

IMPORTANT!

Please Read Before Starting

This air conditioner must be installed by the sales dealer or installer.

This information is provided for use only by authorized persons.

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

- This Installation Instructions is for the outdoor unit and read the Installation Instructions of the indoor unit as well.
- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- This air conditioner shall be installed in accordance with National Wiring Regulations.
- That compliance with national gas regulations shall be observed.
- This product is intended for professional use. Permission from the power supplier is required when installing the U-8LZ2E8 outdoor unit that is connected to a 16 A distribution network.

- This equipment complies with EN/IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to the following table at the interface point between the user's supply and the public system.

It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to supply with a short-circuit power S_{sc} greater than or equal to the values in the table.

	U-10LZ2E8
S_{sc}	1,800 kVA

- The product meets the technical requirements of EN/IEC 61000-3-3.
- Pay close attention to all warning and caution notices given in this manual.
- An RCD suitable for use with inverters, resistant to high frequency noise, is most suitable. RCD's intended for protection to include high frequency currents are unnecessary and should be avoided, as potentially causing nuisance tripping, in this application.
- If capacity of power supply circuit and enforcement are not enough, it can cause the electric shock and a fire.



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 or product or property damage.

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.



WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- The following checks shall be applied to installations using flammable refrigerants. Appliance shall be installed, operated and stored in a room with a floor area larger than [Amin] m².
As for [Amin], see “Check of Density Limit” and then refer to Section “Check of Density Limit” under the Technical Data of indoor unit.

SPECIAL PRECAUTIONS



WARNING 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 see the wiring diagram and these instructions under “2-3. Electrical Wiring” when wiring. Improper connections and inadequate grounding can cause accidental injury or death.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Provide a power outlet to be used exclusively for each unit.
- ELCB must be incorporated in the fixed wiring. Circuit breaker must be incorporated in the fixed wiring in accordance with the wiring regulations.

	U-8LZ2E8	U-10LZ2E8
Circuit breaker	25 A	30 A

- Provide a power outlet exclusively for each unit, and full disconnection means having a contact separation by 3 mm in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.
- To prevent possible hazards from insulation failure, the unit must be grounded.
- 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.
- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.

When Transporting

- It may need two or more people to carry out the installation work.
- 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 Storing...



WARNING

- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliance shall be stored in a room without continuously operating open flames (for example: an operating gas appliance) and ignition sources (for example: an operating electric heater).
- The appliance shall be stored so as to prevent mechanical damage from occurring.

When Installing...

- Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- An unventilated area where the appliance using flammable refrigerants is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

...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.



WARNING

- If the air conditioner is installed in a small room, take measures to prevent the refrigerant concentration from exceeding the safety limit in the event of refrigerant leakage.

Consult the sales dealer regarding the appropriate measures to prevent the allowable concentration from being exceeded.

If the refrigerant comes in contact with a flame, it produces toxic gases and fires.

If the refrigerant leaks and the allowable concentration is exceeded, hazards due to a lack of oxygen in the room will result.

- When air flow decrease is detected of a circulation fan beside the indoor unit installed, the system must be powered off within 10 seconds from the detection.



CAUTION

Keep the fire alarm and the air outlet at least 1.5 m away from the unit.

...In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

...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. Provide snow vents.

When Connecting Refrigerant Tubing


Pay particular attention to refrigerant leakages.



WARNING

- When performing piping work, do not mix air except for specified refrigerant in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.
- If the refrigerant comes in contact with a flame, it produces toxic gases and fires.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury, etc.
- Ventilate the room immediately in the event of a refrigerant gas leakage during installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of toxic gases and fires.
- Keep all tubing runs as short as possible.
- 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 starting the test run.
- Do not leak refrigerant while piping work for an installation or re-installation, and while repairing refrigeration parts.
Handle liquid refrigerant carefully as it may cause frostbite.
- Under no circumstances shall potential sources of ignition be used in the searching or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.
- Electronic leak detectors may be used to detect refrigerant leaks but, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the Lower Flammable Limit (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 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.
- 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. Oxygen Free Nitrogen (OFN) shall then be purged through the system both before and during the brazing process.
- If refrigerant R32 is used and R32 refrigerant leakage detection sensor is connected to the indoor unit, do not turn off the ELCB of the indoor unit except when there is a symptom of abnormality or failure, or when performing short-term maintenance. (When the ELCB is turned off, R32 refrigerant leakage detection sensor cannot detect the refrigerant leakage when the refrigerant leaks, and it may lead to cause the generation of toxic gases and fires.)

