Technical Service Manual

HRV

with DC Fan Motor

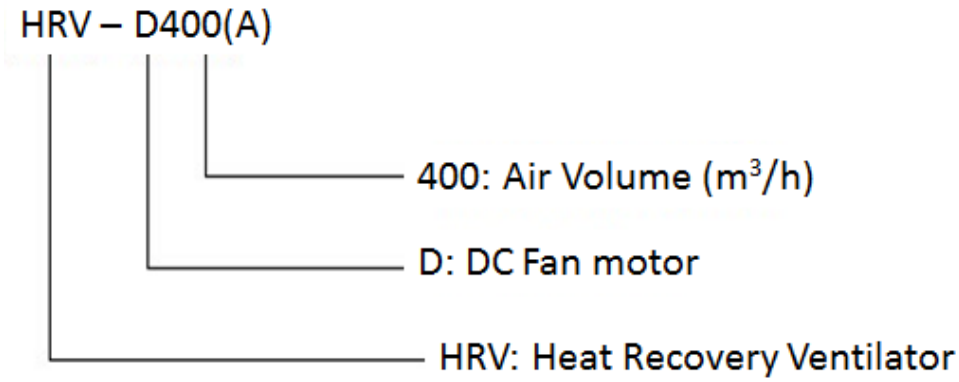
Model:

1 phase, 220-240V, 50/60Hz

HRV-D200(A)	HRV-D800(A)
HRV-D300(A)	HRV-D1000(A)
HRV-D400(A)	HRV-D1500(A)
HRV-D500(A)	HRV-D2000(A)

Contents

1. Nomenclature



2. Product Details

Model	Air volume (m^3/h)	Net dimension (L×W×H) (unit: mm)	Net weight (kg)	Power supply
HRV-D200(A)	200	1195×801×272	46.5	220-240V~50/60Hz
HRV-D300(A)	300	1195×914×272	56.5	220-240V~50/60Hz
HRV-D400(A)	400	1276×1204×272	71.5	220-240V~50/60Hz
HRV-D500(A)	500	1311×1106×390	76	220-240V~50/60Hz
HRV-D800(A)	800	1311×1286×390	80	220-240V~50/60Hz
HRV-D1000(A)	1000	1311×1526×390	90	220-240V~50/60Hz
HRV-D1500(A)	1500	1740×1375×615	181.5	220-240V~50/60Hz
HRV-D2000(A)	2000	1811×1575×685	208.5	220-240V~50/60Hz

3. External Appearance

HRV-D200(A) ~ HRV-D400(A)

HRV-D500(A)~HRV-D1000(A)

HRV-D1500(A)~HRV-D2000(A)

4. Features

HRV (Heat Recovery Ventilator) employs advanced technology; the heat exchange core is formed by special paper that is processed with chemical treatment and thus creates optimum results in temperature, humidity and cooling recovery.

- **High efficiency heat exchange core:** When the exhaust air coming out and the outdoor air coming in cross ways in the heat exchange core, as a result of the temperature difference between the two sides of the partition board, heat transfer takes place. In summers, outdoor air getting inside rejects heat to the exhaust air and as a result the outdoor air is cooler as it gets in. In winters, outdoor air acquires heat from the exhaust air so as to increase its temperature and as a result the outdoor air l hotter as it gets inside. As a result of this process heat recovery and energy saving takes place.

- **Energy saving**
  Fresh-air and exhaust air cross through the heat exchanger. Temperature exchange happer ıe heat recovery ventilator. As a result of this exchange fresh air can save a lot of energy. It adopts centrifugal fan with lower power consumption and longer air supply distance which results in easy control and operation.

- **High efficiency**
  The new HRV units can greatly reduce energy losses and room temperature fluctuations caused by the ventilation process. The heat exchanger core is made up of specially treated paper which gives enhanced temperature and humidity control

.

- **Low noise**
  As a result of advanced 3-D spiral fan design and use of sound absorbing materials; the HRV has a quiet operation.

- **Flexible multi control ways**
  It can be controlled together with other indoor units.

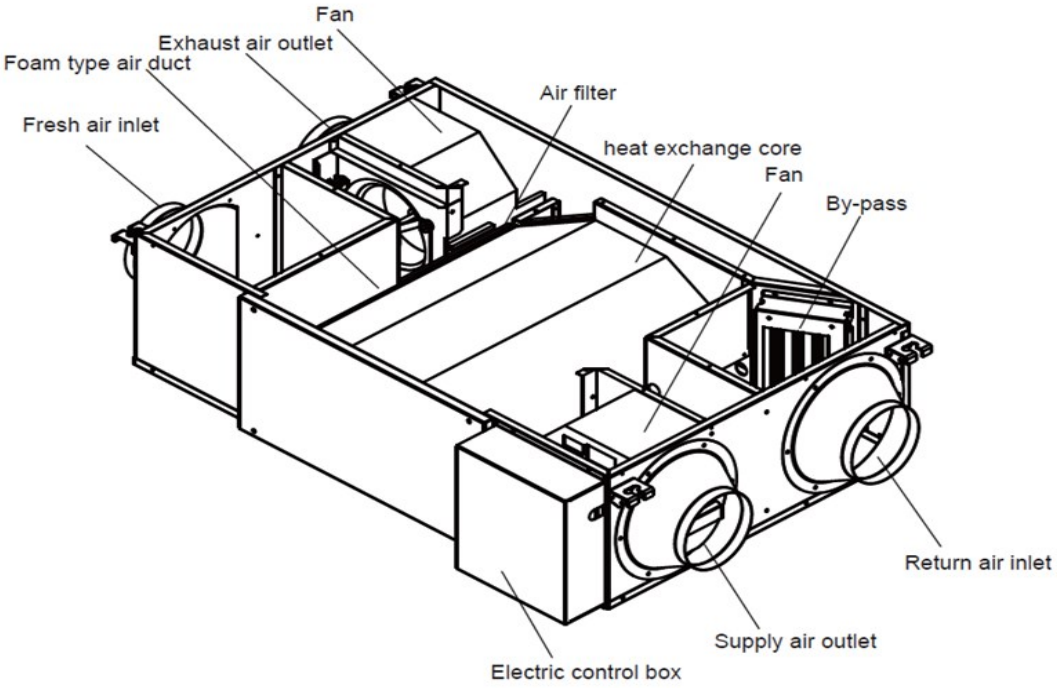
- **Eco-design**
  It complies with regulation (EU) 1253/2014 requirements for ventilation units.

- **Full DC fan motors**:
  The new HRV units use full DC fan motors which comply with the requirements of ErP Directive 2009/125/ec commission regulation (EU) No 327/2011.

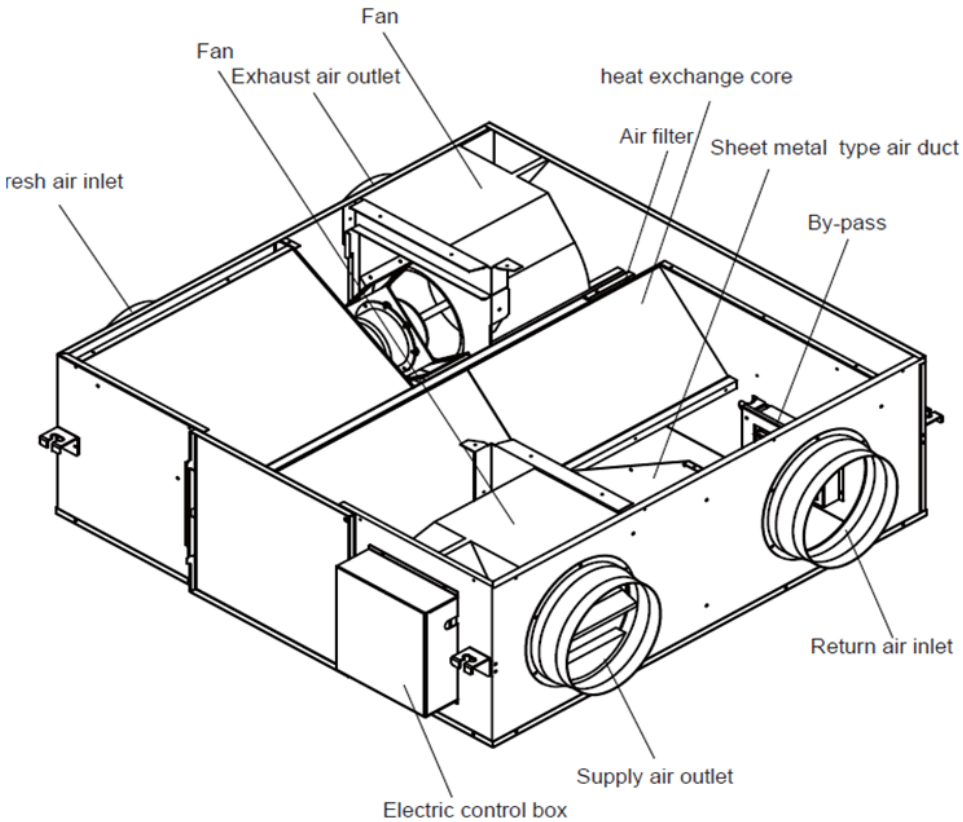
- Compact design , easy installation and maintenance

