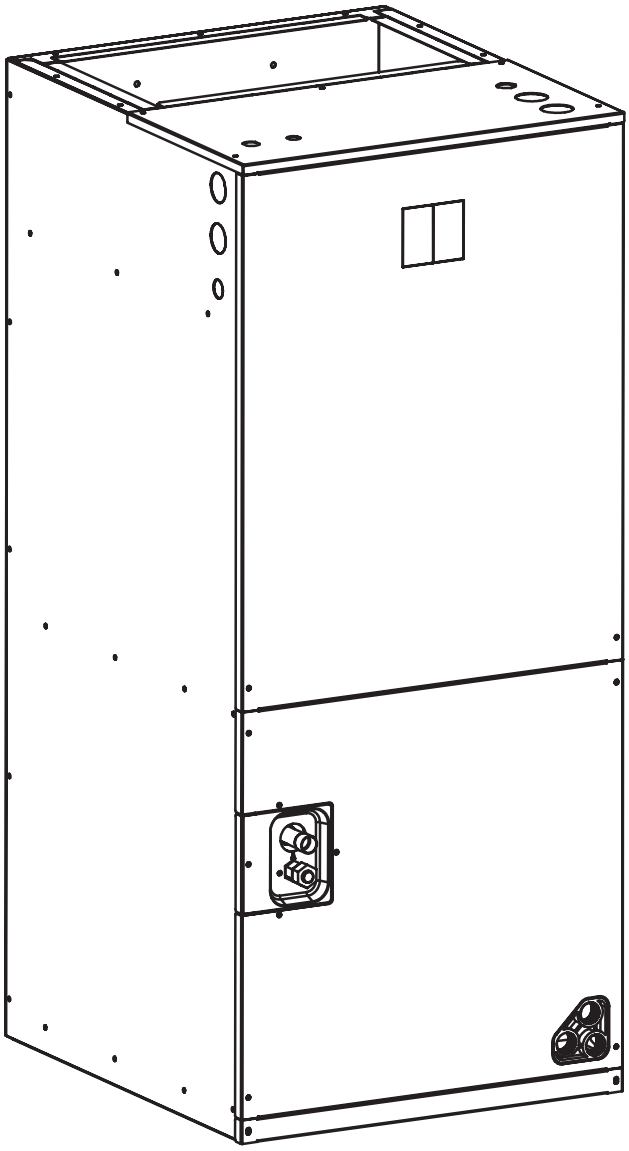
A-SERIES MULTI-POSITION AIR HANDLER



Installation Manual

Outdoor Split System Unit 1.5, 2, 2.5, 3, 3.5, 4, & 5 Ton R454B	*Split System* *Heat Pump & Air Conditioner*	*Version Date:* *10 / 20 / 26*

Revision History

Initial Release ..... **7 / 24 / 25**

Revision A ..... **10 /20 / 26**

IMPORTANT SAFETY INFORMATION

WARNING

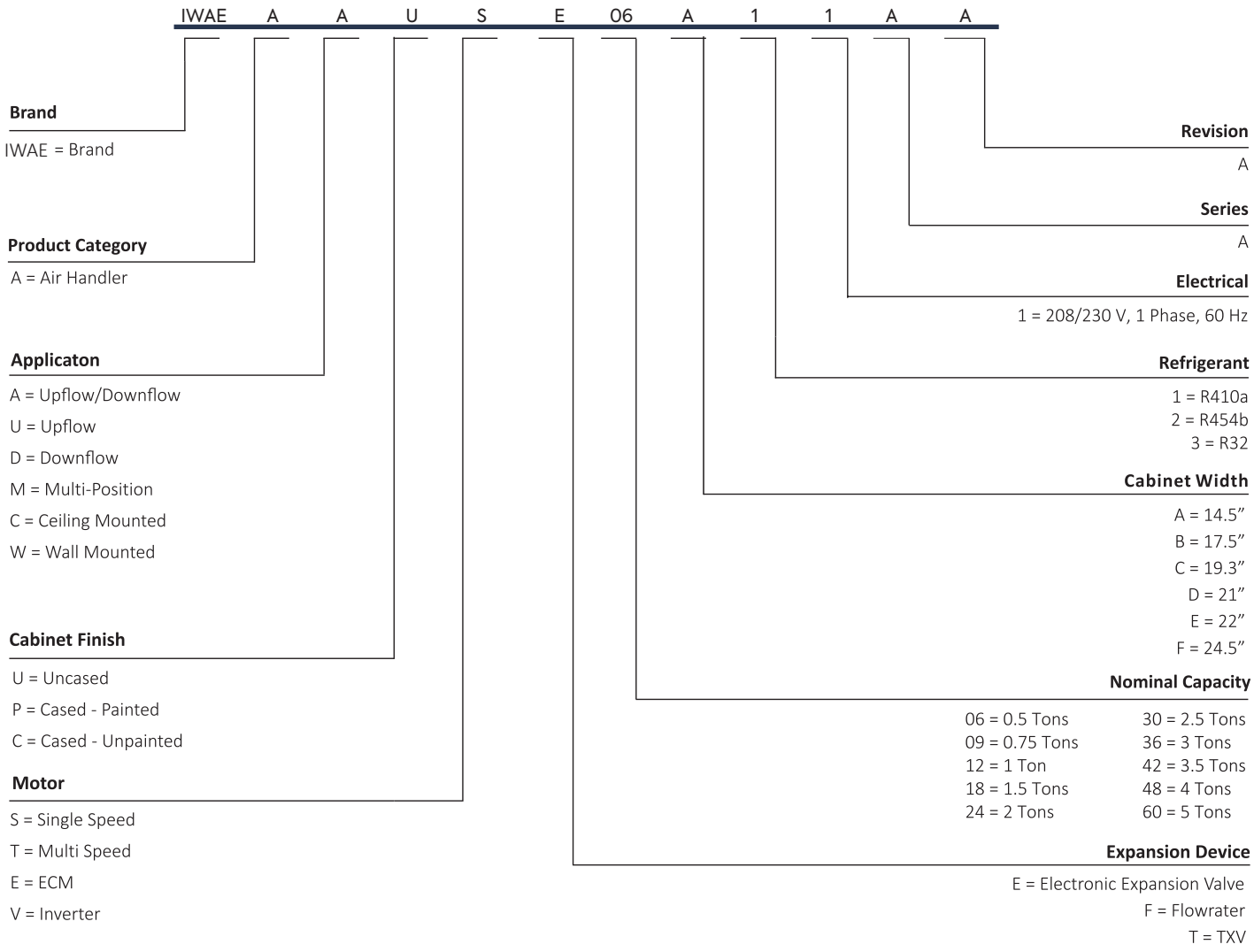
THESE INSTRUCTIONS ARE INTENDED FOR REFERENCE BY QUALIFIED LICENSED PERSONNEL FOR THE PROPER INSTALLATION, ADJUSTMENT, AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING ANY INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE, OR MAINTENANCE, POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

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DO NOT DESTROY THIS MANUAL
Please read carefully and keep in a safe place for future reference by a serviceman.


IWAE A A U S E 06 A 1 1 A A
Brand
IWAE = Brand
Product Category
A = Air Handler
Applicaton
A = Upflow/Downflow
U = Upflow
D = Downflow
M = Multi-Position
C = Ceiling Mounted
W = Wall Mounted
Cabinet Finish
U = Uncased
P = Cased - Painted
C = Cased - Unpainted
Motor
S = Single Speed
T = Multi Speed
E = ECM
V = Inverter
Expansion Device
E = Electronic Expansion Valve
F = Flowrater
T = TXV
Nominal Capacity
06 = 0.5 Tons
09 = 0.75 Tons
12 = 1 Ton
18 = 1.5 Tons
24 = 2 Tons
30 = 2.5 Tons
36 = 3 Tons
42 = 3.5 Tons
48 = 4 Tons
60 = 5 Tons
Cabinet Width
A = 14.5”
B = 17.5”
C = 19.3”
D = 21”
E = 22”
F = 24.5”
Refrigerant
1 = R410a
2 = R454b
3 = R32
Electrical
1 = 208/230 V, 1 Phase, 60 Hz
Series
A
Revision
A

This document is customer property and must remain with the unit. These instructions do not cover all system variations nor does it include every possible installation scenario. All phases of this installation must comply with ***NATIONAL STATE AND LOCAL CODES****. If additional information is required, contact your local distributor.*

i. CREATING A SAFE WORKING AREA

1. Safety checks are necessary prior to beginning work on systems containing flammable refrigerants to minimize the risk of ignition.
2. Ensure that the work area is open or that it is adequately ventilated before opening the system or conducting any hot work. Ventilation must continued during the period of work. The ventilation should safely disperse any released refrigerant and preferably expel it externally.
3. Disconnect all power to the unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause personal injury or death.
4. 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.
5. Signs for similar appliances used in a work area are generally addressed by local regulation and give the minimum requirements for the provision of safety and/or health signs for a work location.
6. The effectiveness of signs should not be diminished by too many signs being placed together.
7. Any pictograms used should be as simple as possible and contain only essential details.

ii. SAFETY RULES AND INSTALLER RECOMMENDATIONS

1. Because of possible damage to equipment and risk of personal injury, the installation, service, and maintenance of this unit should only be performed by a trained, qualified service personnel. Consumer servicing is only recommended for air filter cleaning/replacement.
2. These instructions are intended as an aid to qualified, licensed service personnel for the proper installation, adjustment, and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.
3. This unit must be permanently grounded. Failure to do so can result in electrocution, personal injury, or death.
4. If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of the unit) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock, resulting in personal injury or death.
5. Make sure the blower motor support is tight (with 3 motor mount bolts) then check to see if the wheel is secured to the motor shaft before operating the unit, as shown in **Fig. i-1**.
6. The first 36 inches of supply air plenum and ductwork must be constructed of sheet metal as required by **NFPA 90B**. The supply air plenum or duct must have a solid sheet metal bottom directly under the unit with no openings, registers, or flexible air ducts located in it. If flexible supply air ducts are used, they may be located only in the vertical walls of rectangular plenum, a minimum of 6 inches from the solid bottom. Metal plenum of duct may be connected to the combustible floor base. Otherwise, it must be connected to the unit supply duct exposed to the supply air opening from the down flow unit. Exposing combustible (non-metal) material to the supply opening of a down flow unit can cause a fire, resulting in property damage, personal injury, or death.

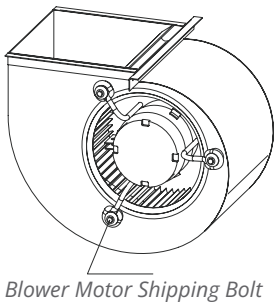


Fig. i-1 Checking Motor Fix Status

⚠ EXCEPTION WARNING FOR DOWNFLOW ⚠

If performing an installation on a concrete floor slab with the supply air plenum and ductwork completely encased, you must have no less than 2 inches of concrete (see **NFPA 90A**).

7. Only use this unit in a well-ventilated area and ensure the unit's airflow inlet and outlet are not impeded by obstructions. Do not use this unit in the following locations:
   - Locations with mineral oil
   - Locations with saline atmospheres, such as seaside locations
   - Locations with sulphurous atmospheres, such as near natural hot 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
8. Do not use means to accelerate the defrosting process or to clean the unit other than those recommended by the manufacturer.
9. This appliance must be stored in a room that does not have continuously operation ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater.)
10. Do not pierce or burn the unit.
11. You must comply with national gas regulations.

⚠ WARNING ⚠

Refrigerants may not contain an odor. If refrigerant gas leaks during installation, ventilate the area immediately.

12. Servicing may only be performed as recommended by the equipment manufacturer.
13. Maintenance and repair requiring the assistance of other skilled personnel must be carried out under the supervision of a person competent in the use of flammable refrigerants.
14. Where electrical components are being charged, they must be implemented according to their intended purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines must be followed. If in doubt, consult the manufacturer's technical department for assistance.
15. The following checks must 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 adequately and are not obstructed
    - If an indirect refrigerating circuit is used, the secondary circuit must be checked for the presence of refrigerant
    - Equipment markings must remain visible and legible. Markings and signs that are illegible must be corrected.
16. Ensure that refrigerating pipes or components are installed in a position where they are unlikely to be exposed to any substances that may corrode refrigerant containing parts, unless the components are constructed of materials that are inherently resistant to corrosion or are suitably protected against corrosion.

17. Repair and maintenance of electrical components must include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, no electrical supply may be connected to the circuit until the fault has been dealt with. You must ensure that:
    - There is continuity of grounding
    - Capacitors are discharged. This must be done in a safe manner to avoid the possibility of sparking
    - No live electrical components and wiring are exposed while charging, recovering, or purging the system
18. Check that cabling will not be subject to wear, corrosion, excessive pressure, vibrations, sharp edges, or any other adverse environmental effects. The check must also take into account the effects of aging or continual vibration from sources such as compressors or fans.
19. In order to avoid electric shock or fire, make sure that a ground leak protector is installed.
20. Objects touching the fan at high speed can be dangerous.
21. 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.
22. When the system is installed and operated in a small room, you must maintain the refrigerant concentration below the limit, in case a leak occurs. Otherwise, oxygen in the room may be affected, resulting in a serious accident.
23. Keep ventilation openings clear of obstruction.
24. Be sure the air conditioner is grounded to avoid electric shock. Make sure the unit is ground and the ground wire is not connected to a gas or water pipe, lightning conductor, or telephone ground wire.
25. To avoid oxygen deficiency, ventilate the room sufficiently if equipment with a burner is used together with the air conditioner.
26. Arrange the drain hose to ensure smooth drainage. Incomplete drainage may cause leaks that can damage the building, furniture, etc.
27. 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 with be determined by the applicable transport regulations.
28. The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.
29. 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.
30. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

iii. SAFETY PROHIBITIONS

1. 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 by a person responsible for their safety concerning the use of the appliance. Do not allow children to play with the appliance.
2. Do not use the air conditioner for other purposes. In order 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 operation, turn off the breaker or unplug the supply cord. Otherwise, electric shock and injury may occur.
3. Never touch the air outlet or the horizontal blades while the swing flap is in operation. Your fingers may get caught or the unit may break down.
4. Never put any objects into the air inlet or outlet.
5. Never inspect or service the unit by yourself
6. 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.

