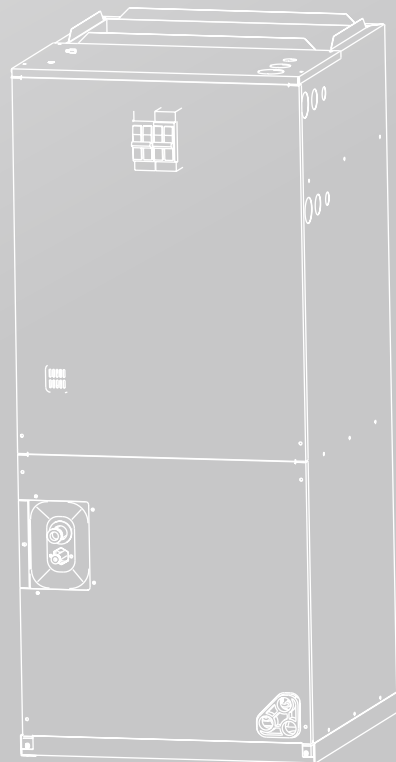


INSTALLATION AND OPERATION MANUAL

High Efficiency Air Handlers
1.5-5 Tons Capacity | R454B



Please read this manual carefully and keep it for future reference.
All the pictures in this manual are for illustrations purpose only.

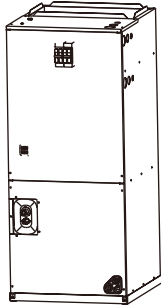


RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

WARNING

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instruction may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

Air Handler Features



GREATER ECONOMY

- High heat transfer efficiency and low static pressure drop “A” shaped coil.
- Foil faced insulation to prevent energy loss through the cabinet.
- Multi-Stage blower Speed Control to match different capacity demand better.

GREATER CONVENIENT

- 4-position installation: Upflow, Horizontal Right and Downflow, Horizontal Left.
- Horizontal and vertical condensate drain pans standard, primary and secondary condensate fittings.
- Field-installed electric heater kits 5, 7.5, 10, 15, 20 kW available as an accessory.
- Multiple electrical entry locations.
- Integrated filter rack with tool-less door access.
- The connection of evaporator is copper, easy to braze.

GREATER RELIABLE

- All-aluminium heat exchanger to ensure long-life operation.
- Advanced internal welding process to reduce potential difference corrosion.
- Polymer condensate drain pan with UVC inhibitor to improve anti-aging effect.
- Fully-insulated cabinet design.
- R454B refrigerant sensor is configured to ensure safe operation.
- R454B refrigerant sensor is factory-installed, more rooms are available for installation.

CONTENTS

1 ABOUT THE DOCUMENTATION	
• 1.1 About this document.....	01
• 1.2 Safety instructions	02
2 SAFETY WARNING	
• 2.1 Safety precautions.....	04
• 2.2 Electric safety requirements	04
• 2.3 Safety precaution about the appliances using flammable refrigerant	05
3 ABOUT THE PRODUCT	
• 3.1 Unit dimensions	12
• 3.2 Parts introduction	13
• 3.3 Attached fittings.....	14
• 3.4 Refrigerant sensor	14
4 INSTALLATION	
• 4.1 Installation instructions	15
• 4.2 Vertical upflow	18
• 4.3 Vertical downflow	18
• 4.4 Horizontal.....	18
5 REFRIGERANT LINE.....	21
6 AIRFLOW PERFORMANCE	22
7 ABOUT THE AIR FILTER	
• 7.1 Air filter (not factory-installed).....	25
• 7.2 Filter installation dimensions	25
8 DRAIN PIPE INSTALLATION	26
9 ELECTRICAL WIRING	
• 9.1 Electrical characteristics	28
• 9.2 Wiring diagram	29
• 9.3 Wiring	30
10 ERROR CODES	
• 10.1 Error codes and definitions.....	39
• 10.2 Operating status codes and definitions (non-error)	42
11 SETTINGS	43

1 ABOUT THE DOCUMENTATION

1.1 About this document

NOTICE

Make sure that the user has the printed documentation and ask him/her to keep it for future reference.

Target audience

Authorised installers + end users

NOTICE

This appliance is intended to be used by expert or trained users in shops, in light industry, and on farms, or for commercial and household use by lay persons.

⚠ WARNING

Please thoroughly read and ensure that you fully understand the safety precautions (including the signs and symbols) in this manual, and follow relevant instructions during use to prevent damage to health or property.

⚠ CAUTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning 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.

Documentation set

This document is part of a documentation set. The complete set consists of:

- General safety precautions:
 - Safety instructions that you must read before installing
- Indoor unit installation and operation manual:
 - Installation and operation instructions
- Repeater installation and operation manual:
 - Installation and operation instructions
- Controller installation and operation manual:
 - Installation and operation instructions

Please refer to the product manual for other accessories.

Technical engineering data

Latest revisions of the supplied documentation may be available via your dealer.

The original documentation is written in English. All other languages are translations.

If it is necessary to take precautions during installation of the appliance, appropriate details shall be given.

For appliances marked with different RATED VOLTAGES or different RATED FREQUENCIES (separated by a /), instructions shall be included to indicate to the user or installer what action must be taken to adjust the appliance for operation at the required RATED VOLTAGE or RATED FREQUENCY.

Compliance is checked by inspection.

If a STATIONARY APPLIANCE is not fitted with a SUPPLY CORD and a plug, or with other means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under over voltage category III conditions, the instructions shall state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Compliance is checked by inspection.

The instructions for BUILT-IN APPLIANCES shall include information with regard to the following:

- dimensions of the space to be provided for the appliance;
- dimensions and position of the means for supporting and fixing the appliance within this space;
- minimum distances between the various parts of the appliance and the surrounding structure;
- minimum dimensions of ventilating openings and their correct arrangement; connection of the appliance to the supply mains and the interconnection of any separate components;
- necessity to allow disconnection of the appliance from the supply after installation, unless the appliance incorporates a switch complying with 24.3. The disconnection may be achieved by having the plug accessible or by incorporating a switch in the fixed wiring in accordance with the wiring rules.

Compliance is checked by inspection.

For appliances with TYPE x ATTACHMENT having a specially prepared cord, the instructions shall contain the substance of the following:

If the SUPPLY CORD is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

For appliances with TYPE Y ATTACHMENT, the instructions shall contain the substance of the following.

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

For appliances with TYPE Z ATTACHMENT, the instructions shall contain the substance of the following.

The SUPPLY CORD cannot be replaced. If the cord is damaged the appliance should be scrapped.

Compliance is checked by inspection.

If a NON-SELF-RESETTING THERMAL CUT-OUT is required in order to comply with the standard then the instructions for appliances incorporating a NON-SELF-RESETTING THERMAL CUT-OUT that is reset by disconnection of the supply mains shall contain the substance of the following:

⚠ CAUTION

In order to avoid a hazard due to inadvertent resetting of the THERMAL CUT-OUT, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

Compliance is checked by inspection.

The instructions for **FIXED APPLIANCES** shall state how the appliance is to be fixed to its support. The method of fixing stated is not to depend on the use of adhesives since they are not considered to be liable fixing means.

Compliance is checked by inspection.

1.2 Safety instructions

Please thoroughly read and ensure that you fully understand the safety precautions (including the signs and symbols) in this manual, and follow relevant instructions during use to prevent damage to health or property.

Safety signs

⚠ DANGER

indicates a hazardous situation which, if not avoided, will result in death or serious injury

⚠ WARNING

indicates a hazardous situation which, if not avoided, could result in death or serious injury

⚠ CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury

NOTICE

is used to address practices not related to physical injury

SAFETY INSTRUCTIONS

safety instruction (or equivalent) signs indicate specific safety-related instructions or procedures

Symbols

	WARNING	This symbol shows that this appliance used a 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 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 manual should be read carefully.
	CAUTION	This symbol shows that only a competent service personnel should be handling this equipment with reference to the technical manual.
	CAUTION	This symbol shows that information is available such as the operating manual or installation manual.

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants might not contain an odour.

Competence of service personnel

WARNING

Risk of Fire. Flammable Refrigerant Used.
Installation, repair, maintenance, decommission and disposal Should Be Performed Only By Trained and Certified Service Personnel.

Information of procedures additional to usual information for refrigerating appliance installation, repair, maintenance and decommission procedures is required when an appliance with FLAMMABLE REFRIGERANTS is affected.

The training of these procedures is carried out by national training organisations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation.

The achieved competence should be documented by a certificate.

Transportation, marking and storage for units that employ flammable refrigerants



WARNING

The unit employs FLAMMABLE REFRIGERANT R454B.

1. General

The following information is provided for units that employ FLAMMABLE REFRIGERANTS.

2. Transport

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing 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.

3. Marking of equipment using signs

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.

4. Disposal of equipment using flammable refrigerants

See national regulations.

5. Storage of equipment

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

6. Storage of packed (unsold) equipment

Storage package protection should be constructed in 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.

2 SAFETY WARNING

WARNING CONTENTS



Ensure Proper
Earthing



Professional Only

PROHIBITION SIGNS



No Laying
Inflammable Thing



No Strong Currents



No Open Flame;
Fire, Open Ignition
Source and Smoking
Prohibited



No Acid or
Alkali Materials

2.1 Safety precautions

DANGER

In the event of refrigerant leakage, smoking and open flames are prohibited. Disconnect the main power switch immediately, open windows to allow ventilation, keep away from the leakage point, and contact your local dealer or technical support to request a professional repair.

WARNING

Air conditioner installation must comply with local standards and electrical codes, and relevant instructions in this manual.

The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.

The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).

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

Do not use any liquid cleanser, liquefied cleanser, or corrosive cleanser to wipe this unit or spray water or other liquids on the unit. Otherwise, the plastic parts of the unit will become damaged and an electrical shock may occur. Disconnect the main power switch before cleaning and maintenance to avoid accidents.

Ask a professional to remove and reinstall the air conditioner.

Ask a professional for maintenance and repair assistance.

CAUTION

Cleaning and user maintenance shall not be made by children without supervision.

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

When the product is used for commercial application. This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

The sound pressure level is below 70 dB(A).

LEAK DETECTION SYSTEM installed. Unit Must be powered except for service.

2.2 Electric safety requirements

WARNING

The air conditioner shall be installed according to the local wiring specifications. Wiring work must be completed by qualified electricians.



The air conditioner must be well earthed. Specifically, the main switch of the air conditioner must have a reliable earthing cable.

Before contacting wiring devices, cut off all the power supplies.

The user MAY NOT disassemble or repair the air conditioner. Doing so can be dangerous. In the event of a fault, immediately cut off the power and contact your local dealer or technical support.

A separate power supply that meets the rated parameter values must be provided for the air conditioner.

The fixed wiring to which the air conditioner is connected must be equipped with a power cut-off device that meets the wiring requirements.

The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection.

The specifications of the fuse are printed on the circuit board.

NOTICE: For the units with R454B refrigerant, only the blast-proof ceramic fuse can be used.



CAUTION

Under no circumstances should the earth wires of the power supply system be disconnected.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Do not use a damaged power supply cable and replace it if it is damaged.

When the air conditioner is used for the first time or is in a power-off state for a long time, it needs to be connected to the power supply and warmed up for at least 12 hours before use.



2.3 Safety precaution about the appliances using flammable refrigerant

WARNING

The following precautions should be complied with when installation, service, maintenance and repair, and decommissioning of appliances using flammable refrigerant.

General

This appliance employed **A2L** flammable refrigerant R454B.

Symbols

Refer to the previous section.

Installation

WARNING

Every working procedure that affects safety means shall only be carried out by competent personnel.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

1. General

WARNING

Pipe-work shall be in compliance with national and local codes and standards.

The pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed;

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements;

The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

- field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected;
- taking into consideration the length and diameter of the connecting refrigerant piping, add refrigerant to complete the installation according to the information provided on the label for determining the required additional refrigerant charge, as well as the instructions in this manual on how to complete the refrigerant charge.

The minimum INSTALLED HEIGHT h_{inst} shall comply with the corresponding requirements in this manual.

Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;

Provision shall be made for expansion and contraction of long runs of piping;

WARNING

This appliance contains FLAMMABLE REFRIGERANTS, the minimum floor area of the room shall comply with the requirements in the "Required Minimum Room Area" table within this manual;

A REFRIGERANT DETECTION SYSTEMS is installed. The unit must be powered except for service.

REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS Shall Only be replaced with sensors specified by the appliance manufacture.

The detailed information on the following topics is included in the manual:

- function, operation and required servicing measures;
- specified end-of-life and replacement instructions;
- other information about REFRIGERANT DETECTION SYSTEMS.

2. Unventilated areas

The appliance contains more than m1 for any refrigerating circuit, an unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

SAFETY INSTRUCTIONS

False ceilings or drop ceilings may be used as a return air plenum if a REFRIGERANT DETECTION SYSTEM is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint.

Information on servicing

1. General

CAUTION

Servicing shall be performed only by trained and certified service personnel.

2. Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, Clause "Work procedure" to Clause "No ignition sources" shall be completed prior to conducting work on the system.

3. Work procedure

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

4. General work area

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

5. Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. 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.

6. Presence of fire extinguisher

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

7. No ignition sources

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

8. Ventilated area

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

9. Checks to the refrigerating equipment

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

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

- *the 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 being used, the secondary circuit shall be checked for the presence of refrigerant;*
- *marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;*
- *refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.*

10. Checks to electrical devices

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

Initial safety checks shall include:

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

Repairs to sealed components

WARNING

Sealed electrical components shall be replaced.

Repair to intrinsically safe components

WARNING

Intrinsically safe components must be replaced.

Cabling

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

Detection of flammable refrigerants

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

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of **flammable refrigerants**, the sensitivity can be inadequate, or can need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the **LFL** of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

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

NOTE Examples of leak detection methods are

- bubble method,
- fluorescent agent method.

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

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause "Refrigerant removal and circuit evacuation".

Refrigerant removal and circuit evacuation

CAUTION

Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

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 (optional for A2L);
- evacuate (optional for A2L);
- continuously flush with inert gas when using flame to open circuit;
- open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national 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 (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). 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.

CAUTION

An inert gas, specifically, is dry oxygen free nitrogen(OFN).

The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times.

CAUTION

This operation is absolutely vital if brazing operations on the pipework are to take place.

Charging procedures

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

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the **refrigerating system** is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already labelled).
- Extreme care shall be taken not to overfill the refrigerating 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.

Decommissioning

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

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure, ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that the cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with instructions.
- h) Do not overfill cylinders (no more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing **flammable refrigerants**, ensure that there are labels on the equipment stating the equipment contains **flammable refrigerant**.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so 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 valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the **flammable refrigerant**. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

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 make 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.

Refrigerant charge amount 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 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.

NOTICE

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 appliances serving one or more rooms with an air duct system).

TA: The total area of the conditioned space connected by air ducts.

h0 : h0 is the release height, the vertical distance from the floor to the point of release when the appliance is installed.

mREL: refrigerant releasable charge in oz/kg, used for Refrigerant shut-off device.

Qmin: minimum CIRCULATION AIR FLOW circulated to the total conditioned space.

WARNING

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.

The room area calculation requirements

For determination of room area (A) when used to calculate the refrigerant charge limit, the following shall apply.

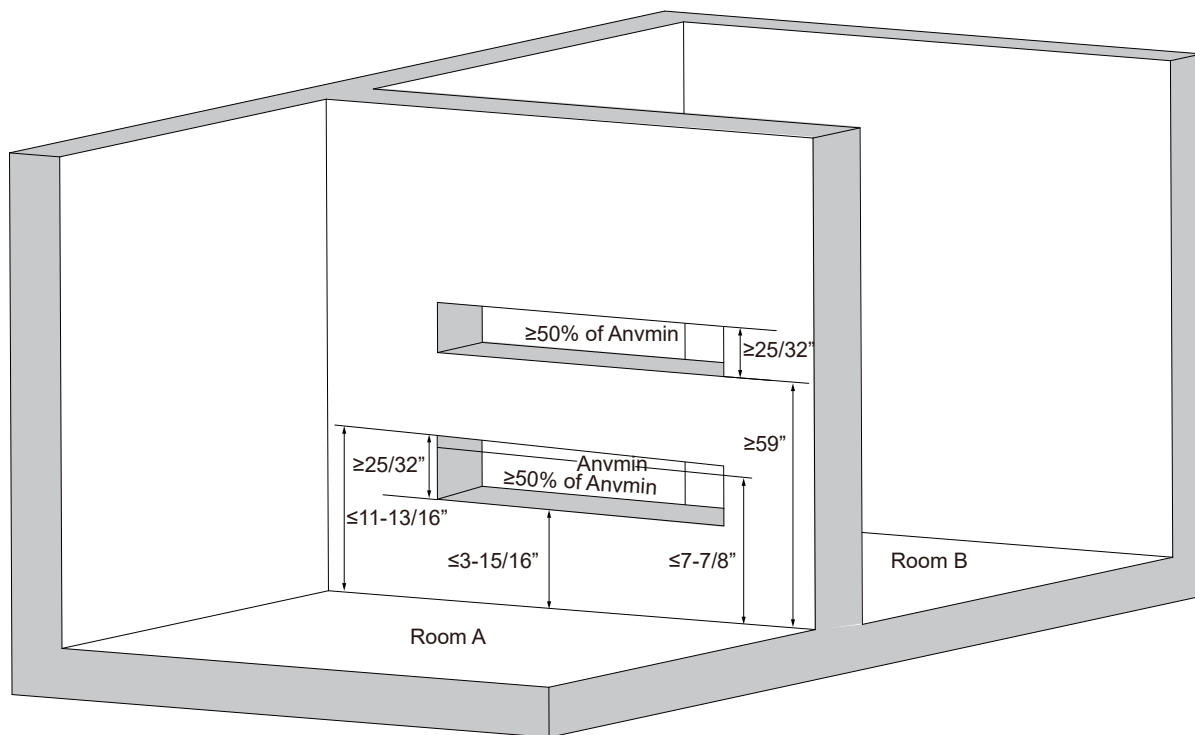
The room area (A) shall be defined as the room area enclosed by the projection to the base of the walls, partitions and doors of the space in which the appliance is installed.