When Servicing

- Contact the sales dealer or service dealer for a repair.
- Ventilate the room by opening windows before servicing if there is a possibility of a refrigerant leakage.
- Be sure to turn off the power before servicing.
- Turn the power OFF at the main power box (mains), wait at least 5 minutes until it is discharged, then open 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.



WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.
- Do not clean inside the indoor and outdoor units by users. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this appliance, do not repair by yourself. Contact the sales dealer or service dealer for a repair and disposal.



CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerously toxic gases.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of toxic gases and fires.

Others

When disposing of the product, do follow the precautions referring to Section “Recovery” in the installation instructions supplied with the outdoor unit and comply with national regulations.






WARNING

- Do not sit or step on the unit. You may fall down accidentally. 



CAUTION

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured. 
- Do not stick any object into the FAN CASE. You may be injured and the unit may be damaged. 
- Do not touch the fan because it automatically rotates when it detects a refrigerant leak. You may be injured. 

SERVICING

CAUTION

- Any qualified person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
 - Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
 - Servicing shall be performed only as recommended by the manufacturer.
 - Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, (2) to (6) shall be completed prior to conducting work on the system.
- (1) Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
 - (2) All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
 - (3) 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.
 - (4) 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.
 - (5) 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.
 - (6) 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.

- (7) 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 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.
 - 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.
- (8) 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.
- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
 - Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
 - Ensure that apparatus is mounted securely.
 - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
 - Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE:

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer. Unspecified parts by manufacturer may result ignition of refrigerant in the atmosphere from a leak.

REMOVAL AND EVACUATION



CAUTION

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used.
However, it is important that best practice is followed since flammability is a consideration.
The following procedure shall be adhered to:
 - Remove refrigerant.
 - Purge the circuit with inert gas.
 - Evacuate.
 - Purge again with inert gas.
 - Open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed” with Oxygen Free Nitrogen (OFN) to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system.
- When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and there is ventilation available.

CHARGING PROCEDURES



CAUTION

- 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 upright.
 - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
 - Label the system when charging is complete (if not already).
 - Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas.
- The system shall be leak-tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

- Electrostatic charge may accumulate and create a hazardous condition when charging or discharging the refrigerant.
To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before charging / discharging.

DECOMMISSIONING



CAUTION

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant.
- It is essential that electrical power is available before the task is commenced.
 - a) Become familiar with the equipment and its operation.
 - b) Isolate system electrically.
 - c) Before attempting the procedure ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
 - All personal protective equipment is available and being used correctly.
 - The recovery process is supervised at all times by a competent person.
 - Recovery equipment and cylinders conform to the appropriate standards.
 - d) Pump down refrigerant system, if possible.
 - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - f) Make sure that cylinder is situated on the scales before recovery takes place.
 - g) Start the recovery machine and operate in accordance with instructions.
 - h) Do not overfill cylinders. (No more than 80% volume liquid charge).
 - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
 - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
 - k) Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.
- Electrostatic charge may accumulate and create a hazardous condition when charging or discharging the refrigerant.
To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before charging / discharging.
- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant.
- The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

RECOVERY



CAUTION

- 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 are 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 all appropriate refrigerants including, when applicable, flammable refrigerants.
- 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.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
Consult manufacturer if in doubt.
- 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 evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

NOTICE

The English text is the original instructions. Other languages are translations of the original instructions.

Check of Density Limit

Check the amount of refrigerant in the system and floor space of the room according to the legislation on refrigerant drainage. If there is no applicable legislation, follow the standards described below.

The refrigerant (R32), which is used in the air conditioner, is a flammable refrigerant. So the requirements for the maximum refrigerant charge amount [m_{\max}] used in the appliance are determined according to installation space of the appliance.

