Energy Recovery Ventilator

Technical Manual

EVASLIM 75

Models

EVAS200 HA | EVAS300 HA | EVAS400 HA | EVAS600 HA

EVAB800 HA | EVAS1000 HA | EVA1300 HA

CE Padrão Executivo: EN13141-7-2010

Contents

1.General Information

1.1 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 potencial 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 sho.
	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			

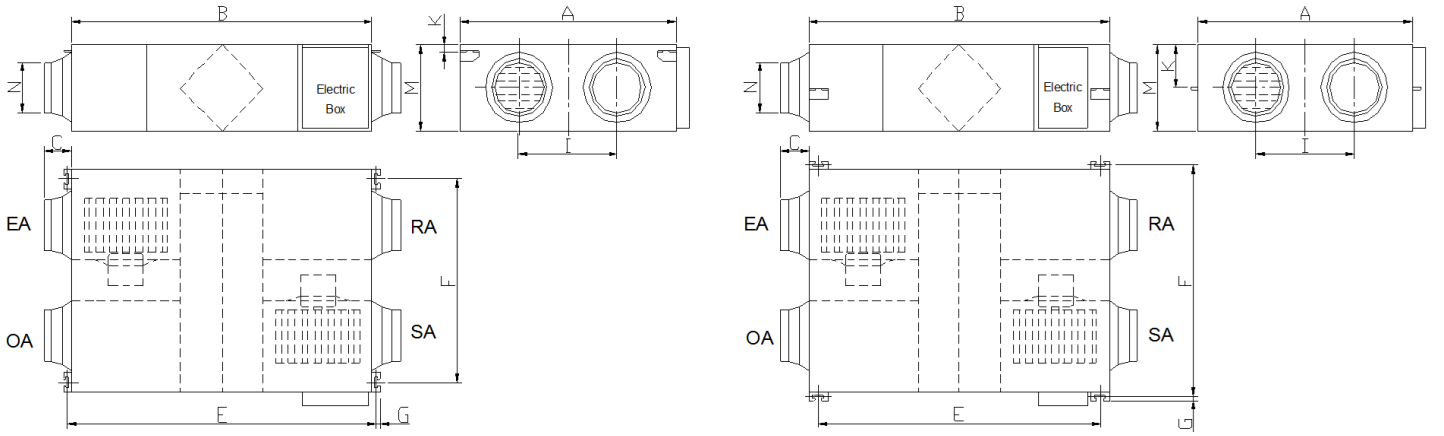
	Power cable and wires must be installed by a qualified electrical engineer. Improper connection can cause over heating. Fire and loss of efficiency.		To avoid condensation, insulation should be fitted to fresh air ducts. Other ducting may also require insulation depending on dew point conditions.
	Insulation 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.

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.

2. Specifications

Model			EVAS 200 HA	EVAS 300 HA	EVAS 400 HA	EVAS 600 HA	EVAS 800 HA	EVAS 1000 HA	EVAS 1300 HA
Airflow	(m3/h)	L	150	250	350	500	700	900	1000
		M	200	300	400	600	800	1000	1300
		H	200	300	400	600	800	1000	1300
External pressure	(Pa)	L	60	75	80	89	92	80	75
		M	70	82	85	92	96	85	85
		H	75	85	88	97	100	86	90
Enthalpy Eff.(%)	Arrefecimento	L	60	62	62	63	57	60	58
		M	55	57	57	59	55	58	56
		H	55	57	57	59	5	58	56
	Aquecimento	L	63	65	65	67	63	64	62
		M	59	61	60	61	57	62	59
		H	59	61	60	61	57	62	59
Temp.Eff	%	L	75	73	74	76	74	76	76
		M	70	68	69	70	68	70	70
		H	70	68	69	70	68	70	70
Noise	dB(A)	L	25	27	31	29	34	34	38
		M	30	34	37	35	39	38	41
		H	31,5	34,5	37,5	39	41	42	43
Voltage (V)			220	220	220	220	220	220	220
Current (A)			0,5	0,56	0,72	0,96	1,7	2.1	3.4
Input Power (W)			105	117	150	200	355	440	710
Net Weight (KG)			23	25	31	36	60	70	79

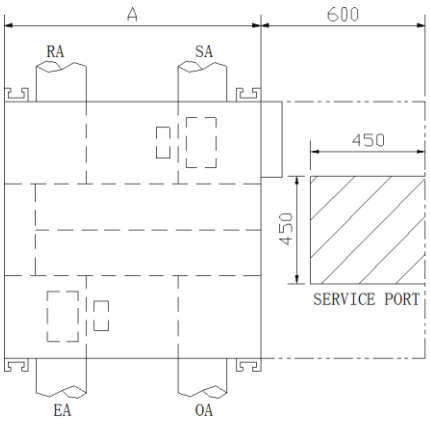
3. Dimensioned Drawings

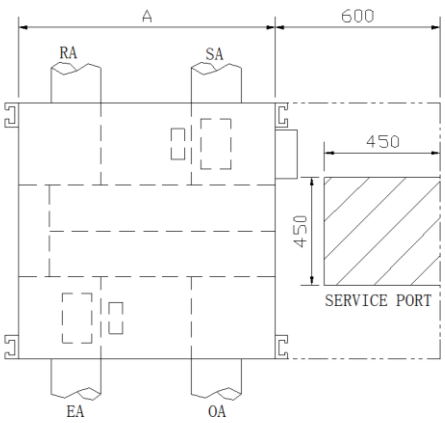


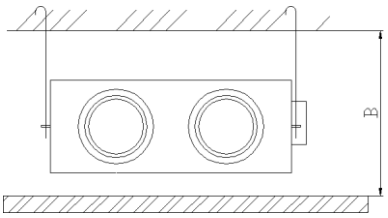
Model	A	B	C	E	F	G	I	K	M	N
EVAS200 HA	580	666	100	725	510	19	290	20	264	ϕ144
EVAS300 HA	599	744	100	675	657	19	315	111	270	Φ144
EVAS400 HA	804	744	100	675	862	19	480	111	270	Φ144
EVAS600 HA	904	824	107	754	960	19	500	111	270	ϕ194
EVAS800 HA	884	1116	85	1045	940	19	428	170	388	ϕ242
EVAS1000 HA	1134	1116	85	1045	1190	19	678	170	388	ϕ242
EVAS1300 HA	1216	1129	85	1059	1273	19	621	170	388	ϕ242

4. 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.



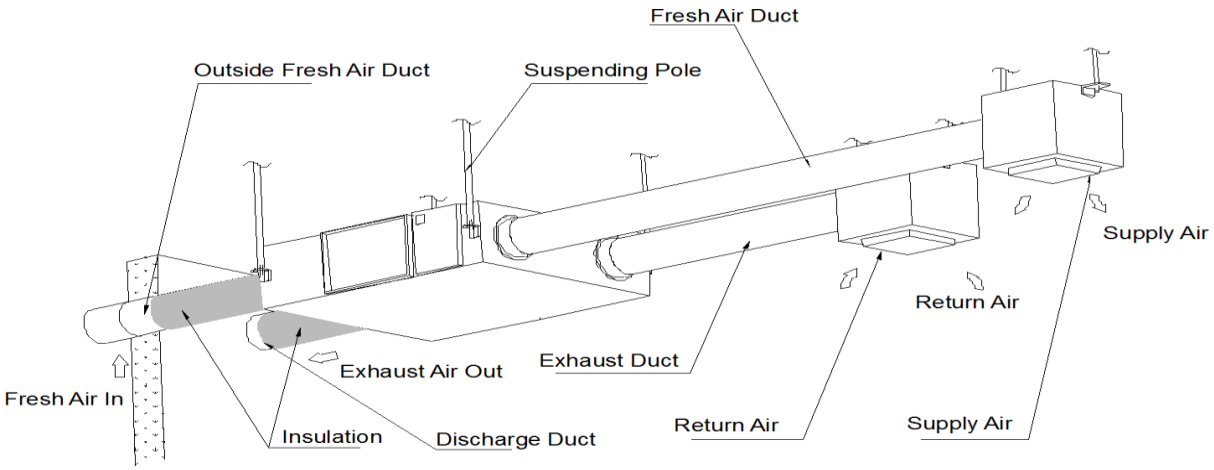




Model	A	Teto internoaltura B
EVAS200 HA	580	320

Model	A	Teto interno altura B
EVAS300 HA	599	320
EVAS400 HA	804	320
EVAS600 HA	904	320
EVAS800 HA	884	450
EVAS1000 HA	1134	450
EVAS1300 HA	1134	450

