MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

July 2016

No. OCH516
REVISED EDITION-B

TECHNICAL & SERVICE MANUAL

CITY MULTI Series Wall Mounted R410A

Indoor unit [Model Name]

PKFY-P06NBMU-E2

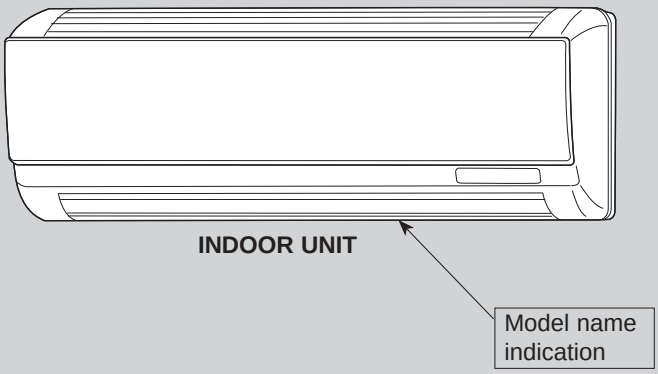
[Service Ref.]

PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

Revision:
- Added PKFY-P06NBMU-E2R1 in REVISED EDITION-B.
- Some descriptions have been modified.

OCH516 REVISED EDITION-A is void.

Notes:
- This manual describes only service data of the indoor units.
- RoHS compliant products have <G> mark on the spec name plate.



CONTENTS

CITY MULTI

TECHNICAL CHANGES

PKFY-P06NBMU-E2 ➔ PKFY-P06NBMU-E2R1
HEAT EXCHANGER and LEV have been changed.

1 SAFETY PRECAUTION

CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Do not use the existing refrigerant piping.

The old refrigerant and lubricant in the existing piping contains a large amount of chlorine which may cause the lubricant deterioration of the new unit.

Use "low residual oil piping"

If there is a large amount of residual oil (hydraulic oil, etc.) inside the piping and joints, deterioration of the lubricant will result.

Store the piping indoors, and 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.

Do not use refrigerant other than R410A.

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

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 R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for 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.

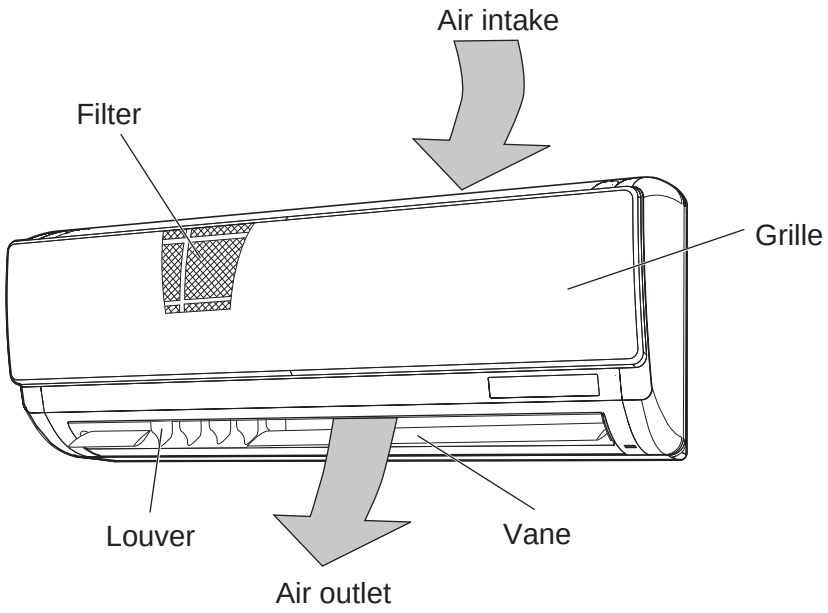
Use the specified refrigerant only.

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 in the manuals and on the spec labels provided with our products.
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.

2 PARTS NAMES AND FUNCTIONS

2-1. Indoor unit



2-2. Wired Remote Controller <PAR-32MAA> <PAC-YT53CRAU>

Wired remote controller function

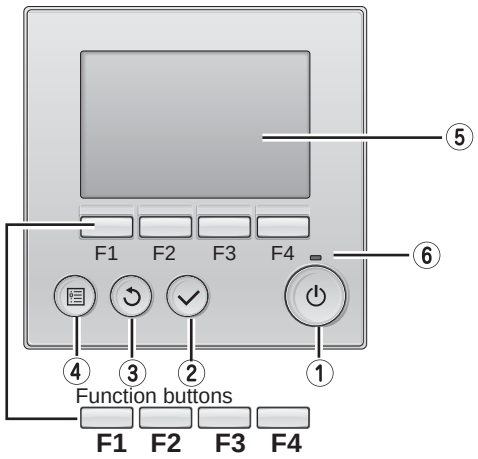
The functions which can be used are restricted according to each model.

○ : Supported ✕ : Unsupported

	Function	PAR-32MAA		PAC-YT53CRAU
		Slim	City multi	
Body	Product size H × W × D (mm)	120 × 120 × 19		120 × 70 × 14.5
	LCD	Full Dot LCD		Partial Dot LCD
	Backlight	○		○
Energy-saving	Energy-saving operation schedule	○	✕	✕
	Automatic return to the preset temperature	○		✕
Restriction	Setting the temperature range restriction	○		○
Function*	Operation lock function	○		○
	Weekly timer	○		✕
	ON/OFF timer	○		✕
	High Power	○	✕	✕
	Manual vane angle	○		✕

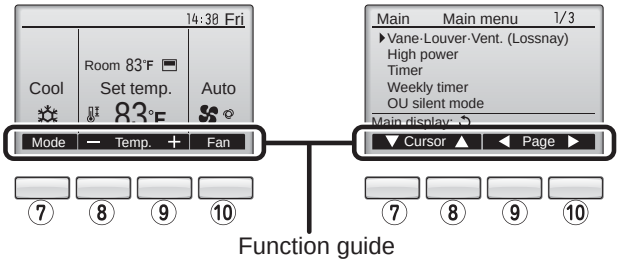
*Some functions may not be available depending on model types.

2-2-1. Wired Remote Controller <PAR-32MAA>



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.

<Main display> **<Main menu>**



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)

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.
Main menu : Press to move the cursor down.

⑧ Function button F2

Main display : Press to decrease temperature.
Main menu : Press to move the cursor up.

⑨ Function button F3

Main display : Press to increase temperature.
Main menu : Press to go to the previous page.

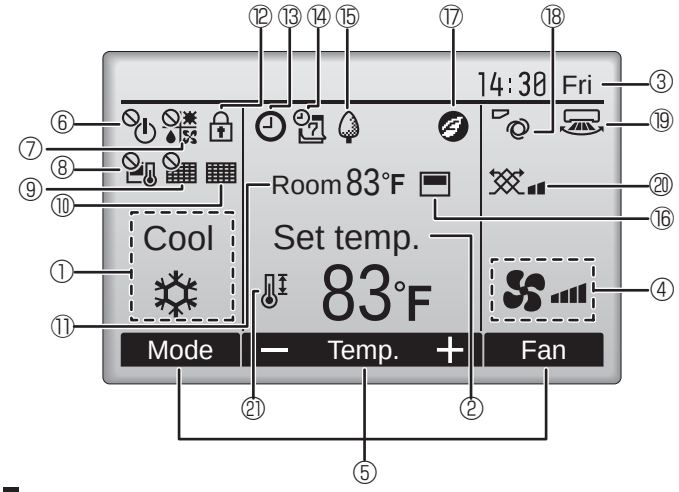
⑩ Function button F4

Main display : Press to change the fan speed.
Main menu : Press to go to the next page.

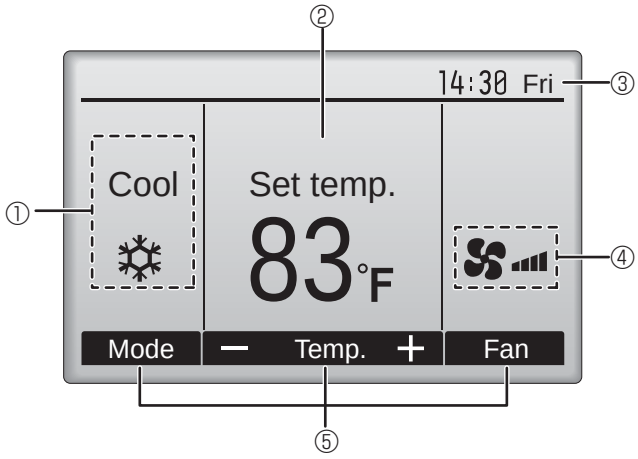
The main display can be displayed in 2 different modes: "Full" and "Basic".
The initial setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting.

<Full mode>

All icons are displayed for explanation.



<Basic mode>



① Operation mode

Indoor unit operation mode appears here.

② Preset temperature

Preset temperature appears here.

③ Clock (See the Installation Manual.)

Current time appears here.

④ Fan speed

Fan speed setting appears here.

⑤ Button function guide

Functions of the corresponding buttons appear here.

⑥

Appears when the ON/OFF operation is centrally controlled.

⑦

Appears when the operation mode is centrally controlled.

⑧

Appears when the preset temperature is centrally controlled.

⑨

Appears when the filter reset function is centrally controlled.

⑩

Indicates when filter needs maintenance.

⑪ Room temperature (See the Installation Manual.)

Current room temperature appears here.

⑫

Appears when the buttons are locked.

⑬

Appears when the On/Off timer or Night setback function is enabled.

⑭

Appears when the Weekly timer is enabled.

⑮

Appears while the units are operated in the energy-save mode.

⑯

Appears when the built-in thermistor on the remote controller is activated to monitor the room temperature.
appears when the thermistor on the indoor unit is activated to monitor the room temperature.

⑰

Appears when the units are operated in the energy-save mode with 3D i-see Sensor.

⑱

Indicates the vane setting.

⑲

Indicates the louver setting. (This function is not available on this unit.)

