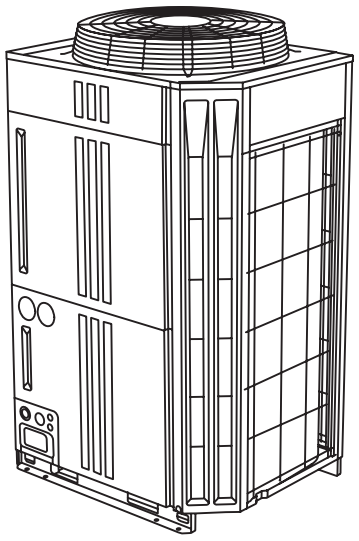
AIR CONDITIONER



INSTALLATION MANUAL
OUTDOOR UNIT
For authorized service personnel only.

English

INSTALLATIONSANLEITUNG
AUSSENGERÄT
Nur für autorisiertes Fachpersonal.

Deutsch

MANUEL D'INSTALLATION
APPAREIL EXTÉRIEUR
Pour le personnel d'entretien autorisé uniquement.

Français

MANUAL DE INSTALACIÓN
UNIDAD EXTERIOR
Únicamente para personal de servicio autorizado.

Español

MANUALE DI INSTALLAZIONE
UNITÀ ESTERNA
A uso esclusivo del personale tecnico autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ
ΕΞΩΤΕΡΙΚΗ ΜΟΝΑΔΑ
Μόνο για εξουσιοδοτημένο τεχνικό προσωπικό.

Ελληνικά

MANUAL DE INSTALAÇÃO
UNIDADE EXTERIOR
Apenas para pessoal de assistência autorizado.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ
ВНЕШНИЙ МОДУЛЬ
Только для авторизованного обслуживающего персонала.

Русский

MONTAJ KILAVUZU
DIŞ ÜNİTE
Yalnızca yetkili servis personeli için.

Türkçe

PART No. 9378945135

INSTALLATION MANUAL
OUTDOOR UNIT
PART No. 9378945135 English

Contents

1. SAFETY PRECAUTIONS

- Be sure to read this Installation manual thoroughly before installation.
- The warnings and precautions indicated in this Installation manual contain important information pertaining to your safety. Be sure to observe them.
- After installing the unit, perform a test run to make sure the unit operates normally. Then, explain to the customer how to operate and maintain the unit.
- Please pass this Installation manual together with the Operating manual to the customer.
  Please ask the customer to keep the Operating manual and Installation manual at hand for future reference during the moving or repair of the main unit.

⚠ WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.

Consult the retail store or professional technicians to install the main unit according to the installation manual.
Improper installation will cause serious accidents such as refrigerant leakage, water leakage, electric shock, and fire.
Manufacturer's guarantee will be invalid when instructions in the Installation manual are ignored during installation.

For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts.
Using non-specified parts will cause serious accidents such as falling unit, refrigerant leakage, water leakage, electric shock, and fire.

To install a unit that uses the R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use.
Because the pressure of the R410A refrigerant is approximately 1.6 times higher than the R22, failure to use dedicated piping material or improper installation can cause rupture or injury.
It will also cause serious accidents such as refrigerant leakage, water leakage, electric shock, and fire.

Do not use this equipment with air or any other unspecified refrigerant in the refrigerant lines.
Excess pressure can cause a rupture.

Do not introduce any substance other than the prescribed refrigerant into the refrigeration cycle.
If air enters the refrigeration cycle, the pressure in the refrigeration cycle will become abnormally high and cause the piping to rupture.

Be sure to install the unit as prescribed, so that it can withstand earthquakes and typhoons or other strong winds.
Improper installation can cause the unit to topple or fall, or other accidents.

Ensure that the outdoor unit is securely installed at a place that can withstand the weight of the unit.
Improper installation will cause injuries caused by falling unit.

If there is a refrigerant leakage, make sure that it does not exceed the concentration limit.
If a refrigerant leakage exceeds the concentration limit, it can lead to accidents such as oxygen starvation.

If a refrigerant leakage occurs during operation, immediately vacate the premises and thoroughly ventilate the area.
If the refrigerant is exposed to fire, it will create a hazardous gas.

Electrical work must be performed in accordance with this installation 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.

For wiring, use the prescribed type of wires, connect them securely, making sure that there are no external forces of the wires applied to the terminal connections.
Improperly connected or secured wires can cause serious accidents such as overheating the terminals, electric shock, or fire.

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.

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.

After the installation, make sure there is no refrigerant leakage.
If the refrigerant leaks into the room and becomes exposed to a source of fire such as a fan heater, stove, or burner, it will create a hazardous gas.

Use a wall hole pipe. Otherwise, it may cause a short circuit.

Do not place the outdoor unit near the handrail of the balcony.
Children may climb onto the outdoor unit, lean over the handrail and fall over.

Use only a specified power cable. Poor connection, poor insulation, and exceeding the allowable current will lead to electric shock and fire.

Attach the connecting cables securely to the terminal. Or secure it firmly with a “wiring suppressor”.
Loose connection will lead to malfunction, electric shock, and fire.

Install a breaker (earth leakage breaker) to cut off all AC main current at the same time.
If you do not install a breaker (earth leakage breaker), it may cause electric shock and fire.

Be sure to install the refrigerant pipe before operating the compressor. If the refrigerant pipe is not installed and you operate the compressor while the valve is open, air will be sucked into the system and abnormal pressure will occur in the cooling cycle. This will damage the unit and cause injuries.

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 rupture 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 rupture and even injury.

⚠ CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

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 fall 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 fall or the unit to leak water.
- 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 containing equipment that generates electromagnetic interference.
  It will cause the control system to malfunction, preventing the unit from operating normally.
- Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile inflammables such as paint thinner or gasoline.
  If gas leaks and settles around the unit, it can cause a fire.
- Avoid installing the unit at places where it will come into contact with animals’ urine or ammonia.

Obtain the distribution network operator's agreement about the power capacity of the power supply system, specification of the cable and the harmonic current, and etc. when you connect the outdoor unit with the power supply.
This product is intended for professional use. Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
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.
Be sure to perform the grounding work. Do not connect grounding wires to a gas pipe, water pipe, lightning rod or grounding wire for a telephone. Connection to a gas pipe may cause a fire or explosion if gas leaks. Connection to a water pipe is not an effective grounding method if PVC pipe is used. Connection to the grounding wire of a telephone or to a lightning rod may cause a dangerously abnormal rise in the electrical potential if lightning strikes. Improper grounding work can cause electric shocks.
Perform draining for the unit according to the Installation manual. Check that the water is properly drained. If the drain processing is improperly installed, water may drip down from the unit, wetting the furniture.
Do not touch the fins with bare hands.
Read carefully all security information before use or install the air conditioner.
Do not attempt to install the air conditioner or a part of the air conditioner by yourself.
This unit must be installed by qualified personnel with a capacity certificate for handling refrigerant fluids. Refer to regulation and laws in use on installation place.
The installation must be carried out in compliance with regulations in force in the place of installation and the installation instructions of the manufacturer.
This unit is part of a set constituting an air conditioner. It must not be installed alone or with non-authorized 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 3 mm for this unit.
The unit must be correctly earthed (grounded) and the supply line must be equipped with a differential breaker in order to protect the persons.
The units are not explosion proof and therefore should not be installed in explosive atmosphere.
This unit contains no user-serviceable parts. Always consult authorized service personnel to repairs.
When moving, consult authorized service personnel for disconnection and installation of the unit.
Children should be monitored to ensure they do not play with the device.
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.
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.
Do not place any other electrical products or household belongings under indoor unit or outdoor unit. Dripping condensation from the unit might get them wet, and may cause damage or malfunction of your property.

Regulation

- This unit must be connected to a power supply with impedance of 0.33 ohm and below. If the power supply does not satisfy this requirement, please consult the power supplier.
- Be sure to use a dedicated power circuit.
  Never use a power supply shared by another appliance.

2. ABOUT THE PRODUCT

2.1. Caution when using R410A refrigerant

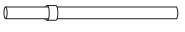
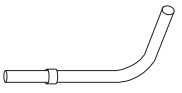
Pay careful attention to the following points:
• Since the working pressure is 1.6 times higher than that of R22 models, some of the piping and installation and service tools are special. (See the table in the SPECIAL TOOLS FOR R410A section.) Especially, when replacing a conventional refrigerant (other than R410A) model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
• Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with R22, R407C and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
• Be more careful than the installation of the refrigerant (other than R410A) models, not to enter foreign matters (oil, water, etc.) and other refrigerant into the piping. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
• 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 side whose composition is stable.

2.2. Special tools for R410A

Tool name	Contents of change for R22 tool
Gauge manifold	Pressure is huge and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use a gauge manifold with a high pressure display range -0.1 to 5.3 MPa and a low pressure display range -0.1 to 3.8 MPa.
Charging hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter. Be sure that the pump oil does not backflow into the system. Use one capable for vacuum suction of –100.7 kPa (5 Torr, –755 mmHg).
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

2.3. Accessories

Use connecting parts as required.
Do not throw away the connecting parts until the installation has been complete.

Name and shape	Q'ty	Application
Installation manual 	1	(This book)
Joint pipe A 	1	For connecting gas pipe (Straight type)
Joint pipe B 	1	For connecting gas pipe (L type)
Binder 	7	For binding power cable and transmission cable

3. INSTALLATION WORK

Please obtain the approval of the customer when selecting the location of installation and installing the main unit.

3.1. Selecting an installation location

⚠ WARNING

Install the unit in a location that can withstand its weight, and where it will not topple or fall.

Calculate the proper refrigerant concentration if you will be installing it in an enclosed location.

$$\frac{\text{Total amount of replenished refrigerant in refrigerant facility (kg)}}{\text{Capacity of smallest room where unit is installed (m}^3\text{)}} \leqq \text{Refrigerant concentration (kg/m}^3\text{) (0.3kg/m}^3\text{)}$$

If the results of the calculation exceed the concentration limit, increase the room surface area or install a ventilation duct.