4.1 Installation Diagram



4.2 Physical Installation

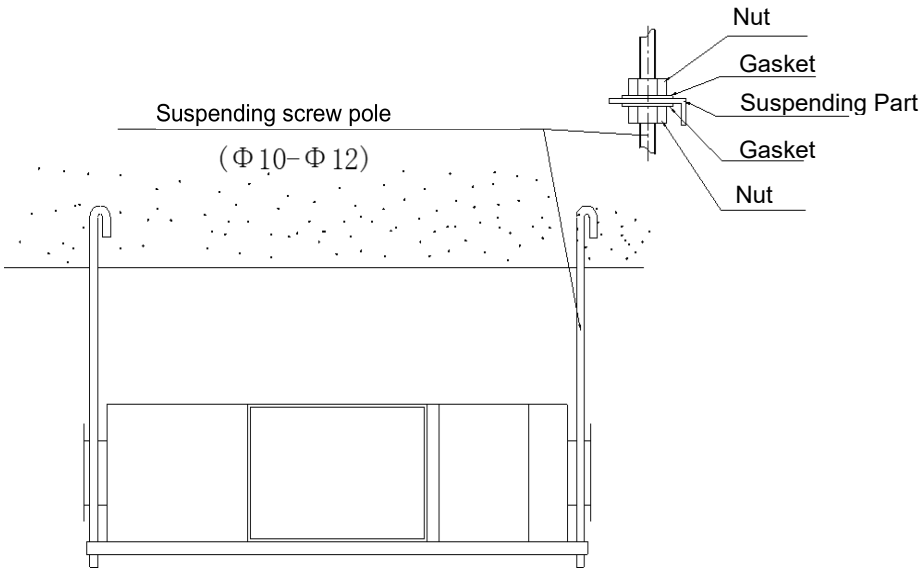
1. Installer to prepare suitable threaded hangers with adjustable nuts and gaskets.

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..



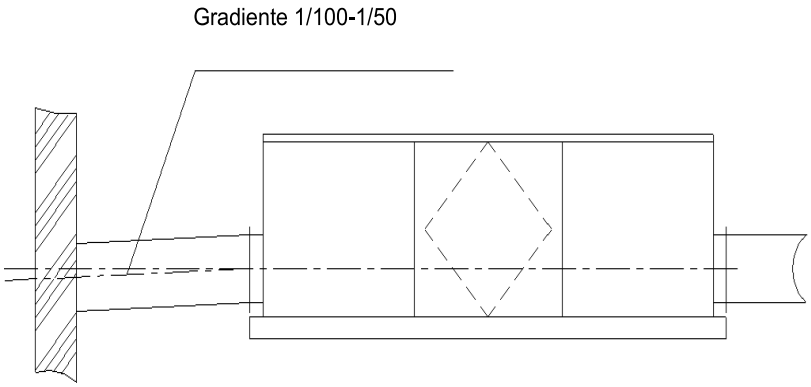
4.3 Ducting

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.

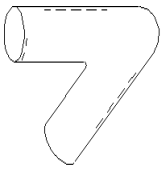
Material: glass cotton, Thickness: 25mm



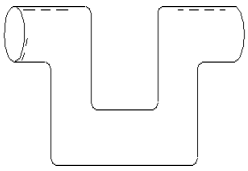
1. Be sure the ceiling height is no less than the Figures in above table B column.

2. Unit must not be installed close to boiler flues.

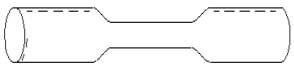
3. Following phenomenon should be avoided in the ducting installation.



Serve bends



Multiple direction changes



Multiple reducers/ crimped duct

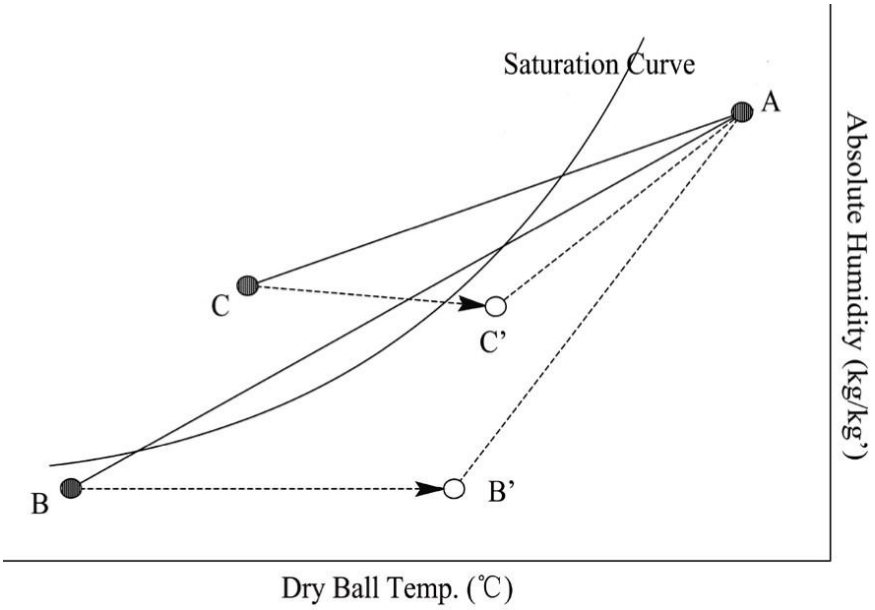
4. Exessive use of flex-duct and long flex-duct runs should be avoided.

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.

5. 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.