⑳

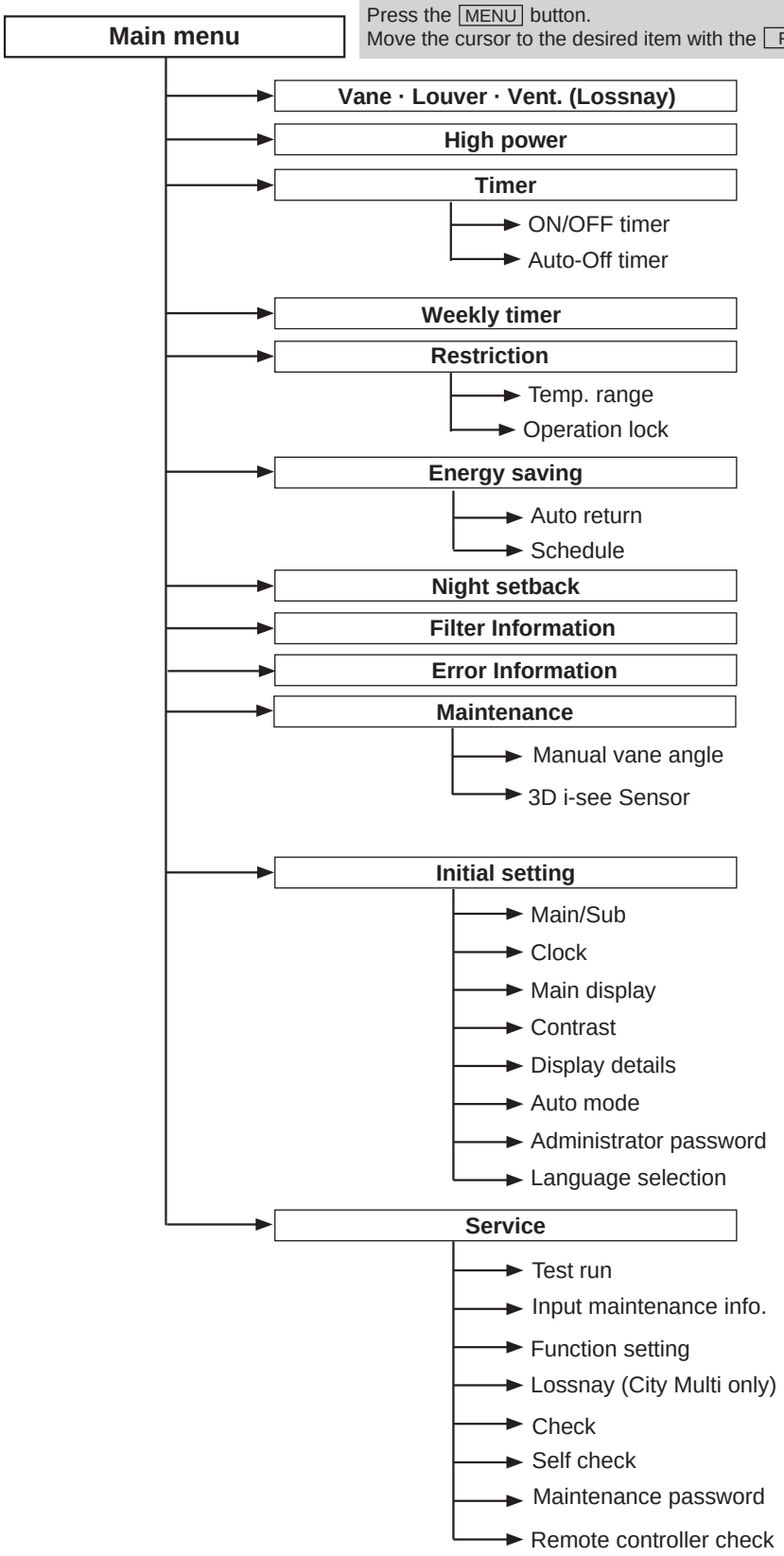
Indicates the ventilation setting.

㉑

Appears when the preset temperature range is restricted.

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

Press the MENU button.
Move the cursor to the desired item with the F1 and F2 buttons, and press the SELECT button.



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

Main menu list

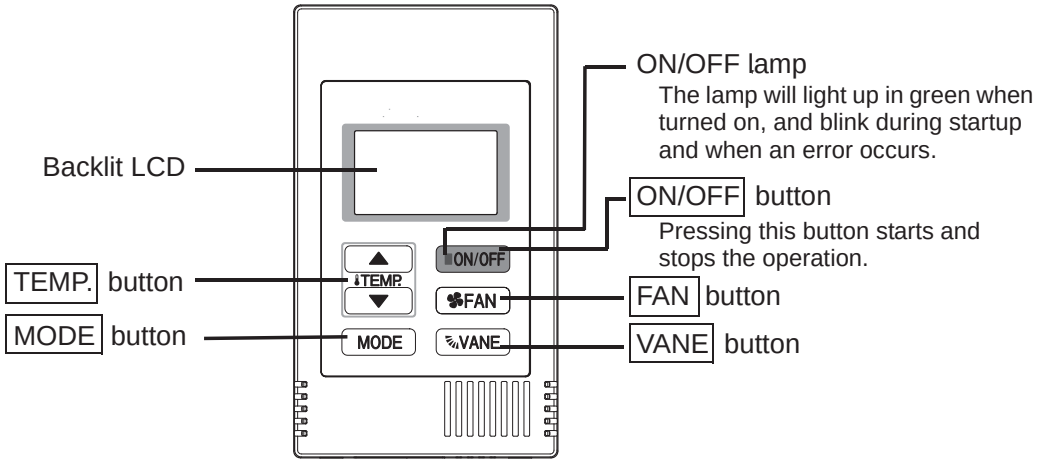
Setting and display items		Setting details
Vane · Louver · Vent. (Lossnay)		**Use to set the vane angle.** • Select a desired vane setting from 5 different settings. **Use to turn ON/OFF the louver.** • Select a desired setting from "ON" and "OFF." **Use to set the amount of ventilation.** • Select a desired setting from "Off," "Low," and "High."
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	**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 8 operation patterns can be set for each day. (Not valid when the ON/OFF timer is enabled.)
Restriction	**Temp. range**	**Use to restrict the preset temperature range.** • Different temperature ranges can be set for different operation modes.
	Operation lock	**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-save operation for a specified time period.** • Time can be set to a value from 30 and 120 in 10-minute increments. (This function will not be valid when the preset temperature ranges are restricted.)
	Schedule*	**Set the start/stop times to operate the units in the energy-save mode for each day of the week, and set the energy-saving rate.** • Up to 4 energy-save 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% or 50 to 90% in 10% increments.
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.
Filter information		**Use to check the filter status.** • The filter sign can be reset.
Error information		**Use to check error information when an error occurs.** • Check 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.)
Maintenance	**Manual vane angle**	**Use to set the vane angle for each vane to a fixed position.**
	3D i-see Sensor	**Use to set the following functions for 3D i-see Sensor.** • Air distribution • Energy saving option • Seasonal airflow
Initial setting	**Clock**	**Use to set the current time.**
	Main display	**Use to switch between "Full" and "Basic" modes for the Main display.** • The initial setting is "Full."
	Contrast	**Use to adjust screen contrast.**
	Language selection	**Use to select the desired language.**

Continue to the next page

Setting and display items		Setting details
	Input maintenance	**Select "Input maintenance Info." from the Service menu to bring up the Maintenance information screen.** **The following settings can be made from the Maintenance Information screen.** • Model name input • Serial No. input • Dealer information input
	LOSSNAY setting	**This setting is required only when the operation of City Multi units is interlocked with LOSSNAY units.**
	Check	**Error history:** Display the error history and execute delete error history.
	Self check	**Error history of each unit can be checked via the remote controller.**
	Maintenance password	**Use to change the maintenance password.**
	Remote controller check	**When the remote controller does not work properly, use the remote controller checking function to troubleshoot the problem.**

2-2-2. Wired Remote Controller <PAC-YT53CRAU>

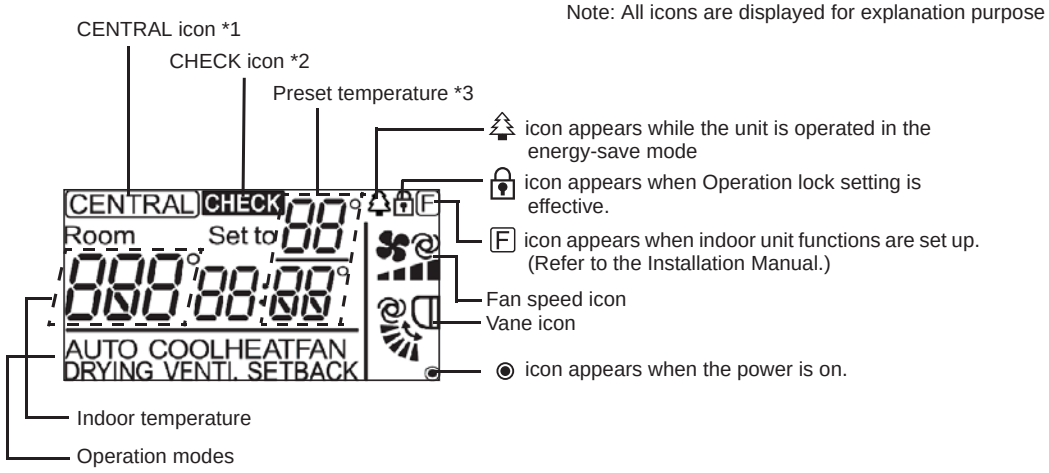
Note:
The phrase "Wired remote controller" in this manual refers only to the PAC-YT53CRAU.
If you need any information for the other remote controller, please refer to either the installation manual or initial setting manual which are included in remote controller's box.



Note: To set the functions that are not available on this controller (PAC-YT53CRAU) such as Louver, use the centralized controller.

Display section

Note: All icons are displayed for explanation purpose



*1 CENTRAL icon

Appears when one of the following local operations is prohibited: ON/OFF; operation mode; preset temperature; fan speed; vane.

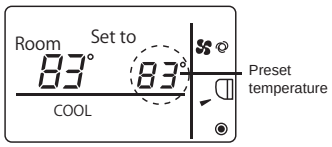
*2 **CHECK** icon

For City Multi, when an error occurs, power indicator will blink, and unit address (3 digits) and check code (4 digits) will blink.
Check the error status, stop the operation, and consult your dealer.

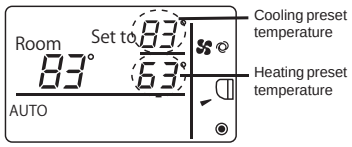
*3 Preset temperature

* Centigrade or Fahrenheit is selectable. Refer to the Installation Manual for details.