7. Do not use the air conditioner until a service person confirms that the refrigerant leak is repaired.
8. Do not operate the air conditioner with wet hands, or else you could be electrocuted.
9. Do not touch the heat exchanger find. These fins are sharp and could cut you.
10. Never touch the internal parts of the controller.
11. Do not remove the blower access panel. Some parts inside are dangerous to touch, and machine issues may occur.
12. Never operate this unit when the access panels are removed.
13. Do not operate the air conditioner when using a room fumigation type of insecticide. Failure to observe this precaution could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals. It may also trigger the refrigerant sensor alarm.
14. Do not place appliances that 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.
15. 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.

⚠ FLAMMABLE REFRIGERANT WARNING ⚠
Sealed electrical components must be replaced Intrinsically safe components must be replaced

iv. REPAIRING REFRIGERANT SYSTEMS

When repairing the refrigerating system, heed the following precautions prior to conducting work on the system:

1. Any person who is involved with working on or opening a refrigerant circuit should hold a current valid certificate from an industry accredited assessment authority.
2. Work must be undertaken according to controlled procedures to minimize the risk of leaking flammable gases or vapors while work is being performed.
3. All maintenance staff and other working in the local area must be instructed on the nature of the work being carried out. You must avoid working in confined spaces.
4. The work area must be checked with an appropriate refrigerant detector prior to and during work, to ensure that the technician is aware of potentially toxic or flammable environments. 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.
5. If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment must be available and easily accessible. Keep a dry powder or CO2 fire extinguisher near the charging area.
6. When carrying out work on a refrigerating system that involves exposing any pipe work, do not use any sources of ignition in a manner that may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoke, should be kept sufficiently far away from the installation, repair, or removal and disposal site, during which refrigerant can be released into the surrounding space. Prior to beginning work, the area around the equipment should be surveyed to make sure there are no flammable hazards or ignition risks. “No Smoking” signs much be clearly displayed.

v. DETECTING REFRIGERANT LEAKS

1. The refrigerant in the air conditioner is safe and normally does not leak.
2. If the refrigerant leaks into the room and comes into contact with a burner fire, heater, or 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 if this occurs.
3. Under no circumstances may potential sources of ignition be used while searching for or detecting refrigerant leaks. A halide torch (or any other detector using a naked flame) must not be used.
4. 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 must 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 must be set at a percentage of the LFL of the refrigerant and must be calibrated for the refrigerant employed. The appropriate percentage of gas (25% maximum) must be confirmed.
5. If a leak is suspected, all naked flames must be removed or extinguished.
6. If a leakage of refrigerants that requires brazing is found, all refrigerant must be recovered from the system, or isolated by means of shut off valves in a part of the system remote from the leak.
7. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine must be avoided as the chlorine may react with the refrigerant and corrode the copper pipe work.
8. Examples of Leak Detection Fluids:
    - Bubble Method
9. To prevent a refrigerant leak, contact your dealer.

vi. RECOVERING & RECHARGING REFRIGERANT

1. When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures must be used. However, for flammable refrigerants it is important that best practices be followed, since flammability is a consideration. You must adhere to the following procedure:
    - Safely remove refrigerant following local and national regulations
    - Evacuate the refrigerant
    - Purge the circuit with inert gas
    - Evacuate again
    - Continuously flush or purge with inert gas when using flames to open the circuit
    - Open the circuit
2. The refrigerant must be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system must 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 must not be used for purging refrigerant systems.
3. For appliances containing flammable refrigerants, you must purge refrigerant by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum. This process must be repeated until no refrigerant is in the system. When the final oxygen-free nitrogen charge is used, the system must be vented down to atmospheric pressure to enable work to take place.
4. The vacuum pump outlet must not be near any potential ignition sources, and ventilation must be available.
5. Ensure that the contamination of different refrigerants does not occur when using charging equipment. Hoses or lines must be as short as possible to minimize the amount of refrigerant they contain.
6. Cylinders must be kept upright. Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
7. Label the system when charging is complete (if it is not already labeled).

8. Take extreme care not to overfill the refrigeration system.
9. Prior to recharging the system, perform a pressure test with the appropriate purging gas. The system must be leak-tested on completion of charging but prior to commissioning. A follow up leak test must be carried out prior to leaving the site.
10. Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample must be taken in case analysis is required prior to reusing the reclaimed refrigerant. It is essential that electrical power is available before the take is commenced.
    - Isolate the 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 used correctly
        - The recovery process is supervised at all times by a competent person
        - Recovery equipment and cylinders conform to the appropriate standards
    - Pump down the refrigerant system, if possible
    - If a vacuum is not possible, make a manifold so refrigerant can be removed from various parts of the system
    - Make sure that they cylinder is situated on the scales before recovery 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 cylinders and the equipment are removed from the site promptly and all isolation valves on the equipment are closed off
    - Recovered refrigerant must not be charged into another refrigeration system unless it has been cleaned and checked
11. Equipment must be labeled stating that it has been decommissioned and emptied of refrigerant. The label must be dated and signed.
12. Ensure that there are labels on the equipment stating that the equipment contains flammable refrigerant.
13. When removing refrigerant from a system, either for servicing or decommissioning, it is recommended that all refrigerants are removed safely.
14. 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 labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders must be complete with a pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
15. 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. In addition, a set of calibrated weighing scales must be available and in good working order. Hoses must be complete with leak-free disconnect couplings and in good condition.
16. The recovered refrigerant must be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note must be arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
17. 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 must not be heated by any open flame or other ignition sources to accelerate this process. When oil is drained from a system, it must be carried out safely.

vii. Proposition 65

This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the State of California to cause cancer. All manufacturer products meet current federal OSHA guidelines for safety. California Proposition 65 requires warnings for products sold in California that contain or produce any of the 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 OEHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org. Consumer education is important because the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products can present safety and health risks when improperly used, handled, and maintained.

This appliance uses R454B refrigerant.



1. Servicing Instructions 1
1. 1 Precautions 1
1. 2 R454B Refrigerant Leakage Sensor 2
1. 3 Refrigerant Charge and Room Area Limitations 3
1. 4 Room Area Calculations 3
1. 5 The Allowed Maximum Refrigerant Charge and Required Minimum Room Area 6
2. Unit Dimensions 9
3. Parts 10
4. Installation Applications 11
4. 1 General Applications 11
4. 2 Installation Considerations 11
4. 3 Vertical Upflow 13
4. 4 Vertical Downflow 13
4. 5 Horizontal Applications 14
4. 6 Steps for Changing the Cabinet Orientation to Vertical Downflow or Horizontal Left Orientation 15
4. 7 Coil Piston Replacement & Installation 16
4. 8 Refrigerant Connections 17
4. 9 Condensate Drain Tubing 17
5. Electrical 19
5. 1 Power Wiring 20
5. 2 Control Wiring 20
5. 3 Grounding 20
5. 4 Electrical Data 21
5. 5 MCA/MOP Data for Electric Heat Kits 21
5. 6 Wiring Diagram 22
5. 7 Low Voltage Wires Connections with the Thermostat 25
5. 8 Electric Wiring Gauge 27
6. Air Filter 28
6. 1 Filter Installation Dimensions 28
6. 2 Air Filter Removal 29
7. Airflow Performance 30
8. Specifications 32

1. Servicing Instructions

1-1 Refrigerant Charge Matrix 3
1-2 Opening Conditions for Connected Rooms 4

2. Unit Dimensions

2-1 Unit Dimensions 9

3. Parts

3-1 Parts Diagram 10

4. Installation Applications

4-1 Clearances for the Horizontal Position 11
4-2 Clearances for the Vertical Position 11
4-3 Vertical Install Drain Piping 12
4-4 Horizontal Install Drain Piping 12
4-5 Dimensions for Front Connect Coil 13
4-6 Vertical Downflow Application 14
4-7 Horizontal Left Application 14
4-8 Condensate Drain Piping 18

5. Electrical

5-1 Wiring Connection for Heat Pump Systems 22
5-2 Wiring Connection for A/C Systems 23
5-3 Wiring Connection for 18K 23
5-4 Wiring Connection for 24K 24
5-5 Wiring Connection for 30K, 36K, 42K, 48K, 60K 24
5-6 Connecting the Control Communication Cables 25
5-7 Wiring Diagram for the Thermostat 26

6. Air Filter

6-1 External Filter Base 28
6-2 Air Filter Cleaning Methods 29

1. Servicing Instructions

1-1 The Minimum Opening Area for Connected Rooms 5
1-2 The Allowable Maximum Refrigerant Charge 6
1-3 The Required Minimum Room Area 7
1-4 The Minimum Circulation Airflow 7
1-5 Required Minimum Room Area for Altitude Installations Higher than 2000ft 8

2. Unit Dimensions

2-1 Unit Dimensions 9

5. Electrical

5-1 Electrical Data 21
5-2 Electric Heat Kit MCA/MOP Data 21
5-3 Electric Heater Kit Match-up 22
5-4 DIP Switches 25
5-5 Electric Wiring Gauge for Cooling Only Models 27
5-6 Electrical Wiring Gauge for Cooling & Heat Models 27

6. Air Filter

6-1 Air Filter Dimensional Data 28

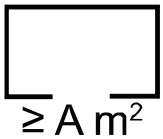
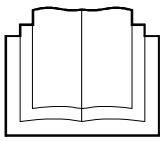
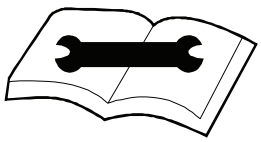
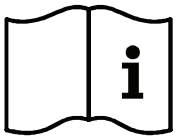
7. Airflow Performance

7-1 Airflow Performance Data 30

The following safety codes are used in this manual. Pay close attention to them to minimize safety risks.

DANGER
Indicates a dangerous situation, which, if not avoided, ***will*** lead to death or serious injury.
WARNING
Indicates a dangerous situation, which, if not avoided, ***may*** lead to death or serious injury.
CAUTION
Indicates a dangerous situation, which, if not avoided, ***may*** cause mild to moderate injury.
Note
Used to indicates additional information unrelated to personal injury, such as installation tips.

The following symbols are displayed on the unit. Pay close attention to them to minimize safety risks.

	**DANGER**	This appliance uses a mildly flammable refrigerant. If this refrigerant leaks and is exposed to an external ignition source, it will create a fire risk.
	**WARNING**	This appliance must be installed, operated, and stored in a room with a floor area no less than the minimum allowed floor area.
	**CAUTION**	Carefully read this manual.
	**CAUTION**	A service personnel should handle this equipment in accordance with this manual.
	**CAUTION**	Relevant information is available in the operational or installation manual.

Abbreviation	Meaning
Mc	Actual refrigerant charge in the system
A	Actual room area where the appliance is installed
A_{min}	Required minimum room area
M_{max}	Allowable maximum refrigerant charge in a room
Q_{min}	Minimum circulation airflow
Anv_{min}	Minimum opening area for connected rooms
TA_{min}	The total area of the conditioned space (For appliances serving one or more rooms with an air duct system)
TA	The total area of the conditioned space connected by air ducts

NOTE
These instructions are exclusively intended for qualified contractors and authorized installers.

1. 1 Precautions

1. Check the information in this manual to find the dimensions of space needed for proper device installation, including minimum distances allowed compared to adjacent structures.

⚠ WARNING ⚠
The appliance must be stored in a well-ventilated area where the room size corresponds to the room area specified for operation. The appliance must be stored in a room without continuously operating open flames (an operating gas appliance, etc.) and ignition sources (an operating electric heater, etc.)

2. You must comply with national gas regulations.
3. The mechanical connections must be accessible for maintenance purposes.
4. You **must** follow these instructions for handling, installing, cleaning, maintaining, and disposing refrigerant.
5. Make sure ventilation openings are clear of obstruction.
6. The appliance must be stored in a way to prevent mechanical damage from occurring.
7. Any person performing installation, maintenance, repair, or refrigerant handling must a valid and current certification in accordance with UL 60335-2-40, Section HH and recognized by the applicable regulatory authority (e.g., EPA Section 608, F-Gas, or an equivalent). Unauthorized servicing is strictly prohibited.
8. Every working procedure that affects safety may only be performed by competent persons.
9. Work on electrical equipment may only be carried out by a qualified electrician.
10. 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 person authorized by the installer.
11. 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 must be constructed so that if any refrigerant were to leak, it will not stagnate and create a fire or explosion hazard.
12. The appliance must be stored to prevent mechanical damage from occurring.
13. Do not stack combustible materials on the surface of the indoor unit.

⚠ WARNING ⚠
1. Do not use any means other than those recommended by the manufacturer to accelerate the defrosting process or to clean the unit. 2. Do not store this appliance near continuously operating fuel sources (e.g. open flames, operating gas appliances, operating electric heaters.) 3. Do not pierce or burn 4. Be aware that refrigerants may not emit an odor.

1. 2 R454B Refrigerant Leakage Sensor

WARNING

A LEAK DETECTION SYSTEM is installed on the indoor unit. The unit must be powered on except for during servicing

The R454B refrigerant leakage sensor is configured for the indoor unit. To meet different installation scenarios, the refrigerant sensor has two installation positions, outlined in **Section 4. INSTALLATION APPLICATIONS**. The factory set of the refrigerant sensor is applied to the vertical upflow and horizontal right. The refrigerant sensor needs to be relocated for vertical downflow and horizontal left. Before installing the indoor unit, check whether the refrigerant sensor is correctly installed, as shown in **Fig. 3-1**.