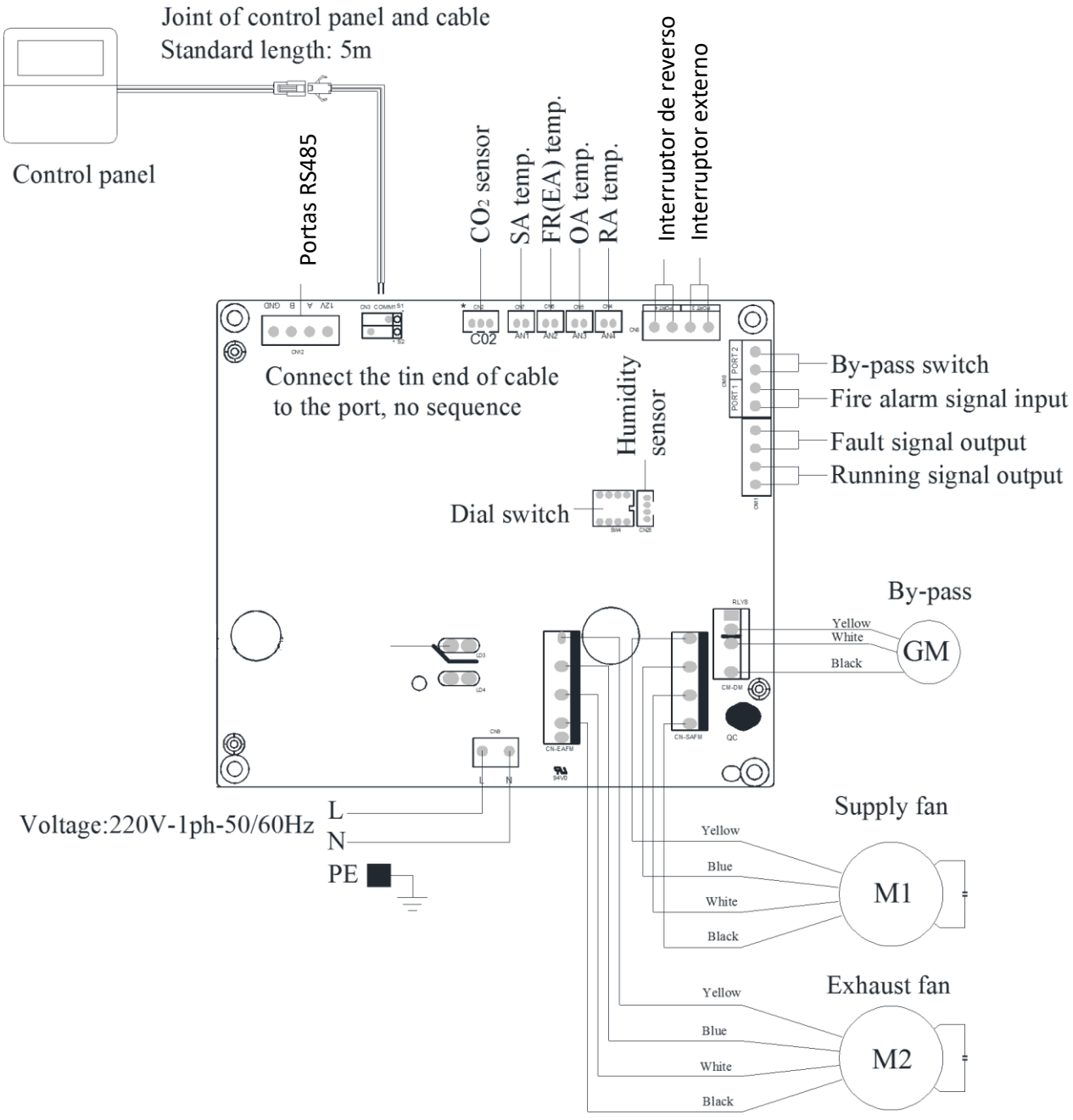
Modelo	Spec. of power supply cable	Spec. of normal controller cable
EVAS200 HA	2 x 1,5 mm2	2×0,5∽1mm2
EVAS300 HA		
EVAS400 HA		
EVAS600 HA		
EVAS800 HA		
EVAS1000 HA		
EVAS1300 HA		

Warning

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

Model	**Capacitor**		**Power Supply**	**Control Panel Model**
EVAS200 HA / EVAS300 HA	1,5µF		220V/1Ph/50Hz	Touch screen controller
EVAS400 HA	3µF	450 V CA		
EVAS600 HA	3,5µF	450 V CA		
EVAS800 HA	8µF	450 V CA		
EVAS1000 HA	10µF	450 V CA		
EVAS1300 HA	7µF	450 V CA		

6. Wiring Diagrams



7. Commissioning

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

1. Press button ⏻ to turn on/off the ventilator.

2. Match the correct fan speed displayed on touch screen controller to ERV. Press MODE for 6 seconds to enter parameters setting and at this time the parameter number is shown in the middle of the screen, press button SET to switch to parameter No. 23 (refer to parameters list in comming page) then press MODE shortly to enter the parameter setting, default value “0” flesh at the top right corner, press UP and DWON buttons to change the value be “1 (3 speeds control)” then press button again to confirm setting..

3. Then check the mode and fan speed switch. Press button MODE shortly to switch to OA, RA, SA or EA mode, check whether the temperature of the corresponding mode is correct. Under SA or RA mode, Press ▼ ▲ to switch the fan speed, check if the airflow is adjusted corresponding to H speed, M speed and L speed.

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 present OA temperature is among 19-21C, then bypass will open automatically. If the OA temperature is not within 19-21C, say 18C, then press button MODE more than 6 seconds to enter the parameter setting. Press SET button to switch to parameter number 02, default value 19 flashes shown at the top right corner ,then press MODE button shortly to enter setting, by pressing ▼ ▲ buttons and set the value to be “X”, “X” should be less than 18C (present OA temperature), then press SET again to confirm. with the same way to set parameter number 03 value to be “Y”, if “X” < OA temperature < “X+Y”. then bypass will open automatically, after bypass open, user can adjust the values under parameters 2 and 3 to make OA<“X” or OA>“X+Y”, then bypass will close automatically, please pay attention that bypass open/closed will be around 1 minute delayed.

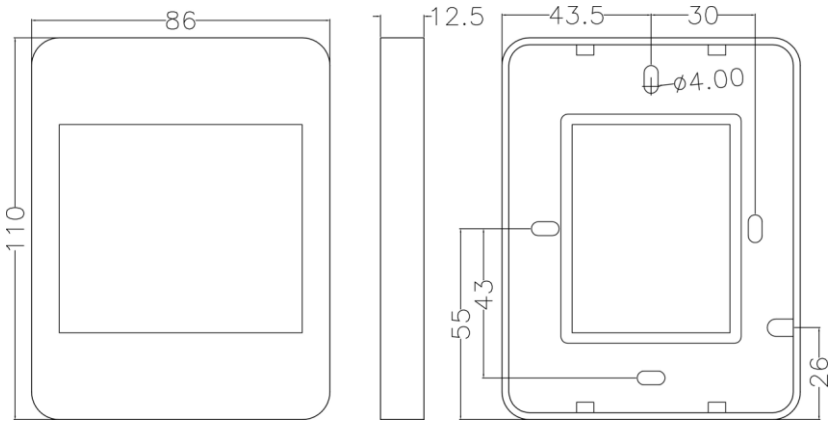
Warning			
	Loose or incorrect wiring connection can cause explosion or fire when the unit starts to work. Use only rated power voltage.		Don’t put fingers or objects into vents of fresh air or exhaust air supply. Injury may be caused by the rotation of the impeller.
	Don’t install, move or re-install 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 applianc.
	Clean the filter regularly. A blocked filter may result in poor indoor air quality.		

