TCL AHU

Installation

Content

1 Preparation before Installation

2 Outdoor unit installation

3 Indoor unit installation

4 Piping/ Pressure/ Vacuum

5 Electrical wiring

6 Test Run

Preparation before Installation

Safety

- Safety is always priority during installation
- Safety assessment should be arranged to all personnel involved in the installation
- Relevant national safety regulations and local code must be followed

Precautions

1. The unit must be installed where strong enough to withstand the weight of the unit and fixed securely, otherwise the unit would topple or fall off.

2. Install the air conditioner at a place where the inclination is less than 5°.

3. Do not install where there is a risk of inflammable gas leakage.

4. Do not install the unit at a place with leakage of inflammable gas.

Basic Requirement on Installation Site

(1) **Noise and air flow** produced by the outdoor unit will **not disturb the neighbors**.

(2) Select a location that is **safe** and **away from animals and plants**. If not, please add safety fences to protect the unit.

(3) Install at a place with **good ventilation**. Make sure the outdoor unit stays at a well-ventilated place with no obstacles nearby that may obstruct the air inlet and outlet.

(4) The installation location should be able to **withstand the weight and vibration** of outdoor unit and allow the installation to be carried out safely.

(5) Avoid installing at a place with leakage of inflammable gas, oil smoke or corrosive gas.

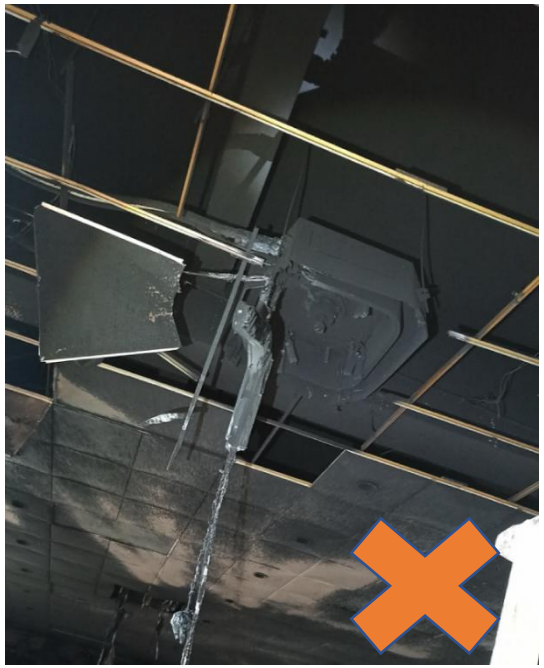
(6) Keep it **away from strong wind** because strong wind will affect the outdoor fan and lead to insufficient air flow volume and thus affecting the unit's performance.

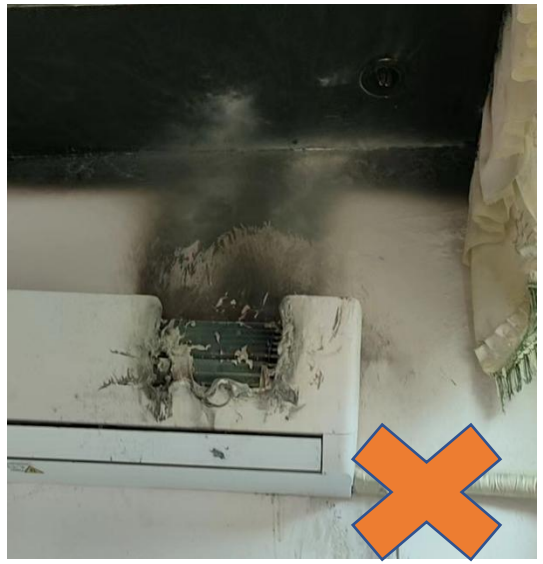
(7) **Away from any object** that may get the air conditioner generating **noise**.

(8) Install the outdoor unit at a place where **condensate** can be **easily drained**.

Basic Requirement on Installation Site

CASE 1 :Avoid internal circuits in walls when installation and check if the suspension rod or hanging panel is energized.





Electrical Safety Requirements

1.The **power supply** shall conform to the value on the **nameplate**.

2.The unit can operate normally within the range of **90%～110%** of **rated voltage**.

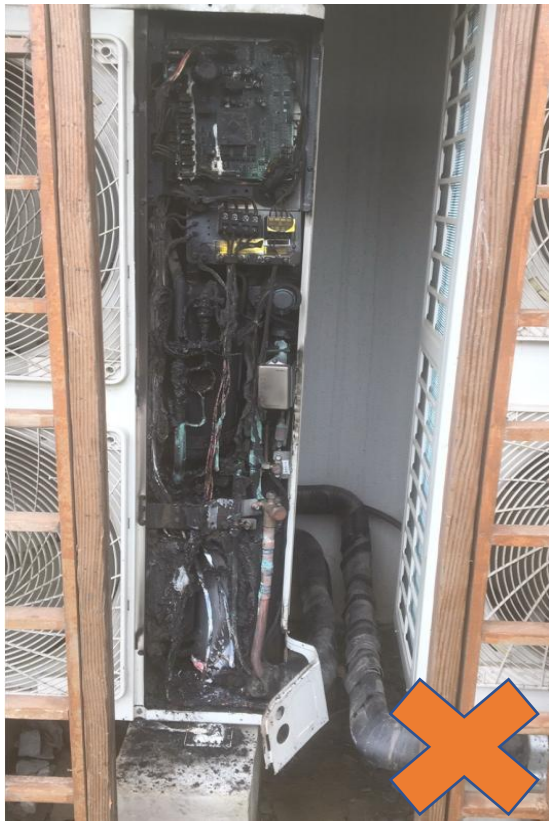
3. Do not pull the power supply with excessive force.

4.The **ground wire** shall be connected reliably.

5. The air conditioner should be at least **1.5m(5 ft)** away from the **flammable material**.

Electrical Safety Requirements

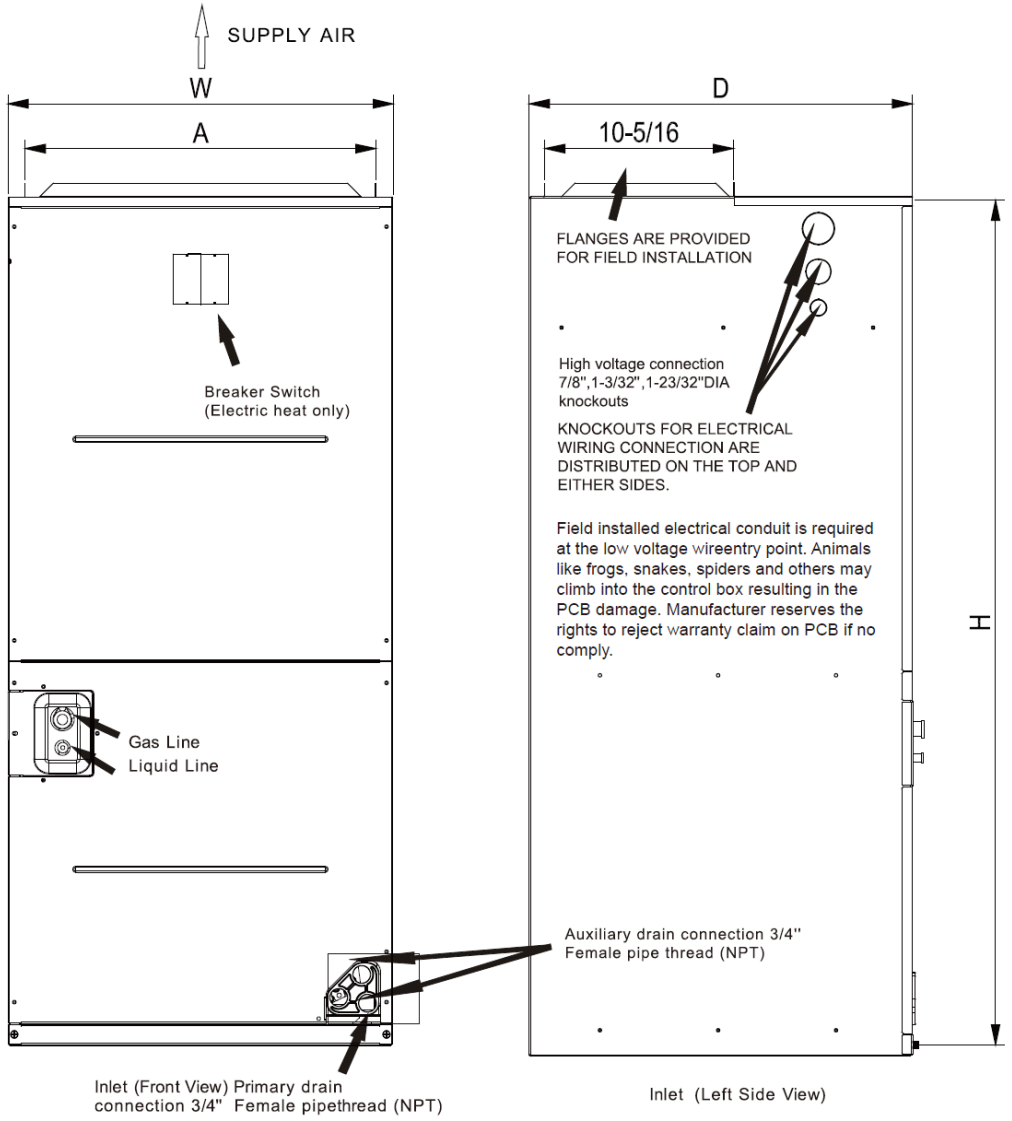
CASE 2 :The power cord should have the reinforced insulation sheath, to prevent insulation wire aging or damaged or other environmental factors that can cause short circuits.



Indoor Unit Installation

Indoor Unit Installation

IDU Size (Air handler)

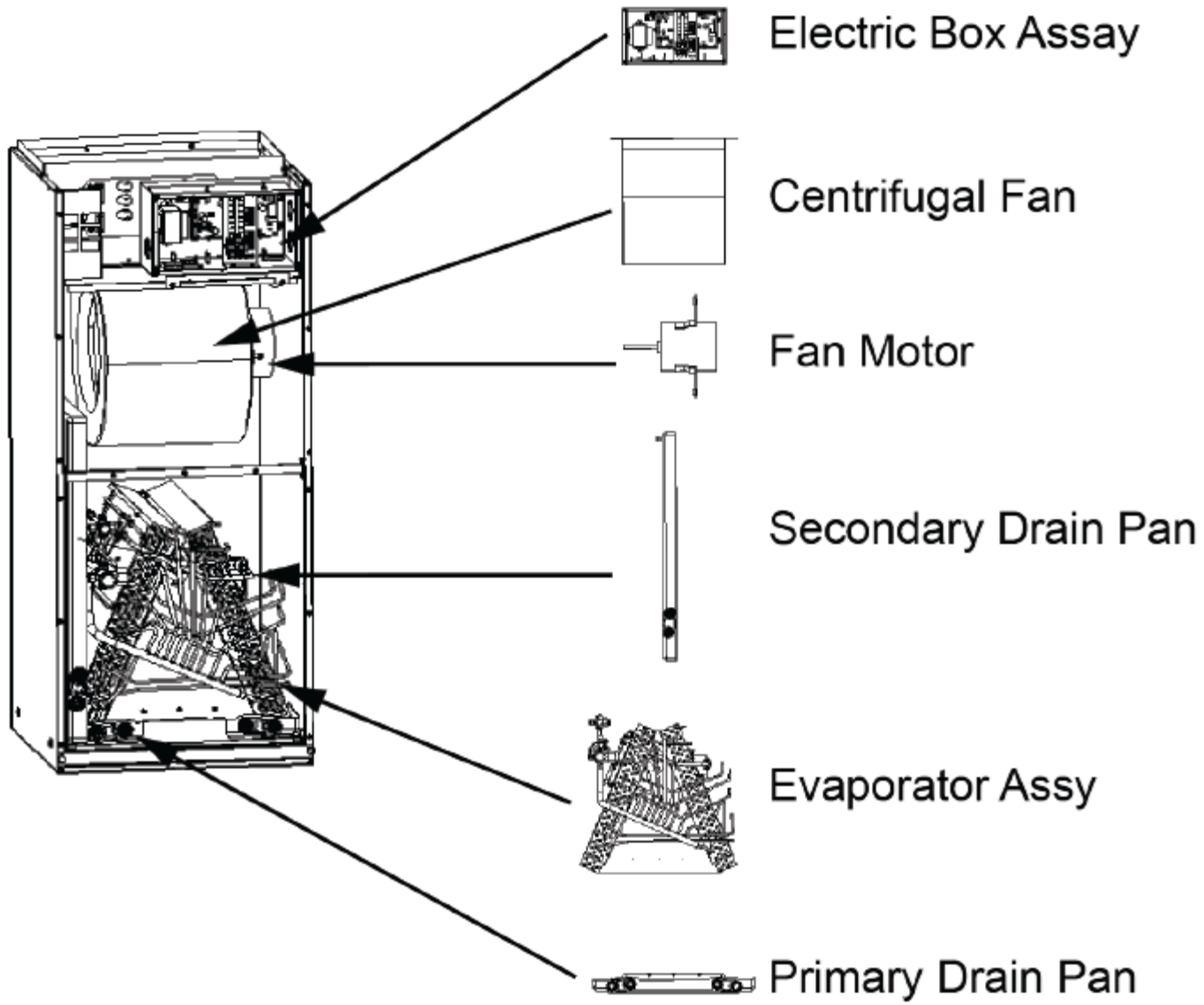


Unit Dimensions

Model	Dimensions (in.)					
	H	W	D	A	Liquid Line Connection	Gas Line Connection
24/36K	46-1/2	21	21	19-1/4	3/8	3/4
48/60K	56	24-1/2	21	22-3/4	3/8	7/8

Indoor Unit Installation

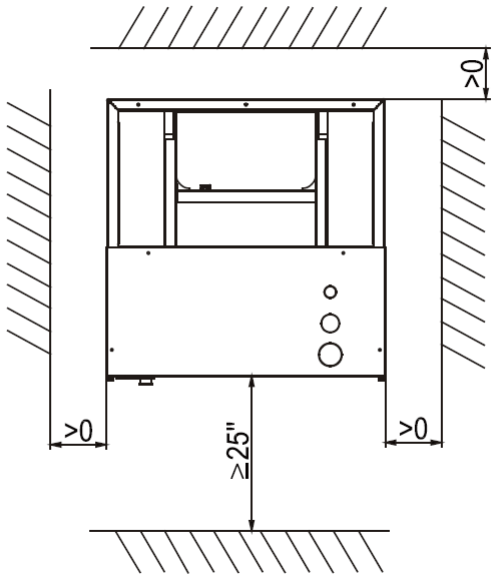
Main Components

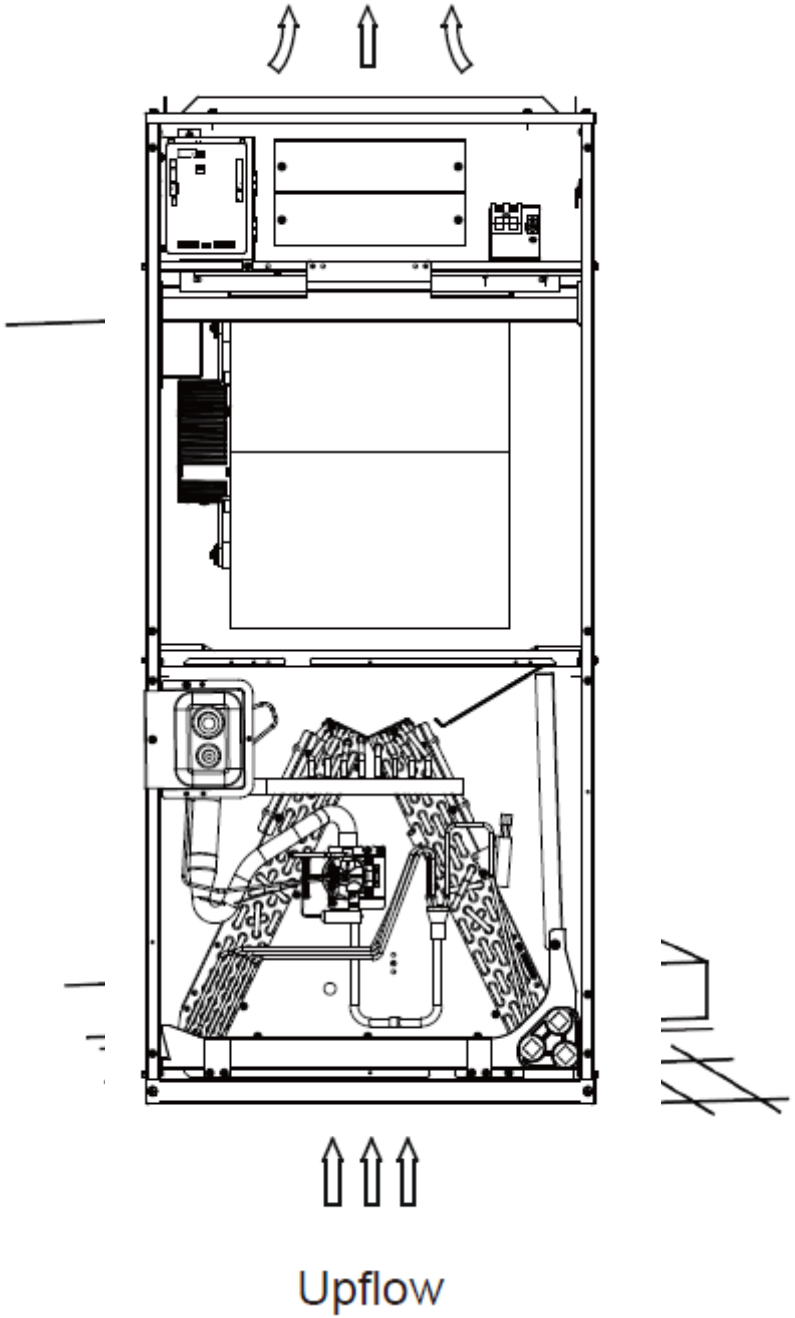


Indoor Unit Installation

Vertical Installation

If air handler is installed as the figure, the air handler should be concealed in a specific room or space and make sure the air handler is not accessible to the general public. And keep a minimum of 24” in front of the unit for service clearance.

