TOSHIBA
Leading Innovation

FILE NO. A10-001
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SERVICE MANUAL

AIR-CONDITIONER
SPLIT TYPE

INDOOR UNIT <DIGITAL INVERTER>

RAV-SM2242DT-E
RAV-SM2802DT-E
RAV-SM2242DT-TR
RAV-SM2802DT-TR

HFC
R410A

PRINTED IN JAPAN, Apr., 2010 ToMo

CONTENTS

Original instruction

Please read carefully through these instructions that contain important information which complies with the “Machinery” Directive (Directive 2006/42/EC), and ensure that you understand them.

Some of the details provided in these instructions differ from the service manual, and the instructions provided here take precedence.

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)	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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.
Qualified service person (∗1)	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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.

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 and from heat Insulating shoes Clothing to provide protection from electric shock
Work done at heights (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 and from heat

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
⚠ **DANGER**	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.
⚠ **WARNING**	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.
⚠ **CAUTION**	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]

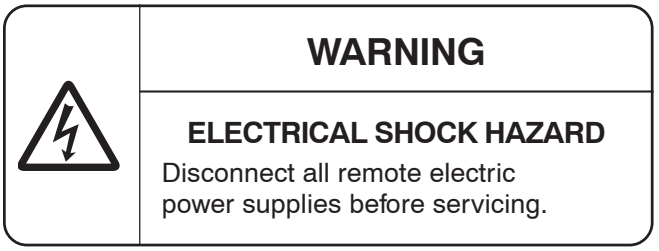
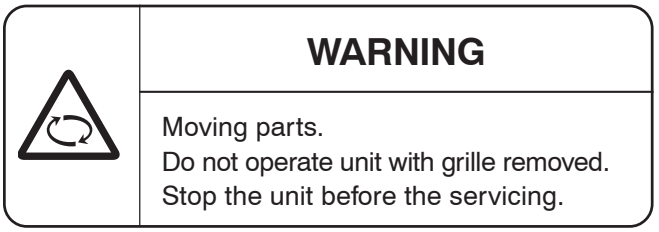
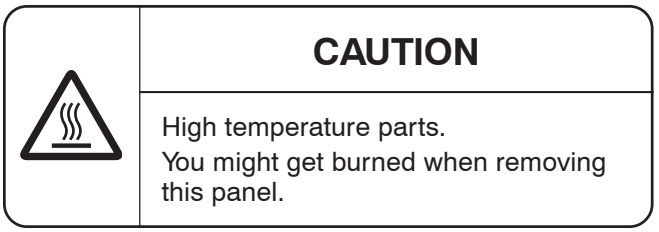
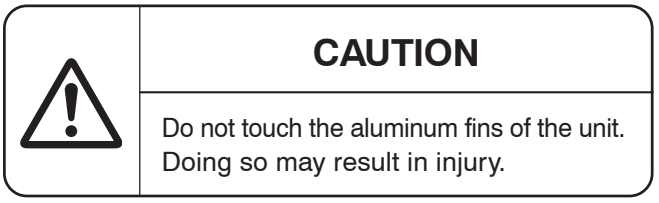
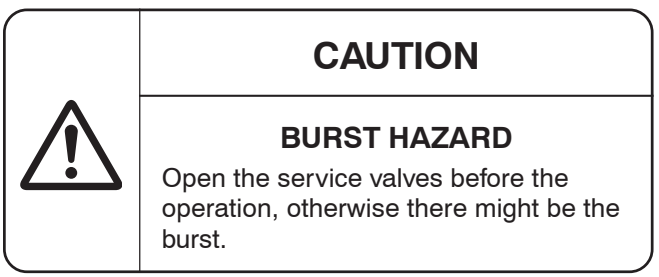
Mark	Explanation
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	Indicates cautions (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.

Warning indication	Description
	**WARNING** ELECTRICAL SHOCK HAZARD Disconnect all remote electric power supplies before servicing.
	**WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.
	**CAUTION** High temperature parts. You might get burned when removing this panel.
	**CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.
	**CAUTION** BURST HAZARD Open the service valves before the operation, otherwise there might be the burst.

Precaution for Safety

⚠ 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.
	When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide protection for electricians and from heat, insulating shoes and clothing to provide protection from electric shocks. Failure to wear this protective gear may result in electric shocks.
	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.
	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 or to remove the intake grille of the indoor unit to undertake work.
	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.
	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.
	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.
	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.
	When transporting the air conditioner, wear shoes with additional protective toe caps.
	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.
	This air conditioner has passed the pressure test as specified in IEC 60335-2-40 Annex EE.

⚠ DENGER

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 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.
	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.

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.
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

Check earth wires.	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.
	After completing the repair or relocation work, check that the ground wires are connected properly.
	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.
Prohibition of modification.	Do not modify the products.Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	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.
Do not bring a child close to the equipment.	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.
Insulating measures	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.
No fire	When performing repairs using a gas burner, replace the refrigerant with nitrogen gas because the oil that coats the pipes may otherwise burn. 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.

 Refrigerant	The refrigerant used by this air conditioner is the R410A. Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22. For an air conditioner which uses R410A, never use other refrigerant than R410A. For an air conditioner which uses other refrigerant (R22, etc.), never use R410A. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused. 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. When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A 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. After installation work, check the refrigerant gas does not leak. If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. 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.
 Assembly/ Cabling	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.
 Insulator check	After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 2MΩ 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.
 Ventilation	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.
 Compulsion	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 cocking 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.
	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.
	Nitrogen gas must be used for the airtight test.
	The charge hose must be connected in such a way that it is not slack.
	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.

 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. • Connect the pipes surely and there is no leak of refrigerant. • The valve is opened. 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 kind of insulated heat-resistant gloves designed to protect electricians.
	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 kind of insulated heat-resistant gloves designed to protect electricians.
 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 the indoor unit at least 2.5 m above the floor level since otherwise the users may injure themselves or receive electric shocks if they poke their fingers or other objects into the indoor unit while the air conditioner is running.
	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 qualified service person (∗1).
	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.”

Declaration of Conformity

Manufacturer:	Toshiba Carrier Corporation 336 Tadehara, Fuji-shi, Shizuoka-ken 416-8521 JAPAN
Authorized Representative/TCF holder:	Nick Ball Toshiba EMEA Engineering Director Toshiba Carrier UK Ltd. Porsham Close, Belliver Industrial Estate, PLYMOUTH, Devon, PL6 7DB. United Kingdom

Hereby declares that the machinery described below:

Generic Denomination:	Air Conditioner
Model/type:	RAV-SM2242DT-E, RAV-SM2802DT-E RAV-SM2242DT-TR, RAV-SM2802DT-TR
Commercial name:	Digital Inverter Series

Complies with the provisions of the “Machinery” Directive (Directive 2006/42/EC) and the regulations transposing into national law.

Complies with the provisions of the following harmonized standard:

EN 378-2: 2008

Note: This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer’s consent.

Specifications

Model	Sound power level (dB)		Weight (kg)
	Cooling	Heating	
RAV-SM2242DT-E	74	74	160
RAV-SM2802DT-E	75	75	160
RAV-SM2242DT-TR	74	74	160
RAV-SM2802DT-TR	75	75	160

New Refrigerant (R410A)

This air conditioner adopts a new HFC type refrigerant (R410A) which does not deplete the ozone layer.

1. Safety Caution Concerned to New Refrigerant

The pressure of R410A is high 1.6 times of that of the former refrigerant (R22).

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 new 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 R410A 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 R410A, 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 new refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.
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) R410A 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 R410A, 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 R410A

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

   The table below shows the tools exclusive for R410A and their interchangeability.

Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether conventional equipment can be used
①	Flare tool	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	Refrigerant cylinder	Refrigerant charge	Yes	No	No
⑨	Leakage detector	Gas leakage check	Yes	No	Yes

(Note) When flaring is carried out for R410A 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 are necessary as the general tools.

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

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

1) Clamp meter
2) Thermometer
3) Insulation resistance tester (Megger)
4) Electroscope

1. SPECIFICATIONS

1-1. Indoor Unit

1-1-1. Concealed Duct High static pressure Type

Model	Indoor unit				RAV-SM2242DT-E	RAV-SM2802DT-E
	Outdoor unit				RAV-SM2242AT8-E	RAV-SM2802AT8-E
Cooling capacity				(kW)	20.0	23.0
Heating capacity				(kW)	22.4	27.0
Electrical characteristics	Cooling	Indoor unit	Power supply	(V)	1 phase 220-240V~ 50Hz	
			Running current	(A)	5.25 – 4.81	5.25 – 4.81
			Power consumption	(kW)	1.12	1.12
			Power factor	(%)	97	97
		Outdoor unit	Power supply	(V)	3 phase 380-415V	
			Running current	(A)	9.83 – 9.00	12.33 – 11.29
			Power consumption	(kW)	6.08	7.63
			Power factor	(%)	94	94
		Total	Power consumption	(kW)	7.20 (3.26 – 9.09)	8.75 (3.36 – 12.76)
			EER		2.78	2.63
			Energy efficiency class *		D	D
	Heating	Indoor unit	Power supply	(V)	1 phase 220-240V~ 50Hz	
			Running current	(A)	5.25-4.81	5.25-4.81
			Power consumption	(kW)	1.12	1.12
			Power factor	(%)	97	97
		Outdoor unit	Power supply	(V)	3 phase 380 – 415V	
			Running current	(A)	8.68 – 7.95	11.36 – 10.40
			Power consumption	(kW)	5.37	7.03
			Power factor	(%)	94	94
		Total	Power consumption	(kW)	6.49 (2.57 – 7.45)	8.15 (2.57 – 11.01)
			COP		3.45	3.31
			Energy efficiency class *		B	C
	Maximum current	Indoor unit		(A)	15.0	15.0
		Outdoor unit		(A)	18.0	20.0
Appearance	Main unit				Zinc hot dipping steel plate	
Outer dimension	Main unit	Height		(mm)	470	470
		Width		(mm)	1380	1380
		Depth		(mm)	1250	1250
Total weight	Main unit			(kg)	160	160
Heat exchanger					Finned tube	
Fan unit	Fan				Centrifugal fan	Centrifugal fan
	Standard air flow at 137Pa / (at Mid tap)			(m^3/min)	3600	4200
	Fan Speed				1	1
	Motor			(W)	370 × 3	370 × 3
	External static pressure (H/M/L)			(Pa)	196 / 137 / 69	196 / 137 / 69
Air filter					None (Local procure)	None (Local procure)
Controller (Sold Separately)					RBC-AMT32E, AMS41E, AS21E2	
Sound pressure level		H/M/L		(dB•A)	54	55
Sound power level		H/M/L		(dB•A)	74	75
Connecting pipe	Gas side			(mm)	28.6	28.6
	Liquid side			(mm)	12.7	12.7
	Drain port			(mm)	32 (VP25)	

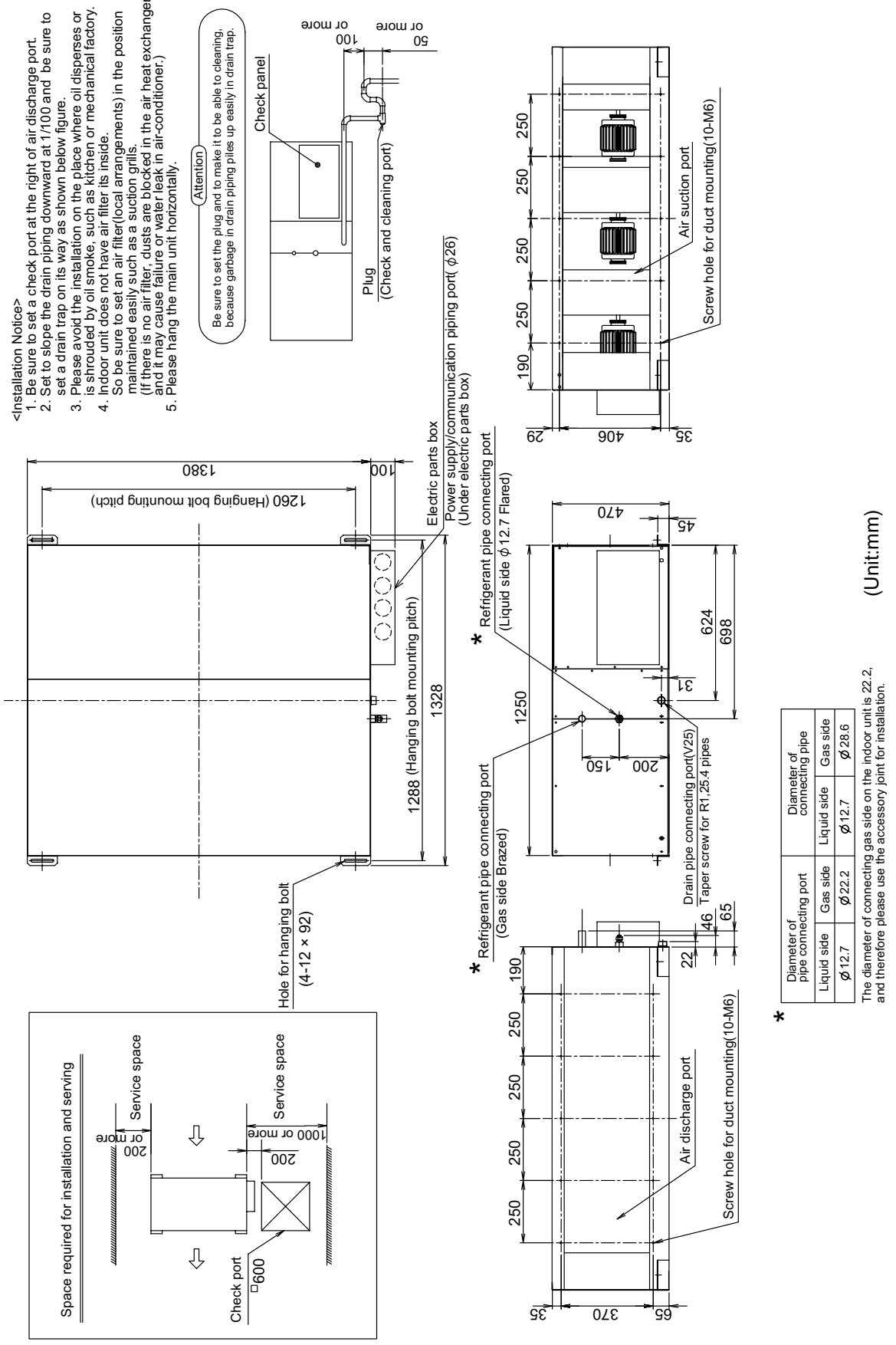
1-1-1. Concealed Duct High static pressure Type (Contined)

Model	Indoor unit				RAV-SM2242DT-TR	RAV-SM2802DT-TR
	Outdoor unit				RAV-SM2244AT8-E	RAV-SM2804AT8-E
Cooling capacity				(kW)	20.0	23.0
Heating capacity				(kW)	22.4	27.0
Electrical characteristics	Cooling	Indoor unit	Power supply	(V)	1 phase 220-240V~ 50Hz	
			Running current	(A)	5.25 – 4.81	5.25 – 4.81
			Power consumption	(kW)	1.12	1.12
			Power factor	(%)	97	97
		Outdoor unit	Power supply	(V)	3 phase 380-415V	
			Running current	(A)	9.83 – 9.00	12.33 – 11.29
			Power consumption	(kW)	6.08	7.63
			Power factor	(%)	94	94
		Total	Power consumption	(kW)	7.20 (3.26 – 9.09)	8.75 (3.36 – 12.76)
			EER		2.78	2.63
			Energy efficiency class *		D	D
	Heating	Indoor unit	Power supply	(V)	1 phase 220-240V~ 50Hz	
			Running current	(A)	5.25 – 4.81	5.25 – 4.81
			Power consumption	(kW)	1.12	1.12
			Power factor	(%)	97	97
		Outdoor unit	Power supply	(V)	3 phase 380-415V	
			Running current	(A)	8.68 – 7.95	11.36 – 10.40
			Power consumption	(kW)	5.37	7.03
			Power factor	(%)	94	94
		Total	Power consumption	(kW)	6.49 (2.57 – 7.45)	8.15 (2.57 – 11.01)
			COP		3.45	3.31
			Energy efficiency class *		B	C
	Maximum current	Indoor unit		(A)	15.0	15.0
		Outdoor unit		(A)	18.0	20.0
Appearance	Main unit				Zinc hot dipping steel plate	
Outer dimension	Main unit	Height		(mm)	470	470
		Width		(mm)	1380	1380
		Depth		(mm)	1250	1250
Total weight	Main unit			(kg)	160	160
Heat exchanger					Finned tube	
Fan unit	Fan				Centrifugal fan	Centrifugal fan
	Standard air flow at 137Pa / (at Mid tap)			(m^3/min)	3600	4200
	Fan Speed				1	1
	Motor			(W)	370 × 3	370 × 3
	External static pressure (H/M/L)			(Pa)	196 / 137 / 69	196 / 137 / 69
Air filter					None (Local procure)	None (Local procure)
Controller (Sold Separately)					RBC-AMT32E, AMS41E, AS21E2	
Sound pressure level		H/M/L		(dB•A)	54	55
Sound power level		H/M/L		(dB•A)	74	75
Connecting pipe	Gas side			(mm)	28.6	28.6
	Liquid side			(mm)	12.7	12.7
	Drain port			(mm)	32 (VP25)	

2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

2-1. Indoor Unit

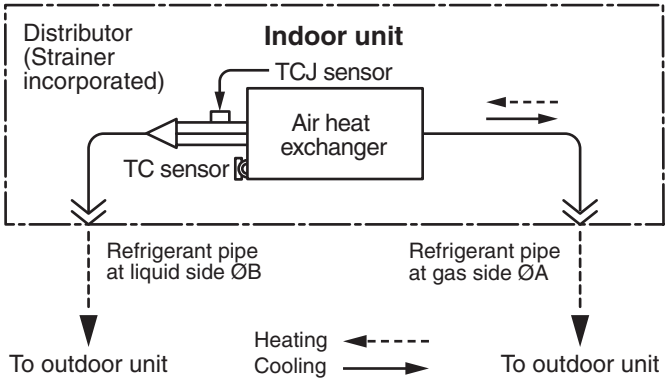
RAV-SM2242DT-E, RAV-SM2802DT-E / RAV-SM2242DT-TR, RAV-SM2802DT-TR



3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

3-1. Indoor Unit

RAV-SM2242DT-E, RAV-SM2802DT-E
RAV-SM2242DT-TR, RAV-SM2802DT-TR



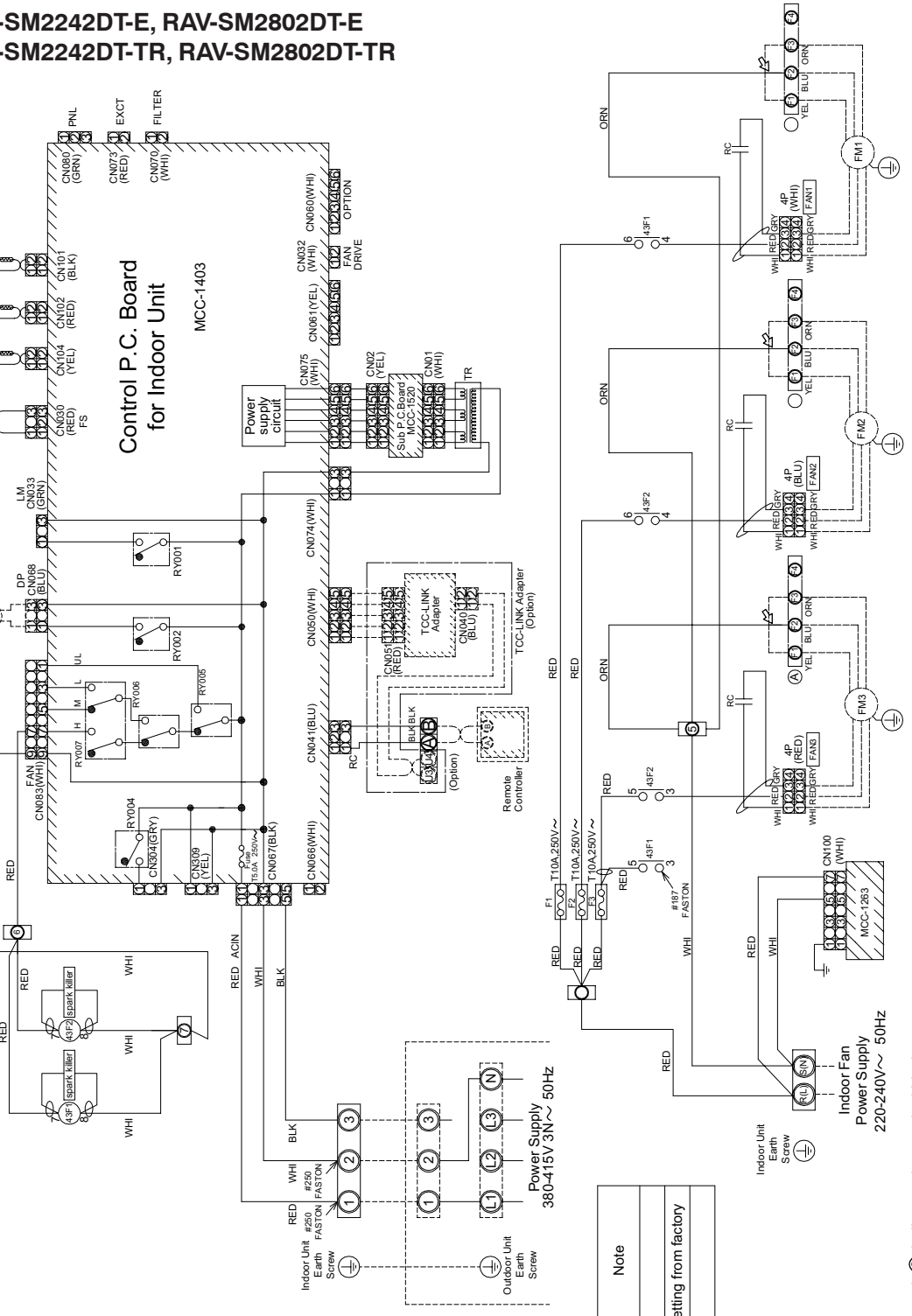
Dimension table

Indoor unit	Outer diameter of refrigerant pipe	
	Gas side ØA	Liquid side ØB
SM224, SM280 type	28.6	12.7

4. WIRING DIAGRAM

4-1. Indoor Unit

RAV-SM2242DT-E, RAV-SM2802DT-E
RAV-SM2242DT-TR, RAV-SM2802DT-TR



Terminal No.	Fan motor wiring	Static pressure Pa (mmAg)	Note
F_1	YEL	69 (7)	
F_2	BLU	137 (14)	Setting from factory
F_3	ORN	196 (20)	

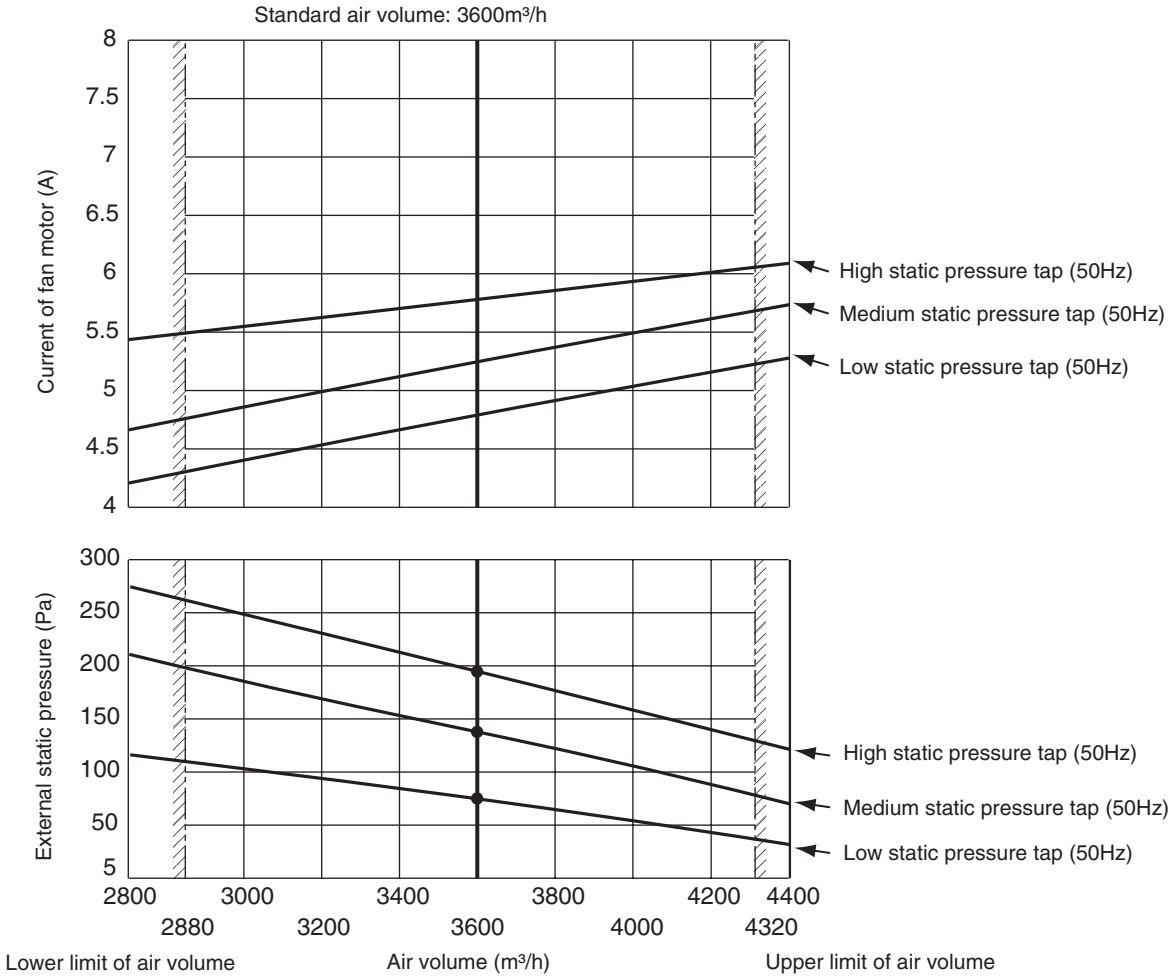
Symbol	Parts name
FM1~3	Fan Motor
RC	Running Capacitor
TR	Transformer
TA	Indoor temp sensor
TC,TCJ	Temp sensor
RY005~007	Fan Motor Control Relay
RY002	Drain Control Relay
RY001	Louver Control Relay
DP	Drain Pump Motor
F1~3	Fuse for Fan Motor
43F1,43F2	Fan Motor Control Relay

1. ◎ indicates the terminal block.
   Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at site.
3. ▨ indicates the control P.C board.
4. When installing the drain pump connect the froat switch connector to CN030 connector.
5. Ⓐ position is connected to terminal block when change to static pressure. exchange the lead wire of arrow( ) position after check the terminal number as figure and lead wire's color of fan motor.

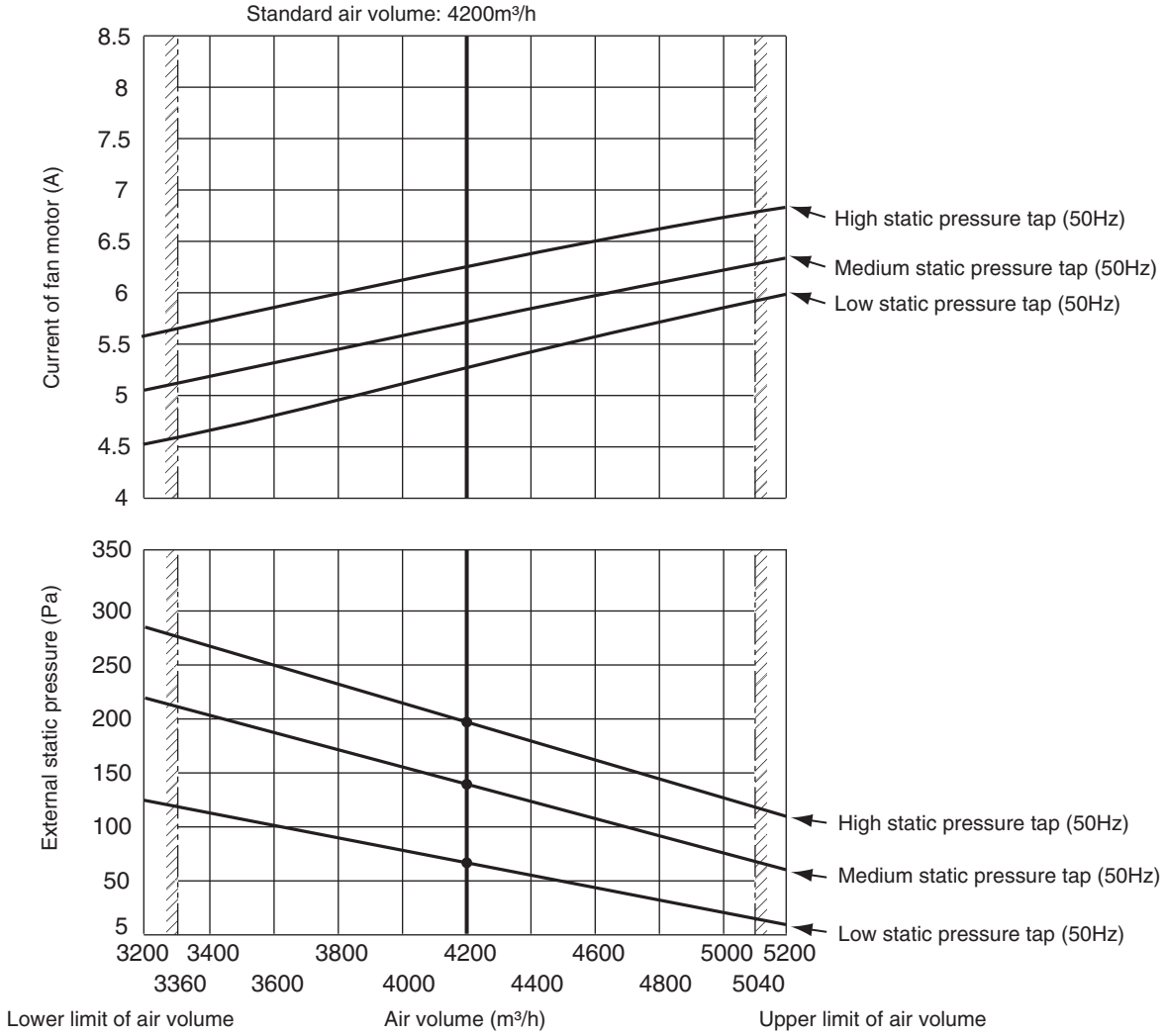
4-2. Fan Characteristics

Current value as a criterion, adjust the air volume value to become within the range of the chart below.]

< RAV-SM2242 type >



< RAV-SM2802 type >



REQUIREMENT

Add a air volume damper to the air supply duct, and adjust the air volume in the range from 80% to 120% of the standard air volume.

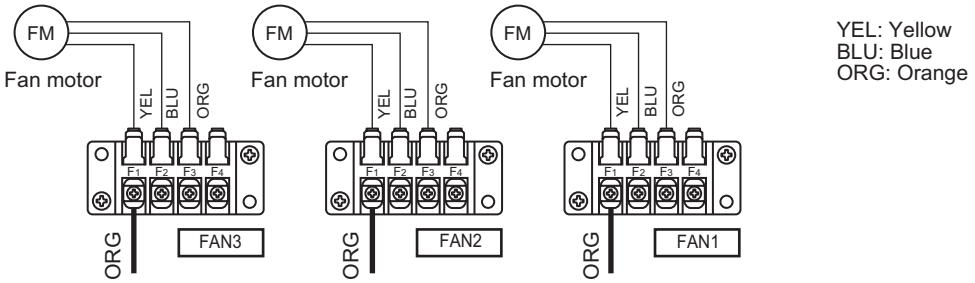
■ Wire connection change of fan motor

This duct is composed of 3 fan motors.

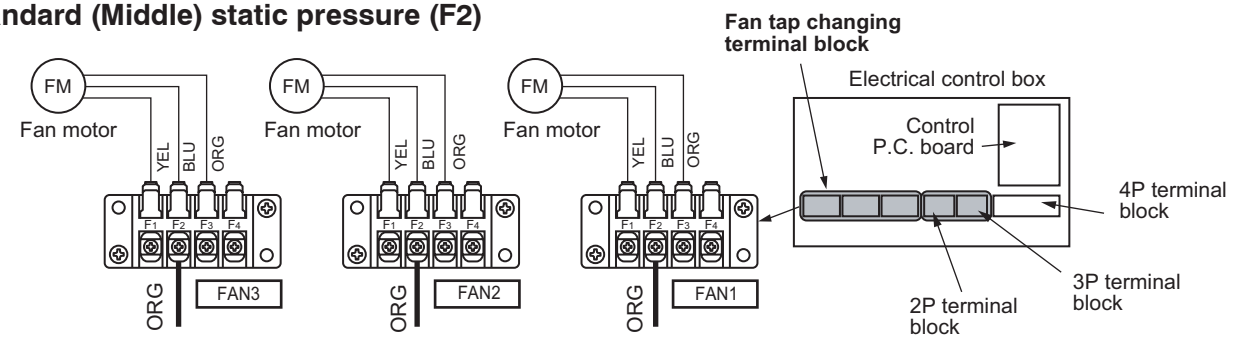
To change external static pressure by duct resistance, connect the 3 connectors of the orange lead wires that are connected to the underside of the fan tap changing terminal block to the same number (F1, F2 or F3) terminal.

The wires of the fan motor has been connected to (F2) [External static pressure 137Pa (14mmAq)] as factory default.

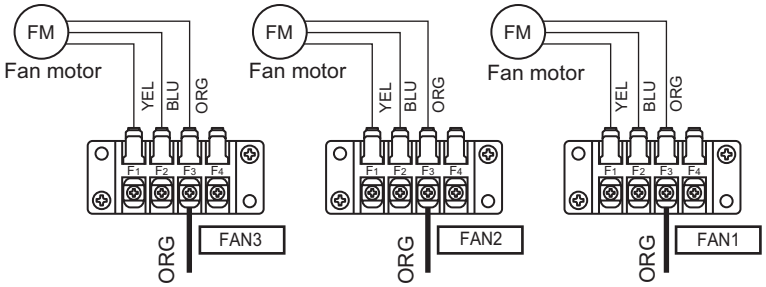
Low static pressure (F1)



Standard (Middle) static pressure (F2)



High static pressure (F3)



Terminal block No.	Fan motor wiring	External static pressure Pa (mmAq)	Remarks
F1	Yellow Low static pressure	69 (7)	
F2	Blue Middle static pressure	137 (14)	Factory default
F3	Orange High static pressure	196 (20)	

∗ Do not use F4.

NOTE

When the external static pressure is changed, write down the static pressure once change in the wiring diagram of the indoor unit is made.

5. SPECIFICATIONS OF ELECTRICAL PARTS

5-1. Indoor Unit

RAV-SM2242DT-E, RAV-SM2802DT-E
RAV-SM2242DT-TR, RAV-SM2802DT-TR

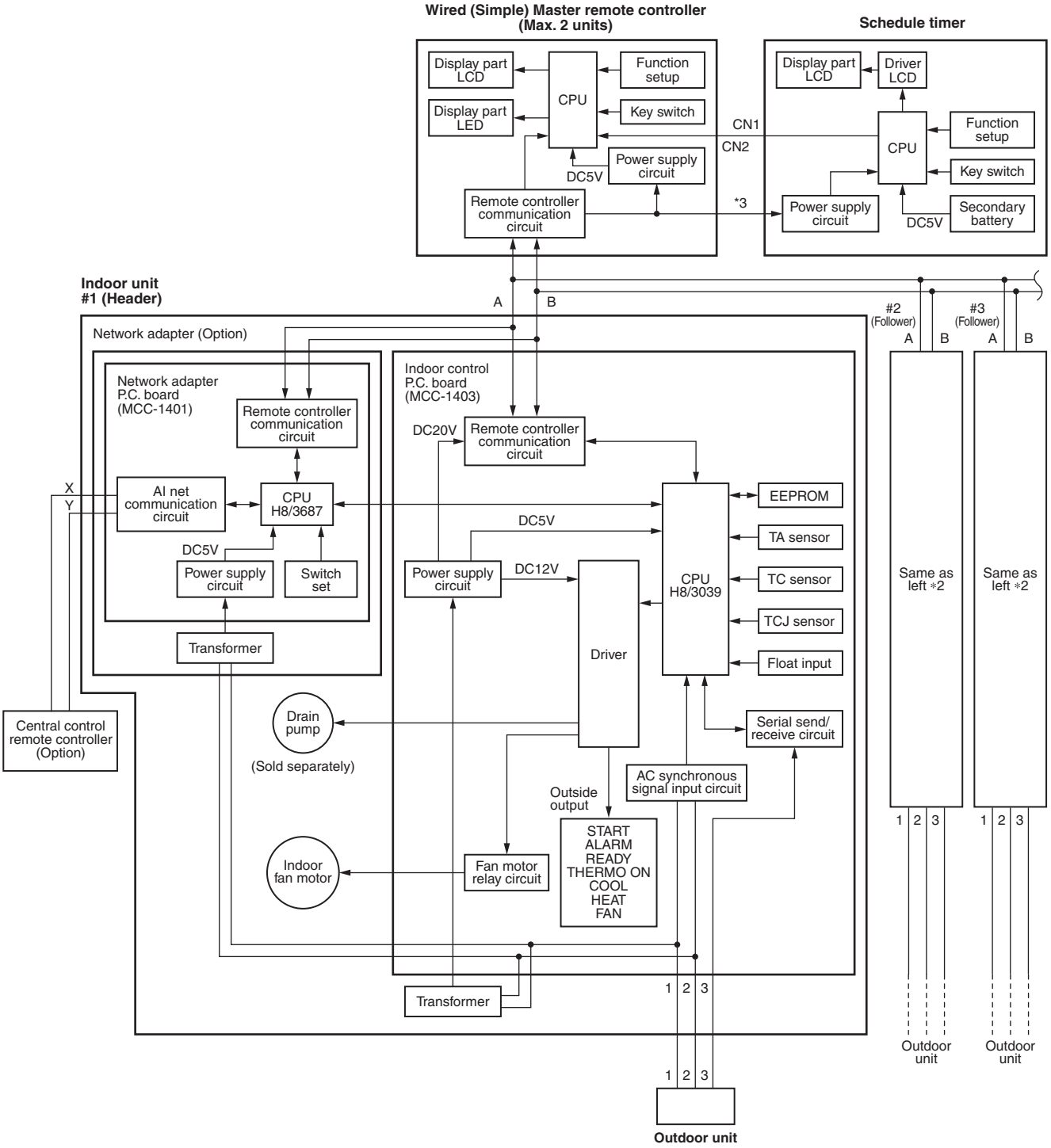
No.	Parts name	Type	Specifications
1	Fan motor	STF-200-370-4AR	Output (Rated) 370 W
2	TA sensor	Lead wire length : 818mm	10 kΩ at 25°C
3	TC sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)	10 kΩ at 25°C
4	TCJ sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Red)	10 kΩ at 25°C

6. INDOOR CONTROL CIRCUIT

6-1. Indoor Controller Block Diagram

RAV-SM2242DT-E, RAV-SM2802DT-E / RAV-SM2242DT-TR, RAV-SM2802DT-TR

6-1-1. Connection of Wired (Simple) Remote Controller



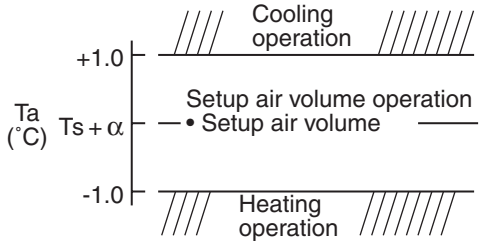
Max. 8 units are connectable. *1

*1 However when mounting a network adapter while 2 wired (simple) remote controllers are connected, Max. 7 units are connectable.

