

**TOSHIBA**  
*Carrier*

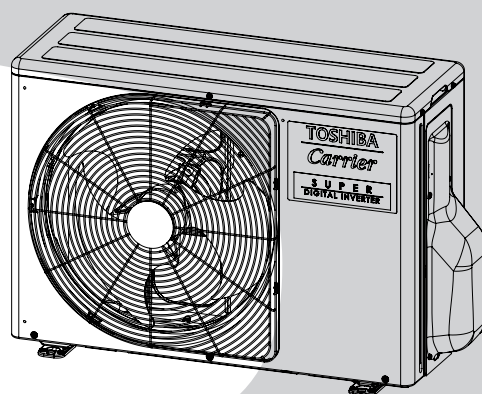
# SERVICE MANUAL AIR-CONDITIONER (SPLIT TYPE)

OUTDOOR UNIT  
<SUPER DIGITAL INVERTER>

RAV-BP121AT2P-UL  
RAV-BP181AT2P-UL

R454B

**Puron**  
ADVANCE™



November, 2024

## Adoption of R454B Refrigerant

This Air Conditioner is a new type which adopts a new refrigerant HFC (R454B) instead of the conventional in order to prevent destruction of the ozone layer.

### WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself.

The cleaning diagram for the air filter is there for the service person, and not for the customer.

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# SAFETY CAUTION

Please read carefully through these instructions that contain important information and ensure that you understand them.

## Generic Denomination: Air Conditioner

### Definition of Qualified Installer or Qualified Service Person

The air conditioner must be installed, maintained, repaired and removed by a qualified installer or qualified service person.

When any of these jobs is to be done, ask a qualified installer or qualified service person to do them for you.

A qualified installer or qualified service person is an agent who has the qualifications and knowledge described in the table below.

Agent	Qualifications and knowledge which the agent must have
Qualified installer (*1)	<ul style="list-style-type: none"><li>• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners. He or she has been trained to install, maintain, relocate and remove the air conditioners he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations.</li><li>• The qualified installer who is allowed to do the electrical work involved in installation, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li><li>• The qualified installer who is allowed to do the refrigerant handling and piping work involved in installation, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li><li>• The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li></ul>
Qualified service person (*1)	<ul style="list-style-type: none"><li>• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations.</li><li>• The qualified service person who is allowed to do the electrical work involved in installation, repair, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li><li>• The qualified service person who is allowed to do the refrigerant handling and piping work involved in installation, repair, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li><li>• The qualified service person who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.</li></ul>

## Definition of Protective Gear

When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and “safety” work clothing.




In addition to such normal protective gear, wear the protective gear described below when undertaking the special work detailed in the table below.

Failure to wear the proper protective gear is dangerous because you will be more susceptible to injury, burns, electric shocks and other injuries.

Work undertaken	Protective gear worn
All types of work	Protective gloves “Safety” working clothing
Electrical-related work	Gloves to provide protection for electricians Insulating shoes Clothing to provide protection from electric shock
Work done at heights (1'7" (50 cm) or more)	Helmets for use in industry
Transportation of heavy objects	Shoes with additional protective toe cap
Repair of outdoor unit	Gloves to provide protection for electricians




The important contents concerned to the safety are described on the product itself and on this Service Manual. Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications/Illustrated marks), and keep them.

### [Explanation of indications]

Indication	Explanation
 <b>DANGER</b>	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.
 <b>WARNING</b>	Indicates possibilities assumed that a danger causing a death or serious injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.
 <b>CAUTION</b>	Indicates contents assumed that an injury or property damage (*) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.

\* Property damage : Enlarged damage concerned to property, furniture, and domestic animal/pet

### [Explanation of illustrated marks]

Mark	Explanation
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	Indicates cautions (Including danger/warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.







# Warning Indications on the Air Conditioner Unit




## [Confirmation of warning label on the main unit]





Confirm that labels are indicated on the specified positions

If removing the label during parts replace, stick it as the original.

## MEANINGS OF SYMBOLS DISPLAYED ON THE UNIT

	<p><b>WARNING</b> <b>(Risk of fire)</b></p> <p>This mark is for R454B refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R454B, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.</p>
	<p>Read the OWNER'S MANUAL carefully before operation.</p>
	<p>Service personnel are required to carefully read the OWNER'S MANUAL and INSTALLATION MANUAL before operation.</p>
	<p>Further information is available in the OWNER'S MANUAL, INSTALLATION MANUAL, and the like.</p>






Warning indication	Description
<div data-bbox="191 1106 737 1363">  <div> <p><b>WARNING</b></p> <p><b>ELECTRICAL SHOCK HAZARD</b></p> <p>Disconnect all remote electric power supplies before servicing.</p> </div> </div>	<p><b>WARNING</b></p> <p><b>ELECTRICAL SHOCK HAZARD</b></p> <p>Disconnect all remote electric power supplies before servicing.</p>
<div data-bbox="191 1417 737 1673">  <div> <p><b>WARNING</b></p> <p>Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.</p> </div> </div>	<p><b>WARNING</b></p> <p>Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.</p>
<div data-bbox="191 1728 737 1984">  <div> <p><b>CAUTION</b></p> <p>High temperature parts. You might get burned when removing this panel.</p> </div> </div>	<p><b>CAUTION</b></p> <p>High temperature parts. You might get burned when removing this panel.</p>

<div><div><div><b>CAUTION</b></div><div>Do not touch the aluminum fins of the unit. Doing so may result in injury.</div></div></div>	<div><b>CAUTION</b>  Do not touch the aluminum fins of the unit. Doing so may result in injury.</div>
<div><div><div><b>CAUTION</b></div><div><b>BURST HAZARD</b> Open the service valves before the operation, otherwise there might be the burst.</div></div></div>	<div><b>CAUTION</b>  <b>BURST HAZARD</b> Open the service valves before the operation, otherwise there might be the burst.</div>
<div><div><div><b>WARNING</b></div><div>Capacitor connected within this disconnect or downstream upon shutdown wait 5 minutes to allow capacitors to discharge.</div></div></div>	<div><b>WARNING</b>  Open the service valves before the operation, otherwise there might be the burst.</div>
<div><div><div><b>WARNING!</b></div><div>Be sure to connect earth wire. (Grounding work)</div></div></div>	<div><b>WARNING</b>  Be sure to connect earth wire. (Grounding work) Incomplete grounding causes an electric shock.</div>


# Precaution for Safety

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.








## DANGER






 Turn off breaker.	Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breaker to the OFF position. Otherwise, electric shocks may result.
	Before opening the intake grille of the indoor unit or service panel or valve cover of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer (*1) or qualified service person (*1) is allowed to remove the intake grille of the indoor unit or service panel of the outdoor unit and do the work required.
	Before starting to repair the outdoor unit fan or fan guard, be absolutely sure to set the circuit breaker to the OFF position, and place a "Work in progress" sign on the circuit breaker before proceeding with the work.
	When cleaning the filter or other parts of the indoor unit, set the circuit breaker to OFF without fail, and place a "Work in progress" sign near the circuit breaker before proceeding with the work.
 Electric shock hazard	When you access inside of the service panel to repair electric parts, wait for about five minutes after turning off the breaker. Do not start repairing immediately. Otherwise you may get electric shock by touching terminals of high-voltage capacitors. Natural discharge of the capacitor takes about five minutes.
	Before operating the air conditioner after having completed the work, check that the electrical parts box cover of the indoor unit and service panel or valve cover of the outdoor unit are closed, and set the circuit breaker to the ON position. You may receive an electric shock etc. if the power is turned on without first conducting these checks.
 Execute discharge between terminals.	Even if the circuit breaker has been set to the OFF position before the service panel is removed and the electrical parts are repaired, you will still risk receiving an electric shock. For this reason, short-circuit the high-voltage capacitor terminals to discharge the voltage before proceeding with the repair work. For details on the short-circuiting procedure, refer to the Service Manual. You may receive an electric shock if the voltage stored in the capacitors has not been sufficiently discharged.
 Prohibition	Place a "Work in progress" sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
	When checking the electric parts, removing the cover of the electric parts box of Indoor Unit and/or front panel of Outdoor Unit inevitably to determine the failure, put a sign "Do not enter" around the site before the work. Failure to do this may result in third person getting electric shock.
 Stay on protection	If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the indoor units and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, wear insulated heat-resistant gloves, insulated boots and insulated work overalls, and take care to avoid touching any live parts. You may receive an electric shock if you fail to heed this warning. Only qualified service person (*1) is allowed to do this kind of work.






## WARNING

 General	Before starting to repair the air conditioner, read carefully through the Service Manual, and repair the air conditioner by following its instructions.
	Only qualified service person (*1) is allowed to repair the air conditioner. Repair of the air conditioner by unqualified person may give rise to a fire, electric shocks, injury, water leaks and/or other problems.
	Only a qualified installer (*1) or qualified service person (*1) is allowed to carry out the electrical work of the air conditioner. Under no circumstances must this work be done by an unqualified individual since failure to carry out the work properly may result in electric shocks and/or electrical leaks.
	Wear protective gloves and safety work clothing during installation, servicing and removal.

## **WARNING**

 General	<p>Use wiring that meets the specifications in the Installation Manual and the stipulations in the local regulations and laws. Use of wiring which does not meet the specifications may give rise to electric shocks, electrical leakage, smoking and/or a fire.</p>
	<p>The appliance shall be installed in accordance with national wiring regulations. Capacity shortages of the power circuit or an incomplete installation may cause an electric shock or fire.</p>
	<p>Only a qualified installer (*1) or qualified service person (*1) is allowed to undertake work at heights using a stand of 50 cm or more.</p>
	<p>When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder's instructions. Also wear a helmet for use in industry as protective gear to undertake the work.</p>
	<p>When working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below.</p>
	<p>Do not touch the aluminum fin of the outdoor unit. You may injure yourself if you do so. If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.</p>
	<p>Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.</p>
	<p>When transporting the air conditioner, wear shoes with additional protective toe caps.</p>
	<p>When transporting the air conditioner, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.</p>
	<p>When transporting the air conditioner, use a forklift and when moving the air conditioner by hand, move the unit with 2 people, or move the unit with 4 people.</p>
	<p>Do not customize the product. Doing so may result in electric shock or other failure.</p>
	<p>This air conditioner has passed the pressure test as specified in UL 60335-2-40 Annex EE.</p>
 Check earth wires.	<p>Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, otherwise an electric shock is caused when a leak occurs. If the earth wire is not correctly connected, contact an electric engineer for rework.</p>
	<p>After completing the repair or relocation work, check that the ground wires are connected properly.</p>
	<p>Be sure to connect earth wire. (Grounding work) Incomplete grounding causes an electric shock. Do not connect ground wires to gas pipes, water pipes, and lightning rods or ground wires for telephone wires.</p>
 Prohibition of modification.	<p>Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.</p>
 Use specified parts.	<p>When any of the electrical parts are to be replaced, ensure that the replacement parts satisfy the specifications given in the Service Manual (or use the parts contained on the parts list in the Service Manual). Use of any parts which do not satisfy the required specifications may give rise to electric shocks, smoking and/or a fire.</p>
 Do not bring a child close to the equipment.	<p>If, in the course of carrying out repairs, it becomes absolutely necessary to check out the electrical parts with the electrical parts box cover of one or more of the indoor units and the service panel of the outdoor unit removed in order to find out exactly where the trouble lies, place "Keep out" signs around the work site before proceeding. Third-party individuals may enter the work site and receive electric shocks if this warning is not heeded.</p>
 Insulating measures	<p>Connect the cut-off lead wires with crimp contact, etc, put the closed end side upward and then apply a water-cut method, otherwise a leak or production of fire is caused at the users' side.</p>
 No fire	<p>When performing repairs using a gas burner, replace the refrigerant with nitrogen gas because the oil that coats the pipes may otherwise burn.</p>
	<p>When repairing the refrigerating cycle, take the following measures. 1) Be attentive to fire around the cycle. When using a gas stove, etc, be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.</p>

 Refrigerant	<p>The refrigerant used by this air conditioner is the R454B.</p>
	<p>Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R454B refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see.</p>
	<p>Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.</p>
	<p>For an air conditioner which uses R454B, never use other refrigerant than R454B. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused.</p>
	<p>Do not charge refrigerant additionally.  If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury.  Therefore if the refrigerant gas leaks, recover the refrigerant in the air conditioner, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant.  In this time, never charge the refrigerant over the specified amount.</p>
	<p>When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R454B into the specified refrigerant.  If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage.</p>
	<p>After the installation work, confirm that refrigerant gas does not leak.  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may be generated.</p>
 Assembly/ Cabling	<p>Never recover the refrigerant into the outdoor unit.  When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.</p>
	<p>After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before.  Perform the work so that the cabinet or panel does not catch the inner wires.  If incorrect assembly or incorrect wire connection was done, a disaster such as a leak or fire is caused at user's side.</p>
 Insulator check	<p>After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 1MΩ or more between the charge section and the non-charge metal section (Earth position).  If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.</p>
 Ventilation	<p>When the refrigerant gas leaks during work, execute ventilation.  If the refrigerant gas touches to a fire, poisonous gas generates.  A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.</p>
	<p>If refrigerant gas has leaked during the installation work, ventilate the room immediately.  If the leaked refrigerant gas comes in contact with fire, noxious gas may be generated.</p>
	<p>After the installation work, confirm that refrigerant gas does not leak.  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may be generated.</p>
 Compulsion	<p>When the refrigerant gas leaks, find up the leaked position and repair it surely.  If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room.  The poisonous gas generates when gas touches to fire such as fan heater, stove or cooking stove though the refrigerant gas itself is innocuous.  When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks.  If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused.</p>
	<p>Tighten the flare nut with a torque wrench in the specified manner.  Excessive tighten of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.</p>
	<p>Nitrogen gas must be used for the airtight test.</p>
	<p>The charge hose must be connected in such a way that it is not slack.</p>
	<p>For the installation/moving/reinstallation work, follow to the Installation Manual.  If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.</p>

 Check after repair	Once the repair work has been completed, check for refrigerant leaks, and check the insulation resistance and water drainage. Then perform a trial run to check that the air conditioner is running properly.
	After repair work has finished, check there is no trouble. If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
 Do not operate the unit with the valve closed.	Check the following matters before a test run after repairing piping. <ul style="list-style-type: none"> <li>• Connect the pipes surely and there is no leak of refrigerant.</li> <li>• The valve is opened.</li> </ul> Running the compressor under condition that the valve closes causes an abnormal high pressure resulted in damage of the parts of the compressor and etc. and moreover if there is leak of refrigerant at connecting section of pipes, the air is suctioned and causes further abnormal high pressure resulted in burst or injury.
 Check after reinstallation	Only a qualified installer (*1) or qualified service person (*1) is allowed to relocate the air conditioner. It is dangerous for the air conditioner to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and/or vibration may result.
	Check the following items after reinstallation. 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.
	When carrying out the pump-down work shut down the compressor before disconnecting the refrigerant pipe. Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.
 Cooling check	When the service panel of the outdoor unit is to be opened in order for the compressor or the area around this part to be repaired immediately after the air conditioner has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the compressor pipes and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the heat-resistant gloves.
	When the service panel of the outdoor unit is to be opened in order for the fan motor, reactor, inverter or the areas around these parts to be repaired immediately after the air conditioner has been shut down, set the circuit breaker to the OFF position, and then wait at least 10 minutes before opening the service panel. If you fail to heed this warning, you will run the risk of burning yourself because the fan motor, reactor, inverter heat sink and other parts will be very hot to the touch. In addition, before proceeding with the repair work, wear the heat-resistant gloves.
 Installation	Only a qualified installer (*1) or qualified service person (*1) is allowed to install the air conditioner. If the air conditioner is installed by an unqualified individual, a fire, electric shocks, injury, water leakage, noise and/or vibration may result.
	Before starting to install the air conditioner, read carefully through the Installation Manual, and follow its instructions to install the air conditioner.
	Do not install the air conditioner in a location that may be subject to a risk of expire to a combustible gas. If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
	Install a circuit breaker that meets the specifications in the installation manual and the stipulations in the local regulations and laws.
	Install the circuit breaker where it can be easily accessed by the agent.
	Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.

## **Explanations given to user**

- If you have discovered that the fan grille is damaged, do not approach the outdoor unit but set the circuit breaker to the OFF position, and contact a qualified service person to have the repairs done.  
Do not set the circuit breaker to the ON position until the repairs are completed.

## **Relocation**

- Only a qualified installer (\*1) or qualified service person (\*1) is allowed to relocate the air conditioner.  
It is dangerous for the air conditioner to be relocated by an unqualified individual since a fire, electric shocks, injury, water leakage, noise and/or vibration may result.
- When carrying out the pump-down work shut down the compressor before disconnecting the refrigerant pipe.  
Disconnecting the refrigerant pipe with the service valve left open and the compressor still operating will cause air, etc. to be sucked in, raising the pressure inside the refrigeration cycle to an abnormally high level, and possibly resulting in reputing, injury, etc.

(\*1) Refer to the "Definition of Qualified Installer or Qualified Service Person."

# Refrigerant (R454B)

This air conditioner adopts HFC type refrigerant (R454B) which does not deplete the ozone layer.

## 1. Safety Caution Concerned to Refrigerant

The pressure of R454B is higher than of that of the former refrigerant (R22), (R410A).

Accompanied with change of refrigerant, the refrigerating oil has been also changed.

Therefore, be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with refrigerant during installation work or service work.

If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident.

Use the tools and materials exclusive to R454B to purpose a safe work.

## 2. Cautions on Installation/Service

1) Do not mix the other refrigerant or refrigerating oil.

For the tools exclusive to R454B, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.

2) As the use pressure of the refrigerant is high, use material thickness of the pipe and tools which are specified for R454B.

3) In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide scales, oil, etc.

Use the clean pipes.

Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)

4) For the earth protection, use a vacuum pump for air purge.

5) R454B refrigerant is azeotropic mixture type refrigerant.

Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

## 3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used.

It is necessary to select the most appropriate pipes to conform to the standard.

Use clean material in which impurities adhere inside of pipe or joint to a minimum.

### 1) Copper pipe

#### <Piping>

The pipe thickness, flare finishing size, flare nut and others differ according to a refrigerant type.

When using a long copper pipe for R454B, it is recommended to select "Copper or copper-base pipe without seam" and one with bonded oil amount 40mg/10m or less.

Also do not use crushed, deformed, discolored (especially inside) pipes.  
(Impurities cause clogging of expansion valves and capillary tubes.)

#### <Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

### 2) Joint

The flare joint and socket joint are used for joints of the copper pipe.

The joints are rarely used for installation of the air conditioner. However clear impurities when using them.



## 4. Tools

### 1. Required Tools for R454B

Mixing of different types of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

- 1) Tools exclusive for R454B (Those which cannot be used for conventional refrigerant (R22), (R410A))
- 2) Tools exclusive for R454B, but can be also used for conventional refrigerant (R22), (R410A)
- 3) Tools commonly used for R454B and for conventional refrigerant (R22), (R410A)

The table below shows the tools exclusive for R454B and their interchangeability.

#### Tools exclusive for R454B (The following tools for R454B are required.)

Tools whose specifications are changed for R454B and their interchangeability

No.	Used tool	Usage	R454B air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R454B	Whether conventional equipment can be used	Whether conventional equipment can be used
①	Flare tool (Double Flare tooling)	Pipe flaring	Yes	*(Note)	Yes
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note)	*(Note)
③	Torque wrench	Tightening of flare nut	Yes	No	No
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	No	No
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes
⑦	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes
⑧	Leakage detector	Gas leakage check	Yes	No	Yes
⑨	Refrigerant cylinder	Refrigerant charge	Yes	No	No

**(Note)** When flaring is carried out for R454B using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

#### General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22, R410A are necessary as the general tools.

- |  |  |
|--|--|
| 1) Vacuum pump. Use vacuum pump by<br>attaching vacuum pump adapter. | 7) Screwdriver (+, -)                        |
| 2) Torque wrench   | 8) Spanner or Monkey wrench                  |
| 3) Pipe cutter   | 9) Hole core drill                           |
| 4) Reamer  | 10) Hexagon wrench (Opposite side 0.2"(4mm)) |
| 5) Pipe bender   | 11) Tape measure                             |
| 6) Level vial  | 12) Metal saw                                |

Also prepare the following equipments for other installation method and run check.

- |                |  |
|----------------|--|
| 1) Clamp meter | 3) Insulation resistance tester (Megger) |
| 2) Thermometer | 4) Electroscop                           |

# 1. SPECIFICATIONS

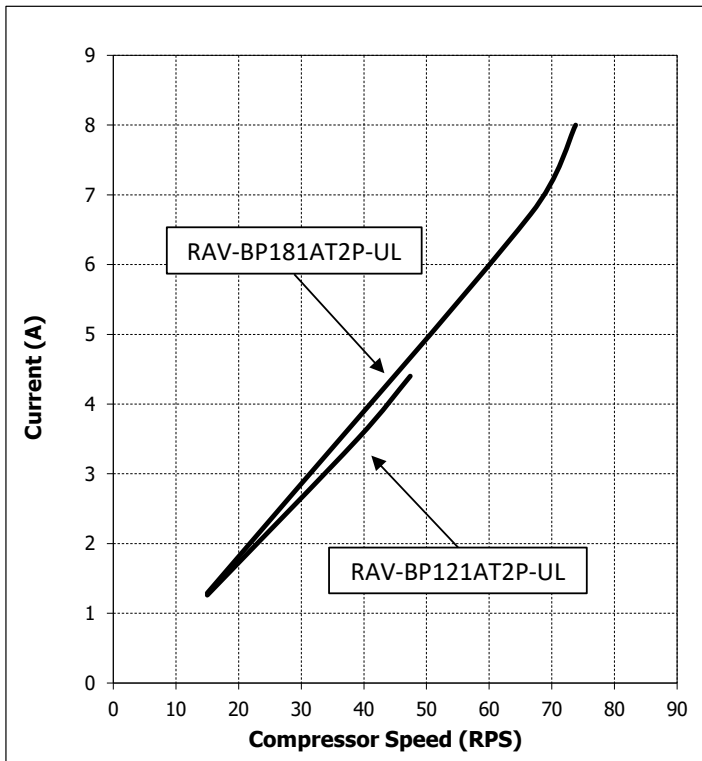
## 1-1. Outdoor Unit

### <Super Digital Inverter>

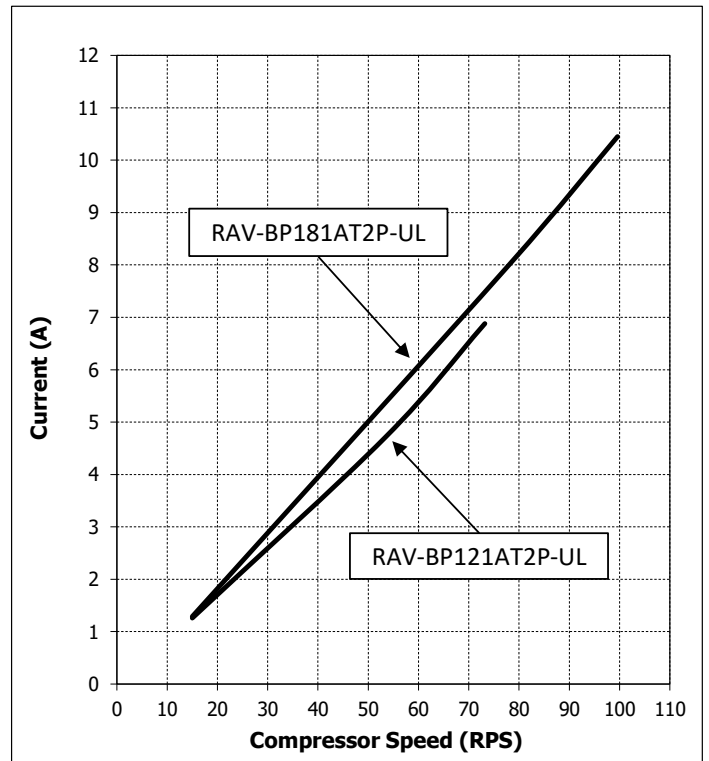
System	Capacity Rank		012	018
	Outdoor Model		RAV-BP121AT2P-UL	RAV-BP181AT2P-UL
Operating Range	Cooling	Indoor Min - Max DB (°F)	70 to 89	70 to 89
		Outdoor Min - Max DB (°F)	5 to 115	5 to 115
		Outdoor Min - Max DB (°F) with wind buffels	5 to 115	5 to 115
	Heating	Indoor Min - Max DB (°F)	59 to 86	59 to 86
		Outdoor Min - Max DB (°F)	-13 to 59	-13 to 59
Piping	Standard Piping Length (ft)		24'7"	24'7"
	Min. Piping Length (ft)		16'5"	16'5"
	Max. Piping Length (ft)		164'1"	164'1"
	Lift (Outdoor below Indoor) (ft)		98'5"	98'5"
	Lift (Outdoor above Indoor) (ft)		98'5"	98'5"
	Gas Pipe (size/connection type)		1/2"	1/2"
	Liquid Pipe (size/connection type)		1/4"	1/4"
	Additional refrigerant charge under long piping connection		0.22oz/ft (65'7" to 164'1")	0.22oz/ft (65'7" to 164'1")
Electrical	Voltage		1Ph, 208/230V ~ 60Hz.	1Ph, 208/230V ~ 60Hz.
	Minimum Current Amps (A)		14	14
	Maximum Overcurrent Protection Device Amps (A)		20	20
Outdoor	Dimensions	Height (in)	21.7	21.7
		Width (in)	30.7	30.7
		Depth (in)	11.4	11.4
	Weight-Net/Gross (lbs)		82/89	82/89
	Refrigerant charged (lbs)		3.31	3.31
	Sound Pressure (dBA)		48/52	48/52

