



ENGLISH

ESPAÑOL

FRANÇAIS

USE AND INSTALLATION INSTRUCTIONS

Thank you very much for purchasing this Heat Pump Air Conditioner. Please read this use and installation instructions carefully before installing and using this appliance and keep this manual for future reference.

WARNING

This product can expose you to chemicals which are known to the State of California to cause cancer, birth defects, or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.

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Caution Statements

Alert Symbols:

-  **DANGER** : The symbol refers to a hazard which can result in severe personal injury or death.
-  **WARNING** : The symbol refers to a hazard or an unsafe practice which may result in severe personal injury or death.
-  **CAUTION** : The symbol refers to a hazard or an unsafe practice which may result in minor personal injury, product, or property damage.

NOTE: Refers to the remarks and instructions related to the operation, maintenance, and service. Installation, maintenance, and repair of this unit must be performed by qualified, licensed service personnel.

Read these instructions thoroughly before installation or operation. Failure to follow these instructions may result in improper installation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

Before installation, check if the voltage of the power supply at the installation site is the same as the voltage shown on the nameplate.

DANGER

- Do not perform any alteration to this product, otherwise, it may cause water leakage, equipment failure, short circuit, electric shock, fire, etc.
- Piping, welding, and other such work should be carried out far away from any flammable and explosive materials, including the air conditioner refrigerant, in order to guarantee the security of the site.
- To protect the equipment from heavy corrosion, avoid installing the outdoor unit in the place, where sea water can splash directly onto it or in sulphurous air near a spa.
- Do not install the air conditioner where excessively high heat-generating objects are placed

WARNING

- If the power cable is damaged, it must be replaced by a service professional.
- The place where this product is installed must have the reliable electrical grounding facilities and protections. Do not connect the grounding of this product to air ducts, drain pipes, lightning protection facilities, as well as other piping lines to avoid electric shock and damage caused by other factors.
- Wiring must be done by a qualified electrician. All the wiring operations must be conducted according to local electrical codes.
- Consider the capacity of the electric current of your electrical meter and socket before installation.
- The power wire where this product is installed should have the independent leakage protection device and the electric current over-load protection device provided for this product.
- Never use gasoline or other inflammable gas near the equipment to avoid danger.
- When any abnormality like burnt smell, deformation, fire, smoke, etc. is found, you should stop using the equipment, immediately disconnect the main power supply and contact the dealer.
- The first 6 inches of supply air plenum and duct work must be constructed of sheet metal as required by NFPA 90B.
- The supply air plenum or duct must have a solid sheet metal bottom piece directly after the air handler unit with no opening, registers or flexible air ducts located in it. If flexible supply air ducts are used, they may be located only in the side walls of the rectangular plenum, a minimum of 6 inches from the solid bottom.

- **Read this manual carefully before using the equipment. If you still have any difficulties or problems, consult your dealer.**
- **The equipment is designed to provide you with comfortable room conditions. Use this unit only for its intended purpose as described in this installation and operation manual.**

 WARNING

PROPOSITION 65:

- This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to State of California to cause cancer.
- All manufacturer products meet current federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.
- California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.
- All "new equipment" shipped for sale in California will have labels stating that the product contains and /or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.
- You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.
 - Glass Wool (Fiberglass) Insulation
 - Carbon Monoxide (CO)
 - Formaldehyde
 - Benzene
- More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.