8. Touch Screen Intelligent Controller

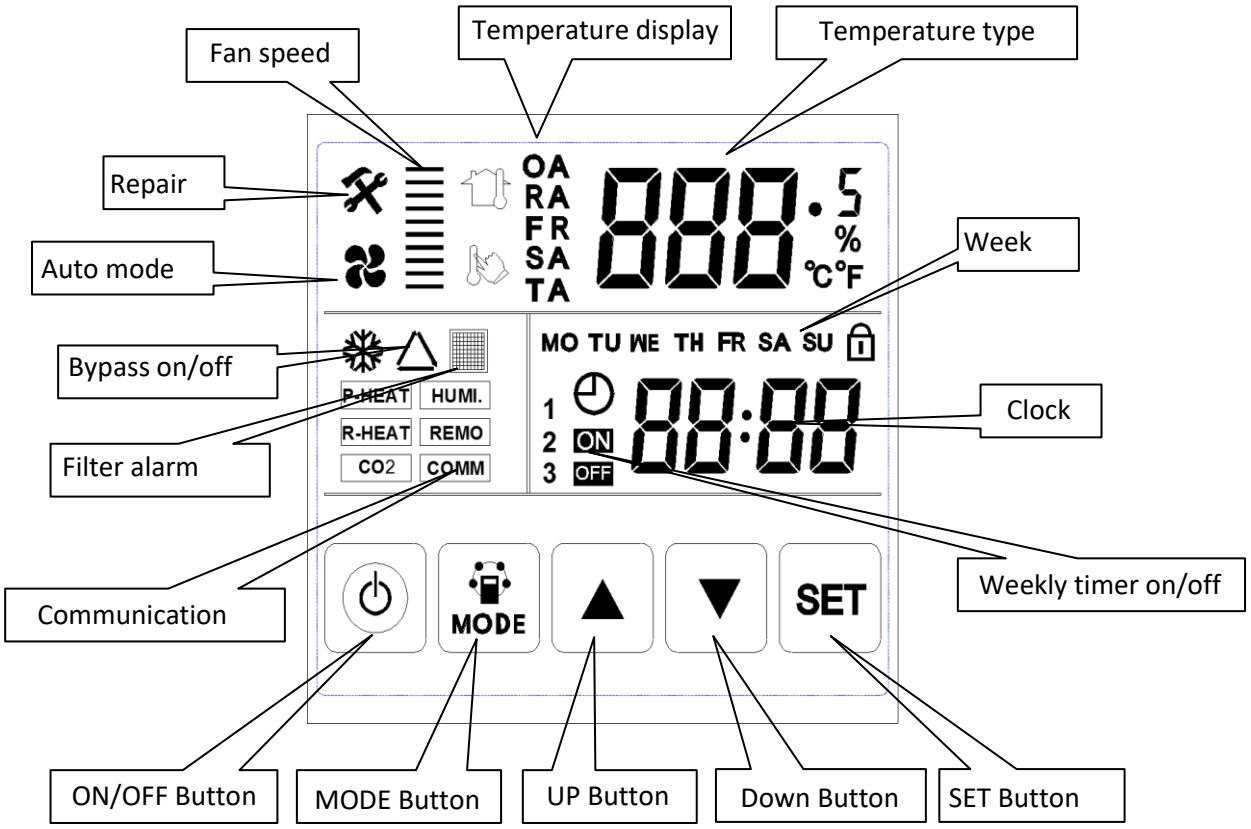
8.1 Control Panel

The intelligent controller is surface mounted and comes with a touch screen LCD display screen.

The standard connection cable is 5 meters, but you can prepare extra cable if necessary.

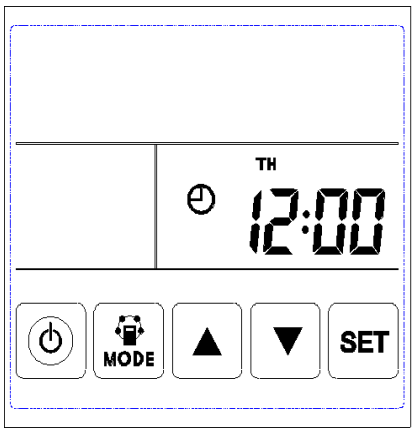


8.2 Display screen and Buttons

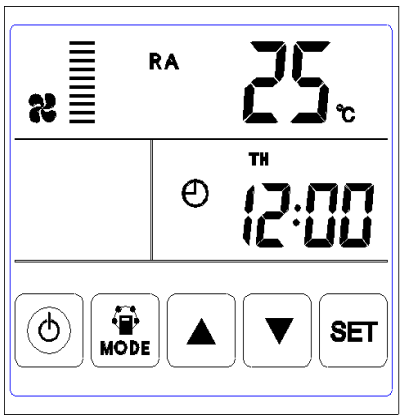


9. Touch Screen Controller Instructions

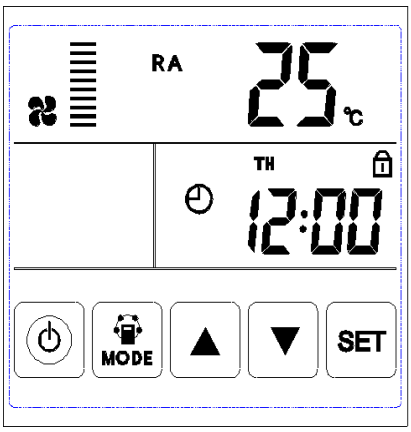
1. ON/OFF: press ON/OFF button once for starting; twice for closing. In ON status, backlit LCD display lights up, in OFF status, backlit LCD display off, without operation for 30 seconds, backlit LCD display off too. By pressing ON/OFF button for around 6 seconds can lock and unlock the controller.



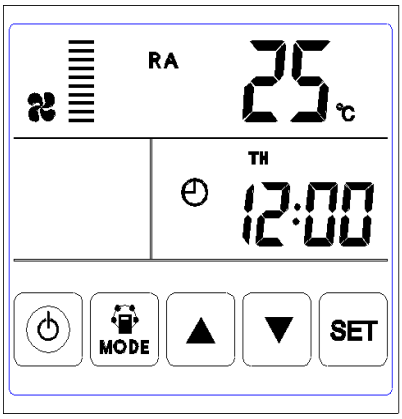
OFF state



ON state

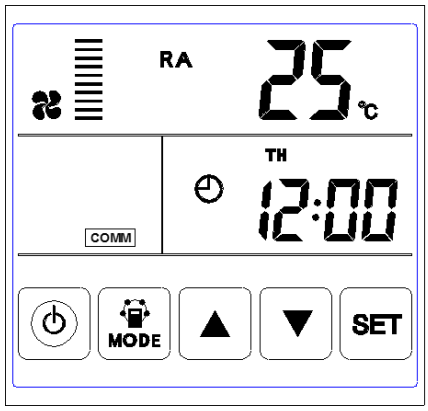


Lock state

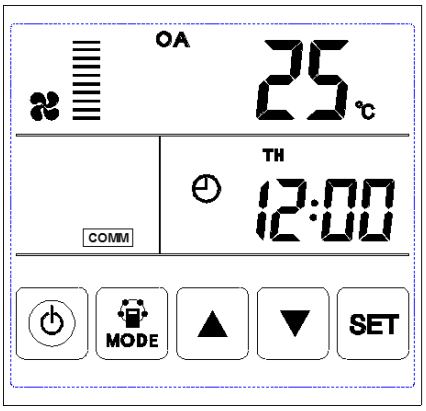


Unlock state

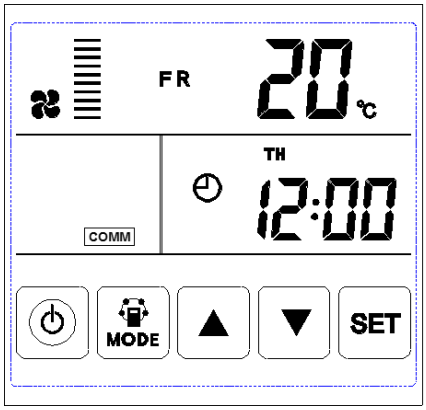
2. Modo switch: press MODE button to choose display the RA-AO-FR(EA)-SA Setting-CO2 status or Humidity control status.



