



INSTALLATION MANUAL

RHF025EE Series
RHF035EE Series
RHF050EE Series
RHF080EE Series
RHF100EE Series

ENGLISH

ESPAÑOL

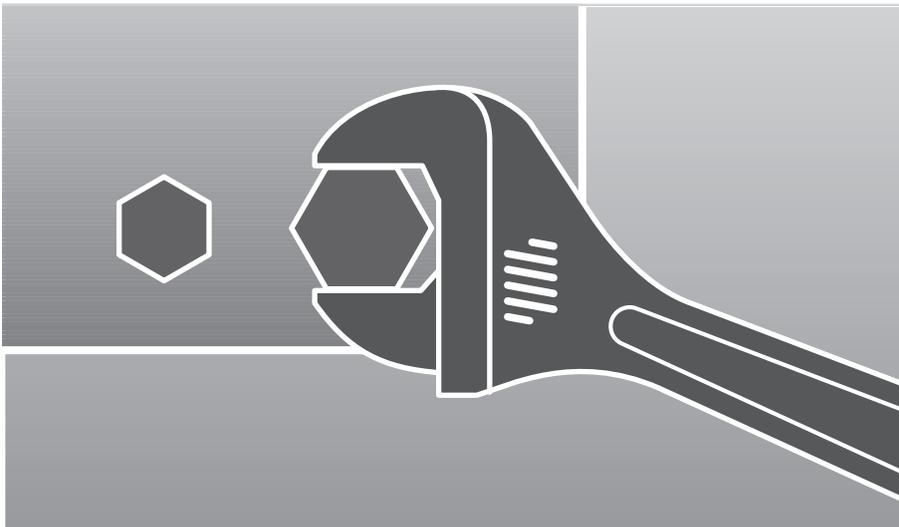
FRANÇAIS

ITALIANO

PORTUGUÊS

DEUTSCH

ERV (Energy Recovery Ventilator)



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Safety Precautions

Keep this installation manual together with the user's manual in a handy place so that you can find it whenever you need to see it after reading this manual thoroughly.

- ▶ **Make sure to read the following safety precautions carefully before installation.**
- ▶ **Make sure to observe the cautions specified in this manual.**
- ▶ **Conduct a test run of the unit after installation and then explain all system functions to the owner.**
- ▶ **The indications and meanings are as shown below.**



WARNING • This indicates the possibility of serious injury or death.

- ▶ Do not install the unit by yourself. Incorrect installation of the unit could cause injury due to fire, electric shock and water leakage or from the unit falling. Consult a dealer or a qualified installer.
- ▶ Hang down a blockage for bird in front of outdoor air suction duct. If something such as bird's nest blocks the air suction duct, it may result in oxygen shortage indoors.
- ▶ Perform the installation securely referring to the installation manual. Incomplete installation could cause personal injury due to fire, electric shock or the unit falling.
- ▶ Do not attempt to repair, move, modify or reinstall the unit on your own. Make sure that these installations are carried out by qualified personnel to avoid electric shock or fire.
- ▶ Check if the voltage and the frequency of the main power supply are required for the unit to be installed and check the connection.
- ▶ The electric work must be done by service agent or similarly qualified person according to national wiring regulations and use only rated cable. If the capacity of the electric work is not properly completed, electric shock or fire may occur.
- ▶ Make sure the air intake is located far from an exhaust port of a burner. It may cause oxygen shortage.
- ▶ Ground the unit. Do not connect the ground to a gas pipe, water pipe, lighting rod or telephone grounding. Defective grounding could cause electric shock.
- ▶ Install the cables with supplied cables firmly. Fix them securely so that external force is not to exert to the terminal board. If the connection or fixing is incomplete, heat generation, electric shock or fire may occur.
- ▶ Install separate MCCB and ELB when installing the power cable. If you do not install the MCCB and ELB, electric shock or fire may occur.
- ▶ If the power plug is damaged, replace it by the manufacturer or qualified personnel to avoid the risk.
- ▶ Disconnect the circuit breaker when you don't use the product for a long period of time to save energy.
- ▶ Do not install the electric wire to get tension to avoid a hazard.
- ▶ Unplug the product before get repaired.
- ▶ Do not pull the electric wire or touch the power plug with wet hands.
- ▶ Installers are required to read the general information carefully for safety.
- ▶ Do not put the product near dangerous substances to prevent fire, explosion or injury and do not expose the product to direct sunlight.



WARNING

• This indicates the possibility of serious injury or death.

- ▶ Avoid the use of an extension cord and do not share the power outlet with other appliances. Incomplete connection, defective insulation or exceeding the permissible current may cause electric shock or fire.
- ▶ Make sure to turn off the main power when setting up the product's electric circuit or power cords. There is electric shock.
- ▶ The product should be installed in accordance with the National Electrical regulations.
- ▶ Ensure that the national safety code requirements have been followed for the main supply circuit. Ensure that a properly sized and connected ground wire is in place.



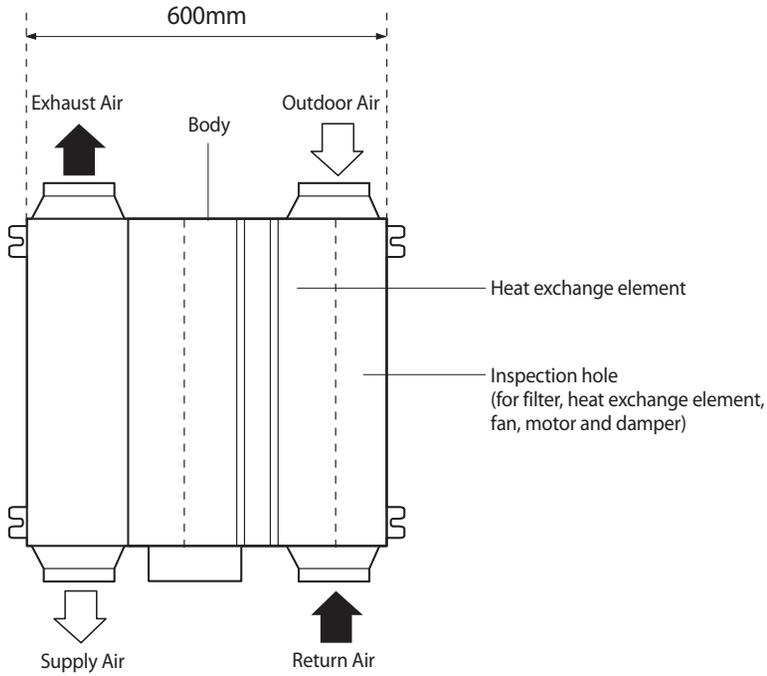
CAUTION

• This indicates the possibility of serious injury or damage to environments when operated incorrectly.

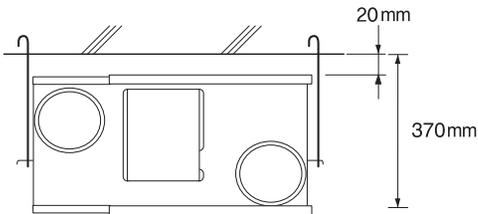
- ▶ Install the unit in a place where it is strong enough to hold the product weight. When installed in place where it is not strong enough to withhold the product weight, the unit may fall and cause injury.
- ▶ Install the product inside heat insulation over the ceiling not to be contacted with the outside air. If the product is installed out of the insulation, it may result in electric shock or malfunction due to moisture generated in the product.
- ▶ Do not install the product in a place where it is exposed to inflammable gas leakage.
- ▶ Do not install the product in humid place such as bathroom. It may cause electric shock or malfunction.
- ▶ Make sure to use the part provided or specified parts for the installation work. The use of defective parts could cause injury, fire, electric shock or the unit falling, etc.
- ▶ Do not install the product in the place where exposed to sulfuric acid or steam because it may damage the parts or cause malfunction.
- ▶ Do not install the product in the place where generates toxic gas such as chemical factory. It may cause fire or gas poisoning.
- ▶ Check the product for damage that may have taken place during transportation and do not install or use damaged equipment.
- ▶ All of the manufacturing and packaging material used for your new appliance are compatible with the environment and can be recycled.
- ▶ Dispose of the packaging material in accordance with the local requirements.
- ▶ Install a ground leakage breaker depending on the installation place (where it is humid). If not, it may cause electric shock.
- ▶ The product must be installed according to the national electrical regulations.
- ▶ The maximum input power and current is measured according to the IEC Standard and the input power and current is measured according to ISO standard.

