

WALL MOUNTED FAN COIL UNIT

SERVICE MANUAL

SF-xxxH



SINCLAIR
AIR CONDITIONING

Wall Mounted DC FCU

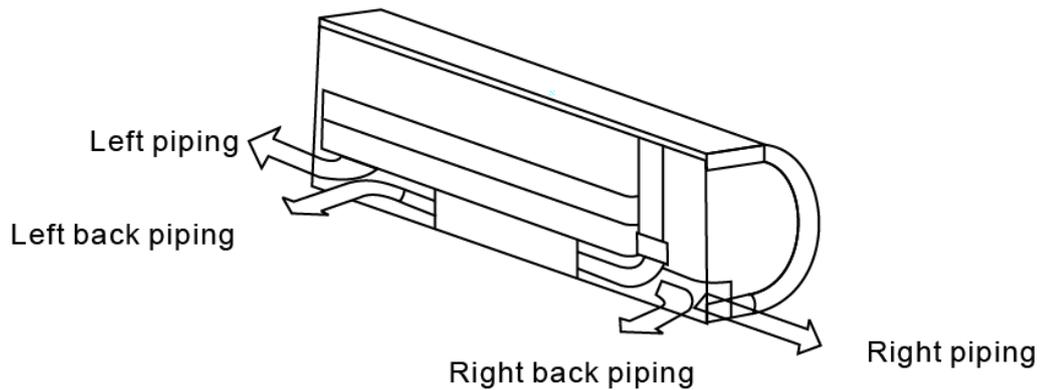
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1. External Appearance



2. Features

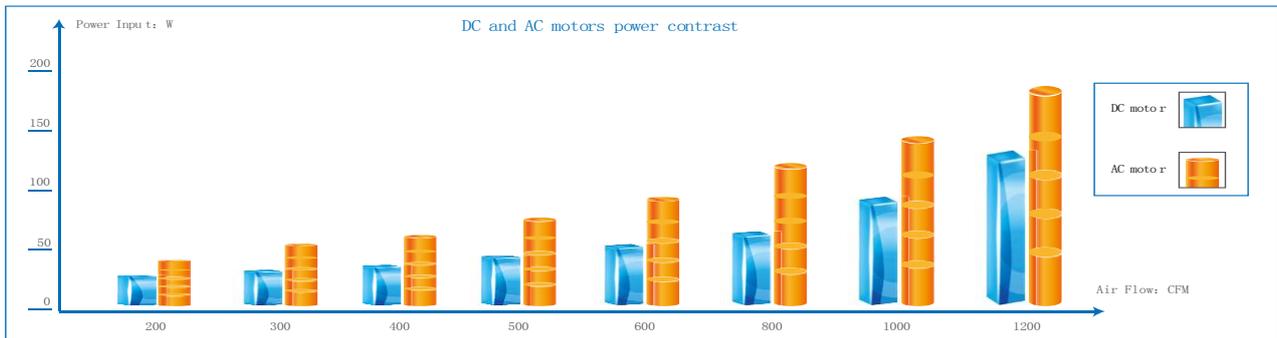
- Multi-connection outlet pipe method: left/right/rear, satisfy the need of different rooms.



- Cross flow fan creates quiet and comfortable environment.
- Built-in the 3-way electromagnetic valve.
- Built-in network interface module.
- Easy maintenance has been realized as the front panel can be removed for easy access.

✚ Excellent efficiency

Sinclair DC FCU adopt the brushless DC motor, the DC motor efficiency is up to 90%. The power consumption of DC FCU can be reduced by more than 30% in contrast to the corresponding AC FCU.



✚ DC brushless motor

The motor adopts fully enclosed structure design; it is energy-saving, of high operating efficiency and durable motor. The motor bearing can operate 80,000 hours continuously, and easy for maintenance.

✚ Low noise

Advanced 3-D spiral fan design reduces air resistance and operating sound. The motor bearing with unique design makes less operation vibration.

3. Product lineup

Type	250	400	600
Wall Mounted (SF-xxxH)	●	●	●

4. Accessories

4.1 Standard accessories

Accessory name	Qty.	Shape	Usage
Owner's & installation manual	1	/	Installation guide
Screw ST3.9x25 for installation board	8		Screw the installation board
Plastic expanded tube	8		
Wrapping tape	1		
Drain pipe	1		
Wall conduit cover	1		
Remote controller& Its Frame	1		Remote controller R05/BGE
	1		Frame
	2		Mounting screw(ST2.9x10-C-H)
	2		Alkaline dry batteries
Remote controller manual	1		
Seet gasket	4		For conner water pipe

4.2 Optional accessories

Accessory name	Qty.	Shape	Usage
Wired controller KJR-29B	1		Wired control
Wired controller KJR-12B	1		Wired control
Central controller CCM09/CCM30	1		Central control

5. Specifications

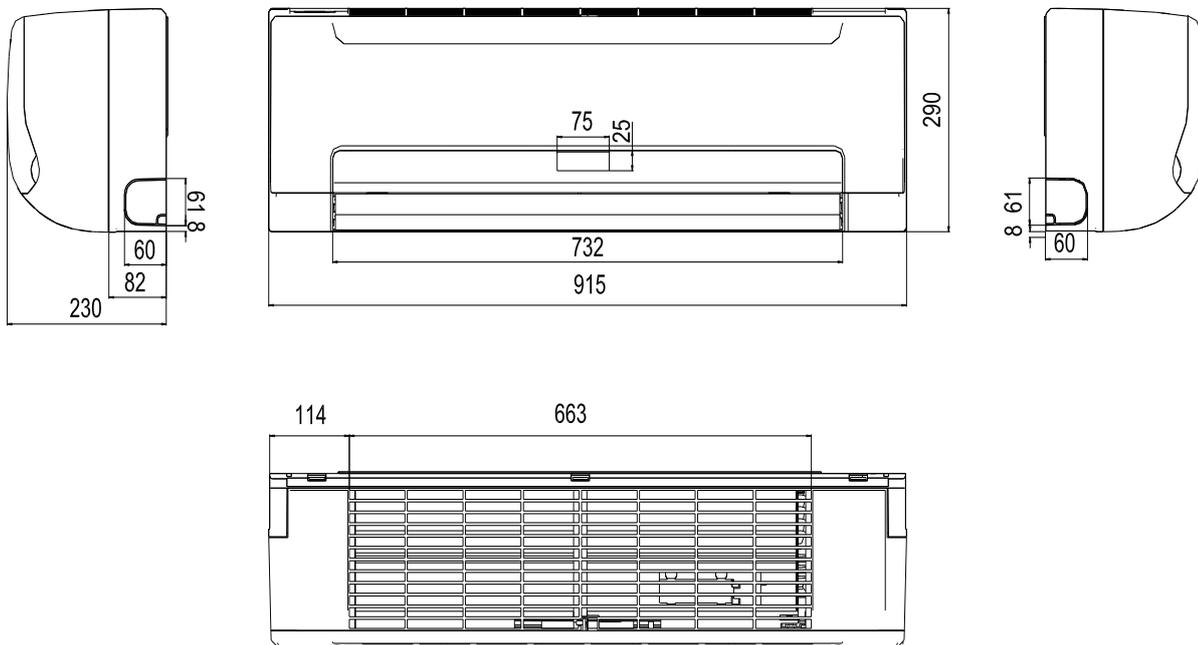
Model				SF-250H	SF-400H	SF-600H
Air flow		H/M/L	m ³ /h	425/410/320	680/550/504	1020/820/670
		H/M/L	CFM	250/241/188	400/324/297	600/483/394
Cooling	Capacity	H/M/L	kW	2.63/2.2/1.97	3.28/2.90/2.66	5.0/3.95/3.21
	Water flow rate	H	l/h	452	564	860
	Water pressure drop	H	kPa	23.1	42	36.3
Heating	Capacity	H/M/L	kW	3.36/2.85/2.35	4.37/3.77/3.35	6.7/5.17/4.18
	Water pressure drop	H	kPa	22	40	32.8
Power supply			V/Ph/Hz	220-240/1/50		
Power input		H	W	10.7	33	37.5
Sound pressure level		H/M/L	dB(A)	30/26/23	36/32/29	40/36/31
Fan motor	Type			DC Motor		
	Quantity			1	1	1
Fan	Type			Tangential fan		
	Quantity			1	1	1
Coil	Row			2		
	Max. Working pressure		MPa	1.6		
	Coil length x height		mm	635x26.74		785x26.74
	Fin spacing		mm	1.5		
	Fin type			Hydrophilic aluminium		
	Number of circuits			5		7
	Diameter		mm	Φ7		
Body	Dimensions	W×H×D	mm	915×290×230	915×290×230	1072×315×230
	Packing	W×H×D	mm	1020×390×315	1020×390×315	1180×415×315
	Net weight		kg	12.7	12.7	14.9
	Gross weight		kg	17.3	17.3	18.6
Pipe connection	Water inlet/outlet pipe		Inch	RC3/4		
	Drain pipe		mm	ODΦ20		

Note:

