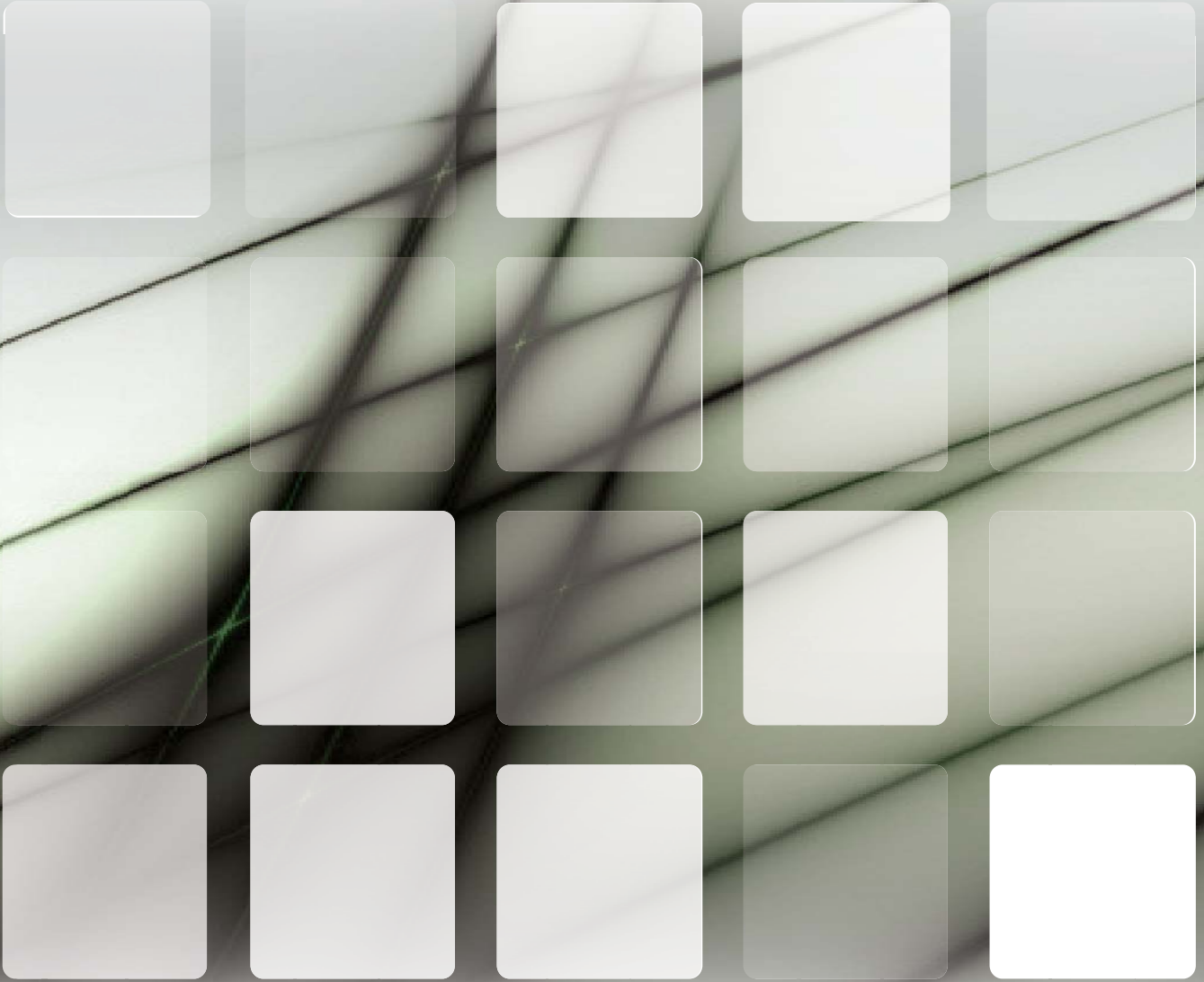


ERVD(B) -D Series

Energy Recovery Ventilator

Technical Manual

220~240V/1/50Hz



Contents

- 2. Product Schedule2**
- 3. External appearance.....2**
- 4. Features.....2**
- 5. Specifications3**
- 6. Dimensions5**
- 7. Maintenance Spaces.....7**
- 8. Wiring Diagrams7**
- 9. Electric Characteristics8**
- 10. Operation Condition Limits.....8**
- 11. Exploded View.....9**
- 12. Blast Pressure Graphic 11**
- 13. Installation..... 12**
- 14. Wiring..... 13**
- 15. Troubleshooting..... 15**
- 16. Maintenance 17**
- 17. Controller..... 18**
- 18. Accessory.....20**

2. Product Schedule

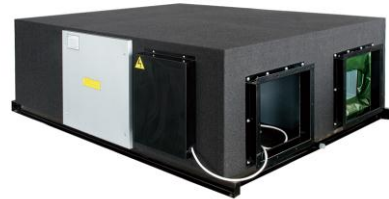
Model	Air volume	Net dimension	Net weight	Power supply
	(m ³ /h)	(L×W×H) (unit: mm)	(kg)	
ERV010A3N-DCN020	200	866×655×264	23	220V-1Ph-50Hz
ERV015A3N-DCN030	300	944×722×270	26	220V-1Ph-50Hz
ERV020A3N-DCN040	400	944×927×270	31	220V-1Ph-50Hz
ERV030A3N-DCN050	500	1038×1026×270	41	220V-1Ph-50Hz
ERV050A3N-DCN080	800	1286×1006×388	62	220V-1Ph-50Hz
ERV060A3N-DCN100	1000	1286×1256×388	79	220V-1Ph-50Hz
ERV090A3N-DCN150	1500	1600×1270×540	163	380V-3Ph-50HZ
ERV120A3N-DCN200	2000	1650×1470×540	182	380V-3Ph-50HZ

3. External appearance

ERV020, 015, 020, 030, 050, 060



ERV090, 120



4. Features

HRV (Heat Recovery Ventilator) employ advanced technique and technics, the heat exchanged core forming by special paper that be processed with chemical treatment, which could create the optimum result in temperature, humidity and cooling recovery.

High efficiency heat exchanged core: When air flow formed by exhaust air and outdoor air through the heat exchanged core in cross way, because of temperature difference in the two sides of flat partition board, the heat transmission is occurred. In summer, outdoor air acquire cooling from air exhaust to decrease environment temperature; In winter, outdoor air acquire heating from air exhaust to increase temperature, that is to say, it realizing the energy recovery during air exhaust process to exchange the heating in heat exchanged core to outdoor air.

- Energy saving

Fresh-air and exhaust air are crossed through the exchanger. Temperature exchange was happened in the heat recovery ventilator. Fresh-air can beget a great deal of energy from exhaust air.

Adopt centrifugal fan with lower power consumption and longer air supply distance; Easy control, operation friendly.

- High efficiency

Adopt high quality heat-exchange core which makes small air resistance.

Optional sprayer can increase heat-exchanger efficiency.

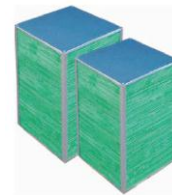
- Low noise

Add sound absorption material, quiet operation.

- Flexible multi control ways

It can be controlled together with other indoor units.

- Compact design, easy installation and maintenance.



5. Specifications

Sale Model			ERVD010A3N	ERVD015A3N	ERVD020A3N	ERVD030A3N	
Power supply			V-Ph-Hz	220V-1Ph-50Hz			
Cooling	Temp. efficiency	High	%	55	55	55	55
		Medium	%	55	55	55	55
		Low	%	60	60	60	60
	Enthalpy efficiency	High	%	50	50	50	50
		Medium	%	50	50	50	50
		Low	%	55	55	55	55
Heating	Temp. efficiency	High	%	60	60	60	65
		Medium	%	60	60	60	65
		Low	%	65	65	65	70
	Enthalpy efficiency	High	%	55	55	60	60
		Medium	%	55	55	60	60
		Low	%	60	60	65	65
Indoor fan motor	Model		YDK-10-4992A1	YDK-20-4992A2	YDK-40-4991A2T	YDK-60-4991T	
	Insulation class		B				
	Safe class		IP34				
	Input	W	20	40	80	120	
	Capacitor	uF	1.5	2	3	3.5	
	Speed	r/min	1050	1050	1150	1250	
Indoor fan	material		ABS				
	Type		Centrifugal fan				
	Diameter	mm	Φ154	Φ194	Φ194	Φ203	
	Height	mm	102	100	100	151	
Indoor static pressure and air flow	High	Pa/m ³ /h	75/200	75/300	80/400	80/500	
	Medium	Pa/m ³ /h	58/200	60/300	65/400	68/500	
	Low	Pa/m ³ /h	35/150	40/225	43/300	45/375	
Sound pressure level	Heat exchange model	High	dB(A)	27	30	32	35
		Medium	dB(A)	26	29	31	34
		Low	dB(A)	20	23	25	28
	Bypass model	High	dB(A)	28	31	33	36
		Medium	dB(A)	27	30	32	35
		Low	dB(A)	22	25	27	30
Net dimension (LxWxH)		mm	866x655x264	944x722x270	944x927x270	1038x1026x270	
Packing size (LxWxH)		mm	960x770x445	1020x810x452	1020x1020x452	1120x1120x452	
Net/Gross weight		kg	23/40	26/44	31/52	41/64	
Connection wiring	Power wiring	mm ²	2x2.5	2x2.5	2x2.5	2x2.5	
	Signal wiring	mm ²	3x0.75	3x0.75	3x0.75	3x0.75	
Controller			Wired controller				
Fresh air	Fresh Air Diameter	mm	Φ144	Φ144	Φ144	Φ194	
	Air drop	Pa	75	75	80	80	
Operating temperature range			°C -7~43 DB, 80% RH or less				

