

April 2012

No. OCH421

REVISED EDITION-B

# TECHNICAL & SERVICE MANUAL

## CITY MULTI Series Ceiling Cassettes R410A / R22

**Indoor unit**

[Model names]	[Service Ref.]	
PLFY-P12NBMU-E	PLFY-P12NBMU-E PLFY-P12NBMU-ER2	PLFY-P12NBMU-ER1
PLFY-P15NBMU-E	PLFY-P15NBMU-E PLFY-P15NBMU-ER2	PLFY-P15NBMU-ER1
PLFY-P18NBMU-E	PLFY-P18NBMU-E PLFY-P18NBMU-ER2	PLFY-P18NBMU-ER1
PLFY-P24NBMU-E	PLFY-P24NBMU-E PLFY-P24NBMU-ER2	PLFY-P24NBMU-ER1
PLFY-P30NBMU-E	PLFY-P30NBMU-E PLFY-P30NBMU-ER2	PLFY-P30NBMU-ER1
PLFY-P36NBMU-E	PLFY-P36NBMU-E PLFY-P36NBMU-ER2	PLFY-P36NBMU-ER1

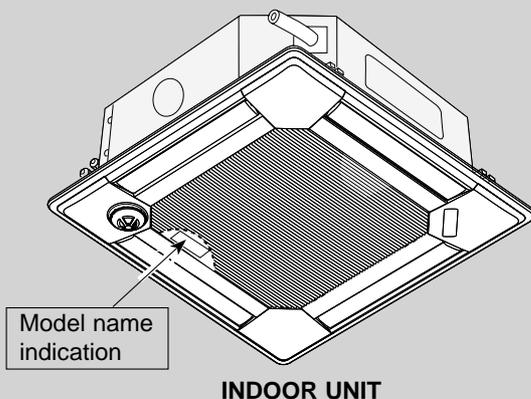
**Revision:**

- PLYF-P12/15/18/24/30/36 NBMU-ER2 have been added in REVISED EDITION-B.
- Some descriptions have been modified.

- Please void OCH421 REVISED EDNTION-A.

**Note:**

- This manual does not cover outdoor units. When servicing them, please refer to the outdoor unit's service manual.
- RoHS compliant products have <G> mark on the spec name plate.



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**PARTS CATALOG (OCB421)**


# CITY MULTI

## Use the specified refrigerant only

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

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

Correct refrigerant is specified in the manuals and on the spec labels provided with our products.

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

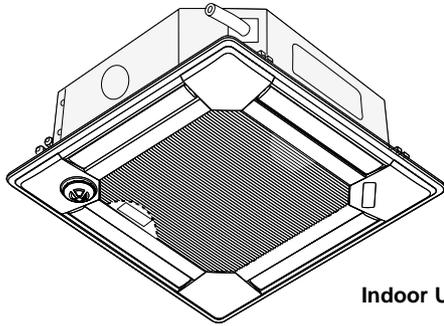
## 1 TECHNICAL CHANGES

PLFY-P12NBMU-ER1 → PLFY-P12NBMU-ER2  
PLFY-P15NBMU-ER1 → PLFY-P15NBMU-ER2  
PLFY-P18NBMU-ER1 → PLFY-P18NBMU-ER2  
PKFY-P24NBMU-ER1 → PLFY-P24NBMU-ER2  
PKFY-P30NBMU-ER1 → PLFY-P30NBMU-ER2  
PKFY-P36NBMU-ER1 → PLFY-P36NBMU-ER2

INDOOR CONTROLLER BOARD (I.B.) has been changed (S/W version up).

PLFY-P12NBMU-E → PLFY-P12NBMU-ER1  
PLFY-P15NBMU-E → PLFY-P15NBMU-ER1  
PLFY-P18NBMU-E → PLFY-P18NBMU-ER1  
PKFY-P24NBMU-E → PLFY-P24NBMU-ER1  
PKFY-P30NBMU-E → PLFY-P30NBMU-ER1  
PKFY-P36NBMU-E → PLFY-P36NBMU-ER1

INDOOR CONTROLLER BOARD (I.B.) has been changed.



Indoor Unit

**Models**

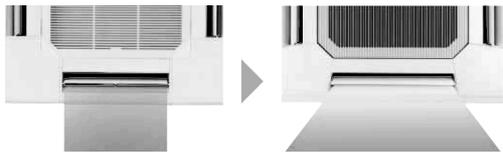
PLFY-P12NBMU-E  
 PLYY-P15NBMU-E  
 PLYY-P18NBMU-E  
 PLYY-P24NBMU-E  
 PLYY-P30NBMU-E  
 PLYY-P36NBMU-E

**Cooling capacity / Heating capacity**

12,000 / 13,500 Btu/h  
 15,000 / 17,000 Btu/h  
 18,000 / 20,000 Btu/h  
 24,000 / 27,000 Btu/h  
 30,000 / 34,000 Btu/h  
 36,000 / 40,000 Btu/h

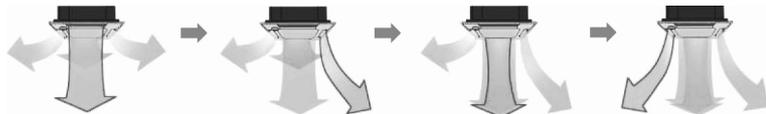
**1. WIDE AIRFLOW**

The new wide shape vane capable of wide angle air supply provides comfort even at the corners of a room regardless of cooling and heating operation. A reduction in the air speed by 20% compared to the conventional product eliminates uncomfortable draft sensation for friendly air conditioning.

**2. WAVE AIRFLOW SYSTEM (HEATING MODE)**

The wave airflow system has 4 vanes where each vane runs independently. Repeating of horizontal and down blows with a time lag allows the conditioned warm air to be distributed even to room corners thus preventing uneven room temperature distribution.

Operation image of "Wave Airflow"

**3. AUTOMATIC AIR SPEED ADJUSTMENT MODE**

The automatic air speed adjustment mode is provided in addition to the 4 air speed stages of "High/Medium 1/Medium 2/ Low." Air speed can be changed freely in accordance with a difference between the set temperature and the room temperature. The automatic air speed adjustment mode presents quick cooling of a room with the high mode, such as at the starting up of cooling operation, for example. After the room temperature is stabilized, the low mode will be applied by automatic switching to keep your comfort.

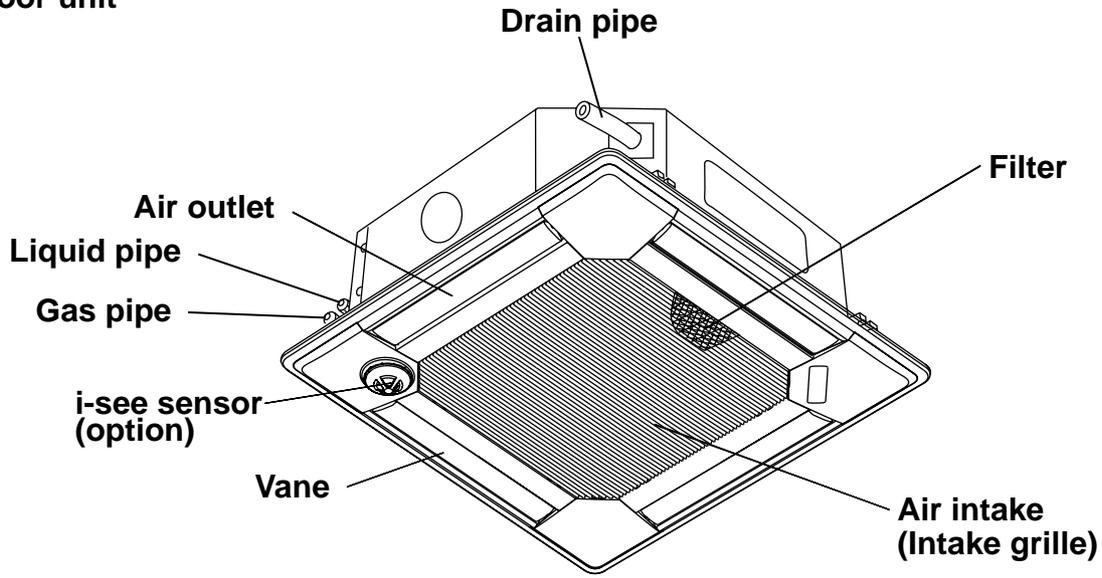
**4. i-see Sensor (OPTIONAL CORNER PANEL)**

The i see sensor is a radiation temperature sensor originated from Mitsubishi's new technology. In order to create a really comfortable space in shops and offices, it is essential to control the temperature near the floor where occupants/visitors gather. The i see sensor measures the infrared rays generated from the surrounding wall and floor surface at an angle of 360° and the infrared ray energy is computed to convert it into the value of temperature. In addition, the floor temperature at distant spots (radiation temperature) is also measured to supply the optimum airflow to realize comfort which was never experienced in the past.

# 3

# PART NAMES AND FUNCTIONS

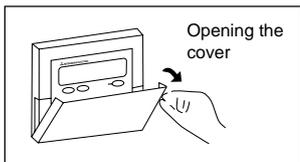
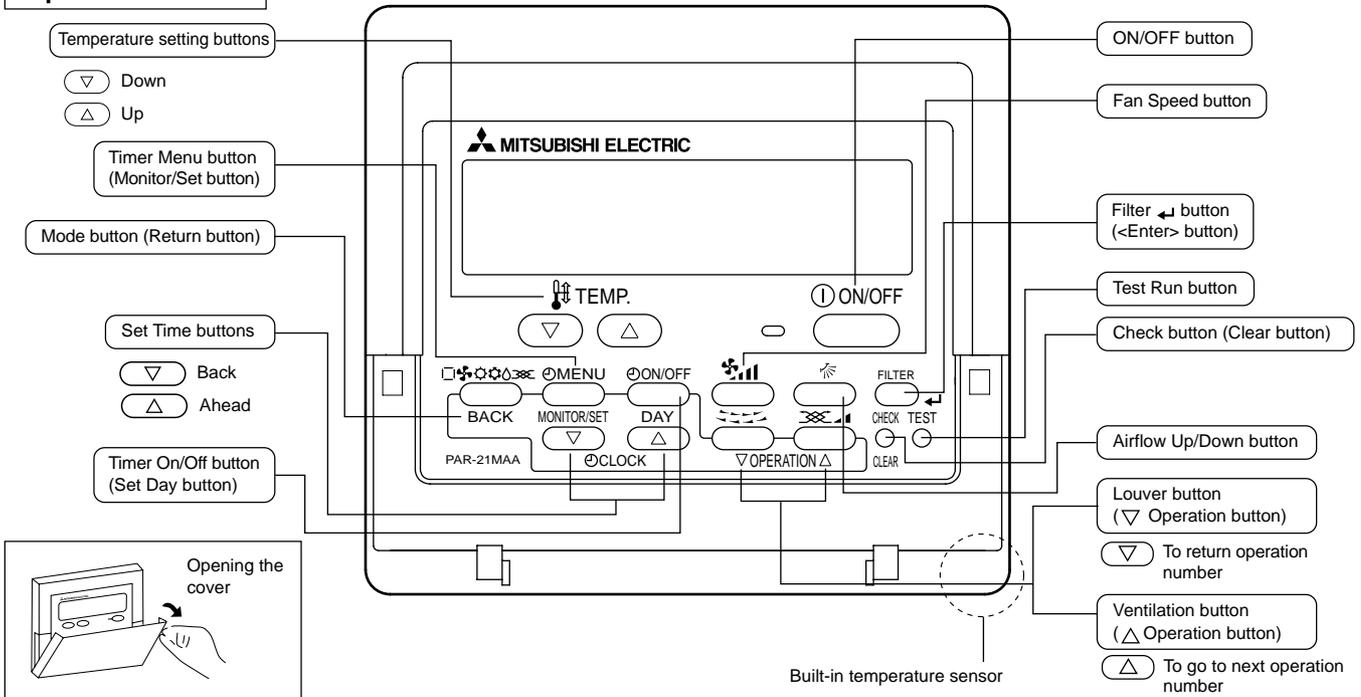
## • Indoor unit



## • Wired remote controller

**Note:**  
 The phrase "Wired remote controller" in this manual refers only to the PAR-21MAA.  
 If you need any information for the other remote controller, please refer to either the installation manual or initial setting manual which are included in remote controller's box.

### Operation Section



## • Wired remote controller

### Display Section

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

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

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

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

**Temperature Setting**  
Shows the target temperature.

**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**  
Displayed when the remote controller sensor is used.

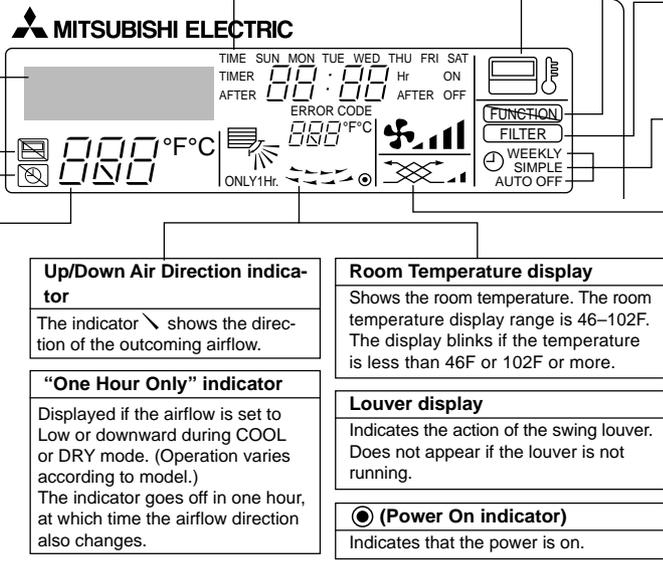
**"Locked" indicator**  
Indicates that remote controller buttons have been locked.

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

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

**Fan Speed indicator**  
Shows the selected fan speed.

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



## 4-1. SPECIFICATIONS

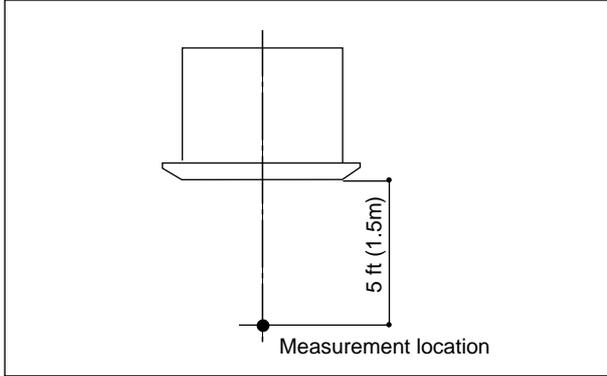
Model		PLFY-P12NBMU-E PLFY-P12NBMU-ER1 PLFY-P12NBMU-ER2	PLFY-P15NBMU-E PLFY-P15NBMU-ER1 PLFY-P15NBMU-ER2	PLFY-P18NBMU-E PLFY-P18NBMU-ER1 PLFY-P18NBMU-ER2		
Power source		1-phase 208-230V 60Hz				
Cooling capacity (Nominal)	*1	BTU/h	12,000	15,000	18,000	
	*1	kW	3.5	4.4	5.3	
	Power input		kW	0.03	0.04	0.05
	Current input		A	0.22	0.29	0.36
Heating capacity (Nominal)	*2	Btu/h	13,500	17,000	20,000	
	*2	kcal/h	4.0	5.0	5.9	
	Power input		kW	0.02	0.03	0.04
	Current input		A	0.14	0.22	0.29
External finish		Galvanized steel sheet				
External dimension H x W x D		in.	10-3/16 x 33-3/32 x 33-3/32	10-3/16 x 33-3/32 x 33-3/32	10-3/16 x 33-3/32 x 33-3/32	
		mm	258 x 840 x 840	258 x 840 x 840	258 x 840 x 840	
Net weight		lbs (kg)	49 (22)	49 (22)	51 (23)	
Decoration panel	Model		PLP-40BAU	PLP-40BAU	PLP-40BAU	
	External finish		MUNSELL (6.4Y 8.9/0.4)			
	Dimension H x W x D	in.	1-3/8 x 37-13/32 x 37-13/32	1-3/8 x 37-13/32 x 37-13/32	1-3/8 x 37-13/32 x 37-13/32	
		mm	35 x 950 x 950	35 x 950 x 950	35 x 950 x 950	
	Net weight		lbs (kg)	13 (6)	13 (6)	13 (6)
Heat exchanger		Cross fin				
FAN	Type x Quantity		Turbo fan x 1	Turbo fan x 1	Turbo fan x 1	
	External static press.	in.WG	0.000 (208V)	0.000 (208V)	0.000 (208V)	
		Pa	0	0	0	
		in.WG	0.000 (230V)	0.000 (230V)	0.000 (230V)	
		Pa	0	0	0	
	Motor type		DC motor			
	Motor output		kW	0.050	0.050	0.050
	Driving mechanism		Direct-drive			
	Airflow rate (Low-Mid2- Mid1-High)	cfm	388 - 424 - 459 - 494	424 - 459 - 494 - 565	494 - 530 - 565 - 636	
		m <sup>3</sup> /min	11.0 - 12.0 - 13.0 - 14.0	12.0 - 13.0 - 14.0 - 16.0	14.0 - 15.0 - 16.0 - 18.0	
		L / s	183 - 200 - 217 - 233	200 - 217 - 233 - 267	233 - 250 - 267 - 300	
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)	dB <A>	27 - 28 - 29 - 31 (208-230V)	27 - 28 - 30 - 31 (208-230V)	28 - 29 - 30 - 32 (208-230V)		
	dB <A>	—	—	—		
	dB <A>	—	—	—		
Insulation material		PS				
Air filter		PP honeycomb (long life filter, anti-bacterial type)				
Protection device		Fuse				
Refrigerant control device		LEV				
Connectable outdoor unit		R410A, R22 CITY MULTI				
Diameter of refrigerant pipe (O.D.)	Liquid (R410A) (R22)	in. (mm)	1/4 (6.35) Flare	1/4 (6.35) Flare	1/4 (6.35) Flare	
			1/4 (6.35) Flare	1/4 (6.35) Flare	3/8 (9.52) Flare	
	Gas (R410A) (R22)	in. (mm)	1/2 (12.7) Flare	1/2 (12.7) Flare	1/2 (12.7) Flare	
			1/2 (12.7) Flare	1/2 (12.7) Flare	5/8 (15.88) Flare	
Field drain pipe size		in. (mm)	O.D. 1-1/4 (32)	O.D. 1-1/4 (32)	O.D. 1-1/4 (32)	
Standard attachment	Document Accessory	Installation Manual, Instruction Book				
Optional parts	Air outlet shutter plate		PAC-SH51SP-E	PAC-SH51SP-E	PAC-SH51SP-E	
	High efficiency filterelement		PAC-SH59KF-E	PAC-SH59KF-E	PAC-SH59KF-E	
	Multi-function casement		PAC-SH53TM-E	PAC-SH53TM-E	PAC-SH53TM-E	
Remark						
	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	*2 Nominal heating conditions	Unit converter		
		Indoor : 80degF D.B. / 67degF W.B. (26.7degC D.B. / 19.4degC W.B.)	70degF D.B. (21.1degC D.B.)	kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m <sup>3</sup> /min x 35.31 lbs = kg/0.4536		
		Outdoor : 95degF D.B. (35degC D.B.)	47degF D.B. / 43degF W.B. (8.3degC D.B. / 6.1degC W.B.)			
		Pipe length : 25 ft. (7.6 m)	25 ft. (7.6 m)			
		Level difference : 0 ft. (0 m)	0 ft. (0 m)			
*Due to continuing improvement, above specification may be subject to change without notice.						
*Above specification data is subject to rounding variation.						



