EN

# USER'S MANUAL

## ENERGY RECOVERY VENTILATION SYSTEM

MODELS:

CH-HRV1.5KDC
CH-HRV2.5KDC
CH-HRV3.5KDC
CH-HRV5KDC
CH-HRV6.5KDC
CH-HRV8KDC
CH-HRV10KDC
CH-HRV15KDC
CH-HRV20KDC

**Attention**
For proper operation, please read and keep this manual carefully
Designed by Cooper&Hunter International Corporation, Oregon, USA

www.cooperandhunter.com

# Contents

# Safety Considerations

Please read the following safety instructions before installation. And ensure that the unit is installed correctly.
Please observe all instruction in order to avoid any injury or damage to equipment or property.

| Safety attentions | | | |
|---|---|---|---|
| The following symbols indicate potential levels of caution. | | | |
| Warning | Situations with a risk or death or serious injure. | Attention | Situations with a risk of injury or equipment/property damage. |
| The following symbols indicate compliance which must be observed | | | |
| | Not allowed or Stop | | Must follow or obliged |

| Warning | | | |
|---|---|---|---|
| | Installation to be carried out by qualified person, End Users must not install, move or re-install this equipment by themselves | | An anti-bird net or similar device should be installed to outside vents. Ensure there are no obstructions to or in the ducts |
| | Installation engineers must follow this manual strictly. Improper action can create a health hazard and reduce efficiency of the unit | | Fresh air vent must be far enough away from any flue gas discharge or areas where hazardous vapors are present |
| | Unit must be installed strictly following this manual and mounted to a weight bearing surface for the weight of the unit | | Electric engineering must follow national regulations and the manual, use special cables. Less capacity cables and improper engineering can cause electric shock or fire. |
| | During maintenance or repair, the unit and circuit breaker must be switched off. Otherwise electric shock could occur. | | Ground wire cannot be connected to gas pipe, water pipe, lighting rod or telephone line etc. Incorrect grounding can cause electric shock. |
| **Attention** | | | |
| | Power cable and wires must be installed by a qualified electrical engineer. Improper connection can cause over heating. Fire and loss of efficiency. | | To avoid condensation, insulation should be fitted to fresh air ducts. Other ducting may also require insulation depending on dew point conditions. |
| | Insulation between the metal ducting and wall penetration must be installed if the ducting penetrates metal wall cladding, to avoid risk of electric shock or current leakage. | | The cover of wiring box must be pressed down and closed to avoid dust and dirt entering. Excess dust and dirt can cause overheating of terminals and result in fire or electric shock. |
| | Use only approved installation hardware and accessories. Failure to observe can result in fire risk, electric shock and equipment failure | | Where the unit is positioned, at high level in a hot humid situation. Please ensure sufficient ventilation is available |
| | The outdoor ducts must be installed facing downwards to avoid rain water entering. Improper installation can cause water leakage. | | Correctly sized MCB must be fitted to the unit suitable earth leakage protection should also be installed to avoid risk of electric shock or fire. |

## Safety Considerations

| Attention | | | |
|---|---|---|---|
| | Do not install the unit in an extremely humid conditions, as it may result in electric shock and pose a fire risk. | | Do not use the units as the primary kitchen extract grease and fatty deposits can block the heat exchanger, filter and pose a fire risk. |
| | Don not install the unit in areas there any poisonous or caustic gases are present. | | Do not install the unit near open flame as it may result in over heating and pose a fire risk |
| | Acidic or alkali environments can cause poisoning or a fire | | Rated supply voltage must be maintained, otherwise this may cause fire. |

# Specifications

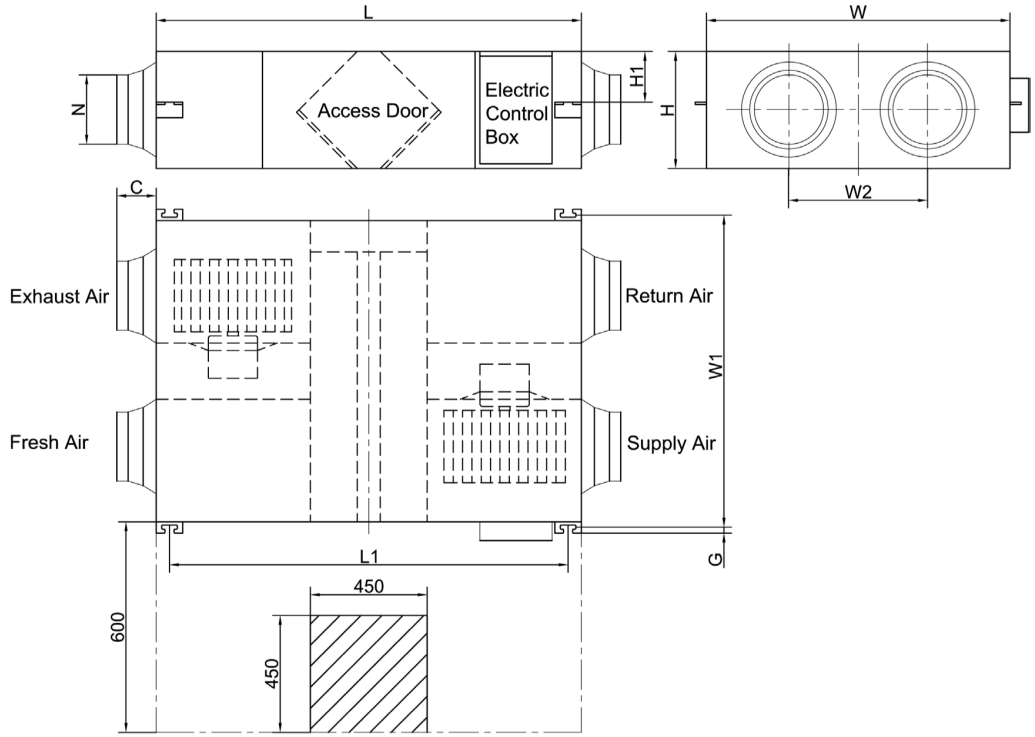
| Model | | CH-HRV1.5KDC | CH-HRV2.5KDC | CH-HRV3.5KDC | CH-HRV5KDC |
|---|---|---|---|---|---|
| Performance | | | | | |
| Airflow ($m^3/h$) | | 150 | 250 | 350 | 500 |
| Airflow (l/s) | | 43 | 71 | 100 | 143 |
| Enth. Eff (%) | Heating | 70 | 70 | 69 | 67 |
| | Cooling | 63 | 63 | 66 | 62 |
| Temp. Eff (%) | | 75 | 75 | 75 | 75 |
| Noise Db(A) | | 23 | 24 | 28 | 30 |
| Power Supply | | 220V/1Ph/50Hz | | | |
| Input Power (W) | | 51 | 81 | 112 | 143 |
| Power Cable | | $2x1.5mm^2$ | | | |
| Control Cable | | $2x0.5mm^2$ | | | |
| Control | Standard | Yes (7-Day Time-clock) | | | |
| | (BMS) Modbus | Yes | | | |
| Fan Type | | DC Fan Motors | | | |
| Fan Speeds (Supply) | | 10 Speed Fan Control | | | |
| Fan Speeds (Exhaust) | | 10 Speed Fan Control | | | |
| Summer Bypass | | Yes (Automatic with adjustable range) | | | |
| Defrost | | Yes (Automatic with adjustable range) | | | |
| $CO_2$ Control | | Optional controller available (On / Off control with adjustable range) | | | |
| Fan Boost Contacts | | Yes (3x available connections to Contacts: Closed = Boost to High Speed) | | | |
| Fire Shutdown | | Yes (1x available connection to Contact: Closed = Shutdown) | | | |
| Weight (Kg) | | 25 | 29 | 37 | 43 |
| Size (WxHxD) | | 580x264x808 | 599x264x882 | 804x270x882 | 904x270x962 |
| Duct Size | | 150 | 150 | 150 | 200 |