Specifications

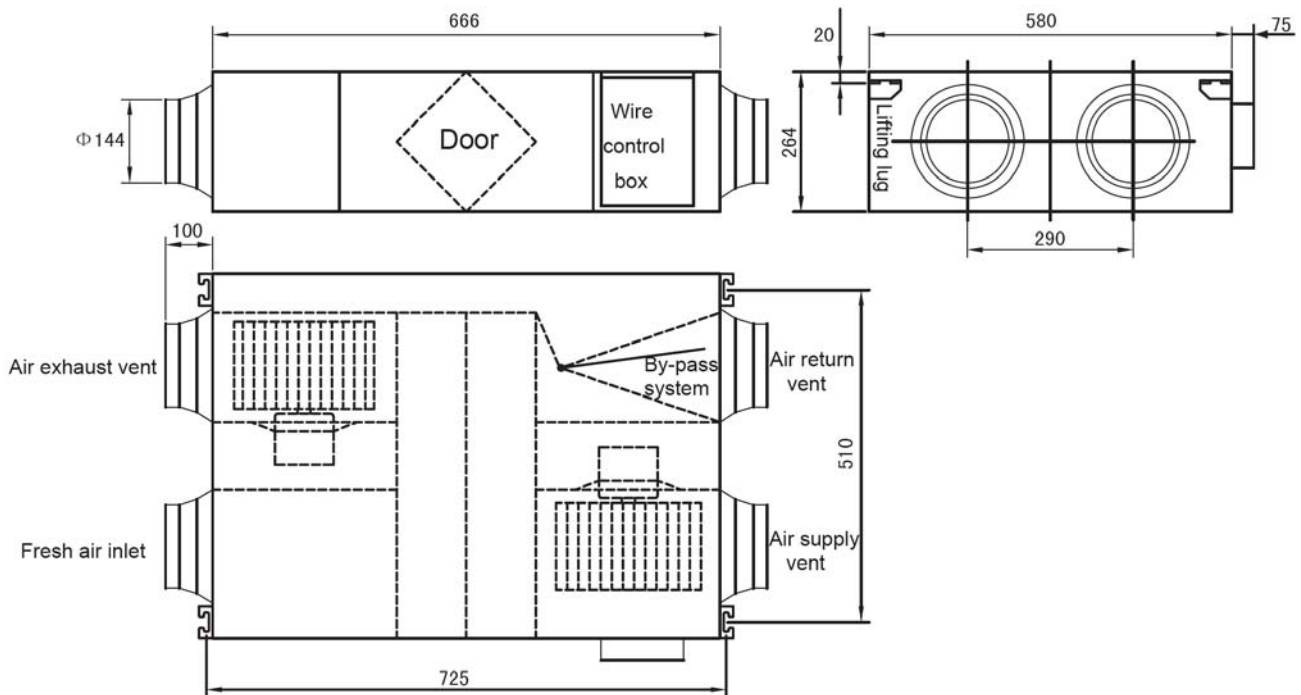
Sale Model			ERVD050A3N	ERVD060A3N	ERVB090A3N	ERVB120A3N	
Power supply			V-Ph-Hz	220V-1Ph-50Hz		380V-3Ph-50HZ	
Cooling	Temp. efficiency	High	%	55	55	55	55
		Medium	%	55	55	/	/
		Low	%	60	60	/	/
	Enthalpy efficiency	High	%	50	50	50	50
		Medium	%	50	50	/	/
		low	%	55	55	/	/
Heating	Temp. efficiency	High	%	65	65	65	65
		Medium	%	65	65	/	/
		Low	%	70	70	/	/
	Enthalpy efficiency	High	%	60	60	60	60
		Medium	%	60	60	/	/
		Low	%	65	65	/	/
Indoor fan motor	Model		YDK-180-4990B1T	YDK-180-4990A4T	SYB-250I (0.45-4)	SYB-250II (0.45-4)	
	Insulation class		B				
	Safe class		IP34		IPX4		
	Input	W	360	360	450	450	
	Capacitor	uF	8	10	-	-	
	Speed	r/min	1350	1350	1350	1350	
Indoor fan	material		ABS		metal		
	Type		Centrifugal fan				
	Diameter	mm	Φ245	Φ245	Φ234	Φ254	
	Height	mm	203	203	253	285	
Indoor static pressure and air flow	High	Pa/m ³ /h	100/800	100/1000	160/1500	170/2000	
	Medium	Pa/m ³ /h	82/800	85/1000	/	/	
	Low	Pa/m ³ /h	54/600	58/750	/	/	
Sound pressure level	Heat exchange model	High	dB(A)	39	40	51	53
		Medium	dB(A)	38	39	/	/
		Low	dB(A)	32	33	/	/
	Bypass model	High	dB(A)	40	41	52	54
		Medium	dB(A)	39	40	/	/
		Low	dB(A)	34	35	/	/
Net dimension (LxWxH)		mm	1286x1006x388	1286x1256x388	1600x1270x5	1650x1470x540	
Packing size (LxWxH)		mm	1380x1100x573	1400x1370x573	1710x1410x720	1760x1610x720	
Net/Gross weight		kg	62/88	79/110	163/224	182/247	
Connection	Power wiring	mm ²	2x2.5	2x2.5	4x2.5	4x2.5	
	Signal wiring	mm ²	3x0.75	3x0.75	3x0.75	3x0.75	
Controller		Wired controller					
Fresh air	Fresh Air Diameter	mm	Φ242	Φ242	346x326	346x326	
	Air drop	Pa	100	100	160	170	
Operating temperature range		°C	-7~43 DB, 80% RH or less				

Note:

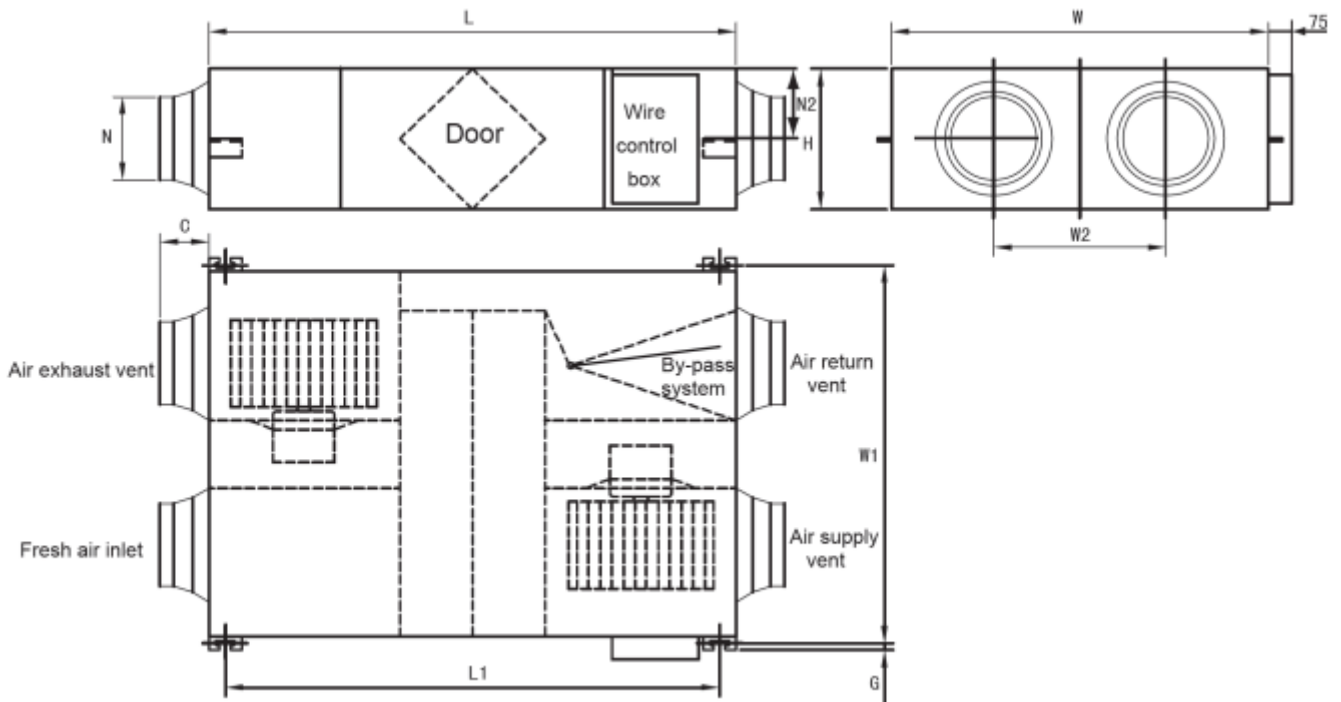
1. For the units model of ERVD010~ERVD060, there are 3-speed adjustable air-volume (Hi, Med, Low), but for the units model of ERVB090 and ERVB120, there are only 1-speed air-volume which cannot be adjust.
2. For the units model of ERVD010~ERVD060, all the parameters in the manual is measured at the high speed air-volume.