Model			PLFY-P24NBMU-E PLFY-P24NBMU-ER1 PLFY-P24NBMU-ER2	PLFY-P30NBMU-E PLFY-P30NBMU-ER1 PLFY-P30NBMU-ER2	PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2
Power source			1-phase 208-230V 60Hz		
Cooling capacity (Nominal)	*1	BTU/h	24,000	30,000	36,000
		kW	7.0	8.8	10.5
	Power input	kW	0.06	0.07	0.16
		A	0.43	0.51	1.07
Heating capacity (Nominal)	*2	Btu/h	27,000	34,000	40,000
		kcal/h	7.9	10.0	11.7
	Power input	kW	0.05	0.06	0.15
		A	0.36	0.43	1.00
External finish			Galvanized steel sheet		
External dimension H x W x D		in.	10-3/16 x 33-3/32 x 33-3/32	10-3/16 x 33-3/32 x 33-3/32	11-3/4 x 33-3/32 x 33-3/32
		mm	258 x 840 x 840	258 x 840 x 840	298 x 840 x 840
Net weight		lbs (kg)	51 (23)	51 (23)	60 (27)
Decoration panel	Model		PLP-40BAU	PLP-40BAU	PLP-40BAU
	External finish		MUNSELL (6.4Y 8.9/0.4)		
	Dimension H x W x D	in.	1-3/8 x 37-13/32 x 37-13/32	1-3/8 x 37-13/32 x 37-13/32	1-3/8 x 37-13/32 x 37-13/32
		mm	35 x 950 x 950	35 x 950 x 950	35 x 950 x 950
	Net weight		lbs (kg)	13 (6)	13 (6)
Heat exchanger			Cross fin		
FAN	Type x Quantity		Turbo fan x 1	Turbo fan x 1	Turbo fan x 1
	External static press.	in.WG	0.000 (208V)	0.000 (208V)	0.000 (208V)
			Pa	0	0
		in.WG	0.000 (230V)	0.000 (230V)	0.000 (230V)
			Pa	0	0
	Motor type		DC motor		
	Motor output	kW	0.050	0.050	0.120
	Driving mechanism		Direct-drive		
	Airflow rate (Low-Mid2- Mid1-High)	cfm	530 - 565 - 636 - 706	565 - 636 - 706 - 777	777 - 883 - 989 - 1,059
		m <sup>3</sup> /min	15.0 - 16.0 - 18.0 - 20.0	16.0 - 18.0 - 20.0 - 22.0	22.0 - 25.0 - 28.0 - 30.0
L/s		250 - 267 - 300 - 333	267 - 300 - 333 - 367	367 - 417 - 467 - 500	
Noise level (Low-Mid2-Mid1-High) (measured in anechoic room)	dB <A>	28 - 30 - 32 - 34 (208-230V)	30 - 32 - 35 - 37 (208-230V)	35 - 38 - 41 - 43 (208-230V)	
	dB <A>	—	—	—	
	dB <A>	—	—	—	
Insulation material			PS		
Air filter			PP honeycomb (long life filter, anti-bacterial type)		
Protection device			Fuse		
Refrigerant control device			LEV		
Connectable outdoor unit			R410A, R22 CITY MULTI		
Diameter of refrigerant pipe (O.D.)	Liquid (R410A) (R22)	in. (mm)	3/8 (9.52) Flare	3/8 (9.52) Flare	3/8 (9.52) Flare
			3/8 (9.52) Flare	3/8 (9.52) Flare	3/8 (9.52) Flare
	Gas (R410A) (R22)	in. (mm)	5/8 (15.88) Flare	5/8 (15.88) Flare	5/8 (15.88) Flare
			5/8 (15.88) Flare	5/8 (15.88) Flare	3/4 (19.05) Flare
Field drain pipe size		in. (mm)	O.D. 1-1/4 (32)	O.D. 1-1/4 (32)	O.D. 1-1/4 (32)
Standard attachment	Document Accessory		Installation Manual, Instruction Book		
Optional parts	Air outlet shutter plate		PAC-SH51SP-E	PAC-SH51SP-E	PAC-SH51SP-E
	High efficiency filterelement		PAC-SH59KF-E	PAC-SH59KF-E	PAC-SH59KF-E
	Multi-function casement		PAC-SH53TM-E	PAC-SH53TM-E	PAC-SH53TM-E
Remark					
	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 : 80degF D.B. / 67degF W.B. (26.7degC D.B. / 19.4degC W.B.) Outdoor : 95degF D.B. (35degC D.B.) Pipe length : 25 ft. (7.6 m) Level difference : 0 ft. (0 m)	*2 Nominal heating conditions 70degF D.B. (21.1degC D.B.) 47degF D.B. / 43degF W.B. (8.3degC D.B. / 6.1degC W.B.) 25 ft. (7.6 m) 0 ft. (0 m)	Unit converter kcal/h = kW x 860 BTU/h = kW x 3,412 cfm = m <sup>3</sup> /min x 35.31 lbs = kg/0.4536  *Above specification data is subject to rounding variation.	
*Due to continuing improvement, above specification may be subject to change without notice.					

## 4-2. SOUND LEVEL

### PLFY-P-NBMU-E



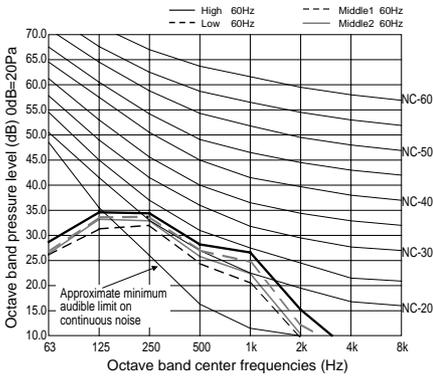
Sound level at anechoic room : Low-Mid2-Mid1-High

	Sound level dB (A)
PLFY-P12NBMU-E PLFY-P12NBMU-ER1 PLFY-P12NBMU-ER2	27-28-29-31
PLFY-P15NBMU-E PLFY-P15NBMU-ER1 PLFY-P15NBMU-ER2	27-28-30-31
PLFY-P18NBMU-E PLFY-P18NBMU-ER1 PLFY-P18NBMU-ER2	28-29-30-32
PLFY-P24NBMU-E PLFY-P24NBMU-ER1 PLFY-P24NBMU-ER2	28-30-32-34
PLFY-P30NBMU-E PLFY-P30NBMU-ER1 PLFY-P30NBMU-ER2	30-32-35-37
PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2	35-38-41-43

## 4-3. NC CURVES

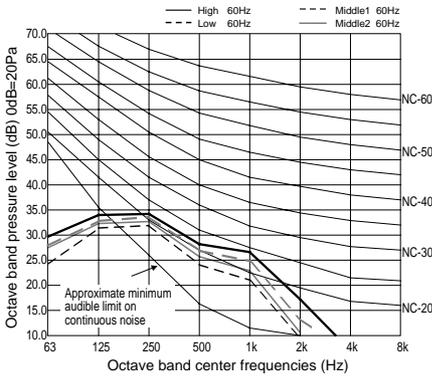
### PLFY-P12NBMU-E PLFY-P12NBMU-ER1 PLFY-P12NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



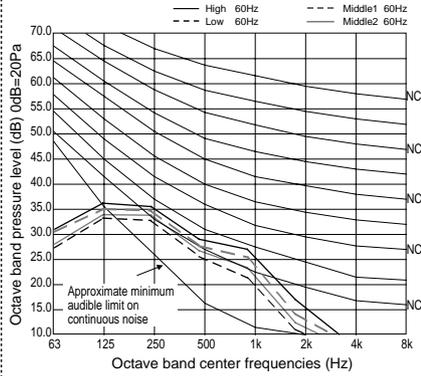
### PLFY-P15NBMU-E PLFY-P15NBMU-ER1 PLFY-P15NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



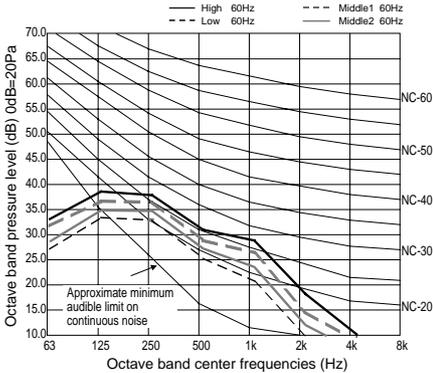
### PLFY-P18NBMU-E PLFY-P18NBMU-ER1 PLFY-P18NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



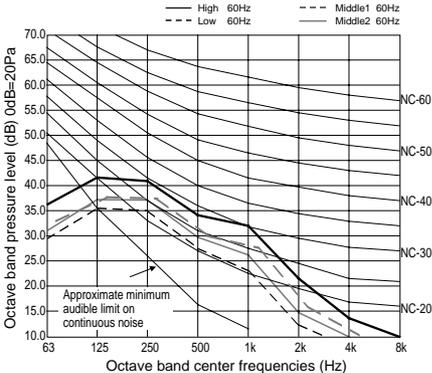
### PLFY-P24NBMU-E PLFY-P24NBMU-ER1 PLFY-P24NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



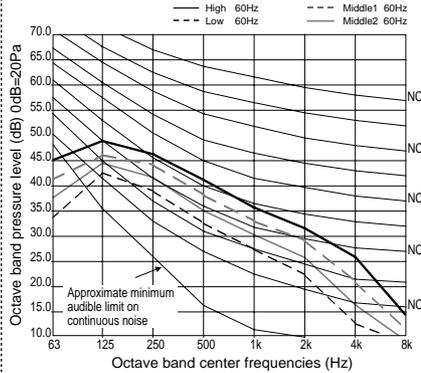
### PLFY-P30NBMU-E PLFY-P30NBMU-ER1 PLFY-P30NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



### PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2

External static pressure : 0Pa  
Power source : 208,230V, 60Hz



#### 4-4. ELECTRICAL PARTS SPECIFICATIONS

Service Ref.	Symbol	PLFY-P12NBMU-E PLFY-P12NBMU-ER1 PLFY-P12NBMU-ER2	PLFY-P15NBMU-E PLFY-P15NBMU-ER1 PLFY-P15NBMU-ER2	PLFY-P18NBMU-E PLFY-P18NBMU-ER1 PLFY-P18NBMU-ER2	PLFY-P24NBMU-E PLFY-P24NBMU-ER1 PLFY-P24NBMU-ER2	PLFY-P30NBMU-E PLFY-P30NBMU-ER1 PLFY-P30NBMU-ER2	PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2
Room temperature thermistor	TH21	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ					
Liquid pipe thermistor	TH22	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ					
Gas pipe thermistor	TH23	Resistance 30°F/15.8kΩ, 50°F/9.6kΩ, 70°F/6.0kΩ, 80°F/4.8kΩ, 90°F/3.9kΩ, 100°F/3.2kΩ					
Fuse (Indoor controller board)	FUSE	250V 6.3A					
Fan motor	MF	8-pole OUTPUT 50W					8-pole OUTPUT, 120W
Vane motor	MV	MSBPC20M04 DC12V 300Ω/phase					
Drain pump	DP	PLD-12230ME-1 INPUT 12/10.8W 24 ℓ /Hr					
Drain float switch	FS	Open/short detection					
Linear expansion valve	LEV	DC12V Stepping motor drive port dimension $\phi$ 3.2 (0~2000pulse) EDM-40YGME				DC12V Stepping motor drive port dimension $\phi$ 5.2 (0~2000pulse) EDM-80YGME	
Power supply terminal block	TB2	(L1, L2, GR) 330V 30A					
Transmission terminal block	TB5	(M1, M2, S) 250V 20A					
MA remote controller terminal block	TB15	(1, 2) 250V 10A					

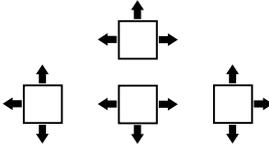
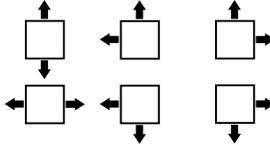
### 5-1. PLACEMENT OF THE AIR OUTLETS

- For this grille, the blowout direction comes in 11 patterns.

Also, by setting the remote controller to the appropriate settings, you can adjust the air flow and speed. Select the settings from Table1 according to the location in which you want to install the unit.

- Decide on the pattern of the airflow direction.

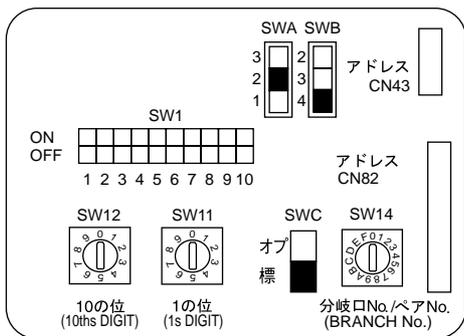
<Table 1>

	4-direction	3-direction	2-direction
Blowout direction pattern	<b>Pattern 1</b> Initial setting 	<b>Pattern 4</b> One air outlet fully closed 	<b>Pattern 6</b> 2 air outlet fully closed 

Note: For 3 and 2-direction settings, please use the air outlet shutter plate (option).

- According to the number of air outlets and height of the ceiling to install the unit, be sure to set up the switches (SWA, SWB) on the address board to the appropriate setting.

- Correspondence of ceiling heights to numbers of air outlets



PLFY-P12-P15-P18-P24-P30NBMU-E  
 PLFY-P12-P15-P18-P24-P30NBMU-ER1  
 PLFY-P12-P15-P18-P24-P30NBMU-ER2

SWA		①	②	③
SWB		Silent	Standard	High ceiling
④	4 direction	2.5m, 8.2ft	2.7m, 8.9ft	3.5m, 11.5ft
③	3 direction	2.7m, 8.9ft	3.0m, 9.8ft	3.5m, 11.5ft
②	2 direction	3.0m, 9.8ft	3.3m, 10.8ft	3.5m, 11.5ft

PLFY-P36NBMU-E  
 PLFY-P36NBMU-ER1  
 PLFY-P36NBMU-ER2

SWA		①	②	③
SWB		Silent	Standard	High ceiling
④	4 direction	2.7m, 8.9ft	3.2m, 10.5ft	4.5m, 14.8ft
③	3 direction	3.0m, 9.8ft	3.6m, 11.8ft	4.5m, 14.8ft
②	2 direction	3.3m, 10.8ft	4.0m, 13.1ft	4.5m, 14.8ft

## 5-2. BRANCH DUCT HOLE AND FRESH AIR INTAKE HOLE

At the time of installation, use the duct holes (cut out) located at the positions shown in following diagram, as and when required.

- A fresh air intake hole for the optional multi function casement can also be made.

Note:

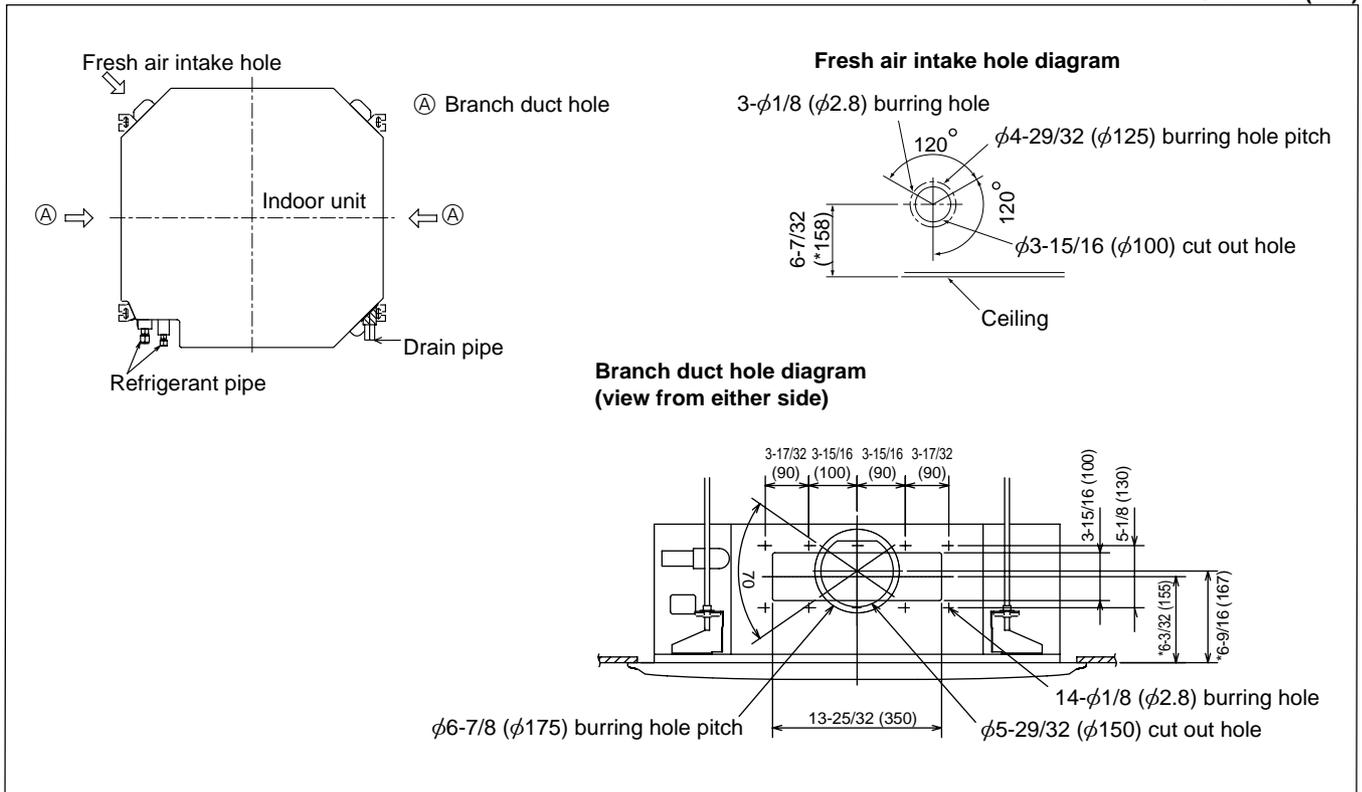
The figures marked with \* in the drawing below represent the dimensions of the main unit excluding those of the optional multi function casement.

