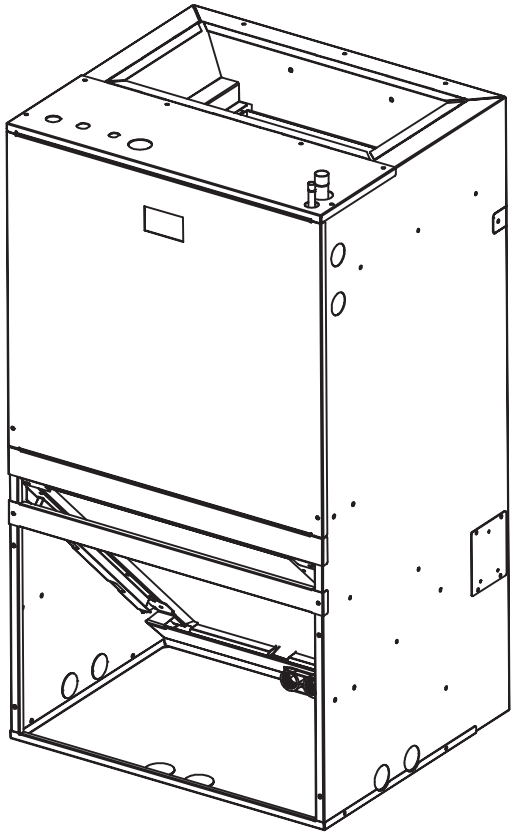
# Installation Manual

## WALL-MOUNT AIR HANDLERS
## 1.5 to 3 Ton
## R32



The manufacturer has a policy of continuous data improvement and it reserves the right to change design and specifications without notice.

All phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES.

Important: This Document is customer property and is to remain with this unit.

### Product Features

- Front or bottom return air.
- Blower slides out easily for maintenance.
- 5, 7.5 and 10 kW single phase electric heaters.
- Painted finish on galvanized steel.
- Thermoplastic drain pan with bottom primary and secondary drain connections.
- 208/230 VAC operation.
- Stud or wall mounting installation.
- Direct-drive, multi-speed motor allows air volume variation for heating/cooling.
- Built-in filter rack.
- Wall-hanging brackets.
- Fully insulated cabinet.
- 3/4" NPT primary and secondary drains.
- AHRI certified and ETL listed.

# Table of Contents

# 1.0 Key to Symbols and Safety Instructions

## 1.1 Key to Symbols

**Warnings**

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

**The following keywords are defined and used in this document.**

| ⚠ DANGER | |
|---|---|
| **DANGER** | Indicates a dangerous situation, which, if not avoided, will lead to death or serious injury. |
| **⚠ WARNING** | |
| **WARNING** | Indicates a dangerous situation, which, if not avoided, may lead to death or serious injury. |
| **⚠ CAUTION** | |
| **CAUTION** | Indicates a dangerous situation, which, if not avoided, may cause mild to moderate injury. |
| **⚠ NOTE** | |
| **NOTE** | Used to deal with behaviors unrelated to personal injury. |

**Important information**

This symbol represents important information that is not dangerous to people or property.

## 1.2 Explanation of Symbols Displayed on the Unit

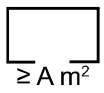
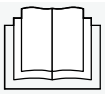
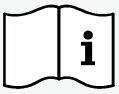
| | | |
|---|---|---|
|   | **DANGER** | This symbol shows that this appliance uses a mild flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire. |
|   | **WARNING** | This symbol shows that the appliance shall be installed, operated and stored in a room with a floor area not less than the minimum room area. |
|  | **CAUTION** | This symbol shows that the operation manual should be read carefully. |
|  | **CAUTION** | This symbol shows that a service personnel should be handling this equipment with reference to the installation manual. |
|  | **CAUTION** | This symbol shows that information is available such as the operating manual or installation manual. |

*Table 1*

## 1.3 Safety Precaution

**WARNING**

**SAFETY HAZARD!**
This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

**WARNING**

**HAZARDOUS VOLTAGE!**
Disconnect all electrical power, including remote disconnects before installing or servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

**WARNING**

**LIVE ELECTRICAL COMPONENTS!**
During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

**WARNING**

**EXPLOSION HAZARD!**
Do not store corrosive or combustible materials, gasoline, or other flammable vapors or liquids near the unit. Failure to follow this warning could result in property damage, serious personal injury, or death.

**WARNING**

**ELECTRICAL HAZARD!**
Grounding Required! Follow proper local and state electrical code on requirements for grounding. Failure to follow this warning could result in property damage, serious personal injury, or death.

**WARNING**

**HAZARDOUS VAPORS!**
Do not install an air handler with a non-ducted return in the same closet, alcove, or utility room as a fossil fuel device. Hazardous vapors can be distributed throughout the conditioned space and equipment damage can result.

**Important:** These instructions do not cover all variations in systems nor provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

**Important:** Installation of this unit shall be made in accordance with the National Electric Code, NFPA No. 90A and 90B, and any other local codes or utilities requirements.

Note: The small air handlers have been evaluated in accordance with the Code of Federal Regulations, Chapter XX, Part 3280 or the equivalent. "SUITABLE FOR MOBILE HOME USE."

**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 vapor.

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 found in, or produced by, some of our heating and air-conditioning equipment, or found in natural vapor 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 OEHHA (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

**CORROSION HAZARD!**

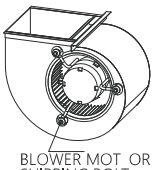
To prevent shortening its service life, the air handler should not be used during the finishing phases of construction. The low return air temperatures can lead to the formation of condensate. Condensate in the presence of chlorides and fluorides from paint, varnish, stains, adhesives, cleaning compounds, and cement creates a corrosive condition which may cause rapid deterioration of the cabinet and internal components.

## ⚠ CAUTION

**SAFETY HAZARD!**

Sharp Edge Hazard. Be careful of sharp edges on equipment or any cuts made on sheet metal while installing or servicing. Personal injury may result.

## ⚠ WARNING




Make sure the blower motor support is tight (3-motor mount bolts) then check to see if wheel is secured to motor shaft before operating unit.

## ⚠ WARNING

Only use this unit in a well-ventilated area and ensure unit's airflow inlet and outlet would not be impeded by obstructions. Do not use this unit in the following locations:

· Locations with mineral oil.

· Locations with saline atmospheres, such as seaside location.

·Locations with sulphurous atmospheres, such as near natura lhot springs.

· Where high voltage electricity is present, such as in certain industrial locations.

· On vehicles or vessels, such as trucks or ferry boats.

· Where exposure to oily or very humid air may occur, such as kitchens.

· In proximity to sources of electromagnetic radiation, such as high -frequency transmitters or other high strength radiation devices.

## ⚠ WARNING

● Do not use means to accelerate the defrosting process or toclean, other than those recommended by the manufacturer.
● The appliance shall be stored in a room that does not have continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
● Do not pierce or burn the unit. Be aware that refrigerants may not contain an odour.
● Ifrefrigerant gas leaks during installation, ventilate the area immediately.
● Comply with national gas regulations.

## ⚠ WARNING

When repairing the refrigerating system, comply with the following precautions prior to conducting work on the system:
● Work shall be undertaken according to controlled procedures to minimize the risk of the presence of flammable gases or vapors while the work is being performed.
● 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 shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable environment. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed or intrinsically safe.
● If any hot work is to be conducted on the refrigerating equipment or any associated parts,appropriate fire extinguishing equipment shall be available and easily accessible. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.
● When carrying out work in relation to a refrigerating systemthat involves exposing any pipe work, no sources of ignition shall be used 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, repair, or removal and disposal of the unit, during which refrigerant can possibly be released into the surroundi-ng space. Prior to beginning work, the areaaround the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Sm-oking" signs shall be clearly displayed.

## ⚠ WARNING

This appliance is not intended for use by people (including children) with reduced physical, sensory or mental capabilities, or people who lack experience and knowledge, unless they are supervised or have been given instructions concerning the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Any person who is involved with working on or opening a refrig - erant circuit should hold a current valid certificate from an indus try-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment credential.

Servicing shall only be performed as recommended by the eq- uipment manufacturer.

Maintenance and repair requiring the assistance of other skilld personnel shall be carried out under the supervision of a pers- on competent in the use of flammable refrigerants.

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to minimize the risk of ignition.

## ⚠ WARNING

for appliances using A2L refrigerants connected via an air duct system to one or more rooms, a warning that only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed inconnecting ductwork, The manufacturer shall list in the instructions all approvedauxlllary devices by manufacturer and modelnumber for use with the specificappliance, if those devices have a potential to become an ignition source.

## WARNING

Ensure that the area is in the open or that it is adequately ventilated before opening 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 surroundings.

Where electrical components are being changed, they shall befit according to their purpose and to the correct specification. At all times the manufacturer's maintenance andservice guidelines shall be followed. If in doubt, consult the manufacturer's technical department for ass istance.The followi - ngchecks shall be applied to installations using flammable refrigerants:

- The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
- The ventilation machinery and outlets are operating adequatelyand are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
- Equipment marking must remain visible and legible. Markings and signs that are illegible shall be corrected.

## WARNING

Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substances which may corrode refrigerant containing components, unless the components are constructed of materials that are inherently resistant to corrosion or are suitably protectedagainst corrosi on.

Repair and maintenance of electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, the no electrical supply shall be connected to the circuit until the fault has been dealt with.

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

## WARNING

:

Sealed electrical components shall be replaced.

Intrinsically safe components must be replaced.

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.

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

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need recalibration. (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

## WARNING

refrigerant and shall be calibrated for the refrigerant employed , and the appropriate percentage of gas (25% maximum) is confirmed.

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant which requires brazing is found, 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.

Leak detection fluids are also 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 corrodethe copper pipe-work.

NOTE:Examples of leak detection fluids arebubble method ,

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

The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations.
- evacuate.
-purge the circuit with inert gas.
- evacuate.
- continuously flush or purge with inert gas when using flameto open circuit.
- open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and nationa l codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen 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 oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

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 they contain.

Cylinders shall be kept upright. Ensure that the refrigeration systemis grounded prior to charging the system with refrigerant.

Label the system when charging is complete (if it is not already labeled).

Take extreme care not to overfill the refrigeration system.

Prior to recharging the system, it shall be pressure-tested with the

appropriate purging gas. 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.
Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended 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.

- Isolate system electrically.
- Become familiar with the equipment and its operation.
- Before attempting the procedure ensure that:

–mechanical handling equipment is available, if required, for handling refrigerant cylinders;
–all personal protective equipment is available and usedcorre ctly;
– the recovery process is supervised at all times by a competent person;
– recovery equipment and cylinders conform to the appropriate standards.

- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refriger ant can be removed from various parts of the system.
- Make sure that the cylinder is situated on the scales beforer ecovery takes place.
- Start the recovery machine and operate it in accordance with the manufacturer's instructions.
- Do not overfill cylinders. (No more than 80% volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process has been completed, make sure that the cylindersand the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- Recovered refrigerant shall not be charged into another ref rigeration system unless it has been cleaned and checked.

Equipment shall be labeled stating that it has been de-comm issioned and emptied of refrigerant. The label shall be datedand signed. Ensure that there are labels on the equipment stating that the equipment contains flammable refrigerant.

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended 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 is 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 valvesin good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment must be in good working order and come with a set of instructions for proper usage. Furthermore,the equipment should be suitable for safely recovering flammable refrigerants. If in doubt, the manufacturer should be consulted. n 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.

The recovered refrigerant shall be processed according to local legislation in the correct recovery 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 be certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process.When oil is drained from a system, it shall be carried out safely.

Do not use the air conditioner for other purposes. Inorder to avoid any quality deterioration, do not use the unit for the cooling of precision instruments, food, plants, animals or works of art. Before cleaning, be sure to stop the operation, turn the breaker off or unplug the supply cord. Otherwise, electric shock and injury may occur.

In order to avoid electric shock or fire, make sure that an ground leak detector is installed.

Never touch the air outlet or the horizontal blades while the swing flap is in operation.Your fingers may be come caught or the unit may break down.

Never put any objects into the air inlet or outlet.

Objects touching the fan at high speed can bedangerous.

Never inspect or service the unit by yourself.

Ask a qualified service person to perform this task.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, harming your health and well-being.

Do not dispose of this product as unsorted municipal waste. This waste should be collected separately for special treatment. Do not dispose of electrical appliances as unsorted municipal waste. Use separate collection facilities. Contact your local government for information regarding the connection systems available.

