

AIR CONDITIONER INDOOR UNIT (Duct type)



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NOTES: This manual describes how to install the air conditioner described above.
Handling and installation shall only be done by professionals as outlined in this manual.

INSTALLATION MANUAL



PART No. 9381386611-02

For authorized service personnel only.

- Installation must be performed in accordance with the requirement of NEC (National Electrical Code) and CEC (Canadian Electrical Code) by authorized personnel only.
- All products are manufactured to metric units and tolerances. United States customary units are provided for reference only. In cases where exact dimensions and tolerances are required, always refer to metric units.

1. SAFETY PRECAUTIONS

1.1. IMPORTANT! Please read before starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all danger, warning, and caution notices given in this manual.

WARNING: This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION: This symbol refers to a hazard or unsafe practice which can result in personal injury and the potential for product or property damage.

- Hazard alerting symbols



: Electrical



: Safety/alert

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

1.2. Special precautions

When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding (earthing) can cause accidental injury or death.
- Ground (Earth) the unit following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing...

...In a Ceiling or Wall

Make sure the ceiling/wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.

...In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

...In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

...In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow.

When Connecting Refrigerant Tubing

- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before opening the refrigerant valves.

English

Français

Español

When Servicing

- Turn the power OFF at the main circuit breaker panel before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.
- After installation, explain correct operation to the customer, using the operation manual.

WARNING

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 10 minutes or more before touching electrical components.

- Be sure to read this manual thoroughly before installation.
- The warnings and precautions indicated in this Manual contain important information pertaining to your safety. Be sure to observe them.
- Hand this Manual, together with the operation manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.

WARNING

- Installation of this product must be done by experienced service technicians or professional installers only in accordance with this manual. Installation by nonprofessional or improper installation of the product may cause serious accidents such as injury, water leakage, electric shock, or fire. If the product is installed in disregard of the instructions in this manual, it will void the manufacturer's warranty.
- Do not turn on the power until all work has been completed. Turning on the power before the work is completed can cause serious accidents such as electric shock or fire.
- If refrigerant leaks when you are working, ventilate the area. If the leaking refrigerant is exposed to a direct flame it may produce a toxic gas.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- Do not use this equipment with air or any other unspecified refrigerant in the refrigerant lines. Excess pressure can cause a rupture.
- Installation must be performed in accordance with regulations, codes, or standards for electrical wiring and equipment in each country, region, or the installation place.
- 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.
- To avoid danger of suffocation, keep the plastic bag or thin film used as the packaging material away from young children.
- 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 may not contain an odour.
- Keep any required ventilation openings clear of obstruction.
- If the power cable or the connection cable is damaged, it must be replaced by the manufacturer, its service agent or similar qualified persons in order to avoid a safety hazard.
- After servicing, check for refrigerant leak before turning on the unit.
- Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

CAUTION

- Read carefully all safety information written in this manual before you install or use the air conditioner.
- Do not attempt to install the air conditioner or a part of the air conditioner by yourself.
- This product must be installed by qualified personnel with a capacity certificate for handling refrigerant fluids. Refer to regulation and laws in use on installation place.
- Install the product by following local codes and regulations in force at the place of installation, and the instructions provided by the manufacturer.
- This product contains no user-serviceable parts. Always consult experienced service technicians for repairing.
- This product is part of a set constituting an air conditioner. The product must not be installed alone or be installed with non-authorized device by the manufacturer.
- Always use a separate power supply line protected by a circuit breaker operating on all wires with a distance between contact of 1/8 in (3 mm) for this product.
- To protect the persons, ground (earth) the product correctly, and use the power cable combined with an Earth Leakage Circuit Breaker (ELCB).
- This product is not explosion proof, and therefore should not be installed in explosive atmosphere.
- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the product.
- Do not touch the aluminum fins of heat exchanger built-in the indoor or outdoor unit to avoid personal injury when you install or maintain the unit.
- This product contains no user-serviceable parts. Always consult experienced service technicians for repairing.
- Do not place any other electrical products or household belongings under the product. Condensation dripping from the product might get them wet, and may cause damage or malfunction to the property.

- Be careful not to scratch the air conditioner when handling it.

2. PRODUCT SPECIFICATION

2.1. Precautions for using R32 refrigerant

- The basic installation work procedures are the same as conventional refrigerant (R410, R22) models.
However, pay careful attention to the following points:
- Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (Refer to the following table.)
Especially, when replacing a conventional refrigerant (R22) model with a new refrigerant R32 model, always replace the conventional piping and flare nuts with the R32 and R410A piping and flare nuts.
- Models that use refrigerant R32 and R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant (R22) and for safety. Therefore, check beforehand. [The charging port thread diameter for R32 and R410A is 1/2-20 UNF.]
- Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant (R22) models. Also, when storing the piping, securely seal the opening by pinching, taping, etc. (Handling of R32 is similar to R410A.)
- When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases. And always charge from the liquid phase where refrigerant composition is stable.

This manual includes requirements of clauses according to Table DD.1 (Installation, Maintenance and repair, Decommissioning)

WARNING

- Auxiliary devices which may be a potential ignition source shall not be installed in the duct work.
- Examples of such potential ignition sources are hot surfaces with a temperature exceeding 1292°F (700°C) and electric switching devices.
- Minimum room area is corrected by multiplying by an altitude adjustment factor (AF) based on for building site ground level altitude (H_{alt}) in meters.

Altitude Adjustment Factor

| H_{alt} | 0 | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 |
|-----------|------|------|------|------|------|------|------|------|------|
| AF | 1.00 | 1.00 | 1.00 | 1.00 | 1.02 | 1.05 | 1.07 | 1.10 | 1.12 |
| H_{alt} | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
| AF | 1.12 | 1.15 | 1.18 | 1.21 | 1.25 | 1.28 | 1.32 | 1.36 | 1.40 |

- The appliance shall not be installed in an unventilated space, if that space is smaller than minimum installation area.
- The installation height is the minimum installation height, which is the lowest installation of ductwork outlets or indoor unit, whichever is the lowest, and the minimum installation areas on the table below were determined based on the lowest installation heights 5.9 ft (1.8 m).
- If the ducted air conditioner is used to condition more than one room, then the minimum installation area on table below shall apply to the smallest room.
- Should the desired minimum installation height be below 5.9 ft (1.8 m), the minimum installation area must be re-calculated accordingly.
- When the safety measure is enabled, the safety measure-compatible installation area will be applied.
- For more information about safety measure settings, refer to "6. FUNCTION SETTING".

(UL60335-2-40) Without safety measures

| Amount of refrigerant charge M [lbs (kg)] | Minimum room area [ft² (m²)] | |
|--|--------------------------------|--|
| | Installation height H [ft (m)] | |
| | 5.9 (1.8) ≤ H | |
| M ≤ 4.05 (1.836) | — | |
| 4.05 (1.836) < M ≤ 4.19 (1.90) | 60.82 (5.65) | |
| 4.19 (1.90) < M ≤ 4.41 (2.00) | 64.05 (5.95) | |
| 4.41 (2.00) < M ≤ 4.63 (2.10) | 67.17 (6.24) | |
| 4.63 (2.10) < M ≤ 4.85 (2.20) | 70.40 (6.54) | |
| 4.85 (2.20) < M ≤ 5.07 (2.30) | 73.63 (6.84) | |
| 5.07 (2.30) < M ≤ 5.29 (2.40) | 76.85 (7.14) | |
| 5.29 (2.40) < M ≤ 5.51 (2.50) | 79.98 (7.43) | |
| 5.51 (2.50) < M ≤ 5.73 (2.60) | 83.21 (7.73) | |
| 5.73 (2.60) < M ≤ 5.95 (2.70) | 86.43 (8.03) | |
| 5.95 (2.70) < M ≤ 6.17 (2.80) | 89.56 (8.32) | |
| 6.17 (2.80) < M ≤ 6.39 (2.90) | 92.79 (8.62) | |
| 6.39 (2.90) < M ≤ 6.61 (3.00) | 96.01 (8.92) | |
| 6.61 (3.00) < M ≤ 6.83 (3.10) | 99.14 (9.21) | |
| 6.83 (3.10) < M ≤ 7.05 (3.20) | 102.37 (9.51) | |
| 7.05 (3.20) < M ≤ 7.28 (3.30) | 105.59 (9.81) | |
| 7.28 (3.30) < M ≤ 7.50 (3.40) | 108.82 (10.11) | |
| 7.50 (3.40) < M ≤ 7.72 (3.50) | 111.95 (10.40) | |
| 7.72 (3.50) < M ≤ 7.94 (3.60) | 115.17 (10.70) | |
| 7.94 (3.60) < M ≤ 8.16 (3.70) | 118.40 (11.00) | |
| 8.16 (3.70) < M ≤ 8.38 (3.80) | 121.53 (11.29) | |
| 8.38 (3.80) < M ≤ 8.60 (3.90) | 124.75 (11.59) | |
| 8.60 (3.90) < M ≤ 8.82 (4.00) | 127.98 (11.89) | |

WARNING

(UL60335-2-40) With safety measures

| Amount of refrigerant charge M [lbs (kg)] | Minimum room area [ft ² (m ²)] |
|--|---|
| M ≤ 4.05 (1.836) | — |
| 4.05 (1.836) < M ≤ 4.19 (1.90) | 60.82 (5.65) |
| 4.19 (1.90) < M ≤ 4.41 (2.00) | 64.05 (5.95) |
| 4.41 (2.00) < M ≤ 4.63 (2.10) | 67.17 (6.24) |
| 4.63 (2.10) < M ≤ 4.85 (2.20) | 70.40 (6.54) |
| 4.85 (2.20) < M ≤ 5.07 (2.30) | 73.63 (6.84) |
| 5.07 (2.30) < M ≤ 5.29 (2.40) | 76.85 (7.14) |
| 5.29 (2.40) < M ≤ 5.51 (2.50) | 79.98 (7.43) |
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| 6.39 (2.90) < M ≤ 6.61 (3.00) | 96.01 (8.92) |
| 6.61 (3.00) < M ≤ 6.83 (3.10) | 99.14 (9.21) |
| 6.83 (3.10) < M ≤ 7.05 (3.20) | 102.37 (9.51) |
| 7.05 (3.20) < M ≤ 7.28 (3.30) | 105.59 (9.81) |
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| 7.94 (3.60) < M ≤ 8.16 (3.70) | 118.40 (11.00) |
| 8.16 (3.70) < M ≤ 8.38 (3.80) | 121.53 (11.29) |
| 8.38 (3.80) < M ≤ 8.60 (3.90) | 124.75 (11.59) |
| 8.60 (3.90) < M ≤ 8.82 (4.00) | 127.98 (11.89) |

- Ducts connected to this product shall not contain a potential ignition source such as hot surfaces, flames or current carrying devices that can be the source of arcing or sparking.
- Where the indoor unit is connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings must not be used as a return air duct. And when using auxiliary devices, it shall be installed that is declared suitable with R32 refrigerant in connecting ductwork.

CAUTION

1 General

1-1 Installation

- That 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.
- That 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;

1-2 Unventilated areas

- When installing this product to an unventilated area, pay attention to prevent fire and explosion caused by the stagnated gas in case of refrigerant leakage. (For products which contain more than 4.05 lbs (1.836 kg) refrigerant.)
- The appliance shall be stored so as to prevent mechanical damage from occurring.

1-3 Qualification of workers

- As this product uses flammable refrigerant, its installation, repair, maintenance, removal, and deposition must be performed by dedicated service personnel who completed trainings and obtained relevant certificates provided by the domestic training facilities or manufactures certified for obtaining relevant national certificate stipulated by the applicable law.

2 Information on servicing

(Checks to the area)

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.
- For repair to the refrigerating system, 2-1 to 2-5 shall be completed prior to conducting work on the system.

2-1 Work procedure

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

2-2 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.

2-3 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.

2-4 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.

2-5 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 may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

2-6 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.

2-7 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 actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
 - the ventilation machinery and outlets are operating adequately and are not obstructed;
 - if an indirect refrigerating circuit is 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 may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

2-8 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.