When installing the optional multi function casement, add 5-5/16" (135 mm) to the dimensions marked on the figure.

When installing the branch ducts, be sure to insulate adequately.

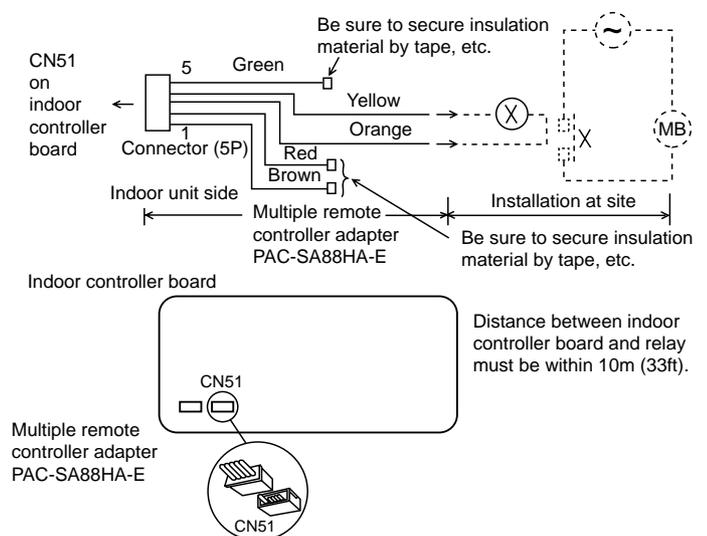
Otherwise, condensation and dripping may occur.

Unit : inch(mm)



## 5-3. OPERATION IN CONJUNCTION WITH DUCT FAN (Booster fan)

- Whenever the indoor unit is operating, the duct fan also operates.
  - (1) Connect the optional multiple remote controller adapter (PAC-SA88HA-E) to the connector CN51 on the indoor controller board.
  - (2) Drive the relay after connecting the 12V DC relay between the Yellow and Orange connector lines.
- MB: Electromagnetic switch power relay for duct fan.  
X: Auxiliary relay (For DC 12V, coil rating: 1.0W or smaller)

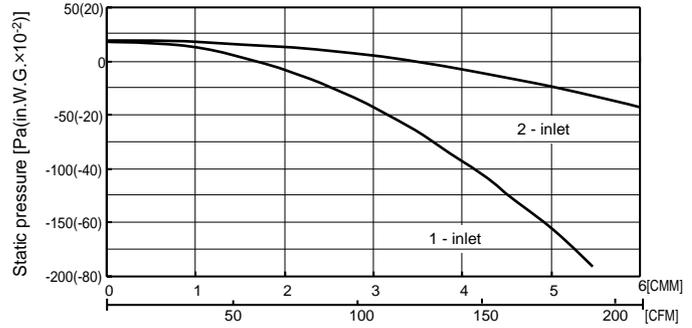
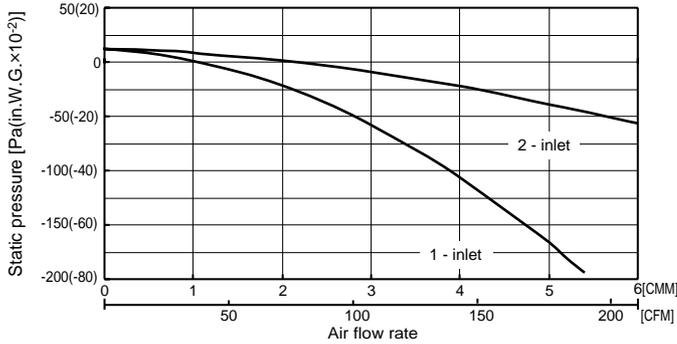


## 5-4. FRESH AIR INTAKE AMOUNT & STATIC PRESSURE CHARACTERISTICS

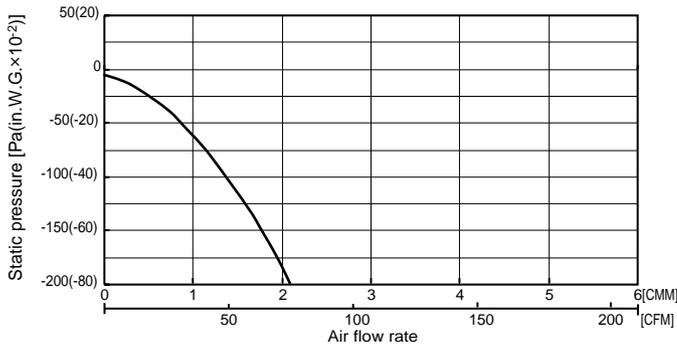
1 PLFY-P12 · P18 · P24 · P30NBMU-E, PLFY-P12 · P18 · P24 · P30NBMU-ER1  
 PLFY-P12 · P18 · P24 · P30NBMU-ER2

Multifunction casement + High efficiency filter

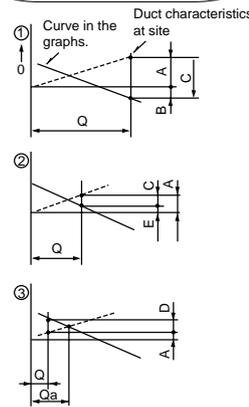
Multifunction casement + Standard filter



Taking air into the unit



How to read curves

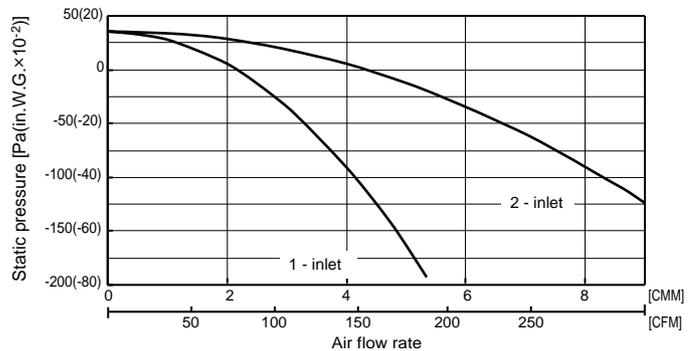
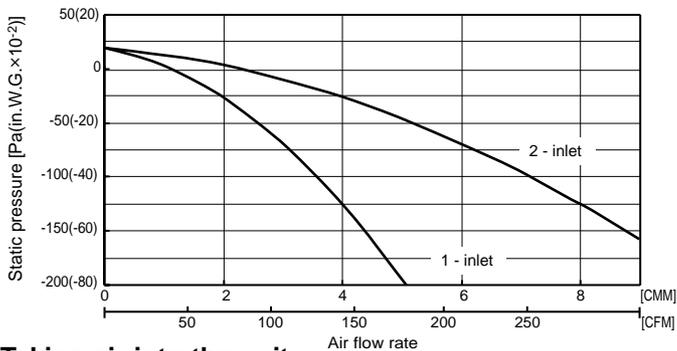


- Q...Designed amount of fresh air intake <CMM (CFM)>
- A...Static pressure loss of fresh air intake duct system with air flow amount Q <Pa (in.W.G.×10<sup>-2</sup>)>
- B...Forced static pressure at air conditioner inlet with air flow amount Q <Pa (in.W.G.×10<sup>-2</sup>)>
- C...Static pressure of booster fan with air flow amount Q <Pa (in.W.G.×10<sup>-2</sup>)>
- D...Static pressure loss increase amount of fresh air intake duct system for air flow amount Q <Pa (in.W.G.×10<sup>-2</sup>)>
- E...Static pressure of indoor unit with air flow amount Q <Pa (in.W.G.×10<sup>-2</sup>)>
- Qa...Estimated amount of fresh air intake without D <CMM (CFM)>

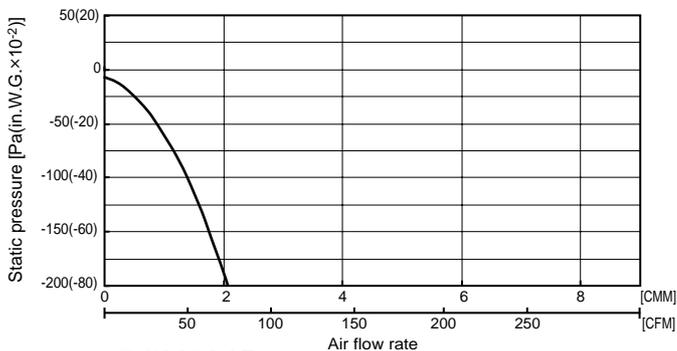
2 PLFY-P36NBMU-E, PLFY-P36NBMU-ER1, PLFY-P36NBMU-ER2

Multifunction casement + Standard filter

Multifunction casement + High efficiency filter

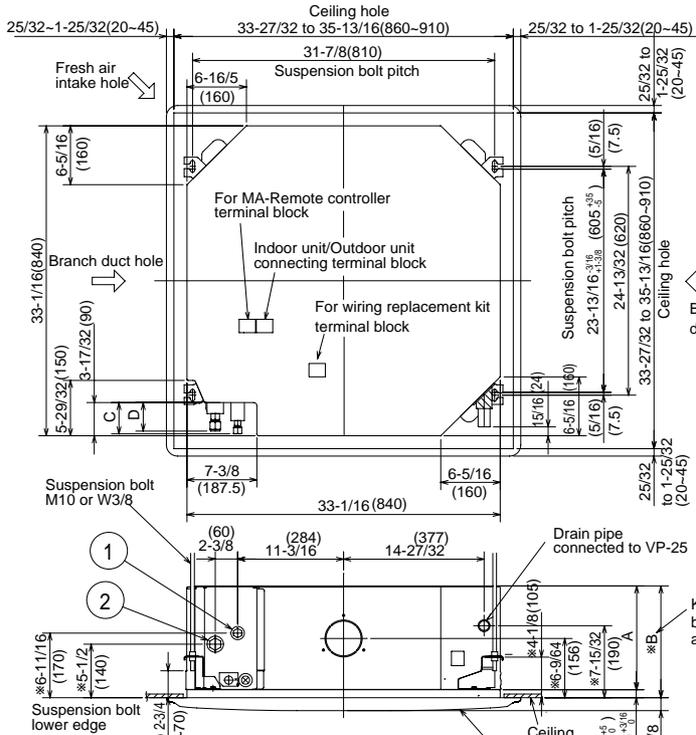


Taking air into the unit

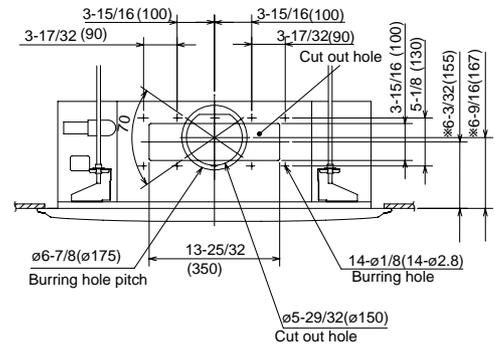


PLFY-P12/15/18/24/30/36NBMU-E  
 PLY-P12/15/18/24/30/36NBMU-ER1  
 PLY-P12/15/18/24/30/36NBMU-ER2

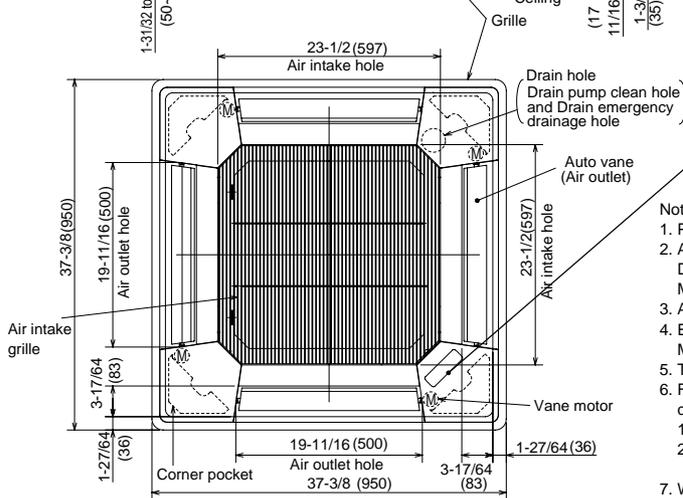
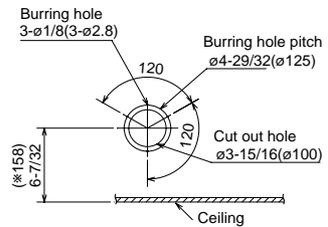
Unit : inch (mm)



Detail connecting of branch duct (Both aspects)



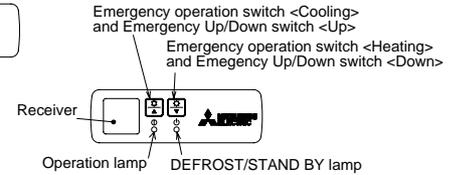
Detail drawing of fresh air intake hole



In case of standard grille

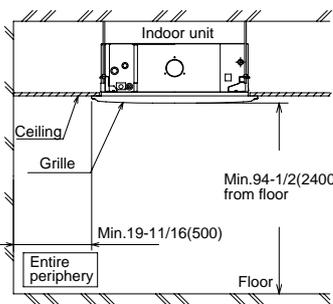


In case of wireless remote controller



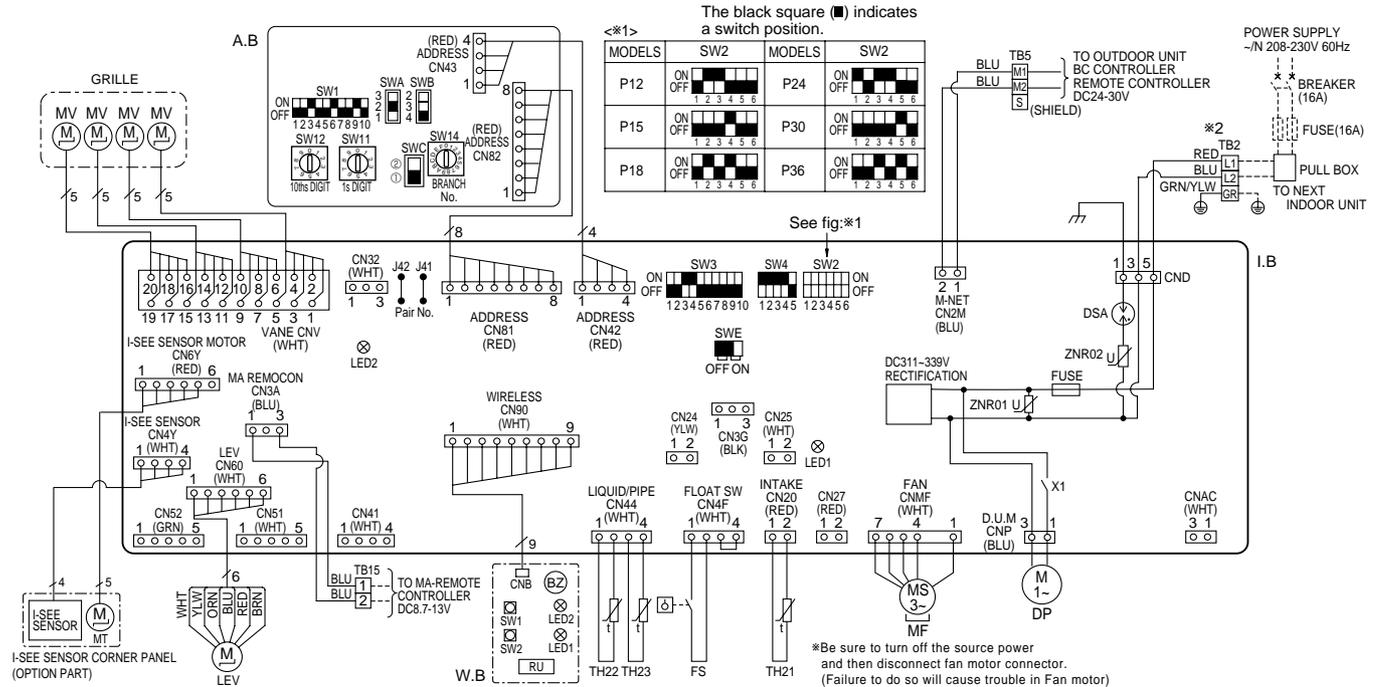
Note:

- Please choose the Grille from a standard grille.
- As for drain pipe, please use VP-25 (O.D.  $\phi$ 1-1/4( $\phi$ 32) PVC TUBE.)  
 Drain pump is included.  
 Max. lifting height is 70-7/18 (850mm) from the ceiling.
- As for suspension bolt, please use M10 or W3/8. (Procured at local site)
- Electrical box may be removed for the service purpose.  
 Make sure to slack the electrical wire little bit for control/power wires connection.
- The height of the indoor unit is able to be adjusted with the grille attached.
- For the installation of the optional high efficiency filter or optional multi-functional casement.
  - Add 5-5/16" (135mm) to the dimensions \*marked on the figure.
  - The optional high efficiency filter becomes optional multi-functional casement and concomitant use.
- When installing the branch ducts, be sure to insulate adequately.  
 Otherwise condensation and dripping may occur.  
 (It becomes the cause of dew drops/water dew.)
- As for necessary installation/service space, please refer to the left figure.