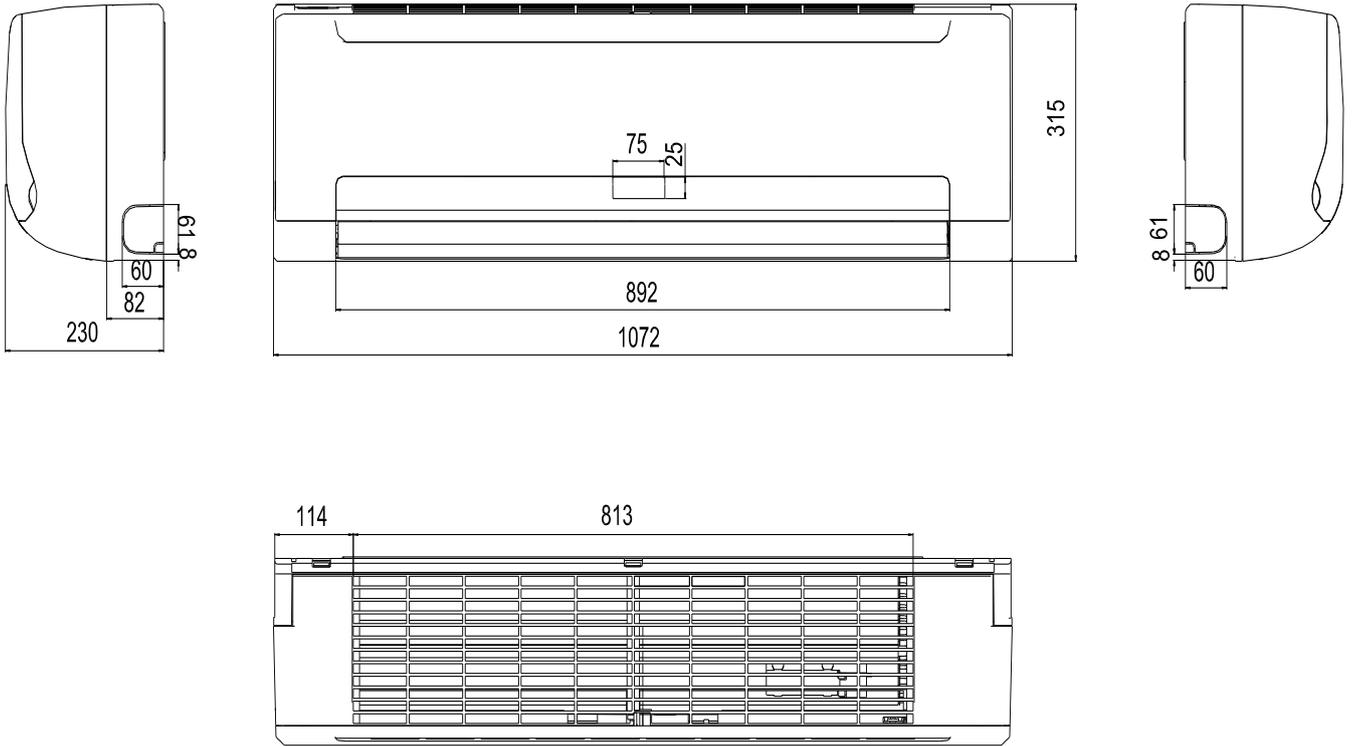
1. H: high speed; M: medium speed; L: low speed
2. Cooling Conditions: Entering water 7°C, temperature rise 5°C, entering air temperature 27°C DB, 19°CWB.
Heating Conditions: Entering water 50°C, enter air temperature 20°C, the same water flow as the cooling conditions.
3. Noise is tested in semi-anechoic test room.