## 1-2. Operation Characteristic Curve

### <Cooling>

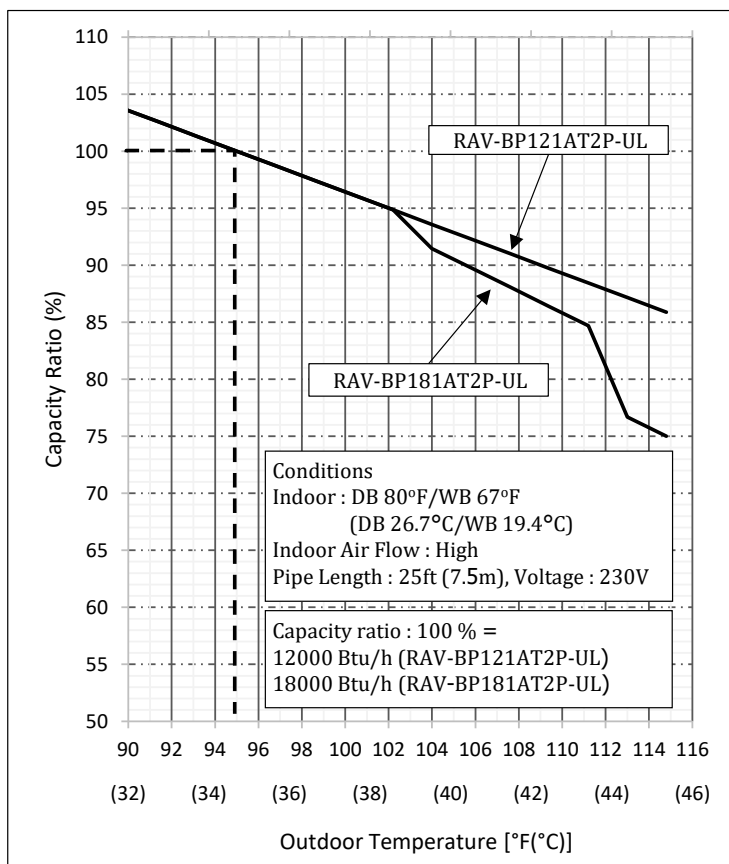


### <Heating>

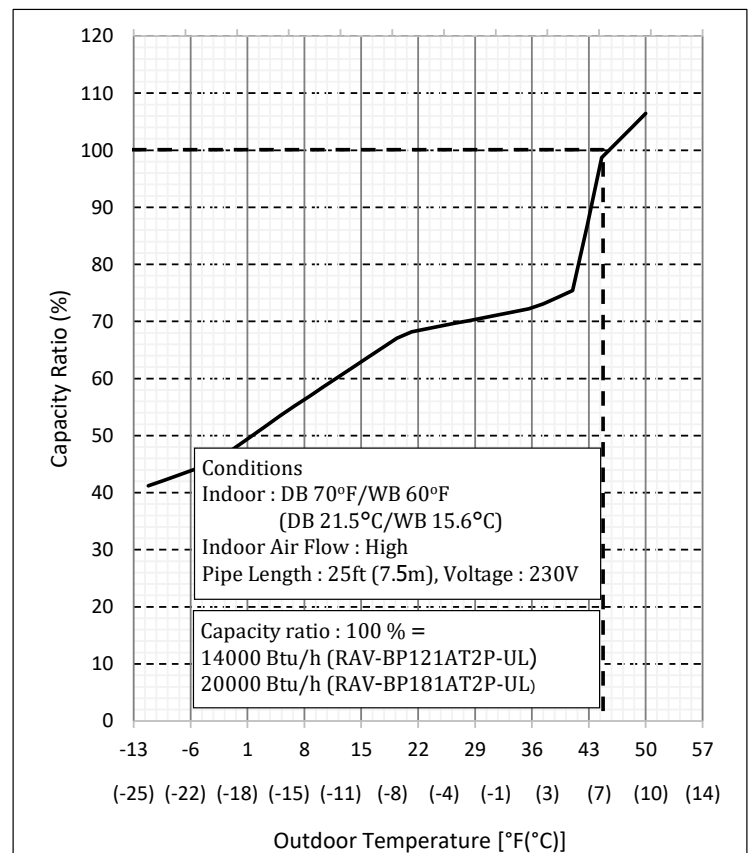


## Capacity variation ratio according to temperature

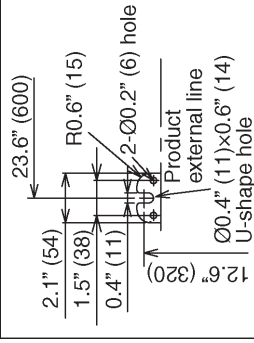
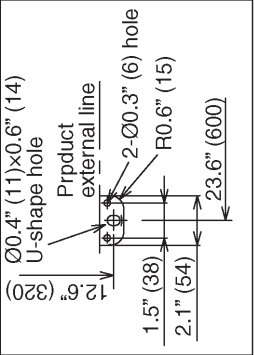
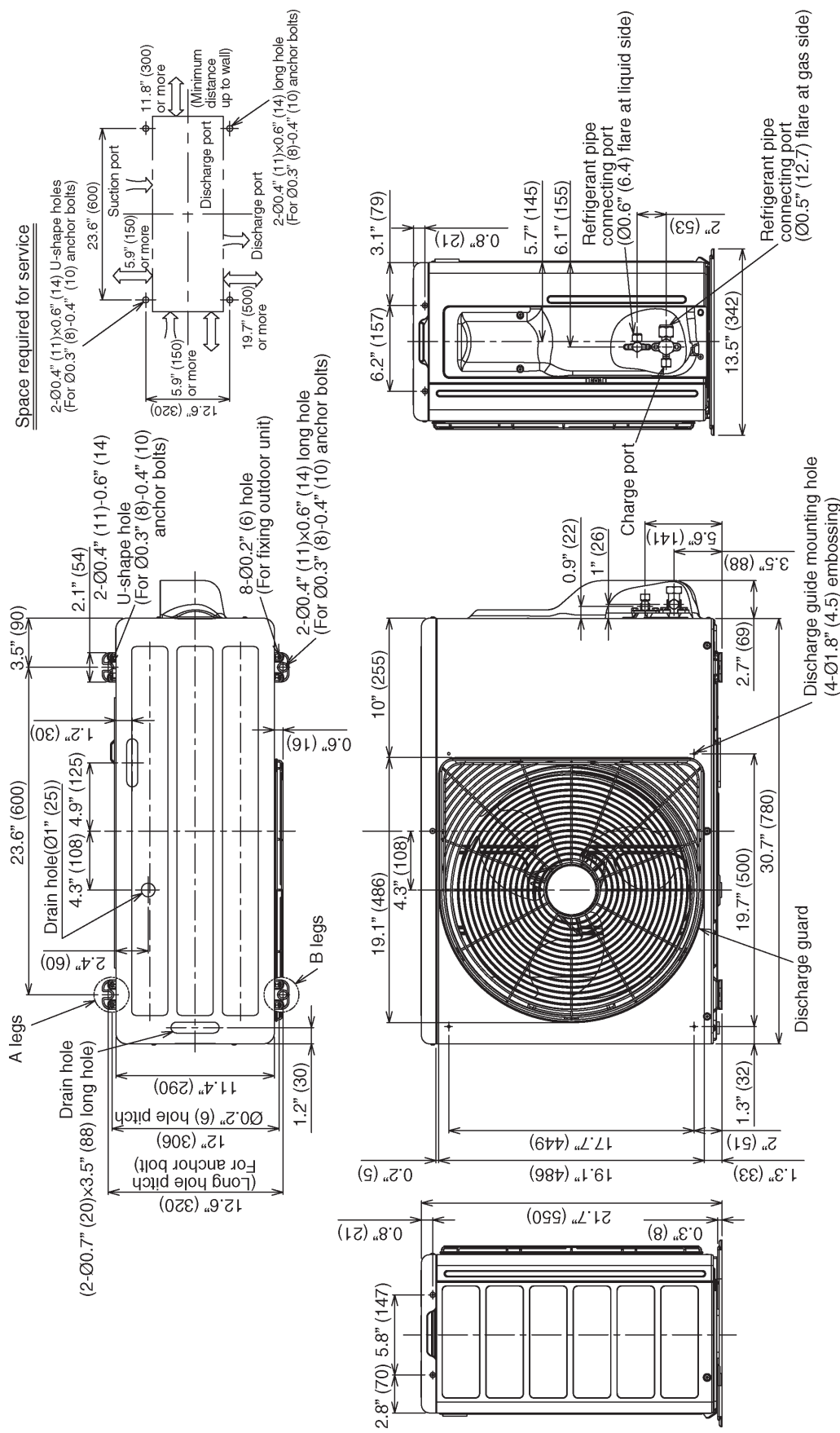
### <Cooling>



### <Heating>



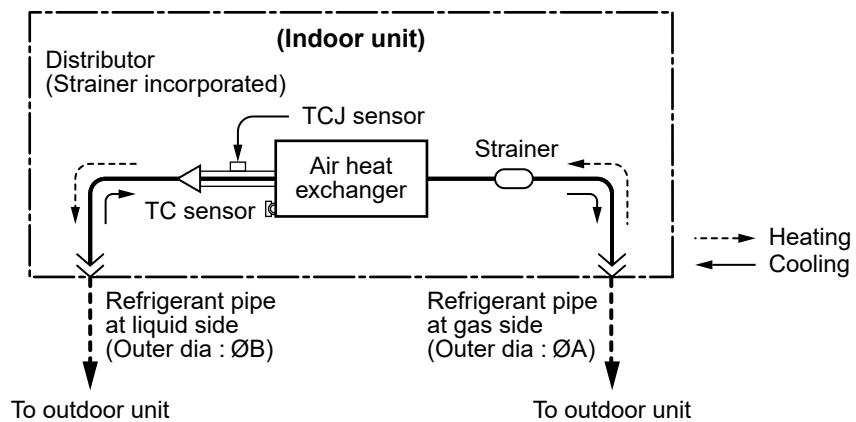
2. DIMENSIONAL DRAWING



### 3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

#### 3-1. Indoor Unit

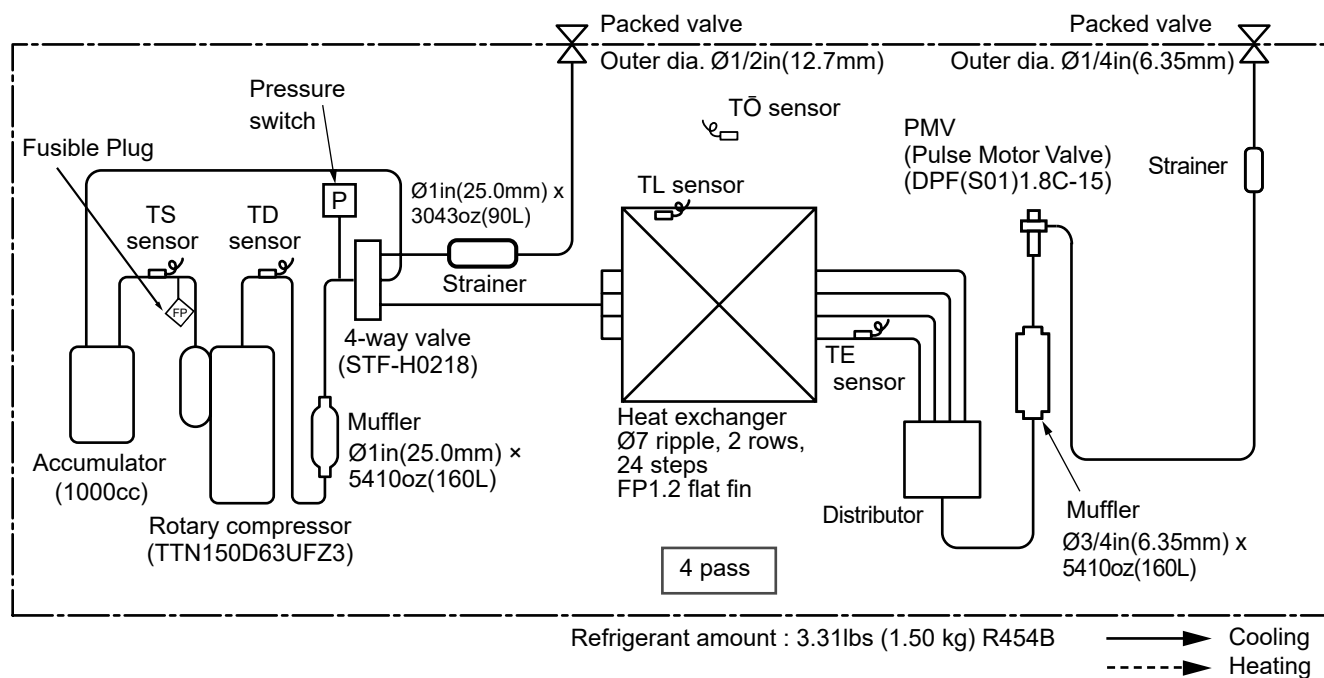
- Single type (Combination of 1 indoor unit and 1 outdoor unit)



Dimension table

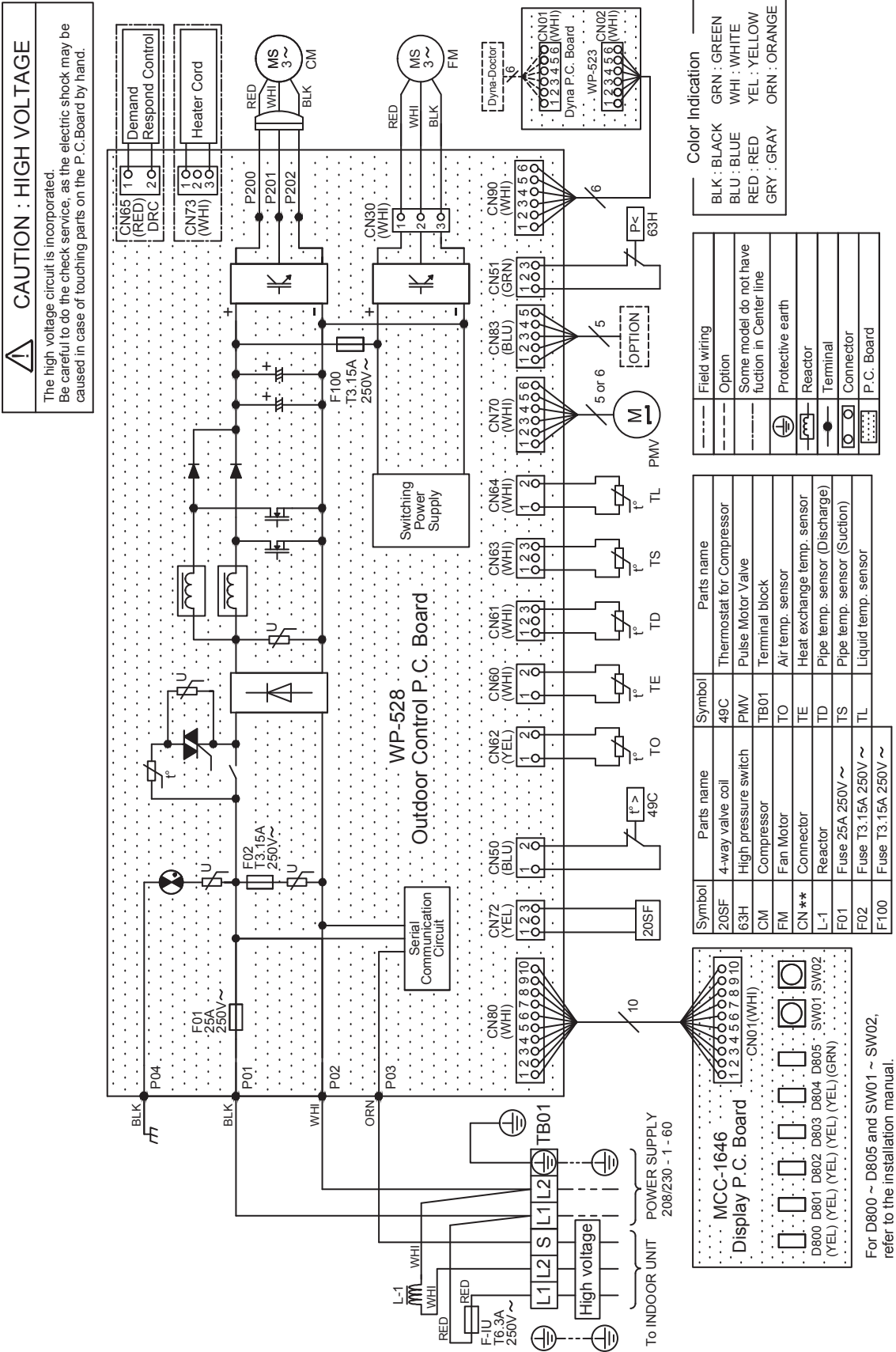
Indoor unit	Outer diameter of refrigerant pipe	
	Gas side ØA	Liquid side ØB
HB121,181 type	1/2" (12.7)	1/4" (6.4)

### 3-2. Outdoor Unit



		Pressure		Pipe surface temperature °F(°C)				Comp. Hz	Temp. °F(°C)	
		PSI (Mpa)							In	Out
		Pd	Ps	TD	TS	TC	TE			
Cooling	Standard	443(3.057)	137(0.945)	158(70)	55(13)	55(13)	96(36)	61	80(27)	95(35)
	Over load	472(3.256)	154(1.064)	159(71)	68(20)	68(20)	123(51)	52	89(32)	115(46)
	Low temp.	323(2.232)	118(0.818)	111(44)	42(6)	46(8)	46(8)	29	64(18)	5(-15)
Heating	Standard	370(2.555)	90(0.623)	150(66)	33(1)	104(40)	46(8)	75	68(20)	44(7)
	Over load	461(3.181)	119(0.822)	186(86)	50(10)	129(54)	51(11)	78	80(27)	75(24)
	Low temp.	134(0.930)	38(0.264)	55(13)	-16(-27)	48(9)	-9(-23)	99	59(15)	-13(-25)

# 4. WIRING DIAGRAM



## 5. SPECIFICATIONS OF ELECTRICAL PARTS

No.	Parts name	Type	Specification
1	Compressor	TTN150D63UFZ3	3 phase, 4P, 1100 W
2	Fan motor	LDF-340-A43AA1-1	Output 43 W
3	4-way valve coil	SQ-A2522G-000352	-
4	PMV coil	PQ-M01012-000082	-
5	High-pressure SW	ACB-4UB83W	OFF : 4.15MPa / ON : 3.2MPa
6	P.C. board	WP-528	-
7	Fuse (Mounted on P.C. board)	-	AC250 V, 25 A
8	Fuse (Mounted on P.C. board)	-	AC250 V, 3.15 A
9	Outdoor temp. sensor (TO sensor)	-	10 k $\Omega$ at 25°C
10	Heat exchanger temp. sensor (TE sensor)	-	10 k $\Omega$ at 25°C
11	Suction temp. sensor (TS sensor)	-	10 k $\Omega$ at 25°C
12	Discharge temp. sensor (TD sensor)	-	50 k $\Omega$ at 25°C
13	Heat exchanger temp. sensor (TL sensor)	-	50 k $\Omega$ at 25°C
14	Compressor thermo. (Protection)	S104CT4C800	OFF: 125 $\pm$ 4°C, ON: 90 $\pm$ 5°C



## 6. REFRIGERANT R454B

This air conditioner adopted the refrigerant HFC (R454B which does not damage the ozone layer.

The working pressure of the refrigerant R454B is 1.6 times higher than conventional refrigerant (R22), (R410A). The refrigerating oil is also changed in accordance with change of refrigerant, so be careful that water, dust, and existing refrigerant or refrigerating oil are not entered in the refrigerant cycle of the air conditioner using the refrigerant during installation work or servicing time.

The next section describes the precautions for air conditioner using the refrigerant.

Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work.

### 6-1. Safety During Installation/Servicing

As R454B's pressure is about 1.6 times higher than that of R22, R410A improper installation/servicing may cause a serious trouble. By using tools and materials exclusive for R454B, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

1. Never use refrigerant other than RR454B in an air conditioner which is designed to operate with R454B.

If other refrigerant than R454B is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture.

2. Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant R454B. The refrigerant name R454B is indicated on the visible place of the outdoor unit of the air conditioner using R454B as refrigerant. To prevent mischancing, the diameter of the service port differs from that of R22, R410A.

3. If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully. If the refrigerant gas comes into contact with fire, a poisonous gas may occur.

4. When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.

5. After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.

6. When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level.

If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result.

7. Be sure to carry out installation or removal according to the installation manual. Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc.
8. Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.

Improper repair may result in water leakage, electric shock and fire, etc.

### 6-2. Refrigerant Piping Installation

#### 6-2-1. Piping Materials and Joints Used

For the refrigerant piping installation, copper pipes and joints are mainly used.

Copper pipes and joints suitable for the refrigerant must be chosen and installed.

Furthermore, it is necessary to use clean copper pipes and joints whose interior surfaces are less affected by contaminants.

1. Copper Pipes

It is necessary to use seamless copper pipes which are made of either copper or copper alloy and it is desirable that the amount of residual oil is less than 40 mg/10 m.

Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface).

Otherwise, the expansion valve or capillary tube may become blocked with contaminants.

As an air conditioner using R454B incurs pressure higher than when using R22, R410A it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R454B are as shown in Table 6-2-1. Never use copper pipes thinner than 0.03"(0.8mm) even when it is available on the market.

#### NOTE:

Refer to the "6-6. Instructions for Re-use Piping of R22, R410A or R407C".

**Table 6-2-1 Thicknesses of annealed copper pipes**

	Thickness (In (mm))
Outer diameter (In (mm))	R454B
1/4" (6.4)	0.03" (0.80)
3/8" (9.5)	0.03" (0.80)
1/2" (12.7)	0.03" (0.80)
5/8" (15.9)	0.04" (1.00)

**1. Joints**

For copper pipes, flare joints or socket joints are used. Prior to use, be sure to remove all contaminants.

**a) Flare Joints**

Flare joints used to connect the copper pipes cannot be used for pipings whose outer diameter exceeds 0.79"(20mm). In such a case, socket joints can be used.

Sizes of flare pipe ends, flare joint ends and flare nuts are as shown in Tables 6-2-3 to 6-2-4 below.

**b) Socket Joints**

Socket joints are such that they are brazed for connections, and used mainly for thick pipings whose diameter is larger than 0.79"(20mm). Thicknesses of socket joints are as shown in Table 6-2-2.

**Table 6-2-2 Minimum thicknesses of socket joints**

Reference outer diameter of copper pipe jointed (In (mm))	Minimum joint thickness (In (mm))
1/4" (6.4)	0.02" (0.50)
3/8" (9.5)	0.02" (0.60)
1/2" (12.7)	0.03" (0.70)
5/8" (15.9)	0.03" (0.80)

**6-2-2. Processing of Piping Materials**

When performing the refrigerant piping installation, care should be taken to ensure that water or dust does not enter the pipe interior, that no other oil other than lubricating oils used in the installed air conditioner is used, and that refrigerant does not leak.

When using lubricating oils in the piping processing, use such lubricating oils whose water content has been removed. When stored, be sure to seal the container with an airtight cap or any other cover.

**1. Flare Processing Procedures and Precautions (Double Flare tooling)****a) Cutting the Pipe**

By means of a pipe cutter, slowly cut the pipe so that it is not deformed.

**b) Removing Burrs and Chips**

If the flared section has chips or burrs, refrigerant leakage may occur.

Carefully remove all burrs and clean the cut surface before installation.

c) Insertion of Flare Nut

d) Flare Processing

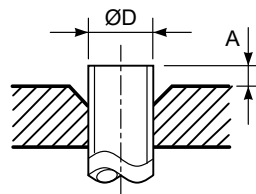
Make certain that a clamp bar and copper pipe have been cleaned.

By means of the clamp bar, perform the flare processing correctly.

Use either a flare tool for R454B or conventional flare tool.

Flare processing dimensions differ according to the type of flare tool.

When using a conventional flare tool, be sure to secure "dimension A" by using a gauge for size adjustment.



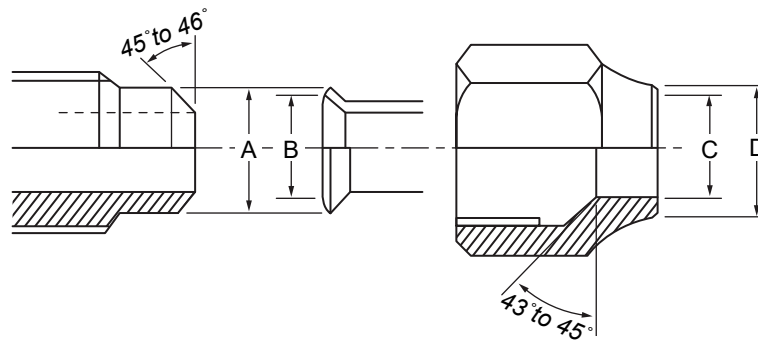
**Fig. 6-2-1 Flare processing dimensions**

**Table 6-2-3 Dimensions related to flare processing for R454B**

Outer diameter (In (mm))	Thickness (In (mm))	A (In (mm))		
		Flare tool for R454B clutch type	Conventional flare tool (R454B)	
			Clutch type	Wing nut type
1/4" (6.4)	0.03" (0.8)	0 – 0.02" (0 – 0.5)	0.04" – 0.06" (1.0 – 1.5)	0.06" – 0.08" (1.5 – 2.0)
3/8" (9.5)	0.03" (0.8)	0 – 0.02" (0 – 0.5)	0.04" – 0.06" (1.0 – 1.5)	0.06" – 0.08" (1.5 – 2.0)
1/2" (12.7)	0.03" (0.8)	0 – 0.02" (0 – 0.5)	0.04" – 0.06" (1.0 – 1.5)	0.08" – 0.10" (2.0 – 2.5)
5/8" (15.9)	0.04" (1.0)	0 – 0.02" (0 – 0.5)	0.04" – 0.06" (1.0 – 1.5)	0.08" – 0.10" (2.0 – 2.5)

**Table 6-2-4 Flare and flare nut dimensions for R454B**

Outer diameter (In (mm))	Thickness (In (mm))	Dimension (In (mm))				Flare nut width (In (mm))
		A	B	C	D	
1/4" (6.4)	0.03" (0.8)	0.36" (9.1)	0.36" (9.2)	0.26" (6.5)	0.51" (13)	0.67" (17)
3/8" (9.5)	0.03" (0.8)	0.52" (13.2)	0.53" (13.5)	0.38" (9.7)	0.79" (20)	0.87" (22)
1/2" (12.7)	0.03" (0.8)	0.65" (16.6)	0.63" (16.0)	0.51" (12.9)	0.91" (23)	1.02" (26)
5/8" (15.9)	0.04" (1.0)	0.78" (19.7)	0.75" (19.0)	0.63" (16.0)	0.98" (25)	1.14" (29)



**Fig. 6-2-2 Relations between flare nut and flare seal surface**

## 2. Flare Connecting Procedures and Precautions

- Make sure that the flare and union portions do not have any scar or dust, etc.
- Correctly align the processed flare surface with the union axis.
- Tighten the flare with designated torque by means of a torque wrench.  
The tightening torque for R454B is the same as that for conventional R22, R410A.  
Incidentally, when the torque is weak, the gas leakage may occur.  
When it is strong, the flare nut may crack and may be made non-removable.  
When choosing the tightening torque, comply with values designated by manufacturers.  
Table 6-2-5 shows reference values.
- Joint preparation are recommend to double-flare fitting accordance to ASHRAE15 requirements.

## NOTE

When applying oil to the flare surface, be sure to use oil designated by the manufacturer.  
If any other oil is used, the lubricating oils may deteriorate and cause the compressor to burn out.

**Table 6-2-5 Tightening torque of flare for R454B [Reference values]**

Outer diameter (In (mm))	Tightening torque (ft • lbs (N • m))
1/4" (6.4)	10 – 13 (14 – 18)
3/8" (9.5)	24 – 31 (33 – 42)
1/2" (12.7)	37 – 46 (50 – 62)
5/8" (15.9)	50 – 60 (68 – 82)

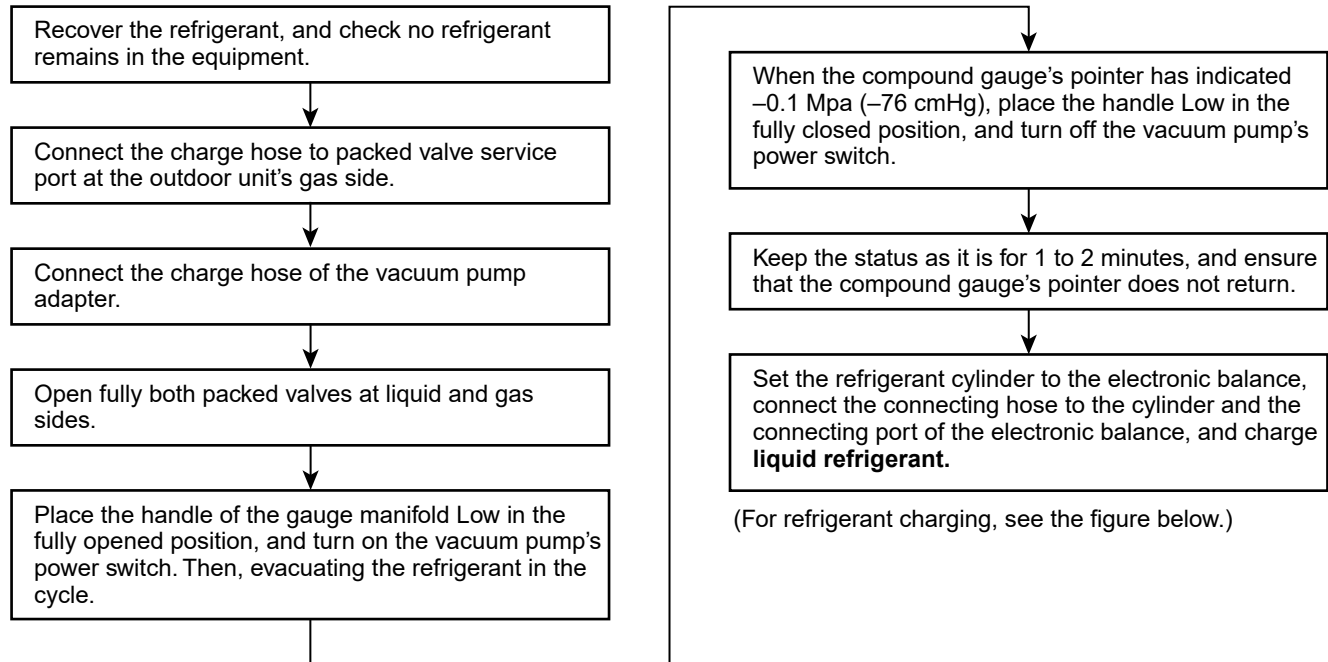
## 6-3. Tools

### 6-3-1. Required Tools

Refer to the “4. Tools” (Page 13)

## 6-4. Recharging of Refrigerant

When it is necessary to recharge refrigerant, charge the specified amount of refrigerant according to the following steps.



- 1) Never charge refrigerant exceeding the specified amount.
- 2) If the specified amount of refrigerant cannot be charged, charge refrigerant **bit by bit** in COOL mode.
- 3) Do not carry out additional charging.

When additional charging is carried out if refrigerant leaks, the refrigerant composition changes in the refrigeration cycle, that is characteristics of the air conditioner changes, refrigerant exceeding the specified amount is charged, and working pressure in the refrigeration cycle becomes abnormally high pressure, and may cause a rupture or personal injury.