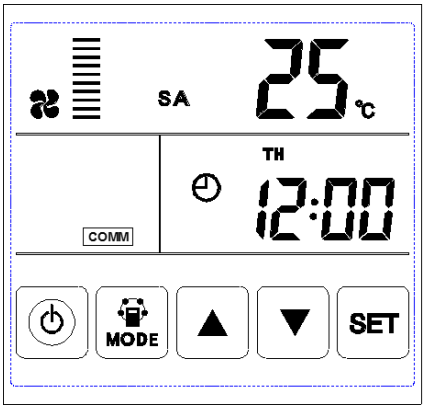
RA temperature



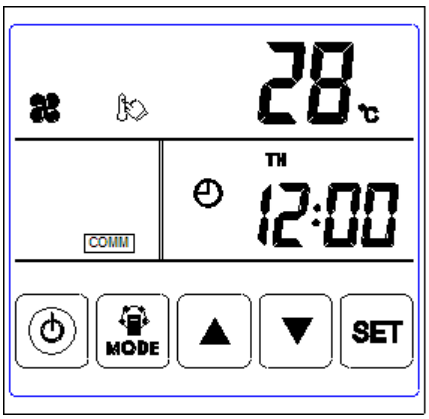
OA temperature



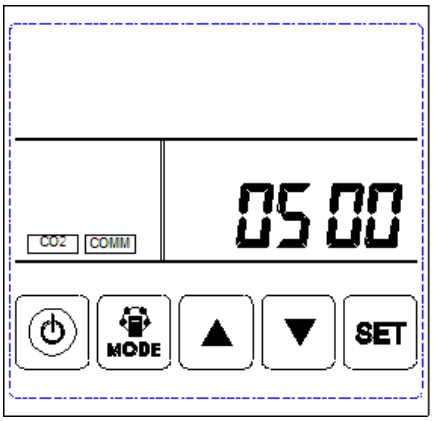
FR temperature



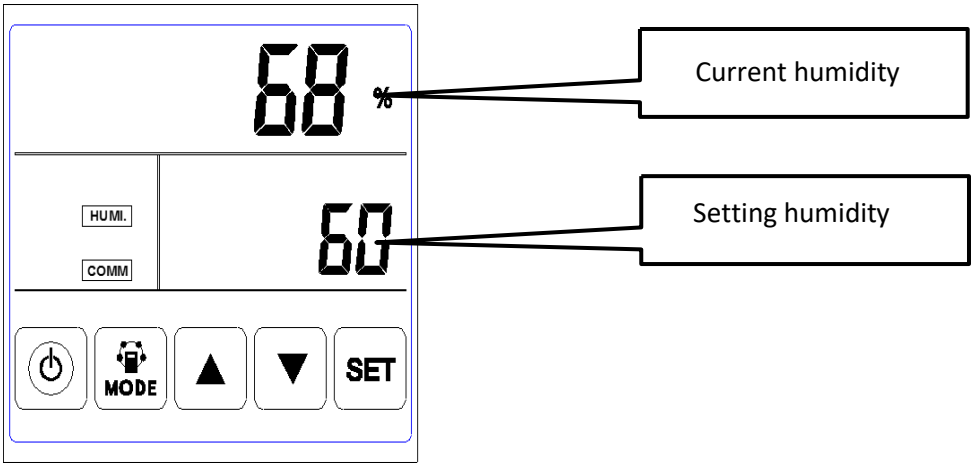
SA temperature



SA temperature setting



CO2 concentration



Humidity control

Remark:

1) Under SA setting mode, after connecting the electrical heater to the PCB (LD3 and LD4) and change parameter 01 to value 1, users can set the supply air temperature by pressing up and down button. The setting temperature range is 10-25oC.

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

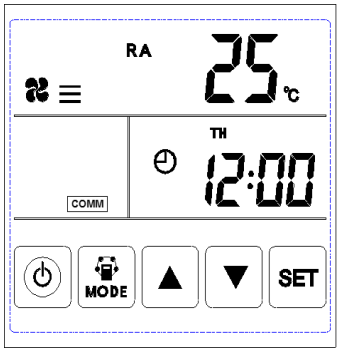
B) Setting temperature minus SA temperature ＞5℃, 1st and 2nd stage heater on

2) The CO2 symbol appears when the CO2 sensor is connected. ERV runs at boost speed when CO2 concentration higher than setting value.

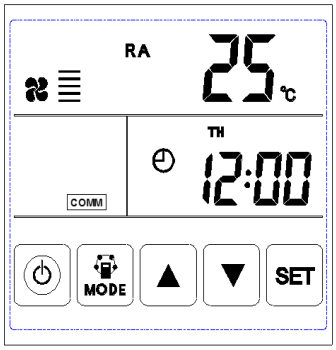
3) The humidity symbol appears when the “temperature and humidity sensor” is connected. ERV runs at boost speed when humidity higher than setting value.

Under “humidity control” mode, users can set the setting humidity by pressing up and down button. The setting range is 45% ~ 90%. And the Dial switch SW4-3 on the PCB should be switched ON to switch from CO2 control function to humidity control function.

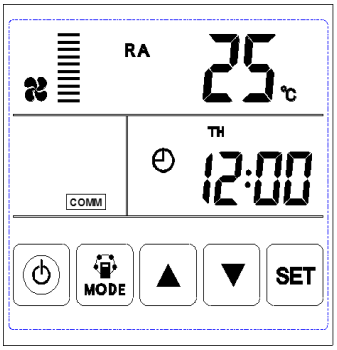
3. Air volume setting: Under SA or RA temperature interface. Users can set the return air volume in “RA” status, and set the supply air volume in “SA” status by pressing up and down button. Totally 3 speeds control.



Low speed

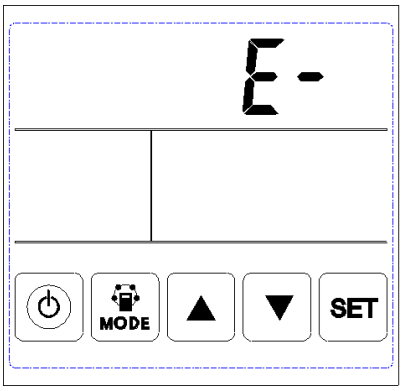


Middle speed

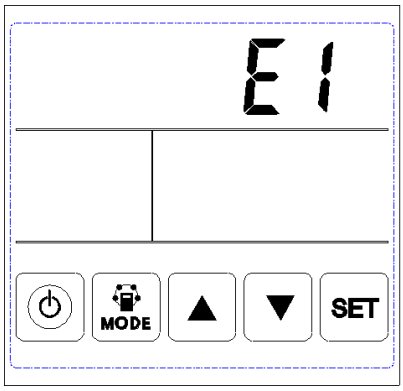


High speed

4. Error code checking: under the main interface, press the SET button for short, user can check the error code of ventilator, refer to below table.



No Error

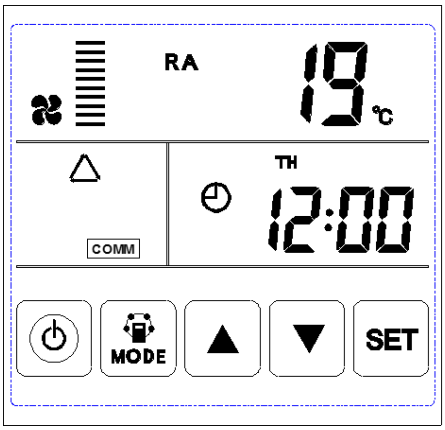


Error alarm

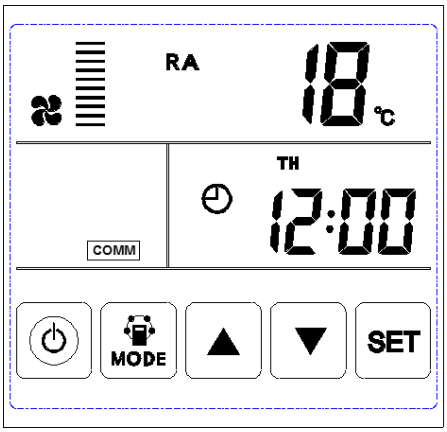
Code	Error
E1	Fresh air temperature sensor error
E2	EEPROM error
E3	Return air temperature sensor error

E4	Exhaust air temperature sensor error (defrosting temperature error)
E5	Communication error
E6	Reserved

5. **Bypass setting:** when bypass is on, the triangle bypass symbol appears, when bypass is off, the symbol disappears, please refer to page 15 commissioning part for the detailed setting introduction.

