



Ventilation

# Technical Data

Heat Reclaim Ventilation



EEDEN13-205

HRV design guide



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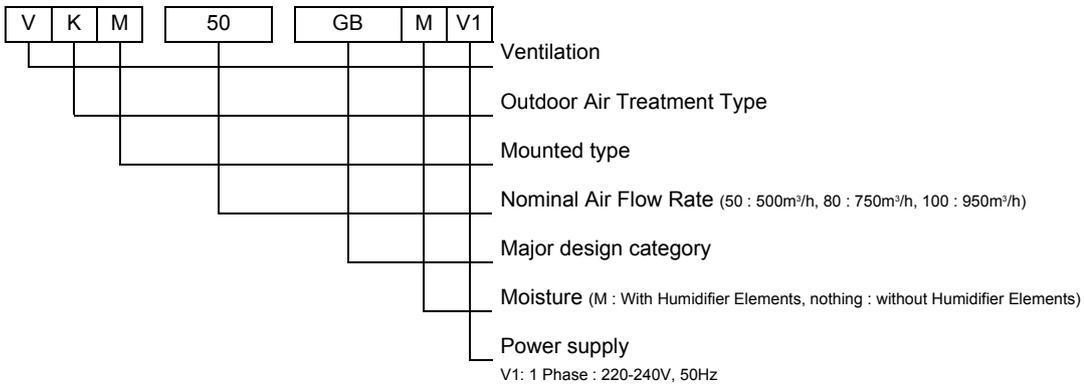
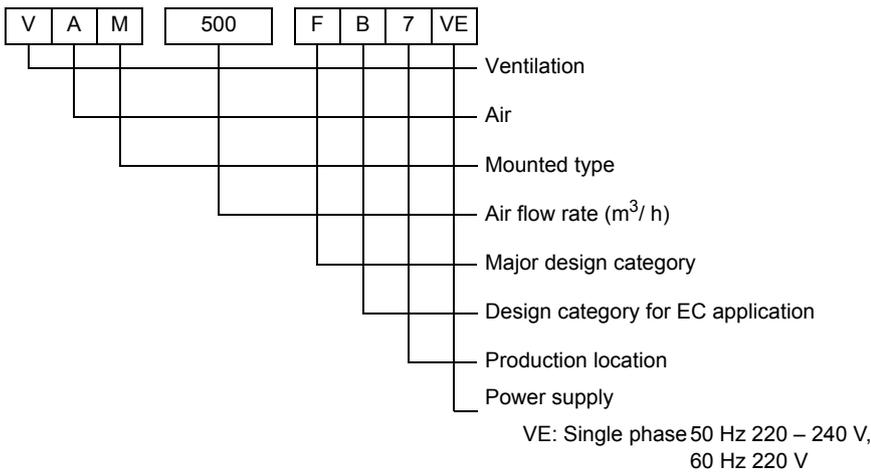
# TABLE OF CONTENTS

## HRV design guide

1	Nomenclature .....	2
2	HRV Features .....	3
	Interlocked operation with VRV & Sky Air .....	3
	Energy Saving .....	4
	FRESH-UP operation .....	7
	Element (HEP element) .....	7
	Easy Installation and service maintenance .....	8
	Additional Optional accessories .....	8
	Unique Control System .....	9
3	Installation .....	10
	Reducing operating sound .....	10
	Centralized piping .....	12
	Cautions .....	13
	Cautions in installation .....	15
	Duct Work .....	16
	Electrical wiring procedure .....	17
4	Optional accessories .....	18
	KRP50-2 / KRP50-2A90 (for VAM-FA) .....	18
	KDDM24B50, KDDM24B100: Silencer (for VAM-FB) .....	19
	BRP4A50: Heater control kit (for VAM-FA) .....	20
5	Control systems .....	23
	DCS302C51: Centralized control .....	23
	Introduction of control system .....	26
	Basic patterns .....	28
	Applicable patterns .....	37
	Additional information on control of VKM-GB(M) units .....	45

# 1 Nomenclature

1



Check with your sales representative if the unit is sold in your country.

## 2 HRV Features

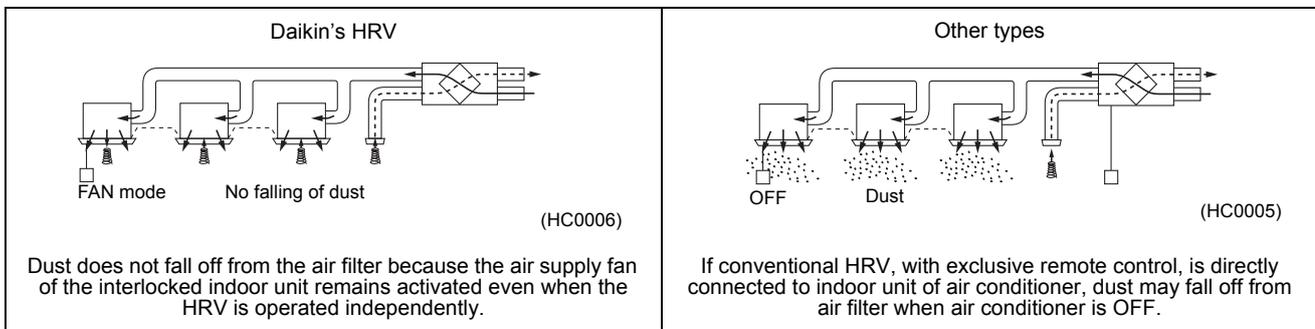
### 2 - 1 Interlocked operation with VRV & Sky Air

- 1 Simultaneous ON / OFF with the indoor unit by the indoor unit remote control.
- 2 HRV independent operation during air conditioning off season by the indoor unit remote control.
- 3 Automatic ventilation mode changeover: Auto / Heat Recovery / Bypass
- 4 Fan speed changeover by the indoor unit remote control: High / Low, Ultra-High / High, Ultra-High / Low
- 5 Precooling / heating control function setting to delay the start of ventilation during air conditioner start-up to realize the high energy saving efficiency.
- 6 FRESH-UP operation setting
- 7 Filter sign display notifies the time for cleaning the filter
- 8 No need to purchase or install the HRV exclusive remote control
- 9 Advantage to IAQ (Internal Air Quality.)

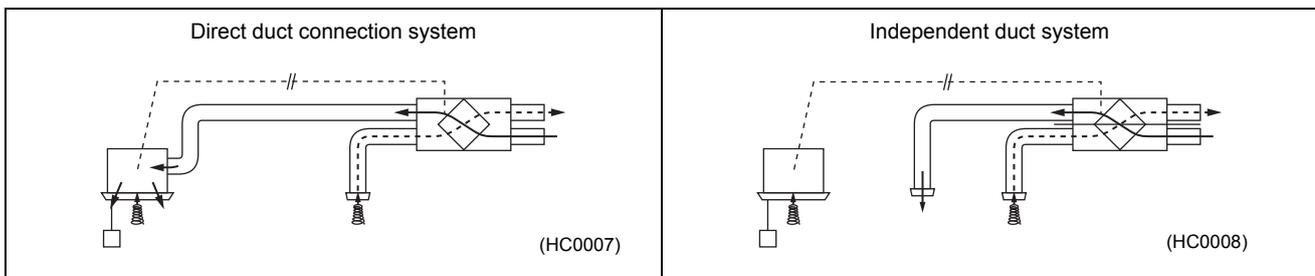
**NOTE**

- 1 5-7 can be set at the initial setting only.

Type	Interlocked operation with air conditioner	HRV independent operation
Structure	<p style="text-align: right;">(HC0228)</p>	<p style="text-align: right;">(HC0229)</p>
Features	<ul style="list-style-type: none"> <li>• Simultaneous operation by air conditioner's remote control is available</li> <li>• Fan speed can be set at the initial setting.</li> </ul>	<ul style="list-style-type: none"> <li>• Both simultaneous operation by air conditioner's remote control and independent operation by HRV exclusive remote control are available</li> <li>• Fan speed can be changed by switch of HRV (High / Low, High / Ultra-high, Low / Ultra-high)</li> </ul>
Connectable Indoor unit	VRV (all indoor unit), SkyAir (Optional connecting PCB is required.)	



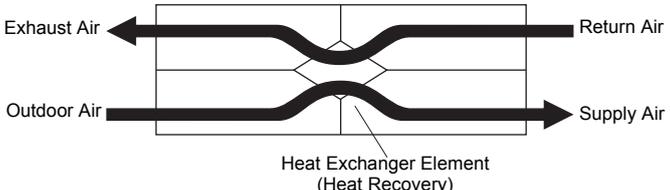
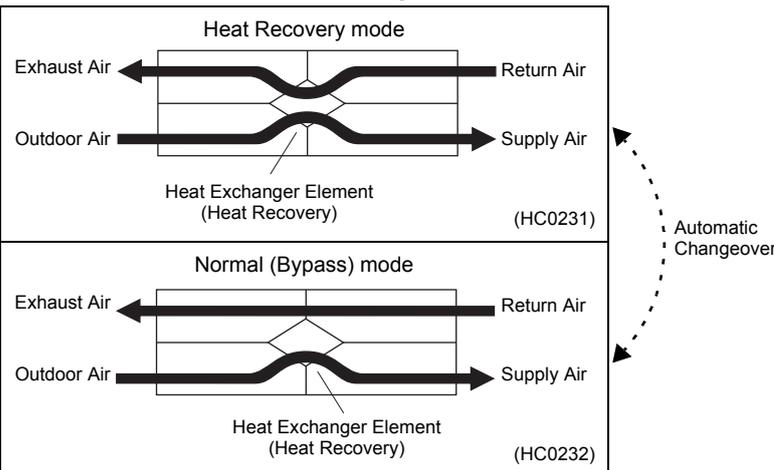
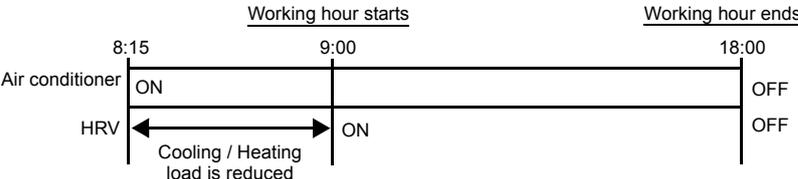
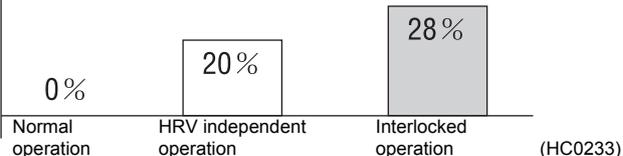
### Installation Examples



## 2 HRV Features

### 2 - 2 Energy Saving

2

<p>By heat recovery operation</p> <p>Approx. 20% reduction of heating / cooling load</p> <p>+</p>	<p>HRV unit recovers the thermal energy during cooling / heating operation of air conditioner. HRV reduces the cooling / heating load drastically and enhances the heating / cooling efficiency.</p>  <p style="text-align: right;">(HC0230)</p>												
<p>By setting to automatic ventilation mode</p> <p>Approx. 6% reduction of heating / cooling load</p> <p>+</p>	<p>Proper use of Heat recovery ventilation and normal ventilation saves energy. When the cooling operation is required in winter, use of heat recovery ventilation is not efficient because the outdoor air temperature is normally lower than that of the indoor. Thus, the proper use of ventilation mode enhances the heating / cooling efficiency.</p> <p>Automatic Ventilation mode changeover</p> <table border="1" data-bbox="635 694 1417 896"> <thead> <tr> <th>Operation</th> <th>Sensor of ventilation</th> <th>Decision of mode (Which is more energy efficient?)</th> </tr> </thead> <tbody> <tr> <td></td> <td>Difference between indoor / outdoor temp.</td> <td></td> </tr> <tr> <td>Cooling</td> <td>Indoor temp. &gt; Outdoor temp. Indoor temp. &lt; Outdoor temp.</td> <td>Normal ventilation (Bypass) Heat recovery ventilation</td> </tr> <tr> <td>Heating</td> <td>Indoor temp. &gt; Outdoor temp. Indoor temp. &lt; Outdoor temp.</td> <td>Heat recovery ventilation Normal ventilation (Bypass)</td> </tr> </tbody> </table> <p>Refer to the CONTROL for the mode changeover.</p> 	Operation	Sensor of ventilation	Decision of mode (Which is more energy efficient?)		Difference between indoor / outdoor temp.		Cooling	Indoor temp. > Outdoor temp. Indoor temp. < Outdoor temp.	Normal ventilation (Bypass) Heat recovery ventilation	Heating	Indoor temp. > Outdoor temp. Indoor temp. < Outdoor temp.	Heat recovery ventilation Normal ventilation (Bypass)
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Cooling	Indoor temp. > Outdoor temp. Indoor temp. < Outdoor temp.	Normal ventilation (Bypass) Heat recovery ventilation											
Heating	Indoor temp. > Outdoor temp. Indoor temp. < Outdoor temp.	Heat recovery ventilation Normal ventilation (Bypass)											
<p>By Precooling / heating operation</p> <p>Approx. 2% reduction of heating / cooling load</p> <p>  </p>	<p>The load is reduced at startup of the air conditioner by the following control. Before the working hour, the room air is clean. Therefore, the startup of HRV can be delayed.</p> 												
<p>Total 28% reduction of heating / cooling load</p>	<p>Reduction of heating / cooling load (%)</p>  <p style="text-align: right;">(HC0233)</p>												

**NOTE**

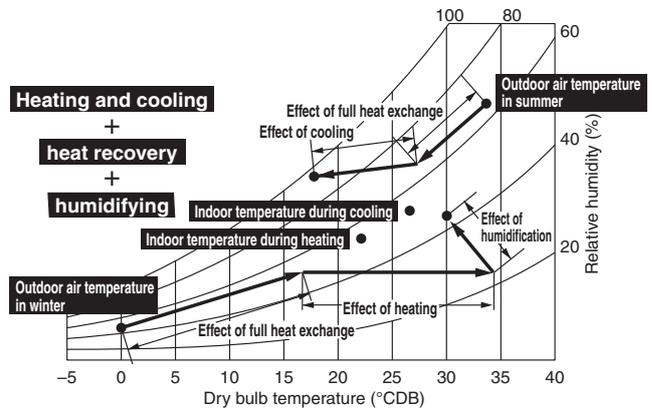
1 The total heating / cooling load may vary depending on the climate or the other environmental conditions.

## 2 HRV Features

### 2 - 2 Energy Saving

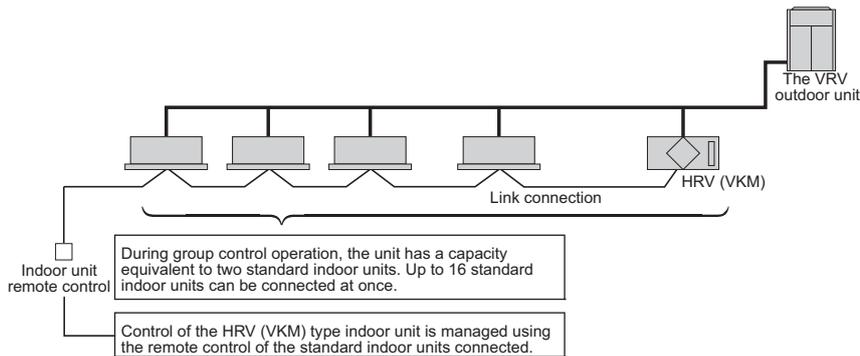
#### 2 - 2 - 1 Efficient Outdoor Air Introduction with Heat Exchanger and Cooling / Heating Operation

**Indoor unit with outdoor air treatment**  
 Using outdoor air, the temperature can be brought near room temperature with minimal cooling capacity through the use of outdoor air.



#### 2 - 2 - 2 Operations, Such as Cleaning, Ventilation, Cooling / Heating and Humidifying, are Possible with One Remote Control.

Four air conditioner functions can be managed using a single remote control. This makes it easy to obtain high-quality and energy-efficient outdoor air treatment.



## 2 HRV Features

### 2 - 2 Energy Saving

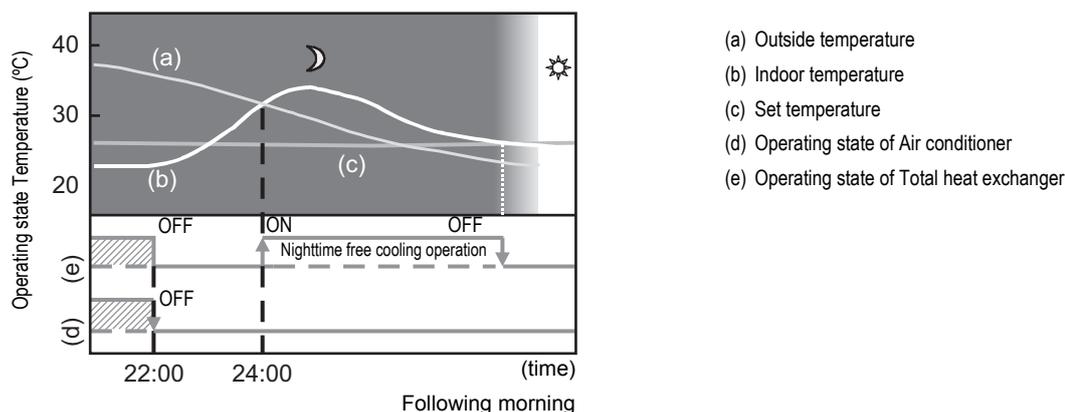
#### 2 - 2 - 3 Night time free cooling operation

##### Automatic heat purge function at night

The nighttime free cooling is an energy-conserving function which works at night when the air conditioners is off, reducing the cooling load in the morning when the air conditioner is turned on. This is mainly for rooms that contain office equipment, which raises the room temperature.

- Nighttime free cooling only works during cooling and when connected to Building Multi or VRV systems.
- Nighttime free cooling is set to "off" in the factory settings; so request your dealer to turn it on if you intend to use it.

##### Operation image



##### Explanation of nighttime free cooling operation image

The unit compares the indoor and outdoor temperatures after the air conditioning operation stops for the night. If the following conditions are satisfied, the operation starts, and when the indoor temperature reaches the air conditioning setting, the operation stops.

##### Conditions

- 2 the indoor temperature is higher than the air conditioning setting and
- 3 the outdoor temperature is lower than the indoor temperature.

If the above conditions are not satisfied, reevaluation is made every 60 minutes.