6. Dimension

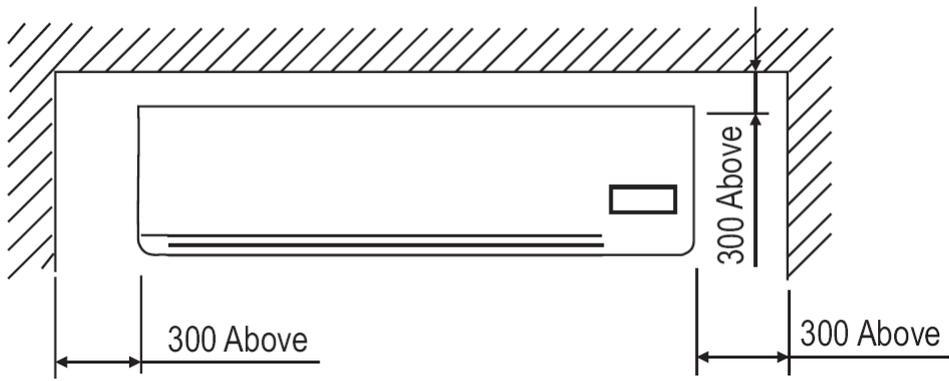
SF-250H, SF-400H



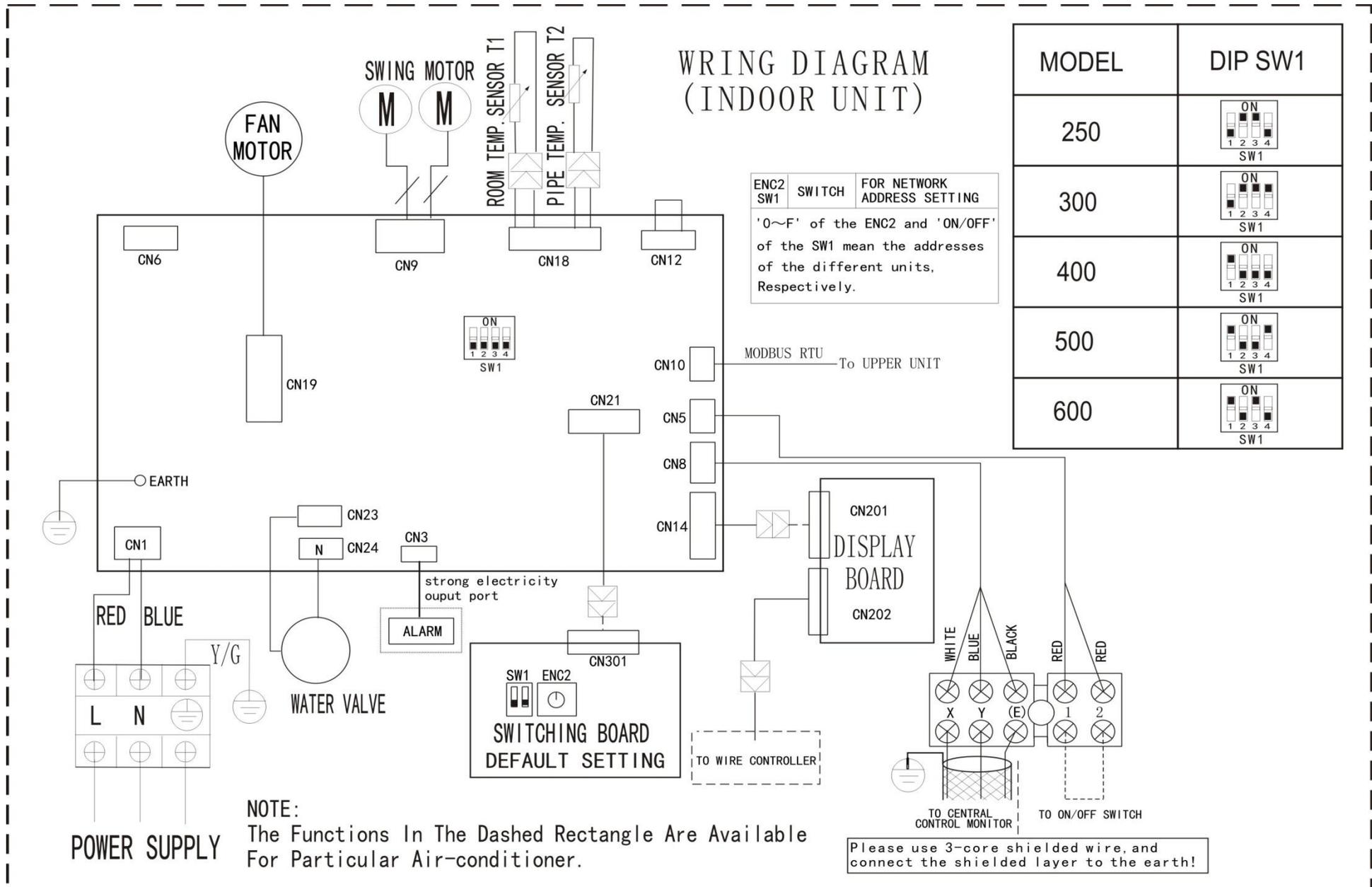
SF-600H



7. Service Spaces

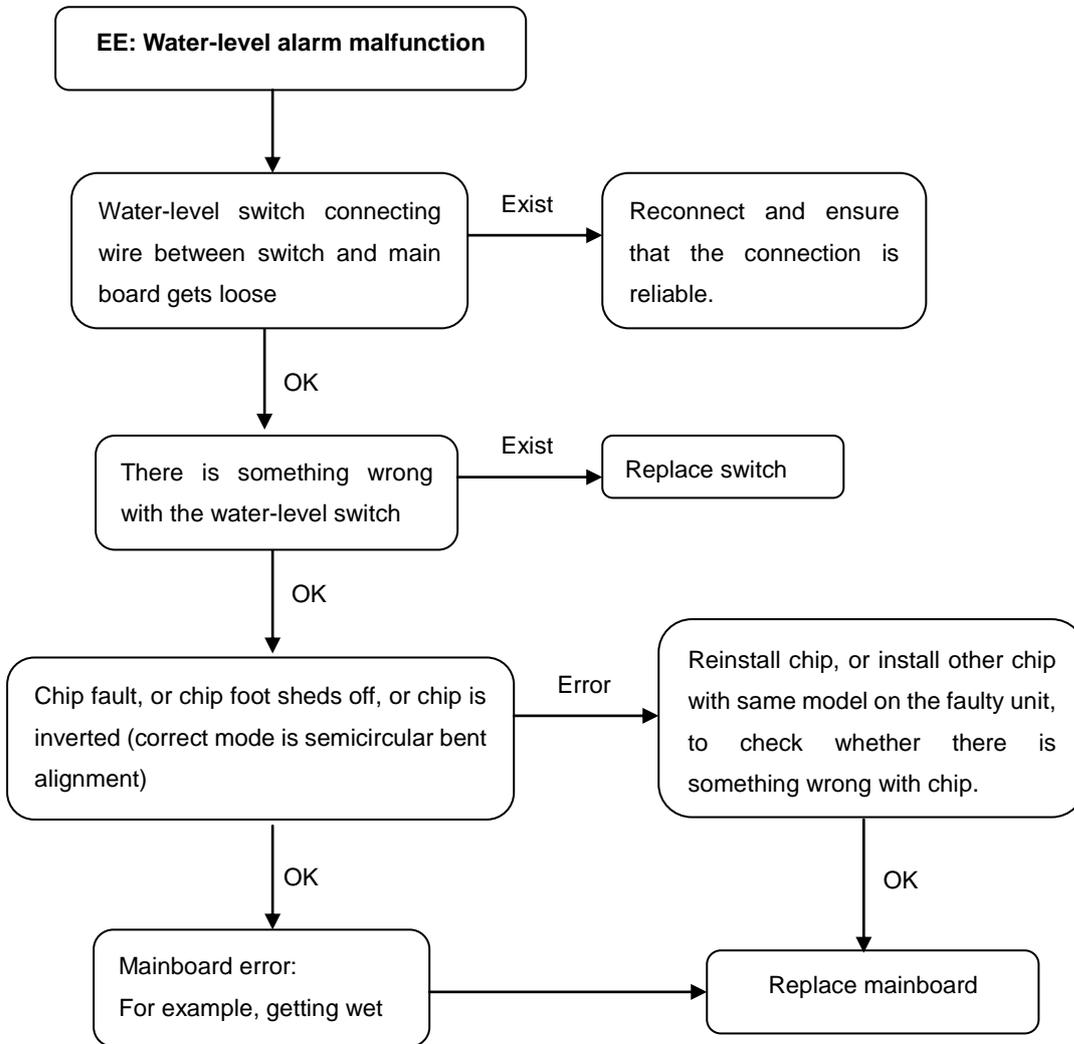


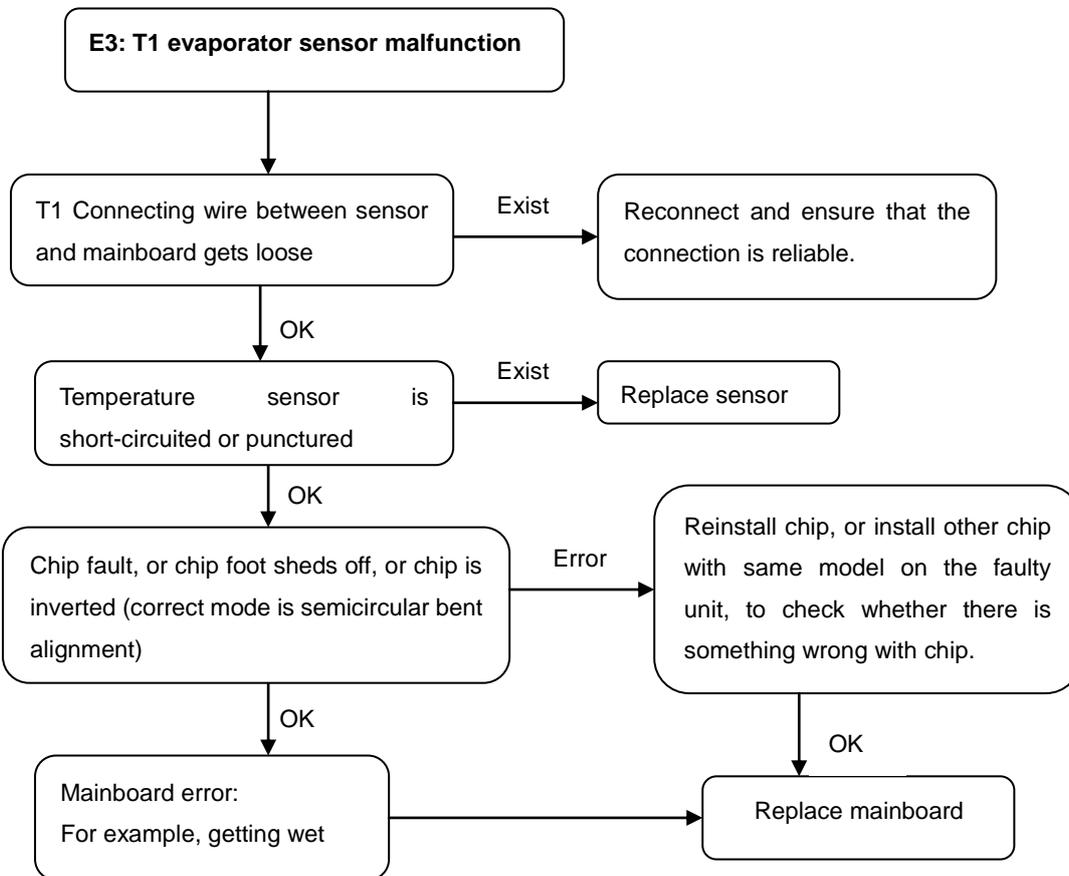
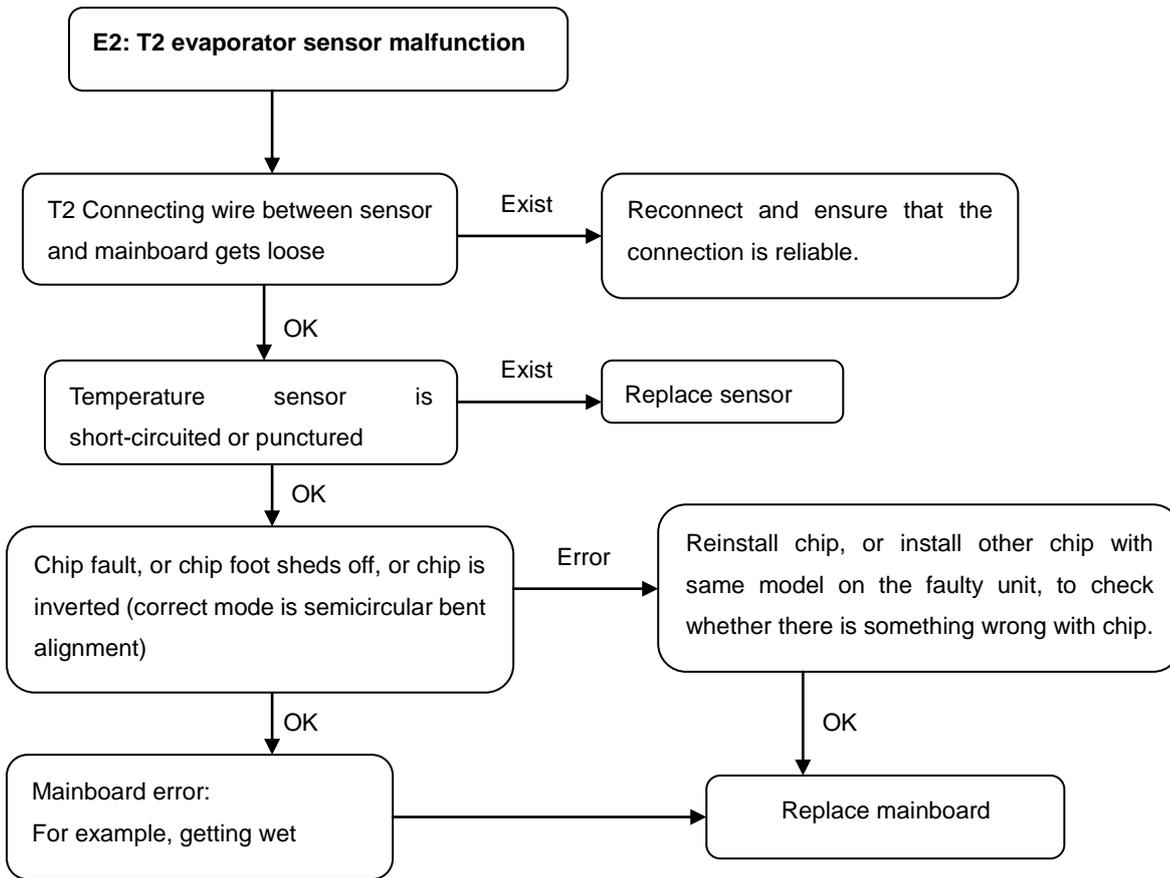
8. Wiring Diagrams



9.Trouble-shooting:

Malfunction code	Malfunction
EE	Water-level alarm malfunction
E2	T2 evaporator sensor malfunction
E3	T1 evaporator sensor malfunction





10. Installation

10.1 Installation Attention

※ Warning:

- **Be sure only trained and qualified service personnel to install, repair or service the equipment.**

Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.

- **Install according to this installation instructions strictly.**
- **If installation is defective, it will cause water leakage, electrical shock and fire.**
- **When installing the unit in a small room, take measures against to keep water concentration from exceeding allowable safety limits in the event of water leakage.**

Contact the place of purchase for more information.

- **Use the attached accessories parts and specified parts for installation.**

Otherwise, it will cause the set to fall, water leakage, electrical shock fire.

- **Install at a strong and firm location which is able to withstand the set's weight.**

If the strength is not enough or installation is not properly done, the set will drop to cause injury.

- **The appliance must be installed 2.3m above floor.**
- **The appliance shall not be installed in the laundry.**
- **Before obtaining access to terminals, all supply circuits must be disconnected.**
- **The appliance must be positioned so that the plug is accessible.**
- **The enclosure of the appliance shall be marked by word, or by symbols, with the direction of the fluid flow.**
- **For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used.**

If electrical circuit capacity is not enough or defect in electrical work, it will cause electrical shock fire.

- **Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal.**

If connection or fixing is not perfect, it will cause heat-up or fire at the connection.

- **Wiring routing must be properly arranged so that control board cover is fixed properly.**
- **If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.**

If the supply cord is damaged, it must be replaced by the manufacture or its service agent or a similarly qualified person in order to avoid a hazard.

- **An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.**
- **Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances.**

Otherwise, it will cause fire or electrical shock.

- **Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes.**

Improper installation work may result in the equipment falling and causing accidents.

- **If the water leaks during installation, ventilate the area immediately.**
- **After completing the installation work, check that water does not leak.**

※ **Caution:**

Ground the air conditioner.

Do not connect the ground wire to gas or water pipes, lightning rod or a telephone ground wire. Incomplete grounding may result in electric shocks.

Be sure to install an earth leakage breaker.

Failure to install an earth leakage breaker may result in electric shocks.

Connect the outdoor unit wires, then connect the indoor unit wires.

