



User Manual

TITAN^{Slim} SERIES



Models

ATIS-T-AHU36DC / ATIS-T-AHU60DC

To Users

Thank you for selecting our product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

1. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
2. In order to ensure reliability of product, the product may consume some power under stand-by status for maintaining normal communication of system and preheating refrigerant and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.
3. Please properly select the model according to actual using environment, otherwise it may impact the using convenience.
4. If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support. users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and our company will bear no responsibilities.
5. All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. If there is adjustment in the product, please subject to actual product.
6. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:

1. Damage the product due to improper use or misuse of the product.
2. Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer.
3. After verification, the defect of product is directly caused by corrosive gas.
4. After verification, defects are due to improper operation during transportation of product.
5. Operate, repair, maintain the unit without abiding by instruction manual or related regulations.
6. After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers.
7. The damage is caused by natural calamities, bad using environment or force majeure.

Safety Notice

	The air conditioner is charged with inflammable refrigerant R32.
	Before using the air conditioner, please first read the instruction manual.
	Before installing the air conditioner, please first read the instruction manual.
	Before repairing the air conditioner, please first read the technical service manual.

Compared with common refrigerant, R32 is an environmental-friendly refrigerant that has no harm to the ozone layer and weak greenhouse effect. Its GWP is 675. Because of its thermodynamic characteristics, R32 requires a smaller charging quantity to reach high energy efficiency. It is inflammable and odourless, but may cause explosion under certain circumstances.

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1. Safety

Read the following safety instructions before installing the unit or doing service work.

 WARNING	May cause personal death or serious injury.
 CAUTION	May lead to injury or structural damage under some conditions.

 WARNING
This product can expose you to chemicals including lead, identified in certain regions as a substance that may cause cancer, birth defects, or other reproductive harm.
Pressurized refrigerant ! - Improper refrigerant ! System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. Do not use non-approved refrigerants or refrigerant substitutes or refrigerant additives. See outdoor unit nameplate for refrigerant type. Failure to follow the above could result in death, serious injury or equipment damage.
Hazardous voltage ! Disconnect all electric power including remote disconnects before servicing insure that all motor capacitors have discharged stored voltage. Failure to do the above could result in death or serious injury
Flammable Vapors ! The use and storage of gasoline or other flammable vapors and liquids in open containers in the vicinity of this furnace can result in explosion or fire. Failure to follow the above could result in death or serious injury, or property damage.
Sharp Edges ! Avoid contact with coil fins and sheet metal edges. Failure to follow the above could result in death or serious injury.
Use Copper Conductors Only ! Unit terminals are not designed to accept other types of conductors. Failure to do the above could result in equipment damage.
Rotating Fan Blade ! Disconnect all electric power including remote disconnects before servicing. Failure to disconnect power before servicing can cause severe personal injury or death.

2. Instructions for Servicing(R32)

1. Check the information in this manual to find out the dimensions of space needed for proper installation of the device, including the minimum distances allowed compared to adjacent structures.
2. Appliance shall be installed, operated and stored in a room with a floor area larger than 4m².
3. The installation of pipe-work shall be kept to a minimum.
4. The pipe-work shall be protected from physical damage, and shall not be installed in an unventilated space if the space is smaller than 4m².
5. The compliance with national gas regulations shall be observed.
6. The mechanical connections shall be accessible for maintenance purposes.
7. Follow the instructions given in this manual for handling, installing, cleaning, maintaining and disposing of the refrigerant.
8. Make sure ventilation openings clear of obstruction.
9. **Notice:** The servicing shall be performed only as recommended by the manufacturer.
10. **Warning:** The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
11. **Warning:** The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
12. The appliance shall be stored so as to prevent mechanical damage from occurring.
13. It is appropriate that anyone who is called upon to work on a refrigerant circuit should hold a valid and up-to-date certificate from an assessment authority accredited by the industry and recognizing their competence to handle refrigerants, in accordance with the assessment specification recognized in the industrial sector concerned. Service operations should only be carried out in accordance with the recommendations of the equipment manufacturer. Maintenance and repair operations that require the assistance of other qualified persons must be conducted under the supervision of the person competent for the use of flammable refrigerants.
14. Every working procedure that affects safety means shall only be carried out by competent persons.
15. **Warning:**
 - 1) Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
 - 2) The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating as appliance or an operating electric heater).
 - 3) Do not pierce or burn.
 - 4) Be aware that refrigerants may not contain an odor.

 Caution: Risk of fire		Read operator's manual
		Operating instructions
		Read technical manual

16. Information on servicing:

1) Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

2) Work procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

3) General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material

4) Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

5) Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

6) No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. No Smoking signs shall be displayed.

7) Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into

the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out.

The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

8) Checks to the refrigeration equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed.

If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

9) Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- That there is continuity of earth bonding.

17. Repairs to sealed components

- 1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- 2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections,

terminals not made to original specification, damage to seals, incorrect fitting of glands, etc. Ensure that apparatus is mounted securely. Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

18. Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

19. Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

20. Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

21. Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area).

Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed / extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen-free nitrogen (OFN) shall be purged through the system both before and during the brazing

process to ensure that potential ignition sources are removed or extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

22. Removal and evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, it is important that best practice is followed since inflammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be flushed with OFN to render the unit safe. This process may need to be repeated several times.

Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

23. Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- 1) Become familiar with the equipment and its operation.
- 2) Isolate system electrically.
- 3) Before attempting the procedure, ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - All personal protective equipment is available and being used correctly;
 - The recovery process is supervised at all times by a competent person;
 - Recovery equipment and cylinders conform to the appropriate standards.
- 4) Pump down refrigerant system, if possible.
- 5) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

- 6) Make sure that the cylinder is situated on the scales before recovery takes place.
- 7) Start the recovery machine and operate in accordance with manufacturer's instructions.
- 8) Do not overfill cylinders. (No more than 80% volume liquid charge).
- 9) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- 10) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- 11) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

24. Labeling

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant.

The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

25. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. Special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order.

Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recover cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant .

The evacuation process shall be carried out prior to returning the compressor to the suppliers.

Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Important Considerations

1. The air conditioner must be installed by professional personnel and the Installation manual is used only for the professional installation personnel! The installation specifications should be subject to our after-sale service regulations.
2. When filling the combustible refrigerant, any of your rude operations may cause serious injury or injuries to human body and objects.
3. A leak test must be done after the installation completed.
4. It is a must to do the safety inspection before maintaining or repairing an air conditioner using combustible refrigerant in order to ensure that the fire risk is reduced to minimum.
5. It is necessary to operate the machine under a controlled procedure in order to ensure that any risk arising from the combustible gas or vapor during the operation is reduced to minimum.
6. Requirements for the total weight of filled refrigerant and the area of a room to be equipped with an air conditioner.

3. Installation

3.1. Installation Preparation

3.1.1. Notice on Installation

1. Notice on Refrigerant concentration before installation.

This air conditioner uses R32 refrigerant. The construction area for installation, operation and storage of the air conditioner must be larger than the minimum construction area.

The minimum area for installation is determined by:

1) Refrigerant charging quantity for the entire system (ex-factory charging quantity + additional charging quantity).

2) Checking out in the applicable tables:

A. For indoor unit, confirm the model of indoor unit and check the corresponding table.

B. For outdoor unit that is installed or placed indoors, select the corresponding table according to the height of the room.

Height of the room	select the applicable table
<1.8m	Floor standing type
≥1.8m	wall mounted type

3) Refer to the following table to check out the minimum construction area.

ceiling type		wall mounted type		Floor standing type	
weight (kg)	Area (m ²)	weight (kg)	Area (m ²)	weight (kg)	Area (m ²)
<1.224	-	<1.224	-	<1.224	-
1.224	0.956	1.224	1.43	1.224	12.9
1.4	1.25	1.4	1.87	1.4	16.8
1.6	1.63	1.6	2.44	1.6	22.0
1.8	2.07	1.8	3.09	1.8	27.8
2.0	2.55	2.0	3.81	2.0	34.3
2.2	3.09	2.2	4.61	2.2	41.5
2.4	3.68	2.4	5.49	2.4	49.4
2.6	4.31	2.6	6.44	2.6	58.0
2.8	5.00	2.8	7.47	2.8	67.3
3.0	5.74	3.0	8.58	3.0	77.2
3.2	6.54	3.2	9.76	3.2	87.9
3.4	7.38	3.4	11.0	3.4	99.2
3.6	8.27	3.6	12.4	3.6	111
3.8	9.22	3.8	13.8	3.8	124
4.0	10.2	4.0	15.3	4.0	137
4.2	11.3	4.2	16.8	4.2	151
4.4	12.4	4.4	18.5	4.4	166
4.6	13.5	4.6	20.2	4.6	182
4.8	14.7	4.8	22.0	4.8	198
5.0	16.0	5.0	23.8	5.0	215
5.2	17.3	5.2	25.8	5.2	232
5.4	18.6	5.4	27.8	5.4	250
5.6	20.0	5.6	29.9	5.6	269

ceiling type	
weight (kg)	Area (m ²)
<1.224	-
5.8	21.5
6.0	23.0
6.2	24.5
6.4	26.1
6.6	27.8
6.8	29.5
7.0	31.3
7.2	33.1
7.4	34.9
7.6	36.9
7.8	38.8
8.0	40.8

wall mounted type	
weight (kg)	Area (m ²)
<1.224	-
5.8	32.1
6.0	34.3
6.2	36.6
6.4	39.1
6.6	41.5
6.8	44.1
7.0	46.7
7.2	49.4
7.4	52.2
7.6	55.1
7.8	58.0
8.0	61.0

Floor standing type	
weight (kg)	Area (m ²)
<1.224	-
5.8	289
6.0	309
6.2	330
6.4	351
6.6	374
6.8	397
7.0	420
7.2	445
7.4	470
7.6	496
7.8	522
8.0	549

- When installing an outdoor unit with single fan, hold the handle and then lift it up slowly (Do not touch the condenser with your hand or other objects). If you hold only one side of the casing, the casing may be pulled out of shape, so please hold the base of the unit as well. During installation, be sure to use the components specified in the instruction manual.
- Please use the charge machine specialized for R32 refrigerant before charging, keep the refrigerant tank in an upright position. After charging, stick a label on the air conditioner saying no excessive charging.
- The following tools will be used: 1) Liquid-level gauge; 2) Screwdriver; 3) Electric driven rotary hammer; 4) Drill; 5) Pipe expander; 6) Torque wrench; 7) Open-end wrench; 8) Pipe cutter; 9) Leak detector; 10) Vacuum pump; 11) Pressure gauge; 12) Universal meter; 13) Hexagon wrench; 14) Tapeline.

3.1.2. Selection of Installation Location

INDOOR UNITS

- A place where there are sufficient space for repair Hung ceiling that can bear the weight of the machine.
- A place that air inlet and outlet is not hindered and without influence from outdoor air.
- A place without heat source like smoke, fire or toxic pollution.
- A place where air flow can be transmitted everywhere in the room.
- A place convenient for installation.