##### NOTE

The Nighttime free cooling operation works when the HRV unit is off. Therefore, it is not possible to stop the night purge operation, though the forced off is input from the optional controllers for centralized control.

##### Test run

After completing the installation of the system, check again to make sure that no error was made in wiring or switch setting on the printed circuit boards of the HRV units.

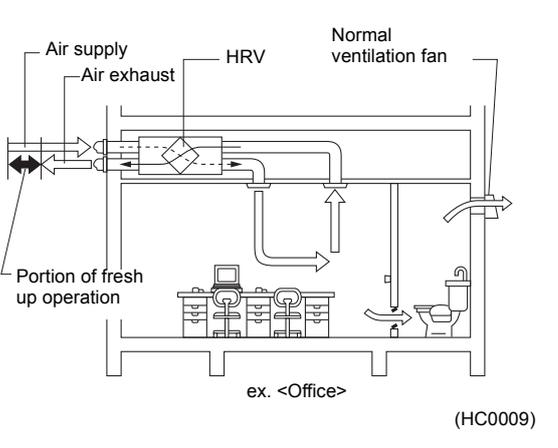
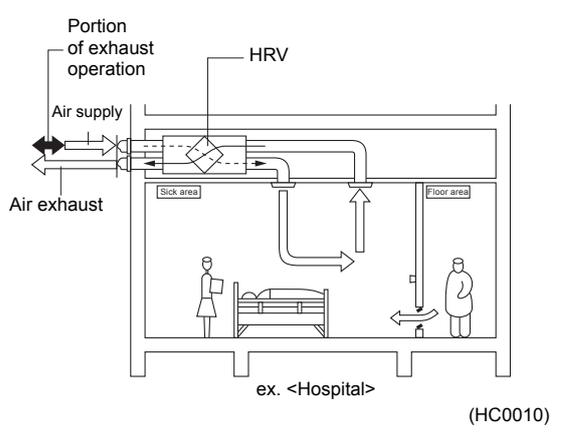
Then, turn on the power of the HRV units. Refer to the manual of the remote controller of each unit (remote controller for air conditioner, central control unit, etc.) for conducting a trial operation.

## 2 HRV Features

### 2 - 3 FRESH-UP operation

Both the excessive supply mode and the excessive exhaust mode are selectable.

This function creates a more comfortable air environment.

	Supply Fresh-up (Excessive outdoor air supply)	Exhaust Fresh-up (Excessive Exhaust air supply)
Detail	Supply air volume can be set at a higher level than the exhaust air by the remote control.	Exhaust air volume can be set at a higher level than the supply air by the remote control.
Major effects	<ul style="list-style-type: none"> <li>Prevents inflow of toilet odor</li> <li>Prevents inflow of outdoor air in winter</li> </ul>	<ul style="list-style-type: none"> <li>Prevents outflow of airborne bacteria from rooms in a hospital</li> <li>Prevents outflow of odors from rooms in a nursing home</li> </ul>
Application	Offices, etc.	Hospitals, Nursing homes, etc.
Example		

### 2-4 Element (HEP element)

#### Material

The heat exchanger element adopts a new paper of high permeability. The material recovers exhaust humidity at a speed of 2 times of the previous model.

The material is flame-retardant for safety.

The fungiproof design also keeps the air clean.

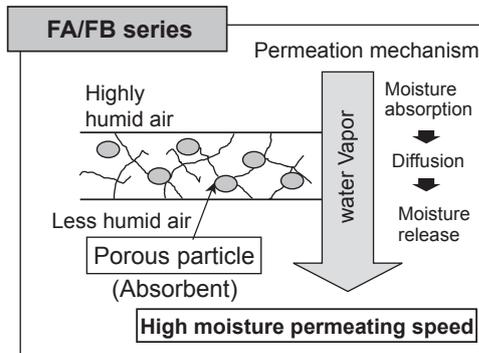
#### Structure

The heat exchanger element is designed without moving parts for higher durability and reliability.

The supply air passage and the exhaust air passage are arranged in right angle to prevent the supply and exhaust air from getting mixed.



(HC0013)

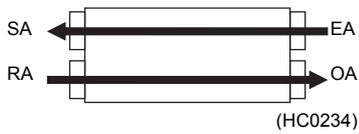


## 2 HRV Features

### 2 - 5 Easy Installation and service maintenance

#### Parallel air flow system (Daikin)

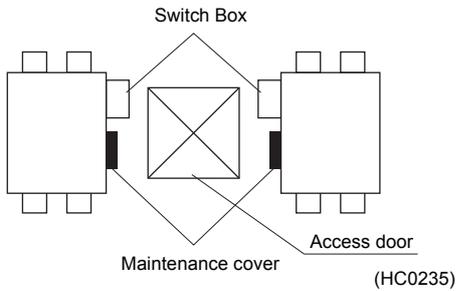
This system prevents misconnection and simplify the installation work.



#### Cross air flow system



#### Service Maintenance



Upside-down installation is available.

It allows the common use of the access door and reduces the space and installation work.

For 2 units closely installed, only one inspection hole of 450 × 450 mm will do for maintenance or replacement of the heat exchanger element etc.

Long life filter is equipped.

### 2-6 Additional Optional accessories

#### Built-in optional high efficiency filter

It greatly reduces the installation space.

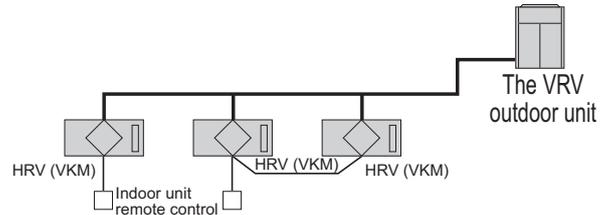
The installation of access doors and the unit can be reduced.

## 2 HRV Features

### 2 - 7 Unique Control System

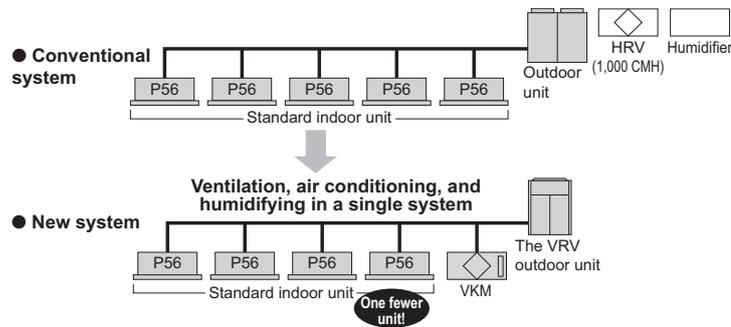
#### 2 - 7 - 1 Independent Control Possible

Individual outdoor air treatment operation is possible by connecting an optional remote controller.



#### 2 - 7 - 2 Integrated System Includes Ventilation, Air Conditioning and Humidifying Operations

Rather than using separate ventilation, air conditioning, and humidifying components, the system incorporating HRV (VKM) integrates all functions, reducing the total number of indoor units and facilitating a far simpler system. The installation space becomes smaller and the labor required for installation and maintenance is reduced significantly.



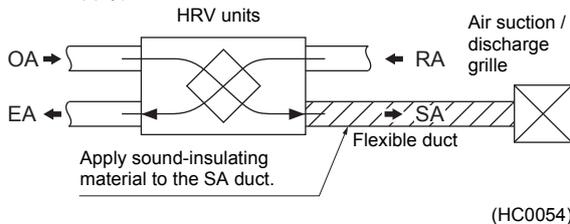
### 3 Installation

#### 3 - 1 Reducing operating sound

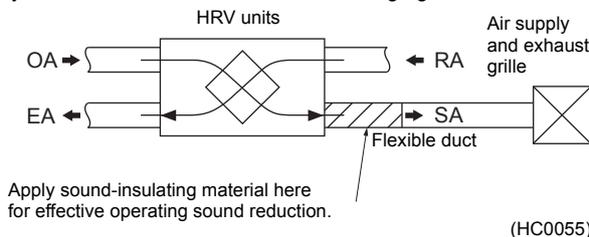
The air suction and discharge grille may give out operating sound higher by 8 to 11 phons than of the HRV units body. When installing this unit in a quiet place, take measures to reduce operating sound.

##### 3 - 1 - 1 Points for reducing operating sound

1. Operating sound heard from the air discharge outlet can be reduced just by applying sound-insulating material to the SA (indoor air supply) duct.

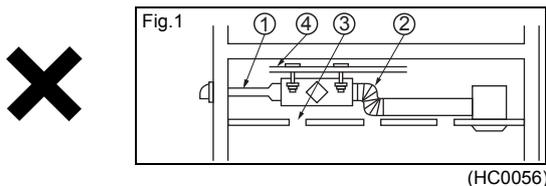


2. Operating sound can be reduced more effectively by applying sound-insulating material to a portion of the SA duct near the unit body than that near the air suction / discharge grille.



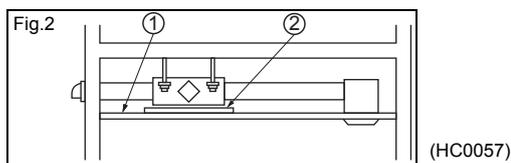
##### 3 - 1 - 2 Taking measures to reduce operating sound heard from attic-installed equipment and air ducts.

1. When installing large air volume models (650 m<sup>3</sup> / h or more), avoid the following wherever possible if it is expected to be necessary to apply sound-insulating material to them. (Fig.1)



- ① Making the duct diameter extremely small (Example: φ 250 → φ 150, φ 200 → φ 100)
- ② Making the duct extremely bent using bellows (in particular, connecting bellows to the air discharge outlet of the unit body)
- ③ Making opening holes on the ceiling
- ④ Hanging the unit on a material which does not have enough hanging strength  
See "Precautions for installing and handling the unit" on pages 77 and 87.

2. Take the following sound reduction measures. (Fig.2)



- ① Use a sound-insulating (low-permeability-to-sound) ceiling.

##### Note:

Some sound-insulating ceilings are not very effective in reducing low-frequency element of the operating sound.

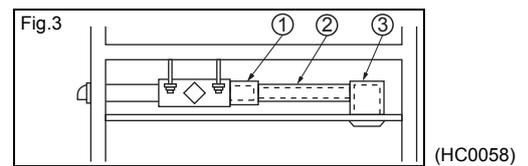
- ② Place a sound-reducing material under the source of the operating sound.

##### Note:

When using a sound-insulating sheet, it is necessary to have the entire body of the unit covered with it. Note, however, that some models do not allow the use of a sound-insulating sheet because it may badly affect the ventilation of their radiation heat.

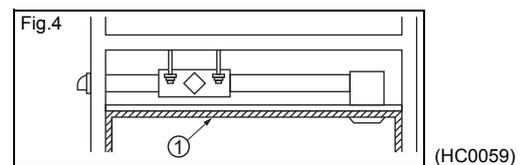
##### 3 - 1 - 3 Reducing operating sound heard from the air discharge outlet (suction inlet)

1. Use the following recommended optional accessories to reduce operating sound heard from attic-installed duct type models. (Fig.3)



- ① Sound-eliminating box (Silencer)
- ② Flexible duct
- ③ Sound-eliminating air suction / discharge grille

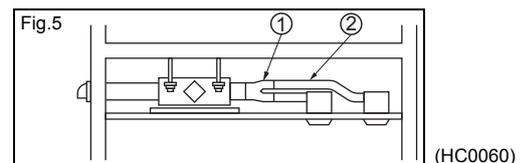
2. If the above accessories do not give satisfactory effect or when an attic-installed cassette type model is used, take the following measure.



- ① Apply a sound-absorbing material to the interior of the room.

3. To reduce the air flow sound heard from the air discharge outlet (suction inlet) of an attic-installed duct type model, use a small diameter flexible duct, which excels in sound absorptivity, for greater sound reduction effect.

- ① Branched duct (for letting air flow through two ducts to slow down its speed before it reaches the air discharge outlets (suction inlets))



- ② Flexible duct

4. Installation of the unit with the source of its operating sound located at a corner of a room will be a partially effective sound reduction measure; it will keep persons in the center of the room free from the annoying operating sound, with those in the corner of the room kept annoyed by the operating sound. To avoid this, try to find the best installation place from which the operating sound is least heard by everyone in the room.

### 3 Installation

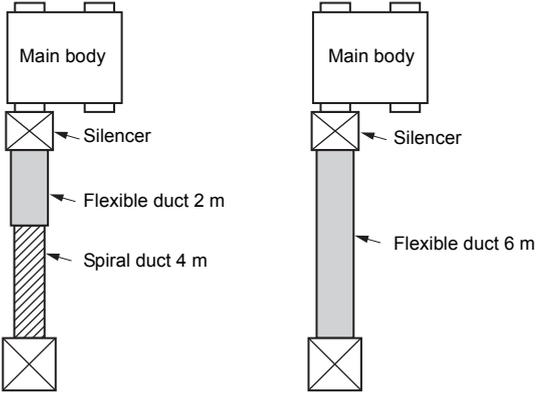
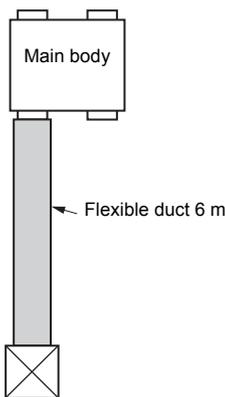
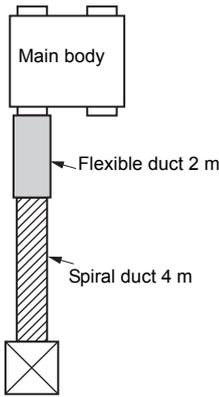
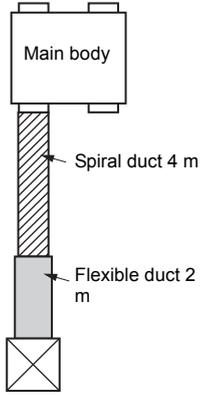
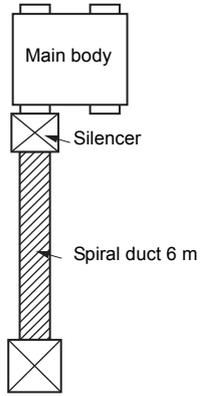
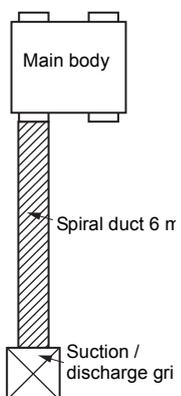
#### 3 - 1 Reducing operating sound

##### 3 - 1 - 4 Effect of remedy for sound

###### Caution

1. Be sure to connect a flexible duct (2 m) to an outlet of the main body in the indoor air supply side.
2. Do not connect a spiral duct and an aluminium bellows directly to the outlet of the main body.  
\*A silencer is effective especially when using the flexible duct at the same time.

##### 3 - 1 - 5 General comparison of the effect (① → ⑥ in more effective order)

<p>① Mounting a silencer + flexible duct 2 m long Mounting a silencer + flexible duct 6 m long</p>  <p>(Effect of a remedy for noise does not change even for over 2 m long duct)</p>	<p>② Mounting a flexible duct 6 m long</p> 	<p>③ Mounting a flexible duct 2 m long to the main body</p> 																																																									
<p>④ Mounting a flexible duct 2 m long to an air suction discharge grill</p> 	<p>⑤ Mounting a silencer</p> 	<p>⑥ Spiral duct 6 m No measures taken</p> 	<table border="1"> <tr> <td></td> <td>①</td> <td>②</td> <td>③</td> <td>④</td> <td>⑤</td> <td>⑥</td> </tr> <tr> <td>(dB)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		①	②	③	④	⑤	⑥	(dB)																																																
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(dB)																																																											

(HC0061)

**Note:**  
Measure the noise at 1.5 m below the air supply grille. Operating noise conforms to JIS standard and the value is converted in terms of the anechoic chamber.