# Specifications

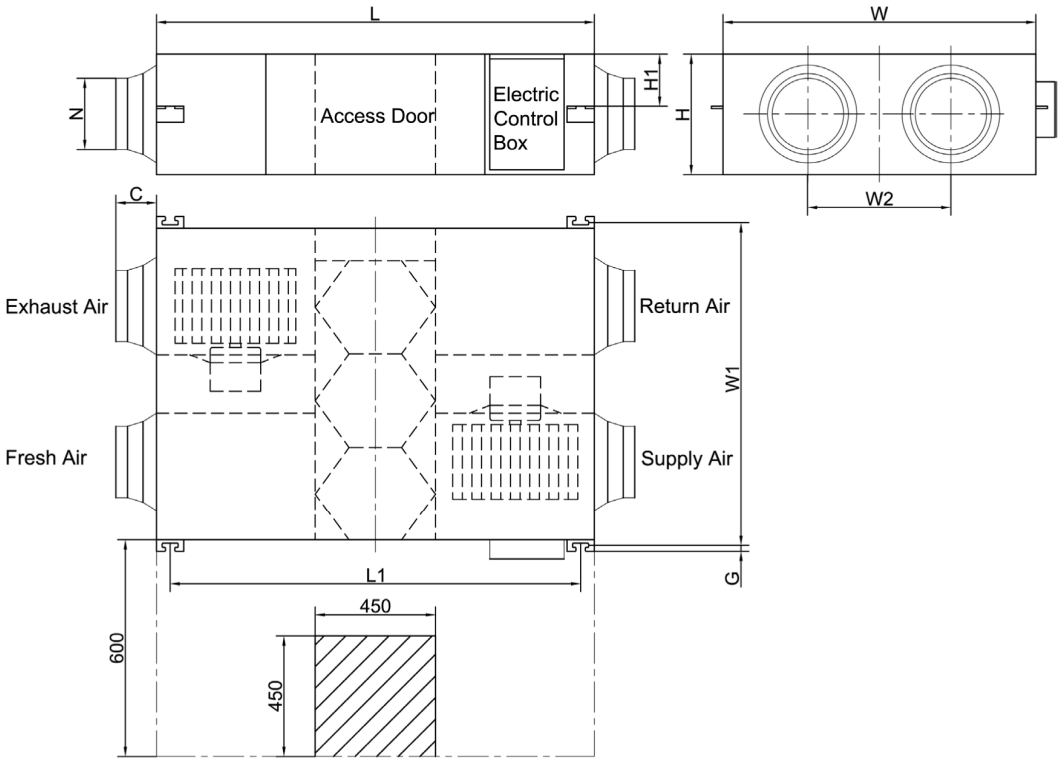
| Model | | CH-HRV6.5KDC | CH-HRV8KDC | CH-HRV10KDC | CH-HRV15KDC | CH-HRV20KDC |
|---|---|---|---|---|---|---|
| Performance | | | | | | |
| Airflow($m^3$/h) | | 650 | 800 | 1000 | 1500 | 2000 |
| Airflow (l/s) | | 186 | 229 | 286 | 429 | 571 |
| Enth. Eff (%) | Heating | 68 | 71 | 71 | 71 | 71 |
| | Cooling | 62 | 65 | 65 | 65 | 65 |
| Temp. Eff (%) | | 75 | 75 | 75 | 75 | 75 |
| Noise Db(A) | | 32 | 35 | 35 | 38 | 38 |
| Power Supply | | 220V/1Ph/50Hz | | | | |
| Input Power (W) | | 205 | 290 | 305 | 580 | 610 |
| Power Cable | | 2x1.5$mm^2$ | | | | |
| Control Cable | | 2x0.5$mm^2$ | | | | |
| Control | Standard | Yes (7-Day Time-clock) | | | | |
| | (BMS) Modbus | Yes | | | No | |
| Fan Type | | DC Fan Motors | | | | |
| Fan Speeds (Supply) | | 10 Speed Fan Control | | | | |
| Fan Speeds (Exhaust) | | 10 Speed Fan Control | | | | |
| Summer Bypass | | Yes (Automatic with adjustable range) | | | | |
| Defrost | | Yes (Automatic with adjustable range) | | | | |
| $CO_2$ Control | | Optional controller available (On / Off control with adjustable range) | | | | |
| Fan Boost Contacts | | Yes (3x available connections to Contacts: Closed = Boost to High Speed) | | | | |
| Fire Shutdown | | Yes (1x available connection to Contact: Closed = Shutdown) | | | | |
| Weight (Kg) | | 64 | 71 | 83 | 165 | 189 |
| Size (WxHxD) | | 884x340x1222 | 884x388x1322 | 1134x388x1322 | 884x785x1322 | 1134x785x1322 |
| Duct Size | | 200 | 250 | 250 | 300 | 300 |

# Dimensioned Drawings

## CH-HRV1.5KDC to HRV5KDC Models

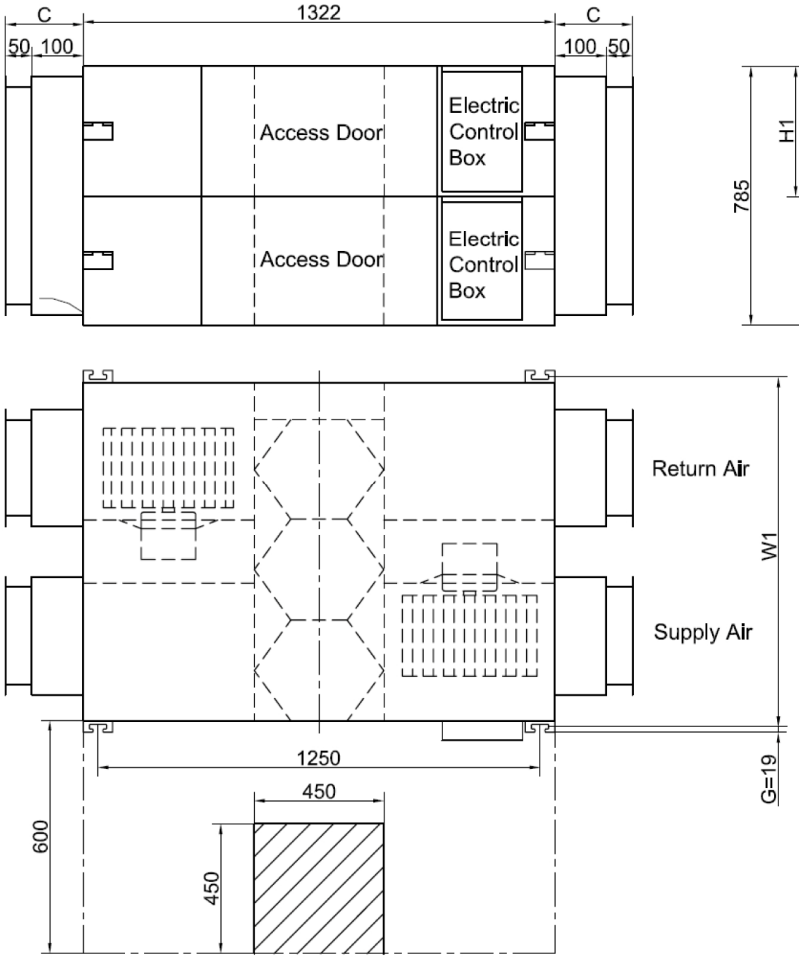



## CH-HRV6.5KDC to HRV10KDC Models



# Dimensioned Drawings

## CH-HRV15KDC to HRV20KDC Models




| Model | Dia. (mm) |
|---|---|
| CH-HRV1.5KDC | Φ150 |
| CH-HRV2.5KDC | Φ150 |
| CH-HRV3.5KDC | Φ150 |
| CH-HRV5KDC | Φ200 |
| CH-HRV6.5KDC | Φ200 |
| CH-HRV8KDC | Φ250 |
| CH-HRV10KDC | Φ250 |
| CH-HRV15KDC | 280*650 |
| CH-HRV20KDC | 280*650 |

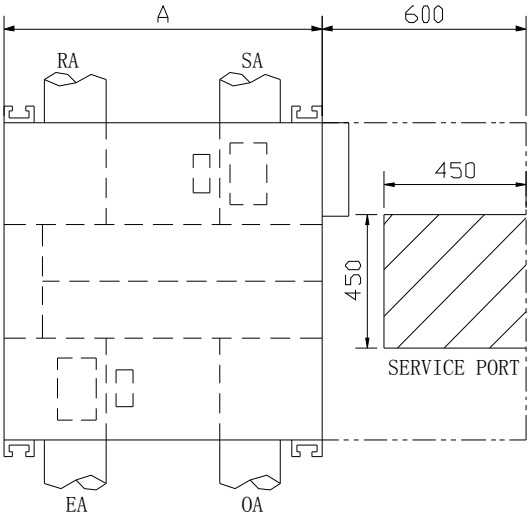
## Diagram Measurements

The table on right side shows suitable duct measurements for each unit.
The table below shows the dimensions of the image above and the two images previously, the letter in the table represents the letter on the diagram .