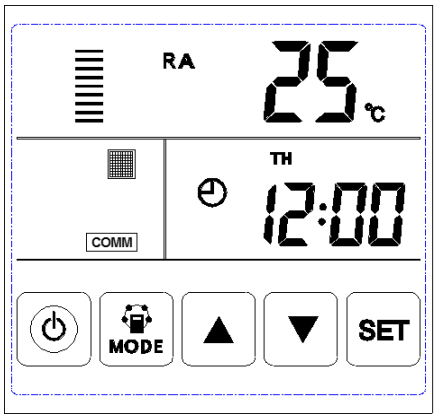


Bypass On

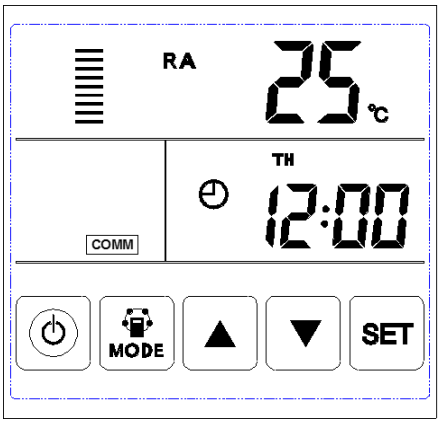


Bypass Off

6. **Filter alarm:** When running time of ventilator is over the setting filter alarm time, the filter alarm symbol flashes to remind user clean/replace the air filters. After filters being cleaned/replaced, please sweep the filter alarm by setting parameter Number 24, value 1.

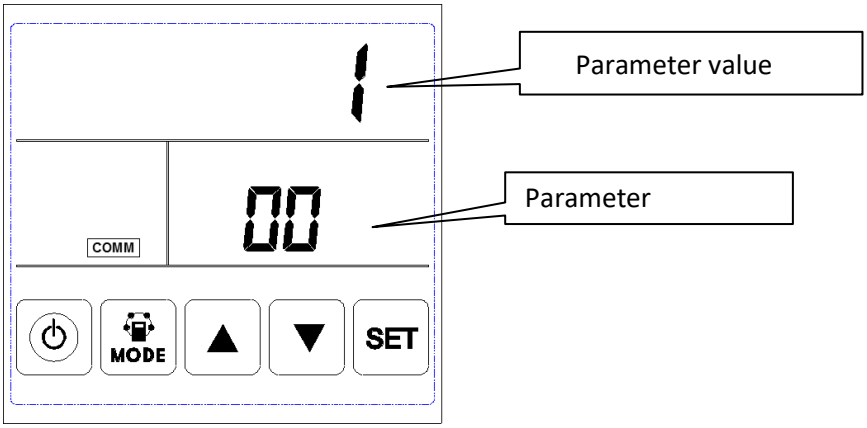


Filter alarm on



Filter alarm off

7. Parameters setting: Keep pressing the MODE button for 6 seconds, after buzzing to enter the parameter setting interface.



After entering the parameter setting interface, press SET button shortly to change the parameter number, every pressing will make parameter value +1 (until number 24 then repeat again). After choosing the correct parameter number, press Mode button for short, parameter value flashes at the top right corner, at this time to change the value by UP and DOWN buttons. After parameters setting then press SET button to save.

Attention:

1) After parameters setting, system need around 15 seconds to record, during this period power should not be off.

2) Please refer to below valid parameters table to set the suitable parameters according to different requests.

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	00-250	00 (off)	X10PPM	Main control
08	ModBus/ERV ID address	1-16	1		Main control
21	Air speed mode selection (valid for DC motors only)	0-7	0		Main control
22	Reserved	0-4	0		Main control
23	Fan speed display selection	0: 2 speed (HL) 1: 3 speed (HML) 2: 10 speed (DC fan)	1		
24	Multiple function setting	0: Reserved 1: Filter alarm clearance 2: Weekly timer clearance	0		
25	Filter alarm timer	0: 45 days 1: 60 days 2: 90 days 3: 180 days	0		Controlo principal

Instruction of Parameter Settings

1) Parameter 00 refers to power to auto restart.

0: Invalid, 1: Valid

2) Parameter 01 refers to Supply air electrical heater function

0: Not available 1: Available

When connecting with supply air electrical heater, user should choose 1 to activate the electrical heater, and under the SA temperature setting interface (see page 17), the SA temperature can be set by pressing up and down button. The setting temperature range is 10-25℃.

3) Parameter 02-03 refers to automatic bypass function

The bypass is opened on the condition that the outdoor temperature is equal or higher than X (parameter 02) and less than X+Y (parameter 03). Bypass is closed on other conditions.

4) Parameter 04-06 refers to automatic defrost function

When EA side of heat exchanger temperature lower than –1℃(defrosting entering temperature, parameter 05) and last for 1 minute, and the interval of defrosting is longer than 30 minutes (parameter 04), 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 (parameter 06).

5) Parameter 07 refers to CO2 concentration control function (optional)

After connecting the optional CO2 sensor, the CO2 symbol will display on the screen. If CO2 concentration is higher than setting value, then ERV runs at high speeds automatically, after CO2 concentration is lower than setting value, then ERV returns back to the previous status (stand by, low speed or medium speed), if the ERV is already in high speed when CO2 concentration higher than setting value, then ERV keeps the high speed running.

6) Parameter 08 refers to the central control function to identify the address of ERV.

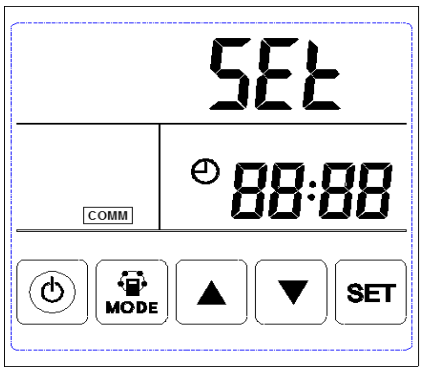
7) Parameter 23 refers to the fan speed display, for the ERV with AC motor, user should change value from 0 to 1 for three speed control.

8) Parameter 24 refers to clear filter alarm and weekly timer setting.

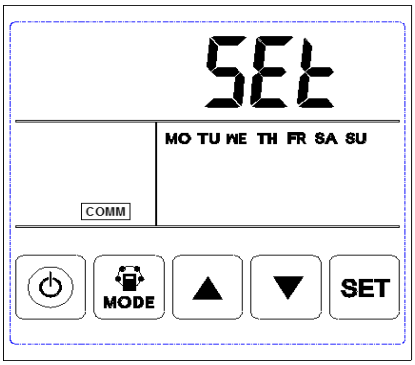
9) Parameter 25 refers to set the filter alarm timer.

8. Time setting

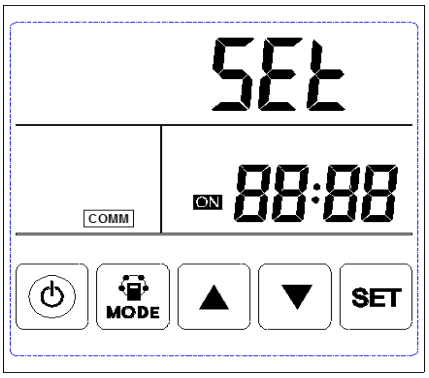
Keep pressing the SET button for 6 seconds, after buzzing to enter the time setting interface. Under this interface, press the MODE button shortly, then can switch from time setting, day setting, weekly timer on and weekly timer off setting.