 CAUTION

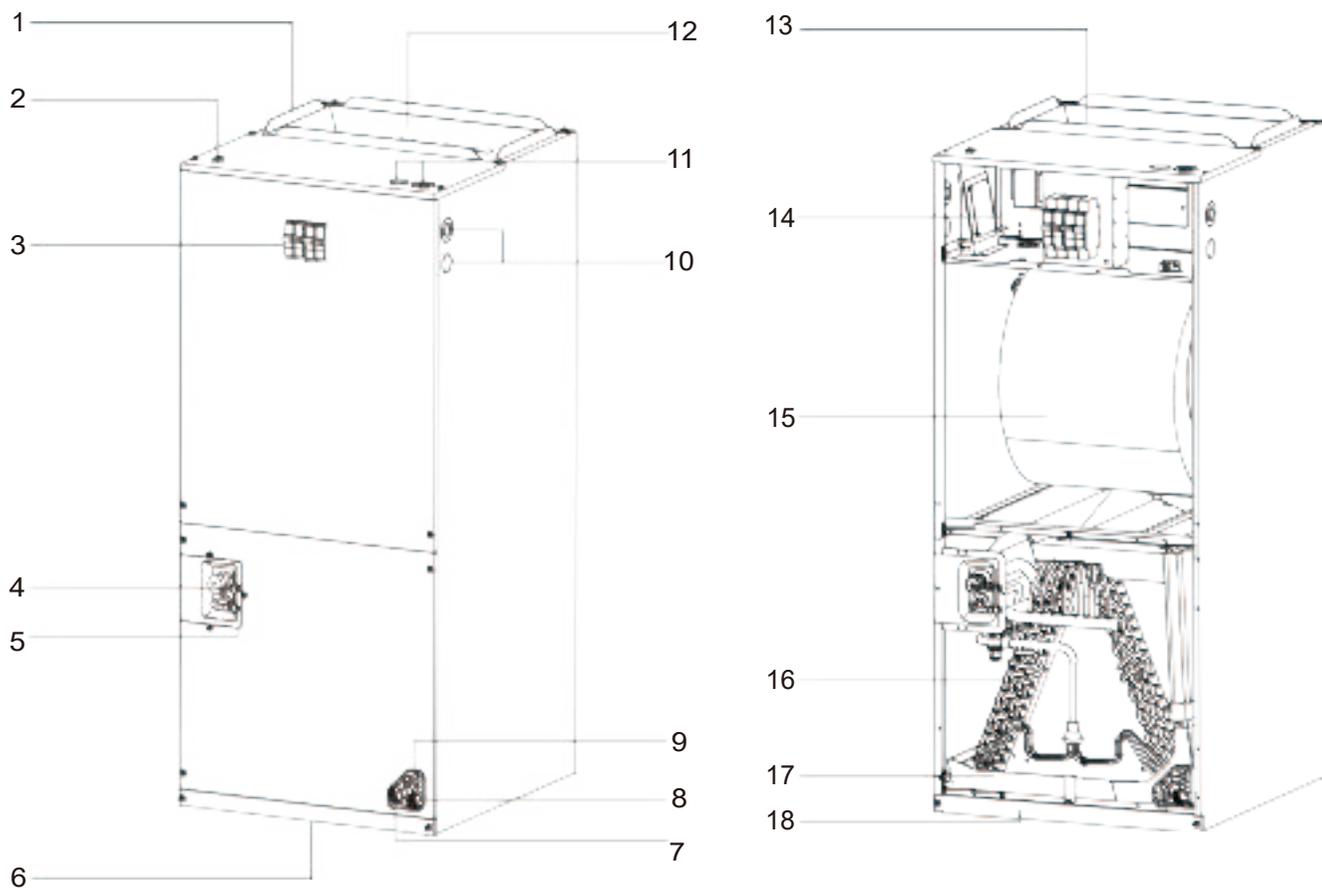
- Do not turn the air conditioner on and off from the main power switch. Use the ON/OFF operation button.
- Do not stick anything into the air inlet and air outlet of both the indoor and outdoor units. This is dangerous because the fan is rotating at a high speed.
- Do not cool or heat the room too much if babies or person are present.
- Type and rating of circuit breakers / ELB are detailed below.
- The method of connection of the appliance to the electrical supply and interconnection of separate components are detailed below.
- The information of dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed below.
- The range of external static pressures for ducted appliances is detailed below.
- Make sure the blower motor support is tight (3-motor mounting bolts). Then check to see if wheel is tightly secured to motor shaft before operation unit.

