MITSUBISHI ELECTRIC

Changes for the Better

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

September 2012

No. OCH461
REVISED EDITION-B

TECHNICAL & SERVICE MANUAL

Series PKFY Wall Mounted R410A / R22

Indoor unit [Model names]

PKFY-P06NBMU-E

PKFY-P08NBMU-E

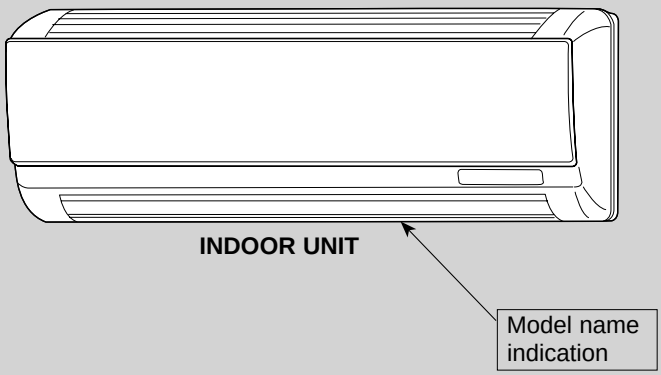
[Service Ref.]

PKFY-P06NBMU-E
PKFY-P06NBMU-ER1
PKFY-P08NBMU-E
PKFY-P08NBMU-ER1

Revision:
- "8-2. Function of Dip switch" has been modified.
- Some descriptions have been modified.

- Please void OCH461 REVISED EDITION-A.

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



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PARTS CATALOG (OCB461)

CITY MULTI

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.

1 TECHNICAL CHANGES

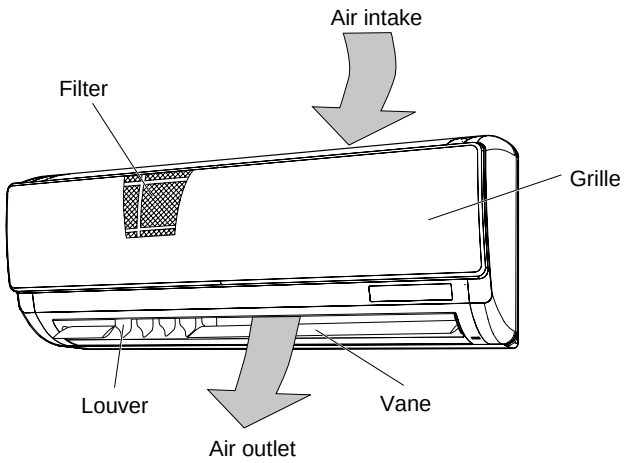
PKFY-P06NBMU-E ➔ PKFY-P06NBMU-ER1

PKFY-P06NBMU-E ➔ PKFY-P06NBMU-ER1

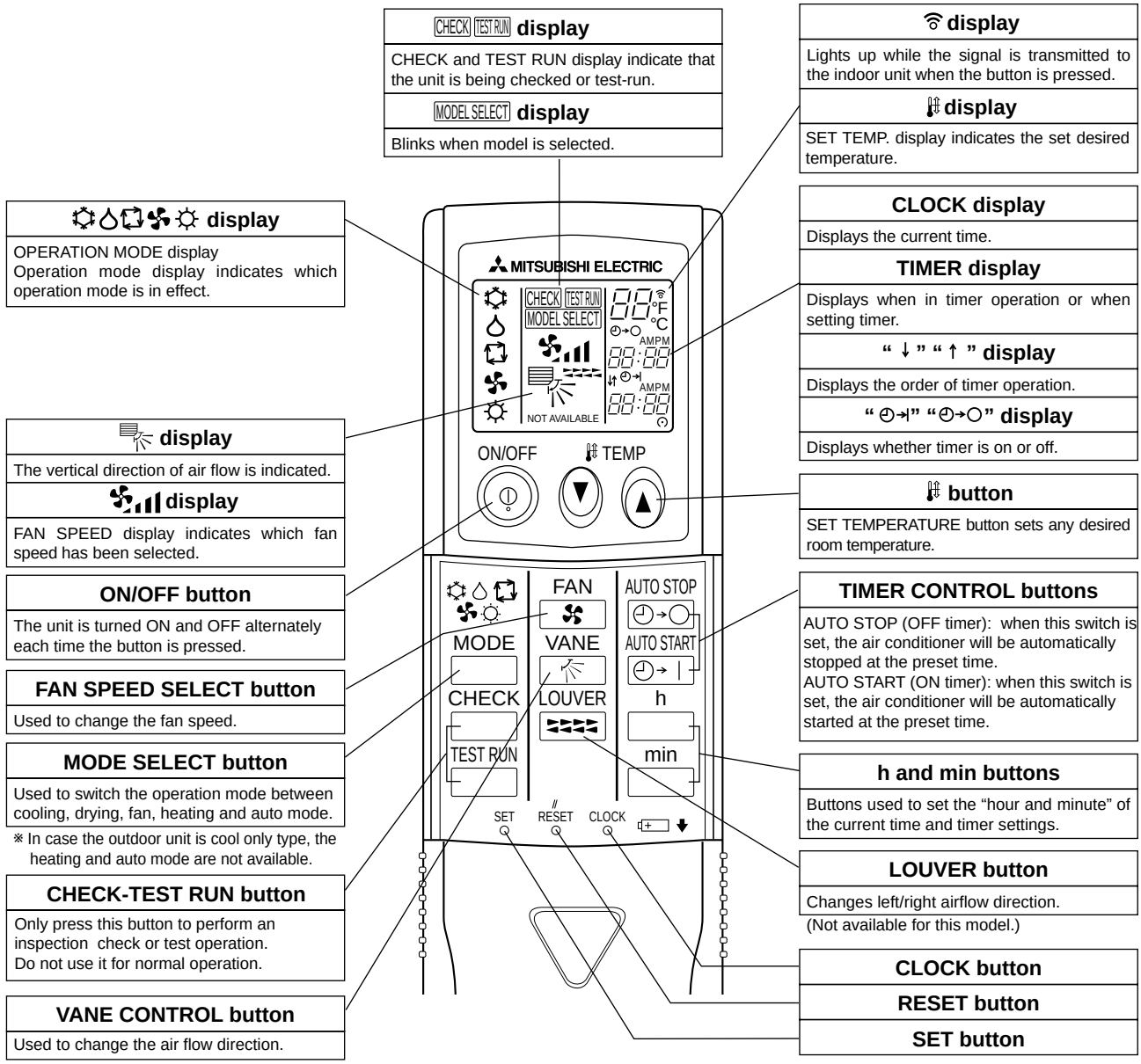
HEAT EXCHANGER and WATER CUT have been changed.

2 PART NAMES AND FUNCTIONS

● **Indoor unit**



● Wireless remote controller



● Wired remote controller

Display Section

For purposes of this explanation, all parts of the display are shown. During actual operation, only the relevant items will be lit.

Day-of-Week
Shows the current day of the week.

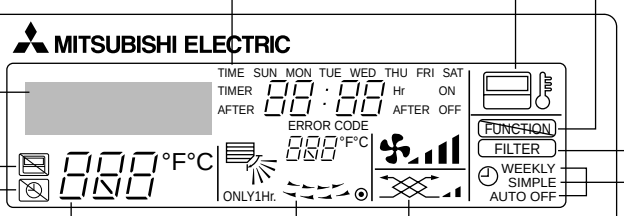
Time/Timer Display
Shows the current time, unless the simple or Auto Off timer is set.
If the simple or Auto Off timer is set, the time to be switched off is shown.

"Sensor" indication
Displays when the remote controller sensor is used.

"Locked" indicator
Indicates that remote controller buttons have been locked.

"Clean The Filter" indicator
To be displayed on when it is time to clean the filter.

Identifies the current operation
Shows the operating mode, etc.
*Multilanguage display is available.



Timer indicators
The indicator comes on if the corresponding timer is set.

"Centrally Controlled" indicator
Indicates that operation from the remote controller has been prohibited by a master controller.

Fan Speed indicator
Shows the selected fan speed.

Up/Down Air Direction indicator
The indicator ↘ shows the direction of the outcoming airflow.

Room Temperature display
Shows the room temperature. The room temperature display range is 46–102°F. The display blinks if the temperature is less than 46°F or 102°F or more.

Ventilation indicator
Appears when the unit is running in Ventilation mode.

"Timer is Off" indicator
Indicates that the timer is off.