Service ref.	①	②	A	B	C	D
PLFY-P12NBMU-E PLFY-P12NBMU-ER1 PLFY-P12NBMU-ER2	Refrigerant pipe ... $\phi$ 6.35 Flared connection ...1/4F	Refrigerant pipe ... $\phi$ 12.7 Flared connection ...1/2F				
PLFY-P15NBMU-E PLFY-P15NBMU-ER1 PLFY-P15NBMU-ER2	Refrigerant pipe $\phi$ 6.35 / $\phi$ 9.52 Flared connection 1/4F / 3/8F (compatible)	Refrigerant pipe $\phi$ 12.7 / $\phi$ 15.88 Flared connection 1/2F / 5/8F (compatible)	9-1/2 (241)	10-3/16 (258)	3-5/32 (80)	2-29/32 (74)
PLFY-P24NBMU-E PLFY-P24NBMU-ER1 PLFY-P24NBMU-ER2	Refrigerant pipe ... $\phi$ 9.52 Flared connection ...3/8F	Refrigerant pipe ... $\phi$ 15.88 Flared connection ...5/8F				
PLFY-P30NBMU-E PLFY-P30NBMU-ER1 PLFY-P30NBMU-ER2	Refrigerant pipe ... $\phi$ 9.52 Flared connection ...3/8F	Refrigerant pipe $\phi$ 15.88 / $\phi$ 19.05 Flared connection 5/8F / 3/4F (compatible)	11-1/16 (281)	11-3/4 (298)	3-11/32 (85)	3-1/32 (77)
PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2		Refrigerant pipe ... $\phi$ 15.88 Flared connection ...5/8F				

PLFY-P12/15/18/24/30/36NBMU-E  
 PLYF-P12/15/18/24/30/36NBMU-ER1



NOTES:

1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
  2. In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
  3. In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
  4. Symbol [S] of TB5 is the shield wire connection.
  5. Symbols used in wiring diagram above are, [ ] : terminal block, [ ] : connector.
  6. The setting of the SW2 dip switches differs in the capacity. For the detail, refer to fig.<\*1>.
- \*2. Use copper supply wires.

[LEGEND]

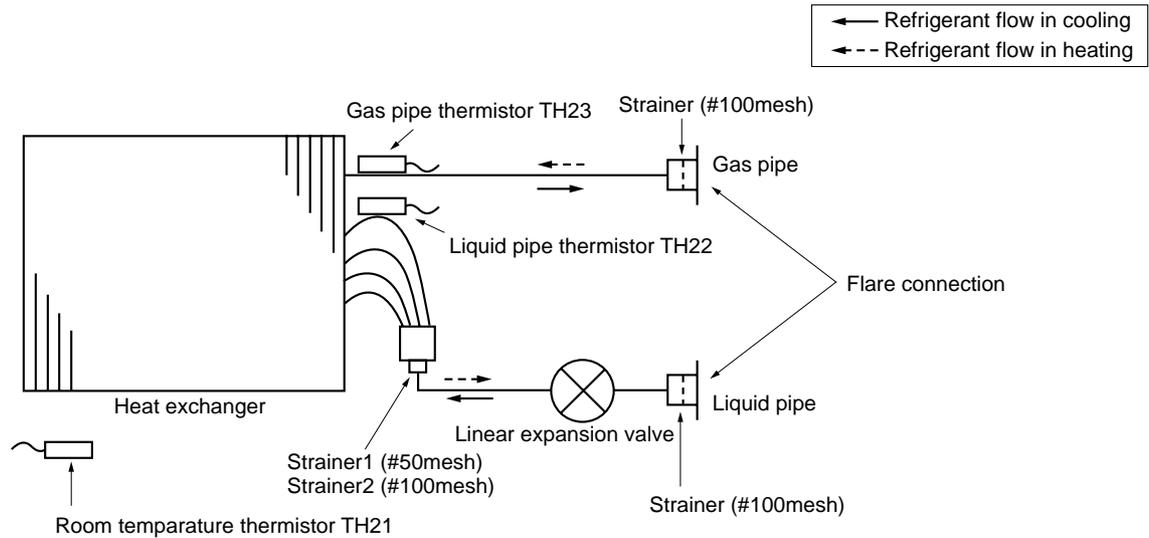
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I. B	INDOOR CONTROLLER BOARD	DP	DRAIN-UP MACHINE	A. B	ADDRESS BOARD
CN27	CONNECTOR	FS	DRAIN FLOAT SWITCH	SWA	SWITCH
CN32	REMOTE SWITCH	LEV	LINEAR EXPANSION VALVE	SWB	SWITCH
CN51	CENTRALLY CONTROL	MF	FAN MOTOR	SWC	SWITCH
CN52	REMOTE INDICATION	MV	FAN MOTOR	SW1	SWITCH
DSA	SURGE ABSORBER	TB2	TERMINAL BLOCK	SW11	SWITCH
FUSE	FUSE (T6.3AL250V)	TB5	TERMINAL BLOCK	SW12	SWITCH
LED1	POWER SUPPLY (I. B)	TB15	TERMINAL BLOCK	SW14	SWITCH
LED2	POWER SUPPLY (I. B)	TH21	THERMISTOR	OPTION PART	
SW2	SWITCH	TH22	THERMISTOR	W. B	PCB FOR WIRELESS REMOTE CONTROLLER
SW3	SWITCH	TH23	THERMISTOR	BZ	BUZZER
SW4	SWITCH			LED1	LED (OPERATION INDICATION: GREEN)
SWE	SWITCH			LED2	LED (PREPARATION FOR HEATING: ORANGE)
X1	AUX. RELAY			RU	RECEIVING UNIT
ZNR01.02	VARIATOR			SW1	EMERGENCY OPERATION (HEAT/DOWN)
				SW2	EMERGENCY OPERATION (COOL/UP)

LED on indoor board for service

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



PLFY-P12/15/18/24/30/36NBMU-E  
 PLY-P12/15/18/24/30/36NBMU-ER1  
 PLY-P12/15/18/24/30/36NBMU-ER2

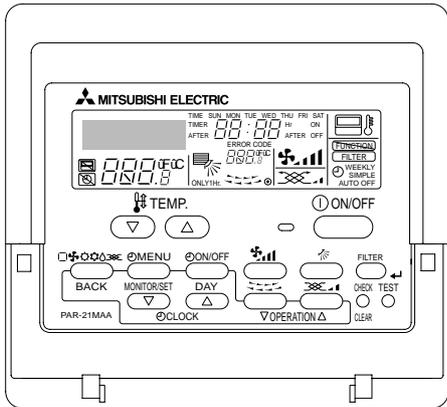


Unit : mm (inch)

Item \ Model	PLFY-P12/P15NBMU-E PLFY-P12/P15NBMU-ER1 PLFY-P12/P15NBMU-ER2	PLFY-P18NBMU-E PLFY-P18NBMU-ER1 PLFY-P18NBMU-ER2	PLFY-P24/P30NBMU-E PLFY-P24/P30NBMU-ER1 PLFY-P24/P30NBMU-ER2	PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2
Gas pipe	$\phi 12.7$ (1/2")	$\phi 12.7$ (1/2")/ $\phi 15.88$ (5/8")	$\phi 15.88$ (5/8")	$\phi 15.88$ (5/8")/ $\phi 19.05$ (3/4")
Liquid pipe	$\phi 6.35$ (1/4")	$\phi 6.35$ (1/4")/ $\phi 9.52$ (3/8")	$\phi 9.52$ (3/8")	$\phi 9.52$ (3/8")

## INDOOR UNIT CONTROL

## 9-1. COOL OPERATION



## &lt;How to operate&gt;

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

**NOTE:** The set temperature changes 2°F when the  $\nabla$  or  $\Delta$  button is pressed one time. Cooling 67 to 87°F

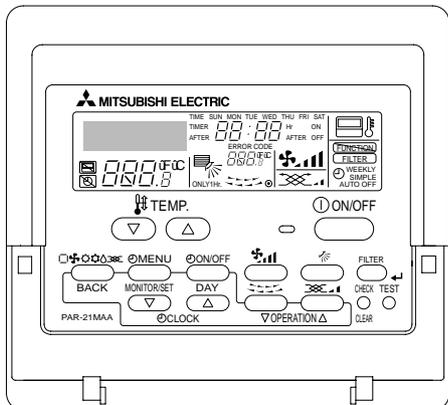
Control modes	Control details	Remarks				
1. Thermostat function	1-1. Thermostat function (Function to prevent restarting for 3 minutes) <ul style="list-style-type: none"> <li>• Room temperature <math>\geq</math> desired temperature + 2°F ...Thermo ON</li> <li>• Room temperature <math>\leq</math> desired temperature ...Thermo OFF</li> </ul>					
	1-2. Anti-freezing control Detected condition : When the liquid pipe temp. (TH22) is 32°F or less in 16 minutes from compressors start up, anti-freezing control starts and the thermo OFF. Released condition : The timer which prevents reactivating is set for 3 minutes, and anti-freezing control is cancelled when any one of the following conditions is satisfied. <ol style="list-style-type: none"> <li>① Liquid pipe temp. (TH22) turns 50°F or above.</li> <li>② The condition of the thermo OFF has become complete by thermostat, etc.</li> <li>③ The operation modes became mode other than COOL.</li> <li>④ The operation stopped.</li> </ol>					
2. Fan	By the remote controller setting (switch of 4 speeds+Auto) <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td>[Low], [Med2], [Med1], [High], [Auto]</td> </tr> </tbody> </table> When [Auto] is set, fan speed is changed depending on the value of: Room temperature - Desired temperature	Type	Fan speed notch	4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]	
Type	Fan speed notch					
4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]					

To be continued on the next page.

From the preceding page.

Control modes	Control details	Remarks
3. Drain pump	<p>3-1. Drain pump control</p> <ul style="list-style-type: none"> <li>•Always drain pump ON during the COOL and DRY mode operation. (Regardless of the thermo ON/OFF)</li> <li>•When the operation mode has changed from the COOL or DRY to the others (including Stop), OFF the control after the drain pump ON for 3 minutes.</li> </ul> <p><b>Float switch control</b></p> <ul style="list-style-type: none"> <li>• Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF.</li> <li>In the water: Detected that the float switch is ON for 15 seconds.</li> <li>In the air : Detected that the float switch is OFF for 15 seconds.</li> </ul>	
4. Vane (up/down vane change)	<p>(1) Initial setting: Start at COOL mode and horizontal vane.</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 When setting the downward vane A, B, C or D in [Med1], [Med2] or [Low] of the fan speed notch, the vane changes to horizontal position after 1 hour have passed.</p>	<p>• "ONLY 1 Hr" appears on the wired remote controller.</p>

## 9-2. DRY OPERATION

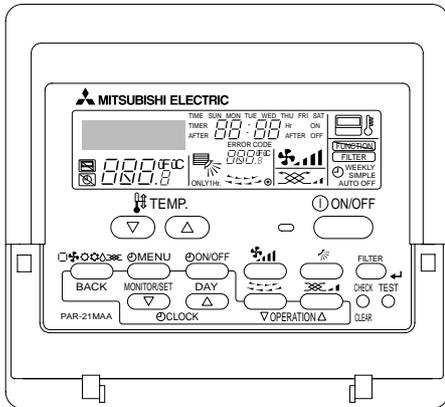


### <How to operate>

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

Control modes	Control details	Remarks																															
1. Thermostat function	<p>1-1. Thermostat 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 <math>\geq</math> desired temperature + 2°F Dry thermo OFF Room temperature <math>\leq</math> desired temperature</p> <table border="1"> <thead> <tr> <th rowspan="2">Room temperature</th> <th colspan="2">3 min. passed since starting operation</th> <th rowspan="2">Dry thermo ON time (min)</th> <th rowspan="2">Dry thermo OFF time (min)</th> </tr> <tr> <th>Thermostat signal</th> <th>Room temperature (T1)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Over 64°F</td> <td rowspan="4">ON</td> <td>T1 <math>\geq</math> 83°F</td> <td>9</td> <td>3</td> </tr> <tr> <td>83°F &gt; T1 <math>\geq</math> 79°F</td> <td>7</td> <td>3</td> </tr> <tr> <td>79°F &gt; T1 <math>\geq</math> 75°F</td> <td>5</td> <td>3</td> </tr> <tr> <td>75°F &gt; 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>Less than 64°F</td> <td colspan="4">Dry thermo OFF</td> </tr> </tbody> </table>	Room temperature	3 min. 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	Less than 64°F	Dry thermo OFF				
	Room temperature		3 min. 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																													
Less than 64°F	Dry thermo OFF																																
	<p>1-2. Frozen prevention control No control function</p>																																
2. Fan	<p>Indoor fan operation controlled depends on the compressor conditions.</p> <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. &lt; 64°F</td> <td>[Low]</td> </tr> </tbody> </table> <p>Note: Remote controller setting is not acceptable.</p>	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	Same control as COOL operation																																
4. Vane (up/down vane change)	Same control as COOL operation																																

## 9-3. FAN OPERATION

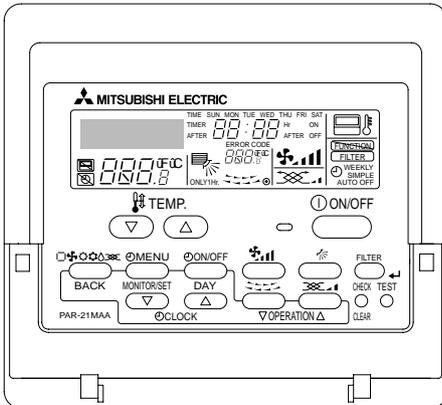


### <How to operate>

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

Control modes	Control details	Remarks				
1. Fan	<p>Set by remote controller.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td>[Low], [Med2], [Med1], [High], [Auto]</td> </tr> </tbody> </table> <p>When [Auto] is set, fan speed becomes [Low].</p>	Type	Fan speed notch	4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]	
Type	Fan speed notch					
4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]					
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 is met:</p> <ol style="list-style-type: none"> <li>① ON for 3 minutes after the operation mode is switched from COOL or DRY to another operation mode (FAN).</li> <li>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.</li> </ol>					
	<p>2-2. Float switch control</p> <ul style="list-style-type: none"> <li>• Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF.</li> </ul> <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>	<ul style="list-style-type: none"> <li>• Same control as COOL operation</li> </ul>				
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					

## 9-4. HEAT OPERATION



### <How to operate>

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

### <Display in HEAT operation>

#### [DEFROST]

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

#### [STANDBY]

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

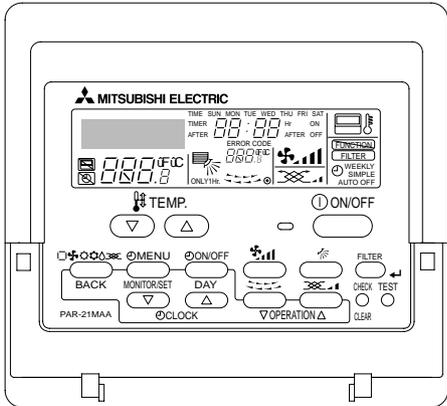
Control modes	Control details	Remarks				
1. Thermostat function	<p>1-1. Thermostat function (Function to prevent restarting for 3 minutes)</p> <ul style="list-style-type: none"> <li>• Room temperature <math>\leq</math> desired temperature -2°F ...Thermo ON</li> <li>• Room temperature <math>\geq</math> desired temperature ...Thermo OFF</li> </ul>					
2. Fan	<p>By the remote controller setting (switch of 4 speeds+Auto)</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Type</th> <th>Fan speed notch</th> </tr> </thead> <tbody> <tr> <td>4 speeds + Auto type</td> <td>[Low], [Med2], [Med1], [High], [Auto]</td> </tr> </tbody> </table> <p>When [Auto] is set, fan speed is changed depending on the value of: Desired temperature - Room temperature Give priority to under-mentioned controlled mode</p> <p>2-1. Hot adjust mode 2-2. Preheating exclusion mode 2-3. Thermo OFF mode (When the compressor off by the thermostat) 2-4. Cool air prevention mode (Defrosting mode)</p>	Type	Fan speed notch	4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]	
Type	Fan speed notch					
4 speeds + Auto type	[Low], [Med2], [Med1], [High], [Auto]					
	<p>2-1. Hot adjust mode</p> <p>The fan controller becomes the hot adjuster mode for the following conditions.</p> <ol style="list-style-type: none"> <li>① When starting the HEAT operation</li> <li>② When the thermostat function changes from OFF to ON.</li> <li>③ When release the HEAT defrosting operation</li> </ol> <div style="text-align: center;"> </div> <p>A: Hot adjust mode starts. B: 5 minutes have passed since the condition A or the indoor liquid pipe temperature turned 95°F or more. C: 2 minutes have passed since the condition A. (Terminating the hot adjust mode)</p>	*1 "STAND BY" will be displayed during the hot adjust mode.				
	<p>2-2. Preheating exclusion mode</p> <p>When the condition changes the auxiliary heater ON to OFF (thermostat or operation stop, etc), the indoor fan operates in [Low] mode for 1 minute.</p>	• This control is same for the model without auxiliary heater.				

To be continued on the next page.

