

# SERVICE MANUAL

## Series PCA Ceiling Suspended

R32/R410A

Indoor unit  
[Model Name]

PCA-M71HA

[Service Ref.]

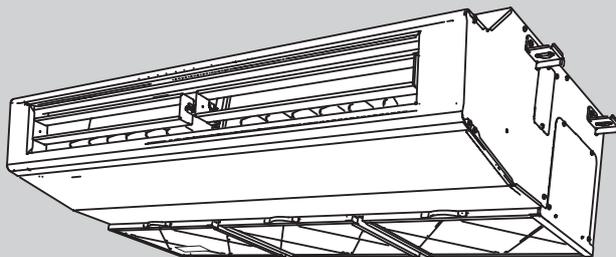
**PCA-M71HA**

PCA-M71HA-ET

**PCA-M71HA-ET**

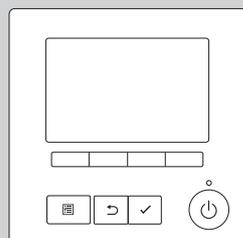
Notes:

- This manual describes service data of the indoor units only.



INDOOR UNIT

Model name  
indication



REMOTE CONTROLLER  
(Option)

## CONTENTS

1. REFERENCE MANUAL.....	2
2. SAFETY PRECAUTION.....	3
3. PARTS NAMES AND FUNCTIONS.....	8
4. SPECIFICATIONS.....	14
5. NOISE CRITERION CURVES.....	14
6. OUTLINES AND DIMENSIONS.....	15
7. WIRING DIAGRAM.....	16
8. REFRIGERANT SYSTEM DIAGRAM.....	17
9. TROUBLESHOOTING.....	18
10. SPECIAL FUNCTION.....	31
11. DISASSEMBLY PROCEDURE.....	34

PARTS CATALOG (OCB725)

**Mr. SLIM**

## 1-1. OUTDOOR UNIT'S SERVICE MANUAL

Model Name	Service Ref.	Service Manual No. Parts Catalog No.
PUHZ-ZRP71VHA2	PUHZ-ZRP71VHA2(-ET/-ER)	OCH635 OCB635
PUHZ-ZRP140VKA3 PUHZ-ZRP140YKA3	PUHZ-ZRP140VKA3(R1).UK PUHZ-ZRP140YKA3(R1/R2).UK	OCH645 OCB645
PUHZ-ZRP250YKA3	PUHZ-ZRP250YKA3.UK	OCH680 OCB680
PUZ-ZM71VHA	PUZ-ZM71VHA(R1) PUZ-ZM71VHA(R1)-ET PUZ-ZM71VHA-ER(R1)	OCH653 OCB653
PUZ-ZM140VKA PUZ-ZM140YKA	PUZ-ZM140VKA(R1).UK PUZ-ZM140YKA(R1).UK	OCH654 OCB654

## MEANINGS OF SYMBOLS DISPLAYED ON THE UNIT

	<b>WARNING</b> (Risk of fire)	This mark is for R32 refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.
	Read the OPERATION MANUAL carefully before operation.	
	Service personnel are required to carefully read the OPERATION MANUAL and INSTALLATION MANUAL before operation.	
	Further information is available in the OPERATION MANUAL, INSTALLATION MANUAL, and the like.	

## 2-1. ALWAYS OBSERVE FOR SAFETY

**Before obtaining access to terminal, all supply circuits must be disconnected.**

## 2-2. CAUTIONS RELATED TO REFRIGERANT

## Cautions for units utilizing refrigerant R32/R410A

**Use new refrigerant pipes.**

In the case of using the existing pipes for R22, be careful with the following.

- Be sure to clean the pipes and make sure that the insides of the pipes are clean.
- Change flare nut to the one provided with this product. Use a newly flared pipe.
- Avoid using thin pipes.
- In case of reconnecting the refrigerant pipes after detaching, make the flared part of pipe re-fabricated.

**Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc, which are hazard to refrigerant cycle. In addition, use pipes with specified thickness.**

Contamination inside refrigerant piping can cause deterioration of refrigerant oil, etc.

**Store the piping indoors, and keep both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)**

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

**The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.**

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil, etc.

**Charge refrigerant from liquid phase of gas cylinder.**

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

**Use a vacuum pump with a reverse flow check valve.**

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil, etc.

**Use the following tools specifically designed for use with R32/R410A refrigerant.**

The following tools are necessary to use R32/R410A refrigerant.

Tools for R32/R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

**Handle tools with care.**

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

**Do not use a charging cylinder.**

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

**Use the specified refrigerant only.**

**Never use any refrigerant other than that specified.**

Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.

Correct refrigerant is specified on name plate of outdoor unit.

If other refrigerant (R22, etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil, etc.

We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

**Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.**

## [1] Warning for service

- (1) Do not alter the unit.
- (2) For installation and relocation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with refrigerant specified in the outdoor unit installation manual.
- (3) Ask a dealer or an authorized technician to install, relocate and repair the unit.
- (4) This unit should be installed in rooms which exceed the floor space specified in outdoor unit installation manual. Refer to outdoor unit installation manual.
- (5) Install the indoor unit at least 2.5 m above floor or grade level.  
For appliances not accessible to the general public.
- (6) Refrigerant pipes connection shall be accessible for maintenance purposes.
- (7) If the air conditioner is installed in a small room or closed room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. Should the refrigerant leak and cause the concentration limit to be exceeded, hazards due to lack of oxygen in the room may result.
- (8) Keep gas-burning appliances, electric heaters, and other fire sources (ignition sources) away from the location where installation, repair, and other air conditioner work will be performed.  
If refrigerant comes into contact with a flame, poisonous gases will be released.
- (9) When installing or relocating, or servicing the air conditioner, use only the specified refrigerant written on outdoor unit to charge the refrigerant lines.  
Do not mix it with any other refrigerant and do not allow air to remain in the lines.  
If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards.
- (10) After installation has been completed, check for refrigerant leaks. If refrigerant leaks into the room and comes into contact with the flame of a heater or portable cooking range, poisonous gases will be released.
- (11) Do not use low temperature solder alloy in case of brazing the refrigerant pipes.
- (12) When performing brazing work, be sure to ventilate the room sufficiently. Make sure that there are no hazardous or flammable materials nearby.  
When performing the work in a closed room, small room, or similar location, make sure that there are no refrigerant leaks before performing the work.  
If refrigerant leaks and accumulates, it may ignite or poisonous gases may be released.
- (13) Do not install the unit in places where refrigerant may build-up or places with poor ventilation such as a semi-basement or a sunken place in outdoor: Refrigerant is heavier than air, and inclined to fall away from the leak source.
- (14) Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- (15) The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- (16) Do not pierce or burn.
- (17) Be aware that refrigerants may not contain an odour.
- (18) Pipe-work shall be protected from physical damage.
- (19) The installation of pipe-work shall be kept to a minimum.
- (20) Compliance with national gas regulations shall be observed.
- (21) Keep any required ventilation openings clear of obstruction.
- (22) Servicing shall be performed only as recommended by the manufacturer.
- (23) The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- (24) Maintenance, service and repair operations shall be performed by authorized technician with required qualification.

## [2] Cautions for service

- (1) Perform service after recovering the refrigerant left in unit completely.
- (2) Do not release refrigerant in the air.
- (3) After completing service, charge the cycle with specified amount of refrigerant.
- (4) When performing service, install a filter drier simultaneously.  
Be sure to use a filter drier for new refrigerant.

## [3] Additional refrigerant charge

### When charging directly from cylinder

- (1) Check that cylinder for R32/R410A available on the market is a syphon type.
- (2) Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)

## [4] Cautions for unit using R32 refrigerant

Basic work procedures are the same as those for conventional units using refrigerant R410A. However, pay careful attention to the following points.

### (1) Information on servicing

#### (1-1) Checks on the Area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.

For repair to the refrigerating systems, (1-3) to (1-7) shall be completed prior to conducting work on the systems.

#### (1-2) Work Procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

#### (1-3) General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.

Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

#### (1-4) Checking for Presence of Refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

#### (1-5) Presence of Fire Extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand.

Have a dry powder or CO<sub>2</sub> fire extinguisher adjacent to the charging area.

#### (1-6) No Ignition Sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

#### (1-7) Ventilated Area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

#### (1-8) Checks on the Refrigeration Equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being corroded.

#### (1-9) Checks on Electrical Devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include that:

- capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- no live electrical components and wiring are exposed while charging, recovering or purging the system;
- there is continuity of earth bonding

### (2) Repairs to Sealed Components

#### (2-1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

#### (2-2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that the apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres.

Replacement parts shall be in accordance with the manufacturer's specifications.

(3) Repair to intrinsically Safe Components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

(4) Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

(5) Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks.

A halide torch (or any other detector using a naked flame) shall not be used.

(6) Leak Detection Methods

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)

Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. For appliances containing flammable refrigerants, oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

(7) Removal and Evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- remove refrigerant
- purge the circuit with inert gas
- evacuate
- purge again with inert gas
- open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. For appliances containing flammable refrigerants, the system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times.

Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and that ventilation is available.

(8) Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

(9) Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

Continued to the next page

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure, ensure that:
  - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  - all personal protective equipment is available and being used correctly;
  - the recovery process is supervised at all times by a competent person;
  - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer's instructions.
- h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

(10) Labelling

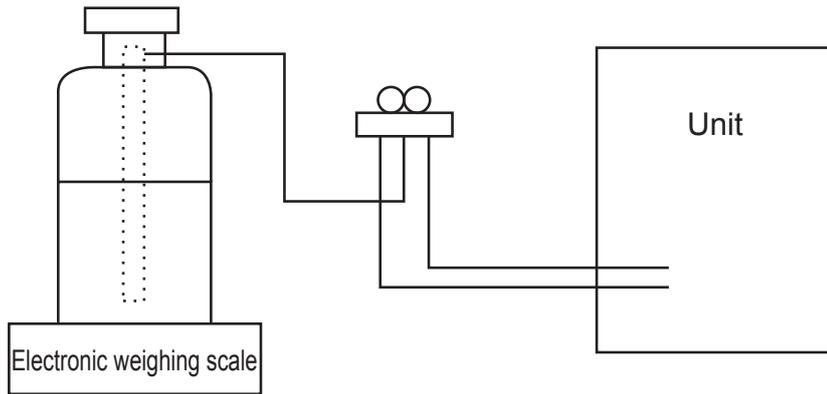
Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

(11) Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.



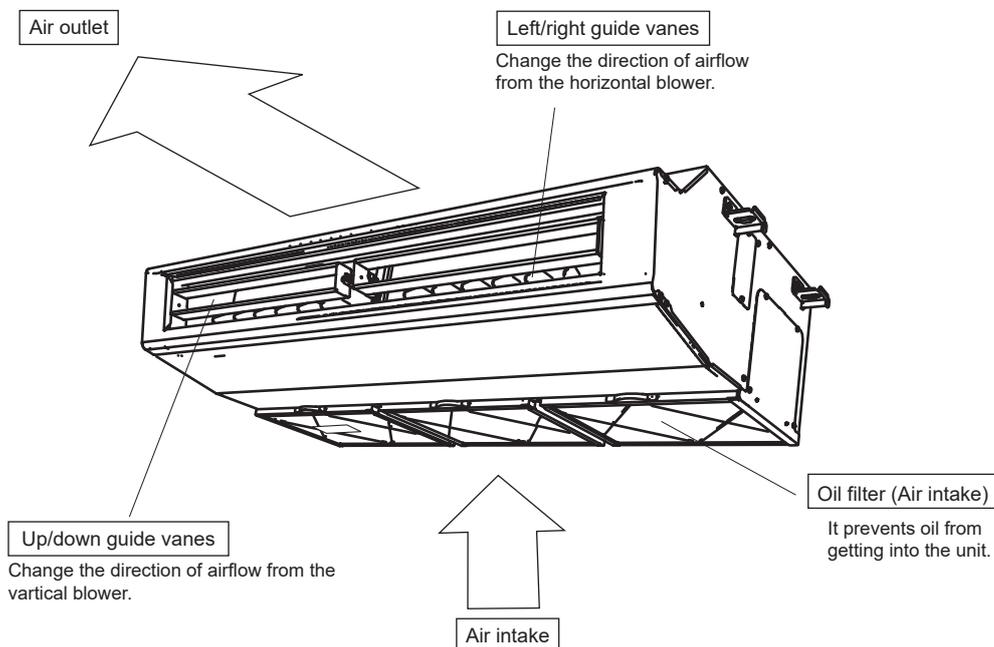
### [5] Service tools

Use the below service tools as exclusive tools for R32/R410A refrigerant.  
Refer to the spec name plate on outdoor unit for the type of refrigerant being used.

No.	Tool name	Specifications
1.	Gauge manifold	· Use the existing fitting specifications. (UNF1/2) · Use high-tension side pressure of 5.3MPa·G or over.
2.	Charge hose	· Use pressure performance of 5.09MPa·G or over.
3.	Electronic weighing scale	—
4.	Gas leak detector	· Use the detector for R134a, R407, R410A, or R32.
5.	Adaptor for reverse flow check	· Attach on vacuum pump.
6.	Refrigerant charge base	—
7.	Refrigerant cylinder	· R32 or R410A refrigerant · Cylinder with syphon
8.	Refrigerant recovery equipment	—

## 3 PARTS NAMES AND FUNCTIONS

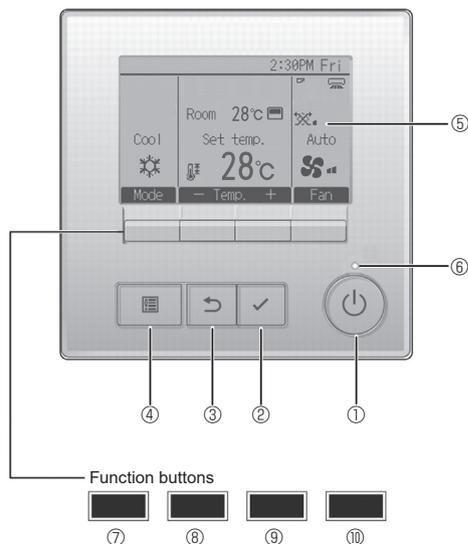
### 3-1. Indoor (Main) Unit



## 3-2. WIRED REMOTE CONTROLLER (OPTION) <PAR-40MAA>

The main display can be displayed in two different modes: "Full" and "Basic".  
The factory setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting

### Controller interface



#### ① [ON/OFF] button

Press to turn ON/OFF the indoor unit.