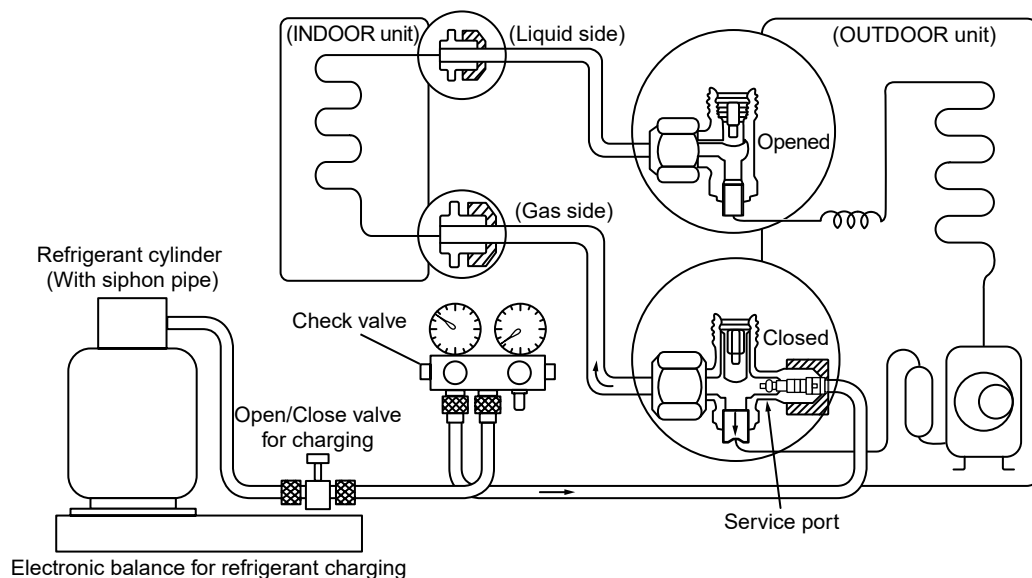
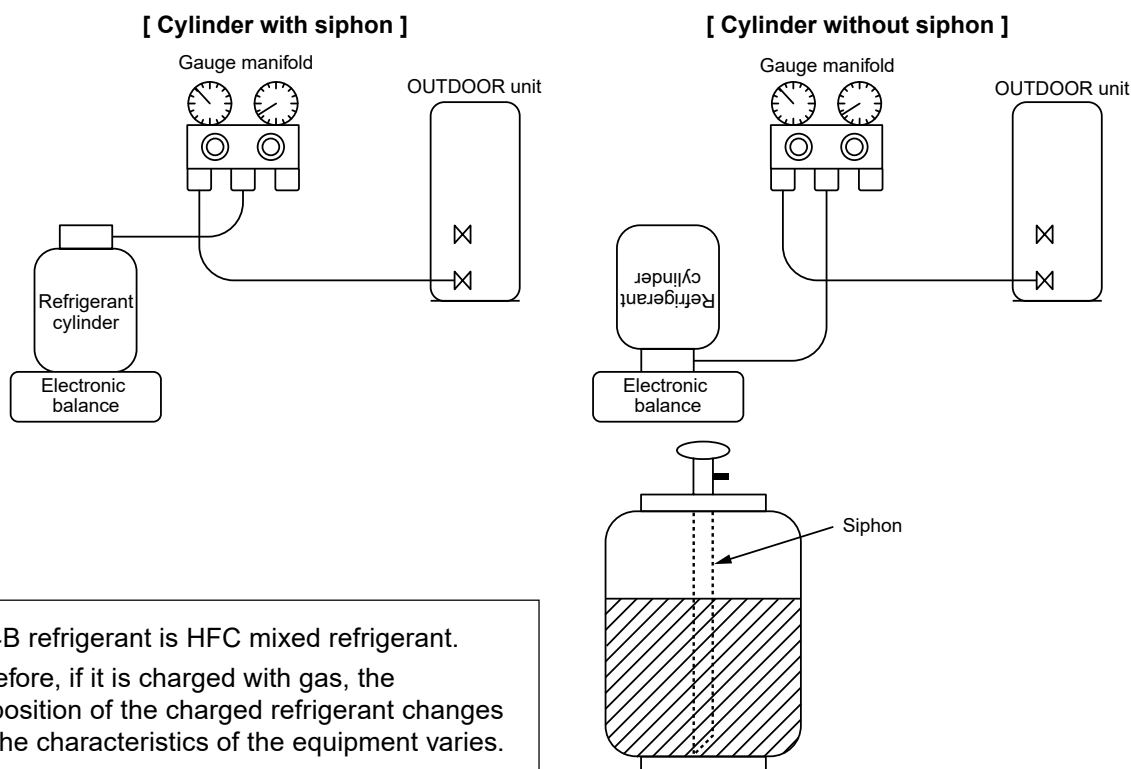


Fig. 6-4-1 Configuration of refrigerant charging

- 1) Be sure to make setting so that **liquid** can be charged.
- 2) When using a cylinder equipped with a siphon, liquid can be charged without turning it upside down.

It is necessary for charging refrigerant under condition of liquid because R454B is mixed type of refrigerant. Accordingly, when charging refrigerant from the refrigerant cylinder to the equipment, charge it turning the cylinder upside down if cylinder is not equipped with siphon.



R454B refrigerant is HFC mixed refrigerant. Therefore, if it is charged with gas, the composition of the charged refrigerant changes and the characteristics of the equipment varies.

Fig. 6-4-2

## 6-5. Brazing of Pipes

### 6-5-1. Materials for Brazing

#### 1. Silver brazing filler

Silver brazing filler is an alloy mainly composed of silver and copper.

It is used to join iron, copper or copper alloy, and is relatively expensive though it excels in solderability.

#### 2. Phosphor bronze brazing filler

Phosphor bronze brazing filler is generally used to join copper or copper alloy.

#### 3. Low temperature brazing filler

Low temperature brazing filler is generally called solder, and is an alloy of tin and lead.

Since it is weak in adhesive strength, do not use it for refrigerant pipes.

- 1) Phosphor bronze brazing filler tends to react with sulfur and produce a fragile compound water solution, which may cause a gas leakage. Therefore, use any other type of brazing filler at a hot spring resort, etc., and coat the surface with a paint.
- 2) When performing brazing again at time of servicing, use the same type of brazing filler.

### 6-5-2. Flux

#### 1. Reason why flux is necessary

- By removing the oxide film and any foreign matter on the metal surface, it assists the flow of brazing filler.
- In the brazing process, it prevents the metal surface from being oxidized.
- By reducing the brazing filler's surface tension, the brazing filler adheres better to the treated metal.

## 2. Characteristics required for flux

- Activated temperature of flux coincides with the brazing temperature.
- Due to a wide effective temperature range, flux is hard to carbonize.
- It is easy to remove slag after brazing.
- The corrosive action to the treated metal and brazing filler is minimum.
- It excels in coating performance and is harmless to the human body.

As the flux works in a complicated manner as described above, it is necessary to select an adequate type of flux according to the type and shape of treated metal, type of brazing filler and brazing method, etc.

## 3. Types of flux

### • Noncorrosive flux

Generally, it is a compound of borax and boric acid.

It is effective in case where the brazing temperature is higher than 1,472°F (800°C).

### • Activated flux

Most of fluxes generally used for silver brazing are this type.

It features an increased oxide film removing capability due to the addition of compounds such as potassium fluoride, potassium chloride and sodium fluoride to the borax-boric acid compound.

## 4. Piping materials for brazing and used brazing filler/flux

Piping material	Used brazing filler	Used flux
Copper - Copper	Phosphor copper	Do not use
Copper - Iron	Silver	Paste flux
Iron - Iron	Silver	Vapor flux

- 1) Do not enter flux into the refrigeration cycle.
- 2) When chlorine contained in the flux remains within the pipe, the lubricating oil deteriorates. Therefore, use a flux which does not contain chlorine.
- 3) When adding water to the flux, use water which does not contain chlorine (e.g. distilled water or ion-exchange water).
- 4) Remove the flux after brazing.

## 6-5-3. Brazing

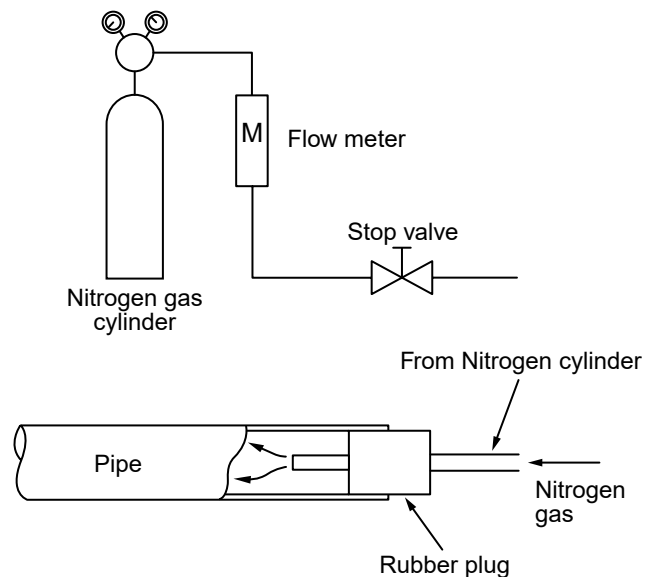
As brazing work requires sophisticated techniques, experiences based upon a theoretical knowledge, it must be performed by a person qualified.

In order to prevent the oxide film from occurring in the pipe interior during brazing, it is effective to proceed with brazing while letting dry Nitrogen gas flow.

**Never use gas other than Nitrogen gas.**

### 1. Brazing method to prevent oxidation

- 1) Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder.
- 2) Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder.
- 3) Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas.
- 4) When the Nitrogen gas is flowing, be sure to keep the piping end open.
- 5) Adjust the flow rate of Nitrogen gas so that it is lower than 0.05 m<sup>3</sup>/Hr or 2.9 psi (0.02 MPa) by means of the reducing valve.
- 6) After performing the steps above, keep the Nitrogen gas flowing until the pipe cools down to a certain extent (temperature at which pipes are touchable with hands).
- 7) Remove the flux completely after brazing.



**Fig. 6-5-1 Prevention of oxidation during brazing**

## 6-6. Replenishing refrigerant

In order to assure the reliability of the appliance, the amount of refrigerant to be replenished shall be subject to the following restrictions. Follow the margin of excess replenished refrigerant, which is equivalent to the current R22, R410A. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in failure, explosion of the product, or personal injury.

### [Possible gas leakage]

Recharging refrigerant is allowed only if it is confirmed that the amount of leakage (e.g. slow leakage upon installation) is within the additional margin specified below

The amount of leakage is not certain if the product does not function properly (e.g. insufficient cooling / heating performance). In such case, recover the refrigerant and replenish the refrigerant.

### [Restrictions for the amount of additional charging]

- a. The amount of refrigerant additionally charged shall not exceed 10% of that specified. If the situation is not solved with such amount, recover the refrigerant completely and charge the specified amount
- b. In case of slow leakage upon installation and the pipe connection length of not over 15m, further tighten the flare nut or take other effective measures. Do not recharge the refrigerant

### [Cautions for recharging with refrigerant]

- a. Use a scale with an accuracy of at least 10g to recharge the refrigerant. Do not use a bathroom scale.
- b. If the refrigerant leaks, identify the source and make sure to repair it. The refrigerant gas is not hazardous, but if it touches a heat source (e.g. fan heater, stove), a poisonous gas may be generated.
- c. Use liquid refrigerant for replenishment. Replenish the refrigerant carefully and slowly.

## 6-6-1. Pump down process

1. Turn off the Air Conditioner system.
2. Connect the charge hose from the manifold valve to the service port of the packed valve at gas side.
3. Turn on the Air Conditioner system in cooling operation more than 10 minutes.
4. Check the operating pressure of the system should be normal value. (Ref. with product specification)
5. Release the valve rod cap of both service valves.
6. Use the Hexagon wrench to turning the valve rod of Liquid side fully close.  
(\*Make sure no entering air into the system)
7. Continue operate Air Conditioner system until the gauge of manifold dropped into the range of 0.5 - 0 kgf/cm<sup>2</sup>.
8. Use the Hexagon wrench to turning the valve rod of Gas side fully close. And turn off the Air Conditioner system immediately thereafter.
9. Remove the gauge manifold from the service port of the packed valve.
10. Securely tighten the valve rod cap to the both service valves.



### CAUTION

Should be check the compressor operating condition while pumping down process. It must not any abnormal sound, more vibration. If abnormal condition appears and must turn off the Air Conditioner immediately.



## 7. OUTDOOR CONTROL CIRCUIT

### 7-1. Outline of Main Controls

#### 1. Pulse Modulating Valve (PMV) control

- 1) For PMV with BP121, BP181 : 50 to 500 pulses during operation, respectively.
- 2) In cooling operation, PMV is controlled with the temperature difference between TS sensor and TC sensor.
- 3) In heating operation, PMV is controlled with the temperature difference between TS sensor and TE sensor.
- 4) For the temperature difference in items 2) and 3), -1 to 5K is aimed as the target in both cooling and heating operations.
- 5) When the cycle excessively rose in both cooling and heating operations, PMV is controlled by TD sensor.

The aimed value is usually 212.00°F(100°C) in both cooling and heating operations.

### REQUIREMENT

A sensor trouble may cause a liquid back-flow or abnormal overheat resulting in excessive shortening of the compressor life. In a case of trouble on the compressor, be sure to check there is no error in the resistance value an the refrigerating cycle of each sensor after repair and then start the operation.

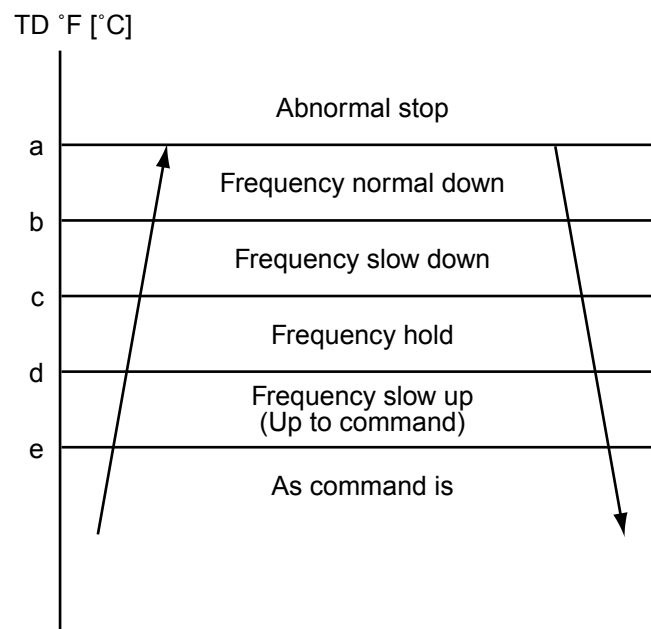
#### 2. Discharge temperature release control

- 1) When the discharge temperature did not fall or the discharge temperature rapidly went up by PMV control, this control lowers the compressor frequency. It subdivides the frequency control up to 0.6Hz to stabilize the cycle.
- 2) When the discharge temperature detected an abnormal stop zone, the compressor stops and then restarts after 2 minutes 30 seconds.

The error counting is cleared when the operation continued for 10 minutes. If the error is detected by 4 times without clearing, the error is determined and restarting is not performed.

\* The cause is considered as excessively little amount of refrigerant, PMV error or clogging of the cycle.

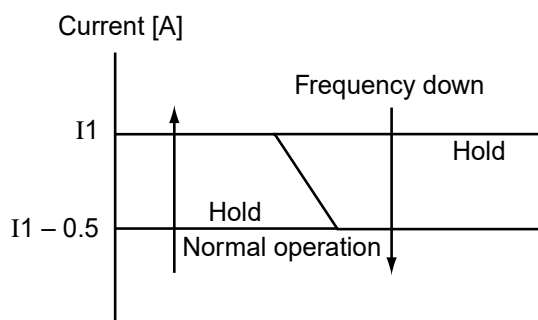
- 3) For displayed contents of error, confirm on the check code list.



a	b	c	d	e
242(117)	239(115)	223(106)	217(103)	205(96)

### 3. Current release control

The output frequency and the output voltage are controlled by AC current value detected by current transformer on the outdoor P.C. board so that input current of the inverter does not exceed the specified value



Model	COOL	HEAT
I1 value [A]	10.1	12.0

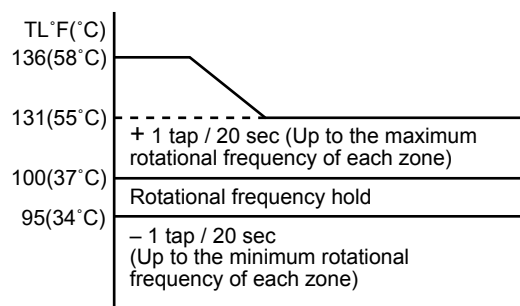
### 4. Outdoor fan control

Allocations of fan tap revolutions [rpm]

Model	W1	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	WC	WD	WE	WF
BP121, BP181	200	300	350	410	480	500	530	560	640	670	700	800	850	1000	1050

#### 4-1. Cooling fan control

- 1) An outdoor fan is controlled by TL sensor, TO sensor and compressor frequency. An outdoor fan is controlled at 1-tap interval of DC fan control.
- 2) At the start time, the fan is fixed for 60 seconds only with the maximum fan tap corresponded to the zone in the following table but it is controlled with TL sensor temperature after then.



Temp. range	20.4Hz or lower		20.4Hz to 58.8Hz		58.8Hz or higher	
	Min.	Max.	Min.	Max.	Min.	Max.
$100(38^{\circ}\text{C}) \leq \text{TO}$	W6	WB	W8	WE	WA	WE
$84(29^{\circ}\text{C}) \leq \text{TO} < 100(38^{\circ}\text{C})$	W5	WA	W7	WE	W9	WE
$59(15^{\circ}\text{C}) \leq \text{TO} < 84(29^{\circ}\text{C})$	W3	W7	W5	W9	W7	WB
$41(5^{\circ}\text{C}) \leq \text{TO} < 59(15^{\circ}\text{C})$	W2	W5	W4	W7	W6	W9
$32(0^{\circ}\text{C}) \leq \text{TO} < 49(5^{\circ}\text{C})$	W1	W3	W3	W5	W4	W7
$25(-4^{\circ}\text{C}) \leq \text{TO} < 32(0^{\circ}\text{C})$	W1	W2	W2	W4	W3	W5
$\text{TO} < 25(-4^{\circ}\text{C})$	OFF	OFF	OFF	W3	W1	W4
TO error	OFF	WB	OFF	WE	W1	WE

#### 4-2. Heating fan control

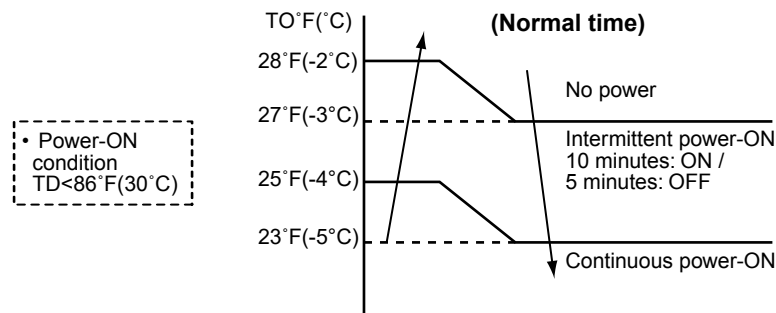
- 1) An outdoor fan is controlled by TE sensor, TO sensor and compressor frequency. (It is controlled with W1 for minimum and the maximum is controlled according to the following table.)
- 2) At the start time, the fan is fixed for 3 minutes only with the maximum fan tap corresponded to the zone in the following table but it is controlled with TE sensor temperature after then.
- 3) When a status  $TE \geq 75^{\circ}\text{F}(24^{\circ}\text{C})$  continues for 5 minutes, the operation stops. In this case, no error display appears and the status is same as the normal thermo-OFF. The can restarts after approx. 2 minutes 30 seconds and this continuous operation is not an error.
- 4) When the above status as 3) occurs frequently, it is considered that filter of the suction part of the indoor unit is dirty. Clean the filter and restart the operation.

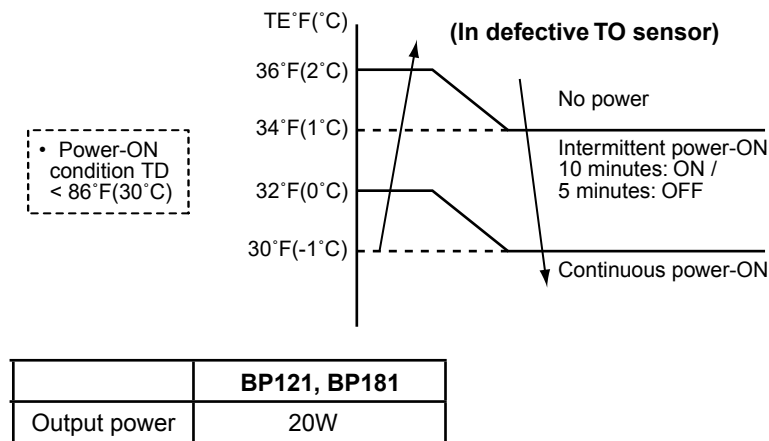
TE°F(°C)	– 2 tap / 20 seconds (up to W1) Stop timer count
75(24°C)	– 2 tap / 20 seconds (up to W1)
70(21°C)	– 1 tap / 20 seconds (up to W1)
64(18°C)	Rotational frequency hold
59(15°C)	+ 1 tap / 20 seconds (up to Max. tap of each zone)

Temp. range	20.4 Hz or lower	20.4Hz to 45.0Hz	45.0Hz or higher
	Max.	Max.	Max.
$50(10^{\circ}\text{C}) \leq \text{TO}$	W7	W8	W9
$41(5^{\circ}\text{C}) \leq \text{TO} < 50(10^{\circ}\text{C})$	W9	WB	WE
$27(-3^{\circ}\text{C}) \leq \text{TO} < 41(5^{\circ}\text{C})$	WE	WE	WE
$14(-10^{\circ}\text{C}) \leq \text{TO} < 27(-3^{\circ}\text{C})$	WE	WE	WE
$\text{TO} < 14(-10^{\circ}\text{C})$	WF	WF	WF
TO error	WF	WF	WF

#### 5. Coil heating control

- 1) This control function heats the compressor by turning on the stopped compressor instead of a case heater. It purposes to prevent stagnation of the refrigerant inside of the compressor.
- 2) As usual, turn on power of the compressor for the specified time before a test run after installation otherwise a trouble of the compressor may be caused.  
As same as a test run, it is recommended to turn on power of the compressor beforehand when starting operation after power of the compressor has been interrupted and left as it is for a long time.
- 3) A judgment for electricity is performed by TD and TO sensors.  
If TO sensor is defective, a backup control is automatically performed by TE sensor.  
For a case of defective TO sensor, judge it with outdoor LED display.
- 4) For every model, the power is turned off when TD is  $86^{\circ}\text{F}(30^{\circ}\text{C})$  or more.





## REQUIREMENT

While heating the coil, the power sound may be heard. However it is not a trouble.

### 6. Short intermittent operation preventive control

- For 3 to 10 minutes after operation start, in some cases, the compressor does not stop to protect the compressor even if receiving the thermostat-OFF signal from indoor.  
However it is not abnormal status. (The operation continuance differs according to the operation status.)
- When the operation stops by the remote controller, the operation does not continue.

### 7. Current release value shift control

- This control purposes to prevent troubles of the electronic parts such as the compressor driving elements and the compressor during cooling operation.
- The current release control value (I1) is selected from the following table according to TO sensor value.

#### Current release control value (I1)

Temperature range	[A]
$122^{\circ}\text{F}(50^{\circ}\text{C}) \leq \text{TO}$	4.7
$113^{\circ}\text{F}(45^{\circ}\text{C}) \leq \text{TO} \leq 118^{\circ}\text{F}(47.5^{\circ}\text{C})$	4.7
$104^{\circ}\text{F}(40^{\circ}\text{C}) \leq \text{TO} < 113^{\circ}\text{F}(45^{\circ}\text{C})$	6.2
$\text{TO} < 104^{\circ}\text{F}(40^{\circ}\text{C})$	10.1
TO error	4.7

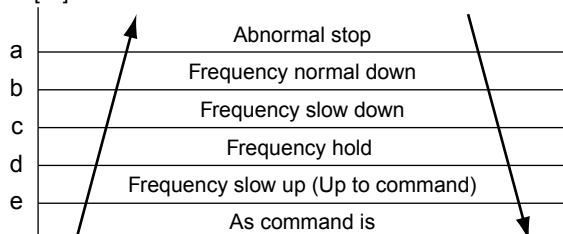
### 8. Over-current protective control

- When the over-current protective circuit detected an abnormal current, stop the compressor.
- The compressor restarts after 2 minutes 30 seconds setting [1] as an error count.
- When the error count [8] was found, determine an error and restart operation is not performed.
- For the error display contents, confirm on the check code list

### 9. High-pressure release control

- The operation frequency is controlled to restrain abnormal rising of high pressure by TL sensor in cooling operation and TC sensor in heating operation.
- When TL sensor in cooling operation or TC sensor in heating operation detects abnormal temperature of the stop zone, stop the compressor and the error count becomes +1.
- When the compressor stopped with 2), the operation restarts from the point of the normal operation zone (e point or lower) where it returned after 2 minutes 30 seconds.
- The error count when the compressor stopped with 2) is cleared after the operation continued for 10 minutes.  
If the error count becomes [10] without clearing, the error is determined and reactivation is not performed.
- For the error display contents, confirm on the check code list

HEAT TC / COOL TL  
°F[°C]



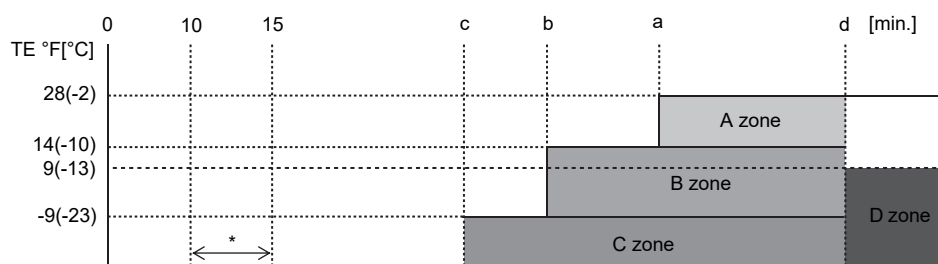
°F[°C]

	BP121, BP181	
	HEAT	COOL
	TC	TL
a	144(62°C)	145(63°C)
b	135(57°C)	145(63°C)
c	131(55°C)	142(61°C)
d	127(53°C)	138(59°C)
e	120(49°C)	131(55°C)

## 10. Defrost control

- ① In heating operation, defrost operation is performed when TE sensor temperature satisfies any condition i A zone to D zone.
- ② The defrost operation is immediately finished if TE sensor temperature has become 54°F(12°C) continuing for 3 seconds or more, or it also is finished when condition of 45°F(7°C) < TE 54°F(12°C) has continued for 1 minute. The defrost operation is also finished when defrost operation has continued for 10 minutes even if TE sensor temperature has become 45°F(7°C) or lower.
- ③ After defrost operation has finished, the compressor and the outdoor fan start heating operation after stopped for approx. 40 seconds.

## Start of heating operation



\* From 10 minutes to 15 minutes after a heating operation started, the minimum value of TE is stored in memory as TEO and the minimum temperature of TO as ToO.

	At normal TO	At error TO
<b>A zone</b>	When status of $[(TEO - TE) - (ToO - TO)] \geq 37(3^{\circ}C)$ continued for 20 seconds	When status of $[(TEO - TE) \geq 37(3^{\circ}C)]$ continued for 20 seconds
<b>B zone</b>	When status of $[(TEO - TE) - (ToO - TO)] \geq 36(2^{\circ}C)$ continued for 20 seconds	When status of $[(TEO - TE) \geq 36(2^{\circ}C)]$ continued for 20 seconds
<b>C zone</b>	When status of $[TE \leq -13^{\circ}F(-25^{\circ}C)]$ continued for 20 seconds	
<b>D zone</b>	When compressor operation status with $TE < 9(-13^{\circ}C)$ is added by d times	

	BP121, BP181
a	43
b	41
c	31
d	70

## 11. High-pressure switch

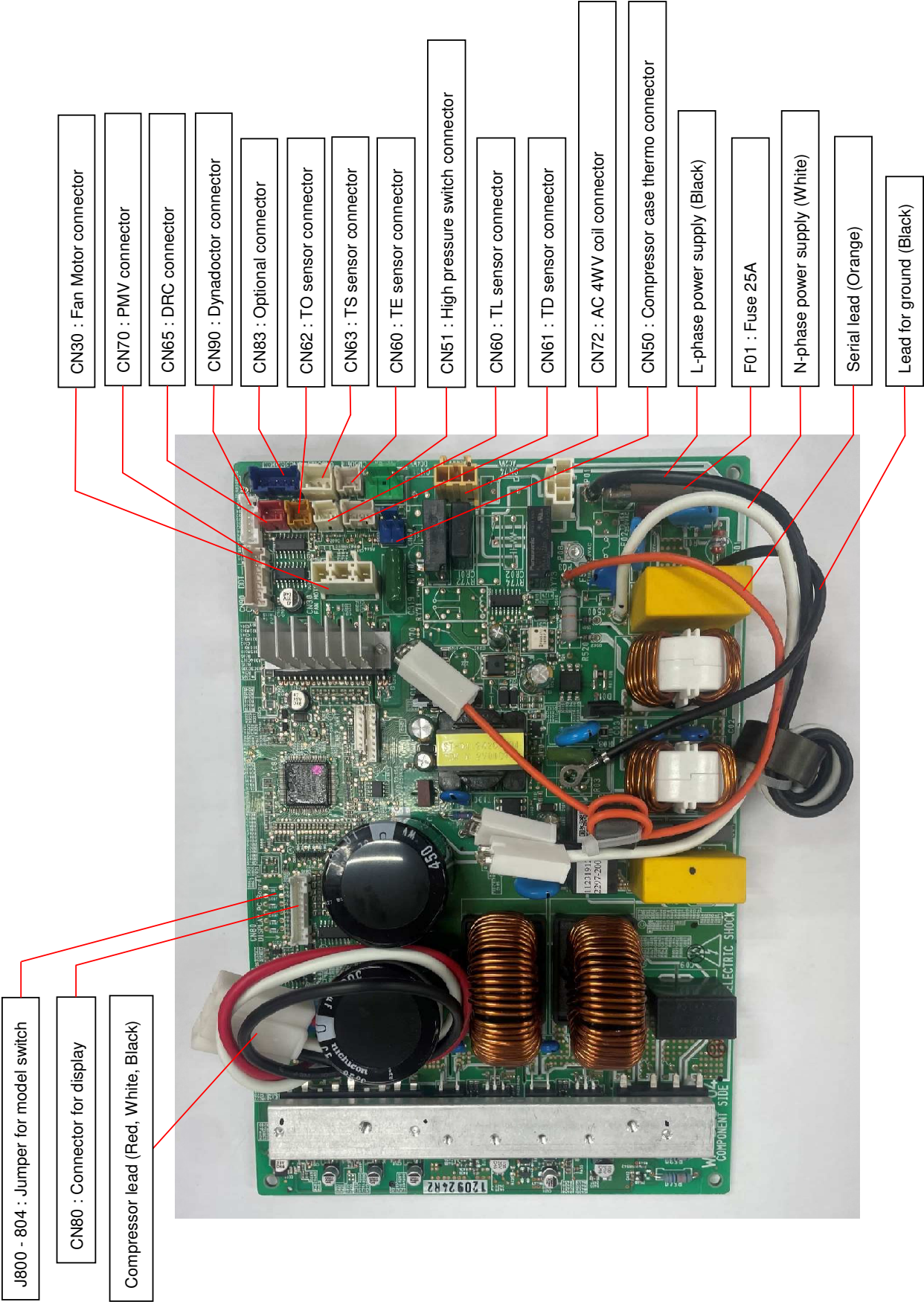
- 1) When the high-pressure switch operates, the operation of the compressor is terminated.
- 2) The compressor restarts after 5 minutes using [1] as an error count.  
After restart, the error count is cleared when operation continues for 10 minutes or more.
- 3) An error is confirmed with the error count [10].
- 4) For the indicated contents of error, confirm using the check code table.

