
Total Heat Exchanger Heat Reclaim Ventilator -with DX Coil-

MODELS
(Ceiling mounted duct type)

Humidifier With DX coil

VKM50JMV1
VKM80JMV1
VKM100JMV1

Heat Reclaim Ventilator

Heat Reclaim Ventilator

Please read this installation manual carefully and install the unit properly to keep it at full capacity for a long time.

Please provide some necessary parts, for example round hoods, air suction/discharge grilles etc., before the installation of the unit.

Ventilatore a recupero di calore

Leggere attentamente questo manuale ed installare correttamente l'unit in modo da farla funzionare a lungo al massimo delle sue capacita. Prima dell'installazione, è opportuno disporre delle parti necessarie, come ganci arrotondati, griglie di aspirazione/di mandata, ecc.

CONTENTS

1 SAFETY PRECAUTIONS 1

2 BEFORE INSTALLATION2

3 SELECTING INSTALLATION SITE.....3

4 PREPARATIONS BEFORE INSTALLATION 4

5 THE METHOD OF INSTALLATION5

6 DRAIN PIPING AND WATER SUPPLY WORK.....5

7 REFRIGERANT PIPING WORK.....7

8 DUCT CONNECTION.....9

9 ELECTRIC WIRING WORK.....9

10 WIRING EXAMPLE AND HOW TO SET THE REMOTE
CONTROLLER 10

11 FIELD SETTING AND TEST RUN..... 13

The original instructions are written in English. All other languages are translations of the original instructions.

1 SAFETY PRECAUTIONS

Be sure to follow this “SAFETY PRECAUTIONS”. This product comes under the term “appliances not accessible to the general public”. This manual classifies the precautions into WARNINGS and CAUTIONS. Be sure to follow all the precautions below: They are all important for ensuring safety.

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

 **CAUTION**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

- After the installation is completed, test the Heat Reclaim Ventilator unit and check if the Heat Reclaim Ventilator unit operates properly. Give the user adequate instructions concerning the use and cleaning of the Heat Reclaim Ventilator unit according to the Operation Manual. Ask the user to keep this manual and the Operation Manual together in a handy place for future reference.

 WARNING

- Ask your local dealer or qualified personnel to carry out installation work. Improper installation may result in water leakage, electric shocks or a fire.
- Installation should be done following the installation manual and no changes should be made to the unit.
Improper installation may result in water leakage, electric shocks or a fire. Injuries may result if the Heat Reclaim Ventilator unit falls.
- Install the Heat Reclaim Ventilator unit on a foundation that can withstand its mass.
Insufficient strength may result in the Heat Reclaim Ventilator unit falling down and causing injury. In addition, it may lead to vibration of indoor units and cause unpleasant chattering noise.
- Do not allow exhaust air to enter the outside air intake vent. This may cause the air of the room to become contaminated, harming the health.
- Locate the outside air intake vent so that it does not take in exhaust air which contains combustion air, etc.
Incorrect installation may cause a loss of oxygen in the room, leading to serious accidents.
- Make certain that all electrical work is carried out by qualified personnel according to the applicable legislation (note 1) and this installation manual, using a separate circuit.
In addition, even if the wiring is short, make sure to use a wiring that has sufficient length and never connect additional wiring to make the length sufficient. Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or a fire.

(note 1) applicable legislation means “All international, national and local directives, laws, regulations and/or codes which are relevant and applicable for a certain product or domain”.

- Be sure to use only the specified parts and accessories for installation work. Failure to use the specified parts may result in the Heat Reclaim Ventilator unit falling down, water leakage, electric shocks, a fire, etc.
- Carry out the specified installation work in consideration of strong winds, typhoons, or earthquakes. Improper installation may result in an accident such as Heat Reclaim Ventilator unit falling.
- Make sure that all wiring is secure, using the specified wiring and ensuring that external forces do not act on the terminal connections or wiring. Incomplete connection or fixing may cause an overheat or a fire.
- When wiring remote controller wiring and transmission wiring, and wiring the power supply, form the wiring orderly so that the control box lid can be securely fastened. If the control box lid is not in place, overheat of the terminals, electric shocks or a fire may be caused.
- Consult your local dealer regarding what to do in case of refrigerant leakage.

When the Heat Reclaim Ventilator unit is installed in a small room, it is necessary to take proper measures so that the amount of any leaked refrigerant does not exceed the concentration limit in the event of a leakage. Otherwise, this may lead to an accident due to oxygen deficiency.

- If refrigerant gas leaks during installation work, ventilate the area immediately. Toxic gas may be produced if refrigerant gas comes into contact with a fire.
Furthermore, if leaked refrigerant gas exceeds the refrigerant concentration limit, it can lead to an oxygen deficiency accident.
- After completing the installation work, check to make sure that there is no leakage of refrigerant gas. Toxic gas may be produced if refrigerant gas leaks into the room and comes into contact with a source of a fire, such as a fan heater, stove or cooker.
- Disconnect the power supply before touching the electric components. If you touch the live part, you may get an electric shocks.
- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.
- Earth the Heat Reclaim Ventilator unit.
Do not connect the earth wiring to gas or water piping, lightning conductor or telephone earth wiring. Incomplete earthing may cause electric shocks or a fire. A high surge current from lightning or other sources may cause damage to the air conditioner.
- Be sure to install an earth leakage circuit breaker.
Failure to do so may cause electric shocks and a fire.

 CAUTION

- Install drain piping according to this installation manual to ensure good drainage, and insulate the piping to prevent condensation. Improper drain piping may cause water leakage, make the furniture get wet.
- Install the Heat Reclaim Ventilator unit, power supply wiring, remote controller wiring and transmission wiring at least 1 meter away from televisions or radios to prevent image interference or noise. (Depending on the radio waves, a distance of 1 meter may not be sufficient to eliminate the noise.)
- Install the two outdoor ducts with down slope to prevent rain-water from entering the unit. If this is not done completely, water may enter the building, may damage furniture, and cause electric shocks and fire.
- Insulate the two outdoor ducts and the supply air duct to prevent condensation. If this is not done completely, water may enter the building, may damage furniture, etc.
- Insulate the duct and the wall electrically when a metal duct is to be penetrated through the metal lattice and wire lattice or metal lining of a wooden structure wall. Improper duct work may cause electric shocks or fire.

- Do not install the Heat Reclaim Ventilator unit in places such as the following:
 - Place subjected to high temperature or direct flame.
May result in a fire or overheating.
 - Where mineral oil mist accumulates, or in areas such as kitchens where oil may splatter or steam may be present. Plastic parts may deteriorate and fall off resulting in water leakage or fire.
 - Place such as machinery plant and chemical plant where gas, which contains noxious gas or corrosive components of materials such as acid, alkali organic solvent and paint, is generated. Place where combustible gas leakage is likely. Copper piping and brazed joints may corrode, causing refrigerant to leak or poisoning and a fire due to leaked gas.
 - Where flammable gases may leak, where carbon fibre or ignitable dust is suspended in the air or where volatile flammables, such as thinner or gasoline, are handled. If the gas should leak and remained around the Heat Reclaim Ventilator unit, it may cause ignition.
 - Do not install in environments where gases such as propane, butane, or methane are used.
 - Where corrosive gas, such as sulfurous acid gas, is produced. This may cause a fire.
 - Where there is machinery which emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
 - Locations below freezing point. Using the unit at temperatures below 0°C may cause the drain pan the supply and discharge piping, the humidifying element, the solenoid valves, and other parts to freeze, which can cause accidents.
- Make sure the temperature and humidity near the unit and the air suction/discharge air grille is within limit dictated by the usage conditions.
 - Refrigerated truck or other locations with low temperatures.
 - Place such as bathroom or heated pools subjected to moisture. This may cause fires or electric leak or electric shocks.
- Make sure that a snow protection measure is taken. If no protection snow may enter through the outdoor ducts, and cause damaging furniture and electric shock and a fire.
- In areas where insects are easily attracted to a light, such as where there is a window or light near a ventilation opening, extremely small insects can sometimes infiltrate the room by passing through the ventilation opening. Since totally preventing against infiltration by extremely small insects is difficult, it is important to consider a serious solution like a filter box (field supply) during the design process to protect against insect infiltration.
- The Heat Reclaim Ventilator unit is not intended for use in a potentially explosive atmosphere.

2 BEFORE INSTALLATION

The accessories needed for installation must be retained in your custody until the installation work is completed. Do not discard them!

After carrying in the unit, protect it with packing materials to prevent it from scratching until installation work is done.

- Decide upon a line of transport.
- Leave the unit inside its packaging while moving, until reaching the installation site. Where unpacking is unavoidable, use a sling of soft material or protective plates together with a rope when lifting, to avoid damage or scratches to the unit.

Hold the unit by the hanger brackets (4) when opening the crate and moving it, and do not lift it holding on to any other part (especially the refrigerant piping, the drain piping, the water supply piping, and the duct connecting flange).

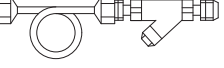
- Check that the type of refrigerant to be used is R410A or R32. (Using an incorrect refrigerant will prevent normal operation of the unit.)
- For the installation of an outdoor unit, refer to the installation manual attached to the outdoor unit.
- The sound pressure level is less than 70 dBA.

2.1 PRECAUTIONS

- Be sure to instruct customers how to properly operate the unit (especially maintenance of air filter, and operation procedure) by having them carry out operations themselves while looking at the manual.
- Do not use in locations where ambient salt content is high, such as coastal areas, locations where the supply voltage fluctuates a lot, such as factories, or in vehicles or marine vessels.
- Appliance not accessible to the general public, install it in a secured area, protected from easy access.

2.2 ACCESSORIES

Check the following accessories are accessory with your unit.