#### ② [SELECT] button

Press to save the setting.

#### ③ [RETURN] button

Press to return to the previous screen.

#### ④ [MENU] button

Press to bring up the Main menu.

#### ⑤ Backlit LCD

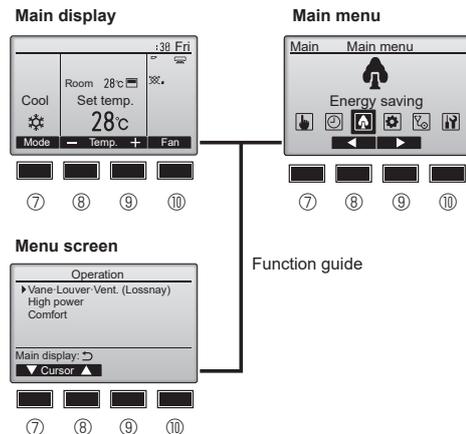
Operation settings will appear.  
When the backlight is off, pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen.

When the backlight is off, pressing any button turns the backlight on and does not perform its function. (except for the [ON/OFF] button)

The functions of the function buttons change depending on the screen.

Refer to the button function guide that appears at the bottom of the LCD for the functions they serve on a given screen.

When the system is centrally controlled, the button function guide that corresponds to the locked button will not appear.



#### ⑥ ON/OFF lamp

This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.

#### ⑦ Function button [F1]

Main display: Press to change the operation mode.  
Menu screen: The button function varies with the screen.

#### ⑧ Function button [F2]

Main display: Press to decrease temperature.  
Main menu: Press to move the cursor left.  
Menu screen: The button function varies with the screen.

#### ⑨ Function button [F3]

Main display: Press to increase temperature.  
Main menu: Press to move the cursor right.  
Menu screen: The button function varies with the screen.

#### ⑩ Function button [F4]

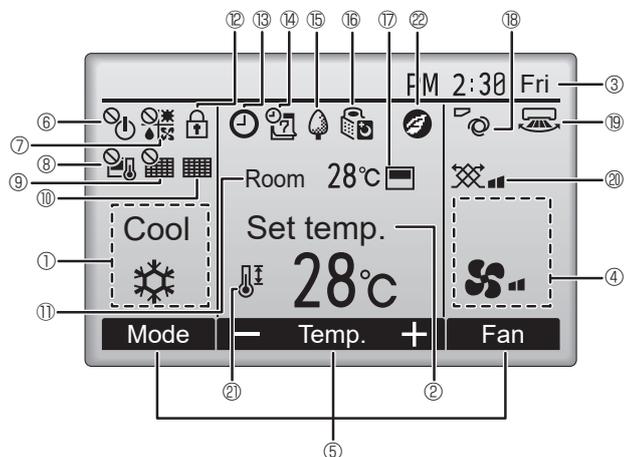
Main display: Press to change the fan speed.  
Menu screen: The button function varies with the screen.

## Display

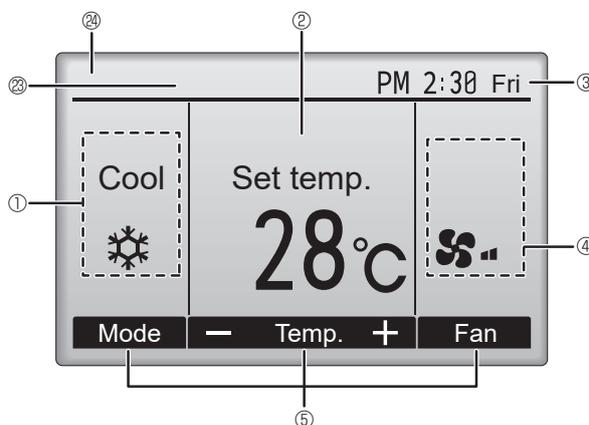
The main display can be displayed in two different modes: "Full" and "Basic". The factory setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting. (Refer to operation manual included with remote controller.)

<Full mode>

\* All icons are displayed for explanation.



<Basic mode>



### ① Operation mode

### ② Preset temperature

### ③ Clock

### ④ Fan speed

### ⑤ Button function guide

Functions of the corresponding buttons appear here.



Appears when the ON/OFF operation is centrally controlled.



Appears when the operation mode is centrally controlled.



Appears when the preset temperature is centrally controlled.



Appears when the filter reset function is centrally controlled.



Indicates when filter needs maintenance.

### ⑪ Room temperature



Appears when the buttons are locked.



Appears when the On/Off timer, Night setback, or Auto-off timer function is enabled.

 appears when the timer is disabled by the centralized control system.



Appears when the Weekly timer is enabled.



Appears while the units are operated in the energy-save mode. (Will not appear on some models of indoor units)



Appears while the outdoor units are operated in the silent mode.



Appears when the built-in thermistor on the remote controller is activated to monitor the room temperature (⑪).



 appears when the thermistor on the indoor unit is activated to monitor the room temperature.



Indicates the vane setting.



Indicates the louver setting.



Indicates the ventilation setting.



Appears when the preset temperature range is restricted.



Appears when an energy-saving operation is performed using a "3D i-See sensor" function.

### ⑳ Centrally controlled

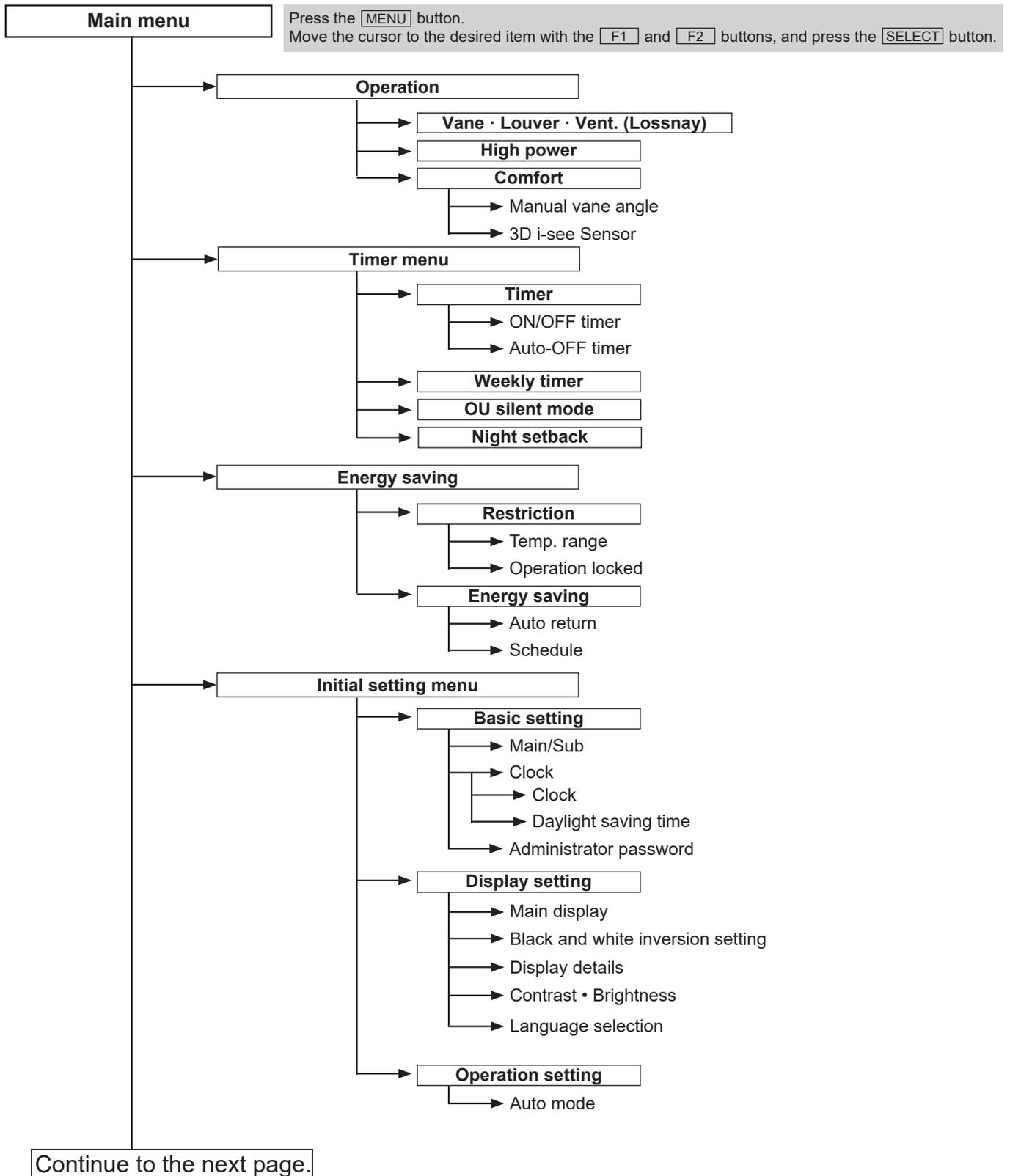
Appears for a certain period of time when a centrally-controlled item is operated.

### ㉔ Preliminary error display

An error code appears during the preliminary error.

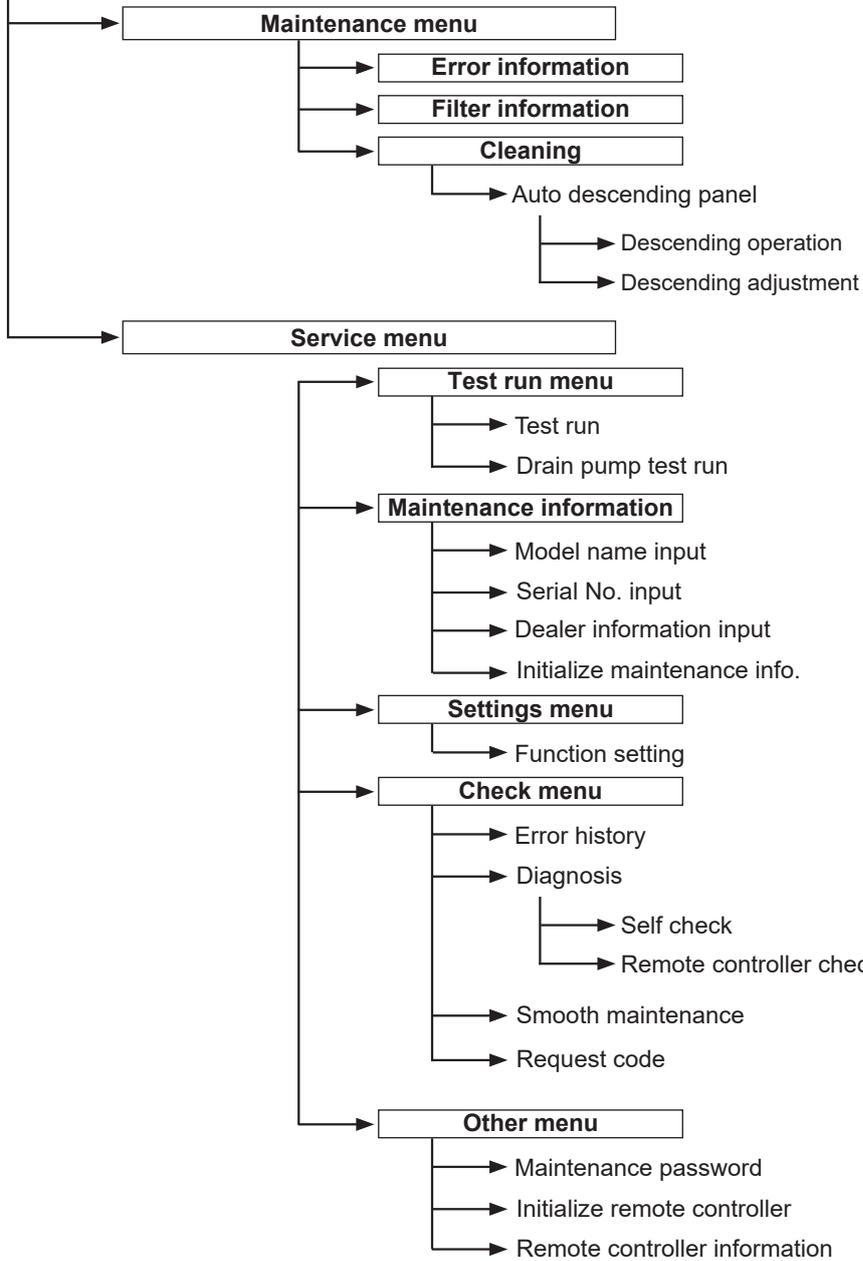
Most settings (except ON/OFF, mode, fan speed, temperature) can be made from the Main menu.

## Menu structure

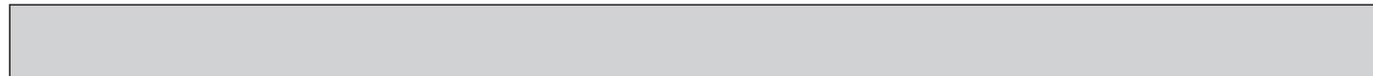


Not all functions are available on all models of indoor units.

Continue from the previous page.