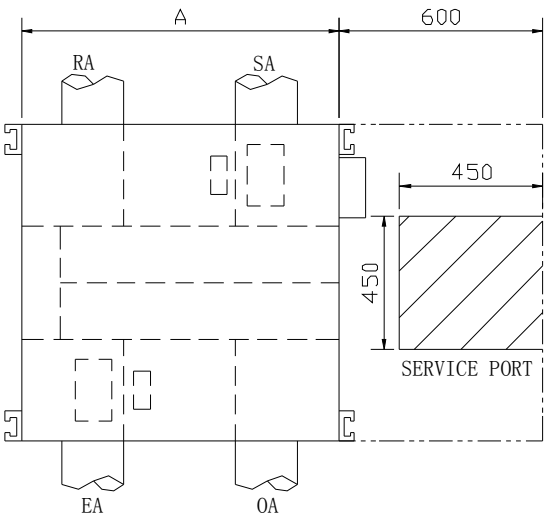
| Model | L | L1 | W | W1 | W2 | H | H1 | C | G | N |
|---|---|---|---|---|---|---|---|---|---|---|
| CH-HRV1.5KDC | 808 | 867 | 580 | 510 | 290 | 264 | 20 | 100 | 19 | Φ144 |
| CH-HRV2.5KDC | 882 | 810 | 599 | 657 | 315 | 270 | 111 | 100 | 19 | Φ144 |
| CH-HRV3.5KDC | 882 | 810 | 804 | 860 | 480 | 270 | 111 | 100 | 19 | Φ144 |
| CH-HRV5KDC | 962 | 890 | 904 | 960 | 500 | 270 | 111 | 107 | 19 | Φ194 |
| CH-HRV6.5KDC | 1222 | 1150 | 884 | 940 | 480 | 340 | 146 | 107 | 19 | Φ194 |
| CH-HRV8KDC | 1322 | 1250 | 884 | 940 | 428 | 388 | 170 | 85 | 19 | Φ242 |
| CH-HRV10KDC | 1322 | 1250 | 1134 | 1190 | 678 | 388 | 170 | 85 | 19 | Φ242 |
| CH-HRV15KDC | 1322 | 1250 | 884 | 940 | 428 | 785 | 170 | 150 | 19 | 280*650 |
| CH-HRV20KDC | 1322 | 1250 | 1134 | 1190 | 678 | 785 | 170 | 150 | 19 | 280*650 |

## Installation Considerations

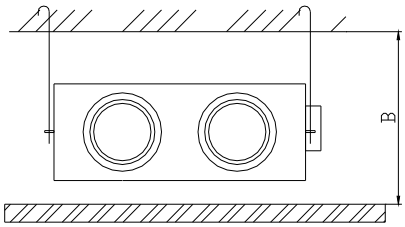
Protect the unit to avoid dust or other obstructions entering the unit and accessories during installation, or whilst in storage on site. Service ports should be installed to allow access for filter maintenance.



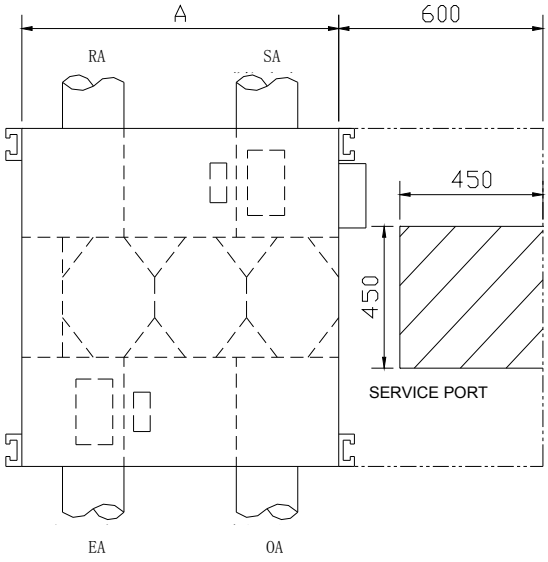

CH-HRV1.5KDC




CH-HRV2.5KDC to HRV5KDC

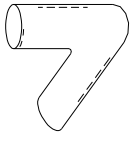



| Dimensions | Celling Height | |
|---|---|---|
| Model | A | B |
| CH-HRV1.5KDC | 580 | 320 |
| CH-HRV2.5KDC | 599 | 320 |
| CH-HRV3.5KDC | 804 | 320 |
| CH-HRV5KDC | 904 | 320 |
| CH-HRV6.5KDC | 884 | 390 |
| CH-HRV8KDC | 884 | 440 |
| CH-HRV10KDC | 1134 | 440 |
| CH-HRV15KDC | 884 | 835 |
| CH-HRV20KDC | 1134 | 835 |

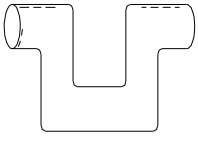



CH-HRV6.5KDC to HRV20KDC

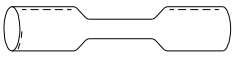
1. Be sure the ceiling height is no less than the Figures in above table B column.
2. Unit must not be installed close to boiler flues.
3. Following phenomenon should be avoided in the ducting installation.



Serve bends



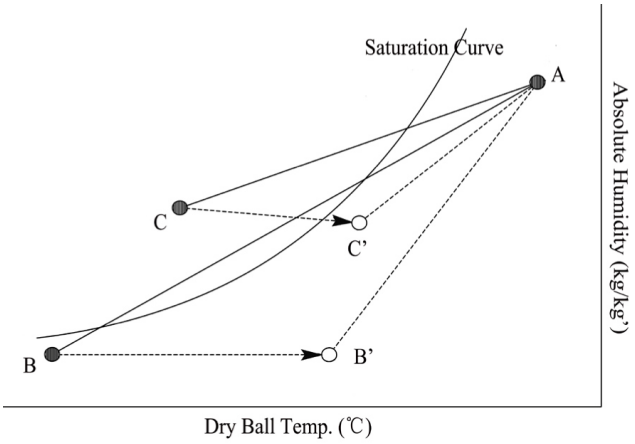
Multiple direction changes



Multiple reducers/ crimped duct

4.Exessive use of flex-duct and long flex-duct runs should be avoided.
5.Fire dampers must be fitted as per national and local fire regulations.
6.Unit must not be exposed to ambient temperature above 40℃ and should not face an open fire.
7.Take action to avoid dew and frost.

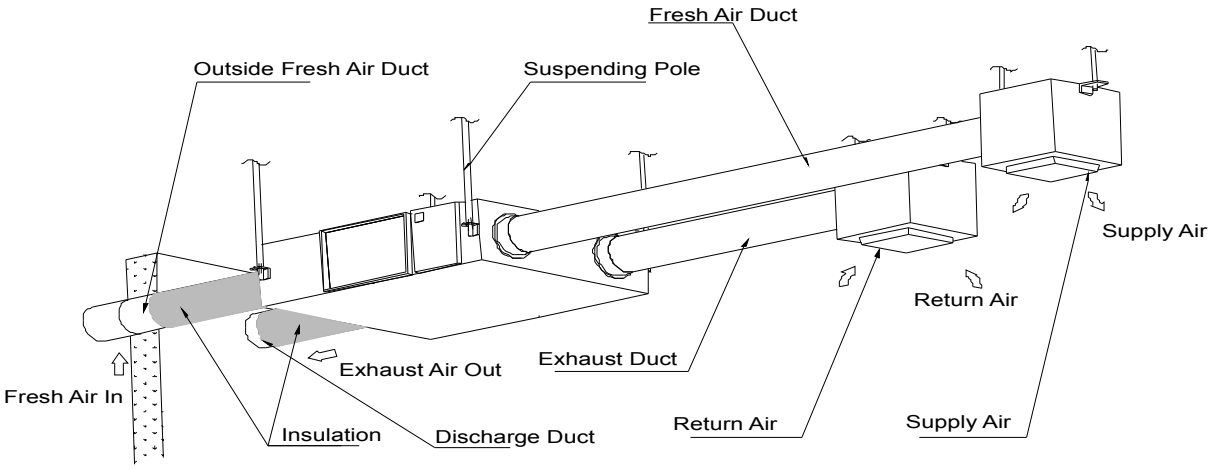
As shown by drawing below, unit will produce dew or frost when saturation curve is formed from A to C. Use pre-heater to ensure conditions are kept to right of the curve (B to B′ , to move C to C) to prevent condensation or frost formation.




8. To avoid the outdoor exhaust air cycling back to indoor, the distance between the two vents installed on the outside wall should be over 1000mm.
9.If heater is equipped to the unit, operation of heater should be synchronous with the unit, so that the heater starts to work only when unit starts.
10.Duct muffler may be considered if user wants indoor noise to be minimized.

# Installation Considerations

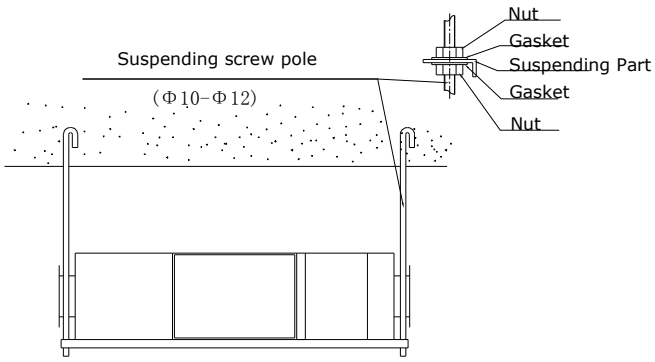
## Installation Diagram




## Physical Installation

1.Installer to prepare suitable threaded hangers with adjustable nuts and gaskets.
2.Install as shown by the image above. Installation must be level and securely fastened.
3.Failure to observe proper fixing could result in injury, equipment damage and excessive vibration. Uneven installation will also effect damper operation.