Installation conditions

Procedure of preliminary calculation

1. Determine the room space in accordance with the requirements of installation.
2. Calculate the maximum refrigerant charge amount [m_{\max}]. When connecting the refrigerant tubes and installing the indoor unit in each partitioned room, it is necessary to calculate the allowable refrigerant charge amount in each room.

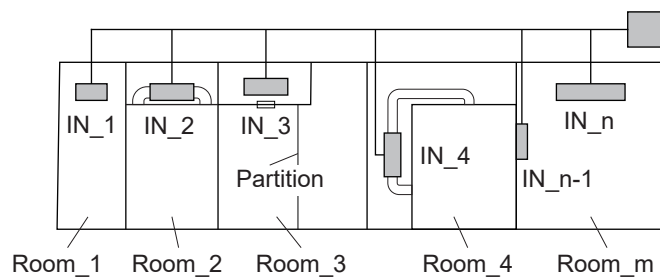


Fig. 1

For all indoor units shown in Fig. 1, calculate the allowable refrigerant charge amount that can be used in each room [m_{IN_1} , m_{IN_2} , ..., m_{IN_n}]

Calculate the maximum refrigerant charge for each indoor unit from Fig. 2 by referring to the following items.

- Floor area of the room
- Indoor units type
- Installation conditions A, B (Middle Static Pressure Duct and Slim Low Static Ducted)
 - *Installation condition A to be recommended. Installation condition B is extremely limited to the refrigerant charge amount. (Refer to Section "Installation Patterns" under the Installation Instructions attached to the indoor unit.)
- Capacity of indoor unit
- Installation height or air outlet height of indoor unit
- Use or nonuse of R32 refrigerant leakage detection sensor

In case that the room equipped with the indoor unit is divided by partition walls with openings.

- Installation height of indoor unit in the minimum area among partitioned areas: h_{instn}
- Floor space of the minimum area among partitioned areas: A_{instn}
- Opening space of the part that meets the required opening conditions: A_{nvmin} (Refer to Section "About Opening in a Partition Wall" under the Installation Instructions attached to the indoor unit.)

Room No.	No. of indoor units	Indoor units type	Installation conditions A, B	Capacity of indoor unit	Installation height or air outlet height of indoor unit: h_{inst} or h_0 (m)	R32 refrigerant leakage detection sensor	Floor area of the room: A_{inst} (m ²)	First step for calculating allowable refrigerant charge amount for each indoor unit (kg)
Room_1	IN_1	4-Way Cassette 60 × 60	—	15	$h_{inst} \geq 2.2$	Use	10	F-min ₁
Room_2	IN_2	Slim Low Static Ducted	—	56	$h_0 \geq 2.2$	Nonuse	15	F-min ₂
Room_3	IN_3	Slim Low Static Ducted	B	56	$h_0 \geq 1.8$	Use	20	F-min ₃
Room_4	IN_4	Middle Static Pressure Duct	A	160	$h_0 \geq 2.2$	included	40	F-min ₄
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Room_m	IN_n-1	Wall-Mounted	—	45	$h_{inst} \geq 1.8$	Use	30	F-min _{n-1}
Room_m	IN_n	4-Way Cassette (2-way airflow)	—	140	$h_{inst} \geq 2.2$	Use	30	F-min _n

Room No.	Partition's effective opening space (m ²)	Installation height of indoor unit in the minimum area among partitioned areas: h_{instn} (m)	Floor space of the minimum area among partitioned areas: A_{instn} (m ²)	Partition's necessary effective opening space: A_{nvmin} (m ²)	Refrigerant charge amount that can be used for each indoor unit (kg)
Room_1	—	—	—	—	m _{IN_1}
Room_2	—	—	—	—	m _{IN_2}
Room_3	0.11	$h_{instn} \geq 1.8$	5	0.20	m _{IN_3}
Room_4	—	—	—	—	m _{IN_4}
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Room_m	—	—	—	—	m _{IN_n-1}
Room_m	—	—	—	—	m _{IN_n}

$$[m_{\max}] = \text{Min. } (m_{\text{IN}_1}, m_{\text{IN}_2}, m_{\text{IN}_3}, \text{---}, m_{\text{IN}_{n-1}}, m_{\text{IN}_n})$$

The minimum value of the allowable refrigerant charge amount in each room is the maximum value of the maximum refrigerant charge amount $[m_{\max}]$ that can be used in the system.