OUTDOOR UNITS

- A place where there is sufficient space for installation and repair.
- A place where the air inlet and outlet are not hindered, without strong air flowing.
- A dry and ventilated place.
- A place where the over hanging is level and bear the weight of the outdoor unit, without much noise.

5. A place where neighbours are not annoyed by noise and exhausted air.
6. A place without leakage of flammable gas.
7. A place convenient for installation.

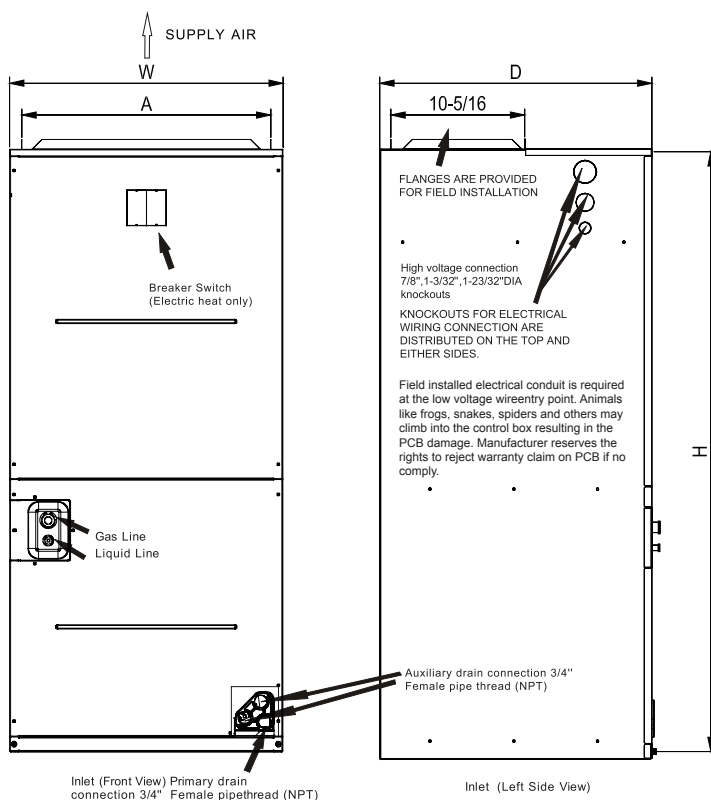
Caution: Location in the following places may cause malfunction of the machine.

1. A place where there is flammable gas leakage.
2. There is salty air surrounding(near the coast)
3. There is caustic gas(the sulfide, for example) existing in the air.
4. A place where can not bear the weight of the machine.
5. In kitchen where it is full of oil gas.
6. There is strong electromagnetic wave existing.
7. There is acid or alkaline liquid evaporating.
8. A place where air circulation is not enough.
9. Other special surroundings.

3.1.3. Unit Dimension

1. Indoor Unit

NOTE: 25" clearance is required in the front of the unit for filter and coil maintenance.

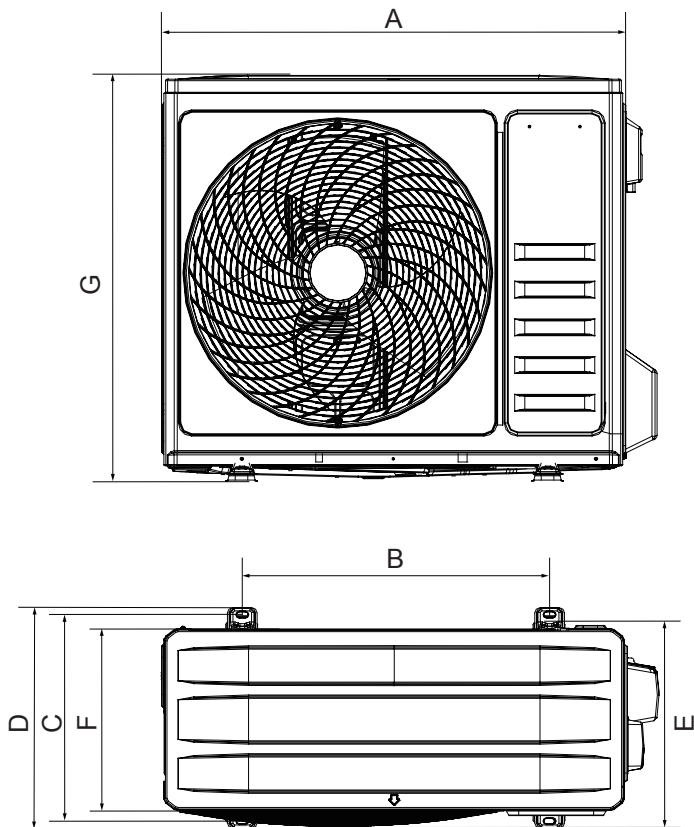


Unit dimensions

Unit Dimensions

Model	Dimensions (in.)					
	H	W	D	A	Liquid Line Connection	Gas Line Connection
24/36/48/55K	46-1/2	21	21	19-1/4	3/8	5/8

2. Outdoor Unit



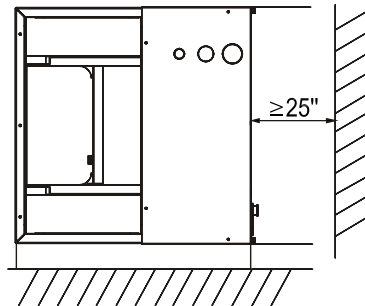
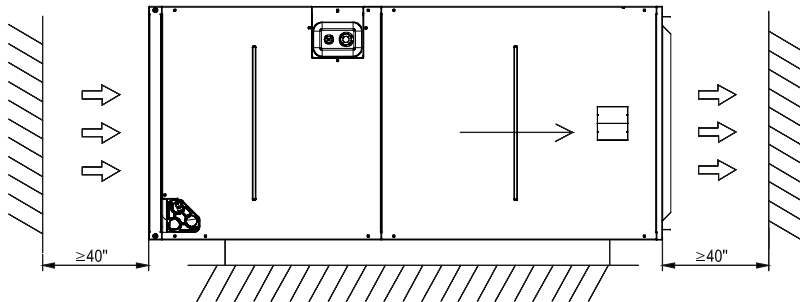
Unit: mm

MODEL	A	B	C	D	E	F	G
24K	910	607	390	421	391	378	804
36K	910	607	390	421	391	378	804
48K	1010	660	462	494	440	436	858
55K	1010	660	462	494	440	436	858

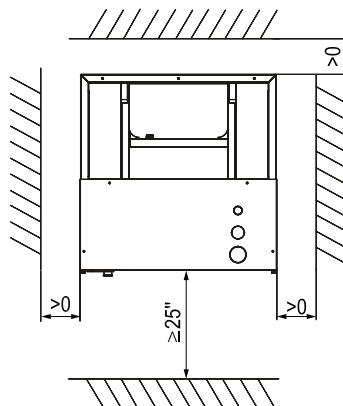
3.1.4. Diagram of Unit Installation Space and Location

1. Diagram of installation space and location for outdoor unit (Notice: for best performance of the outdoor unit, make sure its installation space conforms to the following installation dimensions).

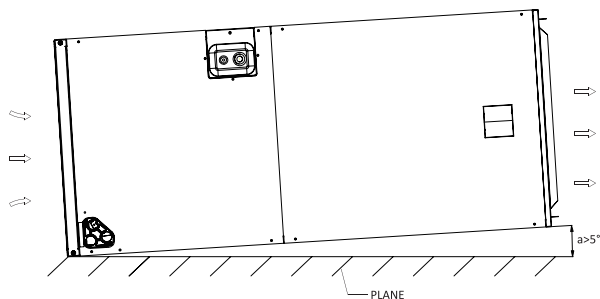
Select a solid and level site, keep enough space for proper installation and maintenance. Adjust motor speed tap on indoor main control board (MCB) to select correct air flow according to blower performance table.



a) Horizontal position



b) Vertical position

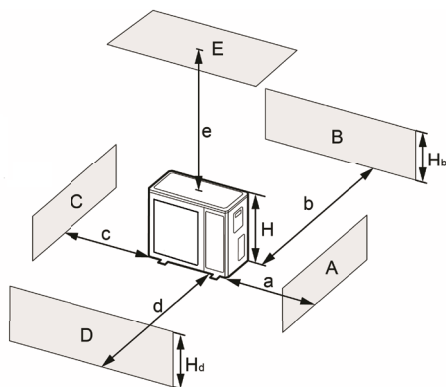


Installation slope

Note: When installing, ensure a certain tilt Angle ($a > 5^\circ$) to ensure smooth drainage.

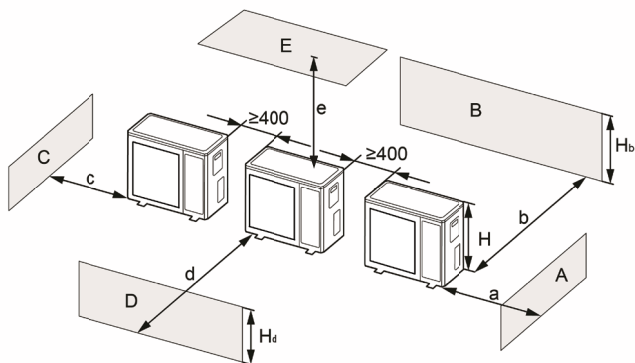
2. Diagram of installation space and location for outdoor unit (Notice: for best performance of the outdoor unit, make sure its installation space conforms to the following installation dimensions).

1) When one outdoor unit is to be installed.



