Commercial Air Conditioners

Technical Manual

DC Series HRV

DC 50Hz

HRV-D200(B)

HRV-D300(B)

HRV-D400(B)

HRV-D500(B)

HRV-D800(B)

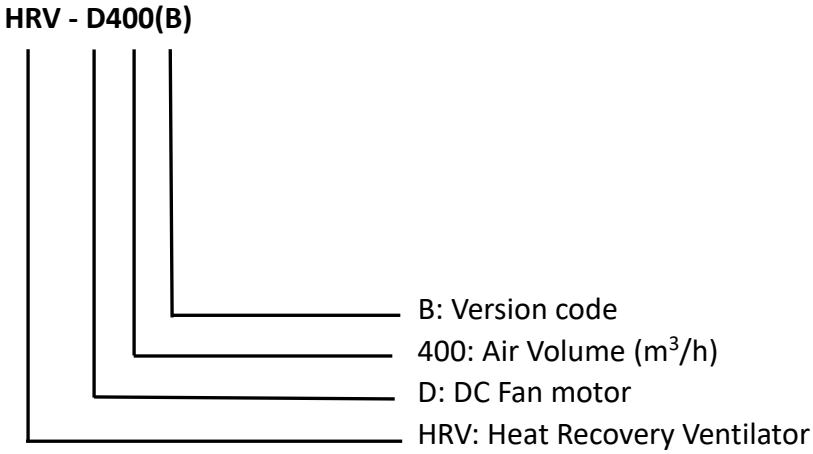
HRV-D1000(B)

HRV-D1500(B)

HRV-D2000(B)

HRV

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(B)	200	1195×801×272	53.6	220-240V~50Hz
HRV-D300(B)	300	1195×914×272	59	220-240V~50Hz
HRV-D400(B)	400	1276×1204×272	71.5	220-240V~50Hz
HRV-D500(B)	500	1311×1106×390	74.4	220-240V~50Hz
HRV-D800(B)	800	1311×1286×390	80	220-240V~50Hz
HRV-D1000(B)	1000	1311×1526×390	90	220-240V~50Hz
HRV-D1500(B)	1500	1740×1375×615	181.5	220-240V~50Hz
HRV-D2000(B)	2000	1811×1575×685	208.5	220-240V~50Hz

3. External Appearance

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

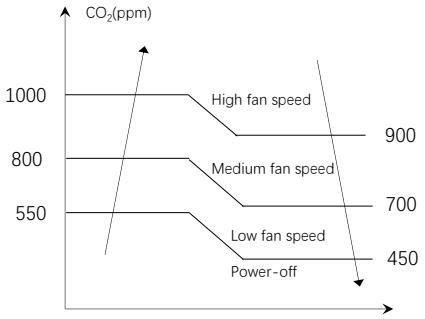
- **HRV-D500(B)~HRV-D1000(B)**

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

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.

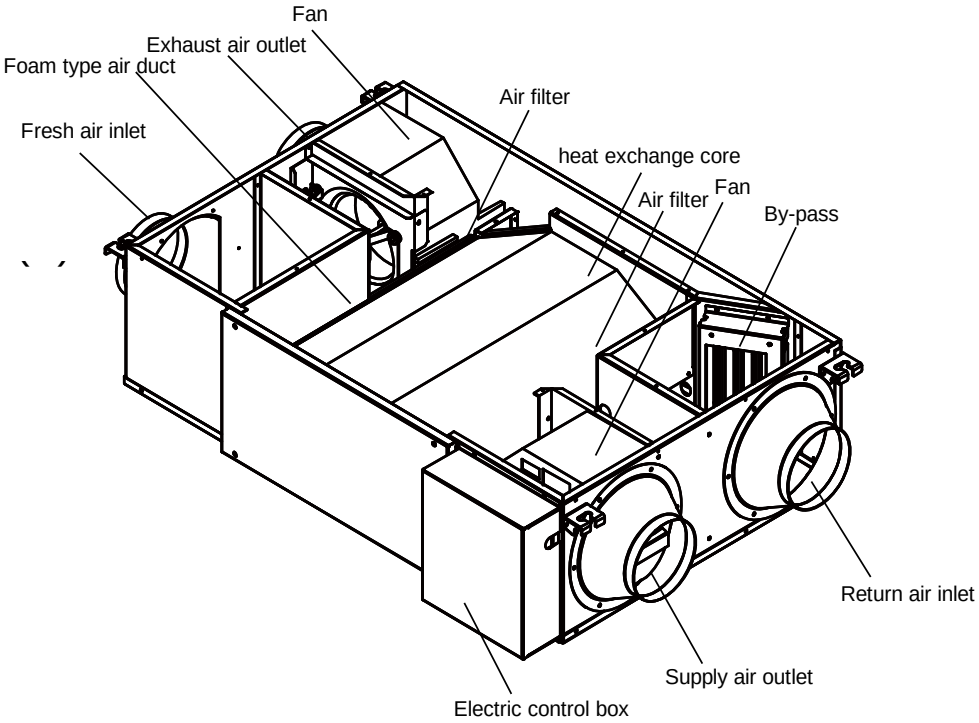
- Wide capacity range up to 2000 m^3/h
- Wide indoor and outdoor ambient operation range from -7°C to +43°C
- High performance built-in DC fan motors ensure reliable performance complying with EU and ErP regulations
- Differential pressure sensor is embedded inside（When the differential pressure is too high, automatically remind to replace the filter）
- Several operation modes; Auto, Bypass, Heat recovery, Free cooling mode
- Slim and compact design of units, making the installation more convenient
- Free cooling mode (Works when outdoor ambient temperature is below indoor ambient temperature)
- New heat exchange element with high efficiency paper
- Standard Built-in dust filter (G4); Optional F7 filter for air supply side and Class M5 filter for exhaust air side in line with EU legislations can be customized
- Optional CO_2 sensor connection（Automatically control fan speed according to different CO_2 concentration, please refer below for more details）



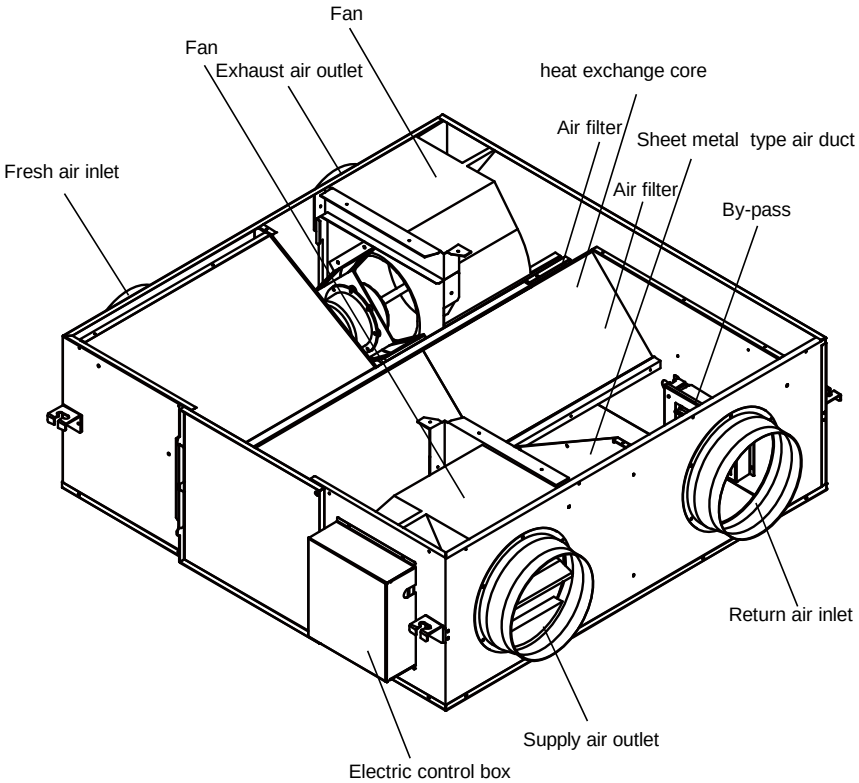
- No drain piping needed, thanks to sensible & latent heat transfer at heat exchanger

