (kW)	Gas Pipe	Liquid Pipe
$Q \leq 15.9$	15.88	9.52
$16 \leq Q < 25$	19.05	9.52
$25 \leq Q < 33.5$	22.2	9.52
$33.5 \leq Q < 45$	25.4	12.7
$45 \leq Q < 50$	28.58	12.7
$50 \leq Q < 72.9$	28.58	15.88
$72.9 \leq Q < 100.8$	31.75	19.05
$100.8 \leq Q < 156.8$	38.1	19.05
$156.8 \leq Q < 190.4$	44.45	19.05
$190.4 \leq Q < 207.2$	44.45	22.2
$207.2 \leq Q < 252$	50.8	22.2
$252 \leq Q < 274.4$	50.8	25.4
$274.4 \leq Q < 349.5$	50.8	28.58

④ The piping diameter between the last branch pipe and the indoor unit (④)

Indoor Unit Type	Indoor Unit Model	Gas Pipe	Liquid Pipe
Compact Ducted Indoor Unit Medium ESP Ducted Indoor Unit High ESP Ducted Indoor Unit Floor Concealed Indoor Unit	18~45	12.7	6.35 ^{(*)5}
	50~56	15.88	6.35 ^{(*)5}
	63~160	15.88	9.52
Round-way Cassette Indoor Unit 2-way Cassette Indoor Unit High Wall Indoor Unit	22~63	12.7	6.35 ^{(*)5}
	71~160	15.88	9.52
Fresh Air Ducted Indoor Unit	65,108	15.88	9.52
	168	19.05	9.52
	210	22.2	9.52
	300,400	25.4	12.7
	500,600	28.58	15.88



- ⑤ Diameter of the pipe between the branch pipes of outdoor units. For example, diameter of piping between branch pipe 1, branch pipe 2 and branch pipe 3.

HP (Downstream outdoor unit capacity)	The Pipe Diameter Between Branch ①,② and ③	
16	28.58	12.7
18	28.58	15.88
20	28.58	15.88
22	28.58	15.88
24	28.58	15.88
26	31.75	19.05
28	31.75	19.05
30	31.75	19.05
32	31.75	19.05
34	31.75	19.05
36	38.1	19.05
38	38.1	19.05
40	38.1	19.05
42	38.1	19.05
44	38.1	19.05
46	38.1	19.05
48	38.1	19.05
50	38.1	19.05
52	38.1	19.05
54	38.1	19.05
56	44.45	19.05
58	44.45	19.05
60	44.45	19.05
62	44.45	19.05
64	44.45	19.05
66	44.45	19.05
68	44.45	22.2
70	44.45	22.2
72	44.45	22.2

● Piping construction conditions:

Project		Mark	Allowed Piping Length ^(*) 7)	
			≤ Number of Recommended Indoor Units	> Number Of Recommended Indoor Units
Total Piping Length		Total Length of Liquid Pipe	≤ 1,000m ^(*) 8)	≤ 300m
Maximum piping length	Actual length	L1	≤ 165m	≤ 165m
	Equivalent length		≤ 190m	≤ 190m
The longest piping length between the first branch to each indoor unit		L2	≤ 90m	≤ 40m
The longest piping length between the branch to the connected indoor unit		L3	≤ 40m	≤ 30m
Piping length between the branch 1 to each outdoor unit		La, Lb, Lc, Ld	≤ 10m	≤ 10m
The height difference between the outdoor units	Outdoor unit up	H1	≤ 50m ^(*) 9)	≤ 50m ^(*) 9)
	Outdoor unit down		≤ 40m	≤ 40m
The height difference between the indoor units		H2	≤ 30m	≤ 30m
The height difference between the outdoor units		H5	≤ 0.1m	≤ 0.1m

(*1) The branch pipe 1 is a branch pipe near the outdoor unit side.

(*2) If piping length between single outdoor unit or branch pipe 1 and indoor unit is longer than 100m, the gas & liquid pipe of the main piping (from branch pipe 1 to the first branch pipe) must be enlarged by one gauge.

(*3) When the size of the piping after the first branch pipe is larger than the diameter of the main piping, enlarge the main pipe diameter to the size of the pipe after the first branch pipe. If piping size after the branch pipe is larger than the piping size of the pipe before the branch pipe, adjust it to the same size as the size of the pipe after the branch pipe.

(*4) The pipe diameter ④ is same as the piping diameter of indoor units.

(*5) When the length of the liquid pipe is longer than 15m, use Ø9.52 pipe and reducer.

(*6) Please keep the linear distance of 500mm or more from the branch pipe of outdoor unit.

(*7) The installation conditions of the refrigerant pipe are different depending on the number of connected indoor units.

(*8) Limited by the maximum refrigerant charge volume, the permissible pipe total length may be less than 1000m.

(*9) When the height difference between indoor and outdoor units is greater than 50m (8-54Hp: up to 110m, 56-96Hp: up to 90m), contact your local dealer or distributor.

NOTE:

1. To ensure that the length of same section of the refrigerant pipe, gas pipe, and liquid pipe are same.
2. If the length of branch pipe to the indoor unit (L3) is significantly longer than the one to other indoor unit,
3. the refrigerant flow will be impacted and performance deteriorates compared to other systems. Recommended length of pipe is less than 15m.
4. For the combination of two or three modules, outdoor unit A should be connected after branch pipe 1. For the case of 4-module combination, connect the outdoor units A and B after the branch pipe 2, and then connect outdoor units C and D to the branch pipe 3.
5. Length of piping between outdoor units is : $La \leq Lb \leq Lc \leq Ld \leq 10m$.

- Limitation of piping branch

If the length of the pipe from the first branch pipe to the farthest indoor unit is more than 40m, follow the following conditions during installation:

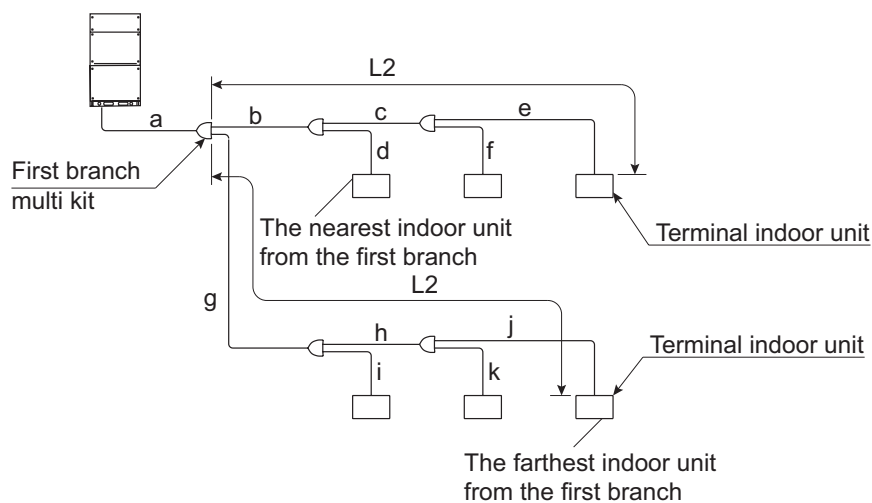
Example 1:

In case of that the piping length L2 from 1st branch pipe to the farthest indoor unit exceeds 40m, perform the construction following the conditions as below:

- (1) When the piping distance L2 exceeds 40m, the b, c or g, h and the piping diameters of the gas and liquid side are all required to be enlarged by one gauge through the adapter. If you increase the diameter and a diameter is less than b and g, then increase a diameter to be as the same as b and g.
- (2) Piping length difference between piping from farthest indoor unit to the first branch and piping from nearest indoor unit to the first branch pipe should not be less than 40m.

$$(g + h + j) - (b + d) \leq 40m.$$

The length of the piping from the end of first branch pipe to the end indoor unit is more than 40 meters and less than 90m

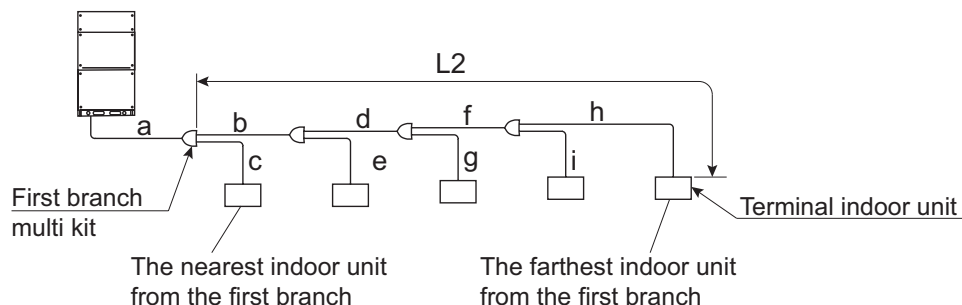


Example 2:

From the first branch of the main sub-manifold to the end indoor unit piping length of more than 40m and less than 90m:

- (1) When the piping distance L2 exceeds 40m, the pipe diameter of the b, d, f gas and the liquid side is enlarged by one gauge through adaptor. By increasing the diameter, if a diameter is less than b, then increase a to match with b.

The piping length between the first level branch pipe to the end indoor unit exceed 40m and less than 90m



7. Electrical Wiring



WARNING

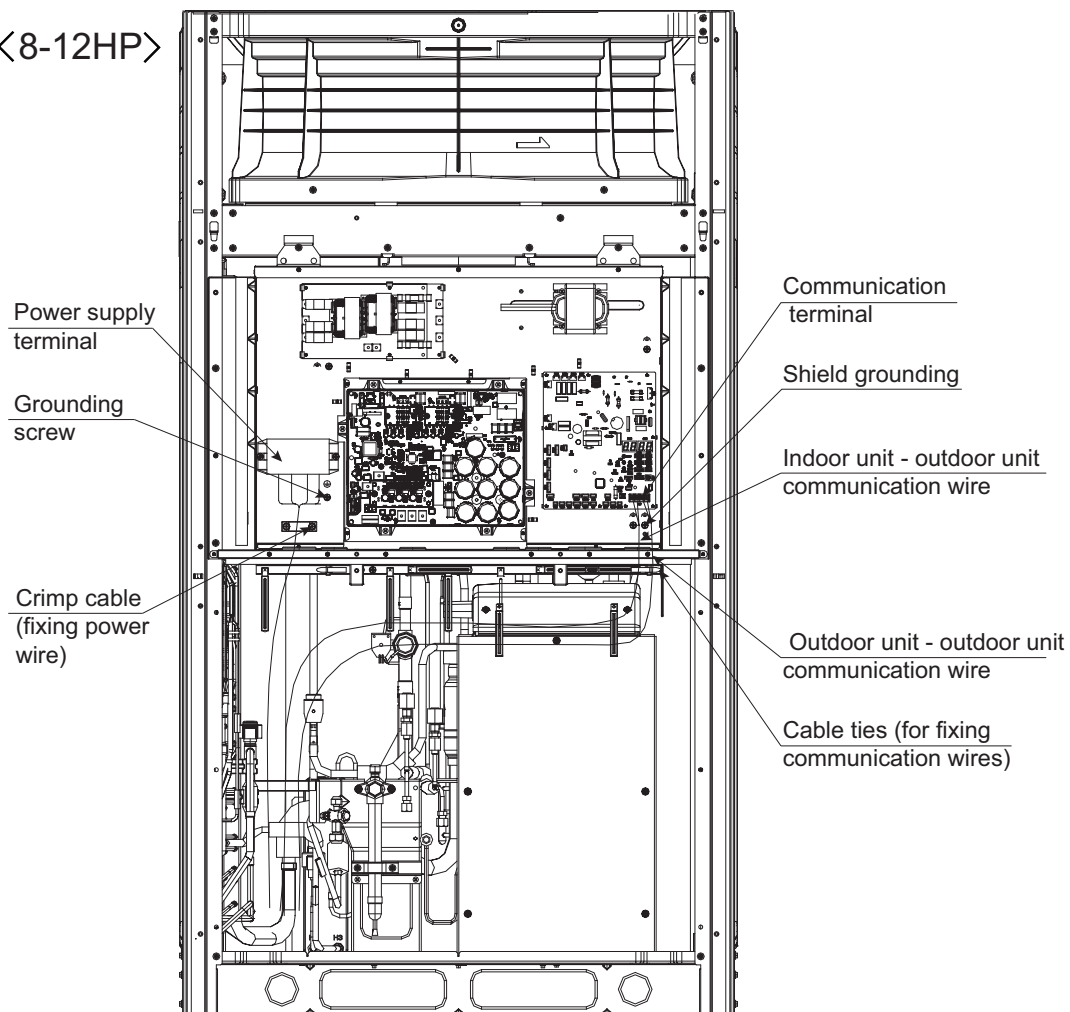
- Before performing wiring connection or regular check, turn off the main power supply of the indoor and outdoor units. Wait for at least ten minutes after shutting off the power supply.
- Before performing wiring connection or regular inspection, ensure that the indoor and outdoor fan is stopped.
- Protect wires, electrical components and so on in order to prevent mice or other small animals from destroying them. If not protected, the mouse may bite the unprotected components, which may cause fire.
- Avoid the wiring from touching the refrigerant pipes, sheet metal edges, and the electrical components inside the unit. This can damage the wires and can also cause fire.
- Use a medium-speed induction ELB (earth leakage circuit breaker, action time 0.1 second or less). If not, it will cause electric shocks or fire.
- Fix the wires firmly, this may lead to fire incidents if the terminals is forced by outside.
- Do not use the air conditioner power supply terminal block to connect the power cord. Use the power distribution box inside the unit to extend the power supply wiring. Take care of the wiring capacity calculation. It may easily lead to fire, if the wiring capacity is too small.
- Fasten the 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