The location of the leakage sensors must be chosen in relation to the different installation scenarios.

If the refrigerant leakage sensor detects a refrigerant leak, the fan will keep running, the compressor will stop, and the electric heater will shut off. Immediately leave the leak area and notify a professional for handling.

The fan operation can be initiated by the R454B refrigerant sensor, ensuring that it meets the required circulation airflow. The allowed maximum refrigerant charge (M_{max}) and the required minimum room area (A_{min}) can be determined according to **Table 1-2** and **Table 1-3**.

WARNING

The system will return when refrigerant is no longer detected for 5 minutes. The service life of the refrigerant sensor is 15 years. 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 sense after it is used for a long time.

1. 2. 1 Refrigerant Sensor Installation Requirements

- The installation of the refrigerant leakage sensor must allow access for checks, repairs, or replacements by an authorized person.
- Ensure that the apparatus is mounted securely
- The refrigerant leakage sensor must be installed so its function can be verified easily.
- The refrigerant leakage sensor must 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.

WARNING

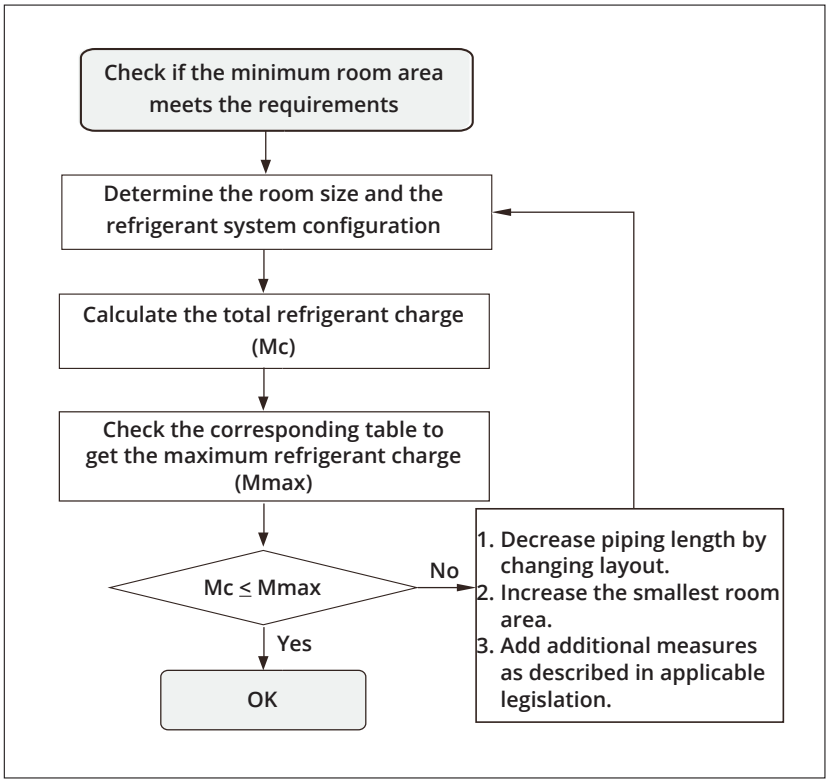
The refrigerant leakage sensor can only use the factory model or the specified model indicated in the corresponding manual. The R454B refrigerant leakage sensor must be used to activate the refrigerant shut-off device, the alarm device, incorporated circulation airflow, or other emergency controls, which will set off an electrical signal at a predetermined alarm set point in response to leaked refrigerant.

1. 3 Refrigerant Charge and Room Area Limitations

In UL/CSA 60335-2-40, R454B refrigerant is classified as class A2L, which is mildly flammable. Therefore, R454B refrigerant is suitable for systems needing additional refrigerant charge and that will limit the area of the rooms being served by the systems.

Similarly, the total amount of refrigerant in the system must 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. Follow the matrix below to determine the appropriate refrigerant charge.

Fig. 1-1 Refrigerant Charge Matrix



1. 4 Room Area Calculation Requirements

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

To determine the room area (A) for use calculating the refrigerant charge limit:

- The room area (A) is 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 are not considered a single space.

Units mounted higher than 70-55/64 inches and spaces divided by partition walls no higher than 62-63/64 inches are considered a single space. Rooms on the same floor, connected by an open passageway between the spaces can be considered a single room when determining compliance to A_{min}, if the passageway meets all 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 food, connected by a permanent opening in the walls and/or doors between occupied spaces, including gaps between the wall and the floor, can be considered a single room when determining compliance to A_{min}, provided all of the following conditions are met as **Fig 1-2**.

1. 4. 1 Low Level Opening

1. The opening must not be less than Anv_{min} in **Table 1-1**.
2. Do not consider the area of any openings above 11-13/16 inches from the floor to determine compliance with Anv_{min}.
3. At least 50% of the opening area of Anv_{min} must 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 may be no less than 25/32 inches above the floor covering surface.

1. 4. 2 High Level Opening

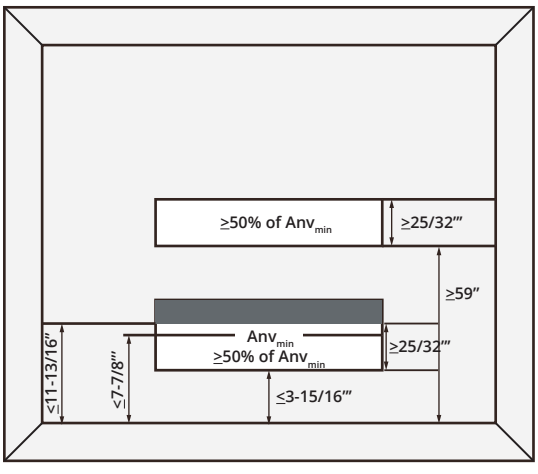
1. The opening must not be less than 50% of Anv_{min} in **Table 1-1.**
2. The opening is a permanent opening that cannot be closed.
3. The opening must be at least 59 inches above the floor.
4. The height of the opening cannot be less than 25/32 inches.

1. 4. 3 Room Size Requirement

1. The room that refrigerant can leak into plus the connected adjacent room(s) must not have a room area less than A_{min}.
2. The room area the unit is installed in cannot be less than 20% of A_{min}.

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.

Fig. 1-2 Opening Conditions for Connected Rooms



The minimum opening for natural ventilation (Anv_{min}) in connected rooms is related to the room area (A), the actual refrigerant charge of refrigerant in the system (Mc), and the allowable **MAXIMUM REFRIGERANT CHARGE** in the system (M_{max}), Anv_{min} can be determined according to **Table 1-1**.

Table 1-1 The Minimum Opening Area for Connected Rooms

A(ft^2)	Mc(□lb□oz)		M_{max}(□lb□oz)		Anv_{min}(ft^2)
	lb	oz	lb	oz	
100	17	3	6	10	1.3
110	17	3	7	5	1.2
120	17	3	8	0	1.1
130	17	3	8	10	1.0
140	17	3	9	5	1.0
150	17	3	10	0	0.9
160	17	3	10	10	0.8
170	17	3	11	5	0.7
180	17	3	12	0	0.6
190	17	3	12	10	0.5
200	17	3	16	5	0.5
210	17	3	14	0	0.4
220	17	3	14	10	0.3
230	17	3	15	5	0.2
240	17	3	16	0	0.1
250	17	3	16	10	0.1
260	17	3	17	5	0.0

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 is 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.

CAUTION

If the actual room area, air outlet height, and refrigerant charge amount are not reflected in the provided tables, more severe cases need to be considered according to the data in **Table 1-1**, **Table 1-2, Table 1-3**, and **Table 1-4**.

1. 5 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 (M_{max}) and the required minimum room area (A_{min}/TA_{min}) is shown in **Table 1-2** and **Table 1-3**.

CAUTION

The allowable maximum refrigerant charge of **Table 1-2** or the required minimum room area of **Table 1-3** 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. Do not deduct the grill area.
- Minimum airflow rate must meet the corresponding values in **Table 1-4**, which is related to the actual refrigerant charge of the system (Mc).
- R454B refrigerant leakage sensor is configured.

NOTE

The maximum refrigerant limit described above applies to unventilated areas. If adding additional measures, such as areas with mechanical ventilation or natural ventilation, the maximum refrigerant charge can be increased or the minimum room area can be reduced. The R454B 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 **Table 1-2** or **Table 1-3**.

Table 1-2 The Allowable Maximum Refrigerant Charge

A/TA		M_{max}		A/TA		M_{max}	
ft^2	m^2	lb-oz	kg	ft^2	m^2	lb-oz	kg
30	2.8	2-0	0.9	150	13.9	10-0	4.5
40	3.7	2-9	1.2	160	14.9	10-9	4.8
50	4.6	3-5	1.5	170	15.8	11-4	5.1
60	5.6	3-14	1.8	180	16.7	11-15	5.4
70	6.5	4-9	2.1	190	17.7	12-9	5.7
80	7.4	5-3	2.4	200	18.6	13-4	6.0
90	8.4	5-14	2.7	210	19.5	14-0	6.4
100	9.3	6-9	3.0	220	20.4	14-12	6.7
110	10.2	7-5	3.3	230	21.4	15-7	7.0
120	11.1	7-15	3.6	240	22.3	16-0	7.3
130	12.1	8-9	3.9	250	23.2	16-12	7.6
140	13.0	9-4	4.2	260	24.2	17-13	7.9

Table 1-3 The Required Minimum Room Area

Mc(□lb□oz)		$A_{min}/TA_{min}(ft^2)$	Mc(□lb□oz)		$A_{min}/TA_{min}(ft^2)$
lb	oz		lb	oz	
4	6	66.1	11	0	165.3
4	13	72.7	11	7	171.9
5	4	79.3	11	14	178.5
5	11	86.0	12	5	185.1
6	2	92.6	12	12	191.7
6	9	99.2	13	3	198.4
7	0	105.8	13	10	205.0
7	7	112.4	14	1	211.6
7	15	119.0	14	8	218.2
8	6	125.6	14	15	224.8
8	13	132.2	15	6	231.4
9	4	138.8	15	14	238.0
9	11	145.5	16	5	244.6
10	2	152.1	16	12	251.2
10	9	158.7	17	3	257.9

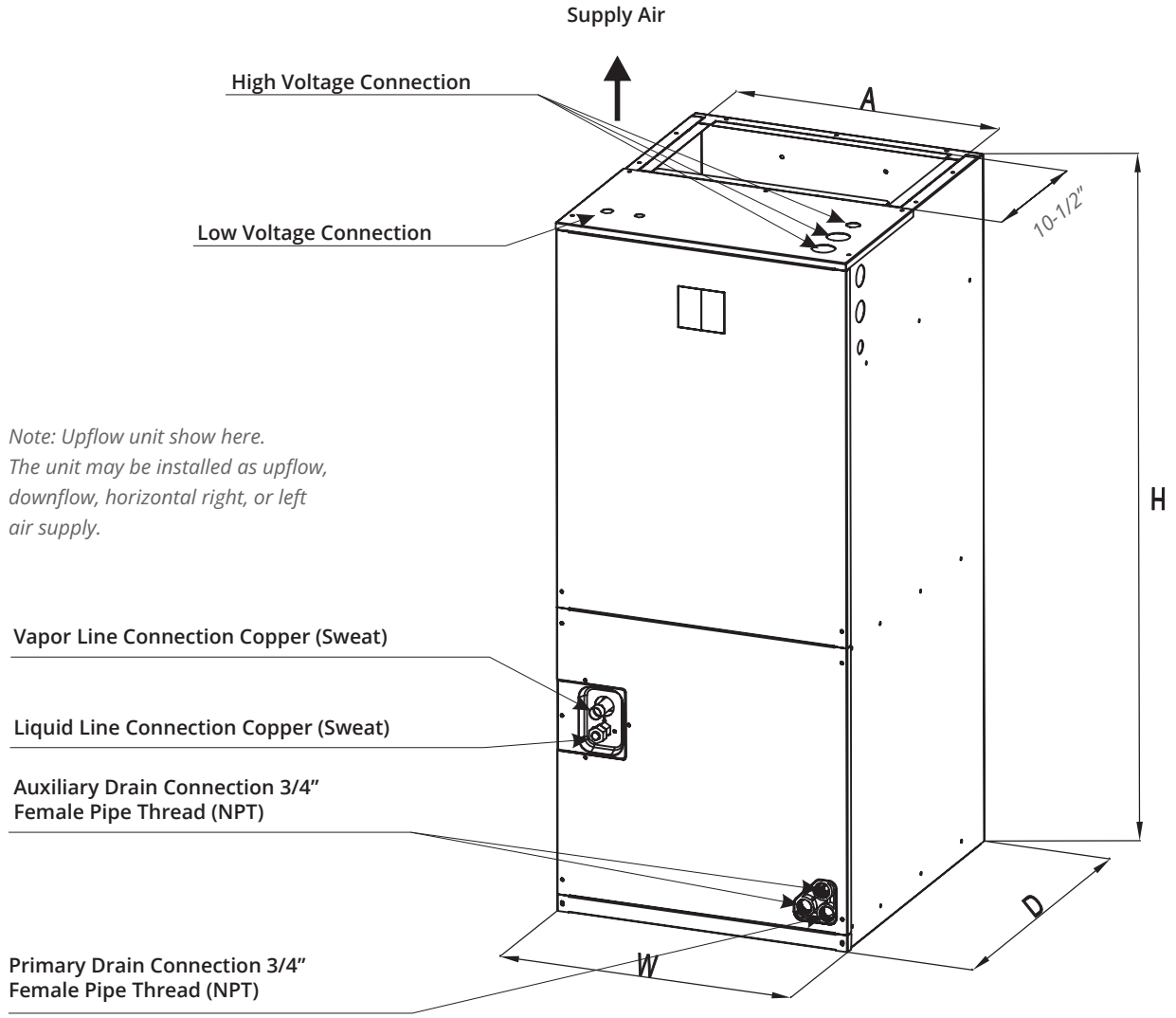
Table 1-4 The Minimum Circulation Airflow