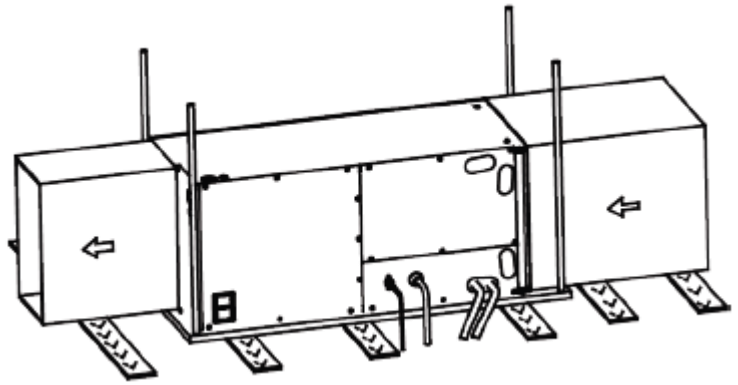


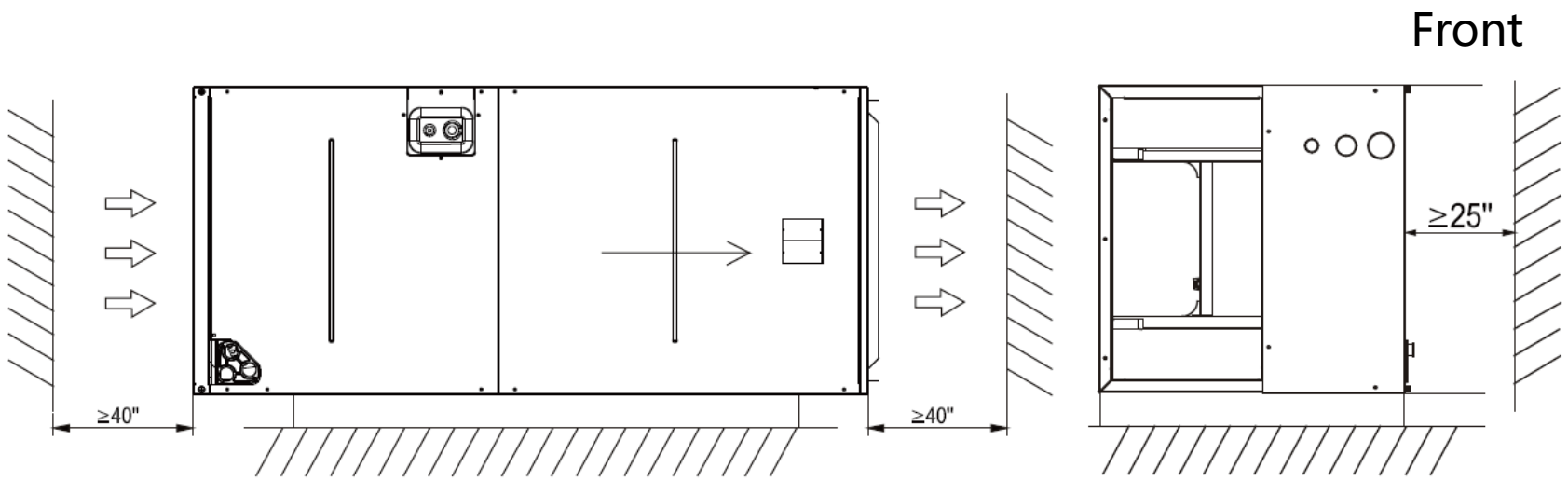


Upflow

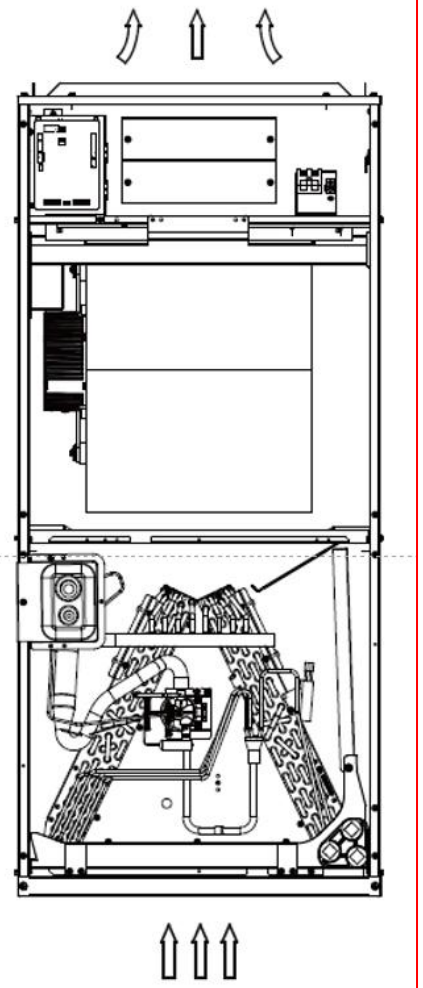
Horizontal Installation

If air handler is installed as the figure, make sure that there is enough space for care and maintenance and the height between the air handler and ground is above 2500mm. And the air handler is not accessible to the general public. And keep a minimum of 24” in front of the unit for service clearance.

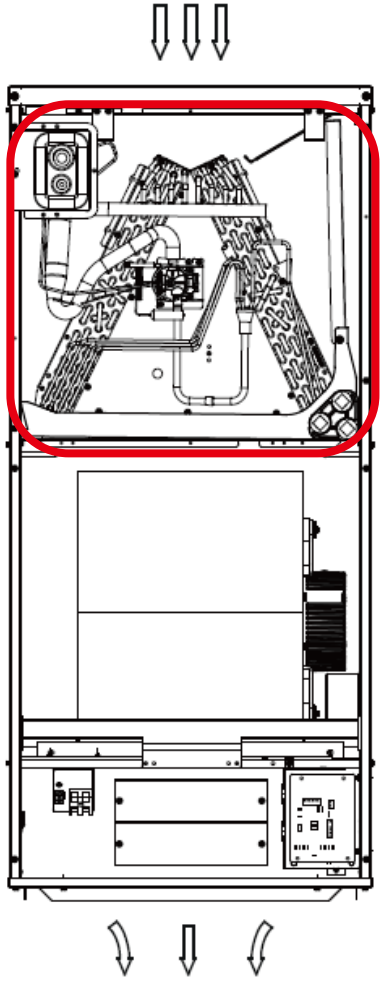




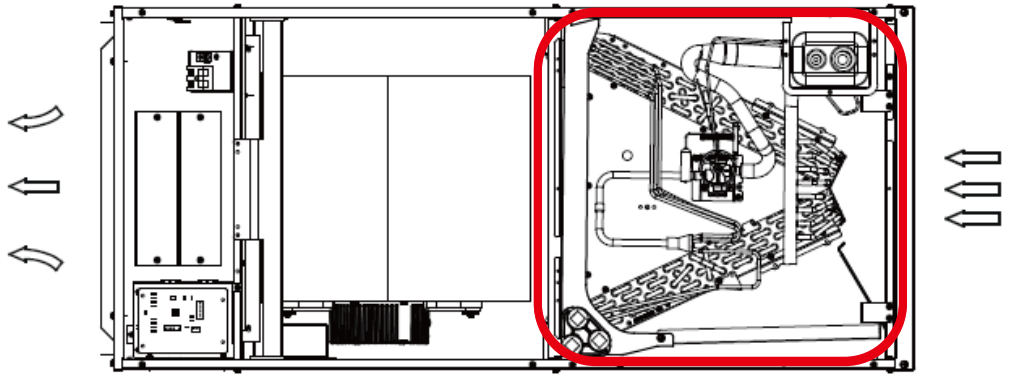
Indoor Unit Installation



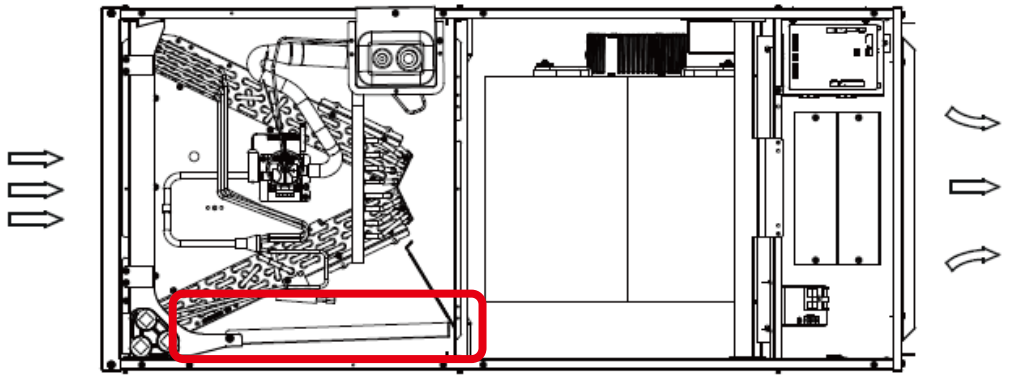
Upflow



downflow



horizontal left

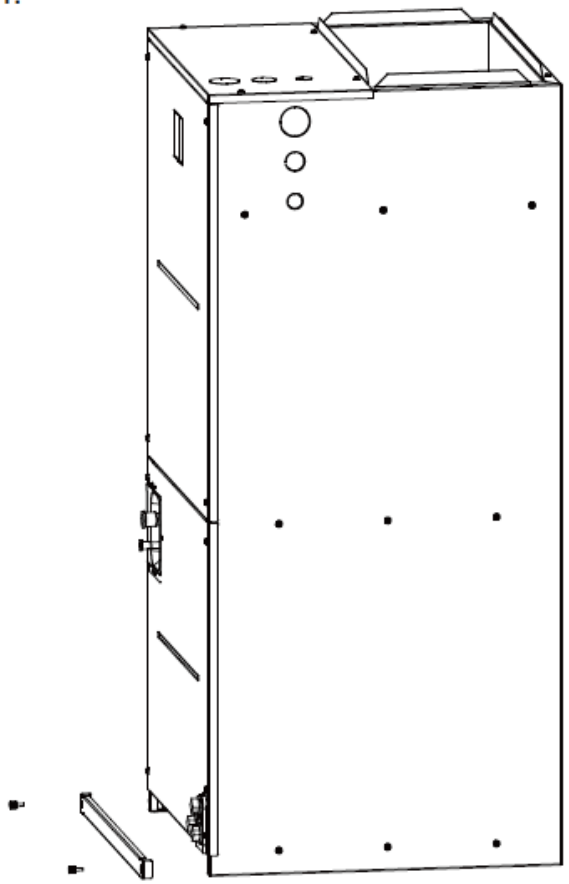


horizontal right

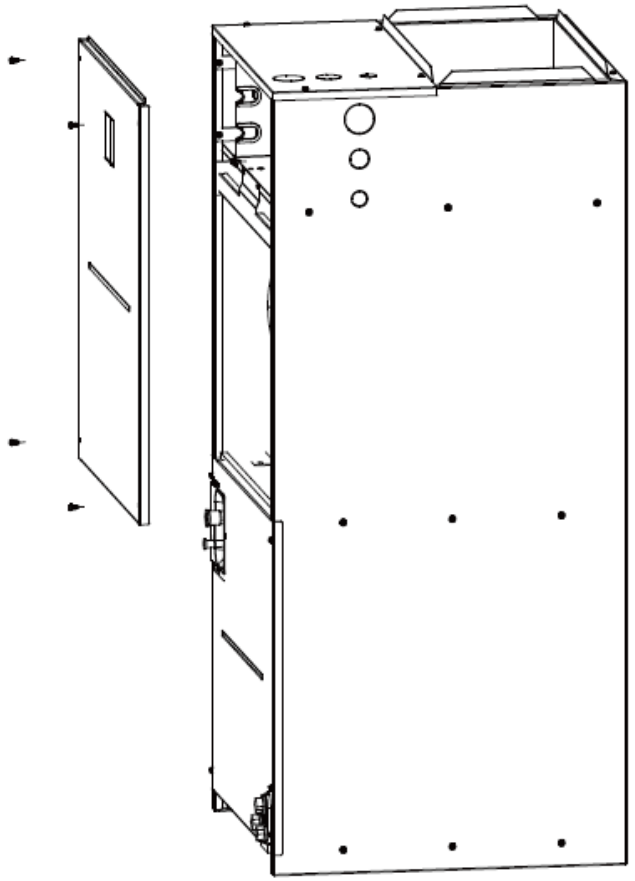
TCL

Reversing instructions

1. Remove the fixed plate of the filter, then take the filter off.



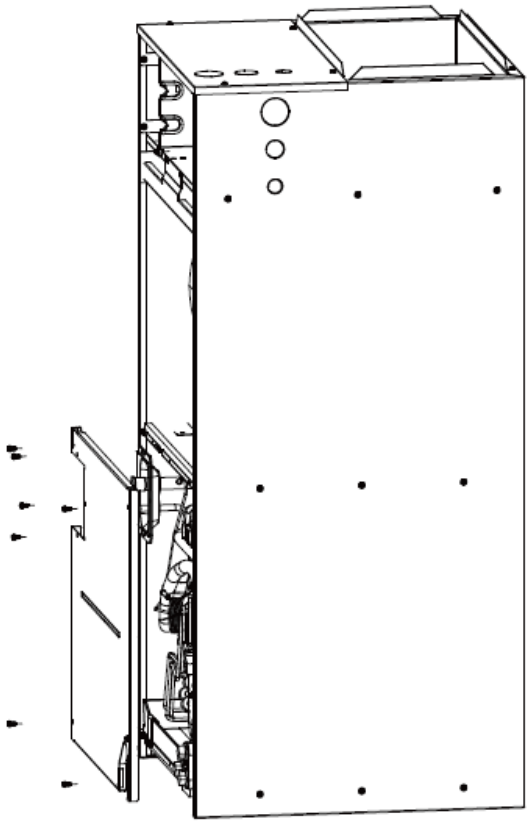
2. Remove the upper cover assembly.



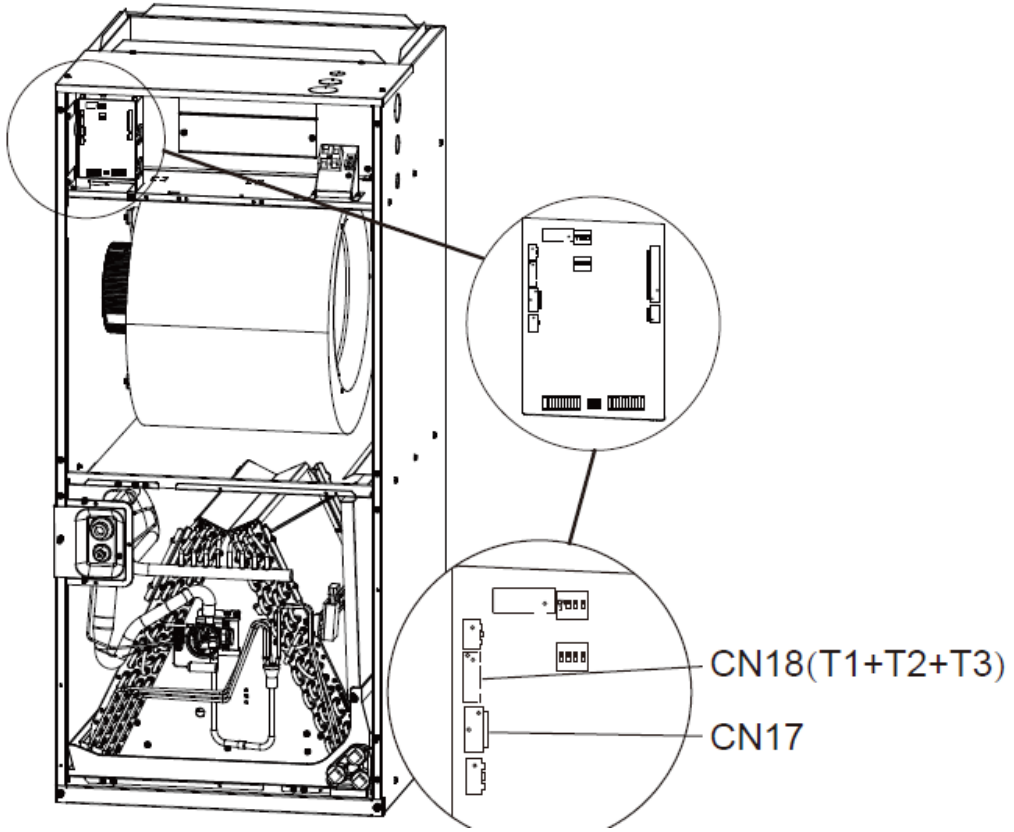
TCL

Reversing instructions

3. Remove evaporator cover plate.



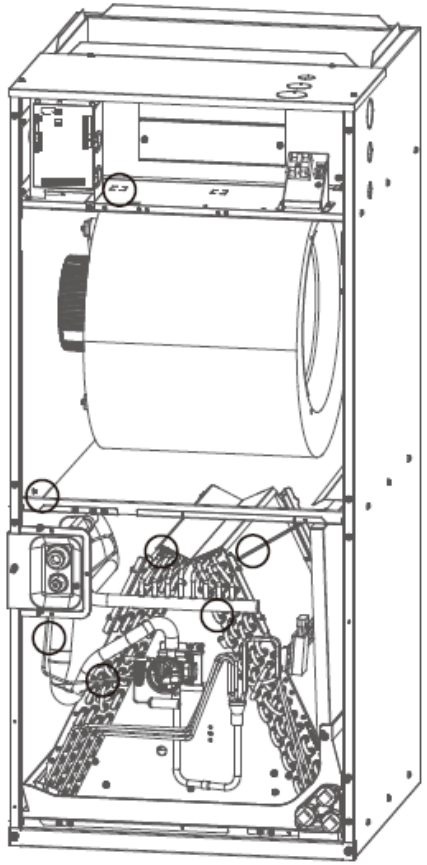
4. Remove the plug of the CN17 refrigerant sensor and the plug of the CN18 temperature sensing bag.
CN17: Refrigerant Sensor
CN18: Temperature Sensor