To prevent refrigerant leak, contact your dealer.

When the system is installed and operated in a small room, it is required to maintain the concentration of the refrigerant below the limit, in case a leak occurs. Otherwise, oxygen in the room may be affected, resulting in a serious accident.

The refrigerant in the air conditioner is safe and normally does not leak.

If the refrigerant leaks into the room and comes into contact with the fire of a burner, a heater or a cooker, a harmful gas could be released.

Turn off any combustible heating devices, ventilate the room, and contact the dealer from whom you purchased the unit.

Do not use the air conditioner until a service person confirms that the refrigerant leak is repaired.

Keep ventilation openings clear of obstruction.

**WARNING**

Be sure the air conditioner is grounded.
In order to avoid electric shock, make sure that the unit is grounded and that the ground wire is not connected to a gas orwater pipe, lightning conductor or telephone ground wire.

Do not operate the air conditioner with wet hands. An electric shock may happen.

Do not touch the heat exchanger fins. These fins are sharp and could cut you.

**WARNING**

To avoid oxygen deficiency, ventilate the room sufficiently if equipment with a burner is used together with the air conditioner.

Arrange the drain hose to ensure smooth drainage.Incomplete drainage may cause wetting of the building, furniture, etc.

Never touch the internal parts of the controller.

Do not remove the blower access panel. Some parts inside are dangerous to touch, and machine issues may occur.

Attention is drawn to the fact that additional transportation regulations may exist with respect to the equipment containing a flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and

training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together.

Any pictograms used should be as simple as possible and contain only essential details.

The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.

Storage package protection should be constructed such a way that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

Do not operate the air conditioner when using a room fumigation - type insecticide. Failure to observe this precaution could cause the hemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals. It may also cause the refrigerant sensor to alarm.

Do not place appliances which produce open flames in places exposed to the air flow from the unit or under the indoor unit. It may cause incomplete combustion or deformation of the unit due to the heat.

Do not install the air conditioner in a location where flammable gas may leak out. If the gas leaks out and stays around the air conditioner, a fire may break out.

The appliance uses R32 refrigerant.


## DISPOSAL

Comply with national regulations.
Components and accessories from the units are not part of ordinary domestic waste.
Complete units,compressors,motors etc.are only to be disposedof via qualifed disposal specialists.
This unit uses fiammable refrigerant R32 Please conlact the dealer when you want to dispose of this unit.Law requires that thecollection,transportealion and disposal of rerigerants must confcrm with the regulations governing the colleclion and destruction ahydrofluorocarbons.

**WARNING**

The space considered shall be any space which contains refrigerant-conlaining parts or into which refrigerant could bereleased.Theroomarea(A)ofthesmallest,enclosed, occupiedspaceshaltbeusedinthe detemination of the refrigerant quantity limits.

**WARNING**

Room height must be greater than 2.2m.
For detemination of room area (A) when used to caicuiate the refrigerant charge limit, the following shall apply.
The room area (A) shall be defined as the room area enclosed by the projection to the base of the walls,partitions and doors of the space in which the appliance is installed.
Spaces connected by only drop ceilings, ductwork, or similar connections shall not be considered a singlespace.

**WARNING**

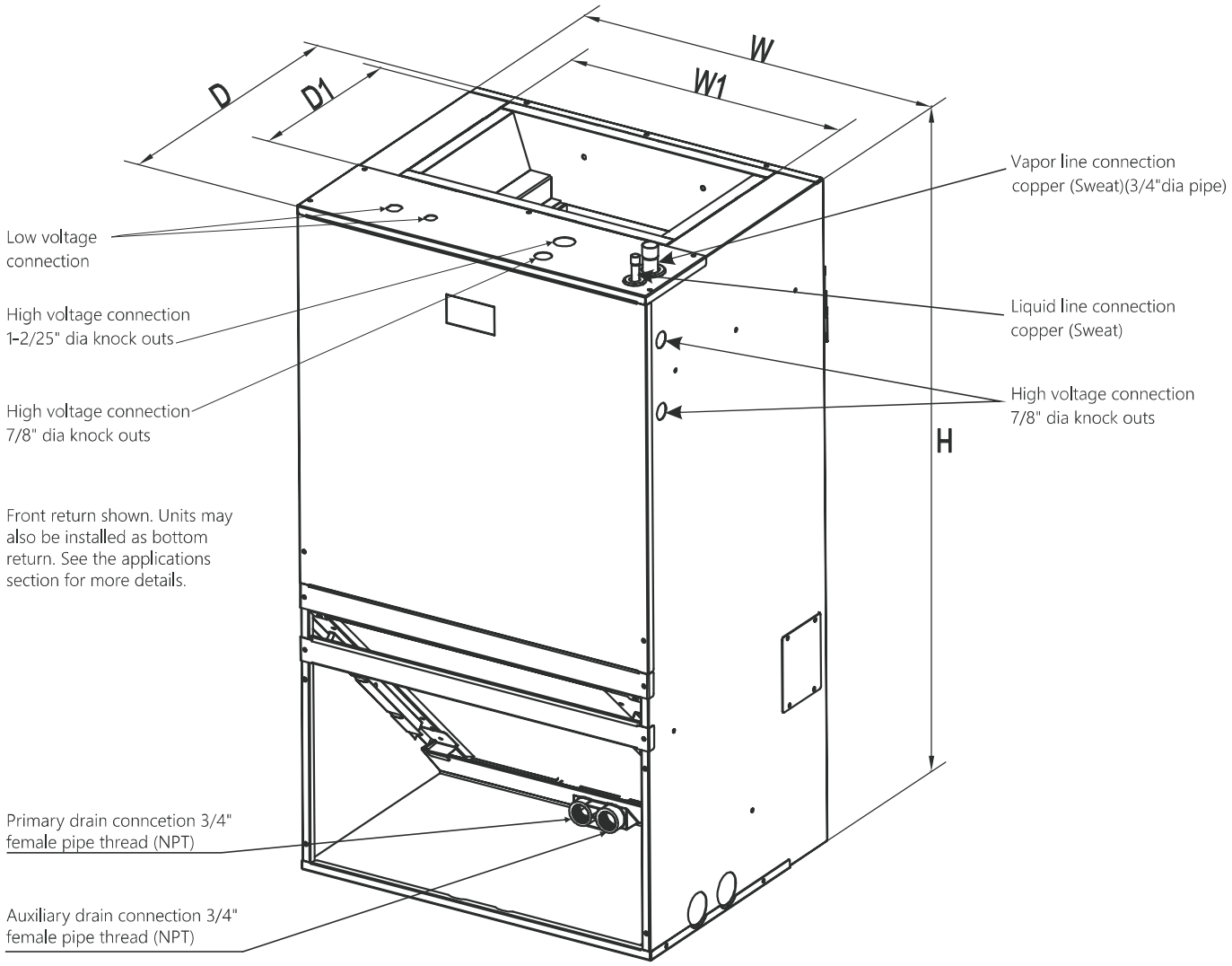
If appliances connected via an air duct syster to one or more rooms are installed in a room with an area iess than shown in section 3,5 Table 3-3.that room shall be without continuously operating open flames (e.g. an operating gas appliance) or other potential Ignition sources (for e.g.an operating electric heater,hot surfaces).A flame-producing device may be instailed in thesame space if the device is provided with.an effective flame arrest. For appliances connected via an air duct systemia one or more rooms, auxiliary devices which may be a potential Ignition source shall not be installed in the duct work, Exampies of suchpotential Igniton sources are hot surfaces with atemperature exceeding 700°C and clectricswitching devices.

**WARNING**

a warning that if appliances connected via an air duct system to one or more rooms with A2L REFRIGERANTS are installed in a room with an area less than Amin asdetermined in Clause GG.2, or installed in a room with an EFFECTIVE DISPERSAL VOLUME VED less than the minimum as determined by Clause 101.DVN.8, that room shall be without continuously operating open flames (e.g. an operating gas appliance) or other POTENTIAL IGNITION SOURCES (fore.g. an operating electric heater, hot surfaces).A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.

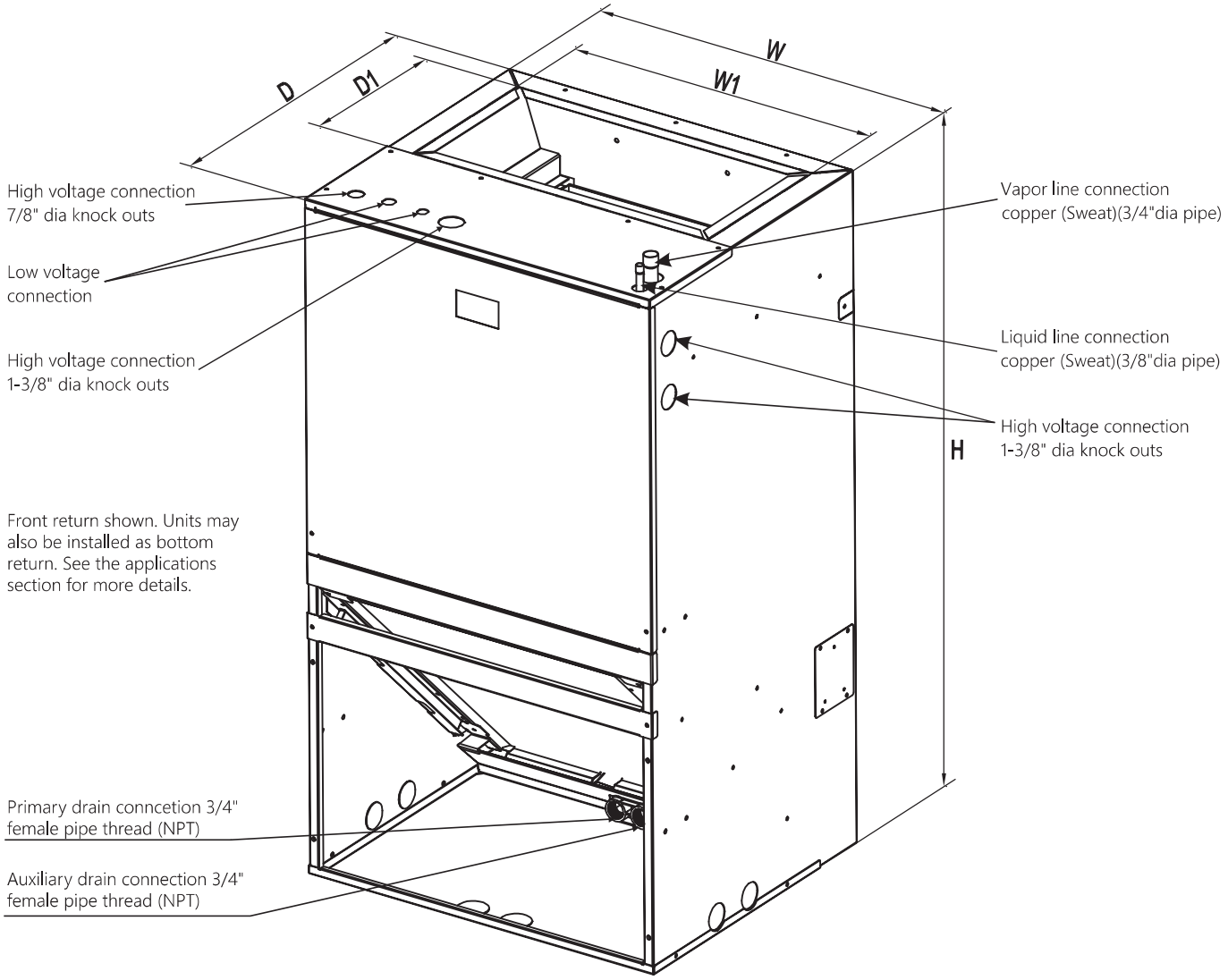
# Section 2. Dimension Data

## 2.1 Unit Dimensions




All units are configured for vertical upflow.
Units cannot be installed in any other configuration.