You are not allowed to connect the air conditioner with the power source until wiring and piping the air conditioner is done.

While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.

Improper drain piping may result in water leakage and property damage.

Install the indoor and outdoor 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 noise.

The appliance is not intended for use by young children or infirm persons without supervision.

Don't install the air conditioner in the following locations:

- There is petrolatum existing.
- There is salty air surrounding (near the coast).
- There is caustic gas (the sulfide, for example) existing in the air (near a hot spring).
- The Volt vibrates violently (in the factories).
- In buses or cabinets.
- In kitchen where it is full of oil gas.
- There is strong electromagnetic wave existing.
- There are inflammable materials or gas.
- There is acid or alkaline liquid evaporating.
- Other special conditions.

※ **Installation Order:**

- Select the location;
- Install the indoor unit;
- Install the outdoor unit;
- Connect the drain pipe;
- Wiring;
- Test operation.

10.2 Inspecting and Handling the unit

At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.

When handling the unit, take into account the following:

1.  Fragile, handle the unit with care.
2.  Keep the unit upright in order to avoid compressor damage.
3. Choose on before hand the path along which the unit is to be brought in.
4. Move this unit as originally package as possible.
5. When lifting the unit, always use protectors to prevent belt damage and pay attention to the position of the unit's centre of gravity.

10.3 Indoor Unit Installation

10.3.1 Installation place

Installation in the following places may cause trouble. If it is unavoidable, please consult with the local dealer.

- ✧ A place full of machine oil.
- ✧ A saline place such as coast.
- ✧ A place full of sulfide gas such as hot-spring resort.
- ✧ Places where there are high frequency machines such as wireless equipment, welding
- ✧ Machine and medical facility.
- ✧ A place there is no combustive gases and volatile matter.
- ✧ A place of special environmental conditions.

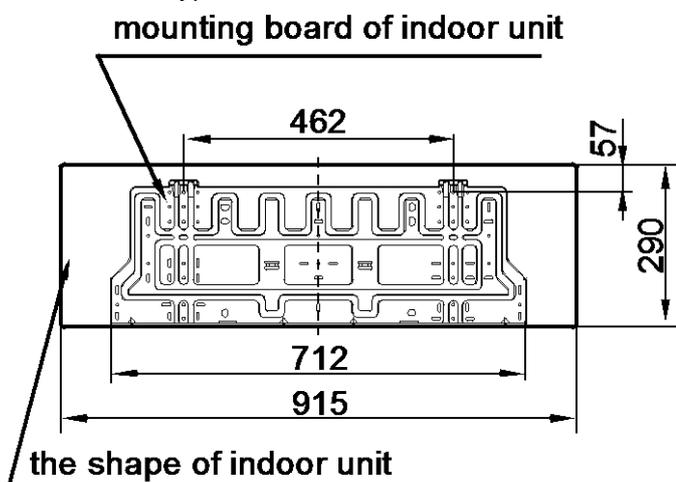
Installation in the following places:

- ✓ A place where is no obstacle near the inlet and outlet area.
- ✓ A place which can bearf the indoor unit.
- ✓ A place which is convenient to maintenance.
- ✓ A place which provides the space around the indoor unit as required right in the diagram.
- ✓ There is strong electromagnetic wave existing.
- ✓ A place which is far from heat, steam and inflammable gas.

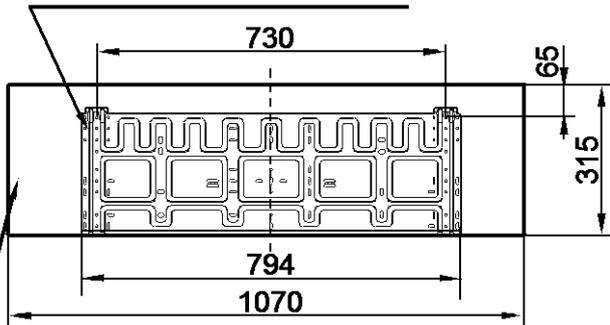
10.3.2 Drilling A Hole and Mounting Installation Board

Installation Board and Its Direction (unit: mm)

250/400 type:



600 type:
mounting board of indoor unit

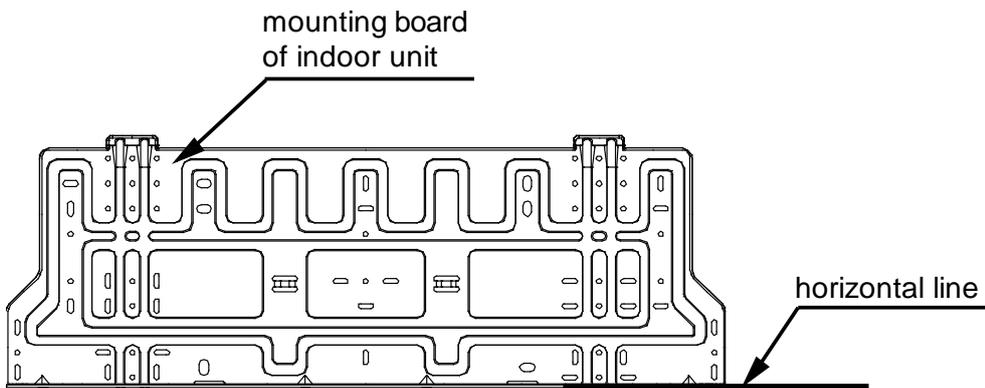


the shape of indoor unit

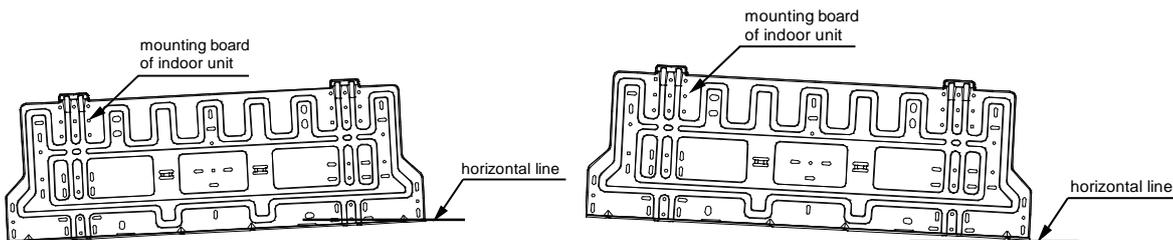
1. Fix the installation board.

- Install the installation board horizontally on structural parts in the wall with the spaces provided around the plate.
- In case of brick, concrete or similar type walls, make 5mmdia, holes in the wall. Insert clip anchors for appropriate mounting screws.
- Fix the installation board on the wall.

Right installation:



False installation:



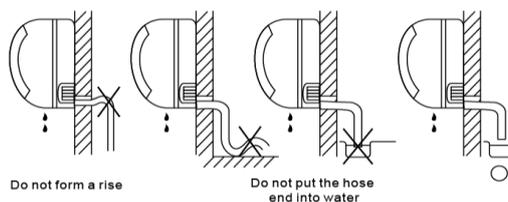
2. Drilling a hole.

- Determine the pipe hole position using the installation board, and drill the pipe hole (N95mm) so it slants slightly downward.
- Always use a wall hole conduit when piercing metal lath, ply wood or metal plate.

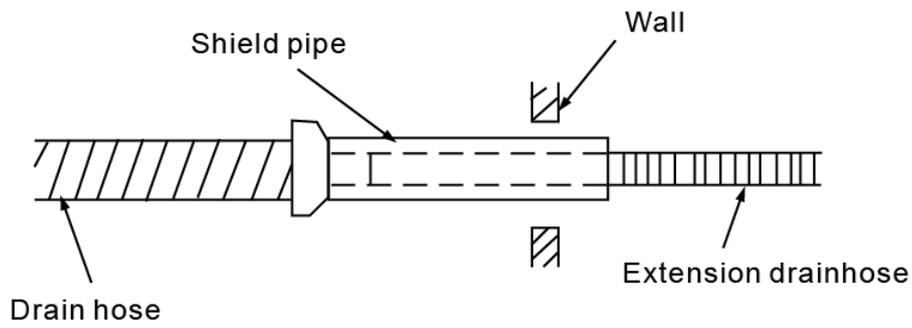
10.3.3 Connective Pipe and Drainage Installation

1. Drainage

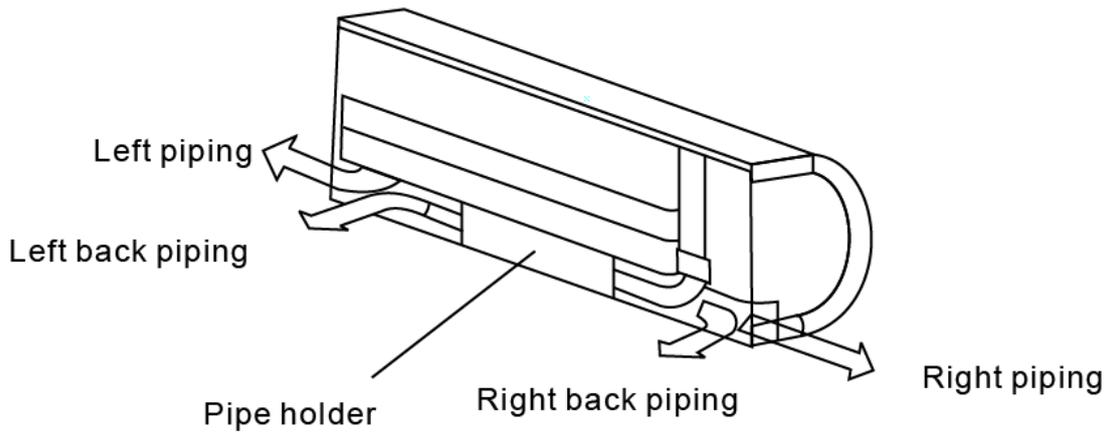
Run the drain hose sloping downward. Do not install the drain hose as illustrated below.