NOTE:

- **Storage condition:** Temperature -13~140°F (-25~60°C)
Humidity 30%~80%

Composition of the Air Conditioner

Indoor unit



1. Supply air outlet flange
2. Low voltage connection (for 24V)
3. Circuit breaker switch (Optional)
4. Refrigerant pipe (Gas)
5. Refrigerant pipe (Liquid)
6. Return air inlet
7. Auxiliary drain connection
8. Primary drain connection
9. Auxiliary drain connection
10. Knockout for power cable
11. Supply air outlet
12. Auxiliary heater (Optional)

13. Electrical enclosure
14. Blower fan
15. Coil
16. Condensate drain pan
17. Filter cover
18. Filter cover

NOTE: The figures are based on the external views of the standard model.
Shape and format may differ for the air conditioner model you have selected.

Trouble Shooting

CAUTION

When drain water overflows from the indoor unit, stop operation and contact your service provider. When you smell or see white smoke coming out of the unit, turn OFF the main power supply and contact your service provider.

1. If issues still Exists

If the issues still exists even after checking the following, contact your dealer and inform them of the following items.

- (1) Unit Model Name
- (2) Description of issue

2. No Operation

Check whether the SET TEMP is set at the correct temperature.

3. Not Cooling or Heating Properly

- Check for obstruction of air flow of outdoor or indoor units.
- Check if there are too many heating sources in the room.
- Check if the air filter is clogged with dust.
- Check if the doors or windows are open.
- Check if the temperature condition is within the operation range.

4. Examples of Abnormal/Normal Operation

Odor from Indoor Unit-

If filter goes unchanged for too long, or regular service of Evaporator coil lapse, unpleasant odors can occur. Please change your filter on a regular basis depending on your application. For coil service please contact your service provider. It is also highly recommended that your home or business has proper ventilation.

Unusual sounds-

It's common to hear the fan come on as well as some refrigerant or heater noise in regular operation. However, metal to metal, grinding or popping sounds are not. Please contact your service provide if any of the latter are heard.

Steam from outdoor unit-

This is a natural occurrence in the mode of defrost. Steam can be seen in certain outdoor conditions.

Air Filter

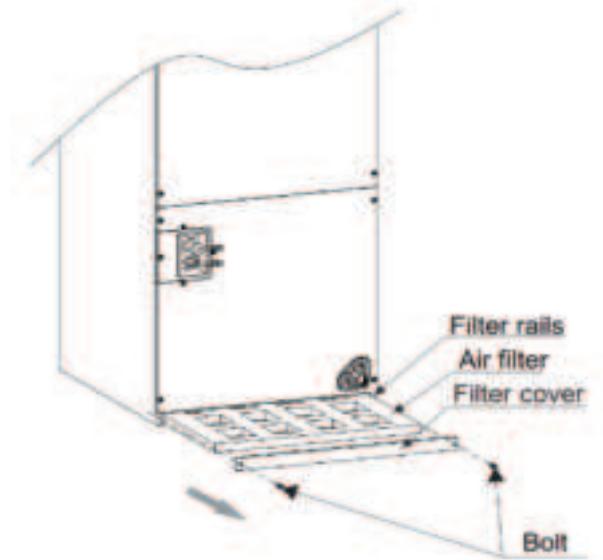
Air Filter (Field provided and installed)

Please replace or clean the filter regularly, to remove accumulated dust from the filter surface.

Follow these steps to properly replace the filter:

- (1) Removing the two bolts, then remove the filter cover and pull out the filter from the cabinet.
- (2) Insert the new filter into the cabinet along the filter rail.
- (3) Fix the filter cover with bolts.