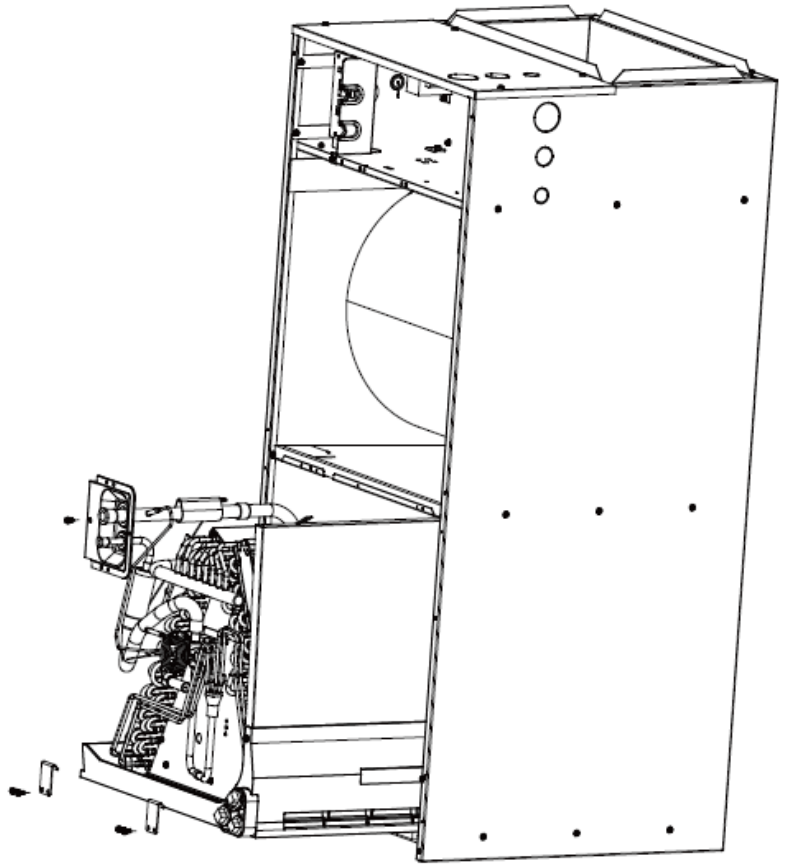
TCL

Reversing instructions

5. Remove CN17、CN18 wire ties.



6. Take out the evaporator and drain pan and rotate 180°.

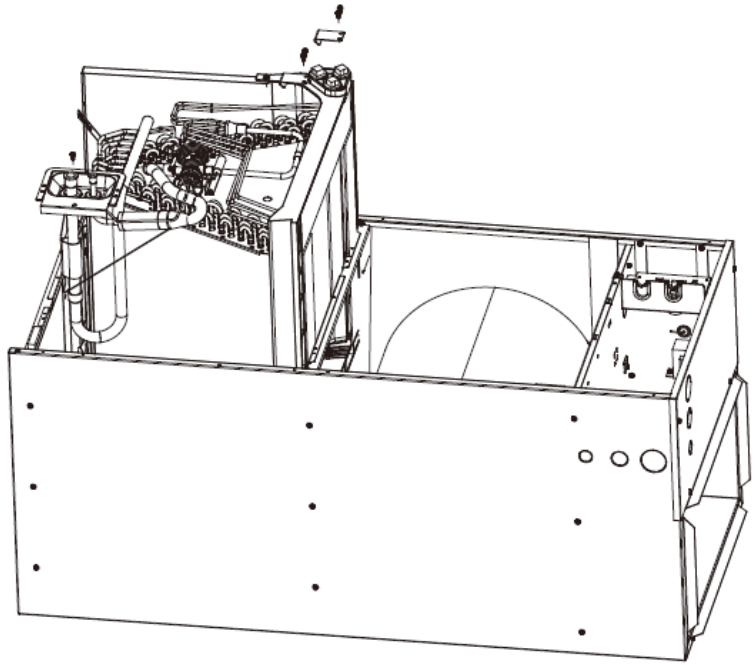


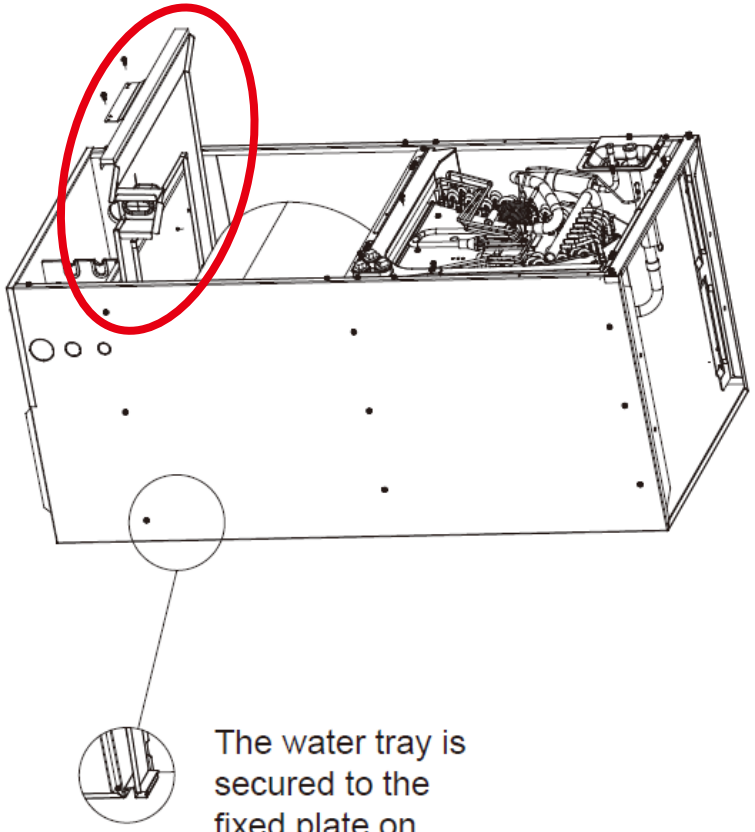
TCL

Reversing instructions

7. Reinstall the evaporator and drain pan.

   The water collection tray accessories are optional and are only needed when installing the unit with downward air outlet. They can be purchased separately from the manufacturer.





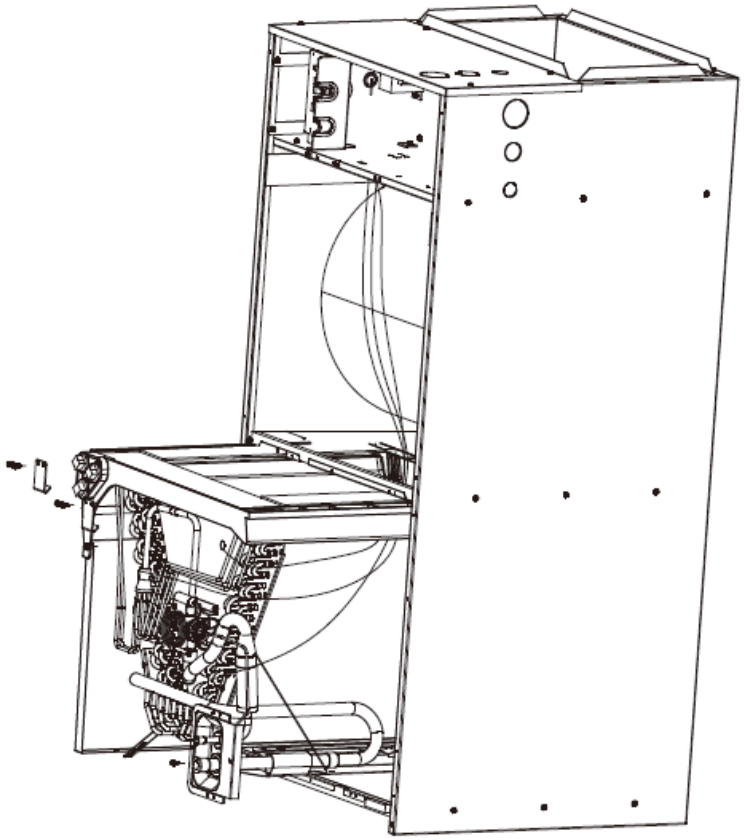
The water tray is secured to the fixed plate on both sides.

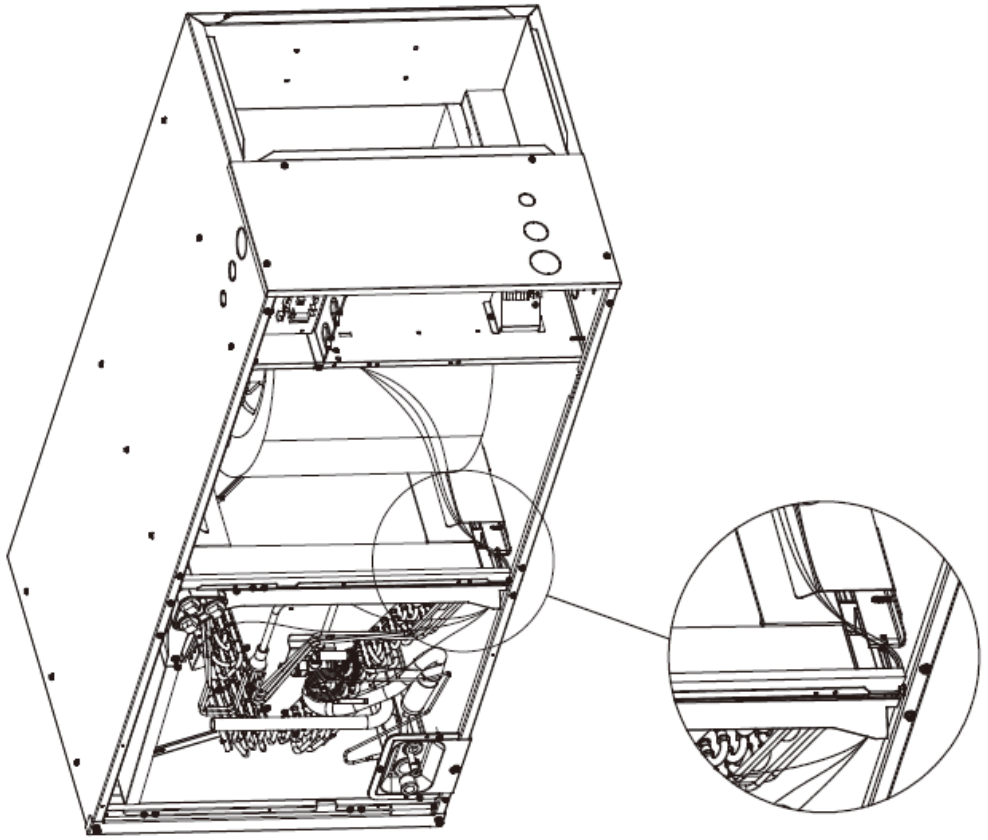
TCL

Reversing instructions

8. Reinstall CN17、CN18 plug and tie up the sensor wires.

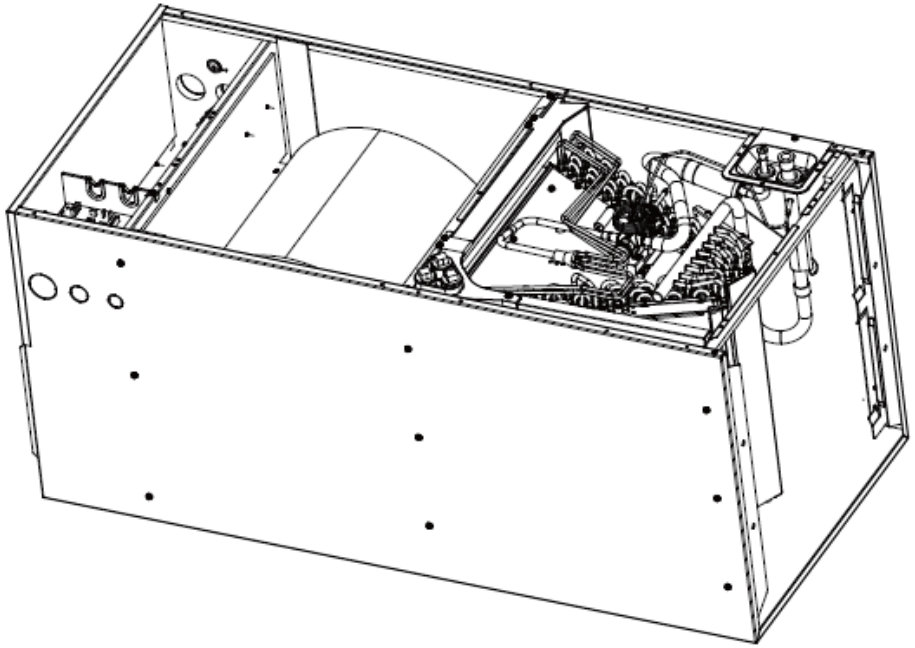
NOTICE: The wire body needs to pass through the wire groove from the water receiving tray and be stuck on the hook of the water receiving tray.

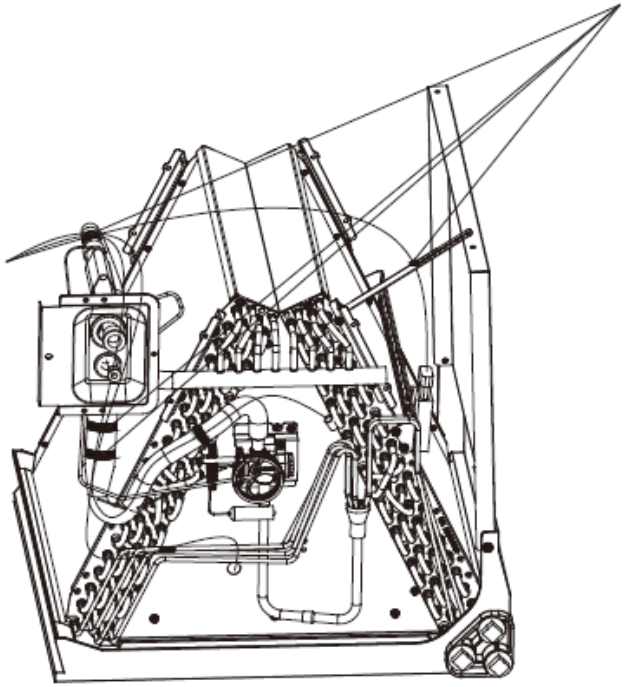




Reversing instructions

9. Reinstall the drain pan fixed plate and auxiliary support plate.

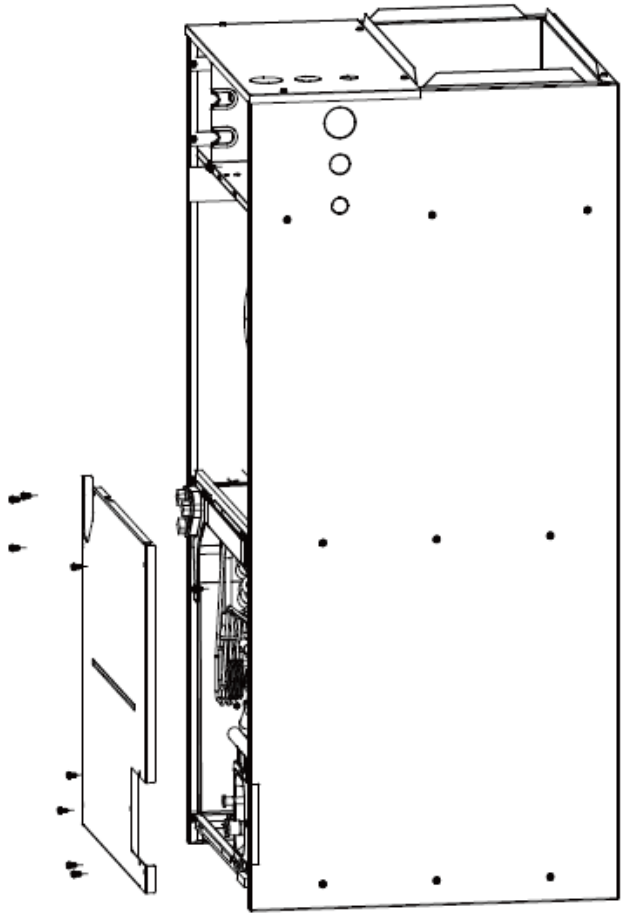




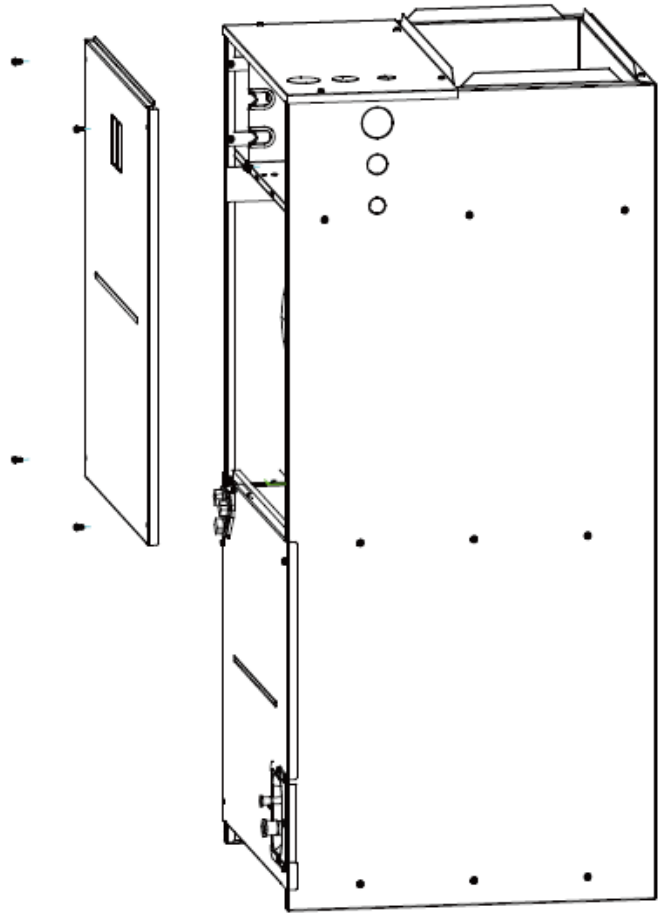
Use cable ties to bind and fix the environmental temperature sensitive bag as shown in the figure.