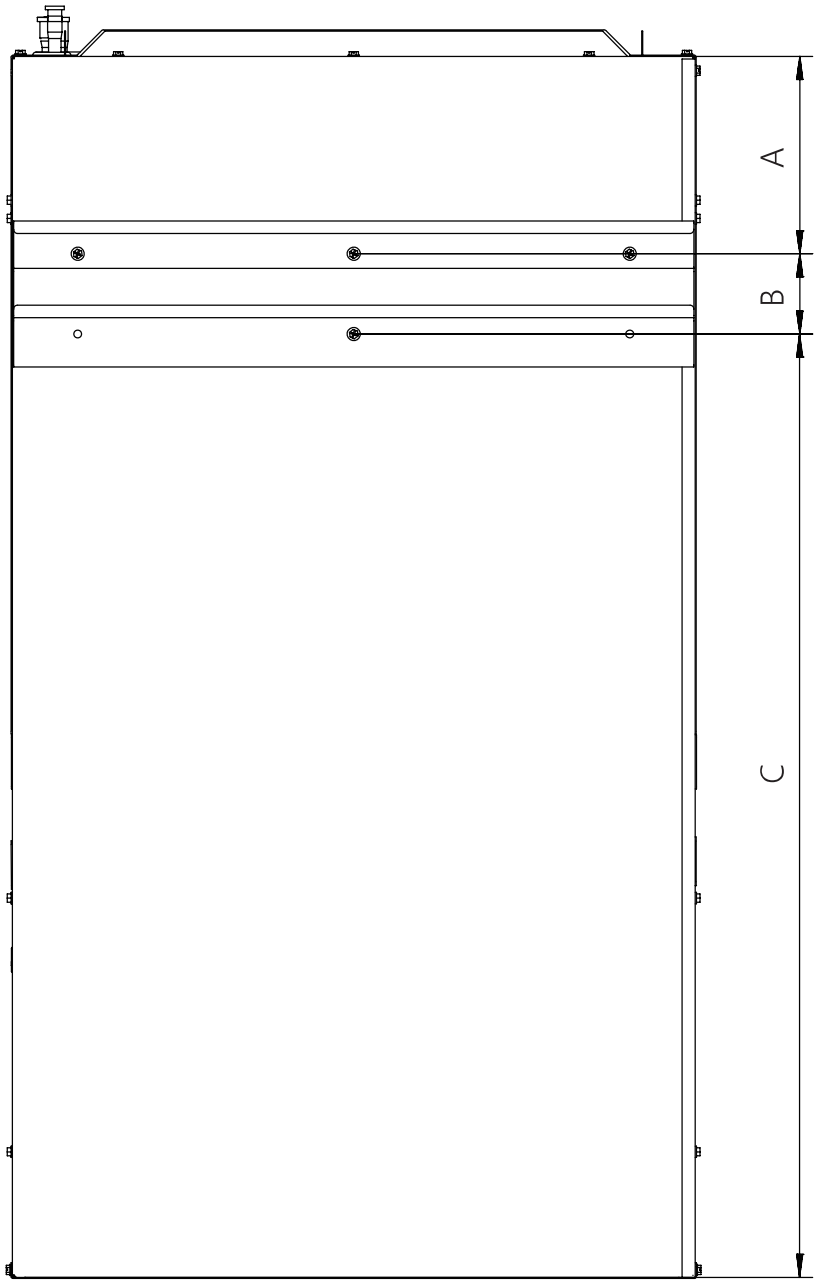
| Model | Dimensions- In. (mm) | | | | |
|---|---|---|---|---|---|
| | Height<br>H | Width<br>W | Width<br>W1 | Depth<br>D | Depth<br>D1 |
| 18K | 36-1/2 (928) | 20-3/5 (524) | 17-2/5 (402) | 16-3/5(421) | 10-2/5 (264) |
| 24K | 36-1/2 (928) | 20-3/5 (524) | 17-2/5 (402) | 16-3/5(421) | 10-2/5 (264) |




All units are configured for vertical upflow.
Units cannot be installed in any other configuration.

| Model | Dimensions- In. (mm) | | | | |
|---|---|---|---|---|---|
| | Height<br>H | Width<br>W | Width<br>W1 | Depth<br>D | Depth<br>D1 |
| 30K | 39-3/5 (1006) | 22 (559) | 18-4/5 (477) | 19 (485) | 10 (251) |
| 36K | 39-3/5 (1006) | 22 (559) | 18-4/5 (477) | 19 (485) | 10 (251) |

## 2.2 Unit Back Dimensions




| Model | Dimensions- In. (mm) | | |
|---|---|---|---|
| | A | B | C |
| 18K | 5-6/8 (147) | 2-2/5 (61) | 28-1/4 (718) |
| 24K | 5-6/8 (147) | 2-2/5 (61) | 28-1/4 (718) |
| 30K | 6 (151) | 2-2/5 (61) | 31-1/4 (794) |
| 36K | 6 (151) | 2-2/5 (61) | 31-1/4 (794) |

## 2.3 Unit Back Dimensions

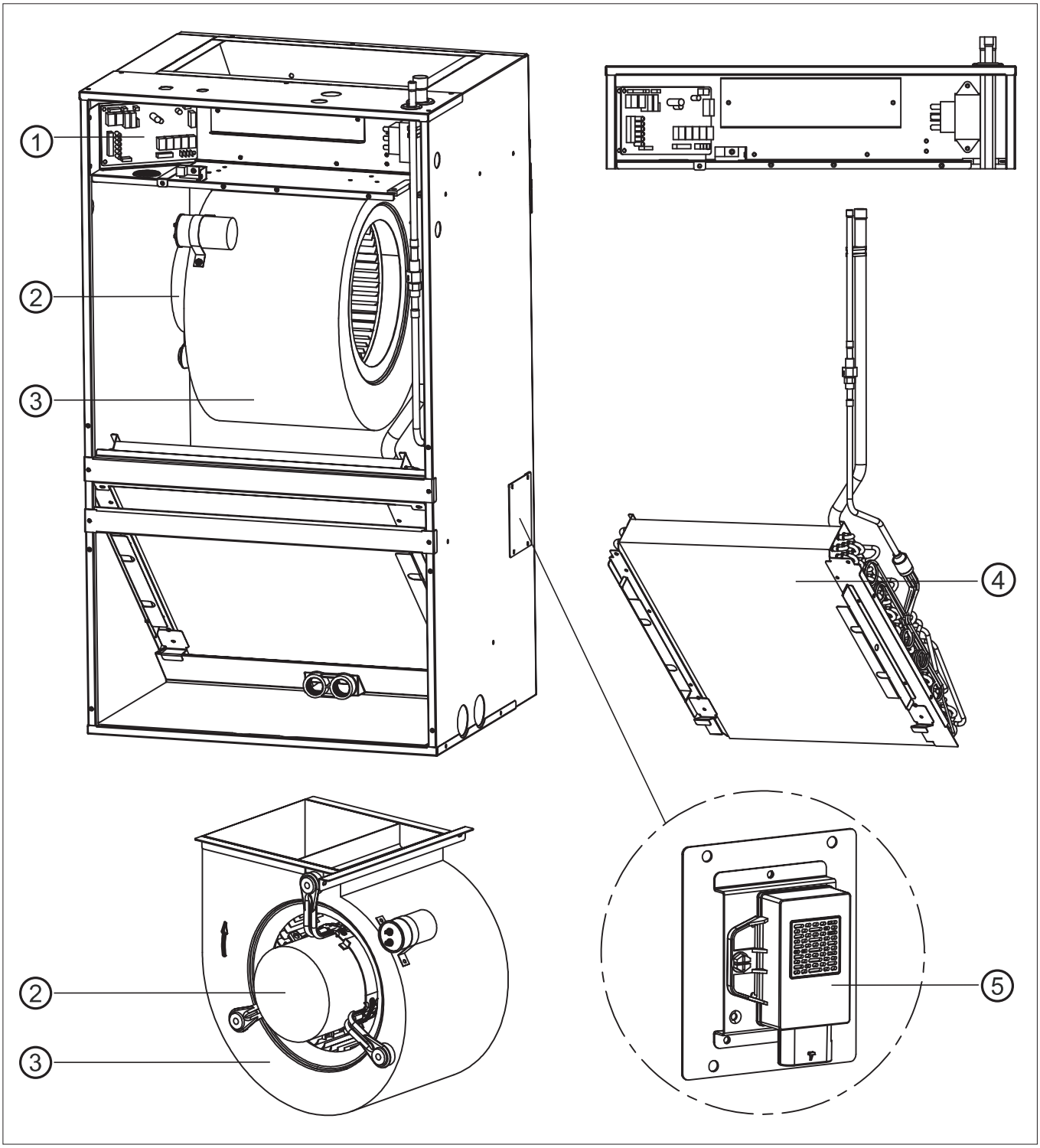



Fig.2-1

| Number | ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|---|
| Parts | Control Board | AC Motor | Blower | AL-Evaporator | A2L Refrigerant Sensor |

*Table 3*

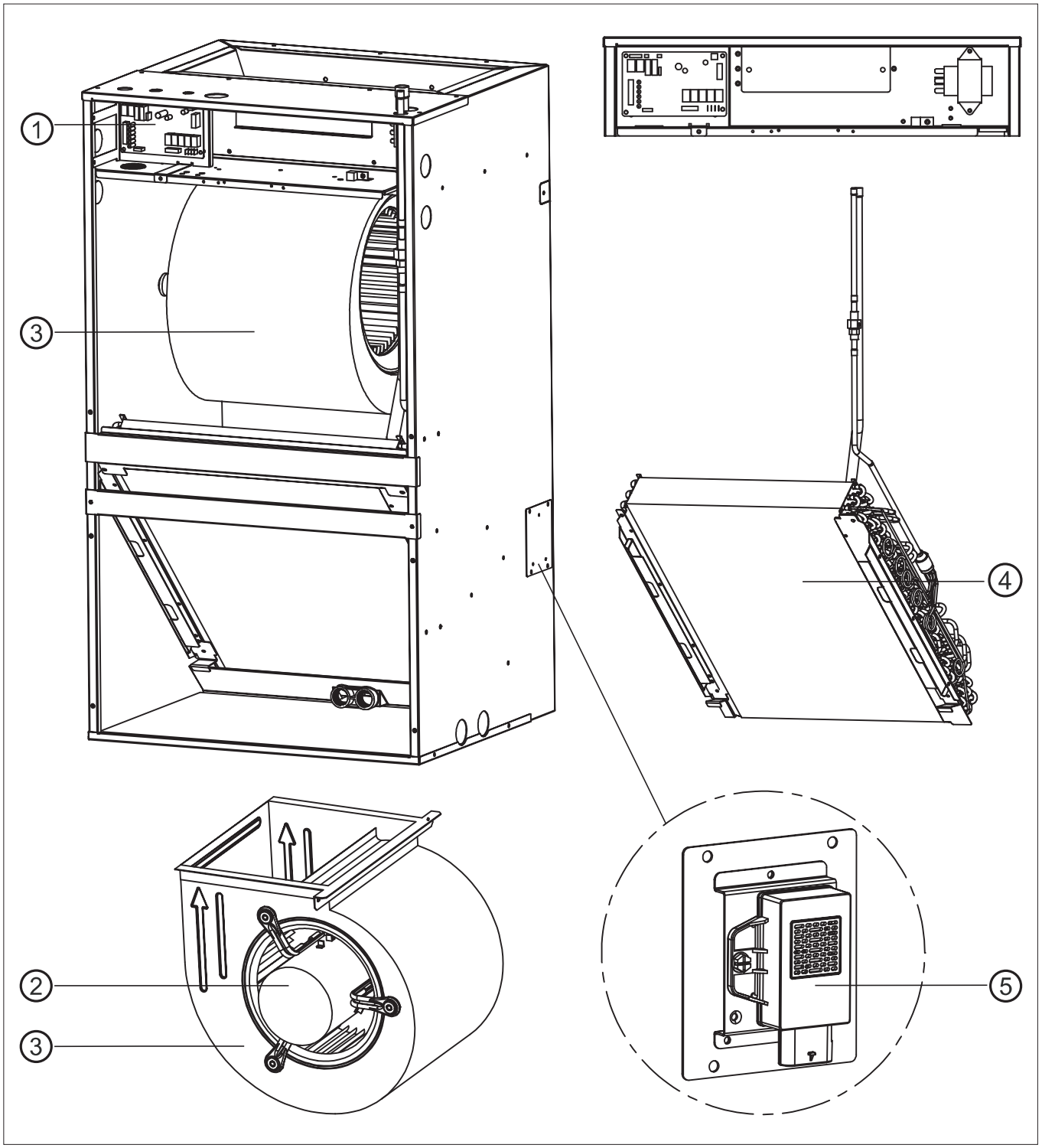



Fig.2-2

| Number | ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|---|
| Parts | Control Board | AC Motor | Blower | AL-Evaporator | A2L Refrigerant Sensor |

*Table 3*

# 3.0 Installation Instructions

## 3.1 Unpacking

Unpack unit and move to final location. Remove carton, taking care not to damage unit. Remove protective sheet metal from the base of the unit, if equipped. Inspect equipment for damage prior to installation. File claim with shipping company if shipment is damaged or incomplete. Locate rating plate on unit. It contains information needed to properly install unit. Check rating plate to be sure unit matches job specifications. A front access panel is provided, which permits access to blower assembly and electrical controls for removal and servicing.