Model	Filter Size (LxWxH) in.
24K/36K	20x18x1
48K/60K	22x20x1



Installation and Maintenance

1. Safety notice

WARNING

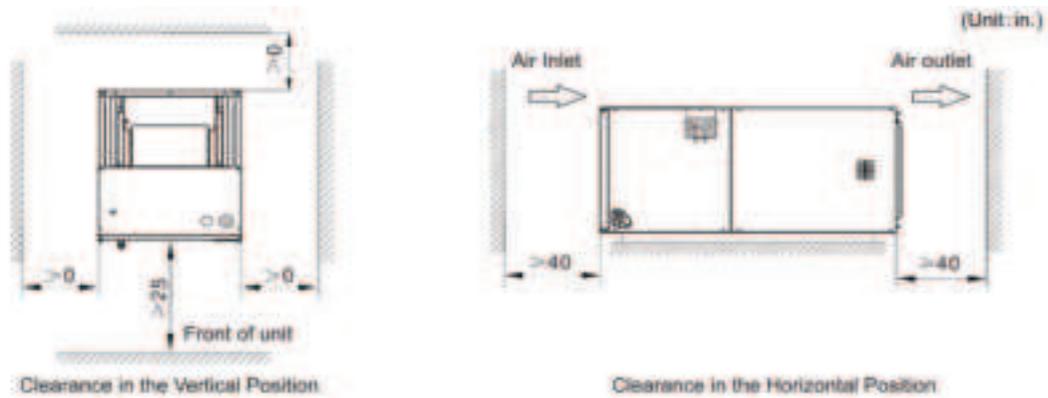
- Install the air conditioner on a solid base that can support the unit weight. (An inadequate base or incomplete installation may cause injury due to falling of the base.)
- Electrical work should be carried out in accordance with the installation manual and the local and national electrical wiring rules or code.
(Insufficient capacity or incomplete electrical work may cause electrical shock or fire.)
- Be sure to use a dedicated power circuit. (Never use the power supply shared by another appliance.)
- For wiring, use a cable long enough for the entire distance, and do not use an extension cord.
- Do not put other loads on the power supply, and please use a dedicated power circuit.
- Use the specified types of wires for electrical connections between the indoor and outdoor units.
(Firmly clamp the interconnecting wires so that the terminals receive no external stress.)
- Incomplete connections or clamping may cause terminal overheating or fire.
- After establishing connection between all the wires, fix the cables to prevent undue force on the electrical covers or panels. (Install covers over the wires, incomplete cover installation may cause terminal overheating, electrical shock or fire.)
- When installing or relocating the system, be sure to keep the refrigerant circuit free from air (Air in the refrigerant circuit may cause an abnormal pressure rise or rupture, resulting in injury.)
- If any refrigerant leakage occurs during the installation work, ventilate the room.
- After all installations are completed, make sure that no refrigerant leaks. (The refrigerant produces, toxic gas if exposed to flames.)
- When carrying out piping connection, do not let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause decreased performance, abnormal high pressure in the refrigeration cycle, explosion and injury.)
- Make sure that the installation has a proper earth connection. Do not ground the unit to a utility pipe, arrester, or telephone grounding. Incomplete grounding may cause electrical shock. (A high surge current from lightning or other sources may cause damage to the air conditioner.)
- An earth leakage circuit breaker may be required depending on the site condition to prevent electrical shock.
- Disconnect the power supply before wiring, piping, or checking the unit.

2. Installation of the Indoor Unit

2.1 Initial Check

- When moving the unit after unpacking, do not exert any pressure on other parts, especially the refrigerant piping, drain piping, and flange parts.
- Wear protective gear when installing the unit.