3 Sealed electrical components

Sealed electrical components shall be replaced.

4 Intrinsically safe components

Intrinsically safe components must be replaced.

5 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.

6 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.

7 Leak detection methods

- 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 may not be adequate, or may need recalibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the 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 may react with the refrigerant and corrode the copper pipe-work.

NOTE:

Examples of leak detection fluids are

- bubble method,
- fluorescent method agents.
- 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.

CAUTION

8 Removal and evacuation

- 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 is followed since flammability is a consideration. The following procedure shall be adhered to:
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
 - safely remove refrigerant following local and national regulations;
 - evacuate;
 - purge the circuit with inert gas (optional for R32);
 - evacuate (optional for R32);
 - continuously flush or purge with inert gas when using flame to open circuit; and
 - 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 R32).
- This process shall be repeated until no refrigerant is within the system (optional for R32).
- 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 is not close to any potential ignition sources and that ventilation is available.

9 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 minimize 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.
 - 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.

10 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.
 - Become familiar with the equipment and its operation.
 - Isolate system electrically.
 - 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.
 - Pump down refrigerant system, if possible.
 - If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - Make sure that cylinder is situated on the scales before recovery takes place.
 - Start the recovery machine and operate in accordance with instructions.
 - Do not overfill cylinders (no more than 80 % volume liquid charge).
 - Do not exceed the maximum working pressure of the cylinder, even temporarily.
 - When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
 - Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.





11 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.

12 Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge 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 returned to the refrigerant supplier 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.

Explanation of symbols displayed on the indoor unit or outdoor unit.

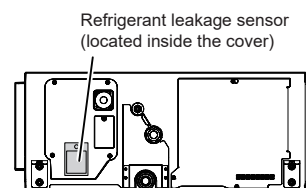
| | | | |
|---|-------------------------------------|----------------|---|
|  | Refrigerant Safety Group A2L | WARNING | This symbol shows that this product uses a low burning velocity material. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire. |
|  | | CAUTION | This symbol shows that the operation manual should be read carefully. |
|  | | CAUTION | This symbol shows that a service personnel should be handling this equipment with reference to the installation manual. |
|  | | CAUTION | This symbol shows that information is available such as the operation manual or installation manual. |

2. 2. Refrigerant leakage sensor

CAUTION

- This product is equipped with a refrigerant leakage sensor. Do not install the product at a location filled with smoke, gases or chemicals.
- When connecting the pipes, be careful not to allow the refrigerant to be leaked. If the refrigerant is sprayed directly onto the sensor, the sensor may fail.
- After installation is complete, explain to the customer that the breaker must be always turned on to ensure the operation of the refrigerant leakage sensor.
- Do not use flammable substances (such as pesticides and hair sprays). Doing so may cause an electric shock, fire or wrong detection by the refrigerant sensor.
- Do not use silicone fillers or sprays. Otherwise, it may cause sensor failure.

- When installing or refrigerant piping or drain piping, do not subject the sensor to shock or expose it to refrigerant or water. Otherwise, it may cause sensor failure.



Refrigerant leakage sensor have an expiration date

- The expiration date is 10 years, provided the sensor element is not affected by substances that degrade it.
 - If the expiry date of the sensor is approaching or has passed, an error code will be shown. Refer to "11. ERROR CODES".
 - Refrigerant leakage sensor that have passed their expiration date must be replaced.
- Request replacement of the refrigerant leakage sensor to your dealer or authorized service personnel.**

2. 3. Installation tools

| Tool name | Contents of change |
|----------------------|---|
| Gauge manifold | Pressure is high and cannot be measured with a R22 gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use gauge with seals -30 inHg to 768 psi (-0.1 to 5.3 MPa) for high pressure. -30 inHg to 551 psi (-0.1 to 3.8 MPa) for low pressure. |
| Charge hose | To increase pressure resistance, the hose material and base size were changed.(R32/R410A) |
| Vacuum pump | A conventional vacuum pump can be used by installing a vacuum pump adapter. |
| Gas leakage detector | Special gas leakage detector for HFC refrigerant R410A or R32. |

■ Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 0.004 oz/100 ft (40 mg/10 m). Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.





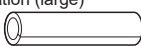
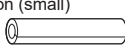





As an air conditioner using R32 (R410A) incurs pressure higher than when using R22, it is necessary to choose adequate materials.

⚠ WARNING

- Do not use the existing (for R22) piping and flare nuts. If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause failure, injury, etc. (Use the special R32/R410A materials.)
- Use (refill or replace with) specified refrigerant (R32) only. Use of unspecified refrigerant can cause product malfunction, burst, or injury.
- Do not mix any gas or impurities except specified refrigerant (R32). Inflow of air or application of unspecified material makes the internal pressure of the refrigerant cycle too high, and may cause product malfunction, burst of piping, or injury.
- For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts. The use of non-prescribed parts can cause serious accidents such as the unit falling, water leakage, electric shock, or fire.
- Do not turn on the power until all work has been completed.

2. 4. Accessories

- The following installation parts are furnished. Use them as required.
- Keep the Installation Manual in a safe place and do not discard any other accessories until the installation work has been completed.

| Name and Shape | Q'ty | Description |
|--|------|--|
| Operation manual  | 1 | |
| Installation manual  | 1 | (This book) |
| Washer A (with insulation)  | 4 | For installing indoor unit |
| Washer B  | 4 | |
| Coupler heat insulation (large)  | 1 | For indoor side pipe joint (gas pipe) |
| Coupler heat insulation (small)  | 1 | For indoor side pipe joint (liquid pipe) |
| Cable tie (large)  | 4 | For fixing the heat insulation |
| Cable tie (medium)  | 1 | For fixing the remote controller cable |
| Drain hose insulation  | 1 | Insulates the drain hose and vinyl hose |
| Drain hose  | 1 | For installing drain pipe (Ø 1 in [I.D.], Ø 1-1/4 in [O.D.]) |
| Hose Band  | 1 | For installing drain hose |

2. 5. Pipe requirement

⚠ CAUTION

- Do not use existing pipes from another refrigeration system or refrigerant.
- Use pipes that have clean external and internal sides without any contamination which may cause trouble during use, such as sulfur, oxide, dust, cutting waste, oil, or water.
- It is necessary to use seamless copper pipes.
Material : Phosphor deoxidized seamless copper pipes
It is desirable that the amount of residual oil is less than 0.004 oz/100 ft (40 mg/10 m).
- Do not use copper pipes that have a collapsed, deformed, or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
- Improper pipe selection will degrade performance. As an air conditioner using R32 incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.

- Thicknesses of copper pipes used with R32 are as shown in the table.
- Never use copper pipes thinner than those indicated in the table even if they are available on the market.

Thicknesses of Annealed Copper Pipes (R32)

| Pipe outside diameter [in (mm)] | Thickness [in (mm)] |
|---------------------------------|---------------------|
| 1/4 (6.35) | 0.031 (0.80) |
| 3/8 (9.52) | 0.031 (0.80) |
| 1/2 (12.70) | 0.031 (0.80) |
| 5/8 (15.88) | 0.039 (1.00) |
| 3/4 (19.05) | 0.047 (1.20) |

⚠ CAUTION

Refer to the installation manual of the outdoor unit for description of the length of connecting pipe or for difference of its elevation.

| Model | Diameter [in (mm)] | |
|-------------|--------------------|-------------|
| | Liquid | Gas |
| 12 | 1/4 (6.35) | 3/8 (9.52) |
| 18/24 | 1/4 (6.35) | 1/2 (12.70) |
| 30/36/42/48 | 3/8 (9.52) | 5/8 (15.88) |

- Use pipe with water-resistant heat insulation.

⚠ CAUTION

- Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks.
- Use heat insulation with heat resistance above 248 °F (120 °C). (Reverse cycle model only)
- If expected humidity of the installation location of refrigerant pipes is higher than 70 %, wrap the heat insulation around the refrigerant pipes.
If the expected humidity is between 70 % and 80 %, use heat insulation that has a thickness of 9/16 in (15 mm) or more.
If the expected humidity is higher than 80 %, use heat insulation that has a thickness of 13/16 in (20 mm) or more.
- The use of thinner heat insulation than specified above, may cause a condensation on the surface of the insulation.
- Use heat insulation with thermal conductivity of 0.045 W/(m·K) or less (at 68 °F (20 °C)).

2. 6. Electrical requirement

The indoor unit is powered from the outdoor unit. Do not power indoor unit from separate power source.

⚠ WARNING

Standard for electrical wiring and equipment differs in each country or region. Before you start electrical working, confirm related regulations, codes, or standards.

| Cable | Conductor size (AWG) | Remarks |
|------------------|----------------------|-----------------------------------|
| Connection cable | AWG 14 | 3Wire+Ground (Earth), 1Ø 208/230V |

Cable Length: Limit voltage drop to less than 2%. Increase cable gauge if voltage drop is 2% or more.

*Refer to the installation manual of the wired remote controller for the conductor size of the remote control cable.

2. 7. Optional parts

Refer to each installation manual for the method of installing optional parts.

| Parts name | Model No. | Application |
|---------------------------------------|--------------|---|
| Wired remote controller | UTY-RNRUZ* | For air conditioner operation (2-wired type) |
| | UTY-RVR* | |
| Simple remote controller | UTY-RSRY | For air conditioner operation (2-wired type) |
| | UTY-RHRY | |
| IR receiver unit | UTY-LBTUM | For air conditioner operation |
| WLAN interface | UTY-TFSX** | For wireless LAN control |
| Thermostat converter | UTY-TTRXZ* | For air conditioner operation |
| Remote sensor | UTY-XSZXZ1 | For measuring room temperature |
| External switch controller | UTY-TERX | For control external switches |
| External input and output PCB | UTY-XCSX | For connecting external devices |
| External input and output PCB bracket | UTZ-GXNA | For installing the External input and output PCB |
| External connect kit | UTY-XWZXZG | For control output port |
| Air filter kit | UTD-LFNA/B/C | LFNA : 36/42/48 model LFNB : 18/24/30 model LFNC : 12 model |
| Network convertor | UTY-VTGX | For air conditioner operation |
| Modbus converter | UTY-VMSX | Only one communication converter can be connected. |
| KNX convertor | UTY-VKSX | |

* Optional parts are subject to change without notice.

3. INSTALLATION WORK

WARNING

- Do not turn on the power until all installation work is complete.
- Carrying and installation of the unit should be performed by a sufficient number of people and with sufficient equipment that is adequate for the weight of the unit. Performing such work with an insufficient number of people or with inadequate equipment could result in dropping of the unit or personal injury.

CAUTION

For installation details, refer to the technical data.

3. 1. Selecting an installation location

Decide the mounting position together with the customer as follows.

WARNING

- Select installation locations that can properly support the weight of the indoor unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.
- Install the units securely so that they do not topple or fall.

WARNING

- Install the air conditioner in a location which can withstand a load of at least 5 times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.

| MODEL | Withstandable weight (Unit weight x 3*) |
|----------|---|
| 12 | 198 Lbs (90 kg) |
| 18/24/30 | 277 Lbs (126 kg) |
| 36/42/48 | 363 Lbs (165 kg) |

*In accordance with UL standards.

- Carrying and installation of the unit should be performed by a sufficient number of people and with sufficient equipment that is adequate for the weight of the unit. Performing such work with an insufficient number of people or with inadequate equipment could result in dropping of the unit or personal injury.
- If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.
- When fastening the hangers, make the bolt positions uniform.