**From the preceding page**

Control modes	Control details	Remarks
2. Fan	2-3. Thermo OFF mode When the thermostat function changes to OFF, the indoor fan operates in [Extra low].	
	2-4. Heat defrosting mode The indoor fan stops.	
3. Drain pump	3-1. Drain pump control The drain pump turns ON for the specified amount of time when any of the following conditions is met: 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.	
	3-2. 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.	• Same control as COOL operation
4. Vane control (Up/down vane change)	(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] (2) Vane position: Horizontal →Downward A →Downward B →Downward C→Downward D→Swing→Auto ↑ (3) Restriction of vane position ① The vane is horizontally fixed for the following modes. (The control by the remote controller is temporally invalidated and control by the unit.) •Thermo OFF •Hot adjust [Extra low] mode •Heat defrost mode	

## 9-5. AUTO OPERATION [AUTOMATIC COOL/HEAT CHANGE OVER OPERATION]



### <How to operate>

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

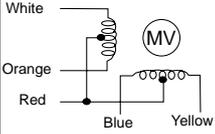
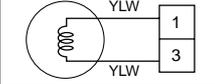
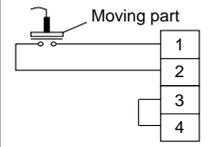
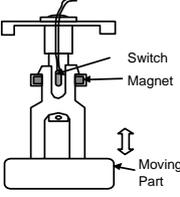
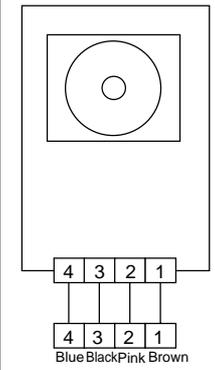
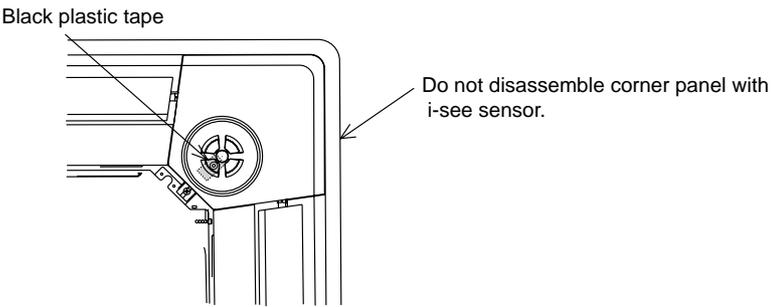
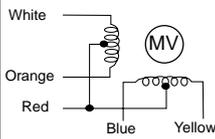
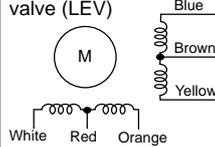
Control modes	Control details	Remarks
1. Initial value of operation mode	HEAT mode for room temperature < Desired temperature COOL mode for room temperature ≥ Desired temperature	
2. Mode change	(1) HEAT mode → COOL mode Room temperature ≥ Desired temperature + 3°F. or 3 min. has passed (2) COOL mode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

## 9-6. WHEN UNIT IS STOPPED CONTROL MODE

Control modes	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 is met: 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.	• Same control as COOL operation

10-1. HOW TO CHECK THE PARTS  
 PLFY-P12/15/18/24/30/36NBMU-E  
 PLFY-P12/15/18/24/30/36NBMU-ER2

PLFY-P12/15/18/24/30/36NBMU-ER1

Parts name	Check points														
Room temperature thermistor (TH21) Liquid pipe thermistor (TH22) Gas pipe thermistor (TH23)	Disconnect the connector then measure the resistance with a tester. (At the ambient temperature 50°F~86°F) <table border="1" data-bbox="336 457 831 520"> <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 a detail.)	Normal	Abnormal	4.3kΩ~9.6kΩ	Open or short										
Normal	Abnormal														
4.3kΩ~9.6kΩ	Open or short														
Vane motor (MV) 	Measure the resistance between the terminals with a tester. (At the ambient temperature of 68°F~86°F) <table border="1" data-bbox="336 596 1058 730"> <tr> <th>Connector</th> <th>Normal</th> <th>Abnormal</th> </tr> <tr> <td>Red - Yellow</td> <td rowspan="4">300Ω</td> <td rowspan="4">Open or short</td> </tr> <tr> <td>Red - Blue</td> </tr> <tr> <td>Red - Orange</td> </tr> <tr> <td>Red - White</td> </tr> </table>	Connector	Normal	Abnormal	Red - Yellow	300Ω	Open or short	Red - Blue	Red - Orange	Red - White					
Connector	Normal	Abnormal													
Red - Yellow	300Ω	Open or short													
Red - Blue															
Red - Orange															
Red - White															
Drain pump (DP) (Option) 	Measure the resistance between the terminals with a tester. (Winding temperature 68°F) <table border="1" data-bbox="336 806 831 869"> <tr> <th>Normal</th> <th>Abnormal</th> </tr> <tr> <td>290Ω</td> <td>Open or short</td> </tr> </table>	Normal	Abnormal	290Ω	Open or short										
Normal	Abnormal														
290Ω	Open or short														
Drain float switch (FS) (Option) 	Measure the resistance between the terminals using a tester. <table border="1" data-bbox="336 940 1034 1031"> <tr> <th>State of moving part</th> <th>Normal</th> <th>Abnormal</th> </tr> <tr> <td>UP</td> <td>Short</td> <td>Other than short</td> </tr> <tr> <td>DOWN</td> <td>Open</td> <td>Other than open</td> </tr> </table> 	State of moving part	Normal	Abnormal	UP	Short	Other than short	DOWN	Open	Other than open					
State of moving part	Normal	Abnormal													
UP	Short	Other than short													
DOWN	Open	Other than open													
i-see sensor (Option) 	Turn on the indoor unit with black plastic tape on the outside of the i-see sensor controller board. With electricity being turned on, measure the power voltage between connectors with a tester. The i-see sensor rotates, and pull out the connector of motor for the i-see sensor.  i-see sensor (At the ambient temperature of 50°F~104°F) <table border="1" data-bbox="336 1514 1219 1591"> <tr> <th>i-see sensor connector</th> <th>Normal</th> <th>Abnormal</th> </tr> <tr> <td>②(-)—①(+)</td> <td>DC 1.857V~ 3.132V</td> <td>Other than the normal</td> </tr> <tr> <td>①(+)—②(-)</td> <td>DC 0.939V~ 1.506V</td> <td>Other than the normal</td> </tr> </table> NOTE : Be careful when handling static electricity.	i-see sensor connector	Normal	Abnormal	②(-)—①(+)	DC 1.857V~ 3.132V	Other than the normal	①(+)—②(-)	DC 0.939V~ 1.506V	Other than the normal					
i-see sensor connector	Normal	Abnormal													
②(-)—①(+)	DC 1.857V~ 3.132V	Other than the normal													
①(+)—②(-)	DC 0.939V~ 1.506V	Other than the normal													
i-see sensor motor (MT) (Option) 	Measure the resistance between the terminals with a tester. (At the ambient temperature of 68°F~86°F) <table border="1" data-bbox="336 1675 1058 1801"> <tr> <th>Connector</th> <th>Normal</th> <th>Abnormal</th> </tr> <tr> <td>Red - Yellow</td> <td rowspan="4">250Ω</td> <td rowspan="4">Open or short</td> </tr> <tr> <td>Red - Blue</td> </tr> <tr> <td>Red - Orange</td> </tr> <tr> <td>Red - White</td> </tr> </table>	Connector	Normal	Abnormal	Red - Yellow	250Ω	Open or short	Red - Blue	Red - Orange	Red - White					
Connector	Normal	Abnormal													
Red - Yellow	250Ω	Open or short													
Red - Blue															
Red - Orange															
Red - White															
Linear expansion valve (LEV) 	Disconnect the connector then measure the resistance valve with a tester. <table border="1" data-bbox="336 1871 1171 1969"> <tr> <th colspan="4">Normal</th> <th>Abnormal</th> </tr> <tr> <td>White-Red</td> <td>Yellow-Brown</td> <td>Orange-Red</td> <td>Blue-Brown</td> <td rowspan="2">Open or short</td> </tr> <tr> <td colspan="4">200Ω ±10%</td> </tr> </table> Refer to 7-1-2.	Normal				Abnormal	White-Red	Yellow-Brown	Orange-Red	Blue-Brown	Open or short	200Ω ±10%			
Normal				Abnormal											
White-Red	Yellow-Brown	Orange-Red	Blue-Brown	Open or short											
200Ω ±10%															

## 10-1-1. Thermistor

<Thermistor characteristic graph>

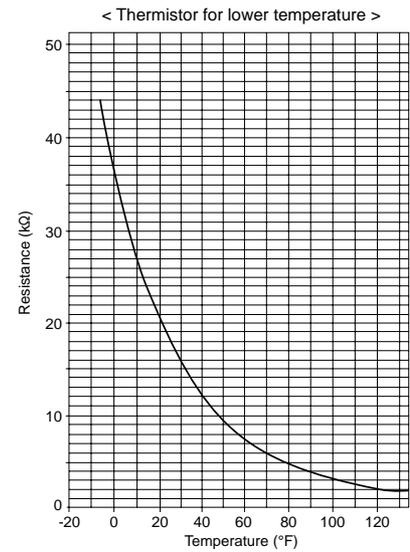
Thermistor for lower temperature

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

Thermistor  $R_0=15k\Omega \pm 3\%$   
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	15.8kΩ
50°F	9.6kΩ
70°F	6.0kΩ
80°F	4.8kΩ
90°F	3.9kΩ
100°F	3.2kΩ

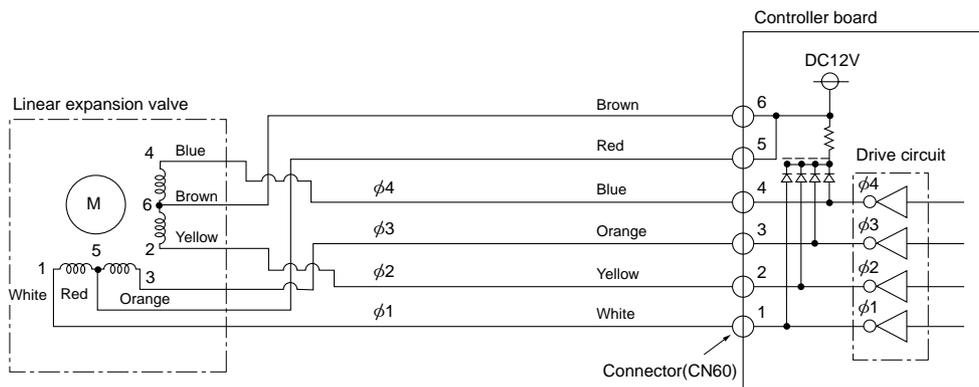


## 10-1-2. Linear expansion valve

① Operation summary of the linear expansion valve

- Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
- Valve position can be changed in proportion to the number of pulse signals.

<Connection between the indoor controller board and the linear expansion valve>



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>

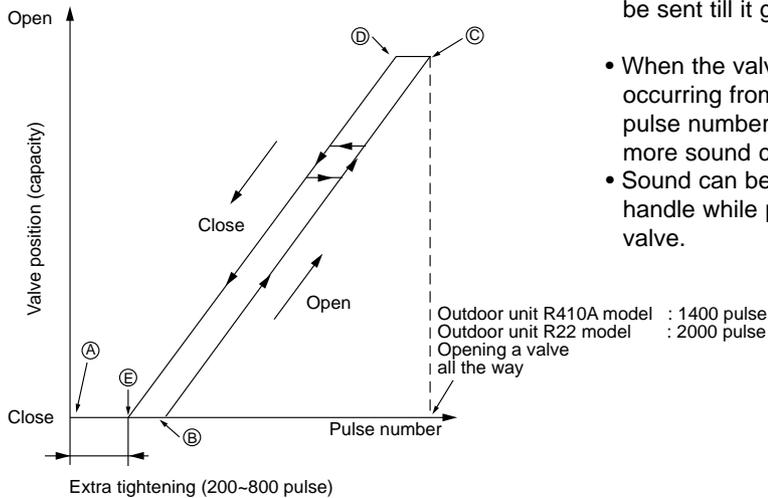
Output (Phase)	Output			
	1	2	3	4
φ1	ON	OFF	OFF	ON
φ2	ON	ON	OFF	OFF
φ3	OFF	ON	ON	OFF
φ4	OFF	OFF	ON	ON

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

**Note:**

- When linear expansion valve operation stops, all output phase become OFF.
- At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will lock and vibrate.
- When the switch is turned on, 2200 pulse closing valve signal will be sent till it goes to point ㉔ in order to define the valve position.
- When the valve moves smoothly, there is no sound or vibration occurring from the linear expansion valves, however, when the pulse number moves from ㉔ to ㉓ or when the valve is locked, more sound can be heard than in a normal situation.
- Sound can be detected by placing the ear against the screw driver 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 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) with a tester. It is normal if the resistance is in the range of 150Ω ±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.

### 10-1-3. DC Fan motor (fan motor/indoor controller board)

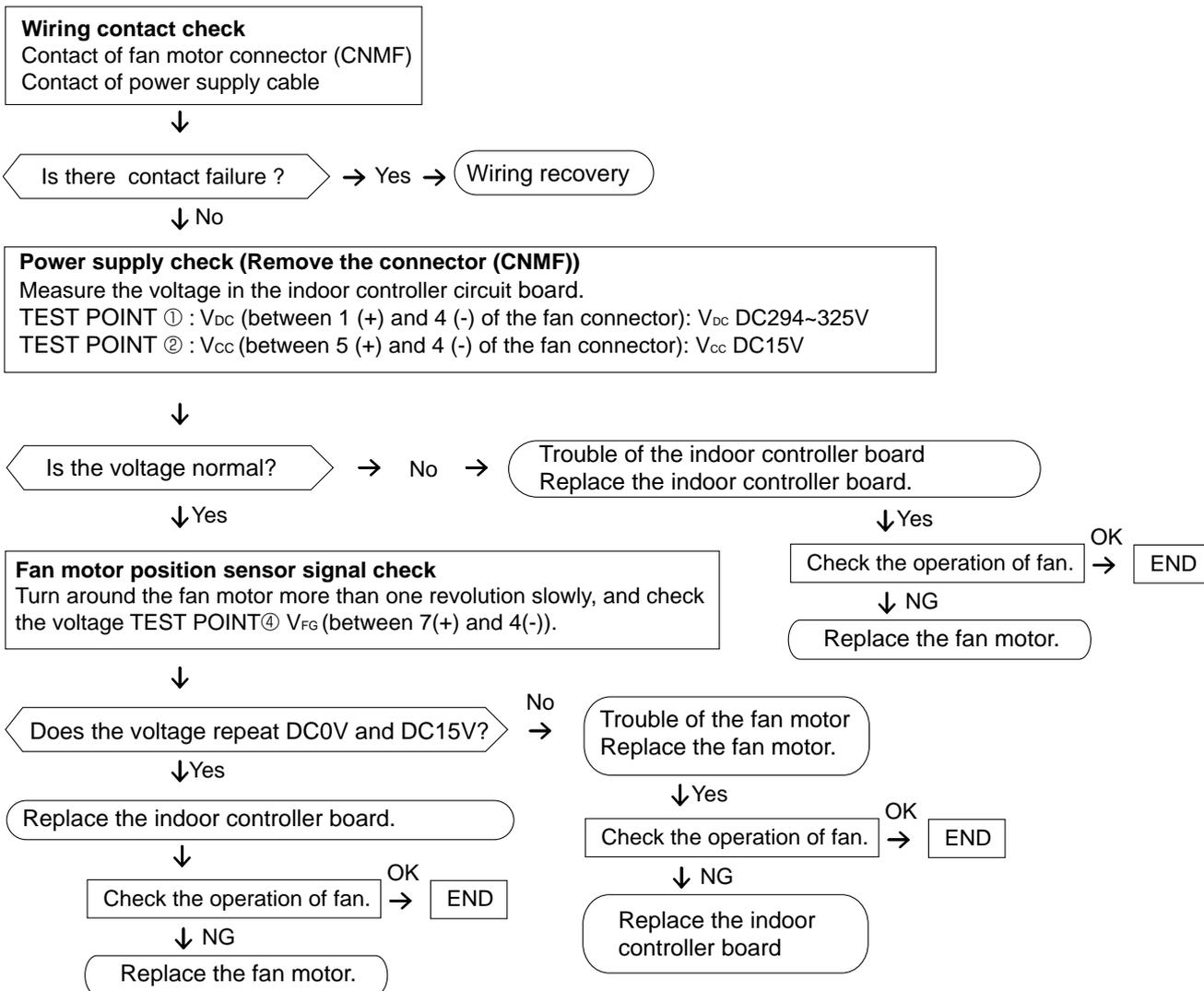
Check method of indoor fan motor (fan motor/indoor controller board)

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)

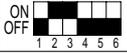
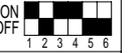
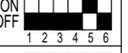
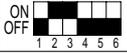
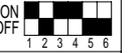
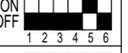
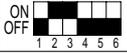
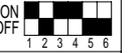
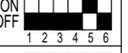
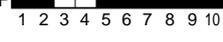
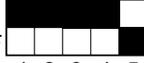
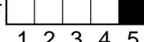
② Self check

Conditions : The indoor fan cannot turn around.



## 10-2. FUNCTION OF DIP SWITCH

The black square (■) indicates a switch position.

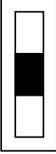
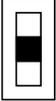
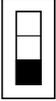
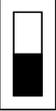
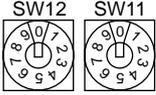
Switch	Pole	Function	Operation by switch		Effective timing	Remarks															
			ON	OFF																	
SW1 Function setting	1	Thermistor <Room temperature detection> position	Built-in remote controller	Indoor unit	Under suspension	<div style="border: 1px solid black; padding: 2px;">Address board</div> <div style="border: 1px solid black; padding: 2px;">&lt;Initial setting&gt;</div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">ON</div>  </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">OFF</div>  </div> <p>Note :</p> <ul style="list-style-type: none"> <li>*1 Fan operation at Heating mode</li> <li>*2 Heating thermo ON is operating.</li> </ul> <p>*3</p> <table border="1" style="font-size: small;"> <tr> <td>SW1-7</td> <td>SW1-8</td> <td></td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>Extra low</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Low</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Setting air flow</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Stop</td> </tr> </table>	SW1-7	SW1-8		OFF	OFF	Extra low	ON	OFF	Low	OFF	ON	Setting air flow	ON	ON	Stop
	SW1-7	SW1-8																			
	OFF	OFF	Extra low																		
	ON	OFF	Low																		
	OFF	ON	Setting air flow																		
	ON	ON	Stop																		
	2	Filter clogging detection	Provided	Not provided																	
	3	Filter cleaning	2,500hr	100hr																	
	4	Fresh air intake	Effective	Not effective																	
	5	Switching remote display	Thermo ON signal display	Indicating fan operation ON/OFF																	
6	Humidifier control	Always operated while the heat in ON *1	Operated depends on the condition *2																		
7	Air flow set in case of Heat thermo OFF	Low *3	Extra low *3																		
8		Setting air flow *3	Depends on SW1-7																		
9	Auto restart function	Effective	Not effective																		
10	Power ON/OFF by breaker	Effective	Not effective																		
SW2 Capacity code setting	1~6	<table border="1" style="font-size: x-small; width: 100%;"> <tr> <th>MODELS</th> <th>SW2</th> <th>MODELS</th> <th>SW2</th> </tr> <tr> <td>P12</td> <td>ON OFF </td> <td>P24</td> <td>ON OFF </td> </tr> <tr> <td>P15</td> <td>ON OFF </td> <td>P30</td> <td>ON OFF </td> </tr> <tr> <td>P18</td> <td>ON OFF </td> <td>P36</td> <td>ON OFF </td> </tr> </table>	MODELS	SW2	MODELS	SW2	P12	ON OFF 	P24	ON OFF 	P15	ON OFF 	P30	ON OFF 	P18	ON OFF 	P36	ON OFF 		Before power supply ON	<div style="border: 1px solid black; padding: 2px;">Indoor controller board</div> <div style="border: 1px solid black; padding: 2px;">&lt;Initial setting&gt;</div> <p>Set for each capacity.</p>
MODELS	SW2	MODELS	SW2																		
P12	ON OFF 	P24	ON OFF 																		
P15	ON OFF 	P30	ON OFF 																		
P18	ON OFF 	P36	ON OFF 																		
SW3 Function setting	1	Heat pump/Cooling only	Cooling only	Heat pump	Under suspension	<div style="border: 1px solid black; padding: 2px;">Indoor controller board</div> <div style="border: 1px solid black; padding: 2px;">&lt;Initial setting&gt;</div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">ON</div>  </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">OFF</div>  </div> <p>Note :</p> <ul style="list-style-type: none"> <li>*4 SW3-5,6</li> <li>*5 Please do not use SW-3-9,10 as trouble might be caused by the usage condition.</li> </ul>															
	2	Louver/Humidifier	Available	Not available																	
	3	Vane	Available	Not available																	
	4	Vane swing function in heating (wave-flow)	Available	Not available																	
	5	Vane horizontal angle ①	Second setting *4	First setting *4																	
	6	Vane horizontal angle ②	Third setting *4	Depends on SW3-5																	
	7	Changing the opening of linear expansion valve	Effective	Not effective																	
	8	Sensible temperature correction	Not effective	Effective																	
	9	Superheat setting temperature *5	—	—																	
	10	Sub cool setting temperature *5	—	—																	
SW4 Model Selection (Setting for PLFY series)	1~5	<div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">ON</div>  </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">OFF</div>  </div>		Before power supply ON	<div style="border: 1px solid black; padding: 2px;">Indoor controller board</div>																

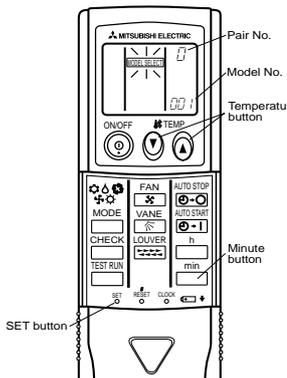
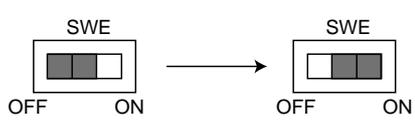
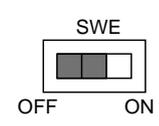
Note : \*4 SW3-5,6

SW3-5	SW3-6	Vane setting	Initial setting	Setting	Vane position
OFF	OFF	Set up ①	●	Standard	Standard
ON	OFF	Set up ②		Less draft *	Upward position than the standard
OFF	ON	Set up ③		Less smudging	Downward position than the standard
ON	ON	unused		—	—

\* Be careful of the smudge on ceiling.