## 3.2 Location

The small air handler should be centrally located and may be installed in a closet, alcove, utility room, or basement. Minimum clearances must be met.

The air handler comes standard with two different options for mounting, wall mount or frame mount. Both mounting options require the unit to be level from side to side and from front to back in order to allow condensate to properly drain from the unit. Failure to do this will result in condensate leaking out from the unit, potentially causing structural damage to the surrounding support structures, dry wall, carpet, etc. Also, both mounting structures require the ability to accommodate a minimum of 150 lb load. Failure to do this will cause damage to the support structure and potentially damage the unit.

### 3.2.1 Wall Mount

The air handler comes standard with a wall mounting bracket and air handler mounting bracket. Reference Figure 3-1 for more details.

1. Remove lower wall mounting bracket from the back of the unit by removing one screw which attaches the bracket to the air handler. Note: Discard the screw after you have removed the wall mounting bracket.
2. Install bracket on the wall by using 3 wood screws (not provided). Make sure the bracket is level in order to provided proper drainage from the unit. Note: Do not attach the wall mounting bracket into unsupported dry wall. Make sure that the wood screws are going into a structure that can suppport a minimum load of 150 lb.
3. Lift the air handler above the wall mounting bracket and attach the unit to the installed bracket. Reference Figure 3-1.
4. Install the additional bottom plate for extra support for this type mounting (see figure 3-1).

Note: The additional plate is shipped in the bottom of the shipping carton.

### 3.2.2 Frame Mount

The air handler comes with 8 clearance holes (4 on each side). These holes are used to mount the air handler inside of a frame structure (see Figure 3-2). When mounting in this fashion, make sure that the wood screws are mounted from within the air handler and not from outside the unit in order to avoid damaging the coil. If the frame does not provide support in the front of the unit and additional support is needed, open up the tabs and fix the unit to the frame or other support structure with screws. Select a solid and level site to ensure proper installation of the frame mount. Verify that there is sufficient space for installation and maintenance.(see Figure. 3-3)

**IMPORTANT:** The (8) wood screws are not provided with the unit. #12 x 1 ½″ wood screws are recommended. When the unit is installed on a wood frame, the screws should be used to fix the unit to the studs. If they are not used, the unit may fall down or cause other damage. See Figure 3-2 for frame mount installation.

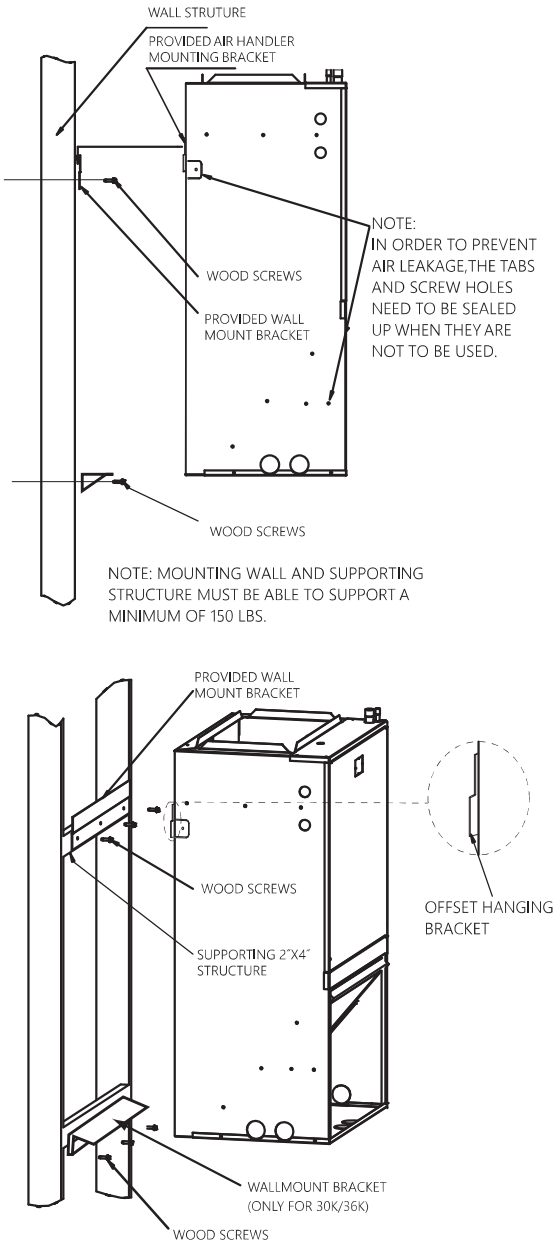



**Fig. 3-1 Wall Mount**

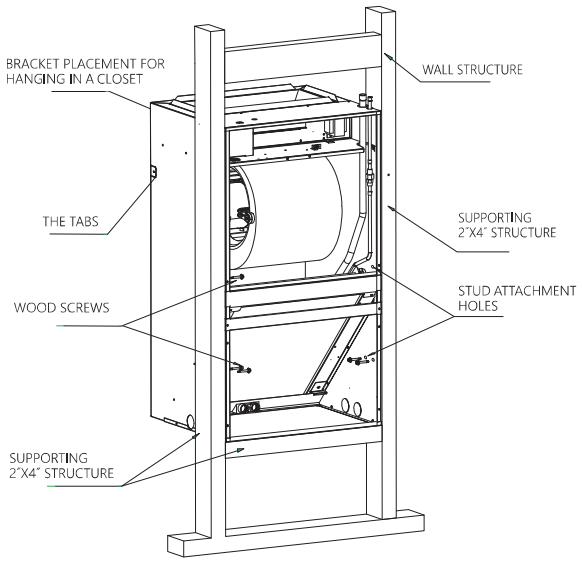



**Fig. 3-2 Frame Mount**

## 3.3 Duct Work

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.

**⚠ 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. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork 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 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 resistance. See airflow performance tables in this manual.
- Design the duct system in accordance with "ACCA" Manual "0" Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: "ACCA" Air Conditioning Contractors of America. If duct system incorporates flexible air duct, be sure pressure drop information (straight length plus all turns) shown in "ACCA" Manual "D" is accounted for in system.
- Supply plenum is attached to the 3/4" duct flanges supplied with the unit.
- 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.
- **IMPORTANT:** If connected to the blower casing, the front flange on the return duct must not be screwed into the area where the power wiring is located. Drilles or sharp screw points can damage insulation on wires located inside unit.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

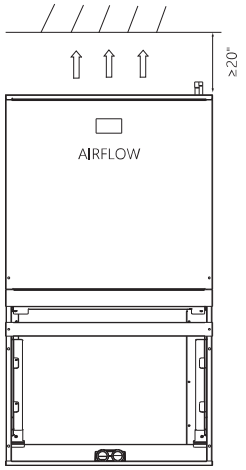
## 3.4 Condensate Drain

The unit is supplied with primary and auxiliary condensate drains that have 3/4" NPT connections. Both drains must be trapped outside the unit and piped in accordance with applicable materials and building codes. Do not reduce the drain line size less than the connection size on the drain pan. Condensate should be piped to an open drain or to the outside. All drains must pitch downward away from the unit a minimum of 1/4" per foot of line to ensure proper drainage. Insulate the primary drain line to prevent sweating where dew point temperatures may be met. (Insulation is optional depending on climate and application needs.)

Important: If cleanout Tee is used, standpipe must be sealed/capped.

**⚠ WARNING**

The unit can be applied with supplementary heaters, the minimum clearance from the appliance to combustible surfaces is 0.




Top view of the indoor unit clearance (including air duct).

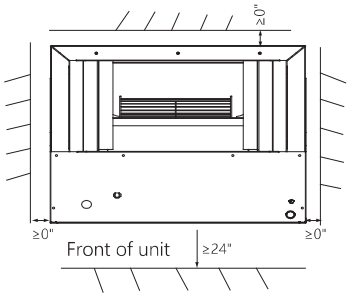



**Fig.3-3 Space for Frame Mount**

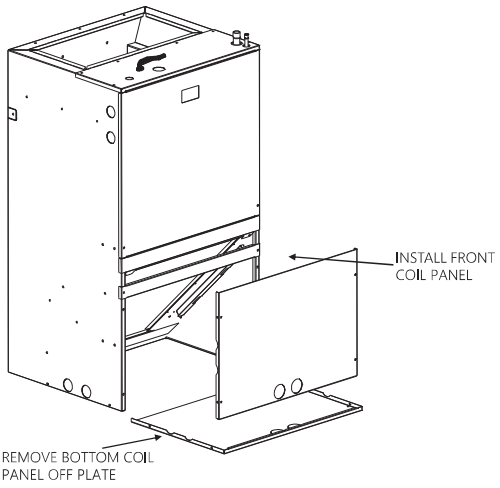



**Fig. 3-4 Different Air Supply**

Remove the cross brace when converting cabinet to bottom return.

that pipe-work including piping material, pipe routing, and installation shall include protection from physical damage inoperation and service, and be incompliance with national andlocal codes and standards, such as ASHRAE15,ASHRAE15.2,IAPMO Uniform Mechanical Code, ICC InternationalMechanical Code, or CSAB52. All field joints shall be accessible for inspection prior to being covered or enclosed;

### 3.5 Refrigerant Sensor

The R32 refrigerant leakage sensor is configured for the indoor unit. The refrigerant sensor is factory set for front or bottom return air, and the refrigerant sensor has only one installation position. Before installing the indoor unit, check whether the refrigerant sensor is correctly installed according to Fig 1 and Fig 2.

**WARNING**

The refrigerant leakage sensor can only use the factory model or the specified model indicated in the corresponding manual.

The R32 refrigerant leakage sensor must be used to activate the refrigerant shut-off device, the alarm device, incorporated circulation airflow or other emergency controls, which shall give an electrical signal at a predetermined alarm set point in response to leaked refrigerant.
The location of leakage sensors shall be chosen in relation to the different installation scenarios. Please refer to the indoor unit installation manual for specific requirements.
The installation of the refrigerant leakage sensor shall allow access for checking, repair or replacement by an authorized person.
The refrigerant leakage sensor shall be installed so itsfunction can be verified easily.
The refrigerant leakage sensor shall be protected to prevent tampering or unauthorized resetting of the pre-set value.
To be effective, the refrigerant leakage sensor must be electrically powered at all times after installation, other than when servicing.
If the refrigerant leakage sensor detects a refrigerant leak, the fan will keep running, the compressor will stop and electric heater will be shut off. You should immediately leave the leak area and notify a professional for handling.

**WARNING**

System will return when refrigerant is no longer detected in 5 minutes.

The service life of the refrigerant sensor is 15 years, and it should be replaced after the service life.

To ensure the detection accuracy of the refrigerant sensor, it is recommended to blow dust off the surface of the refrigerant sensor after it is used for a long time.

**WARNING**

These instructions are exclusively intended for qualified contractorsand authorized installers.

Work on the refrigerant circuit with flammable refrigerant in safety group A2L may only be carried out by authorized contractors. These heating contractors must be trained in accordance with UL 60335-2-40, Section HH. The certificate of competence from an industry accredited body is required.

Work on electrical equipment may only be carried out by a qualified electrician.

Before initial commissioning, all safety – related points must be checked by the particular certified heating contractors. The system must be commissioned by the system installer or a qualified personauthorized by the installer.

For installation of the indoor unit, refer to the corresponding installation and operation manual.If an indoor unit is installed in an unventilated area, the area shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

The appliance shall be stored so as to prevent mechanical damage from occurring.

Do not stack combustible materials on the surface of the indoor unit.

**WARNING**

LEAK DETECTION SYSTEM installed on indoor unit. Unit must be powered on except for during servicing.

**WARNING**

Ensure the apparatus is mounted securely.

**NOTE**

The R32 refrigerant leakage sensor is configured for the indoor unit. The fan operation can be initiated by the R32 refrigerant sensor, ensuring that it meets the requiredcirculation airflow requirements. The allowed maximum refrigerant charge (Mmax) and the required minimum room area (Amin) can be determined according to Table 8 and Table 9.