CAUTION

Do not install the unit in the following areas:

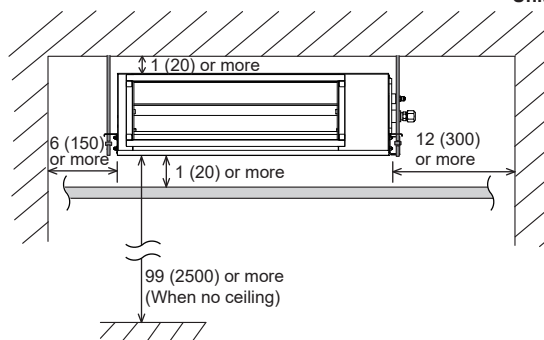
- Area with high salt content, such as at the seaside. It will deteriorate metal parts, causing the parts to fail or the unit to leak water.
- Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen. It will deteriorate plastic parts, causing the parts to fail or the unit to leak water.
- Area where is close to heat sources.
- Area that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
- Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile in flammables such as paint thinner or gasoline.
- If gas leaks and settles around the unit, it can cause a fire.
- Area where animals may urinate on the unit or ammonia may be generated.
- Do not use the unit for special purposes, such as storing food, raising animals, growing plants, or preserving precision devices or art objects. It can degrade the quality of the preserved or stored objects.
- Install the unit where drainage does not cause any trouble.
- Install the indoor unit, outdoor unit, power supply cable, transmission cable, and remote controller cable at least 40 in (1 m) away from a television or radio receivers. The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 40 in (1 m) apart, you could still receive noise under some signal conditions.)
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.
- Install the unit where ambient temperature does not reach 140 °F (60 °C) or more. Take a measure such as ventilation for an environment in which heat is retained.

- The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
- Leave the space required to service the air conditioner.
- Install the unit where connection to the outdoor unit is easy.
- Install the unit where the connection pipe can be easily installed.
- Install the unit where the drain pipe can be easily installed.
- Install the unit where noise and vibrations are not amplified.
- Take servicing, etc., into consideration and leave the spaces. Also install the unit where the filter can be removed.
- Do not install the unit where it will be exposed to direct sunlight.

Correct initial installation location is important because it is difficult to move unit after it is installed.

3. 2. Installation dimensions

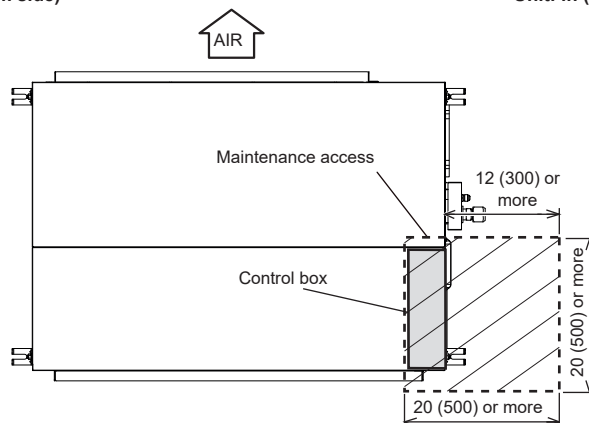
Unit: in (mm)



Provide a maintenance access for maintenance purposes.

(Bottom side)

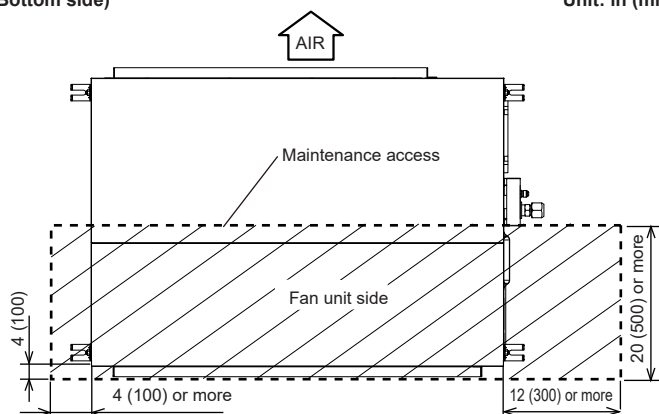
Unit: in (mm)



* The maintenance access necessary for fan units and filter maintenance.

(Bottom side)

Unit: in (mm)



3. 3. Installing the unit

CAUTION

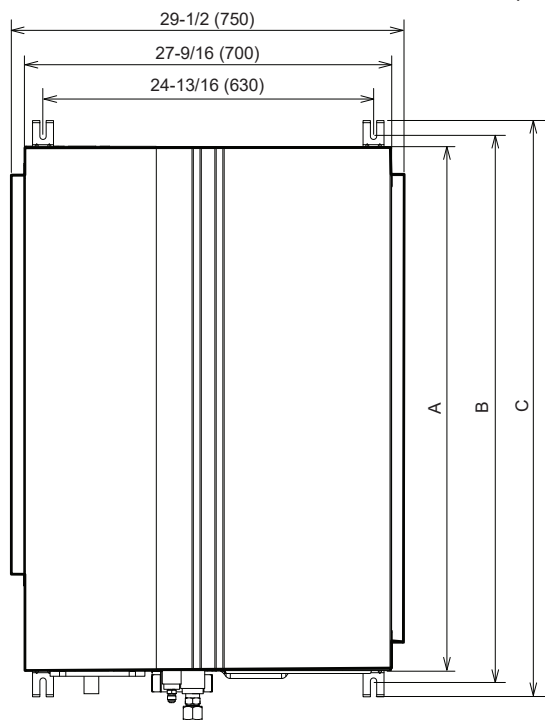
Confirm the directions of the air intake and outlet before installing the unit.

3. 3. 1. Position the ceiling hole

Hanging bolt installation diagram.

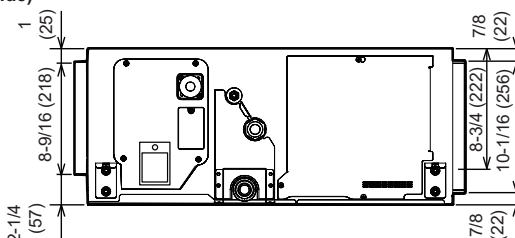
(Top side)

Unit: in (mm)

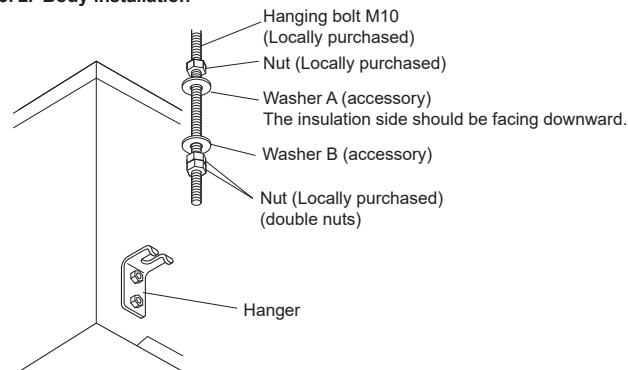


| Model | Dimensions [in (mm)] | | |
|----------|----------------------|-----------------|----------------|
| | A | B | C |
| 12 | 27-9/16 (700) | 29-1/8 (740) | 31-1/2 (800) |
| 18/24/30 | 39-3/8 (1000) | 40-15/16 (1040) | 43-5/16 (1100) |
| 36/42/48 | 55-1/8 (1400) | 56-11/16 (1440) | 59-1/16 (1500) |

(Right side)



3. 3. 2. Body installation



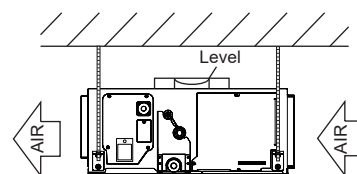
CAUTION

Perform final tightening by tightening the double nuts firmly.

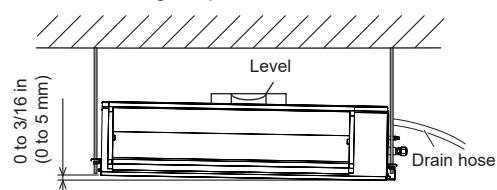
3. 3. 3. Leveling

Base vertical direction leveling on the unit (right and left).

(Right side)



Base horizontal direction leveling on top of the unit.



Give a slight tilt to the side to which the drain hose is connected. The tilt should be in the range of 0 to 3/16 in (0 to 5 mm).

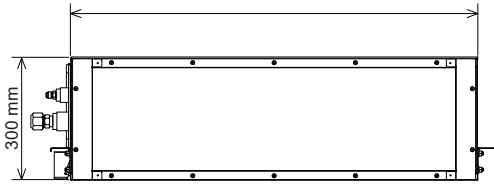
3. 4. Intake duct connection

Follow the procedure in the following figure.

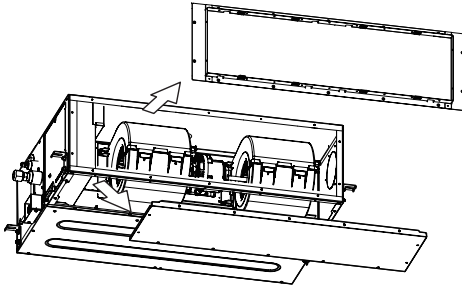
*18/24/30/36/42/48 model is different from the figure.

(Back side)

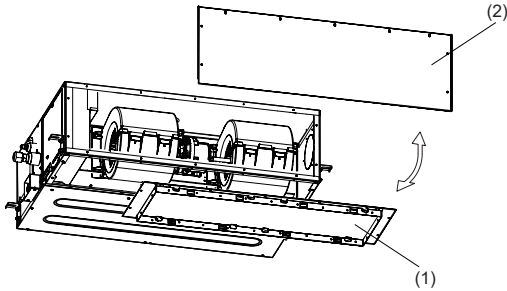
12 model : 27-9/16 in (700 mm)
18/24/30 model : 39-3/8 in (1000 mm)
36/42/48 model : 55-1/8 in (1400 mm)



The air inlet duct can be changed by replacing the intake grille and service panel.

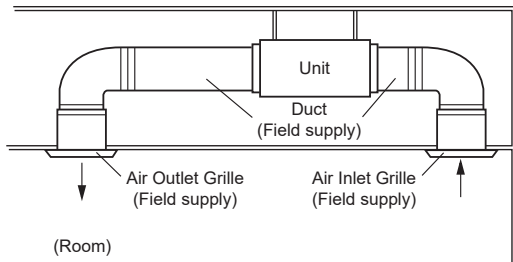


For the bottom air intake, position (1) the intake grille, and (2) the service panel, as shown in the following figure. (The factory setting is back air intake.)



CAUTION

- Make sure the drain water is properly drained.
- To prevent people from touching the parts inside the unit, be sure to install grilles on the inlet and outlet ports. The grilles must be designed in such a way that cannot be removed without tools.
- Set the appropriate external static pressure within the permissible range. (Refer to "6. FUNCTION SETTING")
- If an intake duct is installed, take care not to damage the temperature sensor (the temperature sensor is attached to the intake port flange).
- Be sure to install the air inlet grille and air outlet grille for air circulation. The correct temperature cannot be detected.



- When connecting the duct, perform duct-insulation appropriate for the installing environment. Inappropriate insulation work may cause condensation on the surface of the insulating material, and may lead to condensation dripping.

3. 5. Drain installation

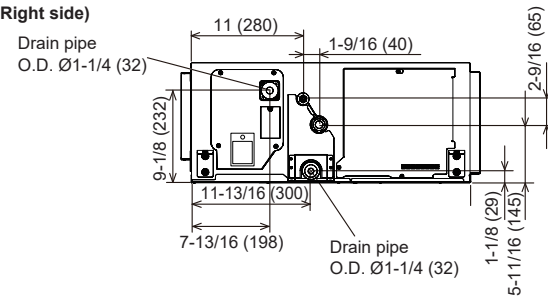
CAUTION

- Install the drain hose in accordance with the instructions in this installation manual and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.
- Be sure to properly insulate the drain hose so that the water will not drip from the connected parts.
- The position of the installed drain hose should have a downward gradient of 1/100 or more.
- Do not connect the drain hose in which ammonia or other types of gas affecting the unit is generated. Heat exchange erosion may occur.

Install the drain hose according to the measurements given in the following figure.

