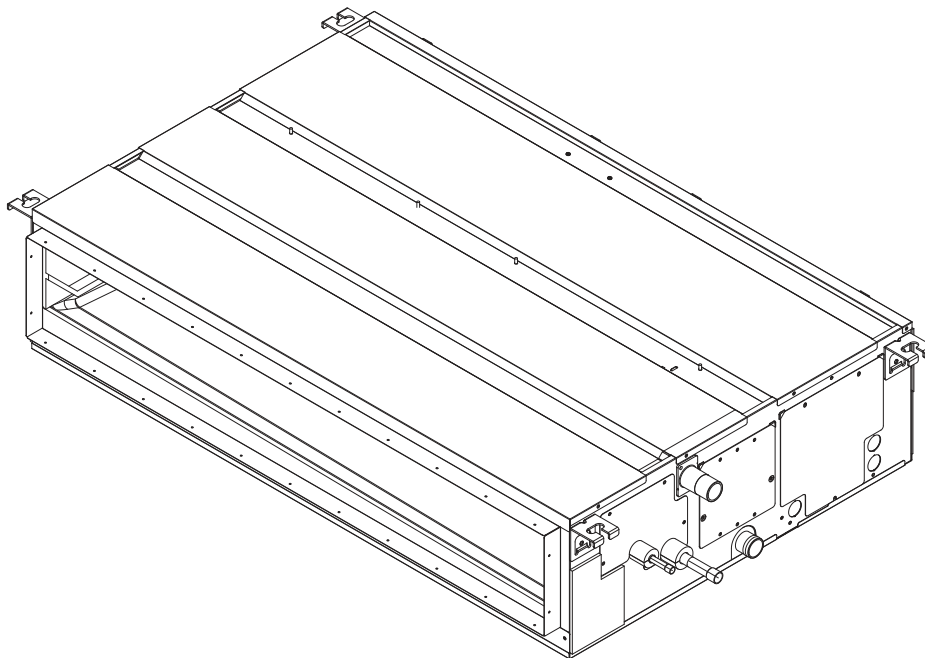


# TECHNICAL & SERVICE MANUAL

Model name

<Indoor unit>

**PEFY-P06NMAU-E4, PEFY-P27NMAU-E4**  
**PEFY-P08NMAU-E4, PEFY-P30NMAU-E4**  
**PEFY-P12NMAU-E4, PEFY-P36NMAU-E4**  
**PEFY-P15NMAU-E4, PEFY-P48NMAU-E4**  
**PEFY-P18NMAU-E4, PEFY-P54NMAU-E4**  
**PEFY-P24NMAU-E4**



# CITY MULTI

# Safety Precautions

## Read before installation and performing electrical work

- Thoroughly read the following safety precautions prior to installation.
- Observe these safety precautions for your safety.
- This equipment may have adverse effects on the equipment on the same power supply system.
- Contact the local power authority before connecting to the system.

### Symbol explanations



#### WARNING

This symbol indicates that failure to follow the instructions exactly as stated poses the risk of serious injury or death.



#### CAUTION

This symbol indicates that failure to follow the instructions exactly as stated poses the risk of serious injury or damage to the unit.



Indicates an action that must be avoided.



Indicates important instructions.



Indicates a parts that requires grounding.



Indicates that caution must be taken with rotating parts. (This symbol is on the main unit label.) <Color: Yellow>



Indicates that the parts that are marked with this symbol pose a risk of electric shock. (This symbol is on the main unit label.) <Color: Yellow>



#### WARNING

Carefully read the labels affixed to the main unit.



#### WARNING

Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.

Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit.

It may also be in violation of applicable laws. MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.

Ask your dealer or a qualified technician to install the unit.

Improper installation by the user may result in water leakage, electric shock, or fire.

Properly install the unit on a surface that can withstand its weight.

Unit installed on an unstable surface may fall and cause injury.

Only use specified cables. Securely connect each cable so that the terminals do not carry the weight of the cable.

Improperly connected cables may produce heat and start a fire.

Take appropriate safety measures against wind gusts and earthquakes to prevent the unit from toppling over.

Improper installation may cause the unit to topple over and cause injury or damage to the unit.

Only use accessories (i.e., air cleaners, humidifiers, electric heaters) recommended by MITSUBISHI ELECTRIC CORPORATION.

Do not make any modifications or alterations to the unit. Consult your dealer for repair.

Improper repair may result in water leakage, electric shock, or fire.

Do not touch the heat exchanger fins with bare hands.

The fins are sharp and pose a risk of cuts.

In the event of a refrigerant leak, thoroughly ventilate the room.

If gaseous refrigerant leaks out and comes in contact with an open flame, toxic gases will be generated.