7.1 General Check

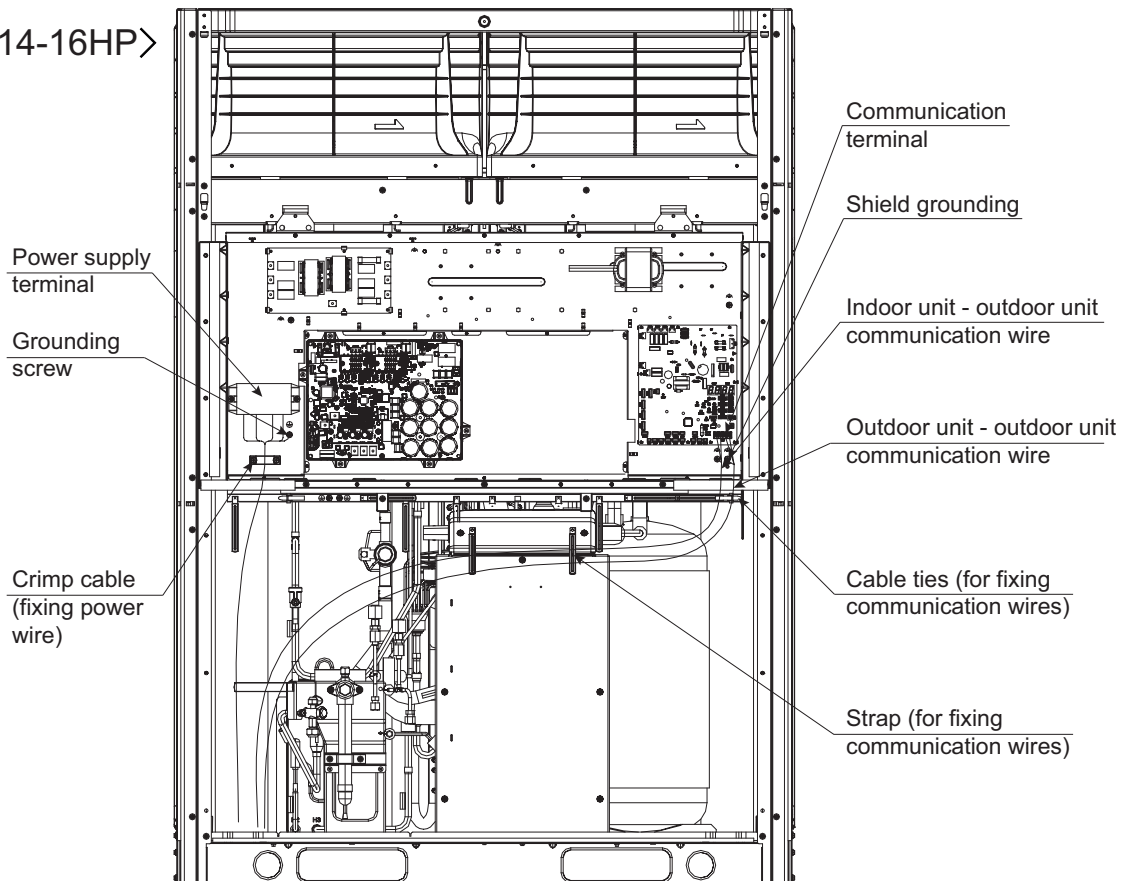
- (1) Ensure that the electrical components (main power, circuit breakers, wires, electrical conduit connections and terminals) used in the installation site are selected as per the requirements specified in technical manual. The specifications are compliant with national electrical code.
 - Power on each outdoor unit. Each outdoor unit should use earth leakage circuit breakers, circuit breakers and main switches. Otherwise, may cause a fire or electric shock.
 - Indoor unit and outdoor unit should be powered separately.

For each indoor unit (connected to the same outdoor unit) connect a power wire.
- (2) Check that the power supply voltage is within $\pm 10\%$ of the rated voltage. If the power supply voltage is too low, the system fails to start due to voltage drop.
- (3) Check the wire specifications.
- (4) The air conditioner may not work due to the following reasons in some scenarios:
 - Air conditioner and some high power consuming equipment are powered by the same transformer*.
 - The equipment* and air conditioner lines are too close to each other.
 - *(For example) elevators, container cranes, electric rectifiers, inverters, electric arc furnaces,
 - electric furnaces and large induction motor and a large switch. In the cases mentioned above,
 - due to the rapid changes in power consumption and switching devices, air conditioning power induction surge occurs. Therefore, to protect the air conditioner's power wires, electric pre-job inspection must be performed at the installation site specifications and standards.
- (5) Check that the grounding wire is connected for both, outdoor and indoor unit.