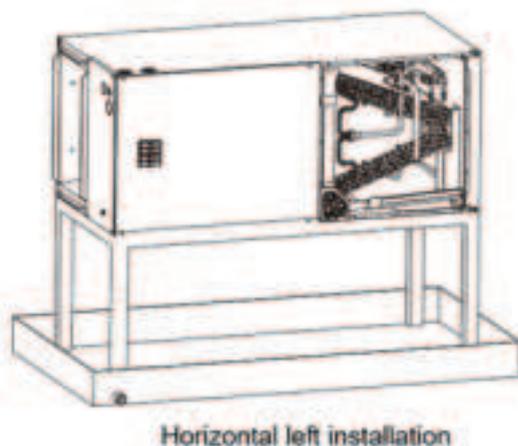
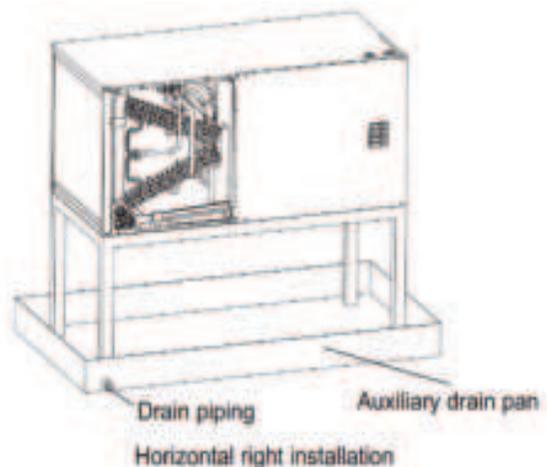
 CAUTION



2.2 Installation location

Obtain owners approval before selecting the installation location.

- Select ideal installation location for proper air distribution.
- Ensure the air path is not blocked.
- Ensure condensation can drain properly.
- Maintain sufficient clearance for maintenance and servicing.
- Piping between the indoor and outdoor units should be within the allowable limits. (Refer to the installation of the outdoor unit)
- The indoor unit, outdoor unit, cable and transmission should be kept at least 3-1/4ft (1 m) away from televisions and radio, to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a 3-1/4ft (1 m) distance is maintained.)
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil can flow to the indoor unit. Oil deposit on the heat exchanger, will reduce system performance and may damage the equipment.
- When the unit is installed in a hot and humid location, it is recommended to insulate the cabinet exterior and to use auxiliary drain pans.
- If installed above a finished living space, an auxiliary drain pan (as required by local building codes), must be installed under the entire unit and the condensate drain line must be routed to a location such that the user will see the condensate discharge.

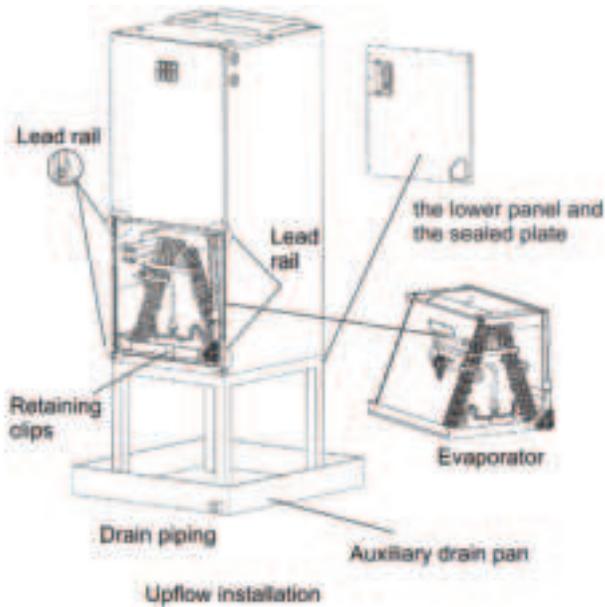


2.3 Installation

NOTE:

This equipment is designed for indoor installation only.

The indoor units can be installed in one of the following orientations: upflow, horizontal left, or horizontal right. Figure below for reference.



Minor field modifications are necessary to convert to horizontal left. Up-flow installation method is selected by default. When the unit is mounted in the horizontal right configuration, rotate it to the right for 90 degrees, as shown in image horizontal right installation. When the unit is horizontal left mounted, the following steps are required.