⚠ CAUTION

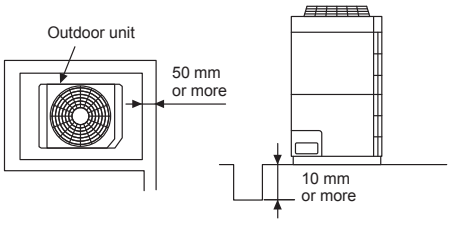
Select an installation location by observing the following precautions:

- Install the unit horizontally. (Within 3 degrees)
- Install this unit in a location with good ventilation.
- If the unit must be installed in an area within easy reach of the general public, install as necessary a protective fence or the like to prevent their access.
- Install the unit in an area that would not inconvenience your neighbors, as they could be affected by the airflow coming out from the outlet, noise, or vibration. If it must be installed in proximity to your neighbors, be sure to obtain their approval.
- If the unit is installed in a cold region that is affected by snow accumulation, snow fall, or freezing, take appropriate measures to protect it from those elements. To ensure a stable operation, install inlet and outlet ducts.
- Install the unit in an area that would not cause problems even if the drain water is discharged from the unit. Otherwise, provide drainage that would not affect people or objects.
- Install the unit in an area that has no heat sources, vapors, or the risk of the leakage of flammable gas in the vicinity.
- Install the unit in an area that is away from the exhaust or vent ports that discharge vapor, soot, dust, or debris.
- Install the indoor unit, outdoor unit, power supply cable, transmission cable and remote control cable at least 1 meter away from a television or radio. The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 1 meter apart, you could still receive noise under some signal conditions.)
- Keep the length of the piping of the indoor and outdoor units within the allowable range.
- For maintenance purposes, do not bury the piping.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

3.2. Drain processing

- The drain water is discharged from the bottom of the equipment. Construct a drain ditch around the base and discharge the drain water properly.
- When installing on a roof, perform floor waterproofing properly.

Drain processing:
- The drain water from the base of the outdoor unit may generate during operations. Perform drain processing, as necessary.
- When you want to prevent the drain water from leaking at the perimeter, construct a ditch for the drain water as shown in the figure.
- Provide a central drain pan, as necessary.



3.3. Installation dimensions

⚠ CAUTION

When installing the outdoor unit, pay attention to the following items.

- Provide sufficient installation space, such as transportation route, maintenance space, ventilation space, refrigerant piping space, and passageways.
- Pay attention to the specifications of the installation space as shown in the figure. If the unit is not installed according to specifications, it may cause short circuit or poor performance. The unit may be prone to lapse into non-operation due to high pressure protection.
- Do not place obstructions in the air flow outlet direction. If there is an obstruction in the outlet direction, install an outlet duct.
- When there is a wall in front of the unit, provide a space of 500 mm or more as maintenance space.
- When there is a wall at the side of the unit, provide a space of 30 mm or more as maintenance space.
- An outdoor temperature of 35 degrees in air-conditioned operation is assumed for the installation space in this item. If the outdoor temperature exceeds 35 degrees, provide a larger inlet space.
- If you are installing more outdoor units than indicated here, please ensure sufficient space or consult your distributing agent as it may affect the performance due to short circuit and other problems.

3.3.1. When install near by limited height wall

(1) Single and multiple installations
- There are no restrictions on the height of the side wall.
- Provide installation spaces L1 and L2 in accordance with the table below according to the wall height (front side, rear side) conditions.
- Provide installation spaces other than L1 and L2 in accordance with the conditions shown in the figure below.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

Wall height condition	Necessary installation space
When H1 is 1500 (mm) or less	L1 ≧ 500 (mm)
When H1 is 1500 (mm) or more	L1 ≧ 500+h1÷2 (mm)
When H2 is 500 (mm) or less	L2 ≧ 300 (mm)
When H2 is 500 (mm) or more	L2 ≧ 300+h2÷2 (mm)

Fig. 1

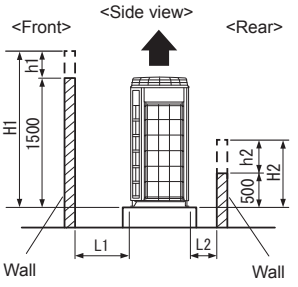


Fig. 2 Single installation

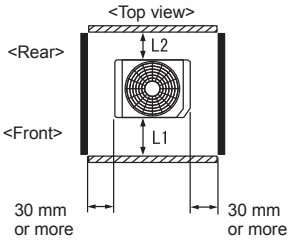
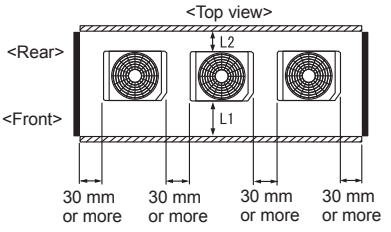


Fig. 3 Multiple installations



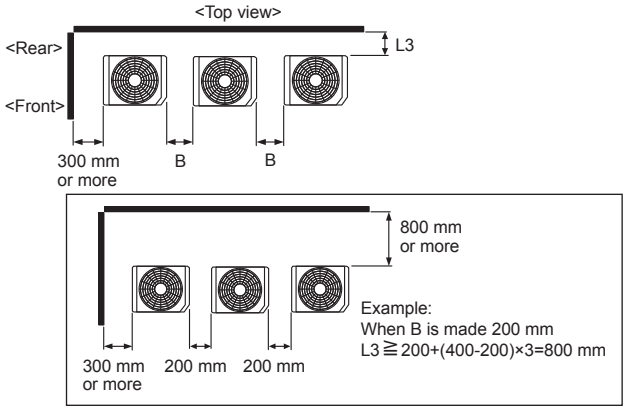
3.3.2. When install near by unlimited height wall

(2) Single and multiple installations
- There are no restrictions on the height of the wall.
- The wall (without height restrictions) must not exist on the both sides (left/right) of outdoor unit. Also, must not exist on the both sides (front/rear) of outdoor unit.
- Provide installation spaces other than L3 in accordance with the conditions shown in the figure below.
- Ventilation resistance can be ignorable when the distance from a wall or product, etc. is larger than 2m.

Condition	Necessary installation space
When B ≧ 400 (mm)	L3 ≧ 200 (mm)
When 30 ≦ B < 400 (mm)	L3 ≧ 200 + (400-B) ×3 (mm)

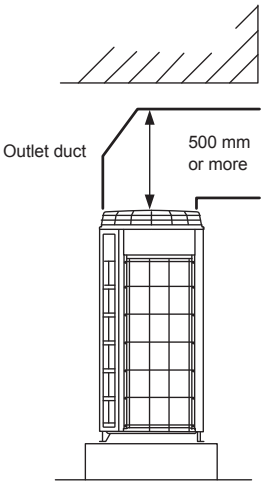
Fig. 4 Single installation

Fig. 5 Multiple installations



3.3.3. When there are obstacles above the product

When there are obstacles above the product, keep the minimum installation height as shown in the figure and install the outlet duct.
The efficiency might decrease when the outlet duct etc. are installed.



3.4. Transportation the outdoor unit

Hoisting method (Fig. A)
- When hanging the outdoor unit and conveying it to installation location, hang the unit with rope by passing through the 4 opening holes on bottom of front and rear side as shown in figure.
- Use 2 ropes at least 8m long. If used shorter length, it may cause to damage the unit.
- Use the sufficiently strong rope to bear the unit's weight.
- Place the protective board or filler cloth at the place where the cabinet may come into contact with rope to prevent from damages. Without using them, cabinet may cause to damage or deform.
- During the hanging unit, make sure to keep the unit horizontally to prevent the drop.
- Be careful not to shock the impacts during the hanging.

Conveying by forklift (Fig. B)
- When using the forklift to convey the unit, pass the forklift arms through the opening space as shown in below.
  Front: Bottom of the wooden delivery pallet.
  Side: Space between pallet and cabinet.
- Enable to remove the pallet from cabinet.
- Be careful not to be damaged.

Conveying by forklift (Manual forklift: hand-fork)
- When using the manual forklift to convey the unit, pass the forklift arms through the opening space between pallet and cabinet from side.

Fig. A

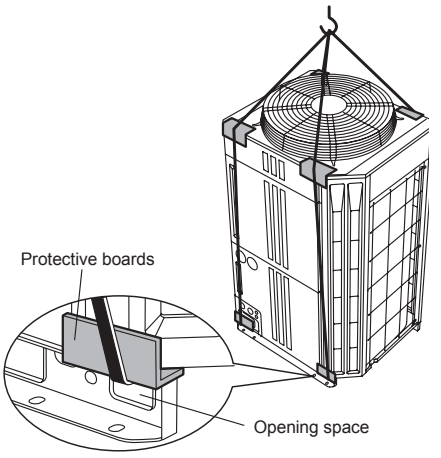
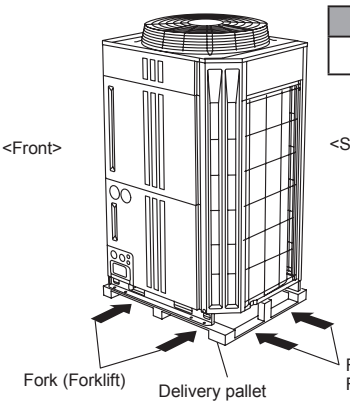


Fig. B



Product mass (kg)
220

3.5. Installation the unit

- Install the unit horizontally. (Within 3 degrees).
- Install 4 or more anchor bolts at the 8 locations indicated by arrows (Fig. A).
- Place the left and right anchor bolts at a distance further away than 610 mm. (Excluding the case where anchor bolts are installed at 8 locations.)
- To minimize vibration, do not install the outdoor unit directly on the ground. Instead, install it on top of a firm platform (such as concrete block). (Fig. B)
- Keep the height of foundation base over 200 mm from the floor surface.
- The foundation base should be able to support the product and the foot width of the product should be more than 46.5 mm.
- Depending on the installation condition, vibration during the operation of the unit may cause noise and vibration. Install vibration-proofing materials (such as rubber pads).
- Consider the removal space of the connection piping when installing the foundation.
- Secure the equipment firmly with anchor bolts, washers, and nuts.