- Calculate the maximum refrigerant charge amount $[m_c]^*$ by following details of piping installation.

* $[m_c] \leq 12.0$ (Maximum refrigerant charge amount)

As a reference, see in the section "2. DESIGN OF Mini VRF SYSTEM", "1-3. Tubing Length", "1-4. Additional Refrigerant Charge", "1-5. System Limitations", "1-6. Tubing Size", "1-7. Straight Equivalent Length of Joints", and "2-3. Installing Distribution Joint".

- Determine from two values $[m_{\max}]$ in Step 2 and $[m_c]$ in Step 3.

$[m_c] \leq [m_{\max}]$: Can be installed.

$[m_c] > [m_{\max}]$: Return to Steps 1 to 3 and change the indoor unit type, capacity and pipe length.

When there are partitioned rooms in the system and $[m_{\max}]$ is lower than the minimum value of the allowable refrigerant charge amount under the first step calculating allowable refrigerant charge amount for each indoor unit, change the effective opening of the partition to satisfy the necessary opening condition if available.

< Whether or not to use R32 refrigerant leakage detection sensor >

- According to the type of diagrams shown in Fig. 2, it is necessary to install R32 refrigerant leakage detection sensor if the installation space is within the range of using R32 refrigerant leakage detection sensor.
- As to installation method of R32 refrigerant leakage detection sensor, refer to the Technical Data of indoor unit and R32 refrigerant leakage detection sensor.
- When connecting R32 refrigerant leakage detection sensor, group connection with a remote controller is not possible. Be sure to prepare a remote controller for each indoor unit.

NOTE

In the case of connecting R32 refrigerant leakage detection sensor :

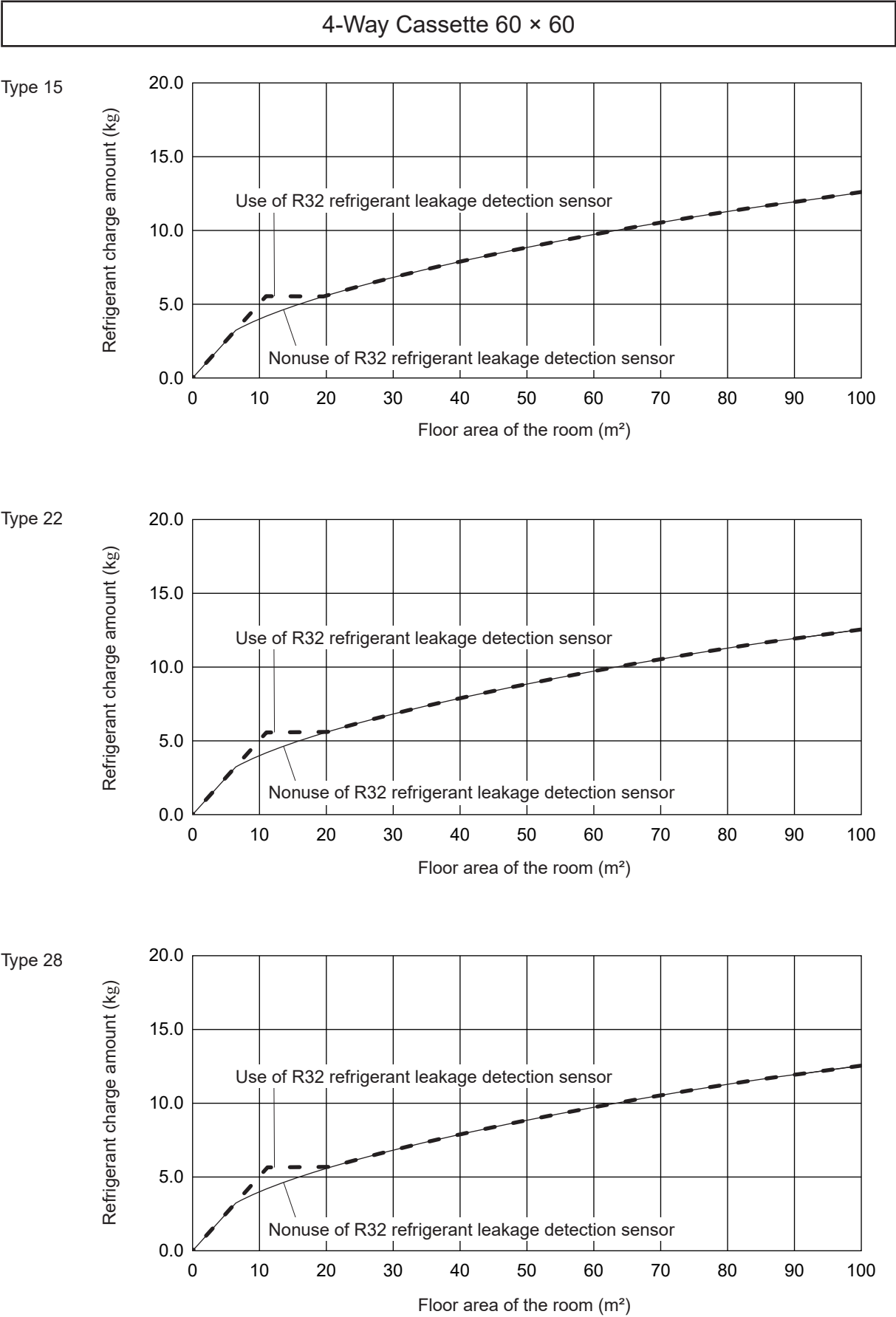
- For systems using R32 refrigerant, this unit is equipped with a refrigerant leak detector for safety. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

