Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

December 2012

No. OCH418
REVISED EDITION-C

TECHNICAL & SERVICE MANUAL

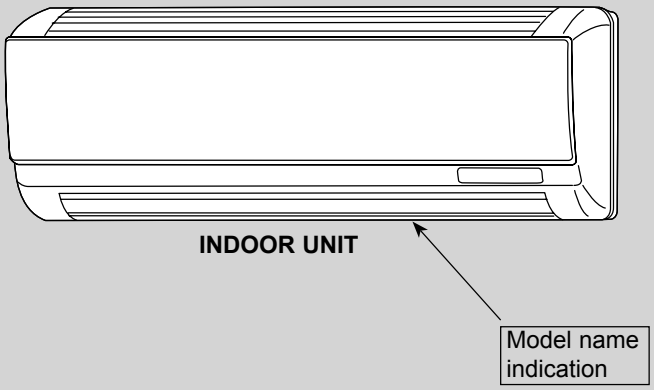
Series PKFY Wall Mounted R410A

Indoor unit [Model names]	[Service Ref.]
PKFY-P15VBM-E	PKFY-P15VBM-E
	PKFY-P15VBM-ER2
	PKFY-P15VBM-ER3
PKFY-P20VBM-E	PKFY-P20VBM-E
	PKFY-P20VBM-ER1
	PKFY-P20VBM-ER2
	PKFY-P20VBM-ER3
PKFY-P25VBM-E	PKFY-P25VBM-E
	PKFY-P25VBM-ER1
	PKFY-P25VBM-ER2
	PKFY-P25VBM-ER3

Revision:
- PKFY-P15/20/25VBM-ER3 have been added in REVISED EDITION-C.
- Some descriptions have been modified.

- Please void OCH418 REVISED EDITION-B.

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



CONTENTS

1 TECHNICAL CHANGES

PKFY-P15VBM-ER2 → PKFY-P15VBM-ER3
PKFY-P20VBM-ER2 → PKFY-P20VBM-ER3
PKFY-P25VBM-ER2 → PKFY-P25VBM-ER3
INDOOR CONTROLLER BOARD (I.B.) has been changed. (S/W version up)

PKFY-P15VBM-E → PKFY-P15VBM-ER2
PKFY-P20VBM-ER1 → PKFY-P20VBM-ER2
PKFY-P25VBM-ER1 → PKFY-P25VBM-ER2
HEAT EXCHANGER and WATER CUT have been changed.

PKFY-P20VBM-E → PKFY-P20VBM-ER1
PKFY-P25VBM-E → PKFY-P25VBM-ER1
INDOOR CONTROLLER BOARD (I.B.) has been changed.

2 SAFETY PRECAUTION

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.

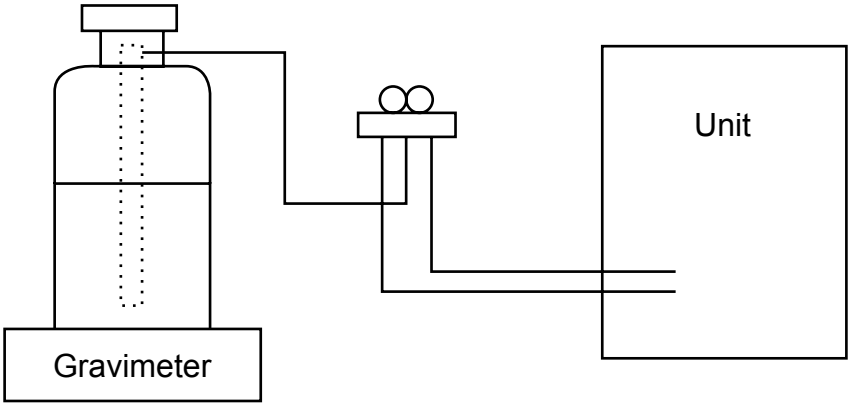
[1] Cautions for service

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

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



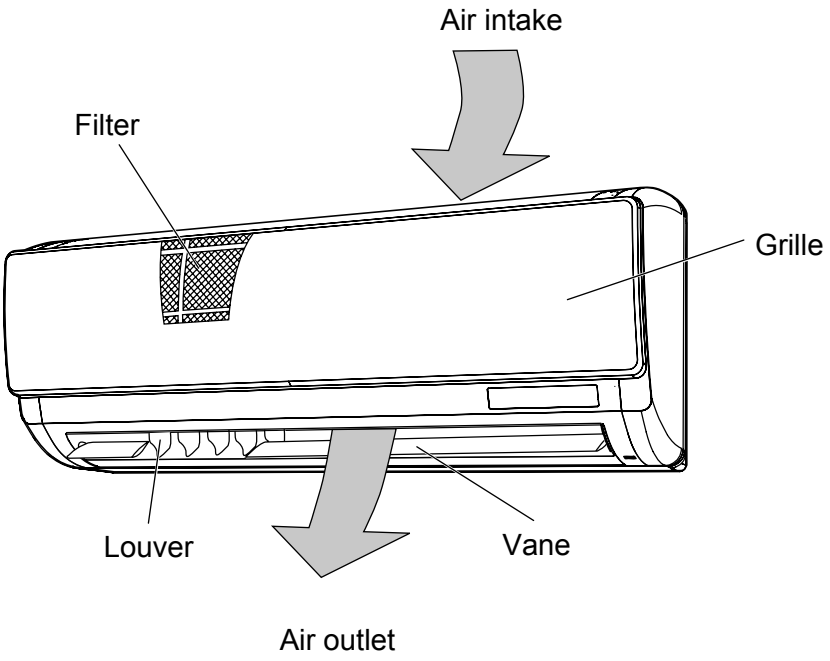
[3] Service tools

Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3 MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09 MPa·G or over.
③	Electronic scale	—
④	Gas leak detector	· Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	· Only for R410A Top of cylinder (Pink) Cylinder with syphon
⑧	Refrigerant recovery equipment	—

3 PART NAMES AND FUNCTIONS

3-1. Indoor unit



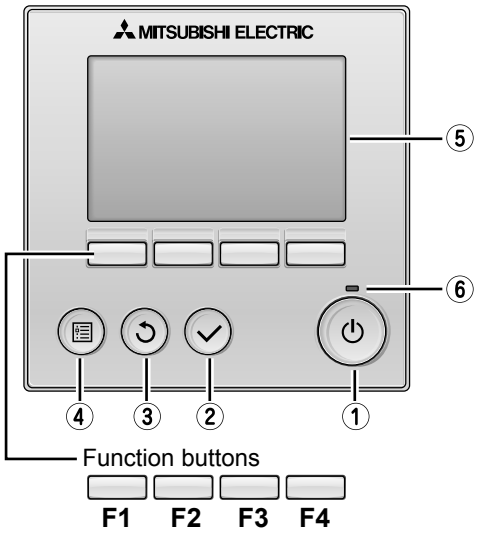
3-2. WIRED REMOTE CONTROLLER <PAR-30MAA/PAR-31MAA>

Wired remote controller function

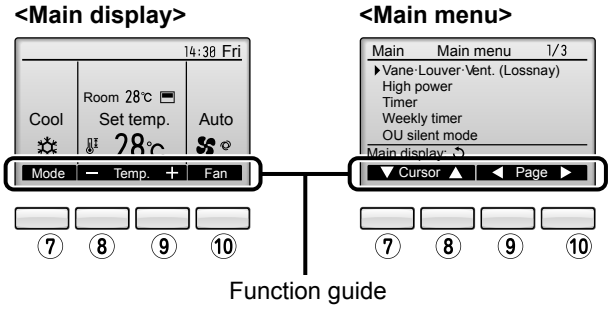
* The functions which can be used are restricted according to the model.

○ : Supported × : Unsupported

	Function	PAR-30MAA/PAR-31MAA		PAR-21MAA
		Slim	City multi	
Body	Product size H × W × D (mm)	120 × 120 × 19		120 × 130 × 19
	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	○		○



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.



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.

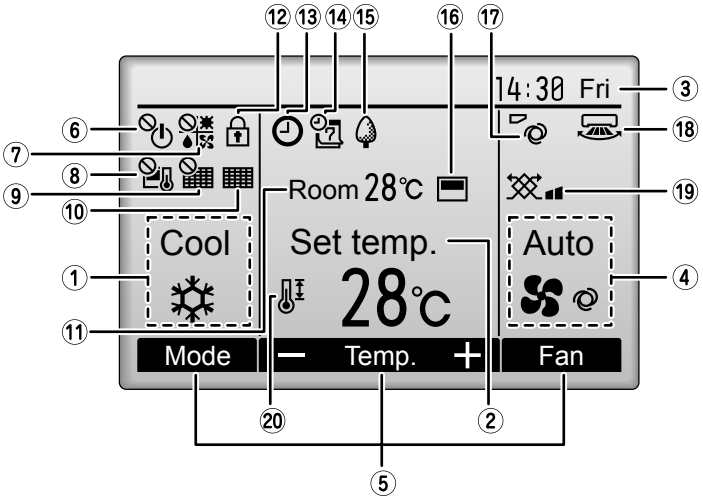
⑩ Function button F4

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

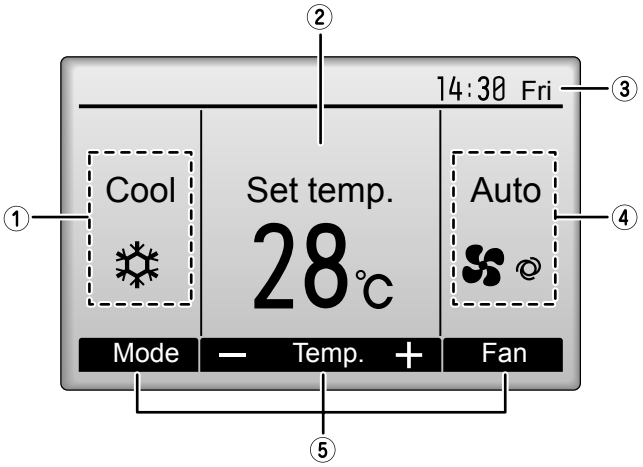
The main display can be displayed in two different modes: "Full" and "Basic".
The factory setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting.

<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 f lter reset function is centrally controlled.

⑩

Indicates when f lter 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

Indicates the vane setting.

⑱

Indicates the louver setting.

⑲

Indicates the ventilation setting.

⑳

Appears when the preset temperature range is restricted.

