# (8) Wall mounted type (FDK)

This manual is for the installation of an indoor unit. For electrical wiring work (Indoor), refer to page 238. For wired remote control installation, refer to page 242. For wireless kit installation refer to page 358. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to the installation manual attached to an outdoor unit. For motion sensor kit installation.

# SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, [AWARNING] and [ACAUTION] <u>AWARNING</u>: Wrong installation would cause serious consequences such as injuries or death ACAUTION: Wrong installation might cause serious consequences depending on circumstances Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown as follows:

Never do it under any circumstances.

 After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit. Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

# **△** WARNING

Installation should be performed by the specialist.

If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit

 Install the system correctly according to these installation manuals. Improper installation may cause explosion, injury, water leakage, electric shock, and fire

• When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).

If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious accidents

ecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit.

Ventilate the working area well in case the refrigerant leaks during installation.

If the refrigerant contacts the fire, toxic gas is produced In case of R32, the refrigerant could be ignited because of its flammability

Install the unit in a location that can hold heavy weight.

Use the genuine accessories and the specified parts for installation.

Improper installation may cause the unit to fall leading to accidents

• Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes Improper installation may cause the unit to fall leading to accidents

 Do not mix air in to the cooling cycle on installation or removal of the air conditioner. If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injuri

 Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit. Power source with insufficient capacity and improper work can cause electric shock and fire.

• Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal. ctions or hold could result in abnormal heat generation or fire

Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services

Improper fitting may cause abnormal heat and fire.

 Check for refrigerant gas leakage after installation is completed. If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced

Use the specified pipe, flare nut, and tools for R32 or R410A.

Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle • Tighten the flare nut according to the specified method by with torque wrench.

If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period • Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can occur.

Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak.

 Connect the pipes for refrigeration circuit securely in installation work before compressor is operated. If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system

 Stop the compressor before removing the pipe after shutting the service valve on pump down work. If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.

• Only use prescribed option parts. The installation must be carried out by the qualified installer.

If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire Do not repair by yourself. And consult with the dealer about repair.

Improper repair may cause water leakage, electric shock or fire Consult the dealer or a specialist about removal of the air-conditioner.

Improper installation may cause water leakage, electric shock or fire.  $\bullet$  Turn off the power source during servicing or inspection work.

If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan Do not run the unit when the panel or protection guard are taken off. Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get

Shut off the power before electrical wiring work.

burned, or electric shock.

It could cause electric shock, unit failure and improper running

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# **⚠ CAUTION**

Perform earth wiring surely.

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Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure, electric shock and fire due to a short circuit.

Earth leakage breaker must be installed.

If the gas leaks and gathers around the unit, it could cause fire.

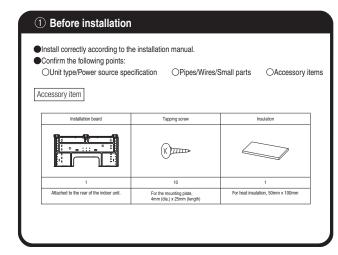
Do not use the indoor unit at the place where water splashes such as laundry.

• Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use.

ncomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables

keep the surroundings clean.