Spaces connected by only drop ceilings, ductwork, or similar connections shall not be considered a single space.

Units mounted higher than 70-55/64 inches and spaces divided by partition walls that are no higher than 62-63/64 inches shall be considered a single space. Rooms on 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 between the wall and the floor, can be considered a single room when determining compliance to Amin, provided all of the following conditions are met as shown in the figure below.



Opening conditions for connected rooms

1. Low level opening

- ① The opening shall not be less than Anv_{min} which is 0.012 m²(0.13 ft²) for enhanced tightness refrigerating systems.
- ② The area of any openings above 11-13/16 inches from the floor shall not be considered in determining compliance with Anv_{min} .
- ③ At least 50 % of the opening area of Anv_{min} 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. High level opening

- ① The opening shall not be less than 50 % of Anv_{min} .
- 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. Room size requirement

The room into which refrigerant can leak, plus the connected adjacent room(s) shall have a total area not less than A. A is shown in the table below.

Our units meet the requirements for enhanced tightness refrigerating systems using A2L refrigerants.

The minimum room area of operating or storage should be as specified in the following table:

The allowed maximum refrigerant charge: Determine the maximum refrigerant limit for the system based on the area and height of the room where the indoor unit is installed. First, determine the area A and effective height H_e of each room where the indoor unit is installed, then refer to the table below to find the maximum allowable system refrigerant amount for each room.

For example, a system with one outdoor unit and three indoor units: Indoor unit A is installed in a room with an area of 13.9 m²(150 ft²) and a height of 2.8 m(9.2 ft), indoor unit B is installed in a room with an area of 10.7 m² (115 ft²) and a height of 2.2 m(7.2 ft), and indoor unit C is installed in a room with an area of 9.3 m²(100 ft²) and a height of 2.2 m(7.2 ft). Referring to the table below, the maximum allowable refrigerant amount for the room with indoor unit A is 5.14 kg(11.36 lb), for the room with indoor unit B is 3.32 kg(7.33 lb), and for the room with indoor unit C is 3.02 kg(6.66 lb). Therefore, the maximum allowable refrigerant amount for the system is 3.02 kg (6.66 lb). [$m_{max} = \min(m_A, m_B, m_C)$]

The allowable maximum refrigerant charge for R454B indoor unit are listed in the following table.

A/TA		m_{max}											
		$H_e=a$		$H_e=b$		$H_e=c$		$H_e=d$		$H_e=e$		$H_e=f$	
m ²	ft ²	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
0.9	10	0.5	1.2	0.4	0.9	0.3	0.7	0.3	0.6	0.2	0.6	0.2	0.5
1.9	20	1.0	2.4	0.8	1.8	0.6	1.5	0.6	1.3	0.5	1.2	0.4	1.0
2.8	30	1.6	3.6	1.2	2.7	1.0	2.2	0.9	2.0	0.8	1.8	0.7	1.6
3.7	40	2.1	4.8	1.6	3.6	1.3	3.0	1.2	2.6	1.0	2.4	0.9	2.1
4.6	50	2.7	6.0	2.0	4.5	1.7	3.7	1.5	3.3	1.3	3.0	1.2	2.7
5.6	60	3.2	7.2	2.4	5.4	2.0	4.5	1.8	4.0	1.6	3.6	1.4	3.2
6.5	70	3.8	8.4	2.8	6.3	2.4	5.3	2.1	4.6	1.9	4.2	1.7	3.8
7.4	80	4.3	9.7	3.2	7.2	2.7	6.0	2.4	5.3	2.1	4.8	1.9	4.3
8.4	90	4.9	10.9	3.7	8.1	3.0	6.8	2.7	6.0	2.4	5.4	2.2	4.9
9.3	100	5.4	12.1	4.1	9.0	3.4	7.5	3.0	6.6	2.7	6.0	2.4	5.4
10.2	110	6.0	13.3	4.5	10.0	3.7	8.3	3.3	7.3	3.0	6.6	2.7	6.0
11.1	120	6.5	14.5	4.9	10.9	4.1	9.0	3.6	8.0	3.2	7.2	2.9	6.5
12.1	130	7.1	15.7	5.3	11.8	4.4	9.8	3.9	8.6	3.5	7.8	3.2	7.0
13.0	140	7.6	16.9	5.7	12.7	4.8	10.6	4.2	9.3	3.8	8.4	3.4	7.6
13.9	150	8.2	18.1	6.1	13.6	5.1	11.3	4.5	10.0	4.1	9.0	3.7	8.1
14.9	160	8.7	19.4	6.5	14.5	5.4	12.1	4.8	10.6	4.3	9.7	3.9	8.7
15.8	170	9.3	20.6	7.0	15.4	5.8	12.8	5.1	11.3	4.6	10.3	4.2	9.2
16.7	180	9.8	21.8	7.4	16.3	6.1	13.6	5.4	12.0	4.9	10.9	4.4	9.8
17.7	190	10.4	23.0	7.8	17.2	6.5	14.3	5.7	12.6	5.2	11.5	4.7	10.3
18.6	200	10.9	24.2	8.2	18.1	6.8	15.1	6.0	13.3	5.4	12.1	4.9	10.9

A/TA		m_{max}											
		$H_r=a$		$H_r=b$		$H_r=c$		$H_r=d$		$H_r=e$		$H_r=f$	
m ²	ft ²	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
19.5	210	11.5	25.4	8.6	19.0	7.2	15.9	6.3	14.0	5.7	12.7	5.1	11.4
20.4	220	12.0	26.6	9.0	20.0	7.5	16.6	6.6	14.6	6.0	13.3	5.4	12.0
21.4	230	12.6	27.8	9.4	20.9	7.9	17.4	6.9	15.3	6.3	13.9	5.6	12.5
22.3	240	13.1	29.1	9.8	21.8	8.2	18.1	7.2	16.0	6.5	14.5	5.9	13.0
23.2	250	13.7	30.3	10.3	22.7	8.5	18.9	7.5	16.6	6.8	15.1	6.1	13.6
24.2	260	14.0	30.8	10.7	23.6	8.9	19.7	7.8	17.3	7.1	15.7	6.4	14.1
25.1	270	14.0	30.8	11.1	24.5	9.2	20.4	8.1	18.0	7.4	16.3	6.6	14.7
26.0	280	14.0	30.8	11.5	25.4	9.6	21.2	8.4	18.6	7.6	16.9	6.9	15.2
26.9	290	14.0	30.8	11.9	26.3	9.9	21.9	8.7	19.3	7.9	17.5	7.1	15.8
27.9	300	14.0	30.8	12.3	27.2	10.3	22.7	9.0	20.0	8.2	18.1	7.4	16.3
28.8	310	14.0	30.8	12.7	28.1	10.6	23.4	9.3	20.6	8.5	18.7	7.6	16.9
29.7	320	14.0	30.8	13.1	29.1	10.9	24.2	9.6	21.3	8.7	19.4	7.9	17.4
30.7	330	14.0	30.8	13.6	30.0	11.3	25.0	9.9	22.0	9.0	20.0	8.1	18.0
31.6	340	14.0	30.8	14.0	30.8	11.6	25.7	10.2	22.6	9.3	20.6	8.4	18.5
32.5	350	14.0	30.8	14.0	30.8	12.0	26.5	10.5	23.3	9.6	21.2	8.6	19.0
33.4	360	14.0	30.8	14.0	30.8	12.3	27.2	10.8	24.0	9.8	21.8	8.9	19.6
34.4	370	14.0	30.8	14.0	30.8	12.7	28.0	11.1	24.6	10.1	22.4	9.1	20.1
35.3	380	14.0	30.8	14.0	30.8	13.0	28.7	11.4	25.3	10.4	23.0	9.4	20.7
36.2	390	14.0	30.8	14.0	30.8	13.4	29.5	11.7	26.0	10.7	23.6	9.6	21.2
37.2	400	14.0	30.8	14.0	30.8	13.7	30.3	12.0	26.6	10.9	24.2	9.8	21.8
38.1	410	14.0	30.8	14.0	30.8	14.0	30.8	12.4	27.3	11.2	24.8	10.1	22.3
39.0	420	14.0	30.8	14.0	30.8	14.0	30.8	12.7	28.0	11.5	25.4	10.3	22.9
39.9	430	14.0	30.8	14.0	30.8	14.0	30.8	13.0	28.6	11.8	26.0	10.6	23.4
40.9	440	14.0	30.8	14.0	30.8	14.0	30.8	13.3	29.3	12.0	26.6	10.8	24.0
41.8	450	14.0	30.8	14.0	30.8	14.0	30.8	13.6	30.0	12.3	27.2	11.1	24.5
42.7	460	14.0	30.8	14.0	30.8	14.0	30.8	13.9	30.6	12.6	27.8	11.3	25.0
43.7	470	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	12.9	28.4	11.6	25.6
44.6	480	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.1	29.1	11.8	26.1
45.5	490	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.4	29.7	12.1	26.7
46.5	500	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.7	30.3	12.3	27.2
47.4	510	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	12.6	27.8
48.3	520	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	12.8	28.3
49.2	530	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.1	28.9
50.2	540	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.3	29.4
51.1	550	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.6	30.0
52.0	560	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	13.8	30.5
53.0	570	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8	14.0	30.8

- (a): The effective room height not less than 4.0m(13.2 ft) .
(b): The effective room height between 3.0m(9.9 ft) and 4.0m(13.2 ft) .
(c): The effective room height between 2.5m(8.2 ft) and 3.0m(9.9 ft) .
(d): The effective room height between 2.2m(7.2 ft) and 2.5m(8.2 ft) .
(e): The effective room height between 2.0m(6.6 ft) and 2.2m(7.2 ft) .
(f): The effective room height between 1.8m(5.9 ft) and 2.0m(6.6 ft) .

4. The minimum circulation airflow

For enhanced tightness refrigerating systems, the minimum circulation airflow is 240 m³/h.

NOTICE

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 (Anv_{min}) in connected rooms is related to the room area (A), the actual refrigerant charge of refrigerant in the system (m_c), and the allowable MAXIMUM REFRIGERANT CHARGE in the system (m_{max}), Anv_{min} can be determined.

3 ABOUT THE PRODUCT

3.1 Unit dimensions

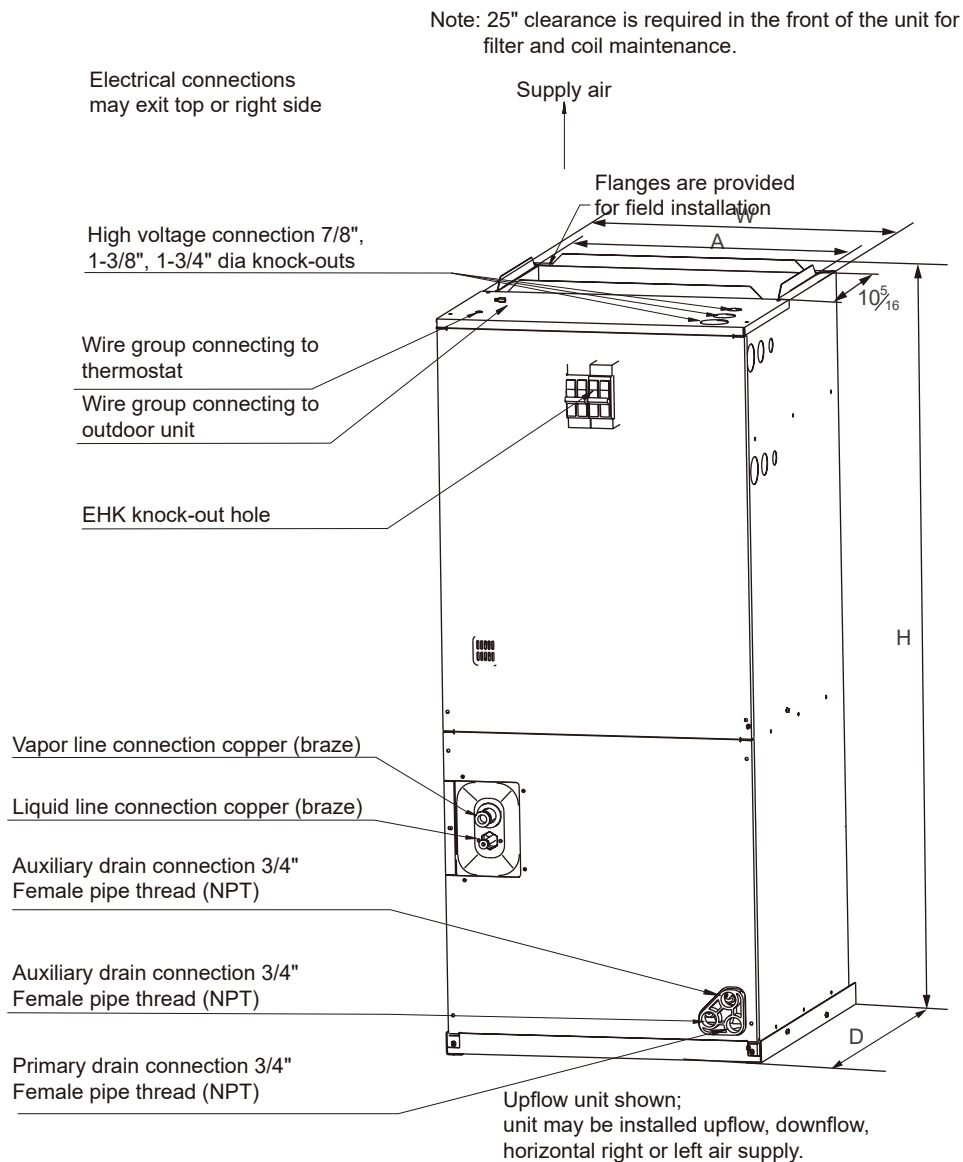


Fig.3-1 Dimensions

Dimensional Data

Model Size	Unit Height "H" in. [mm]	Unit Width "W" in. [mm]	Unit Length "D" in. [mm]	Supply Duct "A"	Unit Weight (lbs.[kg])
12	41-5/16"[1050]	18-1/8"[460]	20-1/2"[520]	16"[406]	108 [49]
18	41-5/16"[1050]	18-1/8"[460]	20-1/2"[520]	16"[406]	108 [49]
24	46-7/16"[1180]	19-11/16"[500]	21-5/8"[550]	17-15/16"[456]	130 [59]
30	46-7/16"[1180]	19-11/16"[500]	21-5/8"[550]	17-15/16"[456]	130 [59]
36	46-7/16"[1180]	19-11/16"[500]	21-5/8"[550]	17-15/16"[456]	130 [59]
48	54-1/2"[1385]	22-1/16"[560]	24"[610]	19-1/2"[496]	157 [71]
54	54-1/2"[1385]	22-1/16"[560]	24"[610]	19-1/2"[496]	157 [71]
60	54-1/2"[1385]	22-1/16"[560]	24"[610]	19-1/2"[496]	165 [75]

Table 3-1

3.2 Parts introduction

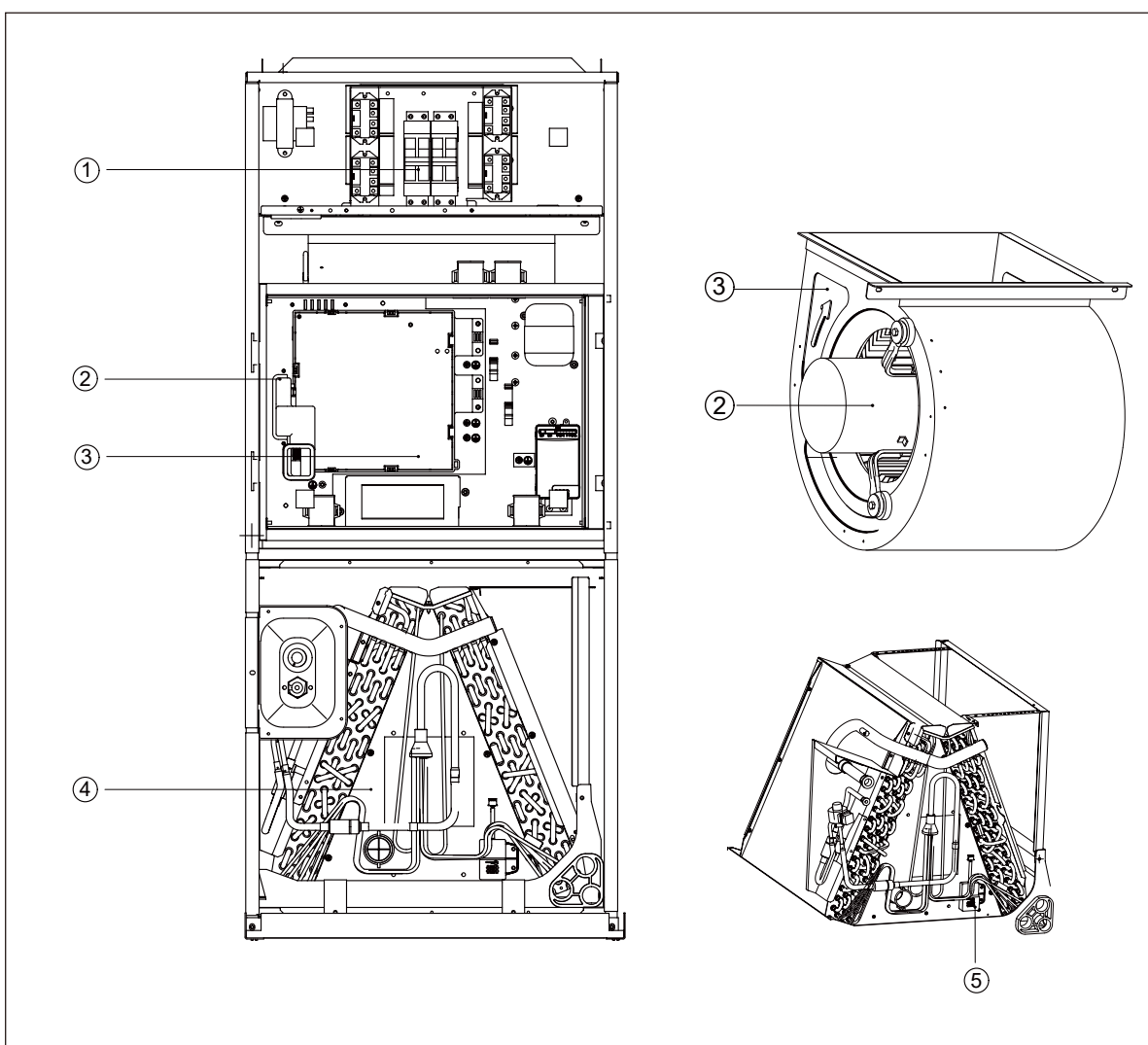


Fig.3-2

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

Table 3-2

3.3 Attached fittings

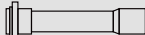
Installation Fittings	Name	Appearance	Quantity	Name	Appearance	Quantity
	Indoor unit operation and installation manual		1	Pipe Joint		1
	Accessory package		1	Seal plug		2

Table 3-3

Note: The above list is for most models, different models of the attached fittings list may be slightly different. Check if any accessory in the above figure is missing. All the accessories must be kept properly. All the fittings should be factory fittings.