5. Main parts of the unit

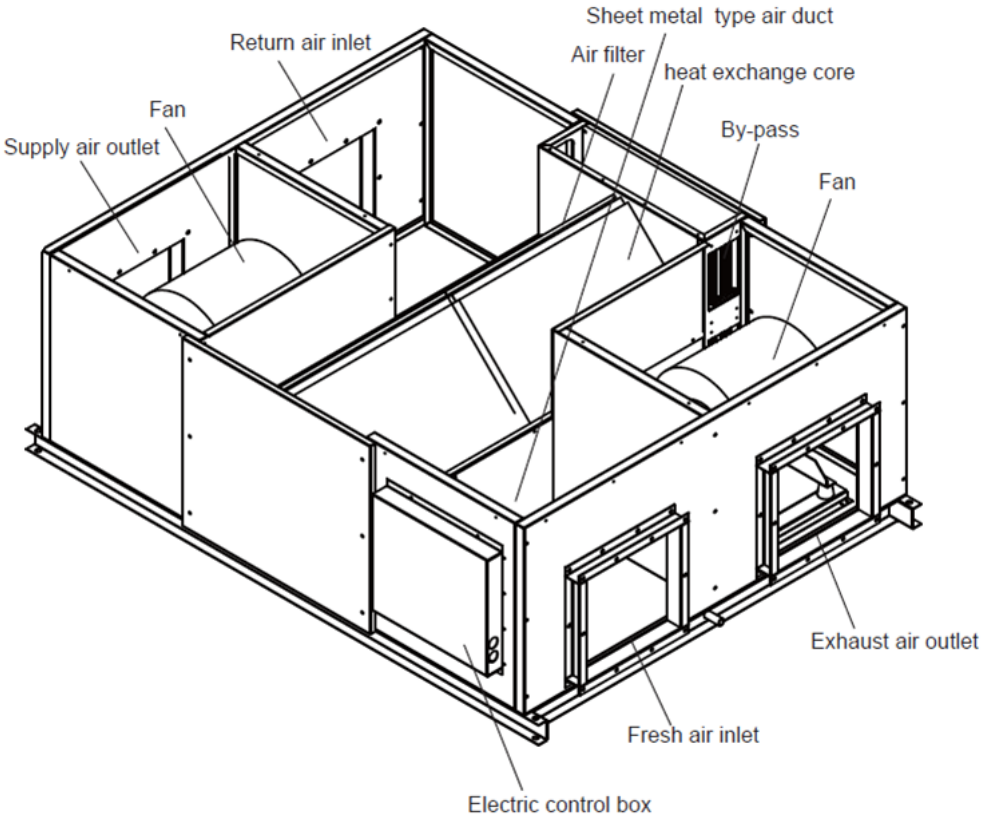
- **HRV-D200(A)~HRV-D400(A)**



- **HRV-D500(A)~HRV-D1000(A)**



- **HRV-D1500(A)~HRV-D2000(A)**



6. Specifications

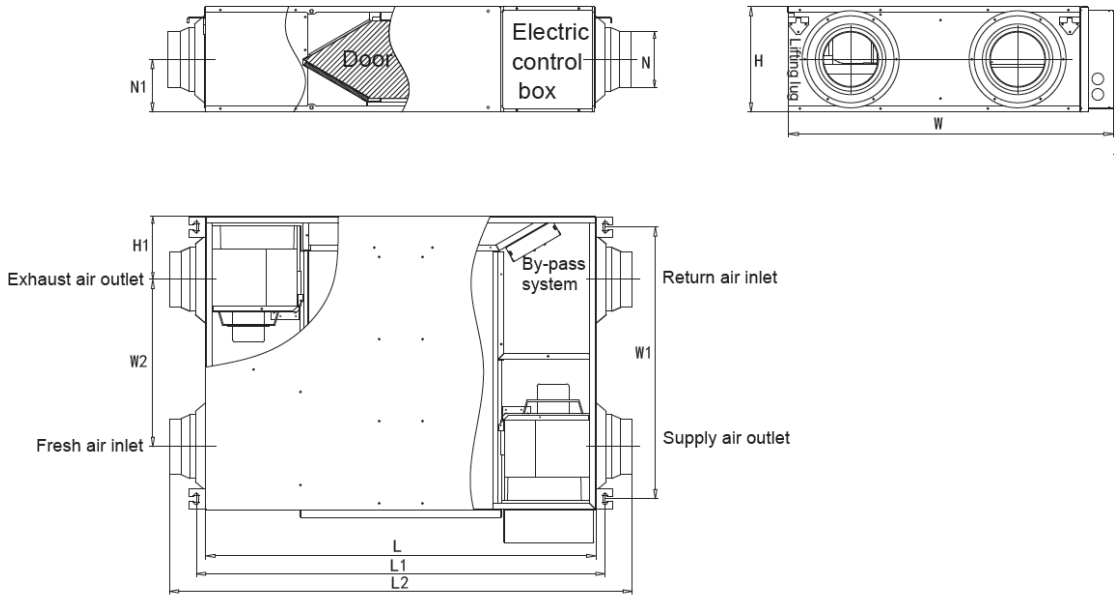
Sale Model			**HRV-D200(A)**	**HRV-D300(A)**	**HRV-D400(A)**	**HRV-D500(A)**
Power supply		Ph-V-Hz	1-phase, 220-240V~50/60Hz			
Input power		kW	0.07	0.1	0.11	0.15
Nominal Temperature Efficiency		%	81.1	75.5	77.7	80.6
Nominal Enthalpy Efficiency		%	77.5	72.1	73.5	74.0
Current		A	0.64	0.84	0.97	1.2
Indoor external static pressure (Hi)		Pa	100	90	100	90
Nominal air flow		m^3/h	200	300	400	500
Sound pressure level		dB(A)	45	48	48	50
Net dimension (L×W×H)		mm	1195×801×272	1195×914×272	1276×1204×272	1311×1106×390
Packing size (L×W×H)		mm	1275×880×420	1275×994×420	1360×1284×420	1390×1244×540
Net/Gross weight		kg	46.5/63.5	56.5/75.5	71.5/91.5	76/98
Power supply wire	Wire qty.		3	3	3	3
	Code wire cross-section	mm^2	2.5	2.5	2.5	2.5
Controller			Wired controller			
Fresh air	Fresh Air Diameter	mm	Φ144	Φ144	Φ198	Φ244
	Air drop	Pa	52	179	218	189

Sale Model			**HRV-D800(A)**	**HRV-D1000(A)**	**HRV-D1500(A)**	**HRV-D2000(A)**
Power supply		Ph-V-Hz	1-phase, 220-240V~50/60Hz			
Input power		kW	0.32	0.38	0.68	0.95
Current		A	2.4	2.9	3.8	5.7
Nominal Temperature Efficiency		%	78.7	82.8	75.5	77.2
Nominal Enthalpy Efficiency		%	72.3	76.0	69.4	74.7
Indoor external static pressure (Hi)		Pa	140	160	180	200
Nominal air flow		m^3/h	800	1000	1500	2000
Sound pressure level		dB(A)	55	54	69	70
Net dimension (L×W×H)		mm	1311×1286×390	1311×1526×390	1740×1375×615	1811×1575×685
Packing size (L×W×H)		mm	1390×1424×540	1390×1670×540	1830×1520×770	1900×1720×845
Net/Gross weight		kg	80/104	90/112	181.5/213	208.5/245
Power supply wire	Wire qty.		3	3	3	3
	Code wire cross-section	mm^2	2.5	2.5	2.5	2.5
Controller			Wired controller			
Fresh air	Fresh Air Diameter	mm	Φ244	Φ244	346×326	346×326
	Air drop	Pa	357	384	253	322