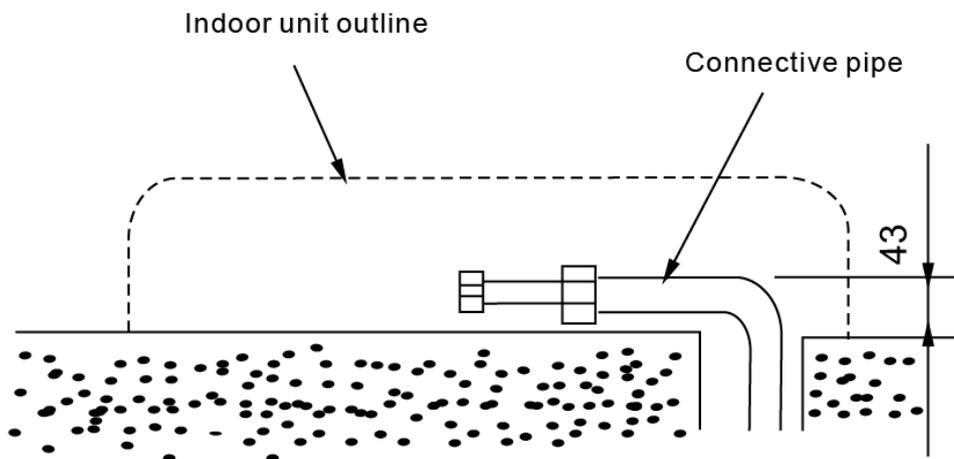
When connection extension drain hose, insulate the connecting part of extension drain hose with a shield pipe.



2. Connection pipe



- For the left-hand and rear-left-hand piping, install the piping as shown. Bend the connective pipe to be laid at 43mm height or less from the wall.



- **Fix the end of the connective pipe.**

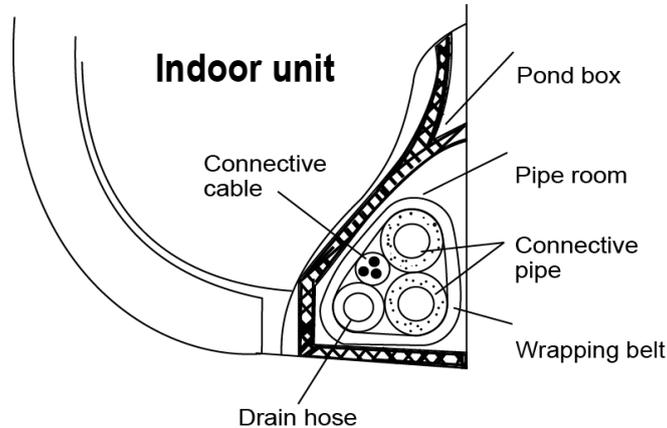
Caution:

- Connect the indoor unit first then the outdoor unit and bend and arrange the pipe carefully.
- Do not allow the piping to let out from the back of the indoor unit.
- Be careful not to let the drain hose slack.
- Insulate both of the auxiliary piping.
- Banding the drain hose under the auxiliary pipe.
- Do not allow the piping to let out from the back of the indoor unit.

3. Piping and bandaging

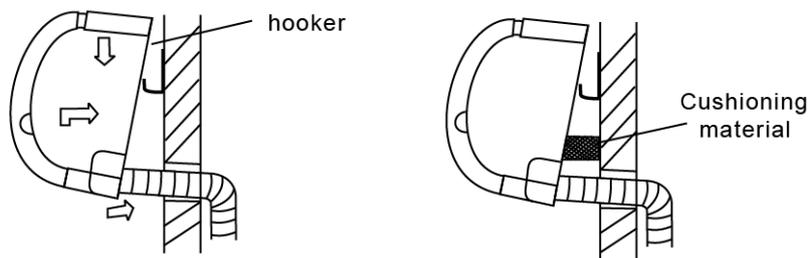
Wind the connective cable, drain hose and wiring with tape securely, evenly as shown below.

- Because the condensed water from rear of the indoor unit is gathered in Pond Box and is piped out of room. Do not put anything else in the box.



10.4 Indoor Unit Installation

- ◇ Pass the piping through the hole in the wall.
- ◇ Put the claw at the back of the indoor unit on the hook of the installation board, move the Indoor Unit from side to side to see that it is securely hooked.
- ◇ Piping can easily be made by lifting the indoor unit with a cushioning material between the indoor unit and the wall. Get it out after finish piping.
- ◇ Push the lower part of the Indoor Unit up to the wall, then move the Indoor Unit from side to side, up and down to check if it is hooked securely.



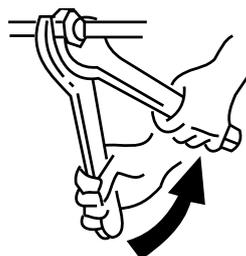
10.4.1 Material and Size of the Piping

Pipe material	Copper Pipe for Air Conditioner	
Model	250/400	600
Coil connections (flat plate)	3/4"	3/4"
	3/4"	3/4"

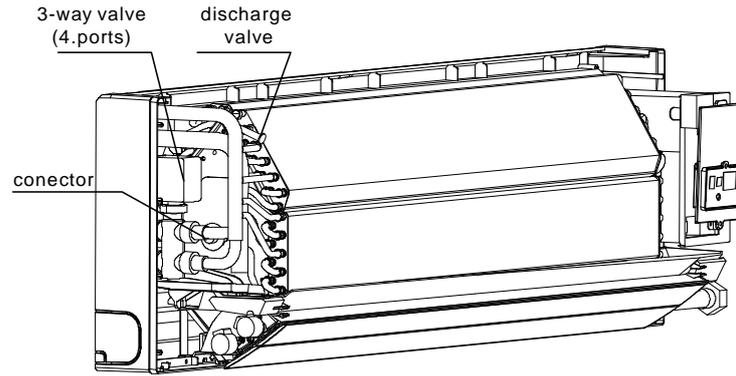
10.4.2 Connection of the Water Pipe

Connection of the water pipe should be done by professionals.

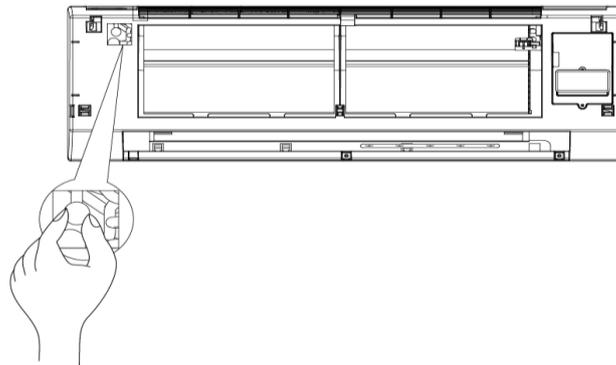
Double-span should be used when connecting pipes of Indoor Unit.



Note:Please refer to installation instructions for the water piping connection of the air conditioner that with throttle device inside.



- At the first debugging, completely expel air from coils via expelling valve.

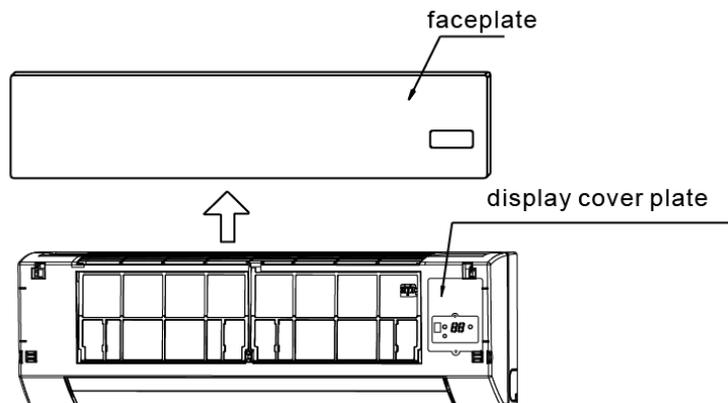


10.5 Wiring

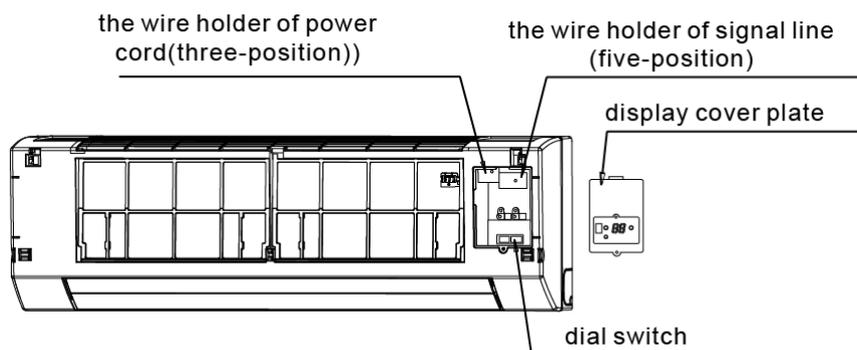
Caution:

The reserved function is indicated in broken line table, users can select it when necessary.

1. Take out the faceplate, then dismantle the display cover plate.



2. Individual connects the power cord and signal line, adjusts the dial switch.



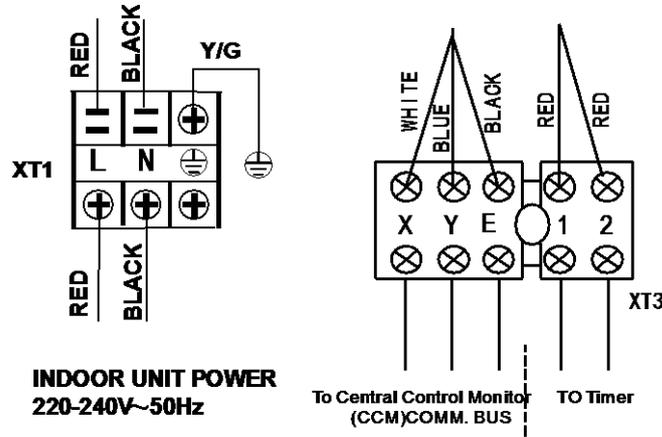
10.5.1 Terminal Board Diagram

Please refer to the indoor unit wiring diagram for the wiring.