3.4 Refrigerant sensor

R454B refrigerant leakage sensor is configured for the indoor unit. To meet different installation scenarios, the refrigerant sensor has two installation positions. The factory set of the refrigerant sensor is applied to the vertical upflow and horizontal right. The refrigerant sensor need to be relocated for vertical downflow and horizontal left. Before installing the indoor unit, check whether the refrigerant sensor is correctly installed according to Section 4.

⚠ CAUTION

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 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 its function 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 be turned on to the maximum, the compressor will stop running. you should immediately leave the leak area and notify a professional for handling.

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

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

NOTICE

R454B refrigerant leakage sensor is configured for the indoor unit, the operation of fan can initiated by R454B refrigerant sensor. meets the incorporated circulation airflow requirements. The allowed maximum refrigerant charge (Mmax) and the required minimum room area (Amin) can be determined according to Table 4-2 and Table 4-3.

4 INSTALLATION

4.1 Installation instructions

The unit can be positioned for bottom return air in the upflow position, left and right return in the horizontal position, top return in 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. 5-Speed motors provide selections of air flow to meet desired applications.

Power wiring and control wiring which are set on top and right of the unit, accessible screw terminals for control wiring all combine to make the installation easy, and minimize installation cost. See Fig.4-1.

Do not install unit in an area where flammable materials are present due to the risk of an explosion resulting in serious injury or death.

If the supporting structural members are not strong enough to take the unit's weight, the unit could fall out of place and cause serious injury.

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 $\frac{1}{4}$ " rise over the width or depth of the unit is allowed to create additional sloping towards the drain. Unit must be positioned between level and $\frac{1}{4}$ " rise, sloping toward the drain connections.

Install the indoor and outdoor unit, power supply wiring and connecting wires at least 3.5 ft. away 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 maintained for installation and maintenance.

See Fig.4-1 and Fig.4-2.

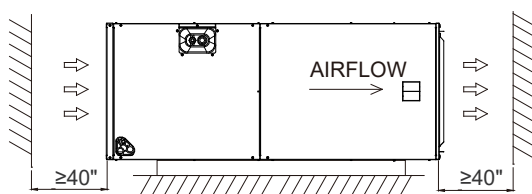


Fig.4-1 Clearances in the horizontal position

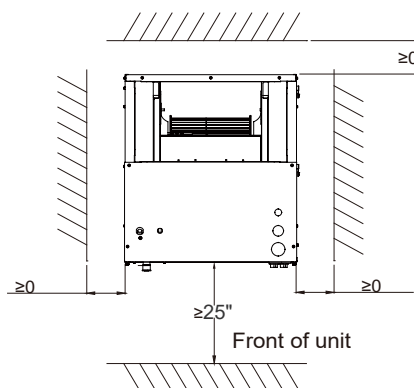


Fig.4-2 Clearances in the vertical position

When the unit is installed in a hot and humid place, If the humidity inside the installation space might exceed 86 °F and RH 80%, it is recommended to insulate the cabinet exterior.

Use glass wool or polyethylene foam as insulation so that the thickness is more than 2 inch and fits inside the installation space opening.

Respectively, 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 cool operation. It is also recommended to use second drain pan and secure the unit firmly to prevent it from falling. See Fig.4-3 , Fig.4-4, Fig.4-5, Fig.4-6.

⚠ WARNING

These instructions are exclusively intended for qualified contractors and 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 person authorized 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.

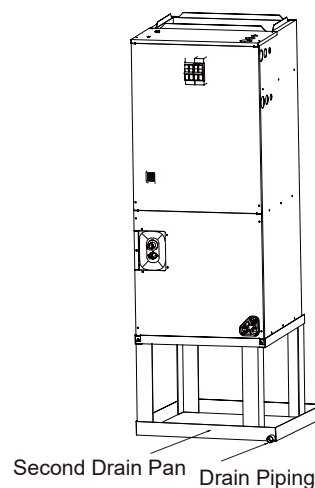


Fig.4-3 Installed vertically

NOTICE

If installed vertically downflow in a hot and humid place that might exceed 86°F and RH 80%, such as in the basement, the extra drain pan, sponge and sealant shall be installed as Fig. 4-7. Sealant must meet the fire rating requirements of 5VA. Extra drain pan filter is optional part, isn't factory-installed. You can consult dealers or manufacturers to buy it.

No matter what kind of Installation method of unit, as long as the knock-out hole is used, the knock-out hole needs to use sealant.

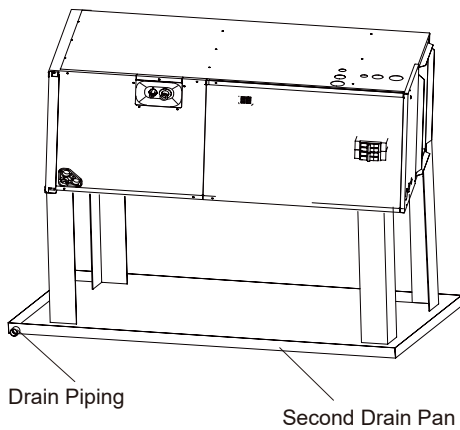


Fig.4-4 Installed horizontally right

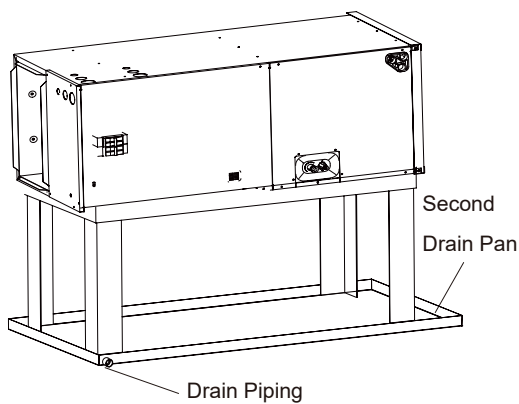


Fig.4-5 Installed horizontally left

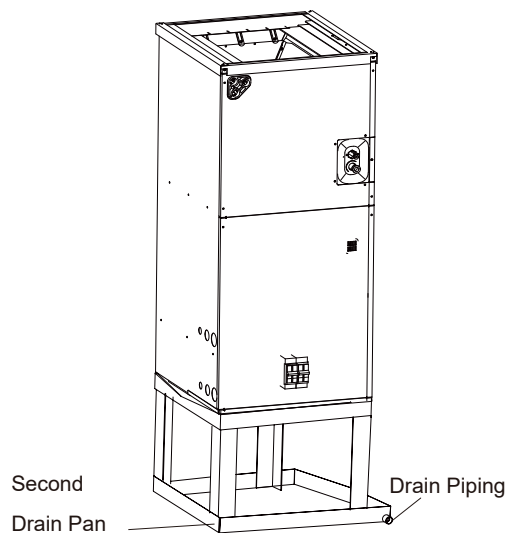
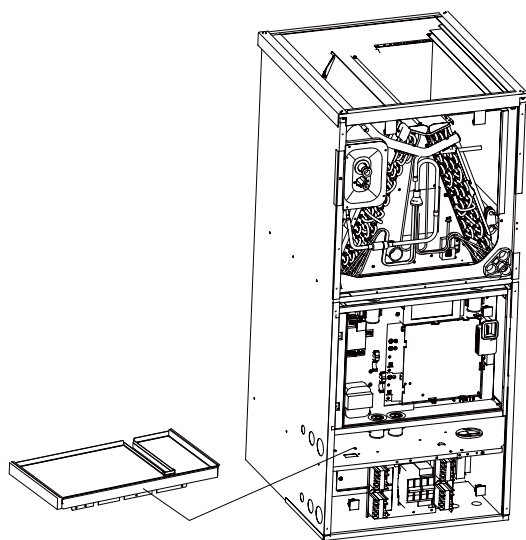


Fig.4-6 Installed vertically downflow

⚠ WARNING

Ensure that apparatus is mounted securely.

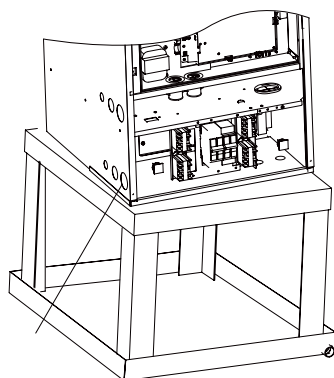
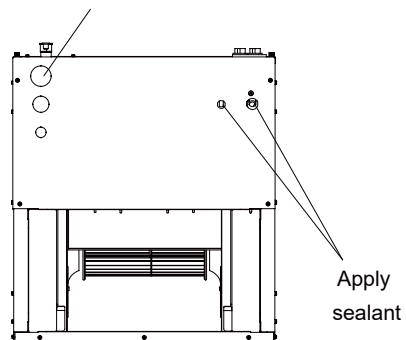
STEP1



Extra Drain Pan

Note: Extra drain pan filter is optional part, isn't factory-installed.

Note: High voltage connection 7/8", 1-3/8", 1-3/4" dia knock-outs, sealant must be applied here.



Note: High voltage connection 7/8", 1-3/8", 1-3/4" dia knock-outs, sealant must be applied here.

STEP2

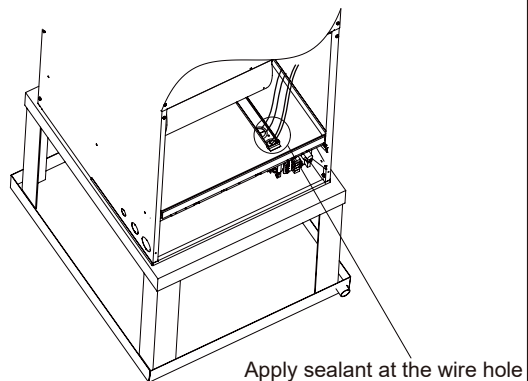


Fig.4-7 Extra pan and sealant installed

4.2 Vertical upflow

Vertical Upflow configuration is the factory set on all models. See Fig.4-8.

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

IMPORTANT NOTE

Torque applied to drain connections should not exceed 15 ft.lbs. For vertical upflow and horizontal right installations, dimensions for refrigerant and drain pipes may be found in Fig.4-8.

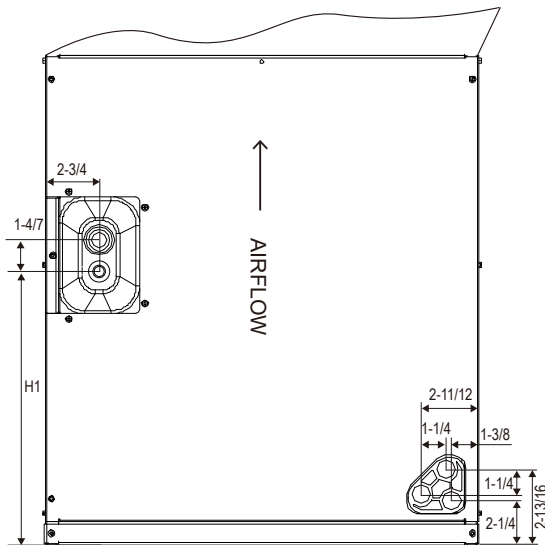


Fig.4-8 Dimensions for air handler (Coil Section)

Model	"H1" in. [mm]
12/18	8-7/8[226.0]
24/30/36	13-1/5[335.5]
48/54/60	13-7/8 [352.8]

4.3 Vertical downflow

Conversion to Vertical Downflow:

A vertical upflow unit may be converted to vertical downflow. See Fig.4-8 and Fig.4-9.

1. Remove the coil access panel
2. Remove the refrigerant leak detection sensor and indoor coil.
3. Reinstall indoor coil 180° from original position.
4. Reinstall the refrigerant sensor at the location shown in Fig.4-10.

CAUTION

The refrigerant leak detection sensor need to be relocated in this application. Please follow the steps in the next page.

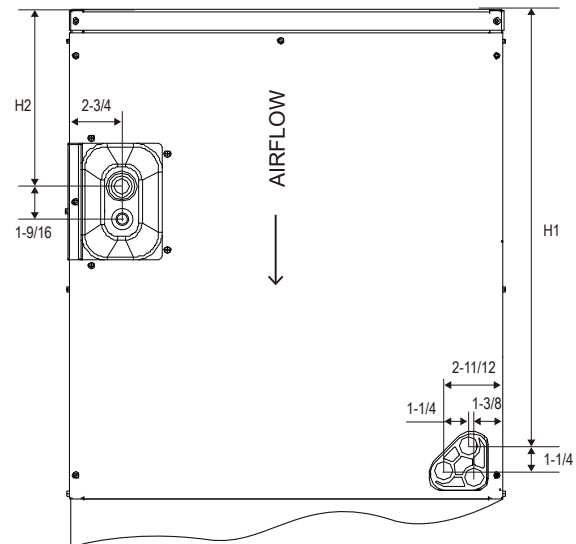


Fig.4-9 Dimensions for air handler (Coil Section)
Dimensional Data

Model	"H1" in. [mm]	"H2" in. [mm]
12/18	14-5/8[372.0]	8-3/8[213.0]
24/30/36	17-2/5[441.5]	6-2/5[162.5]
48/54/60	22-1/6 [563.5]	10-1/2 [267.2]

4.4 Horizontal

Horizontal right is the default factory configuration for all models.

CAUTION

The refrigerant leak detection sensor need to be relocated in this application. Please follow the steps in the next page.

A vertical upflow unit may be converted to horizontal left by removing indoor coil assembly and the refrigerant leak detection sensor. Reinstall the indoor coil and the refrigerant sensor for left hand air supply. See Fig.4-10.

- Rotate the unit 90° into the horizontal left position, with the coil compartment on the right and the blower compartment on the left.
- Remove the coil access panel.
- Remove the refrigerant leak detection sensor and indoor coil.
- Reinstall the indoor coil 180° from original position. Ensure the retaining channel is fully engaged with the coil rail. See Fig.4-10 and 4-11.
- An additional field supplied drain pan kit is recommended when the unit is configured for the horizontal position over a finished ceiling and/or living space.

Steps for changing cabinet orientation to vertical downflow or horizontal left orientation

1. Remove the screws and front panel and disconnect the terminal near the refrigerant sensor, attention the terminal is not that connected to the control board.
2. Pull out the coil with refrigerant sensor (see 2A on Figure 4-10, Step 2).
3. Unscrew and remove the refrigerant sensor and housing from the evaporator coil. Do not disconnect the refrigerant sensor from the indoor control board. Then place and screw in the refrigerant sensor housing at the sensor position shown in the Figure 4-10.
4. Replace the coil in the correct orientation and secure in place. Plug the refrigerant sensor wire back to the refrigerant sensor (Figure 4-10, Step 3).
5. Reinstall the front panel and secure with screws.