<8-12HP>



<14-16HP>



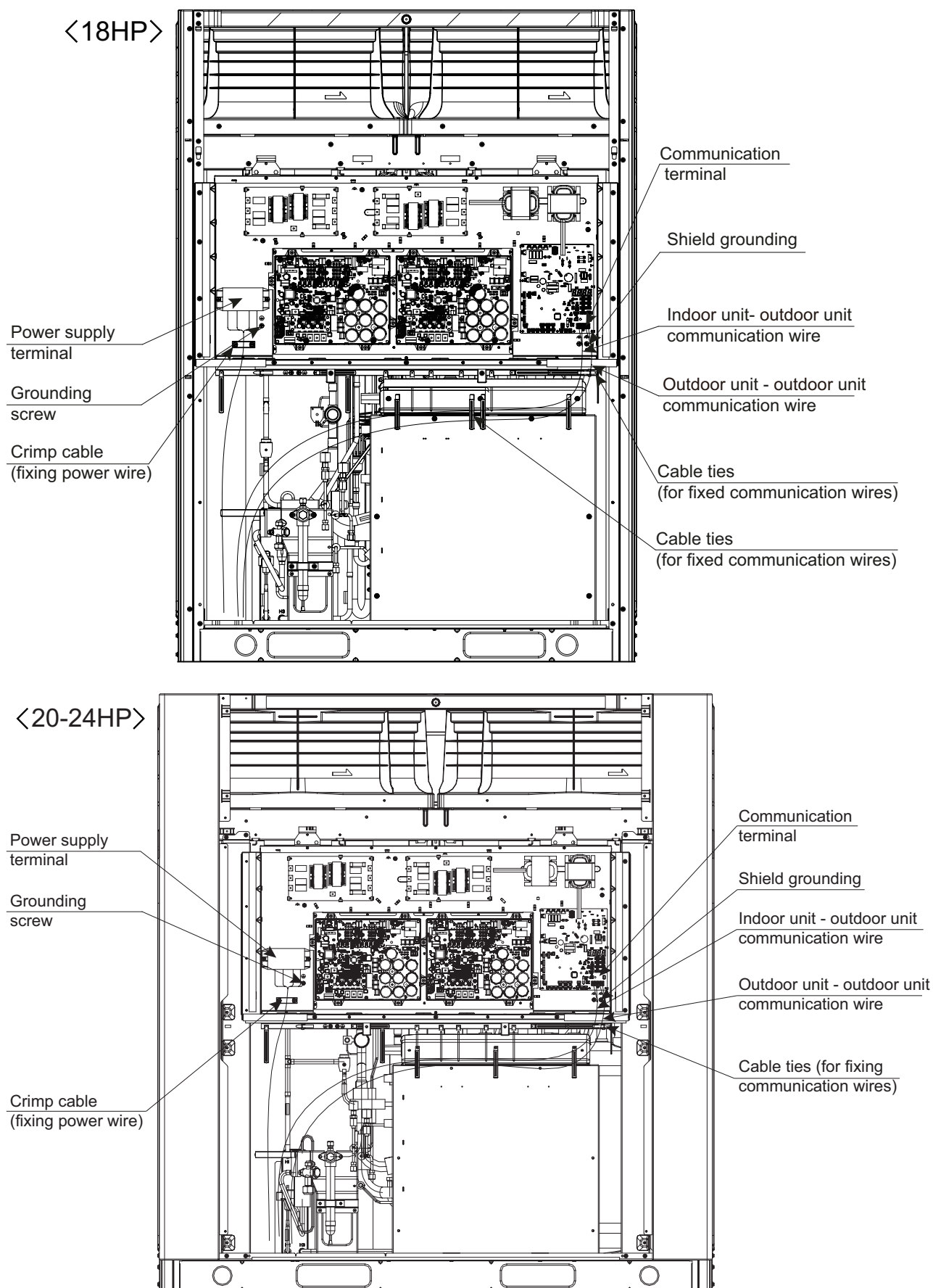


Figure 7.1 Wire connection

7.2 Wiring

⚠ WARNING

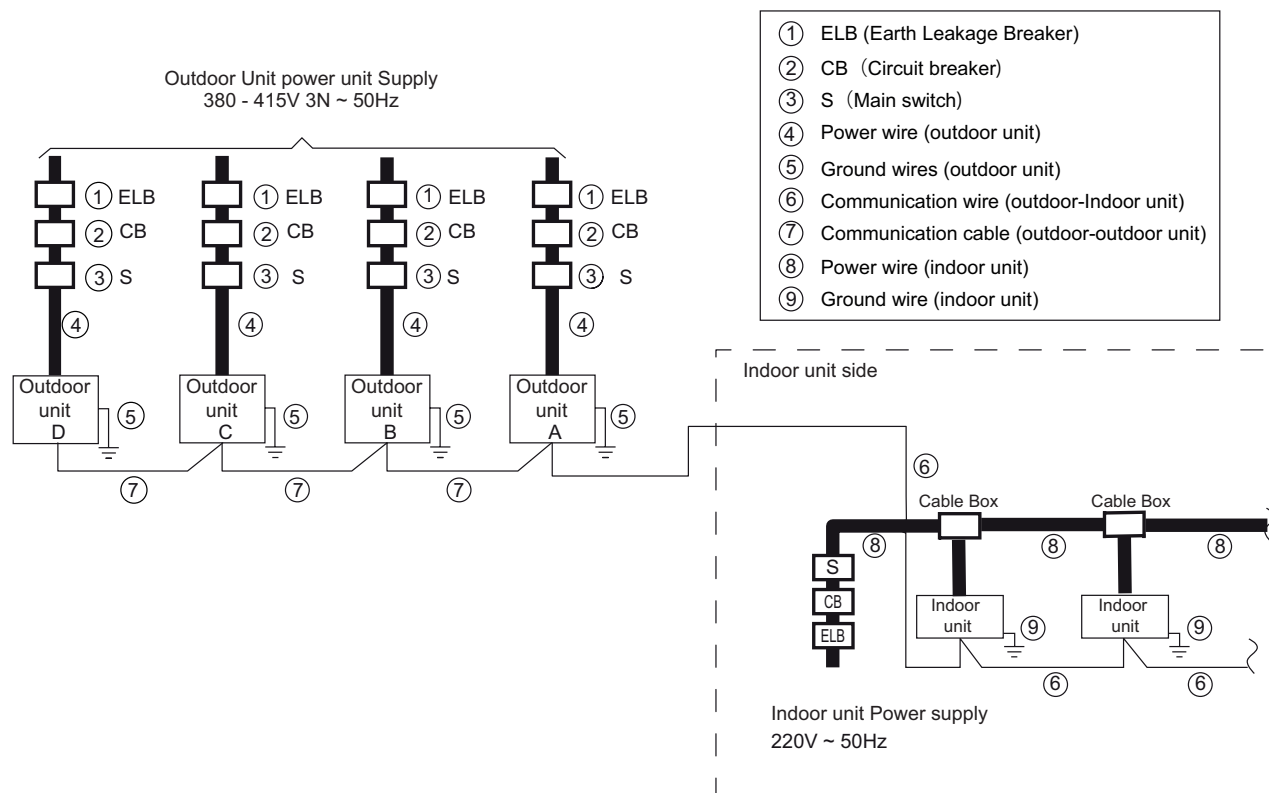
It is a must to connect ELB (Earth Leakage Breaker), CB (Circuit Breaker) and S (Main Switch) to each outdoor unit's power supply. Otherwise, it may cause electric shock or fire.

Remark:

Connect power wires to indoor unit and outdoor unit separately.

(1) Power wire

Separate power wires for each outdoor unit as per the following method (Don't connect power wire from other module):



(2) Recommended wire, ELB, and switching capacity is shown in Table 7.1

Table 7.1 Electrical Parameters And Recommendations Wires, ELB (Earth Leakage Breaker), capacity per outdoor unit

Model	Power Supply	Maximum Operating Current	Power Wire④	Communication Wire⑥⑦	ELB①		Circuit Breaker②	Ground Wire⑤
					Rated Current	Current Sensitivity		
		(A)	(mm ²)	(mm ²)	(A)	(mA)	(A)	(mm ²)
JVOH080VPEMBQ	380 - 415V 3N ~ 50Hz	17.0	6	0.75	25	30	25	6
JVOH100VPEMBQ		23.0	6	0.75	32	30	32	6
JVOH120VPEMBQ		27.0	6	0.75	32	30	32	6
JVOH140VPEMBQ		31.5	10	0.75	40	30	40	10
JVOH160VPEMBQ		35.5	10	0.75	50	30	50	10
JVOH180VPEMBQ		43.5	16	0.75	50	30	50	16
JVOH200VPEMBQ		45.0	16	0.75	63	30	63	16
JVOH220VPEMBQ		52.0	16	0.75	63	30	63	16
JVOH240VPEMBQ		61.5	25	0.75	80	30	80	16

Note:

- (1) Ensure that field wiring is as per provisions of local laws and regulations, and that a qualified or certified personnel performs all the wiring operations is must.
- (2) Refer power cable dimensions specified in the above table must be according to relevant standards.
- (3) If power wire is connected using a distribution box, sum up the current value and select the wires as per the below table specifications.
- (4) Power wire specification should not be less than GB5013.1 requirements for #57 gauge neoprene sheathed wire. Also, the power wire must use copper wire.
- (5) The wiring specification of weak electricity communication circuit is not lower than RVV (S) P shielded wire or equivalent, the shield layer need to be grounded.
- (6) The switch, that ensure all poles can disconnect, should be installed between the power supply and the air conditioner, the switch contact spacing should be not less than 3 mm.
- (7) If the power wire is damaged, must contact the professional of dealer or the designated service for repairing and exchanging.
- (8) When installing the power wire, the ground wire should be longer than the current-carrying wire.

Table 7.2 Power Wire Selection Principle

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



To install multi-stage master switch between each phase, its phase distance is 3.5mm or more.

Note:

- (1) When the power supply wire is too longer, select the minimum wiring size whose voltage drop is within 2%.
- (2) The supply voltage must meet the following conditions:

Power supply voltage	Voltage fluctuations within $\pm 10\%$
Starting voltage	Voltage fluctuations within -15%
Operating voltage	Voltage fluctuations within $\pm 10\%$
Inter-phase imbalance rate	Less than 3%

- (3) Do not connect the ground wire to the gas pipe, water pipes and lightning rods.

Gas pipe: happens when a gas leak explosion and fire.

Water pipe: when you use hard vinyl tubes ground is not valid.

Lightning rod: When the lightning rod is used, the earth potential increases abnormally.