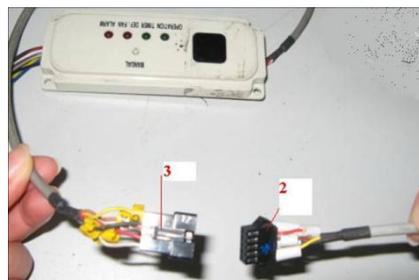
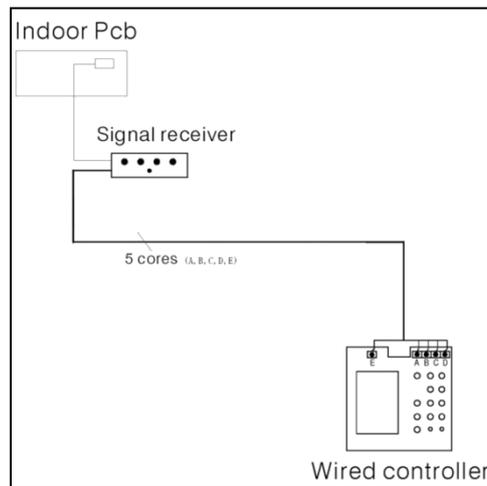
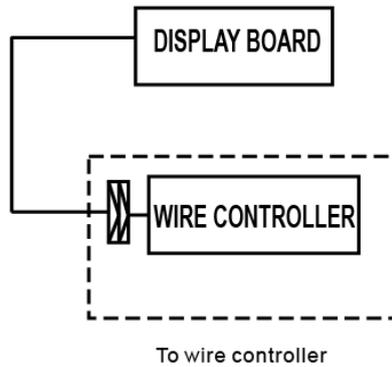
Note:

The air-conditioners can connect with Central Control Monitor (CCM). Before operation, please wiring correctly and set system address and network address of indoor units.

Single phase indoor unit:



Please adopt the shielded twisted-pair wire, and connect the shielded layer to E



Insert 2 & 3 together is OK

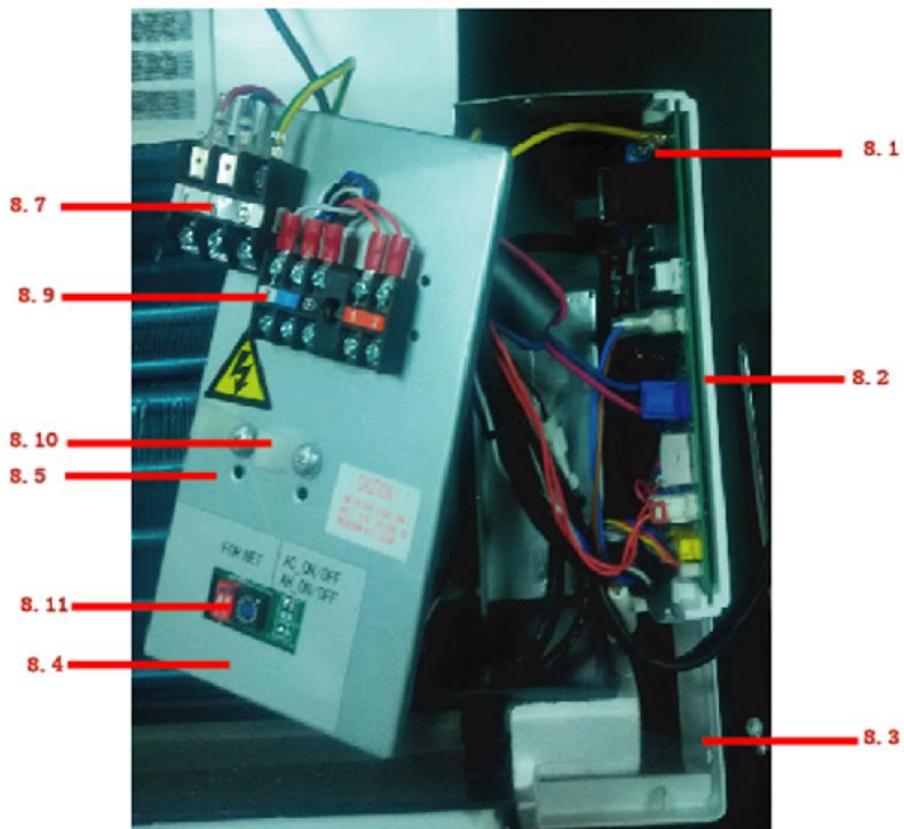
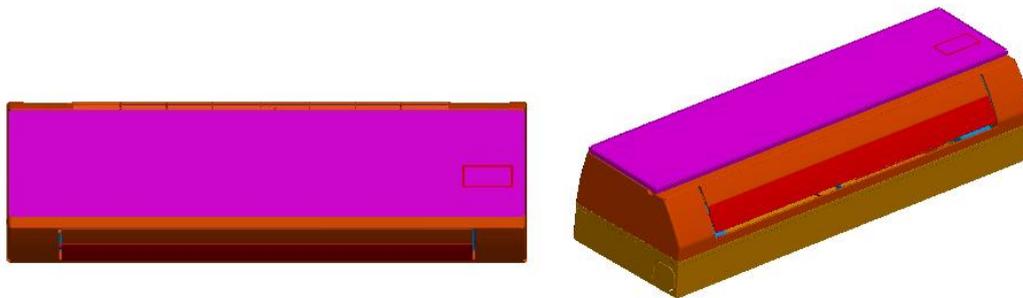
The reserved wire control function is indicated in broken line table, users can purchase the wire controller when necessary.

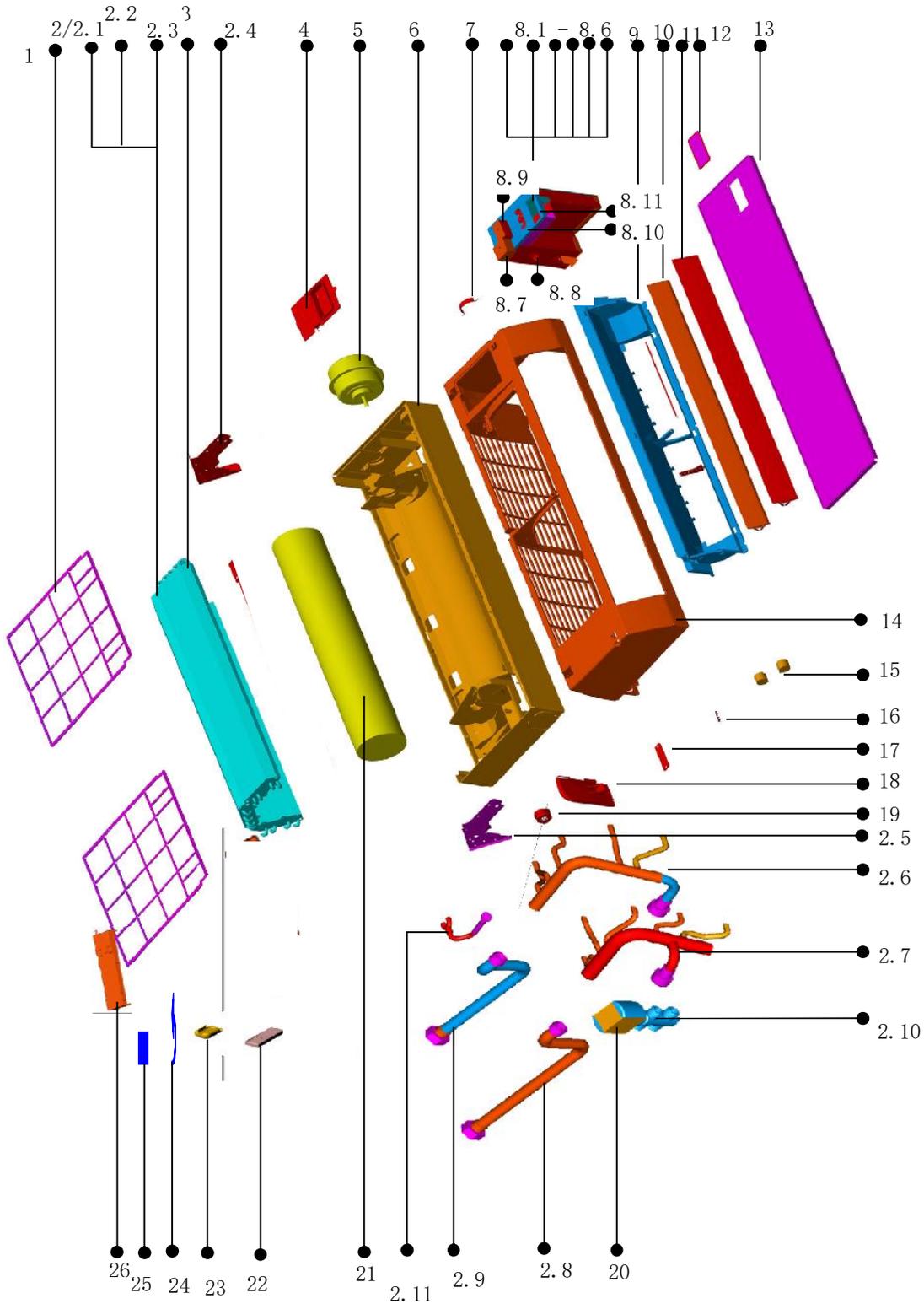
10.5.2 Network address set

Every air-conditioner in network has only one network address to distinguish each other. Address code of air-conditioner in LAN is set by code switch on Network Interface Module (NIM), and the set range is 0-63.