## 12. Control of compressor case thermo

- 1) The compressor stops when the case thermo of the compressor operated.
- 2) When the case thermo operated for approx. 80 seconds, H04 error code is displayed on the wired remote controller. → Refer to the Check Code.
- 3) When the case thermo is reset, the operation restarts.

7-2. Outdoor Print Circuit Board

<WP-528>



## 8. TROUBLESHOOTING

### 8-1. Summary of Troubleshooting

#### <Wired remote controller type>

#### 1. Before troubleshooting

- 1) Required tools/instruments
  - ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, push pins for reset switch
  - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation the following points before check
  - a) The following operations are normal.
    1. Compressor does not operate.
      - When 3-minutes delay (3 minutes after compressor OFF)
      - When the outdoor unit is in standby mode due to the room temperature reached the setup temperature
      - When the timer is operating
      - When indoor fan only operation mode
      - When an overflow error is detected in the indoor unit
      - When outside high-temperature operation controlled is in heating operation
      - When Thermo-OFF setting by Application Control Kit (TCB-PCOS1UL)
    2. Indoor fan does not rotate.
      - When cool air discharge prevention control is working in heating operation
    3. Outdoor fan does not rotate or air volume changes.
      - When high-temperature release operation control is working in heating operation
      - When outside low-temperature operation control is working in cooling operation
      - When defrost operation is being performed
    4. ON/OFF operation cannot be performed from remote controller.
      - When the control operation is being performed from outside/remote side
      - When automatic address is being set up  
(When the power is turned on at the first time or when indoor unit address setting is changed, the operation will be performed after power-ON in 5 minutes or before.)
      - When the test run is being performed by operation of the outdoor controller
- 3) Did you return the cabling to the initial positions?
- 4) Are indoor unit and remote controller connected correctly?

#### 2. Troubleshooting procedure

When a trouble occurred, check the parts along with the following procedure.



#### NOTE

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Microcomputer misdiagnosis may also be caused by power condition problem and outer noise other than the checked items. If there is any noise source, change the cables of the remote controller to shield cables.

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## <Wireless remote controller type>

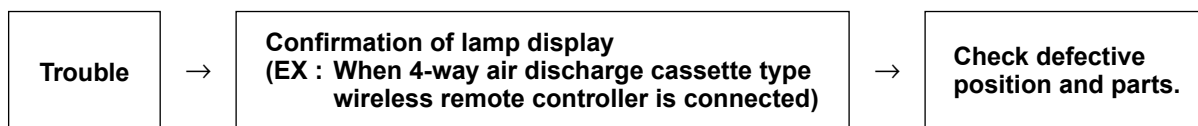
### 1. Before troubleshooting

- 1) Required tools/instruments
  - ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, etc.
  - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation the following points before chec
  - a) The following operations are normal.
    1. Compressor does not operate.
      - When 3-minutes delay (3 minutes after compressor OFF)
      - When the outdoor unit in standby status due to the room temperature reached the setup temperature
      - When the timer is operating
      - When indoor fan only operation mode
      - When an overflow error is detected on the indoor uni
      - When outside high-temperature operation controlled is in heating operation
      - When Thermo-OFF setting by Application Control Kit (TCB-PCOS1UL)
    2. Indoor fan does not rotate.
      - Does not cool air discharge preventive control work in heating operation?
    3. Outdoor fan does not rotate or air volume changes.
      - When high-temperature release operation control is working in heating operation
      - When outside low-temperature operation control is working in cooling operation
      - When defrost operation is being performed
    4. ON/OFF operation cannot be performed from remote controller.
      - When forced operation is being performed
      - When the control operation is being performed from outside/remote side
      - When automatic address being set up
      - When the test run is being performed by operation of the outdoor controller
  - a) Did you return the cabling to the initial positions?
  - b) Are connecting cables between indoor unit and receiving unit correct?

### 2. Troubleshooting procedure

(When the power is turned on at the first time or when indoor unit address setting is changed, the operatio will be performed after power-ON in 5 minutes or before.)

When a trouble occurred, check the parts along with the following procedure.



#### 1) Outline of judgment

The primary judgment to check where a trouble occurred in indoor unit or outdoor unit is performed with the following method.

---

### The errors can be identified by lamp indication of indoor unit (sensors of the receiving unit)

---

The indoor unit monitors operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.




## 8-2. Troubleshooting






### 8-2-1. Outline of judgment

The following method can be done to check whether the problem occurred in indoor or outdoor unit.

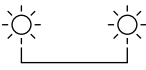
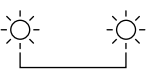
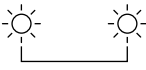
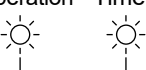
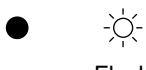
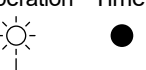
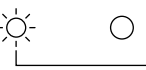
The error is indicated by indication lamp on the display of the indoor unit. (sensors of the receiving part)

The indoor unit monitors the operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.

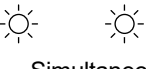
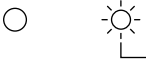
● : OFF, ○ : ON,  : Flash (0.5 sec.)

Lamp indication	Check code	Cause of trouble
Operation   Timer   Ready ●   ●   ● No indication at all	—	Power supply OFF or miswiring between receiving unit and indoor unit
Operation   Timer   Ready  ●   ● Flash	E01	Receiving error
	E02	Sending error
	E03	Communication stop
	E08	Duplicated indoor unit No.
	E09	Duplicated header units of remote controller
	E10	Communication error between CPUs on indoor unit P.C. board
	E11	Communication error between Application control kit and indoor unit P.C. board
	E18	Wire connection error between indoor units, Indoor power OFF (Communication stop between indoor master and follower or between main and sub indoor twin)
	E04	Miswiring between indoor unit and outdoor unit or connection error (Communication stop between indoor and outdoor units)
Operation   Timer   Ready ●   Alternate flash	P10	Overflow was detected.
	P12	Indoor DC fan error
Operation   Timer   Ready  ●  Alternate flash	P03	Outdoor unit discharge temp. sensor error
	P04	Case thermostat operation, High pressure protective operation, High pressure SW system error, Power supply error,
	P05	Power supply error
	P07	Heat sink overheat error
	P15	Gas leak detection
	P19	4-way valve inverse error (Indoor or outdoor unit detected)
	P20	High pressure protective operation
	P22	Outdoor unit fan system error
	P26	Short-circuit of compressor drive element
	P29	Position detection circuit error
	P31	Stopped because of error of other indoor units in a group (Check codes of E03/L03/L07/L08)

**Note :** In case that wire remote controller show error E04, please check error code at LED display outdoor too.

Lamp indication	Check code	Cause of trouble occurrence
Operation Timer Ready  Alternate flash	F01	Heat exchanger sensor (TCJ) error
	F02	Heat exchanger sensor (TC) error
	F10	Heat exchanger sensor (TA) error
Operation Timer Ready  Alternate flash	F04	Discharge temp. sensor (TD) error
	F06	Temp. sensor (TE, TS, TL) error
	F07	Heat exchanger temp. sensor (TL) error
	F08	Outside air temp. sensor (TO) error
	F12	Suction temp. sensor (TS) error
	F13	Heat sink temp. sensor (TH) error
	F15	Miss-mounting of temp. sensor (TE, TS)
Operation Timer Ready  Simultaneous flash	F29	Indoor EEPROM error
Operation Timer Ready  Simultaneous flash	F31	Outdoor EEPROM error
Operation Timer Ready  Flash	H01	Compressor break down
	H02	Compressor lock
	H03	Outdoor unit current detection circuit error
	H04	Case thermostat operation
Operation Timer Ready  Simultaneous flash	L03	Duplicated header indoor units
	L07	There is indoor unit of group connection in individual indoor unit.
	L08	Unsetting of group address
	L09	Missed setting (Unset indoor capacity)
Operation Timer Ready  Simultaneous flash	L10	Outdoor unit unset model type of service P.C. board
	L20	Duplicated indoor central addresses
	L29	Outdoor P.C. board part error was detected (EEPROM error, Heat sink temp. sensor (TH) error) Outdoor unit unset model type of service P.C. board. Outdoor Heat sink overheat error, Gas leak detection, or 4-way valve system error.
	L30	Outside interlock error











## 8-2-2. Others (Other than Check Code)

Lamp indication	Check code	Cause of trouble occurrence
Operation Timer Ready  Simultaneous flash	—	During test run
Operation Timer Ready  Alternate flash	—	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model)

### 8-2-3. Monitor Function of Remote Controller Switch

#### ■ Calling of sensor temperature display

The sensor temperature or operational status of indoor unit, outdoor unit, or remote controller can be monitored.

- 1** Push [  Menu] to open the “Menu”.
- 2** Push and hold [  Menu] and [  ] at the same time to open “Field setting menu”.
  - Push and hold 4 second .
- 3** Push [  ] and [  ] to select “Monitor function”, and then push [  Set/Fix].
  - In a group connection, after a selection in the unit selection screen, move to the “Monitor function” screen.
- 4** Push [  ] to black highlight the code (DN), and then push [  ] and [  ] to change to CODE No. of the item to monitor. Refer to the next page for CODE No..
- 5** Push [  Return]
  - Return to the “Field setting menu” screen.

Indoor unit data	
Code	Data name
01	Room temperature (remote controller)
02	Indoor unit intake air temperature (TA)
03	Indoor unit heat exchanger (coil) temperature (TCJ)
04	Indoor unit heat exchanger (coil) temperature (TC)
F3	Indoor unit fan cumulative operating hours (x1 h)
E2	Indoor unit refrigerant leak detection sensor output*

Outdoor unit data	
Code	Data name
60	Outdoor unit heat exchanger (coil) temperature (TE)
61	Outside air temperature (TO)
62	Compressor discharge temperature (TD)
63	Compressor suction temperature (TS)
65	Heatsink temperature (THS)
6A	Operating current (x1/10)
6D	Outdoor heat exchange (coil) temperature (TL)
F1	Compressor cumulative operating hours (x100 h)

\* Display and the contents

- - - : Sensor function is not available.
- 0000 : Normal
- 0001 : Sensor has been used for 5 years.
- 0002 : Sensor trouble or exceeding the life of the product for sensor
- 0003 : Sensor is detecting refrigerant leak

## 8-2-4. Check Code List (Outdoor)

ALT (Alternate): Alternate flashing when there are two flashing LED/SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

○ : ON, ◎ : Flash, ● : OFF

Central Control indication	Remote Controller indication	Sensor lamp part		Defected position	Detection	Explanation of error contents	Automatic Reset	Operation continuation
		Block indication	Flash					
19	F04	◎ ◎ ○	ALT	Outdoor unit Discharge temp. sensor (TD) error	Outdoor	Disconnection, short of discharge temp. sensor (TD) was detected	×	×
18	F06	◎ ◎ ○	ALT	Outdoor unit heat exchanger temp. sensor (TE) error	Outdoor	Disconnection, short of outdoor unit heat exchanger temp. sensor (TE) was detected.	×	×
18	F07	◎ ◎ ○	ALT	Outdoor unit Heat exchanger temp. sensor (TL) error	Outdoor	Disconnection, short of outside heat exchanger temp. Sensor (TL) was detected.	×	×
1b	F08	◎ ◎ ○	ALT	Outdoor unit Outside air temp. sensor (TO) error	Outdoor	Disconnection, short of outside air temp. Sensor (TO) was detected.	○	○
A2	F12	◎ ◎ ○	ALT	Outdoor unit Suction temp. sensor (TS) error	Outdoor	Disconnection, short of suction temp. Sensor (TS) was detected.	×	×
43	F13	◎ ◎ ○	ALT	Outdoor unit Heat sink temp. sensor (TH) error	Outdoor	Disconnection, short of heat sink temp. Sensor (TH) (P.C. board installed) was detected.	×	×
18	F15	◎ ◎ ○	ALT	Outdoor unit Miss-mounting of temp. sensor (TE, TS)	Outdoor	Miss-mounting of outdoor heat exchanger temp. sensor (TE) and suction temp. sensor (TS) was detected.	×	×
1F	H01	● ◎ ●		Outdoor unit Compressor break down	Outdoor	Reached release point at min-Hz during compressor operating, Short-circuited current (Ibc) was detected after DC excitation.	×	×
1d	H02	● ◎ ●		Outdoor unit Compressor lock	Outdoor	Compressor lock was detected.	×	×
17	H03	● ◎ ●		Outdoor unit Current detection circuit error	Outdoor	Current detection circuit error.	×	×
44	H04	● ◎ ●		Outdoor unit case thermostat operated	Outdoor	Case thermostat operated.	×	×
88	L10	◎ ○ ◎	SIM	Outdoor unit Unset model type of service P.C. board	Outdoor	When outdoor service P.C. board was used, model type select jumper setting was inappropriate.	×	×
1C	L29	◎ ○ ◎	SIM	Outdoor unit error	Outdoor	1) Outdoor P.C. board part error was detected (EEPROM error, Heat sink temp. sensor (TH) error) 2) Outdoor unit Unset model type of service P.C. board. 3) Outdoor Heat sink overhear error, Gas leak detection, or 4-way valve system error.	×	×
1E	P03	◎ ● ◎	ALT	Outdoor unit Discharge temp. error	Outdoor	Error was detected by discharge temp. release control.	×	×
21	P04	◎ ● ◎	ALT	Outdoor unit High pressure SW system error	Outdoor	High pressure protection switch operated.	×	×
AF	P05	◎ ● ◎	ALT	Power supply error	Outdoor	Power supply voltage error.	×	×
1C	P07	◎ ● ◎	ALT	Outdoor unit Heat sink overhear error	Outdoor	Abnormal overhear was detected by outdoor heat sink temp. sensor (TH).	×	×
AE	P15	◎ ● ◎	ALT	Gas leak detection	Outdoor	Abnormal overhear of discharge temp. sensor (TD) or suction temp. sensor (TS) was detected.	×	×
22	P20	◎ ● ◎	ALT	Outdoor High pressure protective operation	Outdoor	Error was detected by high pressure release control from indoor / outdoor heat exchanger temp. sensor.	×	×
1A	P22	◎ ● ◎	ALT	Outdoor unit Outdoor fan system error	Outdoor	Error (Over-current, lock, etc.) was detected on outdoor fan drive circuit.	×	×
14	P26	◎ ● ◎	ALT	Outdoor unit Short-circuit of compressor drive element	Outdoor	Short-circuited protective operation of compressor drive circuit element (G-Tr / IGBT) operated.	×	×
16	P29	◎ ● ◎	ALT	Outdoor unit Position detection circuit error	Outdoor	Position detection error of compressor motor was detected.	×	×
97	E01	◎ ● ●		No remote controller master unit Remote controller communication error	Remote controller	Signal was not received from indoor unit. Main remote controller was not set. (including 2 remote controllers)	—	—
—	E02	◎ ● ●		Remote controller send error	Remote controller	Signal cannot be sent to indoor unit.	—	—
97	E03	◎ ● ●		Regular communication error between indoor and remote controller	Indoor	No communication from remote controller and network adapter	○	×
04	E04	● ● ◎		Indoor/Outdoor serial error	Indoor	Serial communication error between indoor and outdoor	○	×
96	E08	◎ ● ●		Duplicated indoor addresses	Indoor	Same address as yours was detected.	○	×
99	E09	◎ ● ●		Duplicated main remote controllers	Remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	×
CF	E10	◎ ● ●		Communication error between CPU	Indoor	MCU communication error between main motor and micro computer	○	△

Central Control indication	Remote Controller indication	Sensor lamp part			Defected position	Detection	Explanation of error contents	Automatic Reset	Operation continuation
		Block indication	Operation	Timer Ready					
4B	E11	○ ● ● ●	○		Communication error between Application control kit and indoor unit	Indoor	Communication error between Application control kit and indoor unit P.C. board	○	×
97,99	E18	○ ● ● ●	○		Regular communication error between master and follower indoor units	Indoor	Regular communication cannot be performed between master and follower indoor units.	○	×
96	L03	○ ● ● ●	○	SIM	◇ Duplicated indoor master units	Indoor	Communication between twin master (Main unit) and follower (sub unit) cannot be performed. There are multiple master units in a group.	×	×
99	L07	○ ● ● ●	○	SIM	◇ There is group cable in individual indoor unit.	Indoor	When even one group connection indoor unit exists in individual indoor unit	×	×
99	L08	○ ● ● ●	○	SIM	◇ Unset indoor group address	Indoor	Indoor address group was unset.	×	×
46	L09	○ ● ● ●	○	SIM	◇ Unset indoor capacity	Indoor	Capacity of indoor unit was unset.	×	×
66	L30	○ ○ ○ ○	○	SIM	Outside error input to indoor unit (Interlock)	Indoor	Abnormal stop by CN80 outside error input	×	×
08	P19	○ ● ● ●	○	ALT	4-way valve inverse error	Indoor Outdoor	In heating operation, error was detected by temp. down of indoor heat exchanger or temp. up of TE, TS.	○	×

◇ When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

## Error mode detected by indoor unit

Operation of diagnostic function				Judgment and measures
Check code	Cause of operation	Status of air conditioner	Condition	
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	1. Check wires of remote controller and communication adapters. • Remote controller LCD display OFF (Disconnection) • Central remote controller [97] check code
E04	The serial signal is not output from outdoor unit to indoor unit. • Miswiring of inter-unit wire • Defective serial sending circuit on outdoor P.C. board • Defective serial receiving circuit on indoor P.C. board	Stop (Automatic reset)	Displayed when error is detected	1. Outdoor unit does not completely operate. • Inter-unit wire check, correction of miswiring • Check outdoor P.C. board. Correct wiring of P.C. board. 2. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address	Stop	Displayed when error is detected	1. Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on (Finish of group construction/Address check). * If group construction and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)
L03	Duplicated indoor header unit			
L07	There is group wire in individual indoor unit.			
L08	Unset indoor group address			
L09	Unset indoor capacity	Stop	Displayed when error is detected	1. Set indoor capacity (DN=11)
L30	Abnormal input of outside interlock	Stop	Displayed when error is detected	1. Check outside devices. 2. Check indoor P.C. board.
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	1. Trouble of drain pump 2. Clogging of drain pump 3. Check float switch. 4. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	1. Position detection error 2. Over-current protective circuit of indoor fan driving unit operated. 3. Indoor fan locked. 4. Check indoor P.C. board.
P19	4-way valve system error • After heating operation has started, indoor heat exchanger temp. is down.	Stop (Automatic reset)	Displayed when error is detected	1. Check 4-way valve. 2. Check 2-way valve and check valve. 3. Check indoor heat exchanger (TC/TCJ). 4. Check indoor P.C. board.
P31	Own unit stops while warning is output to other indoor units.	Stop (Follower unit) (Automatic reset)	Displayed when error is detected	1. Judge follower unit while header unit is [E03], [L03], [L07] or [L08]. 2. Check indoor P.C. board.
F01	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TCJ). 2. Check indoor P.C. board.
F02	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TC). 2. Check indoor P.C. board.
F10	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temp. sensor (TA). 2. Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor EEPROM. (including socket insertion) 2. Check indoor P.C. board.
E10	Communication error between indoor MCU • Communication error between fan driving MCU and main MCU	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor P.C. board.
E18	Regular communication error between indoor header and follower units and between main and sub units	Stop (Automatic reset)	Displayed when error is detected	1. Check remote controller wiring. 2. Check indoor power supply wiring. 3. Check indoor P.C. board.

## Error mode detected by outdoor unit

Operation of diagnostic function				Judgment and measures
Check code	Cause of errors	Status of air conditioner	Condition	
Indoor unit				
F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	1. Check discharge temp. sensor (TD). 2. Check outdoor P.C. board
F06	Disconnection, short of heat exchanger temp. sensor (TE)	Stop	Displayed when error is detected	1. Check heat exchanger temp. sensor (TE). 2. Check outdoor P.C. board .
F07	Disconnection, short of heat exchanger temp. sensor (TL)	Stop	Displayed when error is detected	1. Check heat exchanger temp. sensor (TL). 2. Check outdoor P.C. board .
F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	1. Check suction temp. sensor (TS). 2. Check outdoor P.C. board.
F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	1. Check temp. sensor (TE, TS). 2. Check outdoor P.C. board.
F08	Disconnection, short of outside air temp. sensor (TO)	Continue	Displayed when error is detected	1. Check outside air temp. sensor (TO). 2. Check outdoor P.C. board.
F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	1. Check outdoor P.C. board
F31	Outdoor EEPROM error	Stop	Displayed when error is detected	1. Check outdoor P.C. board.
L10	Unset model type of service P.C. board	Stop	Displayed when error is detected	1. Outdoor service P.C. board. Check model type setting jumper wire.
P07	Heat sink overheat error * Heat sink temp. sensor detected over specified temperature.	Stop	Displayed when error is detected	1. Check screw tightening between P.C. board and heat sink and check radiator grease. 2. Check heat sink blast path.
P15	Detection of gas leak * Discharge temp. sensor (TD), Suction temp. sensor (TS) detected temperature over specified temp.	Stop	Displayed when error is detected	1. Check gas leak, recharge 2. Check full open of service valve. 3. Check PMV (Pulse Motor Valve). 4. Check broken pipe. 5. Check discharge temp. sensor (TD), suction temp. sensor (TS).
P19	4-way valve inverse error * After heating operation has started, indoor heat exchanger temp. drops under the specified temp. * After heating operation has started, outdoor heat exchanger / suction temp. rises over the specified temp.	Stop	Displayed when error is detected	1. Check operation of 4-way valve. 2. Check outdoor heat exchanger (TE), suction temp. sensor (TS). 3. Check indoor heat exchanger sensor (TC). 4. Check 4-way valve coil. 5. Check PMV (Pulse Motor Valve).
H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	1. Check power supply voltage. (60 Hz : AC 198 to 242 V) 2. Overload operation of refrigerating cycle
H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	1. Compressor problem (Lock, etc.): Replace compressor. 2. Compressor wiring error (Open phase)

Operation of diagnostic function				Judgment and measures
Check code	Cause of errors	Status of air conditioner	Condition	
Indoor unit				
H03	Current detection circuit error	Stop	Displayed when error is detected	1. Check outdoor P.C. board. (AC current detection circuit)
H04	Case thermostat operation *Abnormal overheat of compressor	Stop	Displayed when error is detected	1. Check case thermostat and its connector 2. Check gas leak, recharge 3. Check full open of service valve 4. Check PMV (Pulse Motor Valve) 5. Check broken pipe
P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	1. Check refrigerating cycle (Gas leak) 2. Check PMV (Pulse Motor Valve) 3. Check discharge temp. sensor (TD).
P04	High pressure SW system error	Stop	Displayed when error is detected	1. Check service valves are fully opened. (Gas side, Liquid side) 2. Check outdoor fan operation. 3. Check motor error of outdoor fan. 4. Check clogging of outdoor PMV. 5. Check clogging of heat exchanger in indoor/outdoor units. 6. Short-circuit of suction/discharge air in outdoor unit. 7. Check outdoor P.C. board error. 8. Check fan system error (Cause of air volume drop) at indoor side. 9. Check PMV opening status in indoor unit.
P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage. (60 Hz : AC 198 to 242 V)
P20	High pressure protective operation • During cooling operation, outdoor temp. sensor (TL) detected temperature over specified temp. • During heating operation, indoor temp. sensor (TC, TCJ) detected temperature over specified temp.	Stop	Displayed when error is detected	1. Check outdoor heat exchanger sensor (TL). 2. Check indoor heat exchanger sensor (TC, TCJ). 3. Check full open of service valve. 4. Check indoor/outdoor fan. 5. Check PMV (Pulse Motor Valve). 6. Check clogging and short circuit of indoor/outdoor heat exchanger. 7. Overcharge of refrigerant. Recharge
P22	Outdoor fan system error	Stop	Displayed when error is detected	1. Check lock of fan motor. 2. Check power supply voltage. (60 Hz : AC 198 to 242V) 3. Check outdoor P.C. board.
P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	1. When performing operation while taking-off compressor wire. If P26 error occurs, check control P.C. board. 2. When performing operation while taking-off compressor wire. If an error does not occurs, compressor is layer short.
P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board.

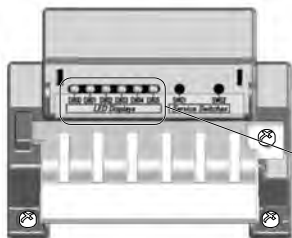


## Contents Error Display

- \* When the errors were overlapped, the latest error is displayed.
- \* When D800 to D804 are slowly flashing or D805 is flashing, push and hold SW01 and SW02 simultaneously for 5 seconds or more. The error display changes to the error which is generated.

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times /second)

No.	Error	Check code [Wired remote controller]	LED display					
			D800 (Yellow)	D801 (Yellow)	D802 (Yellow)	D803 (Yellow)	D804 (Yellow)	D805 (Green)
1	Normal	—	●	●	●	●	●	○
2	Discharge temperature sensor (TD) error	F04	◎	●	●	●	●	○
3	Heat exchanger temperature sensor (TE) error	F06	●	◎	●	●	●	○
4	Heat exchanger temperature sensor (TL) error	F07	◎	◎	●	●	●	○
5	Outside temperature sensor (TO) error	F08	●	●	◎	●	●	○
6	Suction temperature sensor (TS) error	F12	◎	●	◎	●	●	○
7	Heat sink temperature sensor (TH) error	F13	●	◎	◎	●	●	○
8	Miss-mounting of sensor (TE, TS)	F15	◎	◎	◎	●	●	○
9	EEPROM error	F31	●	◎	●	◎	●	○
10	Compressor breakdown	H01	◎	◎	●	◎	●	○
11	Compressor lock	H02	●	●	◎	◎	●	○
12	Current detection circuit error	H03	◎	●	◎	◎	●	○
13	Case thermostat activated	H04	●	◎	◎	◎	●	○
14	Unset model type	L10	●	●	●	●	◎	○
15	Discharge temperature sensor error	P03	●	◎	●	●	◎	○
16	High pressure SW system error	P04	◎	◎	●	●	◎	○
17	Power supply voltage error	P05	●	●	◎	●	◎	○
18	Heatsink overheating error	P07	●	◎	◎	●	◎	○
19	Gas leak detected	P15	◎	◎	◎	●	◎	○
20	4-way valve inverse error	P19	●	●	●	◎	◎	○
21	High pressure protective activated	P20	◎	●	●	◎	◎	○
22	Fan system error	P22	●	◎	●	◎	◎	○
23	Compressor driver device short circuit	P26	◎	◎	●	◎	◎	○
24	Position detection circuit error	P29	●	●	◎	◎	◎	○
25	Others (continuously operate )	-	◎	●	◎	◎	◎	○



\* The LEDs and switches are located at the outdoor unit as shown in the figure on the left.

LED displays					
○ D800 (Yellow)	○ D801 (Yellow)	○ D802 (Yellow)	○ D803 (Yellow)	○ D804 (Yellow)	○ D805 (Green)

### 8-2-5. Diagnostic Procedure for Each Check Code (Outdoor Unit)

- 1) This section describes the diagnostic method for each check code displayed on the wired remote controller.
- 2) In some cases, a check code indicates multiple symptoms.

In this case, confirm LED display on the outdoor unit to narrow the contents to be confirmed.

- 3) The check code on the wired remote controller is displayed only when the same error occurred continuously by multiple times while LED of the outdoor unit displays even an error which occurred once.

Therefore the display on the wired remote controller may differ from that of LED.

