

TECHNICAL & SERVICE MANUAL

Series PKFY Wall Mounted R410A

Indoor unit

[Model Name]

[Service Ref.]

PKFY-P04NLMU-E PKFY-P04NLMU-E.TH

PKFY-P06NLMU-E PKFY-P06NLMU-E.TH

PKFY-P08NLMU-E PKFY-P08NLMU-E.TH

PKFY-P12NLMU-E PKFY-P12NLMU-E.TH

PKFY-P15NLMU-E PKFY-P15NLMU-E.TH

PKFY-P18NLMU-E PKFY-P18NLMU-E.TH

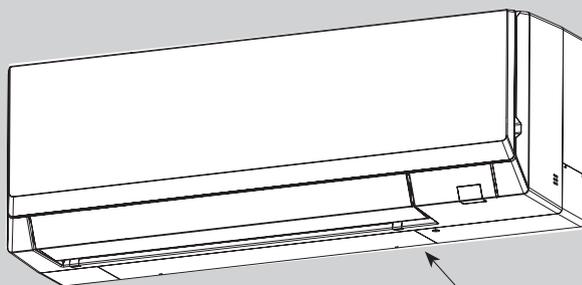
Revision:

- Outlines and dimensions have been modified in REVISED EDITION-A.

OCH715 is void.

Note:

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



INDOOR UNIT

Model name
indication

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PARTS CATALOG (OCB715)

CITY MULTI

1

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.

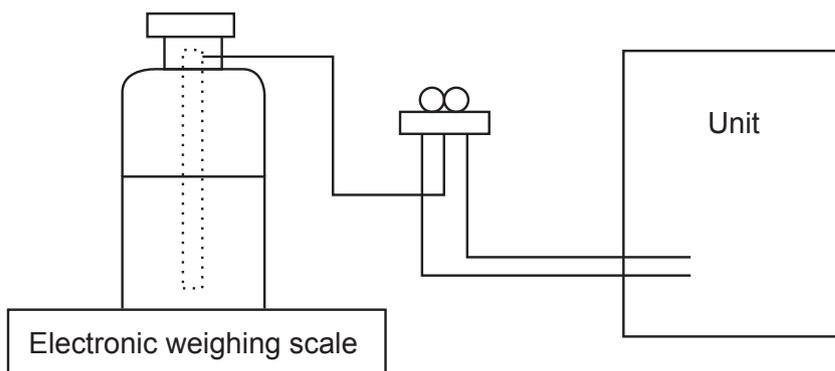
[1] Cautions for service

- (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

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

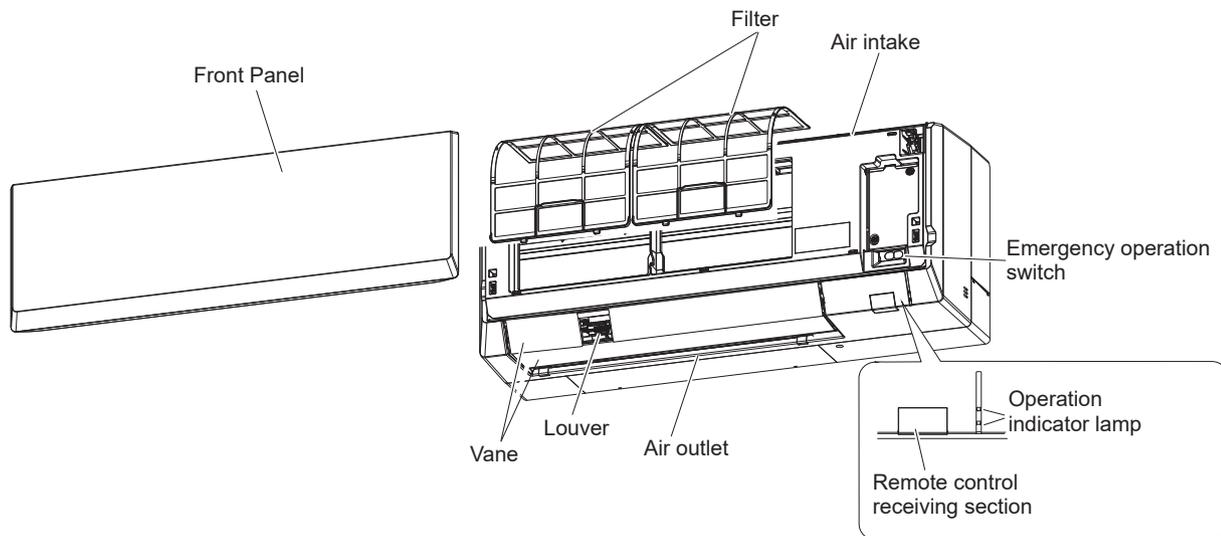


[3] Service tools

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 768.7 PSIG [5.3MPa.G] or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 738.2 PSIG [5.09MPa.G] or over.
③	Electronic weighing 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	—

2-1. Indoor unit



2-2. Wired Remote Controller <PAR-40MAA>

Wired remote controller function

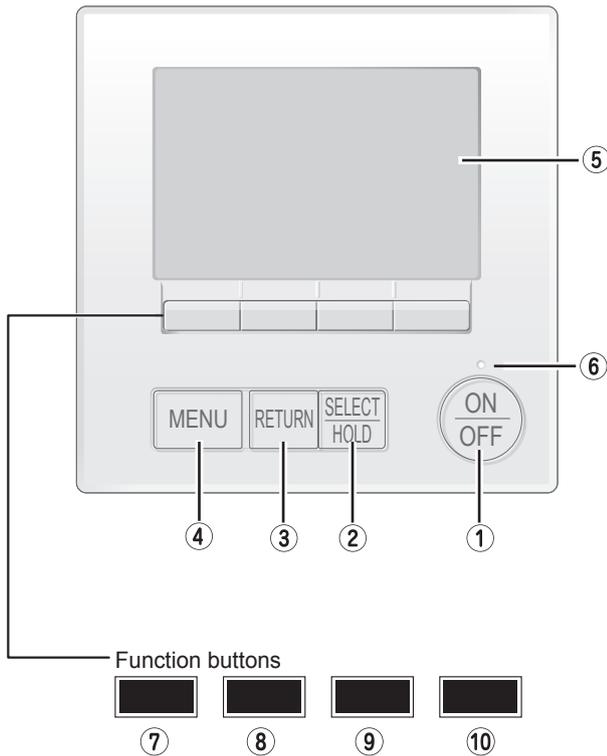
The functions which can be used are restricted according to each model.

○ : Supported × : Unsupported

	Function	PAR-40MAA	
		Slim	CITY MULTI
Body	Product size H × W × D (mm)	120 × 120 × 14.5	
	LCD	Full Dot LCD	
	Backlight	○	
Energy saving	Energy saving operation schedule	○	×
	Automatic return to the preset temperature	○	
Restriction	Setting the temperature range restriction	○	
Function*	Operation lock function	○	
	Weekly timer	○	
	ON/OFF timer	○	
	High Power	○	×
	Manual vane angle	○	

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

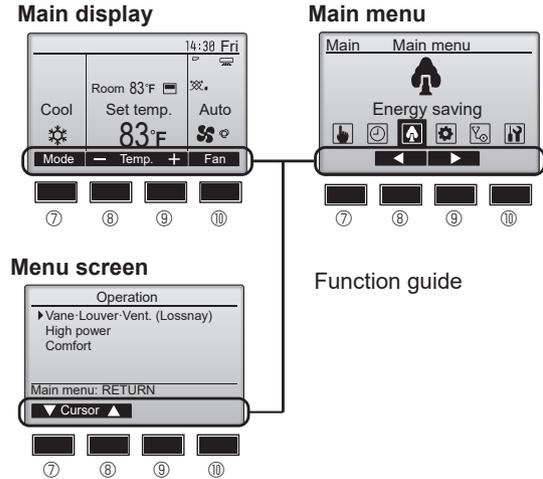
Controller interface



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/HOLD] button

Press to save the setting.

When the Main menu is displayed, pressing this button will enable/disable the HOLD function.

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.

Menu screen: The button function varies with the screen.

⑧ Function button [F2]

Main display: Press to decrease temperature.

Main menu: Press to move the cursor left.

Menu screen: The button function varies with the screen.

⑨ Function button [F3]

Main display: Press to increase temperature.

Main menu: Press to move the cursor right.

Menu screen: The button function varies with the screen.

⑩ Function button [F4]

Main display: Press to change the fan speed.

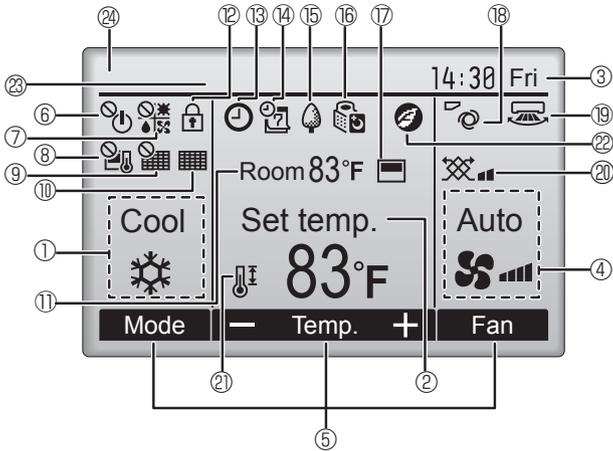
Menu screen: The button function varies with the screen.

Display

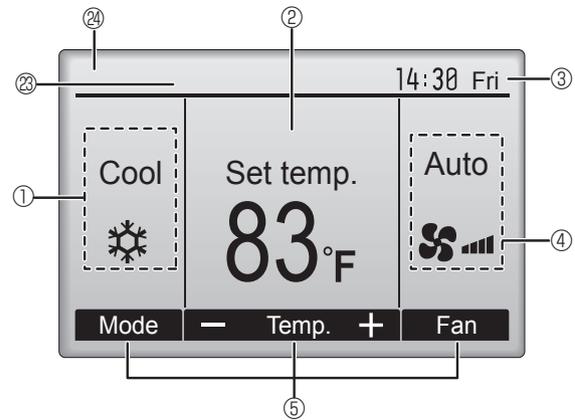
The main display can be displayed in two different modes: "Full" and "Basic". The factory setting is "Full". To switch to the "Basic" mode, change the setting on the Main display setting. (Refer to operation manual included with remote controller.)

<Full mode>

* All icons are displayed for explanation.



<Basic mode>



① Operation mode

② Preset temperature

③ Clock

Current time appears here.

④ Fan speed

⑤ Button function guide

Functions of the corresponding buttons appear here.



Appears when the ON/OFF operation is centrally controlled.



Appears when the operation mode is centrally controlled.



Appears when the preset temperature is centrally controlled.



Appears when the filter reset function is centrally controlled.



Indicates when filter needs maintenance.

⑪ Room temperature

Current room temperature appears here.



Appears when the buttons are locked.



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

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



Appears when the Weekly timer is enabled.



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



Appears while the outdoor units are operated in the silent mode. (This indication is not available for CITY MULTI models.)



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



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



Indicates the vane setting.



Indicates the louver setting.



Indicates the ventilation setting.



Appears when the preset temperature range is restricted.



Appears when an energy-saving operation is performed using a "3D i-See sensor" function. (not available)

⑳ Centrally controlled

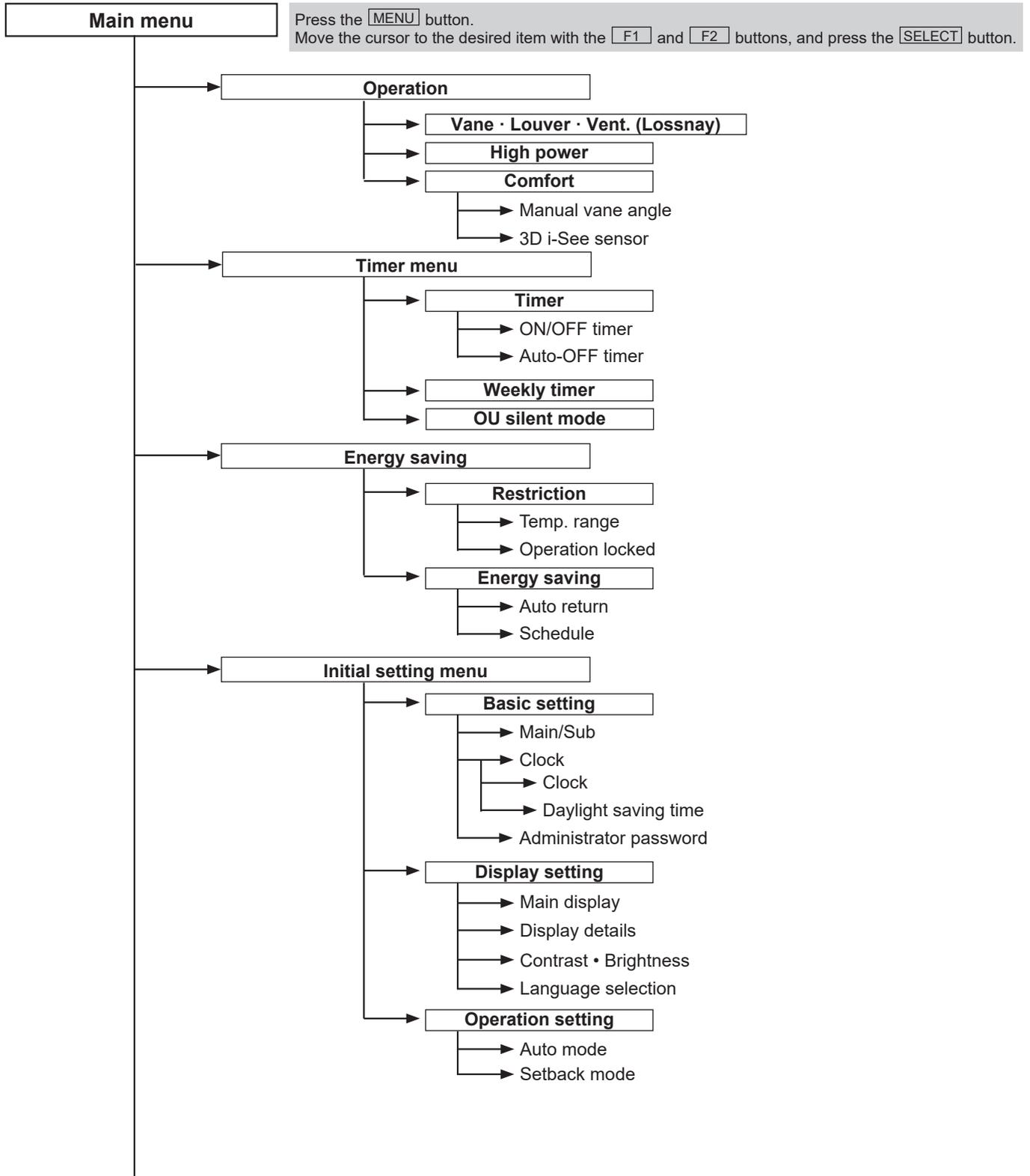
Appears for a certain period of time when a centrally-controlled item is operated.