6. Dimensions

ERVD010

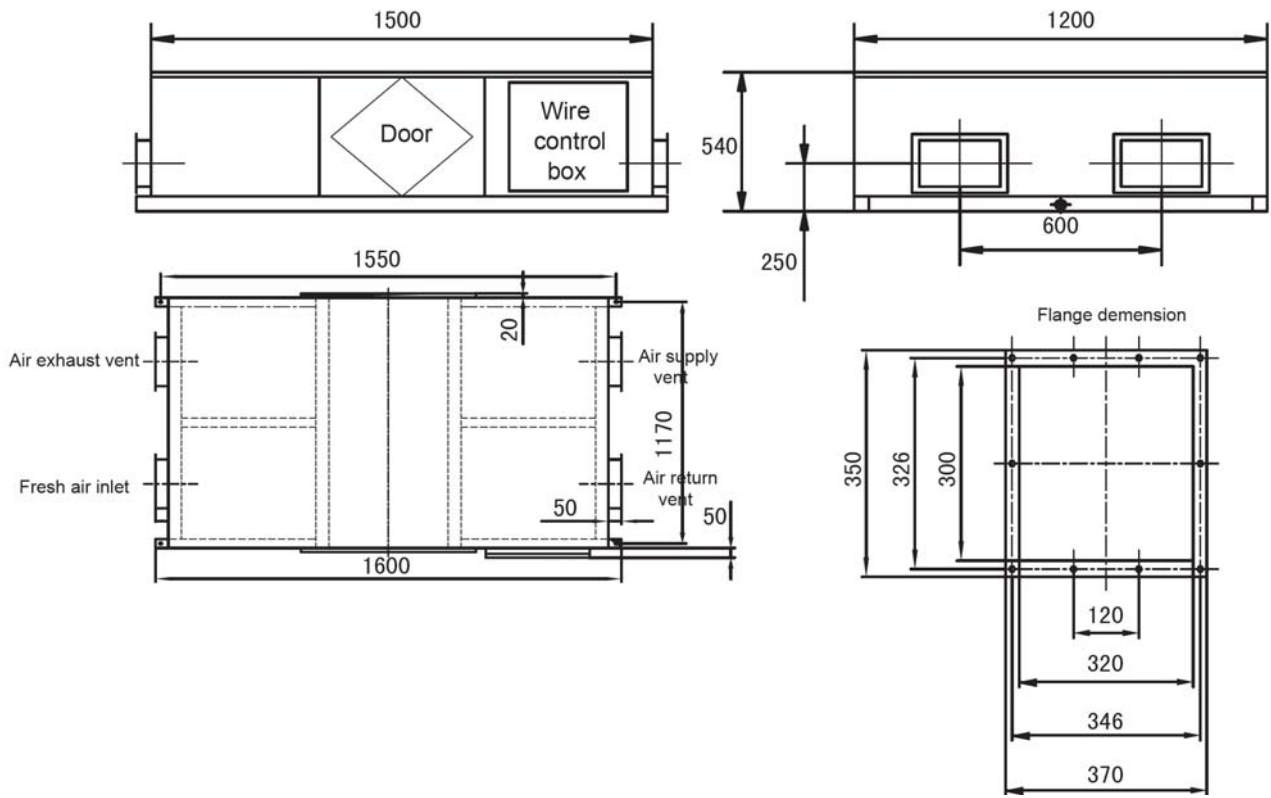


ERVD015, ERVD020, ERVD030, ERVD050, ERVD060

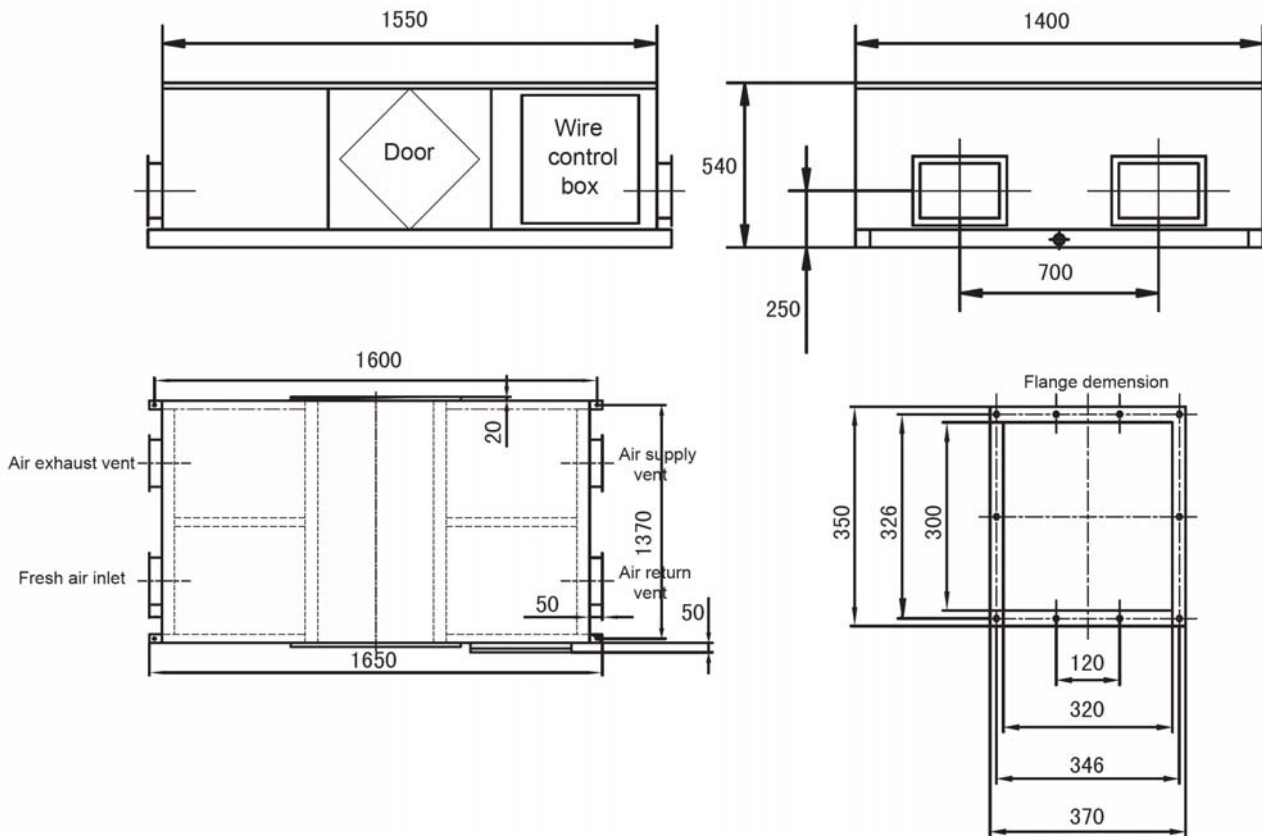


Model	L	L1	W	W1	W2	H	C	G	N	N2
ERVD015A3N	744	675	599	657	315	270	100	19	$\Phi 144$	111
ERVD020A3N	744	675	804	862	480	270	100	19	$\Phi 144$	111
ERVD030A3N	824	754	904	960	500	270	107	19	$\Phi 194$	111
ERVD050A3N	1116	1045	884	940	428	388	85	19	$\Phi 242$	170
ERVD060A3N	1116	1045	1134	1190	678	388	85	19	$\Phi 242$	170