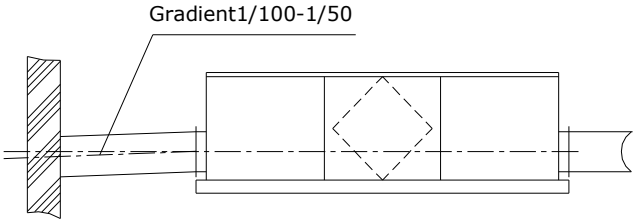
Notes for reverse installation of the unit
4.Reverse labeling shows the unit is upside down.




## Ducting

1. Connection of unit vents and ducts should be taped or sealed to prevent air leakage, and should comply to relevant guidelines and regulations.
2. The two outdoor vents should face downward toward the outside to prevent any rain water ingress. (angle 1/100 1/50).
3. Insulation must be with the two ducts outside to prevent condensation.

Material: glass cotton, Thickness: 25mm



# Electrical Installation

**Warning**

Power must be isolated during installation and before maintenance to avoid injury by electric shock. The specifications of cables must strictly match the requirements, otherwise it may cause performance failure and danger of electric shock or fire.

Power supply is AC220V/50HZ/1 Phase. Open the cover of electrical box, connect the 2 wires (L/N/) to the terminals and connect the cable of the control panel to the board according to the wiring diagram, and join the control panel to the cable.

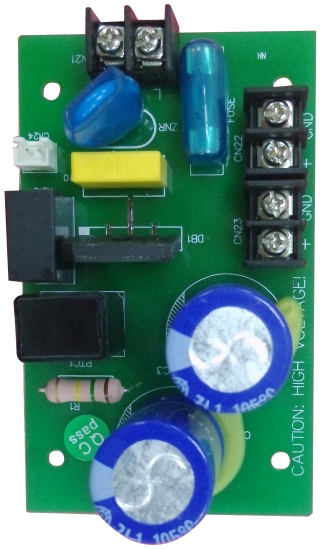
| Model | Spec. of power supply cable | Spec. of normal controller cable |
|---|---|---|
| CH-HRV1.5KDC | $2\times1.5mm^2$ | $2\times0.5mm^2$ |
| CH-HRV2.5KDC | | |
| CH-HRV3.5KDC | | |
| CH-HRV5KDC | | |
| CH-HRV6.5KDC | | |
| CH-HRV8KDC | | |
| CH-HRV10KDC | | |
| CH-HRV15KDC and CH-HRV20KDC | | |

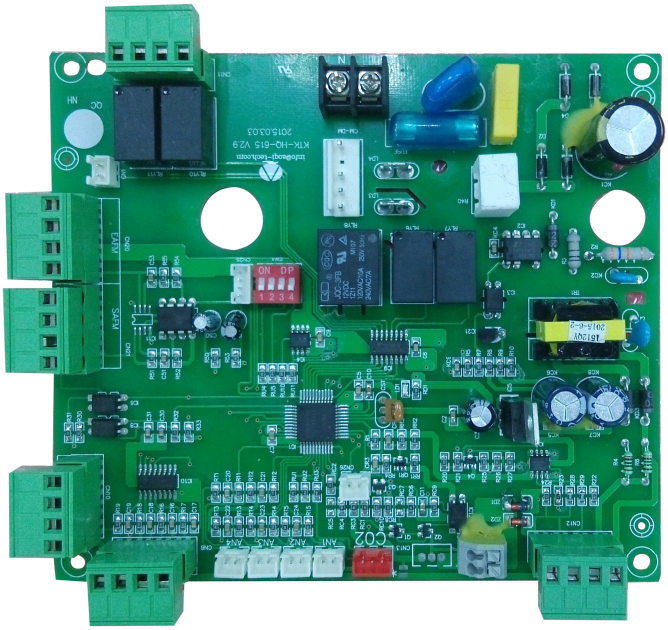
**Warning**

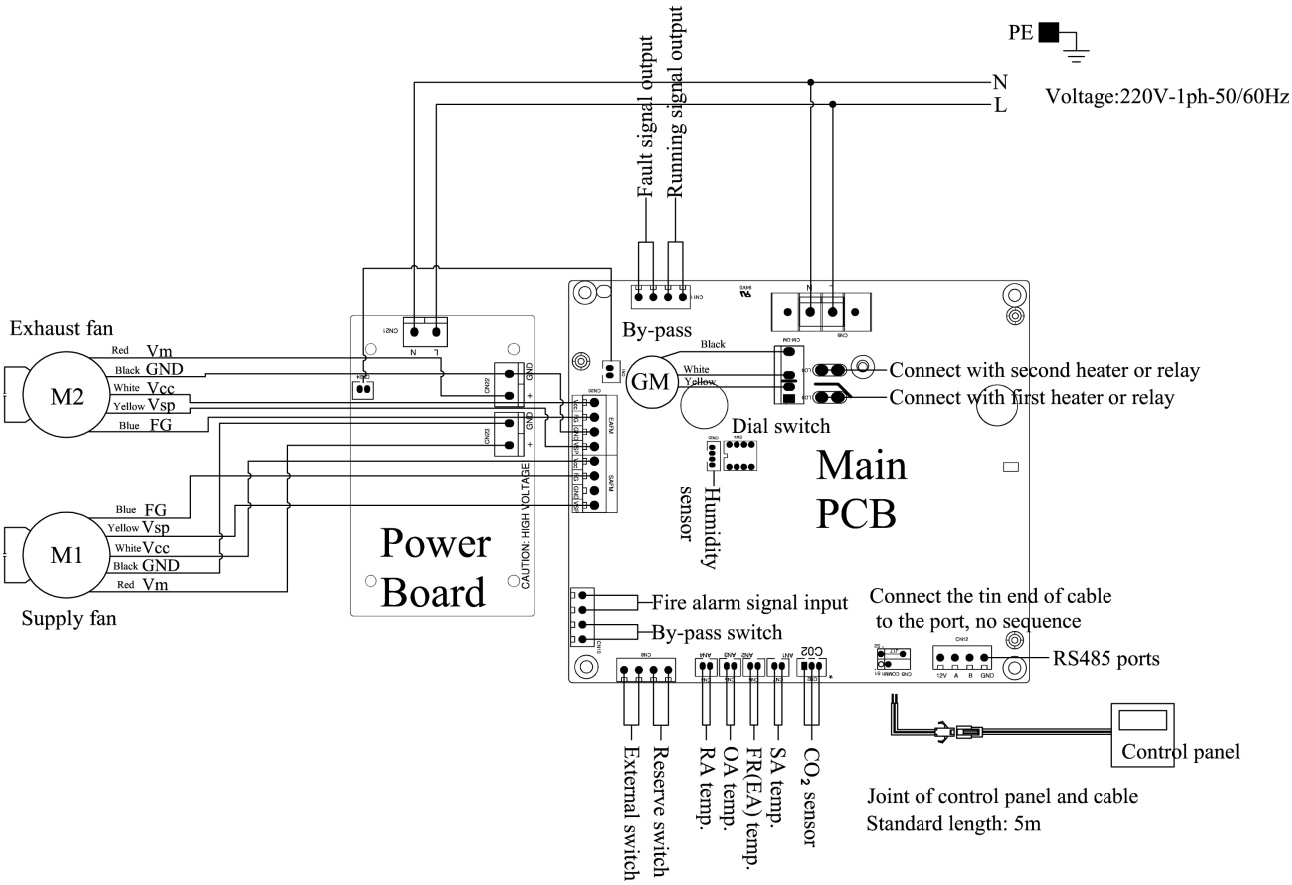
We do not accept any liability for any problems caused by the user's self and non-authorized re-engineering to the electrical and control systems.