㉑ Preliminary error display

An error code appears during the preliminary error.

Most settings (except ON/OFF, mode, fan speed, temperature) can be made from the Main menu. (Refer to Page 10.)

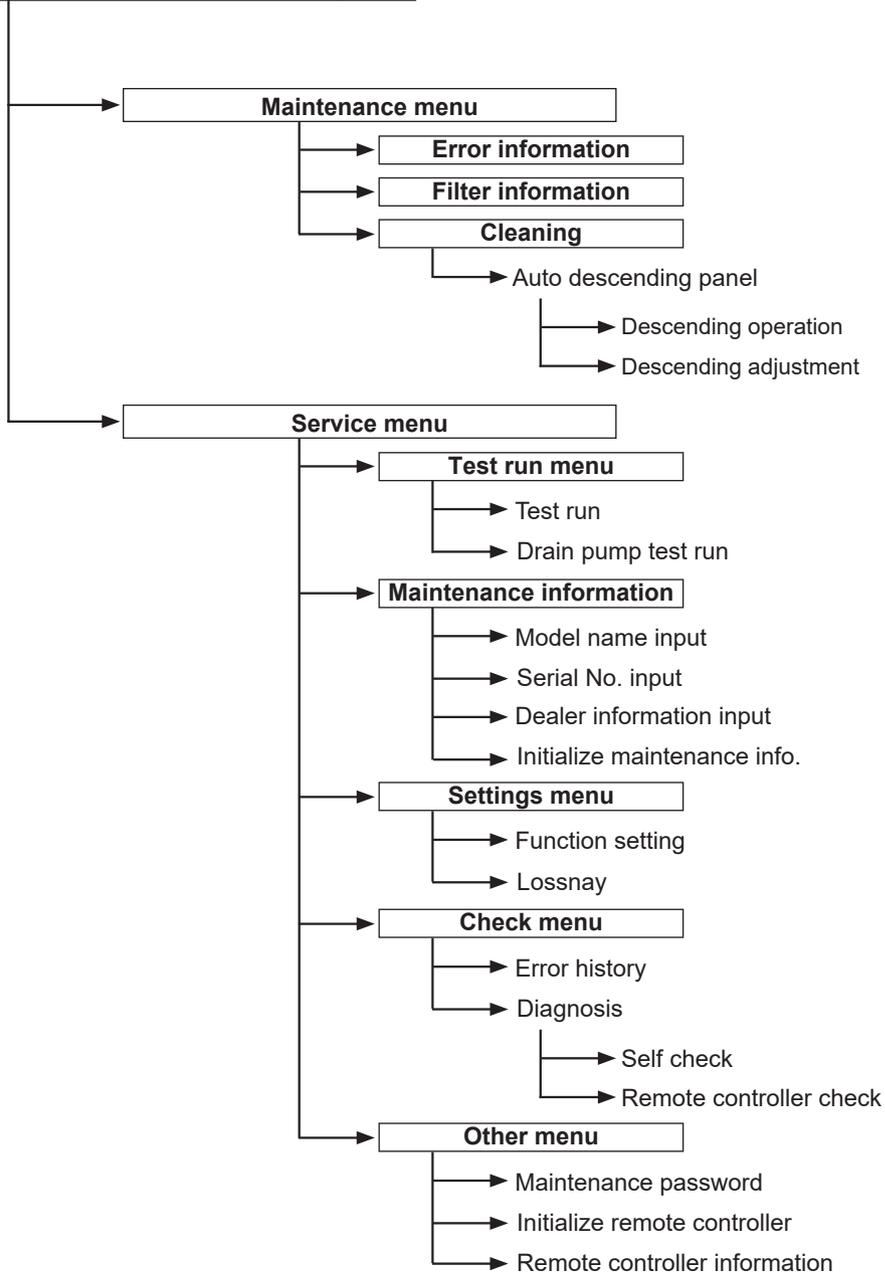
Menu structure



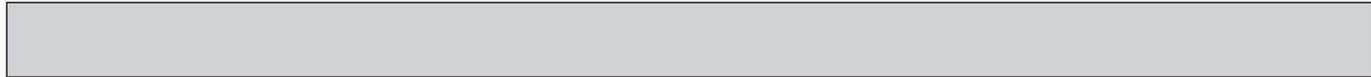
Continue to the next page.

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

Continue from the previous page.



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

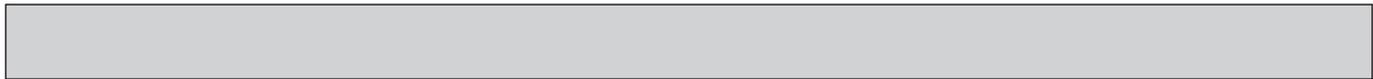


Main menu list

Main menu	Setting and display items		Setting details
Operation	Vane · Louver · Vent. (Lossnay)		<p>Use to set the vane angle.</p> <ul style="list-style-type: none"> • Select a desired vane setting from 5 different settings. <p>Use to turn ON/OFF the louver.</p> <ul style="list-style-type: none"> • Select a desired setting from "ON" and "OFF." <p>Use to set the amount of ventilation.</p> <ul style="list-style-type: none"> • Select a desired setting from "Off," "Low," and "High."
	High power		<p>Use to reach the comfortable room temperature quickly.</p> <ul style="list-style-type: none"> • Units can be operated in the High-power mode for up to 30 minutes.
	Comfort	Manual vane angle	Use to fix each vane angle.
		3D i-See sensor	<p>Use to set the following functions for 3D i-See sensor.</p> <ul style="list-style-type: none"> • Air distribution • Energy saving option • Seasonal airflow
Timer	Timer	ON/OFF timer *1	<p>Use to set the operation ON/OFF times.</p> <ul style="list-style-type: none"> • Time can be set in 5-minute increments.
		Auto-Off timer	<p>Use to set the Auto-Off time.</p> <ul style="list-style-type: none"> • Time can be set to a value from 30 to 240 in 10-minute increments.
	Weekly timer *1, *2		<p>Use to set the weekly operation ON/OFF times.</p> <ul style="list-style-type: none"> • Up to 8 operation patterns can be set for each day. (Not valid when the ON/OFF timer is enabled.)
	OU silent mode *1		<p>Use to set the time periods in which priority is given to quiet operation of outdoor units over temperature control. Set the Start/Stop times for each day of the week.</p> <ul style="list-style-type: none"> • Select the desired silent level from "Normal," "Middle," and "Quiet."
Energy saving	Restriction	Temp. range *2	<p>Use to restrict the preset temperature range.</p> <ul style="list-style-type: none"> • Different temperature ranges can be set for different operation modes.
		Operation lock	<p>Use to lock selected functions.</p> <ul style="list-style-type: none"> • The locked functions cannot be operated.
	Energy saving	Auto return *2	<p>Use to get the units to operate at the preset temperature after performing energy saving operation for a specified time period.</p> <ul style="list-style-type: none"> • 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 *1	<p>Set the start/stop times to operate the units in the energy saving mode for each day of the week, and set the energy saving rate.</p> <ul style="list-style-type: none"> • Up to 4 energy saving operation patterns can be set for each day. • Time can be set in 5-minute increments. • Energy saving rate can be set to a value from 0% or 50 to 90% in 10% increments.

*1 Clock setting is required.

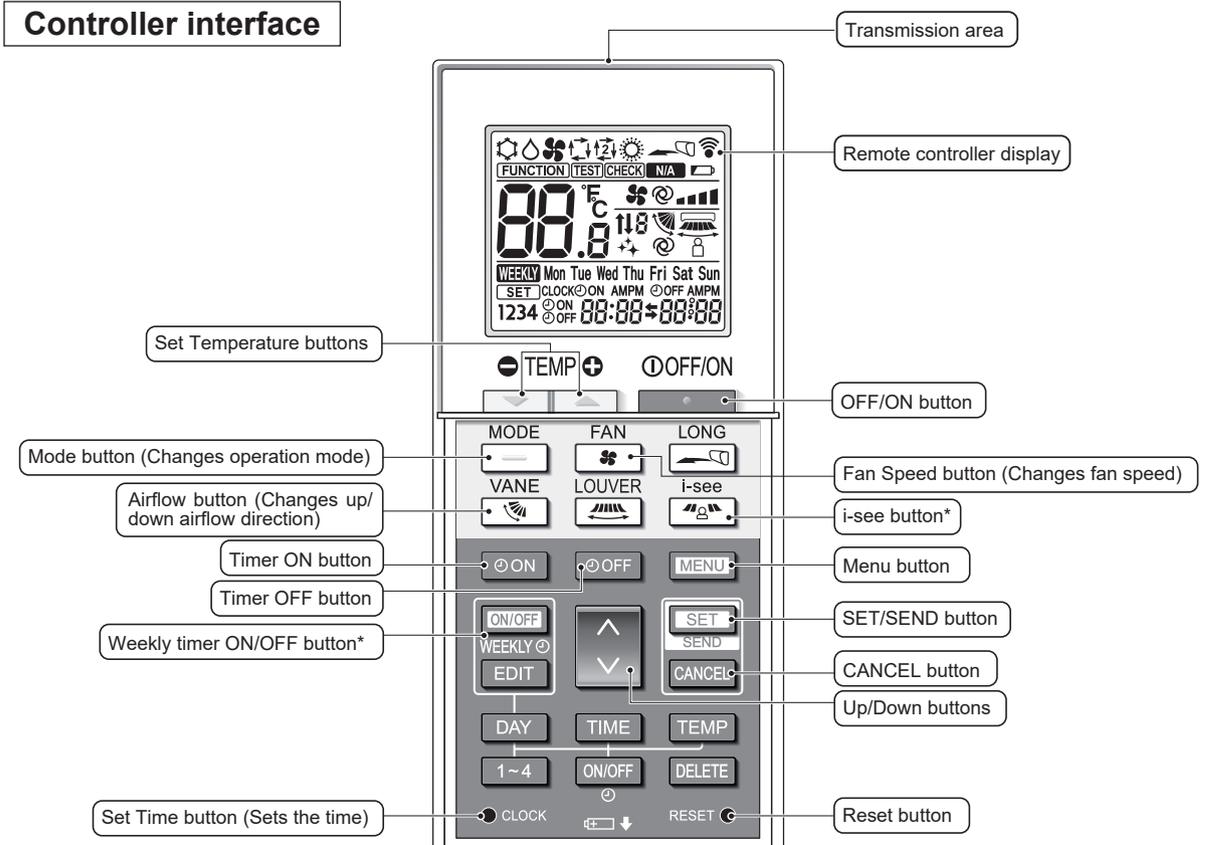
*2 33.8°F (1°C) increments.



Main menu	Setting and display items		Setting details
Initial setting	Basic setting	Main/Sub	When connecting 2 remote controllers, one of them needs to be designated as a sub controller.
		Clock	Use to set the current time.
		Daylight saving time	Set the daylight saving time.
		Administrator password	The administrator password is required to make the settings for the following items. • Timer setting • Energy saving setting • Weekly timer setting • Restriction setting • Outdoor unit silent mode setting • Night set back
	Display setting	Main display	Use to switch between "Full" and "Basic" modes for the Main display, and use to change the background colors of the display to black.
		Display details	Make the settings for the remote controller related items as necessary. Clock: The initial 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.
		Contrast • Brightness	Use to adjust screen contrast and brightness.
		Language selection	Use to select the desired language.
	Operation setting	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.
		Setback mode	Whether or not to use the Setback mode can be selected by using the button. This setting is valid only when indoor units with the Setback mode function are connected.
Maintenance	Error information		Use to check error information when an error occurs. • Check code, error source, refrigerant address, unit model, manufacturing number, contact information (dealer's phone number) can be displayed. (The unit model, manufacturing number, and contact information need to be registered in advance to be displayed.)
	Filter information		Use to check the filter status. • The filter sign can be reset.
	Cleaning	Auto descending panel	Use to lift and lower the auto descending panel (Optional parts).
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 • Initialize maintenance info.
	Settings	Function setting	Make the settings for the indoor unit functions via the remote controller as necessary.
		LOSSNAY setting	This setting is required only when the operation of CITY MULTI units is interlocked with LOSSNAY units.
	Check	Error history	Display the error history and execute "delete error history".
		Diagnosis	Self check: Error history of each unit can be checked via the remote controller. Remote controller check: When the remote controller does not work properly, use the remote controller checking function to troubleshoot the problem.
	Other	Maintenance password	Use to change the maintenance password.
		Initialize remote controller	Use to initialize the remote controller to the factory shipment status.
remote controller information		Use to display the remote controller model name, software version, and serial number.	

2-3. Wireless remote controller

Controller interface



Note:

* This button is enabled or disabled depending on the model of the indoor unit.

Display

Operation mode

	Cool		Dry
	Fan		Auto (single set point)
	Heat		Auto* (dual set point)

* The initial setting is necessary. Refer to 4) in 3.2.

Temperature setting

The units of temperature can be changed. For details, refer to the Installation Manual.

Vane setting

Step 1 Step 2 Step 3 Step 4 Step 5 Swing Auto

Not available

Appears when a non-supported function is selected.

Battery replacement indicator

Appears when the remaining battery power is low.

Fan speed setting

Auto

3D i-See sensor (Air distribution)

Default Direct Indirect

When Direct or Indirect is selected, the vane setting is set to "Auto".

3-1. SPECIFICATIONS

Model			PKFY-P04NLMU-E	PKFY-P06NLMU-E	PKFY-P08NLMU-E
Power source			1-phase 208-230 V 60 Hz		
Cooling capacity (Nominal)	*1	kW	1.1	1.8	2.3
	*1	BTU/h	4000	6000	8000
	Power input	kW	0.02	0.02	0.03
	Current input	A	0.20	0.20	0.25
Heating capacity (Nominal)	*2	kW	1.3	2.0	2.6
	*2	BTU/h	4500	6700	9000
	Power input	kW	0.01	0.01	0.02
	Current input	A	0.15	0.15	0.20
External finish(Munsell No.)			Plastic (0.7PB 9.2/0.4)		
External dimension H x W x D		inch	11-25/32 x 30-7/16 x 9-11/32		
		mm	299 × 773 × 237		
Net weight		lb (kg)	23.6 (10.7)	24.5(11.1)	
Heat exchanger			Cross fin (Aluminum fin and copper tube)		
Fan	Type x Quantity		Line flow fan x 1		
	External static press	Pa (mmH2O)	0 (0)		
	Motor type		DC motor		
	Motor output	kW	0.03		
	Driving mechanism		Direct driven		
	Airflow rate (Low-Mid2 -Mid1-High)	m ³ /min	3.3-3.5-3.8-4.2	4.0-4.4-4.9-5.4	4.0-4.6-5.4-6.7
		L/s	55-58-63-70	67-73-82-90	67-77-90-112
cfm		117-124-134-148	141-155-173-191	141-162-191-237	
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)		dB <A>	22-24-26-28	22-26-29-31	22-27-31-35
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	in (mm)	φ1/4 (φ6.35)		
	Gas	in (mm)	φ1/2 (φ12.7)		
Field drain pipe size		in (mm)	I.D. 5/8 (16)		
Standard attachment			Installation Manual, Instruction Book		
Optional parts	DRAIN PUMP KIT		PAC-SK01DM-E		
Remark			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.		
Notes:				Unit converter	
*1.Nominal cooling conditions (subject to JIS B8615-1) Indoor: 81°F.D.B./66°F.W.B. (27°C.D.B./19°C.W.B.), Outdoor: 95°F.D.B. (35°C.D.B.) Pipe length: 24-9/16 ft (7.5 m), Level difference: 0 ft (0 m)				kcal/h = kW × 860 Btu/h = kW × 3,412 cfm = m ³ /min × 35.31 lb = kg/0.4536	
*2.Nominal heating conditions (subject to JIS B8615-1) Indoor: 68°F.D.B. (20°C.D.B.), Outdoor: 45°F.D.B./43°F.W.B. (7°C.D.B./6°C.W.B.) Pipe length: 24-9/16 ft (7.5 m), Level difference: 0 ft (0 m)				Note: Above specification data is subject to rounding variation.	