Fig. A

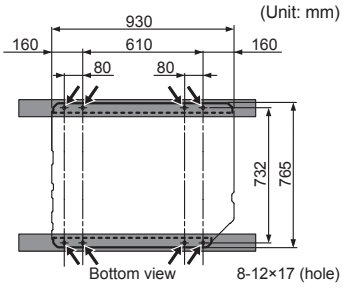
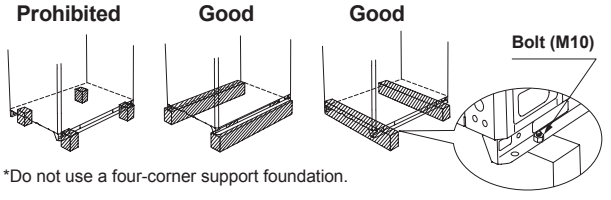


Fig. B



*Do not use a four-corner support foundation.

4. PIPE SELECTION

4.1. Selecting the pipe material

⚠ CAUTION
• This unit is designed specifically for use with the R410A refrigerant.
• Pipes for R407C or R22 may not be used with this unit.
• Do not use existing pipes.
• 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 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 R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.

Table. A (Wall thickness and pipe material for each diameter)

Outside Diameter	mm	12.70	22.22	25.40	28.58
Wall Thickness*3	mm	0.8	1.0	1.0	1.0
Material		COPPER*1 JIS H3300 C1220T-O or equivalent	COPPER*2 JIS H3300 C1220T-H or equivalent		

*1. Allowable tensile stress ≧ 33 (N/mm^2) (125°C)
*2. Allowable tensile stress ≧ 61 (N/mm^2) (125°C)
*3. Design pressure 4.2MPa

Please select the pipe size in accordance with local rules.

4.2. Protection of pipes

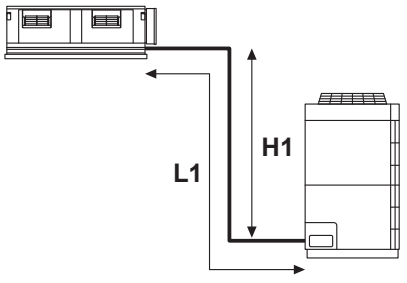
- Protect the pipes to prevent the entry of moisture and dust.
- Especially, pay attention when passing the pipes through a hole or connecting the end of a pipe to the outdoor unit.

Location	Working period	Protection method
Outdoor	1 month or more	Pinch pipes
	Less than 1 month	Pinch or tape pipes
Indoor	-	Pinch or tape pipes

4.3. Refrigerant pipe size and allowable piping length

⚠ CAUTION
• Keep the piping length between the indoor unit and outdoor unit within the allowable tolerance.

Capacity [BTU/h class]		72,000 / 90,000
Pipe diameter (Standard) [mm (in.)]	Liquid	12.70 (1/2)
	Gas	25.40 (1)
Max. piping length (L1)	[m]	75*1
Min. piping length (L1)	[m]	5
Max. height difference (H1) <Indoor unit to outdoor unit>	[m]	30



*1: For the standard pipe diameter.

4.4. Connectable pipe diameter and max. piping length

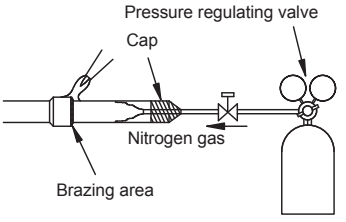
- The figures enclosed by a thick-lined frame indicate the standard pipe diameter and max. piping length.

Capacity [BTU/h class]		72,000 / 90,000		
Pipe diameter [mm (in.)]	Liquid pipes	12.70 (1/2)		
	Gas pipes	22.22 (7/8)	25.40 (1)	28.58 (9/8)
Piping length [m (m)]	Max. piping length < L1 >*1 (Max. chargeless length)	75 (20)	75 (20)	50 (20)

*1: Refer to “4.3.”.

5. PIPE INSTALLATION

5.1. Brazing

⚠ CAUTION
• If air or another type of refrigerant enters the refrigeration cycle, the internal pressure in the refrigeration cycle will become abnormally high and prevent the unit from exerting its full performance.
• Apply nitrogen gas while brazing the pipes. Nitrogen gas pressure: 0.02 MPa (= pressure felt sufficiently on the back of your hand) **Fig.** 
• If a pipe is brazed without applying nitrogen gas, it will create an oxidation film. This can degrade performance or damage the parts in the unit (such as the compressor or valves).
• Do not use flux to braze pipes. If the flux is the chlorine type, it will cause the pipes to corrode. In addition, if the flux contains fluoride, it will affect the refrigerant piping system due to deterioration of refrigerant oil.
• For brazing material, use phosphor copper that does not require flux.

5.2. Piping method

5.2.1. Opening the knockout hole

⚠ CAUTION
• Be careful to prevent panel deformed or damaged while opening the knockout hole.
• To prevent cutting of the wiring after the knockout hole was opened, remove the burrs along the edge. In addition, to prevent rusting, painting the edge with rust preventive paint is recommended.

The piping can be connected from two directions; the front or the bottom.
(Knockout holes are provided so that the piping can be connected from two different directions.)
Use the front knockout hole, as required.

Fig. A Knockout position

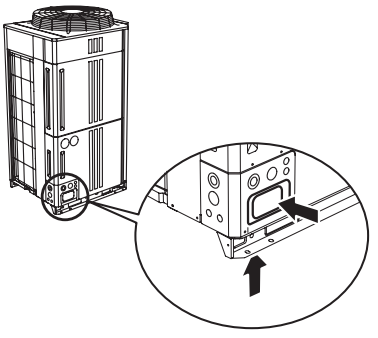


Fig. B Detail of knockout position (bottom)

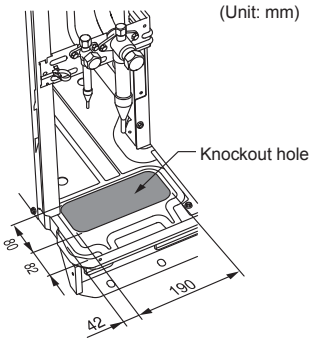
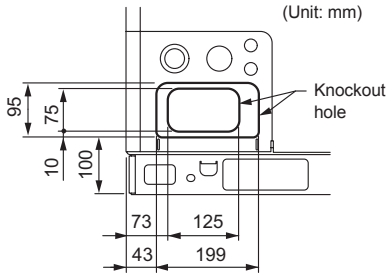


Fig. C Detail of knockout position (front)



5.2.2. Removing the pinch pipe

⚠ WARNING

Remove the pinch pipe only when the internal gas is completely drained.
If gas still remains inside, the piping may crack if you melt the brazing filler metal of the junction area with a burner.

Before connecting the piping, remove the pinch pipe in accordance with the following instructions:

1) Verify that the liquid side and gas side 3-way valves are closed. (Fig. A)
2) Cut the end of the liquid side and gas side pinch pipe and vent the gas inside the pinch pipe. (Fig. B)
3) After all the gas is vented, melt the brazing filter metal on connecting part using a burner and remove the pinch pipe. (Fig. C)

Fig. A

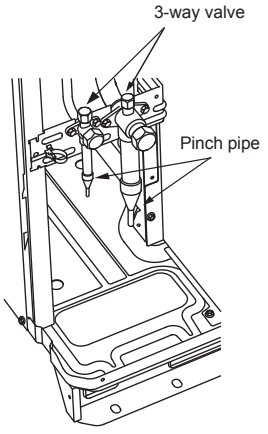


Fig. B

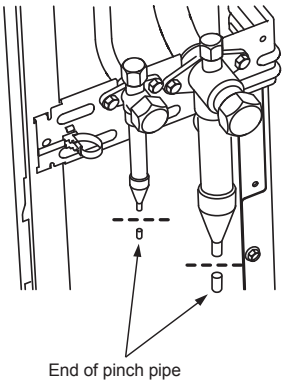
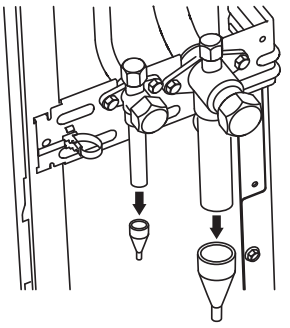


Fig. C



5.2.3. Pipe connection

⚠ CAUTION

- Seal the pipe route hole with putty (field supply) such that there are no gaps.
  Small insects or animals that are trapped in the outdoor unit may cause a short circuit in the electrical component box.
- To prevent pipe damage; do not make sharp bends in the pipe.
  Bend the pipe at a radius of 100~150 mm or greater.
- Do not bent pipe many times at same part to prevent break.
- Do not use flare connection on the indoor unit pipe until the connection piping has been connected.
- Wait until the 3-way valve is completely cooled down before removing the pinch pipe or brazing the joint pipe.
  Otherwise, the 3-way valve may be damaged.

- If pipes are shaped by hand, be careful not to collapse them.
- Do not bend the pipes at an angle of more than 90°.
- When pipes are repeatedly bent 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 three times.
- Blaze the joint pipe onto the 3-way valves at the liquid and gas side.
  Process the joint pipe appropriately so that it can be connected easily with the main pipe.
- Blaze the joint pipe at the liquid and gas side with the main pipe.
  * Be sure to supply nitrogen when blazing.