Space Requirements

***025**

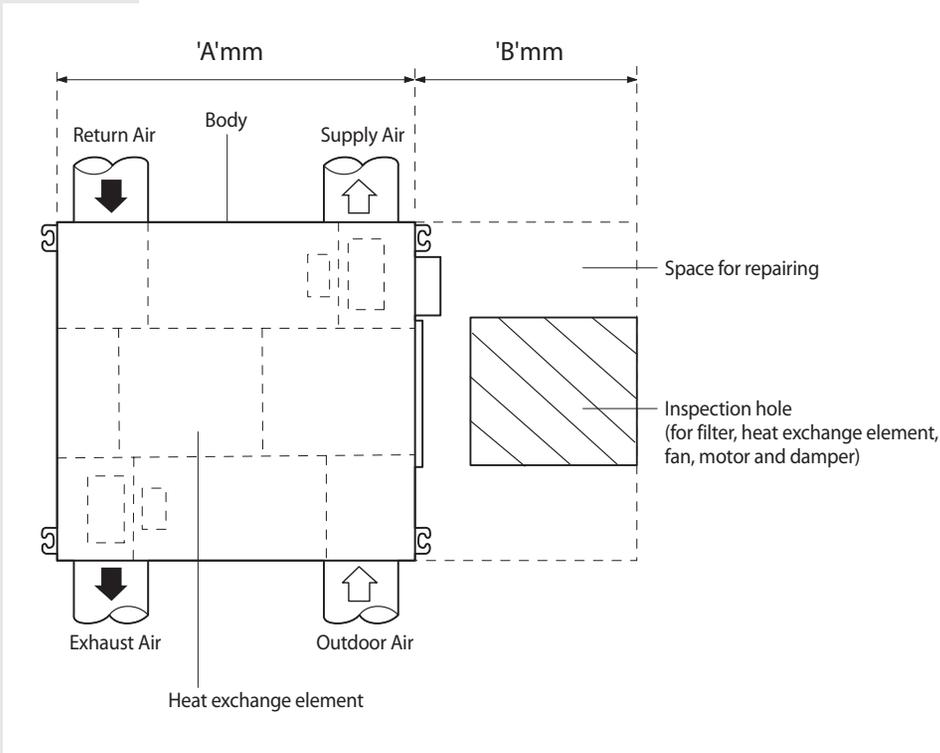


➤ **The ventilator should be installed in a ceiling which has enough space above as seen in the picture.**



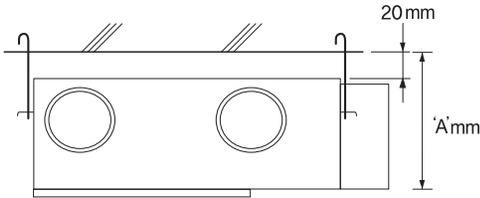
Space Requirements (Continued)

■ **035/050/080/100**



Model	'A'	'B'	Number of heat exchange elements
035/050	1000	600	2
080/100	1135	800	

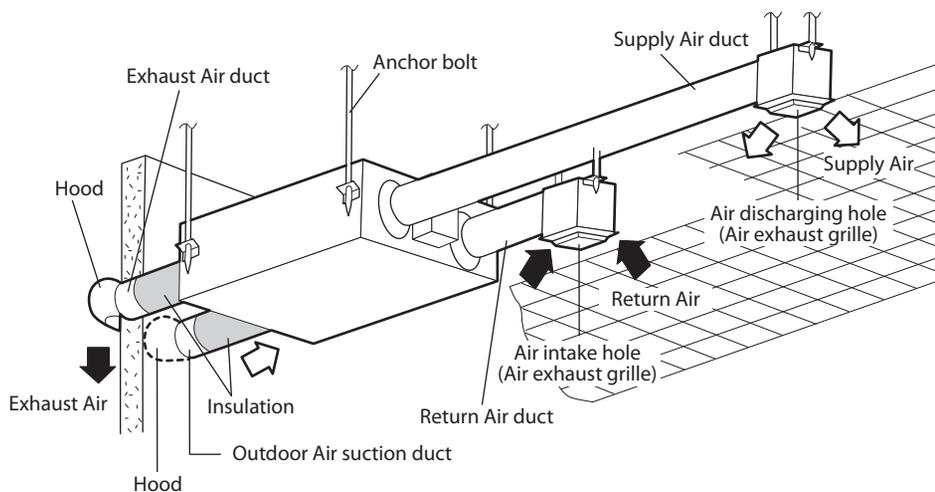
➤ **The ventilator should be installed in a ceiling which has enough space above as seen in the picture.**



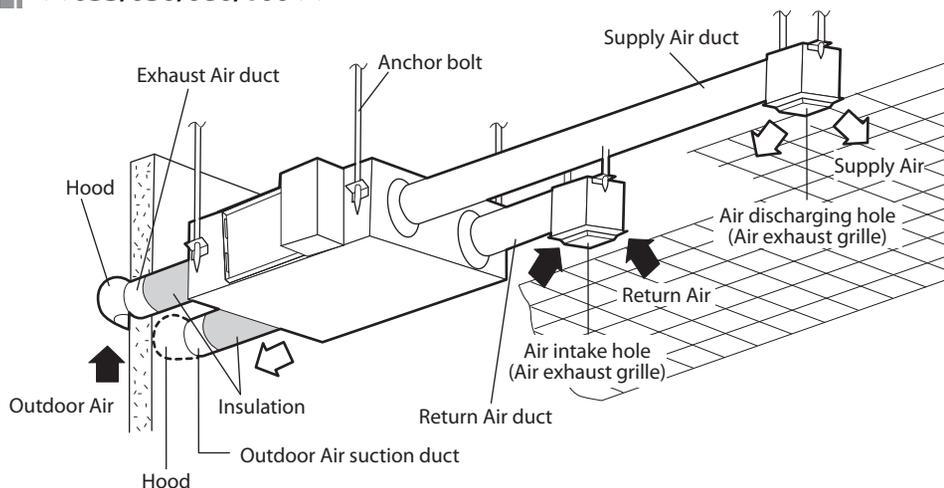
Model	'A'
035/050	320
080/100	440

Installation Diagram

****025****



****035/050/080/100****

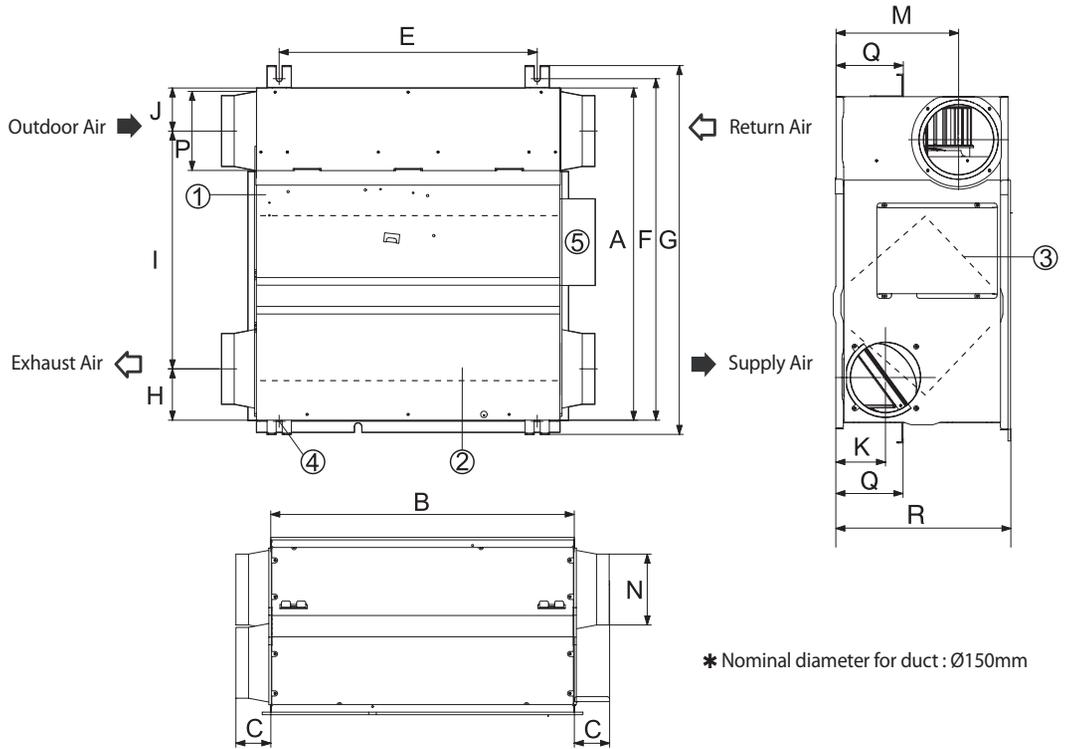


CAUTION

- ◆ **Install the unit in a place where it is strong enough to hold the product weight.**
- ◆ **Install the unit in a place where the space is enough to install or repair the unit.**
- ◆ **Do not install the unit in humid place such as bathroom.**
- ◆ **Do not install the unit in a place over 40°C or where exposed to fire, gasoline or smoke directly.**
- ◆ **Install the cables with supplied ones securely.**