- 1). Disassemble the lower panel and the sealed plate
 - 2). Disassemble the retaining clips for the evaporator so that the evaporator can be pulled out along the lead rail easily
 - 3). Rotate the evaporator for 180 degrees and insert it into the upper side of the lead rail
 - 4). Rotate the unit to the left for 90 degrees, as shown in image horizontal left installation
 - 5). Reinstall the sealed plate and the lower panel.
- Do not, under any circumstances, connect return duct work 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 duct work run in unconditioned spaces must be adequately insulated and covered with a vapor barrier. Fibrous duct work may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Duct work must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on duct work 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 duct work, grills, special filters, accessories, etc, are accounted for in total resistance.

3. Refrigerant Pipe



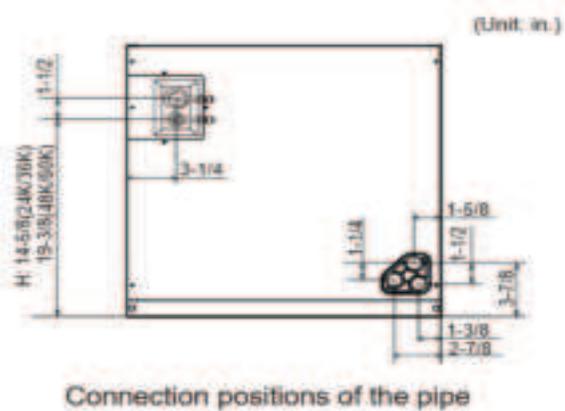
Use refrigerant according to outdoor nameplate. When carrying out the leakage check and test, do not mix in the oxygen with the acetylene and the flammable reactive gas, because these gases may result in explosion. It is suggested to use nitrogen to perform these tasks.

3.1 Pipe Material

- (1) Select clean, and dry copper pipes.
- (2) Choose dustless, dry and non-humid, clean copper pipe.
Before installing the pipe, use nitrogen or dry air to blow away dust and impurity on the pipe.
- (3) Choose the copper pipe according to outdoor manual.

3.2 Piping Connection

- (1) The connection positions of the pipe are shown below.



Refer to the outdoor unit Installation Instructions for details on pipe sizing, selection, pipe installation, and charging information.
Evaporator coil is pressurized with Nitrogen at the factory and shipped. Evacuate the system before charging with refrigerant.
Install refrigerant lines so that they do not block service access to the front of the unit.

Nitrogen should flow through the refrigerant lines while brazing.
Use a wet rag or an approved heat paste to protect the TXV sensing bulb during the brazing process.

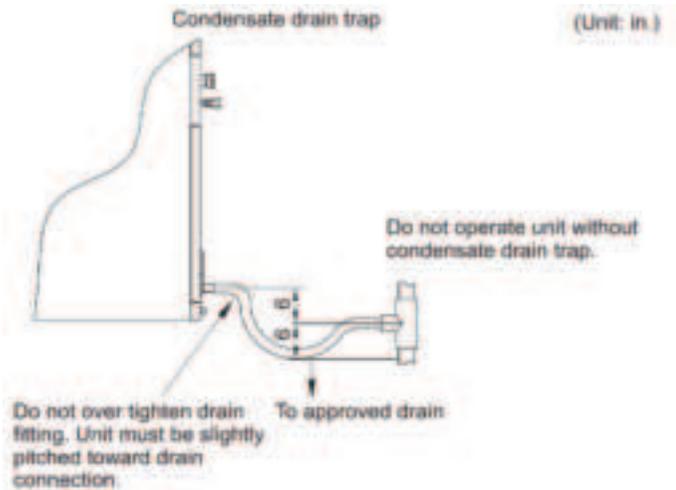
4. Drain Piping

The indoor units have field supplied primary and secondary 3/4-in. NPT drain connections.

When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, Silicone or Teflon tape and install by hand tightening.

When making drain fitting connections to drain pan, do not over-tighten.