Fig. A

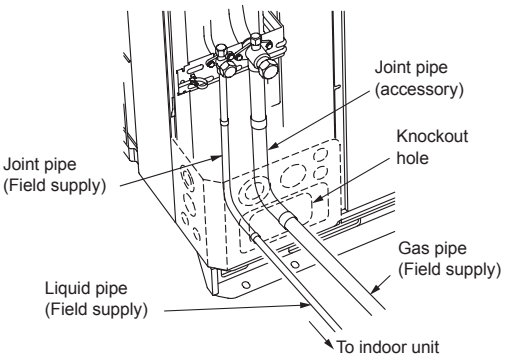
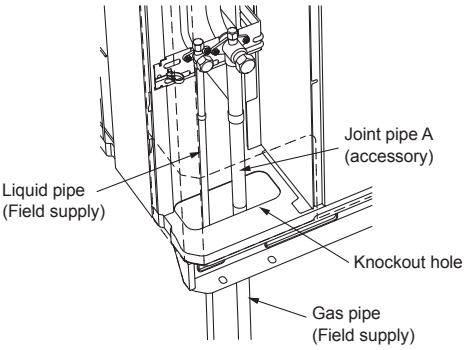


Fig. B



6. ELECTRICAL WIRING

6.1. The precautions of electrical wiring

⚠ WARNING

- Wiring connections must be performed by a qualified person in accordance with specifications.
  The rated supply of this product is 50Hz, 400V of 3-phase, 4-wire. Use a voltage within the range of 342-456V.
- Before connecting the wires, make sure the power supply is OFF.
- Select a breaker (earth leakage breaker) of appropriate capacity and install one at every power supply of an outdoor unit. Wrong selection of breakers (earth leakage breakers) or transition wiring will lead to electric shock and fire.
- Do not connect AC power supply to the transmission line terminal board. Improper wiring can damage the entire system.
- Install a breaker (earth leakage breaker) in accordance with the related laws and regulations.
- Connect the connector cord securely to the terminal. Faulty installation can cause a fire.
- Make sure to secure the insulation portion of the connector cable with the cord clamp. A damaged insulation can cause a short circuit.
- Never install a power factor improvement condenser. Instead of improving the power factor, the condenser may overheat.
- Before servicing the unit, turn the power supply switch OFF. Then, do not touch electric parts for 10 minutes due to the risk of electric shock.
- Make sure to perform grounding work. Improper grounding work can cause electric shocks.
- A circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.
- Do not modify power cable, use extension cable or branch wiring. Improper use may cause electric shock or fire by poor connection, insufficient insulation or over current.
- Use crimp-type terminals and tighten the terminal screws to the specified torques, otherwise, abnormal overheating may be produced and possibly cause serious damage inside the unit.
- Fix cables so that cables do not make contact with the pipes (especially on high pressure side). Do not make power supply cable and transmission cable come in contact with valves (Gas).
- Securely install the electrical box cover on the unit. An improperly installed service panel can cause serious accidents such as electric shock or fire through exposure to dust or water.

⚠ CAUTION

- The primary power supply capacity is for the air conditioner itself, and does not include the concurrent use of other devices.
- Connect the power cables in positive phase sequence. If they are connected in negative phase sequence, an error will be displayed. If there is a missing phase connection, the unit will not operate normally. Do not connect a N phase (neutral phase) cable to other phases (misconnection). Wrong wiring will lead to parts damage.
- Do not use crossover power supply wiring for the outdoor unit.
- If the electrical power is inadequate, contact your electric power company.
- Install a breaker (earth leakage breaker) in a location that is not exposed to high temperatures.
  If the temperature surrounding the breaker (earth leakage breaker) is too high, the amperage at which the breaker (earth leakage breaker) cuts out may decrease.
- Use a breaker (earth leakage breaker) that is capable of handling high frequencies. Because the outdoor unit is inverter controlled, a high-frequency earth leakage breaker is necessary to prevent a malfunction of the breaker itself.
- When the electrical switchboard is installed outdoors, place it under lock and key so that it is not easily accessible.
- Do not fasten the power supply cable and transmission cable together.
- Always keep to the maximum length of the transmission cable. Exceeding the maximum length may lead to erroneous operation.
- The static electricity that is charged to the human body can damage the control PC Board when handling the control PC Board for function setting, etc.
  Please keep caution to the following points.
  Provide the grounding of Indoor unit, Outdoor unit and Option equipment.
  Cut off the power supply (breaker).
  Touch the metal section (such as the unpainted control box section) of the indoor or outdoor unit for more than 10 seconds. Discharge the static electricity in your body.
  Never touch the component terminal or pattern on the PC Board.
- Do not start operation until the refrigerant is charged completely. The compressor will fail if it is operated before the refrigerant piping charging is complete.
- Transmission cable between indoor unit and outdoor unit is 230 V.
- Be sure not to remove thermistor sensor etc. from power wiring and connection wiring. Compressor may fail if operated while removed.

⚠ CAUTION

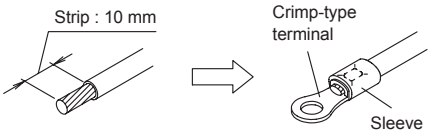
- Start wiring work after closing branch switch and over current breaker.
- When using an earth leakage breaker that has been designed solely for ground fault protection, be sure to install a fuse-equipped switch or circuit breaker.

How to connect wiring to the terminal

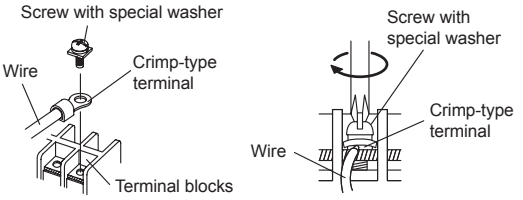
Caution when wiring cable

- When stripping off the coating of a lead wire, always use a special tool such as a wire stripper. If there is no special tool available, carefully strip the coating with a knife etc.

(1) Use crimp-type terminals with insulating sleeves as shown in the figure below to connect to the terminal block.



(2) Securely clamp the crimp-type 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) See the table below for the terminal screw tightening torques.

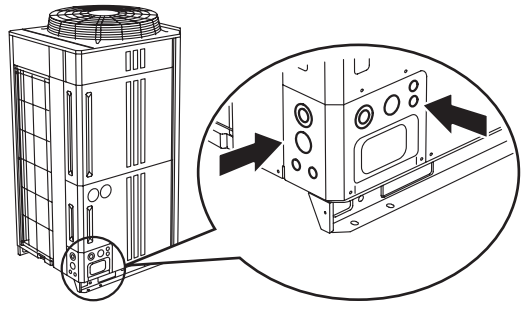
Tightening torque [N·m (kgf·cm)]	
M4 screw	1.2 to 1.8 (12 to 18)
M5 screw	2.0 to 3.0 (20 to 30)

6.2. Knockout hole

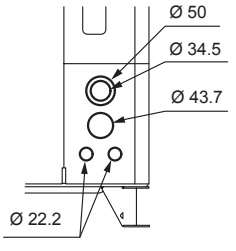
⚠ CAUTION

- Be careful not to deform or scratch the panel while opening the knockout holes.
- After opening the knockout hole, remove the burr on the edges to prevent snapping of wires.
  It is recommended to apply rust proof paint on the edges to prevent rust.

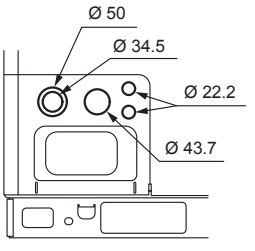
Electric wires can be connected from the front or from the left.
(Knockout holes are prepared so that wiring can be made from two different directions.)
Use the knockout holes on the front and the left separately when necessary.



< Left view >



< Front view >



(Unit : mm)

6.3. Selecting power supply cable and breaker

⚠ CAUTION

- Regulation of wire size and circuit breaker differs from each locality, please refer in accordance with local rules.

Refer to the table for the wiring and breaker specifications of each installation condition.

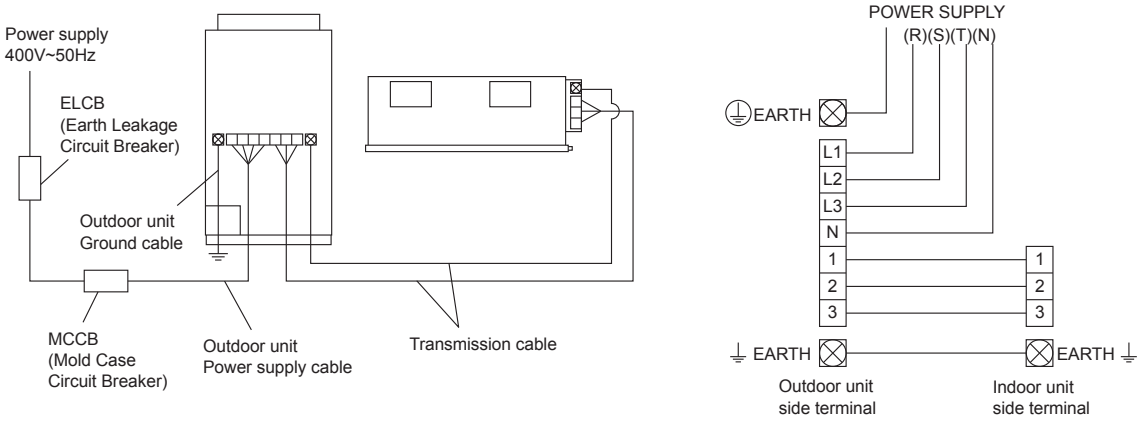
Selecting power supply cable and breaker.