ERVB090A3N-DCN150

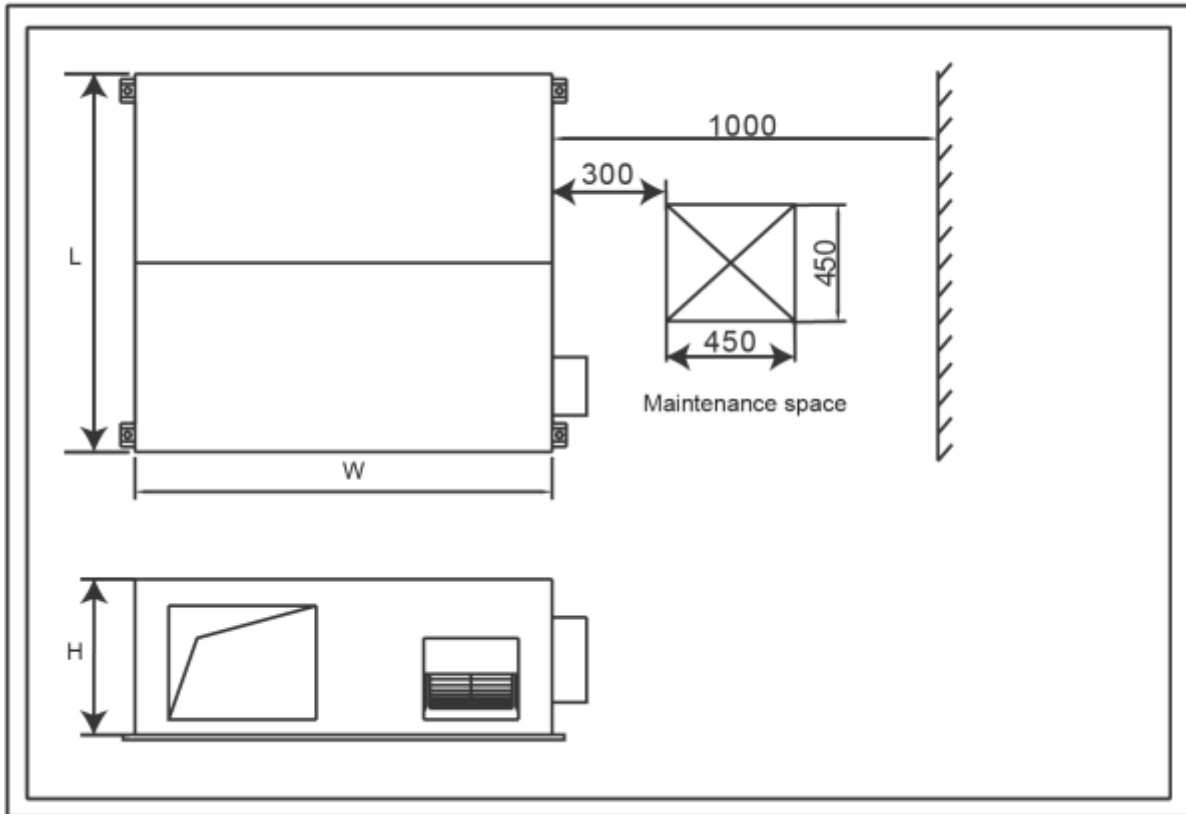


ERVB120A3N-DCN200



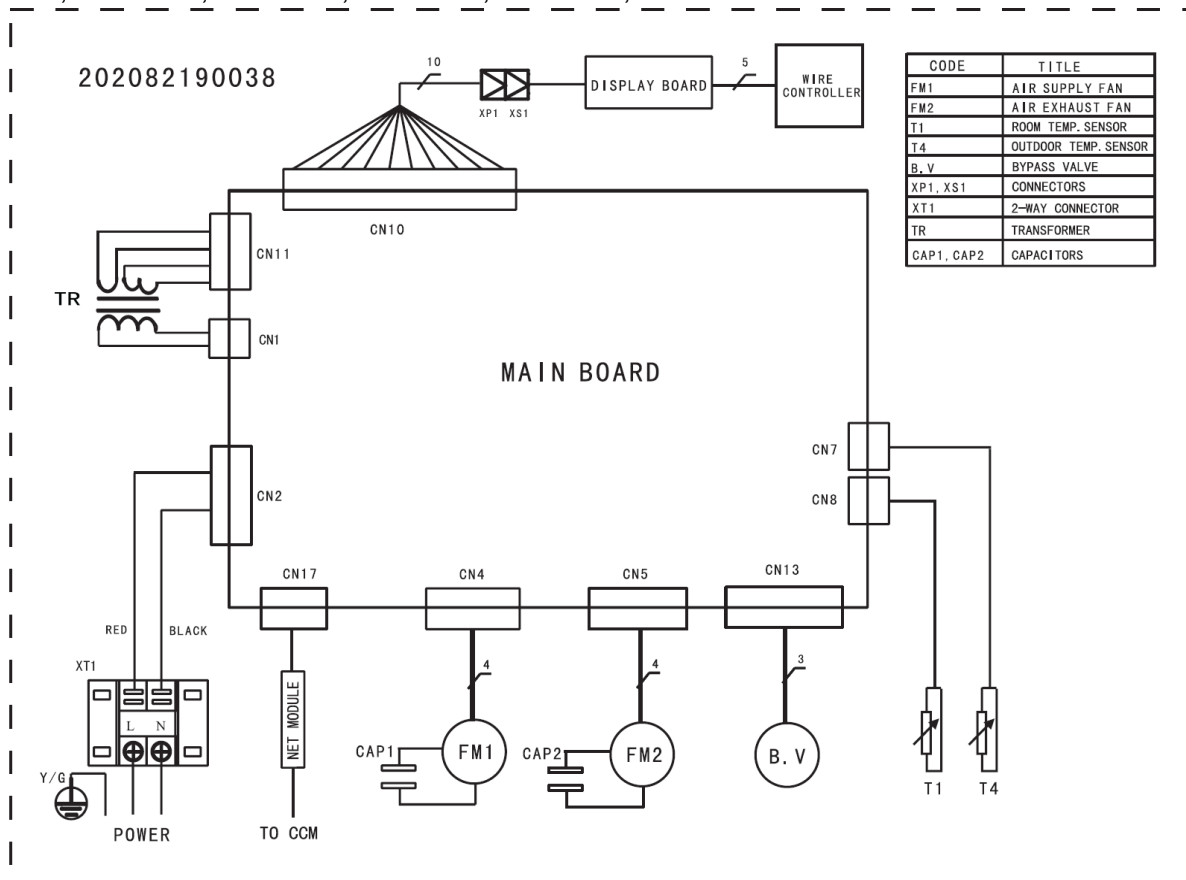
7. Maintenance Spaces

Unit: mm

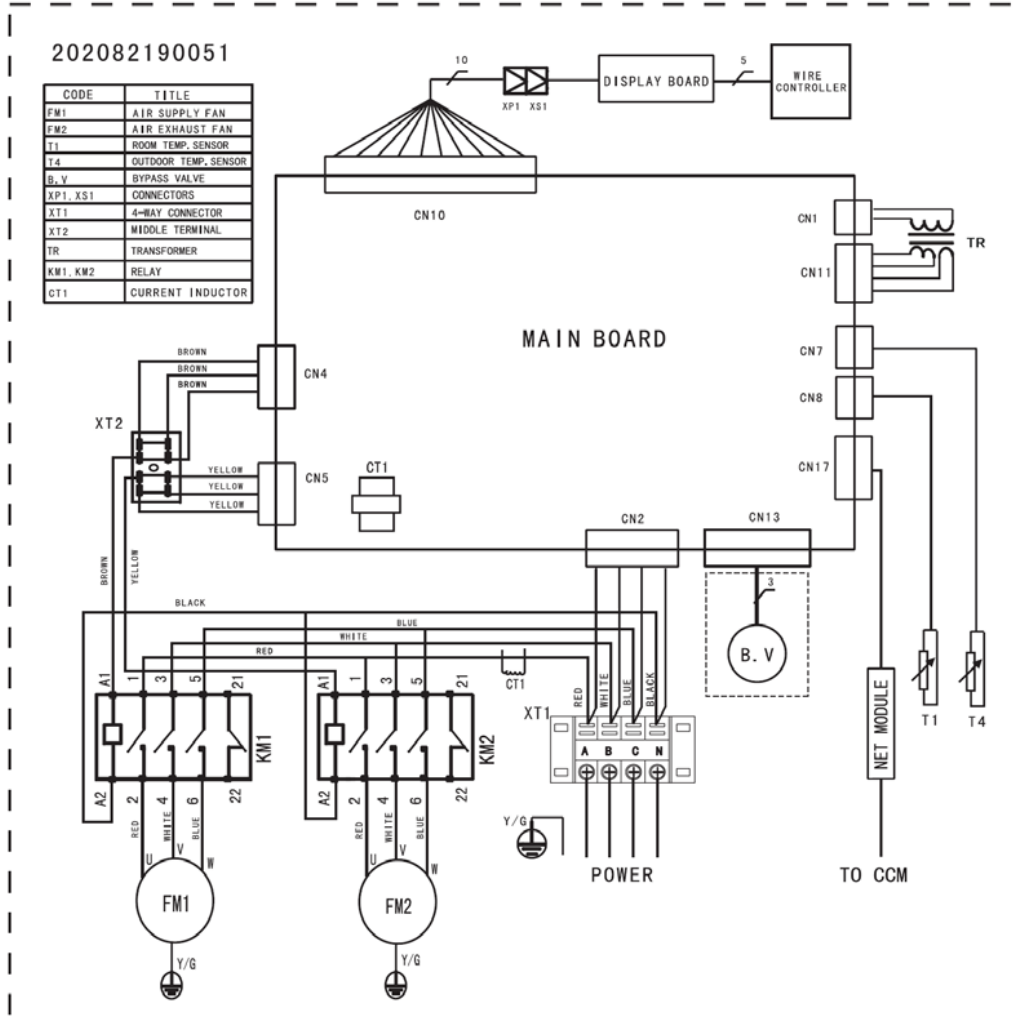


8. Wiring Diagrams

ERVD010, ERVD015, ERVD020, ERVD030, ERVD050, ERVD060



ERVB090, ERVB120



9. Electric Characteristics

Model	Indoor Unit				Power Supply		IFM	
	Hz	Voltage	Min.	Max.	MCA	MFA	KW	FLA
ERVD010A3N-DCN020	50	220	198	242	0.625	15	0.02	0.5
ERVD015A3N-DCN030	50	220	198	242	0.7	15	0.04	0.56
ERVD020A3N-DCN040	50	220	198	242	1.25	15	0.08	1
ERVD020A3N-DCN050	50	220	198	242	1.25	15	0.12	1
ERVD050A3N-DCN080	50	220	198	242	2.5	15	0.36	2
ERVB060A3N-DCN100	50	220	198	242	3	15	0.36	2.4
ERVB090A3N-DCN150	50	380	342	418	4	15	0.9	3.2
ERVB120A3N-DCN200	50	380	342	418	4.5	15	1.1	3.6

Note:

MCA: Min. Current Amps. (A)

MFA: Max. Fuse Amps. (A)

FLA: Full Load Amps. (A)

KW: Rated Motor Input (kW)