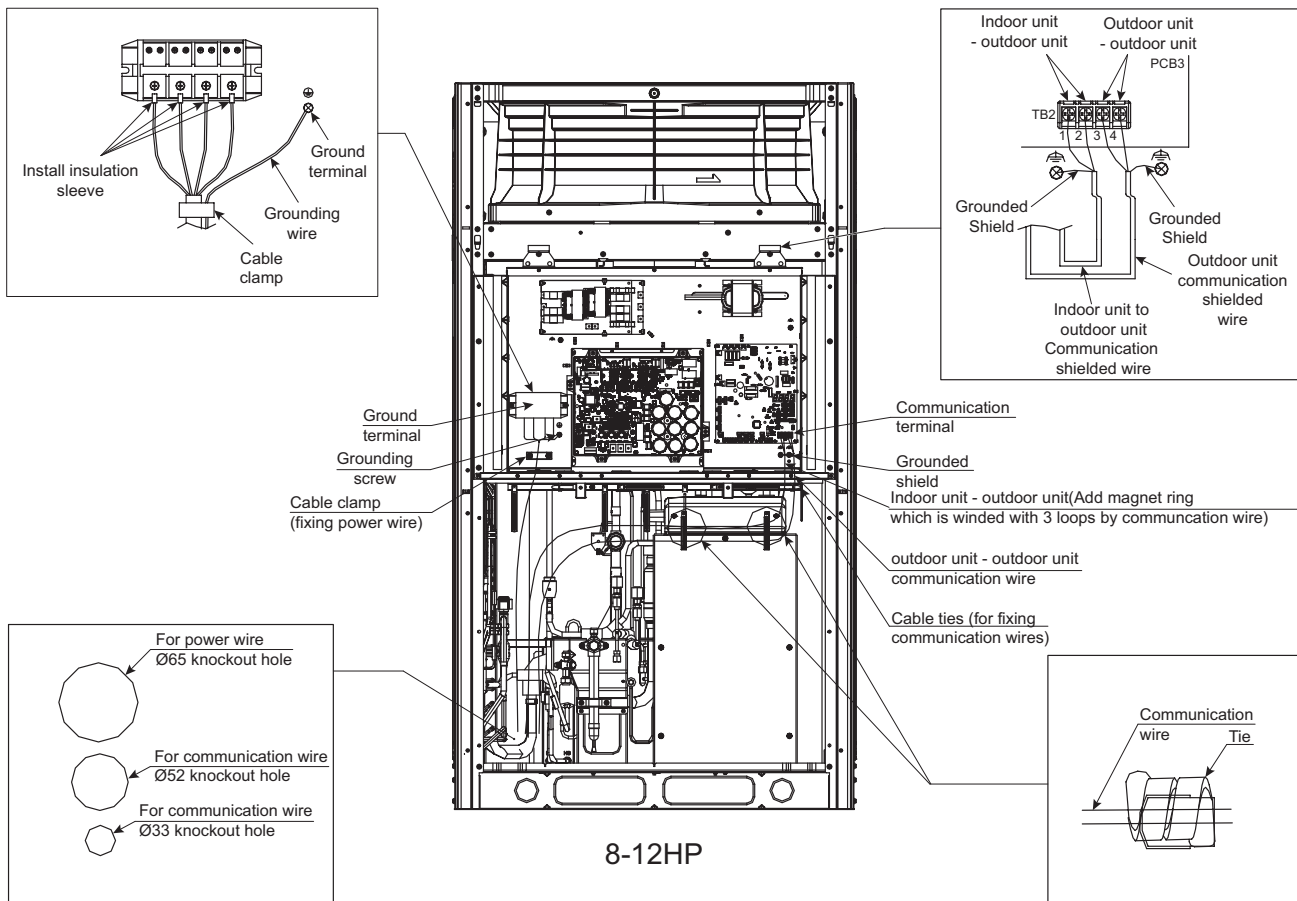
7.3 Outdoor Unit Wiring

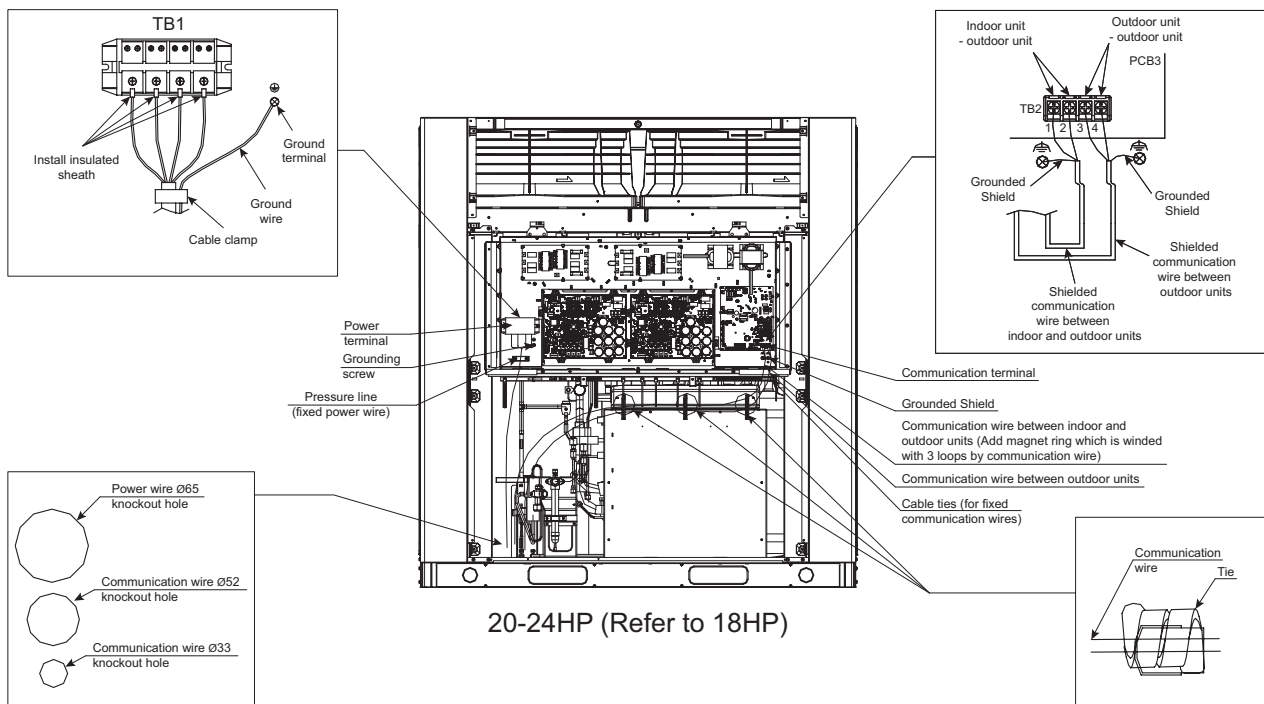
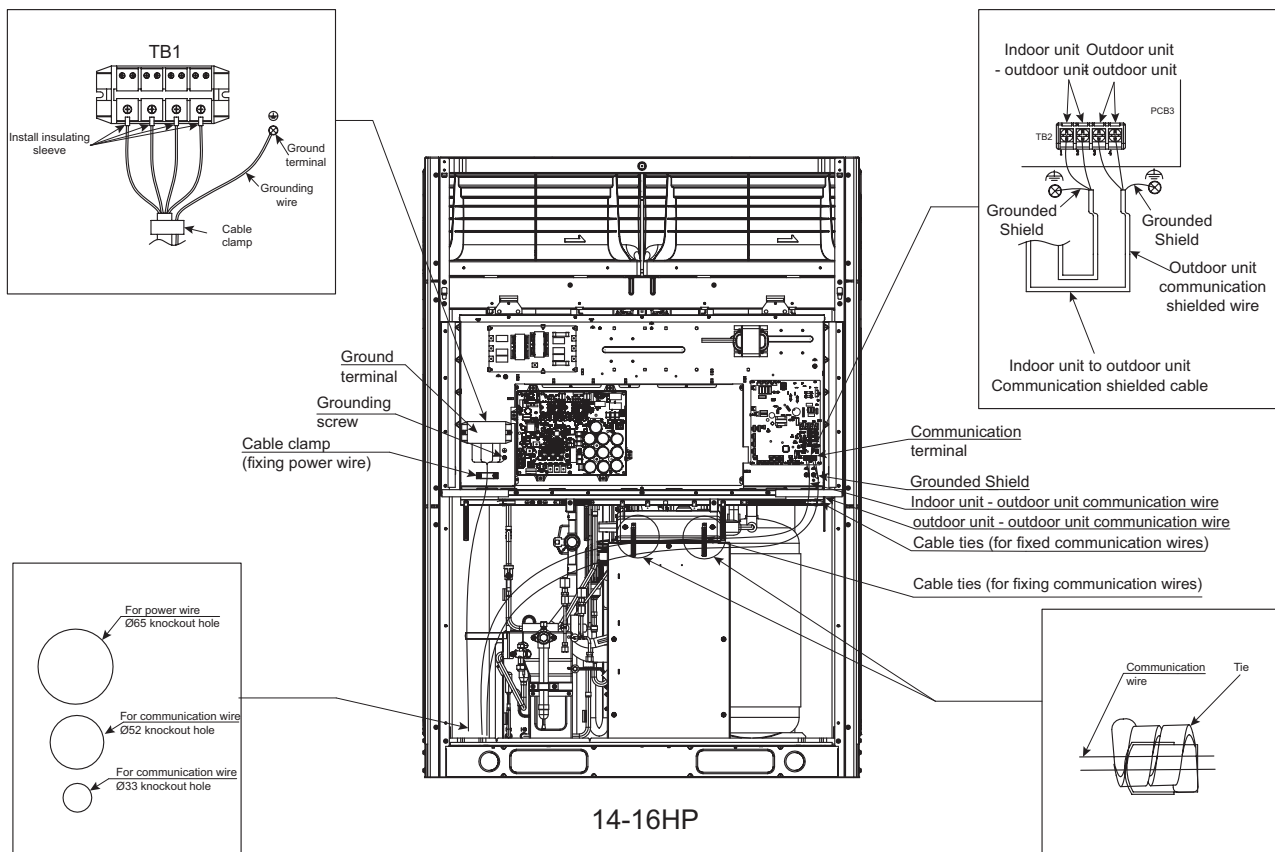
Perform the wiring connection as per the following:

- (1) Connect three-phase electric power wire to the terminal L1, L2, L3, and N (380V) of the block and connect the ground wire to the ground terminal in the electrical box.
- (2) Connect the communication cable between the indoor and the outdoor unit to terminals 1 and 2 of the terminal block TB2 on the PCB3. The communication wires between the outdoor units of the same refrigerant system are connected to terminals 3 and 4 of the terminal block TB2 on the PCB3.
- (3) Fasten the screws on the terminal block according to the following table:

Required Tightening Torque

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



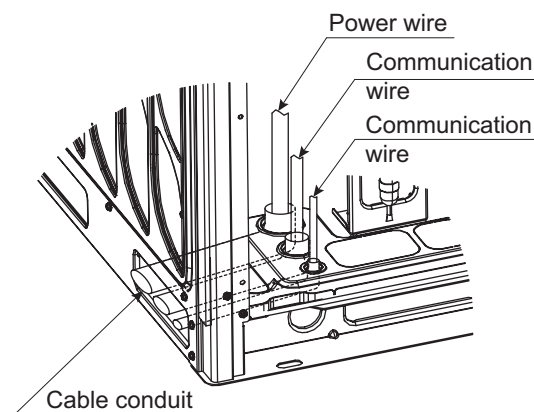


NOTICE

When running the cable at rear side of the unit, follow the procedure carefully to route the cable through the bottom of the unit using the conduit.

NOTE:

1. Do not put the power and communication cables in the same cable conduit. In addition, keep a distance of at least 5 cm between the power wires and communication wires.
2. Put the cable through the rubber rings and fix it to the entrance hole to protect the cable.
3. Avoid the wires to touch the pipes, metal sheet edges, and electrical components inside the unit.
4. Use sealing material to completely seal cable conduit to prevent rain water entering cable conduit.

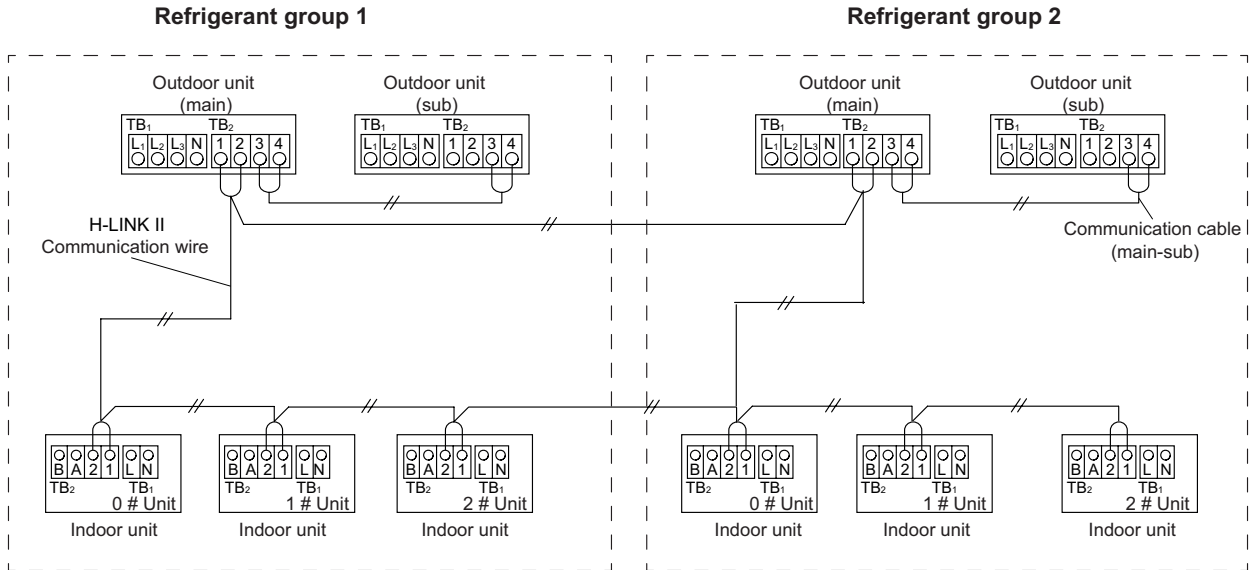
**CAUTION**

Tighten the power wire with a clamp in the unit.

7.4 Electrical Wiring for Indoor and Outdoor Unit

- (1) Connect the power cable to each of the outdoor unit. Each of the outdoor unit connection should consist of a ELB (Earth Leakage Breaker), circuit breaker, and the main switch (S).
- (2) Connect the power wire to each group of the indoor units. Indoor units refer to all the indoor units connected to the same outdoor unit. Each group of indoor units is connected with a earth leakage breaker, circuit breaker and the main switch (S).
- (3) As shown in Figure 7.2, connect the communication cable between indoor and outdoor unit.
- (4) Connect the communication wire between the units in the same refrigerant system (connect the communication cable to the same indoor unit in the case where the refrigerant pipe of the indoor unit is connected to the outdoor unit). If you connect the refrigerant pipe and communication wires to different refrigerant circulation system, malfunction may be caused.
- (5) Use 2-core cable communication wire such as shielded twisted pair. (Do not use 3-core or 3 more core wire).
- (6) Use the same specifications provided in the H-LINK system of the same refrigerant system.
- (7) Separate the communication wire from the power cable. Maintain at least 5cm spacing between the communication wire and the power wire. Maintain at least 1.5m spacing between the communication wire and other electrical devices. If not, place the power wire in a metal conduit to isolate it from other wires.
- (8) Connect the following communication wires to terminals 1 and 2 of the terminal block TB2 of the outdoor unit A (main unit):
 - Between the outdoor unit and indoor unit
 - Between outdoor unit and indoor unit of other refrigerant system
- (9) Do not connect the power wire to the communication terminal block TB2. This may damage the printed circuit board.
- (10) Connect GRD wire to the outdoor/indoor unit. GRD wire with grounding resistance of 100Ω (Max) should be connected by qualified personnel.
- (11) Communication wires between the outdoor units within the same refrigerant system will be connected to the terminal 3 and 4 of the terminal block TB2.

● Communication wire



Remarks:

1. For modular combination units (26 HP ~ 96 HP), set the master-slave through DSW.
2. An alarm will appear if the communication wires between the outdoor units are connected to the terminal 1 and 2 of H-LINK II.
3. If there is an alarm on the LCD of the master outdoor unit, please go through spot check according to 7-segment code indication of the master outdoor unit.
4. Set the function for master outdoor unit.
5. Connectable a maximum of refrigerant groups with one central controller is 64 .

For H- Link II Maximum number of indoor unit connectable is 160.