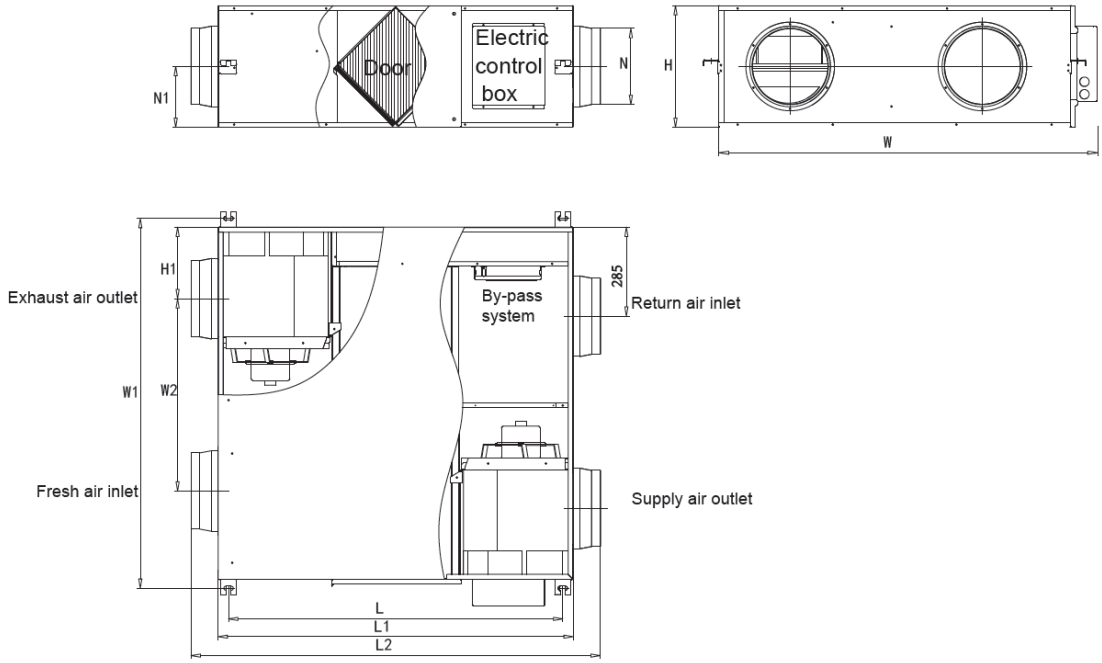
Note:
1. For the units model of HRV-D200(A)~HRV-D2000(A), there are 3-speed adjustable air-volume (Hi, Med, Low).
2. The parameters in the above table are measured at high speed.

7. Dimensions

HRV-D200(A)~HRV-D400(A)

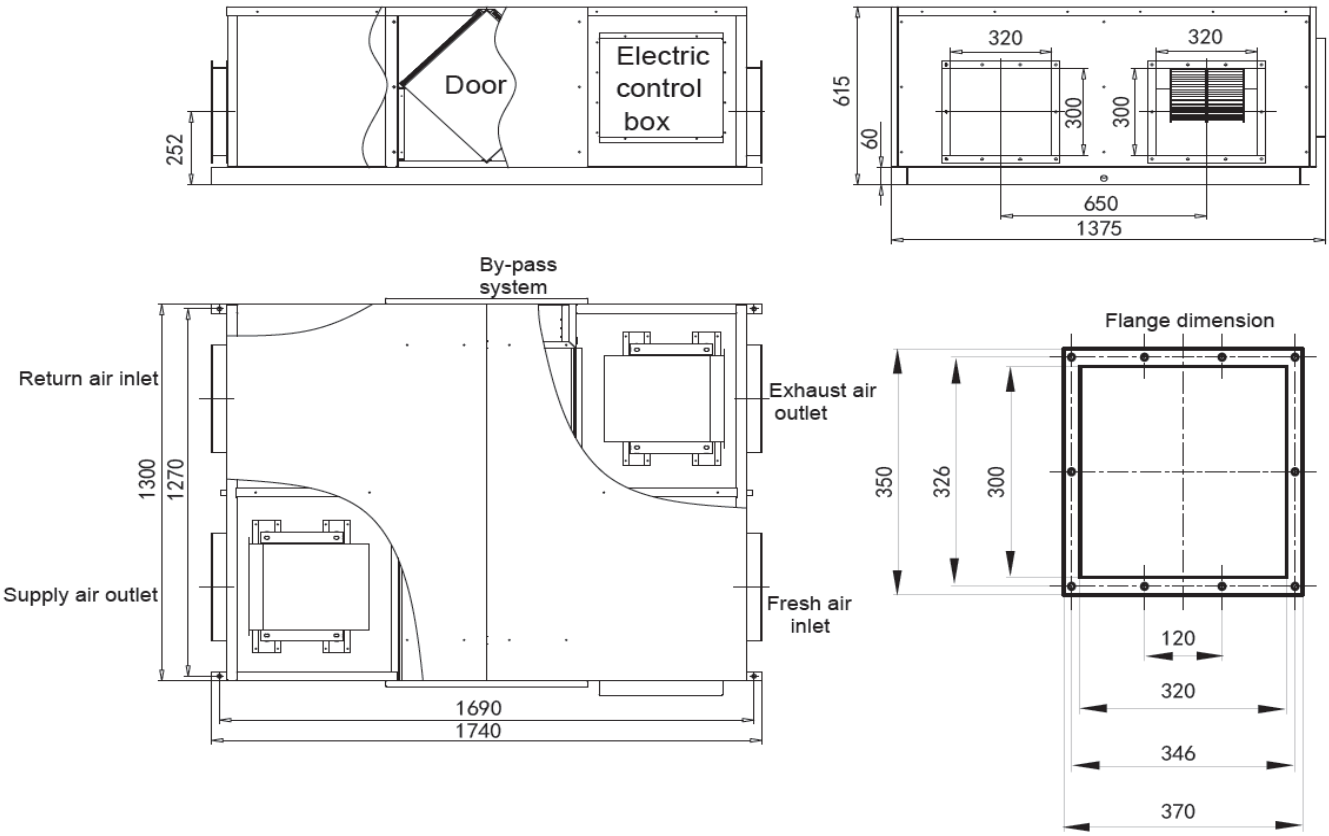


HRV-D500(A)~HRV-D1000(A)

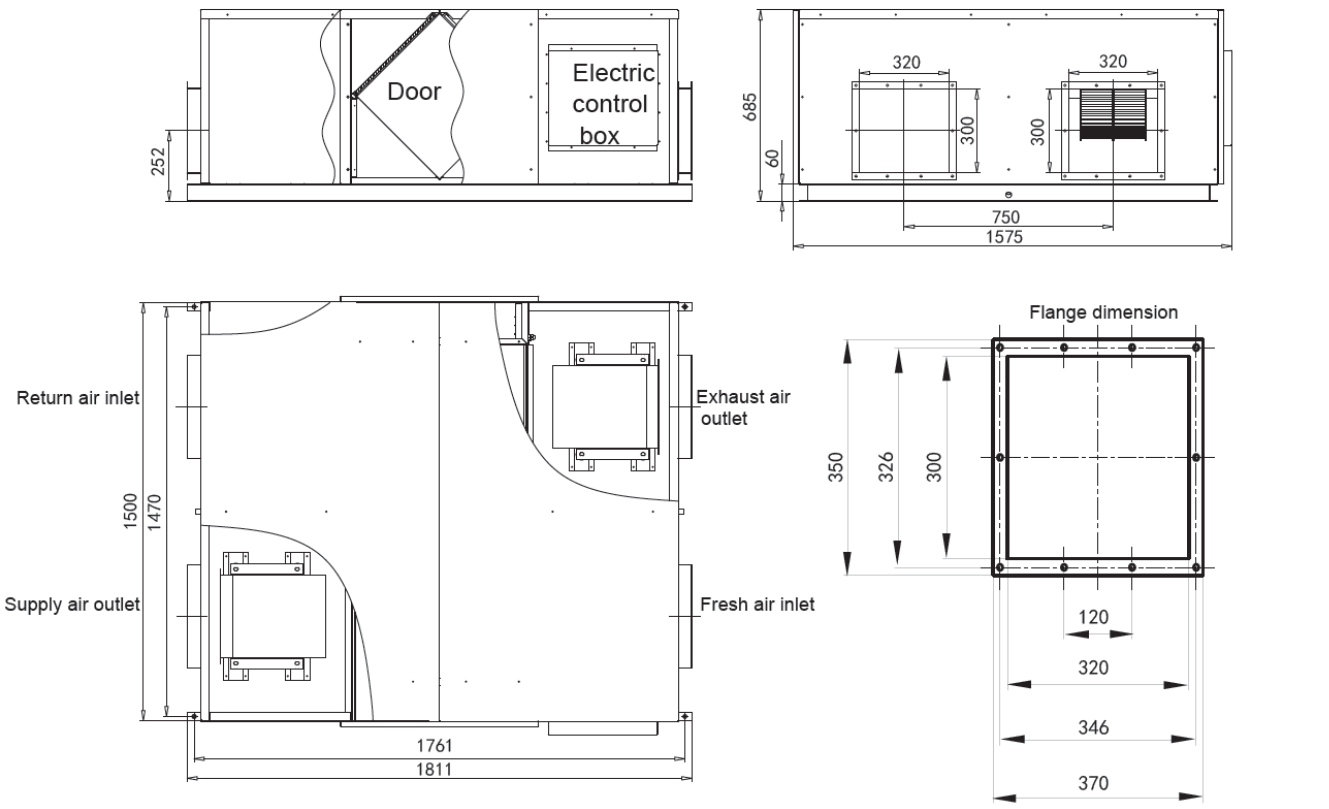


Model	L	L1	L2	W1	W2	W	H	H1	N	N1
HRV-D200(A)	1007	1054	1195	588	356	801	272	142	Φ144	136
HRV-D300(A)	1007	1054	1195	701	431	914	272	163	Φ144	136
HRV-D400(A)	1081	1129	1276	991	595	1204	272	202	Φ198	136
HRV-D500(A)	1071	1138	1311	1005	465	1106	390	227	Φ244	195
HRV-D800(A)	1071	1138	1311	1185	616	1286	390	229	Φ244	195
HRV-D1000(A)	1071	1138	1311	1431	764	1526	390	230	Φ244	195