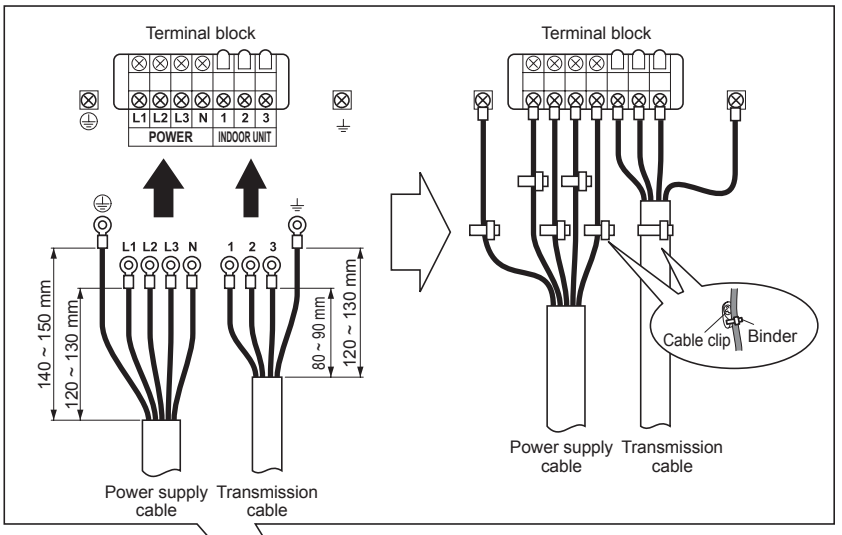
Capacity [BTU/h class]	Breaker		Outdoor unit power supply cable		Transmission cable	
	MCCB Capacity (A)	ELCB leakage current	Power supply cable (mm^2)	Ground cable (mm^2)	Transmission cable (mm^2)	Max. wiring length (m)
72.000	30	30mA 0.1sec or less	6 (MIN.) (Type 60245 IEC66)		1.5 (MIN.)* (Type 60245 IEC57)	75
90.000						

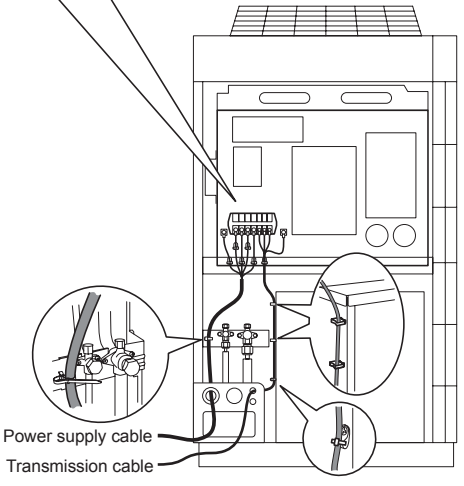
* If the transmission cable is longer than 50 m, use the bigger conductor size.

- These values are recommended data.
- Max. wiring length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

Fig. In case of connected outdoor unit







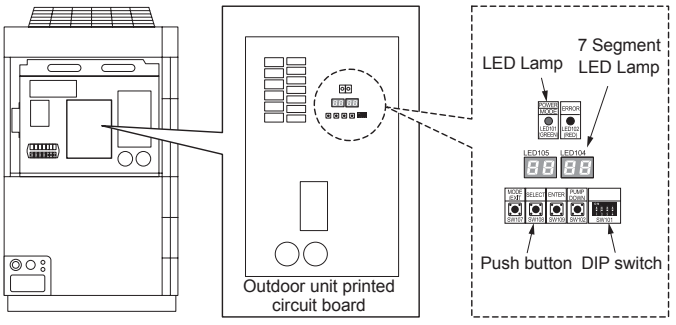
7. FIELD SETTING

⚠ CAUTION

Discharge the static electricity from your body before setting up the DIP switches.
Never touch the terminals or the patterns on the parts that are mounted on the board.

7.1. Field setting switches

Remove the front panel of the outdoor unit and the cover of the electrical component box to access the print circuit board of the outdoor unit.
Print circuit board switches for various settings and LED displays are shown in the figure.



7.2. Function settings

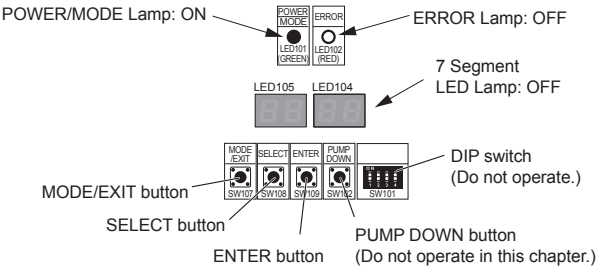
Various functions can be set. Follow the setting method described in 7.2.1. to set as per the requirement.
Perform these settings after the indoor unit stops.

Table. Settings List

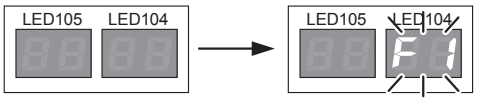
No	Setting Item		7 segment LED				Factory setting	Content
			First 2 digits		Last 2 digits			
0	Forbidden		0	0	0	0	O	
13	Forbidden		1	3	0	0	O	
14	Forbidden		1	4	0	0	O	
30	Energy-saving level	Level 1 (stop operation)	3	0	0	0		Settings for limited capacity operation or stopping the compressor can be done. Settings will enable when input signal has been entered the external input terminal “CN131”. (For details, refer to 7.2.2. Energy-saving level setting.)
		Level 2 (Limited at 50%)			0	1		
		Level 3 (Limited at 75%)			0	2	O	
		Level 4 (100%)			0	3		
41	Low noise operation setting	Normal operation	4	1	0	0	O	Noise of the outdoor unit can be kept low. Set Low noise operation, which will enable when the input signal has been entered the external input terminal “CN131”. (For details, refer to 7.2.3. Low noise operation setting.)
		Low noise operation			0	1		
42	Low noise operation level setting	Level 1	4	2	0	0	O	This item allows you to configure the noise level when the unit operates under low noise operation level.
		Level 2			0	1		
		Forbidden			0	2		

7.2.1. Setting method

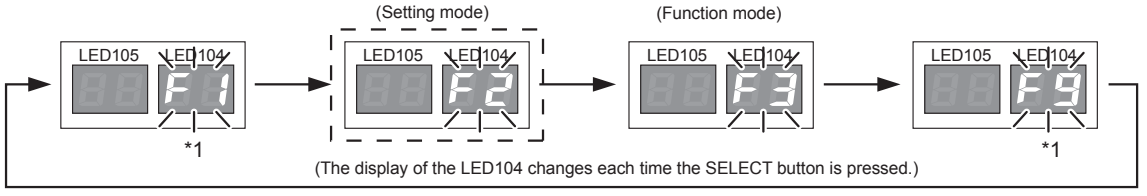
(1) Turn on the power of the outdoor unit and enter standby mode.
POWER/MODE lamp lights up. (ERROR Lamp is off.)



(2) Press the MODE/EXIT button (SW107) once.

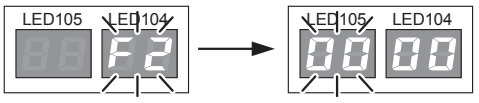


(3) Press the SELECT button (SW108), and display “F2” on the LED104.

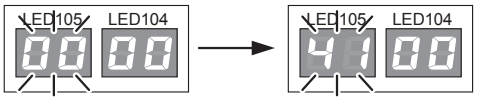


*1: The “F1” and “F9” modes are used for maintenance, so do not set them in regular operation.

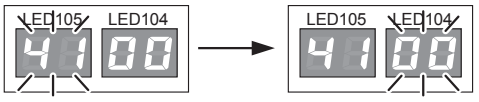
(4) When “F2” appears on the LED104, press the ENTER button (SW109).



(5) Referring to the Settings List shown below, press the SELECT button (SW108) and display the code number of the mode you want to set on the LED105.
Ex.) To select the Low noise operation setting.

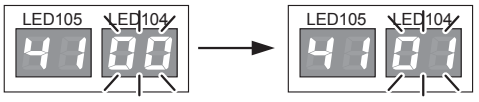


Next, press the ENTER button (SW109), and confirm the selection of the mode you want to set.

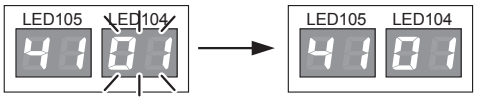


A flashing display on the LED105 changes to an illuminated display, and an illuminated display on the LED104 changes to flashing display.

(6) Again, referring to the Settings List shown below, press the SELECT button (SW108), and display the code number of the function you want to set on the LED104.
Ex.) To select the Low noise operation setting.

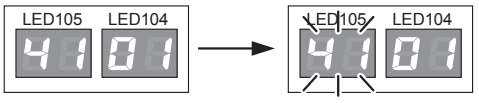


Next, press the ENTER button (SW109), and confirm the selection of the mode you want to set.



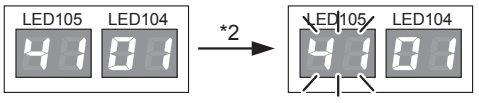
A flashing display on the LED104 changes to an illuminated display. Settings are complete with the procedures described above.

(7) To set another function, press the ENTER button (SW109) in the setting completed status shown in step (5) above.



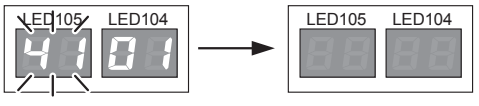
Repeat steps (5) and (6) above to set other functions.
When all settings are complete, perform the operation described in step (8) above to exit.

(8) To exit FUNCTION SETTING, press the ENTER button (SW109) in the setting completed status shown in step (6) above.



*2: 5 seconds after, even if ENTER button (SW109) is not pressed, LED105 changes to a flashing display automatically.