Properly install the unit according to the instructions in the Installation Manual.

Improper installation may result in water leakage, electric shock, or fire.

Have all electrical work performed by an authorized electrician according to the local regulations and the instructions in this manual. Use a dedicated circuit.

Insufficient power supply capacity or improper installation of the unit may result in malfunctions of the unit, electric shock, or fire.

Keep electrical parts away from water.

Wet electrical parts pose a risk of electric shock, smoke, or fire.

Securely attach the control box cover.

If the cover is not installed properly, dust or water may infiltrate and pose a risk of electric shock, smoke, or fire.

Only use the type of refrigerant that is indicated on the unit when installing or relocating the unit.

Infiltration of any other types of refrigerant or air into the unit may adversely affect the refrigerant cycle and may cause the pipes to burst or explode.

When installing the unit in a small space, take appropriate precautions to prevent leaked refrigerant from reaching the limiting concentration.

Leaked refrigerant gas will displace oxygen and may cause oxygen starvation. Consult your dealer before installing the unit.

Consult your dealer or a qualified technician when moving or reinstalling the unit.

Improper installation may result in water leakage, electric shock, or fire.

After completing the service work, check for a refrigerant leak.

If leaked refrigerant is exposed to a heat source, such as a fan heater, stove, or electric grill, toxic gases will be generated.

Do not try to defeat the safety features of the unit.

Forced operation of the pressure switch or the temperature switch by defeating the safety features for these devices, or the use of accessories other than the ones that are recommended by MITSUBISHI ELECTRIC CORPORATION may result in smoke, fire, or explosion.

Consult your dealer for proper disposal method.

Do not use a leak detection additive.

## Precautions for handling units for use with R410A

### CAUTION

Do not use the existing refrigerant piping.

A large amount of chlorine that may be contained in the residual refrigerant and refrigerator oil in the existing piping may cause the refrigerator oil in the new unit to deteriorate.

Use refrigerant piping materials made of phosphorus deoxidized copper. Keep the inner and outer surfaces of the pipes clean and free of such contaminants as sulfur, oxides, dust, dirt, shaving particles, oil, and moisture.

Contaminants in the refrigerant piping may cause the refrigerator oil to deteriorate.

Store the piping materials indoors, and keep both ends of the pipes sealed until immediately before brazing. (Keep elbows and other joints wrapped in plastic.)

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerator oil to deteriorate or cause the compressor to malfunction.

Use a small amount of ester oil, ether oil, or alkyl benzene to coat flares and flanges.

Infiltration of a large amount of mineral oil may cause the refrigerator oil to deteriorate.

Charge the system with refrigerant in the liquid phase.

If gaseous refrigerant is drawn out of the cylinder first, the composition of the remaining refrigerant in the cylinder will change and become unsuitable for use.

Only use R410A.

The use of other types of refrigerant that contain chloride may cause the refrigerator oil to deteriorate.

Use a vacuum pump with a check valve.

If a vacuum pump that is not equipped with a check valve is used, the vacuum pump oil may flow into the refrigerant cycle and cause the refrigerator oil to deteriorate.

Prepare tools for exclusive use with R 410A. Do not use the following tools if they have been used with the conventional refrigerant: gauge manifold, charging hose, gas leak detector, check valve, refrigerant charge base, vacuum gauge, and refrigerant recovery equipment.

If the refrigerant or the refrigerator oil that may be left on these tools are mixed in with R410A, it may cause the refrigerator oil in the new system to deteriorate. Infiltration of water may cause the refrigerator oil to deteriorate. Leak detectors for conventional refrigerants will not detect an R410A leak because R410A is free of chlorine.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of the refrigerant in the cylinder will change and become unsuitable for use.

Exercise special care when handling tools for use with R410A.

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerator oil to deteriorate.



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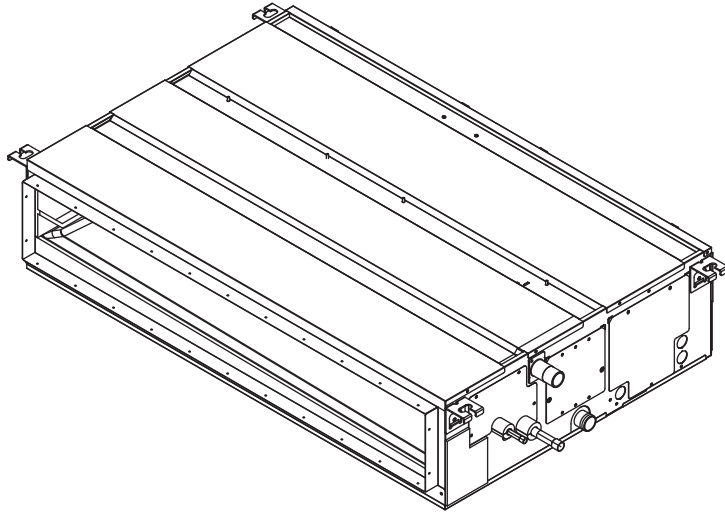
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**[1] Features**