**Not all functions are available on all models of indoor units.**



## Main menu list

Main menu	Setting items		Setting details
Operation	High power **		Use to reach the comfortable room temperature quickly. • Units can be operated in the High-power mode for up to 30 minutes.
Timer	Timer	On/Off timer*	Use to set the operation On/Off times. • Time can be set in 5-minute increments.
		Auto-Off timer	Use to set the Auto-Off time. • Time can be set to a value from 30 to 240 in 10-minute increments.
	Weekly timer*		Use to set the weekly operation On/Off times. • Up to eight operation patterns can be set for each day. • Two types of weekly schedules can be set. • Not valid when the On/Off timer is enabled. • 1°C increments
	OU silent mode*		Use to set the time periods in which priority is given to quiet operation of outdoor units over temperature control. Set the Start/Stop times for each day of the week. • Select the desired silent level from "Normal," "Middle," and "Quiet."
	Night setback*		Use to make Night setback settings. • Select "Yes" to enable the setting, and "No" to disable the setting. The temperature range and the start/stop times can be set. • 1°C increments
Energy saving	Restriction	Temp. range	Use to restrict the preset temperature range. • Different temperature ranges can be set for different operation modes. • 1°C increments
		Operation locked	Use to lock selected functions. • The locked functions cannot be operated.
	Energy saving	Auto return	Use to get the units to operate at the preset temperature after performing energy saving operation for a specified time period. • Time can be set to a value from 30 to 120 in 10-minute increments. • This function will not be valid when the preset temperature ranges are restricted. • 1°C increments
		Schedule*	Set the start/stop times to operate the units in the energy saving mode for each day of the week, and set the energy saving rate. • Up to four energy saving operation patterns can be set for each day. • Time can be set in 5-minute increments. • Energy saving rate can be set to a value from 0% and 50 to 90% in 10% increments.
Initial setting	Basic setting	Clock	Use to set the current time.
		Daylight saving time	Sets daylight saving time.
	Display setting	Main display	Use to switch between "Full" and "Basic" modes for the Status display and the Main display. • The default setting is "Full."
		Black and white inversion setting	Use to invert the colors of the display, turning white background to black and black characters to white.
		Contrast• Brightness	Use to adjust screen contrast and brightness.
		Language selection	Use to select the desired language.
Service	Initialize remote controller		Use to initialize the remote controller to the factory shipment status.
	Remote controller information		Use to display the remote controller model name, software version, and serial number.
Maintenance	Error information		Use to check error information when an error occurs. • Error code, error source, refrigerant address, unit model, manufacturing number, contact information (dealer's phone number) can be displayed. • The unit model, manufacturing number, and contact information need to be registered in advance to be displayed.
	Filter information		Use to check the filter status. • The filter sign can be reset.

\*: Clock setting is required.

\*\* : This function can only be set when certain outdoor units are connected.

# 4

# SPECIFICATIONS

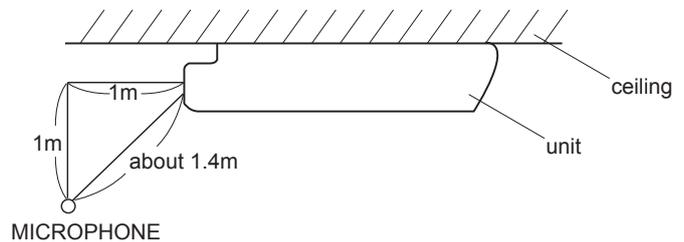
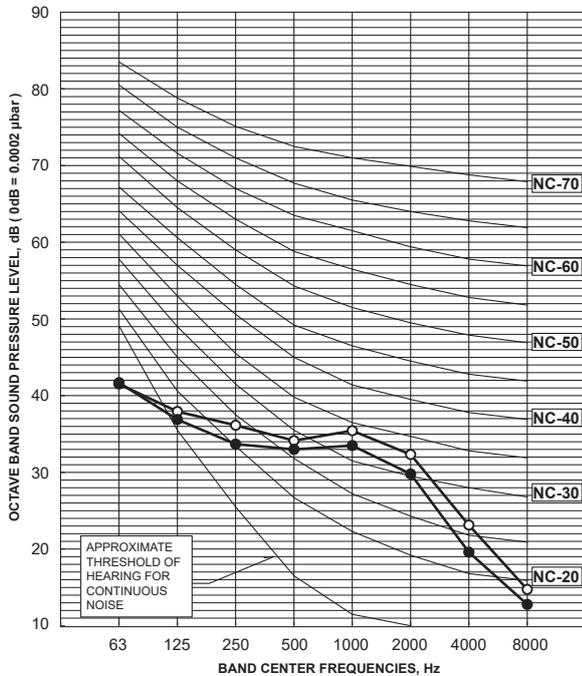
Service Ref.			PCA-M71HA(-ET)	
Mode			Cooling	Heating
Power supply (phase, frequency, voltage)			Single phase, 50Hz, 230V	
INDOOR UNIT	Input	kW	0.10	
	Running current	A	0.43	
	Starting current	A	0.86	
External finish			Stainless steel	
Heat exchanger			Plate fin coil	
INDOOR UNIT	Fan (drive) × No.	Sirocco fan (direct) × 2		
	Fan motor output	kW	0.04	
	Airflow (Low-High)	m <sup>3</sup> /min (CFM)	16-18 (717-767)	
	External static pressure	Pa (mmAq)	0 (direct blow)	
Operation control & Thermostat			Remote controller & built-in	
Sound pressure level (SPL) (Low-High)		dB	37-39	
Unit drain pipe O.D.		mm	26	
Dimensions	W	mm	1,136	
	D	mm	650	
	H	mm	280	
Weight		kg	42	

# 5

# NOISE CRITERION CURVES

## PCA-M71HA(-ET)

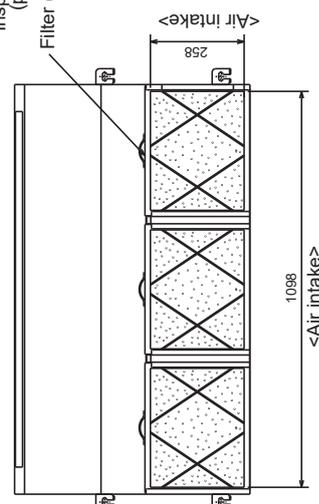
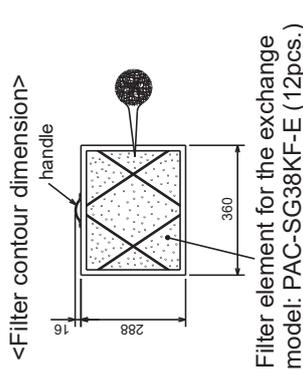
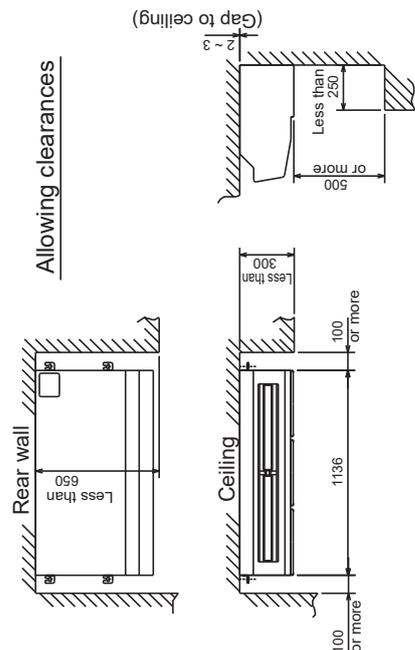
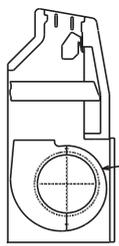
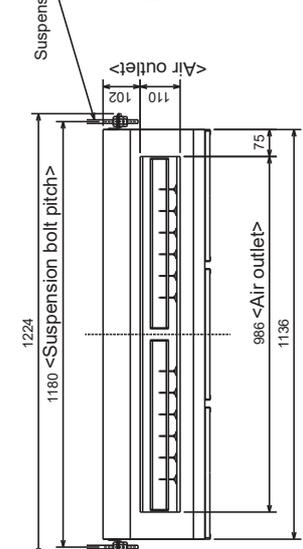
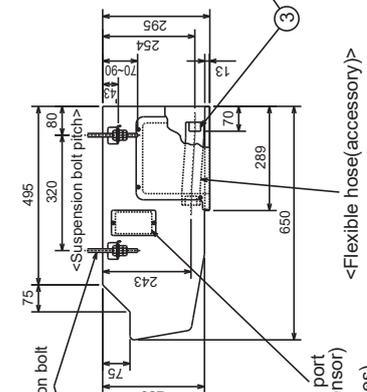
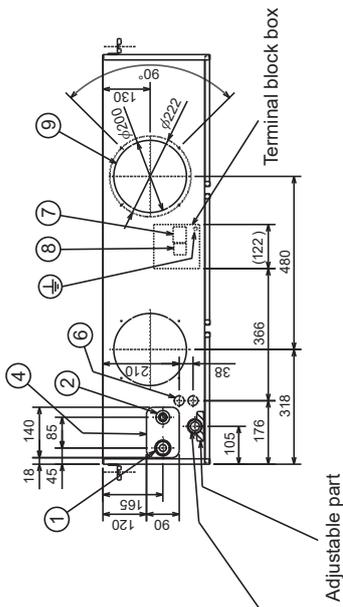
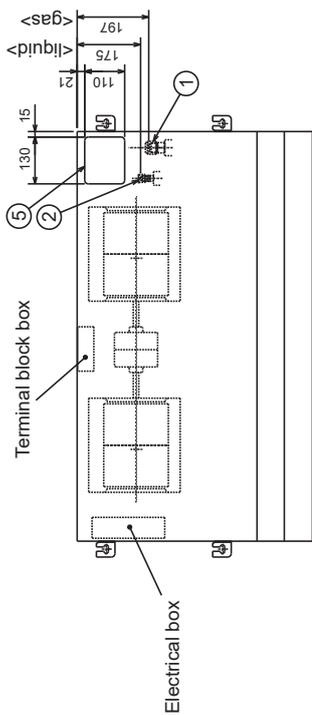
NOTCH	SPL(dB)	LINE
High	39	○—○
Low	37	●—●



PCA-M71HA(-ET)

Unit: mm

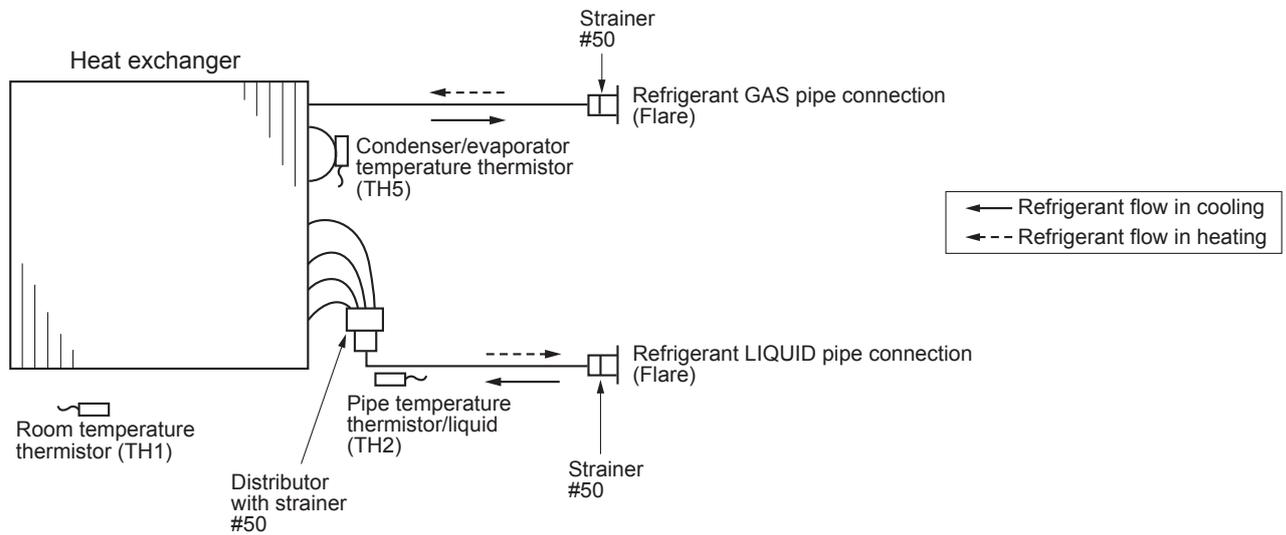
- ① Refrigerant-pipe connection(gas pipe side/flared connection: 5/8F)
  - ② Refrigerant-pipe connection(liquid pipe side/flared connection: 3/8F)
  - ③ Flexible hose(accessory) → Drainage pipe connection(26mm I.D.)
  - ④ Knockout hole for behind refrigerant-pipe arrangement
  - ⑤ Knockout hole for upper refrigerant-pipe arrangement
  - ⑥ Knockout hole for wiring arrangement: 2-  $\phi 27$
  - ⑦ Terminal block(indoor/outdoor connecting line)
  - ⑧ Terminal block(remote controller)
  - ⑨ Knockout hole (duct for fresh air intake): 2-  $\phi 200$
- Option parts: duct flange( $\phi 200$ ), model: PAC-SF280F-E(1 pc.)



NOTES.  
1. Use M10 or W3/8 screw for anchor bolt.



PCA-M71HA(-ET)



### 9-1. TROUBLESHOOTING

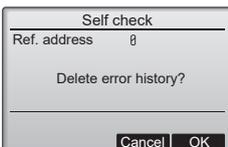
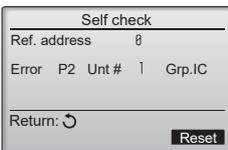
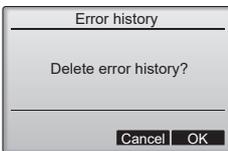
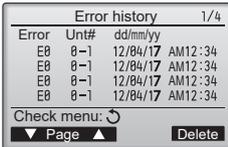
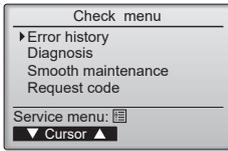
#### <Check code displayed by self-diagnosis and actions to be taken for service (summary)>

Present and past check codes are logged, and they displayed on the wired remote controller or controller board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring in the field, are summarized in the table below. Check the contents below before investigating details.