# Wiring Diagrams

## CH-HRV1.5KDC to HRV10KDC Models

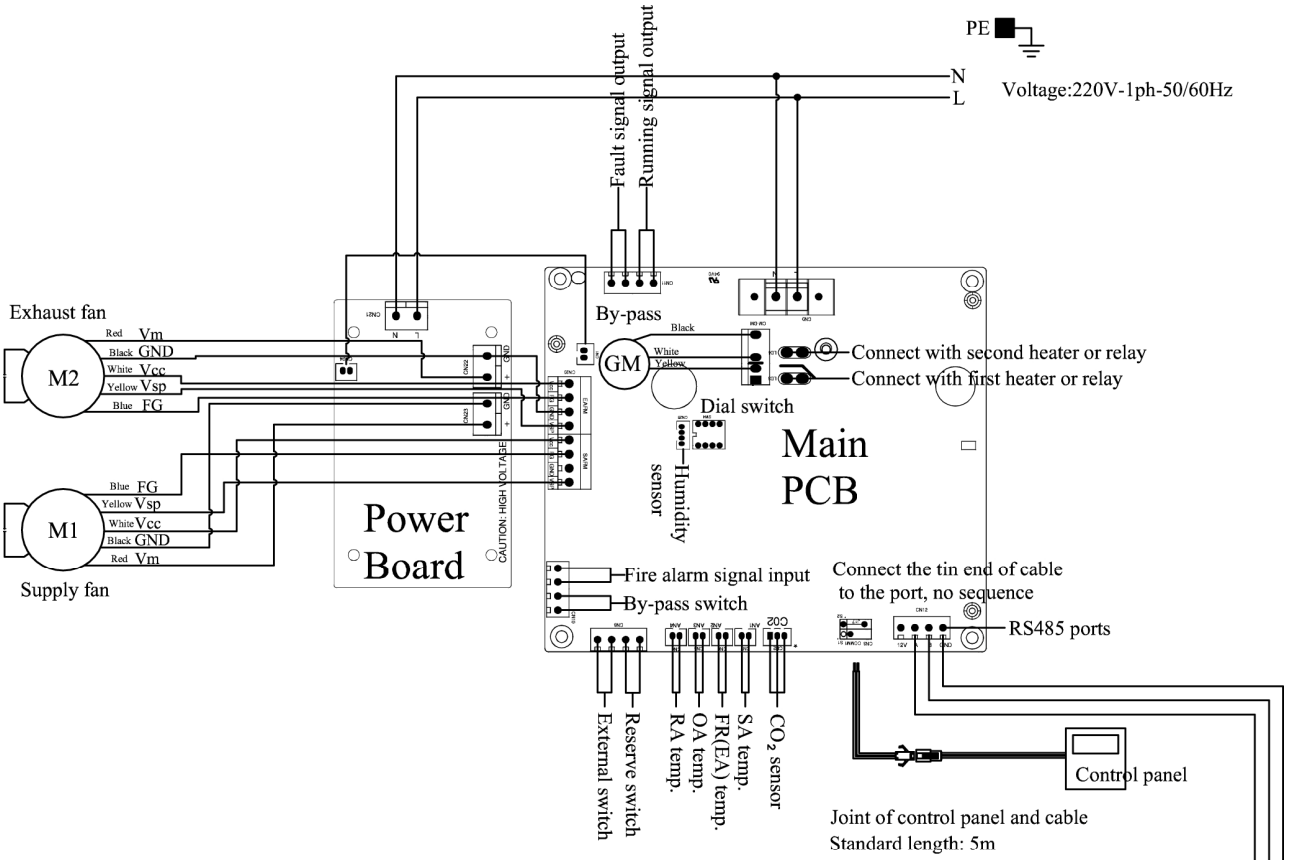


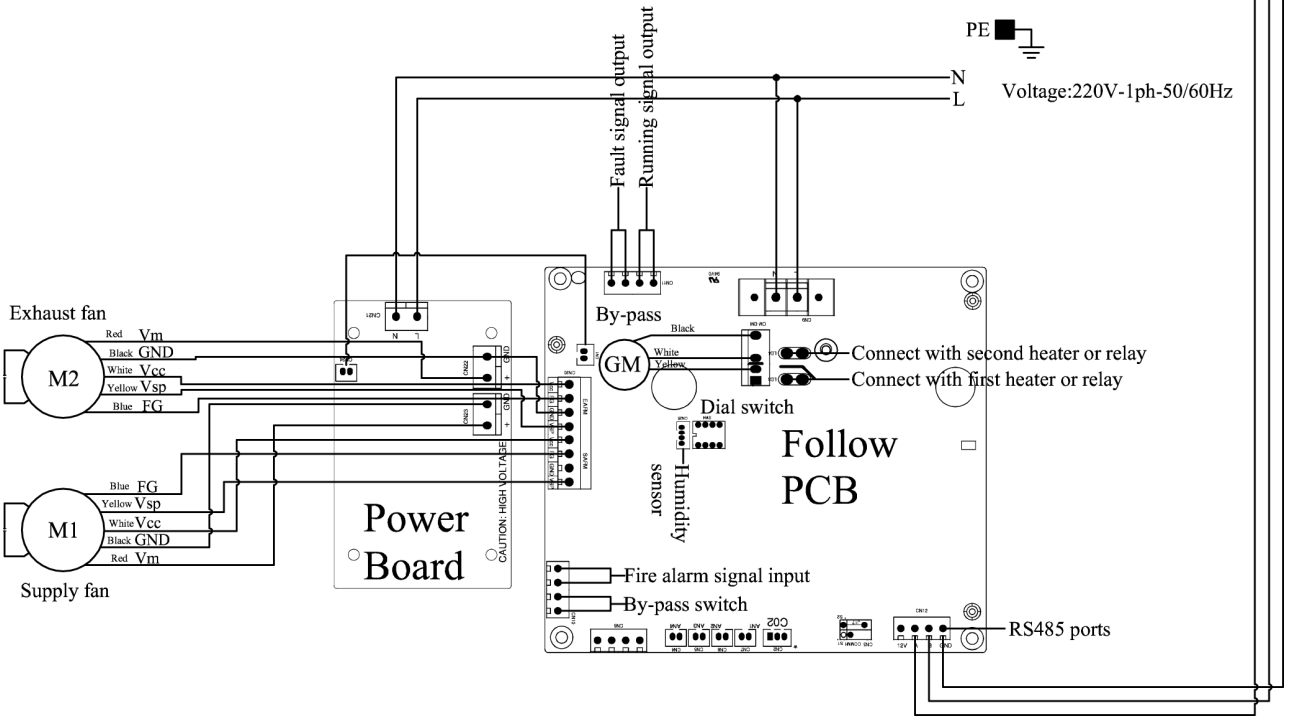




# Wiring Diagrams

## CH-HRV15KDC to HRV20KDC Models



# Commissioning

Check that all cable sizes, circuit breakers and wire connections are correct before following below commissioning steps:

1. Press the power button 

once for starting; twice for closing. In On status, the light of power indicator is on, while in OFF status, the light is off.

2. Match the correct fan speeds to each ERV models. Press button MODE for 6 seconds to enter parameter settings and at this time the parameter number is shown in the middle of the screen, press button SET to switch to parameter No. 21 (refer to parameters list in comming page) then press MODE to enter the parameter setting, default value (ERV codes) flesh at the right corner, press UP and DWON buttons to change the codes to mach the correct ERV models according to below table, then press button SET again to confirm setting.

| Code | Models | Code | Models |
|---|---|---|---|
| 6 | CH-HRV1.5KDC | 1 | CH-HRV8KDC |
| 5 | CH-HRV2.5KDC | 2 | CH-HRV10KDC |
| 4 | CH-HRV3.5KDC | 1 | CH-HRV15KDC |
| 3 | CH-HRV5KDC | 2 | CH-HRV20KDC |
| 0 | CH-HRV6.5KDC | | |

3. Then check the mode and fan speed switch. Press button MODE to switch rA , oA or SA mode, check whether the temperature of the corresponding mode is correct. Press FAN to switch the fan speed of rA and SA , check if the airflow is adjusted corresponding to number 1-10 (stands for 10 speeds control in screen middle)

4. Check the operation of bypass. The default opening temperature of bypass is 19-21C (adjustable), press button MODE to check the temperature of oA . If the oA is 19-21C, the bypass will open automatically. If the outdoor temperature is not within 19-21C, then adjust the bypass opening temperature according the current to oA temperature to check the bypass function.

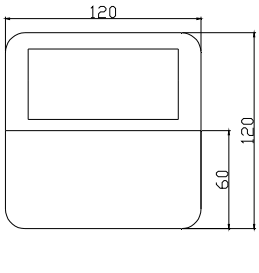
5. Bypass open temperature setting: press MODE more than 6 seconds to enter the parameter setting mode. Press SET twice to switch the parameter number from 00 to 02, the value flashes shown at the right corner, the default value is 19. Then press MODE to modify the value according to the current oA temperature by pressing up-down button and press SET to save the data. At the same time, check the bypass is opened or not. Please remember to modify the bypass opening temperature to 19-21 after the commissioning.