In COOL, DRYING, HEAT, or AUTO (single set point) modes



In AUTO (dual set point) or SETBACK modes



3 SPECIFICATION

3-1. Specifications

Service Ref.			PKFY-P06NBMU-E2 PKFY-P06NBMU-E2R1
Power source			1-phase 208/230V 60Hz
Cooling capacity (Nominal)	*1	kW	1.8
	*1	BTU/h	6,000
	Power input	kW	0.03
	Current input	A	0.15
Heating capacity (Nominal)	*2	kW	2.0
	*2	BTU/h	6,700
	Power input	kW	0.03
	Current input	A	0.15
External finish			Plastic, MUNSELL (1.0Y 9.2/0.2)
External dimension H × W × D		inch	11-5/8" × 32-1/8" × 8-7/8"
		mm	295 × 815 × 225
Net weight		lb (kg)	22 (10)
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type × Quantity		Line flow fan × 1
	External static press.	Pa	0
		mmH_2O	0
	Motor type		1-phase induction motor
	Motor output	kW	0.008
	Driving mechanism		Direct-driven by motor
	Airflow rate	m^3/min	4.9 - 5.2 - 5.6 - 5.9
	(Low-Mid2-Mid1-High)	L/s	82 - 87 - 93 - 98
		cfm	170 - 180 - 200 - 210
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)		dB <A>	32 - 33 - 35 -36
Insulation material			Polyethylene sheet
Air filter			PP honeycomb
Protection device			Fuse
Refrigerant control device			LEV
Connectable outdoor unit			R410A CITY MULTI
Diameter of refrigerant pipe	Liquid (R410A)	inch (mm)	ø1/4"(ø6.35) Flare ø1/4" (ø6.35) Flare
	Gas (R410A)	inch (mm)	ø1/2" (ø12.7) Flare ø1/2"(ø12.7) Flare
Field drain pipe size		inch (mm)	I.D. 5/8" (16)
Standard attachment	Document		Installation Manual, Instruction Book
	Accessory		MA remote controller cable
Optional parts	External heater adapter		PAC-SA88HA-E
Remarks	Installation		Details on foundation work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.

	*1 Nominal cooling conditions	*2 Nominal heating conditions
Indoor :	80°FDB/67°FWB (26.7°CDB/19.4°CWB)	70°FDB(21°CDB)
Outdoor :	95°FDB (35°CDB)	47°FDB/43°FWB (8.3°CDB/6.1°CWB)
Pipe length :	25 ft. (7.6 m)	25 ft. (7.6 m)
Level difference :	0 ft (0 m)	0 ft (0 m)

Note: Due to continuing improvement, above specification may be subject to change without notice.

Unit converter

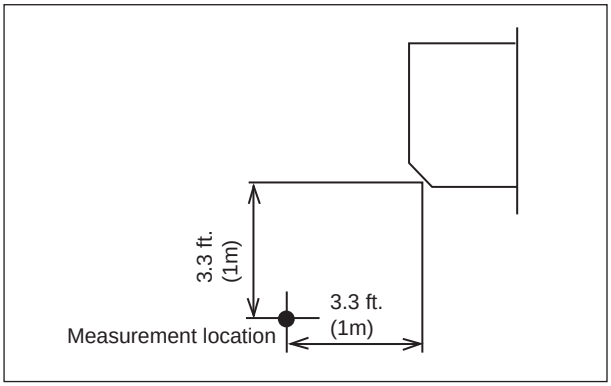
kcal/h = kW × 860
Btu/h = kW × 3,412
cfm = m^3/min × 35.31
lb = kg/0.4536

Note: Above specification data is subject to rounding variation.

3-2. Electrical parts specifications

Service Ref. / Parts name	Symbol	PKFY-P06NBMU-E2 PKFY-P06NBMU-E2R1
Room temperature detection thermistor	TH21	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Pipe temperature detection thermistor/liquid	TH22	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Pipe temperature detection thermistor/gas	TH23	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ
Fuse (Indoor controller board)	FUSE	250V 6A
Fan motor (with thermal fuse)	MF	4-Pole Output 8W / PS4N8-KB
Fan motor capacitor	C1	1.2μF × 440V
Vane motor (with limit switch)	MV	MSFBC20 DC12V
Linear expansion valve	LEV	DC12V Stepping motor drive Port φ3.2 (0~2000pulse)
Power supply terminal block	TB2	(L1, L2, GR) 250V 20A
Transmission terminal block	TB5	(M1, M2, S) 250V 20A
MA remote controller terminal block	TB15	(1, 2) 250V 10A

3-3. Sound levels



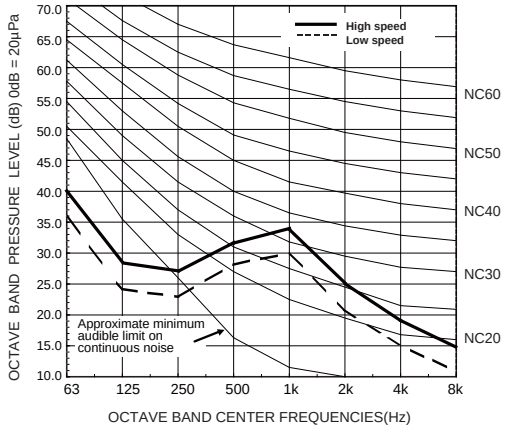
* Measured in anechoic room.

Sound level at anechoic room : Low-Middle2-Middle1-High

Service Ref.	Sound level dB (A)
PKFY-P06NBMU-E2 PKFY-P06NBMU-E2R1	32-33-35-36

3-4. NC curve

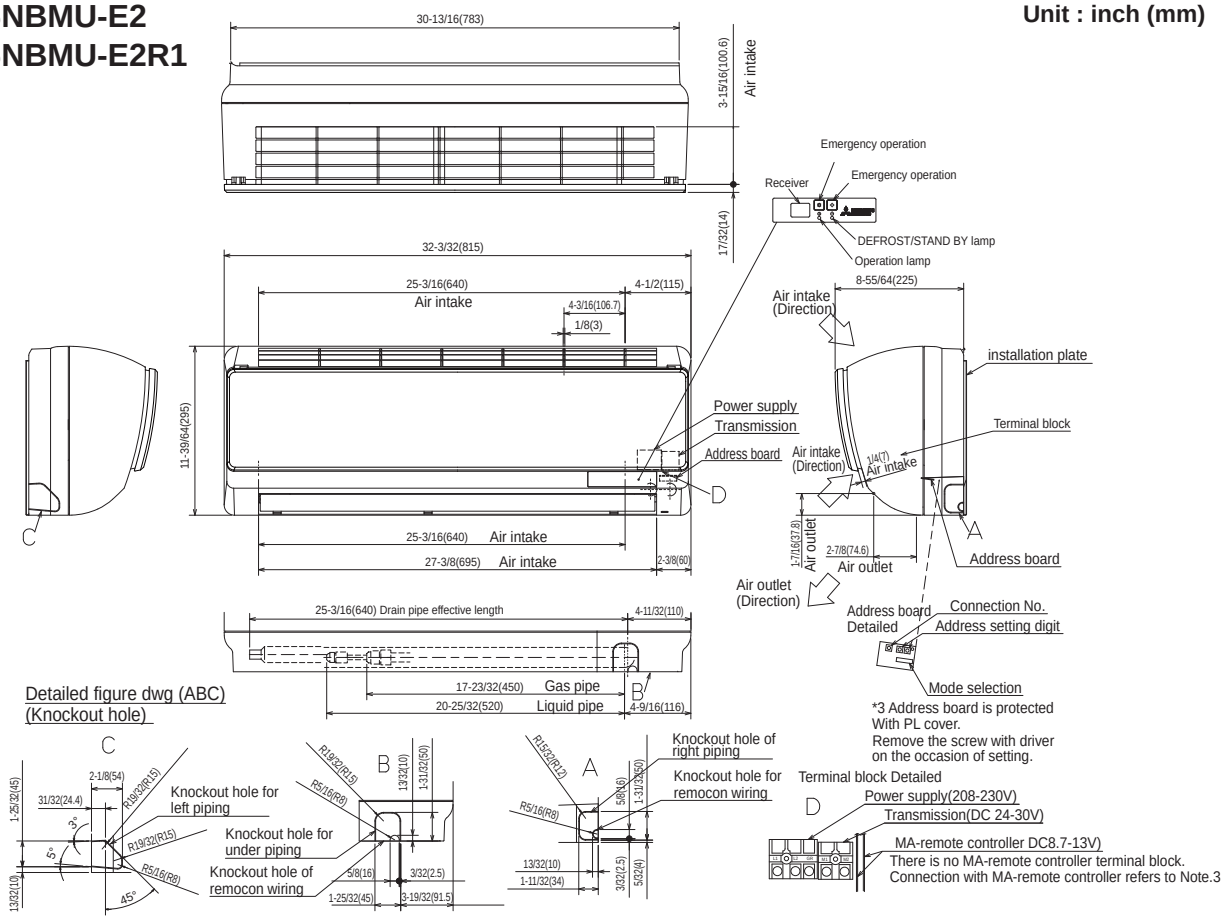
PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1
External static pressure : 0Pa
Power source : 208,230V, 60Hz

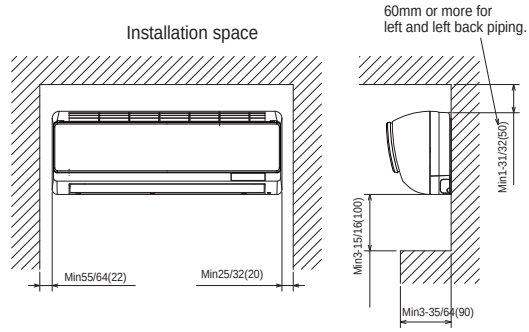


4 OUTLINES AND DIMENSIONS

PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

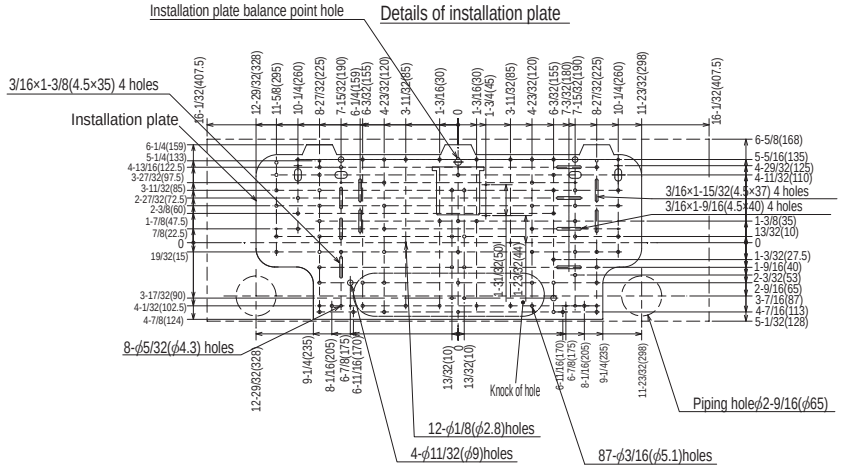
Unit : inch (mm)





Note.1 Use M10 or W3/8 screw for installation plate.
Note.2 Extension piping side.
Note.3 In case of connecting MA-remote controller, please connect MA-remote controller cable (anaccssory) to the connector.