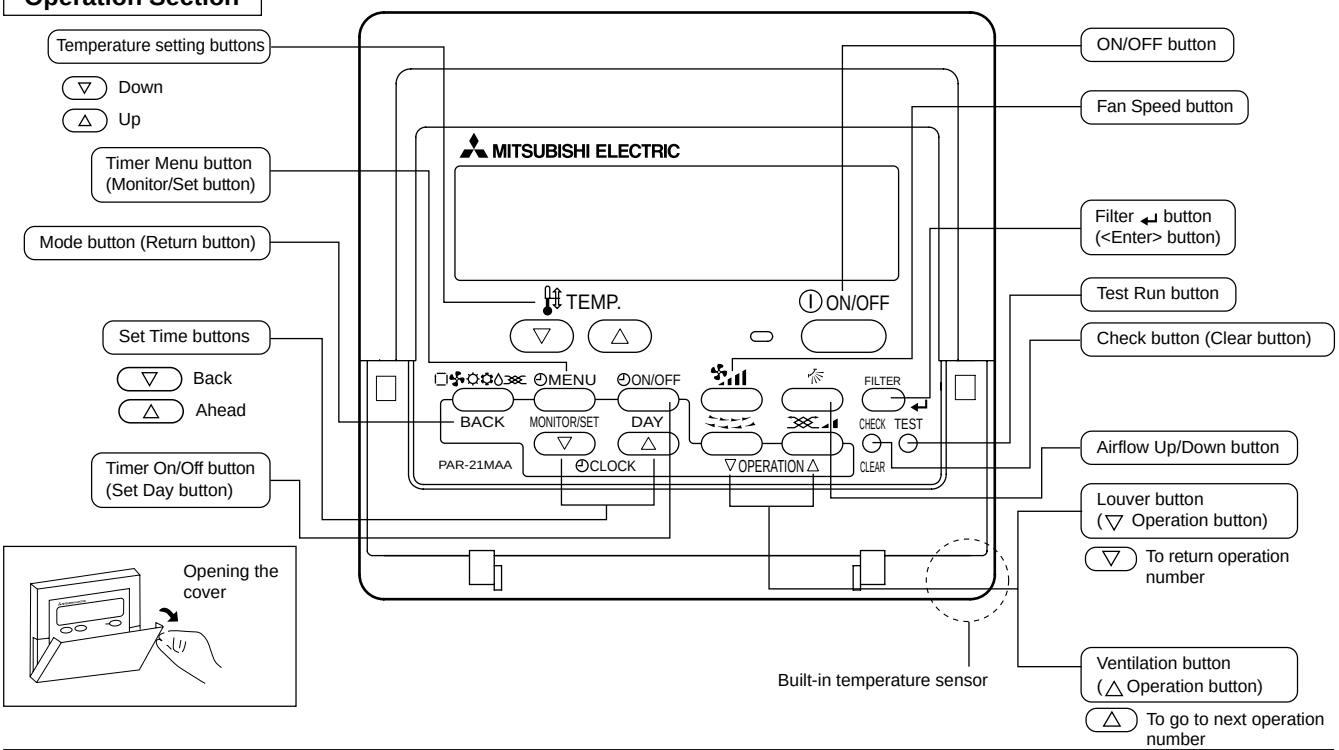
"One Hour Only" indicator
Displays if the airflow is set to Low or downward during COOL or DRY mode. (Operation varies according to model.)
The indicator goes off in one hour, at which time the airflow direction also changes.

Louver display
Indicates the action of the swing louver. Does not appear if the louver is not running.

Temperature Setting
Shows the target temperature.

◉ (Power On indicator)
Indicates that the power is on.

Operation Section



Note:
- "PLEASE WAIT" message
  This message is displayed for approximately 3 minutes when power is supplied to the indoor unit or when the unit is recovering from a power failure.
- "NOT AVAILABLE" message
  This message is displayed if an invalid button is pressed (to operate a function that the indoor unit does not have).
  If a single remote controller is used to operate multiple indoor units simultaneously that are different types, this message will not be displayed as far as any of the indoor units is equipped with the function.

3 SPECIFICATION

3-1. Specifications

Service Ref.			PKFY-P06NBMU-E PKFY-P06NBMU-ER1	PKFY-P08NBMU-E PKFY-P08NBMU-ER1
Power source			1-phase 208/230V 60Hz	
Cooling capacity (Nominal)	*1	kW	1.8	2.3
	*1	Btu/h	6,000	8,000
	Power input	kW	0.03	0.03
	Current input	A	0.15	0.15
Heating capacity (Nominal)	*2	kW	2.0	2.6
	*2	Btu/h	6,700	9,000
	Power input	kW	0.03	0.03
	Current input	A	0.15	0.15
External finish			Plastic, MUNSELL (1.0Y 9.2/0.2)	
External dimension H × W × D		mm	295 × 815 × 225	
		in.	11-5/8" × 32-1/8" × 8-7/8"	
Net weight		kg (lb)	10 (22)	
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 (Low-Mid2-Mid1-High)	m^3/min	4.9 - 5.2 - 5.6 - 5.9	4.9 - 5.2 - 5.6 - 5.9
		L/s	82 - 87 - 93 - 98	82 - 87 - 93 - 98
		cfm	170 - 180 - 200 - 210	170 - 180 - 200 - 210
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)		dB <A>	32 - 33 - 35 -36	32 - 33 - 35 -36
Insulation material			Polyethylene sheet	
Air filter			PP honeycomb	
Protection device			Fuse	
Refrigerant control device			LEV	
Connectable outdoor unit			R410A, R22 CITY MULTI	
Diameter of refrigerant pipe	Liquid (R410A)	mm (in.)	ø6.35 (ø1/4") Flare	ø6.35 (ø1/4") Flare
	(R22)		ø6.35 (ø1/4") Flare	ø6.35 (ø1/4") Flare
	Gas (R410A)	mm (in.)	ø12.7 (ø1/2") Flare	ø12.7 (ø1/2") Flare
	(R22)		ø12.7 (ø1/2") Flare	ø12.7 (ø1/2") Flare
Field drain pipe size		mm (in.)	I.D. 16mm (5/8")	
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.	

Note : *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)

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

Unit converter

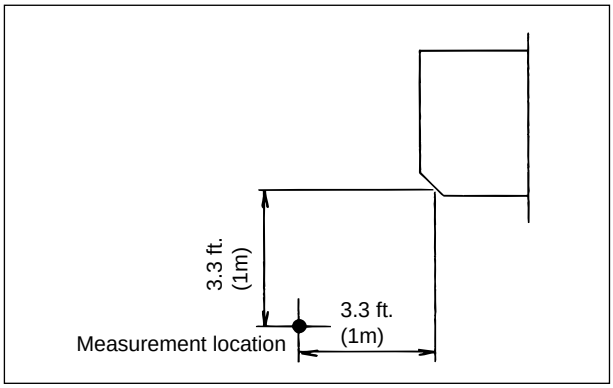
kcal/h = kW × 860
Btu/h = kW × 3,412
cfm = m^3/min × 35.31
lb = kg/0.4536

*Above specification data is subject to rounding variation.

3-2. Electrical parts specifications

Service Ref. / Parts name	Symbol	PKFY-P06NBMU-E PKFY-P06NBMU-ER1	PKFY-P08NBMU-E PKFY-P08NBMU-ER1
Room temperature 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	
Liquid pipe thermistor	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	
Gas pipe thermistor	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



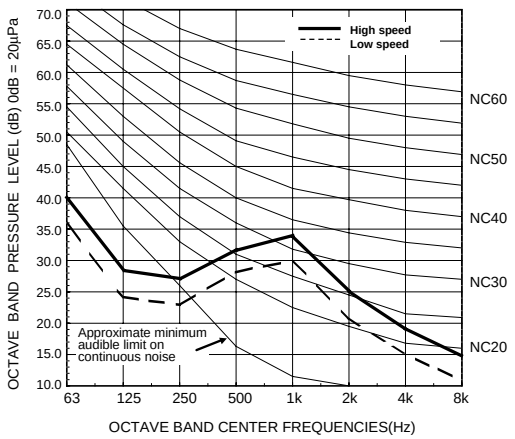
* Measured in anechoic room.

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

Service Ref.	Sound level dB (A)
PKFY-P06NBMU-E PKFY-P06NBMU-ER1	32-33-35-36
PKFY-P08NBMU-E PKFY-P08NBMU-ER1	32-33-35-36

3-4. NC curve

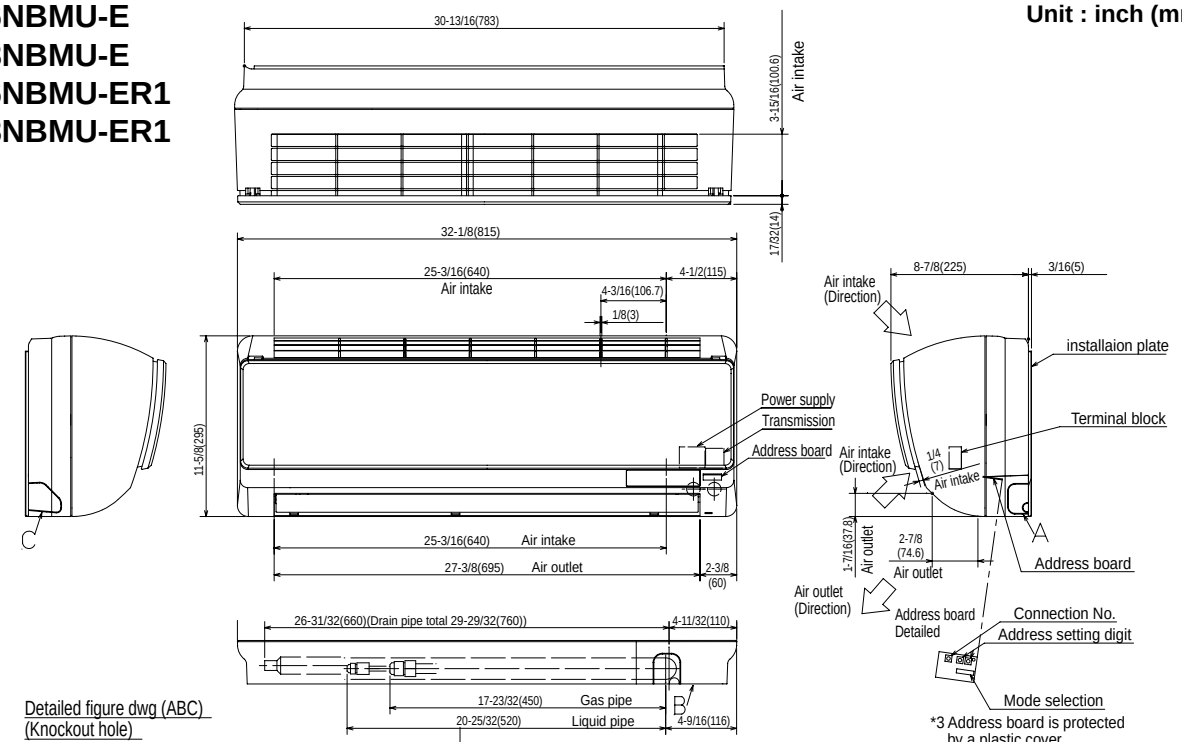
PKFY-P06/08NBMU-E(R1)
External static pressure : 0Pa
Power source : 208,230V, 60Hz