Toggle switch set			Network address code
SW1	ENC2		
		~	00~15
		~	16~31
		~	32~47
		~	48~63

EXPLODED VIEW OF UNIT SF-250H

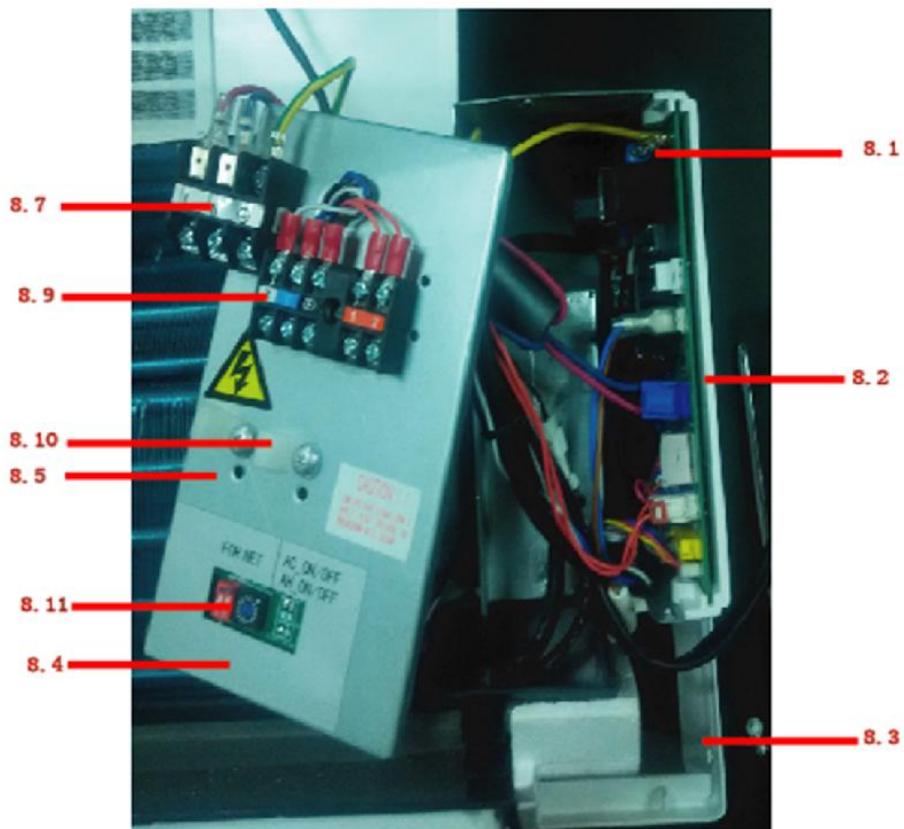
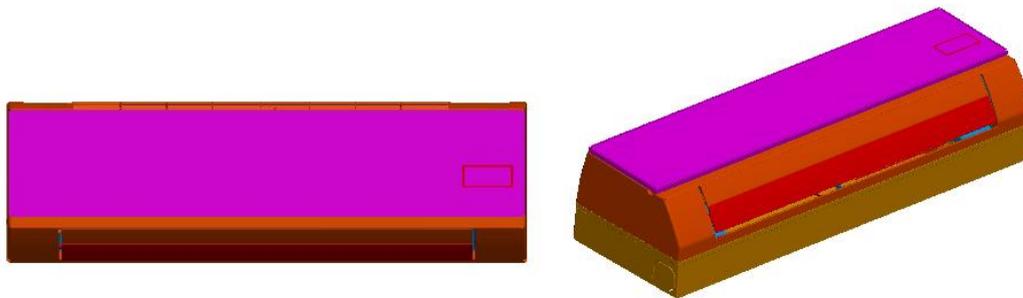


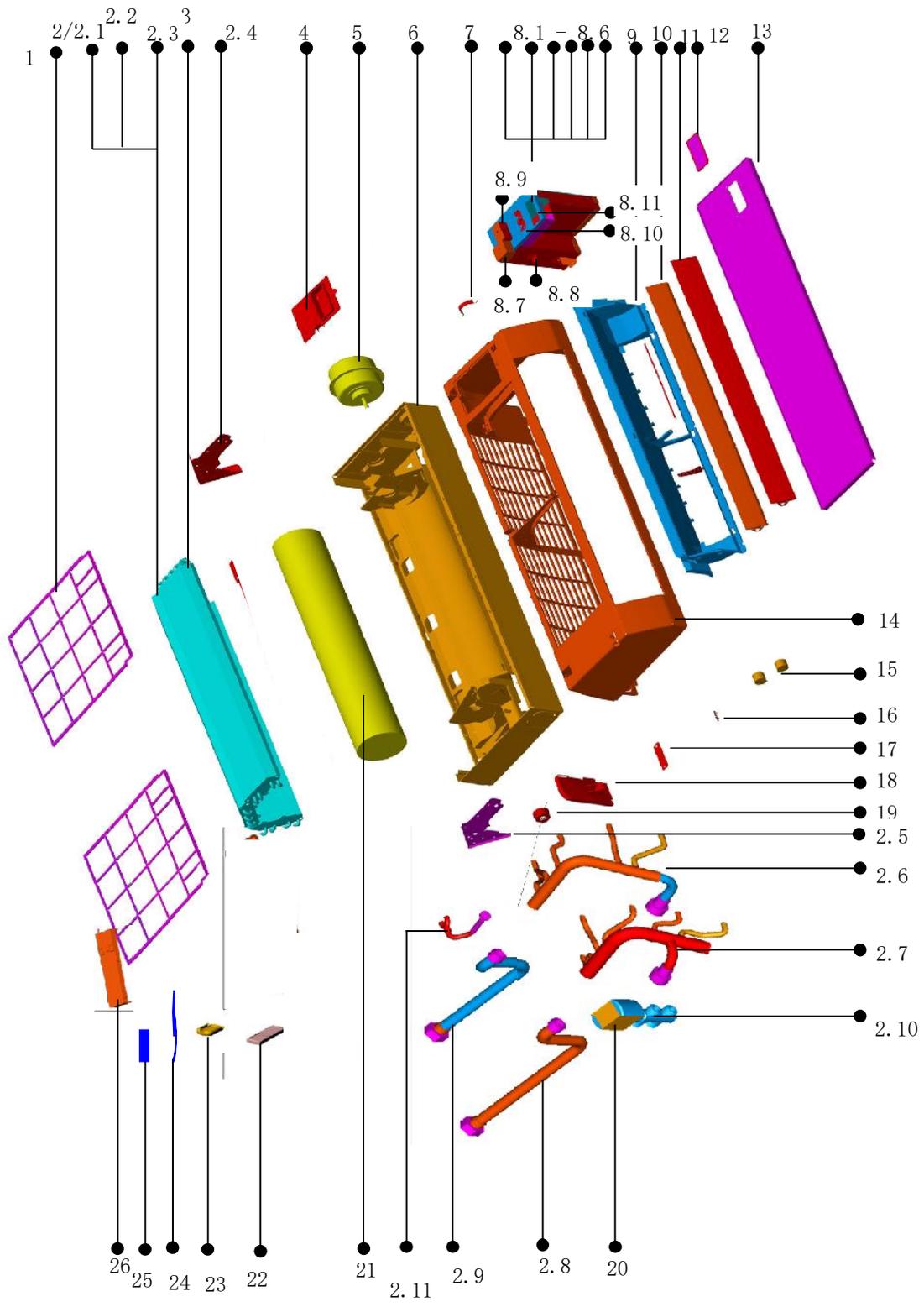


No	Description	Part Code	Actualization	Qty	Price Code
MODEL: SF-250H					
1	Filter	201187090020		2	
2	Evaporator ass'y	201580491124		1	
2.1	Evaporator	201580490050		1	
2.2	Evaporator	201580490052		1	
2.3	Evaporator	201580490051		1	
2.4	Evaporate connect board	201287090029		1	
2.5	Evaporator left clapboard	201287090028		1	
2.8	Water-outlet pipe ass'y	201680490140		1	
2.9	Water-inlet pipe ass'y	201680490132		1	
2.10	3-Ways valve	201601600254		1	
2.11	Discharge valve	201680490128		1	
5	DC fan motor	202400370022		1	
6	Chassis components	201187090589		1	
7	Motor spud	201287090018		2	
8	E-box ass'y	203380490968		1	
8.1	Main control board ass'y	201380490984		1	
8.3	Electric control box seat	201187090027		1	
8.4	Dial switch cover label	202080491809		1	
8.7	Wire joint, 3p	202301450134		1	
8.9	Wire joint(5P)	202301400248		1	
8.10	Wire clamp	201120000010		2	
8.11	Main control board ass'y	201380490983		1	
9	Air outlet frame ass'y	201187090021		1	
10	Upper air vane	201187090579		1	
11	Lower air vane	201187090578		1	
12	Panel dalle	201187090015		1	
13	Panel	201187090576		1	
14	Panel frame ass'y	201187090593		1	
15	Stepper motor	202400200028		1	
16	Screw cover	201187090017		3	
17	Pipe clamp	201287090017		1	
18	Drain pan ass'y	2011870A0676		1	
19	bearing block	202730100201		1	
20	Three-way valve solenoid coil	202480490058		1	
21	Cross fan	201100200024		1	
25	Network matching line group	202402200387		1	
26	Formaldehyde-kill	201131410703		1	

The data are subject to change without notice.