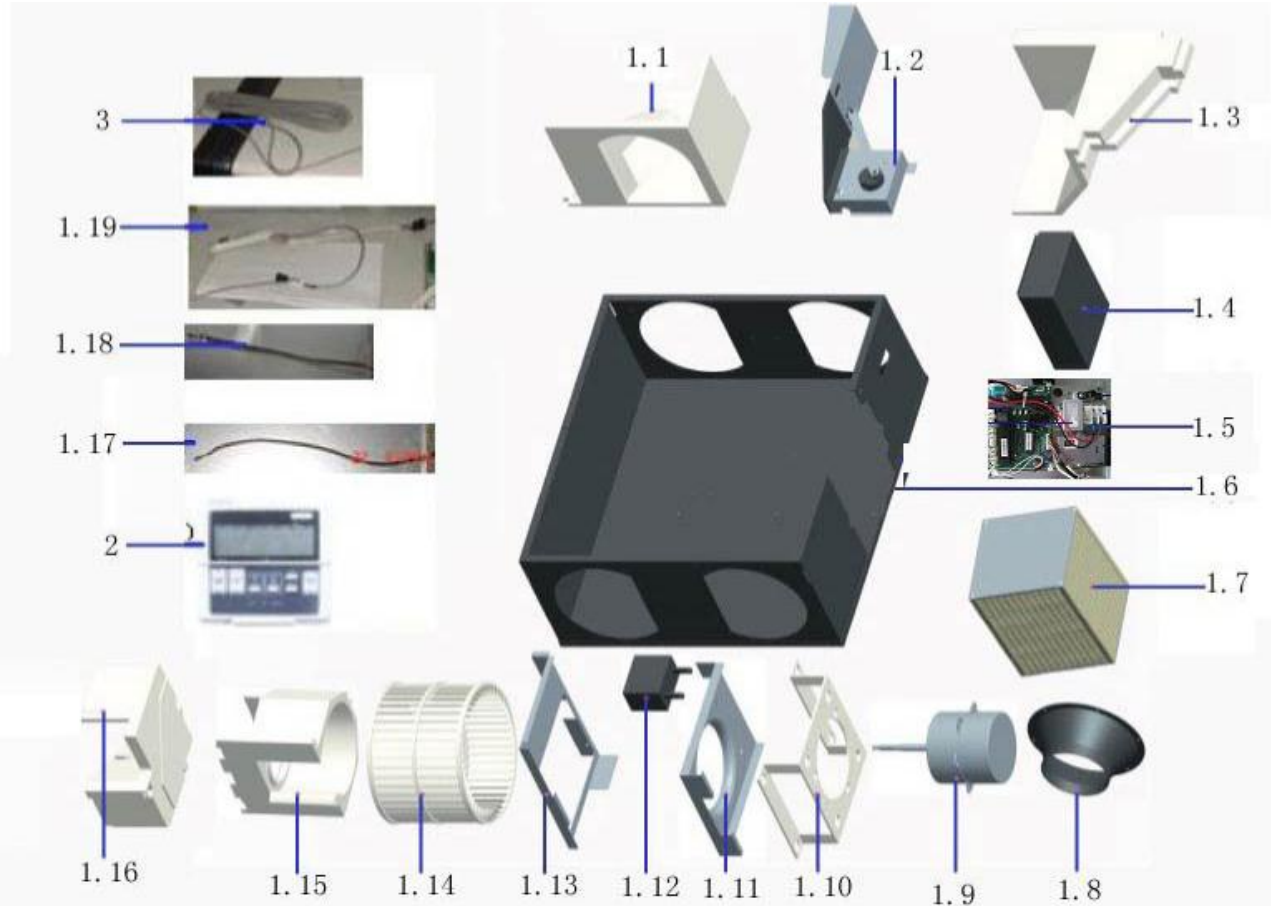
IFM: Indoor Fan Motor

10. Operation Condition Limits

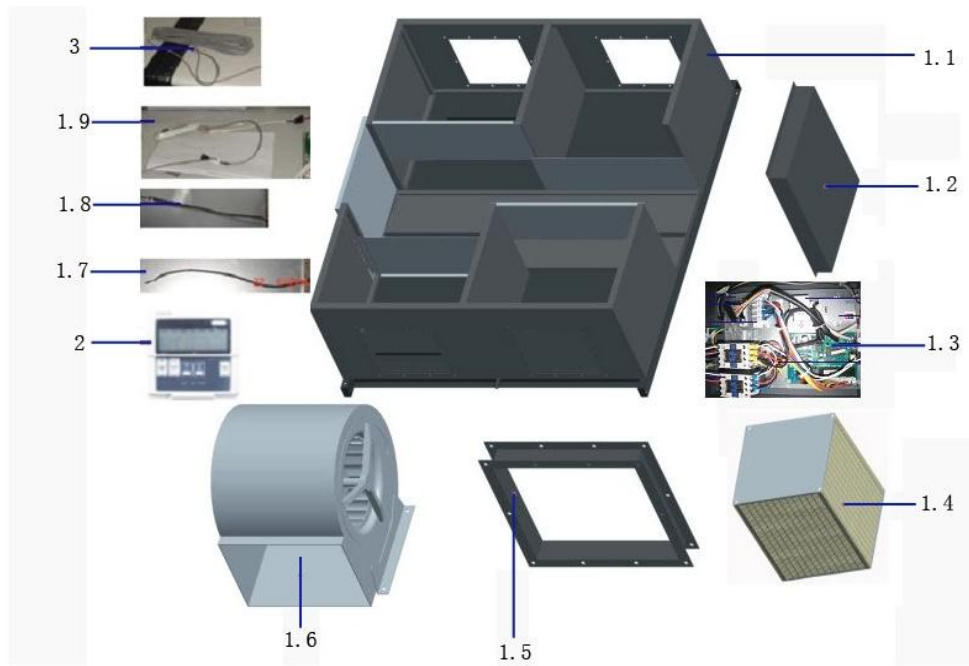
Model	Outdoor air temperature	Room temperature	Room humidity
All models	-7°C ~ 43°C	-7°C ~ 43°C	Lower than 80% If higher than 80%, the surface of indoor unit may be condensed or the condensate will be blown from air outlet.

11. Exploded View

ERVD010 ERVD015 ERVD020 ERVD030 ERVD050 ERVD060



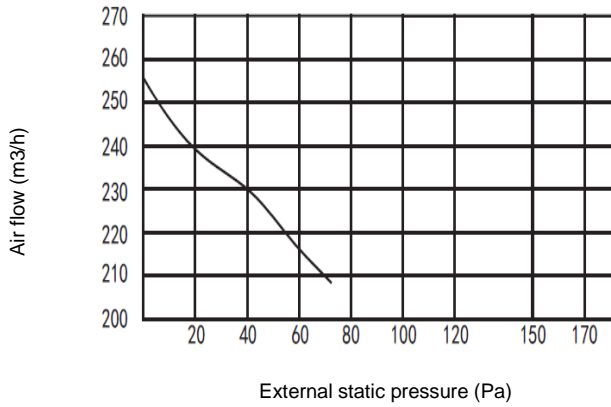
NO.	Part Name	Quantity
1.1	Inlet channel	2
1.2	Bypass part	1
1.3	Partition board	2
1.4	Electrical box	1
1.5	Electrical box ass'y (RoHS)	1
1.6	Chassis	1
1.7	Heat exchange core	1
1.8	Inlet/Outlet air	4
1.9	Fan Motor	2
1.10	Motor bracket	2
1.11	Guide plate	2
1.12	Motor capacitor	2
1.13	Fan bracket	2
1.14	Fan	2
1.15	Volute shell	2
1.16	Bypass channel	1
1.17	Room temp sensor ass'y (RoHS)	1
1.18	Temp. sensor (T1) (RoHS)	1
1.19	Display board ass'y (M54) (RoHS)	1
2	Wired Controller	1
3	Connecting wire assembly	1



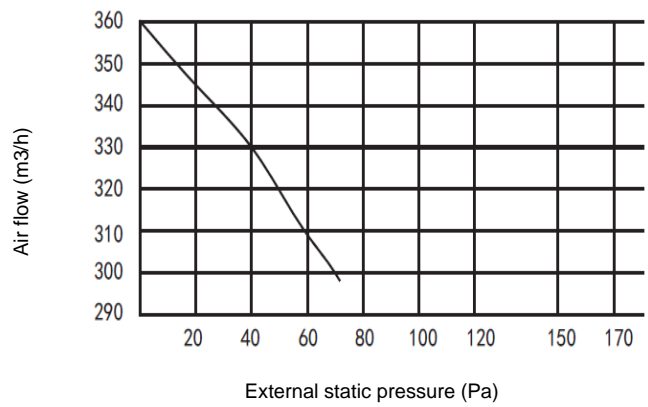
NO.	Part Name	Quantity
1.1	Chassis	1
1.2	Electrical box	1
1.3	Electrical box ass'y (RoHS)	1
1.4	Heat exchange core	2
1.5	Inlet/Outlet air	4
1.6	Fan	2
1.7	Room temp sensor ass'y (RoHS)	1
1.8	Temp. sensor (T1) (RoHS)	1
1.9	Display board ass'y (M54) (RoHS)	1
2	Wired Controller	1
3	Connecting wire assembly	1

12. Blast Pressure Graphic

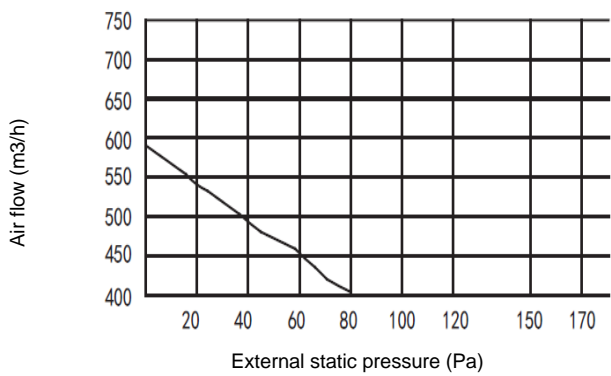
ERVD010A3N-DCN020



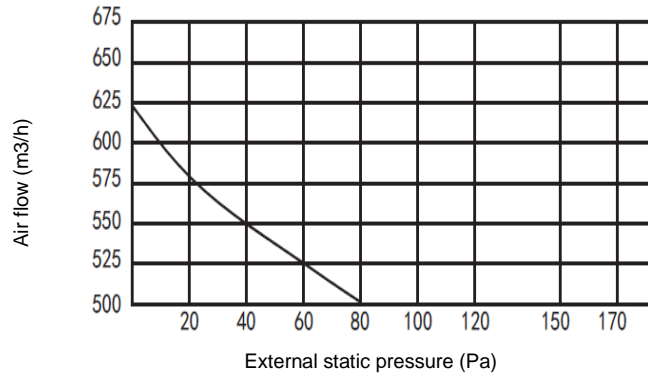
ERVD015A3N-DCN030



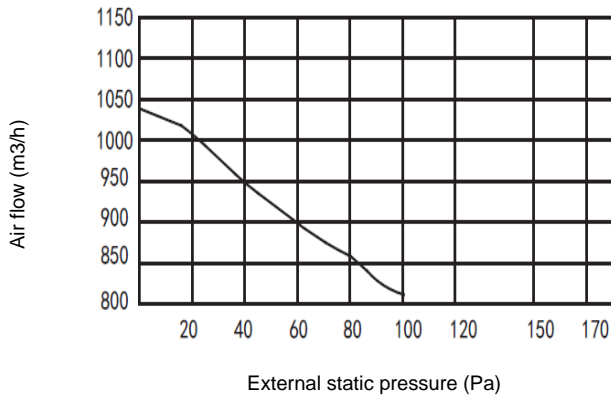
ERVD020A3N-DCN040



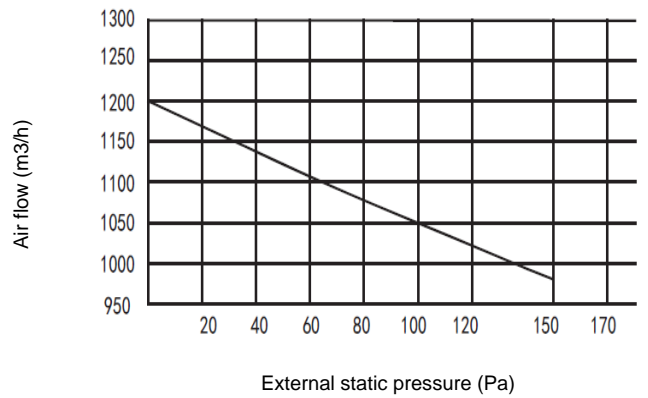
ERVD030A3N-DCN050



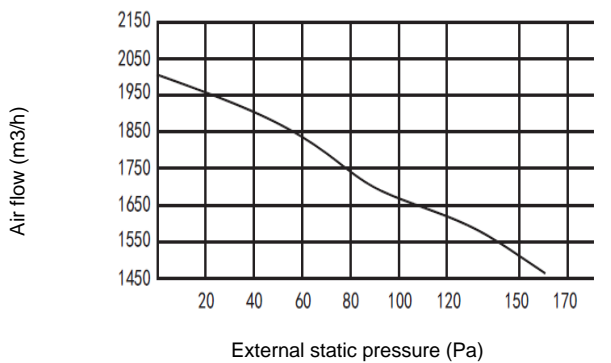
ERVD050A3N-DCN080



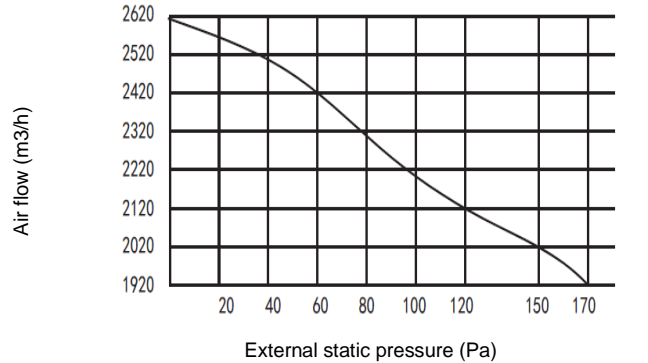
ERVB060A3N-DCN100



ERVB090A3N-DCN150



ERVB120A3N-DCN200



13. Installation

13.1 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 when lifting, to avoid damage or scratches to the unit.

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

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

13.2 Select the Installation Site

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

a. HRV should be installed far away from office, recreation or any other place silent requiring environment (install that in special machine room or wash room is recommended)

b. install in a place which has sufficient strength and stability. (Beam, ceiling and other locations capable of fully supporting the weight of the unit.) Insufficient strength is dangerous. It may also cause vibration and unusual operating noise.