*2 A network adapter is mounted to only 1 unit.

*3 Connection of schedule timer to the simple remote controller is unavailable.

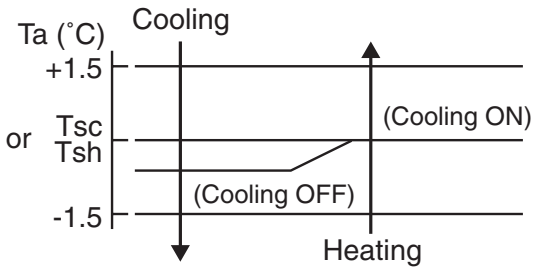
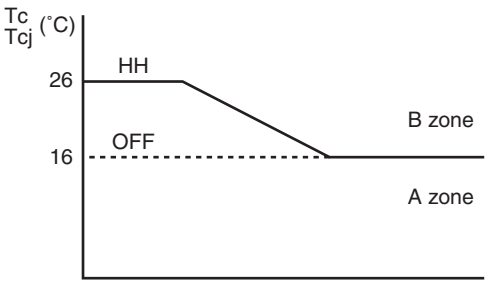
6-2. Control Specifications

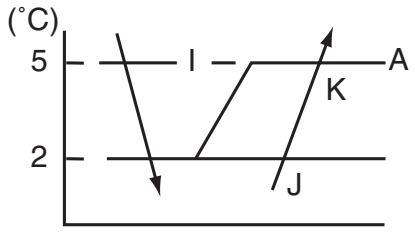
<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>When power supply is reset</td><td>1) Distinction of outdoor unit
When the power supply is reset, the outdoors are distinguished and the control is selected according to the distinguished result.</td><td></td></tr>
<tr><td>2</td><td>Operation mode selection</td><td>1) Based on the operation mode selecting command from the remote controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Air conditioner stops.</td></tr>
<tr><td>FAN</td><td>Fan operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>AUTO</td><td>• COOL/HEAT operation mode is automatically selected by Ta, Ts and To for operation.
• The operation is performed as shown in the following figure according to Ta value at the first time only.
(In the range of Ts + α –1 < Ta < Ts + α + 1, Setup air volume operation continues.)</td></tr>
</table>


• α is corrected according to the outside temperature.
<table>
<tr><th>Outside temp.</th><th>Correction value (a)</th></tr>
<tr><td>No To</td><td>0K</td></tr>
<tr><td>To ≥ 24°C</td><td>–1K</td></tr>
<tr><td>24 > To ≥ 18°C</td><td>0K</td></tr>
<tr><td>To < 18°C</td><td>+1K</td></tr>
<tr><td>To error</td><td>0K</td></tr>
</table></td><td>Ta: Room temp.
Ts: Setup temp.
To: Outside temp.

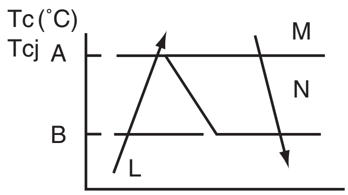
K = deg</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>3</td><td>Room temp. control</td><td>1) Adjustment range: Remote controller setup temperature (°C)
<table><tr><th></th><th>COOL</th><th>HEAT</th><th>AUTO</th></tr><tr><td>Wired type</td><td>18 to 29</td><td>18 to 29</td><td>18 to 29</td></tr></table>2) Using the Item code 06, the setup temperature in heating operation can be corrected.
<table><tr><th>Setup data</th><td>0</td><td>2</td><td>4</td><td>6</td></tr><tr><td>Setup temp. correction</td><td>+0°C</td><td>+2°C</td><td>+4°C</td><td>+6°C</td></tr></table>Setup air volume operation
<table><tr><th>Indoor formation</th><td>Setup data</td></tr><tr><td>1-way Air Discharge Cassette Type
2-way Air Discharge Cassette Type
Concealed Duct Standard Type
High Wall Type
Under Ceiling Type</td><td>2</td></tr><tr><td>Floor Standing Concealed Type
Floor Standing Type</td><td>0</td></tr></table></td><td>Shift of suction temperature in heating operation</td></tr>
<tr><td>4</td><td>Automatic capacity control
(GA control)</td><td>1) Based on the difference between Ta and Ts, the operation frequency is instructed to the outdoor unit.
2) Cooling operation
Every 90 seconds, the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected.
Ta (n) – Ts (n) : Room temp. difference
n : Counts of detection
Ta (n-1) – Ts (n) : Varied room temp. value
n – 1 : Counts of detection of 90 seconds before
3) Heating operation
Every 1 minute (60 sec.), the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected.
Ts (n) – Ta (n) : Room temp. difference
n : Counts of detection
Ta (n) – Ta (n – 1) : Varied room temp. value
n – 1 : Counts of detection of 1 minute before
NOTE)
In case that Low volume is set, the maximum frequency is restricted to approx. [SB].</td><td></td></tr>
</table>

No.	Item	Outline of specifications	Remarks
5	Automatic cooling/ heating control	1) The judgment of selecting COOL/HEAT is carried out as shown below. When exceeding +1.5 against Tsh 10 minutes and after thermo.-OFF, heating operation (Thermo. OFF) exchanges to cooling operation. Description in the parentheses shows an example of cooling ON/OFF.  WWhen –1.5 or more lowers against Tsc 10 minutes and after thermo. OFF, cooling operation (Thermo. OFF) exchanges to heating operation. 2) For the automatic capacity control after judgment of cooling/heating, see Item 4. 3) For temperature correction of room temp. control in automatic heating, see Item 3.	Tsc: Setup temp. in cooling operation Tsh: Setup temp. in heating operation + temp. correction of room temp. control
6	Cool air discharge preventive control	1) In heating operation, the indoor fan is controlled based on the detected temperature of Tc sensor or Tcj sensor. As shown below, the upper limit of the revolution frequency is restricted. However B zone is assumed as C zone for 6 minutes and after when the compressor activated. In defrost operation, the control value of Tc or Tcj are shifted by 6°C.  	In A zone, [PRE-HEAT (Heating ready)] is displayed.

No.	Item	Outline of specifications	Remarks
7	Freeze preventive control (Low temperature release)	1) The cooling operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. When [J] zone is detected for 6 minutes (Following figure), the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [J] zone. In [K] zone, time counting is interrupted and the operation is held. When [I] zone is detected, the timer is cleared and the operation returns to the normal operation. If the commanded frequency becomes S0 because the operation continues in [J] zone, the return temperature A is raised from 5°C to 12°C until [I] zone is detected and the indoor fan operates with [Fan] mode.  In heating operation, the freeze-preventive control works if 4-way valve is not exchanged and the following conditions are satisfied. (However the temperature for J zone dashing control is changed from 2°C to –5°C.) **<Conditions>** • When ① or ② is established 5 minutes after activation. ① Tcn ≤ Tc (n – 1) – 5 ② Tcn < Tc (n – 1) – 1 and Tcn ≤ Ta < 5°C	**Tc, Tcj:** Indoor heat exchanger sensor temperature **Tcn:** Tc temperature when 5 minutes elapsed after activation **Tc (n – 1):** Tc temperature at start time

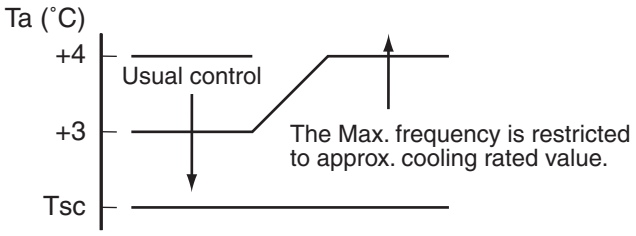
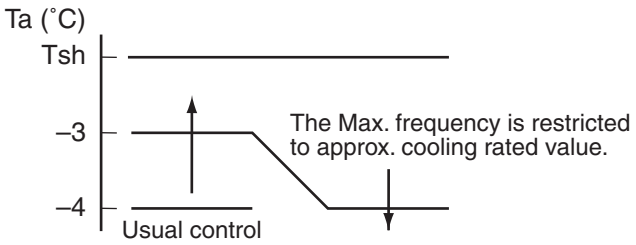
<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>8</td><td>High-temp. release control</td><td>1) The heating operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor.
• When [M] zone is detected, the commanded frequency is decreased from the real operation frequency.
After then the commanded frequency changes every 30 seconds while operation is performed in [M] zone.
• In [N] zone, the commanded frequency is held.
• When [L] zone is detected, the commanded frequency is returned to the original value by approx. 6Hz every 60 seconds.

Setup at shipment
<table>
<tr><th colspan="2">Control temp. (°C)</th></tr>
<tr><th>A</th><th>B</th></tr>
<tr><td>56 (54)</td><td>52 (52)</td></tr>
</table>


NOTE:
When the operation has started or when Tc or Tcj < 30°C at start of the operation or after operation start, temperature is controlled between values in parentheses of A and B.</td><td>Same status as that when “thermostat-OFF”</td></tr>
<tr><td>9</td><td>Drain pump control
(When drain up kit sold separately is mounted)</td><td>1) In cooling operation, the drain pump is usually operated.
2) If the float switch works while drain pump drives, the compressor stops, the drain pump continues the operation, and a check code is output.
3) If the float switch works while drain pump stops, the compressor stops and the drain pump operates. If the float switch keeps operating for approx. 4 minutes, a check code is output.</td><td>Check code [P10]</td></tr>
<tr><td>10</td><td>After-heat elimination</td><td>When heating operation stops, in some cases, the indoor fan operates with [FAN] for approx. 30 seconds.</td><td></td></tr>
<tr><td>11</td><td>HA control</td><td>1) ON/OFF is possible by HA signal input from the remote site when it is connected to the wireless remote unit or the remote Start/Stop I/F.
2) ON/OFF status is output to HA output terminal.
3) HA I/O specification conforms to JEMA Standard.</td><td>Use for remote start/stop
When using HA terminal (CN61), the connecting connector sold separately is necessary.

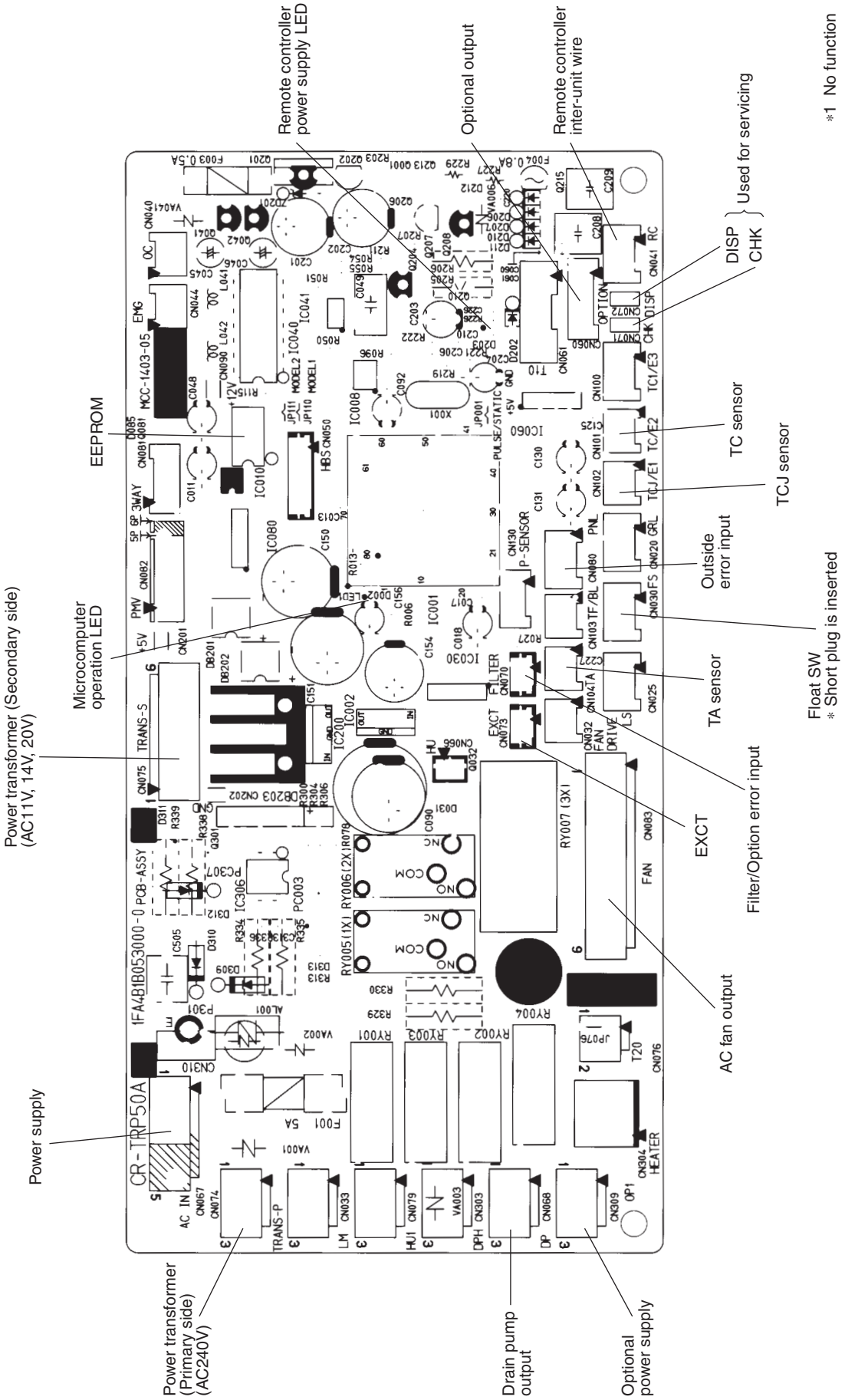
In a group operation, connect it to any of master or follower indoor unit for use.</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
12	Frequency fixed operation (Test run)	**<In case of wired remote controller>** 1) When pushing [CHK] button for 4 seconds or more, [TEST] is displayed on the display screen and the mode enters in Test run mode. 2) Push [ON/OFF] button. 3) Using [MODE] button, set the mode to [COOL] or [HEAT]. • Do not use other mode than [COOL]/[HEAT] mode. • During test run operation, the temperature cannot be adjusted. • An error is detected as usual. • A frequency fixed operation is performed. 4) After the test run, push [ON/OFF] button to stop the operation. (Display in the display part is same as the procedure in Item 1.) 5) Push [CHK] button to clear the test run mode. ([TEST] display in the display part disappears and the status returns to the normal stop status.)	Approx. command frequency [S7]
13	Filter sign display	1) The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the specified time has passed, and it is displayed on LCD. 2) When the filter reset signal has been received from the remote controller, time of the calculation timer is cleared. In this case, the measurement time is reset if the specified time has passed, and display on LCD disappears.	[FILTER ▦] goes on. Specified time Duct: 2500H
14	Central control mode selection	1) Setting at the centerl controller side enables to select the contents which can be operated on the remote controller at indoor unit side. 2) Setup contents • 64 line central controller (TCB-SC642TLE2) [Individual]: Operated on the remote controller (Priority to second pushing) [Central 1]: ON/OFF operation cannot be operated on the remote controller. [Central 2]: ON/OFF, mode selection, temp. setup operations cannot be operated on the remote controller. [Central 3]: Mode selection and temp. setup operations cannot be operated on the remote controller. [Central 4]: Mode selection cannot be operated on the remote controller. ∗ In case of the wireless type, the display lamp does not change but the contents are same. If operating an item which is prohibited by the central control mode from the remote controller, it is notified with the receive sound, Pi, Pi, Pi, Pi, Pi (5 times).	Display at remote controller side (No display) [Central 🖴] goes on [Central 🖴] goes on [Central 🖴] goes on [Central 🖴] goes on “Fixed with 75%”.)

No.	Item	Outline of specifications	Remarks
15	Save operation (By connected outdoor unit)	1) When selecting [AUTO] mode, the save operation is enabled. 2) Shift (Correct) the setup temperature from input values of the every sensor in the range of not spoiling comfortable ability. 3) The input values mean the room temperature Ta, outside temperature To, air volume, and indoor heat exchanger sensor temperature Tc. Their data for 20 minutes are averaged to calculate the correction value of the setup temperature. 4) The setup temperature is shifted every 20 minutes, and the shift value is In cooling time: +1.5 to ~1.0K In heating time: –1.5 to +1.0K.	
16	Max. frequency cut control	1) When selecting [AUTO] mode, the Max. frequency cut control operation is enabled. 2) Cooling operation mode: In case of To <28°C, Max. frequency cut is controlled based on the following figure.  3) Heating operation mode: In case of To > 15°C, Max. frequency cut is controlled based on the following figure.  	

6-3. Indoor Print Circuit Board

<MCC-1403>



6-3-1. Optional Connector Specifications of Indoor P.C. Board

Function	Connector No.	Pin No.	Specifications	Remarks
Ventilation output	CN32	1	DC12V	Setting at shipment: Interlock of ON by indoor unit operation, with OFF by stop operation * The single operation setting by FAN button on the remote controller is performed on the remote controller (DN [31] = 0000 → 0001)
		2	Output (Open collector)	
Option output	CN60	1	DC12V	
		2	Defrost output (Open collector)	ON when outdoor unit is defrosted
		3	Thermostat ON output (Open collector)	ON when real thermostat is on. (Compressor ON)
		4	Cooling output (Open collector)	ON when operation mode is cooling system (COOL, Cooling/Heating automatic cooling)
		5	Heating output (Open collector)	ON when operation mode is heating system (HEAT, Cooling/Heating automatic heating)
		6	Fan output (Open collector)	ON when indoor fan is on. (When air cleaner is used) OFF while clean operation is performed.
Outside error input	CN80	1	DC12V	Generate the warning code "L30" (continuously for 1 minute) and stop the operation forcibly.
		2	NC	
		3	Outside error input	
AUTO up/ down grille (*)	CN20	1	DC12V	The grille is controlled according to up/down operation from the remote controller. * Setting of automatic up/down grille provided is performed on the remote controller. (DN [30] = 0000 → 0001)
		2	Panel operation input	
		3	Panel up output (Open collector)	
		4	Panel down output (Open collector)	
		5	0V	
FILTER Option error / Humidifier setting (*)	CN70	1	A	Selection of option error input (Protective operation display of device attached to outside) or Humidifier setting input (Vaporizing + Drain pump ON) Humidifier is set at shipment from factory. * Setting of option error input is performed on the remote controller. (DN [2A] = 0002 → 0001)
		2	0V	
CHK Operation check	CN71	1	0V	This check is used to check indoor operation. (Performs operation of indoor fan "H", Louver horizontal and Drain pump ON without communication with outdoor and remote controller)
		2		
DISP Exhibition mode	CN72	1	0V	Communication is available by indoor unit and remote controller only.
		2	Demand input	
EXCT Demand	CN73	1	0V	Indoor unit forced thermostat OFF operation
		2		

* This option is not provided to oversea models.

7. INDOOR UNIT TROUBLESHOOTING

7-1. 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 points before check
   a) The following operations are normal.
      1. Compressor does not operate.
         - Is not 3-minutes delay (3 minutes after compressor OFF)?
         - Is not it during thermo-OFF?
         - Does not timer operate during fan operation?
         - Is not an overflow error detected on the indoor unit?
         - Is not outside high-temperature operation controlled in heating operation?
      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.
         - Does not high-temperature release operation control work in heating operation?
         - Does not outside low-temperature operation control work in cooling operation?
         - Is not defrost operation performed?
      4. ON/OFF operation cannot be performed from remote controller.
         - Is not the control operation performed from outside/remote side?
         - Is not automatic address being set up?
           (When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)
         - Is not being carried out a test run by operation of the outdoor controller?
   b) Did you return the cabling to the initial positions?
   c) Are connecting cables of indoor unit and remote controller correct?

2. Troubleshooting procedure

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

Trouble → **Confirmation of check code display** → **Check defective position and parts.**

NOTE :

For cause of a trouble, power conditions or malfunction/erroneous diagnosis of microcomputer due to outer noise is considered except the items to be checked. If there is any noise source, change the cables of the remote controller to shield cables.

Main remote controller (RBC-AMT32E)

How to read check monitor display

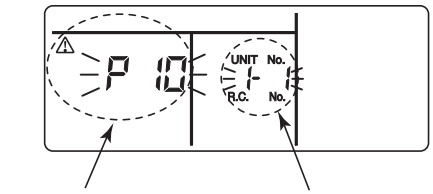
<7-segment display>

■ Confirmation and check

When an error occurred in the air conditioner, an error code and indoor UNIT No. appear on the display part of the remote controller.

The error code is only displayed during the operation.

If the display disappears, operate the air conditioner according to the following "Confirmation of error log" for confirmation.



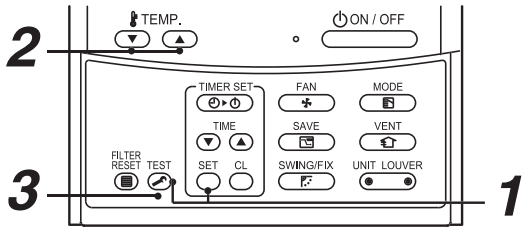
Error code

Indoor UNIT No. in which an error occurred

■ Confirmation of error log

When an error occurred on the air conditioner, the error log can be confirmed with the following procedure. (The error history is stored in memory up to 4 errors.)

The log can be confirmed from both operating status and stop status.

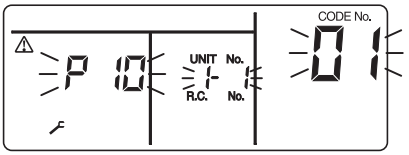


Procedure *1*

When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears.

If is displayed, the mode enters in the error log mode.

- [**01**: Order of error log] is displayed in CODE No.
- [Error code] is displayed in CHECK.
- [Indoor unit address in which an error occurred] is displayed in Unit No..



Procedure *2*

Every pushing of TEMP. button used to set temperature, the error log stored in memory is displayed in order.

The numbers in CODE No. indicate CODE No. [**01**] (latest) → [**04**] (oldest).

REQUIREMENT

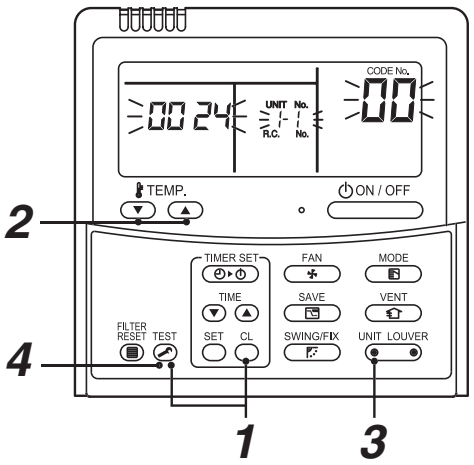
Do not push CL button because all the error log of the indoor unit will be deleted.

Procedure *3*

After confirmation, push TEST button to return to the usual display.

■ Remote controller switch monitoring function

This function is available to call the service monitor mode from the remote controller during a test run to acquire temperatures of sensors of the remote controller, indoor unit, and outdoor unit.



1. Push CL and TEST buttons simultaneously for at least 4 seconds to call the service monitor mode.
   The service monitor indicator lights up and the header indoor unit number is displayed first.
   CODE No. 00 is also displayed.
2. Pushing TEMP. (▼) (▲) buttons, select the number of sensor, etc. (CODE No.) to be monitored. (See the following table.)
3. Pushing UNIT LOUVER (left side of the button), select an indoor unit to be monitored.
   The sensor temperatures of indoor units and their outdoor unit in the control group are displayed.
4. Push TEST button to return to the normal display.

Indoor unit data	
CODE No.	**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)

Outdoor unit data	
CODE No.	**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)
64	—
65	Heatsink temperature (THS)
6A	Operating current (x1/10)
F1	Compressor cumulative operating hours (x100h)

7-1-1. Check Code List (Indoor)

(Indoor unit detected)

Check code indication	Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central & Remote controller			Automatic reset	Operation continuation
E03	Regular communication error between indoor and remote controller	No communication from remote controller and network adapter (Also no communication from central control system)	○	×
E04	Indoor/Outdoor serial error	There is error on serial communication between indoor and outdoor units	○	×
E08	Duplicated indoor addresses ✧	Same address as yours was detected.	○	×
E10	Communication error between indoor MCU	MCU communication error between main motor and micro computer	○	×
E18	Regular communication error between indoor master and follower units	Regular communication between indoor master and follower units is impossible.	○	×
F01	Indoor unit, Heat exchanger (TCJ) error	Open/short was detected on heat exchanger (TCJ).	○	×
F02	Indoor unit, Heat exchanger (TC) error	Open/short was detected on heat exchanger (TC).	○	×
F10	Indoor unit, Room temp. sensor (TA) error	Open/short was detected on room temp. sensor (TA).	○	×
F29	Indoor unit, other indoor P.C. board error	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	Duplicated setting of indoor group master unit ✧	There are multiple master units in a group.	×	×
L07	There is group cable in individual indoor unit. ✧	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	Unset indoor group address ✧	Indoor group address is unset.	×	×
L09	Unset indoor capacity	Capacity of indoor unit is unset.	×	×
L20	Duplicated central control system address	Duplicated setting of central control system address	○	×
L30	Outside error input to indoor unit (Interlock)	Abnormal stop by outside error (CN80) input	×	×
P01	Indoor unit, AC fan error	An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10	Indoor unit, overflow detection	Float switch worked.	×	×
P19	4-way valve system error	In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	○	×
P31	Other indoor unit error	Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	○	×

✧ 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.

(Remote controller detected)

Check code indication	Representative defective position	Explanation of error contents	Air conditioner operation	
Remote controller			Automatic reset	Operation continuation
E01	No master remote controller, Remote controller communication (Receive) error	Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers)	—	—
E02	Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	—	—
E09	Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	△

(Central control devices detected)

Check code indication	Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central			Automatic reset	Operation continuation
C05	Central control system communication (send) error	Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET)	—	—
C06	Central control system communication (receive) error	Signal receiving operation of central control system is impossible.	—	—
C12	General-purpose device control interface batched warning	An error on device connected to general-purpose device control interface of exclusive to TCC-LINK/AI-NET	—	—
P30	Group follower unit is defective.	Group follower unit is defective. (For remote controller, above-mentioned [＊＊＊] details are displayed with unit No.)	—	—

NOTE: Even for the same contents of error such as communication error, the display of check code may differ according to detection device.
When remote controller or central controller detects an error, it is not necessarily related to operation of the air conditioner. In this list, the check codes that outdoor unit detects are not described.

Check Code List

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 cables 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.
P19	4-way valve system error • After heating operation has started, indoor heat exchangers 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 master 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	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

The check code has been ramified from **4** series and after

The ramified check code is displayed only when both the indoor unit and the outdoor unit are **4** series and after.
(Ex. Combination of RAV-SM140**4**UT-E with RAV-SM280**4**AT8-E)

When the indoor unit is 3 series and before, the conventional check code is displayed.
(Ex. Combination of RAV-SM140**2**BT-E and RAV-SM280**4**AT8-E: Outdoor unit only is **4** series.)

Operation of diagnostic function					Judgment and measures
Check code		Cause of operation	Status of air conditioner	Condition	
Indoor unit					
before 3 series	after 4 series				
F04	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 (MCC-1599).
F06	F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	1. Check temp. sensor (TE). 2. Check outdoor P.C. board (MCC-1599).
	F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	1. Check temp. sensor (TL). 2. Check outdoor P.C. board (MCC-1599).
	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 (MCC-1599).
	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 (MCC-1599).
F08	F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	1. Check outside temp. sensor (TO). 2. Check outdoor P.C. board (MCC-1599).
L29	F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	1. Check outdoor P.C. board (MCC-1599). (Q201 is incorporated in TH sensor.)
	F31	Outdoor P.C. EEPROM error	Stop	Displayed when error is detected	1. Check outdoor P.C. board (MCC-1599).
	L10	Unset jumper of service P.C. board	Stop	Displayed when error is detected	1. Outdoor service P.C. board Check model type setting jumper wire.
	L29	Communication error between outdoor P.C. board MCU	Stop	Displayed when error is detected	1. Check outdoor P.C. board (MCC-1596, MCC-1597, MCC-1599). 2. Connection check between CN802 of MCC-1599 and CN504 of MCC-1597, and also connection check between CN505 of MCC-1597 and CN851 of MCC-1596.
	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 (MCC-1596). 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. lowers 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	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. (AC342 to 457V) 2. Overload operation of refrigerating cycle
H02	H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	1. Trouble of compressor (Lock, etc.): Replace compressor. 2. Wiring error of compressor (Open phase)

Operation of diagnostic function					Judgment and measures
Check code		Cause of operation	Status of air conditioner	Condition	
Indoor unit					
before 3 series	after 4 series				
H03	H03	Current detection circuit error	Stop	Displayed when error is detected	1. Check outdoor P.C. board (MCC-1596). (AC current detection circuit)
	P05	Open phase of 3-phase power supply	Stop	Displayed when error is detected	1. Check open phase of 3-phase power supply. 2. Black lead wire to be connected to CN03 of MCC-1596 does not pass through T611.
H06	F23	Ps sensor error	Stop	Displayed when error is detected	1. Check connection of Ps sensor connector. 2. Check failure of Ps sensor. 3. Check compressing power error of compressor. 4. Check 4-way valve error. 5. Check outdoor P.C. board error.
	H06	Low pressure protective operation	Stop	Displayed when error is detected	1. Check service valves are fully opened. (Gas side, Liquid side) 2. Check clogging of outdoor PMV. (PMV1, 2) 3. Check SV2 circuit. 4. Check Ps sensor error. 5. Check clogging of indoor filter. 6. Check clogging of refrigerant pipe. 7. Check of outdoor fan operation. (In heating mode) 8. Check short of refrigerant.
P03	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. Trouble of electronic expansion valve 3. Check discharge temp. sensor (TD).
P04	H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	1. Check case thermostat and connector. 2. Check gas leak, recharge 3. Check full open of service valve. 4. Check PMV (Pulse Motor Valve). 5. Check broken pipe.
	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 of outdoor fan operation. 3. Check motor error of outdoor fan. 4. Check clogging of outdoor PMV. (PMV1, 2) 5. Check clogging of heat exchanger in indoor/outdoor units. 6. Short-circuit status 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. AC342 to 457V
	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	P22	Outdoor fan system error	Stop	Displayed when error is detected	1. Check lock of fan motor. 2. Check power supply voltage between L2 and N. AC198 to 264V 3. Check outdoor P.C. board.
P26	P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	1. When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board (MCC-1596). 2. When performing operation while taking-off compressor wire, an error does not occur. (Compressor rare short)
P29	P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board (MCC-1596).

Error mode detected by remote controller or central controller (TCC-LINK)

Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
Not displayed at all (Operation on remote controller is impossible.)	No communication with master indoor unit • Remote controller wiring is not correct. • Power of indoor unit is not turned on. • Automatic address cannot be completed.	Stop	—	Power supply error of remote controller, Indoor EEPROM error 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) → Automatic address repeating phenomenon generates.
E01 ∗2	No communication with master indoor unit • Disconnection of inter-unit wire between remote controller and master indoor unit (Detected by remote controller side)	Stop (Automatic reset) ∗ If center exists, operation continues.	Displayed when error is detected	Receiving error from remote controller 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board.
E02	Signal send error to indoor unit (Detected by remote controller side)	Stop (Automatic reset) ∗ If center exists, operation continues.	Displayed when error is detected	Sending error of remote controller 1. Check sending circuit inside of remote controller. → Replace remote controller.
E09	There are multiple main remote controllers. (Detected by remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	1. In 2-remote controllers (including wireless), there are multiple main units. Check that there are 1 main remote controller and other sub remote controllers.
L20 Central controller L20	Duplicated indoor central addresses on communication of central control system (Detected by indoor/central controller side)	Stop (Automatic reset)	Displayed when error is detected	1. Check setting of central control system network address. (Network adapter SW01) 2. Check network adapter P.C. board.
— ∗3 Central controller (Send) C05 (Receive) C06	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	1. Check communication wire / miswiring 2. Check communication (U3, U4 terminals) 3. Check network adapter P.C. board. 4. Check central controller (such as central control remote controller, etc.) 5. Check terminal resistance. (TCC-LINK)
— Central controller P30	Indoor Gr sub unit error (Detected by central controller side)	Continuation/Stop (According to each case)	Displayed when error is detected	Check the check code of the corresponding unit from remote controller.

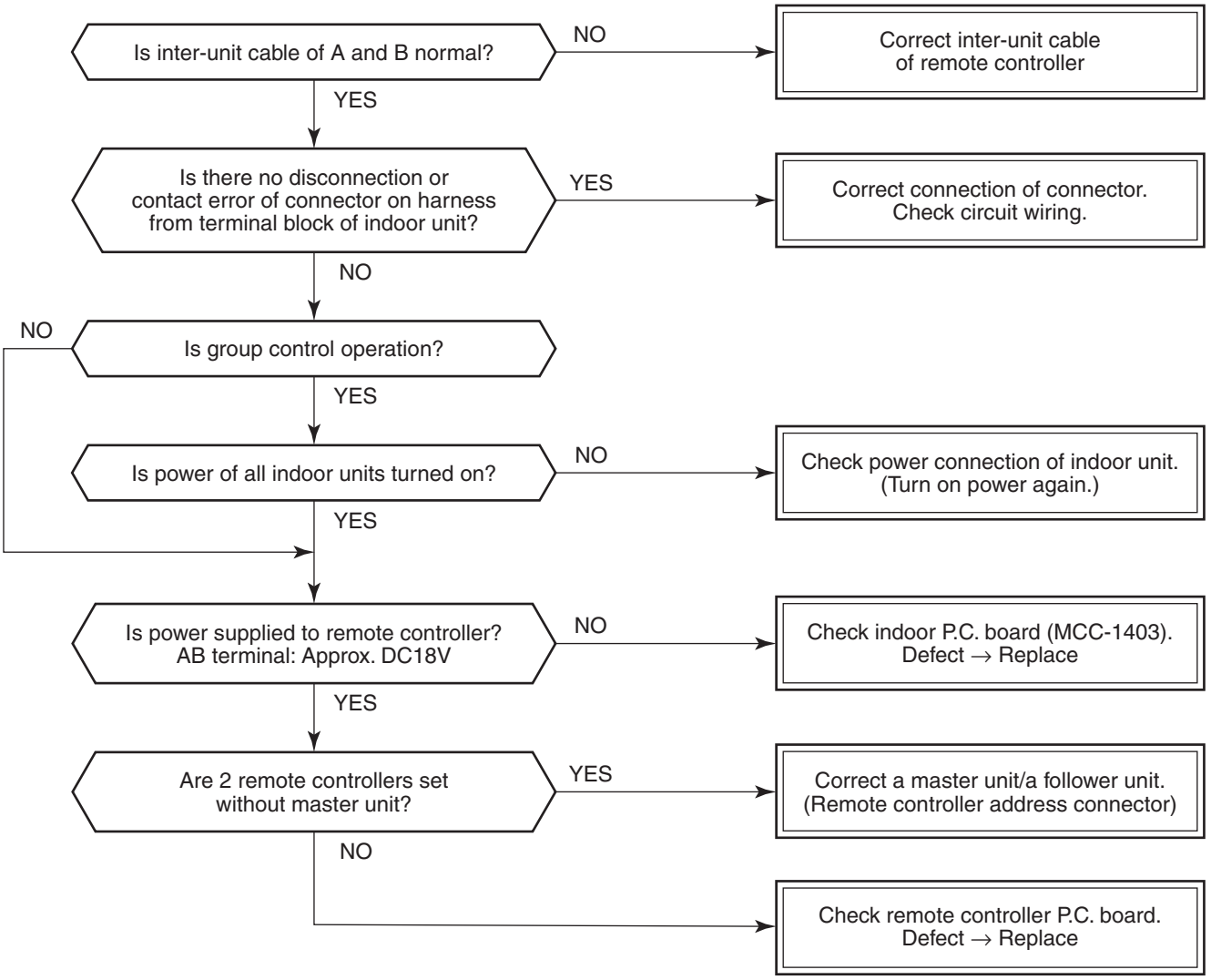
∗2 The check code cannot be displayed by the wired remote controller. (Usual operation of air conditioner becomes unavailable.)
For the wireless models, an error is notified with indication lamp.

∗3 This trouble is related to communication of remote controller (A, B), central system (TCC-LINK U3, U4), and [E01], [E02], [E03], [E09] or [E18] is displayed or no check display on the remote controller according to the contents.