Note: Refer to the manual of outdoor unit for malfunction-diagnosis method by remote controller.

Unit conditions at service	Check code	Actions to be taken for service (summary)
The trouble is reoccurring.	Displayed	Judge the problem and take a corrective action according to "9-3. SELF-DIAGNOSIS ACTION TABLE".
	Not displayed	Conduct troubleshooting and ascertain the cause of the trouble according to "9-4. TROUBLESHOOTING BY INFERIOR PHENOMENA".
The trouble is not reoccurring.	Logged	<ul style="list-style-type: none"> <li>①Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise, etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the trouble occurred, matters related to wiring, etc.</li> <li>②Reset check code logs and restart the unit after finishing service.</li> <li>③There is no abnormality in electrical component, controller board, remote controller, etc.</li> </ul>
	Not logged	<ul style="list-style-type: none"> <li>①Re-check the abnormal symptom.</li> <li>②Conduct troubleshooting and ascertain the cause of the trouble according to "9-4. TROUBLESHOOTING BY INFERIOR PHENOMENA".</li> <li>③Continue to operate unit for the time being if the cause is not ascertained.</li> <li>④There is no abnormality concerning of parts such as electrical component, controller board, remote controller, etc.</li> </ul>

## 9-2. MALFUNCTION-DIAGNOSIS METHOD BY REMOTE CONTROLLER



### Self-check

Select "Check" on the Service menu to bring up the Check menu screen.  
The type of menu that appears depends on the type of indoor units that are connected.

#### (1) Error history

##### [Button operation]

Select "Error history" from the Check menu, and press the [✓] button to view up to 16 error history records. Four records are shown per page, and the top record on the first page indicates the latest error record.

##### [Deleting the error history]

To delete the error history, press the [F4] button (Delete) on the screen that shows error history. A confirmation screen will appear asking if you want to delete the error history. Press the [F4] button (OK) to delete the error history.

"Error history deleted" will appear on the screen. Press the [ ] button to go back to the Check menu screen.

#### (2) Diagnostic function

Error history of each unit can be checked via the controller.

##### [Button operation]

- ① Select "Self check" from the Diagnosis menu, and press the [✓] button to view the Self check screen.
- ② With the [F1] or [F2] button, enter the refrigerant address and press the [✓] button.
- ③ Error code, unit number, attribute, will appear. "-" will appear if no error history is available.

##### [Resetting the error history]

- ① Press the [F4] button (Reset) on the screen that shows the error history. A confirmation screen will appear asking if you want to delete the error history.

- ② Press the [F4] button (OK) to delete the error history. If deletion fails, "Request rejected" will appear, and "Unit not exist" will appear if no indoor units that are correspond to the entered address are found.

## Error code

[Output pattern A] Errors detected by indoor unit

Check code	Symptom	Remark
P1	Intake sensor error	
P2	Pipe (TH2) sensor error	
P9	Pipe (TH5) sensor error	
E6, E7	Indoor/outdoor unit communication error	
P6	Freezing/Overheating safeguard operation	
EE	Communication error between indoor and outdoor units	
P8	Pipe temperature error	
E4	Controller signal receiving error	
FL	Refrigerant leakage	
FH	Refrigerant sensor error	
FB (Fb)	Indoor unit control system error (memory error, etc.)	
--	No corresponding	

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)

Check code	Symptom	Remark
E9	Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)	
UP	Compressor overcurrent interruption	
U3, U4	Open/short of outdoor unit thermistors	
UF	Compressor overcurrent interruption (When compressor locked)	
U2	Abnormal high discharging temperature/49C worked/insufficient refrigerant	
U1, Ud	Abnormal high pressure (63H worked)/Overheating safeguard operation	
U5	Abnormal temperature of heat sink	
U8	Outdoor unit fan safeguard stop	
U6	Compressor overcurrent interruption/Abnormal of power module	
U7	Abnormality of super heat due to low discharge temperature	
U9, UH	Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit/ Current sensor error	
Others	Other errors (Refer to the technical manual for the outdoor unit.)	For details, check the LED display of the outdoor controller board.

• On controller

Check code displayed in the LCD.

• If the unit cannot be operated properly after the above test run has been performed, refer to the following table to remove the cause.

Controller	Symptom		Cause
	For about 3 minutes following power-on	LED 1, 2 (PCB in outdoor unit)	
PLEASE WAIT	For about 3 minutes following power-on	After LED 1, 2 are lighted, LED 2 is turned off, then only LED 1 is lighted. (Correct operation)	• For about 3 minutes following power-on, operation of the controller is not possible due to system start-up. (Correct operation)
PLEASE WAIT → Error code	After about 3 minutes has expired following power-on	Only LED 1 is lighted. → LED 1, 2 blink.	• Connector for the outdoor unit's protection device is not connected. • Reverse or open phase wiring for the outdoor unit's power terminal block (L1, L2, L3)
Display messages do not appear even when operation switch is turned ON (operation lamp does not light up).		Only LED 1 is lighted. → LED 1 blinks twice, LED 2 blinks once.	• Incorrect wiring between indoor and outdoor units (incorrect polarity of S1, S2, S3) • Remote controller wire short

**Note:**

**Operation is not possible for about 30 seconds after cancellation of function selection. (Correct operation)**

For description of each LED (LED 1, 2, 3) provided on the indoor controller, refer to the following table.

LED 1 (power for microcomputer)	Indicates whether control power is supplied. Make sure that this LED is always lit.
LED 2 (power for remote controller)	Indicates whether power is supplied to the remote controller. This LED lights only in the case of the indoor unit which is connected to the outdoor unit refrigerant address "0".
LED 3 (communication between indoor and outdoor units)	Indicates state of communication between the indoor and outdoor units. Make sure that this LED is always blinking.

**Note:**

**If the unit is operated continuously during a test run, the unit stops after 2 hours.**

Note:

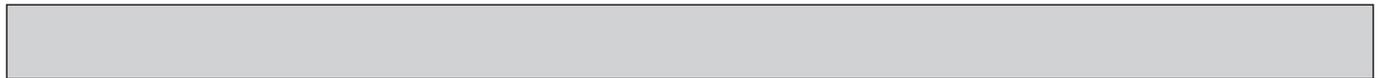
Errors to be detected in outdoor unit, such as codes starting with F, U or E (excluding E0 to E7), are not covered in this document. Please refer to the outdoor unit's service manual for the details.

### 9-3. SELF-DIAGNOSIS ACTION TABLE

Check code	Abnormal point and detection method	Cause	Countermeasure										
P1	<p><b>Room temperature thermistor (TH1)</b></p> <p>① The unit is in 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally.)</p> <p>② Constantly detected during cool, dry, and heat operation. Short: 90°C or more Open: -40°C or less</p>	<p>① Defective thermistor characteristics</p> <p>② Contact failure of connector (CN20) on the indoor controller board (Insert failure)</p> <p>③ Breaking of wire or contact failure of thermistor wiring</p> <p>④ Defective indoor controller board</p>	<p>①-③ Check resistance value of thermistor.</p> <table border="0"> <tr><td>0°C</td><td>15.0 kΩ</td></tr> <tr><td>10°C</td><td>9.6 kΩ</td></tr> <tr><td>20°C</td><td>6.3 kΩ</td></tr> <tr><td>30°C</td><td>4.3 kΩ</td></tr> <tr><td>40°C</td><td>3.0 kΩ</td></tr> </table> <p>If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor, breaking of wire or contact failure can be detected.</p> <p>② Check contact failure of connector (CN20) on the indoor controller board. Refer to "9-7. TEST POINT DIAGRAM". Turn the power on again and check restart after inserting connector again.</p> <p>④ Check room temperature display on remote controller. Replace indoor controller board if there is abnormal difference with actual room temperature.</p> <p>Turn the power off, and on again to operate after check.</p>	0°C	15.0 kΩ	10°C	9.6 kΩ	20°C	6.3 kΩ	30°C	4.3 kΩ	40°C	3.0 kΩ
0°C	15.0 kΩ												
10°C	9.6 kΩ												
20°C	6.3 kΩ												
30°C	4.3 kΩ												
40°C	3.0 kΩ												
P2	<p><b>Pipe temperature thermistor/Liquid (TH2)</b></p> <p>① The unit is in 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally.)</p> <p>② Constantly detected during cool, dry, and heat (except defrost) operation. Short: 90°C or more Open: -40°C or less</p>	<p>① Defective thermistor characteristics</p> <p>② Contact failure of connector (CN21) on the indoor controller board (Insert failure)</p> <p>③ Breaking of wire or contact failure of thermistor wiring</p> <p>④ Defective refrigerant circuit is causing thermistor temperature of 90°C or more or -40°C or less.</p> <p>⑤ Defective indoor controller board</p>	<p>①-③ Check resistance value of thermistor. For characteristics, refer to (P1) above.</p> <p>② Check contact failure of connector (CN21) on the indoor controller board. Refer to "9-7. TEST POINT DIAGRAM". Turn the power on and check restart after inserting connector again.</p> <p>④ Check pipe &lt;liquid&gt; temperature with remote controller in test run mode. If pipe &lt;liquid&gt; temperature is extremely low (in cooling mode) or high (in heating mode), refrigerant circuit may be defective.</p> <p>⑤ Check pipe &lt;liquid&gt; temperature with remote controller in test run mode. If there is extremely difference with actual pipe &lt;liquid&gt; temperature, replace indoor controller board.</p> <p>Turn the power off, and on again to operate after check.</p>										



Check code	Abnormal point and detection method	Cause	Countermeasure
P6	<p><b>Freezing/overheating protection is operating</b></p> <p>① Freezing protection (Cooling mode) The unit is in 6-minute resume prevention mode if pipe &lt;liquid or condenser/evaporator&gt; temperature stays under -15°C for 3 minutes, 3 minutes after the compressor started. Abnormal if it stays under -15°C for 3 minutes again within 16 minutes after 6-minute resume prevention mode.</p> <p>② Overheating protection (Heating mode) The units is in 6-minute resume prevention mode if pipe &lt;condenser/evaporator&gt; temperature is detected as over 70°C after the compressor started. Abnormal if the temperature of over 70°C is detected again within 30 minutes after 6-minute resume prevention mode.</p>	<p>(Cool or dry mode)</p> <p>① Clogged filter (reduced airflow) ② Short cycle of air path ③ Low-load (low temperature) operation out of the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective.</p> <p>⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (clogs)</p> <p>(Heating mode)</p> <p>① Clogged filter (reduced airflow) ② Short cycle of air path ③ Overload (high temperature) operation out of the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective. ⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (clogs) ⑧ Bypass circuit of outdoor unit is defective.</p>	<p>(Cool or dry mode)</p> <p>① Check clogs of the filter. ② Remove blockage.</p> <p>④ Refer to "9-6. HOW TO CHECK THE PARTS".</p> <p>⑤ Check outdoor fan motor. ⑥⑦ Check operating condition of refrigerant circuit.</p> <p>(Heating mode)</p> <p>① Check clogs of the filter. ② Remove blockage.</p> <p>④ Refer to "9-6. HOW TO CHECK THE PARTS".</p> <p>⑤ Check outdoor fan motor. ⑥-⑧ Check operating condition of refrigerant circuit.</p>
P8	<p><b>Pipe temperature</b> &lt;Cool mode&gt; Detected as abnormal when the pipe temperature is not in the cooling range 3 minutes after compressor start and 6 minutes after the liquid or condenser/evaporator pipe is out of cooling range. Note 1: It takes at least 9 minutes to detect. Note 2: Abnormality P8 is not detected in dry mode. Cooling range: -3 °C ≧ (TH-TH1) TH: Lower temperature between liquid pipe temperature (TH2) and condenser/evaporator temperature (TH5) TH1: Intake temperature</p> <p>&lt;Heat mode&gt; When 10 seconds have passed after the compressor starts operation and the hot adjustment mode has finished, the unit is detected as abnormal when condenser/evaporator pipe temperature is not in heating range within 20 minutes. Note 3: It takes at least 27 minutes to detect abnormality. Note 4: It excludes the period of defrosting. (Detection restarts when defrosting mode is over.) Heating range: 3 °C ≦ (TH5-TH1)</p>	<p>① Slight temperature difference between indoor room temperature and pipe &lt;liquid or condenser / evaporator&gt; temperature thermistor • Shortage of refrigerant • Disconnected holder of pipe &lt;liquid or condenser / evaporator&gt; thermistor • Defective refrigerant circuit</p> <p>② Reversed connection of extension pipe (on plural units connection) ③ Reversed wiring of indoor/outdoor unit connecting wire (on plural units connection) ④ Defective detection of indoor room temperature and pipe &lt;condenser / evaporator&gt; temperature thermistor ⑤ Stop valve is not opened completely.</p>	<p>①-④ Check pipe &lt;liquid or condenser/evaporator&gt; temperature with room temperature display on remote controller and outdoor controller circuit board. Pipe &lt;liquid or condenser/evaporator&gt; temperature display is indicated by setting SW2 of outdoor controller circuit board as follows.</p> <p>( Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool(PAC-SK52ST)' )</p> <p>②③ Check reversed connection of extension pipe or reversed wiring of indoor/outdoor unit connecting wire.</p>