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

d. Where 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 unit in the following locations:

- Place subjected to high temperature or direct flame. May result in fire or overheating.
- Place such as machinery plant and chemical plant where gas, which contains noxious gas or corrosive components of materials such as acid, alkali organic solvent and paint, is generated. Place where combustible gas leakage is likely.

Copper piping and brazed joins may corrode, causing refrigerant to leak or poisoning and fire due to leaked gas.

- Place such as bathroom subjected to moisture.

Electric leak or electric shocks and other failure can be caused.

- Near machinery emitting electromagnetic waves.

Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the equipment.

13.3 Preparations before Installation

1. Confirm the positional relationship between the unit and suspension bolts.

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

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

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

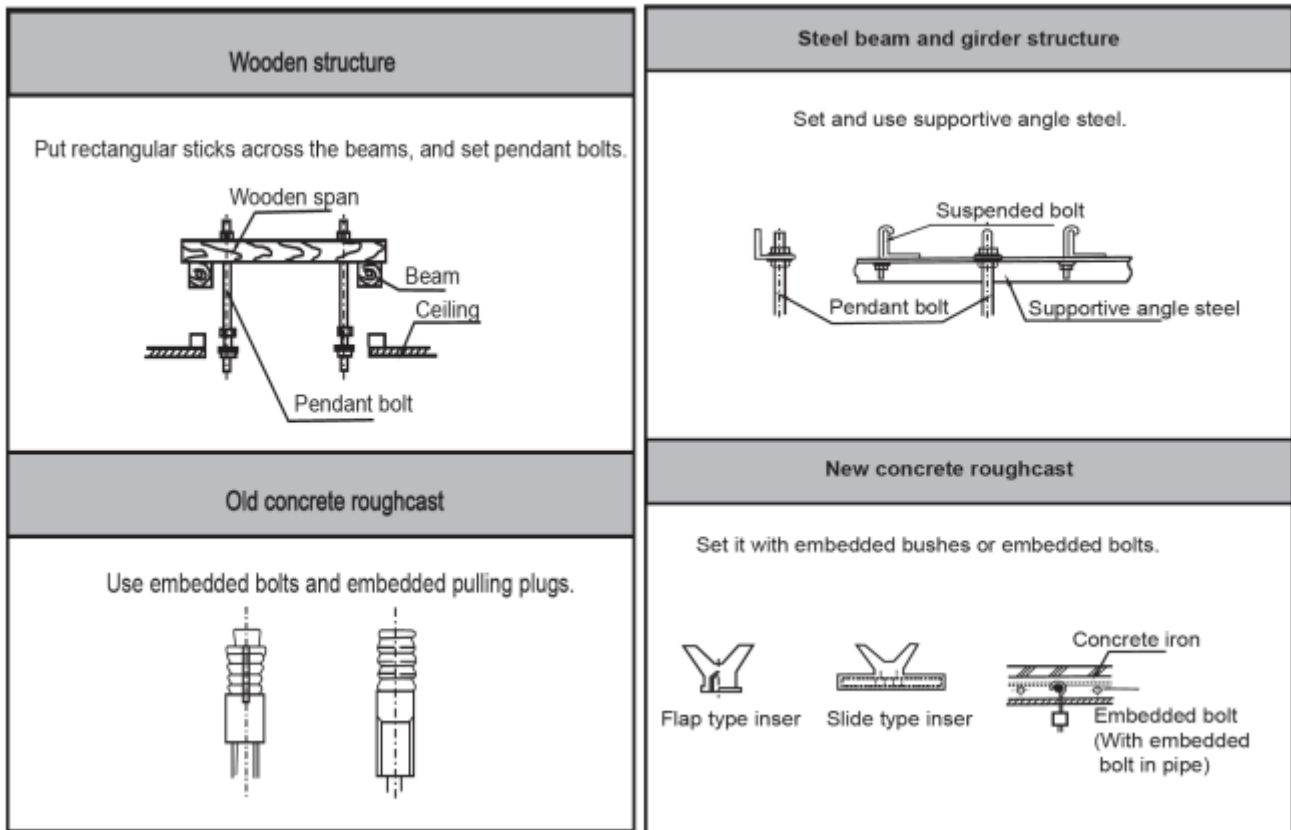
Once the installation hole is opened in the ceiling where the unit is to be installed, pass transmission wiring, and remote controller wiring to the unit's wiring holes.

After opening the ceiling hole, make sure ceiling is level if needed. It might be necessary to reinforce the ceiling frame to prevent shaking.

Please consult architect or woodworker, if necessary.

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

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



13.4 Installation the Unit

1. Before installation, please confirm all external parts are stand in their place and without damage.
2. The surrounding environment of the unit, especially the sides of wiring cabinet and water collecting side should reserve sufficient wiring and maintenance and space; additionally, one should ensure the removing space for filter griller.
3. Unit should mount steadily and without sustain the weight form condensate water pipe and air duct. The vents of air inlet/outlet and return should be connected with flexible tube.
4. Unit in AC 220V/50Hz or 380V/50Hz, reliable grounding; each one possesses of independent cut-off and protection device.
5. The installation dimension and maintenance space. (See the maintenance space.)

14. Wiring

Warning: Before obtaining access to terminal device, all power supply circuits must be interrupted.

14.1 Precautions When Laying Power Supply Wiring

A circuit breaker of shutting down power supply to the entire system be installed.

A single switch can be used to supply power to units on the same system. However, branch switches and circuit breakers must be selected carefully.

Fit the power supply wiring of each unit with a switch and fuse as shown in the drawing.

Install a wiring interrupter or ground-fault circuit interrupter for the power wiring.

Make sure the ground resistance is no greater than 100Ω.

This value can be as high as 500Ω when using a grounding fault circuit interrupter since the protective ground resistance can be applied.

Be sure to give the electric grounding (earth) connection.

Do not let the grounding wire should come in contact with gas pipes, water pipes, lighting rods, or telephone ground wires.

- Gas pipes: gas leaks can cause explosions and fire.

Water pipes: cannot be grounded if hard vinyl pipes are used.

- Telephone grounded and lightning rods: The ground potential when struck by lightning gets extremely high.

Do no turn on the power supply (wiring interrupter or ground-fault circuit interrupter) until all other work is done.

Tightening torque for the terminal screws.

Use the correct screwdriver for lighting the terminal screws. If the blade of screwdriver is too small, the head of the screw might be damaged, and the will not be properly tightened.

If the terminal screws are tightened too hard, screws might be damaged.

Refer to the table below for the tightening torque of the terminal screws.

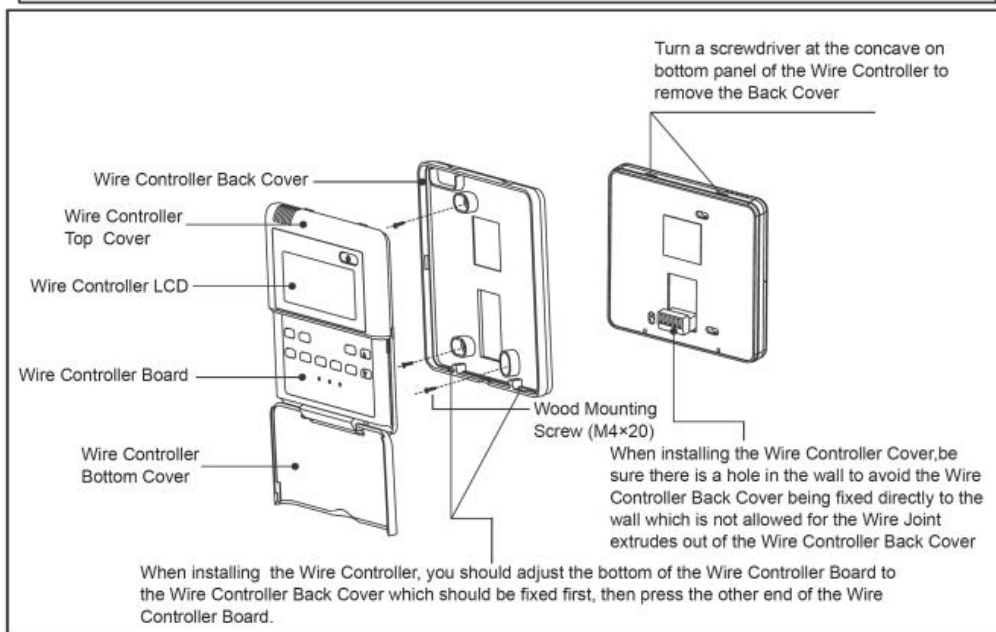
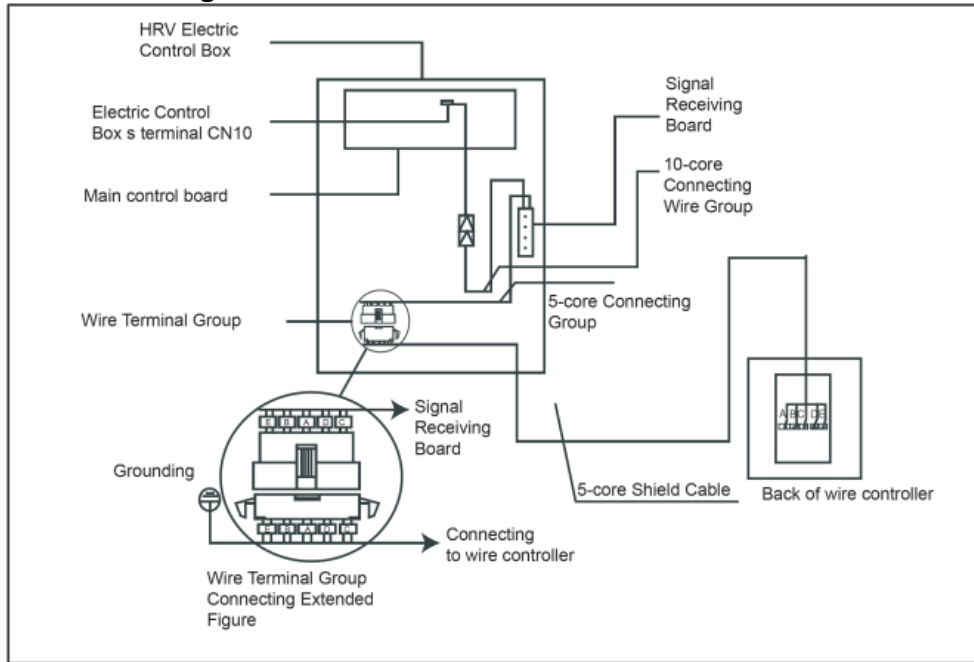
	Tightening torque (N·m)
Terminal base of remote controller/ Signal transmission wire (X2M)	0.79-0.97
Terminal base of power supply (X1M)	1.18-1.44
Grounding terminal (M4)	1.44-1.94

- After wiring, please confirm all connections are correct, and then power to the unit.
- Pay attention to the power supply wire of three-phase model; confirm the phase sequence of which is correct.