LOCATION	H_b H_d H		Unit: mm				
			a	b	c	d	e
B	—	—	—	≥ 100	—	—	—
A,B,C,	—	—	≥ 300	≥ 100	≥ 100	—	—
B,E	—	—	—	≥ 100	—	—	≥ 1000
A,B,C,E	—	—	≥ 300	≥ 150	≥ 150	—	≥ 1000
D	—	—	—	—	—	≥ 1000	—
D,E	—	—	—	—	—	≥ 1000	≥ 1000
B,D	$H_b < H_d$	$H_d > H$	—	≥ 100	—	≥ 1000	—
	$H_b > H_d$	$H_d < H$	—	≥ 100	—	≥ 1000	—
B,D,E	$H_b < H_d$	$H_b \leq 1/2H$	—	≥ 250	—	≥ 2000	≥ 1000
		$1/2H < H_b \leq H$	—	≥ 250	—	≥ 2000	≥ 1000
		$H_b > H$	Prohibited				
	$H_b > H_d$	$H_d \leq 1/2H$	—	≥ 100	—	≥ 2000	≥ 1000
		$1/2H < H_d \leq H$	—	≥ 200	—	≥ 2000	≥ 1000
		$H_d > H$	Prohibited				

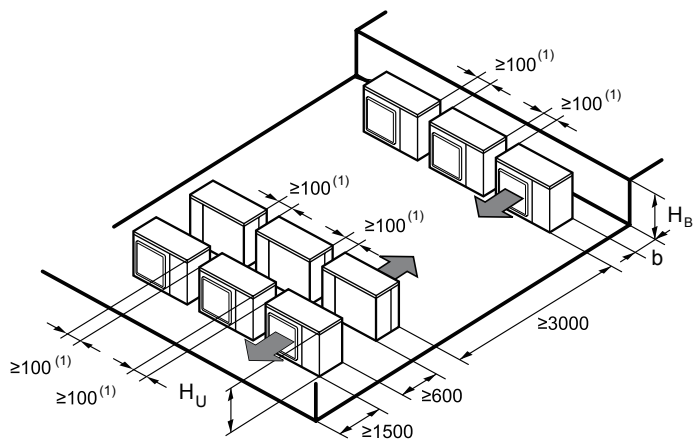
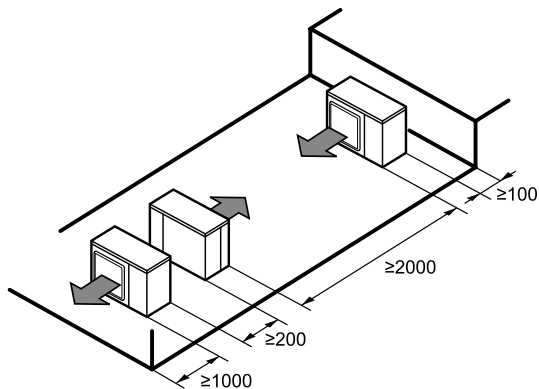
2) When two or more outdoor units are to be installed side by side.



LOCATION	H_b H_d H		Unit: mm				
			a	b	c	d	e
A,B,C	—		≥300	≥300	≥1000	—	—
A,B,C,E	—		≥300	≥300	≥1000	—	≥1000
D	—		—	—	—	≥2000	—
D,E	—		—	—	—	≥2000	≥1000
B,D	$H_b < H_d$	$H_d > H$	—	≥300	—	≥2000	—
	$H_b > H_d$	$H_d \leq 1/2H$	—	≥250	—	≥2000	—
		$1/2H < H_d \leq H$	—	≥300	—	≥2500	—
B,D,E	$H_b < H_d$	$H_b \leq 1/2H$	—	≥300	—	≥2000	≥1000
		$1/2H < H_b \leq H$	—	≥300	—	≥2500	≥1000
		$H_b > H$	Prohibited				
	$H_b > H_d$	$H_d \leq 1/2H$	—	≥250	—	≥2500	≥1000
		$1/2H < H_d \leq H$	—	≥300	—	≥2500	≥1000
		$H_d > H$	Prohibited				

3) When outdoor units are installed in rows.

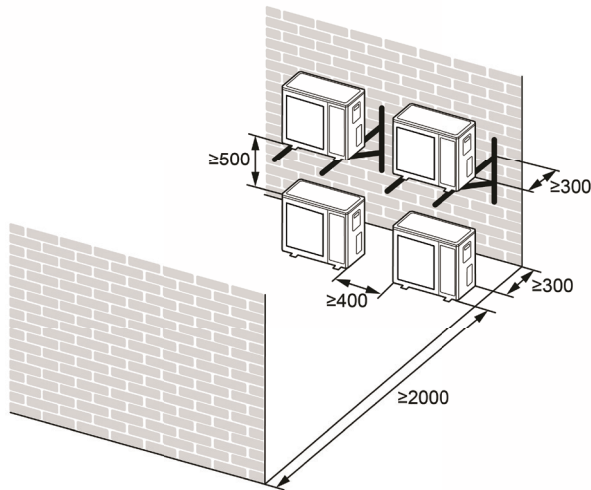
Unit: mm



H_B H_U	b (mm)
$H_B \leq \frac{1}{2} H_U$	$b \geq 250$
$\frac{1}{2} H_U < H_B \leq H_U$	$b \geq 300$
$H_B > H_U$	⊘

4) When outdoor units are installed one above another.

Unit: mm



3.2. Unit Installation

Pre-installation precautions

Please confirm that the installation personnel are qualified in relevant installation service. If the air conditioner was installed by persons without special skills, normal operations would not be ensured, even the personal and estate safety would be affected.

NOTE

The air conditioner must be correctly installed by installation technicians according to the attached Installation Manual , and the user himself should not install it.

User guideline

1. The user's installation site should be provided with regular power supply in conformity with that indicated in nameplate of the air conditioner, and its voltage should be within a range 90 %-110 % of the rated voltage value.
2. Power circuit should be equipped with protector, such as electricity leakage protector or air switch, which should possess a capacity greater than 1.5 times the maximum current value of the air conditioner.
3. Never fail to adopt personal circuit and effectively-grounded socket compatible with the attached plug of the air conditioner. The attached plug is equipped with grounding pin, and it must not be modified as desired.
4. Please adopt the fuse or circuit breaker prescribed in Installation Instructions.

5. Only qualified electrician is allowed to carry out wiring tasks strictly according to electric safety requirements.
6. Do ensure good earth of air conditioner, in other words, the main power switch of air conditioner must be connected to reliable ground wire.



PRECAUTIONS

The air conditioner should be installed securely; otherwise poor installation may lead to abnormal noises and vibration.

Outdoor unit should be installed at a spot ensuring that its air outlet noises and hot exhaust will not violate your neighbors.

3.2.1. Indoor Unit Installation

3.2.1.1. Vertical Up-flow and Horizontal Right-flow(Left-flow)

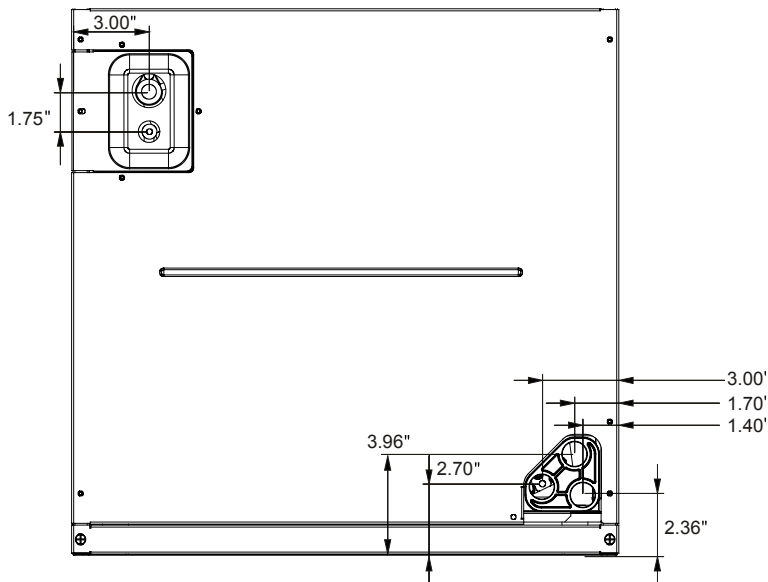
Vertical up-flow and horizontal right-flow configurations are the factory settings on all models.

If return air is to be ducted, install duct flush with floor. Use fireproof resilient gasket 1/8" to 1/4" thick between the ducts, unit and floor. Set unit on floor over opening.

IMPORTANT

Lightly tighten the drain connections so they do not leak.

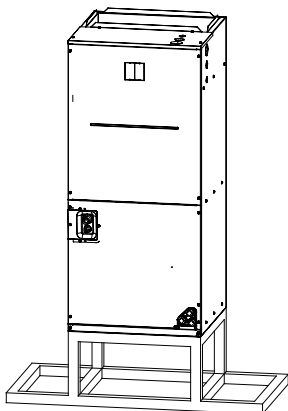
Using excessive force may cause damage to the drain connections. Torque applied to drain connections should not exceed 10.ft.lbs.



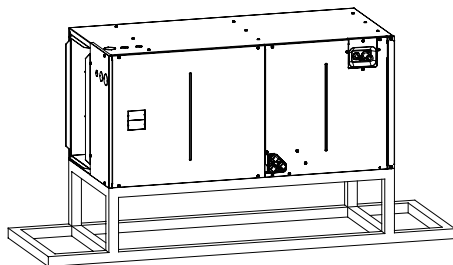
Dimensions for front connection coil

The units can be installed in a Vertical (down and up) and Horizontal(right and left) configuration.

Vertical up installations



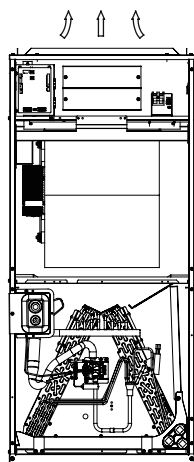
Horizontal installations



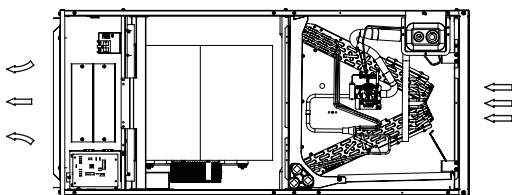
NOTICE: For horizontal installation, a secondary drain pan (not supplied) is suggested to install under the unit.

Please follow these steps to perform Vertical up installation and Horizontal right installation:

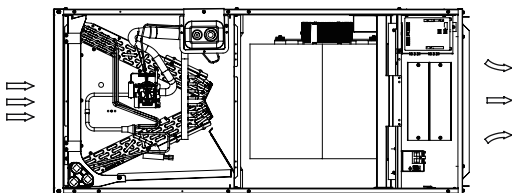
1. Open the upper cover.
2. Open the cover of the electronic control box.
3. Connect the wire according to the wiring diagram.
4. Connect the pipes.
5. Install the drainage pipes.



Upflow



Horizontal left flow

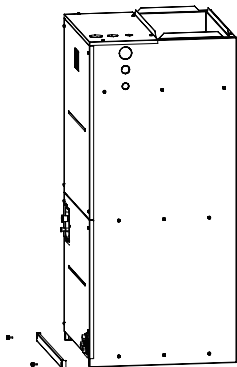


Horizontal right flow

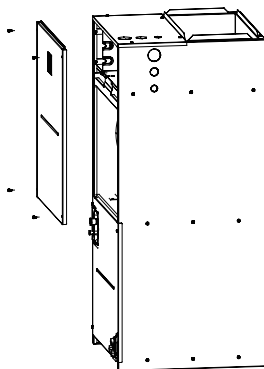
NOTE: For a downward air outlet installation, may cause a risk of condensed water entering the electric control board, do not install in an inverted manner.

Note: For the horizontal installation, how to disassemble and reinstall the evaporator assembly.

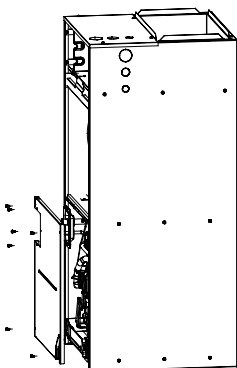
1. Remove the fixed plate of the filter, then take the filter off.