Check code	Abnormal point and detection method	Cause	Countermeasure
P9	<p><b>Pipe temperature thermistor/Condenser-Evaporator (TH5)</b></p> <p>① The unit is in 3-minute resume protection mode if short/open of thermistor is detected. Abnormal if the unit does not get back to normal within 3 minutes. (The unit returns to normal operation, if it has been reset normally.)</p> <p>② Constantly detected during cool, dry, and heat operation (except defrost) Short: 90°C or more Open: -40°C or less</p>	<p>① Defective thermistor characteristics</p> <p>② Contact failure of connector (CN29) on the indoor controller board (Insert failure)</p> <p>③ Breaking of wire or contact failure of thermistor wiring</p> <p>④ Temperature of thermistor is 90°C or more or -40°C or less caused by defective refrigerant circuit.</p> <p>⑤ Defective indoor controller board</p>	<p>①-③ Check resistance value of thermistor. For characteristics, refer to (P1).</p> <p>② Check contact failure of connector (CN29) on the indoor controller board. Refer to "9-7. TEST POINT DIAGRAM". Turn the power on and check restart after inserting connector again.</p> <p>④ Operate in test run mode and check pipe &lt;condenser/evaporator&gt; temperature with outdoor controller circuit board. If pipe &lt;condenser / evaporator&gt; temperature is extremely low (in cooling mode) or high (in heating mode), refrigerant circuit may have defect.</p> <p>⑤ Operate in test run mode and check pipe &lt;condenser / evaporator&gt; temperature with outdoor control circuit board. If there is extreme difference with actual pipe &lt;condenser / evaporator&gt; temperature, replace indoor controller board. There is no abnormality if none of above comes within the unit. Turn the power off and on again to operate.</p> <p>( In the case of checking pipe temperature with outdoor controller circuit board, be sure to connect A-control service tool (PAC-SK52ST). )</p>
E0 or E4	<p><b>Remote controller transmission error(E0)/signal receiving error(E4)</b></p> <p>① Abnormal if main or sub remote controller cannot receive any transmission normally from indoor unit of refrigerant address "0" for 3 minutes. (Check code: E0)</p> <p>② Abnormal if sub remote controller could not receive any signal for 2 minutes. (Check code: E0)</p> <p>① Abnormal if indoor controller board cannot receive any data normally from remote controller board or from other indoor controller board for 3 minutes. (Check code: E4)</p> <p>② Indoor controller board cannot receive any signal from remote controller for 2 minutes. (Check code: E4)</p>	<p>① Contact failure at transmission wire of remote controller</p> <p>② All remote controllers are set as "sub" remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board.</p> <p>③ Miswiring of remote controller</p> <p>④ Defective transmitting receiving circuit of remote controller</p> <p>⑤ Defective transmitting receiving circuit of indoor controller board of refrigerant addresses "0".</p> <p>⑥ Noise has entered into the transmission wire of remote controller.</p>	<p>① Check disconnection or looseness of indoor unit or transmission wire of remote controller.</p> <p>② Set one of the remote controllers "main" if there is no problem with the action above.</p> <p>③ Check wiring of remote controller.</p> <ul style="list-style-type: none"> <li>• Total wiring length: max. 500 m (Do not use cable with 3 or more cores.)</li> <li>• The number of connecting indoor units: max. 16 units</li> <li>• The number of connecting remote controller: max. 2 units</li> </ul> <p>When it is not the above-mentioned problem of ①-③</p> <p>④ Diagnose remote controllers.</p> <p>a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. If abnormality occurs again, replace indoor controller board.</p> <p>b) When "RC NG" is displayed, replace remote controller.</p> <p>c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality.</p> <p>Note: If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address "0" may be abnormal.</p>
E3 or E5	<p><b>Remote controller transmission error(E3)/signal receiving error(E5)</b></p> <p>① Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Check code: E3)</p> <p>② Remote controller receives transmitted data at the same time and compares the received and transmitted data. Abnormal if these data are judged to be different 30 continuous times. (Check code: E3)</p> <p>① Abnormal if indoor controller board could not find blank of transmission path. (Check code: E5)</p> <p>② Indoor controller board receives transmitted data at the same time and compares the received and transmitted data. Abnormal if these data are judged to be different 30 continuous times. (Check code: E5)</p>	<p>① 2 remote controllers are set as "main." (In the case of 2 remote controllers)</p> <p>② Remote controller is connected with 2 indoor units or more.</p> <p>③ Repetition of refrigerant address</p> <p>④ Defective transmitting receiving circuit of remote controller</p> <p>⑤ Defective transmitting receiving circuit of indoor controller board</p> <p>⑥ Noise has entered into transmission wire of remote controller.</p>	<p>① Set a remote controller to main, and the other to sub.</p> <p>② Remote controller is connected with only one indoor unit.</p> <p>③ The address changes to a separate setting.</p> <p>④-⑥ Diagnose remote controller.</p> <p>a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. When becoming abnormal again, replace indoor controller board.</p> <p>b) When "RC NG" is displayed, replace remote controller.</p> <p>c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality.</p>



Check code	Abnormal point and detection method	Cause	Countermeasure
E6	<p><b>Indoor/outdoor unit communication error (Signal receiving error)</b></p> <p>① Abnormal if indoor controller board cannot receive any signal normally for 6 minutes after turning the power on.</p> <p>② Abnormal if indoor controller board cannot receive any signal normally for 3 minutes.</p> <p>③ Consider the unit abnormal under the following condition: When 2 or more indoor units are connected to an outdoor unit, indoor controller board cannot receive a signal for 3 minutes from outdoor controller circuit board, a signal which allows outdoor controller circuit board to transmit signals.</p>	<p>① Contact failure, short circuit or, miswiring (reversed wiring) of indoor/outdoor unit connecting wire</p> <p>② Defective transmitting receiving circuit of indoor controller board</p> <p>③ Defective transmitting receiving circuit of indoor controller board</p> <p>④ Noise has entered into indoor/outdoor unit connecting wire.</p>	<p>Note: Check LED display on the outdoor control circuit board. (Connect A-control service tool, PAC-SK52ST.) Refer to outdoor unit service manual.</p> <p>① Check disconnection or looseness of indoor/outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in the case of twin triple indoor unit system.</p> <p>②-④ Turn the power off, and on again to check. If abnormality occurs again, replace indoor controller board or outdoor controller circuit board.</p> <p>Note: Other indoor controller board may have defect in the case of twin triple indoor unit system.</p>
E7	<p><b>Indoor/outdoor unit communication error (Transmitting error)</b></p> <p>Abnormal if "1" receiving is detected 30 times continuously though indoor controller board has transmitted "0".</p>	<p>① Defective transmitting receiving circuit of indoor controller board</p> <p>② Noise has entered into power supply.</p> <p>③ Noise has entered into outdoor control wire.</p>	<p>①-③ Turn the power off, and on again to check. If abnormality occurs again, replace indoor controller board.</p>
FB(Fb)	<p><b>Indoor controller board</b></p> <p>Abnormal if data cannot be read normally from the nonvolatile memory of the indoor controller board.</p>	<p>① Defective indoor controller board</p>	<p>① Replace indoor controller board.</p>
E1 or E2	<p><b>Remote controller control board</b></p> <p>① Abnormal if data cannot be read normally from the nonvolatile memory of the remote controller control board. (Check code: E1)</p> <p>② Abnormal if the clock function of remote controller cannot be operated normally. (Check code: E2)</p>	<p>① Defective remote controller</p>	<p>① Replace remote controller.</p>

## 9-4. TROUBLESHOOTING BY INFERIOR PHENOMENA

Note: Refer to the manual of outdoor unit for the detail of remote controller.

Phenomena	Cause	Countermeasure
(1)LED2 on indoor controller board is off.	<ul style="list-style-type: none"> <li>• When LED1 on indoor controller board is also off.</li> </ul> <p>① Power supply of rated voltage is not supplied to outdoor unit.</p> <p>② Defective outdoor controller circuit board</p> <p>③ Power supply of 220–240 V is not supplied to indoor unit</p> <p>④ Defective indoor power board</p> <p>⑤ Defective indoor controller board</p> <p><b>(For the separate indoor/outdoor unit power supply system)</b></p> <p>① Power supply of 220–240 V AC is not supplied to indoor unit.</p> <p>② The connectors of the optional replacement kit are not used.</p> <p>③ Defective indoor controller board</p> <p>④ Defective indoor power board</p>	<p>① Check the voltage of outdoor power supply terminal block (L, N) or (L3, N).</p> <ul style="list-style-type: none"> <li>• When 220–240 V AC is not detected, check the power wiring to outdoor unit and the breaker.</li> <li>• When 220–240 V AC is detected, check ② (below).</li> </ul> <p>② Check the voltage between outdoor terminal block S1 and S2.</p> <ul style="list-style-type: none"> <li>• When 220–240 V AC is not detected, check the fuse on outdoor controller circuit board.</li> <li>• Check the wiring connection.</li> <li>• When 220–240 V AC is detected, check ③ (below).</li> </ul> <p>③ Check the voltage between indoor terminal block S1 and S2.</p> <ul style="list-style-type: none"> <li>• When 220–240 V AC is not detected, check indoor/outdoor unit connecting wire for miswiring.</li> <li>• When 220–240 V AC is detected, check ④ (below).</li> </ul> <p>④ Check voltage output from CN2S on indoor power board (13.1 V DC). Refer to "9-7-1. Power board".</p> <ul style="list-style-type: none"> <li>• When no voltage is output, check the wiring connection.</li> <li>• When output voltage is between 12.5 V DC and 13.7 V DC, check ⑤ (below).</li> </ul> <p>⑤ Check the wiring connection between indoor controller board and indoor power board. Check the fuse on indoor controller board. If no problems are found, indoor controller board is defective.</p> <p>① Check the voltage of indoor power supply terminal block (L,N).</p> <ul style="list-style-type: none"> <li>• When 220–240 V AC is not detected, check the power supply wiring.</li> <li>• When 220–240 V AC is detected, check ② (below).</li> </ul> <p>② Check that there is no problem in the method of connecting the connectors.</p> <ul style="list-style-type: none"> <li>• When there are problems in the method of connecting the connectors, connect the connector correctly referring to installation manual of an optional kit.</li> <li>• When there is no problem in the method of connecting the connectors, check ③ (below).</li> </ul> <p>③ Check voltage output from CNDK on indoor controller board.</p> <ul style="list-style-type: none"> <li>• When 220–240 V AC is not detected, check the fuse on indoor controller board. Check the wiring connection between indoor power supply terminal block and CND on indoor controller board.</li> <li>• When 220–240 V AC is detected, check ④ (below).</li> </ul> <p>④ Check voltage output from CN2S on indoor power board.</p> <ul style="list-style-type: none"> <li>• When no voltage output, check the wiring connection between CNDK on indoor controller board and CNSK on indoor power board. If no problems are found, indoor power board is defective.</li> <li>• When 12.5–13.7 V DC is detected, check the wiring connection between CN2S on indoor power board and CN2D on indoor power board. If no problems are found, indoor controller board is defective.</li> </ul>
	<ul style="list-style-type: none"> <li>• When LED1 on indoor controller board is lit.</li> </ul> <p>① Mis-setting of refrigerant address for outdoor unit (There is no unit corresponding to refrigerant address "0".)</p>	<p>① Reconfirm the setting of refrigerant address for outdoor unit.</p> <p>Set the refrigerant address to "0". (For grouping control system under which 2 or more outdoor units are connected, set one of the units to "0".)</p> <p>Set refrigerant address using SW1 (3-6) on outdoor controller circuit board.</p>

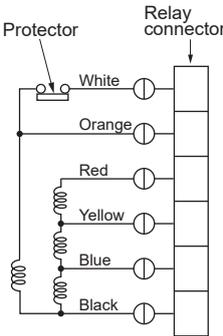
Note: Refer to the outdoor unit's service manual for the detail of remote controller.

Phenomena	Cause	Countermeasure
<p><b>(2)LED2 on indoor controller board is blinking.</b></p>	<ul style="list-style-type: none"> <li>• When LED1 on indoor controller board is also blinking.</li> <li>① Connection failure of indoor/outdoor unit connecting wire</li> <li>• When LED1 is lit</li> <li>① Miswiring of remote controller wires Under twin triple indoor unit system, 2 or more indoor units are wired together.</li> <li>② Refrigerant address for outdoor unit is wrong or not set. Under grouping control system, there are some units whose refrigerant address is 0.</li> <li>③ Short-cut of remote controller wires</li> <li>④ Defective remote controller</li> </ul>	<ul style="list-style-type: none"> <li>① Check indoor/outdoor unit connecting wire for connection failure.</li> <li>① Check the connection of remote controller wires in the case of twin triple indoor unit system. When 2 or more indoor units are wired in one refrigerant system, connect remote controller wires to one of those units.</li> <li>② Check the setting of refrigerant address in the case of grouping control system. If there are some units whose refrigerant address is 0 in one group, set one of the units to 0 using SW1 (3-6) on outdoor controller circuit board.</li> <li>③④ Remove remote controller wires and check LED2 on indoor controller board. <ul style="list-style-type: none"> <li>• When LED2 is blinking, check the short-cut of remote controller wires.</li> <li>• When LED2 is lit, connect remote controller wires again and: <ul style="list-style-type: none"> <li>if LED2 is blinking, remote controller is defective; if LED2 is lit, connection failure of remote controller terminal block etc. has returned to normal.</li> </ul> </li> </ul> </li> </ul>

## 9-5. WHEN WIRED REMOTE CONTROLLER OR INDOOR UNIT MICROPROCESSOR FAILS

1. When the wired remote controller or the indoor unit microprocessor has failed, but all other components work properly, if you set the switch (SWE) on the indoor controller board ON, the indoor unit will start emergency operation.  
When emergency operation is activated, the indoor unit operates as follows:
  - Indoor fan runs at high speed.
2. When you activate emergency operation of the cooling or heating, you have to set the switch (SWE) on the indoor controller board and activate emergency operation of the outdoor unit.  
For details on how to activate emergency operation of the outdoor unit, refer to the outdoor unit wiring diagram.
3. Before you activate emergency operation, check the following points:
  - (1) Emergency operation cannot be activated when:
    - the outdoor unit malfunctions.
    - the indoor fan malfunctions.
  - (2) Emergency operation becomes continuous only by switching the power source on/off.  
ON/OFF on the remote control or temperature control, etc. does not function.
  - (3) Avoid operating for a long time when the outdoor unit starts defrosting while emergency operation of the heating is activated because it will start to blow cold air.
  - (4) Emergency cooling should be limited to 10 hours maximum (The indoor unit heat exchanger may freeze).
  - (5) After emergency operation has been deactivated, set the switches, etc. to their original positions.