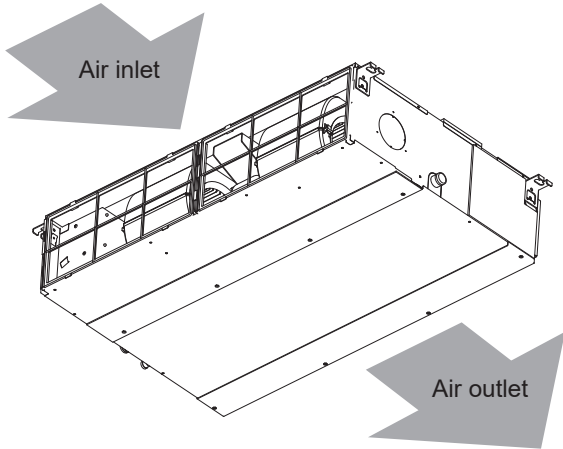
Model	Cooling capacity/Heating capacity	
	BTU/h	kW
PEFY-P06NMAU-E4	6000/6700	1.8/2.0
PEFY-P08NMAU-E4	8000/9000	2.3/2.6
PEFY-P12NMAU-E4	12000/13500	3.5/4.0
PEFY-P15NMAU-E4	15000/17000	4.4/5.0
PEFY-P18NMAU-E4	18000/20000	5.3/5.9
PEFY-P24NMAU-E4	24000/27000	7.0/7.9
PEFY-P27NMAU-E4	27000/30000	7.9/8.8
PEFY-P30NMAU-E4	30000/34000	8.8/10.0
PEFY-P36NMAU-E4	36000/40000	10.6/11.7
PEFY-P48NMAU-E4	48000/54000	14.1/15.8
PEFY-P54NMAU-E4	54000/60000	15.8/17.6



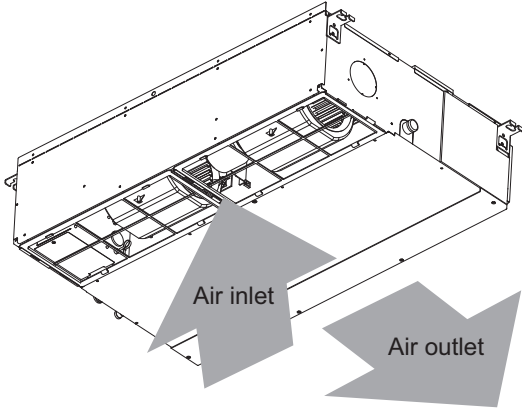
**[1] Components and Functions**

1. Indoor (Main) Unit

(1) In case of rear inlet



(2) In case of bottom inlet

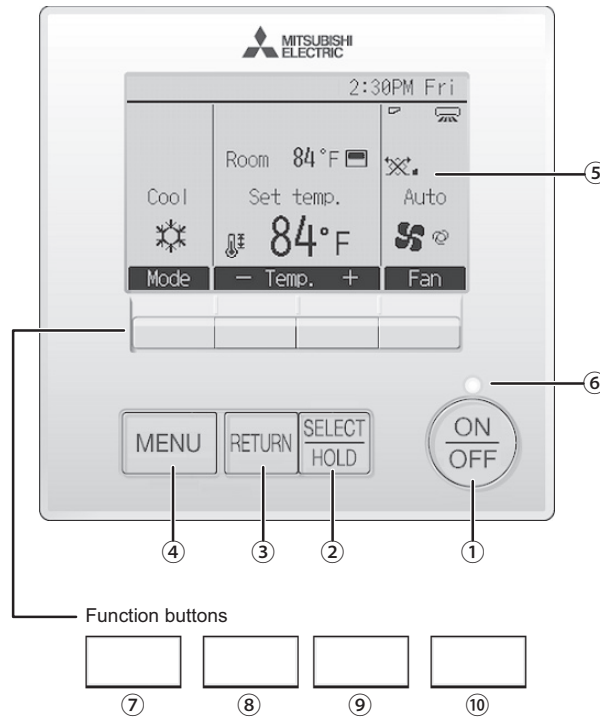


2. Remote Controller

[PAR-40MAAU]

Once the operation mode is selected, the unit will remain in the selected mode until changed.