The black square (■) indicates a switch position.

Switch	Pole	Operation by switch	Effective timing	Remarks																				
SWA Ceiling height selector	1~3	<p>(High ceiling) 3</p> <p>(Standard) 2</p> <p>(Silent) 1</p>  <p>* Ceiling height can be changed depending on SWB setting.</p> <p>PLFY-P12.P15-P18-P24-P30NBMU-E PLFY-P12.P15-P18-P24-P30NBMU-ER1 PLFY-P12.P15-P18-P24-P30NBMU-ER2</p> <table border="1"> <thead> <tr> <th>SWA</th> <th>①</th> <th>②</th> <th>③</th> </tr> </thead> <tbody> <tr> <td>SWB</td> <td>Silent</td> <td>Standard</td> <td>High ceiling</td> </tr> <tr> <td>④ 4 direction</td> <td>2.5m, 8.2ft</td> <td>2.7m, 8.9ft</td> <td>3.5m, 11.5ft</td> </tr> <tr> <td>③ 3 direction</td> <td>2.7m, 8.9ft</td> <td>3.0m, 9.8ft</td> <td>3.5m, 11.5ft</td> </tr> <tr> <td>② 2 direction</td> <td>3.0m, 9.8ft</td> <td>3.3m, 10.8ft</td> <td>3.5m, 11.5ft</td> </tr> </tbody> </table>	SWA	①	②	③	SWB	Silent	Standard	High ceiling	④ 4 direction	2.5m, 8.2ft	2.7m, 8.9ft	3.5m, 11.5ft	③ 3 direction	2.7m, 8.9ft	3.0m, 9.8ft	3.5m, 11.5ft	② 2 direction	3.0m, 9.8ft	3.3m, 10.8ft	3.5m, 11.5ft	Under operation or suspension	<p>Address board</p> <p>&lt;Initial setting&gt;</p> 
SWA	①	②	③																					
SWB	Silent	Standard	High ceiling																					
④ 4 direction	2.5m, 8.2ft	2.7m, 8.9ft	3.5m, 11.5ft																					
③ 3 direction	2.7m, 8.9ft	3.0m, 9.8ft	3.5m, 11.5ft																					
② 2 direction	3.0m, 9.8ft	3.3m, 10.8ft	3.5m, 11.5ft																					
SWB Discharge outlet number selector	3	<p>(2 direction) 2</p> <p>(3 direction) 3</p> <p>(4 direction) 4</p>  <p>PLFY-P36NBMU-E PLFY-P36NBMU-ER1 PLFY-P36NBMU-ER2</p> <table border="1"> <thead> <tr> <th>SWA</th> <th>①</th> <th>②</th> <th>③</th> </tr> </thead> <tbody> <tr> <td>SWB</td> <td>Silent</td> <td>Standard</td> <td>High ceiling</td> </tr> <tr> <td>④ 4 direction</td> <td>2.7m, 8.9ft</td> <td>3.2m, 10.5ft</td> <td>4.5m, 14.8ft</td> </tr> <tr> <td>③ 3 direction</td> <td>3.0m, 9.8ft</td> <td>3.6m, 11.8ft</td> <td>4.5m, 14.8ft</td> </tr> <tr> <td>② 2 direction</td> <td>3.3m, 10.8ft</td> <td>4.0m, 13.1ft</td> <td>4.5m, 14.8ft</td> </tr> </tbody> </table>	SWA	①	②	③	SWB	Silent	Standard	High ceiling	④ 4 direction	2.7m, 8.9ft	3.2m, 10.5ft	4.5m, 14.8ft	③ 3 direction	3.0m, 9.8ft	3.6m, 11.8ft	4.5m, 14.8ft	② 2 direction	3.3m, 10.8ft	4.0m, 13.1ft	4.5m, 14.8ft	<p>Address board</p> <p>&lt;Initial setting&gt;</p> 	
SWA	①	②	③																					
SWB	Silent	Standard	High ceiling																					
④ 4 direction	2.7m, 8.9ft	3.2m, 10.5ft	4.5m, 14.8ft																					
③ 3 direction	3.0m, 9.8ft	3.6m, 11.8ft	4.5m, 14.8ft																					
② 2 direction	3.3m, 10.8ft	4.0m, 13.1ft	4.5m, 14.8ft																					
SWC Option selector	2	<p>② オフ (Option)</p> <p>① 標 (Standard)</p>  <p>When attaching the optional high performance filter elements (multi function casement) to the unit, be sure to attach it to the option side in order to prevent the airflow reducing.</p>	<p>Address board</p> <p>&lt;Initial setting&gt;</p> <p>② オフ</p> <p>① 標</p> 																					
SW11 1s digit address setting SW12 10ths digit address setting	Rotary switch	  <p>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".</p>	Before power supply ON	<p>Address board</p> <p>&lt;Initial setting&gt;</p> 																				
SW14 Branch No. setting	Rotary switch	 <p>How to set branch number SW14 (Series R2 only) Match the indoor unit's refrigerant pipe with the BC controller's end connection number Remain other than series R2 at "0".</p>		<p>Address board</p> <p>&lt;Initial setting&gt;</p> 																				

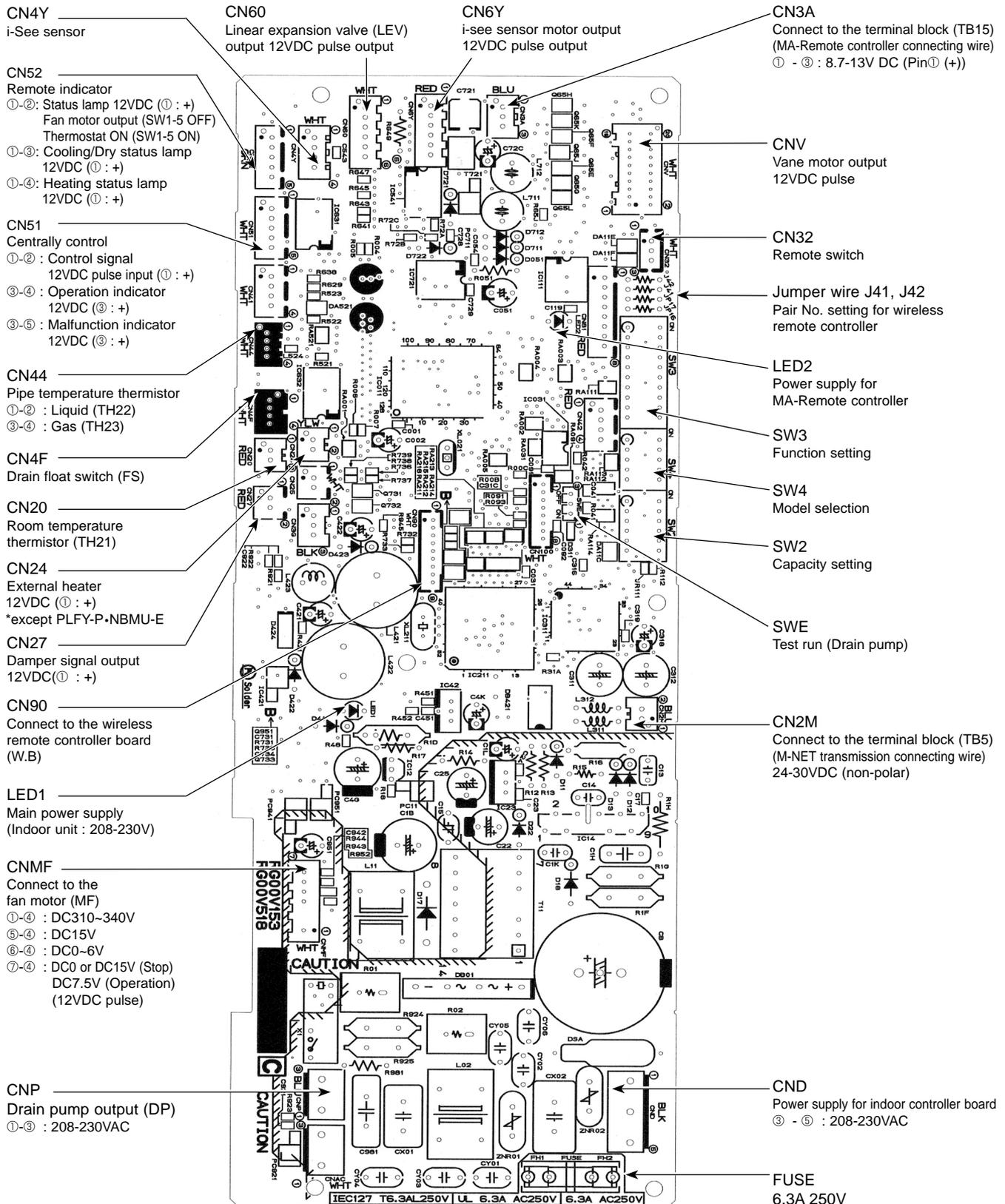
Switch	Pole	Operation by switch	Effective timing	Remarks																											
J41, J42 Wireless remote controller Pair No.	Jumper	<ul style="list-style-type: none"> <li>To operate each indoor unit by each remote controller when installed 2 indoor units or more are near, Pair No. setting is necessary.               <ol style="list-style-type: none"> <li>Pair No. setting is available with the 4 patterns (Setting patters A to D).</li> <li>Make setting for J41, J42 of indoor controller board and the Pair No. of wireless remote controller.</li> </ol> </li> <li>You may not set it when operating it by one remote controller.               <ol style="list-style-type: none"> <li>Setting for indoor unit Jumper wire J41, J42 on the indoor controller board are cut according to the table below.</li> <li>Wireless remote controller Pair No.: Setting operation                   <ol style="list-style-type: none"> <li>Press the SET button (using a pointed implement). Check that the remote controller's display has stopped before continuing. MODEL SELECT blinks, and the model No. (3 digits) appears (steadily-lit).</li> <li>Press the MINUTE button twice. The pair number appears flashing.</li> <li>Press the temperature <math>\odot</math> <math>\ominus</math> buttons to select the pair number to set.</li> <li>Press the SET button (using a pointed implement). The set Pair No. is displayed (steadily-lit) for 3 seconds, then disappears.</li> </ol> </li> </ol> </li> </ul> <table border="1" style="margin: 10px auto;"> <thead> <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> </thead> <tbody> <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> </tbody> </table> <p>* Pair No.4-9 of wireless remote controller is setting pattern D.</p>	Setting pattern	Indoor controller Jumper wire		Pair No. of wireless remote controller *		J41	J42	A	—	—	0	Initial setting	B	Cut	—	1	—	C	—	Cut	2	—	D	Cut	Cut	3	—	Under operation or suspension	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-bottom: 10px;">Indoor controller board</div> <p style="text-align: center;">&lt;Initial setting&gt; Pattern A</p> 
Setting pattern	Indoor controller Jumper wire			Pair No. of wireless remote controller *																											
	J41	J42																													
A	—	—	0	Initial setting																											
B	Cut	—	1	—																											
C	—	Cut	2	—																											
D	Cut	Cut	3	—																											
SWE Test run for Drain pump	Connector	<p>Drain pump and fan are activated simultaneously after the connector SWE is set to ON and turn ON the power.</p> <div style="text-align: center;">  </div> <p>The connector SWE is set to OFF after test run.</p>	Under operation	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-bottom: 10px;">Indoor controller board</div> <p style="text-align: center;">&lt;Initial setting&gt;</p> <div style="text-align: center;">  </div>																											

# 10-3. TEST POINT DIAGRAM

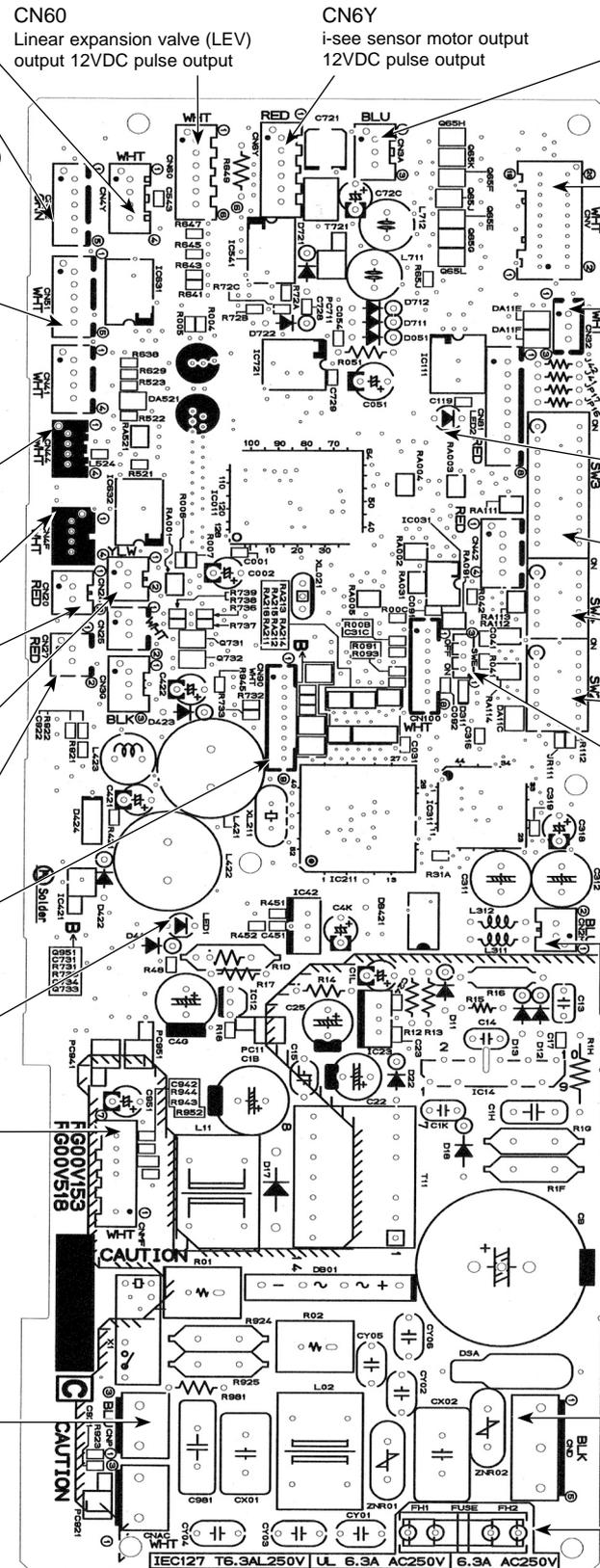
## 10-3-1. Indoor controller board

PLFY-P12/15/18/24/30/36NBMU-E  
 PLYF-P12/15/18/24/30/36NBMU-ER2

PLFY-P12/15/18/24/30/36NBMU-ER1



- CN4Y i-See sensor
- 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: +)
- CN51 Centrally control  
 ①-②: Control signal  
 12VDC pulse input (①: +)  
 ③-④: Operation indicator  
 12VDC (③: +)  
 ③-⑤: Malfunction indicator  
 12VDC (③: +)
- CN44 Pipe temperature thermistor  
 ①-②: Liquid (TH22)  
 ③-④: Gas (TH23)
- CN4F Drain float switch (FS)
- CN20 Room temperature thermistor (TH21)
- CN24 External heater  
 12VDC (①: +)  
 \*except PLYF-P-NBMU-E
- CN27 Damper signal output  
 12VDC(①: +)
- CN90 Connect to the wireless  
 remote controller board  
 (W.B)
- LED1 Main power supply  
 (Indoor unit : 208-230V)
- CNMF Connect to the  
 fan motor (MF)  
 ①-④ : DC310~340V  
 ⑤-④ : DC15V  
 ⑥-④ : DC0~6V  
 ⑦-④ : DC0 or DC15V (Stop)  
 DC7.5V (Operation)  
 (12VDC pulse)
- CNP Drain pump output (DP)  
 ①-③ : 208-230VAC