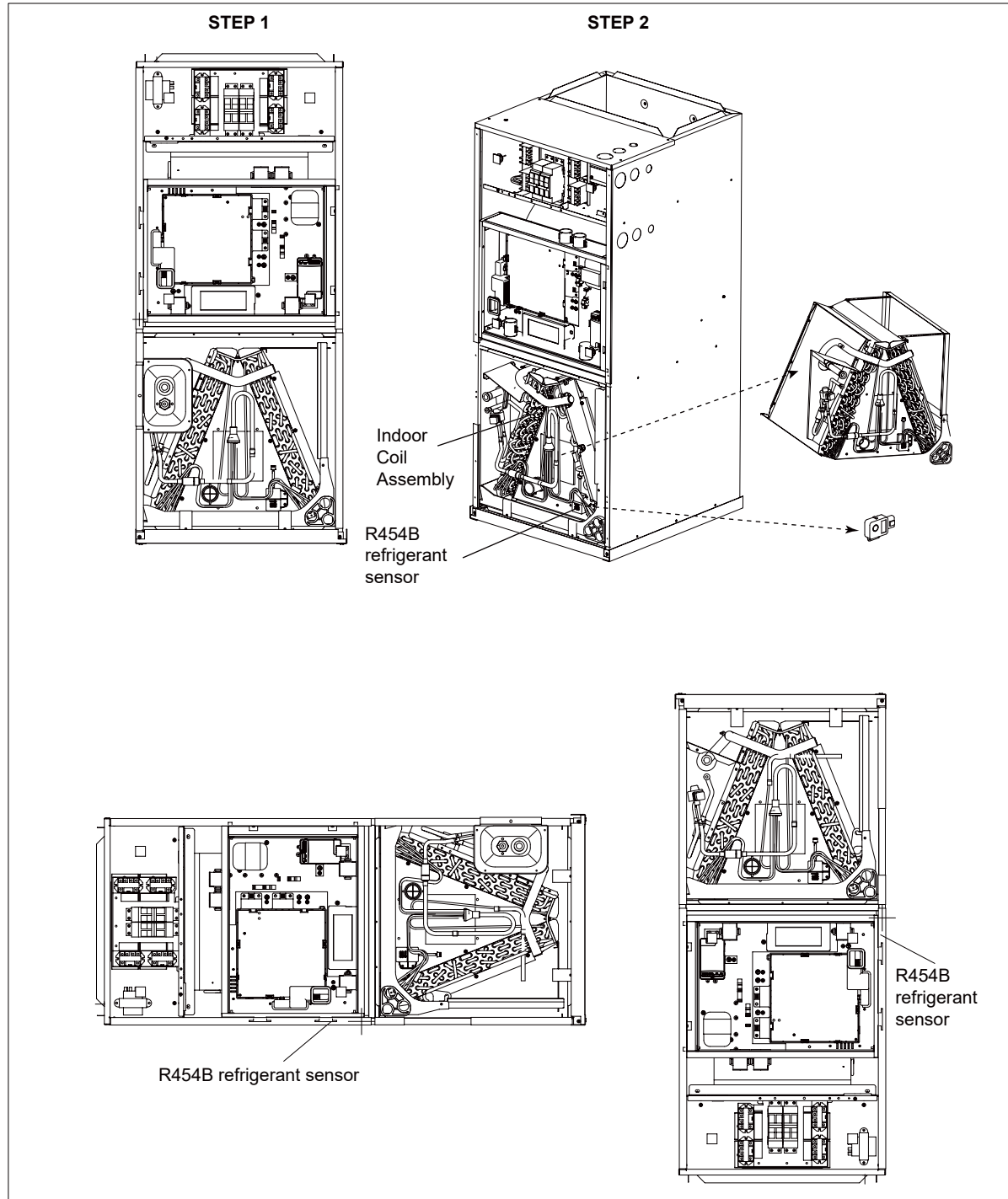


Fig.4-10 Vertical Downflow & Horizontal Left Applications Conversion

When installing the evaporator, ensure the retaining channel is fully engaged with the coil rail.

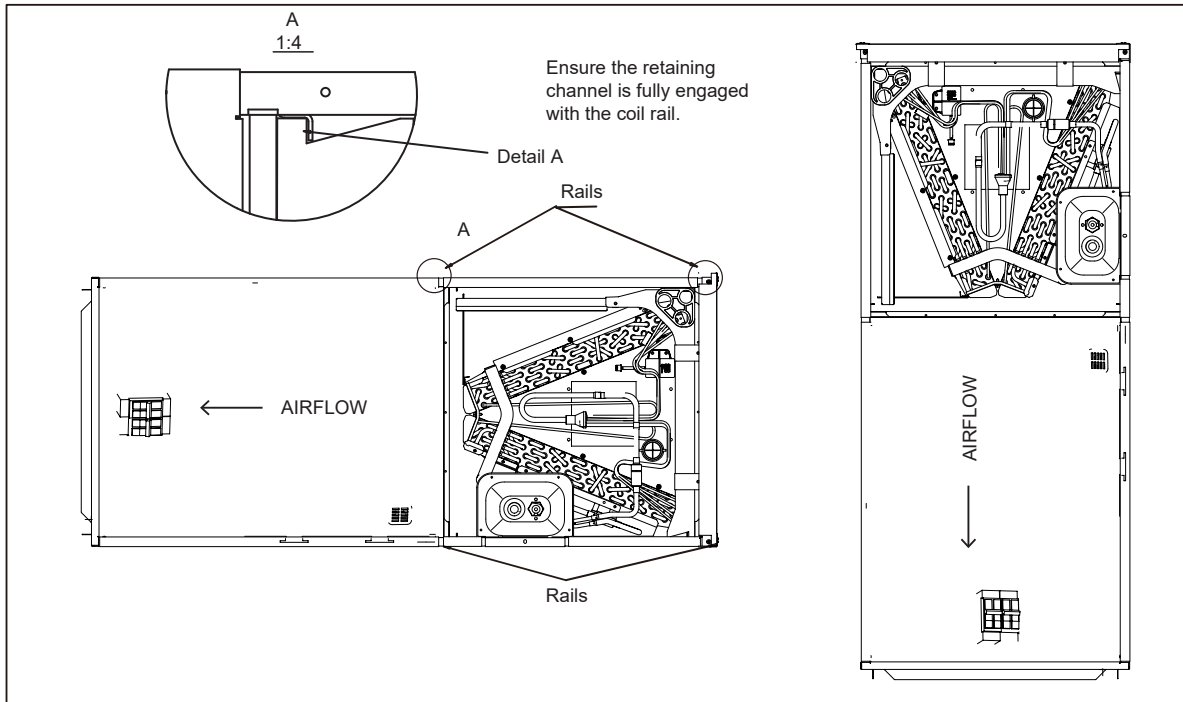


Fig.4-11 Vertical Downflow & Horizontal Left Applications

NOTE

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

Conversion in Horizontal Direction:

Horizontal right-hand supply can be changed to horizontal left-hand supply by removing the indoor coil and reinstalling 180° from original.

Indoor coil and drain pan set-up, as shown in the Fig.4-12. (Take 48K as example)

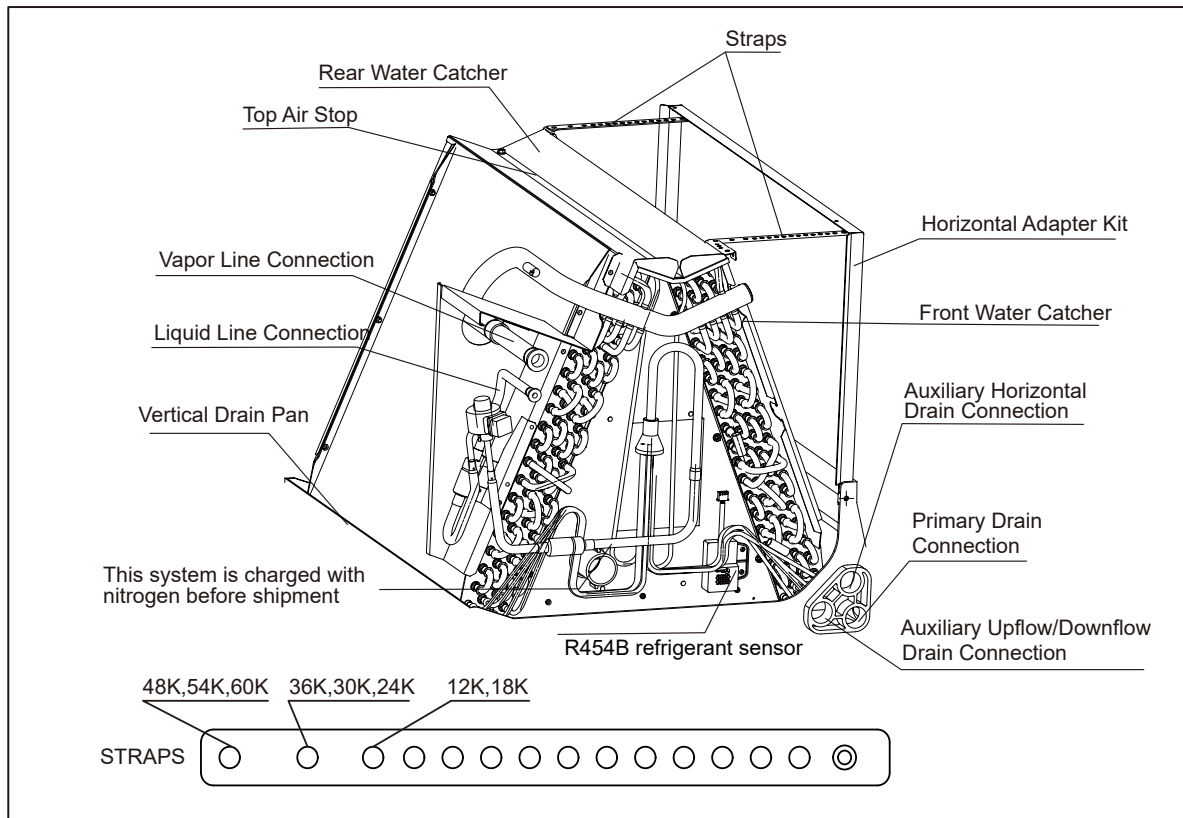


Fig.4-12 Indoor Coil and Drain Pan Set-up

5 REFRIGERANT LINE

The suction pipe and liquid pipe of the indoor unit need to be protected and cannot be grabbed when moving the indoor unit.

Keep the coil connections sealed until refrigerant connections are made. See the Installation Instructions for the outdoor unit for details on line sizing, tubing installation, and charging information.

Coil is shipped with Nitrogen. 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.

All joints made in the installation between parts of the refrigerating system, with at least one part charged, shall be made in accordance with the following:

- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe or any uncharged refrigerating system part.

- Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be refabricated.

- Refrigerant tubing shall be protected or enclosed to avoid damage.

- Flexible refrigerant connectors (such as connecting lines between the indoor and outdoor unit) that may be displaced during normal operation shall be protected against mechanical damage.

Compliance is checked according to the installation instructions and a trial installation, if necessary.

Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected.

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements.

The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

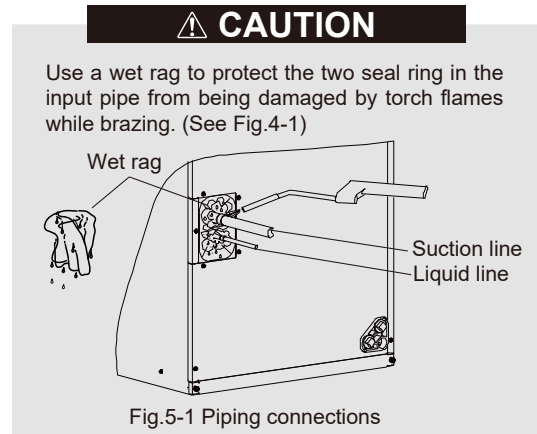
Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected.

- mechanical joints in compliance with ISO 14903 or UL 207 (U.S. only).

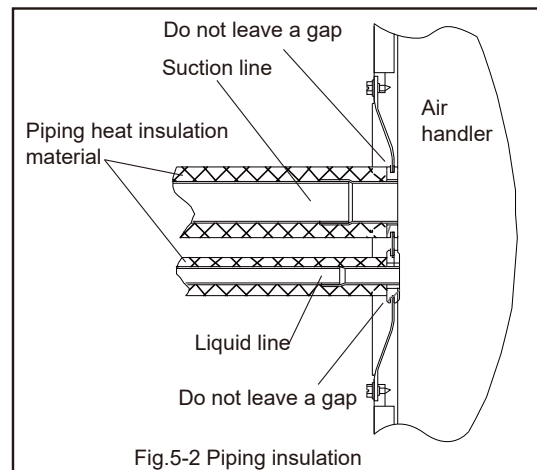
- welded or brazed joints.

- joints in enclosures that vent to the unit or to the outside.

Compliance is checked by inspection and tests.



After the brazing work is finished, make sure to check if there is refrigerant leakage. After checking for vapor leaks, be sure to insulate the pipe connections referring to Fig.5-2.



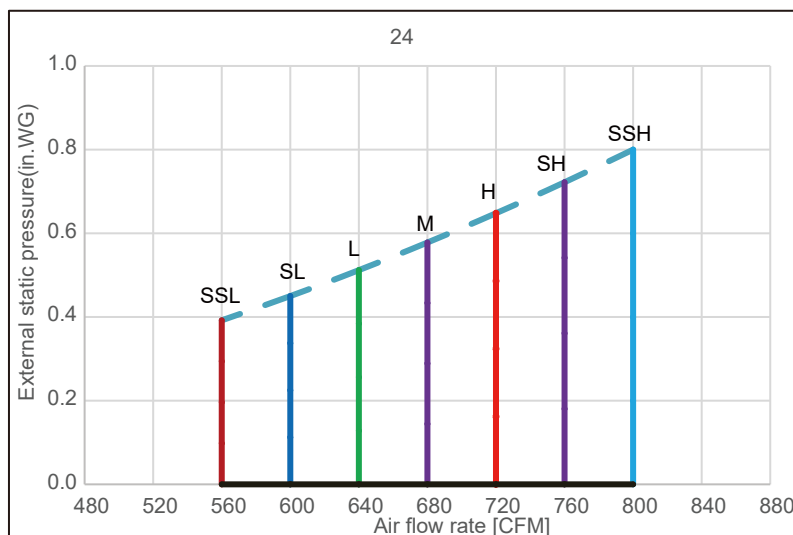
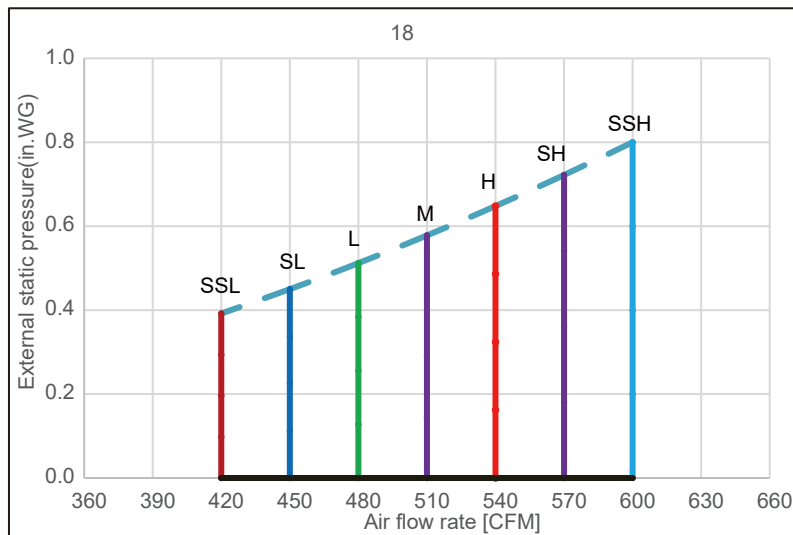
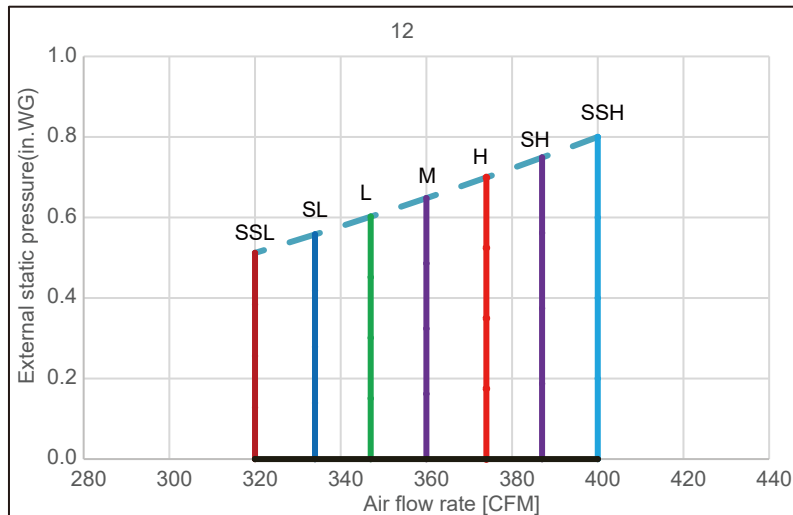
6. AIRFLOW PERFORMANCE