(1) Remote Controller Interface



① [ON/OFF] button

Press to turn ON/OFF the indoor unit.

② [SELECT/HOLD] button

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

③ [RETURN] button

Press to return to the previous screen.

④ [MENU] button

Press to bring up the Main menu.

⑤ Backlit LCD

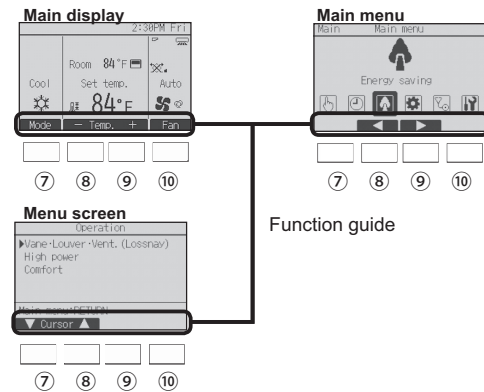
Operation settings will appear.  
When the backlight is off, pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen.

When the backlight is off, pressing any button turns the backlight on and does not perform its function. (except for the [ON/OFF] button)

⑥ ON/OFF lamp

This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.

The functions of the function buttons change depending on the screen. Refer to the button function guide that appears at the bottom of the LCD for the functions they serve on a given screen. When the system is centrally controlled, the button function guide that corresponds to the locked button will not appear.



⑦ Function button [F1]

Main display: Press to change the operation mode.  
Menu screen: The button function varies with the screen.

⑧ Function button [F2]

Main display: Press to decrease temperature.  
Main menu: Press to move the cursor left.  
Menu screen: The button function varies with the screen.

⑨ Function button [F3]

Main display: Press to increase temperature.  
Main menu: Press to move the cursor right.  
Menu screen: The button function varies with the screen.

⑩ Function button [F4]

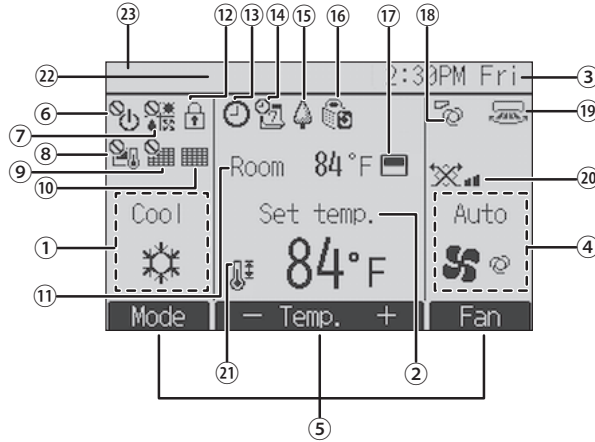
Main display: Press to change the fan speed.  
Menu screen: The button function varies with the screen.

(2) Remote Controller Display

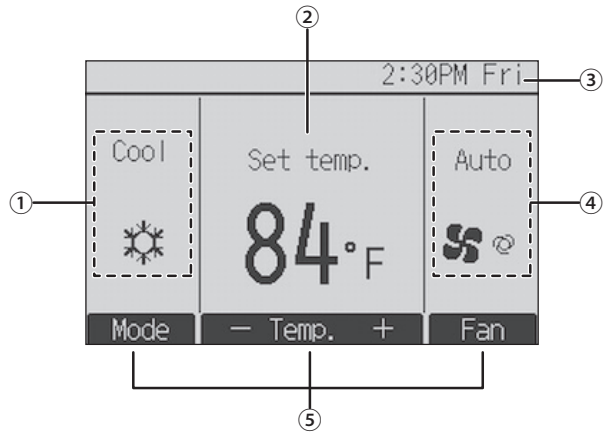
The main display can be displayed in two different modes: "Full" and "Basic." The factory setting is "Full." To switch to the "Basic" mode, change the setting on the Main display setting.

**Full mode**

\* All icons are displayed for explanation.



**Basic mode**



**① Operation mode**

Indoor unit operation mode appears here.

**② Set temperature**

Set temperature appears here.

**③ Clock**

Current time appears here.

**④ Fan speed**

Fan speed setting appears here.

**⑤ Button function guide**

Functions of the corresponding buttons appear here.



Appears when the ON/OFF operation is centrally controlled.



Appears when the operation mode is centrally controlled.



Appears when the set temperature is centrally controlled.



Appears when the filter reset function is centrally controlled.



Indicates when filter needs maintenance.

**⑪ Room temperature**

Current room temperature appears here.



Appears when the buttons are locked.



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



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



appears when the HOLD function is enabled.



Appears when the Weekly timer is enabled.



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



Appears while the outdoor units are operated in the silent mode.