5. Main parts of the unit

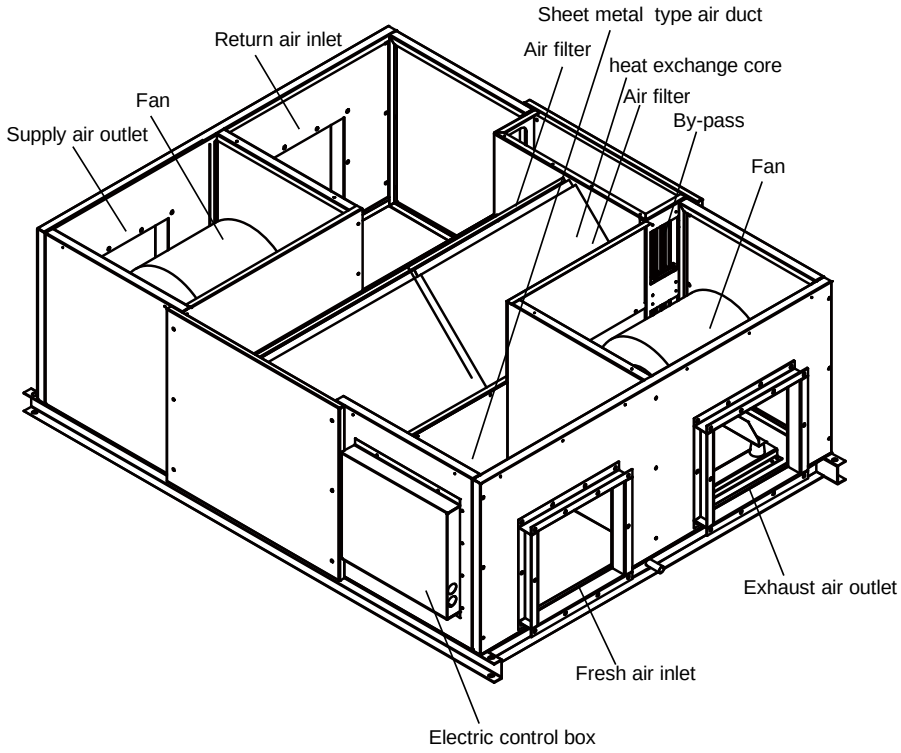
- **HRV-D200(B)~HRV-D400(B)**



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



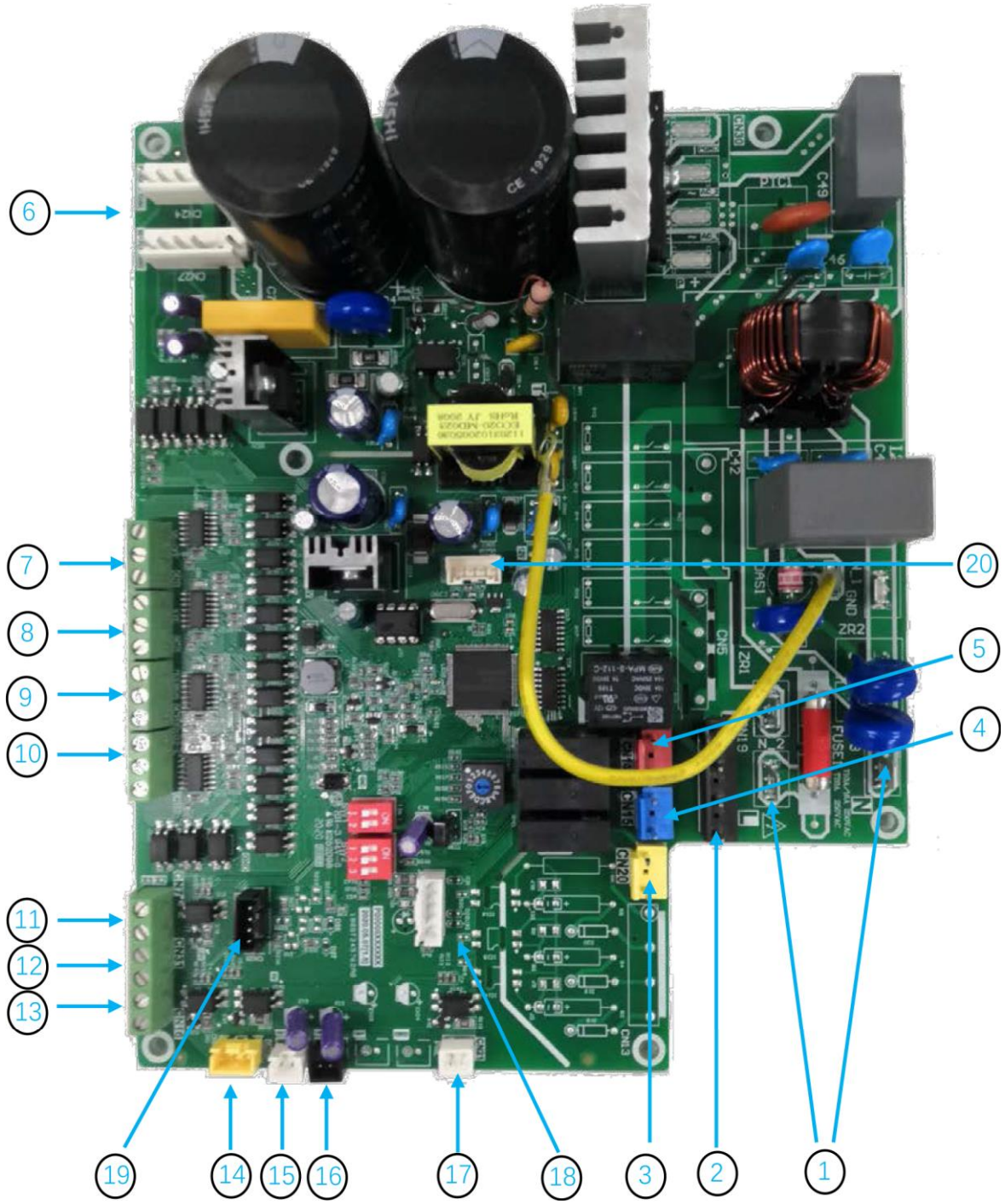
- **HRV-D1500(B)~HRV-D2000(B)**



6. Main PCB Description

6.1 Main PCB Ports

Figure 6.1: HRV-200(300,,400,500,800,1000,1500,2000)(B) Main PCB



Picture shows all the terminals. Some reserved terminal will not be existed when mass production. Reserved terminals are showing in following table.

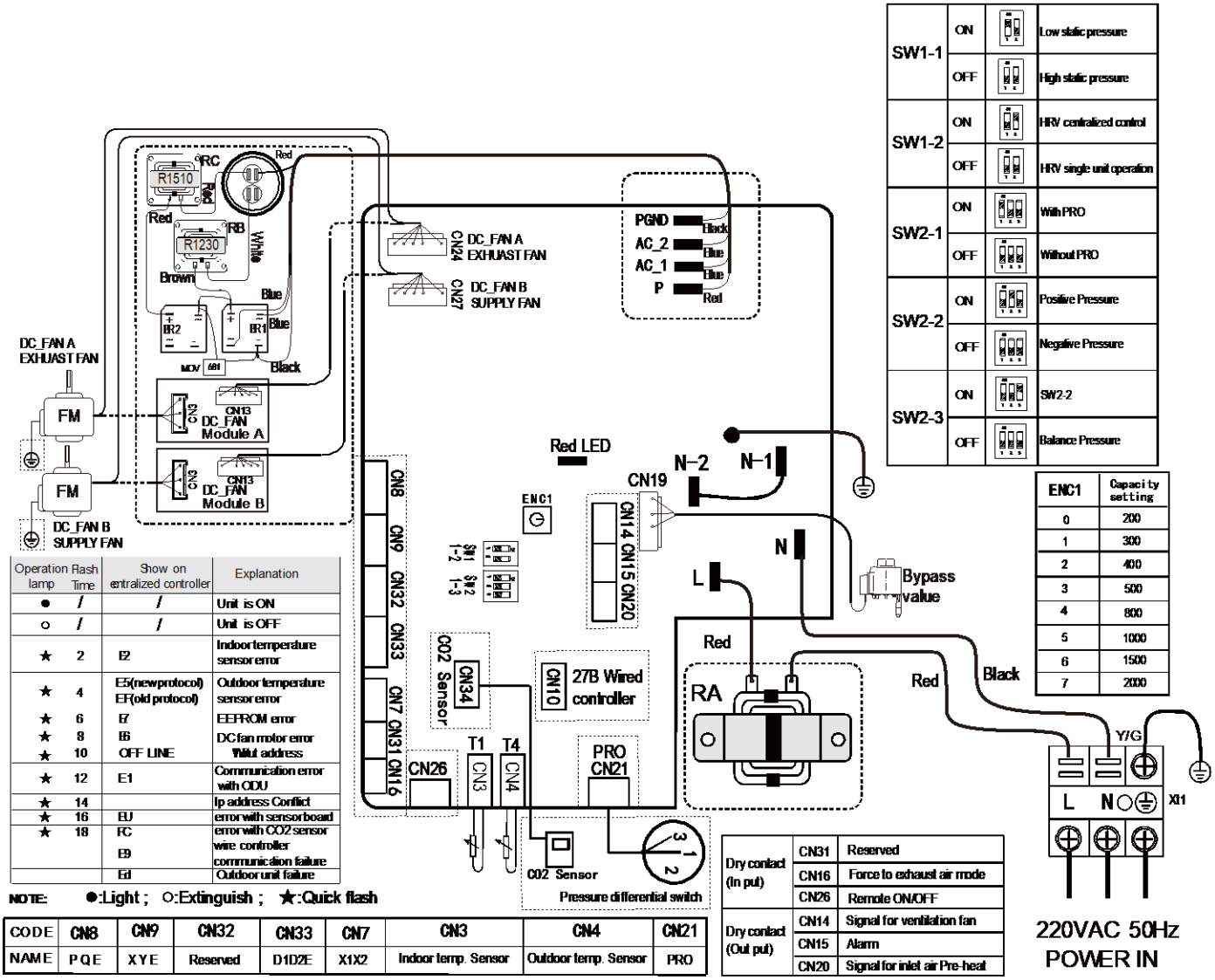
Table 6.1: HRV-200(300,400,500,800,1000,1500,2000)(B) Main PCB ports

Label in Figure 1.1	Code	Content	Port voltage
1	L,N	AC power input	220V AC
2	CN19	bypass port	220V AC
3	CN20	E-heat control	220V AC
4	CN15	Alarm	220V AC
5	CN14	Signal for ventilation fan	220V AC
6	CN24/CN27	DC fan	310 DC
7	CN8	P Q E communication port	2.5-2.7V DC
8	CN9	X Y E communication port (reserved)	2.5-2.7V DC
9	CN32	MODBUS communication port(reserved)	2.5-2.7V DC
10	CN33	D1 D2 E communication port	2.5-2.7V DC
11	CN7	X1 X2 communication port	18V DC
12	CN31	Inlet air pre-heat Signal	/
13	CN16	Force to exhaust air	/
14	CN26	ON/OFF	/
15	CN3	T1	5V DC
16	CN4	T4	5V DC
17	CN21	Pressure differential switch	/
18	CN10	27B Wired controller(reserved)	5V DC
19	CN28	CO_2 Sensor Box	5V DC
20	CN25	Program burning port	5V DC

Notes:

1. CN14: When the wire controller sets the ventilation fan ON, the port is closed, the external ventilation fan opens; When the wire controller sets the ventilation fan OFF, the port is open, the external ventilation fan close.
2. CN16: The dry contact port is open, HRV turn on negative pressure mode. When the dip switch mode is inconsistent with the dry contact mode, the dry contact mode will be on..
3. CN20, CN31: The dry contact port is open, HRV realize electrical auxiliary heat function. CN31 connects to third party signals.

7. Wiring Diagrams



8. Specifications

HRV-D200(B) / HRV-D300(B) / HRV-D400(B) / HRV-D500(B)

Sale Model			HRV-D200(B)	HRV-D300(B)	HRV-D400(B)	HRV-D500(B)
Power supply		Ph-V-Hz	1-phase, 220-240V~50Hz			
Input power (H/M/L)(standard G4)		W	70/45/25	100/55/35	110/70/40	150/95/50
Input power (H/M/L)(F7+M5)		W	80/40/25	100/55/35	110/70/40	150/95/50
Nominal Temperature Efficiency (standard G4) (H/M/L)		%	79.5/81.1/83.5	75.5/78.8/82.5	77.7/79.0/81.3	80.6/82.2/85.5
Nominal Enthalpy Efficiency (standard G4) (H/M/L)		%	75.0/77.5/79.6	72.1/75.0/79.3	73.5/75.3/78.0	74.0/76.6/80.5
Nominal Temperature Efficiency (F7+M5) (H/M/L)		%	81.8/85.4/87.5	80.4/81.8/83.5	79.2/81.1/83.3	77.2/79.4/82.5
Nominal Enthalpy Efficiency (F7+M5) (H/M/L)		%	81.2/83.1/85.0	79.4/81.2/84.0	79.6/81.8/84.2	72.3/75.6/78.6
Current		A	0.64	0.84	0.97	1.2
Indoor external static pressure(H speed+ standard G4)		Pa	100	90	100	90
Fresh air external static pressure (H speed +F7)		Pa	75	70	70	65
Discharge air external static pressure (H speed +M5)		Pa	100	110	110	110
Nominal air flow		m^3/h	200	300	400	500
Sound Pressure (H/M/L)		dB(A)	33/29.5/25.5	36.5/33.5/30	36.5/32/28	36/30.5/24.5
Sound Power		dB	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	53.6/63.5	59/75.5	71.5/91.5	74.4/98
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, Centralized controller, BMS gateway			
Fresh air	Fresh Air Diameter	mm	Φ144	Φ144	Φ198	Φ244
	Air drop	Pa	52	179	218	357

Notes:

1. For the units model of HRV-D200(B)~HRV-D500(B), there are 3-speed adjustable air-volume (Hi, Med, Low).
2. The parameters in the above table are measured at high speed.
3. Sound level is measured at 1.5m below the unit.