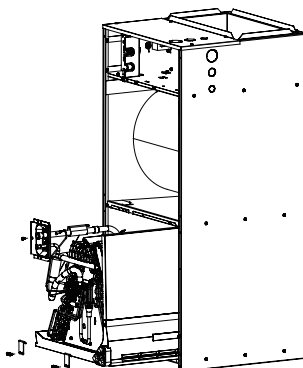
2. Remove the upper cover assembly.



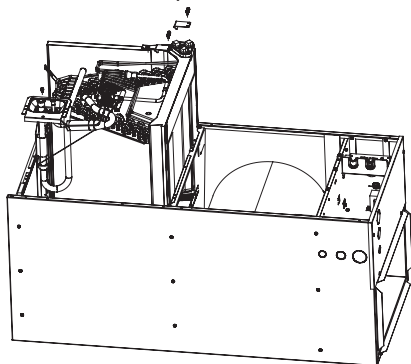
3. Remove evaporator cover plate.



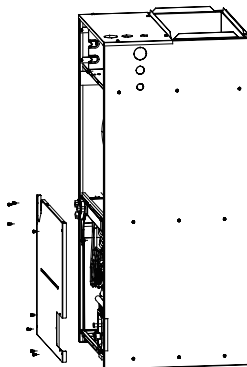
4. Take out the evaporator and drain pan and rotate 180°.



5. Reinstall the evaporator.

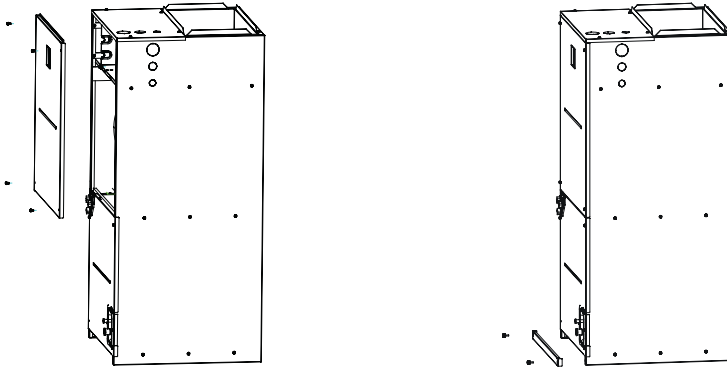


6. Reinstall evaporator cover plate.



7. Reinstall the upper cover assembly.

8. Reinstall the filter and filter plate.



9. Connect the wire according to the wiring diagram.

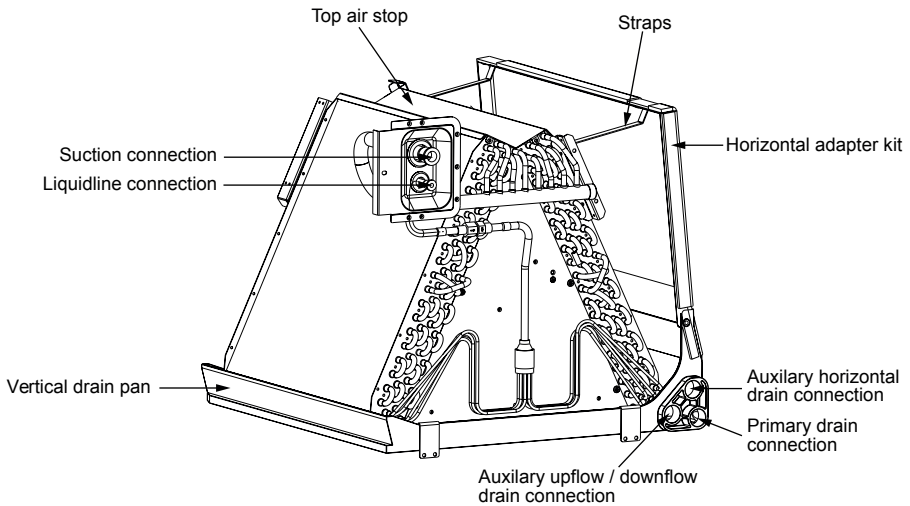


Figure Evaporator diagram

CAUTION

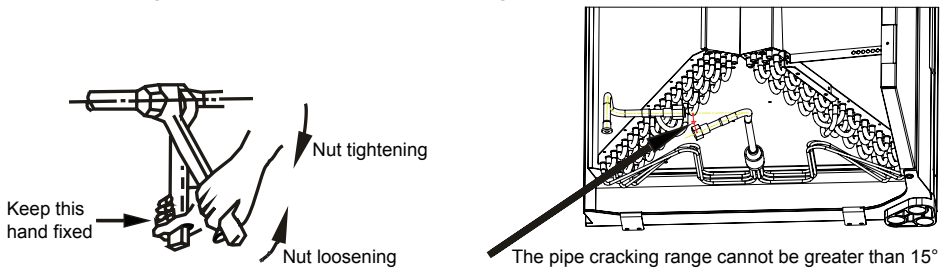
Horizontal units must be configured for right hand air supply or left hand air supply. Horizontal drain pan must be located under indoor coil. Failure to use the drain pan can result in property damage.

3.2.1.2. Installation in an Unconditioned Space

There are two pairs of coil rails in the air handler for default and counter flow application. If the air handler is installed in an unconditioned space, the two unused coil rails should be removed to minimize air handler surface sweating. The coil rails can be easily removed by taking off the 6 mounting screws from both sides of the cabinet.

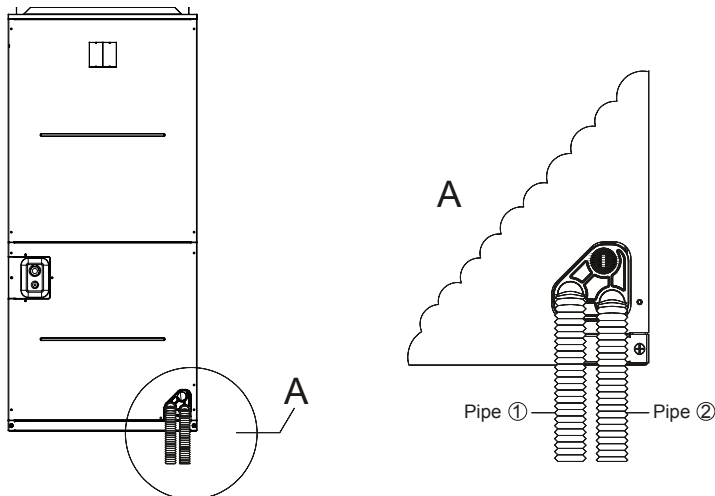
3.2.1.3. Throttle Valve Core Replacement

When replacing the throttle valve core, use two wrenches together. Hold one of the wrenches in your right hand to fix the entire pipe, and hold the other handle in your left hand to move upward, and then loosen the nut to replace the throttle valve core. It should be noted that the amplitude of cracking should not be too large, and the outward deformation Angle of the pipeline should not be greater than 15° .



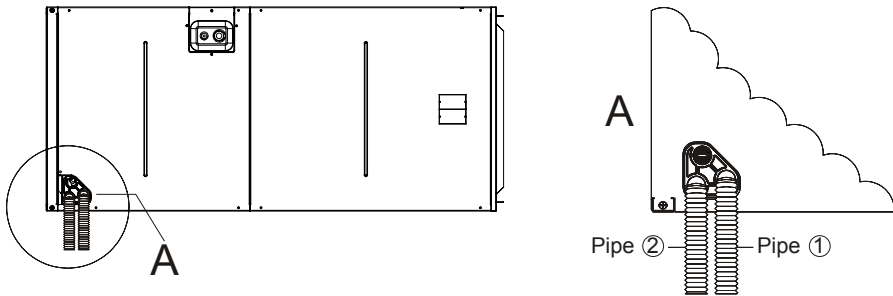
3.2.1.4. Indoor Side Drain Pipe

1. When the air handler is installed vertically, please block the upper drainage hole with a cover. The lower right of the the drainage hole is connected with the drainage pipe, and the lower left of the drainage hole is connected with the overflow pipe that should be exposed to the air; If the pipe ① is draining, which means the pipe ② is blocked. Contact maintenance personnel as soon as possible.



Vertical

2. When installing the air handler lying down, the upper drainage hole is covered the lower left of the drainage hole is connected with the drainage pipe, the lower right of the drainage hole is connected with the overflow pipe that should be exposed to the air. If the pipe ① is draining, which means the pipe ② is blocked. Contact maintenance personnel as soon as possible.



Horizontal right

Condensate Drain Connection

- Use a thin layer of Teflon paste, silicone or Teflon tape when making drain fitting connections.
- Do not over tighten fittings resulting in splitting pipe connections on the drain pan.

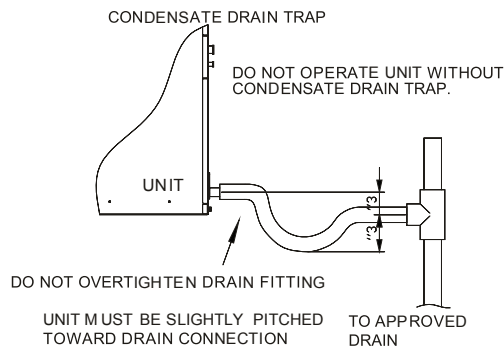


Figure Condensate drain trap

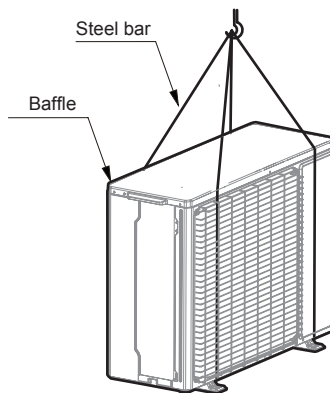
- Make sure the drain pipes layout do not block service access. Minimum clearance of 25" is required for filter, coil or blower removal and service access.
- Ensure the unit is level or pitched slightly toward primary drain connection so that water will drain smoothly from the pan. All horizontal drain pipes must be pitched downward away from the unit a minimum of 1/8 per foot of line to ensure proper drainage.
- Do not reduce drain pipe size less than connection size provided on condensate drain pan.
- Do not connect condensate drain pipe to a closed or open sewer pipe.
- The drain pipe should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.

- Make provisions for disconnecting and cleaning of the primary drain pipe if it become necessary. Install a 3 inch trap in the primary drain pipe as close as possible to the unit. Make sure that the top of the trap is below connection to the drain pan to allow complete drainage of pan.
- Auxiliary drain pipe should be connected to a place where it will be noticeable. Homeowner should be warned that a problem exists if water begins running from the auxiliary drain pipe.
- Test condensate drain pan and drain pipe after installation is complete. Pour enough water into drain pan, make sure that the drain pan is draining completely, no leaks are found in drain pipe fittings, and no water is draining from the termination of the primary drain pipe.