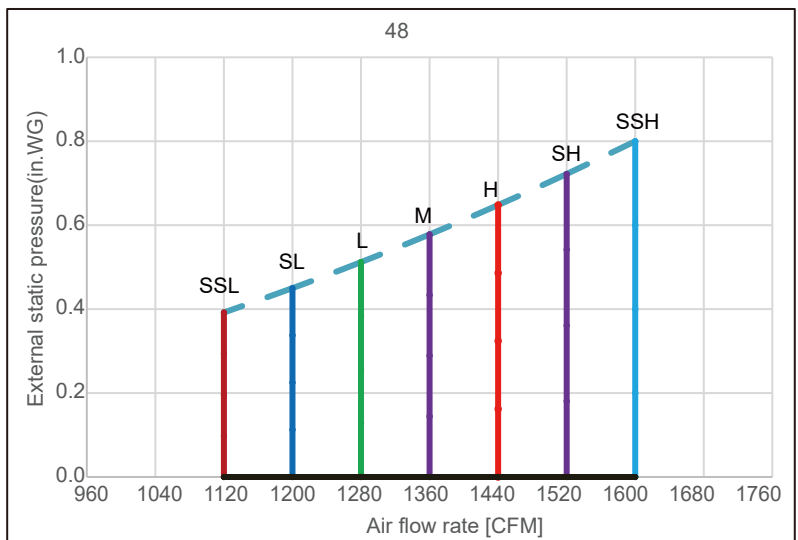
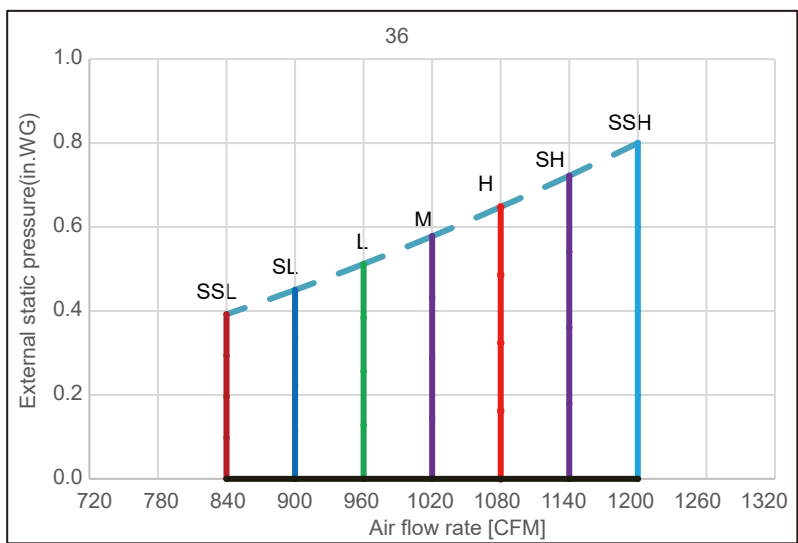
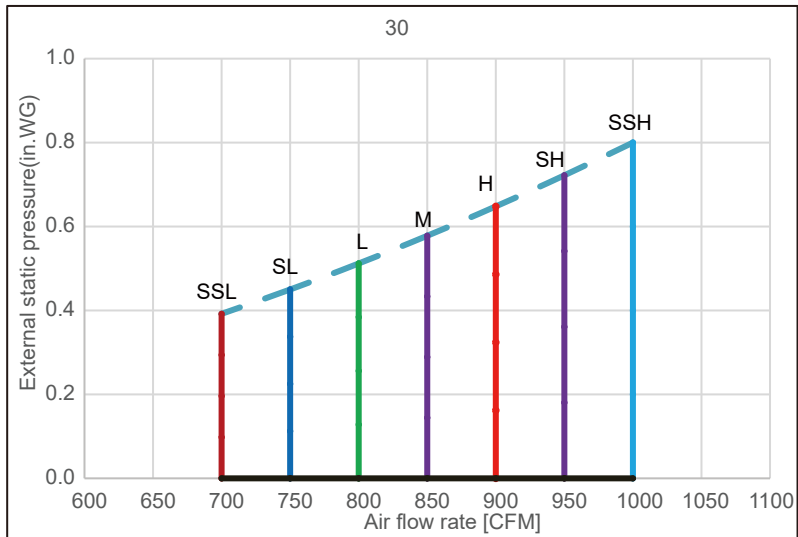
Indoor units that are equipped with a constant air flow function are set to the constant air flow mode when they leave the factory.

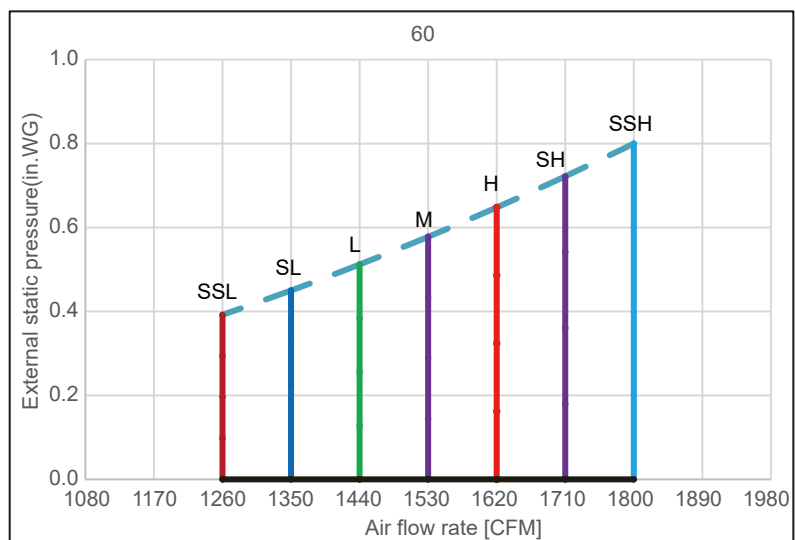
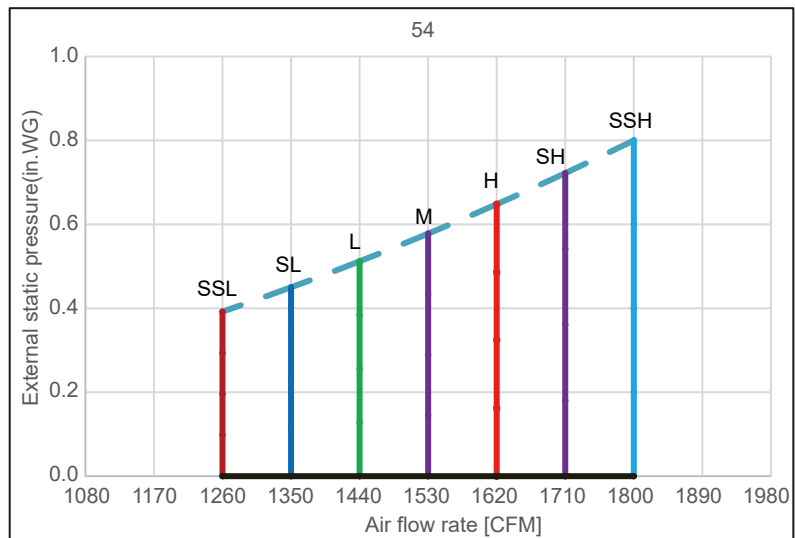
The following figures show fan characteristics at SSL, SL, L, M, H, SH, and SSH represent fan speeds from level 1 to level 7.

The unit can automatically adjust the external static pressure (ESP) between 0 – 0.8 inches.

Airflow cannot operate at the rated value if it is outside the ESP range in the flowing figures.







7 ABOUT THE AIR FILTER

7.1 Air filter (not factory-installed)

External filter or other means of filtration is required. Units should be sized for a maximum of 300 feet/min air velocity or what is recommended for the type of filter installed.

Filter application and placement are critical to airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as motor, 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, can have a filter installed 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 air flow is reduced the overall performance and efficiency of the unit will be reduced. It is strongly recommended that a professional installation technician is contacted to ensure installation of these such filtration systems are installed correctly.

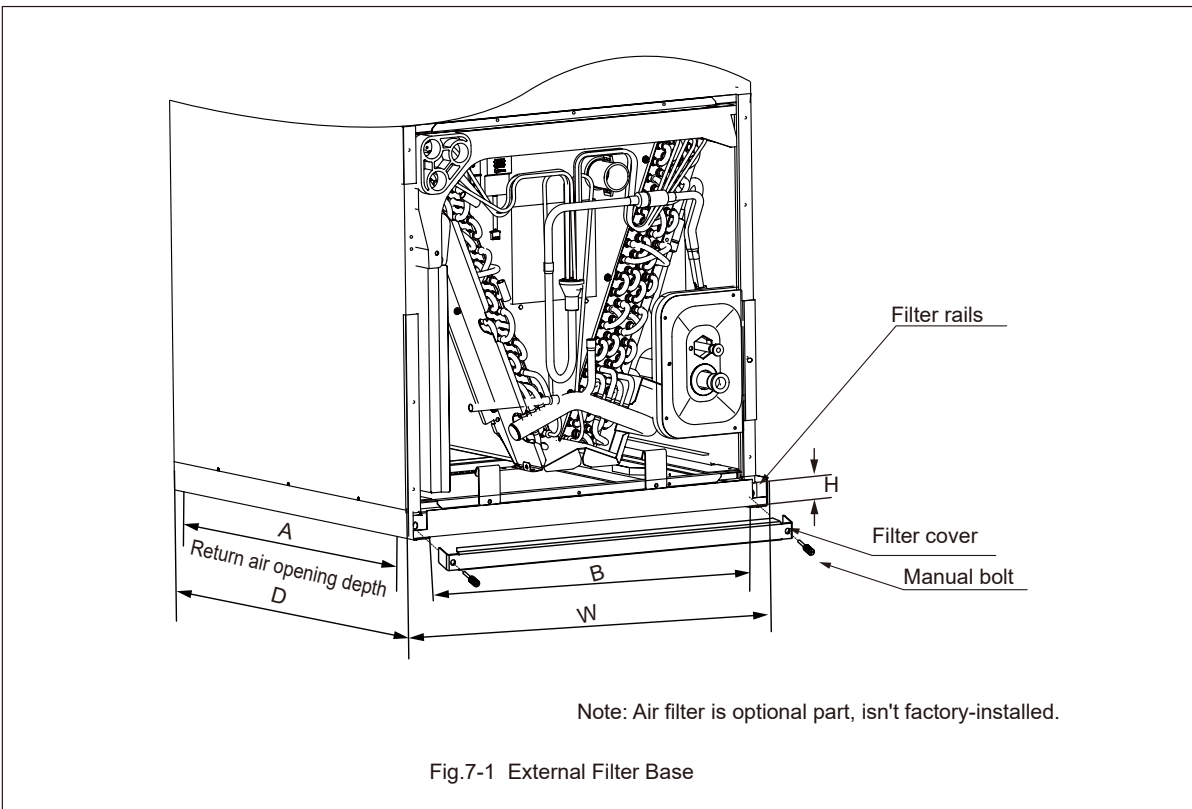
IMPORTANT: Do not double filter the return air duct system. Do not filter the supply air duct system. This will change the performance of the unit and reduce airflow.

WARNING

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct and run 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.

7.2 Filter installation dimensions



Dimensional Data

Model	Filter Size in. [mm]	"W" in. [mm]	"D" in. [mm]	"H" in. [mm]	Return width "A" in.	Return length Model "B" in.
12/18	16X20[406X508]	16.8[426]	20.4[518]	1[25.4]	19.6	14.8
24/30/36	18X20[457X508]	18.3[466]	21.6[548]	1[25.4]	20.8	16.3
48/54/60	20X22[508X559]	20.7[526]	23.9[608]	1[25.4]	23	18.8

AIR FILTER REMOVAL

1. Remove bolts manually, remove air filter recover. See in Fig.7-1.
2. Hold the edge of the air filter and extract out.
3. Clean the air filter (Vacuum cleaner or pure water may be used to clean the air filter. If the dust accumulation is too heavy, use soft brush and mild detergent to clean it and dry out in cool place). See in Fig.7-2.
4. Install new filter so that the arrow on the filter is in the same direction as airflow.

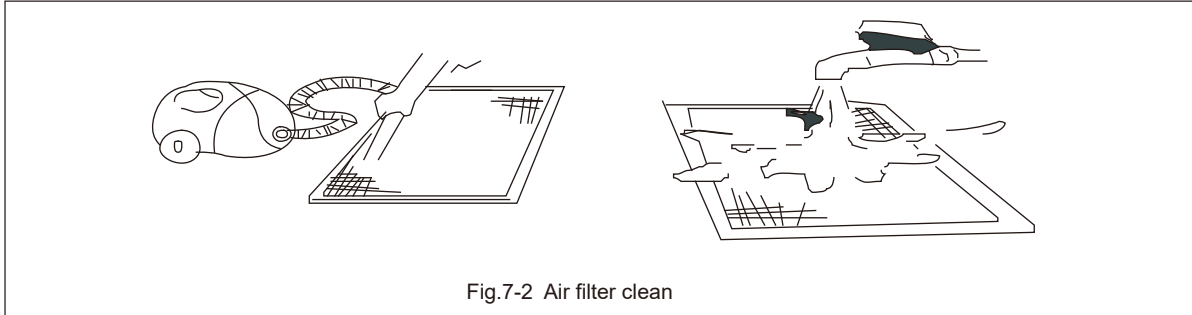


Fig.7-2 Air filter clean

8 DRAIN PIPE INSTALLATION

Consult local codes for specific requirements.

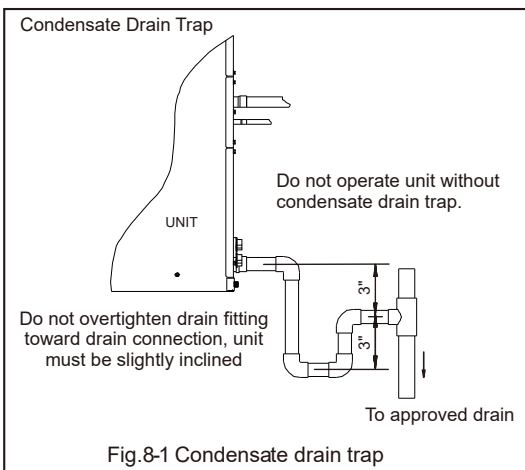


Fig.8-1 Condensate drain trap

IMPORTANT:

1. When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, silicone or Teflon tape and install, hand tighten.
2. When making drain fitting connections to drain pan, do not overtighten. Over tightening fittings can split pipe connections on the drain pan.

- Install drain lines so they do not block service access to front of the unit. Minimum clearance of 24 inches is required for filter, coil or blower removal and service access.
- Do not reduce drain line size less than connection size provided on condensate drain pan. Use 3/4" PVC piping for drain piping connections.
- Do not connect condensate drain line to a closed or open sewer pipe. Run condensate to an open drain or run line to a safe outdoor area.
- Make provisions for disconnecting and cleaning of 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 connection to the drain pan to allow complete drainage of pan (See Fig. 8-1).

- All drain lines must be pitched downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage.
- Make sure unit is level or pitched slightly toward primary drain connection so that water will drain completely from the pan. Up to an additional 1/4" rise over the width or depth of the unit is allowed to create additional sloping towards the drain. Unit must be positioned between level and 1/4" rise, sloping toward the drain connections. See Fig.8-2, Fig.8-3, Fig.8-4, Fig.8-5.
- Plug the unused drain connection 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 condensate drain pan and drain line after installation is complete. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain line fittings, and water is draining from the termination of the primary drain line.
- Auxiliary drain line should be run to a place where it will be noticeable if it becomes operational. Homeowner should be warned that a problem exists if water should begin running from the auxiliary drain line.
- The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
- Be sure to insulate the drain piping and drain socket since condensation may cause water leakage.
- Be sure to install a drain trap at the drain outlet since the inside of the unit is at negative pressure relative to atmospheric pressure during operation.

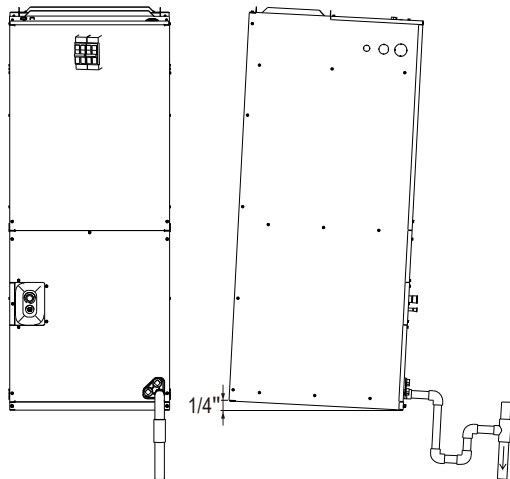


Fig.8-2 Vertically upflow view

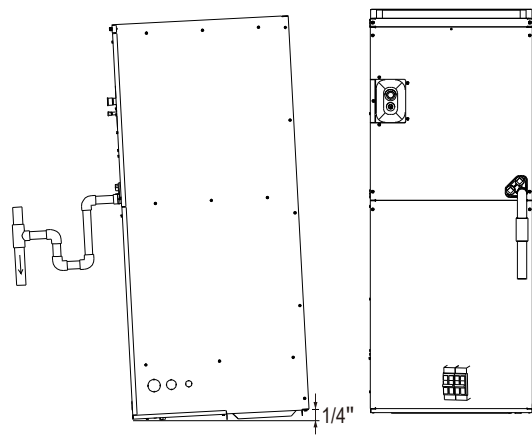


Fig.8-3 Vertically downflow view

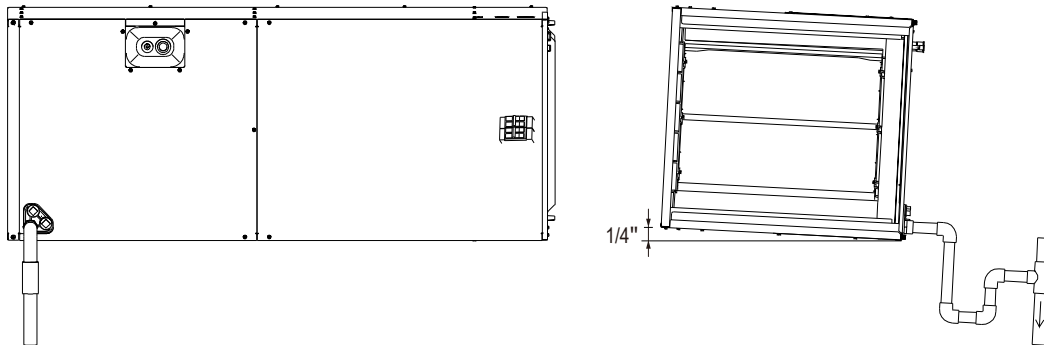


Fig.8-4 Horizontally right view

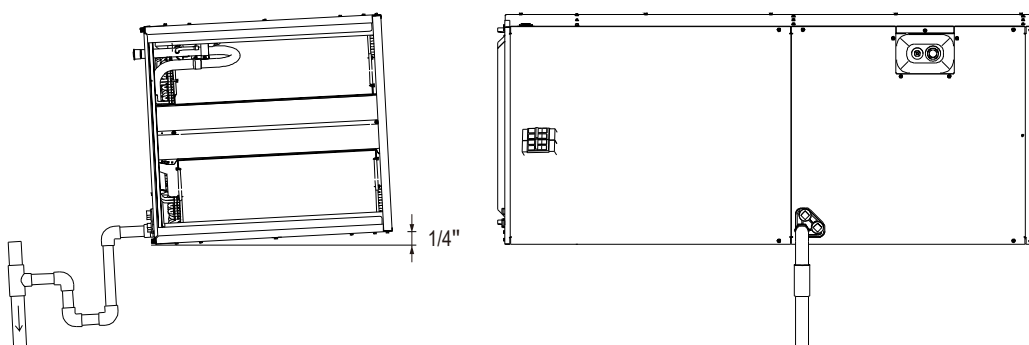


Fig.8-5 Horizontally left view

9 ELECTRICAL CONNECTION

DANGER

The power supply must be cut off before any electrical work is carried out. Do not conduct electrical work when the power is on; otherwise, it may cause serious personal injury.