Name	Duct connecting flange	Tapping screw (For connecting duct)	Water supply piping with strainer
Quantity	4 pcs.	24 pcs.	1 pc.
Shape		 Type 50: 4x10 Type 80, 100: 4x12	

Name	Half-union joint (Copper piping joint)	Flare nut (Copper piping joint)	Refrigerant piping insulation cover
Quantity	1 pc.	1 pc.	1 set
Shape			 I.D.: φ35 I.D.: φ26

Name	Water supply piping insulation cover	Sealing material (for insulation)	Sealing material (for wiring)	Clamp	(Other)
Quantity	1 pc.	1 pc.	3 pcs.	8 pcs.	• Installation manual • Operation manual • Declaration of conformity
Shape	 I.D.: φ15				

2.3 OPTIONAL ACCESSORIES

- Each this unit **MUST** be connected to a separate user interface.
The user interface listed in the table below Must be used.

Table

Remote controller type	BRC1H52 (or a compatible H-type user interface)
------------------------	---

NOTE) 1

If you use the remote controller except the above, please consult your local dealer.

This operation manual offers a non-exhaustive overview of the main functions of the system.

For more information about the user interface, see the operation manual of the installed user interface.

NOTE) 2

The user interface will generate a visible and audible warning sign in case of refrigerant leakage detection. E.g. the BRC1H52* remote controllers can generate an alarm of 65 dB (sound pressure, measured at 1 m distance of the alarm). Sound data is available in the technical data sheet of the remote controller. The alarm should always be 15 dB louder than the background noise of the room.

CAUTION

- Each indoor unit has to be connected to a separate user interface. Only a safety system compatible remote controller can be used as the user interface. See technical data sheet for remote controller compatibility (e.g. BRC1H52).
- The user interface has to be put in the same room as the indoor unit. For details, please refer to the installation and operation manual of the user interface.
- When installing the unit, have ready the round shape hood, the air discharge grille and the air suction grille, and other parts needed for the installation.
Consult your local dealer when selecting optional accessories.

FOR THE FOLLOWING ITEMS, TAKE SPECIAL CARE DURING CONSTRUCTION AND CHECK AFTER INSTALLATION IS FINISHED.

a. Items to be checked after completion of work

Items to be checked	If not properly done, what is likely to occur	Check
Are the indoor and outdoor units fixed firmly?	The units may drop, vibrate or make noise.	
Is the outdoor duct installed to outside with down slope? (Refer to page 9 Fig. 16)	Water leakage, electric shocks, or fire may result.	
Is the gas leak test finished?	It may result in insufficient cooling. Failure to cool / failure to heat.	
Is the unit fully insulated?	Condensate water may drip.	
Does drainage flow smoothly?	Condensate water may drip.	
Does the power supply voltage correspond to that shown on the name plate?	The unit may malfunction or the components may burn out.	
Are wiring and piping correct?	The unit may malfunction or the components may burn out.	
Is the unit safely grounded?	Risk of electric shock or fire in case of electrical leakage.	
Is wiring size according to specifications?	The unit may malfunction or the components may burn out.	
Is something blocking the air outlet or inlet of either the indoor or outdoor units?	Failure to cool / failure to heat / insufficient ventilation / excessive noise.	
Are refrigerant piping length and additional refrigerant charge noted down?	The refrigerant charge in the system is not clear.	
Is water supplied with the water supply piping connected?	Not humidified.	

Please check all items listed in the "SAFETY PRECAUTIONS" above once again.

b. Items to be checked at time of delivery

Items to be checked	Check
Did you explain about operations while showing the operation manual to your customer?	
Did you hand the operation manual and warranty over to your customer?	

c. Points for explanation about operations

The items with  WARNING or  CAUTION mark in the operation manual are the items pertaining to possibilities for bodily injury and material damage in addition to the general usage of the product. Accordingly, it is necessary that you make a full explanation about the described contents and also ask your customers to read the operation manual.

3 SELECTING INSTALLATION SITE

CAUTION

- When moving the unit during or after unpacking, make sure to lift it by holding its hanger brackets. Do not exert any pressure on other parts, especially the refrigerant piping, drain piping, water supply piping and duct connecting flange.
- When installing where temperature and relative humidity exceed 30 °C and RH80%, the unit body must be insulated additionally.
- Use glass wool or polyethylene foam of 10 mm or more thick which fit into ceiling opening as insulation material.

(1) Select an installation site where the following conditions are fulfilled and that meets with your customer's approval.

- Install in a place which has sufficient strength and stability. (Beams, ceiling, and other locations capable of fully supporting the weight of the unit.) Insufficient strength is dangerous. It may also cause vibration and unusual operating noise.
- Where piping between indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual for the outdoor unit.)
- Where nothing blocks air passage.
- Where condensate can be properly drained.
- Install in a location where the air around the unit or taken into the humidifier will not drop below 0°C.
- Do not install the unit directly against a ceiling or wall. (If the unit is in contact with the ceiling or wall, it can cause vibration.)

- Where sufficient clearance for maintenance and service can be ensured. (Refer to Fig. 1)

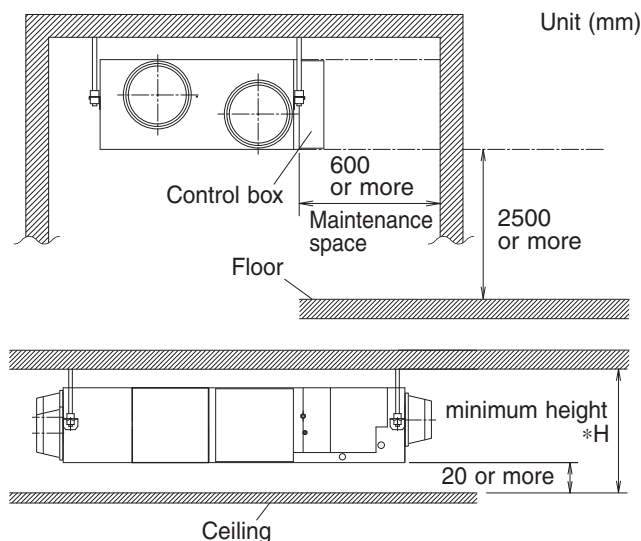


Fig. 1

- Select the *H dimension such that a downward slope of at least 1/100 is ensured as indicated in "6 DRAIN PIPING AND WATER SUPPLY WORK".

[PRECAUTION]

- Install the indoor and outdoor units, power supply wiring and connecting wires at least 1 meter away from televisions or radios in order to prevent image interference or noise. Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the electric noise.
- The bellows may not be able to be used in some districts, so exercise caution. (Contact your local government office or fire department for details.)

- (2) If mist, fog, or highly humid air is drawn in, water droplets may drip from the air filter or heat exchange element, which may cause water leakage outside the unit or the malfunction of electrical components such as the damper motor.

In such cases, stop operation. Additionally, in locations subject to negative pressure indoors or strong outdoor winds, outdoor air may be drawn in even when the unit is not operating. In such cases, install a motorized damper (locally procured) on both the outside air intake (OA) and exhaust air outlet (EA), or take equivalent measures, to prevent air ingress.

- (3) Use suspension bolts for installation. Check whether the ceiling is strong enough to support the weight of the unit or not. If there is a risk, reinforce the ceiling before installing the unit.

(Installation pitch is mentioned as follow. Refer to it to check for points requiring reinforcing.)

4 PREPARATIONS BEFORE INSTALLATION

- (1) Confirm the positional relationship between the unit and suspension bolts. (Refer to Fig. 2)

Leave space for servicing the unit and include inspection hatches. (Always open a hole on the side of the control box so that the air filters, heat exchange elements, fans, and humidifier elements can easily be inspected and serviced.)

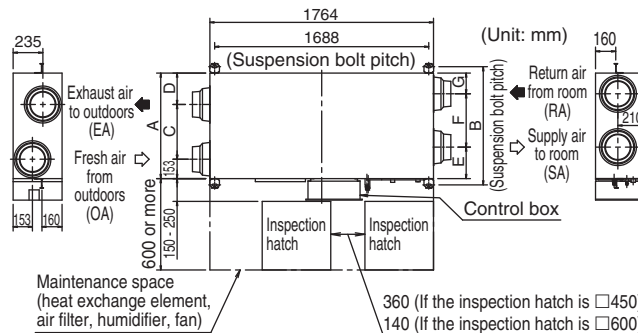


Fig. 2

(Unit: mm)

Product name	A	B	C	D	E	F	G
Type 50	832	932	431	248	248	420	164
Type 80, 100	1214	1314	622	439	439	592	183

- (2) Make sure the range of the unit's external static pressure is not exceeded.

(See the fan-strength and static performance characteristic drawings as well as the general catalog for the range of the external static pressure setting.)

- (3) Open the installation hole. (Pre-set ceilings)

- Once the installation hole is opened in the ceiling where the unit is to be installed, pass refrigerant, drain piping, transmission wiring, and remote controller wiring to the unit's piping and wiring holes.

See "6 DRAIN PIPING AND SUPPLY WATER WORK", "7 REFRIGERANT PIPING WORK", and "10 WIRING EXAMPLE AND HOW TO SET THE REMOTE CONTROLLER".

- After opening the ceiling hole, make sure ceiling is level if needed. It might be necessary to reinforce the ceiling frame to prevent shaking.

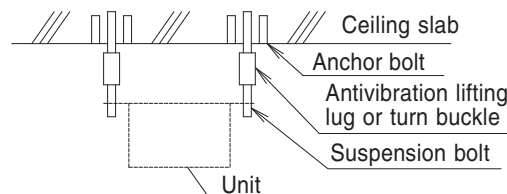
Consult an architect or carpenter for details.

- (4) Install the suspension bolts.

(Use M10 or M12 or W3/8 suspension bolts.)

Use a hole-in-anchor, sunken insert, sunken anchor for existing ceilings, or other part to be procured in the field to reinforce the ceiling to bearing the weight of the unit.

(Refer to Fig. 3)



Note: All the above parts are locally procured.

Fig. 3

5 THE METHOD OF INSTALLATION

CAUTION

When moving the Heat Reclaim Ventilator unit during or after unpacking, lift it by the suspension brackets (4 locations) only. Do not apply force to any other parts, particularly the piping (refrigerant, drain, or water supply), duct joints, control box, inlet or outlet.

<<As for the parts to be used for installation work, be sure to use the provided accessories and specified parts designated by our company.>>

(1) Install the unit temporarily.

- Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using nuts (locally procured) and washers (M10·W3/8 with external dia. 30 to 34 mm, M12 with external dia. 32 to 37 mm) (locally procured) from the upper and lower sides of the hanger bracket. (Refer to Fig. 4)

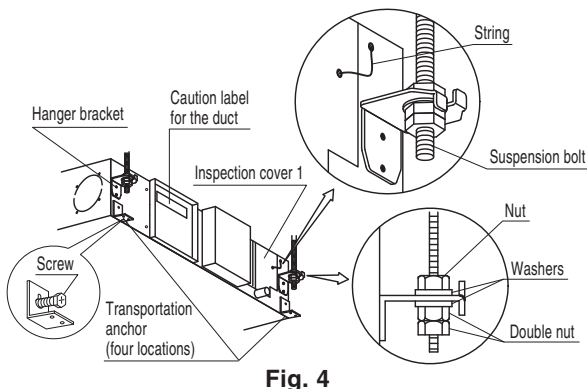


Fig. 4

- Install the unit after checking the indoor (SA/RA) and outdoor (EA/OA) in accordance with the figure duct layout precaution label.
- Do not turn the unit upside down.
- Do not pass the suspension bolts through the string on the inspection cover 1. (Refer to Fig. 4)
- If there is not much distance between the suspension bolts and the product, consider using tapered washers.

(2) Remove the four transportation anchors.

- Loosen the screws.
- Slide upward and remove the transportation anchors.
- Securely tighten the screws as before.

CAUTION

- The screws shouldn't be removed from the unit and should be tightened in order to prevent air from escaping.
- Check that foreign objects such as plastic or paper are not contained in the unit when installing.

(3) Adjust the height of the unit.

(Tighten the double nuts securely.)

(4) Check the unit is horizontally level.

CAUTION

Use a level to make sure that the unit is level and that the tilt (downward slope) to the drain piping connection is within 1°. (Refer to Fig. 5)

(One thing to watch out for in particular is if it is installed so that the slope is not in the direction of the drain piping, as this might cause leaking.)



Fig. 5

(5) Tighten the upper nut.

(6) Attach the duct connecting flanges (accessory) using screws (accessory) to the outlet and inlet holes (total of 4 locations).

When attaching, make sure the alignment markings on the unit match up with the triangle on the each duct connecting flange. (Refer to Fig. 6)

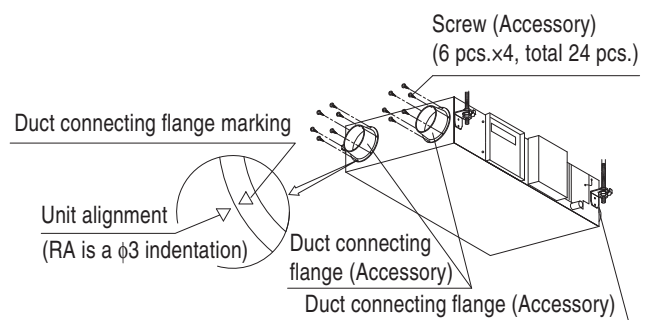


Fig. 6

CAUTION

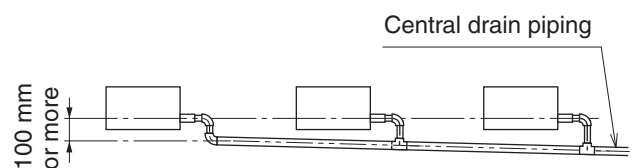
Always use a duct connecting flange (accessory) and attach it using the screws (accessory).

If the accessory duct joint and screws are not used, air leakage or noise may result.

6 DRAIN PIPING AND WATER SUPPLY WORK

(1) Install the drain piping.

- Make sure the drain works properly.
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100. Leave the end of the drain pipes open to atmospheric pressure and avoid creating traps or peaks in the pipes. Failing to do so may result in poor drainage. Furthermore, do not install any air bleeder along the pipes. (Refer to Fig. 7)
- If converging multiple drain pipes, install according to the procedure shown below.



(Install with a downward slope of at least 1/100)

Fig. 7

⚠ CAUTION

Set the drain pipe at a downward slope of 1/100 or more
If water accumulates in the drain piping, the drain may become clogged.

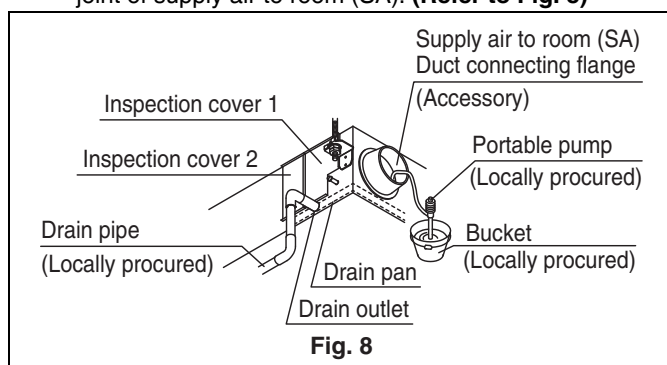
⚠ CAUTION

Water accumulating in the drain piping can cause the drain to clog.

- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe. (pipe size: R3/4B)
- When piping passes indoors, always insulate it all the way to the base of the drain socket.
- In areas where freezing may occur, always take steps to prevent the pipes from freezing.
- Make sure water doesn't leak from the drain pipes.
- Avoid bends and curves in the pipes to prevent them getting clogged.
- If you are using central drain piping, follow the procedure outlined in the figure 7.
- Select central drain pipes of proper size according to the capacity of the connected unit.
- Make sure the tip of the drain pipes opens out into a location where the drainage can be safely processed.

(2) After piping work is finished, check drainage flows smoothly.

- Test the drainage by pouring around 1000cc of water into the drain pan through the inspection hole by removing Inspection cover 1 (8 screws) or through the outlet duct joint of supply air to room (SA). (Refer to Fig. 8)



(3) Make sure that heat insulation work is executed on the following 2 spots to prevent any possibility water leakage due to dew condensation.

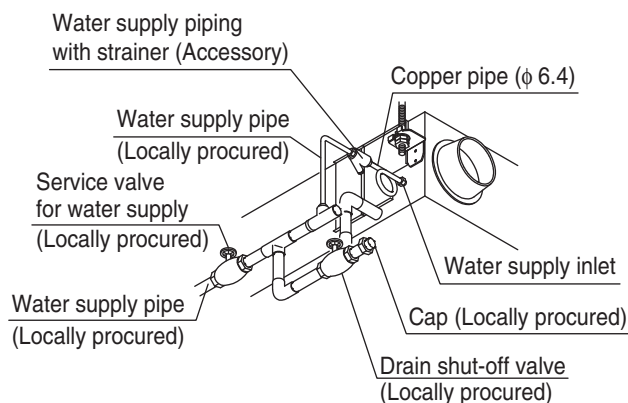
- Indoor drain piping
- Drain outlet

(4) Install the water supply piping.

⚠ CAUTION

- During drain piping work, rinse the piping clean with tap water to remove any cutting debris or other foreign matter.
- Install a drain valve in the piping and flush it thoroughly until the water becomes clear and free of odour.
- Ensure that cutting oil, cleaning solution, or other fluids do not contaminate the system.

- Connect the water supply piping with strainer (accessory), other pipings and valves (locally procured) to the indoor unit as shown in the figure at below.



[PRECAUTION]

- When installing the water supply piping, do not pass piping in front of the maintenance cover, as this will make it impossible to remove the humidifier element.
- Water supply piping must include a water supply service valve (locally procured) and a drain shut-off valve (locally procured), which must be installed within reach of the inspection port for operation.
- It is impossible to connect the water supply piping directly to public piping. Use a cistern tank (of the approved type) if you need to get your water supply from public piping.
- When connecting the water supply connection port (R1/2) to a copper pipe (φ 6.4), replace the fitting with the half-union joint (accessory) and use the flare nut (accessory). (Refer to Fig. 9)

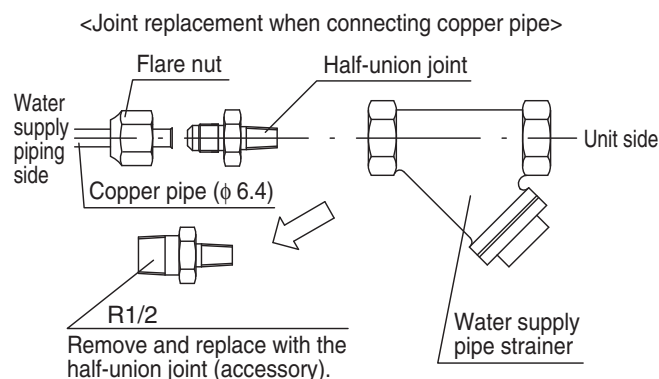


Fig. 9

- Be sure to use both a spanner and torque wrench together, as shown in the figure, when connecting or disconnecting pipes to/from the half-union joint (accessory). (Refer to Fig. 11 on "7 REFRIGERANT PIPING WORK")
- Refer to the "Table 1" on "7 REFRIGERANT PIPING WORK" for tightening torque.
- If a torque wrench is not available, tighten the nut in the following procedure. As the flare nut is tightened with the wrench, the torque will suddenly increase. From that position, tighten the nut to the angle shown on "Table 2" on "7 REFRIGERANT PIPING WORK".
- Secure the water supply piping without applying pressure.

[PRECAUTIONS]

- Dirty water may cause valves to clog, dirt to accumulate in water tanks, and resulting in poor humidifier performance. (Never use water from a cooling tower or warm water for heating.)
- Make sure the supply water is between 5°C and 40°C in temperature and 0.02 MPa to 0.49 MPa (0.2 kg/cm² to 5 kg/cm²) in pressure. Include a pressure release valve between the humidifier and the strainer if the water pressure will be higher than this range.

