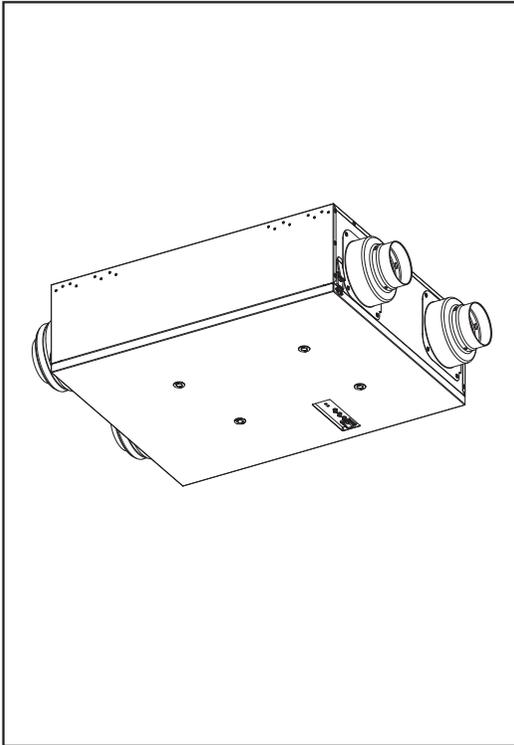


Installation and Operating Instructions Energy Recovery Ventilator

Model No. FV-10VEC2R



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READ AND SAVE THESE INSTRUCTIONS

Thank you for purchasing this Panasonic product.

Please read these instructions carefully before attempting to install, operate or service the Panasonic product. Please carefully read the "GENERAL SAFETY INFORMATION" (P.2~3) of this manual before use. Failure to comply with instructions could result in personal injury or property damage. Please explain to users how to operate and maintain the product after installation, and this booklet should be presented to users.

Please retain this booklet for future reference.



GENERAL SAFETY INFORMATION

For Your Safety

To reduce the risk of injury, loss of life, electric shock, fire, malfunction, and damage to equipment or property, always observe the following safety precautions.

Explanation of symbol word panels

The following symbol word panels are used to classify and describe the level of hazard, injury, and property damage caused when the denotation is disregarded and improper use is performed.

 WARNING	Denotes a potential hazard that could result in death or serious injury.
 CAUTION	Denotes a hazard that could result in minor injury.
<i>NOTICE</i>	Denotes a hazard that could result in property damage.

The following symbols are used to classify and describe the type of instructions to be observed.

	This symbol is used to alert users to a specific operating procedure that must not be performed.
	This symbol is used to alert users to a specific operating procedure that must be followed in order to operate the unit safely.
	This symbol is used to alert users not to disassemble the equipment.
	This symbol is used to alert users to make sure of grounding when using the equipment with the grounding terminal.

WARNING

-  When cutting or drilling into wall or ceiling, be careful not to damage electrical wiring and other hidden utilities.
-  Solid state controls may cause harmonic distortion which can cause motor humming noise. To reduce the risk of fire or electric shock, do not use this unit with any solid-state control device.
-  Canada only: Not to be installed in a ceiling thermally insulated to a value greater than R40.
-  Never install the unit in a high humidity space, such as a bathroom, kitchen or laundry room.
-  Do not install with a method which is not approved in the instructions.
-  Do not disassemble the unit. It may cause fire or electric shock.
-  Use this unit only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer.
-  Installation work and electrical wiring must be performed by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
-  Ducted fans must always be vented to the outdoors.

GENERAL SAFETY INFORMATION

- ⚠ Ceiling joist and wall stud must be subjected to static load more than five times the weight of the product.
- ⚠ The special-purpose or dedicated parts, such as mounting fixtures, must be used if such parts are provided.
- ⚠ Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating Refrigeration and Air Conditioning Engineers (ASHRAE) and the local code authorities.
- ⚠ Install the unit in the area where air temperature is above 50 °F (10 °C) to avoid condensation in unit.

⚠ CAUTION

- ⊘ For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.
- ⊘ Do not kink the power cord.
- ⊘ Do not install the unit in the area where the air stream temperature may exceed 104 °F (40 °C).
- ⚠ The unit must be installed in a mechanical room, basement, or other conditioned space.
- ⚠ The OA duct and EA duct must be connected directly to the outside.
- ⚠ Make certain that the electric service supply voltage is AC 120 V, 60 Hz.
- ⚠ Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
- ⚠ Always disconnect the power source before working on or near the fan, motor, fixture or wiring cover.
- ⚠ Protect the power cord from sharp edges, oil, grease, hot surfaces, chemicals or other objects.
- ⚠ These fans are intended for residential use only.
- ⚠ When the product is to no longer be used, it must not be left in place but removed, to prevent it from possibly falling.
- ⚠ Disconnect power by switching off wall switch first, then main switch and unplug the product before working on unit when replacing the jumper cable with wall switch.

NOTICE

- ⊘ Do not install the unit where ducts are configured as shown below.



Excessive bending



Successive bending



Squeezed duct



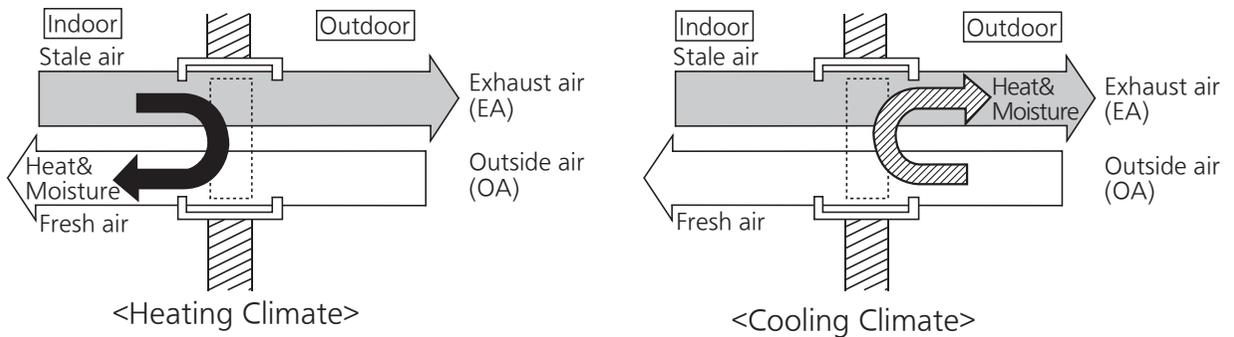
Bend close to duct adapter

DESCRIPTION

The Panasonic Energy Recovery Ventilator (ERV) uses 2 blower fans driven by 2 DC motors. The motor is designed to have an extended service life with reduced energy consumption. It also incorporates a thermal-cutoff for safety.

The exhaust air (EA) duct includes an electric damper to prevent backdrafting. The outside air (OA) duct includes an electric damper to prevent backdrafting.

Energy Recovery Introduction: Compared to an HRV (Heat Recovery Ventilator), the ERV can also transfer humidity and recover energy from that humidity. The ERV can exchange energy between the stale EA and the "fresh" OA, transferring heat and moisture into the incoming cold air in a heating climate and pre-cooling and reducing the humidity of the incoming hot air in a cooling climate. This tempering and treatment of the required ventilation air helps maintain a fresh environment even when the heating or cooling system is not operating.