HRV-D1500(A)

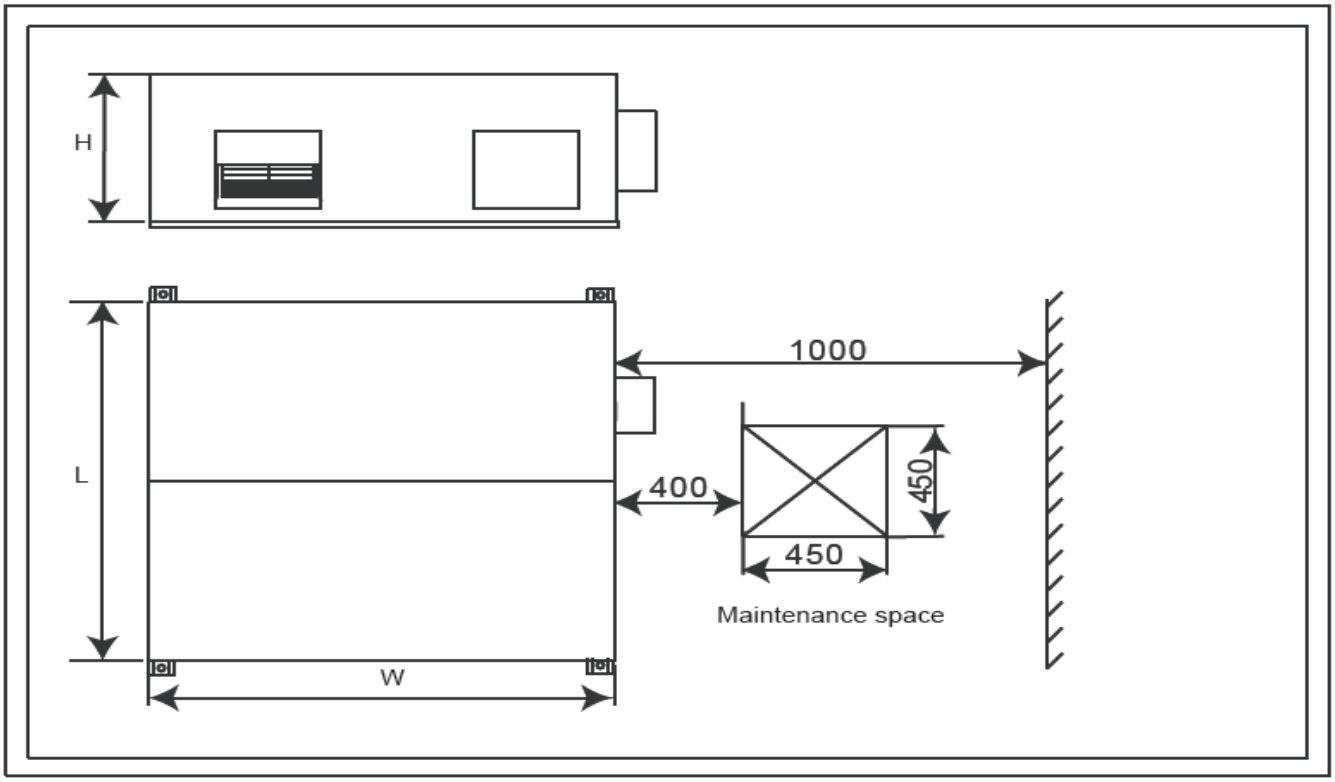


HRV-D2000(A)

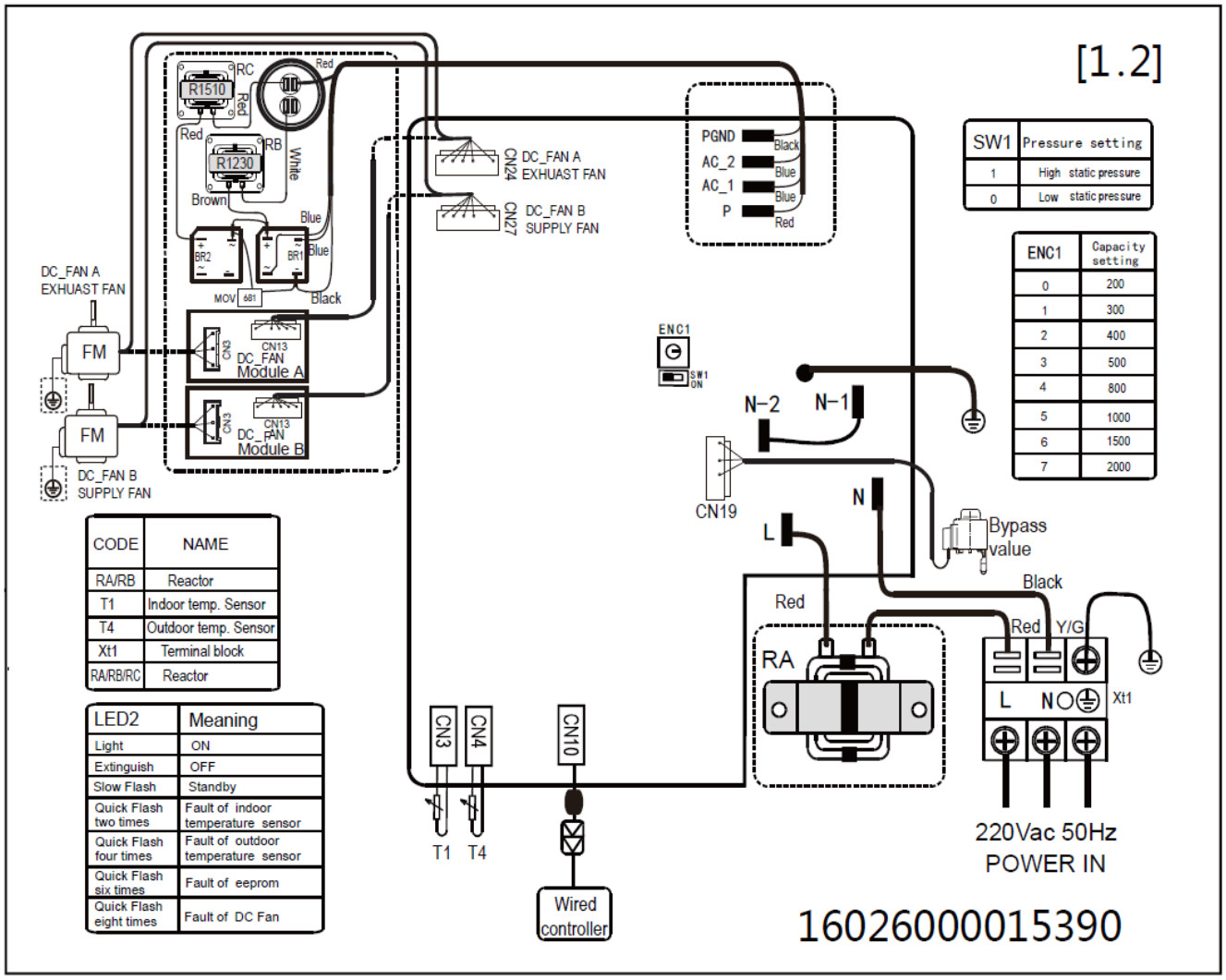


8. Maintenance Spaces

Unit:mm



9. Wiring Diagrams



10.Electric Characteristics

Model	Indoor Unit				Power Supply	
	Hz	Voltage	Min.	Max.	MCA	MFA
HRV-D200(A)	50/60	220-240	220	240	1.3A	10A
HRV-D300(A)	50/60	220-240	220	240	1.7A	10A
HRV-D400(A)	50/60	220-240	220	240	2.0A	10A
HRV-D500(A)	50/60	220-240	220	240	2.5A	16A
HRV-D800(A)	50/60	220-240	220	240	5.0A	16A
HRV-D1000(A)	50/60	220-240	220	240	6.0A	16A
HRV-D1500(A)	50/60	220-240	220	240	8.0A	30A
HRV-D2000(A)	50/60	220-240	220	240	10.0A	30A

Note:
MCA: Min. Current Amps. (A)
MFA: Max. Fuse Amps. (A)
FLA: Full Load Amps. (A)

11. Operating Condition Limits

Note: Protection or error may occur if the unit is operated beyond the below written operation limits

Model	Outdoor air temperature	Room temperature	Room humidity
All models	-7℃～43℃	-7℃～43℃	Lower than 80% If higher than 80%, the surface of indoor unit may be condensed or the condensate will be blown from air outlet.