The refrigerant charge amount in accordance with the floor area of the room is roughly described on the pages that follow.

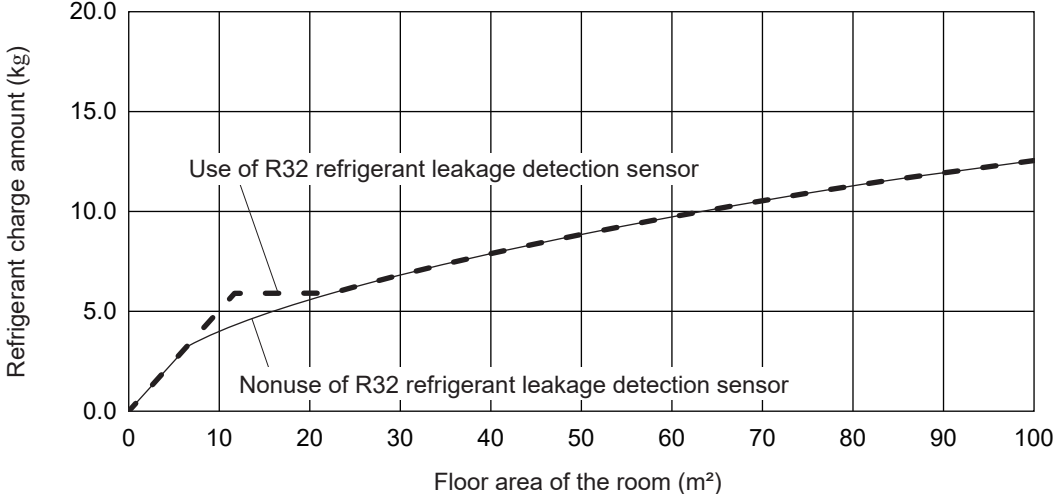
Here is one of an example shown below. The following diagram is subject to change according to the type of the connected indoor units. Refer to the Technical Data of indoor unit.