Mc(□lb□oz)		Q_{min} (CFM)	Mc(□lb□oz)		Q_{min} (CFM)
lb	oz		lb	oz	
4	6	119	11	0	298
4	13	131	11	7	310
5	4	143	11	14	322
5	11	155	12	5	334
6	2	167	12	12	346
6	9	179	13	3	358
7	0	191	13	10	370
7	7	203	14	1	382
7	15	215	14	8	394
8	6	227	14	15	406
8	13	239	15	6	418
9	4	251	15	14	430
9	11	263	16	5	442
10	2	275	16	12	454
10	9	287	17	3	466

Table 1-5 Required Minimum Room Area for Altitude Installations Higher than 2000 ft

	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	2.8	2.8	2.8	2.9	3.0	3.1	3.1	3.2
3	4.2	4.2	4.3	4.4	4.5	4.6	4.7	4.8
4	5.6	5.6	5.7	5.9	6.0	6.1	6.2	6.4
5	7.0	7.0	7.1	7.3	7.5	7.7	7.8	8.0
6	8.4	8.4	8.5	8.8	8.9	9.2	9.4	9.6
7	9.8	9.8	9.9	10.2	10.4	10.7	10.9	11.2
8	11.1	11.1	11.4	11.7	11.9	12.3	12.5	12.8
9	12.5	12.5	12.8	13.2	13.4	13.8	14.0	14.4
10	13.9	13.9	14.2	14.6	14.9	15.3	15.6	16.0
11	15.3	15.3	15.6	16.1	16.4	16.9	17.2	17.6
12	16.7	16.7	17.1	17.6	17.9	18.4	18.7	19.2
13	18.1	18.1	18.5	19.0	19.4	19.9	20.3	20.8
14	19.5	19.5	19.9	20.5	20.9	21.5	21.8	22.4
15	20.9	20.9	21.3	21.9	22.4	23.0	23.4	24.0
16	22.3	22.3	22.7	23.4	23.8	24.5	25.0	25.6
17	23.7	23.7	24.2	24.9	25.3	26.1	26.5	27.2
18	25.1	25.1	25.6	26.3	26.8	27.6	28.1	28.8
19	26.5	26.5	27.0	27.8	28.3	29.1	29.6	30.4
20	27.9	27.9	28.4	29.3	29.8	30.6	31.2	32.0

Fig. 2-1 Unit Dimensions



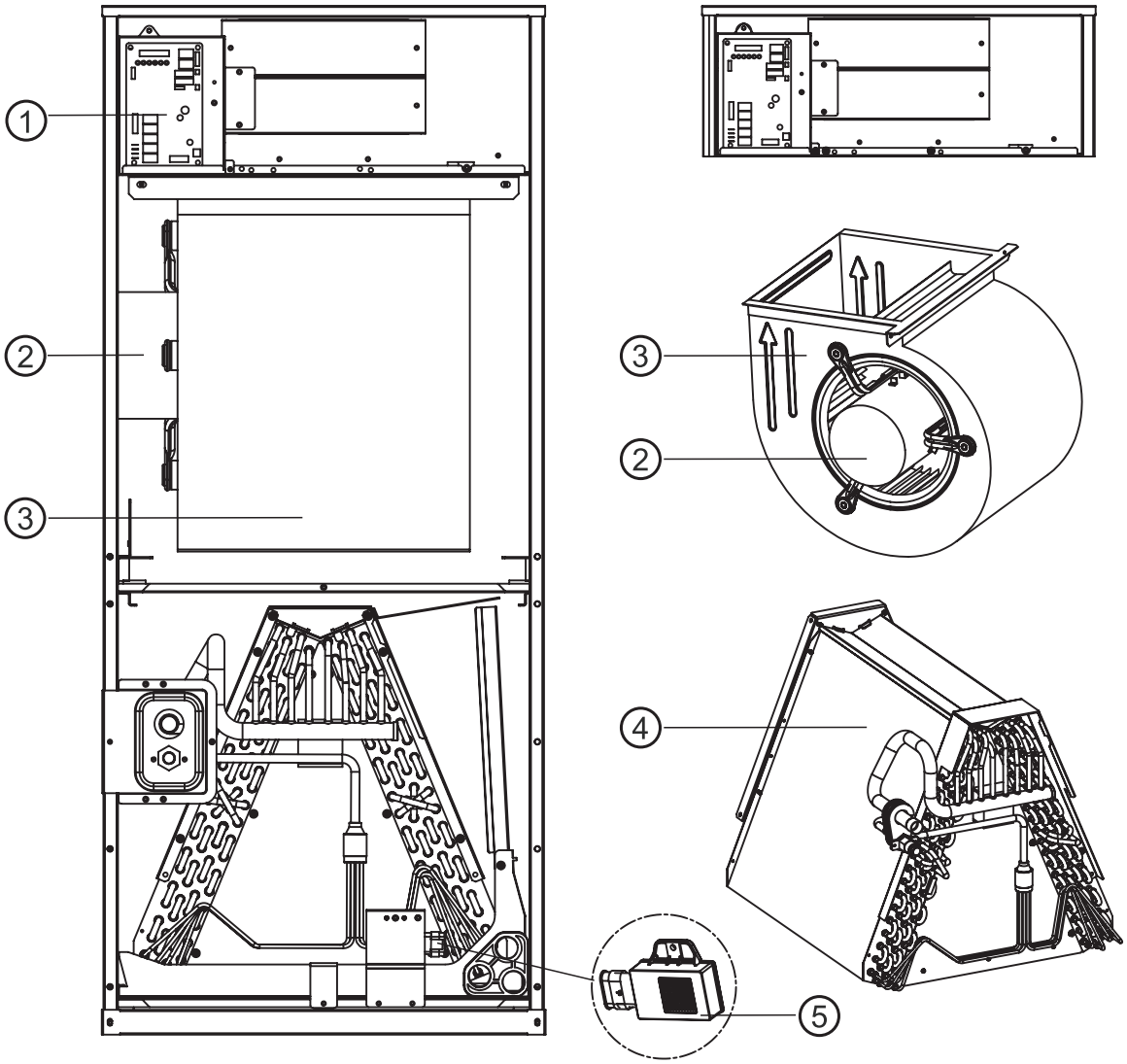
Note: Upflow unit show here. The unit may be installed as upflow, downflow, horizontal right, or left air supply.

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

Table 2-1 Unit Dimensions

Model Size	Dimensions inches [mm]				
	Unit Height "H"	Unit Width "W"	Unit Length "D"	Supply Duct "A"	Liquid Line / Vapor Line
18K	45-3/4" [1162]	19-5/8" [500]	22" [560]	17-7/8" [454]	3/8" / 3/4"
24K	45-3/4" [1162]	19-5/8" [500]	22" [560]	17-7/8" [454]	3/8" / 3/4"
30K	45-3/4" [1162]	19-5/8" [500]	22" [560]	17-7/8" [454]	3/8" / 3/4"
36K	45-3/4" [1162]	19-5/8" [500]	22" [560]	17-7/8" [454]	3/8" / 3/4"
42K	45-3/4" [1162]	19-5/8" [500]	22" [560]	17-7/8" [454]	3/8" / 3/4"
48K	53-1/8" [1350]	22" [560]	24-1/2" [623]	19-1/2" [496]	3/8" / 7/8"
60K	53-1/8" [1350]	22" [560]	24-1/2" [623]	19-1/2" [496]	3/8" / 7/8"

Fig. 3-1 Parts Diagram



Number	1	2	3	4	5
Parts	Control Board	AC Motor	Blower	AL- Evaporator	R454B Refrigerant Sensor

4. 1 General Applications

The unit can be positioned for bottom return air in the upflow position. For left and right return, use the horizontal position, and for top return place the unit in the downflow position.

This air handler provides the flexibility for installation in any upflow or downflow horizontal application. The direct drive motors provide a selection of air volume to match any application. 3-speed motors provide selections of air flow to meet the desired applications.

Top and side power and control wiring and accessible screw terminals for control wiring make the installation easy, and minimize the installation cost. Contact your local distributor for more information,

⚠ FLAMMABLE REFRIGERANT WARNING ⚠

As a reminder, **DO NOT** install the unit in an area where flammable materials are present due to the risk of an explosion, which can result in injury or death.

4. 2 Installation Considerations

This appliance is only intended to supply conditioned air to one room.

If the supporting structure for the unit is not strong enough to hold the unit's weight, the unit could fall out of place and cause serious injury and damage.

If a return-air duct is not installed, carefully select the place and method of product installation so that air flow into the product will not be blocked.

The unit should be installed in a level position to ensure proper condensation drainage. Up to an additional 1/4" rise over the width or depth of the unit is allowed to create additional sloping towards the drain. The unit must be positioned between level and a 1/4" rise , sloping toward the drain connection.

Install the indoor and outdoor unit, power supply wiring, and connecting wires at least 3.5 ft. from televisions or radios in order to prevent image interference or noise. To ensure the proper installation, select a solid and level site. Ensure enough space is maintained for both installation and maintenance. See **Fig. 4-1** and **Fig. 4-2**.

Fig. 4-1 Clearances for the Horizontal Position

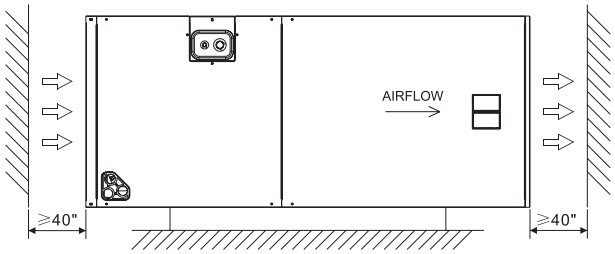
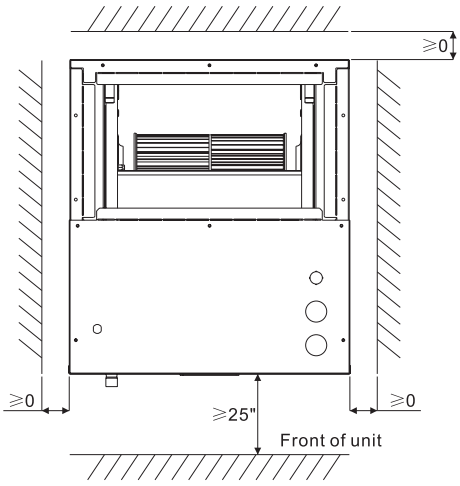


Fig. 4-2 Clearances for the Vertical Position



When the unit is installed in a hot place where the humidity inside the installation space might exceed 86°F and RH 80%, we recommend insulating the cabinet exterior. Use glass wool or polyethylene foam as insulation so that the thickness is greater than 2 in. and fits inside the installation space opening. Condensation may form on the surface of the insulation. Be sure to use insulation that is designed for use with HVAC systems. Condensation may form on the product during the cooling operation. It is also recommended to use a second drain pan and to secure the unit firmly to prevent it from falling, as in **Fig. 4-3** and **Fig. 4-4**.

Fig. 4-3 Vertical Install Drain Piping

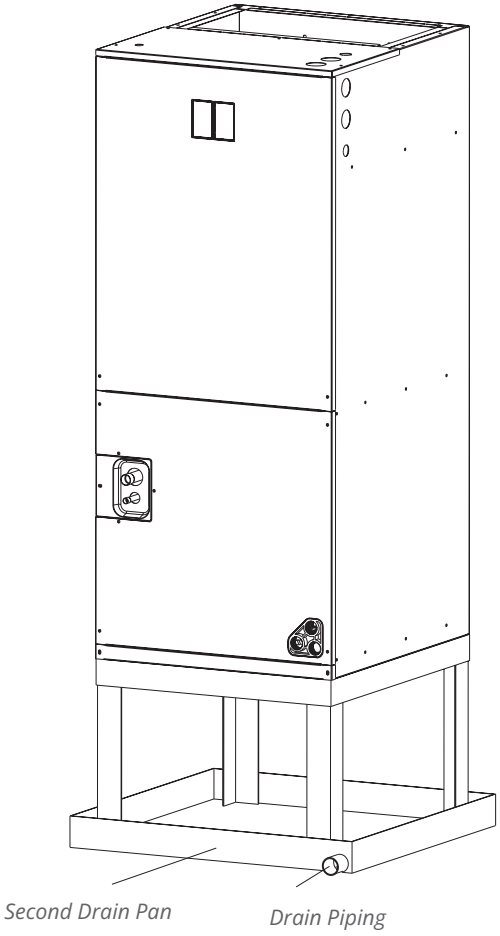
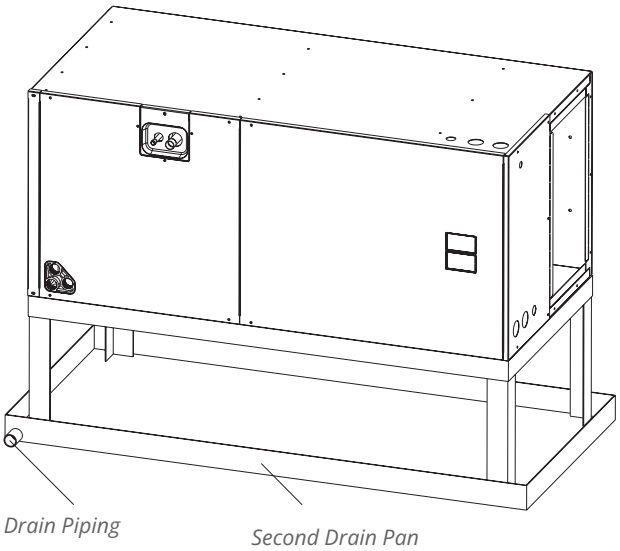