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



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



Indicates the vane setting.



Indicates the louver setting.



Indicates the ventilation setting.



Appears when the set temperature range is restricted.

**⑫ Centrally controlled**

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

**⑬ Error display**

An error code appears during the error.

\* When an error code is displayed on the main display, an error is occurring but the indoor unit can keep its operation. If an error occurs, note the error code and consult your dealer.

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

**[1] Specifications**

**1. Specifications**

Model		PEFY-P06NMAU-E4	PEFY-P08NMAU-E4	PEFY-P12NMAU-E4	PEFY-P15NMAU-E4	
Power source		1-phase 208/230V 60Hz				
Cooling capacity (Nominal)	*1 BTU / h	6,000	8,000	12,000	15,000	
	*1 kW	1.8	2.3	3.5	4.4	
	Power input	0.042	0.042	0.052	0.062	
	Current input	A 0.42/0.38	0.42/0.38	0.56/0.51	0.64/0.58	
Heating capacity (Nominal)	*2 BTU / h	6,700	9,000	13,500	17,000	
	*2 kW	2.0	2.6	4.0	5.0	
	Power input	0.040	0.040	0.050	0.060	
	Current input	A 0.42/0.38	0.42/0.38	0.56/0.51	0.64/0.58	
External finish		Galvanized steel plate				
External dimension H x W x D		in.	9-7/8x27-9/16x28-7/8	9-7/8x27-9/16x28-7/8	9-7/8x27-9/16x28-7/8	9-7/8x35-7/16x28-7/8
		mm	250 x 700 x 732	250 x 700 x 732	250 x 700 x 732	250 x 900 x 732
Net weight		lbs (kg)	47(21)	47(21)	47(21)	58(26)
Heat exchanger		Cross fin (Aluminium fin and copper tube)				
FAN	Type x Quantity		Sirocco fan x 1	Sirocco fan x 1	Sirocco fan x 1	Sirocco fan x 2
	External static press.	in.WG	<0.14>-<0.20>-<0.28>-<0.40>-<0.60>			
		Pa	<35>-<50>-<70>-<100>-<150>			
	Motor type		DC motor			
	Motor output		kW 0.085	0.085	0.085	0.121
	Driving mechanism		Direct-driven by motor			
	Airflow rate (Low-Mid-High)	cfm	212-265-300	212-265-300	265-318-371	353-424-494
m <sup>3</sup> / min		6.0-7.5-8.5	6.0-7.5-8.5	7.5-9.0-10.5	10.0-12.0-14.0	
L / s		100-125-142	100-125-142	125-150-175	167-200-233	
Sound pressure level (Low-Mid-High) (measured in anechoic room)		dB <A>	24-28-30	24-28-30	26-30-34	27-31-34
Insulation material		EPS, Polyethylene foam,Urethane foam				
Air filter		PP honeycomb fabric				
Protection device		Fuse				
Refrigerant control device		LEV				
Connectable outdoor unit		R410A CITY MULTI				
Diameter of refrigerant pipe (O.D.)	Liquid (R410A)	in. (mm)	1/4 (6.35) Brazed	1/4 (6.35) Brazed	1/4 (6.35) Brazed	1/4 (6.35) Brazed
	Gas (R410A)	in. (mm)	1/2 (12.7) Brazed	1/2 (12.7) Brazed	1/2 (12.7) Brazed	1/2 (12.7) Brazed
Diameter of drain pipe		in.(mm)	O.D. 1-1/4(32)			
Drawing	External		-			
	Wiring		-			
	Refrigerant cycle		-			
Standard attachment	Document		Installation Manual, Instruction Book			
	Accessory		Washer, Drain hose, Tie band			
Optional parts	External heater adapter		PAC-YU25HT			
	Filter box		PAC-KE91TB-E	PAC-KE91TB-E	PAC-KE91TB-E	PAC-KE92TB-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. Due to continuing improvement, above specifications may be subject to change without notice.			

Note :	*1 Nominal cooling conditions	*2 Nominal heating conditions	Unit convertor 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.
	Indoor : 80degF D.B. / 67degF W.B. (26.7degC D.B. / 19.4degC W.B.)	70degF D.B. (21.1degC D.B.)	
	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)	
	*The external static pressure is set to 0.20in. WG(50Pa) at factory shipment. *Due to continuing improvement, above specification may be subject to change without notice.		