The air conditioning unit must be earthed reliably and must meet the requirements of the local country/region. If the earthing is not reliable, serious personal injury due to electric leakage may occur.

WARNING

The appliance shall be installed in accordance with national wiring regulations. Installation, inspection or maintenance operations must be completed by professional technicians. All parts and materials must comply with the relevant regulations of the local country/region.

The air conditioning unit must be equipped with a special power supply, and the power supply voltage should conform to the nominal working voltage range of the air conditioning unit.

The power supply of the air conditioning unit must be equipped with a power disconnect device that conforms to the requirements of relevant local technical standards for electrical equipment. The power disconnecting device must be equipped with short circuit protection, overload protection and electric leakage protection. The clearance between open contacts of the power disconnecting device shall be at least 3 mm.

The core of the power supply cable must be made of copper, and the wire diameter should meet the current-carrying requirements. For details, refer to the "Power supply cable Diameter and Electric Leakage Protector Selection". A wire diameter that is too small may cause the power supply cable to heat up, resulting in a fire.

The power supply cable and the earth wires should be secured reliably to avoid stress on the terminals. Do not pull the power supply cable forcibly; otherwise, the wiring may become loosened or the terminal blocks may be damaged.

Strong current wires such as power supply cable cannot be connected to weak current wires such as communication wiring; otherwise, the product may be seriously damaged.

Do not bond and connect the power supply cable. Bonding and connecting the power supply cable may cause it to heat up, resulting in a fire.

CAUTION

Avoid bonding and connecting the communication wiring. If doing so is unavoidable, at the very least, ensure a reliable connection by crimping or soldering and make sure the copper wire at the connection is not exposed; otherwise, communication failure may occur.

The power supply cable and communication wiring must be routed separately, with a distance of over 5 cm. Otherwise, communication failure may occur.

Keep the vicinity of the air conditioning unit as clean as possible to avoid small animals from nesting and biting the cables. If a small animal touches or bites the cables, short circuiting or electric leakage may occur.

Do not connect the earth wires to the gas pipe, water pipe, lightning rod earth wires or telephone earth wires.

Gas pipe: Risk of explosion and fire when gas leaks.

Water pipe: If rigid plastic pipes are used, there will be no earthing effect.

Lightning rod earth wires or telephone earth wires: In the event of lightning strikes, abnormal earth potential may rise.

After all wiring is completed, check carefully before turning on the power supply.

9.1 Electrical characteristics

Capacity (kBtu/h)	Electric specifications of the indoor unit				Indoor fan motor
	Frequency(Hz)	Voltage(V)	MCA(A)	MFA(A)	Rated motor output(W)
12	60	208/230	3.38	15	375
18			3.38		375
24			5.08		375
30			5.08		375
36			5.08		375
48			5.65		750
54			5.65		750
60			5.65		750

NOTICE

NOTICE

MCA: Min. Circuit Amps. (A), which is used to select the minimum circuit size to ensure safe operation over a long period of time.

MFA: Max. Fuse Amps. (A), which is used to select the circuit breaker.

Use wires with a cross-sectional area of at least 1 mm².

NOTICE

MCA: Min. Circuit Amps. (A), which is used to select the minimum circuit size to ensure safe operation over a long period of time.

MFA: Max. Fuse Amps. (A), which is used to select the circuit breaker.

Use wires with a cross-sectional area of at least 1 mm².

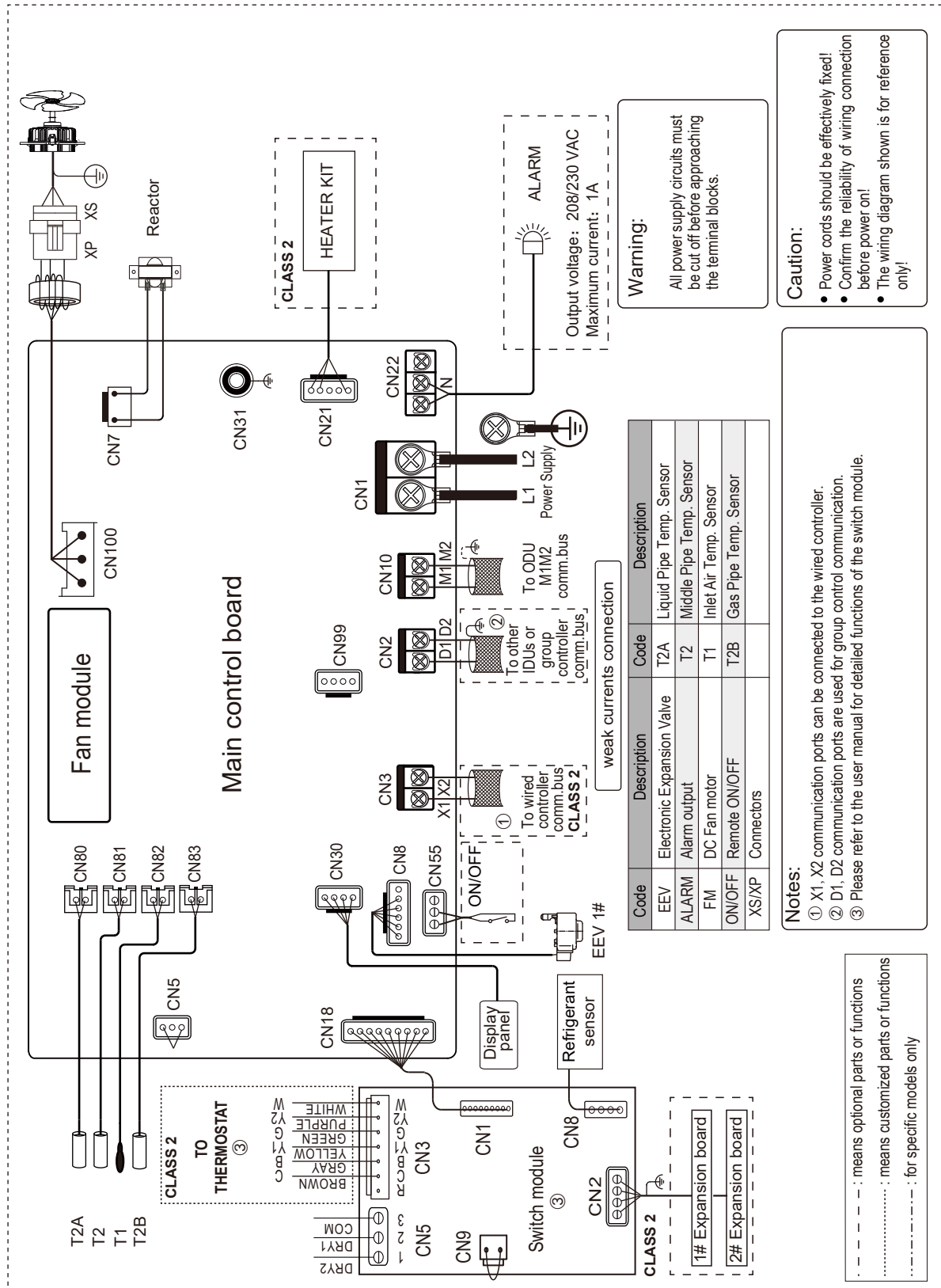
NOTICE

MCA: Min. Circuit Amps. (A), which is used to select the minimum circuit size to ensure safe operation over a long period of time.

MFA: Max. Fuse Amps. (A), which is used to select the circuit breaker.

Use wires with a cross-sectional area of at least 1 mm².

9.2 Wiring diagram



⚠ CAUTION

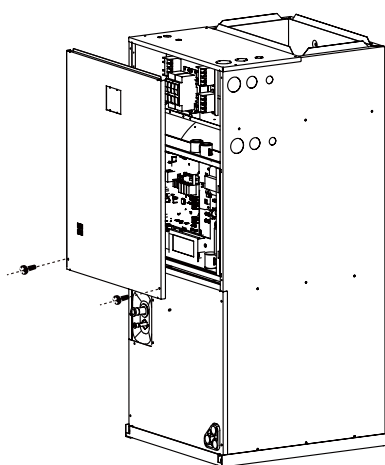
All weak point connection points meet SELV, such as X1, X2, M1, M2, CN18, CN55 etc.



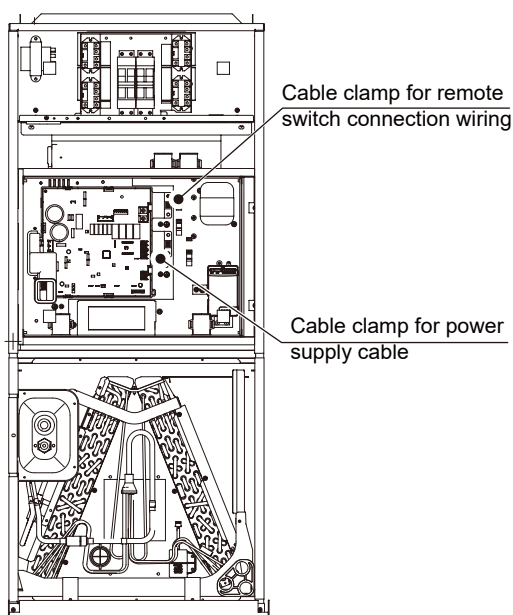
9.3 Wiring

1) Open the indoor unit's electric control box cover.

- ① Remove the two screws at the positions shown in the figure;
- ② Pull the bottom end of the electric control box cover horizontally outward;
- ③ Remove the electric control box cover by pulling downwards.



2) Connect the strong current wires (power supply cable, and alarm signal output wires,) and weak current wires (communication wiring, remote switch connection wiring, expansion board connection wiring) to the electric control box through the strong and weak current inlets of electric control box.



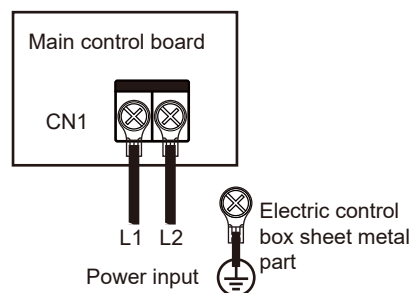
⚠ CAUTION

Power supply cable must be routed separately from the other cable such as communication wiring and display box communication wiring. The strong and weak current wires must be separated. The expansion board are optional.

3) Power supply cable connection

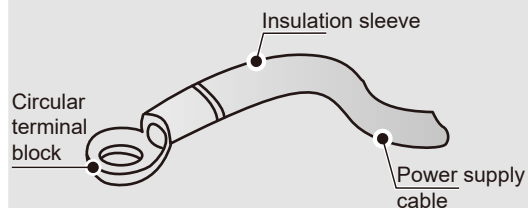
① Connection between the power supply cable and power supply terminal

The power supply terminal of the indoor unit is fixed on the main control board, the power supply cable is connected to the power supply terminal labeled "CN1" on the main control board. The live and neutral wires are connected according to the main control board logos "L1" and "L2", and the earth wires is directly connected to the electric control box sheet metal part.

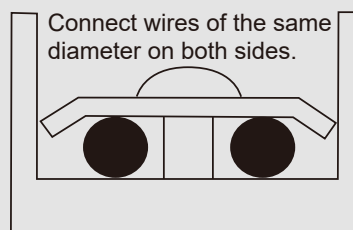


⚠ CAUTION

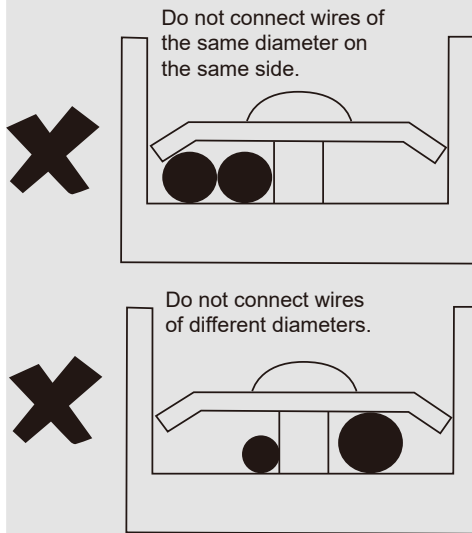
- Use copper conductors only. Do not bond and connect the power supply cable. Bonding and connecting the power supply cable may cause it to heat up, resulting in a fire.
- The power supply cable must be crimped reliably using an insulated circular terminal block, and then connected to the power supply terminal of the indoor unit, as shown in the figure below.



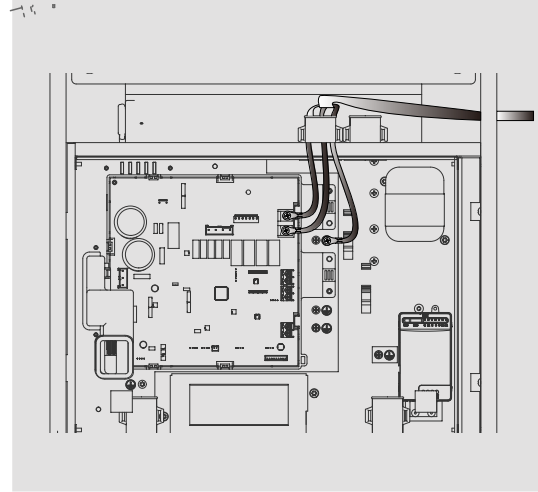
- If it fails to crimp the insulated circular terminal block due to on-site limitations, connect the power supply cable of the same diameter to both sides of the power supply terminal block of the indoor unit, as shown in the figure below.



- Do not press the power supply cable of the same wire diameter on the same side of the terminal. Do not use two power supply cable of different wire diameters for the same terminal blocks; otherwise, they can easily loosen due to uneven pressure and cause accidents, as shown in the figure below.

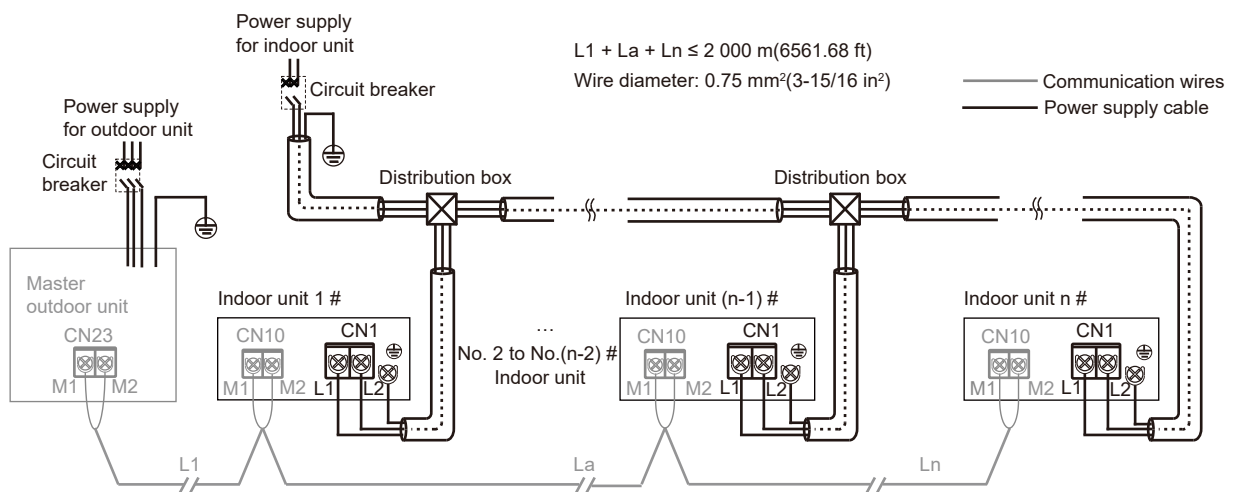


- The connected power supply cable should be secured with a wire clamp to prevent loosening, as shown in the right figure.



② Power supply cable system connection

Use a dedicated power supply for the indoor unit that is different from the power supply for the outdoor unit. Use the same power supply, circuit breaker and leakage protective device for the indoor units connected to the same outdoor unit.



4) Communication wiring connection

① Explanation of Communication Methods between indoor unit and outdoor unit

The HyperLink (M1M2) communication method is used between the indoor unit and outdoor unit, which has the following characteristics:

1. Any topology connection of communication wiring.
2. Two-core and non-polar communication for M1M2.

⚠ CAUTION

Do not connect the HyperLink (M1M2) communication line to the RS-485 communication interface, such as D1D2.