HRV-D800(B) / HRV-D1000(B) / HRV-D1500(B) / HRV-D2000(B)

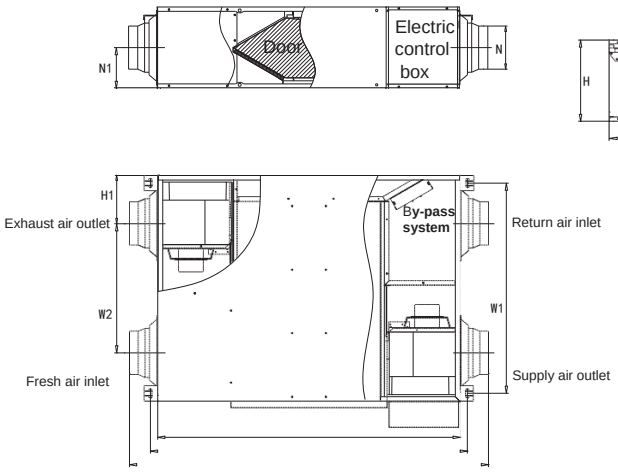
Sale Model			HRV-D800(B)	HRV-D1000(B)	HRV-D1500(B)	HRV-D2000(B)
Power supply		Ph-V-Hz	1-phase, 220-240V~50Hz			
Input power (H/M/L) (standard G4)		W	320/170/80	380/210/100	680/320/200	950/500/230
Input power(H/M/L) (F7+M5)		W	320/170/80	420/230/100	680/320/200	950/500/230
Nominal Temperature Efficiency (standard G4) (H/M/L)		%	78.7/82.1/86.8	82.8/84.0/87.4	75.5/78.6/80.2	77.2/79.5/83.4
Nominal Enthalpy Efficiency (standard G4) (L×W×H)		%	72.3/75.4/79.0	76.0/76.0/80.1	69.4/71.2/74.8	74.7/77.0/80.6
Nominal Temperature Efficiency (F7+M5) (H/M/L)		%	74.9/77.1/80.8	75.4/78.0/81.4	83.8/84.6/86.2	78.8/80.5/83.4
Nominal Enthalpy Efficiency (F7+M5) (L×W×H)		%	71.1/74.4/78.0	67.3/71.1/75.0	74.6/76.2/78.8	71.1/75.0/79.6
Current		A	2.4	2.9	3.8	5.7
Indoor external static pressure(H speed+ standard G4)		Pa	140	160	180	200
Fresh air external static pressure (H speed +F7)		Pa	100	110	150	160
Discharge air external static pressure (H speed +M5)		Pa	155	145	180	180
Nominal air flow		m^3/h	800	1000	1500	2000
Sound Pressure (H/M/L)		dB(A)	42/39/34	44/39/33.5	51.5/46.5/41.5	53/48.5/42.5
Sound Power		dB	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, Centralized controller, BMS gateway			
Fresh air	Fresh Air Diameter	mm	Φ244	Φ244	346×326	346×326
	Air drop	Pa	357	384	253	322

Notes:

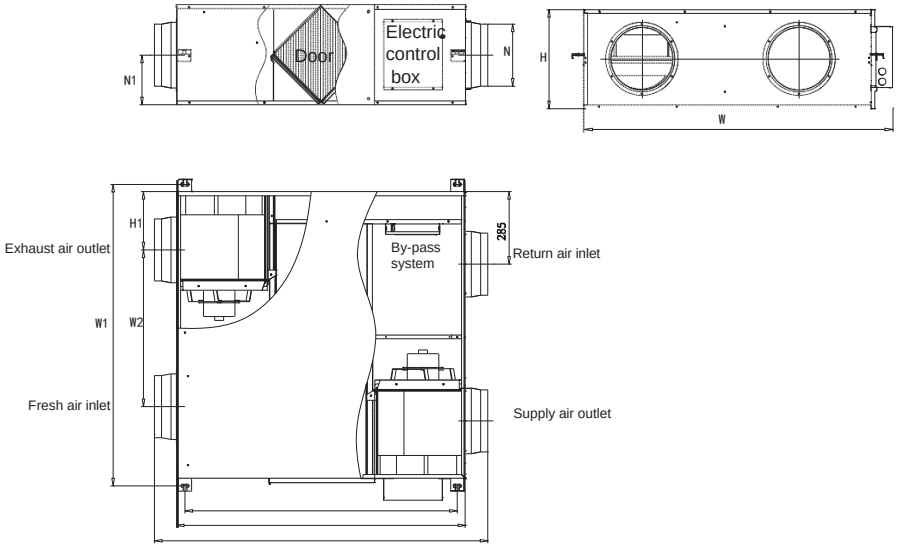
1. For the units model of HRV-D800(B)~HRV-D2000(B), there are 3-speed adjustable air-volume (Hi, Med, Low).
2. The parameters in the above table are measured at high speed.
3. Sound level is measured at 1.5m below the unit.

9. Dimensions

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

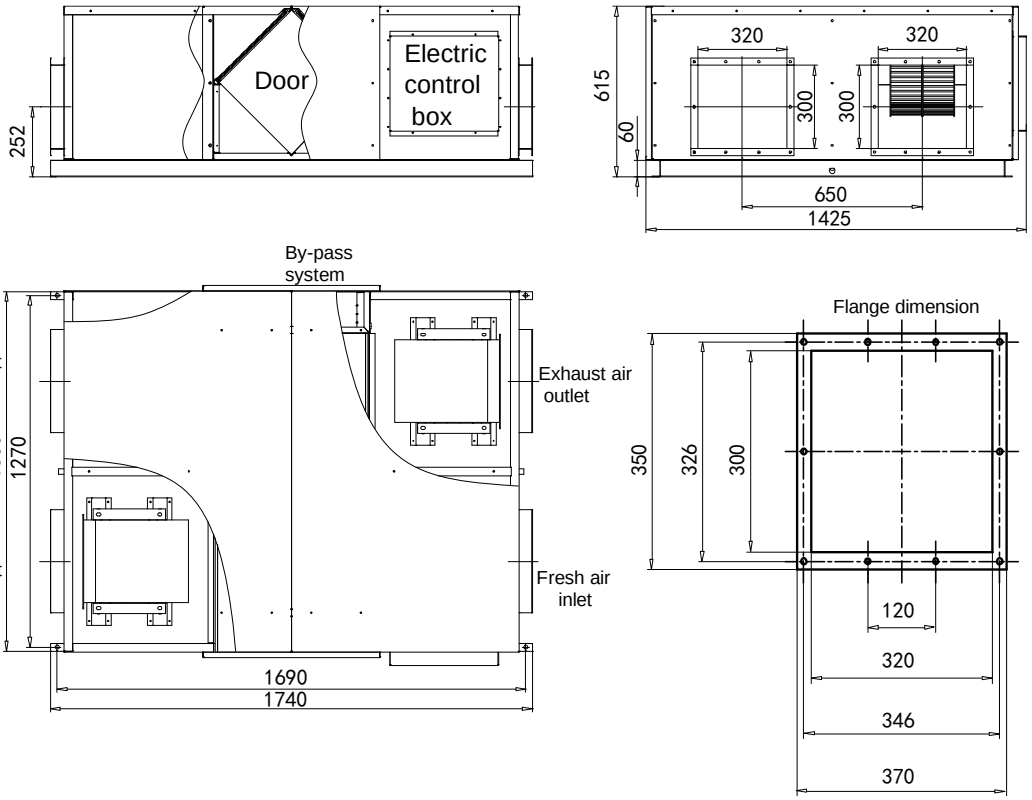


- **HRV-D500(B)~HRV-D1000(B)**

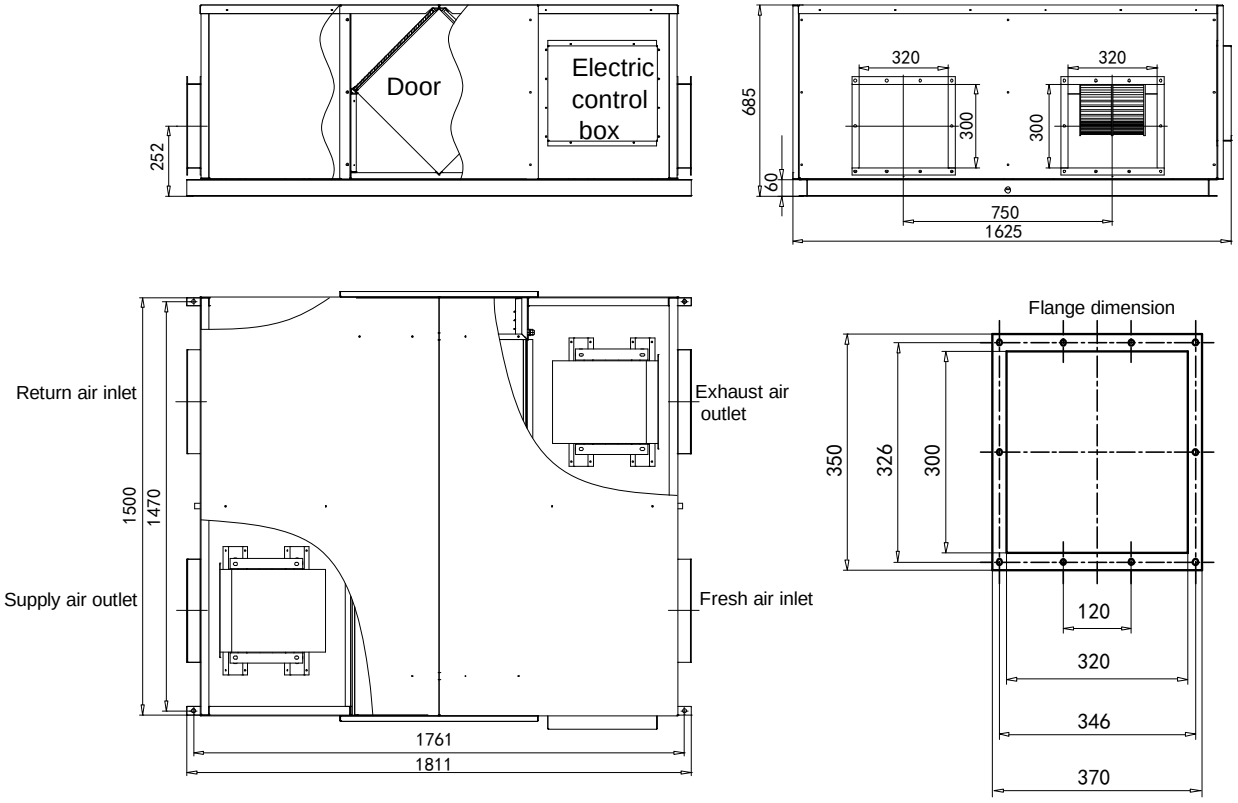


Model	L	L1	L2	W1	W2	W	H	H1	N	N1
HRV-D200(B)	1007	1054	1195	588	356	801	272	142	Φ144	136
HRV-D300(B)	1007	1054	1195	701	431	914	272	163	Φ144	136
HRV-D400(B)	1081	1129	1276	991	595	1204	272	202	Φ198	136
HRV-D500(B)	1071	1138	1311	1005	465	1106	390	227	Φ244	195
HRV-D800(B)	1071	1138	1311	1185	616	1286	390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