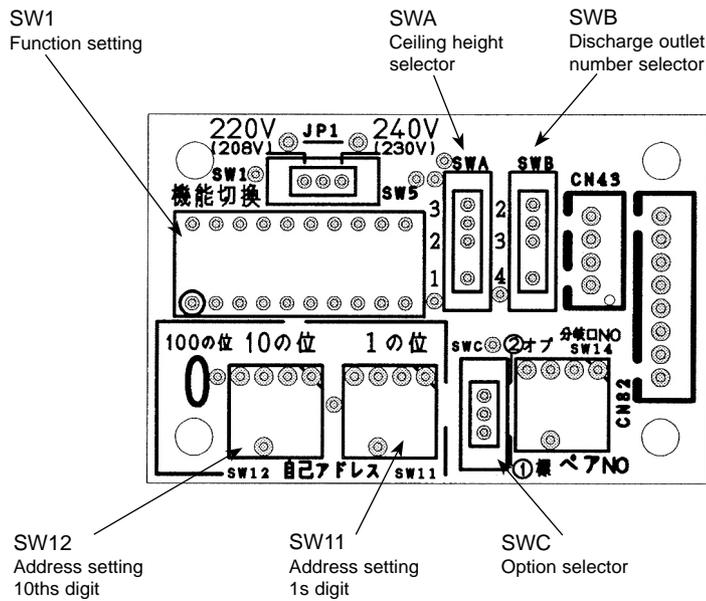
- CN3A Connect to the terminal block (TB15)  
 (MA-Remote controller connecting wire)  
 ① - ③ : 8.7-13V DC (Pin① (+))
- CNV Vane motor output  
 12VDC pulse
- CN32 Remote switch
- Jumper wire J41, J42  
 Pair No. setting for wireless  
 remote controller
- LED2 Power supply for  
 MA-Remote controller
- SW3 Function setting
- SW4 Model selection
- SW2 Capacity setting
- SWE Test run (Drain pump)
- CN2M Connect to the terminal block (TB5)  
 (M-NET transmission connecting wire)  
 24-30VDC (non-polar)
- CN2 Power supply for indoor controller board  
 ③ - ⑤ : 208-230VAC
- FUSE 6.3A 250V

10-3-2. Circuit board

PLFY-P12/15/18/24/30/36NBMU-E

PLFY-P12/15/18/24/30/36NBMU-ER1

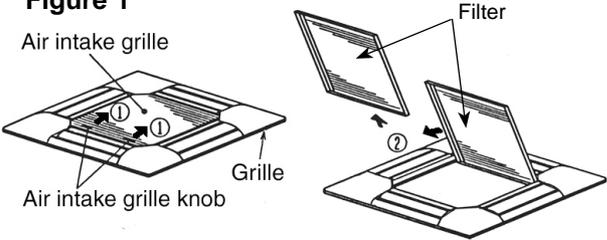
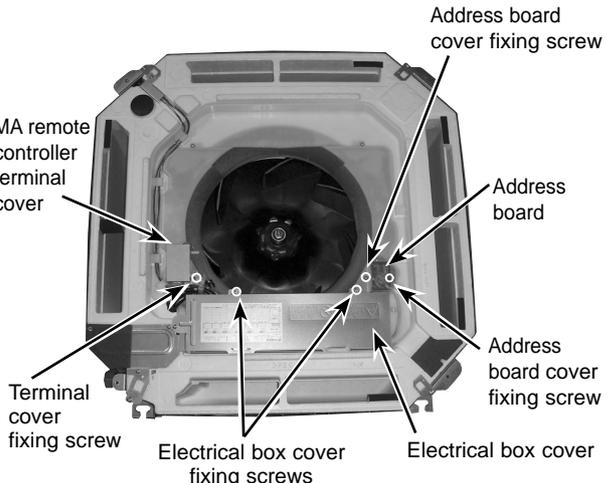
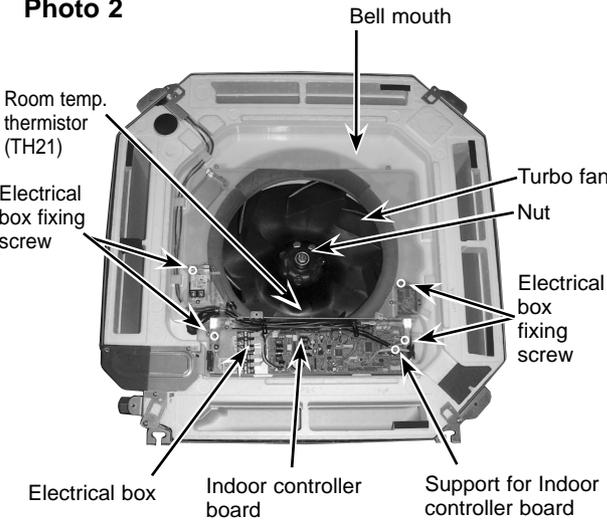
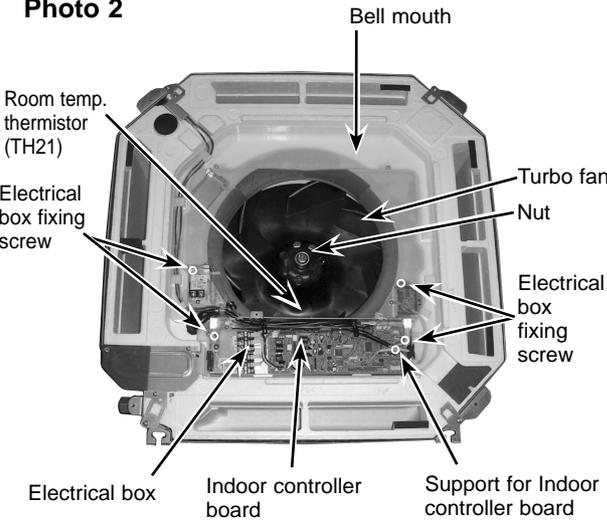
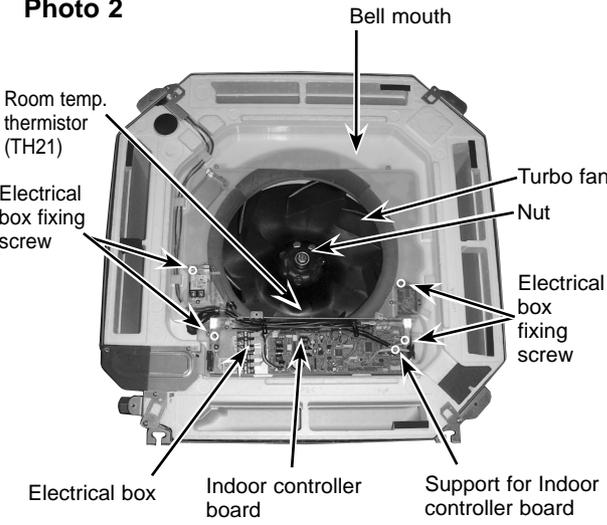
PLFY-P12/15/18/24/30/36NBMU-ER2



PLFY-P12/15/18/24/30/36NBMU-E  
PLFY-P12/15/18/24/30/36NBMU-ER2

PLFY-P12/15/18/24/30/36NBMU-ER1

Be careful when removing heavy parts.

OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
<p><b>1. Removing the air intake grille</b></p> <ol style="list-style-type: none"> <li>(1) Slide the knob of air intake grille toward the arrow ① to open the air intake grille.</li> <li>(2) Remove drop prevention hook from the panel.</li> <li>(3) Slide the shaft in the hinge to the direction of the arrow ② and remove the air intake grille.</li> </ol>	<p><b>Figure 1</b></p>  <p>Air intake grille knob, Air intake grille, Grille, Filter</p>
<p><b>2. Removing the room temperature thermistor (TH21)</b></p> <ol style="list-style-type: none"> <li>(1) Remove the air intake grille and the filter. (See Figure 1)</li> <li>(2) Remove the 2 screws from the electrical box cover.</li> <li>(3) Disconnect the connector CN20 (Red) from the indoor controller board.</li> <li>(4) Remove the room temperature thermistor.</li> </ol>	<p><b>Photo 1</b></p>  <p>MA remote controller terminal cover, Address board cover fixing screw, Address board, Address board cover fixing screw, Terminal cover fixing screw, Electrical box cover fixing screws, Electrical box cover</p>
<p><b>3. Removing the address board (A.B)</b></p> <ol style="list-style-type: none"> <li>(1) Remove the air intake grille and the filter. (See Figure 1)</li> <li>(2) Remove the 2 screws from the address board cover.</li> <li>(3) Disconnect the connectors CN43 (RED/4P) and CN82 (RED/8P).</li> <li>(4) Slide and remove the address board.</li> </ol>	<p><b>Photo 2</b></p>  <p>Bell mouth, Room temp. thermistor (TH21), Turbo fan, Nut, Electrical box fixing screw, Electrical box, Indoor controller board, Support for Indoor controller board</p>
<p><b>4. Removing the indoor controller board (I.B)</b></p> <ol style="list-style-type: none"> <li>(1) Remove the air intake grille and the filter. (See Figure 1)</li> <li>(2) Remove the 2 screws from the electrical box cover.</li> <li>(3) Disconnect the connectors : <ul style="list-style-type: none"> <li>CNMF (White/7P) for fan motor</li> <li>CN44 (White/4P) for thermistor (TH22/TH23)</li> <li>CNP (Blue/3P) for drain pump</li> <li>CN4F (White/4P) for float switch</li> <li>CND (Black/5P) for earth and TB2</li> <li>CNV (White/20P) for vane motor</li> <li>CN81, CN42 (Red/8P, 4P) for address board</li> <li>CN2M (Blue/2P) for TB5</li> <li>CN3A (Blue/3P) for TB15</li> </ul> </li> <li>(4) Remove the 6 supports from indoor controller board.</li> <li>(5) Remove the indoor controller board.</li> </ol>	<p><b>Photo 2</b></p>  <p>Bell mouth, Room temp. thermistor (TH21), Turbo fan, Nut, Electrical box fixing screw, Electrical box, Indoor controller board, Support for Indoor controller board</p>
<p><b>5. Removing the electrical box</b></p> <ol style="list-style-type: none"> <li>(1) Remove the air intake grille and the filter. (See Figure 1)</li> <li>(2) Remove the 2 screws from the electrical box cover.</li> <li>(3) Disconnect the connectors. (Refer to procedure 4)</li> <li>(4) Remove 4 electrical box fixing screws and remove 2 hooks.</li> <li>(5) Pull the electrical box.</li> </ol> <p>&lt;Electrical parts in the electrical box&gt;</p> <ul style="list-style-type: none"> <li>Indoor controller board</li> <li>Terminal block (TB2) (TB5)</li> </ul>	<p><b>Photo 2</b></p>  <p>Bell mouth, Room temp. thermistor (TH21), Turbo fan, Nut, Electrical box fixing screw, Electrical box, Indoor controller board, Support for Indoor controller board</p>

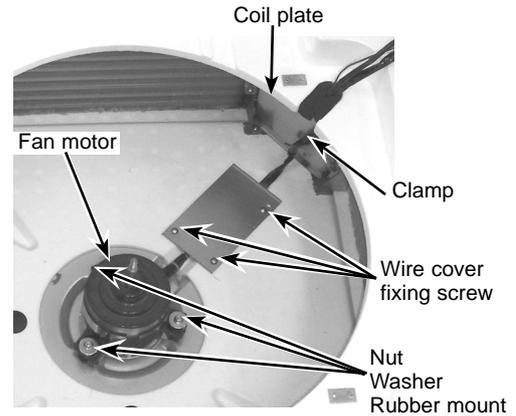
## OPERATING PROCEDURE

## PHOTOS & ILLUSTRATIONS

### 6. Removing the fan and fan motor (MF)

- (1) Remove the electrical box. (See Photo 2)
- (2) Remove the bell mouth (3 screws). (See Photo 2)
- (3) Remove the turbo fan nut.
- (4) Pull out the turbo fan.
- (5) Remove the wire cover (3 screws).
- (6) Remove 2 wiring clamps.
- (7) Disconnect the connector of the fan motor (CNMF).
- (8) Remove the 3 nuts and washers and rubber mounts of the fan motor.

Photo 3



### 7. Removing the panel

- (1) Remove the air intake grille and the filter. (See Figure 1)
  - (2) Disconnect the connector CNV (White/20P).
- Corner panel (See Figure 2)**
- (3) Remove the corner screw.
  - (4) Slide the corner panel to the direction of the arrow ①, and remove the corner panel.
- Panel (See Photo 4, 5)**
- (5) Remove the 2 screws from the panel which fixes to the oval holes.
  - (6) Rotate the panel a little to come to the bell shaped hole where the screw is large and remove the panel.

Figure 2

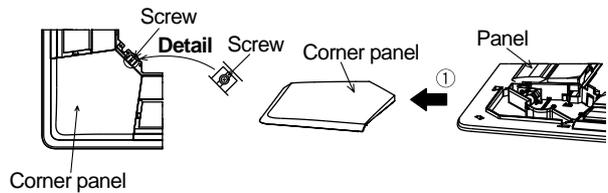
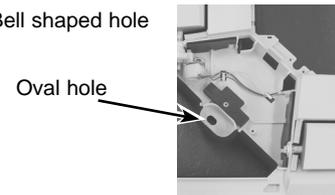


Photo 4



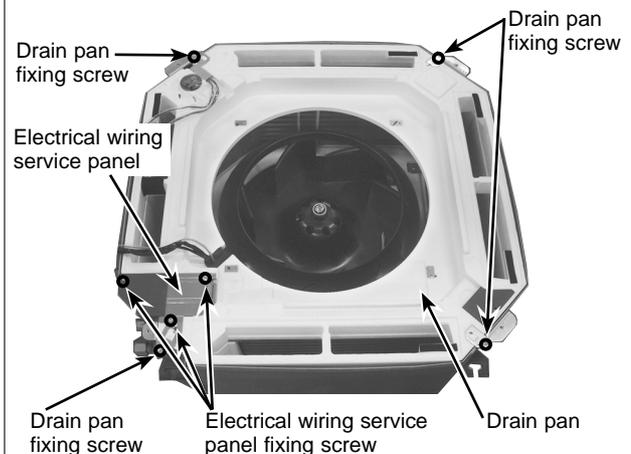
Photo 5



### 8. Removing the drain pan

- (1) Remove the air intake grille and the filter. (See Figure 1)
  - (2) Remove the 2 screws from the electrical box cover.
  - (3) Disconnect the connectors. (Refer to procedure 4)
  - (4) Remove the panel. (See Photo 4, 5)
  - (5) Remove the electrical wiring service panel (3 screws).
  - (6) Remove the electrical box. (See Photo 2)
  - (7) Remove the bell mouth. (See Photo 2)
  - (8) Remove the 4 screws and pull out the drain pan.
- \* Pull out the left and right of the pan gradually.  
Be careful not to crack or damage the pan.

Photo 6



## OPERATING PROCEDURE

### 9. Removing the liquid pipe temperature thermistor (TH22) and gas pipe temperature thermistor (TH23)

- (1) Remove the drain pan. (See Photo 6)
- (2) Remove the turbo fan. (Refer to procedure 6)
- (3) Remove the 2 wiring clamps. (See Photo 3)
- (4) Remove the coil plate (2 screws).
- (5) Remove the thermistors which are inserted into the holders installed to the thin copper pipe.
- (6) Disconnect the 4-pin white connector (CN44).

### 10 Removing the drain pump (DP) and float switch (FS)

- (1) Remove the drain pan. (See Photo 6)
- (2) Cut the hose band and remove the hose.
- (3) Remove the drain pump assembly (3 screws and 2 hooks).
- (4) Remove the drain pump (3 screws).
- (5) Remove the float switch (2 screws).

## PHOTOS & ILLUSTRATIONS

Photo 7

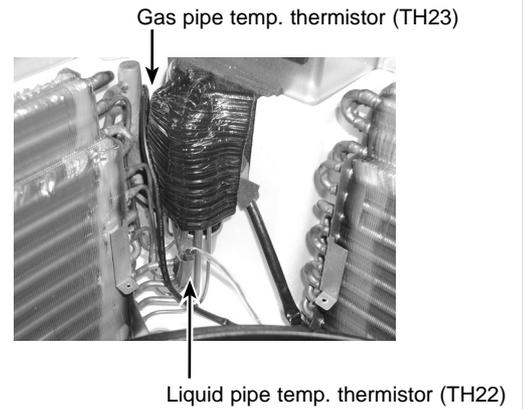


Photo 8

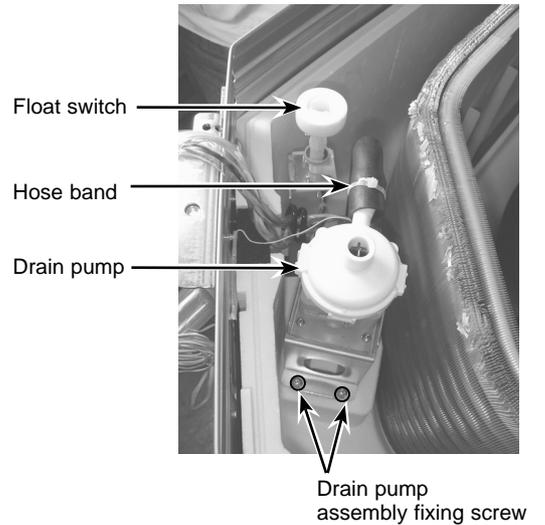
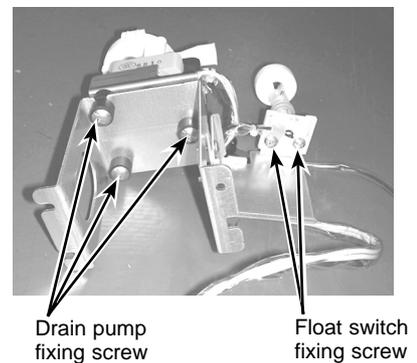


Photo 9



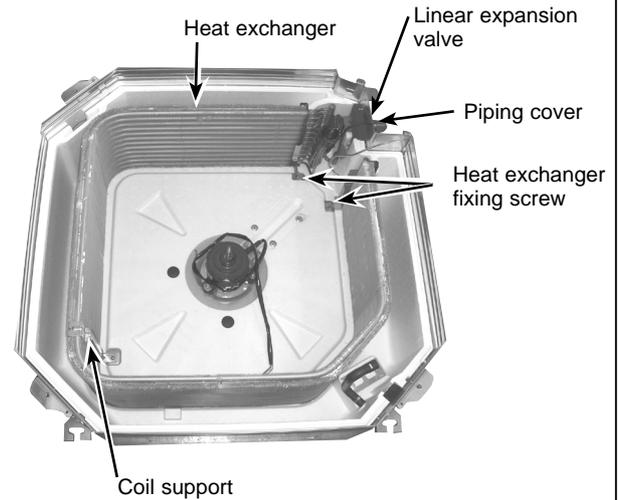
## OPERATING PROCEDURE

### 11. Removing the heat exchanger

- (1) Remove the drain pan. (See Photo 6)
- (2) Remove the 3 screws of the piping cover, and pull out piping cover.
- (3) Remove the 2 screws of coil plate.
- (4) Remove the 2 screws of the coil.
- (5) Remove the screw of the coil support.
- (6) Pull out the heat exchanger.