Example:

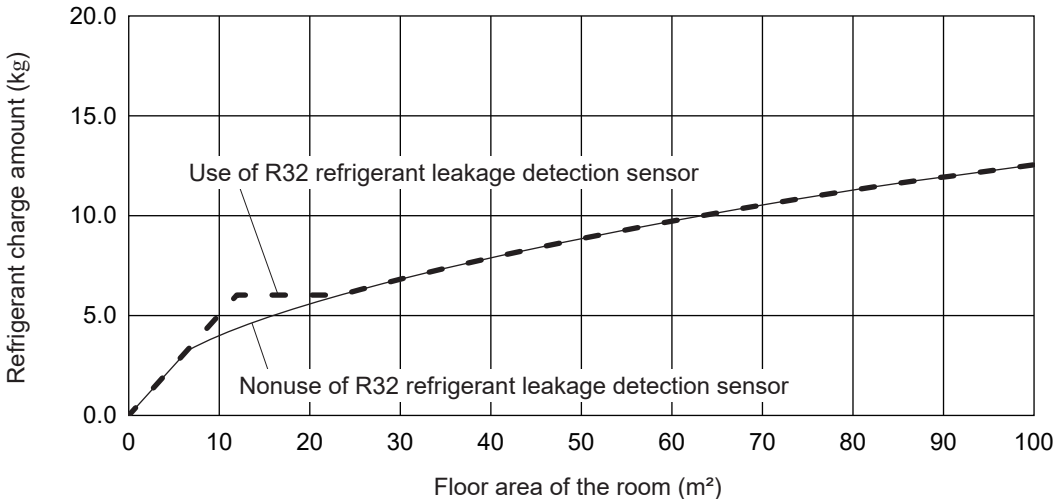
Fig. 2



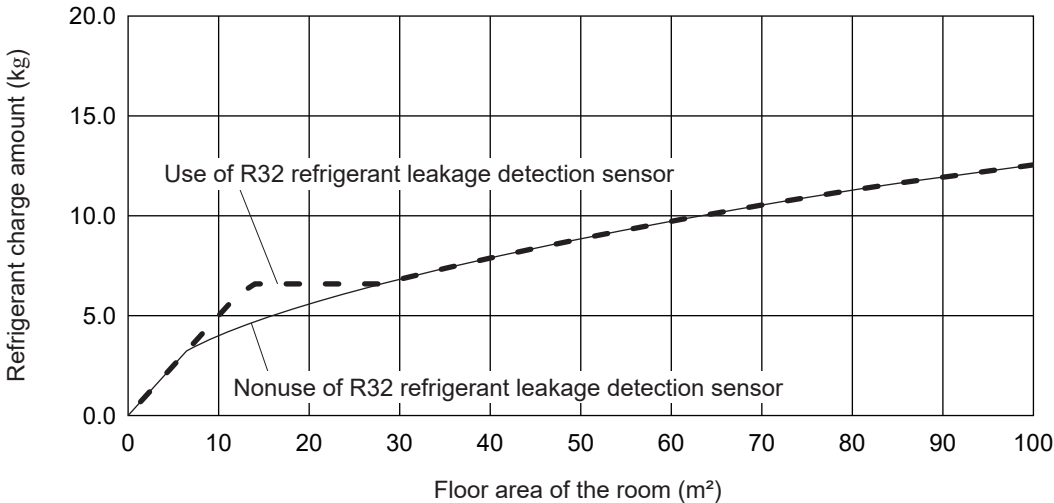
Type 36



Type 45



Type 56



Table

4-Way Cassette 60 × 60								
	Use or nonuse of R32 refrigerant leakage detection sensor	Nonuse	Use					
	Capacity of indoor unit	15~56	15	22	28	36	45	56
		Refrigerant charge amount (kg)						
Floor area of the room (m ²)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	4	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	6	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	8	3.5	4.0	4.0	4.0	4.0	4.0	4.0
	10	3.9	5.0	5.0	5.0	5.0	5.0	5.0
	12	4.3	5.5	5.6	5.7	5.8	6.0	6.0
	14	4.7	5.5	5.6	5.7	5.8	6.0	6.6
	16	5.0	5.5	5.6	5.7	5.8	6.0	6.6
	18	5.3	5.5	5.6	5.7	5.8	6.0	6.6
	20	5.6	5.6	5.6	5.7	5.8	6.0	6.6
	22	5.8	5.8	5.8	5.8	5.8	6.0	6.6
	24	6.1	6.1	6.1	6.1	6.1	6.1	6.6
	26	6.4	6.4	6.4	6.4	6.4	6.4	6.6
	28	6.6	6.6	6.6	6.6	6.6	6.6	6.6
	30	6.8	6.8	6.8	6.8	6.8	6.8	6.8
	32	7.1	7.1	7.1	7.1	7.1	7.1	7.1
	34	7.3	7.3	7.3	7.3	7.3	7.3	7.3
	36	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	38	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	40	7.9	7.9	7.9	7.9	7.9	7.9	7.9
	42	8.1	8.1	8.1	8.1	8.1	8.1	8.1
	44	8.3	8.3	8.3	8.3	8.3	8.3	8.3
	46	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	48	8.7	8.7	8.7	8.7	8.7	8.7	8.7
	50	8.8	8.8	8.8	8.8	8.8	8.8	8.8
	52	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	54	9.2	9.2	9.2	9.2	9.2	9.2	9.2
	56	9.4	9.4	9.4	9.4	9.4	9.4	9.4
	58	9.5	9.5	9.5	9.5	9.5	9.5	9.5
	60	9.7	9.7	9.7	9.7	9.7	9.7	9.7
	62	9.8	9.8	9.8	9.8	9.8	9.8	9.8
	64	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	66	10.2	10.2	10.2	10.2	10.2	10.2	10.2
	68	10.3	10.3	10.3	10.3	10.3	10.3	10.3