12. Installation

12.1 Installation Preparation

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

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

2) Hold the unit by the hanger brackets when opening the crate and moving it and do not lift it holding on to any other part (especially the duct connecting flange).

Note: Be sure to instruct customers how to properly operate the unit (especially maintenance of air filter and operation procedure) by having them carry out operations themselves with the help of this manual.

12.2 Selecting the Installation Site

1) Select an installation site where the following conditions are fulfilled and meet with the customer's approval.

a. HRV should be installed far away from office, recreation area or any other place where noise is not allowed. It is recommended to install the HRV in a special machine room.

b. HRV should be installed in a place having sufficient strength in beam, ceiling and other locations to fully support the weight of the unit. Installing in a place of insufficient strength can be dangerous. It may also cause vibration or unusual operating noise.

c. Do not install the HRV directly against a ceiling or wall. (If the HRV is in contact with the ceiling or wall, it can cause vibration.)

d. HRV should be installed in such a fashion that sufficient clearance for maintenance and service can be ensured.

Caution:
- Install the units, power supply wiring and connecting wires at least 1 meter away from televisions or radios in order to prevent image interference or noise. (Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the electric noise.)
- The bellows may not be able to be used in some districts, so exercise caution. (Contact your local government office or fire department for details.)
- When discharging exhaust air to a common duct, the Building Standard Law requires the use of fire proof materials, so attach a 2m copper plate standing duct.

2) Do not install the HRV in the following locations:

a. HRV should not be installed in a place subjected to high temperature or direct flame. It can result in fire or overheating.

b. HRV should not be installed in a place such as machinery plant or chemical plant where gas, which contains poisonous gas or corrosive materials such as acid, alkali, organic solvent or other chemicals harmful for environment, is generated. Copper piping and brazed joins may corrode, causing refrigerant to leak or poisoning due to leaked gas

c. HRV should not be installed in a place where combustible gas leakage is likely.
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d. HRV should not be installed in a place with high moisture content such as washroom..
Electric leak or electric shocks and other failure can be caused.

e. HRV should not be installed near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the equipment.

12.3 Preparations before Installation

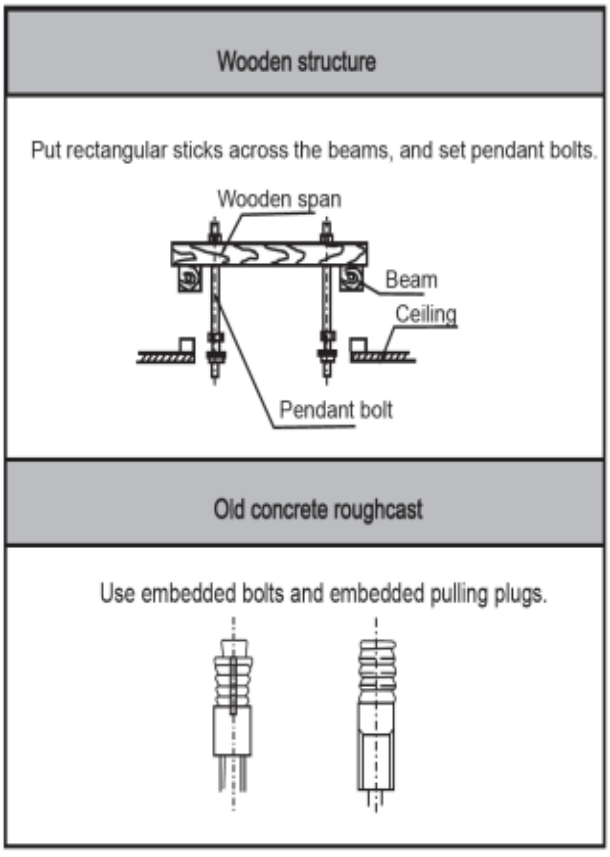
1. Confirm the positional relationship between the HRV and the suspension bolts.
Leave space for servicing the unit and include inspection hatches. (Always open a hole on the side of the electric parts box so that the air filters, heat exchange elements, fans etc. can easily be inspected and serviced.)

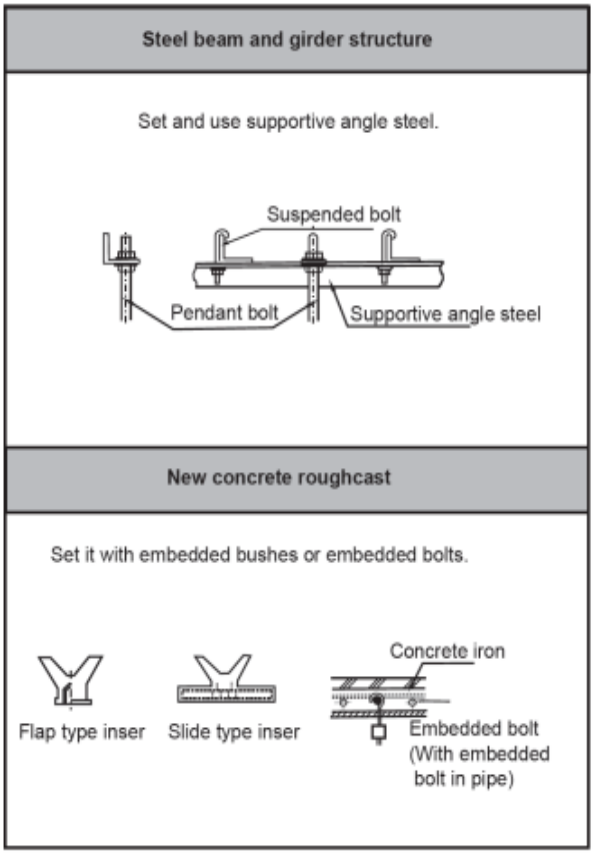
2. Make sure that the range of the HRV's external static pressure is not exceeded.

3. Open the installation hole (Pre-setting ceilings)
Once the installation hole is opened in the ceiling where the unit is to be installed, pass transmission wiring and remote controller wiring to the unit's wiring holes. After opening the ceiling hole, make sure ceiling is level if needed. It might be necessary to reinforce the ceiling frame to prevent shaking.
Please consult architect or carpenter if necessary.

4. Install the suspension bolts. (Use M10 to M12 suspension bolts.) Use a hole-in anchor, sunken insert anchor for existing ceilings or other parts, procured in the field to reinforce the ceiling to bear the weight of the HRV.

5. Install vibration damping feet. (For vibration damping)





12.4 Installation

1. Before installation, make sure that all external parts are in their place.

2. The surrounding environment of the unit, especially the sides of wiring cabinet and water collecting side should reserve sufficient wiring and maintenance and space. Additionally, one should ensure the removing space for filter grill.

3. Unit should mount steadily and without strain of the weight form condensate water pipe and air duct. The vents of air inlet/outlet and return should be connected with flexible tube.

4. Unit in AC (220-240V/50Hz / 220-240V/60Hz) possesses independent cut-off and protection device.

5. Make sure to have sufficient maintenance space.

13. Wiring

Warning:

1. All the supplied parts, materials and electric works must comply with local regulations.

2. Only use copper wires.

3. Use a steady power supply for air-conditioners. The power voltage must be in line with rated voltage.

4. The electric wiring works must be carried out by a professional technician and must comply with the labels stated in the circuit diagram.

5. Before the electrical connection works are carried out; turn off the power supply to prevent the injuries caused by electric shocks.

6. The external power supply circuit of the air conditioner must include an earth line; the earth line of power cord connecting the indoor unit must be securely connected to the earth line of the external power supply.

7. Leakage protective devices must be configured according to the local technical standards and requirements for electrical and electronic devices.

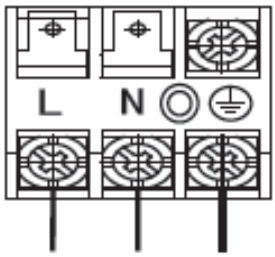
8. The fixed wiring connected must be equipped with an all pole disconnection device with a 3 mm contact separation.