## 3.6 Refrigerant Charge and Room Area Limitations

In UL/CSA 60335-2-40, R32 refrigerant is classified as class A2L, which is mildly flammable. Therefore, R32 refrigerant is suitable for systems needing additional refrigerant charge and which will limit the area of the rooms being served by the system.

Similarly, the total amount of refrigerant in the system shall be less than or equal to the allowable maximum refrigerant charge. The allowable maximum refrigerant charge depends on the area of the rooms being served by the system.

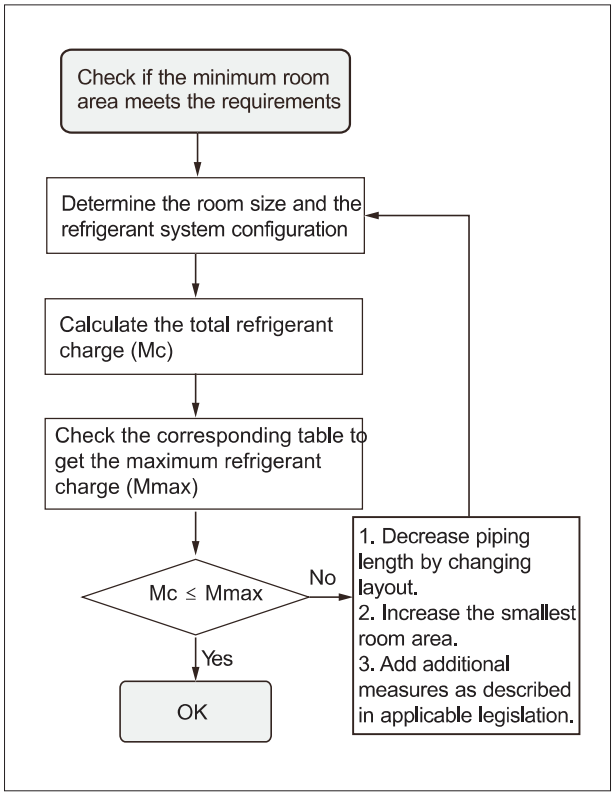



Fig.3-5

**NOTE**

The nouns in this section are explained as follows:
Mc: The actual refrigerant charge in the system.
A: the actual room area where the appliance is installed.
Amin: The required minimum room area.
Mmax:The allowable maximum refrigerant charge in a room.
Qmin : The minimum circulation airflow.
Anvmin : The minimum opening area for connected rooms.
TAmin : The total area of the conditioned space (For
ppliances serving one or more rooms with an air duct system).
TA : The total area of the conditioned space connected by air ducts.

## 3.7 The room area calculation requirements

**CAUTION**

The space considered shall be any space which contains refrigerant-containing parts or into which refrigerant could be released.
The room area (A) of the smallest, enclosed,occupied space shall be used in the determination of the refrigerant quantity limits.

For determination of room area (A) when used to calculate the refrigerant charge limit, the following shallapply.
The room area (A) shall be defined as the room area enclosed by the projection to the base of the walls, partitions and doors of the space in which the applianceis installed.
Spaces connected by only drop ceilings, ductwork, or similar connections shall not be considered a single space.

Units mounted higher than 70-55/64 inches and spacesdivided by partition walls that are no higher than 62-63/64 inches shall be considered a single space. Roomson the same floor and connected by an open passageway between the spaces can be considered a single room when determining compliance to Amin, if the passageway complies with all of the following.
1. It is a permanent opening.
2. It extends to the floor.
3. It is intended for people to walk through.

The area of the connected rooms, on the same floor,connected by permanent opening in the walls and/or doors between occupied spaces, including gaps betweenthe wall and the floor , can be considered a single roomwhen determining compliance to Amin, provided all of the following conditions are met as Fig 3-6.

**ing:**

1) The opening shall not be less than Anvmin in Table 7.
2) The area of any openings above 11-13/16 inches from the floor shall not be considered in determining compliance with Anvmin.
3) At least 50% of the opening area of Anvmin shall be below 7 -7/8 inches from the floor.
4) The bottom of the opening is not more than 3-15/16 inches from the floor.
5) The opening is a permanent opening that cannot be closed.
6) For openings extending to the floor the height shall not be less than 25/32 inches above the surface of the floor covering.

**2.H ing:**

1) The opening shall not be less than 50% of Anvmin in Table 5.
2) The opening is a permanent opening that cannot be closed.
3) The opening shall be at least 59 inches above the floor.
4) The height of the opening is not less than 25/32 inches.

**3.R equirement:**

1) The room into which refrigerant can leak, plus the connected adjacent room(s) shall have a total area not less than Amin. Amin is shown in Tables 9.
2) The room area in which the unit is installed shall be not less than 20% Amin. Amin is shown in Tables 9.

**NOTE**

The requirement for the second opening can be met by drop ceilings, ventilation ducts, or similar arrangements that provide an airflow path between the connected rooms.

The minimum opening for natural ventilation (Anvmin) in connected rooms is related to the room area (A), the actual refrigerant charge of refrigerant in thesystem (Mc) , and the allowable MAXIMUM REFRIGERANTCHARGE in the system (Mmax), Anvmin can be determined according to Table4.

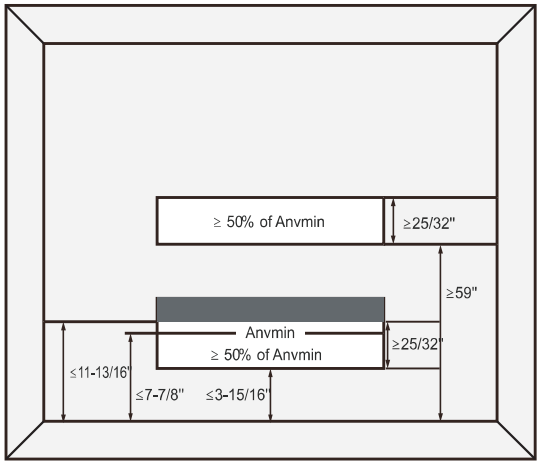



Fig.13 Opening Conditions for Connected Rooms

The minimum opening area for connected rooms

| A($ft^2$) | Mc(□ lb□ oz) | | Mmax(□ lb□ oz) | | Anvmin($ft^2$) |
|---|---|---|---|---|---|
| | lb | oz | lb | oz | |
| 60 | 15 | 3 | 4 | 2 | 1.4 |
| 70 | 15 | 3 | 4 | 13 | 1.3 |
| 80 | 15 | 3 | 5 | 8 | 1.2 |
| 90 | 15 | 3 | 6 | 3 | 1.1 |
| 100 | 15 | 3 | 6 | 14 | 1.1 |
| 110 | 15 | 3 | 7 | 9 | 1.0 |
| 120 | 15 | 3 | 8 | 4 | 0.9 |
| 130 | 15 | 3 | 8 | 15 | 0.8 |
| 140 | 15 | 3 | 9 | 10 | 0.7 |
| 150 | 15 | 3 | 10 | 5 | 0.6 |
| 160 | 15 | 3 | 11 | 0 | 0.5 |
| 170 | 15 | 3 | 11 | 12 | 0.4 |
| 180 | 15 | 3 | 12 | 7 | 0.4 |
| 190 | 15 | 3 | 13 | 2 | 0.3 |
| 200 | 15 | 3 | 13 | 13 | 0.2 |
| 210 | 15 | 3 | 14 | 8 | 0.1 |
| 220 | 15 | 3 | 15 | 3 | 0.0 |

Table 4

Note: Take the Mc=17 lb 3 oz as an example.

For appliances serving one or more rooms with an air duct system, The room area calculation shall be determined based on the total area of the conditioned space (TA) connected by ducts taking into consideration that the circulating airflow distributed to all the rooms by the appliance integral indoor fan will mix and dilute the leaking refrigerant before entering any room.

## 3.8 The allowed maximum refrigerant charge and required minimum room area

If the fan incorporated in the appliance is continuously operated or operation is initiated by a REFRIGERANT DETECTION SYSTEM with a sufficient CIRCULATION AIRFLOW rate, the allowable maximum refrigerant charge (Mmax) and the required minimum room area (Amin/TAmin) is shown in Table 5 and Table 6.

The allowable maximum refrigerant charge

| A/TA ($ft^2$) | | Mmax(□ lb□ oz) | | A/TA ($ft^2$) | | Mmax(□ lb□ oz) | |
|---|---|---|---|---|---|---|---|
| $ft^2$ | $m^2$ | lb-oz | kg | $ft^2$ | $m^2$ | lb-oz | kg |
| 60 | 5.6 | 4-2 | 1.9 | 150 | 13.9 | 10-0 | 4.7 |
| 70 | 6.5 | 4-13 | 2.2 | 160 | 14.9 | 11-0 | 5.0 |
| 80 | 7.4 | 5-8 | 2.5 | 170 | 15.8 | 11-12 | 5.3 |
| 90 | 8.4 | 6-3 | 2.8 | 180 | 16.7 | 12-7 | 5.6 |
| 100 | 9.3 | 6-14 | 3.1 | 190 | 17.7 | 13-2 | 5.9 |
| 110 | 10.2 | 7-9 | 3.4 | 200 | 18.6 | 13-13 | 6.3 |
| 120 | 11.1 | 8-4 | 3.8 | 210 | 19.5 | 14-8 | 6.6 |
| 130 | 12.1 | 8-15 | 4.1 | 220 | 20.4 | 15-3 | 6.9 |
| 140 | 13.0 | 9-10 | 4.4 | | | | |

Table 5

The required minimum room area

| Mc(□ lb□ oz) | | Amin/TAmin($ft^2$) | Mc(□ lb□ oz) | | Amin/TAmin($ft^2$) |
|---|---|---|---|---|---|
| lb | oz | | lb | oz | |
| 4 | 7 | 64.0 | 10 | 2 | 147.1 |
| 4 | 14 | 70.4 | 10 | 9 | 153.5 |
| 5 | 5 | 76.7 | 11 | 0 | 159.9 |
| 5 | 12 | 83.1 | 11 | 7 | 166.3 |
| 6 | 3 | 89.5 | 11 | 14 | 172.7 |
| 6 | 10 | 95.9 | 12 | 6 | 179.1 |
| 7 | 1 | 102.3 | 12 | 13 | 185.5 |
| 7 | 8 | 108.7 | 13 | 4 | 191.9 |
| 7 | 15 | 115.1 | 13 | 11 | 198.3 |
| 8 | 6 | 121.5 | 14 | 2 | 204.7 |
| 8 | 13 | 127.9 | 14 | 9 | 211.1 |
| 9 | 4 | 134.3 | 15 | 0 | 217.5 |
| 9 | 11 | 140.7 | 15 | 3 | 220.7 |

Table 6

The minimum circulation airflow

| Mc(□ lb□ oz) | | Qmin(CFM) | Mc(□ lb□ oz) | | Qmin(CFM) |
|---|---|---|---|---|---|
| lb | oz | | lb | oz | |
| 4 | 7 | 196 | 10 | 2 | 451 |
| 4 | 14 | 216 | 10 | 9 | 471 |
| 5 | 5 | 235 | 11 | 0 | 490 |
| 5 | 12 | 255 | 11 | 7 | 510 |
| 6 | 3 | 275 | 11 | 14 | 529 |
| 6 | 10 | 294 | 12 | 6 | 549 |
| 7 | 1 | 314 | 12 | 13 | 569 |
| 7 | 8 | 333 | 13 | 4 | 588 |
| 7 | 15 | 353 | 13 | 11 | 608 |
| 8 | 6 | 373 | 14 | 2 | 627 |
| 8 | 13 | 392 | 14 | 9 | 647 |
| 9 | 4 | 412 | 15 | 0 | 667 |
| 9 | 11 | 431 | 15 | 3 | 676 |

Table 7

If the installation height cannot exceed 2000m, the required minimum room area follow as Table 8.