## 9-6. HOW TO CHECK THE PARTS PCA-M71HA(-ET)

Parts name	Checkpoints										
Room temperature thermistor (TH1) Pipe temperature thermistor/liquid (TH2) Condenser/evaporator temperature thermistor (TH5)	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 10 to 30°C)  Refer to the <Thermistor Characteristic Graph> below.										
Fan motor(MF) 	Measure the resistance between the terminals with a tester. (Winding temperature 20°C)  <table border="1" data-bbox="438 728 853 918"> <thead> <tr> <th>Connector</th> <th>Normal</th> </tr> </thead> <tbody> <tr> <td>White-Black</td> <td>140.5Ω</td> </tr> <tr> <td>Black-Blue</td> <td>15.4Ω</td> </tr> <tr> <td>Blue-Yellow</td> <td>28.5Ω</td> </tr> <tr> <td>Yellow-Red</td> <td>80.4Ω</td> </tr> </tbody> </table> Protector OPEN : 135±5°C CLOSE : 95±15°C	Connector	Normal	White-Black	140.5Ω	Black-Blue	15.4Ω	Blue-Yellow	28.5Ω	Yellow-Red	80.4Ω
Connector	Normal										
White-Black	140.5Ω										
Black-Blue	15.4Ω										
Blue-Yellow	28.5Ω										
Yellow-Red	80.4Ω										

### <Thermistor Characteristic Graph>

Thermistor for lower temperature

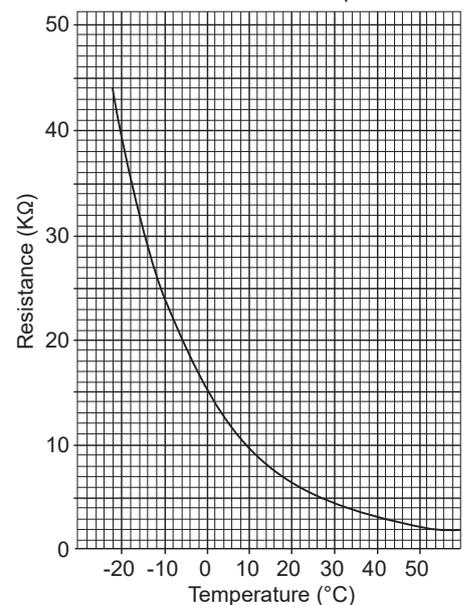
Room temperature thermistor(TH1)  
Pipe temperature thermistor/ liquid (TH2)  
Condenser/evaporator temperature thermistor(TH5)

Thermistor  $R_0=15 \text{ k}\Omega \pm 3\%$   
Fixed number of  $B=3480 \text{ k}\Omega \pm 2\%$

$$R_t = 15 \exp \left\{ 3480 \left( \frac{1}{273+t} - \frac{1}{273} \right) \right\}$$

0°C	15 kΩ
10°C	9.6 kΩ
20°C	6.3 kΩ
25°C	5.4 kΩ
30°C	4.3 kΩ
40°C	3.0 kΩ

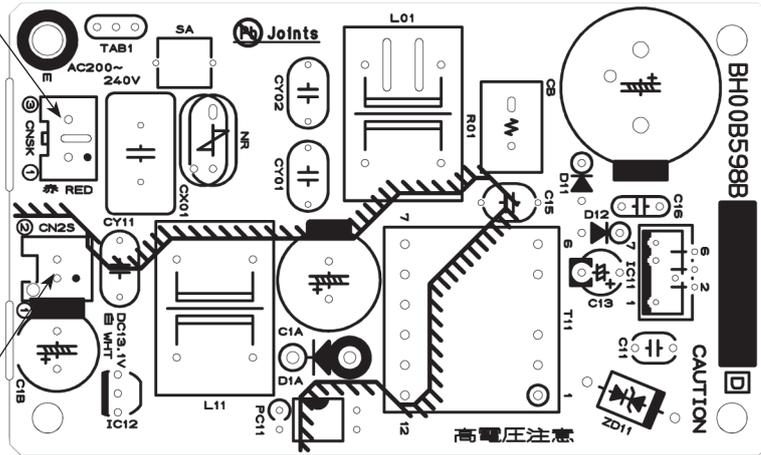
< Thermistor for lower temperature >



## 9-7. TEST POINT DIAGRAM

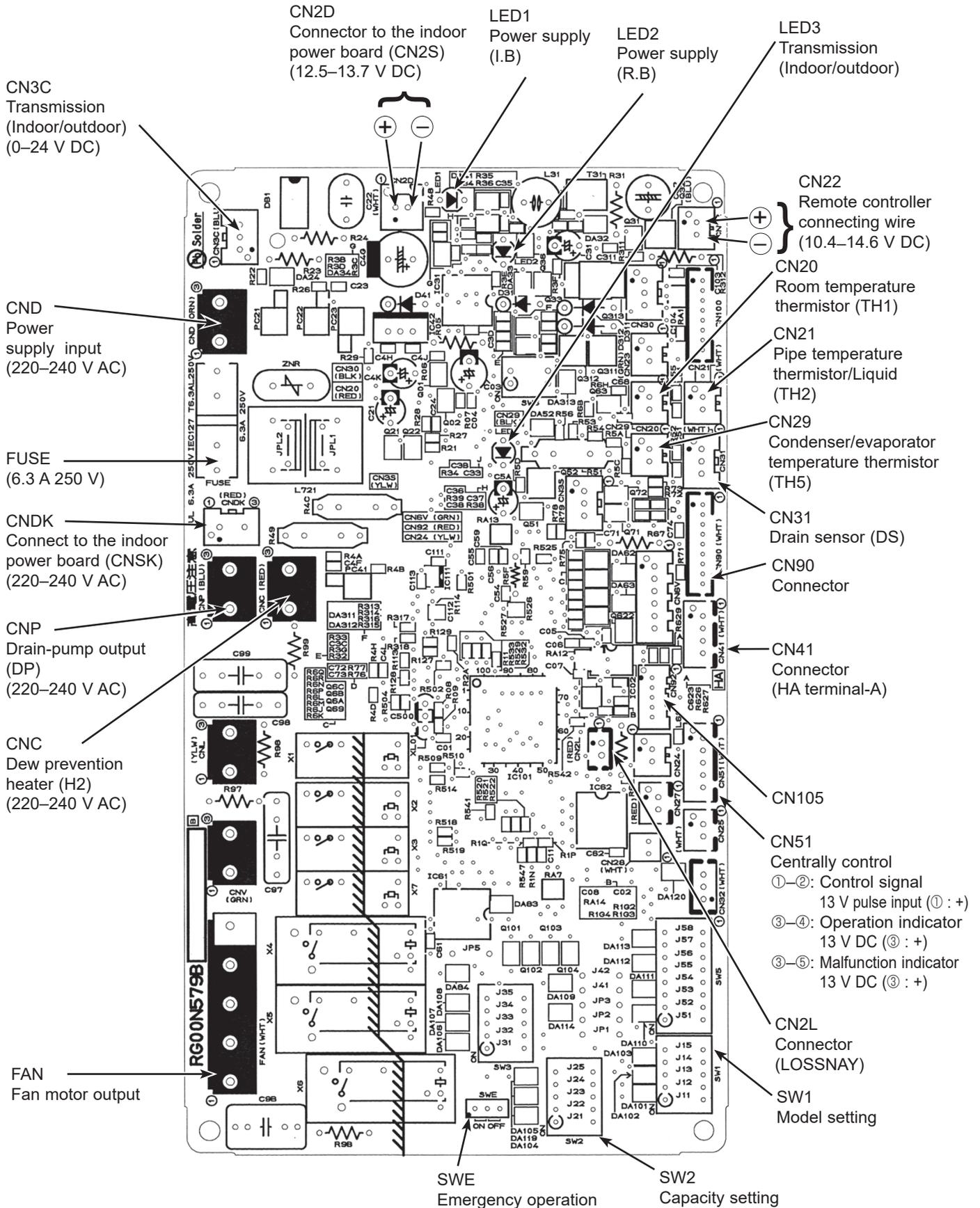
### 9-7-1. Power board PCA-M71HA(-ET)

CNSK  
Connect to the indoor controller board  
(CNDK)  
Between ① to ③ 220–240 V AC



CN2S  
Connect to the indoor controller board (CN2D)  
Between ① to ③ 12.6–13.7 V DC (Pin① (+))

**9-7-2. Indoor controller board  
PCA-M71HA(-ET)**



## 9-8. FUNCTIONS OF DIP SWITCH AND JUMPER WIRE

Each function is controlled by the dip switch and the jumper wire on controller board.

SW1 and SW2 are equipped only for service parts.

Model setting and capacity setting are preset in the nonvolatile memory of the controller board of the unit.

The black square (■) indicates a switch position.

(Marks in the table below) Jumper wire (○: Short ×: Open)

Jumper wire	Functions	Setting by the DIP switch and jumper wire	Remarks																	
SW1	Model settings	<table border="1"> <tr> <td>MODEL</td> <td>Service board</td> </tr> <tr> <td>PCA-M • HA</td> <td> <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table> </td> </tr> </table>	MODEL	Service board	PCA-M • HA	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table>	1	2	3	4	5	ON	■	■	■	■	■	OFF		
MODEL	Service board																			
PCA-M • HA	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table>	1	2	3	4	5	ON	■	■	■	■	■	OFF							
1	2	3	4	5	ON															
■	■	■	■	■	OFF															
SW2	Capacity settings	<table border="1"> <tr> <td>MODEL</td> <td>Service board</td> </tr> <tr> <td>PCA-M71HA</td> <td> <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table> </td> </tr> </table>	MODEL	Service board	PCA-M71HA	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table>	1	2	3	4	5	ON	■	■	■	■	■	OFF		
MODEL	Service board																			
PCA-M71HA	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>ON</td> </tr> <tr> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>■</td> <td>OFF</td> </tr> </table>	1	2	3	4	5	ON	■	■	■	■	■	OFF							
1	2	3	4	5	ON															
■	■	■	■	■	OFF															
J41 J42	Pair number setting with wireless remote controller	<table border="1"> <tr> <td rowspan="5">Wireless remote controller setting</td> <td colspan="2">Control PCB setting</td> </tr> <tr> <td>J41</td> <td>J42</td> </tr> <tr> <td>0</td> <td>○</td> <td>○</td> </tr> <tr> <td>1</td> <td>×</td> <td>○</td> </tr> <tr> <td>2</td> <td>○</td> <td>×</td> </tr> <tr> <td>3 ~ 9</td> <td>×</td> <td>×</td> </tr> </table>	Wireless remote controller setting	Control PCB setting		J41	J42	0	○	○	1	×	○	2	○	×	3 ~ 9	×	×	<p>&lt;Initial setting&gt;            Wireless remote controller: 0            Control PCB: ○ (for both J41 and J42)            Four pair number settings are supported.            The pair number settings of the wireless remote controller and indoor control PCB (J41/J42) are given in the table on the left.            ('×' in the table indicates the jumper line is disconnected.)</p>
Wireless remote controller setting	Control PCB setting																			
	J41	J42																		
	0	○		○																
	1	×		○																
	2	○	×																	
3 ~ 9	×	×																		
JP1	Unit type setting	<table border="1"> <tr> <td>Model</td> <td>JP1</td> </tr> <tr> <td>Without TH5</td> <td>○</td> </tr> <tr> <td>With TH5</td> <td>×</td> </tr> </table>	Model	JP1	Without TH5	○	With TH5	×	There is no jumper (JP1) because these models have the cond./eva. temperature thermistor (TH5).											
Model	JP1																			
Without TH5	○																			
With TH5	×																			
JP3	Indoor controller board type setting	<table border="1"> <tr> <td>Indoor controller board type</td> <td>JP3</td> </tr> <tr> <td>For product</td> <td>×</td> </tr> <tr> <td>Service parts</td> <td>○</td> </tr> </table>	Indoor controller board type	JP3	For product	×	Service parts	○												
Indoor controller board type	JP3																			
For product	×																			
Service parts	○																			

10-1. ROTATION FUNCTION (AND BACK-UP FUNCTION, 2ND STAGE CUT-IN FUNCTION)

10-1-1. Operation

(1) Rotation function (and Back-up function)

• Outline of functions

- Main and sub unit operate alternately according to the interval of rotation setting.
- Main and sub unit should be set by refrigerant address. (Outdoor DIP switch setting)
- Refrigerant address "00" → Main unit
- Refrigerant address "01" → Sub unit
- When an error occurs to one unit, another unit will start operation. (Back-up function)

• System constraint

- This function is available only by the grouping control system (INDOOR UNIT : OUTDOOR UNIT=1:1) of 2 refrigerant groups. (Refer to Fig. 1)
- Main indoor unit should be connected for wired remote controller and the transmission line (TB5) for main and sub unit should also be connected. (Refer to Fig. 1)
- (This function cannot be set by wireless remote controller.)
- Set refrigerant address of each unit. (DIP switch on the outdoor unit · Refrigerant address 00/01)