4 OUTLINES AND DIMENSIONS

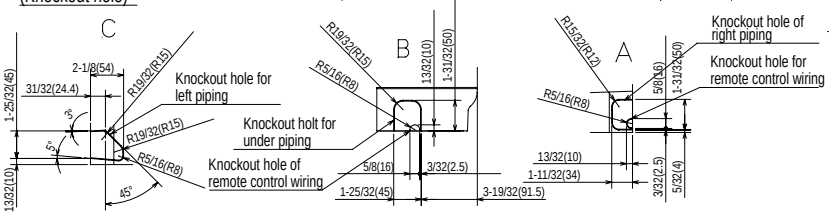
PKFY-P06NBMU-E
PKFY-P08NBMU-E
PKFY-P06NBMU-ER1
PKFY-P08NBMU-ER1

Unit : inch (mm)

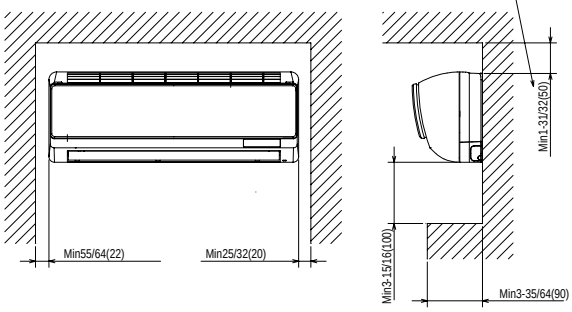


*3 Address board is protected by a plastic cover. Remove the screw holding the cover with screw-driver at the time of address setting.

Detailed figure dwg (ABC) (Knockout hole)

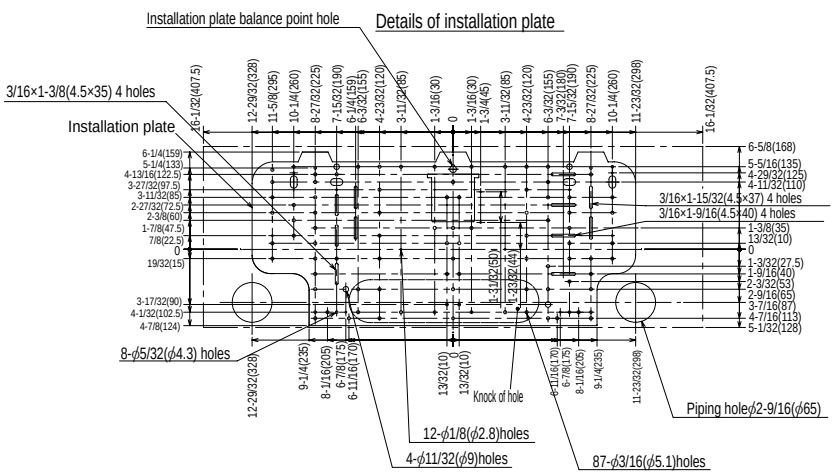


Required space



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 use MA-remote controller cable in an accessories to the connector.

Refrigerart piping	Liquid pipe	1/4F(ϕ6.35)
	Gas pipe	1/2F(ϕ12.7)
Drain pipe		ϕ5/8(ϕ16) I.D



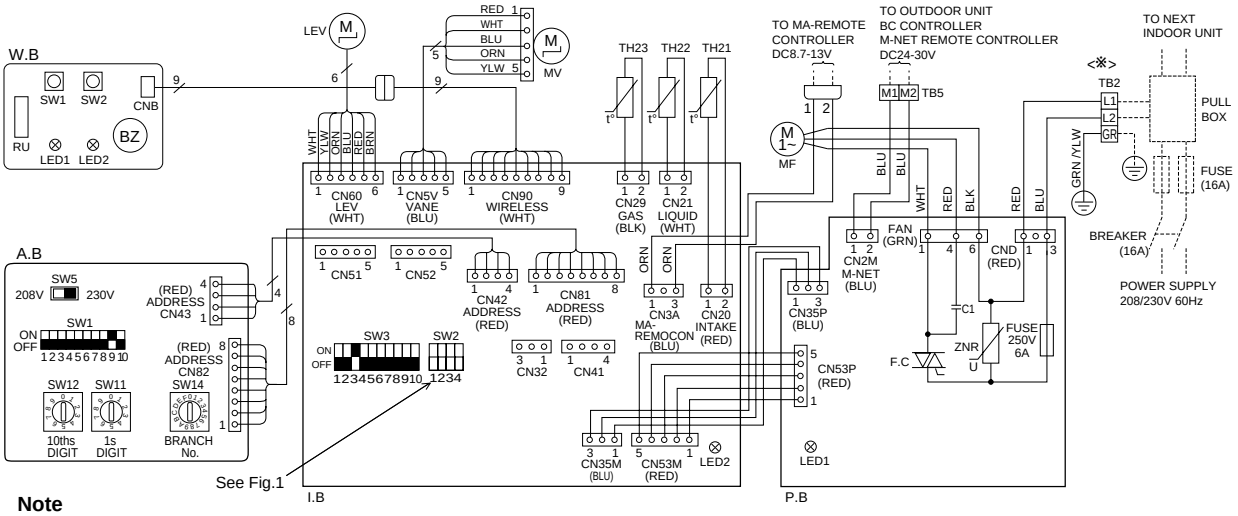
5 WIRING DIAGRAM

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**

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, External heater	TB2	Terminal block	Power supply
			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)
ZNR	Varistor				
FUSE	Fuse (6A 250V)		TH23		Pipe temp.detection/Gas (32°F/15kΩ,77°F/5.4kΩ)
F.C	Fan phase control				
C1	Capacitor (Fan motor)				

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)	



Note

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 setting of the SW2 dip switches differs in the capacity. For the detail, refer to the Fig. 1.
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.

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

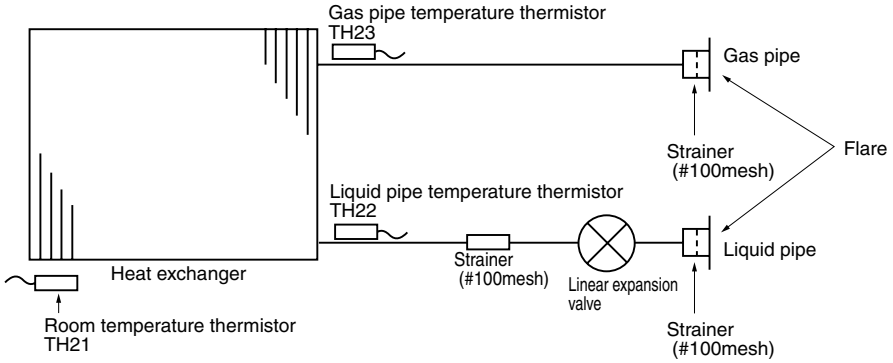
<Fig. 1>

MODELS	SW2	MODELS	SW2
P06	ON OFF 1 2 3 4	P08	ON OFF 1 2 3 4

<※>Use copper supply wires.

6 REFRIGERANT SYSTEM DIAGRAM

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**

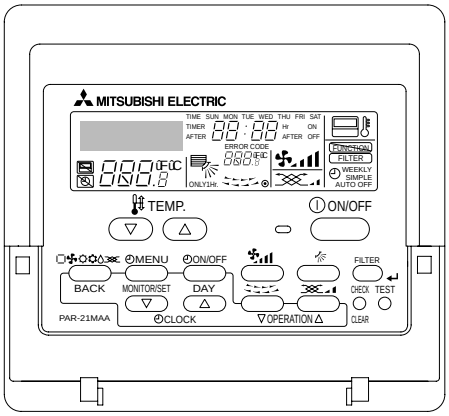


Unit: mm(inch)

Item \ Service ref.	PKFY-P06/08NBMU-E PKFY-P06/08NBMU-ER1
Gas pipe	ϕ12.7 (1/2")
Liquid pipe	ϕ6.35 (1/4")

7 MICROPROCESSOR CONTROL

INDOOR UNIT CONTROL
7-1. COOL OPERATION



<How to operate>

①Press POWER ON/OFF button.

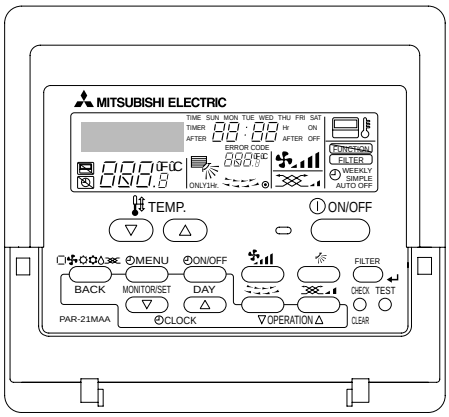
②Press the operation MODE button to display COOL.