- **HRV-D1500(B)**

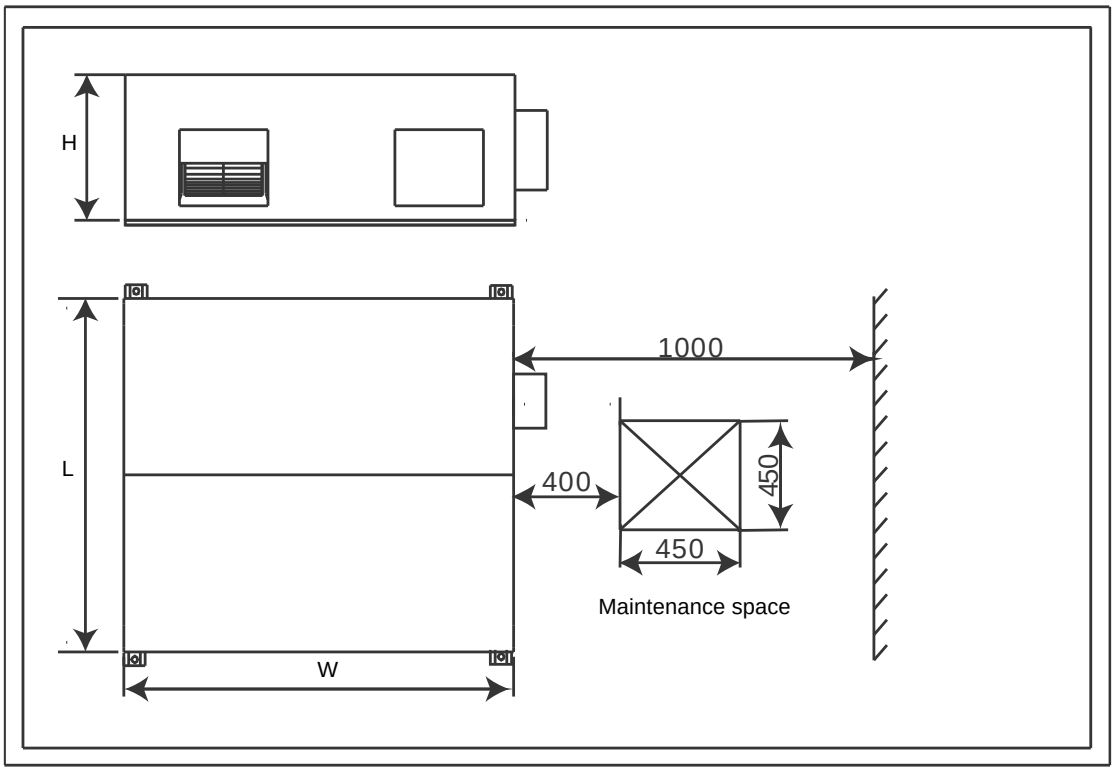


- **HRV-D2000(B)**



10. Maintenance Spaces

Unit:mm

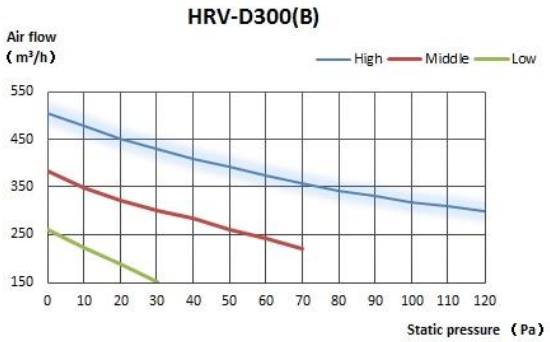


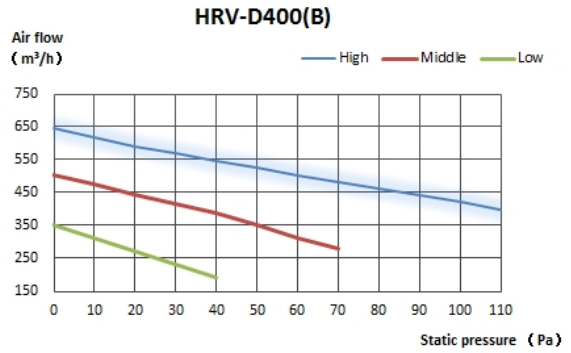
11. Fan Performance

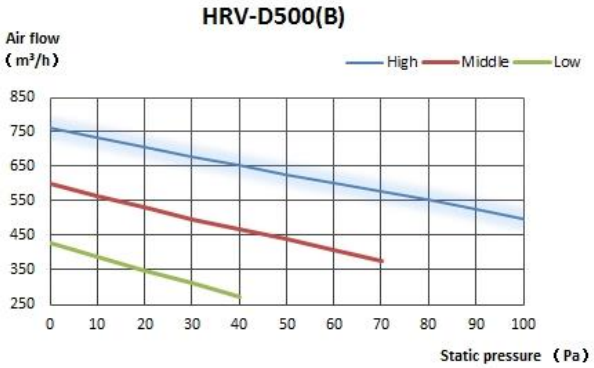
11.1 How to Read the Diagram

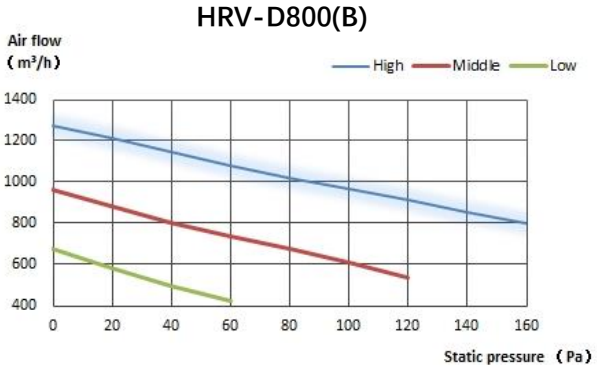
The horizontal axis is the Static Pressure (Pa) while the vertical axis represents the Air Flow (m^3/h). The characteristic curve for the “H” “M” and “L” fan speed control.

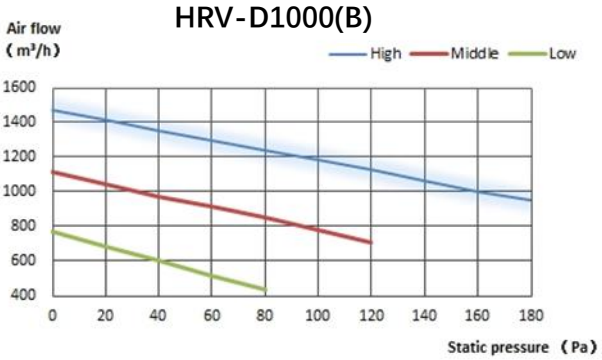
11.2 Fan Performance Diagram

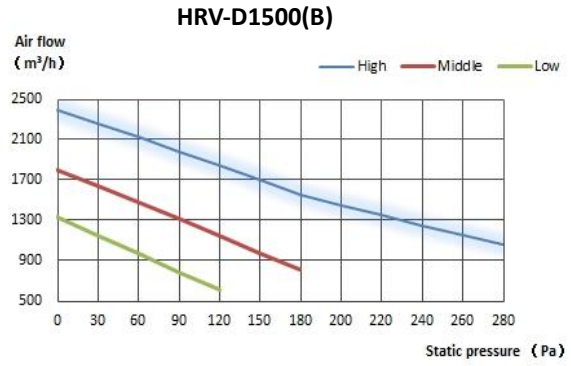


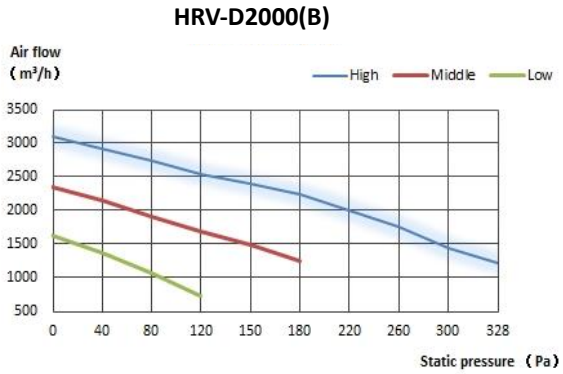






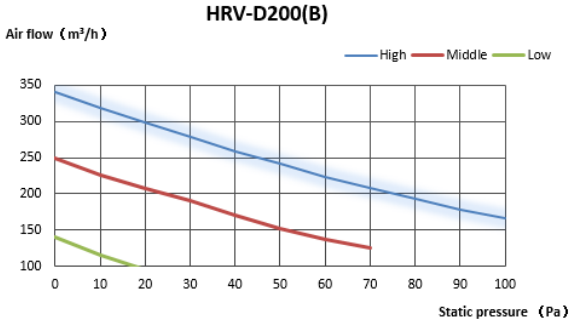




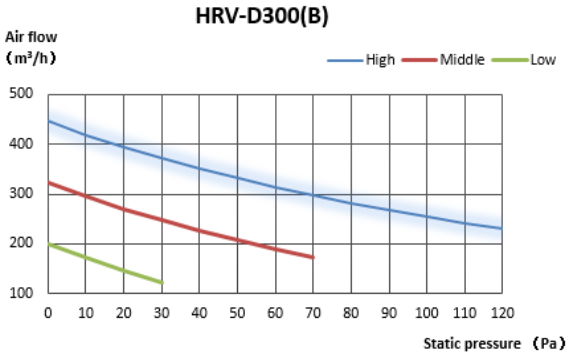


Notes: All the above fan performance diagrams are obtained under the condition of G4 filter.

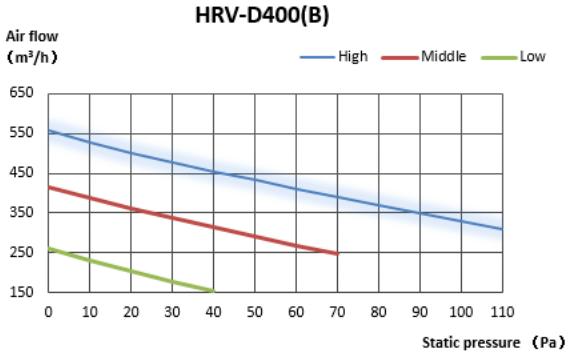
HRV-D200(B)



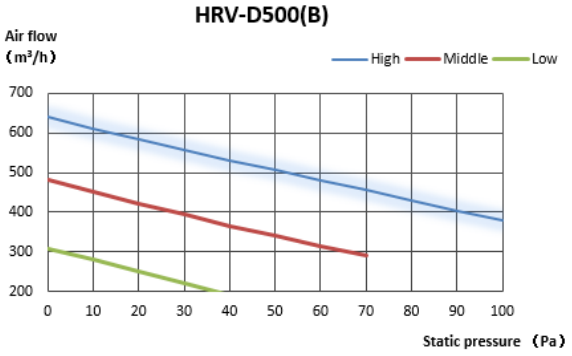
HRV-D300(B)



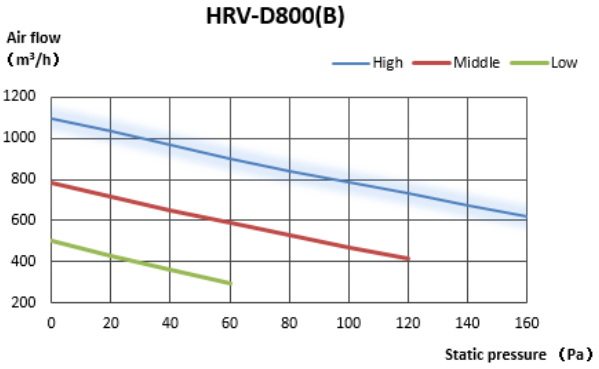
HRV-D400(B)



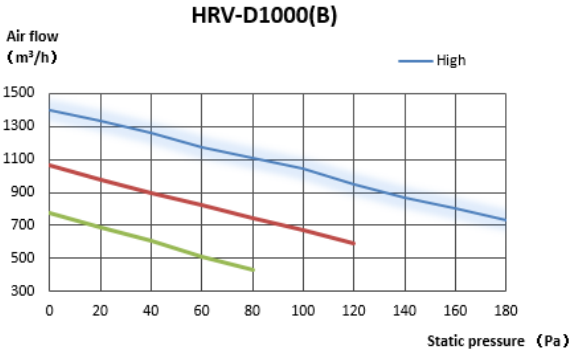
HRV-D500(B)