UNPACKING

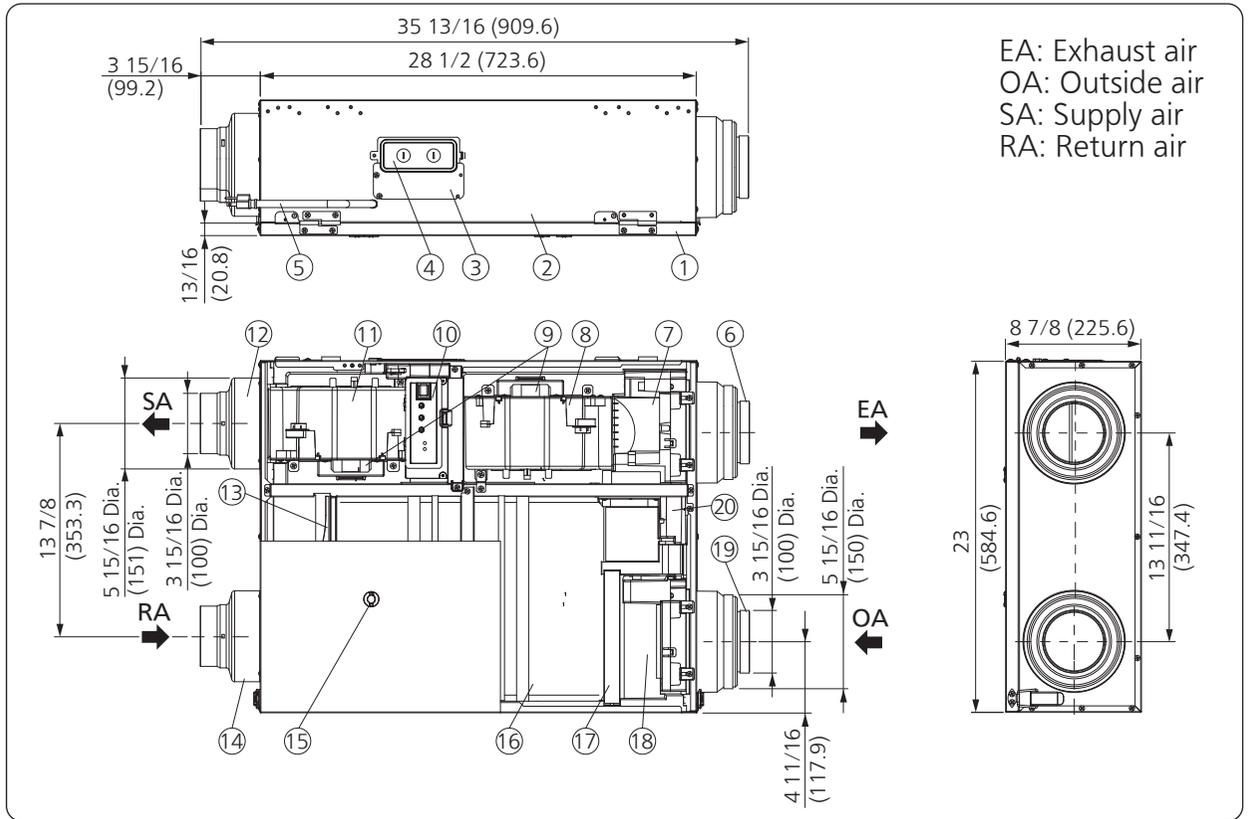
Unpack and remove unit carefully from carton. Refer to the supplied accessories list to verify that all parts are presented.

SUPPLIED ACCESSORIES

Part name	Appearance	Quantity
Hanger I		1
Hanger II		4
Wall bracket		1
L plate		4
Screw (M4X8)		12
Long screw (ST4.2X20)		12
Plug cover		4
Installation and operating instructions		1
Limited warranty		1

DIMENSIONS

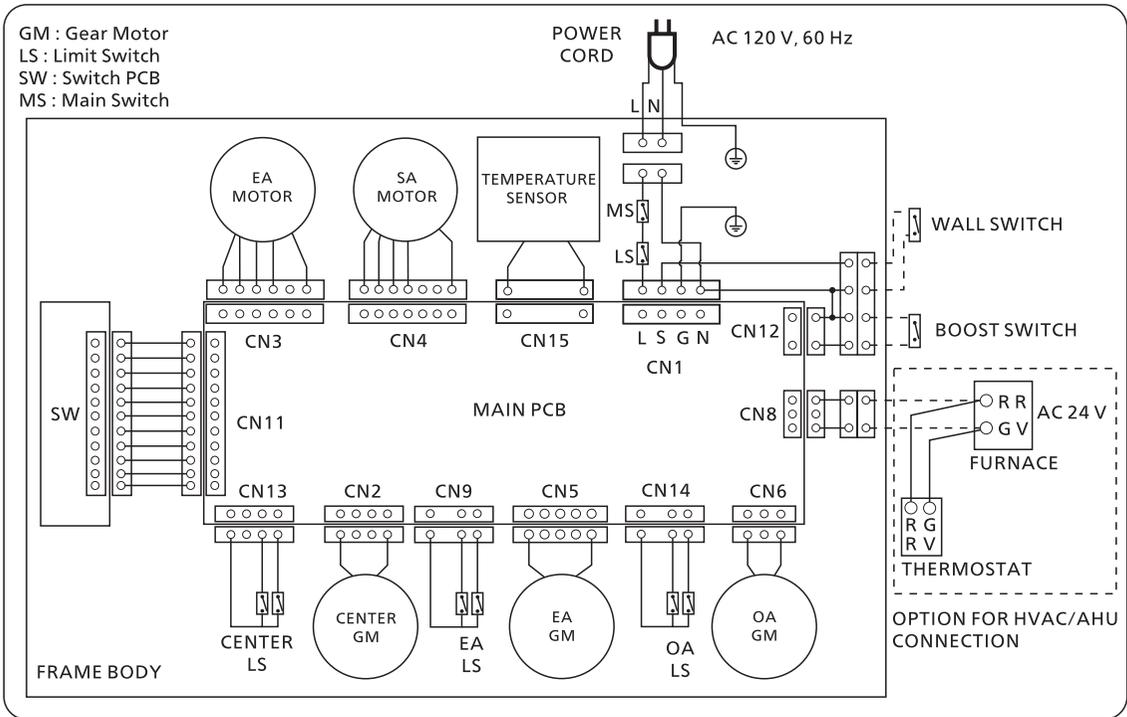
Unit: inches (mm)



EA: Exhaust air
 OA: Outside air
 SA: Supply air
 RA: Return air

No.	Part name	No.	Part name
①	Frame cover	⑪	SA fan assy.
②	Frame body	⑫	SA adapter
③	Maintenance plate	⑬	RA filter
④	Wiring cover	⑭	RA adapter
⑤	Power cord (length 70 7/8 (1800))	⑮	Plug
⑥	EA adapter	⑯	Energy recovery core
⑦	EA damper assy.	⑰	OA filter
⑧	EA fan assy.	⑱	OA damper assy.
⑨	DC motor	⑲	OA adapter
⑩	Control panel	⑳	Center damper assy.

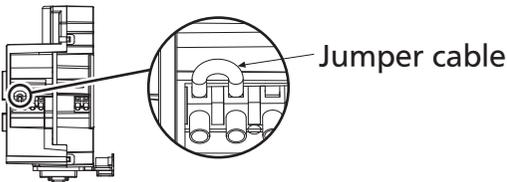
WIRING DIAGRAM



WIRING METHOD

Note

- (1) The HVAC/AHU signal cord, wall switch cord, boost switch cord, wall switch and boost switch are not supplied.
- (2) The terminal of wall switch has been connected by jumper cable for factory default.



- (3) If a wall switch is not used to power down the ERV note that cutting power by unplugging the unit, and/or opening the frame cover to maintenance, will disallow the unit to run a power down process; leaving the dampers in the open position. This could increase the risk of cold air infiltration which may lead to frost forming in the ERV.
- (4) If you do not intend to run the product for more than 24 hours we recommend you connect product with a wall switch to control the standby and running of the product.

WIRING METHOD

CAUTION

The capacity of wall switch, boost switch should be more than 120 V~3 A to control the power of the product.

1. Open the knock-out hole and remove maintenance plate and wiring cover. (Fig. 1)

Note

If you are not connecting to the HVAC/AHU, please open knock-out hole for wall switch cord/boost switch cord connection only. (Fig. 1)

2. Thread wall switch cord, boost switch cord and HVAC/AHU signal cord (optional) through conduits respectively and install the conduits into knock-out holes. (Fig. 1)

Note

- (1)The HVAC/AHU signal cord is optional, please connect it when you want to control the HVAC/AHU.
- (2)If connecting with HVAC/AHU, the HVAC/AHU will turn on while ERV turns on.
- (3)If connecting with wall switch, please remove the jumper cable first.