Model			PKFY-P12NLMU-E	PKFY-P15NLMU-E	PKFY-P18NLMU-E	
Power source			1-phase 208-230 V 60 Hz			
Cooling capacity (Nominal)	*1	kW	3.5	4.4	5.3	
	*1	BTU/h	12000	15000	18000	
		Power input	kW	0.04	0.04	0.05
		Current input	A	0.35	0.35	0.45
Heating capacity (Nominal)	*2	kW	4.0	5.0	5.9	
	*2	BTU/h	13500	17000	20000	
		Power input	kW	0.03	0.03	0.04
		Current input	A	0.30	0.30	0.40
External finish(Munsell No.)			Plastic (0.7PB 9.2/0.4)			
External dimension H x W x D		inch	11-25/32 x 30-7/16 x 9-11/32	11-25/32 x 35-23/64 x 9-11/32		
		mm	299 x 773 x 237	299 x 898 x 237		
Net weight		lb (kg)	24.5 (11.1)	28.4 (12.9)		
Heat exchanger			Cross fin (Aluminum fin and copper tube)			
Fan	Type x Quantity		Line flow fan x 1			
	External static press	Pa (mmH2O)	0 (0)			
	Motor type		DC motor			
	Motor output	kW	0.03			
	Driving mechanism		Direct driven			
	Airflow rate (Low-Mid2 -Mid1-High)	m ³ /min	4.3-5.4-6.9-8.4	6.3-7.4-8.6-10.0	6.8-8.3-10.2-12.4	
		L/s	72-90-115-140	105-123-143-167	113-138-170-207	
cfm		152-191-244-297	222-261-304-353	240-293-360-438		
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)		dB <A>	24-31-37-41	29-34-37-40	31-36-41-46	
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	in (mm)	ϕ1/4 (ϕ6.35)			
	Gas	in (mm)	ϕ1/2 (ϕ12.7)			
Field drain pipe size		in (mm)	I.D. 5/8 (16)			
Standard attachment			Installation Manual, Instruction Book			
Optional parts	DRAIN PUMP KIT		PAC-SK01DM-E			
Remark			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.			
Notes: *1.Nominal cooling conditions (subject to JIS B8615-1) Indoor: 81°F.D.B./66°F.W.B. (27°C.D.B./19°C.W.B.), Outdoor: 95°F.D.B. (35°C.D.B.) Pipe length: 24-9/16 ft (7.5 m), Level difference: 0 ft (0 m) *2.Nominal heating conditions (subject to JIS B8615-1) Indoor: 68°F.D.B. (20°C.D.B.), Outdoor: 45°F.D.B./43°F.W.B. (7°C.D.B./6°C.W.B.) Pipe length: 24-9/16 ft (7.5 m), Level difference: 0 ft (0 m)						

3-2. ELECTRICAL PARTS SPECIFICATIONS

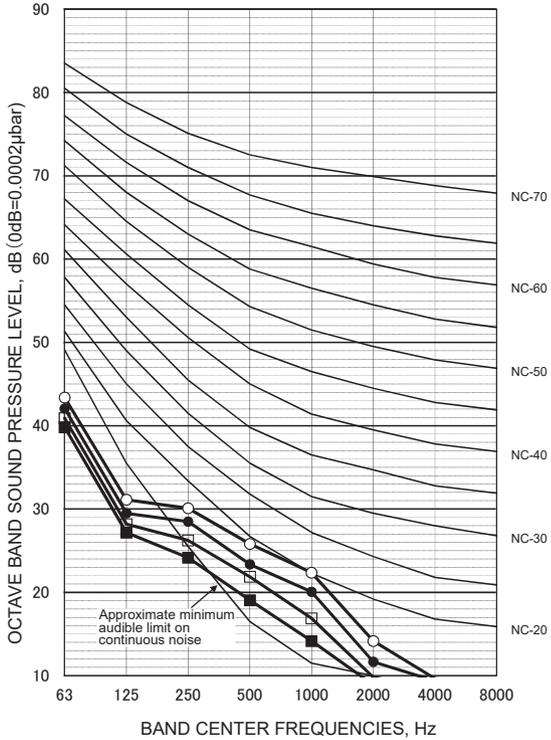
Service ref. Parts name	Symbol	PKFY-P04NLMU-E.TH PKFY-P06NLMU-E.TH PKFY-P08NLMU-E.TH	PKFY-P12NLMU-E.TH PKFY-P15NLMU-E.TH PKFY-P18NLMU-E.TH
Room temperature detection thermistor	TH21	Resistance 32°F/15 kΩ, 50°F/9.6 kΩ, 68°F/6.3 kΩ, 77°F/5.4 kΩ, 86°F/4.3 kΩ, 104°F/3.0 kΩ	
Pipe temperature detection thermistor/liquid	TH22	Resistance 32°F/15 kΩ, 50°F/9.6 kΩ, 68°F/6.3 kΩ, 77°F/5.4 kΩ, 86°F/4.3 kΩ, 104°F/3.0 kΩ	
Pipe temperature detection thermistor/gas	TH23	Resistance 32°F/15 kΩ, 50°F/9.6 kΩ, 68°F/6.3 kΩ, 77°F/5.4 kΩ, 86°F/4.3 kΩ, 104°F/3.0 kΩ	
Fuse (Indoor controller board)	FUSE	T3.15AL250V	
Fan motor (with thermal fuse)	MF	8 X 30W / RC0J30-QD	
Vane motor (Upper)	MV1	NSEK302 DC12V	
Vane motor (Lower)	MV2	MSBPC20 DC12V	
Linear expansion valve	LEV	DC12V Stepping motor drive Port $\phi 3/32$ (P04), $\phi 7/64$ (P06/08/12/15/18) (0-2000pulse)	
Power supply terminal block	TB2	(L1,L2) Rated to 250V 20A *	
Transmission terminal block	TB5	(M1, M2, S) Rated to 250V 20A *	
MA-Remote controller terminal block	TB15	(1, 2) Rated to 250V 10A *	

* Refer to WIRING DIAGRAM for the supplied voltage.