Reversing instructions

10. Reinstal evaporator cover plate.

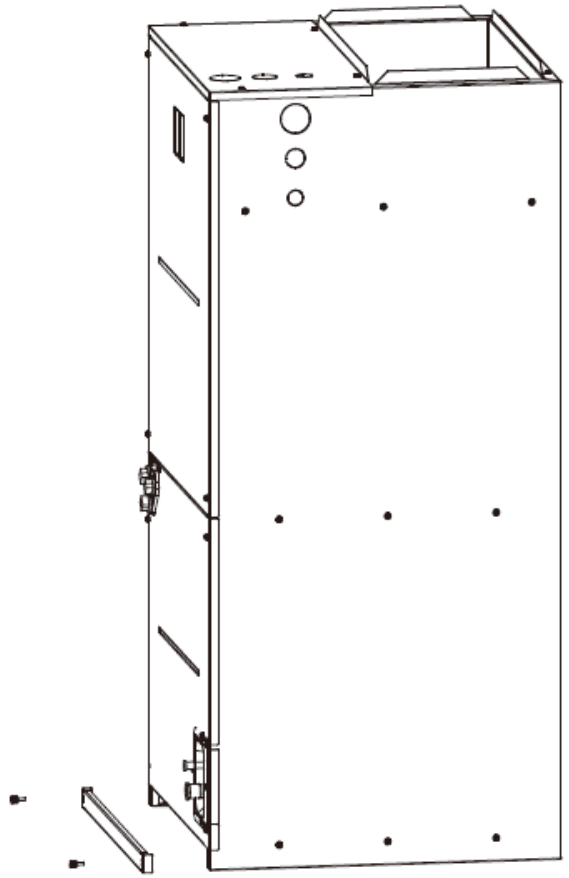


11. Remove the upper cover assembly.



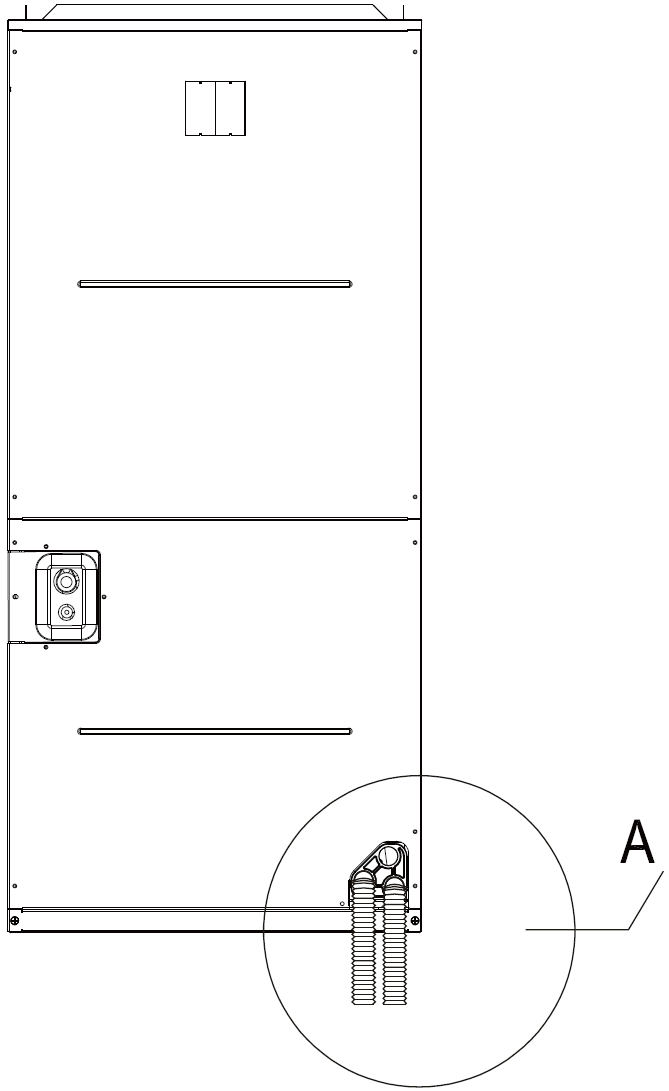
Reversing instructions

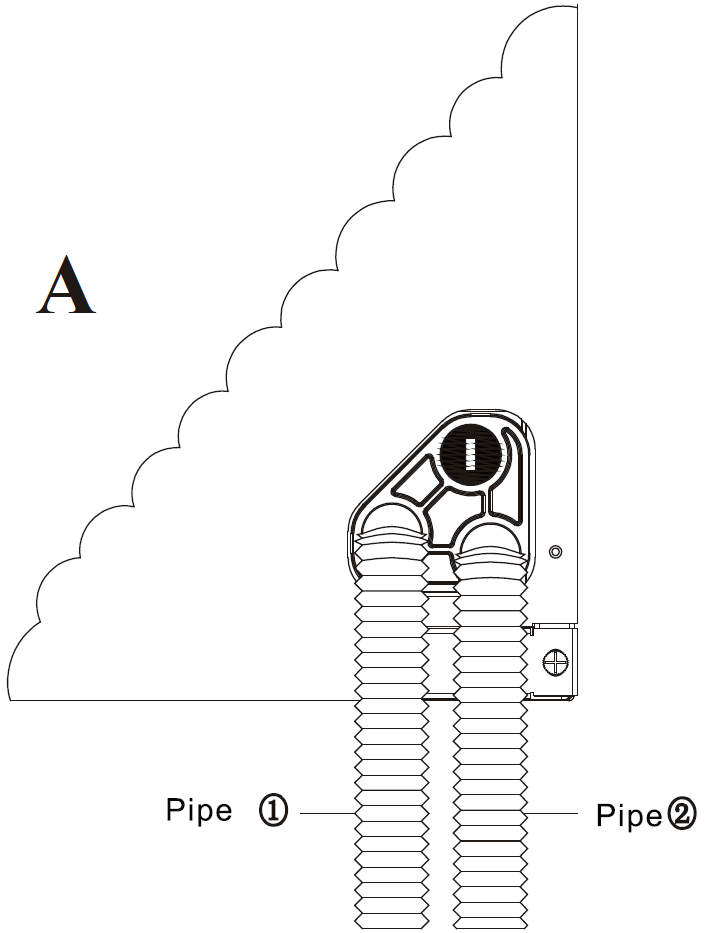
12. Reinstal the filter and filter plate.



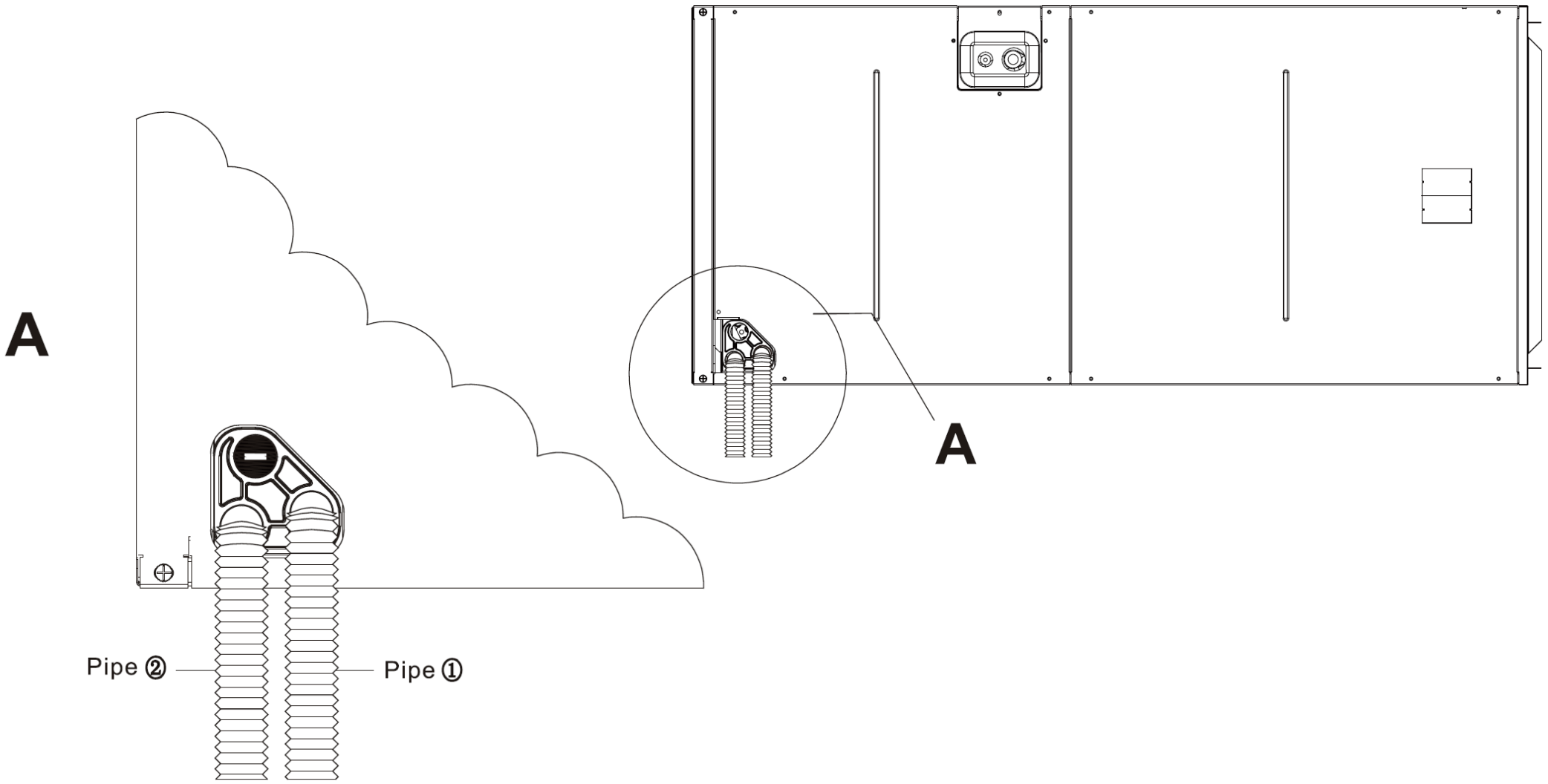
13. Open the cover of the electronic control box.
14. Connect the wire according to the wiring diagram.
15. Connect the pipes.
16. Install the drainage pipes.

Installation of drainpipe

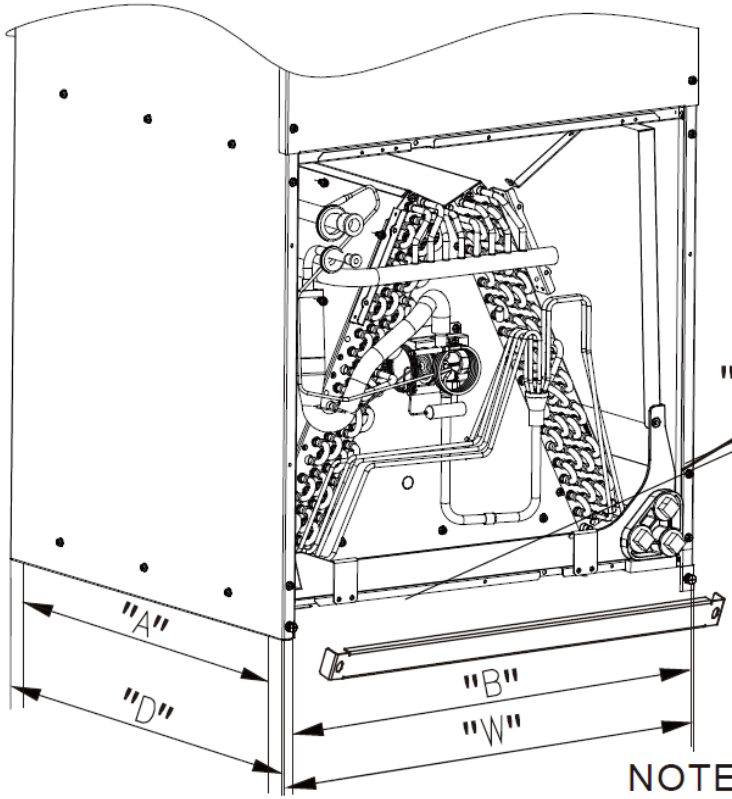




Installation of drainpipe



Installation of drainpipe



Air filter Clean/Replacement

1. Remove bolts to take the filter cover away.
2. Hold the edge of the air filter and extract it out.
3. Clean the air filter or use a new one to replace.

NOTE: AIR FILTER IS NOT FACTORY INSTALLED

Filter installation and clean

TCL

Installation of air filter

Filter Dimensions

Model	Dimensions (in.)					
	Filter size	W	D	H	A	B
24K/36K	18 x 20	19-3/4	21	1	16	13-7/8
48K/60K	22 x 20	23-1/4	21	1	16	15-1/4

NOTE:

- Refer to the label on filter cover to install the correct filter size.
- The product is not equipped with a filter.