Operation pattern

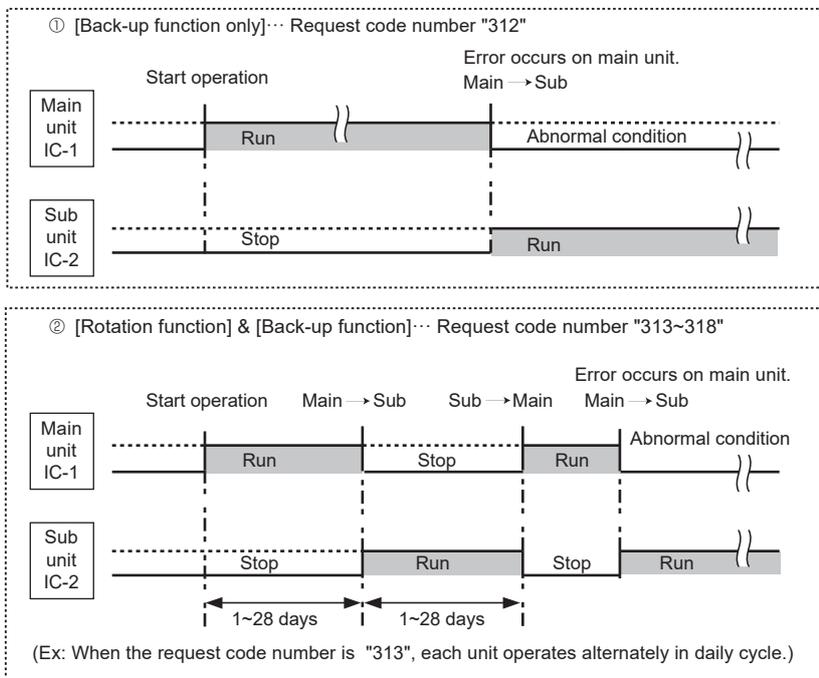
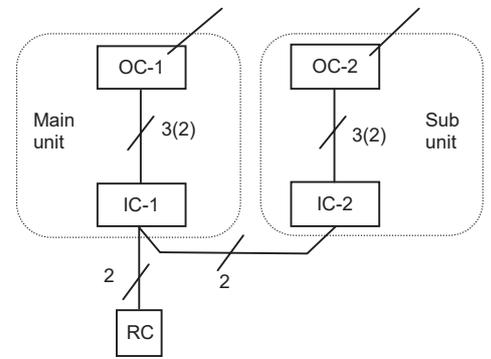


Fig. 1 Refrigerant address "00"      Refrigerant address "01"



OC: Outdoor unit  
IC : Indoor unit  
RC: Wired remote controller

Note:

- When the unit is restarted to operate after turning off the power or operation OFF status, the unit which was operating will start operation.
- To operate the main unit, refer to "10-1-2. How to set rotation function (Back-up function, 2nd stage cut-in function)" and set the request code No. which is not the same as the current one, then set again the former request code No.

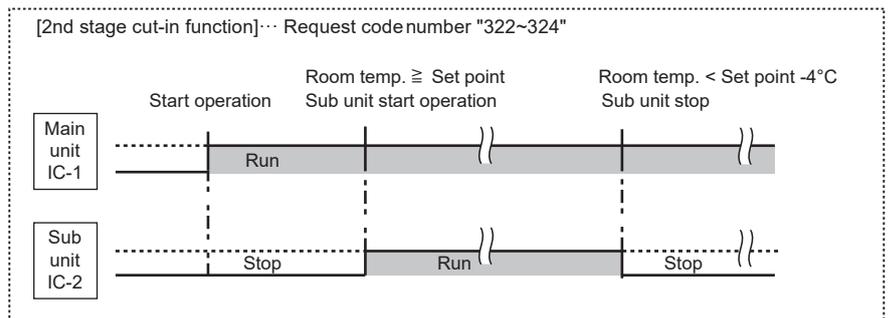
(2) 2nd stage cut-in function

Outline of functions

- Number of operating units is determined according to the room temperature and set point.
- When room temperature reaches higher than set point, standby unit starts. (2 units operation)
- When room temperature falls below set point -4°C, standby unit stops. (1 unit operation)

System constraint

- This function is available only in rotation operation and back-up function in cooling mode.



## 10-1-2. How to set rotation function (Back-up function, 2nd stage cut-in function)

You can set these functions by wired remote controller. (Maintenance monitor)

### NOTICE

Both main and sub unit should be set in same setting.  
Every time replacing indoor controller board for servicing, the function should be set again.

#### (1) Request Code List

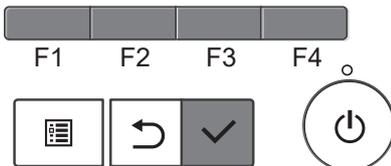
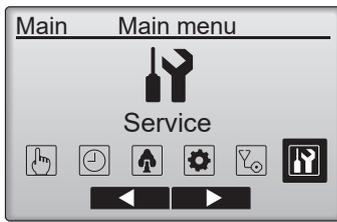
##### Rotation setting

Setting No. (Request code)	Setting contents	Initial setting
No.1 (310)	Monitoring the request code of current setting	
No.2 (311)	Rotation and Back-up OFF (Normal group control operation)	☉
No.3 (312)	Back-up function only	
No.4 (313)	Rotation ON (Alternating interval = 1day) and back up function	
No.5 (314)	Rotation ON (Alternating interval = 3day) and back up function	
No.6 (315)	Rotation ON (Alternating interval = 5day) and back up function	
No.7 (316)	Rotation ON (Alternating interval = 7day) and back up function	
No.8 (317)	Rotation ON (Alternating interval = 14day) and back up function	
No.9 (318)	Rotation ON (Alternating interval = 28day) and back up function	

##### 2nd stage cut-in setting

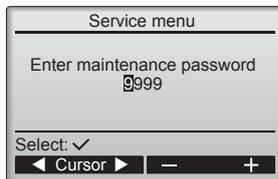
Setting No. (Request code)	Setting contents	Initial setting
No.1 (320)	Monitoring the request code of current setting	
No.2 (321)	Cut-in function OFF	☉
No.3 (322)	Cut-in Function ON(Set point = Set temp.+ 4°C(7.2°F))	
No.4 (323)	Cut-in Function ON(Set point = Set temp.+ 6°C(10.8°F))	
No.5 (324)	Cut-in Function ON(Set point = Set temp.+ 8°C(14.4°F))	

## (2) How to send a request code



① Press the [  ] button.

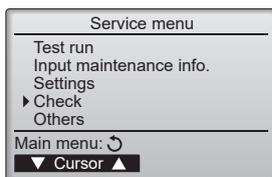
② Select "Service" with the [ F2 ] and [ F3 ] and press the [  ] button.



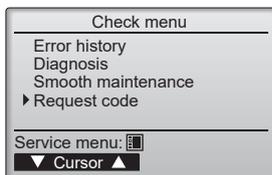
③ Enter the current maintenance password (4 numerical digits).

- Move cursor to the digit you want to change with the [ F1 ] or [ F2 ] button.
- Set each number (0 through 9) with the [ F3 ] or [ F4 ] button.  
(Note: The initial maintenance password is "9999".)

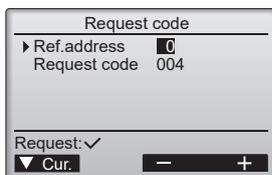
④ Then, press the [  ] button.



⑤ Select "Check" with the [ F1 ] or [ F2 ] button, and press the [  ] button.



⑥ Select "Request code" with the [ F1 ] or [ F2 ] button, and press the [  ] button.



⑦ Set the Refrigerant address and Request code.

- Select the item to be changed with the [ F1 ] or [ F2 ] button.
- Select the required setting with the [ F3 ] or [ F4 ] button.

⑧ Press the [ F3 ] or [ F4 ] button to set the Refrigerant address "0".

⑨ Press the [ F3 ] or [ F4 ] button to set the desired request code No.

- Rotation & Back up operation: Enter one request code from 311 to 318.
- 2nd stage cut-in operation: Enter one request code from 321 to 324.

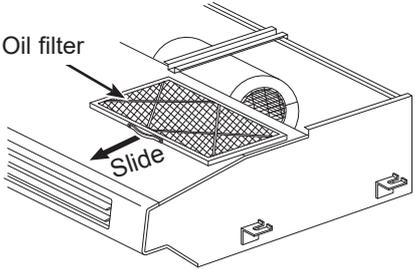
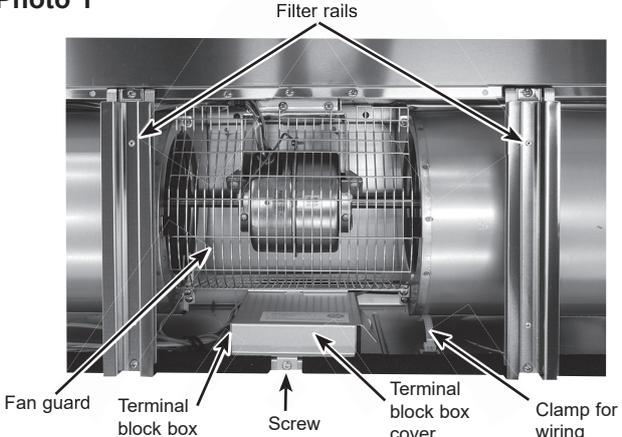
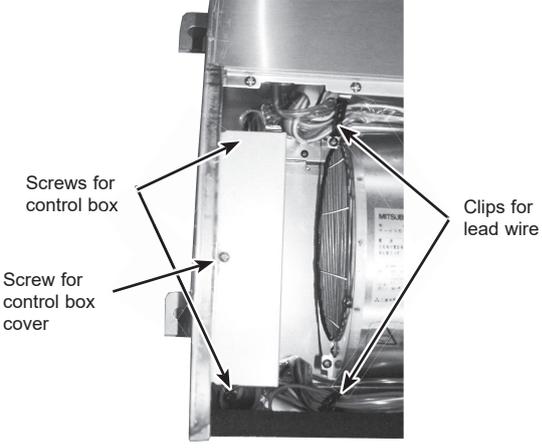
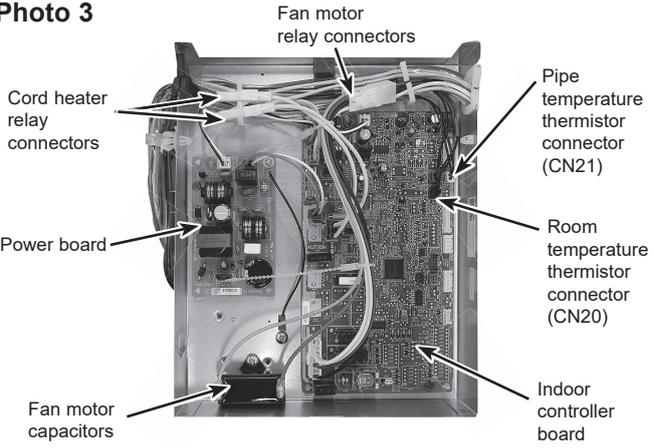
⑩ Press the [  ] button. Data will be collected and displayed.

⑪ Press the [ F3 ] or [ F4 ] button to set the Refrigerant address "1".  
Set above ⑨-⑩.

⑫ To return to the Main menu, press the [  ] button.

**PCA-M71HA(-ET)**

→ : Indicates the visible parts in the photos/figures.

OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>1. Removing the oil filter</b>                      (1) Slide the oil filter towards you to remove. (See Figure 1)</p>	<p><b>Figure 1</b></p> 
<p><b>2. Removing the terminal block box cover</b>                      (1) Remove the oil filter. (See Figure 1)                      (2) Remove a screw for terminal block box cover, and remove the terminal block box cover. (See Photo 1)</p>	<p><b>Photo 1</b></p> 
<p><b>3. Removing the control box</b>                      (1) Remove the oil filter. (See Figure 1)                      (2) Loosen the screw for control box cover to remove the control box cover. (See Photo 2)                      (3) Remove the lead wire from the 2 clips.                      (4) Remove the 2 white cord heater relay connectors (1P × 2) and 2 fan motor relay connectors (6P × 2) in the control box.                      (5) Remove the 2 screws for control box to slide the control box downward.</p> <p>Electrical parts in the control box</p> <ul style="list-style-type: none"> <li>• Fan motor capacitor</li> <li>• Indoor controller board</li> <li>• Power board</li> </ul>	<p><b>Photo 2</b></p>  <p><b>Photo 3</b></p> 

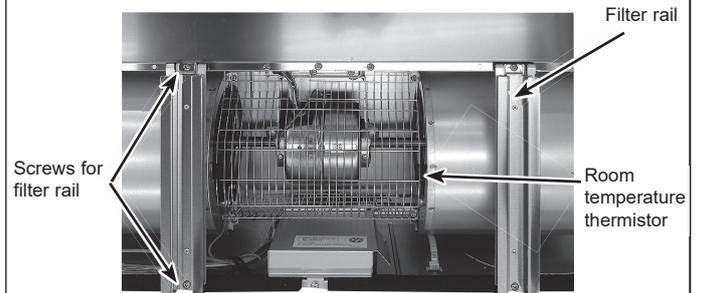
## OPERATING PROCEDURE

### 4. Removing the fan motor

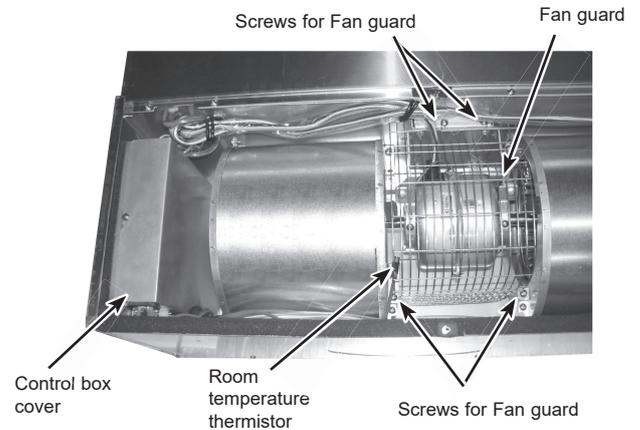
- (1) Remove the oil filter. (See Figure 1)
- (2) Remove the control box cover. (See Photo 2)
- (3) Remove the room temperature thermistor connector (CN20) on the indoor controller board. (See Photo 3)
- (4) Remove a filter rail that is the nearest to the control box. (See Photo 4)
- (5) Remove the fan guard. (See Photo 5)
- (6) Remove the room temperature thermistor together with the holder at the right side of the casing.