Unit: in (mm)

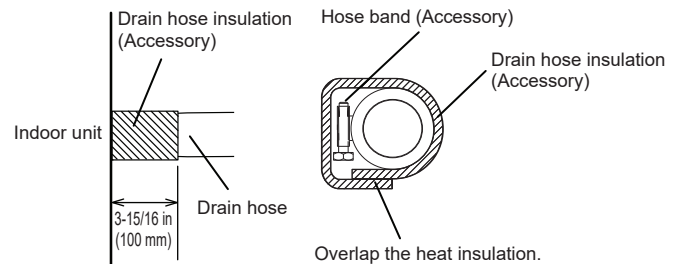
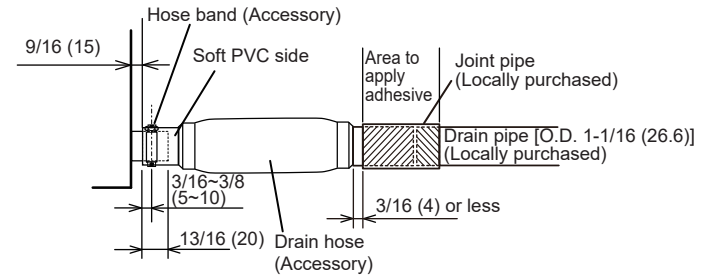
(Right side)



3. 5. 1. Installing the drain hose

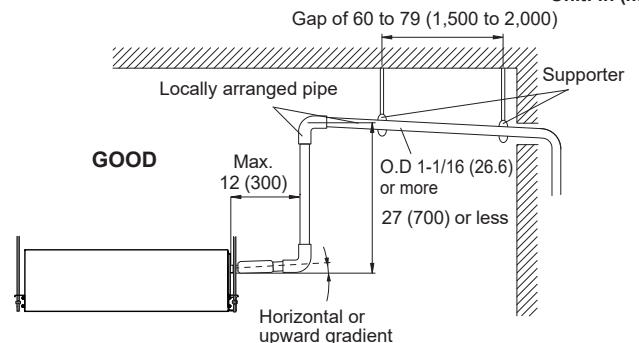
- (1) Install the drain hose (accessory) to the drain port of the indoor unit. Attach the hose band around the hose within the dimensions shown. Secure firmly with the hose band.
- (2) Attach the drain pipe (locally purchased). Use general hard polyvinyl chloride pipe [outside diameter 1-1/16 in (26.6 mm)] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- (3) Check the drainage.
- (4) Wrap the drain hose insulation around the drain hose connection.

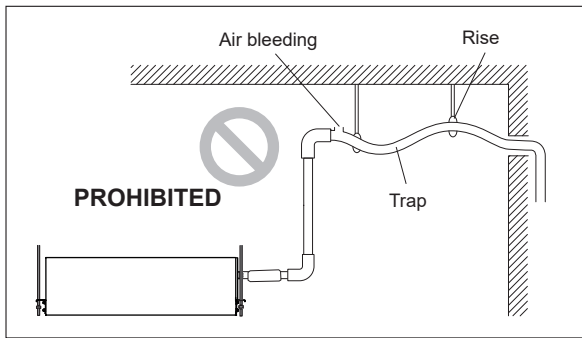
Unit: in (mm)



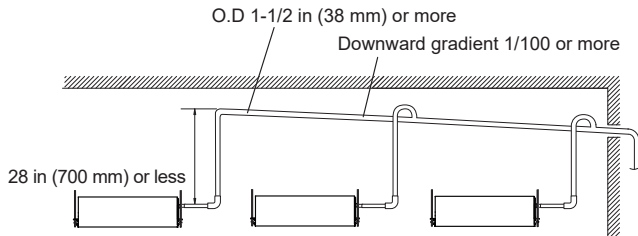
■ When drain pump is used

Unit: in (mm)



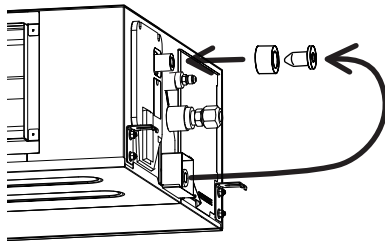


Observe the following procedures to construct centralized drain pipe fittings.



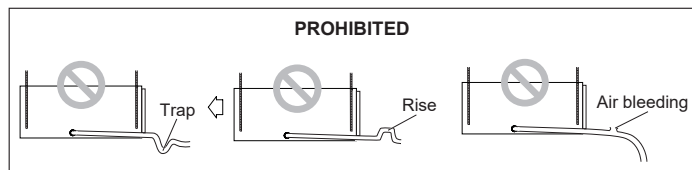
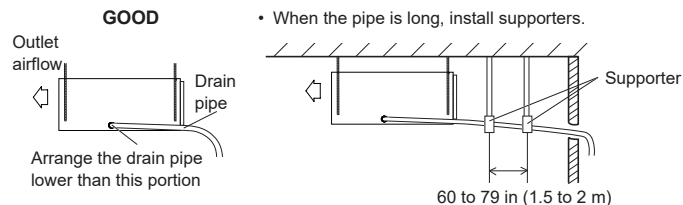
■ When drain pump is not used (Natural drainage)

If the drain pump is not used, please move the position of the drain cap and insulation.



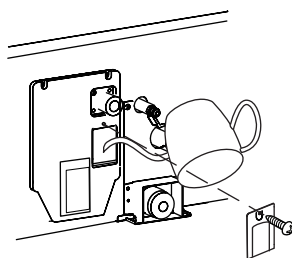
NOTE:

- Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.



3. 5. 2. Check for drainage

Pour about 1 liter of water from the position shown in the diagram or from the airflow outlet to the dew tray. Check for any abnormalities such as strange noises and whether the drain pump functions normally.



⚠ CAUTION

Make sure the drain water is properly drained.

3. 6. Pipe installation

⚠ WARNING

- During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor.
Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.
- During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.
Do not remove the connection pipe while the compressor is in operation with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.
- When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R32) to enter the refrigerant cycle.
If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.
- If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

⚠ CAUTION

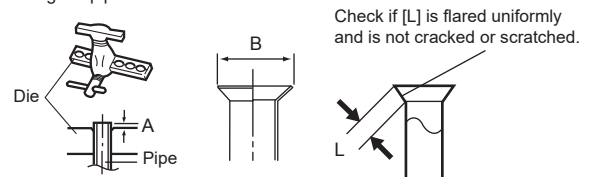
- Be more careful so that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant R32 models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- While brazing the pipes, be sure to blow dry nitrogen gas through them.

3. 6. 1. Pipe connection

■ Flaring

Use special pipe cutter and flare tool designed for R32 pipework.

- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove any burrs.
- Insert the flare nut (always use the flare nut attached to the indoor unit(s) and outdoor unit or branch box respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R32 flare tool, or the conventional flare tool. Leakage of refrigerant may result if other flare nuts are used.
- Protect the pipes by pinching them or with tape to prevent dust, dirt, or water from entering the pipes.



| Pipe outside diameter [in (mm)] | Dimensions A [in (mm)] | Dimensions B ^{0 (0)} -0.015 (-0.4) [in (mm)] |
|------------------------------------|------------------------------------|---|
| | Flare tool for R32, clutch type | |
| 1/4 (6.35) | 0 to 0.020 (0 to 0.5) | 3/8 (9.1) |
| 3/8 (9.52) | | 1/2 (13.2) |
| 1/2 (12.70) | | 5/8 (16.6) |
| 5/8 (15.88) | | 3/4 (19.7) |
| 3/4 (19.05) | | 15/16 (24.0) |

When using conventional (R22) flare tools to flare R32 pipes, the dimensions A should be approximately 0.020 in (0.5 mm) more than indicated in the table (for flaring with R32 flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimensions A. It is recommended that a R32 flaring tool is used.

| Width across flats | Pipe outside diameter [in (mm)] | Width across flats of Flare nut [in (mm)] |
|--------------------|------------------------------------|---|
| | 1/4 (6.35) | 11/16 (17) |
| | 3/8 (9.52) | 7/8 (22) |
| | 1/2 (12.70) | 1 (26) |
| | 5/8 (15.88) | 1-1/8 (29) |
| | 3/4 (19.05) | 1-7/16 (36) |

NOTE: The flare nut specification is compliant with ISO14903.

■ Bending pipes

- If pipes are shaped by hand, be careful not to collapse them.
- Do not bend the pipes in an angle more than 90°.
- When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more.
- Do not bend or stretch the pipes more than 3 times.

⚠ CAUTION

- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 1- 15/16 in (50 mm) or over.
- If the pipe is bent repeatedly at the same place, it will break.

■ Flare connection

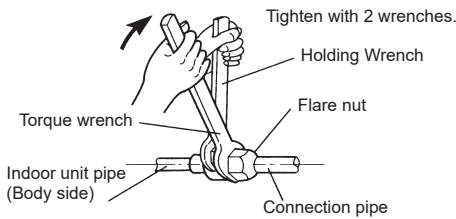
⚠ CAUTION

- Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
- Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.
- Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
- When flared joints are reused indoors, the flare part shall be re-fabricated.

- (1) Detach the caps and plugs from the pipes.
- (2) Centering the pipe against port on the indoor unit, turn the flare nut with your hand.
- (3) When the flare nut is tightened properly by your hand, hold the body side coupling with a separate spanner, then tighten with a torque wrench. (See the table below for the flare nut tightening torques.)

⚠ CAUTION

- Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.
- Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate a hazardous gas if the refrigerant comes into contact with a flame.

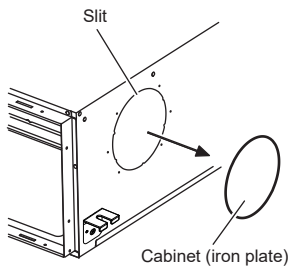


| Flare nut [in (mm)] | Tightening torque [ft-lb (N·m)] |
|---------------------|---------------------------------|
| 1/4 (6.35) dia. | 12 to 13 (16 to 18) |
| 3/8 (9.52) dia. | 24 to 31 (32 to 42) |
| 1/2 (12.70) dia. | 36 to 45 (49 to 61) |
| 5/8 (15.88) dia. | 46 to 55 (63 to 75) |
| 3/4 (19.05) dia. | 66 to 81 (90 to 110) |

3.7. Fresh air intake

■ Processing before use

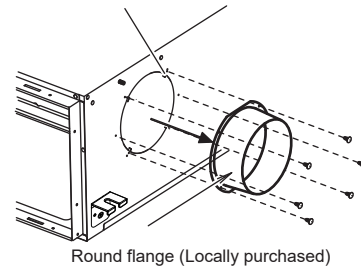
- (1) When taking in fresh air, cut out the slit of the cabinet on the left side of the outer case with nippers.



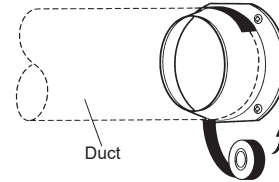
⚠ CAUTION

- When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).
- When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.
- When using the Fresh air intake, set the Room temperature sensor switching (Aux.) to "Wired remote controller" (01), or to use the Remote sensor.

- (2) Install the round flange to the fresh air intake.



- (3) Connect the duct to the round flange.
- (4) Seal with a band and vinyl tape, etc. so that air does not leak from the connection.



3.8. Electrical wiring

⚠ WARNING

- Electrical work must be performed in accordance with this Manual by a person certified under the national or regional regulations. Be sure to use a dedicated circuit for the unit.
- An insufficient power supply circuit or improperly performed electrical work can cause serious accidents such as electric shock or fire.
- Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
- Use the included connection cables and power cables or ones specified by the manufacturer. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
- For wiring, use the prescribed type of cables, connect them securely, making sure that there are no external forces of the cables applied to the terminal connections. Improperly connected or secured cables can cause serious accidents such as overheating the terminals, electric shock, or fire.
- Do not modify the power cables, use extension cables, or use any branches in the wiring. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
- Match the terminal board numbers and connection cable colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- Securely connect the connection cables to the terminal board. In addition, secure the cables with wiring holders. Improper connections, either in the wiring or at the ends of the wiring, can cause a malfunction, electric shock, or fire.
- Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed, electric leakage may occur.)
- Securely install the electrical box cover on the unit. An improperly installed electrical box cover can cause serious accidents such as electric shock or fire through exposure to dust or water.
- Install sleeves into any holes made in the walls for wiring. Otherwise, a short circuit could result.
- Install a ground leakage breaker. In addition, install the ground leakage breaker so that the entire AC main power supply is cut off at the same time. Otherwise, electric shock or fire could result.
- Always connect the ground (earth) cable.
- Improper grounding (earthing) work can cause electric shocks.
- Install the remote controller cables so as not to be touched directly with your hand.
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Connect the connection cable firmly to the terminal board. Imperfect installation may cause a fire.