③Press the TEMP. button to set the desired temperature.

NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Cooling 67 to 87°F

Control modes	Control details	Remarks
1. Thermo stat function	1-1. Thermo stat function (Function to prevent restarting for 3 minutes) • Room temperature ≧ desired temperature + 2°F ···Thermo ON • Room temperature ≦ desired temperature ···Thermo OFF	
	1-2. Anti-freezing control Detected condition : When the liquid pipe temp. (TH22) is 32°F or less in 16 minutes from compressors start up, anti-freezing control starts and the thermo OFF. Released condition : The timer which prevents reactivating is set for 3 minutes, and anti-freezing control is cancelled when any one of the following conditions is satisfied. ① Liquid pipe temp. (TH22) turns 50°F or above. ② The condition of the thermo OFF has become complete by thermo stat, etc. ③ The operation modes became mode other than COOL. ④ The operation stopped.	
2. Fan	By the remote controller setting (switch of 4 speeds) Type: 4 speeds type — Fan speed notch: [Low], [Mid2], [Mid1], [High]	
3. Vane (up/down vane change)	(1) Initial setting: Start at COOL mode and horizontal vane. (2) Vane position: Horizontal →Downward A →Downward B →Downward C (3) Restriction of the downward vane setting When setting the downward vane A, B or C in [Mid] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed.	· "ONLY 1 Hr" appears on the wired remote controller.

7-2. DRY OPERATION



<How to operate>

①Press POWER ON/OFF button.

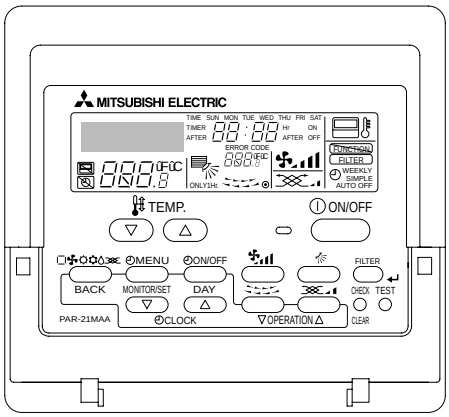
②Press the operation MODE button to display DRY.

③Press the TEMP. button to set the desired temperature.

NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Dry 67 to 87°F

<table>
<tr><th>Control modes</th><th>Control details</th><th>Remarks</th></tr>
<tr><td>1. Thermo stat function</td><td>1-1. Thermo stat function (Function to prevent restarting for 3 minutes)
Setting the Dry thermo by the thermo stat signal and the room temperature (TH21).
Dry thermo ON Room temperature ≧ desired temperature + 2°F
Dry thermo OFF Room temperature ≧ desired temperature
<table>
<tr><th rowspan="2">Room temperature</th><th colspan="2">3 min. 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>Thermo stat 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>Less than 64°F</td><td colspan="4">Dry thermo OFF</td></tr>
</table>
1-2. Freeze prevention control
No control function</td><td></td></tr>
<tr><td>2. Fan</td><td>Indoor fan operation controlled depending 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: Remote controller setting is not acceptable.</td><td></td></tr>
<tr><td>3. Vane
(up/down vane change)</td><td>Same control as COOL operation</td><td></td></tr>
</table>

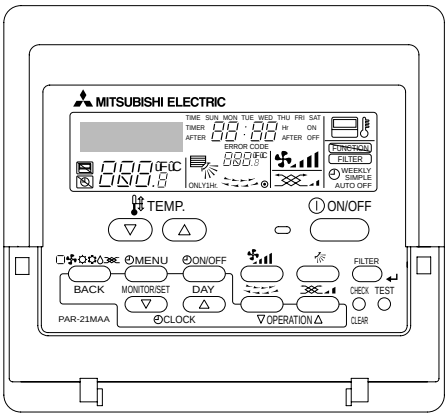
7-3. FAN OPERATION



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

Control modes	Control details	Remarks
1. Fan	Set by remote controller. Type: 4 speeds type Fan speed notch: [Low], [Mid2], [Mid1], [High]	
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	· Same control as COOL operation

7-4. HEAT OPERATION



<How to operate>

①Press POWER ON/OFF button.

②Press the operation MODE button to display HEAT.

③Press the TEMP. button to set the desired temperature.

NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Heating 63 to 83°F.

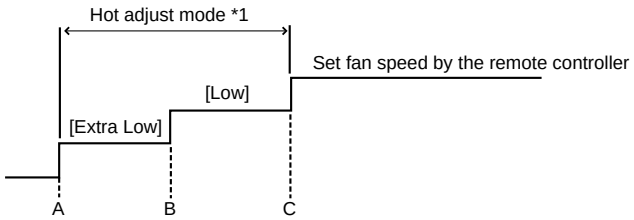
<Display in HEAT operation>

[DEFROST]

The [DEFROST] symbol is only displayed during the defrost operation.

[STANDBY]

The [STANDBY] symbol is only displayed during the hot adjust mode.

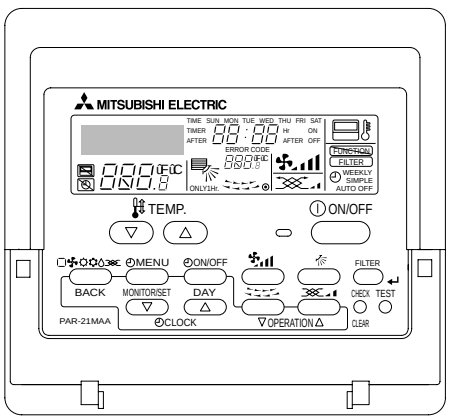
Control modes	Control details	Remarks
1. Thermo stat function	1-1. Thermo stat function (Function to prevent restarting for 3 minutes) • Room temperature ≦ desired temperature -2°F ···Thermo ON • Room temperature ≦ desired temperature ···Thermo OFF	
2. Fan	By the remote controller setting (switch of 4 speeds) Type: 4 speeds type — Fan speed notch: [Low], [Mid2], [Mid1], [High] Give priority to under-mentioned controlled mode 2-1. Hot adjust mode 2-2. Residual heat exclusion mode 2-3. Thermo OFF mode (When the compressor off by the thermo stat) 2-4. Cool air prevention mode (Defrosting mode)	
	2-1. Hot adjust mode The fan controller becomes the hot adjuster mode for the following conditions. ①When starting the HEAT operation ②When the thermo stat function changes from OFF to ON. ③When 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 turned 95°F or more. C: 2 minutes have passed since the condition B. (Terminating the hot adjust mode)	*1 "STAND BY" will be displayed during the hot adjust mode.
	2-2. Residual heat exclusion mode When the condition changes the auxiliary heater ON to OFF (thermo stat or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.	· This control is same for the model without auxiliary heater.

To be continued on the next page.

From the preceding page

Control modes	Control details	Remarks
2. Fan	2-3. Thermo OFF mode When the thermo stat 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>
①Press POWER ON/OFF button.
②Press the operation MODE button to display AUTO.
③Press the TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the ▽ or △ button is pressed one time. Automatic 67 to 83°F

Control modes	Control details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Desired temperature COOL mode for room temperature ≧ Desired temperature	
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≧ Desired temperature + 3°F. or 3 min. has passed (2) COOL mode → HEAT mode Room temperature ≧ Desired temperature - 3°F. or 3 min. has passed	
3. COOL mode	Same control as cool operation	
4. HEAT mode	Same control as heat operation	

8 TROUBLESHOOTING

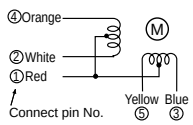
8-1. HOW TO CHECK THE PARTS

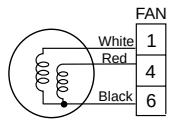
PKFY-P06NBMU-E PKFY-P08NBMU-E
PKFY-P06NBMU-ER1 PKFY-P08NBMU-ER1

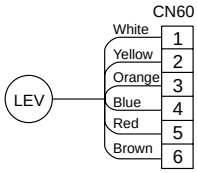
<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH21)

Liquid pipe temperature thermistor (TH22)

Gas pipe temperature thermistor (TH23)</td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 50°F~86°F)

<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>
Refer to the next page for the details.</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 colspan="4">Normal</th><th>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">400Ω ± 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>313Ω ± 8%</td><td rowspan="2">Open or short</td></tr><tr><td>Red-Black</td><td>108Ω ± 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">200Ω ± 10%</td></tr></table></td></tr>
</table>

8-1-1. Thermistor

<Thermistor characteristic graph>

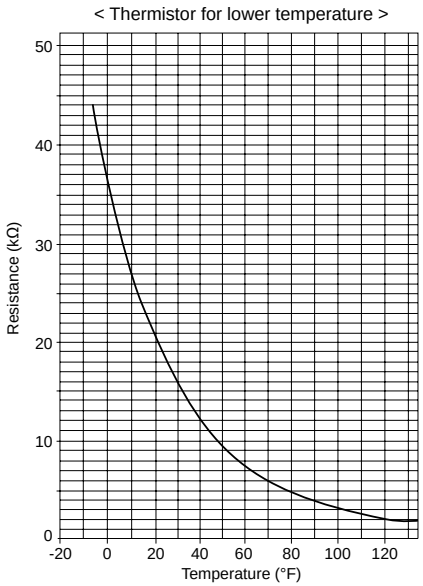
Thermistor for lower temperature

Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)