##### 3 - 1 - 6 Nameplate for note

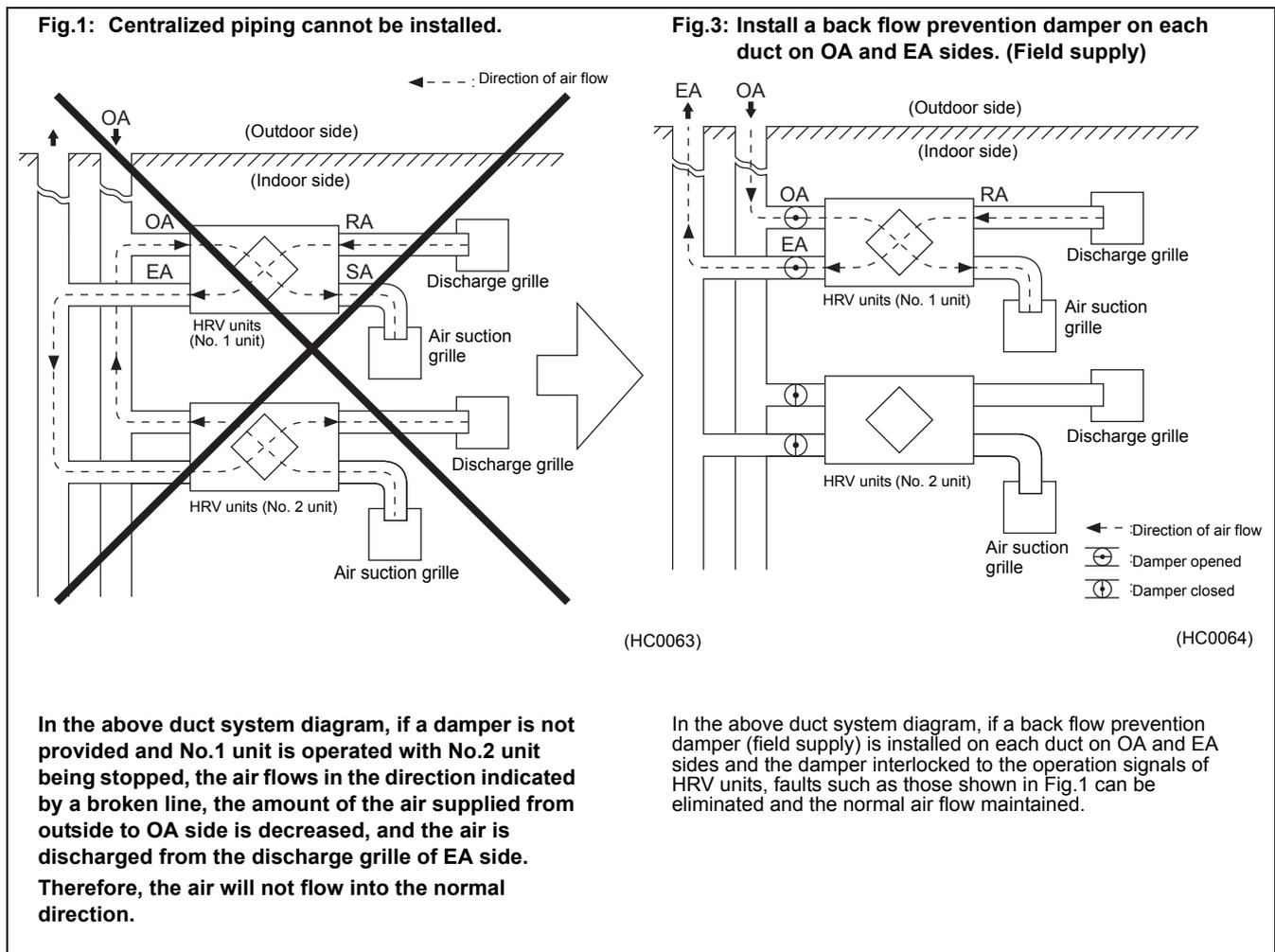
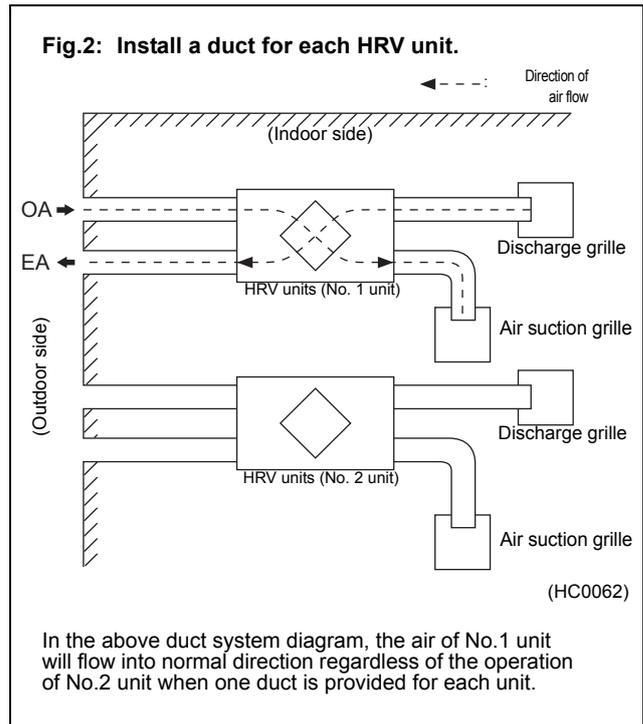
- “Notes for duct work” is written on the HRV units as indicated below.
- When connecting a spiral duct or an aluminium bellows, sound at the air discharge outlet is higher by 8~11 phon than the main body operating sound.
  - When using this unit in a quiet place, take a remedy for sound by connecting an optional flexible duct at the outlet of the indoor air suction side of the main body.

### 3 Installation

#### 3 - 2 Centralized piping

Wherever possible, avoid centralized OA and EA pipings for two or more HRV units, and install ducts for each body of the unit. (Fig. 2)

**3** Because the air flow shown in Fig.1 is generated when centralized OA and EA pipings for two or more HRV units normal air flow cannot be maintained. If a back flow prevention damper is installed in the duct on OA and EA side of each HRV units (Fig.3), costs will increase as compared with the case a duct is installed for each body. It is therefore recommended that a duct be installed for each body. (Before installing the back flow prevention damper, contact our engineering section.)



### 3 Installation

#### 3 - 3 Cautions

1. Install the unit on a rigid and stable place. Refer to the specification and weight of the unit.

Use suspension bolts for installation. Confirm that the place for installation can stand the weight of the unit. If not, reinforce the place with beams, etc. and install the suspension bolts. If the strength of the place for installation is not sufficient, the place resonates to the vibration of the unit and abnormal noise may be transmitted.

2. Install a service space and an inspection hole. Refer to the outline drawing for details.

Be sure to provide a service space and an inspection hole for inspection of air filter, heat exchange element and fan. HRV units require one inspection hole.

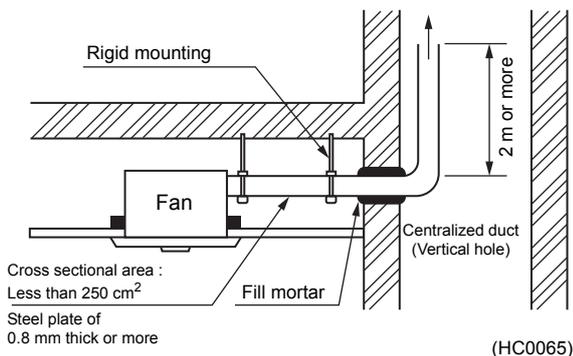
3. Bellows may not be able to use depending on the local regulations. (In the case in Japan)

Some local regulations may not allow the use of bellows in view of the safety for fire prevention. Before using the bellows, contact administrative agencies or fire department in your district. Note that bellows are not allowed in Tokyo in accordance with the Fire Prevention Act of Tokyo.

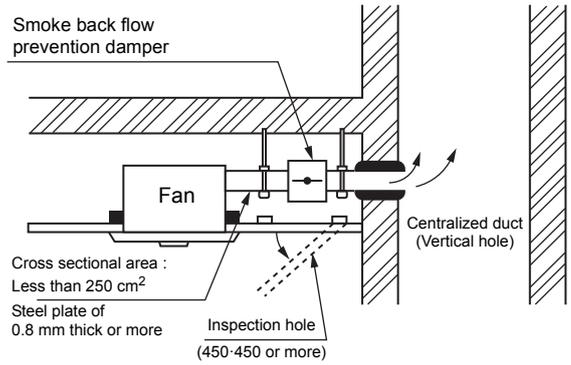
4. When exhausting air into the centralized duct (vertical hole), install a riser duct of steel plate of over two meters long inside the vertical hole or install an approved smoke back flow prevention damper. (In the case in Japan)

**When exhausting air into centralized duct (vertical hole), the Building Standards Act requires that the duct must be capable of preventing fire from expanding through the duct should a fire break out.**

**When a riser duct of steel plate of 2 m long is installed**



**When a smoke back flow prevention damper is installed**



#### Caution

- Installing a 2 m exhaust duct in a centralized duct involves difficulty in construction and maintenance, and is not practised generally. In actual installation a smoke back flow prevention damper is used (field supply).

5. Air filters are provided on the air intake side and exhaust air side. Be sure to install these filters.

Air filter cleans the air and prevents clogging of the element, and must be installed properly.

6. Confirm the using conditions of HRV units before installation.

Ambient conditions for use: -10°C to 50°CDB at 80% RH or less

#### Outdoor air temperature condition

When used below -10°C, indoor air temperature varies greatly from outdoor air temperature and frost may form on the heat exchange element depending on conditions of temperature and humidity. Further, the frost formation may be frozen. The frozen frost melts during the day as the temperature rises but the heat exchange efficiency drops before the frozen frost is melted.

**As a countermeasure, preheating of the air on low temperature side is considered.**

In a place where the temperature exceeds 50°C, deformation of resin parts such as air filter and reduced life of motor and electric parts due to deteriorated insulation are considered.

7. The precise available conditions are shown below.

#### Conditions:

Ambient temperature & humidity for HRV unit	-10°C to 50°CDB 80% RH or less
Indoor / Outdoor air	-10°C to 43°CDB The relative humidity [% RH] is as described below

### 3 Installation

#### 3 - 3 Cautions

- 1) Operation in highly humid areas (in cooling mode)  
To prevent dew formation, use the unit under the condition that the indoor discharge air is 95% RH or less on the psychrometric chart.

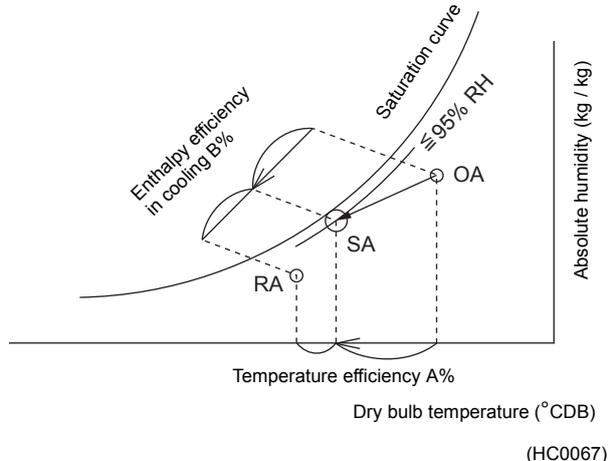
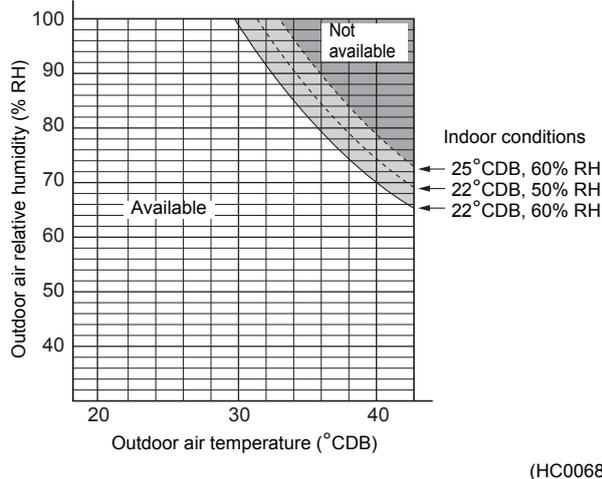
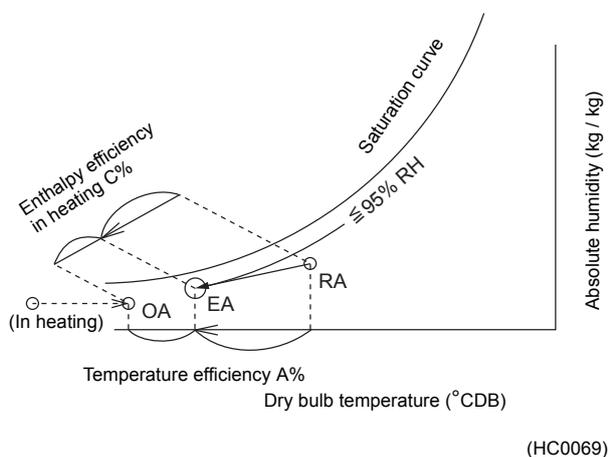


Fig.1 shows the limit under normal indoor conditions.

Fig.1 Conditions:  
 Temperature efficiency A = 72%  
 Enthalpy efficiency B = 56% (In cooling)  
 This conditions are at the minimum efficiency that are the severest to dew formation.



- 2) Operation in cold areas (in heating mode)  
To prevent dew formation and freezing, use the unit under the conditions that the outdoor discharge air is 95% RH or less on the psychrometric chart.



#### Note:

If the outdoor discharge air exceeds 95% RH, please preheat the outdoor suction air before it goes through the heat exchanger.

8. Do not use HRV units where the air contains noxious gas and corrosive components of materials such as acid, alkali, organic solvent, carbon black and paint. Also, do not use in a place where damage from sea wind and hot spring prevail or where air containing odor is recovered for supply to other locations.

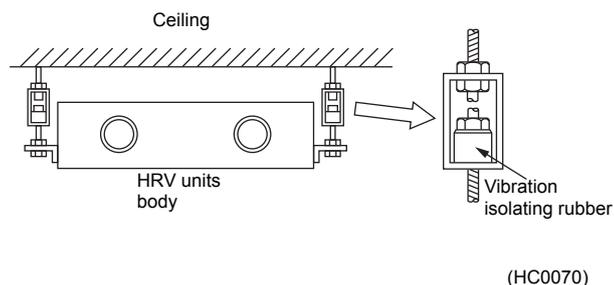
9. Do not operate HRV units in [Bypass] ventilation mode when the indoor is heated during winter.

Such operation may cause frost to form in the body and dirty ceiling may result.

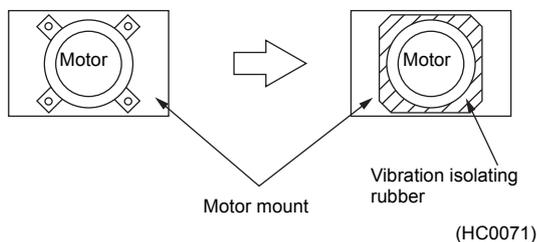
10. When a unit is installed on the ceiling using short suspension bolts, abnormal noise may be generated due to resonance with the ceiling.

Provide resonance preventive measures for the body suspension bolts.

#### Example



If abnormal noise is suspected generating from a spiral duct connection, change the duct to flexible duct. The above preventive measure is considered to eliminate the problem (resonance) but contact our service group and provide means to prevent vibration or necessary changes of the motor of the unit body.



#### Caution

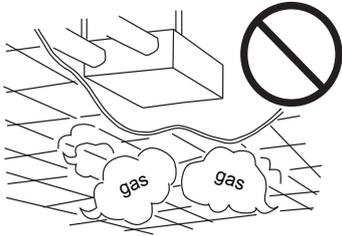
- When the outdoor air infiltrates into the ceiling and the temperature and humidity in the ceiling become high, insulate the metal part of the unit.

### 3 Installation

#### 3 - 4 Cautions in installation

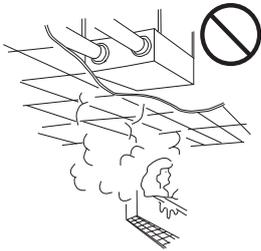
Do not use a HRV or an air suction / discharge grille in the following places.

- A 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.  
Such gas can cause fire.



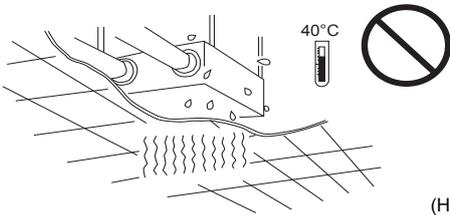
(HC0072)

- A place such as bathroom subjected to moisture.  
Electric leak or electric shock and other failure can be caused.



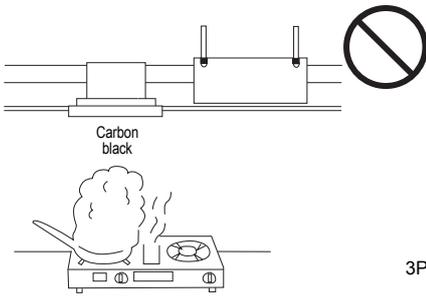
(HC0073)

- A place subjected to high temperature or direct flame.  
Avoid a place where the temperature near the HRV unit and the air suction / discharge air grille exceeds 40°C. If the unit is used at high temperature, deformed air filter and heat exchange element or burned motor result.



(HC0074)

- A place subjected to much carbon black.  
Carbon black attaches to air filter and heat exchange element, marking them unable to use.



(HC0075)  
3P034927-2B

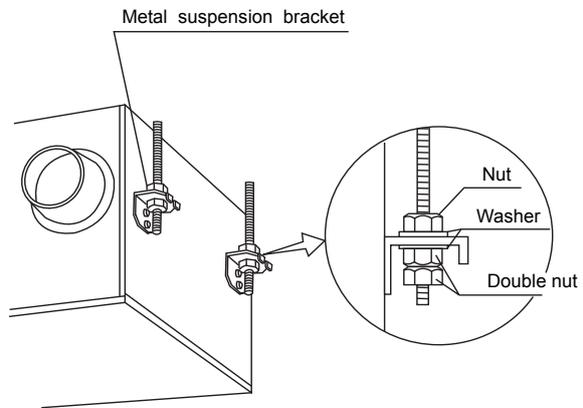
#### 3 - 5 Installation

##### 3 - 5 - 1 Installation of HRV units

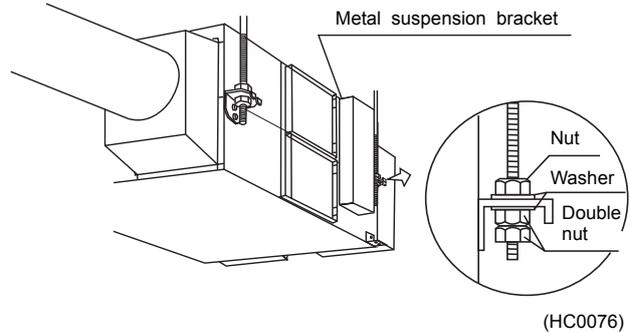
- Install the anchor bolt (M10 to 12) in advance.  
Pass the ceiling suspension fixture through the anchor bolt and secure the anchor bolt with washer and nut. (Before installation, check for foreign objects such as vinyl and paper remaining inside the fan housing.)
- The ceiling suspension fixture is fitted on top of the standard unit. If the anchor bolt is long, install it on the bottom of the unit. (Be sure to screw in the removed mounting screw on top to prevent air leakage.)

Install the duct caution name plate properly on the indoor side (SA·RA) and outdoor side (EA·OA).

##### VAM150-1000FA



##### VAM1500,2000FA



**Note:**

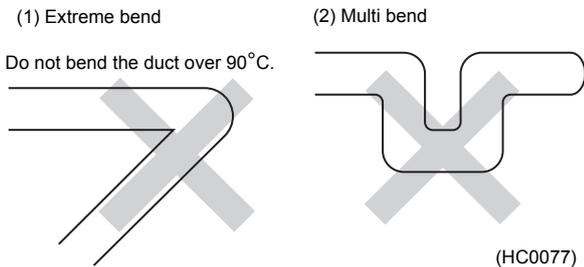
Remove the clamp (at two locations) for securing the unit in transit, if it prevents installation work. (Be sure to screw in the removed mounting screw on the body side to prevent air leakage.)