6. Wire specifications

- * Transmission Wire: 2-Wire
- * Polarity of Transmission Wire: Non-Polar Wire
- * Maximum Wiring Length: Total 1,000m
- * Recommended Cable: Twist-Pair Cable with Shield, over 0.75mm²
- * Voltage: DC5V

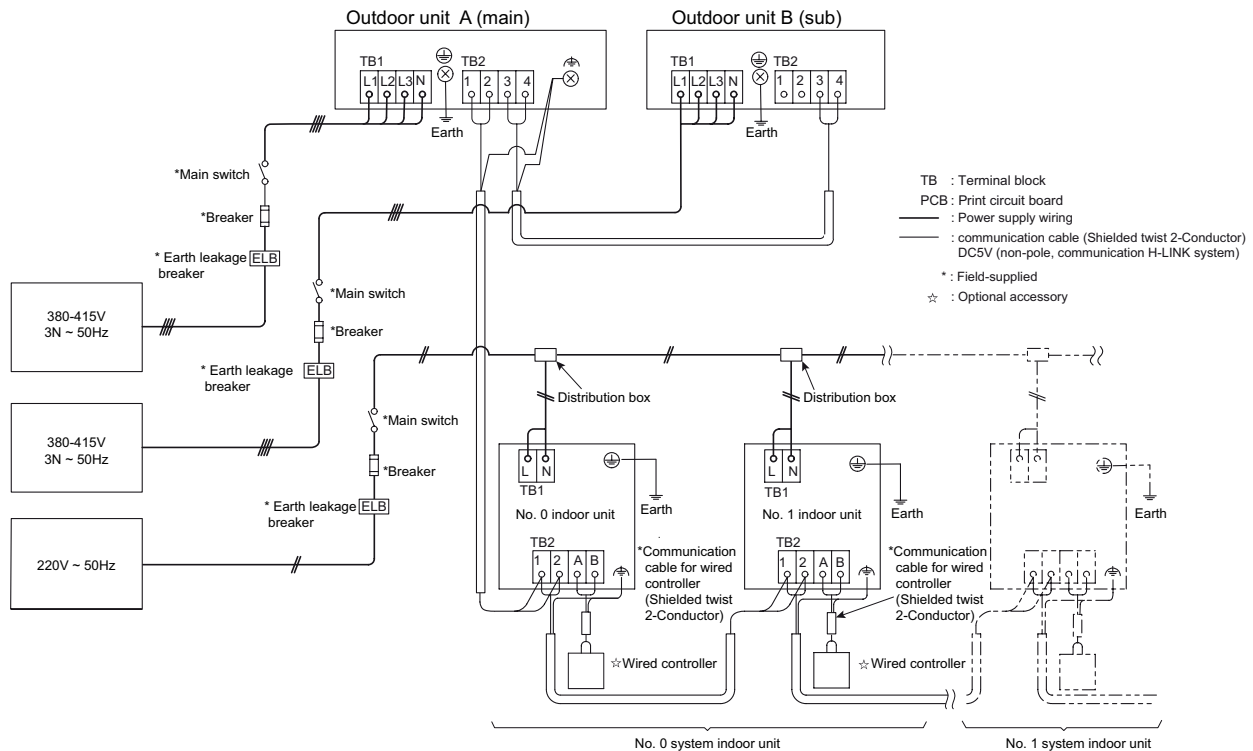


Figure 7.2 Electrical Wiring Instructions

7.5 Outdoor DIP Switch Setting

Turn off the electrical power supply to all units before setting the DIP switches. Otherwise DIP switch fails to work and the setting becomes invalid.

But the dip switch DSW4-No. 1, 2, 4 is valid when the power is turned ON under the status of power ON setting.

- Symbol indicates dip switch position. Refer to Figure 7.3 for setting dip switch settings and positions.

NOTICE

- 10-20 seconds after DIP setting on DSW4, the unit will be start or stop.
- Outdoor unit is numbered to distinguish it from other outdoor unit for repair and maintenance.

Ensure to write a number in the box on the right.

DIP switch layout		Button switch	
DSW1 RSW1 (Refrigerant system setting)		DSW2 (Capacity setting)	
DSW1 Tens digit RSW1 RSW1(Refrigerant system single digit setting) Setting before shipment		JVOH080VPEMBQ JVOH100VPEMBQ JVOH120VPEMBQ JVOH140VPEMBQ JVOH160VPEMBQ JVOH180VPEMBQ JVOH200VPEMBQ JVOH220VPEMBQ JVOH240VPEMBQ	
DSW4 (Test run / service setting)		DSW3 (other function settings)	
Setting before shipment Cooling test run Heating test run Reverse phase overcurrent detection release Compressor forced stop		Setting before shipment	
DSW5 (Emergency operation setting)		DSW6 (Outdoor unit No. setting)	
Setting before shipment INVExcept for compressor 1 INVExcept for compressor 2		Setting before shipment Main No. 1 sub No. 2 sub No. 3 sub	
DSW7 (Voltage setting)		DSW10 (For transmission)	
Setting before shipment 380 Voltage 400 Voltage (Setting before shipment) 415 Voltage		Setting before shipment The terminal resistance is not set	

Figure 7.3 DIP Setting

- Communications settings:

Set the outdoor unit number, the refrigerant system number, and the terminal resistance for the H-LINK or H-LINK II system.

- Outdoor number setting:

When you combine base model module, set the DSW6 as shown below:


DSW6		(Outdoor unit No. setting)																	
Setting before shipment				Main				No. 1 sub				No. 2 sub				No. 3 sub			
<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2 3 4</div>				<div>ON</div> <div> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2 3 4</div>				<div>ON</div> <div> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2 3 4</div>				<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> </div> <div>1 2 3 4</div>				<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> </div> <div>1 2 3 4</div>			

- Refrigerant system setting:

Set the refrigerant system no. for the outdoor unit within the same refrigerant system, as shown in the figure:

Note:

Within the same refrigerant system, refrigerant no. for the outdoor unit and indoor unit should be set to the same.

DSW1		(Refrigerant system ten digit setting)									
Setting before shipment		<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2 3 4 5 6</div>									
RSW1											
RSW (Refrigerant system single digit setting)											
Setting before shipment											

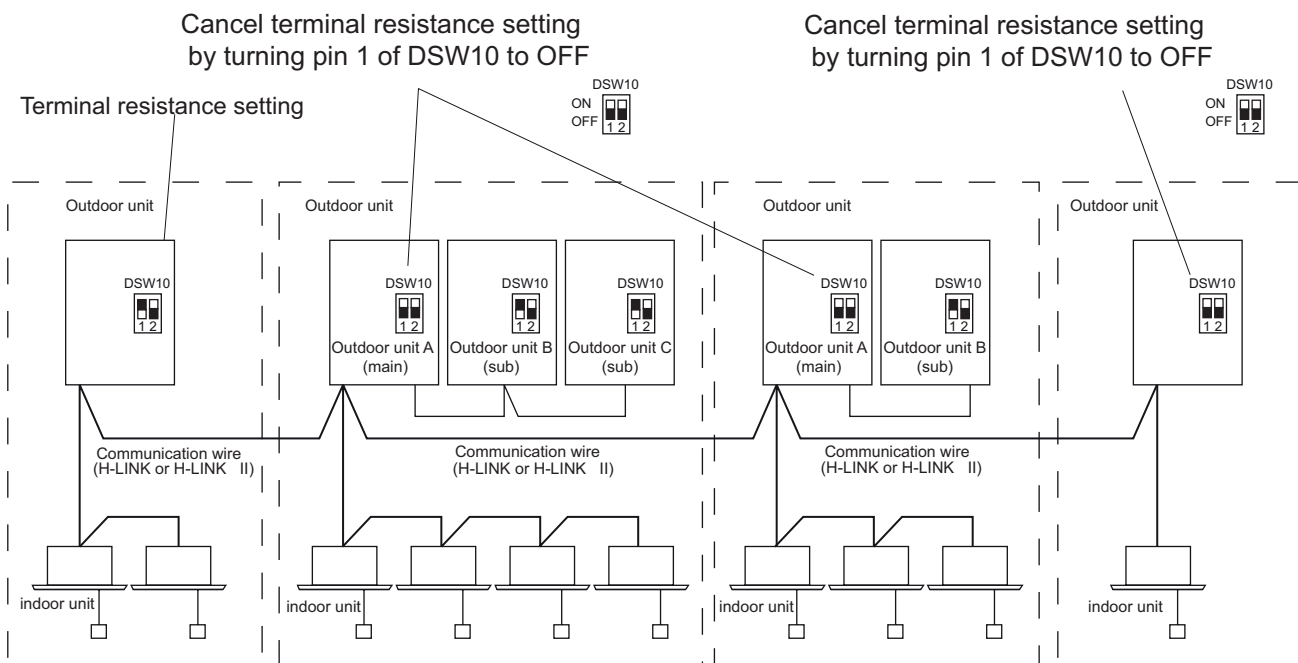
DSW1 and RSW1 factory set to the 0.

The maximum number of refrigerant system is set to 63.

- Terminal resistance setting:

At the factory, position 1 of the DSW10 is set to ON. If the number of outdoor units in the same H-LINK or H-LINK II system is 2 or more, the position 1 of the DSW10 is set to OFF from the outdoor unit of the second refrigerant system. In this case, no need for setting if only one outdoor unit is used.

Terminal Resistance Setting			
DSW10			
Factory setting		When do not use terminal resistance	
<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2</div>	<div>OFF</div> <div> <input checked="" type="checkbox"/> <input type="checkbox"/> </div>	<div>ON</div> <div> <input type="checkbox"/> <input type="checkbox"/> </div> <div>1 2</div>	<div>OFF</div> <div> <input checked="" type="checkbox"/> <input type="checkbox"/> </div>



● Function Setting

1. External Input/Output and Function Setting

(1) External Input/Output and Function Setting Method:

1) Setting start

When unit is stopped, set DSW4-No.4 to ON and set DSW4-No.6 to ON

2) Setting end

Set DSW4-No.6 to OFF and Set DSW4-No.4 to OFF

(2) External Input/Output and Function Setting:

Press PSW3 (▶) and PSW5 (◀) to select function. No. PSW4 (▼): forward

PSW2 (▲): backward

Item	SEG2	SEG1	Set
1 Input setting 1 CN17 [1-2pin]	11	1	<input type="text"/>
2 Input setting 2 CN17 [2-3pin]	12	2	<input type="text"/>
3 Input setting 3 CN18 [1-2pin]	13	3	<input type="text"/>
4 Output setting 1 CN16 [1-2pin]	01	1	<input type="text"/>
5 Output setting 2 CN16 [1-3pin]	02	2	<input type="text"/>

Setting External Input/Output Function:

Function No.	Input	Output
1	Fixed Heating Mode	Operation Signal
2	Fixed Cooling Mode	Alarm Signal
3	Demand Stoppage	Compressor ON Signal
4	Outdoor Fan Motor Start/Stop	Defrost 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 Setting	No setting

Same input/output function cannot be set to different input/output terminal. Otherwise, the larger function number setting will be invalid.

2. Function selection Setting

(1) Function selection Setting Method

1) Setting start

When unit is stopped, set DSW4-No.4 to ON and set DSW4-No.5 to ON.

2) Setting end

Set DSW4-No.5 to OFF and set DSW4-No.4 to OFF.

(2) Function Setting Option

By pressing the push-switches PSW3 (►) and PSW5 (◄) the setting can be changed.

PSW4 (▼): forward, PSW2 (▲): backward

Refer to the Technical Manual for more details.