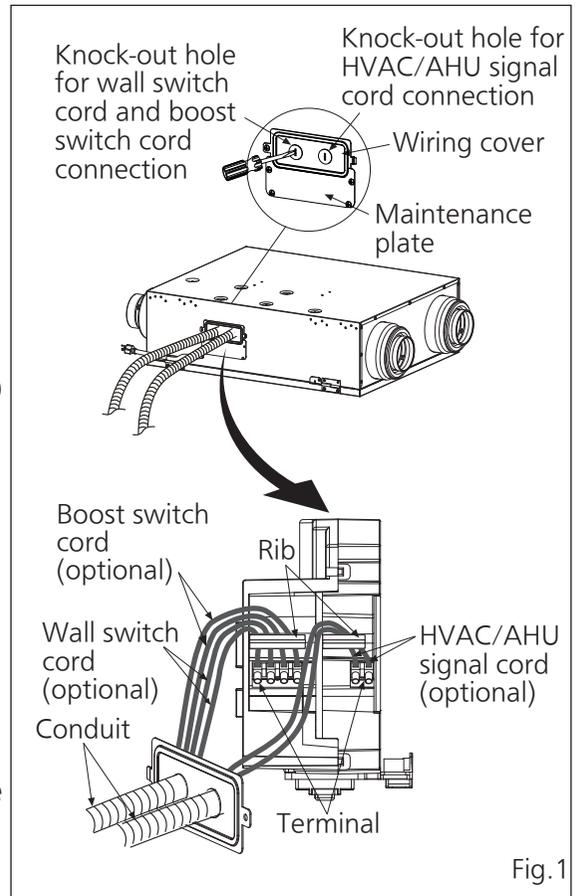
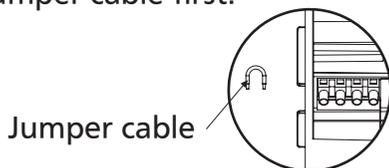
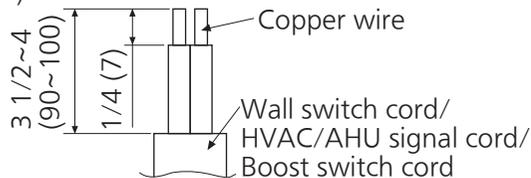


Fig. 1

3.Strip insulation cover for each wires as shown below.

Unit: inches (mm)

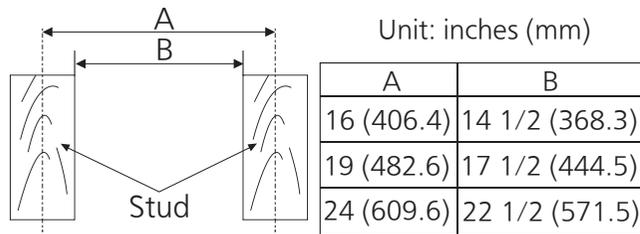


4.Insert wires into the corresponding terminals deeply through the ribs. (Fig. 1)
Make sure the screw of terminal securely fastens the copper wire and the copper wire is not exposed.

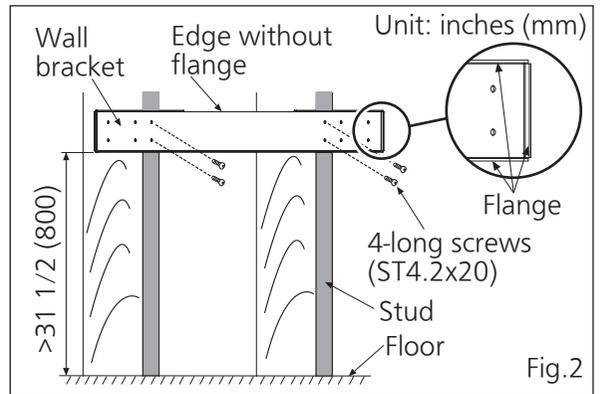
5.Reinstall the wiring cover and maintenance plate.

INSTALLATION I (WALL MOUNT)

This method can be used in stud as below.



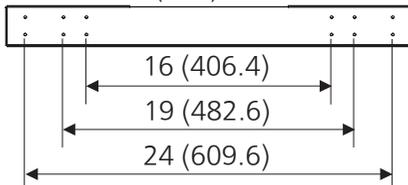
1. Mount wall bracket on stud with long screws (ST4.2x20). (Fig.2)



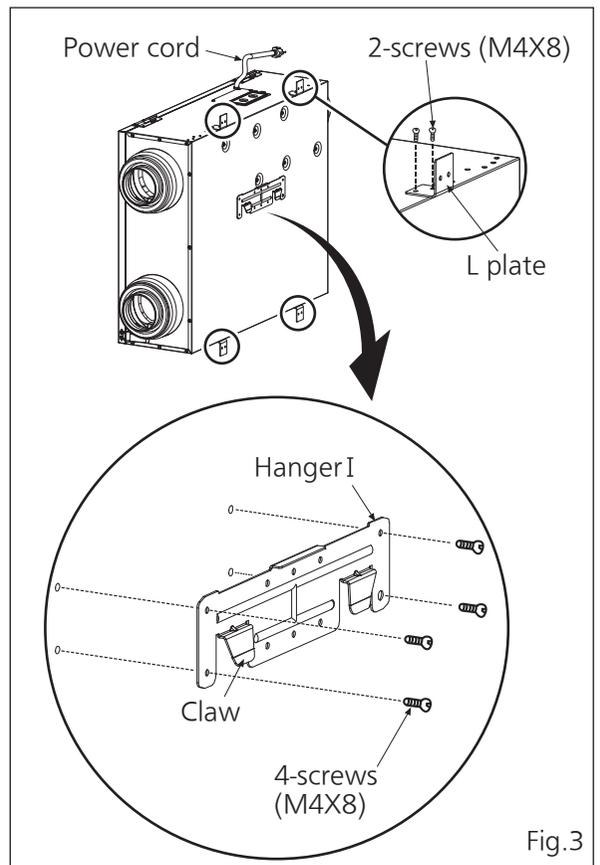
Note

- (1) Attach with flanged edge facing outward and edge without flange facing upward when mounting wall bracket. (Fig.2)
- (2) Choose the mounting hole on wall bracket according to the distance between studs.

Unit: inches (mm)



2. Mount hanger I on the back of frame body with screws (M4X8) and mount L plate on the two side of frame body with screws (M4X8). (Fig.3)

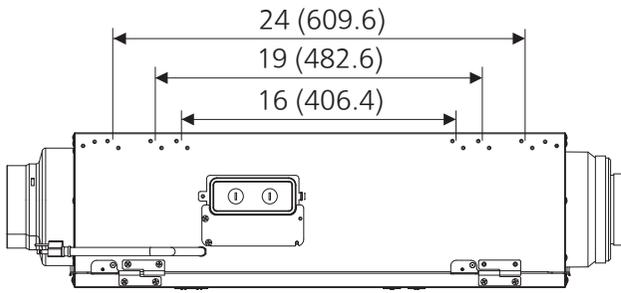


Note

- (1) When mount hanger I, please attach with the claw facing downward to frame body that the side with power cord facing upward.
- (2) Choose the mounting hole according to the distance between studs.