3.2.2. Outdoor Unit Installation

3.2.2.1. Move Outdoor Unit

1. Please use 4 pieces of 6mm steel wire hanging the outdoor unit up and move in.
2. To avoid the outdoor unit is out of shape, please add the baffles at the surface of outdoor unit where the steel wire rope may touch.
3. After moving, please remove the tray wood on the bottom.



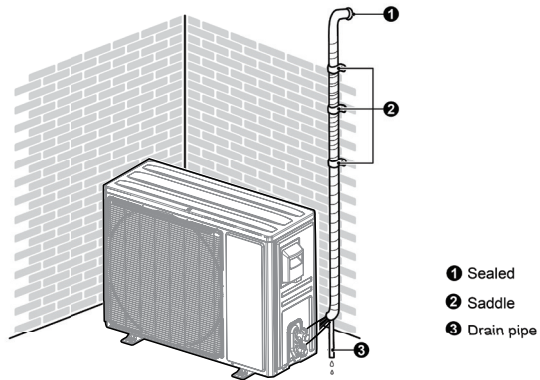
3.2.2.2. Installation Space

1. After leaving repair space as illustrated below, install the outdoor unit with power supply equipment installed at the side of the outdoor unit.
2. Please make sure necessary space for installation and repair.

3.2.2.3. Outdoor Side Drain Pipe

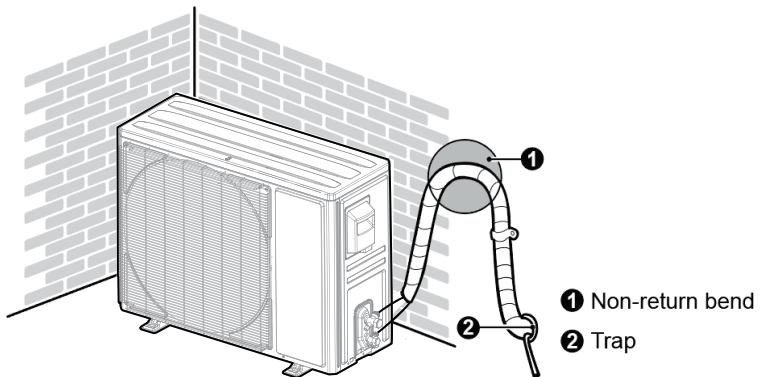
1. If the outdoor unit is underneath the indoor unit, arrange the pipeline according to the following diagram.
 - 1) Drain hose should be placed on the ground and its end should not be immerse into water. The whole pipeline should be supported and fixed onto the wall.
 - 2) Wind the insulating tape from bottom to top.

- 3) The whole pipeline should be wound with insulating tape and fixed onto the wall with saddles.



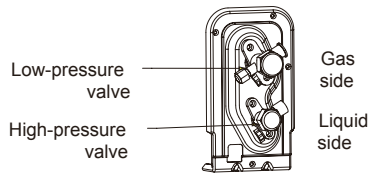
2. If the outdoor unit is above the indoor unit, arrange the pipeline according to the following diagram.

- 1) Wind the insulating tape from bottom to top.
- 2) The whole pipeline should be wound together to avoid water returning to the room.
- 3) Use saddles to fix the whole pipeline onto the wall.



3.2.3. Connection Pipe Installation

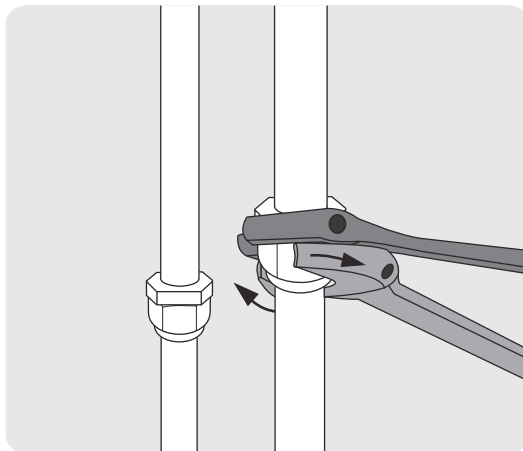
1. The junction is inside the cover of the right panel, please take off the cover first.
2. The pipe gets out of the side gap of the cover.
3. After connecting from the valve gap, reinstall it from left, right or backwards for installation.
4. The right picture is the sketch map of valve installation board of outdoor. Gas-side (low pressure) is the one upward, liquid side is the one downward.



3.2.3.1. Installation Notice and Requirement on Connection Pipe

Installation of ordinary nut unfold the connecting pipe and bend the connecting pipe according to the required length. Open the nut cover on the indoor unit's pipe and align the conical mouth of the connecting pipe with the center of the indoor unit's pipe. Tighten the nut by hand and then tighten it with a torque wrench. If you need to break the connection between indoor and outdoor units, cut the connector.

Replace with a new one and weld again.



! NOTES

1. The air conditioner must be installed in a room that is larger than the minimum room area. And it is not allowed to use in a room that has running fire.
2. Before break the connection pipes between indoor and outdoor units, eliminate the refrigerant first and make sure there is no fire source or potential fire source in the maintenance area. And make sure the area is well-ventilated.
3. The tamperproof box should not be overlapped during installation and must be completely covered with the accompanied insulated pipe before wrapping.

Installation method: Connect the connection pipes first to the indoor unit and then to the outdoor unit. When bending a connection pipe, be careful not to damage the pipe. Do not over-tighten the screw nut, otherwise leakage will occur.

Besides, the outside of connection pipe should be added with a layer of insulating cotton to protect it from mechanical damage during installation, maintenance and transportation.

Pipe Material		Copper Pipe for Air Conditioner
Model		24/36/48/55K
Size(mm)	Liquid side	9.52(3/8 inch)
	Gas side	15.88(5/8 inch)

Additional refrigerant charge

This AC has been charged with that for 7.5m pipe, those beyond 7.5m should recharge as follows.

Model	Additional charge for 1m pipe(R32)/g
24/36K	30
48/55K	40

		Allowed value		
		Conventional pipe, cooling capacity 24000 Btu/h	Conventional pipe, cooling capacity 36000 Btu/h	Conventional pipe, cooling capacity 48000-55000 Btu/h
Longest pipe(L)		30m	50m	60m
Maximum height drop	Height drop between indoor and outdoor unit (H)	15m	25m	30m

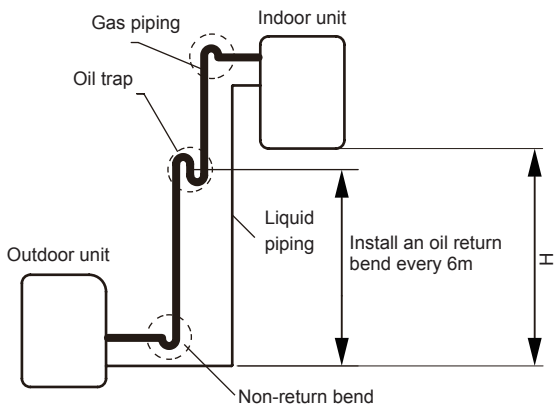
Connection pipe should adopt water-proof insulating material. Its wall thickness should be 0.5-1.0mm and the pipe wall should be able to withstand 6.0MPa. The longer the connection pipe is, the worse the cooling performance it has.

When the drop between indoor and outdoor units is longer than 10m, an oil return bend should be added every 6m.

The requirement on the adding of oil return bend is as below:

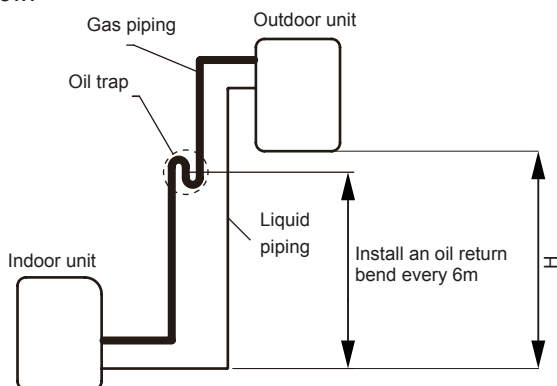
1. Outdoor unit is beneath the indoor unit.

It's necessary to add oil return bend and non-return bend at the lowest and highest position of the vertical pipe, as shown below:

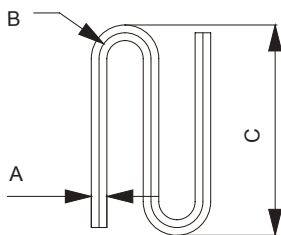


2. Outdoor unit is above the indoor unit.

There's no need to add non-return bend at the lowest or highest position of the vertical pipe, as shown below:



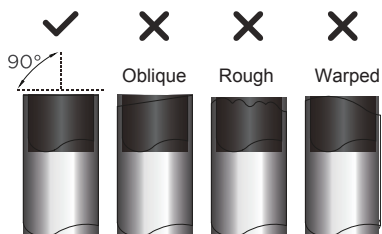
Dimensions for the making of oil return bend are as follows.



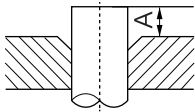
A(inch)	B(mm)	C(mm)
$\Phi 3/8$	220	≤ 150
$\Phi 1/2$	≥ 26	≤ 150
$\Phi 5/8$	233	≤ 150

3.2.3.2. Pipe Flaring

1. Cut the refrigerant pipe off with pipe cutter.



2. Flaring after putting the pipe into connection nut.

	Outside Diameter	A(mm)	
		MAX	MIN
	1/4"	8.7	8.3
	3/8"	12.4	12.0
	1/2"	15.8	15.4
	5/8"	19.0	18.6
	3/4"	23.3	22.9

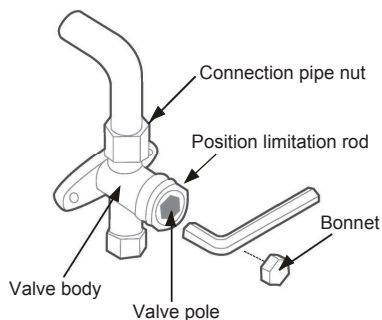
Stop valve operation item

Open the valve rod til to the position limitation rod. Do not try to open larger. Fasten the bonnet with spanner or similar tools.

Fasten the bonnet of valve rod.

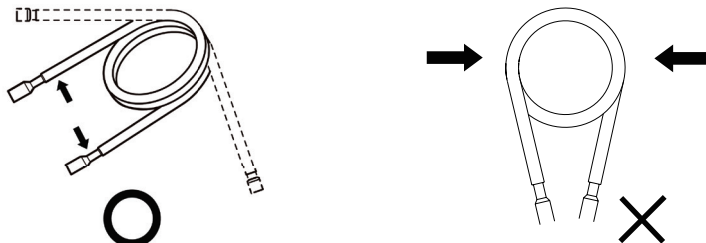
Liquid side(3/8", 1/2"):1180N.cm(120kgf.cm)

gas side(5/8", 3/4"):1180N.cm(120kgf.cm)



3.2.3.3. Pipe Bending

1. The pipes are shaped by your hands. Be careful not to collapse them.



2. Do not bend the pipes in an angle more than 90°.

3. If the pipe is repeatedly bent or extended, it will become hard and difficult to be bent or extended. So do not bend or extend the pipe for more than 3 times.