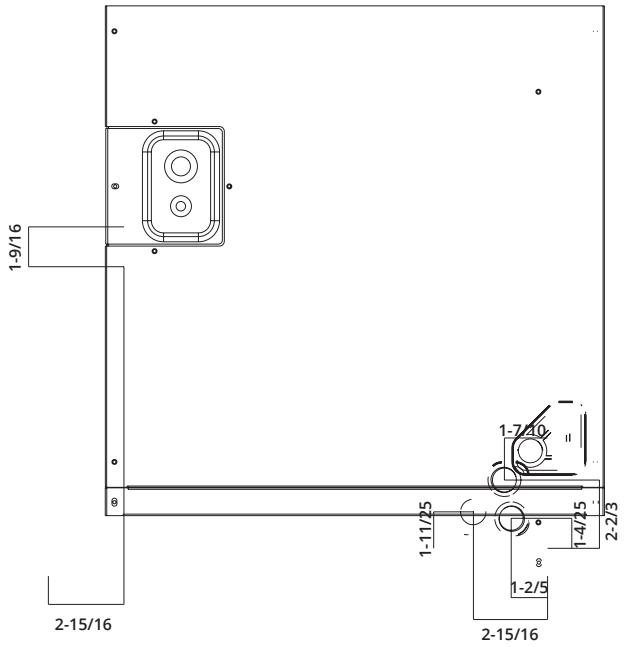
Fig. 4-4 Horizontal Install Drain Piping



⚠ WARNING ⚠

The supply duct is intended to handle conditioned air for circulation through a duct supplying **ONLY ONE ROOM**, Room space may be partitioned into rooms within the same unit, but supply air is **NOT** to be delivered to any other rooms.

Fig. 4-5 Dimensions for Front Connect Coil



4. 3 Vertical Upflow

The vertical upflow configuration is the default factory set on all models.

If a side return air opening is required, field fabricate a return air plenum with an opening large enough to supply the unit and strong enough to support the unit weight.

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

NOTE
The torque applied to the drain connections should not exceed 15 ft.lbs

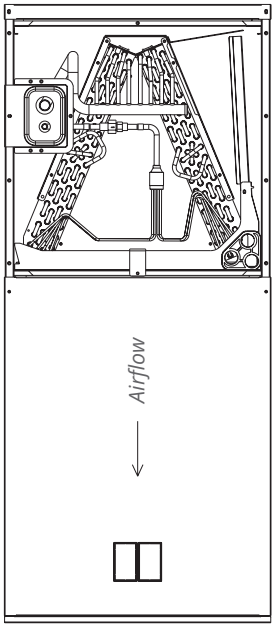
4. 4 Vertical Downflow

If you need to convert to a vertical downflow application, proceed with the following steps:

1. Remove the coil access panel
2. Remove the refrigerant leak detection sensor and indoor coil
3. Reinstall the indoor coil 180 degrees from the original position.
4. Reinstall the refrigerant sensor at the location shown in **Section 4. 6**.

CAUTION
The refrigerant leak detection sensor needs to be relocated in this application. Please follow the steps on page [#]

Fig. 4-6 Vertical Downflow Application



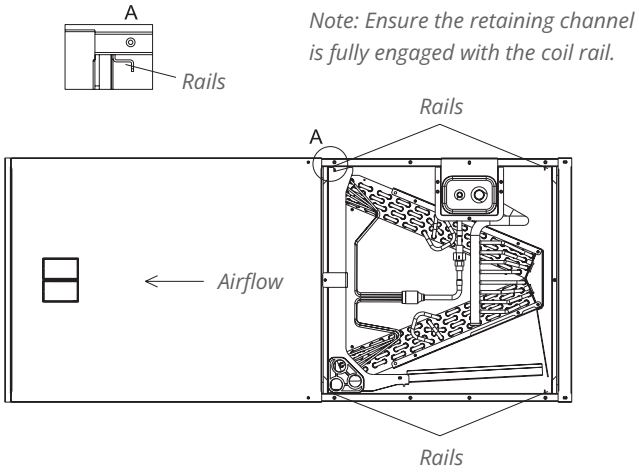
4. 5 Horizontal Applications

Horizontal right is the default factory configuration for the units. Horizontal left isn't the default factory configuration.

If you need to convert to a horizontal left application, proceed with the following steps:

1. A vertical upflow unit may be converted to horizontal left by removing the indoor coil assembly and reinstalling the coil as shown for the left hand air supply.
2. Rotate the unit into the downflow position, with the coil compartment on top and the blower compartment on the bottom.
3. Reinstall the indoor coil 180 degrees from the original position. Ensure that the retaining channel is fully engaged with the coil rail.
4. Secondary drain kits are recommended when the unit is configured for the horizontal position over a finished ceiling and/or living space.

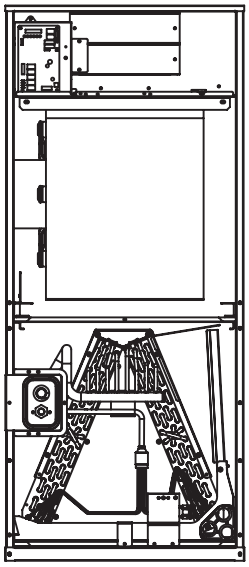
Fig. 4-7 Horizontal Left Application



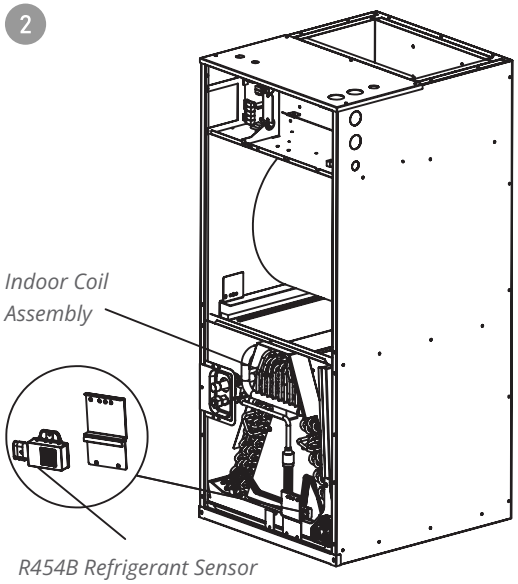
4. 6 Steps for Changing the Cabinet Orientation to Vertical Downflow or Horizontal Left Orientation

1. Remove the screws, upper side plate, lower side plate, filter cover plate, and support strip, and disconnect the refrigerant sensor on the control board
2. Cut off the zipper buckle of the refrigerant leakage sensor harness, and then unscrew the screws from the support strip and the refrigerant leakage sensor mounting plate to remove the sensor

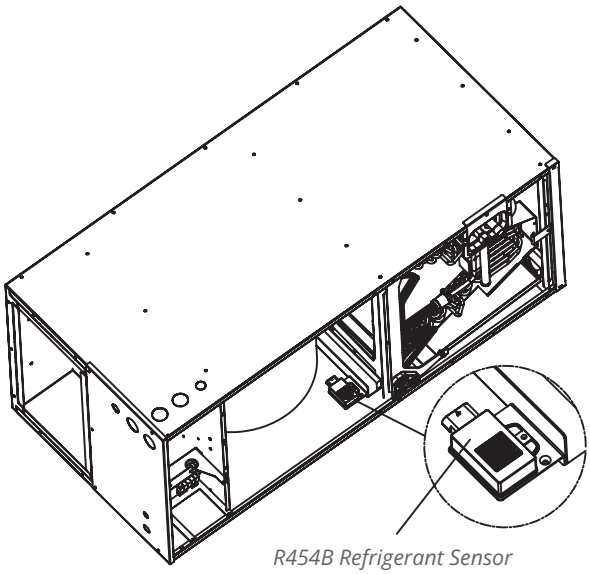
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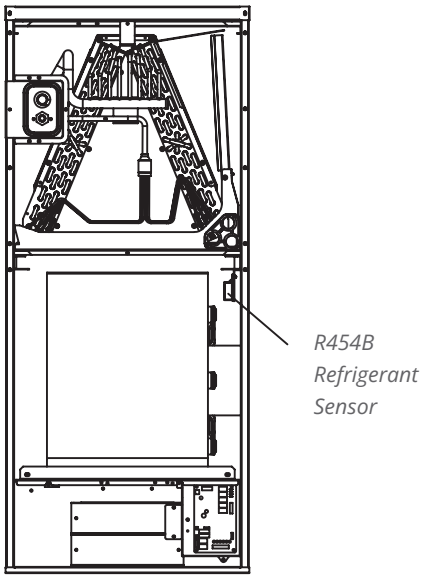


2



3. Cut off the zipper buckle of the refrigerant leakage sensor harness, and then unscrew the screws from the support strip and the refrigerant leakage sensor mounting plate to remove the sensor



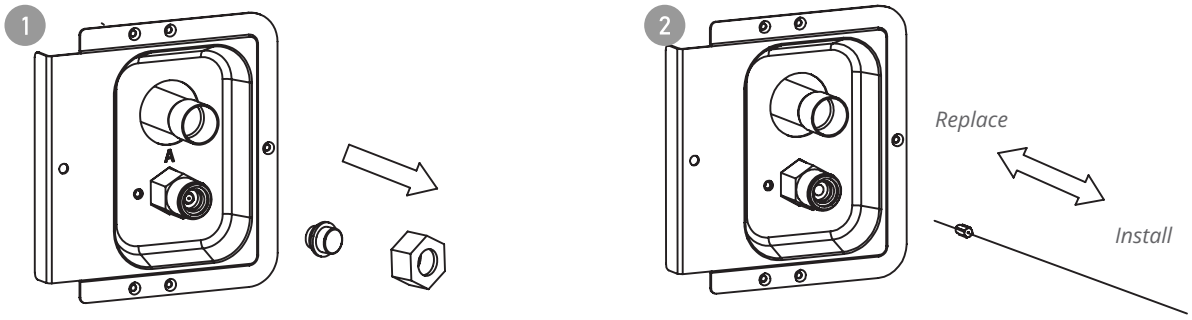


4. Cut off the zipper buckle of the refrigerant leakage sensor harness, and then unscrew the screws from the support strip and the refrigerant leakage sensor mounting plate to remove the sensor
5. Cut off the zipper buckle of the refrigerant leakage sensor harness, and then unscrew the screws from the support strip and the refrigerant leakage sensor mounting plate to remove the sensor

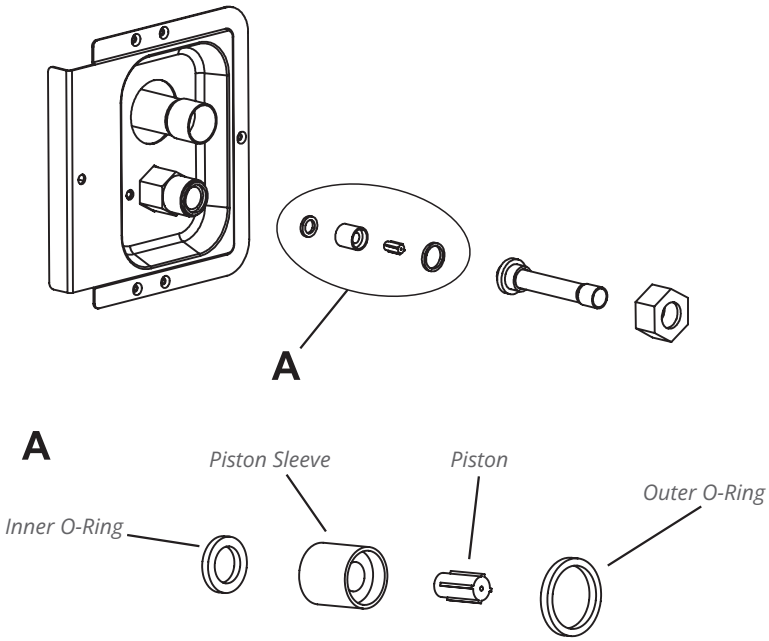
4. 7 Coil Piston Replacement & Installation

1. Use a wrench to loosen the but and pull out the rubber plug.

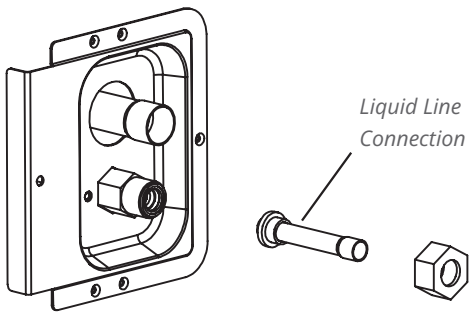
2. For the replacement installation method for the valve core.



3. Take out the inner O-ring, piston sleeve, piston, outer O-ring, and liquid line connection from the accessories, and install them in the sequence shown below. Ensure the direction is correct.