External Dimension

***025**



* Nominal diameter for duct : Ø150mm

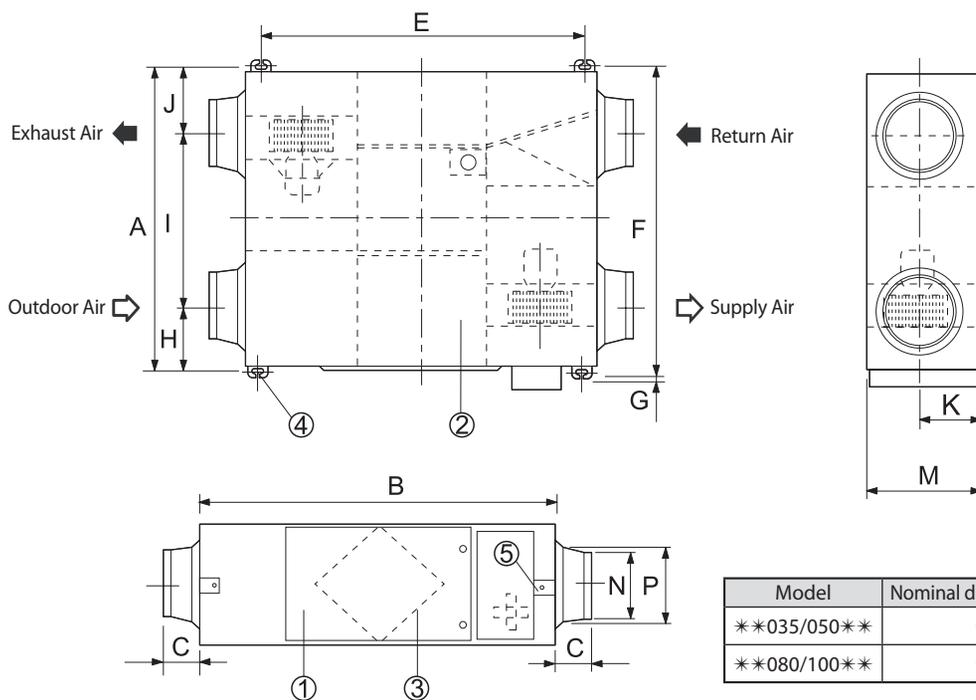
No.	Name	Quantity
①	Maintenance cover	1
②	Heat exchange element	1
③	Dust filter	2
④	Hanger	4
⑤	Electrical component box	1

(Unit : mm)

Model	A	B	C	E	F	G	H	I	J	K	M	N	P	Q	R
***025**	600	660	70	510	675	729	102	470	85	98	242	Ø140	Ø156	133	350

➤ **Ensure the space for installing and repairing.**

****035/050/080/100****



(Unit : mm)

Model	Nominal diameter for duct
035/050	Ø200
080/100	Ø250

No.	Name	Quantity
①	Maintenance cover	1
②	Heat exchange element	2
③	Dust filter	4
④	Hanger	4
⑤	Electrical component box	1

(Unit : mm)

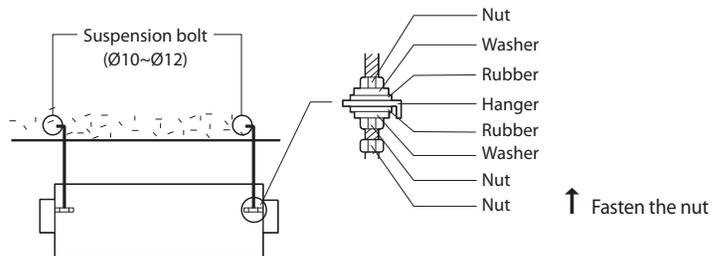
Model	A	B	C	E	F	G	H	I	J	K	M	N	P
035/050	1000	1012	99	940.6	1036.4	26	130	617	253	135	270	Ø194	Ø241.5
080/100	1135	1220	84	1110	1183	25	184	613.25	387.75	170	340	Ø244	Ø270

➤ **Ensure the space for installing and repairing.**

Installing the Unit

Make sure to attach the unit firmly. If the unit is not attached firmly or attached incorrectly, it may result in malfunction or injury.

- 1 Insert bolt anchors to a ceiling. Use existing ceiling support or construct a suitable support.
- 2 Install the suspension bolts depending on the ceiling type.
- 3 Screw two nuts to the suspension bolts making space for hanging the unit.
- 4 Hang the unit horizontally to the suspension bolts between two nuts.
- 5 Fasten the nuts to suspend the unit.
 - ◆ The washer should be fit for the hanger.



CAUTION

Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

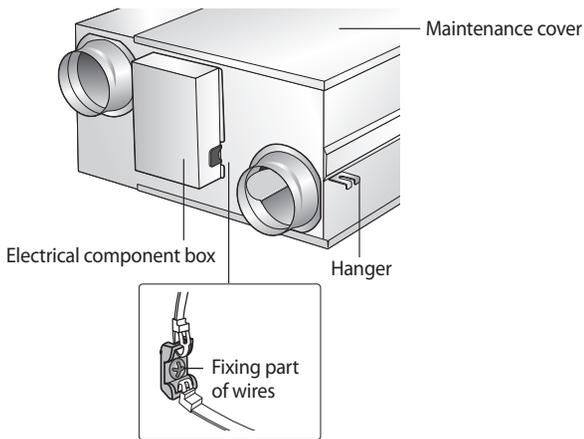
Electric Wiring

Before electric wiring, make sure that the voltage is 1 wire 220V/50Hz.