### 3 Installation

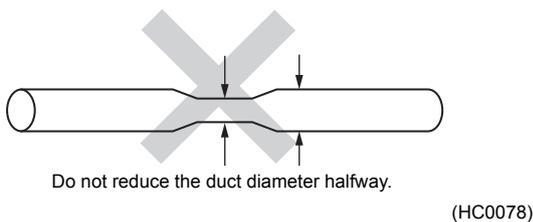
#### 3 - 6 Duct Work

##### 3 - 6 - 1 Caution

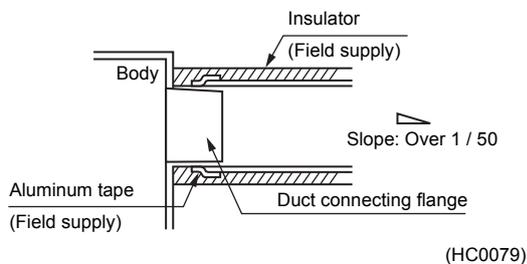
- Do not install ducts as shown below.



- (3) Reduce the diameter of the duct to be connected.



- To prevent air leakage, wind aluminum tape round the section after the duct connecting flange and the duct are connected.
- Install the opening of the indoor air intake as far as from the opening of the exhaust suction.
- Use the duct applicable to the model of unit used (Refer to the outline drawing.)
- Install the two outdoor ducts with down slope (slope of 1 / 50 or more) to prevent entry of rain water. Also, provide insulation for both ducts to prevent dew formation. (Material: Glass wool of 25 mm thick)



- 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.

#### 3 - 6 - 2 Going through the external wall

##### 1. Hole diameter

Duct dia. + 50 or 75  
(I.D. depends on the core drill specification)

<e.g.>

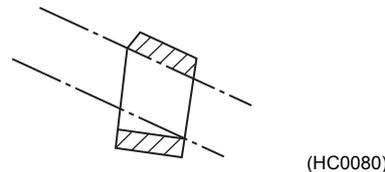
Duct diameter	Hole diameter
$\phi 100 + 50$	$\phi 150$

$\phi 150 + 50$	$\phi 200$
-----------------	------------

##### 2. Drilling the hole

Ideally it is better to grade in the same procedure as refrigerant piping.

In the case of a square duct  
Grade a wood frame of a duct stay.



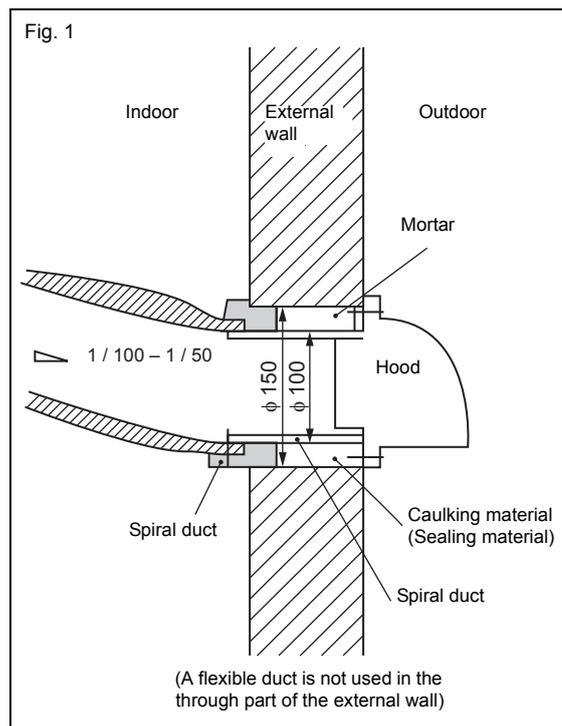
In the case of a round duct

Drill a hole horizontally because the hole cannot be made with the tool graded.

##### 3. Preventing wind and rain from entering

Most of a space between the duct and the external wall is protected by mortar. Coated wall is filled with a caulking material. (See fig. 1)

Image picture



##### 4. How about the building which has already been built?

Same as the newly-built building.

- Only hole diameter 100 is instructed in a drawing by a drawing company, so a detailed work is executed by the judgement of an installation company.

### 3 Installation

#### 3 - 7 Electrical wiring procedure

**▲ Before obtaining access to terminal devices, all power supply circuits must be interrupted.**

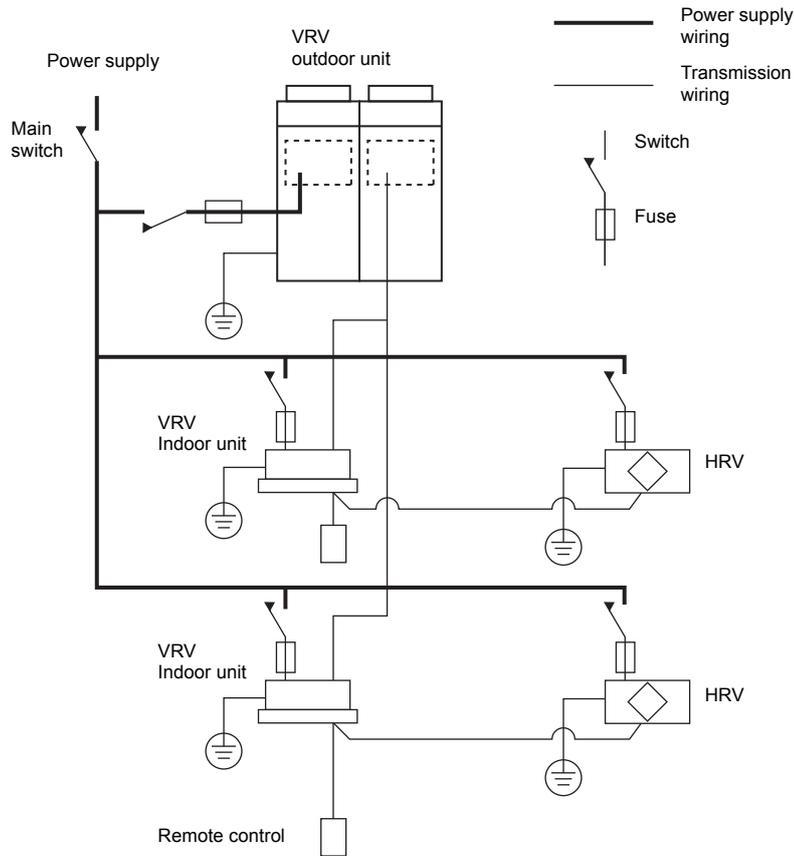
##### Connection of Wiring

- Connect the wires in accordance with the diagram of each system.
- All wiring must be performed by an authorized electrician.
- All field supplied parts and materials and electric works must conform to local codes.
- Use copper wire only.

##### Connection of wiring

- A circuit breaker capable of shutting down supply to the entire system must be installed.
- A single switch can be used to supply power to units on the same system. However, branch switches and branch circuit breakers must be selected carefully.
- Fit the power supply wiring of each unit with a switch and fuse as shown in the drawing.
- Be sure to give the electric grounding (earth) connection.

##### Complete System Example



(HC0082)

Model	Power supply wiring			Transmission wiring	
	Field supplied fuses	Wire	Size	Wire	Size
FXYCP150FA	15A	H05VV-U3G	Wire size must comply with local codes.	Shield wire (2 wire)	0.75 ~ 1.25 mm <sup>2</sup>
FXYCP250FA					
FXYCP350FA					
FXYCP500FA					
FXYCP650FA					
FXYCP800FA					
FXYCP1000FA					
FXYCP1500FA					
FXYCP2000FA					

(HC0083)

## 4 Optional accessories

### 4 - 1 KRP50-2 / KRP50-2A90 (for VAM-FA)

#### 4 - 1 - 1 KRP50-2: Wiring adapter for remote contact / Humidifier KRP50-2A90: Installation box for adapter PCB

##### Components

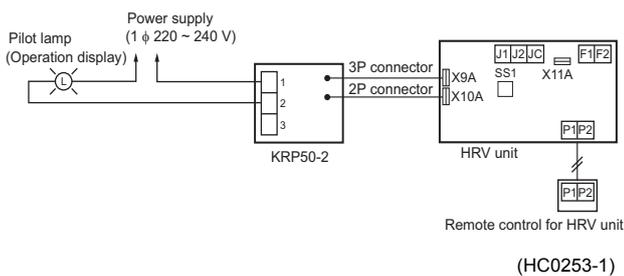
1. KRP50-2 PCB (×1)	2. PCB catches (4 large, 4 small)
(HC0113)	Either large or small catches are used, depending on the model
	(HC0114)
Tie wrap(×1)	Manual(×1)

##### Installation guide

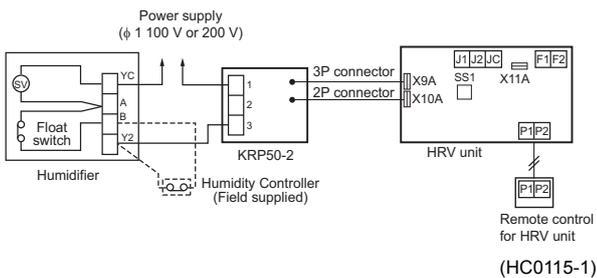
1 The KRP50-2 can be connected to HRV units as follows to send the operation signal (pilot lamp etc.) to remote locations.

Electric wiring is as follows.

- For Remote contact



- For Humidifier



2 KRP50-2 can also be connected to SkyAir indoor unit for the interlocked operation with HRV units.

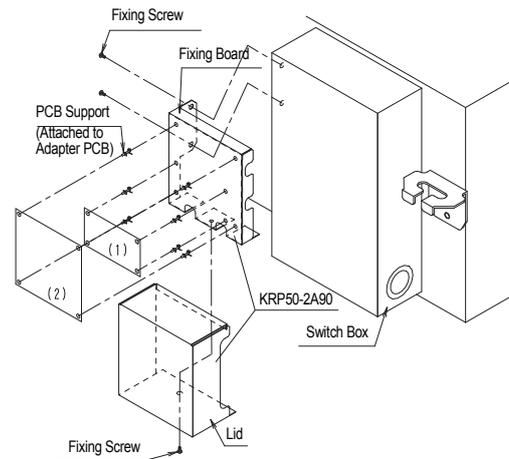
##### Components

See the right for components.

Fixing Screw	3 PCS.
Clamp	2 PCS.

##### Installation

Install the Adapter PCB to the outside of switch box for HRV unit as show below.



##### Applicable adapter

	Adapter name	Kit name
(1)	Adapter PCB for Humidifier	KRP50-2
(2)	Adapter PCB for Remote control	KRP2A21

4P055444

## 4 Optional accessories

### 4 - 2 KDDM24B50, KDDM24B100: Silencer (for VAM-FB)

Part No.	KDDM24B50	KDDM24B100	
Applicable model	VAM500FB	VAM650FB	VAM800FB, VAM1000FB, VAM1500FB, VAM2000FB
Nominal pipe diameter	φ 200 mm	φ 200 mm	φ 250 mm
Noise suppression effect	Approx. 6 dB		

#### Applications and features

- The silencer effectively reduces the noise of the HRV units.
- Air flow rate should be lower than 600 m<sup>3</sup> / h for the model KDDM24B50 and lower than 1000 m<sup>3</sup> / h for the model KDDM24B100.

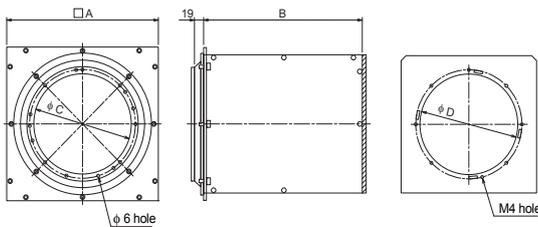
#### Caution

The silencer cannot be used on different model. Confirm the model before installation.

#### Dimensions

##### KDDM24B50

##### KDDM24B100



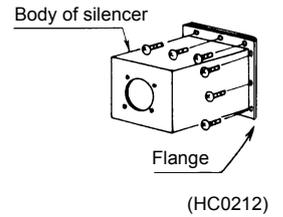
(HC0245)

#### Dimension table (unit: mm)

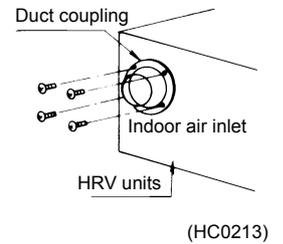
Part name	A	B	C	D
KDDM24B50	320	340	206	210
KDDM24B100	380	480	250	260

#### Installation procedure

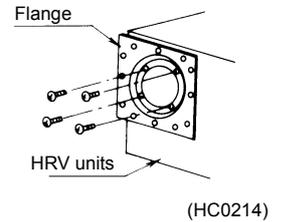
1. Remove the flange from the silencer.



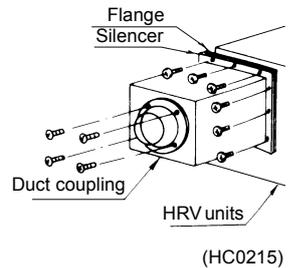
2. Remove the duct coupling of the air inlet provided on the body of HRV units.



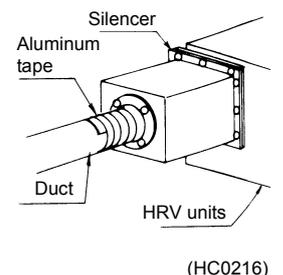
3. Use the provided screws and install the flange on the HRV units.



4. Install the silencer on the flange. Then, install the duct coupling.



5. Insert the duct into the duct coupling and wind round the commercially available aluminum tape, etc. to prevent the air leakage.



## 4 Optional accessories

### 4 - 3 BRP4A50: Heater control kit (for VAM-FA)

Operation range of the HRV is “−10°C to 50°CDB 80% RH or below.”

When operating the HRV units at or below −10°C of the outdoor air temperature, use preheater (field supplied) to preheat outdoor air.

This kit is required to have ON / OFF delay control when preheater is used. (Initial setting is required.)

#### Cautions

- For electric heater, safety devices and installation location, follow the standards or regulations of each country.
- Use nonflammable duct for the electric heater. Be sure to keep 2 m or more between the heater and HRV unit for safety.
- For the HRV units, use a different power supply from that of the electric heater and install a circuit breaker for each.

#### Electric heater capacity formula

$$\text{Heat capacity } P \text{ (kW)} = 0.29 \times \text{Air flow rate} \times \text{Temp.} / 860$$

For VAM500FJVE when Air flow rate = 500m<sup>3</sup> / h (Ultra-high) and preheater so that the outdoor temp. rise from −20°C to −10°C (Temp. = 10 °C)

$$P = (0.29 \times 500 \times 10) / 860 = 1.68 \text{ (kW)}$$

Check the temperature rise at low notch.

For 2kW heater, when 300m<sup>3</sup> / h

$$T = (860 \times P) / (0.29 \times \text{Air flow rate})$$

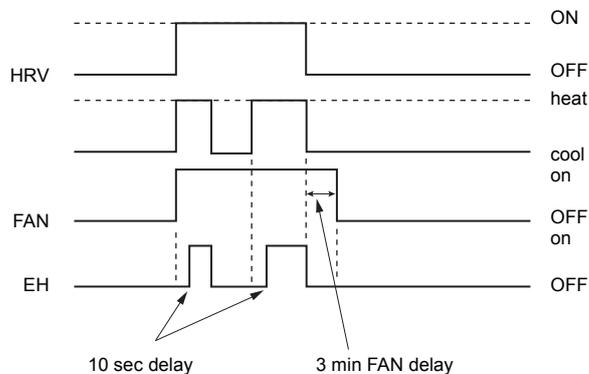
$$= (860 \times 2) / (0.29 \times 300) = 19.7 \text{ }^{\circ}\text{C}$$

Therefore −20 + 19.7 = −0.3°C

#### Cautions at initial setting

- Make sure to set remote control of HRV at initial setting as follows:  
(for ON / OFF delay)

	Setting mode	Setting switch no.	Setting position
Heat setting	19	8	03 or 04



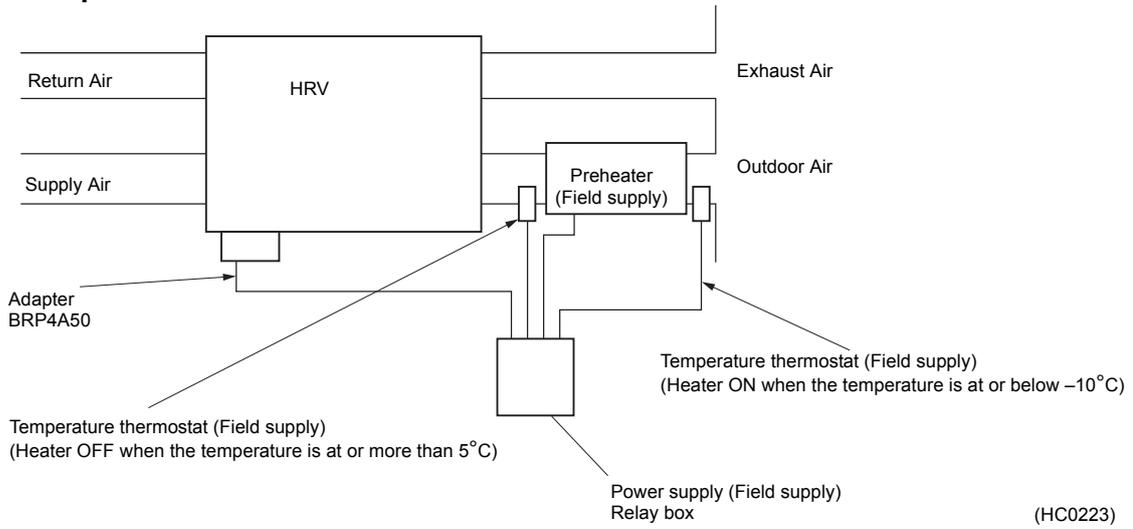
(HC0097)

- Heater operating condition  
Heater starts operation when it is judged as Heating operation.  
(Judged from VRV signal of heating operation or HRV signal of thermostat.)
- ON / OFF delay  
Heater starts 10 seconds after HRV starts operation.  
Fan stops 3 minutes later after HRV stops operation.