② Table of selection of communication wiring diameter

Function	Indoor unit and outdoor unit communication	One controller to one indoor unit (Two controllers to one indoor unit) Communication	One-to-more (centralized controller) Communication
Item	HyperLink (M1M2) communication (Indoor units are powered uniformly)	X1X2 communication	D1D2 communication
Wire diameter	2 × 0.75 mm ² (3-15/16 in ²)	2 × 0.75 mm ² (3-15/16 in ²) (shielded cable)	2 × 0.75 mm ² (3-15/16 in ²) (shielded cable)
Length	≤ 2 000 m(6561.68 ft)	≤ 200 m(656.17 ft)	≤ 1 200 m(3937.01 ft)

⚠ CAUTION

Please select the communication wiring according to the requirements in the above reference table. Use shielded cables for communication when strong magnetism or interference is present.

On-site wiring must comply with the relevant regulations of the local country/region and must be completed by professionals.

Do not connect the communication wiring when the power is on.

Do not connect the power supply cable to the communication terminal; otherwise, the main control board may be damaged.

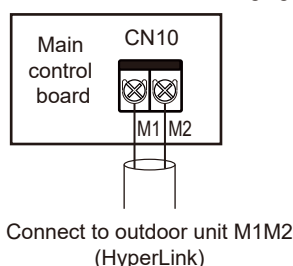
The standard value of the screw torque of the communication wiring terminal is 0.5 N·m. Insufficient torque may cause poor contact; excessive torque may damage the screws and power supply terminals.

Do not bundle the communication wiring with the refrigerant pipeline, power supply cable, etc. When the power supply cable and the communication wiring are laid in parallel, a distance of more than 5cm should be maintained to prevent interference from the signal source.

Bonding and connecting the communication wiring should be avoided, but if it is used, at the very least, ensure a reliable connection by crimping or soldering and make sure the copper wire at the connection is not exposed; otherwise, communication failure may occur.

③ Indoor unit and outdoor unit communication cable connection

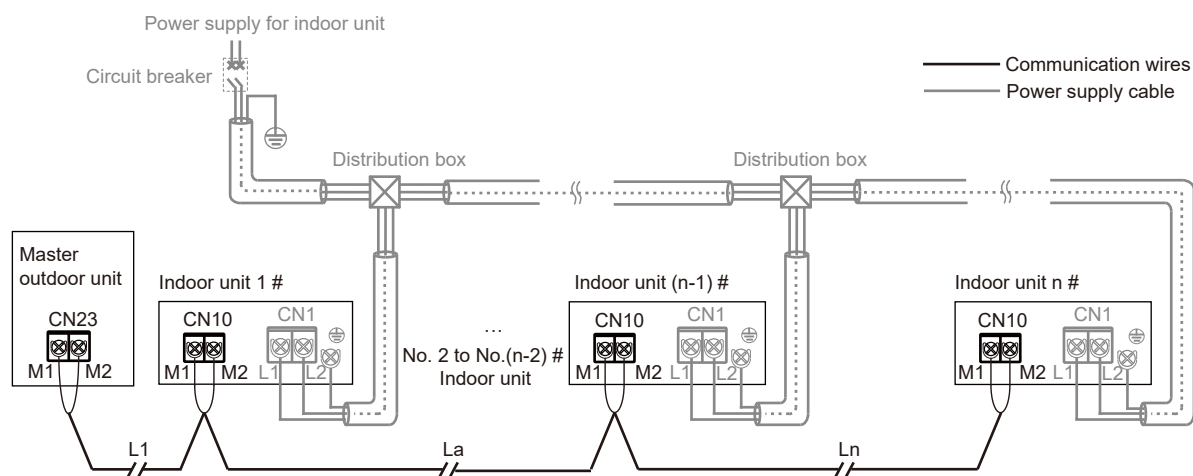
Single unit: M1 and M2 ports are located at terminal block "CN10" of the main control board. There is no distinction between negative and positive electrodes. For details, see the following figure:



⚠ CAUTION

Do not connect the HyperLink (M1M2) communication wiring to the D1D2 communication wiring.

System: The HyperLink (M1M2) communication wiring between indoor unit and outdoor unit can reach a length of up to 2 000 meters(6561.68 ft), supporting any topology connection. The following figure shows a serial connection:

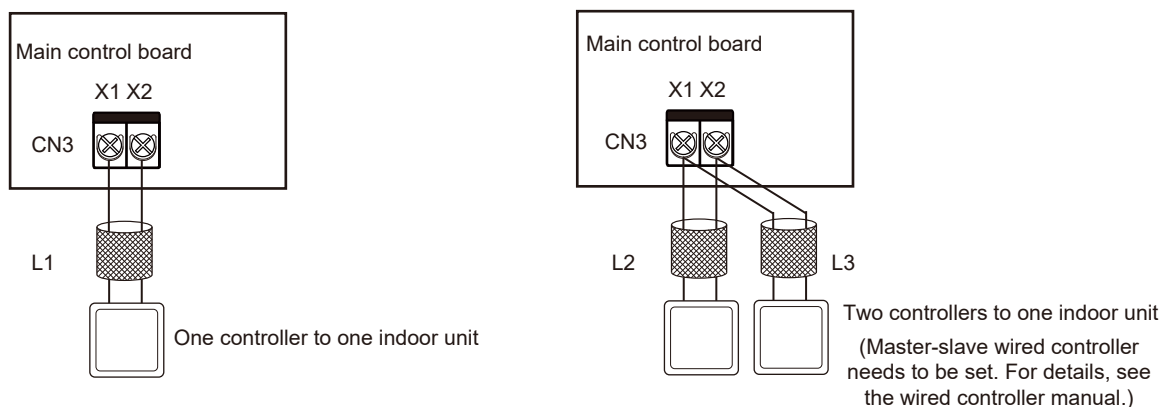


$$L1 + La + Ln \leq 2\,000\text{ m}(78\text{-}3/4\text{ in})$$

For other connection methods (tree topology, star topology, ring topology), please refer to the technical manual or consult technical personnel.

④ X1/X2 communication cable connection

The X1X2 communication wiring is mainly connected to the wired controller to achieve one controller per indoor unit and two controllers per indoor unit. The total length of the X1X2 communication wiring can reach 200 meters. Please use shielded wires, but the shield layer cannot be earthed. X1 and X2 ports are located at terminal block "CN3" of the main control board. There is no distinction between negative and positive electrodes. For details, see the following figure:



$$L1 \leq 200\text{ m}(7\text{-}7/8\text{ in}), L2+L3 \leq 200\text{ m}(7\text{-}7/8\text{ in}).$$

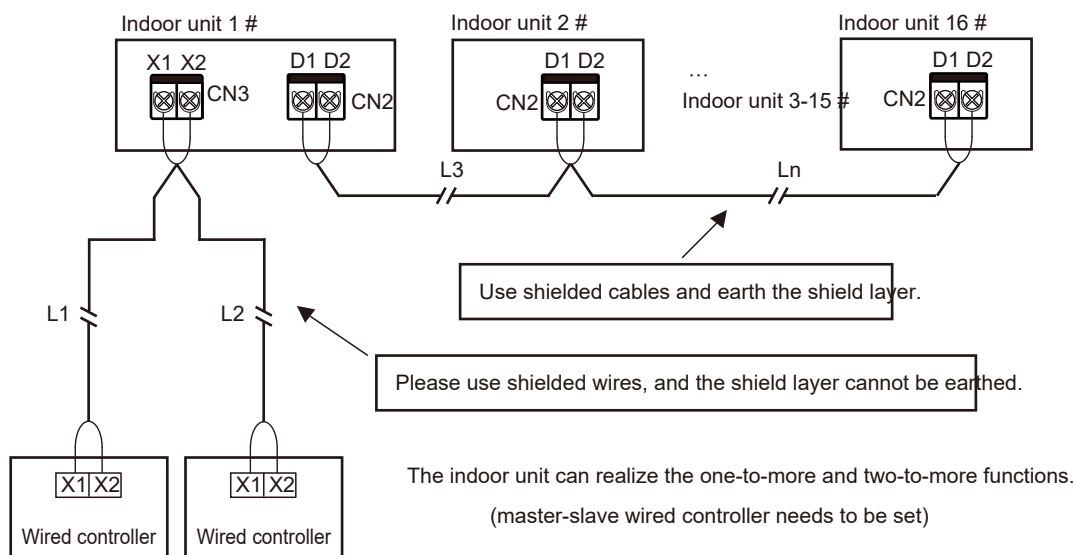
⚠ CAUTION

Two wired controllers of the same model can be used to control one indoor unit at the same time. In this case, need to set one controller to be the master and the other to be the slave. For details, see the wired controller manual.

⑤ D1D2 communication wiring connection (limited to outdoor unit and system configuration)

Achieving one-to-multiple and two-to-multiple functions of the indoor unit wired controller through D1D2 communication (a maximum of 16 sets)

D1D2 communication is 485 communication. The one-to-more and two-to-more functions of the indoor unit wired controller can be achieved through D1D2 communication, as shown in the figure below:



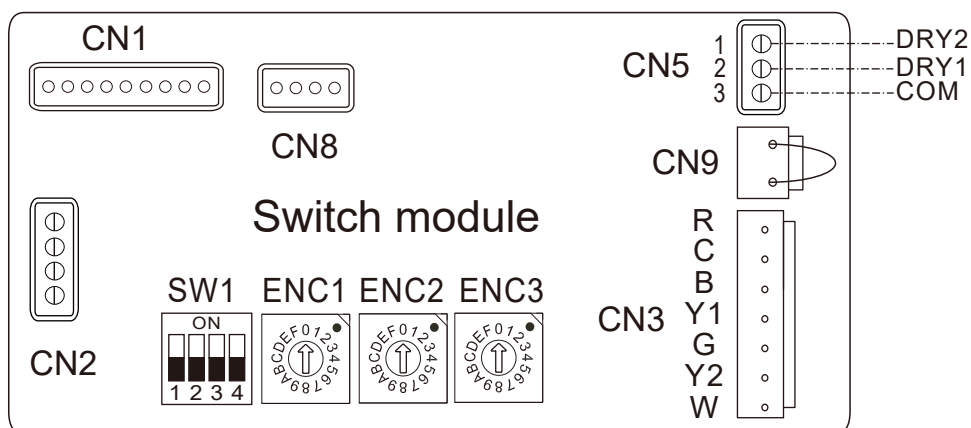
$L1 + L2 \leq 200 \text{ m (7-7/8 in)}$, $L3 + L_n \leq 1200 \text{ m (47-1/4 in)}$.

⚠ CAUTION

D1D2 communication can enable one-to-multiple and two-to-multiple functions of the indoor unit wired controller. To enable two-to-multiple functions, wired controllers must be of the same model.

5) Switch module setting

① Layout of Switch module



Port definition and function description

No.	Port	Attribute	Function
1	CN8	Input	Connect the A2L refrigerant leakage
2	CN9	Input	Short circuit, No function definition
3	CN5	Output	A passive multi-function dry contact corresponds to an ENC1 dip drive. The function definition depends on the dip switch
4	CN1	Output	Connect to the indoor unit main board CN18 for communication between the Switch module and the main board
5	CN2-E1	Communication	Connect the CN1-E1 port of the expansion board for communication between the switch module and the expansion board
	CN2-E2		Connect the CN1-E2 port of the expansion board for communication between the switch module and the expansion board
	CN2-GND		Connect the CN10-GND port of the expansion board
	CN2-+12V		Connect the CN10-+ 12 V port of the expansion board to supply power for the CN10 port of the expansion board
6	SW1-1	Setting	These are used to set the MS address combined with ENC2. All 0s do not take effect
	SW1-2		
	SW1-3	Setting	Reserve
	SW1-4	Setting	OFF: 24 V thermostat disable , ON: 24 V thermostat enable
	ENC1	Setting	Multi-function dry contact definition
	ENC2	Setting	These are used to set the MS address combined with SW1-1 and SW1-2. All 0s do not take effect.
	ENC3	Setting	Heat recovery device MS tube number set

② LED1 and LED3 Indicator Description

No.	Definition	Display	Description
LED1	Refrigerant sensor communication indicator(gree)	OFF	No communication history between the switch module and the refrigerant sensor
		Stays on	Normal communication between the switch module and the refrigerant sensor
		Blink	Abnormal communication between the switch module and refrigerant sensor
LED3	Communication indicator (red)	OFF	Communication between the switch module and the indoor unit main control board fails
		Stays on	Normal communication between the switch module and the indoor unit main control board
		Blink	Abnormal communication between the switch module and indoor unit main control board

③ ENC1/ENC2/ENC3, DRY1, DRY2 functions

There are three switches on the switch module: ENC1, ENC2 and ENC3.

The CN3 port of the communication switching board has two output dry contacts: dry contact 1 (DRY1), dry contact 2 (DRY2). DRY 1: Fan Output dry contact, which can be connected to devices such as air valves, new fans, and exhaust fans.

Dry 2: multi-function dry contact. The specific logic varies according to the dip switch value of ENC 1. The corresponding logic takes effect only after the Switch value is set to a function and the indoor unit is powered on again.

ENC1	Dry2 Signal Type	Display	Common external device
0	Invalid setting	/	/
1	Indoor unit fan status output	ON/OFF ≤ 24 V DC/AC 1A	Air valve, FAPU, Air discharge device
2	Shutdown/ non- shutdown output	ON/OFF ≤ 24 V DC/AC 1A	FAPU
3	Third-party heater output (air duct installed inside)	ON/OFF ≤ 24 V DC/AC 1A	Electric heating Tube
4	Fault alarm output	ON/OFF ≤ 24 V DC/AC 1A	Alarm equipment
5	Third-party humidifier control	ON/OFF ≤ 24 V DC/AC 1A	Humidifier
6	Dehumidifier control	ON/OFF ≤ 24 V DC/AC 1A	Dehumidifier
7	Preheater control	ON/OFF ≤ 24 V DC/AC 1A	Fresh air preheater
8	Third-party heater output (air ducts installed outside)	ON/OFF ≤ 24 V DC/AC 1A	Wall-mounted heater
9	Cooling operation output	ON/OFF ≤ 24 V DC/AC 1A	External device
A	Heating operation output	ON/OFF ≤ 24 V DC/AC 1A	External device
B	Human detection sensor status output	ON/OFF ≤ 24 V DC/AC 1A	Indicator /window off control
C	Defrosting operation output	ON/OFF ≤ 24 V DC/AC 1A	External device
D	Economizer control	ON/OFF ≤ 24 V DC/AC 1A	Air-side economizer
E	Invalid setting	/	/
F	Invalid setting	/	/

④ 24 V thermostat function (SW1-4 ON)

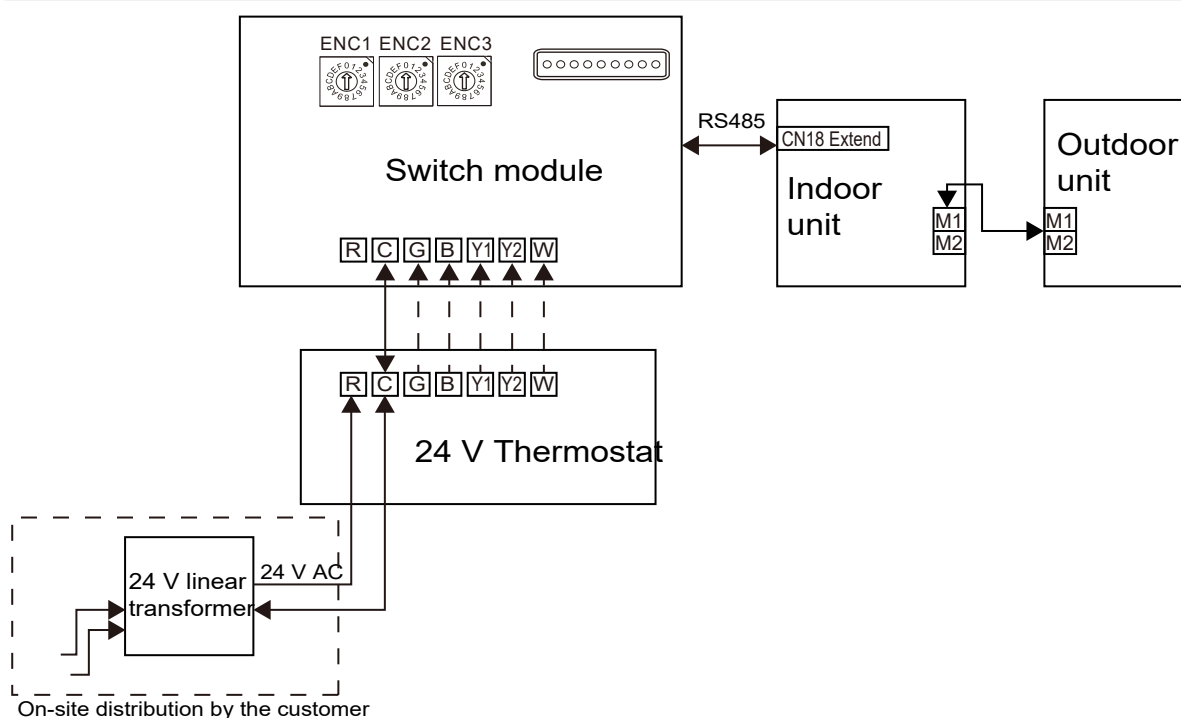
Check whether the DIP switch is correct according to the wiring nameplate after the electrical wiring is complete. In the switch settings, when there is Y1 or G signal, running at the lower speed, when there is Y1+Y2 signal, running at the high speed. The factory default will prevent cold air from blowing into the room as the initial stage of heating.