9. The distance between the power cord and signal line must at least 300 mm to prevent occurrences of electrical interference, malfunction or damage to electric components. At the same time, these lines must also not be in contact with the piping and valves.

10. Choose electrical wiring that confirms with the corresponding electrical requirements.

11. Connect the power supply only after all the wiring and connections have been completed and make sure that the connections are correct.

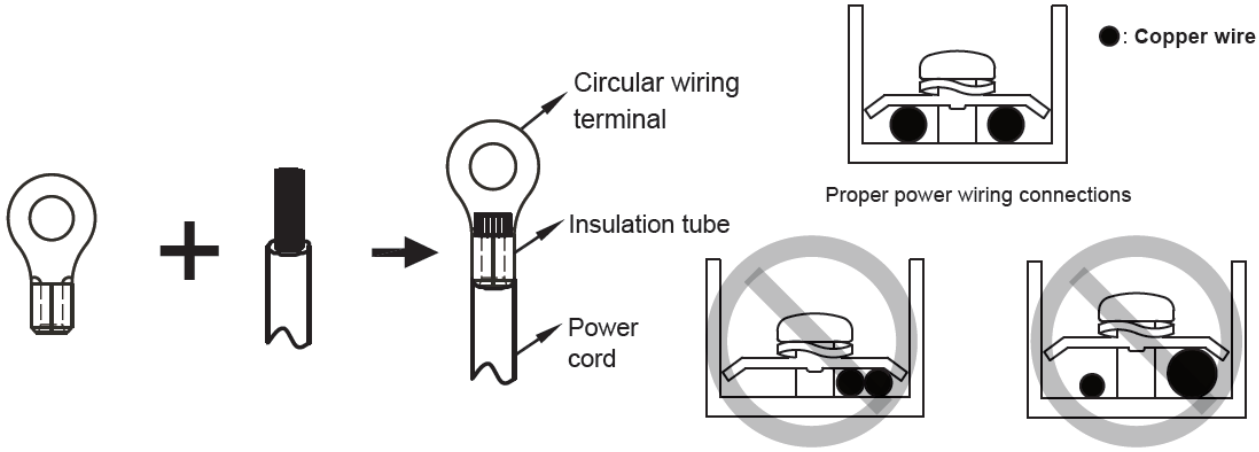
figure of the power supply terminal



POWER INPUT

While connecting the power supply terminals, use circular wiring terminals with insulation.Use power cord that confirms with the specifications and connect the power cord firmly. To prevent the cord from being pulled out by external force; make sure it is fixed securely.
If the circular wiring terminal with insulation cannot be used, make sure that:

1. Do not connect two power codes with different diameters to the same power supply terminals (may cause overheating).



13.2 Electric data Specification

Model	Power supply		Input current main switch /fuse(A)	Power supply wire dimension	
HRV-D	Phase	Frequency/voltage		Wire's quantity	Code wire cross-section (mm^2)
200(A),300(A),400(A), 500(A), 800(A), 1000(A),1500(A),2000(A)	Single phase	220-240V~ 50/60Hz	15/15	3 (Yellow/green wires grounding wire)	2.5

- After wiring, make sure that all the connections are correct and then power ON the unit
- Pay attention to the power supply wire of three-phase model; make sure that the phase sequence is correct.

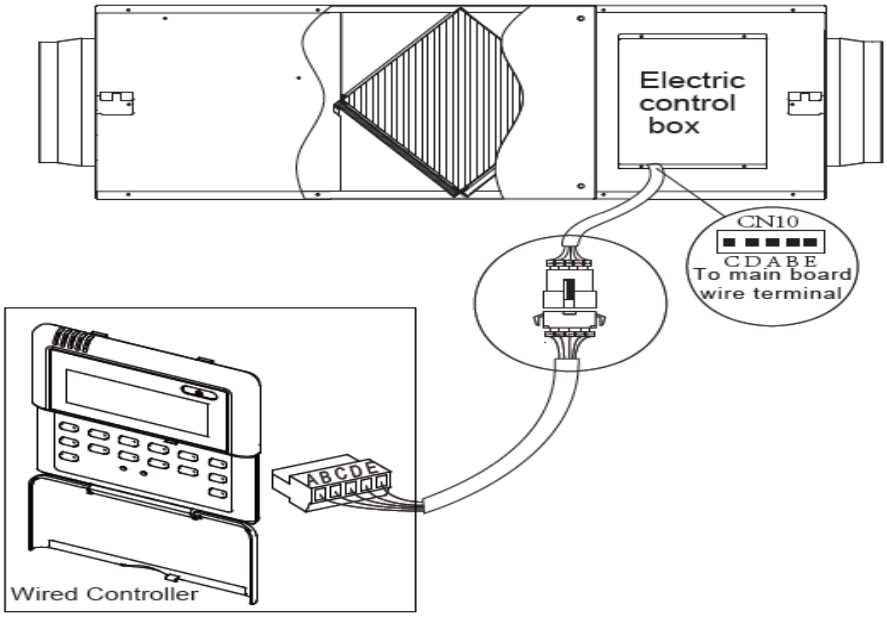
ENC1	
Dial code	Capacity
0	200
1	300
2	400
3	500
4	800
5	1000
6	1500
7	2000

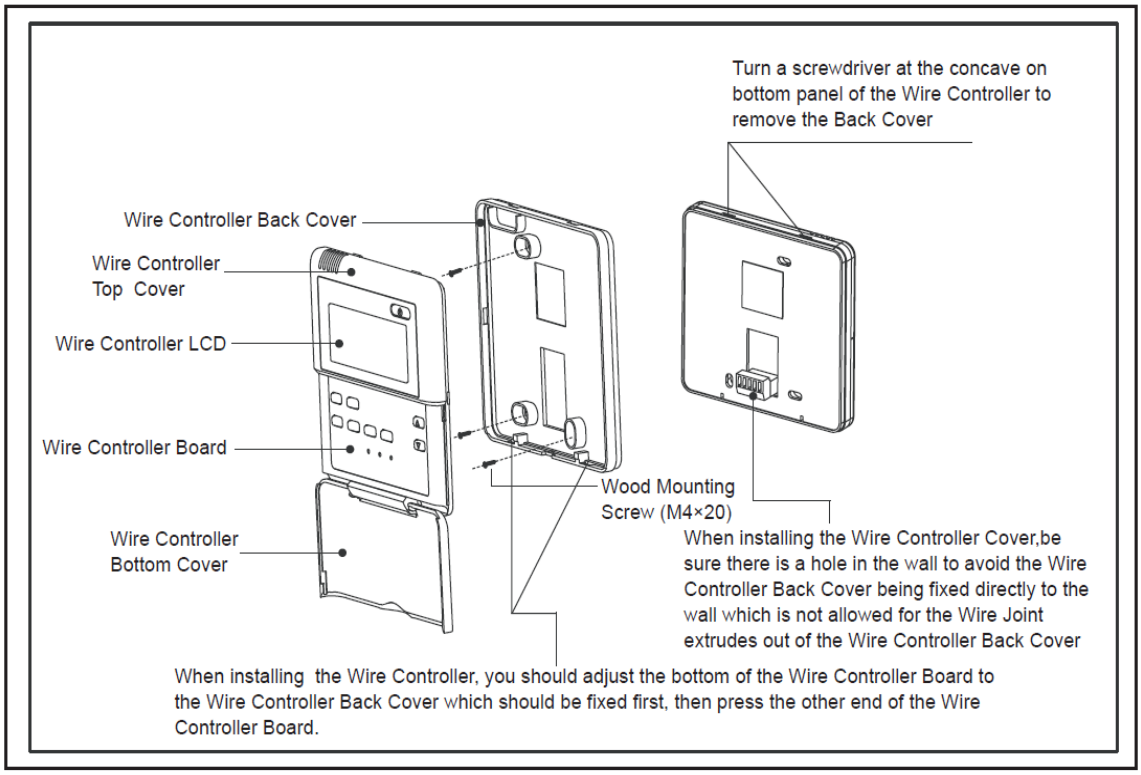
SW1	
SW1 [0] 	Low static pressure
SW1 [1] 	High static pressure(default)

ENC1 (Setting for Capacity) **SW1 setting for static pressure**

Note: The dip switch settings are already configured in factory. Do not change on site.

13.3 System connection diagram





Caution:
1. Never turn screws too tightly, or else the cover would be dented or the Liquid Crystal breaks.
2. Please leave enough space for maintain and upkeep the wire controller.
3. KJR-27B/E must be purchased separately.