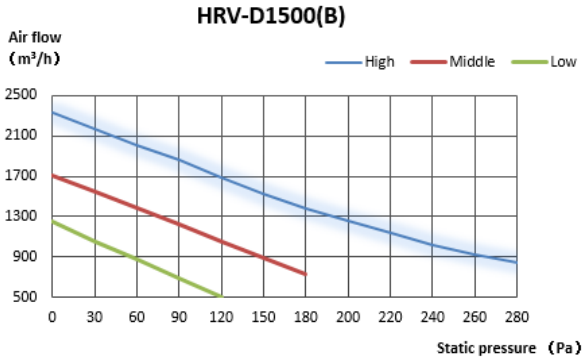
HRV-D800(B)



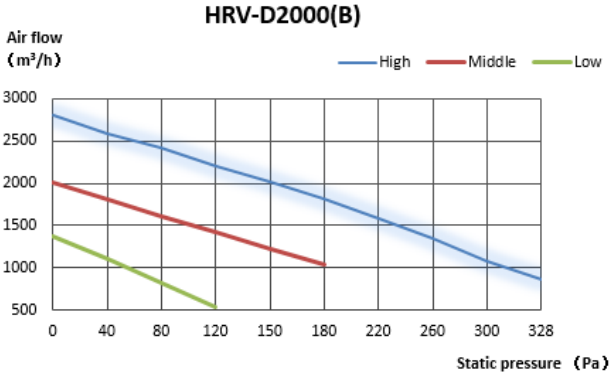
HRV-D1000(B)



HRV-D1500(B)



HRV-D2000(B)



Notes: All the above fan performance diagrams are obtained under the condition of F7+M5 filter.

12. Electrical Characteristics

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

Notes:
MCA: Min. Circuit Amps. (A)
MFA: Max. Fuse Amps. (A)

13. Operating Condition 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.

Notes: Protection or error may occur if the unit is operated beyond the above written operation limits

14. Installation

14.1 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. Use the hanger bracket to fix the machine, when opening the crate and moving it, do not lift it, do not hold on any other part (Especially the duct connecting flange).

Notes: Ensure that this manual can guide customers how to operate the equipment correctly (especially the air filter maintenance and operating procedures)., and allow customers to operate with the help of this manual.

14.2 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 with high temperature or open flame. It can result in fire or overheating.

b. HRV should not be installed in machinery factories or chemical plants that produce gases containing toxic or corrosive substances (such as acids, alkalis, organic solvents or other chemical substances harmful to the environment). Copper piping and brazed joins may corrode, causing refrigerant to leak or poisoning due to leaked gas

c. HRV should not be installed where flammable gases are likely to leak.

d. HRV should not be installed in places with high humidity such as toilets, which may cause electric leakage, electric shock or other failures.

e. HRV should not be installed near a machine that emits electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause equipment failure..

14.3 Preparations before Installation

1. Make sure that the position between the HRV and the suspension bolts.

Leave space for servicing the unit and include inspection hatches. (Make sure to open a hole on the side of the electrical parts box for easy inspection and maintenance of air filters, heat exchange elements, fans, etc.)

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

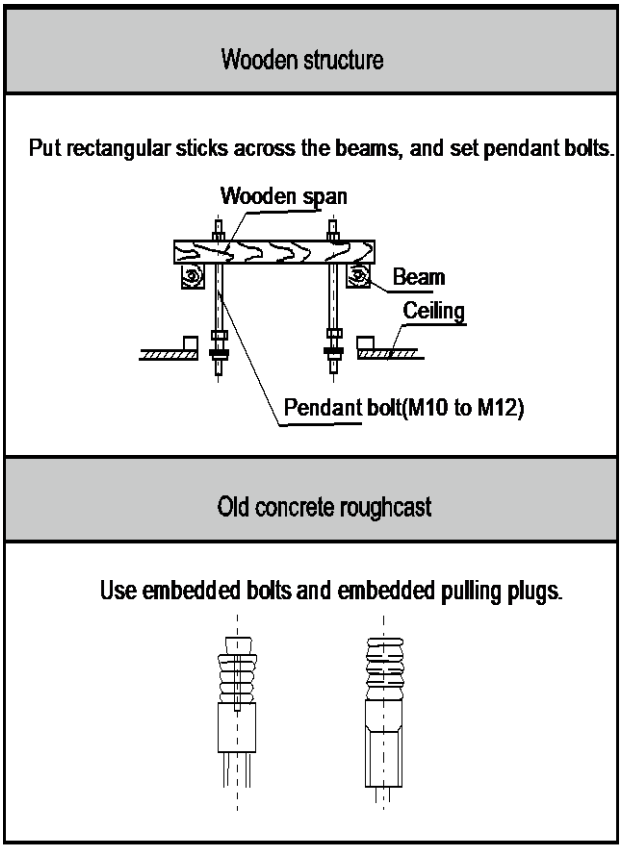
3. Open the installation hole (Pre-setting ceilings).

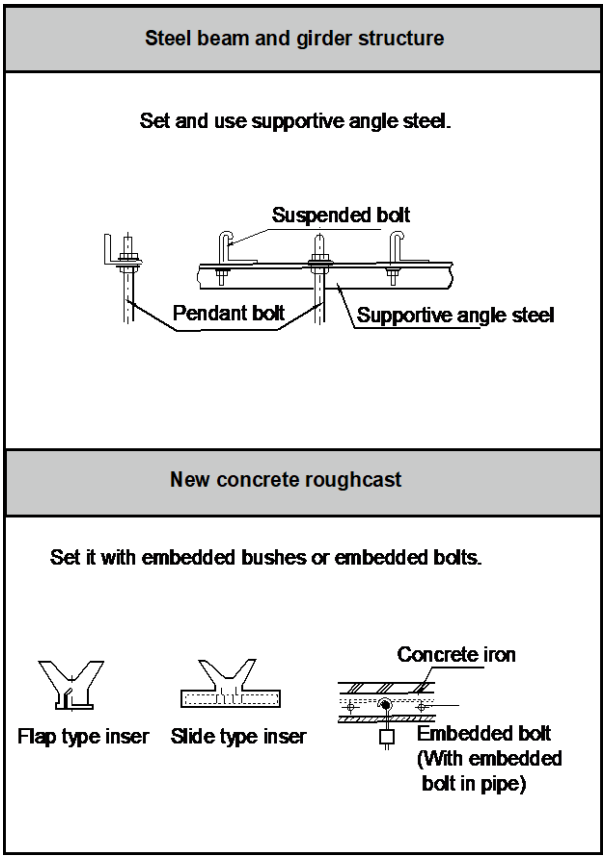
Once the installation hole is opened in the ceiling where the unit is to be installed, pass transmission wiring and remote controller wiring to the unit's wiring holes. After opening the ceiling hole, if necessary, make sure that the ceiling is level. It might be necessary to reinforce the ceiling frame to prevent shaking.

Please consult architect or carpenter if necessary.

4. Install the suspension bolts (Use M10 to M12 suspension bolts). For existing ceilings or other parts purchased on site, please use embedded anchors and sunken insert anchors to reinforce the ceiling to withstand the weight of HRV.

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





14.4 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. In addition, space for disassembly of the filter should be ensured.

3. The units should be installed firmly and will not be deformed by the weight of the condensate pipe and air duct. The air inlet/outlet and return should be connected with flexible tube.

4. Unit in DC 220-240V/50Hz reliable grounding; each one possesses of independent cut-off and protection device.

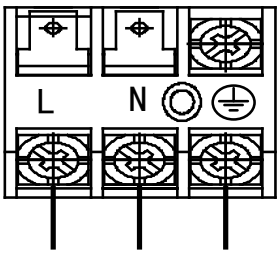
5. Make sure that there is sufficient maintenance space.

15. Wiring

15.1 Warning:

1. All the supplied parts, materials and electrical 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 electrical wiring works must be carried out by a professional technician and must comply with the labels in the circuit diagram.
5. Before the electrical connection works are carried out, please turn off the power to prevent electric shock.
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

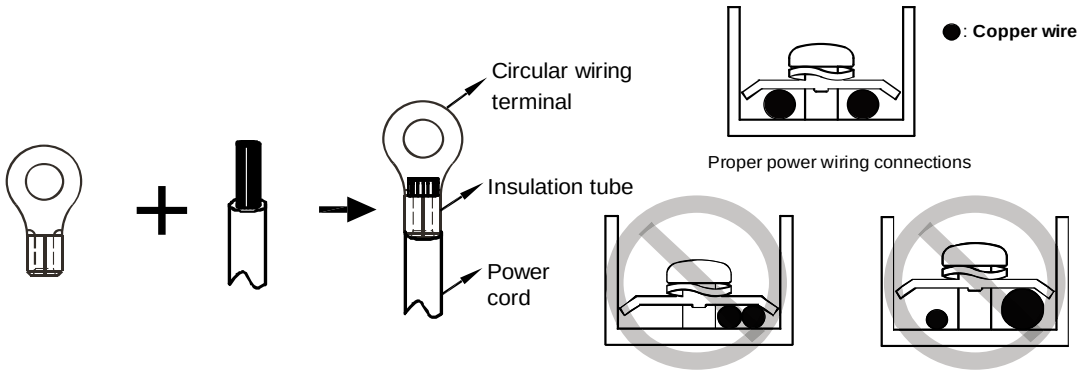


POWER INPUT

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:

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



15.2 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(B),300(B),400(B), 500(B), 800(B), 1000(B), 1500(B), 2000(B)	Single phase	220-240V~50Hz	15/30	3 (Earthing line should be used yellow/green 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	Capacity setting
0	200
1	300
2	400
3	500
4	800
5	1000
6	1500
7	2000

ENC1 (Setting for Capacity)

SW1-1	ON		Low static pressure
	OFF		Hige static pressure
SW1-2	ON		HRV centralized control
	OFF		HRV single unit operation
SW2-1	ON		With PRO
	OFF		Without PRO
SW2-2	ON		Positive Pressure
	OFF		Negative Pressure
SW2-3	ON		SW2-2
	OFF		Balance Pressure

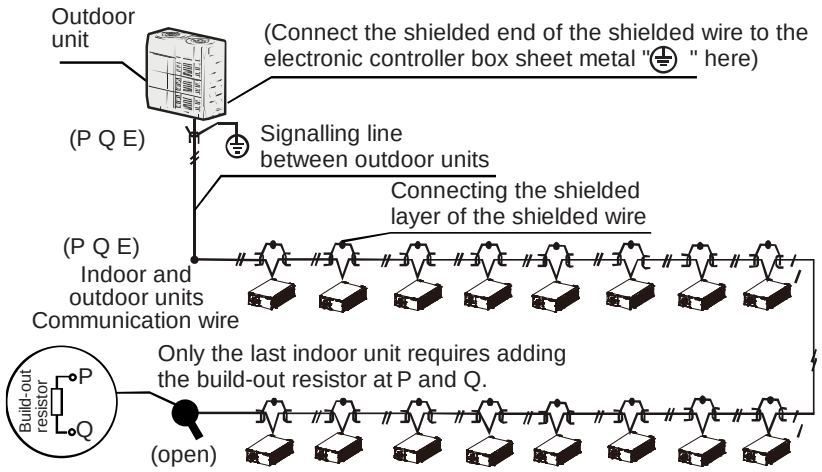
SW1 setting for static pressure

Notes:

1. PRO means that differential pressure sensor. Connect the differential pressure sensor, dip switch to on, the wired controller WDC-120G/WK is equipped with a differential pressure sensor.
2. Balance Pressure means that fresh air and exhaust air speed are the same. Positive Pressure means that fresh air speed is higher than exhaust air speed. Negative Pressure means that fresh air speed is lower than exhaust air speed. Different pressure modes are aimed at different application.
3. High static pressure settings are already configured in factory, when the actual demand is 20pa lower than the static pressure on the nameplate, low static pressure can be selected.