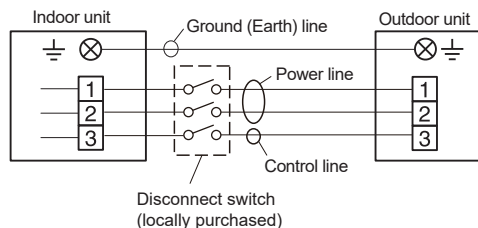
⚠ CAUTION

- Ground the unit.
- Do not connect the ground (earth) cable to a gas pipe, water pipe, lightning rod, or a telephone ground (earth) cable.
- Improper grounding (earthing) may cause electric shocks.
- Do not connect power supply cables to the transmission or remote controller terminals, as this will damage the product.
- Never bundle the power supply cable and transmission cable together. Bundling these cables together will cause miss operation.
- When handling PCB, static electricity charged in the body may cause malfunction of the PCB. Follow the cautions below:
 - Establish a ground for the indoor and outdoor units and peripheral devices.
 - Cut power (breaker) off.
 - Touch metal part of the indoor and outdoor units for more than 10 seconds to discharge static electricity charged in the body.
 - Do not touch terminals of parts and patterns implemented on PCB.

3.8.1. Wiring system diagram

■ Standard pair

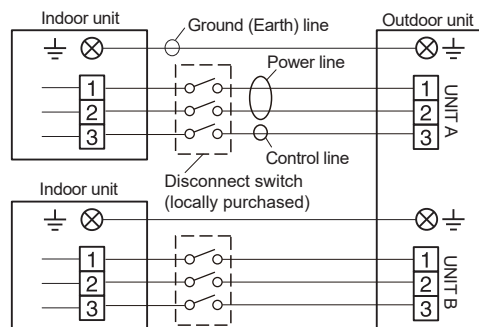
Connection cable



NOTE: Disconnect Switch - Field supplied if required by local code. Select the correct capacity of disconnect switch according to the load.

■ Flexible multi-split type

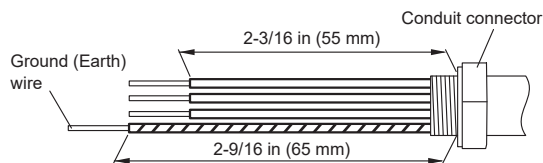
Connection cable



3.8.2. Connection cable preparation

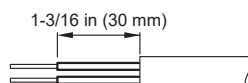
■ Connection cable

Keep the ground (earth) wire longer than the other wires.



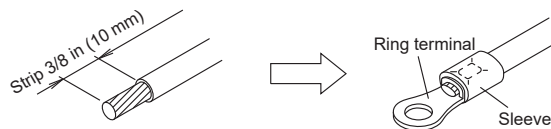
- Use a 4-core wire cable.

■ Remote controller cable



3.8.3. How to connect wiring to the terminals.

- (1) Use ring terminals with insulating sleeves as shown in the figure below to connect to the terminal block.
- (2) Securely crimp the ring terminals to the wires using an appropriate tool so that the wires do not come loose.
- (3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
- (4) Use an appropriate screwdriver to tighten the terminal screws.
Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.
- (5) Do not tighten the terminal screws too much, otherwise, the screws may break.
- (6) Refer to the table below for the terminal screw tightening torques.

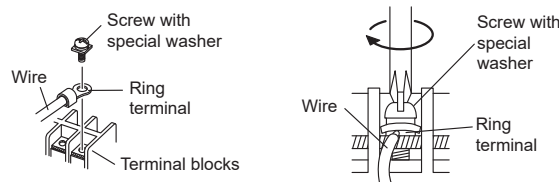


⚠ WARNING

Use ring terminals and tighten the terminal screws to the specified torques, otherwise, abnormal overheating may be produced and possibly cause serious damage inside the unit.

Tightening torque [lbf-in (N-m)]

| | |
|------------|-----------------------|
| M3.5 screw | 7 to 9 (0.8 to 1.0) |
| M4 screw | 11 to 16 (1.2 to 1.8) |

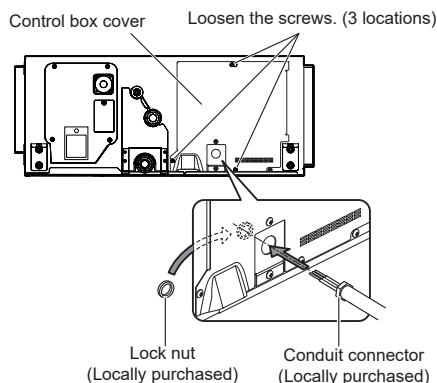


3.8.4. Connection wiring

⚠ CAUTION

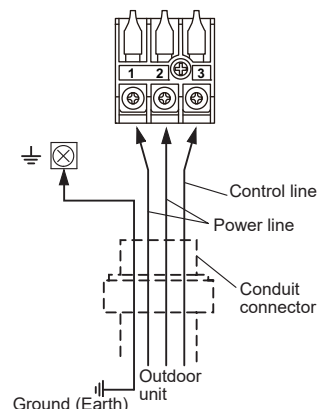
- Be careful not to mistake the power supply cable and connection wires when installing.
- Install so that the wires for the remote controller will not come in contact with other connection wires.

- (1) Remove the control box cover and install each connection wire.

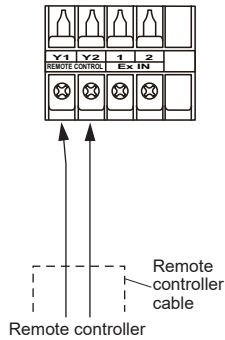


Attach the conduit connector on the wiring connecting port.
(The grommet edging and the connection cable clamp are not used.)

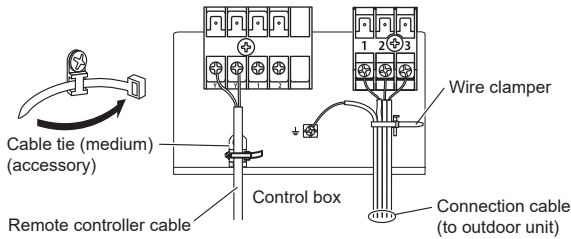
■ Connection cable



■ Remote controller cable



- (2) After wiring is complete, secure the remote controller cable and connection cable with the wire clumper or cable tie.



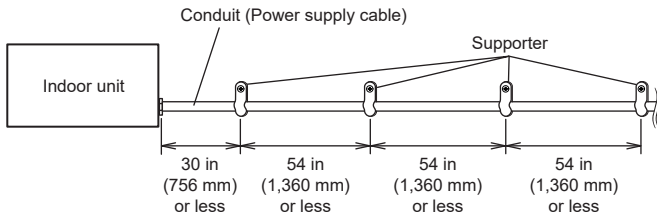
- (3) Seal the cable outlet or other gaps with putty to prevent dew condensation or insect from entering the electric control box.

- (4) Replace the control box cover.

⚠ CAUTION

- Do not bundle the remote controller cable, or wire the remote controller cable in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cable. It may cause erroneous operation.
- Tighten the indoor unit connection wire and power supply indoor and outdoor unit, terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.
- Connect the indoor unit connection wire by matching the numbers of the outdoor and indoor units terminal board numbers as shown in terminal label.
- Be sure to refer to the connection diagram for the correct field wiring. Wrong wiring causes malfunction of the unit.

- (5) Fix the conduit with the supporters as shown below.



3. 9. Remote controller installation

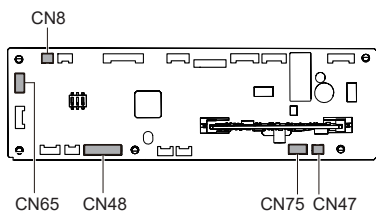
To install and set the remote controller, refer to the installation manual of the remote controller (wired type).

4. OPTIONAL INSTALLATION WORK

4. 1. Optional kit installation

⚠ WARNING

Regulation of cable differs from each locality, refer in accordance with local rules.



This air conditioner can be connected with the following optional kits.
For details on how to install optional parts, refer to the installation manual included in each item.

| Connector No. | Option type |
|---------------|---|
| CN47*1 | External output |
| CN8 | Remote sensor |
| CN48 | IR Receiver |
| CN65 | Other optional parts (External input and output PCB, Modbus converter, KNX convertor, WLAN interface *2 etc.) may be connectable. |
| CN75 | |

*1: For external output terminal setting, refer to Function No.60 in "6. FUNCTION SETTING".

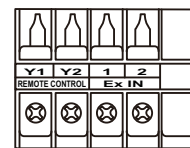
*2: Be sure to connect the WLAN interface to CN75.

4. 2. External input and output

4. 2. 1. External input

- Indoor unit functions such as Operation/Stop or Forced stop can be done by using indoor unit terminals.
- "Operation/Stop" mode or "Forced stop" mode can be selected with function setting of indoor unit.
- A twisted pair cable (22 AWG) should be used. Maximum length of cable is 492 ft (150 m).
- Use an external input and output cable with appropriate external dimensions, depending on the number of cables to be installed.
- The wire connection should be separated from the power cable.

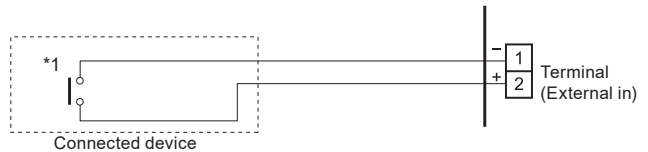
Terminal



Connected device

• Dry contact terminal

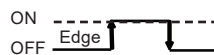
When a power supply is unnecessary at the input device you want to connect, use the Dry contact terminal.



*1: The switch can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

■ Operation behavior

• Input signal type



When function setting is "Operation/Stop" mode 1.

| Input signal | Command |
|--------------|-----------|
| OFF → ON | Operation |
| ON → OFF | Stop |

When function setting is "Forced stop" mode.

| Input signal | Command |
|--------------|-------------|
| OFF → ON | Forced stop |
| ON → OFF | Normal |

* When the forced stop is triggered, indoor unit stops and Operation/Stop operation by a remote controller is restricted.

When function setting is "Operation/Stop" mode 2.

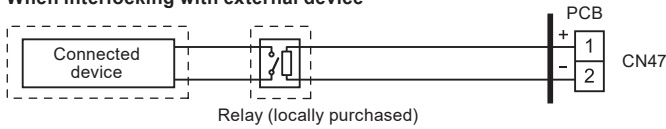
| Input signal | Command |
|--------------|----------------------|
| OFF → ON | Operation |
| ON → OFF | Stop (R.C. disabled) |

4. 2. 2. External output

- A twisted pair cable (22AWG) should be used. Maximum length of cable is 82 ft (25 m).
- Use an external input and output cable with appropriate external dimensions, depending on the number of cables to be installed.
- Output voltage: Hi DC12V±2V, Lo 0V.
- Permissible current: 50mA

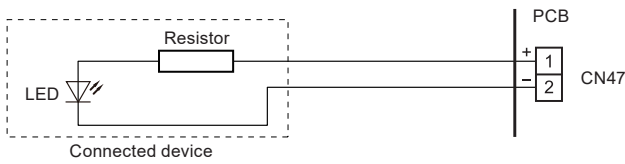
■ Output select

When interlocking with external device



or

When displaying "Operation/Stop"



■ Operation behavior

Functions of the external output terminal can be switched.