[ III Specifications ]

Model		PEFY-P18NMAU-E4	PEFY-P24NMAU-E4	PEFY-P27NMAU-E4	PEFY-P30NMAU-E4		
Power source		1-phase 208/230V 60Hz					
Cooling capacity (Nominal)	*1	BTU / h	18,000	24,000	27,000	30,000	
	*1	kW	5.3	7.0	7.9	8.8	
	Power input		kW	0.082	0.142	0.142	0.142
	Current input		A	0.82/0.74	1.24/1.12	1.24/1.12	1.24/1.12
Heating capacity (Nominal)	*2	BTU / h	20,000	27,000	30,000	34,000	
	*2	kW	5.9	7.9	8.8	10.0	
	Power input		kW	0.080	0.140	0.140	0.140
	Current input		A	0.82/0.74	1.24/1.12	1.24/1.12	1.24/1.12
External finish		Galvanized steel plate					
External dimension H x W x D	in.		9-7/8x35-7/16x28-7/8	9-7/8x43-5/16x28-7/8	9-7/8x43-5/16x28-7/8	9-7/8x43-5/16x28-7/8	
	mm		250 x 900 x 732	250 x 1100 x 732	250 x 1100 x 732	250 x 1100 x 732	
Net weight		lbs (kg)	58(26)	67(30)	67(30)	67(30)	
Heat exchanger		Cross fin (Aluminium fin and copper tube)					
FAN	Type x Quantity		Sirocco fan x 2	Sirocco fan x 2	Sirocco fan x 2	Sirocco fan x 2	
	External static press.	in.WG	<0.14>-<0.20>-<0.28>-<0.40>-<0.60>				
		Pa	<35>-<50>-<70>-<100>-<150>				
	Motor type		DC motor				
	Motor output	kW	0.121	0.121	0.121	0.121	
	Driving mechanism		Direct-driven by motor				
	Airflow rate (Low-Mid-High)	cfm	424-512-600	618-742-883	618-742-883	618-742-883	
		m <sup>3</sup> / min	12.0-14.5-17.0	17.5-21.0-25.0	17.5-21.0-25.0	17.5-21.0-25.0	
L / s		200-242-283	292-350-417	292-350-417	292-350-417		
Sound pressure level (Low-Mid-High) (measured in anechoic room)		dB <A>	29-33-37	31-35-39	31-35-39	31-35-39	
Insulation material		EPS, Polyethylene foam,Urethane foam					
Air filter		PP honeycomb fabric					
Protection device		Fuse					
Refrigerant control device		LEV					
Connectable outdoor unit		R410A CITY MULTI					
Diameter of refrigerant pipe (O.D.)	Liquid (R410A)	in. (mm)	1/4 (6.35) Brazed	3/8 (9.52) Brazed	3/8 (9.52) Brazed	3/8 (9.52) Brazed	
	Gas (R410A)	in. (mm)	1/2 (12.7) Brazed	5/8 (15.88) Brazed	5/8 (15.88) Brazed	5/8 (15.88) Brazed	
Diameter of drain pipe		in. (mm)	O.D. 1-1/4(32)				
Drawing	External		-				
	Wiring		-				
	Refrigerant cycle		-				
Standard attachment	Document		Installation Manual, Instruction Book				
	Accessory		Washer, Drain hose, Tie band				
Optional parts	External heater adapter		PAC-YU25HT				
	Filter box		PAC-KE92TB-E	PAC-KE93TB-E	PAC-KE93TB-E	PAC-KE93TB-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. Due to continuing improvement, above specifications may be subject to change without notice.				

Note :	*1 Nominal cooling conditions	*2 Nominal heating conditions	Unit convertor
	Indoor : 80degF D.B. / 67degF W.B. (26.7degC D.B. / 19.4degC W.B.)	70degF D.B. (21.1degC D.B.)	
	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)	
	*The external static pressure is set to 0.20in. WG(50Pa) at factory shipment.		
	*Due to continuing improvement, above specification may be subject to change without notice.		
	*Above specification data is subject to rounding variation.		

[ III Specifications ]