## PHOTOS/FIGURES

**Photo 4**



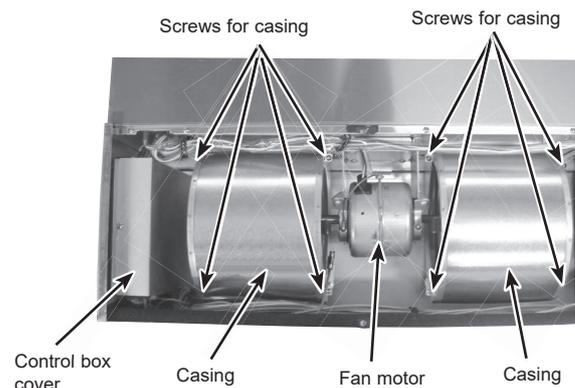
**Photo 5**



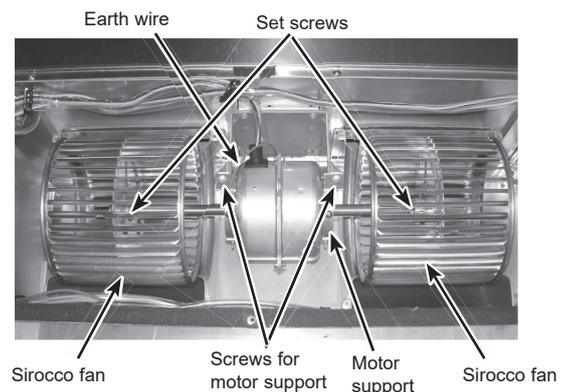
### 5. Removing the fan motor and the sirocco fan

- (1) Remove the oil filter. (See Figure 1)
- (2) Remove the control box cover. (See Photo 2.)
- (3) Remove the fan motor relay connectors (6P) in the control box. (See Photo 3)
- (4) Remove the 2 filter rails. (See Photo 1, 4)
- (5) Remove the fan guard. (See Photo 5)
- (6) Remove the lower casing. (See Photo 6)
- (7) Remove the green earth wire from the motor support. (See Photo 7)
- (8) Remove the 2 screws (M5 × 12) for motor support, and remove the left and right motor supports.
- (9) Remove the fan motor together with the sirocco fan.
- (10) Remove the 2 set screws (M6) to separate the fan motor from the sirocco fan.

**Photo 6**



**Photo 7**



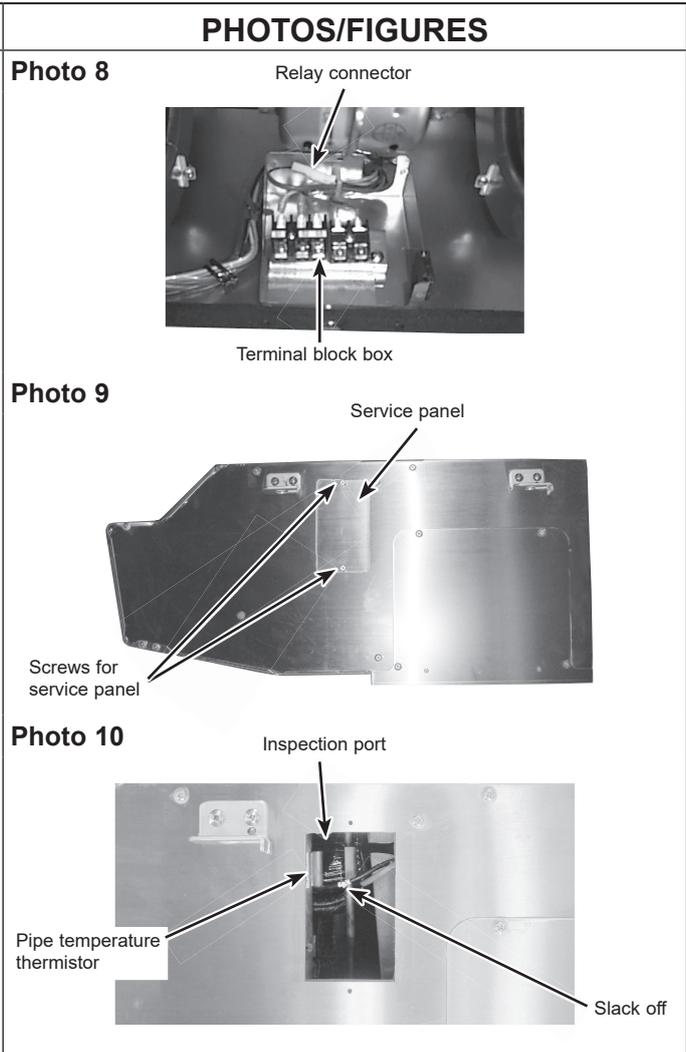


**OPERATING PROCEDURE**

**6. Removing the pipe temperature thermistor**

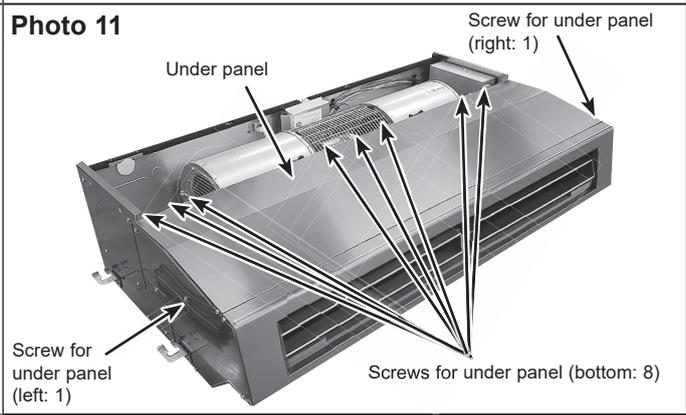
- (1) Remove the oil filter. (See Figure 1)
- (2) Remove the fan guard. (See Photo 1)
- (3) Remove the terminal block box cover.
- (4) Remove the white relay connector (2P) in the terminal block box. (See Photo 8)
- (5) Remove the service panel. (See Photo 9)
- (6) Remove the pipe temperature thermistor from the holder. (See Photo 10)

**Caution for installation**  
When installing the pipe temperature thermistor, slack off its lead wire as shown in the photo. Otherwise, water trickled down the lead wire may splash on the connector and this could cause a short circuit of the connector.



**7. Removing the under panel**

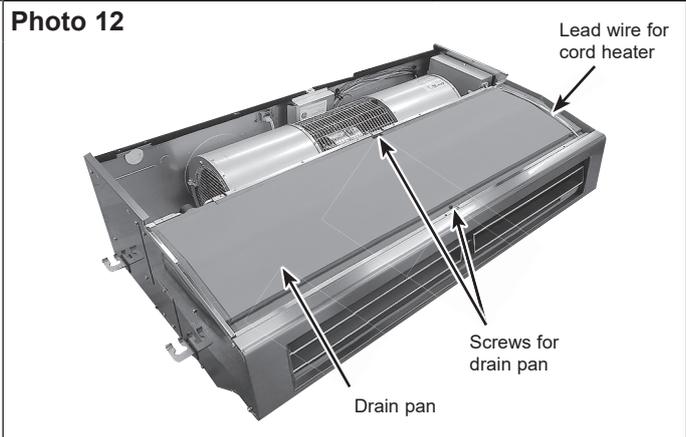
- (1) Remove the oil filter. (See Figure 1)
- (2) Remove the 2 filter rails. (See Photo 1, 4)
- (3) Remove the 10 screws (left: 1, right: 1, bottom: 8) for under panel, and remove the under panel. (See Photo 11)

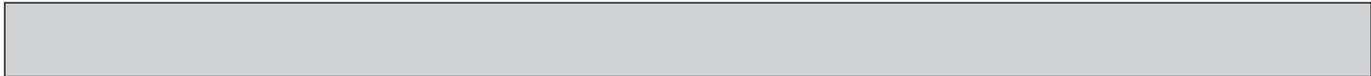


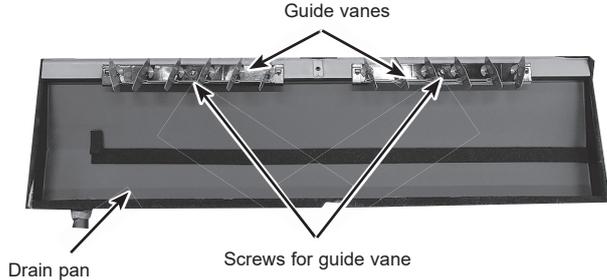
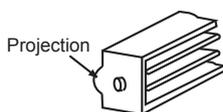
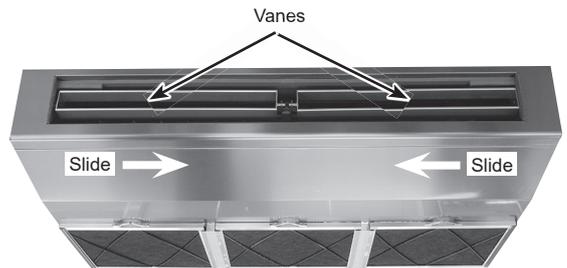
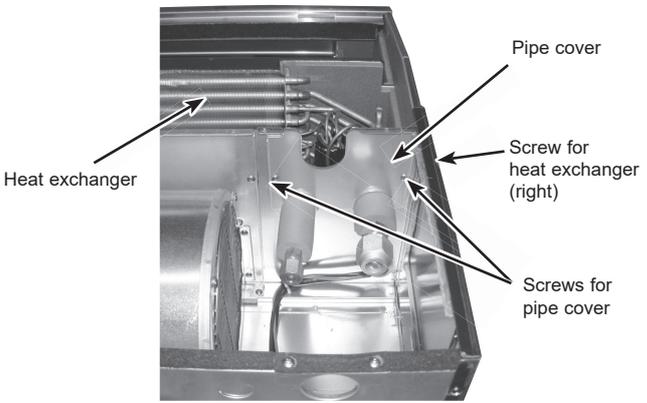
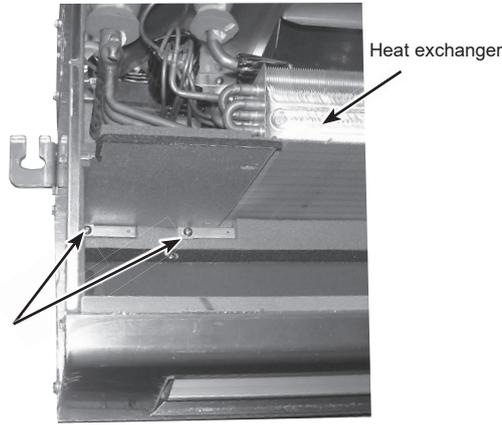
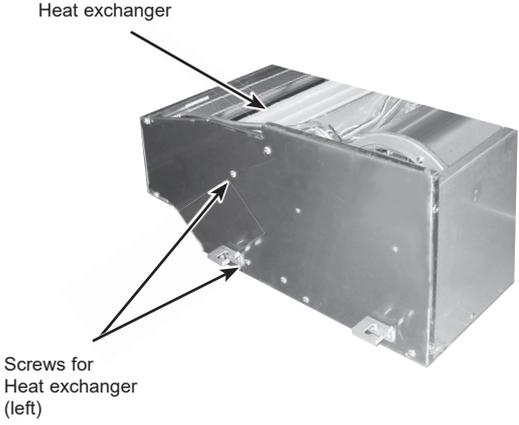
**8. Removing the drain pan**

- (1) Remove the oil filter. (See Figure 1)
- (2) Remove the 2 filter rails. (See Photo 1, 4)
- (3) Remove the under panel. (See Photo 11)
- (4) Pull the blue lead wire for cord heater towards you to slack off. (See Photo 12)
- (5) Remove the 2 screws at the center of the drain pan, and remove the drain pan.

Note: Remove the drain pan carefully since the drain could remain in it.





OPERATING PROCEDURE	PHOTOS/FIGURES
<p><b>9. Removing the guide vane</b></p> <p>(1) Remove the oil filter. (See Figure 1)            (2) Remove the 2 filter rails. (See Photo 1, 4)            (3) Remove the under panel. (See Photo 11)            (4) Remove the drain pan. (See Photo 12)            (5) Remove the 2 screws (4 × 10) for guide vane, and remove the guide vane. (See Photo 13)</p>	<p><b>Photo 13</b></p>  <p>Labels: Guide vanes, Drain pan, Screws for guide vane</p>
<p><b>10. Removing the vane</b></p> <p>(1) Slide the vane to the center of the unit, and pull it towards you to remove. (See Photo 14)</p> <p><b>Caution for installation</b>            When installing the vane, check that its projection is on the left-rear side.</p>  <p>Label: Projection</p>	<p><b>Photo 14</b></p>  <p>Labels: Vanes, Slide</p>
<p><b>11. Removing the heat exchanger</b></p> <p>(1) Remove the oil filter. (See Figure 1)            (2) Remove the 2 filter rails. (See Photo 1, 4)            (3) Remove the under panel. (See Photo 11)            (4) Remove the drain pan. (See Photo 12)            (5) Remove the 2 screws (4 × 10) for pipe cover, and remove the pipe cover. (See Photo 15)            (6) Remove the 3 screws (4 × 10, left: 2, right: 1) for heat exchanger. (See Photo 15, 16)            (7) Remove the 2 screws (4 × 10) for heat exchanger at the top of the unit, and remove the heat exchanger. (See Photo 17)</p>	<p><b>Photo 15</b></p>  <p>Labels: Heat exchanger, Pipe cover, Screw for heat exchanger (right), Screws for pipe cover</p>
<p><b>Photo 17</b></p>  <p>Labels: Heat exchanger, Screws for Heat exchanger (top)</p>	<p><b>Photo 16</b></p>  <p>Labels: Heat exchanger, Screws for Heat exchanger (left)</p>

**Mr. SLIM**

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