14. Trial Run

14.1 Pay attention to the following items before operation

a. Before drive-up, please clean up the duct and check whether all air valves and devices are normal.

b. Carefully adjust the system air valves when start-up; control the current of motor in rated range.

c. Three-phase model is without the by-pass function, therefore the fan would start-up would be delayed by 30 seconds post start-up.

d. Connect the wired controller. Wired controller should be installed according to wired controller owner's manual and installation manual.(Attached in the package)

14.2 Pay attention to the following points before trial run:

a. The unit is installed correctly.

b. Ducting and wiring are completed correctly.

c. The drainage is smooth.

d. The heating insulation works well.

e. The ground wiring is connected correctly.

f. The power voltage fits the rated voltage of the HRV.

g. There is no obstacle at the outlet and inlet of the HRV.

14.3 Control the HRV by wired controller; operate it according to the wired controller owner's manual

Check the following points while controlling:

a. Whether the switch on the remote controller works well.

b. Whether the room temperature is adjusted well.

c. Whether the indicator lights normally.

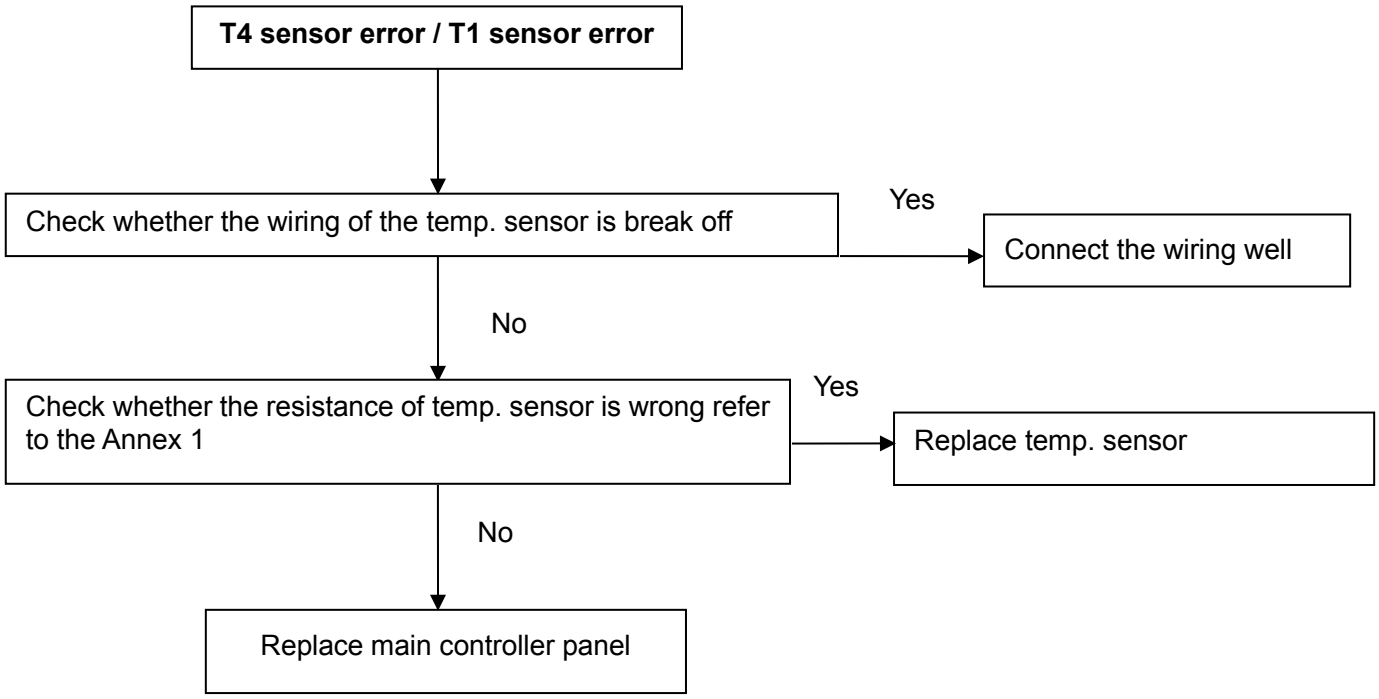
d. Whether there is vibration or abnormal noise during operation.

15. Troubleshooting

15.1 LED2 Explanations:

Sr. No.	LED2	Explanation	Solution
1	Light	ON	
2	Extinguish	OFF	
3	Slow Flash	Standby	
4	Quick Flash two times	Fault of indoor temperature Sensor(T1)	Refer to 15.2
5	Quick Flash four times	Fault of outdoor temperature Sensor(T4)	Refer to 15.2
6	Quick Flash six times	Fault of EEPROM	Check whether the EEPROM is damaged or it is not connected properly.
7	Quick Flash eight times	Fault of DC Fan	Check whether the DC fan motor is damaged or it is not properly connected.

15.2 T4/T1 Temperature Sensor Troubleshooting



16. Maintenance

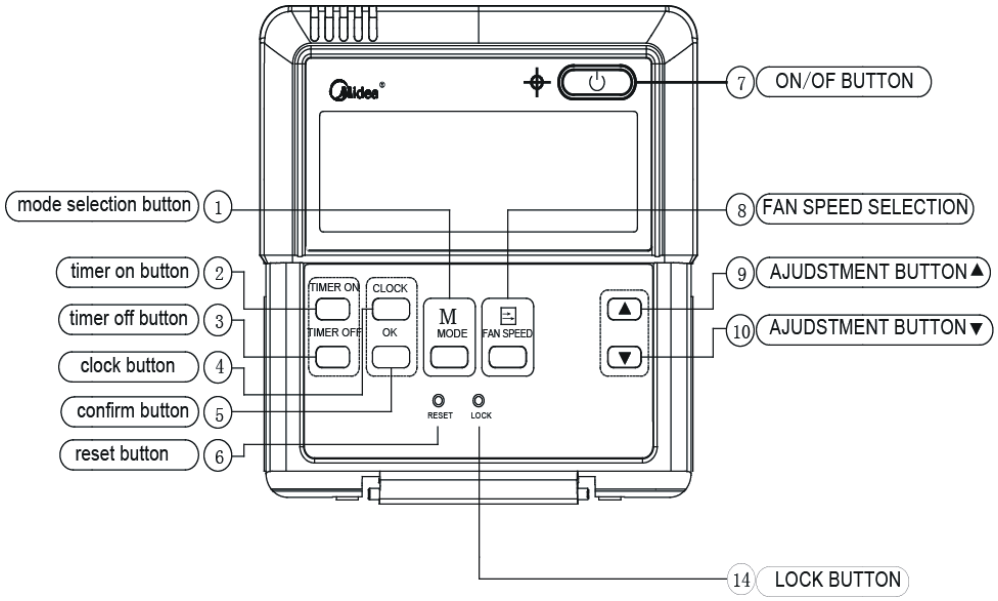
1. During early use, one should check the fan operation regularly.

2. The cleaning regulation for filter mesh depends on local environment. It can be cleaned by vacuum dirt exhauster or water; if heavy dust accumulates, neutral detergent should be used to clean it thereafter should be dried in shady and cool place for 20 to 30 minutes and replace it.

3. Clean the core at least 2 years a time by vacuum dirt exhauster to remove dust and foreign substances in the unit assemblies, do not touch the assemblies by exhauster and flush by water to avoid core damage.

4. Check the fan every half a year to maintain that its in well shape and balance.

17. Controller



The basic operation conditions of wired controller are as follows:

1. The range of power supply voltage: the voltage input is 5V DC.
2. Amblent temprature range: -15℃～+43℃.
3. Ambient humidity range: RH40%～RH90%.
4. The safety certification of electric control should conform to GB4706.32-2004, GB/T7725-2004

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17.1 Name and functions of buttons on wired controller

1 Mode selection button:
It is used to select mode, push the button one time, then the operation modes will change in turn as follows:
AUTO→HEAT RECOVERY→EXHAUST→BYPASS→SUPPLY

2 Timer on button:
Push the button to set TIMER ON, each time you push the button the time moves forward by o.5 hours. When the set time is over 10 hours, each time you push the button the time moves forward by 1 hour. If want to cancel the TIMER ON, then adjust the time of TIMER ON as 0.0

3 Timer off button:
Push the button to set TIMER OFF, each time you push the button the time moves forward by o.5 hours. When the set time is over 10 hours, each time you push the button the time moves forward by 1 hour. If want to cancel the TIMER OFF, then adjust the time of TIMER OFF as 0.0

4 CLOCK button:
Normally display the clock set currently (display 12:00 for the first electrifying or resetting). When push the button for 4 seconds, the hour part on the clock display flashes every 0.5 seconds, then push button ▲ and ▼ to adjust hour; Push the button CLOCK again, the minute part flashes every 0.5 seconds, then push and button to adjust minute. When set clock or alter clock setting, must push the confirm button to complete the setting.