#### LED display on outdoor unit

##### Operation method of the service SW

[Display of error which is generating]

- When even one of D800 to D804 rapid flashing, it indicates that an error occurred. When D800 to D801 indicate slow flashing or when D805 flashes, push and hold SW01 and SW02 for 5 seconds or more simultaneously. The error display ex-changes to display of the error under occurrence at present.

##### [Example of discharge temp. sensor error]

(No error)

● D800 (Yellow)	● D801 (Yellow)	● D802 (Yellow)	● D803 (Yellow)	● D804 (Yellow)	○ D805 (Green)
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------------

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times /second)

(Error occurred)

◎ D800 (Yellow)	● D801 (Yellow)	● D802 (Yellow)	● D803 (Yellow)	● D804 (Yellow)	○ D805 (Green)
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------------

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times /second)

##### Display of the latest error3

- The latest error is displayed by the following action. As the memory is kept, it is confirmed even after the power supply was turned off once. (Except outside air temp. sensor (TO) error)

- 1) Check D800 to D804 are turned off (or rapid flashing) and D805 is turned on. When D800 to D804 are slowly flashing or D805 flashes, push and hold SW01 and SW02 for 5 seconds or more simultaneously. D800 to D804 will be turned off (or rapid flashing) and D805 flashes.
- 2) Push and hold SW01 for 5 seconds or more. D804 changes to slow flashing.
- 3) Push SW01 several times and change LED display (D800 to D804) to [Display of latest error (Including the present error)].
- 4) Push SW02. The latest error is displayed.
- 5) When finishing the work, be sure to execute item 1) to return LED to the initial status (Display of on occurring error).

Display of latest error

(Including the present error)

○ D800 (Yellow)	● D801 (Yellow)	● D802 (Yellow)	● D803 (Yellow)	● D804 (Yellow)	◎ D805 (Green)
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------------


○ : ON, ● : OFF, ◎ : Rapid flashing (5 times /second)

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[E04]	—	<p><b>[Indoor/Outdoor communication error]</b></p> <pre> graph TD     Q1{{Is setting of group address of remote controller correct?}} -- NO --&gt; A1[Check CODE No. [14]. Refer to "10 ADDRESS SETUP"]     Q1 -- YES --&gt; Q2{{Are inner wiring and indoor/outdoor control wires (1, 2, 3) correct?}}     Q2 -- NO --&gt; A2[Correct wiring indoor/outdoor control wires]     Q2 -- YES --&gt; Q3{{Are wiring of terminal blocks (1, 2, 3) correct?}}     Q3 -- NO --&gt; A3[Correct wiring of connectors and terminal blocks.]     Q3 -- YES --&gt; A4[Check outdoor P.C. board. Defect → Replace]           </pre>
[F04]	◎ ● ● ● ● ○	<p><b>[Discharge temp. sensor (TD) error]</b></p> <pre> graph TD     Q1{{Is CN601 connection correct? Is resistance value of TD sensor correct?}} -- NO --&gt; A1[Correct connector. Sensor error → Replace]     Q1 -- YES --&gt; A2[Check outdoor P.C. board. Defect → Replace]           </pre>
[F06]	● ◎ ● ● ● ○	<p><b>Heat exchanger temp. sensor (TE) error]</b></p> <pre> graph TD     Q1{{Is CN600 connection correct? Is resistance value of TE sensor correct?}} -- NO --&gt; A1[Correct connector. Sensor error → Replace]     Q1 -- YES --&gt; A2[Check outdoor P.C. board. Defect → Replace]           </pre>
[F07]	◎ ◎ ● ● ● ○	<p><b>[Heat exchanger temp. sensor (TL) error]</b></p> <pre> graph TD     Q1{{Is CN604 connection correct? Is resistance value of TL sensor correct?}} -- NO --&gt; A1[Correct connector. Sensor error → Replace]     Q1 -- YES --&gt; A2[Check outdoor P.C. board. Defect → Replace]           </pre>

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[F08]	● ● ◎ ● ● ○	<p><b>[Outside air temp. sensor (TO) error]</b></p> <pre> graph TD     Q1{{Is CN602 connection correct? Is resistance value of TO sensor correct?}}     Q1 -- NO --&gt; A1[Correct connector. Sensor error → Replace]     Q1 -- YES --&gt; A2[Check outdoor P.C. board. Defect → Replace]           </pre>
[F12]	◎ ● ◎ ● ● ○	<p><b>[Suction temp. sensor (TS) error]</b></p> <pre> graph TD     Q2{{Is CN603 connection correct? Is resistance value of TS sensor correct?}}     Q2 -- NO --&gt; A3[Correct connector. Sensor error → Replace]     Q2 -- YES --&gt; A4[Check outdoor P.C. board. Defect → Replace]           </pre>
[F13]	● ◎ ◎ ● ● ○	<p><b>[Heat sink temp. sensor (TH) error]</b></p> <pre> graph TD     A5[Check outdoor P.C. board. Defect → Replace]           </pre>
[F15]	◎ ◎ ◎ ● ● ○	<p><b>[Miss-mounting of outdoor temp. sensor (TE)]</b></p> <pre> graph TD     Q3{{Is mounting status of TE and TS sensors correct?}}     Q3 -- NO --&gt; A6[Correct sensor mounting.]     Q3 -- YES --&gt; Q4{{Is CN603 connection correct? Is resistance value of TS sensor correct?}}     Q4 -- NO --&gt; A7[Correct connector. Sensor error → Replace]     Q4 -- YES --&gt; Q5{{Is CN600 connection correct? Is resistance value of TE sensor correct?}}     Q5 -- NO --&gt; A8[Correct connector. Sensor error → Replace]     Q5 -- YES --&gt; A9[Check outdoor P.C. board. Defect → Replace]           </pre>

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[F31]	● ◎ ● ◎ ● ○	<b>[EEPROM error]</b> <div>Check outdoor P.C. board. Defect → Replace</div>
[H01]	◎ ◎ ● ◎ ● ○	<b>[Compressor break down]</b> <div> Is power supply voltage correct? 60 Hz : AC 198 to 242 V </div> <div> NO → Correct power supply line. </div> <div> YES → </div> <div> Is wire connection correct? Compressor lead (P.C. board side, Compressor side), Reactor lead, Power supply lead </div> <div> NO → Check wire connection and correct it. </div> <div> YES → </div> <div> Does an abnormal overload happen? </div> <div> YES → Remove and improve the cause of overload. </div> <div> NO → Check outdoor P.C. board. Defect → Replace </div>
[H02]	● ● ◎ ◎ ● ○	<b>[Compressor lock]</b> <div> Is power supply voltage correct? 60 Hz : AC 198 to 242 V </div> <div> NO → Correct power supply line. </div> <div> YES → </div> <div> Is wire connection correct? Compressor lead (P.C. board side, Compressor side), Reactor lead, Power supply lead </div> <div> NO → Check wire connection and correct it. </div> <div> YES → </div> <div> Is compressor under correct condition? </div> <div> YES → Check outdoor P.C. board. Defect → Replace </div> <div> NO → </div> <div> Is there refrigerant stagnation? </div> <div> NO → Compressor lock → Replace </div> <div> YES → </div> <div> Does PMV correctly operate? </div> <div> NO → Check TE, TS sensors and PMV. Defect → Replace </div> <div> YES → Check outdoor P.C. board. Defect → Replace </div>


Check code	Outdoor LED display	Check and troubleshooting (Item without special mention indicates part of outdoor unit.)
[H03]	● ● ● ● ● ● ● ●	<b>[Current detection circuit error]</b> <div>Check outdoor P.C. board. Defect → Replace</div>
[H04]	● ● ● ● ● ● ● ●	<b>[Case thermostat operation]</b> <div> Are CN500 connection and case thermostat correct?  NO → Correct connector. Case thermostat error → Replace  YES ↓  Short each pins of CN500. Can compressor operate?  NO → Check outdoor P.C. board. Defect → Replace  YES ↓  Is there gas leak? Is there refrigerant shortage?  YES → Repair defectives position. Recharge refrigerant.  NO ↓  Is service valve fully opened?  NO → Open service valve fully.  YES ↓  Is PMV under correct conditions?  NO → Correct defective position. Replace defective part.  YES ↓  Check crushed or broken pipe. Defect → Correct and Replace </div>
[L10]	● ● ● ● ● ● ● ●	<b>[Unset model type] : Only when service P.C. board is used</b> <div>Cut jumper line according to the explanation sheet packaged with the service P.C. board.</div>
[P03]	● ● ● ● ● ● ● ●	<b>[Discharge temp. error]</b> <div> Is there gas leak? Is there refrigerant shortage?  YES → Repair defective position. Recharge refrigerant.  NO ↓  Is PMV under correct condition  NO → Repair defective position. Replace defective part.  YES ↓  Does an abnormal overload happen  YES → Remove and improve the cause of overload.  NO ↓  Is CN601 connection correct? Is resistance value of TD sensor correct?  NO → Correct connector. Sensor error → Replace  YES ↓  Check outdoor P.C. board. Defect → Replace </div>

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[P04]		<p><b>[High pressure SW system error]</b></p> <pre> graph TD     Q1{{Does high pressure switch operate?}} -- NO --&gt; Q2{{Is circuit wiring correct?}}     Q1 -- YES --&gt; Q3{{Are parts of high pressure switch correct?}}     Q2 -- NO --&gt; A1[Wiring check, Correct.]     Q2 -- YES --&gt; A2[Check outdoor PC board Defective → Replace]     Q3 -- NO --&gt; A3[Parts check Defective → Replace]     Q3 -- YES --&gt; Q4{{Is service valve fully opened?}}     Q4 -- NO --&gt; A4[Open service valve fully.]     Q4 -- YES --&gt; A5[Reset the power supply and then do a test operation according to the season.]     A5 --&gt; B[ⓑ ← Cooling operation ⓒ ← Heating operation]     B --&gt; B1[ⓑ Cooling operation.]     B1 --&gt; Q5{{Does cooling outdoor fan correctly operate?}}     Q5 -- NO --&gt; Q6{{Is there fan breakage or coming-off?}}     Q5 -- YES --&gt; Q7{{Is there any element which blocks heat exchanger of the outdoor unit? ① Clogging of heat exchanger ② Short circuit}}     Q6 -- YES --&gt; A6[Repair defective position. Connection of connectors, outdoor P.C. board, Fan motor, Wiring.]     Q6 -- NO --&gt; Q7     Q7 -- YES --&gt; A7[Elimination of blocking element]     Q7 -- NO --&gt; A8[Overcharge of refrigerant/ Clogging/Pipe breakage/ Abnormal overload]     B --&gt; C[ⓒ Heating operation]     C --&gt; Q8{{Does the heating indoor fan correctly operate?}}     Q8 -- NO --&gt; Q9{{Are connections of connectors, capacitors and fan motor correct?}}     Q8 -- YES --&gt; Q10{{Is there any element which blocks indoor heat exchanger? ① Filter clogging ② Clogging of heat exchanger ③ Short circuit}}     Q9 -- YES --&gt; Q11{{Are resistance value of TC and TCJ sensor correct?}}     Q9 -- NO --&gt; A9[Repair defective position.]     Q10 -- YES --&gt; A10[Elimination of blocking element]     Q10 -- NO --&gt; A11[Clogging by refrigerant overcharge/Pipe breakage/ Abnormal overload]     A11 --&gt; Q11     Q11 -- YES --&gt; A12[Check indoor P.C. board Defective → Replace]     Q11 -- NO --&gt; A13[Replace TC or TCJ sensor.]           </pre>




Check code	Outdoor LED display	Check and troubleshooting (Item without special mention indicates part of outdoor unit.)
[P05]	● ● ◎ ● ◎ ○	<p><b>[Power supply error]</b></p> <pre> graph TD     Q1{{Is the power supply voltage is lower than or over the range? 60 Hz : AC 198 to 242 V}}     Q1 -- YES --&gt; A1[Confirm power supply, etc.]     Q1 -- NO --&gt; A2[Check outdoor P.C. board. Defect → Replace]           </pre>
[P07]	● ◎ ◎ ● ◎ ○	<p><b>[Heat sink overheat error]</b></p> <pre> graph TD     Q1{{Is the power device on P.C. board tightly screwed? Are radiation grease properly applied?}}     Q1 -- NO --&gt; A1[Apply radiation grease to the power device. Retightening of screws.]     Q1 -- YES --&gt; Q2{{Does anything block the ventilation around the heat sink? Does anything block air flow from the fan?}}     Q2 -- YES --&gt; A2[Remove blocking matter. Correct short-circuit.]     Q2 -- NO --&gt; A3[Check outdoor P.C. board. Defect → Replace]           </pre>
[P15]	◎ ◎ ◎ ● ◎ ○	<p><b>[Gas leak detection]</b></p> <pre> graph TD     Q1{{Is there gas leak? Is there refrigerant shortage?}}     Q1 -- YES --&gt; A1[Repair defective position. Recharge refrigerant.]     Q1 -- NO --&gt; Q2{{Is PMV under correct condition?}}     Q2 -- NO --&gt; A2[Correct defective position. Replace defective part.]     Q2 -- YES --&gt; Q3{{Is service valve fully opened?}}     Q3 -- NO --&gt; A3[Open service valve fully.]     Q3 -- YES --&gt; Q4{{Is there crushed pipe?}}     Q4 -- YES --&gt; A4[Correct and replace piping.]     Q4 -- NO --&gt; Q5{{Check temp. sensor. TD sensor CN601, TS sensor CN603}}     Q5 -- Error --&gt; A5[Correct connector. Sensor error → Replace]     Q5 -- OK --&gt; A6[Check outdoor P.C. board. Defect → Replace]           </pre>



Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)																												
[P19]	● ● ● ◎ ◎ ○	<div><div><div><div><div>Is operation of 4-way valve correct? (Check pipe temp. and etc. in cooling/heating operation.)</div><div>YES</div><div>Are temperature sensors correct? TE sensor : CN600 TS sensor : CN603</div><div>YES</div><div>Is refrigerant flow by PMV correct?</div><div>YES</div><div>Are resistance value of indoor TC and TCJ sensors correct?</div><div>YES</div><div>Check indoor P.C. board. Defect → Replace</div></div><div>NO</div><div>Replace TE sensor. Replace TS sensor.</div><div>NO</div><div>Check and replace of PMV</div><div>NO</div><div>Replace TC sensor Replace TCJ sensor</div><div>NO</div><div>Replace coil of 4-way valve.</div></div><div><div>Is the 4-way valve coil is normal? (Check the resistance value of 4-way valve coil)</div><div>YES</div><div>Does power supply to 4-way valve coil when 4-way valve is operated?</div><div>YES</div><div>Check outdoor P.C. board.</div><div>OK</div><div>Check outdoor P.C. board. Defect → Replace</div><div>Error</div><div>Check 4-way valve. Defect → Replace</div></div></div></div> <div><div><div><b>4-way valve maintenance check operation (SW01 and SW02 operations)</b> You can confirm 4-way valve operation by handling service switch SW01 and SW02. Use this method to check whether there is trouble or not on the 4-way valve.</div><div><b>[Method]</b> (1) Check D800 to D804 are turned off (or rapid flashing) and D805 is turned on. When D800 to D804 flash slowly or D805 flashes, pu and hold SW01 and SW02 for 5 seconds or more simultaneously. In the result, D800 to D804 are turned off (or rapid flashing) and D80 changes from flashing to lighting (2) Push and hold SW01 for 5 seconds or more. D804 changes to slow flashing (3) Push SW01 several time and stop it at LED display of the following “Self-preservation valve operation”</div><table><tr><td>Self-preservation valve suck operation</td><td>D800</td><td>D801</td><td>D802</td><td>D803</td><td>D804</td><td>Switch to cooling cycle This function is operated only by ten seconds, and turned off afterwards.</td></tr><tr><td></td><td>○</td><td>●</td><td>○</td><td>○</td><td>◎</td><td></td></tr><tr><td>Self-preservation valve secession operation</td><td>D800</td><td>D801</td><td>D802</td><td>D803</td><td>D804</td><td>Switch to heating cycle This function is operated only by ten seconds, and turned off afterwards.</td></tr><tr><td></td><td>●</td><td>○</td><td>○</td><td>○</td><td>◎</td><td></td></tr></table><div>○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second) (4) Push SW02 and then stop it at LED display of D805 flashes rapidly (5) Push and hold SW02 for 5 seconds or more. In the result, D804 changes to slow flashing, D805 changes to lighting and the 4-way valve is operated.</div><div>* If an unknown point generated on the way of the operation, push and hold SW01 and SW02 for 5 seconds or more simultaneously. You can return to the item (1).</div></div></div>	Self-preservation valve suck operation	D800	D801	D802	D803	D804	Switch to cooling cycle This function is operated only by ten seconds, and turned off afterwards.		○	●	○	○	◎		Self-preservation valve secession operation	D800	D801	D802	D803	D804	Switch to heating cycle This function is operated only by ten seconds, and turned off afterwards.		●	○	○	○	◎	
Self-preservation valve suck operation	D800	D801	D802	D803	D804	Switch to cooling cycle This function is operated only by ten seconds, and turned off afterwards.																								
	○	●	○	○	◎																									
Self-preservation valve secession operation	D800	D801	D802	D803	D804	Switch to heating cycle This function is operated only by ten seconds, and turned off afterwards.																								
	●	○	○	○	◎																									

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention indicates part of outdoor unit.)
[P20]		<p><b>[High pressure protective operation]</b></p> <pre> graph TD     Q1{{Is service valve fully opened?}} -- NO --&gt; A1[Open service valve fully.]     Q1 -- YES --&gt; B1[Reset the power supply and then make a test run matching to the season.]     B1 --&gt; Q2{{Is resistance value of outdoor TL sensor correct?}}     Q2 -- NO --&gt; A2[Replace sensor.]     Q2 -- YES --&gt; Q3{{Is there any defect such as loosen nut in outdoor fan?}}     Q3 -- YES --&gt; A3[Check outdoor fan. Defect → Replace, retightening]     Q3 -- NO --&gt; Q4{{Does the outdoor fan perform abnormal operation?}}     Q4 -- YES --&gt; A4[Check the same items as [P22] error.]     Q4 -- NO --&gt; Q5{{Is there any element which blocks heat exchanger of outdoor unit? • Clogging of heat exchanger • Short circuit}}     Q5 -- YES --&gt; A5[Eliminate interfering element.]     Q5 -- NO --&gt; A6[Check overcharge of refrigerant, clogging of cycle, broken pipe, abnormal overload, etc. Defect → Correct defective position.]     A6 --&gt; Q6{{Does indoor fan correctly operate?}}     Q6 -- YES --&gt; Q7{{Is there any element blocks heat exchanger of indoor unit? • Clogging of filter • Clogging of heat exchanger • Short circuit}}     Q7 -- YES --&gt; A7[Eliminate interfering element.]     Q7 -- NO --&gt; A8[Check overcharge of refrigerant, clogging of cycle, broken pipe, abnormal overload, etc. Defect → Correct defective position.]     Q6 -- NO --&gt; Q8{{Are indoor fan motor and connector correct?}}     Q8 -- NO --&gt; A9[Correct the connection.]     Q8 -- YES --&gt; Q9{{Are resistance values of indoor TC and TCJ sensors correct?}}     Q9 -- NO --&gt; A10[Replace sensor.]     Q9 -- YES --&gt; A11[Check indoor P.C. board. Defect → Replace]   </pre> <p>Heating season Heating operation</p> <p>Cooling season Cooling operation</p>

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)												
[P22]	● ◎ ● ◎ ◎ ○	<p><b>[Fan system error]</b></p> <div><div>Is the power supply voltage is lower than or over the range? 60 Hz : AC 198 to 242 V</div><div>NO</div><div>Check wiring construction. Ask to repair the power supply.</div><div>YES</div><div>Rotate shaft of the fan motor by hands during power-OFF. Can it be rotated smoothly? Is the resistance value of fan motor coil correct? Between red and white lead wire : 32 to 35Ω Between white and black lead wire : 32 to 35Ω Between black and red lead wire : 32 to 35Ω</div><div>YES</div><div>Check outdoor P.C. board. Defect → Replace</div><div>NO</div><div>Replace fan motor.</div></div> <p><b>Single operation check for outdoor fan</b></p> <p>A single operation of the outdoor fan can be confirmed by handling the service switches SW01 and SW02. Use this method to check whether there is trouble on the fan or not.</p> <p><b>[Method]</b></p> <p>(1) Check D800 to D804 are turned off (or rapid flashing) and D805 is turned on. When D800 to D804 flash slowly or D805 flashes, push and hold SW01 and SW02 for 5 seconds or more simultaneously. As a D800 to D804 are turned off (or rapid flashing) and D805 changes from flashing to lighting.</p> <p>(2) Push and hold SW01 for 5 seconds or more. D804 changes to slow flashing.</p> <p>(3) Push SW01 several times until the LED displays as the following “Outdoor fan single operation”.</p> <table><tr><td>Outdoor fan single operation</td><td>D800</td><td>D801</td><td>D802</td><td>D803</td><td>D804</td></tr><tr><td></td><td>○</td><td>○</td><td>●</td><td>○</td><td>◎</td></tr></table> <p>○ : ON, ● : OFF ◎ : Rapid flashing</p> <p>(4) Push SW02 several times until D805 rapidly flashes rapidly.</p> <p>(5) Push and hold SW02 for 5 seconds or more. As a result, D804 changes to slow flashing, D805 changes to lighting and the fan rotates.</p> <p>(6) The fan stops when pushing long SW01 and SW02 for 5 seconds or more simultaneously or when 2 minutes passed.</p> <p>* If lost tracking on the operation, push and hold SW01 and SW02 for 5 seconds or more simultaneously to return to the item (1).</p>	Outdoor fan single operation	D800	D801	D802	D803	D804		○	○	●	○	◎
Outdoor fan single operation	D800	D801	D802	D803	D804									
	○	○	●	○	◎									

Check code	Outdoor LED display	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[P26]		<p><b>[Short-circuit of compressor driving elements]</b></p> <pre> graph TD     Q1{{Are connections of compressor lead and reactor lead correct? (Check referring to Wiring diagram.)}}     Q1 -- NO --&gt; A1[Correct wiring.]     Q1 -- YES --&gt; Q2{{Does the same error occur in operation without compressor lead?}}     Q2 -- YES --&gt; A2[Replace outdoor P.C. board.]     Q2 -- NO --&gt; A3[Check compressor. (Layer short, etc.) Defect → Replace]           </pre>
[P29]		<p><b>[Position detection circuit error]</b></p> <div data-bbox="587 839 997 923" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> Check outdoor P.C. board. Defect → Replace </div>
— No code		<p><b>[Other]</b> Compressor disorder due to sudden change of load, etc.</p> <ul style="list-style-type: none"> <li>* Although the display of outdoor LED outputs, the unit automatically restarts and error is not determined.</li> <li>* A code may appear when an open phase of compressor, coming-out of wires or power relay trouble occurred.</li> </ul>

## 8-2-6. Diagnostic Procedure for Each Check Code (Outdoor Unit)

### Temperature sensor

### Temperature – Resistance value characteristic table

#### TA, TC, TCJ, TE, TS, TO sensors

#### TD, TL sensors

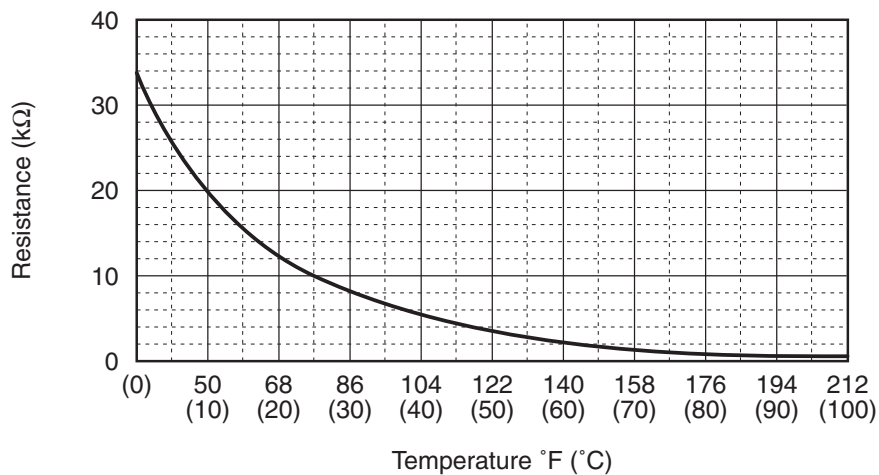
#### Representative value

Temperature °F (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
32 (0)	32.33	33.80	35.30
50 (10)	19.63	20.35	21.09
68 (20)	12.23	12.59	12.95
77 (25)	9.75	10.00	10.25
86 (30)	7.764	7.990	8.218
104 (40)	5.013	5.192	5.375
122 (50)	3.312	3.451	3.594
140 (60)	2.236	2.343	2.454
158 (70)	1.540	1.623	1.709
176 (80)	1.082	1.146	1.213
194 (90)	0.7740	0.8237	0.8761
212 (100)	0.5634	0.6023	0.6434

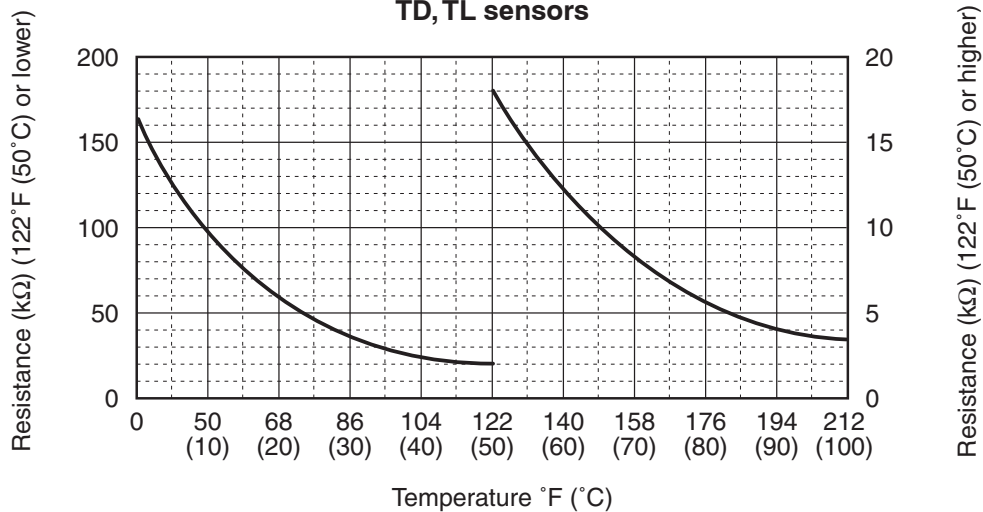
#### Representative value

Temperature °F (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
32 (0)	150.5	161.3	172.7
50 (10)	92.76	99.05	105.6
68 (20)	58.61	62.36	66.26
77 (25)	47.01	49.93	52.97
86 (30)	37.93	40.22	42.59
104 (40)	25.12	26.55	28.03
122 (50)	17.00	17.92	18.86
140 (60)	11.74	12.34	12.95
158 (70)	8.269	8.668	9.074
176 (80)	5.925	6.195	6.470
194 (90)	4.321	4.507	4.696
212 (100)	3.205	3.336	3.468

#### TA, TC, TCJ, TE, TS, TO sensors

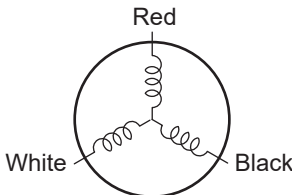
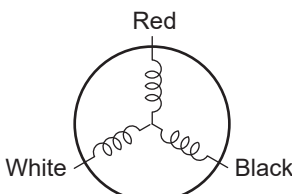
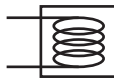


#### TD, TL sensors



\* As TH sensor (Outdoor unit heat sink temp. sensor) is incorporated in the outdoor control P.C. board, the resistance value cannot be measured.

### 8-3. Table Inspection of outdoor unit main parts

No.	Parts name	Checking procedure						
1	Compressor (Model : TTN150D63UFZ3)	<div>Measure the resistance value of each winding by using the tester.</div> <div></div> <div><table><tr><th>Position</th><th>Resistance value</th></tr><tr><td>Red – White</td><td rowspan="3">2.06 ± 7% Ω</td></tr><tr><td>White – Black</td></tr><tr><td>Black – Red</td></tr></table><div>Under 68°F(20°C)</div></div>	Position	Resistance value	Red – White	2.06 ± 7% Ω	White – Black	Black – Red
Position	Resistance value							
Red – White	2.06 ± 7% Ω							
White – Black								
Black – Red								
2	Fan motor (Model : LDF-340-A43AA1-1)	<div>Measure the resistance value of each winding by using the tester.</div> <div></div> <div><table><tr><th>Position</th><th>Resistance value</th></tr><tr><td>Red – White</td><td rowspan="3">34.0 ± 10% Ω</td></tr><tr><td>White – Black</td></tr><tr><td>Black – Red</td></tr></table><div>Under 68°F(20°C)</div></div>	Position	Resistance value	Red – White	34.0 ± 10% Ω	White – Black	Black – Red
Position	Resistance value							
Red – White	34.0 ± 10% Ω							
White – Black								
Black – Red								
3	4-way valve coil (Cooling/heating switching) (Model : SHF(L)-7H-34U)	<div>Measure the resistance value of each winding by using the tester.</div> <div><div>Connector : White</div></div> <div><table><tr><th>Resistance value</th></tr><tr><td>2210 ± 221 Ω</td></tr></table><div>Under 68°F(20°C)</div></div>	Resistance value	2210 ± 221 Ω				
Resistance value								
2210 ± 221 Ω								

## 9. SETUP AT LOCAL SITE AND OTHERS

### 9-1. Calling of Error History

Displays the last 10 check codes, and at which unit and when they occurred.