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

Menu structure

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 f ve 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. * Clock setting is required.
	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.
Filter information		**Use to check the f lter status.** • The f lter sign can be reset.
Error information		**Use to check error information when an error occurs.** • Error code, error source, refrigerant address, unit model, manufacturing number, contact information (dealer's phone number) can be displayed. * The unit model, manufacturing number, and contact information need to be registered in advance to be displayed.
Weekly timer		**Use to set the weekly operation On / Off times.** • Up to eight operation patterns can be set for each day. * Clock setting is required. * Not valid when the On/Off timer is enabled.
Energy saving	**Auto return**	**Use to get the units to operate at the preset temperature after performing energy-save operation for a specif ed 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 four 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. * Clock setting is required.
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. * Clock setting is required.
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.
Maintenance	**Auto descending panel**	**Auto descending panel (Optional parts) Up / Down you can do.**
	Manual vane angle	**Use to set the vane angle for each vane to a f xed position.**
Initial setting	**Main/Sub**	**When connecting two remote controllers, one of them needs to be designated as a sub controller.**
	Clock	**Use to set the current time.**
	Main display	**Use to switch between "Full" and "Basic" modes for the Main display.** • The default setting is "Full."
	Contrast	**Use to adjust screen contrast.**

Setting and display items		Setting details
Initial setting	**Display details**	**Make the settings for the remote controller related items as necessary.** **Clock:** The factory settings are "Yes" and "24h" format. **Temperature:** Set either Celsius (°C) or Fahrenheit (°F). **Room temp. :** Set Show or Hide. **Auto mode:** Set the Auto mode display or Only Auto display.
	Auto mode	**Whether or not to use the AUTO mode can be selected by using the button.** **This setting is valid only when indoor units with the AUTO mode function are connected.**
	Administrator password	**The administrator password is required to make the settings for the following items.** • Timer setting • Energy-save setting • Weekly timer setting • Restriction setting • Outdoor unit silent mode setting • Night set back
	Language selection	**Use to select the desired language.**
Service	**Test run**	**Select "Test run" from the Service menu to bring up the Test run menu.** • Test run • Drain pump test run
	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
	Function setting	**Make the settings for the indoor unit functions via the remote controller as necessary.**
	LOSSNAY setting (City Multi only)	**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. **Refrigerant leak check:** Refrigerant leaks can be judged. **Smooth maintenance:** The indoor and outdoor maintenance data can be displayed. **Request cord:** Details of the operation data including each thermistor temperature and error history can be checked.
	Self check	**Error history of each unit can be checked via the remote controller.**
	Maintenance password	**Take the following steps to change the maintenance password.**
	Remote controller check	**When the remote controller does not work properly, use the remote controller checking function to troublushoot the problem.**

3-3. WIRED REMOTE CONTROLLER <PAR-21MAA>

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.

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

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

Temperature Setting
Shows the target temperature.

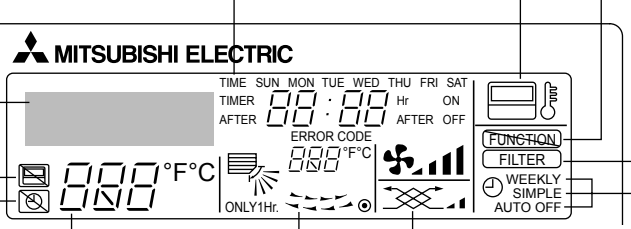
Up/Down Air Direction indicator
The indicator ＼ shows the direction of the outcoming airflow.

"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.

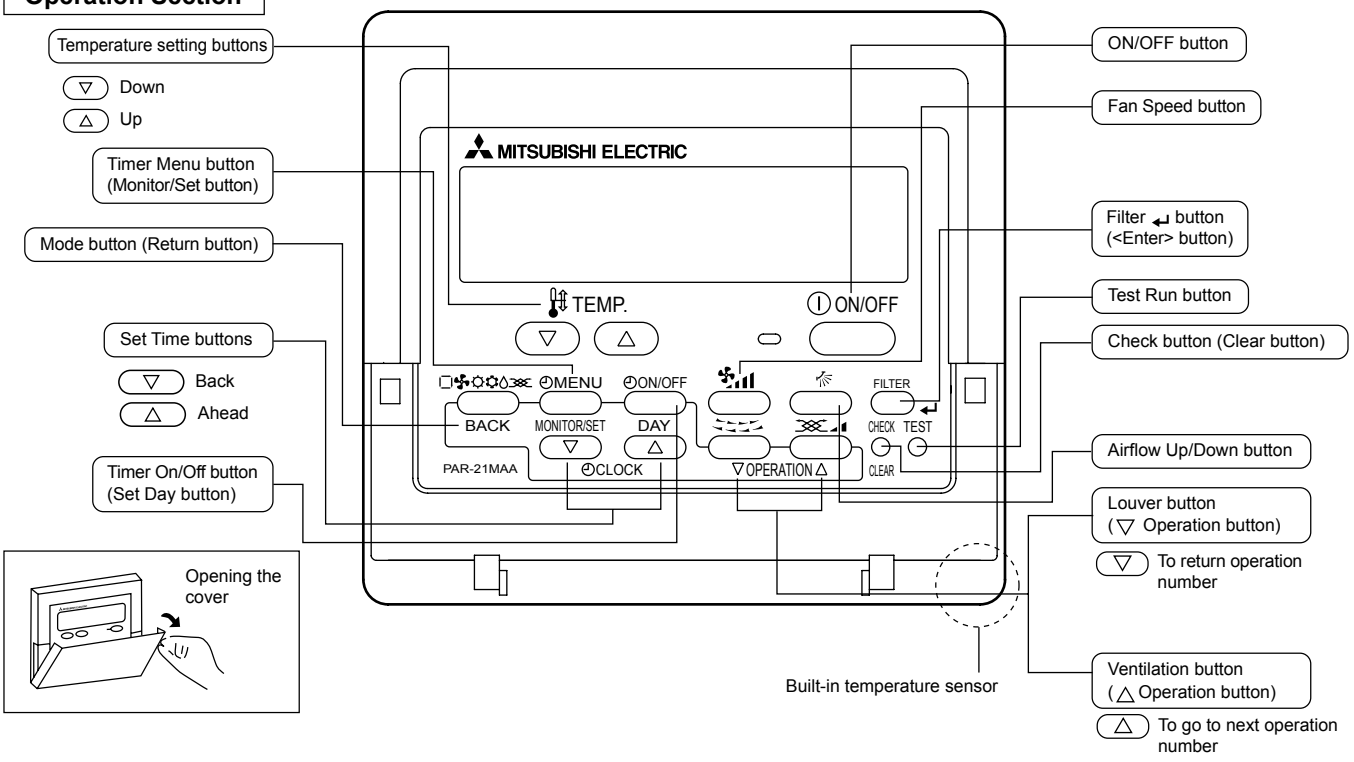
Room Temperature display
Shows the room temperature. The room temperature display range is 8 - 39℃. The display blinks if the temperature is less than 8℃ or 39℃ or more.

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

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

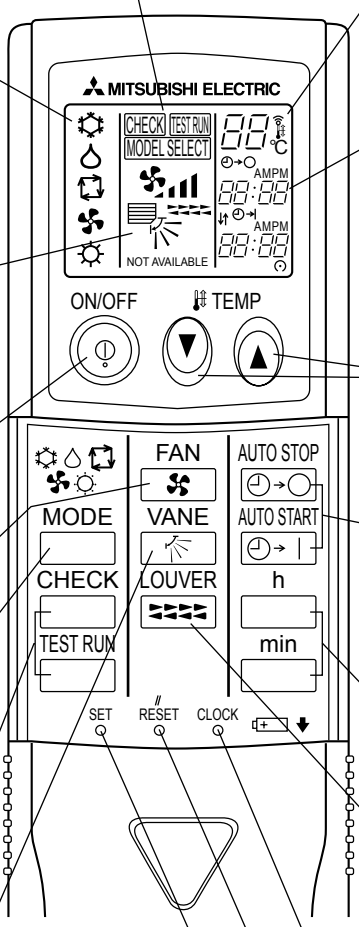


Operation Section



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.

3-4. Wireless remote controller



CHECK TEST RUN display

CHECK and TEST RUN display indicate that the unit is being checked or test-run.

MODEL SELECT display

Blinks when model is selected.

display

Lights up while the signal is transmitted to the indoor unit when the button is pressed.

display

SET TEMP. display indicates the set desired temperature.

display

OPERATION MODE display
Operation mode display indicates which operation mode is in effect.

CLOCK display

Displays the current time.

TIMER display

Displays when in timer operation or when setting timer.

" ↓ " " ↑ " display

Displays the order of timer operation.

" ⏲→| " " ⏲→○ " display

Displays whether timer is on or off.

display

The vertical direction of air flow is indicated.

display

FAN SPEED display indicates which fan speed has been selected.

buttons

SET TEMPERATURE button sets any desired room temperature.

ON/OFF button

The unit is turned ON and OFF alternately each time the button is pressed.

TIMER CONTROL buttons

AUTO STOP (OFF timer): when this switch is set, the air conditioner will be automatically stopped at the preset time.
AUTO START (ON timer): when this switch is set, the air conditioner will be automatically started at the preset time.

FAN SPEED SELECT button

Used to change the fan speed.

h and min buttons

Buttons used to set the "hour and minute" of the current time and timer settings.

MODE SELECT button

Used to switch the operation mode between cooling, drying, fan, heating and auto mode.

* If the outdoor unit is cool only type, the heating and auto mode are not available.

LOUVER button

Changes left/right airflow direction.

(Not available for this model.)

CHECK-TEST RUN buttons

Only press this button to perform an inspection check or test operation.
Do not use it for normal operation.

CLOCK button

RESET button

VANE CONTROL button

Used to change the air flow direction.

SET button

4 SPECIFICATION

4-1. SPECIFICATIONS

Service ref.			PKFY-P15VBM-E PKFY-P15VBM-ER2 PKFY-P15VBM-ER3	PKFY-P20VBM-E PKFY-P20VBM-ER1 PKFY-P20VBM-ER2 PKFY-P20VBM-ER3	PKFY-P25VBM-E PKFY-P25VBM-ER1 PKFY-P25VBM-ER2 PKFY-P25VBM-ER3
Power source			1-phase 220-240V 50Hz, 1-phase 220V 60Hz		
Cooling capacity (Nominal)	*1	kW	1.7	2.2	2.8
	*1	kcal/h	1,450	1,900	2,400
	*1	Btu/h	5,800	7,500	9,600
	*2	kcal/h	1,500	2,000	2,500
	Power input	kW	0.04	0.04	0.04
	Current input	A	0.20	0.20	0.20
Heating capacity (Nominal)	*3	kW	1.9	2.5	3.2
	*3	kcal/h	1,600	2,200	2,800
	*3	Btu/h	6,500	8,500	10,900
	Power input	kW	0.04	0.04	0.04
	Current input	A	0.20	0.20	0.20
External finish			Plastic, MUNSELL (1.0Y 9.2/0.2)		
External dimension H x W x D		mm	295 × 815 × 225	295 × 815 × 225	295 × 815 × 225
		in.	11-5/8" × 32-1/8" × 8-7/8"	11-5/8" × 32-1/8" × 8-7/8"	11-5/8" × 32-1/8" × 8-7/8"
Net weight		kg (lb)	10 (23)	10 (23)	10 (23)
Heat exchanger			Cross fin (Aluminum fin and copper tube)		
Fan	Type x Quantity		Line flow fan × 1	Line flow fan × 1	Line flow fan × 1
	External static press.	Pa	0	0	0
		mmH_2O	0	0	0
	Motor type		1-phase induction motor		
	Motor output	kW	0.017	0.017	0.017
	Driving mechanism		Direct-driven by motor		
	Airflow rate (Low-Mid2-Mid1-High)	m^3/min	4.9 - 5.0 - 5.2 - 5.3	4.9 - 5.2 - 5.6 - 5.9	4.9 - 5.2 - 5.6 - 5.9
		L/s	82 - 83 - 87 - 88	82 - 87 - 93 - 98	82 - 87 - 93 - 98
		cfm	173 - 177 - 184 - 187	173 - 184 - 198 - 208	173 - 184 - 198 - 208
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)		dB <A>	29 - 31 - 32 - 33	29 - 31 - 34 - 36	29 - 31 - 34 - 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)	mm (in.)	ø6.35 (ø1/4") Flare	ø6.35 (ø1/4") Flare	ø6.35 (ø1/4") Flare
	Gas (R410A)	mm (in.)	ø12.7 (ø1/2") Flare	ø12.7 (ø1/2") Flare	ø12.7 (ø1/2") Flare
Field drain pipe size		mm (in.)	I.D. 16mm (5/8")	I.D. 16mm (5/8")	I.D. 16mm (5/8")
Standard attachment	Document Accessory		Installation Manual, Instruction Book		
Remark	Optional parts				
	External LEV Box		PAC-SG95LE-E	PAC-SG95LE-E	PAC-SG95LE-E
	Installation		Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.		