INSTALLATION I (WALL MOUNT)

Unit: inches (mm)



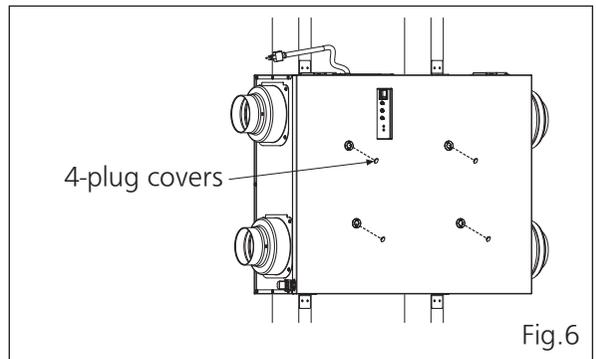
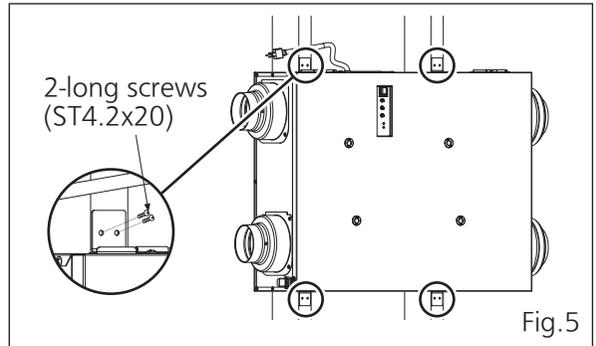
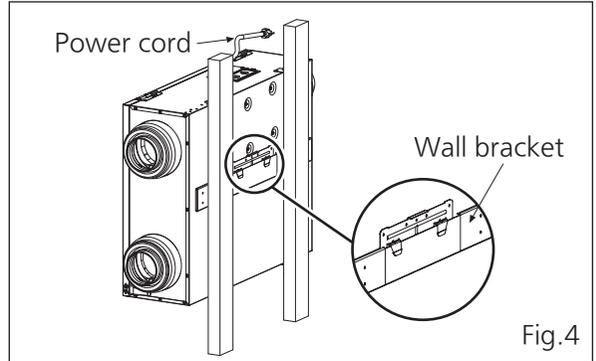
3. Hang ERV on to wall bracket.



! Make sure the power cord is upward. (Fig.4)

4. Mount L plate on to stud with long screws (ST4.2X20). (Fig.5)

5. Install plug covers into plugs on frame cover. (Fig.6)



DUCTWORK

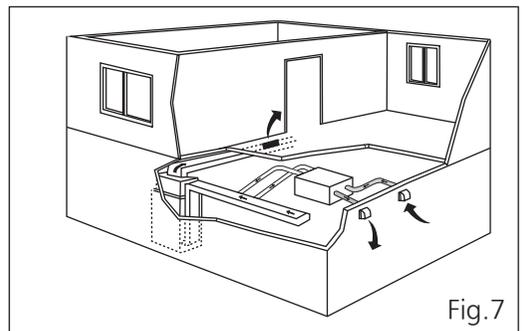
1. Install ducts according to one of three methods as shown below.

Method I - Simplified ducted installation (Return method)

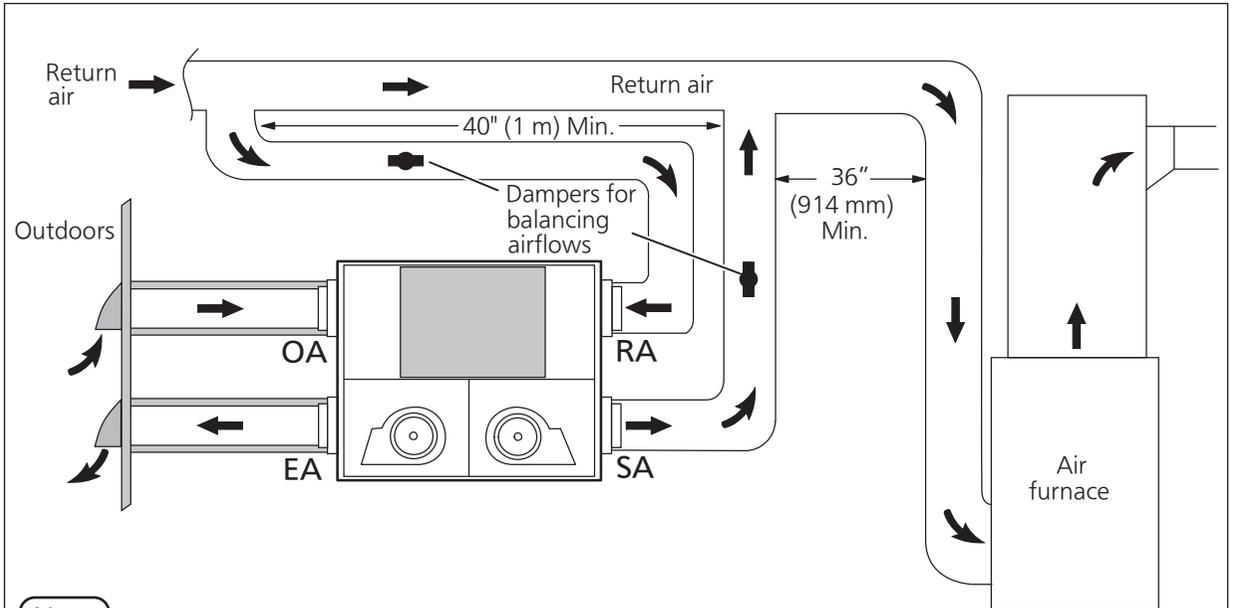
This method draws return air from the return air duct of the air furnace and supplies an equal amount of outside air farther downstream into the return duct. (Fig.7 & Fig.8)

Note

- (1) The ERV unit must be balanced.
- (2) It is mandatory that HVAC/AHU signal cord be connected.
- (3) Check local codes and authority having jurisdiction for acceptance.



DUCTWORK



Note

- (1) Must have 2-3 feet of straight duct run from all duct attachment points on the ERV. Do not use any elbows or other peripheral pieces inside of 2-3 feet when attaching duct runs to the ERV.
- (2) Unit is normally balanced on high speed with the furnace blower on.
- (3) A minimum separation of 40 inches (1 m) is recommended between the two direct connections.
- (4) The exhaust air connection shall be upstream of the supply air connection to prevent exhausting any fresh air.
- (5) The distance between two outdoor hoods please see P.12.
- (6) The airflow must be confirmed on site using the balancing procedures found in P.14.

Fig.8

Method II - Partially dedicated ducted installation

This method draws return air from specific points in the house and supplies an equal amount of outside air into the return air duct of the air furnace. (Fig.9 & Fig.10)

Return air ducts of ERV should be installed in areas of the home where the poorest indoor air quality exists (bathroom and kitchen).

The air furnace blower should be running when the ERV is operating to evenly distribute the outside air throughout the house.

Note

- (1) The ERV unit must be balanced.
- (2) It is mandatory that HVAC/AHU signal cord be connected.
- (3) Check local codes and authority having jurisdiction for acceptance.