- Supplied water must be clean water that meets the requirements prescribed by the laws and regulations of each country, and also be purified water (municipal water / tap water or water equivalent in quality) that conforms to the following water quality standards.
Acid consumption: 50 mg/L or less, Total hardness: 70 mg/L or less, Ionic silica: 30 mg/L or less
If the acid consumption, supply water hardness, or ionic silica content is high, it may result in valve blockage, deterioration of the humidifier, and deposition of scale components (white powder) on the surface of the humidifying element. (These values do not guarantee the service life of the humidifying element.)
When air is supplied directly into the room, scale particles may be dispersed indoors. To prevent this, consider using a filter box (locally procured) as a countermeasure.
- If the humidifying element becomes contaminated with impurities (silicone, machining oil, etc.), humidification performance may decrease.
Immerse in a solution of 25 g of citric acid per 1 L of water for about 3 hours, then rinse thoroughly with water. Perform cleaning and rinsing at room temperature.
Depending on the installation location, cleaning may be required about once a month. Frequent cleaning may shorten the replacement interval.
- The service life of the humidifying element is approximately 3 years (4,000 hours) under water hardness conditions of 150 mg/L.
(Under 400 mg/L hardness conditions, the service life is about 1 year (1,500 hours).)
Annual operating time: 10 hours/day × 26 days/month × 5 months = 1,300 hours.

(5) Insulate all piping that passes indoors.

After confirming that all water supply piping connections do not leak, insulate them with the water supply piping insulation cover (accessory). Secure both ends with the clamps (accessory) trimming off any excess. (Refer to Fig. 10)

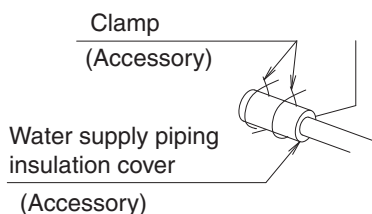


Fig. 10

- Wrap the water supply piping with insulation to prevent condensation from forming.
- In areas where freezing may occur, always take steps to prevent the pipes from freezing.

7 REFRIGERANT PIPING WORK

<For refrigerant piping of outdoor units, see the installation manual attached to the outdoor unit.>

<Execute heat insulation work completely on both sides of the gas piping and the liquid piping. Otherwise, a water leakage can result sometimes.

Use insulation that can withstand temperatures of at least 120°C. Improve insulation of refrigerant piping according to the installation environment.

Refer to the following information as a guide.

- The ambient temperature is 30°C and humidity is 75% to 80%: 15 mm min. in thickness.
- The ambient temperature exceeds 30°C and the humidity exceeds 80%: 20 mm min. in thickness.

Without reinforcement, condensation may form on the surface of the insulation.>

<Refrigerant type to be used (R410A or R32) (Proper operation is not possible if the types of refrigerant are not the same.)>

CAUTION

This product must use a refrigerant (R410A or R32). Obey the following items.

- Refrigerant type to be used (R410A or R32)
To prevent contamination with different oil types, use a different tool for each refrigerant type.
- Before connecting flares, apply ether oil or ester oil to the inside surface of the flare only.
- Only use the flare nut accessory with the unit. Using different flare nuts may cause the refrigerant to leak.
- To prevent dust, moisture or other foreign matter from infiltrating the tube, either pinch the end or cover it with tape.
- Do not allow anything other than the designated refrigerant to get mixed into the refrigerant circuit, such as air, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.
- Ensure good ventilation during work and confirm there are no open flames nearby.
- In the event of refrigerant gas leakage during work, ventilate the area.
- Piping MUST be installed according to instructions given in "7 REFRIGERANT PIPING WORK". Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

- The outdoor unit is charged with refrigerant.
- Be sure to use both a spanner and torque wrench together, as shown in the drawing, when connecting or disconnecting pipes to the unit. (Refer to Fig. 11)
- Refer to the "Table 1" for the dimensions of flare nut spaces.
- When connecting the flare nut, coat only the inner surface of the flare with ester oil or ether oil, rotate three or four times first, then screw in. (Refer to Fig. 12)
- Refer to the "Table 1" for tightening torque.

Table 1

Pipe gauge	Tightening torque	Flare dimension A (mm)	Flare shape
φ 6.4	14.2~17.2 N·m	8.7~9.1	
φ 12.7	49.5~60.3 N·m	16.2~16.6	

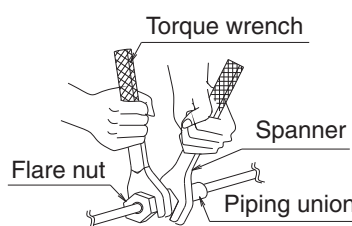


Fig. 11

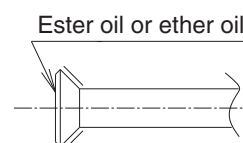


Fig. 12

CAUTION

- Do not overtighten the flare nut. (If the flare nut cracks, refrigerant leakage may result.)
- Do not allow oil to adhere to any parts other than the flared section. (If oil adheres to the drain pan or plastic parts, it may result in deterioration.)

- If a torque wrench is not available, tighten the nut in the following procedure. As the flare nut is tightened with the wrench, the torque will suddenly increase. From that position, tighten the nut to the angle shown on "Table 2".
Once work is complete, make sure there is no gas leaking.

Table 2

Pipe size	Further tightening angle	Recommended arm length of tool
φ 6.4 (1/4")	60~90 degrees	Approx. 150 mm
φ 12.7 (1/2")	30~60 degrees	Approx. 250 mm

- After completing work, **always check that there is no refrigerant leakage**. If tightening is not carried out according to the instructions (tightening is insufficient), refrigerant leakage (slow leak) may result which can lead to equipment malfunction (such as poor cooling or heating performance).
- **After performing nitrogen airtightness tests and refrigerant leakage inspections at the piping connections, be sure to insulate them.** Failure to insulate may result in condensation and water dripping. (Refer to Fig. 13)

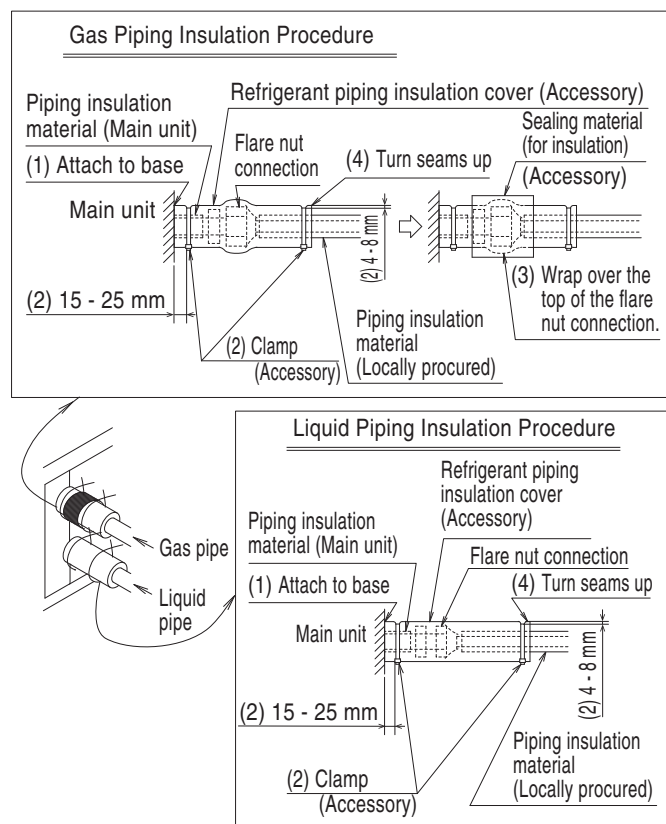


Fig. 13

Precautions for insulation material installation on flare nut connection

- (1) Make sure that refrigerant piping insulation cover (Accessory) comes in close contact with the base so that there will be no air passage at the edges of refrigerant piping insulation cover (Accessory).
- (2) Do not tighten the clamp excessively so as to maintain the appropriate thickness of the insulator.
- (3) Wrap the sealing material (accessory) around the upper part of the flare nut connection. (tightening range: 4~8 mm)
- (4) Turn the seams up (see the figure on the right-hand side).



CAUTION

- **Ensure that insulation of field piping extends to cover pipe projecting from the unit and flare nut connection.** (If piping is exposed, condensation or contact may cause burns, or contact with wiring may result in electric shock or fire.)
- **When reinforcing insulation in high-humidity environments, also reinforce insulation for pipe projecting from the unit and flare nut connection.**
In such cases, do not use the refrigerant piping insulation cover (accessory). Instead, procure additional insulation locally and apply it as required.

- Connect refrigerant piping and branching according to the attached installation manuals that come with the outdoor unit.

Gas piping diameter	Liquid piping diameter
φ 12.7	φ 6.4

- When brazing the refrigerant piping, perform nitrogen replacement first, or perform the brazing (note 2) while feeding nitrogen into the refrigerant piping (note 1), and finally connect the indoor unit using the flare connections. (Refer to Fig. 14)

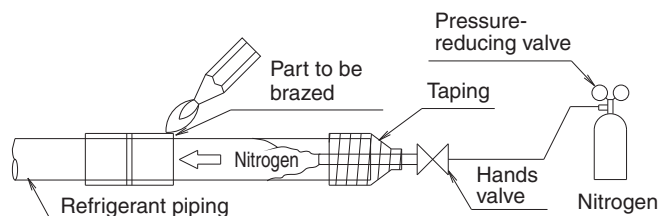


Fig. 14

CAUTION

- When conducting airtightness testing on the indoor unit and connecting pipework, after completing installation of the indoor unit, refer to the installation manual supplied with the connected outdoor unit for airtightness test pressure specifications.
- When brazing a pipe while feeding nitrogen inside the pipe, make sure to set the nitrogen pressure to 0.02 MPa (0.2 kg/cm²) or less using the pressure reducing valve. (This pressure is such that breeze is blown to your cheek.)
- Do not use a flux when brazing the refrigerant pipe joints. Use phosphor copper brazer (BCuP-2: JIS Z 3264/B-Cu93P-710/795: ISO 3677) which does not require flux. (Using a flux containing chlorine may cause the piping to corrode. Using a welding flux containing fluorine may cause the refrigerant lubricant to deteriorate, and affect adversely the refrigerant piping system.)
- When using a brazing torch, confirm using a refrigerant leak detector that there are no refrigerant leakages.
- In the event of a refrigerant leak during brazing work, immediately extinguish any open flames including the torch.
- **When purging gas from the piping for brazing work, always use nitrogen, and never use refrigerant gas.** Failure to observe this may result in fire.
- Do not use anti-oxidants or other similar agent when brazing the pipe joints. Residue can clog the pipes and may cause breakdown of parts.