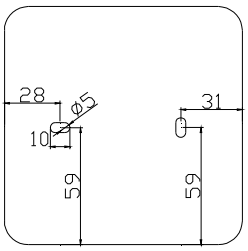
| Warning | | | |
|---|---|---|---|
|  | Loose or incorrect wiring connection can cause explosion or fire when the unit starts to work. Use only rated power voltage. |  | Don't put fingers or objects into vents of fresh air or exhaust air supply. Injury may be caused by the rotation of the impeller. |
|  | Don't install, move or re-install the unit by yourself. Improper action may cause unit instability, electric shock or fire. |  | Don't change, disassemble or repair the unit by yourself. Improper action may cause electric shock or fire. |
|  | Running the unit continuously in an abnormal status may cause failure, electric shock or fire. |  | Switch off the power and breaker when you clean the exchanger. |
| **Attention** | | | |
|  | Don't site intake supply vent in hot and humid conditions , as it may cause failure, current leakage or fire. |  | Don't put any burner directly facing the fresh air discharge, otherwise it may cause an insufficient burning. |
|  | Isolate power during extended off periods Isolate power and take care when cleaning unit. (Risk of electric shock) |  | Observe guidelines and regulations relating to incomplete combustion when use is associated with fuel burning appliances. |
|  | Clean the filter regularly. A blocked filter may result in poor indoor air quality. | | |

# Intelligent Controller Instruction

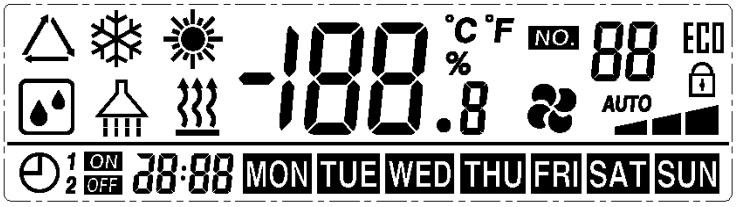
## Control Panel

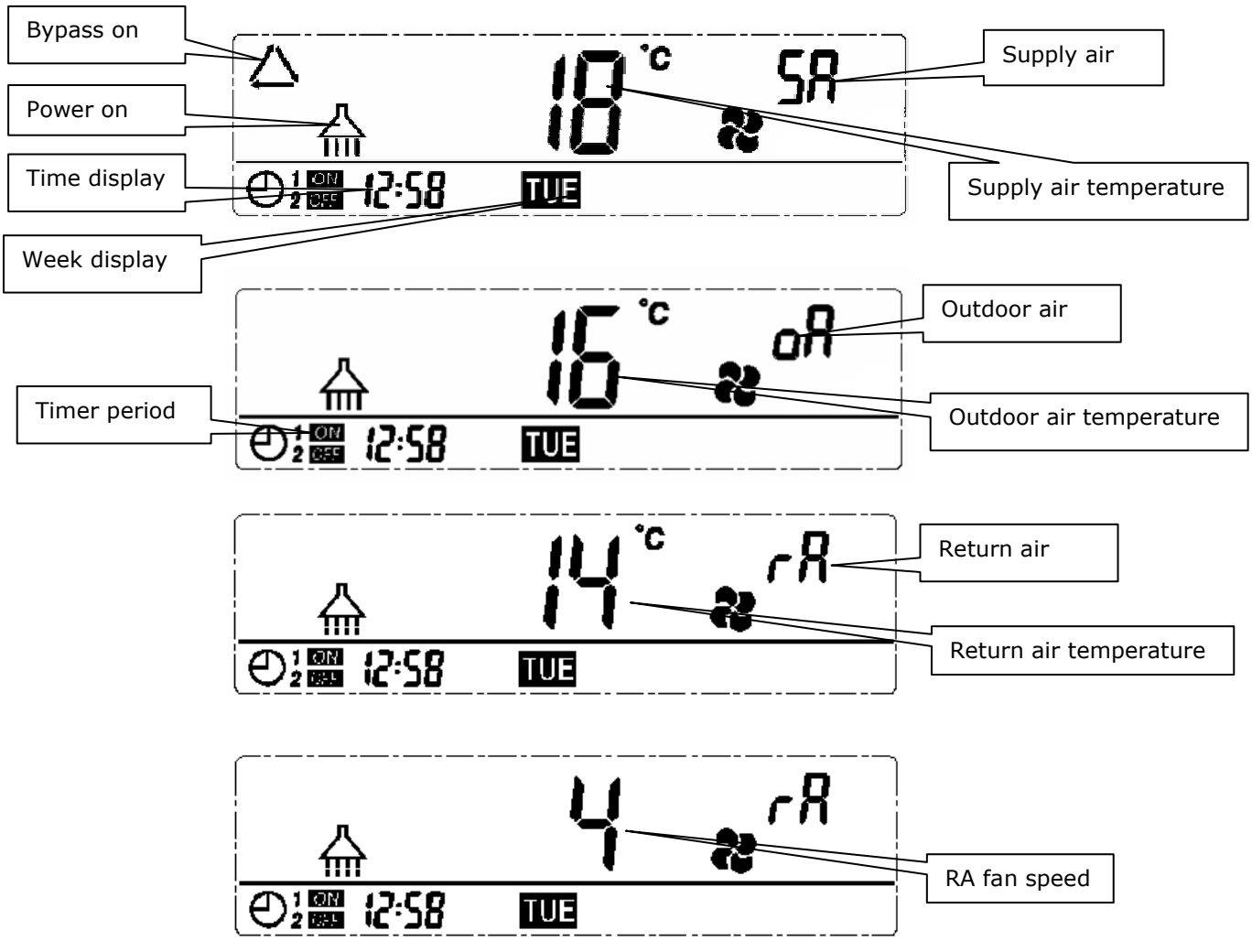
The intelligent controller is surface mounted and comes with a LCD display screen.
The standard connection cable is 5 meters, but you can prepare extra cable if necessary.



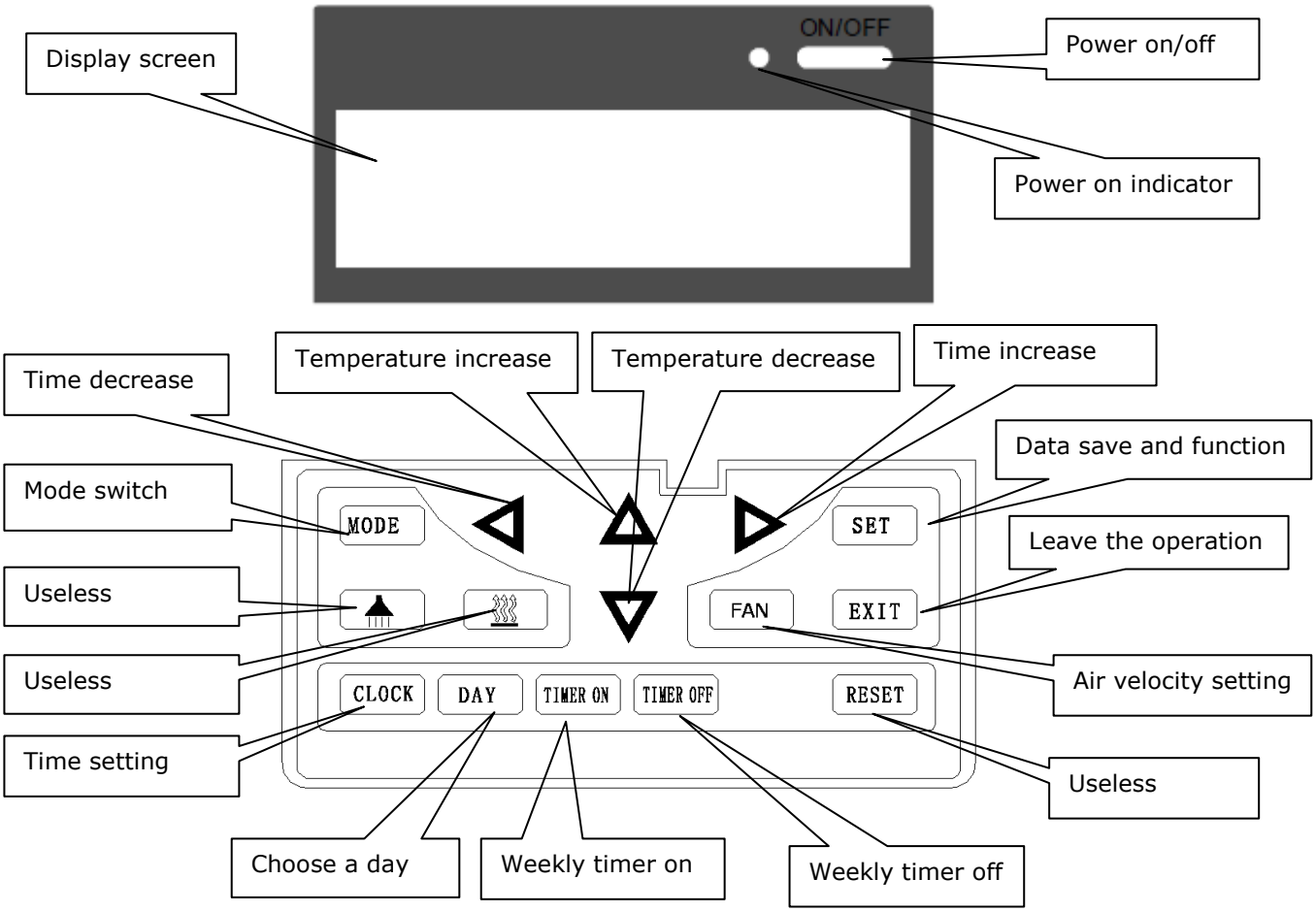




## LCD display screen



# Intelligent Controller Instruction




## Operation Instructions

1. ON/OFF: press ON/OFF button once for starting; twice for closing. In ON status, the light of power indicator is on, and the ventilator begins to run. In OFF status, the light is off and the ventilator stops.