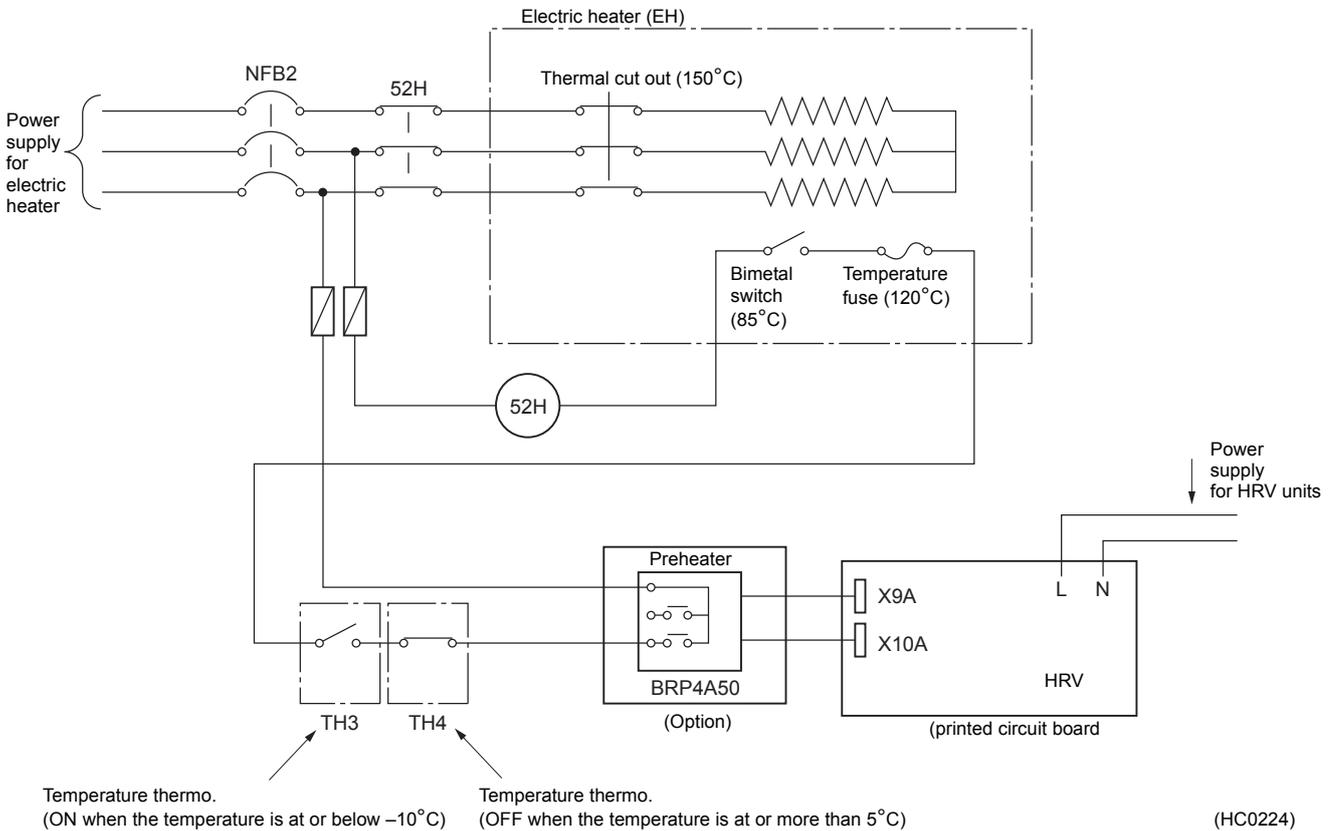
## 4 Optional accessories

### 4 - 3 BRP4A50: Heater control kit (for VAM-FA)

#### Installation example



#### Wiring



Symbol	Part	Installation Place	
52H	Relay	Install a relay box at site	Field supply
EH	Electric heater (Bimetal switch, Temperature fuse, Thermal cut out etc. (built in))	Duct	Field supply
TH3	Temperature thermostat (ON when the temperature is at or below $-10^{\circ}\text{C}$ )	Duct (front of EH)	Field supply
TH4	Temperature thermostat (OFF when the temperature is at or more than $5^{\circ}\text{C}$ )	Duct (behind EH)	Field supply

**Note:**

Make sure to install TH3 and TH4 for safety.

**Test run**

After completing the installation of the system, check again to make sure that no error was made in wiring or switch setting on the printed circuit boards of the HRV units. Then, turn on the power of the HRV units. Refer to the manual of the remote control of each unit (remote control for air conditioner, central control unit, etc.) for conducting a trial operation.

## 4 Optional accessories

### 4 - 3 BRP4A50: Heater control kit (for VAM-FA)

#### Heater control kit

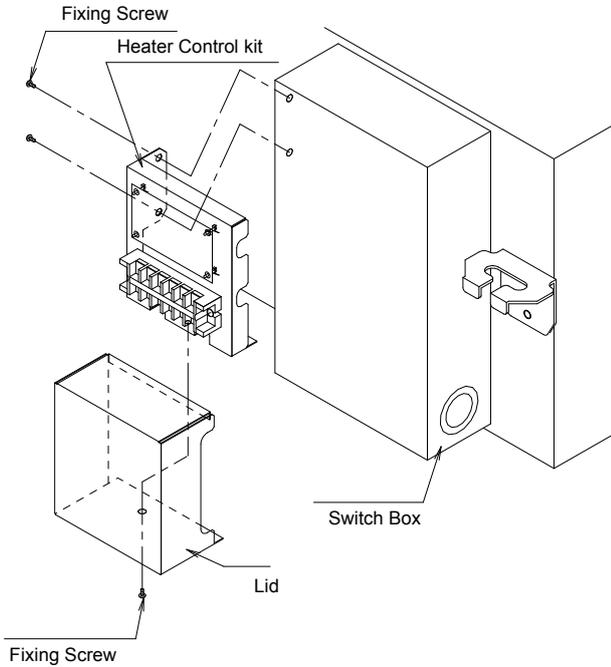
##### Accessories

See the right for component.

Fixing Screw	2 pcs.
Clamp	2 pcs.

#### Installation

Install the Heater control kit to the outside of switch box for HRV unit as shown below.



<< Cautions >>

< Switch setting of the HRV unit >

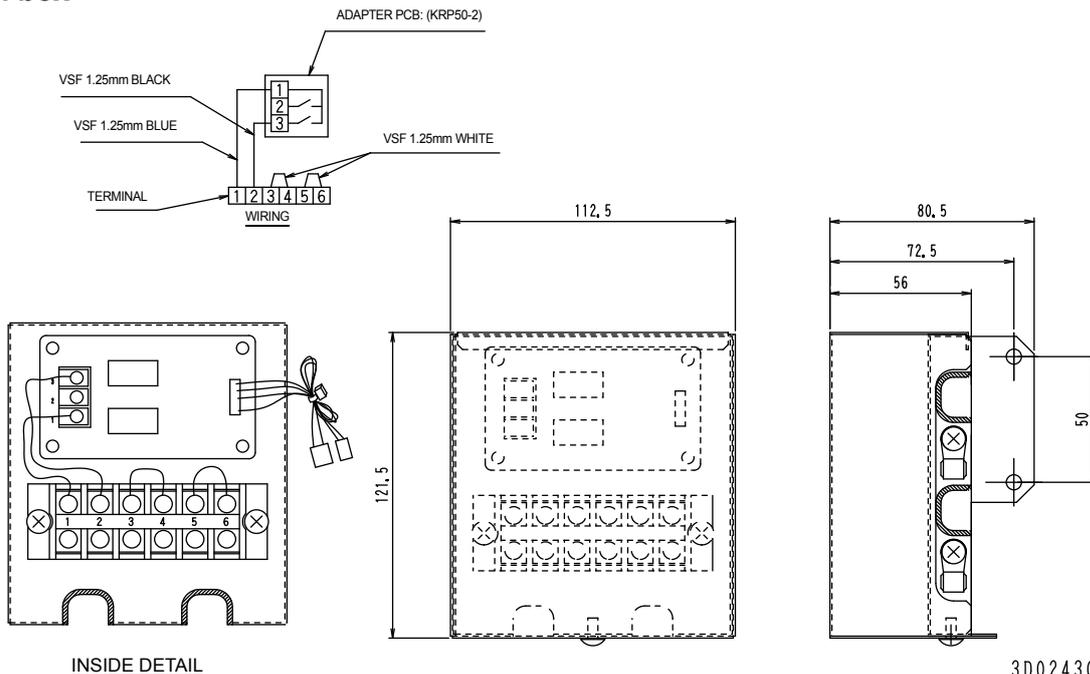
The initial setting is required by remote control for indoor unit or HRV unit.

See the INSTALLATION MANUAL of HRV (Local setting) Electric heater setting ON, OFF delay [19 (29 • 8 • 03)

\* The initial setting is necessary for safety.

3P055038

#### Switch box

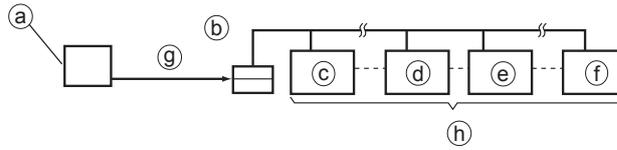


3D024303

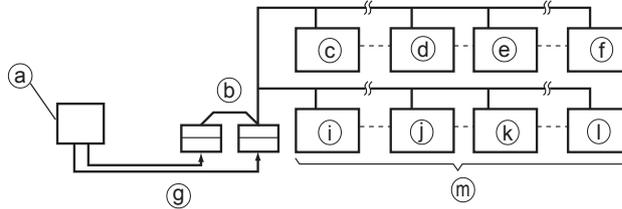
# 5 Control systems

## 5 - 1 DCS302C51: Centralized control

- When using 1 central remote control



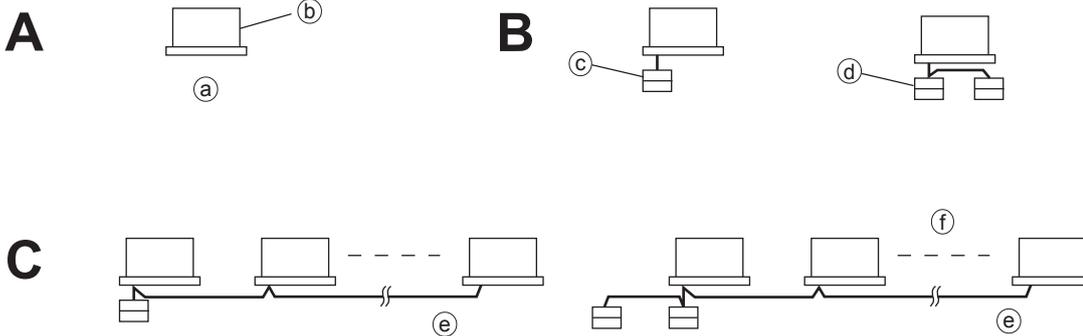
- When using 2 central remote controls



### BEFORE USE: GENERAL DESCRIPTION OF SYSTEM

For a maximum of 64 groups of indoor unit unified operation/stop can be performed. When using 2 central remote controls, unified operation is possible with up to a maximum of 128 groups of indoor units. It can be used to set operation modes by ZONE: ON/OFF operation, operation controlled by timer ON/OFF control possible/impossible; as well as, to set operating state: temperature setting, etc.  
It can display the operation state such as operation modes and preset temperature by group.  
Furthermore, the unit can be connected with an external key system or host computer monitor panel to enable forced ON/OFF input (no-voltage normally open contactor).  
(This unit cannot be used concurrently with the adapter for electrical appendices [optional accessory].)

- Ⓐ Host computer monitor panel, etc.
- Ⓑ Central remote control
- Ⓒ Group No. 1 - 00
- Ⓓ Group No. 1 - 15
- Ⓔ Group No. 2 - 00
- Ⓕ Group No. 4 - 15
- Ⓖ Forced ON/OFF command
- Ⓖ (Stops with command from either central remote control)
- Ⓗ A maximum of 64 groups
- Ⓘ Group No. 5 - 00
- Ⓝ Group No. 5 - 15
- Ⓚ Group No. 6 - 00
- Ⓛ Group No. 8 - 15
- Ⓜ A maximum of 128 groups



(HC0145)

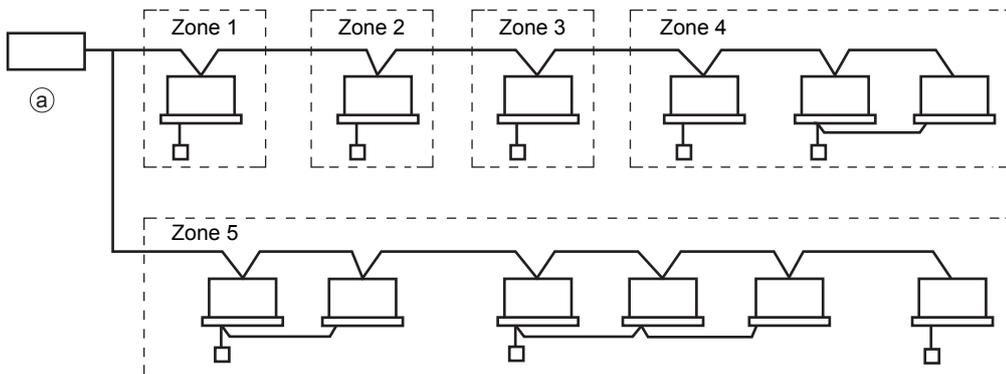
## 5 Control systems

### 5 - 1 DCS302C51: Centralized control

※ GROUP OF INDOOR UNIT refers to the above.

A: A single indoor unit without remote control      B: A single indoor unit controlled by one or two remote control  
 C: Maximum of 16 indoor units, group-controlled by one or two remote controls

- ① Remote control not used      ② Indoor unit      ③ Remote control      ④ Two remote controls  
 ⑤ A maximum of 16 units



※ Zone control from the central remote control

Zone control is available from the central remote control. With it, it is possible to make unified settings for multiple groups, so setting operations are greatly simplified.

- Any setting you make within a given zone will apply to all groups in the said zone.
- A maximum of 64 zones can be set from a single central remote control. (Each zone contains a sum of 64 groups.)
- Zones can be set randomly from the central remote control.

- ① Central remote control

## CAUTIONS DURING USE

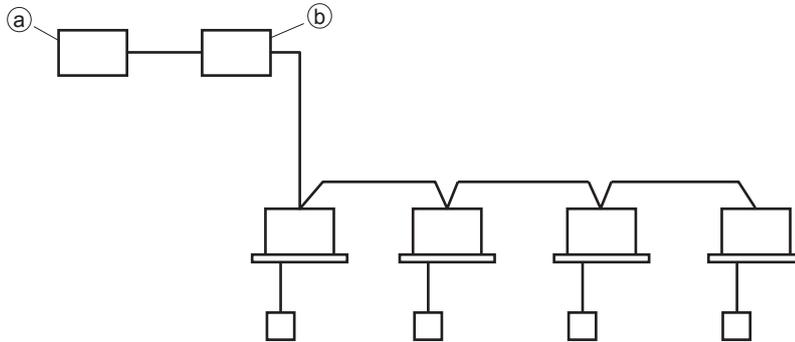
- Do not tamper with the inner mechanism.  
 Do not remove the front panel. Tampering with the inner mechanism is dangerous and may damage equipment. For inspection and adjustment, contact your DAIKIN dealer.
- Avoid places where the unit may be contacted by water.  
 Water penetrating the inner mechanism may cause electrical leakage, or render electric parts defective.
- Do not press the button on the central remote control with a pointed hard tool.  
 This may damage the central remote control.
- Avoid direct exposure to sunlight.  
 Direct sunlight may discolor the LCD and obscure the image.
- Do not wipe the surface of the operation panel with benzene, thinner, chemically treated dust cloth, etc.  
 This may cause discoloring or peeling. To clean, moisten a cloth with a neutral cleanser diluted in water, rinse and wipe. Blot adhering water with a dry cloth.
- Never pull or twist the electric wire of a remote control.  
 It can cause the unit to malfunction.
- Never inspect or service the central remote control by yourself.  
 Ask a qualified service person to perform this work.

(HC0146)

## 5 Control systems

### 5 - 1 DCS302C51: Centralized control

## OPTIONAL ACCESSORIES

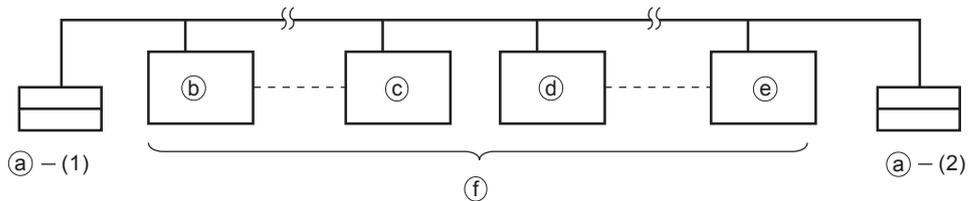


You can perform the normal operation, take off the malfunction contact point and unified operation/stop by contact point, all by connecting this unit with the unification adapter for computerized control. For further details, ask your DAIKIN dealer.

(a) Unification adapter for computerized control

(b) Central remote control

## DOUBLE CENTRAL REMOTE CONTROLS



With two central remote controls, centralized control (indoor units) is possible from different locations.

(a) Central remote control

(b) Group No. 1-00

(c) Group No. 1-15

(d) Group No. 2-00

(e) Group No. 4-15

(f) Maximum 64 groups

### Note:

- For control alignment and settings for double central remote control, contact your DAIKIN dealer.