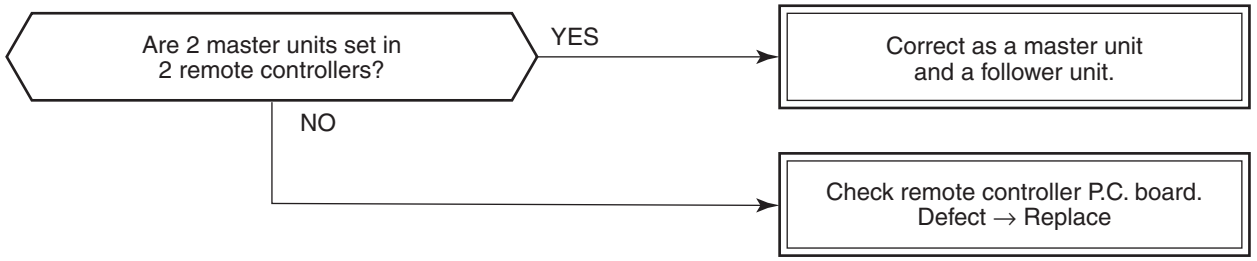
7-1-2. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code

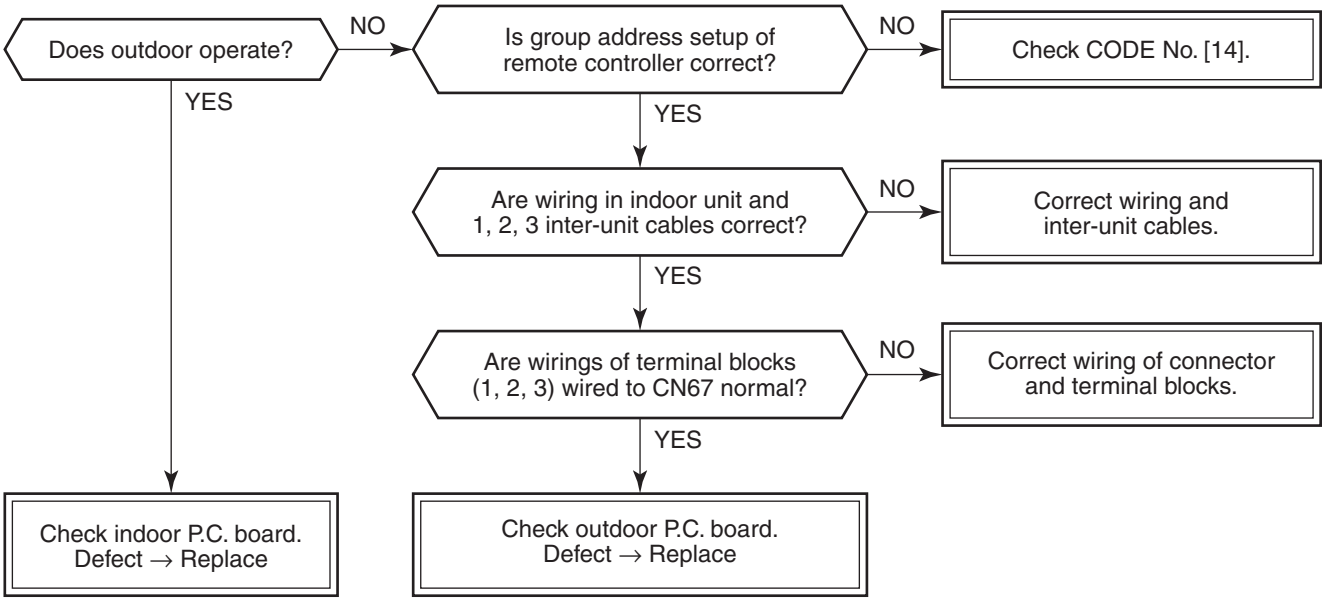
[E01 error]



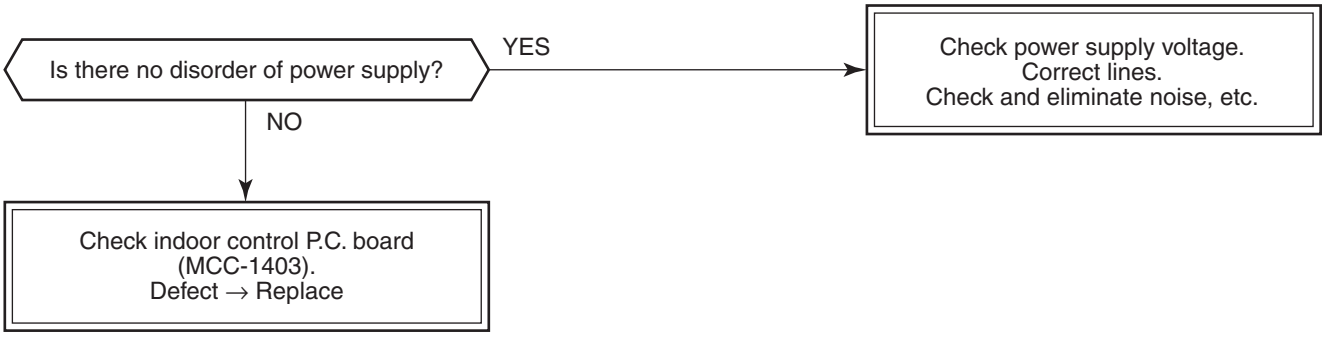
[E09 error]



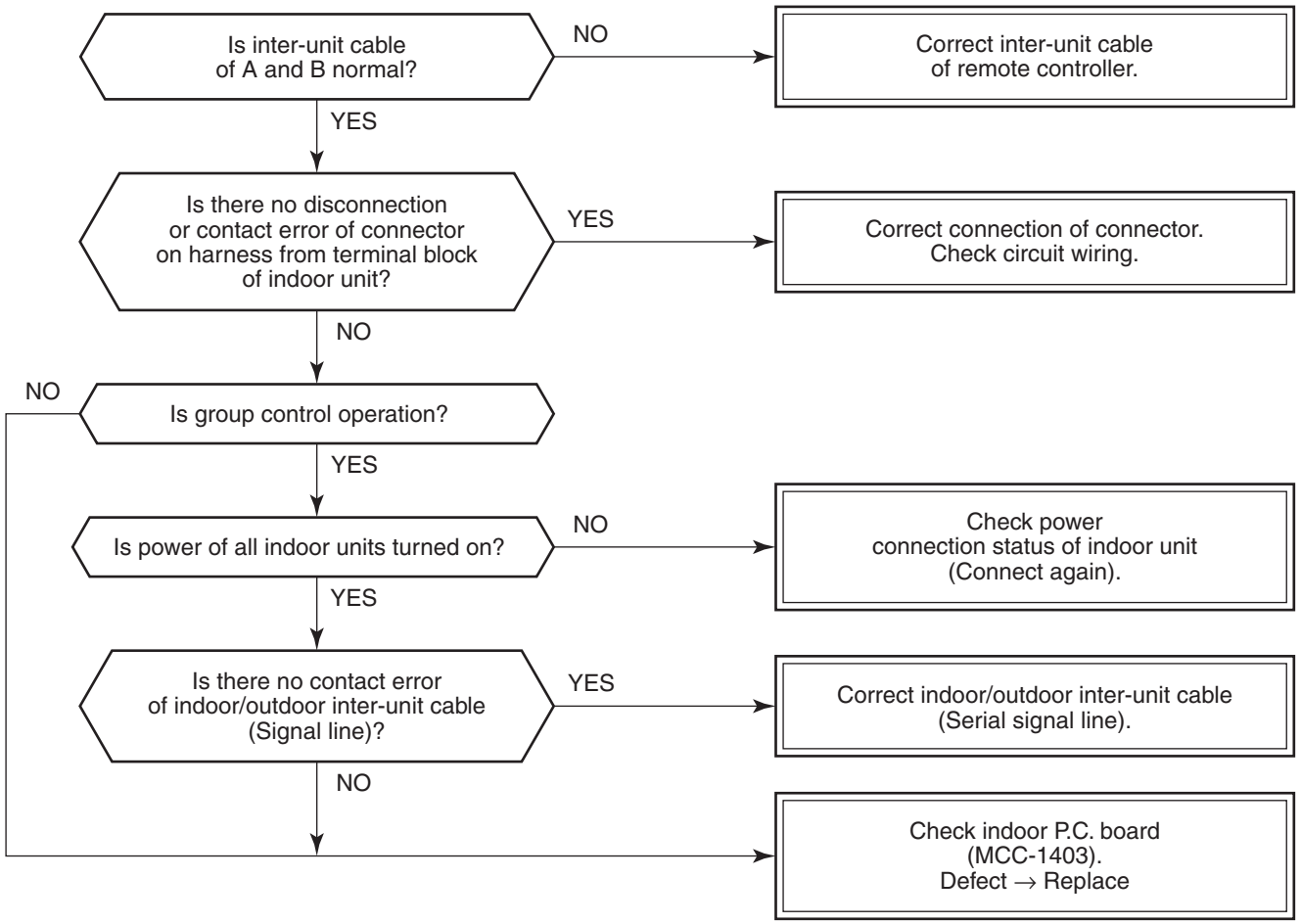
[E04 error]



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

L03: There are 2 or more master units in a group control.

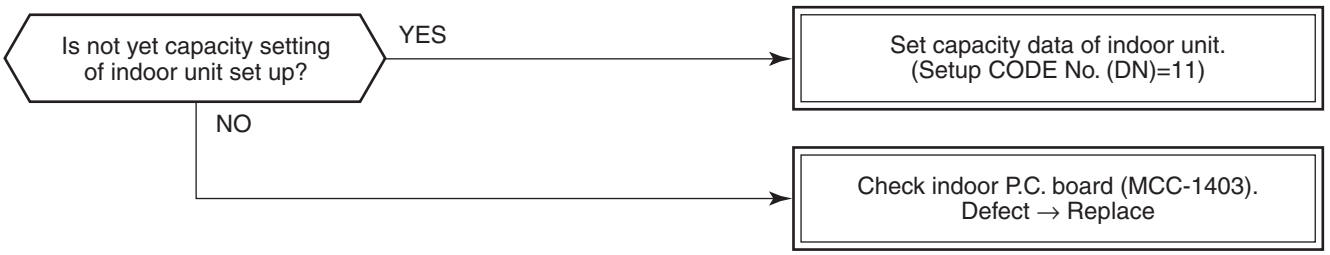
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (99)

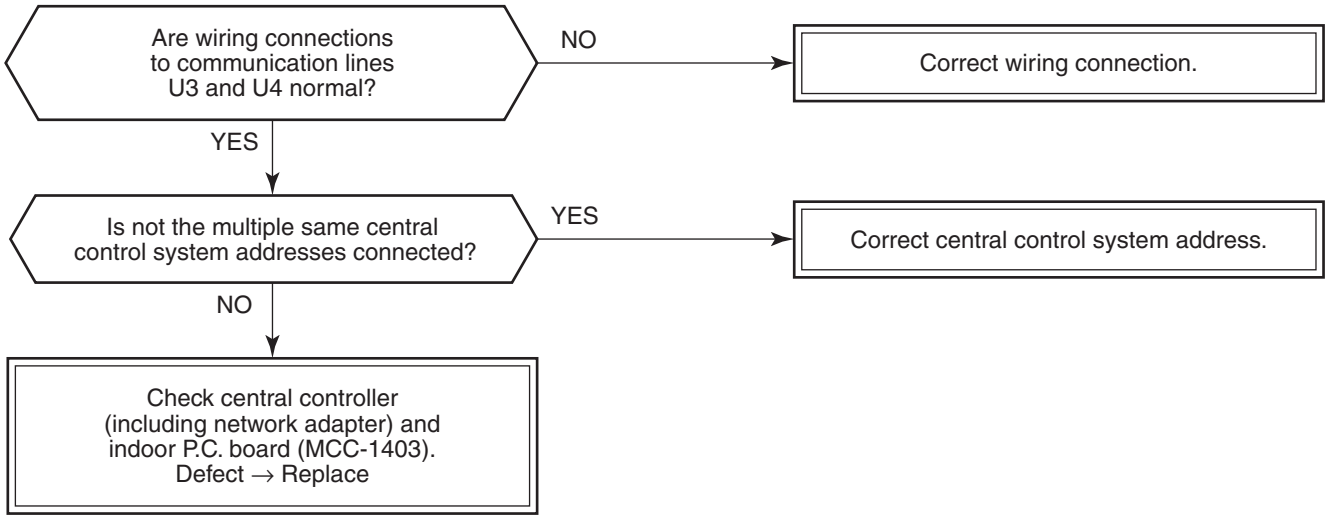
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

However, if the above error is detected during the automatic address set mode, a check code may be output.

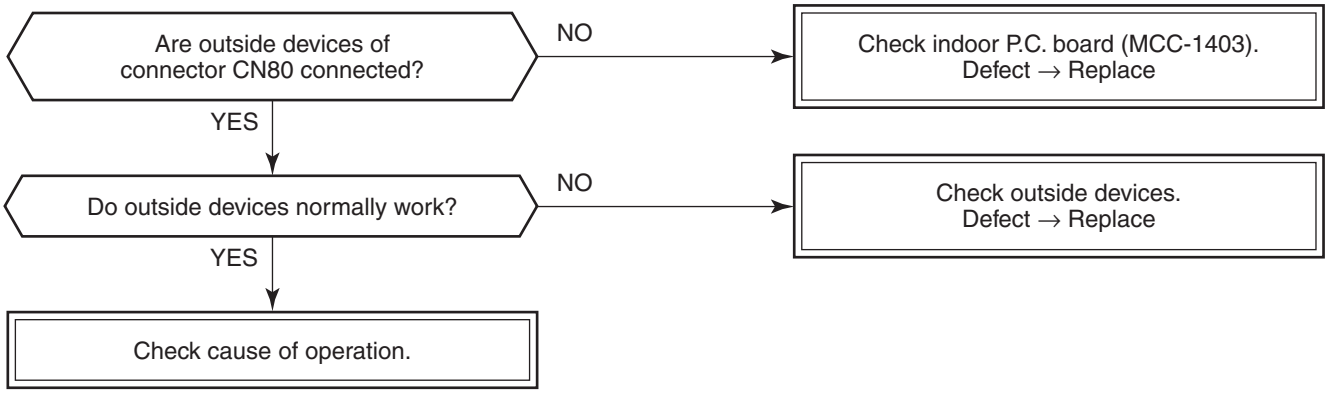
[L09 error]



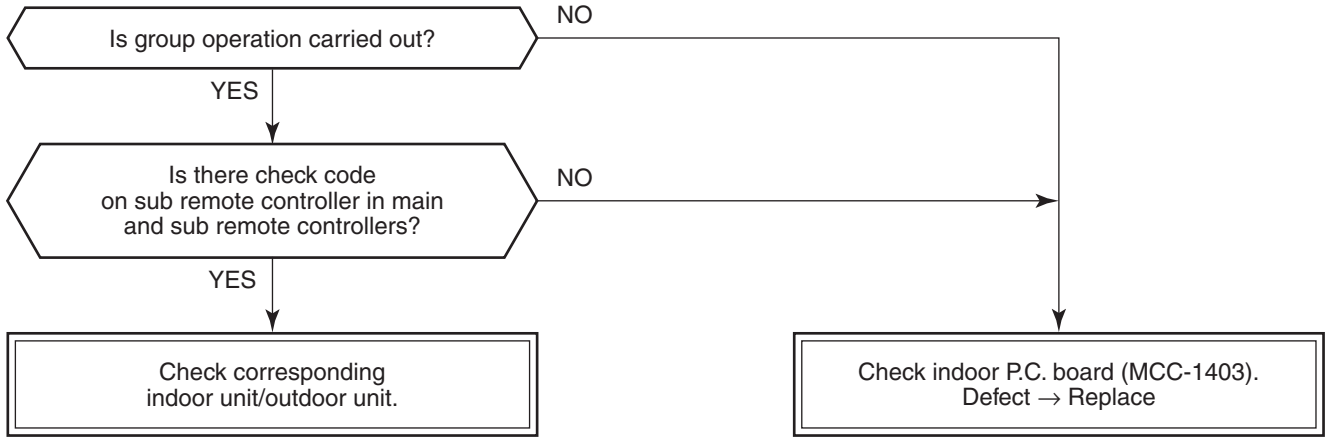
[L20 error]



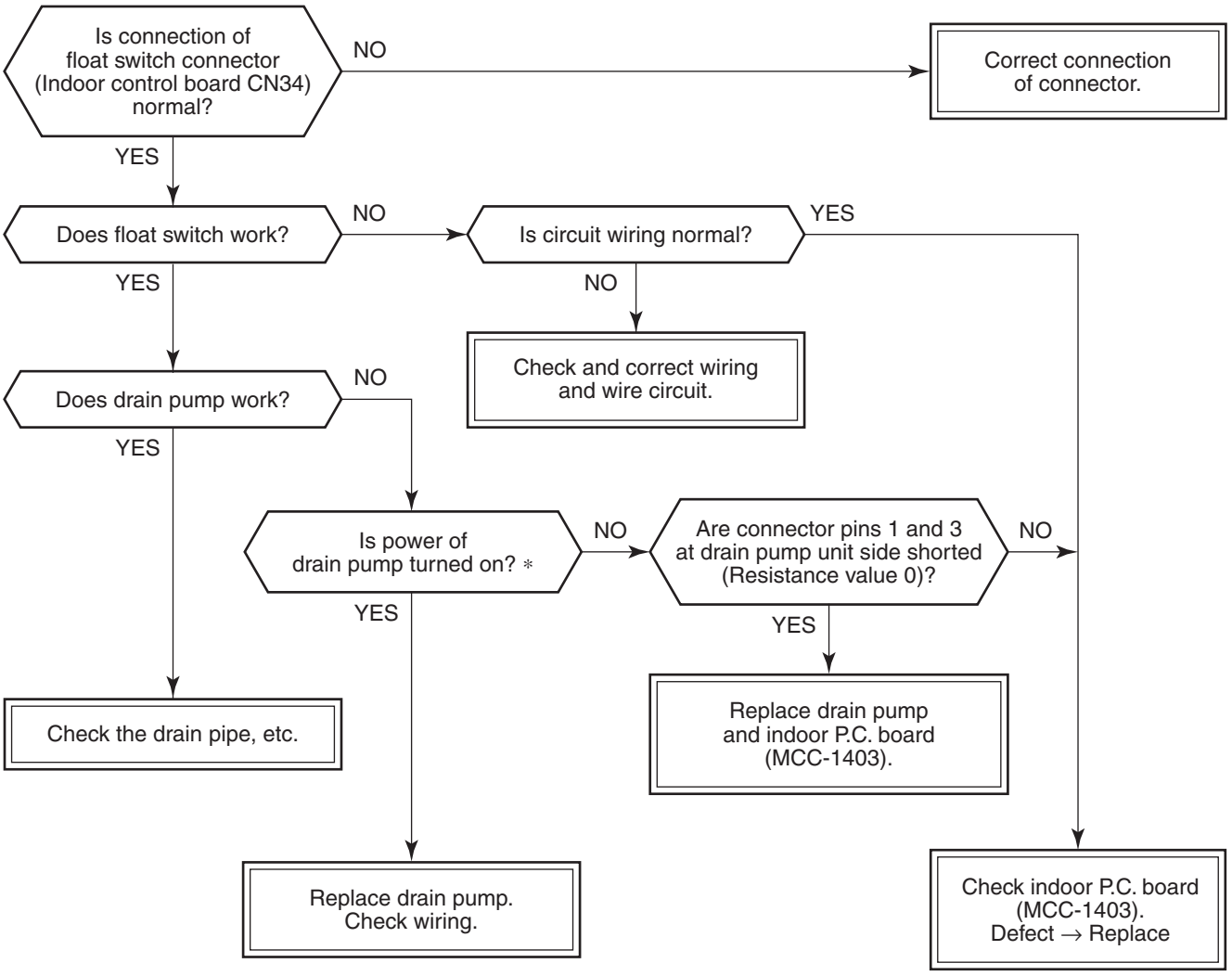
[L30 error]



[P30 error] (Central controller)

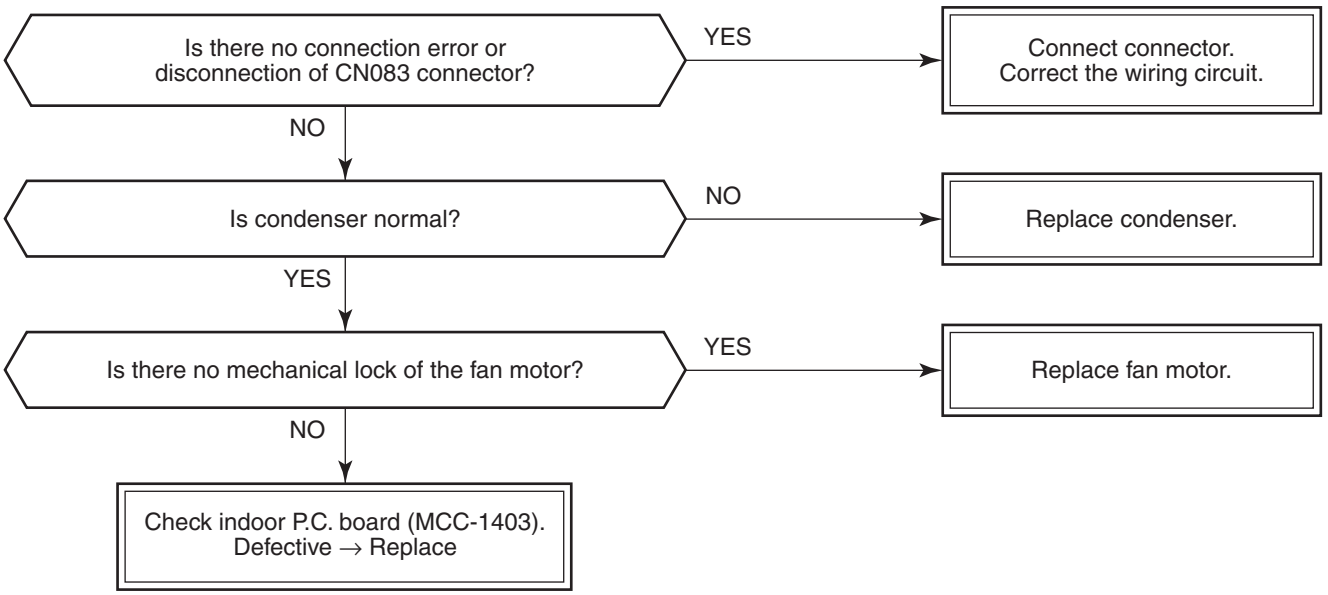


[P10 error]

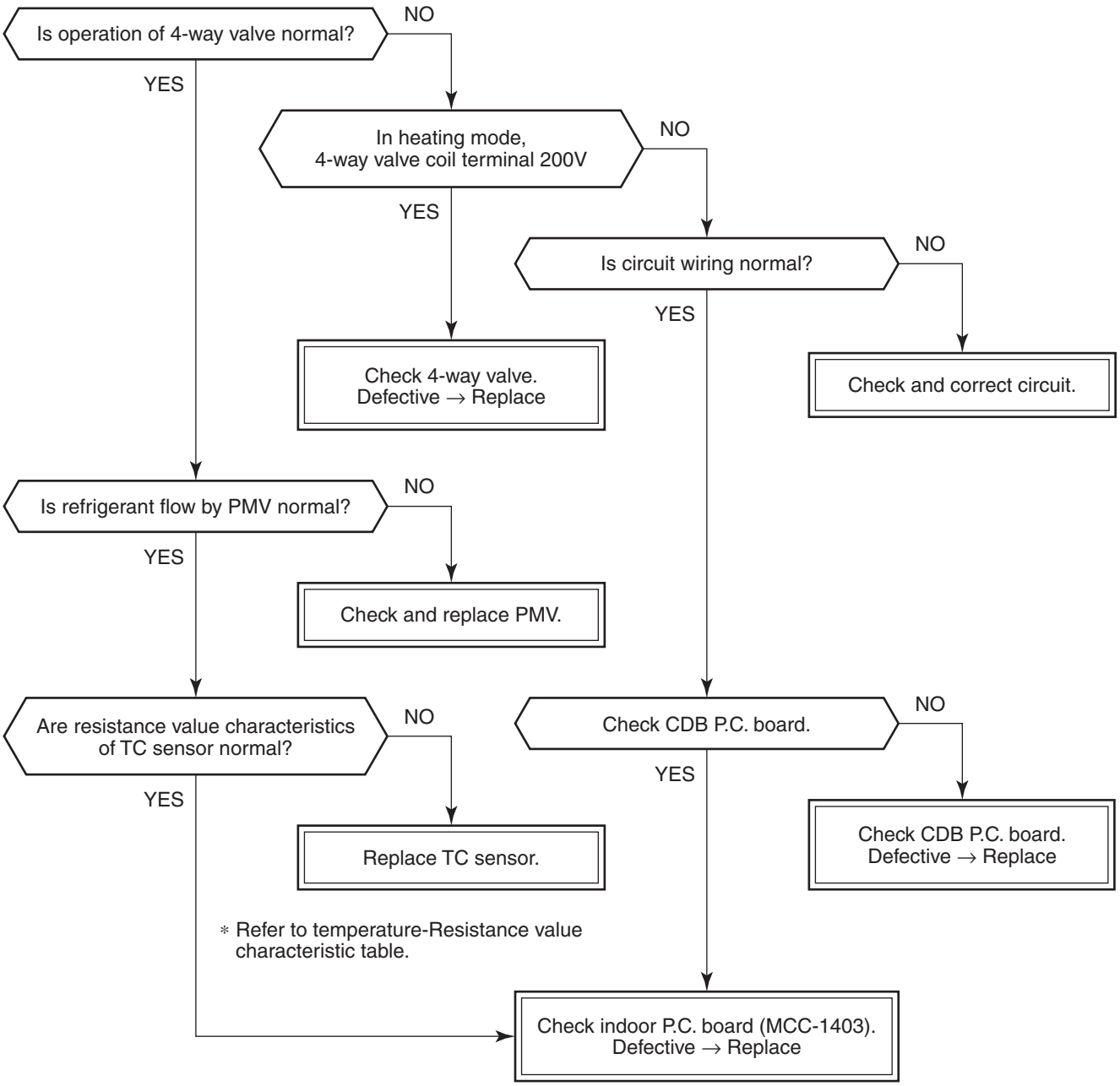


* Check that voltage of 1 – 3 pin of CN068 on the indoor P.C. board is 220–240V.

[P01 error]

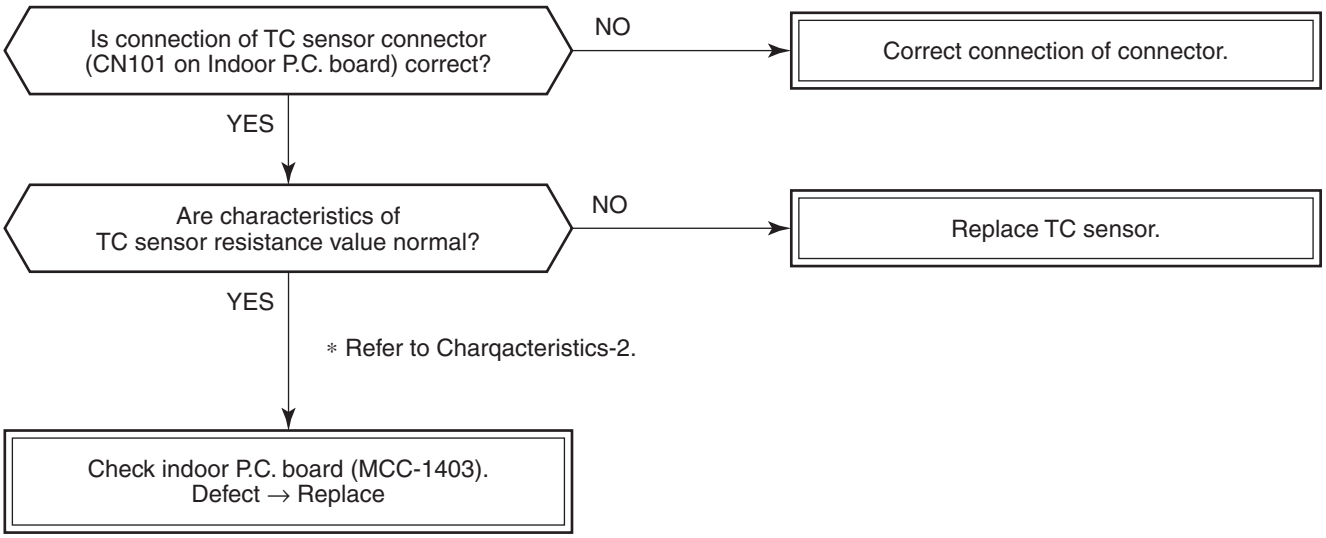


[P19 error]

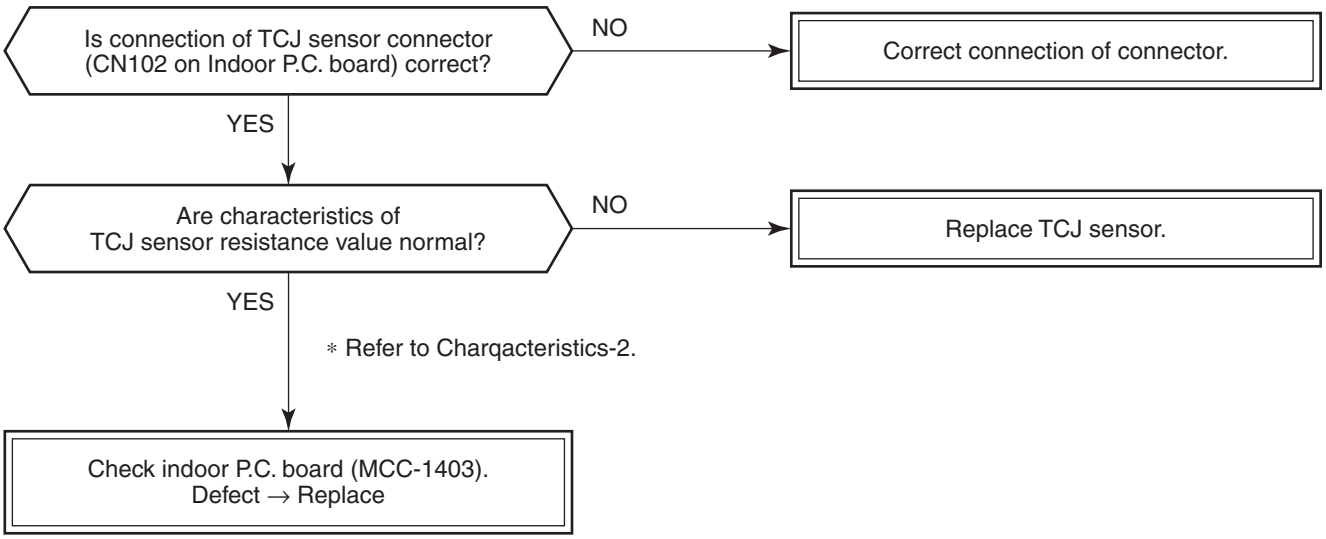


- In cooling operation, the outdoor unit [P19 error] may be displayed when high pressure is abnormally up.
  In this case, referring to item [P04 error], eliminate the pressure-up cause and then diagnose the error again.

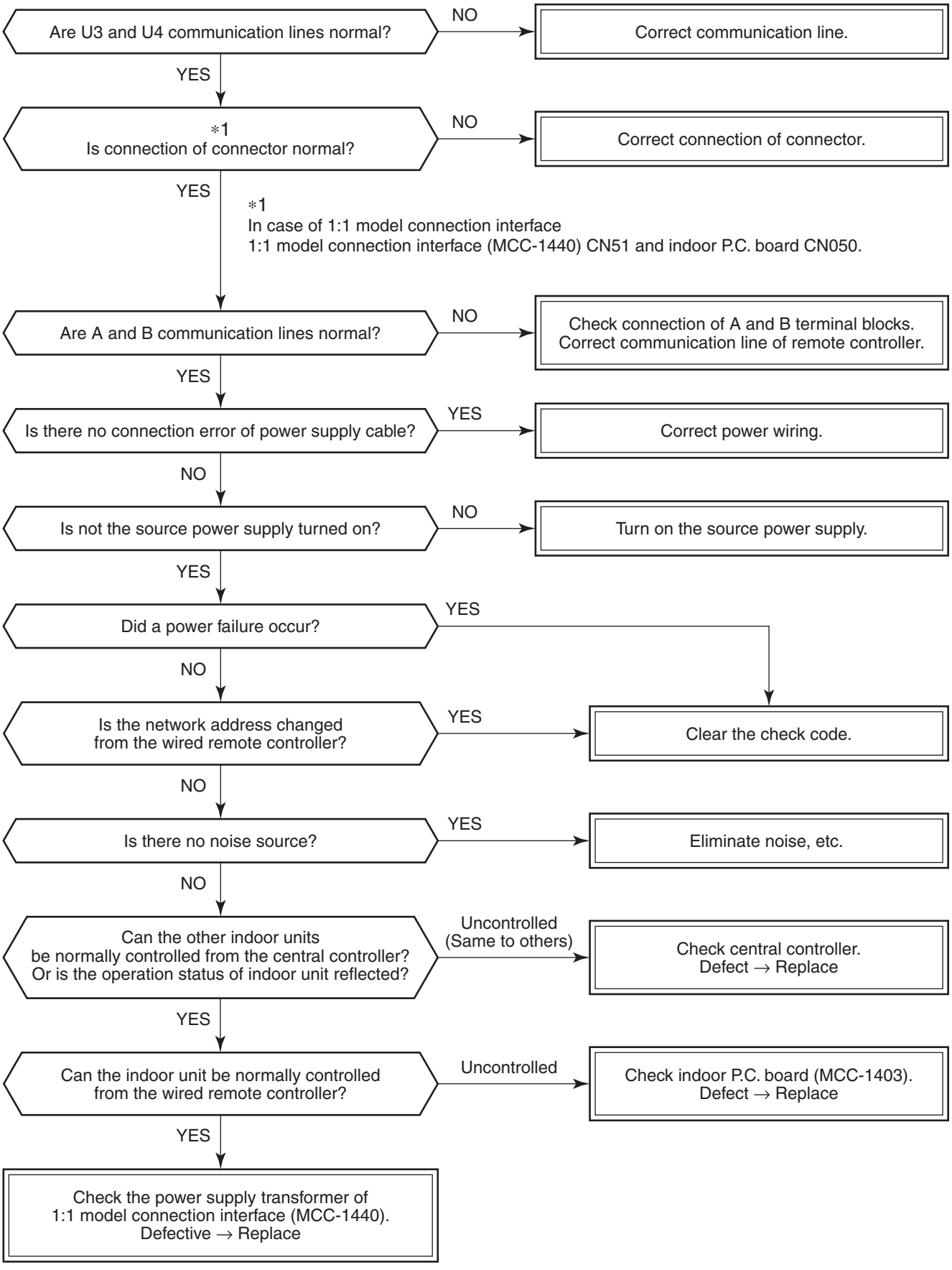
[F02 error]



[F01 error]



[C06 error] (1:1 model connection interface)



[E03 error] (Master indoor unit)

[E03 error] is detected when the indoor unit cannot receive a signal from the wired remote controller (also central controller).

Check A and B remote controllers and communication lines of the central control system U3 and U4.

As communication is impossible, this check code [E03] is not displayed on the wired remote controller and the central controller.

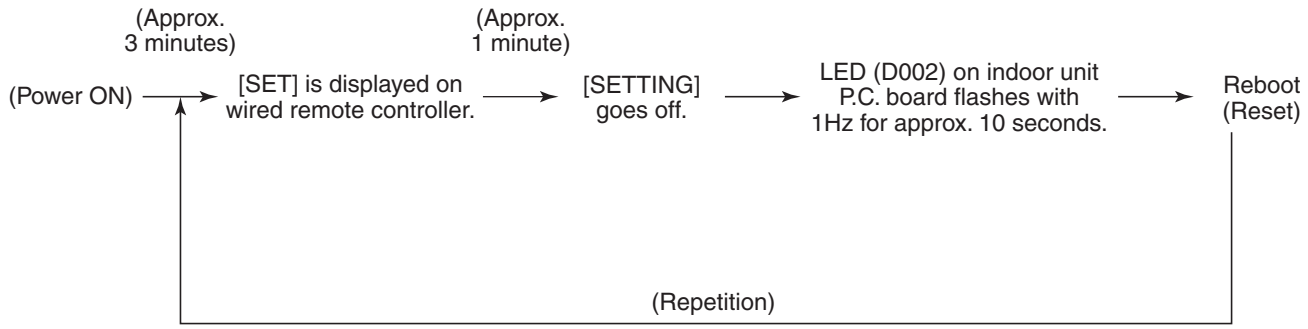
[E01] is displayed on the wired remote controller and [C06 error] is displayed on the central controller.

If these check codes generate during operation, the air conditioner stops.

[F29 error]

This check code indicates a detection error of IC10 non-volatile memory (EEPROM) on the indoor unit P.C. board, which generated during operation of the air conditioner. Replace the service P.C. board.

* When EEPROM was not inserted when power supply turned on or when the EEPROM data read/write operation is impossible at all, the automatic address mode is repeated. In this time, [97 error] is displayed on the central controller.



[P31 error] (Follower indoor unit)

When the master unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

There is no display of the check code or alarm history of the wired remote controller. (In this model, the mode enters in automatic address set mode when the master unit detected [L03], [L07] or [L08] error.)

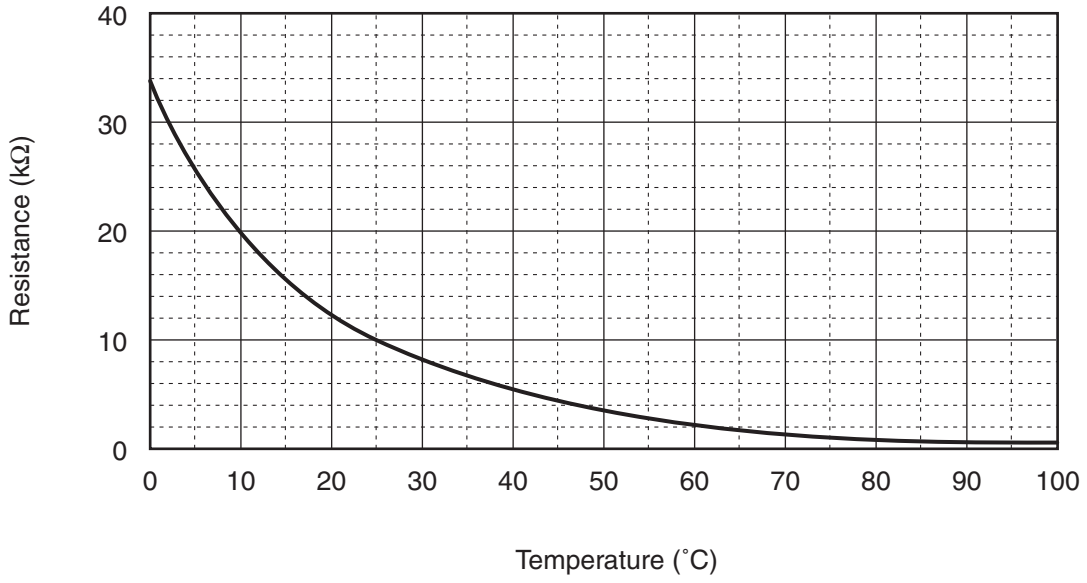
Temperature – Resistance value characteristic table

Temperature sensor TA, TC, TCJ

Representative value

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

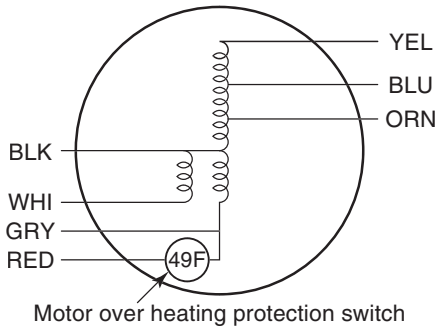
TA, TC, TCJ sensors



Inspection of Fan Motor

Part name	Checking procedure
Fan motor STF200–370–4AR	Measure the resistance value of each winding by using the tester.