	70	10.5	10.5	10.5	10.5	10.5	10.5	10.5
	72	10.6	10.6	10.6	10.6	10.6	10.6	10.6
	74	10.8	10.8	10.8	10.8	10.8	10.8	10.8
	76	10.9	10.9	10.9	10.9	10.9	10.9	10.9
	78	11.1	11.1	11.1	11.1	11.1	11.1	11.1
	80	11.2	11.2	11.2	11.2	11.2	11.2	11.2

Table

4-Way Cassette 60 × 60								
	Use or nonuse of R32 refrigerant leakage detection sensor	Nonuse	Use					
	Capacity of indoor unit	15~56	15	22	28	36	45	56
		Refrigerant charge amount (kg)						
Floor area of the room (m ²)	82	11.3	11.3	11.3	11.3	11.3	11.3	11.3
	84	11.5	11.5	11.5	11.5	11.5	11.5	11.5
	86	11.6	11.6	11.6	11.6	11.6	11.6	11.6
	88	11.7	11.7	11.7	11.7	11.7	11.7	11.7
	90	11.9	11.9	11.9	11.9	11.9	11.9	11.9
	92	12.0	12.0	12.0	12.0	12.0	12.0	12.0
	94	12.1	12.1	12.1	12.1	12.1	12.1	12.1
	96	12.3	12.3	12.3	12.3	12.3	12.3	12.3
	98	12.4	12.4	12.4	12.4	12.4	12.4	12.4
	100	12.5	12.5	12.5	12.5	12.5	12.5	12.5

Precautions for Installation Using New Refrigerant

1. Care regarding tubing

1-1. Process tubing

- **Material:** Use seamless phosphorous deoxidized copper tube for refrigeration. Wall thickness shall comply with the applicable legislation. The minimal wall thickness must be in accordance with the table below.
- **Tubing size:** Be sure to use the sizes indicated in the table below.
- Use a tube cutter when cutting the tubing, and be sure to remove any flash. This also applies to distribution joints (optional).
- When bending tubing, use a bending radius that is 4 times the outer diameter of the tubing or larger.



CAUTION

Use sufficient care in handling the tubing. Seal the tubing ends with caps or tape to prevent dirt, moisture, or other foreign substances from entering. These substances can result in system malfunction.