8 DUCT CONNECTION

<Perform duct work keeping the following things in mind.>

- Use the duct applicable to the model of unit used (Refer to the installation drawing.)
- Do not connect the ducts as shown in Fig. 15.
Abnormal static pressure, reduced airflow, or abnormal noise may result.

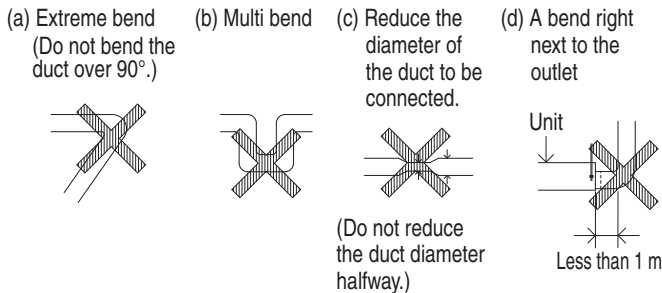


Fig. 15

- Comply with the minimum bend radius specified in the catalogue for the flexible duct in use.
- To prevent air leakage, wrap aluminium tape (locally procured) around the connecting section after the duct connecting flange (accessory) and duct have been connected. (Refer to Fig. 16)
- To prevent short circuit, install the opening of the indoor air intake (SA) as far as from the opening of the exhaust suction (RA).
- Install the two outdoor ducts (inlet and outlet) with a downward slope (1/30 or more) to prevent entry of rainwater.
- Always insulate the outdoor and indoor supply air ducts and the duct connecting flange (accessory) to prevent condensation. (Material: glass wool, thickness 25 mm or more)
Select the insulation thickness considering the ambient temperature around the duct and duct length. (Refer to Fig. 16)



WARNING

Inadequate insulation may result in indoor water leakage and accidents.

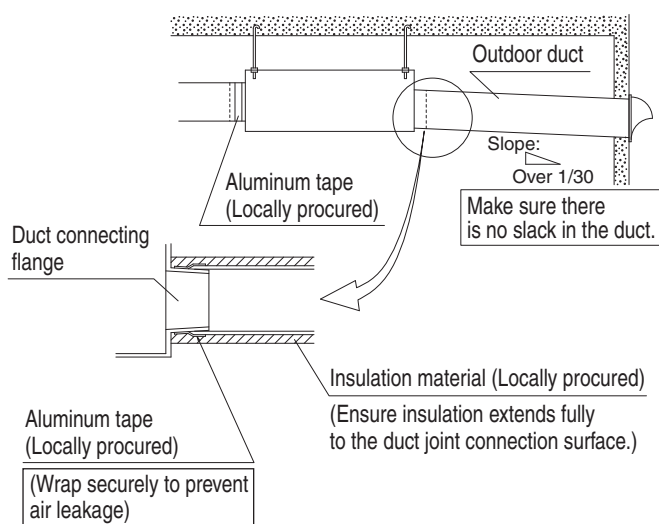


Fig. 16

- If the level of temperature and humidity inside the ceiling is always high, install a ventilation equipment inside the ceiling.
- Insulate the duct and the wall electrically when a metal duct is to be penetrated through the metal lattice and wire lattice or metal lining of a wooden structure wall.
- Using flexible or silent ducts can be effective in reducing the air discharge sound of the supply air to room (SA). Select materials keeping in mind the fan strength and operating sound of the unit. Consult your local dealer for selection.

- Set the pitch between the exhaust air outlet (EA) and the outside air intake (OA) to 3 times the duct diameter.
- Do not use a bent cap or a round hood as the outdoor hood if they might get rained on directly. (We recommend using a deep hood (optional accessory).)
- When using a deep hood, make sure the duct from the deep hood (outer wall) to the unit is at least 1m long.
- During defrost operation, the fan continues to operate to maintain ventilation volume. If draft from the indoor supply air outlet (SA) is a concern, consider changing the discharge direction.
- In the case of suburban buildings where windows and road lighting equipment are close to the air supply opening (OA) and insects tends to swarm around the light, minute insects may intrude indoors through the air supply opening (OA) and air filter. In such cases, the use of a high-performance filter (sold separately) is recommended. However, it may be still difficult to prevent the intrusion of very minute insects. In that case, consider ultimate countermeasures, such as a filter box (Field supply).
- Always install the indoor supply air outlet (SA) and the indoor exhaust air inlet (RA) within the same occupied space. If they are located in different rooms or zones, noise through gaps in doors and odour transfer between rooms may result. Additionally, doors may open and close on their own, or not close properly.
- In cold regions and locations subject to negative pressure indoors or strong outdoor winds, outdoor air may enter through ducts when the unit is not operating, which can cause water to accumulate inside the unit or condensation to form on its exterior surfaces. Therefore, install a motorized damper (locally procured) or take equivalent measures to prevent air ingress.

9 ELECTRIC WIRING WORK

- All wiring must be performed by an authorized electrician.
- All field supplied parts and materials, electric works must conform to local codes.
- Install a wiring interrupter or ground-fault circuit interrupter for the power wiring.
- Use a circuit breaker or earth leakage circuit breaker that is compatible with high-frequency operation. (This unit is equipped with an inverter, and this requirement prevents malfunction of the earth leakage circuit breaker itself.)
- Use copper wire only.
- See also the "Electrical Wiring Diagram label" attached to the control box lid when laying electrical wiring.
- Shut off the power before doing any work.
- When opening the control box lid to perform wiring or other work, discharge any static electricity from your body by touching the product casing, etc., beforehand.
Failure to do so may result in damage to electrical components.
- Do not under any circumstances connect power supply wiring to the control terminal block (X2M). Doing so may cause severe damage to the entire system.
- Install and wire the remote controller in accordance with the remote controller installation manual.
- This system consists of multiple indoor units. Mark each indoor unit as unit A, unit B..., and be sure the terminal board wiring to the outdoor unit and BS unit are properly matched. If wiring and piping between the outdoor unit and an indoor unit are mismatched, the system may cause a malfunction.
- Make sure the ground resistance is no greater than 100Ω . This value can be as high as 500Ω when using a ground fault circuit interrupter since the protective ground resistance can be applied.
- Do not let the earth wire should come in contact with gas pipes, water pipes, lighting rods, or telephone earth wires.
 - Gas pipes: gas leaks can cause explosions and fire.
 - Water pipes: cannot be grounded if hard vinyl pipes are used.
 - Telephone ground and lightning rods: the ground potential when struck by lightning gets extremely high.

- This unit is equipped with an inverter. To reduce noise emissions that may affect other equipment and to discharge any electric charge that may build up on the unit enclosure due to leakage current, always carry out earthing work.
- Do not install a power factor correction capacitor under any circumstances. This unit is equipped with an inverter, and installing a power factor correction capacitor not only fails to improve the power factor but may also cause abnormal overheating of the capacitor due to harmonic currents, leading to failure or other hazards.
- Do not touch the printed circuit board when performing wiring work. Doing so may cause equipment failure.
- Do not turn on the power supply (switch, wiring interrupter or ground fault circuit interrupter) until all other works are done.

SPECIFICATIONS FOR FIELD SUPPLIED FUSES AND WIRE

Model	Power supply wiring and earth wiring			Remote controller wiring Transmission wiring		Residual current device
	Field fuses 	Wire	Size	Wire	Size	
VKM50JMV1	15 A	H05VV-U3G	Follow local standards	Sheathed wire (2 wire)	0.75-1.25 mm ²	Must comply with applicable legislation
VKM80JMV1						
VKM100JMV1						

NOTE

- If the wiring is in a place where people it can be easily touched by people, install a leak interrupter to prevent electric shock.
- When using a ground-fault circuit interrupter, make sure to select one useful also to protection against overcurrent and short-circuit.
If you use a leak interrupter which is designed for protecting again ground faults, be sure to combine it with a wiring interrupter or an load switch that has a fuse.
- The length of the transmission wiring and remote controller wiring are as follows.

Length of outdoor-indoor transmission wiring
... max 1000 m (total wiring length 2000 m)

Length of remote controller wiring between indoor unit and remote controller ... max 500 m

ELECTRICAL CHARACTERISTICS

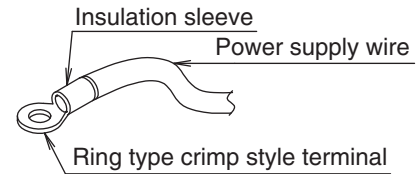
Units				Power supply		Fan motor	
Model	Hz	Volts	Voltage range	MCA	MFA	kW	FLA
VKM50JMV1	50	220-240 V	Max. 264 V Min. 198 V	2.8	15	0.249×2	1.1×2
VKM80JMV1				4.0	15	0.249×2	1.6×2
VKM100JMV1				4.5	15	0.249×2	1.8×2

MCA: Min. Circuit Amps (A) MFA: Max. Fuse Amps (A)
kW: Fan Motor Rated Output (kW) FLA: Full Load Amps (A)

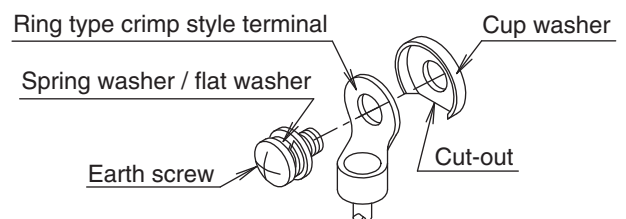
10 WIRING EXAMPLE AND HOW TO SET THE REMOTE CONTROLLER

<Wiring precautions>

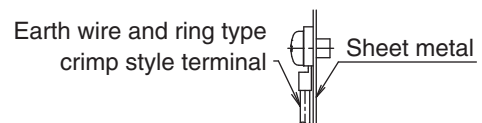
- Always make the connection using ring type crimp style terminals that have been insulated, for example, by fitting an insulation sleeve (locally procured).