EXPLODED VIEW OF UNIT SF-400H

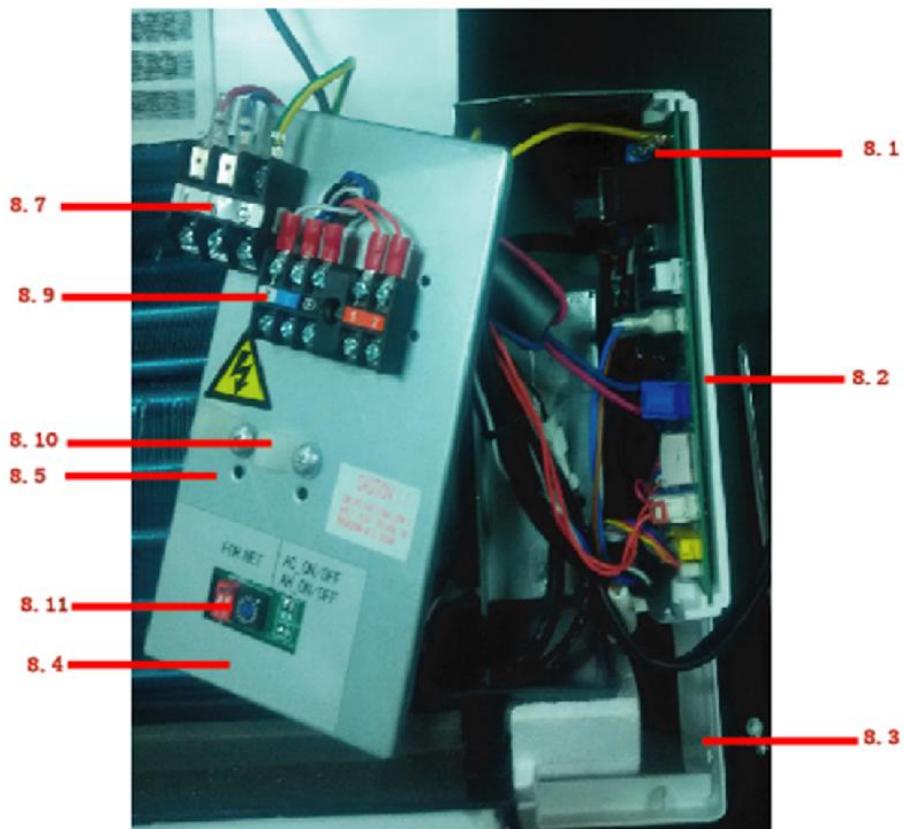
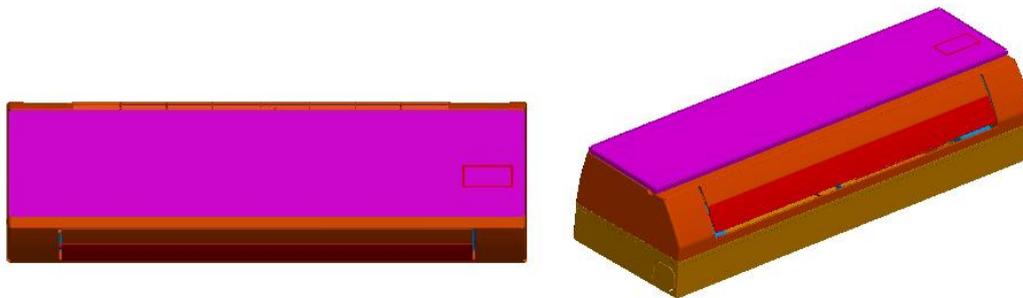


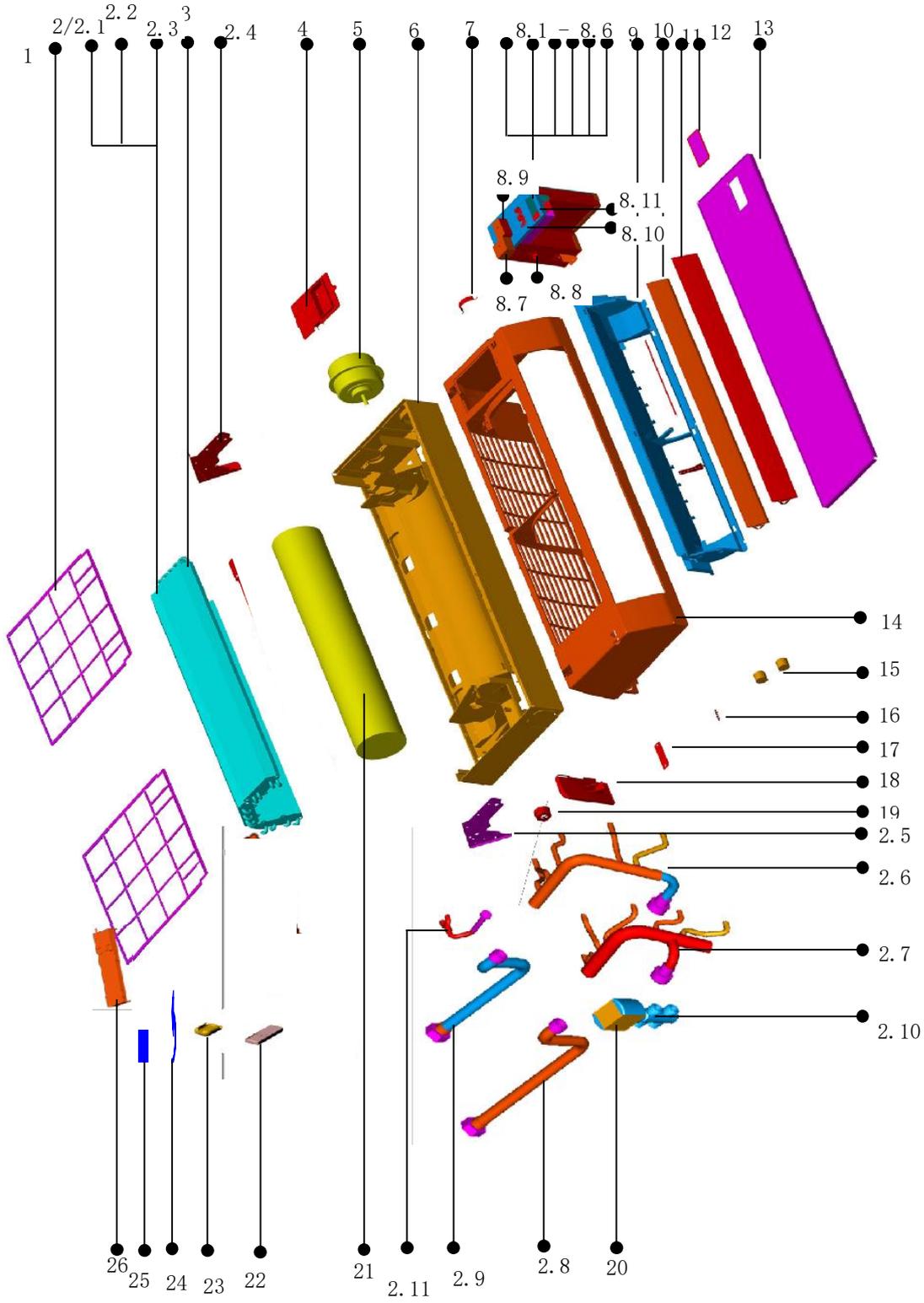


No	Description	Part Code	Actualization	Qty	Price Code
MODEL: SF-400H					
1	Filter	201187090020		2	
2	Evaporator ass'y	201580491124		1	
2.1	Evaporator	201580490050		1	
2.2	Evaporator	201580490052		1	
2.3	Evaporator	201580490051		1	
2.4	Evaporate connect board	201287090029		1	
2.5	Evaporator left clapboard	201287090028		1	
2.8	Water-outlet pipe ass'y	201680490140		1	
2.9	Water-inlet pipe ass'y	201680490132		1	
2.10	3-Ways valve	201601600254		1	
2.11	Discharge valve	201680490128		1	
5	DC fan motor	202400370022		1	
6	Chassis components	201187090589		1	
7	Motor spud	201287090018		2	
8	E-box ass'y	203380490968		1	
8.1	Main control board ass'y	201380490984		1	
8.3	Electric control box seat	201187090027		1	
8.4	Dial switch cover label	202080491809		1	
8.7	Wire joint, 3p	202301450134		1	
8.9	Wire joint(5P)	202301400248		1	
8.10	Wire clamp	201120000010		2	
8.11	Main control board ass'y	201380490983		1	
9	Air outlet frame ass'y	201187090021		1	
10	Upper air vane	201187090579		1	
11	Lower air vane	201187090578		1	
12	Panel dalle	201187090015		1	
14	Panel frame ass'y	201187090593		1	
15	Stepper motor	202400200028		1	
16	Screw cover	201187090017		3	
17	Pipe clamp	201287090017		1	
18	Drain pan ass'y	2011870A0676		1	
19	bearing block	202730100201		1	
20	Three-way valve solenoid coil	202480490058		1	
21	Cross fan	201100200024		1	
25	Network matching line group	202402200387		1	
26	Formaldehyde-kille	201131410703		1	

The data are subject to change without notice.

EXPLODED VIEW OF UNIT SF-600H





No	Description	Part Code	Actualization	Qty	Price Code
MODEL: SF-600H					
1	Filter	201187090033		2	
2	Evaporator ass'y	201580491125		1	
2.1	Evaporator	201580490056		1	
2.2	Evaporator	201580490055		1	
2.3	Evaporator	201580490054		1	
2.4	Evaporate connect board	201287090031		1	
2.5	Evaporator left clapboard	201287090030		1	
2.8	Water-outlet pipe ass'y	201680490158		1	
2.9	Water-inlet pipe ass'y	201680490154		1	
2.10	3-Ways valve	201601600253		1	
2.11	Discharge valve	201680490164		1	
4	Cross flow fan	201100200025		1	
5	DC fan motor	202400370022		1	
7	Chassis components	201187090586		1	
8	E-box ass'y	203380490968		1	
8.1	Main control board ass'y	201380490984		1	
8.3	Electric control box seat	201187090027		1	
8.4	Dial switch cover label	202080491809		1	
8.7	Wire joint, 3p	202301450134		1	
8.9	Wire joint(5P)	202301400248		1	
8.10	Wire clamp	201120000010		2	
8.11	Main control board ass'y	201380490983		1	
9	Panel frame ass'y	201187090592		1	
11	Air outlet frame ass'y	201187090028		1	
12	Upper air vane	201187090581		1	
13	Lower air vane	201187090580		1	
14	Panel dalle	201187090029		1	
15	Panel	201187090577		1	
16	Stepper motor	202400200028		1	
17	Screw cover	201187090017		3	
18	Drain pan ass'y	2011870A0676		1	
20	bearing block	202730100201		1	
21	3-way valve coil	202480490059		1	
22	Installation board ass'y	201287000310		1	
26	Network matching line group	202402200387		1	
27	Formaldehyde-kille	201131410703		1	
26	Motor spud	201287090044		1	

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NOTE CONCERNING PROTECTION OF ENVIRONMENT



This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

In case of quality problem or other please contact your local supplier or authorized service center.

Emergency number: 112

PRODUCER

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