Note :

*1 Nominal cooling conditions

Indoor :	27°CDB/19°CWB (81°FDB/66°FWB)
Outdoor :	35°CDB (95°FDB)
Pipe length :	7.5 m (24-9/16 ft)
Level difference :	0 m (0 ft)

*2 Nominal cooling conditions

	27°CDB/19.5°CWB (81°FDB/67°FWB)
	35°CDB (95°FDB)
	5 m (16-3/8 ft)
	0 m (0 ft)

*3 Nominal heating conditions

	20°CDB (68°FDB)
	7°CDB/6°CWB (45°FDB/43°FWB)
	7.5 m (24-9/16 ft)
	0 m (0 ft)

* Nominal conditions *1, *3 are subject to JIS B8615-1.
* 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.

4-2. ELECTRICAL PARTS SPECIFICATIONS

Service ref. / Parts name	Symbol	PKFY-P15VBM-E PKFY-P15VBM-ER2 PKFY-P15VBM-ER3	PKFY-P20VBM-E PKFY-P20VBM-ER1 PKFY-P20VBM-ER2 PKFY-P20VBM-ER3	PKFY-P25VBM-E PKFY-P25VBM-ER1 PKFY-P25VBM-ER2 PKFY-P25VBM-ER3
Room temperature thermistor	TH21	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ		
Liquid pipe thermistor	TH22	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ		
Gas pipe thermistor	TH23	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.4kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ		
Fuse (Indoor controller board)	FUSE	250V 6.3A		
Fan motor (with thermal fuse)	MF	4-Pole Output 17W / PS4V17-KB		
Fan motor capacitor	C1	1.5μF × 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	(L, N, ⏚) 250V 20A		
Transmission terminal block	TB5	(M1, M2) 250V 10A		

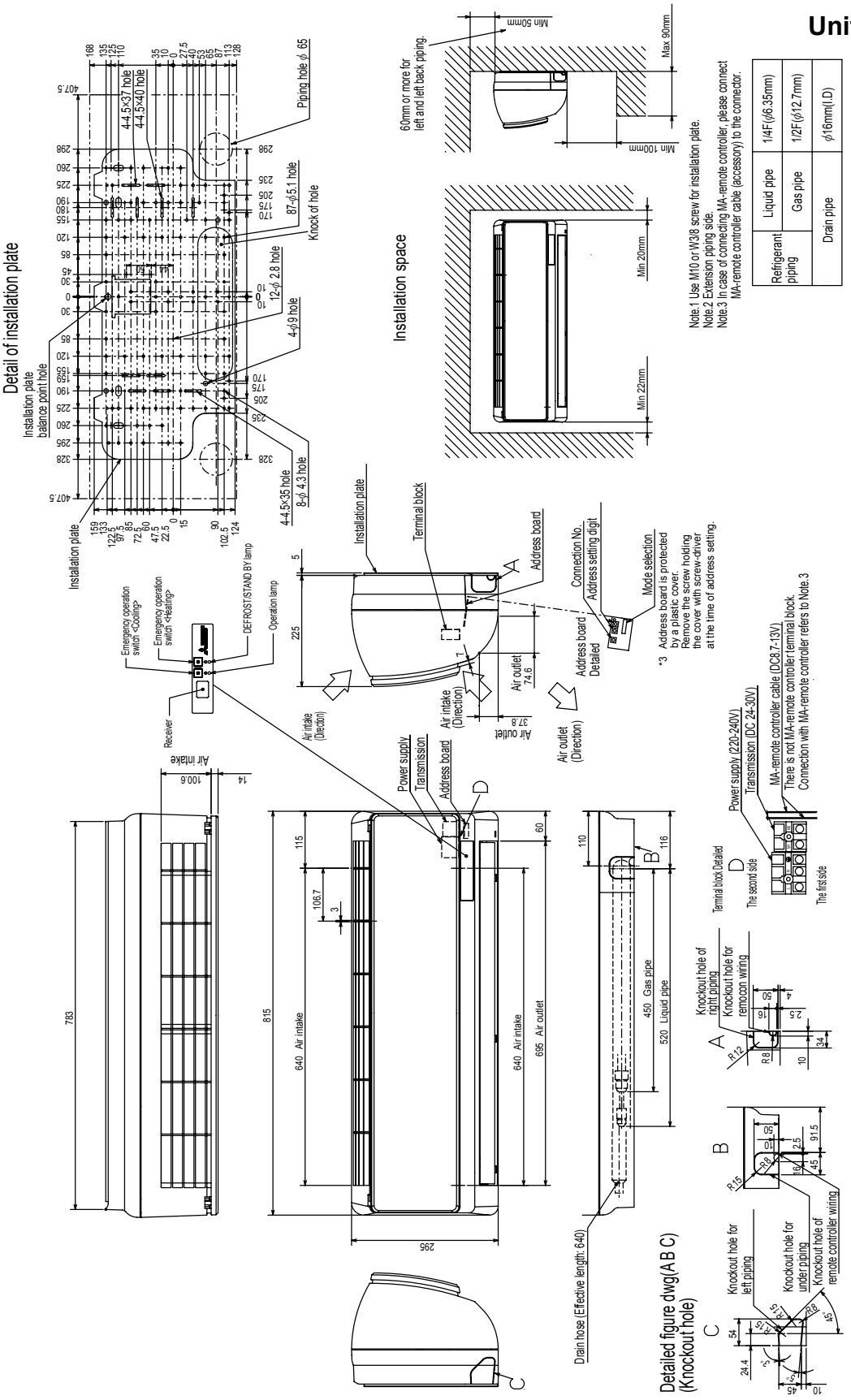
5 OUTLINES AND DIMENSIONS

PKFY-P15VBM-E
PKFY-P15VBM-ER2
PKFY-P15VBM-ER3

PKFY-P20VBM-E
PKFY-P20VBM-ER1
PKFY-P20VBM-ER2
PKFY-P20VBM-ER3

PKFY-P25VBM-E
PKFY-P25VBM-ER1
PKFY-P25VBM-ER2
PKFY-P25VBM-ER3

Unit: mm

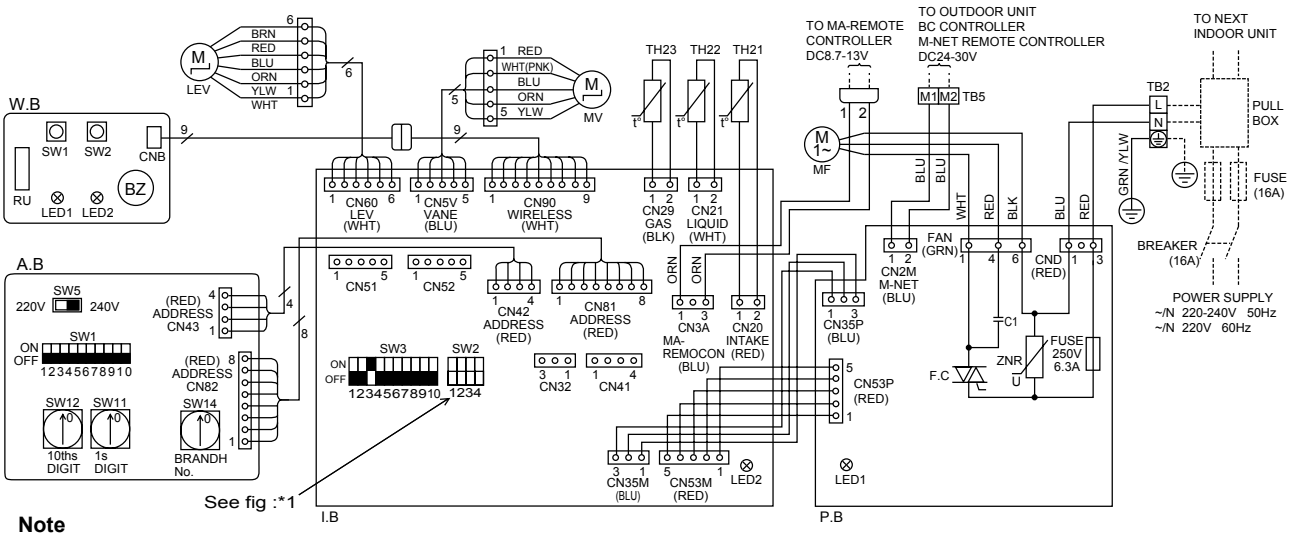


6 WIRING DIAGRAM

PKFY-P20VBM-E PKFY-P25VBM-E

Legend

Symbol	Name		Symbol	Name		Symbol	Name	
I.B	Indoor controller board		MV	Vane motor		SW5	Switch	Voltage selection
CN32	Connector	Remote switch	LEV	Linear expansion valve		SW11		Address setting 1s digit
CN51		Centrally control	TB2	Terminal block	Power supply	SW12		Address setting 10ths digit
CN52		Remote indication	TB5		Transmission	SW14		Connection No.
SW2	Switch	Capacity code	TH21	Thermistor	Room temp.detection	W.B	Wireless remote controller board	
SW3		Mode selection			(0℃/15kΩ,25℃/5.4kΩ)	RU	Receving unit	
P.B	Indoor power board		TH22		Pipe temp.detection/liquid	BZ	Buzzer	
ZNR	Varistor				(0℃/15kΩ,25℃/5.4kΩ)	LED1	LED (Operation indicator: Green)	
FUSE	Fuse (6.3A 250V)		TH23		Pipe temp.detection/Gas	LED2	LED (Preparation for heating: Orange)	
F.C	Fan phase control				(0℃/15kΩ,25℃/5.4kΩ)	SW1	Emergency operation (Heat)	
C1	Capacitor (fan motor)		A.B	Address board		SW2	Emergency operation (Cool)	
MF	Fan motor		SW1	Switch	Mode selection			



Note

1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of connecting 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 240V side when the power supply is 230 and 240 volts.
   When the power supply is 220 volts, set SW5 to 220V side.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply (indoor unit:220-240V) power on →lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on→ lamp is lit