- Use specified wires, make secure connections, and clamp the sheath with clamps (accessory) so no external force is applied to the terminal.
- Make sure to route the earth wire through the cut-out in the cup washer, ensuring other wires do not get pinched. (Failure to observe this will result in insufficient earth contact, negating the earthing effect.)



- Connect the earth wire and ring type crimp style terminal such that they are flush against the sheet metal.

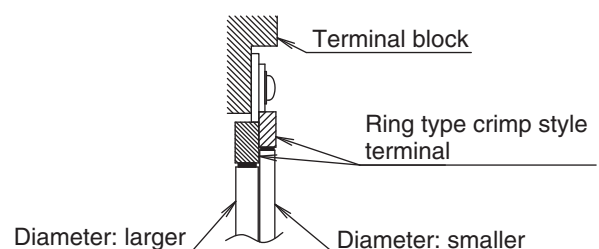


Ensure it is flush against the sheet metal

- Use an appropriate screwdriver for tightening the terminal screws.
A screwdriver that is too small may damage the screw head and make proper tightening impossible.
- Overtightening terminal screws may damage them. Refer to the table below for terminal screw tightening torques.

	Tightening torque (N·m)
Control terminal block (X2M)	0.79~0.97
Power supply terminal block (X1M)	1.32~1.62
Earth terminal	1.44~1.94

- Do not solder stranded wire.
- If connecting 2 wires to 1 terminal, arrange the crimp terminals back-to-back.
In such cases, place the wire with the smaller diameter on top.

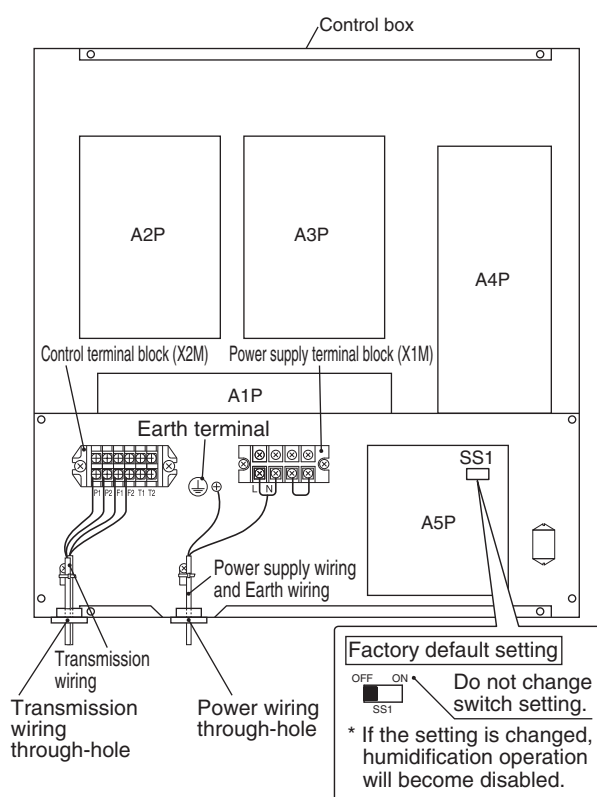
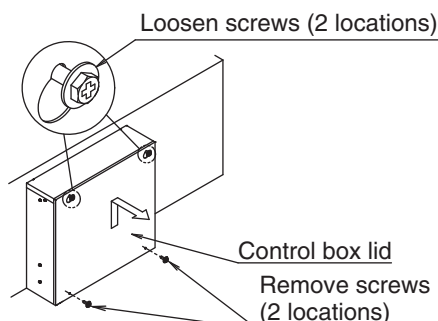


10. 1 OPENING AND SHUTTING THE CONTROL BOX AND CONNECTING THE WIRING

CAUTION

Be sure to power off before opening the control box.

- Remove the control box lid on the side as shown below, and perform the wiring connections.
* After fastening with the clamp, trim any excess band ensuring no sharp edges remain.



CAUTION

- See "Electrical Wiring Diagram label" on the backside of the lid of the control box for electric wiring work.
- Be sure to attach the sealing material or putty (locally procured) to hole of wiring to prevent the infiltration of water as well as any insects and other small creatures from outside. Otherwise a short-circuit may occur inside the control box.
- When clamping the wires, be sure no pressure is applied to the wire connections by using the accessory clamping material to make appropriate clamps. Also, when wiring, make sure the lid on the control box fits snugly by arranging the wires neatly and attaching the control box lid firmly. When attaching the control box lid, make sure no wires get caught in the edges. Pass wiring through the wiring through holes to prevent damage to them.
- Make sure the remote controller wiring, the wiring between the units, and other electrical wiring do not pass through the same locations outside of the unit, separating them by at least 50 mm, otherwise electrical noise (external static) could cause mistaken operation or breakage.

10. 2 CONNECTING POWER SUPPLY WIRING AND EARTH WIRING

- Pull the power supply wiring together with the earth wire through the wiring through-hole (high voltage) into the control box. Connect the power supply wires to the power terminal block (X1M) [L, N] and the earth wire to the earth terminal, and then securely fasten them using clamps (accessory). (Refer to Fig. 17)

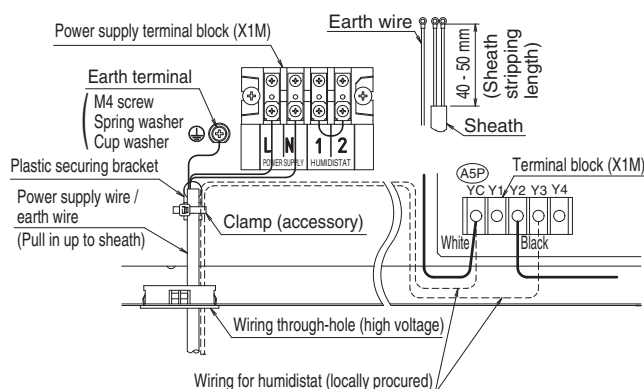


Fig. 17

10. 3 REMOTE POWER SUPPLY WIRING, TRANSMISSION WIRING, COMPUTERISED CONTROL WIRE

- Pull the remote controller wiring and transmission wiring through the wiring through-hole (low voltage) into the control box. Connect the remote controller wiring to the control terminal block (X2M) [P1, P2] and the transmission wiring to [F1, F2], and then securely fasten them using clamps (accessory).
- Outside the unit, do not route low voltage wiring (remote controller and transmission wiring) and high voltage wiring (power supply, earth, and other electrical wiring) together; keep them at least 50 mm apart. Electrical noise (interference) may cause malfunction or failure.

- Make sure to connect the remote controller and transmission wiring to the control terminal block (X2M) correctly. (Refer to Fig. 18)

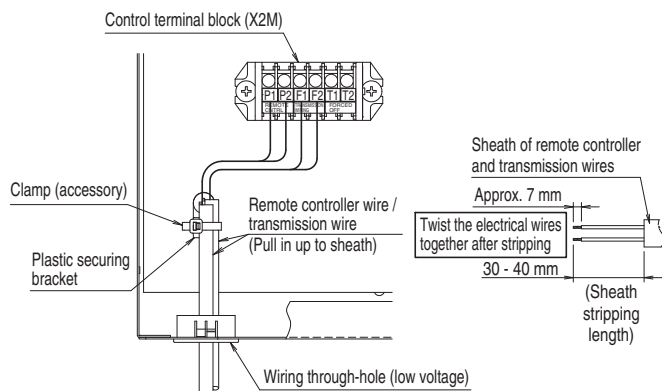


Fig. 18

[PRECAUTIONS]

- Refer to the "Remote Controller Installation Manual" on how to install and lay the wiring for the remote controller.
- Do not, under any circumstances, connect the power wiring to the remote controller or transmission wiring terminal block. Doing so can destroy the entire system.
- Connect the remote controller and transmission wiring their respective terminal blocks.

10. 4 WIRING FOR THE HUMIDITY REGULATOR (LOCALLY PROCURED)

- If you wish to limit the upper humidity, install a humidistat (locally procured).
 - (1) Route it into the control box through the wiring through-hole (for high voltage wires) together with the power supply wiring.
 - (2) Connect the humidistat (locally procured) wiring to the printed circuit board (A5P) terminal block (X1M) [YC, Y3].
Connect the YC terminal together with the existing white lead.
Arrange the crimp terminals back-to-back as described in <Wiring precautions>.
 - (3) Secure together with the power supply wiring using clamps. (Refer to Fig. 17)

Humidistat (locally procured) wiring specifications

Wiring specifications	Sheathed wire (2 wire)
Size	0.75 - 1.25 mm ²
Length	MAX. 100 m
External contact specifications	Normally closed contact (Current tolerance 10 mA – 0.5 A)

- When closing the control box lid, ensure no wires are pinched and tighten with the 2 removed screws and the 2 loosened screws.



CAUTION

- If using a humidistat (locally procured), install one per Heat Reclaim Ventilator unit.
Controlling more than one Heat Reclaim Ventilator unit with a single humidity controller (locally procured) may prevent normal humidification operation and result in water leakage, etc.