3.2.3.4. Connection Pipe of Indoor and Outdoor Units

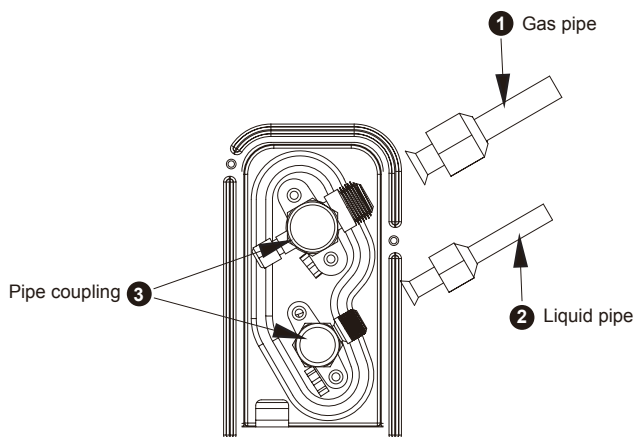
! NOTES

1. Connect the pipe to the unit. Please follow the instructions stated in the figures below. Use both spanner and torque wrench.
2. When connecting the tapered screw nut, first apply chilled machine oil on its inner and outer surface and then screw it up for 3~4 circles.
3. Confirm the tightening torque by referring to the following table (If the screw nut is over-twisted, it may be damaged and cause leakage).
4. Check whether gas leakage occurs to the connection pipe and then apply thermal insulation, as shown below.
5. Wind sponge around the joint of gas pipe and heat insulation sheath of gas collecting pipe.
6. Be sure to connect gas pipe after liquid pipe is connected.
7. The installation of pipe-work shall be kept to a minimum.
8. Pipe-work shall be protected from physical damage and shall not be installed in an unventilated space.

According to installation conditions, overlarge wrenched torch will destroy the nut.

Pipe diameter (inch)	Tightening torque
$\Phi 1/4$	1420~1720 N·cm (144~176kg f·cm)
$\Phi 3/8$	3270~3990 N·cm (333~407kg f·cm)
$\Phi 1/2$	4950~6030 N·cm (504~616kg f·cm)
$\Phi 5/8$	6180~7540 N·cm (630~770kg f·cm)
$\Phi 3/4$	9720~11860 N·cm (990~1210kg f·cm)

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



3.2.4. Connection Pipe Vacuum Pumping and Leak Detection

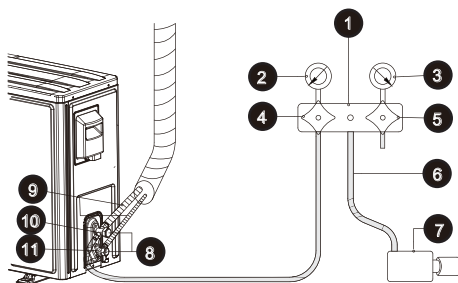


NOTE

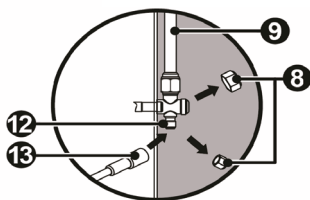
Make sure the outlet of vacuum pump is away from fire source and is well-ventilated.

When vacuum pump is used, each low-pressure valve must be manipulated as follow. Please refer to operation manual for the usage of manifold valve.

1. Connect the recharged hose to lower pressure valve junction (low/high pressure valve must be tightened.)
2. Connect the charged hose junction with vacuum pump.
3. Open the low pressure handler of manifold fully.
4. Start vacuumizing with vacuum pump. when vacuumizing begins, loosen the nut of low pressure valve a bit. check is the air enters(noise of vacuum pump changes, the all-purpose meter indication change from negative to zero) then tighten the nut of connection pipe.
5. After vacuumizing finishing, tighten the low pressure handler of manifold valve fully and stops the vacuum pump. when vacuumizing is carried out for over 15 minutes, please confirm if the all-purpose meter points at -1.0×10^5 pa(-76cm Hg)
6. Open the high/low pressure valve fully.
7. Dismantle the re charged hose from charge gap of low pressure valve.
8. Tighten the bonnet of low-pressure valve.



- ① Gauge manifold
- ② Pressure gauge (Low-pressure)
- ③ Pressure gauge (High-pressure)
- ④ Switch (Low-pressure)
- ⑤ Switch (High-pressure)
- ⑥ Hose
- ⑦ Vacuum pump
- ⑧ Cap
- ⑨ Connection pipe
- ⑩ Gas valve
- ⑪ Liquid valve
- ⑫ Service port
- ⑬ Hose with the valve pin



For large-size units, there are maintenance ports for liquid valve and gas valve.

During evacuation, you may connect the two hoses of the branch valve assembly to the maintenance ports to speed up the evacuation.

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration (Detection equipment shall be calibrated in a refrigerant-free area).

Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL Of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in apart of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

3.2.5. Refrigerant Adding

NOTE

Before and during operation, use an appropriate refrigerant leak detector to monitor the operation area and make sure the technicians can be well aware of any potential or actual leakage of inflammable gas. Make sure the leak detecting device is applicable to inflammable refrigerant. For example, it should be free of sparks, completely sealed and safe in nature.

3.2.6. Installation of the Duct

WARNING

Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grilles, special filters, accessories, etc. are accounted for in total flow resistance. Refer to the airflow performance table in this manual.
- Supply plenum is attached to the 3/4" duct flanges supplied with the unit. Attach flanges around the blower outlet.
- Secure the supply and return ductwork to the unit flanges using proper fasteners for the type of duct used and tape the duct-tounit joint as required to prevent air leaks.

IMPORTANT

If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

The front flange on the return duct connected to the blower casing must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires locate.

3.3. Electric Wiring

Field wiring must comply with the National Electric Code and any applicable local ordinance.

WARNING

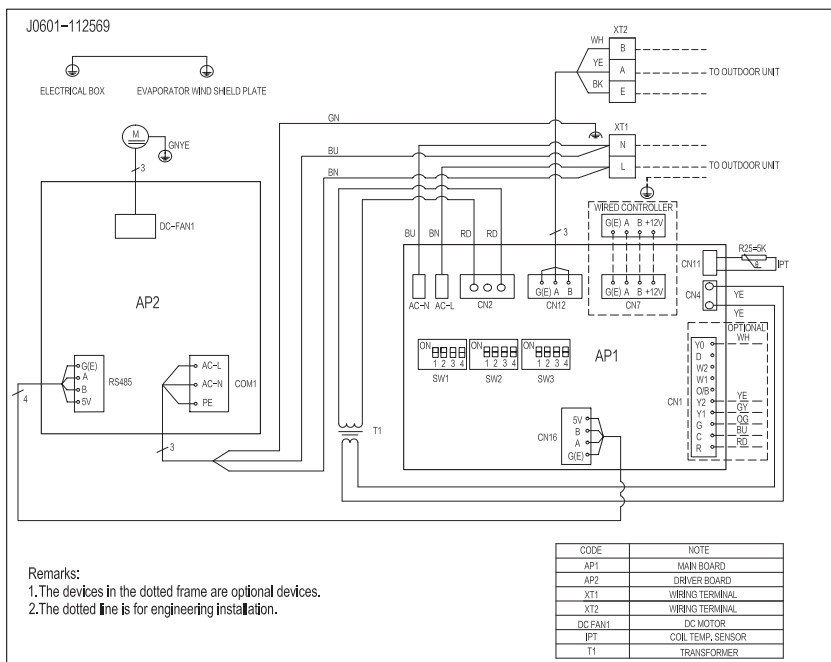
Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

Ground the condensing unit according to National, State, and Local code requirements.

3.3.1. Power Wiring

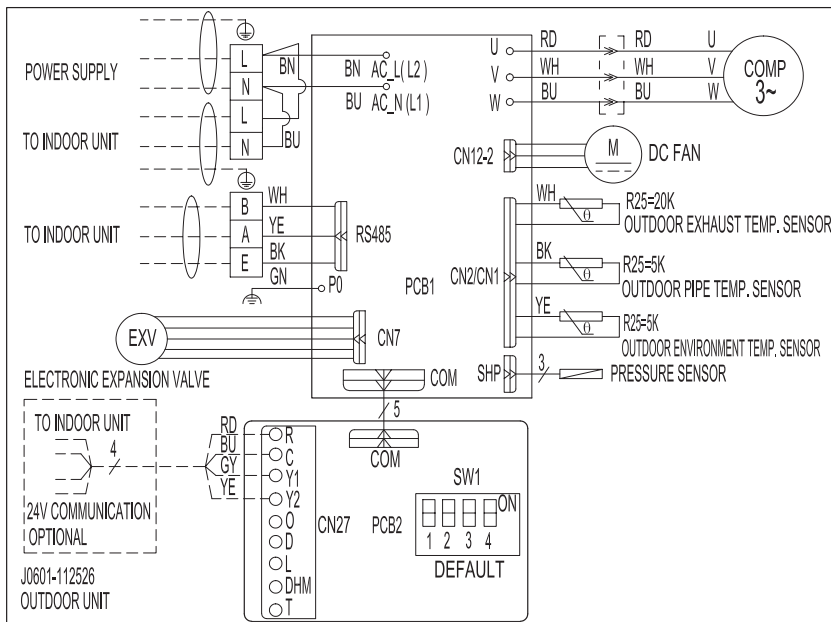
It is important that proper electrical power is available for connection to the unit model being installed.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- Supply circuit power wiring must refer to electrical data for ampacity, wire size and circuit protector requirements.