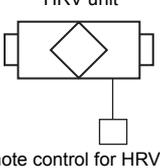
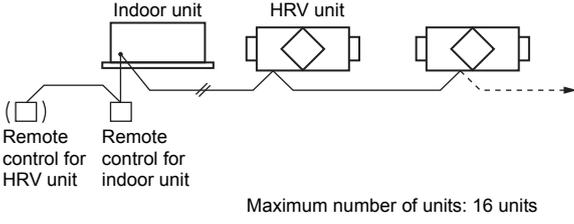
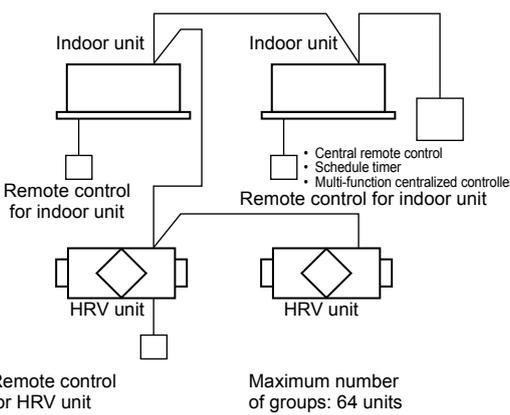
(HC0173)

# 5 Control systems

## 5 - 2 Introduction of control system

The control systems introduced here is for the HRV unit adopting the high speed and high performance transmission system (DIII-NET), the same as the VRV systems and SkyAir series,

### Description of system

Control system	Purposes and applications	Description of system	Control system											
			Controller						Function					
			Central remote control	Unified On / Off controller	Schedule timer	Remote control for HRV unit	Remote controller for indoor unit	Operation / Stop	Ventilation mode changeover		Air flow rate changeover (High / Low)	Air flow rate mode changeover (normal mode / fresh-up mode)	Precool / preheat operation	Malfunction display
Independent	<ul style="list-style-type: none"> <li>Basic method to operate HRV unit (Operation by exclusive remote control for HRV unit)</li> </ul>	 <p>HRV unit</p> <p>Remote control for HRV unit</p>				○		○	○	○	○	○	○	○
Interlocked operation	<ul style="list-style-type: none"> <li>Interlocked operation with indoor unit by remote control for indoor unit</li> <li>The HRV unit can also be operated independently by the remote control for indoor unit, even if indoor unit is not in operation. The HRV unit cannot be operated independently when the duct is connected directly to the indoor unit.)</li> </ul>	 <p>Indoor unit</p> <p>HRV unit</p> <p>Remote control for HRV unit</p> <p>Remote control for indoor unit</p> <p>Maximum number of units: 16 units</p>				○*1	○	○	○	Initial setting required		○	○*2	
Centralized control	<ul style="list-style-type: none"> <li><b>[Unified On / Off controller]</b></li> <li>A maximum of 16 groups can be controlled of "On / Off" by one unified On / Off controller. (Note) Up to 4 unified ON / OFF controllers can be installed in one system.</li> <li><b>[Schedule timer]</b></li> <li>One schedule timer can control the weekly schedule of up to 128 units.</li> <li><b>[Central remote control]</b></li> <li>Up to 64 groups of the units can be controlled individually by one central remote control.</li> </ul>	 <p>Indoor unit</p> <p>Indoor unit</p> <p>Remote control for indoor unit</p> <p>Remote control for indoor unit</p> <p>HRV unit</p> <p>HRV unit</p> <p>Remote control for HRV unit</p> <p>Maximum number of groups: 64 units</p>	○	○	○	○	○	○	○	(Only when remote control for HRV unit is used) ○		(Initial setting required when remote control for HRV unit is not used) ○		

(HC0018)

1. A remote control for HRV unit can be connected as the 2nd remote control. In addition to air volume control, selection of ventilation mode and Fresh up mode is available.
2. In case of installing Indoor unit remote control only, initial setting is required for the setting of above function. However, in case of installing both indoor unit remote control and HRV unit remote control, initial setting is not required.

## 5 Control systems

### 5 - 2 Introduction of control system

# 5 Control systems

## 5 - 3 Basic patterns

### 5 - 3 - 1 List of control system

5

Control system	Purposes and applications	Description of system	Optional accessories required
Independent system	<p>Operation by main switch</p> <ul style="list-style-type: none"> <li>Basic method to operate HRV unit The remote control for HRV unit is installed on each HRV unit for its operation.</li> </ul>	<p>HRV unit</p> <p>Remote control for HRV unit</p>	BRC301B61 Liquid crystal remote control
	<p>Control with two remote controls</p> <ul style="list-style-type: none"> <li>The HRV is operable from a place near the unit or a remote place and the selected control is indicated in the display. (Priority is on the last selection)</li> </ul>	<p>HRV unit</p> <p>Remote control for HRV unit</p> <p>Remote control for HRV unit</p>	BRC301B61 Liquid crystal remote control
	<p>Group control</p> <ul style="list-style-type: none"> <li>Simultaneous control of multiple units installed in such as a spacious room is available.</li> </ul>	<p>HRV unit</p> <p>HRV unit</p> <p>HRV unit</p> <p>Remote control for HRV unit</p>	BRC301B61 Liquid crystal remote control
Interlocked operation system with VRV systems and Sky/Air series	<p>Single-group interlocked operation</p> <ul style="list-style-type: none"> <li>The HRV unit operates whenever the indoor unit is in operation, and can also be operated independently by the remote control for indoor unit, even if the indoor unit is not in operation.</li> </ul>	<p>Indoor unit</p> <p>HRV unit</p> <p>Remote control for HRV unit</p> <p>Remote control for indoor unit</p>	_____
	<p>Direct duct connection system</p> <ul style="list-style-type: none"> <li>Within the same group, the remote control for indoor unit can control the operation of both the indoor unit and HRV unit connected by duct.</li> </ul>	<p>Indoor unit</p> <p>HRV unit</p> <p>Remote control for HRV unit</p> <p>Remote control for indoor unit</p>	_____

# 5 Control systems

## 5 - 3 Basic patterns

	Function	Nos. of the unit controlled and length of wiring	Cautions	page
	<p><b>BRC301B61</b></p> <ul style="list-style-type: none"> <li>• ON / OFF</li> <li>• Ventilation mode (Auto / Heat Exchange / Bypass)</li> <li>• Ventilating rate (High / Low)</li> <li>• Fresh up mode (On / Off)</li> </ul>	<ul style="list-style-type: none"> <li>• One remote control operates each HRV unit.</li> <li>• Remote control wiring can be extended up to 500 m maximum.</li> </ul>	<ul style="list-style-type: none"> <li>• The wire for remote control is not included as standard accessories and should be arranged locally.</li> <li>• By connecting the adapter PCB, the operation signal can be taken out remotely.</li> <li>• "Fresh-up operation" is possible by external input.</li> <li>• The group control is not possible by the remote control for HRV unit.</li> </ul>	32
	<p><b>BRC301B61</b></p> <ul style="list-style-type: none"> <li>• ON / OFF</li> <li>• Ventilation mode (Auto / Heat Exchange / Bypass)</li> <li>• Ventilating rate (High / Low)</li> <li>• Fresh up mode (On / Off)</li> <li>• Timer setting (On / Off)</li> <li>• Indication of filter cleaning signal</li> <li>• Digital indication of malfunction</li> </ul>	<ul style="list-style-type: none"> <li>• Control of one HRV with two remote controls</li> <li>• The maximum allowable total length of remote control wiring is 500 m.</li> </ul>	<ul style="list-style-type: none"> <li>• Same as operation from local place.</li> <li>• It is necessary to set the Master / Slave changeover switch in the remote controller.</li> <li>• Two remote control operation is not available with simple remote control.</li> </ul>	33
		<ul style="list-style-type: none"> <li>• Up to 16 HRV units can be controlled with one liquid crystal remote control.</li> <li>• The maximum total length of remote control wiring is 500 m.</li> <li>• Control with two remote control is available.</li> </ul>	<ul style="list-style-type: none"> <li>• Same as operation from local place.</li> <li>• Group control is not available with a simple remote control.</li> <li>• All the settings of HRVs in the same group are the same (However, it is possible to fix the individual setting by each unit)</li> </ul>	33
	<ul style="list-style-type: none"> <li>• The HRV unit operates whenever the indoor unit is in operation.</li> <li>• Precool / preheat operation is also possible.</li> <li>• Various settings are available by adding the HRV remote controllers.</li> </ul>	<ul style="list-style-type: none"> <li>• A maximum of 16 units of indoor unit and HRV unit can be controlled by the remote controller for indoor unit. (If they are in the same group)</li> <li>• Remote control wiring can be extended up to 500 m maximum.</li> </ul>	<p>_____</p>	34
		<ul style="list-style-type: none"> <li>• A maximum of 16 units of indoor unit and HRV unit can be controlled the operation by the remote control for indoor unit.</li> <li>• Remote control wiring can be extended up to 500 m maximum.</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure to set "ON" for direct ducting setting.</li> <li>• The HRV cannot be operated independently to prevent the dust, when the indoor unit is not in operation. However, if the fan of indoor unit is in operation, the HRV unit can be operated independently.</li> </ul>	34

(HC0019)

# 5 Control systems

## 5 - 3 Basic patterns

### 5 - 3 - 1 List of control system

Control system	Purposes and applications	Description of system	Optional accessories required
Interlocked operation system with VRV systems and SkyAir series Interlocked operation with 2 or more groups	<ul style="list-style-type: none"> <li>When the HRV unit is interlocked to 2 or more groups of indoor units, The HRV unit operates if one of indoor unit in the groups is in operation. The HRV unit can also be operated independently by remote control for indoor unit, even if the indoor unit is not in operation.</li> </ul>		KRP2A61 ♦ Adapter PCB for remote control (One adapter PCB should be installed in either the HRV unit or the indoor unit.)
Centralized control system Collective / Individual control	<ul style="list-style-type: none"> <li>[Unified On / Off Controller] A maximum of 16 groups can be controlled of "On / Off" by one controller, and up to four controllers can be installed in one system.</li> <li>[Schedule Timer] One schedule timer can control the weekly schedule of up to 128 units.</li> <li>[Adapter PCB for remote control] One adapter PCB can control up to 64 groups collectively.</li> </ul>		DCS301B61 ♦ Unified On / Off Controller (up to 4 controllers) DST301B61 ♦ Schedule timer KRP2A61 ♦ Adapter PCB for remote control (not possible to use together with other central control) * One of the above control should be installed in indoor unit. (However, only KRP2A61 can also be installed in HRV unit.)
Centralized control system Zone control system	<ul style="list-style-type: none"> <li>The Central remote controller can control the zone operation of the several groups of the units collectively.</li> <li>Central remote controller can control the independent operation of HRV unit in each zone.</li> </ul>		DCS302B61 ♦ Central remote control

# 5 Control systems

## 5 - 3 Basic patterns

	Function	Nos. of the unit controlled and length of wiring	Cautions	page
	<ul style="list-style-type: none"> <li>The HRV unit operates of one of the indoor units connected to the central control transmission line is in operation.</li> <li>The various setting for the operation of HRV unit should be set by the remote control for the indoor unit.</li> </ul>	<ul style="list-style-type: none"> <li>A maximum of 64 groups of the units can be controlled.</li> <li>The central control transmission line can be extended up to 1000 m maximum.</li> </ul>	<ul style="list-style-type: none"> <li>No direct duct connection is possible.</li> <li>Set "ON" for collective zone interlock setting.</li> </ul>	34
	<p><b>Collective / Individual operation</b> [The unified On / Off control]</p> <ul style="list-style-type: none"> <li>Each group can be controlled of "On / Off" individually.</li> <li>Each 16 groups can be controlled "On / Off" collectively.</li> <li>The power supply terminal for the schedule timer is provided.</li> </ul> <p>[The schedule timer]</p> <ul style="list-style-type: none"> <li>The schedule timer can control collectively the operation "ON / OFF" twice a day by weekly.</li> <li>Back-up power supply for 48 hours is provided, when the power failure is occurred.</li> </ul> <p>[Adapter PCB for remote control]</p> <ul style="list-style-type: none"> <li>The HRV units can be controlled "On / Off" collectively by external input.</li> </ul>	<ul style="list-style-type: none"> <li>A maximum of 64 groups connected by the central transmission line can be controlled.</li> <li>The central transmission line can be extended up to 1000 m maximum.</li> </ul>	<ul style="list-style-type: none"> <li>When you use the central controller, no direct duct connection is possible.</li> </ul> <p>[The unified On / Off control]</p> <ul style="list-style-type: none"> <li>Each group should be set the group number. (It cannot be set by the remote control for HRV unit.)</li> <li>The power must be supplied.</li> </ul> <p>[The schedule timer]</p> <ul style="list-style-type: none"> <li>When you use the schedule timer alone, it is necessary to supply the power of DC16V, which can be supplied from the printed circuit board of the unit. (from CN11 in case of HRV unit)</li> </ul> <p>[Adapter PCB for remote control]</p> <ul style="list-style-type: none"> <li>The adapter PCB for remote control cannot be used with other central controller. (It can be installed in the either indoor unit or HRV unit.)</li> <li>Only KRP2A61 can be installed in the HRV unit. (KRP2A2.A3 cannot be installed in the HRV unit because of their size.)</li> </ul>	34
	<p><b>The interlocked operation</b> [Multi function centralized controller]</p> <ul style="list-style-type: none"> <li>It can control the operation "On / Off" individually or collectively.</li> <li>The several group of the units can be controlled collectively by zone.</li> <li>It can control the interlocked operation of the indoor units and the HRV units in the same zone.</li> <li>The electrical terminal for the schedule timer is provided.</li> </ul>	<ul style="list-style-type: none"> <li>A maximum of 64 groups connected by the centralized transmission line can be controlled.</li> <li>The central transmission line can be extended up to 1000 m maximum.</li> </ul>	<ul style="list-style-type: none"> <li>The initial setting by remote control for indoor unit is needed. (The collective zone interlock setting should be "On".) However, if there is no indoor unit in the same zone (only HRV units), the initial setting is not required.</li> <li>When you use the central transmission line, no direct duct connection is possible.</li> </ul> <p>[Multi function central controller]</p> <ul style="list-style-type: none"> <li>Each group should be set the group number for central control. (It cannot be set by the remote controller for HRV unit.)</li> <li>The power supply is needed.</li> </ul>	34

(HC0020)

## 5 Control systems

### 5 - 3 Basic patterns

#### 5 - 3 - 2 Independent system

##### Operation by main switch

5

##### Purposes and functions

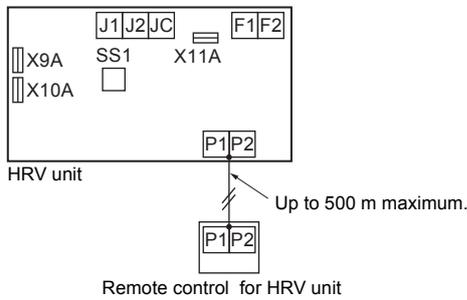
- Basic method to operate HRV unit  
The remote control for HRV unit is installed on each HRV unit for its operation.

##### [When you use remote control for HRV unit]

##### Cautions

1. The remote control for HRV unit should be connected to the terminal no. P1 and P2.
2. The remote control wiring should be arranged locally.
3. The operation by two remote controls or the group control is not possible.
4. The initial setting cannot be done by the remote control for HRV unit, which has to be set by the remote control for indoor unit.

##### Example of control wiring



(HC0021)

##### Switch setting of HRV unit

- No change is required (as per factory setting)

##### Optional accessories required

- Remote control for HRV unit BRC301B61

##### Information

1. If you increase the air flow rate from "High" to "Ultra-High" by the remote control for HRV unit, it is necessary to have initial setting by the remote control for indoor unit or HRV unit.

(HC0022)

# 5 Control systems

## 5 - 3 Basic patterns

### 5 - 3 - 2 Independent system

#### Control with two remote controls

**Purpose and functions**

- For control of one HRV unit (Also one group control is possible)  
Sophisticated operation and indication output are possible from either local place or remote place by two liquid crystal remote controls.
- Either one of two liquid crystal remote controls can be used for all operations and indications.  
(However, initial setting can only be carried out by the master remote control)

**Point**

- The wiring to the remote controls must be branched from the unit as shown in the diagram.  
(Though the crossover between the master and slave remote controls is acceptable, the work to put two wires into the remote control takes time.)

**Example of wiring for control**

(HC0023)

**Note**

- The maximum allowable total length of wires to the remote control is 500 m.
- Simple remote controls cannot be used for control with two remote controls.

**The following setting is required**

- Either one of two remote controls must be set as a slave remote control.

**Required optional accessories**

- Liquid crystal remote control × 2  
BRC301B61

#### Group control

**Purpose and functions**

- Simultaneous control of multiple HRV units (max. 16 units) is available (for application to such as a spacious room)
- All operation and individual setting can be carried out from one remote control.
- In case the liquid crystal indicates malfunction, the indication of HRV unit No. shows in the display.  
(If another remote control is additionally installed, control with two remote controls is possible.)

**Point**

- No address setting is required because address is automatically set.  
(The address is optionally allocated. The address No. can be confirmed by setting to service mode "Forced fan operation" and be checked whether the unit is in operation or not.)

**Example of wiring for control**

(HC0024)

**Note**

- The maximum allowable total length of wires to the remote control is 500 m.
- One liquid crystal remote control is always required.
- Simple remote controls cannot be used for control with two remote controls.

**The following setting is required**

- No setting is required. (product is to be just as it was when shipped from the factory)

**Required optional accessories**

- One set of liquid crystal remote control  
BRC301B61

# 5 Control systems

## 5 - 3 Basic patterns

### 5 - 3 - 3 The interlocked operation system

#### Single-group interlocked operation (Basic pattern)

5

**Purposes and functions**

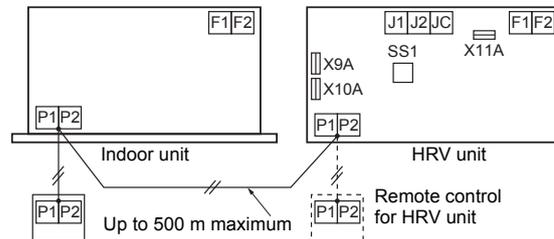
- The remote control for indoor unit can control the interlocked operation with the HRV unit, and it can make an initial setting of the ventilation flow rate, the ventilation mode changeover and fresh-up operation. The HRV unit can independently be operated, even if the indoor unit is not in operation.

**Note**

- The remote control should be connected to the terminal no. P1 and P2, the same as the group control wiring of indoor units.
- Since this is two remote control system (for Indoor unit and HRV unit), the Master / Slave setting is required.

Remote control for	Setting
Indoor unit	Slave
HRV unit	Master

**Example of control wiring**



(HC0025)

**Switch setting for HRV unit**

- No change is required. (as per factory setting)

**Optional accessories required**

- None

#### Single-group interlocked operation (Direct duct connection)

**Purposes and functions**

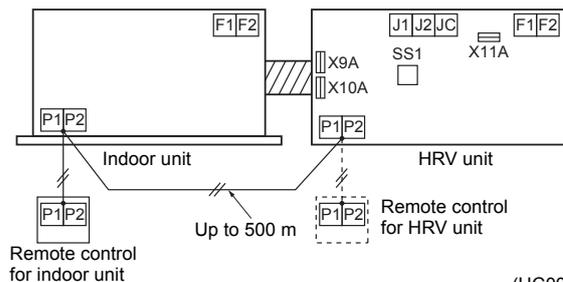
- The operation of HRV unit is interlocked to the indoor unit connected by the duct, which has a fresh air intake.
- It can reduce the number of outlets for supply air.
- The HRV unit cannot be operated independently to prevent a reverse stream of fresh air to the suction side of the indoor unit, unless the fan of indoor is in operation.