| | Altitude(m) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 201-400 | 401-600 | 601-800 | 801-1000 | 1001-1200 | 1201-1400 | 1401-1600 | above 1600 |
| Charge lb | Minimum Conditioned Space($m^2$) | | | | | | | |
| 2 | 2.7 | 2.7 | 2.7 | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 |
| 3 | 4.0 | 4.0 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 |
| 4 | 5.4 | 5.4 | 5.5 | 5.6 | 5.7 | 5.9 | 6.0 | 6.2 |
| 5 | 6.7 | 6.7 | 6.9 | 7.1 | 7.2 | 7.4 | 7.5 | 7.7 |
| 6 | 8.1 | 8.1 | 8.2 | 8.5 | 8.6 | 8.9 | 9.0 | 9.3 |
| 7 | 9.4 | 9.4 | 9.6 | 9.9 | 10.1 | 10.3 | 10.5 | 10.8 |
| 8 | 10.7 | 10.7 | 11.0 | 11.3 | 11.5 | 11.8 | 12.0 | 12.4 |
| 9 | 12.1 | 12.1 | 12.3 | 12.7 | 12.9 | 13.3 | 13.5 | 13.9 |
| 10 | 13.4 | 13.4 | 13.7 | 14.1 | 14.4 | 14.8 | 15.0 | 15.4 |
| 11 | 14.8 | 14.8 | 15.1 | 15.5 | 15.8 | 16.3 | 16.5 | 17.0 |
| 12 | 16.1 | 16.1 | 16.4 | 16.9 | 17.2 | 17.7 | 18.1 | 18.5 |
| 13 | 17.5 | 17.5 | 17.8 | 18.3 | 18.7 | 19.2 | 19.6 | 20.1 |
| 14 | 18.8 | 18.8 | 19.2 | 19.7 | 20.1 | 20.7 | 21.1 | 21.6 |
| 15 | 20.1 | 20.1 | 20.6 | 21.2 | 21.6 | 22.2 | 22.6 | 23.2 |
| 16 | 21.5 | 21.5 | 21.9 | 22.6 | 23.0 | 23.6 | 24.1 | 24.7 |
| 17 | 22.8 | 22.8 | 23.3 | 24.0 | 24.4 | 25.1 | 25.6 | 26.3 |
| 18 | 24.2 | 24.2 | 24.7 | 25.4 | 25.9 | 26.6 | 27.1 | 27.8 |
| 19 | 25.5 | 25.5 | 26.0 | 26.8 | 27.3 | 28.1 | 28.6 | 29.3 |
| 20 | 26.9 | 26.9 | 27.4 | 28.3 | 28.7 | 29.5 | 30.1 | 30.9 |

Table 8

**⚠ CAUTION**

The allowable maximum refrigerant charge of the Table 5 or the required minimum room area of the Table 6 is available only if the following conditions are met:
Minimum velocity of 3.28 ft/s, which is calculated as the indoor unit airflow divided by the nominal face area of the outlet. The grill area shall not be deducted.
Minimum airflow rate must meet the corresponding values in Table 7, which is related to the actual refrigerant charge of the system (Mc).
R32 refrigerant leakage sensor is configured.

**⚠ NOTE**

The R32 refrigerant leakage sensor is configured for the indoor unit and meets the incorporated circulation airflow requirements.
The maximum refrigerant charge or minimum room area can be determined according to Table5 or Table 6.

**⚠ CAUTION**

If the actual room area, air outlet height, and refrigerant charge amount are not reflected in the above table, more severe cases need to be considered according to the data in the Table 4, 5, 6, 7.

## 3.9 Refrigerant Piping

Refrigerant pipe connections are located on the top of the unit. Refrigerant piping external to the unit shall be sized in accordance with the instructions of the outdoor equipment. When units are recessed mounted in the wall, make certain that piping connections are pressure tested prior to the wall being closed. While brazing, be sure to protect the cabinet and grommets from heat damage.

## 3.10 Metering Device

All units are shipped and installed with an orifice designed for air conditioning or heat pump operation. Pressures equalize after shut down. Some outdoor models may require a start assist kit. See outdoor unit for more information.

## 3.11 Blower

This unit is supplied with a multi-speed motor with a direct drive blower wheel which can obtain various air flows. The unit is shipped with factory set cooling and heating speed taps. Airflow performance tables are available for additional speed taps. Disconnect all power to the unit before making any adjustments to the motor speed taps. Be sure to check the air flow and the temperature drop across the evaporator coil to ensure sufficient air flow.

## 3.12 Wiring

Field wiring must comply with the National Electric Code (C.E.C. in Canada ) 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.

### 3.12.1 Power Wiring

It is important that proper electrical power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- **IMPORTANT:** After the Electric Heater is installed, units are equipped with one 60 amp. circuit breaker. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.
- Supply circuit power wiring must be 75°C minimum copper conductors only. See Electrical Data in this section for ampacity, wire size and circuit protector requirements. Supply circuit protective devices may be either fuses.
- Power wiring may be connected to either the right or left side. Two 7/8" dia. concentric knockouts are provided for connection of power wiring to unit.
- Power wiring is connected to the power cable in unit electric cabinet.

### 3.12.2 Control Wiring

**IMPORTANT:** 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.

- Low voltage control wiring should be 18 AWG. color-coded. For lengths longer than 100 ft., 16 AWG. wire should be used.
- Low voltage control connections are made to low voltage pigtails extending from top of air handler. Connections for control wiring are made with wire nuts. Control wiring knockouts (7/8″) are also provided on the right and left side of the unit for side connection.
- See wiring diagrams attached to indoor and outdoor sections to be connected.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

### 3.12.3 Grounding

**⚠ WARNING**

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- Grounding may be accomplished when installed in accordance with electrical codes by bonding the metal conduit to the unit cabinet or by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Ground lug(s) are located close to wire entrance on left side of unit (upflow). Lug(s) may be moved to marked locations near wire entrance on right side of unit (upflow) if alternate location is more convenient.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

### 3.12.4 Electrical Data

| MODEL | VOLTAGE | HERTS | HP | RPM | SPEEDS | CIRCUIT AMPS. | MAXIMUM CIRCUIT PROTECTOR |
|---|---|---|---|---|---|---|---|
| 18K | 208/230 | 60 | 1/5 | 903 | 3 | 2.3 | 3(A) |
| 24K | 208/230 | 60 | 1/5 | 903 | 3 | 2.3 | 3(A) |
| 30K | 208/230 | 60 | 1/3 | 865 | 3 | 2.8 | 3(A) |
| 36K | 208/230 | 60 | 1/3 | 865 | 3 | 2.8 | 3(A) |

## 3.13 Air Filter

An air filter must be installed before air enters the evaporator coil in order to protect the coil, blower, and other internal parts from excessive dirt and dust . A filter must be installed. Consult the filter manufacturer for proper sizing and maximum velocity requirements.

Filter Sizes

| Model | Filter Sizes in. [mm] |
|---|---|
| 18K/24K | 17.5*15.5[445*394] |
| 30K/36K | 19.5*19[495*482] |

## 3.14 Thermostat

Select a thermostat that is commonly used with HP or AC single stage heating/cooling with electric heat. The thermostat will energize the fan on a demand for heating or cooling.

Install the thermostat on an inside wall, away from drafts, lights or other heat sources in a location that has sufficient air circulation from other rooms being controlled by the thermostat. The thermostat should be mounted 4 to 5 feet above the floor.

## 3.15 Sequence of Operation

**Cooling (cooling only)**

When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is controlled by a 24V signal from the temperature controller.

The circuit from R to Y is also completed, energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

**Cooling (heat pump)**

When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is controlled by a 24V signal from the temperature controller.

The circuit from R to Y is also completed, energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

**Heating (heat pump)**

When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is controlled by a 24V signal from the temperature controller.

The circuit from R to Y is also completed, energizing the compressor contactor of the outdoor unit. The contactor will close and start the compressor and condenser fan motor.

Circuit R to B energizes the reversing valve to the heating position.

If the indoor temperature continues to fall, the R to W2 circuit is completed, energizing the electric heat contactor(s).

**Heating (electric heat only)**

Note: The thermostat must be setup to bring the blower on when the electric heat is energized.

When the thermostat calls for cooling, the circuit from R to G is completed. The blower motor is controlled by a 24V signal from the temperature controller. The circuit from R to W1 is completed energizing the heating contactor(s).

If the indoor temperature continues to fall, the R to W2 circuit is completed, energizing the electric heat contactor(s).

**Defrost**

Supplemental heat during defrost can be provided by connecting the W1 (white) wire from the outdoor unit to W1 at the indoor unit. This will prevent cold air from being discharged from the indoor unit during defrost.

Low voltage control wiring should be 18 AWG, color coded (105 degree C minimum). For lengths longer than 100ft., 16 AWG wire should be used. Make certain that separation of control wiring and power wiring has been maintained.

## 3.16 Operational And Checkout Procedures

To obtain proper performance, all units must be operated and charge adjustments made in accordance with procedures found in the Service Facts document of the outdoor unit.

After installation has been completed, it is recommended that the entire system be checked against the following list:

1. Be sure unit suspension (if used) is secure and there are no tools or loose debris in, around or on top of the unit.
2. Properly insulate suction lines and fittings.
3. Properly secure and isolate all refrigerant lines.
4. Verify that all electrical connections are tight.
5. Check all duct outlets; they must be open and unrestricted.
6. Check drain lines and be sure all joints are tight.
7. Be sure the return air filter is installed.
8. Operate complete system in each mode to verify proper performance. Verify operation of supplementary electric heater.

## 3.17 Maintenance

The system air filter(s) should be inspected, cleaned or replaced at least monthly. Make certain that the access panels are replaced and secured properly before placing the unit back in operation. This product is designed for dependable service; however, periodic maintenance should be scheduled and conducted by trained professional service personeel. This service should be conducted at least annually, and should include testing and inspection of electrical and refrigerant components. The heat transfer surface should be cleaned. The blower motor is permanently lubricated for normal operating conditions.

### 3.11 MCA/MOP data of electric heat kit

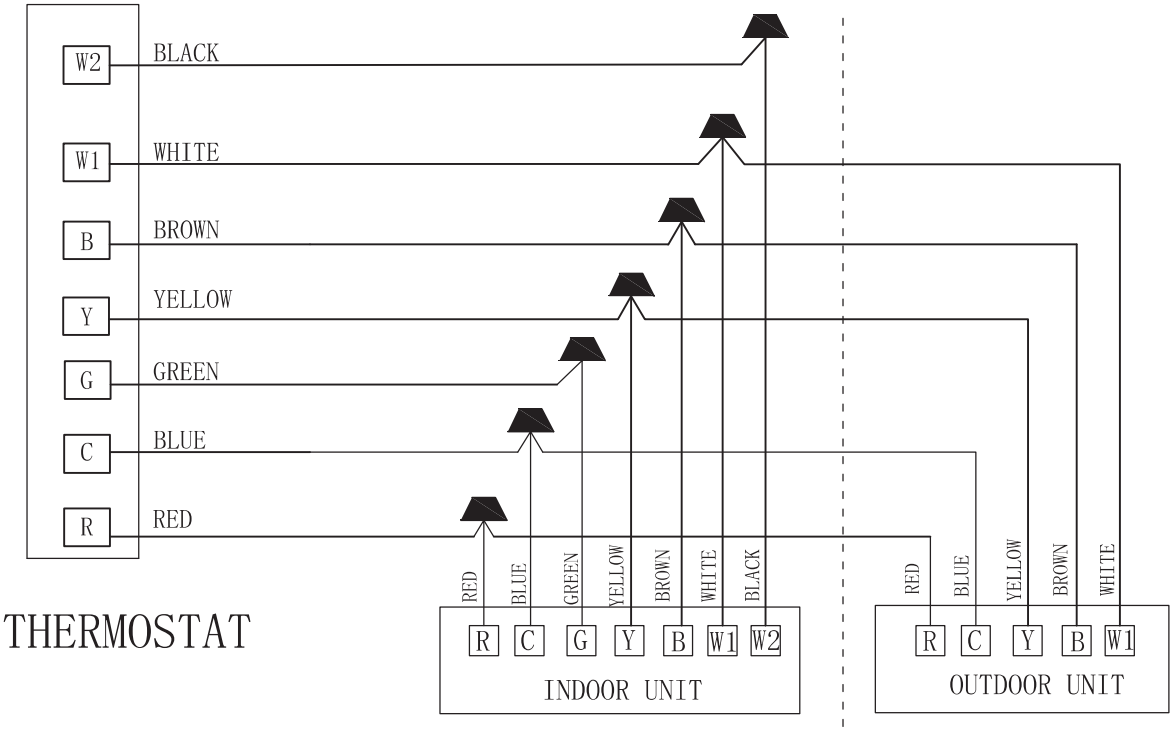
| Heat Kit Model | Air Handler Model | Electric Heater (kW) | MCA(Min. Circuit Ampacity) | | MOP(Max. Fuse or Breaker (HACR) Ampacity) | | Fan Soeed(AC/HP) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 208V | 230V | 208V | 230V | (Low) | (Medium) | (High) |
| AP-HF50-01 | 18K | 5 | 23.1 | 25.1 | 25 | 30 | ● | ● | ● |
| AP-HF75-01 | | 7.5 | 35.3 | 38.5 | 40 | 40 | ● | ● | ● |
| AP-HF100-01 | | 10 | 46.3 | 50.3 | 50 | 60 | ● | ● | ● |
| AP-HF50-01 | 24K | 5 | 23.1 | 25.1 | 25 | 30 | ● | ● | ● |
| AP-HF75-01 | | 7.5 | 35.3 | 38.5 | 40 | 40 | ● | ● | ● |
| AP-HF100-01 | | 10 | 46.3 | 50.3 | 50 | 60 | ● | ● | ● |
| AP-HF50-01 | 30K | 5 | 23.1 | 25.1 | 25 | 30 | ● | ● | ● |
| AP-HF75-01 | | 7.5 | 35.3 | 38.5 | 40 | 40 | × | ● | ● |
| AP-HF100-01 | | 10 | 46.3 | 50.3 | 50 | 60 | × | ● | ● |
| AP-HF50-01 | 36K | 5 | 23.1 | 25.1 | 25 | 30 | ● | ● | ● |
| AP-HF75-01 | | 7.5 | 35.3 | 38.5 | 40 | 40 | × | ● | ● |
| AP-HF100-01 | | 10 | 46.3 | 50.3 | 50 | 60 | × | ● | ● |

NOTE:
Heat kit suitable for AHU 4-way position installation.
Ampacities for MCA and Fuse/breaker including 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), or 400 CFM nominally.