14.2 Power Specification

Model	Power supply		Input current main switch /fuse(A)	Power supply wire dimension	
	Phase	Frequency/voltage		Wire's quantity	Code wire cross-section (mm ²)
010, 015, 020, 030, 050, 060	Single phase	220V~50Hz	15/15	3 (Yellow/green wire is grounding wire)	2.5
090, 120	Three phase	380V 3N~50Hz	15/15	5 (Yellow/green wire is grounding wire)	2.5

14.3 System connection diagram



Caution:

1. Never turn screws too tightly, or else the cover would be dented or the Liquid Crystal breaks.
2. Please leave enough space for maintain and upkeep the wire controller.

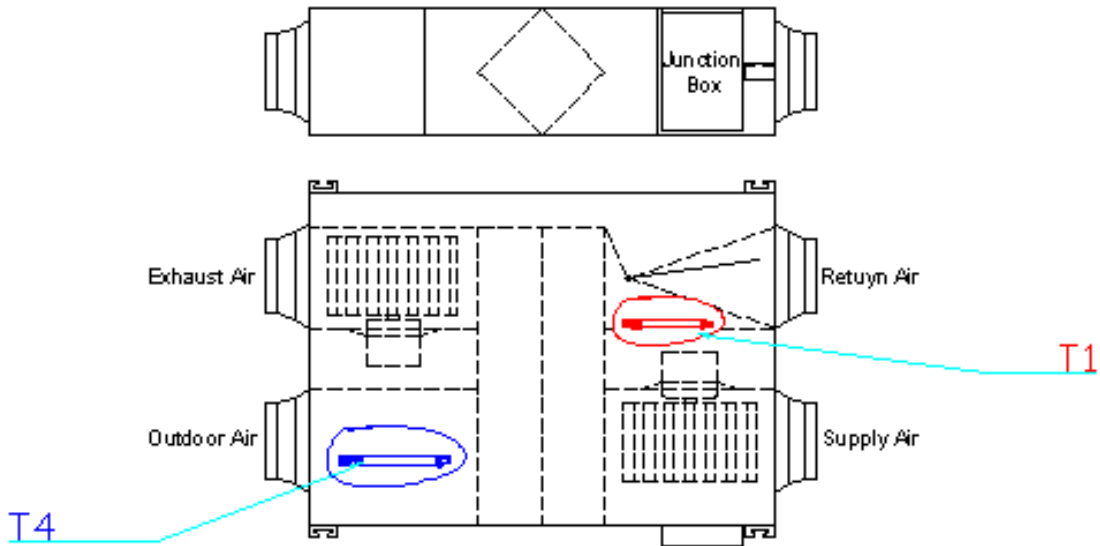
15. Troubleshooting

15.1 Lamp flashes

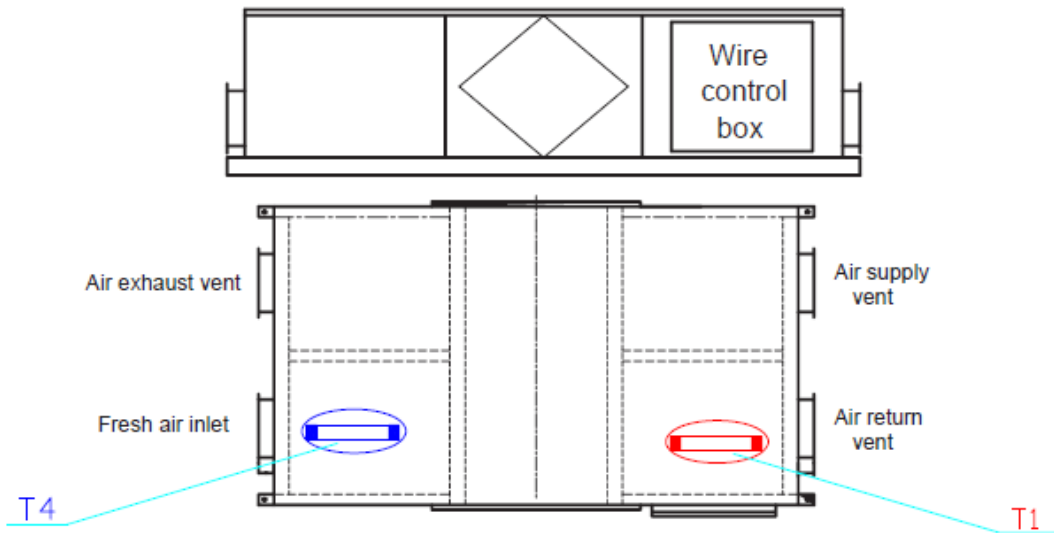
No.	Operation lamp	Timerlamp	Defrosting lamp	Alarmlamp	Explanation
1	★	○	○	○	T4 sensor error
2	★	★	○	○	T1 sensor error
3	★	○	★		Current protection
4	★	○	○	★	Phase absent, phase error