All horizontal drain pipes must be pitched downward away from the unit a minimum of 1/8" per foot to provide free drainage.



Do not connect the drain pipes directly to sewage pipes to avoid any odor. Ammonia in the sewage may enter the indoor unit through the drain pipe and corrode the heat exchanger. Do not twist or bend the drain hose.

Excessive force applied during twisting or bending may cause leakage.

The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the pipe. Test condensate drain pan and drain pipe after installation is complete. Keep the cabinet horizontal (horizontal left or horizontal right) to ensure smooth drainage, or incline the case 0.5° to the drainage hole, making it the lowest point for draining. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain pipe fittings, and water is draining from the termination of the primary drain pipe.

NOTES:

If unit is located in or above a living space where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan, the unit requires servicing or water damage will occur. Install traps in the condensate lines as close to the coil as possible.

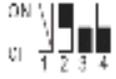
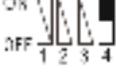
NOTE:

- (1) Follow local codes and regulations when sizing conductors. Minimum wire sizes are stated above.
- (2) When transmitting cable length is longer than 262ft. (80m), a larger wire size should be selected.
- (3) Install main switch and ELB for indoor and outdoor unit separately. Select the high response type ELB that is acted within 0.1second.
- (4) If auxiliary heater is required and already installed on indoor unit, power source cable should be installed separately and the size should be selected in accordance with UL.

5.2 Change of Static Pressure

The static pressure can be selected by changing Dip Switches on electric board.

Static Pressure Setting:

Dip Switch S2 Setting	Blower Speed Tap	Fan Speed Select	Static Pressure (W.C.[kPa]) 24K	Static Pressure (W.C.[kPa]) 36K	Static Pressure (W.C.[kPa]) 48K/60K
	2	Medium Low (Default setting)	0.18[0.045]	0.24[0.057]	0.28[0.07]
	3	Medium	0.25[0.08]	0.4[0.1]	0.4[0.1]
	4	Medium High	0.58[0.145]	0.58[0.145]	0.58[0.145]
	5	High	0.8[0.2]	0.8[0.2]	0.8[0.2]

Note: Symbol “  ” indicates the position of the dip switch.
 Symbol “  ” indicates any position of ON or OFF.

Blower data

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

NOTES:

- Required 350-450 CFM/Ton range.
- When there is an electric heater, set the fan speed based on the air volume that the electric heater needs (not less than 350 CFM/Ton).
- Airflow based upon air handler unit operates at 230 V with no electric heater kit and no filter. Airflow at 208 V is approximately the same as 230 V.

• Model: WFH24Z193C

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	815	792	752	709	—	—	—	—	—
	w	94	102	110	123	—	—	—	—	—
Tap (3)	CFM	862	828	792	735	705	—	—	—	—
	w	106	114	125	137	145	—	—	—	—
Tap (4)	CFM	—	—	—	859	853	803	769	735	—
	w	—	—	—	178	185	193	203	213	—
Tap (5)	CFM	—	—	—	—	—	895	864	825	779
	w	—	—	—	—	—	241	251	258	267

• Model: WFH36Z193C

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,264	1,216	1,172	1,135	1,096	—	—	—	—
	w	215	222	233	238	244	—	—	—	—
Tap (3)	CFM	1,350	1,314	1,269	1,206	1,116	1,082	1,050	—	—
	w	257	264	274	282	292	297	302	—	—
Tap (4)	CFM	—	—	—	1,323	1,266	1,192	1,122	1,060	—
	w	—	—	—	304	313	323	333	340	—
Tap (5)	CFM	—	—	—	—	1,350	1,292	1,221	1,148	1,088
	w	—	—	—	—	371	381	394	401	406