NOISE CRITERION CURVES

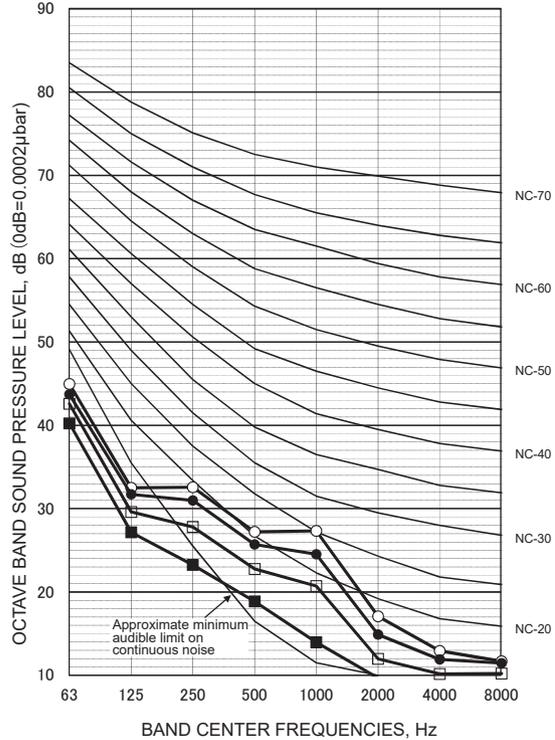
PKFY-P04NLMU-E

FAN	SPL(dB)	LINE
High	28	○—○
Medium1	26	●—●
Medium2	24	□—□
Low	22	■—■



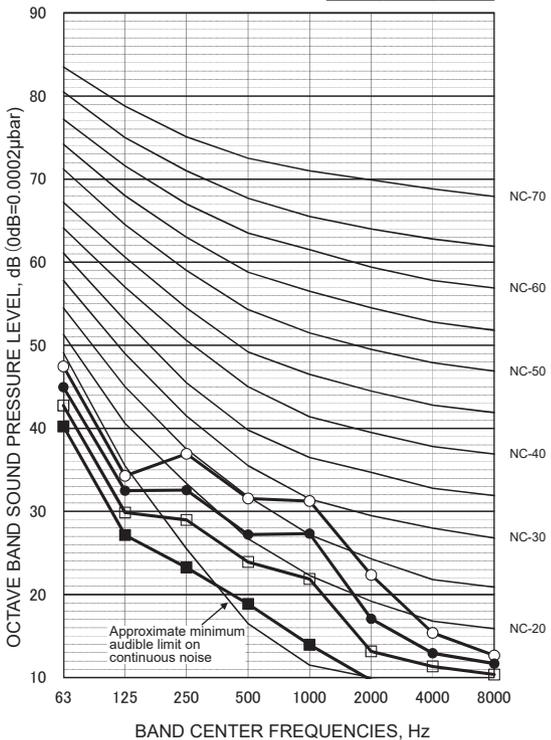
PKFY-P06NLMU-E

FAN	SPL(dB)	LINE
High	31	○—○
Medium1	29	●—●
Medium2	26	□—□
Low	22	■—■



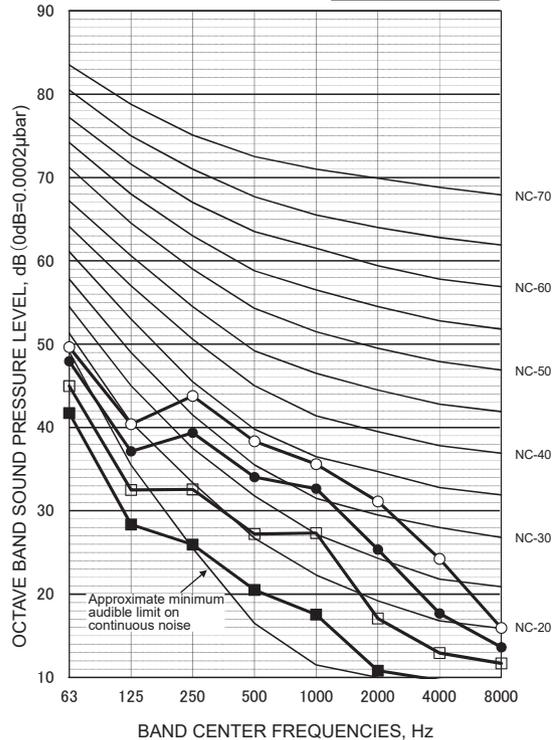
PKFY-P08NLMU-E

FAN	SPL(dB)	LINE
High	35	○—○
Medium1	31	●—●
Medium2	27	□—□
Low	22	■—■



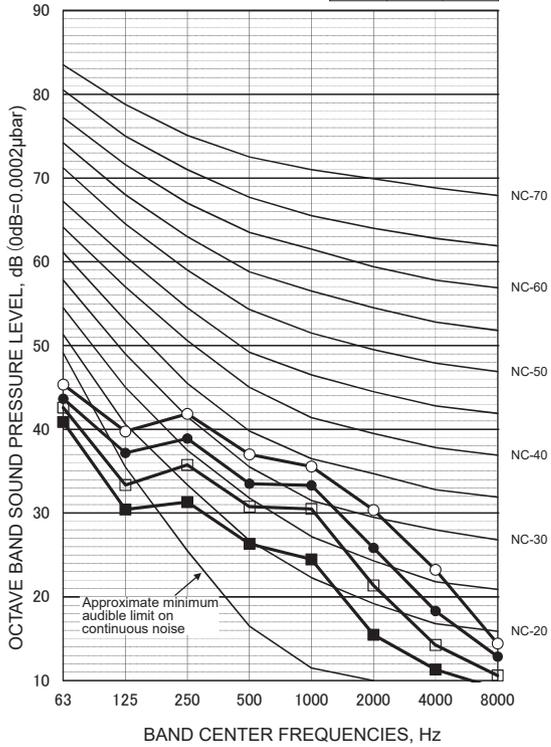
PKFY-P12NLMU-E

FAN	SPL(dB)	LINE
High	41	○—○
Medium1	37	●—●
Medium2	31	□—□
Low	24	■—■



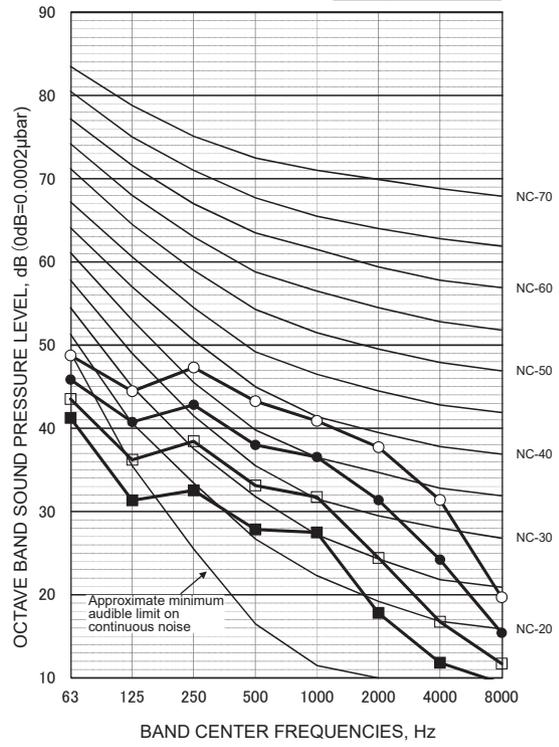
PKFY-P15NLMU-E

FAN	SPL(dB)	LINE
High	40	○—○
Medium1	37	●—●
Medium2	34	□—□
Low	29	■—■



PKFY-P18NLMU-E

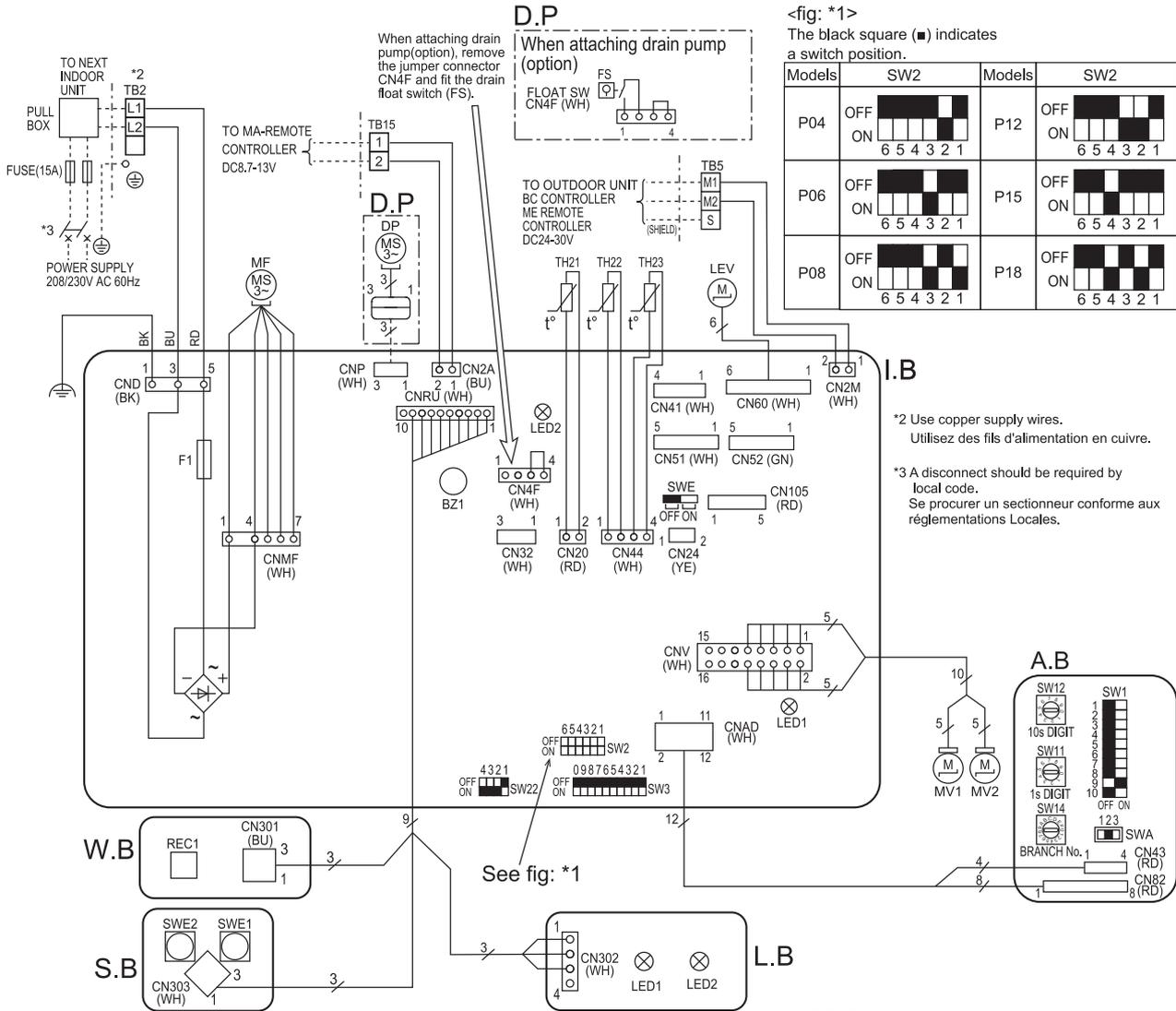
FAN	SPL(dB)	LINE
High	46	○—○
Medium1	41	●—●
Medium2	36	□—□
Low	31	■—■



PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH



SYMBOL	NAME	SYMBOL	NAME
I.B	INDOOR CONTROLLER BOARD	TH21	THERMISTOR
CN24	CONNECTOR	TH22	THERMISTOR
CN32	EXTERNAL HEATER	TH23	THERMISTOR
CN51	REMOTE SWITCH		
CN52	CENTRALLY CONTROL		
CN52	REMOTE INDICATION		
CN105	IT TERMINAL		
BZ1	BUZZER	A.B	ADDRESS BOARD
F1	FUSE (T3.15A/250V)	SW1	SWITCH
LED1	POWER SUPPLY (I.B)	SW11	SWITCH
LED2	POWER SUPPLY (MA-REMOTE CONTROLLER)	SW12	SWITCH
SW2	SWITCH	SW14	SWITCH
SW3	SWITCH	S.B	SWITCH BOARD
SW22	SWITCH	SWE1	SWITCH
SWE	SWITCH	SWE2	SWITCH
LEV	LINEAR EXPANSION VALVE	W.B	PCB FOR WIRELESS REMOTE CONTROLLER
MF	FAN MOTOR	REC1	RECEIVING UNIT
MV1	VANE MOTOR (UPPER)	L.B	LED BOARD
MV2	VANE MOTOR (LOWER)	LED1	LED
TB2	TERMINAL	LED2	LED
TB5	BLOCK	D.P	DRAIN PUMP KIT (OPTION)
TB15	MA-REMOTE CONTROLLER	FS	DRAIN FLOAT SWITCH
		DP	DRAIN PUMP

LED on indoor controller board for service

Symbol	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

NOTES:

- At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
- In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
- In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
- Symbol [S] of TB5 is the shield wire connection.
- Symbols used in wiring diagram above are, : terminal block, : connector.
- The setting of the SW2 dip switches differs in the capacity.
For the detail, refer to the fig: *1.

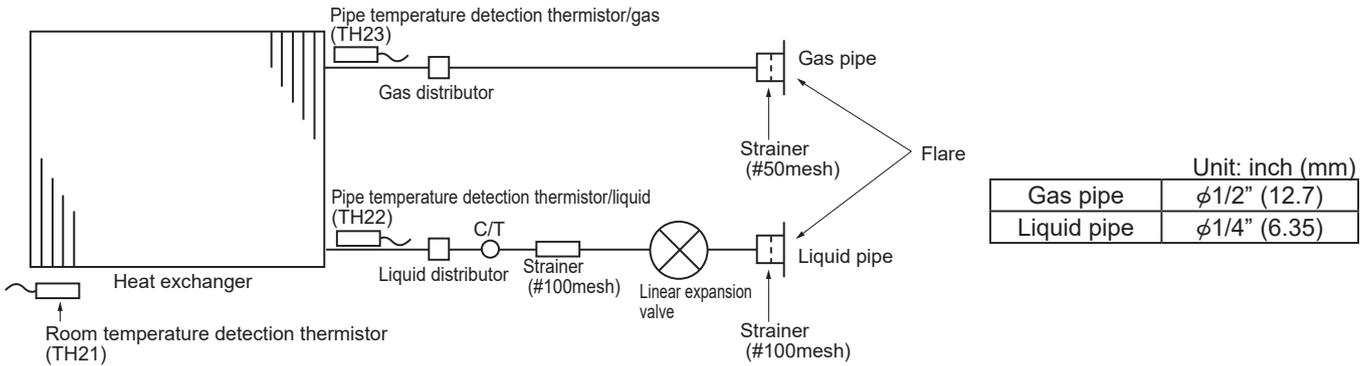
7

REFRIGERANT SYSTEM DIAGRAM

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH

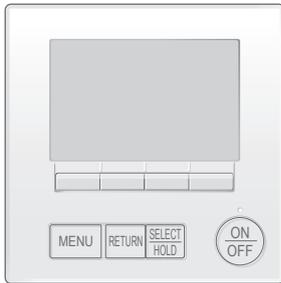


8

MICROPROCESSOR CONTROL

INDOOR UNIT CONTROL

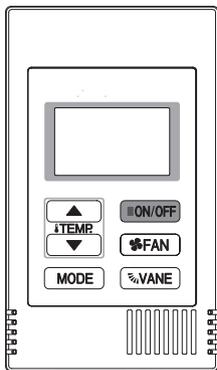
8-1. COOL OPERATION



<How to operate>

- ① Press ON/OFF button.
- ② Press [F1] button to display COOL.
- ③ Press [F2] [F3] button to set the set temperature.

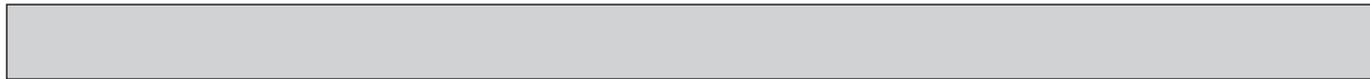
NOTE: The settable temperature range varies with the model of outdoor units and remote controller.



<How to operate>

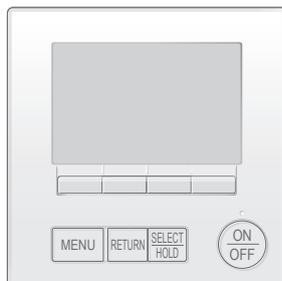
- ① Press POWER ON/OFF button.
- ② Press the operation MODE button to display COOL.
- ③ Press the TEMP. button to set the set temperature.

NOTE: The set temperature changes 1°F when the ∇ or Δ button is pressed one time. Cooling 67 to 87°F



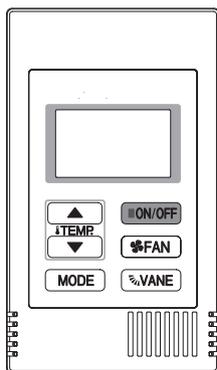
Control Mode	Control Details	Remarks																													
1. Temperature adjustment function	<p>1-1. Determining temperature adjustment function (Function to prevent restarting for 3 minutes)</p> <ul style="list-style-type: none"> Room temperature \geq Set temperature + 2°F ...Thermo-ON Room temperature \leq Set temperature ...Thermo-OFF <hr/> <p>1-2. Anti-freeze control</p> <ul style="list-style-type: none"> Condition to detect When the pipe temperature detection thermistor/liquid (TH22) detects 32°F or less in 16 minutes from thermo-ON, the anti-freeze control initiates, and the unit enters to the thermo-OFF. Condition to release The timer which prevents reactivating is set for 3 minutes, and anti-freeze control is cancelled when any one of the following conditions has been satisfied: <ol style="list-style-type: none"> Pipe temperature detection thermistor/liquid (TH22) reaches 50°F or above. The condition of thermo-OFF has been completed by the thermostat. The operation has changed to a mode other than COOLING. 	<ul style="list-style-type: none"> The ON/OFF commands by the indoor unit thermostatic control are not an ON/OFF commands to the compressor but an open/close commands to the linear expansion valve. (The compressor stops only when the thermostatic control for all the indoor units connected to the same outdoor unit turns OFF.) 																													
2. Fan	<p>By the remote controller setting (switch of 4 speeds+Auto)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td> </td> </tr> </tbody> </table> </div> <p>When [Auto] is set, fan speed is changed depending on the value of: $\Delta T = \text{Room temperature} - \text{Set temperature}$</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <table border="1" style="width: 100%; text-align: center;"> <tbody> <tr> <td>High</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>Med2</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>Med1</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>Low</td> <td>-----</td> <td>-----</td> <td>-----</td> <td>-----</td> </tr> <tr> <td></td> <td>1.8°F</td> <td>3.15°F</td> <td>5.4°F</td> <td>ΔT</td> </tr> </tbody> </table> </div>	Type	Fan speed notch	4 speeds + Auto type		High	-----	-----	-----	-----	Med2	-----	-----	-----	-----	Med1	-----	-----	-----	-----	Low	-----	-----	-----	-----		1.8°F	3.15°F	5.4°F	ΔT	
Type	Fan speed notch																														
4 speeds + Auto type																															
High	-----	-----	-----	-----																											
Med2	-----	-----	-----	-----																											
Med1	-----	-----	-----	-----																											
Low	-----	-----	-----	-----																											
	1.8°F	3.15°F	5.4°F	ΔT																											
3. Drain pump	<p>3-1. Drain pump control</p> <ul style="list-style-type: none"> The drain pump will always run when the unit is in COOL or DRY mode. (Regardless of the thermo ON/OFF) Whenever the operation is changed over to the other modes (including Stop), the drain pump will stop pumping after approximately 3 minutes. <p>Float switch control</p> <ul style="list-style-type: none"> Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF. In the water: Detected that the float switch is ON for 15 seconds. In the air: Detected that the float switch is OFF for 15 seconds <div style="border: 1px solid black; padding: 5px;"> <p>Float SW</p> </div>																														
4. Vane (up/down vane change)	<p>(1) The initial vane setting for COOL mode will be the horizontal position.</p> <p>(2) Vane position: Horizontal →Downward A →Downward B →Downward C→Downward D→Swing→Auto</p> <p>(3) Restriction of the downward vane setting If the vane position is set to Downward A/B/C/D in [Med1], [Med2], or [Low], the vane will return to the horizontal position after 1 hour has passed.</p>	<ul style="list-style-type: none"> "1h" appears on the wired remote controller. 																													

8-2. DRY OPERATION



<How to operate>

- ① Press ON/OFF button.
- ② Press [F1] button to display DRY.
- ③ Press [F2] [F3] button to set the set temperature.

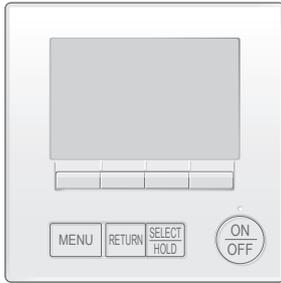


<How to operate>

- ① Press POWER ON/OFF button.
 - ② Press the operation MODE button to display DRY.
 - ③ Press the TEMP. button to set the set temperature.
- NOTE:** The set temperature changes 1°F when the  or  button is pressed one time. Dry 67 to 87°F

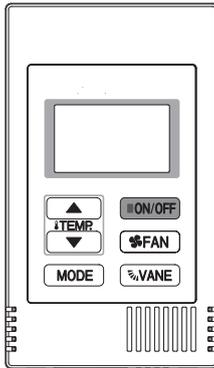
Control Mode	Control Details	Remarks																														
1. Temperature adjustment function	1-1. Determining temperature adjustment function (Function to prevent restarting for 3 minutes) Setting the Dry thermo by the thermostat signal and the room temperature (TH21). Dry thermo-ON Room temperature \geq Set temperature + 2°F Dry thermo-OFF Room temperature \leq Set temperature																															
	<table border="1"> <thead> <tr> <th rowspan="2">Room temperature</th> <th colspan="2">3 minutes passed since starting operation</th> <th rowspan="2">Dry thermo-ON time (min)</th> <th rowspan="2">Dry thermo-OFF time (min)</th> </tr> <tr> <th>Thermostat signal</th> <th>Room temperature (T1)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Over 64°F</td> <td rowspan="3">ON</td> <td>T1 \geq 83°F</td> <td>9</td> <td>3</td> </tr> <tr> <td>83°F > T1 \geq 79°F</td> <td>7</td> <td>3</td> </tr> <tr> <td>79°F > T1 \geq 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></td> <td>OFF</td> <td>Unconditional</td> <td>3</td> <td>10</td> </tr> <tr> <td>Below 64°F</td> <td colspan="4">Dry thermo OFF</td> </tr> </tbody> </table>	Room temperature	3 minutes passed since starting operation		Dry thermo-ON time (min)	Dry thermo-OFF time (min)	Thermostat signal	Room temperature (T1)	Over 64°F	ON	T1 \geq 83°F	9	3	83°F > T1 \geq 79°F	7	3	79°F > T1 \geq 75°F	5	3	75°F > T1	3	3		OFF	Unconditional	3	10	Below 64°F	Dry thermo OFF			
Room temperature	3 minutes passed since starting operation		Dry thermo-ON time (min)	Dry thermo-OFF time (min)																												
	Thermostat signal	Room temperature (T1)																														
Over 64°F	ON	T1 \geq 83°F	9	3																												
		83°F > T1 \geq 79°F	7	3																												
		79°F > T1 \geq 75°F	5	3																												
	75°F > T1	3	3																													
	OFF	Unconditional	3	10																												
Below 64°F	Dry thermo OFF																															
	1-2. Anti-freeze control No control function																															
2. Fan	Indoor fan operation controlled depends on the compressor conditions. <table border="1"> <thead> <tr> <th>Dry thermo</th> <th colspan="2">Fan speed notch</th> </tr> </thead> <tbody> <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> </tbody> </table> Note: Fan speed change is not allowed during DRY operation.	Dry thermo	Fan speed notch		ON	[Low]		OFF	Excluding the following	Stop	Room temp. < 64°F	[Low]																				
Dry thermo	Fan speed notch																															
ON	[Low]																															
OFF	Excluding the following	Stop																														
	Room temp. < 64°F	[Low]																														
3. Drain pump	Operates as it would in COOL operation.																															
4. Vane (up/down vane change)	Settings are the same in DRY operation as they are in COOL operation.																															