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

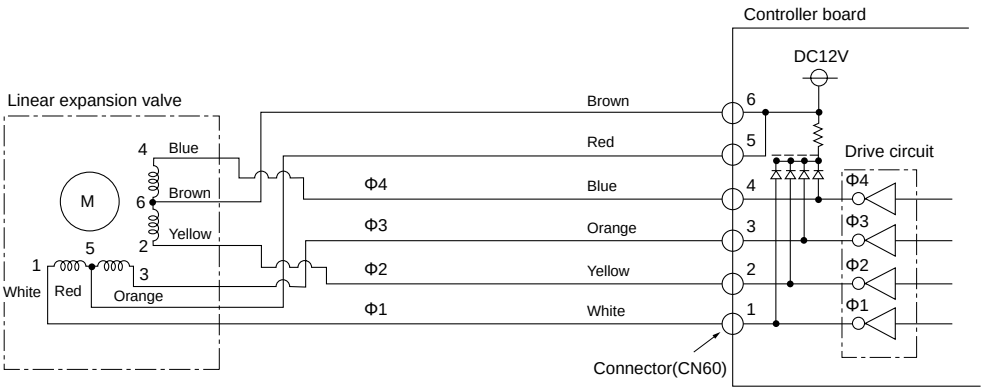
$$Rt=15\exp\{3480(\frac{1}{273+(t-32)/1.8}-\frac{1}{273})\}$$

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



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>



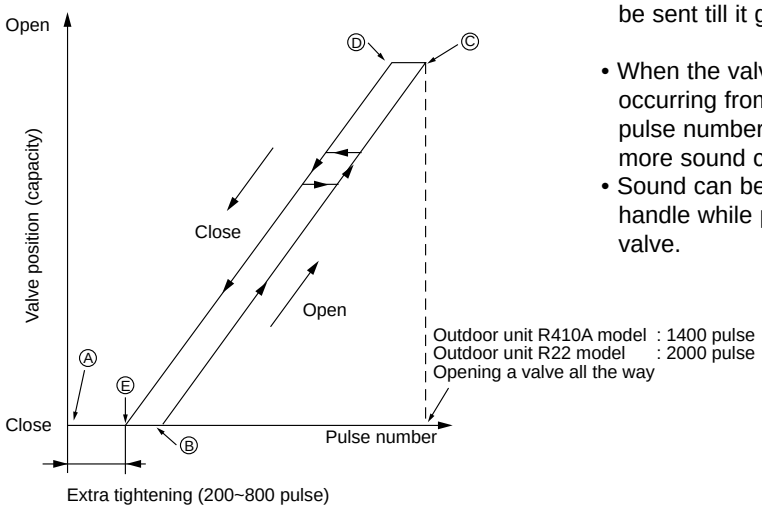
<Output pulse signal and the valve operation>

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.

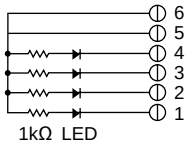
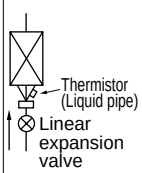
② Linear expansion valve operation



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

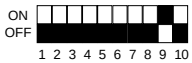
- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valves, however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more sound can be heard than in a normal situation.
- Sound can be detected by placing the ear against the screw driver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

③ Trouble shooting

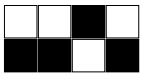
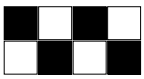
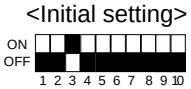
Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor	Disconnect the connector on the controller board, then connect LED for checking.  When power is turned on, pulse signals will be output for 10 seconds. There must be some defects in the operation circuit if the LED 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.

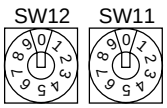
8-2. Function of Dip switch

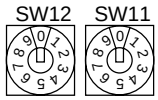
PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**

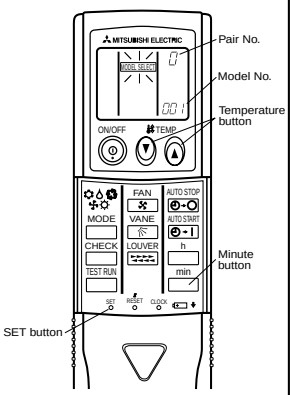
Switch	Pole	Function	Operation by switch		Effective timing	Remarks
			ON	OFF		
SW1 Mode selection	1	Thermistor<Room temperature> position	Built-in remote controller	Indoor unit	Under suspension	Address board <Initial setting>  NOTE: ※1 SW1-7 / SW1-8 / Fan speed OFF / OFF / Extra low ON / OFF / Low OFF / ON / Setting air flow ON / ON / Stop ※2 It is impossible to intake the fresh air.
	2	Filter clogging detection	Provide	Not provide		
	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 at 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		

※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.

Switch	Pole	Function	Operation by switch		Effective timing	Remarks
			ON	OFF		
SW2 Capacity code switch	1~6	Models / SW2 P06:  P08:  			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>  ※1 At cooling mode, each angle can be used only 1 hour. ※2 Please do not use SW3-9,10 as trouble might be caused by the usage condition. ※3 Second setting is the same as first setting.
	2	Louver	—	—		
	3	Vane	Available	Not available		
	4	Vane swing	—	—		
	5	Vane horizontal angle	Second setting ※3	First setting		
	6	Vane cooling limit angle setting ※1	Horizontal angle	Down B, C		
	7	Changing the opening of linear expansion valve	Effective	Not effective		
	8	Heating 4 degree (4 °C) up	Not effective	Effective		
	9	Target superheat setting ※2	—	—		
	10	Tartget subcool setting ※2	—	—		

<table>
<tr><th>Switch</th><th></th><th>Operation by switch</th><th>Effective timing</th><th>Remarks</th></tr>
<tr><td>SW11
1s digit address setting
SW12
10ths digit address setting</td><td>Rotary Switch</td><td> 

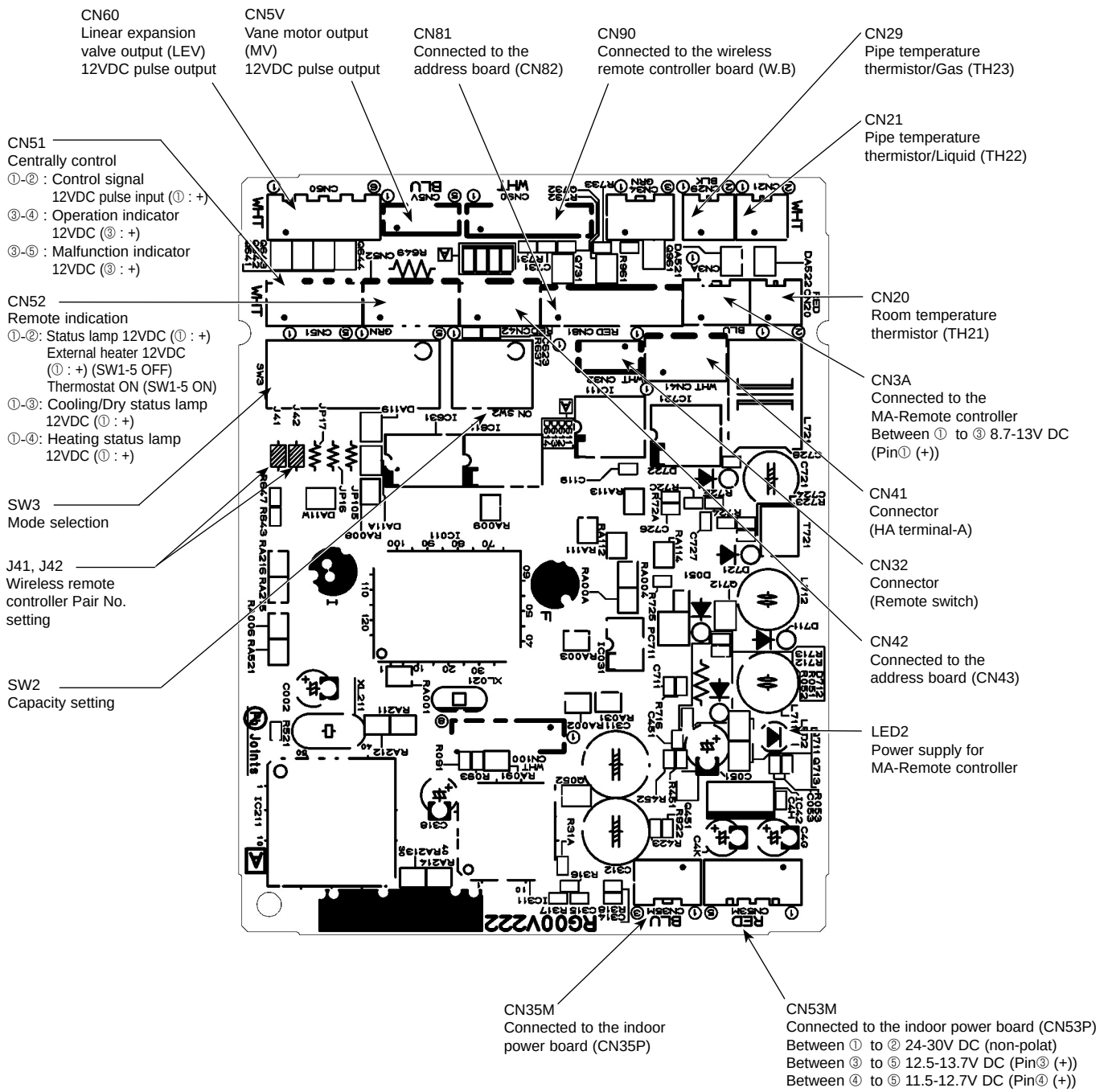
How to set addresses
Example : If address is "3", remain SW12 (for over 10) at "0", and match SW11 (for 1 to 9) with "3".</td><td rowspan="2">Before power supply ON</td><td>Address board
<Initial setting>
 