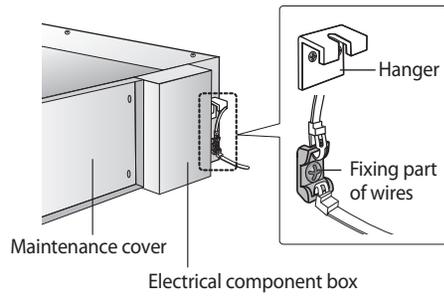
Electrical Component Box

Surface

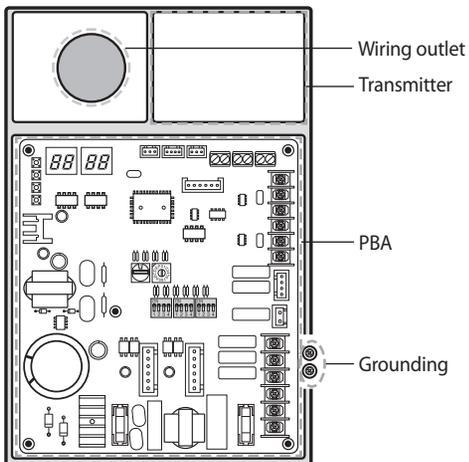
025



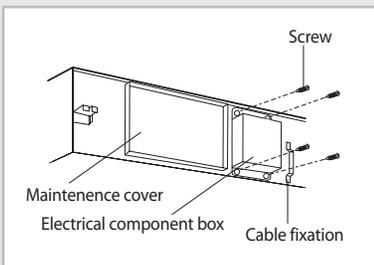
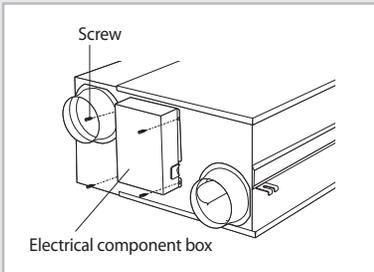
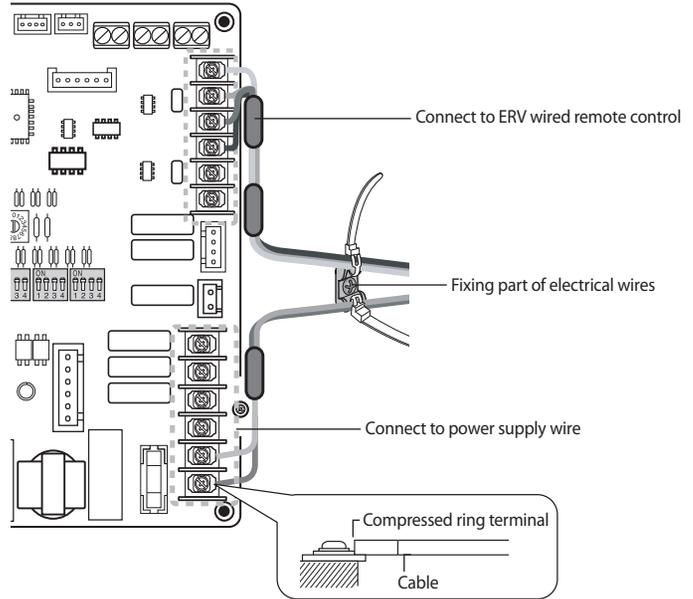
035/050/080/100



Inside



Electric Wiring



1 Remove the 4 screws on the electrical component box and open the cover plate.

2 Connect the cables correctly as seen in the picture.

◆ Fix the cables with a cable tie.

3 Connect the cable to the terminal board with a compressed ring terminal.

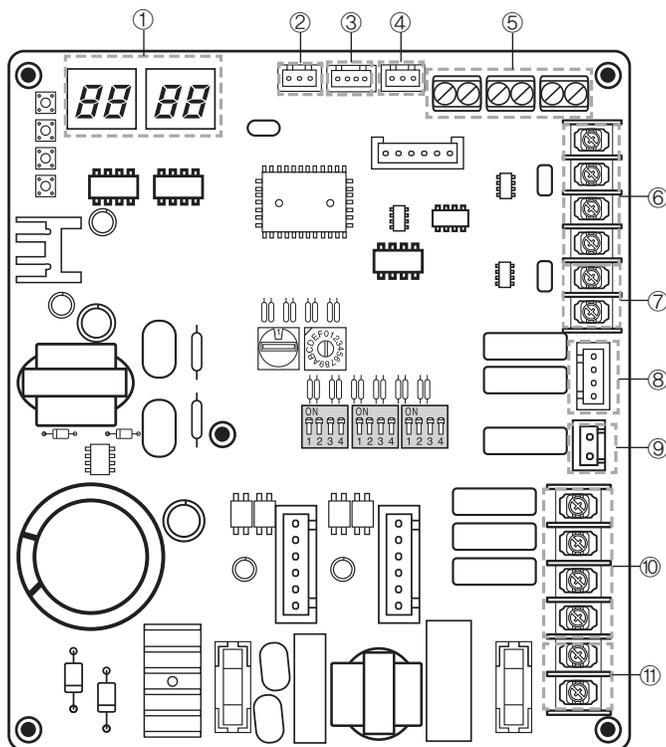
➤ **Fix the screws in the electrical component box with designated torque referring to the table.**

Size		M5 Bolt	M6 Bolt
Recommended size	N·m	1.34~2.0	1.67~2.5
	kgf·cm	13.4~20.0	16.7~25.0

CAUTION

- ◆ Do not wash the heat exchange element. It may decrease the efficiency.
- ◆ Make sure to use rated cable for power supply and do not extend or cut the cord.
- ◆ The unit should be installed in accordance with the National Electrical regulations. Ensure that the national safety code requirements have been followed for the main supply circuit.

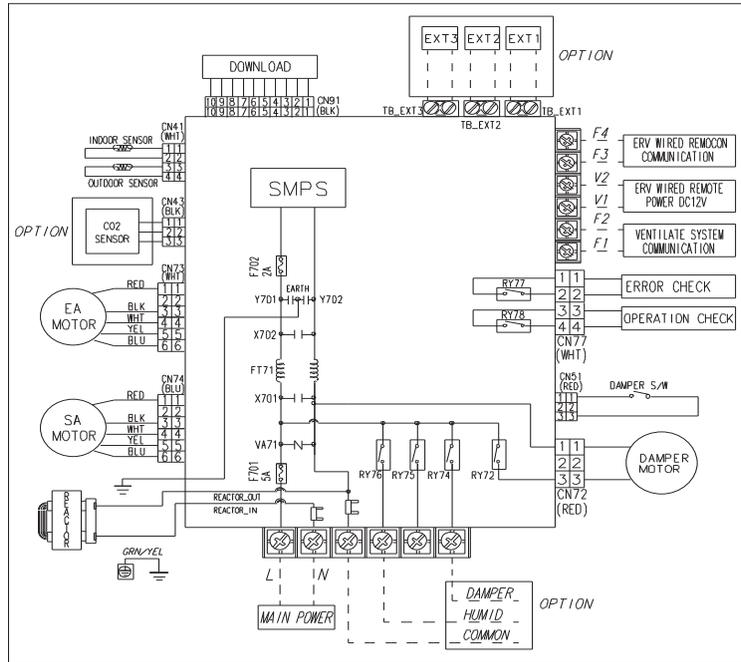
Main PCB



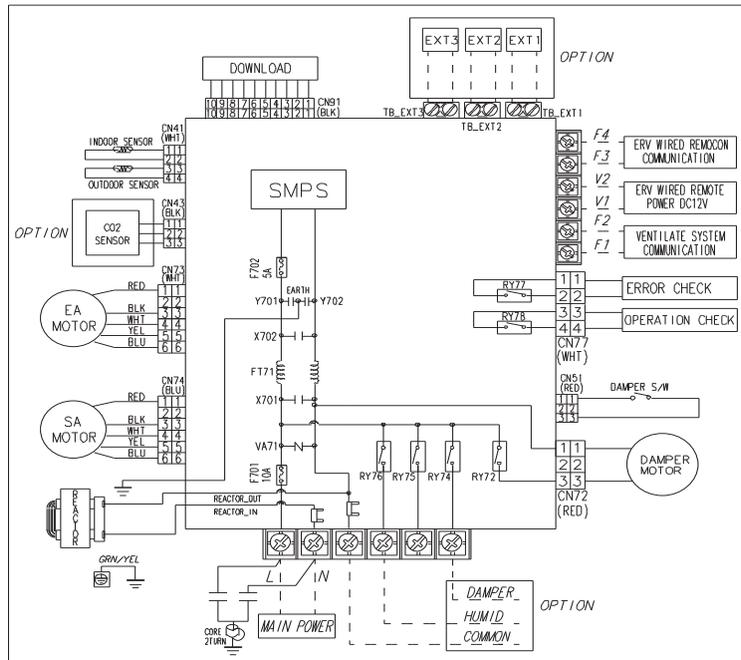
No.	Classification	Explanation	Specifications
①	DISPLAY	DISPLAY	
②	CO ₂ sensor	CO ₂ sensor connection port	3PIN (CN43)
③	Temperature sensor	Indoor/outdoor temperature sensor connection port	4PIN (CN41)
④	Damper switch	Signal input port of damper switch	3PIN (CN51)
⑤	External control	On/Off control by external contact signal	2PIN (EXT1) / 2PIN (EXT2) / 2PIN (EXT3)
⑥	ERV wired remote control	V1, V2 (DC 12V power supply), F3, F4 (ERV wired remote control communication)	4PIN (TB±COM)
⑦	Communication	F1, F2 (Communication between the ventilators or transmitter)	2PIN (TB±COM)
⑧	Monitor the operation status	Report operation errors	4PIN (CN77)
⑨	Damper motor	Damper control port for changing operation modes	2PIN (CN72)
⑩	External device	External humidifier/ External damper	4PIN (TB±LOAD)
⑪	Power supply	220V/50Hz(L/N)	2PIN (TB±LOAD)

Schematic Diagram

****025/035/050****



****080/100****



Power and Communication cables specification

Power Cable	Communication Cable
2.0mm ² (CV)	0.75mm ² (VCTF)

※ (---) indicates Installation specification in the field.