Fan motor inside wiring diagram



Position	Resistance value
Black – Red	12.1 Ω
Black – White	12.4 Ω
Black – Yellow	3.94 Ω
Orange – White	13.47 Ω
Blue – White	15.02 Ω

Under 20°C

8. REPLACEMENT OF SERVICE P.C. BOARD

8-1. Indoort Unit

<Note: when replacing the P.C. board for indoor unit servicing>

The nonvolatile memory (hereafter called EEPROM, IC503) on the indoor unit P.C. board before replacement includes the model specific type information and capacity codes as the factory-set value and the important setting data which have been automatically or manually set when the indoor unit is installed, such as system/indoor/group addresses, high ceiling select setting, etc.

When replacing the P.C. board for indoor unit servicing, follow the procedures below.

After replacement completes, confirm whether the settings are correct by checking the indoor unit No., Group master unit / sub unit settings and perform the cooling cycle confirmation through the trial operation.

<Replacement procedures>

CASE 1

Before replacement, the indoor unit can be turned on and the setting data can be read out by wired remote control operation.

EEPROM data read out **[1]**

⇩

Replacement of P.C. board for Indoor unit servicing and power on **[2]**

⇩

Writing the read out EEPROM data **[3]**

⇩

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

CASE 2

Before replacement, the indoor unit cannot be turned on or the wired remote controller operation is impossible due to trouble of the power supply circuit to the remote controller. (Defective P.C. board)

Replacement of EEPROM

Remove EEPROM installed on the P.C. board before replacement and then replace it with EEPROM of the service P.C. board.

⇩

Replacement & power ON for service P.C. board **[2]**

⇩

Read-out of EEPROM data **[1]**

If reading-out is impossible, proceed to CASE 3.

⇩

Replacement of EEPROM

Replace EEPROM again. (Set the original EEPROM to the service P.C. board.)

⇩

Replacement & power ON for service P.C. board **[2]**

⇩

Writing-in of the read-out EEPROM data **[3]**

Power reset

(for all indoor units connected to the remote controller when the group operation control is performed.)

CASE 3

The EEPROM before replacement is defective and the setting data cannot be read out.

Replacement & power ON for service P.C. board **[2]**

⇩

Writing the setting data to EEPROM, such as high ceiling installation setting and optional connection setting, etc., based on the customer information. **[3]**

⇩

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

[1] Setting data read out from EEPROM

The setting data modified on the site, other than factory-set value, stored in the EEPROM shall be read out.

Step 1 Push SET, CL and TEST button on the remote controller simultaneously for more than 4 seconds.

∗ When the group operation control is performed, the unit No. displayed for the first time is the header unit No.
At this time, the CODE No. (DN) shows "10". Also, the fan of the indoor unit selected starts its operation and the swing operation also starts if it has the louvers.

Step 2 Every time when the UNIT LOUVER button is pushed, the indoor unit No. under the group control is displayed in order. Specify the indoor unit No. to be replaced.

1. **Change the CODE No. (DN) to 10 → 01 by pushing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.)**
   At this time, be sure to write down the setting data displayed.
2. Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting.
   Similarly, be sure to write down the setting data displayed.
3. Repeat the step 2-2 to set the other settings in the same way and write down the setting data as shown in the table 1 (example).
   ∗ The CODE No. (DN) are ranged from "01" to "FF". The CODE No. (DN) may skip.

Step 3 After writing down all setting data, push TEST button to return to the normal stop status.
(It takes approx. 1 min until the remote controller operation is available again.)

CODE No. required at least

DN	Contents
10	Type
11	Indoor unit capacity
12	System address
13	Indoor unit address
14	Group address

1. The CODE No. for the Indoor unit type and Indoor unit capacity are required to set the rotation number setting of the fan.
2. If the system/indoor/group addresses are different from those before replacement, the auto-address setting mode starts and the manual resetting may be required again.
   (when the multiple units group operation including twin system.)

[2] P.C. Board for indoor unit servicing replacement procedures

Step 1 Replace the P.C. board to the P.C. board for indoor unit servicing.
On the new P.C. board, set the same setting of the jumper wire and setting of shortcut connection connector as those of the P.C. board before replacement.

Step 2 According to the system configuration, turn on the indoor unit following to the either methods shown below.

a) Single operation (Indoor unit is used as standalone.)
Turn on the indoor unit.
1. After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3]. (System address = 1, Indoor unit address = 1, Group address = 0 (standalone) are automatically set.)
2. Push SET, CL and TEST buttons simultaneously for more than 4 seconds to interrupt the auto-address setting mode, and proceed to [3]. (The unit No. " ALL " is displayed.)

b) Group operation (including twin system)
Turn on the indoor unit(s) with its P.C. board replaced to the P.C. board for indoor unit servicing, according to either methods 1 or 2 shown below.
1. Turn on only the indoor unit with its P.C. board replaced. (Be sure to confirm the remote controller is surely connected. If not, the operation [3] cannot be performed.)
   Perform either methods 1 or 2 described in item a) above.
2. Turn on the multiple indoor units including the indoor unit with its P.C. board replaced.
   • Twin 1 system only
   • All group connections

After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3].

∗ The header unit of the group may be changed by performing the auto-address setting.
Also, the system address/Indoor unit address of the indoor unit with its P.C. board replaced may be assigned to the addresses (not used) other than those of the indoor units without its P.C. board replaced.
It is recommended to keep the information in advance, which cooling system the indoor unit belongs to or whether the indoor unit works as the header unit or the follower unit in the group control operation.

[3] Writing the setting data to EEPROM

The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.

Step 1 Push SET, CL and TEST buttons on the remote controller simultaneously for more than 4 seconds.

∗ In the group control operation, the unit No. displayed for the first time is the header unit No.
At this time, the CODE No. (DN) shows "10". Also, the fan of the indoor unit selected starts its operation and the swing operation starts if it has the louvers.
(The unit No. " ALL " is displayed if the auto-address setting mode is interrupted in [2] step 2 a))

Step 2 Every time when UNIT LOUVER button is pushed, the indoor unit No. in the group control operation are displayed in order.
(The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.)
Specify the indoor unit No. with its P.C. board replaced to the P.C. board for indoor unit servicing.
(You cannot perform this operation if " ALL " is displayed.)

Step 3 Select the CODE No. (DN) can be selected by pushing the ▼ / ▲ button for the temperature setting.

• Set the indoor unit type and capacity.
The factory-set values shall be written to the EEPROM by changing the type and capacity.

1. Set the CODE No. (DN) to "10". (without change)
2. Select the type by pushing ▼ / ▲ buttons for the timer setting.
(For example, 4-way Air Discharge Cassette Type is set to "0001". Refer to table 2)
3. Push SET button.
(The operation completes if the setting data is displayed.)
4. Change the CODE No. (DN) to " 11 " by pushing ▼ / ▲ buttons for the temperature setting.
5. Select the capacity by pushing ▼ / ▲ buttons for the timer setting.
(For example, 80 Type is set to "0012". Refer to table 3)
6. Push SET button.
(The setting completes if the setting data are displayed.)
7. Return to the normal stop status by pushing TEST button.
(Approx. 1 minute is needed to start operation of the remote controller.)

Step 4 Write the on-site setting data to the EEPROM, such as address setting, etc. Perform the steps 1 and 2 above again.

Step 5 Change the CODE No. (DN) to "01 " by pushing ▼ / ▲ buttons for the temperature setting.
(this is the setting for the filter sign lighting time.)

Step 6 Check the setting data displayed at this time with the setting data put down in [1].

1. If the setting data is different, modify the setting data by pushing ▼ / ▲ buttons for the timer setting to the data put down in [1].
The operation completes if the setting data is displayed.
2. If the data is the same, proceed to next step.

Step 7 Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting.
As described above, check the setting data and modify to the data put down in [1].

Step 8 Repeat the steps 6 and 7.

Step 9 After the setting completes, push TEST button to return to the normal stop status. (It takes approx. 1 min until the remote control operation is available again.)

∗ The CODE No. (DN) are ranged from "01 " to "FF ".
The CODE No. (DN) is not limited to be serial No.
Even after modifying the data wrongly and pushing SET button, it is possible to return to the data before modification by pushing CL button if the CODE No. (DN) is not changed.

<Fig. 1 RBC-AMT32E>

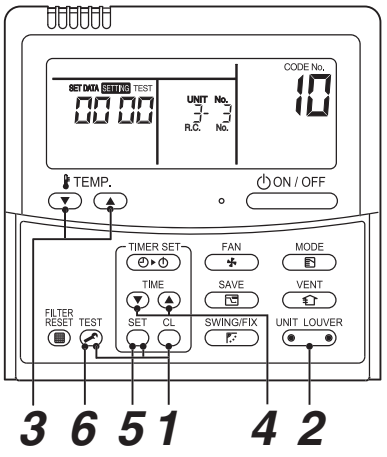


Table 1

DN	Item	Setting data	Factory-set value
01	Filter sign lighting time		Depending on Type
02	Filter pollution leve		0000: standard
03	Central control address		0099: Not determined
06	Heating suction temperature shift		0002: +2°C (flooring installation type: 0)
OF	Cooling only		0000: Heat pump
10	Type		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
1E	Temperature range of cooling/heating automatic SW control point		0003: 3 deg (Ts ± 1.5)
28	Power failure automatic recovery		0000: None
2b	Thermo output SW (T10 ③)		0000: Thermo ON
31	Ventilation fan (standalone)		0000: Not available
32	Sensor SW (Selection of static pressure)		0000: Body sensor
40	Humidifier control (+ drain pump control)		0003: Humidifier ON + Pump OFF
60	Timer setting (wired remote controller)		0000: Available

Table 2. Type: CODE No. 10

Setting data	Type	Type name abb.
0006	Concealed Duct High Static Type	RAV-SM∗∗∗DT-E (TR)

Table 3. Indoor unit capacity: CODE No. 11

Setting data	Type
0000∗	Disable
0021	224
0023	280

∗ EEPROM initial value on the P.C. board for indoor unit servicing.

9. SETUP AT LOCAL SITE AND OTHERS

9-1. Indoor Unit

9-1-1. Test Run Setup on Remote Controller

<Wired remote controller>

1. When pushing TEST button on the remote controller for 4 seconds or more, "TEST" is displayed on LC display. Then push ON / OFF button.
   - "TEST" is displayed on LC display during operation of Test Run.
   - During Test Run, temperature cannot be adjusted but air volume can be selected.
   - In heating and cooling operation, a command to fix the Test Run frequency is output.
   - Detection of error is performed as usual.

     However, do not use this function except case of Test Run because it applies load on the unit.
2. Use either heating or cooling operation mode for [TEST].

   NOTE : The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.
3. After a Test Run has finished, push TEST button again and check that [TEST] on LC display has gone off. (To prevent a continuous test run operation, 60-minutes timer release function is provided to this remote controller.)

9-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Preparation in advance)

1 **Push TEST + SET + CL buttons simultaneously for 4 seconds or more on the remote controller. (Push buttons while the air conditioner stops.)**

The first displayed unit No. is the master indoor unit address in the group control.

2 **Every pushing UNIT button, the indoor unit No. in the group control is displayed one after the other.**

Select a main indoor unit (outdoor unit is connected) which is to be defrosted.

In this time, fan and louver of the selected indoor unit operate.

3 **Using the set temperature TEMP. buttons, specify the CODE No. (DN) 8C.**

4 **Using the timer time TIME buttons, set time to data 0001. (0000 at shipment)**

5 **Push SET button. (OK if indication lights)**

6 **Pushing TEST button returns the status to the normal stop status.**

(Practical operation)

- Push ON/OFF ON / OFF Key.
- Select the HEAT mode.
- After while, the forced defrost signal is sent to the outdoor unit and then the outdoor unit starts defrost operation. (The forced defrost operation is performed for Max. 12 minutes.)
- After defrost operation finished, the operation returns to the heating operation.

To execute the defrost operation again, start procedure from above item *1* .

(If the forced defrost operation was executed once, setting of the above forced defrost operation is cleared.)

9-1-3. LED Display on Indoor P.C. Board

1. D002 (Red)

- Goes on at the same time when power was turned on (Main microcomputer operates and goes on.)
- Flashes with 1-second interval (every 500ms): When EEPROM is not provided or writing was an error.
- Flashes with 10-seconds interval (every 5S): When the mode is DISP

2. D203 (Red)

- Goes on when power is supplied to remote controller (Lights on the hardware)

9-1-4. Function Selection Setup

<Procedure> Perform setting while the air conditioner stops.

1 **Push TEST + SET + CL buttons simultaneously for 4 seconds or more.**
The first displayed unit No. is the master indoor unit address in the group control.
In this time, fan and louver of the selected indoor unit operate.

⇩

2 **Every pushing UNIT LOUVER button (button at left side), the indoor unit No. in the group control is displayed one after the other. In this time, fan and louver of the selected indoor unit only operate.**

⇩

3 **Using the set temperature TEMP. buttons, specify the CODE No. (DN).**

⇩

4 **Using the timer time TIME buttons, select the set data.**

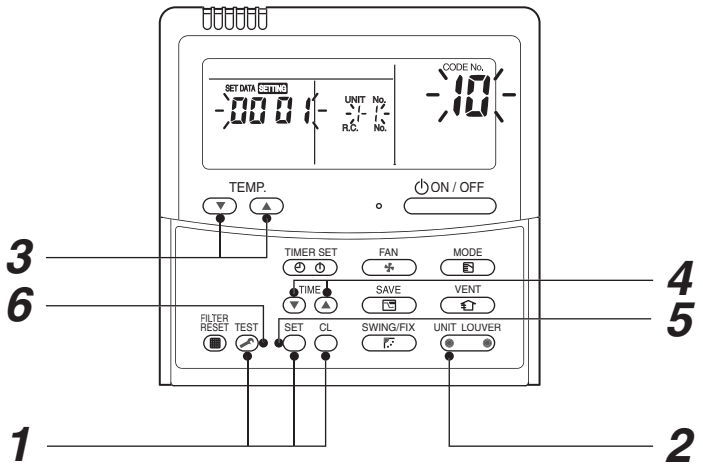
⇩

5 **Push SET button. (OK if indication lights)**

- To change the selected indoor unit, proceed to Procedure ***2*** .
- To change item to be set up, proceed to Procedure ***3*** .

⇩

6 **Pushing TEST button returns the status to the normal stop status.**



<Operation procedure>

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** END

Function selection item No. (DN) list

DN	Item	Contents	At shipment from factory
01	Filter sign lighting time	0000:None 0001: 150H 0002:2500H 0003: 5000H 0004:10000H 0005: Clogging sensor used	According to type
03	Central control address	0001:No.1 unit to 0064: No.64 unit 0099:Undecided	0099:Undecided
06	Heating suction temp. shift	0000:No shift 0001: +1°C 0002:+2°C to 0010: +10°C (Up to +6 is recommended.)	0002:+2°C (Floor type 0000: 0°C)
10	Type	0000:(1-way air discharge cassette) 0001:(4-way air discharge cassette) to 0038	According to model type
11	Indoor unit capacity	0000:Undecided 0001 to 0034	According to capacity type
12	Line address	0001:No.1 unit to 0030: No.30 unit	0099:Undecided
13	Indoor unit address	0001:No.1 unit to 0064: No.64 unit	0099:Undecided
14	Group address	0000:Individual 0001: Master unit in group 0002:Follower unit in group	0099:Undecided
1E	In automatic cooling/heating, temp. width of cool → heat, heat → cool mode selection control point	0000:0 deg to 0020: 20 deg (Cool/heat are reversed with ± (Data value) / 2 against the set temperature)	0003:3 deg (Ts±1.5)
28	Automatic reset of power failure	0000:None 0001: Provided	0000:None
2A	Selection of option / error input (CN70)	0000:Filter input 0001:Alarm input (Air cleaner, etc.) 0002:Humidifier input	0002:Humidifier
2b	Selection of thermostat output (T10 ③)	0000:Indoor thermostat ON 0001:ON receiving output of outdoor compressor	0000:Thermostat ON
31	Fan (Single operation)	0000:Impossible 0001: Possible	0000:Impossible
32	Sensor selection	0000: Body TA sensor 0001: Remote controller sensor	0000:Body sensor
40	Humidifier control (+Drain pump control) (This function is not provided.)	0000:No control 0001:Humidifier + Vaporizing type (Pump ON) 0002:Humidifier + Supersonic type (Pump ON when specified time elapsed) 0003:Humidifier + Natural drain type (Pump OFF)	0003:Humidifier ON Pump OFF
60	Timer setting (Wired remote controller)	0000:Operable 0001:Operation prohibited	0000:Operable
C2	Current demand X% to outdoor unit	0050:50% to 0100: 100%	0075:75%
D0	Existence of remote controller save function	0000:Invalid (Impossible) 0001: Valid (Possible)	0001:Valid (Possible)

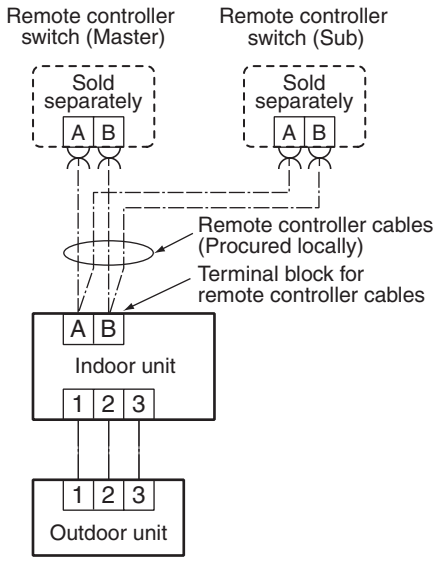
* Restriction ratio setting for save operation (DN code No. [C2]) can be set/changed from the normal DN setup (Detail DN setup).

9-1-5. Wiring and Setting of Remote Controller Control

2-remote controller control (Controlled by 2 remote controllers)

This control is to operate 1 or multiple indoor units are operated by 2 remote controllers.
(Max. 2 remote controllers are connectable.)

- **When connected 2 remote controllers operate an indoor unit**



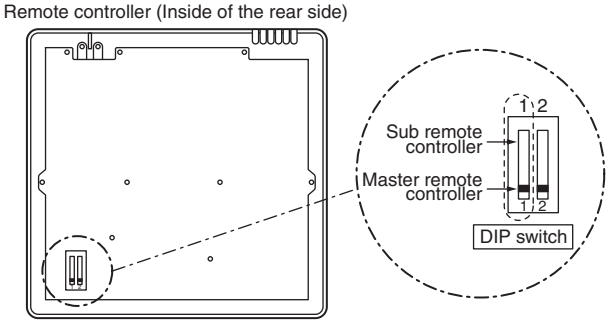
(Setup method)

One or multiple indoor units are controlled by 2 remote controllers.
(Max. 2 remote controllers are connectable.)

<Wired remote controller>

How to set wired remote controller as sub remote controller

Change DIP switch inside of the rear side of the remote controller switch from remote controller master to sub. (In case of RBC-AMT32E)



[Operation]

1. The operation contents can be changed by Last-push-priority.
2. Use a timer on either Master remote controller or Sub remote controller.

9-1-6. Monitor Function of Remote Controller Switch

■ Calling of sensor temperature display

<Contents>

Each data of the remote controller, indoor unit and outdoor unit can be understood by calling the service monitor mode from the remote controller.

<Procedure>

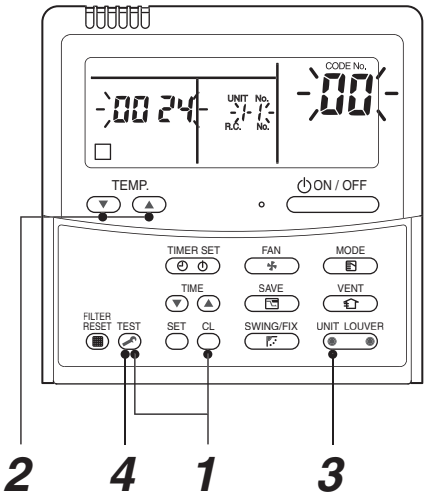
1 **Push TEST + CL buttons simultaneously for 4 seconds to call the service monitor mode.**

The service monitor goes on, the master indoor unit No. is displayed at first and then the temperature of CODE No. 00 is displayed.

⇩

2 **Push temperature set TEMP. buttons and then change the CODE No. of data to be monitored.**

The item code list is shown below.



<Operation procedure>

1→ 2→ 3→ 4

Returned to usual display

	CODE No.	Data name	Unit
Indoor unit data	01	Room temperature (Remote controller)	°C
	02	Indoor suction temperature (TA)	°C
	03	Indoor heat exchanger (Coil) temperature (TCJ)	°C
	04	Indoor heat exchanger (Coil) temperature (TC)	°C
	∗ 07	Indoor fan revolution frequency	rpm
	∗ F2	Indoor fan calculated operation time	×100h
	F3	Filter sign time	×1h
	∗ F8	Indoor discharge temperature*1	°C

	CODE No.	Data name	Unit
Outdoor unit data	60	Outdoor heat exchanger (Coil) temperature (TE)	°C
	61	Outside temperature (TO)	°C
	62	Compressor discharge temperature (TD)	°C
	63	Compressor suction temperature (TS)	°C
	65	Heat sink temperature (THS)	°C
	6A	Operation current (× 1/10)	A
	∗ 6D	Outdoor heat exchanger (Coil) temperature (TL)	°C
	∗ 70	Compressor operation frequency	rps
	∗ 72	Outdoor fan revolution frequency (Lower)	rpm
	∗ 73	Outdoor fan revolution frequency (Upper)	rpm
	F1	Compressor calculated operation time	×100h

Item with ∗ marks are not provided to the Concealed Duct Type.

⇩

3 **Push UNIT LOUVER button to select the indoor unit to be monitored.**
Each data of the indoor unit and its outdoor units can be monitored.

⇩

4 **Pushing TEST button returns the status to the usual display.**

∗1 The indoor discharge temperature of CODE No. [F8] is the estimated value from TC or TCJ sensor.
Use this value to check discharge temperature at test run.
(A discharge temperature sensor is not provided to this model.)

- The data value of each item is not the real time, but value delayed by a few seconds to ten-odd seconds.
- If the combined outdoor unit is one before 2 or 3 series, the outdoor unit data [6D], [70], [72] and [73] are not displayed.

■ Calling of error history

<Contents>

The error contents in the past can be called.

<Procedure>

1 **Push SET + TEST buttons simultaneously for 4 seconds or more to call the service check mode.**

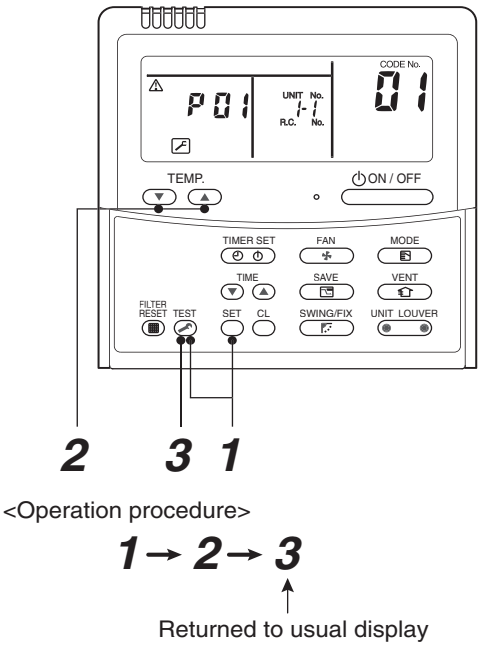
Service Check goes on, the **CODE No. *01*** is displayed, and then the content of the latest alarm is displayed.
The number and error contents of the indoor unit in which an error occurred are displayed.

2 **In order to monitor another error history, push the set temperature (▼) / (▲) buttons to change the error history No. (CODE No.)**

CODE No. *01* (Latest) → **CODE No.** *04* (Old)

NOTE : 4 error histories are stored in memory.

3 **Pushing TEST button returns the display to usual display.**



<Operation procedure>

1 → 2 → 3

Returned to usual display

REQUIREMENT

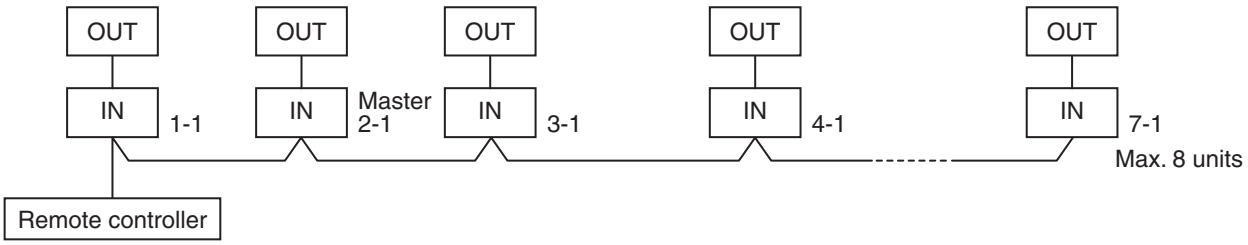
Do not push CL button, otherwise all the error histories of the indoor unit are deleted.

(Group control operation)

In a group control, operation of maximum 8 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.

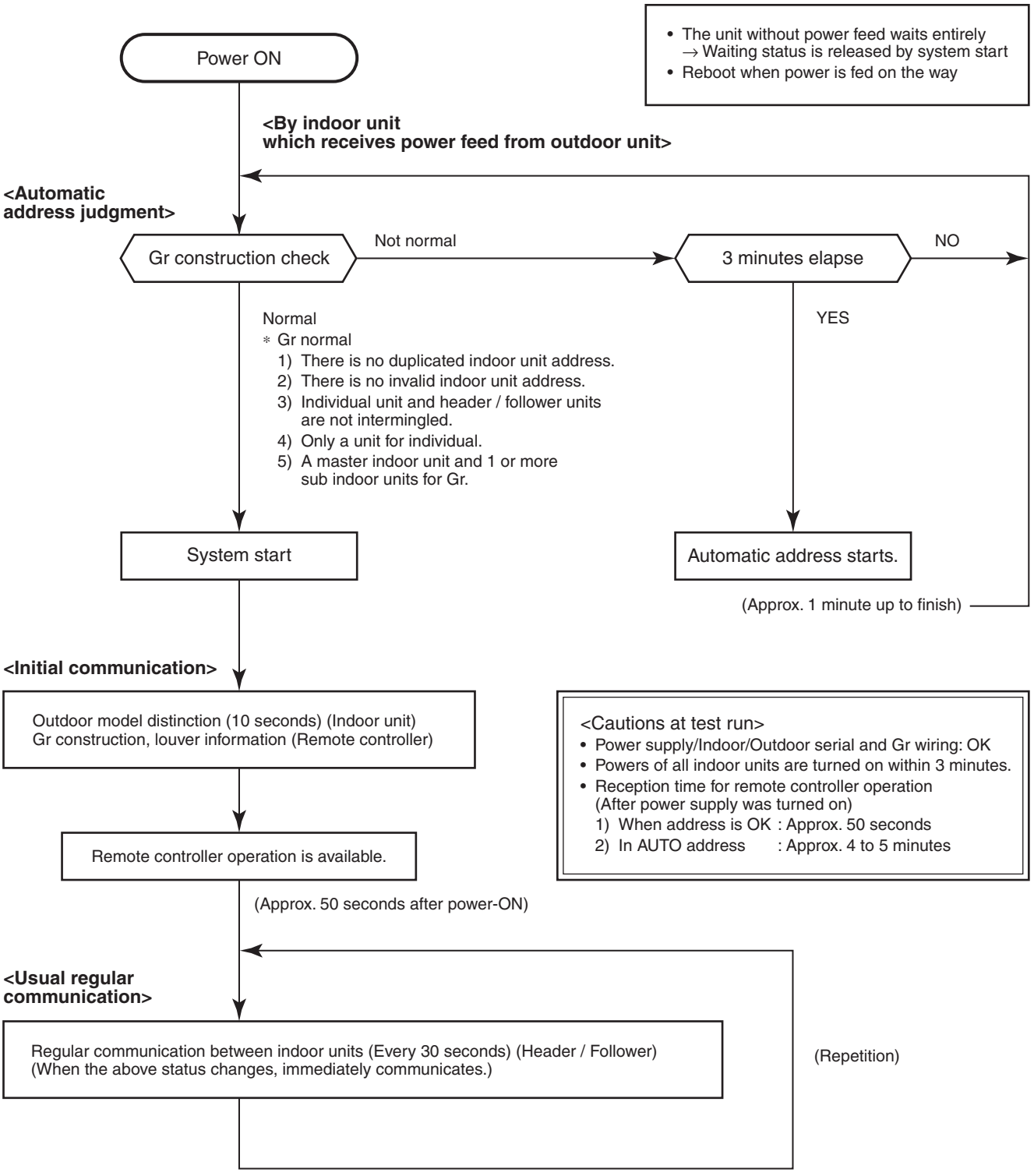
   1) Concealed duct (RAV-SMXXXDT) is not set up on the master unit.
      - If the Concealed duct is the master unit:
        Operation mode: [Cooling/Heating AUTO] [HEAT] [COOL] [FAN] and no [DRY]
        Air volume select: [HIGH]
      - When the operation mode is [DRY], [FAN] stops in duct models.

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.)

9-2. Setup at Local Site / Others

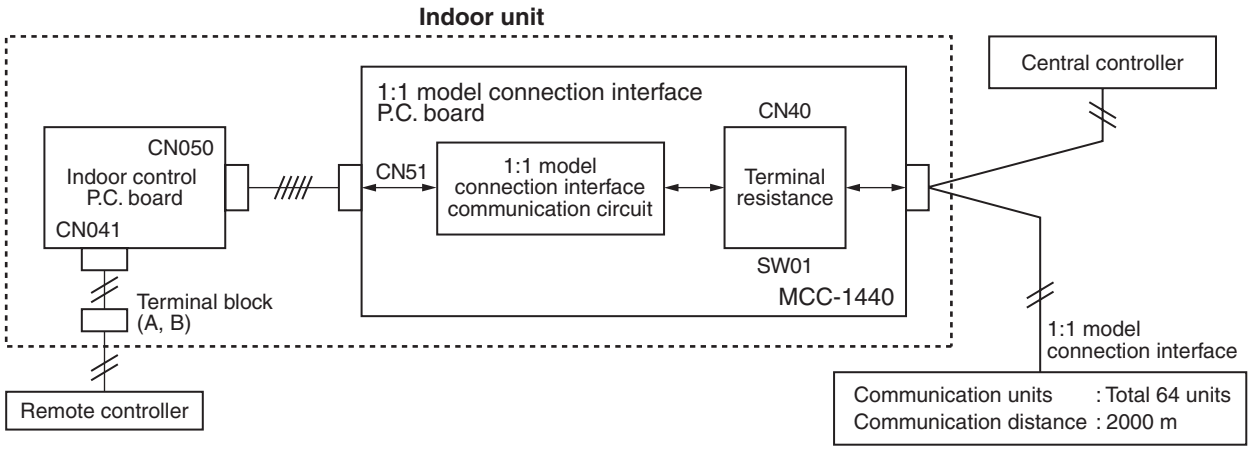
Model name: TCB-PCNT30TLE2

9-2-1. 1:1 Model Connection Interface

1. Function

This model is an optional P.C. board to connect the indoor unit to 1:1 model connection interface.

2. Microprocessor block diagram

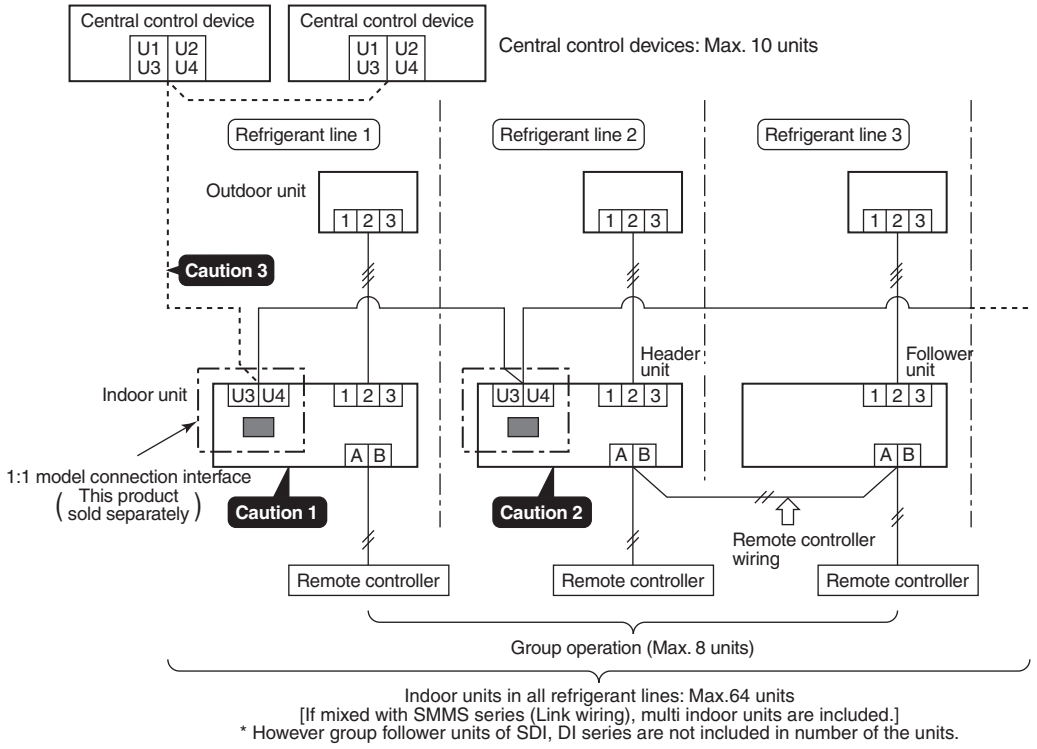


3. 1:1 model connection interface wiring connection

CAUTION

1) When controlling customized setup collectively, 1:1 model connection interface (This option) is required.
2) In case of group operation, the 1:1 model connection interface is necessary to be connected to the main unit.
3) Connect the central control devices to the central control system wiring.
4) When controlling DI, SDI series only, turn on only Bit 1 of SW01 of the least line of the system address No. (OFF when shipped from the factory)

∗ In case of DI, SDI series, the address is necessary to be set up again from the wired remote controller after automatic addressing.



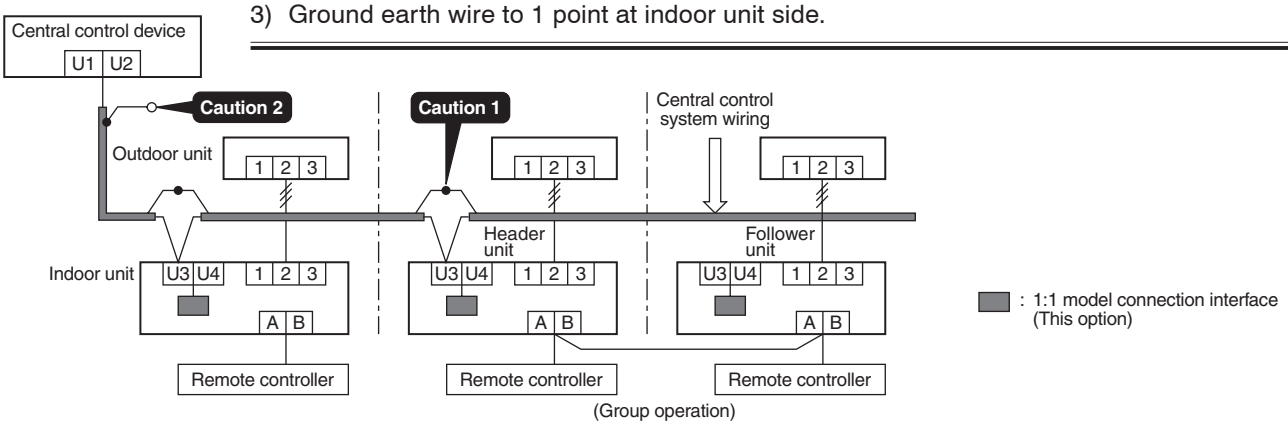
4. Wiring specifications

- Use 2-core with no polar wire.
- Match the length of wire to wire length of the central control system.
  If mixed in the SMMS system, the wire length is lengthened with all indoor/outdoor inter-unit wire length at side.
- To prevent noise trouble, use 2-core shield wire.
- Connect the shield wire by closed-end connection and apply open process (insulating process) to the last terminal. Ground the earth wire to 1 point at indoor unit side. (In case of central controlling of digital inverter (DI, SDI) unit setup)

No. of wires	Size
2	Up to 1000m: twisted wire 1.25mm^2 Up to 2000m: twisted wire 2.0mm^2

CAUTION

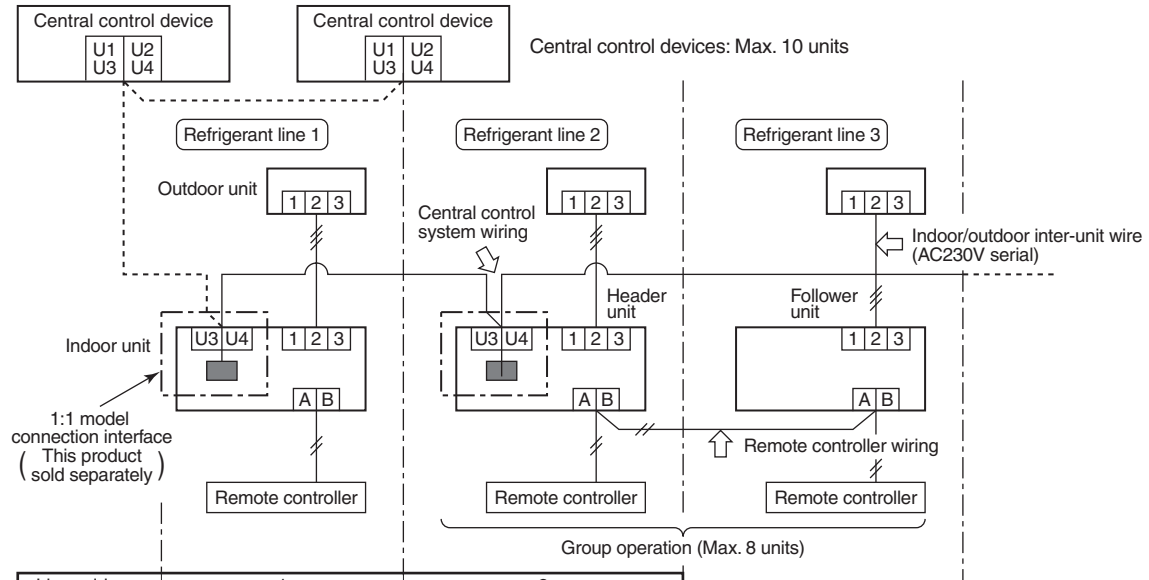
1) Closed-end connection of shield wire (Connect all the connecting parts of each indoor unit)
2) Apply open process to the last terminal (insulating process).
3) Ground earth wire to 1 point at indoor unit side.



5. P.C. board switch (SW01) setup

When performing collective control by DI or SDI only, the setup of terminator is necessary.