Fill out the selected function No. in the space provided in the following table:

Item	SEG2	SEG1	SET	Item	SEG2	SEG1	SET
1 Circulator Function at Heating Thermo-Off	FA	0	<input type="text"/>	25 N/A	F1	0	<input type="text"/>
2 Switch to Night Mode (Low Noise)	n1	0	<input type="text"/>	26 Crankcase Heating Band Control During Stoppage	F2	0	<input type="text"/>
3 Cancellation of Outdoor Ambient Temperature Limit	CS	0	<input type="text"/>	27 Indoor Fan Warm Start Period Setting	F3	0	<input type="text"/>
4 Defrost in Cold Area (Change Of Defrost Condition)	Jo	0	<input type="text"/>	28 Intermittent Operation of Outdoor Fan Motor	F4	0	<input type="text"/>
5 Gentle Fan Speed Defrost Setting	bu	0	<input type="text"/>	29 Indoor Expansion Valve Target Value Control for Cooling (Only For 4-Way Cassette Type)	F5	0	<input type="text"/>
6 Cancellation of Outdoor Unit warm Start	HR	0	<input type="text"/>	30 Indoor Expansion Valve Minimum Opening Limit During Heating Switch-Off	F6	0	<input type="text"/>
7 Capacity Priority Mode	nU	0	<input type="text"/>	31 N/A	F7	0	<input type="text"/>
8 Minimum Evaporating Temperature Setting for Cooling	Hc	0	<input type="text"/>	32 Forced Defrosting After Forced Stoppage Of Defrosting Cycle	F8	0	<input type="text"/>
9 Compressor Frequency Target Value Control for Heating	Hh	0	<input type="text"/>	33 Indoor Expansion Valve Control Change for Stoppage Indoor Unit in Heating Mode	F9	0	<input type="text"/>
10 Indoor Expansion Valve Target Value Control for Cooling	SC	0	<input type="text"/>	34 Compressor Maximum Frequency Suppression	FC	0	<input type="text"/>
11 Indoor Expansion Valve Target Value Control for Heating	SH	0	<input type="text"/>	35 Convert Unit in Checking Mode	Fd	0	<input type="text"/>
12 Indoor Expansion Valve Opening Control During Heating Operation Stoppage	Si	0	<input type="text"/>	36 Indoor Fan ON/OFF Setting during Forced Stoppage	FE	0	<input type="text"/>
13 Indoor Expansion Valve Opening Control During Heating Thermo-Off	So	0	<input type="text"/>	37 N/A	FF	0	<input type="text"/>
14 Indoor Expansion Valve Initial Opening Control During Heating Thermo-On	ci	0	<input type="text"/>	38 High difference setting	FG	0	<input type="text"/>
15 Indoor Expansion Valve Initial Opening Control for Cooling	cb	0	<input type="text"/>	39 N/A	FH	0	<input type="text"/>
16 Outdoor Expansion Valve Initial Opening Control for Heating	ch	0	<input type="text"/>	40 Oil return control	Fi	0	<input type="text"/>
17 Low Noise Setting*	db	0	<input type="text"/>	41 Performance correction	FJ	0	<input type="text"/>
18 Demand Function Setting	de	0	<input type="text"/>	42 Outdoor temperature range	FL	0	<input type="text"/>
19 Wave Function Setting	UE	0	<input type="text"/>	43 Cooling mode Start control 2 Hz change speed	Fn	0	<input type="text"/>
20 Protection of Decrease in Outlet Temperature for Cooling	Fb	0	<input type="text"/>	44 Cooling mode Start control 2 Hz change speed	FP	0	<input type="text"/>
21 Outlet Temperature Control	Fr	0	<input type="text"/>	45 Compressor Maximum Frequency Change during Defrosting Mode	Fr	0	<input type="text"/>
22 Adjustment of Fan Running (For Multiple Installation)	Fo	0	<input type="text"/>	46 Oil return mode of indoor unit	FU	0	<input type="text"/>
23 N/A	Lr	0	<input type="text"/>	47 N/A	Fy	0	<input type="text"/>
24 Thermo-Off Setting for Outdoor Unit After Defrosting Operation	d5	0	<input type="text"/>				

*when ambient temperature is higher than 44°C, silence and low noise setting mode is invalid.

8. Additional Refrigerant Charge

8.1 Air Tightness Test

- (1) Ensure that the stop valve is completely closed before airtight inspection.
<Air tightness detection>
 - (a) After you connect the liquid pipe, open the liquid side stop valve bonnet. Do not connect low pressure piping and gas side stop valve. Seal the low-pressure side of the pipe line by welding with a filed supplied cap.
 - (b) After the above test is completed, carry out the air tightness detection. Please refer to page 31.
- (2) Connect the indoor and outdoor units with the refrigeration pipe provided on the site.
Provide support at regular intervals to prevent the cooling pipe touching the wall, ceiling of the building. (Piping vibrations cause abnormal sounds, hence pay much more attention when the piping length is shorter).
- (3) Connect the regulating valve and the vacuum pump or the nitrogen tank specially to the test joint of the liquid valve. Conduct air tightness test. Connect the regulating valve to the check joint of the outdoor liquid side valve, and do not open the liquid side stop valve. Ensure that the nitrogen pressure is 4.15MPa.



DANGER

Ensure that you carry out air tightness test only with nitrogen. If other gases such as oxygen, acetylene, or carbon hydrocarbon gas are used for airtight test, it can cause explosion or toxication.

- (4) Use leakage detector or bubble to detect if there is leakage at the flare nut and brazing position.
- (5) After the airtight test, release the nitrogen, remove the low-pressure side pipe welding sealing cap, and brazing then the gas side stop valve and low pressure side piping welding.
- (6) After completion of piping connection, install the pipe insulation material.

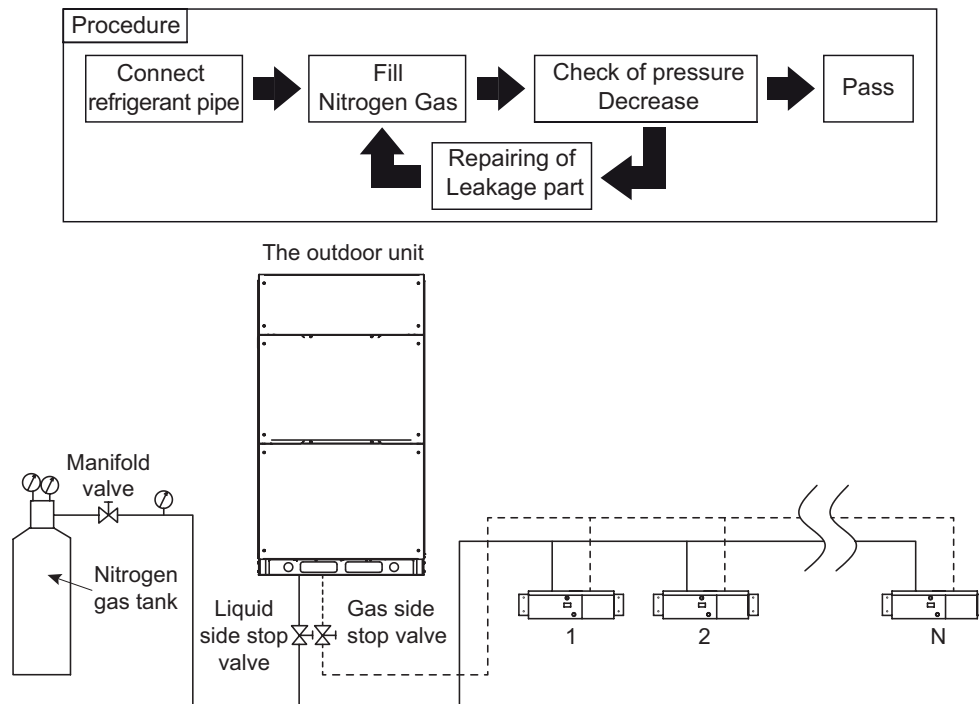


Figure 8.1 Air tightness test

CAUTION

- Isolate and protect the gas side stop valve, and do not directly charge to the gas side stop valve (see Figure 8.1).
- Before charging, ensure that the electronic expansion valve of the indoor unit is in the open state. Make sure that the piping is connected with the indoor unit.
- Gas side stop valve and low pressure pipe welding joints cannot be detected by air tightness to confirm whether leakage occurs, pay attention to welding quality during welding operation.

8.2 Vacuum

- (1) Connect the regulating valve and the vacuum pump to the liquid side stop valve detection joint.
- (2) Vacuuming for 1 or 2 hours to create vacuum space until the pressure reaches -0.1MPa (-756 mm Hg) or less. After the vacuuming finished, close the valve of the regulating valve. Stop vacuuming and hold for 1 hour. Make sure that the pressure on the regulating valve does not go high.
- (3) After vacuuming, tighten the inspection joint valve cap of liquid side stop valve torque: 14-18 N•m.

Prompt:

1. In case of direct touch with the new refrigerant R410A, use specified tools and instruments.
2. If the pressure for vacuum cannot reach - 0.1MPa (-756mm Hg), indicates that there may be leakage. In this case perform leakage detection. If there is no leakage, pump for 1 or 2 hours to create vacuum space.

NOTICE

- Apply thermal insulation to the refrigerant pipes as shown in Figure 8.2. After completion of piping connection, use field supplied insulation material to apply thermal insulation to the gas pipe, liquid pipe and check joint, connecting part such as connecting nut, etc., and use adhesive tap to wrap the exterior surface of them so as to prevent heat loss and condensation on the pipe surface.

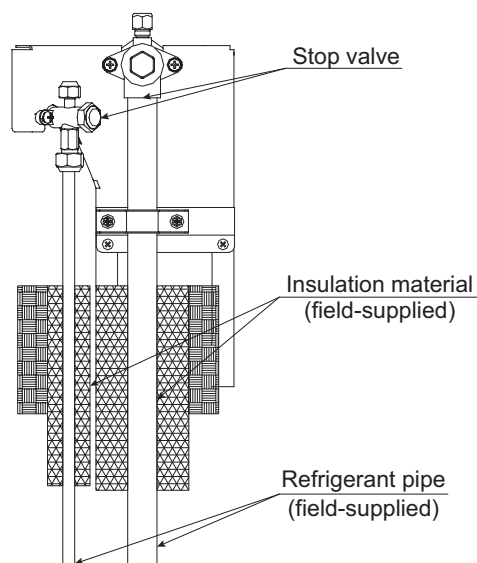


Figure 8.2

8.3 Calculating Refrigerant's Additional Charge

Although the unit is charged with refrigerant, the supplementary refrigerant quality is determined and charged into the system based on the length of refrigerant piping. The actual additional charge volume is determined according to the following requirements.

After completing the charging, report the additional charge to the local service center.