- **Model: WFH48Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,756	1,701	1,626	1,579	1,520	1,468	1,425	—	—
	w	348	357	369	378	387	395	407	—	—
Tap (3)	CFM	1,799	1,746	1,678	1,634	1,571	1,522	1,449	1,402	—
	w	366	377	388	398	410	419	428	444	—
Tap (4)	CFM	—	1,794	1,749	1,719	1,670	1,633	1,589	1,553	1,510
	w	—	387	401	413	428	437	452	465	482
Tap (5)	CFM	—	—	—	1,782	1,735	1,701	1,665	1,626	1,585
	w	—	—	—	456	469	481	495	510	525

- **Model: WFH60Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,838	1,810	1,770	1,760	—	—	—	—	—
	w	376	387	401	413	—	—	—	—	—
Tap (3)	CFM	1,888	1,855	1,813	1,782	1,751	—	—	—	—
	w	415	428	445	456	469	—	—	—	—
Tap (4)	CFM	1,971	1,941	1,893	1,864	1,820	1,786	1,755	—	—
	w	472	485	501	513	530	540	558	—	—
Tap (5)	CFM	2,056	2,022	1,978	1,950	1,907	1,878	1,826	1,801	1,750
	w	533	545	562	575	592	603	495	631	638

6. Test Run

Please perform test run according to installation manual of outdoor unit.

7. TXV Replacement Information

Please follow the steps below when replacing TXV:

- (1) Disassemble the front panel.
- (2) Remove the thermal bulb down by undoing the copper strips around it.
- (3) Seal the pressure pipe from the gas pipe with a welding gun. Be careful not to burn the gas pipe.
- (4) Remove the TXV off from the liquid pipe with a welding gun. Be careful not to burn the liquid pipe.
- (5) Wrap the new TXV with a piece of wet cloth to prevent damage caused by heat from being too hot and connect the nitrogen flow to the liquid pipe to prevent it from being oxidized. Weld the TXV to the liquid pipe, and pay attention to the direction of the TXV, then weld the pressure pipe to the gas pipe.
- (6) When the pipe cools down, connect it with 150PSI nitrogen equipment and examine the work for any leaks.
- (7) Secure the thermal bulb to the gas pipe with copper strips and perform insulation works.
- (8) Vacuum the unit, start up the system and the unit will start cooling operation.
- (9) Allow the unit to operate for 20 minutes, then adjust the TXV superheat to 6.
- (10) After the unit has operated for another 20 minutes, examine whether the superheat is appropriate and record the reading.

8. Electric Heat Kit Selection Table

Electric Heat Kit Model	Air Handler Model	Electric Heat (kW)	MIN. Circuit Ampacity		MAX. Fuse or Breaker (HACR) Ampacity		Fan Speed Tap			
			230VAC	208VAC	230VAC	208VAC	2	3	4	5
AUX5KW	24k	5	28.3	25.9	30	30	●	●	●	●
AUX7KW		7.5	40.7	37.2	45	40	x	●	●	●
AUX10KW		10	53.2	48.5	60	50	x	x	●	●
AUX5KW	36k	5	29.8	27.4	30	30	●	●	●	●
AUX7KW		7.5	42.2	38.7	45	50	x	●	●	●
AUX10KW		10	54.7	49.9	60	50	x	x	●	●
AUX15KW		15	42.2+36.9	38.6+33.8	45+40	40+35	x	x	x	●
AUX5KW	48K/60K	5	31.8	29.4	35	30	●	●	●	●
AUX7KW		7.5	44.8	40.7	45	45	x	●	●	●
AUX10KW		10	56.7	51.9	60	55	x	x	●	●
AUX15KW		15	44.8+36.9	40.7+33.8	50+40	50+35	x	x	●	●
AUX20KW		20	56.7+49.9	51.9+45.2	60+50	60+50	x	x	x	●

● Available
x Not available

NOTES:

Heat kit is an optional part, and it must have a separate power supply.

It is recommended that the electric heater kit should be installed in cold climate regions or when long piping is used. Properly size the axillary heater per the table above.

Ampacities for MCA and Fuse/breaker include the blower motor.

Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute(CFM).