<Sealing procedure for wiring through-holes>

After completing wiring, to prevent ingress of water and small animals from outside the unit (which could result in a short circuit inside the control box), wrap the sealing material (for wiring) (accessory) around both the power supply / earth wiring and the remote controller / transmission wiring, and seal the wiring through-holes so that no gaps remain. (Refer to Fig. 19)

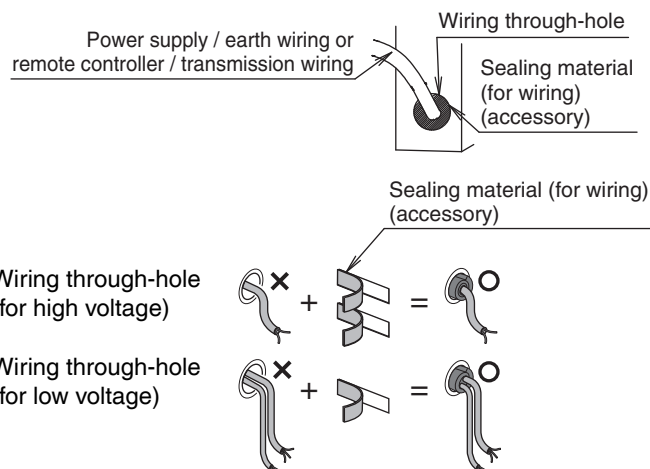
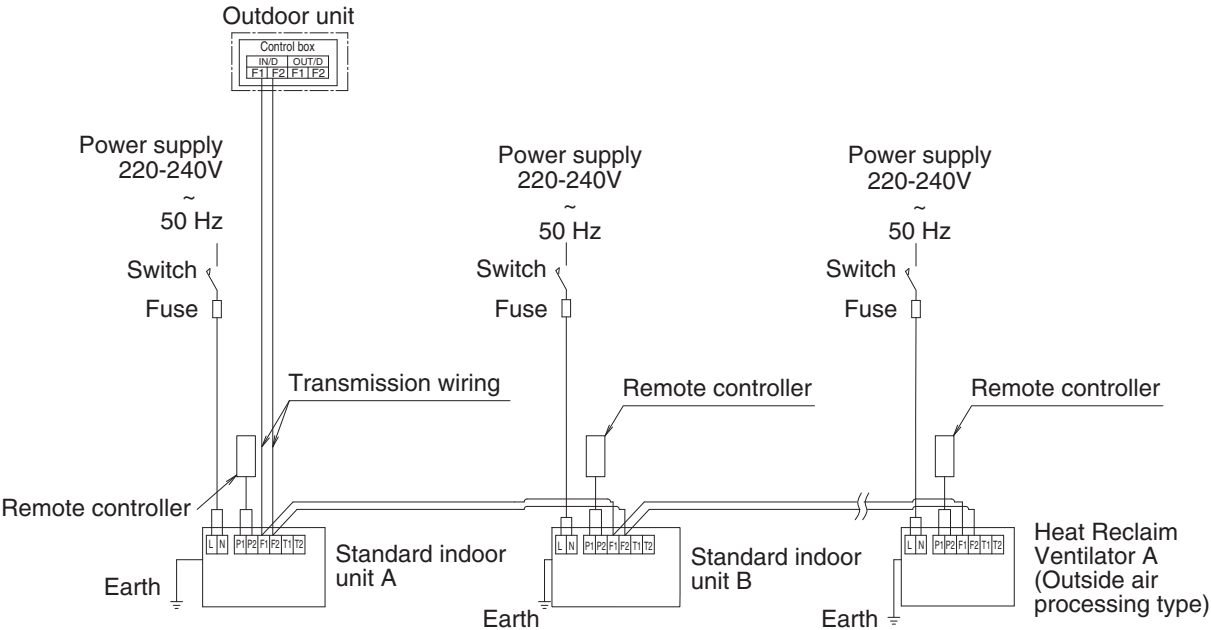


Fig. 19

10. 5 WIRING EXAMPLE

- This unit can be used as an independent system for processing outside air, but CANNOT be used as part of the combined operation system used together with indoor units (VRV system air conditioners).
- This unit does not permit control by 2 remote controllers (controlling 1 indoor unit with 2 remote controllers).

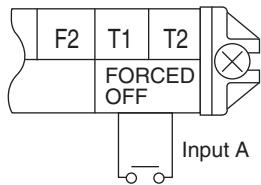
System example



10. 6 EXTERNAL REMOTE CONTROL
(FORCED OFF AND ON/OFF OPERATION)

⚠ WARNING
In case of R32 refrigerant, terminal connections T1/T2 are for fire alarm input ONLY. Fire alarm has a higher priority than R32 safety and shuts the entire system down.

- Wire specifications and how to perform wiring
Connect the input from outside to terminals T1 and T2 of the terminal block for remote controller.



Wire specification	Sheathed wire (2-wire)
Gauge	0.75 - 1.25 mm ²
Length	Max. 100 m
External terminal	Contact that can ensure the minimum applicable load of 15V DC, 1mA.

- Actuation
The following table explains FORCED OFF and ON/OFF OPERATIONS in response to Input A.
- | FORCED OFF | ON/OFF OPERATION |
|--|--------------------------------|
| Input ON stops operation (impossible by remote controllers.) | Input OFF → ON turns ON unit. |
| Input OFF enables control by remote controller. | Input ON → OFF turns OFF unit. |
- How to select FORCED OFF and ON/OFF OPERATION
Enter the FORCED OFF and ON/OFF OPERATION selection using the local "External ON/OFF input" settings based on "11 FIELD SETTING AND TEST RUN".

10. 7 CENTRAL CONTROL

- If control is performed with a central device (central management controller, etc.), group number needs to be set with the remote controller. See the manual of each central device for detail.
- Even when using a central device, the remote controller is still required, so it should be installed in a location where operation is possible.

11 FIELD SETTING AND TEST RUN

11. 1 PERFORM FIELD SETTINGS WITH THE REMOTE CONTROLLER

- Make sure the control box lids are closed on the indoor and outdoor units.
- Depending on the type of installation, make the field settings from the remote controller after the power is turned on, following the "Field Settings" manual which came with the remote controller.
Lastly, make sure the customer keeps the "Field Settings" manual, along with the operating manual, in a safe place.

11. 1. 1 TO CHANGE SETTINGS

Using the remote controller to make Heat Reclaim Ventilator unit settings

<Initial setting>

- MODE NO. 12–19 cannot be used. Use MODE NO. 22–29.
- The settings (format: e.g. 19(29)-1-02), that are used in this chapter are composed of 3 parts, divided by "-":
- MODE NO.: e.g. 29
 - FIRST CODE NO.: e.g. 1
 - SECOND CODE NO.: e.g. 02

11.1.2 SETTINGS AND SETTING NUMBERS

- SECOND CODE NO. which are enclosed by bold lines are the factory settings.
- Do not set anything not shown on the list. If the applicable functions are not available, they will not be displayed.
- When “Filter sign indication setting” or “Nighttime free cooling operation setting” is changed, explain set contents to the customer.

Description of setting	MODE NO.	FIRST CODE NO.	SECOND CODE NO.														
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
External ON/OFF input ^(e)	12 (22)	1	Forced OFF	ON/OFF operation	Protection device connected												
Auto-restart after power failure		5	OFF	ON													
R32 leak safety system ^(a)	15 (25)	13	OFF	ON	OFF cancelled after 24 h												
Interval time for filter sign indication	17 (27)	0	Approx. 2500 hours	Approx. 1250 hours	No counting												
Nighttime free cooling operation ON/OFF and starting time ^(b)		1	OFF	ON 2 hours later	ON 4 hours later	ON 6 hours later	ON 8 hours later										
Initial fan speed		4	High	Ultra High													
Setting for cold areas (Fan operation during heating thermo OFF) ^(c)		5	—/—			L/L				—/—							
Fan operation during defrost / oil return / hot start ^(c)			—/—			OFF/OFF				OFF/OFF							
Nighttime free cooling (Fan settings) ^(b)		6	High	Ultra High													
Target temperature for nighttime free cooling ^(b)		7	18°C	19°C	20°C	21°C	22°C	23°C	24°C	25°C	26°C	27°C	28°C	29°C	30°C		
Automatic ventilation control table ^(d)	18 (28)	6	Linear		Tap A												
Fresh-up for supply air / Fresh-up for exhaust air		7	Supply air	Exhaust air													
Filter contamination inspection		11	No Action	Reset cumulative fan operating time	Forced filter sign check												
Ventilation forget-to-off control ^(f)		12	Over 12 hours	8–12 hours	Less than 8 hours							OFF					
Filter contamination detection	19 (29)	0	Check using fan steps 1–15	Check using new fan step	Check by time	Determine target for fan steps 1–15	Determine target for new fan step										
Supply air fan step ^(g)		2	Step1	Step2	Step3	Step4	Step5	Step6	Step7	Step8	Step9	Step10	Step11	Step12	Step13	Step14	Step15
Exhaust air fan step ^(g)		3	Step1	Step2	Step3	Step4	Step5	Step6	Step7	Step8	Step9	Step10	Step11	Step12	Step13	Step14	Step15
Shift reference CO ₂ concentration ^{(d)(h)}		7	0	+200	+400	+600	–200	–400	–600								
Fan residual operation when heater connected		8	Prohibited	Prohibited	Permitted	Permitted											
Normal ventilation airflow ^{(d)(i)}		9	Ultra High	High			CO ₂ sensor controlled										
R32 safety ventilation system ^(j)		15	OFF	ON													
Fresh-up ON/OFF	1A	0	OFF	ON													

 : Factory default setting

- (a) In case R410A refrigerant is used, set to 15(25)-13-01.
- (b) In case the R32 safety system is active, the nighttime free cooling is disabled.
- (c) (Supply air/Exhaust air), e.g. Low/Low means: Supply air low/Exhaust air low.
- (d) Can be set when using a CO₂ sensor (sold separately).
- (e) In case R32 refrigerant is used, terminal connections T1 T2 are for fire alarm input ONLY.
- (f) Indicates estimated daily operating hours.
- (g) See the technical data book for pressure drop curves and selection of fan curves (step 1 to 15).
- (h) This setting is used when shifting the reference CO₂ concentration (unit: ppm).
- (i) When "Auto" is selected as the ventilation rate, this setting increases normal ventilation airflow to enhance the outdoor-air cooling effect.
- (j) In case R32 refrigerant is used, set to 19(29)-15-02 (safety ON). In case R410A refrigerant is used, set to 19(29)-15-01 (safety OFF).

(1) Adjustment set temperature for the local situation:

When the RA is not taken directly from the room (e.g. not connecting the RA duct), the temperature of RA might be higher than the set temperature of the standard indoor unit. In that case, be sure to adjust set temperatures of heating (humidification) and cooling in accordance with the local situation.

- Set temperature at factory setting: Heating (humidification) ...21°C, Cooling (suction temperature at refrigerant heat exchanger) ... 26°C
- Configurable range of set temperature: Heating (humidification) ...14 to 26°C, Cooling ...18 to 33°C

The correlation is as follows:

Cooling set temperature = Heating (humidification) set temperature + Cooling set temperature range (ex. 26°C = 21°C + 5°C)

MODE NO.	FIRST CODE NO.	Description of setting	SECOND CODE NO.												
			01	02	03	04	05	06	07	08	09	10	11	12	13
12 (22)	4	Cooling set temperature range	0°C	1°C	2°C	3°C	4°C	5°C	6°C	7°C					
14 (24)	2	Heating (humidification) set temperature	14°C	15°C	16°C	17°C	18°C	19°C	20°C	21°C	22°C	23°C	24°C	25°C	26°C

(2) Conditions for thermo ON/OFF based on outdoor air temperature for cooling/heating

The outdoor air (OA) temperature is detected by the outdoor-air thermistor of the heat exchanger.