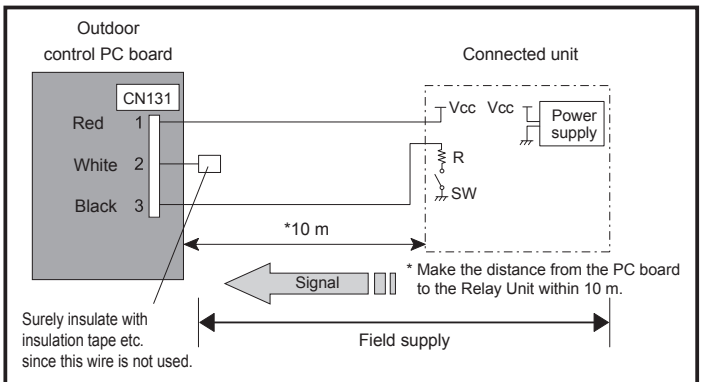
Then, press the MODE/EXIT button (SW107) to exit FUNCTION SETTING MODE.



7.2.2. Energy- saving level setting (Optional parts and wiring are required.)

This operation saves the capacity and reduces the power consumption.
Energy-saving level can be set by adding the contact input of commercially available ON-OFF change-over switch to CN131 connector (external contact input sold separately) located on the control board of outdoor unit.

Installation example



Power supply
- Voltage (Chart sign = Vcc) : DC5V to 24V
- The current capacity: About 100mA

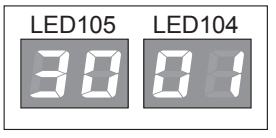
Switch (Chart sign = SW)
- Toggle switch or Rocker switch, etc : Switch which maintains the states.
- Prepare switches which are enough capable for DC 10mA current or more.

Resistance (Chart sign = R)
- Adjust the resistance for current to about DC 10mA

(Example)
- In case of Vcc = DC 5V : Rated resistance value 470Ω 1/4W
- In case of Vcc = DC 12V : Rated resistance value 1kΩ 1/4W
- In case of Vcc = DC 24V : Rated resistance value 2.2kΩ 1/4W

Setting Method
- Perform the following settings according to the function setting method described in previous section.
  Set “F2” with “1: FUNCTION SETTING”.
  Set “2: Set the first two digits of setting item” to “30”.
  Set “3: Set the last two digits of setting item” to “00 (Level 1)” - “03 (Level 4)”.
  * Factory default setting is “02 (Level 3)”.

Example) For setting energy-saving level to 50% (Level 2).

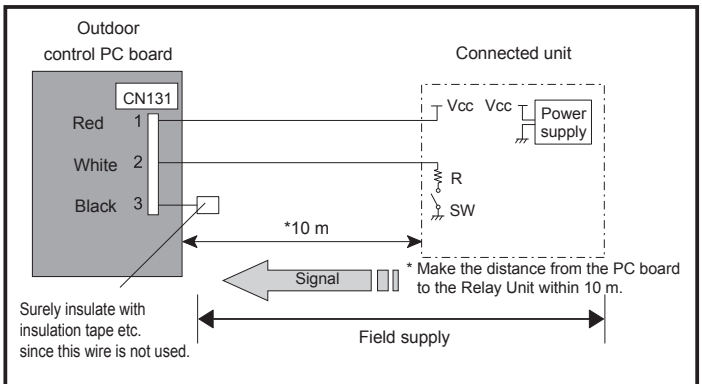


7.2.3. Low noise operation setting

7.2.3.1. Operation setting (Optional parts and wiring are required.)

Outdoor unit is operated in such a way that noise level is reduced below normal level. Low noise operation level is possible by adding the contact input of commercially available timer, or ON-OFF change-over switch to CN131 connector (external contact input sold separately) located on the control board of outdoor unit.

Installation example



Power supply
- Voltage (Chart sign = Vcc) : DC5V to 24V
- The current capacity: About 100mA

Switch (Chart sign = SW)
- Toggle switch or Rocker switch, etc : Switch which maintains the states.
- Prepare switches which are enough capable for DC 10mA current or more.

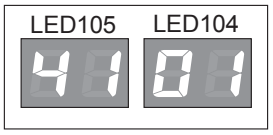
Resistance (Chart sign = R)
- Adjust the resistance for current to about DC 10mA

(Example)
- In case of Vcc = DC 5V : Rated resistance value 470Ω 1/4W
- In case of Vcc = DC 12V : Rated resistance value 1kΩ 1/4W
- In case of Vcc = DC 24V : Rated resistance value 2.2kΩ 1/4W

Setting Method

- Perform the following settings according to the function setting method described in previous section.
  Set “F2” in “1: FUNCTION SETTING”.
  Set “2: Set the first two digits of setting item” to “41”.
  Set “3: Set the last two digits of setting item” to “00 (Normal Operation)” or “01 (Low Noise Operation)”.
  * Factory default setting is “00 (Normal Operation)”.

Example) For setting low noise operation.



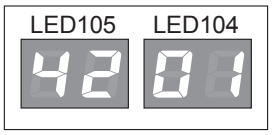
7.2.3.2. Operation level setting

Noise level of low noise operation can be set.

Setting Method

- Perform the following settings according to the function setting method described in previous section.
  Set “F2” in “1: FUNCTION SETTING”.
  Set “2: Set the first two digits of setting item” to “42”.
  Set “3: Set the last two digits of setting item” to “00 (Level 1)” - “01 (Level 2)”.
  * Factory default setting is “00 (Level 1)”.

Example) For setting operation noise level to Level 2.



8. PIPE INSTALLATION II

Fig. A Connection system

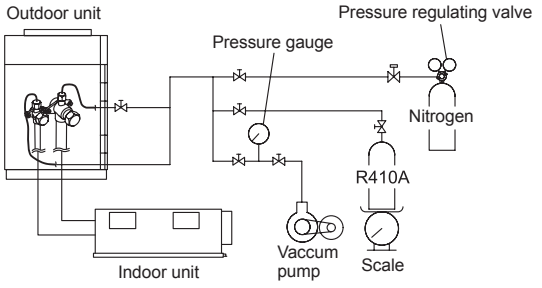


Fig. B

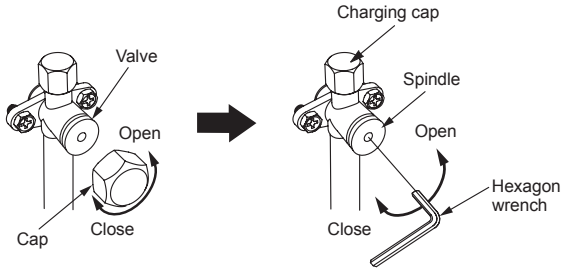


Table. A

Pipe	Spindle	Cap	Charging cap
Liquid valve	9.0 to 12.0 N·m (90 to 120 kgf·cm)	20.0 to 24.0 N·m (200 to 240 kgf·cm)	12.5 to 16.0 N·m (125 to 160 kgf·cm)
Gas valve	27.0 to 33.0 N·m (270 to 330 kgf·cm)	25.0 to 30.0 N·m (250 to 300 kgf·cm)	12.5 to 16.0 N·m (125 to 160 kgf·cm)

8.1. Sealing test

⚠ CAUTION

- Use only nitrogen gas.
  Never use refrigerant gas, oxygen, inflammable gas, or poisonous gas to pressurize the system.
  (If oxygen is used, there is the danger of an explosion.)
- Do not apply shock during sealing test.
  It can rupture the pipes and cause serious injury.
- Do not turn on the power unless all operations are complete.
- Do not block the walls and the ceiling until the sealing test and the charging of the refrigerant gas have been completed.

After connecting the pipes, perform an sealing test.
Recheck that the spindle of the 3-way valve are closed before performing a sealing test. (Fig. B)
Pour nitrogen gas through both the liquid pipe and the gas pipe.
Pressurize nitrogen gas to 4.2 MPa to perform the sealing test.

Check all flare connection areas and welded areas.
Then, check that the pressure has not decreased.
Compare the pressures after pressurizing and letting it stand for 24 hours, and check that the pressure has not decreased.

* When the outdoor temperature changes 5 °C, the test pressure changes 0.05 MPa. If the pressure has dropped, the pipe joints may be leaking.

If a leakage is found, immediately repair it and perform a sealing test again.
* Decrease the pressure of nitrogen gas before blazing
After completing the sealing test, release the nitrogen gas from both valves.
Release the nitrogen gas slowly.

8.2. Vaccum process

⚠ CAUTION

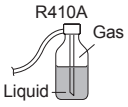
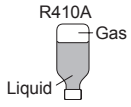
- Do not turn on the power unless all operations are complete.
- If the system is not evacuated sufficiently, its performance will drop.
- Be sure to evacuate the refrigerant system using a vacuum pump.
- The refrigerant pressure may sometimes not rise when a closed valve is opened after the system is evacuated using a vacuum pump. This is caused by the closure of the refrigerant system of the outdoor unit by the electronic expansion valve. This will not affect the operation of the unit.
- Use a clean gauge manifold and charging hose that were designed specifically for use with R410A. Using the same vacuum equipment for different refrigerants may damage the vacuum pump or the unit.
- Do not purge the air with refrigerants, but use a vacuum pump to evacuate the system.
- If moisture might enter the piping, follow below.
  (I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)
  - After operating the vacuum pump for two hours, pressurize to 0.05 MPa (i.e., vacuum breakdown) with nitrogen gas, then depressurize down to -100.7kPa (-755mmHg) for an hour using the vacuum pump (vacuum process).
  - If the pressure does not reach -100.7kPa (-755mmHg) even after depressurizing for at least two hours, repeat the vacuum breakdown - vacuum process.

  After vacuum process, maintain the vacuum for an hour and make sure the pressure does not rise by monitoring with a vacuum gauge.