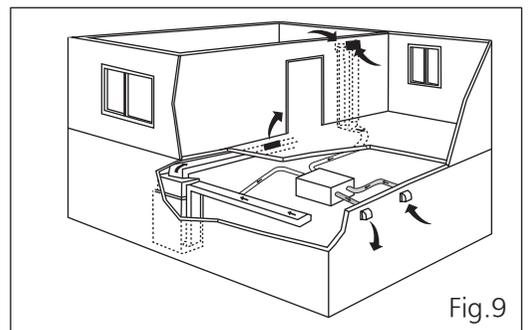


Fig.9

DUCTWORK

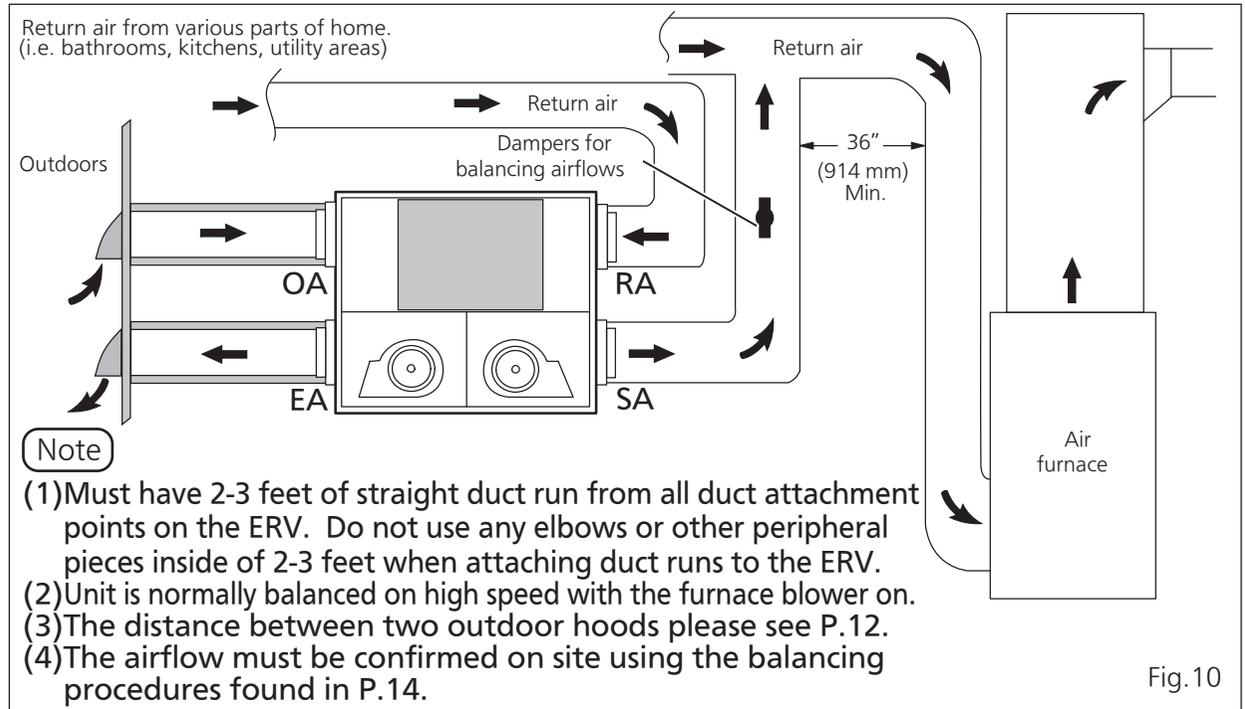


Fig.10

Method III - Fully dedicated ducted installation

This method draws return air from specific points in the house and supplies outside air to specific locations of the house. This system is not connected to an air furnace. (Fig.11 & Fig.12)

Return air ducts should be installed in areas of the home where the poorest indoor air quality exists (bathroom and kitchen). Supply air ducts should be installed to all bedrooms and living areas.

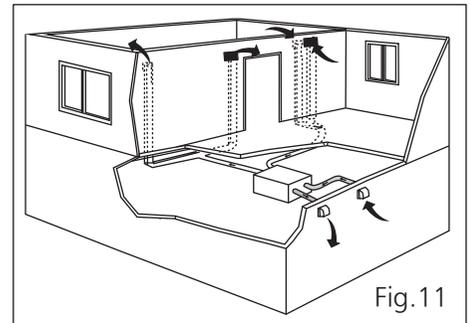


Fig.11

Note

- (1) The ERV unit must be balanced.
- (2) Check local codes and authority having jurisdiction for acceptance.

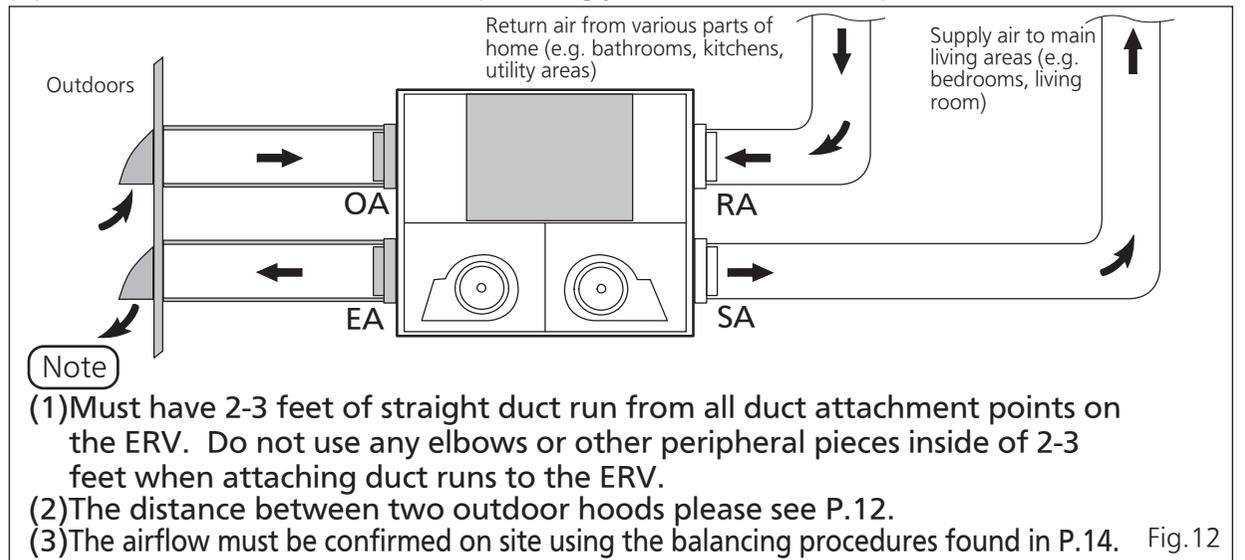
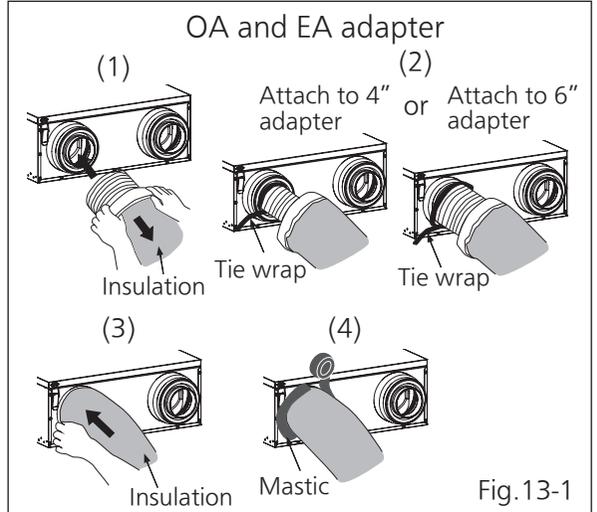


Fig.12

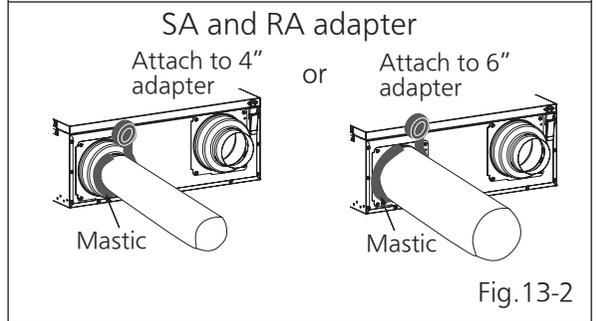
DUCTWORK

2. Install insulated ducts to OA and EA adapter.
(Fig. 13-1)

- (1) Pull back the insulation to expose the flexible duct.
- (2) Attach the flexible duct to the adapter using tie wrap. You can attach to the 4 inch or 6 inch according to size of flexible duct.
- (3) Pull the insulation over the adapter.
- (4) Apply UL181A certified pressure sensitive tape or mastic to insulation duct and adapter making an airtight seal.



3. Attach duct (rigid galvanized duct, etc) to the SA and RA adapter using UL181A certified pressure sensitive tape or mastic. You can attach to the 4 inch or 6 inch according to size of duct. (Fig.13-2)

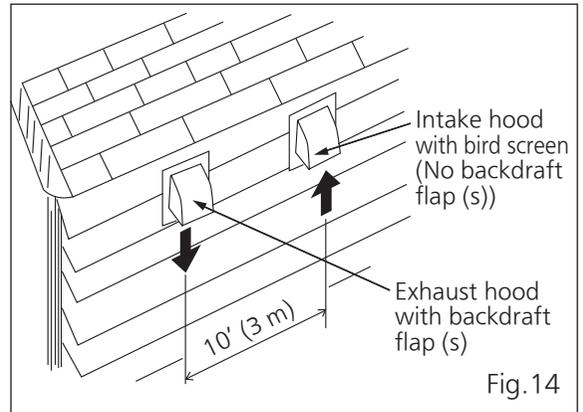


4. Install outdoor hood and connect with insulated ducts.

- (1) If separate hoods are used, locate them at least 10 ft (3 m) apart. (Fig.14)

Note

When install them, please refer to the local codes for detail.