(... Factory setting)

| Function setting | Status | Output voltage |
|------------------|---------|--------------------------------------|
| 60 | 00 | Stop 0 V |
| | 01 - 04 | Operation DC 12 V |
| | | OFF 0 V |
| | 05 | Cooling thermostat ON DC 12 V |
| | | OFF 0 V |
| | 06 | Heating operation ON DC 12 V |
| | | Stop 0 V |
| | 07 - 08 | Operation DC 12 V |
| | | OFF 0 V |
| | 09 | Cooling thermostat ON DC 12 V |
| | | Normal 0 V |
| | 10 | Error DC 12 V |
| | | Indoor unit fan stop 0 V |
| | 11 | Indoor unit fan operation DC 12 V |
| | | External heater OFF 0 V |
| | | External heater ON DC 12 V |

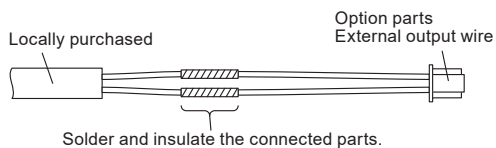
Refer to the Design & technical manual.

4. 2. 3. Connection methods

■ Wire modification

- Remove insulation from wire attached to wire kit connector.
- Remove insulation from locally purchased cable. Use crimp type insulated butt connector to join field cable and wire kit wire.
- Connect the wire with connecting wire with solder.

IMPORTANT: Be sure to insulate the connection between the wires.



- Connecting wires to the terminals.
- Use ring terminals with insulating sleeves to connect to the terminal block.

4. 3. Remote sensor (Optional parts)

4. 3. 1. Connection method

- Remove the existing connector and replace it with the remote sensor connector (ensure that the correct connector is used).
- The original connector should be insulated to ensure that it does not come into contact with other electrical circuitry.

4. 3. 2. Setting for room temperature correction

When a remote sensor is connected, set the function setting of indoor unit as indicated below.

- Function Number "30":
Set the Setting Number to "00". (Default)
- Function Number "31":
Set the Setting Number to "01".

* Refer to "6. FUNCTION SETTING" for details about Function number and Setting value.

4. 4. IR receiver unit (Optional parts)

- For the installation method, refer to the installation manual of IR receiver unit.

4. 4. 1. Connection method

- Use 9 pins for receiver unit cable.
- At first, connect the receiver unit cable to the controller PCB.
- Attach the core that comes between controller PCB and the clamp.

5. REMOTE CONTROL INSTALLATION

⚠ CAUTION

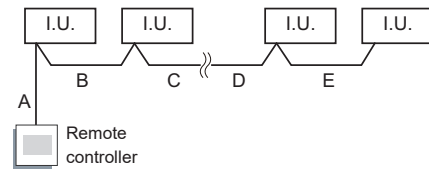
- Be sure to turn off the electrical breaker before making settings.
- When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.
- Use an insulated screwdriver to set the DIP switches.

5. 1. Group control

A number of indoor units can be operated at the same time using a single remote controller.

*When different types of indoor units (such as wall mounted type and cassette type, cassette type and duct type, or other combinations) are connected using group control system, some functions may no longer be available.

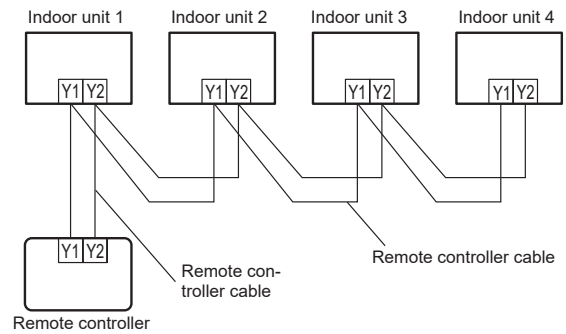
Connect up to 16 indoor units in a system.



A, B, C, D, E : Remote controller cable.

A+B+C+D+E ≤ 1,640 ft (500 m). For Model UTY-RVR* : 230 ft (70 m)

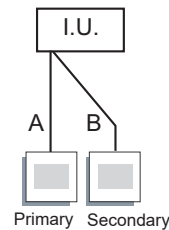
Example of wiring method



5. 2. Multiple remote control

Up to 2 remote controllers can be used to operate one indoor unit.

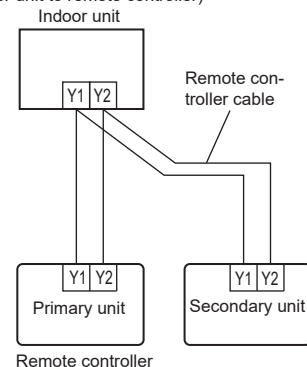
NOTE: Depending on the remote controller, this function may not be available.



A, B : Remote controller cable. (Refer to "2. 6. Electrical requirement")
A+B ≤ 1,640 ft (500 m)

- The timer and self-diagnosis functions cannot be used on the secondary units.

(1) Wiring method (indoor unit to remote controller)

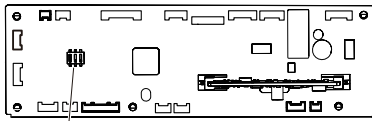


5.3. DIP switch 101 setting

■ Fan delay setting

This setting can be used when the auxiliary heater is mounted.
When the operation is stopped when the indoor unit is operating with an auxiliary heater, the operation continues 1 minutes.

Change the following settings by using the DIP switch.



Dip switch 101

(◆... Factory setting)

| DIP switch 101 | DIP SW state | | Details |
|----------------|--------------|-----------|--------------------------------|
| | ON | OFF | |
| 1 | - | - | Cannot be used (Do not Change) |
| 2 | - | - | Cannot be used (Do not Change) |
| 3 | Enable | Disable ◆ | Fan delay setting |

6. FUNCTION SETTING

To change the function settings, refer to the procedures described in the installation manual of the remote controller (wired type).
The function settings are as follows.

6.1. Function details

■ Filter sign

Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.
If the indication is not required, select "No indication" (03).

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|-----------------------------|
| 11 | 00 | Standard (2500 hours) |
| | 01 | Long interval (4400 hours) |
| | 02 | Short interval (1250 hours) |
| | 03 | No indication ◆ |

■ Room temperature control for indoor unit sensor

Depending on the installed environment, correction of the room temperature sensor may be required.
Select the appropriate control setting according to the installed environment.
The temperature correction values show the difference from the Standard setting "00" (manufacturer's recommended value).

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|---------------------|------------------------------|--------------------------------|
| 30 (For cooling) | 31 (For heating) | 00 Standard setting ◆ |
| | | 01 No correction 0 °F (0.0 °C) |
| | | 02 -1 °F (-0.5 °C) |
| | | 03 -2 °F (-1.0 °C) |
| | | 04 -3 °F (-1.5 °C) |
| | | 05 -4 °F (-2.0 °C) |
| | | 06 -5 °F (-2.5 °C) |
| | | 07 -6 °F (-3.0 °C) |
| | | 08 -7 °F (-3.5 °C) |
| | | 09 -8 °F (-4.0 °C) |
| | Less Cooling More Heating | 10 +1 °F (+0.5 °C) |
| | | 11 +2 °F (+1.0 °C) |
| | | 12 +3 °F (+1.5 °C) |
| | | 13 +4 °F (+2.0 °C) |
| | | 14 +5 °F (+2.5 °C) |
| | | 15 +6 °F (+3.0 °C) |
| | | 16 +7 °F (+3.5 °C) |
| | | 17 +8 °F (+4.0 °C) |

■ Room temperature control for wired remote controller sensor

Depending on the installed environment, correction of the wire remote temperature sensor may be required.

Select the appropriate control setting according to the installed environment.

To change this setting, set Function 42 to Both "01".

Ensure that the Thermo Sensor icon is displayed on the remote controller screen.

(◆... Factory setting)

| Function number | Setting value | Setting description |
|---------------------|------------------------------|--------------------------------|
| 35 (For cooling) | 36 (For heating) | 00 No correction ◆ |
| | | 01 No correction 0 °F (0.0 °C) |
| | | 02 -1 °F (-0.5 °C) |
| | | 03 -2 °F (-1.0 °C) |
| | | 04 -3 °F (-1.5 °C) |
| | | 05 -4 °F (-2.0 °C) |
| | | 06 -5 °F (-2.5 °C) |
| | | 07 -6 °F (-3.0 °C) |
| | | 08 -7 °F (-3.5 °C) |
| | Less Cooling More Heating | 09 -8 °F (-4.0 °C) |
| | | 10 +1 °F (+0.5 °C) |
| | | 11 +2 °F (+1.0 °C) |
| | | 12 +3 °F (+1.5 °C) |
| | | 13 +4 °F (+2.0 °C) |
| | | 14 +5 °F (+2.5 °C) |
| | | 15 +6 °F (+3.0 °C) |
| | | 16 +7 °F (+3.5 °C) |
| | | 17 +8 °F (+4.0 °C) |

■ Auto restart

Enable or disable automatic restart after a power interruption.

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|---------------------|
| 40 | 00 | Enable ◆ |
| | 01 | Disable |

* Auto restart is an emergency function such as for power outage etc. Do not attempt to use this function in normal operation. Be sure to operate the unit by remote controller or external device.

■ Room temperature sensor switching

(Only for wired remote controller)

When using the Wired remote controller temperature sensor, change the setting to "Both" (01).

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|---------------------|
| 42 | 00 | Indoor unit ◆ |
| | 01 | Both |

00: Sensor on the indoor unit is active.

01: Sensors on both indoor unit and wired remote controller are active.

* Remote controller sensor must be turned on by using the remote controller

■ Cold air prevention (Flexible multi-split type cannot be set.)

*This setting is to disable the cold air prevention function during heating operation. When disabled, the fan setting will always follow the setting on the remote controller. (Excluding defrost mode).

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|---------------------|
| 43 | 00 | Enable ◆ |
| | 01 | Disable |

■ External input control

"Operation/Stop" mode or "Forced stop" mode can be selected.

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|-------------------------|
| 46 | 00 | Operation/Stop mode 1 ◆ |
| | 01 | (Setting prohibited) |
| | 02 | Forced stop mode |
| | 03 | Operation/Stop mode 2 |

■ Room temperature sensor switching (Aux.)

To use the temperature sensor on the wired remote controller only, change the setting to "Wired remote controller" (01). This function will only work if the function setting 42 is set at "Both" (01)

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|-------------------------|
| 48 | 00 | Both |
| | 01 | Wired remote controller |

■ Indoor unit fan control for energy saving for cooling

Enables or disables the power-saving function by controlling the indoor unit fan rotation when the outdoor unit is stopped during cooling operation.

(◆... Factory setting)

| Function Number | Setting Value | Setting description |
|-----------------|---------------|---------------------|
| 49 | 00 | Disable |
| | 01 | Enable |
| | 02 | Remote controller |

00: When the outdoor unit is stopped, the indoor unit fan operates continuously following the setting on the remote controller.

01: When the outdoor unit is stopped, the indoor unit fan operates intermittently at a very low speed.

02: Enable or disable this function by remote controller setting.

*When using a wired remote controller without Indoor unit fan control for energy saving for cooling function, or when connecting a single split converter, the setting cannot be made by using the remote controller. Set to "00" or "01".

To confirm if the remote controller has this function, refer to the operation manual of each remote controller.

■ Switching functions for external output terminal

Functions of the external output terminal can be switched.

(◆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------------|
| 60 | 00 | Operation status |
| | 01-04 | Cooling thermostat status |
| | 05 | Heating operation status |
| | 06 | Operation status |
| | 07-08 | Cooling thermostat status |
| | 09 | Error status |
| | 10 | Fresh air control |
| | 11 | Auxiliary heater |

Refer to the Design & technical manual.

■ Control switching of external heaters

Sets the control method for the external heater being used.

For details of the control method, see the Design & Technical Manual.

(◆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|--|
| 61 | 00 | Auxiliary heater control 1 |
| | 01 | Auxiliary heater control 2 |
| | 02 | Heat pump prohibition control |
| | 03 | Heater selection control using outdoor temperature 1 |
| | 04 | Heater selection control using outdoor temperature 2 |
| | 05 | Auxiliary heater control by outdoor temperature 3 |
| | 06 | Auxiliary heat pump control |
| | 07 | Auxiliary heat pump control by outdoor temperature 1 |
| | 08 | Auxiliary heat pump control by outdoor temperature 2 |
| | 09 | Auxiliary heat pump control by outdoor temperature 3 |

■ Operating temperature switching of external heaters

• Sets the temperature conditions when the external heater is ON.

• For the temperature conditions, see "Temperature conditions when the external heater is ON". For a more detailed explanation, see the Design & Technical Manual.