Unit: mm

Material		Temper - O (Soft copper tube)				
Copper tube	Outer diameter	6.35	9.52	12.7	15.88	19.05
	Wall thickness	0.8	0.8	0.8	1.0	1.2

Unit: mm

Material		Temper - 1/2 H, H (Hard copper tube)	
Copper tube	Outer diameter	22.22	25.4
	Wall thickness	1.0	1.0

- 1-2. Prevent impurities including water, dust and oxide from entering the tubing. Impurities can cause R32 refrigerant deterioration and compressor defects. Due to the features of the refrigerant and refrigerating machine oil, the prevention of water and other impurities becomes more important than ever.

2. Be sure to recharge the refrigerant only in liquid form.

- 2-1. Since refrigerant composition changes and performance decreases when gas leaks, collect the remaining refrigerant and recharge the required total amount of new refrigerant after fixing the leak.

3. Different tools required

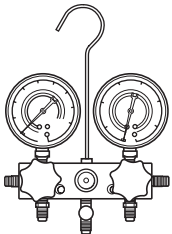
3-1. Tool specifications have been changed due to the characteristics of R32.

Some tools for R22- and R407C-type refrigerant systems cannot be used.

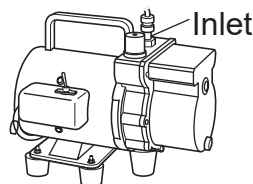
Item	Different tools? (From R22 and R407C)	R410A tools compatible with R32?	Remarks
Manifold gauge	Yes	Yes	Types of refrigerant, refrigerating machine oil, and pressure gauge are different.
Charge hose	Yes	Yes	To resist higher pressure, material must be changed.
Vacuum pump	Yes	Yes	Use a conventional vacuum pump if it is equipped with a check valve. If it has no check valve, purchase and attach a vacuum pump adapter.
Leak detector	Yes	Yes	Leak detectors for CFC and HCFC that react to chlorine do not function because R32 and R410A contains no chlorine. Leak detectors for HFC can be used for R32 and R410A.
Flaring oil	Yes	Yes	For systems that use R22, apply mineral oil (Suniso oil) to the flare nuts on the tubing to prevent refrigerant leakage. For machines that use R32 or R410A, apply synthetic oil (ether oil) to the flare nuts.

* Using tools for R22, R407C, R410A and R32 together can cause defects.

Manifold gauge

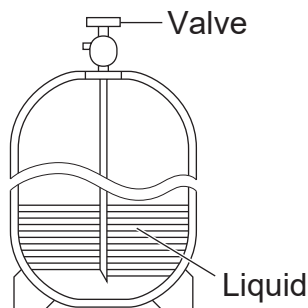


Vacuum pump



Single-outlet valve
(with siphon tube)

Liquid refrigerant should be recharged with the cylinder standing on end as shown.



Important Information Regarding The Refrigerant Used

This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

Refrigerant type: R32

GWP⁽¹⁾ value: 675

⁽¹⁾GWP = global warming potential

Periodical inspections for refrigerant leaks may be required depending on European or local legislation.

Please contact your local dealer for more information.

Please fill in with indelible ink,

■ ① : the factory refrigerant charge of the product

■ ② : the additional refrigerant amount charged in the field

■ ① + ② : the total refrigerant charge

■ $(① + ②) \times 3 / 1000$: CO₂ equivalent in tons; multiply the total refrigerant charge by GWP value, then divided by 1000.

on the refrigerant charge label supplied with the product.

The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the service cover).

This product contains fluorinated greenhouse gases.
CO₂ equivalent amount is shown in "CO₂ eq."

R32

GWP : 675 ③

① = kg 1

② = kg 2

① + ② = kg 3

"CO₂ eq."
 $\frac{(① + ②) \times ③}{1,000} =$ ton 8

* English text printed on this label is original.
Each language label will be sealed on this original text.

7 5 6

1. Factory refrigerant charge of the product: see unit name plate

2. Additional refrigerant amount charged in the field*

3. Total refrigerant charge

4. Contains fluorinated greenhouse gases

5. Outdoor unit

6. Refrigerant cylinder and manifold for charging

7. GWP(global warming potential) of the refrigerant used in this product

8. CO₂ equivalent of fluorinated greenhouse gases contained in this product

* See "1-8. Additional Refrigerant Charge"