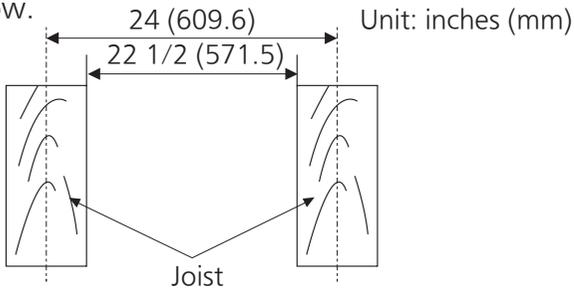
CAUTION



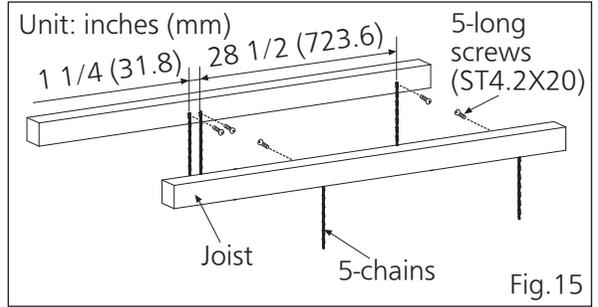
The intake side duct must be connected to the outside and at least 6 ft (1.8 m) away from the exhaust of appliances such as furnace, dryer, fuel burning appliances, etc.

INSTALLATION II (CHAIN MOUNT)

This method should be used in 24" joist as below.



1. Mount chain on joist by long screws (ST4.2X20). (Fig.15)

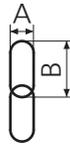


Note

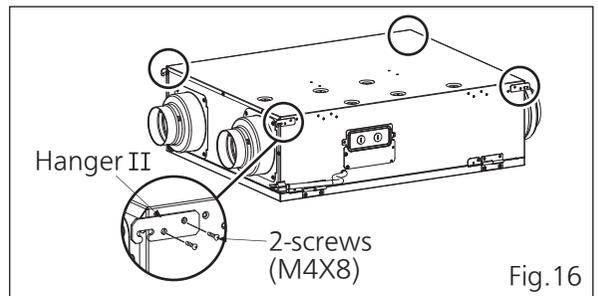
- (1) The chains are not supplied. Please purchase chain which must be subjected to the weight of 66 lbs. (30 kg) or above.
- (2) The length of each chain should be 20 inches~24 inches (500 mm~600 mm) and the dimension A and B are recommended as shown below.

Unit: inches (mm)

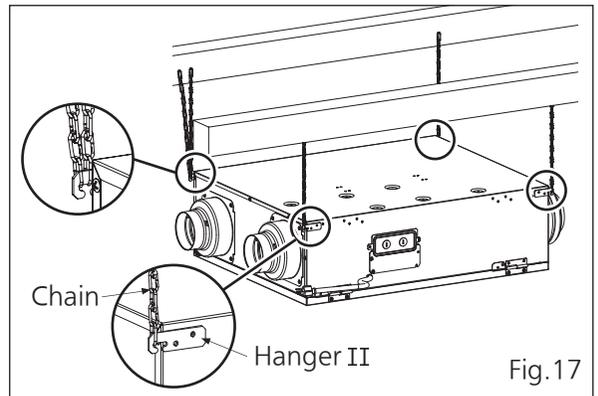
A	B
1/4 (6)	3/4 (20)



2. Mount hanger II on frame body with screws (M4X8). (Fig.16)



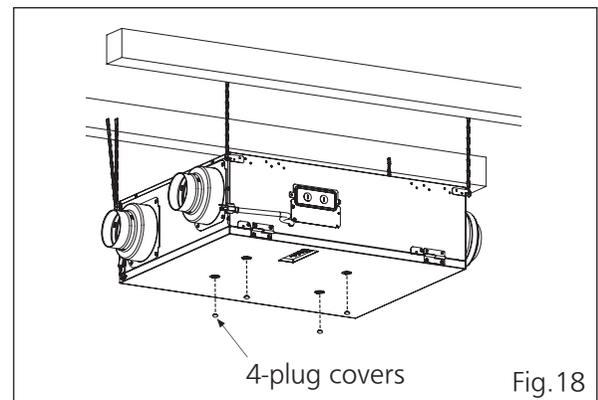
3. Hang the ERV on to chains. (Fig.17)



Note

Make sure ERV is horizontal after installation.

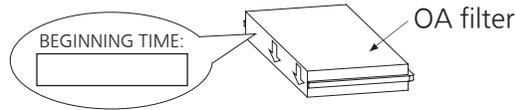
4. Install plug covers into plugs on frame cover. (Fig.18)



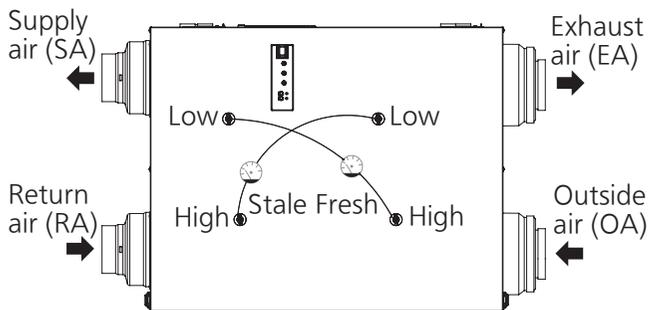
Ductwork please refer to P.9~P.12

START-UP PROCEDURE

1. Fill in beginning time on the OA filter before starting up the unit.
The method of remove and install OA filter please refer to P.17~P.18 (Fig.20~22) and P.18 (Fig.24~25).



2. Connect the power cord to power then turn on the main switch on ERV for start-up.
If the ERV does not run, please check the wiring connections.
3. Remove plug covers in plugs on frame cover and check static pressure.
Using a magnehelic gauge, measure the differential pressure of fresh air and exhaust air respectively, then adjust the dampers for balancing airflows to make the test value reach the differential pressure of setting volume as shown below.
4. Install the plug covers back when the check is complete.



The relation between volume and differential pressure (reference)

Volume (CFM)	Differential pressure (Pa)	
	Fresh	Stale
50	35	45
60	45	60
70	60	80
80	75	105
90	100	140
100	115	190

OPERATION

<Control panel>

- ① **Main switch:** Power on or off for ERV. Push the main switch completely to the on/off position when turning on/off.

Note

The unit will consume some electricity unless you turn off the main switch.

- ② **ASHRAE time knob:** The operation state will be changed with this knob. It is in units of 1 hour, for example: set to "10", 10 minutes (ON) → 50 minutes (OFF) → 10 minutes (ON)... cycle operation. The factory default is 60 min/h.
- ③ **SA knob:** Set the supply air volume with this knob.
The factory default is 100 CFM.
- ④ **EA knob:** Set the exhaust air volume with this knob.
The factory default is 100 CFM.

Note

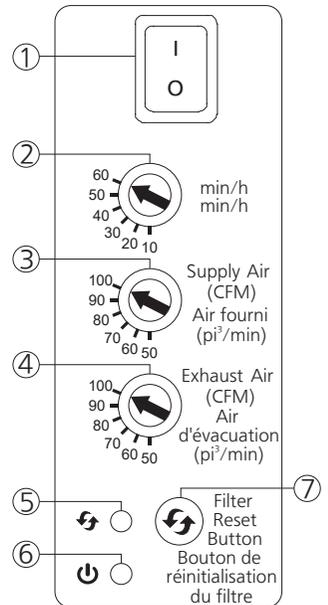
The SA air volume is limited less than "EA air volume + 20 CFM" when the outdoor temperature is -22 °F (-30 °C) ~ 14 °F (-10 °C). For example, when the EA air volume setting is 50 CFM and the SA air volume setting is 100 CFM, actually the EA air volume will be 50 CFM and the SA air volume will be 70 CFM.

OPERATION

- ⑤ **Filter indicator:** The indicator will light on when the accumulated running time is up to 3 months. When the indicator is on (with buzzer sound), indicates need to maintain RA filter and OA filter.