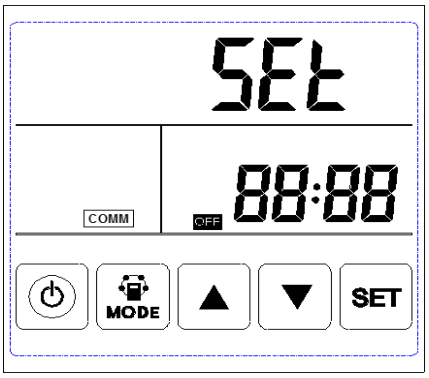
Time setting



Week setting

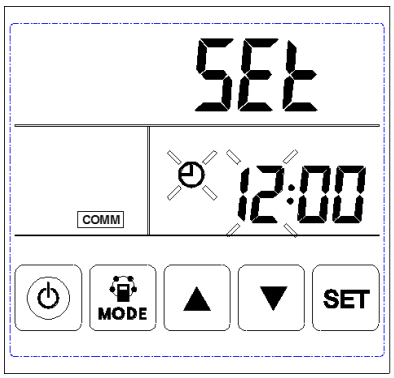


Weekly timer on

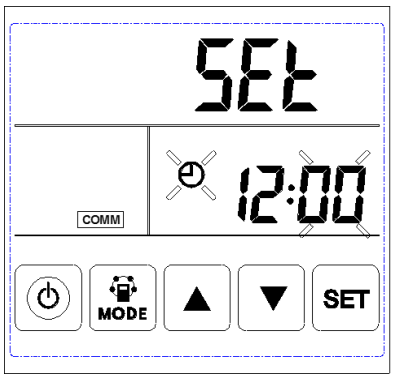


Weekly timer off

A. **Time setting:** under time setting interface, press SET button for short, at this time “hour” flashes, press UP and DOWN button to change “hour”. After setting “hour”, press MODE button for short to switch to “minute” setting, at this time “minute” flashes, press Up and Down button to change “minute”. After time setting, press SET button to save and return to the main interface.

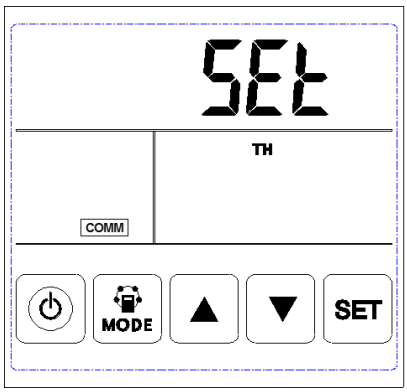


Hour setting



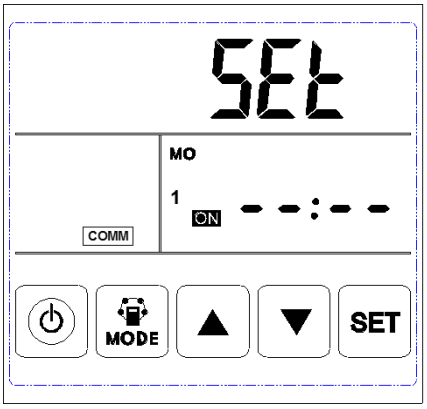
Minute setting

B. Day setting: under day setting interface, press SET button for short to begin the day setting, by pressing UP and DOWN buttons to select the correct day, after this finished, press SET button to save and return to the main interface.

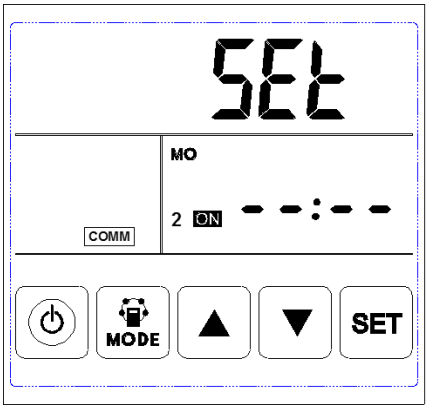


Day setting

C. Weekly timer on setting: under weekly timer on setting interface, press SET button to begin the timer on setting, press SET button time after time to select Monday period 1 to Sunday period 2 (namely Monday period 1 to Sunday period 2).

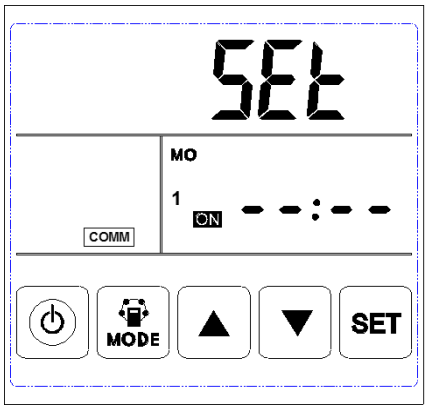


Period 1 timer on

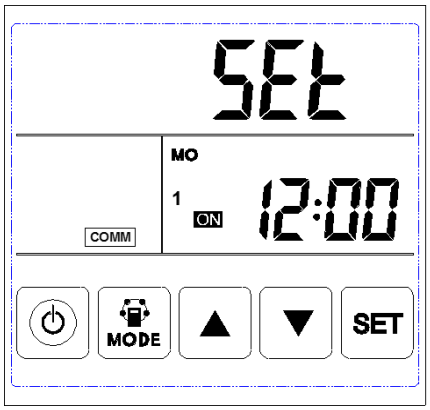


Period 2 timer on

After selecting the day, press ON/OFF button to confirm timer on is valid/invalid.

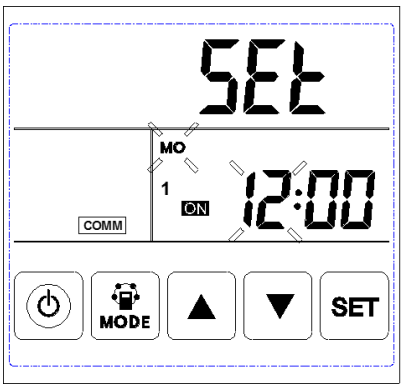


Timer on valid

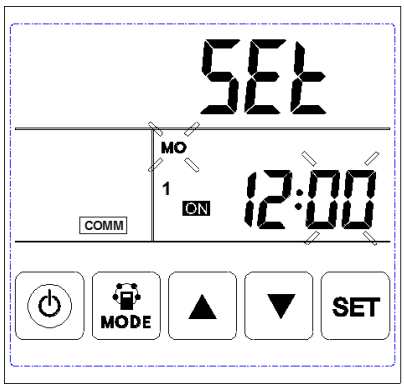


Timer on invalid

When timer on is valid, press MODE button to enter “hour” setting, by pressing UP and DOWN button to set “hour”. After “hour” setting, press MODE button to enter “minute” setting. After “minute” setting, press SET button to save and switch to the next day timer on setting, and repeat the above steps to set all days and periods timer on. After setting all the time on, press SET button to save the data.

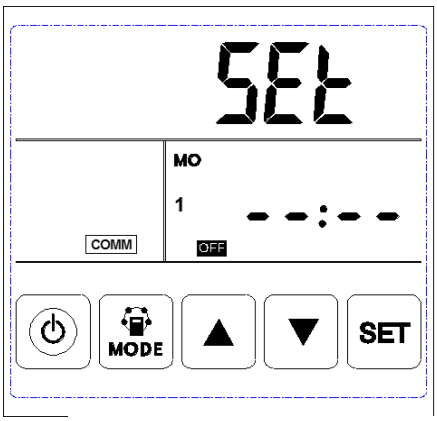


Timer on hour setting

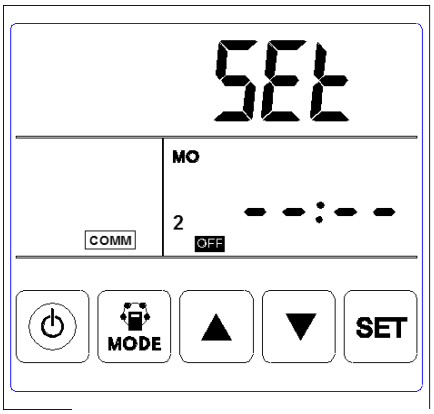


Timer on minute setting

D. Weekly timer off setting: under weekly timer off setting interface, press SET button for short to begin the timer off setting, press SET button time after time to select Monday period 1 to Sunday period 2 (namely Monday period 1 to Sunday period 1 then Monday period 2 to Sunday period 2).