</td></tr>
<tr><td>SW14
Branch No. Setting</td><td>Rotary switch</td><td> 

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>
 
</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 temperature ▼ ▲ 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※</th><th rowspan="2"></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>
※ 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

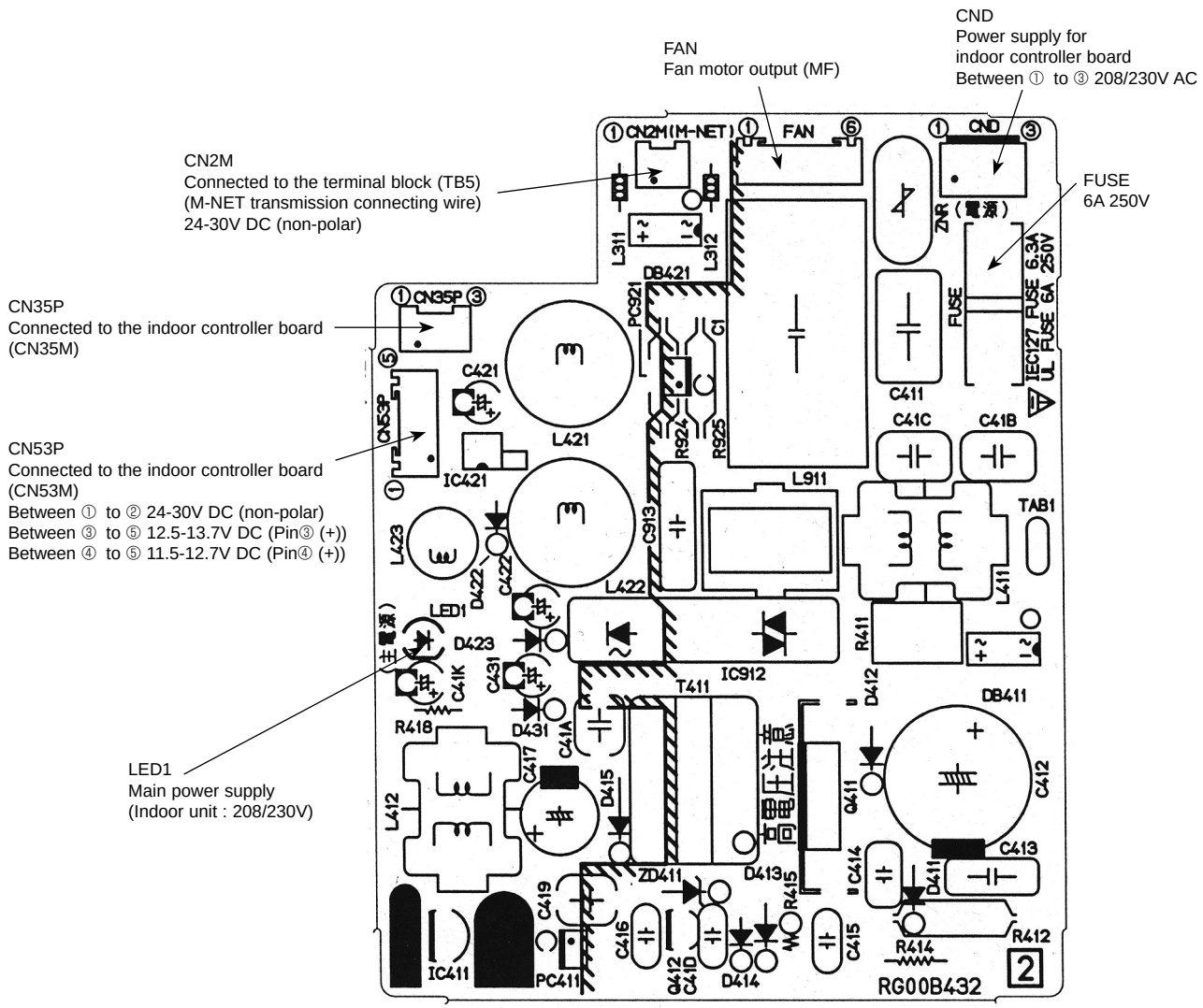
8-3-1. Indoor controller board

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**



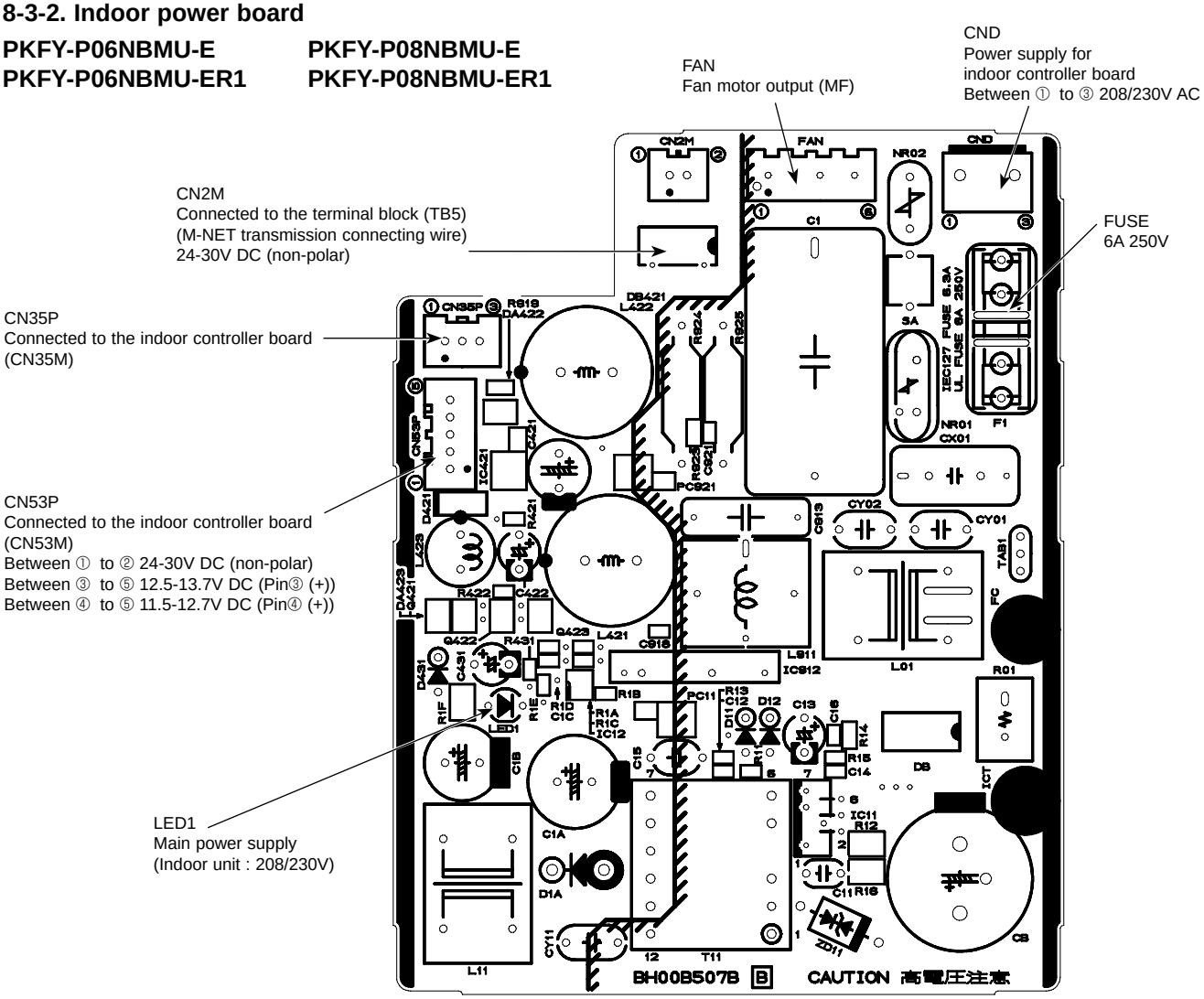
8-3-2. Indoor power board

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**



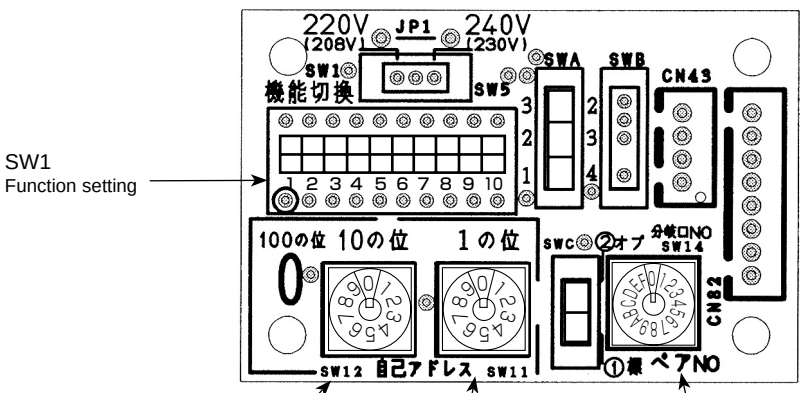
8-3-2. Indoor power board

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**



8-3-3. Address board

PKFY-P06NBMU-E **PKFY-P08NBMU-E**
PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**