Note

- (1) The indicator will be on when the product accumulated running time reaches to 90 days. The buzzing will sound every hour and 10 seconds in a hour.
- (2) If you want to turn off the indication of buzzer, please press filter reset button about 3 seconds until there is the sound of a long beep. Press filter reset button about 3 seconds again until there is sound of two quick beeps, the buzzer indication will be turned on again.
- ⑥ **Running indicator:** When the indicator is on, indicates the product is running.
- ⑦ **Filter reset button:** Press the button after filter maintenance for resetting accumulated running time.



The ERV will run as below:

Setting	State							
	ON		ON		ON	OFF		
MAIN SWITCH	ON		ON		ON	OFF		
JUMPER CABLE	CONNECTED	-	CONNECTED	-	-	CONNECTED	-	
WALL SWITCH	-	ON	-	ON	OFF	-	ON/OFF	
BOOST SWITCH	ON		OFF		ON/OFF	ON/OFF		
ASHRAE TIME SWITCH (min/h)	10~60		10~60		10~60	10~60		
SA SWITCH (CFM)	50~100		50~100		50~100	50~100		
EA SWITCH (CFM)	50~100		50~100		50~100	50~100		
ERV ACTION	ERV enforces the following instructions ASHRAE: 60 min/h SA:100 CFM EA:100 CFM		ERV restores setting instructions of customer ASHRAE: 10~60 min/h SA:50~100 CFM EA:50~100 CFM		Standby	Product is power off.		

For example: when main switch and wall switch are ON, suppose the customer to set as ASHRAE:50 min/h, SA:90 CFM, EA:90 CFM, when boost switch is ON, ERV enforces the instructions ASHRAE:60 min/h, SA:100 CFM, EA:100 CFM; when boost switch is OFF, ERV restores setting instructions of customer ASHRAE:50 min/h, SA:90 CFM, EA:90 CFM;

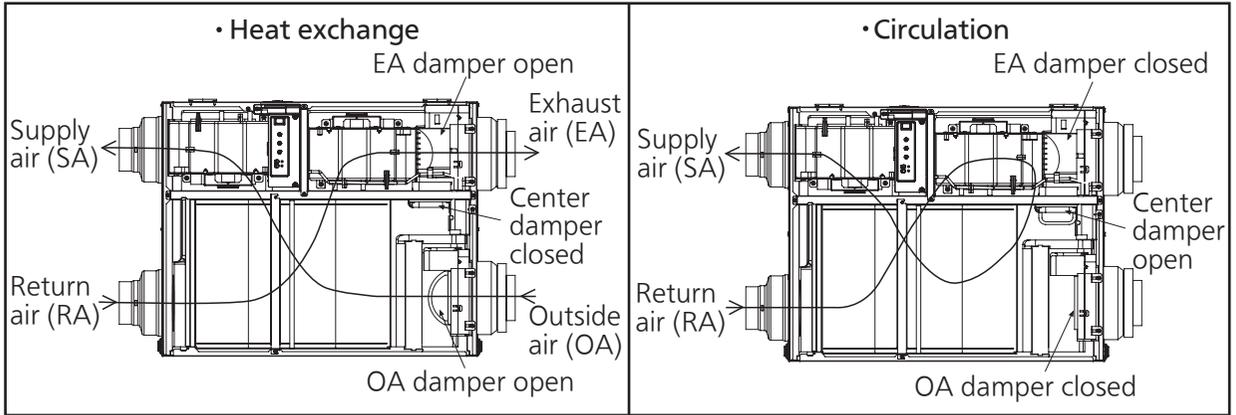
Note

It's better that the product is operated for 24 hours in order to prevent from being frozen.

OPERATION

<Operation mode>

FV-10VEC2R is recommended for areas where temperature is -22 °F (-30 °C)~104 °F (40 °C).



When the ASHRAE timer is set to 60 min/h or the boost switch is on.
 (The operation time of air exchange mode depends on the ASHRAE timer setting, and it is automatically set to 60 min/h when the boost switch is on.)

Outdoor temp.	Operation mode and time (min)	
>14 °F (-10 °C)		
14 °F (-10 °C)~ 5 °F (-15 °C)		
5 °F (-15 °C)~ -4 °F (-20 °C)		
-4 °F (-20 °C)~ -17 °F (-27 °C)		
-17 °F (-27 °C)~ -22 °F (-30 °C)		
≤-22 °F (-30 °C)		

MAINTENANCE

⚠ CAUTION

- ⚠ Electric shock may result. Disconnect power by switching off main switch first, then unplug the product before working on unit when it is in default mode.
- ⚠ Electric shock may result. Disconnect power by switching off wall switch first, then main switch and unplug the product before working on unit when replacing the jumper cable with wall switch.
- ⚠ Routine maintenance must be performed every 2 or 3 months, clogged filters may cause condensation on the unit due to air flow reduction.
- ⚠ Please wear gloves to avoid pinching fingers during maintenance.
- ⚠ Please pay attention to dust, condensation water or parts that may drop down when the frame cover is opened.
- ⊘ Never use petrol, benzene, thinner or any other such chemicals to clean the ERV.
- ⊘ Do not allow water to enter ERV.
- ⊘ Do not immerse resin parts in water over 60 °C.

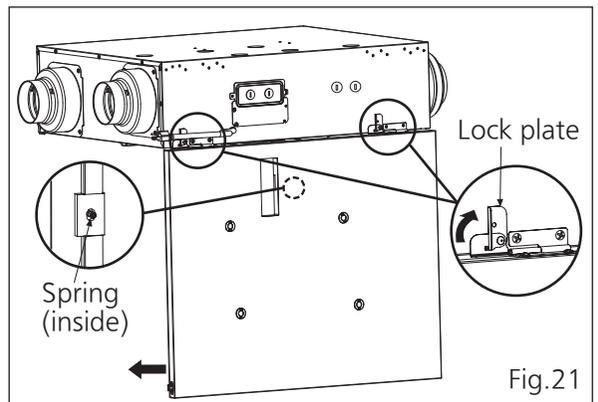
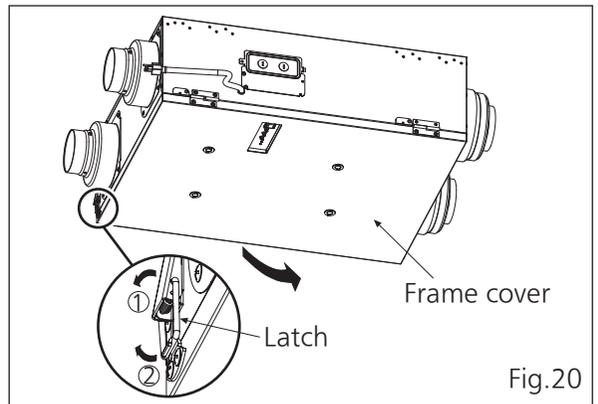
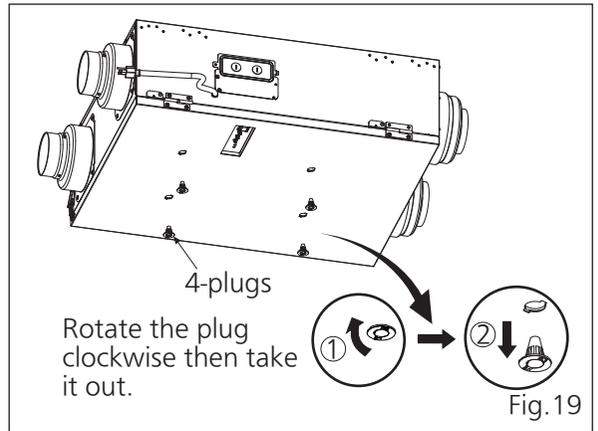
Note

There may be moisture in ERV after running long time in cold climate, please remove the 4 plugs on frame cover to discharge condensation before open the frame cover. (Fig.19)

1. Open the frame cover by unlocking the latches. (Fig.20)

Note

- (1) If not convenient for maintenance, can also rotate the lock plate at the hinge and remove the frame cover. (Fig.21)
- (2) There is a spring on the inside of frame cover, please do not damage or deform it, otherwise, the ERV may not operate. (Fig.21)