Outdoor Unit Installation

Outdoor Unit Installation

MODEL	Gas Pipe	Liquid Pipe	Maximum pipe length (feet)	Maximum height difference (feet)
24K	3/4'	3/8'	100	50
36K	3/4'	3/8'	100	50
48K	7/8'	3/8'	100	50
60K	7/8'	3/8'	100	50

Outdoor Unit Installation

Selection of Installation Site

1. The noise and the air flow will not affect the neighbor, the animal or the plant.
2. There should be good ventilation.
3. The air inlet and outlet should be far away from obstructions.
4. It can bear the weight of the outdoor unit and vibration.
5. Select dry places. It should not be exposed to sunlight or strong wind.
7. It is out of reach of children.
8. It will not block the passage

Outdoor Unit Installation

Unit Dimensions	
Model	**H×W×D(Inches)**
24K	24-15/16×29-1/8×29-1/8
36K	24-15/16×29-1/8×29-1/8
48K	33-3/16×29-1/8×29-1/8
60K	33-3/16×29-1/8×29-1/8

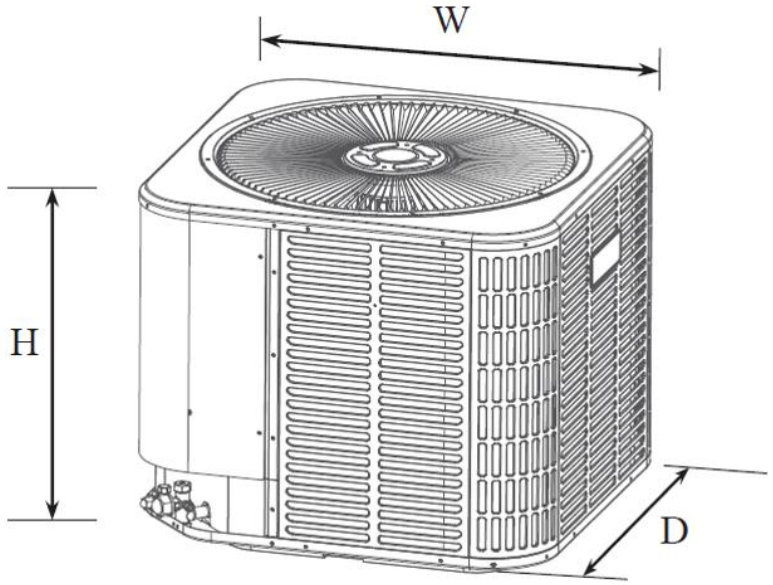


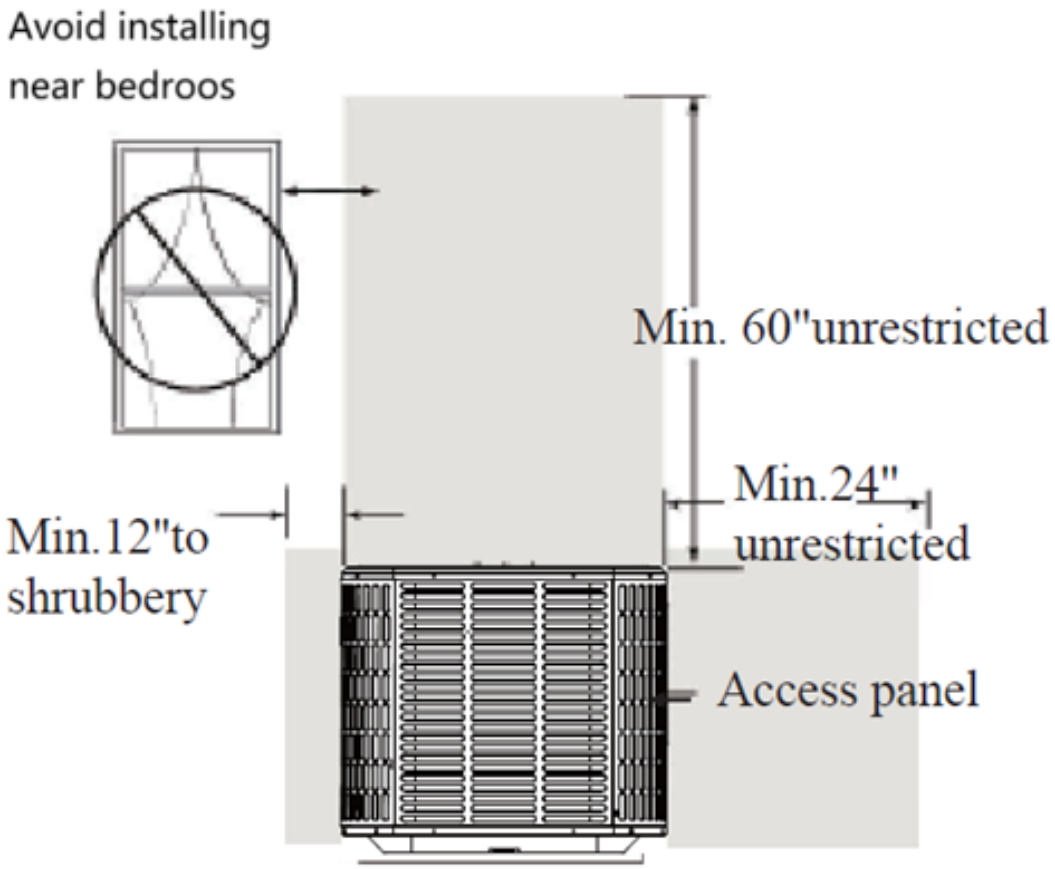
Fig 4-2 External dimensions

Outdoor Unit Installation

Capacity Model	Liquid Line	Suction Line	Total Equivalent Length (FT)			
			25	50	75	100
	Dimensions in inches		Maximum Elevation Difference(FT)			
24K	3/8 Std.	3/4 Std.	25	50	45	40
36K	3/8 Std.	3/4 Std.	25	50	50	50
48K	3/8 Std.	7/8 Std.	25	50	50	40
60K	3/8 Std.	7/8 Std.	25	50	50	40

Outdoor Unit Installation

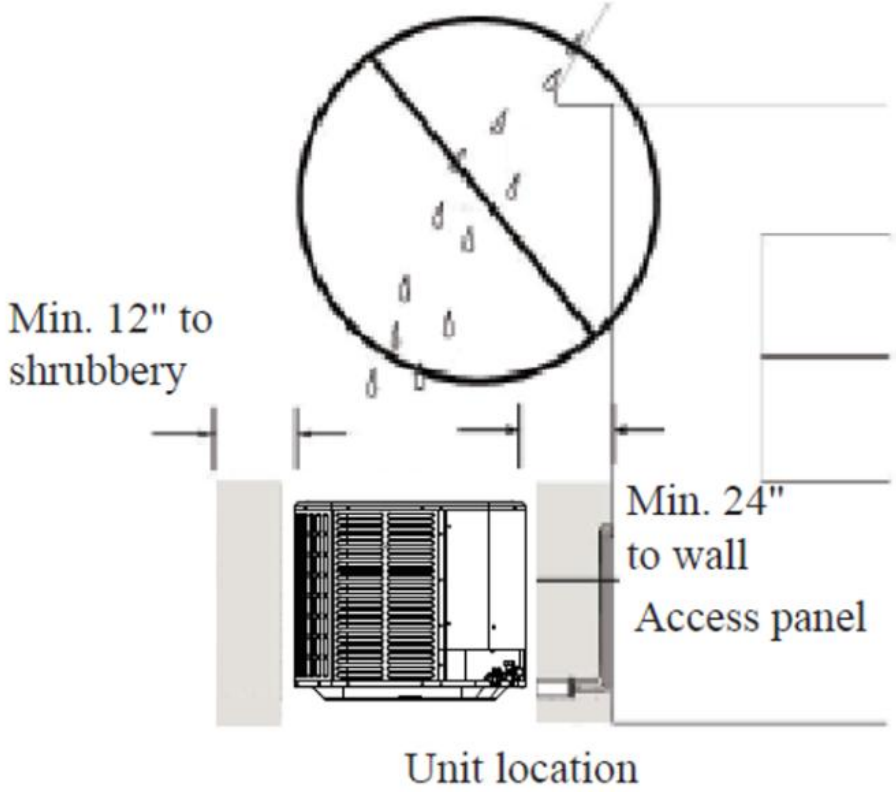
Space requirement

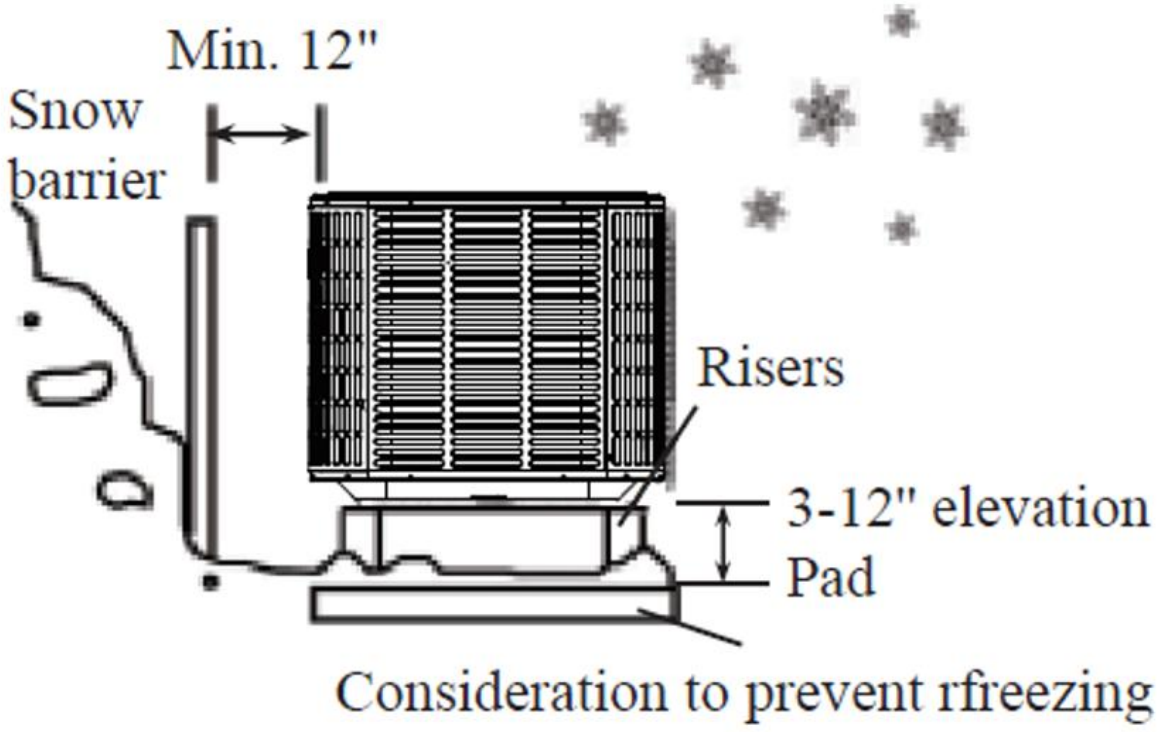


Outdoor Unit Installation

Snow Prevention

In snowstorm areas, user should install snow prevention devices.





TCL

Piping/ Pressure/ Vacuum

Copper Pipe Keeping

1.It can be sealed with tape in a short time.

2.It must be sealed via brazing for long time keeping. (clamp the nozzle and braze it. Charge 2~5kgf/cm2 (30~70Psig) nitrogen)

3.It must be sealed when mounted with insulating sleeve and led through the wall.

No water, No impurity, No leakage

Copper Pipe Cleaning

Coil pipe cleaning: purge with nitrogen

After cleaning, the end of pipe should be treated properly (see previous slide).

Straight pipe cleaning:

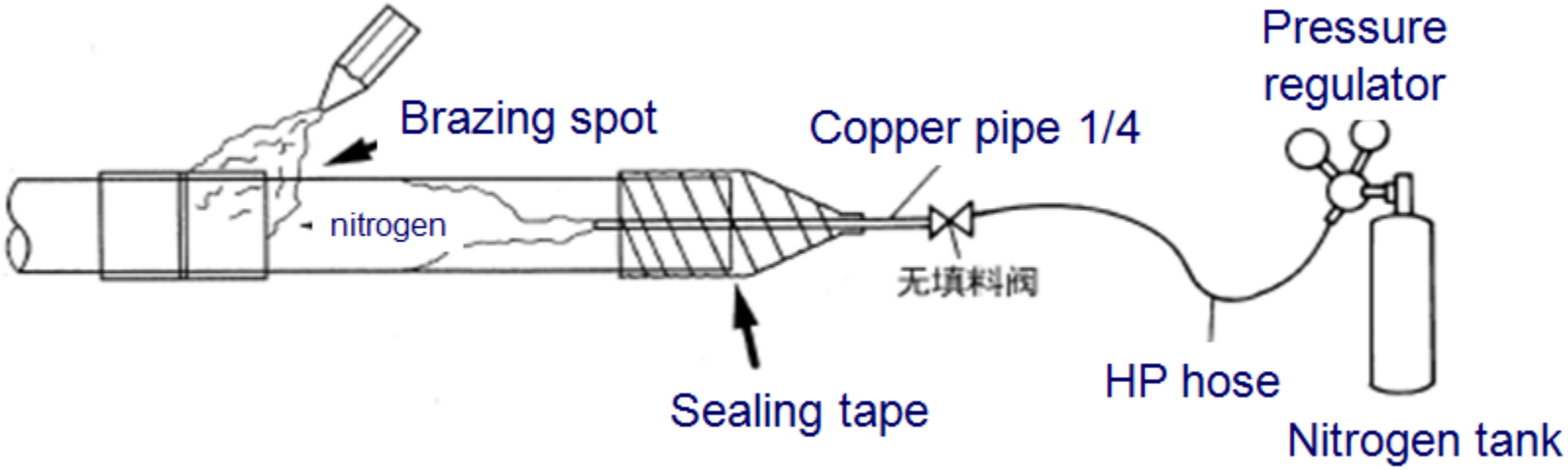
Wrap a gauze to a steel wire and make it a ball shape with the diameter slightly larger than the pipe diameter. Moisten the gauze with alcohol, then pull the gauze through the pipe. Repeat above till the pipe is dustless and purities.

Brazing

Reason: if nitrogen is not applied for protection during brazing, there will be oxide on the copper pipe. If the oxide enters refrigerant system, it will damage valve and compressor .

Method: refer to the following diagram. The pressure of nitrogen is (3~7Psig)0.2~0.5kgf/cm2.

Note: cover the left side of copper pipe and reserve a little space.



Piping/ Pressure/ Vacuum

Brazing

Without nitrogen

With nitrogen

Piping/ Pressure/ Vacuum

Pipe Size

Capacity Model	Liquid Line	Suction Line	Total Equivalent Length (FT)			
			25	50	75	100
	Dimensions in inches		Maximum Elevation Difference(FT)			
24K	3/8 Std.	3/4 Std.	25	50	45	40
36K	3/8 Std.	3/4 Std.	25	50	50	50
48K	3/8 Std.	7/8 Std.	25	50	50	40
60K	3/8 Std.	7/8 Std.	25	50	50	40

Piping/ Pressure/ Vacuum

H	50ft/15m
L	100ft/30m

Piping Distance

• Maximum line length = 100 feet.	• Maximum elevation difference = 50 feet.

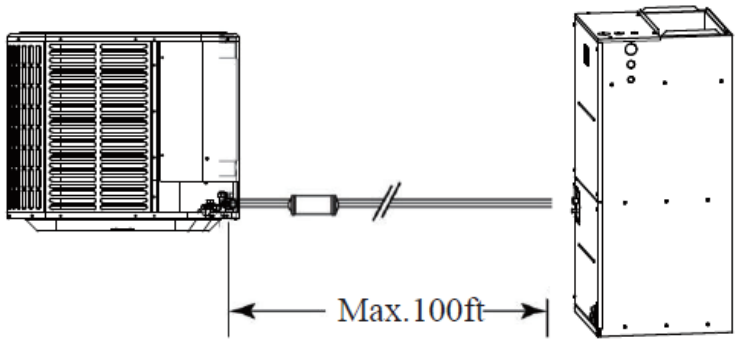


Fig 5-1 Line length limit

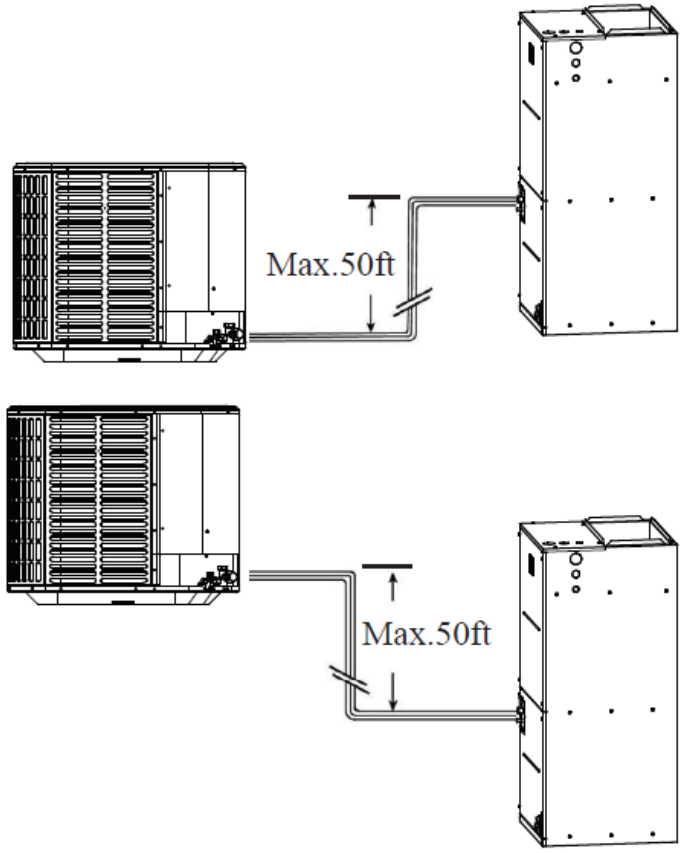
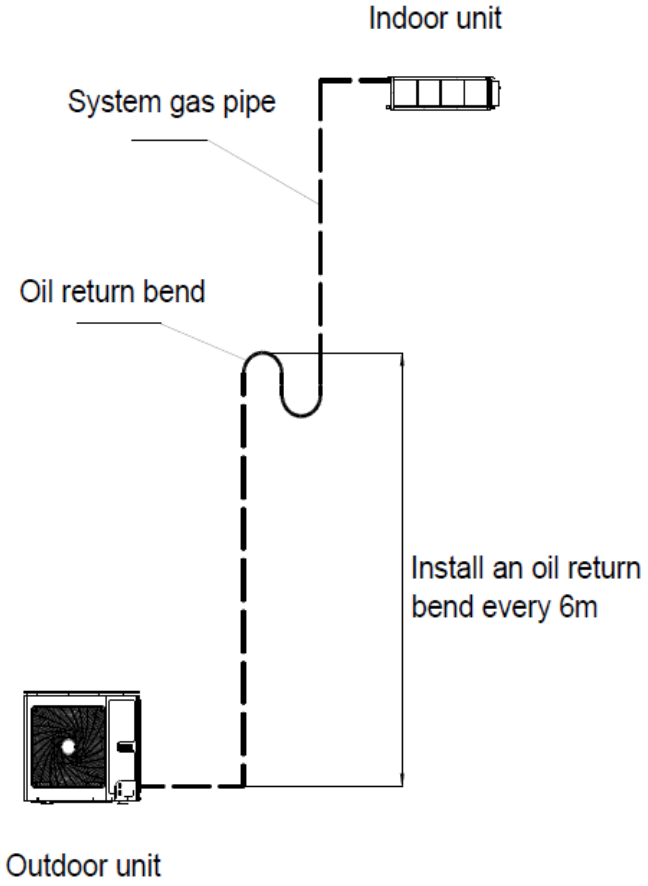