8-3. FAN OPERATION



<How to operate>

- ① Press ON/OFF button.
- ② Press [F1] button to display FAN.

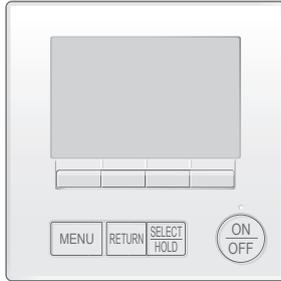


<How to operate>

- ① Press POWER ON/OFF button.
- ② Press the operation MODE button to display FAN.

Control Mode	Control Details	Remarks				
1. Temperature adjustment function	<p>Set by remote controller.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td> </td> </tr> </tbody> </table> <p>When [Auto] is set, fan speed becomes [Low].</p>	Type	Fan speed notch	4 speeds + Auto type		
Type	Fan speed notch					
4 speeds + Auto type						
2. Drain pump	<p>2-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions has been satisfied:</p> <ul style="list-style-type: none"> ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN). ② ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water. <p>2-2. Float switch control</p> <ul style="list-style-type: none"> • Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF. In the water : Detected that the float switch is ON for 15 seconds. In the air : Detected that the float switch is OFF for 15 seconds. 	<ul style="list-style-type: none"> • Operates as it would in COOL operation. 				
3. 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					

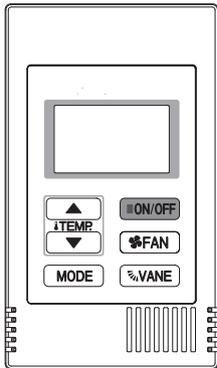
8-4. HEAT OPERATION



<How to operate>

- ① Press ON/OFF button.
- ② Press [F1] button to display HEAT.
- ③ Press [F2] [F3] button to set the set temperature.

NOTE: The settable temperature range varies with the model of outdoor units and remote controller.

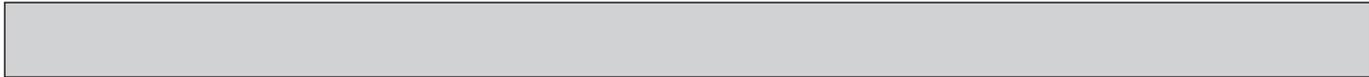


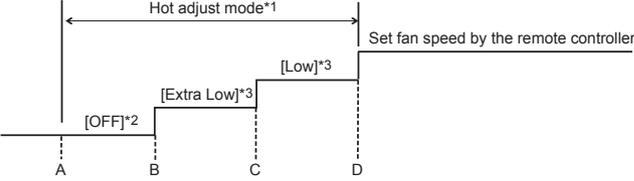
<How to operate>

- ① Press POWER ON/OFF button.
- ② Press the operation MODE button to display HEAT.
- ③ Press the TEMP. button to set the set temperature.

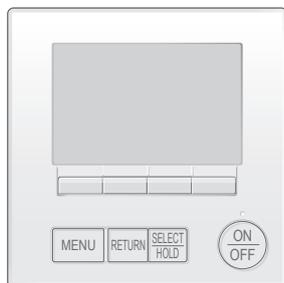
NOTE: The set temperature changes 1°F when the ∇ or Δ button is pressed one time. Heating 63 to 83°F

Control Mode	Control Details	Remarks				
1. Temperature adjustment function	1-1. Determining temperature adjustment function (Function to prevent restarting for 3 minutes) <ul style="list-style-type: none"> • Room temperature \leq Set temperature - 2°F ...Thermo-ON • Room temperature \geq Set temperature ...Thermo-OFF 					
2. Fan	By the remote controller setting (switch of 4 speeds+Auto) <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td> </td> </tr> </tbody> </table> <p>When [Auto] is set, fan speed is changed depending on the value of: $\Delta T = \text{Set temperature} - \text{Room temperature}$</p> <p>Give priority to under-mentioned controlled mode</p> <p>2-1. Hot adjust mode 2-2. Residual heat exclusion mode 2-3. Thermo-OFF mode (When the compressor off by the temperature adjustment function) 2-4. Cool air prevention mode (Defrosting mode)</p>	Type	Fan speed notch	4 speeds + Auto type		
Type	Fan speed notch					
4 speeds + Auto type						



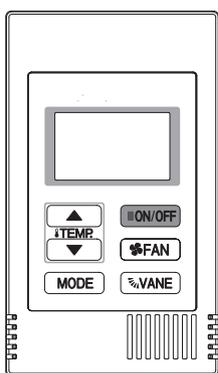
Control Mode	Control Details	Remarks													
	<p>2-1. Hot adjust mode</p> <p>The fan controller becomes the hot adjuster mode for the following conditions.</p> <p>① When starting the HEAT operation ② When the temperature adjustment function changes from OFF to ON. ③ When release the HEAT defrosting operation</p>  <p>A: Hot adjust mode starts. B: 5 minutes have passed since the condition A or the indoor liquid pipe temperature reached 86°F or more. C: 5 minutes have passed since the condition A or the indoor liquid pipe temperature reached 95°F or more. D: 2minutes have passed since the condition C. (Terminating the hot adjust mode)</p> <table border="1" data-bbox="959 725 1513 900"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="2">DIP SW 1-8</th> </tr> <tr> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <th rowspan="2">DIP SW 1-7</th> <th>ON</th> <td>B to C [Extra Low] C to D [Low]</td> <td>B to C [Low] C to D [Low]</td> </tr> <tr> <th>OFF</th> <td>B to C [Setting airflow] C to D [Setting airflow]</td> <td>B to C [Extra Low] C to D [Low] Note: Initial setting</td> </tr> </tbody> </table>			DIP SW 1-8		ON	OFF	DIP SW 1-7	ON	B to C [Extra Low] C to D [Low]	B to C [Low] C to D [Low]	OFF	B to C [Setting airflow] C to D [Setting airflow]	B to C [Extra Low] C to D [Low] Note: Initial setting	<p>*1 "Heat Standby" will be displayed during the hot adjust mode.</p> <p>*2 The step change of A to B will not be performed at the first thermo-ON mode since the HEAT operation has started.</p> <p>*3 The fan speed varies according to the setting of DIP SW1-7 and 1-8 as shown in the table below.</p>
				DIP SW 1-8											
		ON	OFF												
DIP SW 1-7	ON	B to C [Extra Low] C to D [Low]	B to C [Low] C to D [Low]												
	OFF	B to C [Setting airflow] C to D [Setting airflow]	B to C [Extra Low] C to D [Low] Note: Initial setting												
	<p>2-2. Residual heat exclusion mode</p> <p>When the condition changes the auxiliary heater ON to OFF (temperature adjustment function, or operation stop, etc.), the indoor fan operates in [Low] mode for 1 minute.</p> <p>2-3. Thermo-OFF mode</p> <p>When the temperature adjustment function changes to OFF, the indoor fan operates in [Extra low].</p> <p>2-4. Heat defrosting mode</p> <p>The indoor fan stops.</p>	<p>• This control is same for the model without auxiliary heater.</p>													
3. Drain pump	<p>3-1. Drain pump control</p> <p>The drain pump turns ON for the specified amount of time when any of the following conditions has been satisfied:</p> <p>① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN). ② ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water.</p> <p>3-2. Float switch control</p> <ul style="list-style-type: none"> • Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF. <p>In the water: Detected that the float switch is ON for 15 seconds. In the air : Detected that the float switch is OFF for 15 seconds.</p>	<p>• Operates as it would in COOL operation.</p>													
4. Vane control (Up/down vane change)	<p>(1) Initial setting: OFF → HEAT ∙ ∙ [last setting] When the last setting is [Swing] ∙ ∙ [Downward D] When changing the mode from exception of HEAT to HEAT operation ∙ ∙ [Downward D]</p> <p>(2) Vane position: Horizontal → Downward A → Downward B → Downward C → Downward D → Swing → Auto</p> <p>(3) Restriction of vane position</p> <p>① The vane is horizontally fixed for the following modes. (The control by the remote controller is temporarily invalidated and control by the unit.)</p> <ul style="list-style-type: none"> • Thermo-OFF • Hot adjust [Extra low] mode • Heat defrost mode 														

8-5. AUTO OPERATION [AUTOMATIC COOL/HEAT CHANGE OVER OPERATION]



<How to operate>

- ① Press ON/OFF button.
 - ② Press [F1] button to display AUTO.
 - ③ Press [F2] [F3] button to set the set temperature.
- NOTE:** The settable temperature range varies with the model of outdoor units and remote controller.



<How to operate>

- ① Press POWER ON/OFF button.
 - ② Press the operation MODE button to display AUTO.
 - ③ Press the TEMP. button to set the set temperature.
- NOTE:** The set temperature changes 1°F when the  or  button is pressed one time. Automatic 67 to 83°F

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

8-6. WHEN UNIT IS STOPPED CONTROL MODE

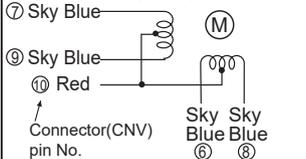
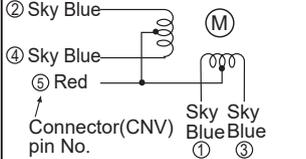
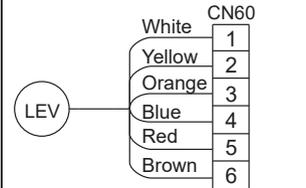
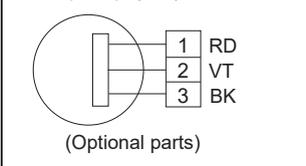
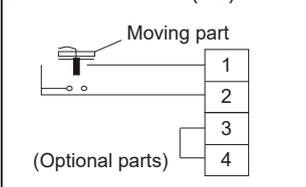
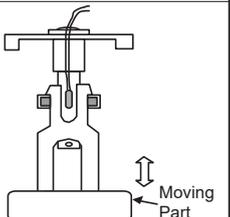
Control Mode	Control Details	Remarks
1. Drain pump	1-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions has been satisfied: ① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN). ② ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water.	
	1-2. Float switch control • Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF. In the water : Detected that the float switch is ON for 15 seconds. In the air : Detected that the float switch is OFF for 15 seconds.	• Operates as it would in COOL operation.

9-1. HOW TO CHECK THE PARTS

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH

Parts name	Check points																
Room temperature detection thermistor (TH21) Pipe temperature detection thermistor/liquid (TH22) Pipe temperature detection thermistor/gas (TH23)	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 10 to 30°C) <table border="1" data-bbox="483 453 679 523"> <tr> <td>Normal</td> </tr> <tr> <td>4.3 to 9.6 kΩ</td> </tr> </table> Refer to "8-1-1. Thermistor".	Normal	4.3 to 9.6 kΩ														
Normal																	
4.3 to 9.6 kΩ																	
Vane motor (MV1) 	Measure the resistance between the terminals with a tester. (At the ambient temperature 25°C) <table border="1" data-bbox="483 576 1046 715"> <tr> <th colspan="4">Normal</th> </tr> <tr> <td>⑩-⑨ Red-Sky Blue</td> <td>⑩-⑧ Red-Sky Blue</td> <td>⑩-⑦ Red-Sky Blue</td> <td>⑩-⑥ Red-Sky Blue</td> </tr> <tr> <td colspan="4">300 Ω±7%</td> </tr> </table>	Normal				⑩-⑨ Red-Sky Blue	⑩-⑧ Red-Sky Blue	⑩-⑦ Red-Sky Blue	⑩-⑥ Red-Sky Blue	300 Ω±7%							
Normal																	
⑩-⑨ Red-Sky Blue	⑩-⑧ Red-Sky Blue	⑩-⑦ Red-Sky Blue	⑩-⑥ Red-Sky Blue														
300 Ω±7%																	
Vane motor (Lower (MV2)) 	Measure the resistance between the terminals with a tester. (At the ambient temperature 25°C) <table border="1" data-bbox="483 772 1046 910"> <tr> <th colspan="4">Normal</th> </tr> <tr> <td>⑤-④ Red-Sky Blue</td> <td>⑤-③ Red-Sky Blue</td> <td>⑤-② Red-Sky Blue</td> <td>⑤-① Red-Sky Blue</td> </tr> <tr> <td colspan="4">300±26.3 Ω</td> </tr> </table>	Normal				⑤-④ Red-Sky Blue	⑤-③ Red-Sky Blue	⑤-② Red-Sky Blue	⑤-① Red-Sky Blue	300±26.3 Ω							
Normal																	
⑤-④ Red-Sky Blue	⑤-③ Red-Sky Blue	⑤-② Red-Sky Blue	⑤-① Red-Sky Blue														
300±26.3 Ω																	
Fan motor (MF)	Refer to "8-1-3. DC Fan motor (fan motor/indoor controller board)"																
Linear expansion valve (LEV) 	Disconnect the connector then measure the resistance valve with a tester. (Coil temperature 20°C) <table border="1" data-bbox="483 1002 1046 1151"> <tr> <th colspan="4">Normal</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> </tr> <tr> <td colspan="4">200 Ω±10%</td> </tr> </table>	Normal				(1)-(5) White-Red	(2)-(6) Yellow-Brown	(3)-(5) Orange-Red	(4)-(6) Blue-Brown	200 Ω±10%							
Normal																	
(1)-(5) White-Red	(2)-(6) Yellow-Brown	(3)-(5) Orange-Red	(4)-(6) Blue-Brown														
200 Ω±10%																	
Drain pump (DP) 	<ol style="list-style-type: none"> Check if the drain float switch works properly. Check if the drain pump works and drains water properly in cooling operation. If no water drains, confirm that the check code 2502 will not be displayed 10 minutes after the operation starts. Note: The drain pump for this model is driven by the internal DC motor, so it is not possible to measure the resistance between the terminals. Normal: Red-Black: Input 13 V DC → The pump motor starts to rotate.																
Drain float switch (FS) 	Measure the resistance between the terminals with a tester. <table border="1" data-bbox="483 1421 1273 1576"> <thead> <tr> <th>State of moving part</th> <th>Normal</th> <th>Abnormal</th> <th>Drain float switch connector terminal</th> </tr> </thead> <tbody> <tr> <td>UP</td> <td>Short</td> <td>Other than short</td> <td>①(+)-②(-)</td> </tr> <tr> <td>DOWN</td> <td>Open</td> <td>Other than open</td> <td>①(+)-②(-)</td> </tr> <tr> <td>-</td> <td>Short</td> <td>Other than short</td> <td>③(+)-④(-)</td> </tr> </tbody> </table> 	State of moving part	Normal	Abnormal	Drain float switch connector terminal	UP	Short	Other than short	①(+)-②(-)	DOWN	Open	Other than open	①(+)-②(-)	-	Short	Other than short	③(+)-④(-)
State of moving part	Normal	Abnormal	Drain float switch connector terminal														
UP	Short	Other than short	①(+)-②(-)														
DOWN	Open	Other than open	①(+)-②(-)														
-	Short	Other than short	③(+)-④(-)														