Evacuation procedure

1) Remove the caps of the gas pipe and liquid pipe and check that the valves are closed.
2) Remove the charging cap.
3) Connect a vacuum pump and a pressure gauge to a charging hose and connect it to the charging port.
4) Activate the vacuum pump and vacuum the indoor unit and connection piping until the pressure gauge becomes -100.7kPa (-755mmHg).
   Evacuate from both the gas pipe and the liquid pipe.
5) Continue evacuating the system for 1 hour after the pressure gauge reads -100.7kPa (-755mmHg).
6) Remove the charging hose and reinstall the charging cap.

8.3. Additional charging

⚠ CAUTION
• Do not turn on the power unless all operations are complete.
• After evacuating the system, add refrigerant.
• Do not charge the system with a refrigerant other than R410A.
• Always keep to the limit on the total amount of refrigerant. Exceeding the limit on the total amount of refrigerant will lead to malfunction during charging of refrigerant.
• Do not reuse recovered refrigerant.
• Use an electronic scale to measure the charging amount of refrigerant. Adding more refrigerant than the specified amount will cause a malfunction.
• Add refrigerant by charging the system with the refrigerant in the liquid state.
• 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 side whose composition is stable. Adding refrigerant through the gas pipe will cause a malfunction.
• Check if the steel cylinder has a siphon installed or not before filling. (There is an indication "with siphon for filling liquid" on the steel cylinder.) **Filling method for cylinder with siphon**    Set the cylinder vertical and fill with the liquid. (Liquid can be filled without turning bottom up with the siphon inside.) **Filling method for other cylinders**    Turn bottom up and fill with liquid. (Be careful to avoid turning over the cylinder.)
• Be sure to use the special tools for R410A for pressure resistance and to avoid mixing of impure substances.
• If the units are further apart than the maximum pipe length, correct operation cannot be guaranteed.
• Make sure to back closing valve after refrigerant charging. Otherwise, the compressor may fail.
• Minimize refrigerant release to the air. Excessive release is prohibited under the Freon Collection and Destruction Law.

8.3.1. If additional refrigerant is required

- When the piping is longer than chargeless piping length, additional charging is necessary.

1) Remove the charging cap from the liquid pipe.
2) Attach a charging hose to the refrigerant cylinder, and connect it to the charging port.
3) Add refrigerant by calculating the additional refrigerant volume in accordance with the table below.
4) Remove the charging hose and install the charging cap.
5) Remove the body caps (gas pipe, and liquid pipe), and open the valves.
6) Close the body caps.

* Tighten the body caps and charging caps to the torque values specified in the Table A.
To open and close the valves,
Use an M5 hexagon wrench for liquid pipes.
Use an M10 hexagon wrench for gas pipes.

Piping length (L1) *Chargeless [m]
20

Additional charging amount

L1* > Chargeless piping length

Refrigerant pipe size [mm (in.)]		Piping length							
Standard		~20 m	30 m	40 m	50 m	60 m	70 m	75 m	g/m
Liquid	12.70 (1/2)	None	1,100 g	2,200 g	3,300 g	4,400 g	5,500 g	6,050 g	110 g/m
Gas	25.40 (1)								
Size down		~20 m	30 m	40 m	50 m	60 m	70 m	75 m	g/m
Liquid	12.70 (1/2)	None	1,100 g	2,200 g	3,300 g	4,400 g	5,500 g	6,050 g	110 g/m
Gas	22.22 (7/8)								
Size up		~20 m	30 m	40 m	50 m				g/m
Liquid	12.70 (1/2)	None	1,100 g	2,200 g	3,300 g				110 g/m
Gas	28.58 (9/8)								

Refer to "4.3.".

8.4. Installing insulation

- Install insulation material after conducting the "8.1. Sealing Test".
- To prevent condensation and water droplets, install insulation material on the refrigerant pipe.
- Refer to the table to determine the thickness of the insulation material.
- If the outdoor unit is installed at a level that is higher than the indoor unit, the water that has condensed in the 3-way valve of the outdoor unit could travel to the indoor unit.
  Therefore, use putty in the space between the pipe and the insulation to prevent the entry of water.

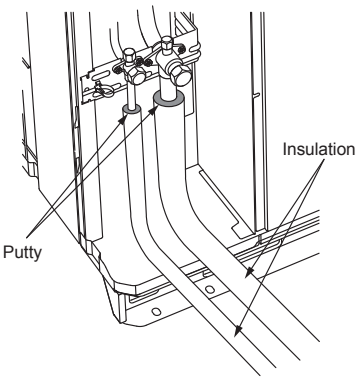


Table. Selection of insulation
(for using an insulation material with equal heat transmission rate or below 0.040W/(m·k))

		Insulation material			
		Minimum thickness (mm)			
Relative humidity		≦ 70%	≦ 75%	≦ 80%	≦ 85%
Pipe diameter (mm)	12.70	10	12	15	19
	22.22	11	13	17	22
	25.40	11	13	17	22
	28.58	11	14	18	23

* When an ambient temperature and relative humidity exceed 32 °C, please strengthen heat insulation of refrigerant pipe.

9. TEST RUN

9.1. Pre-test run check items

Before the test operation, refer to the figure and check the following items.

☐ Is the outdoor unit securely installed?
☐ Have you performed gas leakage inspection? (Connection joints of various pipes (flange connection, brazing))
☐ Is the heat insulation done completely? (Gas pipe, liquid pipe, drain hose extension on indoor unit side, etc.)
☐ Is the water discharging from drain without any problems?
☐ Are the cables connected correctly?
☐ Are the cables as per specifications?
☐ Is the earth wire connected accurately?
☐ Are there any obstacles blocking the suction gate, and outlet of the indoor/outdoor units?
☐ Have you filled the specified amount of refrigerant?
☐ Are the stop valves of gas pipe and liquid pipe fully open?
☐ Has the power been supplied to crankcase heater for more than 6 hours?

After checking that the above items are all in order, refer to "9.2. Test operation method" to test operation the unit. If there are problems, adjust immediately and recheck.

9.2. Test operation method

Be sure to configure test run settings only when the outdoor unit has stopped operating.

- Depending on the communication status between the indoor and outdoor units, it may take several minutes for the system to start operating after settings for the test run are complete.
- After the test run settings are complete, the outdoor units and the connected indoor units will start operating. Room temperature control will not activate during test operation (continuous operation).
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.

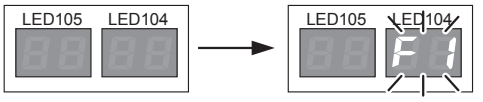
Test operation setting method (It can be performed in the following two ways)

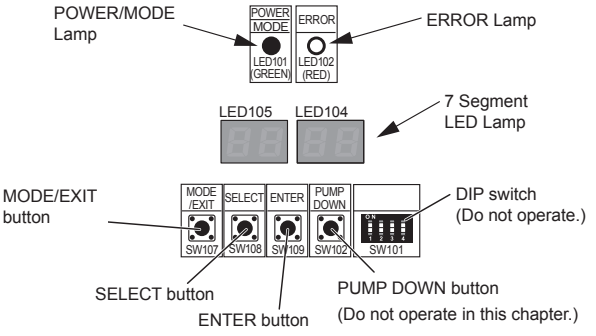
- Set with test operation setting (refer to installation instructions manual of indoor unit for further details) available in the remote controller.
- "Cooling Operation" and "Heating Operation" can be set using MODE/EXIT button, SELECT button and ENTER button available on the board of outdoor unit. *(*Make sure to perform the first test operation with cooling operation.) Set as per the procedure given below.

9.2.1. Setting method on outdoor unit board

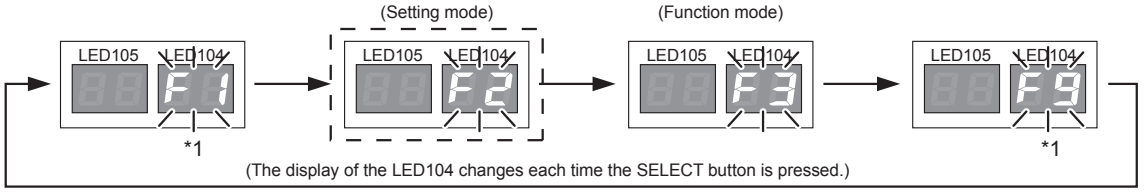
(1) Turn on the power of the outdoor unit and enter standby mode. POWER/MODE Lamp lights up.
(ERROR lamp is off.)

(2) Press the MODE/EXIT button (SW107) once.



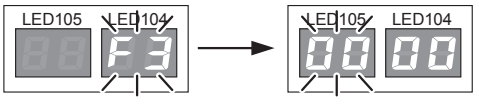


(3) Press the SELECT button (SW108), and display "F3" on the LED104.



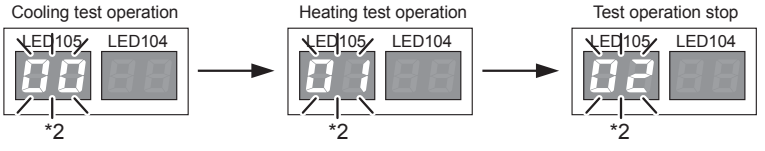
*1: The "F1" and "F9" modes are used for maintenance, so do not set them in regular operation.

(4) When "F3" appears on the LED104, press the ENTER button (SW109).



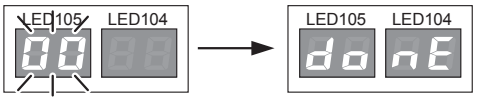
A flashing display appears on the LED105, and the flashing display of "F3" on the LED104 go out.

(5) Press the SELECT button (SW108), and display the code number of the mode you want to get on the LED105.



*2: Numbers other than 00-02 are used during maintenance. Please do not use during normal operation.

(6) After confirming the operation mode you want to set, press ENTER button (SW109) for more than 3 seconds.
Ex.) To select the cooling test operation setting.