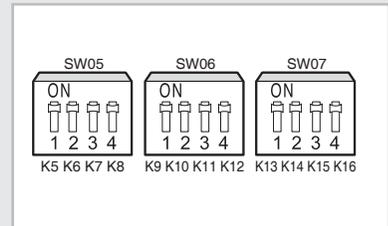
※ The power and communication cables are not supplied with air conditioner.

Option Switches

The default setting of all switches is ON.

If you want to set the function on, turn OFF the switch.

DIP Switch	Function	ON	OFF	
SW05	K5	Spare	-	
	K6	Centralized control	Not use	
	K7	Spare	-	
	K8	MASTER/SLAVE	SLAVE	
SW06	K9	CO ₂ sensor	Not use	
	K10	Filter signal display	2000 Hr	
	K11	External control	Refer to the table below	
	K12			
SW07	K13	External humidifier	Not use	
	K14	Spare	-	
	K15	External damper	Not use	
	K16	Spare	-	



- K5 (Spare)
- K6 (Centralized control)
ON: Not use of centralized controller
OFF: Use of centralized controller
- K7 (Spare)
- K8 (MASTER/SLAVE)
ON: Communicate COM1(F1, F2), operating as SLAVE
OFF: Communicate COM2(F1, F2), operating as MASTER
- K9 (CO₂ sensor)
ON: Not use of external CO₂ sensor
OFF: Use of external CO₂ sensor
- K10 (Filter signal display)
ON: Display filter reset after 2000 of running hours
OFF: Display filter reset after 1000 of running hours
- K11, K12 (External control)
Setup control level of the ERV wired remote control and external control
- K13 (External humidifier)
ON: Not use of external humidifier
OFF: Use of external humidifier
- K14 (Spare)
- K15 (External damper)
ON: Not use of external damper
OFF: Use of external damper
- K16 (Spare)

▶ K11, K12 (External control)

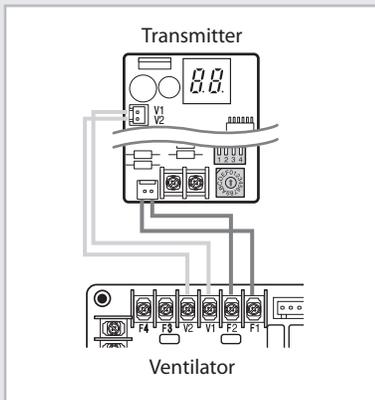
K11	K12	External control setup
ON	ON	Same level control with the ERV wired remote control and external control (Followed by the last control status.)
ON	OFF	Priority to the ERV wired remote control (While operating by the ERV wired remote control, it can not be controlled by the external control. The external control is possible only when the ventilator is turned off.)
OFF	ON	Priority to the external control (While operating by the external control, it can not be controlled by the ERV wired remote control. The ERV wired remote control can control only when the ventilator is turned off.)
OFF	OFF	Not use

Connecting the Unit

Make sure to disconnect the power cable and power supply before connecting the ventilator to other control solutions. If not, it may cause malfunction due to electrical interference.

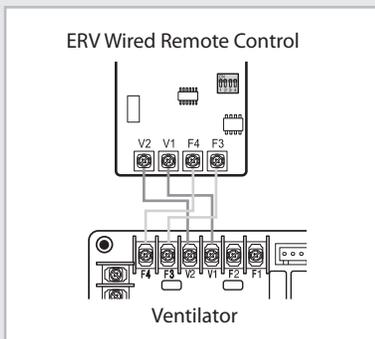
Transmitter

It does not need to connect the transmitter in case of individual control. Connect the transmitter to the MASTER ventilator only, in case of centralized control.



- 1 Attach the transmitter to the case in the electrical component box.
- 2 Connect the V1, V2 terminal of the transmitter to the V1, V2 terminal of the ventilator PCB. (DC 12V)
- 3 Connect the F1, F2 terminal of the transmitter to the F1, F2 terminal of the ventilator PCB. (COM1 Communication)

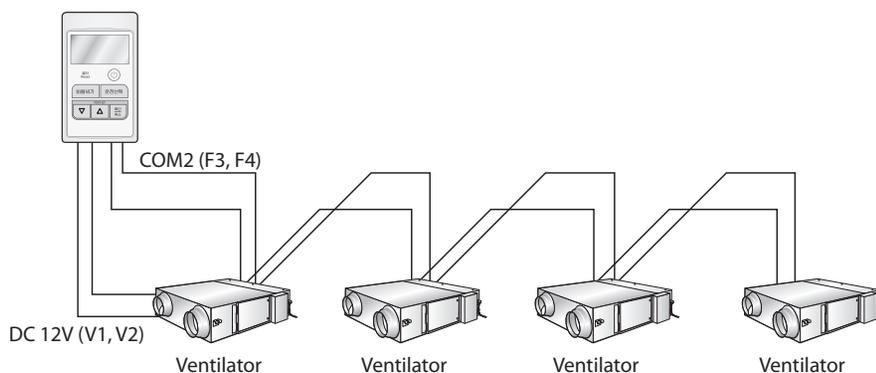
ERV Wired Remote Control



- 1 Remove the maintenance cover of the ERV wired remote control.
- 2 Connect the V1, V2 terminal of the ERV wired remote control to the V1, V2 terminal of the ventilator PCB. (DC 12V)
- 3 Connect the F1, F2 terminal of the transmitter to the F1, F2 terminal of the ventilator PCB. (COM2 Communication)
- 4 Reassemble the maintenance cover and the ERV wired remote control.

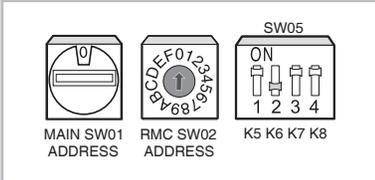
ERV Wired Remote Control and Multiple Ventilators

ERV Wired Remote Control



- 1 Remove the maintenance cover of the ERV wired remote control.
 - 2 Connect the V1, V2 terminal of the ERV wired remote control to the V1, V2 terminal of the ventilator PCB. (DC 12V)
 - 3 Connect the F3, F4 terminal of the transmitter to the F3, F4 terminal of the each ventilator PCB. (COM2 Communication)
 - 4 Reassemble the maintenance cover and the ERV wired remote control.
- **The ERV wired remote control is MASTER of COM2 communication, so it can communicate without separate ADDRESS setting. Up to 16 ventilators can be connected to a ERV wired remote control at once.**

Connecting the Unit (Continued)

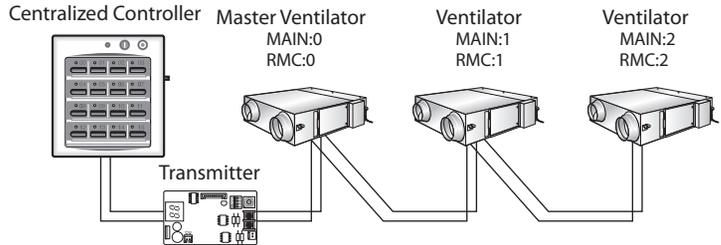


Centralized Controller

Installing the Centralized Controller

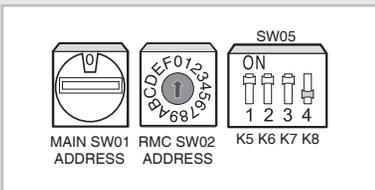
- ◆ To use a centralized controller, set K6 of SW05 to OFF position.
- To centralized control, the ventilator should be set as MASTER among one or more ventilators for communication.

Setup Master Ventilator



Indoor unit RMC ADDRESS	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Number on the centralized controller	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

- 1 Set K8 of SW05 to OFF position.
- 2 Set MAIN ADDRESS as 0,1,2 and also set RMC ADDRESS as 0,1,2 as well.