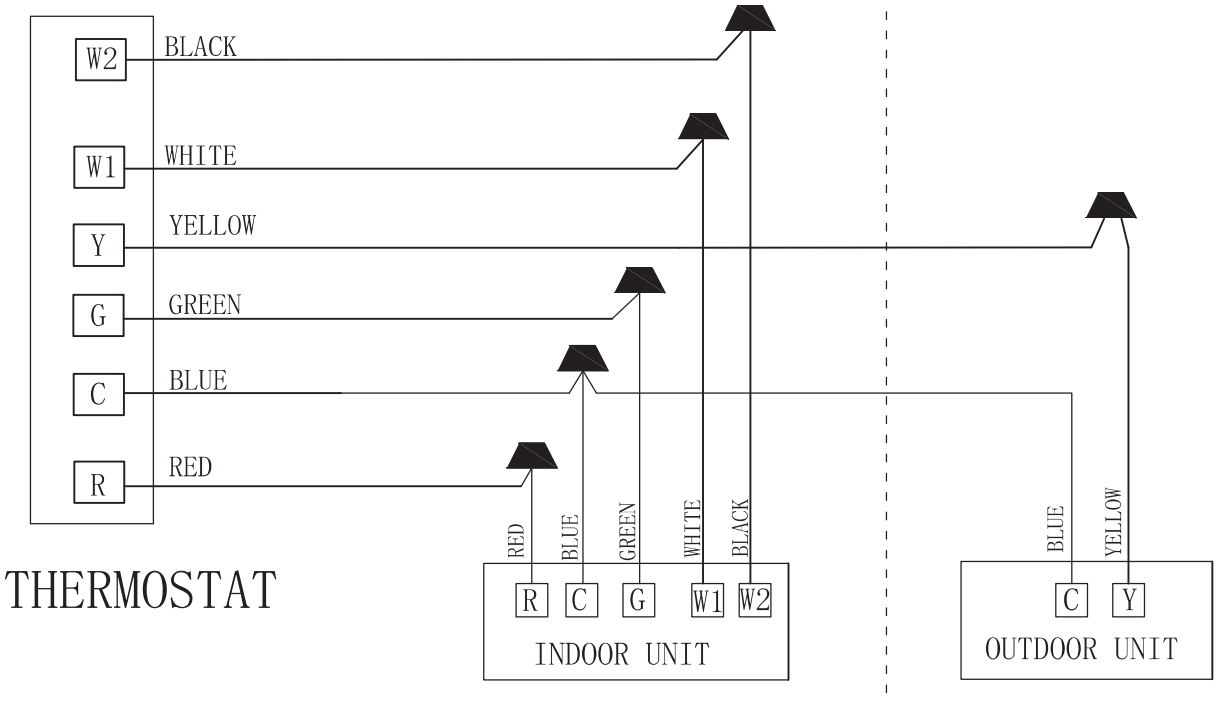
| Electrical Heater Kits | | |
|---|---|---|
| Master Model | Description | Ref.Air Handler Use |
| AP-HF50-01 | 5kW heater kit,double pole circuit breaker | 18/24/30/36 |
| AP-HF75-01 | 7.5kW heater kit,double pole circuit breaker | |
| AP-HF100-01 | 10kW heater kit,double pole circuit breaker | |

## 4.0 WIRING DIAGRAM

1. To avoid the electrical shock, please connect the air conditioner with the ground lug. The main power plug in the air conditioner has been joined with the ground wiring, please don't change it freely.
2. The power socket is used as the air conditioner specially.
3. Don't pull the power wiring hard.
4. When connecting the air conditioner with the ground, observe the local codes.
5. If necessary, use the power fuse or the circuit, breaker or the corresponding scale ampere.

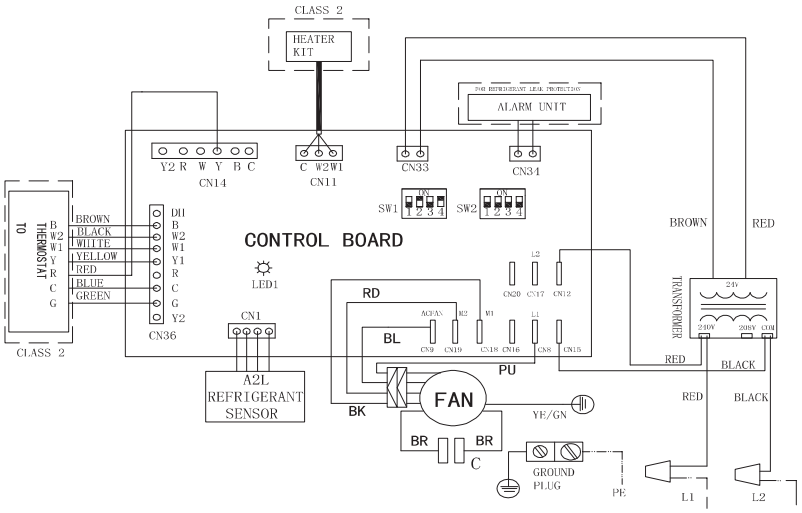



Wiring connection for H/P Systems




Wiring connection for A/C Systems

## Applicable 18K(PSC)




| DIAL SWITCH DESCRIPTION | |
|---|---|
| ON / OFF 1 2 3 4 SW1 SW2 | AC FAN (Default) |

**NOTES**

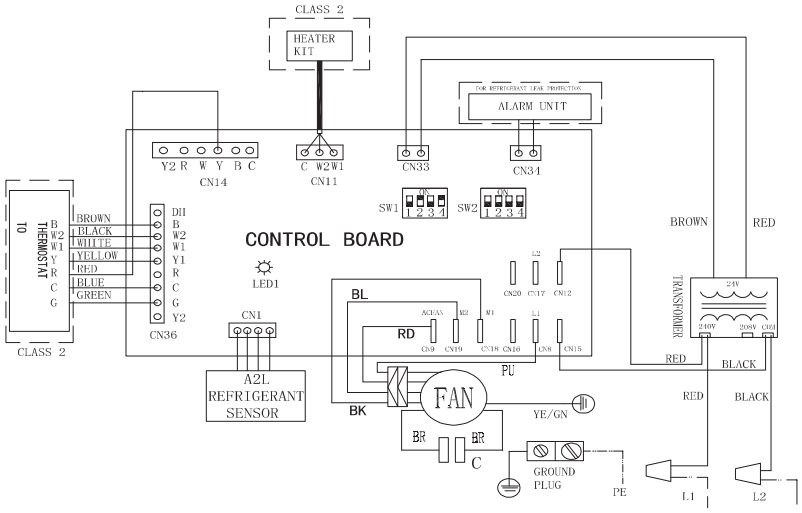
1. Grounded and all wiring to conform to I. E. C.
2. Replacement wire must be the same gauge and insulation type as original wire.
3. The units should connect the stated-cross-section earth wire and keep it grounding unfailingly.
4. Set SW1 or SW2 to 'ON' to select different fan speeds.
5. Electric Heater is optional.

**LINEAR ANNOTATION**

———— FACTORY DEFAULT  -·-·-·-·- FIELD INSTALLED  - - - - - - FACTORY OPTION

lease refer to the actual wiring diagram.

## Applicable 24K/30K (PSC)




| DIAL SWITCH DESCRIPTION | |
|---|---|
| ON / OFF 1 2 3 4 SW1 SW2 | AC FAN (Default) |

**NOTES**

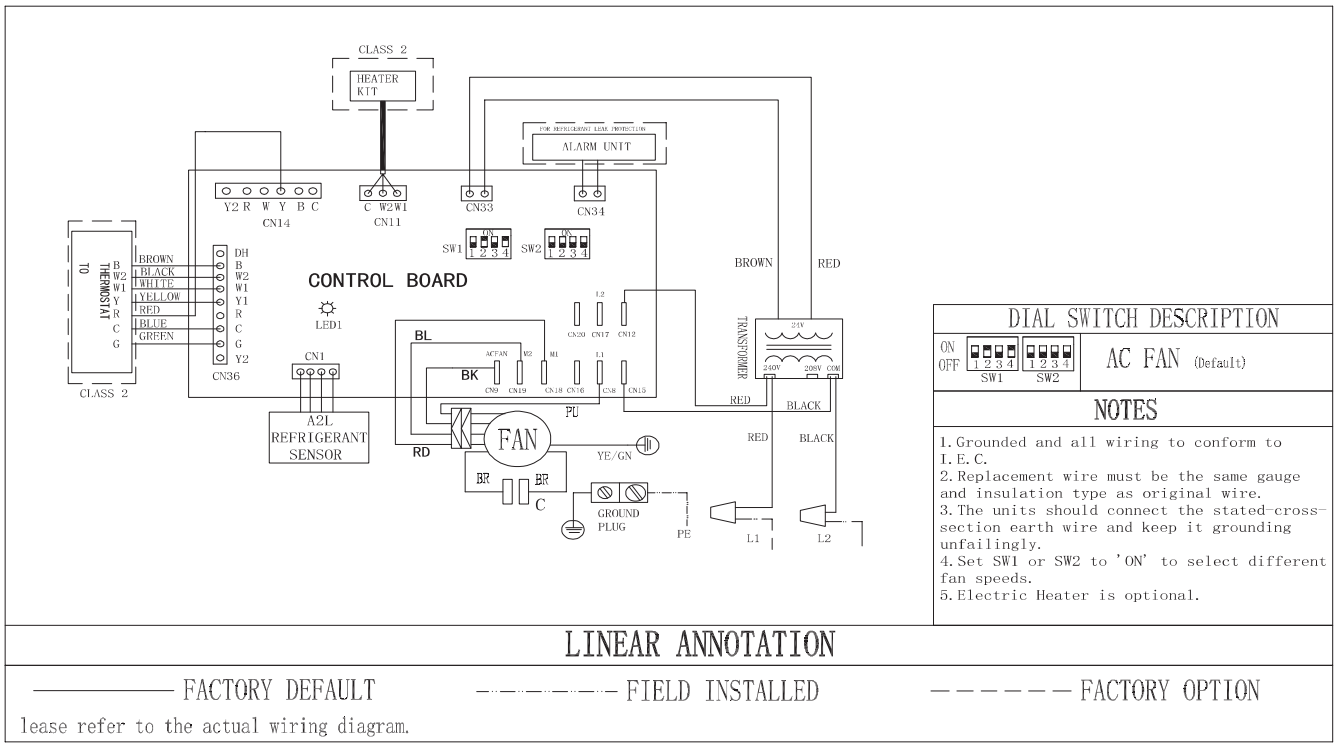
1. Grounded and all wiring to conform to I. E. C.
2. Replacement wire must be the same gauge and insulation type as original wire.
3. The units should connect the stated-cross-section earth wire and keep it grounding unfailingly.
4. Set SW1 or SW2 to 'ON' to select different fan speeds.
5. Electric Heater is optional.