9-1-1. Thermistor

<Thermistor characteristic graph>

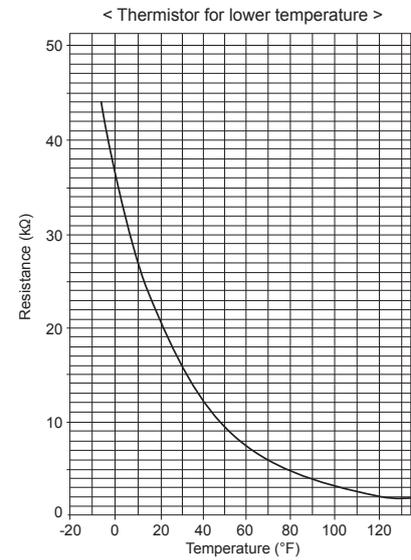
Thermistor for lower temperature

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

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

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

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

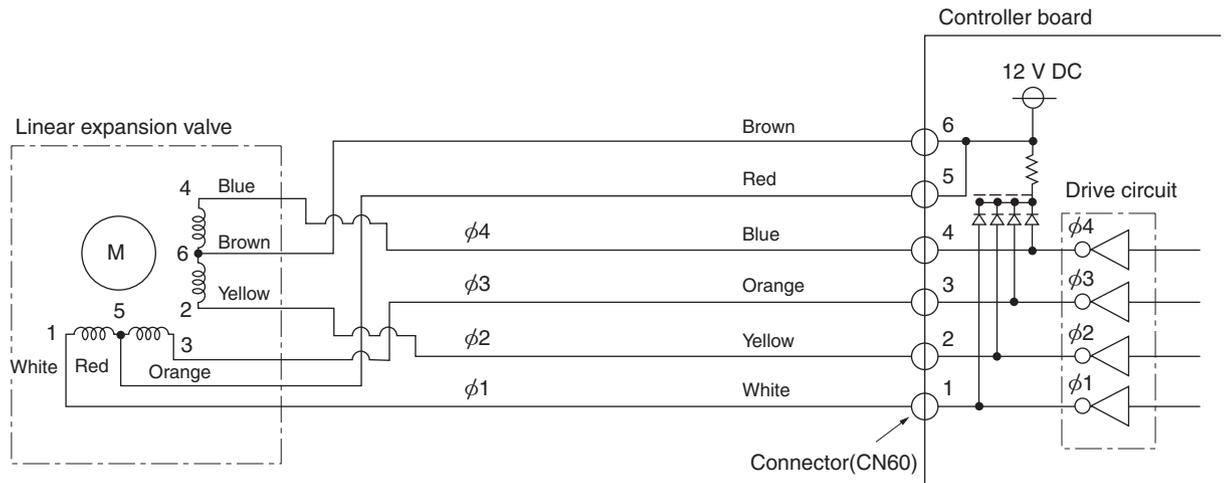


9-1-2. Linear expansion valve

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.

9-1-3. DC Fan motor (fan motor/indoor controller board)

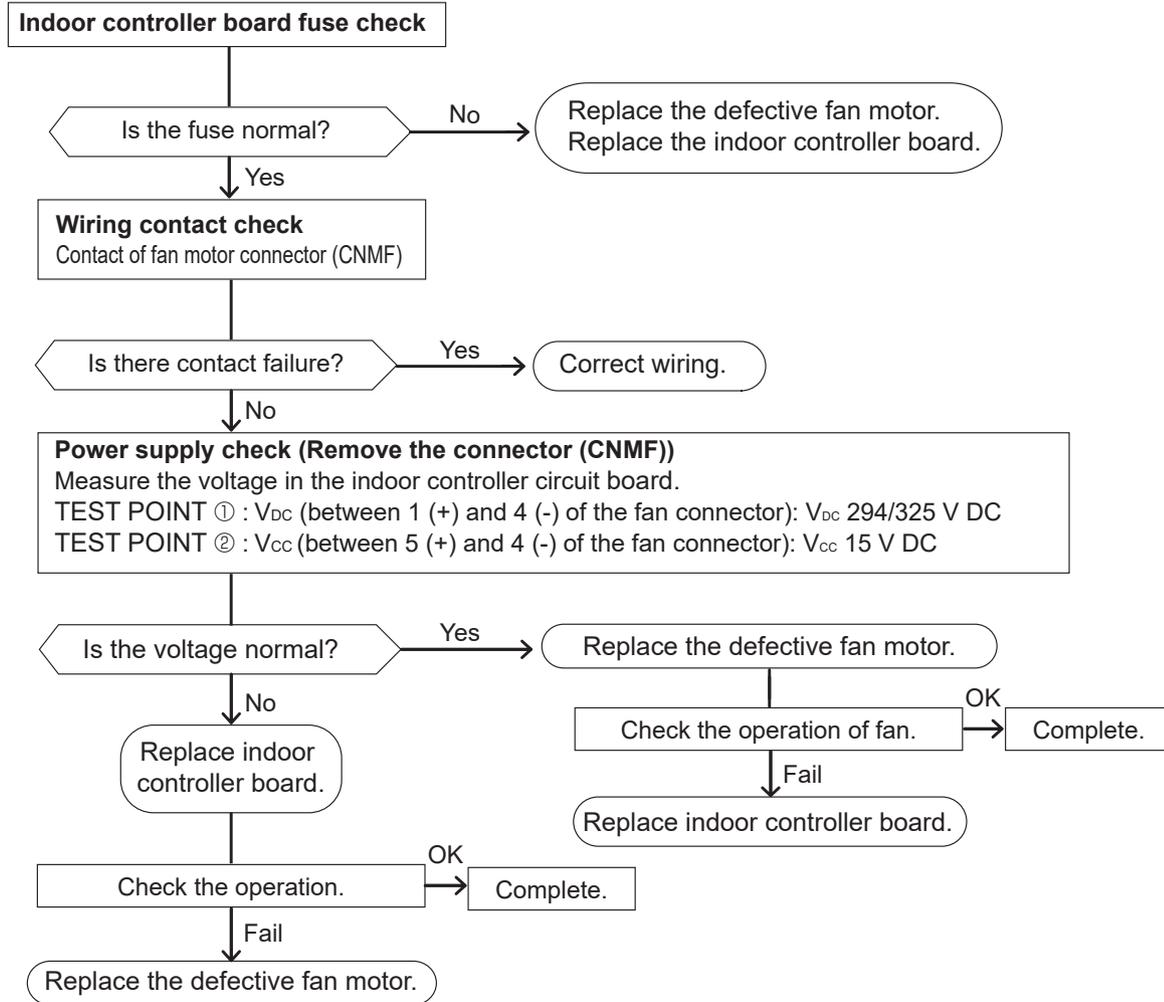
Check method of indoor fan motor (fan motor/indoor controller board)

① Notes

- High voltage is applied to the connector (CNMF) for the fan motor. Pay attention to the service.
- Do not pull out the connector (CNMF) for the motor with the power supply on.
(It causes trouble of the indoor controller board and fan motor.)

② Self check

Conditions : The indoor fan cannot rotate.



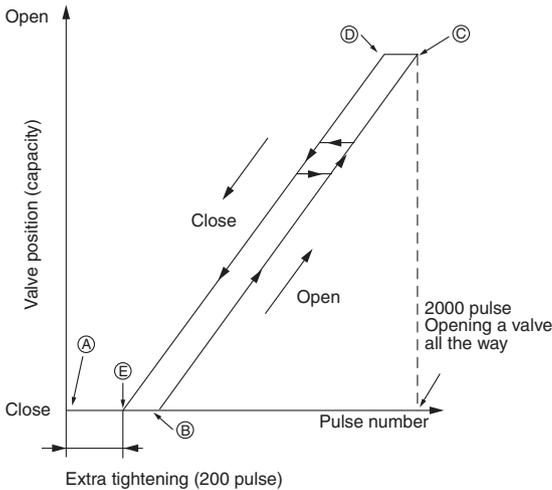
<Output pulse signal and the valve operation>

Output (Phase)	Output			
	1	2	3	4
$\phi 1$	ON	OFF	OFF	ON
$\phi 2$	ON	ON	OFF	OFF
$\phi 3$	OFF	ON	ON	OFF
$\phi 4$	OFF	OFF	ON	ON

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

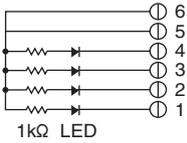
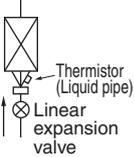
- When linear expansion valve operation stops, all output phase become OFF.
- At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrate.

② Linear expansion valve operation



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

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 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 200 Ω ±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. 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.

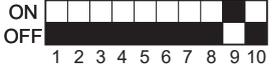
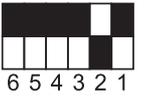
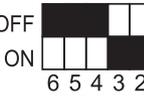
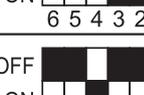
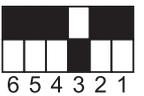
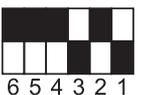
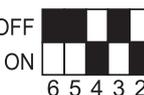
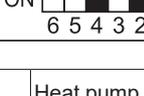
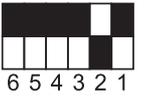
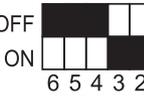
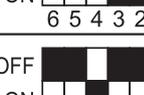
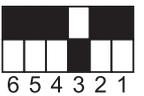
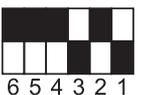
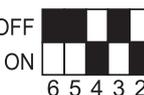
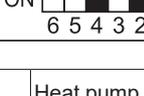
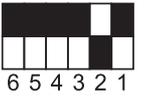
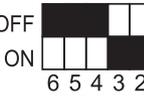
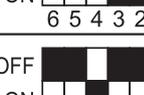
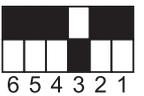
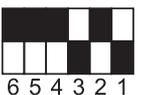
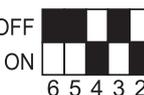
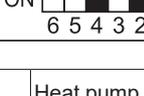
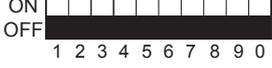
9-2. FUNCTION OF DIP SWITCH

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH

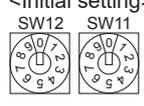
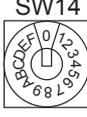
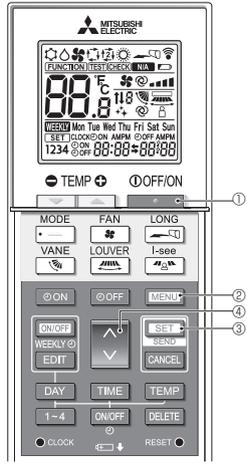
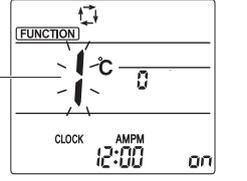
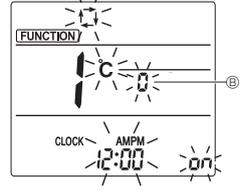
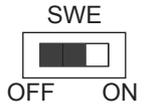
The black square (■) indicates a switch position.

Switch	Pole	Function	Operation by switch		Effective timing	Remarks														
			ON	OFF																
SW1 Mode Selection	1	Thermistor <Intake temperature detection> position	Built-in remote controller	Indoor unit	Under suspension	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Address board</div> <Initial setting> 														
	2	Filter clogging	Provided	Not provided																
	3	Filter sign indication	2,500 hr	100 hr																
	4	Air intake*1	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*2	Extra low*2																
	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 setting	1-4	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Models</th> <th>SW2</th> <th>Models</th> <th>SW2</th> </tr> </thead> <tbody> <tr> <td>P04</td> <td> OFF  ON  </td> <td>P12</td> <td> OFF  ON  </td> </tr> <tr> <td>P06</td> <td> OFF  ON  </td> <td>P15</td> <td> OFF  ON  </td> </tr> <tr> <td>P08</td> <td> OFF  ON  </td> <td>P18</td> <td> OFF  ON  </td> </tr> </tbody> </table>	Models	SW2	Models	SW2	P04	OFF  ON 	P12	OFF  ON 	P06	OFF  ON 	P15	OFF  ON 	P08	OFF  ON 	P18	OFF  ON 	Before power supply ON	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Indoor controller board</div> <Initial setting> Set for each capacity.
		Models	SW2	Models	SW2															
		P04	OFF  ON 	P12	OFF  ON 															
		P06	OFF  ON 	P15	OFF  ON 															
P08	OFF  ON 	P18	OFF  ON 																	
1	Heat pump/Cool only	Cooling only	Heat pump	Under suspension	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Indoor controller board</div> <Initial setting> 															
2	—	—	—																	
3	—	—	—																	
4	—	—	—																	
5	—	—	—																	
6	—	—	—																	
7	Changing the opening of linear expansion valve	Effective	Not effective																	
8	Heating 4 degree up	Not effective	Effective																	
9	—	—	—																	
10	—	—	—																	

<Table A>

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

The black square (■) indicates a switch position.