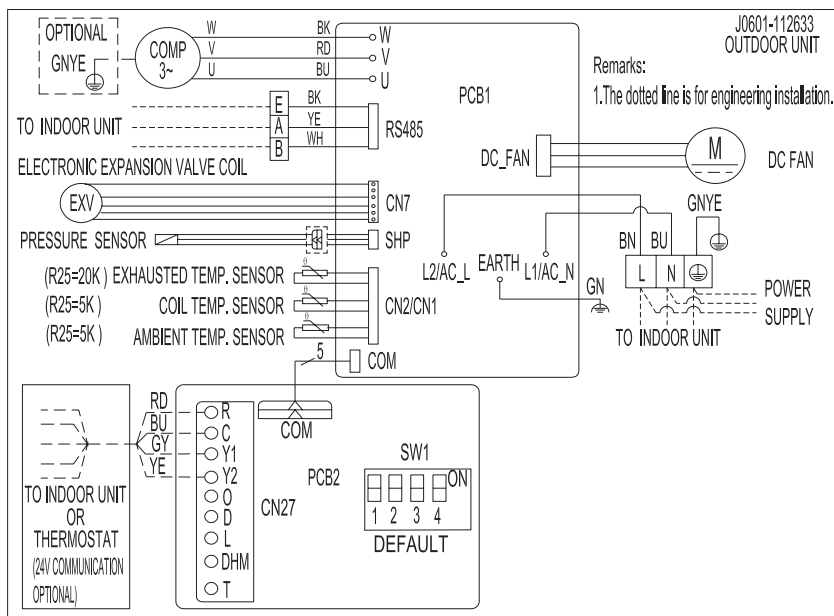
1. Indoor Unit

24/36/48/55K wiring diagram

2. Outdoor Unit



24/36K wiring diagram



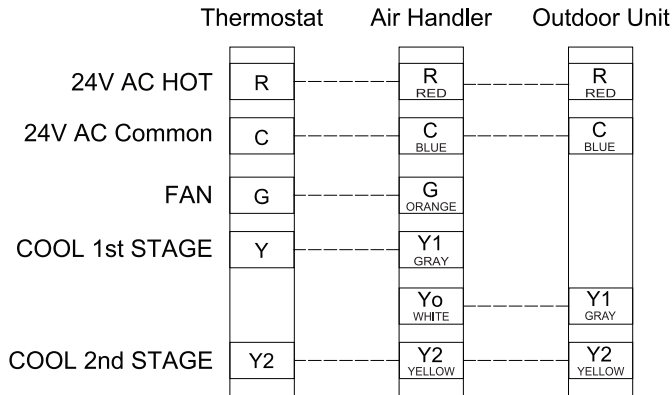
48/55K wiring diagram

3.3.2. Control Wiring

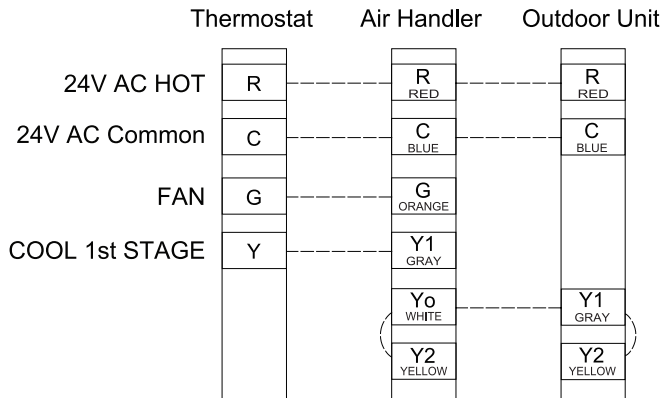
Class 2 low voltage control wiring should not be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Refer to wiring diagrams attached to indoor and outdoor sections to be connected.
- Make sure separation of control wiring and power wiring has been maintained.

2 Stage, 2 Step, Cooling Only



Single Stage, Cooling Only



Thermostat terminal definition chart.

Indoor Unit Terminal	Terminal definition
R	24VAC power supply for thermostat from secondary transformer
C	Common wire
G	Fan motor relay
Y1	Compressor stage1, low motor speed
Y2	Compressor stage2, high motor speed
Y0	Outdoor compressor relay (disconnect when the indoor unit malfunctions to stop the outdoor unit)

Outdoor Unit Terminal	Terminal definition
R	24VAC power supply for thermostat from secondary transformer
C	Common wire
Y1	Compressor stage 1, low load-output control
Y2	Compressor stage 2, high load-output control

NOTES:

1. Be sure power supply agrees with equipment nameplate.
2. Power wiring and grounding of equipment must comply with local codes.
3. For single stage thermostat with Y/Y1 terminal only, place both Y1 and Y2 wire together to Y/Y1 terminal.

3.3.3. Grounding

WARNING

The unit must be grounded.

Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet. Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in the unit.

3.3.4. Electrical Parameters Wire Specifications and Fuse

Indoor Unit	Power Supply	Fuse Capacity	Circuit Breaker Capacity	Min.Sectional Area of Power Cord
	V/Ph/Hz	A	A	mm ²
24K	208-230~ 60Hz	4	6	1.5
36K				
48K				
55K				

Outdoor Unit	Power Supply	Fuse Capacity	Circuit Breaker Capacity	Min.Sectional Area of Power Cord
	V/Ph/Hz	A	A	mm ²
24K	208-230~ 60Hz	30	32	2.5
36K		30	32	2.5
48K		60	50	6.0
55K		60	50	6.0

If the unit uses outdoor power supply only, add a leakage protector to the outdoor unit. If the indoor unit and outdoor unit are powered separately, install a leakage protector to the indoor and outdoor units separately.

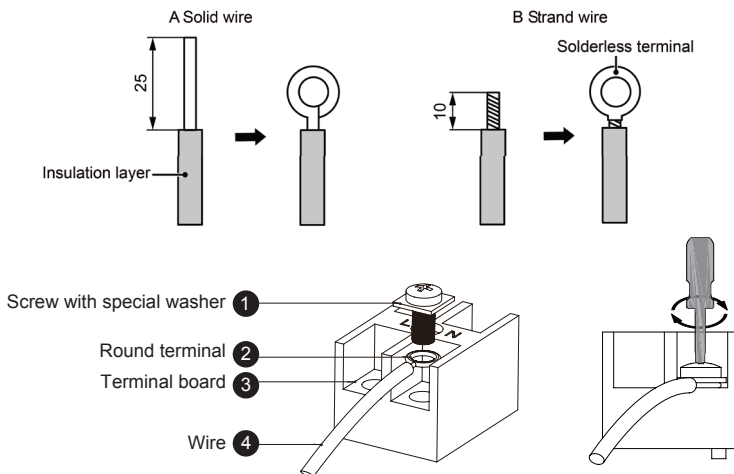
NOTES

1. Fuse is located on the main board.
2. Install a circuit breaker near the outdoor units with at least 3mm contact gap. The units must be able to be plugged or unplugged.
3. Circuit breaker and power cord specifications listed in the above table are determined based on the maximum power input of the units.
4. Specifications of circuit breaker are based on a working condition where the working temperature is 40°C. If working condition changes, please adjust the specifications according to national standards.
5. The wire gauge of power cords and communication cords requirement should be used according to the wiring diagrams. The maximum length of 24K units is 30m, the maximum length of 36K units is 50m. the maximum length of 48/55K units is 60m, Please select a proper length according to local conditions.
6. The diameter of the communication cable should not be less than 0.75 square millimeters. It is recommended to use a 0.75 square millimeter power cable with a twisted pair and shielding layer as the communication cable.

3.3.5. Connection of Power Cord and Communication Cord

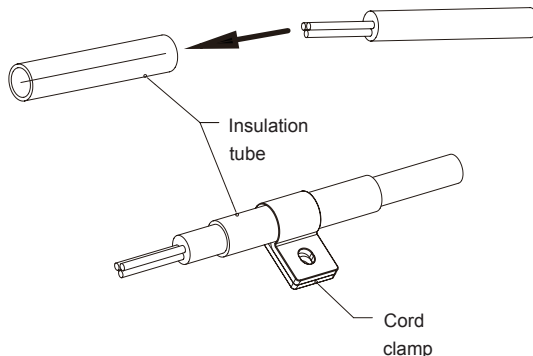
1. For solid wires (as shown below):
 - 1) Use wire cutters to cut off the wire end and then peel away about 25mm of the insulation layer.
 - 2) Use a screwdriver to unscrew the terminal screw on the terminal board.
 - 3) Use nippers to bend the solid wire into a ring that fits the terminal screw.
 - 4) Form a proper ring and then put it on the terminal board. use a screwdriver to tighten up the terminal screw.
2. For strand wires (as shown below):
 - 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 (as shown below).

Unit: mm



3. How to connect the connection wire and power cord.

Lead the connection wire and power cord through the insulation tube. Then fix the wires with wire clamps (as shown in the following figure).

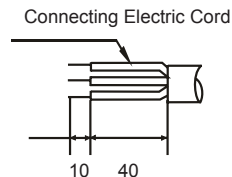


4. Outdoor unit wiring

- 1) Copper-cored wire should be selected.
- 2) As the electric control box is inside the unit body, dismantle the valve installation Cover, top cover right front board sequentially when connecting wires. Then connect the responding wires from the hole of the electric of the right back board.
- 3) Mate series number according to junction box of outdoor unit. (Disposed length of connection wire is good enough for inserting the connection pole completely).
- 4) Wrap the electric wire(conductor), which is not inserted into the connection pole, with PVC belt and make it avoid any electric appliance or metal elements.
- 5) After installing cable connection lug on the main power wire, then connect to the terminal row.

- 6) Connection lug should be installed on the grounded wire of all cables. Only finishing that all cables can be connected to grounded bolt.
- 7) The electric wire from wire terminal should be through wire clips.
- 8) Please refer to the right illustration.

Unit :mm

**! NOTE**

The indoor unit should be connected correctly with the high-pressure and low-pressure stop valve of the outdoor unit as well as the signal line.

Otherwise, some electrical components and system may suffer damages.

! WARNING

- Before working, please check whether the indoor and outdoor units are powered on.
- Match the terminal numbers and wire colors with the colors indicated in the indoor unit.
- Wrong wire connection may burn the electrical components.
- Connect the wires firmly to the wiring box. Incomplete installation may lead to fire hazard.
- Please use wire clamps to secure the external covers of connecting wires.(Insulators must be clamped securely; otherwise, electric leakage may occur.)
- Ground wire should be connected.

4. Airflow Performance

Airflow performance data is based on cooling performance with a coil and no filter in place. Check the table for appropriate unit size selection. External static pressure should stay within the minimum and maximum limits shown in the table below in order to ensure proper airflow.

Airflow performance data

Model	Motor Speed		SCFM						
			External Static Pressure-Pa						
			0	25	50	75	100	125	150
24/36K	Super grade	SCFM	1774	1682	1583	1483	1413	1222	971
	Top grade	SCFM	1662	1541	1419	1342	1236	1014	731
	Mid and high grade	SCFM	1584	1457	1346	1229	1066	808	571
	Mid-range	SCFM	1504	1355	1271	1143	894	619	/
	Mid and low grade	SCFM	1404	1215	1118	999	712	412	/
	Low grade	SCFM	1296	1106	980	796	480	/	/
	Mute tone	SCFM	1198	994	825	591	/	/	/
48/55K	Super grade	SCFM	2110	1990	1845	1777	1704	1573	1371
	Top grade	SCFM	1942	1792	1682	1559	1445	1231	997
	Mid and high grade	SCFM	1833	1678	1542	1446	1307	1084	827
	Mid-range	SCFM	1753	1614	1446	1338	1168	923	725
	Mid and low grade	SCFM	1594	1505	1354	1207	1014	752	557
	Low grade	SCFM	1515	1395	1241	1067	846	506	/
	Mute tone	SCFM	1456	1336	1175	989	679	/	/

Shaded boxes represent airflow outside the required 300-450cfm/ton at full load.