Refrigerant piping	Liquid pipe	1/4F（ϕ6.35）
	Gas pipe	1/2F（ϕ12.7）
Drain pipe		ϕ2-9/16(ϕ16) I.D



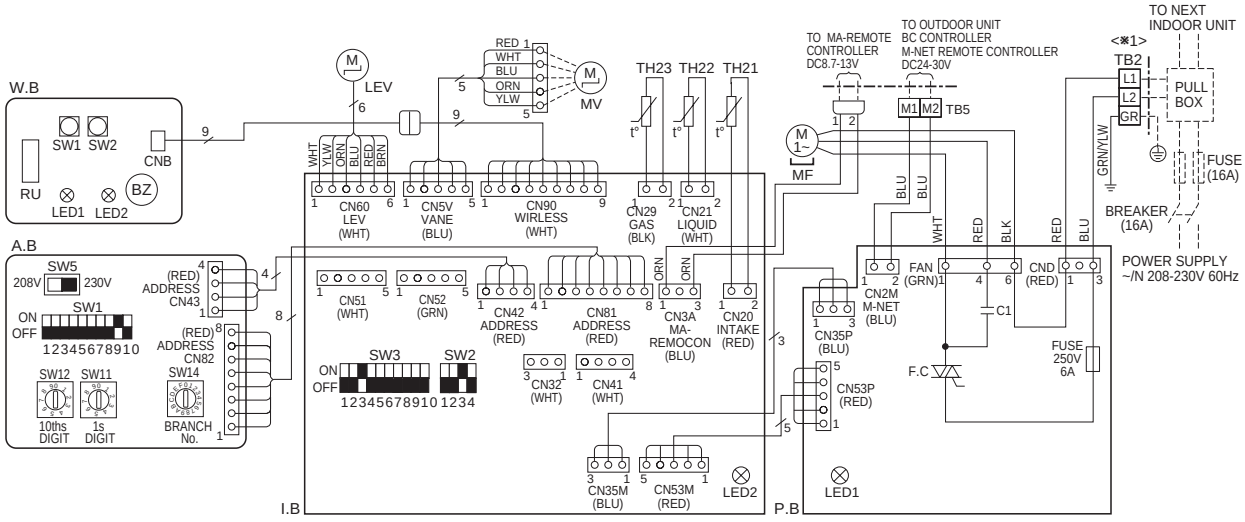
5 WIRING DIAGRAM

PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

LEGEND

SYMBOL	NAME		SYMBOL	NAME	
I. B	INDOOR CONTROLLER BOARD		MF	FAN MOTOR	
CN32	CONNECTOR	REMOTE SWITCH	MV	VANE MOTOR	
CN51		CENTRALLY CONTROL	LEV	LINEAR EXPANSION VALVE	
CN52		REMOTE INDICATION	TB2	TERMINAL BLOCK	POWER SUPPLY
		EXTERNAL HEATER	TB5		TRANSMISSION
SW2	SWITCH	CAPACITY CODE	TH21	THERMISTOR	ROOM TEMP. DETECTION (32°F/15kΩ, 77°F/5.4kΩ)
SW3		MODE SELECTION			
P. B	INDOOR POWER BOARD		TH22		PIPE TEMP. DETECTION/LIQUID (32°F/15kΩ, 77°F/5.4kΩ)
C1	CAPACITOR (FAN MOTOR)				
F.C	FAN PHASE CONTROL		TH23		PIPE TEMP. DETECTION/GAS (32°F/15kΩ, 77°F/5.4kΩ)
FUSE	FUSE (6A/250V)				

SYMBOL	NAME	
A. B	ADDRESS BOARD	
SW1	SWITCH	MODE SELECTION
SW5		VOLTAGE SELECTION
SW11		ADDRESS SETTING 1s DIGIT
SW12		ADDRESS SETTING 10ths DIGIT
SW14		BRANCH No.
W. B	WIRELESS REMOTE CONTROLLER BOARD	
RU	RECEVING UNIT	
BZ	BUZZER	
LED1	LED (OPERATION INDICATOR : GREEN)	
LED2	LED (PREPARATION FOR HEATING : ORANGE)	
SW1	EMERGENCY OPERATION (HEAT)	
SW2	EMERGENCY OPERATION (COOL)	



Notes:

1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of using MA-remote controller, please connect MA remote controller cable in an accessory to the connector 1 2. (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
4. Symbols used in wiring diagram above are, □□□: terminal block, ○○○: connector.
5. The ■ of dip sw is the switch position.
6. Please set the switch SW5 according to the power supply voltage.
   Set SW5 to 230V side when the power supply is 230 volts.
   When the power supply is 208 volts, set SW5 to 208V side.

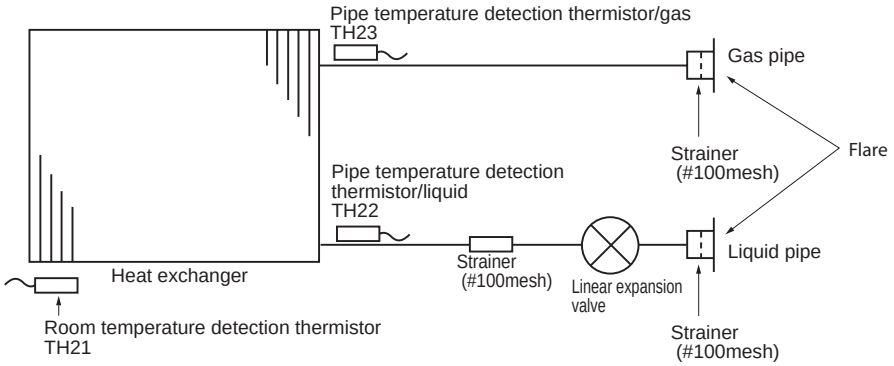
<※1> Use Copper Supply Wire.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply (Indoor unit:208-230V) power on → lamp is lit
LED2	Power supply for MA -Remote controller	Power supply for MA -Remote controller on → lamp is lit

6 REFRIGERANT SYSTEM DIAGRAM

PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

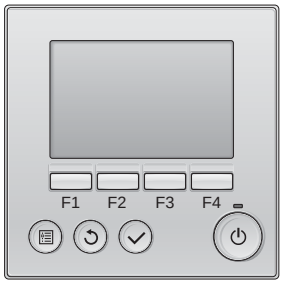


Unit: inch (mm)

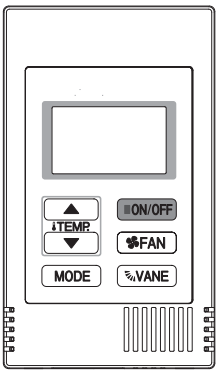
Item \ Service ref.	PKFY-P06NBMU-E2 PKFY-P06NBMU-E2R1
Gas pipe	ϕ1/2” (12.7)
Liquid pipe	ϕ1/4” (6.35)

7 MICROPROCESSOR CONTROL

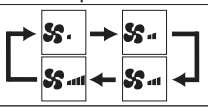
INDOOR UNIT CONTROL
7-1. COOL OPERATION



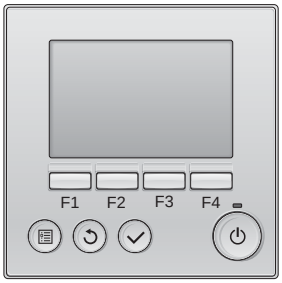
<How to operate>
① Press ⏻ button.
② Press [F1] button to display COOL.
③ Press [F2] [F3] button to set the desired temperature.
NOTE: The settable temperature range varies with the model of outdoor units and remote controller.



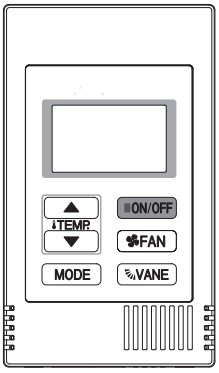
<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display COOL.
③ Press the TEMP. button to set the desired temperature.
NOTE: The set temperature changes 1°F when the ▽ or △ button is pressed one time. Cooling 67 to 87°F

Control Mode	Control Details	Remarks
1. Temperature adjustment function	1-1. Determining temperature adjustment function (Function to prevent restarting for 3 minutes) • Room temperature ≧ Set temperature + 2°F ⋯Thermo-ON • Room temperature ≦ Set temperature ⋯Thermo-OFF 1-2. Anti-freeze control ■ Condition to detect When the pipe temperature detection thermistor/liquid (TH22) detects 32°F or less in 16 minutes from compressor startup, the anti-freeze control initiates, and the unit enters to the thermo-OFF. ■ Condition to release The timer which prevents reactivating is set for 3 minutes, and anti-freeze control is cancelled when any one of the following conditions has been satisfied: ① Pipe temperature detection thermistor/liquid (TH22) reaches 50°F or above. ② The condition of thermo-OFF has been completed by the thermostat. ③ The operation has changed to a mode other than COOL.	• The ON/OFF commands by the indoor unit thermostatic control are not an ON/OFF commands to the compressor but an open/close commands to the linear expansion valve. (The compressor stops only when the thermostatic control for all the indoor units connected to the same outdoor unit turns OFF.)
2. Fan	By the remote controller setting (switch of 4 speeds) Type: 4 speeds type — Fan speed notch: 	
3. Vane (up/down vane change)	(1) The initial vane setting for COOL mode will be the horizontal position. (2) Vane position: Horizontal →Downward A →Downward B →Downward C ↑ └──────────────────────┘ (3) Restriction of the downward vane setting If the vane position is set to Downward A/B/C in [Mid1] or [Low], the vane will return to the horizontal position after 1 hour has passed.	• "ONLY 1 Hr" appears on the wired remote controller.

7-2. DRY OPERATION



<How to operate>
① Press ⏻ button.
② Press [F1] button to display DRY.
③ Press [F2] [F3] button to set the desired temperature.