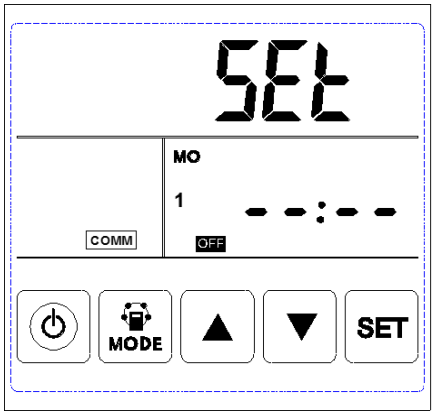


Period 1 timer off

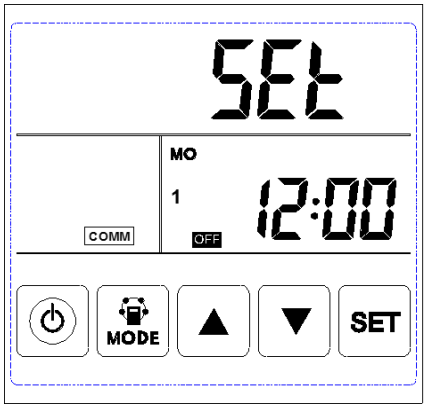


Period 2 timer off

Under the week interface, press ON/OFF button to confirm the timer off is valid/invalid.

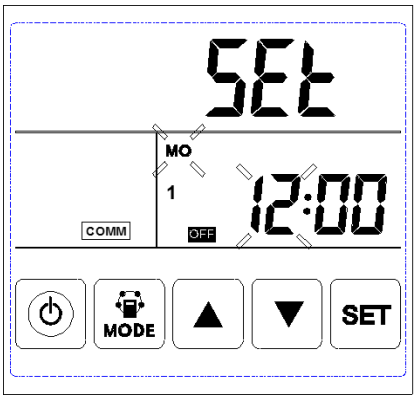


Timer off invalid

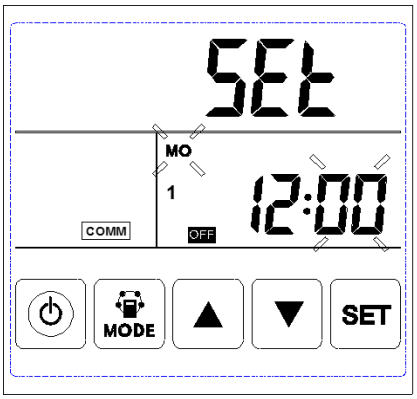


Timer off valid

When timer off is valid, press MODE button to enter “hour” setting, by pressing Up and Down button to set “hour”, after “hour” setting, press MODE button to enter “minute” setting, after “minute” setting, press SET button to save and switch to the next day timer off setting and repeat the above steps to set all days and periods timer off. After setting all the timer off, press SET button to save the data.



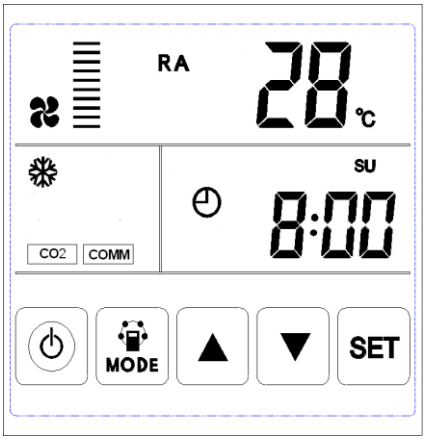
Timer off hour setting



Timer off minute setting

Attention: Under time setting, if no operation for 10 seconds, system will return to the main interface automatically.

9. Defrosting: When the ventilator is under defrosting, the defrosting symbol will show as below.



10. Humidity Control (optional function)

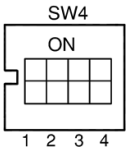
In “humidity control” status, users can set the setting humidity by pressing up and down button. The setting range is 45% ~ 90%.

In off status, current humidity is higher than setting humidity, the ventilator turns on and runs at high speed automatically. At that time, if current humidity is lower than setting humidity, the ventilator turns off.

In on status, current humidity is higher than setting humidity, the ventilator runs at high speed, if the current running status is high speed, then the unit keep the current status. At that time, if current humidity is lower than setting humidity, the ventilator returns the running status before.

Introduction of dial switch

Dial switch



1. SW4-1: OFF-Tradicional EA fan defrost EA ON-AO side electrical heater defrost.
2. SW4-2: OFF-Auto by-pass and bypass via voltage free conector (free cooling)
3. SW4-3: OFF-CO2 sensor ON-Humidity and temperature sensor
4. SW4-4: Baud rate switch
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 < -15ºC, 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 <-1ºC, then the ventilator will stops for 50 minutes.

3) If the exhaust air temperature <-1ºC and the outdoor air temperature >-15ºC, the OA heater switches on for 10 minutes for defrosting.

4) If the OA heater is on and temperature of outdoor air is >+25ºC, 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 CO2 sensor. When turn to “on”, the ventilator is controlled by humidity sensor and CO2 sensor, if SW4-3 turn to “ON” but without connecting temperature sensor, then E3 error happen.
4. SW4-4 off means Baud rate=4800, On means Baud rate=9600

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

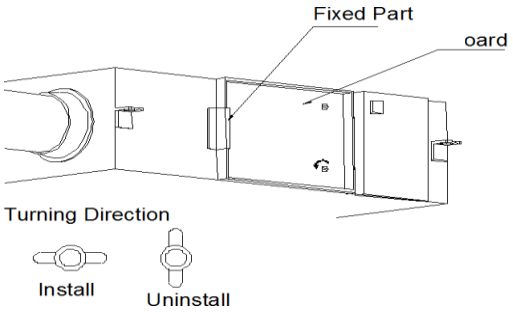
Warning

Power must be isolated before installation and maintenance to avoid injury or electricsshock. 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

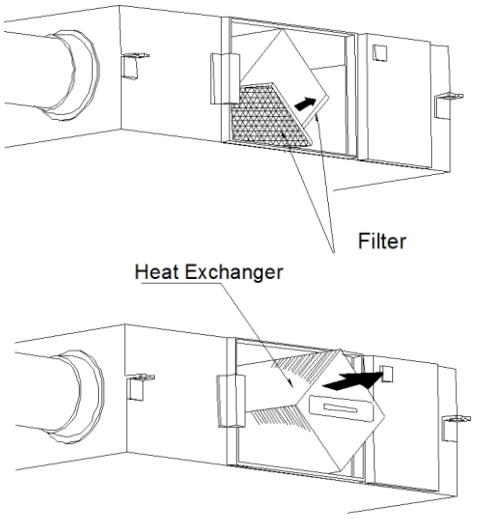
1. Open the access door
2. Remove the filters (from the side of the unit)
3. Vacuum the filters to get rid of the dust and dirt. For bad conditions dip it into water with soft wash to clean.
4. Push the filters to the positions after they get dried naturally, close the access door.
5. Change the filters 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 2. Protection breaker is cut	1. Guarantee power is on 2. Connect the breaker


coolair