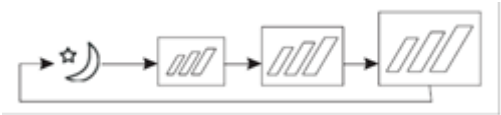
5 Confirm button:
The button is used at the state of CLOCK adjustment. After select the time, push the button to confirm then exit, the current clock will display.

6 RESET button (hidden):
Use a small stick with a diameter of 1mm to push the RESET button to cancel the current settings and get into the condition of resetting.

7 ON/OFF button:
Push the button at the condition of OFF, the OPERATION lamp lights, and the wire controller enters into ON operation, simultaneously sends the information of operation mode set currently, temperature, fan speed, timer etc. Push the button at the condition of ON, the OPERATION lamp extinguishes simultaneously sends the OFF. If having set TIMER ON or TIMER OFF, the wire controller will cancel these settings before entering into OFF, close the concern indicator, and then send the OFF information.

8 Fan speed selection button (FAN SPEED)

Select any one fan speed from "", "LOW"," MED", and "HIGH". Each time push the button, the fan speed will change in turn as follow.

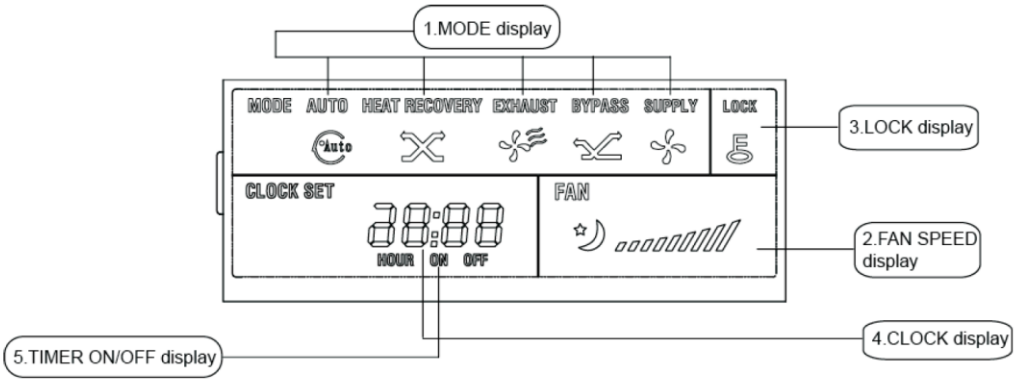


9 Adjustment button:
The button is only for time adjustment. Push the ▲ button, time increases.

10 Adjustment button:
The button is only for time adjustment. Push the ▼ button, time decreases.

11 LOCK button (hidden):
Use a small stick with the diameter of 1mm to push the LOCK button to lock the current setting, push the button again then cancel the setting.

17.2 Name and functions of LCD on wired controller



1 Mode select display (MODE):
Press MODE button to select “AUTO”, “HEAT RECOVERY”, "EXHAUST","BYPASS", or "SUPPLY” mode.

2 Fan speed display (FAN SPEED)

Press FAN SPEED to select fan speed from "", "LOW"," MED”, and "HIGH".

NOTE: "" stand for fan working speed in sleep mode.

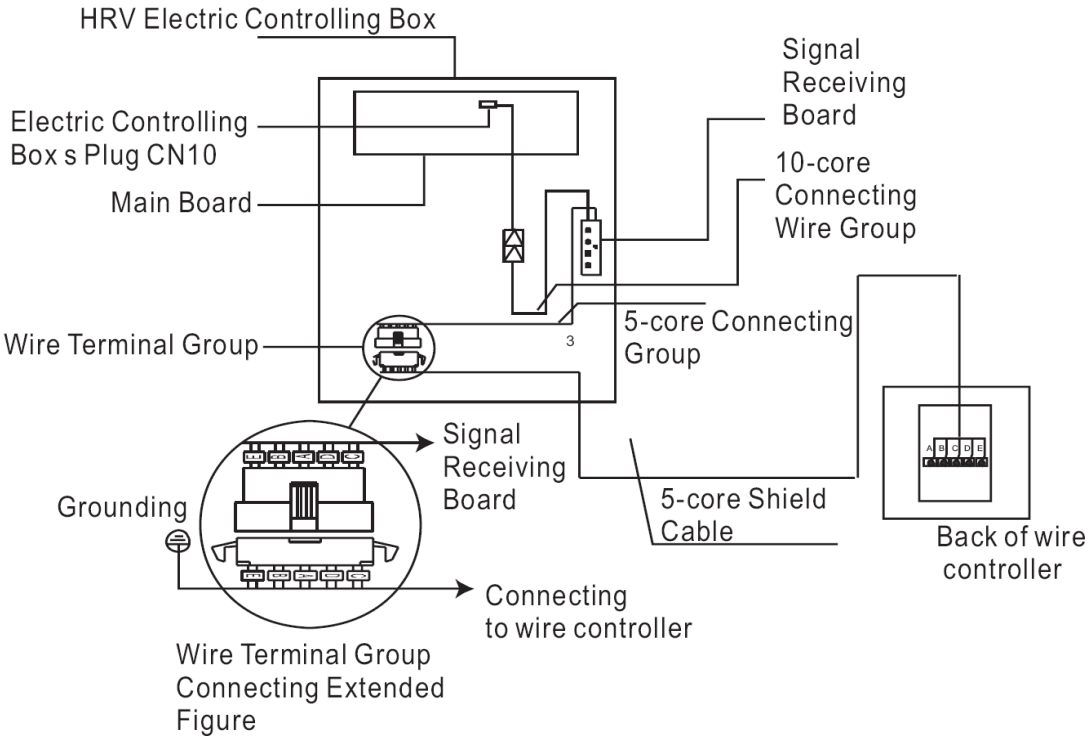
3 Lock display
Press LOCK to display the icon of LOCK. Press the button again then the icon of LOCK disappears. In the mode of LOCK, all the buttons are invalid except for LOCK button.

4 CLOCK display
Usually display the clock set currently. Press the button CLOCK for 4 seconds, the HOUR part will flash, press button ▲and▼ to adjust HOUR. Press the button CLOCK again, the minute part flash, press button ▲ or▼to adjust MINUTE. After clock set or clock operation, it must press CONFIRM to complete the set.

5 TIMER ON/OFF display:
Display ON at the state of TIMER ON adjustment or after only set the TIMER ON; Display OFF at the state of TIMER OFF adjustment or after only set the TIMER OFF; Display ON/OFF if simultaneously set the mode of TIMER ON and TIMER OFF.

17.3 Installation

Connection method and the principle diagram show as follow:



18. Accessories

Name	Quantity	shape	Purpose
Installation and owner's manual	1	This Manual	must be delivered to the customer

Note: Wired Controller KJR-27B/E should be purchased separately.

The following items should be prepared on the site:

Name	Purpose
PVC drain pipe	For connecting unit's drain pipe , whose length is selected according to the actual requirement (Model 1500, 2000 are available)
Damper	For vibration damping while lifting the unit

19. Appendix

The following table shows the Temperature characteristics with resistance of temperature sensor used in the HRV.

Temp.˚C	Resistance KΩ		Temp.˚C	Resistance KΩ		Temp.˚C	Resistance KΩ
-10	62.2756		17	14.6181		44	4.3874
-9	58.7079		18	13.918		45	4.2126
-8	56.3694		19	13.2631		46	4.0459
-7	52.2438		20	12.6431		47	3.8867
-6	49.3161		21	12.0561		48	3.7348
-5	46.5725		22	11.5		49	3.5896
-4	44		23	10.9731		50	3.451
-3	41.5878		24	10.4736		51	3.3185
-2	39.8239		25	10		52	3.1918
-1	37.1988		26	9.5507		53	3.0707
0	35.2024		27	9.1245		54	2.959
1	33.3269		28	8.7198		55	2.8442
2	31.5635		29	8.3357		56	2.7382
3	29.9058		30	7.9708		57	2.6368
4	28.3459		31	7.6241		58	2.5397
5	26.8778		32	7.2946		59	2.4468
6	25.4954		33	6.9814		60	2.3577
7	24.1932		34	6.6835		61	2.2725
8	22.5662		35	6.4002		62	2.1907
9	21.8094		36	6.1306		63	2.1124
10	20.7184		37	5.8736		64	2.0373
11	19.6891		38	5.6296		65	1.9653
12	18.7177		39	5.3969		66	1.8963
13	17.8005		40	5.1752		67	1.830
14	16.9341		41	4.9639		68	1.7665
15	16.1156		42	4.7625		69	1.7055
16	15.3418		43	4.5705		70	1.6469

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