The black square (■) indicates a switch position. <*1>

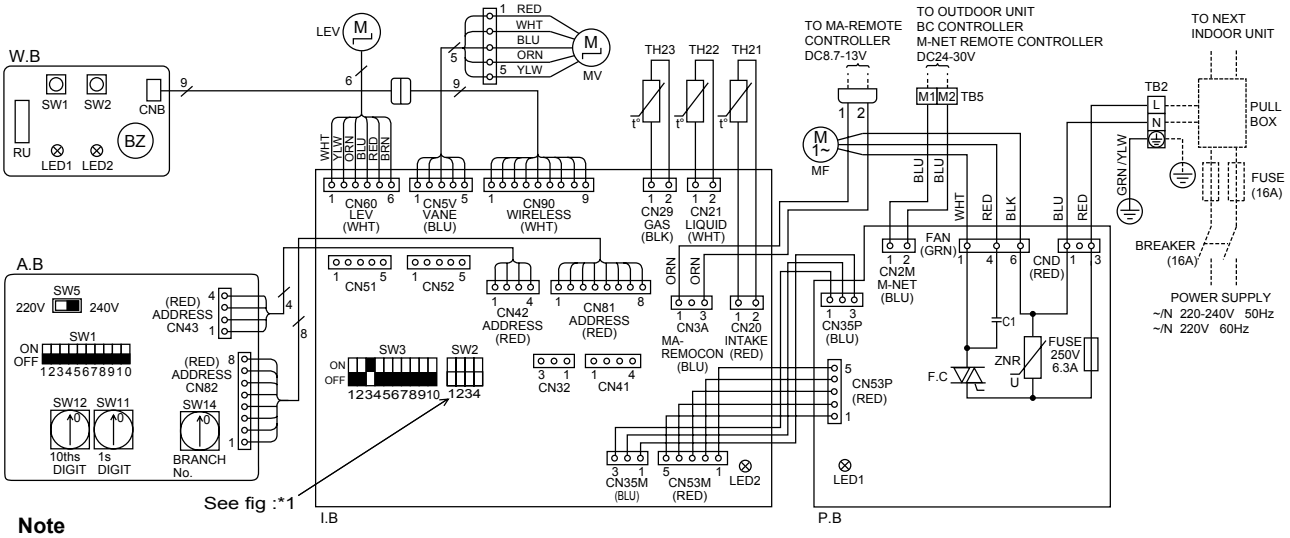
MODELS	SW2	MODELS	SW2
P20	ON OFF 1 2 3 4	P25	ON OFF 1 2 3 4

PKFY-P15VBM-E

PKFY-P15VBM-ER2 PKFY-P20VBM-ER1 PKFY-P20VBM-ER2 PKFY-P25VBM-ER1 PKFY-P25VBM-ER2

Legend

Symbol	Name		Symbol	Name		Symbol	Name	
I.B	Indoor controller board		MV	Vane motor		SW5	Switch	Voltage selection
CN32	Connector	Remote switch	LEV	Linear expansion valve		SW11		Address setting 1s digit
CN51		Centrally control	TB2	Terminal block	Power supply	SW12		Address setting 10ths digit
CN52		Remote indication	TB5		Transmission	SW14		Connection No.
SW2	Switch	Capacity code	TH21	Thermistor	Room temp.detection (0℃/15kΩ,25℃/5.4kΩ)	W.B	Wireless remote controller board	
SW3		Mode selection				RU	Receving unit	
P.B	Indoor power board		TH22		Pipe temp.detection/Liquid (0℃/15kΩ,25℃/5.4kΩ)	BZ	Buzzer	
ZNR	Varistor					LED1	LED (Operation indicator: Green)	
FUSE	Fuse (T6.3AL 250V)		TH23		Pipe temp.detection/Gas (0℃/15kΩ,25℃/5.4kΩ)	LED2	LED (Preparation for heating: Orange)	
F.C	Fan phase control					SW1	Emergency operation (Heat)	
C1	Capacitor (Fan motor)		A.B	Address board		SW2	Emergency operation (Cool)	
MF	Fan motor		SW1	Switch	Mode selection			



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 240V side when the power supply is 230 and 240 volts.
   When the power supply is 220 volts, set SW5 to 220V side.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply (indoor unit:220-240V) power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

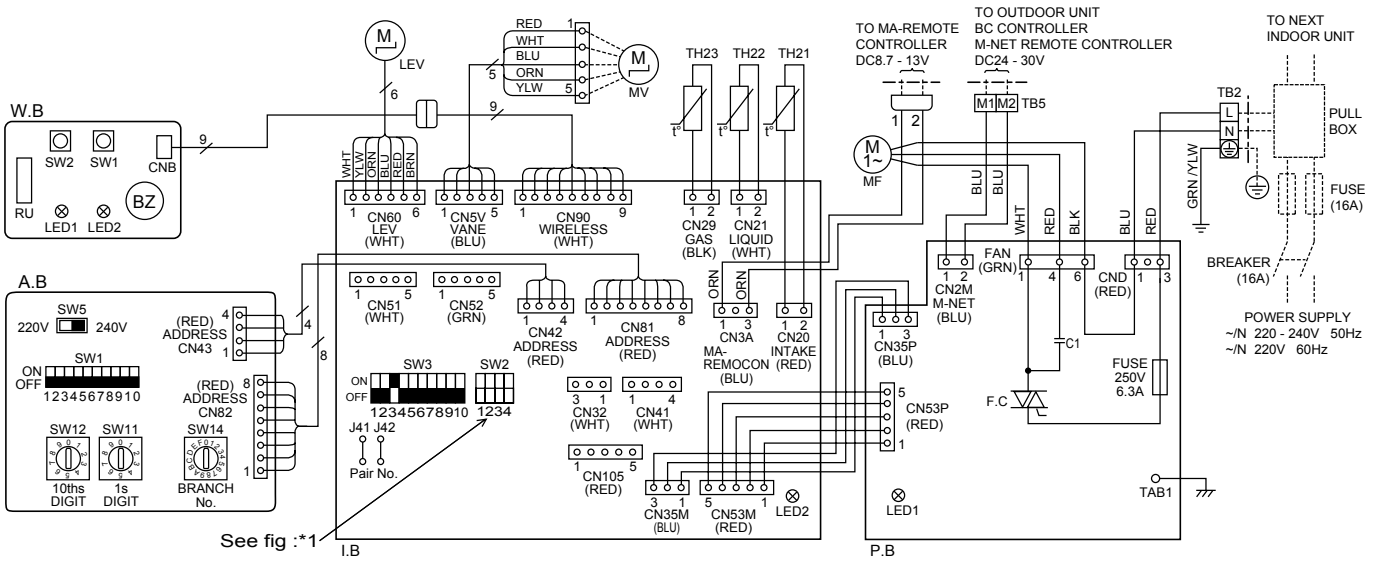
The black square (■) indicates a switch position. <*1>

MODELS	SW2	MODELS	SW2	MODELS	SW2
P15	ON OFF 1 2 3 4	P20	ON OFF 1 2 3 4	P25	ON OFF 1 2 3 4

PKFY-P15VBM-ER3 PKFY-P20VBM-ER3 PKFY-P25VBM-ER3

Legend

Symbol	Name		Symbol	Name		Symbol	Name	
I.B	Indoor controller board		MV	Vane motor		SW5	Switch	Voltage selection
CN32	Connector	Remote switch	LEV	Linear expansion valve		SW11		Address setting 1s digit
CN51		Centrally control	TB2	Terminal block	Power supply	SW12		Address setting 10ths digit
CN52		Remote indication	TB5		Transmission	SW14		Branch No.
CN105		IT Terminal	TH21	Thermistor	Room temp,detection (0°C/15kΩ,25°C/5.4kΩ)	W.B	Wireless remote controller board	
SW2	Switch	Capacity code	TH22		Pipe temp,detection/Liquid (0°C/15kΩ,25°C/5.4kΩ)	RU	Receving unit	
SW3		Mode selection	TH23		Pipe temp,detection/Gas (0°C/15kΩ,25°C/5.4kΩ)	BZ	Buzzer	
P.B	Indoor power board		A.B	Address board		LED1	LED (Operation indicator:Green)	
FUSE	Fuse (T6.3AL 250V)		SW1	Switch	Mode selection	LED2	LED (Preparation for heating:Orange)	
F.C	Fan phase control					SW1	Emergency operation (Heat)	
C1	Capacitor (Fan motor)					SW2	Emergency operation (Cool)	
MF	Fan motor							



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 240V side when the power supply is 230 and 240 volts.
   When the power supply is 220 volts, set SW5 to 220V side.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit : 220-240V) power on →lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on →lamp is lit

The black square (■) indicates a switch position. <*1>

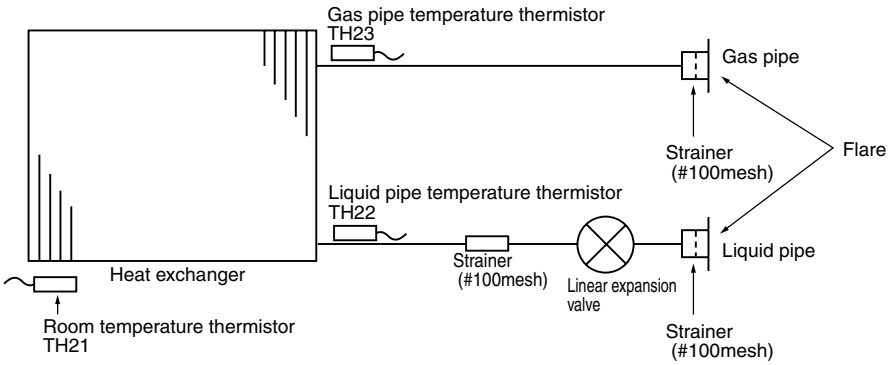
Models	SW2	Models	SW2	Models	SW2
P15	ON OFF 1 2 3 4	P20	ON OFF 1 2 3 4	P25	ON OFF 1 2 3 4

7 REFRIGERANT SYSTEM DIAGRAM

PKFY-P15VBM-E
PKFY-P15VBM-ER2
PKFY-P15VBM-ER3

PKFY-P20VBM-E
PKFY-P20VBM-ER1
PKFY-P20VBM-ER2
PKFY-P20VBM-ER3

PKFY-P25VBM-E
PKFY-P25VBM-ER1
PKFY-P25VBM-ER2
PKFY-P25VBM-ER3



Unit: mm(inch)

Item \ Service ref.	PKFY-P15, 20, 25VBM-E PKFY-P20, 25VBM-ER1 PKFY-P15, 20, 25VBM-ER2
Gas pipe	ϕ12.7 (1/2")
Liquid pipe	ϕ6.35 (1/4")

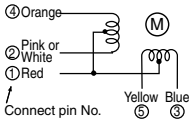
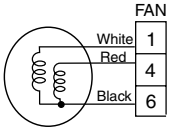
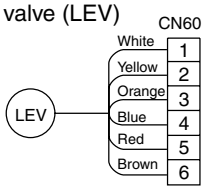
8 TROUBLESHOOTING

8-1. HOW TO CHECK THE PARTS

PKFY-P15VBM-E
PKFY-P15VBM-ER2
PKFY-P15VBM-ER3

PKFY-P20VBM-E
PKFY-P20VBM-ER1
PKFY-P20VBM-ER2
PKFY-P20VBM-ER3

PKFY-P25VBM-E
PKFY-P25VBM-ER1
PKFY-P25VBM-ER2
PKFY-P25VBM-ER3

<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 10℃~30℃)
<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 25℃)<table><tr><th>Normal</th><th colspan="3">Normal</th><th>Abnormal</th></tr><tr><td>①-②
Red-Pink or 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 20℃)<table><tr><th></th><th>Normal</th><th>Abnormal</th></tr><tr><td>White-Black</td><td>286Ω</td><td rowspan="2">Open or short</td></tr><tr><td>Red-Black</td><td>200Ω</td></tr></table></td></tr>
<tr><td>Linear expansion valve (LEV)
  </td><td>Disconnect the connector then measure the resistance valve with a tester.
(Coil temperature 20℃)<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">150Ω 10%</td></tr></table></td></tr>
</table>