2. Mode switch: press MODE to choose to display the oA/rA/SA/Fr status.

3. Air velocity setting: press FAN button to adjust the air velocity. Users can set the return air velocity in "rA" status, and set the supply air velocity in "SA" status. Fan speeds will be shown in number from 1 -10 means 10 different speeds.

4. Time setting: time records if power off. If user need to reset the time, please press the CLOCK button, when the colon of the clock stills, press it again, then the hour flashes, users can press button◄►to adjust the hour; then press the CLOCK button again to adjust the minute in the same way, the interval is 10 minutes. After setting, please press SET button to save the data or press EXIT to leave the operation without saving the data. If no operation in 8 seconds, display will disappear and all setting is invalid.

5. Day setting: press DAY button, when the day code flashes, select the day by pressing button◄and►. After setting, please press SET button to save the data or press EXIT to exit without saving the data. If no operation in 8 seconds, display will disappear and all setting is invalid.

6. Weekly timer on: press TIMER ON button, all the days display, then press this button to switch the hour->minute->invalidation of timer. Users can set the hour and minute when flashing. When it shows "--:--"; it means timer is invalid. Besides, users can press DAY button to switch the day, the day flashed when chosen. After setting, please press SET button to save the data or press EXIT to leave the operation without saving the data. In the status of TIMER ON, code "1" "2" stands for the first or second period of timer. User can choose the period of timer by pressing the button of "MODE". If no operation in 8 seconds, display will disappear and all setting is invalid.

7. Weekly timer off: press TIMER OFF button, all the days display, then press this button to switch the hour->minute->invalidation of timer. Users can set the hour and minute when flashing. When it shows "--:--"; it means timer is invalid. Besides, users can press DAY button to switch the day, the day flashed when chosen.

After setting, please press SET button to save the data or press EXIT to leave the operation without saving the data. In the status of TIMER OFF, code "1" "2" stands for the first or second period of timer. User can choose the period of timer by pressing the button of "MODE". If no operation in 8 seconds, display will disappear and all setting is invalid.

8. Check weekly timer: press DAY button, and press button ◄ and ►to choose the day, then the set timer on and timer off will display. Users can press TIMER ON or TIMER OFF button to check the exact time.

9. The running of weekly timer: the control system will record the current time, the ventilator starts to run automatically when the timer is on, if the unit is on already, it maintains running. On the other hand, it stops when the timer is off, if it is off already, it remains stop status. The timer on and off can be used independently or simultaneously. When the timer is ON/OFF, users can still change the ON/OFF status of the unit.

10. Parameter List of Controller are kept after restarting from power-off.

| No. | Contents | Range | Default | Unit | Record Position |
|---|---|---|---|---|---|
| 00 | Power to auto restart | 0-1 | 1 | | Main control |
| 01 | Electrical heater available | 0-1 | 0 | | Main control |
| 02 | Bypass opening temperature X | 5-30 | 19 | ℃ | Main control |
| 03 | Bypass opening temperature range Y | 2-15 | 3 | ℃ | Main control |
| 04 | Defrosting interval | 15-99 | 30 | Minute | Main control |
| 05 | Defrosting entering temperature | -9-5 | - 1 | ℃ | Main control |
| 06 | Defrosting duration time | 2-20 | 10 | Minute | Main control |
| 07 | CO2 sensor function value | 28-C8<br>(392-1960PPM) | 66<br>(1000PPM) | PPM | Main control |
| 08 | ModBus address | 1-16 | 1 | | Main control |
| 21 | ERV models match/selection | 0-7 | | | Main control |
| 23 | Fan speed control | 0: 2 speeds<br>1: 3 speeds<br>2: 10 speeds (DC) | 2 | | |
| 24 | Multifunction setting | 0: Reserved<br>1: Sweep filter alarm<br>2: sweep weekly timer | 0 | | |
| 25 | Filter alarm setting | 0: 45 days<br>1: 60 days<br>2: 90 days<br>3: 180 days | 0 | | Main control |

11. temperature setting, after connecting the electrical heater to the PCB (LD3 and LD4), then can set the temperature by temperature increase and decrease buttons, when SA temperature lower than setting temperature then electrical heater on

1) 0℃＜setting temperature - SA temperature＜5 ℃，1st stage heater on，2nd stage heater off

2) Setting temperature - SA temperature ＞5℃，1st and 2nd stage heater on

12. Instruction of Parameter Settings

1) The control panel is in parameter setting mode via pressing the MODE button more than 6 seconds.

2) In the parameter setting mode, the valid parameter number (00/01/02/03/04/05/06/07/08/21/23/23/24/25) is shown in the middle of the screen, press button SET to switch the parameter number. Then press MODE to enter the parameter setting, the default value at the right corner flashes, press the up-down button to adjust the data. After setting, press SET button to save all the data. After 10 seconds, the control panel begins to record the parameters. The setting is proved to be successful if the parameters

13. Bypass opening parameter setting

1) The bypass is opened on the condition that the outdoor temperature is equal or higher than X and less than X+Y.
2) The bypass is closed on other conditions.

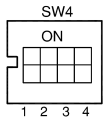
14. EA fan defrosting mode
When EA side of heat exchanger temperature lower than −1℃(defrosting entering temperature, adjustable) and last for 1 minute, and the interval of defrosting is longer than 30 minutes (adjustable), the exhaust fan will run at high speed automatically for defrosting, and supply fan will stop, until EA side temperature higher than defrosting entering temperature +15℃ for 1 minute, or the defrosting time is longer than 10 minutes (adjustable)

15. Filter Alarm, to set the filter alarm under parameter 25, the symbol flash as the filter alarm to remind customer to clean the filters, to sweep filter alarm by setting parameter 24 value 1.

16. Error code, press set button for short to check the Error code, please refer to below error code table

| Code | Error |
|---|---|
| E1 | Fresh air temperature sensor error |
| E2 | EEPROM error |
| E3 | Return air temperature sensor error |
| E4 | Exhaust air temperature sensor error (defrosting temperature error) |
| E5 | Communication error |
| E6 | Supply air temperature sensor error |
| E7 | Exhausted fan error |
| E8 | Supply fan error |

## Introduction of dial switch

Dial switch 


**1. SW4-1: OFF-Traditional EA fan defrost ON-OA side electrical heater defrost**
**2. SW4-2: OFF-Auto by-pass and manual bypass via voltage free connector (free cooling)**
**3. SW4-3: OFF-CO2 sensor ON-Humidity and temperature sensor**
**4. SW4-4: Reserve**

**Attention: Please cut off the power before dialing.**

1. SW4-1 is switching the defrost mode. Default is "off", it means traditional defrost by EA fan. When turn to "on", the defrost mode is changed to be OA side heater defrost (required to connect the heater to the OA duct, only suggested in winter under −15℃), at this time the parameter 01 would be turned to 0 automatically and the supply air side electrical heater is not able to use.

Under electrical heater defrost mode, controller can automatic drive the electric heater on/off to heat the fresh air in order to prevent frosting at the EA side of heat exchanger.
1) If the outdoor fresh air temperature < -15$^0$C, the OA heater turns on for 50 minutes, then the ventilator switches off for 10 minutes and restarts.
2) If the OA heater switches on and the exhaust air temperature still <-1$^0$C, then the ventilator will stops for 50 minutes.
3) If the exhaust air temperature <-1$^0$C and the outdoor air temperature >-15$^0$C, the OA heater switches on for 10 minutes for defrosting.
4) If the OA heater is on and temperature of outdoor air is >+25$^0$C, then OA heater will stop for 5 minutes, If the outdoor air temperature is detected over 25℃ by sensor over 3 times, electrical heater stops.

2. SW4-2 is the by-pass mode. Default is "off", it means that by-pass will open automatically based on the outdoor temperature. After connecting the bypass free voltage connector (refer to the wiring diagram), then bypass damper opens manually and fans run at high speed.

3. SW4-3 is switching the forced ventilation mode. Default is "off", it means that ventilator is controlled by $CO_2$ sensor. When turn to "on", the ventilator is controlled by "humidity and temperature" sensor or together with the CO2 sensor. if SW4-3 turn to "ON" but without connecting "humidity and temperature" sensor, then E3 error happen.

4. SW4-4 is reserved.

**External ON/OFF switch control logic**

External switch can receive voltage free signal to control the ventilator on or off.
-Ventilator off, when ventilator have external on signal, ventilator run at high speed, when ventilator have external off signal, ventilator return back to off.