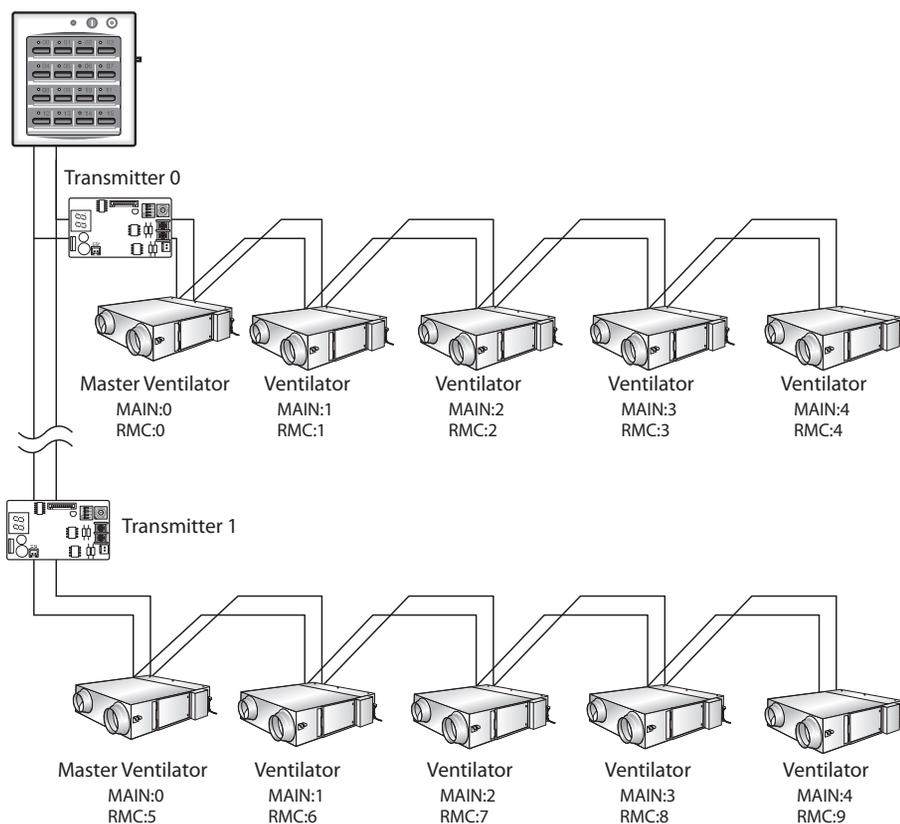
- **MAIN** : Setup switch to designate the address among ventilators
- **RMC** : Setup switch to designate the address when controlling by a centralized controller

Setup the Centralized Controller

Setup the Centralized Individual Control (1:1, Individual Room Control)

- ◆ To centralized individual control, set each of the RMC ADDRESS of each ventilator to different number which is controlled by a centralized controller.

Centralized Controller



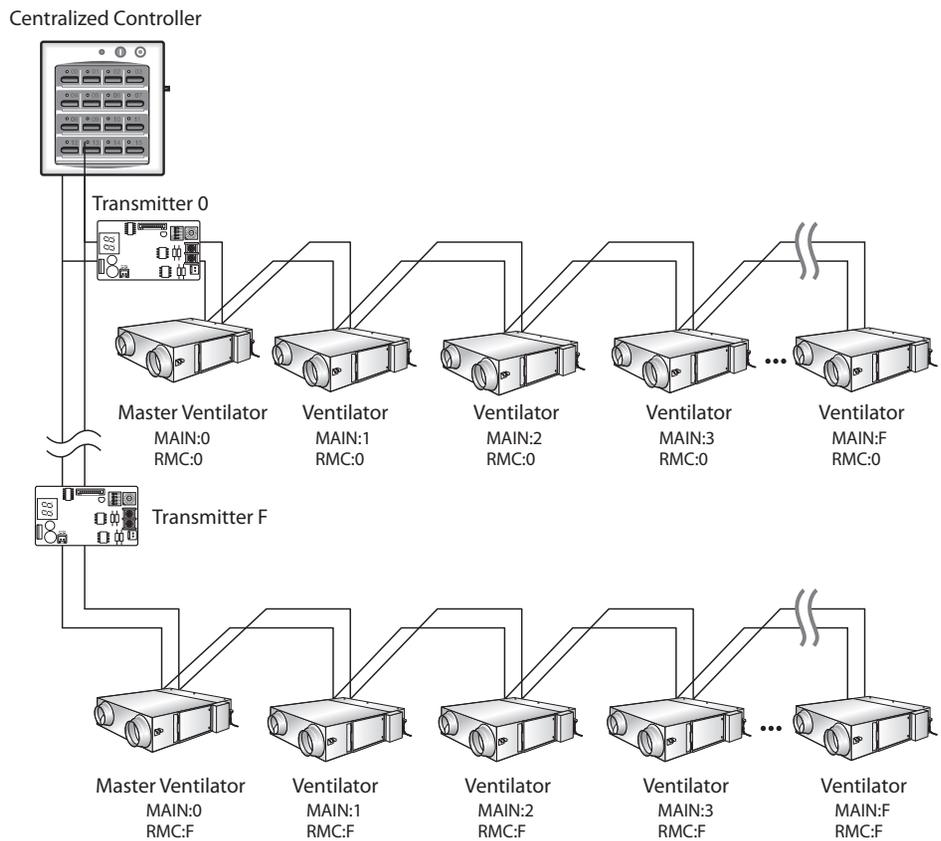
- **If the 00 switch of the centralized controller is set to ON position, the ventilators which are designated 0 of their RMC ADDRESS are operated.**

Connecting the Unit (Continued)

Setup the Centralized Control (Continued)

Setup the Centralized Group Control (1:1 group, 16 Groups Control)

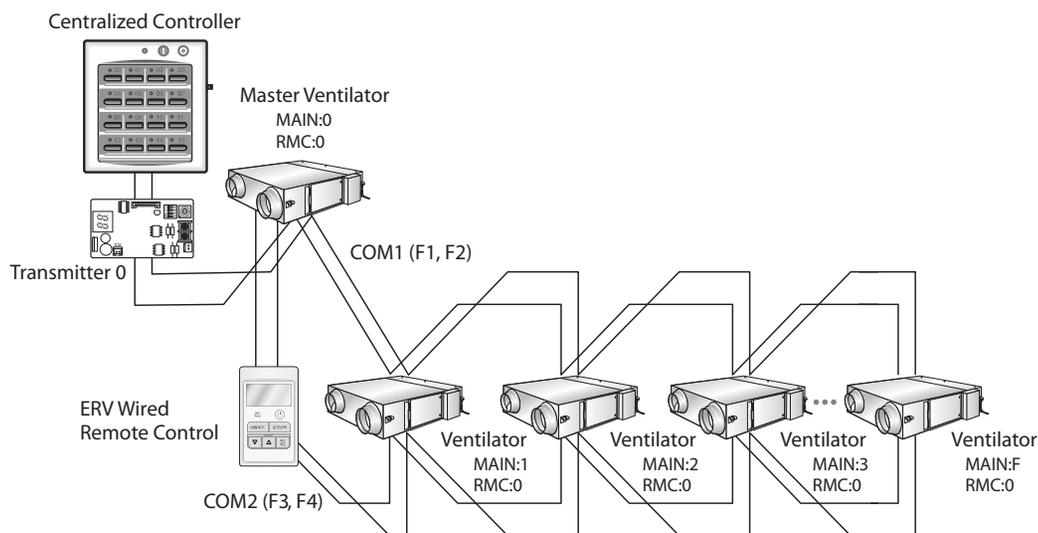
- ◆ To centralized group control, set all of the RMC ADDRESS of all ventilators to be controlled by the centralized controller.



- **If the 00 switch of the centralized controller is set to ON position, 16 ventilators which are set as 0 of their RMC ADDRESS are operating simultaneously. Up to 256 of ventilators can be controlled at once.**

Setup Simultaneous Control of Centralized Controller and the ERV Wired Remote Control

- ◆ The centralized controller can be controlled by RMC ADDRESS of the ventilator, while the ERV wired remote control is controlled by COM2 communication.



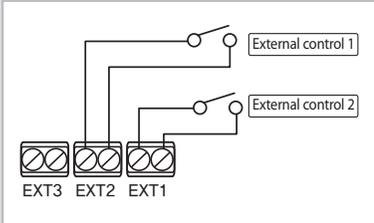
- **The ERV wired remote control is MASTER of COM2 communication, so it can communicate without separate ADDRESS setting.**

Level Setup of Centralized Controller

- ◆ You can control the ventilator in multiple ways with DIP switch (DS01) setting on the centralized controller.