**Note**

- The amount of fresh air to the indoor unit should be less than 20% of the total air volume of the indoor unit. (If the amount of fresh air is too much, the capacity of the indoor unit may reduce and the operating sound might be higher.)
- The HRV unit can be operated independently, if the fan of indoor unit is in operation.
- Since this is two remote control system (for Indoor unit and HRV unit), the Master / Slave setting is required.

Remote control for	Setting
Indoor unit	Slave
HRV unit	Master

**Example of control wiring**



(HC0026)

**Switch setting for HRV unit**

The initial setting by the remote control for indoor unit  
 Direct duct setting ..... "ON" [17(27)-5-02]

**Optional accessories required**

- None

## 5 Control systems

### 5 - 3 Basic patterns

#### 5 - 3 - 3 The interlocked operation system

##### Interlocked operation with 2 or more group of VRV system

###### Purposes and functions

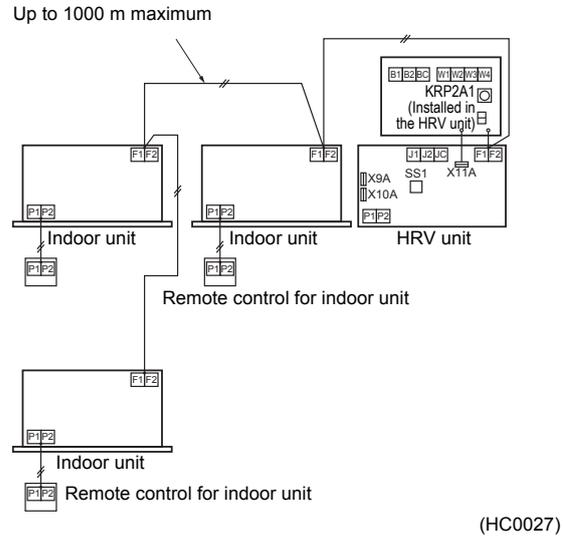
- When the HRV unit is interlocked to 2 or more group of indoor units, the HRV unit operates, if one of indoor unit in groups is in operation. The HRV unit can also be operated independently by remote control for indoor unit, even if the indoor unit is not in operation.

###### Cautions

- It is not necessary to set the group number for central control.
- One adapter PCB for remote control should be installed in the one of the unit connected to the central transmission line.

(When you install an adapter PCB for remote control in the indoor unit, select the applicable model number of Adapter PCB to be installed.)

###### Example of control wiring



###### Note:

The central transmission line can be extended up to 1000 m maximum.

###### Switch setting for HRV unit

The initial setting by the remote control for indoor unit or HRV unit.

###### Optional accessories required

- Adapter PCB for remote control: KRP2A61

# 5 Control systems

## 5 - 3 Basic patterns

### 5 - 3 - 4 Centralized control system

#### Collective / individual control [Unified On / Off control DCS301B61]

##### Purposes and functions

- One control can control the operation of "ON / OFF" of 16 groups of the units collectively or individually.
- Also up to 4 controls can be installed in one centralized transmission line (in one system), which enables to control up to 64 groups. (16 groups × 4 = 64 groups)
- The ventilation mode will be selected automatically.

##### Cautions

1. It is necessary to assign a central group number to each indoor unit and HRV unit.
2. The operation of HRV unit is not interlocked with the operation of indoor unit under this control system. If you like to have a interlocked operation, please consider other control system.

##### Switch setting for HRV unit

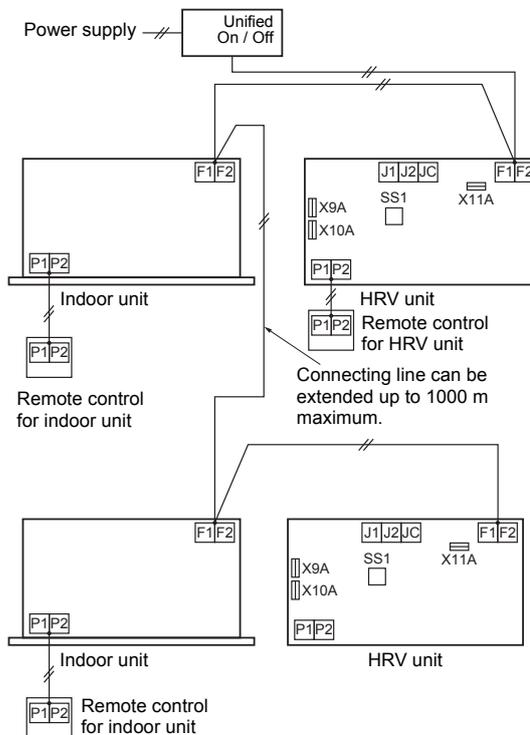
The initial setting is required by the remote control for indoor unit or HRV unit.

- No change is required (as per factory setting)

##### Optional accessories required

- Remote control (Only when you use) BRC301B61

##### Example of control wiring



(HC0028)

#### Zone control system (Central remote control DCS302B61)

##### Purposes and functions

- A maximum of 64 groups can be controlled On / Off individually by one control. And also the central remote control can control the On / Off operation of the units in each zone collectively. (It also can control the interlocked operation as well as the independent operation within the same zone.)
- If the zone setting is not required, or if you like to operate the HRV unit whenever one of indoor unit of any group connected to the central transmission line is in operation, refer to the applied system.

##### Cautions

1. It is necessary to assign a central control group number.
2. If you operate the HRV unit interlocked to the operation of indoor unit, please set the same zone number. At that time, it is necessary to set the zone operation on the HRV unit.
3. It is not possible to operate On / Off from the remote control for the HRV unit in zone 1.
4. It is not necessary to set the zone operation mode in zone 2, which is already set at the factory.

##### Switch setting for HRV unit

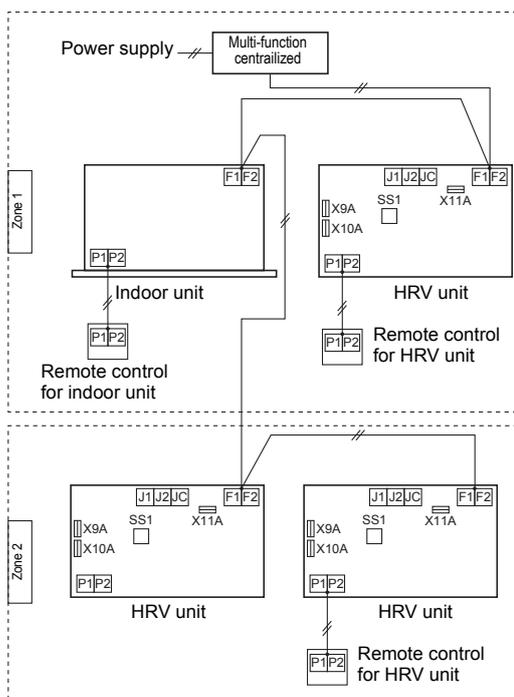
The initial setting is required by the remote control for indoor unit or HRV unit.

- For zone 1 "ON" [17(27)-8-02]
- For zone 2 Factory set (No change is required)

##### Optional accessories required

- Remote control (Only when you use) BRC301B61

##### Example of control wiring



(HC0029)

# 5 Control systems

## 5 - 4 Applicable patterns

### 5 - 4 - 1 Additional functions

#### Operation by power supply [HRV unit]

**Purposes and functions**

- The HRV unit is operated by "On / Off" of the main power breaker. This is possible only for the independent operation system. (When the main power is disconnected, the transmission error will be displayed if the HRV unit is interlocked to the indoor unit or controlled by the centralized control.)

**Cautions**

- Install insect control wire net on the air intake and exhaust openings. (If the power is disconnected when the damper is open, the damper remains open and the insects may get into the room.)
- When you install the remote control, it is possible to have normal operation after the electric power is supplied.

**Example of control wiring**

(HC0030)

**Switch setting for HRV unit**

The initial setting is required by the remote control for indoor unit. Power-on setting..... "ON" [18(28)·1·02]

Install the remote control for indoor unit for the initial setting. After completion of the initial setting, remove the remote control.

**Optional accessories required**

- None

#### Monitor of operation (KRP1C4/BRP4A50A) [HRV unit → operating pilot lamp (local supply)]

**Purposes and functions**

To monitor the operation of one HRV unit.

**Example of control wiring**

(HC0031)

**Switch setting for HRV unit**

- No change is required. (as per factory setting)

**Optional accessories required**

- Adapter PCB: KRP50-2

## 5 Control systems

### 5 - 4 Applicable patterns

#### 5 - 4 - 1 Additional functions

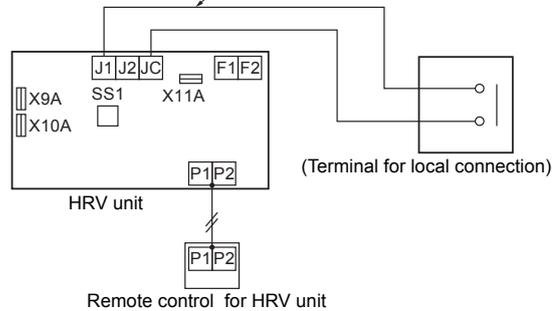
##### Fresh-up operation by external input [HRV unit]

###### Purposes and functions

When the operation is interlocked with the local ventilating fan (such as the one for toilet or kitchen), the HRV unit performs the over-supply operation to prevent the reverse flow of the odor. The flow rate of supply air becomes higher than that of exhaust air.

###### Example of control wiring

Connecting line can be extended up to 50 m maximum.



(HC0032)

###### Local wiring

Operation of HRV unit	Terminal for local connection	Capacity of connecting terminal
Fresh-up	Short-circuit	No-voltage normally open contact for micro-current 16 V, 10 mA
Normal	Open circuit	

###### Note:

The connecting wiring between HRV unit and the terminal for local connection can be extended up to 50 m maximum.

###### Switch setting of HRV unit

- No change is required (factory setting)

###### Optional accessories required

- None

# 5 Control systems

## 5 - 4 Applicable patterns

### 5 - 4 - 1 Additional functions

#### Precool / preheat operation

**Purposes and functions**

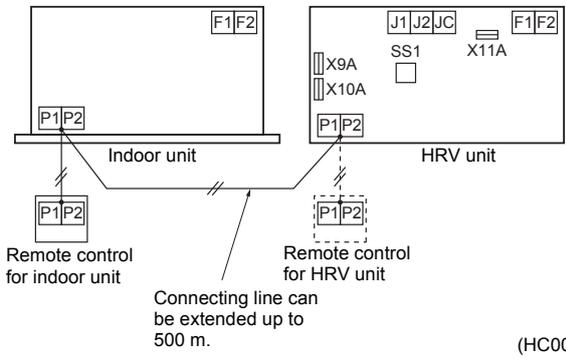
- The operation of HRV unit is delayed when the air conditioner begins operation.

**Cautions**

- The precool / preheat function is possible only when the operation of HRV unit is interlocked to one-group or two-group of indoor unit.  
(It will not function when the HRV unit is in independent operation.)
- You can select the preset time of 30 / 45 / 60 minutes for delayed operation at the time of initial setting.  
If this preset time is not sufficient, you can extend the preset time for further 30 / 60 / 90 minutes only the preheating function.
- Since this is two remote control system (for Indoor unit and HR unit), the Master / Slave setting is required.

Remote control for	Setting
Indoor unit	Slave
HRV unit	Master

**Example of control wiring**



(HC0033)

**Switch setting of the HRV unit**

The initial setting by the remote control for the indoor unit.

- Precool / preheat On / Off setting ..... "ON" [17(27)-2:02]
- Precool / preheat time setting ..... "Time" [17(27)-3:\*1]
- Preheat extra time setting ..... "Time" [17(27)-9:\*2]

\*1 setting 01 for 30, 02 for 45 and 03 for 60 minutes.  
\*2 setting 01 for 0 (factory set), 02 for 30, 03 for 60 and 04 for 90 minutes.

**Optional accessories required**

- None

#### Remote control operation by input from outside

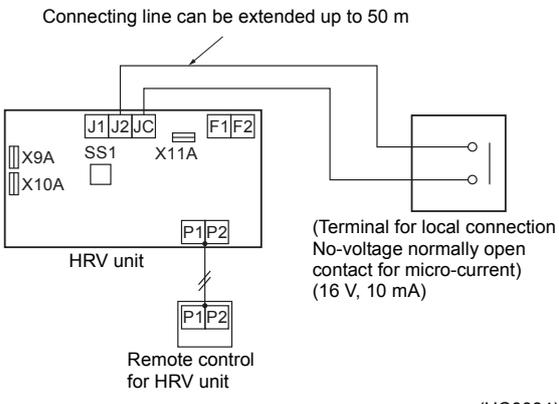
**Purposes and functions**

- The HRV unit can be controlled the operation of "On / Off" remotely by the signal from no-voltage normally open contact.

**Cautions**

- When the system is under group control, the input from outside controls the operation of "ON / OFF" collectively, if it is installed in the one of the unit.

**Example of control wiring**



(Terminal for local connection  
No-voltage normally open contact for micro-current)  
(16 V, 10 mA)

(HC0034)

**Switch setting of HRV unit**

- No change is required.

**Optional accessories required**

- None

# 5 Control systems

## 5 - 4 Applicable patterns

### 5 - 4 - 2 To connect the remote control to the HRV unit

#### (Part 1) single-group interlocked operation

##### Purposes and functions

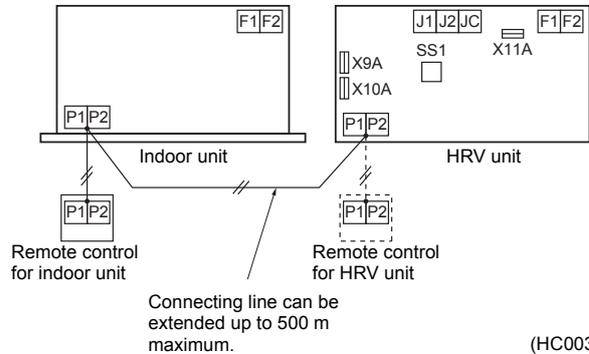
When the HRV unit is interlocked to the single-group control system, the remote control for HRV unit will be connected to change the setting mode at the HRV unit side.

##### Cautions

1. It is not possible to set the "On / Off" and "timer" setting by the remote control for HRV unit. Also it is not possible to display the filter-sign and malfunction code neither on the remote control for indoor unit nor on the remote control for HRV unit.
2. Since this is two remote control system (for Indoor unit and HR unit), the Master / Slave setting is required.

Remote control for	Setting
Indoor unit	Slave
HRV unit	Master

##### Example of control wiring



(HC0033)

##### Switch setting of the HRV unit

- No change is required (as per factory setting)

##### Optional accessories required

- Remote control BRC301B61

#### (Part 2) Centralized control operation

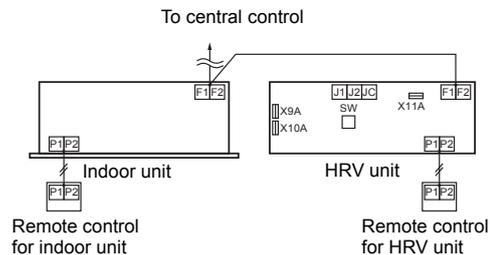
##### Purposes and functions

- Beside the operation by central remote control, the remote control for HRV unit can change the ventilation mode setting, the ventilation air flow setting and etc.

##### Cautions

1. In case of Zone control, the operation / stop and the timer setting cannot be done by the remote control for the HRV unit. (The operation lamp blinks twice to indicate that the operation is not possible.)
2. The remote control for the HRV unit cannot set the group no. for centralized control. In this case, the remote control for the indoor unit has to be connected once for this setting.
3. It is not possible to have Precool / preheat time setting function.

##### Example of control wiring



(HC0035)

##### Switch setting of the HRV unit

Group no. setting for central control is required. It is necessary to set the group number for each unit connected to the central transmission line (terminal no. (F1) and (F2)).

Initial setting is required by the remote control for indoor unit.

- In case of collective / individual control
  - Collective zone interlock setting
    - ....."OFF" (as per factory set)
- In case of zone control
  - Collective zone interlock setting
    - ....."ON" [17(27)-8-02]

##### Optional accessories required

- Remote control BRC301B61



## 5 Control systems

### 5 - 4 Applicable patterns

#### 5 - 4 - 3 Central control system (DCS302B61)

##### Collective operation [Adapter PCB for remote control KRP2A Series]

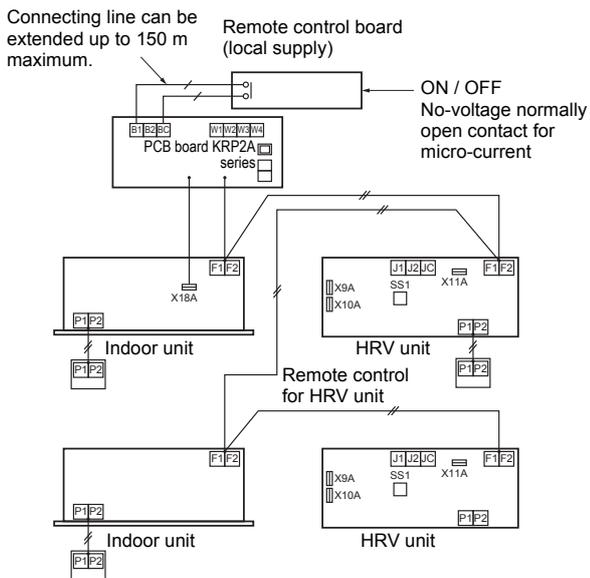
###### Purposes and functions

A maximum of 64 groups can be controlled the operation of "ON / OFF" collectively. (For the individual control, use the central remote control or the unified On / Off control.)

###### Cautions

1. Adapter PCB can be installed in any unit connected to the central transmission line.
2. It cannot be used with other central control.
3. The setting of group number is not required.
4. The HRV unit judges the ventilation mode, individually.

###### Example control wiring



(HC0038)

###### Switch setting of the HRV unit

The initial setting is required by the remote control for the indoor unit or HRV unit.

- Collective zone interlock setting  
....."OFF" (as per factory setting)
- The setting of switch on the PCB
- Voltage / no-voltage changeover switch(SS1)  
....."no-voltage"
- \* Remote control mode changeover switch (RS1) should be selected.