- Ventilator on, when ventilator have external on signal, ventilator run at high speed, when ventilator have external off signal, ventilator return back to previous fan speed

# Eco-Smart ModBus Address

| Parame-ter No. | Content | Range | Default | Record Posi-tion |
|---|---|---|---|---|
| 00 | Useless | | | Main control |
| 01 | Useless | | | Main control |
| 02 | Bypass opening tempera-ture X | 5-30 | 19 | Main control |
| 03 | Bypass opening temperature range Y | 2-15 | 3 | Main control |
| 04 | Defrosting interval | 15-99 | 30 | Main control |
| 05 | Defrosting enter tempera-ture | -9-5 | -1 | Main control |
| 06 | Defrost duration time | 2-20 | 10 | Main control |
| 07 | CO2 sensor | 28-C8 (392-1960ppm) | 66 (1000ppm) | Main control |
| 08 | ModBus address | 1- | | Main control |
| 09 | ERV ON/OFF | 0-OFF 1-ON | | Main control |
| 10 | Supply fan speed | Fan speed:<br>0=stop, 2=speed 1, 3=speed 2, 5=speed 3, 8=speed 4, 9=speed 5,<br>10=speed 6, 11=speed 7,<br>12=speed 8, 13=speed 9,<br>14= speed 10 | | Main control |
| 11 | Exhaust fan speed | Fan speed:<br>0=stop, 2=speed 1, 3=speed 2, 5=speed 3, 8=speed 4, 9=speed 5,<br>10=speed 6, 11=speed 7,<br>12=speed 8, 13=speed 9,<br>14= speed 10 | | Main control |
| 12 | Room temperature | observed value | | Main control |
| 13 | Outdoor temperature | observed value | | Main control |
| 14 | Exhaust air temperature | observed value | | Main control |
| 15 | Defrosting temperature | observed value | | Main control |
| 16 | External ON/OFF signal | query value | | Main control |
| 17 | CO2 ON/OFF signal | query value | | Main control |
| 18 | Fire alarm signal/bypass/ defrosting signal | query value:<br>B0 – 1-fire alarm ON<br>B1- 1-bypass on<br>B2- 1-bypass off<br>B3- 1- defrosting | | Main control |
| 19 | Electrical heater stage | | | Main control |
| 20 | Error symbol | query value:<br>B2-OA temperature error<br>B5-EEPROM error<br>B4-RA temperature error<br>B3-Fr temperature error ( auto defrosting) | | Main control |
| 21 | ERV models selection | | | |
| 22 | Defrosting models | | | |

# Maintenance

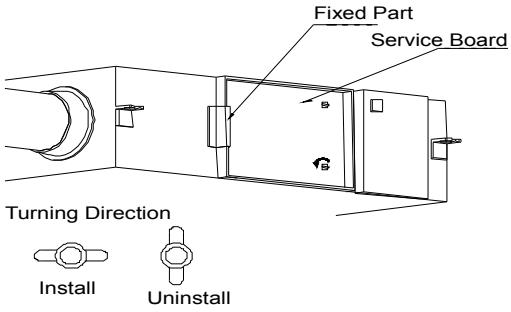
**Warning**

Power must be isolated before installation and maintenance to avoid injury or electric shock. Supply power cables, main circuit breaker and earth leakage protection, must comply with national regulations. Failure to observe could cause unit failure, electric shock or fire.

Standard filtration is supplied with this unit and must be used. Dust and dirt can accumulate in the heat exchanger if filters are removed. (This can lead to failure or decreased performance). To ensure efficient operation, regular cleaning or replacement of filters is required. Filter maintenance frequency will depend on working environment and unit running time.

**Cleaning the filter**

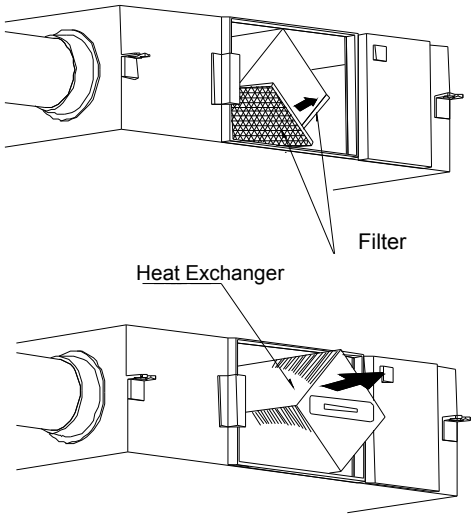
1. Open the access door
2. Remove the filters (from the side of the unit)
3. Vacuum the filters to get rid of the dust and dirt. For bad conditions dip it into water with soft wash to clean.
4. Push the filters to the positions after they get dried naturally, close the access door.
5. Change the filters if they are badly affected with dust and dirt or if they are broken.




**Maintenance of heat exchanger**

1. Pull off the filters first
2. Draw out the exchanger from the unit
3. Establish a cleaner schedule to clean the dust and dirt on the exchanger.
4. Install the exchanger and filters to their positions and close the access door.

Remarks: It is recommended maintenance of the exchanger is made every 3 years



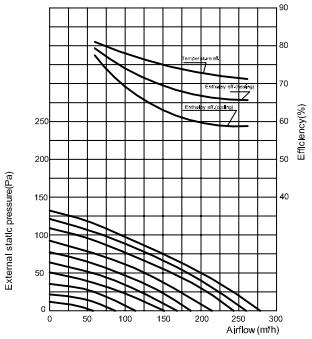

## Failure diagnose

User can use the unit after trial operation. Before contacting us, you can make self trouble shooting following below chart in case of any failure.

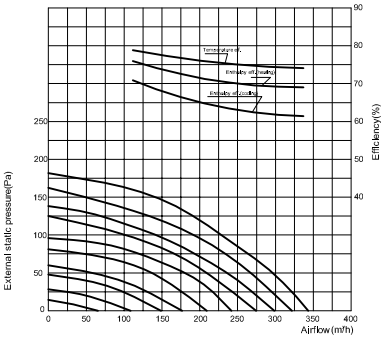
| Phenomenon | Possible reason | Solutions |
|---|---|---|
| The airflow volumes both indoor and outdoor vents drop obviously after a period of operation. | Dust and dirt blocking the filter | Replace or clean the filter |
| Noise comes from vents | Vents installation are loosing. | Re-tightening the vents connections |
| Unit doesn't work | 1. No electricity<br>2. Protection breaker is cut | 1. Guarantee power is on<br>2. Connect the breaker |

# Fan curves

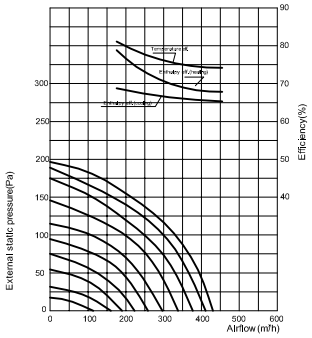
CH-HRV1.5KDC Perfomance Chart



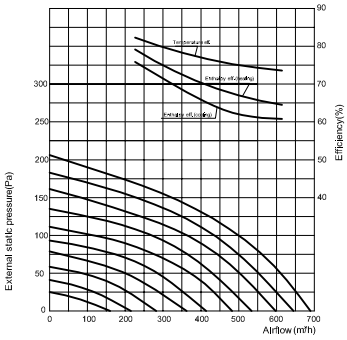

CH-HRV2.5KDC Perfomance Chart



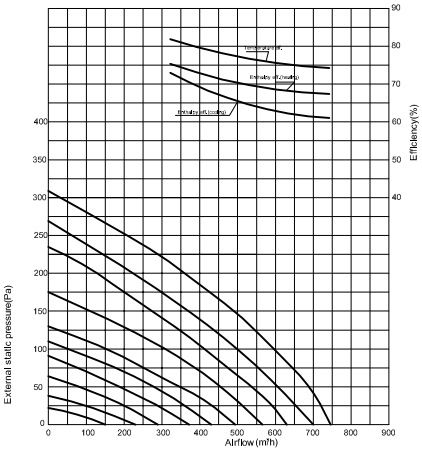

CH-HRV3.5KDC Perfomance Chart



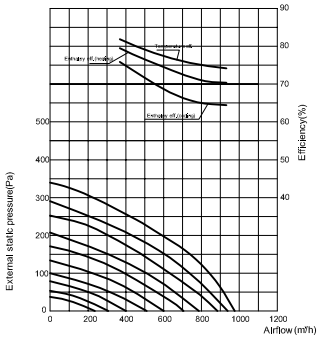

CH-HRV5KDC Perfomance Chart



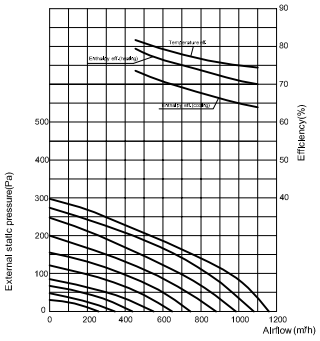

CH-HRV6.5KDC Perfomance Chart



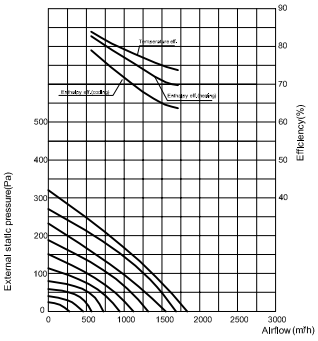

CH-HRV8KDC Perfomance Chart




CH-HRV10KDC Perfomance Chart




CH-HRV15KDC Perfomance Chart




CH-HRV20KDC Perfomance Chart