<Thermistor Characteristic graph>

Thermistor for lower temperature

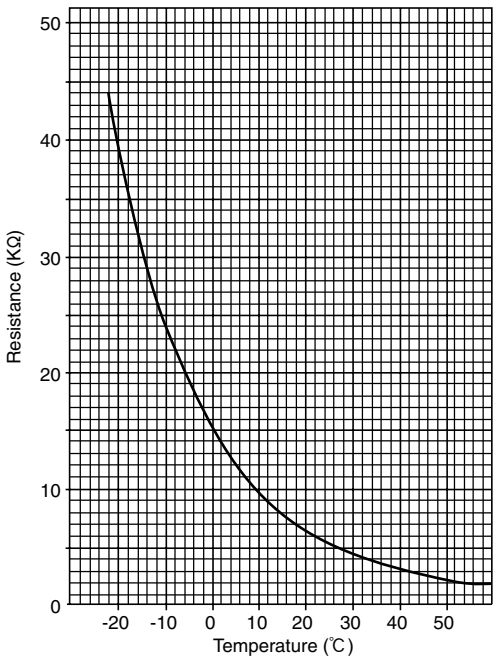
Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)

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

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

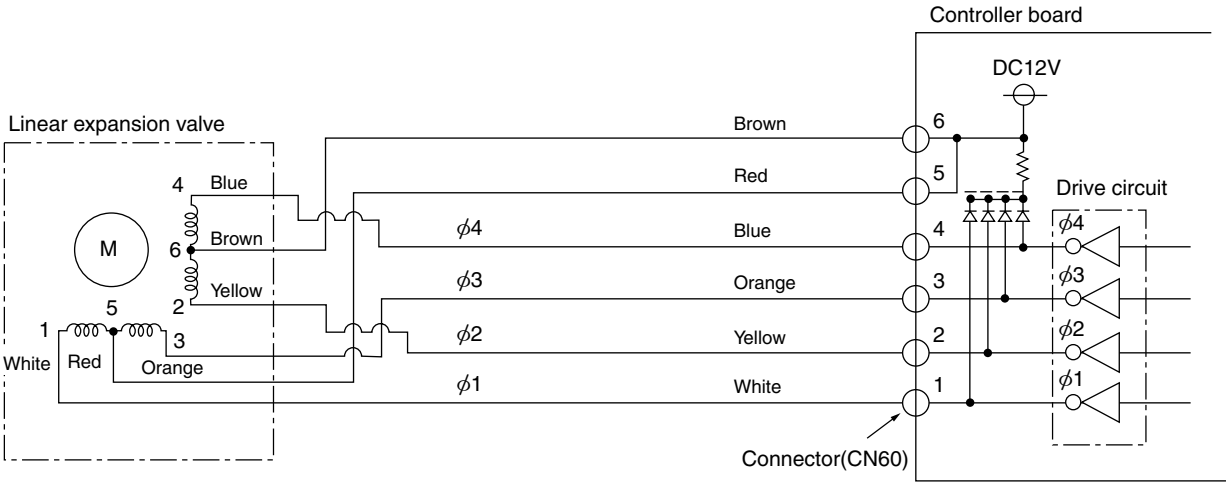
0℃	15kΩ
10℃	9.6kΩ
20℃	6.3kΩ
25℃	5.4kΩ
30℃	4.3kΩ
40℃	3.0kΩ

< Thermistor for lower temperature >



Linear expansion valve

① **Operation summary of the linear expansion valve**
• Linear expansion valve opens/closes 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 signal.
<Connection between the indoor controller board and the linear expansion valve>



Note : Since the number of the connector at the controller board side and the relay connector are different, follow the color of the lead wire.

<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

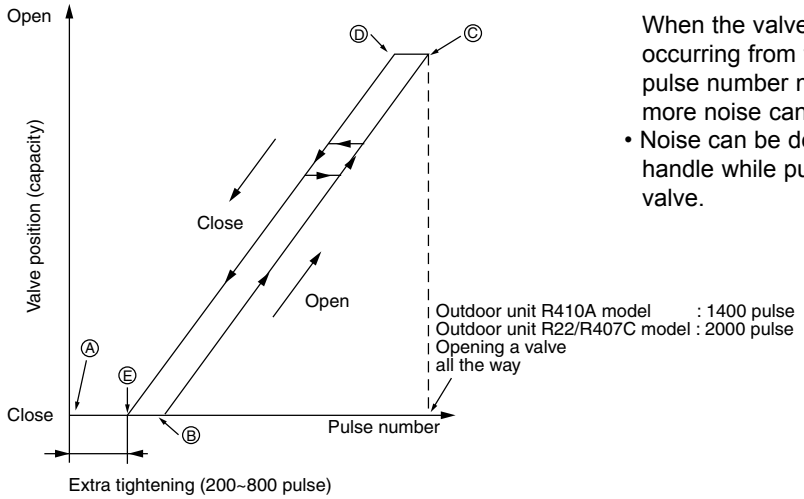
Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4
The output pulse shifts in above order.

- 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.

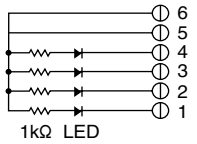
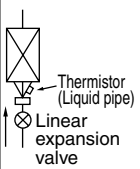
- When the switch is turned on, 2200 pulse closing valve signal will be sent till it goes to point Ⓐ in order to define the valve position.

  When the valve moves smoothly, there is no noise or vibration occurring from the linear expansion valves : however, when the pulse number moves from Ⓔ to Ⓐ or when the valve is locked, more noise can be heard than in a normal situation.
- Noise 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



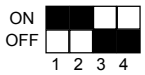
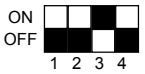
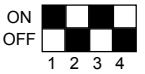
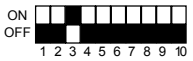
③ Troubleshooting

Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor	Disconnect the connector on the controller board, then connect LED for checking.  1kΩ LED When power is turned on, pulse signals will 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 vale.
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 150Ω ±10%.	Exchange the linear expansion valve.
Valve doesn't 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.  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.

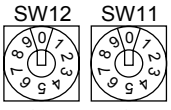
8-2. FUNCTION OF DIP SWITCH

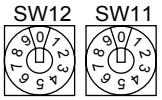
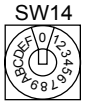
PKFY-P15VBM-E **PKFY-P20VBM-E** **PKFY-P25VBM-E**
PKFY-P20VBM-ER1 **PKFY-P25VBM-ER1**
PKFY-P15VBM-ER2 **PKFY-P20VBM-ER2** **PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3 **PKFY-P20VBM-ER3** **PKFY-P25VBM-ER3**

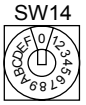
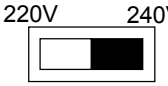
The black square (■) indicates a switch position.

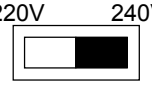
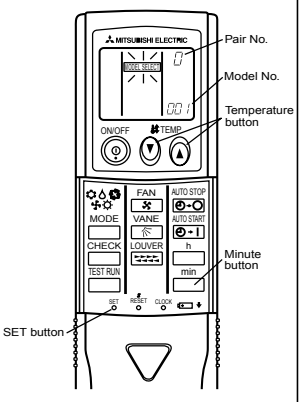
Switch	Pole	Function	Operation by switch ON	Operation by switch OFF	Effective timing	Remarks
SW1 Mode selection	1	Thermistor<Intake temperature> position	Built-in remote controller	Indoor unit	Under suspension	Address board <Initial setting>  NOTE: *1 SW1-7 / SW1-8 / Fan speed: OFF / OFF / Extra low ON / OFF / Low OFF / ON / Setting air flow ON / ON / Stop *2 It is impossible to intake the fresh air.
	2	Filter clogging	Provide	Not provide		
	3	Filter sign indication	2,500 hr	100 hr		
	4	Air intake *2	Not effective	Not effective		
	5	Remote indication switching	Thermo ON signal indication	Fan output indication		
	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	Effective	Not effective		
SW2 Capacity code switch	1~4	Models / SW2: P15 —  P20 —  P25 —  			Before power supply ON	Indoor controller board <Initial setting> Set for each capacity.
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 change SW3-9, 3-10 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 up	Not effective	Effective		
	9	Superheat setting temperature *2	—	—		
	10	Subcool setting temperature *2	—	—		

The black square (■) indicates a switch position.

<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 address
Example : If address is "3", remain SW12 (for over 10) at "0", and match SW11 (for 1 to 9) with "3".</td><td rowspan="3">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 number SW14 (Series R2 only).
Match the indoor unit's refrigerant pipe with the BC contoller's end connection number
Remain other than series R2 at "0".</td><td>Address board
<Initial setting>
 
</td></tr>
<tr><td>SW5
Voltage selection</td><td>2</td><td> 

If the unit is used at the 230V or 240V area, set the voltage to 240V.
If the unit is used at the 220V, set the voltage to 220V.</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
Jumper wire J41, J42 on the indoor controller board are cut according to the table below.
● Wireless remote controller pair number:
Setting operation
1. Press the SET button (using a pointed implemet). 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 implemet). 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>

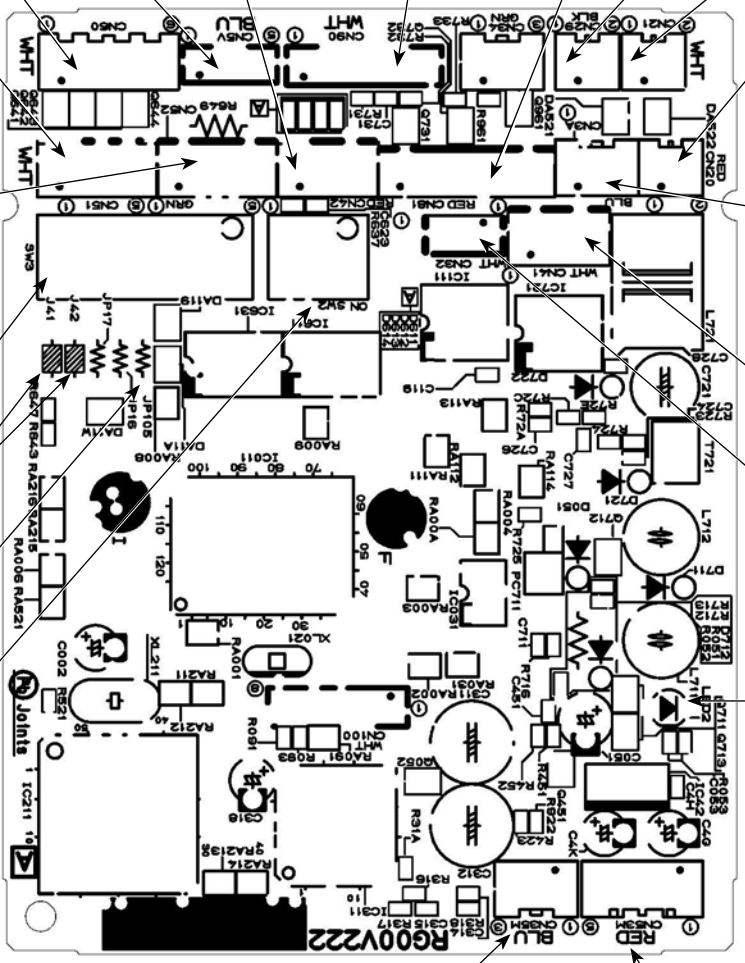
8-3. TEST POINT DIAGRAM

8-3-1. Indoor controller board

PKFY-P15VBM-E
PKFY-P15VBM-ER2
PKFY-P15VBM-ER3

PKFY-P20VBM-E
PKFY-P20VBM-ER1
PKFY-P20VBM-ER2
PKFY-P20VBM-ER3

PKFY-P25VBM-E
PKFY-P25VBM-ER1
PKFY-P25VBM-ER2
PKFY-P25VBM-ER3



CN60
Linear expansion valve output (LEV)