### 0 If the earth leakage breaker is not installed, it can cause fire and electric shocks Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all ø poles under over current. sing the incorrect one could cause the system failure and fire. Do not use any materials other than a fuse of correct capacity where a fuse should be used. Connecting the circuit by wire or copper wire could cause unit failure and fire. Do not install the indoor unit near the location where there is possibility of flammable gas leakages Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, or volatile flammable substances are handled. tt could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire Secure a space for installation, inspection and maintenance specified in the manual. a Insufficient space can result in accident such as personal injury due to falling from the installation place Indoor unit is not waterproof. It could cause electric shock and fire. Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art. It could cause the damage of the items. Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air conditioner and cause a malfunction and breakdown. Or the air conditioner might influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause jamming. Do not install the remote control at the direct sunlight. It could cause breakdown or deformation of the remote contro Do not install the indoor unit at the place listed below Places where flammable gas could leak. Places where flammable gas could leak. Places where carbon fiber, metal powder or any powder is floated. Place where the substances which affect the air conditioner are generated such as sufflet gas, chindreg as, acid, alaid or ammonic atmospheres. Places exposed to oil mist or steam directly. Places where cosmetics or special sprays are frequently used. Highly salted area such as beach. Heavy snow area Places where the system is affected by smoke from a chimney. On vehicles and ships Places where machinery which generates high harmonics is used Altitude over 1000m Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit according to the installation manual for each model because each indoor unit has each limitation) Locations with any obstacles which can prevent inlet and Do not install the motion sensor mounting panel at following places outlet air of the unit It could cause detection error, incapacity of detection, or Locations where vibration can be amplified due to characteristic denradation Locations where vibration can be amplined due to insufficient strength of structure. Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the Place where vibration is applied to it for a long period of time. Place where static electricity or electromagnetic wave generates Place where it is exposed to high temperature or humidity for a infrared specification unit) long period of time. Inflated specification unity Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m) Locations where drainage cannot run off safely. Dusty place or where the lens face could be fouled or damaged. It can affect performance or function and etc Do not put any valuables which will break down by getting wet under the air-conditioner. ion could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's belongings. could cause the unit falling down and injury. Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit. If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit Install the drain pipe to drain the water surely according to the installation manual 0 Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit. Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) to ser's health and safety. Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can ccur, which can cause serious accidents. For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, and not to make air-bleeding. Check if the drainage is correctly done during commissioning and ensure the space for inspection and maintenance Ensure the insulation on the pipes for refrigeration circuit so as not to condense water. 0 Do not install the outdoor unit where is likely to be a nest for insects and small animals sects and small animals could come into the electronic components and cause breakdown and fire. Instruct the user to Pay extra attention, carrying the unit by hand. Carry the unit with 2 people if it is heavier than 20kg. Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury by the aluminum fin. Make sure to dispose of the packaging material. eaving the materials may cause injury as metals like nail and woods are used in the package. Do not operate the system without the air filter. It may cause the breakdown of the system due to clogging of the heat exchanger. Do not touch any button with wet hands It could cause electric shock. Do not touch the refrigerant piping with bare hands when in operation. The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn or froz Do not clean up the air-conditioner with water. It could cause electric shock. Do not turn off the power source immediately after stopping the operation. Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdov Do not control the operation with the circuit breaker It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.



# 2 Selection of installation location for the indoor unit

- $\ensuremath{\textcircled{\textcircled{$1$}}}$  Select the suitable areas to install the unit under approval of the user.
  - Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user
    to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on
    the ceiling.
  - In case of the panel having the motion sensor, the installation height must be no higher than
     4 m. It could reduce the sensitivity of motion sensor, disabling the detection.
  - Areas where there is enough space to install and service.
  - Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
  - Areas where there is no obstruction of airflow on both air return grille and air supply port.
  - Areas where fire alarm will not be accidentally activated by the air-conditioner.
  - Areas where the supply air does not short-circuit.
  - · Areas where it is not influenced by draft air.
  - Areas not exposed to direct sunlight.
  - Areas where dew point is lower than around 23°C and relative humidity is lower than 80%.
     This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition (27°C / 78%RH) and confirmed there is no problem. However, there is some risk of condensation drop if the air-conditioner is operated under the severer condition than mentioned above.

If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.

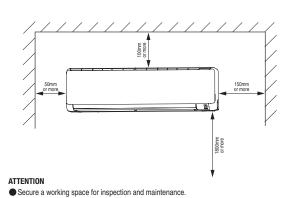
- Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
   Areas where any items which will be damaged by getting wet are not placed such as food,
- table wares, server, or medical equipment under the unit.

  Areas where there is no influence by the heat which cookware generates
- Areas where there is no influence by the heat which cookware generates.
   Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- Areas where lighting device such as fluorescent light or incandescent light doesn't affect the
  operation.

(A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air-conditioner might not work properly.)

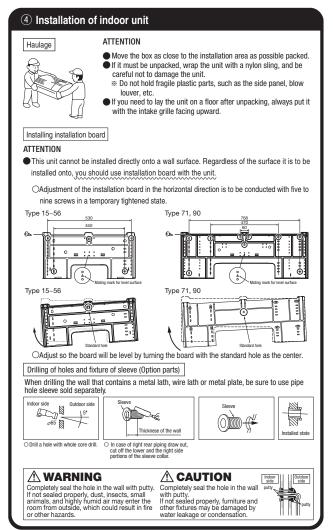
- ② Check if the place where the air-conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.
- ③ If there are 2 units of wireless type, keep them away for more than 6m to avoid malfunction due to cross communication.