NOTES: Airflow based on air-supply mode at 220V with no filter.

The air distribution system has the greatest effect on airflow. For this reason, the contractor should use only industry-recognized procedures to finish ductwork.

Heat pump systems require a specified airflow. Each ton of cooling requires between 300 and 450 cubic feet per minute (CFM). Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship. Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of the space. Return air grilles must be properly sized to carry air back to the blower as well. Failure to follow these may cause abnormal noise and drafts.

The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space. An air velocity meter or airflow hood can give a reading of system CFM.

5. Air Filter

Filter application and replacement are critical to airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as motor, heat relays, evaporator coil or compressor. Units should be sized for a maximum of 300 feet/min. air velocity or what is recommended for the filter type installed.

Ensure the air flow is in the range of 300-450CFM if adding high efficiency filters or electronic air filtration systems.

Note that the overall performance and efficiency of the unit will be reduced because of pressure drop by filters.

IMPORTANT

Do not double filter the return air duct.

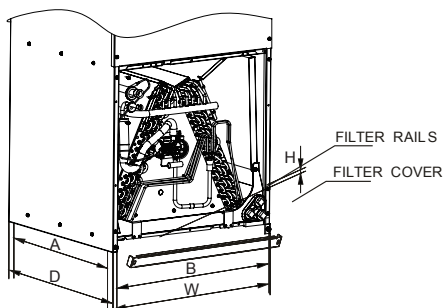
Do not filter the supply air duct which will change the performance of the unit and reduce airflow.

WARNING

Do not operate the system without filters. A portion of the dust suspended in the air may temporarily lodge in the duct. Any circulated dust particles could be heated and charred by contact with the air handler elements.

This residue could soil ceilings, walls, drapes, carpets and other articles in the house.

Soot damage may occur without filters in place when certain types of candles, oil lamps or standing pilots are burned.



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 andc lean

Filter Dimensions

Model	Dimensions (in.)					
	Filter size	W	D	H	A	B
24/36/48/55K	18×20	19-3/4	21	1	16	13-7/8

NOTE:

- Refer to the label on filter cover to install the correct filter size.

6. Maintenance

6.1. Error Code



WARNING

- 1.If abnormal things (for example, awful smell) occur, please stop the unit immediately and disconnect power. Then contact our authorized service center. If the unit continues to run in abnormal situations, it may get damaged and cause electric shock or fire hazard.
- 2.Do not repair the air conditioner by yourself. Improper maintenance will cause electric shock or fire hazard. Please contact our authorized service center and send for professional service staff to repair.

If the display panel or wired control displays an error code, please refer to the error code meaning stated in the following table.

Error Code	Error Content	Error Definition and Protection
E0	Indoor and outdoor communication failure	Hardware Error
E1	Indoor ambient temperature sensor failure	Hardware Error
E2	Indoor fan coil temperature sensor failure	Hardware Error
E3	Outdoor fan coil temperature sensor failure	Hardware Error
E4	Abnormal system malfunction(lack of fluorine)	Hardware Error
E5	Model configuration error	Hardware Error
E6	Indoor PG/DC fan failure	Hardware Error
E7	Outdoor ambient temperature sensor failure	Hardware Error
E8	Outdoor exhaust temperature sensor failure	Hardware Error
E9	Outdoor IPM module failure/compressor drive failure	Hardware Error
EA	Outdoor current sensor failure	Hardware Error
Eb	PCB and display screen communication Failure	Hardware Error
EC	Outdoor modules Communication failure	Hardware Error
Ed	Indoor EEPROM fault	Hardware Error
EE	Outdoor EEPROM fault	Hardware Error
EF	Outdoor DC fan failure	Hardware Error
EH	Outdoor suction sensor failure	Hardware Error
EP	Outdoor compressor casing top failure	Hardware Error
EU	Outdoor voltage sensor failure	Hardware Error
Ej	Outdoor central coil temperature sensor failure	Hardware Error
En	Outdoor air pipe temperature sensor failure	Hardware Error
Ey	Outdoor liquid pipe temperature sensor failure	Hardware Error
P0	IPM module protection	Others Error
P1	Overvoltage and undervoltage protection	Others Error
P2	Overcurrent protection	Others Error
P3	Other protections	Others Error
P4	Protection against excessive outdoor exhaust temperature	Others Error
P5	Cooling protection against over cooling	Others Error
P6	Cooling and anti overheating protection	Others Error
P7	Heating and anti overheating protection	Others Error

Error Code	Error Content	Error Definition and Protetion
P8	Protection against high or low outdoor temperature	Remote control display adjustment
P9	Compressor drive protection (abnormal load)	Others Error
PA	Communication failure/mode conflict	Others Error
F0	Infrared human sensing sensor failure	Remote control display adjustment
F1	Battery module failure	Remote control display adjustment
F2	Exhaust temperature sensor failure protection	Others Error
F3	Failure protection of outer tube temperature sensor	Others Error
F4	Abnormal protection of refrigerant circulation	Others Error
F5	PFC protection	Others Error
F6	Compressor missing/ reverse phase protection	Others Error
F7	Module temperature protection	Others Error
F8	Abnormal commutation of four-way valve	Others Error
F9	Module temperature sensor circuit malfunction	Hardware Error
FA	Compressor phase current detection fault	Hardware Error
Fb	Cooling and heating overload protection limit / reduce frequency	Remote control display adjustment
FC	High power protection limit / reduce frequency	Remote control display adjustment
FE	Module current (compressor phase current) protection limit / reduce frequency	Remote control display adjustment
FF	Module temperature protection limit / reduce frequency	Remote control display adjustment
FH	Drive protection limit / reduce frequency	Remote control display adjustment
FP	Anti condensation protection limit / reduce frequency	Remote control display adjustment
FU	Anti freezing protection limit / reduce frequency	Remote control display adjustment
Fj	Exhaust protection limit / reduce frequency	Remote control display adjustment
Fn	External AC current protection limit / reduce frequency	Remote control display adjustment
Fy	Fluorine deficiency protection	Others Error
H1	High pressure switch malfunction	Hardware Error
H2	Low pressure switch malfunction	Hardware Error
d4	waterful protection	Other error
H3	High-pressure sensor fault (not displayed on indoor unit, displayed on outdoor unit)	Hardware Error
H4	Low-pressure sensor fault (not displayed on indoor unit, displayed on outdoor unit)	Hardware Error
C5	Indoor and wire controller communication failure	Hardware Error
b5	Indoor PCB and fan drive PCB communication failure	Hardware Error

6.2. Unit Maintenance



NOTES

- Before cleaning, please make sure the unit is stopped. cut the circuit breaker and remove the power socket, otherwise, electric shock may occur.
- Do not wash the air conditioner with water, otherwise fire hazard or electric shock may occur.
- When cleaning the filter, please be careful of your steps. If you need to work high above the ground, please be extremely careful.

6.2.1. Filter Screen Cleaning

Increase the frequency of cleaning if the unit is installed in a room where the air is extremely contaminated (As a yardstick for yourself, consider cleaning the filter once a half year).

If dirt becomes impossible to clean, change the air filter. (Air filter for exchange is optional.)

1. Removing the air filter from the duct.

2. Cleaning the air filter.

Remove dust from the air filter using a vacuum cleaner and gently rinse them in cool water. Do not use detergent or hot water to avoid filter shrinking or deformation. After cleaning dry them in the shade.

3. Replacing the air filter and Reinstall the filter as before.

6.2.2. Heat Exchanger of Outdoor Unit

Conduct cleaning for the heat exchanger of outdoor unit periodically, clean it once at least in every two months. clean the dust and sundries on the surface of the heat exchanger with dust collector and nylon brush. If there's compressed air source, use the compressed air to blow the dust on the surface of the heat exchanger. Don't use tap water for cleaning.

6.2.3. Drainage Pipe

Periodically check if the drainage pipe is blocked to smooth the condensate water.

6.2.4. Notices at the Beginning of the Using Season

1. Check if the air inlet/outlet of indoor/outdoor unit is blocked.
2. Check if the ground connection is reliable.
3. Check if the air filter screen is properly installed.
4. Check if the installation of outdoor unit is firm, if not, please contact with TCL appointed maintenance center.

6.2.5. Maintenance at the End of the Using Season

1. Cut off the main power of air conditioner.

2. Clean the filter screen, indoor and outdoor unit.
3. Clean the dust and sundries in indoor and outdoor unit.
4. If the outdoor unit is rusty, coat the rusty location with paint to prevent it from expanding.

6.2.6. Components Replacement

Components are available in our agency or our distributors nearby.

6.3. Notice on Maintenance

6.3.1. Information on Servicing

The manual shall contain specific information for service personnel who shall be instructed to undertake the following when servicing an appliance that employs a flammable refrigerant.

6.3.1.1. Checks to the Area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

6.3.1.2. Work Procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.

6.3.1.3. General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

6.3.1.4. Checking for Presence of Refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

6.3.1.5. Presence of Fire Extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

6.3.1.6. No Ignition Sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

6.3.1.7. Ventilated Area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

6.3.1.8. Checks to the Refrigeration Equipment

When electrical components are being changed, they shall be fit for the purpose and to the correct specification, At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

1. The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
2. The ventilation machinery and outlets are operating adequately and are not obstructed.
3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
4. Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
5. Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

6.3.1.9. Checks to Electrical Devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with, If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

1. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.

2. That no live electrical components and wiring are exposed while charging, recovering or purging the system.
3. That there is continuity of earth bonding.

6.3.2. Repairs to Sealed Components

1. During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
2. particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.

Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

6.3.3. Repair to Intrinsically Safe Components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

6.3.4. Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.

The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

6.3.5. Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

6.3.6. Removal and Evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

1. Remove refrigerant.
2. Purge the circuit with inert gas.
3. Evacuate.
4. Purge again with inert gas.
5. Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. when the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipework are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

6.3.7. Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed.

1. Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
2. Cylinders shall be kept upright.
3. Ensure that the refrigeration system is earthed prior to charging the system with refrigerant .
4. Label the system when charging is complete (if not already).
5. Extreme care shall be taken not to overfill the refrigeration system.
6. Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site .

6.3.8. Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to reuse of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced :

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure ensure that:
 - 1) Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
 - 2) All personal protective equipment is available and being used correctly.
 - 3) The recovery process is supervised at all times by a competent person.
 - 4) Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with manufacturer's instructions
8. Do not overfill cylinders. (No more than 80 % volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked .

6.3.9. Labelling

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

6.3.10. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).

Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak -free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of are refrigerant release. consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste Transfer Notice arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant, The evacuation process shall be carried out prior to returning the compressor to the suppliers. When oil is drained from a system, it shall be carried out safely.

6.4. After-sales Services

When Your air conditioner can not run in order, please shut down the machine and cut off the power supply immediately. Then contact dealers.