1. Calculation method of additional refrigerant filling amount is given in the below table:

Table 8.1 Additional Refrigerant Charge Calculation

SI No.	Symbol	Content										Additional Charge
1	W1	Calculation method of the amount of refrigerant added to the liquid pipe (W1 kg)										kg
		Piping diameter	Piping total length (m)	Supplementary refrigerant charging amount for 1m total length of piping					Additional charge (kg)			
		ø6.35	m	x 0.03=					kg			
		ø9.52	m	x 0.06=					kg			
		ø12.7	m	x 0.12=					kg			
		ø15.88	m	x 0.19=					kg			
		ø19.05	m	x 0.28=					kg			
		ø22.2	m	x 0.36=					kg			
		ø25.4	m	x 0.52=					kg			
		ø28.58	m	x 0.67=					kg			
				Total additional charge of liquid pipe =					kg			
		NOTE: If the indoor units are all Cassette, in addition the models are JDCK028H0PAGQ,JDCK040H0PAGQ,JDCK080H0PAGQ,JDCK090H0PAGQ, the minimum amount of additional refrigerant W1 is shown in the table below										
		Outdoor Unit HP	8~10	12	14~18	20~24	26	28~34	36~42	44~48		
		W1: the minimum amount of additional refrigerant (kg)	2	3	3	4	5	6	7	8		
		Outdoor Unit HP	50	52~58	60~66	68~72	74	76~78	80~96			
W1: the minimum amount of additional refrigerant (kg)	9	10	11	12	13	14	16					
2	W2	Calculation method of additional refrigerant charge in indoor unit (W2 kg)										kg
		Indoor Unit model					Refrigerant additional charge(kg/unit)					
		18 ~ 36 type					0.3					
		40 ~ 160 type					0.5					
		224 and above					1.0					
		NOTE: The maximum amount of refrigerant additional to the indoor unit W2 is 6.0kg										
3	W3	Indoor unit connection ratio (total indoor unit capacity / outdoor unit capacity) Additional charge (W3 kg)										kg
		Indoor capacity ratio					Refrigerant additional charge(kg)					
		<100%					0					
		100% to 130% or less					0.5					
4	W	Total additional charge (W kg) = W1+W2+W3										

Prompt:

The refrigerant charging method must be in compliance with specifications provided in the above table. Ensure that the total additional refrigerant charge of the system not exceed the maximum refrigerant charge as shown in the table below. If the calculated value of the additional charge of the refrigerant exceeds the range shown in the table below, the total length of the piping construction plant should be shortened and the additional charge of the refrigerant should be recalculated to meet the following requirements:

<Maximum supplementary refrigerant charging amount>

HP	8-10	12	14-24	26-66	68-88	90-96
Maximum refrigerant additional charge (kg)	28	36	40	63	73	93

2. Charging operation:

The refrigerant R410A is charged in to the system as required by chapter 8.4.

3. Record the refrigerant charge volume:

The total refrigerant charge is calculated according to the following formula:

Total refrigerant charge = W + Wo

This system = + = kg

The additional total amount of refrigerant : W kg

Total amount of refrigerant: kg

Charge date: year / month / day

Outdoor Unit	The outdoor unit is shipped with refrigerant charge (Wo) kg
JVOH080VPEMBQ	5.0
JVOH100VPEMBQ	5.0
JVOH120VPEMBQ	7.2
JVOH140VPEMBQ	8.9
JVOH160VPEMBQ	9.9
JVOH180VPEMBQ	10.7
JVOH200VPEMBQ	11.3
JVOH220VPEMBQ	11.3
JVOH240VPEMBQ	12.6

Note:

- Wo is the refrigerant charging amount at factory.
- With the base module combination, need to calculate the total refrigerant charging amount at factory for each combination of base modules.

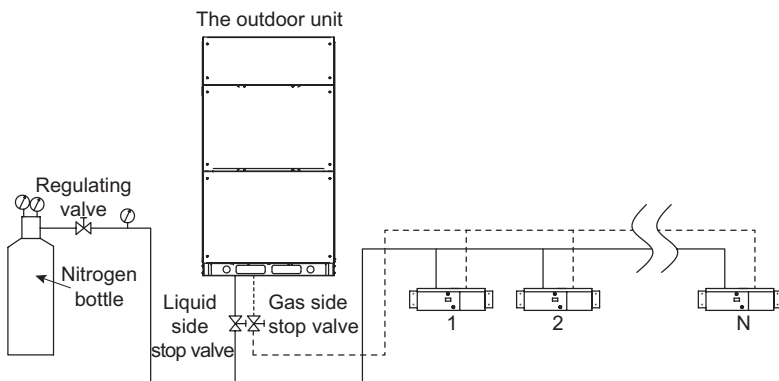
8.4 Charging Operation

After completion of vacuum pumping, check to ensure that the liquid side stop valve is completely closed.

Refer to Table 8.1 and the corresponding refrigerant quantities are charged at the liquid side stop valve check joint (the permissible refrigerant quantity tolerance is less than 0.5 kg).

If you cannot charge the specified amount of refrigerant, follow the steps below:

- (1) Completely open the gas side stop valve (refer to 6.4.5).
- (2) Ensure that the unit is in cooling operation and the refrigerant is added from the liquid side stop valve detection joint. Liquid side stop valve should be slightly open (permissible refrigerant quantity tolerance is 0.5 kg).
- (3) After charging the refrigerant, completely open the liquid side stop valve and the gas side stop valve.



Charge the correct refrigerant quantity according to Table 8.1. 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. If the refrigerant comes into contact with open flames, toxic gas could be generated.

- Please pay special attention to the refrigerant leakage

Before performing installation of air conditioner, pay attention to the critical concentration of the refrigerant in the indoor unit to prevent any leakage accident.

$$\frac{\text{Total amount of refrigerant in system (kg)}}{\text{Control space of indoor unit (m}^3\text{)}} \leq \text{Critical concentration (0.42 kg/m}^3\text{)*}$$

*The critical concentration value is determined by national laws and regulations.

For example, ISO5149 and EN378.

If the detected concentration is greater than 0.42 kg/m³, take the following measures:

- (1) Prepare a leak detector and exhaust fan used for operation control.
- (2) Open the ventilation openings in the walls or doors to reduce the concentration of the refrigerant. (In areas lower than the door, set the ventilation opening area is at least 0.15% of the floor area.)

NOTICE

1. HFC gas R410A maximum allowable concentration:

R410A refrigerant is non flammable, non-toxic gas.

But if the refrigerant gas leaks into the room, it may lead to suffocation.

Once leakage occur it is must to take effective actions to make the concentration of R410A is lower than 0.42 kg/m³

2. Calculation of refrigerant concentration:

(1) Calculate the total amount of refrigerant (kg) (including the charge of all connected indoor unit systems).

(2) Calculate the volume V (m³) of each room.

(3) Calculate the concentration of room refrigerant C (kg/m³) according to the following formula:

$$\frac{\text{R: Total refrigerant (kg)}}{\text{V: Room volume (m}^3\text{)}} = \text{C: Refrigerant concentration is } \leq 0.42 \text{ (kg/m}^3\text{)*}$$

Follow local regulation and laws if available.

9. Test Run

Perform trial run according to Chapter 9.2. Record the values as per Table 9.1.

CAUTION

- **Start the machine only when all the check points are checked and cleared.**

For indoor unit test run, refer to the installation manual and which is attached to the indoor unit.

9.1 Prerequisites for Test Run

1. Ensure that the indoor and outdoor refrigerant pipe and communication wires are connected to the same refrigeration system. Otherwise, it leads to abnormal and serious accidents. Check the refrigerant system no. for indoor/outdoor units (DSW1 and RSW1 [outdoor unit], DSW5 and RSW2 [indoor unit]) and indoor unit number (RSW). Make sure that the DIP switch on the base board of the indoor and outdoor unit is set correctly. In particular, pay attention to the indoor and outdoor unit height difference, refrigerant system number setting and terminal resistance setting. Refer to wiring diagram in chapter 7 for more details.
2. Ensure that the terminal resistance to ground exceeds 1MΩ, Otherwise, find out the earth leakage point and fix it before starting the system. Do not apply strong electricity to the communication terminals (outdoor unit: TB2 1.2.3.4 / indoor unit:TB2 1.2.A.B).
3. Ensure that the power wire L1, L2, L3 and N are connected correctly.

4. The power supply is connected for 12 hours or more to ensure that the crank case heating the compressor oil.

After the power is turned on, if the compressor oil temperature is low, the units do not run immediately (stop code d1-22) .

If starting operation within 2hours of power on, follow the steps below to lift the protection:

1. Turn on the power to the outdoor unit.
 2. Wait for 30 seconds.
 3. Press and hold the PSW5 button on the outdoor unit for more than 3 seconds to release the protection code d1-22.
5. Identification of master unit
With the combination of base modules, to easily distinguish the master unit A, paste an identification label on an apparent location on the master unit (Outdoor unit A). Do not attach master unit label to slave unit (Outdoor unit B, C and D).

NOTICE

Insulation resistance precautions

If the total insulation resistance is lesser than 1MΩ, then the compressor insulation resistance can go low due to the refrigerant remaining in the compressor. This occurs when the machine idle for a long time.

1. Disconnect the compressor power wire. Measure the insulation resistance of the compressor body. If the resistance is higher than 1MΩ, the lower insulation resistance is caused by other electrical components.
2. If the compressor insulation resistance is lesser than 1MΩ, disconnect the inverter cable and then, turn on the compressor crankcase heating belt and turn on the power.
After 3 hours of powering measure the insulation resistance of the compressor body again. (Duration of time should be longer to depending on outdoor weather conditions, piping length and refrigerant status.) Measure the insulation resistance and connect the compressor power wire. If the ELB acts, check and confirm if the ELB specification meets the recommended specification shown in table 7.1.

NOTICE

1. Ensure that the electrical components provided on the site (the main power switch, circuit breaker, wire, cable conduit connection, and terminal) are chosen as per the technical manual. Verify that the device complies with the national electrical code.
2. Use shielded wire ($\geq 0.75 \text{ mm}^2$) for wiring connections to shield the electrical interference. (The total length of the shielded wire should be less than 1000m and the wire specification and size should be compliant with local regulations).
3. Ensure that the terminal block wiring is correct (Terminal L1 and N of the terminal block and voltage 380V). Wrong wiring connection damages the appliance and the associated components.

9.2 Trial Run

- (1) Ensure that the outdoor unit stop valve is completely open and then start the machine. (If there is a module combination, make sure that all stop valves that connect to the outdoor unit are fully open.)
- (2) Turn on the indoor units one after other and ensure that refrigerant pipe setting and electric setting of the indoor unit is set in the same system. (If you start multiple indoor units at the same time, you cannot detect indoor unit and the corresponding outdoor unit .)
- (3) Follow the steps below to perform the test run operation. Make sure that test run operation runs smoothly:

Prompt:

If the two-wire controller (Main and Auxiliary) first start through the main wired controller.

- (a) Holding down the "run mode" and "up" button on the remote control for more than 5 seconds enables the test mode.
 - For other optional wired controllers (wireless remote controller and micro controller), refer to the installation and operation manual attached to the wired controller.
 - If a wired controller controls multiple indoor units operational at the same time, check the number of units connected to the indoor unit on the LCD screen.
 - If the number of displays is incorrect, the address cannot be obtained automatically because the wrong connection. In such cases, disconnect the power wire and check for the following points and correct the wiring connection: (do not repeat the switch within 10 seconds of this action)
 - * The power of the indoor unit is not connected or the connection is not correct.
 - * The connection between the indoor unit cable is incorrect or the communication wire is incorrect
 - * The rotary switch on indoor unit board and the DIP switch are not set correctly (set address repeat).
- (b) Press the "Run Mode" button to set the operating mode.
- (c) Press the "Run/Stop" button.

The run indicator lights turns on before the start of commissioning.

It is automatically set to 2 hours for test run, though the initial set of fan speed is "Low", (This mode is the same as the normal mode) the set can be changed.

Check the operating range as shown below:

		Cooling Operation	Heating Operation
Indoor Side Temperature	Minimum	15°C WB	17°C DB
	Maximum	23°C WB	27°C DB
Outdoor Side Temperature	Minimum	-5°C DB	-20°C WB
	Maximum	52°C DB*	15°C WB

DB: dry bulb temperature, WB: wet bulb temperature

NOTE:

*-5°C~48°C DB is stabilized operation range, 48°C~52°C DB is interval operation.