Field setting menu(1/3)		
1. Test mode		
2. Register service info.		
3. Alarm history		
4. Address		
5. Monitor function		
Return	Set	

- 1 In the “Field setting menu” screen, press [ ] and [ ] to select “Alarm history”, and then press [ Set/Fix]

Alarm history				
	Unit	Code	Date	Time
1.	1-3	E04	06/01/2022	01:56
2.	-	-	-	-
3.	-	-	-	-
4.	-	-	-	-
Reset				
Return				

#### NOTE

- The check code history data shows a history of 10 occurrences. If the occurrences exceed 10, the oldest data is deleted.
- If the same check code occurs repeatedly, the date of the first occurrence is displayed.

### Deleting check code history

Alarm history	
Reset all alarm data.	
No	Yes

- 1 Press [ Menu] while the “Alarm history” screen is displayed  
→ “Reset all alarm data.” is displayed.

- 2 Press [ Set/Fix]

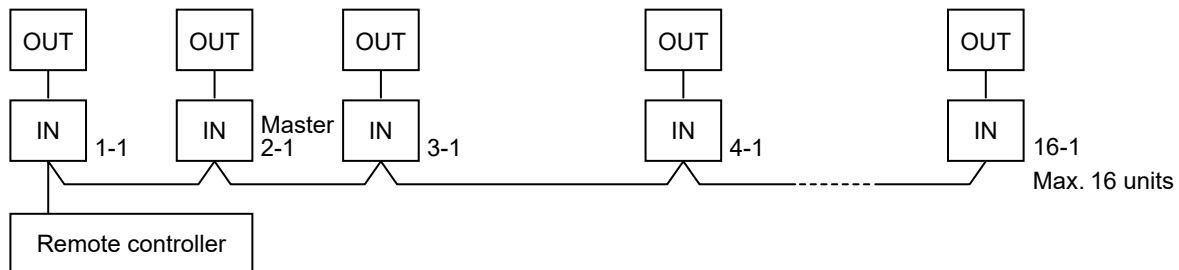
#### REQUIREMENT

If you are using 2 remote controllers, delete the history at each remote controller.

## 9-2. Group Control Operation

In a group control, operation of maximum 16 indoor units can be controlled by a remote controller. The indoor unit connected with outdoor unit (Individual/Master of twin) controls room temperature according to setting on the remote controller.

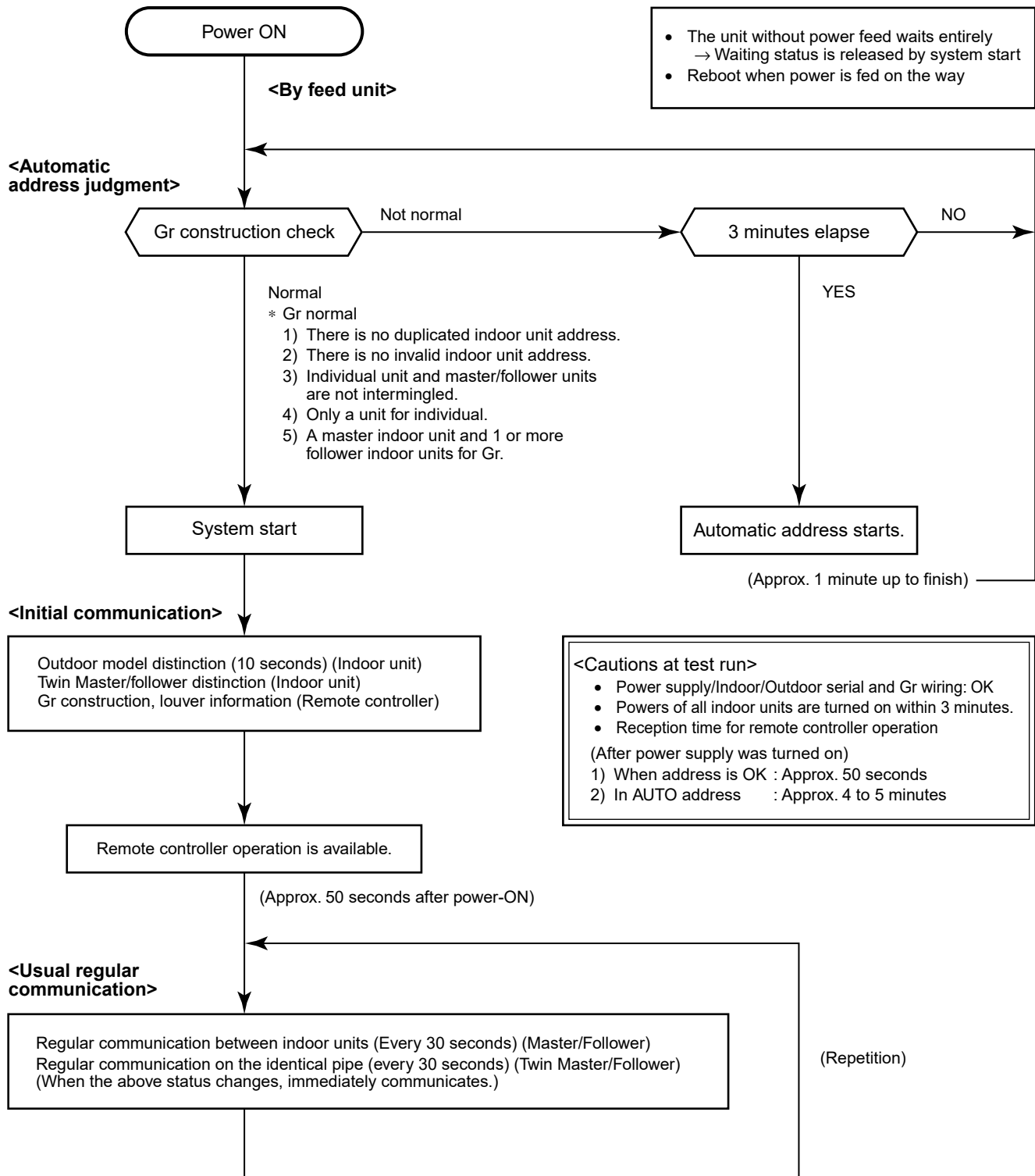
### <System example>



1. Display range on remote controller  
The setup range (Operation mode/Air volume select/Setup temp) of the indoor unit which was set to the master unit is reflected on the remote controller.
2. Address setup  
Turn on power of the indoor unit to be controlled in a group within 3 minutes after setting of automatic address. If power of the indoor unit is not turned on within 3 minutes (completion of automatic address setting), the system is rebooted and the automatic address setting will be judged again.
  - 1) Connect 3 In/Out cables surely.
  - 2) Check line address/indoor address/group address of the unit one by one.
  - 3) The unit No. (line/indoor gout address) which have been set once keep the present status as a rule if the unit No. is not duplicated with one of another unit.



## ■ Indoor unit power-ON sequence



- In a group operation, if the indoor unit which was fed power after judgment of automatic address cannot receive regular communication from the master unit and regular communication on identical pipe within 120 seconds after power was turned on, it reboots (system reset).  
→ The operation starts from judgment of automatic address (Gr construction check) again.  
(If the address of the master unit was determined in the previous time, the power fed to the master unit and reboot works, the master unit may change though the indoor unit line address is not changed.)

### 9-3. Outdoor Unit

Various displays and various operations are enabled by push buttons (service) switches and LED on the outdoor control P.C. board.

\* Service switches and LED can't operate when standby mode operation activated.

#### Service switch (SW01, SW02) operations

##### LED display

- 4 patterns are provided for LED display.

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second), ◇ : Slow flashing (Once/second)

- In the initial status of LED display, D805 is ON as the right figure.

When the initial status does not appear (in case of flashing of D805), LED display can be returned to the initial status by pushing and holding the service switches SW01 and SW02 for 5 seconds or more simultaneously.

LED display : initial status

● or ◎ D800 (Yellow)	● or ◎ D801 (Yellow)	● or ◎ D802 (Yellow)	● or ◎ D803 (Yellow)	● or ◎ D804 (Yellow)	○ D805 (Green)
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#### 9-3-1. Refrigerant recovery control

HFC refrigerant is "Ozone layer destructive coefficient = 0". However the discharge regulation is established for HFC refrigerant as it is greenhouse gas.

For this Model, a switch is mounted for refrigerant recovery operation (pump down) by the outdoor unit so that this Model can easily react to the environment when it will be reinstalled or scrapped.

##### [Operating method]

- Set fan operation to the indoor unit.
- Check LED display is the initial status. If it is not so, set the initial status.
- Push and hold SW01 for 5 seconds or more and then check D804 flashes slowly.
- Push SW01 several times and then stop it at the point where LED display (D800 to D804) is indicated as the following table.

D800	D801	D802	D803	D804
○	●	●	●	◎

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second)

- Push SW02 so that D805 flashes rapidly.
- Push and hold SW02 for 5 seconds or more. The forced cooling operation starts if D804 flashes slowly and D805 is turned on. (Max. 10 minutes)
- After operation for 3 minutes or more, close the valve at liquid side.
- After recovery of refrigerant, close the valve at gas side.
- Push and hold SW01 and SW02 for 5 seconds or more simultaneously. The LED returns to the initial status, the cooling operation stops and the indoor fan operation stops.
- Turn off the power supply.

\* If an unknown point generated on the way of the operation, push and hold SW01 and SW02 for 5 seconds or more simultaneously. You can return to the item 2).

### 9-3-2. Various settings on outdoor unit (Existing piping etc.)

#### (1) Service switch setting

Various settings are available by setting service switches.

#### [Operating method]

- 1) Check LED display is the initial status. If it is not so, set the initial status.
- 2) Push and hold SW01 for 5 seconds or more and then check D804 flashes slowly.
- 3) Push SW01 several times and then stop it at the LED display of function item to be set up.

Function	LED display					Control contents																			
Existing pipes setting	D800 ●	D801 ●	D802 ○	D803 ●	D804 ◎	When the existing piping uses 3/4"(19.1) pipe, this function is validated. In this case, the heating capacity may drop due to outside temp. and indoor temp. in heating time.																			
Snow-break fan control	D800 ●	D801 ○	D802 ●	D803 ●	D804 ◎	This function validates the control to prevent occurrence of motor lock by the accumulated snow entered from clearance of the fan guard or heat exchanger into blast route. Even when the compressor stops, the outdoor fan is operated with W3 when the outside temperature is under 25°F(4°C).																			
Max. frequency change	D800 ●	D801 ●	D802 ●	D803 ○	D804 ◎	<p>This function is validated if the max. value of compressor frequency is required to lower. It lowers the max. frequency in cooling/heating time. In this case, the max. capacity lowers.</p> <p>Max. compressor frequency (rps)</p> <table><tr><th rowspan="2">Model</th><th colspan="2">BP121</th><th colspan="2">BP181</th></tr><tr><th>Cool</th><th>Heat</th><th>Cool</th><th>Heat</th></tr><tr><td>Standard status</td><td>47.4</td><td>60.0</td><td>64.8</td><td>78.6</td></tr><tr><td>When setting is valid</td><td>51.0</td><td>51.0</td><td>66.6</td><td>66.6</td></tr></table>	Model	BP121		BP181		Cool	Heat	Cool	Heat	Standard status	47.4	60.0	64.8	78.6	When setting is valid	51.0	51.0	66.6	66.6
Model	BP121		BP181																						
	Cool	Heat	Cool	Heat																					
Standard status	47.4	60.0	64.8	78.6																					
When setting is valid	51.0	51.0	66.6	66.6																					

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second)

- 4) Push SW02 so that D805 will flash rapidly.
- 5) Push and hold SW02 for 5 seconds or more. D804 changes to slow flashing, D805 changes to lighting and then various settings are validated.
- 6) When you want to continue the settings, moreover repeat items from 3) to 5).
- 7) To invalidate various settings, execute items 1) to 3), push SW02 and then turn off D805.
- 8) Push and hold SW02 for 5 seconds or more. D804 changes to slow flashing, D805 is turned off and then various settings are invalidated.

\* If an unknown point generated on the way of the operation, push and hold SW01 and SW02 for 5 seconds or more simultaneously. You can return to the item (1).

#### Confirmation method of various settings

You can confirm that various settings are validated.

- 1) Check LED displays are in the initial status. If it are not so, return them to the initial status.
- 2) Push and hold SW01 for 5 seconds or more. D804 changes to slow flashing.
- 3) Push SW01 several times and then stop it at the point where LED display (D800 to D804) to be checked. If the setting became valid, D804 and D805 flash rapidly. (When the setup was invalid, D804 flashes rapidly and D805 goes off.)
- 4) Push SW01 and SW02 for 5 seconds or more simultaneously to return LED display to the initial status.

## In the case to return the setting to one at shipment from factory

When to return the setting to one at shipment from the factory due to reinstallation and so on, the setting can be returned in the following procedure.

- 1) Check LED display is the initial status. If it is not the initial status, return the setting to the initial status.
- 2) Push and hold SW01 for 5 seconds or more and then check D804 flashes slowly
- 3) Push SW01 several times to make LED display status to “LED display to return the setting at shipment from the factory” in the right table.
- 4) Push and hold SW02 for 5 seconds or more and then check D804 flashes slowly
- 5) Push and hold SW01 and SW02 simultaneously to return the LED display to the initial status.

LED display to return the setting at shipment from the factory					
D800	D801	D802	D803	D804	D805
●	●	●	●	○	●

○: ON, ●: OFF,  
⊙: Rapid flashing (5 times/second)


## (2) Operation mode for cooling only/heating only

As for the indoor unit, the mode for cooling only/heating only is applied from the Ceiling 7 series.

When a group operates and twin operating, the indoor unit (master unit) connected with the outdoor unit is set to the header unit.

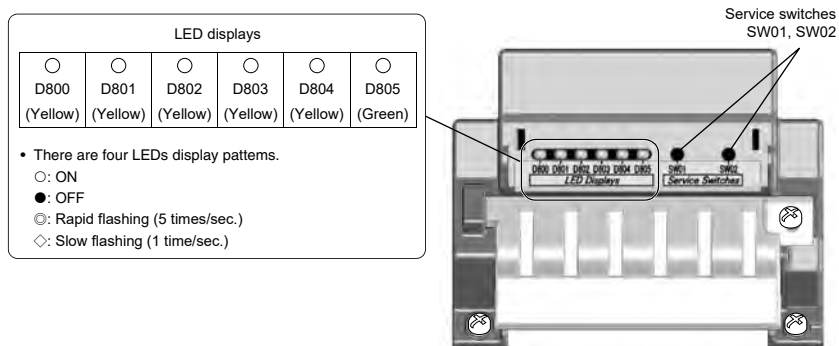
### ▼ Functions

The heating only (cooling only) mode can be selected by the sub P.C. board of outdoor unit.

State	Details of Processing		
(Factory default)	Operation mode	Operation State	Remote control
	Normal	AUTO, COOL, DRY, HEAT, FAN ONLY or can be selected	-
Sub P.C. board setting	The heating only (cooling only) mode can be selected by the sub P.C. board of outdoor unit.		
	P.C. board selection mode	Remote control operation/display	
	Normal	AUTO, COOL, DRY, HEAT, FAN ONLY or can be selected	-
	Cooling only	COOL, DRY, FAN ONLY or can be selected	When using the remote control,  (Operation mode controlled) indicator might be lit displayed.
	Heating only	HEAT, FAN ONLY or can be selected	
	<p>• The remote controller display becomes “AUTO”, “COOL”, “Dry”, “HEAT”, and “FAN ONLY” according to the connection and the indoor unit even if it sets for heating only. The compressor is a stop though the indoor fan works when “AUTO-cooling”, “COOL”, and “Dry” are selected.</p>		

## Setting/cancel method of operation mode for cooling only/heating only

The setting/cancel are done by operating the switch (SW01 and SW02) on the sub P.C. board of outdoor unit.



## ■Setting method

1. Check the LED display is an initial state. (Fig. 1)  
If the initial status is not established (if D805 is flashing), hold down the SW01 and SW02 service switches simultaneously for at least 5 seconds to return the LED displays to the initial status.
2. Hold down SW01 for at least 5 seconds, and check that D804 flashes slowly. (Fig. 2)
3. Several times press SW01 to set the LED displays of the selection mode shown below. (Fig. 3)
4. Press SW02, D805 is rapid flashing. (Fig. 4)
5. Hold down SW02 for at least 5 seconds, and when D804 flashes slowly and D805 lights, and the setting is completed. (Fig. 5)

※If there is any trouble, hold down SW01 and SW02 simultaneously for at least 5 seconds to return to the initial status, and then repeat the steps.

There are four LEDs display patterns. ○: ON, ●: OFF, ◎: Rapid flashing (5 times/sec.)

(Fig. 1)

◇: Slow flashing (1 time/sec.)

LED display initial status					
D800	D801	D802	D803	D804	D805
● or ◎	● or ◎	● or ◎	● or ◎	● or ◎	○
OFF or Rapid flashing	OFF or Rapid flashing	OFF or Rapid flashing	OFF or Rapid flashing	OFF or Rapid flashing	ON

(Fig. 2)

Procedure 2. LED display					
D800	D801	D802	D803	D804	D805
○	●	●	●	◇	●
ON	OFF	OFF	OFF	Slow flashing	OFF

(Fig. 3)

Selection mode	Procedure 3. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◎	●
	ON	ON	OFF	OFF	Rapid flashing	OFF
Heating only	○	○	○	○	◎	●
	ON	ON	ON	ON	Rapid flashing	OFF

(Fig. 4)

Selection mode	Procedure 4. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◎	◎
	ON	ON	OFF	OFF	Rapid flashing	Rapid flashing
Heating only	○	○	○	○	◎	◎
	ON	ON	ON	ON	Rapid flashing	Rapid flashing

(Fig. 5)

Selection mode	Procedure 5. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◇	○
	ON	ON	OFF	OFF	Slow flashing	ON
Heating only	○	○	○	○	◇	○
	ON	ON	ON	ON	Slow flashing	ON

## ■ Cancel

1. and 2. of the setting methods are executed.
2. Several times press SW01 to set the LED displays of the selection mode shown below. (Fig. 6)
3. Press SW02, D805 is turned off. (Fig. 7)
4. Hold down SW02 for at least 5 seconds, and when D804 flashes slowly and D805 lights, and the setting is completed. (Fig. 8)

(Fig. 6)

Selection mode	Procedure 2. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◎	◎
	ON	ON	OFF	OFF	Rapid flashing	Rapid flashing
Heating only	○	○	○	○	◎	◎
	ON	ON	ON	ON	Rapid flashing	Rapid flashing

(Fig. 7)

Selection mode	Procedure 3. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◎	●
	ON	ON	OFF	OFF	Rapid flashing	OFF
Heating only	○	○	○	○	◎	●
	ON	ON	ON	ON	Rapid flashing	OFF

(Fig. 8)

Selection mode	Procedure 4. LED display					
	D800	D801	D802	D803	D804	D805
Cooling only	○	○	●	●	◇	●
	ON	ON	OFF	OFF	Slow flashing	OFF
Heating only	○	○	○	○	◇	●
	ON	ON	ON	ON	Slow flashing	OFF

### 9-3-3. Service support function (LED display, service switch operating method)

#### 1. LED display switching

##### 1-1. Display switching list

The displayed contents of LED D800 to D805 on the outdoor P.C. board can be switched by handling the service switches SW01 and SW02.

##### [Operating method]

- 1) Check LED display is the initial status. If it is not so, set the initial status.
- 2) Push SW01 several times and then stop it at the point where LED display to be indicated.

LED display						Control contents
D800	D801	D802	D803	D804	D805	Error display (Error which is occurring at present) The error which is occurring at present is displayed. LED goes off while an error does not occur. (Refer to table A)
●	●	●	●	●	○	
D800	D801	D802	D803	D804	D805	Error display (The latest error: The latest error including this moment) After error status was eliminated, if you want to check the error which occurred before, call this setting and check it. (Even after turning off the power supply once, you can recheck it.) * In the case that an error occurred at present, the same contents as that at present is displayed. * TO sensor error only is not displayed in this setting. (Check setting which is occurring at present.) (Refer to table B)
○	●	●	●	●	○	
D800	D801	D802	D803	D804	D805	Discharge temperature sensor (TD) display Detected value of the discharge temperature (TD) is displayed. (Refer to table C)
●	○	●	●	●	○	
D800	D801	D802	D803	D804	D805	Outdoor heat exchanger temperature sensor (TE) display Detected value of the outdoor heat exchanger temperature sensor (TE) is displayed. (Refer to table C)
○	○	●	●	●	○	
D800	D801	D802	D803	D804	D805	Liquid temperature sensor (TL) display The detected value of the liquid temperature sensor (TL) is displayed. (Refer to table C)
●	○	○	●	●	○	
D800	D801	D802	D803	D804	D805	Suction temperature sensor (TS) display Detected value of the suction temperature sensor (TS) is displayed. (Refer to table C)
●	●	○	●	●	○	
D800	D801	D802	D803	D804	D805	Outside temperature sensor (TO) display Detected value of the outside temperature sensor (TO) is displayed. (Refer to table C)
○	●	○	●	●	○	
D800	D801	D802	D803	D804	D805	Heat sink temperature sensor (TH) display Detected value of the heat sink temperature sensor (TH) is displayed. (Refer to table C)
○	○	○	●	●	○	
D800	D801	D802	D803	D804	D805	Current display The current value which flows to the outdoor unit is displayed. (Refer to table C)
○	●	●	○	●	○	
D800	D801	D802	D803	D804	D805	Compressor operation frequency display The operation frequency of the compressor is displayed. (Refer to table C)
●	○	●	○	●	○	
D800	D801	D802	D803	D804	D805	PMV opening display The opening of PMV (Electronic expansion valve) is displayed. (Refer to table C)
○	○	●	○	●	○	
D800	D801	D802	D803	D804	D805	Indoor suction temperature sensor (TA) display The detected value of the indoor suction temperature sensor (TA) is displayed. (Refer to table C)
●	●	○	○	●	○	
D800	D801	D802	D803	D804	D805	Indoor heat exchanger temperature sensor (TC) display The detected value of the indoor heat exchanger temperature sensor (TC) is displayed. (Refer to table C)
○	●	○	○	●	○	
D800	D801	D802	D803	D804	D805	Indoor heat exchanger temperature (TCJ) display The detected value of the indoor heat exchanger temperature sensor (TCJ) is displayed. (Refer to table C)
○	●	○	○	●	○	

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second)

- 3) Pushing SW02 changes item to one to be displayed.
- 4) To see other display contents, repeat items 1) to 3).
- 5) To finish LED display, be sure to execute item 1) to return LED to the initial status (error display of current occurrence) and then finish LED display.

## 1-2. Error display

The error which is occurring at present and the latest error (the latest error data including one which is occurring now) can be confirmed by lighting LED D800 to D805 on the outdoor control P.C. board.

### A. Error display which occurs at present

LED display						Error name	Wired remote controller error code
D800	D801	D802	D803	D804	D805		
●	●	●	●	●	○	Normal	—
○	●	●	●	●	○	Discharge temperature sensor (TD) error	F04
●	○	●	●	●	○	Heat exchanger temperature sensor (TE) error	F06
○	○	●	●	●	○	Heat exchanger temperature sensor (TL) error	F07
●	●	○	●	●	○	Outside temperature sensor (TO) error	F08
○	●	○	●	●	○	Suction temperature sensor (TS) error	F12
●	○	○	●	●	○	Heat sink temperature sensor (TH) error	F13
○	○	○	●	●	○	Miss-mounting of sensor (TE, TS)	F15
●	○	●	○	●	○	EEPROM error	F31
○	○	●	○	●	○	Compressor breakdown	H01
●	●	○	○	●	○	Compressor lock	H02
●	○	○	○	●	○	Case thermostat activated	H04
●	●	●	●	○	○	Unset model type	L10
●	○	●	●	○	○	Discharge temperature sensor error	P03
○	○	●	●	○	○	High pressure SW system error	P04
○	●	○	○	●	○	Current detection circuit error	H03
●	●	○	●	○	○	Power supply voltage error	P05
●	○	○	●	○	○	Heatsink overheating error	P07
○	○	○	●	○	○	Gas leak detected	P15
●	●	●	○	○	○	4-way valve inverse error	P19
○	●	●	○	○	○	High pressure protective activated	P20
●	○	●	○	○	○	Fan system error	P22
○	○	●	○	○	○	Compressor driver device short circuit	P26
●	●	○	○	○	○	Position detection circuit error	P29
○	●	○	○	○	○	Others (No determination)	L31

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second)

**Note** : In case that wire remote controller show error E04, please check error code at LED display outdoor too.

### B. Error display of the latest (including error which occurs at present) error

LED display						Error name
D800	D801	D802	D803	D804	D805	
●	●	●	●	●	◇	Normal
○	●	●	●	●	◇	Discharge temperature sensor (TD) error
●	○	●	●	●	◇	Heat exchanger temperature sensor (TE) error
○	○	●	●	●	◇	Heat exchanger temperature sensor (TL) error
○	●	○	●	●	◇	Suction temperature sensor (TS) error
●	○	○	●	●	◇	Heat sink temperature sensor (TH) error
○	○	○	●	●	◇	Miss-mounting of sensor (TE, TS)
●	○	●	○	●	◇	EEPROM error
○	○	●	○	●	◇	Compressor breakdown
●	●	○	○	●	◇	Compressor lock
●	○	○	○	●	◇	Case thermostat activated
●	●	●	●	○	◇	Unset model type
●	○	●	●	○	◇	Discharge temperature sensor error
○	○	●	●	○	◇	High pressure SW system error
○	●	○	○	●	◇	Current detection circuit error
●	●	○	●	○	◇	Power supply voltage error
●	○	○	●	○	◇	Heatsink overheating error
○	○	○	●	○	◇	Gas leak detected
●	●	●	○	○	◇	4-way valve inverse error
○	●	●	○	○	◇	High pressure protective activated
●	○	●	○	○	◇	Fan system error
○	○	●	○	○	◇	Compressor driver device short circuit
●	●	○	○	○	◇	Position detection circuit error
○	●	○	○	○	◇	Others (No determination)

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second), ◇ : Slow flashing (Once/second)



### C. Sensor, current, compressor operation frequency, PMV opening display

The values, such as the temperature sensor or the current value, which the controller detects are easily confirmed.

\* Temperature sensor: TD, TE, TL, TS, TO, TH, TA, TC, TCJ

LED display						Temp. sensor °F(°C)	Current (A)	Compressor frequency (rps)	PMV opening (pls)
D800	D801	D802	D803	D804	D805				
●	●	●	●	●	◇	-13(- 25) or less	0 ~	0 ~	0 ~ 19
○	●	●	●	●	◇	-13(- 25) ~	1 ~	5 ~	20 ~ 39
●	○	●	●	●	◇	- 4(- 20) ~	2 ~	10 ~	40 ~ 59
○	○	●	●	●	◇	5(- 15) ~	3 ~	15 ~	60 ~ 79
●	●	○	●	●	◇	14(- 10) ~	4 ~	20 ~	80 ~ 99
○	●	○	●	●	◇	23(- 5) ~	5 ~	25 ~	100 ~ 119
●	○	○	●	●	◇	32(0) ~	6 ~	30 ~	120 ~ 139
○	○	○	●	●	◇	41(5) ~	7 ~	35 ~	140 ~ 159
●	●	●	○	●	◇	50(10) ~	8 ~	40 ~	160 ~ 179
○	●	●	○	●	◇	59(15) ~	9 ~	45 ~	180 ~ 199
●	○	●	○	●	◇	68(20) ~	10 ~	50 ~	200 ~ 219
○	○	●	○	●	◇	77(25) ~	11 ~	55 ~	220 ~ 239
●	●	○	○	●	◇	86(30) ~	12 ~	60 ~	240 ~ 259
○	●	○	○	●	◇	95(35) ~	13 ~	65 ~	260 ~ 279
●	○	○	○	●	◇	104(40) ~	14 ~	70 ~	280 ~ 299
○	○	○	○	●	◇	113(45) ~	15 ~	75 ~	300 ~ 319
●	●	●	●	○	◇	122(50) ~	16 ~	80 ~	320 ~ 339
○	●	●	●	○	◇	131(55) ~	17 ~	85 ~	340 ~ 359
●	○	●	●	○	◇	140(60) ~	18 ~	90 ~	360 ~ 379
○	○	●	●	○	◇	149(65) ~	19 ~	95 ~	380 ~ 399
●	●	○	●	○	◇	158(70) ~	20 ~	100 ~	400 ~ 419
○	●	○	●	○	◇	167(75) ~	21 ~	105 ~	420 ~ 439
●	○	○	●	○	◇	176(80) ~	22 ~	110 ~	440 ~ 459
○	○	○	●	○	◇	185(85) ~	23 ~	115 ~	460 ~ 479
●	●	●	○	○	◇	194(90) ~	24 ~	120 ~	480 ~ 499
○	●	●	○	○	◇	203(95) ~	25 ~	125 ~	500
●	○	●	○	○	◇	212(100) ~	26 ~	130 ~	—
○	○	●	○	○	◇	221(105) ~	27 ~	135 ~	—
●	●	○	○	○	◇	230(110) ~	28 ~	140 ~	—
○	●	○	○	○	◇	239(115) ~	29 ~	145 ~	—
●	○	○	○	○	◇	248(120) or more	30 ~	150 ~	—
○	○	○	○	○	◇	Sensor error	31 or more	155 or more	—

○ : ON, ● : OFF, ◇ : Slow flashing (Once/second)

## 2. Special operation for maintenance check (SW01 and SW02 operations)

The following special operations for maintenance check can be performed by handling the service switches SW01 and SW02.