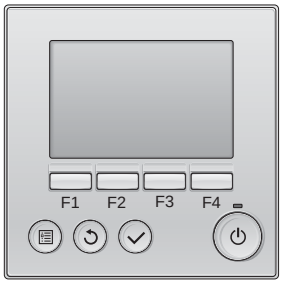


<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display DRY.
③ Press the TEMP. button to set the desired temperature.
NOTE: The set temperature changes 1°F when the ▽ or △ button is pressed one time. Dry 67 to 87°F

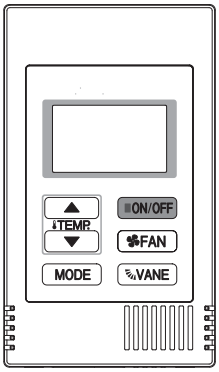
<table>
<tr><th>Control Mode</th><th>Control Details</th><th>Remarks</th></tr>
<tr><td>1. Temperature adjustment function</td><td>1-1. Determining temperature adjustment function
(Function to prevent restarting for 3 minutes)
Setting the Dry thermo by the thermostat signal and the room temperature (TH21).
Dry thermo-ON Room temperature ≧ Set temperature + 2°F
Dry thermo-OFF Room temperature ≦ Set temperature

<table>
<tr><th rowspan="2">Room temperature</th><th colspan="2">3 minutes passed since starting operation</th><th rowspan="2">Dry thermo-ON time (min)</th><th rowspan="2">Dry thermo-OFF time (min)</th></tr>
<tr><th>Thermostat signal</th><th>Room temperature (T1)</th></tr>
<tr><td rowspan="5">Over 64°F</td><td rowspan="4">ON</td><td>T1 ≧ 83°F</td><td>9</td><td>3</td></tr>
<tr><td>83°F > T1 ≧ 79°F</td><td>7</td><td>3</td></tr>
<tr><td>79°F > T1 ≧ 75°F</td><td>5</td><td>3</td></tr>
<tr><td>75°F > T1</td><td>3</td><td>3</td></tr>
<tr><td>OFF</td><td>Unconditional</td><td>3</td><td>10</td></tr>
<tr><td>Below 64°F</td><td colspan="4">Dry thermo OFF</td></tr>
</table>
1-2. Anti-freeze control
No control function</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depends on the compressor conditions.
<table>
<tr><th>Dry thermo</th><th colspan="2">Fan speed notch</th></tr>
<tr><td>ON</td><td colspan="2">[Low]</td></tr>
<tr><td rowspan="2">OFF</td><td>Excluding the following</td><td>Stop</td></tr>
<tr><td>Room temp. < 64°F</td><td>[Low]</td></tr>
</table>
Note: Fan speed change is not allowed during DRY operation.</td><td></td></tr>
<tr><td>3. Vane (up/down vane change)</td><td>Settings are the same in DRY operation as they are in COOL operation.</td><td></td></tr>
</table>

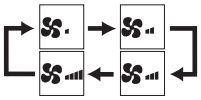
7-3. FAN OPERATION



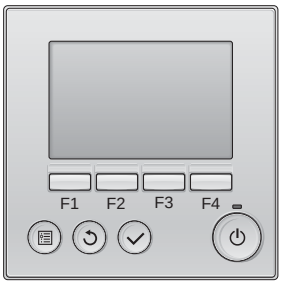
<How to operate>
① Press ⏻ button.
② Press [F1] button to display FAN.



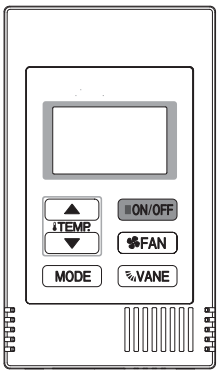
<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display FAN.

Control Mode	Control Details	Remarks
1. Fan	Set by remote controller. Type: 4 speeds type Fan speed notch: 	
2. Vane (up/down vane change)	Same as the control performed during the COOL operation, but with no restriction on the vane's downward blow setting	

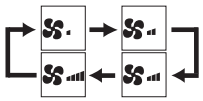
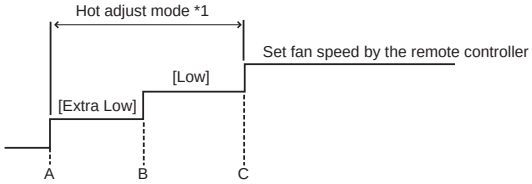
7-4. HEAT OPERATION



<How to operate>
① Press ⏻ button.
② Press [F1] button to display HEAT.
③ Press [F2] [F3] button to set the desired temperature.
NOTE: The settable temperature range varies with the model of outdoor units and remote controller.



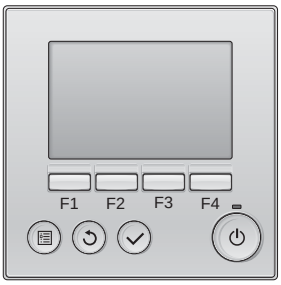
<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display HEAT.
③ Press the TEMP. button to set the desired temperature.
NOTE: The set temperature changes 1°F when the ▽ or △ button is pressed one time. Heating 63 to 83°F

<table>
<tr><th>Control Mode</th><th>Control Details</th><th>Remarks</th></tr>
<tr><td>1. Temperature adjustment function</td><td>1-1. Determining temperature adjustment function (Function to prevent restarting for 3 minutes)
• Room temperature ≦ Set temperature −2°F ⋯Thermo-ON
• Room temperature ≧ Set temperature ⋯Thermo-OFF</td><td></td></tr>
<tr><td>2. Fan</td><td>By the remote controller setting (switch of 4 speeds)<table><tr><th>Type</th><th>Fan speed notch</th></tr><tr><td>4 speeds type</td><td>  </td></tr></table>Give priority to under-mentioned controlled mode:
2-1. Hot adjust mode
2-2. Preheating exclusion mode
2-3. Thermo-OFF mode (When the compressor off by the temperature adjustment function)
2-4. Cool air prevention mode (Defrosting mode)</td><td></td></tr>
<tr><td></td><td>2-1. Hot adjust mode
The fan controller becomes the hot adjuster mode for the following conditions:
① When starting the HEAT operation
② When the temperature adjustment function changes from OFF to ON.
③ When release the HEAT defrosting operation  A: Hot adjust mode starts.
B: 5 minutes have passed since the condition A or the indoor liquid pipe temperature reached 95°F or more.
C: 2 minutes have passed since the condition B. (Terminating the hot adjust mode)</td><td>*1 "STAND BY" will be displayed during the hot adjust mode.</td></tr>
</table>

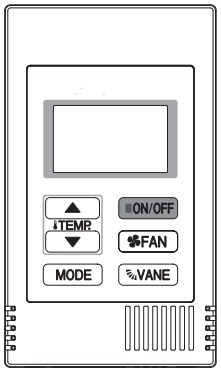
Continue to the next page

Control Mode	Control Details	Remarks
	2-2. Residual heat exclusion mode When the condition changes the auxiliary heater ON to OFF (thermostat or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.	• This control operates the same for the model without auxiliary heater.
	2-3. Thermo-OFF mode When the temperature adjustment function changes to OFF, the indoor fan operates in [Extra low].	
	2-4. Heat defrosting mode The indoor fan stops.	
3. Vane control (Up/down vane change)	(1) Initial setting: OFF → HEAT⋯[last setting] When changing the mode from exception of HEAT to HEAT operation ⋯[Downward C] (2) Vane position: Horizontal →Downward A →Downward B →Downward C (3) Restriction of vane position ① The vane is horizontally fixed for the following modes: (The control by the remote controller is temporally invalidated and control by the unit.) • Thermo-OFF • Hot adjust [Extra low] mode • Heat defrost mode	

7-5. AUTO OPERATION [AUTOMATIC COOL/HEAT CHANGE OVER OPERATION]



<How to operate>
① Press ⏻ button.
② Press [F1] button to display AUTO.
③ Press [F2] [F3] button to set the desired temperature.
NOTE: The settable temperature range varies with the model of outdoor units and remote controller.

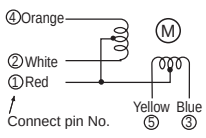
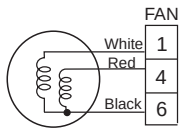
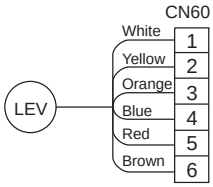


<How to operate>
① Press POWER ON/OFF button.
② Press the operation MODE button to display AUTO.
③ Press the TEMP. button to set the desired temperature.
NOTE: The set temperature changes 1°F when the ▽ or △ button is pressed one time. Automatic 67 to 83°F

Control Mode	Control Details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Set temperature COOL mode for room temperature ≧ Set temperature	
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≧ Set temperature + 3°F or 3 minutes have passed. (2) COOL mode → HEAT mode Room temperature ≦ Set temperature − 3°F or 3 minutes have passed.	
3. COOL mode	Operates as it would in COOL operation.	
4. HEAT mode	Operates as it would in HEAT operation.	

8 TROUBLESHOOTING

8-1. HOW TO CHECK THE PARTS
PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature detection thermistor (TH21)
Pipe temperature detection thermistor/liquid (TH22)
Pipe temperature detection thermistor/gas (TH23)</td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 50 to 86°F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3 to 9.6kΩ</td><td>Open or short</td></tr></table>Refer to “8-1-1. Thermistor”.</td></tr>
<tr><td>Vane motor (MV)
 
</td><td>Measure the resistance between the terminals with a tester. (At the ambient temperature 77°F)
<table><tr><th>Normal</th><th colspan="3">Normal</th><th>Abnormal</th></tr><tr><td>①-②
Red-White</td><td>①-③
Red-Blue</td><td>①-④
Red-Orange</td><td>①-⑤
Red-Yellow</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">400 Ω ± 7%</td></tr></table></td></tr>
<tr><td>Fan motor (MF)
 
</td><td>Measure the resistance between the terminals with a tester. (At the ambient temperature 68°F)
<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>White-Black</td><td>313 Ω ± 8%</td><td rowspan="2">Open or short</td></tr><tr><td>Red-Black</td><td>108 Ω ± 8%</td></tr></table></td></tr>
<tr><td>Linear expansion valve (LEV)
 
</td><td>Disconnect the connector then measure the resistance value with a tester.
(Coil temperature 68°F)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>(1)-(5)
White-Red</td><td>(2)-(6)
Yellow-Brown</td><td>(3)-(5)
Orange-Red</td><td>(4)-(6)
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">200 Ω ± 10%</td></tr></table></td></tr>
</table>

8-1-1. Thermistor

<Thermistor characteristic graph>

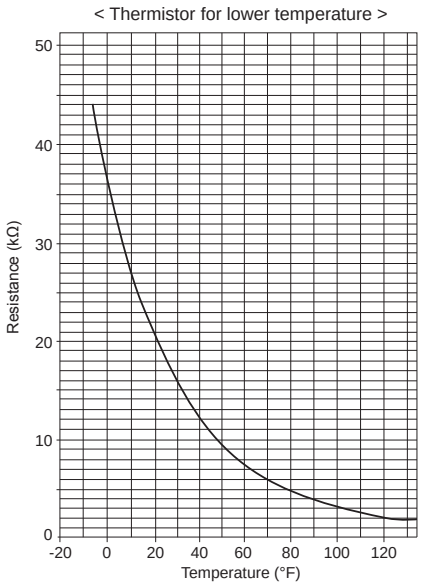
Thermistor for lower temperature

Room temperature detection thermistor (TH21)
Pipe temperature detection thermistor/liquid (TH22)
Pipe temperature detection thermistor/gas (TH23)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480 ± 2%