4. Cut off the zipper buckle of the refrigerant leakage sensor harness, and then unscrew the screws from the support strip and the refrigerant leakage sensor mounting plate to remove the sensor



4. 8 Refrigerant Connections

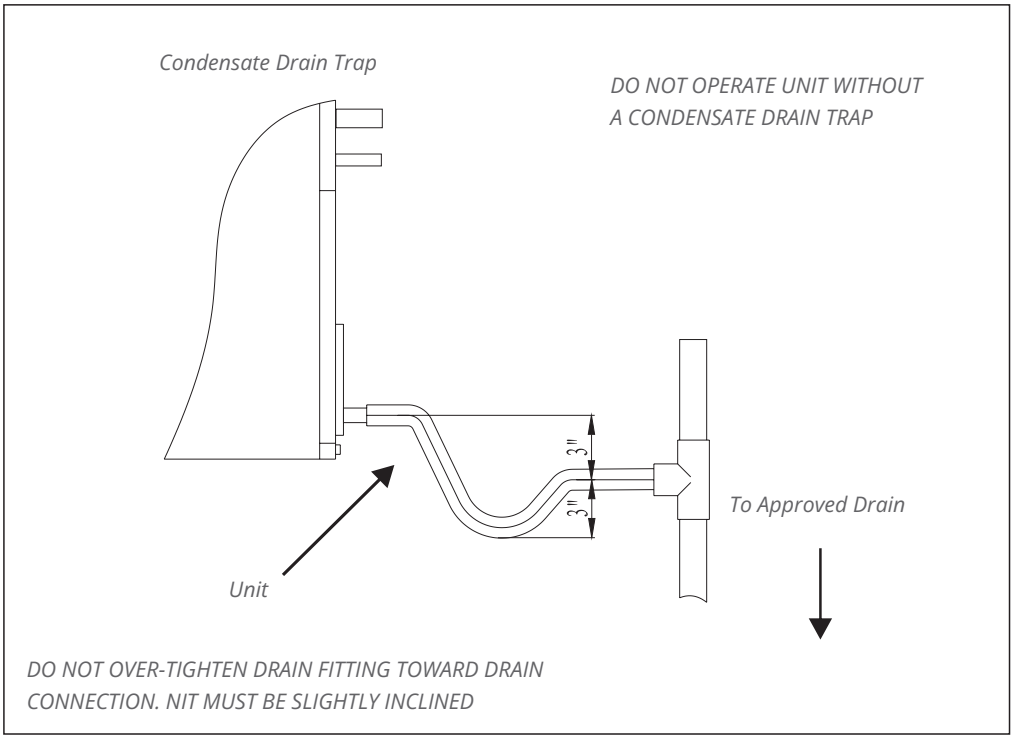
- Keep the coil connections sealed until the refrigerant connections are made. See the Installation Instructions for the Outdoor Unit for details on line sizing, tubing installation, and charging information.
- The coil is shipped with “No Charge”. Evacuate the system before charging with refrigerant.
- Install refrigerant tubing so that it does not block service access to the front of the unit.
- Nitrogen should flow through the refrigerant lines while brazing.
- Use a brazing shield to protect the cabinet’s paint and use a wet rag to protect the rubber grommet from being damaged by torch flames. After the refrigerant connections are made, seal the gap around the connections with a pressure sensitive gasket.

4. 9 Condensate Drain Tubing

IMPORTANT

1. 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.
2. When making drain fitting connections to the drain pan, **DO NOT OVER TIGHTEN**. Over tightening fittings can split the pipe connections on the drain pan.
    - Install drain lines so they do not block service access to the front of the unit. Minimum clearance of 24 inches is required for the filter, coil, or blower removal and service access.
    - Make sure the unit is level or pitched slightly toward the primary drain connection so that the water will drain completely from the pan
    - Do not reduce the drain line size less than the connection size provided on the condensate drain pan.
    - All drain lines must pitch downward away from the unit a minimum of 1/8” per foot of line for proper drainage.
    - Do not connect the condensate drain line to a closed or open sewer pipe. Run the condensate to an open drain or run a line to a safe outdoor area.
    - The drain lines should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
    - Make provisions for disconnecting and cleaning the primary drain line should it become necessary. Install a 3 inch trap in the primary drain line as close to the unit as possible. Make sure that the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.
    - The auxiliary drain line should be run to a place where it will be noticeable if it becomes operational. The homeowner should be warned that a problem exists if water begins running from the auxiliary drain line.
    - Plug the unused drain connections with the plugs provided in the parts bag using a thin layer of Teflon paste, silicone, or Teflon tape to form a water tight seal.
    - Test the condensate drain pan and drain line after installation is complete. Pour water into the drain pan, enough to fill the drain trap and line. Check to make sure the drain pan is draining completely, no leaks are found in the drain line fittings, and water is draining from the termination of the primary drain line.

Fig. 4-8 Condensate Drain Piping



Consult local codes for specific requirements.

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

⚠ WARNING ⚠

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

⚠ WARNING ⚠

Installation and servicing 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.

⚠ 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 wire only with this product.

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 circuiting or electric leakage and result in danger. Wires should be fixed well. Otherwise, the connectors may loosen or the terminal may be damaged when they are pulled.

NOTE

Electrostatic discharge can affect the electronic components. Take care during the 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.

5. 1 Power Wiring

Proper electrical power must be 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 an adequate branch circuit disconnect located in sight of and readily accessible to the unit.
- **IMPORTANT**: After the electric heater is installed, units may be equipped with one, two, or three 30/60 amp. Circuit breakers. 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 **Section 5. 4 Electrical Data** for ampacity, wire size, and circuit protector requirements. Supply circuit protective devices may be fuses or "HACR" type circuit breakers.
- Power wiring may be connected to either the right, left side, or top. Concentric knockouts are provided for connection or power wiring to the unit.

In the USA, 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).

5. 2 Control Wiring

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

- Low voltage control wiring should be 18 AWG. color-coded. For lengths longer than 100ft., use 16 AWG wire.
- See the wiring diagrams attached to the indoor and outdoor sections to be connected.
- After installation, make sure the separation of the control wiring and the power wiring has been maintained.

5. 3 Grounding

⚠ CAN CAUSE INJURY OR DEATH ⚠

The unit must be properly grounded in accordance with national and local codes. Failure to do so can result in electrical shock, personal injury, or death.

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

⚠ WARNING ⚠

Natural grounding poles embedded in the ground can be used. Do not connect the ground wire to:

- Pipes of flammable or explosive gases, which may otherwise lead to an explosion or fire.
- Insulated plastic pipes. They provide no grounding effects.
- Telephone lines or lightning rods. These will increase the ground potential during lightning strikes.

5. 4 Electrical Data

Table 5-1 Electrical Data

Model	Voltage	Herts	HP	RPM	Speeds	Circuit Amps	Maximum Circuit Protector
18K	208/230	60	1/4	710	3	1.2	3(A)
24K	208/230	60	2/7	770	3	1.4	3(A)
30K	208/230	60	1/2	1050	5	3.2	6(A)
36K	208/230	60	1/2	1050	5	3.2	6(A)
42K	208/230	60	3/4	1050	5	5.5	10(A)
48K	208/230	60	3/4	1050	5	5.5	10(A)
60K	208/230	60	3/4	1050	5	5.5	10(A)

5. 5 MCA/MOP Data for Electric Heat Kits

Table 5-2 Electric Heat Kit MCA/MOP Data

Heat Kit Model	Air Handler Model	Electric Heater (kW)	MCA(Min. Circuit Ampacity)		MOP(Max. Fuse or Breaker (HACR) Ampacity)		Fan Speed (AC/HP)				
			208V	230V	208V	230V	1(Low)	2	3	4	5(High)
**AEHFD5X1AA	18K	5	22.8	24.9	25	25	●	/	●	/	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	●	/	●	/	●
**AEHFD5X1AA	24K	5	22.8	24.9	25	25	●	/	●	/	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	●	/	●	/	●
**AEHFD10X1AA		10	45.4	49.8	50	50	●	/	●	/	●
**AEHFD5X1AA	30K	5	22.8	24.9	25	25	×	●	●	●	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	×	●	●	●	●
**AEHFD10X1AA		10	45.4	49.8	50	50	×	●	●	●	●
**AEHFD5X1AA	36K	5	22.8	24.9	25	25	×	●	●	●	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	×	●	●	●	●
**AEHFD10X1AA		10	45.4	49.8	50	50	×	●	●	●	●
**AEHFD5X1AA	42K	5	22.8	24.9	25	25	×	●	●	●	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	×	●	●	●	●
**AEHFD10X1AA		10	45.4	49.8	50	50	×	●	●	●	●
**AEHFD5X1AA	48K	5	22.8	24.9	25	25	×	●	●	●	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	×	●	●	●	●
**AEHFD10X1AA		10	45.4	49.8	50	50	×	●	●	●	●
**AEHFD5X1AA	60K	5	22.8	24.9	25	25	×	×	×	●	●
**AEHFD7X1AA		7.5	34.8	37.9	35	40	×	×	×	●	●
**AEHFD10X1AA		10	45.4	49.8	50	50	×	×	×	●	●

NOTE
Heat kits are 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.

Table 5-3 Electric Heater Kit Match-up

Model	Description	Ref. Air Handler Use
**AEHFD5X1AA	5kW heater kit,double pole circuit breaker	18/24/30/36/42/48/60
**AEHFD7X1AA	7.5kW heater kit,double pole circuit breaker	18/24/30/36/42/48/60
**AEHFD10X1AA	10kW heater kit,double pole circuit breaker	24/30/36/42/48/60