- Using SW01, set up the terminator.
- Set up the terminator to only the adapter connected to the indoor unit of least line address No.



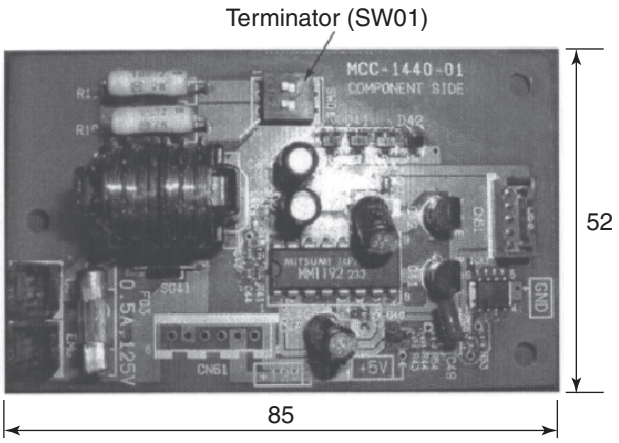
Line address	1	2
SW01 Bit 1	ON	OF
SW01 Bit 2	OFF	OFF
Remarks	Turn SW01 Bit 1 to ON.	As status shipped from factory

(OFF at shipment from factory)
(OFF at shipment from factory)

(Reference) Setup contents of switch

SW01		Terminator	Remarks
Bit 1	Bit 1		
OFF	OFF	None	Mixed with multi (Link wiring) at shipment from factory
ON	OFF	100Ω	Central control by digital inverter only
OFF	ON	75Ω	Spare
ON	ON	43Ω	Spare

6. External view of P.C. board assembly



7. Address setup

In addition to set up the central control address, it is necessary to change the indoor unit number. (Line/Indoor/Group address). For details, refer to 1:1 model connection interface Installation Manual.

9-3. How to Set up Central Control Address Number

When connecting the indoor unit to the central control remote controller using 1:1 model connection interface, it is necessary to set up the central control address number.

- The central control address number is displayed as the line No. of the central control remote controller.

<Procedure> Perform setup while the unit stops.

1 **Push TEST + VENT buttons for 4 seconds or more.**

When group control is executed, first the unit No. ALL is displayed and all the indoor units in the group control are selected. In this time, fans of all the selected indoor units are turned on. **(Fig. 1)**
(Keep ALL displayed status without pushing UNIT LOUVER button.)

In case of individual remote controller which is not group-controlled, Line address and Indoor unit address are displayed.

2 **Using temperature setup TEMP. buttons, specify CODE No. 03.**

3 **Using timer time TIME buttons, select the setup data.**
The setup data is shown in the table below (Table 1).

4 **Push SET button. (OK if display goes on.)**

- To change the item to be set up, return to Procedure ***2***.

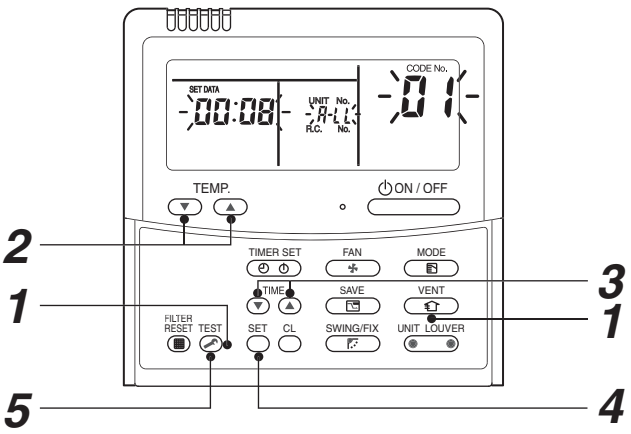
5 **Push TEST button.**

The status returns to usual stop status.

(Table 1)

Setup data	Central control address No.
0001	1
0002	2
0003	3
:	:
0064	64
0099	Unset (Setup at shipment from factory)

(Fig.1)



How to confirm the central control address (New function for AMT32E remote controller)

<Procedure> It can be confirmed even during operation or stopping.

1 **Push** UNIT LOUVER **button for 4 seconds or more.**

⇩

2 **In the frame at left side of the remote controller screen, the lighting set contents are displayed.**

During unset time, 0099 (At shipment from factory) is displayed.

⇩

3 **After lighting display for 3 seconds, the display automatically disappears.**

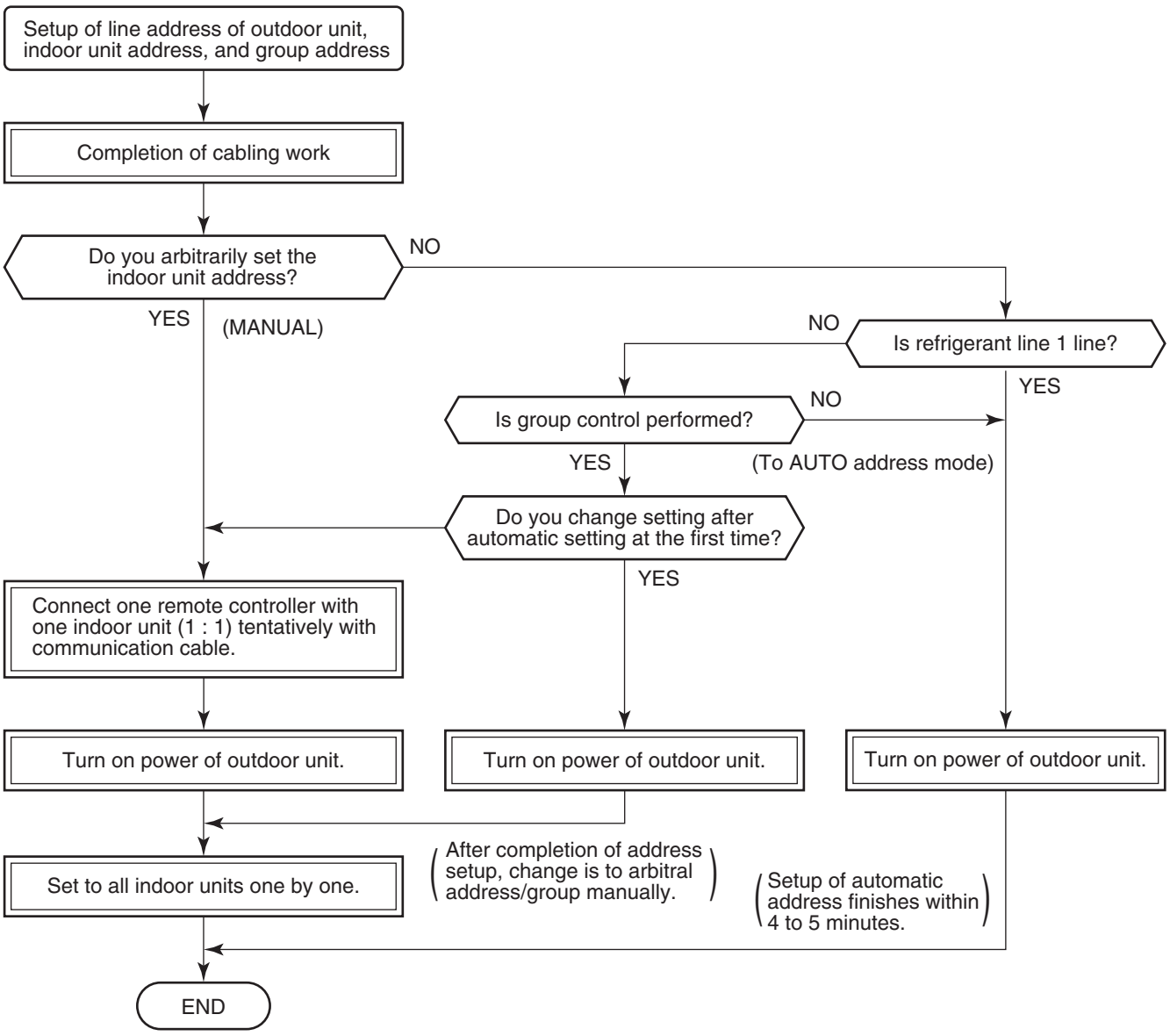
If any button is pushed during display, immediately the display disappears and then the pushed button is displayed.

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)

	CODE No.	Data at shipment	Setup data range
Line address	12	0099	0001 (No. 1 unit) to 0030 (No. 30 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 : Header unit (1 indoor unit in group control) 0002 : Follower 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)

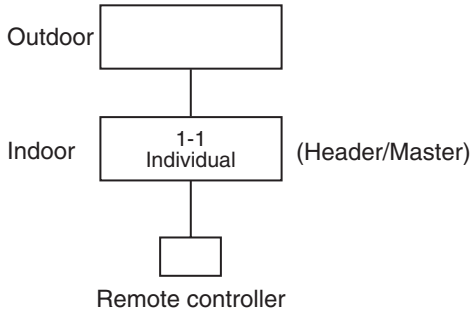
Group address : 0 = Single (Not group control)
1 = Header unit in group control
2 = Follower unit in group control

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

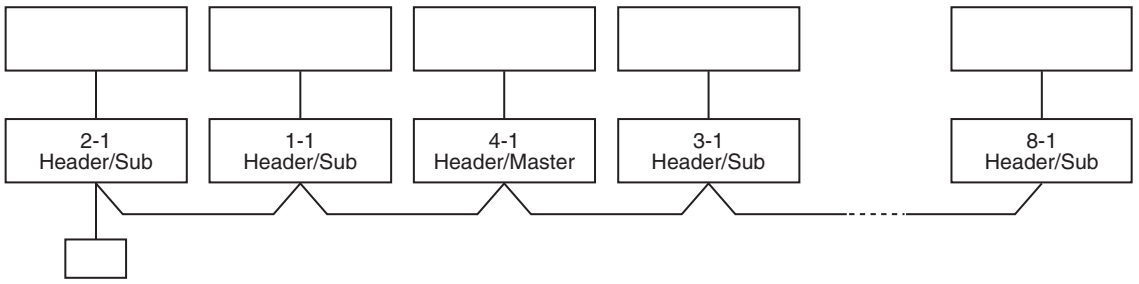
Follower unit (= 2) : Indoor units other than header unit in group operation
Basically, follower units do not send/receive signals to/from the remote controllers.
(Except errors and response to demand of service data)

10-2-1. System Configuration

1. Single

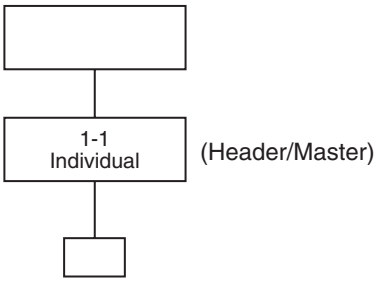


2. Single group operation
   • Each indoor unit controls the outdoor unit individually.



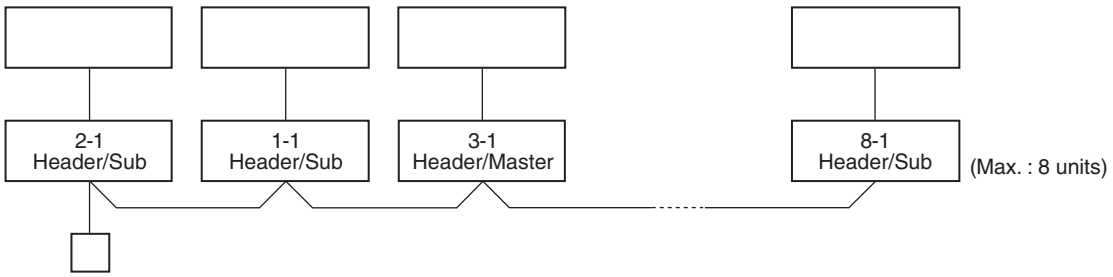
10-2-2. Automatic Address Example from Unset Address (No miswiring)

1. Standard (One outdoor unit)
   1) Single



Only turning on source power supply (Automatic completion)

2. Group operation
   (Multiple outdoor units = Multiple indoor units with serial communication only, without twin)



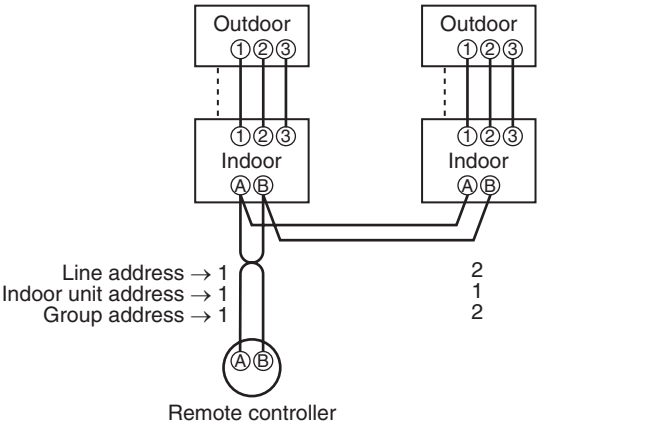
Only turning on source power supply (Automatic completion)

10-3. Address Setup (Manual Setting from Remote Controller)

In case that addresses of the indoor units will be determined prior to piping work after cabling work

- Set an indoor unit per a remote controller.
- Turn on power supply.

(Example of 2-lines cabling)
(Real line: Cabling, Broken line: Refrigerant pipe)



For the above example, perform setting by connecting singly the wired remote controller without remote controller inter-unit cable.

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

1 **Push SET + CL + TEST buttons simultaneously for 4 seconds or more.**

2 **(← Line address)**
Using the temperature setup ▼ / ▲ buttons, set *12* to the CODE No.

3 **Using timer time ▼ / ▲ buttons, set the line address.**

4 **Push SET button.** (OK when display goes on.)

5 **(← Indoor unit address)**
Using the temperature setup ▼ / ▲ buttons, set *13* to the CODE No.

6 **Using timer time ▼ / ▲ buttons, set 1 to the line address.**

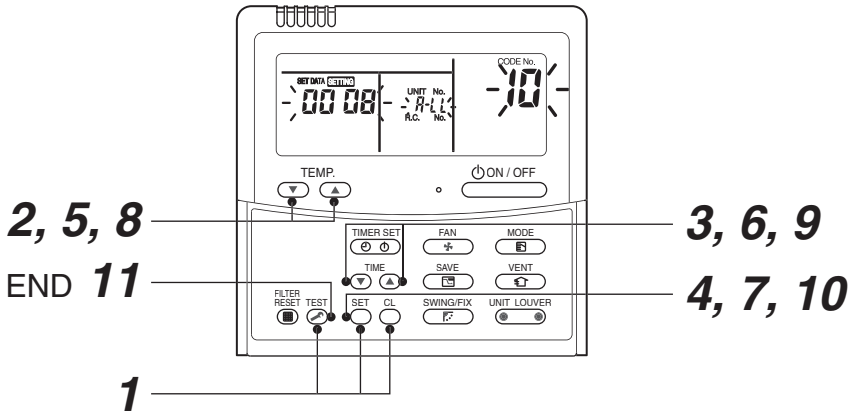
7 **Push SET button.** (OK when display goes on.)

8 **(← Group address)**
Using the temperature setup ▼ / ▲ buttons, set *14* to the CODE No.

9 **Using timer time ▼ / ▲ buttons, set *0000* to Individual, *0001* to Master unit, and *0002* to sub unit.**

10 **Push SET button.** (OK when display goes on.)

11 **Push TEST button.**
Setup completes. (The status returns to the usual stop status.)



<Operation procedure>

1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11 END

■ Confirmation of indoor unit No. position

1. To know the indoor unit addresses though position of the indoor unit body is recognized

- In case of individual operation (Wired remote controller : indoor unit = 1 : 1)
  (Follow to the procedure during operation)

<Procedure>

1 **Push (ON / OFF) button if the unit stops.**

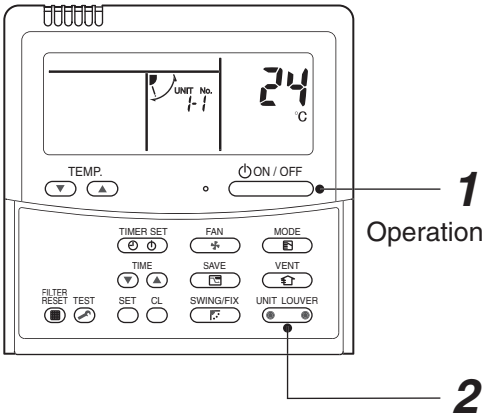
2 **Push (UNIT LOUVER) button.**

Unit No. 1-1 is displayed on LCD.

(It disappears after several seconds.)

The displayed unit No. indicate line address and indoor unit address.

(When other indoor units are connected to the identical remote controller (Group control unit), other unit numbers are also displayed every pushing (UNIT LOUVER) button.



<Operation procedure>

1 → ***2*** END

2. To know the position of indoor unit body by address

- To confirm the unit No. in the group control
  (Follow to the procedure during operation) (in this procedure, the indoor units in group control stop.)

<Procedure>

The indoor unit numbers in the group control are successively displayed, and fan, louver, and drain pump of the corresponding indoor unit are turned on.
(Follow to the procedure during operation)

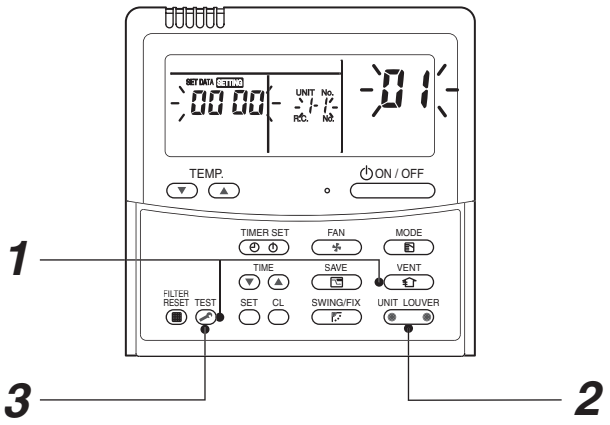
1 **Push (VENT) and (TEST) buttons simultaneously for 4 seconds or more.**

- Unit No. ALL is displayed.
- Fans and louvers of all the indoor units in the group control operate.

2 **Every pushing (UNIT LOUVER) button, the unit numbers in the group control are successively displayed.**

- The unit No. displayed at the first time indicates the master unit address.
- Fan and louver of the selected indoor unit only operate.

3 **Push (TEST) button to finish the procedure.**
All the indoor units in the group control stop.



<Operation procedure>

1 → ***2*** → ***3*** END

11. OWNER'S MANUAL

Original instruction

ADOPTION OF NEW REFRIGERANT

This Air Conditioner uses R410A an environmentally friendly refrigerant.

This appliance is not intended for use by person (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Contents

Thank you for purchasing this Toshiba air conditioner.

Please read carefully through these instructions that contain important information which complies with the "Machinery" Directive (Directive 2006/42/EC), and ensure that you understand them.

Some of the details provided in these instructions differ from the Installation Manual supplied with your product, and the instructions provided here take precedence.

After reading these instructions, be sure to keep them in a safe place together with the Owner's Manual and Installation Manual supplied with your product.

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	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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.
• Qualified service person	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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.

■ Warning Indications on the Air Conditioner Unit

Warning indication	Description
 **WARNING** **ELECTRICAL SHOCK HAZARD** Disconnect all remote electric power supplies before servicing.	**WARNING** ELECTRICAL SHOCK HAZARD Disconnect all remote electric power supplies before servicing.
 **WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.	**WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.
 **CAUTION** High temperature parts. You might get burned when removing this panel.	**CAUTION** High temperature parts. You might get burned when removing this panel.
 **CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.	**CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.
 **CAUTION** **BURST HAZARD** Open the service valves before the operation, otherwise there might be the burst.	**CAUTION** **BURST HAZARD** Open the service valves before the operation, otherwise there might be the burst.

1 PRECAUTIONS FOR SAFETY

⚠ WARNING

General

- Carefully read Owner's Manual before starting the air conditioner.
  There are many important things to keep in mind for daily operation.

Transportation and storage

- When transporting the air conditioner, wear shoes with additional protective toe caps.
- 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.
- When stacking the packing cartons for storage or transportation, heed the precautions written on the packing cartons.
  Failure to heed the precautions may cause the stack to collapse.

Installation

- 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.
- After the installation work has been completed, have the installer explain about the circuit breaker positions.
  In the event that trouble has occurred in the air conditioner, set the circuit breaker to the OFF position, and contact a service person.
- If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks. Consult the dealer from whom you purchased the air conditioner when you implement the measures.
  Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident.
- 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.

Operation

- Before opening the intake grille of the indoor unit or service panel 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.
- Inside the air conditioner are high-voltage areas and rotating parts.
  Due to the danger of electric shocks or of your fingers or physical objects becoming trapped in the rotating parts, do not remove the intake grille of the indoor unit or service panel of the outdoor unit.
  When work involving the removal of these parts is required, contact a qualified installer or a qualified service person.
- Do not move or repair any unit by yourself. Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Use of a stand more than 50 cm high to clean the filter of the indoor unit or to carry out other such jobs constitutes working at heights. Due to the danger of falling off the stand and injuring yourself while working at heights, this kind of work should not be done by unqualified individuals. When this kind of work must be carried out, do not do it yourself but ask a qualified installer or a qualified service person to do it for you.
- Do not touch the aluminum fin of the outdoor unit. You may injure yourself if you do so.
  If the fin must be touched, do not touch it yourself but contact a qualified installer or a qualified service person.
- 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.
- 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.
- When the air conditioner is operated with a combustion appliance in the same place, be careful of ventilation to let fresh air enter the room. Poor ventilation causes oxygen shortage.
- When the air conditioner is used in a closed room, be careful of sufficient ventilation of the room.
  Poor ventilation causes oxygen shortage.

Repairs

- When you have noticed that some kind of trouble (such as when an error display has appeared, there is a smell of burning, abnormal sounds are heard, the air conditioner fails to cool or heat or water is leaking) has occurred in the air conditioner, do not touch the air conditioner yourself but set the circuit breaker to the OFF position, and contact a qualified service person.
  Take steps to ensure that the power will not be turned on (by marking "out of service" near the circuit breaker, for instance) until qualified service person arrives. Continuing to use the air conditioner in the trouble status may cause mechanical problems to escalate or result in electric shocks, etc.
- 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.
- If you have discovered that there is a danger of the indoor unit's falling, do not approach the indoor unit but set the circuit breaker to the OFF position, and contact a qualified installer or a qualified service person to refit the unit.
  Do not set the circuit breaker to the ON position until the unit has been refitted.
- If you have discovered that there is a danger of the outdoor unit's toppling over, do not approach the outdoor unit but set the circuit breaker to the OFF position, and contact a qualified installer or a qualified service person to have the improvements or refitting done. Do not set the circuit breaker to the ON position until the improvements or refitting is completed.

Relocation

- When the air conditioner is to be relocated, do not relocate it yourself but contact a qualified installer or a qualified service person. Failure to relocate the air conditioner properly may result in electric shocks and/or a fire.

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

⚠ CAUTION

TO DISCONNECT THE APPLIANCE FROM THE MAINS SUPPLY

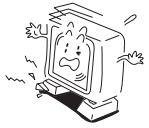
- This appliance must be connected to the mains by means of a switch with a contact separation of at least 3 mm.
- The installation fuse 25A must be used for the power supply line of this air conditioner.

CAUTIONS ABOUT INSTALLATION (Be sure to confirm the following cautions.)

- Certainly lay the drain hose for perfect draining.
  Bad drainage may cause flooding in the house and getting furniture wet.
- Make sure to connect the air conditioner to an exclusive power supply of the rated voltage, otherwise the unit may break down or cause a fire.

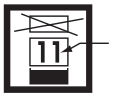
CAUTIONS ABOUT OPERATION

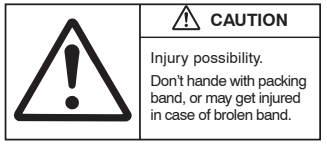
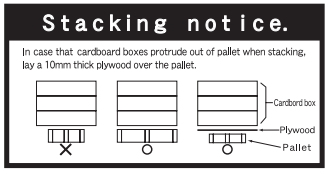
- Do not use this air conditioner for special purpose such as preserving food, precision instruments, art objects, breeding animals, car, vessel, etc.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner will not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety.
- To make the air conditioner operate in its original performance, operate it within the range of the operating temperature specified in the instructions. Otherwise it may cause a malfunction, or water leak from the unit.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.



■ Information on the Transportation, Handling and Storage of the Carton

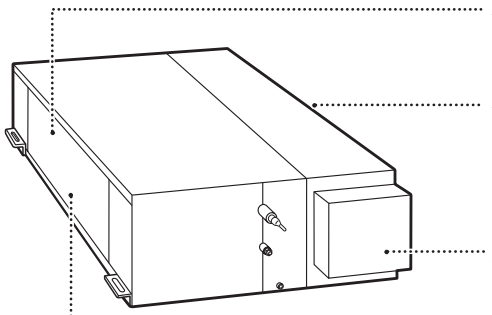
Examples of indication on the carton

Symbol	Description	Symbol	Description
	Keep dry		Do not drop
	Fragile		Do not lay down
 11 cartons	Stacking height (12 cartons can be stacked in this case)		Do not walk on this carton
	This side up		Do not step
	Handle with care		

Other cautions	Description
	**CAUTION** Injury possibility. Don't handle with packing band, or may get injured in case of broken band.
	**Stacking notice.** In case that cardboard boxes protrude out of pallet when stacking. Lay a 10 mm thick plywood over the pallet.

2 PART NAMES

■ Indoor unit



Air discharge
Connect a discharge duct.

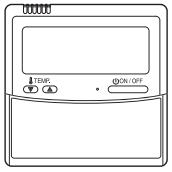
Air intake
Connect a suction duct.

Electrical control box
The earth screw is provided in the electrical control box.

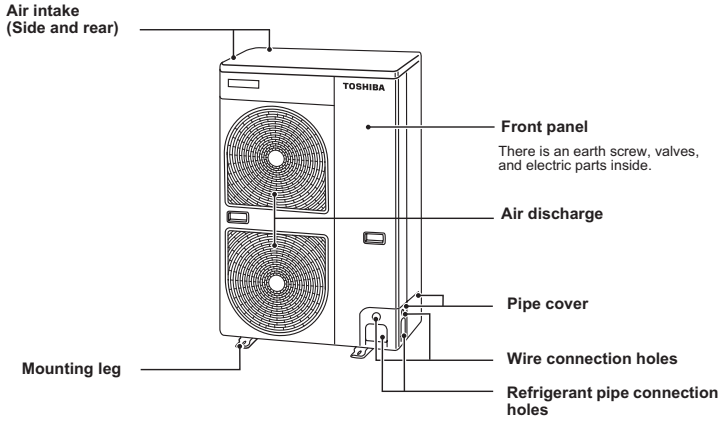
Drain pan

Separate sold part

Remote controller



■ Outdoor unit



Air intake (Side and rear)

Front panel
There is an earth screw, valves, and electric parts inside.

Air discharge

Pipe cover

Mounting leg

Wire connection holes

Refrigerant pipe connection holes

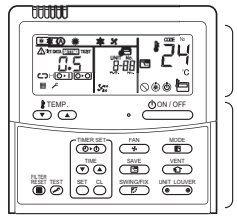
3 WIRED REMOTE CONTROLLER

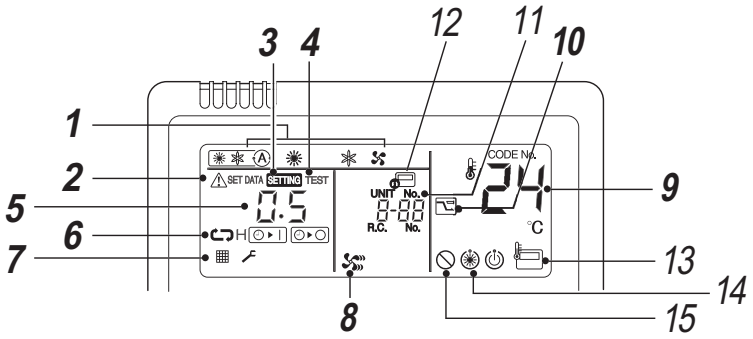
This remote controller can control the operation of up to 8 indoor units.

■ Display section

In the display illustration below all the icons are shown.
When the unit is in operation, only relevant icons will be displayed.

- When turning on the leak breaker at the first time, SETTING flashes on the display part of the remote controller.
- While this icon is flashing, the model is being automatically confirmed. Wait till SETTING icon has disappeared to use the remote controller.





1 Operation mode
The selected operation mode is displayed.

2 Error display
Displayed while the protective device works or a error occurs.

3 SETTING display
Displayed during setup of the timer or other settings.

4 TEST run display
Displayed during a test run.

5 Timer display
When an error occurs, error code is displayed.

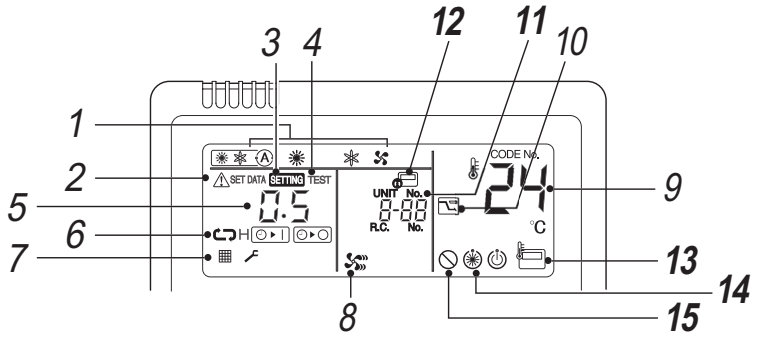
6 Timer mode display
The selected timer mode is displayed.

7 Filter display
Reminder to clean the air filter.

8 Fan speed display
Fan speed is not adjustable. It is fixed to High.
(HIGH)

9 Set temperature display
The selected set temperature is displayed.

10 Power saving mode display
Limits compressor speed (capacity) to save energy.



11 **UNIT No. display**

Displays the number of the indoor unit selected.

Also displays error code of indoor and outdoor units.

12 **Central control display**

Displayed when the air conditioner is used under the central control in combination with a central control remote controller.

In case the remote controller is disabled by the central control system, flashes.

The button operation is not accepted.

Even when you push ON/OFF, MODE, or TEMP. button, and the button operation is not accepted.

(Settings made by the remote controller vary with the central control mode.
For details, refer to the Owner's Manual of the central control remote controller.)

13 **Remote controller sensor display**

Displayed while the sensor of the remote controller is used.

14 **Pre-heat display**

Displayed when the heating mode is energized or defrost cycle is initiated.

While this icon is displayed, the indoor fan stops.

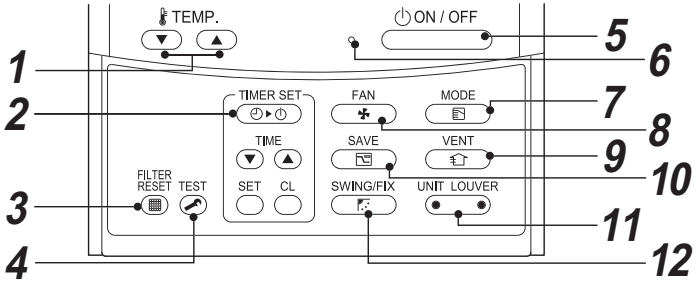
15 **No function display**

Displayed when the function requested is not available on that model.

■ Operation section

Push each button to select a desired operation.

- The control saves commands in memory and after the initial setting, there is no need for any additional settings unless changes are desired. The air conditioner can be operated by pushing the ON / OFF button.



1 **TEMP. button (Temperature set button)**

Adjusts the set point.

Select the desired set point by pushing TEMP. or TEMP. .

2 **TIMER SET button (Timer set button)**

Use to setup the timer.

3 **FILTER RESET button (Filter reset button)**

Resets " " icon after cleaning filter.

4 **TEST button (Test button)**

Use only for service.
(During normal operation, do not use this button.)

5 **ON / OFF button**

When the button is pushed, the operation starts, and it stops by pushing the button again.

When the operation has stopped, the operation lamp and all the displays disappear.

6 **Operation lamp**

Green light illuminates when unit is on.

Although it flashes when operating the protection device or an error occurs.

7 **MODE button (Operation mode button)**

Selects desired operation mode.

8 **FAN button (Fan speed button)**

Fan speed is not adjustable.

It is fixed to High.

9 **VENT button (Ventilation button)**

Use when a power ventilation kit (locally procured) is connected.

- If " " is displayed on the remote controller when this button is pushed no vent kit connected.

10 **SAVE button (Power save operation)**

Use to initiate power saving mode.

11 **UNIT LOUVER button (Unit/Louver select button)**

Selects a unit number (left) and louver number (right).

UNIT:

Selects an indoor unit when multiple indoor units are controlled with one remote controller.

LOUVER:

No Function.

12 **SWING/FIX button (Swing/Louver direction button)**

No Function.

OPTION :

Remote controller sensor

Usually the temperature sensor of the indoor unit senses the temperature.

The temperature on the surrounding of the remote controller can also be sensed.

For details, contact the dealer from which you have purchased the air conditioner.

4 CORRECT USAGE

- When you use the air conditioner for the first time or when you change the setting, follow the steps below. Settings are saved in memory and are displayed anytime the unit is turned on by pushing the (ON / OFF) button.

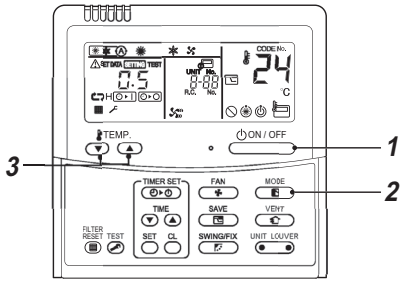
■ Preparation

Turn on the main power switch and/or the leakage breaker.

- When the power supply is turned on, a partition line is displayed on the display part of the remote controller.
- After the power supply is turned on, the remote controller does not accept an operation for approx. 1 minute, but it is not a failure.

REQUIREMENT

- While using the air conditioner, operate it only with (ON / OFF) button without turning off the main power switch and the leakage breaker.
- When you re-power the air conditioner after it has not been used for a long period, turn on the leakage breaker at least 12 hours before starting the air conditioner. (This is required to turn on the compressor case heater for warming in order to prevent overload on the compressor when activating the outdoor unit.)



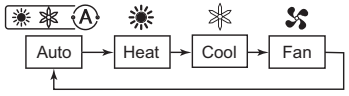
Start

1 Push (ON / OFF) button.

The operation lamp illuminates, and the operation starts.

2 Select an operation mode with the " (MODE) " button.

One push of the button, and the display changes in the order shown below.



3 Select a desired set point by pushing the "TEMP. (▼) " or "TEMP. (▲) " button.

Stop

Push (ON / OFF) button.

The operation lamp goes off, and the operation stops.

NOTE

Auto Changeover

- When in Auto Mode, the unit selects the operating mode (cooling, heating or fan only) based on the user selected set point temperature.
- If the Auto mode is uncomfortable, you can select the desired conditions manually.

Cooling

- If there is a demand for cooling, unit will start approximately 1 minute after mode is selected.

Heating

- If there is a demand for heating, unit will start approximately 3 to 5 minutes after the mode is selected.
- After the heating operation has stopped, fan may continue to run for approx. 30 seconds.
- When the room temperature reaches the set temperature, the outdoor unit stops and the indoor unit will carry on fan operation.

  During defrost operation, the fan stops so that cool air is not discharged. (" ✳ " Pre-heat is displayed.)

When restarting the operation after stop

- When attempting to restart the unit immediately after it was stopped, the unit can not start for approx. 3 minutes this is to protect the compressor.

■ 8°C OPERATION (For object pre-heating) (Available for Super Digital Inverter outdoor units)

The air conditioner can control the heating temperature to about 8°C in the heating mode.
The 8°C heating operation requires settings with the wired remote controller. Ask the installer or dealer for the settings according to the installation manual of the indoor unit.

Start

1 Set the displayed temperature to 18°C in the heating mode by pushing TEMP. (▼) button.
2 Set the displayed temperature to 8°C by pushing TEMP. (▼) button for at least four seconds.

Stop

1 Set the displayed temperature to 18°C by pushing TEMP. (▲) button.
  - The air conditioner returns to the normal HEAT mode. Select a desired temperature and operation mode.

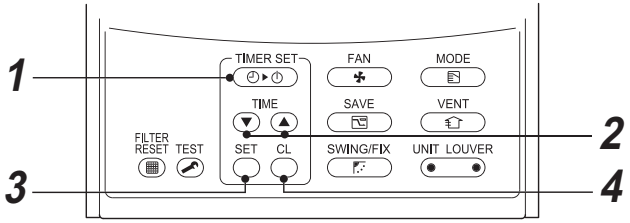
NOTE

- The discharged air temperature is lower than that in the normal heating operation.
- The room temperature may not be heated evenly depending on the remote controller installation location.
- The room temperature may not reach 8°C depending on the room size or the installation conditions.

  The 8°C heating operation is cancelled in the following cases.
  - When operation is stopped with (ON / OFF) button
  - When another operation mode is selected with (MODE) button
  - When temperature setting or operation mode is changed or operation is started/stopped by the wireless remote controller or the central control remote controller.
- If one or more models other than the 4-way air discharge cassette type (4 series), slim duct, Concealed Duct High Static Pressure are connected in the same control group, the 8°C heating operation is not available.
- When you use this operation mode, observe proper operating hours and we recommend that you ask service staff for periodic maintenance of the air conditioner.

5 TIMER OPERATION

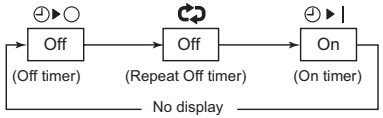
- Three timer modes are available: (Setting of up to 168 hours is enabled.)
  Off timer : The unit stops when the set time is reached.
  Repeat Off timer : The unit stops daily when the set time is reached.
  On timer : The unit starts when the set time is reached.



Set

1 Push TIMER SET button.

The timer mode changes with every push of the button.



- SETTING and timer display flashes.

2 Push TIME ▼ ▲ to select "set time".

- With every push of ▲ button, the set time increases by 0.5 hr (30 minutes).
  When setting a time more than 24 hours for timer operation, timer can be set in increments of 1 hr.
  The maximum set time is 168hr (7 days).
  The remote control displays the set time with time (between 0.5 and 23.5 hours) (*1) or number of days and time (24 hours or more) (*2) as shown below.
- With every push of ▼ button, the set time decreases by 0.5 hr (30 minutes)
  (0.5 - 23.5 hours) or 1 hr (24 - 168 hours).

Example of remote control display

- **23.5 hours (*1)**

- **34hours (*2)**

1d shows 1 day (24 hours).
10h shows 10 hours. (Total 34 hours)

3 Push SET button.

- SETTING icon disappears and time display goes on, and ⏲▸| or ⏲▸◯ icon flashes.
  (When On timer is activated, time and On timer ⏲▸| are icons and other icons disappear.)

4 Cancel timer operation

Push CL button.

Timer icon disappears.

NOTE

- When the operation stops after the timer reached the preset time, the Repeat Off timer resumes the operation by pushing ON/OFF button and stops the operation after the time of the timer has reached the set time.
- When you push SWING/FIX while the Off timer function of the air conditioner is active, the indication of the timer function disappears and then appears again after about 5 seconds.
  This is due to normal processing of the remote controller.

6 POWER SAVING MODE

- The power saving mode saves energy by limiting the maximum current which will effect heating or cooling capacity that the unit can generate.

Push SAVE button during operation.

- The air conditioner enters power saving mode.
- SAVE appears on the display.

Power saving mode will stay in effect until it is cancelled.

To cancel the power saving mode, push SAVE button again.

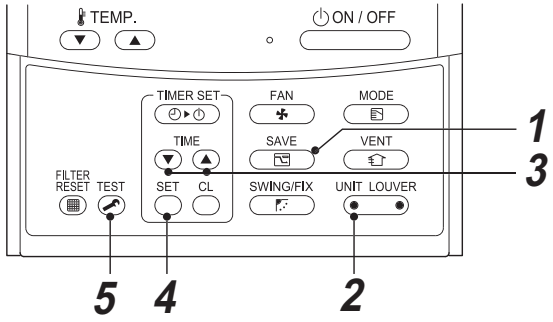
- SAVE disappears.

NOTE

- When other electric appliances are used at the same time, to avoid triggering the circuit breaker, power saving mode is recommended. Of course you can use power saving mode to save energy as well.
- Power saving mode consumes less energy, but may not heat/cool the room as much as normal mode.
  (The maximum current is limited to approximately 75% (factory default) of the normal mode.)
- To adjust the power-save settings, see "Power saving mode" in ADVANCED SETTINGS.
- Even when operation start/stop, operation mode change, or power reset is performed during the power saving mode, the power saving mode is retained until the next operation.

7 ADVANCED SETTINGS

■ Power saving mode



1 Push SAVE button for at least four seconds when the air conditioner is not working.

- SETTING , symbol, and numbers flash.

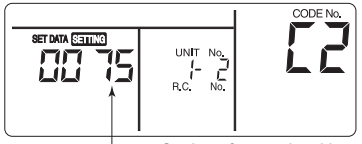
2 Push UNIT LOUVER (left side of the button) to select an indoor unit to be set.

- Each time you push the button, UNIT No. change as follows:

The fan of the selected unit runs.

3 Push TIME ▼ / ▲ buttons, to adjust the power saving mode setting.

- Each push of the button changes the power level by 1% within the range from 100% to 50%.
- The factory default is 75%.



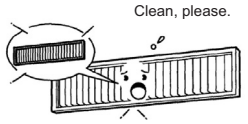
4 Push SET button.

5 Push TEST button to complete the setting.

8 ENERGY SAVING RECOMMENDATIONS

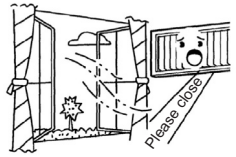
Select a comfortable set point and minimize adjusting it.

- Clean the filter when ever the filter display is illuminated on remote controller.
- Keep doors and windows closed and open them only when necessary.
- Use drapes, curtains, or shades to keep direct sun light from heating the room on very hot days.
- Do not obstruct the return air grille.
  Adjust the air flow direction for even air distribution in the room.



Checks before operating

- Check whether the earth wires are properly connected.
- Check whether the air filters are installed.
- Turn on the leakage breaker at least 12 hours before operating.



Protective device

- The protective device stops operation when the air conditioner is overloaded.
- When the protective device is activated, the current operation stops and the operation lamp and on the remote controller flash.

When the protective device is activated

- When the protective device has been activated and stopped operation, turn off the leakage breaker immediately, and ask the installer to find the cause.
  If the air conditioner is operated without fixing the problem, the air conditioner may malfunction.
- Check whether the air filters are installed.
  If the air filters are not installed, the air heat exchanger may be clogged with dust, which may result in water leakage.

For cooling

- When the air inlet and/or outlet of the outdoor unit are blocked
- When the air outlet of the outdoor unit is continuously exposed to strong wind

For heating

- When the air filters are clogged with too much dust or dirt
- When the suction port and/or discharge port of the indoor unit are blocked

Do not turn off the leakage breaker

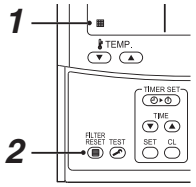
- Do not turn off the leakage breaker during a test run of the air conditioner. Use the ON/OFF button on the air conditioner instead to control the power.

9 MAINTENANCE

⚠ WARNING

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

Cleaning air filters



Clogged air filters will reduce the cooling and heating performance.

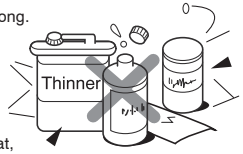
1 If " ▦ " is displayed on the remote controller, clean the air filters.

2 When the cleaning of air filters has been completed, push FILTER RESET button.
" ▦ " disappears.

⚠ CAUTION

Cleaning remote controller

- Use a dry cloth to wipe the remote controller.
- Never use a damp cloth on the remote controller.
- Do not use a chemically-treated duster for wiping or leave such materials on the unit for long.
  It may damage or fade the surface of the unit.
- Do not use benzine, thinner, polishing powder, or similar solvents for cleaning.
  These may cause the plastic surface to crack or deform.



Periodic check

Long-period use of the air conditioner may cause deterioration or failure of parts due to heat, humidity, dust, and operating conditions, or may cause poor drainage of dehumidified water.

Preparing for long Shut Down Period

1) Clean the filters and reposition them in unit.
2) Operate the unit in fan mode for 3 or 4 hours to dry all internal parts.
3) Turn the unit off and disconnect the main power supply.
4) Before unit is turned on again, make sure the circuit breaker has been turned on for at least 12 hours.

Check points before operation

1) Check that the air filters are installed.
2) Check that the air outlet or inlet is not blocked.
3) Turn on the main power switch or the circuit breaker for the main power supply to the air conditioner.

NOTE

For environmental conservation, it is strongly recommended that the indoor and outdoor units of the air conditioner in use be cleaned and maintained regularly to ensure efficient operation of the air conditioner.

When the air conditioner is operated for a long time, periodic maintenance (once a year) is recommended.

Furthermore, regularly check the outdoor unit for rust and scratches, and remove them or apply rustproof treatment, if necessary.

As a general rule, when an indoor unit is operated for 8 hours or more daily, clean the indoor unit and outdoor unit at least once every 3 months. Ask a professional for this cleaning/maintenance work.

Such maintenance can extend the life of the product though it involves the owner's expense.

Failure to clean the indoor and outdoor units regularly will result in poor performance, freezing, water leakage, and even compressor failure.

Maintenance List

Part	Unit	Check (visual/auditory)	Maintenance
Heat exchanger	Indoor/outdoor	• Dust/dirt clogging, scratches	• Wash the heat exchanger when it is clogged.
Fan motor	Indoor/outdoor	• Sound	• Take appropriate measures when abnormal sound is generated.
Filter	Indoor	• Dust/dirt, breakage	• Wash the filter with water when it is contaminated. • Replace it when it is damaged.
Fan	Indoor	• Vibration, balance • Dust/dirt, appearance	• Replace the fan when vibration or balance is terrible. • Brush or wash the fan when it is contaminated.
Air inlet/outlet grilles	Indoor/outdoor	• Dust/dirt, scratches	• Fix or replace them when they are deformed or damaged.
Drain pan	Indoor	• Dust/dirt clogging, drain contamination	• Clean the drain pan and check the downward slope for smooth drainage.
Ornamental panel, louvers	Indoor	• Dust/dirt, scratches	• Wash them when they are contaminated or apply repair coating.
Exterior	Outdoor	• Rust, peeling of insulator • Peeling/lift of coat	• Apply repair coating

10 AIR CONDITIONER OPERATIONS AND PERFORMANCE

3 minutes protection function

3-minutes protection function prevents the air conditioner from starting for initial 3 minutes after the main power switch/ circuit breaker is turned on for re-starting the air conditioner.

Power failure

Power failure during operation will stop the unit completely.

- To restart the operation, push the ON/OFF button on the remote controller.
- Lightning or a wireless car telephone operating nearby may cause the unit to malfunction.
  Turn off the main power switch or circuit breaker and then turn them on again.
  Push the ON/OFF button on the remote controller to restart.

Heating characteristics

Preheating operation

The air conditioner will not deliver warm air immediately after it is turned on.
Warm air will start to flow out after approximately 5 minutes when the indoor heat exchanger warmed up.

Warm air control (In heating operation)

When the room temperature has reached the set temperature while the outdoor unit is stopping, the indoor unit discharges wind with a very small air volume.

Defrosting operation

If the outdoor unit is frosted during the heating operation, defrosting starts automatically (for approximately 2 to 10 minutes) to maintain the heating capacity.

- The fans in both indoor and outdoor units will stop during the defrosting operation.
- During the defrosting operation, the defrosted water will be drained from the bottom plate of the outdoor unit.

Heating capacity

In the heating operation, the heat is absorbed from the outside and brought into the room.
This way of heating is called heat pump system. When the outside temperature is too low, it is recommended to use another heating apparatus in combination with the air conditioner.

Attention to snowfall and freeze on the outdoor unit

- In snowy areas, the air inlet and air outlet of the outdoor unit are often covered with snow or frozen up.
  If snow or freeze on the outdoor unit is left as it is, it may cause machine failure or poor warming.
- In cold areas, pay attention to the drain hose so that it perfectly drains water without water remaining inside for freeze prevention. If water freezes in the drain hose or inside the outdoor unit, it may cause machine failure or poor warming.

Air conditioner operating conditions

For proper performance, operate the air conditioner under the following temperature conditions:

Cooling operation	Outdoor temperature : –15°C to 46°C	
	Room temperature : 21°C to 32°C (Dry bulb temp.), 15°C to 24°C (Wet bulb temp.)	
	[CAUTION]	Room relative humidity – less than 80 %. If the air conditioner operates in excess of this figure, the surface of the air conditioner may cause dewing.
Heating operation	Outdoor temperature : –20°C to 15°C (Wet bulb temp.)	
	Room temperature : 15°C to 28°C (Dry bulb temp.)	

If air conditioner is used outside of the above conditions, safety protection may work.

11 INSTALLATION

Do not install the air conditioner in the following places

- Do not install the air conditioner in any place within 1 m from a TV, stereo, or radio set.
  If the unit is installed in such place, noise transmitted from the air conditioner affects the operation of these appliances.
- Do not install the air conditioner near a high frequency appliance (sewing machine or massager for business use, etc.), otherwise the air conditioner may malfunction.
- Do not install the air conditioner in a humid or oily place, or in a place where steam, soot, or corrosive gas is generated.
- Do not install the air conditioner in a salty place such as seaside area.
- Do not install the air conditioner in a place where a great deal of machine oil is used.
- Do not install the air conditioner in a place where it is usually exposed to strong wind such as in seaside area.
- Do not install the air conditioner in a place where sulfureous gas generated such as in a spa.
- Do not install the air conditioner in a vessel or mobile crane.
- Do not install the air conditioner in an acidic or alkaline atmosphere
  (in a hot-spring area or near a chemicals factory, or in a place subject to combustion emissions).
  Corrosion may be generated on the aluminum fin and copper pipe of the heat exchanger.
- Do not install the air conditioner near an obstacle (air vent, lighting equipment, etc.) that disturbs discharge air.
  (Turbulent airflow may reduce the performance or disable devices.)
- Do not use the air conditioner for special purposes such as preserving food, precision instruments, or art objects, or where breeding animals or growing plants are kept. (This may degrade the quality of preserved materials.)
- Do not install the air conditioner over an object that must not get wet.
  (Condensation may drop from the indoor unit at a humidity of 80% or more or when the drain port is clogged.)
- Do not install the air conditioner in a place where an organic solvent is used.
- Do not install the air conditioner near a door or window subject to humid outside air.
  Condensation may form on the air conditioner.
- Do not install the air conditioner in a place where special spray is used frequently.

Be careful with noise or vibrations

- Do not install the air conditioner in a place where noise by outdoor unit or hot air from its air outlet annoys your neighbors.
- Install the air conditioner on a solid and stable foundation so that it prevents transmission of resonating, operation noise and vibration.
- If one indoor unit is operating, some sound may be audible from other indoor units that are not operating.

12 TROUBLESHOOTING

⚠ CAUTION

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer :

- Switch operation does not work properly.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water fall inside the air conditioner.
- When the air conditioner does not operate even after the cause of the protective device activation has been removed. (The operation lamp and 🔧 on the remote controller are flashing.)
- Any other unusual conditions are observed.

Before you ask for servicing or repairs, check the following points.

◆ Recheck

Inoperative

- The main power switch is turned off.
- The circuit breaker is activated to cut off power supply.
- The main power fuse has blown out.

Does not cool well or heat well

- The air inlet and/or outlet of the outdoor unit is blocked.
- Doors or windows are opened.
- The set temperature is too high (In cooling) or low (In heating).

◆ These are not failures.

Indoor unit or outdoor unit makes a strange noise.

- When the temperature suddenly changes, the indoor or outdoor unit occasionally makes a strange noise because of expansion/ contraction of parts or change of refrigerant flow.
- Air leaking noise is heard occasionally.
  It is generated by the solenoid valve when it is actuated.
- A clattering sound is heard when the power is turned on.
  It is generated by the outdoor unit during preparation for operation.

The room air is smelly or a bad odor comes from the air conditioner.

- Smells impregnated in the walls, carpets, furniture, clothing, or furs, come out.

Outdoor unit is frosted in heating operation.
Water drains from outdoor unit.

- he outdoor unit is sometimes frosted in heating operation.
  In that case, the unit automatically performs defrosting (for 2 to 10 minutes) for increasing the heating efficiency.
- In defrosting operation, both the indoor and outdoor units stop air flow.
- Hiss sound is heard when flow of the refrigerant is changed for defrosting.
- Resultant water of automatic defrosting in heating operation drains from outdoor unit.

A white mist of chilled air or water is generated from the outdoor unit.

- When the indoor unit in cooling operation or the outdoor unit in defrosting operation occasionally steams.

Check these items. If any of these problems still remains, stop the operation, turn off the leakage breaker, and then notifies the dealer of the serial number and details of the error. Never repair any part by yourself as it is dangerous. When 🔧 and a combination of E, F, H, L or P and a number are displayed on the remote controller, also inform the dealer of the display content.

13 SPECIFICATIONS

Model	Sound power level (dB)		Weight (Kg)
	Cooling	Heating	
RAV-SM2242DT-E	74	74	160
RAV-SM2802DT-E	75	75	160

Declaration of Conformity

Manufacturer: Toshiba Carrier Corporation
336 Tadehara, Fuji-shi, Shizuoka-ken 416-8521 JAPAN

Authorized Representative/TCF holder: Nick Ball
Toshiba EMEA Engineering Director
Toshiba Carrier UK Ltd.
Porsham Close, Belliver Industrial Estate,
PLYMOUTH, Devon, PL6 7DB.
United Kingdom

Hereby declares that the machinery described below:

Generic Denomination: Air Conditioner

Model/type: RAV-SM2242DT-E,
RAV-SM2802DT-E,
RAV-SM2242DT-TR,
RAV-SM2802DT-TR

Commercial name: Digital Inverter Series Air Conditioner

Complies with the provisions of the "Machinery" Directive (Directive 2006/42/EC) and the regulations transposing into national law

Complies with the provisions of the following harmonized standard:
EN 378-2: 2008

NOTE

This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer's consent.

Information according to EMC Directive 2004/108/EC	
(Name of the manufacture)	TOSHIBA CARRIER CORPORATION
(Address, city, country)	336 Tadehara, Fuji-shi, Shizuoka-ken 416-8521 Japan
(Name of the Importer/Distributor)	TOSHIBA CARRIER UK Ltd.
(Address, city, country)	Porsham Close, Belliver Industrial Estate, PLYMOUTH, Devon, PL6 7DB. United Kingdom

12. INSTALLATION MANUAL

Original instruction

ADOPTION OF NEW REFRIGERANT

This Air Conditioner uses R410A an environmentally friendly refrigerant.

Contents

Thank you for purchasing this Toshiba air conditioner.

Please read carefully through these instructions that contain important information which complies with the “Machinery” Directive (Directive 2006/42/EC), and ensure that you understand them.

Some of the details provided in these instructions differ from the Installation Manual supplied with your product, and the instructions provided here take precedence.

After reading these instructions, be sure to keep them in a safe place together with the Owner’s Manual and Installation Manual supplied with your product.

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	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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.
Qualified service person	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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. • 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 made by Toshiba Carrier Corporation or, alternatively, 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.

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 and from heat Insulating shoes Clothing to provide protection from electric shock
Work done at heights (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 and from heat

■ Warning Indications on the Air Conditioner Unit

Warning indication	Description
 **WARNING** **ELECTRICAL SHOCK HAZARD** Disconnect all remote electric power supplies before servicing.	**WARNING** ELECTRICAL SHOCK HAZARD Disconnect all remote electric power supplies before servicing.
 **WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.	**WARNING** Moving parts. Do not operate unit with grille removed. Stop the unit before the servicing.
 **CAUTION** High temperature parts. You might get burned when removing this panel.	**CAUTION** High temperature parts. You might get burned when removing this panel.
 **CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.	**CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.
 **CAUTION** **BURST HAZARD** Open the service valves before the operation, otherwise there might be the burst.	**CAUTION** **BURST HAZARD** Open the service valves before the operation, otherwise there might be the burst.

1 PRECAUTIONS FOR SAFETY

⚠ WARNING

General

- Before starting to install the air conditioner, read carefully through the Installation Manual, and follow its instructions to install the air conditioner.
- 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 opening the intake grille of the indoor unit or service panel 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 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.
- 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.
- 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 or to remove the intake grille of the indoor unit to undertake work.
- Wear protective gloves and safety work clothing during installation, servicing and removal.
- Do not touch the aluminium 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.
- 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.
- 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.
- When cleaning the filter or other parts of the outdoor 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.
- 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.
- The refrigerant used by this air conditioner is the R410A.
- You shall ensure that the air conditioner is transported in stable condition.
- Do not move or repair any unit by yourself. There is high voltage inside the unit.
  You may get electric shock when removing the cover and main unit.

Selection of installation location

- If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks.
  Consult the dealer from whom you purchased the air conditioner when you implement the measures.
  Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident.
- Do not install the air conditioner in a location that may be subject to a risk of exposure to a combustible gas.
  If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
- When transporting the air conditioner, wear shoes with additional protective toe caps.
- 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.
- Install the indoor unit at least 2.5 m above the floor level since otherwise the users may injure themselves or receive electric shocks if they poke their fingers or other objects into the indoor unit while the air conditioner is running.
- 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.

Installation

- When the indoor unit is to be suspended, the designated hanging bolts (M10 or W3/8) and nuts (M10 or W3/8) must be used.
- Install the air conditioner at enough strong places to withstand the weight of the unit.
  If the strength is not enough, the unit may fall down resulting in injury.
- Follow the instructions in the Installation Manual to install the air conditioner. Failure to follow these instructions may cause the product to fall down or topple over or give rise to noise, vibration, water leakage, etc.
- The designated bolts (M10, M12) and nuts (M10, M12) for securing the outdoor unit must be used when installing the unit.
- Install the outdoor unit property in a location that is durable enough to support the weight of the outdoor unit.
  Insufficient durability may cause the outdoor unit to fall, which may result in injury.

Refrigerant piping

- Install the refrigerant pipe securely during the installation work before operating the air conditioner.
  If the compressor is operated with the valve open and without refrigerant pipe, the compressor sucks air and the refrigeration cycles is over pressurized, which may cause a injury.
- 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.
- 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.
- When the air conditioner has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle.
  Failure to purge the air completely may cause the air conditioner to malfunction.
- Nitrogen gas must be used for the airtight test.
- The charge hose must be connected in such a way that it is not slack.
- 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.

Electrical wiring

- 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.
- When connecting the electrical wires, repairing the electrical parts or undertaking other electrical jobs, wear gloves to provide protection for electricians and from heat, insulating shoes and clothing to provide protection from electric shocks.
  Failure to wear this protective gear may result in electric shocks.
- 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.
- 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.
- After completing the repair or relocation work, check that the ground wires are connected properly.
- 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.
- When installing the circuit breaker outdoors, install one which is designed to be used outdoors.
- Under no circumstances must the power cable be extended.
  Connection trouble in the places where the cable is extended may give rise to smoking and/or a fire.
- Electrical wiring work shall be conducted according to law and regulation in the community and installation manual.
  Failure to do so may result in electrocution or short circuit.

Test run

- Before operating the air conditioner after having completed the work, check that the electrical parts box cover of the indoor unit and service panel of the outdoor unit are closed, and set the circuit breaker to the ON position.
  You may receive an electric shock if the power is turned on without first conducting these checks.
- When you have noticed that some kind of trouble (such as when an error display has appeared, there is a smell of burning, abnormal sounds are heard, the air conditioner fails to cool or heat or water is leaking) has occurred in the air conditioner, do not touch the air conditioner yourself but set the circuit breaker to the OFF position, and contact a qualified service person.
  Take steps to ensure that the power will not be turned on (by marking “out of service” near the circuit breaker, for instance) until qualified service person arrives.
  Continuing to use the air conditioner in the trouble status may cause mechanical problems to escalate or result in electric shocks, etc.
- After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 2 MΩ or more between the charge section and the non-charge metal section (Earth section).
  If the resistance value is low, a disaster such as a leak or electric shock is caused at user’s side.
- Upon completion of the installation work, check for refrigerant leaks and check the insulation resistance and water drainage.
  Then conduct a test run to check that the air conditioner is operating properly.

Explanations given to user

- Upon completion of the installation work, tell the user where the circuit breaker is located.
  If the user does not know where the circuit breaker is, he or she will not be able to turn it off in the event that trouble has occurred in the air conditioner.
- 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 (∗1) to have the repairs done.
  Do not set the circuit breaker to the ON position until the repairs are completed.
- After the installation work, follow the Owner’s Manual to explain to the customer how to use and maintain the unit.

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 rupture, injury or other trouble.

(∗1) Refer to the “Definition of Qualified Installer or Qualified Service Person.”

⚠ CAUTION

New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**
- The characteristics of R410A refrigerant are; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22.

  Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.
- To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are changed from those for the conventional refrigerant.
- Accordingly the exclusive tools are required for the new refrigerant (R410A).
- For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter.

To Disconnect the Appliance from Main Power Supply.

- This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.
- **The installation fuse must be used for the power supply line of this conditioner.**

2 ACCESSORY PARTS

Part name	Q'ty	Shape	Usage
Installation Manual	1	This manual	(Be sure to hand over to customers) (For other languages that do not appear in this Installation Manual, please refer to the enclosed CD-R.)
Owner's Manual	1		(Be sure to hand over to customers)
Heat insulator	1		For heat insulation of Gas pipe connecting section
	1		For heat insulation of Liquid pipe connecting section
Joint (Ø22.2 – Ø28.6 mm)	1		For connecting the gas side pipe

3 SELECTION OF INSTALLATION PLACE

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- A restaurant kitchen where a lot of oil is used or place near machines in a factory (Oil adhering to the heat exchanger and resin part (fan) in the indoor unit may reduce the performance, generate mist or dew drop, or deform or damage resin parts.)
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighbour house. (Outdoor unit)
- Place where noise of the outdoor unit is easily transmitted. (When install the outdoor unit on the boundary with the neighbour, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air duct installation, check whether value of air volume, static pressure and duct resistance are correct.)
- Do not use the air conditioner for special purposes such as preserving food, precision instruments, or art objects, or where breeding animals or growing plants are kept. (This may degrade the quality of preserved materials.)
- Place where any of high-frequency appliances (including inverter devices, private power generators, medical equipment, and communication equipment) and inverter-type fluorescent light is installed. (A malfunction of the air conditioner, abnormal control, or problems due to noise to such appliances/equipment may occur.)
- When the wireless remote controller is used in a room equipped with an inverter-type fluorescent light or at a place exposed to direct sunlight, signals from the remote controller may not be received correctly.
- Place where organic solvent is used.
- Place where special spray is used frequently.

■ Installation under high-humidity atmosphere

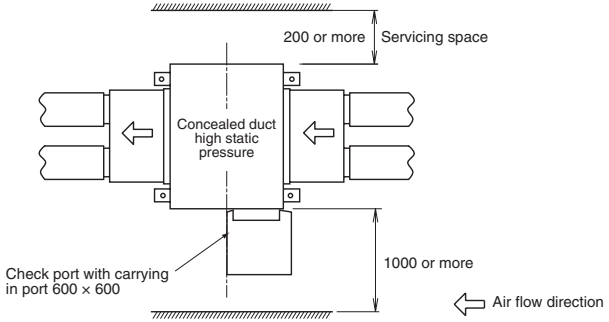
In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23°C or higher).

1. Installation to inside of the ceiling with tiles on the roof
2. Installation to inside of the ceiling with slated roof
3. Installation to a place where inside of the ceiling is used for pathway to intake the fresh air
   - In the above cases, additionally attach the heat insulator to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Check port) so that it is easily removed.
   - Apply also a sufficient heat insulation to the duct and connecting part of the duct.

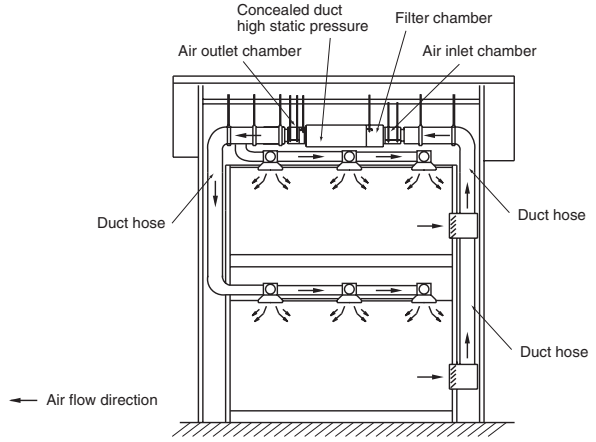
[Reference]	Condensation test conditions
	Indoor side: 27°C dry bulb temperature 24°C wet bulb temperature
	Air volume: Low air volume, operation time 4 hours

■ Installation space (Unit: mm)

Reserve space required for maintenance the indoor unit and service work.



<Installation example>



REQUIREMENT

1. Attach the optional accessories (drain-up kit etc.) on the unit before installing the unit. Also, set the check port with carrying in port to the side surface of the unit except air inlet panel.
2. Prepare the check port with carrying in port hole with the size of 600x600mm.

■ Filter cleaning sign term setting

The lighting term setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation. For setup method, refer to “Filter sign setting” and “To secure better effect of heating” in the Applicable controls of this Manual.

4 INSTALLATION

⚠ WARNING

- Install the air conditioner certainly to sufficiently withstand the weight.
- If the strength is insufficient, the unit may fall down resulting in human injury.
- Perform a specified installation work to guard against strong wind or earthquake.
- An incomplete installation can cause accidents by the units falling and dropping.

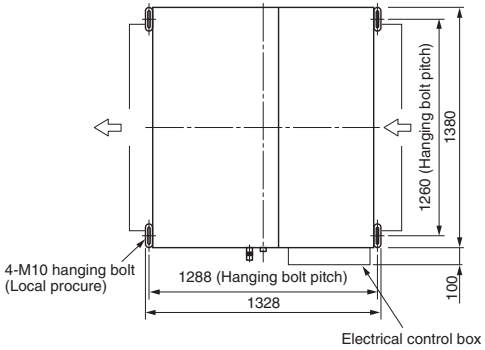
REQUIREMENT

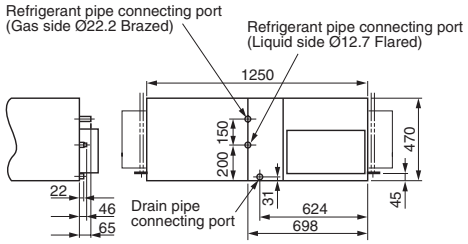
Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible.
  If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Hanging bolt pitch of air inlet chamber side is different (centre position), make sure not to make mistake to install the setting direction.
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.

■ External Dimensions

(Unit: mm)





■ Installation of hanging bolt

- Consider the piping/wiring after the unit is hung when determining the location of the indoor unit installation and orientation.
- After the location of the indoor unit installation has been determined, install hanging bolts.
- For the dimensions of the hanging bolt pitches, refer to the external view.
- When a ceiling already exists, lay the drain pipe, refrigerant pipe, system interconnection wires, and remote controller wires to their connection locations before hanging the indoor unit.

Procure hanging bolts washer and nuts for installing the indoor unit (these are not supplied).

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces
Washer	M10	8 pieces

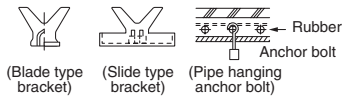
Installation of hanging bolt

Use M10 hanging bolts (4 pcs, to be local procure).

Matching to the existing structure, set pitch according to size in the unit external view as shown below.

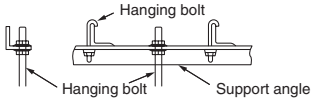
New concrete slab

Install the bolts with insert brackets or anchor bolts.



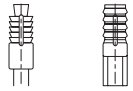
Steel flame structure

Use existing angles or install new support angles.



Existing concrete slab

Use a hole-in anchors, hole-in plugs, or a hole-in bolts.



■ Installation of indoor unit

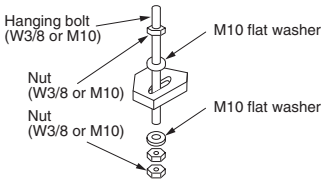
Treatment of ceiling

The ceiling differs according to structure of building.

For details, consult your constructor or interior finish contractor.

In the process after the ceiling board has been removed, it is important to reinforce ceiling foundation (frame) and to keep horizontal level of installed ceiling correctly in order to prevent vibration of ceiling board.

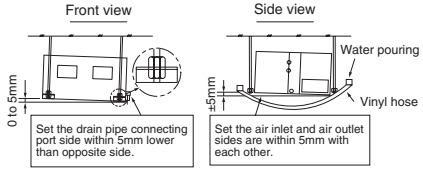
- Attach the nuts and the M10 flat washers to the hanging bolt.
- Put washers at up and down of the hanging bracket of the indoor unit to hang down the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)



- Check that four sides are horizontal using a level vial. (Horizontal degree: Within 5mm)

REQUIREMENT

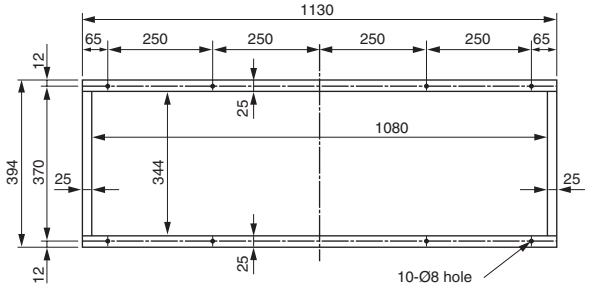
- Hang the unit in a horizontal position.
  When unit is hanged to slant, it may cause overflow of drainage.
- Install the unit within the dimension according to the figure below.
- Using level vial or vinyl hose to confirm whether the unit is hang horizontally.



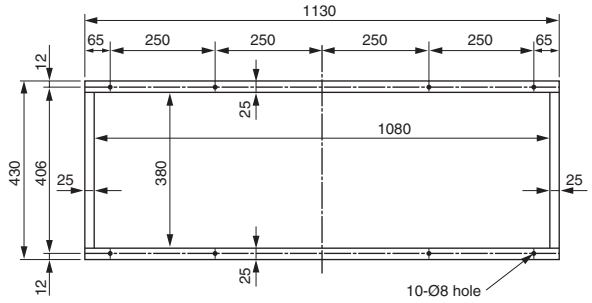
■ Diagrams for making connecting flanges (Unit: mm)

The connecting flange (Incl. the fixing screw) is not supplied to the indoor unit.
When the connecting flange is necessary, produce them in locally.
Drawing figure is as follows. (Material: Galvanized steel plate, thickness of 1.6 mm)

<Air outlet port flange>



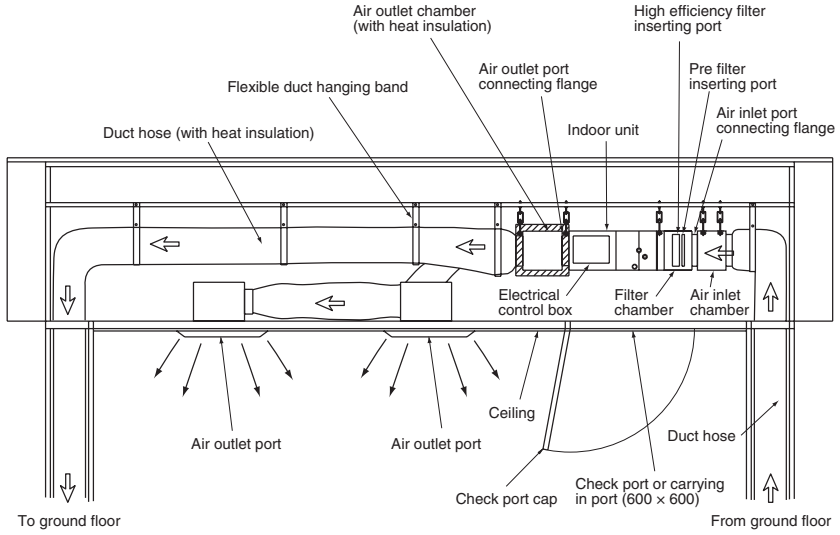
<Air inlet port connecting flange>



■ Duct design

1. In order to prevent short circuits, design the duct installation, so that the intake and discharge openings are not adjacent to each other.
2. The indoor unit does not have a built-in air filter. Make sure to set up the filter chamber etc. and install the air filter (Locally procured).
   If no air filter is installed, the heat exchanger will be blocked by dust, which may cause the malfunction of air conditioner or the water leakage.

<Duct installation example (First floor)>



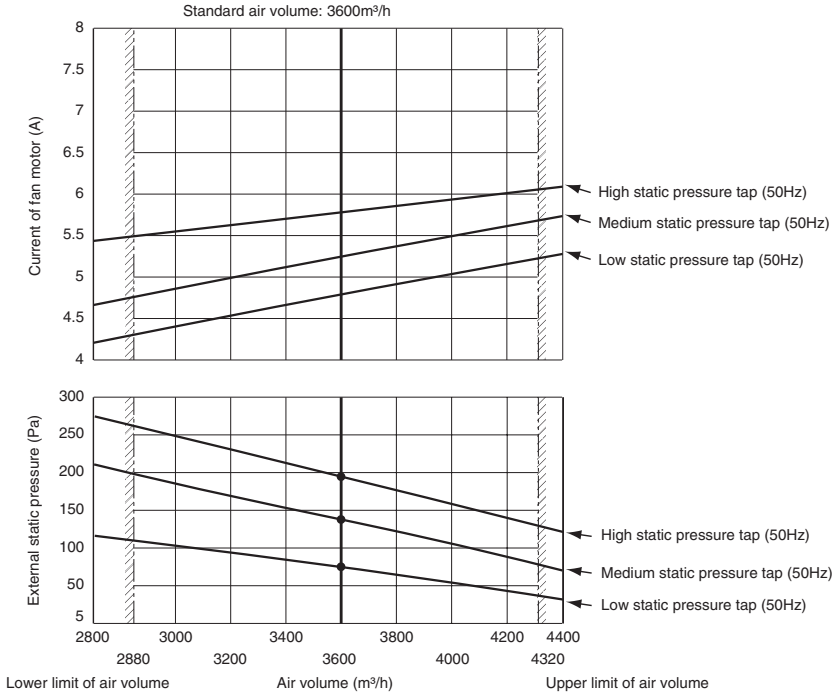
NOTE

All duct connection between units except outdoor unit must be procured and enforced locally.

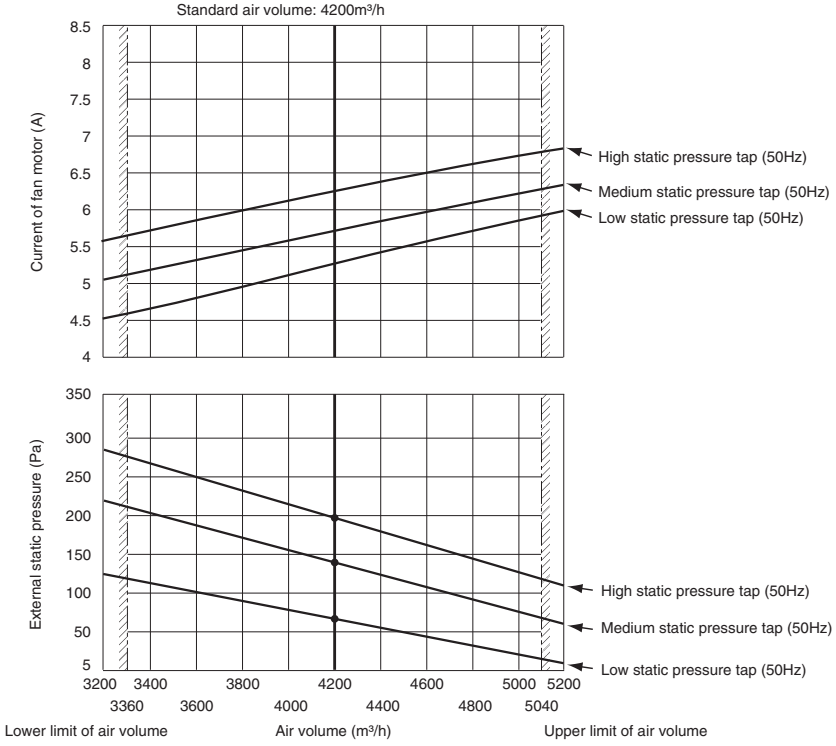
5 FAN CHARACTERISTICS

Current value as a criterion, adjust the air volume value to become within the range of the chart below.

<RAV-SM2242 Type>



<RAV-SM2802 Type>



REQUIREMENT

Add a air volume damper to the air supply duct, and adjust the air volume in the range from 80% to 120% of the standard air volume.

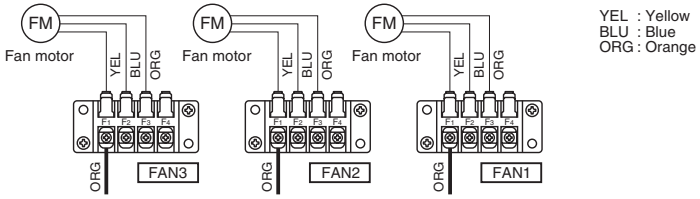
■ Wire connection change of fan motor

This duct is composed of 3 fan motors.

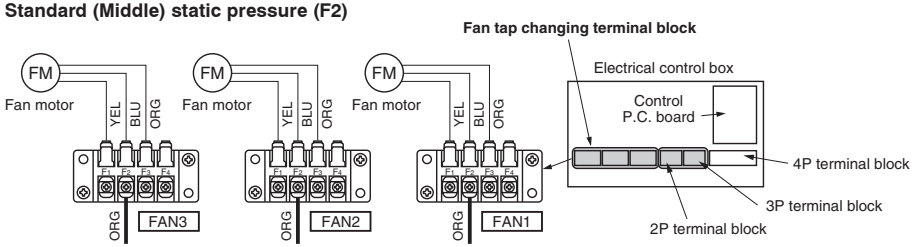
To change external static pressure by duct resistance, connect the 3 connectors of the orange lead wires that are connected to the underside of the fan tap changing terminal block to the same number (F1, F2 or F3) terminal.

The wires of the fan motor has been connected to (F2) [External static pressure 137Pa (14mmAq)] as factory default.

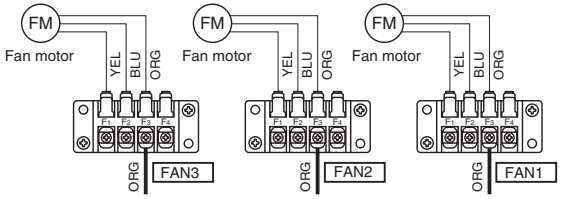
Low static pressure (F1)



Standard (Middle) static pressure (F2)



High static pressure (F3)



Terminal block No.	Fan motor wiring	External static pressure Pa (mmAq)	Remarks
F1	Yellow Low static pressure	69 (7)	
F2	Blue Middle static pressure	137 (14)	Factory default
F3	Orange High static pressure	196 (20)	

∗ Do not use F4.

NOTE

When the external static pressure is changed, write down the static pressure once change in the wiring diagram of the indoor unit is made.

6 DRAIN PIPING WORK

⚠ CAUTION

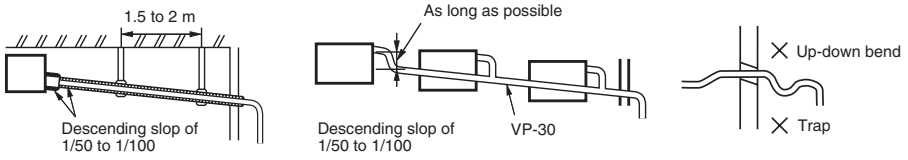
Following the Installation Manual, perform the drain piping work that water is properly drained, and apply a heat insulation not to cause a dew condensation.

Inappropriate piping work may cause the water leakage in the room and wet of furniture.

REQUIREMENT

- The drain piping flows the natural drainage. Make sure to set the drain piping from the unit with descending slope of 1/50 to 1/100 and do not make up-down or trap in the midway.
- Set the horizontal pulling of the drain pipe to 20m or less. When drain piping is too long, attach the support bracket at intervals of 1.5m to 2m to avoid the pipe becomes undulant as shown in figure below.

<Example for installation of the main piping (Incl. piping support)>



- Be sure to connect the drain pipe to the air conditioner with adhesive to avoid water leakage from the joint portion.
- Condensation may occur on the drain pipes including collective pipes.
  All drain pipes must be wrapped with heat insulator to prevent dew condensation.
  Especially a part where drain pipe is connected to the indoor unit must be firmly insulated with the provided heat insulator.

■ Pipe material, size and insulator

The following materials for piping work and insulating process are procured locally.

Pipe material	Hard vinyl chloride pipe socket for VP25
	Hard vinyl chloride pipe VP25 (Nominal outer diameter Ø32mm)
Insulator	Foamed polyethylene foam, thickness: 10mm or more

■ Connecting drain pipe

REQUIREMENT

- Using adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes certainly so that water does not leak.
- It takes some time to dry and indurate the adhesive agent. (Refer to the manual of adhesive agent.)
  Do not apply any extra force on the connecting section until the adhesive agent dried.

■ Drain up

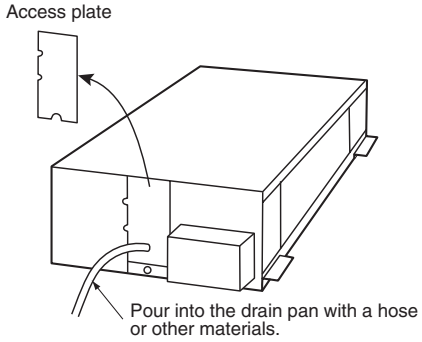
- When install the drain up kit of optional accessory, read the Installation Manual supplied to a drain up kit.

■ Check the draining

Check if the water can flow out properly during the test run. Also, check if no water leakage from the piping connection port.

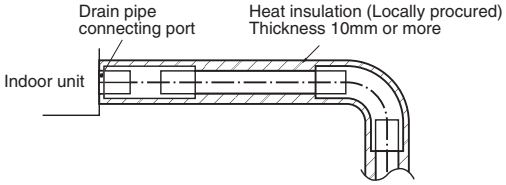
REQUIREMENT

- Do drain test even if installation of heating season.
- Pour water into the drain pan port of the air inlet port gently using the kettle or hose when duct is not connected to the drain pipe. When duct is connected to the drain pipe, remove the Access plate and perform it.



■ Heat insulating process

• After drain check, covering the heat insulator for drain connecting section, wrap the drain pipe with heat insulator (Locally procured) without clearance from the end of the drain pipe connecting port of the indoor unit.



7 REFRIGERANT PIPING AND EVACUATING

■ Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong.
   The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. **Use general copper pipes with a wall thickness of 0.8 mm for Ø12.7 mm, and with a wall thickness of 1.0 mm for Ø28.6 mm (half hard).**
   Do not use any copper pipes with a wall thickness less than these thicknesses.
3. Flare nut and flare works are also different from those of the conventional refrigerant.
   Take out the flare nut attached to the main unit of the air conditioner, and use it.

REQUIREMENT

When the refrigerant pipe is long, provide support brackets at intervals of 2.5 to 3 m to clamp the refrigerant pipe.
Otherwise, abnormal sound may be generated.

⚠ CAUTION

IMPORTANT 4 POINTS FOR PIPING WORK

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (Connected points)

■ Pipe size

Pipe size	Gas side	Liquid side
	28.6 mm	12.7 mm

■ Liquid side refrigerant pipe connection

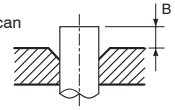
Permissible Piping Length and Height Difference

They vary according to the outdoor unit.
For details, refer to the Installation Manual attached to the outdoor unit.

Flaring

• Cut the pipe with a pipe cutter.
  Remove burrs completely.
  Remaining burrs may cause gas leakage.
• Insert a flare nut into the pipe, and flare the pipe.
  As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

However, the conventional tools can be used by adjusting projection margin of the copper pipe.



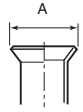
◆ Projection margin in flaring: B (Unit: mm)
Rigid (Clutch type)

Outer dia. of copper pipe	R410A tool used	Conventional tool used
	R410A	R410A
12.7	0 to 0.5	1.5 to 2.0

◆ Flaring dia. meter size: A (Unit: mm)

Outer dia. of copper pipe	A $^{+0}_{-0.02"\ (-0.4)}$
	R410A
12.7	16.6

∗ In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size.
The copper pipe gauge is useful for adjusting projection margin size.



Tightening connection

⚠ CAUTION

Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

(Unit: N•m)

Outer dia. of copper pipe	Tightening torque
12.7 mm (dia.)	50 to 62 (5.0 to 6.2 kgf•m)

◆ Tightening torque of flare pipe connections

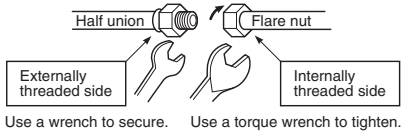
Pressure of R410A is higher than that of R22. (Approx. 1.6 times)

Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque.

Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

Align the centres of the connecting pipes and tighten the flare nut as far as possible with your fingers.

Then tighten the nut with a spanner and torque wrench as shown in the figure.



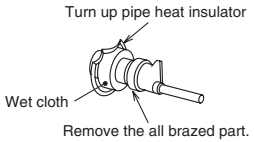
REQUIREMENT

Tightening with an excessive torque may crack the nut depending on installation conditions.

Tighten the nut within the specified tightening torque.

■ Gas side refrigerant pipe connection

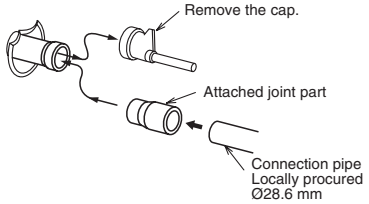
- Turn up the pipe heat insulator to the unit side.
- Wrap the pipe with wet cloth.



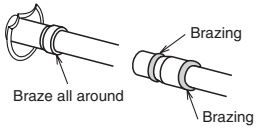
- Remove the cup on the gas side piping by using a brazing machine.

⚠ CAUTION

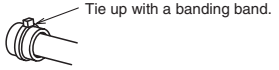
Do not burn the pipe heat insulator.



- Braze the attached joint part to the gas side piping and braze the connection piping to the joint part.



- Turn back the pipe heat insulator and tie up with a banding band.



Piping with outdoor unit

- For details of installation, refer to the Installation Manual of the outdoor unit.

■ Evacuation

Using a vacuum pump, perform vacuuming from the charge port of valve of the outdoor unit.

For details, follow to the Installation Manual attached to the outdoor unit.

- Never use the refrigerant sealed in the outdoor unit for evacuation.

REQUIREMENT

For the tools such as charge hose, etc., use those manufactured exclusively for R410A.

Refrigerant amount to be added

For addition of the refrigerant, add refrigerant “R410A” referring to the attached Installation Manual of outdoor unit.

Be sure to use a scale to charge the refrigerant of specified amount.

REQUIREMENT

- Charging an excessive or too little amount of refrigerant causes a trouble of the compressor.

  Be sure to charge the refrigerant of specified amount.
- A personnel who charged the refrigerant should write down the pipe length and the added refrigerant amount in the nameplate attached to the service panel of the outdoor unit.

  It is necessary to fix the compressor and refrigeration cycle malfunction.

Open the valve fully

Open the valve of the outdoor unit fully.

A 4mm-hexagonal wrench is required for opening the valve.

For details, refer to the Installation Manual attached to the outdoor unit.

Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

REQUIREMENT

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

Heat insulation process

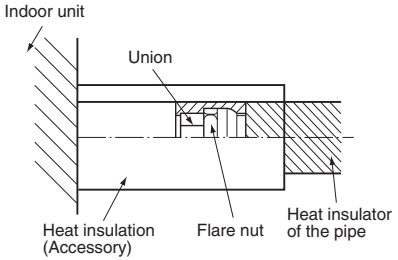
Apply heat insulation for the pipes separately at liquid side and gas side.

For the heat insulation to the pipes at gas side, be sure to use the material with heat-resisting temperature 120°C or higher.

Using the attached heat insulation material, apply the heat insulation to the pipe connecting section of the indoor unit securely without gap.

REQUIREMENT

- Apply the heat insulation to the pipe connecting section of the indoor unit securely up to the root without exposure of the pipe.
  (The pipe exposed to the outside causes water leak.)
- Wrap heat insulator with its slits facing up (ceiling side).



8 ELECTRICAL CONNECTION

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external tension to the wires do not affect the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire. (grounding work)**
   Incomplete grounding cause an electric shock.
   Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
3. **Appliance shall be installed in accordance with national wiring regulations.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- Power supply for indoor unit must be exclusive and separated from the one for outdoor unit.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Never connect 220–240V power to the terminal blocks (Ⓐ, Ⓑ, etc.) for control wiring. (Otherwise, the system will fail.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.
  The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

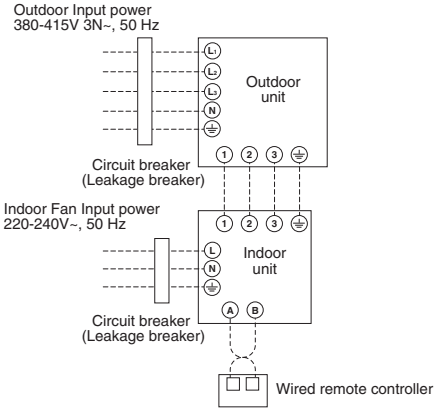
Remote controller wiring

2-core non polarity wire is used for the remote controller wiring.

Wiring

1. Figure below shows the wiring connections indoor power line and between the indoor and outdoor units and between the indoor units and remote controller.
   The wires indicated by the dash lines are provided at the installation place.
2. Insulate the unsheathed redundant cords (conductors) with electrical insulation tape.
   Process them so that they do not touch any electrical or metal parts.

■ Wiring diagram



■ Power and Wiring Specification

Indoor fan Power supply	220-240V~, 50 Hz
Maximum running current	15A
Fuse rating	25A
Indoor fan power supply wire*	3 × 2.5mm² or more (H07 RN-F or 60245 IEC 66)
System interconnecting wires*	4 × 1.5mm² or more (H07 RN-F or 60245 IEC 66)

* Number of wire × wire size

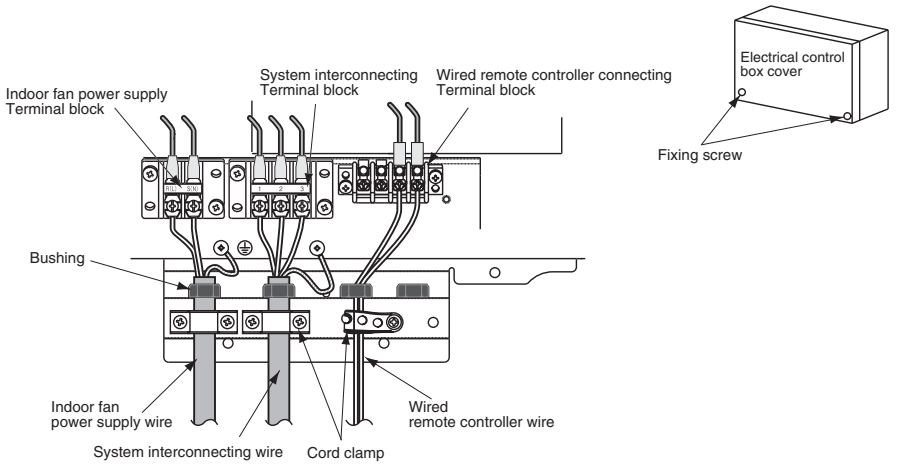
■ Wire connection

REQUIREMENT

- Be sure to connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- Be sure to pass the wires through the bushing of wire connection holes of the indoor unit.
- Keep a margin (Approx. 100mm) on a wire to hang down the electrical control box at servicing, etc.
- The low-voltage circuit is provided for the remote controller. (Do not connect the high-voltage circuit)

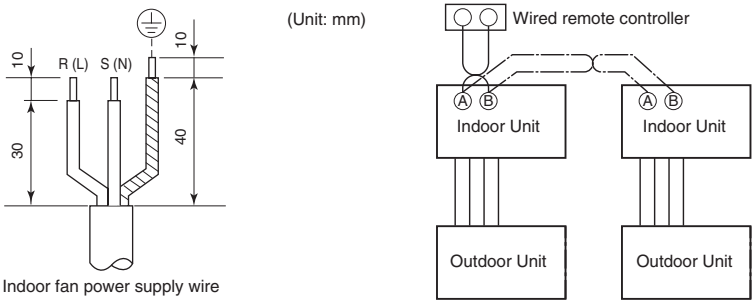
1. Remove the cover of the electrical control box by taking off the mounting screws (2 positions)
2. Tighten the screws of the terminal block, and fix the wires with cord attached to the electrical control box. (Do not apply tension to the connecting section of the terminal block.)
3. Mount the cover of the electrical control box without pinching wires.

<Terminal block of electrical control box>

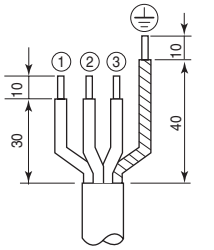


Group control

(Unit: mm)



Indoor fan power supply wire

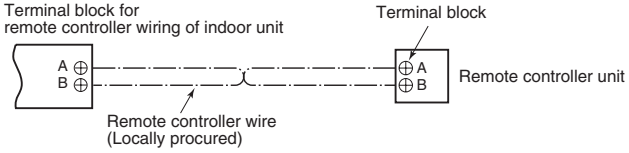


System interconnecting wire

■ Remote Controller Wiring

- Strip off approx. 9mm the wire to be connected.
- Non polarity, 2 core wire is used for wiring of the remote controller. (0.5mm² to 2.0mm² wires)

Wiring diagram



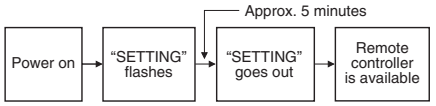
9 APPLICABLE CONTROLS

REQUIREMENT

- When you use this air conditioner for the first time, it takes approx. 5 minutes until the remote controller becomes available after power-on. This is normal.

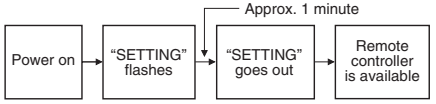
<When power is turned on for the first time after installation>

It takes **approx. 5 minutes** until the remote controller becomes available.



<When power is turned on for the second (or later) time>

It takes **approx. 1 minute** until the remote controller becomes available.

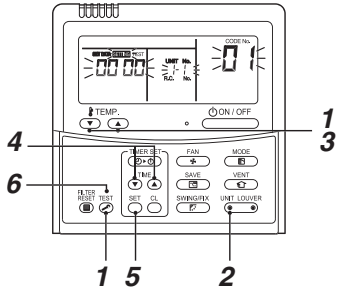


- Normal settings were made when the indoor unit was shipped from factory.
  Change the indoor unit settings as required.
- Use the wired remote controller to change the settings.
  * The settings cannot be changed using the wireless remote controller, sub remote controller, or remote controller-less system (for central remote controller only).
  Therefore, install the wired remote controller to change the settings.

■ Changing of setting applicable control

Basic procedure for changing settings

Change the settings while the air conditioner is not working. (Be sure to stop the air conditioner before making settings.)



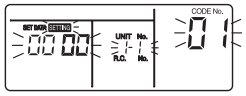
Procedure *1*

Push TEST button and TEMP. ▼ button simultaneously for at least 4 seconds.

After a while, the display flashes as shown in the figure.

Confirm that the CODE No. is [01].

- If the CODE No. is not [01], push TEST button to erase the display content, and repeat the procedure from the beginning. (No operation of the remote controller is accepted for a while after TEST button is pushed.)



(∗ Display content varies with the indoor unit model.)

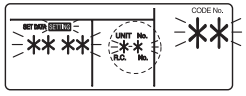
Procedure *2*

Each time you push UNIT LOUVER button, indoor unit numbers in the control group change cyclically.

Select the indoor unit you want to change settings for.

The fan of the selected unit runs.

You can confirm the indoor unit for which you want to change settings.



Procedure *3*

Using TEMP. ▼ / ▲ buttons, specify CODE No. [∗∗].

Procedure *4*

Using TIME ▼ / ▲ buttons, select SET DATA [∗∗∗∗].

Procedure *5*

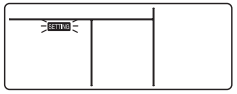
Push SET button. When the display changes from flashing to lit, the setup is completed.

- To change settings of another indoor unit, repeat from **Procedure *2***.
- To change other settings of the selected indoor unit, repeat from **Procedure *3***.
  Use SET button to clear the settings.
  To make settings after SET button was pushed, repeat from **Procedure *2***.

Procedure *6*

When settings have been completed, push TEST button to determine the settings.

When TEST button is pushed, "SETTING" flashes and then the display content disappears and the air conditioner enters the normal stop mode. (While "SETTING" is flashing, no operation of the remote controller is accepted.)



■ Filter sign setting

According to the installation condition, the filter sign term (Notification of filter cleaning) can be changed.

Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the CODE No. in **Procedure *3***, specify [01].
- For the [SET DATA] in **Procedure *4***, select the SET DATA of filter sign term from the following table.

SET DATA	Filter sign term
0000	None
0001	150H
0002	2500H (Factory default)
0003	5000H
0004	10000H

■ To secure better effect of heating

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised.

Also use a circulator, etc. to circulate heat air near the ceiling.

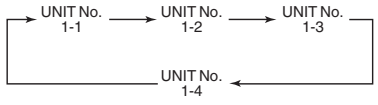
Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the CODE No. in **Procedure *3***, specify [06].
- For the set data in **Procedure *4***, select the SET DATA of shift value of detection temperature to be set up from the table below.

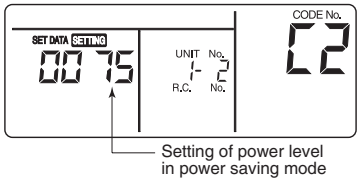
SET DATA	Detection temperature shift value
0000	No shift
0001	+1°C
0002	+2°C (Factory default)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

■ Power saving mode

1. Push SAVE button for at least four seconds when the air conditioner is not working.
   SETTING flashes.
   Indicates CODE No. "C2."
2. Select an indoor unit to be set by pushing UNIT LOUVER (left side of the button).
   Each time you push the button, unit numbers change as follows:



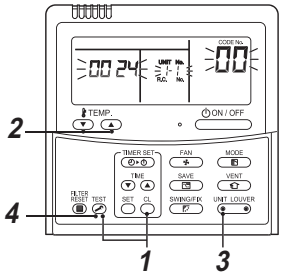
   The fan of the selected unit runs.
3. Adjust the power save setting by pushing TIME (▼) / (▲) buttons.
   Each push of the button changes the power level by 1% within the range from 100% to 50%.
   ∗ The factory default is 75%.



4. Determine the setting by pushing SET button.
5. Push TEST button to complete the setting.

■ Remote controller switch monitoring function

This function is available to call the service monitor mode from the remote controller during a test run to acquire temperatures of sensors of the remote controller, indoor unit, and outdoor unit.



1. Push CL and TEST buttons simultaneously for at least 4 seconds to call the service monitor mode.
   The service monitor indicator lights up and the header indoor unit number is displayed first.
   CODE No. 00 is also displayed.
2. Pushing TEMP. (▼) / (▲) buttons, select the number of sensor, etc. (CODE No.) to be monitored. (See the following table.)
3. Pushing UNIT LOUVER (left side of the button), select an indoor unit to be monitored.
   The sensor temperatures of indoor units and their outdoor unit in the control group are displayed.
4. Push TEST button to return to the normal display.

Indoor unit data	
CODE No.	**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 (× 1 h)

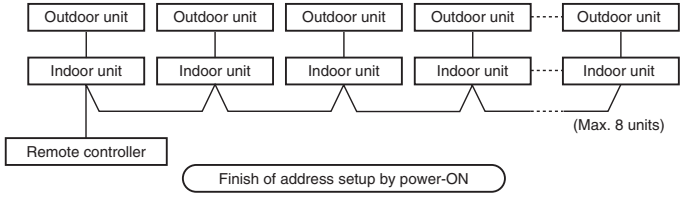
Outdoor unit data	
CODE No.	**Data name**
60	Outdoor unit heat exchanger (coil) temperature (TE)
61	Outside air temperature (TO)
62	Compressor discharge temperature (TD)
63	Compressor suction temperature (TS)
64	—
65	Heatsink temperature (THS)
6A	Operating current (× 1/10)
F1	Compressor cumulative operating hours (× 100)

■ Group control

Group control for system of multiple units

One remote controller can control up to 8 indoor units as a group.

♦ Group control in single system



- For wiring procedure and wiring method of the individual line (Identical refrigerant line) system, refer to "ELECTRICAL CONNECTION".
- Wiring between lines is performed in the following procedure.
  Connect the terminal block (A/B) of the indoor unit connected with a remote controller to the terminal blocks (A/B) of the indoor units of other indoor units by wiring the inter-unit wire of the remote controller.
- When the power supply has been turned on, the automatic address setup starts and which indicates that address is being set up flashes on the display part.
  During setup of automatic address, the remote controller operation is not accepted.

Required time up to the finish of automatic addressing is approx. 5 minutes.

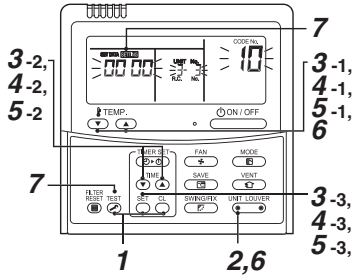
NOTE

In some cases, it is necessary to change the address manually after setup of the automatic address according to the system configuration of the group control.

Procedure example 1

Manual address setup procedure

While the operation stops, change the setup.
(Be sure to stop the operation of the unit.)



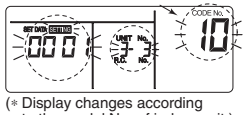
Procedure *1*

Push simultaneously SET + CL + TEST buttons for 4 seconds or more.

After a while, the display part flashes as shown below.

Check the displayed CODE No. is **[10]**.

- When the CODE No. is other than **[10]**, push TEST button to erase the display and repeat procedure from the first step. (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)
  (For a group control, No. of the firstly displayed indoor unit becomes the header unit.)



(✻ Display changes according to the model No. of indoor unit.)

Procedure *2*

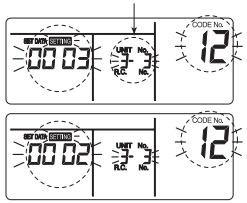
Every pushing UNIT LOUVER button, the indoor UNIT No. in the group control is displayed in order. Select the indoor unit of which setup is changed.

In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure *3*

1. Using TEMP. (▼) / (▲) buttons, specify CODE No. **[12]**. (CODE No. **[12]**: Line address)
2. Using TIME (▼) / (▲) buttons, change the line address from **[3]** to **[2]**.
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

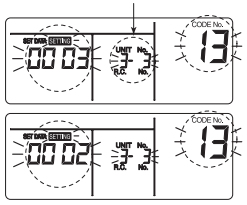
Indoor unit No. before setup change is displayed.



Procedure *4*

1. Using TEMP. (▼) / (▲) buttons, specify CODE No. **[13]**. (CODE No. **[13]**: Indoor address)
2. Using TIME (▼) / (▲) buttons, change the indoor address from **[3]** to **[2]**.
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

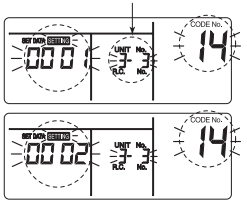
Indoor unit No. before setup change is displayed.



Procedure *5*

1. Using TEMP. (▼) / (▲) buttons, specify CODE No. **[14]**. (CODE No. **[14]**: Group address)
2. Using TIME (▼) / (▲) buttons, change the SET DATA from **[0001]** to **[0002]**. (SET DATA [Header unit: **0001**] [Follower unit: **0002**])
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

Indoor unit No. before setup change is displayed.



Procedure *6*

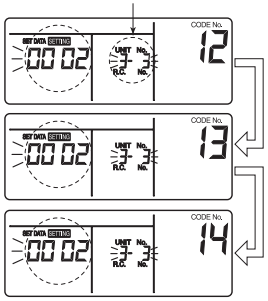
If there is other indoor unit to be changed, repeat **procedure *2*** to ***5*** to change the setup.

When the above setup has finished, push UNIT LOUVER to select the indoor UNIT No. before change of setup, specify CODE No. **[12]**, **[13]**, **[14]** in order with TEMP. ▼ / ▲ buttons, and then check the changed contents.

Address change check Before change:
[3-3-1] → After change: **[2-2-2]**

Pushing CL button clears the contents of which setup was changed. (In this case, **procedure** from ***2*** is repeated.)

Indoor unit No. before setup change is displayed.



Procedure *7*

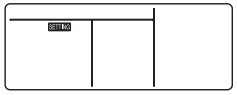
After check of the changed contents, push TEST button. (Setup is determined.)

When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

* If the operation from the remote controller is not accepted even 1 minute or more passed after pushing TEST button, it is considered that the address setup is incorrect.

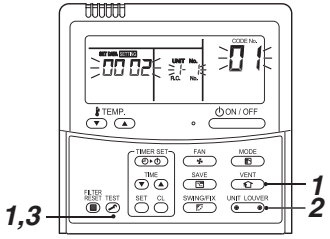
  In this case, the automatic address must be again set up.

  Therefore repeat procedure of the setup change from the **Procedure *1***.



To recognize the position of the corresponding indoor unit though the indoor UNIT No. is known

Check the position during operation stop.
(Be sure to stop operation of the set.)



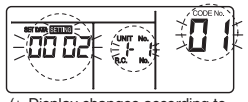
Procedure *1*

Push simultaneously TEST + VENT buttons for 4 seconds or more. After a while, the display part flashes and the display appears as shown below.

In this time, the position can be checked because fan of the indoor unit operate.

- For the group control, the indoor UNIT No. is displayed as [ALL] and fans of all the indoor units in the group control operate.

  Check the displayed CODE No. is **[01]**.
- When the CODE No. is other than **[01]**, push TEST button to erase the display and repeat procedure from the first step. (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)



(* Display changes according to the model No. of indoor unit.)

Procedure *2*

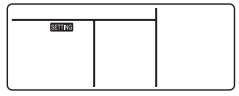
In the group control, every pushing UNIT LOUVER button, the indoor UNIT No. in the group control is displayed in order.

In this time, the position of the indoor unit can be confirmed because only fan of the selected indoor unit operate.
(For a group control, No. of the firstly displayed indoor unit becomes the header unit.)

Procedure *3*

After confirmation, push TEST button to return the mode to the usual mode.

When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)



■ 8°C Operation

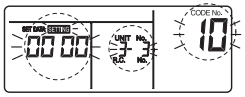
Pre-heating operation can be set for cold regions where room temperature drops to below zero.

Procedure *1*

Push simultaneously SET + CL + TEST buttons for 4 seconds or more when the air conditioner is not working.

After a while, the display part flashes as shown below.
Check the Displayed CODE No. is **[10]**.

- When the CODE No. is other than **[10]**, push TEST button to erase the display and repeat procedure from the first step. (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)



(* Display changes according to the model No. of indoor unit.)

Procedure *2*

Every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order.

Select the indoor unit of which setup is changed.

In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure *3*

Using TEMP. ▼ / ▲ buttons, specify CODE No. **[d1]**.

Procedure *4*

Using TIME ▼ / ▲ buttons, select SET DATA **[0001]**.

SET DATA	8°C Operation setting
0000	None (Factory default)
0001	8°C Operation setting

Procedure *5*

Push SET button.

In this time, the setup finishes when the display changes from flashing to lighting.

Procedure *6*

Push TEST button. (Setup is determined.)

When pushing TEST button, the display disappears and the status

Becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

10 TEST RUN

■ Before test run

- Before turning on the power supply, carry out the following procedure.
  1) Using 500V-megger, check that resistance of 1MΩ or more exists between the terminal block 1 to 3 and the earth (grounding).
     If resistance of less than 1MΩ is detected, do not run the unit.
  2) Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.

■ Execute a test run

Using the wired remote controller, operate the unit as usual.

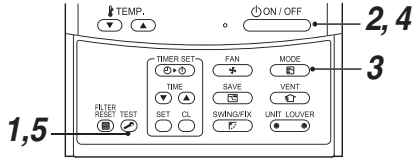
For the procedure of the operation, refer to the attached Owner's Manual.

A forced test run can be executed in the following procedure even if the operation stops by thermostat-OFF.

In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

⚠ CAUTION

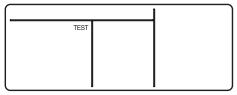
- Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.



Procedure *1*

Keep (TEST) button pushed for 4 seconds or more.

[TEST] is displayed on the display part and the selection of mode in the test mode is permitted.



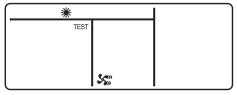
Procedure *2*

Push (ON / OFF) button.

Procedure *3*

Using (MODE) button, select the operation mode, [Cool] or [Heat].

- Do not run the air conditioner in a mode other than [Cool] or [Heat].
- The temperature controlling function does not work during test run.
- The detection of error is performed as usual.

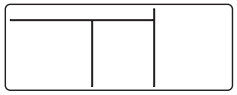


Procedure *4*

After the test run, push (ON / OFF) button to stop a test run. (Display part is same as procedure 1.)

Procedure *5*

Push (TEST) check button to cancel (release from) the test run mode. ([TEST] disappears on the display and the status returns to a normal.)



11 MAINTENANCE

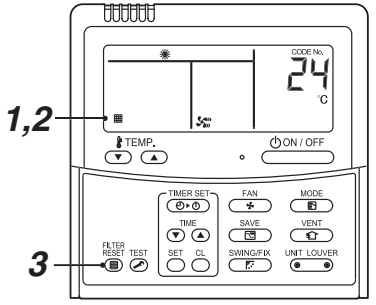
⚠ CAUTION

When connecting a return air duct to the unit, the cleaning method of the air filter differs according to the construction of duct end. Ask a qualified installer or qualified service person.

<Daily maintenance>

Cleaning of air filter

1. If ▦ is displayed on the remote controller, contact to qualified installer or qualified service person.
2. Take out the air filter.
   - Push the extrusion of the air filter to inside and pull out it to take out the air filter.
3. Cleaning with water or vacuum cleaner
   - If dirt is heavy, clean the air filter by tepid water with neutral detergent or water.
   - After cleaning with water, dry the air filter sufficiently in a shade place.
4. Mount the air filter.
5. After cleaning, push (FILTER RESET).
   ▦ display disappears.



⚠ CAUTION

- Do not start the air conditioner while leaving air filter removed.
- Push the filter reset button. (▦ indication will be turn off.)

PERIODIC MAINTENANCE

- For environmental conservation, it is strongly recommended that the indoor and outdoor units of the air conditioner in use be cleaned and maintained regularly to ensure efficient operation of the air conditioner.
  When the air conditioner is operated for a long time, periodic maintenance (once a year) is recommended.
  Furthermore, regularly check the outdoor unit for rust and scratches, and remove them or apply rustproof treatment, if necessary.
  As a general rule, when an indoor unit is operated for 8 hours or more daily, clean the indoor unit and outdoor unit at least once every 3 months. Ask a professional for this cleaning/maintenance work.
  Such maintenance can extend the life of the product though it involves the owner's expense.
  Failure to clean the indoor and outdoor units regularly will result in poor performance, freezing, water leakage, and even compressor failure.
- When a drain pump kit (sold separately) is installed.
  If it is used in a place full of dust or oil mist, the pump will be clogged and proper drainage is disabled.
  Clean the drain pump periodically. For how to clean the drain pump, contact the dealer.

Maintenance List

Part	Unit	Check (visual/auditory)	Maintenance
Heat exchanger	Indoor/outdoor	• Dust/dirt clogging, scratches	• Wash the heat exchanger when it is clogged.
Fan motor	Indoor/outdoor	• Sound	• Take appropriate measures when abnormal sound is generated.
Filter	Indoor	• Dust/dirt, breakage	• Wash the filter with water when it is contaminated. • Replace it when it is damaged.
Fan	Indoor	• Vibration, balance • Dust/dirt, appearance	• Replace the fan when vibration or balance is terrible. • Brush or wash the fan when it is contaminated.
Air inlet/outlet grilles	Indoor/outdoor	• Dust/dirt, scratches	• Fix or replace them when they are deformed or damaged.
Drain pan	Indoor	• Dust/dirt clogging, drain contamination	• Clean the drain pan and check the downward slope for smooth drainage.
Ornamental panel, louvres	Indoor	• Dust/dirt, scratches	• Wash them when they are contaminated or apply repair coating.
Exterior	Outdoor	• Rust, peeling of insulator • Peeling/lift of coat	• Apply repair coating.

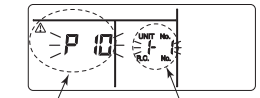
12 TROUBLESHOOTING

■ Confirmation and check

When an error occurred in the air conditioner, an error code and indoor UNIT No. appear on the display part of the remote controller.

The error code is only displayed during the operation.

If the display disappears, operate the air conditioner according to the following “Confirmation of error log” for confirmation.

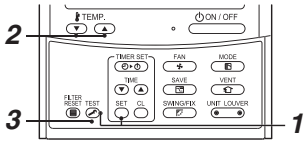


Error code Indoor UNIT No. in which an error occurred

■ Confirmation of error log

When an error occurred on the air conditioner, the error log can be confirmed with the following procedure.
(The error history is stored in memory up to 4 errors.)

The log can be confirmed from both operating status and stop status.

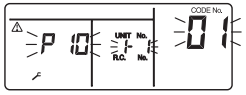


Procedure *1*

When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears.

If 🔧 is displayed, the mode enters in the error log mode.

- [**01**: Order of error log] is displayed in CODE No..
- [Error code] is displayed in CHECK.
- [Indoor unit address in which an error occurred] is displayed in Unit No..



Procedure *2*

Every pushing of TEMP. button used to set temperature, the error log stored in memory is displayed in order.

The numbers in CODE No. indicate CODE No. **[01]** (latest) → **[04]** (oldest).

REQUIREMENT

Do not push CL button because all the error log of the indoor unit will be deleted.

Procedure *3*

After confirmation, push TEST button to return to the usual display.

■ Error codes and parts to be checked

Wired remote controller display	Main defective parts	Judging device	Parts to be checked / error description	Air conditioner status
Indication				
E01	No header remote controller	Remote controller	Incorrect remote controller setting – The header remote controller has not been set (including two remote controllers).	*
	Remote controller communication error		No signal can be received from the indoor unit.	
E02	Remote controller transmission error	Remote controller	System interconnecting wires, indoor P.C. board, remote controller – No signal can be sent to the indoor unit.	*
E03	Indoor unit-remote controller regular communication error	Indoor	Remote controller, network adapter, indoor P.C. board – No data is received from the remote controller or network adapter.	Auto-reset
E04	Indoor unit-outdoor unit serial communication error	Indoor	System interconnecting wires, indoor P.C. board, outdoor P.C. board. – Serial communication error between indoor unit and outdoor unit	Auto-reset
	IPDU-CDB communication error			
E08	Duplicated indoor addresses ★	Indoor	Indoor address setting error – The same address as the self-address was detected.	Auto-reset
E09	Duplicated header remote controllers	Remote controller	Remote controller address setting error – Two remote controllers are set as header in the double-remote controller control.	*
			(* The header indoor unit stops raising alarm and follower indoor units continue to operate.)	
E10	CPU-CPU communication error	Indoor	Indoor P.C. board – Communication error between main MCU and motor microcomputer MCU	Auto-reset
E18	Header indoor unit-indoor follower unit regular communication error	Indoor	Indoor P.C. board – Regular communication is not possible between header and follower indoor units or between twin header (main) and follower (sub) units.	Auto-reset
E31	IPDU communication error	Outdoor	Communication error between IPDU and CDB	Entire stop
F01	Indoor unit heat exchanger sensor (TCJ) error	Indoor	Heat exchanger sensor (TCJ), indoor P.C. board – Open-circuit or short-circuit of the heat exchanger sensor (TCJ) was detected.	Auto-reset
F02	Indoor unit heat exchanger sensor (TC) error	Indoor	Heat exchanger sensor (TC), indoor P.C. board – Open-circuit or short-circuit of the heat exchanger sensor (TC) was detected.	Auto-reset
F04	Outdoor unit discharge temp. sensor (TD) error	Outdoor	Outdoor temp. sensor (TD), outdoor P.C. board – Open-circuit or short-circuit of the discharge temp. sensor was detected.	Entire stop
F06	Outdoor unit temp. sensor (TE/TS) error	Outdoor	Outdoor temp. sensors (TE/TS), outdoor P.C. board – Open-circuit or short-circuit of the heat exchanger temp. sensor was detected.	Entire stop
F07	TL sensor error	Outdoor	TL sensor may be displaced, disconnected or short-circuited.	Entire stop
F08	Outdoor unit outside air temp. sensor error	Outdoor	Outdoor temp. sensor (TO), outdoor P.C. board – Open-circuit or short-circuit of the outdoor air temp. sensor was detected.	Operation continued
F10	Indoor unit room temp. sensor (TA) error	Indoor	Room temp. sensor (TA), indoor P.C. board – Open-circuit or short-circuit of the room temp. sensor (TA) was detected.	Auto-reset
F12	TS (1) sensor error	Outdoor	TS (1) sensor may be displaced, disconnected or short-circuited.	Entire stop
F13	Heat sink sensor error	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
F15	Temp. sensor connection error	Outdoor	Temp. sensor (TE/TS) may be connected incorrectly.	Entire stop
F29	Indoor unit, other P.C. board error	Indoor	Indoor P.C. board – EEPROM error	Auto-reset
F31	Outdoor unit P.C. board	Outdoor	Outdoor P.C. board – In the case of EEPROM error.	Entire stop
H01	Outdoor unit compressor breakdown	Outdoor	Current detect circuit, power voltage – Minimum frequency was reached in the current releasing control or short-circuit current (Idc) after direct excitation was detected	Entire stop
H02	Outdoor unit compressor lock	Outdoor	Compressor circuit – Compressor lock was detected.	Entire stop
H03	Outdoor unit current detect circuit error	Outdoor	Current detect circuit, outdoor unit P.C. board – Abnormal current was detected in AC-CT or a phase loss was detected.	Entire stop
H04	Case thermostat operation (1)	Outdoor	Malfunction of the case thermostat.	Entire stop
H06	Outdoor unit low-pressure system error	Outdoor	Current, high-pressure switch circuit, outdoor P.C. board – Ps pressure sensor error was detected or low-pressure protective operation was activated.	Entire stop

Wired remote controller display	Main defective parts	Judging device	Parts to be checked / error description	Air conditioner status
Indication				
L03	Duplicated header indoor units ★	Indoor	Indoor address setting error – There are two or more header units in the group.	Entire stop
L07	Group line in individual indoor unit ★	Indoor	Indoor address setting error – There is at least one group-connected indoor unit among individual indoor units.	Entire stop
L08	Indoor group address not set ★	Indoor	Indoor address setting error – Indoor address group has not been set.	Entire stop
L09	Indoor power level not set	Indoor	Indoor power level has not been set.	Entire stop
L10	Outdoor unit P.C. board	Outdoor	In the case of outdoor P.C. board jumper wire (for service) setting error.	Entire stop
L20	LAN communication error	Network adapter central control	Address setting, central control remote controller, network adapter – Duplication of address in central control communication.	Auto-reset
L29	Other outdoor unit error	Outdoor	Other outdoor unit error Entire stop 1) Communication error between IPDU MCU and CDB MCU 2) Abnormal temperature was detected by the heat sink temp. sensor in IGBT.	Entire stop
L30	Abnormal external input into indoor unit (interlock)	Indoor	External devices, outdoor unit P.C. board – Abnormal stop due to incorrect external input into CN80	Entire stop
L31	Phase sequence error, etc.	Outdoor	Power supply phase sequence, outdoor unit P.C. board – Abnormal phase sequence of the 3-phase power supply	Operation continued (thermostat OFF)
P01	Indoor unit fan error	Indoor	Indoor fan motor, indoor P.C. board – Indoor AC fan error (fan motor thermal relay activated) was detected.	Entire stop
P03	Outdoor unit discharge temp. error	Outdoor	An error was detected in the discharge temp. releasing control.	Entire stop
P04	Outdoor unit high-pressure system error	Outdoor	High-pressure switch – The IOL was activated or an error was detected in the high-pressure releasing control using the TE.	Entire stop
P05	Open phase detected	Outdoor	The power supply wire may be connected incorrectly. Check open phase and voltages of the power supply.	Entire stop
P07	Heat sink overheat	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
P10	Indoor unit water overflow detected	Indoor	Drain pipe, clogging of drainage, float switch circuit, indoor P.C. board – Drainage is out of order or the float switch was activated.	Entire stop
P15	Gas leakage detected	Outdoor	There may be gas leakage from the pipe or connecting part. Check for gas leakage.	Entire stop
P19	4-way valve error	Outdoor (Indoor)	4-way valve, indoor temp. sensors (TC/TCJ) – An error was detected due to temperature drop of the indoor unit heat exchanger sensor when heating.	Auto-reset (Auto-reset)
P20	High-pressure protective operation	Outdoor	High-pressure protection	Entire stop
P22	Outdoor unit fan error	Outdoor	Outdoor unit fan motor, outdoor unit P.C. board – An error (overcurrent, locking, etc.) was detected in the outdoor unit fan drive circuit.	Entire stop
P26	Outdoor unit inverter Idc activated	Outdoor	IGBT, outdoor unit P.C. board, inverter wiring, compressor – Short-circuit protection for compressor drive circuit devices (G-Tr/IGBT) was activated.	Entire stop
P29	Outdoor unit position error	Outdoor	Outdoor unit P.C. board, high-pressure switch – Compressor motor position error was detected.	Entire stop
P31	Other indoor unit error	Indoor	Another indoor unit in the group is raising an alarm.	Entire stop
			E03/L07/L03/L08 alarm check locations and error description	Auto-reset

★ : The air conditioner automatically enters the auto-address setting mode.

13. DETACHMENTS

13-1. Indoor Unit

REQUIREMENT

- At the service replacing time of the heat exchanger, the following tools are necessary. Prepare them before the service work.

- Necessary tools: Plus screwdriver, monkey wrench, spanner, etc

⚠ CAUTION

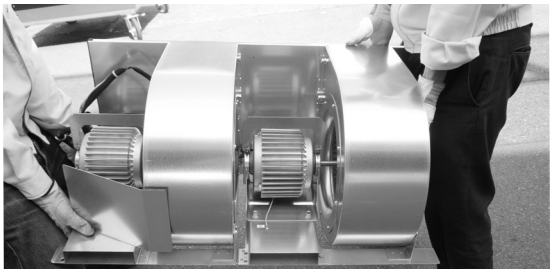
- Be sure to place the heat exchanger at safe and flat place and then start the work.
- Necessarily put gloves when starting the work. Working with the naked hands may cause injury on the hands.

NOTE

"Each fan motor weights approx. 8 kg. An air blower assembly with 1 fan weights approx. 20 kg and with 2 fans weights approx. 39 kg. An air blower assembly can be derived from main unit by one person. However, the assembly must be carried by two people."

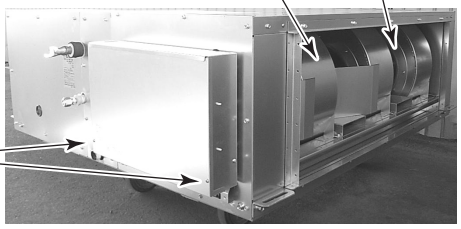
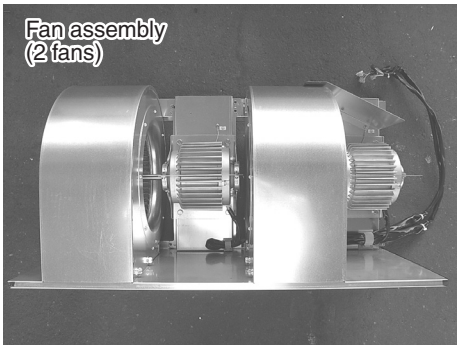
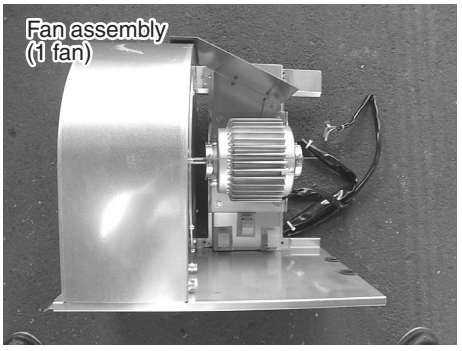
Air blower assembly (1 fan type)

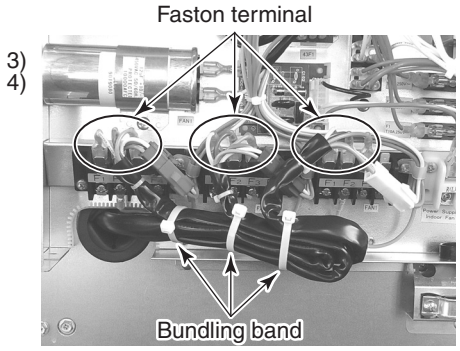
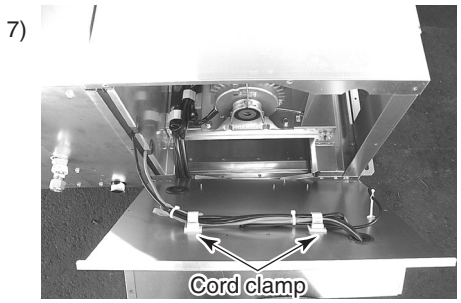
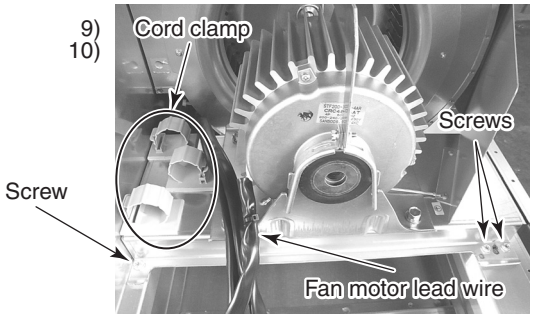
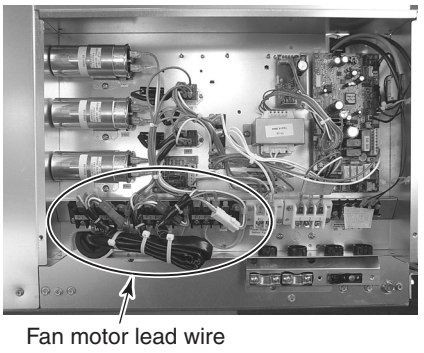
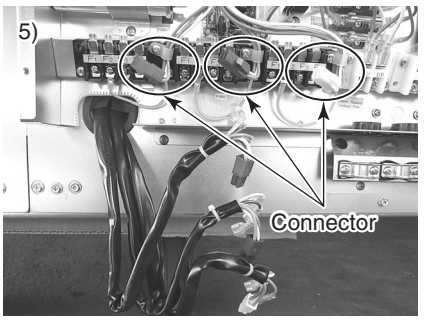
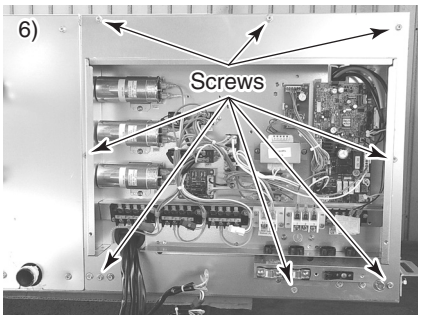
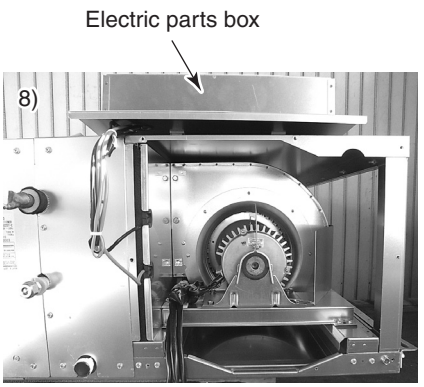
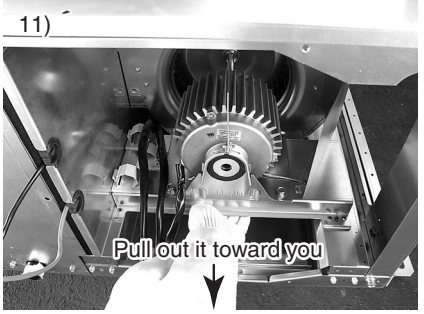
Air blower assembly (2 fans type)

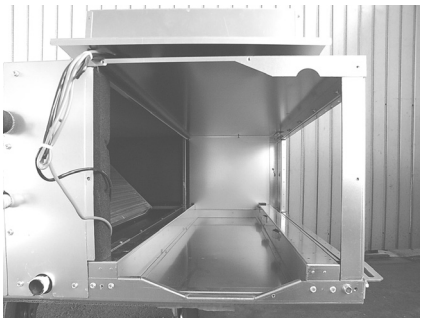
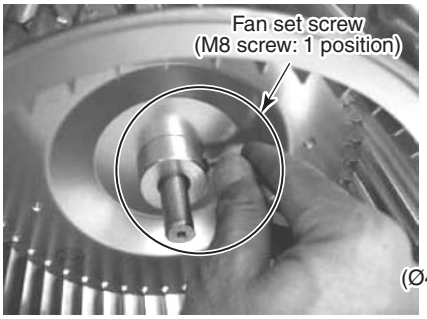
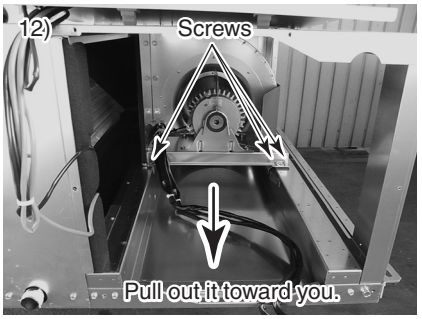
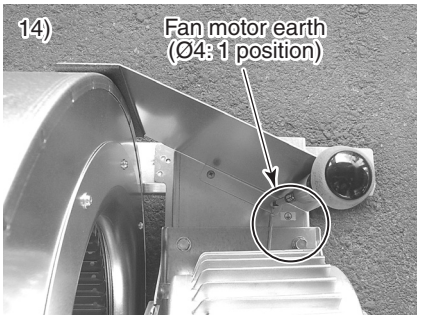
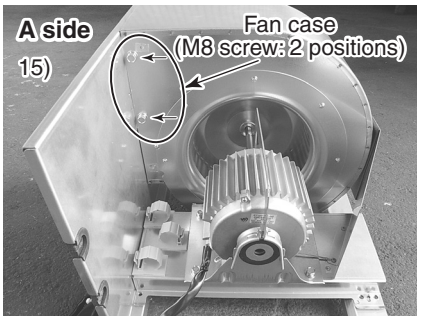
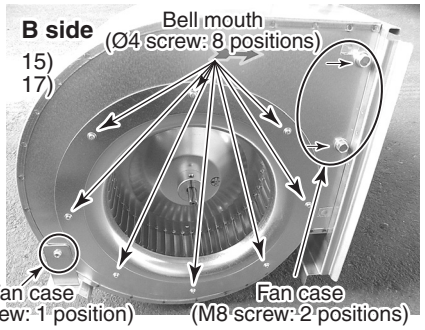
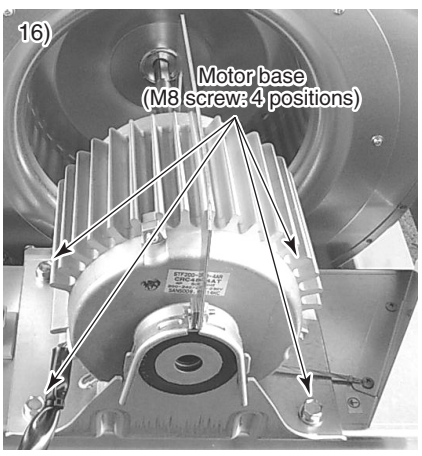


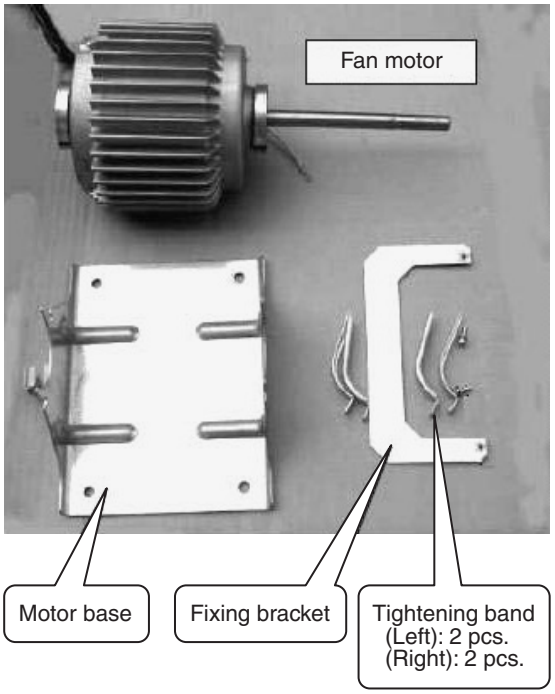
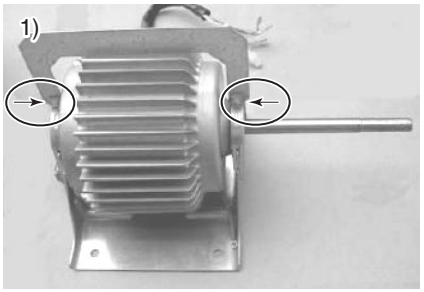
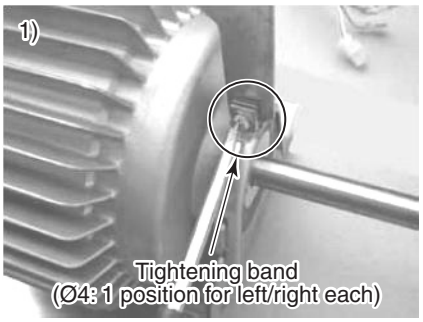
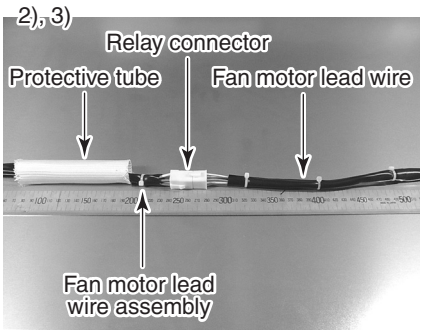
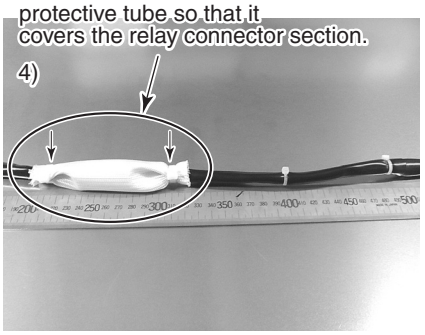
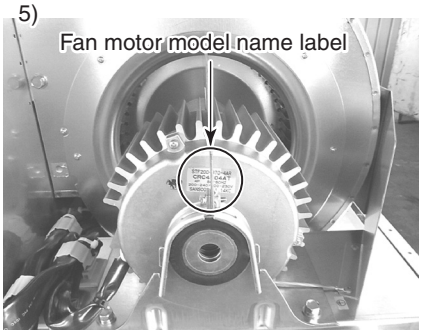
13-2. How to replace the parts

■ Fan assembly and replacement

No.	Part name	Work procedure	Remarks
1	Fan assembly	**<Fan assembly>** • SM224 type fan has the same construction with SM280 type for assembling. • Fan assembly is configured with assembly of 1 fan and assembly of 2 fans.	Appearance Fan assembly (1 fan) Fan assembly (2 fans) 1), 2)  Electric parts box cover (Ø4 screw: 2 positions)  Fan assembly (2 fans)  Fan assembly (1 fan)

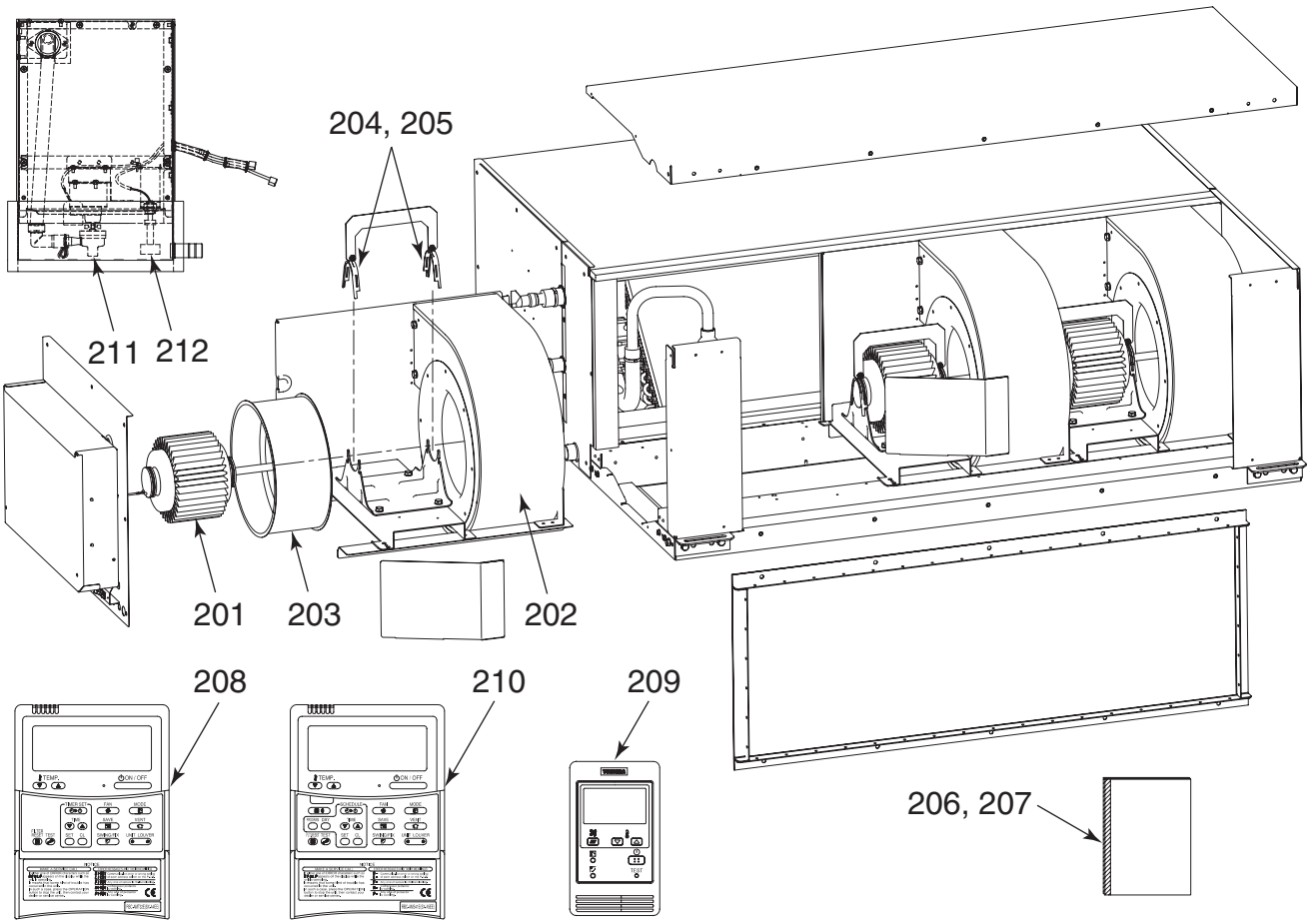
No.	Part name	Work procedure	Remarks
1	Fan assembly (Continued)	**<Fan/Fan case>** 1) Take off screws (2 positions) of the electric parts box cover. 2) Remove the electric parts box cover. 3) Cut the bundling band (3 positions) which binds the fan motor lead wires. 4) Remove yellow (F1), blue (F2) and orange (F3) Faston terminals of the fan motor lead wires. 5) Remove FAN1 (White), FAN2 (Blue) and FAN3 (Red) connectors of the fan motor.  6) Take off screws (Arrow mark indicating position) of the cabinet. (M5 screw: 8 positions) 7) Remove the temperature sensor lead wire from the cord clamp at the rear side of the cabinet. 8) Put the removed electric parts box on the product. 9) Remove lead wires of the fan motor from the cord clamp in the fan assembly. 10) Take off screws (Arrow mark indicating position) of the fan assembly. (M5 screw: 3 positions) 11) Pull out the fan assembly (a fan) toward you.  	    

No.	Part name	Work procedure	Remarks
1	Fan assembly (Continued)	12) Take off screws (Arrow mark indicating position) of the fan assembly. (M5 screw × 3 positions) 13) Pull out the fan assembly (two fans) toward you. ∗ Status when all the fan assemblies are pulled out ∗  14) Take off earth screw (Arrow mark indicating position) of the fan motor. (Ø4 screw × 1 position) 15) Take off screws (Arrow mark indicating position) which mount the fan case. (A side: M8 screw × 2 positions) (B side: M8 screw × 2 positions) (B side: Ø4 screw × 1 position) 16) Take off screws (Arrow mark indicating position) which mount the motor base. (M8 screw × 4 positions) 17) Remove the bell mouth. (Ø4 screw × 8 positions) 18) Loosen the set screw of the fan. (M8 screw × 1 position) 19) Remove the fan. 18)  19) 	    

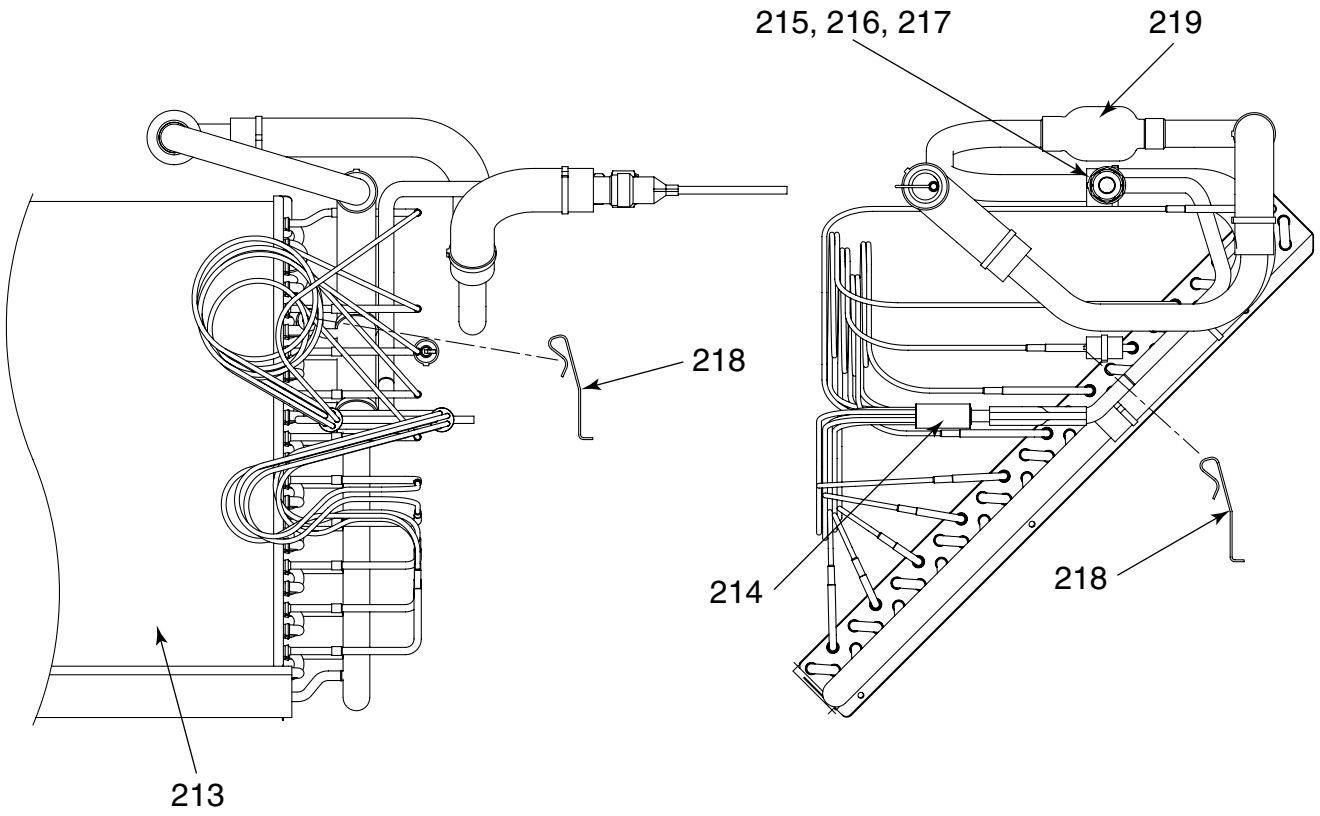
No.	Part name	Work procedure	Remarks
1	Fan assembly (Continued)	**<Fan motor>** 1) Take off screws (Arrow mark indicating position) of the tightening band and then remove the tightening band, the fixing bracket and the fan motor. 2) Cut the bundling band (2 positions) that fix the protective tube (white) on the relay connector of the fan motor. 3) Remove the fan motor lead wire assembly and the protective tube from lead wire of the fan motor. 4) Mount the fan motor lead wire assembly and the protective tube to the fan motor to be replaced, arrange the tube so that it covers the relay connector and then fix it with bundling band (2 positions). 5) Put the fan motor to be replaced on the motor base. Set the fan motor so that label of the model name is at upper side when replaced. ∗ After replacement, assemble the fan motor in reverse order so that it becomes the same status as that before replacement. Be careful there is no loosening of screws when assembling. Check also that there is no fitting of fan with fan case, no air discharge and no abnormal sound  	   Fix the both ends of the protective tube so that it covers the relay connector section.  

14. EXPLODED VIEWS AND PARTS LIST

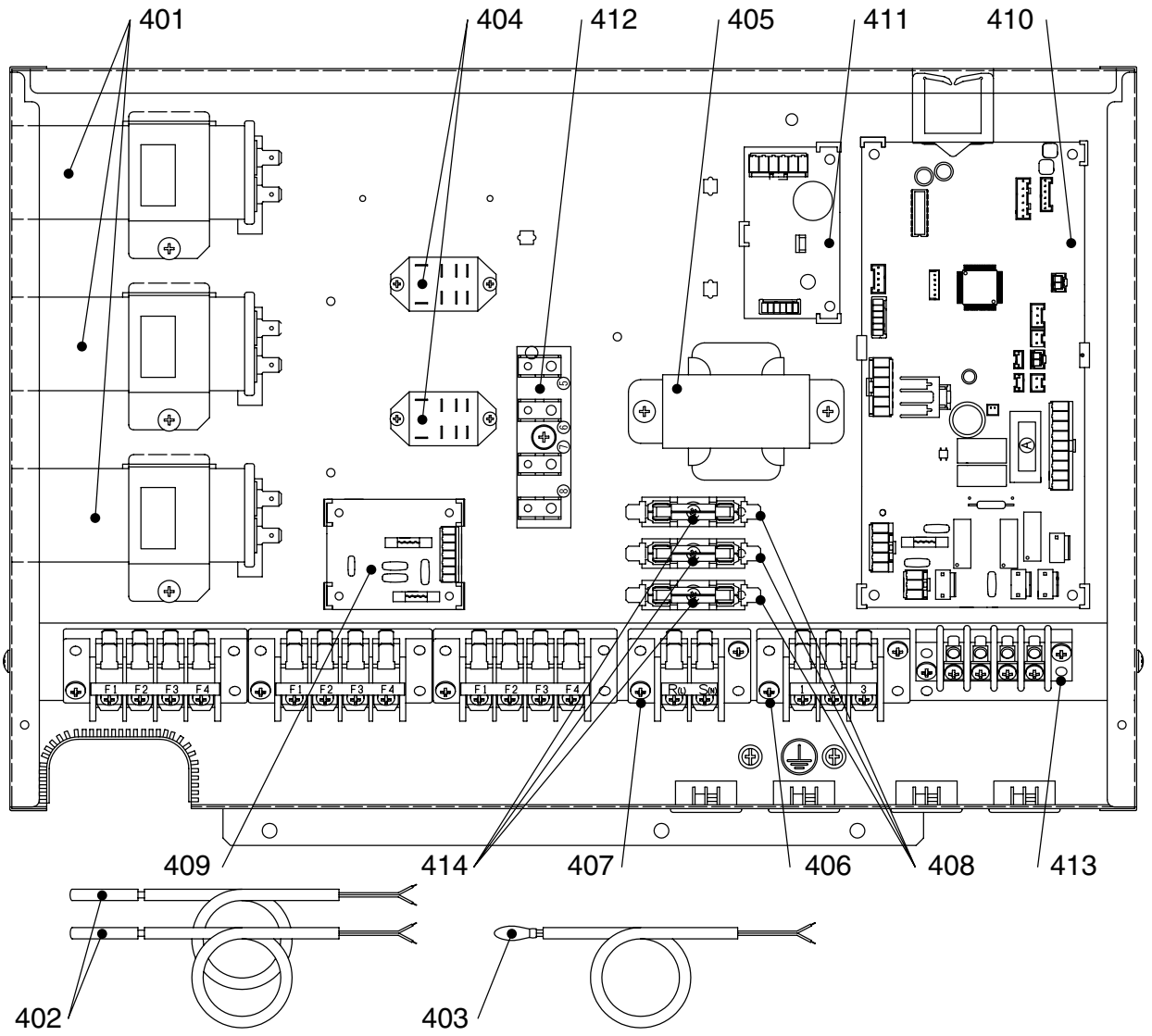
14-1. Indoor Unit



Location No.	Part No.	Description	Model Name RAV-SM			
			2242DT-E	2802DT-E	2242DT-TR	2802DT-TR
201	4312C023	Motor, Fan	3	3	3	3
202	43122106	Case, Fan	3	3	3	3
203	43120237	Fan	3	3	3	3
204	43139154	Band, Motor, Left	6	6	6	6
205	43139155	Band, Motor, Right	6	6	6	6
206	431S8155	Owner's Manual	1	1		
207	431S8156	Owner's Manual			1	1
208	43166011	Remote Controller, SX-A4EE	1	1	1	1
209	43166004	Remote Controller, SX-A11JE2	1	1	1	1
210	43166012	Remote Controller, SX-A5EE	1	1	1	1
211	43177009	Pump, Drain, PCD-4N230TF-2, 230V, 50/60Hz	1	1	1	1
212	43151300	Switch, Float, FS-0208-603	1	1	1	1



Location No.	Part No.	Description	Model Name RAV-SM			
			2242DT-E	2802DT-E	2242DT-TR	2802DT-TR
213	4314J446	Evaporator Ass'y	1	1	1	1
214	4314Q091	Distributor Ass'y	1	1	1	1
215	43047688	Nut, Flare, 1/2 IN	1	1	1	1
216	43149332	Socket	1	1	1	1
217	43147195	Bonnet, 1/2 IN	1	1	1	1
218	43019904	Holder, Sensor	2	2	2	2
219	43147726	Strainer	1	1	1	1



Location No.	Part No.	Description	Model Name RAV-SM			
			2242DT-E	2802DT-E	2242DT-TR	2802DT-TR
401	43155165	Capacitor, 12MF, 450VAC	3	3	3	3
402	43050425	Sensor Ass'y, Service, TC	2	2	2	2
403	43050426	Sensor, Service, TA	1	1	1	1
404	43154141	Relay, LY2F-L, AC230V	2	2	2	2
405	43158204	Transformer, TT-13 (AC220–240V)	1	1	1	1
406	43160565	Terminal Block, 3P, 20A, AC250V	1	1	1	1
407	43160575	Terminal Block, 2P, 20A, AC300V	1	1	1	1
408	43060859	Fuse Block, 30A, 250V	3	3	3	3
409	4316V419	P.C. Board Ass'y, MCC-1263	1	1	1	1
410	4316V418	P.C. Board Ass'y, MCC-1403	1	1	1	1
411	4316V247	P.C. Board Ass'y, MCC-1520	1	1	1	1
412	43060157	Terminal Block, 4P	1	1	1	1
413	43160582	Terminal, 4P	1	1	1	1
414	43060700	Fuse, 10A, 250V	3	3	3	3

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 R410A 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 R410A is almost non-existent.

With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.
Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners.

If a single unit of the multi 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).

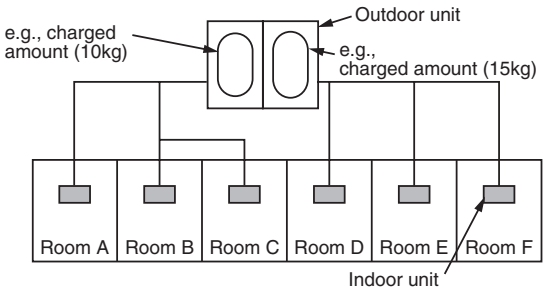
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.
The concentration is as given below.

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

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1 :

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



For the amount of charge in this example:

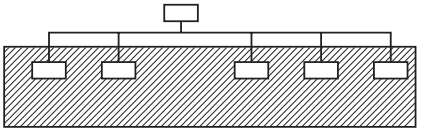
The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

Important

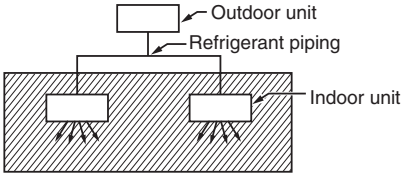
NOTE 2 :

The standards for minimum room volume are as follows.

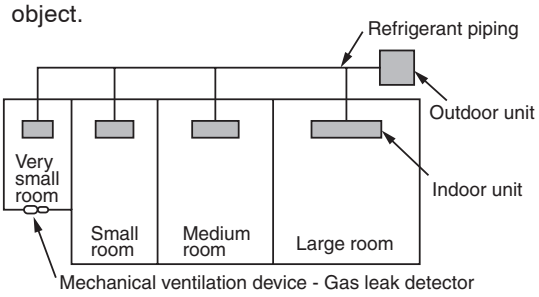
(1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

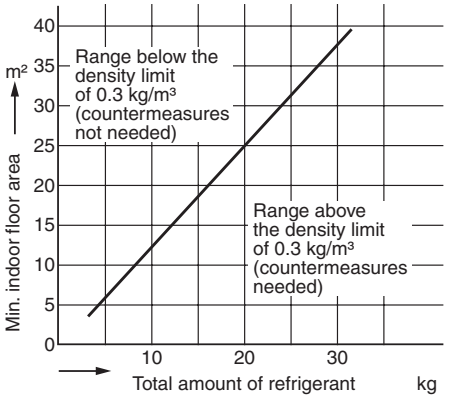


(3) If an indoor unit is installed in each partitioned room and the refrigerant piping is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :

The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7m high)



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