Model		PEFY-P36NMAU-E4	PEFY-P48NMAU-E4	PEFY-P54NMAU-E4		
Power source		1-phase 208/230V 60Hz				
Cooling capacity (Nominal)	*1	BTU / h	36,000	48,000	54,000	
	*1	kW	10.6	14.1	15.8	
		Power input	kW	0.222	0.242	0.252
		Current input	A	2.01/1.82	2.06/1.87	2.29/2.07
Heating capacity (Nominal)	*2	BTU / h	40,000	54,000	60,000	
	*2	kW	11.7	15.8	17.6	
		Power input	kW	0.220	0.240	0.250
		Current input	A	2.01/1.82	2.06/1.87	2.29/2.07
External finish		Galvanized steel plate				
External dimension H x W x D	in.	9-7/8x55-1/8x28-7/8	9-7/8x55-1/8x28-7/8	9-7/8x63x28-7/8		
	mm	250 x 1400 x 732	250 x 1400 x 732	250 x 1600 x 732		
Net weight	lbs (kg)	84(38)	86(39)	91(41)		
Heat exchanger		Cross fin (Aluminium fin and copper tube)				
FAN	Type x Quantity		Sirocco fan x 3	Sirocco fan x 3	Sirocco fan x 3	
	External static press.	in.WG	<0.14>-<0.20>-<0.28>-<0.40>-<0.60>			
		Pa	<35>-<50>-<70>-<100>-<150>			
	Motor type		DC motor			
	Motor output	kW	0.300	0.300	0.300	
	Driving mechanism		Direct-driven by motor			
	Airflow rate (Low-Mid-High)	cfm	883-1077-1271	918-1112-1306	989-1201-1413	
		m <sup>3</sup> / min	25.0-30.5-36.0	26.0-31.5-37.0	28.0-34.0-40.0	
L / s		417-508-600	433-525-617	467-567-667		
Sound pressure level (Low-Mid-High) (measured in anechoic room)	dB <A>	35-39-43	35-40-44	34-38-42		
Insulation material		EPS, Polyethylene foam,Urethane foam				
Air filter		PP honeycomb fabric				
Protection device		Fuse				
Refrigerant control device		LEV				
Connectable outdoor unit		R410A CITY MULTI				
Diameter of refrigerant pipe (O.D.)	Liquid (R410A)	in. (mm)	3/8 (9.52) Brazed	3/8 (9.52) Brazed	3/8 (9.52) Brazed	
	Gas (R410A)	in. (mm)	5/8 (15.88) Brazed	5/8 (15.88) Brazed	5/8 (15.88) Brazed	
Diameter of drain pipe		in. (mm)	O.D. 1-1/4(32)			
Drawing	External		-			
	Wiring		-			
	Refrigerant cycle		-			
Standard attachment	Document		Installation Manual, Instruction Book			
	Accessory		Washer, Drain hose, Tie band			
Optional parts	External heater adapter		PAC-YU25HT			
	Filter box		PAC-KE94TB-E	PAC-KE94TB-E	PAC-KE95TB-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. Due to continuing improvement, above specifications may be subject to change without notice.			

Note :	*1 Nominal cooling conditions	*2 Nominal heating conditions	Unit convertor
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
Outdoor :	95degF D.B. (35degC D.B.)	47degF D.B. / 43degF W.B. (8.3degC D.B. / 6.1degC W.B.)	cfm = m <sup>3</sup> /min x 35.31 lbs = kg / 0.4536
Pipe length :	25 ft. (7.6 m)	25 ft. (7.6 m)	
Level difference :	0 ft. (0 m)	0 ft. (0 m)	
*The external static pressure is set to 0.20in. WG(50Pa) at factory shipment.			*Above specification data is subject to rounding variation.
*Due to continuing improvement, above specification may be subject to change without notice.			

## 2. Electrical component specifications

Component	Sym- bol	PEFY-P06NMAU-E4	PEFY-P08NMAU-E4	PEFY-P12NMAU-E4
Room temperature thermistor	TH21	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Liquid pipe thermistor	TH22	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Gas pipe thermistor	TH23	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Fuse	F1	250 VAC 6.3A		
	F2	400 VDC 3A		
Fan motor	MF	8-pole, Output 85W ZWB278D51A		
Linear expansion valve	LEV	12 VDC Stepping motor (0~2000 pulse)		
Power supply terminal block	TB2	(L1, L2) 250V 20A		
Transmission terminal block	TB5 TB15	(1, 2) 250V 15A, (M1, M2, S) 250V 20A		
Drain float switch	FS	Open/short detection Initial contact resistance 500 mΩ or less		
Drain pump	DP	PMD INPUT 3W (13 VDC) 24L/Hr		

Component	Sym- bol	PEFY- P15NMAU-E4	PEFY- P18NMAU-E4	PEFY- P24NMAU-E4	PEFY- P27NMAU-E4	PEFY- P30NMAU-E4
Room temperature thermistor	TH21	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ				
Liquid pipe thermistor	TH22	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ				
Gas pipe thermistor	TH23	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ				
Fuse	F1	250 VAC 6.3A				
	F2	400 VDC 3A				
Fan motor	MF	8-pole, Output 121W ZWB278D54A				
Linear expansion valve	LEV	12 VDC Stepping motor (0~2000 pulse)				
Power supply terminal block	TB2	(L1, L2) 250V 20A				
Transmission terminal block	TB5 TB15	(1, 2) 250V 15A, (M1, M2, S) 250V 20A				
Drain float switch	FS	Open/short detection Initial contact resistance 500 mΩ or less				
Drain pump	DP	PMD INPUT 3W (13 VDC) 24L/Hr				