## PHOTOS & ILLUSTRATIONS

Photo 10



# MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU TOKYO 100-8310, JAPAN

# PARTS CATALOG

## CITY MULTI Series Ceiling Cassettes R410A / R22

**Indoor unit**

[Model names]	[Service Ref.]	
PLFY-P12NBMU-E	PLFY-P12NBMU-E PLFY-P12NBMU-ER2	PLFY-P12NBMU-ER1
PLFY-P15NBMU-E	PLFY-P15NBMU-E PLFY-P15NBMU-ER2	PLFY-P15NBMU-ER1
PLFY-P18NBMU-E	PLFY-P18NBMU-E PLFY-P18NBMU-ER2	PLFY-P18NBMU-ER1
PLFY-P24NBMU-E	PLFY-P24NBMU-E PLFY-P24NBMU-ER2	PLFY-P24NBMU-ER1
PLFY-P30NBMU-E	PLFY-P30NBMU-E PLFY-P30NBMU-ER2	PLFY-P30NBMU-ER1
PLFY-P36NBMU-E	PLFY-P36NBMU-E PLFY-P36NBMU-ER2	PLFY-P36NBMU-ER1

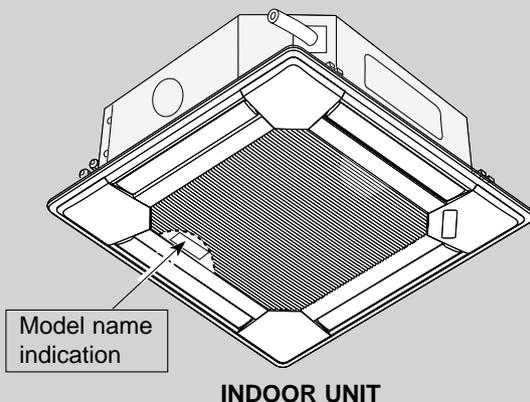
**Revision:**

- Part No. of VANE ASSY and CORNER PANEL have been modified in REVISED EDITION-C.
- Some descriptions have been modified.

- Please void OCB421 REVISED EDITION-B.

**Note:**

- This manual does not cover outdoor units. When servicing them, please refer to the outdoor unit's service manual.
- RoHS compliant products have <G> mark on the spec name plate.



### CONTENTS

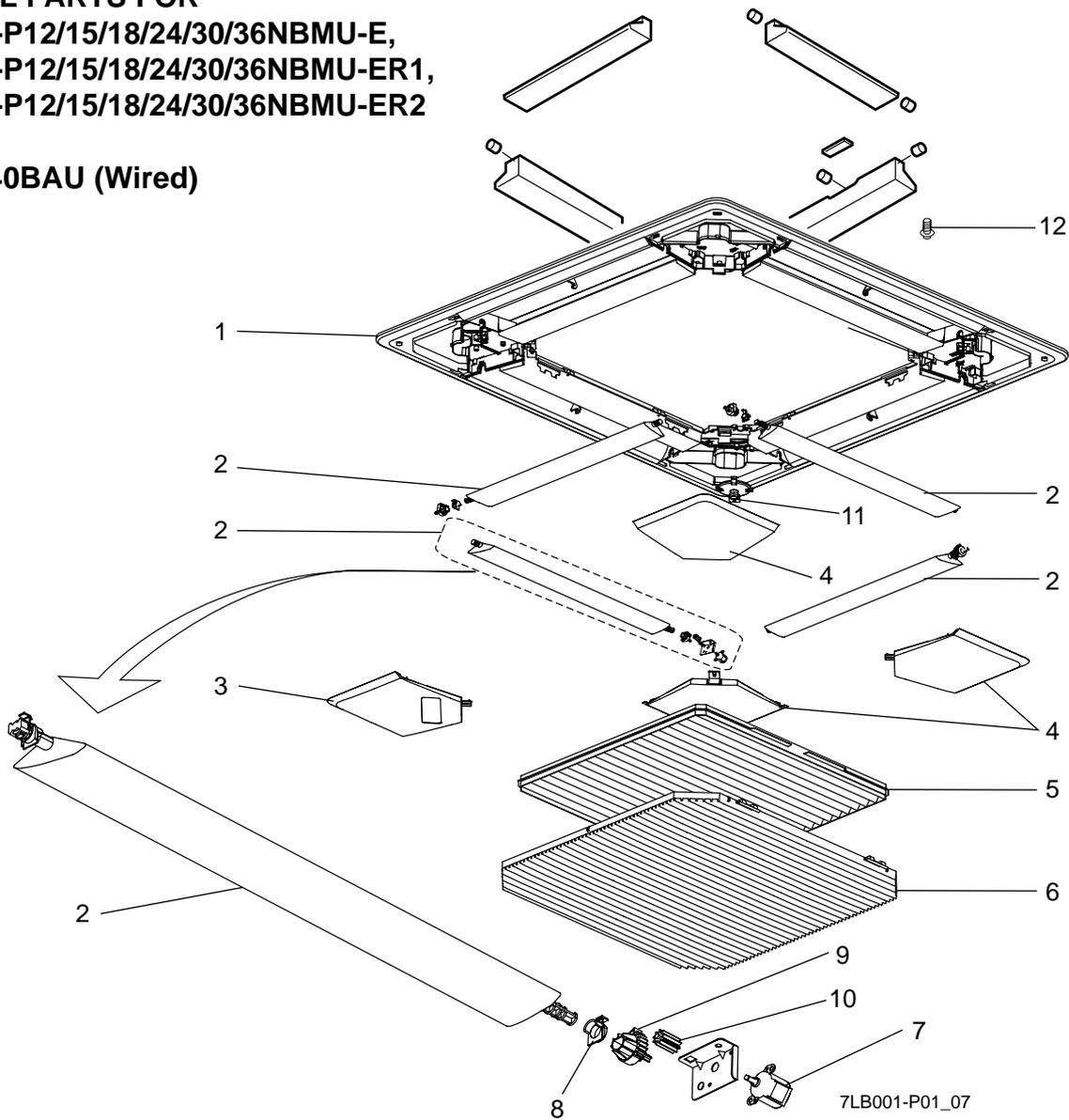
1. RoHS PARTS LIST.....2
2. OPTIONAL PARTS.....Back cover

**SERVICE MANUAL (OCH421)**

Panel model: PLP-40BAU

PANEL PARTS FOR  
 PLFY-P12/15/18/24/30/36NBMU-E,  
 PLFY-P12/15/18/24/30/36NBMU-ER1,  
 PLFY-P12/15/18/24/30/36NBMU-ER2

PLP-40BAU (Wired)

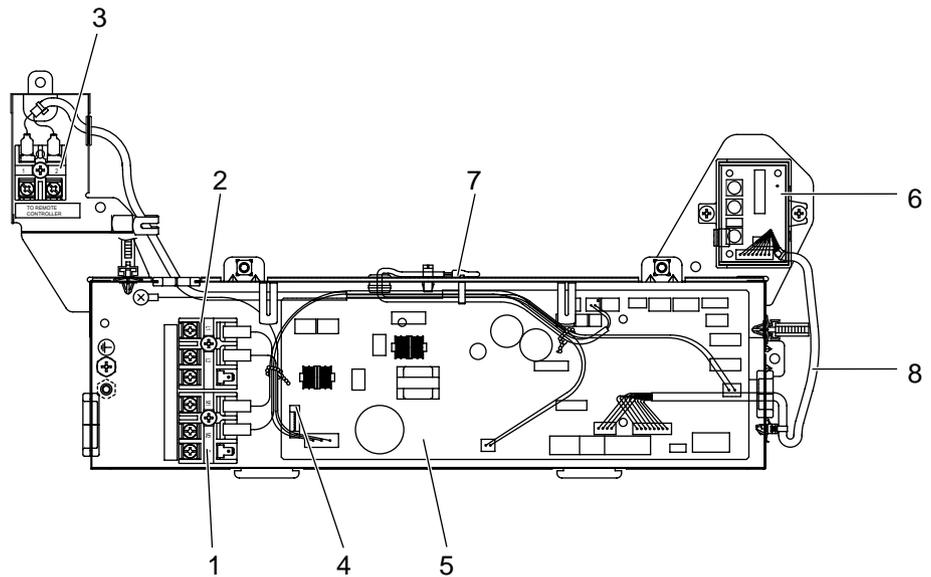


No.	ROHS	Part No.	Part Name	Specification	Q'ty/unit	Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty
					PLP-40BAU			
1	G	T7W E21 003	AIR OUTLET GRILLE		1			
2	G	T7W E13 002	VANE ASSY		4			
3	G	T7W E03 638	CORNER PANEL		1			
4	G	R01 E21 638	CORNER PANEL		3			
5	G	R01 E16 500	L. L. FILTER		1			
6	G	R01 E35 691	GRILLE ASSY		1			
7	G	R01 E19 223	STEPPING MOTOR		4		MV	
8	G	R01 E02 063	VANE BUSH		4			
9	G	R01 E03 040	GEAR(VANE)		4			
10	G	R01 E04 040	GEAR(S/M)		4			
11	G	R01 E03 523	SOCKET		1			
12	G	R01 E02 673	SCREW ASSY		1	4pcs/set, Accessory		

# RoHS PARTS LIST

## ELECTRICAL PARTS

PLFY-P12NBMU-E  
 PLFY-P15NBMU-E  
 PLFY-P18NBMU-E  
 PLFY-P24NBMU-E  
 PLFY-P30NBMU-E  
 PLFY-P36NBMU-E  
 PLFY-P12NBMU-ER1  
 PLFY-P15NBMU-ER1  
 PLFY-P18NBMU-ER1  
 PLFY-P24NBMU-ER1  
 PLFY-P30NBMU-ER1  
 PLFY-P36NBMU-ER1  
 PLFY-P12NBMU-ER2  
 PLFY-P15NBMU-ER2  
 PLFY-P18NBMU-ER2  
 PLFY-P24NBMU-ER2  
 PLFY-P30NBMU-ER2  
 PLFY-P36NBMU-ER2



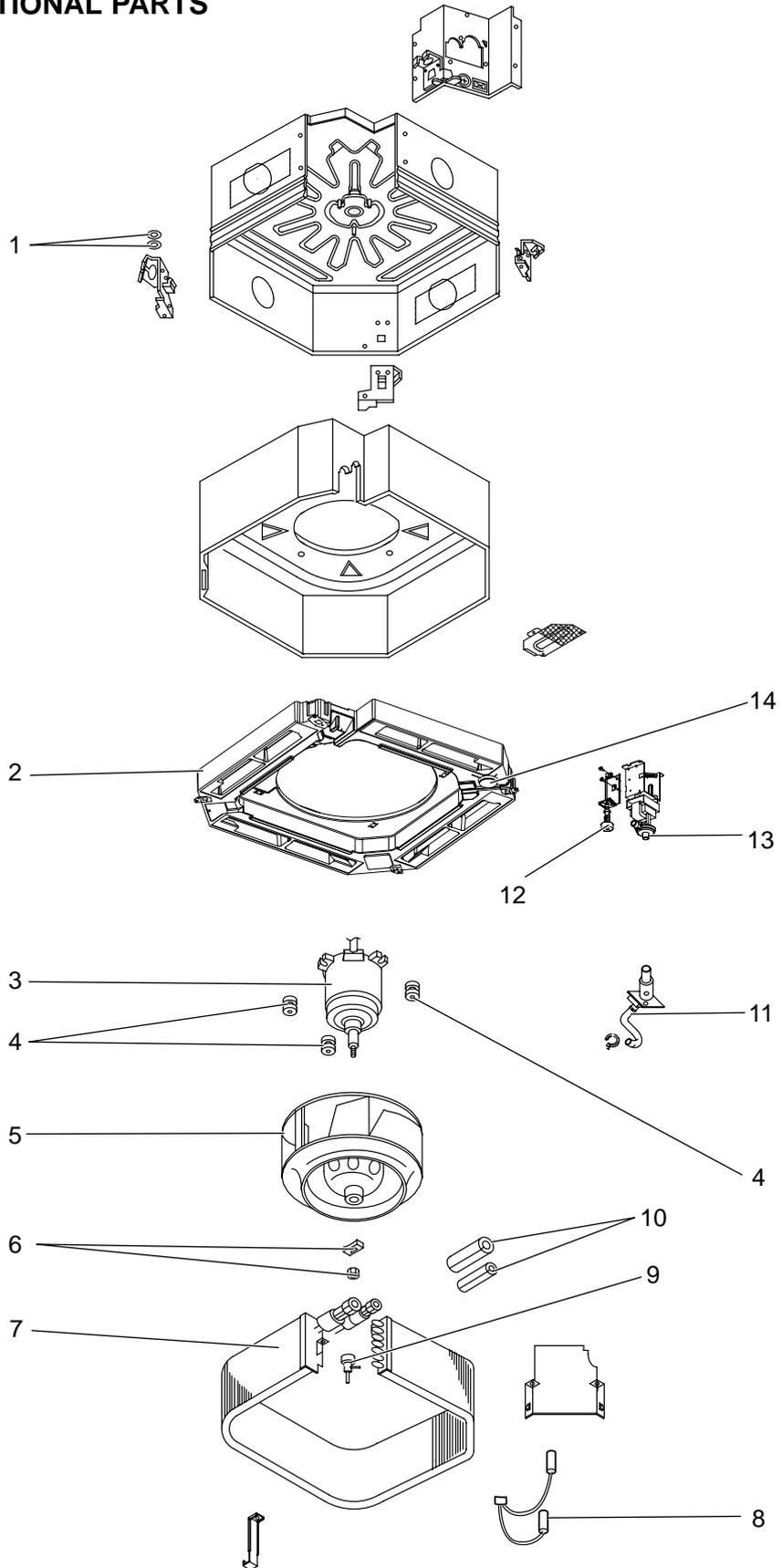
7LB001-E05\_01

No.	RoHS	Part No.	Part Name	Specification	Q'ty/unit			Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty
					PLFY-P					
					12/15/18/24/30/36					
					NBMU-E	NBMU-ER1	NBMU-ER2			
1	G	R01 E27 246	TERMINAL BLOCK	3P (M1,M2,S)	1	1	1		TB5	
2	G	T7W E43 716	TERMINAL BLOCK	3P (L1,L2,GR)	1	1	1		TB2	
3	G	R01 E48 246	TERMINAL BLOCK	2P (1,2)	1	1	1		TB15	
4	G	R01 E06 239	FUSE	6.3A, 250V	1	1	1		FUSE	
5	G	T7W E60 310	INDOOR CONTROLLER BOARD		1				I.B	
	G	T7W E79 310	INDOOR CONTROLLER BOARD			1			I.B	
	G	T7W C03 310	INDOOR CONTROLLER BOARD				1		I.B	
6	G	T7W E01 294	ADDRESS BOARD		1	1	1		A.B	
7	G	R01 H18 202	ROOM TEMP. THERMISTOR		1	1	1		TH1	
8	G	R01 E09 305	CABLE		1	1	1			

# RoHS PARTS LIST

## STRUCTURAL AND FUNCTIONAL PARTS

- PLFY-P12NBMU-E
- PLFY-P15NBMU-E
- PLFY-P18NBMU-E
- PLFY-P24NBMU-E
- PLFY-P30NBMU-E
- PLFY-P36NBMU-E
- PLFY-P12NBMU-ER1
- PLFY-P15NBMU-ER1
- PLFY-P18NBMU-ER1
- PLFY-P24NBMU-ER1
- PLFY-P30NBMU-ER1
- PLFY-P36NBMU-ER1
- PLFY-P12NBMU-ER2
- PLFY-P15NBMU-ER2
- PLFY-P18NBMU-ER2
- PLFY-P24NBMU-ER2
- PLFY-P30NBMU-ER2
- PLFY-P36NBMU-ER2



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# RoHS PARTS LIST

No.	RoHS	Part No.	Part Name	Specification	Q'ty/unit						Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty
					PLFY-P-NBMU-E								
					PLFY-P-NBMU-ER1								
PLFY-P-NBMU-ER2													
12	15	18	24	30	36								
1	G	R01 E13 097	WASHERS SET		1	1	1	1	1	1			
2	G	T7W E34 529	DRAIN PAN		1	1	1	1	1	1			
3	G	R01 E59 220	FAN MOTOR		1	1	1	1	1			MF	
	G	R01 E44 220	FAN MOTOR							1		MF	
4	G	R01 E14 105	MOTOR MOUNT		3	3	3	3	3	3			
5	G	R01 E39 114	TURBO FAN		1	1	1	1	1				
	G	R01 E34 114	TURBO FAN							1			
6	G	R01 10K 097	SPL WASHER / NUT	M6	1	1	1	1	1				
	G	R01 11K 097	SPL WASHER / NUT	M8						1			
7	G	R01 N00 480	HEAT EXCHANGER		1								
	G	R01 N02 480	HEAT EXCHANGER			1							
	G	T7W H61 480	HEAT EXCHANGER				1						
	G	R01 N03 480	HEAT EXCHANGER					1					
	G	R01 N05 480	HEAT EXCHANGER						1				
	G	T7W H96 480	HEAT EXCHANGER							1			
8	G	T7W E50 202	THERMISTOR		1	1	1	1	1	1		TH22/TH23	
9	G	R01 H16 401	LINEAR EXPANSION VALVE		1	1	1	1				LEV	
	G	R01 H17 401	LINEAR EXPANSION VALVE						1	1		LEV	
10	G	R01 E02 660	PIPE COVERS SET		1	1	1	1	1	1			
11	G	R01 E05 523	DRAIN SOCKET		1	1	1	1	1	1			
12	G	R01 E04 272	FLOAT SENSOR		1	1	1	1	1	1		FS	
13	G	T7W E14 355	DRAIN PUMP		1	1	1	1	1	1		DP	
14	G	R01 E02 524	DRAIN PLUG		1	1	1	1	1	1			

**2****OPTIONAL PARTS****2-1. MULTI FUNCTION CASEMENT**

Part No.	PAC-SH53TM-E
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**2-2. AIR OUTLET SHUTTER PLATE**

Part No.	PAC-SH51SP-E
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**2-3. HIGH EFFICIENCY FILTER (PAC-SH53TM-E is required in using this optional part.)**

Part No.	PAC-SH59KF-E
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**2-4. i-SEE SENSOR CORNER PANEL**

Part No.	PAC-SA1ME-E
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**2-5. FLANGE FOR FRESH AIR INTAKE**

Part No.	PAC-SH65OF-E
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**2-6. WIRED REMOTE CONTROLLER (MA REMOTE CONTROLLER)**

Part No.	PAR-21MAA
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**2-7. WIRED REMOTE CONTROLLER (ME REMOTE CONTROLLER)**

Part No.	PAR-F27MEA-US
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**2-8. DECORATION PANEL**

Part No.	PLP-40BAU
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