15.3 Communication wiring between the indoor and outdoor units

- The HRV and outdoor units communicate via the RS485 serial port.
- The communication wiring between the HRV and outdoor units should be connected one unit after another in a daisy chain from the outdoor unit to the final HRV unit. And the shielded layer must be properly grounded, and a build-out resistor must be added to the last HRV unit to enhance the stability of the communication system.
- Incorrect wiring such as a star connection or a closed ring will cause instability of the communication system and system control anomalies.
- Use a three core shielded wire (greater than or equal to 0.75 mm^2) for the communication wiring between the indoor and outdoor units. Make sure the wiring is connected correctly. The connecting lead for this communication wire must come from the master outdoor unit.
- All shielded wiring in the network are interconnected, and will eventually be grounded at the same point "⏚ ".

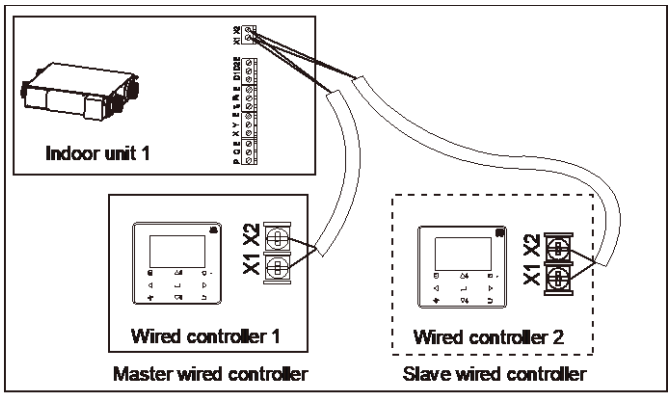


15.4 Communication wiring between the indoor unit and wired controller

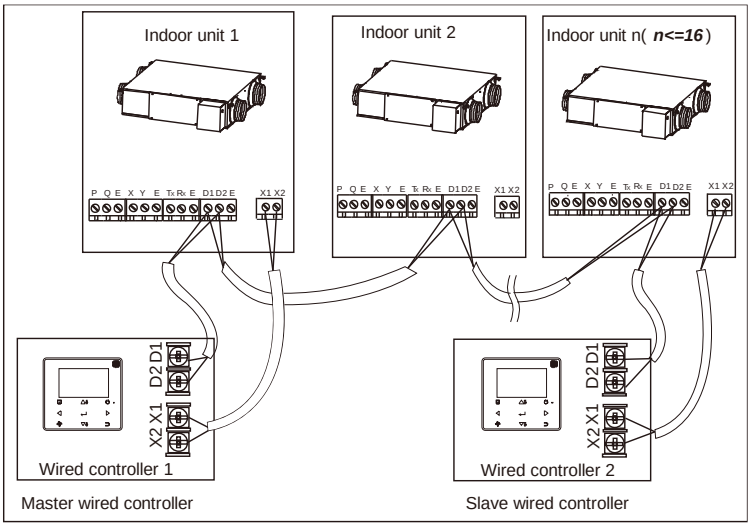
The wired controller and the indoor unit can be connected in different manners, depending on the forms of communication.

1. For a bidirectional communication mode:

- Use 1 wired controller to control 1 indoor unit or 2 wired controllers (one master and one slave controller) to control 1 indoor unit.



- Use 1 wired controller to control multiple indoor units or 2 wired controllers (one master and one slave controller) to control multiple indoor units. The maximum number of connections is 16.



2. For single direction communication mode:

- Use 1 wired controller to control 1 indoor unit
- The X1/X2, D1/D2 ports on the sides of the main control board and single direction communication port are for different types of wired controllers.
- For the specific connection method, refer to the instructions in the corresponding wired controller manual to carry out the wiring and connections.

15.5 Communication wiring between the indoor unit and wired controller

- Once the wiring and connections are done, use tie straps to secure the wiring properly so that the connection joint cannot be pulled apart by external force. The connection wiring must be straight out so that the cover of the electrical box is level and can be closed tightly.
- Use professional insulation and sealing materials to seal and protect the perforated wires. Poor sealing may lead to condensation, and entry of small animals and insects that may cause short circuits in parts of the electrical system, causing the system to fail.

Caution:

- Never turn screws too tightly, or else the cover would be dented or the Liquid Crystal breaks.
- Please leave sufficient space for maintenance and service of wired controller.
- Wired controller should be purchased separately.
- Please follow the installation and owner's manual of wired controller.

16. Trial Run

16.1 Pay attention to the following items before operation

1. Before start-up, please clean up the duct and check whether all air valves and devices are normal.
2. Carefully adjust the system air valves when start-up; control the current of motor in rated range.
3. Three-phase model is without the by-pass function, therefore the fan would start-up with 30 seconds after starting.
4. Connect the wired controller. Wired controller should be installed according to wired controller manual and installation manual.(Attached in the package)

16.2 Pay attention to the following points before trial run:

1. The unit is installed correctly.
2. Ducting and wiring are completed correctly.
3. The drainage is smooth.
4. The heating insulation works well.
5. The ground wiring is connected correctly.
6. The power supply voltage fits the rated voltage of the HRV.
7. There is no obstacle at the outlet and inlet of the HRV.

16.3 Control the HRV by wired controller; operate it according to the wired controller manual

Check the following points while controlling:

1. Whether the switch on the remote controller works well.
2. Whether the room temperature is adjusted well.
3. Whether the indicator lights normally.
4. Whether there is vibration or abnormal noise during operation.

17. Troubleshooting

17.1 LED2 Explanations:

Number	LED2	Flashing Times	Explanation	Display Content	Description
1	●	/	ON	/	Unit is ON
2	○	/	OFF	/	Unit is OFF
3	★2	2	Indoor temperature Sensor(T1)	E2	
4	★4	4	Outdoor temperature Sensor(T4)	E5	Fault of outdoor temperature Sensor(T4) , the old protocol shows that EF is not E5, and the new protocol shows E5;
5	★6	6	EEPROM error	E7	
6	★8	8	DC Fan motor error	E6	
7	★10	10	Without address	OFF LINE	
8	★12	12	Communication error with ODU	E1	
9	★14	14	IP address Conflict		The same address is set when connecting to multiple IDU.
10	★16	16	Error with sensor board	EU	Only valid when CO_2 sensor is selected
11	★18	18	Error with CO_2 sensor	FC	Only valid when CO_2 sensor is selected, The wired controller displays CO_2 concentration and the area displays CO_2 --PPM
12			Wire controller communication failure		The wired controller displays E9 fault code
13			Outdoor unit failure		The wired controller displays Ed fault code

（Priority of failure：E1->E2->E5->E6->E7->Ed->EU->FC，Decrease from left to right）

●：Light；

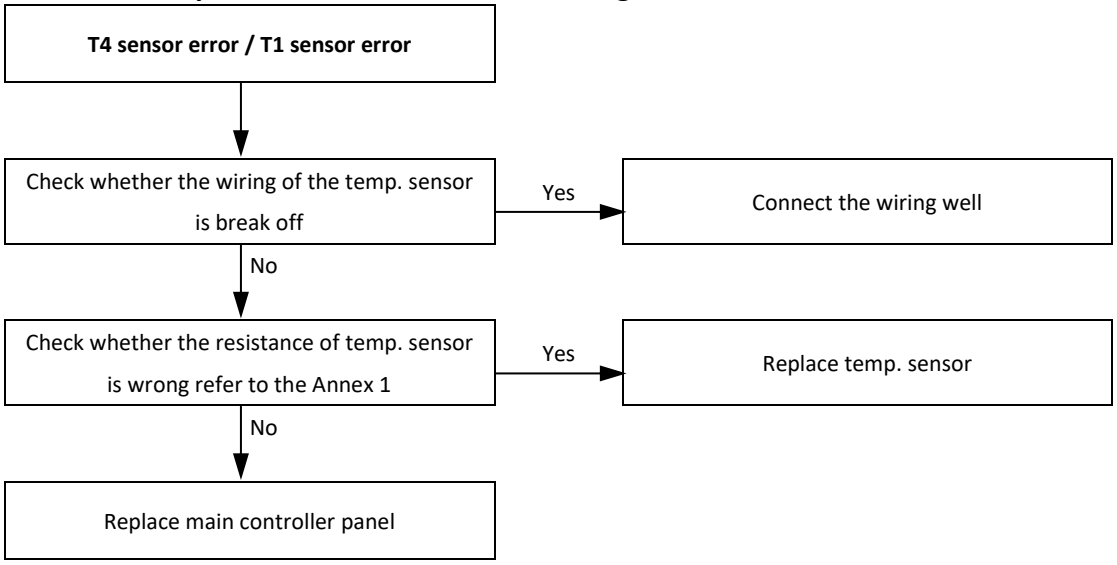
○：Extinguish；

☆：Slow Flash（1 time/s）；

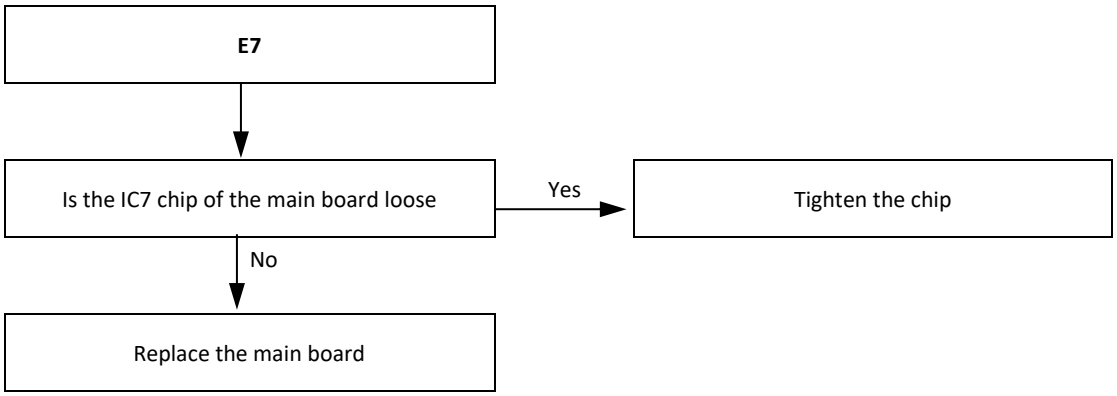
★：Quick Flash（2 times/s）；

Each fault flashes at an interval of 3 seconds.