SW1
Function setting

SW12
Address setting
10ths DIGIT

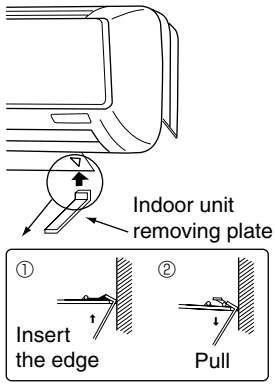
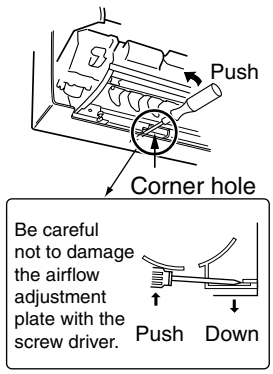
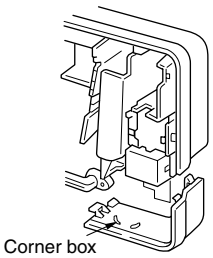
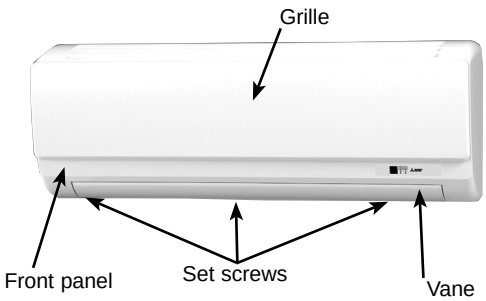
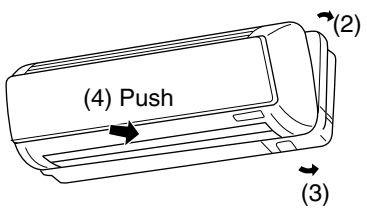
SW11
Address setting
1s DIGIT

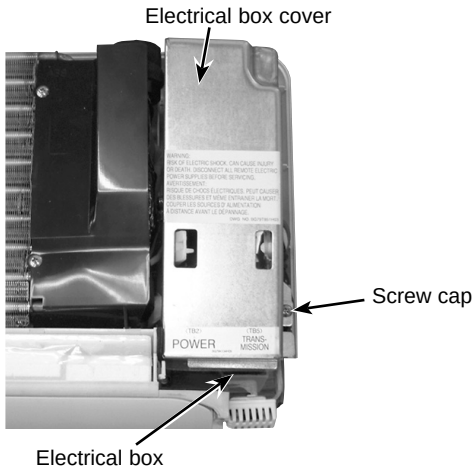
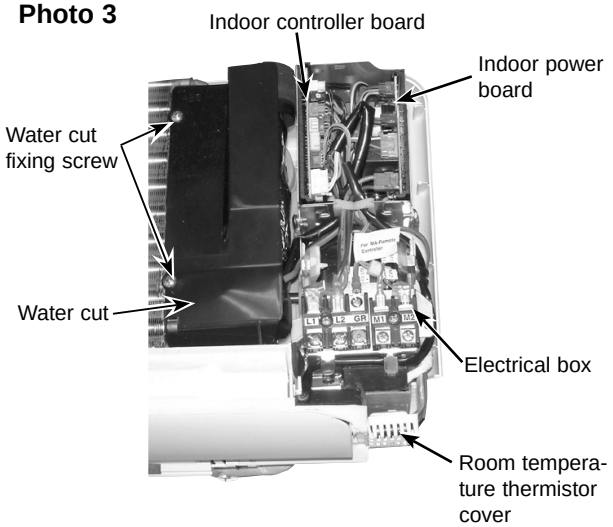
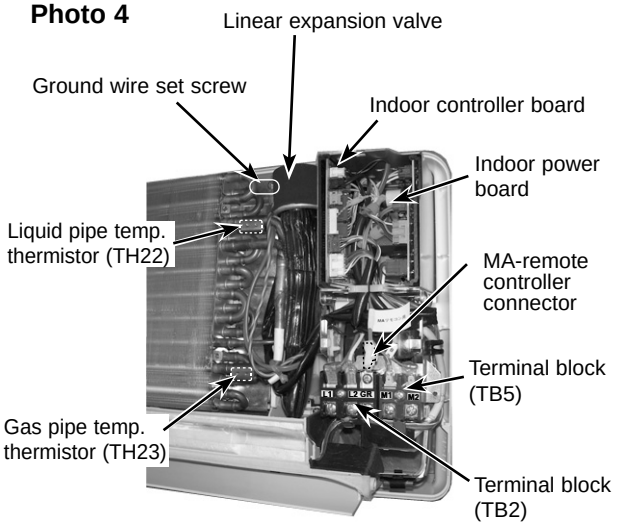
SW14
Branch No.

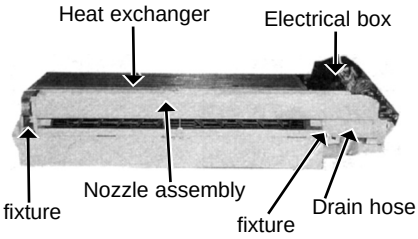
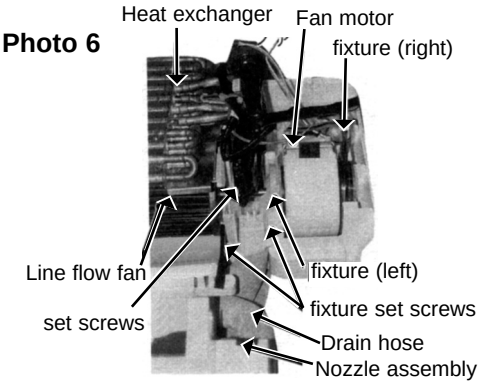
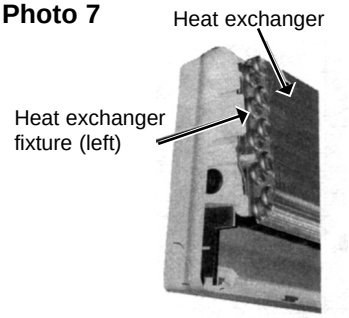
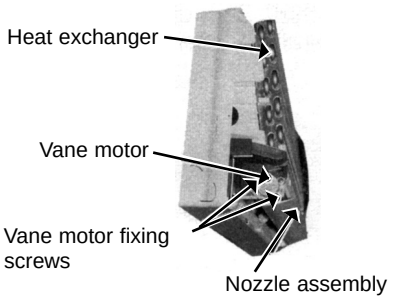
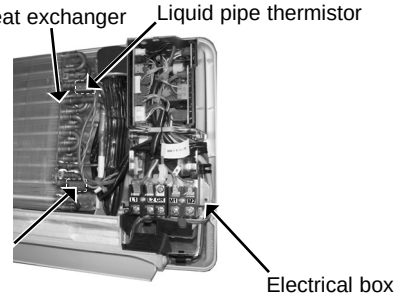
9 DISASSEMBLY PROCEDURE

PKFY-P06NBMU-E PKFY-P08NBMU-E

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. (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 * 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. (Refer to the 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. * 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. (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 2) (2) Remove the electrical box cover (screw 4 × 10). (Refer to the 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 the 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 the Photo 3)	**Photo 2**  **Photo 3** 
4. REMOVING THE ELECTRICAL BOX (1) Remove the front panel. (Refer to 2) (2) Remove the electrical box cover. (See the Photo 2) (3) Pull the nozzle assembly toward you as opening the catch of the nozzle assembly. (See the Photo 5) (4) Disconnect the indoor/outdoor transmission wiring of TB5. (5) Disconnect the power supply wiring of TB2. (6) Disconnect the relay connector of MA-remote controller. (7) Disconnect the following connector on the indoor controller board. ● CN60, CN5V, CN29, CN21, CN90, (CN3A) (8) Disconnect the connector (FAN) on the indoor power board. (9) Remove the ground wire fixing screw. (10) Pull the disconnected lead wire out from the electrical box. (11) Push up the upper fixture catch to remove the box, then pull the lower fixture and remove it from the box fixture.	**Photo 4** 

OPERATION PROCEDURE	PHOTOS
5. REMOVING THE NOZZLE ASSEMBLY AND DRAIN HOSE (1) Remove the front panel (Refer to 2). (2) Remove the electrical box cover. (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 the Photo 5) (6) Remove the drain hose.	**Photo 5** 
6. REMOVING THE LINE FLOW FAN AND THE FAN MOTOR (1) Remove the front panel. (Refer to 2) (2) Remove the nozzle assembly. (Refer to 5) (3) Remove the electrical parts box. (4) Remove the fixture while pressing the right side of motor fixture catch. (See the Photo 6) (5) Remove the left side of the motor fixture. (6) Loosen the screw which fixes the line flow fan to the fan motor, then remove the fan motor by sliding it to the right side. (See the Photo 6) (7) Pull the left-hand side of the heat exchanger toward you. (See the Photo 7) (8) Remove the line flow fan.	**Photo 6**  **Photo 7** 
7. REMOVING THE VANE MOTOR (1) Remove the front panel. (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 8** 
8. REMOVING THE LIQUID PIPE THERMISTOR AND GAS PIPE THERMISTOR (1) Remove the front panel. (Refer to 2) (2) Remove the electrical box cover. (3) Remove the water cut. (4) Cut the wiring fixed band. (5) Remove the liquid pipe thermistor and gas pipe thermistor. (See the Photo 9) (6) Disconnect the connector (CN29) (CN21) on the indoor controller board.	**Photo 9** 

PKFY-P06NBMU-ER1 **PKFY-P08NBMU-ER1**

Be careful when removing heavy parts.