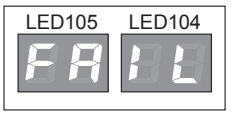


Once "done" has displayed, operation will start after a few minutes. With this, setting is complete.
After operation has started, verify according to "9.3. Checklist" provided below.
If you want to stop during test operation, set to test operation stop described in (5) above and execute.

(7) After the completion of test operation, turn off the power, attach electrical components cover and install front panel of outdoor unit.

Note

- Test run will finish after about 60 minutes automatically.
- Test run may be stopped before operating for 60 minutes if an error occurs after a starting test run.
- Switching between heating and cooling is not possible during test operation. If you want to change the operation mode, stop the test operation, and change the operation mode once again with mode selection of step (5).
  If switching between heating and cooling is done during test operation, display as per the right figure will appear and settings will not change.
  * After 5 seconds since the display of right figure, you can return to screen of step (5) by holding the "Enter" switch.



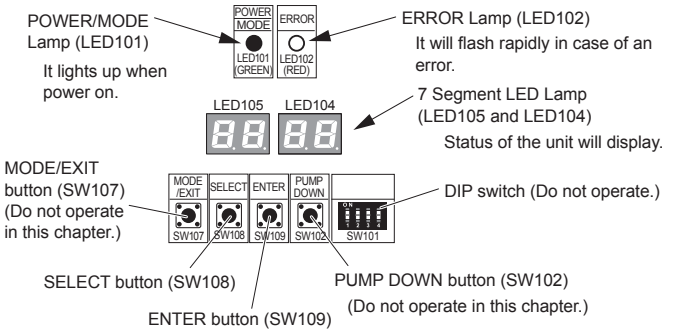
9.3. Checklist

Check items during test operation.

☐ Is the outdoor unit making any abnormal noise or vibrating significantly?
☐ Is the cold air or hot air blowing from indoor unit according to the operation mode?
☐ Check that “Err” is not displayed in 7 segment LED lamp. If, it has displayed, check the error content as per 10.2. described later.
☐ Operate the unit according to the operating manual provided with the indoor unit, and check that it is operating normally.

10. LED Display

You can determine the operating status by the lighting up and flashing of the LED lamp.



10.1. Normal operation mode

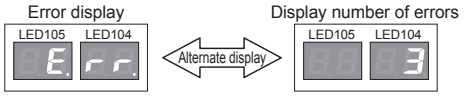
Operation status is displayed in 7 Segment LED Lamp (LED105 and LED104).

Mode	CODE				DESCRIPTION
Operation	C	L			Cooling
	H	t			Heating
			d	F	During defrosting operation
			P	C	During power saving operation
			L	n	During low noise operation
					Stopped

10.2. Error display mode

10.2.1. Method for ascertaining the errors

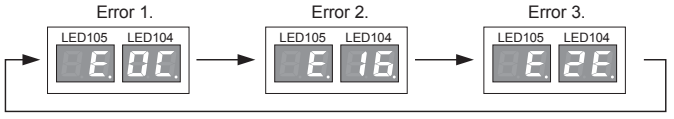
(1) When an error has occurred, ERROR LED (LED102) will flash rapidly, and as shown in the figure below, 7 Segment LED will alternately display “Err” and number of errors.



(2) Error contents will display if ENTER button (SW109) is pressed in the state of (1). For error contents, refer to the list of error code described later.

Ex.) “E.0C” is displayed.
Discharge temperature thermistor error.

(3) If SELECT button (SW108) is pressed in the state of (2), contents of all the errors will display.



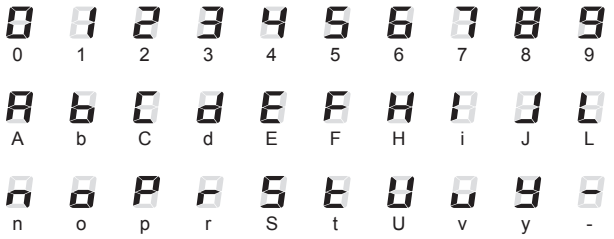
(4) If ENTER button (SW109) is pressed, it will return to state of (1).
If no action is taken, it will return to the state of (1) after 60 seconds.

Note
- In case the errors are resolved, it will return to “Normal operation mode” described in 10.1. earlier.

10.2.2. Error code check table

CODE	DESCRIPTION
E. 06.	Outdoor heat exchanger temperature sensor (outlet) error
E. 0A.	Outdoor temperature sensor error
E. 0C.	Outdoor discharge pipe temperature sensor error
E. 0E.	Heat sink thermistor (inverter) error
E. 0F.	Discharge temperature error
E. 13.	Indoor signal error
E. 15.	Compressor temperature sensor error
E. 16.	Pressure switch error, Pressure sensor error
E. 17.	IPM protection
E. 1A.	Compressor location error
E. 1b.	Outdoor fan error
E. 24.	Excessive high pressure protection
E. 2b.	Compressor temperature error
E. 2E.	Inverter error
E. 2F.	Low pressure error
E. 98.	Pump down error
E. 99.	Indoor unit error condition

LED lamp :



11. PUMP DOWN

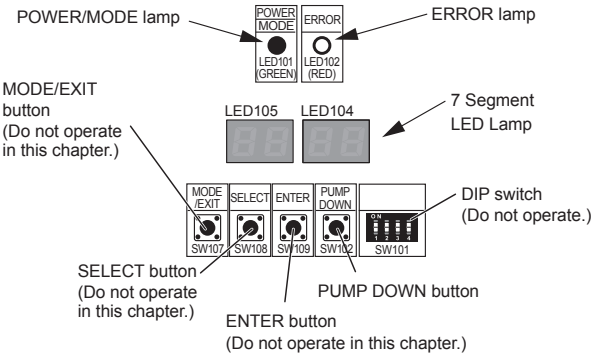
⚠ WARNING

- Never touch electrical components such as the terminal blocks or reactor except the switch on the display board. It may cause a serious accident such as electric shock.

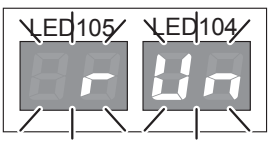
⚠ CAUTION

- Perform the pump down operation before disconnecting any refrigerant pipe or electric cable.
- Collect refrigerant from the service port if pump down cannot be performed.

11.1. PUMP DOWN procedure

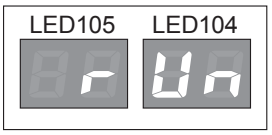


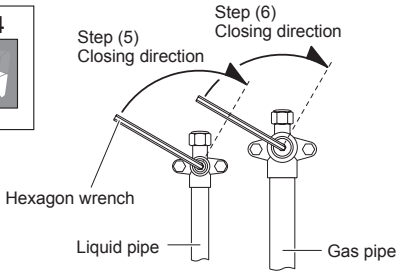
(1) Confirm that the power is off, and then open the service panel.
(2) Turn the power on.
(3) Check that stop valves of liquid side and gas side are fully and properly open.
(4) Hold PUMP DOWN button (SW102) for over 3 seconds. 7 Segment LED of board on outdoor unit will flash, and compressor will start the operation.



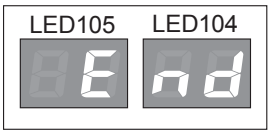
- Fan of indoor unit will start the operation automatically.
- Compressor and outdoor fan will start the operation automatically.
- It you want to stop pump down operation once it has started, hold PUMP DOWN button (SW102) again for over 3 seconds.

(5) LED display of outdoor unit board will light-up with the display of “rUn” after around 5 minutes of the start of compressor operation. At this time, firmly close the three-way valve of liquid side immediately.
- If the valve on liquid side is not closed at this stage, pump down will not be possible.



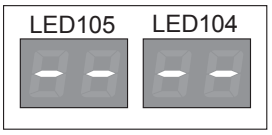


(6) LED display of outdoor unit board will change as shown in the right figure after around 2-7 minutes of the start of compress or operation. At this time, firmly close the three-way valve of gas side immediately.



- If the valve on gas side is not closed at this stage, refrigerant may runoff through pipes after the compressor is stopped.

(7) After “End” displays, compressor and outdoor fan will automatically stop after around 1 minute.

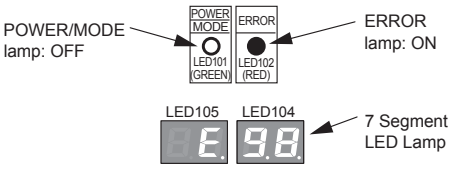


- If pump down operation has ended normally (LED display figure above), outdoor unit will remain stopped until the power supply is disconnected.

(8) Turn the power off. PUMP DOWN is completed.

Note

- For performing pump down once again after pump down task has failed and compressor has automatically stopped; open the close three-way valve (both liquid and gas side), disconnect the power supply at once and restore it after 2-3 minutes, and then perform pump down operation.
- For restarting the operation after the completion of pump down operation; open the close three-way valve (both liquid and gas side), disconnect the power supply at once and restore it after 2-3 minutes, and make sure to perform test operation in “Cooling”.
- If an error occurs during pump down operation; as shown in the figure below, “E.98.” (pump down error) will appear.
  In such case, recover the refrigerant from service port.



12. INFORMATION

Main contents of label

Item	Detail
1. Model name	Model name
2. Serial number	Serial number
3. Electric characteristics	Phase, rated voltage, and frequency
4. Capacity	Cooling/heating capacity
5. Current	Electric current during cooling/heating operation
6. Input power	Input during cooling/heating operation
7. Max. Current	Maximum electric current
8. Noise level	Noise level
9. Refrigerant	Refrigerant type and initial charging amount
10. Origin	Origin country
11. Manufacturer	Manufacturer FUJITSU GENERAL LIMITED Address: 1116, Suenaga, Takatsu-ku, Kawasaki 213-8502, Japan