CN5V
Vane motor output (MV)

CN42
Connected to the address board (CN43)

CN90
Connected to the wireless remote controller board (W.B)

CN81
Connected to the address board (CN82)

CN29
Pipe temperature thermistor/Gas (TH23)

CN21
Pipe temperature thermistor/Liquid (TH22)

CN20
Room temperature thermistor (TH21)

CN51
Centrally control
①-② : Control signal
12VDC pulse input (① : +)
③-④ : Operation indicator
12VDC (③ : +)
③-⑤ : Malfunction indicator
12VDC (③ : +)

CN52
Remote indicator
①-②: Status lamp 12VDC (① : +)
Fan motor output (SW1-5 OFF)
Thermostat ON (SW1-5 ON)
①-③: Cooling/Dry status lamp
12VDC (① : +)
①-④: Heating status lamp
12VDC (① : +)

CN3A
Connected to the MA-Remote controller
Between ① to ③ 8.7-13V DC
(Pin① (+))

CN41
Connector
(HA terminal-A)

CN32
Connector
(Remote switch)

SW3
Mode selection

J41, J42
Wireless remote controller
Pair No. setting

JP105
Model setting

SW2
Capacity setting

LED2
Indication of power supply for MA-Remote controller

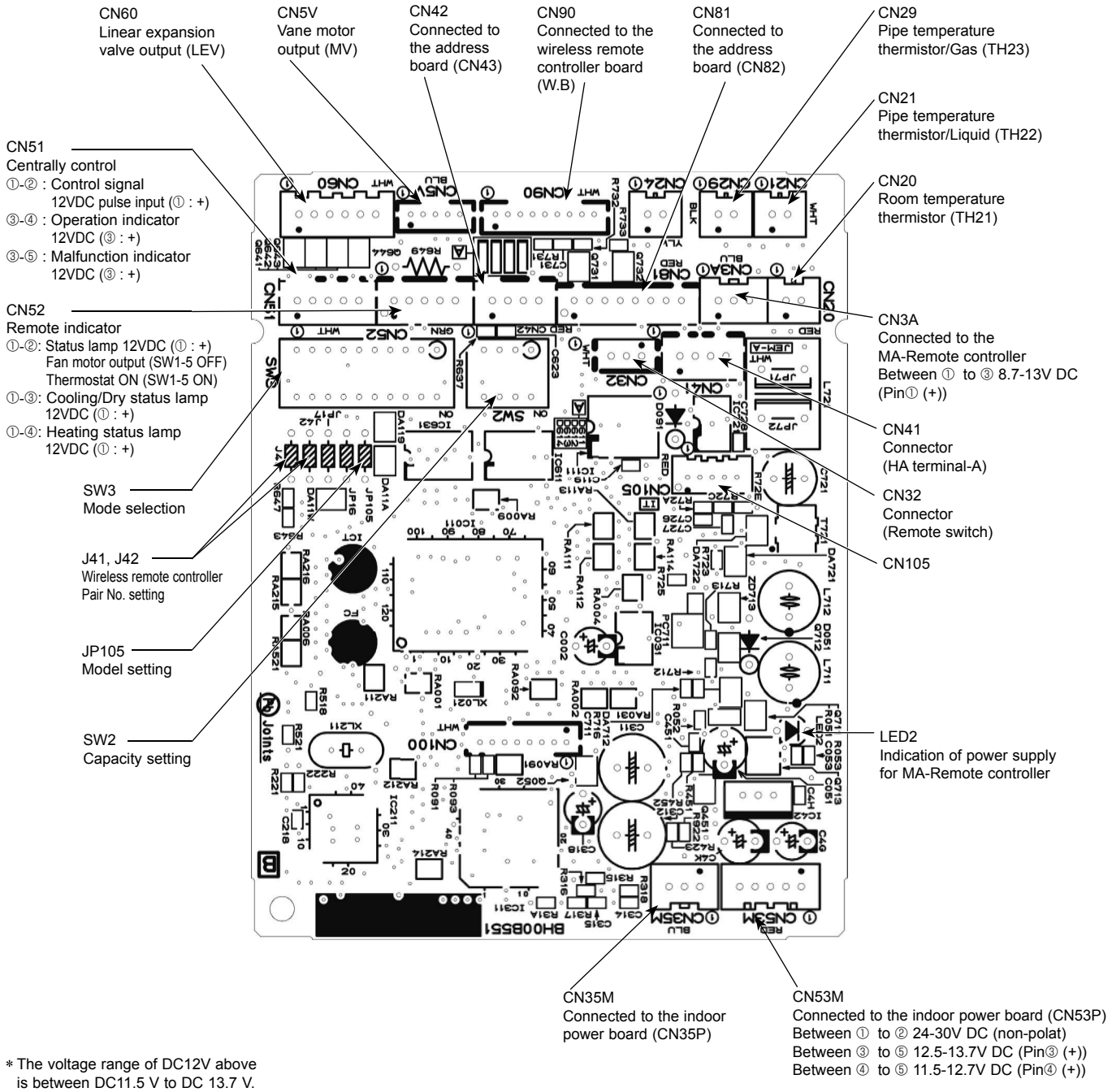
CN35M
Connected to the indoor power board (CN35P)

CN53M
Connected to the indoor power board (CN53P)
Between ① to ② 24-30V DC (non-polat)
Between ③ to ⑤ 12.5-13.7V DC (Pin③ (+))
Between ④ to ⑤ 11.5-12.7V DC (Pin④ (+))

* The voltage range of DC12V above is between DC11.5 V to DC 13.7 V.

Indoor controller board

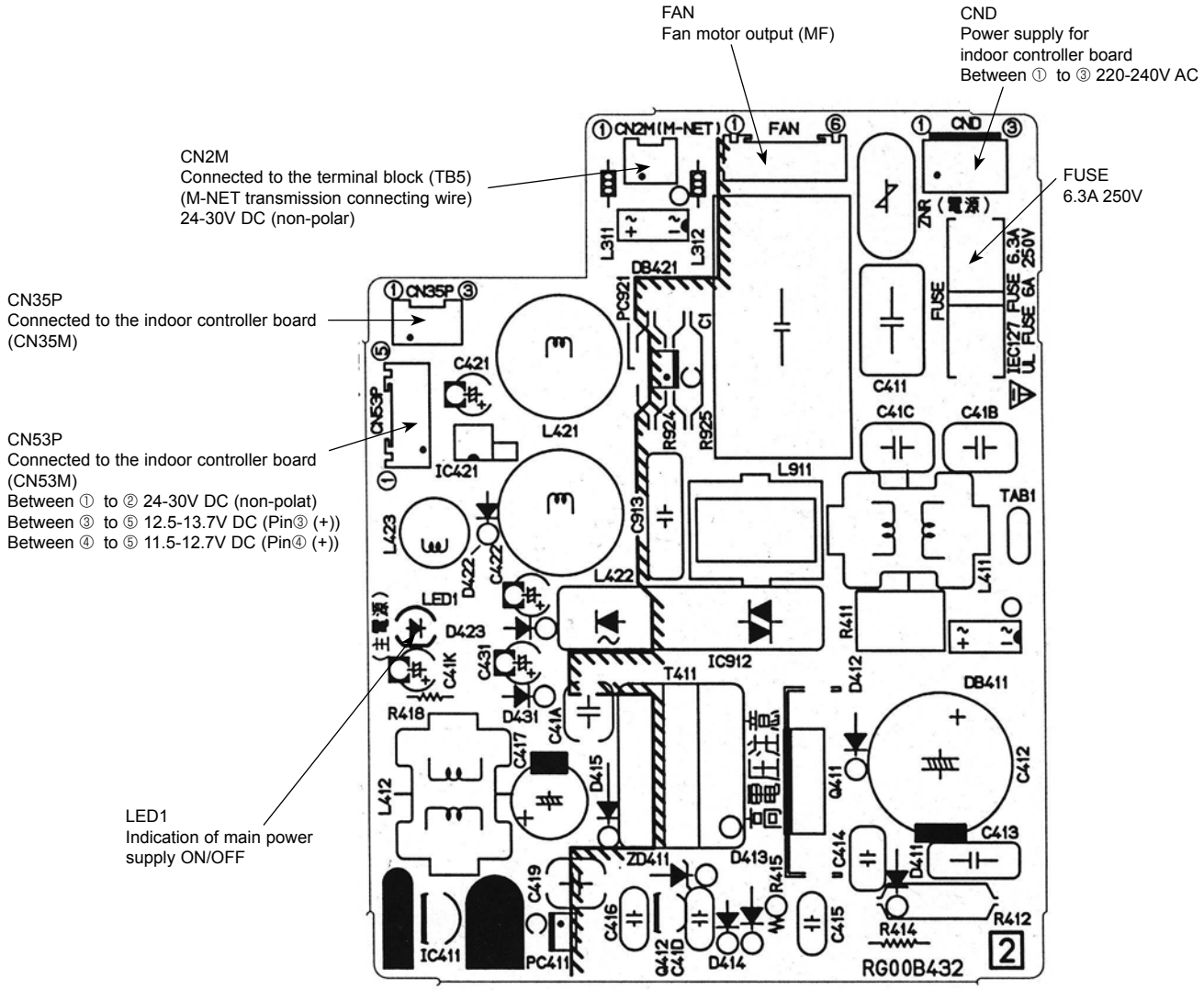
PKFY-P15VBM-E	**PKFY-P20VBM-E**	**PKFY-P25VBM-E**
	PKFY-P20VBM-ER1	**PKFY-P25VBM-ER1**
PKFY-P15VBM-ER2	**PKFY-P20VBM-ER2**	**PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3	**PKFY-P20VBM-ER3**	**PKFY-P25VBM-ER3**



* The voltage range of DC12V above is between DC11.5 V to DC 13.7 V.