(◆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 62 | 00 | Setting 0 |
| | 01 | Setting 1 |
| | 02 | Setting 2 |
| | 03 | Setting 3 |
| | 04 | Setting 4 |
| | 05 | Setting 5 |
| | 06 | Setting 6 |
| | 07 | Setting 7 |
| | 08 | Setting 8 |
| | 09 | Setting 9 |
| | 10 | Setting 10 |
| | 11 | Setting 11 |
| | 12 | Setting 12 |
| | 13 | Setting 13 |
| | 14 | Setting 14 |
| | 15 | Setting 15 |
| | 16 | Setting 16 |
| | 17 | Setting 17 |

Temperature conditions when the external heater is ON/OFF

Temperature (t) = Room temperature - set temperature

| | | Set value of function: 61 | | | |
|---------------------------|----|---------------------------|---------------------|---------------------|---------------------|
| | | 00 | | 01 to 09 | |
| | | ON | OFF | ON | OFF |
| Set value of function: 62 | 00 | t < -5.4°F (-3°C) | t ≥ -1.8°F (-1°C) | t ≤ -0.9°F (-0.5°C) | t ≥ +0.9°F (+0.5°C) |
| | 01 | t < -3.6°F (-2°C) | t ≥ -1.8°F (-1°C) | t ≤ -1.8°F (-1°C) | t ≥ +0.9°F (+0.5°C) |
| | 02 | t < -3.6°F (-2°C) | t ≥ -1.8°F (-1°C) | t ≤ -3.6°F (-2°C) | t ≥ +0.9°F (+0.5°C) |
| | 03 | t < -5.4°F (-3°C) | t ≥ -1.8°F (-1°C) | t ≤ -5.4°F (-3°C) | t ≥ +0.9°F (+0.5°C) |
| | 04 | t < -7.2°F (-4°C) | t ≥ -1.8°F (-1°C) | t ≤ -7.2°F (-4°C) | t ≥ +0.9°F (+0.5°C) |
| | 05 | t < -9.0°F (-5°C) | t ≥ -1.8°F (-1°C) | t ≤ -9.0°F (-5°C) | t ≥ +0.9°F (+0.5°C) |
| | 06 | t < -5.4°F (-3°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -0.9°F (-0.5°C) | t ≥ 0°F (0°C) |
| | 07 | t < -3.6°F (-2°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -1.8°F (-1°C) | t ≥ 0°F (0°C) |
| | 08 | t < -3.6°F (-2°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -3.6°F (-2°C) | t ≥ 0°F (0°C) |
| | 09 | t < -5.4°F (-3°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -5.4°F (-3°C) | t ≥ 0°F (0°C) |
| | 10 | t < -7.2°F (-4°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -7.2°F (-4°C) | t ≥ 0°F (0°C) |
| | 11 | t < -9.0°F (-5°C) | t ≥ -0.9°F (-0.5°C) | t ≤ -9.0°F (-5°C) | t ≥ 0°F (0°C) |
| | 12 | t < -5.4°F (-3°C) | t ≥ 0°F (0°C) | t ≤ -0.9°F (-0.5°C) | t ≥ -0.9°F (-0.5°C) |
| | 13 | t < -3.6°F (-2°C) | t ≥ 0°F (0°C) | t ≤ -1.8°F (-1°C) | t ≥ -0.9°F (-0.5°C) |
| | 14 | t < -3.6°F (-2°C) | t ≥ 0°F (0°C) | t ≤ -3.6°F (-2°C) | t ≥ -0.9°F (-0.5°C) |
| | 15 | t < -5.4°F (-3°C) | t ≥ 0°F (0°C) | t ≤ -5.4°F (-3°C) | t ≥ -0.9°F (-0.5°C) |
| | 16 | t < -7.2°F (-4°C) | t ≥ 0°F (0°C) | t ≤ -7.2°F (-4°C) | t ≥ -0.9°F (-0.5°C) |
| | 17 | t < -9.0°F (-5°C) | t ≥ 0°F (0°C) | t ≤ -9.0°F (-5°C) | t ≥ -0.9°F (-0.5°C) |

■ Outdoor temperature zone boundary temperature A

Setting required if changing of the outdoor temperature setting for heat pump prohibition zone is required when auxiliary heater control by outdoor temperature 1 and 2 are performed on the indoor unit.

For details of the control method, see the Design & Technical Manual.

(◆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 66 | 00 | -4.0 °F (-20 °C) |
| | 01 | -0.4 °F (-18 °C) |
| | 02 | 3.2 °F (-16 °C) |
| | 03 | 6.8 °F (-14 °C) |
| | 04 | 10.4 °F (-12 °C) |
| | 05 | 14.0 °F (-10 °C) |
| | 06 | 17.6 °F (-8 °C) |
| | 07 | 21.2 °F (-6 °C) |
| | 08 | 24.8 °F (-4 °C) |

■ Outdoor temperature zone boundary temperature B

Setting required if changing of the outdoor temperature setting for heat pump only zone is required when auxiliary heater control by outdoor temperature 1 is performed on the indoor unit.

For details of the control method, see the Design & Technical Manual.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 67 | 00 | 42.8 °F (6 °C) |
| | 01 | 14.0 °F (-10 °C) |
| | 02 | 17.6 °F (-8 °C) |
| | 03 | 21.2 °F (-6 °C) |
| | 04 | 24.8 °F (-4 °C) |
| | 05 | 28.4 °F (-2 °C) |
| | 06 | 32.0 °F (0 °C) |
| | 07 | 35.6 °F (2 °C) |
| | 08 | 39.2 °F (4 °C) |
| | 09 | 42.8 °F (6 °C) |
| | 10 | 46.4 °F (8 °C) |
| | 11 | 50.0 °F (10 °C) |
| | 12 | 53.6 °F (12 °C) |
| | 13 | 57.2 °F (14 °C) |
| | 14 | 60.8 °F (16 °C) |
| | 15 | 64.4 °F (18 °C) |

■ Auto mode type

Switches the setting method of the auto mode between single or dual (cooling and heating.)

Set the primary indoor unit using a wired remote controller for heat pump systems.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------------|
| 68 | 00 | Single setpoint auto mode |
| | 01 | Dual setpoint auto mode |

NOTE

The auto mode type setting is available only if a compatible operating device is connected.

■ Deadband value

Sets the minimum temperature of the deadband in the dual setpoint auto mode (the setting value 01 of the function setting number 68: Auto mode type.)

(⬆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|---------------------|
| 69 | 00 | 0 °F (0 °C) |
| | 01 | 1 °F (0.5 °C) |
| | 02 | 2 °F (1.0 °C) |
| | 03 | 3 °F (1.5 °C) |
| | 04 | 4 °F (2.0 °C) |
| | 05 | 5 °F (2.5 °C) |
| | 06 | 6 °F (3.0 °C) |
| | 07 | 7 °F (3.5 °C) |
| | 08 | 8 °F (4.0 °C) |
| | 09 | 9 °F (4.5 °C) |

NOTE

The deadband setting is available only if a compatible operating device is connected.

■ Standby time for auxiliary equipment operation

Sets the standby time until the auxiliary equipment operation starts during primary equipment operation.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 71 | 00 | Disable |
| | 01 | 1 minutes |
| | 02 | 2 minutes |
| | ⋮ | ⋮ |
| | 98 | 98 minutes |
| | 99 | 99 minutes |

■ Heat pump backup setting

Enables or disables the heat pump backup operation.

Please refer to the Design & technical manual.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 72 | 00 | Disable |
| | 01 | Enable |

■ Emergency heat for external output terminal

Enables or disables emergency heat input.

To use this function, select "External heater output" after entering "Function Number 60". For more information, please refer to the Design & technical manual.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 73 | 00 | Disable |
| | 01 | Enable |

■ Fan delay time

Sets the fan delay time when the heater is turned off.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 74 | 00 | 1 minutes |
| | 01 | 50 seconds |
| | 02 | 40 seconds |
| | 03 | 30 seconds |

■ External heater use in defrosting

Enables or disables the external heater use in defrosting.

When using function, inappropriate heater selection may cause cold air in defrosting.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 75 | 00 | Disable |
| | 01 | Enable |

■ Safety measures setting for refrigerant leakage

Sets the safety measures operation in case of refrigerant leakage.

(⬆... Factory setting)

| Function number | Setting value | Setting description |
|-----------------|---------------|---------------------|
| 81 | 00 | No safety measures |
| | 01 | Air circulation |

To activate the safety measures operation for the indoor unit in case of refrigerant leakage, set the setting value to "01" (Air circulation).

When the indoor unit detects refrigerant leakage or the refrigerant leakage sensor failure, the indoor unit operates as follows.

- The indoor unit operates the fan at high speed to diffuse the refrigerant, according to UL60335-2-40.

NOTE: Remote controller cannot stop this fan operation for safety reasons.

- The indoor unit stops cooling or heating operation. Also, Forced cooling operation is not allowed.
- The indoor unit or remote controller indicates error code 45 or A8.

■ Setting record

Record any changes to the settings in the following table.

| No. | Setting description | Setting value |
|-----|---|---------------|
| 11 | Filter sign | |
| 26 | Static pressure | |
| 30 | Room temperature control for indoor unit sensor | Cooling |
| 31 | | Heating |
| 35 | Room temperature control for wired remote controller sensor | Cooling |
| 36 | | Heating |
| 40 | Auto restart | |
| 42 | Room temperature sensor switching | |
| 43 | Cold air prevention | |
| 46 | External input control | |
| 48 | Room temperature sensor switching (Aux.) | |
| 49 | Indoor unit fan control for energy saving for cooling | |
| 60 | Switching functions for external output terminal | |
| 61 | Control switching of external heaters | |
| 62 | Operating temperature switching of external heaters | |
| 66 | Outdoor temperature zone boundary temperature A | |
| 67 | Outdoor temperature zone boundary temperature B | |
| 68 | Auto mode type | |
| 69 | Deadband value | |
| 71 | Standby time for auxiliary equipment operation | |
| 72 | Heat pump backup setting | |
| 73 | Emergency heat for external output terminal | |
| 74 | Fan delay time | |
| 75 | External heater use in defrosting | |
| 81 | Safety measures setting for refrigerant leakage | |

After completing the Function Setting, be sure to turn off the power and turn it on again

6. 2. Static pressure

The static pressure can be set by the following 2 methods. Choose accordingly.

a. Manual setting (Function setting)

Select the appropriate static pressure according to the installation conditions.

(◆... Factory setting)

| Function Number | Setting Value | Setting Description |
|-----------------|---------------|--|
| 26 | 03 | 0.12 in. WG (30 Pa) |
| | 04 | 0.16 in. WG (40 Pa) |
| | 05 | 0.20 in. WG (50 Pa) |
| | 06 | 0.24 in. WG (60 Pa) |
| | 07 | 0.28 in. WG (70 Pa) |
| | 08 | 0.32 in. WG (80 Pa) |
| | 09 | 0.36 in. WG (90 Pa) |
| | 10 | 0.40 in. WG (100 Pa) |
| | 11 | 0.44 in. WG (110 Pa) |
| | 12 | 0.48 in. WG (120 Pa) |
| | 13 | 0.52 in. WG (130 Pa) |
| | 14 | 0.56 in. WG (140 Pa) |
| | 15 | 0.60 in. WG (150 Pa) |
| | 16 | 0.64 in. WG (160 Pa) |
| | 17 | 0.68 in. WG (170 Pa) |
| | 18 | 0.72 in. WG (180 Pa) |
| | 19 | 0.76 in. WG (190 Pa) |
| | 20 | 0.80 in. WG (200 Pa) |
| | 31 | Standard 0.18 in. WG (45 Pa): 12/18/24 model 0.23 in. WG (57 Pa): 30/36/42 model 0.28 in. WG (70 Pa): 48 model ◆ |
| | 32 | Automatic airflow adjustment |

* The range of static pressure is different by model.