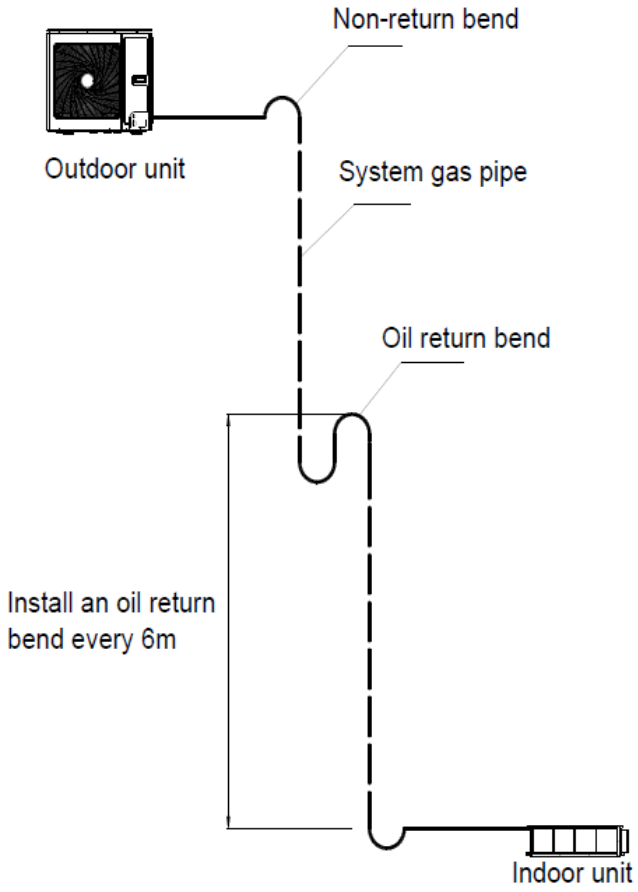
Fig 5-2 Elevation difference limit

Piping/ Pressure/ Vacuum

Oil Trap

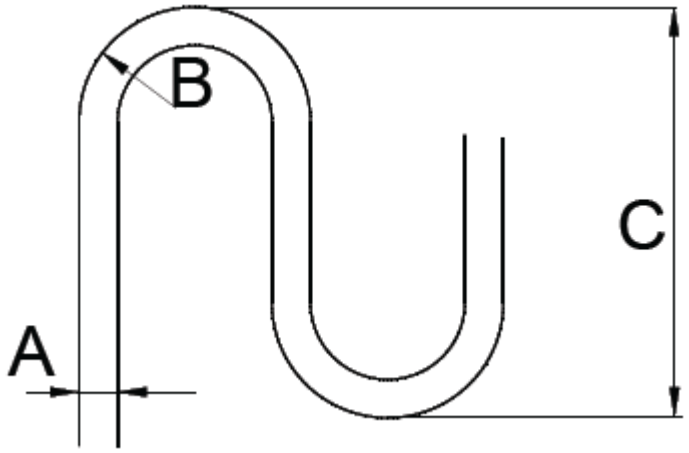
All the traps installed on the gas pipe
Each 6m(20ft) for 1 oil trap on the vertical pipe.



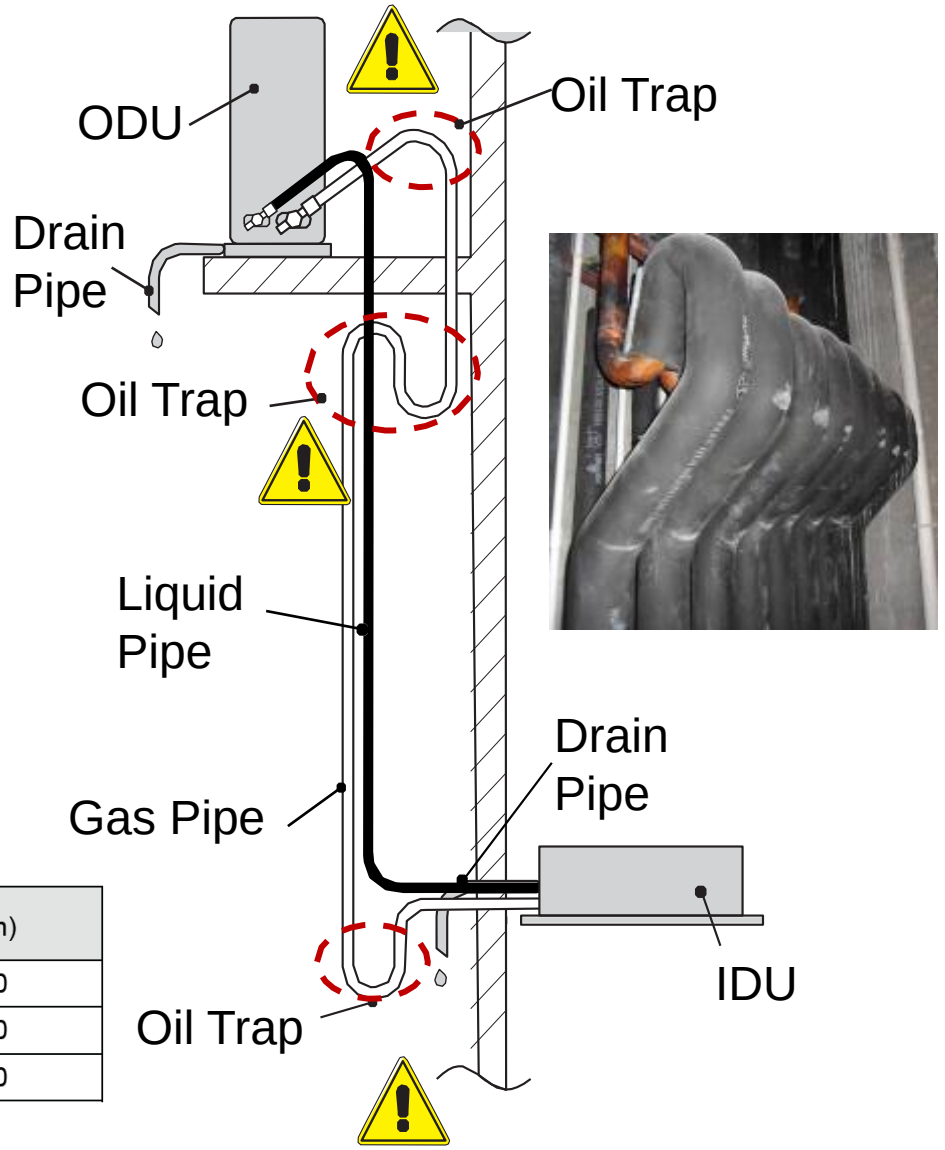


Piping/ Pressure/ Vacuum

Oil Trap



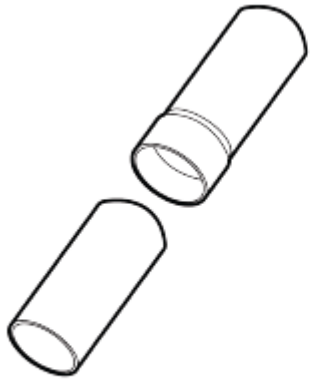
A		B(mm)	C(mm)
mm	In.		
Φ12	1/2	≥26	≤150
Φ16	5/8	≥33	≤150
Φ19	3/4	≥34	≤150



Pipe Connection

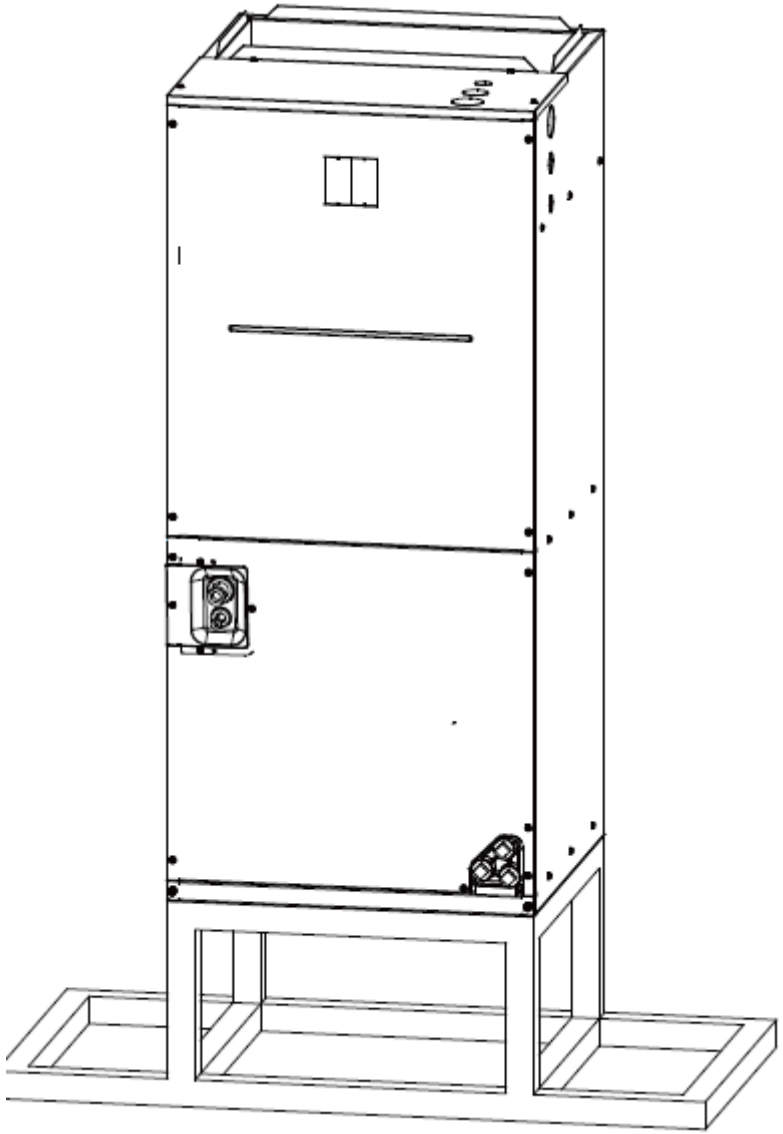
Braze Connection of IDU

All cut ends are to be round, burr free, and cleaned



Line set size matches service valve connector

Do not crimp service valve connector when pipe is smaller than connector



Pipe Connection

Braze Connection of ODU

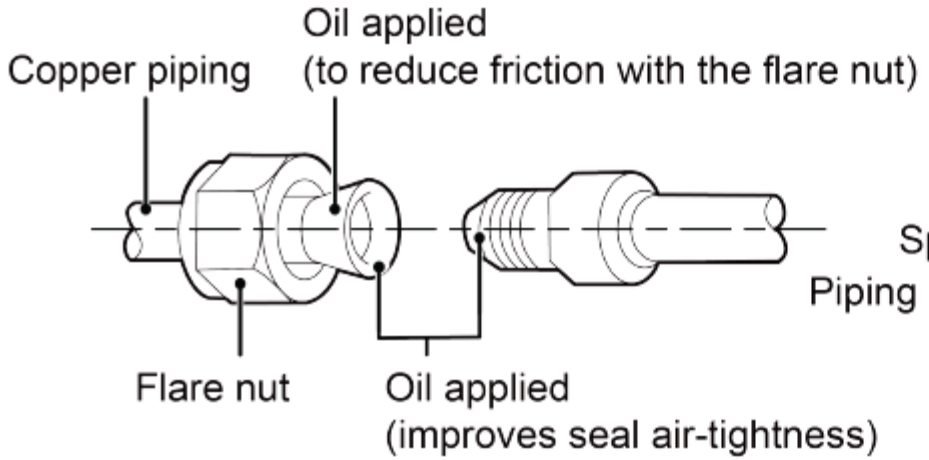
Screw on the flare nut of the flaring connecting pipe on the outdoor unit valve.

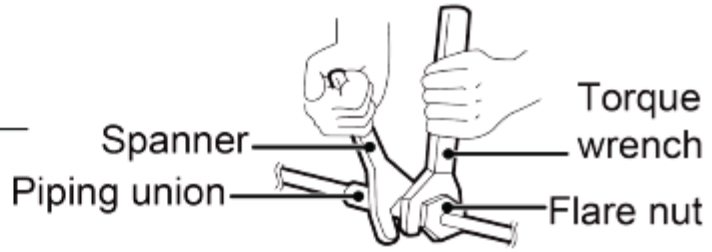
Piping/ Pressure/ Vacuum

Pipe Connection

Screw Connection

Connecting Pipe Size	Torque Values (lbf*in)
3/8"	327-372
3/4"	620-664
7/8"	690-735





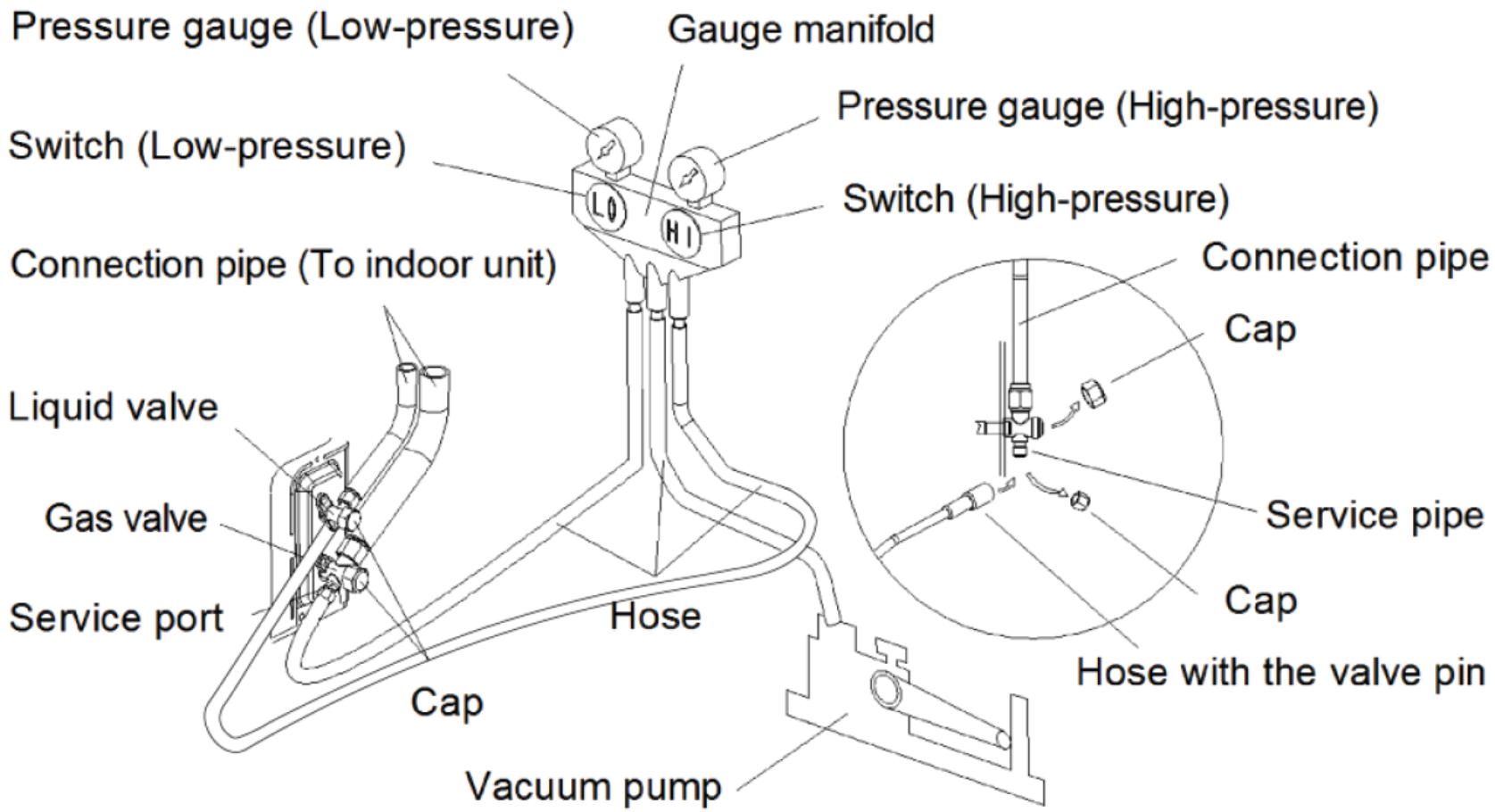
Piping/ Pressure/ Vacuum

Evacuation

1. Remove the caps of valves
2. Connect the charge hose from manifold valve to the service port of the gas valve and connect the charge hose to the port of the vacuum pump.
3. Switch on the low pressure gauge.
4. Operate the vacuum pump to begin. The evacuation duration depends on the unit's capacity, generally 30min for 24/36K unit and 45min for 48/60K unit.
5. When the pressure value showed on gauge is less than 350microns, the evacuation is finished.
6. Switch off the pressure gauge first, then the vacuum pump.
7. Observe the pressure gauge for 1mins, if it returns to more than 500microns, the system is with leakage.
8. Check the possible leakage spots and repeat the above.
9. When finish, Open the liquid valve a bit and close it when the pressure reaches 10 Psi, remove the gauge quickly. (key process)
10. Completely open the liquid valve and then the gas valve, put back the caps of valves.