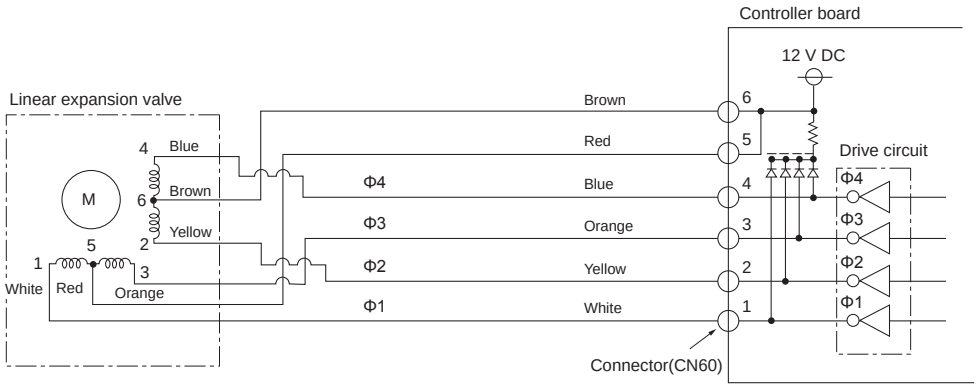
$$Rt=15\exp\{3480(\frac{1}{273+(t-32)/1.8}-\frac{1}{273})\}$$

30°F	15.8 kΩ
50°F	9.6 kΩ
70°F	6.0 kΩ
80°F	4.8 kΩ
90°F	3.9 kΩ
100°F	3.2 kΩ



8-1-2. Liner expansion valve

① Operation summary of the linear expansion valve
• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signals.
<Connection between the indoor controller board and the linear expansion valve>



<Output pulse signal and the valve operation>

Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

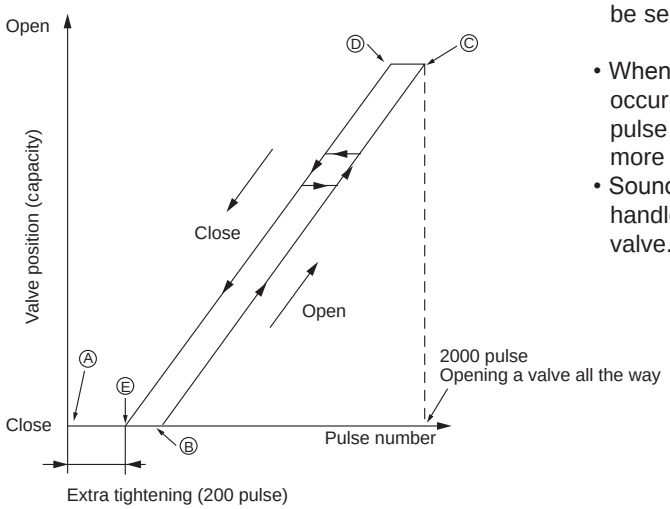
Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4
The output pulse shifts in above order.

Note:
- When linear expansion valve operation stops, all output phase become OFF.
- At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrate.

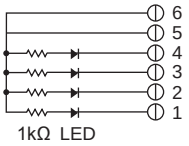
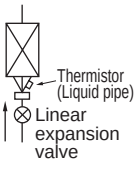
- When the power is turned on, 2200 pulse closing valve signal will be sent till it goes to point Ⓐ in order to define the valve position.

- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valves, however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more sound can be heard than in a normal situation.
- Sound can be detected by placing the ear against the screw driver handle while putting the screw driver tip to the linear expansion valve.

② Linear expansion valve operation



③ Trouble shooting

Symptom	Check points	Countermeasures
Operation circuit failure of the micro-processor	Disconnect the connector on the controller board, then connect LED for checking.  When power is turned on, pulse signals will be output for 10 seconds. There must be some defects in the operation circuit if the LED does not light while the signals are output or keeps lighting even after the signals stop.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make a ticking noise when the motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion valve.
Short or breakage of the motor coil of the linear expansion valve	Measure the resistance between each coil (white-red, yellow-brown, orange-red, blue-brown) using a tester. It is normal if the resistance is in the range of 200Ω ±10%.	Exchange the linear expansion valve.
Valve does not close completely.	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there is any leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way.  Linear expansion valve It is not necessary to exchange the linear expansion valve, if the leakage is small and not affecting normal operation.	If large amount of refrigerant is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

8-2. Function of DIP switch

PKFY-P06NBMU-E2 PKFY-P06NBMU-E2R1

The black square (■) indicates a switch position.

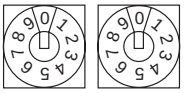
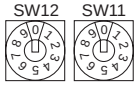
Switch	Pole	Function	Operation by switch		Effective timing	Remarks
			ON	OFF		
SW1 Mode Selection	1	Thermistor <Room temperature detection> position	Built-in remote controller	Indoor unit	Under suspension	Address board <Initial setting>  *1 Refer to <Table A> below. *2 The model is not capable of fresh air intake. *3 SW1-5 has different function for the listed models. The standard function of SW1-5 for the listed models are different from that for other models. When SW1-5 is OFF, even with the free contact function of TG-2000, the external heater signal function of the remote display cannot be changed. When the free contact function of TG-2000 is used, set SW1-5 to ON together with SW1-9 and SW1-10.
	2	Filter clogging detection	Provided	Not provided		
	3	Filter cleaning sign	2,500 hr	100 hr		
	4	Fresh air intake*2	Not effective	Not effective		
	5	Remote indication (CN52-2 output signal)	Thermo-ON signal indication	External heater signal*3		
	6	Humidifier control	Fan operation Heating mode	Thermo-ON operation at heating mode		
	7	Air flow set in case of heat thermo-OFF	Low*1	Extra low*1		
	8		Setting air flow*1	Depends on SW1-7		
	9	Auto restart function	Effective	Not effective		
	10	Power ON/OFF by breaker	Effective	Not effective		
SW2 Capacity code setting	1–4	Model: P06 / SW2: ON OFF 1 2 3 4			Before power supply ON	Indoor controller board
SW3 Function Selection	1	Heat pump/Cool only	Cooling only	Heat pump	Under suspension	Indoor controller board <Initial setting>  *4 At cooling mode, each angle can be used only 1 hour. *5 Please do not use SW3-9,10 as trouble might be caused by the usage condition. *6 Second setting is the same as first setting.
	2	Louver	—	—		
	3	Vane	Available	Not available		
	4	Vane swing	—	—		
	5	Vane horizontal angle	Second setting*6	First setting		
	6	Vane cooling limit angle setting*4	Horizontal angle	Down B, C		
	7	Changing the opening of linear expansion valve	Effective	Not effective		
	8	Heating 4 degree (7.2°F) up	Not effective	Effective		
	9	Target superheat setting*5	—	—		
	10	Target superheat setting*5	—	—		

<Table A>

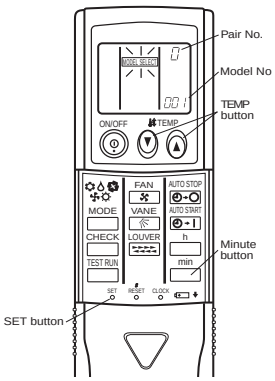
SW1-7	SW1-8	
OFF	OFF	Extra low
ON	OFF	Low
OFF	ON	Setting air flow
ON	ON	stop

Continue to the next page

<table>
<tr><th>Switch</th><th>Pole</th><th>Function</th><th>Effective timing</th><th>Remarks</th></tr>
<tr><td>SW11
1s digit address setting

SW12
10s digit address setting</td><td>Rotary switch</td><td>SW12 SW11
 
10 1
How to set addresses
Example: If address is "3", remain SW12 (for over 10) at "0", and match SW11 (for 1 to 9) with "3".</td><td rowspan="2">Before power supply ON</td><td>Address board
<Initial setting>
SW12 SW11
  </td></tr>
<tr><td>SW14
Branch No. setting</td><td>Rotary switch</td><td>SW14
 
How to set branch numbers SW14 (Series R2 only)
Match the indoor unit's refrigerant pipe with the BC controller's end connection number.
Remain other than series R2 at "0".</td><td>Address board
<Initial setting>
SW14
  </td></tr>
<tr><td>J41, J42
Wireless remote controller Pair No.</td><td>Jumper</td><td>• To operate each indoor unit by each remote controller when installed 2 indoor units or more are near, Pair No. setting is necessary.
● Pair No. setting is available with the 4 patterns (Setting patterns A to D).
● Make setting for J41, J42 of indoor controller board and the Pair No. of wireless remote controller.
• You may not set it when operating it by one remote controller.
● Setting for indoor unit
Cut jumper wire J41, J42 on the indoor controller board according to the table below.
● Wireless remote controller pair number:

Setting operation
1. Press the SET button (using a pointed implement). Check that the remote controller's display has stopped before continuing. MODEL SELECT flashes, and the model No. (3 digits) appears (steadily-lit).
2. Press the MINUTE button twice. The pair number appears flashing.
3. Press the TEMP ▼ ▲ buttons to select the pair number to set.
4. Press the SET button (using a pointed implement). The set pair number is displayed (steadily-lit) for 3 seconds, then disappears.