Switch	Pole	Function	Effective timing	Remarks																																			
SW11 1s digit address setting SW12 10s digit address setting	Rotary switch	  <p>Address setting should be done when M-NET remote controller is being used.</p>	Before power supply ON	<div style="border: 1px solid black; padding: 5px; text-align: center;">Address board</div> <p><Initial setting></p> 																																			
SW14 Connection No. setting	Rotary switch	 <p>This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.</p>		<div style="border: 1px solid black; padding: 5px; text-align: center;">Address board</div> <p><Initial setting></p> 																																			
SW22 Function selection	Jumper	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Function</th> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>—</td> <td>—</td> </tr> <tr> <td>2</td> <td>—</td> <td>—</td> </tr> <tr> <td>3 Pair No. of wireless remote controller</td> <td colspan="2" rowspan="2">Depends on SW22-3, 22-4</td> </tr> <tr> <td>4 Pair No. of wireless remote controller</td> </tr> </tbody> </table> <ul style="list-style-type: none"> To operate each indoor unit by each remote controller when installed 2 indoor units or more are near, Pair No. setting is necessary. <ul style="list-style-type: none"> Pair No. setting is available with the 4 patterns (Setting patterns A to D). You may not set it when operating it by one remote controller. Setting for indoor unit. <p>Wireless remote controller pair number:</p> <ul style="list-style-type: none"> Setting operation (Fig. 1 (A)) <ol style="list-style-type: none"> Press the  button ① to stop the air conditioner. Press the  button ②. Check that function No."1" is displayed, and then press the  button ③. The Screen display setting screen will be displayed. (Fig. 2.) Pair No. changing operation (Fig. 2 (B)) <ol style="list-style-type: none"> Press the  button ④. Each time the  button ④ is pressed, the pair No.0-3 changes. Press the  button ③ to check the setting. Press the  button ②. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2">Indoor unit SW22</th> <th rowspan="2">Pair No. of wireless remote controller</th> <th rowspan="2"></th> </tr> <tr> <th>SW22-3</th> <th>SW22-4</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>ON</td> <td>0</td> <td>Initial setting</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>1</td> <td>—</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>2</td> <td>—</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>3-9</td> <td>—</td> </tr> </tbody> </table>	Function	ON	OFF	1	—	—	2	—	—	3 Pair No. of wireless remote controller	Depends on SW22-3, 22-4		4 Pair No. of wireless remote controller	Indoor unit SW22		Pair No. of wireless remote controller		SW22-3	SW22-4	ON	ON	0	Initial setting	OFF	ON	1	—	ON	OFF	2	—	OFF	OFF	3-9	—	Under operation or suspension	<p><Initial setting></p>   <p style="text-align: center;">Fig. 1</p>  <p style="text-align: center;">Fig. 2</p>
Function	ON	OFF																																					
1	—	—																																					
2	—	—																																					
3 Pair No. of wireless remote controller	Depends on SW22-3, 22-4																																						
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Indoor unit SW22		Pair No. of wireless remote controller																																					
SW22-3	SW22-4																																						
ON	ON	0	Initial setting																																				
OFF	ON	1	—																																				
ON	OFF	2	—																																				
OFF	OFF	3-9	—																																				
SWE Test run for Drain pump	Connector	 <p>The connector SWE is set to OFF after test run.</p>	Under operation	<p><Initial setting></p> 																																			

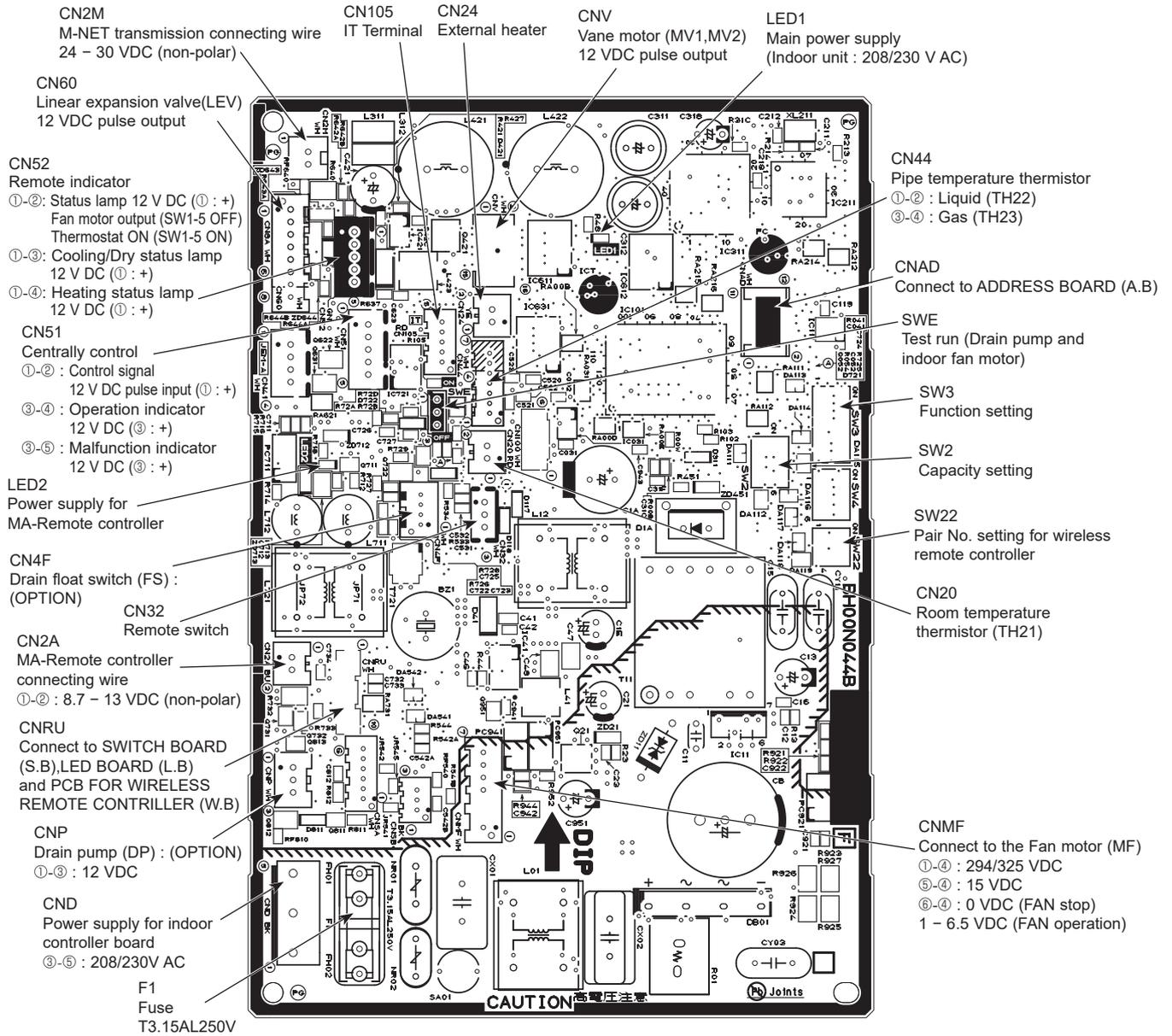
9-3. TEST POINT DIAGRAM

9-3-1. Indoor controller board (I.B)

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH



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

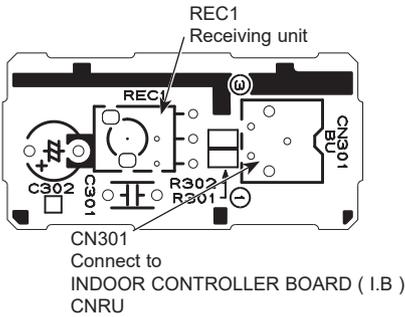
9-3-2. PCB FOR WIRELESS REMOTE CONTROLLER (W.B), SWITCH BOARD (S.B) and LED BOARD (L.B)

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

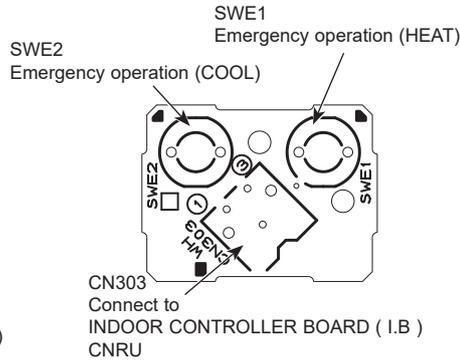
PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH

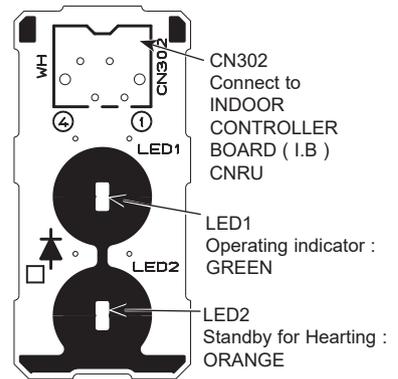
PCB FOR WIRELESS REMOTE CONTROLLER (W.B)



SWITCH BOARD (S.B)



LED BOARD (L.B)

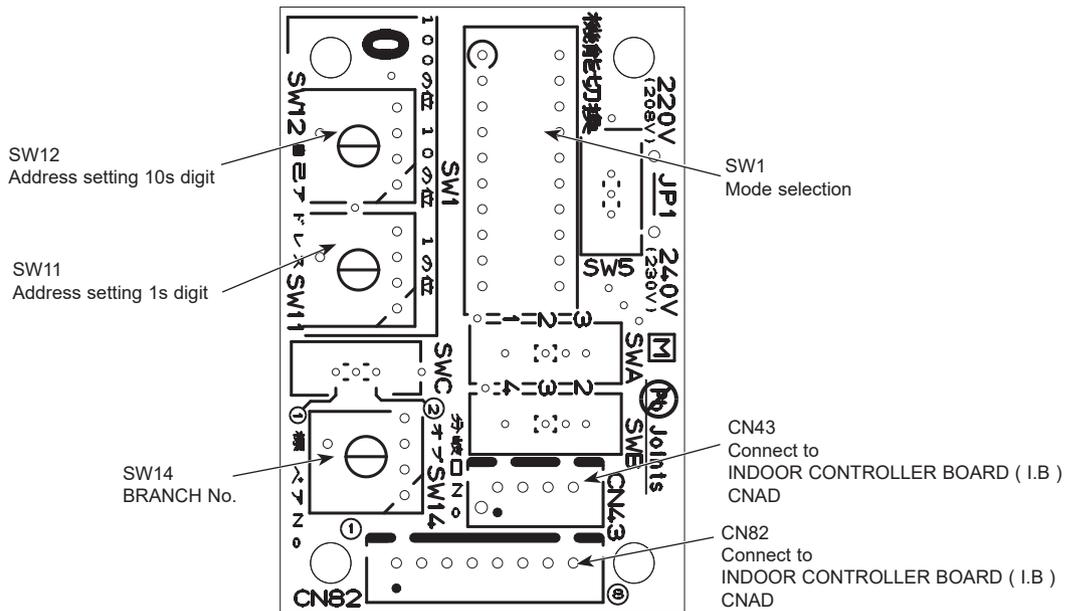


9-3-3. Address board (A.B)

PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH



PKFY-P04NLMU-E.TH
PKFY-P12NLMU-E.TH

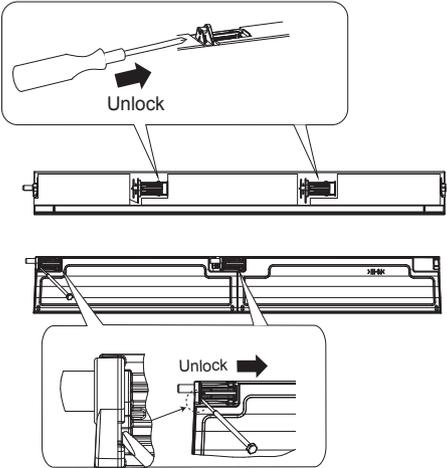
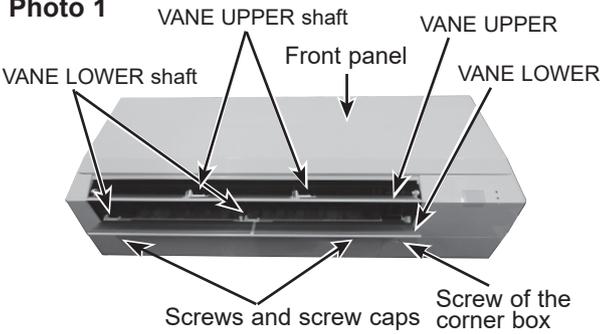
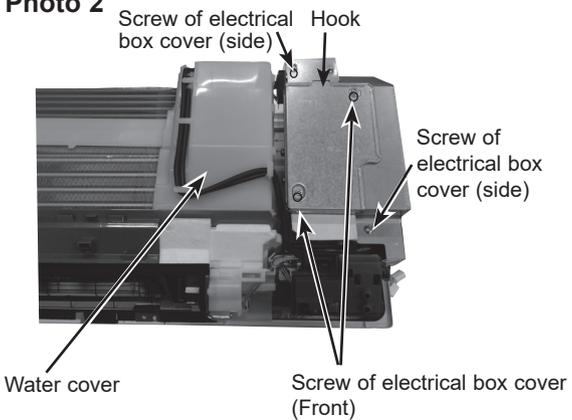
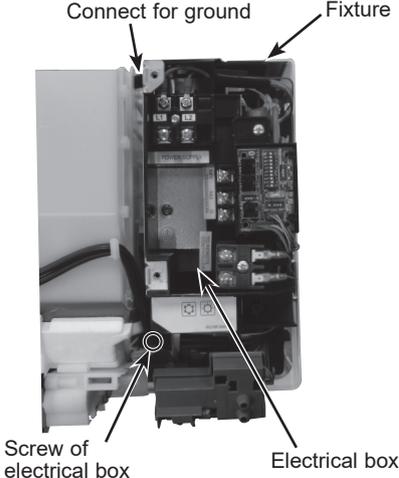
PKFY-P06NLMU-E.TH
PKFY-P15NLMU-E.TH

PKFY-P08NLMU-E.TH
PKFY-P18NLMU-E.TH

Be careful when removing heavy parts.

NOTE: Turn OFF the power supply before assembly.

—————> : Indicates the visible parts in the photos/figures.
-----> : Indicates the invisible parts in the photos/figures.