OPERATION PROCEDURE

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 the 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

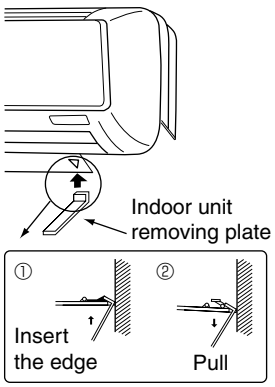


Figure 2

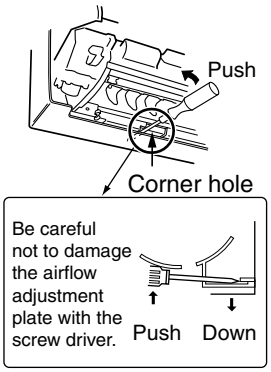
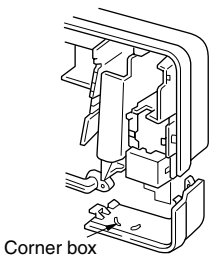


Figure 3



2. REMOVING THE FRONT PANEL

* 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 the 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.
* 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 the 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

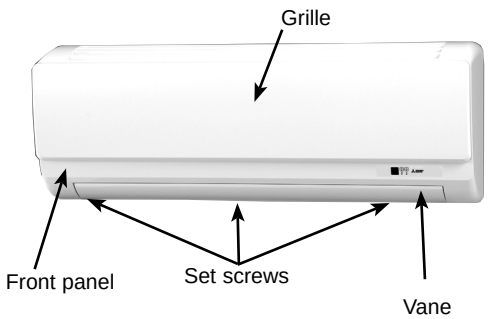
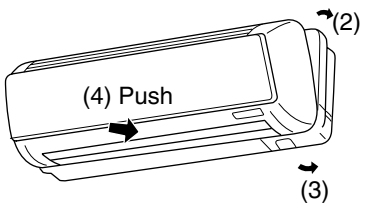
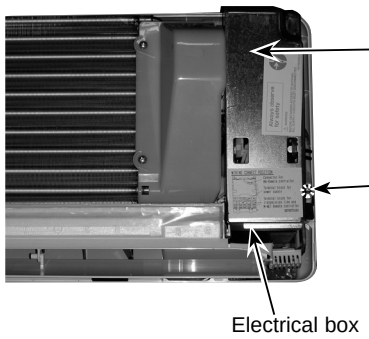
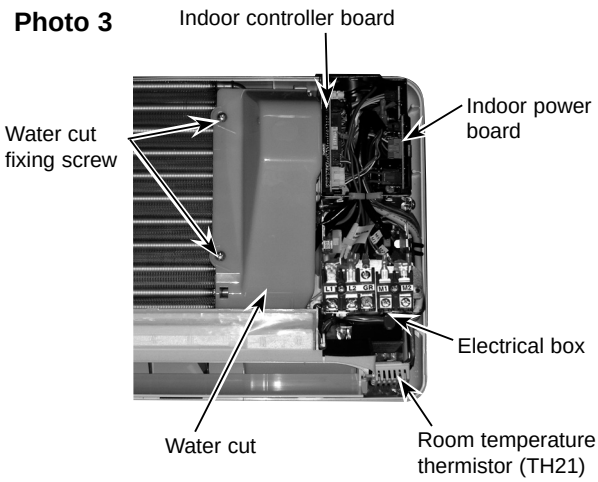
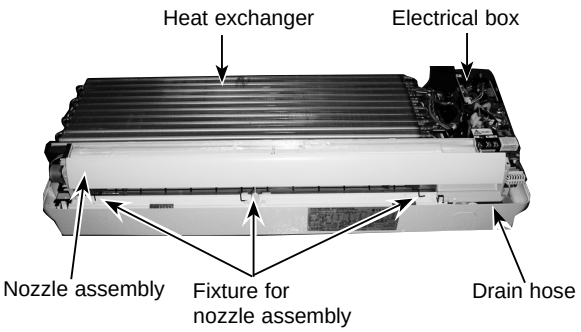
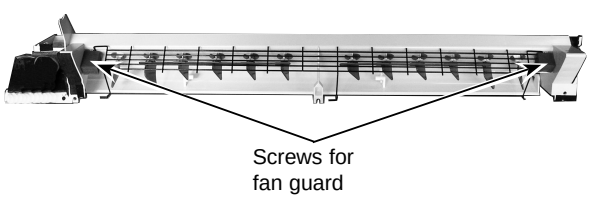
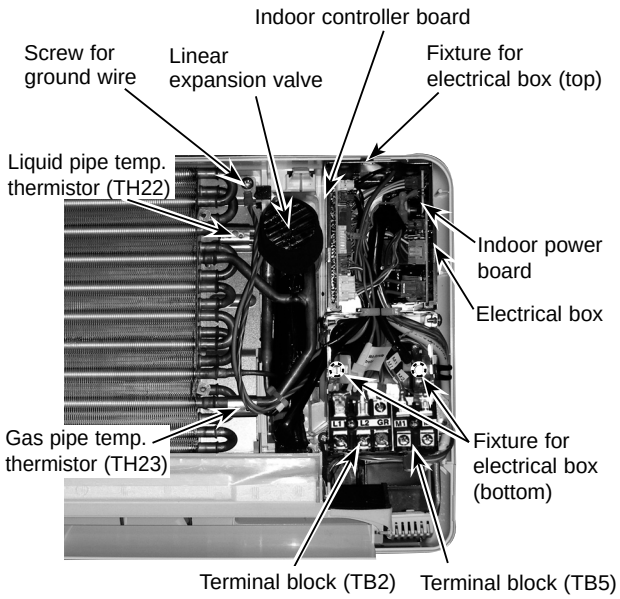
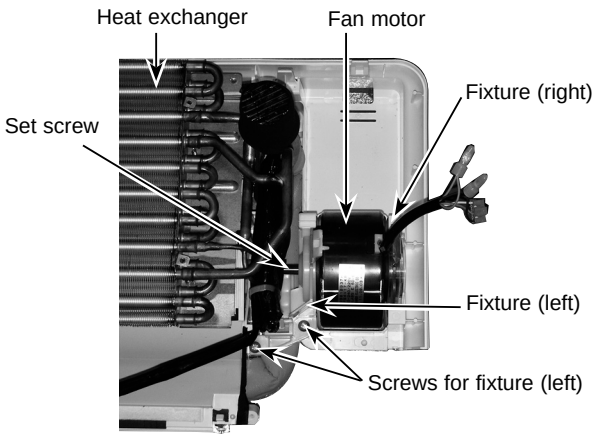
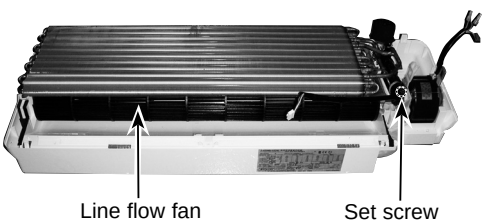
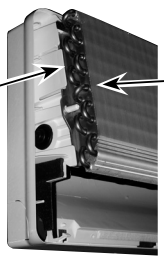
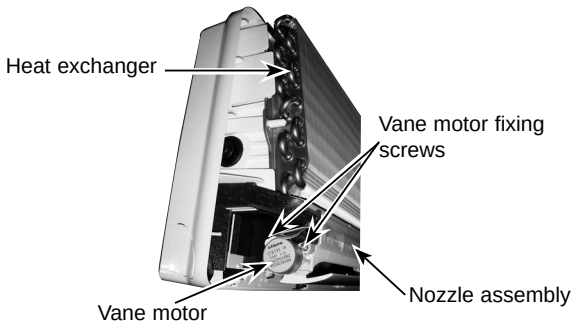
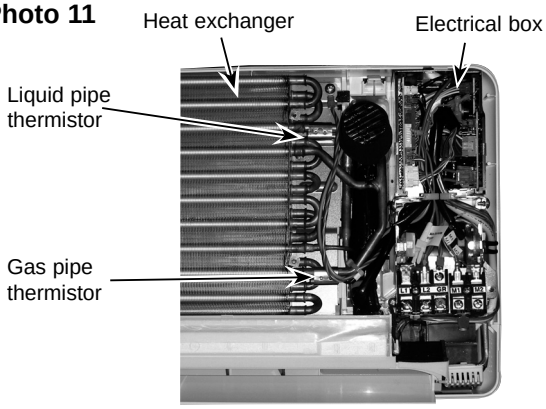


Figure 4



OPERATION PROCEDURE	PHOTOS & ILLUSTRATIONS
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 the 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 the 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 the 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 the 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 the 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 & ILLUSTRATIONS
6. REMOVING THE ELECTRICAL BOX (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See the Photo 2) (3) Remove the water cut. (See the Photo 3) (4) Pull the nozzle assembly toward you as opening the catch of the nozzle assembly. (See the 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 the 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 the Photo 7) (7) Pull the left-hand side of the heat exchanger toward you. (See the Photo 9) (8) Remove the line flow fan.	**Photo 7** 
Photo 8  	**Photo 9** 

OPERATION PROCEDURE	PHOTOS & ILLUSTRATIONS
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 LIQUID PIPE THERMISTOR AND GAS PIPE THERMISTOR (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See the Photo 2) (3) Remove the water cut. (See the Photo 3) (4) Cut the wiring fixed band. (5) Remove the liquid pipe thermistor and gas pipe thermistor. (See the Photo 10) (6) Disconnect the connector (CN29) (CN21) on the indoor controller board.	**Photo 11** 

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