### [Operating method]

- 1) Check LED display is the initial status. If it is not so, set the initial status.
- 2) Push and hold SW01 for 5 seconds or more and then check D804 flashes slowly.
- 3) Push SW01 and then stop it at the LED display of the function item to be set.

Special operation	LED display					Control contents
Refrigerant recovery operation	D800 ○	D801 ●	D802 ●	D803 ●	D804 ◎	The outdoor unit performs cooling operation. As the indoor unit does not operate by this operation only, carry out the fan operation beforehand. (Refer to 9-3-1.)
PMV full open operation	D800 ○	D801 ●	D802 ○	D803 ●	D804 ◎	Open PMV (Electronic expansion valve) fully. Execute the following item 6) or the control returns to normal operation after 2 minutes. (Refer Note 1)
PMV full close operation	D800 ●	D801 ○	D802 ○	D803 ●	D804 ◎	Close PMV (Electronic expansion valve) completely. Execute the following item 6) or the control returns to normal operation after 2 minutes. (Refer Note 1)
PMV middle opening operation	D800 ○	D801 ○	D802 ○	D803 ●	D804 ◎	Open PMV (Electronic expansion valve) to middle position (250 pulses). Execute the following item 6) or the control returns to normal operation after 2 minutes. (Refer Note 1)
Indoor heating trial operation command	D800 ○	D801 ●	D802 ●	D803 ○	D804 ◎	Carry out a trial heating operation. The operation returns to the normal control by executing the following item 6). (Refer Note 2)
Indoor cooling trial operation command	D800 ●	D801 ○	D802 ●	D803 ○	D804 ◎	Carry out a trial cooling operation. The operation returns to the normal control by executing the following item 6). (Refer Note 2)
Fan motor forced operation	D800 ○	D801 ○	D802 ●	D803 ○	D804 ◎	Operate the fan motor forcedly. Execute the following item 6) or the control returns to normal operation after 2 minutes. (Refer Note 1)
Self-preservation valve suck operation	D800 ○	D801 ●	D802 ○	D803 ○	D804 ◎	switch to heating cycle This function is operated only by ten seconds, and turned off afterwards.
Self-preservation valve secession operation	D800 ●	D801 ○	D802 ○	D803 ○	D804 ◎	switch to cooling cycle This function is operated only by ten seconds, and turned off afterwards.

○ : ON, ● : OFF, ◎ : Rapid flashing (5 times/second)

(Note 1) Although these special operations are available even operating time, basically carry out these operations while the machine stops. If carrying out these operations, the pressure may change suddenly and a danger may grow.

(Note 2) Indoor trial cooling operation request / Indoor trial heating operation request

Cooling/heating trial operations are available from the outdoor unit only in combination with the indoor units.

Note) The forced trial operation in this setting cannot be cleared by the indoor remote controller.

Be sure to clear it by operation of the outdoor unit (6 below).

- 4) Push SW02 and then stop it at point where D805 becomes rapid flashing.
- 5) Push and hold SW02 for 5 seconds or more. D804 changes to slow flashing, D805 changes lighting and then the special operation becomes valid.
- 6) To invalidate various settings, push and hold SW01 and SW02 for 5 seconds or more simultaneously. D800 to D804 go off (or rapid flashing), D805 goes on (Initial status: Display of error which is occurring at present), and then the special operation becomes invalid (normal control).

\* If an unknown point generated on the way of the operation, push and hold SW01 and SW02 for 5 seconds or more simultaneously. You can return to the item 1).

## 9-4. Applicable Control of Outdoor unit

The following controls are enabled by connecting the part "Application control kit" (TCB-PCOS1UL) sold separately.

### (1) Power peak cut control

\* The capacity of the outdoor unit is saved by the Demand signal from outside and corresponds to the temporary peak cut.

\* The capacity save is switched to 3 stages, 75%, 50% and operation stop.

### (2) Night operation (Sound reduction)

\* Input a timer on the market (Arranged at site). The capacity is lowered regardless of load and the operation noise is reduced until 45dB. However the normal control is carried out if the outside temperature (TO sensor value) is 104°F(40°C) or more.

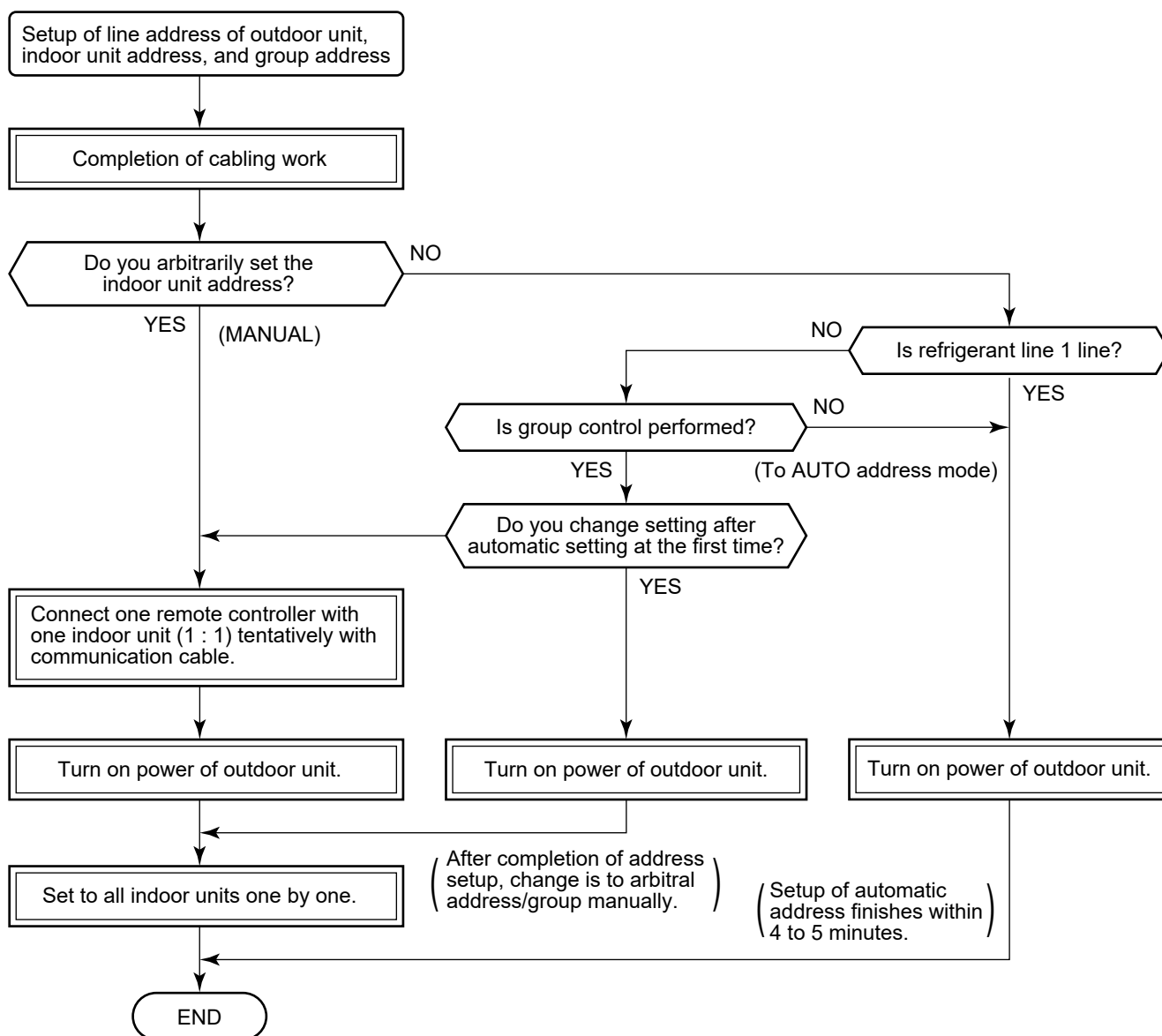
### (3) Compressor operation output

\* When the compressor drives, turn on the contact output of no voltage.

## 10. ADDRESS SETUP

### 10-1. Address Setup Procedure

When an outdoor unit and an indoor unit are connected, or when an outdoor unit is connected to each indoor unit respectively in the group operation even if multiple refrigerant lines are provided, the automatic address setup completes with power-ON of the outdoor unit. The operation of the remote controller is not accepted while automatic address works. (Approx. 4 to 5 minutes)



- When the following addresses are not stored in the neutral memory (IC503) on the indoor P.C. board, a test run operation cannot be performed. (Unfixed data at shipment from factory)

	Item code	Data at shipment	Setup data range
Line address	12	0099	0001 (No. 1 unit) to 0064 (No. 64 unit)
Indoor unit address	13	0099	0001 (No. 1 unit) to 0064 (No. 64 unit) Max. value of indoor units in the identical refrigerant line
Group address	14	0099	0000 : Individual (Indoor units which are not controlled in a group) 0001 : Master unit (1 indoor unit in group control) 0002 : Sub unit (Indoor units other than master unit in group control)

## 10-2. Address Setup & Group Control

### <Terminology>

Indoor unit No. : N - n = Outdoor unit line address N (Max. 30) - Indoor unit address n (Max. 64)

Group address : 0 = Single (Not group control)

1 = Master unit in group control

2 = Sub unit in group control

Master unit (= 1) : The representative of multiple indoor units in group operation sends/receives signals to/from the remote controllers and sub indoor units.

(\* It has no relation with an indoor unit which communicates serially with the outdoor units.)

The operation mode and setup temperature range are displayed on the remote controller LCD.

(Except air direction adjustment of louver)

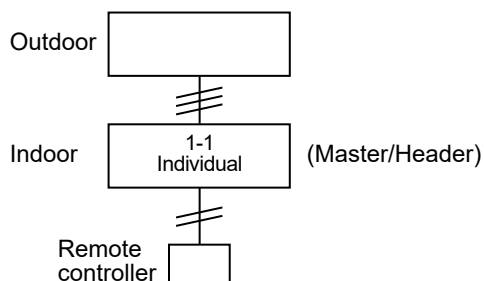
Sub unit (= 2) : Indoor units other than master unit in group operation

Basically, sub units do not send/receive signals to/from the remote controllers.

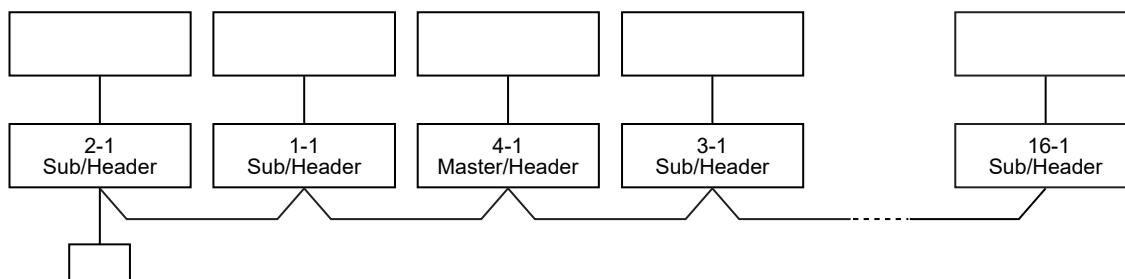
(Except errors and response to demand of service data)

### 10-2-1. System Configuration

#### 1. Single



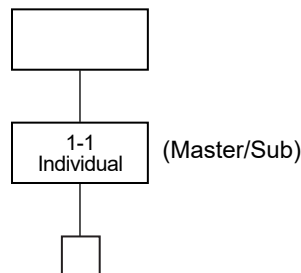
#### 3. Single group operation



**10-2-2. Automatic Address Example from Unset Address (No miswiring)**

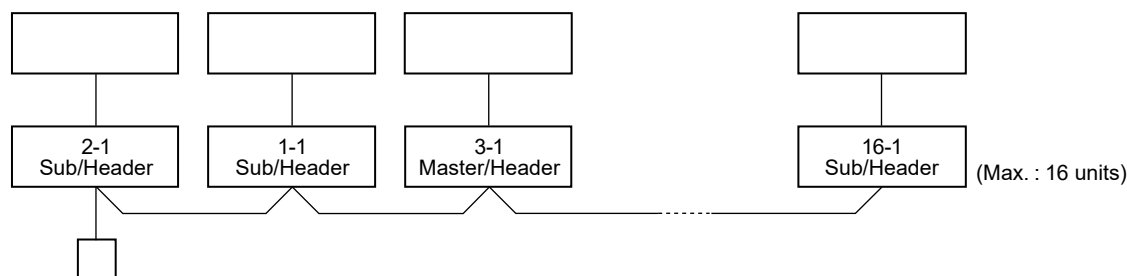
1. Standard (One outdoor unit)

1) Single



2. Group operation

(Multiple outdoor units = Multiple indoor units with serial communication only, without twin)

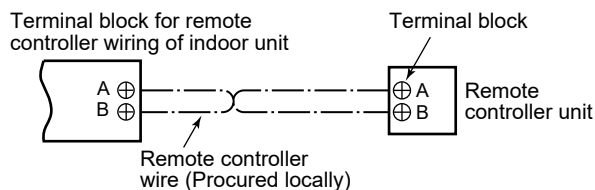


**Only turning on source power supply (Automatic completion)**

### 10-3. Remote Controller Wiring

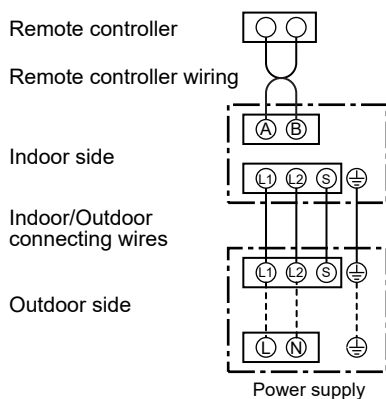
- Strip off approx. 0.354"(9 mm) the wire to be connected.
- For single system, use non polarity, 2 core wire is used for wiring of the remote controller. (AWG20(0.5 mm<sup>2</sup>) to AWG14(2.0 mm<sup>2</sup>) wires)
- For the synchronous twin, triple system, use 2-conre shield wire (Vinyl cord for microphone AWG20(0.5 mm<sup>2</sup>) to AWG14(2.0 mm<sup>2</sup>) conform to the EMC standard.

### Wiring diagram



\* For details of wiring/installation of the remote controller, refer to the Installation Manual enclosed with the remote controller.

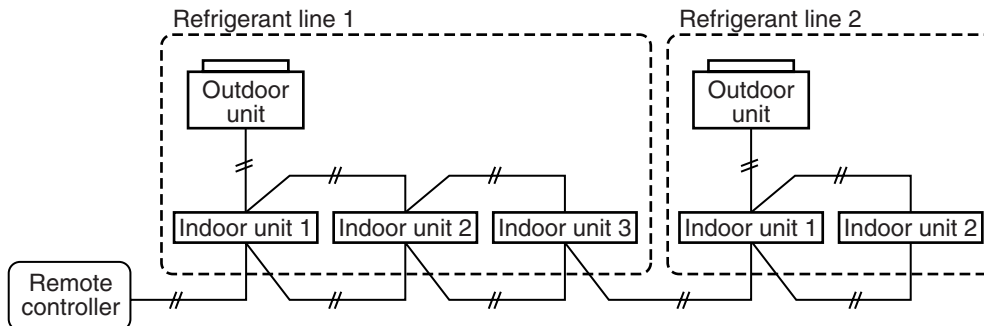
### Single system



## 10-4. Address Setup (Manual address setting using the remote controller)

Procedure when setting indoor units' addresses first under the condition that indoor wiring has been completed and outdoor wiring has not been started (manual setting using the remote controller)

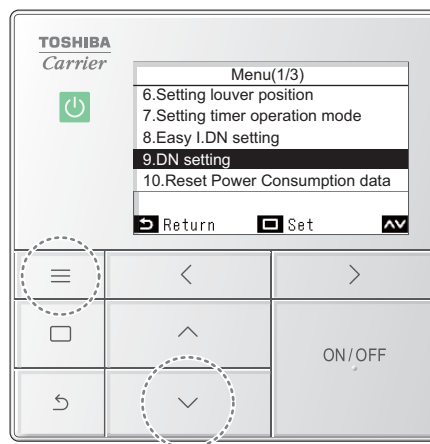
### ▼ Wiring example of 2 refrigerant lines



Line (system) address	1	1	1		2	2
Indoor unit address	1	2	3		1	2
Group address	1 Header unit	2 Follower unit	2 Follower unit		2 Follower unit	2 Follower unit

In the example above, disconnect the remote controller connections between the indoor units and connect a wired remote controller to the target unit directly before address setting.








### <RBC-AWSU5\*>











- 1** Push [ Menu] to open the “Menu”.
- 2** Push and hold [ Menu] and [ ] at the same time to open “Field setting menu”.  
→ Push and hold 4 seconds.
- 3** In the “Field setting menu” screen, push [ ] and [ ] to select “DN setting”, and then push [ Set/Fix].
- 4** Push [ ] and [ ] to select “Indoor unit”, and the push [ Set/Fix].  
→ “Indoor unit” was selected, the fans and louvres of the indoor units operate.










### <Line (system) address>

- 5** Push [  ] to black highlight the code (DN), and then push [  ] and [  ] to set the code number to 12.
- 6** Push [  ] to black highlight the data, and then push [  ] and [  ] to set a system address.  
(Match the address with the address on the interface P.C. board of the header outdoor unit in the same refrigerant line.)
- 7** After finishing setting the data of the code (DN), push [  Set/Fix].  
→ “Continue?” is displayed.






### <Indoor unit address>

- 8** To set the data of Indoor unit address, push [  Set/Fix].
- 9** Push [  ] to black highlight the code (DN), and then push [  ] and [  ] to set the code number to 13.
- 10** Push [  ] to black highlight the data, and then push [  ] and [  ] to set a Indoor unit address.
- 11** After finishing setting the data of the code (DN), push [  Set/Fix].  
→ “Continue?” is displayed.

### <Group address>

- 12** To set the data of Indoor unit address, push [  Set/Fix].
- 13** Push [  ] to black highlight the code (DN), and then push [  ] and [  ] to set the code number to 14.
- 14** Push [  ] to black highlight the data, and then push [  ] and [  ] to set a group address.  
If the indoor unit is individual, set the address to 0000 ; header unit, 0001 ; follower unit, 0002.

Individual : 0000  
Header unit : 0001  
Follower unit : 0002 } In case of group control

- 15** After finishing setting the data of the code. (DN), push [  Set/Fix].  
→ “Continue?” is displayed.
- 16** To not do other settings, push [  Return].  
→ If the “Indoor unit” or “Outdoor unit” selection screen is displayed before “  “ is displayed, push [  Return].  
→ “  ”appears while data is changing.  
→ The changes are fixed, and the “Field setting menu” screen returns.

## 10-5. Confirmation of Indoor Unit No. Position

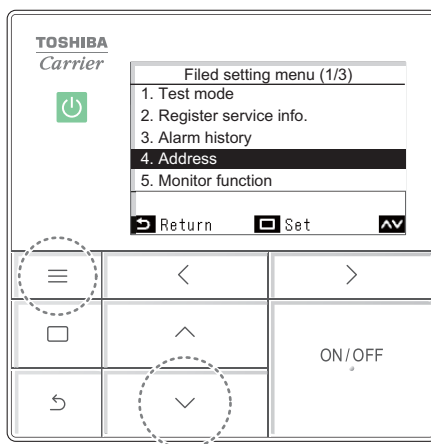
### ■ Confirming the indoor unit addresses and the position of an indoor unit using the remote controller

#### ◆ Confirming the numbers and positions of indoor units

To know the indoor unit addresses though position of the indoor unit is recognized

▼ When the unit is individual (the indoor unit is paired with a wired remote controller one-to-one), or it is a group-controlled one.

<RBC-AWSU5\*>



- 1 Push [ Menu] to open the “Menu”
- 2 Push and hold [ Menu] and [ ] at the same time to open “Field setting menu”  
→Push and hold 4 seconds.

(1)

Indoor unit address			
Current address			
ODU	-	IDU	- Gr -
Unit Return			

(2)

Indoor unit address			
Current address			
ODU	1	IDU	1 Gr 1
Unit Return     Set			

- 3 Select “Indoor unit address” from “Address” in the “Field setting menu”, and push [ Set/Fix]  
→ Screen (1) is displayed, the fans and louvres of all indoor units in the group operate.  
→ The indoor unit that is operating is connected in a group.
- 4 In screen (1), push [ Menu]  
→ Each push of [ Menu] displays in order: Entire group → Header unit → Follower unit 1 ...
- 5 Check the position of the indoor unit  
→ Screen (2) is displayed, the fans and louvres of the selected indoor units operate, the other units stop.
- 6 After checking, push [ Return]  
→ Return to the “Address” screen.

## <Maintenance/Check list>

Aiming in environmental preservation, it is strictly recommended to clean and maintain the indoor/outdoor units of the operating air conditioning system regularly to secure effective operation of the air conditioner.

It is also recommended to maintain the units once a year regularly when operating the air conditioner for a long time.

Check periodically signs of rust or scratches, etc. on coating of the outdoor units.

Repair the defective position or apply the rust resisting paint if necessary.

If an indoor unit operates for approx. 8 hours or more per day, usually it is necessary to clean the indoor/outdoor units once three months at least.

These cleaning and maintenance should be carried out by a qualified dealer.

Although the customer has to pay the charge for the maintenance, the life of the unit can be prolonged.

Failure to clean the indoor/outdoor units regularly will cause shortage of capacity, freezing, water leakage or trouble on the compressor.

Part name	Object		Contents of check	Contents of maintenance
	Indoor	Outdoor		
Heat exchanger	○	○	• Blocking with dust, damage check	• Clean it when blocking is found.
Fan motor	○	○	• Audibility for sound	• When abnormal sound is heard
Filter	○	—	• Visual check for dirt and breakage	• Clean with water if dirty • Replace if any breakage
Fan	○	○	• Visual check for swing and balance • Check adhesion of dust and external appearance.	• Replace fan when swinging or balance is remarkably poor. • If a large dust adheres, clean it with brush or water.
Suction/ Discharge grille	○	—	• Visual check for dirt and scratch	• Repair or replace it if deformation or damage is found.
Drain pan	○	—	• Check blocking by dust and dirt of drain water.	• Clean drain pan, Inclination check
Face panel, Louver	○	—	• Check dirt and scratch.	• Cleaning/Coating with repair painting
External appearance	—	○	• Check rust and peeling of insulator • Check peeling and floating of coating film	• Coating with repair painting

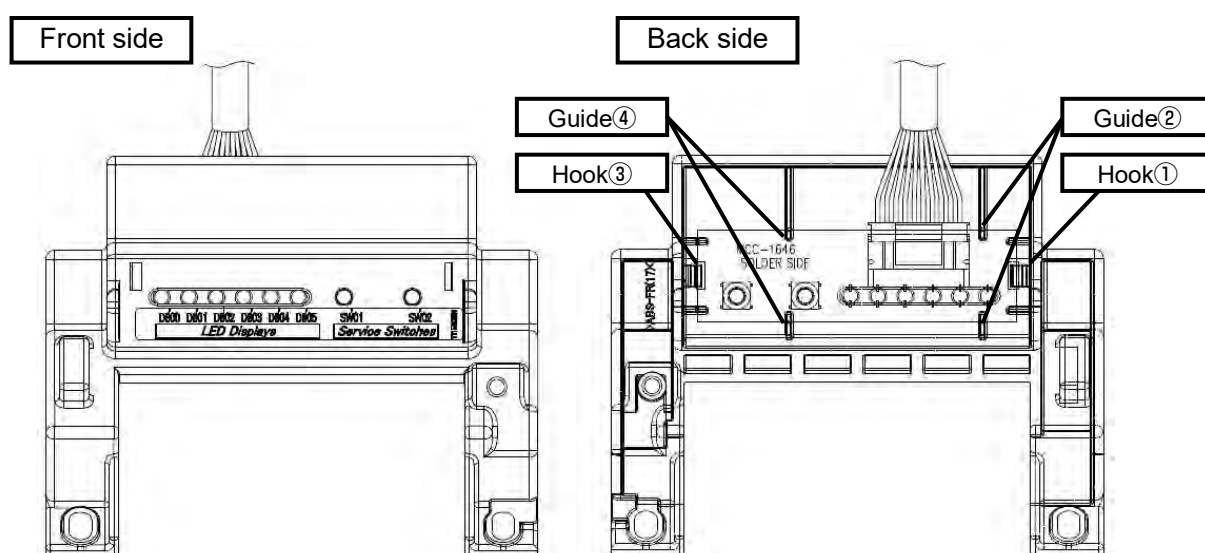
## 11. REPLACEMENT OF THE SERVICE P.C. BOARD

### WARNING

Don't open the inverter cover before 1 minute after power has been turned off because an electric shock may be occurred.

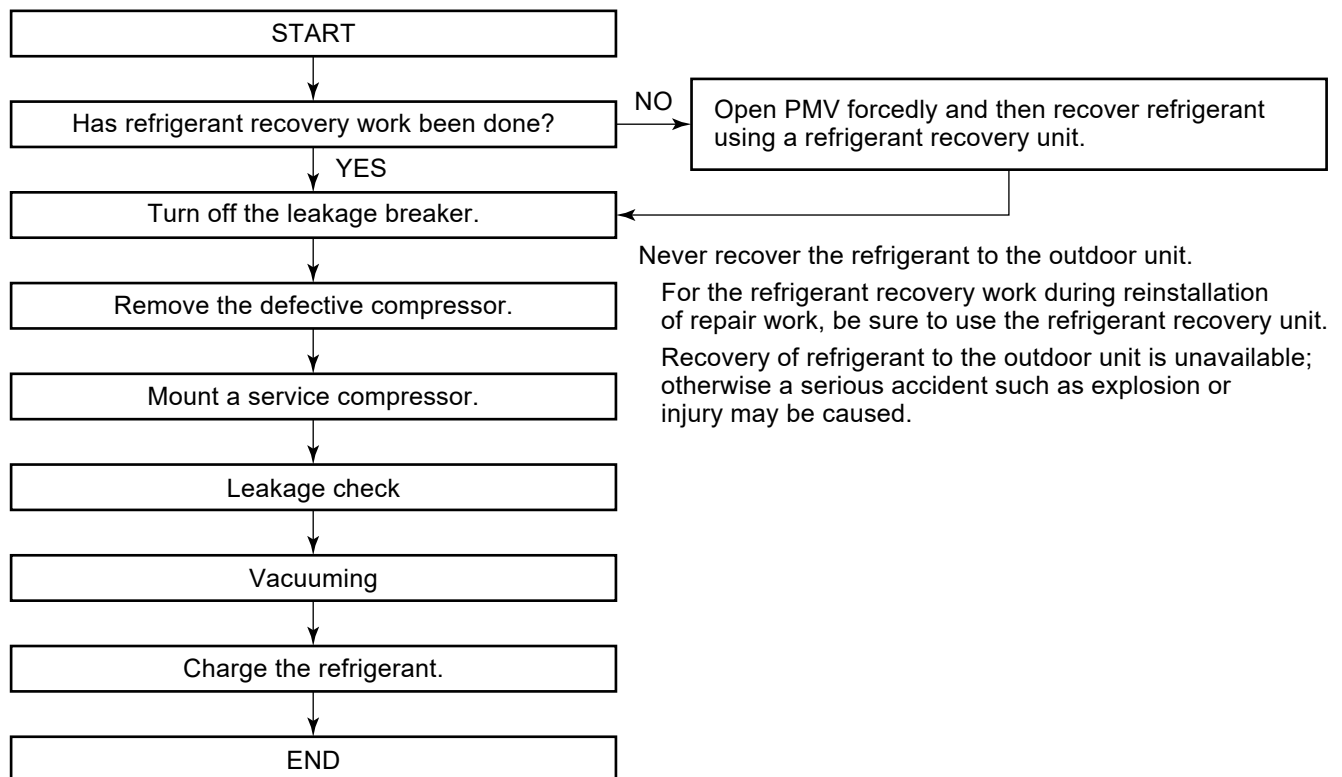
### **Assembly steps:**

- 1** LED side of P.C.Board (MCC-1646) shall be inserted to hook① along the guide② of mold.
- 2** Switch side of P.C.Board (MCC-1646) shall be pressed to hook③ along guide④ of mold.
- 3** After assembly, push SW01 and SW02 to check that switches can be click (sound or feeling of click).