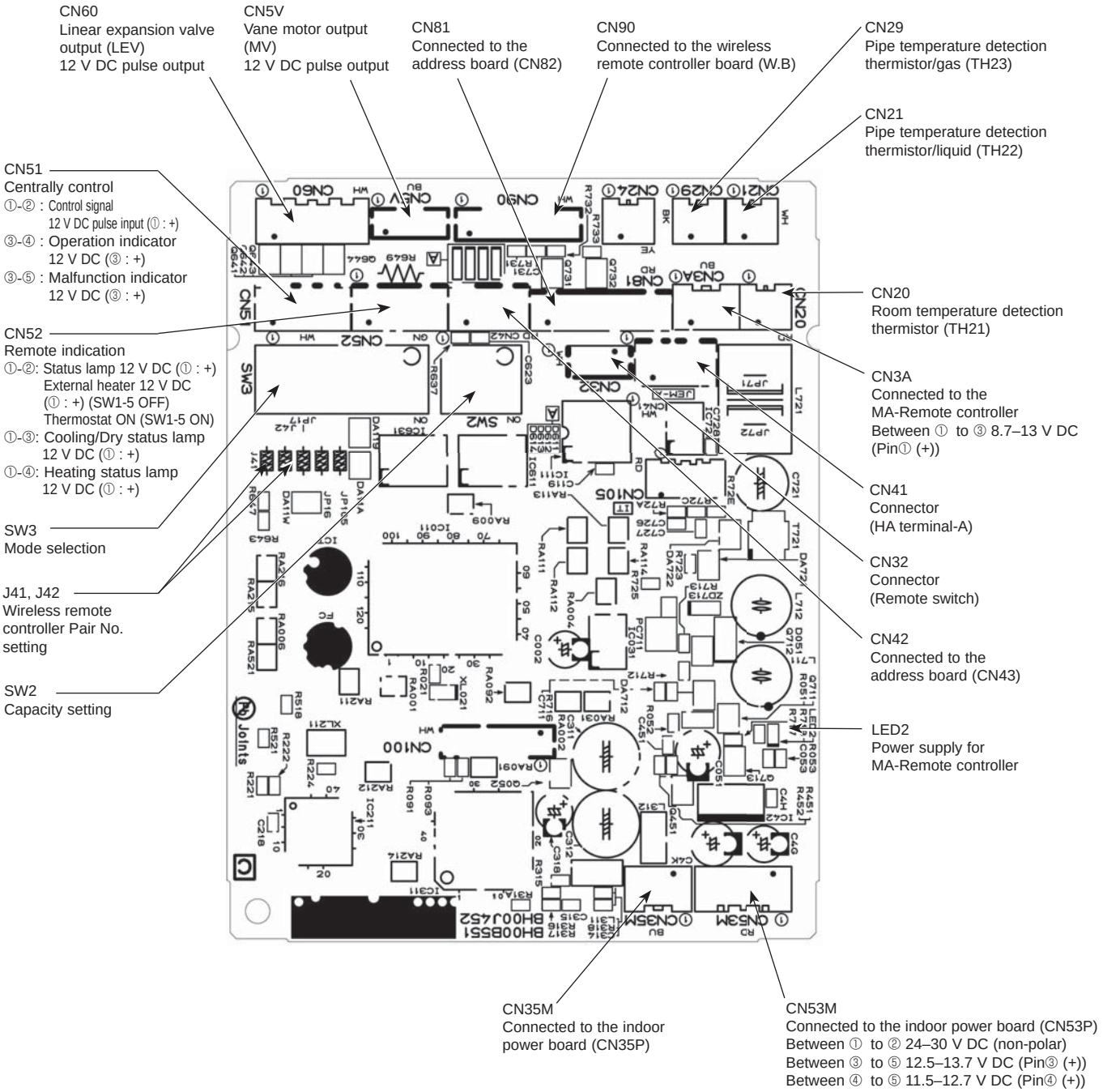
<table>
<tr><th rowspan="2">Setting pattern</th><th colspan="2">Indoor controller jumper wire</th><th rowspan="2">Pair No. of wireless remote controller*6</th><th></th></tr>
<tr><th>J41</th><th>J42</th></tr>
<tr><td>A</td><td>—</td><td>—</td><td>0</td><td>Initial setting</td></tr>
<tr><td>B</td><td>Cut</td><td>—</td><td>1</td><td>—</td></tr>
<tr><td>C</td><td>—</td><td>Cut</td><td>2</td><td>—</td></tr>
<tr><td>D</td><td>Cut</td><td>Cut</td><td>3</td><td>—</td></tr>
</table>
*6 Pair No.4-9 of wireless remote controller is setting pattern D.</td><td>Under operation or suspension</td><td><Initial setting>
Pattern A
 
</td></tr>
</table>

8-3. TEST POINT DIAGRAM

8-3-1. Indoor controller board

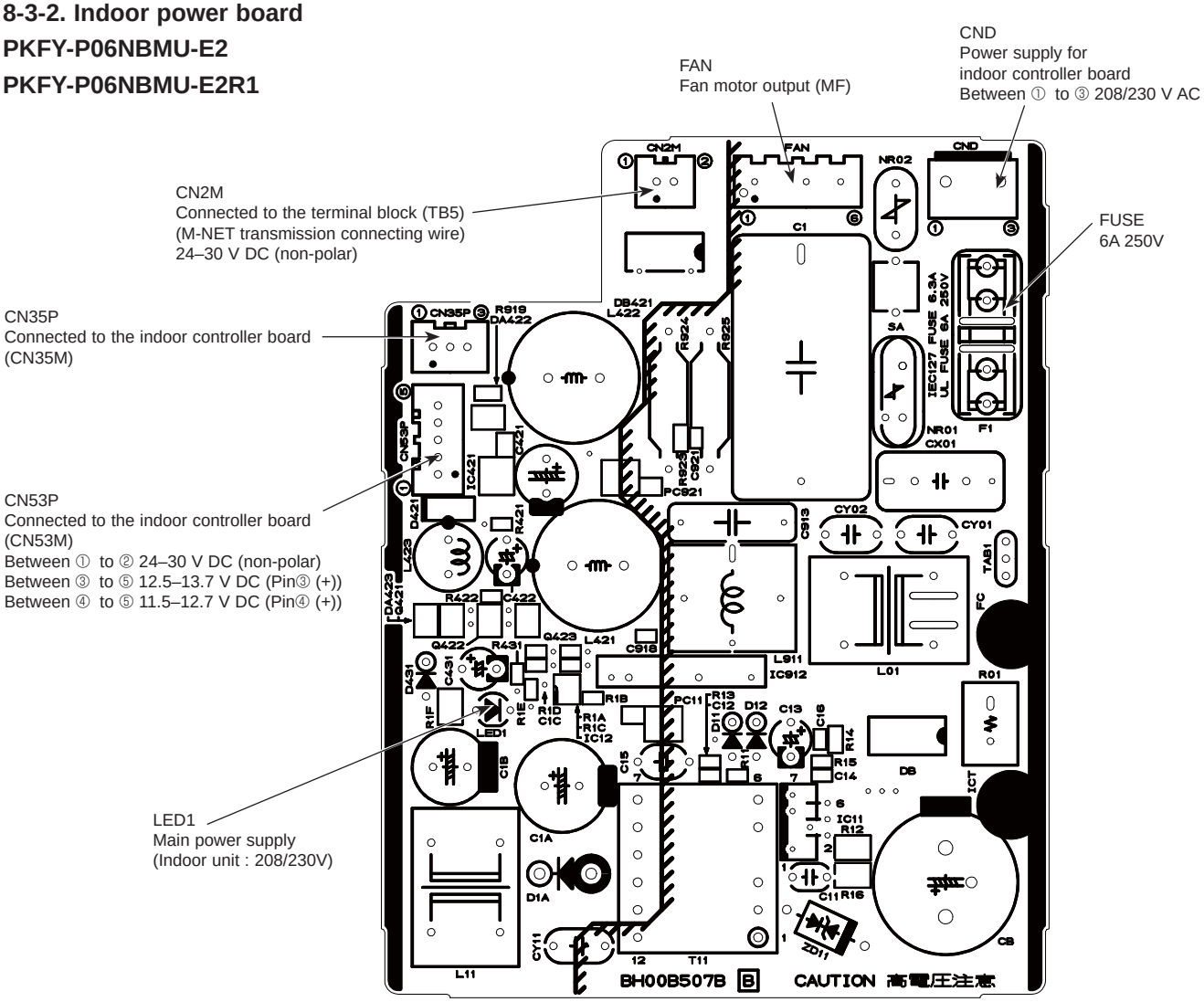
PKFY-P06NBMU-E2

PKFY-P06NBMU-E2R1

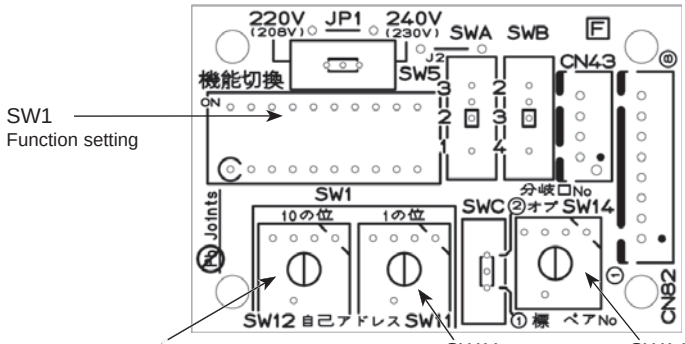


Note: The voltage range of 12 V DC in this page is between 11.5 to 13.7 V DC.

8-3-2. Indoor power board
PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1



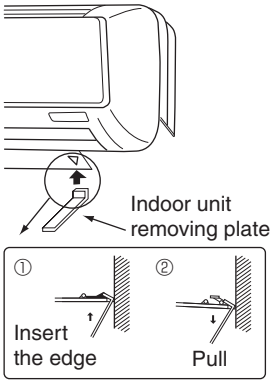
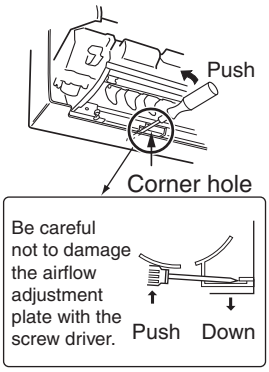
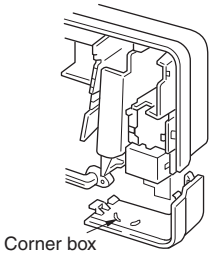
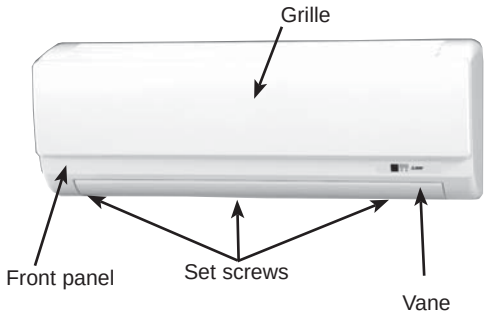
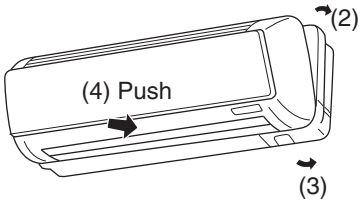
8-3-3. Address board
PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

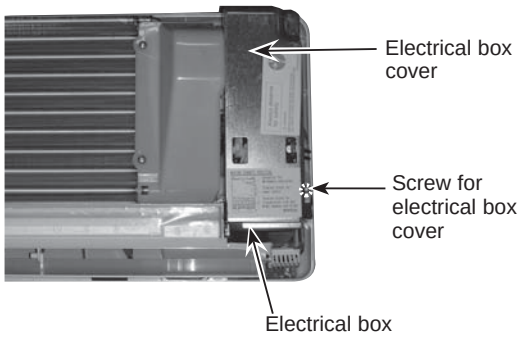
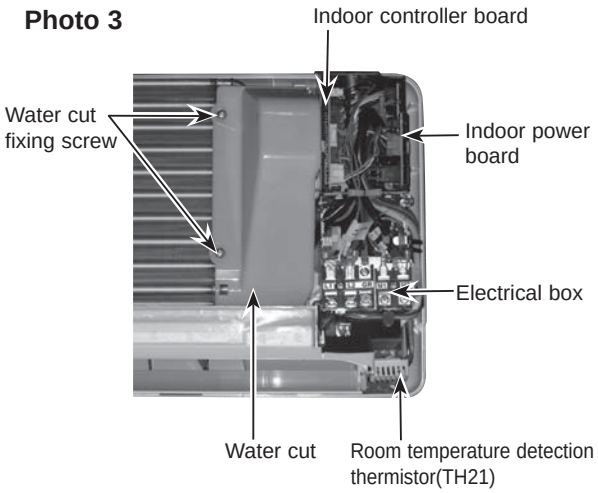
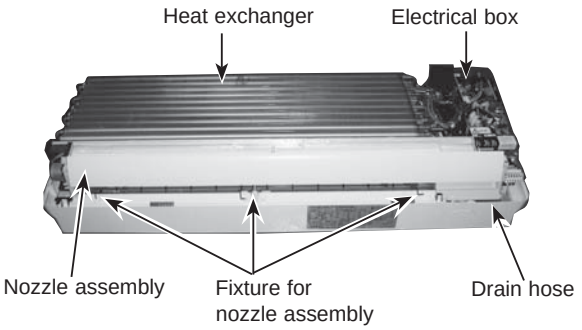
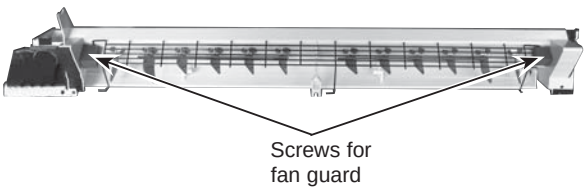