DIP Switch	SW01	SW02	SW03	SW04	Remark
LEVEL 0	OFF	OFF	OFF	OFF	The ventilator operates with the last used control solution
LEVEL 1	ON	OFF	OFF	OFF	When the centralized controller is OFF: You can not use wired/wireless remote control. When the centralized controller is ON: You can use wired/wireless remote control.
LEVEL 2	OFF	ON	OFF	OFF	The ventilator operates only with the centralized controller.
LEVEL 3	ON	ON	OFF	OFF	If the On/Off button is pressed once : The operation indicator is turned on. The ventilator is on standby. The ventilator operated with wired/wireless remote control. If the On/Off button is pressed twice: The operation indicator is turned off. You can not operate the ventilator with wired/wireless remote control.

Connecting the Unit (Continued)



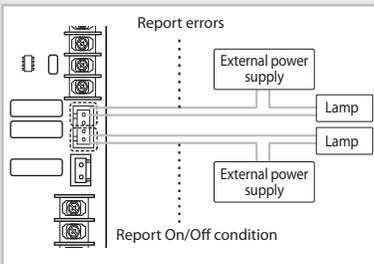
External Control

Use an external control to control the ventilator with separate machinery or external contact point.

- ◆ Connect both sides of EXT1(EXT2 or EXT3).
 - Up to 3 units can be connected at once.
 - The picture displays the condition that 2 external controllers are connected. If the external controller 1 or 2 are set to ON position, ventilator is operated in the last used condition.

Connect to Report the Operation Condition

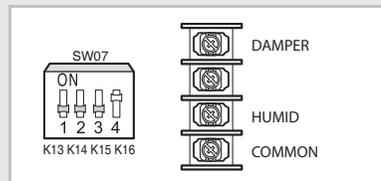
Use this function to check out the operation condition or errors of the ventilator. Make sure that the current which flows through terminal should not exceed 0.5A.



- ◆ Install a lamp to check the operation condition to the ON/OFF output terminal.
 - If the ventilator is turned on/off, the lamp is turned on/off followed by the ventilator.

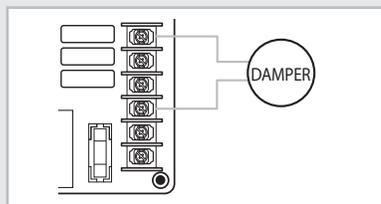
Connecting External Device

Connect to use humidifiers and dampers with the ventilator.



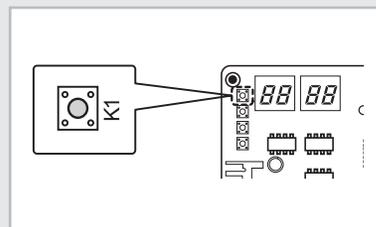
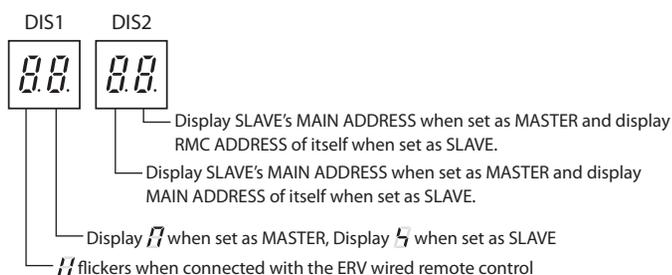
- ◆ Turn off the option switch to use,
 - K13: The use of humidifiers
 - K15: The use of dampers

- If the ventilator is operated, the external damper is operated as well if it had been installed.
- Make sure that the current is not exceed to 0.5A. When you connect an external device over 0.5A, use an extra terminal relay.



Trial Operation

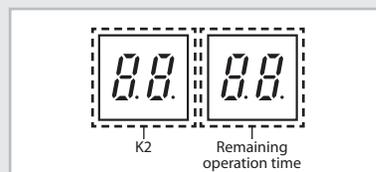
- ◆ Press the trial operation button.
 - Press the trial operation button one more time to turn it off.
 - While operating the trial operation, **F** is displayed on DIS1.
 - Check if the communication between the ventilator and the ERV wired remote control is normal if they are connected. If the ERV wired remote control is correctly connected, **F** flickers on the first DIS1.
 - If multiple ventilators are connected, set at least one of the K8 to OFF position to set as MASTER. Check out the communication to see the display.



What is Constant Air Volume Control

If the dust resistance is under 'A', the air is over 'B'. Therefore, due to excessive increased air volume, the noise and energy load are bound to increase. Control the constant air volume to maintain the 'B' air volume even in case that the duct resistance is set low.

- Constant air volume control is recommended when the power supply is stable 200~240V.
- To operate constant air volume control, press K2 button.
- Constant air volume control remains for 20 minutes. After 20 minutes, it is turned off automatically.
- To stop the constant air volume control, press K2 button again. You should start over the constant air volume control again.
- While the constant air volume control is operated, remain time and K2 flickers on the display panel.



Model	'A' (mmAq)	'B' (CMH)
025	12	250
035	17	350
050	17	500
080	17	800
100	18	1000

Error Code Display

Error Code	Explanation	Classifications
121	Indoor temperature sensor (Short/Open)	Sensor error
221	Outdoor temperature sensor (Short/Open)	
139	CO ₂ sensor (Short/Open)	
561	Supply Air fan motor error	Fan error
562	Exhaust Air fan motor error	
201	Tracking error of MASTER ventilator (After 5 times of tracking, SLAVE ventilators can not be detected.)	Communication error
202	System failure by communication error after tracking	
652	Communication error by installing COM1 Dual MASTER	
601	Communication error between the wired remote control and the ventilator (When the communication is interrupted for 3 minutes)	
606	COM1/COM2 cross installation error	Others
162	EEPROM error	
654	Damper error (When there is no switch input for 100 seconds while monitoring the damper)	

× 602-609 indicate errors due to ERV wired remote control. Refer to the ERV wired remote control installation manual.

■ **Centralized Controller Trial Operation**

Before operating the trial operation, make sure that the ventilator and the transmitter are operating correctly.

-
- 1 Check power cord (L,N) and communication cable (R1, R2).

 - 2 Check the power of the ventilator and the centralized controller.

 - 3 If the power is supplied, the centralized controller operates tracking to check connected ventilators and transmitter.
 - ◆ The LED(Red) on the centralized controller flickers after starting the tracking.
 - ◆ The LED(Red) on the centralized controller still flickers after completing the tracking. Check the completion of tracking by pressing all room ON/OFF button after a minute.
 - ◆ If you reset the setting in other way, disconnect the power of the centralized controller and reset the DS01. And turn the power on again. Check the reset LEVEL by setting all room ON/OFF button to OFF position. If you do not turn on the centralized controller again, you can use it with previous setting.

 - 4 Press the button on the centralized controller to check that the specified indoor unit is being controlled.
 - ◆ The trial operation is completed if the specified indoor unit is controlled.

➤ ***Make sure to operate the trial operation step by step to handle the errors.***

Troubleshooting

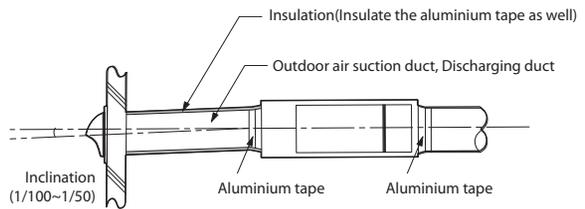
Problem	Explanation/Solution
The LED on the centralized controller is not turned on.	◆ Check a power failure.
The LED on the centralized controller flickers for over 2 minutes and the all ON/OFF button is not operated.	◆ Check the communication cable between the transmitter and the centralized controller (R1,R2) is connected to the R1, R2 terminal, not to C1 and C2. ◆ Check the communication cable is connected according to their polarity.
The centralized controller is not controlled.	◆ Check whether the DS01 is pressed. If you want to reset the previous setting, disconnect the power of the centralized controller and reset the DS01. If you do not turn on the centralized controller again, you can use it with previous setting.