## 12. HOW TO REPLACE COMPRESSOR






### 12-1. Replacement Procedure of Compressor (Outline)

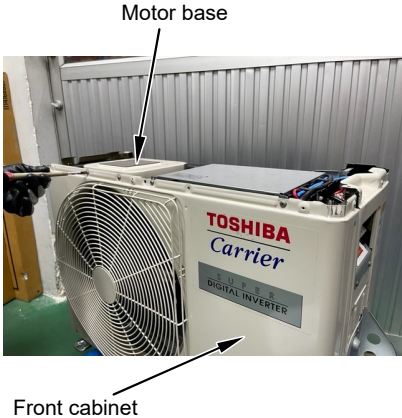

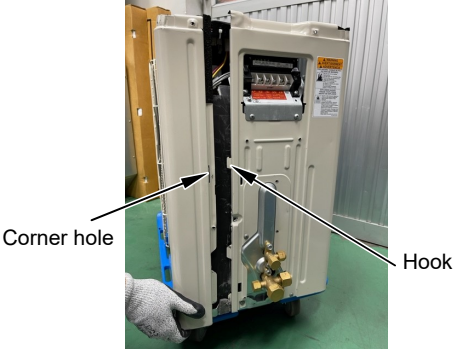



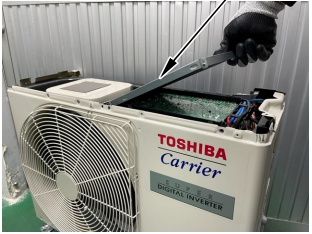


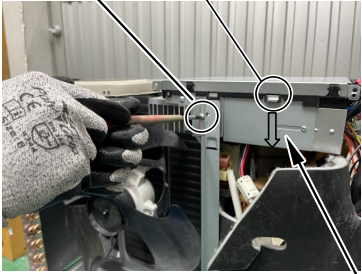
### 12-2. Replacement of Compressor

For replacement of compressors, refer to (11) Compressor in Section of **13. Detachments**.


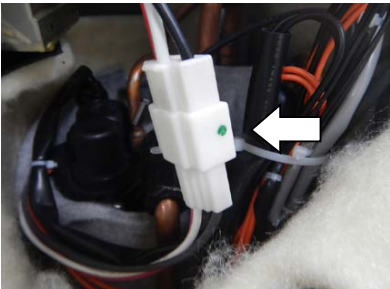
## 13. DETACHMENTS


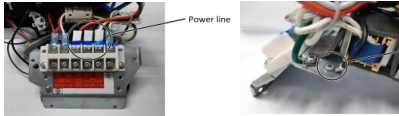

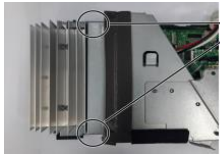
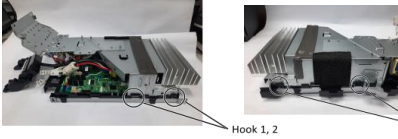
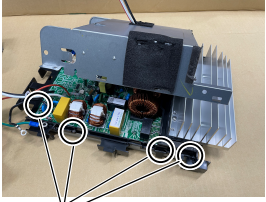
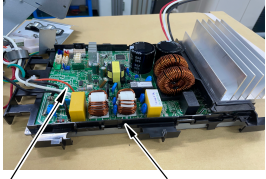
No.	Part name	Procedure	Remarks
①	Common procedure	<div style="text-align: center;"><b>CAUTION</b></div> <p>Never forget to put on the gloves at working time, otherwise an injury will be caused by the parts, etc.</p> <hr/> <p><b>1. Detachment</b></p> <ol style="list-style-type: none"> <li>1) Stop operation of the air conditioner, and turn off the main switch of the breaker for air conditioner.</li> <li>2) Remove the valve cover. (HEX-ST-SCREW Ø4 × 10L, 3 pcs.) After removing screw, remove the valve cover pulling it downward.</li> <li>3) Remove wiring cover (PT2T Ø4 × 10L, 1 pc.), and then remove connecting cable.</li> <li>4) Remove the Plate conduit by taking off 2 screws.(ST1T Ø4 × 8L, 2 pcs.)</li> <li>5) Remove the upper cabinet. (HEX-ST-SCREW Ø4 × 10L, 5 pcs.) <ul style="list-style-type: none"> <li>• After taking off screws, remove the upper cabinet pulling it upward.</li> </ul> </li> </ol> <p><b>2. Attachment</b></p> <ol style="list-style-type: none"> <li>1) Attach the waterproof cover.</li> </ol> <hr/> <div style="text-align: center;"><b>CAUTION</b></div> <p>Be sure to attach a waterproof cover. If it is not attached, there is a possibility that water enters inside of the outdoor unit.</p> <hr/> <ol style="list-style-type: none"> <li>2) Attach the upper cabinet. (HEX-ST-SCREW Ø4 × 10L, 5 pcs.) <ul style="list-style-type: none"> <li>• Hook the rear side of the upper cabinet to claw of the rear cabinet, and then put it on the front cabinet.</li> </ul> </li> <li>3) Perform cabling of connecting cables, and fix with cord clamp. (BT2T Ø4 × 12L, 3 pcs.)</li> <li>4) Attach the wiring cover. (PT2T Ø4 × 10L, 1 pc.)</li> <li>5) Attach the valve cover. (ST1T Ø4 × 8L, 3 pcs.)</li> </ol>	 <p>Valve cover</p>  <p>Wiring cover</p>  <p>Plate conduit</p>  <p>Upper cabinet</p> <p>Front cabinet</p>  <p>Waterproof cover</p>

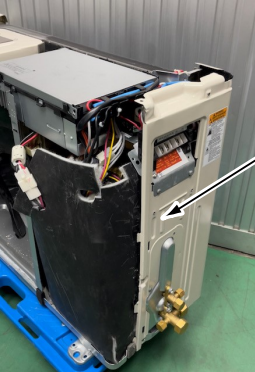
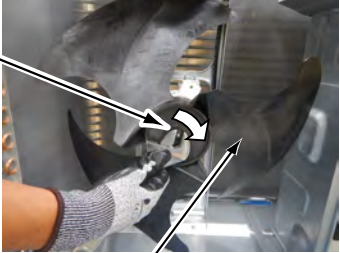


No.	Part name	Procedure	Remarks
②	Front cabinet	<p><b>1. How to remove</b></p> <ol style="list-style-type: none"> <li>1) Perform 1 of ①.</li> <li>2) Remove the screw between front cabinet and side cabinet (right). (HEX-ST-SCREW Ø4 × 10L, 1 pc.)</li> <li>3) Remove the screw between front cabinet and inverter. (ST1T Ø4 × 10L, 2 pcs.)</li> <li>4) Remove the screw between front cabinet and bottom slab. (HEX-ST-SCREW Ø4 × 10L, 3 pcs.)</li> <li>5) Remove the screw between front cabinet and motor base. (ST1T Ø4 × 10L, 2 pcs.) <ul style="list-style-type: none"> <li>• Left side of front panel is inserted into side cabinet (left). Remove by pulling the upper part.</li> </ul> </li> </ol> <p><b>2. How to install</b></p> <ol style="list-style-type: none"> <li>1) Insert front panel's hook into side cabinet (left).</li> <li>2) Insert side cabinet (left)'s hook into front cabinet's corner hole.</li> <li>3) Insert the removed screws to their positions.</li> </ol>	  



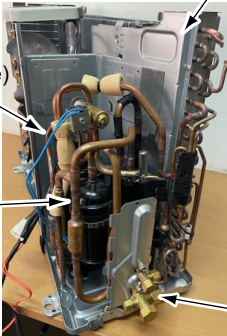
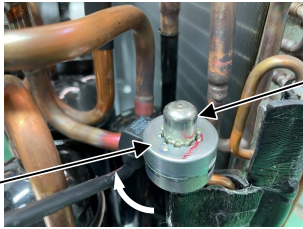
No.	Part name	Procedure	Remarks
③	Inverter assembly	<p><b>1. Detachment</b></p> <ol style="list-style-type: none"> <li>1) Perform work of item 1 of ① .</li> <li>2) Take off screws of the upper part of the front cabinet. (ST1T Ø4 × 10L, 2 pcs.) <ul style="list-style-type: none"> <li>• If removing the inverter cover under this condition, P.C. board can be checked.</li> <li>• If there is no space in the upper part of the upper cabinet, perform work of ②.</li> </ul> </li> </ol> <hr/> <p style="text-align: center;"><b>CAUTION</b></p> <hr/> <p>Be careful to check the inverter because high-voltage circuit is incorporated in it.</p> <hr/> <p style="text-align: center;"><b>WARNING</b></p> <hr/> <p>Never disassemble the inverter for 1minute after power has been turned off because an electric shock may be caused.</p> <hr/> <ol style="list-style-type: none"> <li>3) Perform 1 of ②.</li> <li>4) Take off screw between side cabinet (right) and inverter box (wiring gate side) (ST1T Ø4 × 10L, 2 pcs.)</li> <li>5) Take off screw between partition plate and inverter box. (ST1T Ø4 × 8, 1 pc.)</li> <li>6) Remove each lead wire type from holder of inverter upper part.</li> <li>7) Pull upper part of inverter. Here, please cut bundling band that tie each lead wire type.</li> <li>8) Remove the cover plate assembly. By hold cover plate assembly and pull down from PC board base's hook.</li> <li>9) Remove connector of each lead wire type.</li> </ol>	<p>Screws</p>  <p>Front panel</p> <p>Inverter cover</p>   <p>Screws</p>  <p>Screw</p> <p>Hook</p>  <p>Cover plate assembly</p>


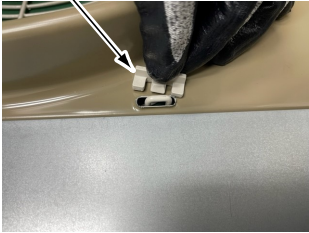
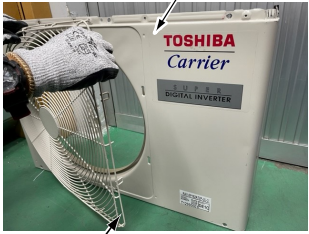


No.	Part name	Procedure	Remarks
③	Inverter assembly	<p>Disconnect the leads and connectors connected to the other parts from the control board assembly</p> <p>1) Leads</p> <ul style="list-style-type: none"> <li>• Lead connected to compressor : Disconnect the connector (3P : white)</li> <li>• Lead connected to reactor : Disconnect the connector (2P : white)</li> </ul> <p>2) Connectors</p> <p>CN30··· Outdoor fan (3P : white)  CN72··· 4 directional valve (2P : Yellow)  CN70··· PMV coil (6P : white)  CN61··· TD sensor (3P : white)  CN63··· TS sensor (3P : white)  CN60··· TE sensor (2P : white)  CN64··· TL sensor (2P : white)  CN62··· TO sensor (2P : Yellow)  CN50··· Case thermo (2P : blue)  CN51··· High pressure switch (3P : green)</p> <div data-bbox="389 941 940 1115" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p style="text-align: center;"><b>NOTE</b></p> <p>These connectors have a disconnect prevention mechanism : as such, the lock on their housing must be released before they are disconnected.</p> </div>	<div data-bbox="997 250 1435 564" style="text-align: center;">  <p>Inverter assembly</p> </div> <p>Connectors with locking mechanisms: as such, to disconnect them, they must be pressed in the direction of the arrow while pulling them out.</p> <div data-bbox="1021 851 1411 1141" style="text-align: center;">  </div>

No.	Part name	Procedure	Remarks
④	Control P.C. board assembly	<ol style="list-style-type: none"> <li>1) Remove sub board base from inverter frame.</li> <li>2) Remove lead wire that connect with terminal block Black, white, orange (single phase), Earthed lines (Black) 1 pc.</li> <li>3) Please cut the bind-band that tie lead wire of compressor, reactor with inverter box(metal plate) and bind-band that tie lead power line with lead of small reactor</li> <li>4) Take off 2 screws that connect box and P.C. board base.</li> <li>5) Remove P.C. board base's hook (hook 1, 2 ,3 , 4) and pull inverter box off.</li> <li>6) Remove Connector : CN80 connect with Display P.C.board (10P : white)</li> <li>7) Remove Control P.C. board from P.C. board base. while heat sink is still attached to Control P.C. board by remove P.C. board base's hook (4 position) hold the heat sink and pull up.</li> <li>8) Take off 2 screw that connect heat sink and Control P.C. board</li> <li>9) Install new Control P.C. board.</li> </ol> <div data-bbox="396 886 950 1061" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p style="text-align: center;"><b>NOTE</b></p> <p><b>When mounting the new control board assembly, ensure that the P.C.board is inserted properly into the P.C.board base support groove.</b></p> </div>	 <p>Sub board Base</p>  <p>Power line</p> <p>Remove earth screw</p>  <p>Warning 1 Cut bindband</p>  <p>Screws</p>  <p>Hook 1, 2</p> <p>Hook 3, 4</p>  <p>Hook (4 place)</p>  <p>Control board frame</p> <p>PC board base</p>

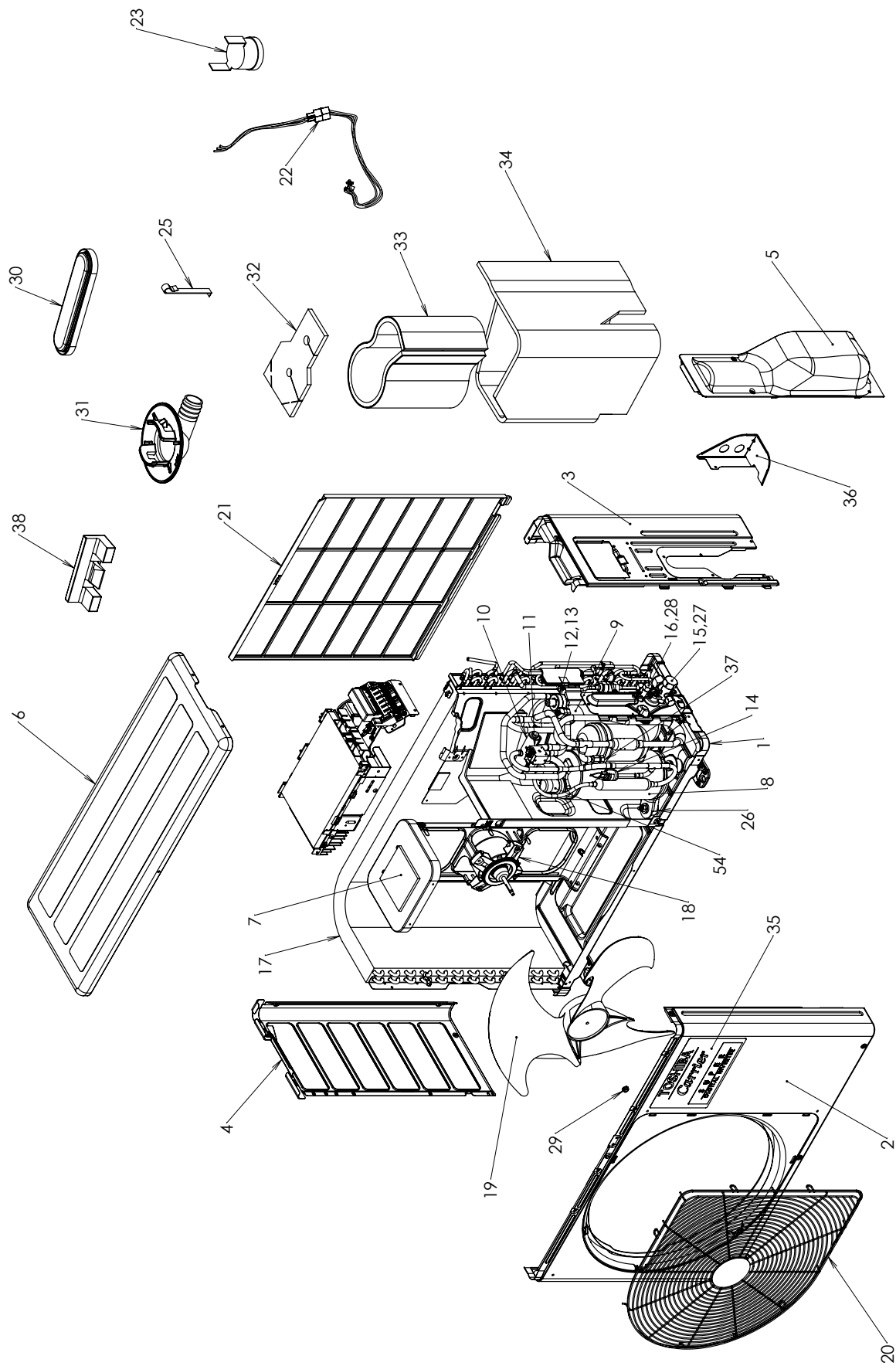
No.	Part name	Procedure	Remarks
⑤	Rear cabinet	1) Perform works of items 1 of ① and ②, ③. 2) Take off fixed screws for the bottom plate. (ST1T Ø4 × 10L, 2 pcs.) 3) Take off fixed screw for the valve mounting plate. (ST1T Ø4 × 10L, 3 pcs.)	 <p>Rear cabinet</p>
⑥	Fan motor	1) Perform works of items 1 of ① and ② . 2) Take off the flange nut fixing the fan motor and the propeller. <ul style="list-style-type: none"> <li>Turning it clockwise, the flange nut can be loosened. (To tighten the flange nut, turn counterclockwise.)</li> </ul> 3) Remove the propeller fan. 4) Disconnect the connector for fan motor from the inverter. 5) Take off the fixing screws (3 pcs.) holding by hands so that the fan motor does not fall. <p><b>NOTE:</b> Tighten the flange nut with torque 4.9Nm (50kgf/cm).</p>	 <p>Flange nut</p> <p>Loosen the nut by turning clockwise</p>  <p>Propeller fan</p>  <p>Fan motor</p>

No.	Part name	Procedure	Remarks
⑦	Compressor	<p>1) Perform works of items 1 of ① and ②, ③, ⑤.</p> <p>2) Discharge refrigerant gas.</p> <p>3) Remove the partition plate. (ST1T Ø4 × 8L, 3 pcs.)</p> <p>4) Remove the terminal covers of the compressor, and disconnect lead wires of the compressor and the compressor thermo assembly from the terminal.</p> <p>5) Take off the soundproof plate.</p> <p>6) Remove pipes connected to the compressor with a burner.</p> <hr/> <p style="text-align: center;"><b>CAUTION</b></p> <hr/> <p>Pay attention to that flame does not involve 4-way valve or PMV. (If doing so, a malfunction may be caused.)</p> <hr/> <p>7) Take off the fixing screws of the bottom plate and heat exchanger. (ST1T Ø4 × 8L)</p> <p>8) Take off the fixing screws of the valve clamping plate to the bottom plate. (ST1T Ø4 × 8L, 2 pcs.)</p> <p>9) Pull upward the refrigerating cycle.</p> <p>10) Take off nut fixing the compressor to the bottom place.</p> <hr/> <p style="text-align: center;"><b>CAUTION</b></p> <hr/> <p>When reconnecting the lead wires to the compressor terminals after replacement of the compressor, be sure to caulk the Faston terminal without loosening.</p> <hr/>	<p>Partition plate</p>  <p>Thermocomp lead</p> <p>Compressor lead</p>  <p>Heat exchanger</p> <p>Remove (Discharge pipe)</p> <p>Remove (Suction pipe)</p> <p>Valve support board</p> 
⑧	Pulse Motor Valve (PMV) coil	<p><b>1. Detachment</b></p> <p>1) Perform works of items ① and ②.</p> <p>2) Release the coil from the concavity by turning it, and remove coil from the PMV.</p> <p><b>2. Attachment</b></p> <p>1) Put the coil deep into the bottom position.</p> <p>2) Fix the coil firmly by turning it to the concavity.</p>	<p>Attachment state</p>  <p>PMV</p> <p>Coil</p>

No.	Part name	Procedure	Remarks
⑨	Fan guard	<p><b>1. Detachment</b></p> <p>1) Perform works of items 1 of ① and ②.</p> <p>2) Remove the front cabinet, and put it down so that fan guard side directs downward.</p> <hr/> <p style="text-align: center;"><b>CAUTION</b></p> <hr/> <p>Perform works on a corrugated cardboard, cloth, etc. to prevent flaw on the product.</p> <hr/> <p>3) Remove the fan guard stopper. (4 position)</p> <p><b>2. Attachment</b></p> <p>1) Insert the fan guard stopper and then fix the fan guard (4 positions)</p> <hr/> <p style="text-align: center;"><b>CAUTION</b></p> <hr/> <p>All the attaching works have completed. Check that all the hooking claws and the fan guard stopper are fixed to the specified positions.</p> <hr/>	<p>Front cabinet</p>  <p>Hooking claw</p> <p>Fan guard stopper</p>  <p>Front cabinet</p>  <p>Fan guard</p>

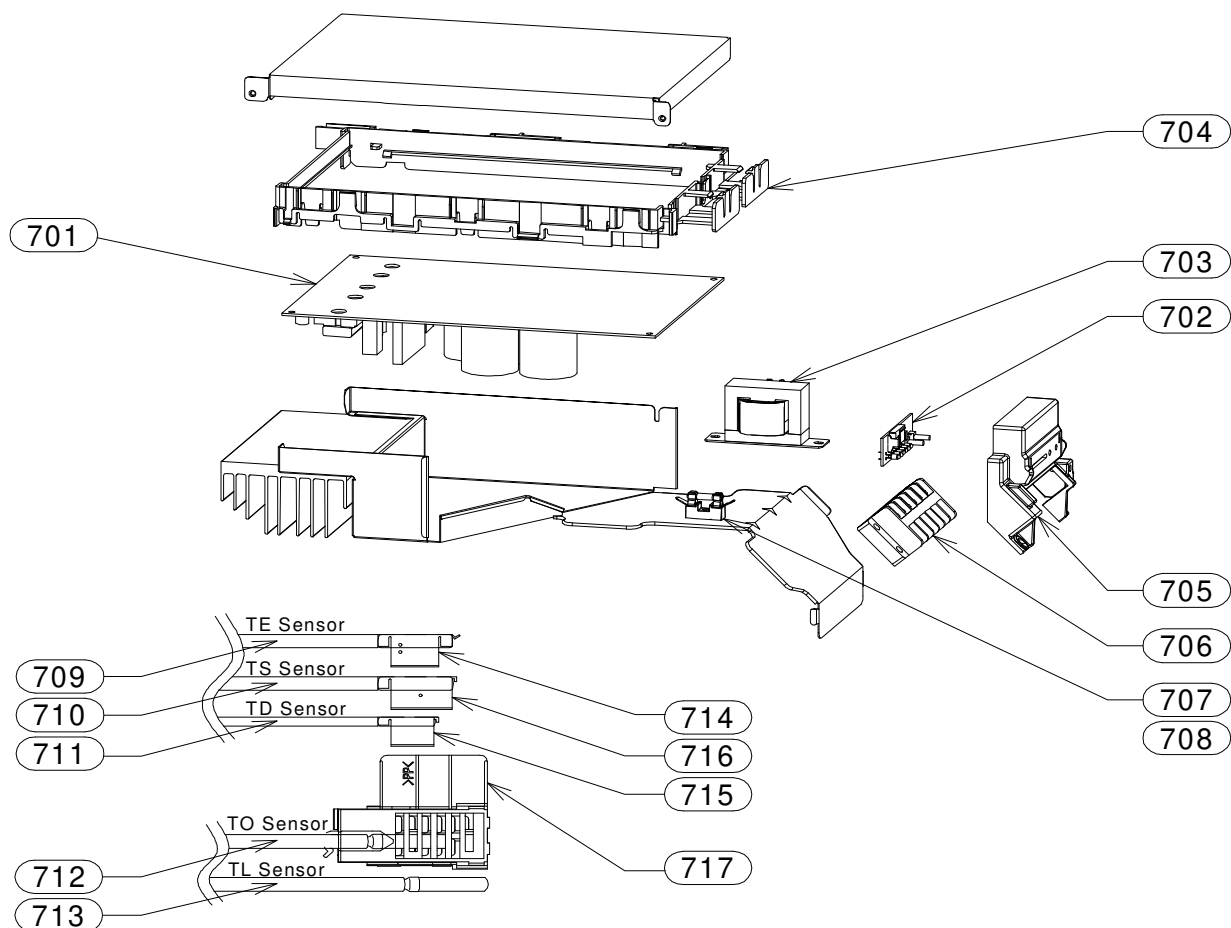
14. EXPLODED VIEWS AND PARTS LIST

<Outdoor Unit>



Location No.	Part No.	Description	Model name	
			RAV-BP121AT2P-UL	RAV-BP181AT2P-UL
1	43T42387	BASE COATING ASSEMBLY	1	1
2	43T00878	FRONT CABINET ASSEMBLY	1	1
3	43T00599	ASM-CABI-SIDE-R	1	1
4	43T00602	ASM-COAT-C-S-L	1	1
5	43T19352	ASM-COVER-PV	1	1
6	43T00791	ASM-CABI-UP	1	1
7	43T39411	ASM-MOTOR-BASE-COAT	1	1
8	43T41615	COMPRESSOR(TTN150D63UFZ3)	1	1
9	43T48302	ASM-ACCUM	1	1
10	43T46424	4 WAY VALVE	1	1
11	43T63327	COIL-4WAY	1	1
12	43T46425	BODY-PMV	1	1
13	43T46430	COIL-PMV	1	1
14	43T63353	SW-PRESS	1	1
15	43T46374	VALVE;PACKED 12.7DIA(H4)	1	1
16	43T46358	VALVE;PACKED 6.35 DIA	1	1
17	43T43599	CONDENSER ASSEMBLY	1	1
18	43T21547	MOTOR FAN	1	1
19	43T20365	PROPELLER FAN	1	1
20	43T19385	WIRE GUARD	1	1
21	43T19331	FIN GUARD	1	1
22	43T60420	ASM-COMP-LEAD	1	1
23	43T54391	BIMETAL THERMO	1	1
25	43T19333	HOLDER, SENSOR	1	1
26	43T49335	RUBBER CUSHION	3	3
27	43T47405	BONNET, 12.7 DIA	1	1
28	43T47403	BONNET, 6.35 DIA	1	1
29	43047669	NUT, FLANGE	1	1
30	43089160	CAP, WATERPROOF	2	2
31	43T79325	DRAIN NIPPLE	1	1
32	43T04416	SOUND INSULATION(UP)	1	1
33	43T04316	SOUND-INSU(IS)	1	1
34	43T04484	SOUND INSULATION (OS)	1	1
35	43T01337	MARK-T(TC-SDI)	1	1
36	43T00538	CONDUIT PLATE	1	1
37	43T49338	FUSIBLE PLUG	1	1
38	43T19002	GUARD-STOPPER	5	5

## <Inverter assembly>



Location No.	Part No.	Description	Model name	
			RAV-BP121AT2P-UL	RAV-BP181AT2P-UL
701	43TNV558	PC BOARD ASSY, WP-528	1	-
701	43TNV559	PC BOARD ASSY, WP-528	-	1
702	43T6V418	PC BOARD ASSY(MCC-1646)-LED	1	1
703	43T58326	REACTOR,CH-76	1	1
704	43T62313	PC PLATE BASE	1	1
705	43T61320	BASE, PC BOARD	1	1
706	43T60423	SERV-TERMINAL	1	1
707	43T60585	GLASS TUBE FUSE	1	1
708	43T60564	HOLDER-FUSE	1	1
709	43T50352	TEMPERATURE SENSOR	1	1
710	43T50336	TEMPERATURE SENSOR	1	1
711	43T50334	TEMPERATURE SENSOR	1	1
712	43T50337	TEMPERATURE SENSOR,TO	1	1
713	43T50335	TEMPERATURE SENSOR	1	1
714	43T63318	HOLDER SENSOR	1	1
715	43T63317	HOLDER,SENSOR	1	1
716	43T63323	HOLDER,SENSOR	1	1
717	43T63319	HOLDER,SENSOR	1	1



## WARNINGS ON REFRIGERANT LEAKAGE

### Check of Concentration Limit

**The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.**

The refrigerant R454B which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R454B is almost non-existent.

If a conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

Refrigerant Concentration limit shall be in accordance with local regulation.

## Air conditioner installation work check items

**After finishing installation work, check items below and hand this sheet to user to keep it in a safe place together with Owner and installation manuals**

Model name \_\_\_\_\_

Check date \_\_\_\_\_

Checked by \_\_\_\_\_

**Note :** Please put a mark "✓" in the box you checked.

### ■Piping work

Check items	Symptom	Result
Connecting pipes are cleaned and no dent	Insufficient Air conditioner capacity Compressor malfunction Compressor rupture or Burst	
Use vacuum pump for completed vacuuming		
No any gas leakage or clogging is found		
Packed valves are fully open before operation		

### ■Wiring work

Check items	Symptom	Result
Electrical wires are connected correctly	Burnt out, No operation	
Use breaker to connect to main power supply	Burnt out, No abnormal protection	
Wiring insulators are in good condition	Burnt out, Electrical leakage	
Use the specified size/rating wires	Burnt out	
Ground wire must be Installation per manufacturing Installation Manual	Electrical leakage or shock	

### ■Drainage work

Check items	Symptom	Result
Drain hose is properly connected.	Water leakage or dropping	
Drain hose is well insulated.	Water or dew dropping	

**Remark)** All check items, please refer procedure from manufacturing Installation Manual

# **CARRIER AIR CONDITIONING (THAILAND) CO., LTD.**

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AMPHUR MUANGPATHUMTHANI, PATHUMTHANI 12000, THAILAND