Piping/ Pressure/ Vacuum

Evacuation



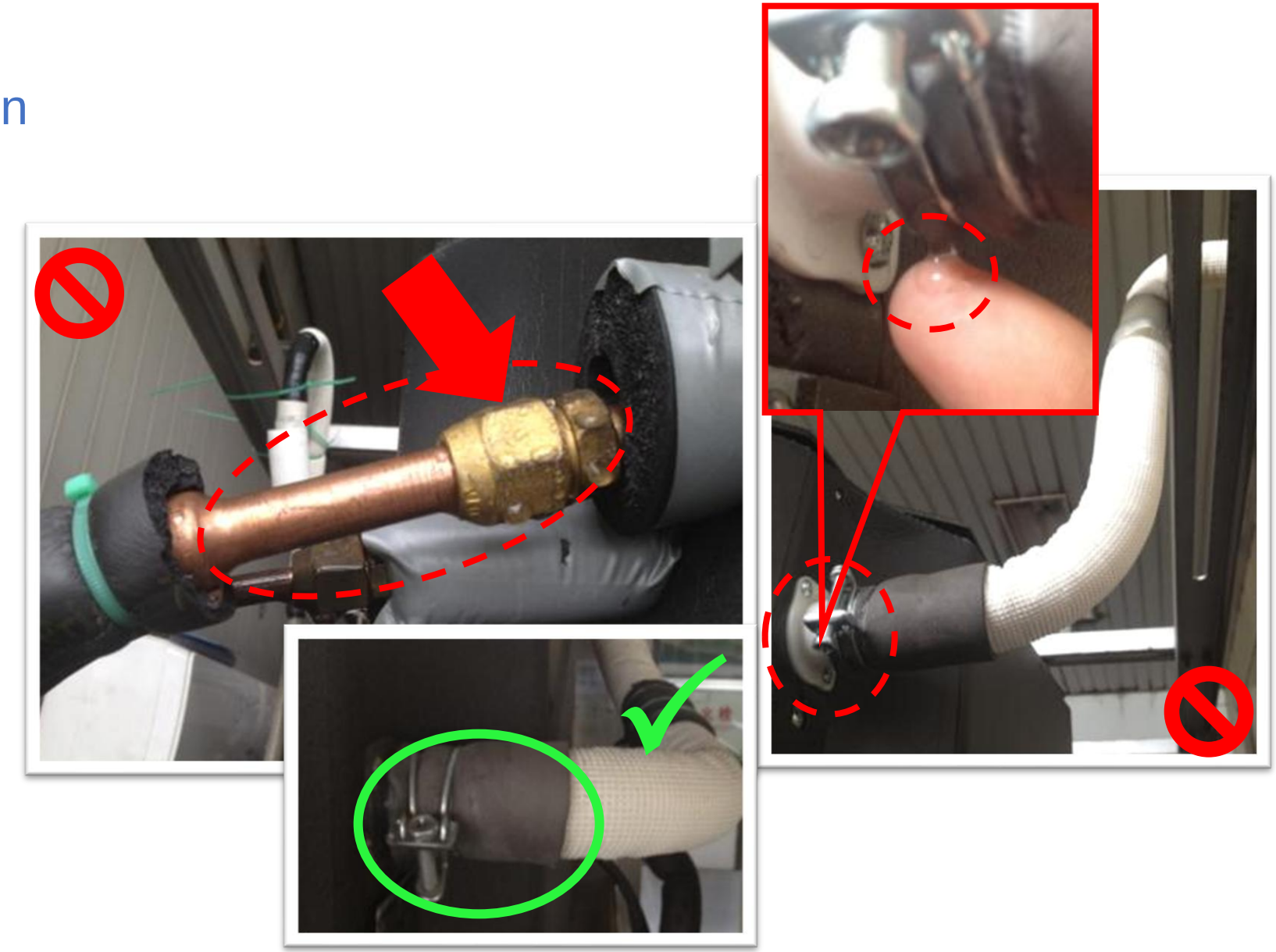
Piping/ Pressure/ Vacuum

Additional Refrigerant

Model	24K	36K	48K	60K
Length of pipe with standard charge(ft)	25	25	25	25
Refrigerant capacity of standard charge(lbs)	4.74	6.28	8.82	8.82
The longest pipe length(ft)	100	100	100	100
Additional refrigerant charge(lbs/ft)	0.0335	0.0335	0.0335	0.0335
Max. diff. in level between indoor and outdoor unit(ft)	50	50	50	50

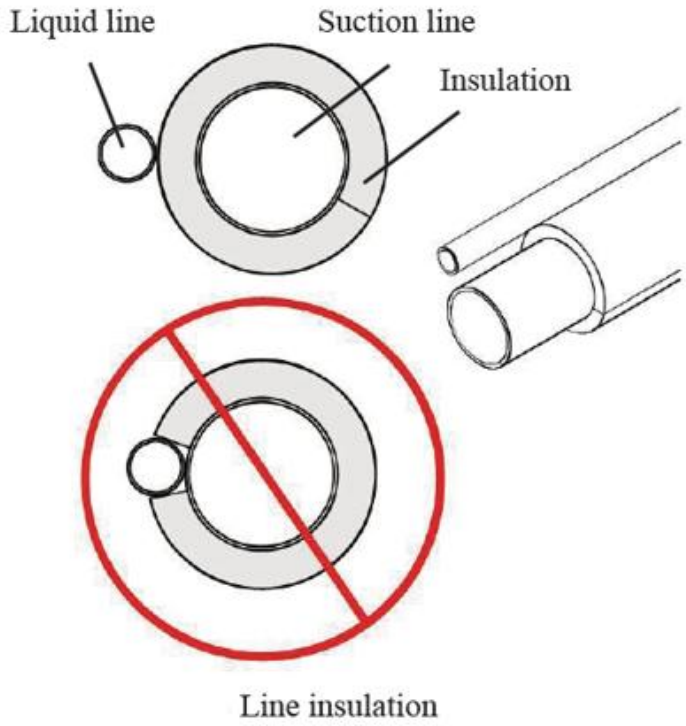
Piping/ Pressure/ Vacuum

Insulation



Insulation

During the refrigeration process, the high temperature and high pressure refrigerant comes out of the condenser, and the throttling is completed in the indoor unit. Before throttling, the temperature of the refrigerant is higher than the ambient dew point temperature, which will not cause condensation in the liquid pipe, and the unit liquid pipe is no need for insulation.



TCL

Electrical Wiring

Electrical Wiring

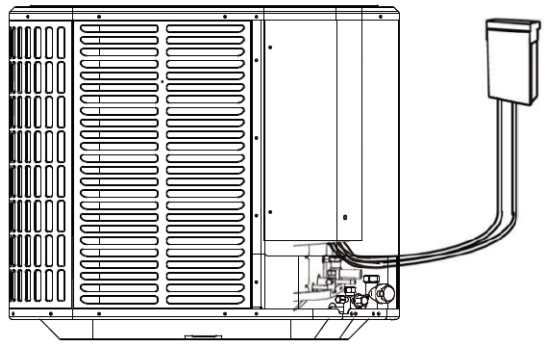
Air Handler

MODEL	Power supply	Minimum Circuit AMpacity	Max. Over Current protection
24K	208-230V~1 ph 60Hz	3.5	15
36K		5.0	
48K		7.0	
60K		7.0	

Electrical Wiring

ODU

MODEL	Power supply	Minimum Circuit AMpacity	Max. Over Current protection
24K	208-230V~1 ph 60Hz	14	25
36K		22	35
48K		35	60
60K		35	60



Connection of Power Cord

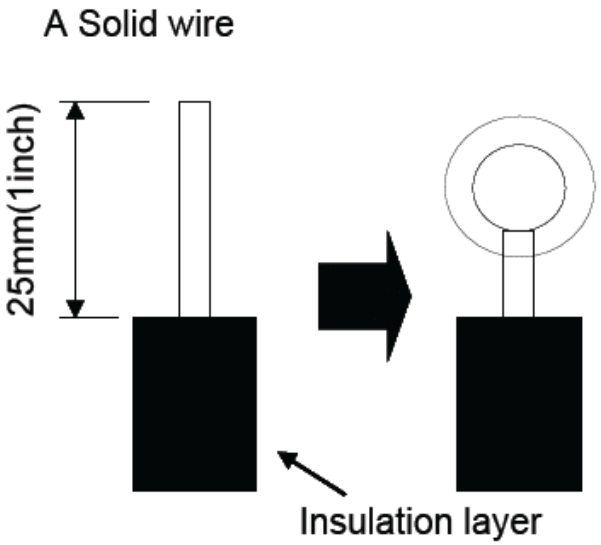
Solid wires

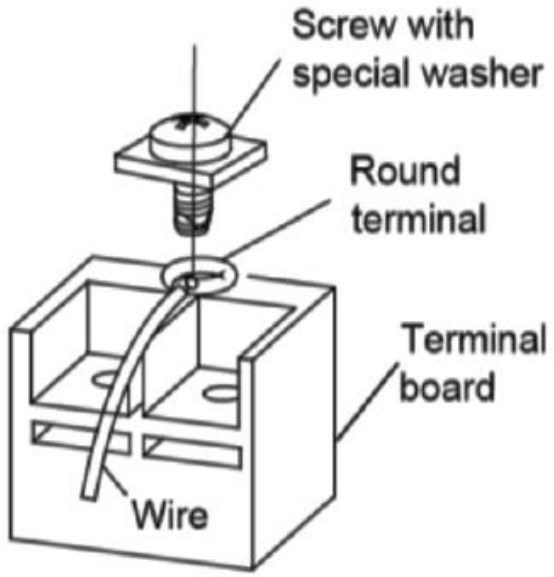
1) Use wire cutters to cut off the wire end and then peel away about 25mm of the insulation layer.

2) Use a screwdriver to unscrew the terminal screw on the terminal board.

3) Use nippers to bend the solid wire into a ring that fits the terminal screw.

4) Form a proper ring and then put it on the terminal board. Use a screwdriver to tighten up the terminal screw.





Connection of Power Cord

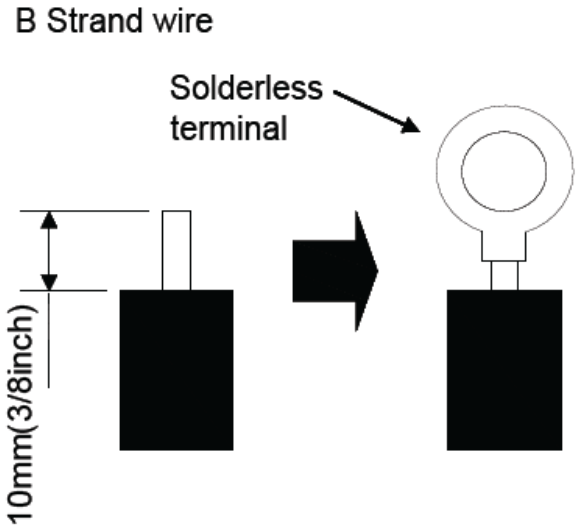
Strand wires

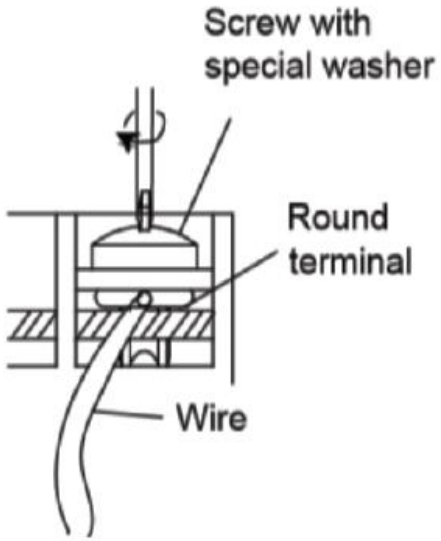
1) Use wire cutters to cut off the wire end and then peel away about 10mm of the insulation layer.

2) Use a screwdriver to unscrew the terminal screw on the terminal board.

3) Use a round terminal fastener or clamp to fix the round terminal firmly on the peeled wire end.

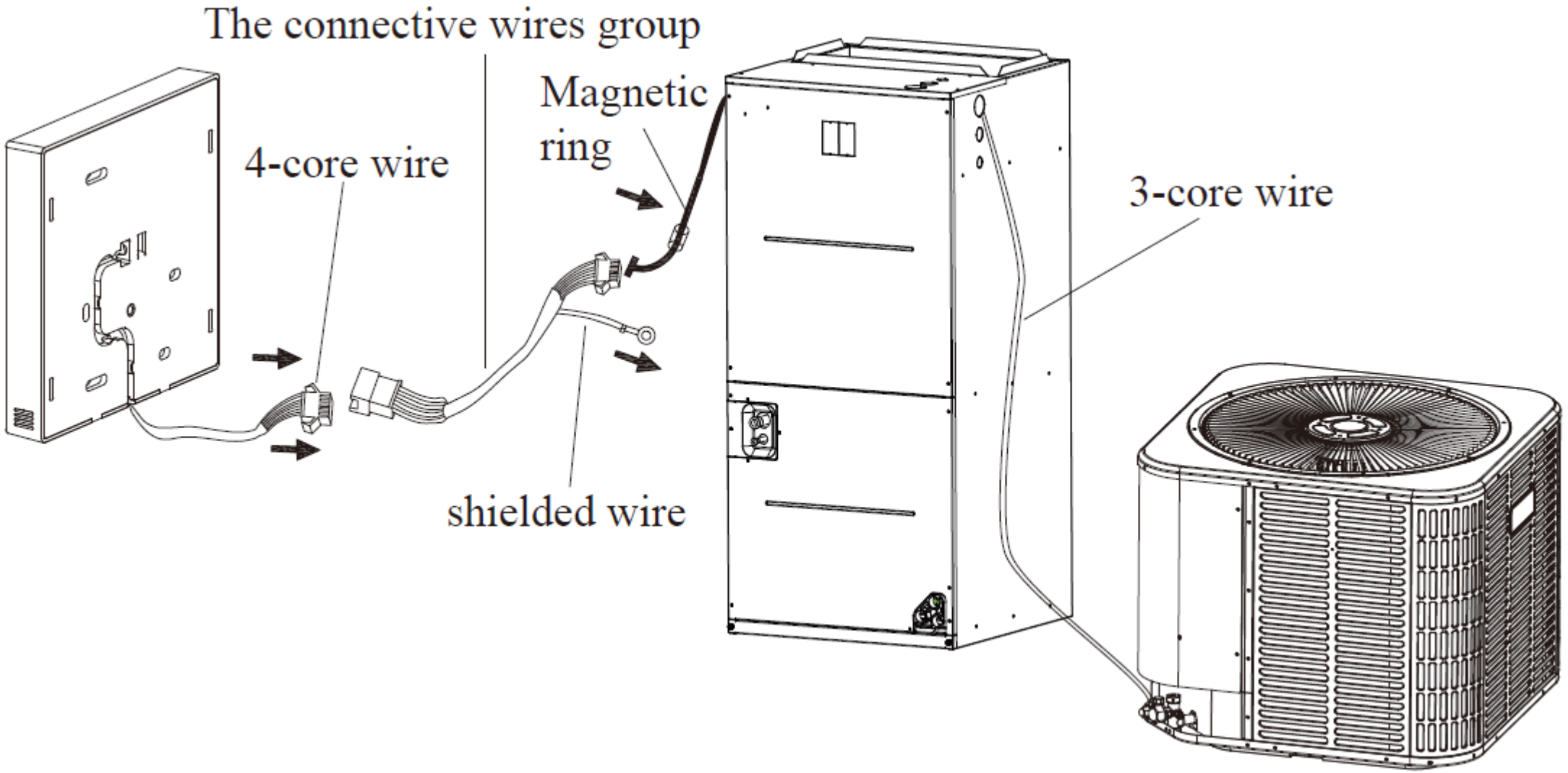
4) Locate the round terminal conduit. Use a screwdriver to replace it and tighten up the terminal screw.





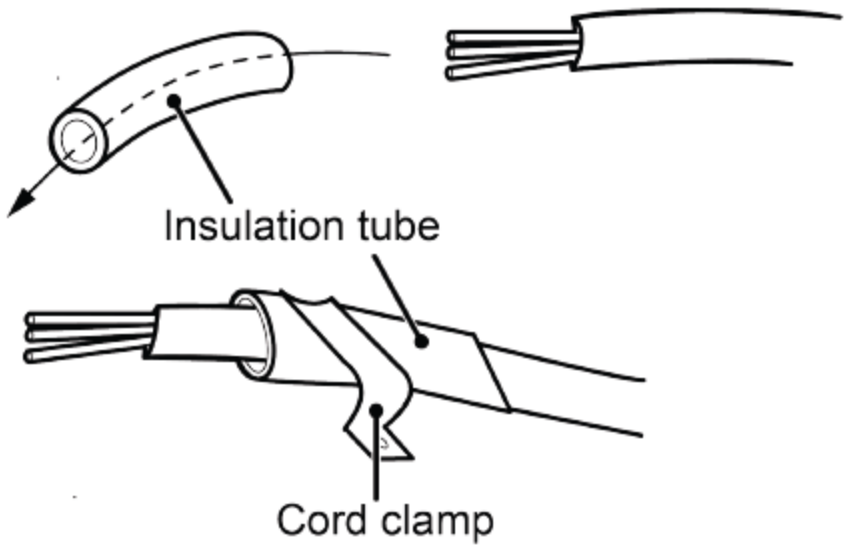
Electrical Wiring

Connection of TCL 485 communication



Connection of Thermostat

Lead the thermostat wire and power cord through the insulation tube. Then fix the wires with wire clamps.