Note: ●: Light, ○: Extinguish, ☆: Slow flash, ★: Quick flash

ERVD010, ERVD015, ERVD020, ERVD030, ERVD050, ERVD060



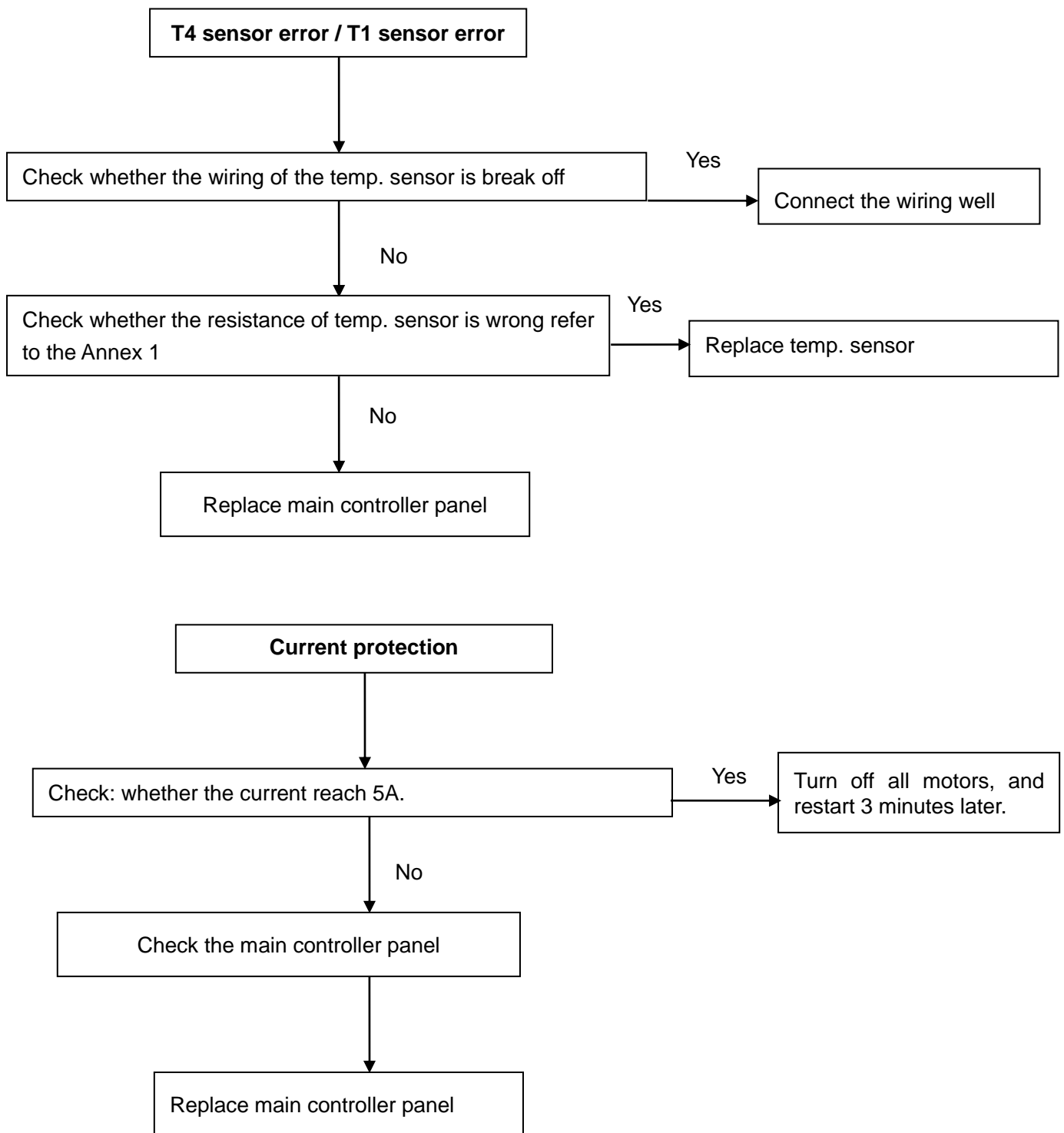
ERVB090, ERVB120

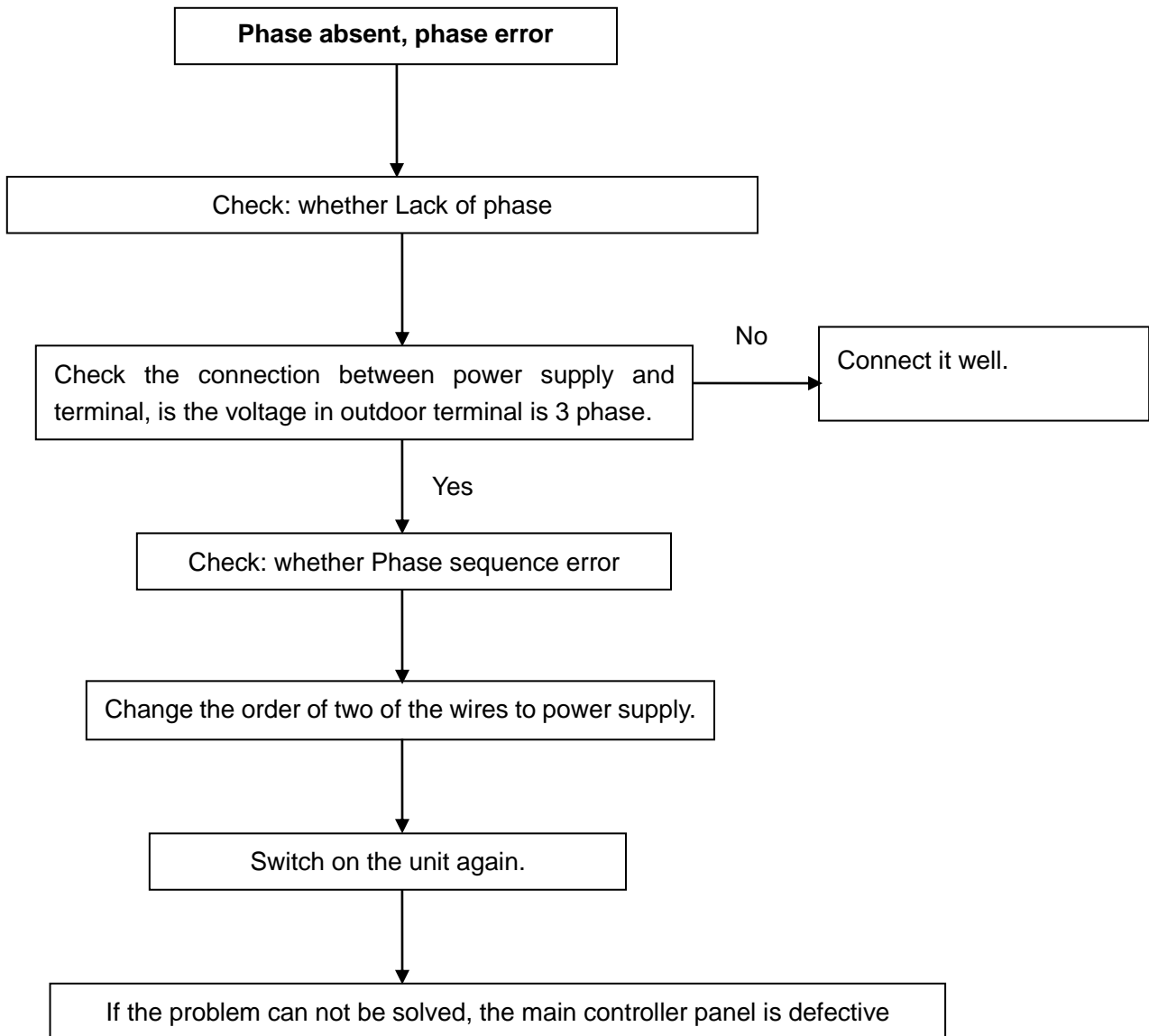


T1 temperature sensor: site at the return air cavity.

T4 temperature sensor: site at the outdoor air inlet cavity.

15.2 Troubleshooting

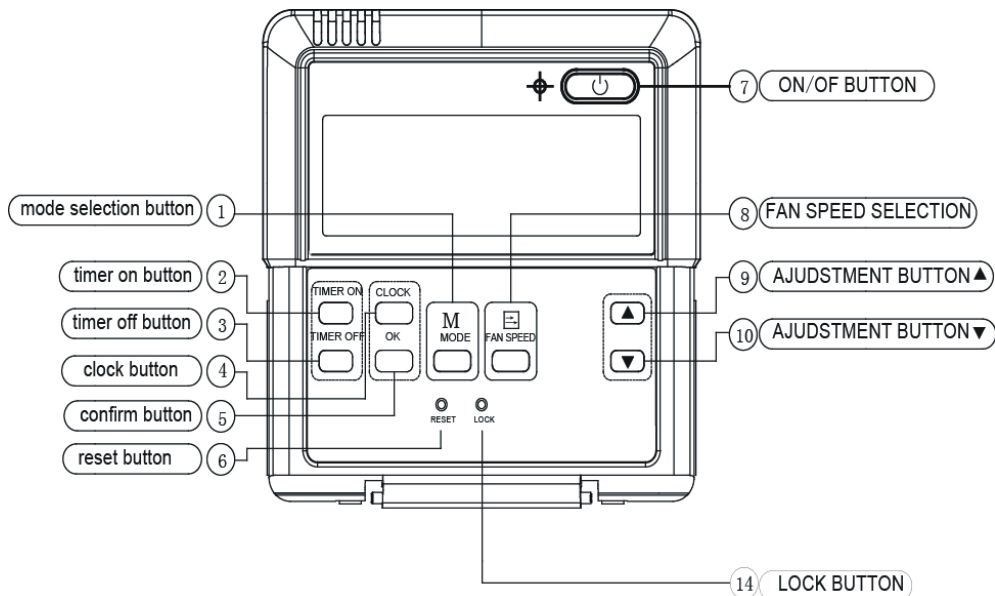




16. Maintenance

1. During new use stage, one should check the fan operation regularly.
2. The cleaning regulation for filter mesh depends on local environment. It could be clean by vacuum dirt exhauster or water, if heavy dust accumulates, it should use neutral detergent to clean it, and then dry it 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 substance 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 the well balance of it and check whether the axletree has loosed.

17. Controller



The basic operation conditions of wired controller are as follows:

1. The range of power supply voltage: the voltage input is 5V DC.
2. Ambient temperature range: $-15^{\circ}\text{C} \sim +43^{\circ}\text{C}$.
3. Ambient humidity range: RH40% ~ RH90%.
4. The safety certification of electric control should conform to GB4706.32-2004, GB/T7725-2004.

17.1 Name and functions of buttons on wired controller

1 Mode selection button:

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

2 Timer on button:

Push the button to set TIMER ON, each time you push the button the time moves forward by 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 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 OFF, then adjust the time of TIMER OFF as 0.0

4 CLOCK button:

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

5 Confirm button:

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

6 RESET button (hidden):

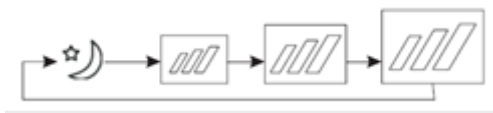
Use a small stick with a diameter of 1mm to push the RESET button to cancel the current settings and get into the condition of resetting

7 ON/OFF button:

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

8 Fan speed selection button (FAN SPEED)

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



9 Adjustment button:

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

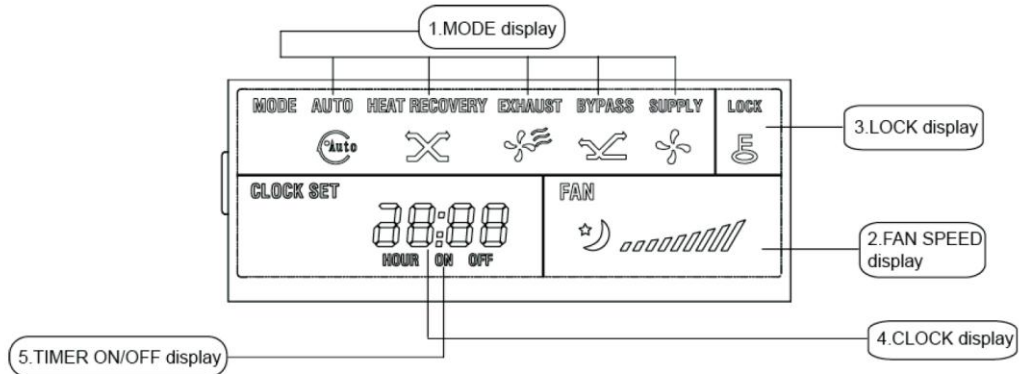
10 Adjustment button:

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

11 LOCK button (hidden):

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

17.2 Name and functions of LCD on wired controller



1 Mode select display (MODE):

Press MODE button to select "AUTO", "HEAT RECOVERY", "EXHAUST", "BYPASS", or "SUPPLY" mode.

2 Fan speed display (FAN SPEED)

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

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

3 Lock display

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

4 CLOCK display

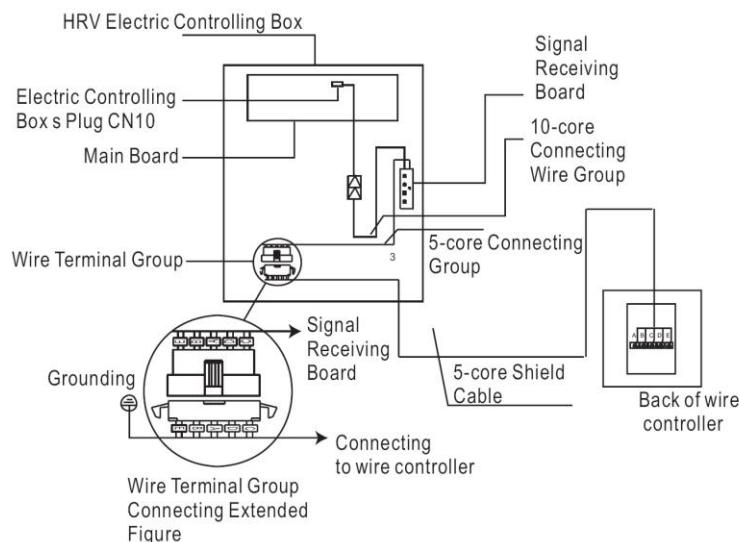
Usually display the clock set currently. Press the button CLOCK for 4 seconds, the HOUR part will flash, press button ▲ and ▼ to adjust HOUR. Press the button CLOCK again, the minute part flash, press button ▲ or ▼ to adjust MINUTE. After clock set or clock operation, it must press CONFIRM to complete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

5 TIMER ON/OFF display:




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

17.3 Installation

Connection method and the principle diagram show as follow:



18. Accessory

Name	Quantity	shape	Purpose
Installation and owner's manual	1		must be delivered to the customer
Butt-joint wire of wire control display panel (6 meters)	1		For connect wire control and display control box
HRV wire controller	1		For controlling HRV units

Annex 1

Characteristic of temperature sensor

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



OMEGA
ENVIRONMENTAL
TECHNOLOGIES LLC.

17702 Mitchell North, #101
Irvine, CA. 92614 .USA
Tel: 714 795 2830
Fax: 714 966 1646
info@otecomega.com
www.otecomega.com

OTECTM
AIR CONDITIONING

Showroom & Technology Center
11380 Interchange Circle North
Miramar, FL 33025 .USA
Tel: 305 901 1270
Fax: 954 212 8280
info@otecvrf.com
www.otecvrf.com

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