**LINEAR ANNOTATION**

———— FACTORY DEFAULT  -·-·-·-·- FIELD INSTALLED  - - - - - - FACTORY OPTION

lease refer to the actual wiring diagram.

## Applicable 36K (PSC)




Note:Explanation of Fan Speed Switch

1. Low windshield wiring: The red wire of the motor is connected to the terminal block, and the blue wire is connected to therelay(swapping plug positions)

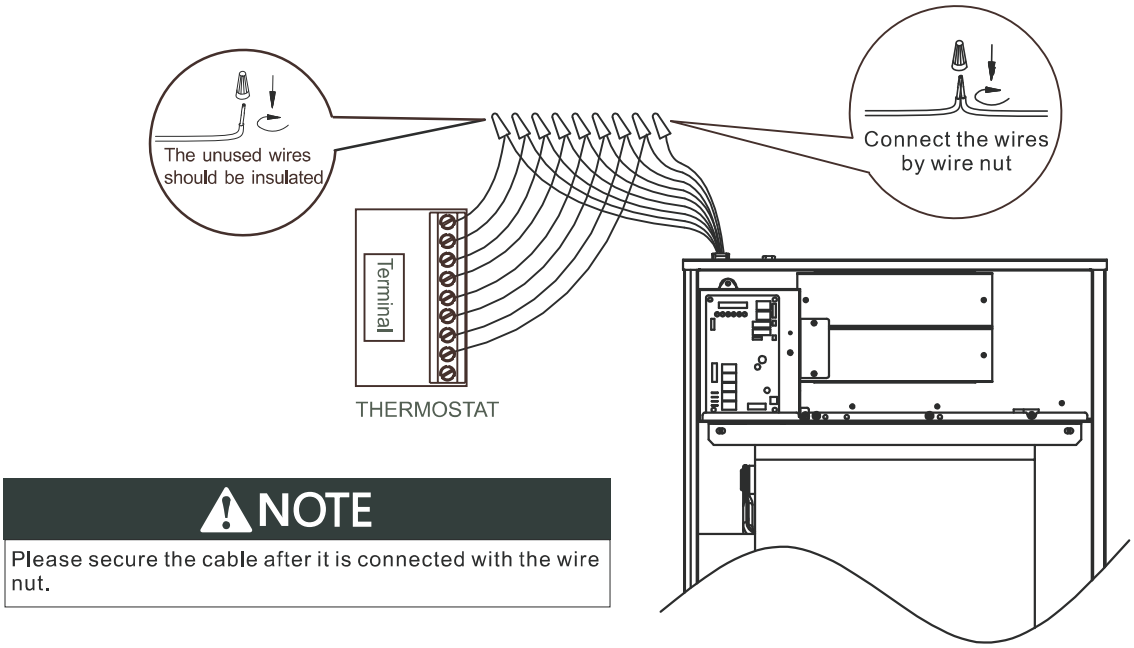
2. Wind gear wiring: The blue wire of the motor is connected to the terminal block, while the red wire is connected to the relay(swapping the position of the plug)

3. High windshield wiring: Connect the blue and red wires of the motor to the terminal block, and connect the black wire to therelay(swapping plug positions).

**NOTE:**For reference only, the actual wiring diagram shall prevai.

## 5.0 Low voltage wires connections with thermostat.

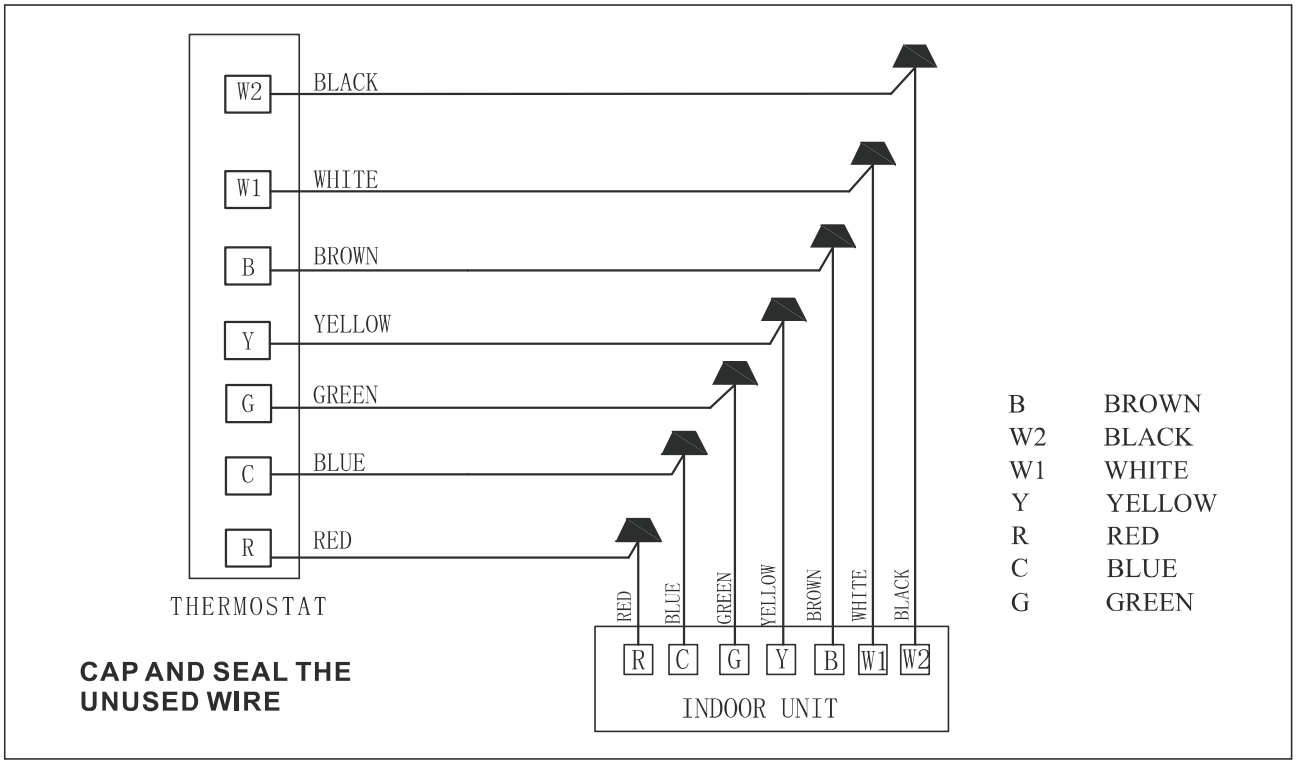
## 5.1 Connect the Control communication cables by wire nut.




**NOTE**

Please secure the cable after it is connected with the wire nut.

## 5.2 Wiring diagram of the thermostat.




**NOTE:**For reference only, the actual wiring diagram shall prevai.

## 5.3 Power Wiring

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

**⚠ WARNING**

Installation and servicing of air conditioning equipment can be hazardous due to internal refrigerant pressure and live electrical components. Only trained and qualified service personnel should install or service this equipment. Installation and service performed by unqualified persons can result in property damage, personal injury, or death.

Risk of electrical shock. Disconnect all remote power supplies before installing or servicing any portion of the system. Failure to disconnect power supplies can result in property damage, personal injury, or death.

Fire Hazard. Use of aluminum wire with this product may result in a fire, causing property damage, severe injury or death. Use copper wire only with this product.

Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Natural grounding poles embedded in the ground can be used, but do not connect the ground wire to the following locations:

(a) Pipes of flammable or explosive gases, which may otherwise lead to an explosion or fire.

(b) Insulated plastic pipes, otherwise there is no grounding effect.

(c) Telephone line or lightning rod, otherwise it will be dangerous for increasing the ground potential during lightning strikes.

**⚠ CAUTION**

Sharp metal edges can cause injury. When installing the unit, use care to avoid sharp edges.

Avoid sharp metal edges for wires to prevent wear, or it may lead to short circuit or electric leakage and cause danger.

Wires should be fixed well. Otherwise, the connectors may be loose or the terminal may be damaged when they are pulled.

**⚠ WARNING**

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

**⚠ NOTE**

Electrostatic discharge can affect electronic components. Take care during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. It is strongly recommended to contact a professional installation technician to ensure the correct installation of such filtration systems.

Do not add phase junction capacitors, otherwise it may cause serious damage to the product.

Do not start the unit before installing pipes. Otherwise, the compressor will be damaged.

## 6. 0 Electric Wiring Gauge

**Note:**

The cross-section areas of wires or lines should not be less than the corresponding ones listed in the table below; Besides, if the power wires is quite long from the unit, please choose the windings with larger cross-section area to guarantee the normal power supply.

| Model (cooling only type) | | | 18K | 24K | 30K | 36K |
|---|---|---|---|---|---|---|
| Line Gauge | Indoor Unit Power Line | Line Quantity | 3 | 3 | 3 | 3 |
| | | Line Diameter(AWG) | 16 | 16 | 16 | 16 |
| | Outdoor Unit Power Line | Line Quantity | 3 | 3 | 3 | 3 |
| | | Line Diameter(AWG) | 14 | 14 | 12 | 12 |
| | Indoor-Thermostat Singal Line | Line Quantity | 5 | 5 | 5 | 5 |
| | | Line Diameter(AWG) | 18 | 18 | 18 | 18 |
| | Outdoor-Thermostat Singal Line | Line Quantity | 2 | 2 | 2 | 2 |
| | | Line Diameter(AWG) | 18 | 18 | 18 | 18 |

| Model ( cooling & heating type ) | | | 18K | 24K | 30K | 36K |
|---|---|---|---|---|---|---|
| Line Gauge | Indoor Unit Power Line | Line Quantity | 3 | 3 | 3 | 3 |
| | | Line Diameter(AWG) | 16 | 16 | 16 | 16 |
| | Outdoor Unit Power Line | Line Quantity | 3 | 3 | 3 | 3 |
| | | Line Diameter(AWG) | 14 | 14 | 12 | 12 |
| | Indoor-Thermostat Singal Line | Line Quantity | 5 | 5 | 5 | 5 |
| | | Line Diameter(AWG) | 18 | 18 | 18 | 18 |
| | Outdoor-Thermostat Singal Line | Line Quantity | 5 | 5 | 5 | 5 |
| | | Line Diameter(AWG) | 18 | 18 | 18 | 18 |

## Section 7. Performance Data

Airflow performance data is based on cooling performance with a coil and no filter in place. Select performance table for appropriate unit size external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

Airflow Performance (Standard CFM)

| Model | Blower Speeds | External Static Pressure (in.w.c.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| 18K | L-Factory Default | 963 | 940 | 904 | 855 | 792 | 716 | 627 | 524 | 408 |
| | M | 1082 | 1053 | 1011 | 955 | 886 | 805 | 710 | 602 | 481 |
| | H | 1218 | 1178 | 1130 | 1071 | 1004 | 927 | 841 | 745 | 640 |
| 24K | L | 963 | 940 | 904 | 855 | 792 | 716 | 627 | 524 | 408 |
| | M-Factory Default | 1082 | 1053 | 1011 | 955 | 886 | 805 | 710 | 602 | 481 |
| | H | 1218 | 1178 | 1130 | 1071 | 1004 | 927 | 841 | 745 | 640 |
| 30K | L | 1065 | 1048 | 1019 | 978 | 924 | 857 | 777 | 685 | 580 |
| | M-Factory Default | 1296 | 1263 | 1221 | 1170 | 1109 | 1040 | 961 | 873 | 776 |
| | H | 1458 | 1415 | 1365 | 1308 | 1244 | 1173 | 1096 | 1011 | 919 |
| 36K | L | 1065 | 1048 | 1019 | 978 | 924 | 857 | 777 | 685 | 580 |
| | M | 1296 | 1263 | 1221 | 1170 | 1109 | 1040 | 961 | 873 | 776 |
| | H-Factory Default | 1458 | 1415 | 1365 | 1308 | 1244 | 1173 | 1096 | 1011 | 919 |

NOTES:

1. Airflow based upon dry coil at 230V with no electric heat and no filter. Please ensure that the voltage is stable at the rated 230V during use to obtain a stable air output.
2. Airflow is equivalent for front or bottom return configurations.

The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.

Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.

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 air along the perimerter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Air grilles must be properly sized to carry air back to the blower.If they are too small, they also cause noise.

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.

Important:

1. When model 30 and 36 used with electrical heater kit model AP-HF75-01 and AP-HF100-01, you need to ensure that the air volume is not less than 1103 CFM.