5. 6 Wiring Diagram

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

Fig. 5-1 Wiring Connection for Heat Pump Systems

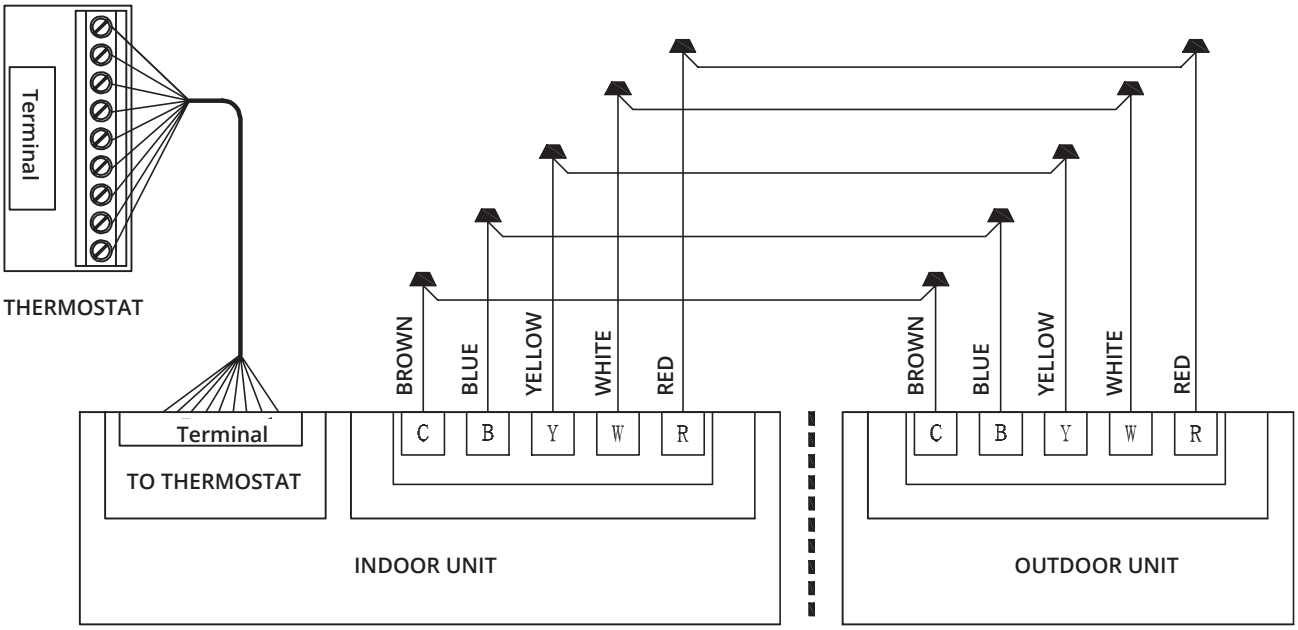


Fig. 5-2 Wiring Connection for A/C Systems

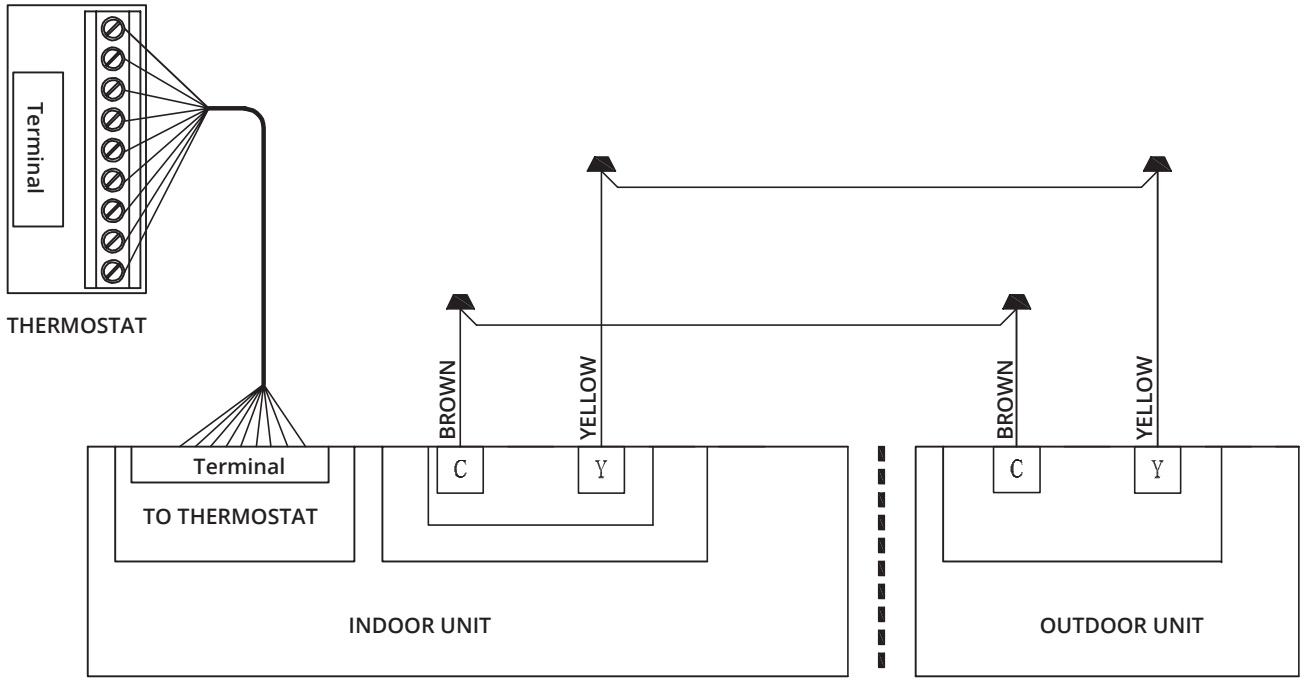
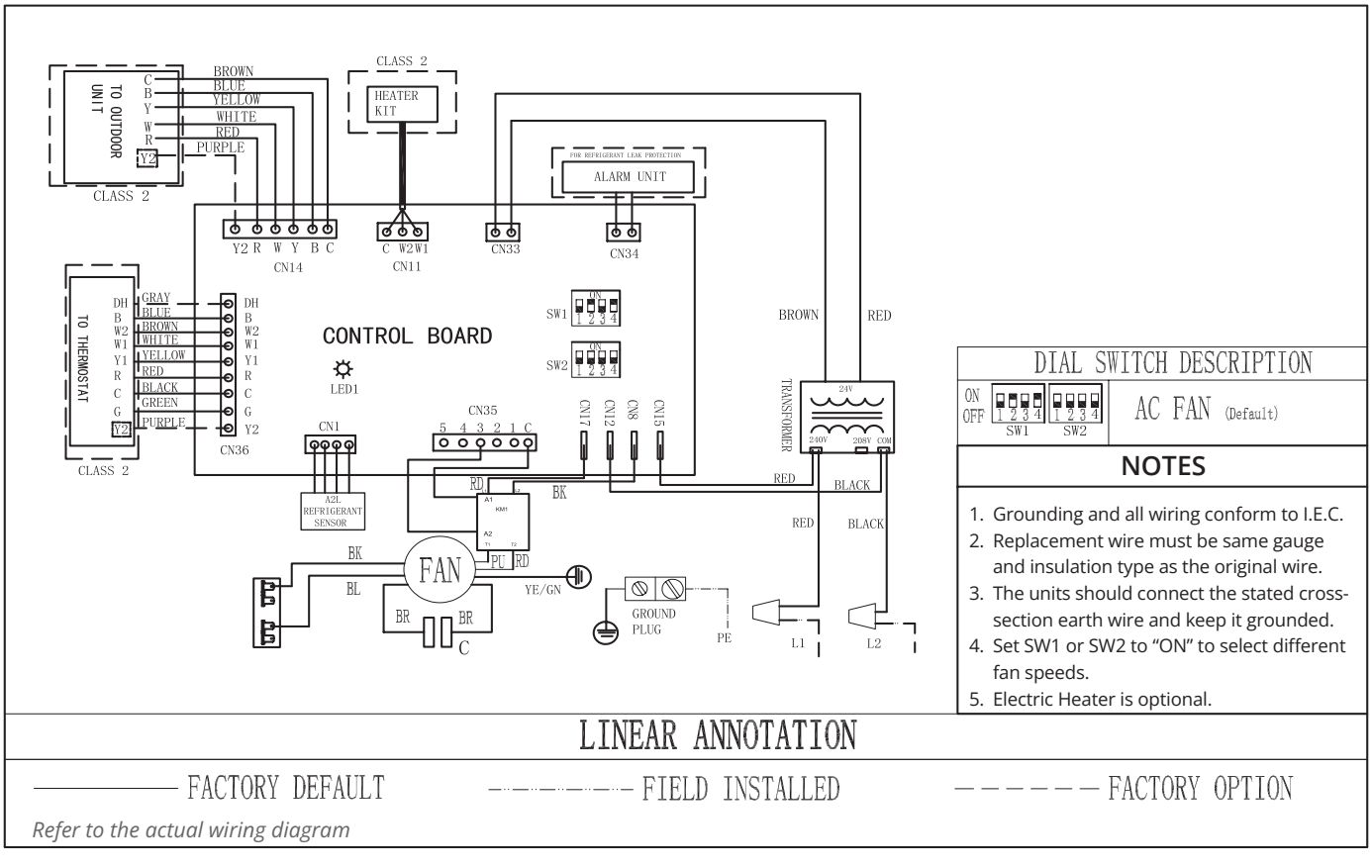
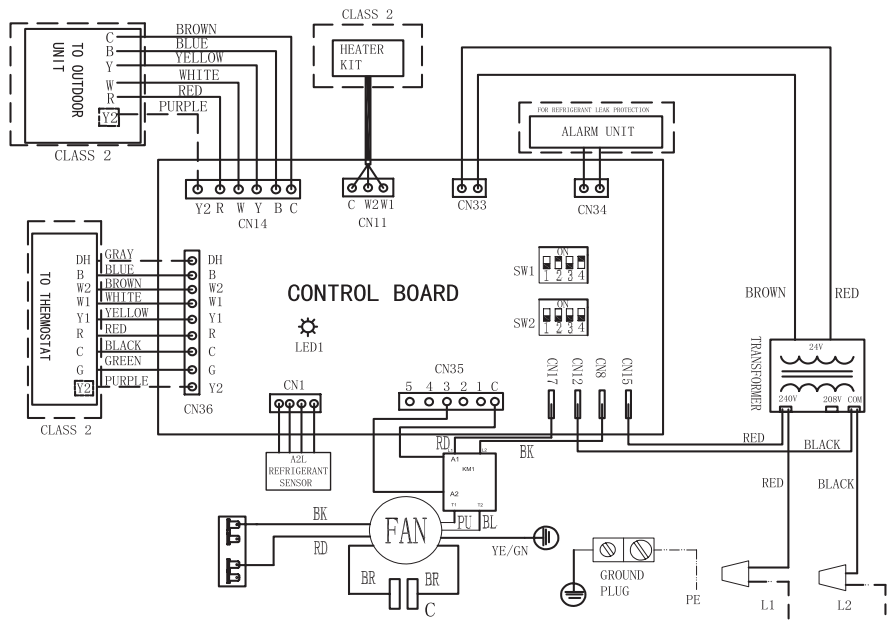


Fig. 5-3 Wiring Connection for 18K



Refer to the actual wiring diagram

Fig. 5-4 Wiring Connection for 24K



DIAL SWITCH DESCRIPTION	
ON / OFF — SW1 / SW2	AC FAN (Default)

NOTES

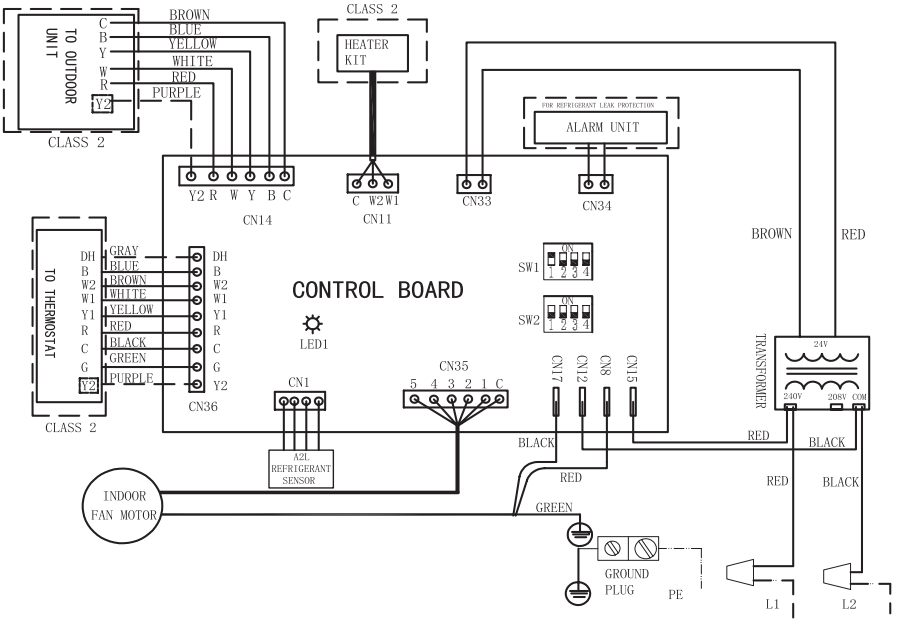
1. Grounding and all wiring conform to I.E.C.
2. Replacement wire must be same gauge and insulation type as the original wire.
3. The units should connect the stated cross-section earth wire and keep it grounded.
4. Set SW1 or SW2 to "ON" to select different fan speeds.
5. Electric Heater is optional.

LINEAR ANNOTATION

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

Refer to the actual wiring diagram

Fig. 5-5 Wiring Connection for 30K, 36K, 42K, 48K, 60K



DIAL SWITCH DESCRIPTION	
ON / OFF — SW1 / SW2	Speed 2
ON / OFF — SW1 / SW2	Speed 3
ON / OFF — SW1 / SW2	Speed 4
ON / OFF — SW1 / SW2	Speed 5

NOTES

1. Grounding and all wiring conform to I.E.C.
2. Replacement wire must be same gauge and insulation type as the original wire.
3. The units should connect the stated cross-section earth wire and keep it grounded.
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

Refer to the actual wiring diagram

Table 5-4 DIP Switches

DIP Switch	Fan Speed	Model	DIP Switch	Fan Speed	Model
ON / OFF 1234 SW1, 1234 SW2	Speed 2	18K, 24K	ON / OFF 1234 SW1, 1234 SW2	Speed 4	36K, 60K
ON / OFF 1234 SW1, 1234 SW2	Speed 3	30K	ON / OFF 1234 SW1, 1234 SW2	Speed 5	48K

NOTE

Explanation of the fan speed switch

1. **Low windshield**: The red wire of the motor is connected to the terminal block, and the blue wire is connected to the realty (swap plug positions).
2. **Medium speed wiring**: The blue wire of the motor is connected to the terminal block, and the red wire is connected to the relay (swap plug positions)

5. 7 Low Voltage Wires Connections with the Thermostat

Connect the control communication cables with wire nuts.

1. The unused wires should be insulated
2. Connect the wires with a wire nut

Note: Secure the cable after it is connected with the wire nut.

Fig. 5-6 Connecting the Control Communication Cables

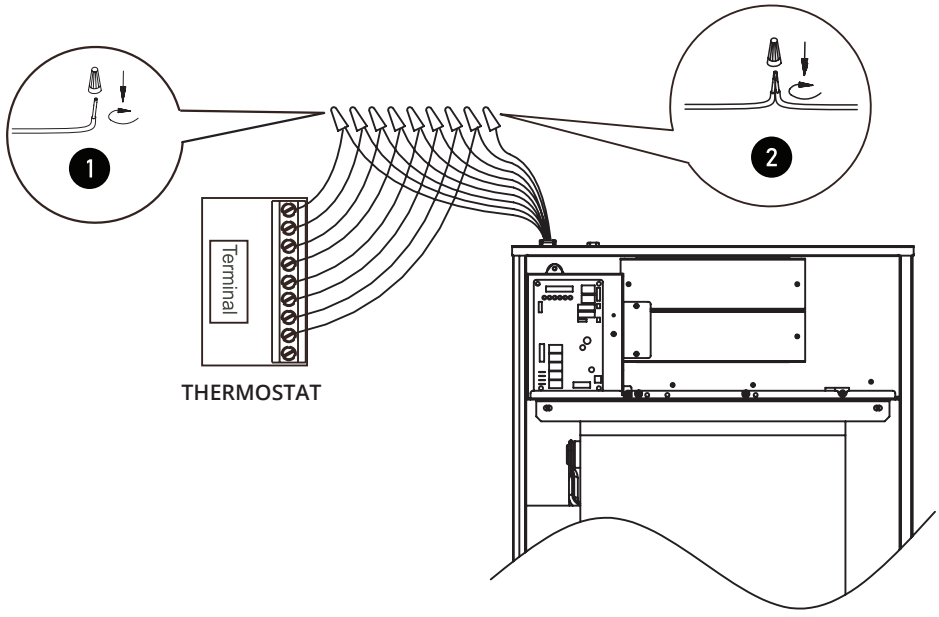
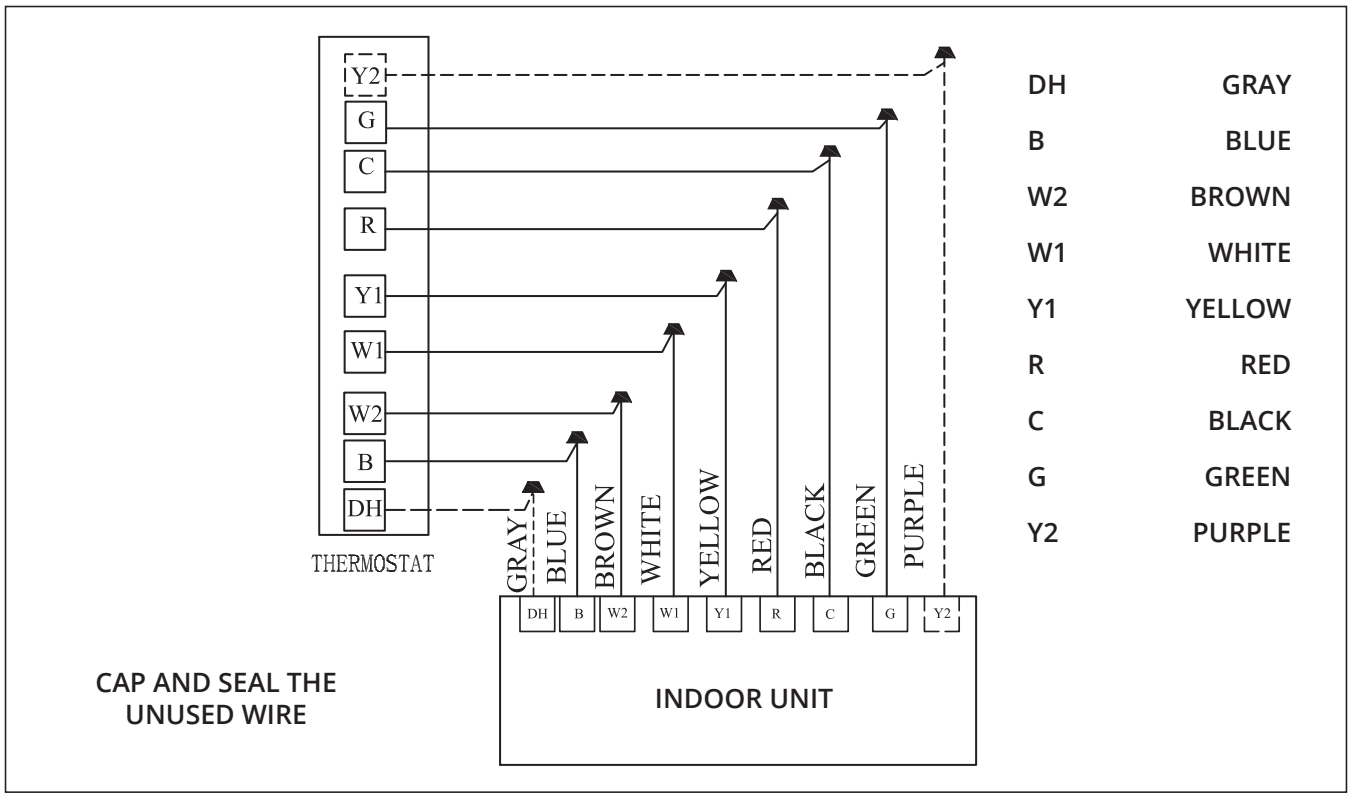