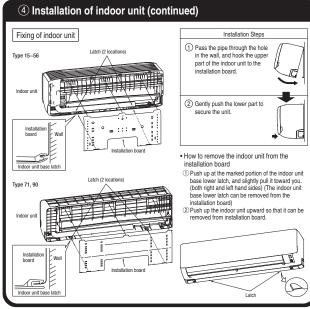


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Wall pulling hole for right rear piping



Union



# **(5)** Shaping of pipes and drain hoses Piping is possible in the rear, left, left rear, left downward Right rear Left Right downward Left do <In case of piping in the right rear direction> OShaping of pipes Tape wrapping Make sure that wires are connected securely onto the terminal block, before you wrap them with a tape after shaping the pipe. Hold the bottom of the ■Tape only the portion that goes through the wall. piping and fix direction Always tape the wiring with the piping. before stretching it and The connecting wires must be wrapped together with the pipe. shaping it. Matters of special notice when piping from left or central/rear of the unit. Right-hand-side piping Left-hand-side piping Piping in the left rear direction Piping in the right rear direction Piping in the left direction Piping in the right direction [Drain hose changing procedures] 1. Remove the drain hose 2. Remove the drain cap. 4. Connect the drain hose Insert the drain cap which was removed at procedure "2" securely using a hexagonal wrench etc. Insert the drain hose securely, making rotate. And install the screw. Note: Be careful that If it is not inserted securely, water Note: Be careful that If it is not inserted securely, water

Since this air-conditioner has been designed to collect dew drops on the rear surface to the drain pan, do not attach the power cord above the gutter.

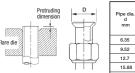
# **6** Refrigerant pipe

# Caution

- Be sure to use new pipes for the refrigerant pipes. Use the flare nut attached to the product. Regarding whether existing pipes can be reused or not, and the washing method unit, catalogue or technical data.

  1) In case of reuse: Do not use old flare nut, but use the nut attached to the unit.
- 2) In case of reuse: Flare the end of pipe replaced partially for R32 or R410A.

<u>AWARNING</u>: When flared joints are reused indoors, the flare part shall be re-fabricated. (only for R32)



		Protruding dimer	ision for flare, mm		
Pipe dia.	Min. pipe wall thickness	Rigid (CI	utch type)	Flare O.D.	Flare nut tightening torque
mm	mm	For R32 For R410A	Conventional tool	mm	N·m
6.35	0.8			8.9 - 9.1	14 - 18
9.52	0.8			12.8 - 13.2	34 - 42
12.7	0.8	0-0.5	0.7 - 1.3	16.2 - 16.6	49 - 61
15.88	1			19.3 - 19.7	68 - 82
19.05	1.2			23.6 - 24.0	100 - 120

- Use phosphorus deoxidized copper alloy seamless pipe (C1220T) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
- Do not use any refrigerant other than the designated refrigerant.

  Using other refrigerant except the designated refrigerant, may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.
- Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc
- Use special tools for R32 or R410A refrigerant.

## Work procedure

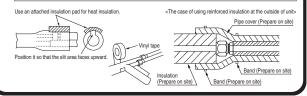
- Remove the flare nut and blind flanges on the pipe of the indoor unit.
  - Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them. (Gas may come out at this time, but it is not abnormal.)

    Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
- Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit. \*Bend radius of pipe must be 4D or larger. Once a pipe is bent, do not readjust the bending
  - Do not twist a pipe or collapse to 2/3D or smaller.

     Make sure to use flare nuts assembled on the unions. Usage of other flare nuts could cause refrigerant leakage. \*Do a flare connection as follows:
  - Make sure to hold the nut on indoor unit pipe side using double spanner method as indicated when fastening / loosening flare nuts in order to prevent unintentional
  - twisting of the copper pipe.

    When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times
  - by hand and then tighten it by spanner with the specified torque mentioned in the table above Cover the indoor unit's flare-connected joints, after they are checked for a gas leak, with an
- indoor unit heat insulating material and then wrap them with a tape with an attached insulation pad placed over the heat insulating material's slit area.
- Make sure to insulate both gas pipes and liquid pipes completely.
   Incomplete insulation may cause dew condensation or water dropping.
- Use heat-resistant (120 °C or more) insulations on the gas side pipes.
- In case of using at high humidity condition, reinforce insulation of refrigerant pipes.
   Surface of insulation may cause dew condition or water dropping, if insulations are not reinfoced.
- Refrigerant is charged in the outdoor unit.
  As for the additional refrigerant charge for the indoor unit and piping, refer to the installation
- manual attached to the outdoor unit.