	Mode	Y or G(MIN)	Y1 + Y2 (MAX)
FAN SPEED	COOL	4	7
	HEAT	4	7

⑤ Wiring diagram

NOTICE

24 V linear transformer needs to be provided by the customer on site.

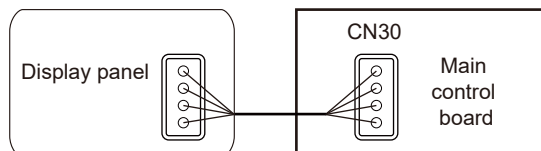


6) External board connection (limited to outdoor unit and system configuration)

The external boards are connection module outside the main control board, including a display box, 1 # Expansion board and 2 # Expansion board.

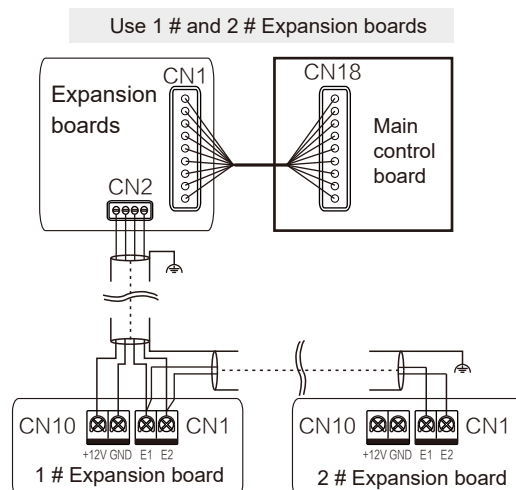
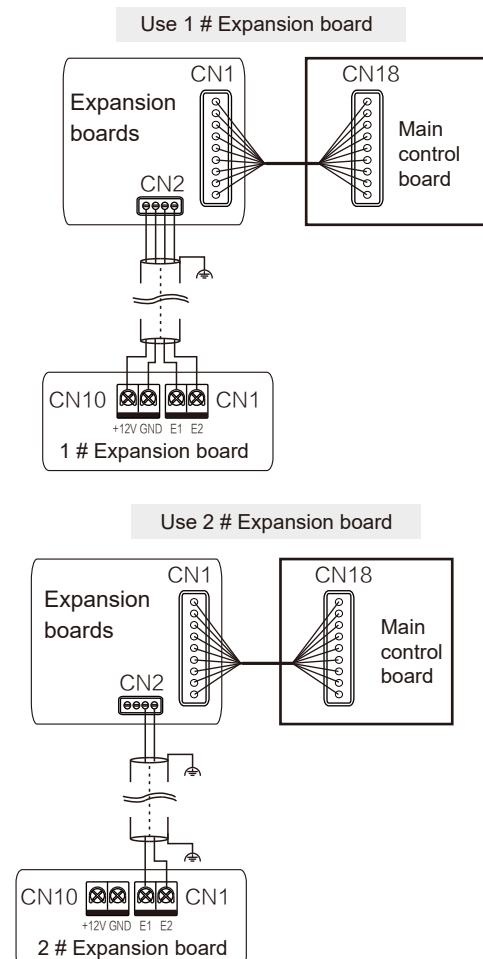
① Connection of Display Panel

The display panel is connected to the main control board through a 4-core cable, and is connected to the "CN30" socket of the main control board, as shown in the following figure:



② Expansion boards connection

Expansion boards can communicate with the main control board through the Switch board. Use one or both of the two expansion boards. The wiring figures are as follows:



NOTICE

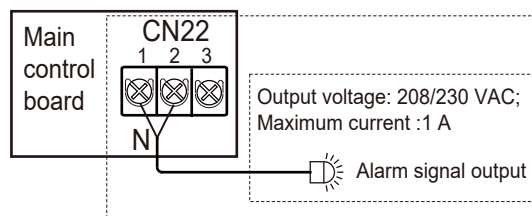
For the function introduction of the 1 # Expansion boards and 2 # Expansion boards, please refer to the function module manual.

7) Alarm signal module

Refer to the following figure for the wiring of alarm signal module.

CAUTION

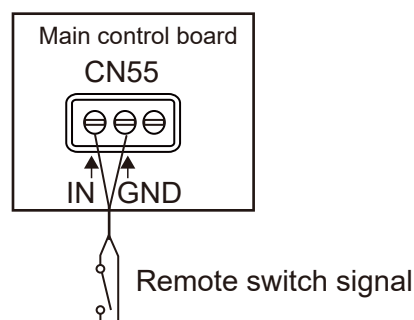
The output voltage is 208/230 V~.



8) Remote On/Off control

Refer to the following figure for using Remote On/Off control.

Remote Switch	Air Conditioning System
On	Off
Off	On

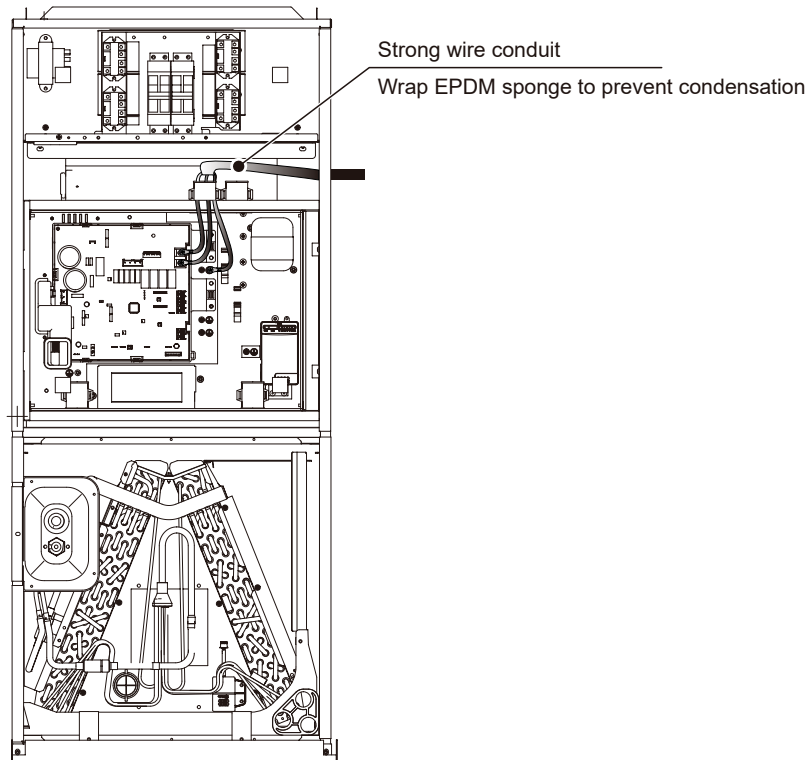


NOTICE

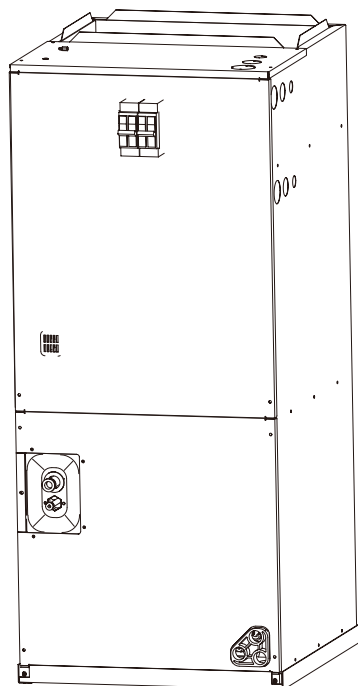
The priority of remote control is higher than that of the wired controller.
More remote control functions, such as delayed control, air conditioning system is on when remote control is on, please refer to the manual of wired controller.

9) Reclose the electric control box cover

Connect the power cord to the main control board's live wire, neutral wire, and earth wire, ensuring that the length of the earth wire is greater than that of the live and neutral wires, and then use a cable clamp to secure it.



Straighten out the connecting wires and lay them flat, and close the electric control box cover again.



10 ERROR CODES

10.1 Error codes and definitions

The error code is displayed on the display box and the wired controller display.

Definition	Error code	Digital display
Emergency stop	A01	
R454B refrigerant leaks,  DANGER requiring shutdown immediately	A11	
Outdoor unit fault	A51	
Interlocking control Heat Recovery Ventilation Unit fault(in-series application)	A71	
The Humidity Unit fault	A72	
Interlocking control Heat Recovery Ventilation Unit fault (non-serial application)	A73	
The AHU Kit slave unit fault	A74	
Self-check fault	A81	
MS (refrigerant flow direction switching device) fault	A82	
Mode conflict	A91	
1# EEV coil fault	b11	
1# EEV body fault	b12	
2# EEV coil fault	b13	
2# EEV body fault	b14	
Protection on 1 # water pump	b34	
Protection on 2 # water pump	b35	
Water level switch alarm	b36	
Reheating electric heater fault	b71	
Preprocessing electric heater fault	b72	
Humidifier fault	b81	
Duplicate indoor unit address code	C11	
Abnormal communication between the indoor unit and outdoor unit	C21	

Definition	Error code	Digital display
Abnormal communication between the indoor unit main control board and fan drive board	C41	
Abnormal communication between the indoor unit and wired controller	C51	
Abnormal communication between the indoor unit and Wi-Fi Kit	C52	
Abnormal communication between the indoor unit main control board and display board	C61	
Abnormal communication between the AHU Kit slave unit and master unit	C71	
Number of AHU Kits is not the same as the set number	C72	
Abnormal communication between the linked humidifying indoor unit and master indoor unit	C73	
Abnormal communication between the linked FAPU and master indoor unit (series setting)	C74	
Abnormal communication between the linked FAPU and master indoor unit (non-series setting)	C75	
Abnormal communication between the main wired controller and secondary wired controller	C76	
Abnormal communication between the indoor unit main control board and 1 # Expansion board	C77	
Abnormal communication between the indoor unit main control board and 2 # Expansion board	C78	
Abnormal communication between the indoor unit main control board and Switch board	C79	
The indoor unit is in power-off state	C81	
Air inlet temperature of the indoor unit is too low in heating mode	d16	
Air inlet temperature of the indoor unit is too high in cooling mode	d17	
Reminder for expiration of life of refrigerant leakage sensor	d43	
Alarm for exceeding temperature and humidity range	d81	
Sensor control board fault	dE1	
PM2.5 sensor fault	dE2	
CO ₂ sensor fault	dE3	
Formaldehyde sensor fault	dE4	
Human Detect sensor fault	dE5	
T0 (fresh inlet air temperature sensor) short-circuits or cuts off	E21	
The upper dry bulb temperature sensor short-circuits or cuts off	E22	
The lower dry bulb temperature sensor short-circuits or cuts off	E23	

Definition	Error code	Digital display
T1 (Indoor unit return air temperature sensor) short-circuits or cuts off	E24	
The built-in room temperature sensor of the wired controller short-circuits or cuts off	E31	
The wireless temperature sensor short-circuits or cuts off	E32	
The external room temperature sensor short-circuits or cuts off	E33	
Tcp (pre-cooled fresh air temperature sensor) short-circuits or cuts off	E61	
Tph (pre-heated fresh air temperature sensor) short-circuits or cuts off	E62	
TA (outlet air temperature sensor) short-circuits or cuts off	E81	
Outlet air humidity sensor fault	EA1	
Return air humidity sensor fault	EA2	
Upper wet bulb sensor fault	EA3	
Lower wet bulb sensor fault	EA4	
R454B refrigerant leakage sensor fault	EC1	
T2A (heat exchanger inlet temperature sensor) short-circuits or cuts off	F01	
T2 (heat exchanger middle temperature sensor) short-circuits or cuts off	F11	
T2 (heat exchanger middle temperature sensor) overtemperature protection	F12	
T2B (heat exchanger outlet temperature sensor) short-circuits or cuts off	F21	
Fan drive board input side overcurrent protection	P31	
At least 6 times P31 fault codes detected within 60 minutes	P34	
Power supply voltage is too low fault	P52	
Main control board EEPROM fault	P71	
Indoor unit display control board EEPROM fault	P72	
Locked (electronic lock)	U01	
Unit model code not set	U11	
Capacity(HP) code not set	U12	
Capacity(HP) code setting error	U14	
AHU Kit fan control input signal DIP setting error	U15	

Definition	Error code	Digital display
Address code not detected	U38	U38
Motor failed more than once	J01	J01
IPM (fan module) overcurrent protection	J1E	J1E
Instantaneous overcurrent protection for phase current	J11	J11
Low bus voltage fault	J3E	J3E
High bus voltage fault	J31	J31
Phase current sample bias error	J43	J43
Motor and indoor unit are unmatched	J45	J45
IPM and indoor unit are unmatched	J47	J47
Motor startup failure	J5E	J5E
Motor blocking protection	J52	J52
Speed control mode setting error	J55	J55
Phase lack protection of motor	J6E	J6E

10.2 Operating status codes and definitions (non-error)

Definition	Code	Digital display
Oil return or preheating operation	d0	d0
Self-cleaning	dC	dC
Mode conflict	dd	dd
Defrosting	dF	dF
Outdoor unit running in heating mode	dH	dH
Static pressure detection	d51	d51
Remote shutdown	d61	d61
Indoor unit backup operation	d71	d71
outdoor unit backup operation	d72	d72
Main control program upgrading	OTA	OTA

CAUTION

Error codes are displayed only for certain outdoor unit models and indoor unit configurations (including the wired controller and display box).
When the main control program is being upgraded, make sure that the indoor unit and outdoor unit remain powered on. Otherwise, the upgrading process will stop.

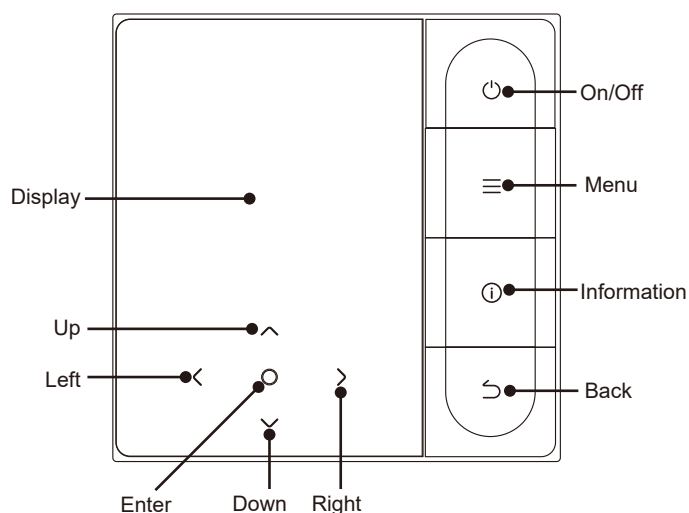
11 SETTINGS

Use the wired controller (for example, WDC3-120T2) to enter engineering settings:

- Parameters can be set in the power-on or power-off state.
- Hold "≡" and ">" for 3 seconds to enter the parameter setting interface.
- After entering the parameter setting interface, Press "∨" and "∧" to switch the parameter. Set parameters according to the Table of Parameter Settings. Press "○" to enter the parameter setting interface.

Then press "<" and ">" to change parameter value and press "○" to save changes.

- Press the "back" button to return to the previous page until exiting the parameter setting or exiting the parameter setting after 60 s without any operation.
- When it is in the parameter settings page, the wired controller does not respond to any remote control signal.



NOTICE

For information such as the engineering menu of the wire controller, please refer to the wire controller manual for details.

System operating status query

No.	Displayed content	Remarks
1	Communication address value (for communication with the outdoor unit)	When there are multiple addresses (an indoor unit with a large horsepower has both real and virtual addresses), the address digits will be displayed sequentially every 0.5 seconds; For example, if the indoor unit is assigned with 4 addresses, after the spot check starts, 01 -> 02 -> 03 -> 04 will be displayed every 0.5 seconds and the displayed digit will finally stay at 04.
2	Capacity (HP)	
3	Temperature set by the user [°C(°F)]	
4	Temperature executed by the program [°C(°F)]	

No.	Displayed content	Remarks
5	T1 - Value detected by the return air temperature sensor [°C(°F)]	
6	Return air temperature corrected through program compensation [°C(°F)]	
7	T2 - Value detected by the heat exchanger middle temperature sensor [°C(°F)]	
8	T2A - Value detected by the heat exchanger liquid pipe temperature sensor [°C(°F)]	
9	T2B - Value detected by the heat exchanger gas pipe temperature sensor [°C(°F)]	
10	Humidity set by the user (RH, %)	
11	RH - Value detected by the RH sensor (%)	
12	Real-time static pressure value (Pa)	Only available for constant air flow models; For example, if the real-time static pressure value is 108 Pa and the display box or panel has a two-digit digital display, 108 will be displayed. If the display box or panel has a two-digit digital display, 10 will be displayed.
13	Value detected by the compressor discharge temperature sensor [°C(°F)]	
14	Target overheating [°C(°F)]	
15	EXV pulse count = Displayed value × 8	If the displayed value is 40, the pulse count is 40 × 8 = 320.
16	Indoor unit main control PCB program version No.	For example, 1) If the program version is V49.4 and the display box or panel has a three-digit digital display, 494 will be displayed. If the display box or panel has a two-digit digital, 49 will be displayed. 2) If the program version is V49 and the display box or panel has a three-digit digital display, 491 will be displayed. If the display box or panel has a two-digit display, 49 will be displayed.
17	Display box or panel PCB program version No.	
18	Fan drive version No.	
19	Historical error code 1	The historical error code 2 is triggered before the error code 1.
20	Historical error code 2	
21	Network address value	For connection to the centralized and gateway
22	Expansion board address	For example, When 00 > --- > 02 > --- > 04 is displayed, it indicates that the expansion board with the address digit 00/02/04 is connected, and the expansion board address is displayed in turn every 1 second.
23	---	

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