Duct Connection

Make sure to insulate the connection part with insulation tapes and carry out duct connection making the indoor air suction duct and air intake as far as possible.

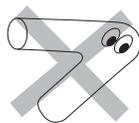
1 Install the 2 ducts toward the outdoor.

2 Make sure to insulate the duct referring to the picture.



- **The use of flexible hose made of fiber glass is recommended to minimize noise. Install the duct at least over 3m to reduce the noise as well.**
- **If the duct is not attached incorrectly or firmly, it may result in malfunction.**

Example of Defective Duct Installation



Extreme bend



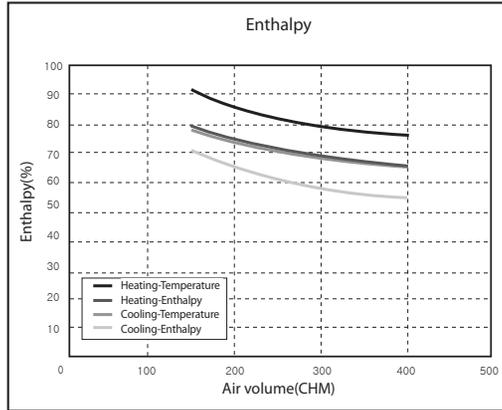
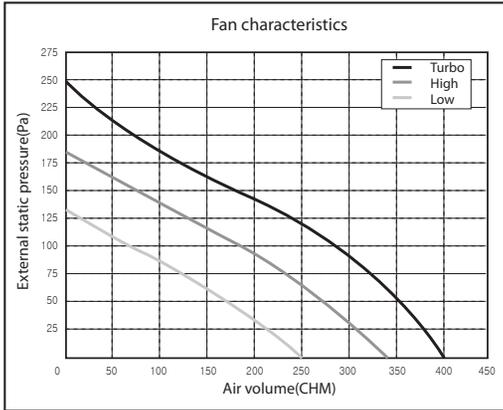
Multi bend



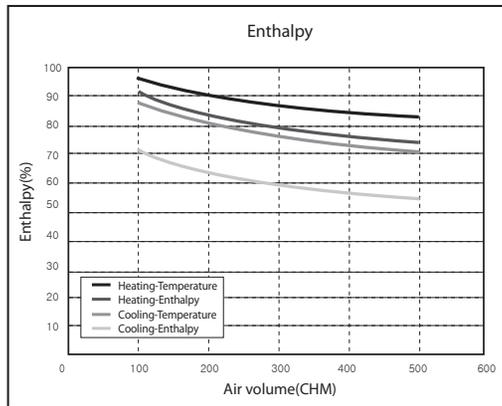
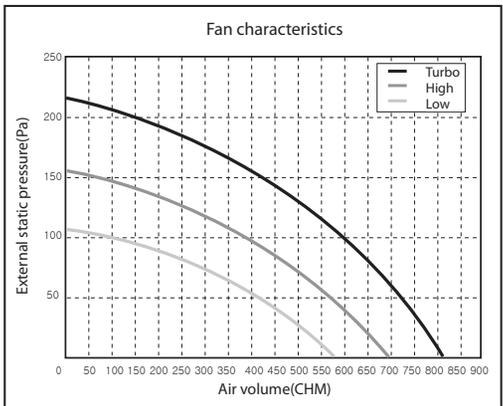
Narrow diameter of connection part

Performance Graph

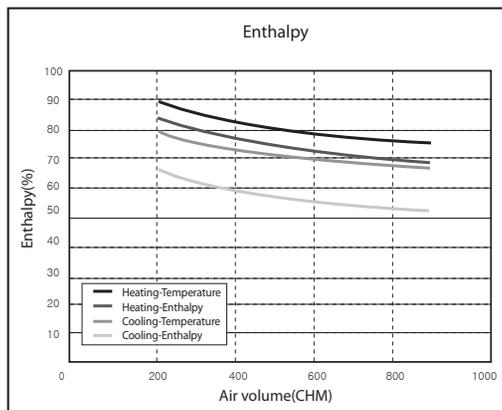
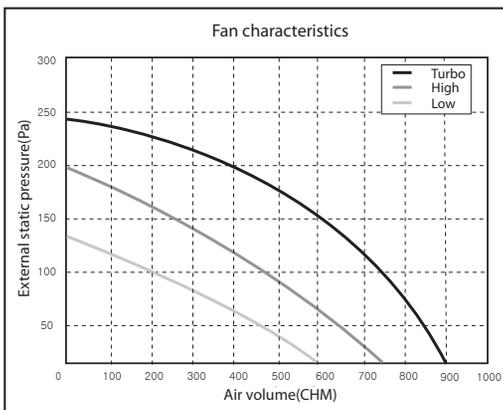
025



035

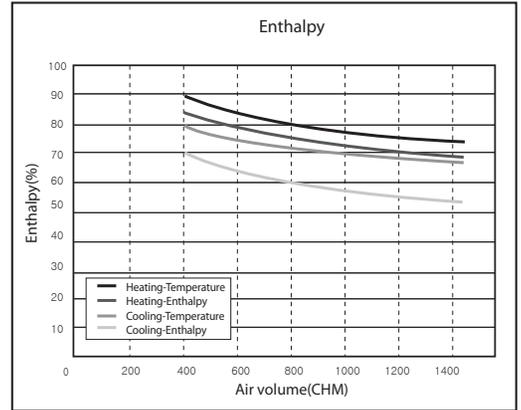
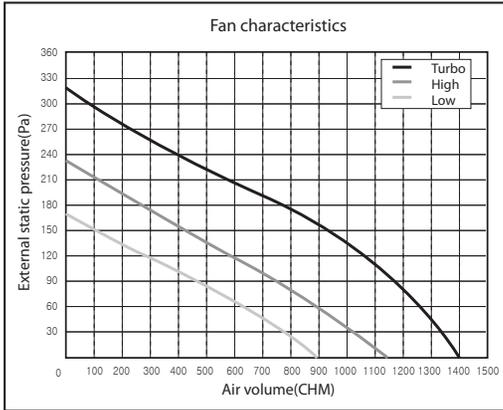


050

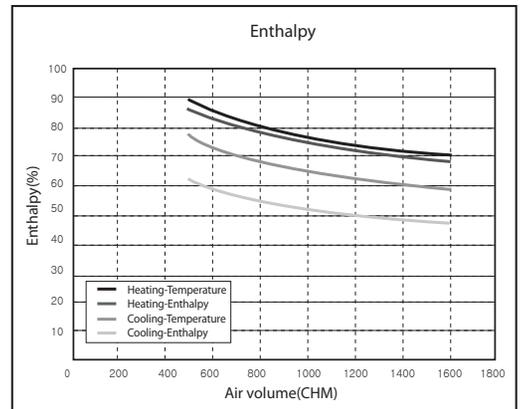
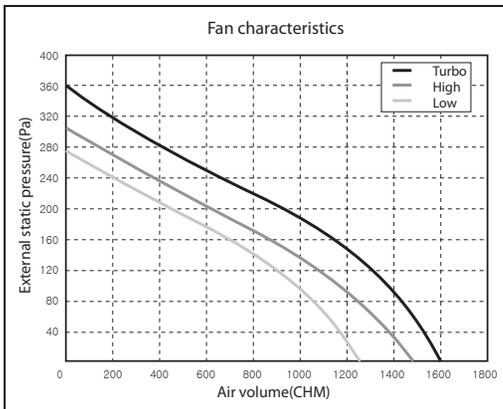


Performance Graph (Continued)

080



100



Final Checks and Trial Operation

Check the follows after the installation.

- ◆ Installation location and its strength
- ◆ Inspection hole installation
- ◆ Wiring
- ◆ Insulation

-
- ◆ Check the operating condition and damper operation.

Setup the ERV wired remote control		Checks	
Function	Air volume	Operating condition	Damper operation
Heat-EX mode	Turbo, High, Low	Check the airflow from outdoor air suction duct and air outlet is controlled by Turbo, High, Low.	Located on the corner (Open)
By-Pass mode	Turbo, High, Low		Located on side (Closed)

- If an error occurs during trial operation, check out the wiring.
Turn off the sub power supply and carry out the wiring work again.
- After the trial operation, explain how to use the ventilator to the user and hand over the product with the user's manual.



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