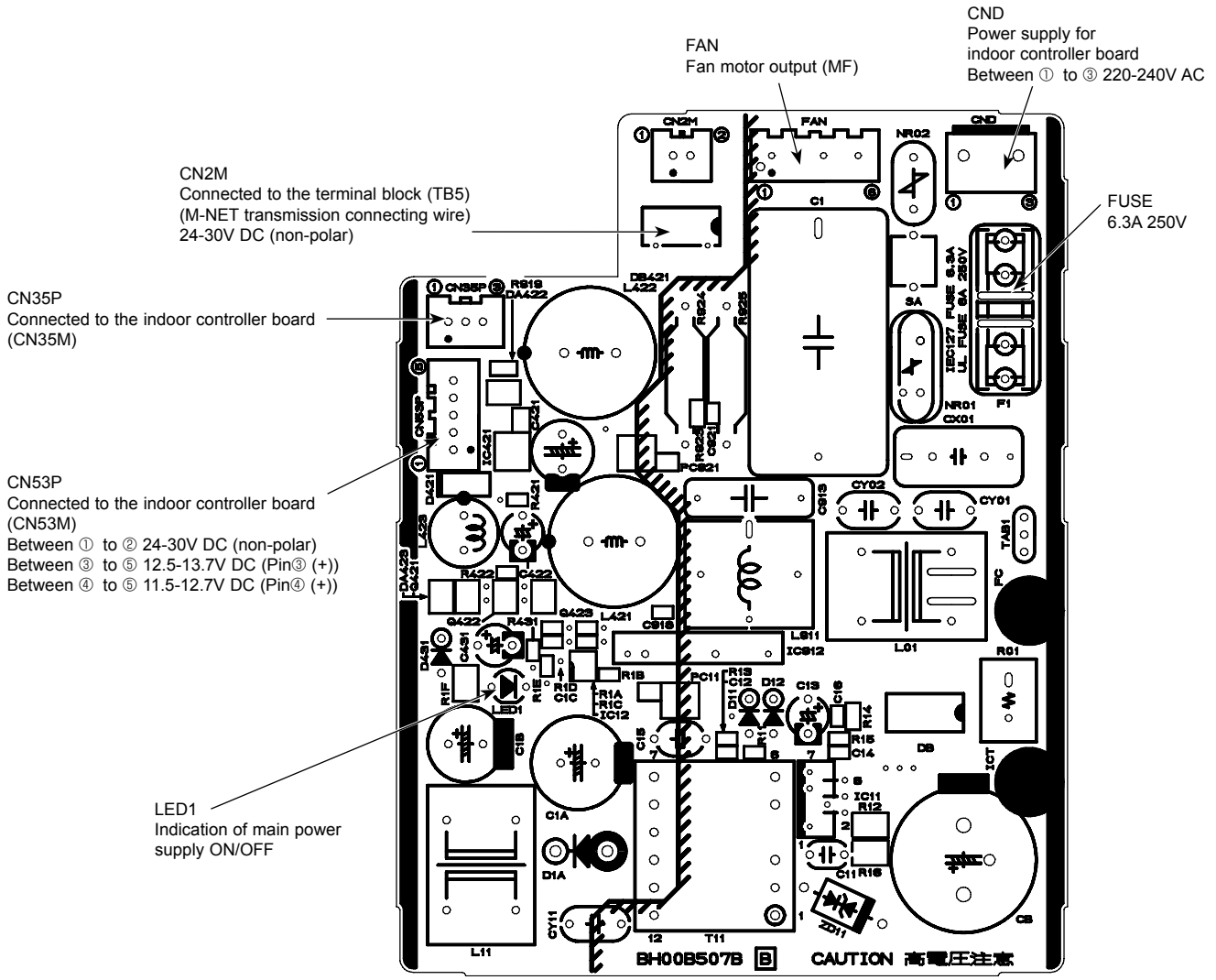
8-3-2. Indoor power board

PKFY-P15VBM-E	**PKFY-P20VBM-E**	**PKFY-P25VBM-E**
	PKFY-P20VBM-ER1	**PKFY-P25VBM-ER1**
PKFY-P15VBM-ER2	**PKFY-P20VBM-ER2**	**PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3	**PKFY-P20VBM-ER3**	**PKFY-P25VBM-ER3**



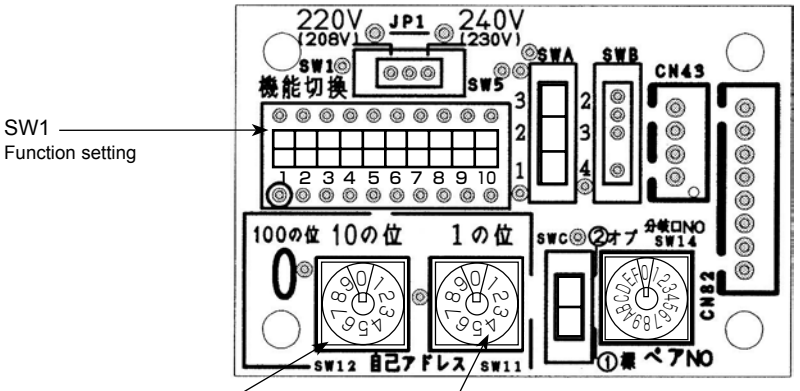
8-3-2. Indoor power board

PKFY-P15VBM-E	**PKFY-P20VBM-E**	**PKFY-P25VBM-E**
	PKFY-P20VBM-ER1	**PKFY-P25VBM-ER1**
PKFY-P15VBM-ER2	**PKFY-P20VBM-ER2**	**PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3	**PKFY-P20VBM-ER3**	**PKFY-P25VBM-ER3**



8-3-3. Address board

PKFY-P15VBM-E	**PKFY-P20VBM-E**	**PKFY-P25VBM-E**
	PKFY-P20VBM-ER1	**PKFY-P25VBM-ER1**
PKFY-P15VBM-ER2	**PKFY-P20VBM-ER2**	**PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3	**PKFY-P20VBM-ER3**	**PKFY-P25VBM-ER3**



SW1
Function setting

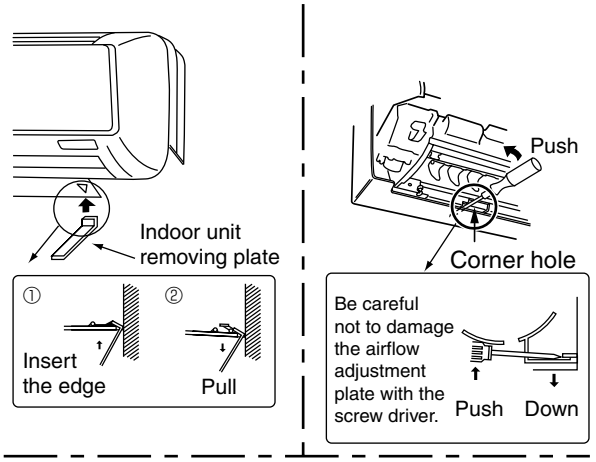
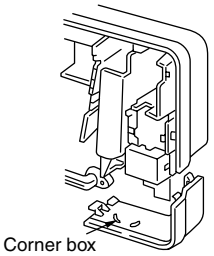
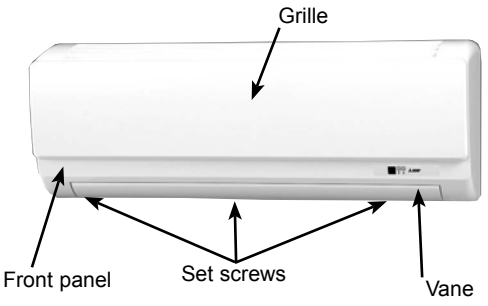
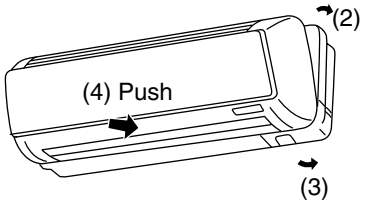
SW12
Address setting
10ths digit

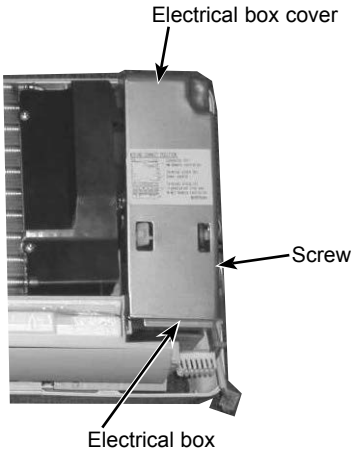
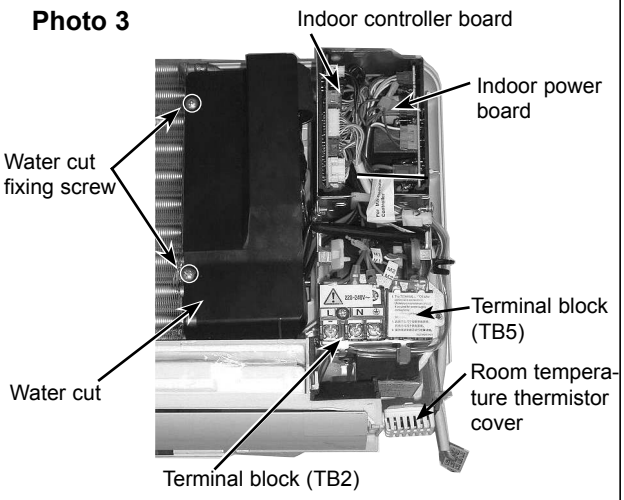
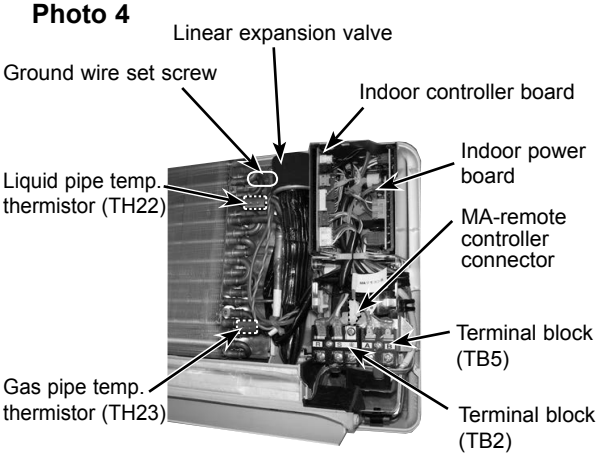
SW11
Address setting
1s digit

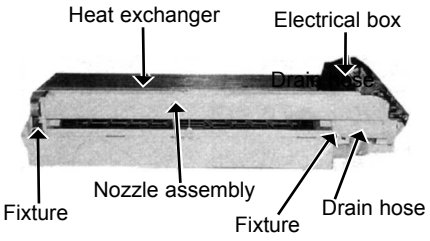
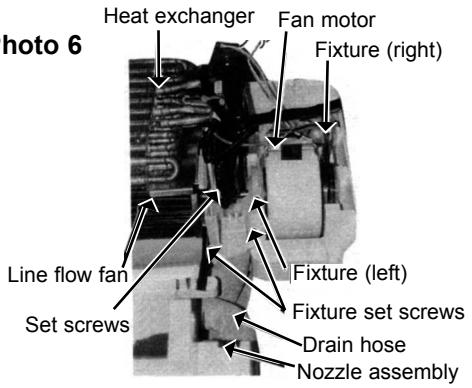
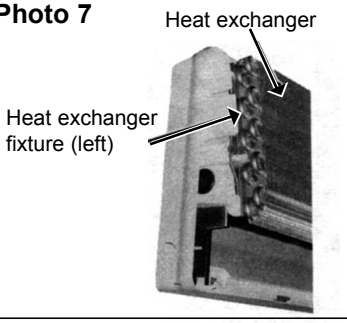
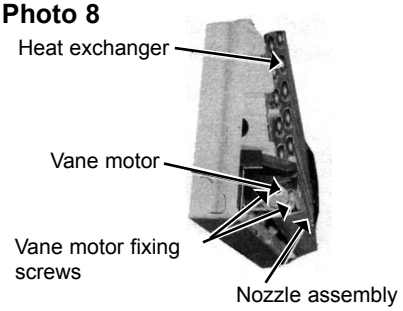
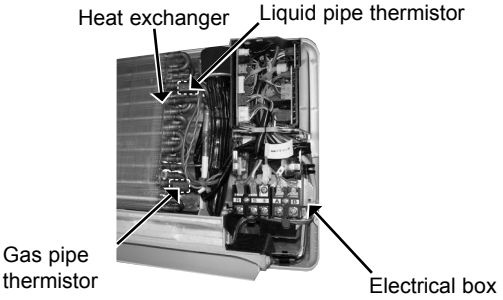
9 DISASSEMBLY PROCEDURE