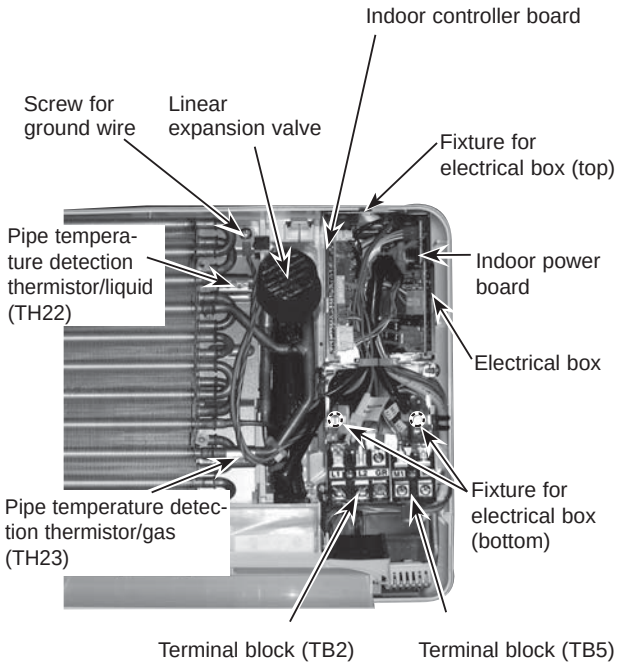
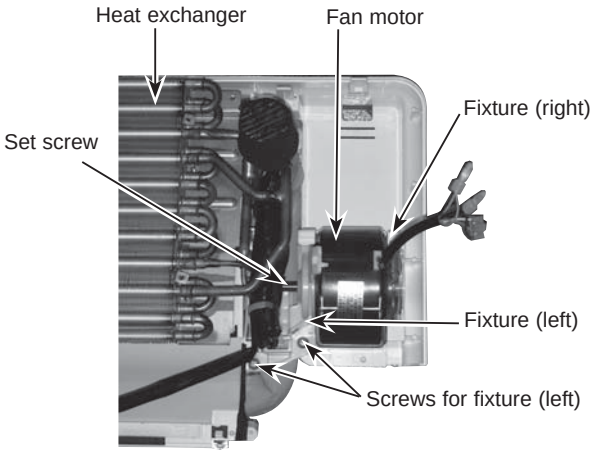
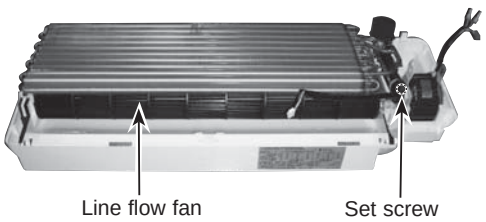
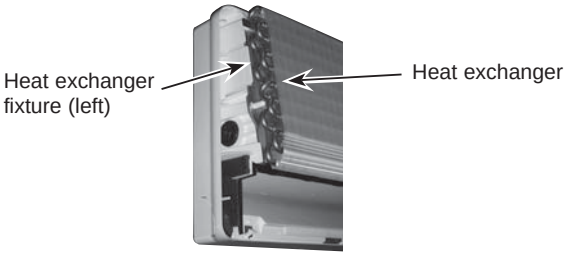
9 DISASSEMBLY PROCEDURE

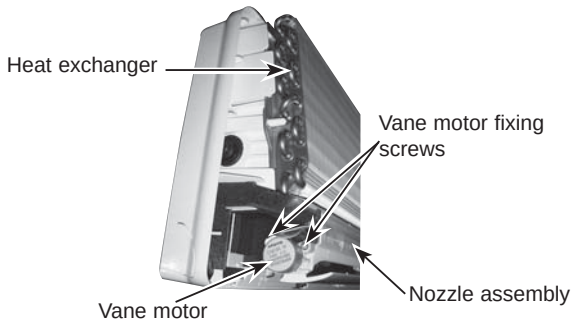
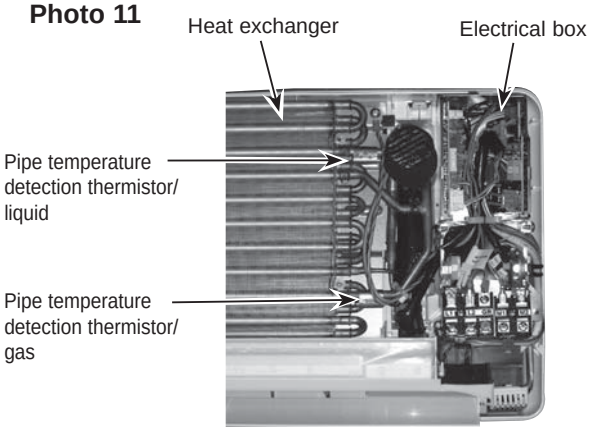
PKFY-P06NBMU-E2
PKFY-P06NBMU-E2R1

Be careful when removing heavy parts.

OPERATION PROCEDURE	PHOTOS & ILLUSTRATIONS
1. Removing the lower side of the indoor unit from the installation plate When there is removing plate (1) Remove the corner box at right lower side of the indoor unit and remove the removing plate from the corner box. (See Figure 3) (2) Insert the removing plate at the back side of the corner box to remove the indoor unit. (3) Remove the hook by pulling the lower side of the indoor unit down as shown in the Figure 1. When there is no removing plate or it cannot be used for some reason. (1) Remove the front panel. (2) Insert the screw driver to the corner hole at both left and right side as shown in the Figure 2. (3) Push it up, then pull down the lower side of indoor unit and remove the hook.	**Figure 1**  **Figure 2**  **Figure 3** 
2. Removing the front panel Note: Before removing the front panel, leave the open space at upper side of the vane approximately 2 to 3 cm. (1) Remove the 3 screw caps then remove the 3 set screws. (See Photo 1) (2) Remove the grille. (3) Remove the left side of the front panel, then right side. (4) After removing the lower side of the front panel a little, remove it as pulling the upper side toward you. Note: Please pay attention to the nozzle assembly. **Installing the front panel** (1) Insert the lower side of the front panel under the vane. (2) Set the upper side of the front panel. (See Figure 4) (3) Set the lower side of the front panel then fix it with the screws. (4) Press the area indicated as arrow sign and set it to the air conditioner unit. (5) Attach the screw caps.	**Photo 1**  **Figure 4** 

OPERATION PROCEDURE	PHOTOS
3. Removing the indoor controller board and indoor power board (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover (screw 4 × 10). (See Photo 2) INDOOR CONTROLLER BOARD (1) Disconnect the following connectors on the indoor controller board. (connector in front of) • CN60, CN5V, CN90, CN29, CN21 • CN42, CN81, CN3A, CN20 (2) Pull out the indoor controller board toward you, then disconnect the rest of connectors. • CN53M, CN35M (See Photo 3) INDOOR POWER BOARD (1) Disconnect the following connectors on the indoor power board. • FAN, CN53P, CN35P, CN2M, CND (2) Remove the earth wire for TAB1. (3) Pull out the indoor power board toward you. (See Photo 3)	**Photo 2**  **Photo 3** 
4. Removing the nozzle assembly and drain hose (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See Photo 2) (3) Disconnect the connector (CN5V) on the indoor controller board. (4) After unhook the right side of the corner box, press the upper left side and remove the corner box. (5) Remove the nozzle assembly from the fixture. (See Photo 4) (6) Remove the drain hose.	**Photo 4** 
5. Removing the fan guard (1) Remove the nozzle assembly and drain hose. (Refer to procedure 4) (2) Remove the screws of fan guard. (3) Remove the fan guard.	**Photo 5** 

OPERATION PROCEDURE	PHOTOS
6. Removing the electrical box (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See Photo 2) (3) Remove the water cut. (See Photo 3) (4) Pull the nozzle assembly toward you as opening the catch of the nozzle assembly. (See Photo 4) (5) Disconnect the indoor/outdoor transmission wiring of TB5. (6) Disconnect the power supply wiring of TB2. (7) Disconnect the relay connector of MA-remote controller. (8) Disconnect the following connector on the indoor controller board. ● CN60, CN5V, CN29, CN21, CN90, (CN3A) (9) Disconnect the connector (FAN) on the indoor power board. (10) Remove the ground wire fixing screw. (11) Pull the disconnected lead wire out from the electrical box. (12) Push up the upper fixture catch to remove the box, then pull the lower fixture and remove it from the box fixture.	**Photo 6** 
7. Removing the line flow fan and the fan motor (1) Remove the front panel. (Refer to procedure 2) (2) Remove the nozzle assembly. (Refer to procedure 4) (3) Remove the electrical parts box. (Refer to procedure 6) (4) Remove the fixture while pressing the right side of motor fixture catch. (See Photo 7) (5) Remove the left side of the motor fixture. (6) Loosen the set screw which fixes the line flow fan to the fan motor, then remove the fan motor by sliding it to the right side. (See Photo 7) (7) Pull the left-hand side of the heat exchanger toward you. (See Photo 9) (8) Remove the line flow fan.	**Photo 7** 
Photo 8  	**Photo 9** 

OPERATION PROCEDURE	PHOTOS
8. Removing the vane motor (1) Remove the front panel. (Refer to procedure 2) (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Remove the 2 screws of the vane motor. Disconnect the relay connector and remove the motor from the shaft. (4) Disconnect the vane motor connector (CN5V) on the indoor controller board.	**Photo 10** 
9. Removing the pipe temperature detection thermistor/liquid and the pipe temperature detection thermistor/gas (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See Photo 2) (3) Remove the water cut. (See Photo 3) (4) Cut the wiring fixed band. (5) Remove the pipe temperature detection thermistor/liquid and the pipe temperature detection thermistor/gas. (See Photo 10) (6) Disconnect the connector (CN29) (CN21) on the indoor controller board.	**Photo 11** 

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