- When the machine is running, note the following:
 - *Do not touch the edges of any components of exhaust because the compressor and pipe in the exhaust end temperature up to 90°C or more.
 - *Do not press the AC contractor button, it leads to serious accidents.
 - Do not touch any electrical components within 3 minutes after disconnecting the main power supply.
 - Through running of indoor unit one after the other, ensure that the refrigerant line and electrical wire are set in the same system.
- (d) During the run, temperature control is invalid though the protection device is valid. If an alarm comes, please figure out the cause of the abnormality according to alarm code shown in table 9.2, and re-start the test run after the failure being solved. As per the spot check label attached on the back surface of the front panel of the outdoor unit, temperature, pressure, operation frequency and connection can be displayed with 7-segment code.
- (e) To stop the test run, press "Run/Stop" button again or wait for two hours.

Table 9.1 Trial Run and Mainten Recordance

Model:	Serial No.:	Compressor No.:	
User name and address:	Date:		

1. Is the indoor fan rotation direction correct?
2. Is the outdoor fan rotation direction correct?
3. Is there any abnormal sound from operation of compressor?
4. If the system has been running for at least 20 minutes?
5. Inspect indoor temperature:

Inlet: <u>No. 1 DB</u> /WB <u> </u> °C	No. 2 DB /WB <u> </u> °C	No. 3 DB /WB <u> </u> °C	No. 4 DB /WB <u> </u> °C
Outlet: <u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C
Inlet: <u>No. 5 DB</u> /WB <u> </u> °C	No. 6 DB /WB <u> </u> °C	No. 7 DB /WB <u> </u> °C	No. 8 DB /WB <u> </u> °C
Outlet: <u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C	<u>DB</u> /WB <u> </u> °C
6. Inspect outdoor temperature:

Inlet: <u>DB</u> °C <u>WB</u> °C	Outlet: <u>DB</u> °C <u>WB</u> °C
----------------------------------	-----------------------------------
7. Inspect refrigerant temperature:

Liquid pipe temperature: <u> </u> °C	Exhaust temperature: <u> </u> °C
---	---
8. Inspect pressure:

Exhaust pressure: <u> </u> Mpa	Intake pressure: <u> </u> Mpa
---------------------------------------	--------------------------------------
9. Inspect voltage:

Rated voltage: <u> </u> V	Operation voltage: L ₁ -L ₂ <u> </u> V, L ₁ -L ₃ <u> </u> V, L ₂ -L ₃ <u> </u> V
Start voltage: <u> </u> V	Imbalance between phrases: 1-(V/Vm)= <u> </u>
10. Inspect compressor input operation current:

Input power: <u> </u> kW	Operation current: <u> </u> A
---------------------------------	--------------------------------------
11. Is the charge amount of refrigerant appropriate?
12. Is the operation control device correct?
13. Does the safety device act correctly?
14. If the system refrigerant leakage detection has been conducted?
15. If cleaning work has been done inside/outside the unit?
16. If all the covers of the unit are being fixed securely?
17. If there is any abnormal sound from all the unit covers?
18. Is the filter cleaned?
19. Is the heat exchanger cleaned?
20. Is the stop valve opened?
21. Is the condensed water being drained smoothly through drain pipe?

Table 9.2 Alarm Code

Code	Classification	Alarm Content	Main Reason
01	Indoor Unit	Indoor protection device action (float switch)	Water level is too high, drain, or float switch is abnormal.
02	The Outdoor Unit	Outdoor protection device action (high pressure switch)	Piping clogging, excessive refrigerant, non-condensable gas mixed
03	Communication	Communication between indoor and outdoor units is abnormal	Wrong wiring, loose terminal, disconnected, outdoor unit power off, outdoor fuse blown
04		Communication between the inverter board and the outdoor PCB is abnormal	Terminals loose, wire disconnected, outdoor unit powered off, outdoor unit fuse blows off.
04.		Communication between fan control board and outdoor PCB is abnormal	Terminals loose, broken, fuse blown
05	Power Supply	Power phase anomaly	Power supply error, power phase error, power wiring phase missing
06		Inverter voltage is abnormal	Outdoor unit voltage is too low, power capacity is not enough
06.		Fan control voltage is abnormal	Outdoor unit voltage is too low, power capacity is not enough
07	Circulatory System	Exhaust superheat TdSH is too low	Excessive refrigerant, expansion valve lock, wiring, piping connection error, thermistor fault, valve room - outdoor unit, refrigerant, electrical system connection error
08		Exhaust temperature Td (top of compressor) is too high	Insufficient refrigerant, expansion valve lock, wiring, piping connection error, thermistor fault, valve room - outdoor unit, refrigerant, electrical system connection error
0A	Communication	Communication abnormal between outdoor units	Communication wire connection error, wire disconnected, terminal loosening.
0b	The Outdoor Unit	The outdoor unit address is incorrect	The same system has two sets of the same set of outdoor unit (slave machine)
0C		The main outdoor unit is set incorrectly	There are 2 or more master units in the same system
11	Indoor Unit Sensor	Return air thermistor abnormal	Indoor thermistor wiring is wrong, broken, not connected or shorted.
12		Air supply thermistor error	
13		Heat exchanger liquid pipe (anti-freeze) thermistor abnormal (indoor unit)	
14		Ambient Thermistor Abnormal (Indoor)	
15		Ambient thermistor abnormality (indoor unit)	
16		Wired controller thermistor exception (fresh air treatment)	
17		Wired controller built-in thermistor abnormal (fresh air treatment)	
19	Fan Motor	Indoor fan protection device action	Indoor fan motor overheats or stuck
21	The Outdoor Unit Sensor	High pressure sensor is abnormal	Outdoor thermistor wiring is wrong, broken, not connected or shorted
22		Ambient thermistor abnormality (outdoor unit)	
23		Compressor top thermistor abnormality (outdoor unit)	
24		Outdoor exchanger liquid pipe Thermistor Abnormal	Outdoor thermistor wiring is wrong, broken, not connected or shorted.
25		Outdoor heat exchanger / sub cooler gas side inlet / air side out of the thermistor abnormalities	
29		Low pressure sensor is abnormal	

31	Circulatory System	Indoor and outdoor unit capacity set, capacity combination error	The outdoor unit capacity is set incorrectly, or the total capacity of the indoor unit is too large.
35		The indoor unit address is incorrect	The same indoor unit number setting appears in the same system.
36		Incorrect indoor unit / misconfigured brand	The indoor unit is J-type (R22) or the brand is misconfigured.
38		Outdoor protection detection circuit abnormalities	Outdoor unit protection circuit is abnormal (outdoor unit board wiring error).
3A	The Outdoor Unit	Abnormal capacity of outdoor unit	The total capacity of outdoor unit is greater than 96 HP.
3b		The outdoor unit is set incorrectly	Outdoor units (Master/slave), combination type, voltage setting error.
3d		Abnormality between outdoor units	Wrong wiring, no wiring, broken wire or PCB board failure.
43	Protective Device	Compression ratio too low protection acts	Poor compressor (compressor frequency converter, power failure).
44		Low pressure is too high protection action	Refrigeration indoor overload, outdoor temperature is too high when heating, expansion valve lock (loose wiring).
45		High pressure is too high to protect the action	Overload operation (heat exchanger blockage, return air short circuit), pipeline blockage, excessive refrigerant, mixed with non-condensable gas.
46		High pressure is too low to protect the action	Lack of refrigerant, four-way valve gas blow-by
47		Low pressure too low protection action (vacuum operation protection)	Insufficient refrigerant, pipe clogged, expansion valve locked in the open position (loose wiring).
48		Overload operation protection action	Overload operation, compressor abnormalities.
51	Sensor	Inverter current sensor is abnormal	Current sensor failure.
53	Frequency Converter	The inverter signal detection is incorrect	IC driver program detects errors (over-current, low voltage, short circuit protection).
54		Inverter radiator temperature anomalies, protection device action	Variable frequency radiator thermistor failure, heat exchanger dirty block, fan motor failure.
55		Inverter fault	Frequency conversion board failure.
57	Fan Control Substrate	Fan control board protection action	IC driver program detects errors (over-current, low voltage, short circuit protection), instantaneous over-current.
5A		Fan control board radiator temperature anomalies	Base board radiator thermistor failure, heat exchanger dirty block, fan motor failure.
5b		Over-current protection action	Fan motor failure.
5c		Fan control board current sensor is abnormal	Current sensor failure (over current, radiator temperature is too low, low voltage, so on.)
EE	Compressor	Compressor alarm	Compressor damage alarm occurred three times within 6 hours
b1	Outdoor Unit Address Setting	Address code. Cooling system setting error (outdoor unit)	Address, the number of refrigeration cycle set more than 64.
b5	Indoor Unit Address Setting	Setting error on number of connected indoor units	In a system connected to 17 or more non-H-LINK II indoor unit.
3E	Protective Device	Frequency control board combination exception	In a system connected to 17 or more non-H-LINK II indoor unit.
A1		Active filter abnormal	When the active filter detects an abnormal signal.

10. Compressor Protection

- Protection of compressor

The compressor is protected by the following protection devices.

- (1) High-pressure pressure switch: When the pressure of exhaust air from the compressor exceeds the set value, the switch acts and the operation is stopped.
- (2) Crank case heating band: This heating band is used to prevent lubricant oil from being blistering during cold starting, it is working on even when the compressor is not running.

Model			JVOH080VPEMBQ	JVOH100VPEMBQ	JVOH120VPEMBQ
Compressor			Automatic reset, not adjustable		
Pressure Switch			1 pcs per compressor		
High Pressure	Cut-out	Mpa	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$
	Cut-in	Mpa	3.20 ± 0.15	3.20 ± 0.15	3.20 ± 0.15
Fuse capacity		A	25	32	32
Crankcase heating capacity		W	40×2	40×2	40×2
CCP timer setting time		min	3	3	3

Model			JVOH140VPEMBQ	JVOH160VPEMBQ	JVOH180VPEMBQ
Compressor			Automatic reset, not adjustable		
Pressure Switch			1 pcs per compressor		
High Pressure	Cut-out	Mpa	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$
	Cut-in	Mpa	3.20 ± 0.15	3.20 ± 0.15	3.20 ± 0.15
Fuse capacity		A	40	50	50
Crankcase heating capacity		W	40×2	40×2	40×4
CCP timer setting time		min	3	3	3

Model			JVOH200VPEMBQ	JVOH220VPEMBQ	JVOH240VPEMBQ
Compressor			Automatic reset, not adjustable		
Pressure Switch			1 pcs per compressor		
High Pressure	Cut-out	Mpa	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$	$4.15_{-0.15}^{-0.05}$
	Cut-in	Mpa	3.20 ± 0.15	3.20 ± 0.15	3.20 ± 0.15
Fuse capacity		A	63	63	80
Crankcase heating capacity		W	40×4	40×4	40×4
CCP timer setting time		min	3	3	3

Demo

Demo

Demo

Packing List

Item		Remarks
The outdoor unit:	1 pc	Tie No. 080-100: 2pc 120-180: 3pc 200-240: 6pc
Piping accessories bag (Except 100Type):	1 pc	
Installation and maintenance manual:	1 pc	
Refrigerant label:	1 pc	
Filter	1 pc	
Insulated cotton	1 pc	
Tie	some	



1098429

Qingdao Hisense Hitachi Air-conditioning Systems Co.,Ltd.

Add: Hisense Information Industry Park 218,Qianwangang Road, Qingdao Economic Development Zone,China

Specifications in this catalogue are subject to change without notice,in order that Hisense may bring the latest innovations to their customers.