PKFY-P15VBM-E **PKFY-P20VBM-E** **PKFY-P25VBM-E**
PKFY-P20VBM-ER1 **PKFY-P25VBM-ER1**

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 * 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 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 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 Photo 2) INDOOR CONTROLLER BOARD (1) Disconnect the following connectors from the indoor controller board. ● 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 ELECTRICAL BOX (1) Remove the front panel. (Refer to procedure 2) (2) Remove the electrical box cover. (See Photo 2) (3) Pull the nozzle assembly toward you as opening the catch of the nozzle assembly. (See 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 & ILLUSTRATIONS
5. 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 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 procedure 2) (2) Remove the nozzle assembly. (Refer to procedure 5) (3) Remove the electrical parts box. (Refer to procedure 4) (4) Remove the fixture while pressing the right side of motor fixture catch. (See 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 Photo 6) (7) Pull the left-hand side of the heat exchanger toward you. (See Photo 7) (8) Remove the line flow fan.	**Photo 6**  **Photo 7** 
7. 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. (See Photo 8) 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 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 liquid pipe thermistor and gas pipe thermistor. (See Photo 9) (6) Disconnect the connector (CN29) (CN21) on the indoor controller board.	**Photo 9** 

PKFY-P15VBM-ER2 **PKFY-P20VBM-ER2** **PKFY-P25VBM-ER2**
PKFY-P15VBM-ER3 **PKFY-P20VBM-ER3** **PKFY-P25VBM-ER3**

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 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.

PHOTOS & ILLUSTRATIONS

Figure 1

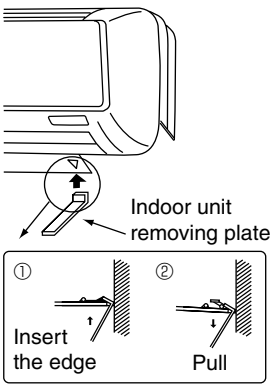


Figure 2

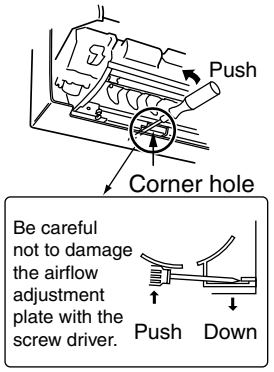
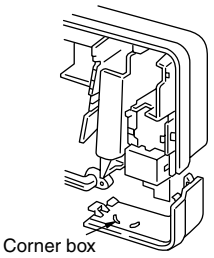


Figure 3



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 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 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

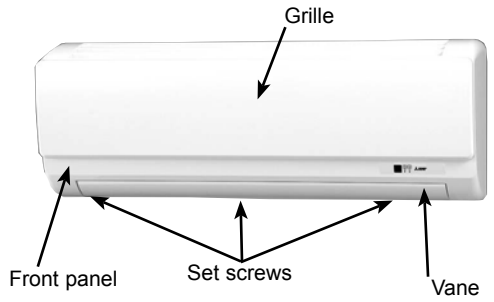
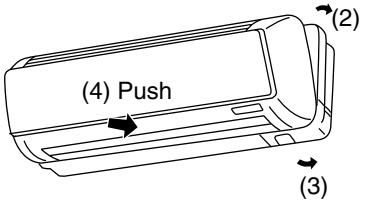
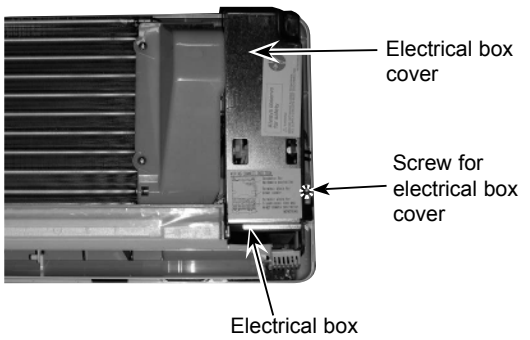
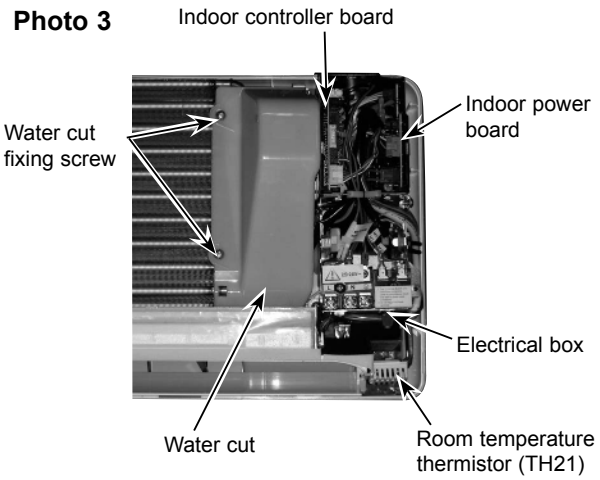
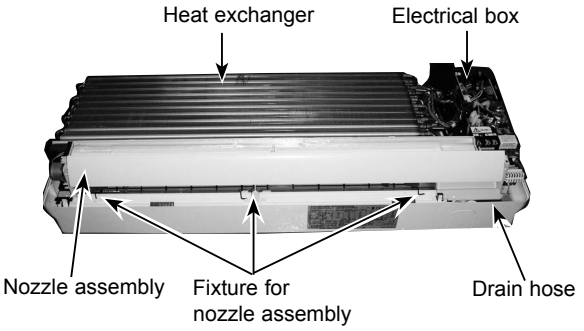
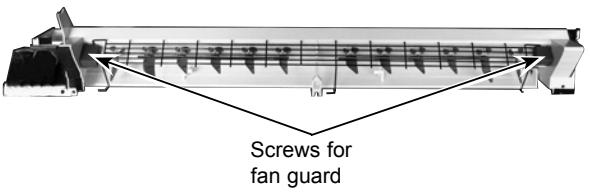
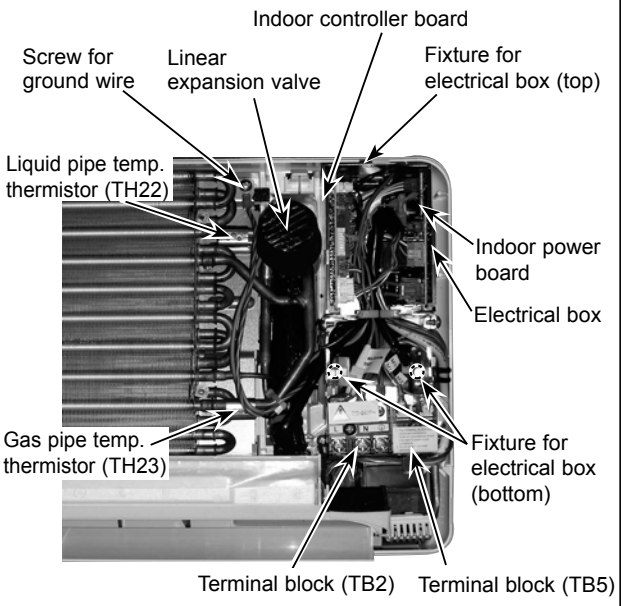
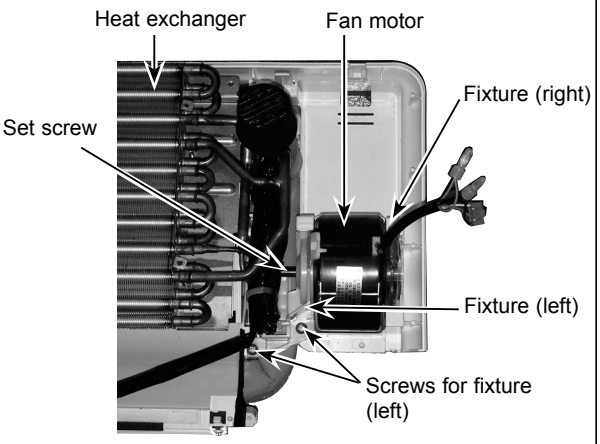
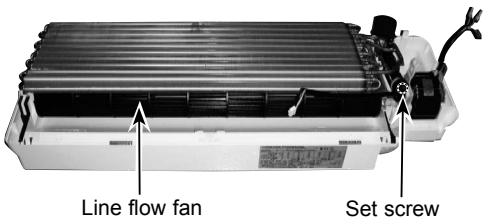
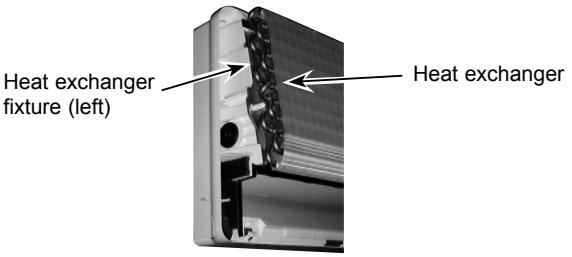
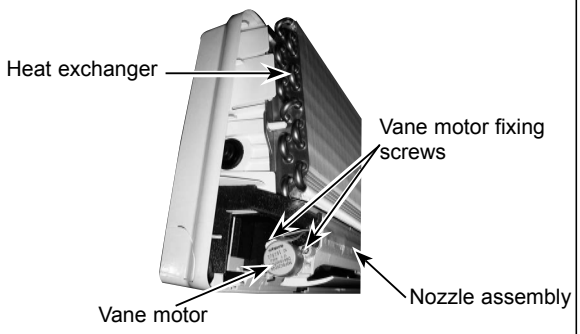
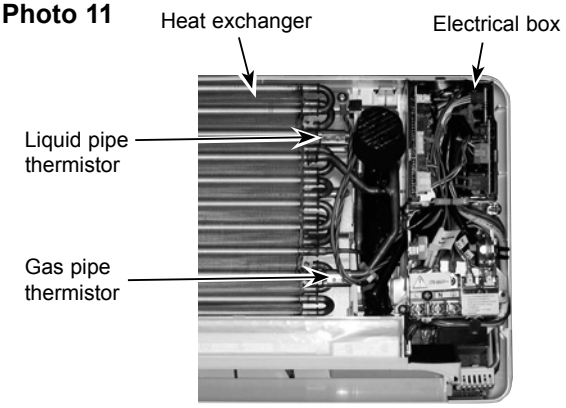


Figure 4



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 Photo 2) INDOOR CONTROLLER BOARD (1) Disconnect the following connectors from the indoor controller board. ● 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. (See Photo 5) (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 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 & 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. (See Photo 10) 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 Photo 2) (3) Remove the water cut. (See Photo 3) (4) Cut the wiring fixed band. (5) Remove the liquid pipe thermistor and gas pipe thermistor. (See Photo 11) (6) Disconnect the connector (CN29) (CN21) on the indoor controller board.	**Photo 11** 

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