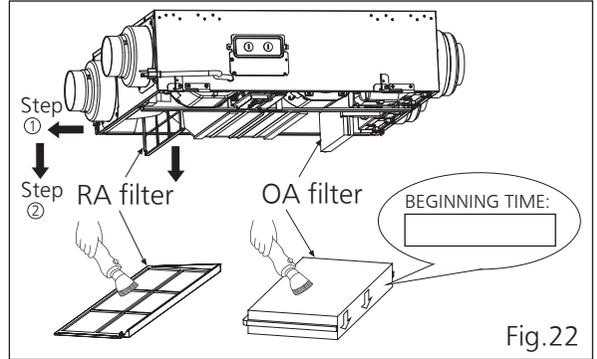
MAINTENANCE

2. Remove OA filter and RA filter to clean with vacuum cleaner. (Fig.22)

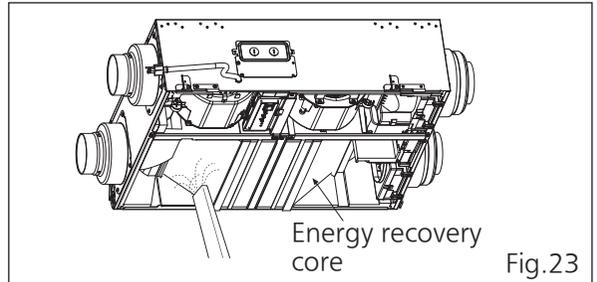
It is suggested to replace the OA filter every 6 months. Please fill in beginning time on new OA filter before replacing.

Note

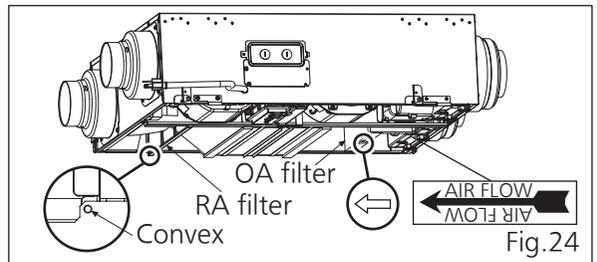
Please replace OA filter by Panasonic Model FV-FL0810VE1 or FV-FL1310VE1.



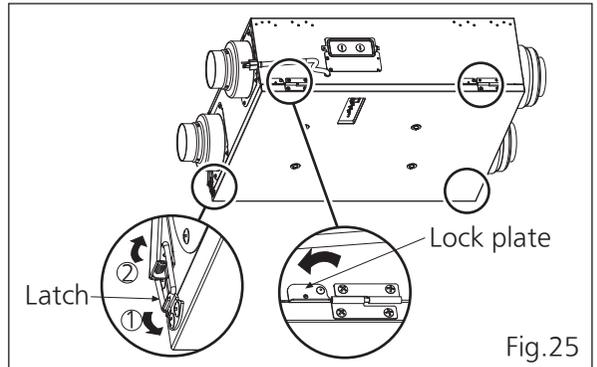
3. Clean energy recovery core with vacuum cleaner. (Fig.23)



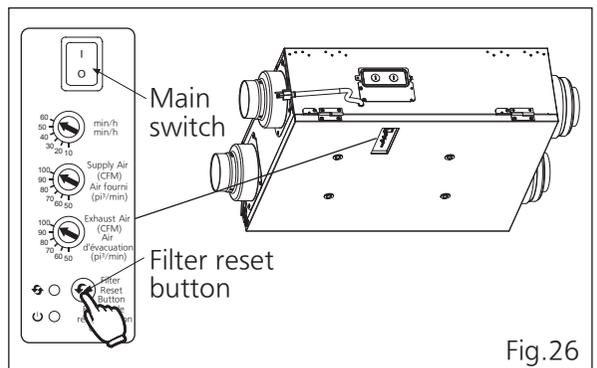
4. Replace the OA and RA filters.
Make sure the RA filter adapts to the convex and the direction of the arrow on the OA filter is in the same direction as the air flow displayed on the nearby label. (Fig.24)



5. Reinstall and close frame cover by locking the latches, then reset the lock plate. (Fig.25)



6. Connect power, press filter reset button with sound of "beep", then filter indicator and buzzer sound will be off. (Fig.26)



TROUBLESHOOTING

If a problem is encountered, please investigate it by going through the following items. If the problem still persists, please disconnect the power and contact the dealer for repair.

Problem	Display		Action
	Running indicator (Green)	Filter indicator (Red)	
1.The ERV doesn't work.	Off	Off	<ul style="list-style-type: none"> ■ Check the power cord is connected. ■ Check the frame cover is closed. ■ Check the main switch in product body is on. ■ Check if the spring on the inside of frame cover is damaged or deformed.
	On	Off	<ul style="list-style-type: none"> ■ ERV running interval according to the ASHRAE time setting. ■ When outdoor temperature is low ($\leq -22\text{ }^{\circ}\text{F}$ ($-30\text{ }^{\circ}\text{C}$)), ERV stops operating automatically. ■ Damper may be frozen shut, please wait for maximum 24 hours for defrosting.
2.The HVAC/AHU doesn't work when ERV works.	On	Off	<ul style="list-style-type: none"> ■ Please disconnect the power and contact the dealer to check the HVAC/AHU wiring connect.
3.Buzzer sound (10 sec in a hour) and ERV works.	On	On	<ul style="list-style-type: none"> ■ The RA filter and OA filter need to be maintained. If you do not want the buzzer notification, please long press the filter reset button for 3 sec to cancel it.
4.Buzzer sound (30 sec in a hour) and ERV doesn't work.	Blink* (0.5 s)	Off	<ul style="list-style-type: none"> ■ SA motor error, please disconnect the power and contact the dealer for repair.
	Blink* (2 s)	Off	<ul style="list-style-type: none"> ■ EA motor error, please disconnect the power and contact the dealer for repair.
	Off	Blink* (0.5 s)	<ul style="list-style-type: none"> ■ OA damper error, please disconnect the power and contact the dealer for repair.
	Off	Blink* (2 s)	<ul style="list-style-type: none"> ■ EA damper error, please disconnect the power and contact the dealer for repair.
	Off	Blink* (4 s)	<ul style="list-style-type: none"> ■ Center damper error, please disconnect the power and contact the dealer for repair.
	Blink* (0.5 s)	On	<ul style="list-style-type: none"> ■ Temperature sensor error, please disconnect the power and contact the dealer for repair.
5.ERV doesn't work base on the setting air volume.	On	Off	<ul style="list-style-type: none"> ■ When product runs in circulation mode for defrosting, the air volume will be more than setting and sound will be slightly louder than normal operation. ■ When outdoor temperature is less than $14\text{ }^{\circ}\text{F}$ ($-10\text{ }^{\circ}\text{C}$), the product will restrict air volume automatically to protect energy recovery core.

*The time under "Blink" means the frequency of blink.

SPECIFICATIONS

<Ventilation Performance>

Model No.	Air direction	Voltage (V)	Frequency (Hz)	Duct	Static pressure	Net air flow (CFM)		Power consumption (W)	Weight lb.(kg)
						Exhaust	Supply	Fan unit	
FV-10VEC2R	Exhaust & Supply	120	60	4"/6"	0.1"WG	100	100	81	50 (22.4)
					0.4"WG	100	100	90	

<Energy Performance>

Model No.	Mode	Supply temperature		Net air flow		Power consumption (W)	Sensible recovery efficiency	Apparent sensible effectiveness	Net moisture transfer
		°F	°C	L/s	CFM				
FV-10VEC2R	Heating	32	0	25	53	29	80%	83%	0.78
		32	0	31	66	39	77%	81%	0.74
		32	0	40	85	68	73%	77%	0.71
		-13	-25	27	57	77	65%	67%	0.71
		-13	-25	30	64	100	56%	60%	0.58
	Cooling						Total recovery efficiency		
		95	35	23	49	32	60%		
		95	35	31	66	42	55%		

The testing of the ventilation performance and the energy performance in accordance with CSA-C439 standard.

PRODUCT SERVICE

Warning Concerning Removal of Covers.

The unit should be serviced by qualified technicians only.

Your product is designed and manufactured to ensure a minimum of maintenance.

Should your unit require service or parts, call Panasonic Call Center at 1-866-292-7299 (USA) or 1-800-669-5165 (Canada).

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