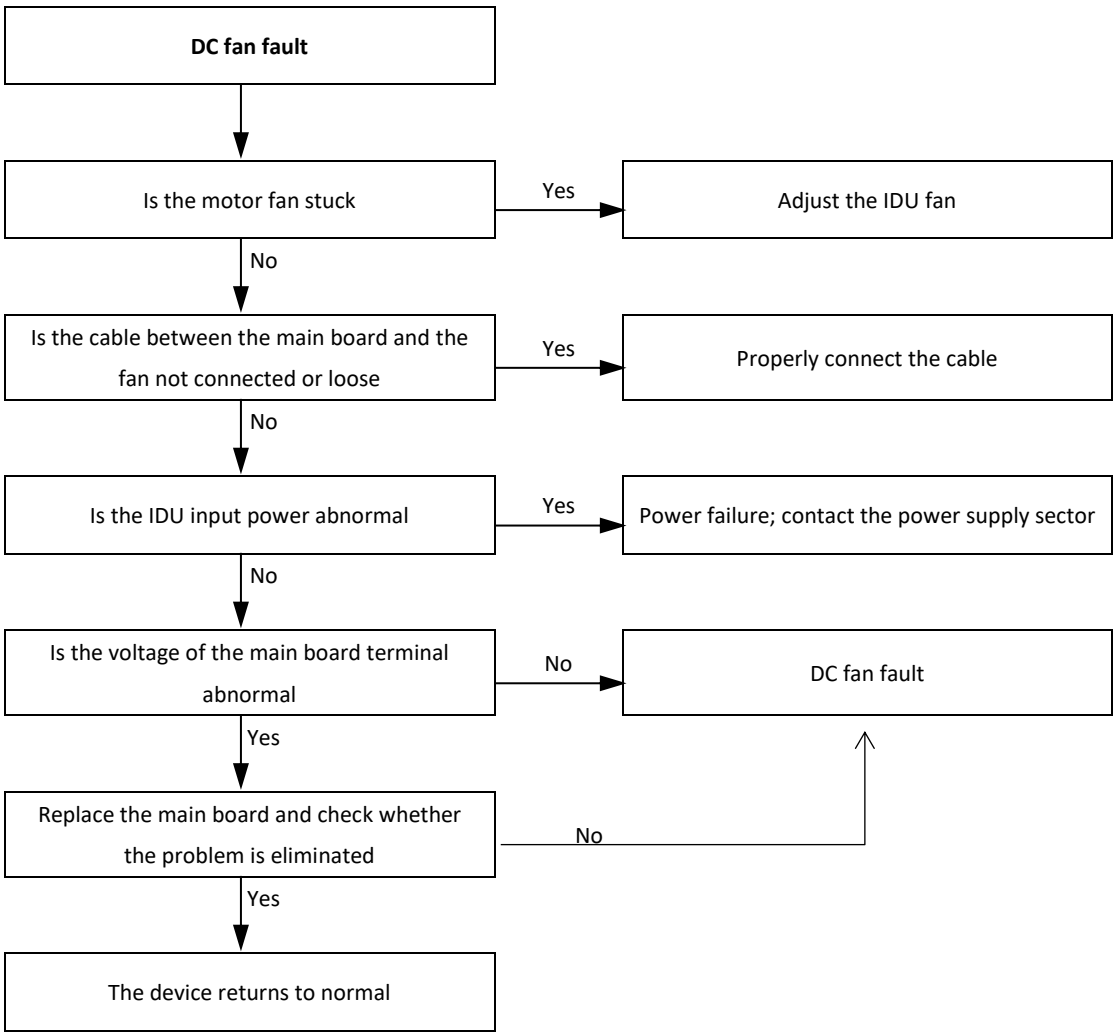
17.2 E2/E5/EF:T4/T1 Temperature Sensor Troubleshooting



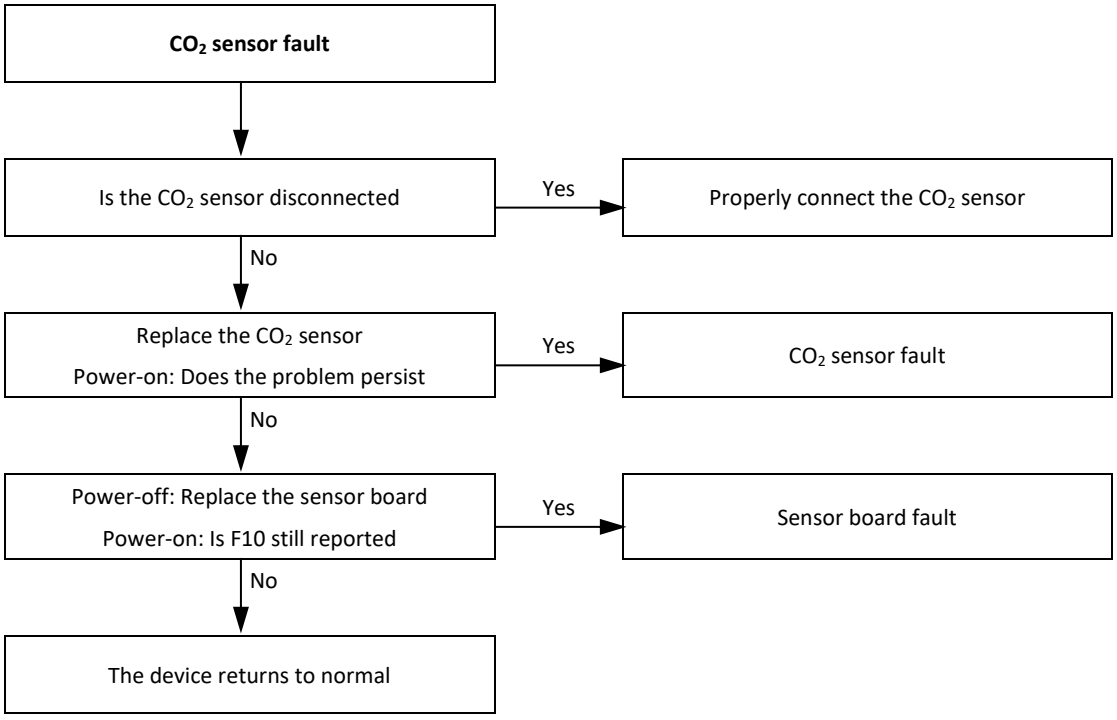
17.3 E7: EEPROM fault



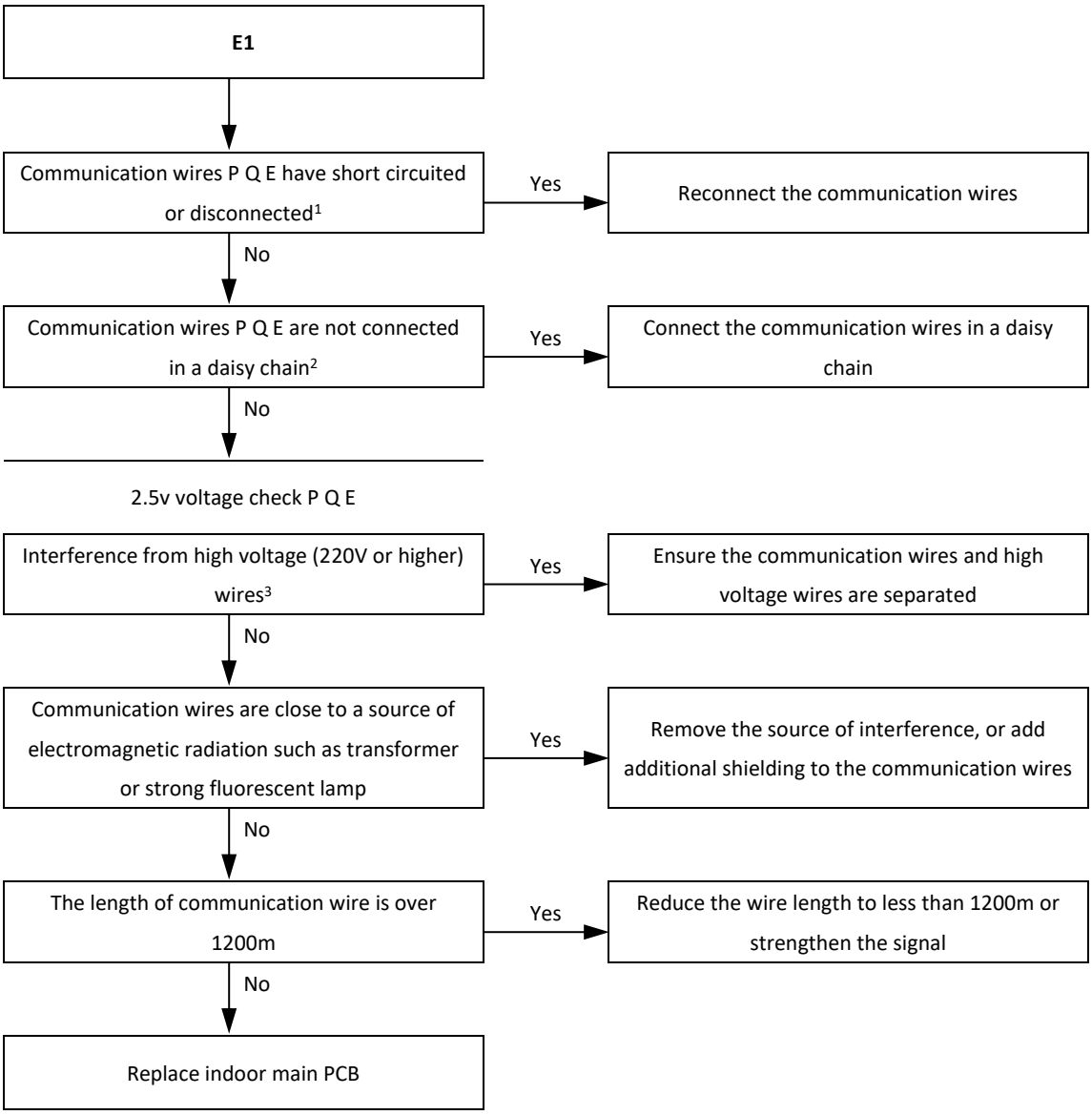
17.4 E6: DC fan fault



17.5 EU/FC: CO_2 sensor concentration display error



17.6 E1: ODU communication failure

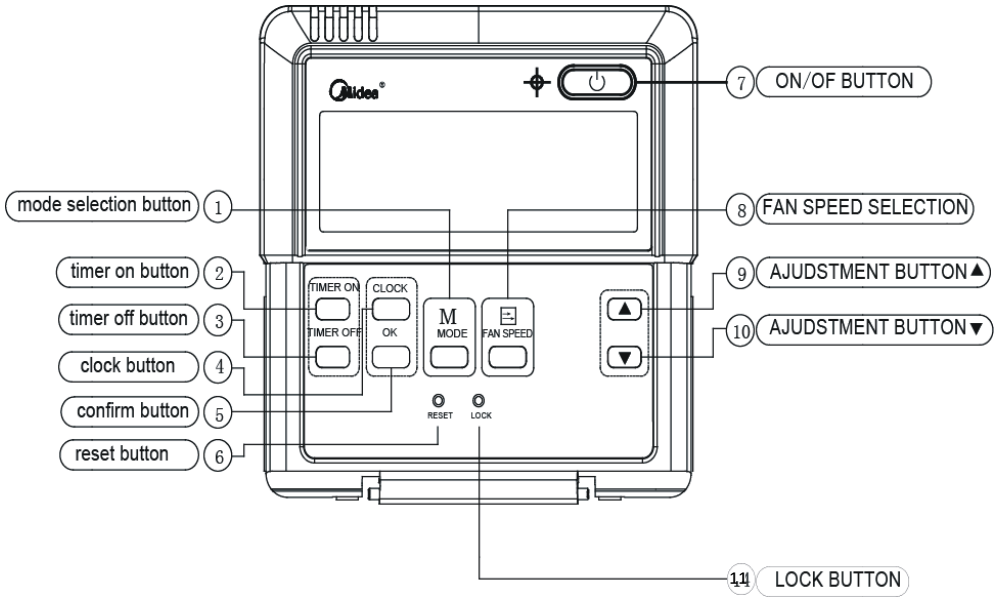


18. Maintenance

1. During early use, the operation of the fan should be checked 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 it’s in well shape and balance.