Refrigerating machine oil should not be applied to the threads of union or external surface of flare. It is because even if the same tightening torque is applied, the oil is likely to decrease the slide friction force on the threads and increase, in turn, the axial component force so that it could crack the flare by the stress corrosion. Refrigerating machine oil may be applied to the internal surface of flare only.



# 7 Drain pipe

- Install the drain pipe according to the installation manual in order to drain properly.
- Imperfection in draining may cause flood indoors and wetting the household goods,etc.

  Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and
- inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance

Pipe accommodating section

# 7 Drain pipe (continued)

- A general-purpose hard PVC pipe VP16 can be connected to the drain hose tip as a part of drain piping.
- Drain piping must be given a descending grade so that drain water may flow smoothly and it must not have any trap or bump within the system.

(The pipe can be routed through the left, right, rear or bottom of the unit) Hard PVC pipes (VP16) laid indoors must be kept warm.

3 Pour water to the drain pan located under the heat exchanger, and ensure that water is discharged the outdoor.

 $\hbox{(For removal of the front panel, refer to $$ $$ Wiring-out position and wiring connection $$ in this manual $$ $$ $$$ 

 $\bigcirc$  Arrange the drain hose in a downward angle  $\bigcirc$  Avoid the following drain piping.



Higher than specified









The drain hose Wavy The gap to the ground is tip is in water. 5 cm or less.

5 cm or less. The ground is the drain nose tip is in the gutter.

O When the extended drain hose is present inside the room, always use a shield pipe (prepare on site) and ensure it is thermally insulated

Drain hose When it is exposed indoor. Extended drain hose

# **®** Wiring-out position and wiring connection

Electrical installation work must be performed according to the installation manual by an
electrical installation service provider qualified by a power provider of the country, and be
executed according to the technical standards and other regulations applicable to electrical
installation in the country.

Be sure to use an exclusive circuit.

- Use specified cord, fasten the wiring to the terminal securely, and hold the cord securely in order not to apply unexpected stress on the terminal.
- Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- Be sure to do D type earth work.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.
- ① Pull the air inlet panel at both ends of lower part and release latches, then pull up the panel until you feel resistance. (The panel stops at approx 60 70 ° open position.)
- 2 Remove the screw and the lid.
- 3 Connect wiring securely to the terminal block.
- Fix wiring the clamp securely, in order not to transmit unexpected stress on the terminal.
- ⑤ Fix the lid and the screw.
- 6 Close the air inlet panel.

(Note)

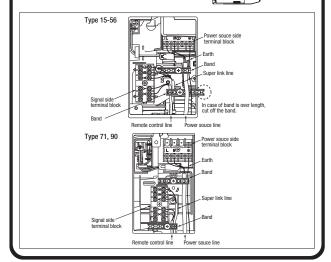
Connect wiring to the terminal block, check number on label of the terminal block

Type 15-56









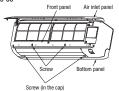
# (8) Wiring-out position and wiring connection (continued)

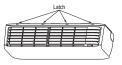
#### Address setting

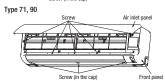
Remove the front panel of indoor unit and the control cover, it is possible to change address setting.

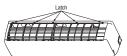
- 1. Remove the front panel
- 1) Remove the air inlet panel.
- 2 Remove the 2 screws in the cap of bottom panel. (Type 15 56 only)
- ③ Remove the 2 hooks of left and right side and then bottom panel can be removed. (Type 15 56 only)
- ④ Remove the screws (Type 15 56: 2 screws, Type 71, 90: 5 screws + 3 screws (in the cap))
- ⑤ Remove the upper latches and then front panel can be removed. (Type 15 56: 4 latches, Type 71, 90: 5 latches)
- 2. Install the front panel
- ① Cover the unit with the front panel and fix upper latches (Type 15 56: 4 latches, Type 71, 90: 5 latches)
- ② Fix the front panel with the screws (Type 15 56: 2 screws, Type 71, 90: 5 screws + 3 screws (in the can))
- ③ Install the 2 hooks of left and right side and then bottom panel can be installed. (Type 15 56 only)
- 4 Fix the bottom panel with 2 screws in the cap. (Type 15 56 only)
- (5) Install the air inlet panel.

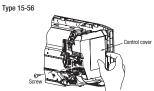
Type 15-56

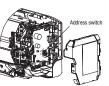


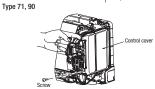


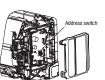












# Check list after installation

Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Power source voltage is same as mentioned in the model name plate $?$	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks airflow on air inlet and outlet?	Insufficient capacity	