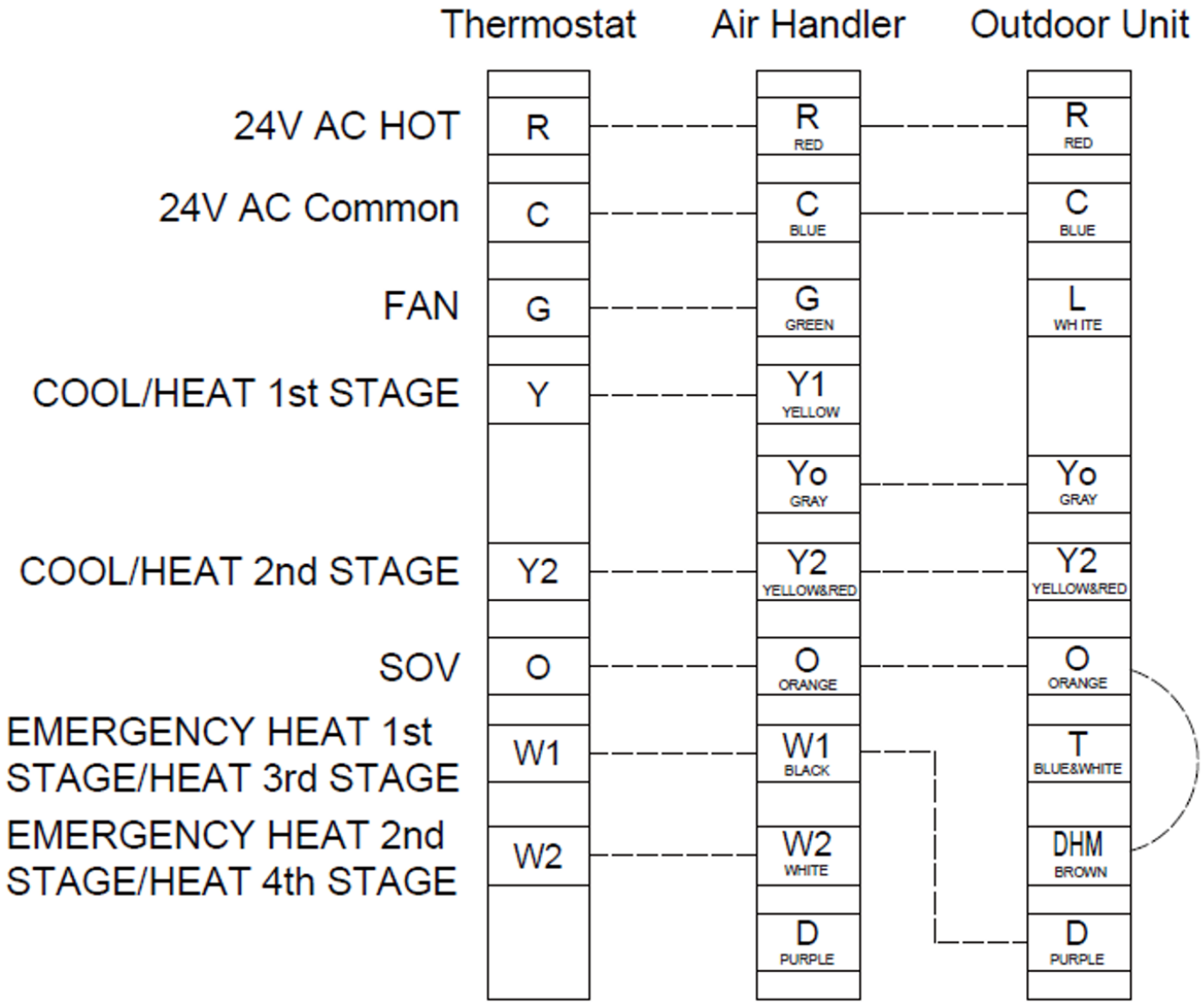


Electrical Wiring

Unit Terminal	Terminal defination
R	24VAC power supply for thermostat from secondary transformer.
C	Common wire.
G	Fan motor relay.
Y1	Compressor stage 1, low load-output control.
Y2	Compressor stage 2, high load-output control.
O	Cooling four-way valve.
W1	Heating stage 1, electrical heater low load-output control.
W2	Heating stage 2, electrical heater high load-output control.
Yo	Outdoor Compressor
D	Defrost signal (receiving the outdoor unit defrost signal)

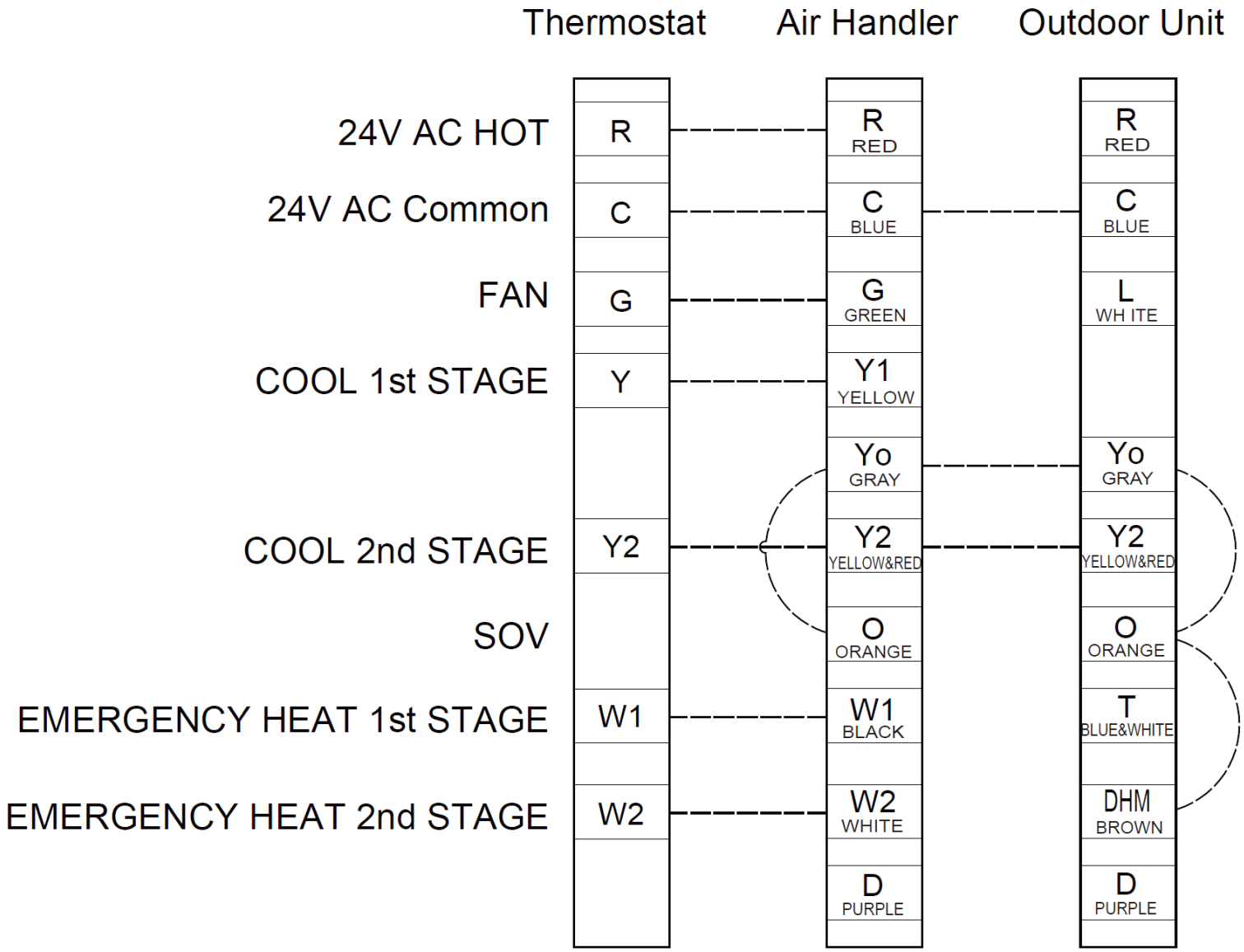
Electrical Wiring

2 Stage, 2 Step, Heating Pump



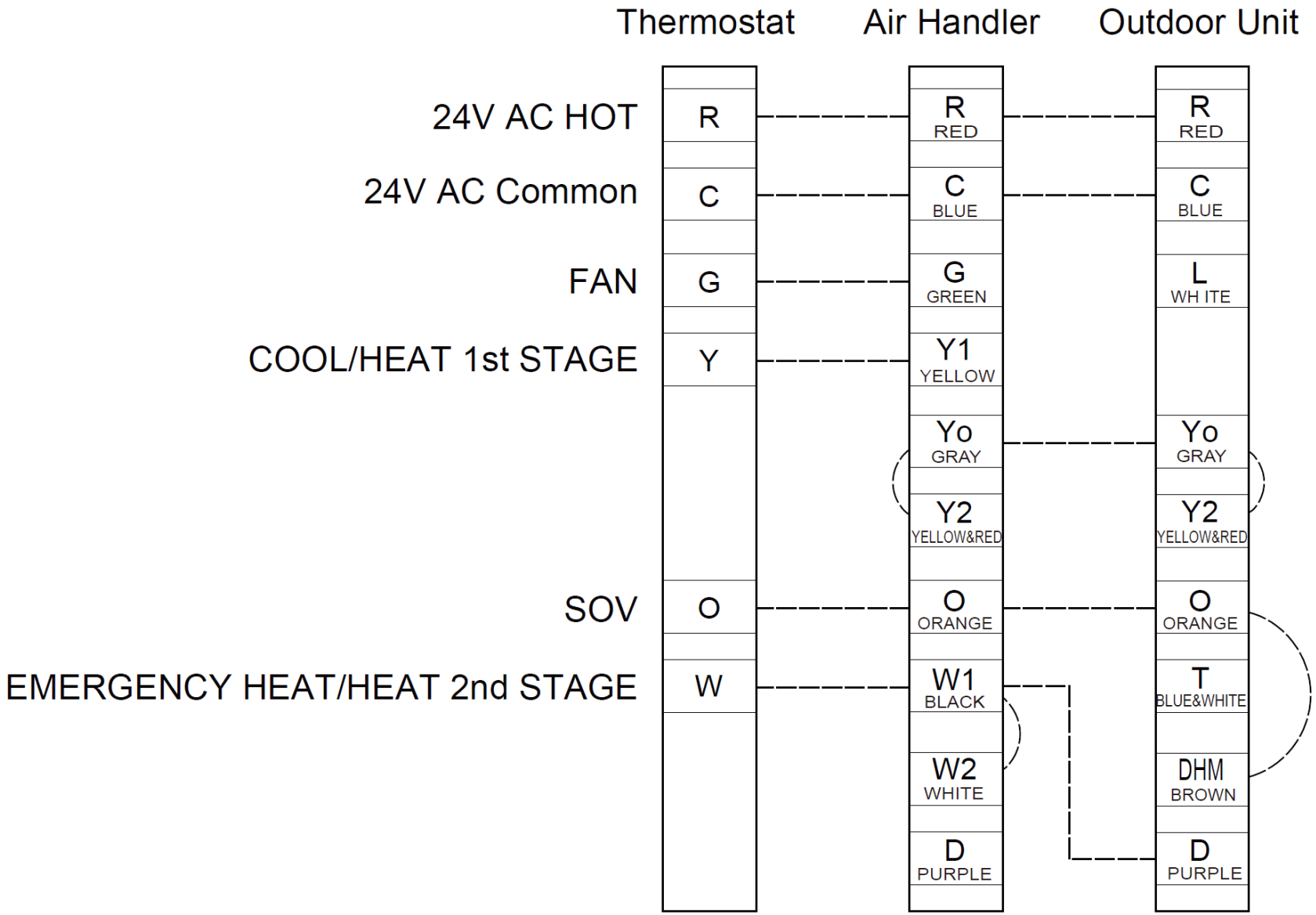
Electrical Wiring

2 Stage, 2 Step, Cooling Only



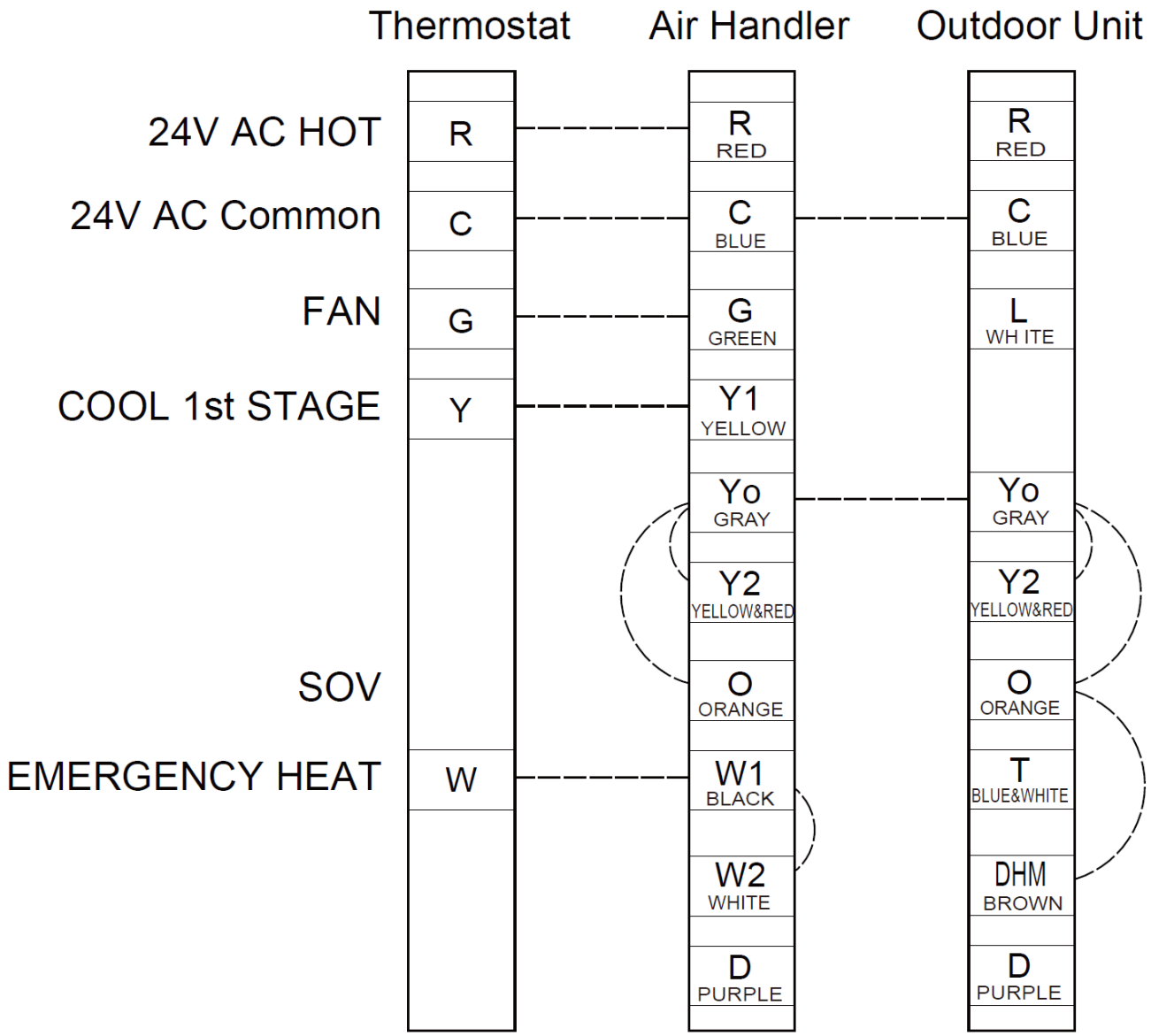
Electrical Wiring

1 Stage, Heating Pump



Electrical Wiring

1 Stage, Cooling Only



Test Run

Check after installation

Items	Possible results caused by improper installation
Is it installed reliably?	Drop of the unit, vibration or noise.
Is leak test performed?	Insufficient cooling (heating)
Is insulation good?	Condensate , water drop
Is water discharged fluently?	Condensate , water drop
Does voltage of power supply conform to nameplate?	Malfunction , burnout of parts
Are wire and pipe installed correctly?	Malfunction , burnout of parts
Is the unit grounded?	Electrical leakage
Does the wire model reach the requirement?	Malfunction , burnout of parts
Is there obstruction near air inlet or air outlet?	Insufficient cooling (heating)
Are length of refrigerant pipe and refrigerant volume recorded?	Insufficient or surplus refrigerant volume

Preparation before connecting the power

(1) Power must not be connected if the installation work is not completed.

(2) Control circuit is correct and all the wires are firmly connected.

(3) Cut-off valves of the gas pipe and liquid pipe are open.

(4) The inside of the unit should be clean. Take irrelevant objects out if there is any.

(5) After checking, re-install the front side plate.

Operation after connecting the power

(1) If all the above works are finished, power on the unit.

(2) If the outside temperature is more than 30℃(86℉) , heating mode can’t be enabled.

(3) Before test operation, make sure unit is power on and compressor has been preheated for more than 8 hours. Touch the unit to check whether it’s normally preheated. Start test operation after unit is normally preheated, otherwise compressor might be damaged. Debugging must be performed by professional technicians or under the guide of professional technicians.

(4) Make sure the units can run normally.

(5) If there’s sound of liquid shock when the compressor is running, then stop the air conditioner immediately. Wait until the electric heating belt is heated enough, and then restart the air conditioner.

THANK YOU