19. Controller

19.1 Wired controller KJR-27B/E (Optional 1)



The basic operation conditions of wired controller are as follows:

1. The range of power supply voltage: the voltage input is 5V DC.
2. Ambient temperature 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.

19.1.1 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

Notes:

1. AUTO mode: The controller chooses heat exchange mode or bypass mode according to the temperature difference between outdoors and indoors. Both fans are set to run at low speed.

2. Heat exchange mode: The flows of incoming and outgoing air pass close to each other, allowing heat transfer between the two channels. During summer, incoming air is cooled by the indoor air being exhausted and in winter, incoming air is warmed.

3. Bypass mode: In mild climates or seasons, where temperature and humidity differences between indoors and outdoors are small, the HRV can work as a conventional ventilation fan. In standard bypass mode the supply and exhaust fans run at the same speed.

2 Timer on button:

Push the button to set TIMER ON, each time you push the button the time moves forward by 0.5 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):

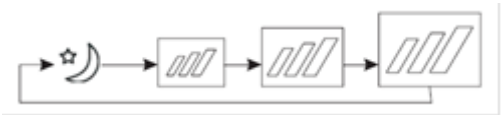
Use a small stick with a diameter of 1mm to push the RESET button to cancel the current settings and get into the condition of resetting.

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.

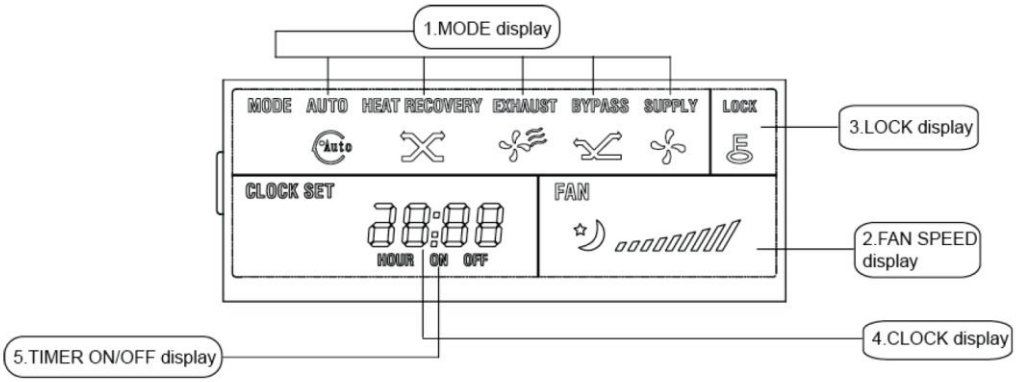
10 Adjustment button:

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.

19.1.2 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.

19.1.3 Address Query and Setting

1. Hold button LOCK for 5 seconds to enter the internal address setting interface; hold button LOCK again for 5 seconds to exit.
2. Query and set the address in the address setting interface.
3. Address query

Press MODE button to send inquiry code

Inquiry code form: L,H,H',O,O',P,P', S, L,H,H',O,O',P,P'

H—B5H

O—F5H

P—FFH

4. Address setting

Press FAN SPEED to send the setting code

Press Up or Down to adjust the address

Setting code form: L,H,H',O,O',P,P', S, L,H,H',O,O',P,P'

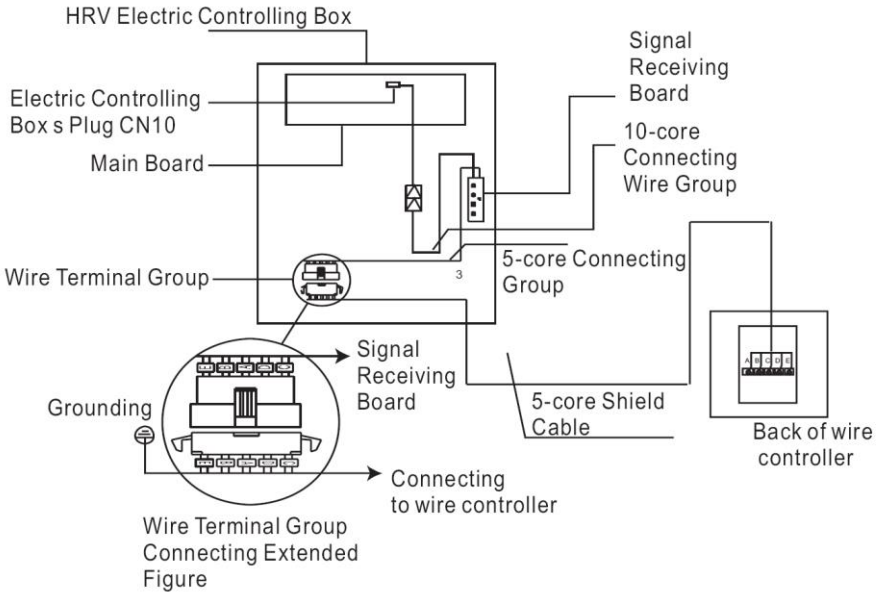
H—B5H

O—F5H

P—Address(00-63)

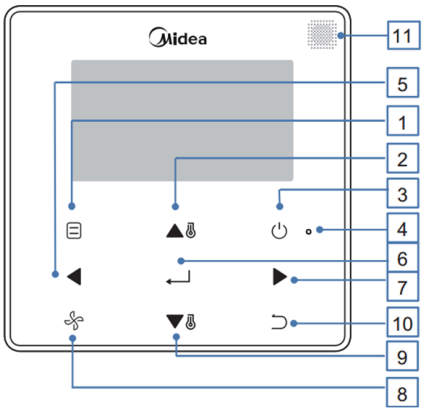
19.1.4 Installation

Connection method and the principle diagram show as follow:



19.2 Wired controller WDC-120G/WK(A) (Optional 2)

19.2.1 Name and functions of buttons on wired controller



NO	Button	Description
1	Mode	Selects the running mode
2	Temp UP button	Increases the set temperature
3	ON/OFF button	Turns ON/OFF the IDU
4	LED (Green)	Stays solid green when the unit is powered ON and blinks if there is a fault
5	Left button	Selects options to the left
6	MENU/OK button	Enters the menu/sub-menu ; Confirms selection
7	Right Button	Selects options to the right
8	Fan	Selects the Fan speed
9	TEMP DOWN button	Reduces the set temperature
10	BACK button	Returns to the previous level; press this button for 3 seconds to Lock/Unlock
11	Remote Controller Signal receiving window	Receives the remote controller control signal

1 Setting the MODE:

It is used to select mode, push the button one time, then the operation modes will change in turn as follows:

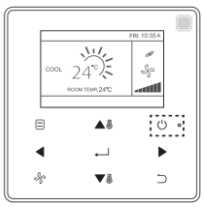
AUTO→HEAT EXCHANGE→BYPASS→FREE COOL

2 Setting the Temperature:

Press TEMP UP ▲🌡 or TEMP DOWN ▼🌡 to adjust the temperature.

3 ON/OFF:

Press ON/OFF ⏻ to turn the IDU ON/OFF. The LED is lit when the unit is turned ON as shown in the picture below:



4 Fan speed selection button (FAN SPEED)

Press FAN to set the fan speed circulation as shown in the picture below:

5 Key lock:

Press the BACK button for 3 seconds while the backlight is illuminated. The icon is displayed. All the buttons are disabled. Use the button now and the icon will flicker 3 times to prompt.

To cancel the key lock mode, hold BACK for 3 seconds while the backlight is already illuminated

6 Reset Filter Indicator:

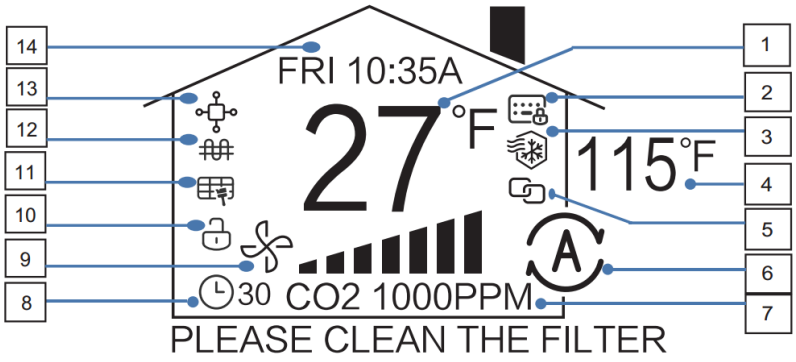
When it is to clean or replace the filter, the filter indicator will be displayed. Hold the fan speed button and Left

at the same time for 1 second to clear the icon display.

7 Quick Reference Menu:

Press the Menu/OK button to enter the Quick reference menu. Press TEMP UP and TEMP DOWN to select and item. Press MENU/OK to enter. On the last level of the menu, press MENU/OK to confirm and return to the homepage. Press BACK to confirm and return to the previous level. If a button on the Menu interface is not pressed within 30 seconds, the system will return to the homepage. This menu provides the basic functions which can be operated by the end customer while operating the indoor unit.

19.2.2 Name and functions of LCD on wired controller



NO	Description	Implication
1	Set Temperature	Displays the set indoor temperature
2	Central Controller / IMMPRO Locking Icon	Turns ON when the central controller/IMMPRO locks the IDU functions and the wired controller cannot use the corresponding functions of the IDU
3	Cold Draft Prevention	In heating mode the fan does not run when the indoor unit heat exchanger temperature is equal to or lower than the setting temperature
4	Outdoor temperature	Displays the current outdoor temperature
5	Interlock Function	When the HRV is connected via PQE with AC system, HRV can be on/off automatically based on IDU running status
6	Mode display	Displays the running mode set by the wired controller
7	CO2 concentration display	Displays the CO2 CONCENTRATION
8	Extension or Timer Icon	Turns ON when the EXTENSION or Timer is enabled on the wired controller
9	Fan Speed display	Displays the fan speed set by the wired controller
10	Function and key locking icon	Turns on when the wired controller locks the on/off function, mode, schedule, temperature setting or engages the button lock
11	Filter Indicator	The following icon will light up if the pressure difference switch detects that the pressure is not proper
12	E- Heat Icon	Turns On when the E-heat is on
13	Secondary Wired Controller icon	This icon will be displayed when the wired controller is set as a secondary wired controller
14	Time Display	Displays the time

Notes:

1. The HRV unit is not equipped with controller as standard, please purchase controller separately.
2. The standard functions can be controlled by wired controller KJR-27B/E.
3. The CO2 sensor function, the differential pressure sensor function, group control function, week timer function, interlock function, delayed power-off function and parameter setting and query function should be customized; these functions are possible in wired controller WDC-120G/WK.
4. The HRV can be centralized control with VRF system through centralized controller CCM-180A/WS(A) and CCM-270B/WS(A).
5. The HRV can be achieved network control with VRF system through BMS gateway GW-MOD(A) and IMMP-BAC (IMMPRO Only).

20. Accessories

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

Notes: Wired Controller KJR-27B/E and WDC-120G/WK are optional. KJR-27B/E and WDC-120G/WK must 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 (Only required for Model 1500 and 2000)
Damper	For vibration damping while lifting the unit

21. Appendix

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

Temp.℃	Resistance KΩ		Temp.℃	Resistance KΩ		Temp.℃	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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