OPERATION PROCEDURE	PHOTOS/FIGURES
<p>1. REMOVING THE PANEL</p> <p>(1) Insert the driver to the hole at VANE LOWER shaft and slide the VANE LOWER shaft (2 places each). Push VANE UPPER shaft with the driver.</p> <p>(2) Pull the VANE LOWER and VANE UPPER from unit.</p> <p>(3) Remove 2 screw caps of the front panel. Remove 2 screws. (See Photo 1)</p> <p>(4) Hold the lower part of both ends of the front panel and pull it slightly toward you, and then remove the front panel by pushing it upward.</p> <p>(5) Remove the screw of the corner box. (See Photo 1) Remove the corner box.</p> <div data-bbox="245 804 769 1387" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Unlock the stopper and remove the horizontal vanes using following tool like a screw driver.</p>  </div>	<p>Photo 1</p>  <p>Photo 2</p> 
<p>2. REMOVING THE ELECTRICAL BOX</p> <p>(1) Remove the panel and the corner box. (Refer procedure to 1)</p> <p>(2) Remove the front and side electrical box covers (each 2 screw). (See Photo 2)</p> <p>(3) Disconnect the connectors below. CNMF : For fan motor CN44 : For indoor piping (2 phase pipe and liquid pipe) CN60 : For LEV</p> <p>(4) Disconnect the connectors below. CN2M : For transmission CND : For power supply CN2A : For MA-remote controller</p> <p>(5) Disconnect the connector for ground wire.</p> <p>(6) Remove the screw on lower side of the electrical box. (See Photo 3)</p> <p>(7) Push up the upper fixture catch to remove the box, then remove it from the box fixture.</p>	<p>Photo 3</p> 

OPERATION PROCEDURE

3. REMOVING THE ADDRESS BOARD, THE INDOOR CONTROLLER BOARD, THE WIRELESS CONTROLLER BOARD, LED BOARD

- (1) Remove the panel and the corner box. (Refer to procedure 1)
- (2) Remove the front and side electrical box covers (each 2 screw).
- (3) Disconnect the connectors of address board.
- (4) Disconnect the connectors on the indoor controller board. (See Photo 4)
- (5) Remove the switch board holder and open the cover.
- (6) Pull out the indoor controller board toward you then remove the indoor controller board and switch board. (See Photo 4)
- (7) Remove the holder of wireless remote controller board and LED board.
- (8) Disconnect the connector of wireless remote controller board and LED board.
- (9) Remove the wireless remote controller board and LED board from the holder.

4. REMOVING THE NOZZLE ASSEMBLY (with VANE and VANE MOTOR) AND DRAIN HOSE

- (1) Remove the panel and corner box. (Refer to procedure 1)
- (2) Remove the electrical box covers. (Refer to procedure 2)
- (3) Disconnect the vane motor connector (CNV) on the indoor controller board.
- (4) Push fixture and pull out the drain hose from the nozzle assembly, and remove nozzle assembly. (See Photo 6)

5. REMOVING THE VANE MOTOR

- (1) Remove the nozzle assembly. (Refer to procedure 4)
- (2) Remove 2 screws of the vane motor unit cover, and pull out the vane motor unit. (See Photo 6)
- (3) Remove screw of the vane motor (LOWER).
- (4) Remove the vane motor (LOWER) from the vane motor unit cover.
- (5) Disconnect the connector (white) from the vane motor. (LOWER)
- (6) Remove 2 screw of the vane motor (UPPER).
- (7) Remove the vane motor (UPPER) from the vane motor unit cover. (See Photo 7)
- (8) Disconnect the connector (blue) from the vane motor (UPPER).

PHOTOS/FIGURES

Photo 4

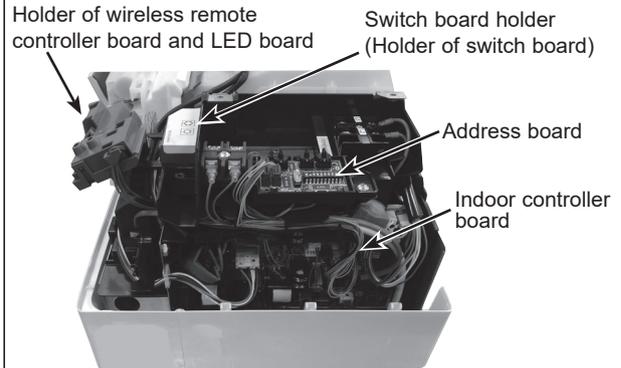


Photo 5 (see the bottom)

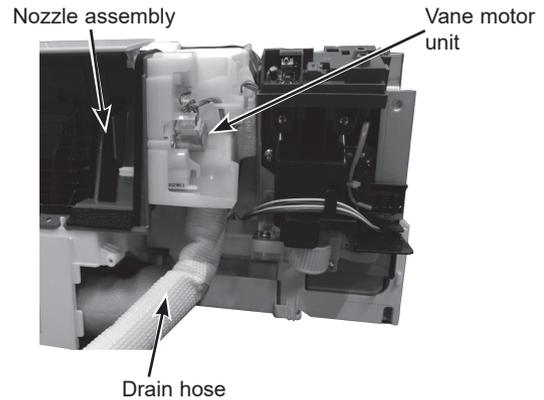


Photo 6

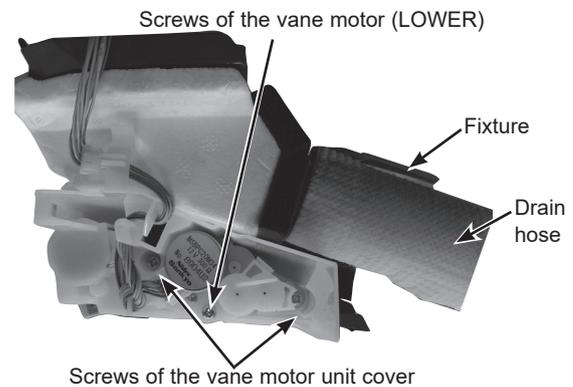
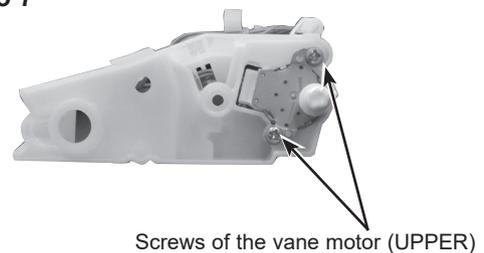


Photo 7



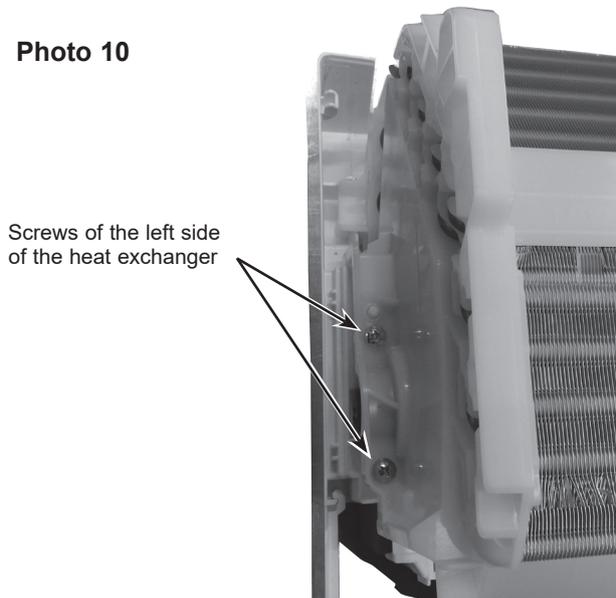
OPERATION PROCEDURE

6. REMOVING THE INDOOR FAN MOTOR AND THE LINE FLOW FAN

- (1) Remove the panel and the corner box. (Refer to procedure 1)
- (2) Remove the electrical box (Refer to procedure 2) and the nozzle assembly (Refer to procedure 4).
- (3) Remove the water cover. (See Photo 2)
- (4) Loosen the screw fixing the line flow fan. (See Photo 9)
- (5) Remove 3 screws fixing the motor bed. (See Photo 8)
- (6) Remove the motor bed together with fan motor and motor band.
- (7) Release the 2 hooks of the motor band. Remove the motor band. Pull out the indoor fan motor.
- (8) Remove 2 screws fixing the left side of the heat exchanger. (See Photo 10)
- (9) Lift the heat exchanger, and pull out the line flow fan to the lower-left.

* When attaching the line flow fan, screw the line flow fan so 4mm gap is provided between the right end of the line flow fan and the right wall of the air passage of the box. (Photo 9)

Photo 10



7. REMOVING THE LIQUID PIPE THERMISTOR AND GAS PIPE THERMISTOR

- (1) Remove the panel and the corner box. (Refer to procedure 1)
- (2) Remove the electrical box covers. (Refer to procedure 2)
- (3) Remove the water cover. (See Photo 2)
- (4) Remove the liquid pipe thermistor and gas pipe thermistors.
- (5) Disconnect the connector (CN44) on the indoor controller board. (TH22 and TH23/CN44)

PHOTOS/FIGURES

Photo 8

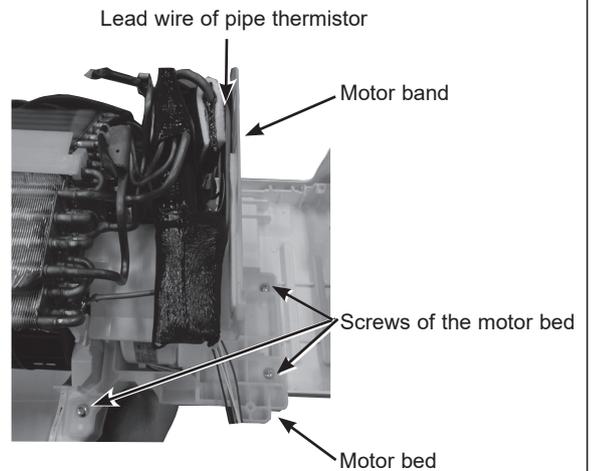


Photo 9

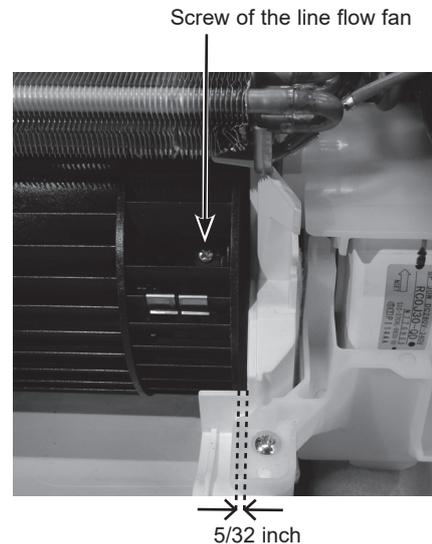
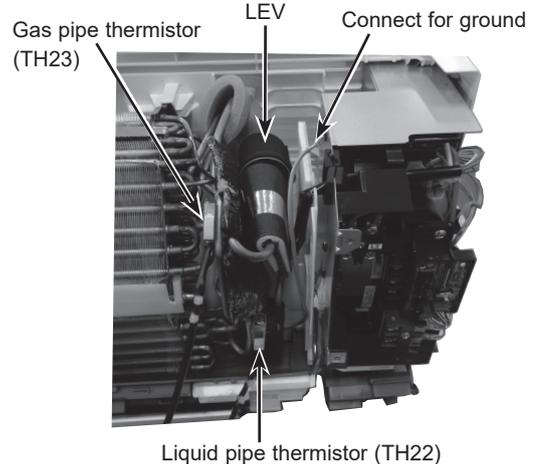
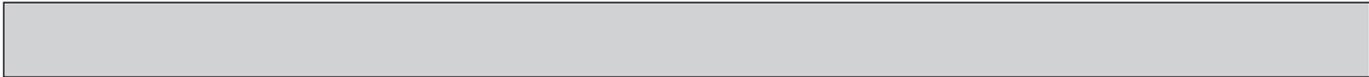


Photo 11

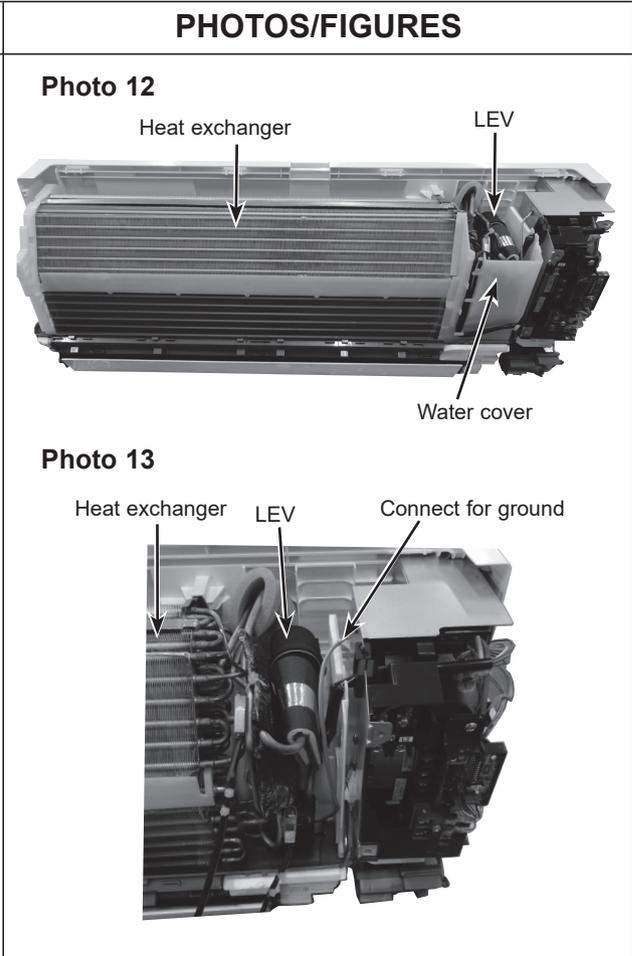




OPERATION PROCEDURE

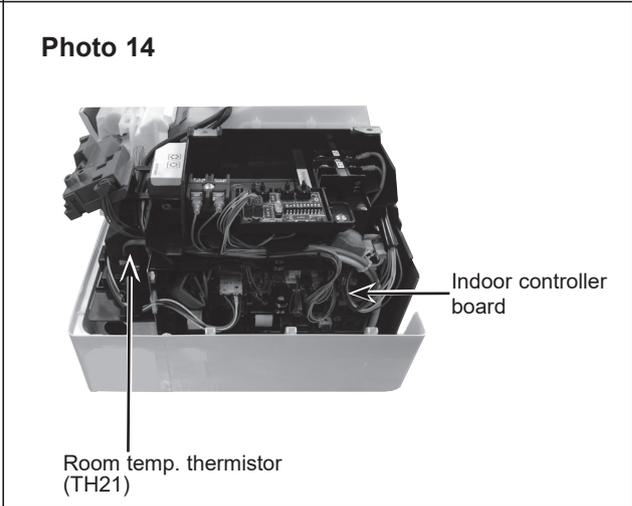
8. REMOVING THE HEAT EXCHANGER AND LEV

- (1) Remove the panel and the corner box (Refer to procedure 1).
- (2) Remove the electrical box (Refer to procedure 3) and the nozzle assembly (Refer to procedure 4).
- (3) Remove the water cover.
- (4) Remove the pipe thermistors. (Refer to procedure 7).
- (5) Disconnect the connector (CN60) on the indoor controller board.
- (6) Remove the motor bed together with fan motor and motor band (Refer to procedure 6).
- (7) Remove 2 screws fixing the left side of the heat exchanger. (See Photo 10)
- (8) Remove the heat exchanger with LEV.



9. REMOVING THE ROOM TEMPERATURE THERMISTOR

- (1) Remove the panel and corner box. (Refer to procedure 1)
- (2) Remove the electrical box covers. (Refer to procedure 2)
- (3) Remove the room temperature thermistor.
- (4) Disconnect the connector (CN20) on the indoor controller board.



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