For details, see the Fan performance curve of the technical data.

| Model name | Range of static pressure |
|----------------------|------------------------------------|
| 12/18/24/30/36 model | 0.12 to 0.8 in. WG (30 to 200 Pa) |
| 42/48 model | 0.12 to 0.72 in. WG (30 to 180 Pa) |

Record the setting value of Function 26 in the Setting record table in "6. 1. Function details".

b. Automatic airflow adjustment

⚠ CAUTION

- This function cannot be used when there is a booster fan between the ducts.
- Be sure that the static pressure is within the allowed range. Incorrect setting may cause incorrect adjustment and may result in insufficient airflow or water leakage.
- When the external static pressure is changeable in the installation by use of automatic changeable dampers, etc., set so that the external static pressure is the lowest.

NOTE:

Be sure to conduct this setting before any other operation. If the motor is warm or the heat exchanger is wet, false detection may lead to incorrect adjustments.

Check if the electrical wirings and duct installations are complete.

If there is a damper installed in the system, make sure the damper is open.

Check if the air filter (optional) is attached.

If there are several inlet, outlet ports, make sure the airflow rates of each port match the designed airflow rate by adjusting the throttles.

Automatic airflow adjustment is possible by the following procedures.

1) Change the setting of Function 26 to "Automatic airflow adjustment" (32).

2) Run the air conditioner on Fan mode (High).

* For instructions on how to operate the air conditioner, refer to the operation manual of the remote controller.

During Automatic airflow adjustment, the mode will be fixed at Fan mode (High).

When this function is active, do not operate the Outdoor unit.

3) The air conditioner will run for about 1 to 8 min. then stop automatically.

* Do not change the throttles of the inlet and outlet ports during operation.

When used in a Group control system, the setting will take about 10 min.

4) Turn the air conditioner off and on again.

5) Check the setting value of Function 26 and record the obtained setting value in the following table.

* If the setting value has not changed, repeat the procedure from step 1.

| Function Number | Setting value |
|-----------------|---------------|
| 26 | |

⚠ CAUTION

- If the detected setting value is not within the range of static pressure, please check and re-arrange the installation, then repeat the procedure from step 1. Incorrect setting may result in insufficient airflow or water leakage.
- When the duct or outlet installations are changed after the Automatic airflow adjustment is completed, repeat the procedure from step 1.

7. CHECK LIST

Pay special attention to the check items below when installing the indoor unit(s). After installation is complete, be sure to check the following check items again.

| Check items | Check box |
|---|-----------|
| Has the indoor unit been installed correctly? | |
| Has there been a check for gas leaks (refrigerant pipes)? | |
| Has heat insulation work been completed? | |
| Does water drain easily from the indoor units? | |
| Is the voltage of the power source the same as that indicated on the label on the indoor unit? | |
| Are the wires and pipes all connected completely? | |
| Is the indoor unit grounded? | |
| Is the connection cable the specified thickness? | |
| Are the inlets and outlets free of any obstacles? | |
| After installation is completed, has the proper operation and handling been explained to the user? | |
| Operate the unit according to the operation manual provided, and check that it is operating normally. | |

8. TEST RUN

8.1. Check items

- ☐ Is operation of each button on the remote controller normal?
 - ☐ Does each lamp light normally?
 - ☐ Is the drain normal?
 - ☐ Do not have an abnormal noise and vibration during operation?
- Do not operate the air conditioner in test run for a long time.

8.2. Operation method

Depending on your installation, choose from the following:

■ By the wireless remote controller (with [TEST RUN] button)

- To start test run, press the [START/STOP] button and the [TEST RUN] button on the remote controller.
- To end test run, press the remote controller [START/STOP] button.

■ By the IR receiver unit

- To start test run, press the [MANUAL AUTO] button of the IR receiver for more than 10 seconds (forced cooling).
- To end test run, press the [MANUAL AUTO] button for more than 3 seconds or press the remote controller [START/STOP] button.
- The Operation indicator lamp and Timer indicator lamp will simultaneously flash during the test run mode.

■ By the wired remote controller

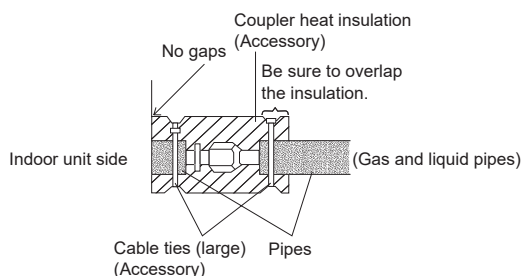
- For the operation method, refer to the installation manual and the operation manual of the wired remote controller.

Heating test run will begin in a few minutes when HEAT is selected by the remote controller [reverse cycle model only].

9. FINISHING

Install the heat insulation material after performing a refrigerant leak check (see the installation manual for the outdoor unit for details).

Coupler heat insulation



CAUTION

There should be no gaps between the insulation and the product.

CAUTION

- After connecting the piping, check the all joints for gas leakage with gas leak detector.
- Once the pressure checking has been completed using nitrogen, please refer to the outdoor unit installation manual to complete the evacuation process.
- Install heat insulation around both the large (gas) and small (liquid) pipes. Failure to do so may cause water leaks.

10. CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operation manual:

- (1) Starting and stopping method, operation switching, temperature adjustment, timer, and other remote controller operations.
- (2) Cleaning and maintenance of the product, and other items such as air filters and air louvers if applicable.
- (3) Give the operating and installation manuals to the customer.
- (4) If the indoor unit custom code is changed, and the installation includes a wireless remote controller, inform the customer the changed code. (On some wireless remote controllers, the custom code may return to A when batteries are replaced.)

11. ERROR CODES

If you use a wired type remote controller, error codes will appear on the remote controller display. If you use a wireless remote controller, the lamps on the IR receiver unit will output error codes by way of blinking patterns. See the lamp blinking patterns and error codes in the table below. An error display is displayed only during operation. For more details, refer to the installation manual of the remote controller. The error code table contains errors irrelevant to this product as well.

| Error display | | | Wired remote controller Error code | Description |
|------------------------|---------------------|----------------------|------------------------------------|---|
| OPERATION lamp (green) | TIMER lamp (orange) | ECONOMY lamp (green) | | |
| ●(1) | ●(1) | ◇ | 11 | Serial communication error |
| ●(1) | ●(2) | ◇ | 12 | Wired remote controller communication error |
| ●(1) | ●(5) | ◇ | 15 | Check run unfinished Automatic airflow adjustment error |
| ●(1) | ●(6) | ◇ | 16 | Peripheral unit transmission PCB connection error |
| ●(1) | ●(8) | ◇ | 18 | External communication error |
| ●(2) | ●(1) | ◇ | 21 | Unit number or Refrigerant circuit address setting error [Simultaneous multi-split type] |
| ●(2) | ●(2) | ◇ | 22 | Indoor unit capacity error |
| ●(2) | ●(3) | ◇ | 23 | Combination error |
| ●(2) | ●(4) | ◇ | 24 | • Connection unit number error (indoor secondary unit) [Simultaneous multi-split type] • Connection unit number error (indoor unit or branch unit) [Flexible multi-split type] |
| ●(2) | ●(6) | ◇ | 26 | Indoor unit address setting error |
| ●(2) | ●(7) | ◇ | 27 | Primary unit, secondary unit setup error [Simultaneous multi-split type] |
| ●(2) | ●(9) | ◇ | 29 | Connection unit number error in wired remote controller system |
| ●(3) | ●(1) | ◇ | 31 | Power supply interruption error |
| ●(3) | ●(2) | ◇ | 32 | Indoor unit PCB model information error |
| ●(3) | ●(3) | ◇ | 33 | Indoor unit motor electricity consumption detection error |
| ●(3) | ●(5) | ◇ | 35 | Manual auto switch error |
| ●(3) | ●(9) | ◇ | 39 | Indoor unit power supply error for fan motor |
| ●(3) | ●(10) | ◇ | 3A | Indoor unit communication circuit (wired remote controller) error |
| ●(4) | ●(1) | ◇ | 41 | Room temp. sensor error |
| ●(4) | ●(2) | ◇ | 42 | Indoor unit heat ex. middle temp. sensor error |
| ●(4) | ●(4) | ◇ | 44 | Occupancy sensor error |
| ●(4) | ●(5) | ◇ | 45 | Refrigerant leakage sensor error. Sensor error, and harness disconnection/connection failure may have occurred. |
| ●(5) | ●(1) | ◇ | 51 | Indoor unit fan motor error |
| ●(5) | ●(3) | ◇ | 53 | Drain pump error |
| ●(5) | ●(4) | ◇ | 54 | Electric air cleaner reverse VDD error |
| ●(5) | ●(5) | ◇ | 55 | Filter set error |
| ●(5) | ●(7) | ◇ | 57 | Damper error |
| ●(5) | ●(8) | ◇ | 58 | Intake grille error |
| ●(5) | ●(9) | ◇ | 59 | Indoor unit fan motor 2 error (Left side fan) |

| Error display | | | Wired remote controller Error code | Description |
|------------------------|---------------------|----------------------|------------------------------------|---|
| OPERATION lamp (green) | TIMER lamp (orange) | ECONOMY lamp (green) | | |
| ●(5) | ●(10) | ◇ | 5A | Indoor unit fan motor 3 error (Right side fan) |
| ●(5) | ●(15) | ◇ | 5U | Indoor unit error |
| ●(6) | ●(1) | ◇ | 61 | Outdoor unit reverse/missing phase and wiring error |
| ●(6) | ●(2) | ◇ | 62 | Outdoor unit main PCB model information error or communication error |
| ●(6) | ●(3) | ◇ | 63 | Inverter error |
| ●(6) | ●(4) | ◇ | 64 | Active filter error, PFC circuit error |
| ●(6) | ●(5) | ◇ | 65 | • Trip terminal L error • IPM temp error |
| ●(6) | ●(8) | ◇ | 68 | Outdoor unit rush current limiting resistor temp. rise error |
| ●(6) | ●(10) | ◇ | 6A | Display PCB microcomputers communication error |
| ●(7) | ●(1) | ◇ | 71 | Discharge temp. sensor error |
| ●(7) | ●(2) | ◇ | 72 | Compressor temp. sensor error |
| ●(7) | ●(3) | ◇ | 73 | Outdoor unit Heat Ex. liquid temp. sensor error |
| ●(7) | ●(4) | ◇ | 74 | Outdoor temp. sensor error |
| ●(7) | ●(5) | ◇ | 75 | Suction Gas temp. sensor error |
| ●(7) | ●(6) | ◇ | 76 | • 2-way valve temp. sensor error • 3-way valve temp. sensor error |
| ●(7) | ●(7) | ◇ | 77 | Heat sink temp. sensor error |
| ●(8) | ●(2) | ◇ | 82 | • Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error |
| ●(8) | ●(3) | ◇ | 83 | Liquid pipe temp. sensor error |
| ●(8) | ●(4) | ◇ | 84 | Current sensor error |
| ●(8) | ●(6) | ◇ | 86 | • Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error |
| ●(9) | ●(4) | ◇ | 94 | Trip detection |
| ●(9) | ●(5) | ◇ | 95 | Compressor rotor position detection error (permanent stop) |
| ●(9) | ●(7) | ◇ | 97 | Outdoor unit fan motor 1 error |
| ●(9) | ●(8) | ◇ | 98 | Outdoor unit fan motor 2 error |
| ●(9) | ●(9) | ◇ | 99 | 4-way valve error |
| ●(9) | ●(10) | ◇ | 9A | Coil (expansion valve) error |
| ●(10) | ●(1) | ◇ | A1 | Discharge temp. error |
| ●(10) | ●(3) | ◇ | A3 | Compressor temp. error |
| ●(10) | ●(4) | ◇ | A4 | High pressure error |
| ●(10) | ●(5) | ◇ | A5 | Low pressure error |
| ●(10) | ●(8) | ◇ | A8 | Refrigerant leakage suspicion |
| ●(10) | ●(11) | ◇ | AC | Heat sink temp error |
| ●(13) | ●(2) | ◇ | J2 | Branch boxes error [Flexible multi-split type] |

Display mode ● : 0.5s ON / 0.5s OFF

◇ : 0.1s ON / 0.1s OFF

() : Number of flashing