###### Optional accessories required

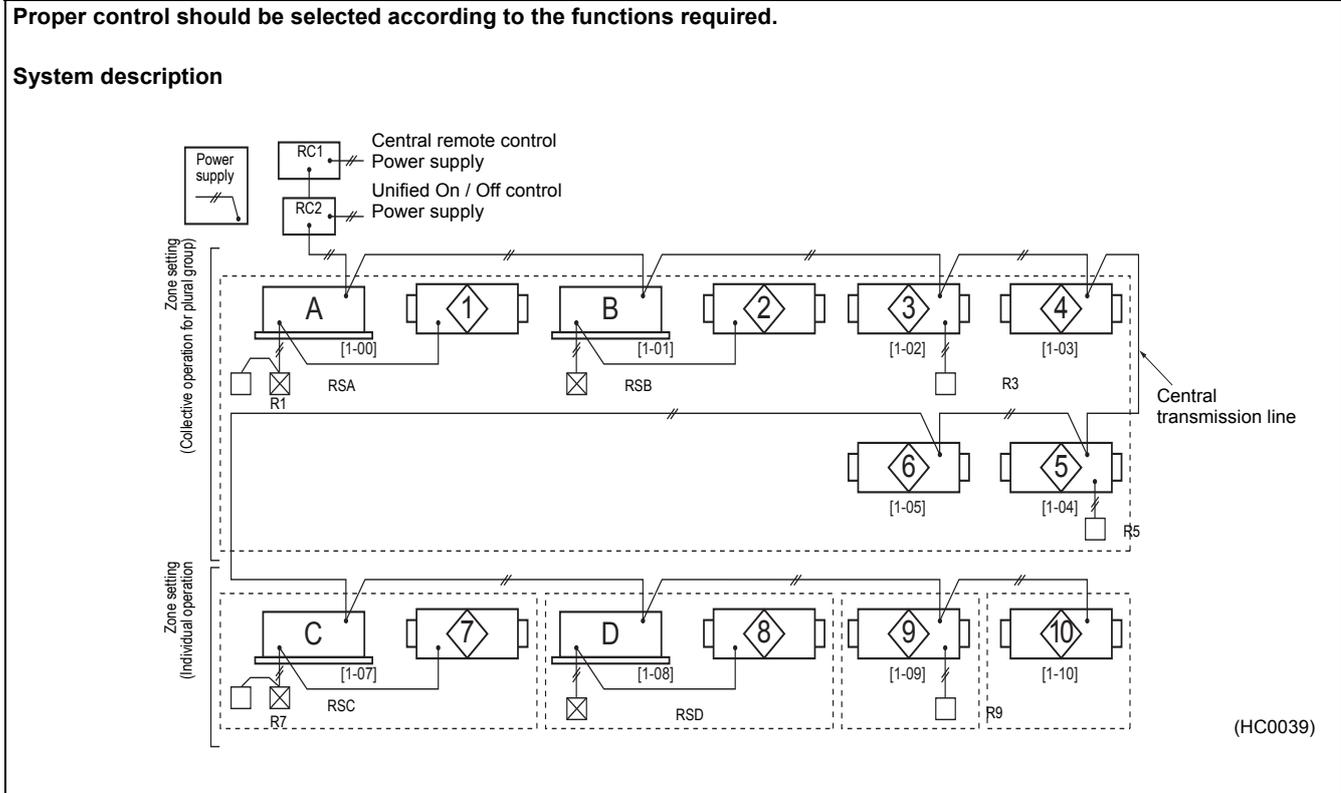
Adapter PCB for remote control KRP2A61

# 5 Control systems

## 5 - 4 Applicable patterns

### 5 - 4 - 3 Central control system (DCS302B61)

#### Multi function central control + Unified On / Off Control



Unit No.	Setting				Operation display functions (○ means possible)												Choose condition							
	Zone setting		Interlocked zone control		Operation / stop				Independent ventilation Operation/stop				Ventilation air flow Ventilation mode Fresh-up				Filter-sign Malfunction code				HRV unit side			
	Collective	Individual	On	Off	Required (●) Not Required	RC1	RC2	RSA - D	R1 - 9	RC1	RC2	RSA - D	R1 - 9	RC1	RC2	RSA - D	R1 - 9	RC1	RC2	RSA - D	R1 - 9	Interlocked operation with Energy saving	*4 Total evaluation	
①	●			●	Not required (Setting required only for ④ ⑤)																		○	AA
②	●			●		Linked to A/B		○															○	AA
③	●		●		●																		○	AA
④	●		●		(Connection required, ● when setting)																		○	BB
⑤	●			●	●																		○	CC
⑥	●			●	(Connection required, ● when setting)																		○	DD
⑦		●		●	Not required (Setting required only for ⑦ ⑩)	Linked to C/D		○															○	AA
⑧		●		●		Linked to C/D		○															○	AA
⑨		●		●	●		○		○														○	CC <sup>*5</sup>
⑩		●		●	(Connection required, ● when setting)		○		○														○	DD <sup>*5</sup>

\*1. Independent operation for ventilation is possible, if collective zone interlock setting is "ON" with the indoor unit in the same zone.

\*2. It is possible by the initial setting.

\*3. Display of malfunction code only.

\*4. The meaning of total evaluation

AA: Interlocked operation with energy saving and changeable of Ventilation mode / Air flow rate

BB: Interlocked operation with energy saving and no changeable of Ventilation mode / Air flow rate

CC: No interlocked operation with energy saving and changeable of Ventilation mode / Air flow rate

DD: No interlocked operation with energy saving and no changeable of Ventilation mode / Air flow rate

\*5. Interlocked operation setting must not be done for individual zone. (Because there is no unit to combine in zone except 1unit.)

## 5 Control systems

### 5 - 4 Applicable patterns

#### 5 - 4 - 4 Examples of mistakes in wiring and system designing

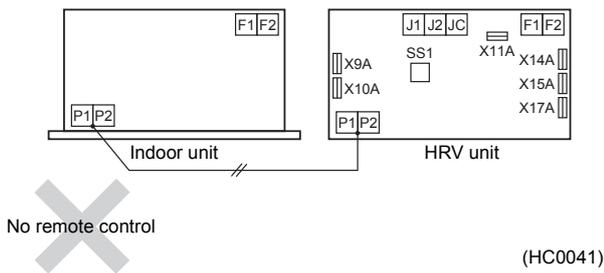
5

It is necessary to install the remote control for the transmission line.

**<Part 1>**

- When you connect the transmission line for the remote control, the remote control should be installed on the transmission line.

**Example of control wiring**



**Reason**

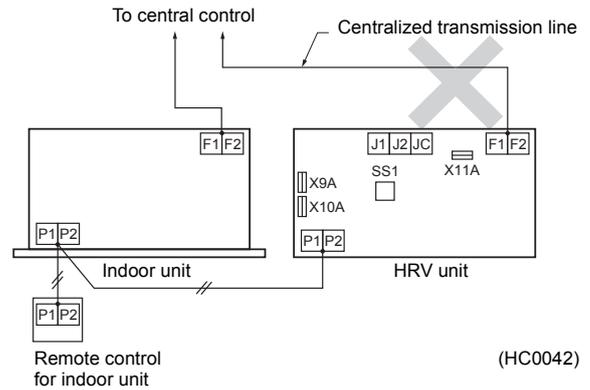
Because the signal through the transmission line is originated from the remote control, there is no transmission signal to operate the units, if the remote control is not installed.

The centralized transmission line should be connected to the indoor unit.

**<Part 2>**

- If the HRV unit is interlocked to the centralized control, the central transmission line should be connected to the terminal no. F1 and F2 of indoor unit.

**Example of control wiring**



**Reason**

The information from the indoor unit cannot be transmitted to the central control through the HRV unit. And also the information from the central control cannot be transmitted to the indoor unit through the HRV unit.

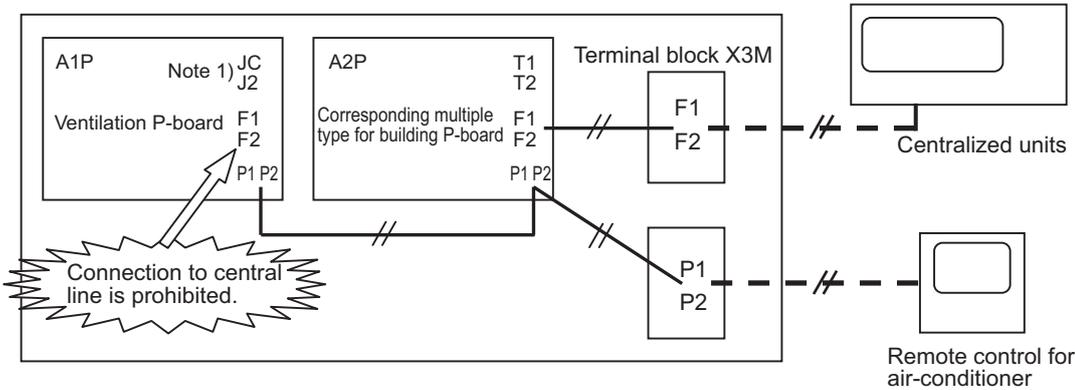
## 5 Control systems

### 5 - 5 Additional information on control of VKM-GB(M) units

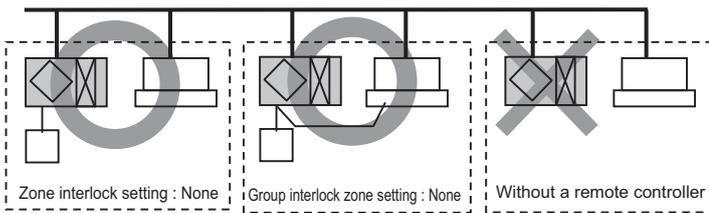
#### 5 - 5 - 1 Central Control System

- When carrying out a central connection, connect the central line to F1 and F2 only on the corresponding multiple type for building P-board. Do not connect to F1 and F2 on the ventilation side. (= Connect to the terminal block X3M.)

An image sketch of internal wiring on the ventilation side



- In case of a central control, operation ON/OFF can be done separately by each zone. (In this case, zone interlocked setting must be kept as the factory setting (17. 08. 01).)
- Structure without a remote control cannot be accepted because the remote control group is controlled within a VKM-GA(M) model. (intelligent Touch Controller, central control controller)



\* Alteration of set temperature and independent ventilation operation cannot be performed from a central device.

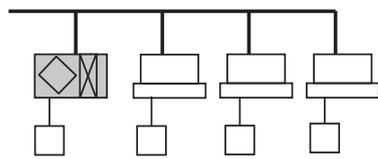
## 5 Control systems

### 5 - 5 Additional information on control of VKM-GB(M) units

#### 5 - 5 - 2 Restrictions to Control System

5 - 5 - 2 - 1 Do not Give VKM-G(M) Model a Function to Select Cooling/Heating.

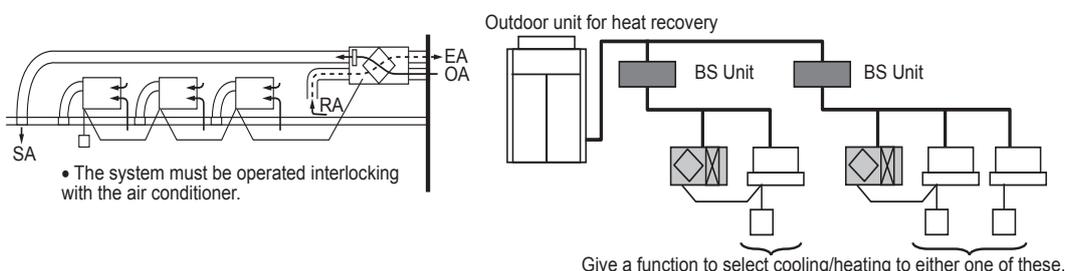
**(This is because the operation mode switches automatically depending on the outdoor conditions regardless of the indoor temperature when set to "Automatic".)**



Give a function to select cooling/heating to either one of these.

#### 5 - 5 - 2 - 2 Caution When Connecting with a VRV System, Heat Recovery Type

When bringing the RA (exhaust gas intake) of this unit directly in from the ceiling, connect to a BS unit identical to the VRV indoor unit (master unit), and use group-linked operation.



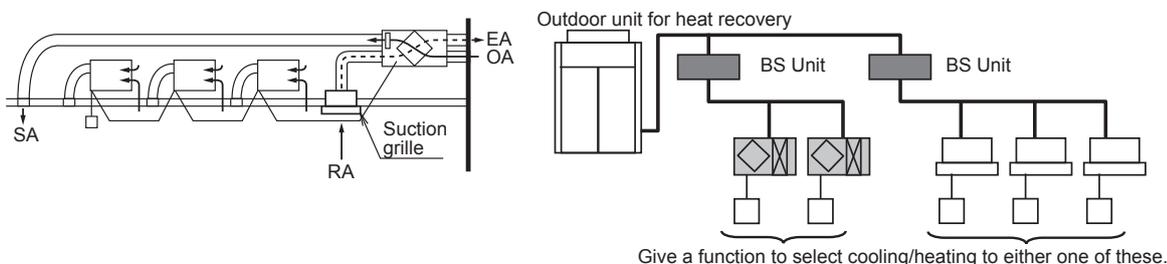
Give a function to select cooling/heating to either one of these.

If above setting is not made, the detection of correct temperature is not available and automatic judgment on proper cooling or heating cannot be made when the temperature in the ceiling gets higher than indoor temperature.

Poor heating or shortage of the amount of humidification may result.

If the indoor unit and this unit are installed with different BS system inevitably, always take following remedies (1) and (2).

- 1 RA (Exhaust and suction) of this unit is not taken directly from inside of the ceiling, connect the suction duct and suction grille to the fitting port of RA duct to suck the indoor air.



Give a function to select cooling/heating to either one of these.

- 2 Do not make the selection of heating or cooling in automatic mode and it shall be made by manual selection from remote control or centralized controller.

## 5 Control systems

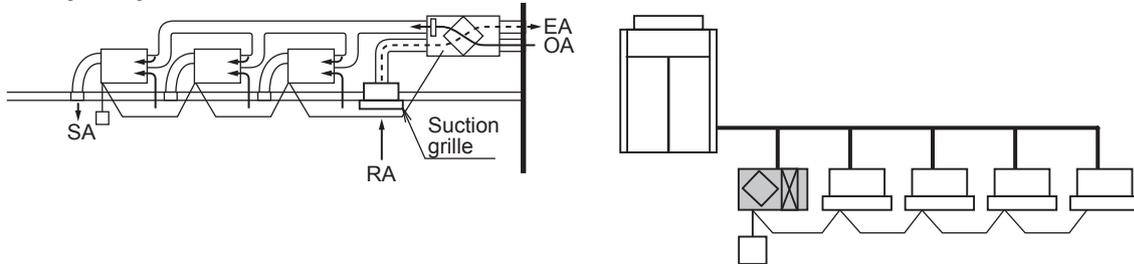
### 5 - 5 Additional information on control of VKM-GB(M) units

#### 5 - 5 - 3 Restrictions to Control System

##### 5 - 5 - 3 - 1 Caution when Connecting the Indoor Unit Directly to the Duct

Follow the indications described below

a) When connecting the indoor unit directly to the duct, always use the same system on the indoor unit as with the outdoor unit, perform group-linked operation, and make the direct duct connection settings from the remote control. (Mode No. "17 (27)" – First code No. "5" – Second code No. "6".) Refer to 15.10.1 concerning setting method.



b) Do not connect to the outlet side of the indoor unit. Depending on the fan strength and static pressure, the unit might back up.

c) When it is connected to the suction side of indoor unit as a direct duct connection system, etc., since there is a possibility that the body thermo of the indoor unit detects erroneously SA discharge from this unit as indoor air, use the remote sensor (Optional).

## 5 Control systems

### 5 - 5 Additional information on control of VKM-GB(M) units

#### 5 - 5 - 4 About the basic control of VKM

##### 5 - 5 - 4 - 1 Basic control of VKM

VKM sucks the air after OA has subjected to total heat exchange with RA, detects the air temperature by means of the thermistor for inlet air into DX-coil (R3T) to make a judgment on operation mode, cooling or heating and exercises the control on the capacity of air heat exchanger.

#### • Sensor position and its function

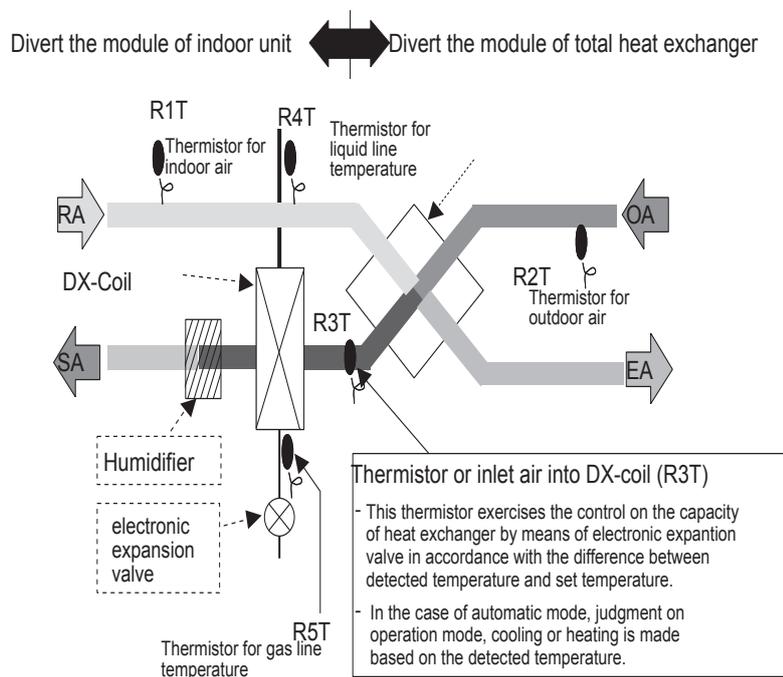
VKM consists of indoor unit + total heat exchanger portion.

Dissimilarities with normal indoor unit are :

- Position of thermostat in the normal indoor unit : Position to detect RA temperature
- Position of thermostat in VKM : Position to detect the air subjected to total heat exchange between OA and RA.

Therefore, the temperature detected by VKM gets lower than that of the indoor unit thermostat.

Doing so allows VKM to perform treatment of outside air with stability even as the indoor unit stays thermo-OFF state because of big difference between the set temperature and suction temperature even though the set temperature of VKM and indoor unit are the same.





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