Fig. 5-7 Wiring Diagram for the Thermostat



5. 8 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. If the power wires from the unit are too long, choose the windings with larger cross-section areas to guarantee the normal power supply.

Table 5-5 Electric Wiring Gauge for Cooling Only Models

Model Cooling Only Type			18K	24K	30K	36K	42K	48K	60K
Line Gauge	Indoor Unit Power Line	Line Quantity	3	3	3	3	3	3	3
		Line Diameter (AWG)	16	16	16	16	16	16	16
	Outdoor Unit Power Line	Line Quantity	3	3	3	3	3	3	3
		Line Diameter (AWG)	14	14	12	12	10	10	8
	Indoor Thermostat Signal Line	Line Quantity	5	5	5	5	5	5	5
		Line Diameter (AWG)	18	18	18	18	18	18	18
	Outdoor Thermostat Signal Line	Line Quantity	2	2	2	2	2	2	2
		Line Diameter (AWG)	18	18	18	18	18	18	18

Table 5-6 Electrical Wiring Gauge for Cooling & Heat Models

Model Cooling & Heat Type			18K	24K	30K	36K	42K	48K	60K
Line Gauge	Indoor Unit Power Line	Line Quantity	3	3	3	3	3	3	3
		Line Diameter (AWG)	16	16	16	16	16	16	16
	Outdoor Unit Power Line	Line Quantity	3	3	3	3	3	3	3
		Line Diameter (AWG)	14	14	12	12	10	10	8
	Indoor Thermostat Signal Line	Line Quantity	5	5	5	5	5	5	5
		Line Diameter (AWG)	18	18	18	18	18	18	18
	Outdoor Thermostat Signal Line	Line Quantity	5	5	5	5	5	5	5
		Line Diameter (AWG)	18	18	18	18	18	18	18

The air filter does not come factory installed. An external filter or other means of filtration is required.

Units should be sized for a maximum of 300 feet/min. air velocity or whatever is recommended for the type of filter installed.

Filter application and placement are critical to the airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as the motor, limits, elements, heat relays, evaporator coil, or compressor. Consequently, we recommend that the return air duct system have only one filter location. For systems with a return air filter grill or multiple filter grills, you can install a filter at each of the return air openings.

If adding high efficiency filters or electronic air filtration systems, it is very important that the air flow is not reduced. If the air flow is reduced, the overall performance and the efficiency of the unit will be reduced. It is strongly recommended that a professional installation technician is contacted to ensure that these filtration systems are installed correctly.

IMPORTANT

DO NOT DOUBLE FILTER THE RETURN AIR DUCT SYSTEM. DO NOT FILTER THE SUPPLY AIR DUCT SYSTEM. THIS WILL CHANGE THE PERFORMANCE OF THE UNIT AND REDUCE AIRFLOW.

⚠ WARNING ⚠

- Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers.
- Any circulated dust particles could be heated and charred by contact with the air handler elements. This residue could soil ceilings, walls, drapes, carpets, and other articles in the house.
- Soot damage may occur with filters in place, when certain types of candles, oil lamps, or standing pilots are burned.

6. 1 Filter Installation Dimensions

Note: The thickness of the filter should be within 1" [25mm].

Fig. 6-1 External Filter Base

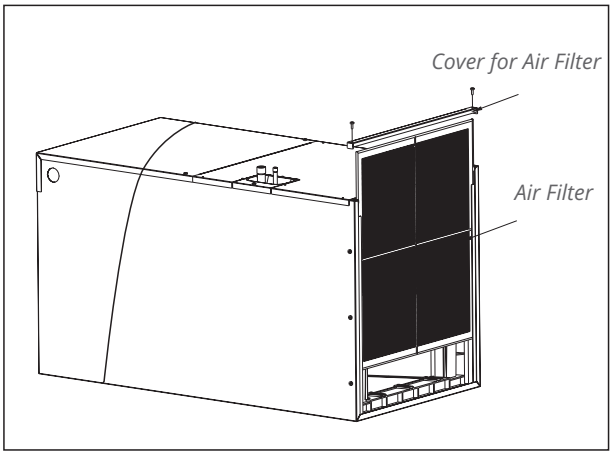


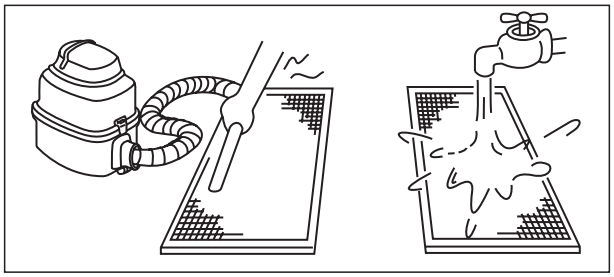
Table 6-1 Air Filter Dimensional Data

Model	Filter Size in[mm]
18/24/30/36/42	18.1×21.4[460×544]
48/60	20.5×23.8[521×605]

6. 2 Air Filter Removal

1. Take off the cover for the air filter.
2. Hold the edge of the air filter and pull it out.
3. Clean the air filter. A vacuum cleaner or pure water may be used to clean the air filter. If the dust accumulation is too much, use a soft brush and mild detergent to clean the filter. Dry it in a cool place.

Fig. 6-2 Air Filter Cleaning Methods



7. Airflow Performance

Airflow performance data is based on cooling performance with a coil and no filter in place. Select the performance table for the appropriate unit size below.

External static applied to the unit allows operation within the minimum and maximum limits shown in the table below for both cooling and electric heat operations.

Table 7-1 Airflow Performance Data

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	887	838	772	683	618	550	507	/	/
	M-Factory Default	1086	1041	993	932	823	749	673	587	529
	H	1134	1090	1039	982	869	784	704	614	528
24K	L-Factory Default	1127	1082	1028	973	856	761	679	574	526
	M	1193	1144	1092	1031	897	803	717	622	531
	H	1292	1240	1185	1120	1037	885	787	693	553
30K	2	1131	1074	1012	950	893	836	779	727	679
	3-Factory Default	1245	1197	1145	1093	1045	983	917	865	817
	4	1359	1316	1270	1226	1183	1131	1074	1007	945
	5	1449	1411	1368	1325	1287	1245	1197	1126	1059
36K	2	1131	1074	1012	950	893	836	779	727	679
	3	1245	1197	1145	1093	1045	983	917	865	817
	4-Factory Default	1359	1316	1270	1226	1183	1131	1074	1007	945
	5	1449	1411	1368	1325	1287	1245	1197	1126	1059
42K	2	1298	1257	1216	1162	1107	1011	961	918	873
	3-Factory Default	1451	1414	1379	1344	1301	1254	1217	1085	1005
	4	1588	1550	1512	1476	1440	1402	1368	1202	1035
	5	1730	1695	1660	1611	1562	1484	1410	1224	1037
48K	2	1404	1360	1316	1267	1219	1170	1136	1051	964
	3	1585	1544	1503	1467	1431	1388	1344	1288	1231
	4-Factory Default	1730	1689	1655	1621	1587	1549	1514	1457	1416
	5	1887	1852	1815	1780	1745	1707	1681	1599	1517
60K	2	1404	1360	1316	1267	1219	1170	1136	1051	964
	3	1585	1544	1503	1467	1431	1388	1344	1288	1231
	4-Factory Default	1730	1689	1655	1621	1587	1549	1514	1457	1416
	5	1887	1852	1815	1780	1745	1707	1681	1599	1517

NOTE

1. The advanced airflow must be used as the rated airflow for the full load operation of the machine
2. The rated airflow of a system without an electric heater kit requires 300 to 450 cubic feet of air per minute (CFM)
3. The rated airflow of a system with an electric heater kit requires 350 to 450 cubic feet of air per minute (CFM)
4. The air distribution system has the greatest influence on air flow. Therefore, the contractor should only use the procedures recognized by the industry.
5. The design and construction of air ducts should be done carefully. Poor design or process will lead to a significant decline in system performance.
6. The air supply duct should be set along the periphery of the air conditioned space with appropriate sizing. Improper location of insufficient airflow may lead to insufficient ventilation or noise in the pipeline system.
7. The installer should balance the air distribution system to ensure that all rooms have proper quiet airflow. The speedometer or airflow hood can be used to balance and verify the branch pipe and system airflow (CFM)

IMPORTANT

1. When model 36 is used with electrical heater kit model HR 150-01, you need to ensure that the air volume is not less than 1100 CFM
2. When model 42 is used with electrical heater kit model HR 150-01 and HR 200-01, you need to ensure that the air volume is not less than 1280 CFM
3. When model 48 is used with electrical heater kit model HR 150-01 and HR 200-01, you need to ensure that the air volume is not less than 1415 CFM

MULTI-POS. AIR HANDLER

			**AEAMPSF-18C21AA	**AEAMPSF-24C21AA	**AEAMPE-F30C21AA	**AEAMPEF-36C21AA	**AEAMPE-F42C21AA	**AEAMPE-F48E21AA	**AEAMPE-F60E21AA
Power Supply			208-230V/1N/60Hz	208-230V/1N/60Hz	208-230V/1N/60Hz	208-230V/1N/60Hz	208-230V/1N/60Hz	208-230V/1N/60Hz	208-230V/1N/60Hz
Min. Circuit Amp.		AMPS	2.1	2.4	4.5	4.5	7.2	7.2	7.2
Max. Overcurrent Protection		AMPS	33		66		10	10	10
Motor	Type		PSC	PSC	ECME	CM	ECM	ECME	CM
	Capacitor	uF	61	0	/////				
	Rated HP		1/4	1/3	1/2	1/2	3/4	3/4	3/4
	Rated RPM	r/min	830	910	960	1000	1040	1010	1010
Blower	Diameter	inch	11	11	11	11	11	11	11
	Width	inch	11	11	11	11	11	11	11
Indoor Coil Type			Φ7 inner grooved copper tube and hydrophilic aluminum fin						
Indoor Air Flow			700	725	1000	1050	1200	1550	1500
Sound Pressure Level		dB(A)5	35	35	35	55	45	75	7
Refrigerant Leakage Sensor			Installed	Installed	Installed	Installed	Installed	Installed	Installed
Indoor Unit	Dimension (WxHxD)	inch	19-5/8x45-3/4x22	19-5/8x45-3/4x22	19-5/8x45-3/4x22	19-5/8x45-3/4x22	19-5/8x45-3/4x22	22x53-1/8x24-1/2	22x53-1/8x24-1/2
	Packing(WxHxD)	inch	22-5/6x47-5/8x25-3/5	22-5/6x47-5/8x25-3/5	22-5/6x47-5/8x25-3/5	22-5/6x47-5/8x25-3/5	22-5/6x47-5/8x25-3/5	27-3/4x54-8/9x25-1/5	27-3/4x54-8/9x25-1/5
	Net / Gross Weight	lbs	120/133	128/141	129/142	129/142	131/144	163/183	170/190
Refrigerant Control			Orifice	Orifice	Orifice	Orifice	Orifice	Orifice	Orifice
Refrigerant Connection Valve	Liquid Side	inch	3/8	3/8	3/8	3/8	3/8	3/8	3/8
	Gas Side	inch	3/4	3/4	3/4	3/4	3/4	7/8	7/8
Shipping per SDT40HQ			144	144	144	144	144	102	102

A-SERIES MULTI-POSITION AIR HANDLER

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The design and specifications of this product and/or manual are subject to change without prior notice. Consult with the manufacturer for details.