Thermo ON occurs when both the outdoor air temperature condition and set temperature condition (1) for thermo ON are met.

- Outdoor air threshold temperature at factory setting: Heating (humidification) ...15°C, Cooling (outdoor temperature) ... 25°C
- Configurable range for outdoor air threshold temperature: Heating (humidification) ...10 to 18°C, Cooling ...19 to 30°C

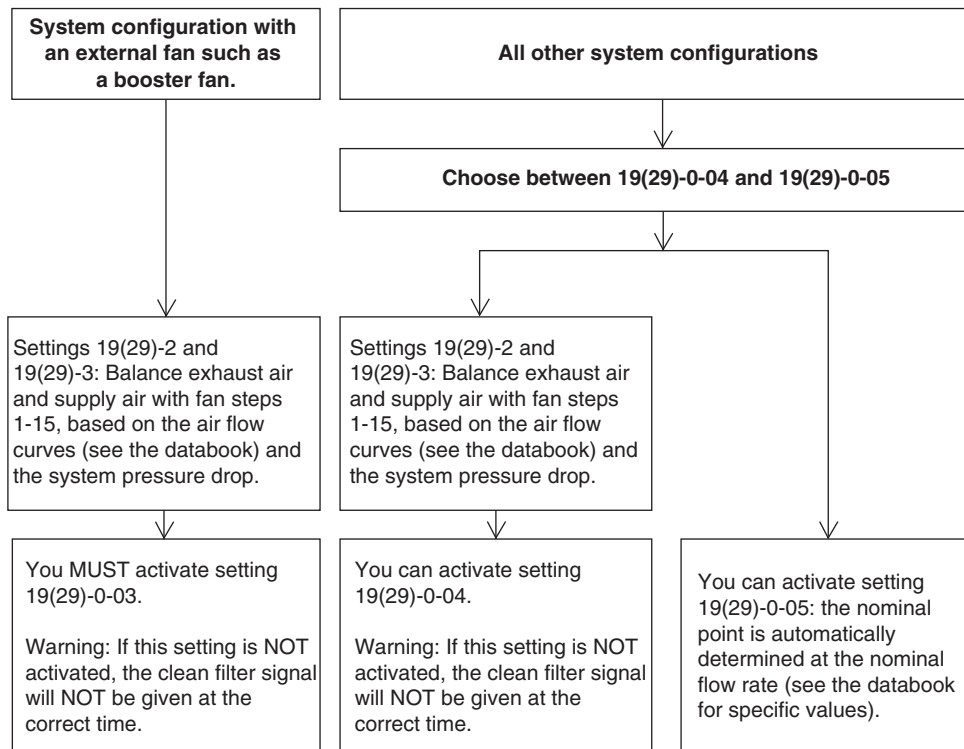
The correlation is as follows:

Outdoor air threshold temperature for cooling mode = Outdoor air threshold temperature for heating mode + Outdoor air threshold temperature range for cooling mode (ex. 25°C = 15°C + 10°C)

MODE NO.	FIRST CODE NO.	Description of setting	SECOND CODE NO.												
			01	02	03	04	05	06	07	08	09	10	11	12	13
14 (24)	3	Outdoor air threshold temperature range for cooling mode	4°C	5°C	6°C	7°C	8°C	9°C	10°C	11°C	12°C	13°C	14°C	15°C	
	4	Outdoor air threshold temperature for heating mode	10°C	11°C	12°C	13°C	14°C	15°C	16°C	17°C	18°C				

(3) Fan airflow and filter contamination inspection settings

Setting 17(27)-4: First choose the fan speed. Set it to high or ultra-high.



<About setting 19(29)-0-04 and 19(29)-0-05>

- When you have configured setting 19(29)-0-04 successfully, the system automatically changes it to setting 19(29)-0-01.
- When you have configured setting 19(29)-0-05 successfully, the system automatically changes it to setting 19(29)-0-02.

NOTE

If the ducting is changed, install clean filters and reconfigure setting 19(29)-0-04 or 19(29)-0-05. Otherwise the signal to clean the filters will come too soon. Do not adjust the dampers when setting 19(29)-0-04 or 05 is activated.

- If the controller is switched off while activating setting 19(29)-0-04 or 19(29)-0-05, configuration is aborted. When you switch the controller back on, the function starts from the beginning.
- Setting 19(29)-0-04 takes between 1 and 6 minutes to complete.
You can check if the setting was completed successfully by checking if the field setting is changed to 0-01.
- Setting 19(29)-0-05 takes between 3 and 35 minutes to complete.
You can check if the setting was completed successfully by checking if the field setting is changed to 0-02.

NOTE

While activating setting 19(29)-0-04 and 19(29)-0-05, the unit is set to heat recovery and the fan is on high or ultra high. After configuration, the settings are returned to what they were before the configuration.

- These settings can ONLY be activated with clean filters.
- The function starts as soon as it is selected and the controller is on.
- Setting 19(29)-0-04 CANNOT be configured if the outside temperature is $\leq -10^{\circ}\text{C}$, which is out of the operation range.
- Setting 19(29)-0-05 CANNOT be configured if the outside temperature is $\leq 5^{\circ}\text{C}$. In this case, error 65-03 is shown and the unit stops working. Change the setting to 19(29)-0-04.
- The setting CANNOT be configured if there are alerts or errors present.

- If booster fans are used, you can ONLY configure setting 19(29)-0-03.
- (4) To deactivate the R32 safety system
During a test run of the system and during maintenance, deactivate the R32 safety system (active by default):
- Set 19(29)-15-01
 - Set 15(25)-13-03 (= OFF cancelled after 24 h) OR 15(25)-13-01 (=OFF)
After completion of test run or maintenance, activate the R32 safety system again:
 - Set 19(29)-15-02
 - Set 15(25)-13-02

11. 2 PERFORM A TEST RUN ACCORDING TO THE OUTDOOR UNIT'S INSTALLATION MANUAL

- (1) Make sure the control box of the unit is closed before turning on power.
- (2) Make a test run following the operation manual of the outdoor unit.
 - The controller displays  on the home screen when an malfunction occurs. Check the malfunction code on the error screen to identify the point of trouble. Refer to the remote controller operation manual for instructions on viewing the error screen. An explanation of malfunction codes and the corresponding trouble is provided in "CAUTION FOR SERVICING" of the outdoor unit. If the display shows any of the following, there may be a fault with the installation, a wiring fault, or the power may not be switched on. Check again.

Code ^(a)	Description
U3	• Test run has not been completed successfully.
U4	• The power on the outdoor unit is off. • The outdoor unit has not been wired for power supply.
U5	• Incorrect wiring for the transmission wiring and the wiring (the remote controller wiring or FORCED OFF wiring.)
UH	• The transmission wiring is cut.
6A	• Damper malfunction. (Power voltage shortage)
A8	• Fan driver malfunction. (Power voltage shortage)
A6-22	• Unstable fan rpm: failure of filter contamination check or failure of function 19(29)-0-04/-05
A6-28 UJ-37	• Air flow rate dropped below legal threshold limit (for R32 application) ^(b)
A6-29 UJ-38	• Air flow rate approaches legal threshold limit (for R32 application) ^(b)
A6-30	• Warning for air flow rate drop (for R32 application) ^(b)
UJ-35	• Find the cause in the error history.
65-03	• Functions 19(29)-0-04/-05 not possible due to low outdoor temperature
No display	• The power on the Heat Reclaim Ventilator is off. • The Heat Reclaim Ventilator has not been wired for power supply. • Incorrect wiring for the remote controller wiring and the wiring (the transmission wiring or the FORCED OFF wiring.) • The remote controller wiring is cut.

^(a) In case of a code with a grey background, this unit still operates. Inspect and repair the unit as soon as possible.

^(b) These error codes only apply when the R32 safety system is active. See "SETTINGS AND SETTING NUMBERS" and operation manual.

11. 3 RUN THE HUMIDIFIER

- (1) Check that the water supply piping is connected securely.
- (2) Open the water supply shut-off valve. (No water will be supplied at this time.)
- (3) Run the Heat Reclaim Ventilator unit in heating mode. (See the operating manual accessory with the indoor unit for details on how to run the unit in heating mode.) The water supply will start and the humidifier will begin operation.
- (4) After starting heating (humidifying), the sound of the water supply solenoid valve will be heard every 3 or 4 minutes (a clicking sound), so listening for that clicking sound let the unit run for 30 minutes to make sure that humidifying operation is normal.

11. 4 POST-TEST RUN CHECK

Post-test run check

Check item	Problems if defective	Check column
Have you performed a test run and confirmed its successful completion?	Operation not possible	
Is air flowing out from each outlet? Is air being drawn in from each inlet?	Insufficient ventilation / noise	
Have you confirmed that no abnormal vibrations or noises are generated during operation?	Vibration / noise	

⚠ CAUTION

- After completing the test run, perform the check in "2 BEFORE INSTALLATION".
- If carpentry work is not completed when a test run is finished, tell the customer not to run the humidifier for the protection of indoor unit and Heat Reclaim Ventilator until it is completed.
- If the humidifier is run, paint, particles generated from adhesive and other materials used for carpentry work may cause Heat Reclaim Ventilator to get dirty, causing splash or leakage of water.

For test run personnel

⚠ CAUTION

- After completing the test run, make sure of the following before handover to the customer:
The heat exchange element, air filter, and humidifying element are installed in their proper positions.
The maintenance cover, inspection lid, and control box lid are properly attached.

DAIKIN INDUSTRIES, LTD.

Osaka Umeda Twin Towers South,
1-13-1, Umeda, Kita-ku, Osaka, 530-0001, Japan

DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium