TOSHIBA

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SERVICE MANUAL

SUPER
SUPER HEAT RECOVERY MULTI

HFC
R410A

System air conditioner

The indoor units in the Super Heat Recovery Multi System are common to those used in the Super Modular Multi System air conditioner. Therefore refer to the service manuals A03-009, A03-010, and A03-011 separately issued.

Heat Recovery Type

Indoor Unit

4-way Air Discharge Cassette Type
MMU-AP0091H, AP0121H, AP0151H,
MMU-AP0181H, AP0241H, AP0271H,
MMU-AP0301H, AP0361H, AP0481H
MMU-AP0561H

2-way Air Discharge Cassette Type
MMU-AP0071WH, AP0091WH, AP0121WH,
MMU-AP0151WH, AP0181WH, AP0241WH,
MMU-AP0271WH, AP0301WH, AP0481WH*
*** CHINA market only**

1-way Air Discharge Cassette Type
MMU-AP0071YH, AP0091YH, AP0121YH,
MMU-AP0151SH, AP0181SH, AP0241SH,
MMU-AP0152SH, AP0182SH, AP0242SH

Concealed Duct Standard Type
MMD-AP0071BH, AP0091BH, AP0121BH, AP0151BH,
MMD-AP0181BH, AP0241BH, AP0271BH, AP0301BH,
MMD-AP0361BH, AP0481BH, AP0561BH

Concealed Duct High Static Pressure Type
MMD-AP0181H, AP0241H, AP0271H,
MMD-AP0361H, AP0481H

Slim Duct Type
MMD-AP0071SPH, AP0091SPH, AP0121SPH,
MMD-AP0151SPH, AP0181SPH

Under Ceiling Type
MMC-AP0151H, AP0181H, AP0241H,
MMC-AP0271H, AP0361H, AP0481H

High Wall Type
MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H,
MMK-AP0072H, AP0092H, AP0122H

Floor Standing Cabinet Type
MML-AP0071H, AP0091H, AP0121H,
MML-AP0151H, AP0181H, AP0241H

Floor Standing Concealed Type
MML-AP0071BH, AP0091BH, AP0121BH,
MML-AP0151BH, AP0181BH, AP0241BH

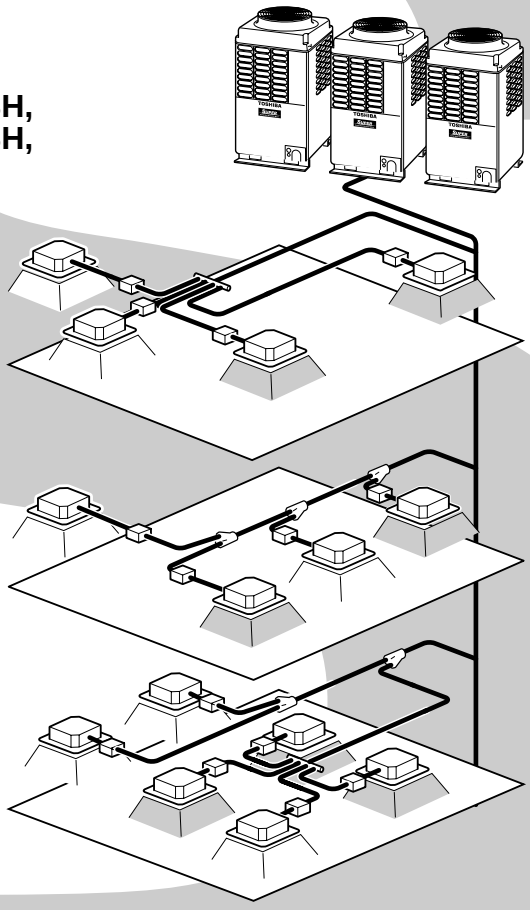
Floor Standing Type
MMF-AP0151H, AP0181H, AP0241H,AP0271H,
MMF-AP0361H, AP0481H, AP0561H

Outdoor Unit

Inverter Unit
MMY-MAP0802FT8
MMY-MAP1002FT8
MMY-MAP1202FT8

Flow Selector Unit (FS unit)

RBM-Y1122FE
RBM-Y1802FE
RBM-Y2802FE



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WARNINGS ON REFRIGERANT LEAKAGE

Check of Concentration Limit

Important

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.

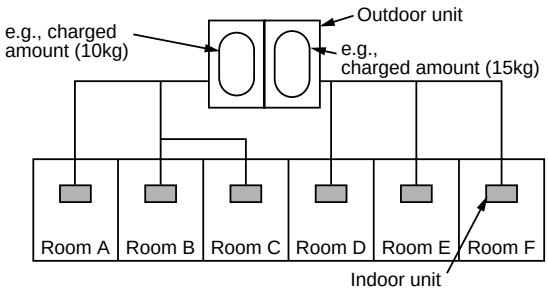
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise 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.



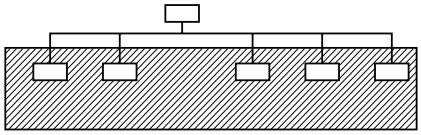
For the amount of charge in this example:

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.

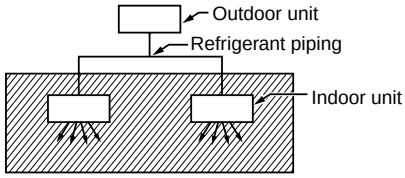
NOTE 2 :

The standards for minimum room volume are as follows.

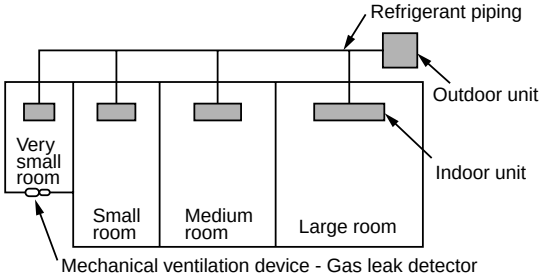
(1) No partition (shaded portion)



(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).

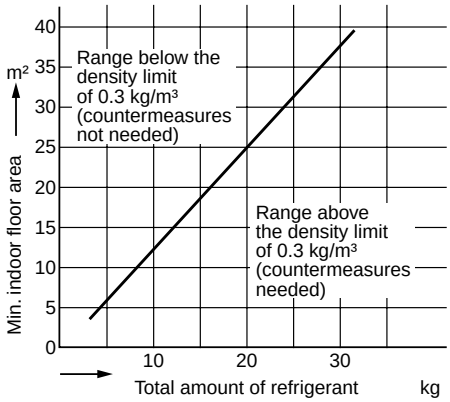


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the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

Ensure power is isolated from the unit when replacing the high performance filter or when opening the service panel.

SAFETY CAUTION

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.

[Confirmation of warning label on the main unit]

Confirm that labels are indicated on the specified positions
(Refer to the Parts disassembly diagram (Outdoor unit).)

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

⚠ DANGER	
 Turn off breaker.	**Turn "OFF" the breaker before removing the front panel and cabinet, otherwise an electric shock is caused by high voltage resulted in a death or injury.** During operation, a high voltage with 400V or higher of circuit (∗) at secondary circuit of the high-voltage transformer is applied. If touching a high voltage with the naked hands or body, an electric shock is caused even if using an electric insulator. ∗ : For details, refer to the electric wiring diagram.
 Execute discharge between terminals.	**When removing the front panel or cabinet, execute short-circuit and discharge between high-voltage capacitor terminals.** If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury. After turning off the breaker, high voltage also keeps to apply to the high-voltage capacitor.
 Prohibition	**Do not turn on the breaker under condition that the front panel and cabinet are removed.** An electric shock is caused by high voltage resulted in a death or injury.

⚠ 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.
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.	**For spare parts, use those specified (∗).** If unspecified parts are used, a fire or electric shock may be caused. ∗: For details, refer to the parts list.
Do not bring a child close to the equipment.	**Before troubleshooting or repair work, do not bring a third party (a child, etc.) except the repair engineers close to the equipment.** It causes an injury with tools or disassembled parts. Please inform the users so that the third party (a child, etc.) does not approach the equipment.
Insulating measures	**Connect the cut-off lead cables 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 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	**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 cables as before. Perform the work so that the cabinet or panel does not catch the inner cables.** If incorrect assembly or incorrect cable connection was done, a disaster such as a leak or fire is caused at user's side.

⚠ WARNING	
Insulator check	**After the work has finished, be sure to use an insulation tester set (500V mugger) 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.
Be attentive to electric shock	**When checking the circuit inevitably under condition of the power-ON, use rubber gloves and others not to touch to the charging section.** If touching to the charging section, an electric shock may be caused.
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. **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 rerair	**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.
Check after reinstallation	**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.

⚠ CAUTION	
Put on gloves	**Be sure to put on gloves (∗) during repair work.** If not putting on gloves, an injury may be caused with the parts, etc. (∗) Heavy gloves such as work gloves
Cooling check	**When the power was turned on, start to work after the equipment has been sufficiently cooled.** As temperature of the compressor pipes and others became high due to cooling/heating operation, a burn may be caused.

• 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 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 new equipment can be used with conventional refrigerant
①	Flare tool	Pipe flaring	Yes	*(Note 1)	Yes
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
③	Torque wrench	Connection 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
⑩	Charging cylinder	Refrigerant charge	(Note 2)	No	No

(Note 1) 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.

(Note 2) Charging cylinder for R410A is being currently developed.

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 (Volt meter)

5. Recharge of Refrigerant

When recharge of the refrigerant is required, charge the new refrigerant with the specified amount in the procedure as described below.

Recover the refrigerant and check there is no refrigerant in the equipment.

↓

Connect the charge hose to the packed valve service ports at gas side, liquid side, and balance side of the outdoor unit.

↓

Connect the charge hose to vacuum pump adaptor.

↓

Open the packed valves of the balance pipe fully at liquid and gas sides, and then return the valve at gas side a little to the closed side.

↓

Open fully PMV of the outdoor unit.
- Turn on power of the outdoor unit.
- Short CN30 on I/F P.C. board of the outdoor unit.
- Turn off power of the outdoor unit within 2 minutes after shorting CN30.

↓

Open fully the handle on the Low side of the gauge manifold, and then turn on the power of vacuum pump for vacuuming.

↓

When the pressure has lowered until indication of the compound gauge pointed –0.1MPa (–76cmHg), open fully the handle Low and turn off the power of vacuum pump.

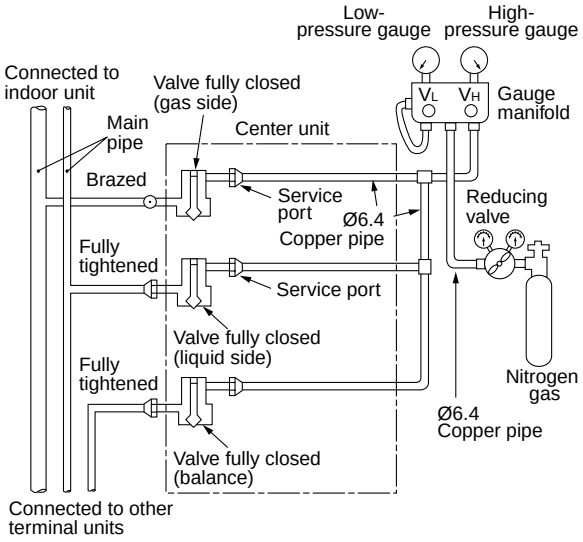
↓

Leave it as it is for 1 to 2 minutes and check the indicator of the compound gauge does not return.

↓

Set the refrigerant cylinder on the electronic balance, connect the charge hose to connecting ports of the cylinder and the electronic gauge, and then charge the liquid refrigerant from the service port at liquid side. (Shield with the gauge manifold so that refrigerant does not flow to gas side.)

(Charge the refrigerant as below.)

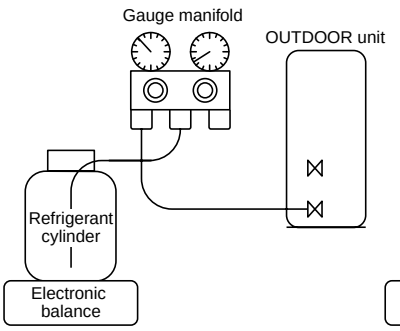


① Never charge the refrigerant over the specified amount.
② Do not charge the additional refrigerant.
If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over 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.

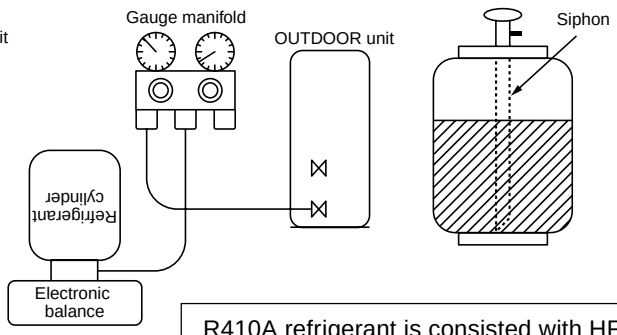
4mm-hexagonal wrench is required.

① Set the equipment so that liquid refrigerant can be charged.
② When using a cylinder with siphon pipe, liquid can be charged without inverting the cylinder.

[Cylinder with siphon]



[Cylinder without siphon]



R410A refrigerant is consisted with HFC mixed refrigerant. Therefore if the refrigerant gas is charged, the composition of the charged refrigerant changes and characteristics of the equipment changes.

6. Environmental concern

Use “Vacuum pump method” for an air purge (Discharge of air in the connecting pipe) in installation time.

- Do not discharge flon gas into the air to protect the earth environment.
- Using the vacuum pump method, clear the remaining air (Nitrogen, etc.) in the unit. If the air remains, the pressure in the refrigerating cycle becomes abnormally high and an injury could occur through failure of the product.

1. OUTLINE

"Super Heat Recovery Multi System" is a multi air conditioning system which enables each indoor unit in a refrigerant line to independently select cooling or heating operation.
As it is able to operate simultaneously in cooling and heating modes, further heat recovery becomes possible. This system is most suitable for a building etc. where cool and hot air are mixed, such as a building where there are large temperature differences between rooms, caused by the influence of daylight or where used in a server room and permanent cooling is required.

Heating and cooling operation are automatically selected in individual unit;
You can save time for operation.

For example, when heating is required for early morning and cooling for daytime, a Flow Selector Unit provides automatically a smooth selection of heating or cooling operation.

Therefore you can obtain a comfortable room environment without feeling somewhat out of place and moreover you can save time to select heat/cool operation.

INFORMATION

The Super Heat Recovery Multi system is different from that of the conventional Multi air conditioner in several ways such as the heating and cooling operations are mixed and only a part of the air conditioning system operates in cooling function.

For this reason, the following table explains the operation modes of this air conditioner.

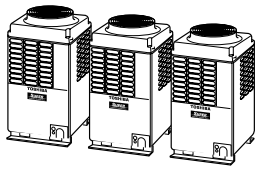
The following table explains the representation of the operation modes within this Manual.

Operation mode

Operation mode	Outline
1. All Cooling	All indoor units are under cooling operation only. Outdoor heat exchanger (Main heat exchanger) is used as condenser.
2. All Heating	All indoor units are under heating operation only. Outdoor heat exchanger (Main heat exchanger) is used as evaporator.
3. Simultaneous operation	MIU for simultaneous operation
3-1. Mainly cooling, partly heating operation	Indoor units are under heating/cooling simultaneous operation with subjective cooling operation Outdoor heat exchanger (Sub heat exchanger) is used as condenser.
3-2. Mainly heating, partly cooling operation	Indoor units are under heating/cooling simultaneous operation with subjective heating operation Outdoor heat exchanger (Main heat exchanger) is used as evaporator.
4. Defrost	Using the reversing operation of the 4-way valve, ice on the outdoor heat exchanger is dissolved within single cooling cycle.

1-1. Component Multi Using High-efficiency Refrigerant R410A

1. Outdoor units

Corresponding HP		Inverter unit			Appearance
		8 HP	10 HP	12 HP	
Model name	Heat pump MMY-	MAP0802FT8	MAP1002FT8	MAP1202FT8	
Cooling capacity (kW)		22.4	28.0	33.5	
Heating capacity (kW)		25.0	31.5	37.5	
No. of connectable indoor units		13	16	20	

2. Combination of outdoor units

Corresponding HP	16 HP	18 HP	20 HP	24 HP	26 HP	28 HP	30 HP
Combined Model MMY-	AP1602FT8	AP1802FT8	AP2002FT8	AP2402FT8	AP2602FT8	AP2802FT8	AP3002FT8
Cooling capacity (kW)	45.0	50.4	56.0	68.0	73.0	78.5	84.0
Heating capacity (kW)	50.0	56.5	63.0	76.5	81.5	88.0	95.0
Combined outdoor units	8 HP	10 HP	10 HP	8 HP	10 HP	10 HP	10 HP
	8 HP	8 HP	10 HP	8 HP	8 HP	10 HP	10 HP
	—	—	—	8 HP	8 HP	8 HP	10 HP
No. of connectable indoor units	27	30	33	40	43	47	48

3. Branching joints and headers

	Model name	Usage		Appearance
Y-shape branching joint (∗3)	RBM-BY53FE	Indoor unit capacity code (∗1) Total below 6.4	For 3 piping	
	RBM-BY103FE	Indoor unit capacity code (∗1) Total below 14.2	For 3 piping	
	RBM-BY53E	Indoor unit capacity code (∗1) Total below 6.4	For 2 piping (∗5)	
	RBM-BY103E	Indoor unit capacity code (∗1) Total below 14.2	For 2 piping (∗5)	
	RBM-BY203FE	Indoor unit capacity code (∗1) Total below 25.2	For 3 piping	
	RBM-BY303FE	Indoor unit capacity code (∗1) Total below 25.2	For 3 piping	
	RBM-BY203E	Indoor unit capacity code (∗1) Total below 25.2	For 2 piping (∗5)	
	RBM-BY303E	Indoor unit capacity code (∗1) Total below 25.2	For 2 piping (∗5)	
4-branching header (∗4)	RBM-1043FE	Indoor unit capacity code (∗1) Total below 14.2	For 3 piping	
	RBM-2043FE	Indoor unit capacity code (∗1) Total below 25.2	For 3 piping	
	RBM-1043E	Indoor unit capacity code (∗1) Total below 14.2	For 2 piping (∗5)	
	RBM-2043E	Indoor unit capacity code (∗1) Total below 25.2	For 2 piping (∗5)	
8-branching header (∗4)	RBM-1083FE	Indoor unit capacity code (∗1) Total below 14.2	For 3 piping	
	RBM-2083FE	Indoor unit capacity code (∗1) Total below 25.2	For 3 piping	
	RBM-1083E	Indoor unit capacity code (∗1) Total below 14.2	For 2 piping (∗5)	
	RBM-2083E	Indoor unit capacity code (∗1) Total below 25.2	For 2 piping (∗5)	
T-branch joint	BT13-FE	The following 3 types of T joint pipes are supplied as 1 set. • Balance pipe (Ø9.5) × 1 • Liquid side (Corresponded dia. Ø12.7 to Ø19.1) × 1 • Suction gas side (Corresponded dia. Ø22.2 to Ø34.9) × 1 • Discharge gas side (Corresponded dia. Ø19.1 to Ø22.2) × 1		

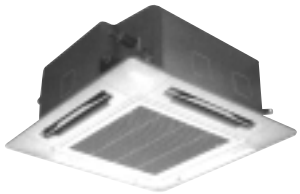
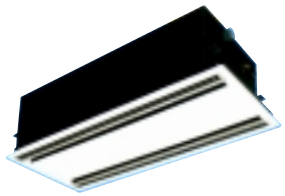
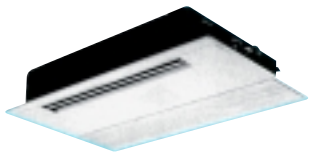
∗1 “Capacity code” can be obtained from page 11, 12. (Capacity code is not actual capacity)
∗2 If the total capacity code value of indoor unit exceeds that of the outdoor unit, apply capacity code of the outdoor unit.
∗3 When using a Y-shape branching joint for 1st branching, select according to the capacity code of the outdoor unit.
∗4 Max. 6.0 capacity code in total can be connected.
∗5 This is used for branching to “cooling only” indoor unit.
∗6 Model names for outdoor described in this guide are shortened because of the space constraint.

4. Flow selector units (FS unit)

Model name	Usage	Appearance
RBM-Y1121FE	Capacity rank for indoor unit : Type 007 to 030	
RBM-Y1801FE	Capacity rank for indoor unit : Type 036 to 056	
RBM-Y2802FE	Capacity rank for indoor unit : Type 018 to 096	

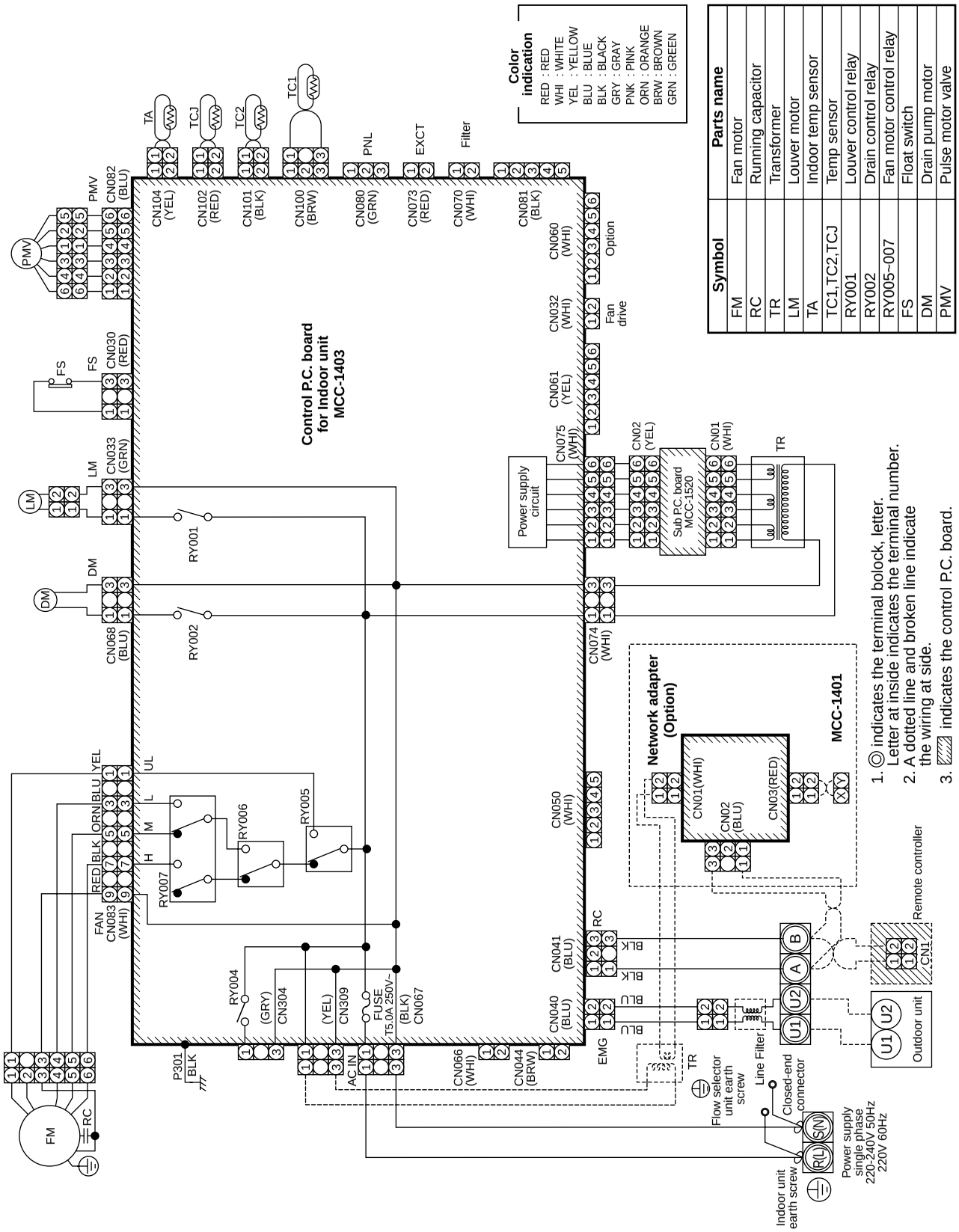
* Accessory part (Sold separately): Connection cable kit (RBC-CBK15FE), up to 15m.

5. Indoor units

Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
4-way Air Discharge Cassette Type		**MMU-AP0091H**	009 type	1	2.8	3.2
		MMU-AP0121H	012 type	1.25	3.6	4.0
		MMU-AP0151H,	015 type	1.7	4.5	5.0
		MMU-AP0181H	018 type	2	5.6	6.3
		MMU-AP0241H	024 type	2.5	7.1	8.0
		MMU-AP0271H	027 type	3	8.0	9.0
		MMU-AP0301H	030 type	3.2	9.0	10.0
		MMU-AP0361H	036 type	4	11.2	12.5
		MMU-AP0481H	048 type	5	14.0	16.0
		MMU-AP0561H	056 type	6	16.0	18.0
2-way Air Discharge Cassette Type		**MMU-AP0071WH**	007 type	0.8	2.2	2.5
		MMU-AP0091WH	009 type	1	2.8	3.2
		MMU-AP0121WH	012 type	1.25	3.6	4.0
		MMU-AP0151WH	015 type	1.7	4.5	5.0
		MMU-AP0181WH	018 type	2	5.6	6.3
		MMU-AP0241WH	024 type	2.5	7.1	8.0
		MMU-AP0271WH	027 type	3	8.0	9.0
		MMU-AP0301WH	030 type	3.2	9.0	10.0
		MMU-AP0481WH (CHINA only)	048 type	5	14.0	16.0
1-way Air Discharge Cassette Type		**MMU-AP0071YH**	007 type	0.8	2.2	2.5
		MMU-AP0091YH	009 type	1	2.8	3.2
		MMU-AP0121YH	012 type	1.25	3.6	4.0
		MMU-AP0151SH	015 type	1.7	4.5	5.0
		MMU-AP0181SH	018 type	2	5.6	6.3
		MMU-AP0241SH	024 type	2.5	7.1	8.0
		MMU-AP0152SH	015 type	1.7	4.5	5.0
		MMU-AP0182SH	018 type	2	5.6	6.3
		MMU-AP0242SH	024 type	2.5	7.1	8.0
Concealed Duct Standard Type		**MMD-AP0071BH**	007 type	0.8	2.2	2.5
		MMD-AP0091BH	009 type	1	2.8	3.2
		MMD-AP0121BH	012 type	1.25	3.6	4.0
		MMD-AP0151BH	015 type	1.7	4.5	5.0
		MMD-AP0181BH	018 type	2	5.6	6.3
		MMD-AP0241BH	024 type	2.5	7.1	8.0
		MMD-AP0271BH	027 type	3	8.0	9.0
		MMD-AP0301BH	030 type	3.2	9.0	10.0
		MMD-AP0361BH	036 type	4	11.2	12.5
		MMD-AP0481BH	048 type	5	14.0	16.0
		MMD-AP0561BH	056 type	6	16.0	18.0

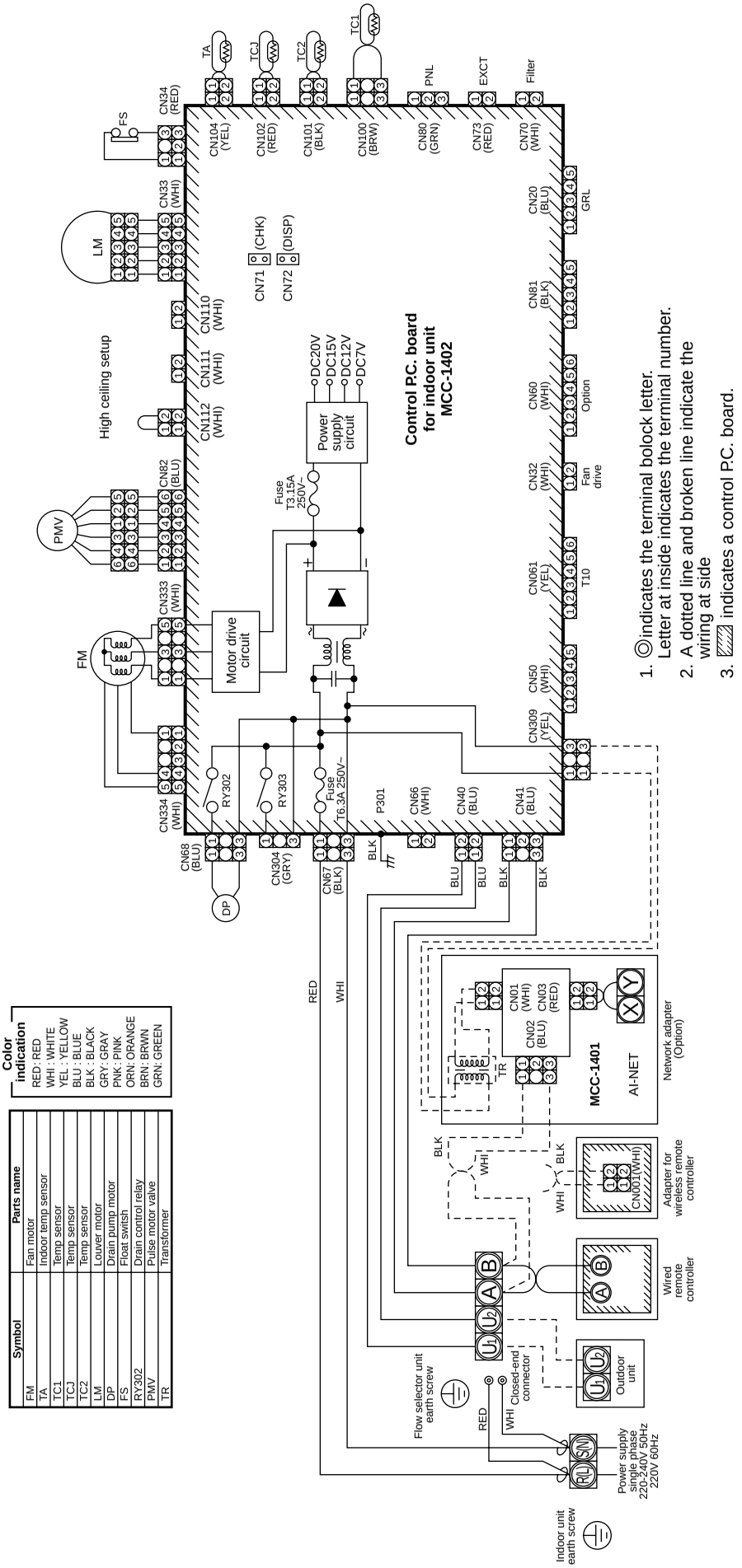
Type	Appearance	Model name	Capacity rank	Capacity code	Cooling capacity (kW)	Heating capacity (kW)
Concealed Duct High Static Pressure Type		**MMD-AP0181H**	018 type	2	5.6	6.3
		MMD-AP0241H	024 type	2.5	7.1	8.0
		MMD-AP0271H	027 type	3	8.0	9.0
		MMD-AP0361H	036 type	4	11.2	12.5
		MMD-AP0481H	048 type	5	14.0	16.0
Slim Duct Type		**MMD-AP0071SPH**	007 type	0.8	2.2	2.5
		MMD-AP0091SPH	009 type	1	2.8	3.2
		MMD-AP0121SPH	012 type	1.25	3.6	1.0
		MMD-AP0151SPH	015 type	1.7	4.5	5.0
		MMD-AP0181SPH	018 type	2	5.6	6.3
Under Ceiling Type		**MMC-AP0151H**	015 type	1.7	4.5	5.0
		MMC-AP0181H	018 type	2	5.6	6.3
		MMC-AP0241H	024 type	2.5	7.1	8.0
		MMC-AP0271H	027 type	3	8.0	9.0
		MMC-AP0361H	036 type	4	11.2	12.5
		MMC-AP0481H	048 type	5	14.0	16.0
		MMK-AP0071H	007 type	0.8	2.2	2.5
		MMK-AP0091H	009 type	1	2.8	3.2
		MMK-AP0121H	012 type	1.25	3.6	4.0
		MMK-AP0151H	015 type	1.7	4.5	5.0
		MMK-AP0181H	018 type	2	5.6	6.3
		MMK-AP0241H	024 type	2.5	7.1	

Model: MMU-AP0151SH, AP0181SH, AP0241SH



2-1-4. 1-way Air Discharge Cassette Type

Model: MMU-AP0152SH, AP0182SH, AP0242SH



1. ◎indicates the terminal bolock letter. Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at side
3. ▨ indicates a control P.C. board.

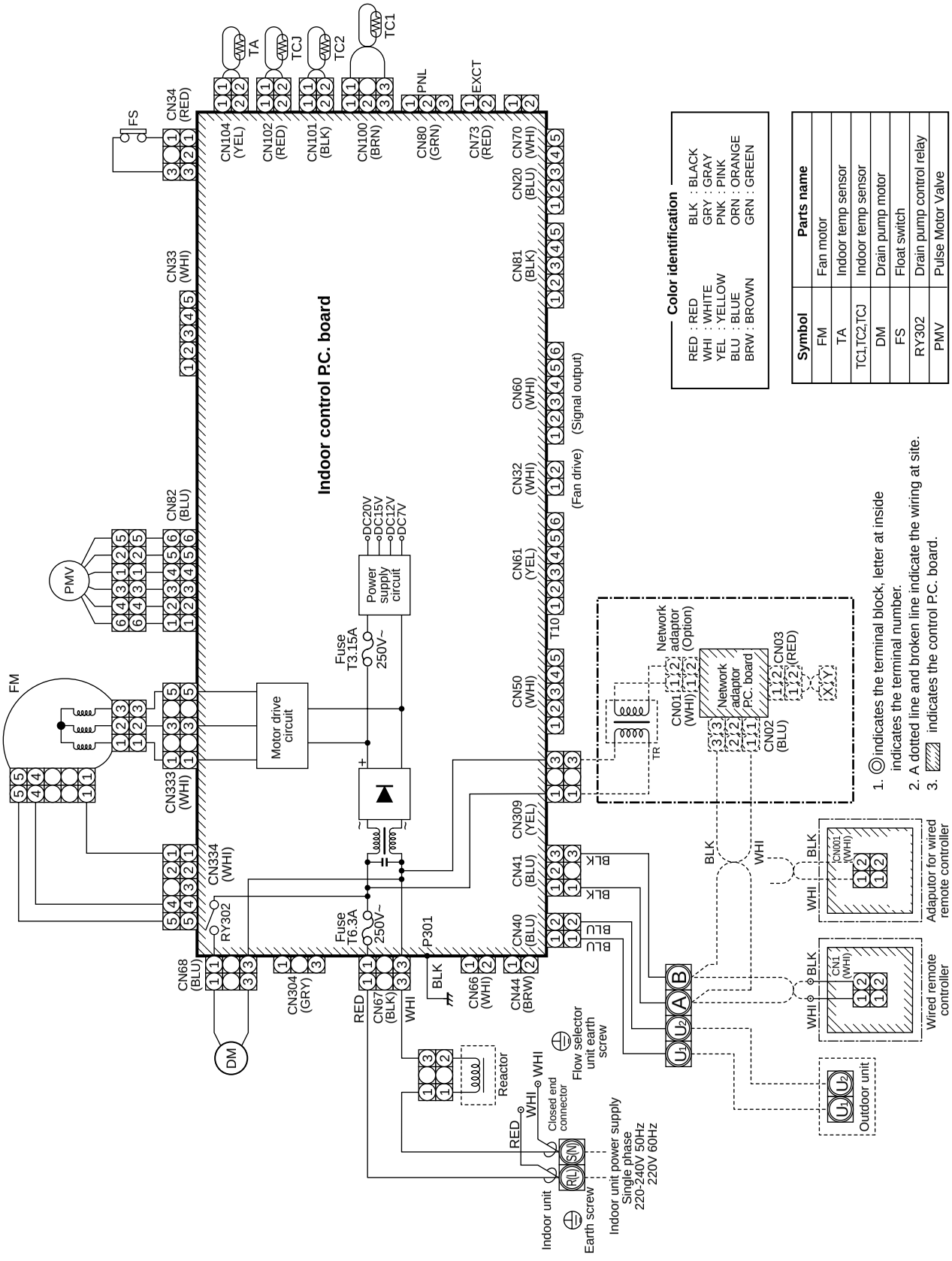
Symbol	Parts name
FM	Fan motor
TA	Indoor temp sensor
TC1	Temp sensor
TCJ	Temp sensor
TC2	Temp sensor
LM	Louver motor
DP	Drain pump motor
FS	Float switch
RY302	Drain control relay
PMV	Pulse motor valve
TR	Transformer

Color indication

RED : RED
WHI : WHITE
YEL : YELLOW
BLU : BLUE
BLK : BLACK
GRY : GRAY
PNK : PINK
ORN : ORANGE
BRN : BRWN
GRN : GREEN

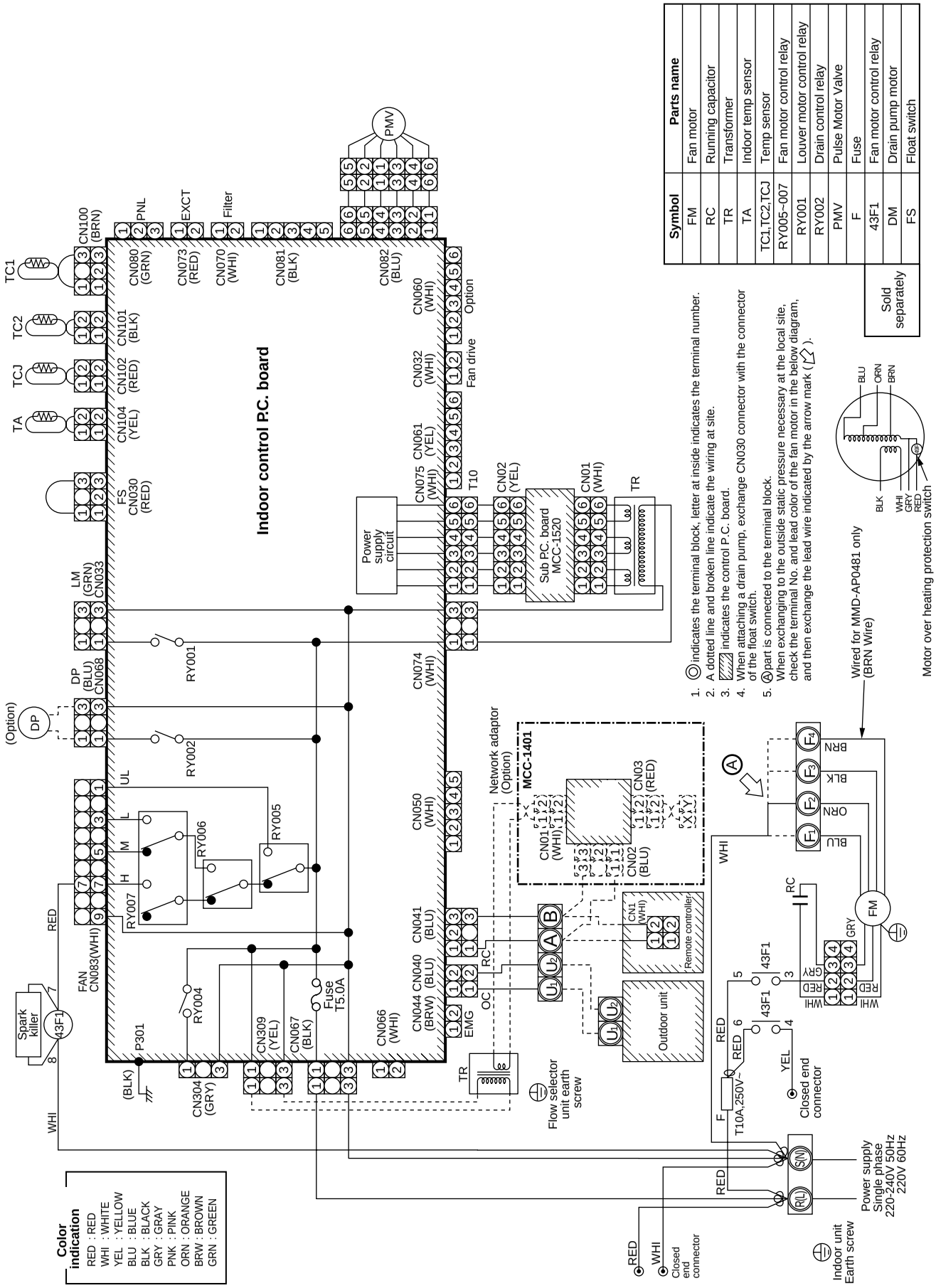
2-1-5. Concealed Duct Standard Type

Model: MMD-AP0071BH, AP0091BH, AP0121BH, AP0151BH, AP0181BH, AP0241BH
MMD-AP0271BH, AP0301BH, AP0361BH, AP0481BH, AP0561BH



2-1-6. Concealed Duct High Static Pressure Type

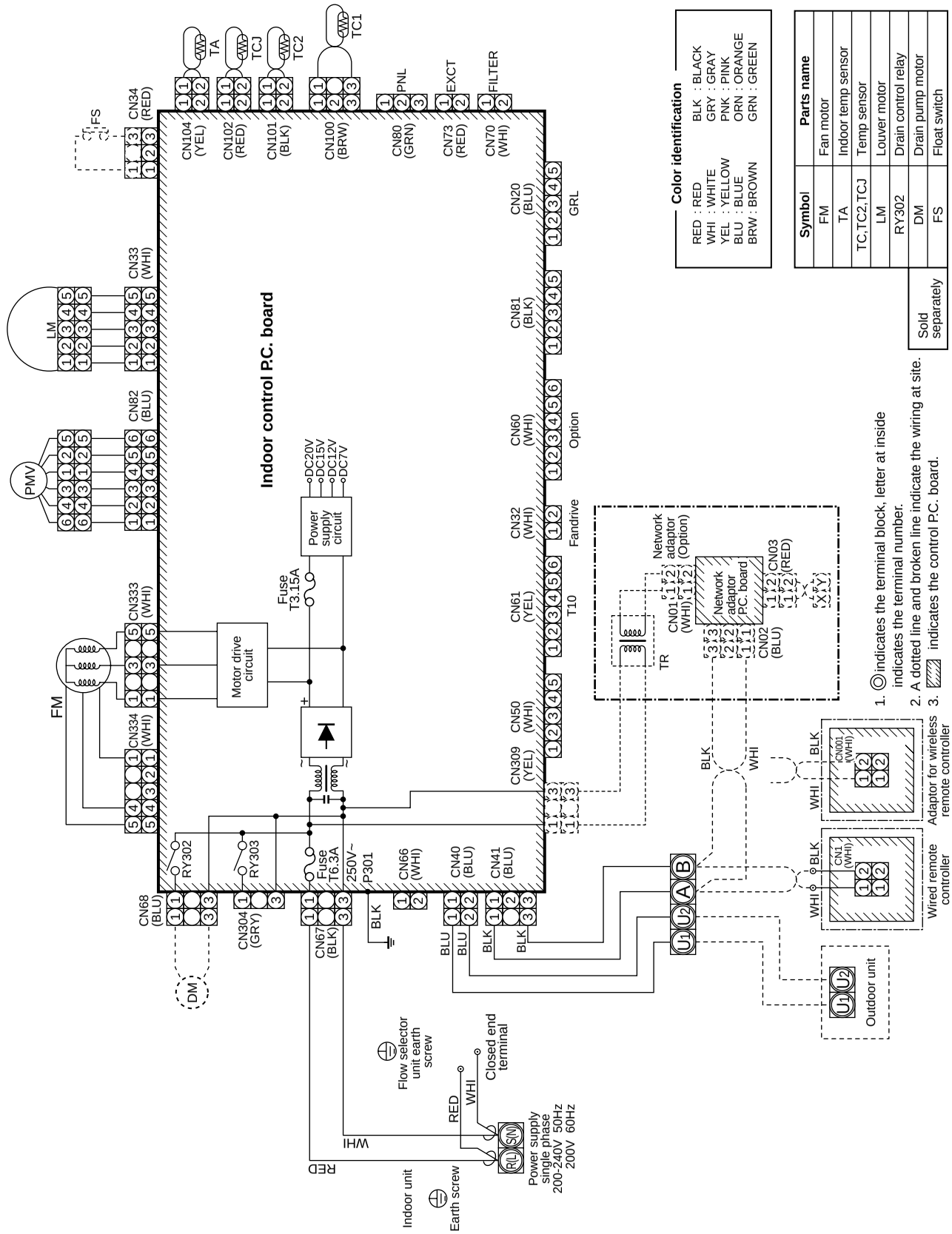
Model: MMD-AP0181H, AP0241H, AP0271H, AP0361H, AP0481H



Symbol	Parts name
FM	Fan motor
RC	Running capacitor
TR	Transformer
TA	Indoor temp sensor
TC1,TC2,TCJ	Temp sensor
RY005~007	Fan motor control relay
RY001	Louver motor control relay
RY002	Drain control relay
PMV	Pulse Motor Valve
F	Fuse
43F1	Fan motor control relay
DM	Drain pump motor
FS	Float switch

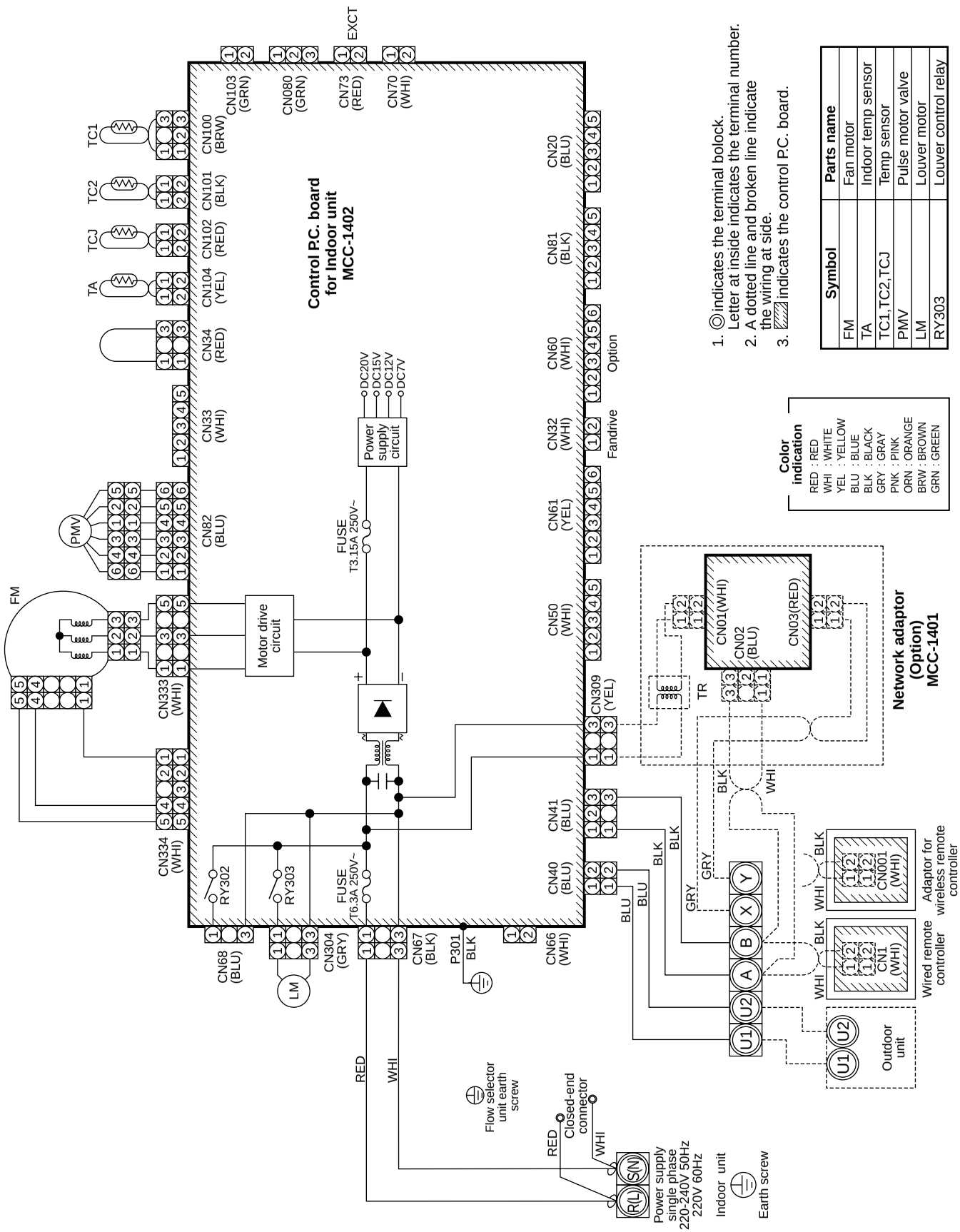
2-1-7. Under Ceiling Type

Model: MMC-AP0151H, AP0181H, AP0241H, AP0271H, AP0361H, AP0481H



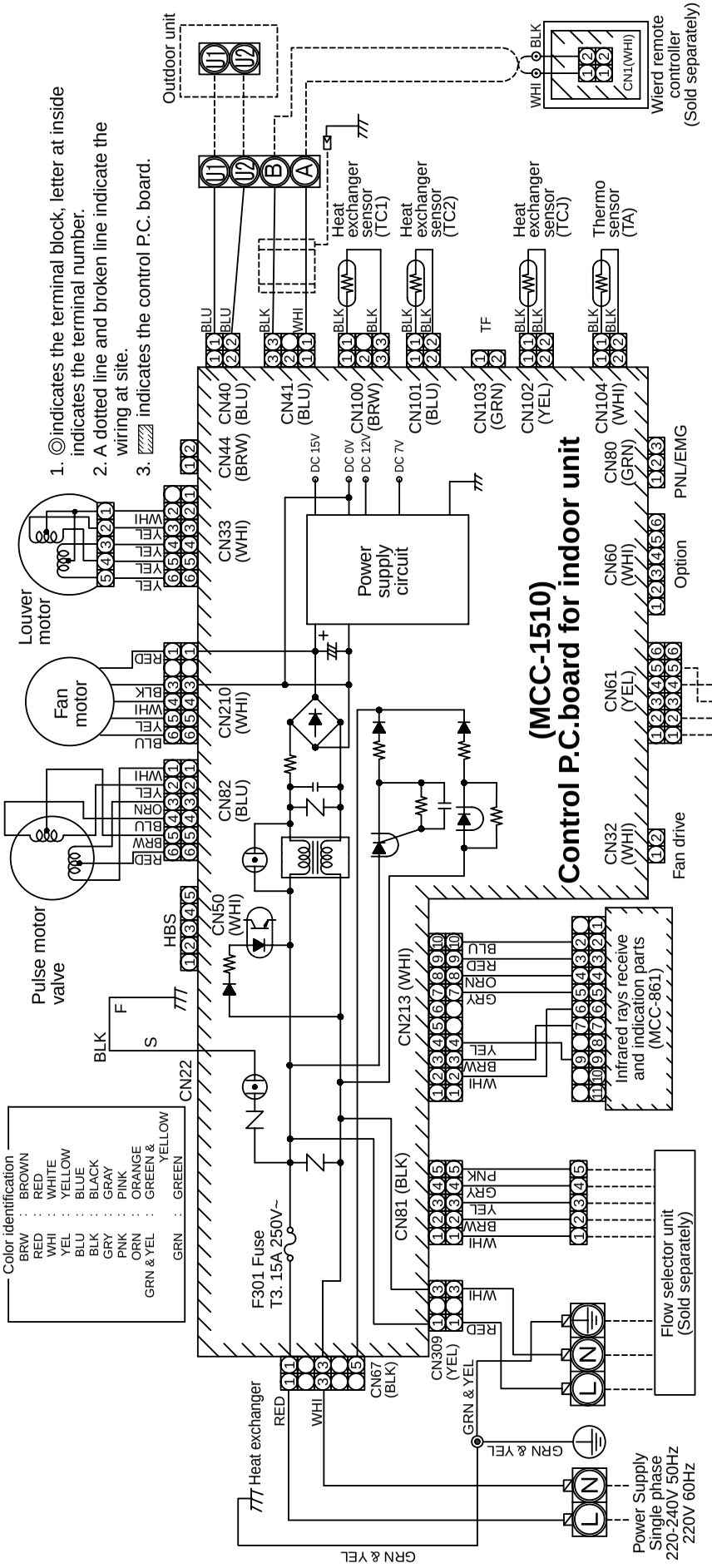
2-1-8. High Wall Type

Model: MMK-AP0071H, AP0091H, AP0121H, AP0151H, AP0181H, AP0241H



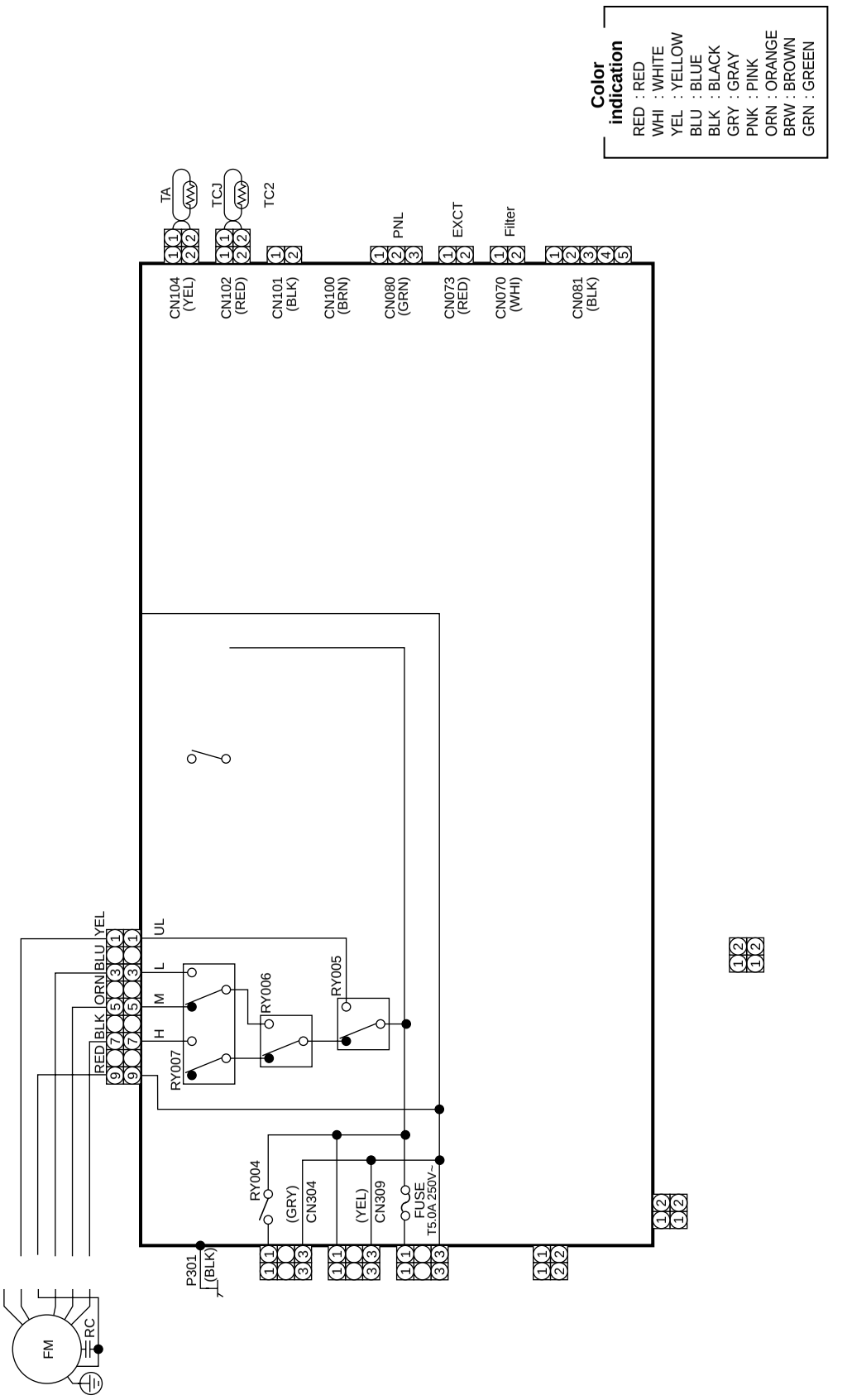
Symbol	Parts name
FM	Fan motor
TA	Indoor temp sensor
TC1,TC2,TCJ	Temp sensor
PMV	Pulse motor valve
LM	Louver motor
RY303	Louver control relay

Model: MMK-AP0072H, AP0092H, AP0122H



2-1-9. Floor Standing Cabinet Type

Model: MML-AP0071H, AP0091H, AP0121H, AP0151H, AP0181H, AP0241H

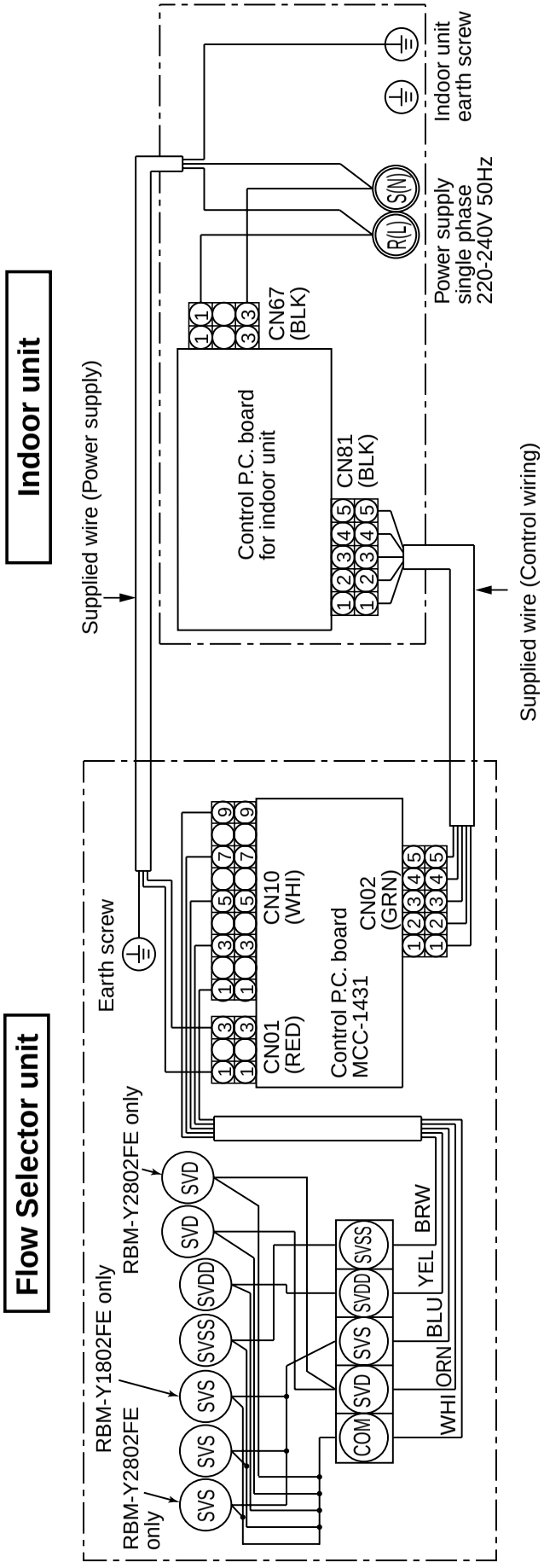


Symbol	Parts name
FM	Fan motor
RC	Running capacitor
TR	Transformer
TA	Indoor temp sensor
TC1,TC2,TCJ	Temp sensor
RY001	Louver control relay
RY002	Drain control relay
RY004	Heater control relay
RY005~007	Fan motor control relay
PMV	Pulse motor valve

1. indicates the terminal block.
   Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at side.
3. ▨ indicates the control P.C. board.

2-3. Flow Selector Unit (FS Unit)

Model: RBM-Y1122FE, Y1802FE, Y2802FE



3. PARTS RATING

3-1. Indoor Unit

4-way Air Discharge Cassette Type

Model MMU-AP	0091H	0121H	0151H	0181H	0241H	0271H	0301H
Fan motor	SWF-230-60-1						
Drain pump motor	ADP-1409						
Float switch	FS-0218-102						
TA sensor	Lead wire length : 155mm						
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)						
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)						
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)						
Pulse motor	EDM-MD12TF-3						
Pulse motor valve	EDM-B25YGTF		EDM-B40YGTF				
Louver motor (panel)	MP24GA						

Model MMU-AP	0361H	0481H	0561H
Fan motor	SWF-200-90-1		
Drain pump motor	ADP-1409		
Float switch	FS-0218-102		
TA sensor	Lead wire length : 155mm		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)		
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)		
Pulse motor	EDM-MD12TF-3		
Pulse motor valve	EDM-B60YGTF-1		
Louver motor (panel)	MP24GA		

2-way Air Discharge Cassette Type

Model MMU-AP	0071WH	0091WH	0121WH	0151WH	0181WH
Fan motor	AF-230-53-4G			AF-230-39-4B	
Running capacitor for fan motor	AC 400V, 1.0µF			AC 450V, 2.0µF	
Drain pump motor	PJD-05230TF-1				
Float switch	FS-0208-608				
Control P.C. board transformer	TT-13				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
TA sensor	Lead wire length : 268mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Model MMU-AP	0241WH	0271WH	0301WH	0481WH
Fan motor	AF-200-53-4F			AF-200-92-4B
Running capacitor for fan motor	AC 450V, 2.5µF		AC 450V, 3.5µF	AC 500V, 5µF
Drain pump motor	PJD-05230TF-1			
Float switch	FS-0208-608			
Control P.C. board transformer	TT-13			
Pulse motor	EDM-MD12TF-3			
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1
TA sensor	Lead wire length : 268mm			
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)			
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)			
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)			

1-way Air Discharge Cassette (Compact type) Type

Model MMU-AP	0071YH	0091YH	0121YH
Fan motor	AF-200-22-4N-1		
Running capacitor for fan motor	AC 400V, 1µF		
Drain pump motor	PJD-05230TF-1		
Float switch	FS-0208-602		
Control P.C. board transformer	TT-13		
Pulse motor	EDM-MD12TF-3		
Pulse motor valve	EDM-B25YGTF		
TA sensor	Lead wire length : 818mm		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)		

Model MMU-AP	0151SH	0181SH	0241SH	0152SH	0182SH	0242SH
Fan motor	AF-200-34-4D			SWF-280-60-1		
Running capacitor for fan motor	AC 450V, 1.5µF		AC 500V, 2.5µF	—		
Drain pump motor	PJD-05230TF-2			ADP-1409		
Float switch	FS-0208-603			FS-0218-103		
Control P.C. board transformer	TT-13			—		
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B40YGTF			EDM-B40YGTF-3		
TA sensor	Lead wire length : 155mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Concealed Duct Standard Type

Model MMD-AP	0071BH	0091BH	0121BH	0151BH	0181BH
Fan motor	ICF-280-120-2				
Drain pump motor	ADP-1409				
Float switch	FS-0218-102				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
TA sensor	Lead wire length : 618mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Model MMD-AP	0241BH	0271BH	0301BH	0361BH	0481BH	0561BH
Fan motor	ICF-280-120-1			ICF-280-120-2		
Drain pump motor	ADP-1409					
Float switch	FS-0218-102					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1		
TA sensor	Lead wire length : 618mm					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Concealed Duct High Static Pressure Type

Model MMD-AP	0181H	0241H	0271H	0361H	0481H
Fan motor	STF-200-160-4B	STF-200-160-4A		STF-200-260-4C	STF-200-260-4B
Running capacitor for fan motor	AC 500V, 4μF	AC 400V, 8μF		AC 450V, 6μF	AC 400V, 8μF
Drain pump motor	ADP-1409				
Float switch	FS-0218-102-6				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1	
TA sensor	Lead wire length : 1200mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

Slim Duct Type

Model MMD-AP	0071SPH(SH)	0091SPH(SH)	0121SPH(SH)	0151SPH(SH)	0181SPH(SH)
Fan motor	SWF-280-60-1				
Pulse motor	EDM-MD12TF-3				
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF	
Drain pump motor ∗	ADP-1409				
Float switch ∗	FS-0218-102				
TA sensor	Lead wire length : 1558mm				
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)				
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)				
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)				

∗ “SPH” series only.

Under Ceiling Type

Model MMC-AP	0151H	0181H	0241H	0271H	0361H	0481H
Fan motor	SWF-280-60-1		SWF-280-60-2		SWF-280-120-2	
Louver motor	MP24GA1					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B40YGTF			EDM-B60YGTF-1		
TA sensor	Lead wire length : 155mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

High Wall Type

Model MMK-AP	0071H	0091H	0121H	0151H	0181H	0241H	0072H	0092H	0122H
Fan motor	ICF-280-120-3						ICF-340-30 or MF-340-30		
Louver motor	MT8-3-6						MP24Z		
Pulse motor	EDM-MD12TF-3								
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF			EDM-B25YGTF-3		
TA sensor	Lead wire length : 818mm Vinyl tube						Lead wire length : 318mm Vinyl tube		
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)						Ø4 size lead wire length : 600mm Vinyl tube (Blue)		
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)						Ø6 size lead wire length : 800mm Vinyl tube (Black)		
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)						Ø6 size lead wire length : 800mm Vinyl tube (Red)		

Floor Standing Cabinet Type

Model MML-AP	0071H	0091H	0121H	0151H	0181H	0241H
Fan motor	AF-200-19-4F		AF-200-45-4F		AF200-70-4K	
Running capacitor for fan motor	AC450V, 1.2μF		AC400V, 1.8μF		AC450V, 2μF	
Transformer	TT13					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B25YGTF		EDM-B40YGTF			
TA sensor	Lead wire length : 818mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)					

Floor Standing Concealed Type

Model MML-AP	0071BH	0091BH	0121BH	0151BH	0181BH	0241BH
Fan motor	AF-200-19-4G			AF-200-70-4K		
Running capacitor for fan motor	AC450V, 1.5μF			AC450V, 1μF		AC450V, 2μF
Transformer	TT-13					
Pulse motor	EDM-MD12TF-3					
Pulse motor valve	EDM-B25YGTF			EDM-B40YGTF		
TA sensor	Lead wire length : 818mm Vinyl tube					
TC1 sensor	Ø4 size lead wire length : 2000mm Vinyl tube (Blue)					
TC2 sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)					
TCJ sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Red)					

Floor Standing Type

Model MMF-AP	0151H	0181H	0241H	0271H	0361H	0481H	0561H
Fan motor	AF-200-37R		AF-200-63T		AF-200-110M-1	AF-200-160H-1	
Running capacitor for fan motor	AC500V, 3μF		AC500V, 3.5μF		AC500V, 4μF		
Transformer	TT-13						
Pulse motor	EDM-MD12TF-3						
Pulse motor valve	EDM-B40YGTF				EDM-B60YGTF-1		
Louver motor	MT8-3-9						
TA sensor	Lead wire length : 1200mm Vinyl tube						
TC1 sensor	Ø4 size lead wire length : 1200mm Vinyl tube (Blue)						
TC2 sensor	Ø6 size lead wire length : 2000mm Vinyl tube (Black)						
TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)						

3-2. Outdoor Unit

Model MMY-	MAP0802FT8	MAP1002FT8	MAP1202FT8
Compressor	DA421A3FB-23M	Output: : 3.75kW × 2	
4-way valve coil (Heat pump only)	LB64046	AC220-240V 50Hz	
Pulse motor valve coil	VPV-MOAJ524C0	HAM-MD12TF-3	DC12V
2-way valve coil	VPV	AC220–240V 50Hz	
		SV2, SV3A, SV3B, SV3C, SV3D, SV3E SV41, SV42, SV5, SV6, SV11, SV12	
2-way valve	VPV-122DQ1	SV2, SV3C, SV3D, SV3E, SV6, SV12	
	VPV-303DQ1	SV3A, SV41, SV42, SV5	
	VPV-603DQ2	SV3B	
	VPV-1204DQ50	SV11	
High-pressure SW	ACB-JB215	OFF : 3.73MPa, ON : 2.9MPa	
Pressure sensor (For high pressure)	150XA4-H3	0.5 to 3.5V / 0 to 0.98MPa	
Pressure sensor (For low pressure)	150XA4-L1	0.5 to 4.3V / 0 to 3.73MPa	
Fan motor	MF-230-600-2	DC280V, 600W	
Case heater		AC240V, 29W × 3	
Compressor case thermo.	US-622KXTMQO-SS	OFF : 125°C, ON : 90°C × 2	

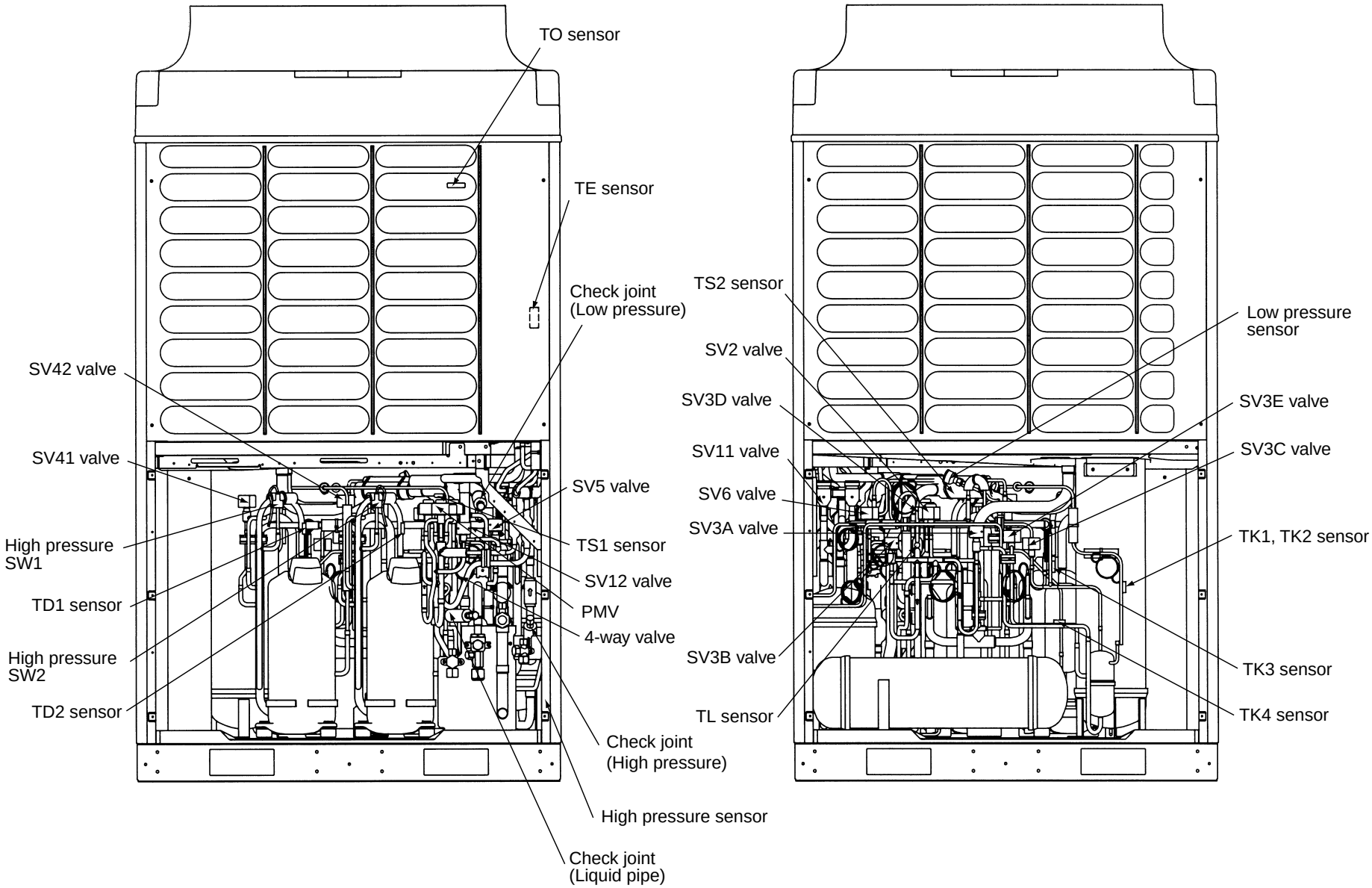
3-3. Outdoor Control Unit

Heat Recovery Model

Model MMY-	MAP0802FT8	MAP1002FT8	MAP1202FT8
Power supply terminal block	JXO-3004	AC600V / 30A, 4P	
Communication line terminal block	JXO-B2H	AC30V (or DC42V) / 1A, 6P	
Inductor	CH-44FK	1.45mH / 25A	
Smoothing condenser (For compressor)	400LRSN 1500M	1500μF / 400V	
Power supply transformer	TT-01-03T	AC230V, 350mA	
P.C. board (Noise filter)		MCC-1366	
Line filter (AC)	FKX-240NK-4810US	0.48mH / 30A (MCC-1366 P.C. board)	
	FKX-220NK-6310US	0.63mH / 25A (MCC-1366 P.C. board)	
P.C. board (Control board)		MCC-1429	
P.C. board (IPDU for compressor)	IPDU-4T62DA1E	6.2kW MCC-1502	
P.C. board (Power supply board)		MCC-1439	
P.C. board (IPDU for fan)	IPDU-2D16DA1	800W MCC-896, MCC-897	
Power complex module	6MBR25UA120	25A/1200V (MCC-1502 P.C. board)	
Pipe temp. sensor (TD)	—	–30°C to 135°C (Ambient temp. range)	
Pipe temp. sensor (TS)	—	–20°C to 80°C (Ambient temp. range)	
Heat exchanger temp. sensor (TE)	—	–20°C to 80°C (Ambient temp. range)	
Outside temp. sensor (TO)	—	–20°C to 80°C (Ambient temp. range)	
Oil temp. sensor (TK)	—	–30°C to 135°C (Ambient temp. range)	
Liquid temp. sensor (TL)	—	–20°C to 80°C (Ambient temp. range)	
Smoothing capacitor (For fan)	400LRSN1000M	1000μF / 400V	
Magnet SW	FC-2S	400V / 38A	
Thermistor	ZPROYCE101A500	100Ω, 13A, 500V	

3-4. Flow Selector Unit (FS Unit)

Model	RBM-Y1122FE	RBM-Y1802FE	RBM-Y2802FE
P.C. board (Control board)	MCC-1431		
2-way valve coil	VPV	AC220-240V 50Hz	
2-way valve	VPV-122DQ1	SVSS, SVDD	
	VPV-1204DQ50	SVS, SVD	



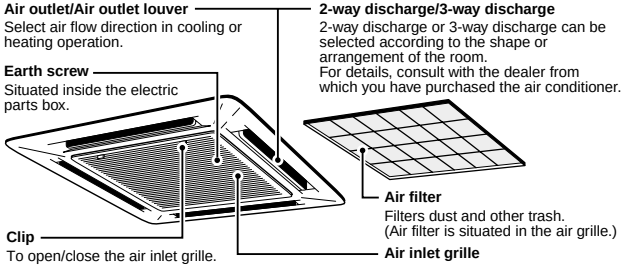
Front side

Rear side

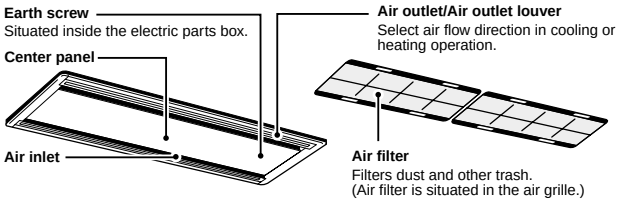
3-6. Name of Each Part

3-6-1. Indoor Unit

[4-way Air Discharge Cassette Type]

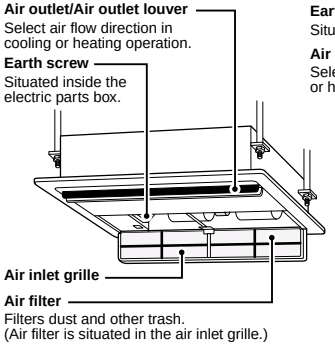


[2-way Air Discharge Cassette Type]

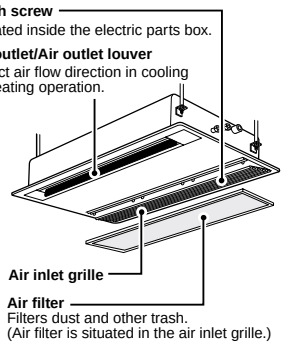


[1-way Air Discharge Cassette Type]

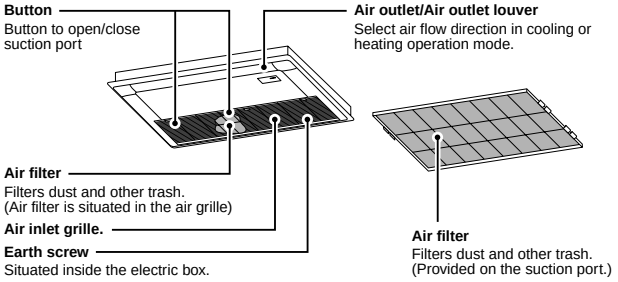
MMU-AP0071YH to AP0121YH



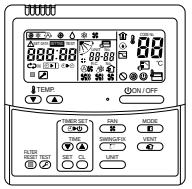
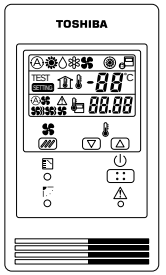
MMU-AP0151SH to AP0241SH



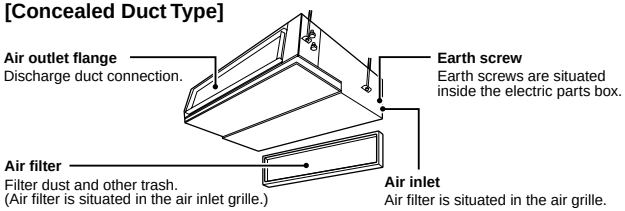
MMU-AP0152SH, AP0182SH, AP0242SH



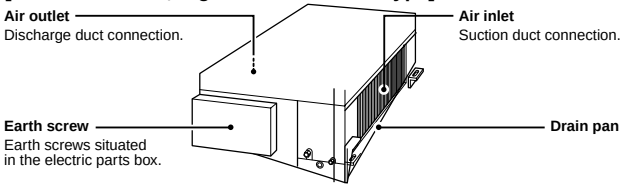
Sold Separately Parts

Main remote controller	RBC-AMT31E	
Sub-remote controller	RBC-AS21E2	
Wireless remote controller kit	RBC-AX21U(W)-E2	
	RBC-AX22CE2	
	TCB-AX21E2	

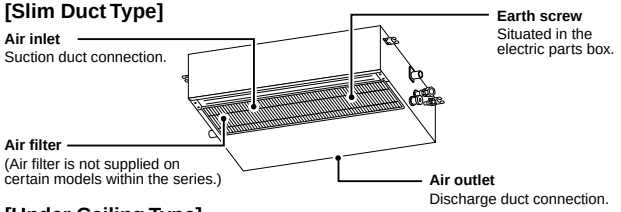
[Concealed Duct Type]



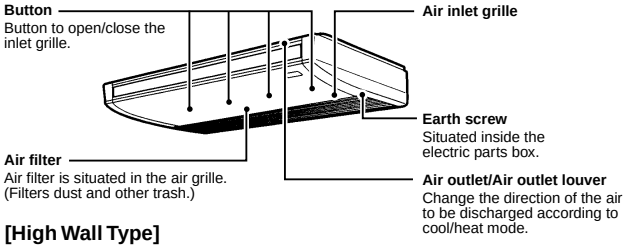
[Concealed Duct, High Static Pressure Type]



[Slim Duct Type]

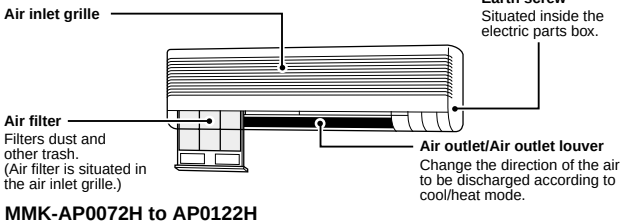


[Under Ceiling Type]

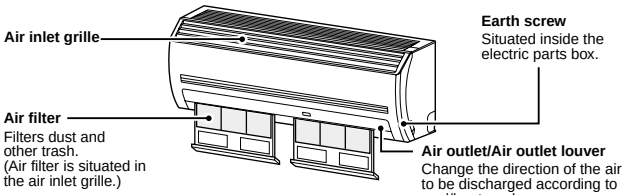


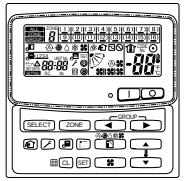
[High Wall Type]

MMK-AP0071H to AP0241H

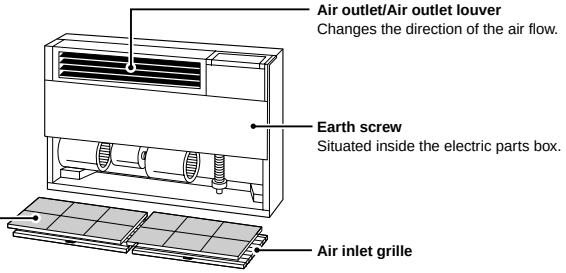


MMK-AP0072H to AP0122H

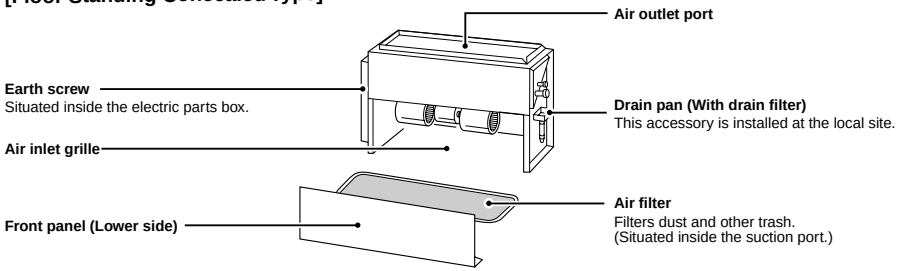


Weekly timer	RBC-EXW21E2	
Central remote controller	TCB-SC642TLE2	

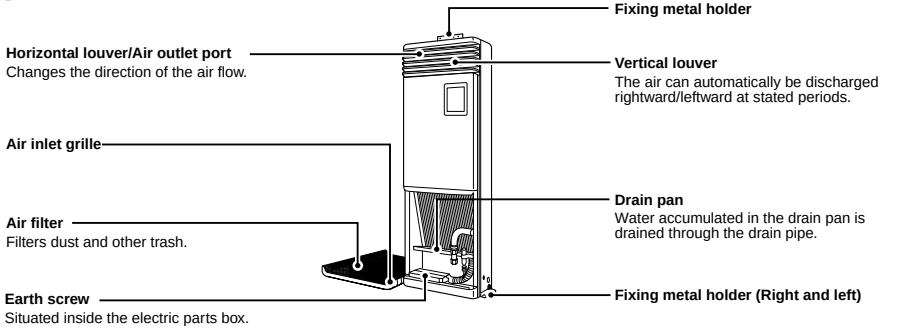
[Floor Standing Cabinet Type]



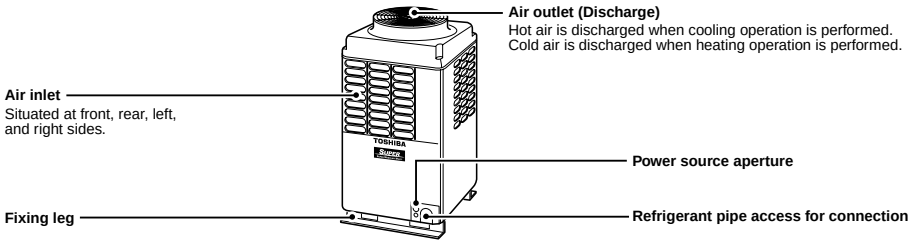
[Floor Standing Concealed Type]



[Floor Standing Type]



3-6-2. Outdoor Unit



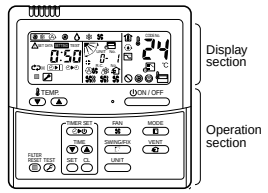
3-7. Parts Name of Remote Controller

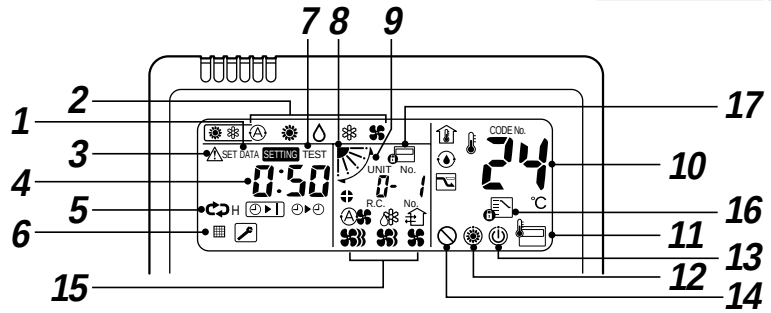
Display section

In the illustration, all of the indicators are displayed for the purpose of explanation.

In normal operation, only the icons relevant to the mode of operation would be displayed.

- When turning on the power breaker switch for the first time, [SET DATA] flashes on the display part of the remote controller. While this display is flashing, the system is performing a self-check function. Wait until this check has been completed and the [SET DATA] display has disappeared before using the remote controller.





1 SET DATA display
Displayed during initialization of controller.

2 Operation mode select display
The selected operation mode is displayed.

3 CHECK display
Will be displayed when a error condition occurs or a protection device operates.

4 Timer time display
Displays the selected delay time.
(When a malfunction occurs, a check code is displayed in place of the time display.)

5 Timer SETIN setup display
By pressing the Timer Set button, the display of the timer is shown in the following order: [OFF] → [OFF] repeat OFF timer → [ON] → No display.

6 Filter display
If "FILTER" is displayed, clean the air filter.

7 TEST run display
Displayed during a test run.

8 Louver position display (for 4-Way Air Discharge Cassette Type and Under Ceiling Type model only)
Displays louver position.

9 Louver swing display
Indicates the movement of the louver.

10 Setpoint temperature display
The selected set up temp. is displayed.

11 Remote controller sensor display
Displayed while the sensor of the remote controller is used.

12 PRE-HEAT display
Displayed when the heating or defrost operation is carried out. While this indication is displayed, the indoor fan stops or the runs in LOW fan speed.

13 Operation ready display
Displayed when cooling or heating operation is impossible because the outdoor temperature goes outside the operating range.

14 No function display
Displayed when the selected function is not available.

15 Fan mode display
The selected Fan mode is displayed.
(AUTO) (HIGH)
(MED.) (LOW)
In the Concealed Duct High Static Pressure type models, [HIGH] only is displayed for the air speed.

16 Mode select control display
Displayed when pushing "Operation mode select" button while the operation mode is fixed to heating or cooling by the system manager of the air conditioner.

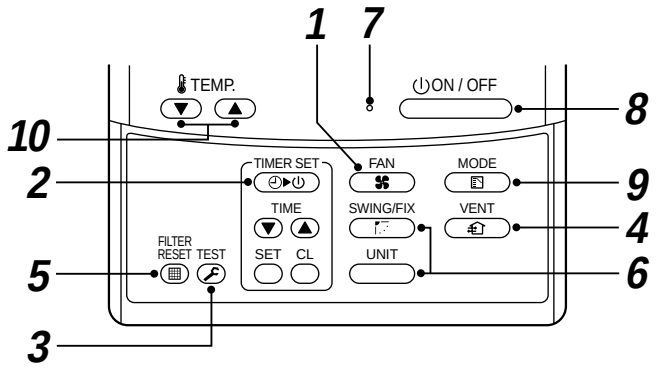
17 Central control display
Displayed when using the remote controller with a central control remote controller, etc.
If the remote controller is prohibited on fan the centralcontrol side, flashes when operating the following ON / OFF, MODE, ▼ / ▲ buttons and the function is not accepted.
(The different settings available on the remote controller when in use with a central controller, can be referred to in the owners manual of the central controller.)

Operation section

Push each button to select the desired operation.

This remote controller can operate up to a maximum 8 indoor units.

- The remote controller can memorize user settings and can be recalled and activated by a single press of the (ON / OFF) button.



1 Fan mode select button

Selects the desired air speed.

The Concealed Duct High Static Pressure type models cannot be operated.

2 Timer set button

Used for setting the timer function.

3 Check button

The CHECK button is used for the check operation. During normal operation, do not use this button.

4 Fan button

When an after-market fan device is connected to the system, this button activates the device.

- If ⊘ is displayed on the remote controller when pushing the FAN button, a fan is not connected.

5 Filter reset button

Resets the "FILTER ▤ " display.

6 Unit and Auto louver buttons

(UNIT) :

Select the desired indoor unit by pressing the unit button.

(SWING/FIX) :

Press the button to set the louver into Auto mode.

- This function is not available on the Concealed Duct Standard Type, High Static Pressure Type, Floor standing Cabinet Type, Floor Standing Concealed Type, or Slim Duct Type.

7 Operation lamp

Lit during normal product operation.

Flashes to indicate malfunction or incorrect timer setting.

8 (ON / OFF) button

Push to cycle between ON and OFF mode.

When the unit is OFF, the Operation Lamp and the display will turn OFF.

9 Operation select button

Selects the desired operation mode.

10 Set up temperature button

Adjusts the temperature set point for the room.

Set the desired temperature by pressing the ▼ or ▲ .

OPTION :

Remote controller sensor

The temperature sensor in the indoor unit measures the room temperature.

The remote controller can also measure the room temperature.

For details of this feature, contact the dealer from whom you purchased the product.

3-8. Correct Usage

When the product is operated for the first time, or after the SET DATA value has been changed, the procedure below should be followed. The remote controller can memorize user settings and can be recalled and activated by a single push of the (ON / OFF) button.

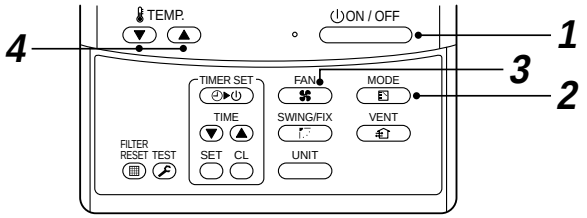
Preparation

Power the system by switching the electrical isolation device on and by pushing the ON/OFF button on the remote controller.

- When the power is switched on, a partition line is shown on the remote controller display.
- The remote controller performs a self-check function for approximately 1 minute during which user input will not be accepted.

REQUIREMENT

- While using the air conditioner, operate it only with (ON / OFF) button without turning off the main power switch and the leak breaker.
- Do not turn off the earth leakage breaker while the air conditioner is in use.
- When the air conditioner has not been operated for a period of time, ensure the earth leakage breaker is turned on for 12 or more hours prior to the start up of operation.

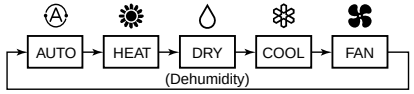


1 Push (ON / OFF) button.

The operation lamp goes on, and the operation starts.

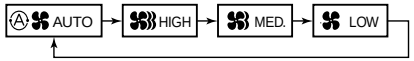
2 Select an operation mode with the (MODE) button.

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



- "DRY mode" function is not available on the Concealed Duct High Static Pressure Type.

3 Select air volume with (FAN) button.



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

- When air volume is "AUTO Ⓐ", air volume differs according to the temperature difference between the set temperature and the room temperature.
- In DRY mode, "AUTO Ⓐ" is displayed and the air volume is LOW.
- In heating operation, if the room temperature is not heated sufficiently with volume "LOW " operation, select "MED. " or "HIGH " operation.
- The temperature which the temperature sensor detects is one near the air inlet of the indoor unit. Therefore it slightly differs from the room temperature according to the installation status. The setup value is a criterion of the room temperature. (Automatic air speed cannot be selected in FAN mode.)
- Air volume of function is not available on "Concealed Duct High Static Pressure Type" air speed "HIGH " only is displayed.

4 Determine the set up temperature by pushing the "TEMP. (▼)" or "TEMP. (▲)" button.

Stop

Push (ON / OFF) button.

The operation lamp goes off, and the operation stops.

REQUIREMENT

[In Cooling operation]

- The operation starts after approximately 1 minute.

[In Heating operation]

- In heating operation, the fan operation may continue for approximately 30 seconds after the air conditioner has stopped.
- The indoor fan continues in preheat operation for 3 to 5 minutes, and then blows out the hot air. (❁ symbol is displayed on the remote controller.)
- When the temperature of the room has reached the set point temperature and after the unit has stopped, the air speed is lowered and the air volume is greatly reduced.
- In defrost mode, the fan stops so that cool air is not discharged. PRE-DEF symbol ❁ is displayed.

[In Automatic operation]

- Using the difference between the set point temperature and the room temperature, the heating and cooling operations are automatically performed.

3-9. Adjustment of Wind Direction

To increase the cooling or heating effect, be sure to make proper use of the discharge louver for cooling or heating operation.

As the characteristics of the air, cool air collects at lower levels, and hot air collects at higher levels.

⚠ CAUTION

Set the louver so that air blows out horizontally.

If cooling operation is performed with the louver blowing air downwards, the air outlet or surface of the louver will be wet with dew, which may drip.

4-way Air Discharge Cassette Type

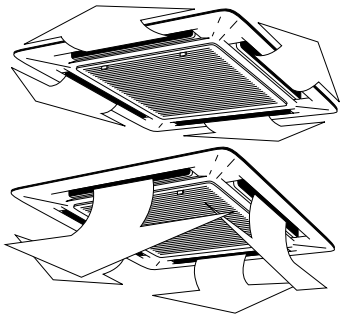
- **While the air conditioner stops, the discharge louver directs downward automatically.**
- **When the heating operation is in PREHEAT/DEFROST ⤴ state, the louver is directed upward. The rotation of the louver starts after PREHEAT/DEFROST ⤴ status cleared ⤴, is displayed on the remote controller even if the heating operation is in PREHEAT/DEFROST ⤴ status.**

[In Cooling operation]

Use the discharge louver with horizontal set point.

[In Heating operation]

Use the discharge louver with downward set point.



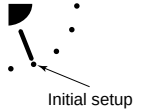
How to set up the air direction

Push SWING/FIX button.

1 **Every push of the button, the air direction changes.**

In Heating operation

Set the air outlet louver downward.
If directing it upward, the hot air may not reach the floor.



In Cooling / Dry operation

Set the air outlet louver upward.
If directing it downward, dew condensation may fall on or near the air discharge port.

How to start louvre swinging

2 **Push SWING/FIX button.**
Set the louver direction to the lowest position, and then push SWING/FIX again.

- [SWING ⤴] is displayed and the air direction automatically changes upward/downward.

  In cases where one remote controller controls the multiple indoor units, each indoor unit can be selected and its air direction can be set up.

How to stop louver swinging

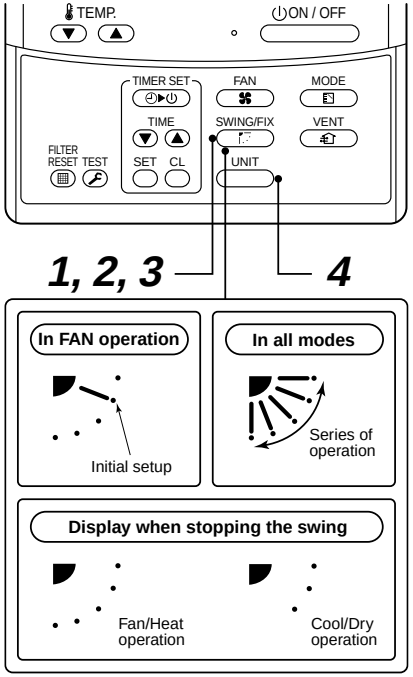
3 **Push SWING/FIX button again while the louver is operating.**

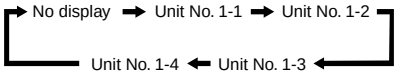
- The louver stops at a position when you push SWING/FIX. If pushing SWING/FIX again, the air direction descends from the highest position.

  * In COOL/DRY operation, the louver does not stop at the lowest position.
    If stopping the louver as it directs downward during operation, it stops after moving to the 3rd position from the highest position.

4 UNIT

- Push UNIT to set up the air direction individually in each indoor unit.
  Then the indoor unit No. in a group control is displayed.
  For the displayed indoor unit, set up the air direction.
- If the unit No. is not displayed, all the indoor units are operated at the same time.
- Every time is UNIT pushed, the display is exchanged as follows:





2-way discharge or 3-way discharge can be selected according to the configuration of the room. For details, consult with the dealer from which you have purchased the air conditioner.

INFORMATION

- If cooling operation has been selected while the louver is in a downward position, the cabinet or surface of the louver may become wet with dew.
- If heating operation has been selected while the louver is in a horizontal position, the room temperature may not be even.
- Never handle the louver directly with hands as a malfunction or injury may occur.
  Use the louver operation functions on the remote controller to change direction of the louver.

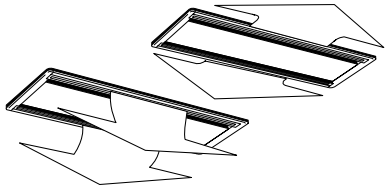
2-way Air Discharge Cassette Type

[In Cooling operation]

Use the air outlet louver with horizontal set point.

[In Heating operation]

Use the air outlet louver with downward set point.



How to set up the air direction

1 **Push SWING/FIX button during operation.**

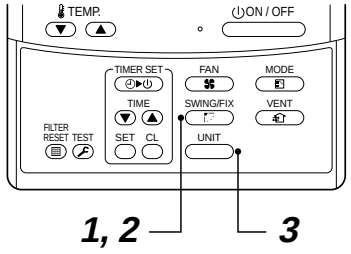
- [SWING] is displayed and the air direction automatically changes upward/downward.
  In case when one remote controller controls multiple indoor units, each indoor unit can be selected and the air direction can be set up.

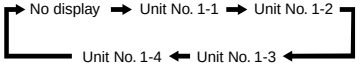
2 **Push SWING/FIX button again during swinging of the air outlet louver.**

- The air outlet louver can be stopped at the required position.

3 UNIT

- To set up the air direction individually, push UNIT button to display each indoor unit No. in a group control. Then set the air direction on the displayed indoor unit.
- If there is no display, all the indoor units can be operated collectively.
- Every pushing of the UNIT button, the display will change as shown in the figure.





1-way Air Discharge Cassette Type (1H Series)

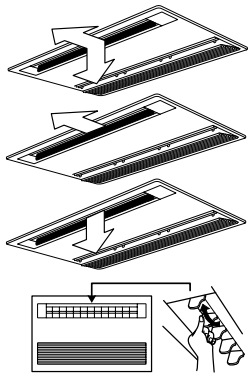
Adjustment of air direction upward/downward

[In Cooling operation]

In cooling operation, use the air outlet louver in a position that will defuse cool air throughout the room.

[In Heating operation]

In heating operation, use the air outlet louver in a downward position so that the air is directed to the floor.



Adjustment of air the direction rightward/leftward

To change the discharge direction from the right or left position, set the vertical grille inside of the air outlet louver to the required direction.

Setup the air flow direction and swinging

Refer to the description of the “2-way Air Discharge Cassette Type”.

Under Ceiling Type, 1-way Air Discharge Cassette Type (2SH Series)

- **When the air conditioner is stopped, the horizontal louver (Up/Down air direction adjustment plate) automatically directs upward.**
- **When the air conditioner is in stand-by status waiting to heat, the horizontal louver (Up/Down air direction adjustment plate) directs upward. The swinging operation starts upon the heating operation starting, but “SWING ” is displayed on the remote controller even when in heating operation.**

How to set up the air flow direction

Push SWING/FIX button during operation. **1** **Every pushing of the button, the air direction changes.**

In Heating operation

Set the horizontal louver (Up/Down air direction adjustment plate) downward. If directing it upward, the hot air may not reach the floor.

In Cooling / Dry operation

Set the horizontal louver (Up/Down air direction adjustment plate) upward. If directing it downward, dew condensation may fall on or near the air discharge port.

How to start swinging

2 **Push SWING/FIX button.**
Set the direction of the horizontal louver (Up/Down air direction adjustment plate) to the lowest position and then push SWING/FIX button again.

- [SWING] is displayed and the air direction automatically changes upward/downward.
  In cases where one remote controller controls the multiple indoor units, each indoor unit can be selected and air flow direction set up.

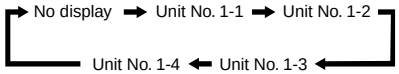
How to stop swinging

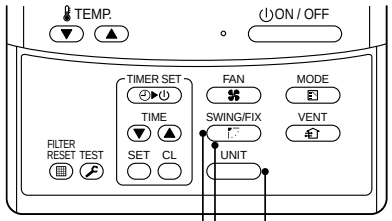
3 **Push SWING/FIX button again during swinging of the horizontal louver.**

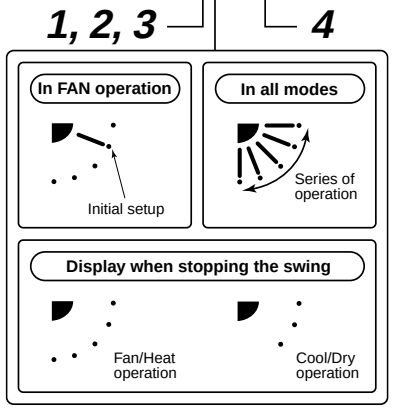
- The horizontal louvre can be stopped at the desired position. The air direction can be again set up from the uppermost position by pushing SWING/FIX button.
  * While the horizontal louver is set downward in cooling/drying operation, it does not stop. If stopping the horizontal louver which directs downward during swinging, it will stop after reaching the 3rd position from the upper position.

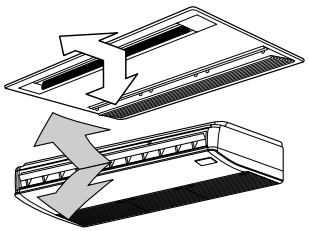
4 UNIT

- Push UNIT to set up the air direction individually in each indoor unit. Then the indoor unit No. in a group control is displayed. For the displayed indoor unit, set up the air direction.
- If the unit No. is not displayed, all the indoor units are operated at the same time.
- Every time UNIT is pushed, the display is exchanged as follows:



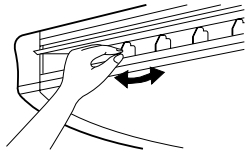






Right/Left air direction adjustment

To change the air outlet direction to the right or left side, set the vertical louver located behind the horizontal louver to the desired direction.



INFORMATION

- If cooling operation is performed with a donwards discharge, dew may form on the surface of the cabinet or the horizontal louver resulting in possible dripping.
- If heating operation is performed with a horizontal discharge, the room temperature may not be equal i.e. there may be a large variance between one side of the room with the other.

High Wall Type

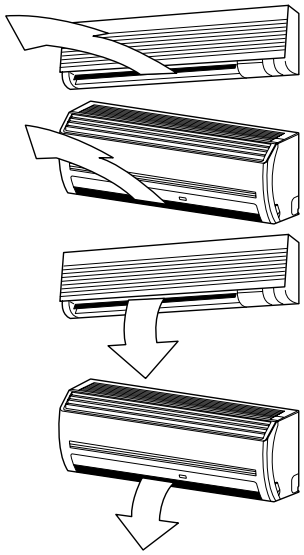
Adjustment of air Flow direction Upwards/Downwards

[In Cooling operation]

In cooling operation, use the horizontal louver with a horizontal set point so that the cold air diffuses the whole room.

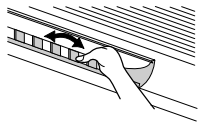
[In Heating operation]

In heating operation, use the horizontal louver with a downwards set point so that the hot air blows towards the floor.



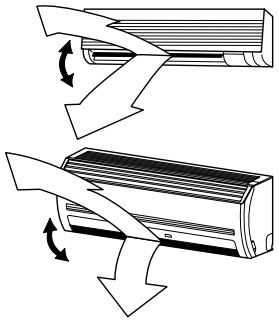
REQUIREMENT

- If cooling operation is performed with the louver set at a downwards position, dew may form on the surface of the cabinet or the horizontal louver resulting in possible dripping.
- If heating operation is performed with the louver set in a horizontal position, the room temperature may not be equal i.e. there may be a large variance between one side of the room with the other.
- Do not move the horizontal louver directly with your hands; otherwise a fault maybe caused. Select the direction of the horizontal louver using the SWING/FIX button on the remote controller. The horizontal louver will not stop immediately even if the switch is pushed. Note pushing the switch again when the required louver direction has been reached will stop the louver.



Adjustment of air Flow direction rightwards/leftwards

To change the air outlet direction to the right or left side, set the vertical louver located behind the horizontal louver to the desired direction.



Setup of air direction and swinging

1H series: Refer to the description of "2-way Air Discharge Cassette Type".

2H series: Refer to the description of "Under Ceiling Type, 1-way Air Discharge Cassette Type (2SH Series)".

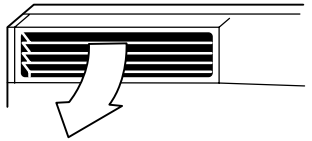
Floor Standing Cabinet Type

[In Cooling operation]

In cooling operation, set the air outlet louver with a horizontal set point so that the cold air diffuses the whole room.

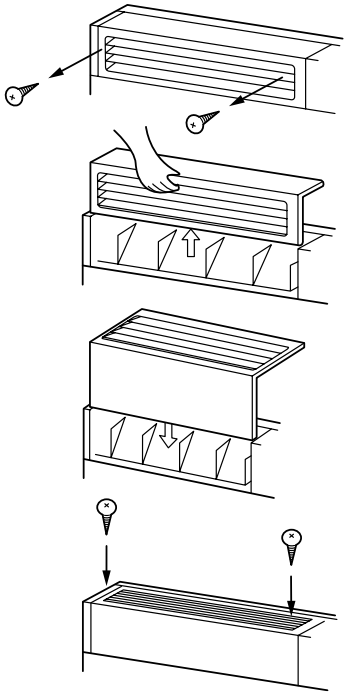
[In Heating operation]

In heating operation, set the air outlet louver with a downwards set point so that the hot air blows towards the floor.



How to change the air outlet port

Change the air outlet port using the following procedure.



1 **Remove the two fixing screws on the air outlet port.**
(The fixing screws are reused.)

2 **Remove the discharge port, by pushing up on the rear side, to a point where you can remove it from the rear clip.**

3 **Lift the air outlet port upwards and remove it.**

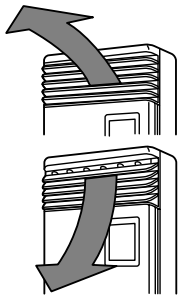
4 **Reverse the air outlet port and attach it to the main unit.**

Pay attention so that four claw hooks (two at rear and two at the lower sides) are hooked on the mounting position.

5 **Be sure to tighten the air outlet port with the removed fixing screws so that the air outlet port does not come off.**

Floor Standing Type

Adjustment of air Flow direction upwards/downwards



[In Cooling operation]

In cooling operation, move the louver with your hands so that the horizontal air outlet points in a direction so that the cold air diffuses the entire room.

[In Heating operation]

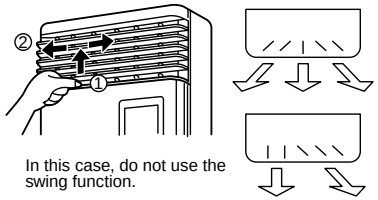
In heating operation, move the louver with your hands so that the horizontal air outlet points in a downward direction, towards the floor.

Adjustment of air Flow direction rightwards/leftwards

[In case of using unsymmetrical air directions]

Lift up the vertical louver lightly and direct it towards the desired direction once completed lower the louver back down.

In this case, do not use the Swing function.



In this case, do not use the swing function.

[In case of automatic swing]

1 Push the SWING/FIX button during operation.

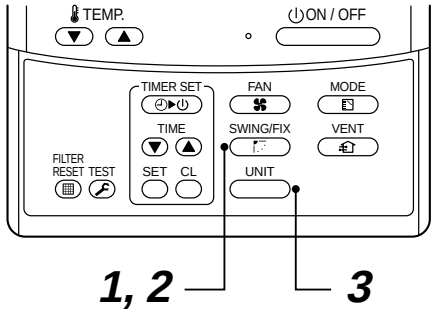
- [SWING] is displayed and the air direction will automatically change rightwards/leftwards.

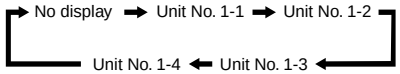
  In cases where one remote controller controls multiple indoor units, it is possible to set each indoor unit individually, so that the air flow direction can be altered.

2 Push the SWING/FIX button again whilst the vertical louver is moving will allow you to stop the louver in the desired position.

3 Swing button UNIT

- To set up the air flow the direction individually, push the UNIT button to display each indoor unit No. in a group control. Then set up the air flow direction to the desired indoor unit.
- If there is no display, all the indoor units can be operated collectively.
- Every push of the UNIT button, will change the display as shown in the figure.





INFORMATION

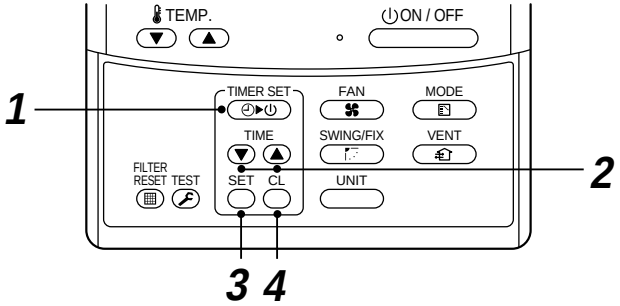
- If cooling operation is performed with downward air outlet, dew may form on the surface of the cabinet or the horizontal louver, resulting in possible dripping of water.
- If heating operation is performed with the horizontal air outlet actively moving, unevenness of the temperature may increase within the room.
- Do not move the louver directly with your hands during swing operation; otherwise a fault may be caused. The vertical louver does not stop immediately even if the SWING/FIX button is pushed. To adjust the stop position, push the SWING/FIX button.

3-10. Timer Operation

The type of timer operation can be selected from the following three types.

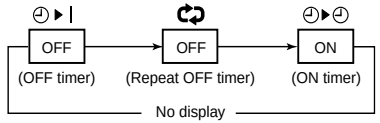
OFF timer : The operation stops when the time on the timer has reached the set time.
Repeat OFF timer : The unit will stop, every time the set time period has elapsed.
ON timer : The unit will start when the time on the timer has reached the set time.

Timer operation



1 Push the TIMER SET button.

- The timer display (type) changes for every push of the button.
- SET TIME and timer time displays flash.



2 Push the TIME buttons to select the "SET TIME".

For every push of the ▲ button, the set time increases in the unit of 0.5 hr (30 minutes).
The maximum set time is 72.0 hr.
For every push of the ▼ button, the set time decreases in the unit of 0.5 hr (30 minutes).
The minimum set time is 0.5 hr.

3 Push the SET button.

- The SETTING display disappears and the timer time display goes on.
  (When the ON timer is activated, the chosen time period will be displayed. Once the time has been reached, all displays except the ON light will disappear.)

Cancel of timer operation

4 Push the CL button.

- TIMER display will disappear.

NOTICE

- When the unit stops after the timer has reached the preset time, the Repeat OFF timer will resume the operation. However by pushing the ON / OFF button the repeat function will stop once the time on the timer has again reached its set time.

3-11. Installation

Installation location

⚠ WARNING

- **Select a location for installation that will be able to safely support the weight of the unit.**
  If the installation location is not strong enough to support the unit and the unit falls, injury could result.

⚠ CAUTION

- **Do not install the unit in a location where combustible gases could conceivably leak.**
  Leaking gases that accumulate in the vicinity of the unit could be ignited by the unit.

REQUIREMENT

- A location that permits the level installation of the unit
- A location that provides enough space to service the unit safely
- A location where water draining from the unit will not pose a problem

Avoid the following types of locations :

- Locations where salt is present in large amounts (seaside areas), or where sulfuric gases are present in large amounts (hot springs areas)
  (If the unit is to be used in such areas, special maintenance is necessary.)
- Locations that generate oils (including machine oils), steam, oily smoke, or corrosive gases
- Locations where organic solvents are used
- Locations in the vicinity of equipment that generates high frequency signals
- Locations where the outdoor unit will blow in the direction of a neighbor's window
- Locations where the noise of the outdoor unit will pose a problem
- Locations with poor air circulation

Electric wiring

⚠ WARNING

Ensure that the unit is correctly earthed.

Grounding is necessary. If earthing is incomplete, an electric shock may be caused.

⚠ CAUTION

Check that the circuit breaker is fitted.

Attaching a earth leakage breaker is necessary. Otherwise, an electric shock may be caused.

Make sure that the correct capacity Fuses are used.

Using wire or copper wire may cause a fire or unit fault.

Ensure that the power supply to the unit is exclusive and is the correct rated voltage.

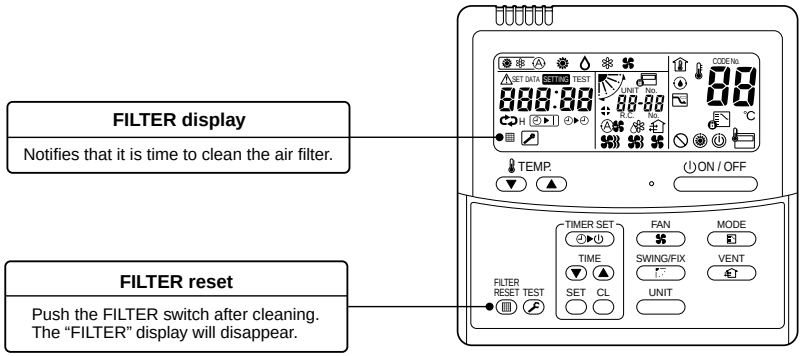
To disconnect the appliance from the main power supply.

This appliance must be connected to the main power supply by means of a circuit breaker or a switch with a contact separation of at least 3mm.

3-12. Maintenance

Cleaning of air filter

- When [FILTER] is displayed on the remote controller, its is time to check and if necessary clean the filter.
- Clogging of air filter decreases the cooling/heating effect.



WARNING

Be sure to turn off the main power supply prior to any maintenance.

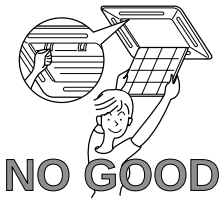
- **Please do not intend to do the daily maintenance and/or Air Filter cleaning by yourself.**
  Cleaning of the air filter and other parts of the unit involves dangerous work in high places, so be sure to have a qualified service person do it. Do not attempt it by yourself.

Daily maintenance

- For daily maintenance including Air Filter cleaning, please use qualified service personnel, particularly for the following models;

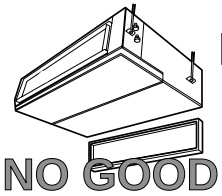
4-way Air Discharge Cassette Type	Concealed Duct Type	Under Ceiling Type
2-way Air Discharge Cassette Type	Slim Duct Type	
1-way Air Discharge Cassette Type	Concealed Duct, High Static Pressure Type	

2-way Air Discharge Cassette Type

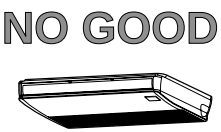


4-way Air Discharge Cassette Type

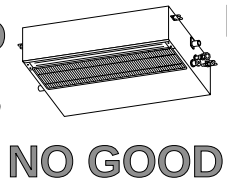
1-way Air Discharge Cassette Type



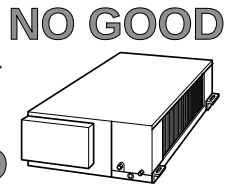
Concealed Duct Type



Under Ceiling Type



Slim Duct Type

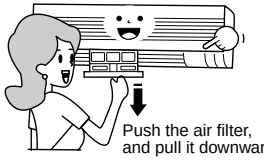


Concealed Duct, High Static Pressure Type

High Wall Type

(Model : 1H series)

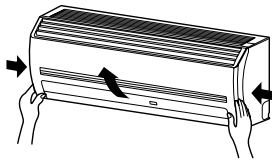
- Push the projection at the center of the air filter.
- Undo the clip on the air filter, pull the air filter downwards while pushing it towards the main unit side.

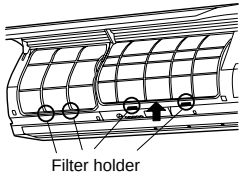


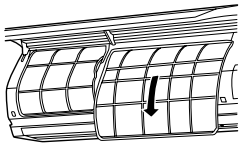
(Model : 2H series)

- Open the air inlet grille.

  Lift the air inlet grille up in to the horizontal position.
- Take hold of the left and right handles of the air filter and lift it up slightly, then pull downwards to remove it from the filter holder.

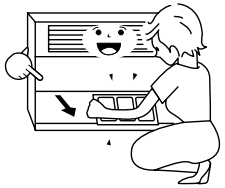






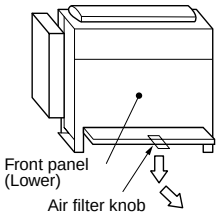
Floor Standing Cabinet Type

- Gently push down the upper part of the suction port, and then pull towards you to remove it.
- Take out the air filter inside of the suction port.



Floor Standing Concealed Type

- Push down on the hook of the air filter on the front panel (Lower side).
- Pull the air filter towards you to remove it.



Floor Standing Type

Removal / Attachment of air filter

- Pull the air filter towards you.
- To attach the air filter, insert it into the main body and push.

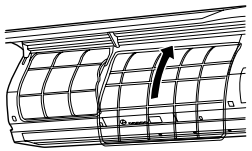
NOTE

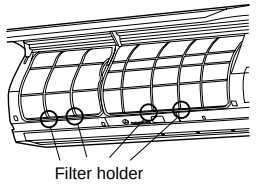
- When cleaning the air filter, use a small brush or cleaning device.
  If the air filter is heavily stained use a neutral detergent mixed with warm water.
- After washing the filter, rinse it out thoroughly and place in the shade to dry.
  Do not expose to direct sun light.
- Once the air filter has dried, place the air filter back into the unit.

Re-installing the air filter

- Insert the upper portion of air filter confirming alignment with the right and left edges of the indoor unit until it is located.
- Close the air inlet grille.

  If the FILTER lamp on the indoor unit is lit, push the FILTER button on the remote controller or the TEMPORARY button on the indoor unit to turn off the lamp.



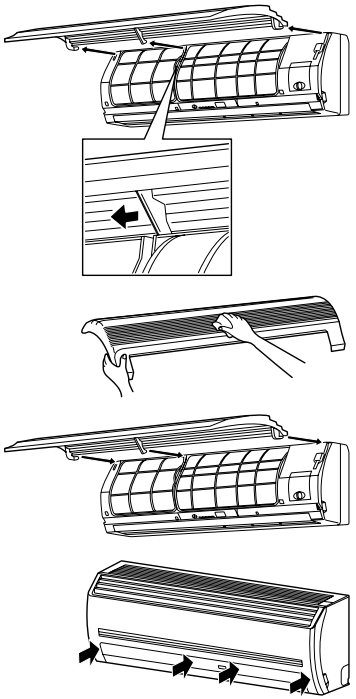


Cleaning the air inlet grille

1. Remove the air inlet grille.

   Hold the two sides of the air inlet grille and open in an upwards direction.

   Move the center arm to the left and remove the grille.
2. Wash it with water using a soft sponge or towel.
   (Do not use metallic scrubbing brush or other hard brushes.)
   - Use of such hard objects will cause scratches on the surface of the grille, and the metal coating to peel off.
   - If very dirty, clean the air inlet grille with a neutral detergent for kitchen use, and rinse it off with water.
3. Wipe the air inlet grille and allow to dry.
4. Fit the left and right arms of the air inlet grille to the shafts on the two sides of the air conditioner and push in completely, then push in the center arm.
5. Check that the center arm has been completely inserted and then close the air inlet grille.
   - Push the arrow locations (Four) at the bottom of the air inlet grille to check whether the grill is completely closed.



Cleaning of main unit / remote controller

CAUTION

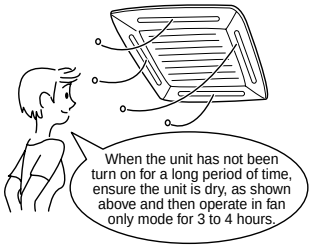
- Wipe them with a soft and dry cloth.
- A cloth dampened with cold water may be used on the indoor unit if it is very dirty.
- Never use a damp cloth on the main unit or remote controller.
- Do not use or leave a chemically treated duster on the unit for long periods of time, as it may damage or alter the colour of the unit surface.
- Do not use benzine, thinner, polishing powder, or similar solvents for cleaning. These may cause the plastic surface to crack or deform.

If you do not plan to use the unit for more than 1 month

1. Operate the fan for 3 to 4 hours to dry the inside of the unit
   - Operate “FAN” mode.
2. Stop the air conditioner and turn off the main power supply or the circuit breaker.

Checks 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 an Air conditioning system which is operated regularly, cleaning and maintenance of the indoor/outdoor units are strongly recommended.
As a general rule, if an indoor unit is operated for about 8 hours daily, the indoor/outdoor units will need to be cleaned at least once every 3 MONTHS. This cleaning and maintenance shall be carried out by a qualified person.
Failure to clean the indoor/outdoor units regularly will result in poor performance, icing, water leakage and even compressor failure.

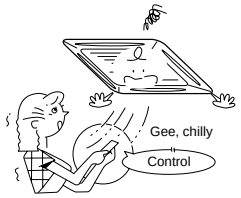
HINTS FOR ECONOMICAL OPERATION

Maintain room temperature at comfortable level
Clean air filters

The clogged air filter impairs the performance of the air conditioner.

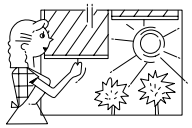
Never open doors and windows more than what is necessary

To keep the cool or warm air in the room, never open doors and windows more than what is necessary.



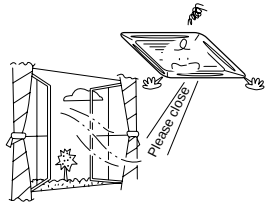
Window curtains

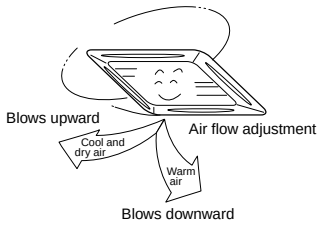
In cooling, close the curtains to avoid direct sunlight.
In heating, close the curtains to keep the heat in.



Ensure uniform circulation of room air

Adjust the air flow direction so that the air is evenly circulated throughout the room.





3-13. Air Conditioner Operations and Performance

WARNING

Turn on the power supply 12 hours or more before starting the air conditioner.

Check before operation

- Check whether earth wire is disconnected or out of place.
- Check that air filter is installed to the indoor unit.

Heating capacity

- During heating operation the heat pump system operates by absorbing the heat from the outside air and discharging it into the room.
  Therefore if the outside temperature drops, the units heating capacity will decrease.
- When the temperature of the outside air is low, it is recommended that you use other forms of heating in conjunction with the air conditioner.

Defrost operation during heating operation

- If the outdoor unit has a build up of frost during the heating operation, the operation mode changes automatically to defrost mode to increase the heating effect (for approximatley 2 to 10 minutes).
- During defrost operation, fans of the indoor and the outdoor units will stop.

Protection for 3 minutes

- The outdoor unit will not operate for approximately 3 minutes after the air conditioner has been immediately restarted after being stop, or the power supply has been turned on. This is to protect the system.

Main power failure

- If a power failure occurs during operation, all operations will stop.
- When restarting the unit, push the ON/OFF button again.

Fan rotation of stopped unit

- When other indoor units within the same system are in operation, the fan on the indoor units that are on “stand-by” will rotate to protect the machine once per approximately 1 hour for several minutes.

Protective device (High pressure switch)

The high pressure switch will stop the unit automatically when excessive load is applied to the air conditioner.

If the protective device operates, the operation lamp will stay lit but the operation will stop.

When the protective device operates, check characters “⚠” on the remote controller display.
The protective device may operate in the following cases.

- When suction or discharge port on the outdoor unit is blocked.
- When strong wind blows continuously against the discharge port of the outdoor unit.
- When dust or dirt is excessively adhered to the air filter of the indoor unit.
- When the discharge port of the indoor unit is blocked.

Cooling/heating operation of a Heat Recovery Multi air conditioner

- When the outdoor temperature goes out of the operating range, the cooling or heating modes may not be performed in order to protect the equipment. In this case, the “⏻” light goes on.

Characteristics of heating operation

- Hot air will not be blown out immediately from the indoor unit. It will take between 3 to 5 minutes (depending on temperature conditions of the room and the outside) before the indoor heat exchanger warms up sufficiently, to allow hot air to be blown.
- During operation, the indoor unit may stop if the outside temperature becomes to high.
- When other indoor units are in heating operation, the fan operation of the indoor unit on fan only operation may be stopped temporarily to prevent hot air from being blown out.

Characteristics of cooling/heating simultaneous operation

- If the outdoor temperature drops during operation, the fan of the outdoor unit may stop.

Air conditioner operating conditions

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

Cooling operation	Outdoor temperature : –10°C to 43°C (Dry-bulb temp.)
	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 : –15°C to 21°C (Dry-bulb temp.), –15°C to 15.5°C (Wet-bulb temp.)
	Room temperature : 15°C to 28°C (Dry-bulb temp.)

- If the air conditioner is used outside of the above conditions, the units safety protection devices may operate.

* Do not use “Super HRM” for other than personal usage where the ambient temperature may go down below –5°C. (For example, OA equipment/Electric device/Food/Animals and plants/Art object)

⚠ CAUTION

When outdoor temperature goes out of specified range, “❁ or ⏻” mark is indicated on the Wired remote controller display and the required operation will stop.

“❁ & ⏻” : When in heating operation. “⏻” : When in cooling operation.

Notice :

- This indication is not failure.
- When outdoor temperature goes back to specified range, “❁ or ⏻” will disappear and the unit will begin normal operation.
- The unit operation may stop if the next operation (request) cannot be fulfilled because it falls outside the specification for Super HRM. See below for the maximum cooling and heating specifications. (Outdoor temp. (DB) < –10°C : Cooling mode, > 21°C : Heating mode)

3-14. Re-Installation

DANGER

If the unit position is to be changed and re-located to a new position ask your local dealer or installation specialist. Do not attempt to move the air conditioner yourself, as incorrect installation may cause electric shock or fire.

Do not install the air conditioner in the following places

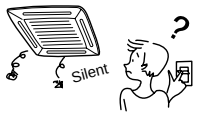
- Do not install the air conditioner in any place within 1 m from a TV, stereo or radio set. If the unit is installed in such places, noise transmitted from the air conditioner may affect the operation of these appliances.
- Do not install the air conditioner near a high frequency appliance (sewing machine or massager for business use, etc.), as 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 maybe generated.
- Do not install the air conditioner in a salty place such as a 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 change winds such as in a seaside area or on the roof / upper floor of a building.
- Do not install the air conditioner in a place where sulfureous gas maybe generated such as in a spa.
- Do not install the air conditioner in a vessel or mobile crane.

Be careful with noise or vibrations

- Do not install the air conditioner in a place where the noise or the hot air created by the outdoor unit will come into contact with your neighbours.
- Install the air conditioner on a solid and stable foundation as this will reduce the transmission of noise and vibration that is produced from the outdoor unit.
- If one indoor unit is operating, some sound may be audible from other indoor units that are connected within the same system (even when not in operation)

3-15. When the Following Symptoms are Found

Check the points described below before contacting your local service repair center.

	Symptom		Cause
It is not a failure.	Outdoor unit	• White misty cold air or water is blown out. • Sometimes, the noise “Pushu !” is heard.	• The fan on the outdoor unit automatically stops when performing a defrost operation. • Solenoid valve works when defrost operation starts and finishes.
	Indoor unit	• “Swish” sound is sometimes heard.	• When the unit is in operation,a sound such as the movement of water from one area to another may be heard. This sound may become larger after a period of 2 to 3 minutes once the unit has begun operation. This is not a cause for concern, but is the movement of the refrigerant or the draining sound of the dehumidifier.
		• Slight “Pishi!” sound is heard.	• This is sound generated when the heat exchanger, etc. expands and contracts slightly due to the change of temperature.
		• Discharge air smells.	• Various odurs such as those from a carpet, clothes, cigarette, or cosmetics will adhere to the air conditioner.
		• “⏻” indication is lit.	• Has the outdoor temperature gone out of its specified range specified range? • When the manager of the air conditioner has fixed the operation to either COOL or HEAT, but a request/demand contrary to this setup operation is requested. • When the fan operation is stopped to prevent the discharge of hot air.
		• Sound or cool air is blown from the indoor unit.	• Since refrigerant is flowed temporarily to prevent the stay of oil or refrigerant in the stand by indoor unit, the sound of flowing refrigerant, “Kyururu” or “Shaa” may be heard. When indoor unit operates in HEAT mode, and cold air in COOL mode white steam may be blown out.
		• When power of the air conditioner is turned on, “Ticktock” sound is heard.	• Sound is generated when the expansion valve operates when power supply has been turned on.
Check again.	Operates or stops automatically.		• Is the timer “ON” or “OFF”?
	Does not operate. 		• Is there a power failure to the unit? • Has the power supply been turned off? • Has the power fuse or breaker blown? • Has the protective device operated? (The operation lamp goes on.) • Is the timer “ON”? (The operation lamp goes on.) • Has the outdoor temperature gone out of the specified range for the outdoor unit?
	Air is not cooled or warmed sufficiently.		• Is the suction port or discharge port of the outdoor unit obstructed? • Are there any doors or windows open? • Is the air filter clogged with dust? • Is the discharge louver of the indoor unit set at appropriate position? • Is the air selection set to “LOW” or “MED” and is the operation mode set to “FAN Only”? • Is the setup temp. the appropriate temperature? • Has the outdoor temperature gone out of the specified range?

When the following symptoms are found, stop the unit operation immediately, turn off the power supply, and contact the dealer from where you have purchased the air conditioner.

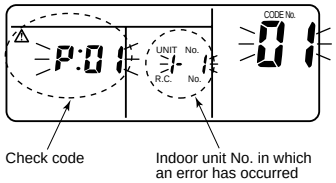
- Activation of the power supply causing the unit to operate in an unstable fashion (power on, power off, power on, power off etc).
- The main power fuse often blows out, or circuit breaker is often activated.
- Foreign matters or water have entered the unit by mistake.
- When the unit fails to operate after the protective device (circuit breaker) has been removed. Not recommended.
- Other unexplained symptoms or unit abnormalities, that cannot be explained.

Confirmation and check

When a error has occurred in the air conditioner, the check code and the indoor unit No. will appear on the display part of the remote controller.

The check code is only displayed during while the unit is operating.

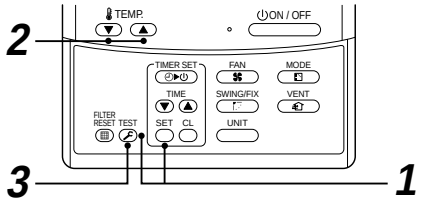
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

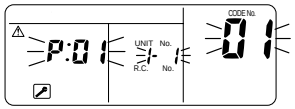


Confirmation of error history

When a error has occurred on the air conditioner, the error history can be confirmed with the following procedure. (Up to 4 errors can be stored in the memory of the remote controller.)

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



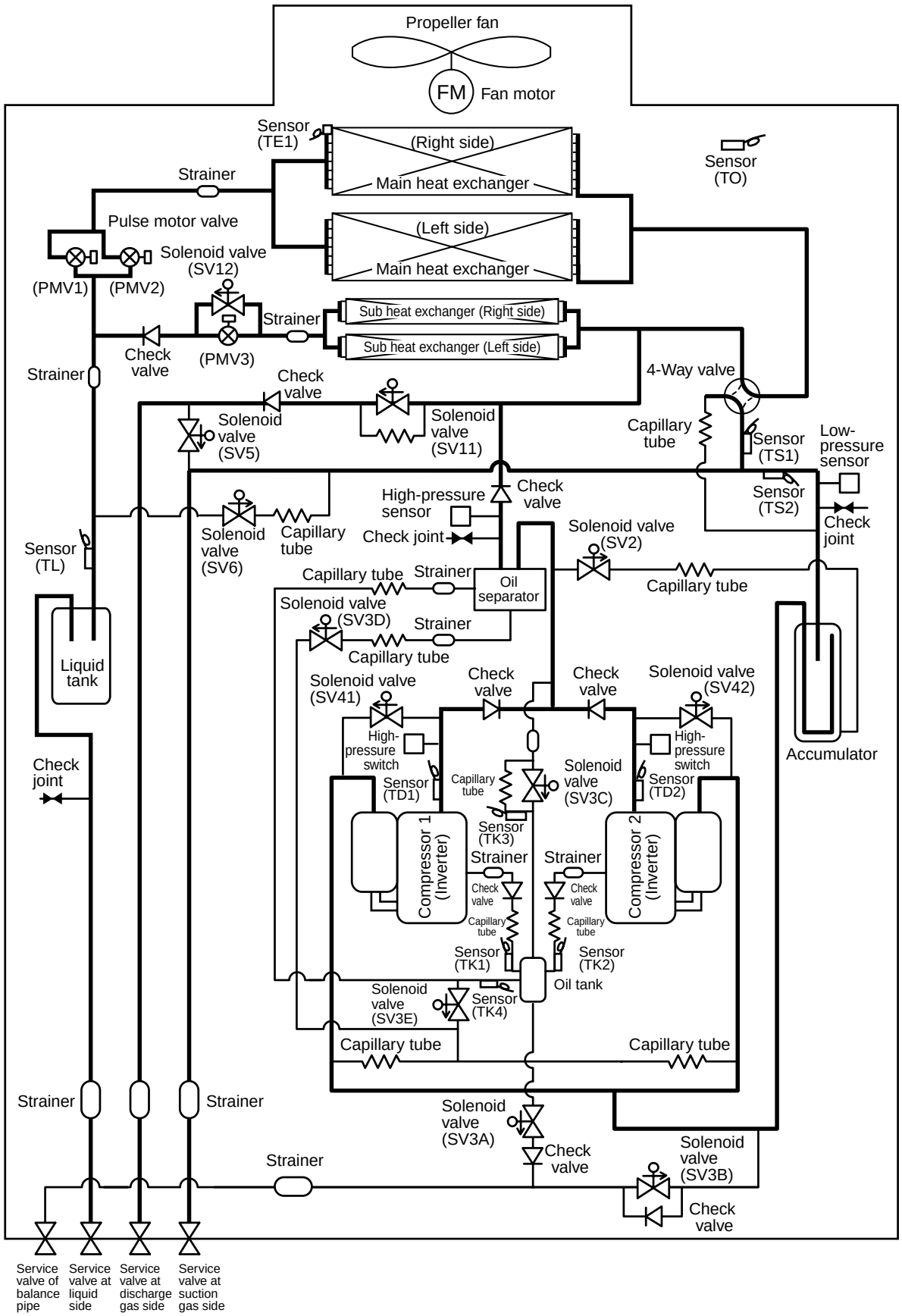
Procedure	Description	
1	When pushing the SET and TEST buttons at the same time for 4 seconds or more, the following display will appear. If [Service check] is displayed, the mode enters into the change error history mode. • [01 : Order of error history] is displayed in CODE No. window. • [Check code] is displayed in CHECK window. • [Indoor unit address in which the error has occurred] is displayed in UNIT No.	
2	For every push of the (▼) , (▲) button used to set temperature, the trouble history stored in memory is displayed in order. The numbers in CODE No. indicate CODE No. [01] (latest) → [04] (oldest). **CAUTION** Do not push the CL button because all the error history of the indoor unit will be deleted.	
3	After confirmation, push the TEST button to return to the normal display.	

1. Check the error codes according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner.
3. More details of the service codes are explained in the Service Manual.

4. REFRIGERANT PIPING SYSTEMATIC DRAWING

4-1. Inverter Unit (8, 10, 12HP)

Model: MMY-MAP0802FT8, MAP1002FT8, MAP1202FT8



4-2. Explanation of Functional Parts

Functional part name		Functional outline
Solenoid valve	SV3A	(Connector CN324: Red) Closed : Allows oil to collect/remain in the oil tank. Open : Allows oil to exit the oil tank.
	SV3B	(Connector CN313: Blue) Open : Allows oil to return to the outdoor unit via the balance pipe.
	SV3C	(Connector CN314: Black) Open : Pressurizes the oil tank..
	SV3D	(Connector CN323: White) Open : Supplies oil to the compressor from the oil separator.
	SV3E	(Connector CN323: White) Open : Turns on during operation and balances oil between compressors.
	SV2	(Hot gas bypass) (Connector CN312: White) 1) Low pressure release function 2) High pressure release function 3) Gas balance function during stop time
	SV4 1 SV4 2	(Gas balance control for compressor start-up) (Connector CN311: Blue) 1) For gas balance start 2) High pressure release function 3) Low pressure release function
	SV5	(Connector CN310: White) 1) Increase of No. of heating indoor units, Gas balance function in defrost time 2) Low-pressure balance function of discharge gas pipe during all cooling operation
	SV6	(Connector CN309: White) 1) Liquid bypass function for discharge temp. release (Cooling bypass circuit)
	SV11	(Connector CN322: White) 1) For shutdown discharge gas (During all cooling operation and defrost operation)
	SV12	(Connector CN319: White) 1) Flow-rate control function of refrigerant to sub heat exchanger during simultaneous operation 2) Flow-rate control function of refrigerant to sub heat exchanger during defrost operation
4-way valve		(Connector CN317: Blue) 1) Cooling/Heating selection 2) Reverse defrost 3) Main-/Sub-heat exchanger selection
Pulse motor valve	PMV1, 2	(Connector CN300, 301: White) 1) Super heat control function during all heating operation and mainly heating, partly cooling operation 2) Under-cool adjustment function during all cooling operation 3) Divided flow control function during mainly cooling, partly heating operation
	PMV3	(Connector CN302: Red) 1) For flow-rate control of sub heat exchanger during simultaneous operation (Control function of heating divided flow) 2) A function preventive high pressure up during all cooling or all heating operation
Oil separator		1) Prevention for early drop of oil level (Decrease of flow-out of discharge oil to cycle) 2) Reserve function of surplus oil
Temp. sensor	TD1, TD2	(TD1: Connector CN502: White, TD2: Connector CN503: Pink) 1) Protection of compressor discharge temp. 2) Releasing of discharge temp.
	TS1	(Connector CN504: White) 1) Controls super heat of PMV1 and 2 during all heating operation and simultaneous operation
	TS2	(Connector CN522: Black) 1) Controls indoor oil recovery during all cooling operation and mainly cooling, partly heating operation 2) Detects overheat of cycle.
	TE	(Connector CN505: Green) 1) Controls defrost during all heating operation and simultaneous operation. 2) Controls outdoor fan during all heating operation and simultaneous operation.
	TK1, TK2, TK3, TK4,	(TK1: Connector CN514: Black, TK2: Connector CN515: Green, TK3: Connector CN516: Red, TK4: Connector CN523: Yellow) 1) Judges oil level of compressor.
	TL	(Connector CN521: White) 1) Detects under-cool during all cooling operation and simultaneous operation.
	TO	(Connector CN507: Yellow) 1) Detects external ambient temperature.

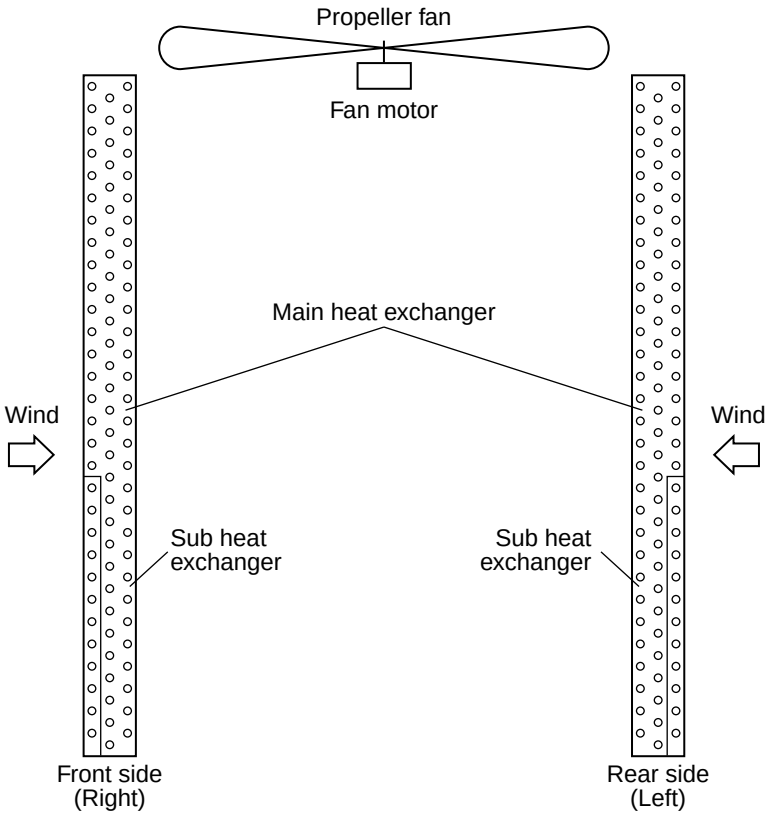
Functional part name		Functional outline
Pressure sensor	High pressure sensor	(Connector CN501: Red) 1) Detects high pressure and uses it to control the capacity of the compressor. 2) Detects high pressure during all cooling operation and uses it to control the fan when cooling with low outside air. 3) Detects under-cool of the indoor unit of which heating thermo.-ON during all heating operation and simultaneous operation. 4) Controls outdoor fan rpm during mainly cooling, part heating operation.
	Low pressure sensor	(Connector CN500: White) 1) Detects low pressure and uses it to control capacity of the compressor during all cooling operation and simultaneous operation 2) Detects low pressure and uses it to controls super heat during all heating operation and simultaneous operation
Heater	Compressor case heater	(Compressor 1 Connector CN316: White, Compressor 2 Connector CN315: Blue) 1) Prevents liquid accumulation in the compressor
	Accumulator case heater	(Connector CN321: Red) 1) Prevents liquid accumulation to accumulator
Balance pipe		1) Oil balancing pipe between outdoor unit (This unit does not use this Balance pipe.)

Operation mode

Operation mode	Outline
1. All Indoor Unit(s) Operating for Cooling	Only cooling operation without heating operation Outdoor heat exchanger (Main heat exchanger) is used as a condenser.
2. All Indoor Unit(s) Operating for Heating	Only heating operation without cooling operation Outdoor heat exchanger (Main heat exchanger) is used as an evaporator.
3. Simultaneous operation	MIU for simultaneous operation
3-1. Mainly cooling, partly heating operation	Cooling/heating simultaneous operation with subjective cooling operation Outdoor heat exchanger (Sub heat exchanger) is used as a condenser.
3-2. Mainly heating, partly cooling operation	Cooling/heating simultaneous operation with subjective heating operation Outdoor heat exchanger (Main heat exchanger) is used as an evaporator.
4. Defrost	Using the reversing operation of the 4-way valve, ice on the outdoor heat exchanger is dissolved within a single cooling cycle.

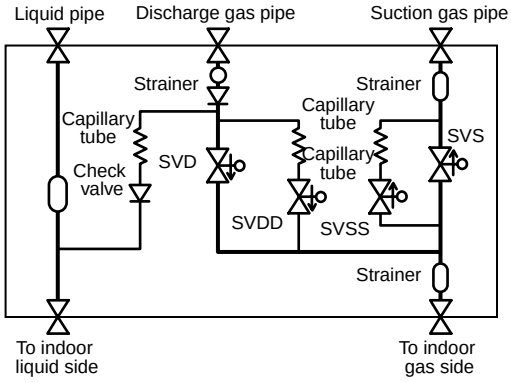
For details of operation mode, refer to page 53 to 59.

Configuration of outdoor unit heat exchanger



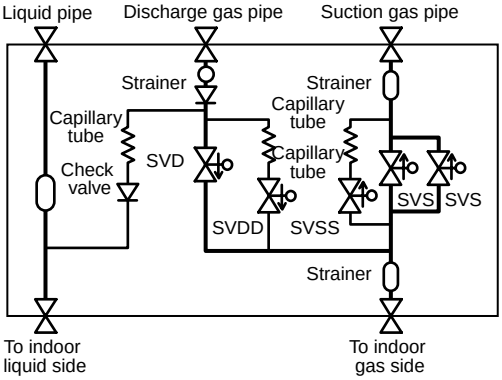
Flow Selector Unit (FS Unit)

RBM-Y1122FE



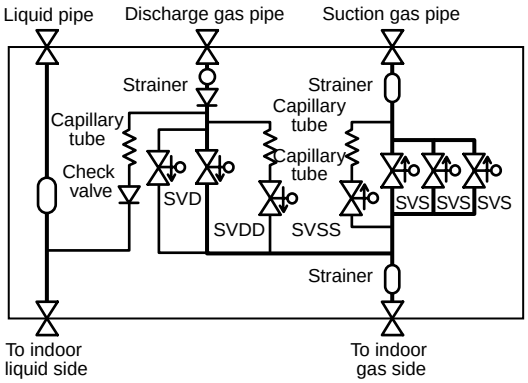
RBM-Y1802FE

* RBM-Y1801FE has two “SVS” valves.



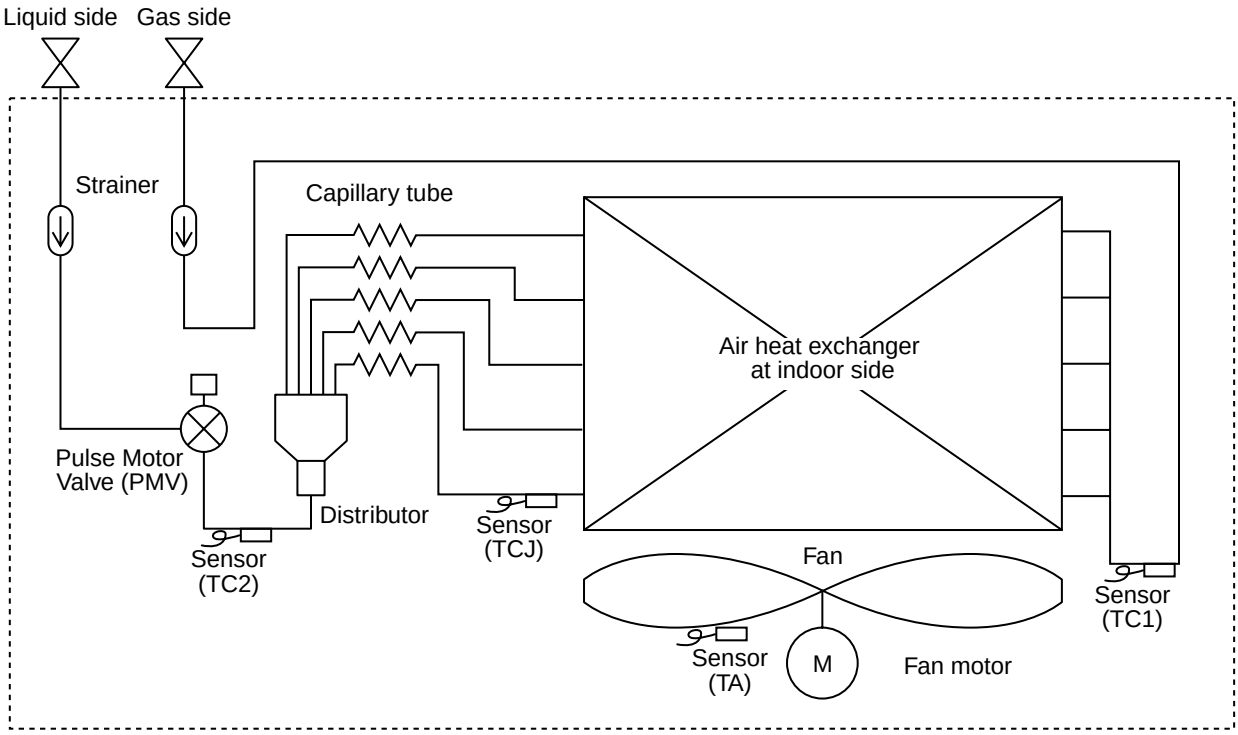
RBM-Y2802FE

* RBM-Y2802FE has three “SVS” valves and two “SVD”.



Functional part name		Functional outline
Solenoid valve	SVD	(Discharge gas block valve) 1) High pressure gas circuit during heating operation
	SVS	(Suction gas block valve) 1) Low pressure gas circuit during cooling operation
	SVDD	(Pressure valve) 1) For pressurizing when No. of heating indoor units increases.
	SVSS	(Reducing valve) 1) For recovery of refrigerant of the stopped indoor unit of which cooling thermo-OFF 2) For reducing pressure when a No. of heating indoor units decreases.

4-3. Indoor Unit



(NOTE) MMU-AP0071YH to AP0121YH type air conditioners have no TC2 sensor.

Functional part name		Functional outline
Pulse Motor Valve	PMV	(Connector CN082 (6P): Blue) 1) Controls super heat in cooling operation 2) Controls under cool in heating operation 3) Recovers refrigerant oil in cooling operation 4) Recovers refrigerant oil in heating operation
Temp. sensor	1. TA	(Connector CN104 (2P): Yellow) 1) Detects indoor suction temperature
	2. TC1	(Connector CN100 (3P): Brown) 1) Controls PMV super heat in cooling operation
	3. TC2	(Connector CN101 (2P): Black) 1) Controls PMV under cool in heating operation
	4. TCJ	(Connector CN102 (2P): Red) 1) Controls PMV super heat in cooling operation 2) [MMU-AP0071 to AP0121YH only] Controls PMV under cool in heating operation

5. SYSTEM REFRIGERANT CYCLE DRAWING

5-1. Refrigerant Piping Systematic Diagram in System

Selection of operation mode

For the selection of each operation mode, refer to the below table:

"Stop Once" this means the system does not operate for 3 minutes **after operation before update has stopped**.

		After update			
		All cooling operation (OFF)	**Mainly cooling, partly heating cooperation (ON)**	**Mainly heating, partly cooling operation (ON)**	**All heating operation (ON)**
Before update	All cooling operation (OFF)		Operation continues (OFF → ON)	Operation continues (OFF → ON)	Stop Once (OFF → ON)
	Mainly cooling, partly heating cooperation (ON)	Operation continues (ON → OFF)		Operation continues (As ON)	Operation continues (As ON)
	Mainly heating, partly cooling operation (ON)	Stop Once (ON → OFF)	Operation continues (As ON)		Operation continues (As ON)
	All heating operation (ON)	Stop Once (ON → OFF)	Operation continues (As ON)	Operation continues (As ON)	

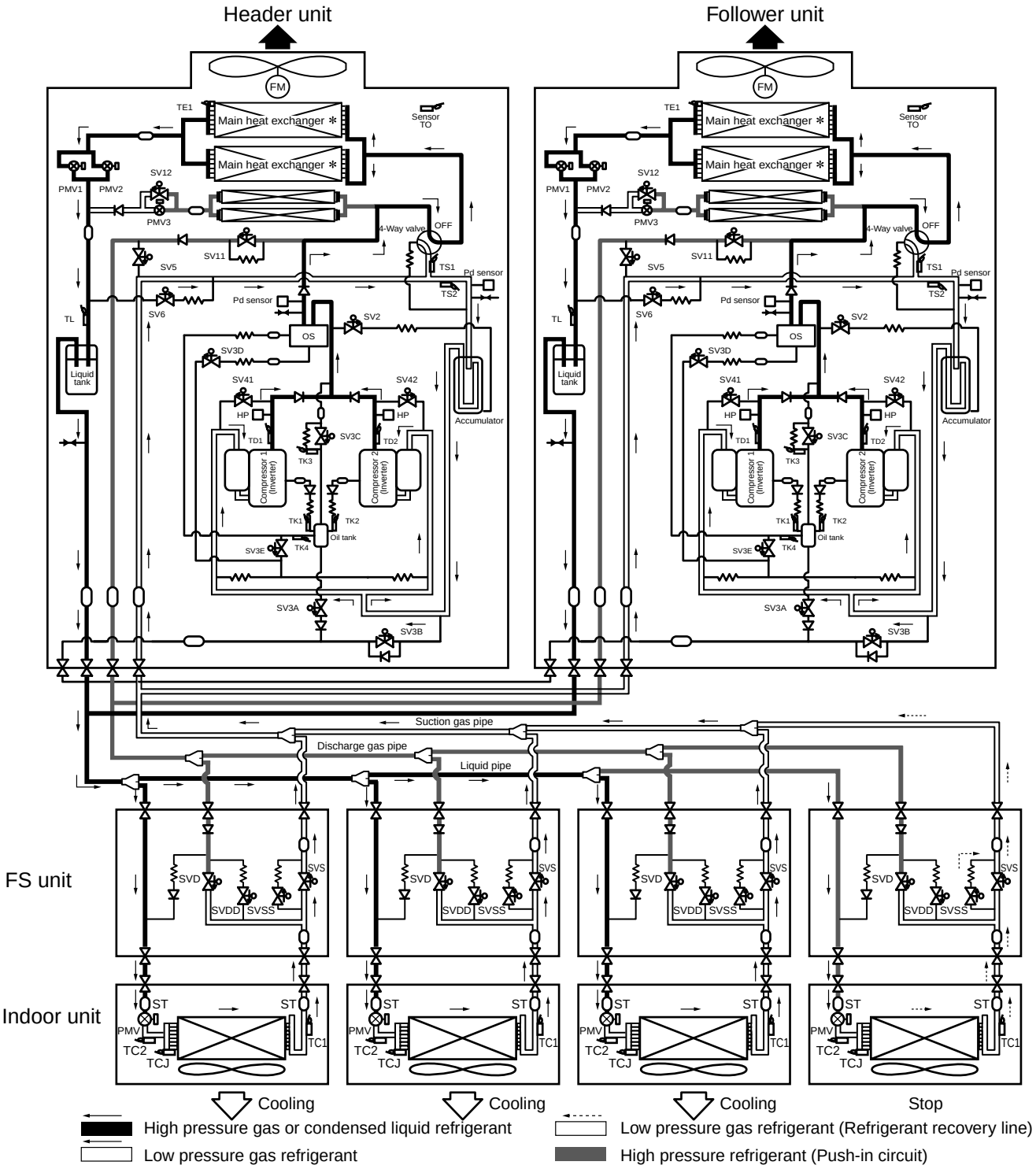
Note) Phrases in the parentheses of the table indicate the status of the 4-way valve.

ON-OFF list of Flow Selector Unit (FS Unit) valve

Indoor operation mode	**Outline of control valve output of FS unit (Basic operation)**			
	SVD (High pressure circuit valve)	**SVDD (Pressure valve <For delay>)**	**SVS (Low pressure circuit valve)**	**SVSS (Reducing valve <For delay>)**
1. Stop (Remote controller OFF) <All system stop>	OFF <OFF>	OFF <OFF>	OFF <OFF>	ON <OFF>
2. Cooling thermo-OFF	OFF	OFF	OFF	ON
3. Cooling thermo-ON	OFF	OFF	ON	ON
4. Heating thermo-OFF	ON	OFF	OFF	OFF
5. Heating thermo-ON				
6. "E04" error is being detected	OFF	ON	OFF	OFF

5-2. All cooling operation (Operation of cooling only)

In high outside temperature (10°C or more: Criterion)

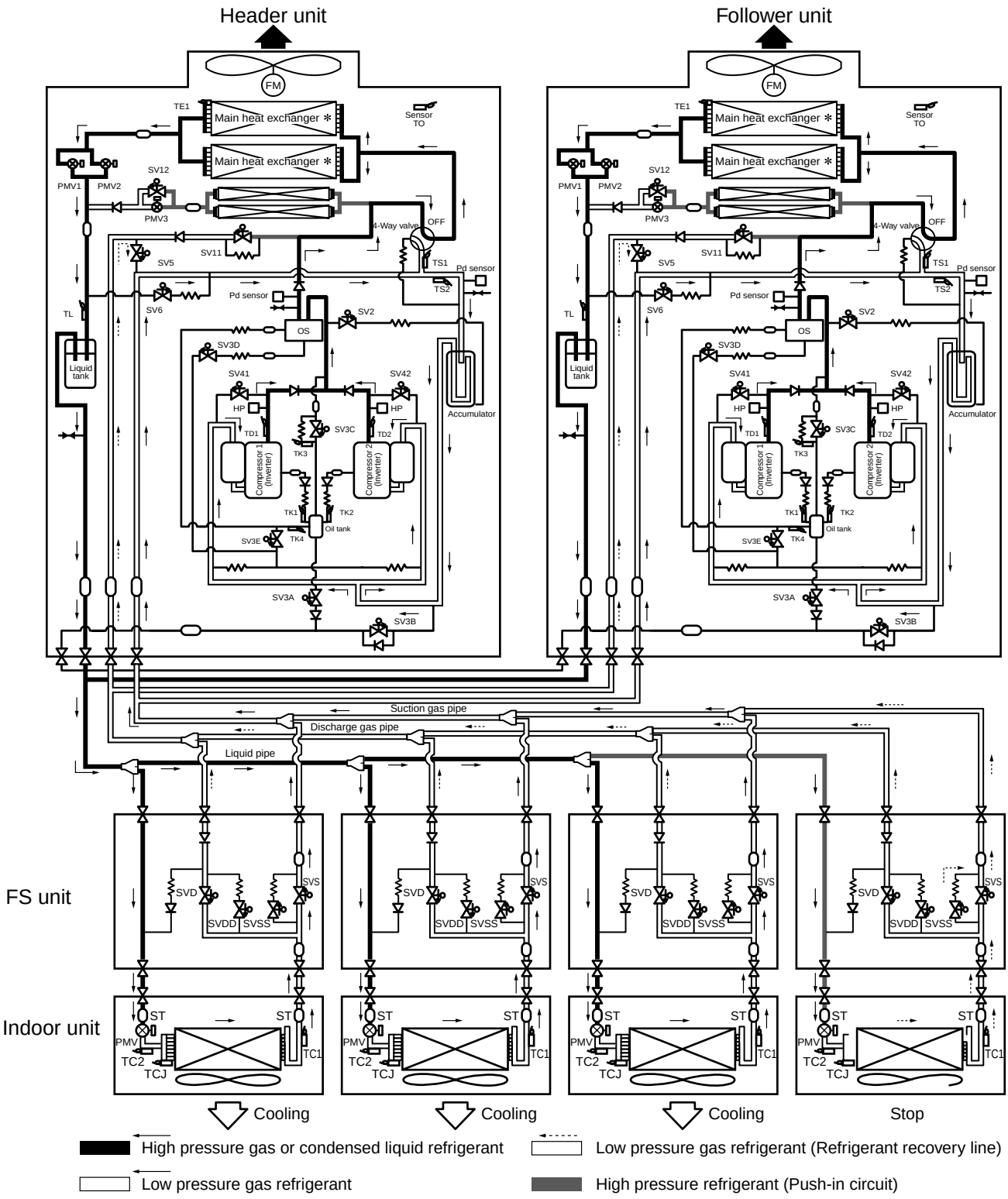


Outdoor unit			
4-way valve	OFF	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	OFF
SV5	OFF	SV3C	OFF
SV6	Control	SV3D	Control
SV11	ON	SV3E	ON
SV12	OFF	PMV1, 2	Control
Outdoor fan	Control	PMV3	Close

Flow selector/Indoor unit			
Cooling thermo.-ON		**Stop**	
SVD	OFF	SVD	OFF
SVS	ON	SVS	OFF
SVDD	OFF	SVDD	OFF
SVSS	ON	SVSS	ON
PMV	Control	PMV	Close

(Note 1) SV4 on the stopped compressor is ON.

In low outside temperature (15°C or less: Criterion)

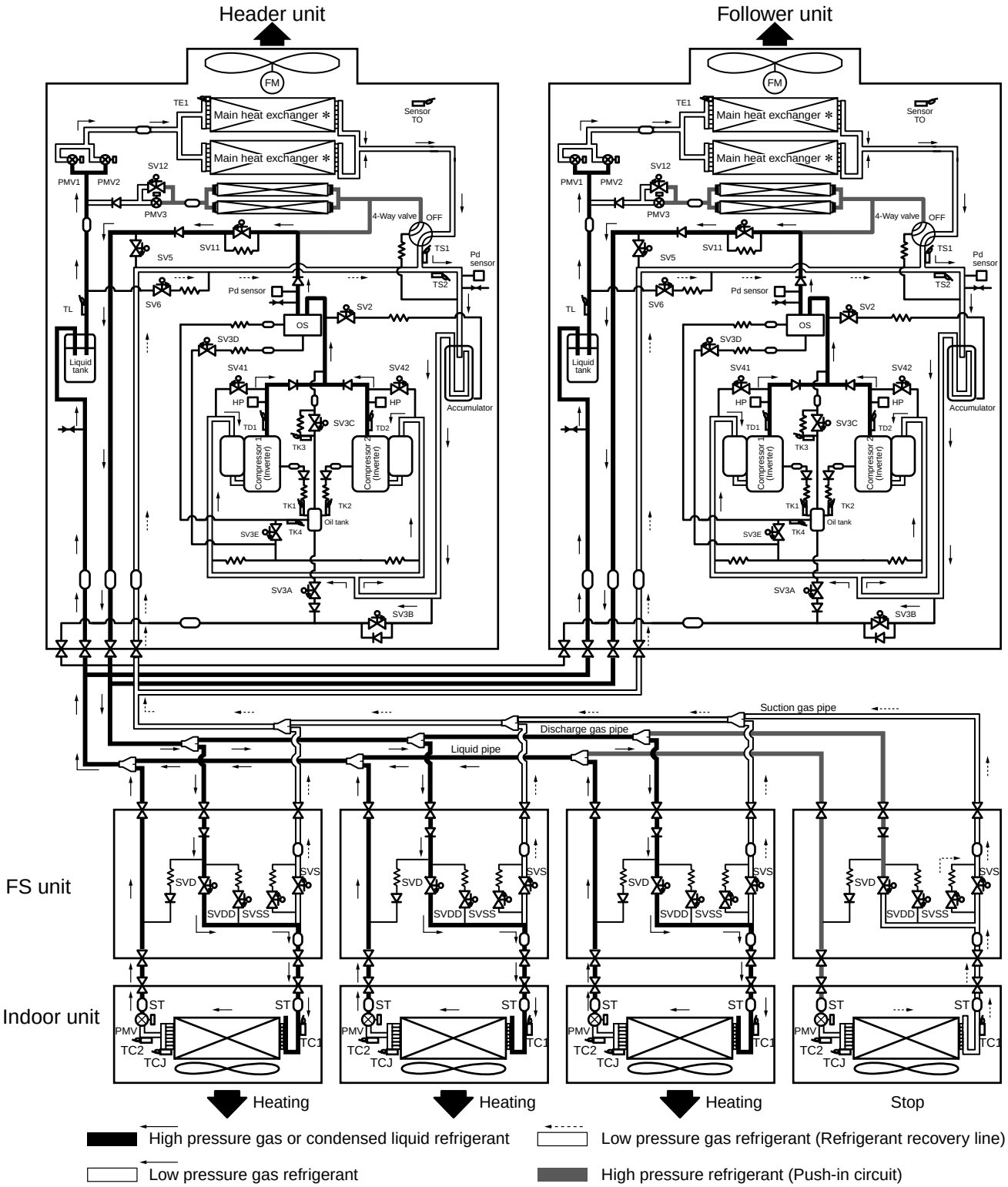


Outdoor unit			
4-way valve	OFF	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	OFF
SV5	ON	SV3C	OFF
SV6	Control	SV3D	Control
SV11	OFF	SV3E	ON
SV12	OFF	PMV1, 2	Control
Outdoor fan	Control	PMV3	Close

Flow selector/Indoor unit			
Cooling thermo.-ON		**Stop**	
SVD	OFF	SVD	OFF
SVS	ON	SVS	OFF
SVDD	OFF	SVDD	OFF
SVSS	ON	SVSS	ON
PMV	Control	PMV	Close

(Note 1) SV4 on the stopped compressor is ON.

5-3. All heating operation (Operation of heating only)



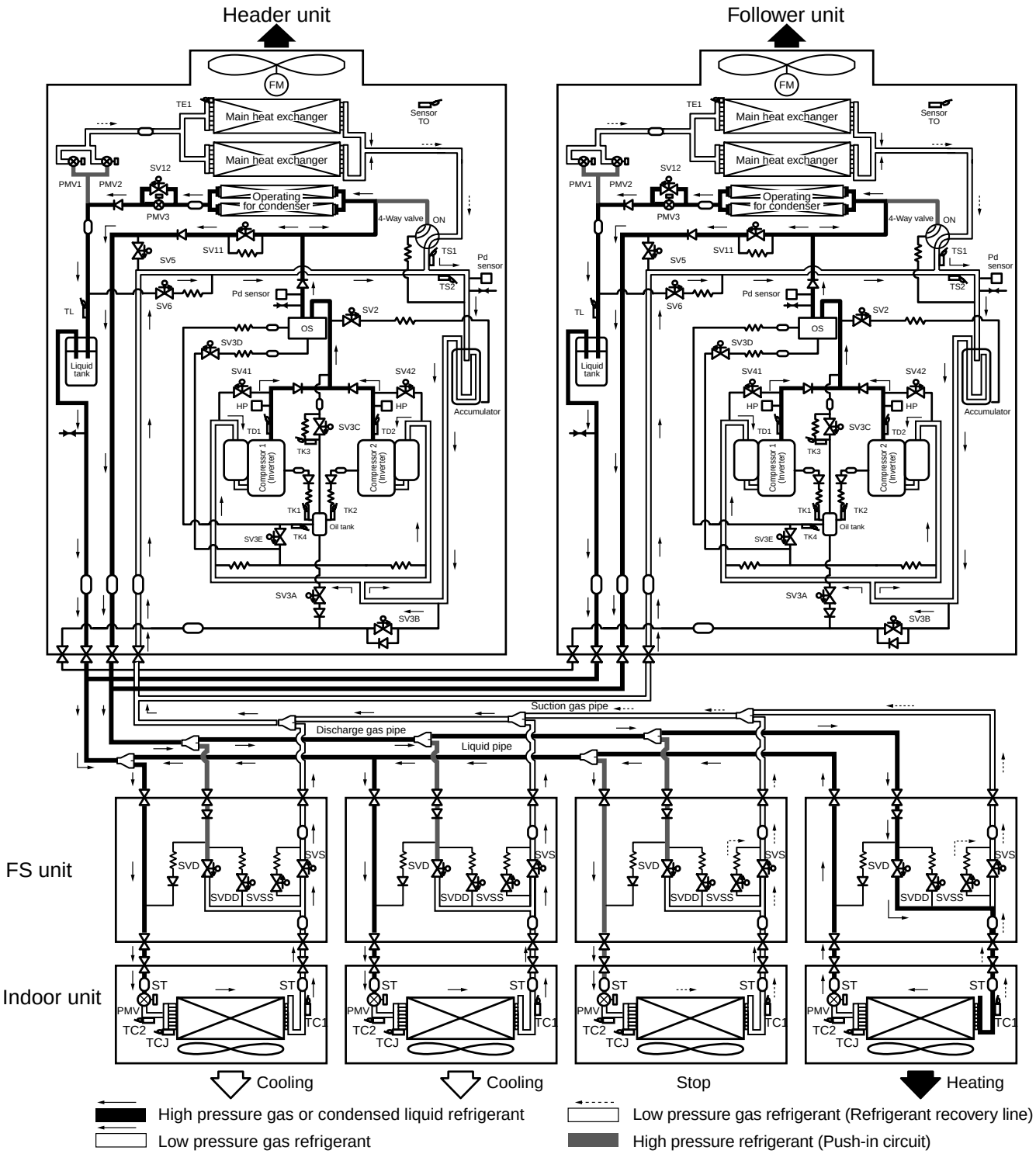
Outdoor unit			
4-way valve	OFF	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	ON
SV5	OFF	SV3C	OFF
SV6	Control	SV3D	Control
SV11	ON	SV3E	ON
SV12	OFF	PMV1, 2	Control
Outdoor fan	Control	PMV3	Close

Flow selector/Indoor unit					
Heating thermo.-ON		Heating thermo.-OFF		Stop	
SVD	ON	SVD	ON	SVD	OFF
SVS	OFF	SVS	OFF	SVS	OFF
SVDD	OFF	SVDD	OFF	SVDD	OFF
SVSS	OFF	SVSS	OFF	SVSS	ON
PMV	Control	PMV	Close	PMV	Close

(Note 1) SV4 on the stopped compressor is ON.

5-4. Mainly Cooling, Partly Heating Operation

(Cooling/heating simultaneous operation with subjective cooling operation)



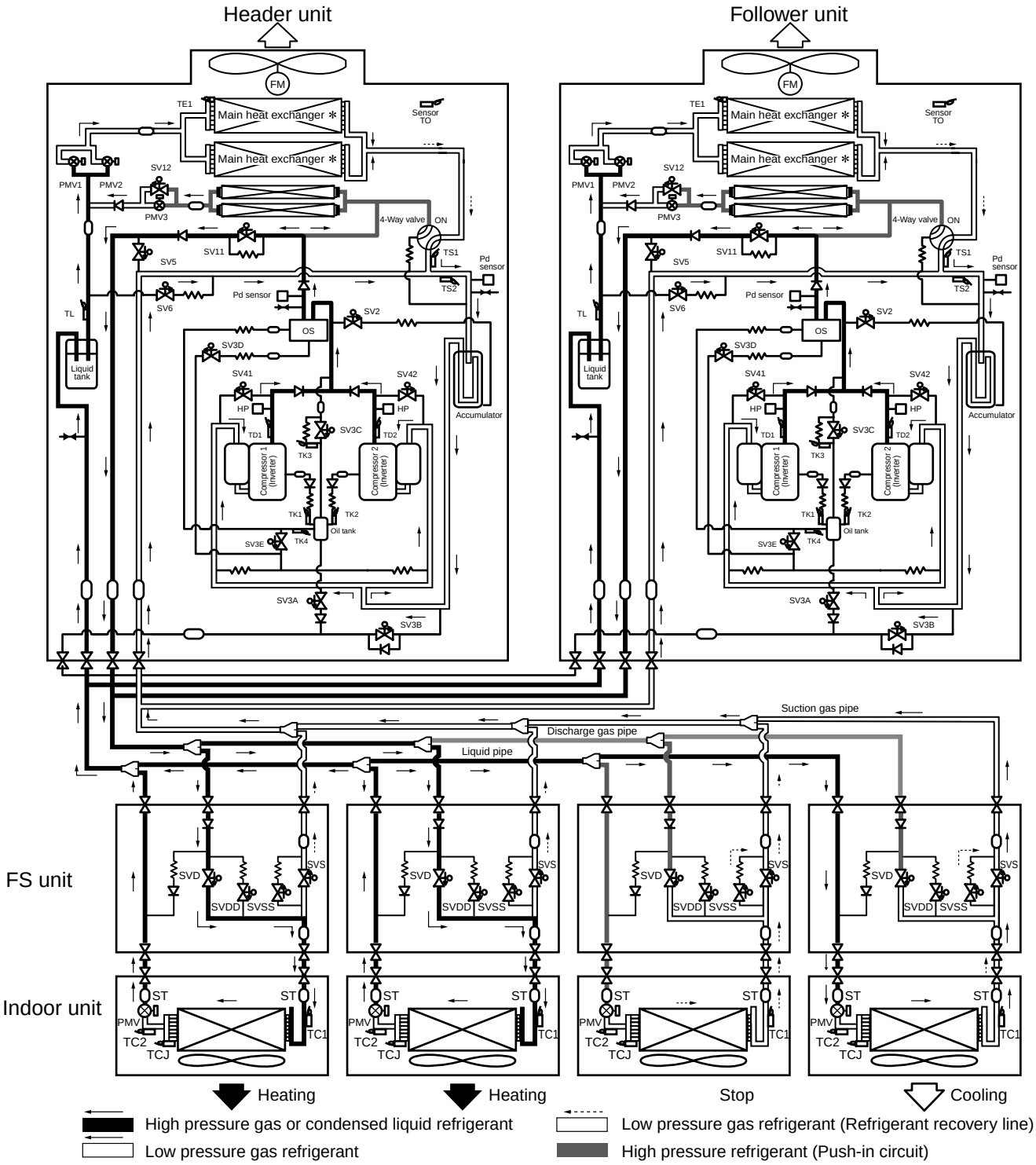
Outdoor unit			
4-way valve	ON	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	OFF
SV5	OFF	SV3C	OFF
SV6	Control	SV3D	Control
SV11	ON	SV3E	ON
SV12	Control	PMV1, 2	Close (Note 2)
Outdoor fan	Control	PMV3	Control

Flow selector/Indoor unit					
Cooling thermo.-ON		Heating thermo.-ON		Stop	
SVD	OFF	SVD	ON	SVD	OFF
SVS	ON	SVS	OFF	SVS	OFF
SVDD	OFF	SVDD	OFF	SVDD	OFF
SVSS	ON	SVSS	OFF	SVSS	ON
PMV	Control	PMV	Control	PMV	Close

(Note 1) SV4 on the stopped compressor is ON. **(Note 2)** May be controlled.

5-5. Mainly Heating, Partly Cooling Operation

(Cooling/heating simultaneous operation with subjective heating operation)

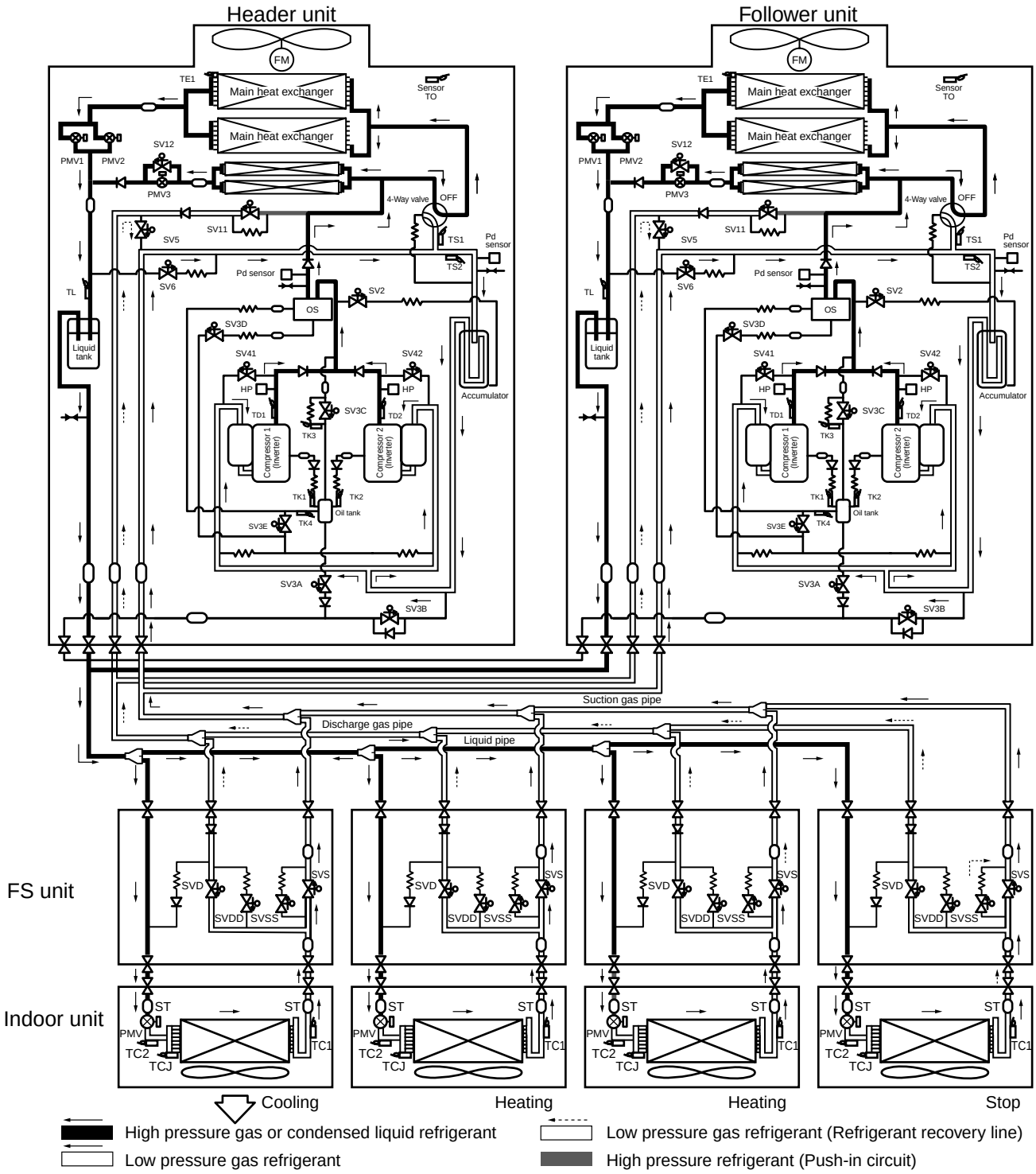


Outdoor unit			
4-way valve	ON	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	OFF
SV5	OFF	SV3C	OFF
SV6	Control	SV3D	Control
SV11	ON	SV3E	ON
SV12	Close (Note 2)	PMV1, 2	Control
Outdoor fan	Control	PMV3	Close (Note 2)

Flow selector/Indoor unit					
Cooling thermo.-ON		Heating thermo.-ON		Stop	
SVD	OFF	SVD	ON	SVD	OFF
SVS	ON	SVS	OFF	SVS	OFF
SVDD	OFF	SVDD	OFF	SVDD	OFF
SVSS	ON	SVSS	OFF	SVSS	ON
PMV	Control	PMV	Control	PMV	Close

(Note 1) SV4 on the stopped compressor is ON. **(Note 2)** May be controlled.

5-6. Defrost



Defrost operation is carried out during all heating operation or Mainly heating, part cooling operation.

Outdoor unit			
4-way valve	OFF	SV3A	OFF
SV4 (n)	(Note 1)	SV3B	OFF
SV5	ON	SV3C	OFF
SV6	Control	SV3D	Control
SV11	OFF	SV3E	ON
SV12	Close	PMV1, 2	Control
Outdoor fan	Stop (Note 2)	PMV3	Control

Flow selector/Indoor unit			
Cooling thermo.-ON		**Others**	
SVD	OFF	SVD	OFF
SVS	ON	SVS	ON
SVDD	OFF	SVDD	OFF
SVSS	ON	SVSS	ON
PMV	Control	PMV	Control
Fan	Control	Fan	Stop

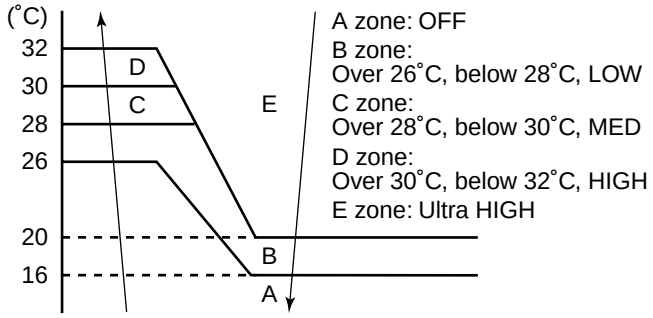
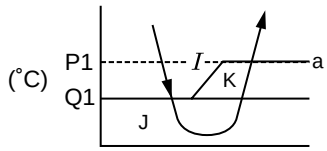
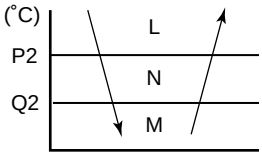
(Note 1) SV4 on the stopped compressor is ON. **(Note 2)** May be controlled.

6. CONTROL OUTLINE

6-1. Indoor Unit

6-1-1. Control Specifications

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>Power supply is reset.</td><td>(1) Identification of outdoor unit
When the power supply is reset, the outdoor units are individually identified and communication is established.
(2) Check code clear
When the power supply is reset, the check code is also reset.
If an abnormal status is still present upon restart the check code will be displayed again on the remote controller.</td><td></td></tr>
<tr><td>2</td><td>Operation select</td><td>(1) Based upon the operation command received from the remote controller or central controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Stops air conditioner.</td></tr>
<tr><td>FAN</td><td>Fan only operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>DRY</td><td>Dry operation ∗</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>COOL/HEAT AUTO</td><td>COOL/HEAT AUTO operation</td></tr>
</table>
Heating operation is automatically selected with difference between the set point temperature and room temperature.</td><td>∗ Concealed Duct High Static Pressure type air conditioner cannot operate in drying mode.</td></tr>
<tr><td>3</td><td>Room temp. control</td><td>(1) Set point temperature adjustment range on remote controller (°C)
<table>
<tr><th></th><th>Allcooling</th><th>All heating</th></tr>
<tr><td>Wired type</td><td>18 to 29°C</td><td>18 to 29°C</td></tr>
<tr><td>Wireless type</td><td>18 to 30°C</td><td>16 to 30°C</td></tr>
</table>
(2) The set point temperature in heating operation can be offset using item code (DN) 06.
<table>
<tr><td>Setup data</td><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 at shipment
<table>
<tr><td>Setup data</td><td>2</td></tr>
</table></td><td>Heating suction temperature shift</td></tr>
<tr><td>4</td><td>Automatic capacity control</td><td>(1) The difference between the temperature reading taken from the Ta (room) sensor and the Ts (set point) selected on the remote controller is used to determine the demand frequency to the outdoor unit.</td><td></td></tr>
<tr><td>5</td><td>Air volume control</td><td>(1) The remote controller is used to select the modes “HIGH (HH)”, “MED (M)”, “LOW (L)” or “AUTO”.
(2) The difference between the temperature reading taken from the Ta (room) sensor and the Ts (set point) selected is used to control the air volume setting when in “AUTO” mode.</td><td>HH > H+ > H > L+ > L > LL</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
6	Prevention of cold air discharge	(1) In all heating operation, the upper limit of the fan tap is set by one with higher temperature of TC2 sensor and TCJ sensor. • When B zone has continued for 6 minutes, the operation shifts to C zone. • In defrost time, the control point is set to +6°C. 	• In D and E zones, priority is given to remote controller air speed setup. • In A and B zones, "❁" is displayed.
7	Freeze prevention control (Low temp. release)	(1) In all cooling operation, the air conditioner operates as described below based upon temp. detected by TC1, TC2 and TCJ sensors. To prevent the heat exchanger from freezing, the operation stops. • When "J" zone is detected for 5 minutes, the command frequency becomes "S0" to the outdoor unit. • In "K" zone, the timer count is interrupted, and held. • When "*I*" zone is detected, the timer is cleared and the operation returns to the normal operation. • When the command frequency became S0 with continuation of "J" zone, operation of the the indoor fan in LOW mode until it reaches the "*I*" zone. It is reset when the following conditions are satisfied. **Reset conditions** 1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C 2) 30 minutes passed after stop.  | | TC1 | |---|---| | P1 | 10°C (5°C) | | Q1 | 0°C | (2) In all cooling operation, the air conditioner operates as described below based upon temp. detected by TC2 and TCJ sensors. • When "M" zone is detected for 45 minutes, the command frequency becomes "S0" to the outdoor unit. • In "N" zone, the timer count is interrupted and held. • When shifting to "M" zone again, the timer count restarts and continues. • If "L" zone is detected, the timer is cleared and the operation returns to normal operation. **Reset conditions** 1) TC1 ≥ 12°C and TC2 ≥ 12°C and TCJ ≥ 12°C 2) 30 minutes passed after stop.  | | TC2, TCJ | |---|---| | P2 | 5°C | | Q2 | –2.0°C |	∗ In a Model without TC2, TC2 is not judged.

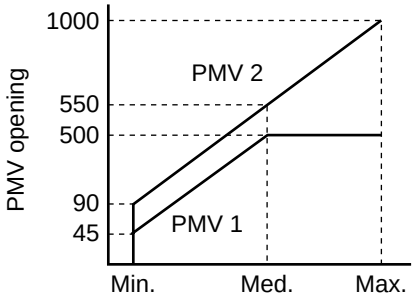
No.	Item	Outline of specifications	Remarks
8	Recovery control for cooling refrigerant and oil	(1) The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode opens PMV of the indoor unit by the specified opening degree when cooling refrigerant or oil recovery signal is received from the outdoor unit. (2) Drain pump of 4-way air discharge cassette type and concealed duct type operate during recovery control mode.	• Recovery operation is usually executed every 2 hours.
9	Recovery control for heating refrigerant and oil	The indoor unit which stops operation, thermostat is OFF, or operates in FAN mode performs the following controls when the heating refrigerant/Oil recovery signal is received from the outdoor unit. 1) Opens PMV of the indoor unit by the specified opening degree. 2) Stops the fan. 3) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approximately 1 minute after recovery control. 4) Only 4-way Air Discharge Cassette type air conditioner rotates the indoor fan with intermittent operation for approximately 1 minute after recovery control as the outdoor unit. 5) After recovery control, drain pump of 4-way air discharge cassette type and concealed duct type will operate.	• In the indoor unit which thermostat is OFF, or operates in FAN mode, "⏻" lamp goes on. • Recovery operation is usually executed every 1 hour.
10	Short intermittent operation compensation control	(1) For 5 minutes after the operation has started, the operation is continued even if entering thermostat-OFF condition. (2) However, if the thermostat has been turned off by changing the set up temp., the thermostat is OFF with even the above condition. The protective control has priority.	
11	Drain pump control	(1) During "COOL" operation (including DRY operation), the drain pump operates. (2) While the drain pump operates, if the float switch works, the drain pump continues operation and a check code is displayed. (3) While the drain pump stops, if the float switch works, turn off the capacity demand command, stop the operation, and operate the drain pump. If the float switch continues operating for approx. 5 minutes, the operation stops and the check code is displayed. (4) In heating operation, if humidifier "provided" is judged, compressor "ON", compressor "ON", fan "ON", and MAX (TC2, TCJ) > 33°C, the drain pump operates.	Check code [P10]
12	Elimination of remaining heat	(1) When the air conditioner stops in the "HEAT" mode, drive the indoor fan with "LOW" mode for approx. 30 seconds.	
13	Auto louver control	(1) When the louver signal has been received from the remote controller, the louver operates if the indoor fan is operating. (2) In 4-way Air Discharge Cassette type, the discharge louver automatically directs downward if the operation stops. (3) In 4-way Air Discharge Cassette type, the discharge louver directs upward if the heating operation is being prepared.	
14	Filter sign display (None in wireless type) * Provided in the separately laid type TCB-AX21E.	(1) The operation time of the indoor fan is integrated and stored in memory, and the filter exchange signal is sent to the remote controller to display on the remote controller LCD after the specified time. (2) When the filter reset signal is received form the remote controller, time of the integrated timer is cleared. In this time, if the specified time has passed, the measured time is reset and LCD display disappears.	

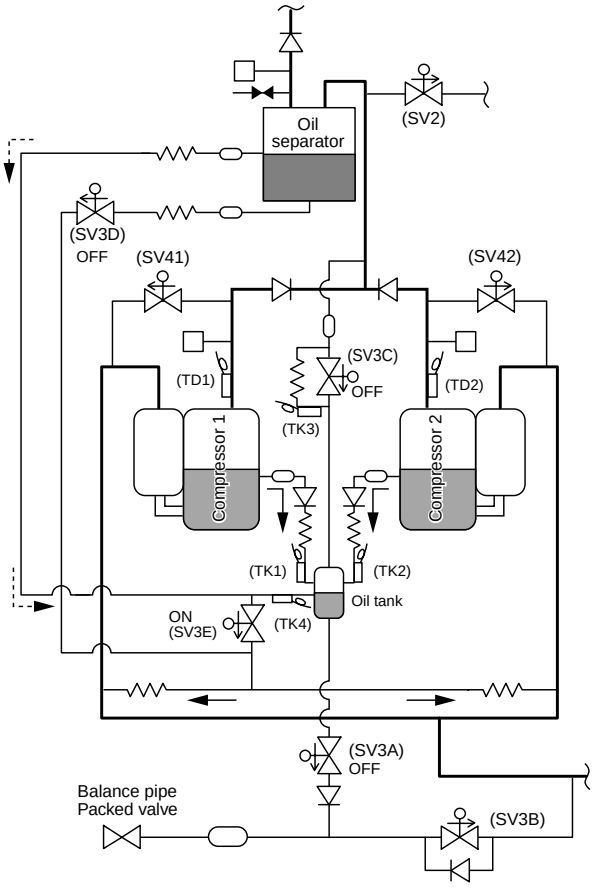
No.	Item	Outline of specifications	Remarks
15	"⏻" and "❋" display (Operation and heating stand-by)	**<Operation standby> .....** Display on remote controller (1) • "P05" is one of displays of power wire missing. • "P05" of power cable is detected. • "COOL/DRY" operation cannot be performed because the other indoor unit is under "HEAT" operation. • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 1-bit is ON) and the other indoor unit is under "COOL/DRY" operation. • "FAN" operation cannot be performed because the system performs "Heat oil/Refrigerant recovery" operation. • There is a unit in which indoor overflow "P10" is detected. • There is a unit in which interlock alarm "P23" is detected. (2) The above indoor units unavailable to operate waits under condition of thermostat OFF. **<HEAT standby> .....** Display on remote controller (1) • HEAT thermostat is OFF. • During HEAT operation, the fan rotates with lower air speed than one specified in order to prevent discharge of cold draft or stops. (including case that defrost operation is being performed) • "HEAT" operation cannot be performed because COOL priority is set (Outdoor I/F P.C. board SW11 bit 1 is ON) and the other indoor unit is under "COOL/DRY" operation. (2) "HEAT standby" is displayed until the above conditions are released.	• "⏻" goes on. • "❋" goes on.
16	Selection of central control mode	(1) The contents which can be changed on the remote controller at indoor unit side can be selected by setup at the central controller side. (2) In case of operation from TCC-LINK central controller (TCB-SC642TLE, etc.) **[Central control mode 1]** : Cannot operate **[Central control mode 2]** : Cannot operate, stop, select mode, set up temp. **[Central control mode 3]** : Cannot select mode, set up temp. **[Central control mode 4]** : Cannot select mode (3) RBC-AMT21E (Wired remote controller) While mode is the central control mode, "CENTRAL" lights on the display part of the remote controller.	If operation is performed from the remote controller "CENTRAL CONTROL" mode, the status is notified with receiving sound.

6-2. Outdoor Unit

6-2-1. Operation Start/Operation End

The compressor, solenoid valve, pulse motor valve (PMV), outdoor fan, etc. are controlled by a command from the indoor controller. The follower outdoor unit starts/stops by a command from the header outdoor unit.

No.	Item	Operation explanation and applied data, etc.	Remarks
1	Pulse Motor Valve (PMV) control	(1) PMV control (using two PMV, 1 and 2) • Each PMV is controlled between 90 to 1000 pulses during operation. • In cooling operation, PMV opening is dependent upon detected readings from the TL sensor and Pd pressure sensor (sub-cool control). • In heating operation, PMV opening is dependent upon detected readings from the TS and TD sensors and the Ps pressure sensor (super-heat control). • Each PMV will be fully closed when the system is in 'Standby' or 'No demand' modes and when a malfunction in the system has occurred.  (2) PMV3 control 1) PMV3 (Pulse Motor Valve 3) is controlled between 0 to 500 pulses during mainly cooling, part heating or mainly heating, part cooling operation. 2) PMV3 opening is controlled according to the demand capacity difference (HP) between the cooling capacity and the total heating capacity. 3) The PMV will be fully closed when the system is in 'Standby' or 'No demand' modes and when a malfunction in the system has occurred.	• During heating operation, PMV2 is 0 pulses and PMV may be controlled with only PMV 1, with a minimum of 45 pulses.
2	Outdoor fan control	(1) Fan control in all cooling operation 1) The outdoor fan speed/mode is determined by the detected Pd pressure value. 2) When cooling operation has started, the outdoor fan speed of the master unit is controlled using the detected Pd pressure value. (2) Fan control in all heating operation 1) The outdoor fan speed/mode is determined by the detected TE sensor value. 2) If a TE value > 25°C has been continuously detected for 5 minutes, the operation may stop. 3) After start up, this control is not available during the specified time after a defrost operation. 4) This operation may start and stop repeatedly when the system is undercharged. (3) Fan control for mainly cooling, part heating operation The outdoor fan speed (mode) is controlled according to the target of the Pd (Discharge pressure).	When TE temp. (ambient temperature) exceeds 25°C, Heating operation stops. • The maximum fan speed differs depending on the outdoor HP.

No.	Item	Operation explanation and applied data, etc.	Remarks
3	Capacity control	1) The capacity request command received from the indoor controller determines the inverter frequency control of the outdoor unit. 2) The two compressors in each outdoor unit swap starting order on successive operation.	• Min. frequency: 26Hz
4	Oil level detection control	1) Measurement of sensors TK1 to TK4 is used to determine whether the correct amount of oil is present in the compressor case. 2) A comparison of measurements taken from TK1/TK2 with that of TK3/TK4 is used to judge whether there is sufficient oil in the compressor case. If there is insufficient oil in the compressor case, the system switches to the oil equalizing control method. 3) This control is performed during compressor operation. 	• The detection is performed when one or both compressors are operated. • Adequate oil level (Standard) 1) The oil level of compressor 1 is adequate when TK1 - TK3 ≥ 15°C 2) The oil level of compressor 2 is adequate when TK2 - TK3 ≥ 15°C

No.	Item	Operation explanation and applied data, etc.	Remarks
5	Oil short protective control	This control is provided to prevent oil shortage occurring in the compressors of each outdoor unit. The control is achieved by ON/OFF operation of the solenoid valves SV3A, SV3B, SV3C and SV3D. (1) Oil-short protective control The oil shortage protection control function stops the outdoor unit, if an oil shortage continues for 30 minutes, after 2 minutes, 30 seconds the outdoor unit restarts. If this function is activated on 3 successive occasions, an error check code (H07) is generated and the outdoor unit is stopped.	• Oil accumulated in the oil separator is returned to the compressor.
6	Refrigerant/Oil recovery control	(1) During cooling operation, this function is executed to regularly to recover the refrigerant/oil from the indoor units and connecting pipe-work back to the outdoor unit. This function is also performed to prevent stagnated refrigerant accumulating in the outdoor heat exchanger during low ambient cooling. The control is managed by the header outdoor unit. 1) Control conditions • Cooling oil recovery operation is executed approximately every 2 hours. 2) Contents of control • The recovery period lasts for approximately 2 or 3 minutes though this is dependant on the system capacity. (2) Refrigerant recovery control in heating room This function is executed regularly to recover the liquid refrigerant from the indoor unit. It is also used to recover oil present in the outdoor heat exchanger during the heating overload operation (except during defrost operation). The control is managed by the header outdoor unit. 1) Heating operation oil, recovery control is executed approximately every hour. 2) The period of recovery lasts for approximately 2 to 10 minutes though this is dependent upon the load condition. (3) Control for refrigerating / whilst oil recovery in simultaneous operation. This function is executed to recover the refrigerating oil accumulated in the low-pressure gas inter-unit piping. (regardless of all cooling operation/all heating operation). 1) Control condition • When the combined time of the compressor-ON has reached 95 minutes in simultaneous operation. 2) Control contents When the conditions have been satisfied, upon changing the indoor unit mode from heating to cooling, (stop the indoor fan) the oil is recovered for a period between 2 minutes 30 seconds to 10 minutes. The indoor unit in cooling operation continues operation.	• Control for refrigerant/ oil recovery is performed approximately every 2 hours. • Recovery lasts for approximately 2 or 3 minutes though this is dependent upon the system capacity. • Heating operation, oil recovery is executed approximately every hour. • Recovery lasts for approximately 2 to 10 minutes though this is dependent upon the load condition.
7	Defrost control (Reverse cycle defrost method)	(1) Defrost start condition The defrost function is initiated when the measurement temperature taken from the TE sensor is lower than -2°C for a period of 25 minutes after compressor initial start up and 55 minutes after subsequent start ups. (2) Contents of control • If the outdoor units are combined, the minimum duration for the defrost operation is 2 minutes. (3) Defrost stop condition • The outdoor fan speed and compressor inverter frequency are determined by the measurement of Pd pressure during defrost operation.	• During the defrost operation, all solenoid 4-way valves are OFF and all compressors are operating.

No.	Item	Operation explanation and applied data, etc.	Remarks
8	Release valve control	(1) SV2 gas balance control In order to decrease the starting load on the compressor, SV2 valve is opened during the time the compressor is 'OFF', and the gas is balanced. (2) SV2 high pressure release control This function limits the pressure level during the low frequency operation of the inverter. (3) SV2 low pressure release control This function is used to prevent rapid pressure drop during transient operation of the unit. This is performed by the header unit only. The function is performed when required, except during 'No demand' status or when the system is in 'Standby'. (4) SV41, SV42 valves 1) SV41, 42 low-pressure release control This function is used to prevent pressure dropping to low. The function is performed during defrost operation, heat start up, all cooling operation, or mainly cooling or part heating operation. • Control contents (Defrost/heating start pattern) Turn on SV41 and SV42 when PS pressure ≤ 0.1MPa, and turn off SV41 and SV42 when PS pressure ≥ 0.15MPa. • Control contents (All cooling operation, Mainly cooling, part heating operation) Turn on SV41 and SV42 when PS pressure ≤ 0.14MPa and Pd pressure ≤ 1.8MPa, and turn off SV41 and SV42 when PS pressure ≥ 0.24MPa and Pd pressure ≥ 2.2MPa 2) High pressure release control This function is for gas bypass control which emergently prevents the high pressure cut. Turn on SV41 and SV42 when Pd pressure ≥ 3.5MPa, and turn off SV41 and SV42 when Pd pressure ≤ 3.45MPa. (5) SV6 valve 1) Cooling bypass control This function is a liquid refrigerant bypass control to suppress the rise of the discharge temperature or the inside temperature of the compressor. Turn on SV6 valve when the discharge temperature (TD1 or TD2) becomes 96°C or higher and turns off when it drops below 84°C by bypassing liquid refrigerant. (6) PMV3 1) High pressure release control (All heating operation) This function suppresses the rise of high pressure during the inverter low frequency operation when in all heating operation mode. Set up PMV3 opening to 45 pulses when Pd pressure = 3.45MPa. 2) High pressure release control (All cooling operation) Set up PMV3 opening to 60 pulses when Pd pressure = 3.5MPa.	
9	Frequency release control	(1) High pressure release control This function is to correct the operation command of the compressor and suppress the rise of high pressure. 1) Control contents The operation frequency is decreased by 1 step when Pd pressure ≥ 3.4MPa. It is decreased by 1 step every 10 seconds until Pd pressure drops below 3.4MPa. 2) Release condition • When Pd pressure ≤ 3.2MPa • When refrigerant recovery control starts in all heating mode • During defrost operation, stop, thermo OFF	

No.	Item	Operation explanation and applied data, etc.	Remarks
10	Compressor stop due to high pressure release	Each compressor is stopped should the Pd pressure sensor reach a value of 3.5 MPa. This control is performed by the header unit and any follower units.	
11	Case heater control	Heating is provided for both the compressor case and accumulator. When the compressor in any outdoor unit is stopped, the heater is switched on to prevent accumulation of refrigerant. After installation of a system, it should be powered for the specified period of time prior to operating a test run to prevent damage to the system. If the system has not been powered for a prolonged period of time, it is important to apply power for the specified period of time before resuming operation. This function is often performed in conjunction with the compressor winding heating control. When this occurs, a noise may be heard which is not an indication of a malfunction. (1) Contents of control • The function is performed during when the compressor is off. • When the TO sensor temp measures 28°C or higher the heater turns off and turns on when it change:measures 25°C or lower • The heater remains 'ON' for 10 minutes after the compressor has changed mode from Off to On.	
12	IPDU control	The IPDU controls the inverter compressor by communicating a command frequency that controls the compressor speed, depending on any active releases. The main controls of the IPDU P.C. board are: (1) Current release control Feedback from the AC input current sensor (CT) is used to prevent the inverter input current exceeding its specified limit (2) Heat sink temperature detection control • Feedback from the thermistor (TH) on the compressor driving module is used to prevent the IGBT from overheating. The highest value is taken from IPDU 1 and IPDU 2 TH sensors. (3) Over-current protective control • When an over-current condition is detected by the IPDU, the compressor is stopped. (4) Compressor case thermo control • The compressor stops when the compressor case thermostat is activated. • Whenever this condition occurs, a 1 count is added to the system error count. • After a period of 2 minutes and 30 seconds, the compressor is reactivated and the error count cleared if the operation continues without further error for a period of 10 minutes or more. • If the error count reaches 4, the check code [H04] is displayed (for compressor 1) and [H14] (for compressor 2).	• A TH sensor is provided in each two IPDU. • The case thermostat is normally closed and connected to interface P.C. board.
13	High pressure prevention control	(1) High pressure SW control • The high pressure switch is connected to the IPDU board and is in the normally closed condition. • When the high pressure switch is activated, the compressor is stopped. • Whenever this condition occurs, a 1 count is added to the system error count. • After a period of 2 minutes and 30 seconds, the drive to the compressor is reactivated and the error count is cleared if the operation continues with further error for a period of 10 minutes or more. • If the error count reaches 4, the check code [P04] is displayed.	

Other cautions

1. Cooling operation in low ambient temperatures

1) The indoor unit freeze prevention control system (TC sensor) may decrease the command frequency to the outdoor unit when low coil temperatures are detected.
2) The cooling capacity control may decrease the command frequency to the outdoor unit when low ambient temperature is detected.
3) When the discharge temperature sensor value reaches 60°C or below, the frequency may be increased above the required demand from the indoor unit.

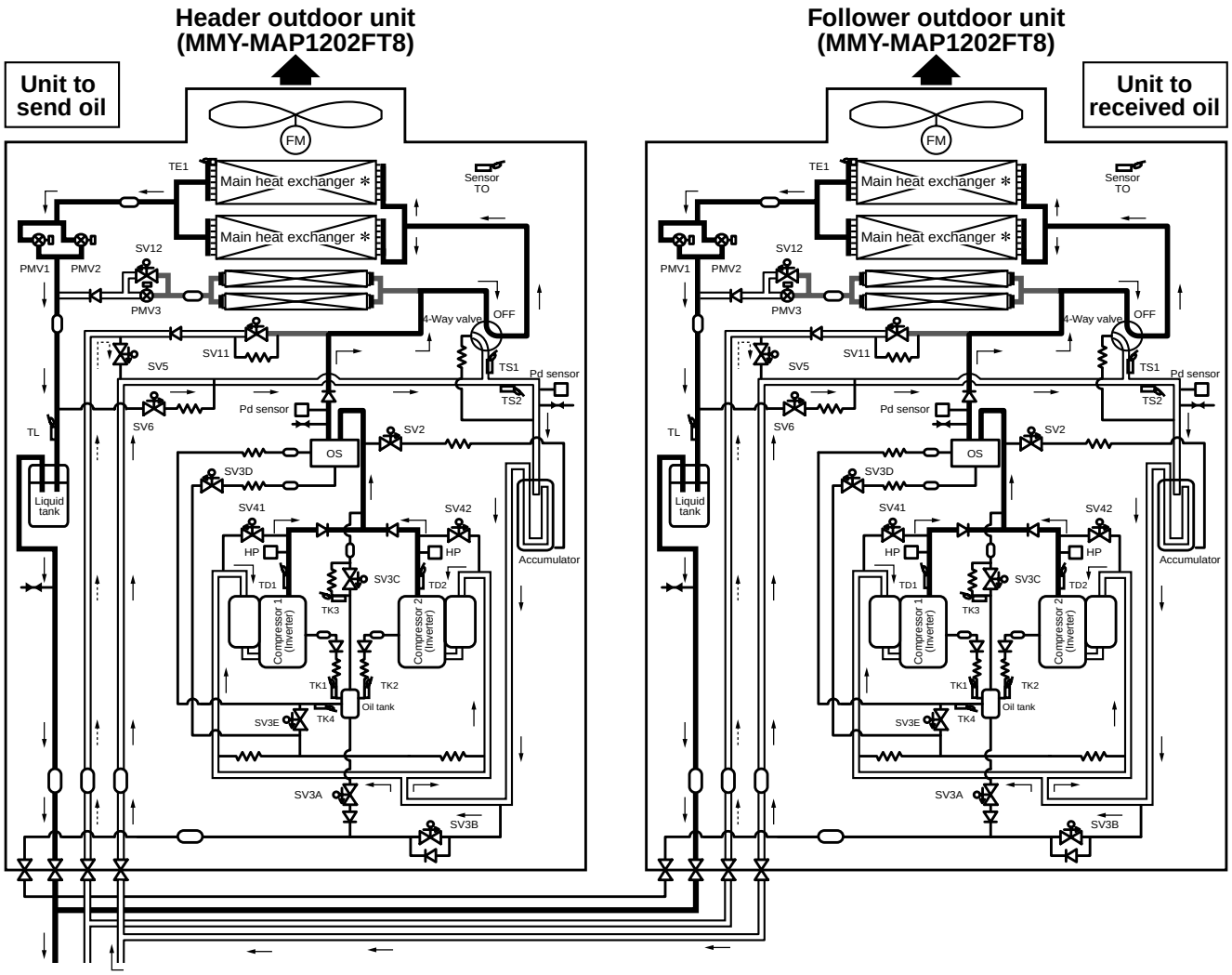
2. PMV (Pulse Motor Valve) for outdoor unit

1) When the system power is turned on an audible “clicking” sound is omitted due to the PMV initialising, this is a normal condition. When the outdoor unit is situated near other sources of noise, this sound may not be noticeable.
2) Do not remove the driving part (head) of the PMV during operation as it may cause the PMV to malfunction.
3) When transporting or replacing the outdoor unit, never keep the driving part (head) removed from the PMV body as the valve will be closed and may result in damage or failure due to sealed liquid compression.
4) When refitting the driving part (head) to the body of the PMV, apply pressure until a “click” sound can be heard, complete the process by resetting the power to the system.

Release control list

Release item	Operation
High pressure release	SV2 ON, SV41, SV42 ON PMV3=45 pulses (All heating operation), 60 pulses (All cooling operation) Operation frequency limit
Low pressure release	SV2 ON, SV41, SV42 ON, Operation frequency limit
Discharge temp. release	SV6 ON, Operation frequency limit
Current release	Operation frequency limit
Heat sink release	Outdoor fan speed up, Operation frequency limit

Oil equation control schematic diagram

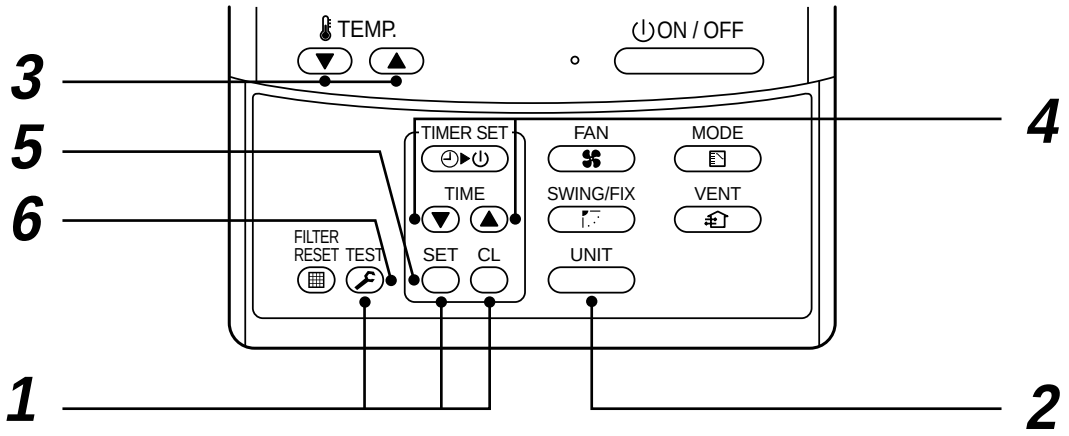


7. APPLIED CONTROL

7-1. Indoor Unit

7-1-1. Setup of Selecting Function in Indoor Unit (Be sure to Execute Setup by a Wired Remote Controller)

<Procedure> Execute the setup operation while the unit stops.



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

The firstly displayed unit No. indicates the master indoor unit address in the group control.
In this time, the fan of the selected indoor unit is turned on.

2 **Every pushing UNIT button, the indoor unit numbers in the group control are successively displayed. In this time, the fan of the selected indoor unit only is turned on.**

3 **Specify the item code (DN) using the setup temperature ▼ and ▲ buttons.**

4 **Select the setup data using the timer time ▼ and ▲ buttons.**

(When selecting the DN code to "33", change the temperature indication of the unit from "°C" to "°F" on the remote controller.)

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

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

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

Table: Function selecting item code (DN)
(Items necessary to perform the applied control at the local site are described.)

DN	Item	Description	At shipment
01	Filter display delay timer	0000 : None 0001 : 150H 0002 : 2500H 0003 : 5000H 0004 : 10000H	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
04	Specific indoor unit priority	0000 : No priority 0001 : Priority	0000 : No priority
06	Heating temp shift	0000 : No shift 0001 : +1°C 0002 : +2°C to 0010 : +10°C (Up to +6 recommended)	0002 : +2°C (Floor type 0000: 0°C)
0d	Existence of [AUTO] mode	0000 : Provided 0001 : Not provided (Automatic selection from connected outdoor unit)	0001 : Not provided
0E	Follows operation mode of the header unit	0000 : Does not follow 0001 : Follows	0000 : Not provided
0F	Cooling only	0000 : Heat pump 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Heat pump
10	Type	0000 : (1-way air discharge cassette) 0001 : (4-way air discharge cassette) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual 0001 : Header unit of group 0002 : Follower unit of group	0099 : Unfixed
19	Louver type (Adjustment of air direction)	0000 : Not provided 0001 : Swing only 0004 : [4-way Air Discharge Cassette type] and [Under Ceiling type]	According to type
1E	Temp difference of [AUTO] mode selection COOL → HEAT, HEAT →COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None 0001 : Restart	0000 : None
29	Operation condition of humidifier	0000 : Usual 0001 : Condition ignored (Detection control for heat exchanger temperature)	0000 : Usual
2A	Selection of option/ error input (CN70)	0000 : Filter input 0001 : Alarm input (Air washer, etc.) 0002 : None	0002 : None
2E	HA terminal (CN61) select	0000 : Usual 0001 : Leaving-ON prevention control	0000 : Usual (HA terminal)
30	Automatic elevating grille	0000 : Unavailable 0001 : Available	0000 : Unavailable
31	Ventilating fan control	0000 : Unavailable 0001 : Available	0000 : Unavailable
32	TA sensor selection	0000 : Body TA sensor 0001 : Remote controller sensor	0000 : Body TA sensor
33	Temperature unit select	0000 : °C (at factory shipment) 0001 : °F	0000 : °C
40	Drain pump control	0000 : None 0001 : Pump ON 0002 : None 0003 : Pump OFF	0003 : Pump OFF
5d	High ceiling selection (Air volume selection)	[4-way Air Discharge Cassette type] and [Under Ceiling type] 0000 : Standard filter 0001 : Super-long life filter 0003 : High efficiency filter [Concealed Duct Standard type] 0000 : Standard static pressure (40Pa) 0001 : High static pressure 1 (70Pa) 0003 : High static pressure 2 (100Pa) 0005 : Correspond to quiet sound 0006 : Low static pressure (20Pa)	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) 0001 : Unavailable (Operation prohibited)	0000 : Available
62	Anti-ceiling smudging control	0000 : Clear	4- way Air Discharge Cassette type only

TYPE

Item code [10]

Setup data	Type	Abbreviated Model name
0000	1-way Air Discharge Cassette	MMU-AP XXX SH
0001	4-way Air Discharge Cassette	MMU-AP XXX H
0002	2-way Air Discharge Cassette	MMU-AP XXX WH
0003	1-way Air Discharge Cassette (Compact type)	MMU-AP XXX YH
0004	Concealed Duct Standard	MMD-AP XXX BH
0005	Slim Duct	MMD-AP XXX SPH, SH
0006	Concealed Duct High Static Pressure	MMD-AP XXX H
0007	Under Ceiling	MMC-AP XXX H
0008	High Wall	MMK-AP XXX H
0010	Floor Standing Cabinet	MML-AP XXX H
0011	Floor Standing Concealed	MML-AP XXX BH
0013	Floor Standing	MMF-AP XXX H
~	—	

Indoor unit capacity

Item code [11]

Setup data	Model
0001	007
0003	009
0005	012
0007	015
0009	018
0011	024
0012	027
0013	030
0015	036
0017	048
0018	056
0021	072
0023	096
~	—

7-1-2. How to Set Up the Cooling Only Indoor Unit

When connecting an indoor unit for use in cooling only. A flow selector unit is not connected.

It is necessary to setup the unit.

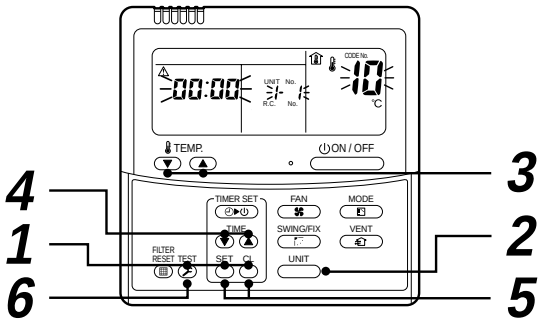
Perform setup as per the following procedure.

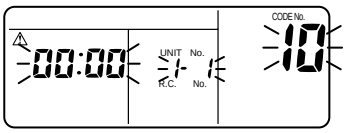
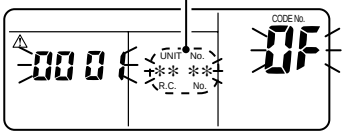
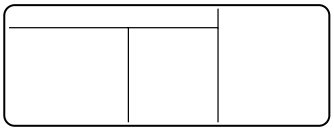
Setup of the indoor unit is performed by use of a wired remote controller.
If a wired remote controller is not used, for setup purposes a wired controller must be temporarily connected.

When using the air conditioner with a wireless remote controller, select “Cooling Only” on the wireless remote controller after the below setup.

Use of the wireless remote controller can be referred to in the manual supplied with the wireless remote controller.

Change the setup during off status.

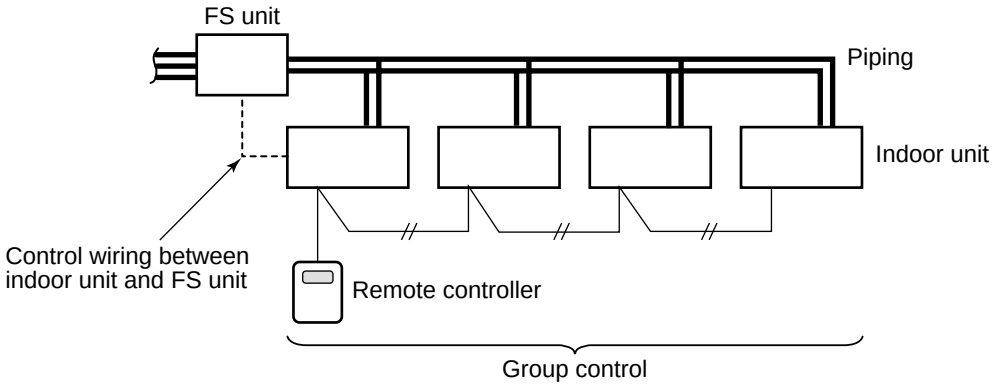


Procedure	Description
1	Push SET + CL + TEST buttons simultaneously for 4 seconds or more and display part will flashes as shown in the figure. Check that the displayed item code is [10]. • If the item code displayed is not [10], push TEST button to erase the display and restart the operation from the first step. (After pushing the TEST button, the operation of the remote controller will not function for a short period.)  (* The display changes according to the indoor unit model.)
2	In group control, the firstly displayed indoor unit No. becomes the header unit. Each pushing of the [UNIT] button, changes the indoor unit number within the group. Select the indoor unit that requires setup. The indoor unit selected can be confirmed at this time as the louver and fan will operate.
3	Use ▼ and ▲ buttons of the set temperature to specify the item code [**0F**].
4	Use ▼ and ▲ buttons on the timer time to select the setup data [**0001**].  **Setup data** / **0000** / **0001** **Cooling Only setup** / Heat pump / Cooling Only
5	Push SET button at this time, if the display changes from flashing to lit this confirms setup is complete. • To change the setup of a different indoor unit other than the selected unit restart operation from Procedure ***2*** . • In a group control, setup change of all the indoor units in the group is necessary. To change the setup of the group other than the selected one, restart operation from Procedure ***2*** . **CAUTION** **Cooling Only and Heat pump cannot be connected in the same group.** • Pushing CL button clears the set up contents which has been previously set. • In this case, restart from Procedure ***2*** .
6	When the setup has completed, push TEST button. (The setup is determined.) Pushing the TEST button deletes the display and returns to the normal stop status. (For some time after TEST button has been pushed, the operation of the remote controller will not function for a short period.) 

7-1-3. Setting When Connecting Multiple Indoor Units to a FS unit

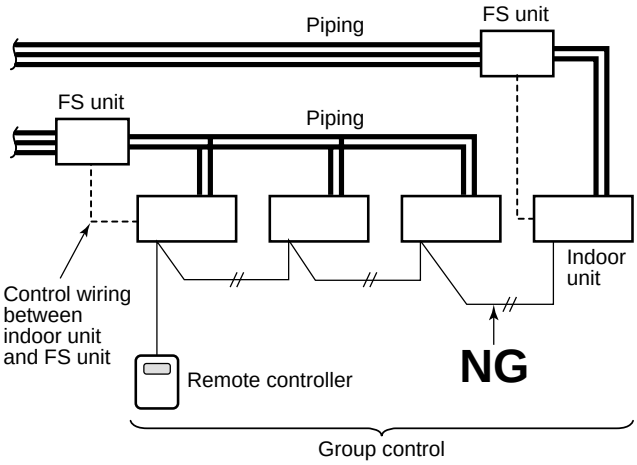
Cautions to connection of indoor unit

- When connecting multiple indoor units to a single FS unit, it is necessary to set up the Item code. This should be done after the addressing of the units.
- When connecting multiple indoor units to a single FS unit, only group control is available. Remote controllers cannot be connected to individual units.

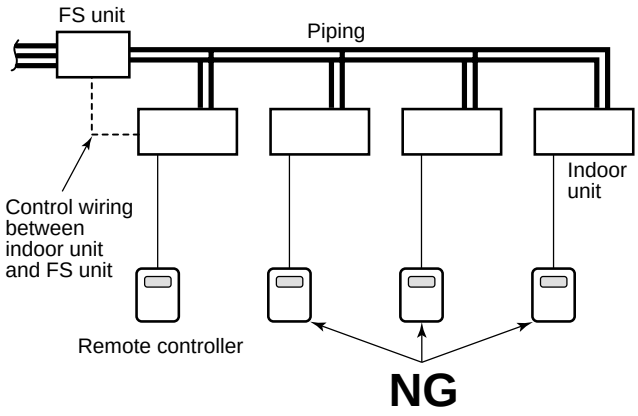


■ Usage/Features

It is not possible to group control indoor units that are connected to more than one FS unit.



Indoor units off of a single FS unit cannot be individually controlled.



How to set up Item code

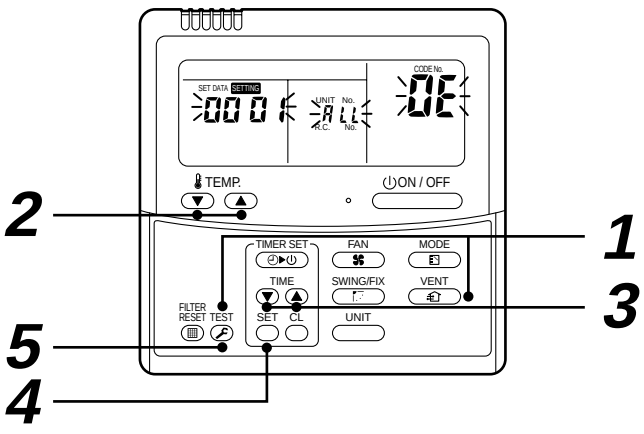
1 **Push VENT + TEST buttons simultaneously for 4 seconds or more.**
- "ALL" is displayed in the UNIT No. window.
- At this time, the fans of all the indoor units in the group control start the fan operation.

2 **Using the set temperature buttons ▼ / ▲, select the Item code "0E".**

3 **Change SET DATA to "01" using the timer buttons ▼ / ▲.**

4 **Push SET button.**

5 **Push TEST button.**
This confirms the setup has finished.

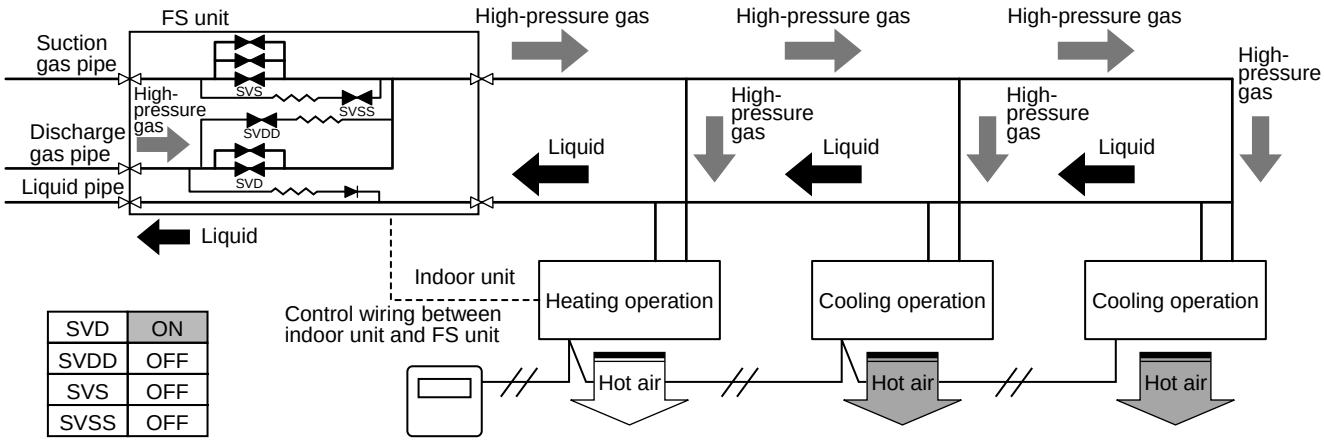


■ In case of not setting 01 to Item code “0E”

When more than one indoor unit has been set up as a group to one FS unit and you have forgotten to set 01 on Item code “0E” on all the indoor units, the following may occur:

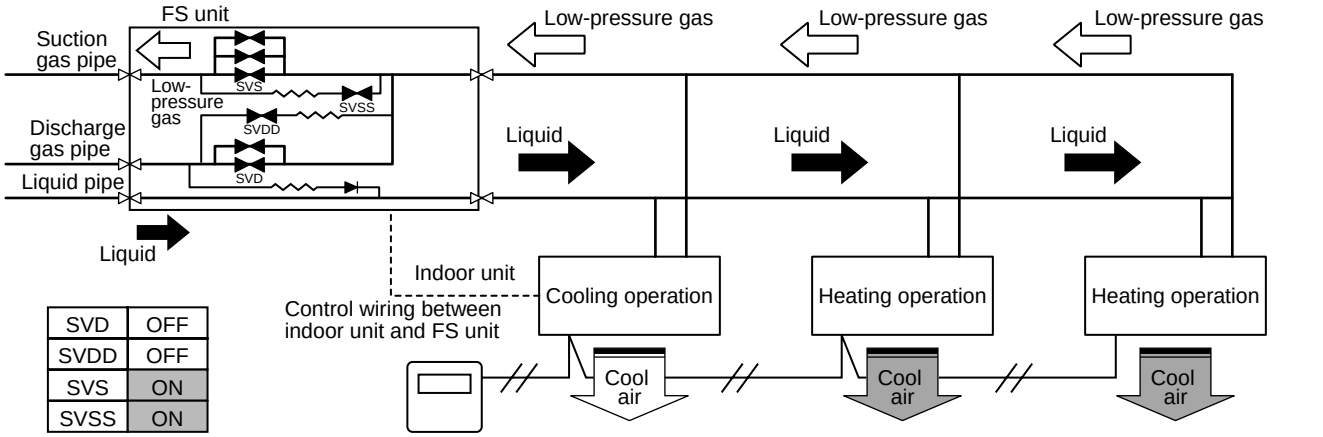
1) When AUTO operation is selected on the remote controller and cooling operation and heating operation are required, hot air may be discharged from the cooling operation unit or cool air may be discharged from the heating operation unit (or fan stops).
However in case of **2**, “L18” error code is output and the air conditioner stops.

1



SVD	ON
SVDD	OFF
SVS	OFF
SVSS	OFF

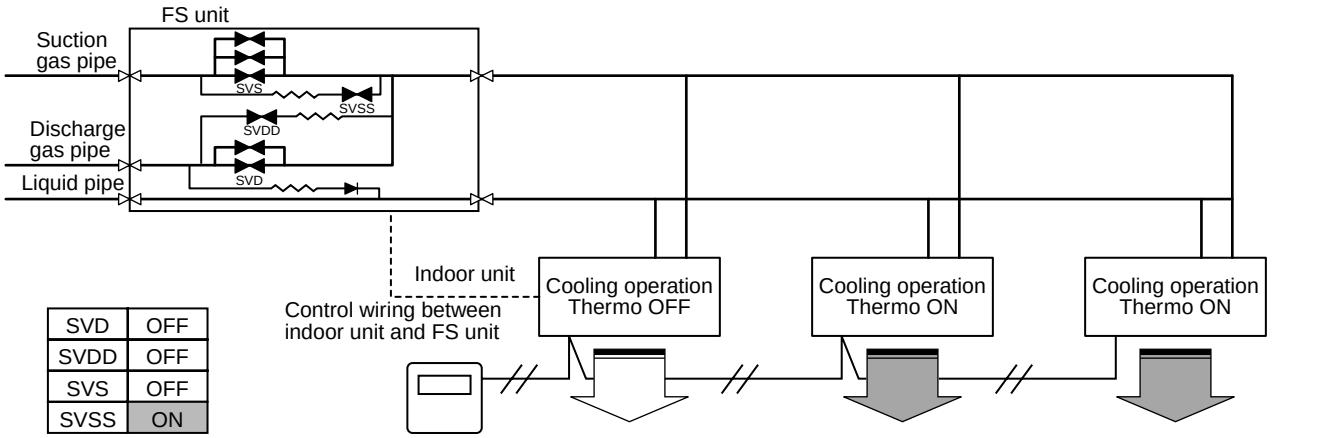
2



SVD	OFF
SVDD	OFF
SVS	ON
SVSS	ON

2) When the cooling thermostat of the indoor unit that is connected to the FS unit has been off, the refrigerant will not flow and cooling air may not discharge evenly if the thermostats of the other cooling operation units are on.

3



SVD	OFF
SVDD	OFF
SVS	OFF
SVSS	ON

7-1-4. Applied Control in Indoor Unit

■ Remote location ON/OFF control box (TCB-IFCB-4E)

[Wiring and setup]

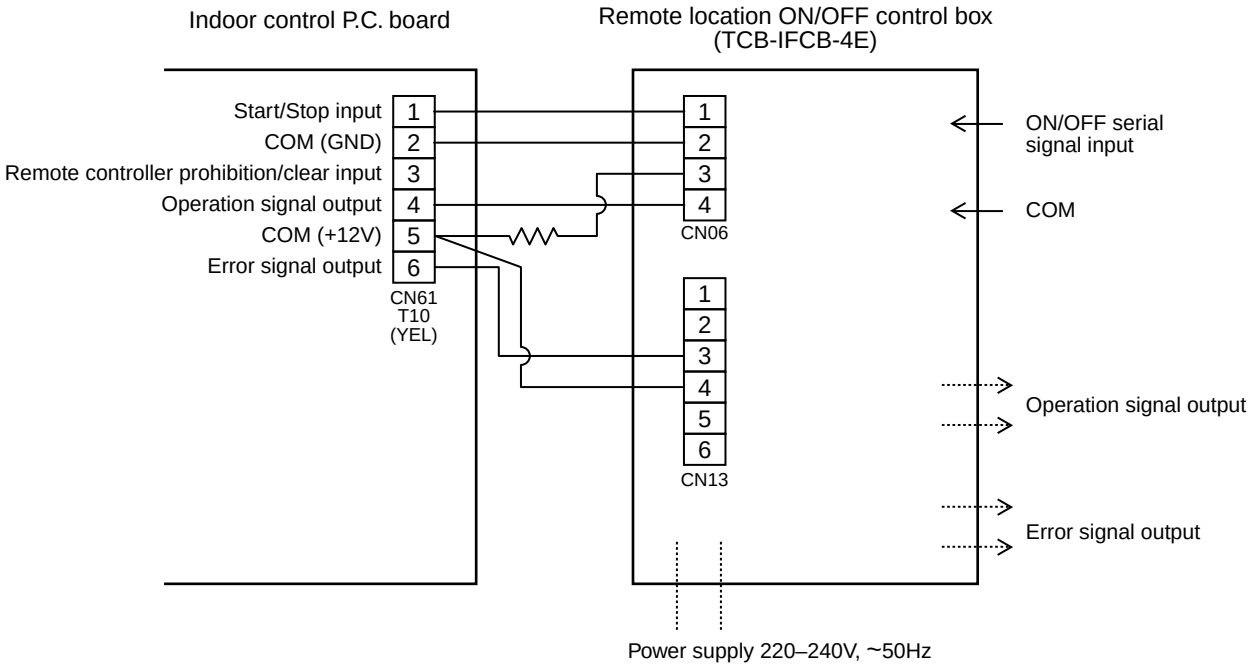
- Use the exclusive connector for connection with the indoor control P.C. board.
- In a group control, the system can operate when connecting with any indoor unit (Control P.C. board) in the group. However when taking out the operation/error signal from the other unit, it is necessary to take out from each unit individually.

(1) Control items

1) Start/Stop input signal : Operation start/stop in unit
2) Operation signal : Output during normal operation
3) Error signal : Output during alarm
(Serial communication error or indoor/outdoor protective device) operation

(2) Wiring diagram using remote control interface (TCB-IFCB-4E)

Input IFCB-4E : No voltage ON/OFF serial signal
Output No voltage contact for operation, error display
Contact capacity: Below Max. AC240V 0.5A



■ Ventilating fan control from remote controller

[Function]

- The start/stop operation can be operated from the wired remote controller when air to air heat exchanger or ventilating fan is installed in the system.
- The fan can be operated even if the indoor unit is not operating.
- Use a fan which can receive the no-voltage A contact as an outside input signal.
- In a group control, the units are collectively operated and they can not be individually operated.

(1) Operation

Handle a wired remote controller in the following procedure.

∗ Use the wired remote controller during stop of the system.

∗ Be sure to set up the wired remote controller to the header unit. (Same in group control)

∗ In a group control, if the wired remote controller is set up to the header unit, both header and follower units are simultaneously operable.

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

The unit No. displayed firstly indicates the header indoor unit address in the group control.

In this time, the fan of the selected indoor unit turns on.

2 Every pushing UNIT button, the indoor unit numbers in group control are displayed successively.

In this time, the fan of the selected indoor unit only turns on.

3 Using the setup temp ▼ or ▲ button, specify the item code 31.

4 Using the timer time ▼ or ▲ button, select the setup data. (At shipment: 0000)

The setup data are as follows:

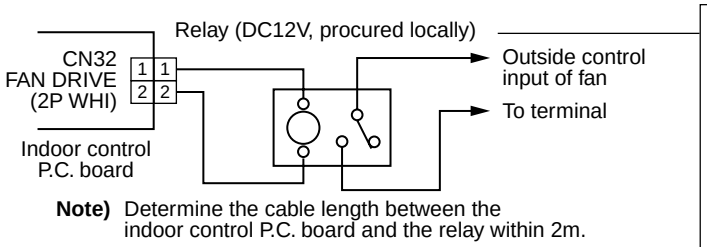
Setup data	Handling of operation of air to air heat exchanger or ventilating fan
0000	Unavailable (At shipment)
0001	Available

5 Push SET button. (OK if display goes on.)

- To change the selected indoor unit, go to the procedure **2**).
- To change the item to be set up, go to the procedure **3**).

6 Pushing TEST returns the status to the usual stop status.

(2) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

4-way Air Discharge Cassette type
1-way Air Discharge Cassette type (2 series)
Concealed Duct Standard type
Slim Duct type
Under Ceiling type
High Wall type
} model :

Corresponds up to a relay in which rated current of the operation coil is approx. 75mA

Other type models:

Correspond up to a relay in which rated current of the operation coil is approx. 16mA (Does not correspond to a terminal block type relay on the market.)

■ Leaving-ON prevention control

[Function]

- This function controls the indoor units individually. It is connected with cable to the control P.C. board of the indoor unit.
- In a group control, it is connected with cable to the indoor unit (Control P.C. board), and the item code 2E is set to the connected indoor unit.
- It is used when the start operation from outside if unnecessary but the stop operation is necessary.
- Using a card switch box, card lock, etc, the forgotten-OFF of the indoor unit can be protected.
  - When inserting a card, start/stop operation from the remote controller is allowed.
  - When taking out a card, the system stops if the indoor unit is operating and start/stop operation from the remote controller is forbidden.

(1) Control items

1) Outside contact ON : The start/stop operation from the remote controller is allowed.
(Status that card is inserted in the card switch box)

2) Outside contact OFF : If the indoor unit is operating, it is stopped forcedly.
(Start/Stop prohibited to remote controller)
(Status that card is taken out from the card switch box)

∗ When the card switch box does not perform the above contact operation, convert it using a relay with b contact.

(2) Operation

Handle the wired remote controller switch in the following procedure.

∗ Use the wired remote controller switch during stop of the system.

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

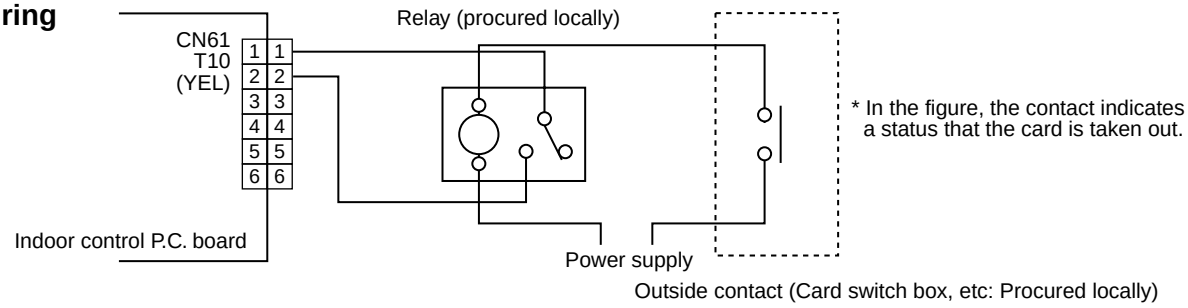
2 Using the setup temp ▼ or ▲ button, specify the item code 2E.

3 Using the timer time ▼ or ▲ button, set 0001 to the setup data.

4 Push SET button.

5 Push TEST button. (The status returns to the usual stop status.)

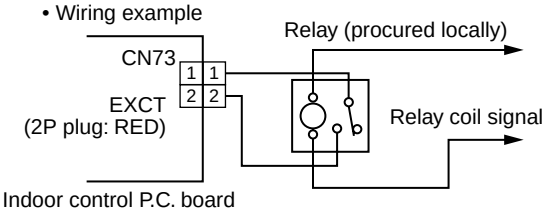
(3) Wiring



Note) Determine the cable length between the indoor control P.C. board and the relay within 2m.

■ Demand control from indoor unit

When the relay is turned on, a forced thermostat-OFF operation starts.



Note) Determine the cable length between the indoor or outdoor control P.C. board and the relay within 2m.

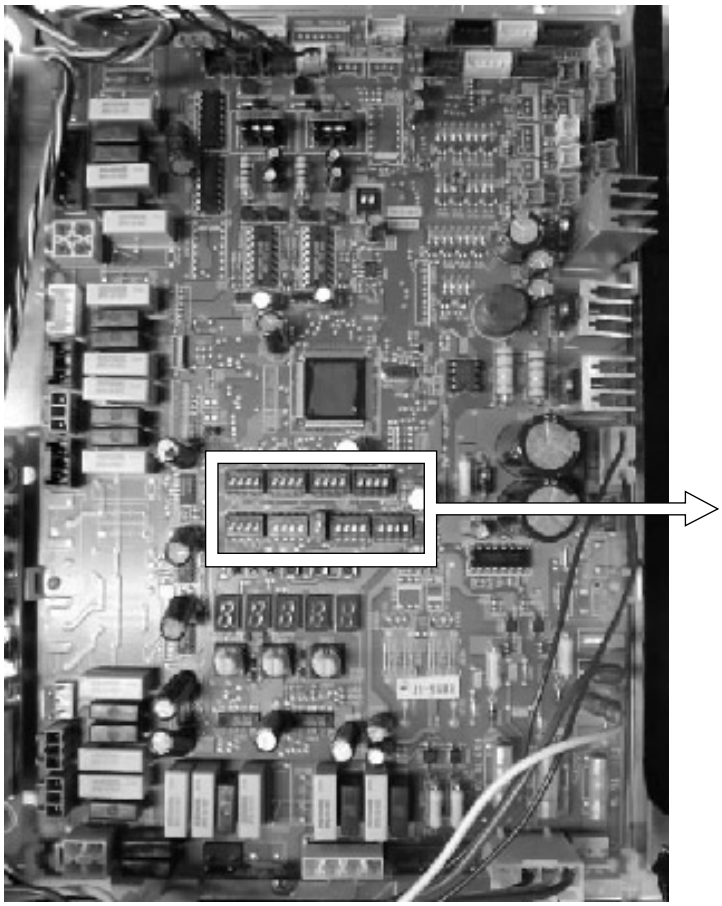
7-2. Outdoor Unit

7-2-1. Applied Control in Outdoor Unit

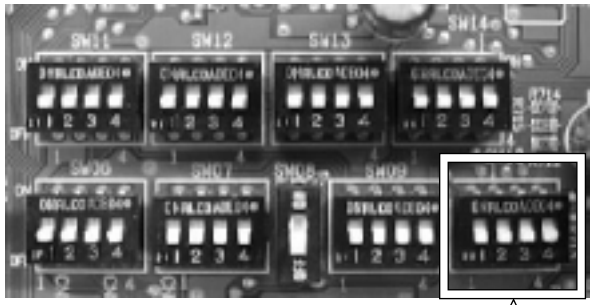
The following functions become available by setting the switches on the outdoor interface P.C. board.

No.	Function	Switch No.	Bit
1	Outdoor fan high static pressure shift	SW10	2

Interface P.C. board of outdoor unit



Switch position detail



SW10

Bit 2	For setup of outdoor fan high static pressure shift

7-2-1-1. Outdoor fan High Static Pressure Shift

■ **Usage/Features**

This function is set when connecting a duct to the discharge port of the outdoor unit.

■ **Setup**

Turn “Bit 2” of the dip switch [SW10] on the interface P.C. board of the outdoor unit to ON.

■ **Specifications**

The outdoor fan high static pressure shift function increases the fan speed on the outdoor unit to enable a discharge duct to be installed on the discharge port - the design of the ducting should be such that a static pressure of 35 Pa is not exceeded.

This function should be executed where the discharge ducting static pressure exceeds 15 Pa.
45Pa or more : For detail of adjustment, consult with the sales subsidiary.
The discharged air volume from each outdoor unit is shown in the table below:

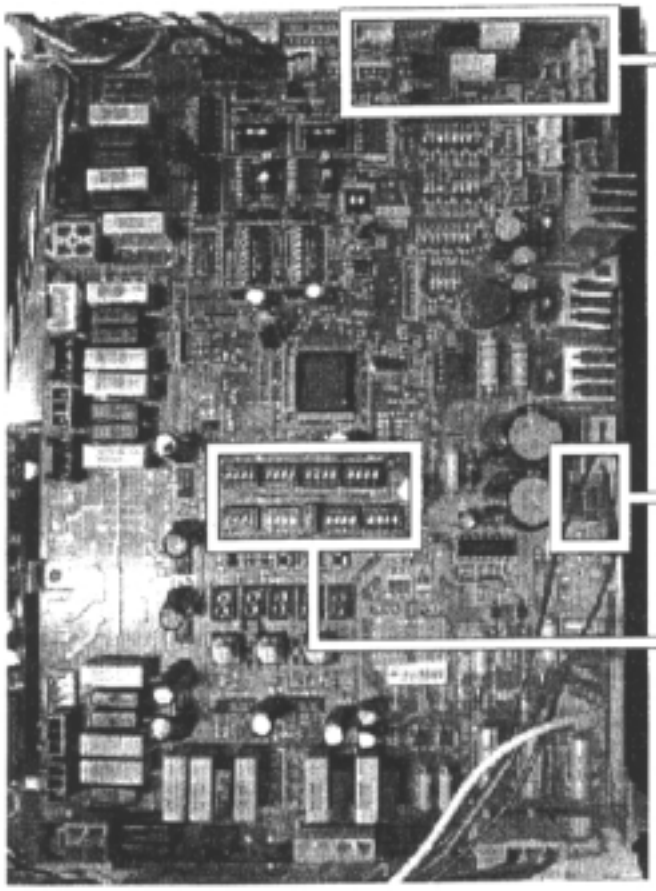
Capacity rank (MMY-MAP)	0801 type	1001, 1201 type
Standard air volume of outdoor unit (m^3/min.)	165	175

7-2-2. Applied Control in Outdoor Unit

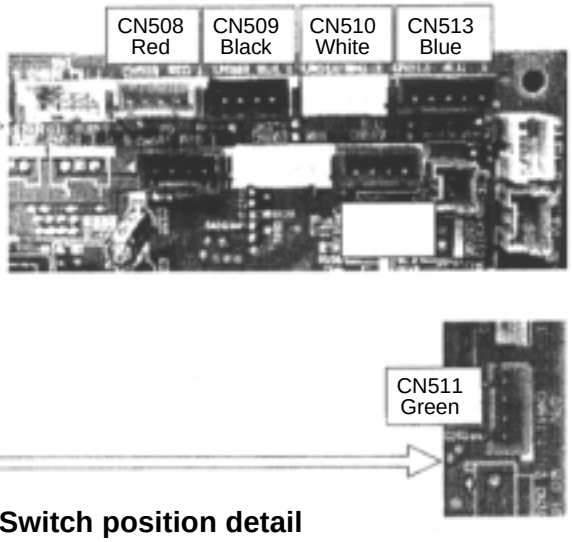
The following functions are available by using a separately supplied P.C. board.
Set up the switches on the outdoor unit (U1).

No.	Function	Switch No.	Bit	Connector No.	Used control P.C. board
1	Power peak-cut control (Standard)	SW07	1	CN513	TCB-PCDM2E
2	Power peak-cut control (Expansion)	SW07	1,2	CN513	TCB-PCDM2E
3	Snowfall fan control	—	—	CN509	TCB-PCMO2E
4	External master ON/OFF control	—	—	CN512	TCB-PCMO2E
5	Night operation control	—	—	CN508	TCB-PCMO2E
6	Operation mode selection control	—	—	CN510	TCB-PCMO2E

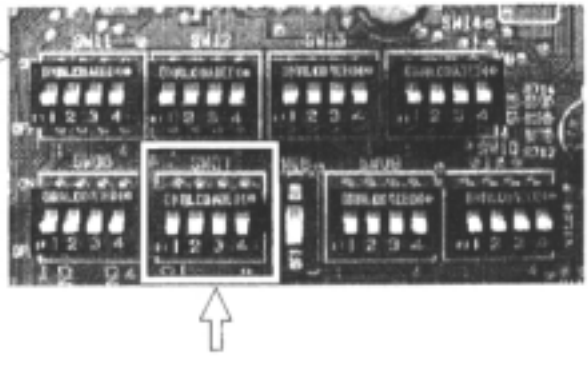
Outdoor unit interface P.C. board



Connector position detail



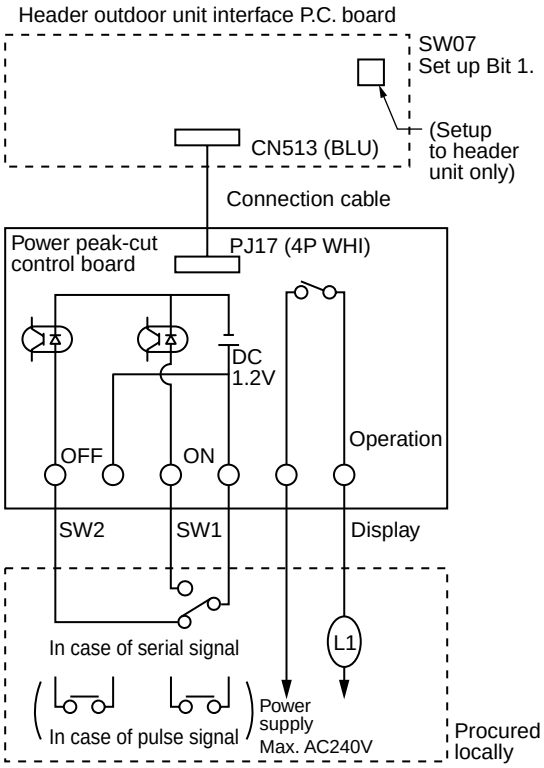
Switch position detail



SW07

Bit 1	For power peak-cut control selection
Bit 2	For power peak-cut control (expansion) selection

7-2-2-1. Power Peak-cut Control (Standard)



Operation

The upper limit capacity of the outdoor unit is restricted based on the demand request signal from outside.

L1 : Display lamp during power peak-cut control

SW1 : Power peak-cut ON switch
(ON during demand, OFF in normal time) ∗1

SW2 : Power peak-cut OFF switch
(OFF during demand, ON in normal time) ∗1

*1

Input signals of SW1 and SW2 are acceptable even if they are longer then pulse input (100mm.sec.) or serially made.

However do not turn on SW1 and SW2 simultaneously.

∗ Be sure to prepare a contact for each terminal.

Relay contact capacity of "operation" port

Below AC240V 0.5A (COSØ = 100%)

Below DC24V 1A (Non-inductive load)

Note) When connecting non-inductive load such as relay coil to L1 load, insert the noise surge absorber CR (In case of AC) or counter electromotive-proof diode (In case of DC) into the bypass circuit.

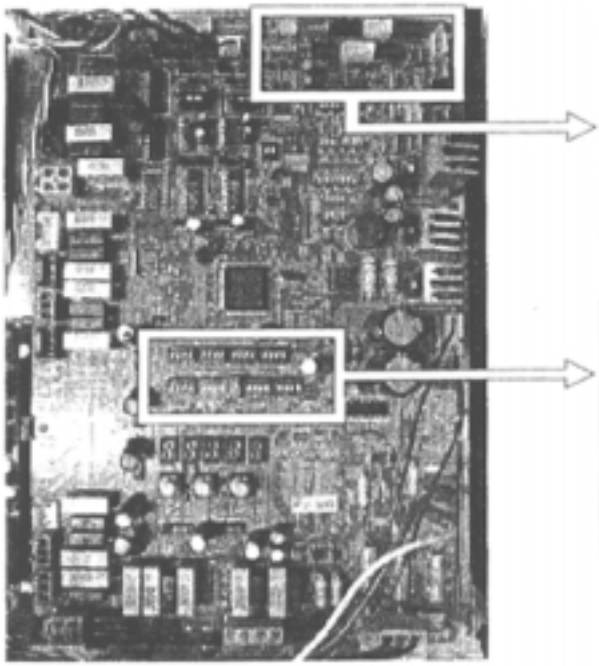
Power peak-cut control board: TCB-PCDM2E

Outdoor unit destination to be connected becomes the header outdoor unit (U1).

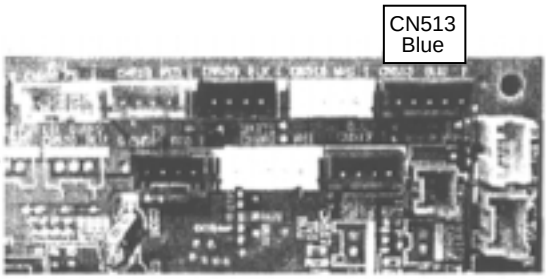
Setup when Power peak-cut control requested

Power peak-cut control board (TCB-PCDM2E)	SW1	SW2	L1	Outdoor unit interface P.C. board	
				SW07: Bit 1 OFF	SW07: Bit 1 ON
Power peak-cut ON signal is input.	ON	OFF	ON	0% (Forced stop)	Capacity 60% (Upper limit restriction)
Power peak-cut OFF signal is input.	OFF	ON	OFF	100% (Normal operation)	100% (Normal operation)

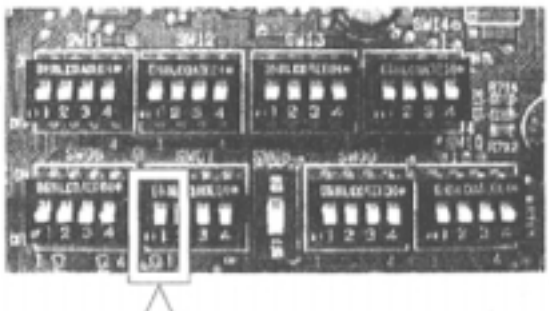
Setup positions of header outdoor unit interface P.C. board



Connector position detail



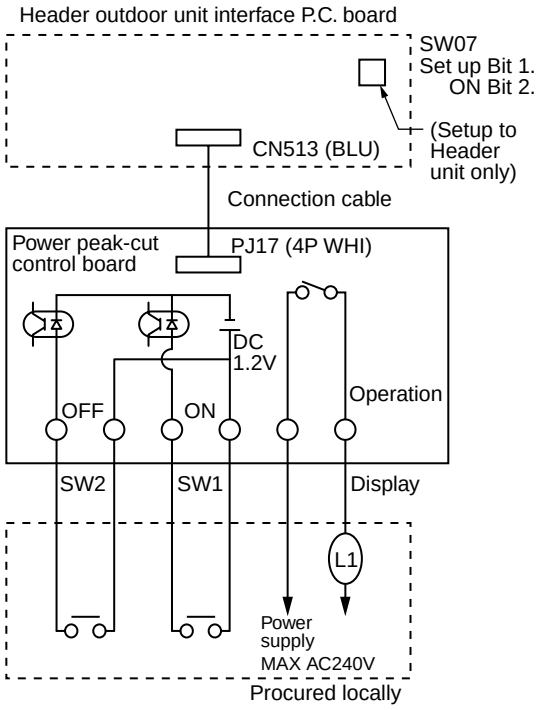
Switch position detail



SW07

Bit 1	OFF	Operation stop to 100%
	ON	ON 60% to 100%

7-2-2-2. Power Peak-cut Control (Expansion)



Operation

The upper limit capacity of the outdoor unit is restricted based on the demand request signal from outside.

L1 : Display lamp during Power peak-cut control

SW1 : Power peak-cut ON switch ∗1

SW2 : Power peak-cut OFF switch ∗1

***1**

Input signals of SW1 and SW2 are acceptable even if they are upper than pulse input (100mm. sec.) or serially made.

∗ Be sure to prepare a contact for each terminal.

Relay contact capacity of "operation" port

Below AC240V 1A (COSØ = 100%)

Below DC24V 2A (Non-inductive load)

Note) When connecting non-inductive load such as relay coil to L1 load, insert the noise surge absorber CR (In case of AC) or counter electromotive-proof diode (In case of DC) into the bypass circuit.

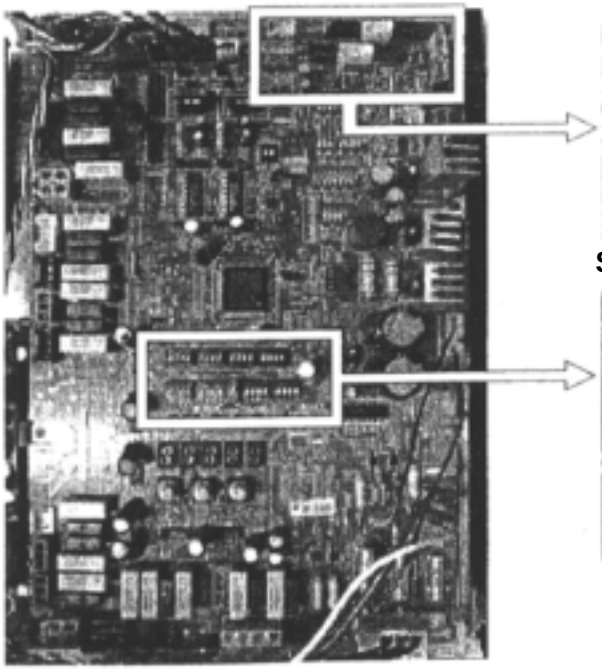
Power peak-cut control board: TCB-PCDM2E

Outdoor unit destination to be connected becomes the header outdoor unit (U1).

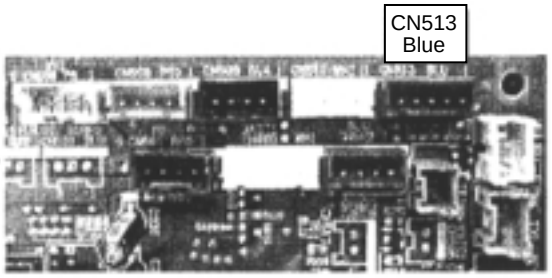
Setup at power peak-cut control (expansion) request

Outside power peak-cut request		Display lamp	Power Peak-cut request	
			Outdoor wire interface P.C. board (SW07/ Bit 2 ON)	
SW1	SW2	L1	**SW07 : Bit 1 OFF**	**SW07 : Bit 1 ON**
OFF	OFF	OFF	100% (Normal operation)	100% (Normal operation)
ON	OFF	ON	80% (Upper limit restriction)	85% (Upper limit restriction)
OFF	ON	ON	60% (Upper limit restriction)	75% (Upper limit restriction)
ON	ON	ON	0% (Forced stop)	60% (Upper limit restriction)

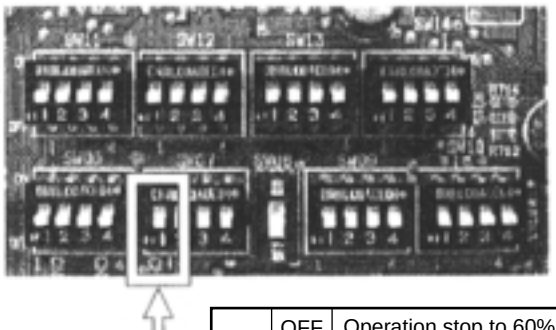
Setup positions of header outdoor unit interface P.C. board



Connector position detail

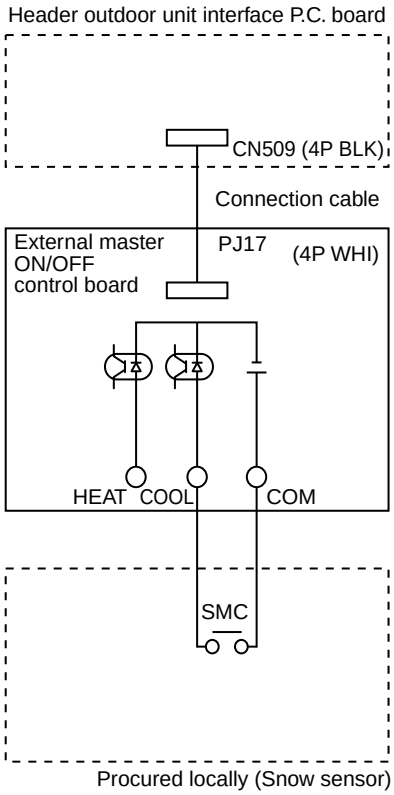


Switch position detail



Bit 1	OFF	Operation stop to 60%, 80%, 100%
	ON	ON 60% to 60%, 75%, 85%, 100%
Bit 2	ON	Power peak-cut (expansion) ON

7-2-2-3. Snowfall Fan Control



Operation

The outdoor unit fan operates when a Snowfall signal is received.

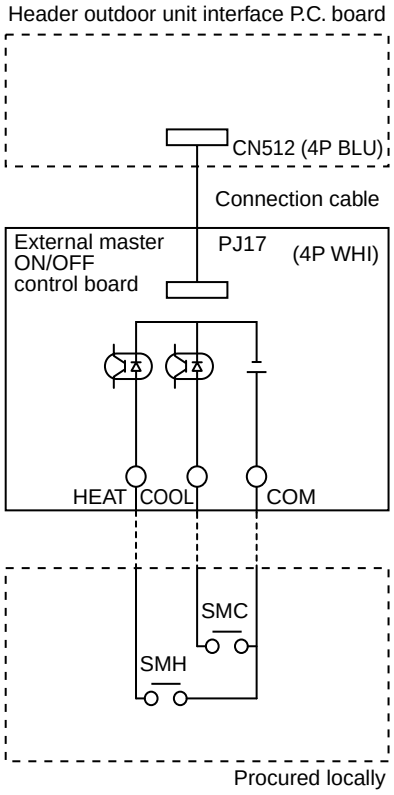
Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Snowfall fan control (Operates outdoor unit fan.)
	ON → OFF	Usual operation (Releases control.)

The control contents are accepted during leading and trailing of the input signal.
(The status of leading and trailing should be held for 100mm. sec. or more.)

External master ON/OFF control board : TCB-PCMO 2E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

SMC: Snowfall detection switch

7-2-2-4. External master ON/OFF control



Operation

The outdoor unit starts or stops the system.

Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Starts collectively indoor units.
Heat (SMH)	ON → OFF	Stops collectively indoor units.

The control contents are accepted during trailing of the input signal.
(The status of trailing should be held for 100mm. sec. or more.)

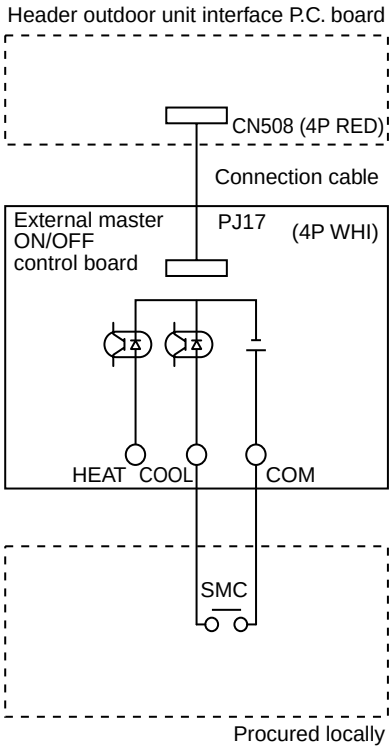
NOTES

1) Do not turn on COOL and HEAT terminals concurrently.
2) Be sure to prepare a contact for each terminal.
   Outside signal: No voltage pulse contact

External master ON/OFF control board : TCB-PCMO 2E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

SMC: Input signal for start.
SMH: Input signal for stop.

7-2-2-5. Night Operation Control



Operation

Reduce emitted noise during night by resting the compressor and fan speed.

Terminal	Input signal	Operation
COOL (SMC)	ON → OFF	Night (sound reduction) operation control
	ON → OFF	Usual operation

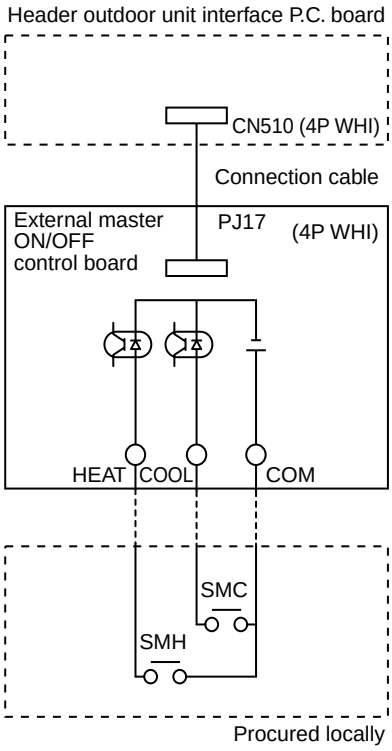
The control contents are accepted during leading and trailing of the input signal.
(The status of leading and trailing should be held for 100mm. sec. or more.)
Capacity criterion during night operation control
Capacity during control indicates values as described in the following table.

	Night operation sound reduction dB (A)	Capacity	
		COOL	HEAT
1201 type	50	Approx. 55%	Approx. 45%
1001 type	50	Approx. 65%	Approx. 55%
0801 type	50	Approx. 80%	Approx. 70%

(Against Max. capacity)

SMC : Input signal for night operation.
External master ON/OFF control board : TCB-PCMO 2E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

7-2-2-6. Operation Mode Selection Control



Operation

This control can be operated with the operation mode which is permitted by SMC or SMH.

The indoor unit operating by operation mode without permission is as follows:

1) Display on remote controller
   " (Mode select controlled)" goes on.
2) Indoor fan
   In FAN mode: Fan normally operates.
   In COOL mode: Fan normally operates.
   In HEAT mode: Fan operates with ultra low speed.
   * Be sure to prepare a contact for each contact terminal.
     Outside signal: No voltage serial contact

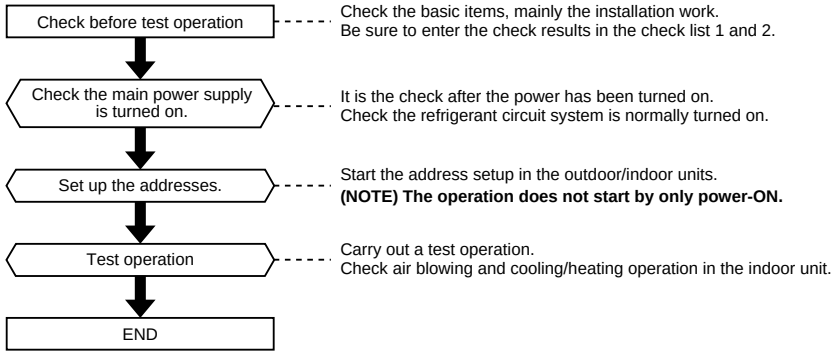
SMC: COOL mode designated input switch
SMH: HEAT mode designated input switch

External master ON/OFF control board : TCB-PCMO 2E
Outdoor unit destination to be connected becomes the header outdoor unit (U1).

8. TEST OPERATION

8-1. Procedure and Summary of Test Operation

A test operation is executed in the following procedure. When a trouble or an error occurs in each step, remove causes of a trouble or an error referring to the section "**9. Troubleshooting**".



8-2. Check Items before Test Operation

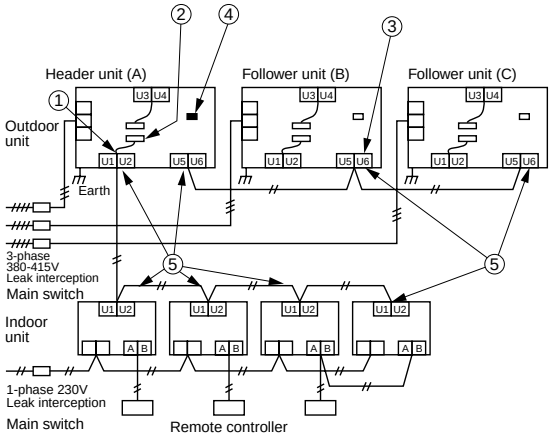
Prior to the test operation, check the following items so that there is no trouble in the installation work.

Main check items for electric wiring

The communication system differs from that of R22 or R407 refrigerant "Modular Multi system" air conditioner.

Check again cautious points on wiring.

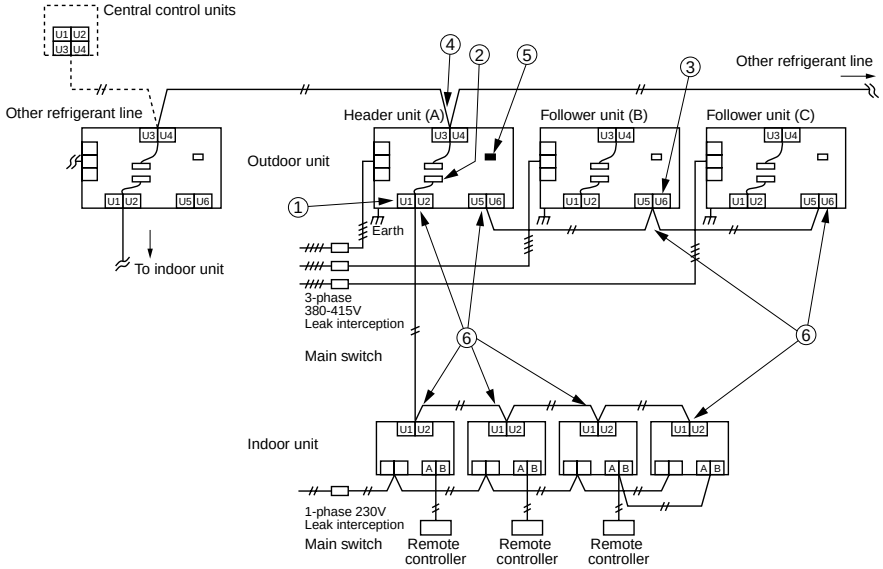
1. In case that a center control system is not connected:



No.	Main check items	Check
①	Are indoor and outdoor communication lines of the header unit connected to U1/U2 terminals?	
②	Is the relay connector between U1/U2 terminal and U3/U4 terminal removed? (Set up at shipment from the factory)	
③	Is the communication line between each outdoor units connected to U5/U6 terminal?	
④	Is the terminal resistance (SW30-2) on the interface P.C. board of the header unit turned on? (Set up at shipment from the factory)	
⑤	Is the end terminal of the shield cable grounded?	

Note) The above figure does not show all the electric cables.
For details, refer to the installation manuals for outdoor unit, indoor unit, remote controller, or optional devices.

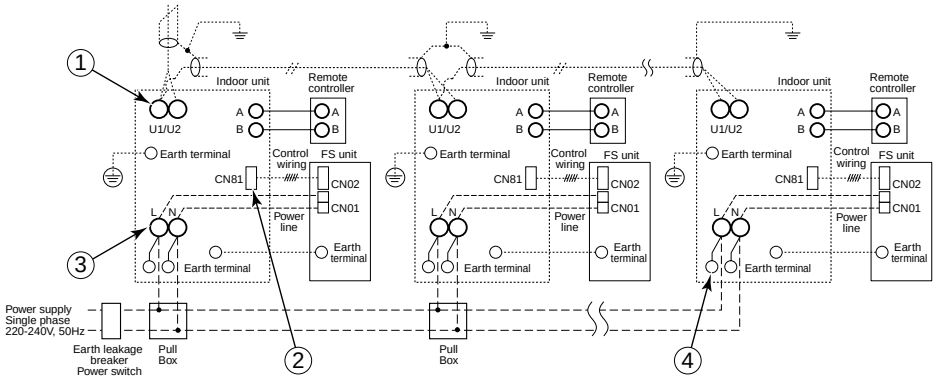
2. In case that a central control system is connected (Before address setup)



No.	Main check items	Check
①	Are indoor and outdoor communication lines of the header unit connected to U1/U2 terminals?	
②	Is the relay connector between U1/U2 terminal and U3/U4 terminal removed? (Set up at shipment from the factory) (Before address setup, remove the relay connector.)	
③	Is the communication line between outdoor and indoor units connected to U5/U6 terminal?	
④	Is the communication line of the central control system connected to the header unit U3/U4 terminals of each refrigerant line? (The communication line of the central control system may be connected to the communication lines of the indoor/outdoor communication lines.)	
⑤	Is the terminal resistance (SW30-2) on the interface P.C. board of the header unit turned on? (Set up at shipment from the factory) (After address setup, turn off SW30-2 of the header unit except the smallest unit after check of trial operation.)	
⑥	Is the end terminal of the shield cable grounded?	
⑦	When the refrigerant line and the central control system of the custom air conditioner are connected: → Are TCC-LINK adaptors correctly connected? → When the digital inverter air conditioner operates with group operation, twin, or triple operation, are the adopters connected to the header unit of the indoor unit?	

Note) The above figure does not show all the electric cables.
For details, refer to the installation manuals for outdoor unit, indoor unit, remote controller, or optional devices.

3. Connection check between Flow Selector Unit (FS Unit) and indoor unit



No.	Main check items	Check
①	Are indoor/outdoor communication lines connected to U1/U2 terminals?	
②	Is the signal line of the FS unit connected to connector CN81?	
③	Is the power supply cable of the FS unit connected to R (L) and S (N) terminals?	
④	Is the power supply cable of the FS unit connected to the closed end connector? When the indoor unit is a Wall type (1 Series) or Concealed Duct High Static Pressure type?	

Note) The above figure does not cover all the electric wirings.
For details, refer to the Installation Manual of Flow selector unit.

Check list 1

• Using the “Check list 1”, check there is no trouble in the installation work.

Is capacity of the leak breaker appropriate?	Outdoor total capacity ☐ A	Header unit (A) ☐ A Follower unit (B) ☐ A Follower unit (C) ☐ A	Indoor unit ☐ A
Is the diameter of the power cable correctly wired?		Header unit (A) ☐ mm² Follower unit (B) ☐ mm² Follower unit (C) ☐ mm²	Indoor unit ☐ mm²
Is the control communication line correctly wired?		Indoor –outdoor connection terminals (U1, U2) ☐ Outdoor–outdoor connection terminals (U5, U6) ☐ Central control system connection terminals (U3, U4) ☐	
Is the power of the indoor units supplied collectively?			
Is the earth grounded			
Is the insulation good? (10MΩ or more)		☐ MΩ or more	
Is the main power voltage correct? (Within 200V ± 10%)		☐ V	
Is the diameter of the connecting pipe correct?			
Is the branch kit correct?			
Does the indoor unit condensate drain adequately?			
Is the thermal insulation of pipes good? (Connecting pipes, Branch kit)			
For both indoor and outdoor units, ensure air is not short-circuited from discharge to inlet ports.			
After pressure test, check that the pipework and indoor units have been vacuumed and the correct amount of additional gas has been charged.			

Are valves of all the outdoor units fully opened?	Suction gas side	Discharge gas side	Liquid side	Balance side
Header unit (A)	☐	☐	☐	☐
Follower unit (B)	☐	☐	☐	☐
Follower unit (C)	☐	☐	☐	☐

• Check the additional amount of refrigerant.

Check list 2

Calculate the additional amount of refrigerant from the following:

$$\text{Additional amount of refrigerant (B)} = \underbrace{\text{Actual liquid pipe length} \times \text{Additional amount of refrigerant per liquid pipe 1m}}_{\text{(A)}} \times 1.3 + \underbrace{\text{Corrective amount of refrigerant by system capacity}}_{\text{(B)}}$$

Firstly enter the total length for each liquid pipe in the following table and then calculate the additional amount of refrigerant by pipe length.

Additional amount of refrigerant by pipe length

Pipe dia at liquid side	Standard amount of refrigerant kg/m	Total pipe length at each liquid side	Additional amount of refrigerant pipe dia at each liquid side kg
Ø6.4	0.025 ×	=	kg
Ø9.5	0.055 ×	=	kg
Ø12.7	0.105 ×	=	kg
Ø15.9	0.160 ×	=	kg
Ø19.0	0.250 ×	=	kg
Ø22.2	0.350 ×	=	kg
		Additional amount of refrigerant by pipe length (A)	kg

Next, refer to the following table for the corrective amount of refrigerant (B) by system capacity.

Corrective amount of refrigerant by system capacity

System horse power HP	Normal type			
	Unit 1	Unit 2	Unit 3	Corrective amount of refrigerant (B) kg
8	8			2.0
10	10			2.5
12	12			3.0
16	8	8		–1.5
18	10	8		0
20	10	10		2.0
24	8	8	8	–4.5
26	10	8	8	–3.0
28	10	10	8	–1.5
30	10	10	10	0

Finally add the additional amount of refrigerant by pipe length (A) to the corrective amount of refrigerant by system capacity (B). This is the final additional amount of refrigerant.

If the result is indicated as a negative, do not add any refrigerant. Do not add the refrigerant (= 0kg).

Additional amount of refrigerant

Additional amount of refrigerant by pipe length (A)	kg
Corrective amount of refrigerant by system HP (B)	kg
Additional amount of refrigerant	kg

8-3. Check at Main Power-ON

After turning on the main power of the indoor units and outdoor unit in the refrigerant line to be executed with a test operation, check the following items in outdoor and each indoor unit.

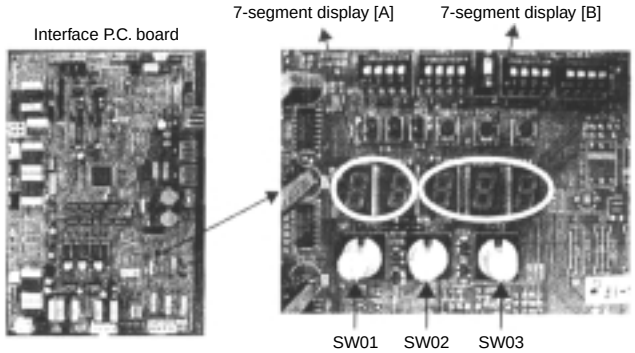
(After turning on the main power, be sure to check in order of indoor unit → outdoor unit.)

If the power supply of the outdoor unit has been firstly turned on, [E19] appears on the 7-segment display on the interface P.C. board until the power supply of the indoor unit is turned on. However it is not an error.

Check on outdoor unit

1. Check that all the rotary switches, SW01, SW02, and SW03 on the interface P.C. board of the outdoor unit are set up to "1".
2. If other error code is displayed on 7-segment [B], remove the cause of trouble referring to "**9. Troubleshooting**".
3. **Check that [L08] is displayed on 7-segment display [B]** on the interface P.C. board of the outdoor unit. (L08: Indoor address unset up)

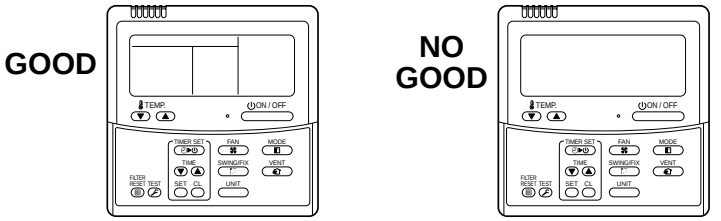
   (If the address setup operation has already finished in service time, etc, the above check code is not displayed, and only [U1] is displayed on 7-segment display [A].)



Check on indoor unit

1. Display check on remote controller (In case of wired remote controller)

   Check that a frame as shown in the following left figure is displayed on LC display section of the remote controller.



Normal status
(Power and operation stop)

Abnormal status
(Power is not normally turned on.)

If a frame is not displayed as shown in the above right figure, the power of the remote controller is not normally turned on. Therefore check the following items.

- Check power supply of indoor unit.
- Check wiring between indoor unit and remote controller.
- Check whether there is cutoff of cable around the indoor control P.C. board or not, and check connection failure of connectors.
- Check failure of transformer for the indoor microcomputer.
- Check indoor control P.C. board failure.

8-4. Address Setup

After power-ON, set up the indoor address from the interface P.C. board of the outdoor unit.

(The address setup operation cannot be performed by power-ON only.)

8-4-1. Cautions

1. It requires approx. 5 minutes usually for 1 line to automatically set up address. However in some cases, it may require maximum 10 minutes.
2. It is unnecessary to operate the air conditioner for address setup.
3. Manual address setup is also available besides automatic setup.

   Automatic address: Setup from SW15 on the interface P.C. board of the outdoor unit

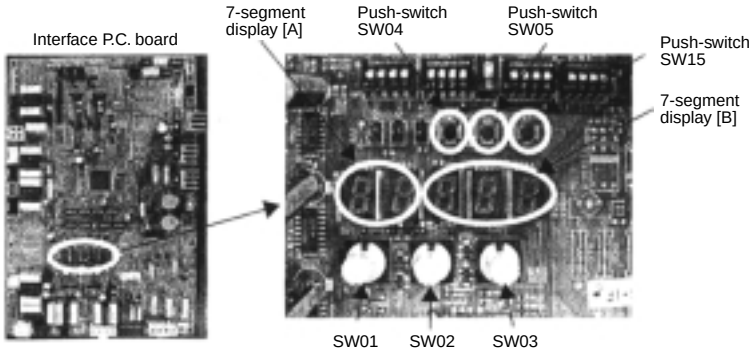
   Manual address: Setup from the weird remote controller.
   (For details, refer to section "**8-4-3. Address setup procedure**")

8-4-2. Address Setup and Check Procedure

Procedure	Item	Operation and check contents
1	Indoor unit power-ON	Turn on power of indoor unit in refrigerant line to which address is set up.
2	Outdoor unit power-ON	Turn on power of all the outdoor units in refrigerant line to which address is set up.
3	7-segment display check	Check that [L08] is displayed on 7-segment display [B] on the interface P.C. board of the outdoor unit in the system to which address is set up.
4	Address setup start	Confirm the corresponding items in "**8-4-3 Address setup procedure**", and then set up address according to the operation procedure. (Be sure that the setup operation may differ in group control or central control.) **Note)** Address cannot be set up if switches are not operated.
5	Display check after setup	• After address setup, [U1] [ ] are displayed in 7-segment display section. • If an error code is displayed in 7-segment display [B], remove the cause of trouble referring to **"9. Troubleshooting"**.
6	System information check after setup	Using 7-segment display function, check the system information of the scheduled system. (This check is executed on the interface P.C. board of the outdoor unit.)

	Rotary switch setup			7-segment display	
	SW01	SW02	SW03	[A]	[B]
System capacity	1	2	3	[No. of HP]	[HP]
No. of connected outdoor unit	1	3	3	[Connected No. of units]	[P]
No. of connected indoor units	1	4	3	[Connected No. of units]	

After the above checks, return rotary switches SW01, SW02, SW03 to 1/1/1.



Rotary switches

8-4-3. Address Setup Procedure

In this air conditioner, it is required to set up address to the indoor unit before starting operation. Set up the address according to the following setup procedure.

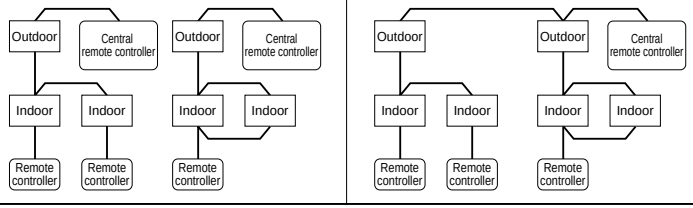
CAUTION

1. Set up address after wiring work.
2. It requires maximum 10 minutes (Usually, approx. 5 minutes) to set up automatically an address to 1 line.
3. To set up an address automatically, the setup at outdoor side is necessary. (Address setup cannot be performed by power-ON only.)
4. To set up an address, it is unnecessary to operate the air conditioner.
5. Manual address setup is also available besides automatic setup.
   Automatic address : Setup from SW15 on the interface P.C. board of the header unit
   Manual address : Setup from the wired remote controller
   ∗ It is temporarily necessary to set the indoor unit and wired to 1 : 1. (In group operation and in time without remote controller)

Automatic Address Setup

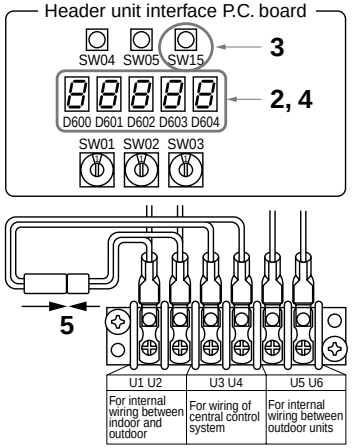
Without central control : To the address setup procedure 1
With central control : To the address setup procedure 2

(However, go to the procedure 1 when the central control is performed in a single refrigerant line.)

(Example)	In case of central control in a single refrigerant line	In case of central control over refrigerant lines
Address setup procedure	To procedure 1	To procedure 2
Cable systematic diagram		

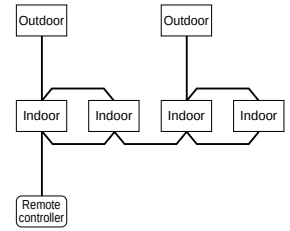
Address setup procedure 1

1. Turn on power of indoor/outdoor units. **(In order of indoor → Outdoor)**
2. After approx. 1 minute, check that U. 1. L08 (U. 1. flash) is displayed in 7-segment display section on the interface P.C. board of the outdoor unit.
3. Push SW15 to start the setup of the automatic addressing. (Max. 10 minutes for 1 line (Usually, approx. 5 minutes))
4. When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light), the setup finished.
5. **When performing an automatic address setup on a single refrigerant line with central control, connect relay connected between [U1, U2] and [U3, U4] terminals in the header unit.**



REQUIREMENT

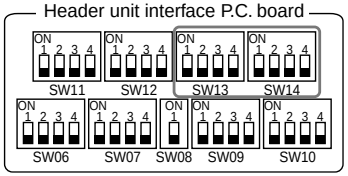
- When a group control is performed over the multiple refrigerant lines, be sure to turn on the power supplies of all the indoor units connected in a group at the time of address setup.
- If turning on the power for each refrigerant line to set up address, a header indoor unit is set for each line. Therefore, an alarm code "L03" (Duplicated header indoor units) is output in operation after address setup. In this case, change the group address from the wired remote controller for only one header unit is set up.

(Example)	Group control over multiple refrigerant lines
Cabling systematic diagram	

Address setup procedure 2

1. Using SW13 and 14 on the interface P.C. board of the outdoor unit in each system, set up the address for each system. (At shipment from factory: Set to Address 1)

Note) Be careful not to duplicate addresses with the other refrigerant line.



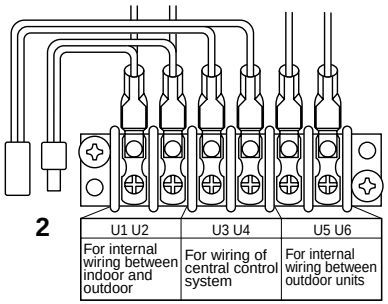
Line address switch on outdoor interface P.C. board (○: Switch ON, × : Switch OFF)

Line address	SW13 1	SW13 2	SW13 3	SW13 4	SW14 1	SW14 2	SW14 3	SW14 4
1				×	×	×	×	×
2				×	○	×	×	×
3				×	×	○	×	×
4				×	○	○	×	×
5				×	×	×	○	×
6				×	○	×	○	×
7				×	×	○	○	×
8				×	○	○	○	×
9				×	×	×	×	○
10				×	○	×	×	○
11				×	×	○	×	○
12				×	○	○	×	○
13				×	×	×	○	○
14				×	○	×	○	○

Line address	SW13 1	SW13 2	SW13 3	SW13 4	SW14 1	SW14 2	SW14 3	SW14 4
15				×	×	○	○	○
16				×	○	○	○	○
17				○	×	×	×	×
18				○	○	×	×	×
19				○	×	○	×	×
20				○	○	○	×	×
21				○	×	×	○	×
22				○	○	×	○	×
23				○	×	○	○	×
24				○	○	○	○	×
25				○	×	×	×	○
26				○	○	×	×	○
27				○	×	○	×	○
28				○	○	○	×	○

: Is not used for setup of system address. (Do not change setup.)

2. Check that the relay connectors between [U1, U2] and [U3, U4] terminals are not connected in all the outdoor units to which the central control is connected. (At shipment from factory: Connector not connected)
3. Turn on power of indoor/outdoor. **(In order of indoor → outdoor)**
4. After approx. 1 minute, check that 7-segment display is U.1.L08 (U.1. flash) on the interface P.C. board of the outdoor unit.
5. **Push SW15 to start the setup of automatic addressing.** (Max. 10 minutes for 1 line (Usually, approx. 5 minutes))
6. When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light), the setup finished.
7. Procedure 4. to 6. are repeated in other refrigerant lines.

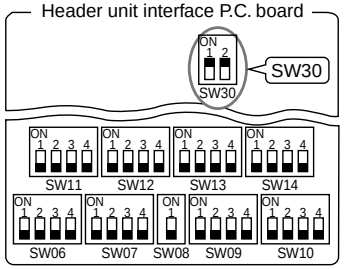


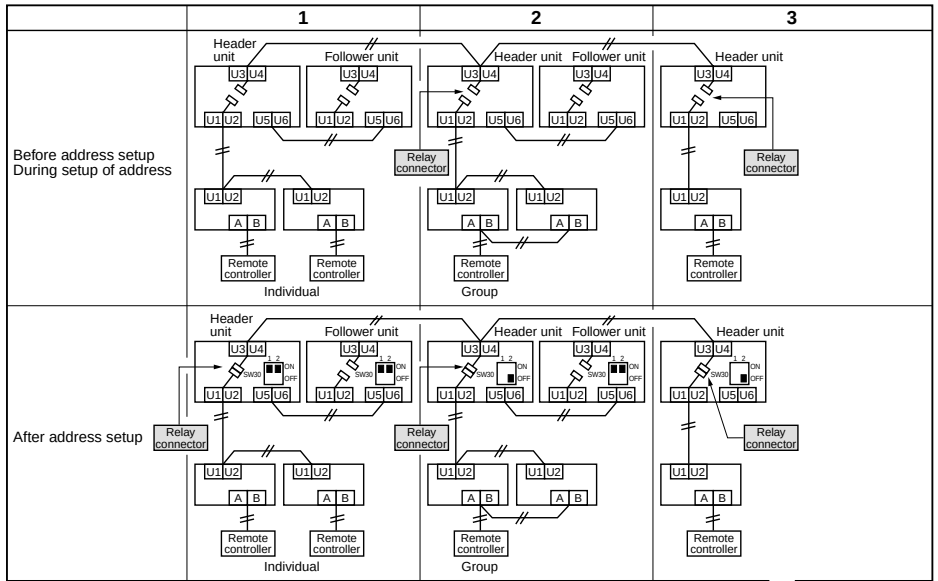
8. How to set up the terminal resistance

   When all the address setups have finished in the same refrigerant circuit system, put the terminal resistance in the same central control line into one.

   - Remain only SW30-2 of the header outdoor unit with address 1 as ON. (With end terminal resistance)
   - Set up SW30-2 of the other header outdoor units to OFF. (Without terminal resistance)

9. Connect the relay connector between [U1, U2] and [U3, U4] of the header unit for each refrigerant line.
10. Then set up the central control address.
    (For the central control address setup, refer to the Installation manual of the central control devices.)





Outdoor interface P.C. board	Header unit	Follower unit	Header unit	Follower unit	Header unit	Setup at shipment from factory
SW13, 14 (Refrigerant line address)	1	(Setup is unnecessary.)	**2**	(Setup is unnecessary.)	**3**	1
SW30-2 Terminal-end resistance of indoor/outdoor communication line/central control communication line	ON	(Setup is unnecessary.)	**OFF after address setup**	(Setup is unnecessary.)	**OFF after address setup**	ON
Relay connector	**Connect short after address setup**	Open	Connect short after address setup	Open	**Connect short after address setup**	Open

Indoor side (Automatic setup)

Refrigerant line address	1	1	2	2	3
Indoor unit address	1	2	1	2	1
Group address	0	0	1	2	0

Note

Never connect a relay connector until address setup for all the refrigerant lines has been completed ; otherwise address cannot be correctly set up.

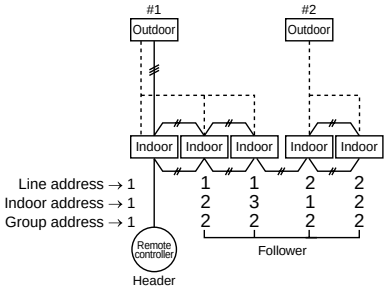
Manual address setup from remote controller

In case to decide an address of the indoor unit prior to finish of indoor wiring work and unpracticed outdoor wiring work (Manual setup from remote controller)

Arrange one indoor unit and one remote controller set to 1 by 1.

Turn on the power.

(Wiring example in 2 lines)



In the above example, under condition of no inter-unit wire of the remote controller, set the address after individual connecting of the wired remote controller.

Group address

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

Operation procedure

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

1 **Push simultaneously SET + CL + TEST buttons for 4 seconds or more.**
LCD changes to flashing.

(Line address)

2 **Using the setup temp. ▼ / ▲ buttons, set *12* to the item code.**

3 **Using the timer time ▼ / ▲ buttons, set up the line address.**
(Match it with the line address on the interface P.C. board of the outdoor unit in the identical refrigerant line.)

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

(Indoor address)

5 **Using the setup temp. ▼ / ▲ buttons, set *13* to the item code.**

6 **Using the timer time ▼ / ▲ buttons, set up the indoor address.**

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

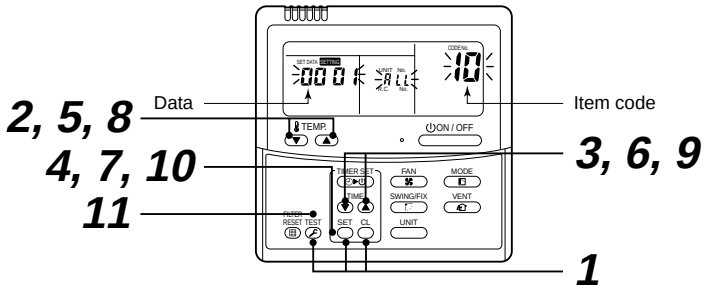
(Group address)

8 **Using the setup temp. ▼ / ▲ buttons, set *14* to the item code.**

9 **Using the timer time ▼ / ▲ buttons, set Individual = *0000*, Header unit = *0001*, Follower unit = *0002*.**

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

11 **Push TEST button.**
Setup operation finished.
(Status returns to normal stop status.)



Note 1)

When setting the line address from the remote controller, do not use address 29 and 30.

The address 29 and 30 cannot be set up in the outdoor unit. Therefore if they are incorrectly set up, a check code [E04] (Indoor/outdoor communication circuit error) is output.

Confirmation of indoor unit address and position by using the remote controller

[Confirmation of indoor unit address and the position]

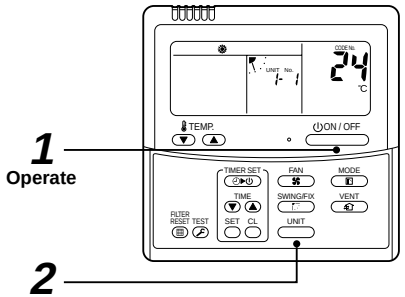
1. When you want to know the indoor address though position of the indoor unit itself can be recognized;

<Procedure> (Operation while the air conditioner operates)

1 **If it stops, push (ON / OFF) button.**

2 **Push (UNIT) button.**

The unit No. 1-1 is displayed on the LCD. (Disappears after several seconds) The displayed unit No indicates the line address and indoor address. (If there is other indoor unit connected to the same remote controller (Group control unit), other unit No. is displayed every pushing (UNIT) button.)



Operation procedure

1 → ***2***

2. When you want to know position of the indoor unit using the address

• To confirm the unit numbers in a group control;

<Procedure> (Operation while the air conditioner stops)

The indoor unit numbers in a group control are successively displayed, and the corresponding indoor fan is turned on. (Operation while the air conditioner stops)

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

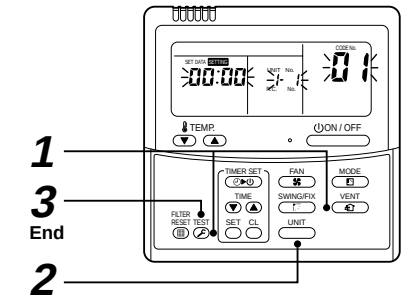
- Unit No. ALL is displayed.
- The fans of all the indoor units in a group control are turned on.

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

- The firstly displayed unit No. indicates the address of the header unit.
- Only fan of the selected indoor unit is turned on.

3 **Push (TEST) button to finish the procedure.**

All the indoor units in group control stop.



Operation procedure

1 → ***2*** → ***3*** **End**

• **To confirm all the unit numbers from an arbitrary wired remote controller;**

<Procedure> (Operation while the air conditioner stops)

The indoor unit No. and position in the same refrigerant line can be confirmed.
An outdoor unit is selected, the indoor unit numbers in the same refrigerant line are successively displayed, and then its indoor unit fan is turned on.

1 **Push the timer time (▼) + (TEST) buttons simultaneously for 4 seconds or more.**

Firstly, the line 1, **item code** AC (Address Change) is displayed. (Select outdoor unit.)

2 **Using (UNIT) + (SWING/FIX) buttons, select the line address.**

3 **Using (SET) button, determine the selected line address.**

- The indoor unit address, which is connected to the refrigerant pipe of the selected outdoor unit is displayed and the fan is turned on.

4 **Every pushing (UNIT) button, the indoor unit numbers in the identical pipe are successively displayed.**

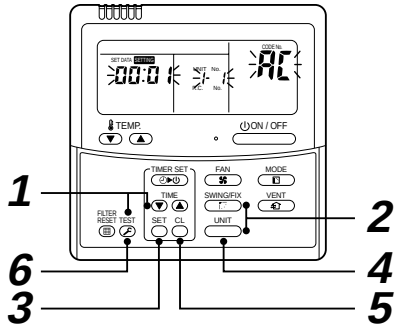
- Only fan of the selected indoor unit operates.

[To select another line address]

5 **Push (CL) button to return to procedure *2*).**

- The indoor address of another line can be successively confirmed.

6 **Push (TEST) button to finish the procedure.**



Operation procedure

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

Change of indoor address from remote controller

Change of indoor address from wired remote controller

• **To change the indoor address in individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control** (When the setup operation with automatic address has finished, this change is available.)

<Procedure> (Operation while air conditioner stops)

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

(The firstly displayed unit No. indicates the header unit in group control.)

2 **In group control, select an indoor unit No. to be changed by (UNIT) button.**

(The fan of the selected indoor unit is turned on.)

3 **Using the setup temp. (▼) / (▲) buttons, set 13 to the item code.**

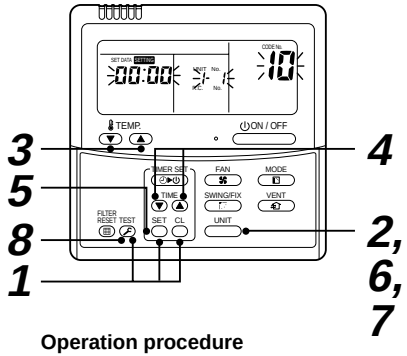
4 **Using the timer time (▼) / (▲) buttons, change the displayed setup data to a data which you want to change.**

5 **Push (SET) button.**

6 **Using the (UNIT) button, select the unit No. to be changed at the next time. Repeat the procedure *4* to *6* and change the indoor address so that it is not duplicated.**

7 **After the above change, push (UNIT) button to confirm the changed contents.**

8 **If it is acceptable, push (TEST) button to finish confirmation.**



Operation procedure

1 → ***2*** → ***3*** → ***4*** →
5 → ***6*** → ***7*** → ***8*** **End**

- **To change all the indoor addresses from an arbitrary wired remote controller;**
  (When the setup operation with automatic address has finished, this change is available.)

Contents : Using an arbitrary wired remote controller, the indoor unit address can be changed for each same refrigerant line

* **Change the address in the address check/change mode.**

<Procedure> (Operation while air conditioner stops)

1 **Push the timer time ▼ + TEST buttons simultaneously for 4 seconds or more.**
Firstly, the line 1, **item code** AC (Address Change) is displayed.

2 **Using UNIT + SWING/FIX buttons, select the line address.**

3 **Push SET button.**
- The indoor unit address, which is connected to the refrigerant pipe of the selected outdoor unit is displayed and the fan is turned on.
  First the current indoor address is displayed on the setup data. (Line address is not displayed.)

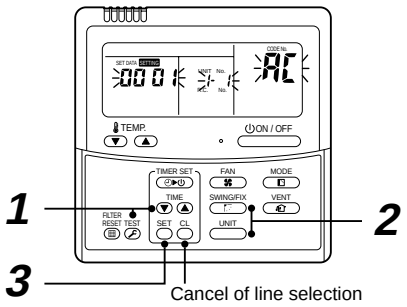
4 **The indoor address of the setup data moves up/down by the timer time ▼ / ▲ buttons.**
Change the setup data to a new address.

5 **Push SET button to determine the setup data.**

6 **Every pushing UNIT button, the indoor unit numbers in the identical pipe are successively displayed. Only fan of the selected indoor unit operates.**
Repeat the procedure ***4*** to ***6*** and change all the indoor addresses so that they are not duplicated.

7 **Push SET button.**
(All the displays on LCD go on.)

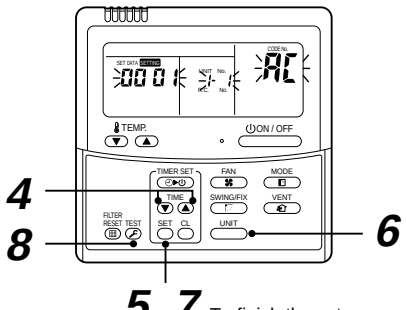
8 **Push TEST button to finish the procedure.**



Cancel of line selection

Here, if the unit No is not called up, the outdoor unit in this line does not exist.

Push CL button, and then select a line according to procedure ***2***.



5, 7 To finish the set

Operation procedure

1 → ***2*** → ***3*** → ***4*** →
5 → ***6*** → ***7*** → ***8*** **End**

Clearance of address (Return to status (Address undecided) at shipment from factory)

Method 1

An address is individually cleared from a wired remote controller.

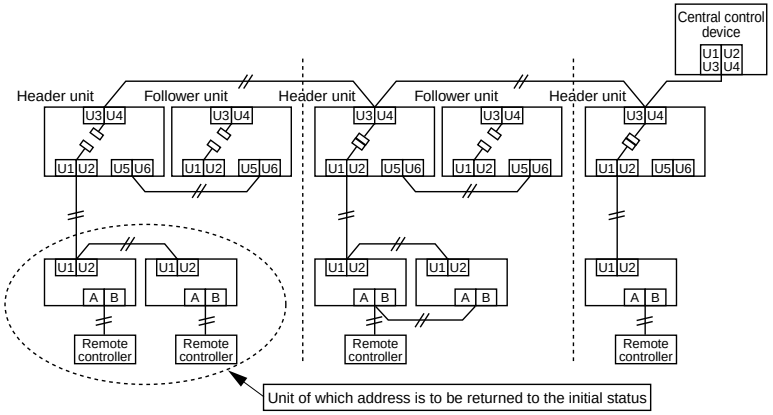
"0099" is set up to line address, indoor address, and group address data from the remote controller.

(For the setup procedure, refer to the abovementioned address setup from the remote controller.)

Method 2

Clear the indoor addresses in the same refrigerant line from the outdoor unit.

1. Turn off the power of the refrigerant line to be returned to the status at shipment, and change the header unit to the following status.
   1) Remove the relay connector between [U1U2] and [U3U4].
      (If it has been already removed, leave it as it is.)
   2) Turn on SW30-2 on the interface P.C. board of the header unit if it is OFF.
      (If it has been already ON, leave it as it is.)



2. Turn on the indoor/outdoor power of which address is to be cleared. After approx. 1 minute, check that "U.1. - - -" is displayed, and then execute the following operation on the interface P.C. board of the header unit of which address is to be cleared in the refrigerant line.

SW01	SW02	SW03	SW04	Address which can be cleared
2	1	2	After checking that "A.d.buS" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Line + Indoor + Group address
2	2	2	After checking that "A.d.nEt" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Central address

3. After "A.d. c.L." has been displayed on 7-degment display, return SW01/SW02/SW03 to 1/1/1.
4. When the address clearing has correctly finished, "U.1.L08" is displayed on 7-degment display after a while. If "A.d. n.G." is displayed on 7-degment display, there is a possibility which is connected with the other refrigerant line. Check again the relay connector between [U1U2] and [U3U4] terminals.
   NOTE) Be careful that the other refrigerant line address may be also cleared if clearing operation is not correctly executed.
5. After clearing of the address, set up an address again.

In case of increase the address-undefined indoor units (Extension, etc.)

If set up the indoor address of which address is undefined accompanied with extension of indoor units, replacement of P.C. board, etc, follow to the methods below.

Method 1

Set up an address individually from a wired remote controller.

(Line address, Indoor address, Group address, Central address)

For the setup method, refer to the above “Manual address setup from remote controller”.

Method 2

Set up an address from the outdoor unit.

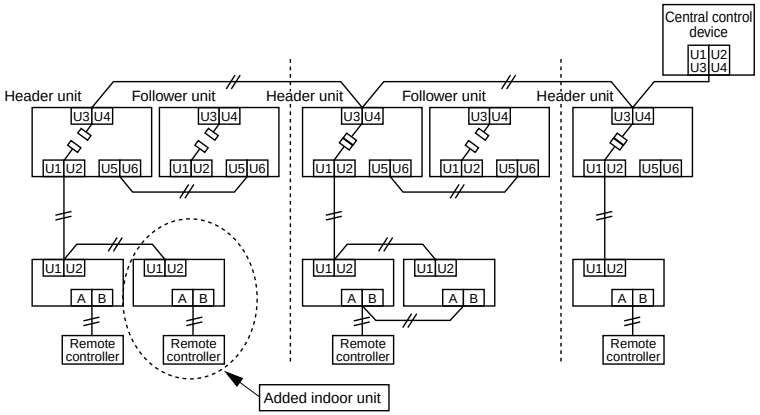
∗ Leave the address of the unit of which address has been already set up as it is.
Set up an address only to the unit of which address is undefined.

The addresses are allocated from the low number.

Setup procedure

Arrange the outdoor header units in the refrigerant line to which indoor units are added. (Figure below)

1. Remove the relay connector between [U1U2] and [U3U4].
2. Turn on SW30-2 on the interface P.C. board at outdoor header unit side if it is OFF.
   ∗ Turn off the power, and then execute the operation.



3. Turn on the indoor/outdoor power of which address is to be set up. After approx. 1 minute, check that “U.1. - - -” is displayed on 7-segment display.
4. Execute the following operation on the interface P.C. board of the header unit.

SW01	SW02	SW03	SW04
2	14	2	After checking that “ InAt ” is displayed on 7-segment display, and then push SW04 for 5 seconds or more.

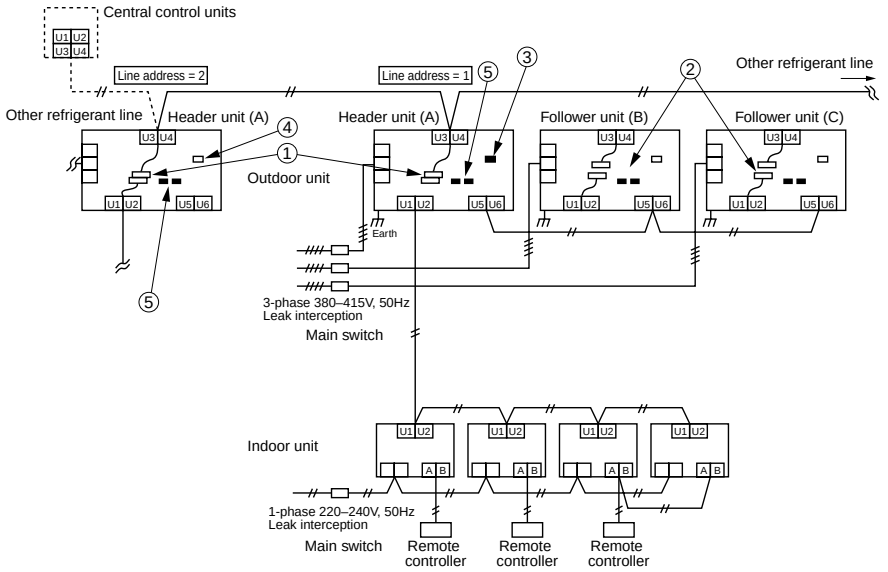
“AUTO1” → “AUTO2” → “AUTO3” → ⋯ → “AUTO9” … is counted and displayed on 7-degment display.

- Return the SW01, 02, 03 setup as before.

5. When “U.1. - - -” is displayed on 7-segment display, the setup operation finished.
   Turn off the indoor/outdoor power.
6. Return the following setup as before.
   - Relay connector
   - SW30-2

8-4-4. Check after Address Setup When Central Control System is Connected

When the central control system is connected, check the following setup has finished after address setup.



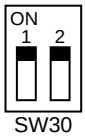
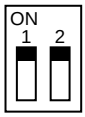
	Main check items	Check
Relay connector	1) Is relay connector of the header unit connected after address setup?	
	2) Is relay connector of the follower unit removed?	
Terminal resistance	3) Is the end resistance (SW30-2) of the header unit with the least refrigerant line address number (in the central control line) turned on? (Setup is unnecessary for follower unit.)	
	4) Are the terminal resistance (SW30-2) of the header units except for the line of which central control refrigerant line address is the smallest, turned off? (Setup is unnecessary for follower unit.)	
Line address	5) Are not addresses in the line address (SW13, SW14) duplicated in each refrigerant line?	

Note) The above table does not describe all the electric cablings. For details, refer to each installation manual for outdoor unit, indoor unit, remote controller, and optional devices.

8-5. Troubleshooting in Test Operation

If the phenomena appear, such as a check code is output or the remote controller is not accepted in power-ON after cabling work or in address setup operation, the following causes are considered.

8-5-1. A check Code is Displayed on the Remote Controller

Check code displayed on remote controller	Outdoor unit 7-segment display	Cause	Countermeasures
E04	E19-00	Outdoor power is formerly turned on.	Turn on the power again. (In order of Indoor → Outdoor)
		There is none of outdoor terminator resistor, or there are two or more resistances. (After address setup)	Check SW30 bit 2 of the outdoor unit. No connection between multiple refrigerant lines: SW30 bit 20N Connection between multiple refrigerant lines: SW30 bit 2 of the connected outdoor unit is turned on only in one line.
		After address was decided, all the indoor units do not correctly response after power-ON in outdoor unit.  SW30	Check and modifies disconnection of indoor/outdoor communication line.(Communication line between outdoor unit and the leading indoor unit) Check influence of communication noise.
	L08	Address setup error • Only line addresses of the connected indoor units are undefined. • The outdoor line address and the line addresses in all indoor units do not match. • The indoor addresses are duplicated. (Units except those displaying E04 are duplicated.) • A header unit is not set up in a group. (Except group displaying E04)	Set up address again.
	E08-XX	Duplication of indoor addresses. (Address No in which sub-code of the check code are duplicated)	Set up address again.
	E07	There is none of outdoor terminal resistance, or there are two or more resistances. (After address setup, when terminal resistance setup is changed after power-ON.)  SW30	Check SW30 bit 2 of the outdoor unit. No connection between multiple refrigerant lines: SW30 bit 20N Connection between multiple refrigerant lines: SW30 bit 2 of the connected outdoor unit is turned on only in one line.
		Transmission circuit error at interface side (P.C. board failure)	Replace the interface P.C. board.
	E06	After address setup, communication from all the indoor units interrupted under condition that a normal operation can be performed.	Check and correct disconnection of indoor/outdoor communication line.(Communication line between outdoor unit and the leading indoor unit) Check influence of communication noise.
E16	E16-XX	Exceeded No of connected indoor units or exceeded capacity.	Adjust No of connected indoor units or capacity.
E25	E25	Duplication of outdoor addresses. (Only when outdoor address was manually set up)	Do not use a manual setup for outdoor address.
L04	L04	Duplication of outdoor line addresses • Line address setup error, occurred after connection between U_1, U_2 and U_3, U_4 connectors	Modify line address setup of the outdoor unit between lines. (Set up SW 13 and 14 on the interface P.C. board.)
L05 (∗)	L06	Duplicated of indoor units with priority	The Heat Recovery Multi is not set up on priority.
L06 (∗)		There are two or more indoor units set up with priority.	
L08	L08	Address setup error • Only indoor addresses of all the connected indoor units are undefined.	Set up address again.

(∗) [L05]: Displayed on the indoor unit set up with priority
[L06]: Displayed on the indoor unit except one set up with priority

8-5-2. Operation from remote controller is not accepted and a check code is displayed on 7-segment display of the interface P.C. board of the outdoor unit.

Remote controller status	7-segment display of outdoor unit	Cause	Countermeasures
No response	L08	Line addresses and indoor addresses of all the connected indoor units are unset.	Set up addresses.
		There is no outdoor unit of group control.	Set up group address.
	E19-00	Indoor unit power is not turned on.	Turn on the power again. (In order of indoor → outdoor)
		Indoor/outdoor communication line is not correctly connected to the outdoor unit. (Fig. 1) (Indoor/outdoor cannot communicate before address setup.)	Correct wiring.
		There is none of outdoor terminator resistor, or there are two or more resistances. (Before address setup) SW30	Check SW30 bit 2 of the outdoor unit. No connection between multiple refrigerant lines: SW30 bit 2 0N Connection between multiple refrigerant lines: SW30 bit 2 of the connected outdoor unit is turned on only in one line.
	E20-01	Address setup is performed with connecting indoor/outdoor communication line between outdoor units. (Fig. 3)	Correct wiring.
		Address setup is performed under condition of connecting between multiple refrigerant lines. (Fig. 3)	Correct wiring.

8-5-3. There is no display of a check code on 7-segment display on the interface P.C. board of the outdoor unit though there is indoor unit which does not accept the operation from the remote controller.

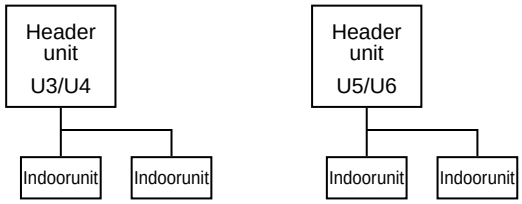
Remote controller status	7-segment display of outdoor unit	Cause	Countermeasures
No response	None	Communication line is not connected between indoor and outdoor.	Modify wiring.
		Line and indoor addresses are unset. (Unit which does not response to remote controller)	Set up address.
		The power of the header unit of the group is not turned on in indoor group control. (Unit which does not response to remote controller)	Turn on the power.
		Group address is set up to follower unit in the individual control. (Unit which does not response to remote controller)	Set [0] to group address in case of individual control.
No display on remote controller (No line is output.)	None	The power is not turned on. (Unit which is not displayed on remote controller)	Turn on the power.
		Remote controller is not connected with cable. (Unit which is not displayed on remote controller)	Correct wiring.
		Miscabling of remote controller (Unit which is not displayed on remote controller)	Correct wiring.
		Remote controller communication circuit error (Unit which is not displayed on remote controller) If 230V is incorrectly applied to the remote controller terminal, the remote controller communication circuit fails.	Remove FASTON terminal connected to remote controller terminals (A/B), and check the voltage. If voltage is not applied, replace P.C. board. (15 to 18V usually)

8-5-4. In check for No. of connected outdoor units and connected Indoor units after address setup, diminished No. of connected units displayed. (There are outdoor/indoor units which do not operate in a test operation.)

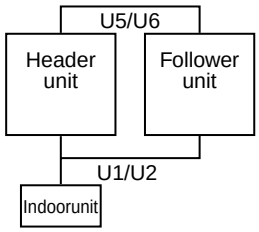
Status	Cause	Countermeasures
Number of connected outdoor units is short.	Miswiring of communication line between outdoor units or unconnected cable (Fig. 4) (Address setup operation has finished without recognition of miswired follower unit.)	After modification of wiring, set up address again and check No. of the connected outdoor units.
Number of connected indoor units is short.	Miswiring of communication line between indoor units or unconnected cable (Fig. 5) (Address setup operation has finished without recognition of miswired indoor unit.)	After modification of wiring, set up address again and check No. of the connected indoor units.
Number of outdoor units connected to group is short in group operation from remote controller.	Remote controller is not connected with wire. Miscabling of remote controller	Using the main remote controller connected to a group, start a test operation, specify the unit which does not operate (Unit unconnected to group), and then check wiring.
	Remote controller communication circuit error If 230V is incorrectly applied to the remote controller terminal, the remote controller communication circuit fails.	Using the main remote controller connected to a group, start a test operation, specify the unit which does not operate (Unit unconnected to group). Remove Fasten receptacle connected to remote controller terminals (A/B), and check the voltage. If voltage is not applied, replace P.C. board. (15 to18V in normal time)

Incorrect wiring example

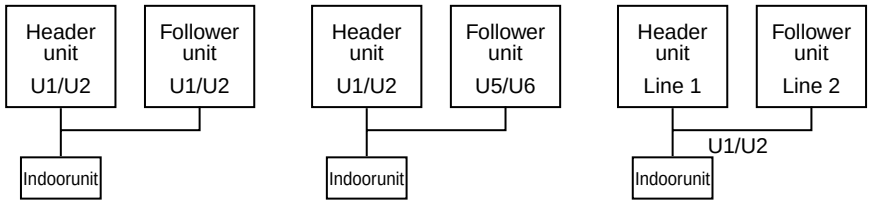
(Fig. 1)

Remote controller status	Header unit 7-segment display	Incorrect example
No response	E19-00	

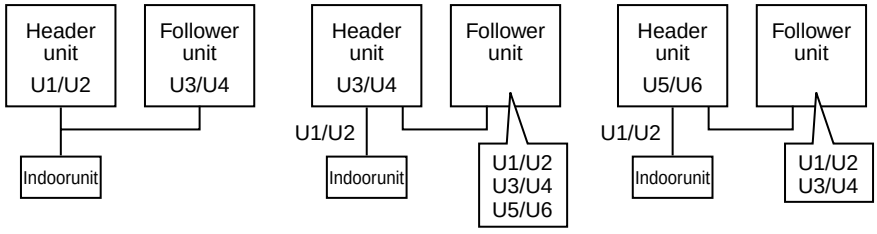
(Fig. 2)

Remote controller status	Header unit 7-segment display	Incorrect example
No response	E19-02	

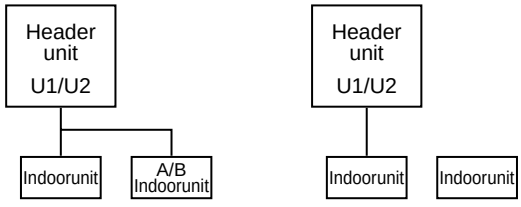
(Fig. 3)

Remote controller status	Header unit 7-segment display	Incorrect example
No response	E20-01	

(Fig. 4)

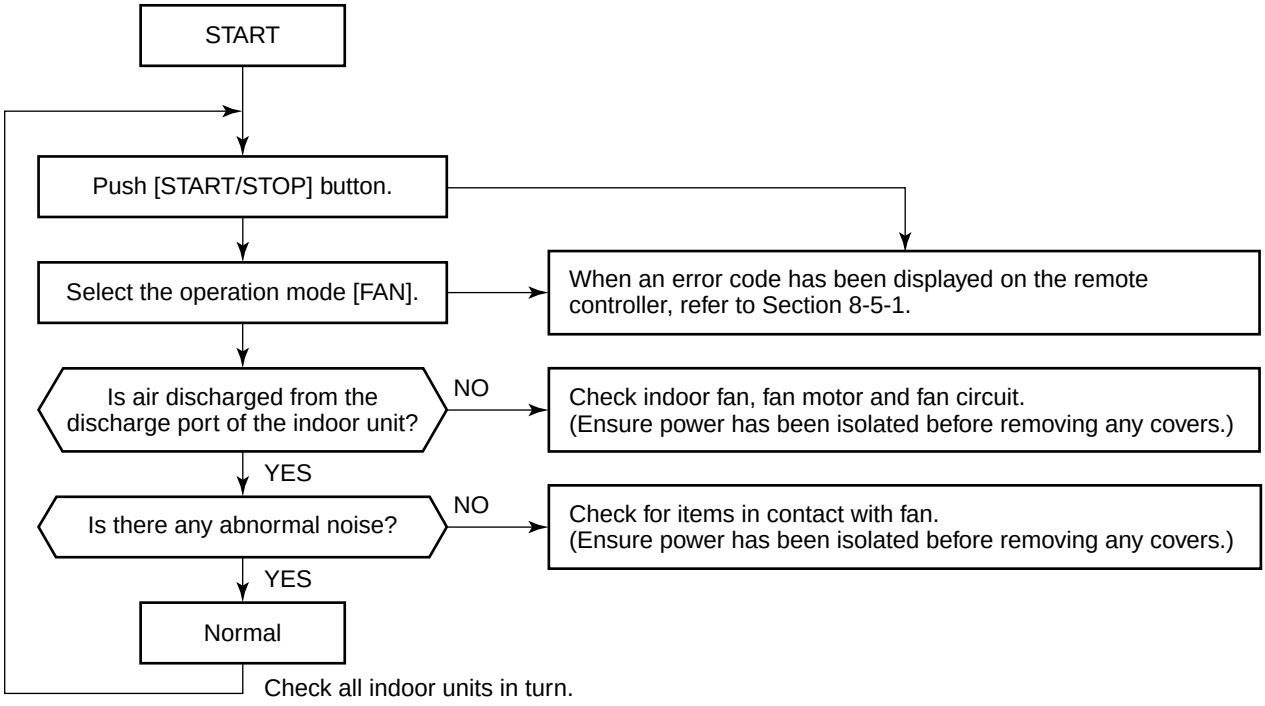
Status	Incorrect example
Number of connected outdoor units is short.	

(Fig. 5)

Status	Incorrect example
Number of connected outdoor units is short.	

8-6. Test Operation Check

8-6-1. Fan Operation Check



8-6-2. Cooling/Heating Test Operation Check

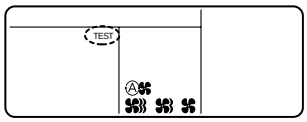
The cooling/heating test operation check can be performed on both remote controller and outdoor interface P.C. board.

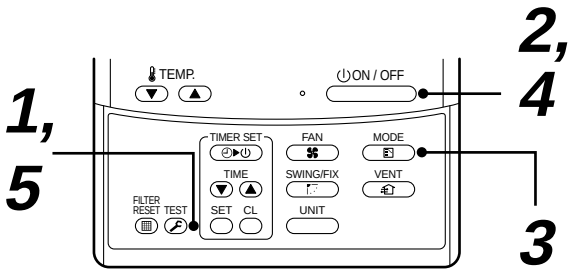
1. Test operation start/stop operation

Test operation from remote controller

Wired remote controller

1 **When pushing TEST button for 4 seconds or more, [TEST] is displayed in the display section and the mode enters the test operation mode.**

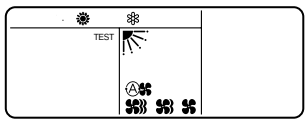




2 **Push ON / OFF button.**

3 **Using MODE button, select an operation mode either [COOL] or [HEAT].**

- Do not use any other operation modes, only [COOL] or [HEAT].
- Temperature adjustment is unavailable during test operation.
- Errors are detected as usual.

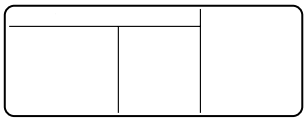


4 **When the test operation has finished, push ON / OFF button to stop the operation.**

The same display as that in procedure 1 appears.

5 **Push TEST button to clear the test operation mode.**

[TEST] display disappears and the status returns to the normal stop status.



Wireless remote controller
(Except 4-way Air Discharge Cassette type, Under Ceiling type and 1-way Air Discharge Cassette type (2 Series))

1 Remove the screw which fixes the name plate to the receiver part on the wireless remote controller.

Remove the nameplate of the receiver section by inserting a minus screwdriver, into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].

2 Execute a test operation with (ON / OFF) button on the wireless remote controller.

- ⏻, 🕘, and ✺ LED flash during test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is not available.

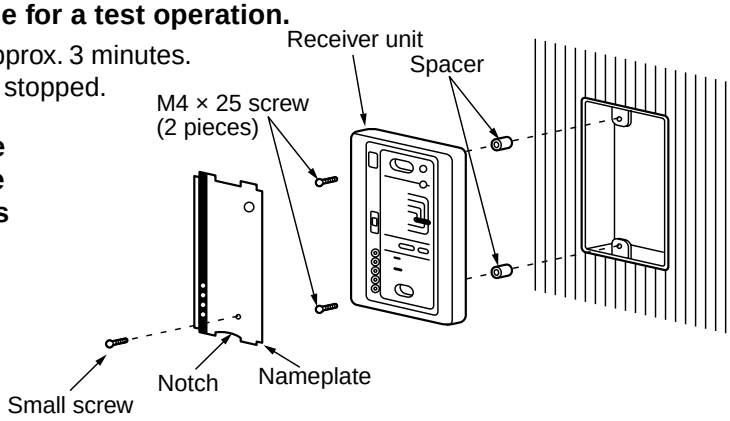
Ensure that this is not used for normal operation as equipment damage may occur.

3 Use either COOL or HEAT operation mode for a test operation.

Note) The outdoor unit does not operate for approx. 3 minutes. After power-ON and after operation has stopped.

4 After the test operation finished, stop the air conditioner using the wireless remote controller, and return the Dip switch to its original setting.

(A 60-minute timing function is designed into the sensor section in order to prevent a continuous test operation.)



Wireless remote controller (4-way Air Discharge Cassette type)

1 Turn OFF the power to the air conditioner.

Remove the adjust corner cap and the attached with sensor section from the ceiling panel. For removal method, follow to the installation instructions attached to the ceiling panel.
(Be careful to handling the sensor section because cables are connected to the sensor.)

Remove the sensor cover from the adjust corner cap. (1 screw)

2 Change Bit [1: TEST] of the switch [S003] on the sensor P.C. board from OFF to ON.

Mount the sensor cover and attach the adjust corner cap with sensors to the ceiling panel.

Turn on power of the air conditioner.

3 Push (ON / OFF) button of the wireless remote controller, and select an operation mode [COOL] or [HEAT] with (MODE) button. (All the display lamps of the wireless remote controller sensor section flash during the test operation.)

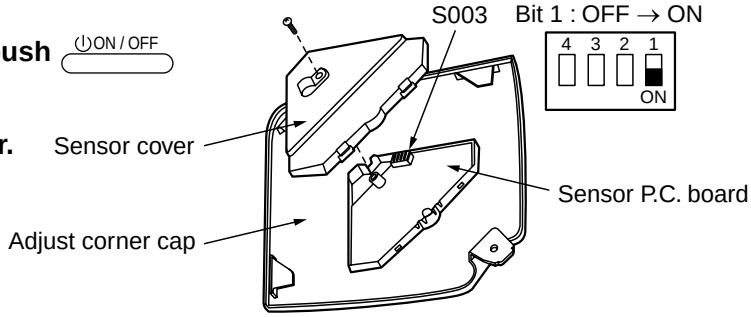
- Do not use operation mode other than [COOL] or [HEAT].
- Errors are detected as usual.

4 When the test operation has finished, push (ON / OFF) button to stop the operation.

5 Turn off the power to the air conditioner.

Change Bit [1] of the switch [S003] on the sensor P.C. board from ON to OFF.

Attach the adjust corner cap with sensors to the ceiling panel.



Test operation from outdoor unit

Refer to "**8-7-2. Function of Start/Stop the Indoor Unit from Outdoor Unit**" in "**8-7. Service Support Function**".

NOTE) The test operation returns to normal operation after 60 minutes have passed.

In case of wireless remote controller
(for Under Ceiling type and 1-way Air Discharge Cassette type (2 Series))

Procedure	Description	
1	Turn on power of the air conditioner.	
	The operation is not accepted for 5 minutes when power has been turned on at first time after installation, and 1 minute when power has been turned on at the next time and after. After the specified time has passed, perform a test operation.	
2	Push [**Start/Stop**] button and change the operation mode to [**COOL**] or [**HEAT**] with [**Mode**] button. Then change the fan speed to [**High**] using [**Fan**] button.	
3	**Test cooling operation**	**Test heating operation**
	Set temperature to [18°C] using [**Temperature set**] button.	Set temperature to [30°C] using [**Temperature set**] button.
4	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [19°C]	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [29°C].
5	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [18°C].	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [30°C].
6	Then repeat the procedure ***4*** → ***5*** → ***4*** → ***5***. After approx. 10 seconds, all the display lamps on the sensor part of wireless remote controller, [**Operation**] (Green), [**Timer**] (Green), and [**Ready**] (Yellow) flash and the air conditioner starts operation. If the lamps do not flash, repeat the procedure ***2*** and after.	
7	After the test operation, push [**Start/Stop**] button to stop the operation.	

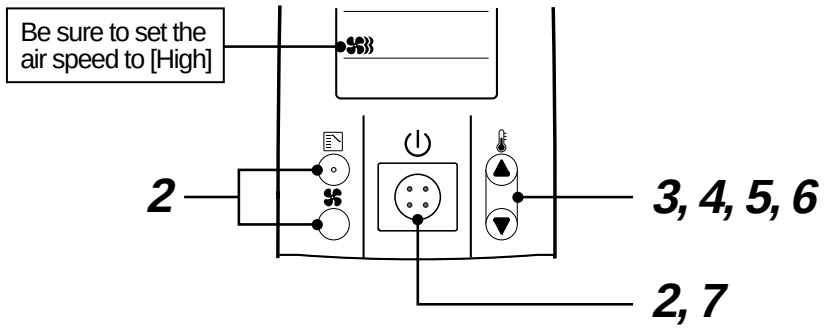
Outline of test operation from the wireless remote controller

Test cooling operation:

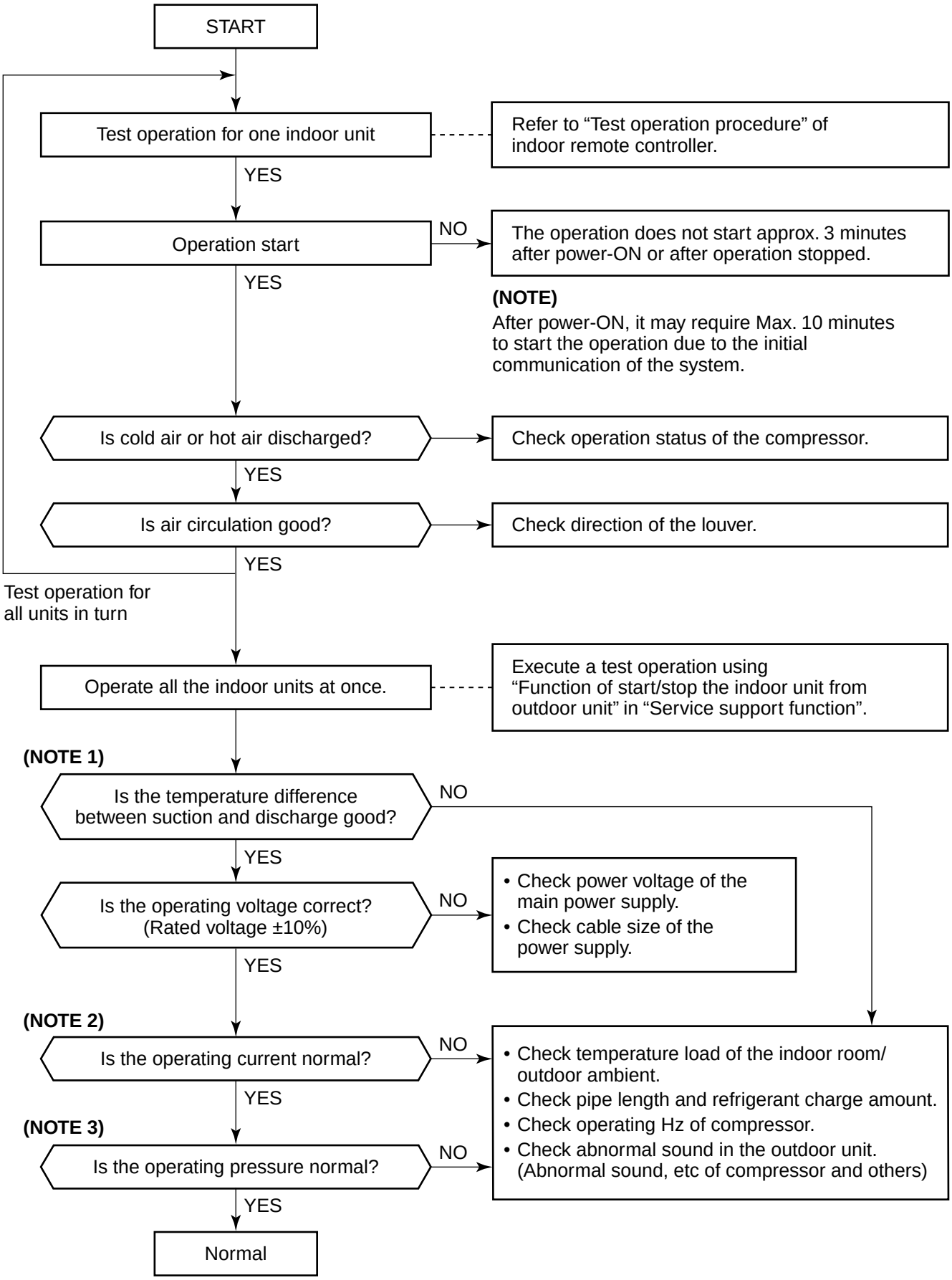
Start → 18°C → 19°C → 18°C → 19°C → 18°C → 19°C → 18°C → (Test operation) → Stop

Test heating operation:

Start → 30°C → 29°C → 30°C → 29°C → 30°C → 29°C → 30°C → (Test operation) → Stop



2. Test operation



(NOTE 1) Criteria for judging difference between suction and discharge temperature

1. Cooling

   After operation for a minimum of 30 minutes in [COOL] mode, check the dry bulb temperature difference.
   Temperature difference: 8°C or more between suction and discharge air of the indoor unit.
   (In Max-Hz operation)

2. Heating

   After operation for a minimum of 30 minutes in [HEAT] mode, check the dry bulb temperature difference.
   Temperature difference: 15°C or more between suction and discharge air of the indoor unit.
   (In Max-Hz operation)

   ∗ The temperature difference may diminish in cases of systems in which the connected indoor capacity exceeds 100%, or with long pipe length, etc.

(NOTE 2) Criteria for operating current

For a test operation (with all the indoor units operating), normal operating current is shown in the following table.

Outdoor unit	8HP	10HP	12HP
Current value	18	21	22

(Unit: A)

(NOTE 3) Criteria for cycle status

1. Refrigerating cycle under standard condition

   The refrigerating cycle under standard cooling and heating condition is as follows:

				10HP MMY-MAP1002FT8	
				Cool standard	**Heat standard**
Pressure	**(MPa)**	High	(Pd)	3.1	2.9
		Low	(Ps)	0.8	0.7
Pipe surface temp	**(°C)**	Discharge	(TD)	86	90
		Suction	(TS1)	6	3
		Indoor heat exchanger	(TC)	8	46
		Outdoor heat exchanger	(TE1)	43	1
		Liquid temp	(TL)	36	36
Number of compressor rotations	**(rps)**	Compressor	1	79	75
		Compressor	2	79	75
Air temp condition	**(DB/WB) (°C)**	Indoor		27/19	20/–
		Outdoor		35/–	7/6

∗ This compressor is driven with 4-pole motor. The value of the compressor frequency (Hz) measured by a clamp meter is two times the rotation count (rps) of the compressor.

∗ This data is the cycle data under condition of standard pipe length and two 4-way Air Discharge Cassette type air conditioners connected.
Data changes according to installed pipe length, combination of indoor units or connected indoor capacity.

∗ For a compressor, the left side is 1 and the right side is 2 viewed front the front of the unit.
Even if two compressors operate, the frequency difference may set as a measures against resonance.

∗ The temperature of indoor heat exchanger (TC) indicates TCJ sensor temperature in cooling time, and TC2 sensor temperature in heating time respectively.

2. Criteria for operating pressure

   General criteria is as follows:

All cooling operaton	High pressure : 2.0 to 3.2MPa	Indoor :18 to 32°C	When all the units operate in cooling mode
	Low pressure : 0.5 to 0.9MPa	Outdoor :25 to 35°C	
All heating operation	High pressure : 2.5 to 3.3MPa	Indoor :15 to 25°C	When all the units operate in heating mode
	Low pressure : 0.5 to 0.7MPa	Outdoor : 5 to 10°C	

Using the rotary switch on the outdoor unit I/F, the operating pressure, cycle temperature, and compressor rotation count can be checked on the 7-segment display.
Refer to “Outdoor refrigerant circuit system data display” and “Indoor cycle data display” in Section **9. Troubleshooting**.

8-7. Service Support Function

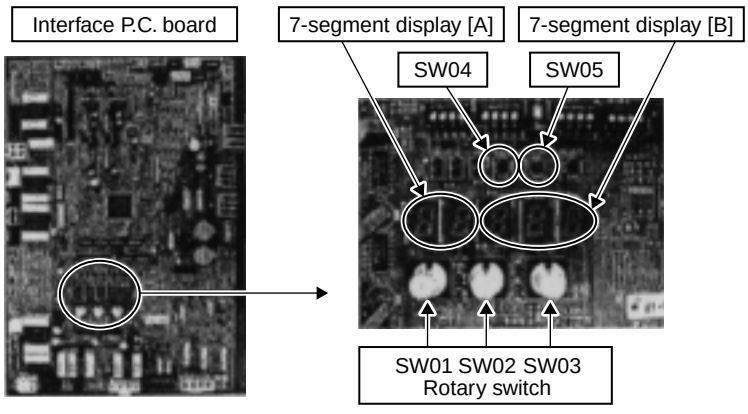
8-7-1. Function to Start/Stop (ON/OFF) Indoor Unit from Outdoor Unit

The following functions enables the start and stop of the indoor units using the switches on the interface P.C. board of the header unit.

No.	Function	Outline	Setup/Release	7-segment display
1	All cooling test operation	Changes the mode of all the connected indoor units collectively to cooling test operation. Note) Control operation same as test operation for remote controller.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"5", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [C] Section B [–C]
2	All heating test operation	Changes the mode of all the connected indoor units collectively to heating test operation. Note) Control operation same as test operation for remote controller.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"6", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [H] Section B [–H]
3	Batch start	Starts all the connected indoor units collectively. Note) The contents follow the setup of remote controller.	[Setup] Push SW04 for 2 seconds or more with SW01"2", SW02"7", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [CH] Section B [11] [11] is displayed on Section B for 5 seconds.
	Batch stop	Stops all the connected indoor units collectively.	[Setup] Push SW05 for 2 seconds or more with SW01"2", SW02"7", SW03"1". [Release] Return SW01, SW02, SW03 to "1".	Section A [CH] Section B [00] [00] is displayed on Section B for 5 seconds.
4	Individual start	Starts the specified indoor unit. Notes) • Control operation same as test. • The other indoor units keep existing status.	[Setup] Push SW04 for 2 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be started. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [11] for 5 seconds from operation-ON.
	Individual stop	Stops the specified indoor unit. Note) The other indoor units keep existing status.	[Setup] Push SW05 for 2 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be stopped. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [00] for 5 seconds from operation-OFF.
	Individual test operation	Operates the specified indoor unit. Note) The other indoor units keep existing status.	[Setup] Push SW04 for 10 seconds or more set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be operated. [Release] Return SW01, SW02, SW03 to "1".	Section A [ ] Section B [ ] Section A: Displays the corresponding indoor address. Section B: Displays [FF] for 5 seconds from test operation-ON.

NOTE 1) This start/stop function only sends the command signals from the outdoor unit to the indoor unit, such as start, stop, operation mode, etc.
Once it does not resend the signals even if the indoor unit does not follow the sent signals.

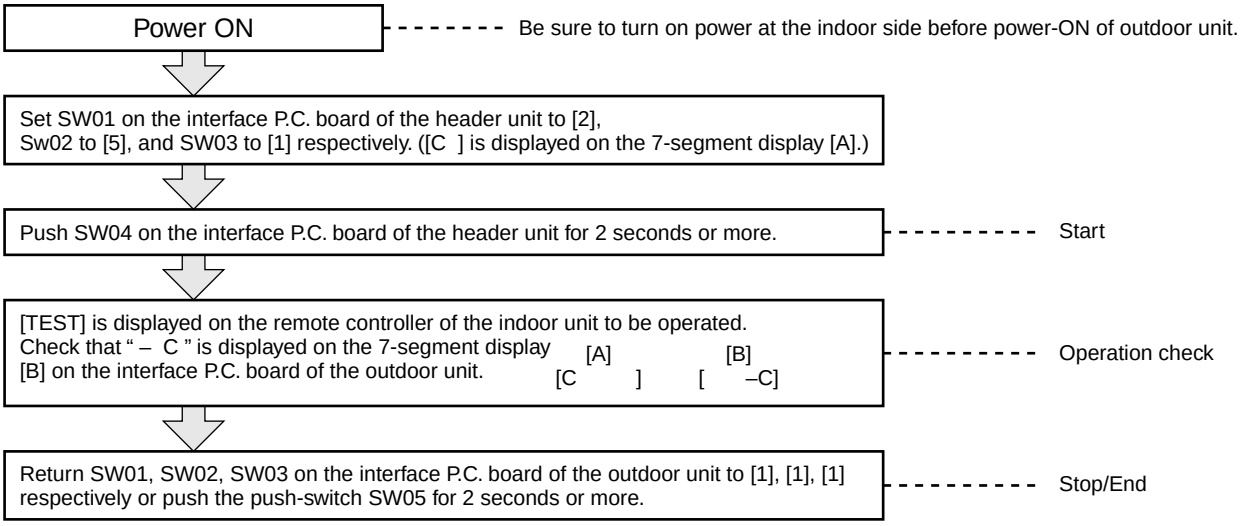
NOTE 2) The above controls are not available when an error has caused the system to stop.



1. All cooling test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system for cooling test operation mode, using switches on the interface P.C. board of the header unit.

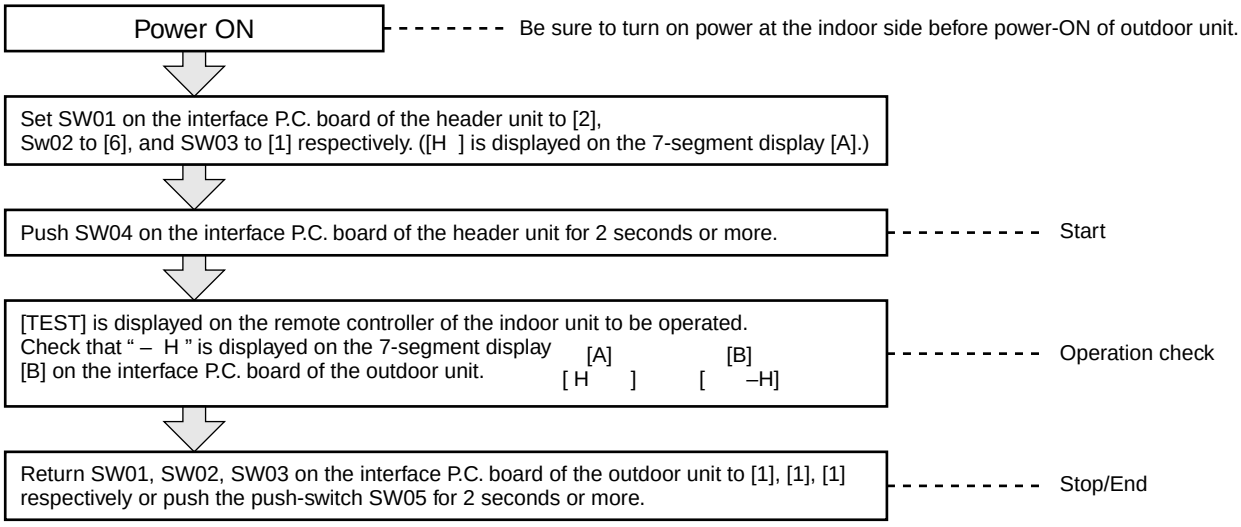
Operation procedure

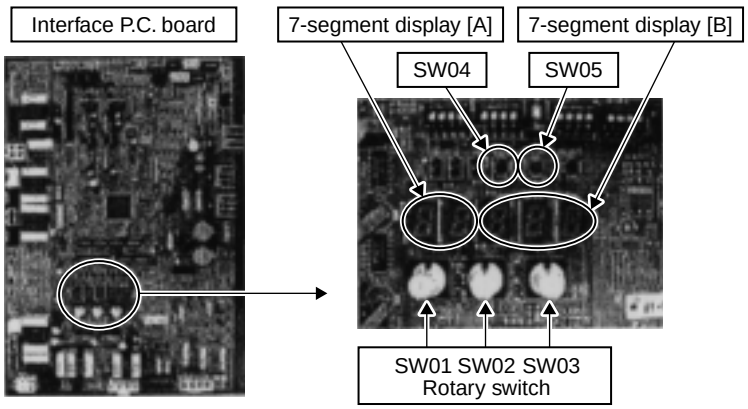


2. All heating test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system for heating test operation mode, using switches on the interface P.C. board of the outdoor unit.

Operation procedure



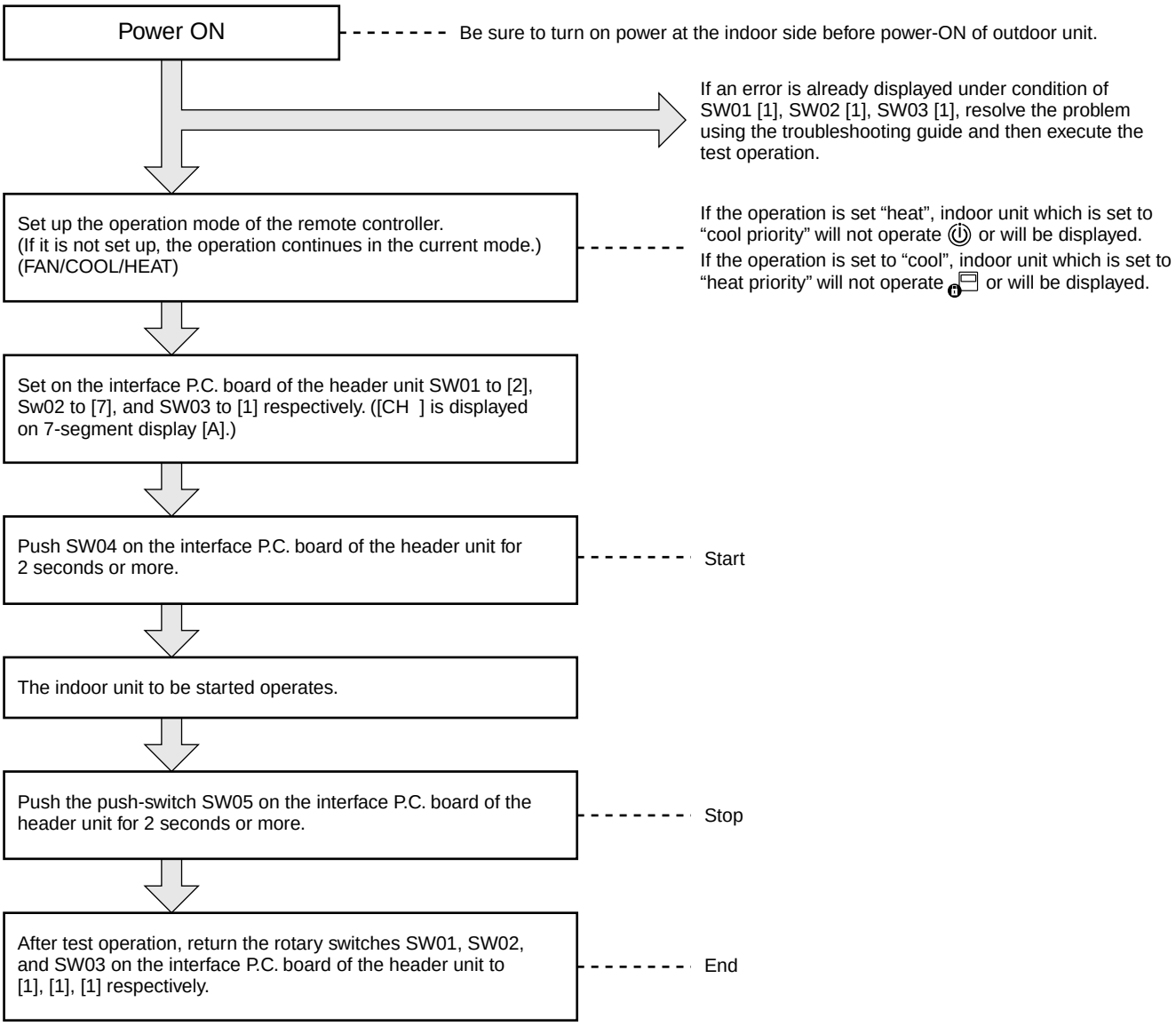


NOTE) The test operation returns to normal operation after 60 minutes.

3. Batch start/stop (ON/OFF) function

This function is provided to start/stop collectively all the indoor units connected to the same system by using switches on the interface P.C. board of the outdoor unit.

Operation procedure



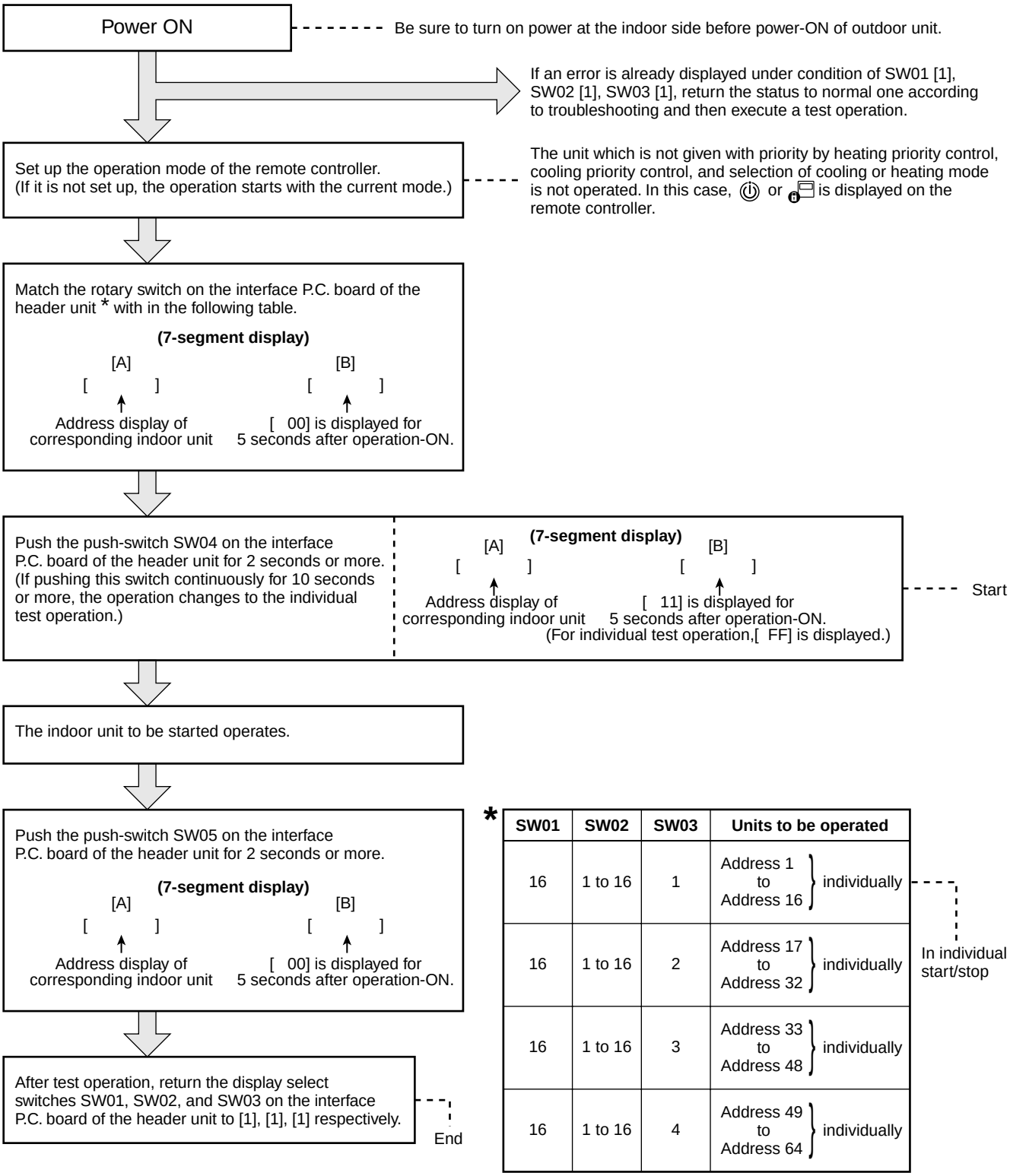
4. Individual start/stop (ON/OFF) individual test operation function

This function is provided to start/stop (ON/OFF) individually each indoor unit connected to the same system by using switches on the interface P.C. board of the header unit.

Set SW01 [16] and set SW02, SW03 to indoor address No. (1 to 64) to be started (Refer to the following table*) - only the setup indoor unit starts operation.

(In the rotary switches of the indoor unit which operates in a group by the remote controller, the follower unit cannot be individually started or stopped. In this case, [– –] is displayed on 7-segment display [B] on the interface P.C. board of the header unit.)

Operation procedure



*

SW01	SW02	SW03	Units to be operated
16	1 to 16	1	Address 1 to Address 16 individually
16	1 to 16	2	Address 17 to Address 32 individually
16	1 to 16	3	Address 33 to Address 48 individually
16	1 to 16	4	Address 49 to Address 64 individually

In individual start/stop

NOTE) The individual test operation returns to the normal operation after 60 minutes.

8-7-2. Error Clearing Function

1. Clearing from the main remote controller

[Error clearing in outdoor unit]

Error of the outdoor unit is cleared by the unit of one refrigerant circuit system to which the indoor units operated by the remote controller. (Error of the indoor unit is not cleared.)

For clearing errors, the service monitor function of the remote controller is used.

<Method>

1 **Change the mode to service monitor mode by pushing CL + TEST buttons simultaneously for 4 seconds or more.**

2 **Using ▼ / ▲ buttons, set "FF" to item code.**

The display in Section A in the following figure is counted with interval of 5 seconds as "0005" → "0004" → "0003" → "0002" → "0001" → "0000".

When the count arrives "0000", the error is cleared.

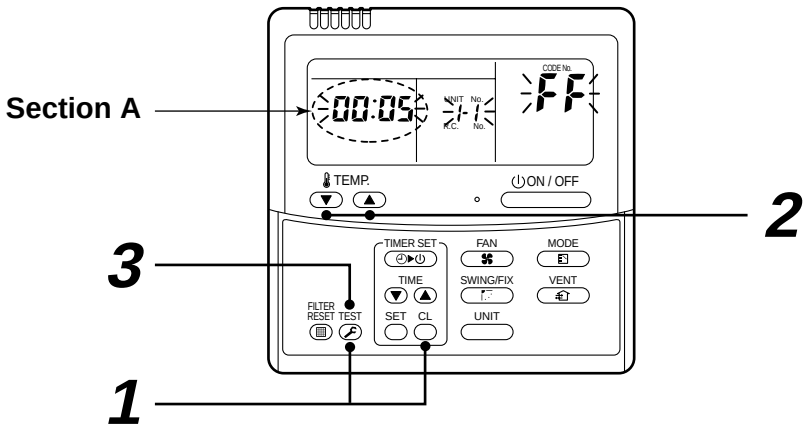
∗ However, counting from "0005" is repeated on the display.

3 **When TEST button is pushed, the status returns to the normal status.**

Operation procedure

1 → 2 → 3

The status returns to the normal status.



[Error clearing in indoor unit]

Error in the indoor unit is cleared by ON / OFF button on the remote controller.

(Only error of the indoor unit connected with operating remote controller is cleared.)

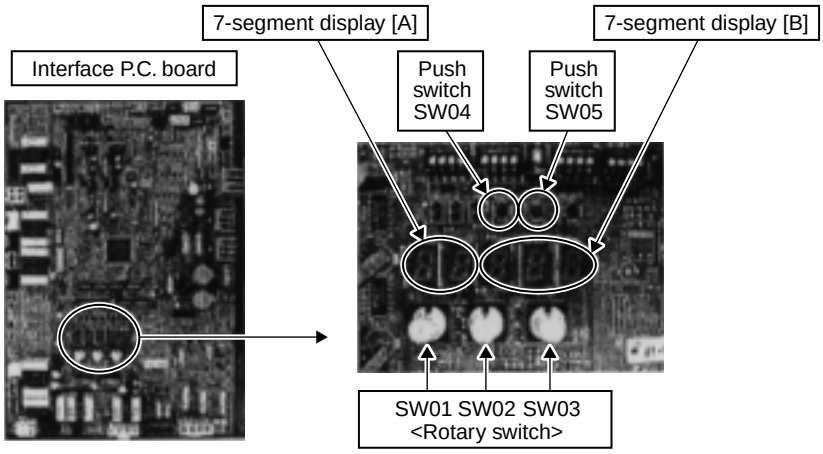
2. Clearing from the interface P.C. board

Using the switches on the interface P.C. board, this function is to clear the currently detected error for each refrigerant circuit system without resetting the power supply.

(→ Restart of error detection)

Errors in both outdoor and indoor units are once cleared.

Set the rotary switches on the interface P.C. board of the header unit to the following setting. SW01=[2] SW02=[16] SW03=[1]	**(7-segment display)** [A] [B] [Er] [ ]
↓	
Push the push-switch SW04 on the interface P.C. board of the header unit for 5 seconds or more.	
↓	
[CL] is displayed in 7-segment display [B] on the P.C. board (for 5 seconds), and the error is completely cleared.	**(7-segment display)** [A] [B] [Er] [CL]



3. Clearing of error check code by power reset

This function is provided to clear error in a refrigerant circuit system by resetting the power of all the outdoor and the indoor units.

(→ Restart of error detection)

As same as the clearing method on the interface P.C. board, errors of both the outdoor and the indoor units are once cleared.

Method

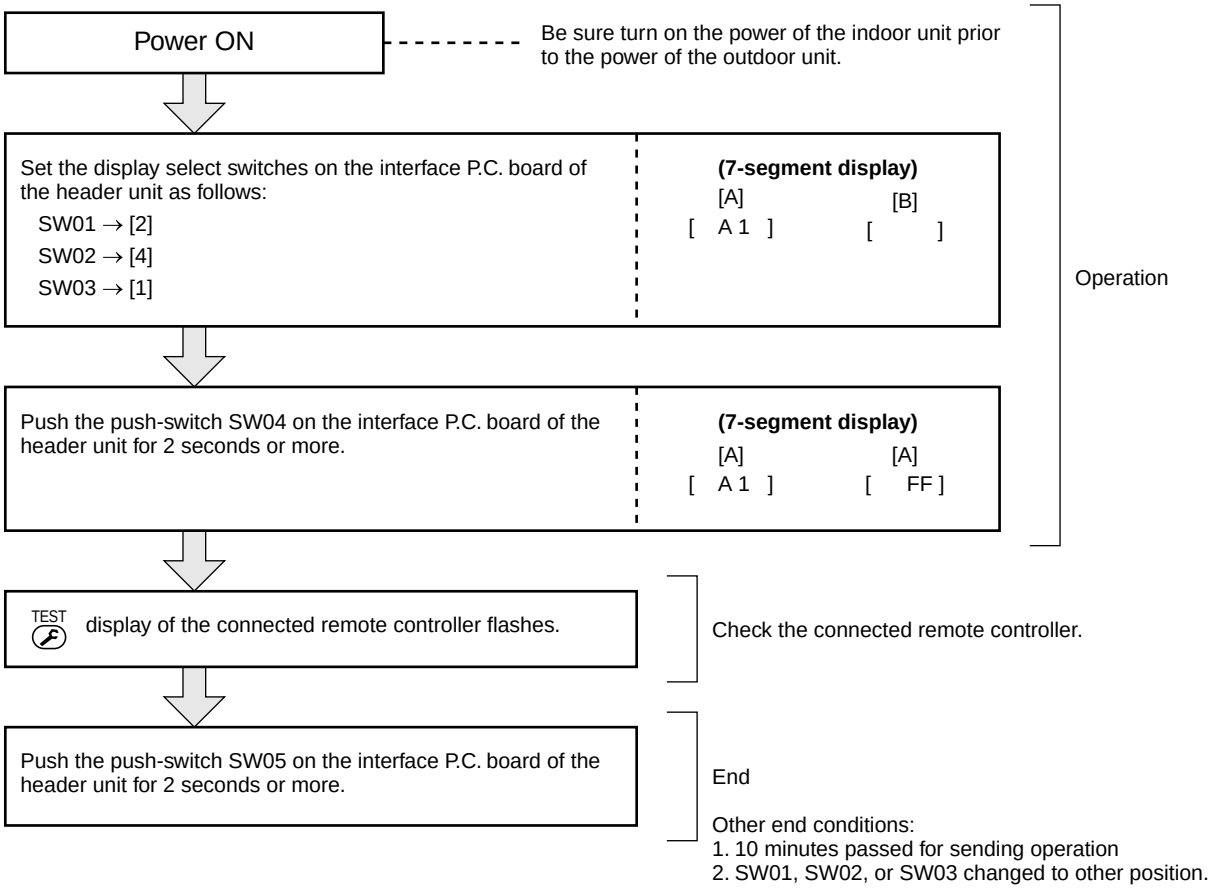
1. Be sure to reset power of both the outdoor and the indoor units.

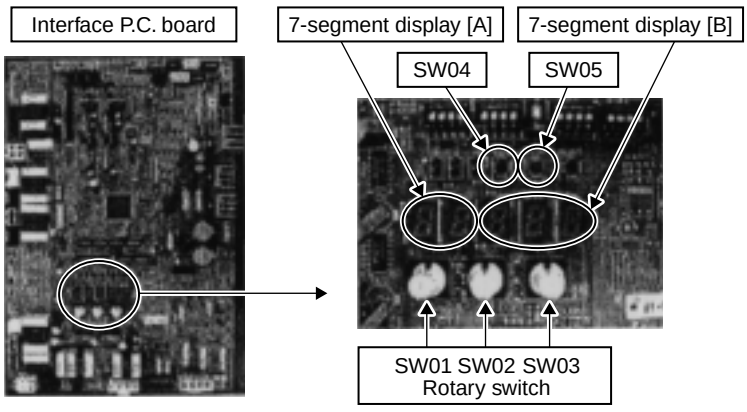
NOTE) After power reset, it requires usually 3 minutes to power-on due to the initial communication of the system. In same cases, it requires Max. 10 minutes.

8-7-3. Remote Controller Distinction Function

This function is provided to distinguish the remote controller connected from the outdoor unit to the indoor unit for a refrigerant circuit system using switches on the interface P.C. board of the header unit.

Distinction procedure





8-7-4. Pulse Motor Valve (PMV) Forced Open/Close Function in Indoor Unit

This function is provided to fully open or close forcibly the PMV for 2 minutes in all indoor units, using the switch operation on the interface P.C. board of the header unit.

This function is also used to open the PMV fully when turning off the power and executing an operation, for example, vacuuming.

Operation

[Open fully]

Set the switch SW01 on the interface P.C. board of the header unit to [2], SW02 to [3], SW03 to [1] and push SW04 for 2 seconds or more.

(Display shown on 7-segment display for 2 minutes as follows.) [P] [FF]

[Close fully]

Set the switch on the interface P.C. board of the header unit SW01 to [2], SW02 to [3], SW03 to [1] and push SW05 for 2 seconds or more.

(Display shown on 7-segment display for one minute as follows.) [P] [00]

[Clear]

After 2 minutes (1 minutes for “Close fully”) have passed when setup has finished, the PMV automatically returns to the normal operation.

8-7-5. Pulse Motor Valve (PMV) Forced Open Fully/Close fully Function in Outdoor Unit

This function is provided to fully open or close fully the P.M.V. (PMV1/PMV2/PMV3) used in the outdoor unit for 2 minutes.

[Open fully]

Short-circuit CN30 on the interface P.C. board of the header unit.

[Close fully]

Short-circuit CN31 on the interface P.C. board of the header unit.

[Clear]

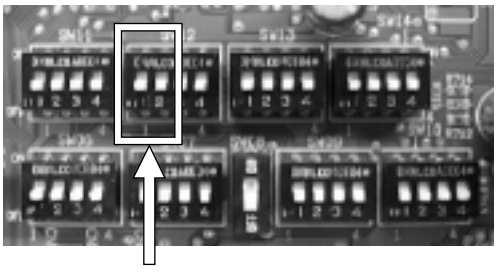
After 2 minutes, the opening returns to the normal operation.

Be sure to remove the short circuit after confirmation.

[Operating method]

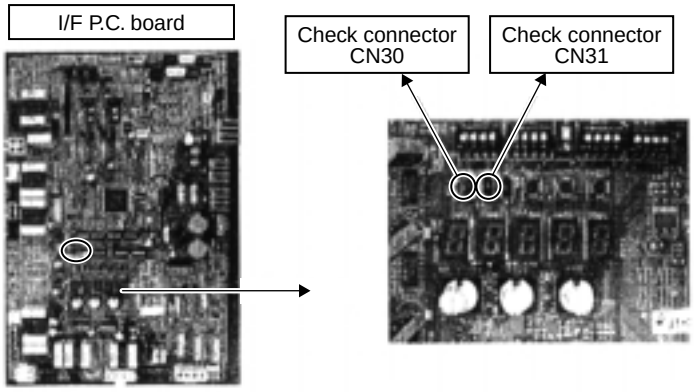
Select one of PMV1 or PMV2 to open. Turn SW12 bit 1 to OFF when handling (PMV1/PMV2), and turn it to ON when selecting PMV3.

Enlarged diagram of switch position



SW12

Bit 1	OFF	PMV1, PMV2
	ON	PMV3



8-7-6. Solenoid Valve Forced Open/Close Function in Outdoor Unit

This function is provided to forcibly open/close each solenoid valve mounted in the outdoor unit by use of the switches provided on the outdoor unit interface P.C. board. This function confirms the operation of each solenoid valve.

[Operation]

1. On the interface P.C. board set SW01 to [2], SW02 to [1] and SW03 to [3].
2. Confirm [H,r] is displayed on the 7-segment display [B]. Push switch SW04 for 2 seconds or more.
3. Confirm [2] is displayed on the 7-segment display - this indicates that solenoid SV2 has been switched on.
4. Each solenoid can be operated by selecting the appropriate SW02 position as shown in the table below.
   (ON/OFF output pattern of each solenoid valve is as below.)

   NOTE 1) Be aware that there is a 5 second delay in the operation of the selected solenoid valve after SW02 has been set.

   NOTE 2) The mark [○] in the table indicates the selected solenoid valve is forced on.

   NOTE 3) The mark [—] in the table indicates the selected solenoid mode will depend on the specifications of the air conditioner.

   NOTE 4) The mark [×] in the table indicates the selected solenoid valve has been turned off.

   NOTE 5) The case heater relay output operates both compressor and accumulator heaters.

SW02	7-segment display [B]	Operation pattern of solenoid valve												Case heater
		SV2	SV5	SV6	SV11	SV12	SV41	SV42	SV3A	SV3B	SV3C	SV3D	SV3E	
1	[··· 2 ···]	○	—	—	—	—	—	—	—	—	—	—	○	○
2	[··· 5 ···]	—	○	—	—	—	—	—	—	—	—	—	○	○
3	[··· 6 —]	—	—	○	—	—	—	—	—	—	—	—	○	○
4	[··· 1 1]	—	—	—	○	—	—	—	—	—	—	—	○	○
5	[··· 1 2]	—	—	—	—	○	—	—	—	—	—	—	○	○
6	[··· 4 1]	—	—	—	—	—	○	—	—	—	—	—	○	○
7	[··· 4 2]	—	—	—	—	—	—	○	—	—	—	—	○	○
8	[··· 4 —]	—	—	—	—	—	○	○	—	—	—	—	○	○
9	[··· 3 A]	—	—	—	—	—	—	—	○	—	—	—	○	○
10	[··· 3 b]	—	—	—	—	—	—	—	—	○	—	—	○	○
11	[··· 3 C]	—	—	—	—	—	—	—	—	—	○	—	○	○
12	[··· 3 d]	—	—	—	—	—	—	—	—	—	—	○	○	○
13	[··· 3 E]	—	—	—	—	—	—	—	—	—	—	—	×	○
14	[··· 3 —]	—	—	—	—	—	—	—	○	○	○	—	○	○
15	[··· ··· ···]	—	—	—	—	—	—	—	—	—	—	—	○	○
16	[A L L]	○	○	○	○	○	○	○	○	○	○	○	○	○

[Clear]

Return settings on SW01, SW02, and SW03 to (1/1/1) on the Interface P.C. board.

NOTE) Ensure this function is cleared to return the air conditioner to normal operation.

8-7-7. Fan Operation Check in Outdoor Unit

This function is provided to check the fan operation on the interface P.C. board in the outdoor unit. The frequency of the fan speed can be controlled.

Therefore utilize this function to check the operation or abnormal sound in the fan system.

NOTE) Do not use this function during operation of the compressor. It may damage the compressor.

[Operation]

1. Set the switch on the interface P.C. board of the outdoor unit SW01 to [2], SW02 to [1], SW03 to [4].
2. When [F. d] is displayed in 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when fan step [31] is displayed in 7-segment display [B], the fan starts operation. (Max. step operation)
4. After then, 7-segment display [B] and the fan step are changed by changing the setup number of the switches SW02 and SW03.

   (Output pattern of the fan is as follows.)

SW01	SW02	SW03	7-segment display [B]	Fan step
2	1	4	[31]	31
	2		[30]	30
	3		[29]	29
	4		[28]	28
	5		[27]	27
	6		[26]	26
	7		[25]	25
	8		[24]	24
	9		[23]	23
	10		[22]	22
	11		[21]	21
	12		[20]	20
	13		[19]	19
	14		[18]	18
	15		[17]	17
	16		[16]	16

SW01	SW02	SW03	7-segment display [B]	Fan step
2	1	5	[15]	15
	2		[14]	14
	3		[13]	13
	4		[12]	12
	5		[11]	11
	6		[10]	10
	7		[9]	9
	8		[8]	8
	9		[7]	7
	10		[6]	6
	11		[5]	5
	12		[4]	4
	13		[3]	3
	14		[2]	2
	15		[1]	1
	16		[0]	0

[Clear]

This function is cleared by one of the following operations.

1. When SW01 setting number was changed to other number.
2. Push-switch SW05 was pushed for 2 seconds or more.

8-7-8. Abnormal Outdoor Unit Discrimination Method <By Fan Operating Function>

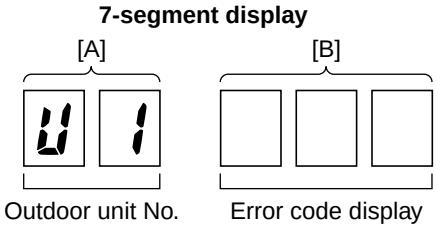
This function is provided to forcedly operate the fan of the outdoor unit in which an error occurred or the fan of the normal outdoor unit by the switch operation on the interface P.C. board in the header unit.

To specify which one of the follower units connected to the system was faulty, use this function for the system stop due to a follower unit fault (Check code [E28]).

[Operation]

In case to operate the fan in the erroneous outdoor unit only

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board in the header unit are set to [1].



2. Push the push-switch SW04 for 2 seconds or more.
3. “E 1” is displayed on 7-segment display [A].
4. The fan of the outdoor unit in which error occurred starts operation within approx. 10 seconds when “E 1” was displayed.

In case to operate the fans in all the normal outdoor units

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board are set to [1/1/1].
2. Push the push-switches SW04 and SW05 at the same time for 2 seconds or more.
3. “E 0” is displayed on 7-segment display [A].
4. The fans of all the normal outdoor units start operation with the Max. fan speed within approx. 10 seconds when “E 0” was displayed.

[Release]

Push the push-switch SW05 on the interface P.C. board in the header unit for 2 seconds or more.

The outdoor fan which was operated stops.

* Check [U. 1] is displayed on 7-segment display [A], and then finish the work.

8-7-9. Manual Adjustment Function of Outside Temp (TO) Sensor

This function is provided to fix TO sensor value manually by the switch operation on the interface P.C. board in the outdoor unit. When the unit stops abnormally due to TO sensor failure, etc, an emergent operation is available by set up the value manually to position near the current outside temperature.

[Operation]

1. Set the rotary switches on the interface P.C. board to numbers as follows.
   - SW01 [2] / SW02 [1] / SW03 [15]
   - 7-segment display: [t o]
2. Keep pushing the push-switch SW04 on the interface P.C. board for 1 second or more. The mode changes to the TO sensor value fix manual mode.
3. As shown in the following table, TO sensor value can be fixed by setting the rotary switch SW02 on the interface P.C. board.

SW01	SW02	SW03	7-segment display [B]	TO sensor value
2	1	15	[10]	10°C
	2		[15]	15°C
	3		[20]	20°C
	4		[25]	25°C
	5		[30]	30°C
	6		[35]	35°C
	7		[40]	40°C
	8		[43]	43°C

SW01	SW02	SW03	7-segment display [B]	TO sensor value
2	9	15	[45]	45°C
	10		[– 15]	–15°C
	11		[– 10]	–10°C
	12		[– 5]	–5°C
	13		[0]	0°C
	14		[2]	2°C
	15		[5]	5°C
	16		[7]	7°C

NOTE) Emergent operation should be restricted to one day or so on. If operating TO sensor fixed with this function, the system control operation of the air conditioner may not become one based upon the specification of the product. Therefore an emergent operation should be restricted to a day or so on.

[Clear]

Return numbers of SW01, SW02, and SW03 on the interface P.C. board in the header unit to [1/1/1] each.

Service support function list

SW01	SW02	SW03	7-segment display [A]	Function contents
2	1	1	[J C]	Refrigerant circuit and control communication line check function (Cooling operation)
	2		[J H]	Refrigerant circuit and control communication line check function (Heating operation)
	3		[P]	Indoor PMV forced full open function
	4		[A 1]	Indoor remote controller discriminating function
	5		[C]	Cooling test operation function
	6		[H]	Heating test operation function
	7		[C H]	Indoor collective start/stop (ON/OFF) function
	16		[E r]	Error clear function

2	1 to 16	3	[H r]	Solenoid valve forced open/close function
		4 to 5	[F d]	Fan forced operation function
		15	[t o]	Outside temp sensor manual adjustment function

16	1 to 16	1	[0 1] to [1 6]	Indoor No. 1 to 16 unit	Indoor individual start/stop (ON/OFF) function
		2	[1 7] to [3 2]	Indoor No.17 to 32 unit	
		3	[3 3] to [4 8]	Indoor No.33 to 48 unit	
		4	[4 9] to [6 4]	Indoor No.49 to 64 unit	

8-7-10. Indoor Fan Operation Check Function

This function is provided to check operation of single indoor unit without using communication with the remote controller or outdoor unit. This function can be used regardless operating or stopping of the system.

However, if this function is used for a long time, a trouble of the air conditioner may be caused. Therefore using of this function should be restricted to several minutes.

[Operation]

1. Short-circuit CHK pin (CN71 on the indoor P.C. board).

   If short-circuiting DISP pin (CN72 on the indoor P.C. board) while short-circuiting CHK pin (CN71 on the indoor P.C. board), the indoor PMV only becomes the minimum opening (30 pulse). When opening DISP pin, it becomes the maximum opening again.

[Clear]

Open CHK pin. If the system is operating, it stops once but automatically restart after several minutes.

∗ For the details of CHK pin (CN71 on indoor P.C. board) and DISP pin (CN72 on indoor P.C. board), refer to **11. Control circuit configuration, Indoor unit 2, Indoor P.C. board MCC-1402 and MCC-1403**.

8-7-11. Indoor Fan Only Operating Mode

When operating an air conditioner with indoor units and remote controller only in fan operation etc., this function can be used. A group operation is also available.

[Operation]

1) Short circuit DISP pin (CN72 on the indoor P.C. board). However, if CHK pin (CN71 on the indoor P.C. board) has been previously short circuited, this function is unavailable.
2) In a group operation, set up a group as usual.
3) While DISP pin is short circuited, all the sensor error judgment operation and communication with the outdoor unit are not performed. PMV is fixed to the Max. opening.

[Clear]

Open DISP pin.

8-7-12. Monitor Function of Remote Controller Switch

When using a remote controller with the model name RBC-ATM21E, the following monitor functions can be used.

Calling of display screen

[Contents]

The temperature or the operation status of the remote controller, indoor unit, or each sensor of the outdoor unit can be known by calling up the service monitor mode from the remote controller.

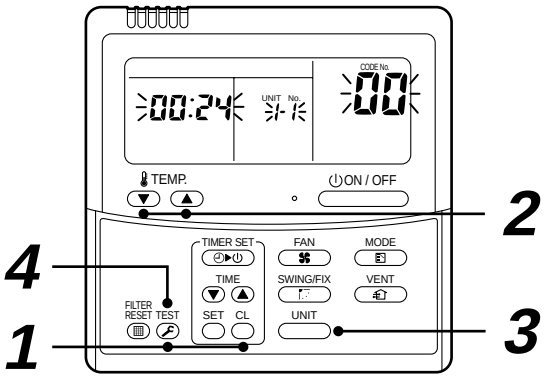
[Procedure]

1 **Push CL + TEST buttons simultaneously for 4 seconds or more to call up the service monitor mode. The service monitor goes on, and temperature of the item code 00 is firstly displayed.**

2 **Push the temperature setup ▼ / ▲ buttons to select the item number (Item code) to be monitored.**
For displayed codes, refer to the table below.

3 **Push UNIT button to change the item to one to be monitored. Then monitor the indoor unit and sensor temperature or operation status in the corresponding refrigerant line.**

4 **Pushing TEST button returns the display to the normal display.**



Operation procedure

1 → ***2*** → ***3*** → ***4***

Returns to the normal display

	Item code	Data name	Unit	Display format		Item code	Data name	Unit	Display format
Indoor unit data (NOTE 2)	00	Room temp (During control)	°C		Outdoor unit individual data (NOTE 4, 5)	10	Compressor 1 discharge temp (Td1)	°C	× 1
	01	Room temp (Remote controller)	°C			11	Compressor 2 discharge temp (Td2)	°C	× 1
	02	Indoor suction temp (TA)	°C	× 1		12	High-pressure sensor detention pressure (Pd)	MPa	× 100
	03	Indoor coil temp (TCJ)	°C	× 1		13	Low-pressure sensor detention pressure (Ps)	MPa	× 100
	04	Indoor coil temp (TC2)	°C	× 1		14	Suction temp (TS)	°C	× 1
	05	Indoor coil temp (TC1)	°C	× 1		15	Outdoor heat exchanger temp (TE)	°C	× 1
	06	Indoor discharge temp (Tf) (NOTE 1)	°C	× 1		16	Temp at liquid side (TL)	°C	× 1
	08	Indoor PMV opening	pulse	× 1/10		17	Outside ambient temp (TO)	°C	× 1
System data	0A	No. of connected indoor units	unit			18	Low-pressure saturation temp (TU)	°C	× 1
	0b	Total HP of connected indoor units	HP	× 10		19	Compressor 1 current (I1)	A	× 10
	0C	No. of connected indoor units	unit			1A	Compressor 2 current (I2)	A	× 10
	0d	Total HP of outdoor units	HP	× 10		1b	PMV1 + 2 opening	pulse	× 1/10
						1d	Compressor 1, 2 ON/OFF	—	(NOTE 3)
						1E	Outdoor fan mode	—	0 to 31
						1F	Outdoor unit HP	HP	× 1

(NOTE 1) Only a part of indoor unit types is installed with the discharge temperature sensor. This temperature is not displayed for other types.

(NOTE 2) When the units are connected to a group, data of the header indoor unit only can be displayed.

(NOTE 3) 01 : Compressor 1 only is ON. 10 : Compressor 2 only is ON. 11 : Both compressor 1 and 2 are ON.

(NOTE 4) The item codes are described as the example of the header unit.

(NOTE 5) The upper digit of an item code represents the outdoor unit number.
1 : Header unit (A) 2 : Follower unit (B) 3 : Follower unit (C)

9. TROUBLESHOOTING

9-1. Troubleshooting Summary

1. Before troubleshooting

1) Applied models

Super Heat Recovery Multi type models

(Indoor unit: MMX-APXXX, Outdoor unit: MMY-MAPXXXFT8)

2) Required tools / measuring devices

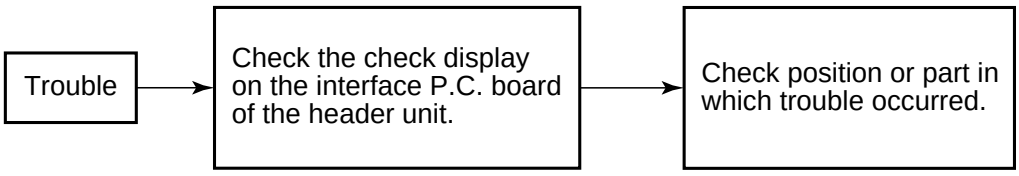
- Screwdrivers (Philips, Flat), spanner, longnose pliers, nipper, push pin for reset switch, etc.
- Digital multimeter, thermometer, pressure gauge, etc.

3) Confirmation before check (The following items are not troubles.)

No.	Operation	Check items
1	Compressor does not operate.	• Is it delayed for 3 minutes? (3 minutes after compressor-OFF) • Is thermostat OFF? • Is the fan operating or timer? • Is the system initially communicating? Heating operation cannot be performed under the condition that the outside temperature is 21°C or higher. Cooling operation cannot be performed under the condition that the outside temperature is –5°C or lower.
2	Indoor fan does not work.	• Is cold draft prevention control operating at heating mode?
3	Outdoor fan does not rotate, or fan speed changes.	• Is it in low ambient cooling control? • Is a defrost operation being performed?
4	Indoor fan does not stop.	• Is the fan operating to remove residual heat after heating operation?
5	Start/stop operation on remote controller is unavailable.	• Is an auxiliary unit or remote controller being operated?
6	None	• Are the wire connections on the indoor units and remote controllers correct?

2. Troubleshooting procedure

When a fault has occurred, follow the procedure detailed below.



NOTE) A malfunction of the microprocessor may be caused by power supply inconsistencies and external noise. If there are any noise sources, move remote controller and signal wires away from the noise sources or shield them.

9-2. Check Method

If an trouble occurs, the error code can be retrieved from the main remote controller/central remote controller (LCD display) or the header unit interface P.C. board (7-segment display). Using this self diagnostic function, the trouble can be identified using the table below.

Check code list

The following list shows all fault codes.

- If check code is from indoor remote controller: See “Main remote controller display” in the list.
- If check code is from outdoor unit: See “Outdoor 7-segment display” in the list.
- If check code is from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- If check code is from indoor unit with wireless remote controller: See “Sensor display of receiving unit” in the list.

IPDU: Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT.: Flashing is alternately when there are two flashing LED.
SIM: Simultaneous flashing when there are two flashing LED

Check code				Wireless remote controller				Check code name	Detecting device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation ⏻	Timer ◴	Ready ❁	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Remote controller transmission error	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor/outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error between indoor/outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated main remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01 ~: No. of connected units	89	●	●	¤		Capacity over / No. of connected indoor units	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor unit error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller				Check code name	Detecting device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation ⏻	Timer ◴	Ready ❁	Flash		
F01	—	—	0F	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	0d	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	¤	¤	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor miscabling (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Indoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor trouble (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	—	—	96	¤	●	¤	SIM	Indoor center unit duplicated	Indoor
L04	L04	—	96	¤	○	¤	SIM	Outdoor line address duplicated	I/F
L05	—	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor, I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L17	L17	—	46	¤	○	¤	SIM	Inconsistency error of outdoor units	I/F
L18	L18	—	8A	¤	¤	¤	SIM	FS unit error	FS unit
L20	L20	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET, Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Indoor outside interlock	Indoor
—	L31	—	—		—			Extended I/C error	I/F

Check code				Wireless remote controller				Check code name	Detecting device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation ⏻	Timer ◴	Ready ❁	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp. TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW system operation	IPDU
P05	P05	01: Phase-missing detection 02: Phase error	AF	¤	●	¤	ALT	Phase-missing detection /Phase error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	IC	¤	●	¤	ALT	Heat sink overheat error	IPDU, I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp. TD2 error	I/F
P19	P19	Detected outdoor unit number	O8	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⌴ : IGBT short 1 ⌴ : Fan motor position detective circuit error 3 ⌴ : Fan motor trouble C ⌴ : TH sensor temp. error (Heat sink overheat) D ⌴ : TH sensor error E ⌴ : Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	P31	—	47	¤	●	¤	ALT	Other indoor unit error (Group terminal unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adapters	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Detecting device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation ⏻	Timer ◴	Ready ❁	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control branching unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

New check code

1. Difference between the TCC LINK and AI-NET check code

The displaying method of the check code changes in this model and onwards.

	AI-NET check code	TCC Link
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/ incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

Display in wired remote controller

- [⚠] is displayed.
- [UNIT No.] + Check code + Operation lamp (Green) flash

Display on sensor part in wireless remote controller

- Block display of combination of [⏻] [◴] [❁]

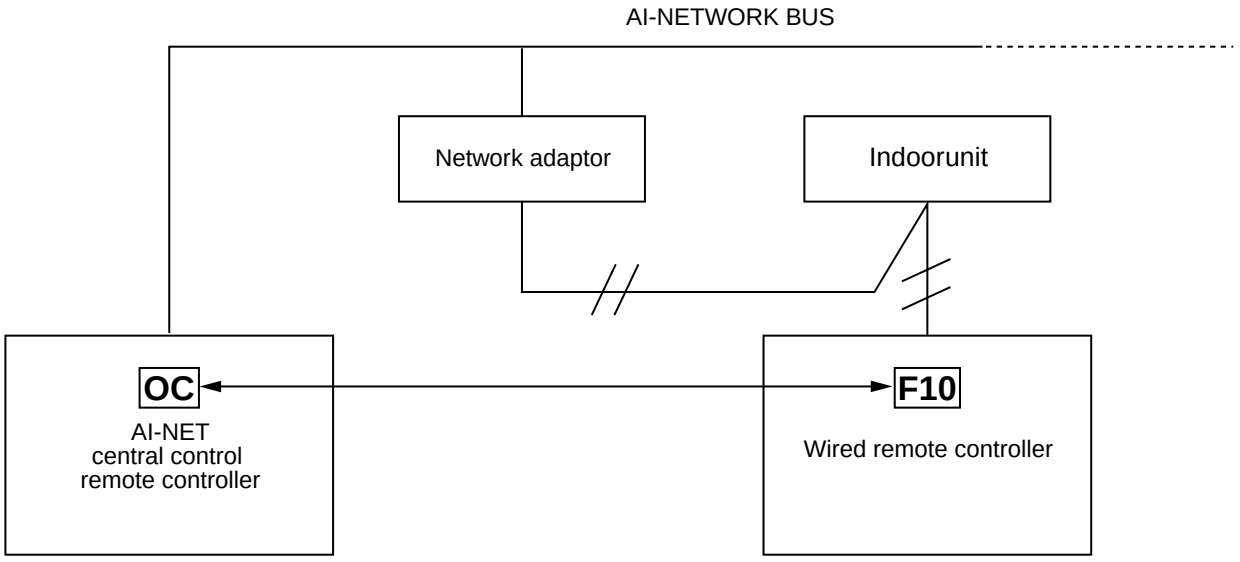
Display on 7-segment in outdoor unit

- Unit No. and check code are displayed.
- In a case of error with auxiliary code, the check code and the auxiliary code are displayed alternately.

2. Special mention

1) If this model is connected to AI-NET by network adaptor, the different check codes are displayed on the main remote controller and AI-NET central control remote controller.

Example) Indoor TA sensor error



2) The check code of the remote controller is displayed only while the air conditioner is operating (remote controller start button ON).

When the air conditioner has stopped and the error has been cleared, the check code display on the remote controller also disappears.

However, if the error continues after the unit has stopped, the check code is immediately displayed when the unit is restarted.

9-3. Troubleshooting by Check Display on Remote Controller

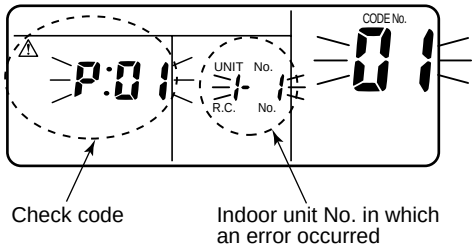
In case of wired remote controller (RBC-AMT31E)

1. Confirmation and check

When a trouble occurs in the air conditioner, the check code and the indoor unit No. are displayed on the of the remote controller.

The check code is displayed while the air conditioner operates.

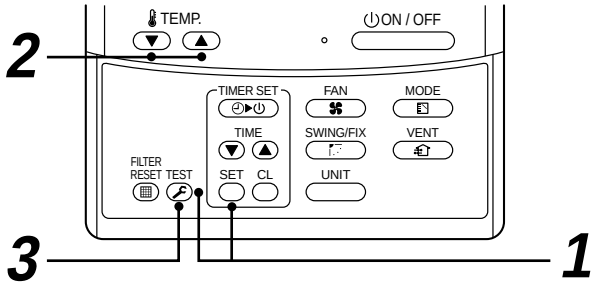
If the display has disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.

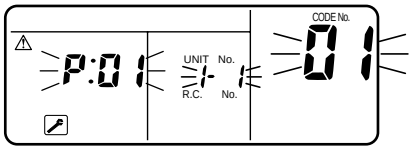


2. Confirmation of error history

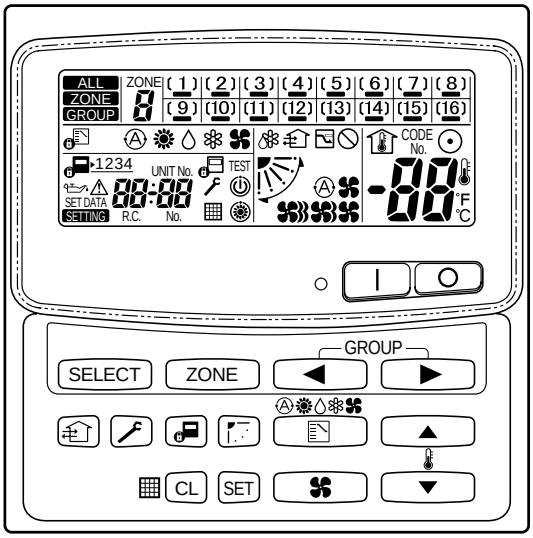
If a trouble occurs in the air conditioner, the error history can be found with the following procedure. (Up to 4 error histories are stored in the memory.)

This history can be confirmed from either operating status or stop status.



Procedure	Description
1	When pushing SET and TEST buttons simultaneously for 4 seconds or more, the below display appears. If [Service Check] is displayed, the mode enters the error history mode. • [01: Error history order] is displayed in code number window. • [Check Code] is displayed in code number window. • [Indoor unit address with error] is displayed in UNIT No. 
2	Each successive push of the temp. set ▼ / ▲ buttons, the error histories stored in the memory are displayed in order. The numbers in item code indicates item code [01] (most recent) to [04] (Oldest). **CAUTION** If [CL] button is pushed all of the error histories of the indoor unit will be deleted.
3	After confirmation, push TEST button to return to the usual display.

In case of central remote controller (TCB-SC642TLE)

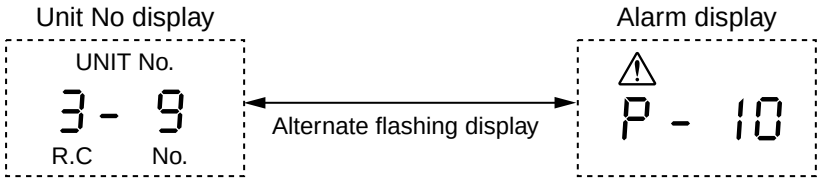


1. Confirmation and check

When a trouble occurred on the air conditioner, the check code and the indoor unit No. are displayed on the display section of the remote controller.

The check code is displayed while the air conditioner operates.

If the display disappeared, operate the air conditioner and check the error based upon the following “Confirmation of error history”.

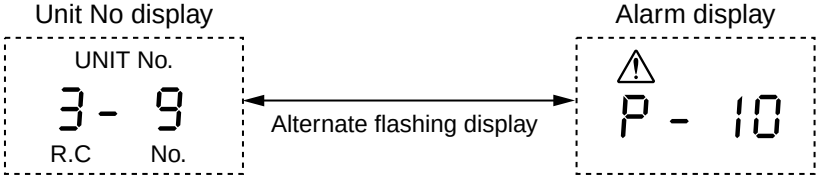


2. Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure. (Up to 4 error histories are stored in memory.)

This history can be confirmed from either operating or stop.

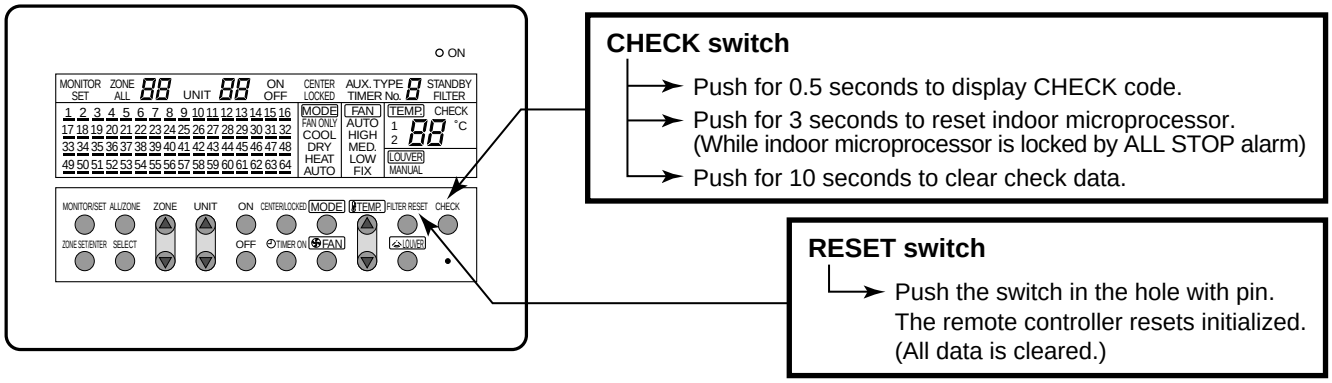
1) Push [🔧] and [SET] buttons in succession for 4 seconds or more.
2) SERVICE CHECK [🔧] goes on and Item code 01 goes on.
3) When selecting (flash) the group number if there is the alarm history, the UNIT number and the latest alarm history are displayed alternately.
   * In this time, the temperature cannot be set up.
4) To confirm the alarm history other than the latest one, push temp. set [▲] / [▼] to select Item code (01 to 04).
5) To confirm the alarm in the other group, push [ZONE] and [GROUP ◀ ▶] to select the group number
   Do not push [CL] button because all the alarm histories of the currently selected group are deleted.
6) To finish the service check, push [🔧] button.



In case of AI-NET central remote controller

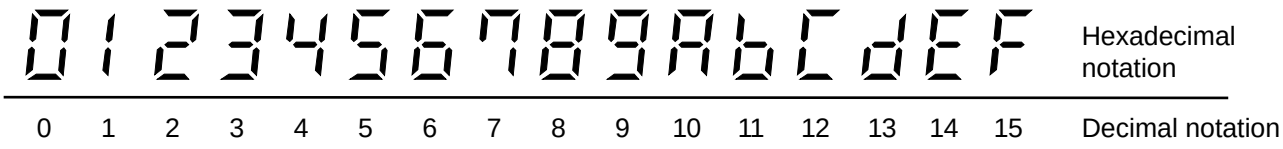
1. Operation for CHECK display

When pushing the CHECK switch, the indoor unit No. (Network address No.) including the check data is displayed in the UNIT No. display section, and the check code is displayed in the set up temp. display section.

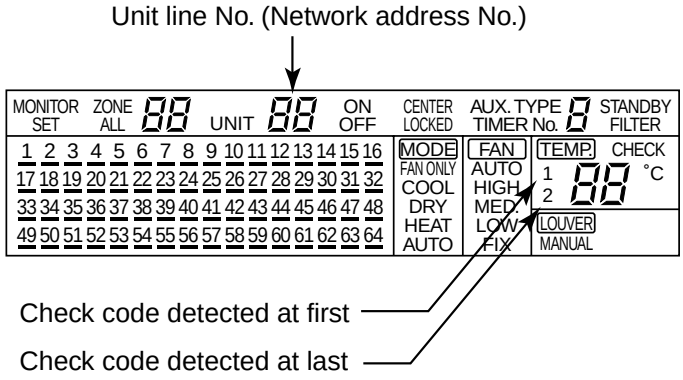


2. Reading of CHECK monitor display

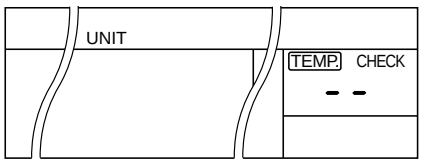
7 segment display



Display on CHECK monitor

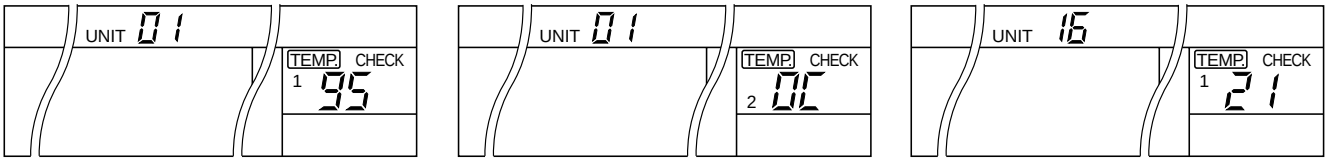


(Example)
There is no check data.



CHECK data

(Example)
In No.1 unit, first the interconnection wire (bus communication line) of indoor/outdoor has failed.
Next, the room temp. sensor is defective.
For No.16 unit, the high pressure switch at the inverter unit side operates.



9-4. Check Code and Check Position Displayed on the Remote Controller and Outdoor Unit (7-Segment Display of Interface)

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E01	—	—	—	Remote controller	Communication error between indoor and remote controller (Detected at remote controller side)	Corresponding unit only stops.	Communication interrupted between indoor P.C. board and remote controller.	• Check remote controller inter-unit cable (A/B). • Check disconnection, connector contact error. • Check indoor power supply. • Check indoor P.C. board error. • Check remote controller address setup. (When two remote controllers operate) • Check remote controller P.C. board.
E02	—	—	—	Remote controller	Remote controller sending error	Corresponding unit only stops.	Signal could not be sent from remote controller to indoor unit.	• Check the communication wire of remote controller: Exchange remote controller.
E03	—	—	97	Indoor unit	Communication error between indoor and remote controller (Detected at indoor side)	Corresponding unit only stops.	No communication from remote controller (including wireless) and communication adapter.	• Check remote controller and communication adapter wiring.
E04	—	—	4	Indoor unit	Indoor/outdoor communication circuit error (Detected at indoor side)	Corresponding unit only stops.	Indoor unit does not receive communication from outdoor unit.	• Check power-ON order of indoor/outdoor. • Check indoor address setup. • Check inter-unit cabling between indoor and outdoor. • Check outdoor end terminal resistance setup (SW30-2).
E06	E06	No. of indoor units which received signal normally	4	I/F	Decreased number of indoor units	All stop	When signal is not sent for a certain period from the indoor unit which has been used to send signals, [E06] is normally displayed.	• Check the power supply of indoor unit. (Power-ON) • Check connection of communication line between indoor and outdoor. • Check connector connection for communication in indoor P.C. board. • Check connector connection for communication in outdoor P.C. board. • Check indoor P.C. board failure. • Check outdoor P.C. board (I/F) failure.
—	E07	—	—	I/F	Indoor/outdoor communication circuit error (Detected at outdoor side)	All stop	Transmission from outdoor to indoor cannot continue for 30 seconds.	• Check outdoor terminator resistor setup (SW30-2). • Check the communication connection between indoor and outdoor.
E08	E08	Duplicated indoor addresses	96	Indoor I/F	Duplicated indoor addresses	All stop	Multiple indoor unit address setup are duplicated.	• Check indoor address. • Check the change of remote controller connection (Group / individual) after setup of indoor address.
E09	—	—	99	Remote controller	Duplicated master remote controllers	Corresponding unit only stops.	In 2-remote controller control (including wireless), both are setup as master (Header indoor unit stops and other indoor unit is operating.)	• Check remote controller setup. • Check remote controller P.C. board.
E10	—	—	CF	Indoor unit	Communication error between indoor P.C. board assembly	Corresponding unit only stops.	There is any trouble in power line.	• Indoor P.C. board failure

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E12	E12	01: Indoor/outdoor communication 02: Between outdoors communication	42	I/F	Automatic address start error	All stop	• When indoor automatic address started, other refrigerant circuit system was setting automatic address. • When outdoor automatic address started, indoor automatic address was executed.	• Setup the address again after disconnecting communication connection with other refrigerant circuit system.
E15	E15	—	42	I/F	No corresponding indoor unit during automatic address	All stop	Indoor unit is not found when indoor automatic address start was set up.	• Check the communication line connection between indoor and outdoor. • Check the electric power line error in indoor. • Check the noise of surrounding devices. • Power failure • Check indoor P.C. board error.
E16	E16	00: Capacity over 01 to: No. of connected units	89	I/F	No. of connected indoor units / Capacity over	All stop	• Total capacity of indoor units exceeded 135% of total outdoor capacity. • No. of connected indoor units are more than 48 units. **[Note]** If this code appears after backup setup of outdoor unit trouble, set up “No. capacity-over detection”. **Setup method of “No. capacity-over detection”** Turn on SW09/Bit 2 on I/F P.C. board of outdoor header unit.	• Check the connection capacity of indoor unit. • Check the HP capacity of indoor unit. • Check the indoor/outdoor capacity setup • Check the No. of connected indoor units. • Check the outdoor I/F P.C. board error
E18	—	—	97, 99	Indoor unit	Communication error between indoor header and follower units	Corresponding unit only stops.	Regular communication between indoor header and follower units	• Check cable of the remote controller. • Check power cabling of indoor. • Check P.C. board of indoor.
E19	E19	00: No header unit 02: Two or more header units	96	I/F	Outdoor unit quantity error	All stop	• There are multiple outdoor units in 1 line. • There is none of outdoor unit in 1 line.	The outdoor unit connected with communication cable between indoor and outdoor (U1.U2) is the outdoor unit. • Check connection of communication line between indoor and outdoor. • Check outdoor P.C. board(I/F) error.
E20	E20	01: Connection of outdoor of other line 02: Connection of indoor of other line	42	I/F	Other line unit connected during automatic address	All stop	Unit of other line was connected when indoor automatic address started.	Separate the cable between lines according to automatic address setup method in “Address setup”.
E23	E23	—	15	I/F	Communication sending error between outdoor units	All stop	Transmission of other outdoor unit was unavailable for 30 seconds or more.	In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.
E25	E25	—	15	I/F	Duplicated outdoor follower address setup	All stop	Outdoor addresses manually set up are duplicated.	**Note)** Do not set up the outdoor address manually.
E26	E26	No. of normally received outdoor units	15	I/F	Decreased number of connected outdoor units	All stop	The signal was not returned for constant from the outdoor unit which was receiving signal.	In this model, only one outdoor unit is provided to one refrigerant line. Be sure to check there is no communication connection with outdoor unit in the other refrigerant line.
E28	E28	No. of detected outdoor units	d2	I/F	Outdoor follower unit error	All stop	Outdoor header unit received error code from outdoor follower unit.	• Check the check code of outdoor follower unit.

Convenient functions

When pushing SW04 for 1 second or more under condition that [E28] is displayed on 7-segment display of outdoor header unit, the fan of outdoor unit which stopped abnormally starts rotating.
If pushing SW04 and SW05 simultaneously, the fan of normal outdoor unit operates.
When pushing SW05 singly, the operation of fan is cleared.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board or outdoor I/F P.C. board error	CF	I/F	IPDU communication error	All stop	Communication of each IPDU (P.C. board) in inverter box interrupted.	• Check connection of communication connector and disconnection between IPDU and I/F P.C. board. • Check outdoor P.C. board (I/F, IPDU, Fan IPDU) error. • Check external noise. • Check power supply P.C. board for fan error.
F01	—	—	OF	Indoor unit	Indoor TCJ sensor error	Corresponding unit only stops	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection/cabling of TCJ sensor connector. • Check characteristics of TCJ sensor resistance value. • Check indoor P.C. board error.
F02	—	—	Od	Indoor unit	Indoor TC2 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC2 sensor connector. • Check characteristics of TC2 sensor resistance value. • Check indoor P.C. board error.
F03	—	—	93	Indoor unit	Indoor TC1 sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TC1 sensor connector. • Check characteristics of TC1 sensor resistance value. • Check indoor P.C. board error.
F04	F04	—	19	I/F	TD1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short)	• Check connection of TD1 sensor connector. • Check characteristics of TD1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F05	F05	—	A1	I/F	TD2 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short)	• Check connection of TD2 sensor connector. • Check characteristics of TD2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F06	F06	—	18	I/F	TE1 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TE1 sensor connector. • Check characteristics of TE1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
F07	F07	—	18	I/F	TL sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TL sensor connector. • Check characteristics of TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F08	F08	—	1b	I/F	TO sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TO sensor connector. • Check characteristics of TO sensor resistance value. • Check outdoor P.C. board (I/F) error.
F10	—	—	OC	Indoor	Indoor TA sensor error	Corresponding unit only stops.	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection/cabling of TA sensor connector. • Check characteristics of TA sensor resistance value. • Check indoor P.C. board error.
F12	F12	01: TS1 02: TS2	A2	I/F	TS1, TS2 sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• Check connection of TS1 or TS2 sensor connector. • Check characteristics of TS1, TS2 sensor resistance value. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
F13	F13	01: Compressor 1 side 02: Compressor 2 side	43	IPDU	TH sensor error	All stop	• Resistance value of sensor is infinite or zero (Open/Short).	• IGBT built-in temp sensor error → Exchange IPDU P.C. board.
F15	F15	—	18	I/F	Outdoor temp sensor miscabling (TE1, TL)	All stop	During operation of compressor in HEAT mode, the TE1 detection temp was higher than that of TL by the specified value continued for 3 minutes or more.	• Check installation of TE1 sensor and TL sensor. • Check characteristics of TE1 and TL sensor resistance value. • Check outdoor P.C. board (I/F) error.
F16	F16	—	43	I/F	Outdoor pressure sensor miscabling (Pd, Ps)	All stop	High-pressure Pd sensor and low-pressure Ps sensor were exchanged, or output voltages of both sensors are zero.	• Check connection of high-pressure Pd sensor connector. • Check connection of low-pressure Ps sensor connector. • Check pressure sensors Pd and Ps error. • Check outdoor P.C. board (I/F) error. • Check compression error of compressor.
F23	F23	—	43	I/F	Ps sensor error	All stop	Output voltage of Ps sensor was zero.	• Misconnection of Ps sensor and Pd sensor connectors • Check connection of Ps sensor connector. • Check Ps sensor error. • Check compression error of compressor. • Check 4-way valve error. • Check outdoor P.C. board (I/F) error. • Check SV4 circuit error.
F24	F24	—	43	I/F	Pd sensor error	All stop	Output voltage of Pd sensor was zero. (Sensor Open) Pd > 4.15MPa during stop of compressor	• Check connection of Pd sensor connector. • Check Pd sensor error. • Check outdoor P.C. board (I/F) error.
F29	—	—	12	Indoor	Indoor other error	Corresponding unit only stops.	Indoor P.C. board did not operate normally.	• Check indoor P.C. board error (EEPROM error).
F31	F31	—	1C	I/F	Outdoor EEPROM error	All stop (*1)	Outdoor P.C. board (I/F) did not operate normally.	• Check power voltage. • Check power noise. • Check outdoor P.C. board (I/F) error.
H01	H01	01: Compressor 1 side 02: Compressor 2 side	1F	IPDU	Compressor breakdown	All stop	Inverter current detection circuit detected over-current and stopped.	• Check power voltage. (AC220–240V ± 10%). • Check compressor error. • Check cause of abnormal overload operation. • Check outdoor P.C. board (IPDU) error.
H02	H02	01: Compressor 1 side 02: Compressor 2 side	1d	IPDU	Compressor error (lock) MG-SW error OCR operation	All stop	Over-current was detected several seconds after header compressor had started.	• Check compressor error. • Check power voltage. (AC380–10%, 415V +10%). • Check cable of compressor and phase-missing. • Check connector/terminal connection on IPDU P.C. board. • Check conduction of case heater. (Check activation error due to liquid stagnation in compressor.) • Check outdoor P.C. board (IPDU) error. • Check outdoor MG-SW or OCR.

(*1) All stop only in case of the header unit The follower unit continues operation.

MG-SW : Magnet Switch, OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H03	H03	01: Compressor 1 side 02: Compressor 2 side	17	IPDU	Current detection circuit system error	All stop	While header compressor stopped, current flowed more than the specified amount.	• Check cabling of current detection circuit system. • Check outdoor P.C. board (IPDU) error.
H04	H04	—	44	I/F	Compressor 1 case thermo operation	All stop	Compressor 1 case thermostat performed protective operation.	• Check compressor 1 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2, 3) • Check SV41 circuit leakage. • Check miscabling/misinstallation of SV41 and SV42. • Check valve open status of indoor PMV. • Check 4-way valve error. • Check refrigerant shortage. • Check SV5 leak. • Check SV11 circuit. (Wiring, OFF at one side only) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
H06	H06	—	20	I/F	Low-pressure protective operation	All stop	Low-pressure Ps detected operation lower than 0.02MPa.	• Check full opening of service valve. (Discharge gas, suction gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV2 circuit and SV4 circuit error. • Check low-pressure Ps sensor error. • Check indoor air filter clogging. • Check valve open of indoor PMV. • Check refrigerant pipe clogging. • Check outdoor fan operation. (All heating, mainly heating, part cooling operation) • Check refrigerant shortage. • Check clogging of circuit at auxiliary heat exchanger side. (PMV3, SV12, check valve) • Check 4-way valve error. (Reversal error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check miswiring of discharge gas/suction gas pipe to FS unit. Check wiring between FS unit and indoor unit. Check miswiring of SVD/SVS valves, misinstallation of coil. Check opened status of SVS valve.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H07	H07	—	d7	I/F	Protection for oil level drop detection	All stop	The operating compressor detected oil shortage continuously for 2 hours.	**Check all the outdoor units in the corresponding line.** • Check full opening of service valve of balance pipe. • Check connection and installation of TK1, TK2, TK3, and TK4 sensors. • Check characteristics of TK1, TK2, TK3, and TK4 resistance values. • Check gas leak and oil leak in the same line. • Check refrigerant stagnation in compressor. • Check error of SV3A, SV3B, SV3C, SV3D, and SV3E valves. • Check clogging of oil separator oil return circuit. • Check clogging of oil-equation circuit. <Check clogging of oil equation pipe between compressors.> • Check TS1, TS2 sensors (Miswiring and misinstallation of TS1 and TS2) • Check leakage of SV6 circuit. • Check FS unit. Leakage of check valve of bypass between liquid pipe and discharge gas pipe Mispiping of discharge/suction gas connection Miswiring of SVD/SVS valve/Misinstallation of coil • Check whether there is no setup missing of indoor unit in all cooling operation mode
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	I/F	Oil level detective temp sensor error	All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK1 sensor connector. • Check characteristics of TK1 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK2 sensor connector. • Check characteristics of TK2 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK3 sensor connector. • Check characteristics of TK3 sensor resistance value. • Check outdoor P.C. board (I/F) error.
						All stop	• Resistance value of sensor is infinite or zero. (Open/Short)	• Check connection of TK4 sensor connector. • Check characteristics of TK4 sensor resistance value. • Check outdoor P.C. board (I/F) error.
H14	H14	—	44	I/F	Compressor 2 case thermo operation	All stop	Compressor 2 case thermostat operated.	• Check compressor 2 case thermo circuit. (Connector, cable, P.C. board) • Check full opening of service valve. (Gas and liquid side) • Check outdoor PMV clogging. (PMV1, 2) • Check SV42 valve leak. • Check miscabling/misinstallation of SV41 and SV42. • Check valve opening of indoor PMV. • Check 4-way valve error. • Check refrigerant shortage. • Check SV11 circuit. (Wiring, OFF at one side only) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	I/F	Oil level detective circuit system error MG-SW error OCR operation	All stop	Temperature change of TK1 could not be detected after compressor 1 started operation.	• Check TK1 sensor coming-off. • Check characteristics of TK1 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check operation error of SV3E valve. • Check capillary clogging of oil-equation circuit and operation error of stop valve. • Check refrigerant stagnation in compressor. • Check MG-SW or OCR.
							Temperature change of TK2 could not be detected after compressor 2 started operation.	• Check TK2 sensor coming-off. • Check characteristics of TK2 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil equalization circuit and check stop valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK3 could not be detected after compressor started operation.	• Check TK3 sensor coming-off. • Check characteristics of TK3 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
							Temperature change of TK4 could not be detected after compressor started operation, or the difference from other TK sensor changed for a constant time only within the specified range.	• Check TK4 sensor coming-off. • Check characteristics of TK4 sensor resistance value. • Check TK1, TK2, TK3, and TK4 misconnection. • Check SV3E valve operation. • Check capillary clogging of oil-equalization circuit and check valve operation. • Check refrigerant stagnation in compressor shell. • Check MG-SW or OCR.
L03	—	—	96	Indoor	Duplicated indoor center units	Corresponding unit only stops.	There are multiple header units in a group.	• Check indoor address. • Check the change of remote controller connection (Group/individual) after indoor address setup.
L04	L04	—	96	I/F	Duplicated outdoor line address	All stop	Line address setup is duplicated against the outdoor unit in different refrigerant pipe system.	• Check line address.
L05	—	—	96	I/F	Duplicated indoor units with priority (Displayed on indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority.

MG-SW : Magnet Switch, OCR : Over-current Relay

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
L06	L06	No. of indoor units with priority	96	I/F	Duplicated indoor units with priority (Displayed on the unit other than indoor unit with priority)	All stop	Indoor units with priority were duplicated.	• Check display of indoor unit with priority and outdoor unit.
L07	—	—	99	Indoor	Group line in individual indoor unit.	Corresponding unit only stops.	At least one indoor unit connected to a group existed in the individual indoor units.	• Check indoor address.
L08	L08	—	99	Indoor	Indoor group / address unset	Corresponding unit only stops.	Address was not yet set up.	• Check indoor address. **Note)** After installation, this code is displayed when the power is first turned on.
L09	—	—	46	Indoor	Indoor capacity unset	Corresponding unit only stops.	Indoor unit capacity was unset.	Set up indoor capacity. (DN=11)
L10	L10	—	88	I/F	Outdoor capacity unset	All stop	On the I/F P.C. board for service, jumper line was not cut according to the model.	Check model setup on outdoor I/F P.C. board A'ssy for service.
L17	L17	—		I/F	Inconsistent models of outdoor units		1 and 2 series outdoor units have been mixed.	• Check outdoor units.
L18	L18	Corresponding indoor address	8A	I/F	FS unit system error	Corresponding unit only stops.	An indoor unit which is not connected with a FS unit is operating without setup of cooling only mode.	• Check setup of remote controller (DN=[OFF]). • Check FS unit. Check pipe connection to FS unit. (Mispiping between discharge gas and suction gas) Check miswiring/misinstallation of SVS/SVD valves.
L20	—	—	98	AI-NET, Indoor	Duplicated central control addresses	All stop	Duplicated central control addresses	• Check central control address. • Check network adaptor P.C. board. (In case of AI-NET)
L28	L28	—	46	I/F	Quantity over of connected outdoor units	All stop	There were more than four outdoor units.	• Check No. of connected outdoor units. (Max. 4 units per 1 system) • Check communication line between outdoor units. • Check outdoor P.C. board (I/F) error.
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 errors 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error or communication error between IPDU and I/F P.C. board, or outdoor I/F P.C. board error	CF	I/F	IPDU quantity error	All stop	No. of IPDU units detected when power was turned on were less.	• Check model setup for outdoor I/F service P.C. board. • Check connection of UART communication connector. • Check IPDU, fan IPDU, and I/F P.C. board error. **Note)** UART: Universal Asynchronous Receiver Transmitter
L30	L30	Detected indoor address	b6	Indoor	Interlock in indoor unit from outside	Corresponding unit only stops.	• Outside error input terminal Detected signal to (CN80) for more than 1 minute	■ Outside device is connected to connector (CN80): 1) Check outside device error. 2) Check indoor P.C. board error. ■ Outside device is not connected to connector (CN80): 1) Check indoor P.C. board error.
—	L31	—	—	I/F	Extended IC (Integrated Circuit) error	Operation continues.	P.C. board (I/F) parts error	Check indoor (I/F) P.C. board.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P01	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.		• Check the lock of fan motor (AC fan). • Check cabling.
P03	P03	—	1E	I/F	Discharge temp TD1 error	All stop	Discharge temp (TD1) exceeded 115°C.	• Check full opening of outdoor service valves (Gas side, Liquid side). • Check clogging of outdoor PMV. (PMV1,2) • Check characteristics of TD1 sensor resistance value. • Check refrigerant shortage. • Check 4-way valve error. • Check leakage of SV41 circuit. • Check SV4 circuit. (Miswiring and misinstallation of SV41 and SV42) • Check leakage of SV5 circuit. • Check leakage of SV6 circuit. (Capillary clogging, valve operation error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
P04	P04	01: Compressor 1 side 02: Compressor 2 side	21	I/F	Actuation of high-pressure SW	All stop	High-pressure SW actuated.	• Check Pd pressure sensor error. • Check full opening of outdoor service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check short-circuiting of outdoor suction/discharge air. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check SV4 valve circuit. • Check SV5 valve circuit. • Check refrigerant overcharge. • Check mispiping of discharge gas/suction gas main pipe. • Check circuit clogging at auxiliary heat exchanger side. (PMV3, SV12, check valve) • Check FS unit. Check clogging of SVD valve and operation error. Check wiring inside of FS unit. (SVD/SVS coil miswiring, etc.) Check wiring between FS unit and indoor unit. (Miswiring, Disconnection, Wiring missing)
P05	P05	01: Power supply missing phase 02: Power supply phase order (reversed phase)	AF	I/F	Phase missing or reversed phase order	All stop	• Missing phase was detected when the power turned on. • Reversed phase was detected when the power turned on.	• Check outdoor power line. • Check outdoor P.C. board (I/F) error.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P07	P07	01: Compressor 1 side 02: Compressor 2 side	1C	IPDU I/F	Heat sink overheat error	All stop	IGBT built-in temp sensor (TH) was overheated.	• Check power voltage. • Check outdoor fan system error. • Check clogging of heat sink cooling duct. • Check fixation between IGBT and heat sink. (Check screwing and contact.) • Check IPDU error.(IGBT built-in temp sensor (TH) error).
P10	P10	Indoor address with trouble	Ob	Indoor	Indoor overflow error	All stop	• Float switch operated. • Float switch circuit disconnected or the connector came off.	• Check the float switch connector. • Check operation of drain pump unit. • Check the drain pump circuit. • Check clogging of drain pipe. • Check indoor P.C. board error.
P12	—	—	11	Indoor	Indoor fan motor error	Corresponding unit only stops.	• The value of motor speed deviated from target value was detected for certain time. • Over-current protection operated.	• Check connection of fan connector and wiring. • Check fan motor error. • Check indoor P.C. board error. • Check influence of outside air control. • Check indoor type code (DN=10) and the capacity code (DN=11).
The standard ducted unit air conditioner utilizes a direct current (DC) indoor fan motor that features current limiting protection. In the event power is not isolated prior to service, the protective control circuit will activate and stop the unit operating. The check code “P12”will be displayed on the remote controller-once service work has been completed, this code can be cleared by switching off then on the electrical isolation device of the indoor unit and pressing the operation stop button on the remote controller to reset the system								
P13	P13	—	47	I/F	Outdoor liquid back detection error	All stop	**In heating** While the system is operating in HEAT mode, outdoor PMV of which opening degree was 100 pulse or less for a certain time.	• Check full close operation of outdoor PMV (1, 2). • Check Pd and Ps sensor error. • Check clogging of SV2 circuit. • Check clogging of 4-way valve error circuit. • Check outdoor P.C. board (I/F) error. • Check capillary clogging of oil return circuit from oil separator. • Check TS1, TS2 sensor error.
P15	P15	01: TS condition	AE	I/F	Gas leak detection (TS1 condition)	All stop	Suction temp exceeded the judgment standard temp for 10 minutes or more. **TS error judgment standard temperature** In cooling operation: 60°C or higher In heating operation: 40°C or higher	• Check refrigerant shortage. • Check full open of outdoor service valves (gas side, liquid side). • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TS1 sensor resistance value. • Check 4-way valve error. • Check leakage of SV4 circuit. • Check leakage of SV5 circuit. • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
		02: TD condition	AE	I/F	Gas leak detection (TD condition)	All stop	Discharge temperature TD1 or TD2 was continuously 108°C or higher for 10 minutes.	• Check refrigerant shortage. • Check outdoor PMV clogging (PMV1, 2). • Check characteristics of TD1, TD2 sensor resistance value. • Check indoor air filter clogging. • Check pipe clogging. • Check SV4 circuit (Valve leakage, misinstallation) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P17	P17	—	bb	I/F	Discharge temp TD2 error	All stop	Discharge temperature (TD2) exceeded 115°C.	• Check full opening of outdoor service valves (gas side, liquid side). • Check clogging of outdoor PMV (PMV1, 2). • Check characteristics of TD2 sensor resistance value. • Check 4-way valve error. • Check leakage of SV42 circuit. • Check SV4 circuit. (Miscabling and misinstallation of SV41 and SV42) • Check leakage of SV5 valve circuit. • Check SV6 circuit. (Clogging, Valve operation error) • Check mispiping of discharge gas/suction gas main pipe. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas), wiring between FS unit and indoor unit, and connection of connectors. Check miswiring of SVS/SVD valves.
P19	P19	Detected outdoor unit No.	8	I/F	4-way valve operation error	All stop	When abnormal refrigerating cycle data was detected in heating	• Error of 4-way valve error • Check coil error and connector connection of 4-way valve. • Check characteristics of TS1/TE1 sensor resistance value. • Check characteristics of Pd, Ps pressure sensor output voltage. • Check misconnection of TE1 and TL sensors. • Check Flow selector unit. Check leakage of SVD valve and SVS valve. (Check leakage of SVDD valve and SVSS.) Check mispiping of FS unit connecting pipe (Suction gas/Discharge gas).
P20	P20	—	22	I/F	High-pressure protective operation	All stop	Pd sensor detected 3.6MPa or more.	• Check Pd pressure sensor error. • Check full opening of service valves (Gas side, Liquid side). • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. (PMV1,2) • Check clogging of indoor/outdoor heat exchangers. • Check air short-circuiting in outdoor unit. • Check clogging of SV2 circuit. • Check outdoor P.C. board (I/F) error. • Check indoor fan system error. (Cause of air volume decrease) • Check valve opening of indoor PMV. • Check miscabling of communication line between indoor and outdoor. • Check operation error of check valve of discharge pipe. • Check circuit of gas balance SV4 valve. • Check mispiping of discharge gas/suction gas main pipe. • Check operation error of check valve of discharge gas pipe. • Check circuit of SV11 valve. (Clogging, OFF at one side only) • Check clogging of circuit at auxiliary heat exchanger side. (Miswiring, Disconnection, Wiring missing) • Check Flow selector unit. Check leakage of SVD valve and operation error. Check wiring inside of FS unit. (SVD/SVS coil miswiring, etc.) Check wiring between FS unit and indoor unit. (Miswiring, Disconnection, Wiring missing) • Check circuit of SV5 valve. • Check refrigerant overcharge.

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
P22	P22	0: IGBT shortage 1: Position detection circuit error 3: Motor lock error 4: Motor current error detection C: TH sensor temp. error D: TH sensor error E: Vdc error	1A	FAN-IPDU	Outdoor fan IPDU error	All stop	**(Sub-code: 0)** • Short-circuit current was detected at start time. • Short-circuit current was detected when checking IGBT short-circuit before start time.	• Check fan motor. (Interphase short-circuit) • Check fan IPDU error.
						All stop	**(Sub-code: 1)** • The standard value of detection circuit of fan IPDU current fluctuated at start time.	• Check fan IPDU error.
						All stop	**(Sub-code: 3)** • Abnormal current was detected within 30 seconds after start time.	• Check fan motor. (Lock, phase missing) • Check cause of abnormal overload at start time. • Check connection of connector to fan motor.
						All stop	**(Sub-code: 4)** • Short-circuit current was detected when 2 seconds or more passed after start time. • Over-current was detected when 30 seconds or more passed after start time.	• Check power supply voltage. • Check fan IPDU error.
						All stop	**(Sub-code: C)** • Heat sink sensor (TH) of fan IPDU detected 95°C error.	• Check outdoor fan system. • Check fan IPDU error. • Check fixation between fan IPDU and heat sink.
						All stop	**(Sub-code: D)** • Heat sink sensor (TH) of fan IPDU detected short-circuiting or open.	• Check fan IPDU error.
						All stop	**(Sub-code: E)** • Input power supply voltage of the fan IPDU over the setup value was detected. • Input power supply terminal of the fan IPDU was unconnected. • Power supply P.C. board error of the fan IPDU	• Check input power supply voltage of the fan IPDU. • Check power supply P.C. board error of the fan IPDU. • Check error of external electrolytic condenser.
P26	P26	01: Compressor 1 side 02: Compressor 2 side	14	IPDU	G-Tr short-circuit protection error	All stop	Instantaneous over-current was detected when compressor started.	• Check connector connection and wiring on IPDU P.C. board. • Check compressor error and defect of compressor coil. • Check outdoor P.C. board (IPDU) error.
P29	P29	01: Compressor 1 side 02: Compressor 2 side	16	IPDU	Compressor position detection circuit error	All stop	Position detected was not normal.	• Check connector connection and wiring. • Check compressor error and defect of compressor coil. • Check P.C. board (IPDU) error.
P31	—	—	47	Indoor	Other indoor error (Group follower unit error)	Corresponding unit only stops.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check indoor P.C. board.

Error detected by TCC-LINK central control device

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Display on central control device	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
C05	—		—	TCC-LINK	TCC-LINK central control device transmission error	Operation continued.	Signal is not transmit from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of terminator resistor.
C06	—		—		TCC-LINK central control device receiving error	Operation continued.	Signal is not received from central control device.	• Check central control device error. • Check communication line error of central control device. • Check setup of terminator resistor. • Check the power of connecting destination connected device. • Check P.C. board error of the connected device.
C12	—		—	HA control interface	Interface batch alarm of HA control interface	Operation continued.	Error was input in HA control interface	• Check error input.
P30	Differs according to error contents of the with alarm			TCC-LINK	Follower unit error of group control	Operation continued.	An error occurred in follower unit of the group control. ([P30] is displayed only on the central remote controller.)	• Check the error code of the unit with alarm.
	(L20 is displayed.)				Duplicated central control address	Operation continued.	Central control addresses were duplicated.	• Check the address setup.

Error detected by AI-NET central control device

Check code				Detected position	Check code name	Status	Error detection condition	Check item (position)
Main remote controller	Outdoor 7-segment display		AI-NET central control remote controller					
	Check code	Sub-code						
—	—	—	97	AI-NET	AI-NET communication system error	Operation continued.	E07/L07/L03/L08 was detected when other indoor unit in the group was defective.	• Check multiple network adapters. • Check wire and miscabling of remote controller: Only one network adapter can be connected to communication line of remote controller.
—	—	—	99	AI-NET	Duplicated network adapters	Operation continued.	Multiple network adapters were connected to communication line of remote controller. (Detected at central controller side)	• Check communication line, miscabling, and power of indoor unit. • Check communication. (X, Y terminals) • Check network adapter P.C. board. • Check the central controller (Central control remote controller, etc.)
—	—	—	b7	AI-NET	Error in indoor group	Operation continued.	Error of follower unit in the group	• Check follower unit in the group.

* These errors are concerned to communication of remote controllers (A, B) and central system [AI-NET X, Y], and the main remote controller displays [E01], [E02], [E03], [E09], or [E18] in some cases and displays none in other cases according to the error.

Cautions when servicing for compressor

1. Removing wires of both compressors check output of the inverter as described below.

How to check inverter output

1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   (Be sure to remove lead cables of both compressors.)
3. Turn on the power supply and start cooling or heating operation.
   In this time, pay attention to touch the fasten receptacle terminal lug of the compressor leads so that they do not contact with other fasten receptacle terminal lug or other position (unit cabinet, etc.).
4. Check output voltage of compressor lead cable at inverter side.
   When the output voltage does not satisfy the criteria in the following table, replace IPDU P.C. board.

No.	Measured position	Criteria
1	Between Red and White	400 V to 650 V
2	Between White and Black	400 V to 650 V
3	Between Black and Red	400 V to 650 V

∗ After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the fasten terminal lug. If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal.

How to check resistance of compressor winding

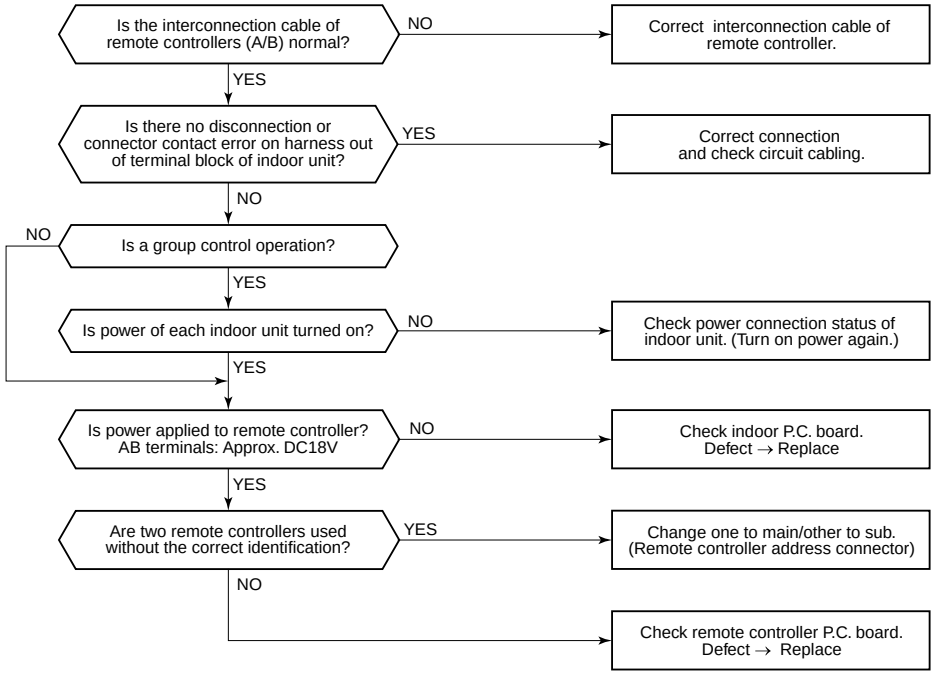
1. Turn off the power supply.
2. Remove the compressor lead cables from the compressors.
   In each compressor, check the winding resistance between phases and resistance of the outdoor cabinet using a tester.
   - Is not it earthed?
     → Normal if 10MΩ or more are measured
   - Is not shorted between windings?
     → Normal if 0.7Ω to 0.9Ω are measured (Use a precise digital tester.)

How to check the outdoor fan motor

1. Turn off the power supply.
2. Take off three connectors (U.V.W) from the fan IPDU P.C. board.
3. Turn the fan with hands. If the fan does not turn, it is a fan motor error (Lock). Replace the fan motor.
   If the fan turns, measure the winding resistance between the phases of the connector (Motor winding) with a tester. If 13 to 33Ω are measured, it is normal. (Use a digital tester.)

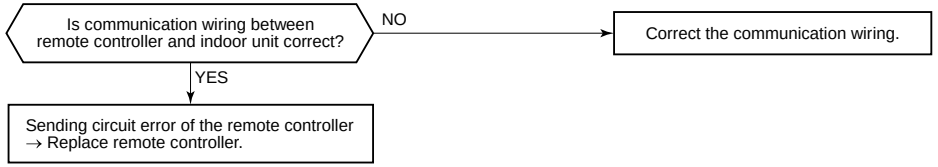
9-5. Diagnosis Procedure for Each Check Code

Check code	Check code name	Cause of operation
[E01] / [–] (TCC-L / AI-NET)	**Communication error between indoor and remote controller (Detected at remote controller side)**	1. Remote controller interconnecting cable error 2. Indoor power supply error 3. Indoor P.C. board error 4. Remote controller address setup error 5. Remote controller P.C. board error



Check code	Check code name	Cause of operation
[E02] / [–] (TCC-L / AI-NET)	**Remote controller sending error**	Signal could not be sent to indoor unit. Check the communication wire of the remote controller.

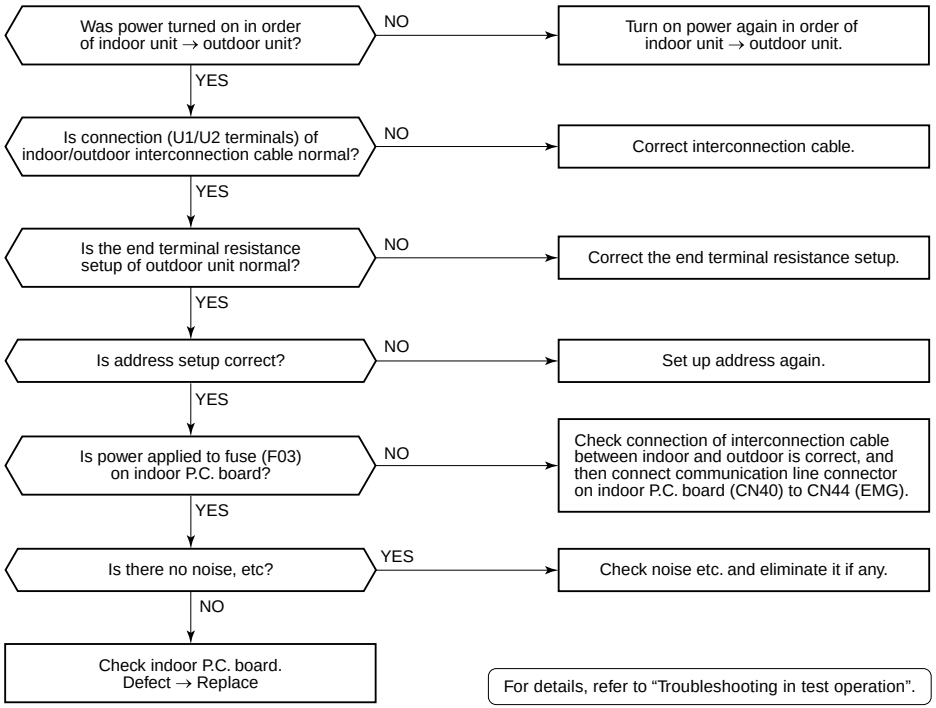
* It is not displayed on 7-segment display of the central control controller.



Check code	Check code name	Cause of operation
[E03] / [97] (TCC-L / AI-NET)	**Communication error between indoor and remote controller (Detected at indoor side)**	No communication from remote controller and communication adaptor

This error is detected when the indoor unit cannot receive a signal from the remote controller.
Check communication wiring of the remote controllers A and B.
As communication is impossible, this fault code [E03] is not displayed on the main remote controller.
It is displayed on TCC-LINK central controller.

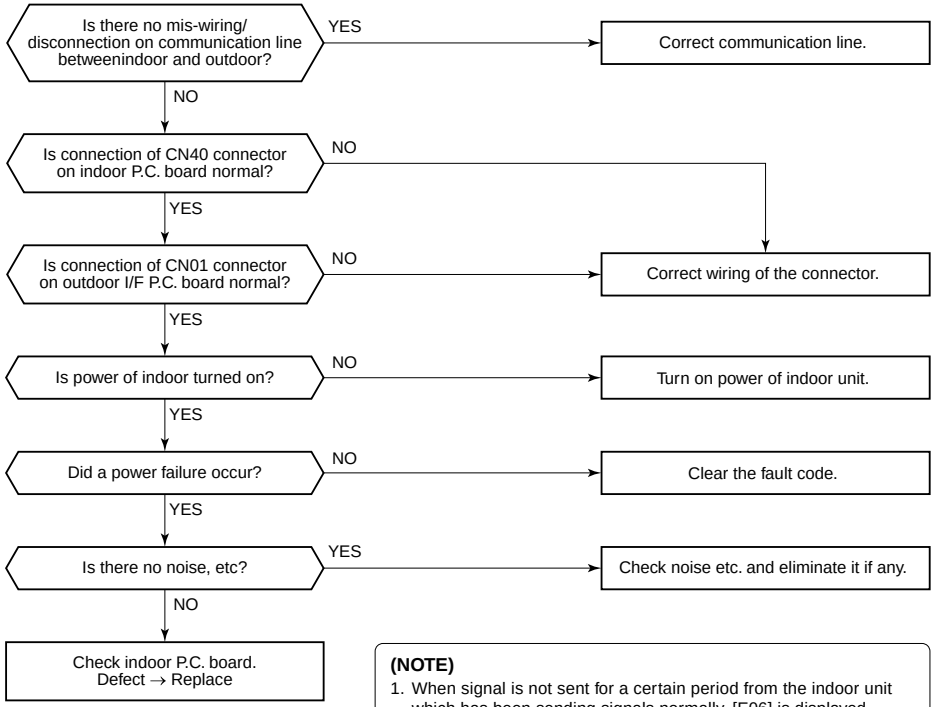
Check code	Check code name	Cause of operation
[E04] / [04] (TCC-L / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at indoor side)**	1. Power of outdoor unit was firstly turned on. 2. Connection error of communication line between indoor and outdoor 3. Terminal resistance setup error on outdoor header unit. 4. Address setup error



For details, refer to “Troubleshooting in test operation”.

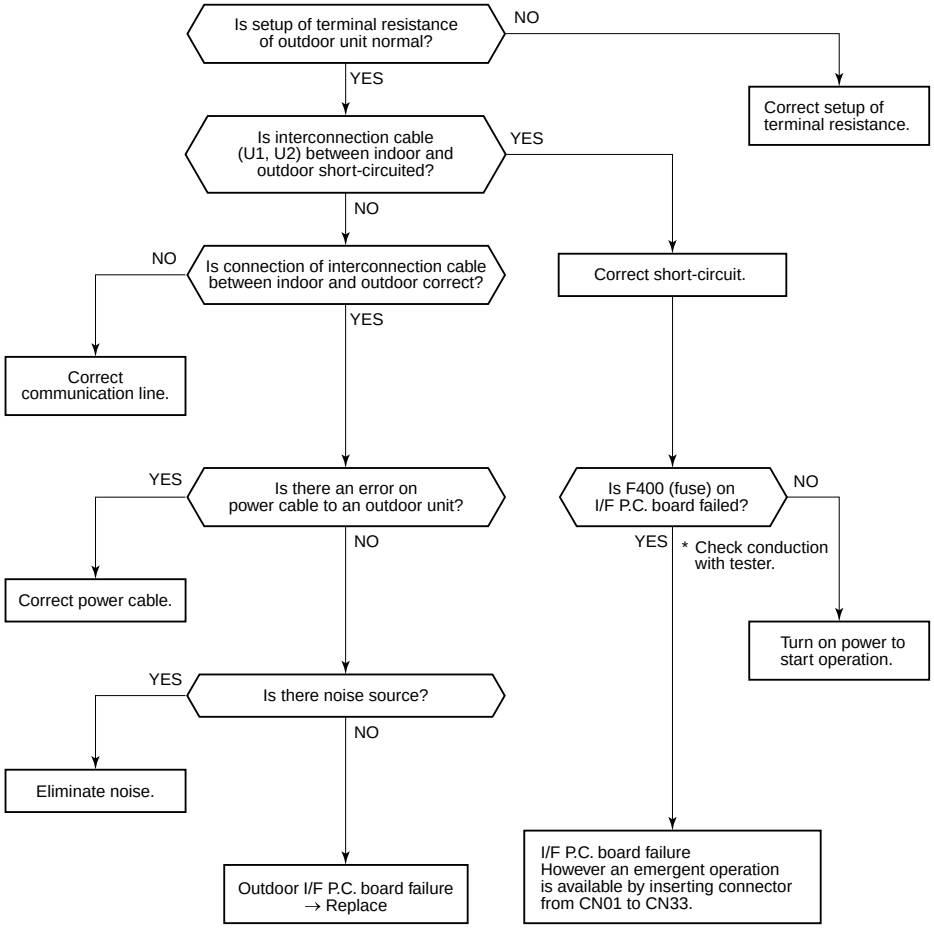
Check code	Check code name	Cause of operation
[E06] / [04] (TCC-L / AI-NET)	**Decreased number of indoor units**	1. Communication lines (U1, U2) connection error between indoor and outdoor 2. Connector connection error of communication for indoor P.C. board 3. Connector connection error of communication for outdoor I/F P.C. board 4. Power supply of indoor unit (Is power turned on?)

Sub-code: No. of indoor units which received signals normally



(NOTE)
1. When signal is not sent for a certain period from the indoor unit which has been sending signals normally, [E06] is displayed.

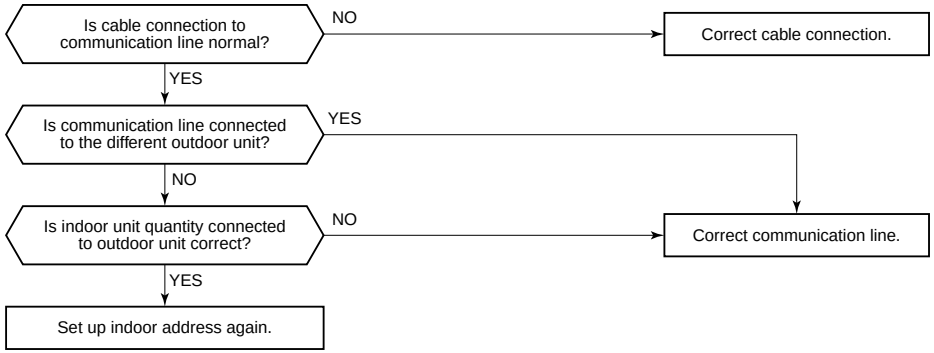
Check code	Check code name	Cause of operation
[E07] / [–] (TCC-L / AI-NET)	**Indoor/Outdoor communication circuit error (Detected at outdoor side)**	1. Outdoor communication terminal resistance setup error 2. Indoor/outdoor communication connection error



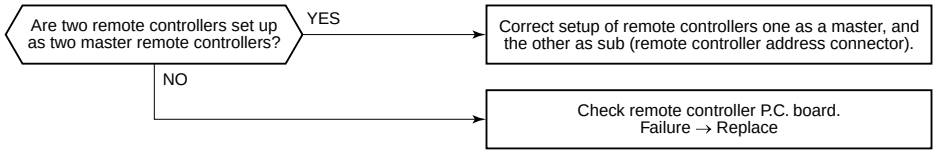
Check code	Check code name	Cause of operation
[E08] / [96] (TCC-L / AI-NET)	**Duplicated indoor addresses**	Indoor addresses are duplicated.

Sub-code: Duplicated indoor address

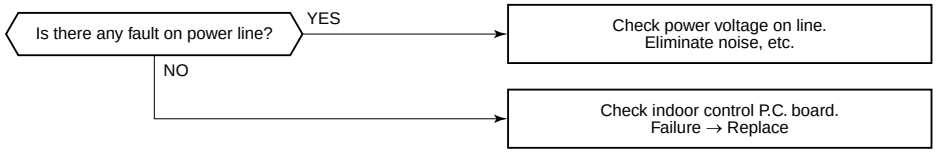
Using a main remote controller (RBC-AMT21E), check the setup item codes (DN code) 12, 13, and 14.
When there is no address duplication, check to the following flowchart.



Check code	Check code name	Cause of operation
[E09] / [99] (TCC-L / AI-NET)	**Duplicated master remote controller**	Setup of master remote controller is duplicated.

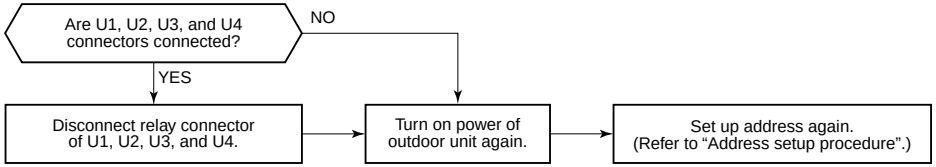


Check code	Check code name	Cause of operation
[E10] / [CF] (TCC-L / AI-NET)	**Communication error in indoor P.C. board assembly**	Indoor P.C. board error failure

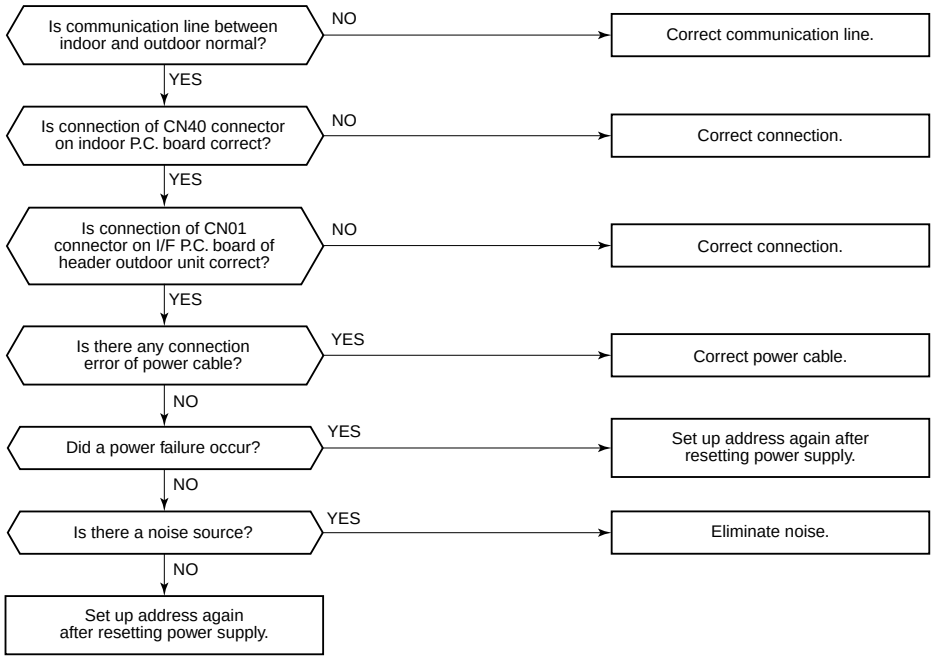


Check code	Check code name	Cause of operation
[E12] / [42] (TCC-L / AI-NET)	**Automatic address start error**	1. When indoor automatic address started, other refrigerant circuit system was setting automatic address. (Sub code : 01) 2. When outdoor automatic address started, the indoor automatic address was being set. (Sub-code: 02)

Sub-code: 01: Communication between indoor and outdoor 02: Communication between outdoor units

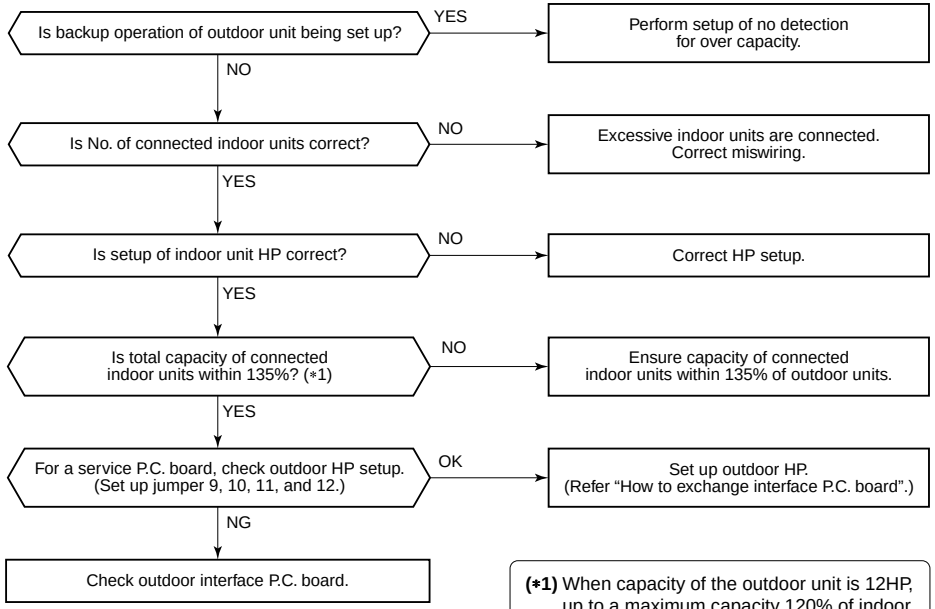


Check code	Check code name	Cause of operation
[E15] / [42] (TCC-L / AI-NET)	**No corresponding indoor unit during automatic address**	1. Communication line connection error between indoor and outdoor. 2. Indoor power system error 3. Noise from surrounding devices 4. Power failure 5. Indoor P.C. board error



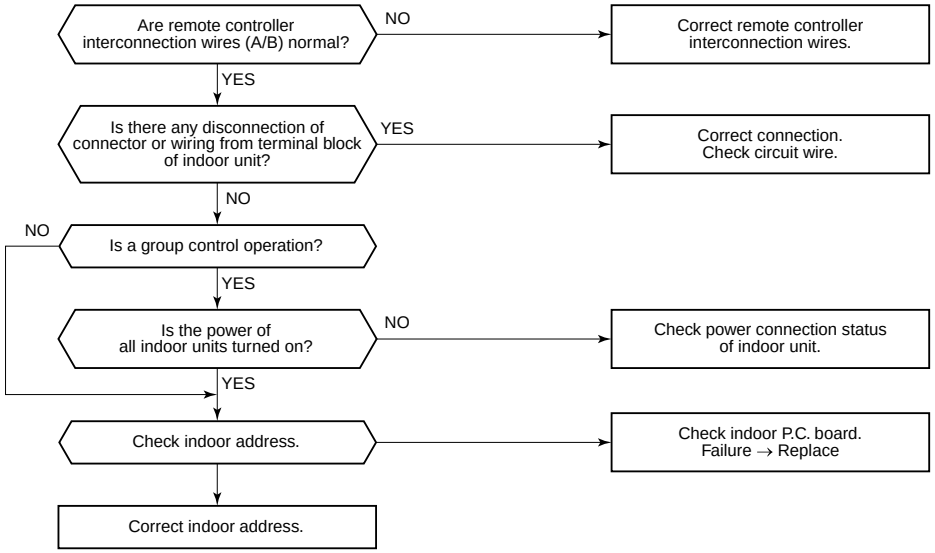
Check code	Check code name	Cause of operation
[E16] / [89] (TCC-L / AI-NET)	**Connected indoor units capacity over**	1. There are 48 or more connected indoor units. 2. Capacity over of total connected indoor units. 3. Incorrect setup of indoor/outdoor capacity

Sub-code: 00 : Capacity over 01 : ~ : Number of connected indoor units



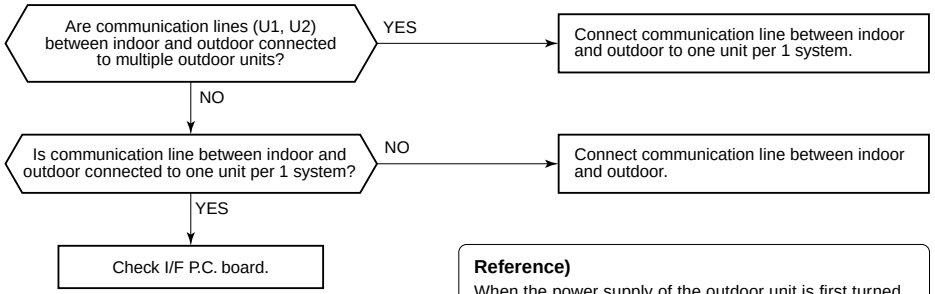
(∗1) When capacity of the outdoor unit is 12HP, up to a maximum capacity 120% of indoor units can be connected.

Check code	Check code name	Cause of operation
[E18] / [97/99] (TCC-L / AI-NET)	**Communication error between indoor header and follower**	Regular communication between indoor header and follower is unavailable.



Check code	Check code name	Cause of operation
[E19] / [96] (TCC-L / AI-NET)	**Header outdoor units quantity error**	1. Misconnection of interconnection cable between indoor and outdoor 2. Outdoor I/F P.C. board error

Sub-code: 00: No header unit 02: Two or more header units



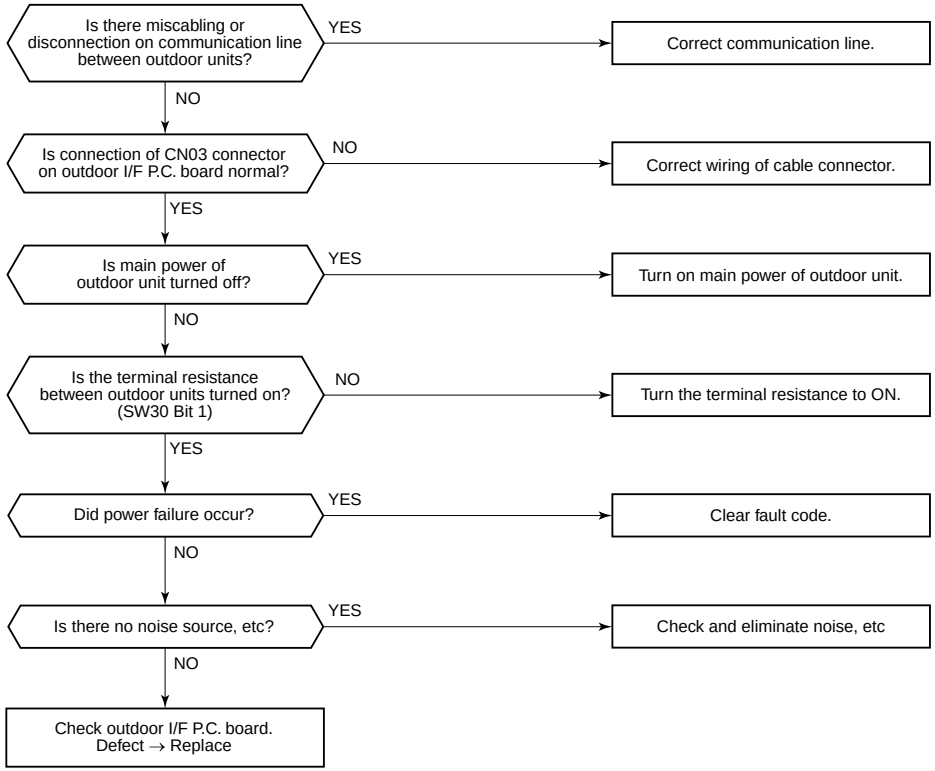
Reference)
When the power supply of the outdoor unit is first turned on, the check code [E19 00] is displayed until the power supply of the indoor units are turned on. However is not an error. When the power supply of the indoor units are this turned on, the check code is automatically reset.

Check code	Check code name	Cause of operation
[E20] / [42] (TCC-L / AI-NET)	**Unit connected to other line during automatic address**	When starting automatic indoor address, a device in another refrigerant system is connected.

Sub-code: 01: Connection of outdoor of another system 02: Connection of indoor unit of another system

Separate the wire between systems according to address setup method.

Check code	Check code name	Cause of operation
[E23] / [15] (TCC-L / AI-NET)	**Communication sending error between outdoor units**	1. Interconnection cable error between outdoor unit 2. Communication error between outdoor units, I/F P.C. board error 3. Terminal resistance setup error between outdoor units

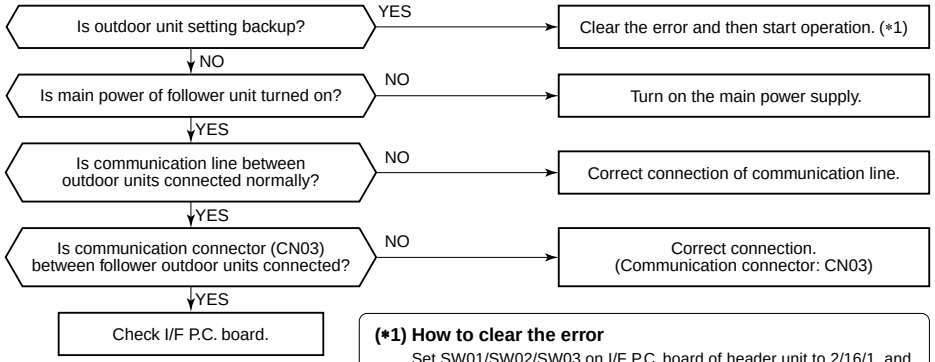


Check code	Check code name	Cause of operation
[E25] / [15] (TCC-L / AI-NET)	**Duplicated address setup of terminal outdoor units**	Addresses are duplicated by manual setting of outdoor address

Never set up the outdoor address manually.

Check code	Check code name	Cause of operation
[E26] / [15] (TCC-L / AI-NET)	**Decrease of connected outdoor units**	1. Outdoor unit backup setup 2. Outdoor power error 3. Communication line connection error between outdoor units 4. Connector error for communication 5. Outdoor I/F P.C. board error

Sub-code: No. of outdoor units which received signals normally



(*1) How to clear the error

Set SW01/SW02/SW03 on I/F P.C. board of header unit to 2/16/1, and push SW04 for 5 seconds or more. (7-segment display: [Er.] [CL])

Check code	Check code name	Cause of operation
[E28] / [d2] (TCC-L / AI-NET)	**Terminal outdoor unit error**	Terminal unit error

Sub-code: Detected outdoor unit number

An error occurred on the terminal unit. Confirm the check code of the terminal unit using 7-segment display on the I/F P.C. board of the terminal unit and check it according to the diagnostic procedure for each fault code.

How to identify the terminal outdoor unit on which error occurred

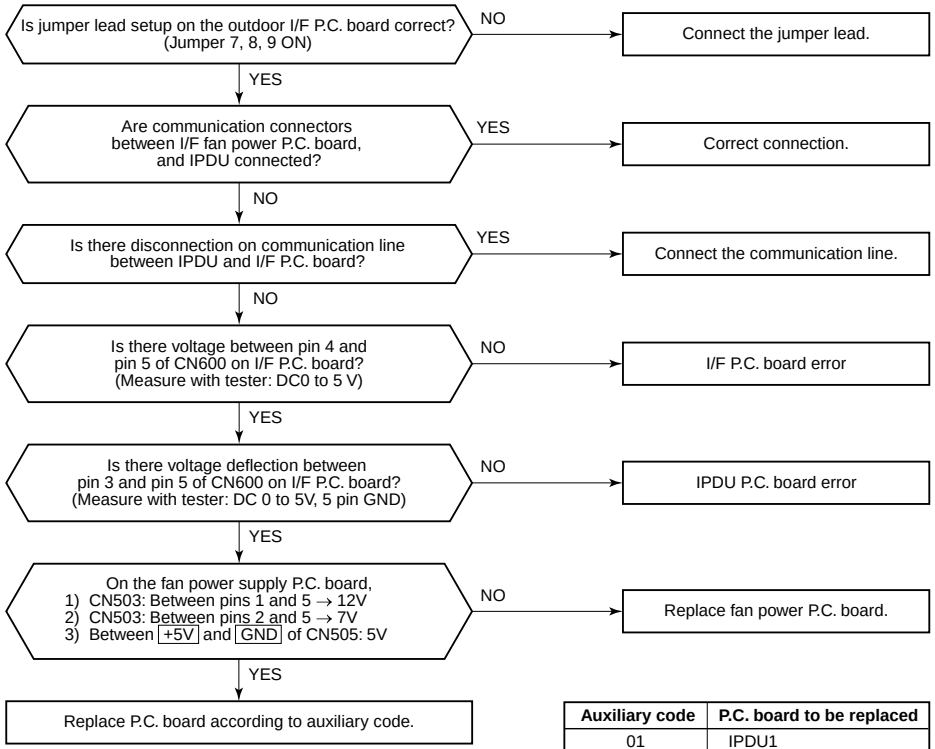
Under condition that [E28] is displayed on the 7-segment display on the header unit, when pushing SW04 for 1 second or more, the fan on the faulty outdoor unit will rotate. Pushing SW05 alone, stops the fan rotation.

Check code	Check code name	Cause of operation
[E31] / [CF] (TCC-L / AI-NET)	**IPDU communication error**	1. Connection error of communication line between IPDU and I/F P.C. board 2. I/F P.C. board error 3. IPDU P.C. board error 4. External noise

Sub-code:

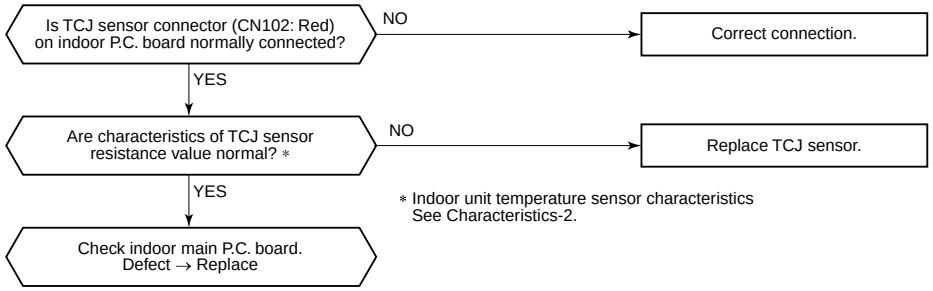
01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or communication line error between IPDU-I/F P.C. boards, or outdoor I/F P.C. board error

∗ If the fan IPDU is abnormal, be sure to check the voltage output on the fan power P.C. board.



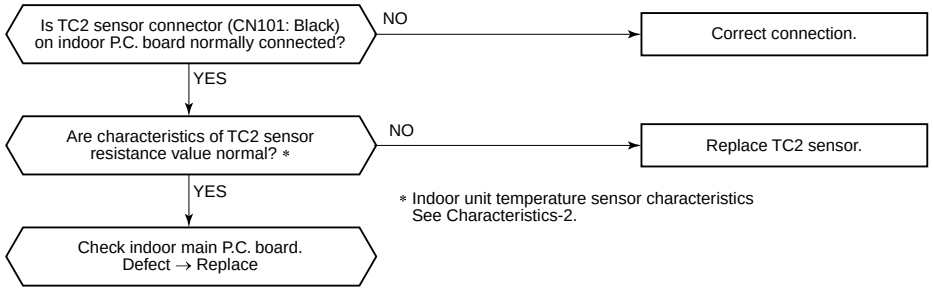
Auxiliary code	P.C. board to be replaced
01	IPDU1
02	IPDU2
03	IPDU1, 2
04	Fan IPDU
05	IPDU1, fan IPDU
06	IPDU2, fan IPDU
07	IPDU1, 2, fan IPDU, I/F

Check code	Check code name	Cause of operation
[F01] / [0F] (TCC-L / AI-NET)	**Indoor TCJ sensor error**	TCJ sensor Open/Short



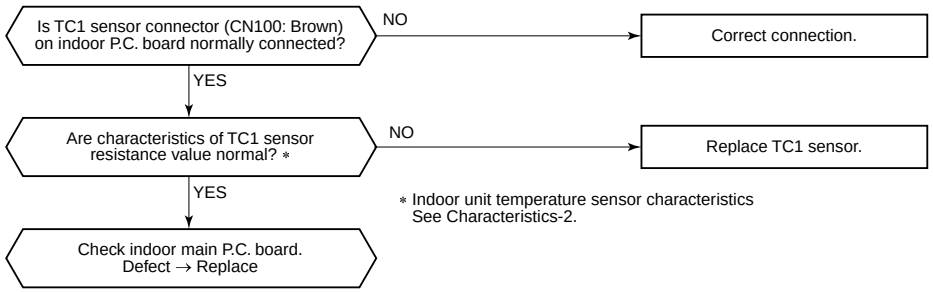
∗ Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F02] / [0d] (TCC-L / AI-NET)	**Indoor TC2 sensor error**	TC2 sensor Open/Short



∗ Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F03] / [93] (TCC-L / AI-NET)	**Indoor TC1 sensor error**	TC1 sensor Open/Short



∗ Indoor unit temperature sensor characteristics
See Characteristics-2.

Check code	Check code name	Cause of operation
[F04] / [19] (TCC-L / AI-NET)	**TD1 sensor error**	TD1 sensor Open/Short

This check code means detection of Open/Short of TD1 sensor.
Check disconnection of connector (TD1 sensor: CN502, White) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F05] / [A1] (TCC-L / AI-NET)	**TD2 sensor error**	TD2 sensor Open/Short

This check code means detection of Open/Short of TD2 sensor.
Check disconnection of connector (TD2 sensor: CN503, Pink) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F06] / [18] (TCC-L / AI-NET)	**TE1 sensor error**	TE1 sensor Open/Short

This check code means detection of Open/Short of TE1 sensor.
Check disconnection of connector (TE1 sensor: CN505, Green) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F07] / [18] (TCC-L / AI-NET)	**TL sensor error**	TL sensor Open/Short

This check code means detection of Open/Short of TL sensor.
Check disconnection of connector (TL sensor: CN521, White) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F08] / [1b] (TCC-L / AI-NET)	**TO sensor error**	TO sensor Open/Short

This check code means detection of Open/Short of TO sensor.
Check disconnection of connector (TO sensor: CN507, Yellow) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F10] / [0C] (TCC-L / AI-NET)	**Indoor TA sensor error**	TA sensor Open/Short

This check code means detection of Open/Short of TA sensor.
Check disconnection of connector (TA sensor: CN104, Yellow) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace indoor P.C. board.

Check code	Check code name	Cause of operation
[F12] / [A2] (TCC-L / AI-NET)	**TS sensor error**	TS1, TS2 sensor Open/Short

Sub-code: 01: TS1 sensor 02 : TS2 sensor

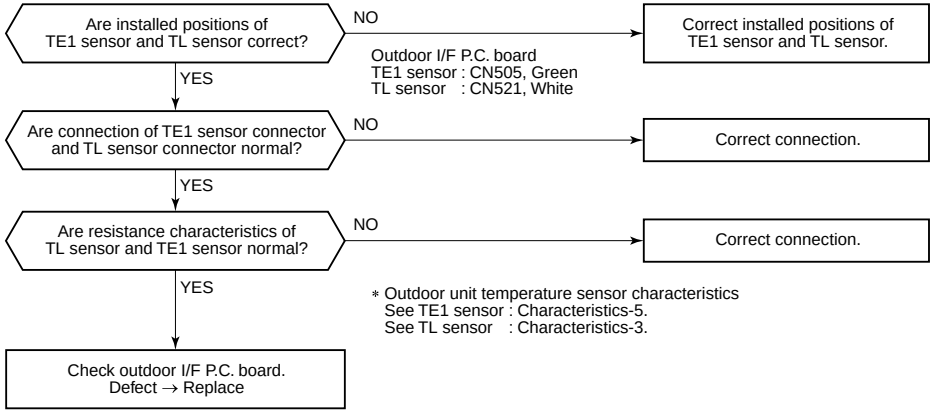
This check code means detection of Open/Short of TS sensor.
Check disconnection of connector (TS1 sensor: CN504, White TS2 sensor: CN522, Black) and characteristics of sensor resistance value. (Refer to Outdoor unit temperature sensor characteristics.)
If sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F13] / [43] (TCC-L / AI-NET)	**TH sensor error**	IGBT built-in sensor error in A3-IPDU

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

This check code means IGBT built-in temperature sensor error.
Check connection of connectors CN06 on IPDU P.C. board and CN600 on I/F P.C. board.
If sensor is normal, replace IPDU P.C. board.

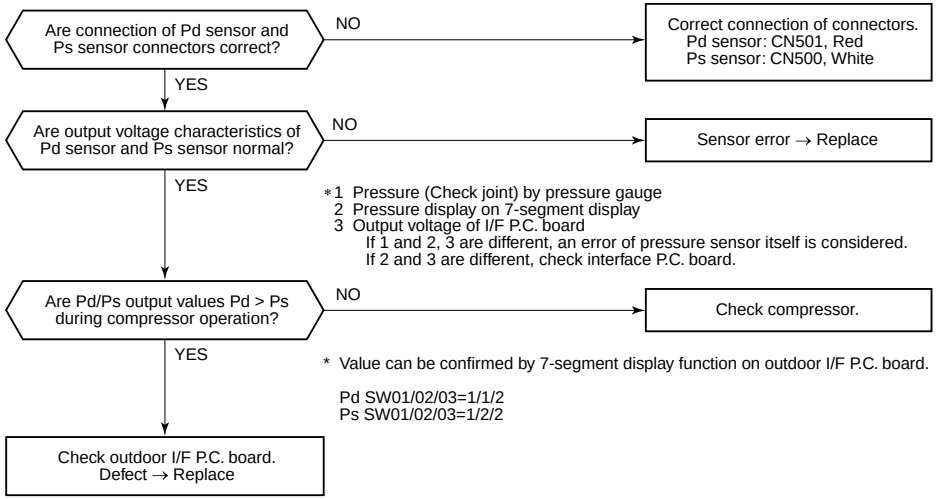
Check code	Check code name	Cause of operation
[F15] / [18] (TCC-L / AI-NET)	**Outdoor temp sensor miscabling (TE1, TL)**	1. Misinstallation and misconnection of TE1 sensor and TL sensor 2. Resistance characteristics error of TE1 sensor and TL sensor 3. Outdoor P.C. board (I/F) error



∗ Outdoor unit temperature sensor characteristics
See TE1 sensor : Characteristics-5.
See TL sensor : Characteristics-3.

∗ TE1 sensor : Outdoor heat exchanger temp sensor
TL sensor : Temp sensor between liquid tanks of outdoor P.M.V. 1/2

Check code	Check code name	Cause of operation
[F16] / [43] (TCC-L / AI-NET)	**Outdoor pressure sensor miscabling (Pd, Ps)**	1. High-pressure Pd sensor and low-pressure sensor Ps are exchanged. 2. Output voltage of each sensor is zero.

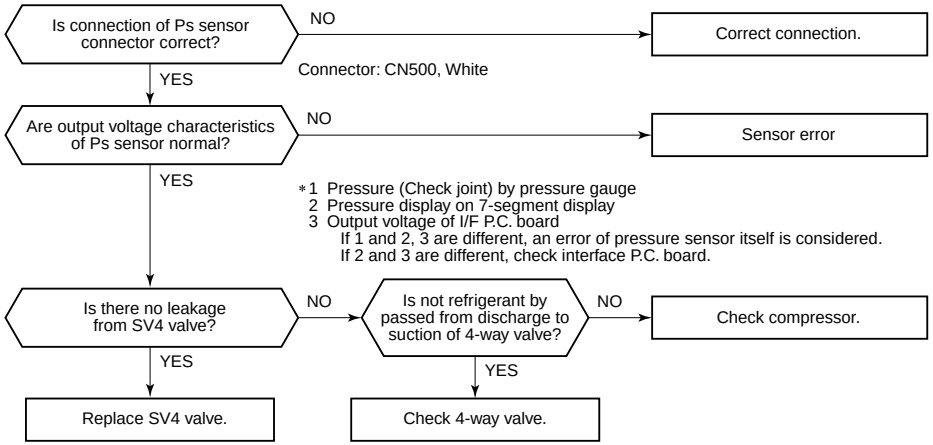


∗1 Pressure (Check joint) by pressure gauge
2 Pressure display on 7-segment display
3 Output voltage of I/F P.C. board
If 1 and 2, 3 are different, an error of pressure sensor itself is considered.
If 2 and 3 are different, check interface P.C. board.

* Value can be confirmed by 7-segment display function on outdoor I/F P.C. board.

Pd SW01/02/03=1/1/2
Ps SW01/02/03=1/2/2

Check code	Check code name	Cause of operation
[F23] / [43] (TCC-L / AI-NET)	**Ps sensor error**	Output voltage error of Ps sensor



∗1 Pressure (Check joint) by pressure gauge
2 Pressure display on 7-segment display
3 Output voltage of I/F P.C. board
If 1 and 2, 3 are different, an error of pressure sensor itself is considered.
If 2 and 3 are different, check interface P.C. board.

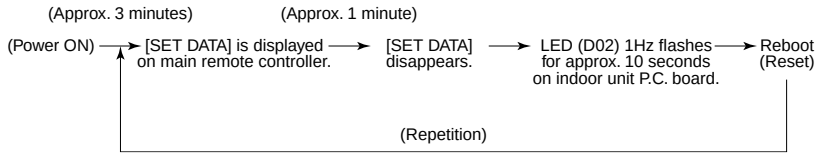
Check code	Check code name	Cause of operation
[F24] / [43] (TCC-L / AI-NET)	**Pd sensor error**	Output voltage error of Pd sensor

It is output voltage error of Pd sensor. Check disconnection of connection of connector (Pd sensor: CN501) circuit and output voltage of sensor.
If the sensor is normal, replace outdoor I/F P.C. board.

Check code	Check code name	Cause of operation
[F29] / [12] (TCC-L / AI-NET)	**Indoor other error**	Indoor P.C. board error EEROM error

This error is detected during operation of air conditioner of IC10 non-volatile memory (EEPROM) on indoor unit P.C. board. Replace service P.C. board.

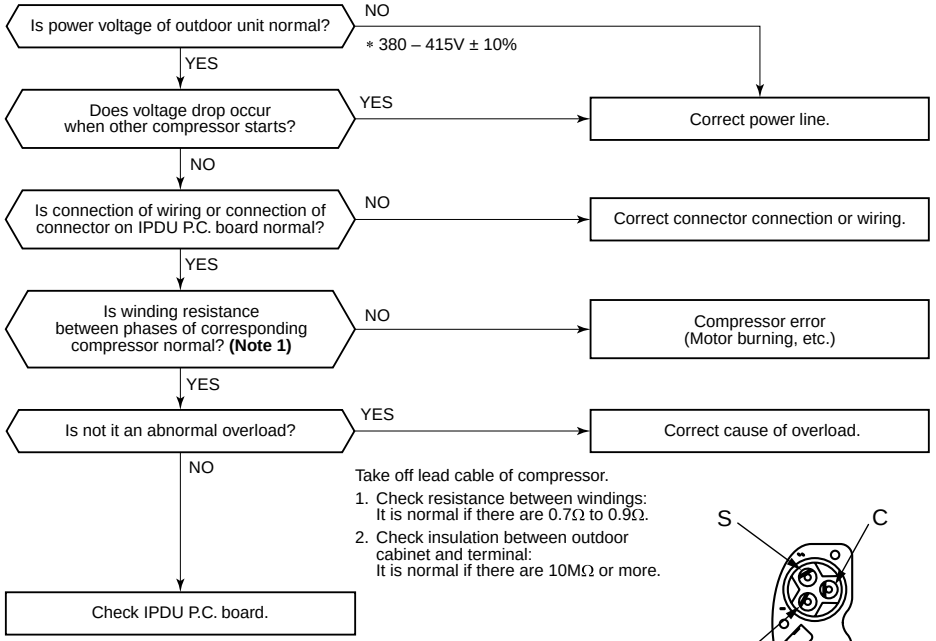
∗ If EEPROM was not inserted when power was turned on or it is absolutely impossible to read/write EEPROM data, the automatic address mode is repeated. In this case, [97 error] is displayed on AI-NET central controller.



Check code	Check code name	Cause of operation
[F31] / [1C] (TCC-L / AI-NET)	**Outdoor EEPROM error**	1. Outdoor unit power error (Voltage, noise, etc.) 2. Outdoor I/F P.C. board error

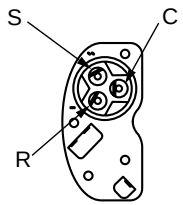
Check code	Check code name	Cause of operation
[H01] / [1F] (TCC-L / AI-NET)	**Compressor breakdown**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Cause of abnormal overload operation 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Take off lead cable of compressor.

1. Check resistance between windings:
   It is normal if there are 0.7Ω to 0.9Ω.
2. Check insulation between outdoor cabinet and terminal:
   It is normal if there are 10MΩ or more.



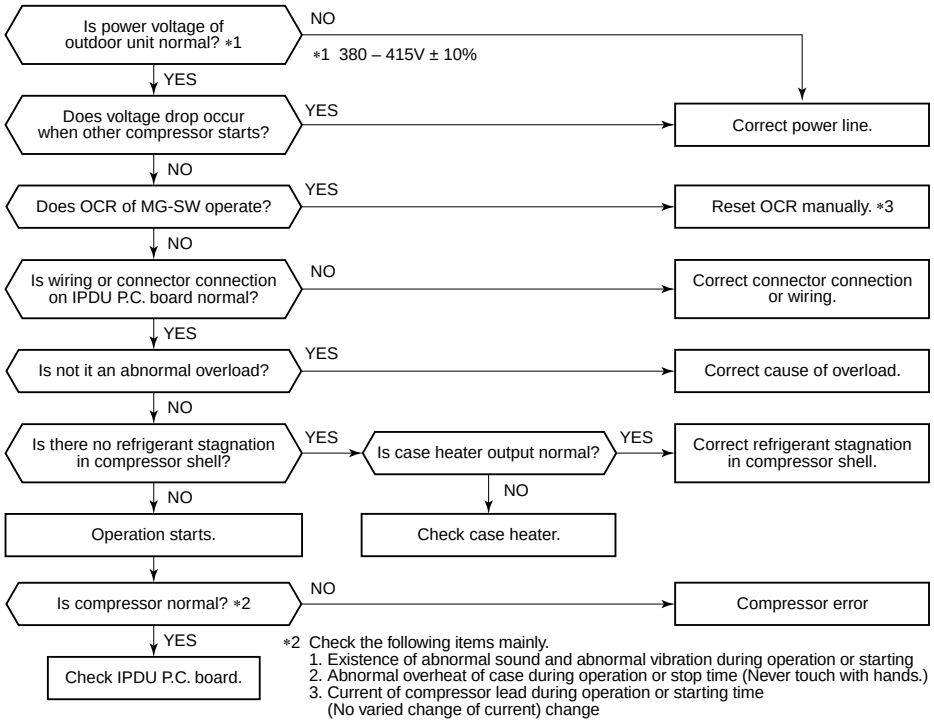
Details of compressor power connecting section

Note 1

* After checking the output, when connecting the compressor lead again to the compressor terminal, check surely there is no distortion on the Fasten receptacle terminal.
If it is loosened, caulk it with pinchers, etc and then connect lead to the terminal firmly.

Check code	Check code name	Cause of operation
[H02] / [1d] (TCC-L / AI-NET)	**Compressor error (Lock)**	1. Outdoor unit power line error 2. Compressor circuit system error 3. Compressor error 4. Refrigerant stagnation in compressor shell 5. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



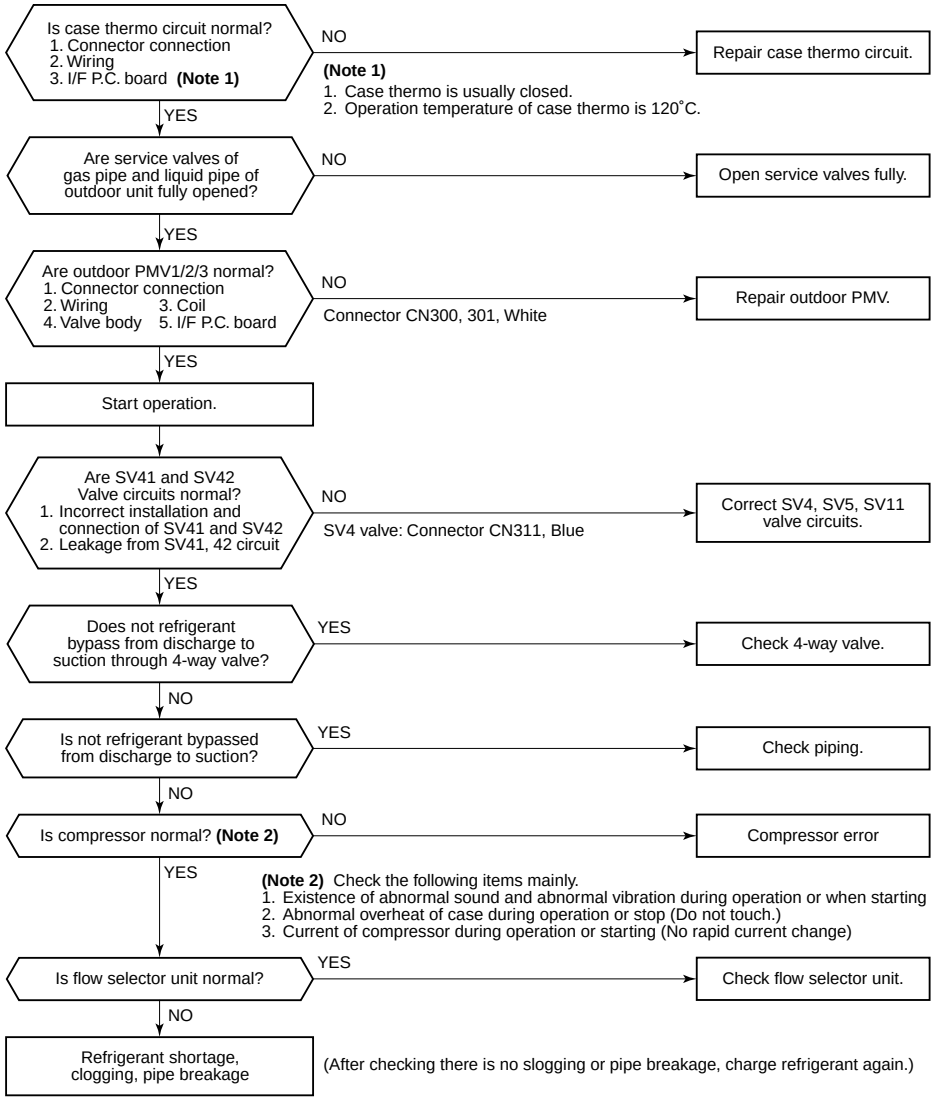
∗2 Check the following items mainly.
1. Existence of abnormal sound and abnormal vibration during operation or starting
2. Abnormal overheat of case during operation or stop time (Never touch with hands.)
3. Current of compressor lead during operation or starting time (No varied change of current) change

∗3 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

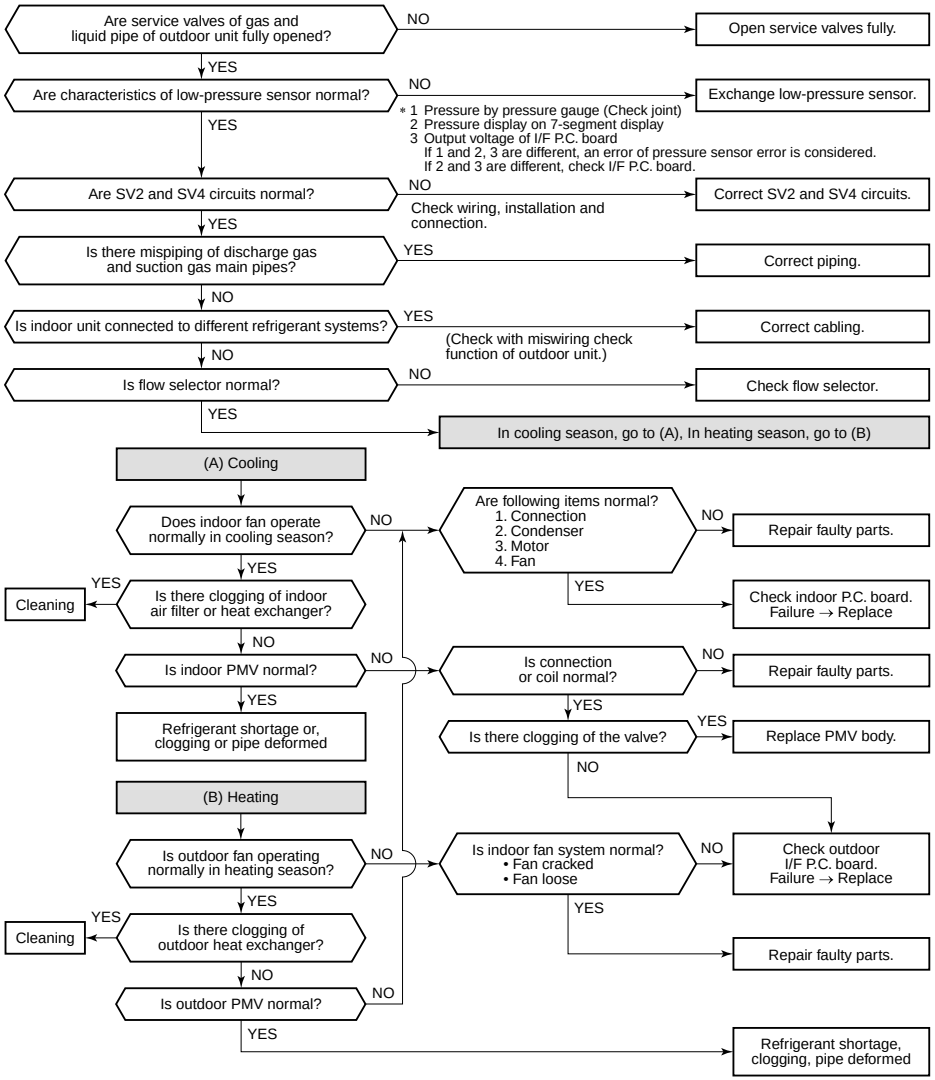
Check code	Check code name	Cause of operation
[H03] / [17] (TCC-L / AI-NET)	**Current detective circuit system error**	1. Cabling or connector connection error on IPDU P.C. board 2. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

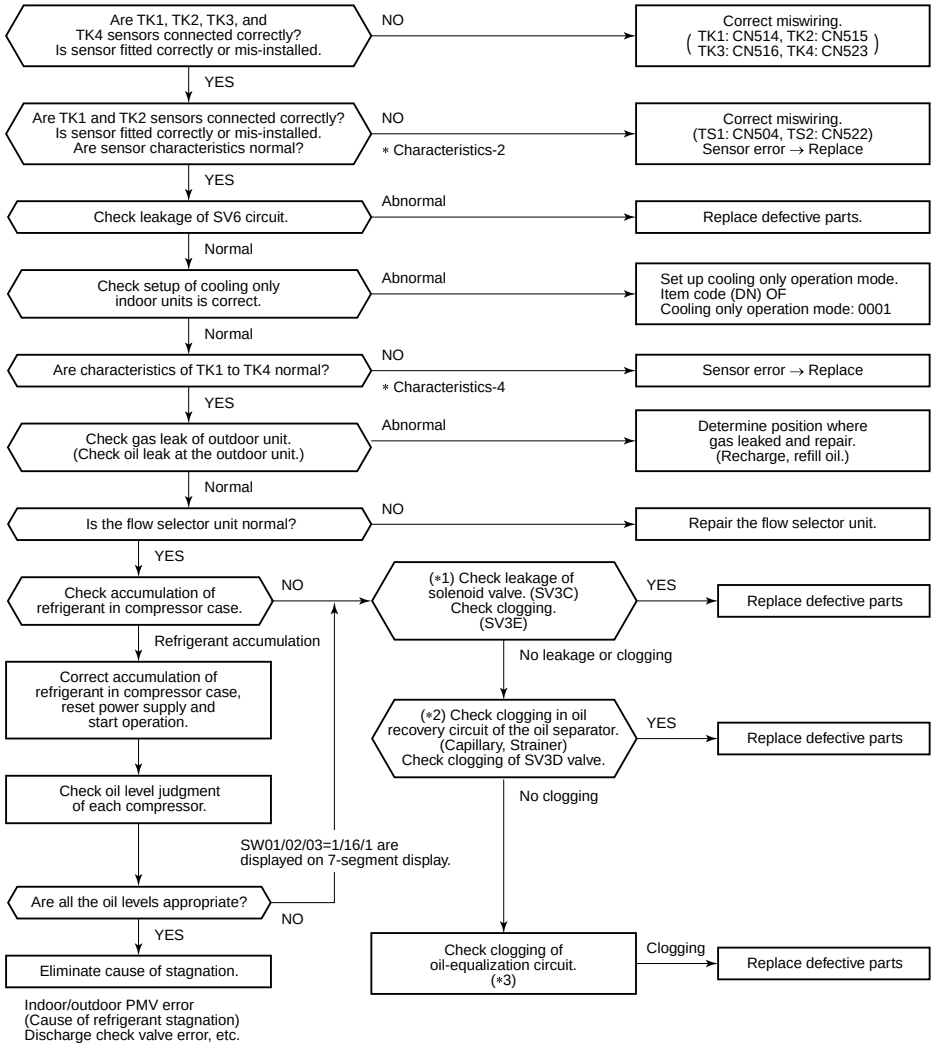
Check code	Check code name	Cause of operation
[H04] / [44] (TCC-L / AI-NET) **[H14] / [44]** (TCC-L / AI-NET)	**Compressor 1 case thermo operation** **Compressor 2 case thermo operation**	1. Case thermo circuit error 2. I/F P.C. board error 3. Service valve closed 4. Outdoor PMV clogging 5. SV4 valve leak, Coil misinstallation 6. 4-way valve error 7. Compressor error 8. Refrigerant shortage



Check code	Check code name	Cause of operation
[H06] / [20] (TCC-L / AI-NET)	**Low-pressure protective operation**	1. Service valve close 2. Ps sensor error 3. SV2, SV4 circuit error 4. Miscabling of communication between indoor and outdoor 5. Indoor/outdoor fan and condenser error 6. Indoor/outdoor PMV clogging 7. Indoor/outdoor heat exchanger clogging 8. Refrigerant shortage



Check code	Check code name	Cause of operation
[H07] / [d7] (TCC-L / AI-NET)	**Low oil level protection**	1. Valves of balance pipes closed. 2. Miscabling or misinstallation of TK1 to TK4 sensors 3. TK1 to TK4 sensor error 4. Gas leak or oil leak of all outdoor units 5. Refrigerant stagnation of compressor case 6. SV3A, 3B, 3D, 3C, 3E valve error 7. Clogging of oil return circuit from oil separator 8. Clogging of oil-equation circuit system



(Note) When refrigerant stagnates in compressor shell, there may appear to be a low oil level.

In some cases, it may be difficult to check for leakage or clogging of refrigerant in low ambient temperature condition.
In this case, it may take longer for the system to warm up before commencing checks.
(Criteria: Discharge temperature of TD1 and TD2 are 60°C or higher)

(*1)

a) Leakage check for SV3A valve (for multiple outdoor unit system)

- Turn off the power supply, take off connector of SV3A valve, and then start a test operation after power-ON.
- Check the temperature change at secondary side of SV3A valve during operation (1 in the figure on the next page).
  - If temperature is increased, it is a leakage of SV3A valve.
    Replace SV3A valve.

b) Leakage check for SV3C valve

- Turn off the power supply, take off connector of SV3C valve, and then start a test operation after power-ON.
- After operation for several minutes, check temperature at secondary side of SV3C valve (2 in the figure on the next page).
  - If temperature is high (equivalent to discharge temperature TD), it is a leakage of SV3C valve.
    Replace SV3C valve.
    (Even if there is leakage from SV3C valve does not occur, temperature of SV3C valve at secondary side rises during operation. When the checked temperature is equivalent to TD temperature, it is a leakage of SV3C valve. Replace SV3C valve.)

c) Clogging check for SV3B valve (for multiple outdoor unit system)

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr], and push SW04 for 2 seconds or more, [Hr] [2] is displayed.
- Set up SW02 = [9], and turn on SV3A, SV3B, SV3C valves (7-segment display [Hr] [3-]).
- While outdoor unit is operating, check temperature change at secondary side of SV3B valve (3 in the figure on the next page).
  - If temperature does not rise (equivalent to suction temperature), it is a clogging of SV3B valve.
    Replace SV3B valve.

d) Clogging check for SV3E valve

- While the outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] the 7-segment display A displays [Hr], and push SW04 for 2 seconds or more, [Hr] [2] is displayed.
- Set up SW02 = [10], and turn on SV3E valve (7-segment displays [Hr] [ ]).
- After operating for several minutes, check the pipe temperature at the secondary side of the SV3E valve.
  If it is the equivalent to the outside temperature, SV3E valve may be clogged.
  Replace SV3E valve.
- Note: If SV3E valve is clogged, the temperature of all TK1 to TK4 sensors do not change.

(*2) Clogging check for SV3D valve of oil return circuit from oil separator

a) Oil return circuit

- While outdoor unit is operating, check temperature (secondary side of capillary) on oil return circuit (5 in the figure on the next page).
  If temperature is equivalent to suction temperature, a clogging of strainer of oil return circuit or capillary is considered.
  Repair the clogged part.

b) Clogging check for SV3D valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr], and push SW04 for 2 seconds or more, [Hr] [2] is displayed.
- Set up SW02 = [7], and turn on SV3D valve (7-segment display [Hr] [3d]).
- If temperature is low at secondary side of the valve or it does not change, clogging of valve, capillary, or strainer is considered (6 in the figure on the next page).

(*3) Check for solenoid valve of outdoor unit (for multiple outdoor unit system)

a) Clogging check for SV3A valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr], and push SW04 for 2 seconds or more, [Hr] [2] is displayed.
- Set up SW02 = [4], and turn on SV3A valve (7-segment display [Hr] [3A]).
- If temperature is low at secondary side of the valve or it does not change, clogging of valve or check valve is considered (1 in the figure).

b) Clogging check for SV3C valve

- While outdoor unit is operating, set up SW01/02/03 = [2] [1] [3] to 7-segment display [Hr], and push SW04 for 2 seconds or more, [Hr] [2] is displayed.
- Set up SW02 = [6], and turn on SV3C valve (7-segment display [Hr] [3C]).
- If temperature does not increase, clogging of valve or strainer is considered (2 in the figure).

(*4)

a) Clogging check for oil-equalization circuit

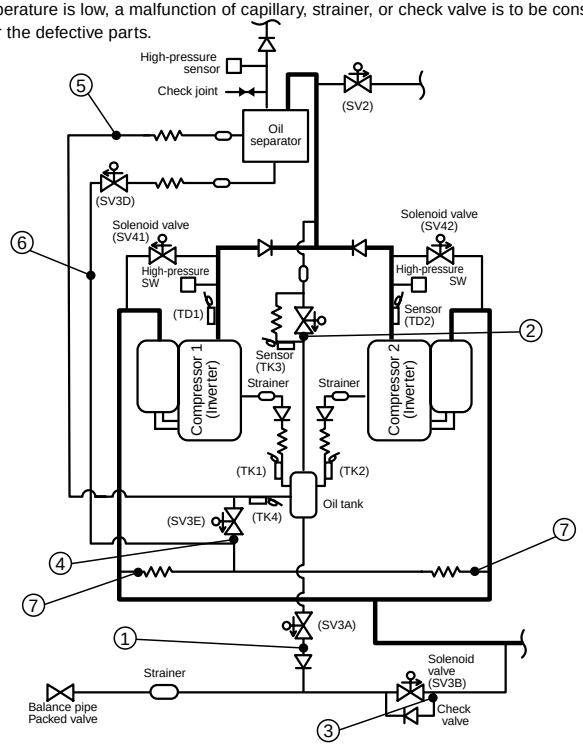
- Operate the outdoor unit (drive both compressors in the unit).
- After operating for 10 minutes, check temperature of TK1 and TK2 sensors and temperature of oil equalization circuit capillary (7 in the figure) have increased.

(Criteria)

TK1, TK2=Td1, Td2 temperature - Approx. 10 to 30°C

Oil-equalization capillary tubes should be significantly higher than outside air temperature and suction temperature.

- If temperature is low, a malfunction of capillary, strainer, or check valve is to be considered. Repair the defective parts.



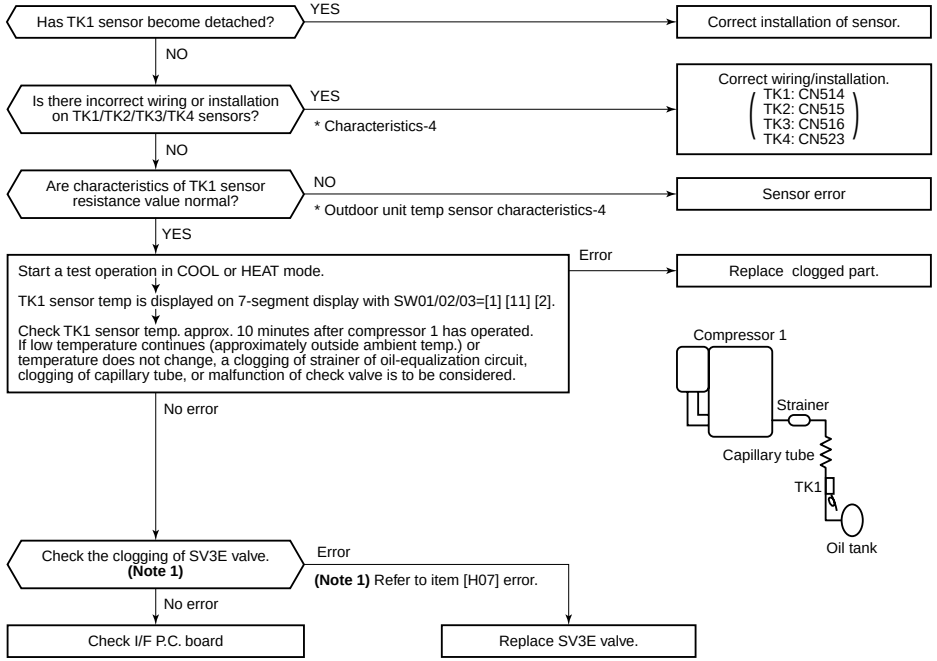
Check code	Check code name	Cause of operation
[H08] / [d4] (TCC-L / AI-NET)	**Oil level detective temperature sensor error**	TK1 to TK4 sensor Open/Short

Sub-code: 01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error

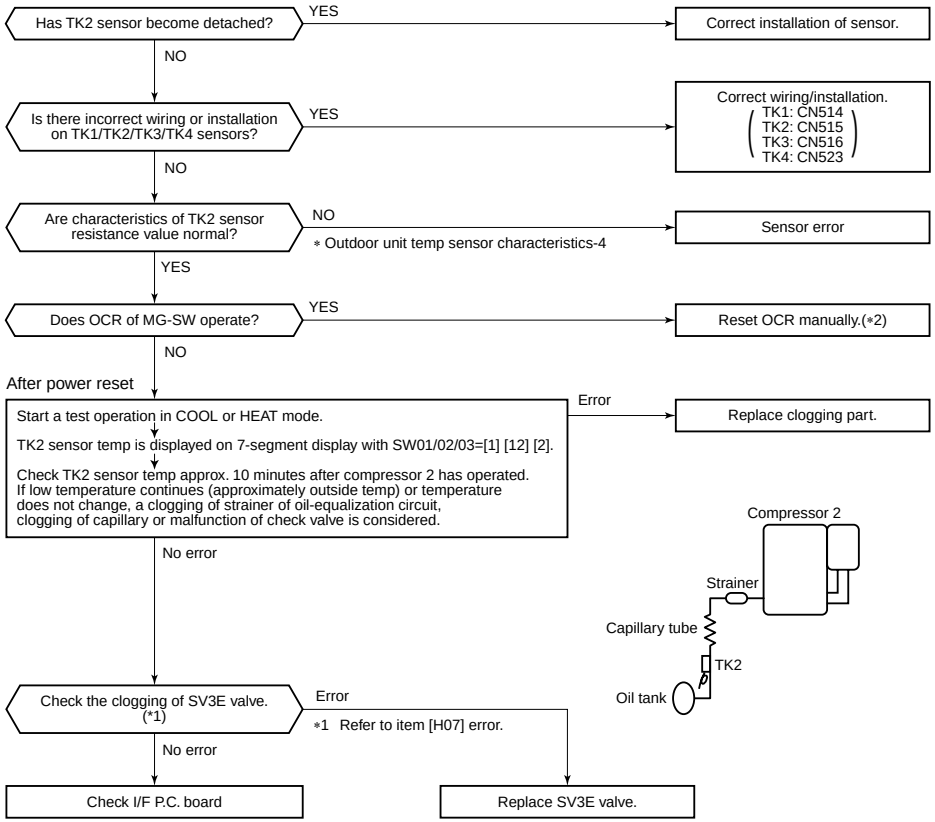
This error is an oil level temperature sensor error.
Check for disconnection of the wiring and resistance value of the sensor.
If the sensors are normal, replace the outdoor I/F P.C. board.

Circuit	Connector
TK1	CN514 (Black)
TK2	CN515 (Green)
TK3	CN516 (Red)
TK4	CN523 (Yellow)

Check code	Check code name	Cause of operation
[H16] / [d7] (TCC-L / AI-NET)	**TK1 temperature detective circuit error (Sub-code: 01)**	1. Connection of TK1 sensor. Error in resistance value of TK1 sensor 2. Oil-equalization circuit error (Check valve, capillary clogging, strainer clogging) 3. Refrigerant stagnation in case of compressor shell

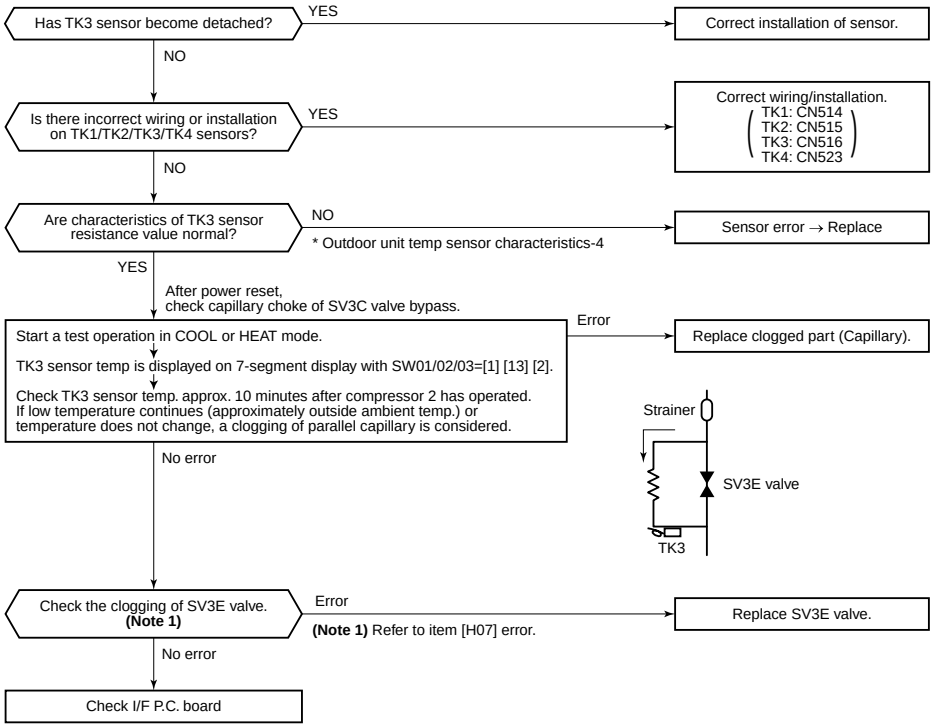


Check code	Check code name	Cause of operation
[H16] / [d7] (TCC-L / AI-NET)	**TK2 detective circuit system error (Sub-code: 02)**	1. Connection of TK2 sensor. 2. Error in resistance value of TK2 sensor (see 9-7 Sensor characteristics). 3. Oil-equalization circuit error (check valve, capillary clogging, strainer clogging). 4. Refrigerant stagnation in case of compressor shell.

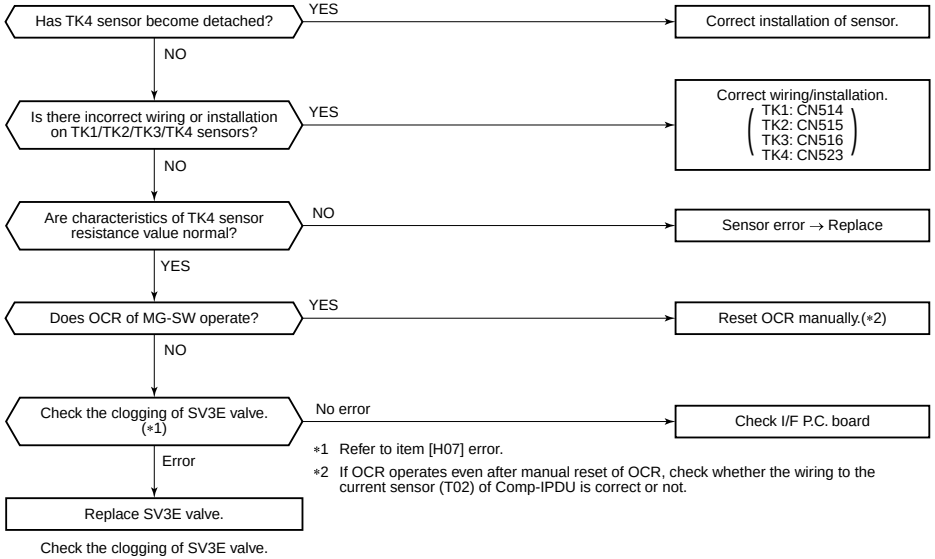


∗2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

Check code	Check code name	Cause of operation
[H16] / [d7] (TCC-L / AI-NET)	**TK3 temperature detective circuit error (Sub-code: 03)**	1. Connection of TK3 sensor. 2. Error in resistance value of TK3 sensor (see 9-7 Sensor characteristics). 3. Error of SV3C valve circuit periphery (check capillary clogging, strainer clogging). 4. Refrigerant stagnation in case of compressor shell.



Check code	Check code name	Cause of operation
[H16] / [d7] (TCC-L / AI-NET)	**TK4 temperature detective circuit error (Sub-code: 04)**	1. Connection of TK4 sensor. 2. Error in resistance value of TK4 sensor (see 9-7 Sensor characteristics). 3. Check clogging and malfunction of SV3E valve circuit. 4. Oil-equalization circuit error (check capillary clogging, strainer clogging). 5. Refrigerant stagnation in case of compressor shell.



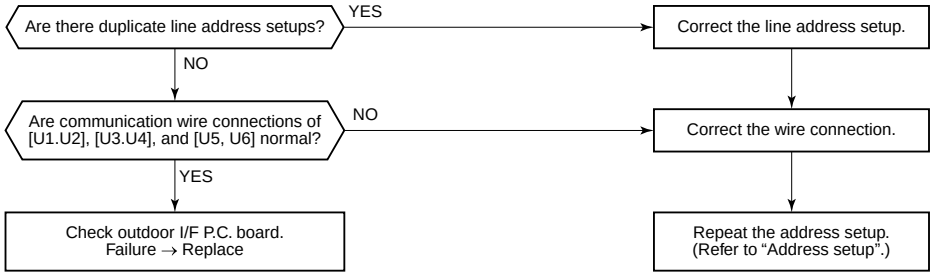
∗1 Refer to item [H07] error.

∗2 If OCR operates even after manual reset of OCR, check whether the wiring to the current sensor (T02) of Comp-IPDU is correct or not.

Check code	Check code name	Cause of operation
[L03] / [96] (TCC-L / AI-NET)	**Duplicated indoor header units**	There were two or more indoor header units within the same remote controller group.

1) Check the connection of the remote controller after the connection has been changed.
2) If the group configuration and address are normal when power has been turned on, the mode automatically shifts to address setup mode. (Re-setup of address) → Refer to “Address setup”.

Check code	Check code name	Cause of operation
[L04] / [96] (TCC-L / AI-NET)	**Duplicated setup of outdoor line address**	Outdoor line addresses are duplicated.



Check code	Check code name	Cause of operation
[L05] / [96] (TCC-L / AI-NET)	**Duplicated indoor units with priority (Displayed on indoor unit with priority)**	1. Two or more prior indoor units exist.

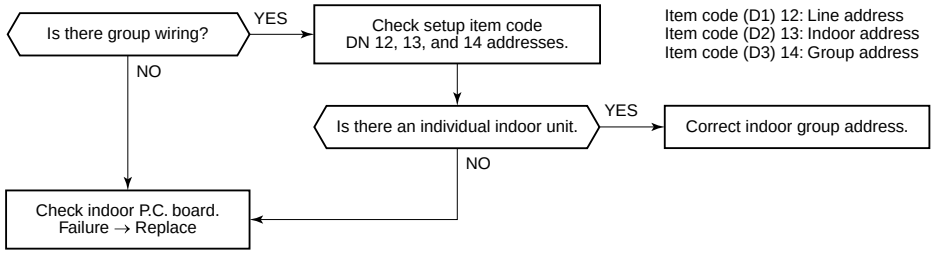
This check code is displayed on the set indoor unit when setup of indoor unit with priority is duplicated.
• Priority setup with two or more units is not available. Choose one prior unit in one refrigerant circuit system.

Check code	Check code name	Cause of operation
[L06] / [96] (TCC-L / AI-NET)	**Duplicated indoor units with priority (Displayed on the indoor unit other than one with priority and on the outdoor unit)**	Two or more indoor units with priority are duplicated.

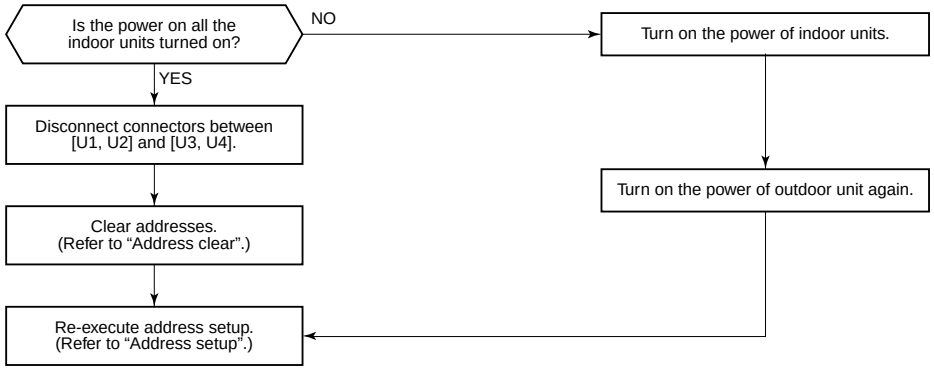
Sub-code: No. of indoor units with priority

When indoor unit with priority is duplicated, this fault code is displayed on the unit other than the setup indoor unit and outdoor unit.
• As only one indoor unit with priority is valid, change the setup.

Check code	Check code name	Cause of operation
[L07] / [99] (TCC-L / AI-NET)	**Group line in individual indoor unit**	The group line is connected in the individual indoor unit.

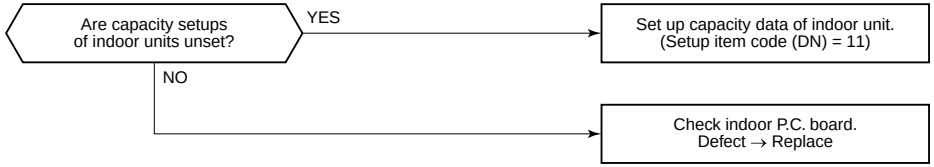


Check code	Check code name	Cause of operation
[L08] / [99]* (TCC-L / AI-NET)	**Indoor group / address unset**	Indoor address unset



Note) This code is displayed when the power is turned on at the first time after installation. (Because the address is not yet set up)

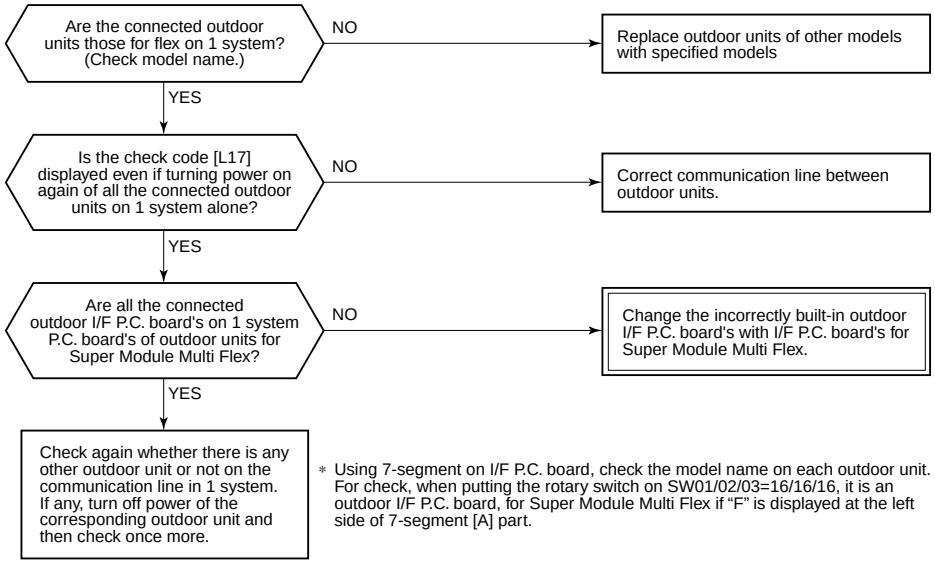
Check code	Check code name	Cause of operation
[L09] / [46] (TCC-L / AI-NET)	**Indoor capacity unset**	Indoor capacity unset



Check code	Check code name	Cause of operation
[L10] / [88] (TCC-L / AI-NET)	**Outdoor capacity unset**	The model selection jumper of the outdoor I/F P.C. board does not match the model.

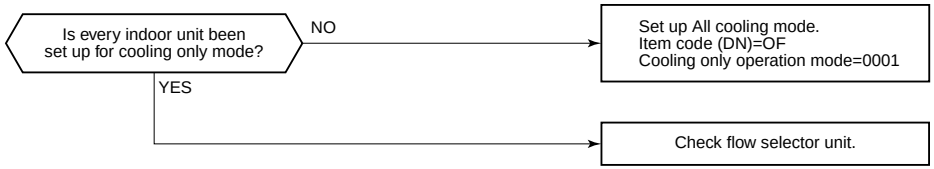
Service I/F P.C. board for the outdoor unit is common to all outdoor units.
The service I/F P.C. board will need to be set up for the correct model based upon the faulty I/F P.C. board, which it is replacing. Set up the model based upon the I/F P.C. board assembly change procedure.

Check code	Check code name	Cause of operation
[L17] / [46] (TCC-L / AI-NET)	**Inconsistent models of outdoor units**	There are outdoor units on the communication line other than Super Module Multi Flex type such as Super Module Multi or Super Module Multi ice regenerative type

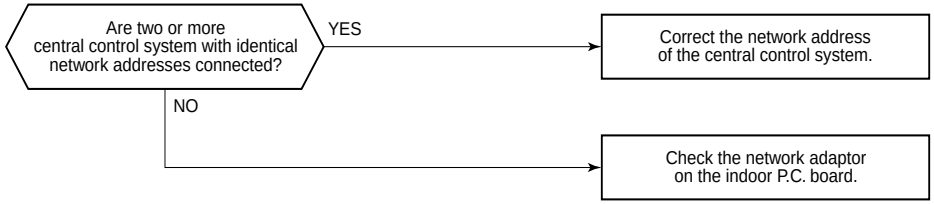


* Using 7-segment on I/F P.C. board, check the model name on each outdoor unit. For check, when putting the rotary switch on SW01/02/03=16/16/16, it is an outdoor I/F P.C. board, for Super Module Multi Flex if “F” is displayed at the left side of 7-segment [A] part.

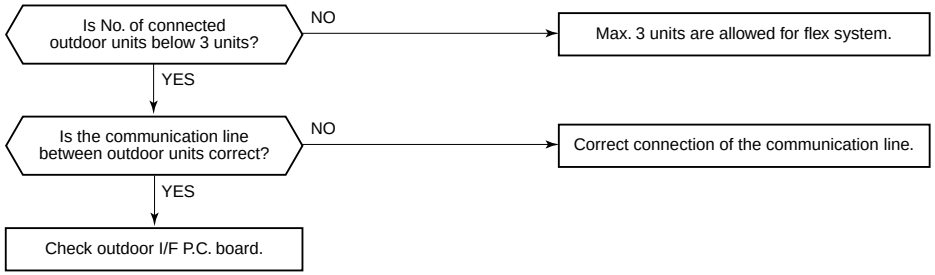
Check code	Check code name	Cause of operation
[L18] / [8A] (TCC-L / AI-NET)	**Flow selector unit system error**	An indoor unit which has been operated in cooling only mode is operated in heating mode without setup for cooling only mode.



Check code	Check code name	Cause of operation
[L20] / [98] (TCC-L / AI-NET)	**Duplicated central control addresses**	Central control addresses are duplicated.

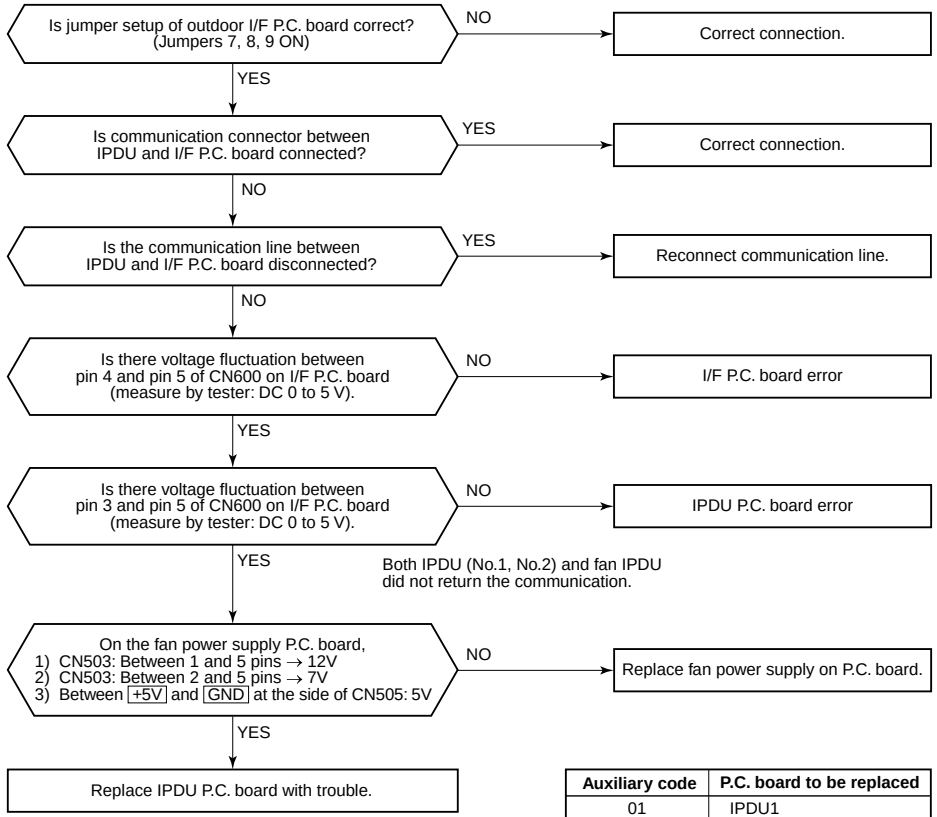


Check code	Check code name	Cause of operation
[L28] / [46] (TCC-L / AI-NET)	**Quantity over of connected outdoor units**	1. Quantity over of connected outdoor units 2. Connection error of communication line between outdoor units 3. Outdoor I/F P.C. board error



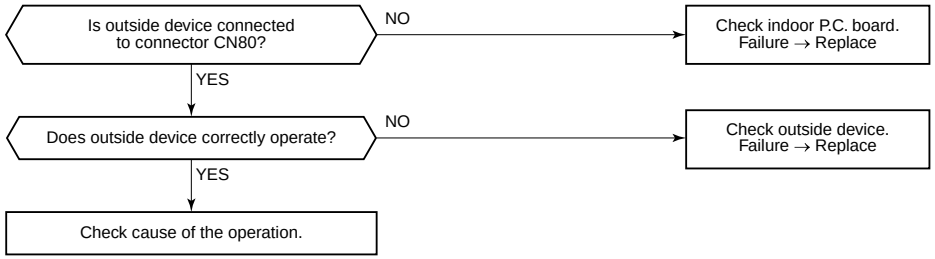
Check code	Check code name	Cause of operation
[L29] / [CF] (TCC-L / AI-NET)	**IPDU quantity error**	1. Incorrect model setup in service for I/F P.C. board 2. Communication error between IPDU, fan IPDU and I/F 3. IPDU, fan IPDU, I/F P.C. board error

Sub-code:
01: IPDU1 error
02: IPDU2 error
03: IPDU1, 2 error
04: Fan IPDU error
05: IPDU1, fan IPDU error
06: IPDU2, fan IPDU error
07: All IPDU error or disconnection of communication line between IPDU-I/F P.C. board or outdoor I/F P.C. board error

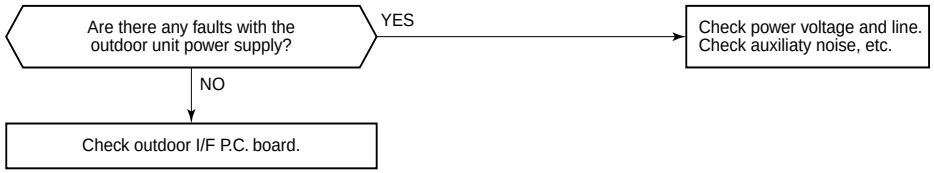


Auxiliary code	P.C. board to be replaced
01	IPDU1
02	IPDU2
03	IPDU1, 2
04	Fan IPDU
05	IPDU1, fan IPDU
06	IPDU2, fan IPDU
07	IPDU1, 2, fan IPDU, I/F

Check code	Check code name	Cause of operation
[L30] / [b6] (TCC-L / AI-NET)	**Interlock in indoor unit from outside**	Outside error was input.

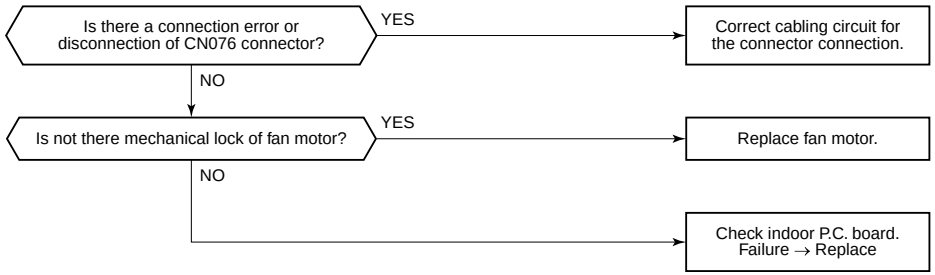


Check code	Check code name	Cause of operation
[L31] / [–] (TCC-L / AI-NET)	**Extended IC error**	1. Outdoor unit power error 2. Outdoor I/F P.C. board error

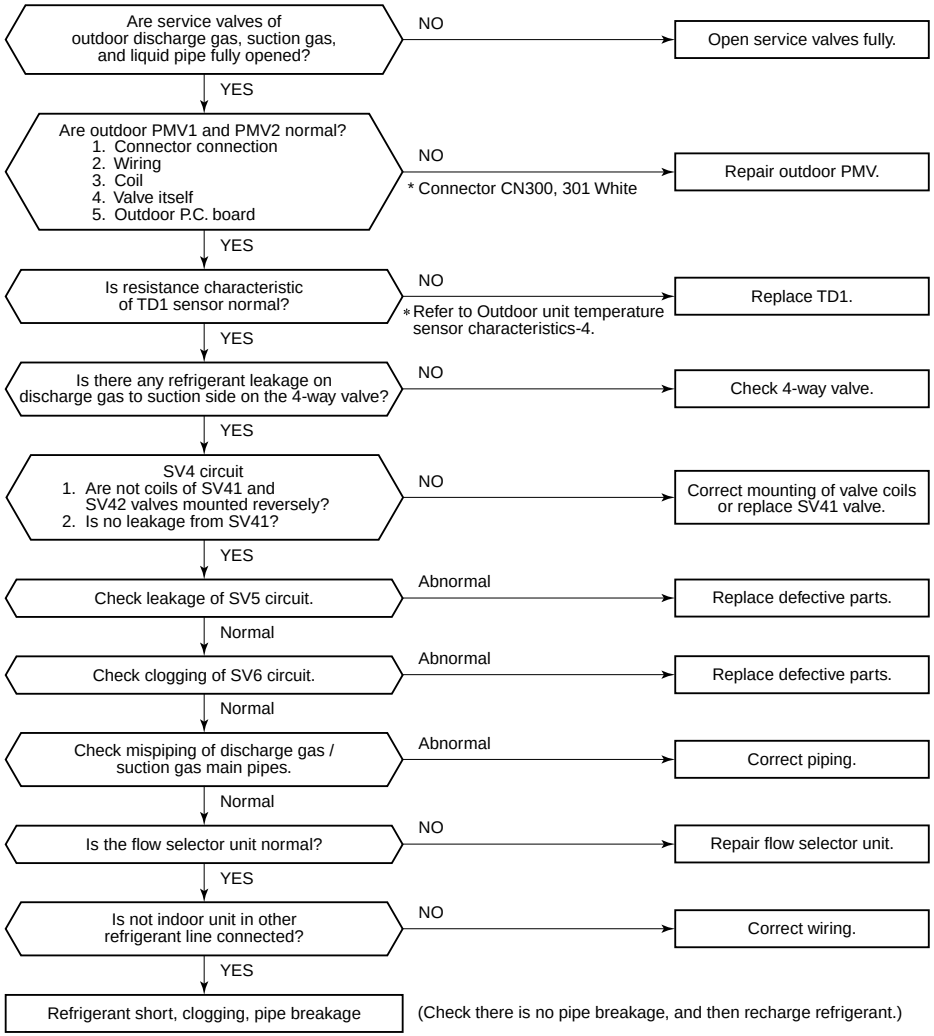


Check code	Check code name	Cause of operation
[P01] / [11] (TCC-L / AI-NET)	**Indoor fan motor error**	1. Cabling error 2. Check fan motor.

∗ For the models installed with AC fan motor only



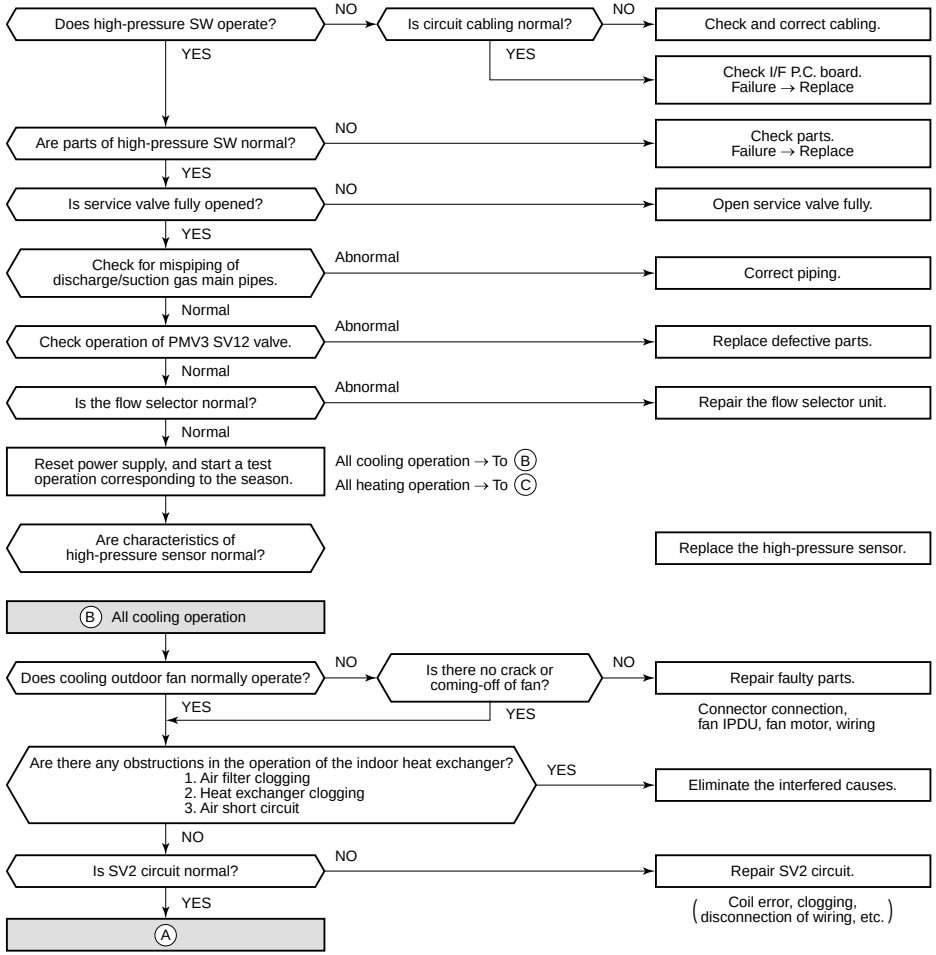
Check code	Check code name	Cause of operation
[P03] / [1E] (TCC-L / AI-NET)	**Discharge temp TD1 error**	1. Service valve of outdoor unit closed. 2. Outdoor PMV1, 2 error 3. TD sensor error 4. Refrigerant short, clogging in pipe 5. 4-way valve error 6. SV4 circuit leakage, misinstallation 7. SV5 circuit leakage 8. SV6 circuit clogging 9. Discharge gas/Suction gas pipes mispiping 10. Flow selector unit error

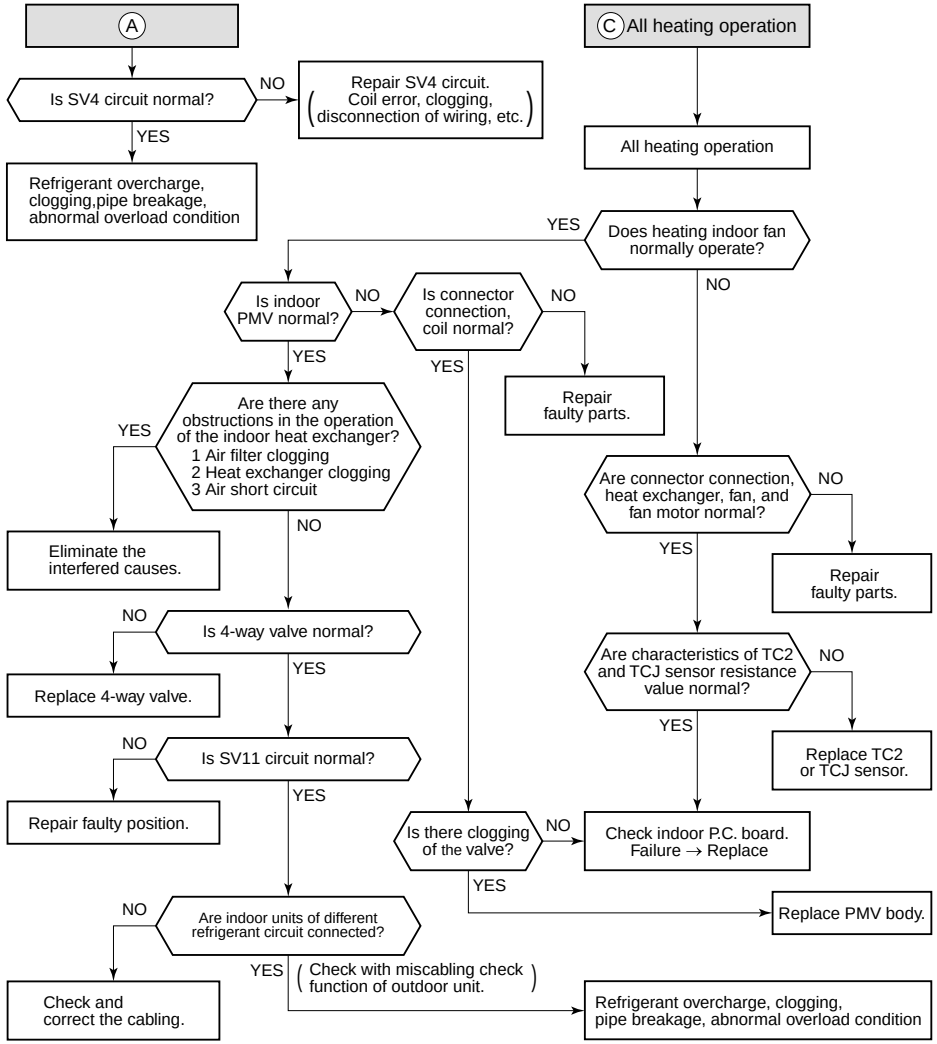


Check code	Check code name	Cause of operation
[P04] / [21] (TCC-L / AI-NET)	**Actuation of high-pressure SW**	1. High-pressure SW error 2. Service valve closed 3. Pd sensor error 4. Indoor/outdoor fan error 5. Indoor/outdoor PMV choke 6. Indoor/outdoor heat exchanger clogging, air short circuit 7. SV2 circuit error 8. SV4 circuit error 9. SV5 circuit error 10. Discharge line check valve malfunction 11. Refrigerant overcharge

Sub-code: 01: Compressor 1 side 02: Compressor 2 side

Note) High-pressure SW is normally closed. (B contact)



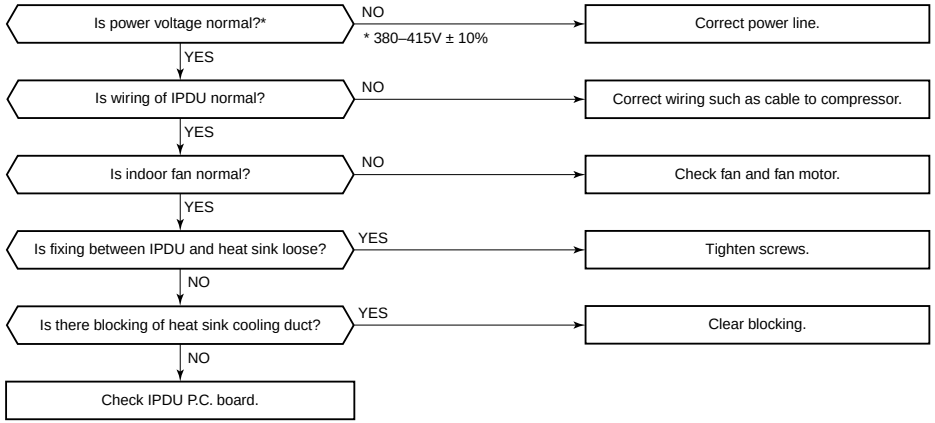


Check code	Check code name	Cause of operation
[P05] / [AF] (TCC-L / AI-NET)	**Open phase, negative phase**	1. Power supply open phase 2. Power supply negative phase

- Check the phase power line of outdoor unit.
- Check error of outdoor I/F P.C. board.
- Check there is no looseness, etc of terminal.

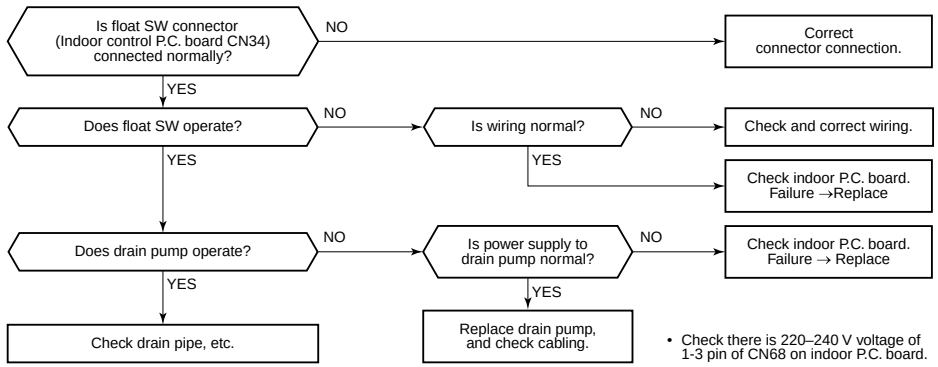
Check code	Check code name	Cause of operation
[P07] / [1C] (TCC-L / AI-NET)	**Heat sink overheat error**	1. Power voltage error 2. Outdoor fan system error 3. Heat sink installation error 4. Clogging of hear sink cooling duct 5. IPDU P.C. board error (TH sensor error)

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



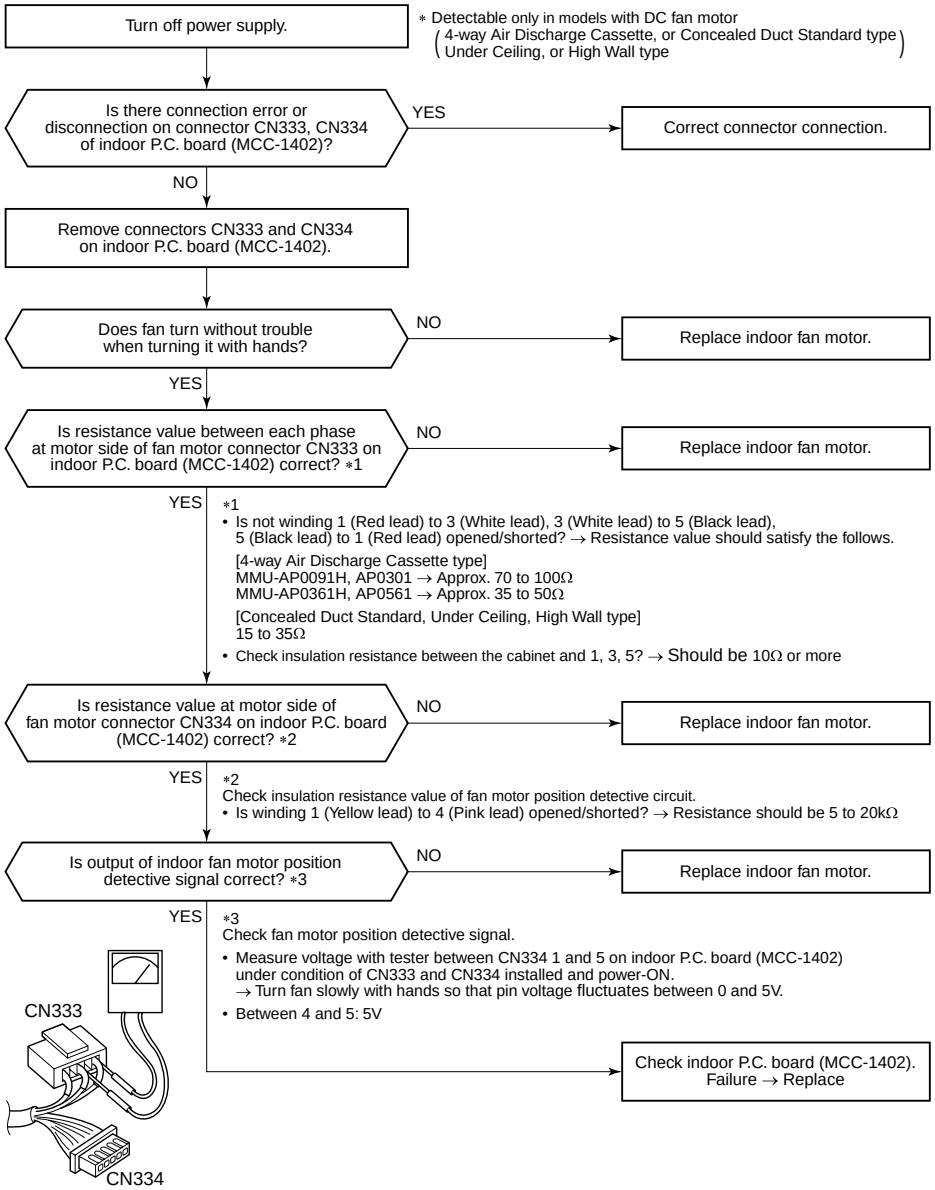
Check code	Check code name	Cause of operation
[P10] / [0b] (TCC-L / AI-NET)	**Indoor overflow error**	1. Float SW operation error 2. Drain pump operation error 3. Clogging of drain pipe 4. Indoor P.C. board error

Sub-code: Indoor address with trouble

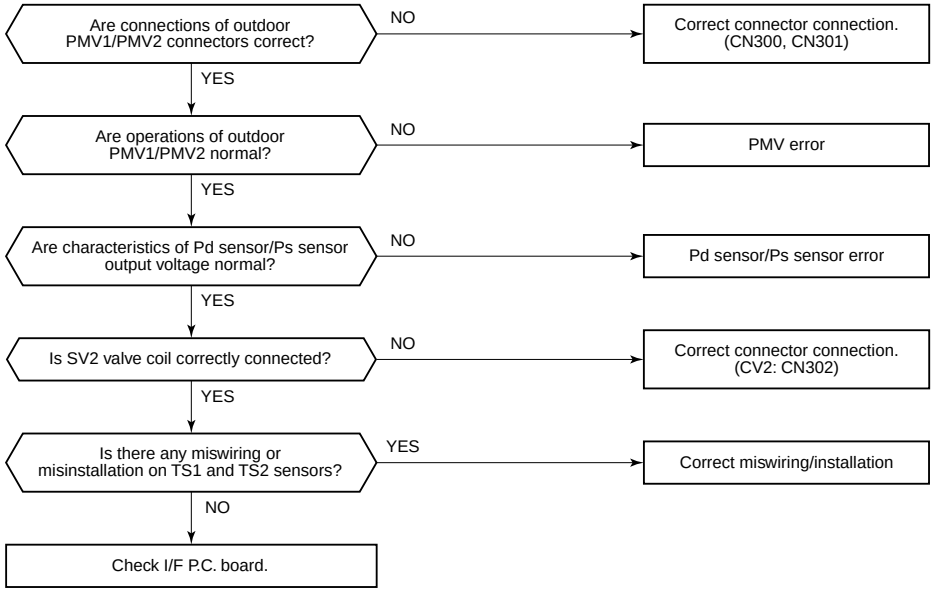


• Check there is 220–240 V voltage of 1-3 pin of CN68 on indoor P.C. board.

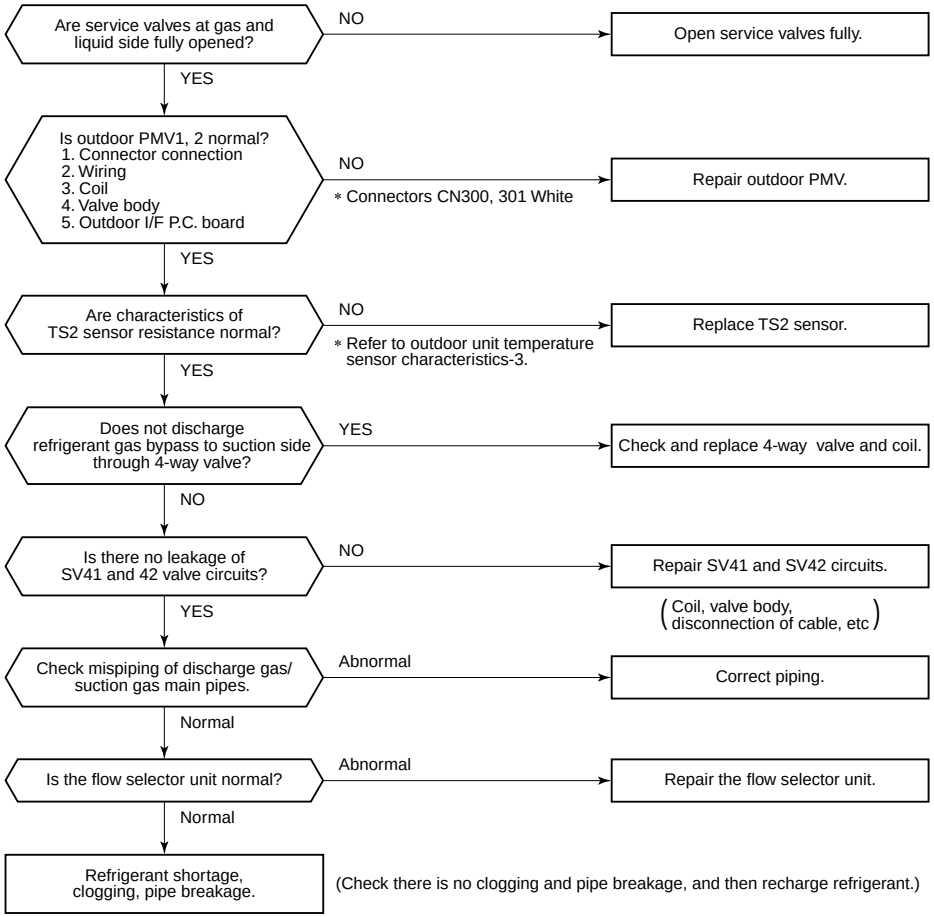
Check code	Check code name	Cause of operation
[P12] / [11] (TCC-L / AI-NET)	**Indoor fan motor error**	1. Cabling error of fan motor connector 2. Fan motor error 3. Indoor P.C. board error



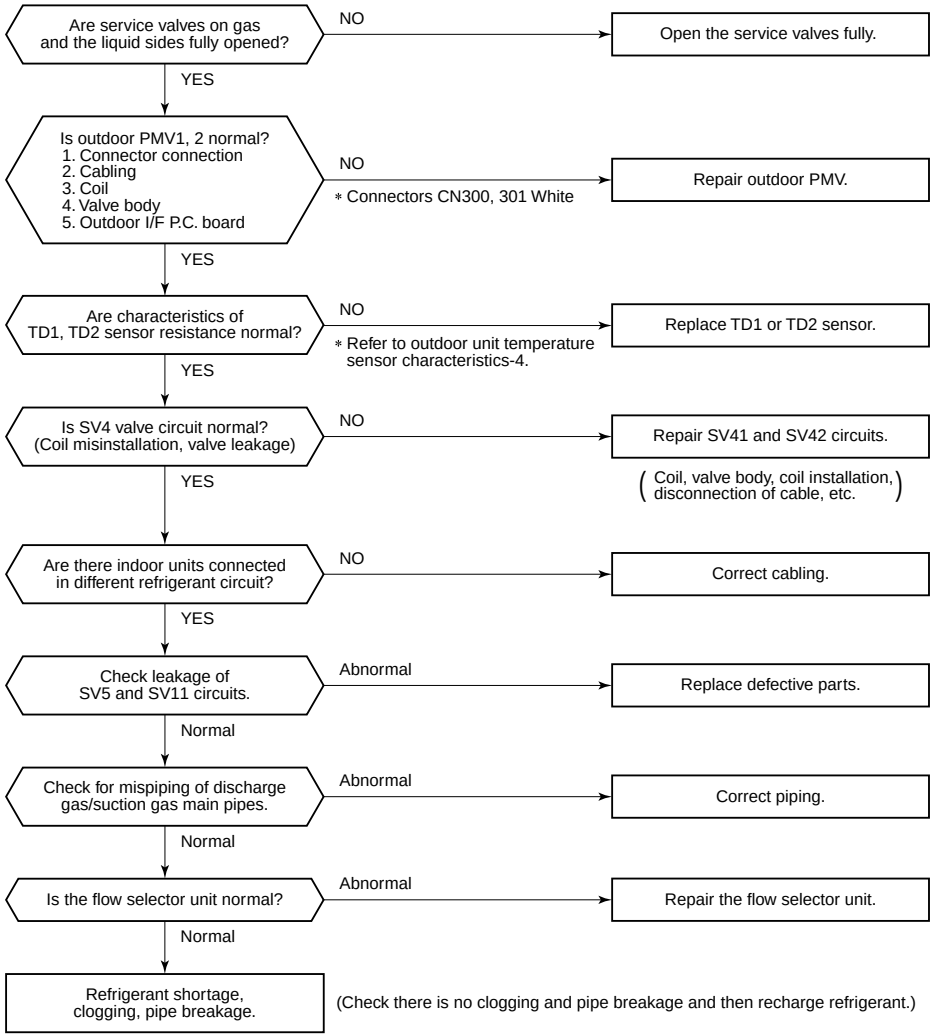
Check code	Check code name	Cause of operation
[P13] / [47] (TCC-L / AI-NET)	**Outdoor liquid back detection error**	1. PMV1/PMV2 error 2. Pd sensor, Ps sensor error 3. Clogging of SV2 circuit 4. Clogging of SV3B circuit, balance pipe 5. Leakage on main discharge pipe 6. Outdoor I/F P.C. board error



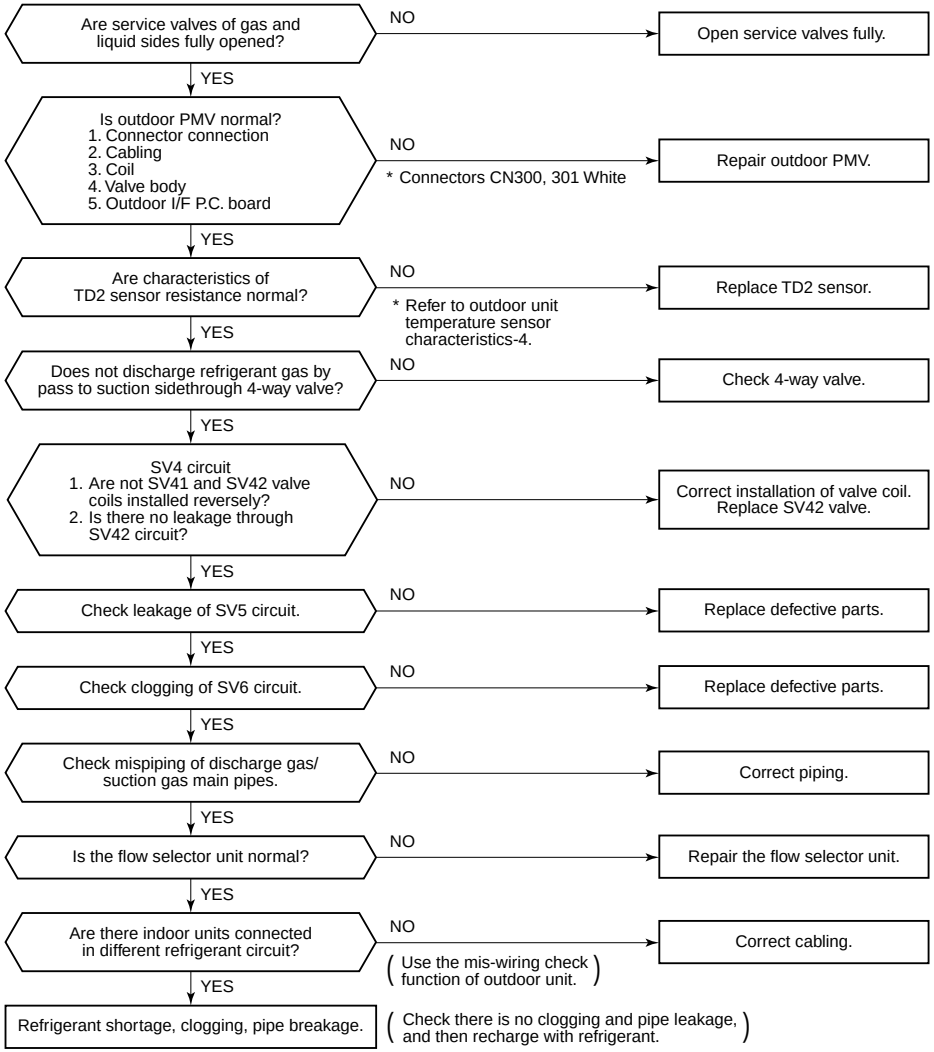
Check code	Check code name	Cause of operation
[P15] / [AE] (TCC-L / AI-NET)	**Gas leak detection** **TS condition (Sub-code: 01)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TS1 sensor error 4. Refrigerant shortage, clogging refrigerant circuit 5. 4-way valve error 6. SV4 circuit error



Check code	Check code name	Cause of operation
[P15] / [AE] (TCC-L / AI-NET)	**Gas leak detection** **TD condition (Sub-code: 02)**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. SV4 circuit error 5. Refrigerant shortage, clogging refrigerant circuit

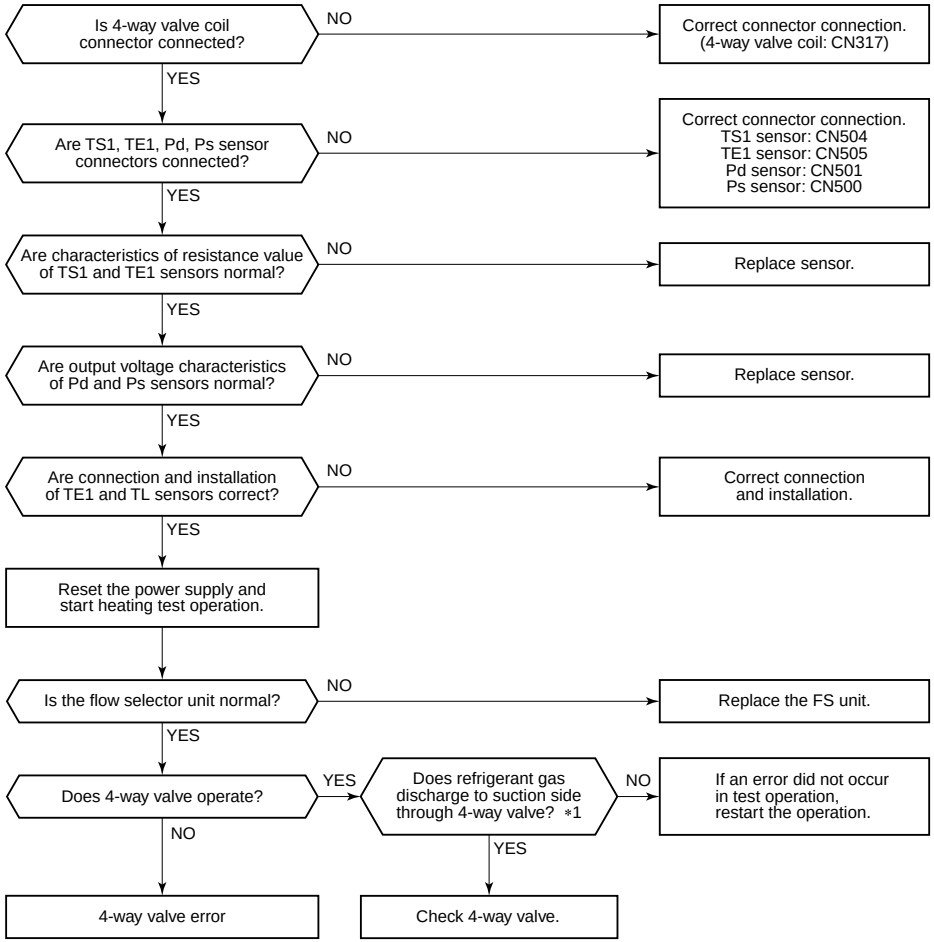


Check code	Check code name	Cause of operation
[P17] / [bb] (TCC-L / AI-NET)	**Discharge temp TD2 error**	1. Outdoor unit service valve closed 2. Outdoor PMV error 3. TD sensor error 4. Refrigerant shortage, clogging of refrigerant circuit 5. 4-way valve error 6. SV4 circuit leakage, misinstallation 7. SV5 circuit leakage 8. SV6 circuit clogging 9. Mispiping of discharge gas/suction gas pipes 10. Flow selector unit error



Check code	Check code name	Cause of operation
[P19] / [08] (TCC-L / AI-NET)	**4-way valve operation error**	1. 4-way valve error 2. TS1 sensor/TE1 sensor error 3. Pd sensor/Ps sensor error 4. TE sensor/TL sensor misconnection

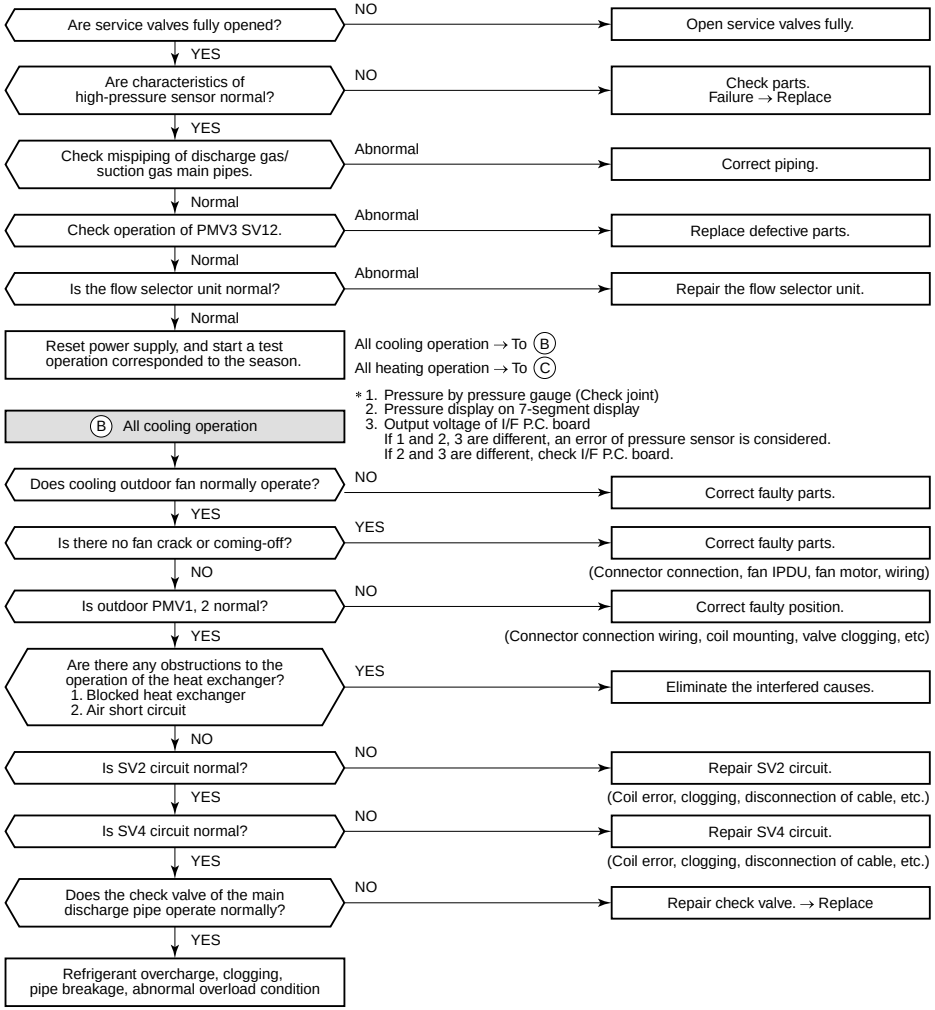
Sub-code: Detected outdoor unit No.

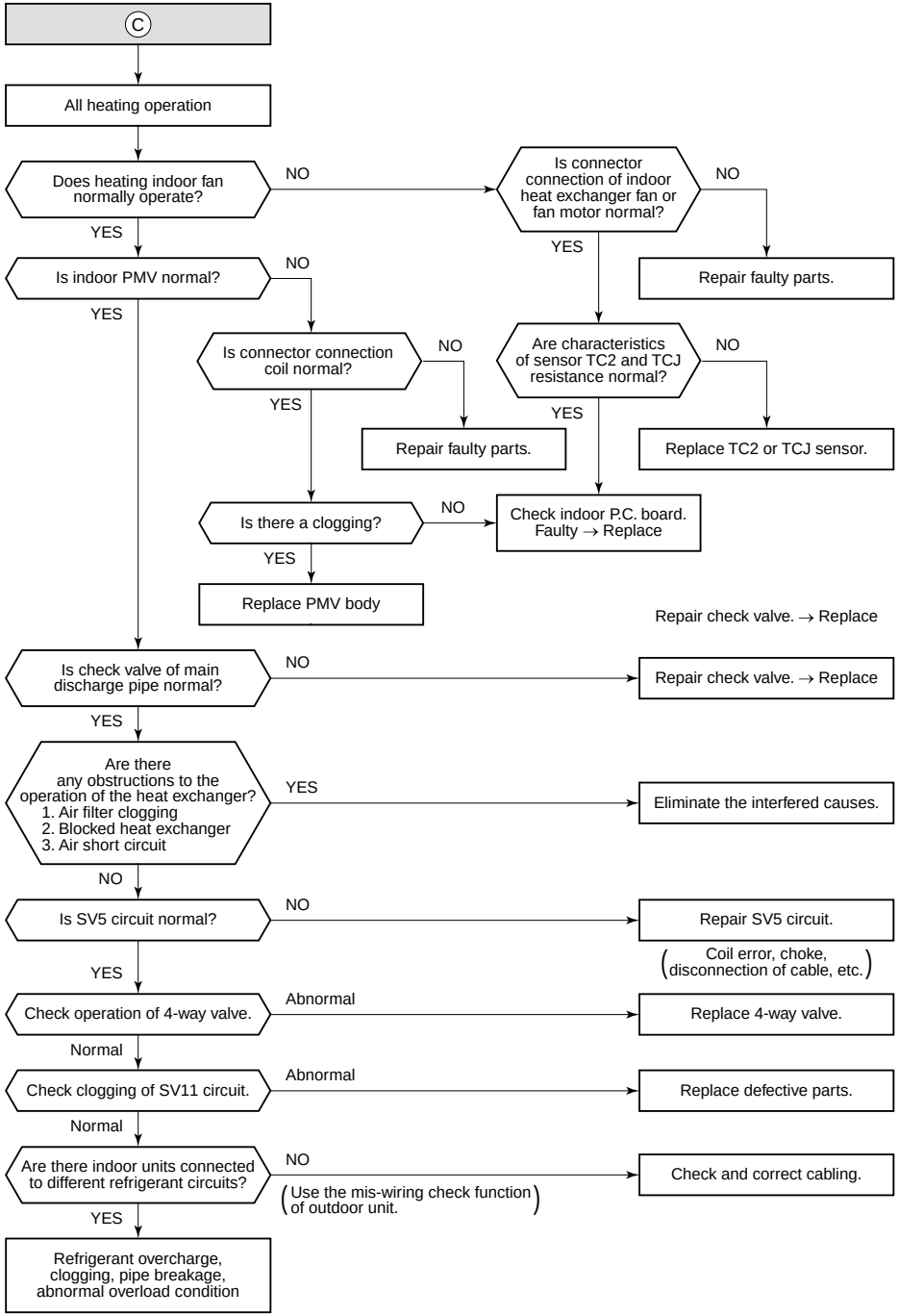


∗1 Check TS and TE temperature of the outdoor unit which compressors is operated.
(I/F) SW01=[1], SW02=[6], SW03=[2] → TS sensor temperature
SW01=[1], SW02=[7], SW03=[2] → TE sensor temperature

Judgment criteria
TE sensor: Normal if TE ≤ 20˚C except summer season (Outside temp 20˚C or lower)
TS sensor: Normal if TS ≤ 40˚C except summer season (Outside temp 20˚C or lower)

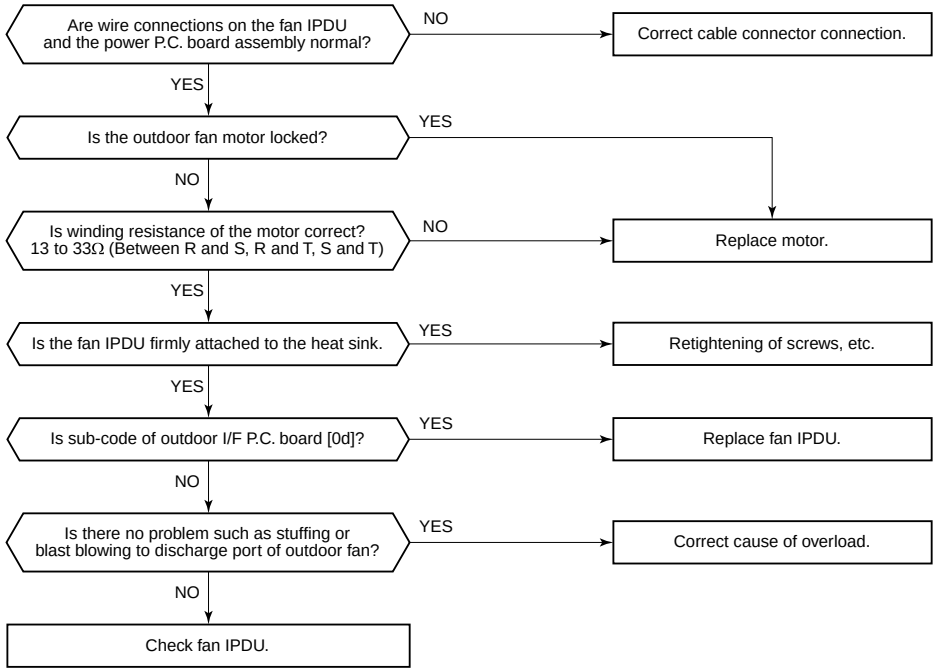
Check code	Check code name	Cause of operation
[P20] / [22] (TCC-L / AI-NET)	**High-pressure protective operation**	1. Pd sensor error 2. Service valve closed. 3. Indoor/outdoor fan error 4. Indoor/outdoor PMV clogging 5. Indoor/outdoor heat exchanger clogging 6. SV2 circuit error 7. SV4 circuit error 8. SV5 circuit error 9. Outdoor I/F P.C. board error 10. Operation error of check valve of main discharge pipe 11. Refrigerant overcharge





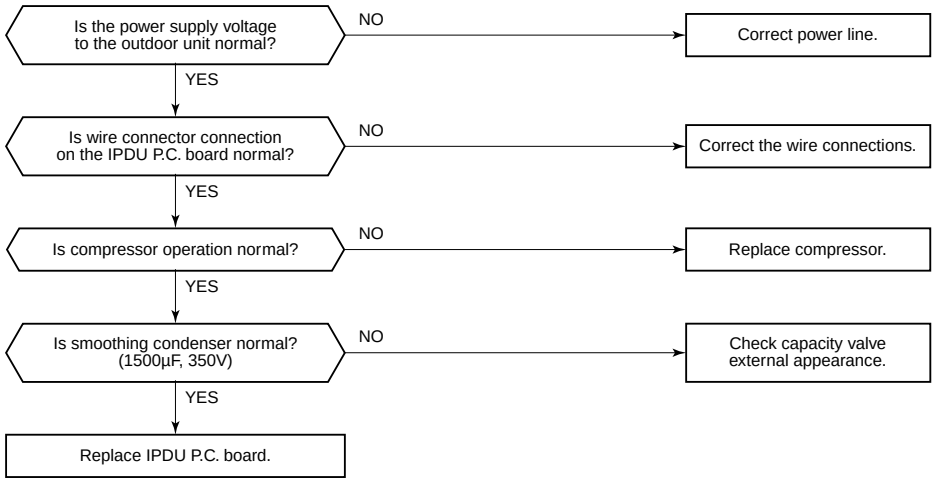
Check code	Check code name	Cause of operation
[P22] / [1A] (TCC-L / AI-NET)	**Outdoor fan IPDU error**	1. Fan lock 2. Fan IPDU P.C. board error 3. Overload 4. External cause such as power surge 5. Fan IPDU power P.C. board error

Sub-code:
- 0∗ : IGBT short circuit
- 1∗ : Position detect circuit error
- 3∗ : Motor lock error
- 4∗ : Motor current error detected
- C∗ : TH sensor error (Heat sink overheat)
- D∗ : TH sensor error
- E∗ : Vdc error



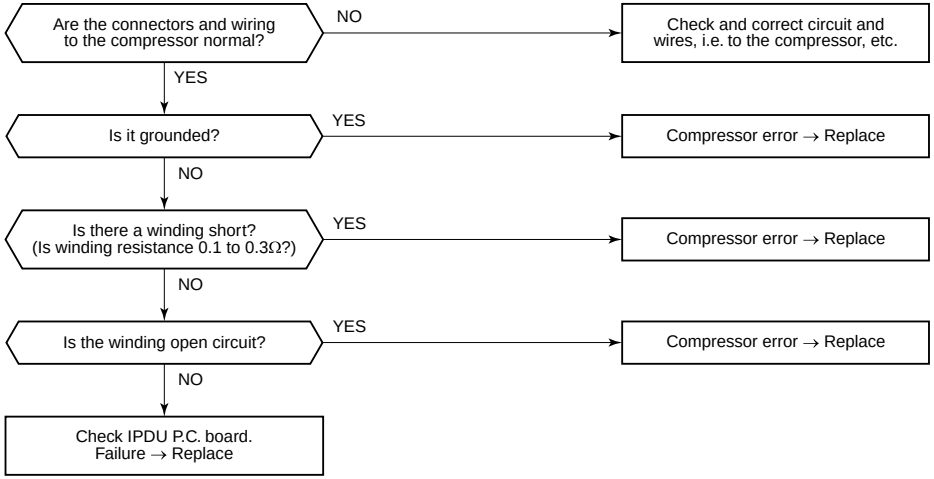
Check code	Check code name	Cause of operation
[P26] / [14] (TCC-L / AI-NET)	**G-Tr short-circuit protection error**	1. Outdoor unit power error 2. IPDU error/Cable connection error 3. Compressor error 4. IPDU P.C. board error

Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code	Check code name	Cause of operation
[P29] / [16] (TCC-L / AI-NET)	**Compressor position detective circuit error**	1. Wire connection error. 2. Compressor error 3. IPDU P.C. board error

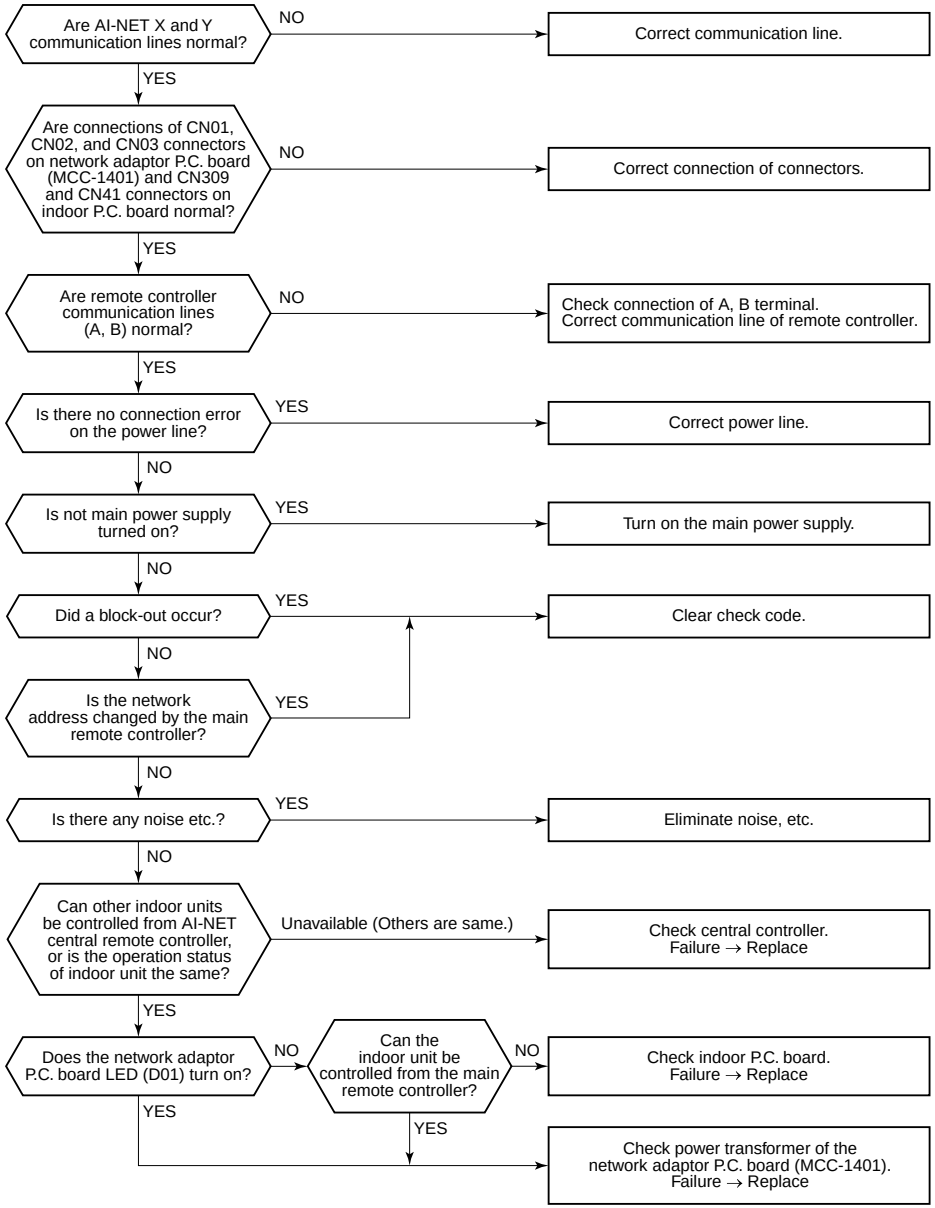
Sub-code: 01: Compressor 1 side 02: Compressor 2 side



Check code	Check code name	Cause of operation
[P31] / [47] (TCC-L / AI-NET)	**Other indoor error (Group follower unit error)**	Other indoor unit in the group has a error.

When the header unit of the group detects [E03, L03, L07, L08 error], the follower unit(s) in the group display [P31] error and stop. There are no check code displays or alarm record on the main remote controller.

Check code	Check code name	Cause of operation
[–] / [97] (TCC-L / AI-NET)	**AI-NET communication line error**	AI-NET communication line error

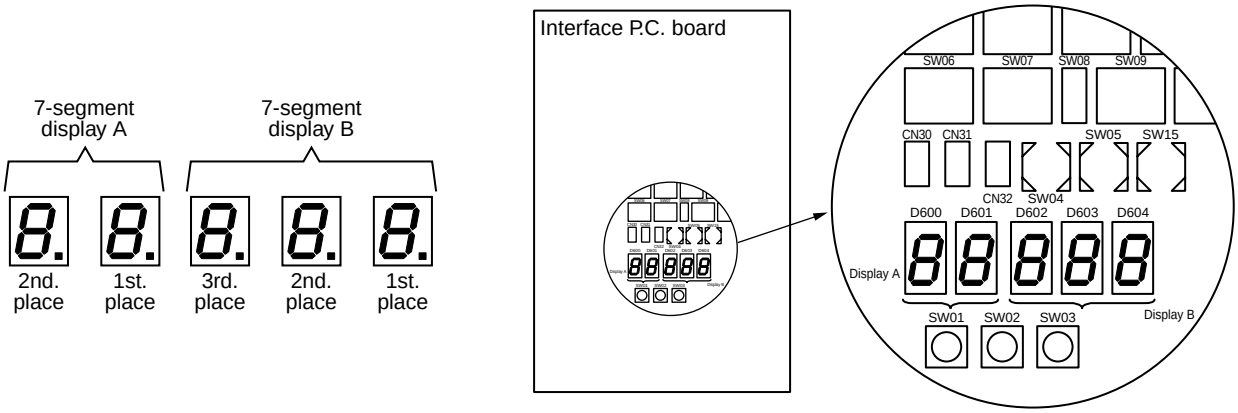


9-6. 7-Segment Display Function

■ 7-segment display on the outdoor unit (Interface P.C. board)

On the interface control P.C. board, a 7-segment LED is provided to check the operating status.

The displayed contents are changed by combining the setup numbers of the rotary switches (SW01, SW02 and SW03) on the I/F P.C. board.



◆ **Check procedure when the system has stopped due to an trouble**

When the system has stopped due to an trouble in the outdoor unit, execute the following check procedure.

1. Open the panels of the outdoor unit, and then check the 7-segment display.
   The check code is shown on the right side of 7-segment display B.
   [U1] [○○○] ([○○○]: Check code)
   ＊ Rotary switch setup for confirming the check code: SW01 [1], SW02 [1], SW03 [1].
   However the check code [OOO] is displayed for 3 seconds and the sub-code [OOO] for 1 second are alternately displayed if a sub-code is provided.
2. Confirm the check code, and then follow the check procedure detailed for the diagnosis of the fault.
3. [U1] [E28] on the 7-segment display means an error on the follower unit. change.
   Push and hold switch SW04 on the header unit for 2 seconds or more.
   Only the fan of the outdoor unit with a fault will operate. Open the panel of the corresponding unit, and then confirm the ceck code shown on the 7-segment display.
4. Perform the check procedure based on each check code diagnosis.

How to read the check display

7-segment display

1. Data display of system information (Displayed on the header outdoor unit only)

SW01	SW02	SW03	Display contents				
1	1	3	Refrigerant name	Displays refrigerant name.		A	B
				Model with refrigerant R410A		r4	10A
				Model with refrigerant R407C		r4	07C
	2		System capacity	A	[5] to [48] : 5 to 48HP		
				B	[HP]		
	3		No. of outdoor units	A	[1] to [4] : 1 to 4 units		
				B	[P]		
	4		No. of connected indoor units/ No. of units with cooling thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[C0] to [C48] : 0 to 48 units (No. of units with cooling thermo ON)		
	5		No. of connected indoor units/ No. of units with heating thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[H0] to [H48] : 0 to 48 units (No. of units with heating thermo ON)		
	6		Compressor command correction amount	A	Data is displayed with hexadecimal notation		
				B			
	7		Release control	A	Normal time : [r], During release control: [r1]		
				B	—		
	8		Oil-equalization control	A	Normal time : [oiL-0]		
				B	During oil equation : [oiL-1]		
	9		Oil-equalization request	A	Displays with segment LED lighting pattern		
				B	Display A Display B A F G B E C D Dp U2 U3 U4 F in the left figure goes on: Header requests oil equalization. C in the left figure goes on: Follower requests oil-equalization. (Outdoor unit number)		
	10		Refrigerant/oil recovery operation	A	During sending of cooling refrigerant oil recovery signal : [C1]. Normal time : [C]		
				B	During sending of heating refrigerant oil recovery signal : [H1]. Normal time : [H]		
	11		Automatic address	A	[Ad]		
				B	Automatic addressing : [FF], Normal time : [ ]		
	12		Demand operation	A	[dU]		
				B	Normal time : [ ]. In 50% to 90% : [50 to 90] When controlling by communication line input : [E50 to E90]		
	13		Optional control (P.C. board input)	Displays optioned control status		A	B
				Operation mode selection : In heating with priority (Normal)		h.∗	∗.∗.∗.
					Priority on cooling	c.∗	∗.∗.∗.
					Heating only	H.∗	∗.∗.∗.
					Cooling only	C.∗	∗.∗.∗.
					Priority on No. of operating indoor units	n.∗	∗.∗.∗.
					Priority on specific indoor unit	U.∗	∗.∗.∗.
				Batch start/stop : Normal		∗.⋯.	∗.∗.∗.
					Start input	∗.1.	∗.∗.∗.
					Stop input	∗.0.	∗.∗.∗.
				Night low-noise operation : Normal		∗.∗.	⋯.∗.∗.
					Operation input	∗.∗.	1.∗.∗.
				Snow fan operation : Normal		∗.∗.	∗.⋯.∗.
					Operation input	∗.∗.	∗.1.∗.
	14		Option control (BUS line input)	Same as above			
	15		Unused				
	16		—	A	—		
				B	—		

∗ mark: Indicates none on display

2. Data display of outdoor unit information (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	1	Error data	A	Displays outdoor unit number: [U1] to [U4]			
				B	Displays check code (Latest code only is displayed.) There is no check code: [– – –] There is sub-code: Check code [∗ ∗ ∗] for 3 seconds, sub-code [– ∗ ∗] for 1 second alternately			
			<SW04> push function : Fan of unit with error only drives. 7-segment A: [E1] <SW04 + SW05> push function : Fan of normal unit only drives. 7-segment A: [E0] <SW05> push function : Interruption of fan operation function					
	2		—	A	—			
				B	—			
	3		Operation mode	A	Stop: [ ] Normal cooling: [C], Normal heating: [H], Normal defrost: [J]			
				B	—			
	4		Outdoor unit HP	A	5HP: [5], 6HP: [6], 8HP: [8], 10HP: [10], 12HP: [12]			
				B	[HP]			
	5		Compressor operation command	A	No.1 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
				B	No.2 compressor operation command is displayed. Data display with Hexadecimal notation: [00 to FF]			
			<SW04> push function : Inverter frequency is exchanged to decimal notation. 7-segment display (A/B) : [∗ ∗] [∗ ∗ H] (Normal display by pushing <SW05>)					
	6		Outdoor fan step	A	[FP]			
				B	Step 0 to 31: [0 to 31]			
	7		Compressor backup	A	Displays No.1 compressor setup status Normal: [ ], Backup setup: [C1]			
				B	Displays No.2 compressor setup status Normal: [ ], Backup setup: [C2]			
	8		—	A	—			
				B	—			
	9		Control valve output data	Displays control output status of solenoid valve			A	B
				4-way valve: ON			H. 1	··· ··· ···
				4-way valve: OFF			H. 0	··· ··· ···
	10			SV2: ON / SV5: OFF			2. 1	··· 5. 0
				SV2: OFF / SV5: ON			2. 0	··· 5. 1
	11			SV3A: ON / SV3B: OFF / SV3C: OFF /SV3D: OFF			3. 1	0 0 0
				SV3A: OFF / SV3B: ON / SV3C: OFF /SV3D: OFF			3. 0	1 0 0
				SV3A: OFF / SV3B: OFF / SV3C: ON /SV3D: OFF			3. 0	0 1 0
				SV3A: OFF / SV3B: OFF / SV3C: OFF /SV3D: ON			3. 0	0 0 1
	12			SV41: ON / SV42: OFF			4. ···	1 0 ···
				SV41: OFF / SV42: ON			4. ···	0 1 ···
	13			—			··· ···	··· ··· ···
				—			··· ···	··· ··· ···
	14		PMV1 /PMV2 opening	Displays opening data (Decimal) (Total opening)			∗ ∗	∗ ∗. P
	15		—	—			··· ∗	∗ ∗. P
	16		Oil level judgment status	A	[oL] [SW05] push SW function: The following data is displayed for 2 seconds. * During oil shortage in compressor 1: [L ···], during oil shortage in compressor 2: [··· L]			
				B	Initial display: [··· ··· ···], Oil level judgment result: [A. #. ∗] Judgment result of compressor 1 in [#], compressor 2 in [∗] (0: Normal, 1, 2: Shortage) is displayed.			

3. Data display of outdoor cycle (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	2	Pd pressure data	Pd pressure (MPaG) is displayed with decimal data. (MPaG: Approx. 1/10 value of kg/cm^{2}G data)			A	B
							P d.	∗. ∗ ∗
	2		Ps pressure data	Ps pressure (MPaG) is displayed with decimal data.			P S.	∗. ∗ ∗
	3		PL pressure conversion data	Estimated pressure of liquid line (MPaG) is displayed with decimal data.			P L.	∗. ∗ ∗
	4		TD1 sensor data	Temperature sensor data (°C) is displayed with decimal notation. • Symbol display for 1 sec. and data display for 3 sec. are alternately displayed. • Data is displayed in [∗]. • Negative data is displayed as [– ∗ ∗ ∗ ∗].		Symbol	t d	1
						Data	∗	∗ ∗. ∗
	5		TD2 sensor data			Symbol	t d	2
						Data	∗	∗ ∗. ∗
	6		TS1 sensor data			Symbol	t S	1
						Data	∗	∗ ∗. ∗
	7		TS2 sensor data			Symbol	tS	2
						Data	∗	∗ ∗. ∗
	8		TE sensor data			Symbol	tE	—
						Data	—	—
	9		TL sensor data			Symbol	t L	
						Data	∗	∗ ∗. ∗
	10		TO sensor data			Symbol	t o	
						Data	∗	∗ ∗. ∗
	11		TK1 sensor data			Symbol	F 1	
						Data	∗	∗ ∗. ∗
	12		TK2 sensor data			Symbol	F 2	
						Data	∗	∗ ∗. ∗
	13		TK3 sensor data			Symbol	F 3	
						Data	∗	∗ ∗. ∗
	14		TK4 sensor data			Symbol	F 4	
						Data	∗	∗ ∗. ∗
	15		—	A	—			
				B	—			
	16		—	A	—			
				B				

4. Data display of indoor unit information (Displayed on the header unit only)

SW01	SW02	SW03	Display contents		
4	1 to 16	1 to 3	Receiving status of indoor BUS communication	B	Receiving time: [⋯ ⋯ 1], Not received: [⋯ ⋯ ⋯]
5			Indoor check code	B	No check code: [– – –]
6			Indoor capacity (HP) horse power	B	0. 2, 0. 5, 0. 8, ⋯ 1, 1. 2, 1. 7, ⋯ 2, 2. 5, ⋯ 3, 3. 2, ⋯ 4, ⋯ 5, ⋯ 6, ⋯ 8, 1 0, 1 6, 2 0
7			Indoor request command (S code)	B	Data is displayed with Hexadecimal notation [⋯ ⋯ 0 to ⋯ ⋯ F] : Heating
8			Indoor PMV opening data	B	Data is displayed with Hexadecimal notation
9			Indoor TA sensor data	B	Data is displayed with Hexadecimal notation
10			Indoor TF sensor data	B	Data is displayed with Hexadecimal notation
11			Indoor TCJ sensor data	B	Data is displayed with Hexadecimal notation
12			Indoor TC1 sensor data	B	Data is displayed with Hexadecimal notation
13			Indoor TC2 sensor data	B	Data is displayed with Hexadecimal notation

NOTE) Indoor address No. is chosen by changing SW02 and SW03.

SW03	SW02	Indoor address	7-segment display A
1	1 to 16	SW02 setup number	[01] to [16]
2	1 to 16	SW02 setup number + 16	[17] to [32]
3	1 to 16	SW02 setup number + 32	[33] to [48]

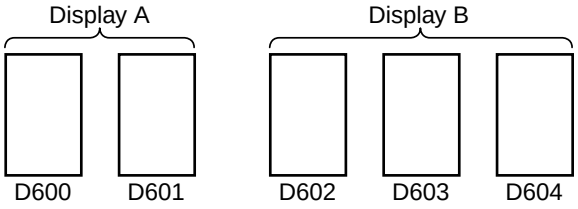
5. Outdoor EEPROM check code display (Displayed on the header unit only)

* The latest check code written in EEPROM on each outdoor unit is displayed.
  (It is used when confirming the check code after power supply has been reset.)

Set SW01 to 03 as shown in the following table and the push SW04 for 5 seconds or more to display an check code.

W01	SW02	SW03	Display contents	7-segment display	
				A	B
1	1	16	The latest check code of the header unit 1 (U1)	E. r	1. – –
	2		The latest check code of the follower unit 1 (U2)	E. r	2. – –
	3		The latest check code of the follower unit 2 (U3)	E. r	3. – –

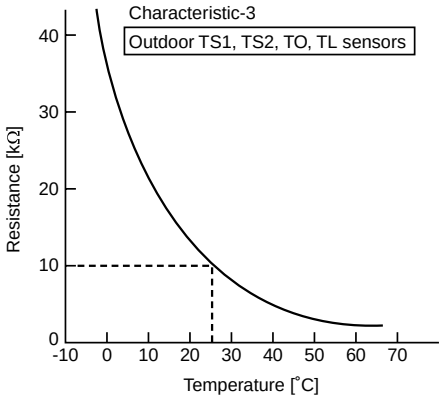
■ 7-segment display A, B

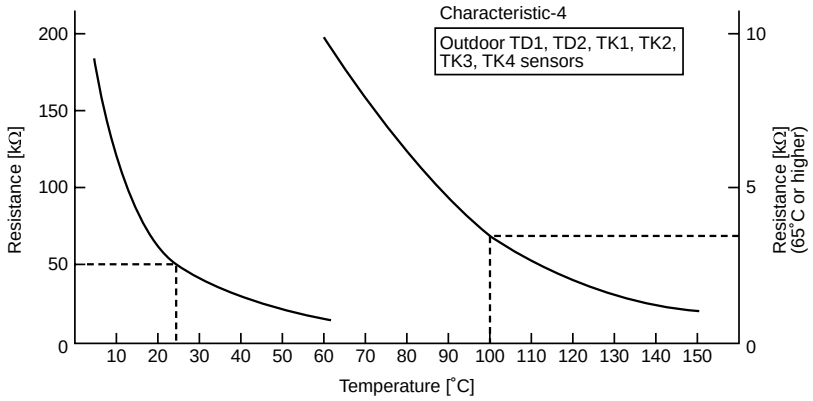


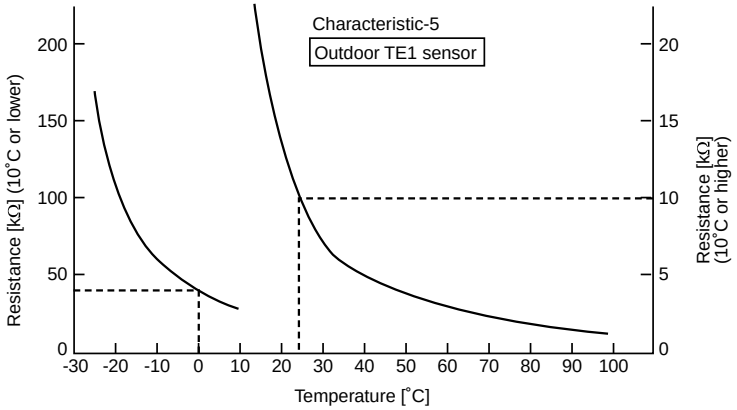
9-7. Sensor Characteristics

9-7-1. Outdoor Unit

■ Temperature sensor characteristics







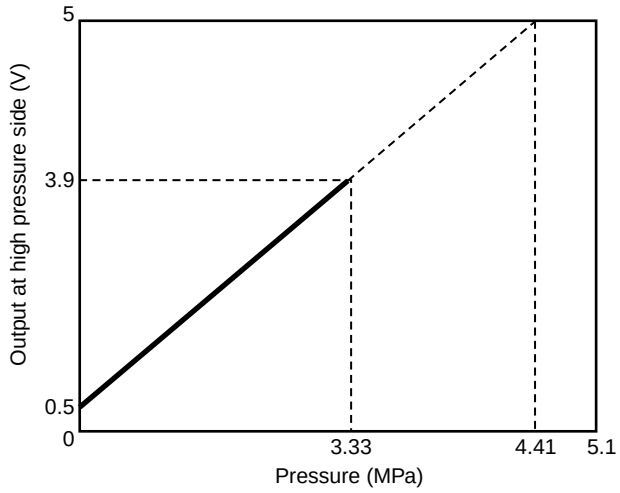
■ Pressure sensor characteristics

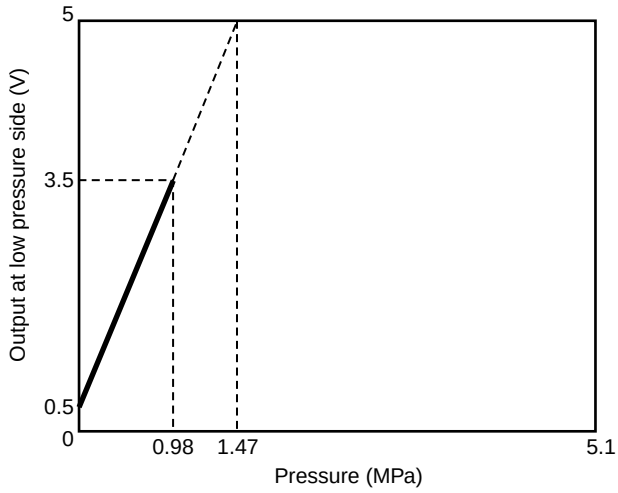
- **I/O cable connection table**

Pin No.	High pressure side (Pd)		Low pressure side (Ps)	
	Input/Output name	Lead wire color	Input/Output name	Lead wire color
1	OUTPUT	White	—	—
2	—	—	OUTPUT	White
3	GND	Black	GND	Black
4	+5V	Red	+5V	Red

- **Output voltage — Pressure**

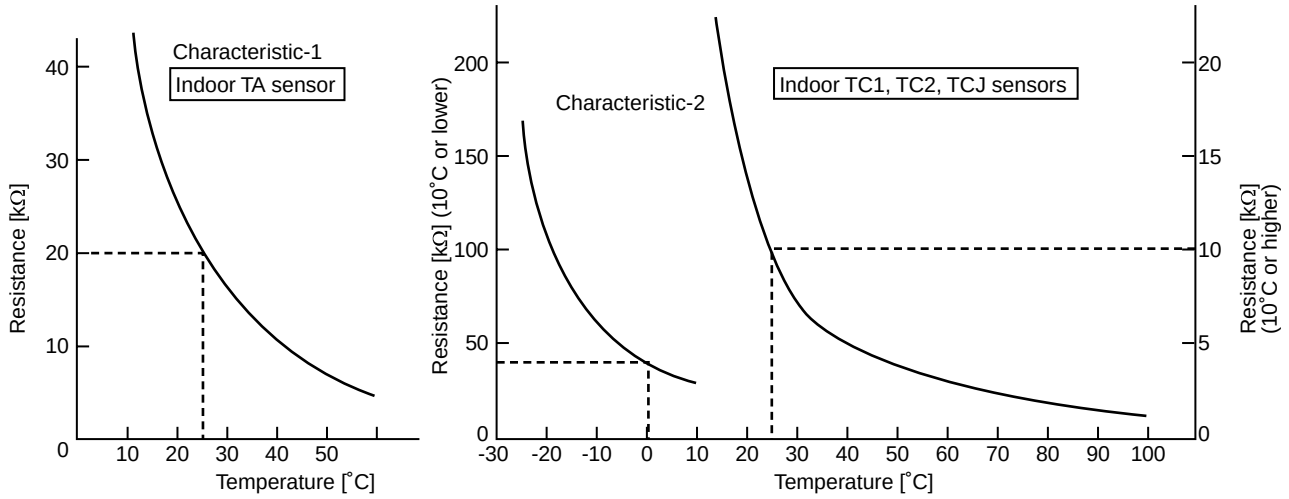
High pressure side (Pd)	Low pressure side (Ps)
0.5 to 3.9 V DC	0.5 to 3.5 V DC
0 to 3.33 MPa	0 to 0.98 MPa





9-7-2. Indoor Unit

■ Temperature sensor characteristics



9-8. Pressure Sensor Output Check

9-8-1. Outdoor Unit

■ Pd sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)

Voltage check between CN501 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.49	5.0	1.99	1.46	14.9	2.99	2.44	24.9	3.98	3.42	34.8
0.02	0.00	0.0	1.02	0.51	5.2	2.01	1.48	15.1	3.01	2.46	25.1	4.00	3.44	35.0
0.04	0.00	0.0	1.04	0.53	5.4	2.03	1.50	15.3	3.03	2.48	25.3	4.02	3.45	35.2
0.06	0.00	0.0	1.06	0.54	5.5	2.05	1.52	15.5	3.05	2.50	25.5	4.04	5.48	35.4
0.08	0.00	0.0	1.07	0.56	5.7	2.07	1.54	15.7	3.07	2.52	25.7	4.06	3.49	35.6
0.10	0.00	0.0	1.09	0.58	5.9	2.09	1.56	15.9	3.09	2.54	25.9	4.08	3.51	35.8
0.12	0.00	0.0	1.11	0.60	6.1	2.11	1.58	16.1	3.11	2.56	26.1	4.10	3.53	36.0
0.14	0.00	0.0	1.13	0.62	6.3	2.13	1.60	16.3	3.13	2.57	26.3	4.12	3.55	36.2
0.16	0.00	0.0	1.15	0.64	6.5	2.15	1.62	16.5	3.15	2.59	26.4	4.14	3.57	36.4
0.18	0.00	0.0	1.17	0.66	6.7	2.17	1.64	16.7	3.16	2.61	26.6	4.16	3.59	36.6
0.20	0.00	0.0	1.19	0.68	6.9	2.19	1.66	16.9	3.18	2.63	26.8	4.18	3.61	36.8
0.22	0.00	0.0	1.21	0.70	7.1	2.21	1.67	17.1	3.20	2.65	27.0	4.20	3.63	37.0
0.23	0.00	0.0	1.23	0.72	7.3	2.23	1.69	17.3	3.22	2.67	27.2	4.22	3.65	37.2
0.25	0.00	0.0	1.25	0.74	7.5	2.25	1.71	17.5	3.24	2.69	27.4	4.24	3.67	37.4
0.27	0.00	0.0	1.27	0.76	7.7	2.27	1.73	17.7	3.26	2.71	27.6	4.26	3.69	37.6
0.29	0.00	0.0	1.29	0.77	7.9	2.29	1.75	17.9	3.28	2.73	27.8	4.28	3.70	37.8
0.31	0.00	0.0	1.31	0.79	8.1	2.31	1.77	18.0	3.30	2.75	28.0	4.30	3.72	38.0
0.33	0.00	0.0	1.33	0.81	8.3	2.32	1.79	18.2	3.32	2.77	28.2	4.32	3.74	38.2
0.35	0.00	0.0	1.35	0.83	8.5	2.34	1.81	18.4	3.34	2.79	28.4	4.24	3.76	38.4
0.37	0.00	0.0	1.37	0.85	8.7	2.36	1.83	18.6	3.36	2.80	28.6	4.36	3.78	38.6
0.39	0.00	0.0	1.39	0.87	8.9	2.38	1.85	18.8	3.38	2.82	28.8	4.38	3.80	38.8
0.41	0.00	0.0	1.41	0.89	9.1	2.40	1.87	19.0	3.40	2.84	29.0	4.40	3.82	38.9
0.43	0.00	0.0	1.43	0.91	9.3	2.42	1.89	19.2	3.42	2.86	29.2	4.41	3.84	39.1
0.45	0.00	0.0	1.45	0.93	9.5	2.44	1.90	19.4	3.44	2.88	29.4	4.43	3.86	39.3
0.47	0.00	0.0	1.47	0.95	9.6	2.46	1.92	19.6	3.46	2.90	29.6	4.45	3.88	39.5
0.49	0.00	0.0	1.48	0.97	9.8	2.48	1.94	19.8	3.48	2.92	29.8	4.47	3.90	39.7
0.51	0.01	0.1	1.50	0.99	10.0	2.50	1.96	20.0	3.50	2.94	30.0	4.49	3.92	39.9
0.53	0.03	0.3	1.52	1.00	10.2	2.52	1.98	20.2	3.52	2.96	30.2	4.51	3.93	40.1
0.55	0.05	0.5	1.54	1.02	10.4	2.54	2.00	20.4	3.54	2.98	3.04	4.53	3.95	40.3
0.57	0.07	0.7	1.56	1.04	10.6	2.56	2.02	20.6	3.56	3.00	30.5	4.55	3.97	40.5
0.59	0.08	0.9	1.58	1.06	10.8	2.58	2.04	20.8	3.57	3.02	30.7	4.57	3.99	40.7
0.61	0.10	1.1	1.60	1.08	11.0	2.60	2.06	21.0	3.59	3.03	30.9	4.59	4.01	40.9
0.63	0.12	1.3	1.62	1.10	11.2	2.62	2.08	21.2	3.61	3.05	31.1	4.61	4.03	41.1
0.65	0.14	1.4	1.64	1.12	11.4	2.64	1.10	21.4	3.63	3.07	31.3	4.63	4.05	41.3
0.66	0.16	1.6	1.66	1.14	11.6	2.66	2.12	21.6	3.65	3.09	31.5	4.65	4.07	41.5
0.68	0.18	1.8	1.68	1.16	11.8	2.68	2.13	21.8	3.67	3.11	31.7	4.67	4.09	41.7
0.70	0.20	2.0	1.70	1.18	12.0	2.70	2.15	22.0	3.69	3.13	31.9	4.69	4.11	41.9
0.72	0.22	2.2	1.72	1.20	12.2	2.72	2.17	22.2	3.71	3.15	32.1	4.71	4.13	42.1
0.74	0.24	2.4	1.74	1.21	12.4	2.73	2.19	22.3	3.73	3.17	32.3	4.73	4.15	42.3
0.76	0.26	2.6	1.76	1.23	12.6	2.75	2.21	22.5	3.75	3.19	32.5	4.75	4.16	42.5
0.78	0.28	2.8	1.78	1.25	12.8	2.77	2.23	22.7	3.77	3.21	32.7	4.77	4.18	42.7
0.80	0.30	3.0	1.80	1.27	13.0	2.79	2.25	22.9	3.79	3.23	32.9	4.79	4.20	42.9
0.82	0.31	3.2	1.82	1.29	13.2	2.81	2.27	23.1	3.81	3.25	33.1	4.81	4.22	43.0
0.84	0.33	3.4	1.84	1.31	13.4	2.83	2.29	23.3	3.83	3.26	33.3	4.82	4.24	43.2
0.86	0.35	3.6	1.86	1.33	13.6	2.85	2.31	23.5	3.85	3.28	33.5	4.84	4.26	43.4
0.88	0.37	3.8	1.88	1.35	13.8	2.87	2.33	23.7	3.87	3.30	33.7	4.86	4.28	43.6
0.90	0.39	4.0	1.90	1.37	13.9	2.89	2.35	23.9	3.89	3.32	33.9	4.88	4.30	43.8
0.92	0.41	4.2	1.91	1.39	14.1	2.91	2.36	24.1	3.91	3.34	34.1	4.90	4.32	44.0
0.94	0.43	4.4	1.93	1.41	14.3	2.93	2.38	24.3	3.93	3.36	34.3	4.92	4.34	44.2
0.96	0.45	4.6	1.95	1.43	14.5	2.95	2.40	24.5	3.95	3.38	34.5	4.94	4.36	44.4
0.98	0.47	4.8	1.97	1.44	14.7	2.97	2.42	24.7	3.97	3.40	34.7	4.96	4.38	44.6
												4.98	4.39	44.8

■ Ps sensor characteristics

0 to 1.48MPa (0.5 to 5V output with 0 to 1.48MPa)

Voltage check between CN500 ② and ③ pins on the outdoor unit I/F P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Ps (MPa)	Ps (kg/cm²)
0.00	0.00	0.0
0.02	0.00	0.0
0.04	0.00	0.0
0.06	0.00	0.0
0.08	0.00	0.0
0.10	0.00	0.0
0.12	0.00	0.0
0.14	0.00	0.0
0.16	0.00	0.0
0.18	0.00	0.0
0.20	0.00	0.0
0.22	0.00	0.0
0.23	0.00	0.0
0.25	0.00	0.0
0.27	0.00	0.0
0.29	0.00	0.0
0.31	0.00	0.0
0.33	0.00	0.0
0.35	0.00	0.0
0.37	0.00	0.0
0.39	0.00	0.0
0.41	0.00	0.0
0.43	0.00	0.0
0.45	0.00	0.0
0.47	0.00	0.0
0.49	0.00	0.0
0.51	0.00	0.0
0.53	0.01	0.1
0.55	0.02	0.3
0.57	0.02	0.2
0.59	0.03	0.3
0.61	0.03	0.4
0.63	0.04	0.4
0.65	0.05	0.5
0.66	0.05	0.5
0.68	0.06	0.6
0.70	0.07	0.7
0.72	0.07	0.7
0.74	0.08	0.8
0.76	0.09	0.9
0.78	0.09	0.9
0.80	0.10	1.0
0.82	0.11	1.1
0.84	0.11	1.1
0.86	0.12	1.2
0.88	0.12	1.3
0.90	0.13	1.3
0.92	0.14	1.4
0.94	0.14	1.5
0.96	0.15	1.5
0.98	0.16	1.6
1.00	0.16	1.7
1.02	0.17	1.7
1.04	0.18	1.8
1.06	0.18	1.8
1.07	0.19	1.9
1.09	0.19	2.0
1.11	0.20	2.0
1.13	0.21	2.1
1.15	0.21	2.2
1.17	0.22	2.2
1.19	0.23	2.3
1.21	0.23	2.4
1.23	0.24	2.4
1.25	0.25	2.5
1.27	0.25	2.6
1.29	0.26	2.6
1.31	0.26	2.7
1.33	0.27	2.8
1.35	0.28	2.8
1.37	0.28	2.9
1.39	0.29	3.0
1.41	0.30	3.0
1.43	0.30	3.1
1.45	0.31	3.2
1.47	0.32	3.2
1.48	0.32	3.3
1.50	0.33	3.3
1.52	0.34	3.4
1.54	0.34	3.5
1.56	0.35	3.5
1.58	0.35	3.6
1.60	0.36	3.7
1.62	0.37	3.7
1.64	0.37	3.8
1.66	0.38	3.9
1.68	0.39	3.9
1.70	0.39	4.0
1.72	0.40	4.1
1.74	0.41	4.1
1.76	0.41	4.2
1.78	0.42	4.3
1.80	0.42	4.3
1.82	0.43	4.4
1.84	0.44	4.5
1.86	0.44	4.5
1.88	0.45	4.6
1.90	0.46	4.6
1.91	0.46	4.7
1.93	0.47	4.8
1.95	0.48	4.8
1.97	0.48	4.9
1.99	0.49	5.0
2.01	0.49	5.0
2.03	0.50	5.1
2.05	0.51	5.2
2.07	0.51	5.2
2.09	0.52	5.3
2.11	0.53	5.4
2.13	0.53	5.4
2.15	0.54	5.5
2.17	0.55	5.6
2.19	0.55	5.6
2.21	0.56	5.7
2.23	0.56	5.8
2.25	0.57	5.8
2.27	0.58	5.9
2.29	0.58	6.0
2.31	0.59	6.0
2.32	0.60	6.1
2.34	0.60	6.1
2.36	0.61	6.2
2.38	0.62	6.3
2.40	0.62	6.3
2.42	0.63	6.4
2.44	0.64	6.5
2.46	0.64	6.5
2.48	0.65	6.6
2.50	0.65	6.7
2.52	0.66	6.7
2.54	0.67	6.8
2.56	0.67	6.9
2.58	0.68	6.9
2.60	0.69	7.0
2.62	0.69	7.1
2.64	0.70	7.1
2.66	0.71	7.2
2.68	0.71	7.3
2.70	0.72	7.3
2.72	0.72	7.4
2.73	0.73	7.4
2.75	0.74	7.5
2.77	0.74	7.6
2.79	0.75	7.6
2.81	0.76	7.7
2.83	0.76	7.8
2.85	0.77	7.8
2.87	0.78	7.9
2.89	0.78	8.0
2.91	0.79	8.0
2.93	0.79	8.1
2.95	0.80	8.2
2.97	0.81	8.2
2.99	0.81	8.3
3.01	0.82	8.4
3.03	0.83	8.4
3.05	0.83	8.5
3.07	0.84	8.6
3.09	0.85	8.6
3.11	0.85	8.7
3.13	0.86	8.8
3.15	0.86	8.8
3.16	0.87	8.9
3.18	0.88	8.9
3.20	0.88	9.0
3.22	0.89	9.1
3.24	0.90	9.1
3.26	0.90	9.2
3.28	0.91	9.3
3.30	0.92	9.3
3.32	0.92	9.4
3.34	0.93	9.5
3.36	0.94	9.5
3.38	0.94	9.6
3.40	0.95	9.7
3.42	0.95	9.7
3.44	0.96	9.8
3.46	0.97	9.9
3.48	0.97	9.9
3.50	0.98	10.0
3.52	0.99	10.1
3.54	0.99	10.1
3.56	1.00	10.2
3.57	1.01	10.2
3.59	1.01	10.3
3.61	1.02	10.4
3.63	1.02	10.4
3.65	1.03	10.5
3.67	1.04	10.6
3.69	1.04	10.6
3.71	1.05	10.7
3.73	1.06	10.8
3.75	1.06	10.8
3.77	1.07	10.9
3.79	1.08	11.0
3.81	1.08	11.0
3.83	1.09	11.1
3.85	1.09	11.2
3.89	1.10	11.2
3.89	1.11	11.3
3.91	1.11	11.4
3.93	1.12	11.4
3.95	1.13	11.5
3.97	1.13	11.5
3.98	1.14	11.6
4.00	1.15	11.7
4.02	1.15	11.7
4.04	1.16	11.8
4.06	1.17	11.9
4.08	1.17	11.9
4.10	1.18	12.0
4.12	1.18	12.1
4.14	1.19	12.1
4.16	1.20	12.2
4.18	1.20	12.3
4.20	1.21	12.3
4.22	1.22	12.4
4.24	1.22	12.5
4.26	1.23	12.5
4.28	1.24	12.6
4.30	1.24	12.7
4.32	1.25	12.7
4.34	1.25	12.8
4.36	1.26	12.9
4.38	1.27	12.9
4.40	1.27	13.0
4.41	1.28	13.0
4.43	1.29	13.1
4.45	1.29	13.2
4.47	1.30	13.2
4.49	1.31	13.3
4.51	1.31	13.4
4.53	1.32	13.4
4.55	1.32	13.5
4.57	1.33	13.6
4.59	1.34	13.6
4.61	1.34	13.7
4.63	1.35	13.8
4.65	1.36	13.8
4.67	1.36	13.9
4.69	1.37	14.0
4.71	1.38	14.0
4.73	1.38	14.1
4.75	1.39	14.2
4.77	1.39	14.2
4.79	1.40	14.3
4.81	1.41	14.3
4.82	1.41	14.4
4.84	1.42	14.5
4.86	1.43	14.5
4.88	1.43	14.6
4.90	1.44	14.7
4.92	1.45	14.7
4.94	1.45	14.8
4.96	1.46	14.9
4.98	1.47	14.9

9-8-2. Flow Selector Unit (FS Unit)

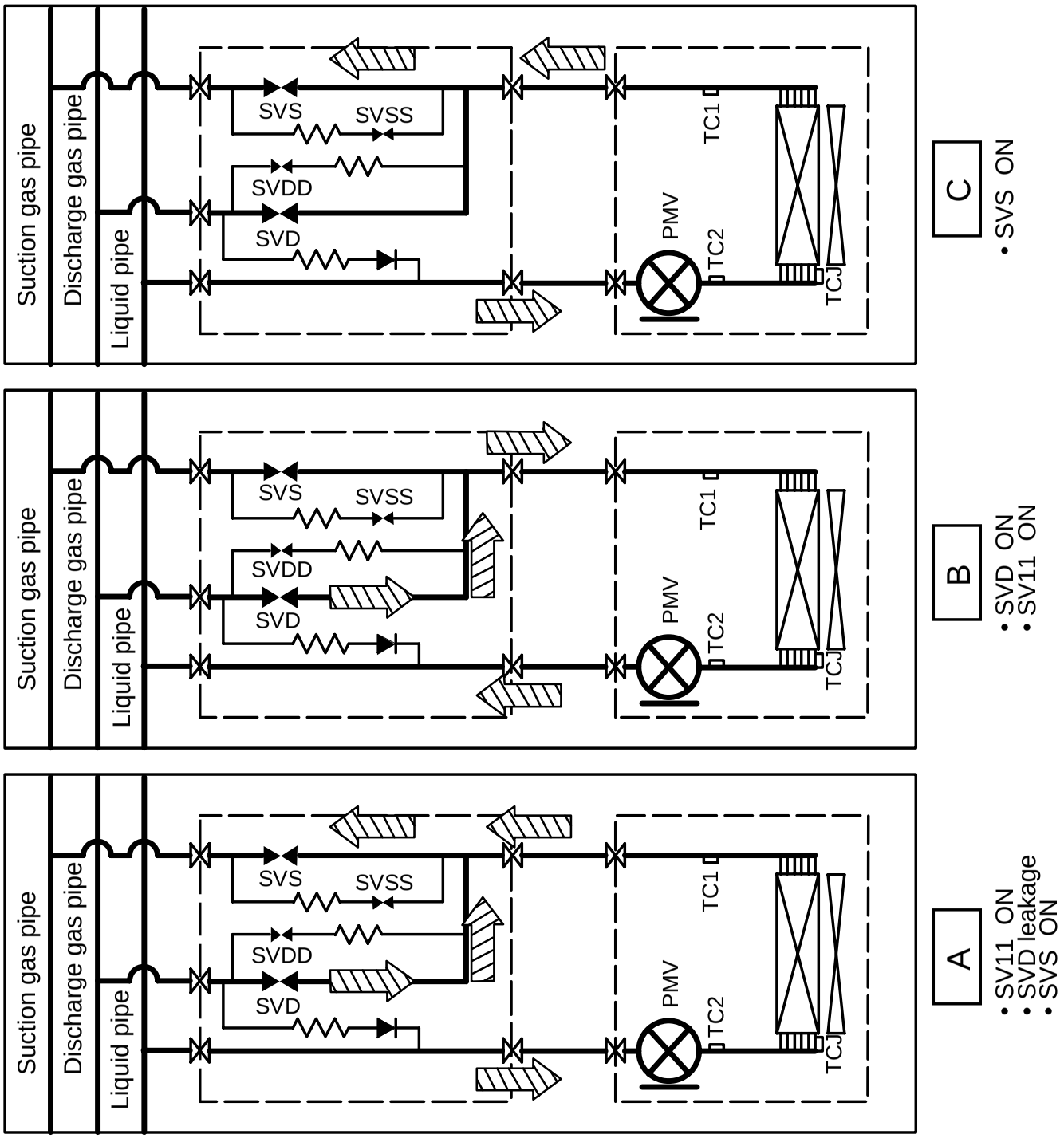
Leakage of SVD valve or SVS valve, etc; Positions to be checked and check code when a trouble such as miswiring occurred.

Part name	Trouble mode	Operation mode	Corresponding indoor unit	Phenomenon which appears as result (Corresponding indoor unit or flow selector unit)					Judgment and position to be checked	Example of refrigerant flow
				Not cooled	Not heated	May become almost normal capacity	● Abnormal cooling sound ○ Circulating sound	Detection of check code		
SVD valve	Clogging	All heating operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Heating unit Heating unit		○				• TC1 is lower than normal indoor unit. • Temperature of suction gas pipe at indoor side of the flow selector unit is lower than that of normal FS unit.	
	Leakage	All cooling operation (SV11 ON) Mainly cooling, part heating operation Mainly cooling, part heating operation	All Cooling unit Cooling unit	○			○ SVD circuit – SVS circuit		• Compared with normal indoor unit, TCJ is higher. • Suction gas pipe at outdoor side of the flow selector unit is hot. • Refrigerant circulating sound is heard in bypass from SVD valve to SVS valve.	A
	Miswiring/ Misinstallation of coil SVD ↔ SVS	All cooling operation (SV11 OFF)	All			○	○ SVD circuit		• Refrigerant circulating sound is heard from SVD valve circuit. • TCJ is high and SH is little. (Liquid pack)	
		All cooling operation (SV11 ON) Mainly cooling, part heating operation Mainly cooling, part heating operation	All Cooling unit Cooling unit	○			○ SVD circuit		• Temperature of TCJ and TC1 become high similar to heating. (All heating circuit) • Discharge gas pipe at outdoor unit side of the flow selector unit is rather hot. • Refrigerant circulating sound is not heard from SVS valve, but it is heard from SVD valve.	B
		All heating operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Heating unit Heating unit		○		○ SVS circuit	L18 “Flow selector unit error”	• Gas pipe at indoor side of the flow selector unit is cold. (Cooling circuit, Liquid pack) • Refrigerant circulating sound is not heard from SVD valve, but it is heard from SVS valve.	C
SVS valve	Clogging	All cooling operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Cooling unit Cooling unit	○			○ SVSS circuit		• TCJ is higher than normal indoor unit. • Gas pipe at indoor side of the flow selector unit is not cold. • Refrigerant circulating sound is heard from SVSS valve.	
	Leakage	All heating operation	All		○		○ SVS circuit	P19 “4-way valve reversal error”	• Compared with normal indoor unit, TCJ is low. • Temperature of suction gas pipe at outdoor side of the flow selector unit is higher than that of normal flow selector unit. • Refrigerant circulating sound is heard from SVS valve circuit.	
		Mainly cooling, part heating operation Mainly heating, part cooling operation	Heating unit Heating unit							
SVDD valve	Clogging	All heating operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Heating unit Heating unit			○	● Indoor unit, flow selector unit		• In start time, when exchanging mode from cooling to heating after defrost operation, refrigerant shock sound may be heard.	
	Leakage	All cooling operation (SV11 ON) Mainly cooling, part heating operation Mainly heating, part cooling operation	All Cooling unit Cooling unit			○	○ SVDD circuit		• Refrigerant circulating sound may be heard from SVDD valve circuit. • Suction gas pipe at outdoor unit side of the flow selector unit may be hot.	
		All heating operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Heating unit Heating unit			○	○ SVDD circuit		• Refrigerant circulating sound may be heard from SVDD valve circuit.	
	Miswiring/ Misinstallation of coil SVD ↔ SVS	All cooling operation (SV11 ON) Mainly cooling, part heating operation Mainly heating, part cooling operation	All Cooling unit Cooling unit			○	○ SVDD circuit		• Refrigerant circulating sound may be heard from SVDD valve circuit. • Suction gas pipe at outdoor unit side of the flow selector unit may be hot.	
		All heating operation Mainly cooling, part heating operation Mainly heating, part cooling operation	All Heating unit Heating unit			○	● Indoor unit, flow selector unit		• In start time, when exchanging mode from cooling to heating after defrost operation, refrigerant shock sound may be heard.	

Part name	Trouble mode	Operation mode	Corresponding indoor unit	Phenomenon which appears as result (Corresponding indoor unit or flow selector unit)					Judgment and position to be checked	Example of refrigerant flow
				Not cooled	Not heated	May become almost normal capacity	● Abnormal cooling sound ○ Circulating sound	Detection of check code		
SVSS valve	Clogging	Single cooling Simultaneous cooling (Indoor cooling) Simultaneous heating (Indoor cooling)				○	● Indoor unit, Selector unit		• Operation is changed from heating to cooling.	
		Single heating Simultaneous cooling (Indoor heating) Simultaneous heating (Indoor heating)				○	● Indoor unit, Selector unit		• Refrigerant impact sound is heard at defrost time.	
	Leakage	Single heating Simultaneous cooling (Indoor heating) Simultaneous heating (Indoor heating)				○	○ SVSS circuit		• Refrigerant sound may be heard from SVSS valve circuit. • Temperature of suction gas pipe at outdoor side of the selector unit is higher than that of normal selector unit.	
Discharge–Liquid bypass capillary, Check valve	Check valve Capillary clogging	Single cooling (SV11 ON) Simultaneous cooling (Indoor cooling) Simultaneous heating (Indoor cooling)	○					P15 [Gas leak detection]	• Gas short is observed and PD and PS may be lower than those in normal time. • TD and TS may be higher than those in normal time.	
		Single heating Simultaneous cooling (Indoor heating) Simultaneous heating (Indoor heating)		○						
	Check valve leakage	Single cooling (SV11 OFF)	○				○ Check valve circuit		• Refrigerant sound may be heard from check valve. • Discharge gas pipe is cold or it may be frozen.	
Piping Discharge pipe Liquid pipe Gas pipe	Incorrect piping Discharge pipe ↔ Suction gas pipe	Single cooling Simultaneous cooling (Indoor cooling) Simultaneous heating (Indoor cooling)	○						• TCJ and TC1 are heated same as heating. (Heating circuit) • Discharge gas pipe at outdoor side of selector unit is fairly heated.	
Signal line Power supply line	Disconnection Contact error Miswiring	In some cases, phenomena such as above occur.								

Reference

Refrigerant circulating example of flow selector unit when a trouble occurred



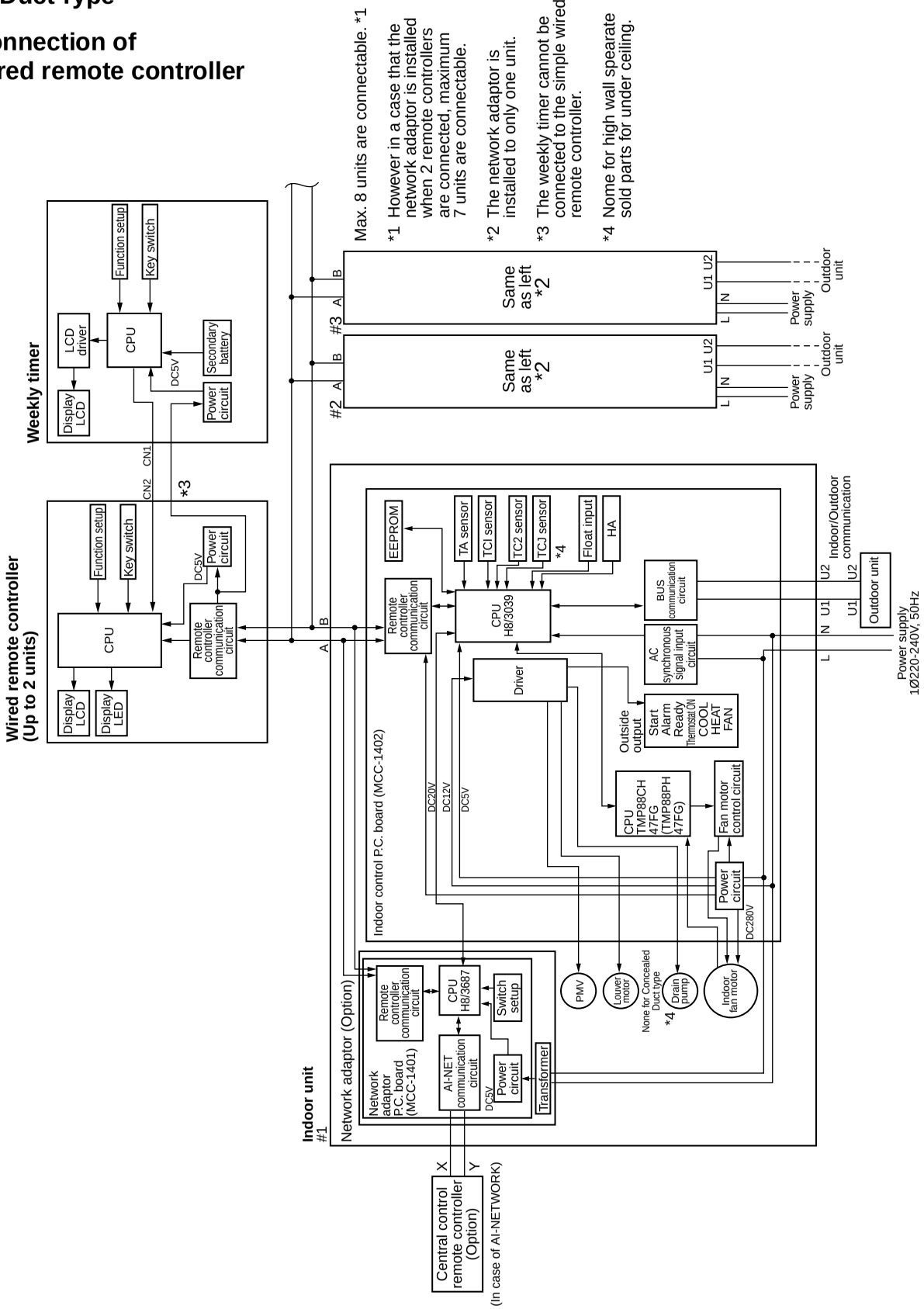
10. CONFIGURATION OF CONTROL CIRCUIT

10-1. Indoor Unit

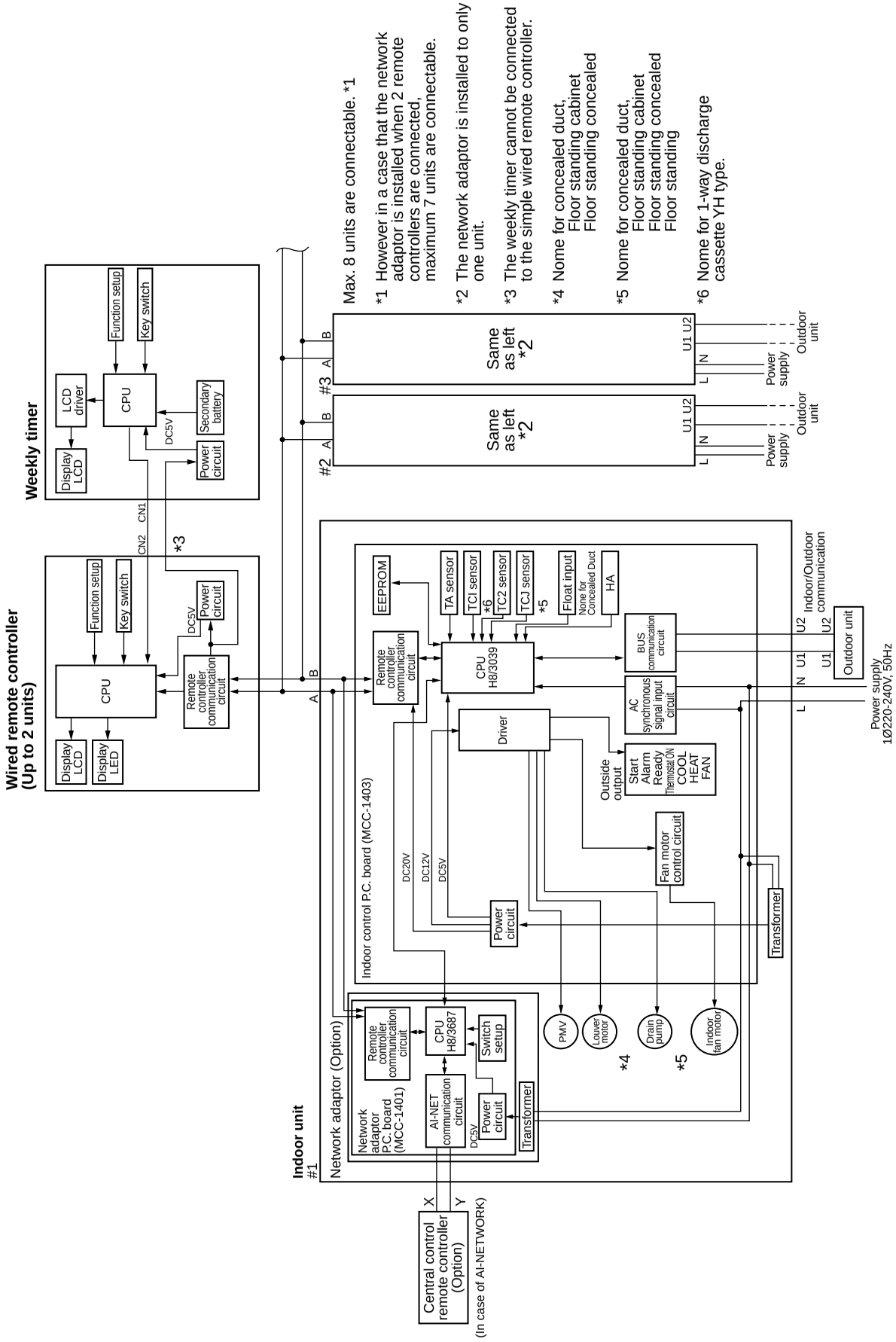
10-1-1. Indoor Controller Block Diagram

4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type, 1-way Air Discharge Cassette Type (2 Series), Slim Duct Type

1. Connection of wired remote controller

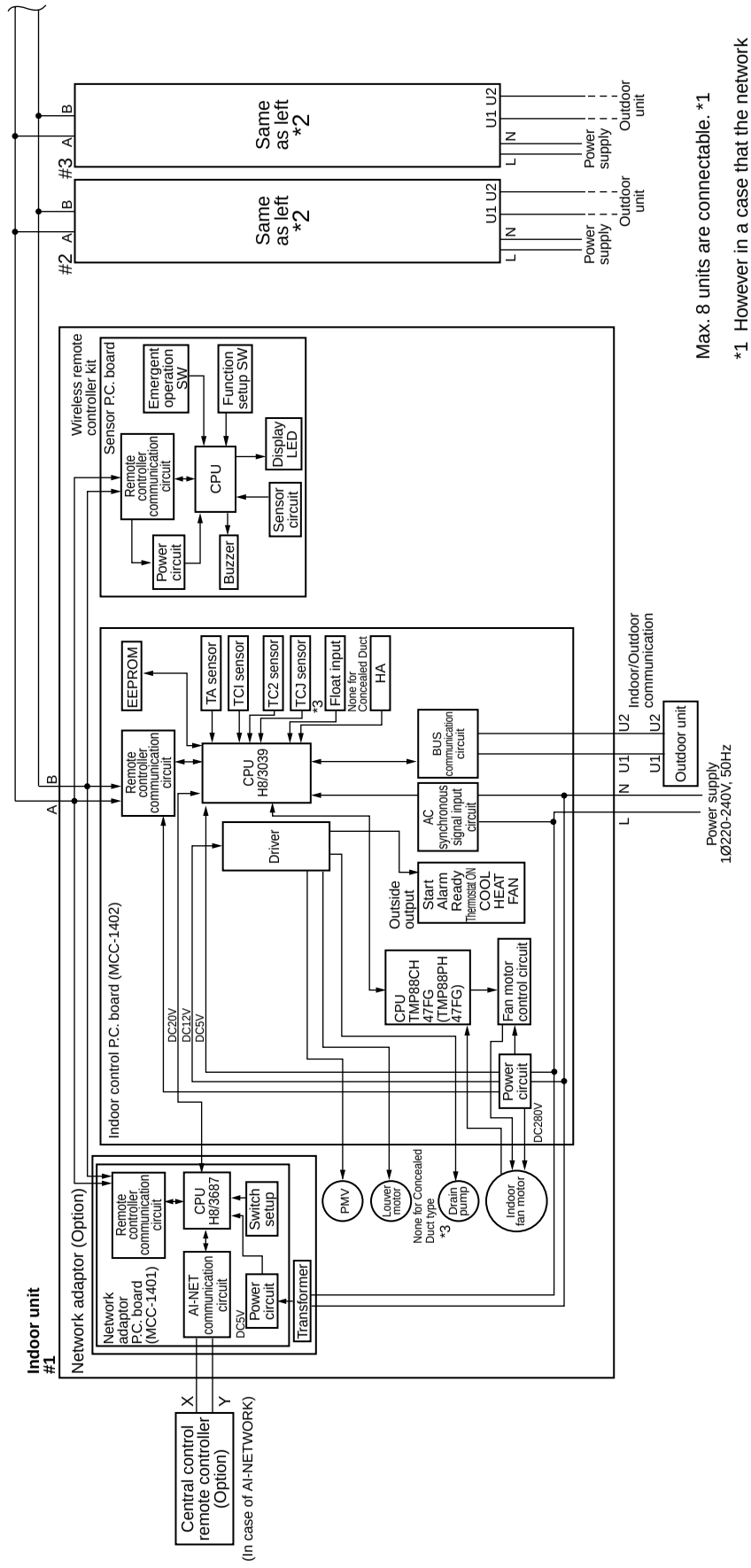


2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type (1 Series), Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type



2. Connection of wireless remote controller kit

4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type, 1-way Air Discharge Cassette Type (2 Series), Slim Duct Type



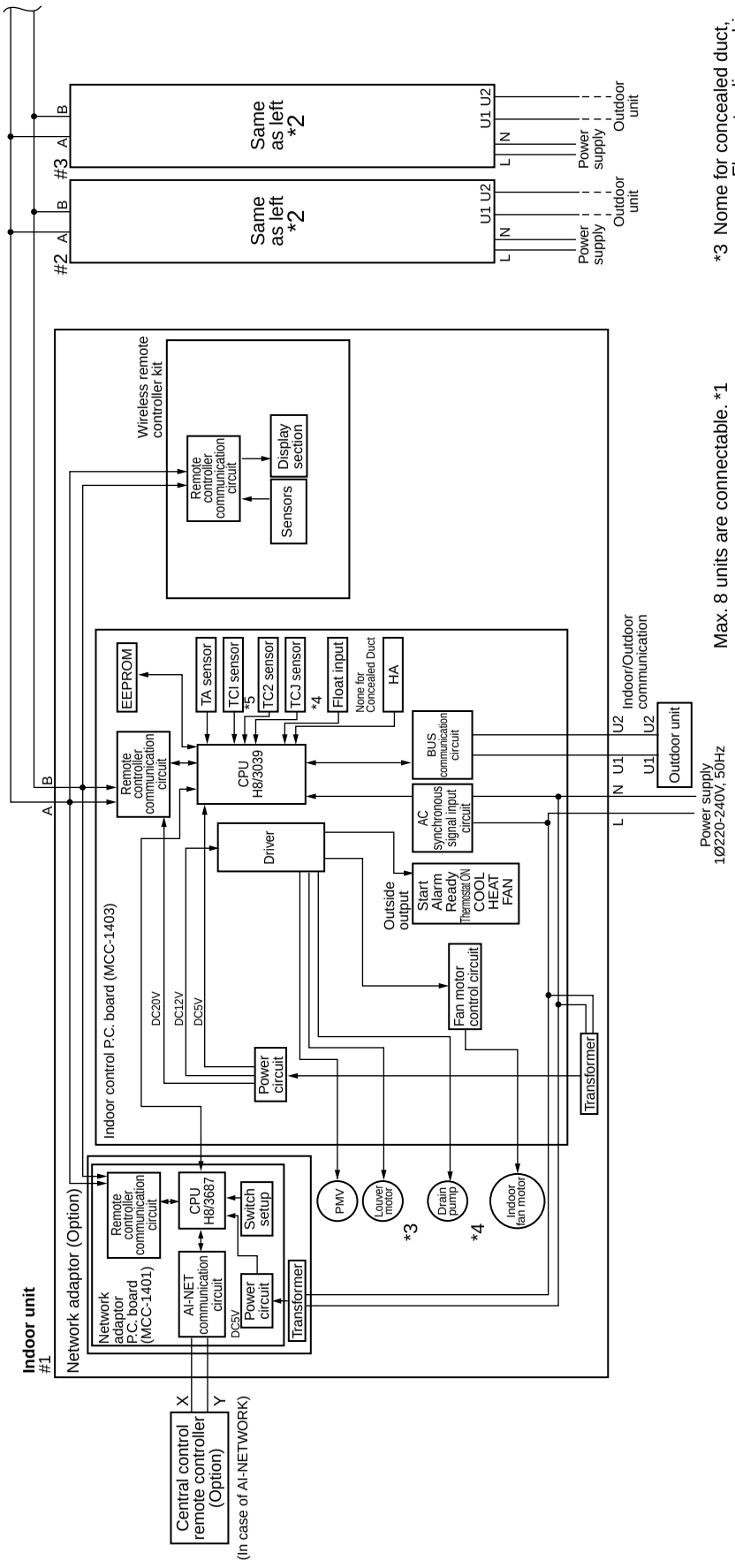
Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed when 2 wireless remote controller kits are connected, maximum 7 units are connectable.

*2 The network adaptor is installed to only

*3 Nome for high wall spearate sold parts for under ceiling. one unit.

2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type (1 Series), Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type



Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed when 2 wireless remote controller kits are connected, maximum 7 units are connectable.

*2 The network adaptor is installed to only one unit.

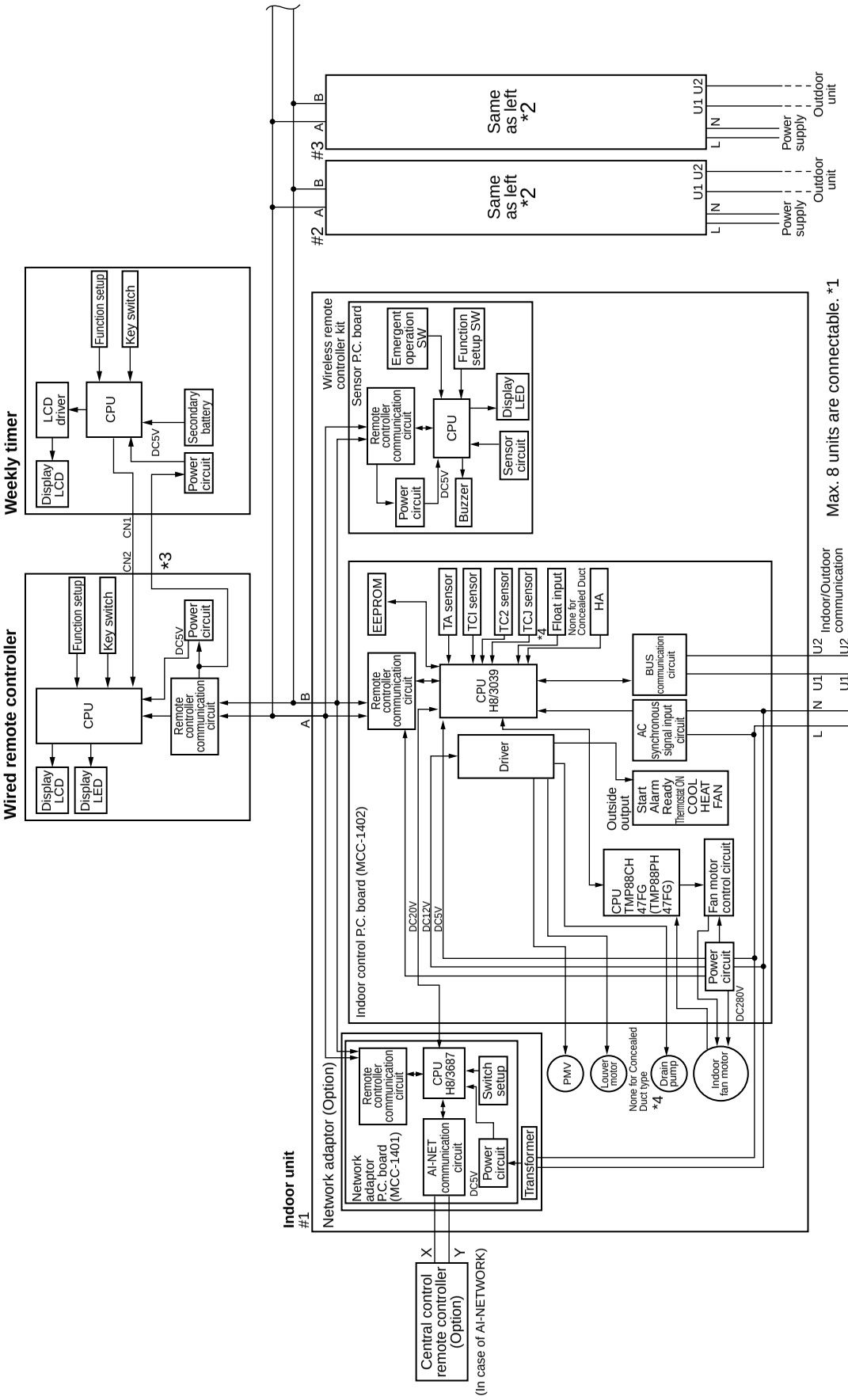
*3 Nome for concealed duct,
Floor standing cabinet
Floor standing concealed

*4 Nome for concealed duct,
Floor standing cabinet
Floor standing concealed
Floor standing

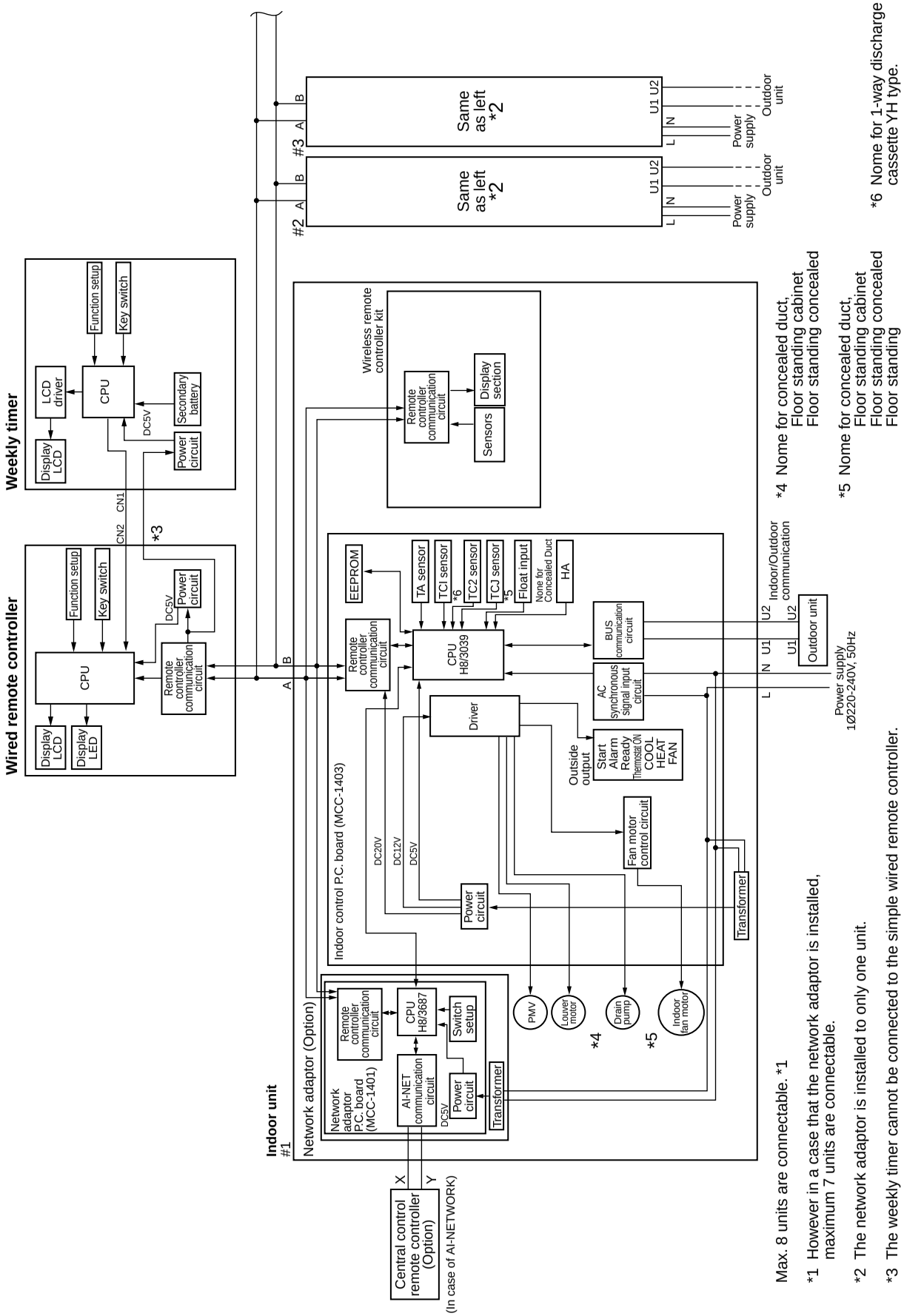
*5 Nome for 1-way discharge cassette YH type.

3. Connection of both remote controller and wireless remote controller kit

4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type, 1-way Air Discharge Cassette Type (2 Series), Slim Duct Type



2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type (1 Series), Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type



Max. 8 units are connectable. *1

*1 However in a case that the network adaptor is installed, maximum 7 units are connectable.

*2 The network adaptor is installed to only one unit.

*3 The weekly timer cannot be connected to the simple wired remote controller.

*4 Nome for concealed duct, Floor standing cabinet Floor standing concealed

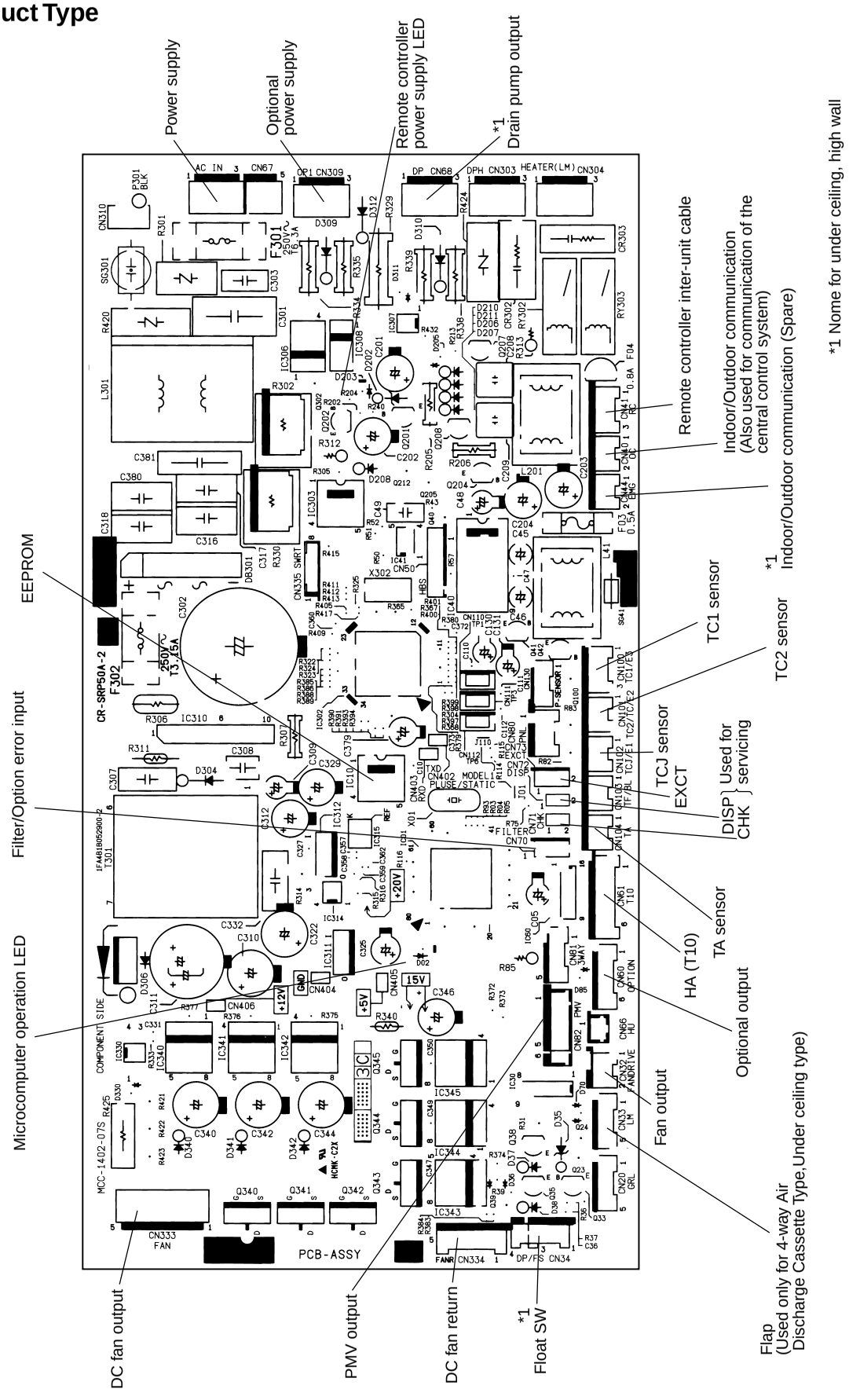
*5 Nome for concealed duct, Floor standing cabinet Floor standing concealed Floor standing

*6 Nome for 1-way discharge cassette YH type.

10-1-2. Indoor P.C. Board

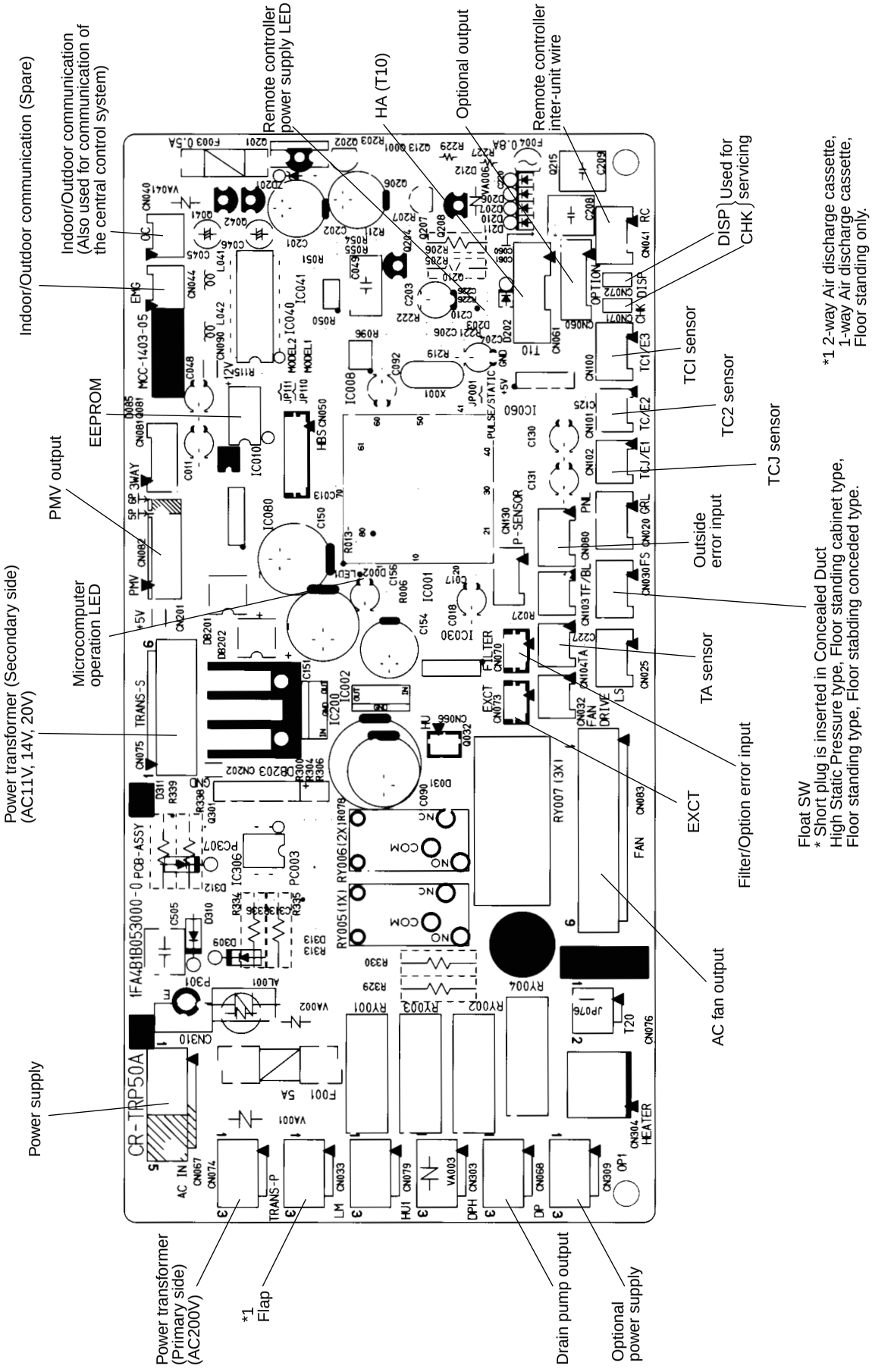
MCC-1402

4-way Air Discharge Cassette Type, Concealed Duct Standard Type, Under Ceiling Type, High Wall Type, 1-way Air Discharge Cassette Type (2 Series), Slim Duct Type

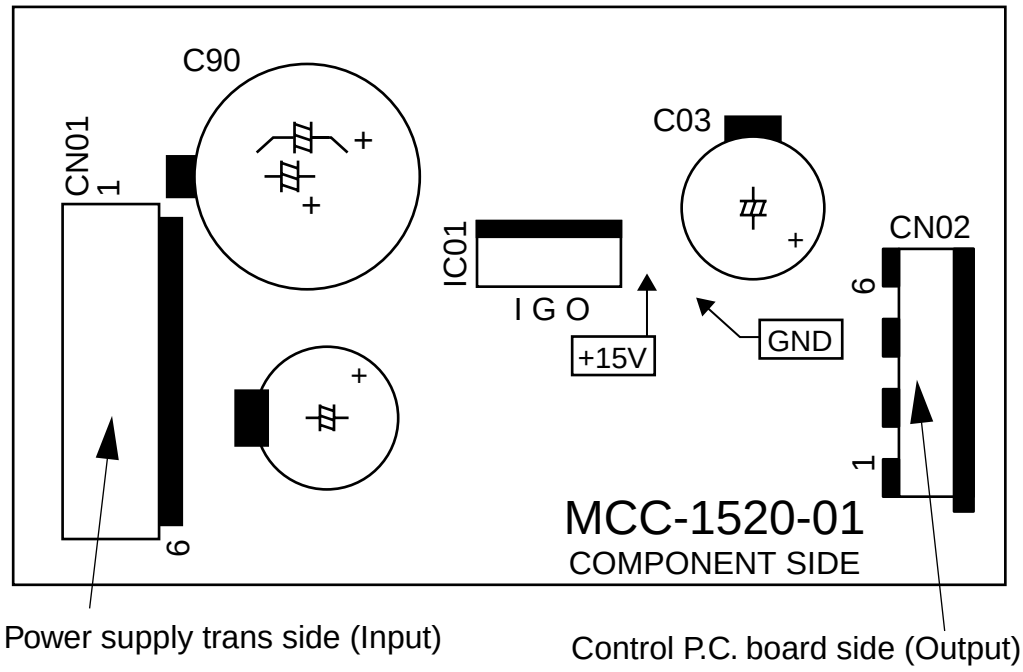


MCC-1403

2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type (1 Series), Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type

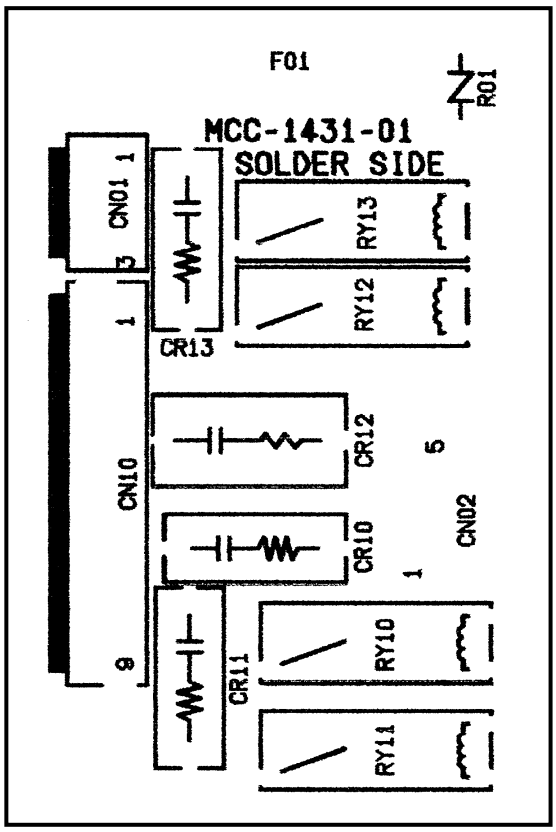


MCC-1520
2-way Air Discharge Cassette Type, 1-way Air Discharge Cassette Type (1 Series), Concealed Duct High Static Pressure Type, Floor Standing Cabinet Type, Floor Standing Concealed Type, Floor Standing Type



10-1-3. Flow Selector Unit P.C. Board

MCC-1431-01

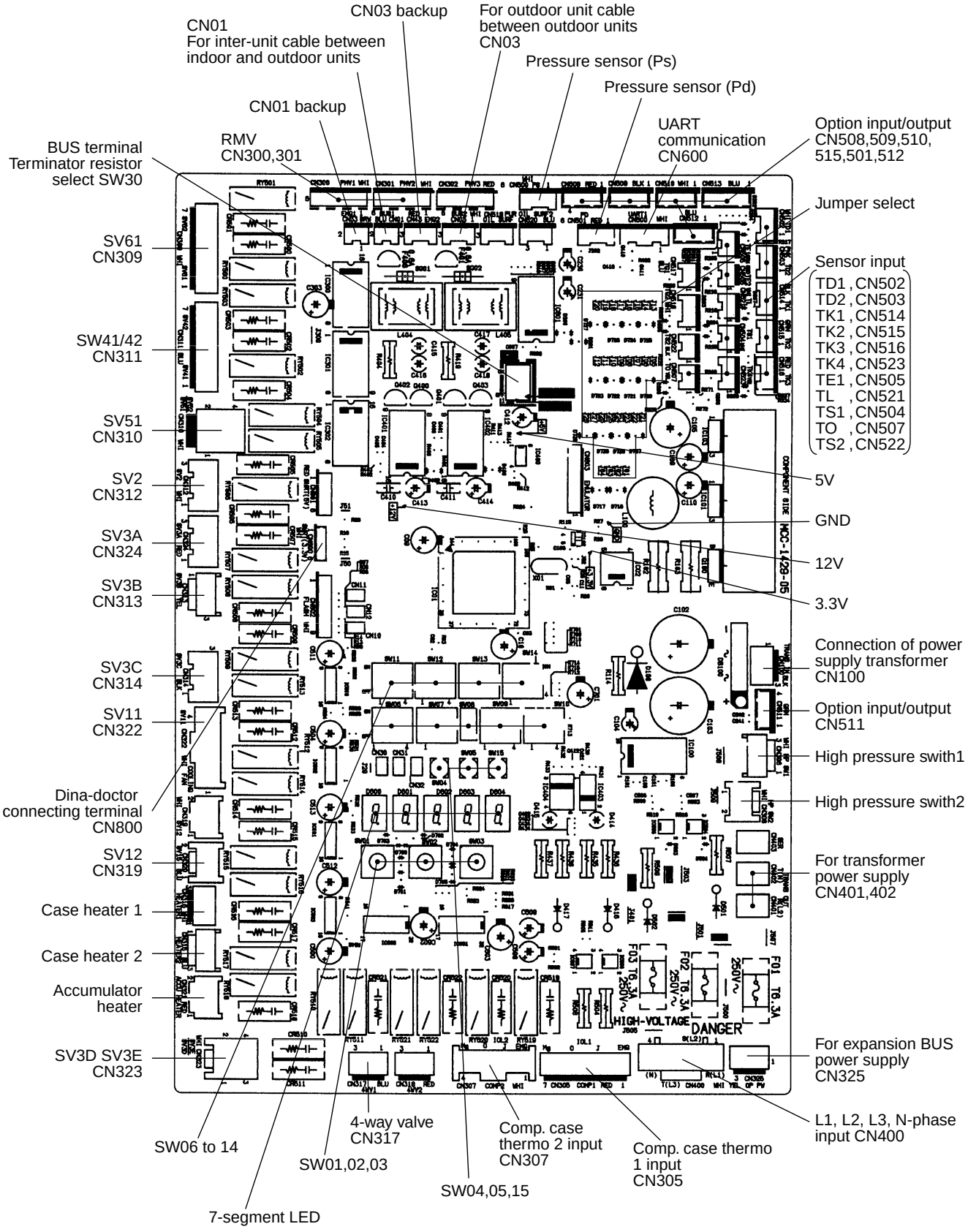


10-1-4. Optional Connector Specifications of Indoor P.C. Board

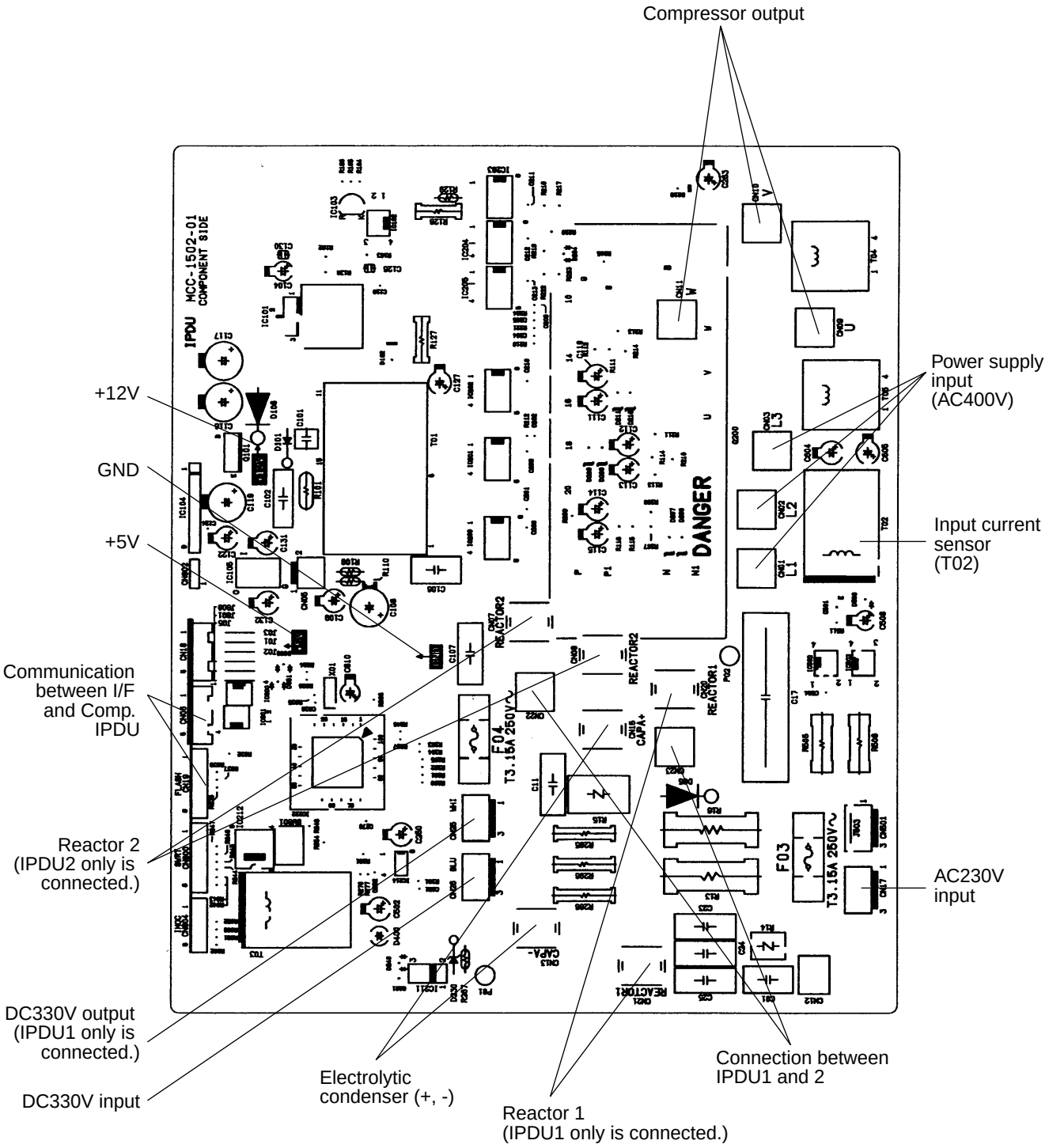
Function	Connector No.	Pin No.	Specifications	Remarks
Humidifier output	CN66	①	DC12V	In heating, thermo ON, Fan ON, Humidifier output ON * Humidifier provided, Drain pump ON is set up by CN70 short-circuit or from remote controller. (DN=40)
		②	Output	
Fan output	CN32	①	DC12V	Shipment setup: ON with indoor unit operation and OFF with stop are linked. * Single operation by FAN button on remote controller is set up from remote controller (DN=31)
		②	Output	
—	CN61	①	ON/OFF input	HA ON/OFF input (J01: YES/NO=Pulse (At shipment) / Static input select)
		②	0V (COM)	
		③	Main prohibition input	Operation stop of main remote controller is permitted / prohibited by input.
		④	Operation output	ON during operation (Answerback of HA)
		⑤	DC12V (COM)	
		⑥	Alarm output	ON during alarm output
Option output	CN60	①	DC12V (COM)	
		②	Defrost output	ON when outdoor unit is defrosted
		③	Thermo ON output	ON during Real thermostat ON (Compressor ON)
		④	COOL output	ON when operation mode is cooling system (COOL, DRY, Cool/Heat Auto cooling)
		⑤	HEAT output	ON when operation mode is heating system (HEAT, Cool/Heat Auto cooling)
		⑥	Fan output	ON when indoor fan is ON (During use of air cleaner/Interlock cabling)
Outside error input	CN80	①	DC12V (COM)	Generate check code “L30” (for 1 minute continuously) to stop forcedly the operation.
		②	DC12V (COM)	
		③	Outside error input	
—	CN20	—	—	—
—	CN70	—	—	—
CHK operation check	CN71	①	Check mode input	Used for indoor operation check. (Outdoor does not communicate with remote controller, and outputs specified operation such as indoor fan “H”, drain pump ON, etc.)
		②	0V	
DISP exhibition mode	CN72	①	Display mode input	Exhibition mode enables to communicate by indoor unit and remote controller only. (When power has been turned on.) Timer short (Usual)
		②	0V	
EXCT demand	CN73	①	Demand input	Indoor unit forced thermostat OFF operation
		②	0V	

10-2. Outdoor unit

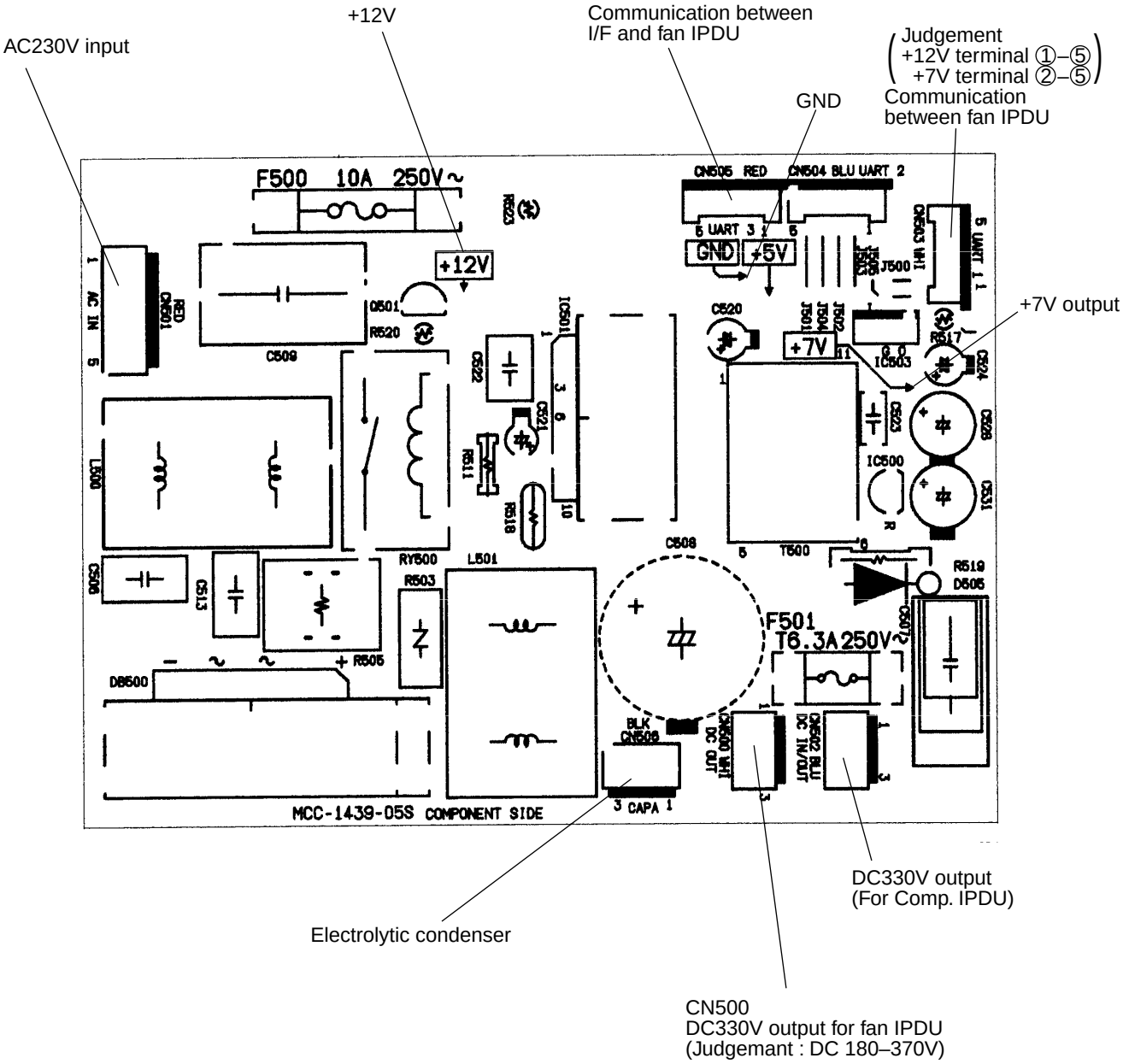
Positions to be checked on the interface P.C. board (MCC-1429)



Inverter P.C. board (MCC-1502) [IPDU1, IPDU2]



Power supply P.C. board for fan (MCC-1439)



CN500
DC330V output for fan IPDU
(Judgemant : DC 180–370V)

10-2-1. Outdoor Interface P.C. Board

Dip switch function exchange setup list

Part type		Exchange contents							Initial setup at shipment
SW01	Rotary SW 4bit 16 step	Display / Operation switch (1)					For 7-segment display / service operation		[1]
SW02	Rotary SW 4bit 16 step	Display / Operation switch (2)					For 7-segment display / service operation		[1]
SW03	Rotary SW 4bit 16 step	Display / Operation switch (3)					For 7-segment display / service operation		[1]
SW04	Push SW	For service [Operation/Start]					[Operation/Start] by pushing		—
SW05	Push SW	For service [Stop/End]					[Stop/End] by pushing		—
SW06	SW 4bit	Bit 1	Backup setup				(Based on the following setup)		OFF
		Bit 2		Bit 4	Bit 3	Bit 2	Bit 1		OFF
		Bit 3		OFF	OFF	OFF	OFF	Normal	OFF
		Bit 4		—	—	OFF	ON	No.1 COMP backup	OFF
				—	—	ON	OFF	No.2 COMP backup	
SW07	SW 4bit	Bit 1	Power peak-cut control exchange				OFF: 0 – 100%, ON: Middle – 100%		OFF
		Bit 2	Power peak-cut control exchange (Expansion)				(For 4-steps exchange)		OFF
		Bit 3	—				—		OFF
		Bit 4	—				—		OFF
SW09	SW 4bit	■ Header unit							
		Bit 1	Outdoor address setup exchange				OFF: Auto setup (Normal), ON: Manual setup		OFF
		Bit 2	Judge indoor capacity over				OFF: YES (Normal), ON: NO		OFF
		Bit 3	Correction of installed pipe size				OFF: Normal, ON: Size UP (For outdoor expansion)		OFF
		Bit 4	Judge abnormal No. of connected indoor units				OFF: No error judgment, ON: Error		OFF
SW10	SW 4bit	Bit 1	—				—		OFF
		Bit 2	Outdoor fan high-static pressure shift				OFF: Normal, ON: High-static pressure shift		OFF
		Bit 3	Sound reduction control				OFF: Normal, ON : INV frequency upper limit restriction		OFF
		Bit 4					OFF: Normal, ON: Fan rpm upper limit restriction		OFF
SW11	SW 4bit	Bit 2	—				—		OFF
		Bit 3	—				—		OFF
		Bit 4	Operation when indoor overflow detected				OFF: System stop, ON : System operation continues		OFF
SW12	SW 4bit	Bit 1	PMV manual operation selected				OFF: PMV1, PMV2 ON : PMV3		OFF
		Bit 2	—				—		OFF
		Bit 3	—				—		OFF
		Bit 4	—				—		OFF
SW13	SW 4bit	Bit 1	—				—		OFF
		Bit 2	—				—		OFF
		Bit 3	—				—		OFF
		Bit 4	Line address setup						OFF
SW14	SW 4bit	Bit 1, 2, 3, 4		Line address setup			Refer to item “Address setup procedure”		OFF
SW30	SW 2bit	Bit 2	Terminator resistor between outdoor units				OFF: No Terminator resistor ON : Exists		ON
CN30	Check connector	Manual full opening setup of PMV					Opened: Normal, Short: Opened fully		Open
CN31	Check connector	Manual full closing setup of PMV					Opened: Normal, Short: Opened fully		Open
CN32	Check connector	Check for assembly line in factory.					Opened: Normal, Short: Check mode		Open

* The outdoor unit connected with indoor/outdoor communication line becomes automatically the master unit. No manual setting is necessary.

11. BACKUP OPERATIONS (EMERGENCY OPERATION)

When a trouble occurs in an outdoor unit or in one of the compressors in an outdoor unit, the malfunctioning unit or compressor stops and a backup operation (emergency operation) is available through the other functioning outdoor units and compressors. A backup operation can be set up following the procedure below.

11-1. Before Backup Operation

The method of the backup operation will differ depending on the type of trouble. Refer to the following table.

Trouble contents	Backup operation method	Setup procedure
When a trouble occurs on one of the compressors in the same unit (Note 1)	Compressor backup	To item 2
When a trouble occurs on the both compressors in the same unit	Outdoor unit backup or outdoor unit backup during cooling season (Note 2)	To item 3 or item 4
Trouble of the compressor coil (Such as defect of compressor coil)		
When a trouble occurs on the refrigerating system parts, fan system parts, or electric system parts		
When a trouble occurs on the temperature sensor or pressure sensor		

(Note 1) When a trouble of the compressor coil etc has occurred, deterioration of the oil will be high. Therefore do not perform a backup operation, as other units within the system may be damaged.

(Note 2) Only one outdoor unit within a given system can be subjected to the backup procedure.

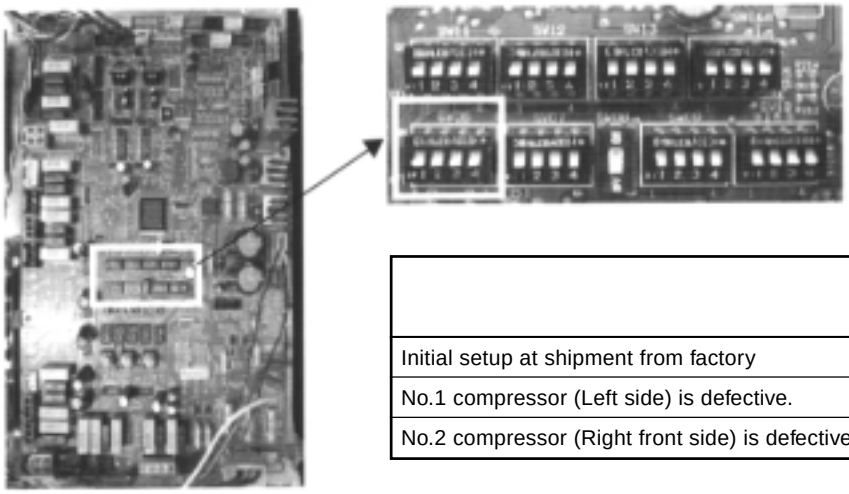
11-2. Compressor Backup Setup

Outline

When a trouble occurs on one of the two compressors, follow the procedure below. If it is necessary perform a backup operation on the other normal compressor.

Procedure

1. Turn off the main power supplies to all the units connected to the system.
2. As shown below set up the switch SW06 on the interface P.C. board on the outdoor unit on which the compressor has failed.



	SW06			
	Bit 1	Bit 2	Bit 3	Bit 4
Initial setup at shipment from factory	OFF	OFF	OFF	OFF
No.1 compressor (Left side) is defective.	ON	OFF	OFF	OFF
No.2 compressor (Right front side) is defective.	OFF	ON	OFF	OFF

3. Turn on the main power supplies of all of the units connected to the system.

After the backup set up for the outdoor unit in cooling season is complete, check the system operates.

11-3. Backup Setup for Outdoor Unit

Outline

In this model, setup of the backup operation is available in either the header unit or the follower unit in a situation where the outdoor units are defective. In a system in which two or more outdoor units are connected, carry out the backup operation on the outdoor unit if the error modes described below occur.

- Compressor error (Rare short error or when one compressor cannot operate, etc.)
- Pressure sensor (Pd, Ps) / Temperature sensor (TD1, TD2, TS1, TE1, TK1, TK2, TK3, TK4, TL) error

  Note only one outdoor unit within a given system can be subjected to the backup procedure.

Procedure

1. Turn off the main power supplies to all the units connected to the system.

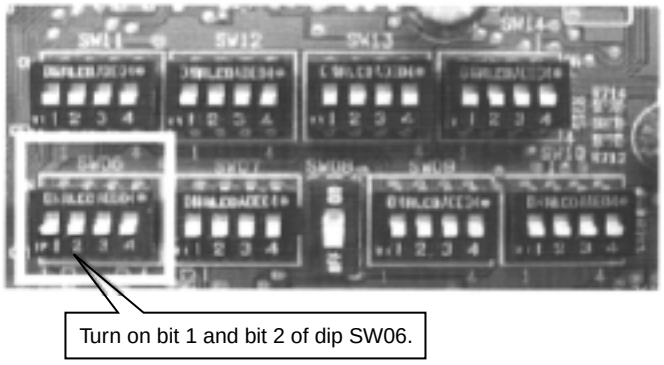
[Set up procedure for the malfunctioning outdoor unit]

(The following work is common to the header unit and follower units in the system.)

2. Turn on both bit 1 and 2 of the SW06 on the interface P.C. board.
3. Fully close the liquid service valve when the outdoor PMV is suspected to be leaking (i.e. when the PMV will not close fully).
4. Turn on the main power supplies of all of the units connected to the system.

   If the fault is a compressor insulation error, remove the wiring to the compressor before turning the power supply on.

After the backup set up for the outdoor unit in cooling season is complete, check the system operates.

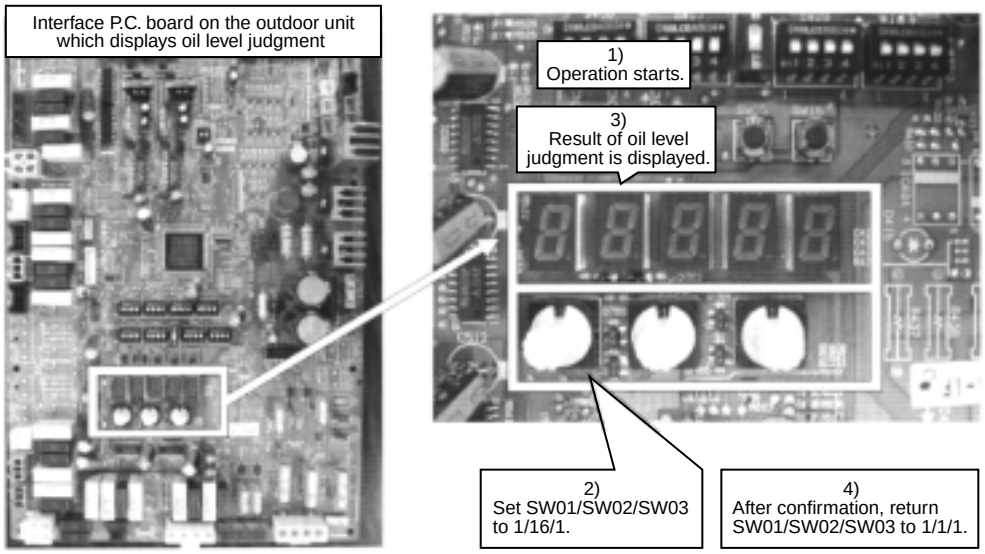


12. OIL LEVEL JUDGMENT DISPLAY

The judgment result of the current oil level of the compressor can be confirmed by the switch setup on the interface P.C. board on the outdoor unit.

Confirm the result using the following procedure.

1. Operation procedure



1) Start the operation.
2) Set the rotary switches SW01/02/03 on the interface P.C. board to 1/16/1.
3) The result of the oil level judgement is displayed on the 7-segment display.

7-segment display [oL] [A00]

The right 3 digits indicate the judgment result. The judgment results of the oil level in compressor 1 and compressor 2 are displayed.

(Example: A ○ □ = ○ : Oil level result of compressor 1, □ : Oil level result of compressor 2

Display example

7-segment display **[oL] [A00]** : Oil level is good in compressor 1 and 2.
[oL] [A01] : Oil level is good in compressor 1 and short in compressor 2
[oL] [A20] : Oil shortage in compressor 1 and good in compressor 2

→ Judgment result in compressor 2
→ Judgment result in compressor 1

For the contents of judgment result, refer to the following table.)

7-segment display oil level results

7-segment display	Judgment result	Contents
0	Appropriate	Oil level inside of the compressor is appropriate.
1 2	Shortage	Shortage of oil level in the compressor (Both A1 and A2 indicate shortage.) If this judgment continues, the system stops for protection.
A	TK1 circuit error	TK1 circuit error is found. If this judgment continues, the system stops for protection.
B	TK2 circuit error	TK2 circuit error is found. If this judgment continues, the system stops for protection.
C	TK3 circuit error	TK3 circuit error is found. If this judgment continues, the system stops for protection.
D	TK4 circuit error	TK4 circuit error is found. If this judgment continues, the system stops for protection.

4) After confirmation, return SW01/SW02/SW03 to (1/1/1).

13. REFRIGERANT RECOVERY WHEN REPLACING THE COMPRESSOR

13-1. Refrigerant Recovery in the Malfunctioning Outdoor Unit

A pump-down function is available in this system. For multiple outdoor unit systems, execute pump-down by using the normal outdoor units and the refrigerant can be recovered from the outdoor unit, which is to be repaired.

13-1-1. Before Refrigerant Recovery Operation

Pay attention to the following items during pump-down operation.

1. The refrigerant recovery rate changes with the outside temperature in the pump-down operation.
   When the pump-down operation has finished, recover the remaining gas using a recovery device and measure the amount of recovered refrigerant.
2. Executing the pump-down operation when heating the accumulator of the malfunctioning outdoor unit improves refrigerant recovery rate.
3. While both outdoor PMVs are closed the refrigerant in the heat exchanger cannot be recovered.
   If executing brazing after pump-down operation, recover the refrigerant in the heat exchanger before starting.

13-1-2. Refrigerant Recovery Procedure

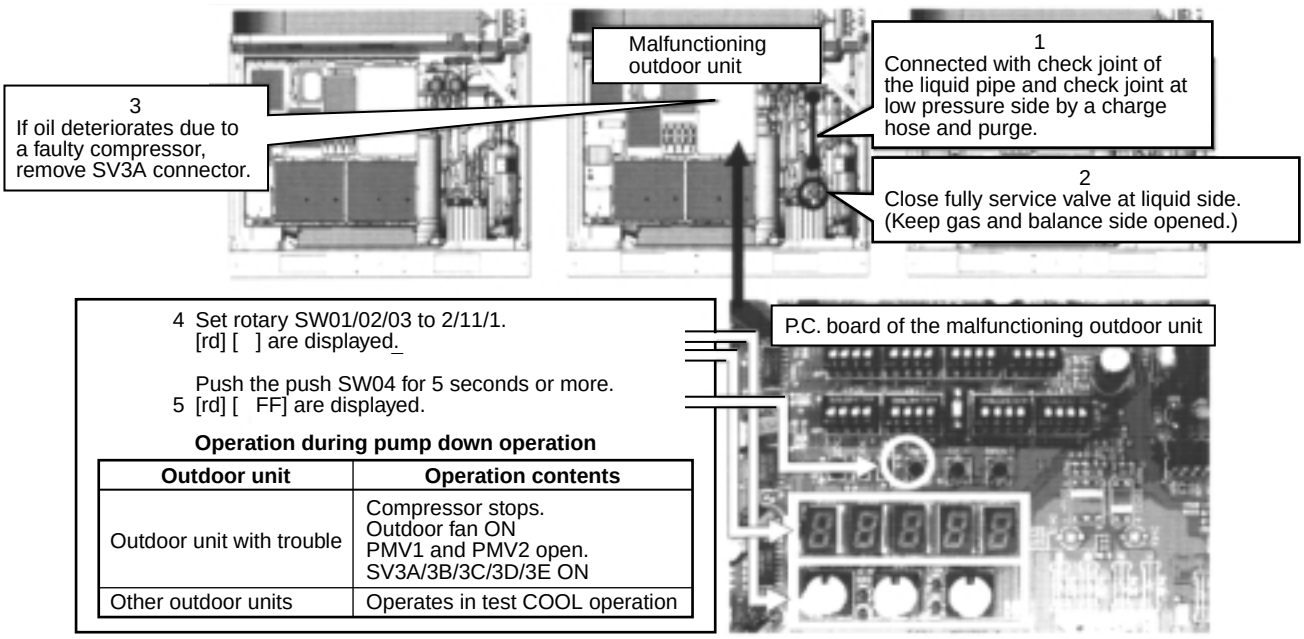
(If no backup operation for the outdoor unit has been implemented)

Procedure

Turn on the power supply to the system, and ensure system operation is stopped. If the fault is an insulation error in the compressor, remove the wiring to the compressor before turning on the power supply.

[Set up the malfunctioning outdoor unit as follows]

1. Using a charge hose, connect the check joint of the liquid pipe and the check joint at the low pressure side, then purge the air in the hose (to recover refrigerant in the heat exchanger and the liquid tank).
2. Fully close the service valve of the liquid pipe of the malfunctioning outdoor unit.
   Keep service valves of the gas pipe and the balance pipe open.
3. If it is thought that the oil has deteriorated due to a faulty compressor, take off the SV3A valve connector of the malfunctioning outdoor unit, so that the oil does not flow in the other outdoor units.
4. Set the rotary switches SW01/02/03 to 2/11/1 on the interface P.C. board of the malfunctioning outdoor unit, [rd] [ ] is displayed on the 7-segment display.
5. Press SW04 for 5 seconds or more, [rd][FF] is displayed on 7-segment display and then pump down starts.
   * When interrupting the operation, turn off the power supplies to all of the outdoor units or push SW05 on the interface P.C. board.

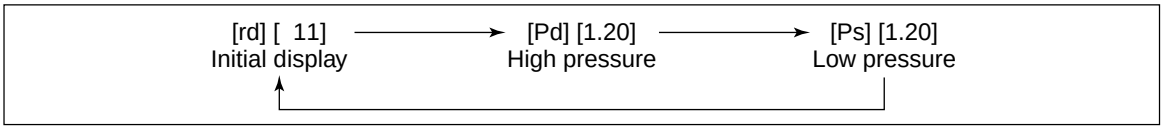


Operation during pump down operation

Outdoor unit	Operation contents
Outdoor unit with trouble	Compressor stops. Outdoor fan ON PMV1 and PMV2 open. SV3A/3B/3C/3D/3E ON
Other outdoor units	Operates in test COOL operation

6. Fully close the service valve in the gas pipe of the malfunctioning outdoor unit approximately 10 minutes after the system has started.
7. Push SW04 of the malfunctioning outdoor unit, to display the pressure data (MPa).
   For each successive push of SW04, the data display changes as shown in the example below.

Display Example



[Select an outdoor unit for pressure adjustment as follows]

8. When operating the pump down mode, the outdoor unit which has the lowest unit number is selected as the outdoor unit for the pressure adjustment.

> **Unit No.**
> When SW01/02/03 are set to 1/1/1, the number displayed on the 7-segment display indicates the unit number ([U#][---]: # indicates the unit number)

[Set up all other outdoor units as follows]

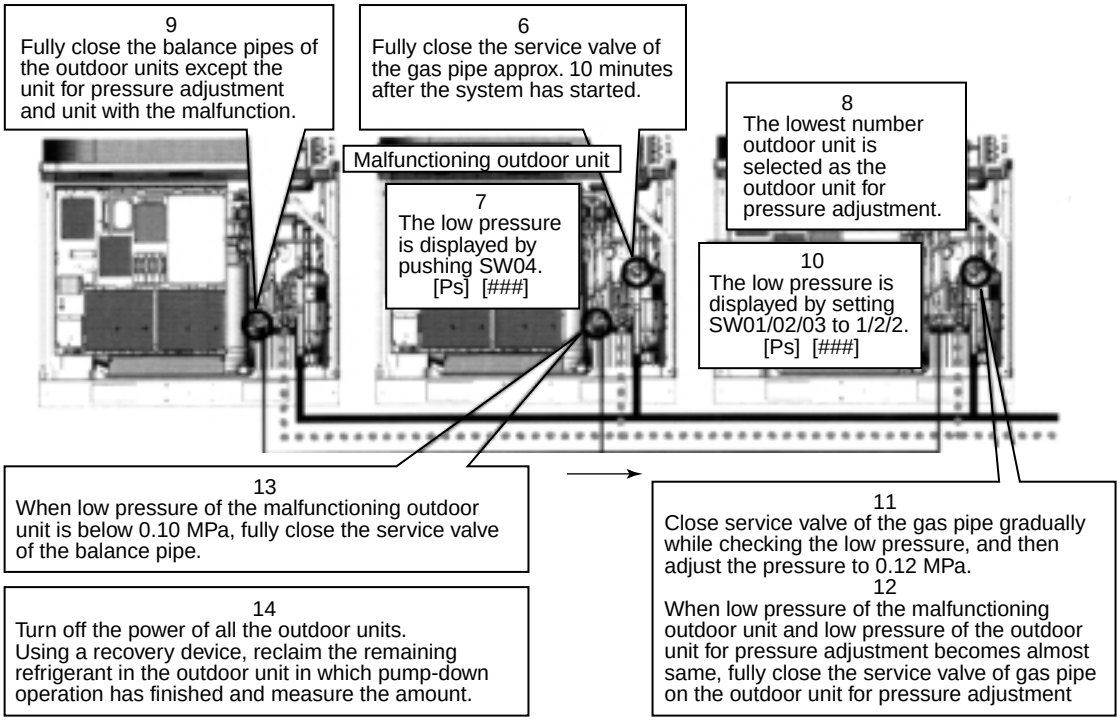
9. Fully close the service valves of all the other outdoor unit balance pipes. Only keep the service valves of the balance pipes of the unit in which the pressure adjustment will be made and the malfunctioning unit fully open.

[Setup for outdoor unit for adjustment of pressure]

10. Set up the rotary SW01/02/03 to 1/2/2 on the interface P.C. board of the outdoor unit in which the pressure adjustment will be made.
11. The low pressure (Ps) data is displayed on the 7-segment display.
    Slowly close the service valve of the gas pipe and adjust so that a pressure of 0.12 MPa is displayed.
12. When the low pressure (Ps) of the malfunctioning outdoor unit is almost the same as that of the unit in which the pressure adjustment has been made, fully close the service valve of the gas pipe in the unit which the pressure adjustment was made.

[Set up the malfunctioning outdoor unit as follows]

13. When the pressure of the malfunctioning outdoor unit is below 0.1 MPa, fully close the service valve of the balance pipe and push SW05 on the interface P.C. board to finish the pump down operation.
14. Turn off the power supplies to all of the outdoor units and use a refrigerant recovery device to recover the remaining refrigerant in the outdoor unit, in which the pump down operation has been completed. Be sure to measure the recovered refrigerant, as the same amount of refrigerant will be required to be recharged after the repair.



Return all rotary switches SW01/02/03 to 1/1/1.

(Refrigerant recovery procedure (backup))

If the power of the malfunctioning unit cannot be turned on, the PMV cannot be opened, therefore the amount of recovered refrigerant decreases compared with the usual pump down operation.

Using a refrigerant recovery device, recover the remaining gas in the unit and measure the recovered refrigerant, as the same amount of refrigerant will be required to be recharged after the repair.

Procedure

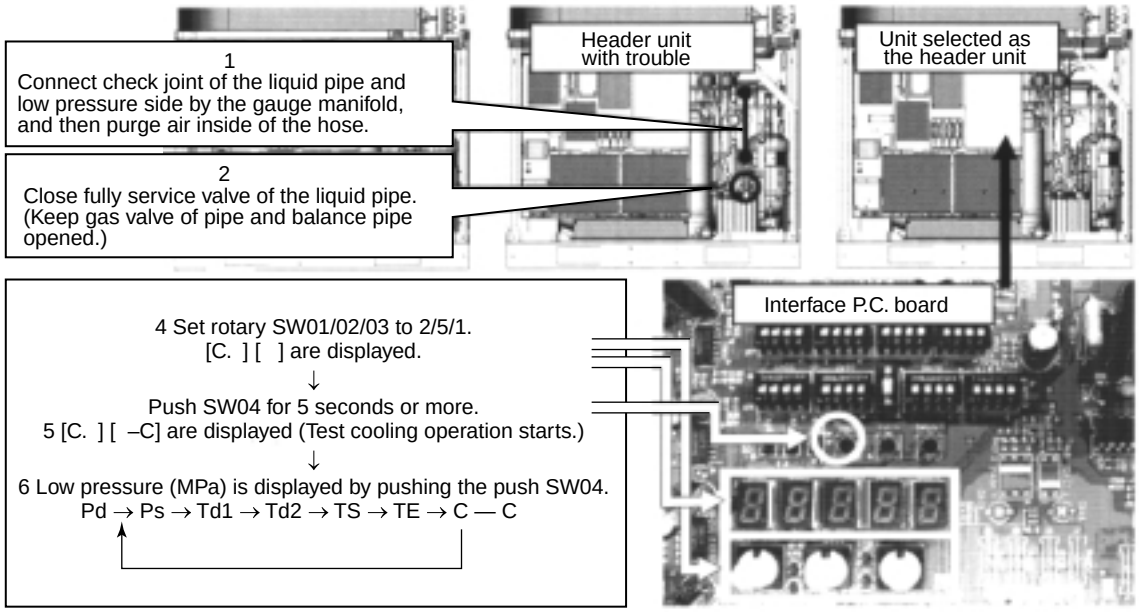
[Set up the malfunctioning outdoor unit as follows]

1. Using a gauge manifold, connect the check joint of the liquid pipe and the low pressure side, and then purge air in the hose (to recover refrigerant in the heat exchanger and the liquid tank).
2. Fully close the service valve of the liquid pipe in the malfunctioning outdoor unit (keep the service valves of the gas pipe and the balance pipe open).

[Set up the unit selected as the header unit as follows]

3. Set up the rotary SW01/02/03 to 2/5/1 on the interface P.C. board of the selected header outdoor unit, [C.] [ ] is displayed on 7-segment display.
4. Push SW04 for 5 seconds or more, the system operates in the test cooling operation when [C.] [C] is displayed on the 7-segment display.

   Set up the rotary SW01/02/03 to 1/2/2 on the interface P.C. board of the selected header outdoor unit to display the low pressure data (MPa) on the 7-segment display.
5. Push the SW04 for 2 seconds, the low pressure (MPa) is displayed on 7-segment.



6. Fully close the service valve of the gas pipe on the malfunctioning outdoor unit approximately 10 minutes after the system has started.

[Select an outdoor unit for pressure adjustment as follows]

7. Select the header unit as the unit for pressure adjustment.

[Set up all other outdoor units as follows]

8. Fully close the service valves of the other outdoor unit balance pipes.

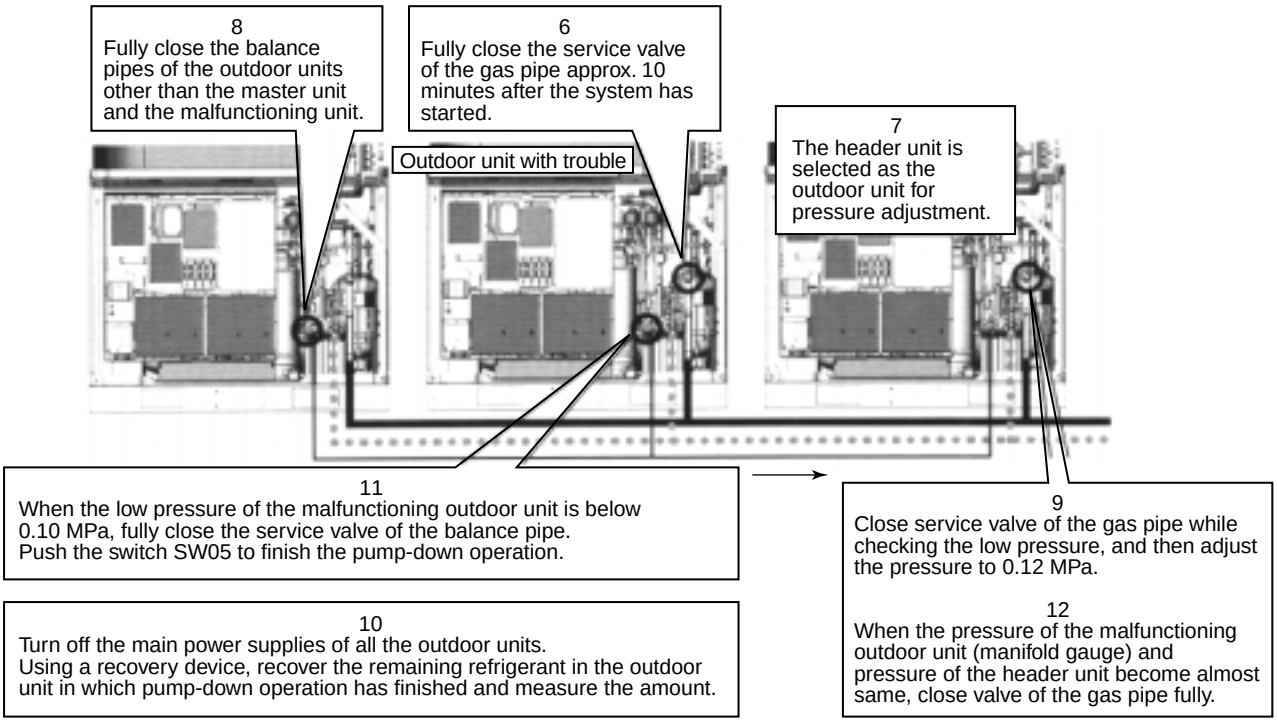
   Only keep the service valves of the balance pipes of the header unit and the malfunctioning unit fully open.

[Setup for header unit]

9. The low pressure (Ps) data is displayed on the 7-segment display.
   Slowly close the service valve of the gas pipe and adjust so that a pressure of 0.12 MPa is displayed.
10. When the manifold gauge pressure of the malfunctioning outdoor unit is almost the same as that of the header unit in which the pressure adjustment has been made, fully close the service valve of the gas pipe in the header unit.

[Set up the malfunctioning outdoor unit as follows]

11. When the manifold gauge pressure of the malfunctioning outdoor unit becomes below 0.1 MPa, fully close the packed valve of the balance pipe and then push SW05 on the interface P.C. board to finish the pump down operation.
12. Turn off the power supplies of all of the outdoor units, and use a refrigerant recovery device to recover the remaining refrigerant in the outdoor unit, in which the pump down operation has been completed.
    Be sure to measure the recovered refrigerant, as the same amount of refrigerant will be required to be re-charged after the repair.



Return all SW01/02/03 of the header unit to (1/1/1) to complete the work.

13-2. How to Operate the System During Repair of the Malfunctioning Outdoor Unit

Procedure

1. Follow the aforementioned "**13-1. Refrigerant Recovery in the Malfunctioning Outdoor Unit**".
2. Recover the refrigerant in the system by using a recovery device.

   The refrigerant amount to be recovered is determined based upon the capacity of the malfunctioning outdoor unit (see the following table).

   Example) In a case of backup for 10 hp-outdoor unit in 30 hp system:
   in the original system hp (30 hp system) = 37.5 kg
   Refrigerant amount in system hp (20 hp system) after backup = 28.0 kg
   Refrigerant amount to be recovered = 37.5 – 28.0 = 9.5 kg

3. For the unit which the refrigerant has been recovered, execute "Outdoor Unit Backup Setup" of another section.

System HP	Combination of outdoor units				Refrigerant amount (kg)
8	8				13.5
10	10				14.0
12	12				14.5
16	8	8			21.5
18	10	8			23.0
20	10	10			25.0
24	8	8	8		30.0
26	10	8	8		31.5
28	10	10	8		33.0
30	10	10	10		34.5

13-3. Process after Repair

After completion of the repair work, perform vacuuming of the outdoor unit using the following procedure.

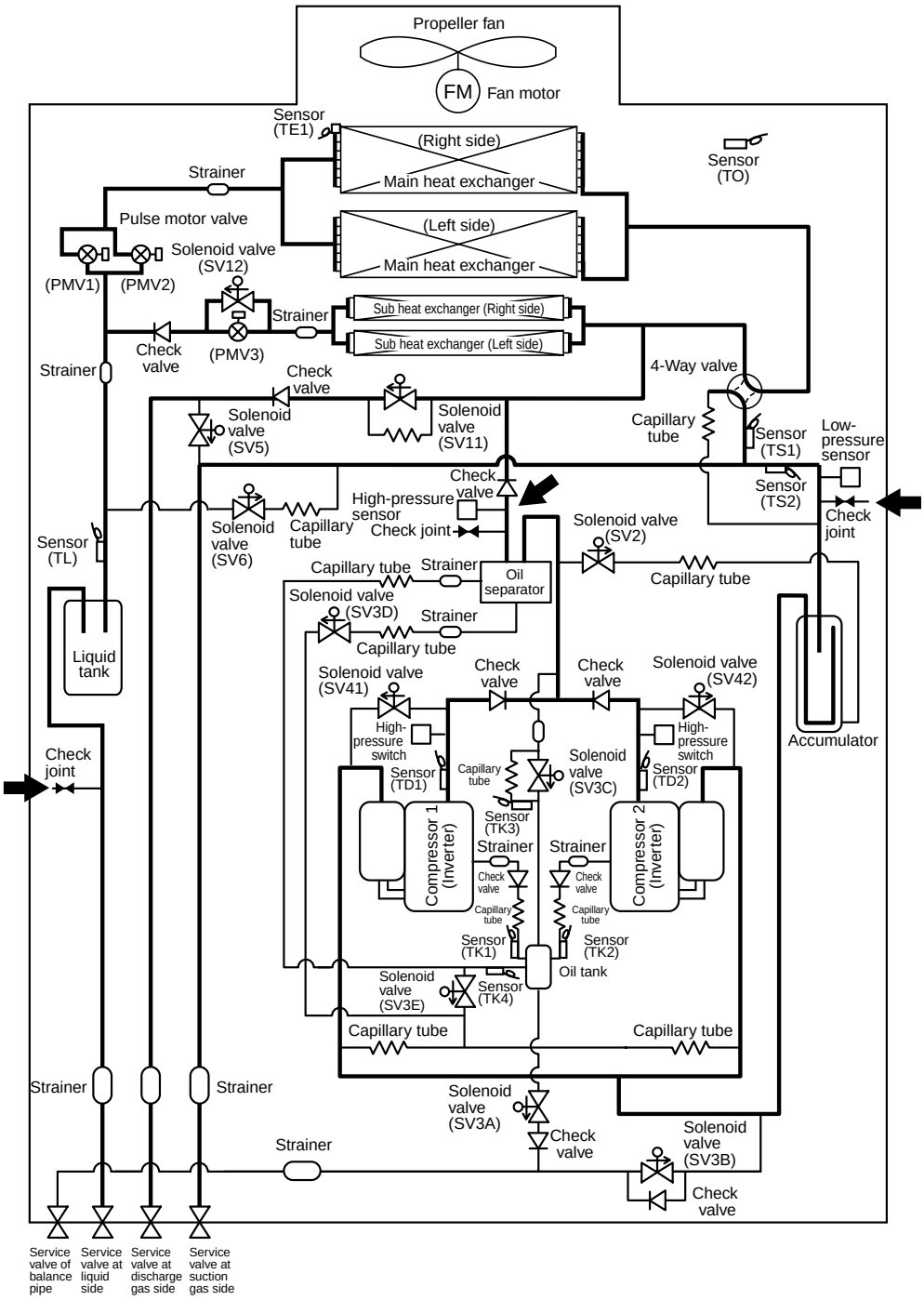
Procedure

1. Short CN30 on the interface P.C. board on the outdoor unit for which the repair work has been completed, to open the PMV fully. (Confirm that Bit 1 of SW12 is OFF.)

   Note) The PMV opening by using short CN30 returns the PMV to fully closed after 2 minutes.

   To continue to fully open status, turn off the power supply of the outdoor unit within 2 minutes after using short CN30.

2. **Be sure to perform vacuuming from the following three check joints. (Liquid pipe, discharge pipe, and suction pipe)**



14. LEAKAGE/CLOGGING OF OIL-EQUALIZATION CIRCUIT

Check code list for leakage, clogging of outdoor refrigerant circuit and oil circuit parts

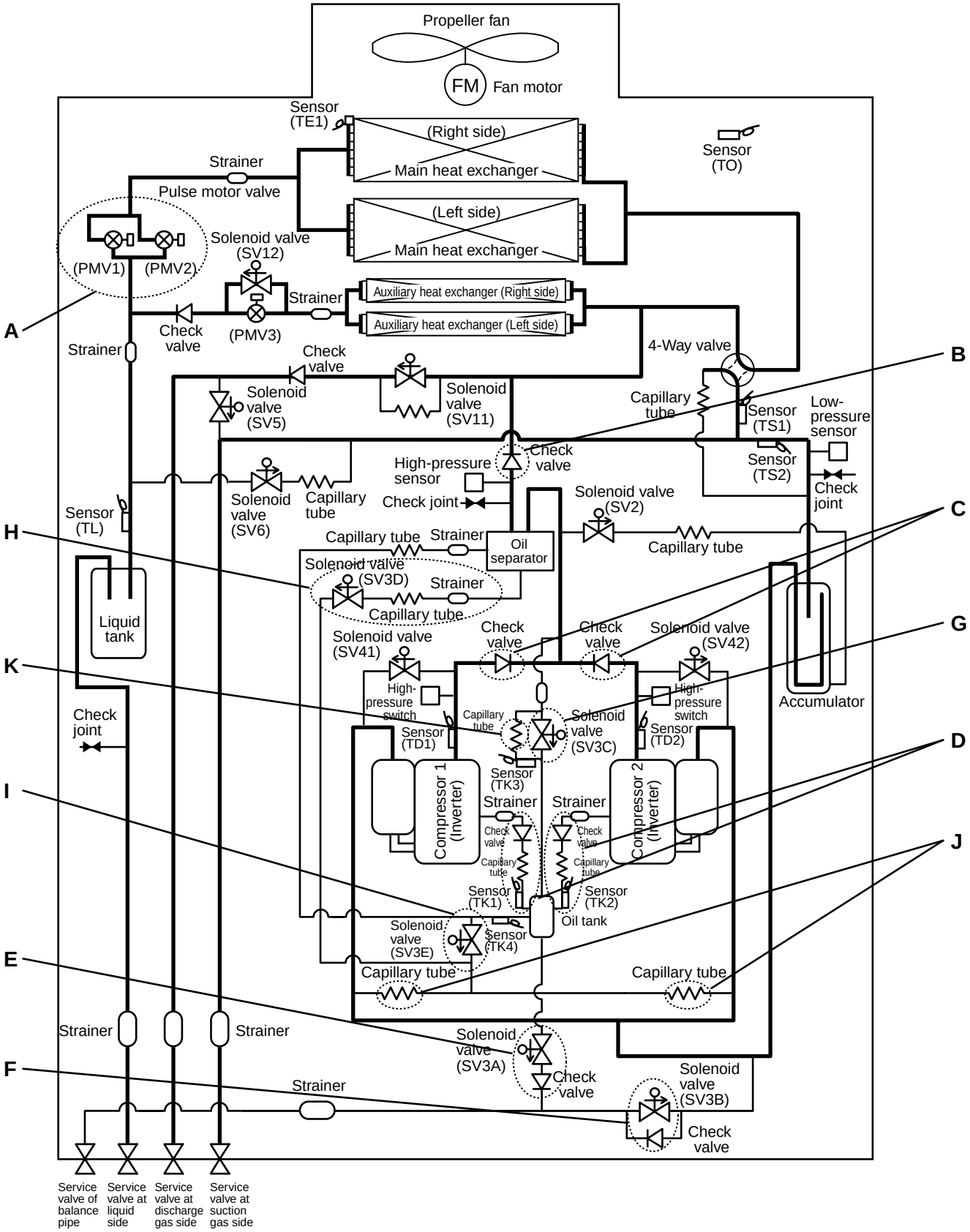
Trouble by clogging

Part name	Position with trouble (See next page.)	Unit issuing check code	Check code to be detected		Phenomena (Corresponding unit)
Outdoor PMV	A	Corresponding unit	High-pressure protective operation Low-pressure protective operation Discharge temp. error	P20 H06 P03 P17	High-pressure up Low-pressure down Discharge temp. up
Check valve of main discharge pipe collective section	B	Corresponding unit	High-pressure protective operation High-pressure SW system error	P20 P04-XX	Abnormal high-pressure up
Check valve of discharge pipe	C	Corresponding unit	High-pressure SW system error	P04-XX	Abnormal high-pressure up
Check valve of oil-equalization circuit Capillary Strainer	D	Corresponding unit	Oil level detective circuit error Oil level down error	H16-XX H07	Oil-equalization circuit error or oil-shortage judgment
SV3A valve	E	Other connected unit	Oil level down error	H07	Excessive oil amount
SV3B valve	F	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C valve	G	Other connected unit	Oil level down error	H07	Excessive oil amount
SV3D valve SV3D valve circuit capillary Strainer	H	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3E valve	I	Corresponding unit	Oil level detective circuit error Oil level down error	H16-04 H07	Oil-equalization circuit error Judgment of shortage Shortage of oil amount
Oil return capillary	J	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C bypass capillary	K	Corresponding unit	Oil level detective circuit error	H16-03	Oil-equalization circuit error

Trouble by leakage

Part name	Position with trouble (See next page.)	Unit issuing check code	Check code to be detected		Phenomena (Corresponding unit)
Outdoor PMV	A	Corresponding unit	Outdoor liquid back error Oil level down error	P13 H07	Refrigerant stagnation
Check valve of main discharge pipe collective section	B	Corresponding unit	Oil level down error Compressor breakdown Compressor error (Lock)	H07 H01-XX H02-XX	Refrigerant stagnation
Check valve of discharge pipe	C	Corresponding unit	Oil level down error Compressor breakdown Compressor error (Lock)	H07 H01-XX H02-XX	Refrigerant stagnation
Check valve of oil-equalization circuit	D	Corresponding unit	Oil level down error	H07	Excessive oil amount (Leaked side) Shortage of oil amount (Normal side)
SV3A valve	E	Corresponding unit	Oil level down error	H07	Shortage of oil amount
SV3C valve	G	Corresponding unit	Oil level down error	H07	Judgment of oil shortage

NOTE) XX: Error on sub-code


Propeller fan
FM
Fan motor
Sensor (TE1)
(Right side)
Main heat exchanger
(Left side)
Main heat exchanger
Sensor (TO)
Strainer
Pulse motor valve
Solenoid valve (SV12)
(PMV1)
(PMV2)
Strainer
Auxiliary heat exchanger (Right side)
Auxiliary heat exchanger (Left side)
Check valve
(PMV3)
A
Strainer
Check valve
4-Way valve
B
Solenoid valve (SV5)
Solenoid valve (SV11)
Capillary tube
Sensor (TS1)
Low-pressure sensor
Sensor (TS2)
Check joint
Check valve
High-pressure sensor
Check joint
Solenoid valve (SV2)
C
Sensor (TL)
Solenoid valve (SV6)
Capillary tube
H
Capillary tube
Strainer
Oil separator
Capillary tube
Solenoid valve (SV3D)
Strainer
Capillary tube
Liquid tank
Solenoid valve (SV41)
Check valve
Check valve
Solenoid valve (SV42)
G
K
High-pressure switch
Capillary tube
Solenoid valve (SV3C)
High-pressure switch
Accumulator
Check joint
Sensor (TD1)
Sensor (TD2)
D
Sensor (TK3)
I
Compressor 1 (Inverter)
Strainer
Strainer
Compressor 2 (Inverter)
Check valve
Capillary tube
Check valve
Capillary tube
J
Sensor (TK1)
Sensor (TK2)
Oil tank
Solenoid valve (SV3E)
Sensor (TK4)
E
Capillary tube
Capillary tube
Strainer
Strainer
Solenoid valve (SV3A)
Check valve
Solenoid valve (SV3B)
F
Strainer
Check valve
Service valve of balance pipe
Service valve at liquid side
Service valve at discharge gas side
Service valve at suction gas side

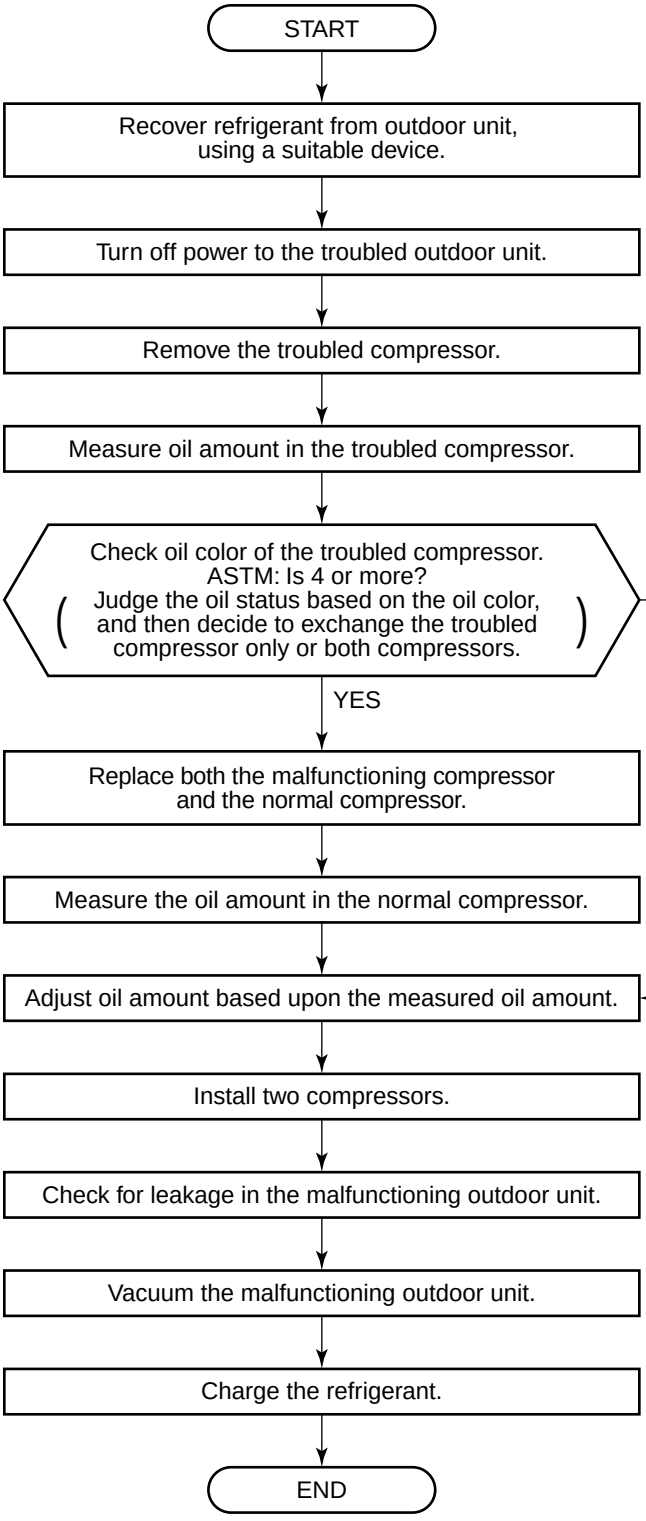
15. REPLACING COMPRESSOR

15-1. Compressor Replacing Procedure (Outline)

⚠ WARNING

Never recover the refrigerant into outdoor unit.

Be sure to use a refrigerant recovery device for refrigerant recovery for reinstallation or repair work. Recovery into the outdoor unit is unavailable; otherwise a serious accident such as rupture or ingury could occur.



NOTE) Full opening operation of PMV by CN30 short-circuiting rwill return to fully closed after 2 minutes have passed.
To continue full-opening status, turn off power to the outdoor unit within 2 minutes.

* This flowchart is the standard for replacing compressors.
Each case must be considered on individual circumstances.
Replace the compressors based on the following conditions of judgement.

1. Oil of 1900 cc is charged in a compressor for service.
2. The amount of oil is 3800 cc in an outdoor unit at shipment.
3. When a compressor is removed, it usually contains 800 to 1400 cc of oil.
   Oil separator usually holds 0 to 1000 cc of oil.

15-2. Replacing Compressor

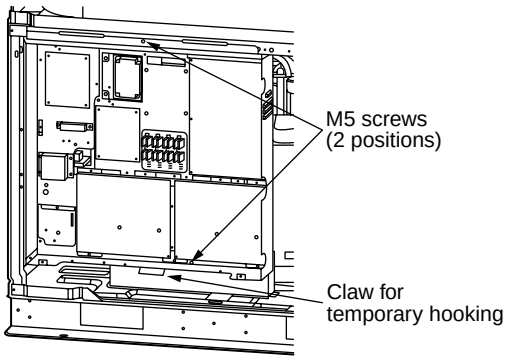
Exchanging a compressor

When changing the compressor, extract oil from the defective compressor and based on the quality of the oil, make the decision of whether to change one or both compressors.

If oil colour ASTM is 4.0 or more, both compressors should be replaced.

⚠ CAUTION

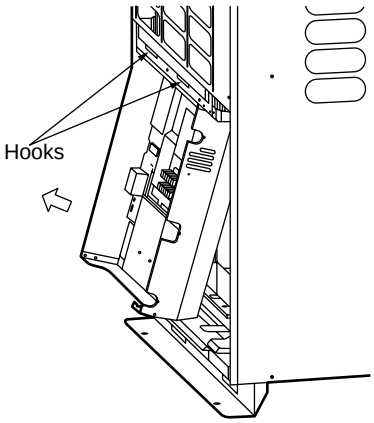
The compressor can weigh in excess of 20kg.
One person should not attempt to lift it alone.



Removal of defective compressor

- Turn off the power supply to the defective unit.
- Remove the front panel. (M5 × 7)
- Remove the cover on the electric parts box. (M4 × 2)
- Remove the screws (M5 × 2) that fix the electric parts box to the outdoor unit.
- Remove the tabs for temporary hooking the lower part of the electric parts box.

  Note) Due to the center of gravity of the electrical box, pay careful attention as the box may fall out.



- Remove the tabs from the upper part of the electric parts box and move it to the valve side.

  Note) The electrical parts box may become unstable.

  If it does, disconnect all cables and completely remove the electrical parts box.

- Remove the lower duct. (M4 × 4)
- Remove the sound-insulation mat.
- Remove the crank case heater.
- Remove the terminal cover of the compressor, the wiring to the compressor and the case thermostat unit.

  Note) Remove the cables from the compressor side only.

  Ensure the cable ends are insulated with electrical tape.

⚠ WARNING

Be aware that if oil is present when brazing a fire could occur.

- Remove the discharge pipe, suction pipe, and oil-equation pipe.
- Remove the hexagonal bolts fixing the compressor. (One side of hexagon: 13mm × 2 pcs. a compressor)

  Note) Only two hexagonal bolts are provided per compressor.

- Remove the compressor.

Measurement of the quantity of oil in the defective compressor

- Place the defective compressor on a scale, and use the weight to calculate the oil quantity.

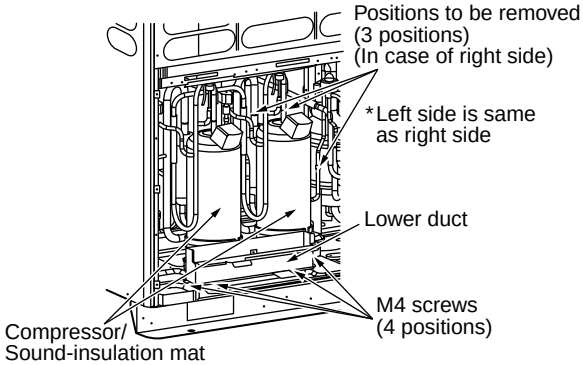
  Oil amount in the defective compressor:

  A [cc] = (Removed compressor mass (kg) –23.5) × 1042

  (Specific gravity of oil: 1042 cc/kg)

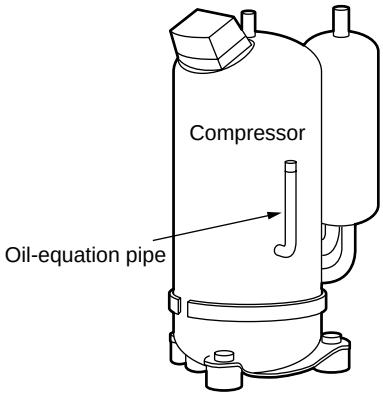
  Note)

  - When compressor holds no oil, mass is 23.5 kg.



Color check of oil in the defective compressor

- Lay the defective compressor down, extract a little oil from the oil-equalization pipe and then check the oil colour based on the oil colour sample.
  - Determine the number of compressors to replace based on the oil colour:
  - ASTM below 4: Replace the defective compressor
  - ASTM above 4: Replace both compressors



When replacing only the defective compressor

Adjustment of oil amount in the service compressor (Oil amount 1900cc at shipment)

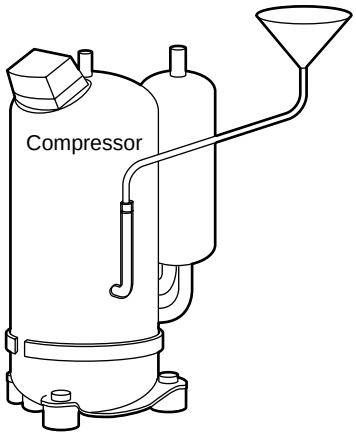
- Adjust the oil amount in the service compressor based on the amount of oil found in the defective compressor by following instructions below.

1. If the amount of oil in the defective compressor is $0 \leq A < 1000$
   1) Adjust the amount of oil in the service compressor to 1000 cc.
      Lay the service compressor down, and extract 900 cc of oil from the oil-equalization pipe.

   Note) Do not extract more than 900 cc as a compressor fault may be caused.

   - If the amount of oil in the defective compressor is below 500 cc, a fault in the oil-equalization circuit is possible.
     Check the compressor using "**15-3. Procedure to Identify the Cause of Compressor Oil Shortage**".

2. If the amount of oil in the defective compressor is $1000 \leq A < 1900$
   1) Adjust the amount of oil in the service compressor to A cc.
      Lay the service compressor down and extract (1900 - A) cc of oil from the oil-equalization pipe.
3. If the amount of oil in the defective compressor is $1900 \leq A$
   1) Adjust the amount of oil in the service compressor to A cc.
      Insert a hose into the discharge pipe or oil equation pipe of the service compressor and then add (A - 1900) cc of oil using a funnel.



When replacing both the defective and normal compressors

Removal of normal compressor

- Remove the normal compressor in the same way as the defective compressor.

Note)

- Be sure to apply insulation to the removed cable terminals with insulating tape, etc.

⚠ WARNING

Be aware that if oil is present when brazing, a fire eruption could occur.

Measurement of oil amount in the normal compressor

- As with measurement of oil amount in the defective compressor, place the defective compressor on a scale, and use the weight to calculate the oil quantity.

  Oil amount of the normal compressor: B [cc] = (Removed compressor mass (kg) –23.5) × 1042
  (Specific gravity of oil: 1042 [cc/kg])

Note)

- When the compressor holds no oil, the compressor mass is 23.5kg.

Adjustment of oil amount in the service compressor

- Adjust the oil amount in the service compressors based on the amount of oil found in the defective compressor (A cc) and normal compressor (B cc) by following instructions below.

1. If the total amount oil in both the compressors is $0 \leq (A + B) < 2000$
   1) Adjust the amount of oil in the two service compressors to 1000 cc each.
      Lay the two service compressors down, and extract 900 cc of oil from each of the oil-equalization pipes.

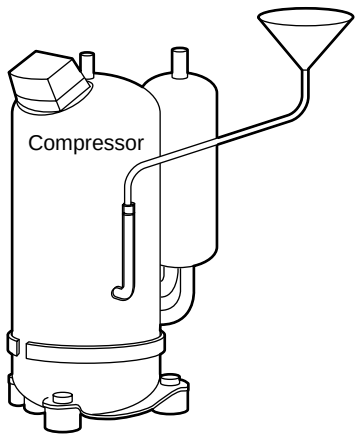
   - If the amount of oil in the defective compressor is below 500 cc, a fault in the oil-equalization circuit is possible.
     Check the compressor using "**15-3. Procedure to Identify the Cause of Compressor Oil Shortage**".

2. If the total amount of oil in both the compressors is $2000 \leq (A + B) < 3800$
   1) Adjust oil amount in the two service compressors to $\frac{A + B}{2}$ [cc] each.

      - Lay the two service compressors down and extract $\frac{3800 - (A + B)}{2}$ [cc] of oil from each oil-equalization pipe.

3. If the total amount of oil in both the compressors is: $3800 \leq A$
   1) Adjust the amount of oil in both the service compressors to $\frac{A + B}{2}$ [cc] each.

      (Insert a hose into the discharge pipe or oil equation pipe of the service compressor and then add $\left(\frac{A + B}{2} - 1900\right)$ [cc] of oil using a funnel.)



Installation of compressor

- Install the compressor in the reverse procedure of removal.
- **When removing the compressor, the terminals may become loose.**
  If this happens crimp them with pliers and then check there are no looseness.

  Note)
  - Only two hexagonal bolts are provided to fix the compressor.
  - The tightening torque of the hexagonal bolt to fix the compressor is 200kg/cm.
  - If oil has been extracted from the accumulator, braze the cutoff pipe after pinching.

Vacuuming

In case of single outdoor system

- Connect vacuum pump to the valve charge ports on the liquid, gas pipes and the check joint on the high-pressure side and then vacuum.
- Vacuum until the vacuum low-pressure gauge indicates 1 (mmHg).
  Note)
  - Before vacuuming, open PMV1, 2 fully. Vacuuming of the outdoor heat exchanger will not occur if PMV 1 and 2 are closed.

In case of multiple outdoor unit systems

- In the case of conducting the refrigerant recovery at replacing the compressor, perform vacuuming as "**13-3. Process after Repair** ".

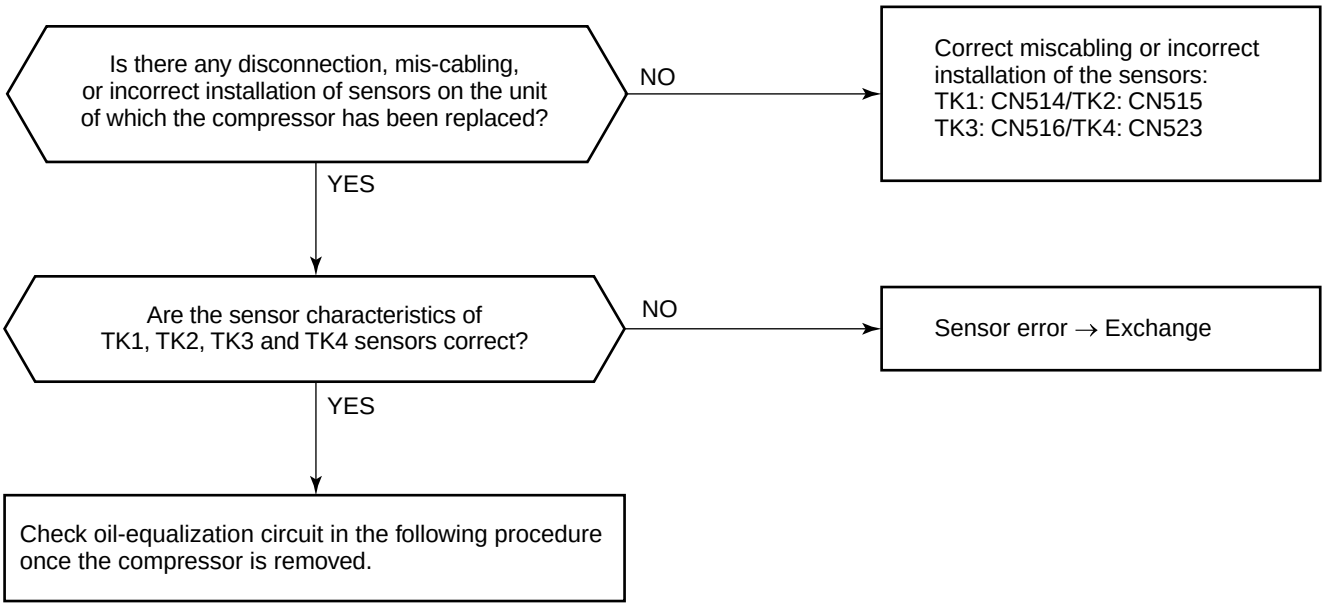
Full opening of PMV1, PMV2

- Turn on the power to the outdoor unit.
- Confirm that Bit 1 on SW12 is OFF.
- Short CN30 on I/F P.C. board on the outdoor unit.
- Turn off the power to the outdoor unit within 2 minutes of short-circuiting.

Refrigerant charging

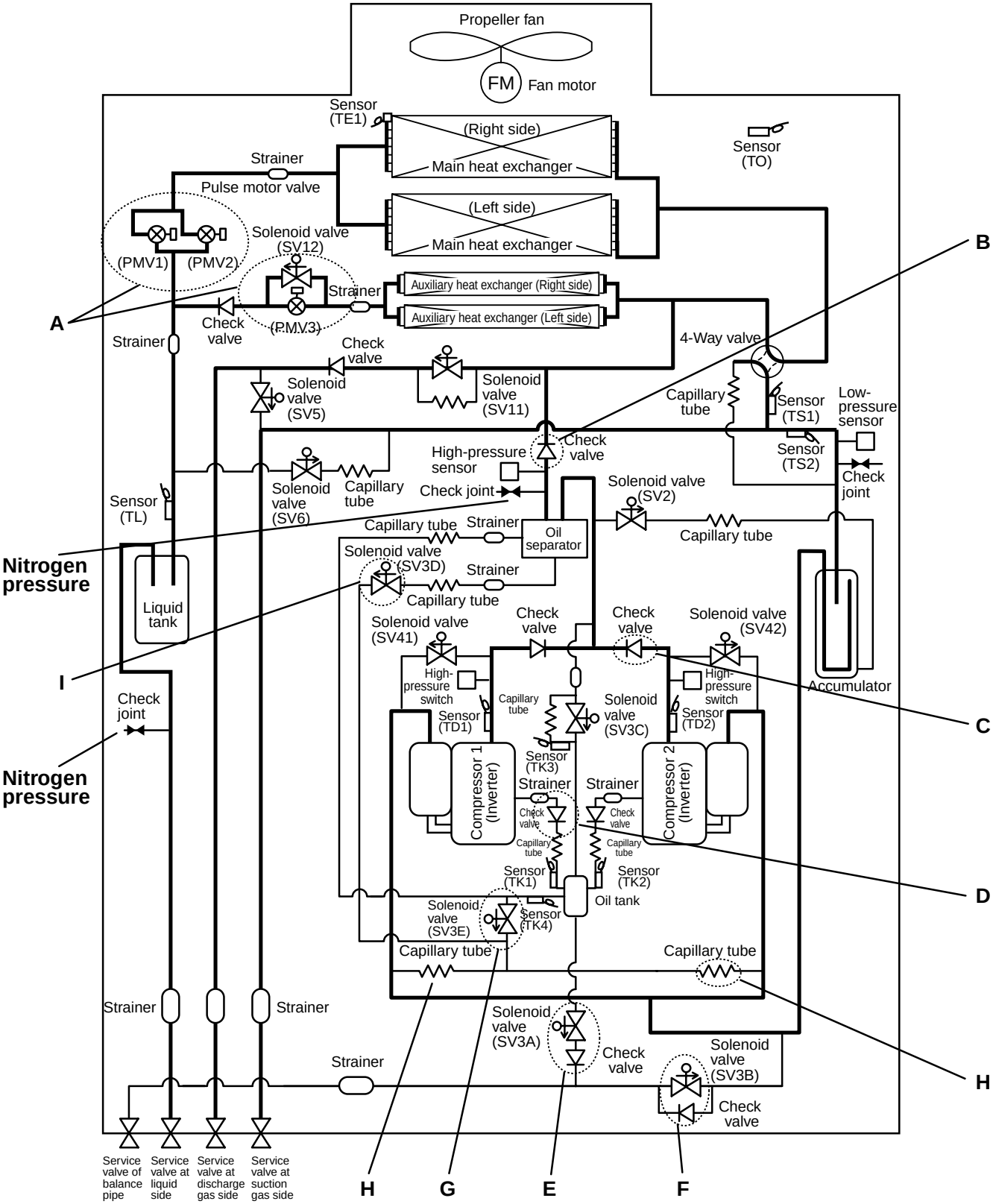
- Add the same amount of refrigerant as the remaining refrigerant from charge port of the liquid service valve.

15-3. Procedure to Identify the Cause of Compressor Oil Shortage



Check items and procedure for the oil-equalization circuit under when the compressor has been removed

	Check items	Position	Procedure
Check for refrigerant stagnation in compressor	Outdoor PMV1, 2, 3 leakage Check valve leakage on main discharge pipe	A B	1) Pressurize with nitrogen through check joint of liquid pipe and check for pressure at check joint of discharge pipe. If pressure of check joint of discharge pipe is high, leakage from outdoor PMV 1,2, 3 and check valve of main discharge pipe are possible. Exchange the parts. 2) If the pressure cannot be found, open outdoor PMV 1,2,3 fully and recheck pressure. If the pressure from the discharge check joint is high, leakage from check valve of main discharge pipe is possible. Exchange the parts.
	Check valve leakage of discharge pipe	C	3) If gas leaks from the brazed discharge pipe where compressor has been removed, when pressurized with nitrogen from the check joint of the main discharge pipes, the discharge pipe check valves is possibly leaking. Exchange the parts.
	Check valve leakage of oil-equalization circuit	D	4) If gas leaks from the brazed oil-equalization pipe where compressor has been removed, when pressurized with nitrogen from the check joint of the discharge pipe, the check valve of oil-equalization circuit is a possibly leaking. Exchange the parts.
Check for oil shortage in compressor	SV3A valve leakage SV3B valve clogging	E F	5) Pressurize with nitrogen with the check joint on the discharge pipe then open SV3B valve manually. If gas leaks from the brazed suction pipe where the compressor should be, there may be a leak in SV3A valve. Exchange the parts.
	SV3E valve clogging. Clogging of oil-return capillary	G H	6) Open SV3E valve manually while pressurizing with nitrogen using the check joint on the discharge pipe. If there is no leakage at the brazed suction pipe where the compressor was removed, the SV3E valve or oil return capillary may be clogged. Exchange the parts.
	SV3D valve capillary clogging. Clogging of oil-return capillary	I H	7) Open SV3E valve manually while pressurizing with nitrogen from the check joint of the discharge pipe. If there is no leakage at the brazed suction pipe where the compressor was removed, the SV3D valve/capillary or oil return capillary may be clogged. Exchange the parts.


Propeller fan
FM
Fan motor
Sensor (TE1)
(Right side)
Main heat exchanger
(Left side)
Main heat exchanger
Sensor (TO)
Strainer
Pulse motor valve
(PMV1)
(PMV2)
Solenoid valve (SV12)
(PMV3)
Strainer
Auxiliary heat exchanger (Right side)
Auxiliary heat exchanger (Left side)
A
B
Check valve
Strainer
Check valve
Solenoid valve (SV5)
Solenoid valve (SV11)
4-Way valve
Capillary tube
Sensor (TS1)
Low-pressure sensor
Sensor (TS2)
Check joint
Check valve
High-pressure sensor
Check joint
Solenoid valve (SV2)
Solenoid valve (SV6)
Capillary tube
Sensor (TL)
Capillary tube
Strainer
Oil separator
Capillary tube
Nitrogen pressure
Solenoid valve (SV3D)
Strainer
Capillary tube
Liquid tank
Solenoid valve (SV41)
Check valve
Check valve
Solenoid valve (SV42)
I
High-pressure switch
Capillary tube
Solenoid valve (SV3C)
High-pressure switch
Accumulator
C
Check joint
Sensor (TD1)
Sensor (TD2)
Nitrogen pressure
Sensor (TK3)
Compressor 1 (Inverter)
Strainer
Strainer
Compressor 2 (Inverter)
Check valve
Check valve
Capillary tube
Capillary tube
Sensor (TK1)
Sensor (TK2)
D
Oil tank
Solenoid valve (SV3E)
Sensor (TK4)
Capillary tube
Capillary tube
H
Strainer
Strainer
Strainer
Solenoid valve (SV3A)
Check valve
Solenoid valve (SV3B)
Check valve
Service valve of balance pipe
Service valve at liquid side
Service valve at discharge gas side
Service valve at suction gas side
H
G
E
F

16. REPLACING PROCEDURE OF PARTS

<table>
<tr><th>No.</th><th>Part to be exchanged</th><th>Work procedure</th><th>Remarks</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Cabinet</td><td>

REQUIREMENT

Wear protective clothing on your hands as other components may cause and injury etc.

Disassembling

1) Stop the unit operation and turn off the power supply to the unit.

2) Remove the screws on the discharge cabinet. (M5 × 16, 4 pcs.)

3) Remove the screws (Front/rear at lower side) on the cabinet. (M5 × 10, 7 pcs. each)

4) Remove the screws on the service panel. (M5 × 10, 3 pcs.)

5) Remove the screws (Front/rear sides) on the suction cabinet.
(M5 × 10, 4 pcs. each)
(M4 × 10, 2 pcs. each)

6) Remove the screws (Right/left sides) on the side panel. (M5 × 10, 4 pcs. each)

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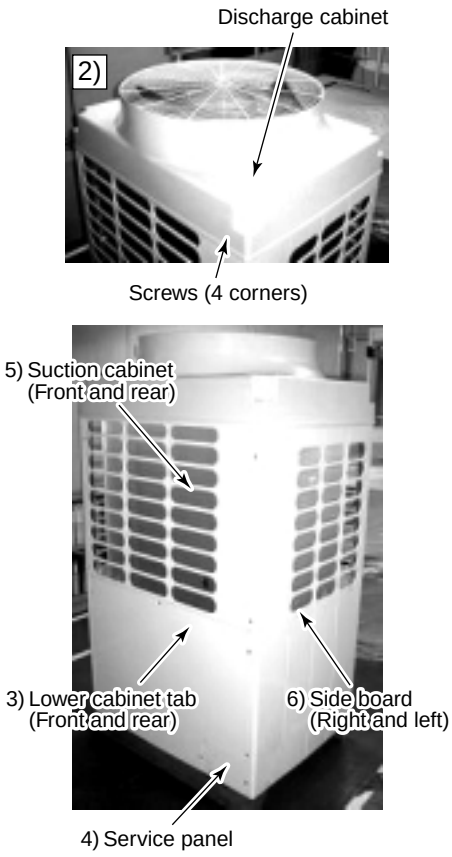

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<tr><td>

Reassembly

Reassemble the cabinet in the reverse procedure (6) → 1)) on the above “Disassembling Procedure”.
However be sure to follow the following points when assembling the discharge cabinet.

- **Cautions when assembling the discharge cabinet**

  The hooking tabs ∗ (6 positions) located on the inside edge of the discharge cabinet, are to be correctly fitted into the relevant slots on the right/left side panels.
  Failure to do so may result in unit vibration.

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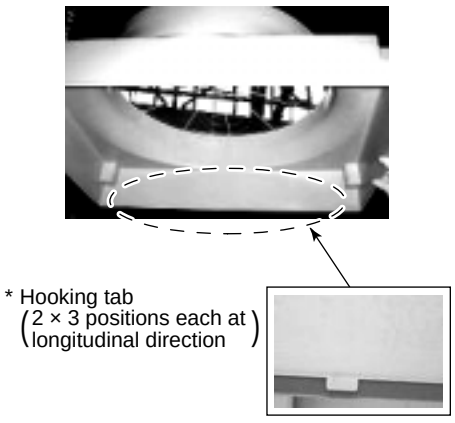

</td></tr>
<tr><td>2</td><td>Propeller fan motor</td><td>

REQUIREMENT

Wear protective clothing on your hands as other components may cause and injury etc.

Disassembling

1) Stop the unit operation and turn off the power supply to the unit.

2) Remove the screws on the discharge cabinet. (M5 × 16, 4 pcs.)

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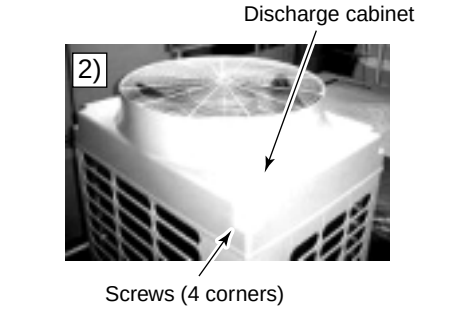
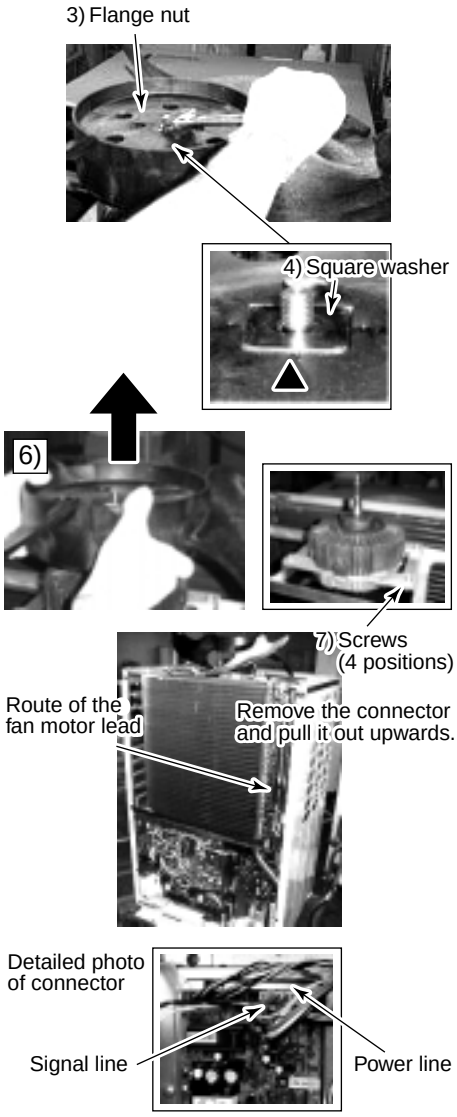
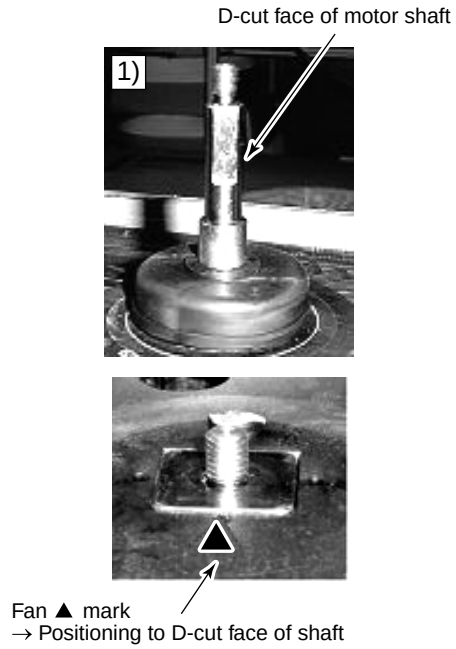
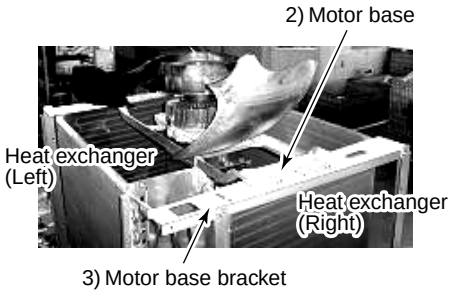
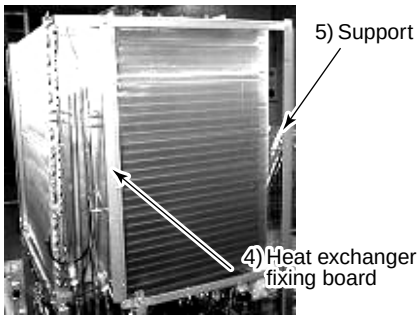
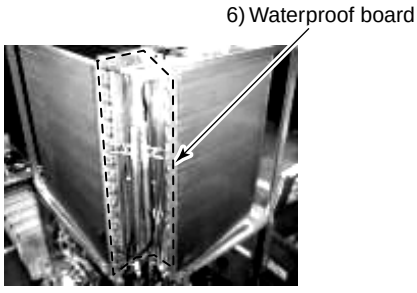
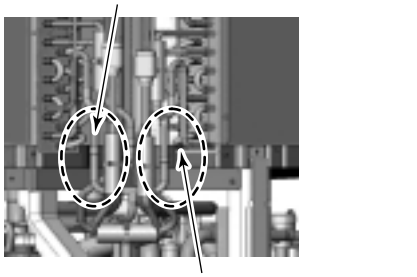
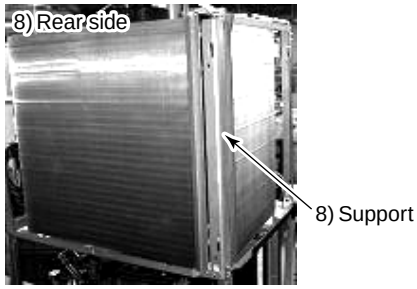
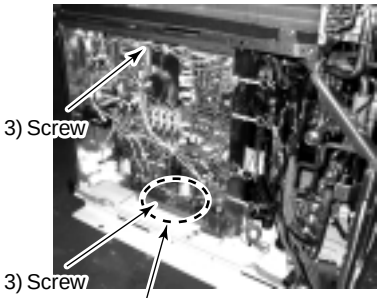
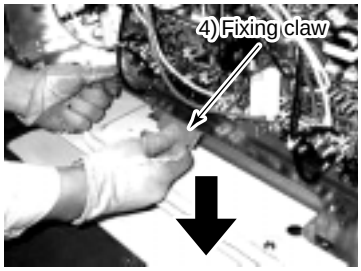
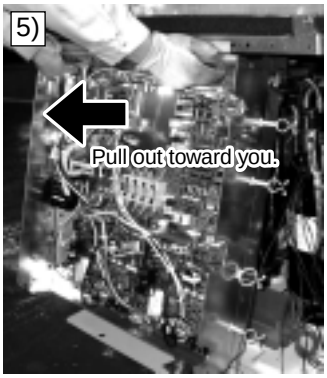
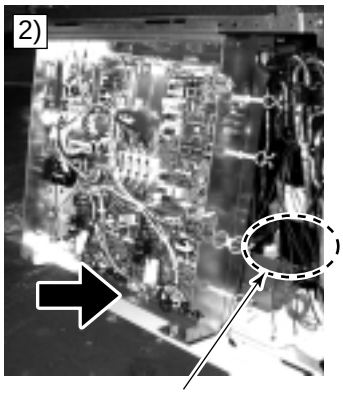
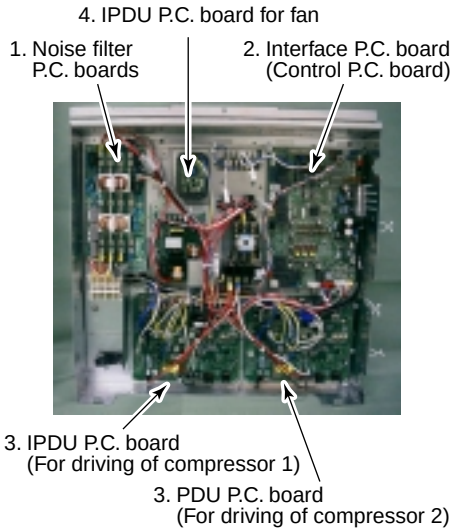
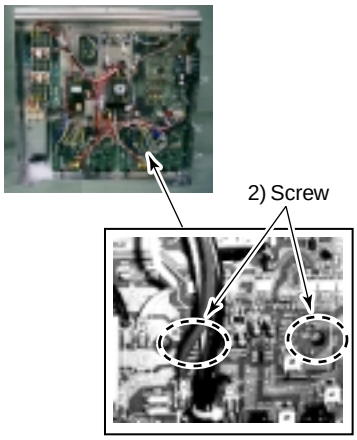
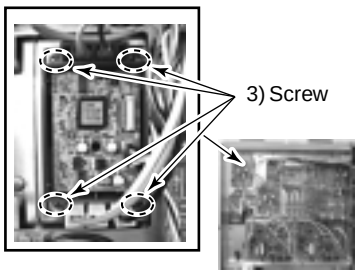


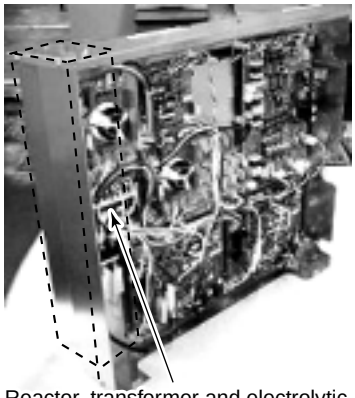
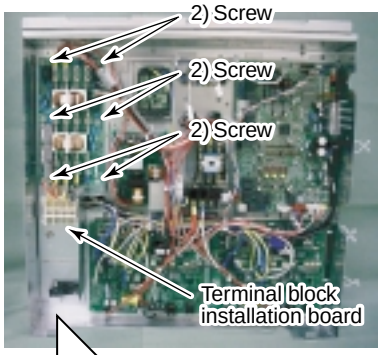
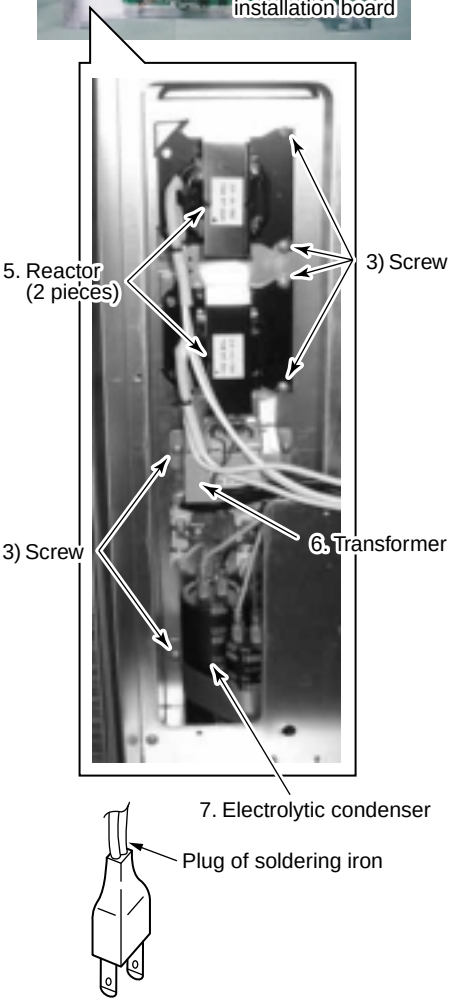
</td></tr>
</table>

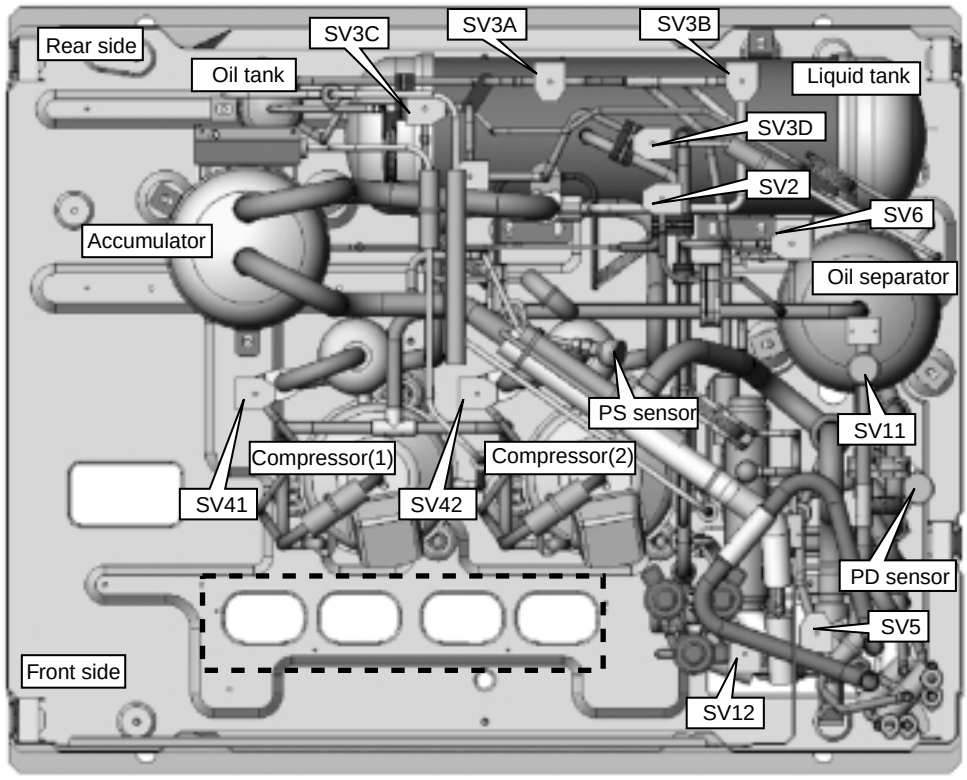
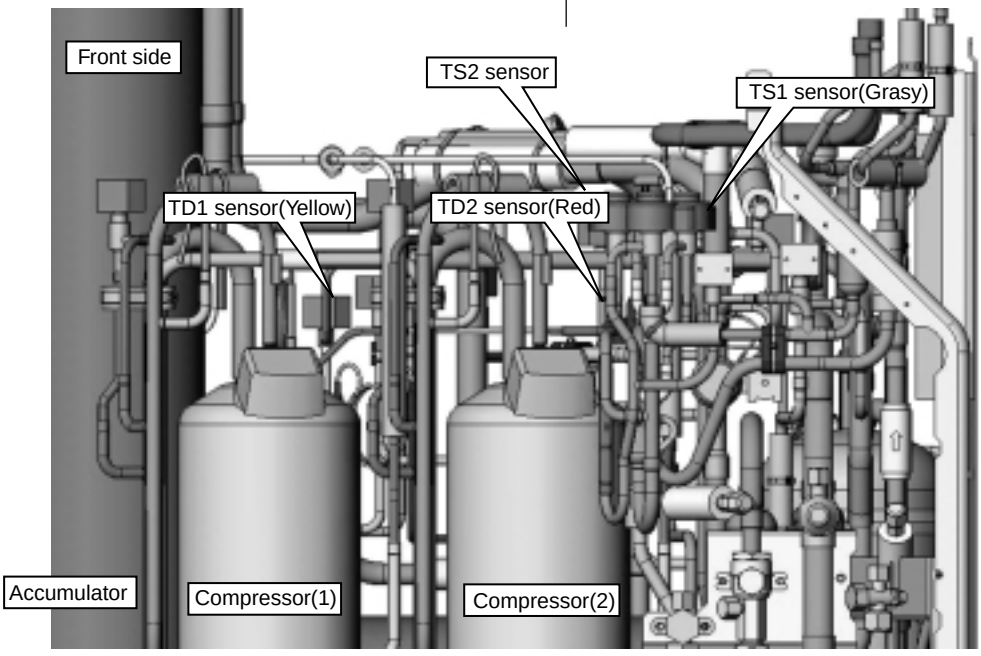
No.	Part to be exchanged	Work procedure	Remarks
2	Propeller fan motor	3) Remove the flange nut fixing on the fan motor and propeller fan. (To tighten the nut, turn it clockwise.) 4) Remove the square washer. 5) Remove the propeller fan. **NOTE** Gently pull the straight upwards. 6) Remove the connectors (3 positions) from IPDU P.C. board on the inverter fan and then pull out the fan motor lead upwards. 7) Remove the fixing screws (4 pcs.) on the fan motor.	
		◆ Cautions when exchange/reassembling the fan motor 1) Match the D-cut surface of the motor with the ▲ mark on the fan, insert the propeller fan. (If tightening the D-cut surface when out of position, the propeller fan will melt due to friction heat, which will cause the unit to malfunction.) 2) Be sure to attach the square washer. (Failure to do so will result in abnormal sound and vibration being generated.) 3) Tighten the flange nut with 15N•m (153kg•cm). 4) Insert the hooking tabs on the discharge cabinet securely into the tab holes on the cabinet. (Refer to the photo in the previous page; 3 positions each at front and rear sides, total 6 positions)	

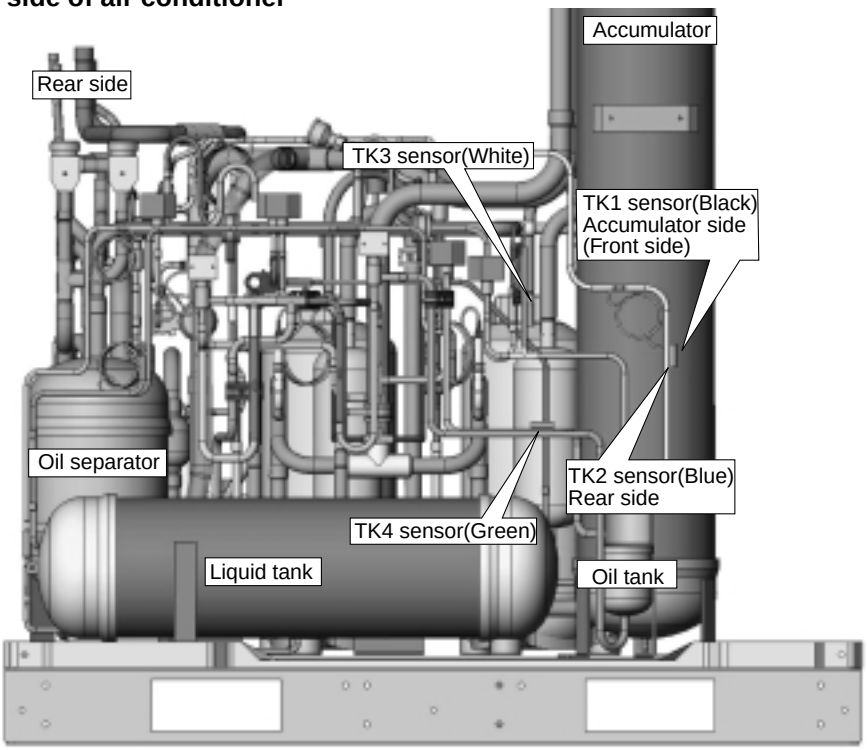
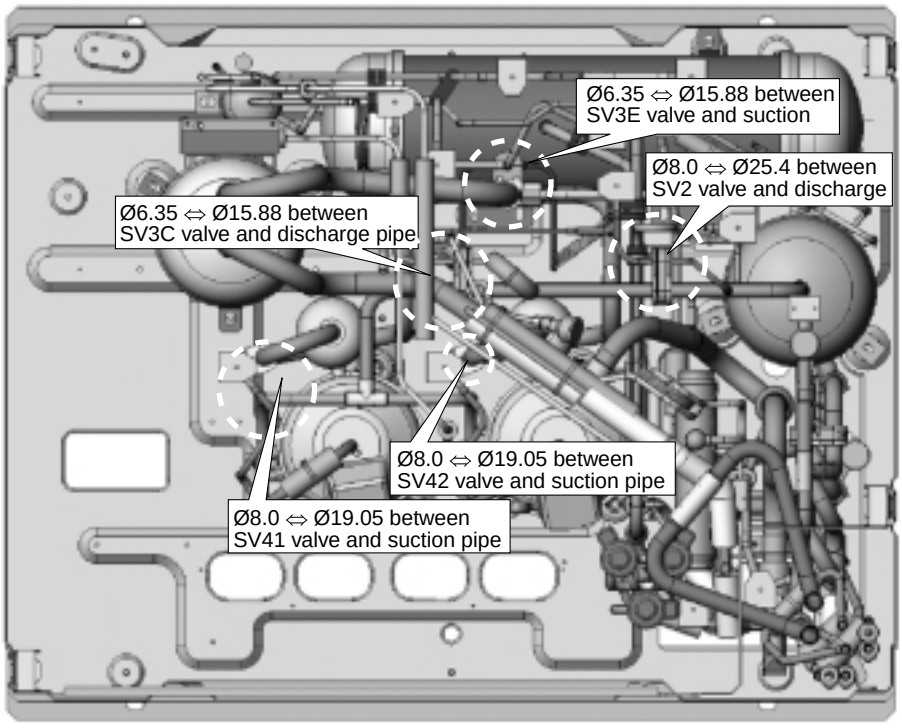
No.	Part to be exchanged	Work procedure	Remarks
3	Heat exchanger	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. Before beginning the procedure, ensure the refrigerant has been reclaimed from the outdoor unit, using a suitable refrigerant recovery device. ◆ **Disassembling (Example): Heat exchanger (Right)** 1) Remove the cabinet. 2) Remove the motor base. (M5 × 10, 4 pcs.) 3) Remove the motor base bracket. (M5 × 10, 5 pcs.) 4) Remove the screws on the heat exchanger fixing board. (M5 × 10, 6 pcs.) 5) Remove the screws on the support. (M5 × 10, 3 pcs.) 6) Remove the screws on waterproof board. (M4 × 10, 3 pcs.) 7) Remove the brazing section on the connected pipe (8 positions). 8) Remove the screws on the support at the rear side, and then pull out the heat exchanger. (M5 × 10, 2 pcs.)	     Draw it out it backwards. (Draw it out forwards in case of a left side heat exchanger.)

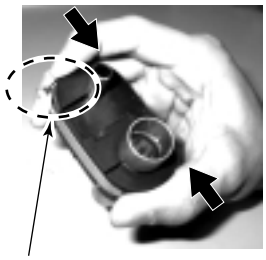
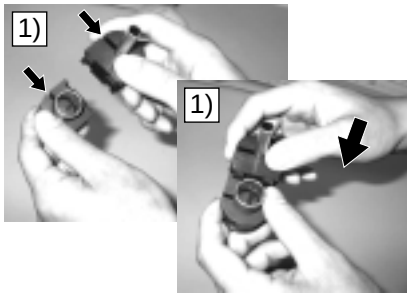
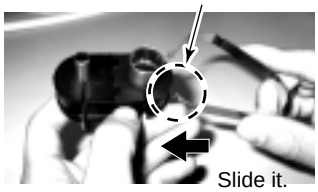
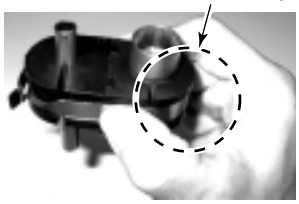
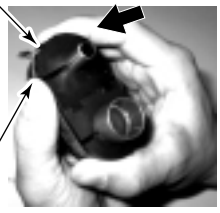
No.	Part to be exchanged	Work procedure	Remarks
4	HeInverter assembly ◆ Removal of box	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. 1) Stop the unit operation and turn off the power supply to the unit. 2) Remove the inverter cover. (M4 × 10, 2 pcs.) 3) Remove the fixing screws on the box. (1 pc. each at upper and lower sides.) 4) Lightly push down the fixing tab at the lower side to enable the box to be removed. 5) Remove the hooking tab at the upper side while holding the ceiling board with both hands.	  
		Reassembly and cautions 1) Hook the upper tab. 2) Push in the lower part. Be sure to check there is no pinching of the cables at the corners on the rear side. 3) Tighten the fixing screws on the upper and lower sides. (1 pc. each at upper/lower part)	 2) When pushing in the lower part, be sure to check that the cable is not be stretched.

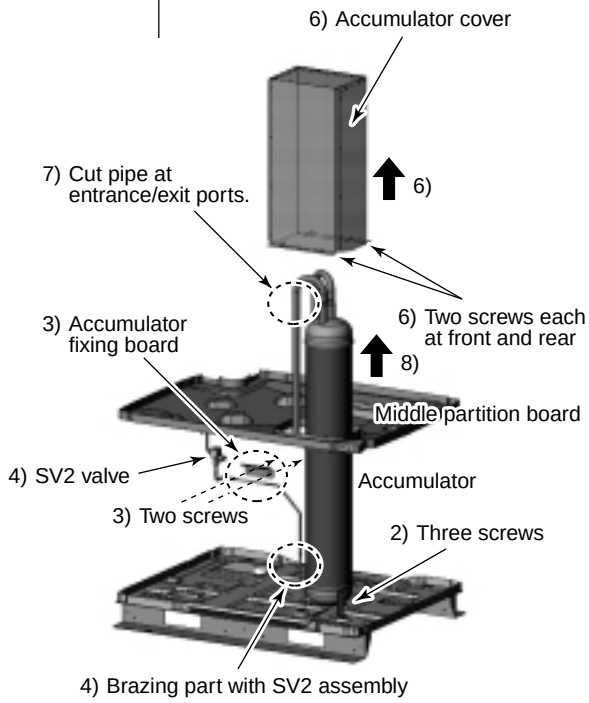
No.	Part to be exchanged	Work procedure	Remarks
5	Inverter assembly ◆ Removal of P.C. board and electric parts 1. Noise filter P.C. board 2. Interface P.C. board	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. 1) Stop the unit operation and turn off the power supply to the unit. 2) Remove the cables and then the P.C. board from the board edge spacer at the corner. **Exchange of service P.C. board** For the interface P.C. board, it is necessary to set up the jumper links, etc for each model. Refer to "Exchange procedure of interface P.C. board".	
	3. IPDU P.C. board	1) Stop the unit operation and turn off the power supply to the unit. 2) Remove the heat sink (Radiator plate) fixing screws. ∗ (M4 × 16, 2 pcs.) 3) Remove the cables. 4) Remove the P.C. board from the card edge spacer at the corners. ∗ Heat sink fixing screw, compressor lead cables (U, V, W), etc, M4 screw tightening torque (1.47±0.1N•m) **Exchange of service P.C. board** For the IPDU P.C. board, it is necessary to set up the jumper links, etc for each model. Refer to "Exchange procedure of IPDU P.C. board".	
	4. IPDU P.C. board for fan	1) Stop the unit operation and turn off the power supply to the unit. 2) Remove the wires. 3) Remove the heat sink (Radiator plate) fixing screws. ***** (M4 × 8, 4 pcs.) ∗ Tightening torque of screw for heat sink fixing board (1.47 ± 0.1N•m)	

No.	Part to be exchanged	Work procedure	Remarks
5	Inverter assembly ◆ Removal of P.C. board and electric parts 5. Reactor 6. Transformer 7. Electrolytic capacitor	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. 1) Stop operation, and then turn the power supply to the unit. 2) Take off the screws (3 positions) on the terminal block installation board. 3) Take off the fixing screws on each part and then remove the cables. ∗ ∗ Caution when removing the electrolytic capacitor (No.7) 1) Electrolytic capacitors will discharge over time. As the natural discharge by the electlytic capacitor may be unavailable and voltage may remain in some cases due to trouble conditions, be sure to confirm discharge of the capacitor. 2) Use a suitable resistive load (100Ω/40W or equivalent) to discharge the capacitor or plug of the soldering iron, make continuity and discharge between ⊕ and ⊖ poles. Recommendation will check the voltage with a DC volt meter. **NOTE** Do not discharge using a tool (e.g. screw-driver) as the capacitor charge can cause an injury.	 Reactor, transformer and electrolytic condenser are stored at the rear side of the terminal block.  

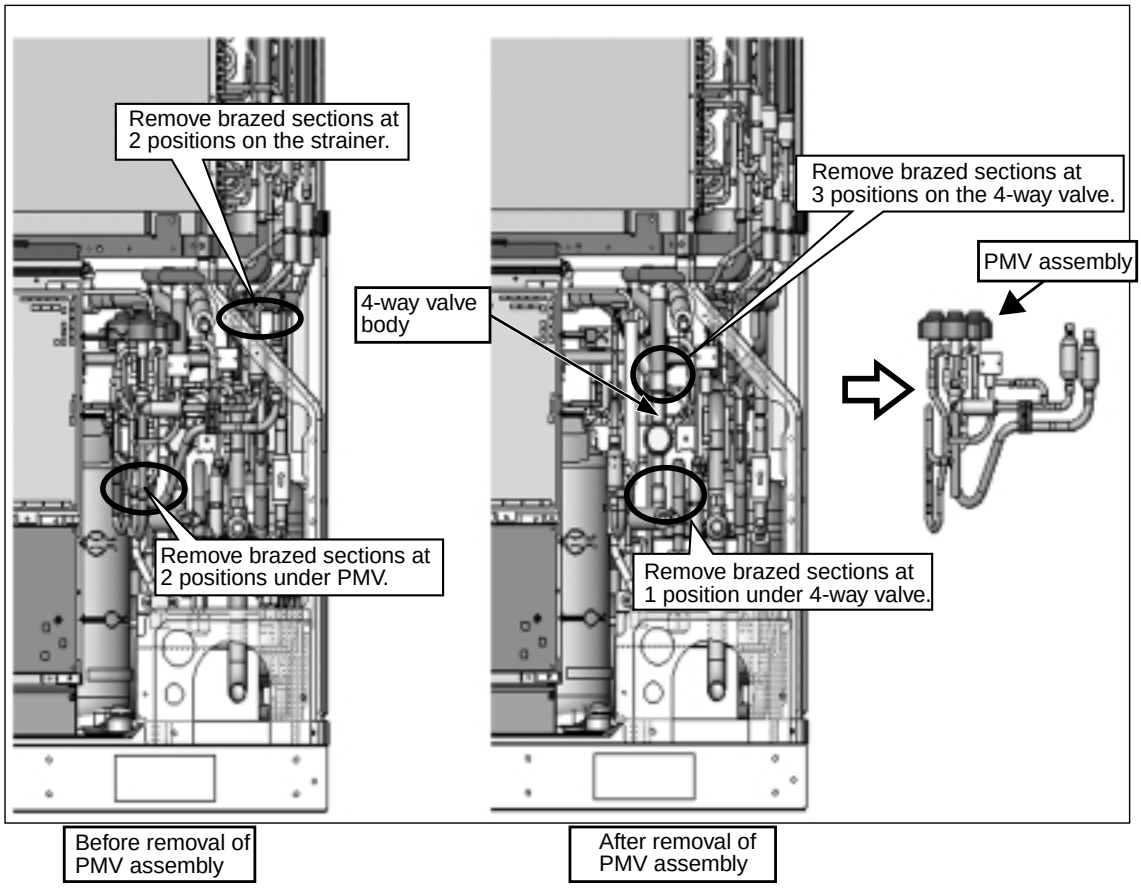
No.	Part to be exchanged	Work procedure	Remarks
6	Pressure sensor positions of 2-way valve coil		
7	Temperature sensor positions and identification	**Front side of air conditioner** 	

No.	Part to be exchanged	Work procedure	Remarks
7	Temperature sensor positions and identification	**Rear side of air conditioner**  	
8	Attachment/ detachment of pipe fixing rubber	This air conditioner has been designed so that vibration has been reduced to a minium by incorporating in the lower section of the unit, the use of eyeglass rubber fixing brackets and SUS bands. Both of which greatly help to reduce vibration and improve unit reliability. **Used positions of SUS fixing band: Total 5 positions**  	

No.	Part to be exchanged	Work procedure	Remarks
8	Attachment/ detachment of pipe fixing rubber	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. **Disassembling** 1) Squeeze the band either side of the clip to release. 2) Pushing in the tab side of SUS band the tab comes off from square hole.	1)  Compress the rubber to release the cup. 1) Push in the band towards the arrow mark.
		Assembly 1) Individually fit each rubber bracket to the relevant pipe. 2) For assembly align the tab side of the SUS band to the slit side of the rubber bracket. 3) Attach the rubber band so that there is no gap between the SUS band and the the fixing rubber bracket. Pay special attention no to create a gap at the hair pin of the rubber band. 4) Squeeze the rubber bracket and band so that the hook part of the band clips into the square hole.	Align the direction of the slits and then attach to each pipe.  Matching the tabs, the slide them. Align the tabs to the slit side of the rubber. 2)  Slide it. Push the band against the rubber to eliminate any gaps. 3)  Slide the square hole side towards the arrow mark. 4)  Push the tab side up against the rubber.

No.	Part to be exchanged	Work procedure	Remarks
9	Exchange of accumulator	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. Before beginning the procedure, ensure the refrigerant has been reclaimed from the outdoor unit, using a suitable refrigerant recovery device. 1) Remove the lower cabinet (rear side). 2) Remove the fixing screws (M6 × 3 pcs.) from the accumulator leg ⇔ base board. 3) Remove the accumulator fixing board ∗ ⇔ fixing screws on accumulator (M6 × 2 pcs.) ∗ The accumulator fixing board is fixed to the middle partition board. (Take off only the screws, which fix the accumulator unit.) 4) Remove the pipe (brazing part) connected to the SV2 valve. 5) Remove the discharge cabinet fan and motor base. 6) Remove the accumulator cover ⇔ fixing screws (M5 × 4 pcs.) of the middle partition board and then pull it upwards. 7) Using a pipe cutter, cut off the entrance/exit pipe of accumulator at the specified position. (For the cut-off position, refer to the Manual attached to the repair parts.) 8) Pull the accumulator upwards.	

No.	Part to be exchanged	Work procedure	Remarks
10	Exchange of 4-way valve	**REQUIREMENT** Wear protective clothing on your hands as other components may cause and injury etc. Before beginning the procedure, ensure the refrigerant has been reclaimed from the outdoor unit, using a suitable refrigerant recovery device. 1) Remove the lower cabinet (Front side). 2) Remove the inverter box according to the item “How to remove the inverter box”. 3) Remove the brazed sections on PMV assembly at 3 positions. (Refer to the figure below.) 4) Remove the brazed sections on the 4-way valve at 4 positions. ∗ When brazing, prepare a shield plate, etc. so that the brazing flames do not burn the wires.	



17. P.C. BOARD

17-1. Indoor Unit

17-1-1. Exchange of P.C. Board for Indoor Service

Part code	Model type	P.C. board model	Label display on P.C. board
431-6V-207	MMU-AP✻✻1WH series MMU-AP✻✻1YH series MMU-AP ✻✻1SH series MMD-AP✻✻1H series MML-AP✻✻1H series MMU-AP✻✻1BH series MMF-AP✻✻1H series	MCC-1403	03RD M01
431-6V-210	MMD-AP✻✻1BH series	MCC-1402	03DD M02
431-6V-269	MMU-AP✻✻1H series MMC-AP✻✻1H series MMK-AP✻✻1H series MMD-AP✻✻1SPH/SH series MMU-AP✻✻2SH series	MCC-1402	03DD M03

Requirement when exchanging the P.C. board assembly for indoor service

The fixed memory (herein EEPROM, IC10) stores the model type and capacity code, which are set upon shipment from the factory.

Data set upon installation (i.e. line/indoor/group addresses) are also stored in the EEPROM.

Proceed with the exchange of the P.C. board as shown in the procedure below.

After exchange, confirm the settings for master/sub, etc. are correct and carry out a test operation.

Exchange procedure

Method 1

Before exchange, it is possible to turn on the power of the indoor unit and read out the setup contents from the wired remote controller.

Readout of EEPROM data: **Procedure 1**

⇩

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Programming the EEPROM data: **Procedure 3**

⇩

Power supply reset
(All the indoor units connected to the remote controller are reset in case of group operation control)

Method 2

Before exchange, it is impossible to read out the setup contents due to EEPROM error.

Exchange of P.C. board for service & power ON: **Procedure 2**

⇩

Writing-in of the setup data such as the model name, capacity code, indoor unit address high ceiling setup, connection setup of option,
etc to EEPROM based upon customer's information: **Procedure 3**

⇩

Power supply reset (All the indoor units connected to the remote controller in case of group operation control)

Procedure 1 : Readout setup contents from EEPROM

(Contents of EEPROM with setup changed at local site include setup at shipment from the factory are read out.)

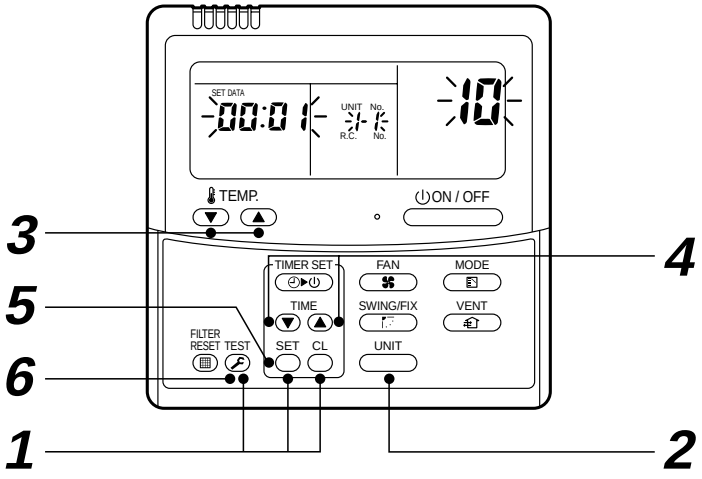
1. Push SET + CL + TEST buttons simultaneously for 4 seconds or more. ***1***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
   ∗ In a group operation control, the firstly displayed unit No. indicates the header indoor unit No.
   In this case, 10 is displayed in the item code (DN). The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
2. Every pushing UNIT , the indoor unit Nos. in the group control are displayed successively. ***2***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
   Specify the indoor unit No. to be exchanged.
   ∗ The fan of the selected indoor unit operates, and also starts swinging in a model with flap.
3. Using temperature setup ▼ / ▲ buttons, the item code (DN) can be moved up/down one by one. ***3***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
4. First change the item code (DN) from 10 → 01. (Setup of filter sign lighting time)
   In this time, make a note of contents of the displayed setup data.
5. In the next time, change the item code (DN) using ▼ / ▲ buttons.
   Make a note of contents of the setup data as same as the above.
6. Then repeat item 5., and make a note of contents of the important setup data as indicated in the attached table (Example).
   ∗ The item code (DN) is consisted with 01 to AA.
   DN No. may jump on the way.
7. When noting has finished, push TEST button to return to the normal stop status. ***6***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
   (It requires approx. 1 minute to operate the remote controller.)

Item code necessary at minimum

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

Type and capacity of the indoor unit are necessary to set up the revolution frequency of the fan.

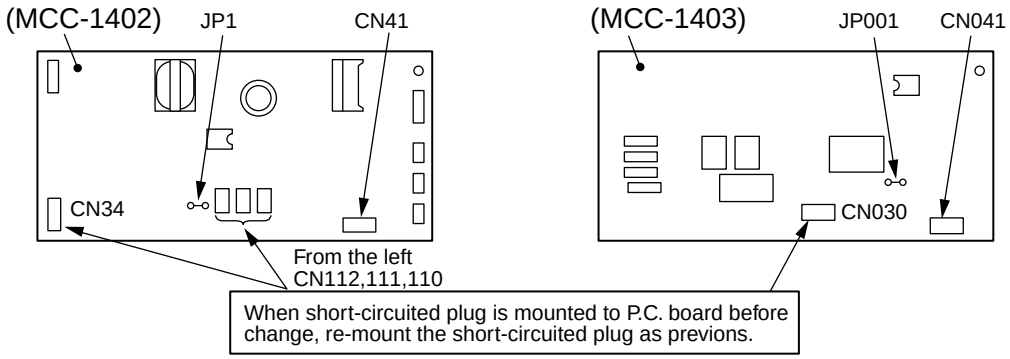
<Remote controller operation diagram>



Procedure 2 : Exchange of P.C. board for service

1. Exchange P.C. board with a P.C. board for service.

   In this time, the jumper line (cut) setup or the (short-circuit) connecting connector setup on the previous P.C. board should be reflected on P.C. board for service. (See the blow figures.)



2. It is necessary to set Indoor unit to be exchanged : Remote controller = 1 : 1

   Based upon the system configuration, turn on power of the indoor unit with one of the following items.

   1) Single (Individual) operation

      Turn on power of the indoor units and proceed to **Procedure 3**.

   2) Group operation

      A) In case that power of the exchanged indoor unit only can be turned on

         Turn on power of the exchanged indoor unit only and proceed to **Procedure 3**.

      B) In case that power of the indoor units cannot be turned on individually (***Case 1***)

         a) Remove temporarily the group wire connected to the terminal blocks A and B of the exchanged indoor unit.

         b) After connecting the remote controller wire only to the removed terminal block, turn on power of the indoor units and proceed to **Procedure 3**.

         ∗ When the above methods cannot be used, follow to the two cases below.

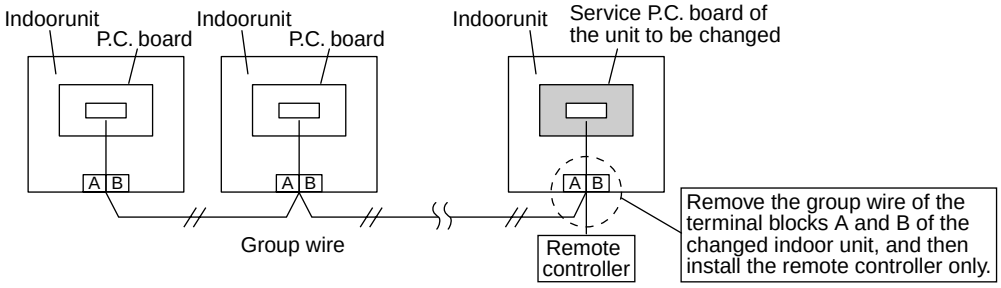
      C) In case that power of the indoor units cannot be turned on individually (***Case 2***)

         a) Remove all CN41 connectors of the indoor units in the same group except those of the exchanged indoor unit.

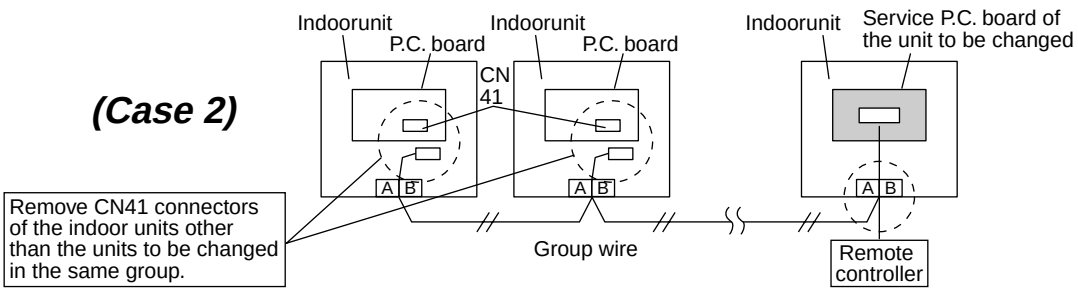
         b) Turn on power of the indoor units and proceed to **Procedure 3**.

         ∗ After **Procedure 3** operation has finished, be sure to return the temporarily removed group wire or CN41 connector to the original connection.

(Case 1)



(Case 2)



Procedure 3 : Writing-in of setup contents to EEPROM

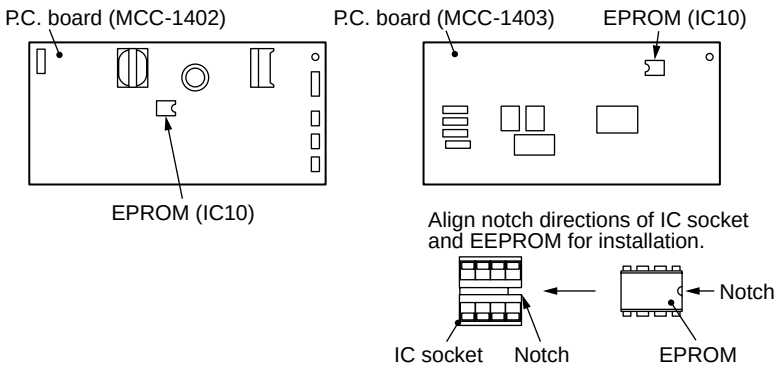
(The EEPROM contents which are installed on the service P.C. board have been set up at shipment from the factory.)

1. Push SET + CL + TEST buttons simultaneously for 4 seconds or more. ***1***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
   (ALL is displayed in the UNIT No box.)
   In this time, 10 is displayed in the item code (DN). The fan of the indoor unit operates, and also starts swinging in a model with flap.
2. Using temperature setup ▼ / ▲ buttons, the item code (DN) can be moved one step up 1 or down one by one. ***3*** (Corresponds to number of the operation diagram of the remote controller in page 218.)
3. First set up the type and capacity code of the indoor unit.
   (The data at shipment from the factory is written in EEPROM by changing the type and capacity code.)
   1) Set 10 to the item code (DN). (As before)
   2) Using the timer time ▼ / ▲ buttons, set up the type. ***4***
      (Corresponds to number of the operation diagram of the remote controller in page 218.)
      (For example, 0001 indicates 4-way Air Discharge Cassette type.): Refer to the attached table.
   3) Push SET button. (OK if display goes on.) ***5***
      (Corresponds to number of the operation diagram of the remote controller in page 218.)
   4) Using temperature setup ▼ / ▲ buttons, set 11 to the item code (DN).
   5) Using the timer time ▼ / ▲ buttons, set up the capacity code.
      (For example, 0012 indicates 027 type.): Refer to the attached table.
   6) Push SET button. (OK if display goes on.)
   7) Push TEST button to return to the normal stop status.
4. In the next, the contents such as address setup, which were set up at the local site after installation are written in EEPROM. Execute again the operation in the above item 1.).
5. Using temperature setup ▼ / ▲ buttons, set 01 to the item code (DN).
   (Lighting time setup for filter sign)
6. Compare the contents of the setup data which is displayed in this time with contents noted in a memo in **Procedure 1** and customer's information.
   1) If data is incorrect, change it using the timer time ▼ / ▲ buttons so that it matches with contents noted in a memo, and then push SET button. (OK if display goes on.)
   2) Do nothing if data is same as those in the memo.
7. Using temperature setup ▼ / ▲ buttons, change the item code (DN).
   Check also the contents of the setup data and then change them it to those in the memo.
8. Then repeat operations in items 6. and 7.
9. After setup operation, push TEST button to return to the normal stop status. ***6***
   (Corresponds to number of the operation diagram of the remote controller in page 218.)
   In a group operation, turn off the power supply once, return the group wires between indoor units and CN41 connectors as before, and then turn on power of all the indoor units.
   (It requires approx. 1 minute to operate the remote controller.)
   * The item code (DN) is consisted with 01 to AA. DN No. may jump on the way.
     Even if pushing SET button after changing the data incorrectly, the data can be returned to one before change by pushing CL button before changing the item code (DN).

EEPROM layout

EEPROM (IC10) is attached to IC socket.
To remove it, use a pair of tweezers, etc.
To attach EEPROM, arrange the direction as shown in the following figures.

* In exchanging time, pay attention not to bend the lead wire of IC.



Record the contents of the following before exchanging P.C. boards. (Item code list)

DN	Item	Memo	Setup at shipment from factory
01	Filter sign lighting time		According to type
02	Dirty condition of filter		0000: Standard
03	Central control address		0099: Undefined
06	Heating inlet temp. shift		0002: +2°C (Floor standing: 0)
0d	Cooling Auto mode existence		0001: No auto mode cooling/heating (* Automatic selection by connected outdoor unit)
0F	Cooling only/Heat pump select		0000: Heat pump
10	Type		According to model type
11	Indoor unit capacity		According to capacity code
12	Line address		0099: Undefined
13	Indoor unit address		0099: Undefined
14	Group address		0099: Undefined
19	Louver type (Air direction adjustment)		According to type
1E	Temp. width between cooling and heating automatic selective control points		0003: 3 deg (Ts ± 1.5)
28	Automatic restart from power failure		0000: None
2A			
2E	HA terminal (T10) selection		0000: Normal
30			
31			
32	Sensor select		0000: Body sensor
40			
5d	High ceiling selection		0000: Standard
60	Timer setup (Wired remote controller)		0000: Possible

Type
Item code [10]

Setup data	Type	Model abb. name
0000	1-way Air Discharge Cassette	MMU-AP✻✻✻SH
0001*	4-way Air Discharge Cassette	MMU-AP✻✻✻H
0002	2-way Air Discharge Cassette	MMU-AP✻✻✻WH
0003	1-way Air Discharge Cassette (Compact type)	MMU-AP✻✻✻YH
0004	Concealed Duct Standard	MMD-AP✻✻✻BH
0005	Slim Duct	MMD-AP✻✻✻SPH MMD-AP✻✻✻SH
0006	Concealed Duct High Static Pressure	MMD-AP✻✻✻H
0007	Under Ceiling	MMC-AP✻✻✻H
0008	High Wall	MMK-AP✻✻✻H
0009		
0010	Floor Standing Cabinet	MML-AP✻✻✻H
0011	Floor Standing Concealed	MML-AP✻✻✻BH
0012		
0013	Floor Standing (Below 6HP)	MMF-AP✻✻✻H

Indoor unit capacity
Item code [11]

Setup data	Model	Setup data	Model
0000*	Invalid	0016	—
0001	007 type	0017	048 type
0002	—	0018	056 type
0003	009 type	0019	—
0004	—	0020	—
0005	012 type	0021	072 type
0006	—	0022	—
0007	015 type	0023	096 type
0008	—	0024	—
0009	018 type	0025	—
0010	—	0026	—
0011	024 type	0027	—
0012	027 type	0028	—
0013	030 type	~	—
0014	—	0034	—
0015	036 type		

* The initial setup value of EEPROM installed on the service P.C. board

17-2. Outdoor Unit

17-2-1. Cautions in Service for Compressor

1. When checking the inverter output, remove the both wires of the compressor as follows.

17-2-2. How to Check Inverter Output

1. Turn off the power supply.
2. Remove the compressor lead from the compressor. (Be sure to remove lead wires of both compressors.)
3. Turn on the power supply and drive the air conditioner in cool or heat mode. In this case, be careful so that a fasten terminal of the compressor lead does not come to contact with other fasten terminal or you don't touch other parts (Set cabinet).
4. Check the output voltage of the compressor lead at the inverter side.
   If the result is not accepted by the following criteria, replace IPDU P.C. board.

No.	Measuring position	Criteria
1	Between Red and White	360V to 520V
2	Between White and Black	360V to 520V
3	Between Black and Red	360V to 520V

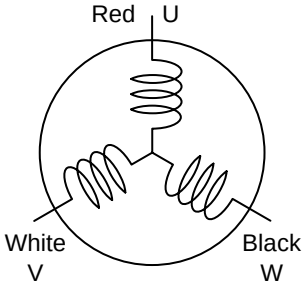
∗ After check of output, sufficiently check there is no distortion on the fasten terminals when reconnecting the compressor lead to the compressor terminals. If any distortion is found, caulk the fasten terminal with pliers, etc. and then connect it.

<How to check resistance or compressor winding>

1. Turn off the power supply.
2. Remove the compressor lead from the compressor.
3. Using a tester, check the winding resistance between each phases of each compressor and resistance of the outdoor cabinet.
   - Is not grounded?
     → It is normal if there are 10MΩ or more.
   - Is not short-circuited between windings?
     → It is normal if there are 0.1Ω to 0.3Ω. (Use a precise digital tester.)

17-2-3. How to Check Outdoor Fan Motor

1. Turn off the power supply.
2. Remove three fasten terminals (U, V, W) of the fan motor from IPDU P.C. board for the outdoor fan.
3. Turn the fan with hands. If it is not turned, a fan motor error (Lock) is considered. Replace the fan motor with a new one. When it is turned, measure the winding resistance between each phases of the fasten terminal (motor winding) with a tester. It is normal if the winding resistance between phases are 13 to 33Ω.
   (Use a precise digital tester.)

<table>
<tr><th>Part name</th><th>Procedure</th></tr>
<tr><td>Outdoor fan motor</td><td>Measure resistance of each winding with a tester.
 

<table>
<tr><th>Position</th><th>Resistance</th></tr>
<tr><td>Red-White</td><td>13~33Ω</td></tr>
<tr><td>Black-Red</td><td>13~33Ω</td></tr>
<tr><td>White-Black</td><td>13~33Ω</td></tr>
</table>
(Normal temp.)</td></tr>
</table>

17-2-4. How to Check Fan Power Supply P.C. Board and Fan IPDU

The fan power supply P.C. board supplies DC power. It supplies DC280V for the fan IPDU, and DC12V and DC7V for the control power supply respectively. If the control power is not supplied, a communication error (Error code [E31]) is out.

1. How to check fan power supply P.C. board (MCC-1439)

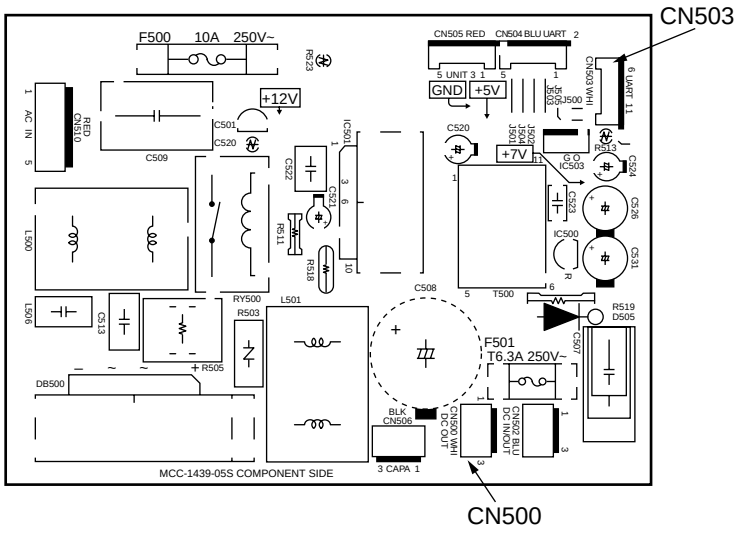
As shown in the following table, measure the voltage of the check positions with a digital tester.

No.	Check item	Check position	Criteria
1	DC280V output	Between CN500 ① and ③	DC260 to DC340V
2	Control power voltage	Between CN500 ① and ⑤	DC12V
3		Between CN500 ② and ⑤	DC7V

2. How to check fan IPDU

1. Check that the lead wires are correctly inserted into 250 fasten terminal of DC280V input and into the communication connector (CN01).
2. After then replace the fan IPDU if an abnormality is recognized.

MCC-1439 Front View



17-2-5. Interface Board Replacement Procedure

This service board is commonly installed in different models. If the board assembly is to be replaced, check the displayed inspection contents and replace the board with the correct version for the model and follow this procedure.

Replacement steps

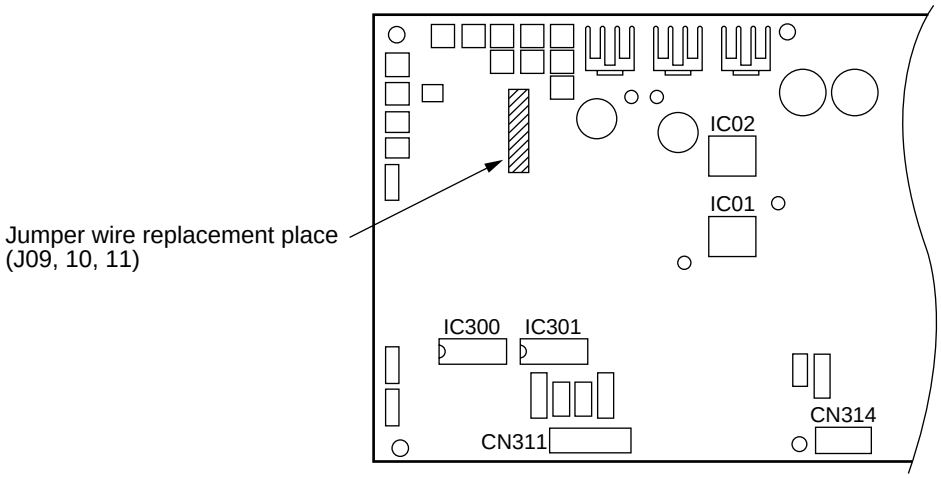
1. Turn off the power supply of the outdoor unit.
2. Remove the connectors, fasteners and screw terminals connected to the interface P.C. board.
3. Remove the interface P.C. board from the six card edge spacers.
4. Disconnect the jumper wires of the service board, as instructed in the table below.
   The jumper setting differs from the one to be replaced.
   If the model is not specified, inspection code “L10” is displayed and the equipment will not operate.

No.	Model name	J09	J10	J11
At shipment	Service P.C. board	Yes	Yes	Yes
1	MMY-MAP0802FT8-INV	Disconnect	Disconnect	Leave intact
2	MMY-MAP1002FT8-INV	Leave intact	Disconnect	Leave intact
3	MMY-MAP1202FT8-INV	Disconnect	Leave intact	Leave intact

5. Set dip switch settings of the service board to the switch settings detailed below before replacement.

Dip Switch	Setting contents
SW07	Demand setting
SW10	Outdoor fan high static pressure setting, etc.
SW13	System address setting
SW14	
SW30	Terminating resistance setting

6. After setting the jumper wires of the service board, install the service board in the outdoor control unit (Confirm that it is securely fixed to the card edge spacers.)
7. Connect the connector and fasten terminals (confirm that they are correctly and securely inserted).
8. If a component part on the board is bent during board replacement, adjust it manually so that it is not in contact with other parts/components.
9. Install the cover then turn on the power supply.
   Check the operation.



17-2-6. Comp-IPDU Board Replacement Procedure Manual

This service board is commonly installed in different models.

If the board assembly is to be replaced, replace it properly in with the correct version for the model and follow this procedure.

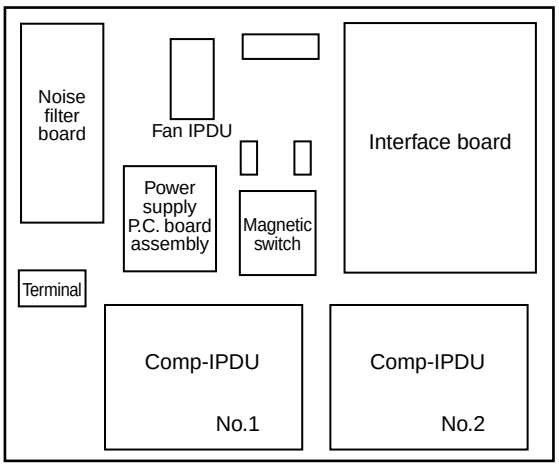
Replacement steps

1. Turn off the power supply to the outdoor unit.
2. Confirm that the capacitor has been fully discharged (confirm that the voltage between CN13 and CN15 is 0 V).
3. Remove the connectors, fasteners and screw terminals connected to the A3-IPDU board.
4. Remove 2 screws that fix the IGBT (Q200) of the Comp-IPDU board to the heat sink.
5. Remove the Comp-IPDU board from the four card edge spacers.
6. Set the dip Switch (SW801) of the Comp-IPDU board, as instructed in the table below.
   If the model is not specified, inspection “L29” is displayed and the equipment will not operate.

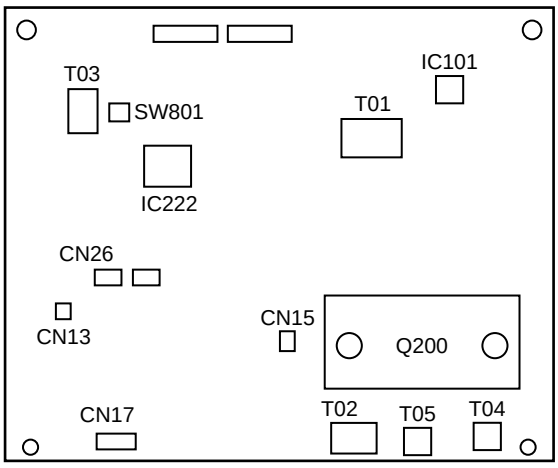
Comp-IPDU No.	SW801	
	Bit 1	Bit 2
JAt shipment	ON	ON
No.1	ON	ON
No.2	ON	OFF

7. After setting the dip Switch of the service board, apply silicone grease evenly onto the IGBT and install it in the outdoor control unit (Confirm that it is securely fixed to the card edge spacers).
8. Fix the IGBT of the Comp-IPDU board to the heat sink with two screws.
9. Connect connectors/fasteners and confirm they are correctly and securely inserted.
10. If a component part on the board is bent during board replacement, adjust it manually so that it does not touch other parts or components.
11. Install the cover then turn on the power supply. Check the operation.

Board layout of the inverter



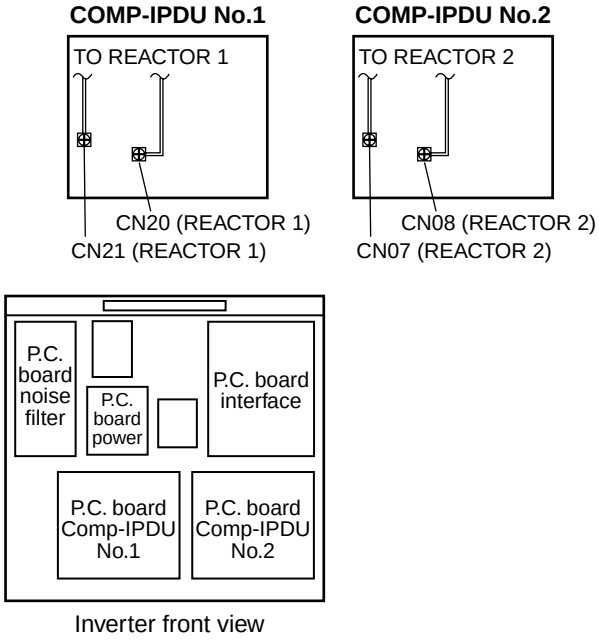
Switch layout on the P.C. board



17-2-7. Notice for Wiring

Wiring for service shall be done according to the wiring diagram.

Special caution is needed for the reactor, which has different connecting points on the COMP-IPDU1 and COMP-IPDU2.



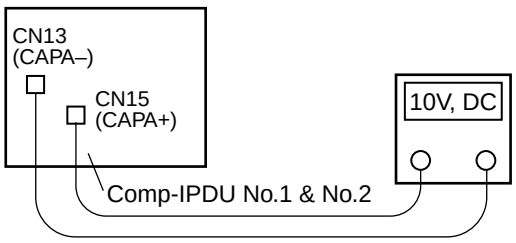
Inverter front view

DANGER

The electrolytic capacitors in this panel are charged to 660 volts D.C.

Before servicing, turn off the power supply and allow the capacitor to discharge for at least 10 minutes. (Purpose: Discharge the capacitor)

Discharge to a safe level of 10 volts D.C. or LESS. Test with a D.C. Voltmeter as shown.

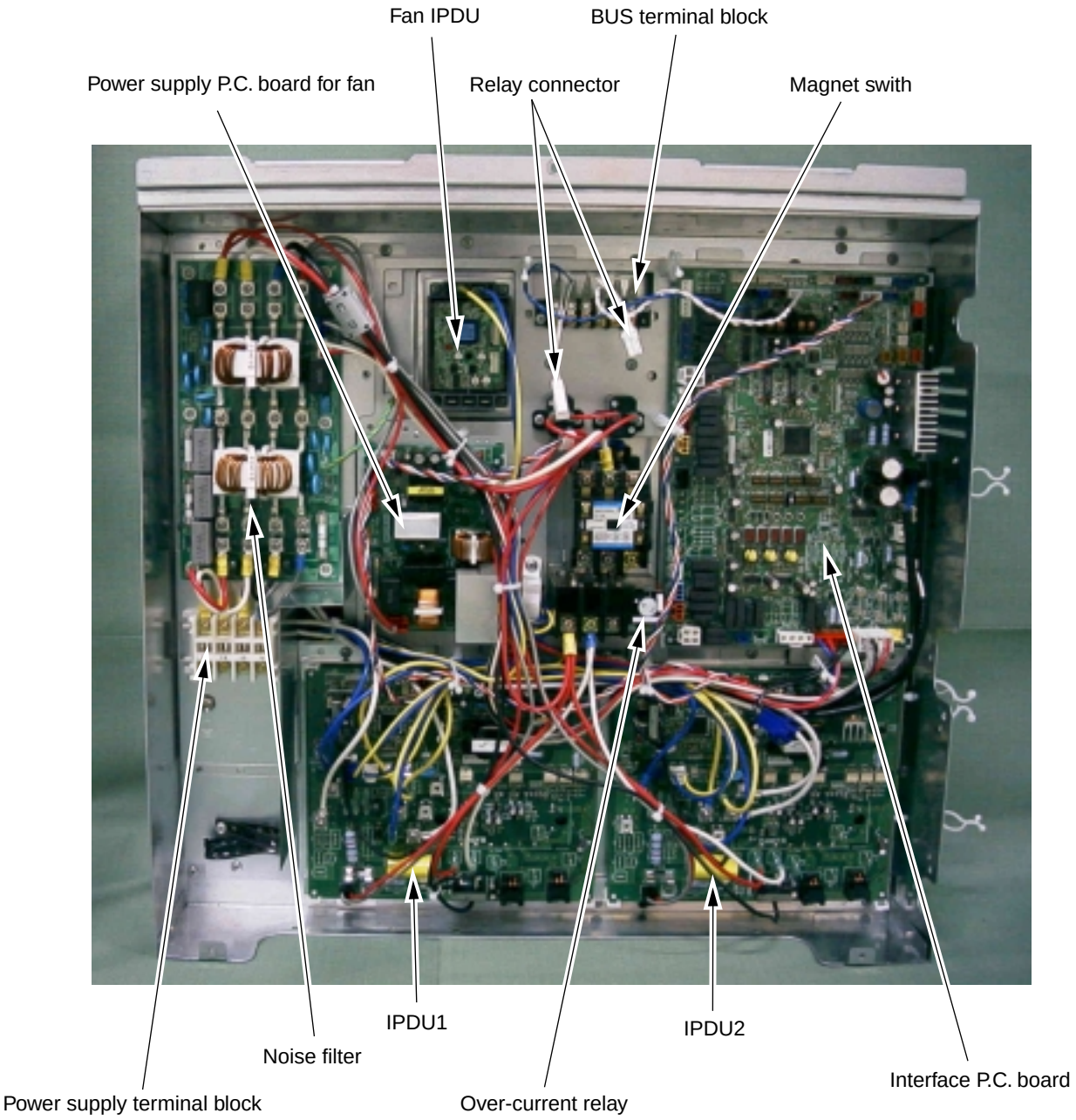


COMP-IPDU No. 1 and COMP-IPDU No.2 have the same electric potential, measure both.

Never discharge the capacitor terminals with any metal implement.

Personal injury or equipment damage may result.

Inverter Assembly Configuration



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