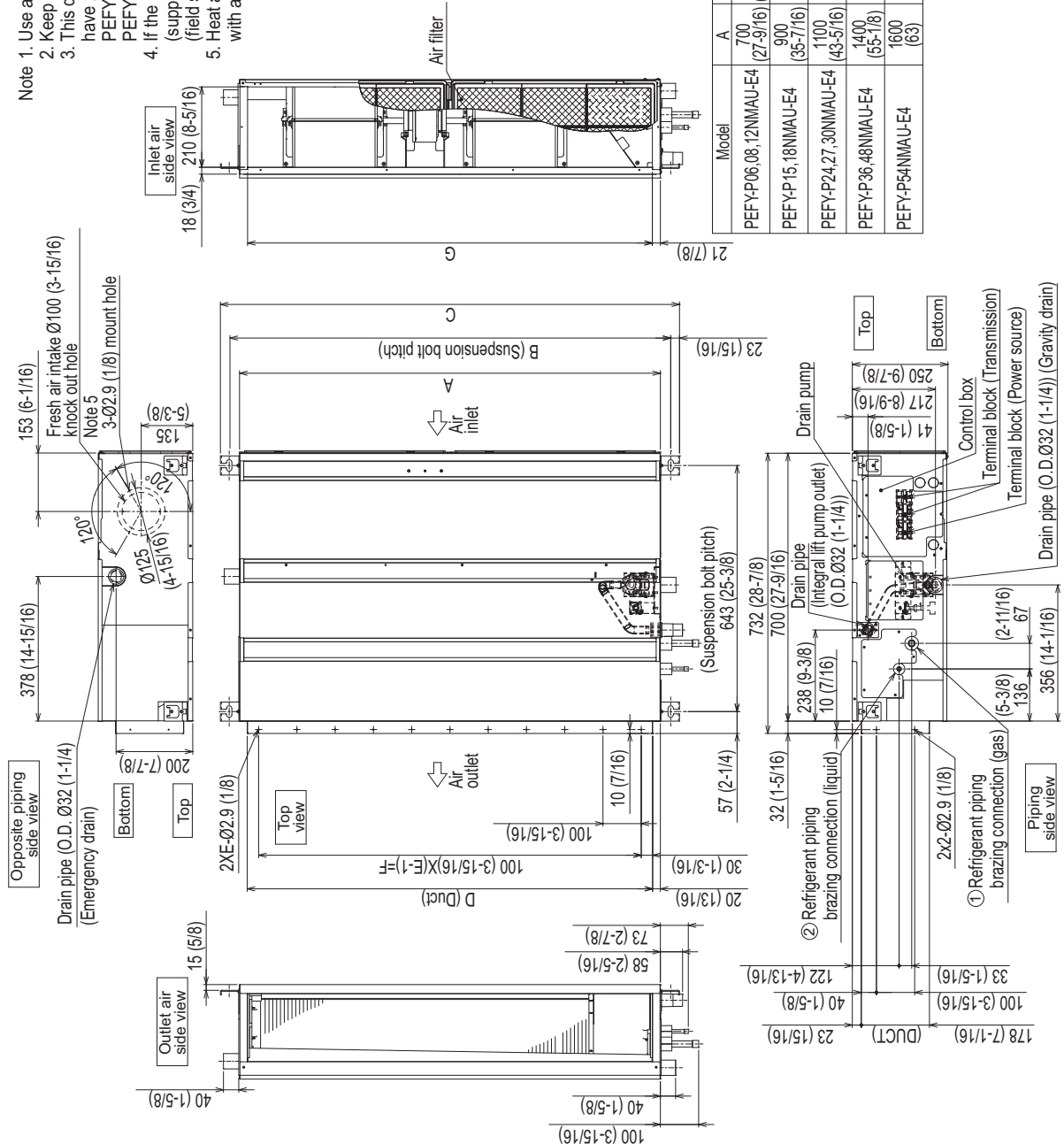
Component	Sym- bol	PEFY-P36NMAU-E4	PEFY-P48NMAU-E4	PEFY-P54NMAU-E4
Room temperature thermistor	TH21	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Liquid pipe thermistor	TH22	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Gas pipe thermistor	TH23	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ		
Fuse	F1	250 VAC 6.3A		
	F2	400 VDC 3A		
Fan motor	MF	10-pole, Output 300W ZWB3710D01A		
Linear expansion valve	LEV	12 VDC Stepping motor (0~2000 pulse)		
Power supply terminal block	TB2	(L1, L2) 250V 20A		
Transmission terminal block	TB5 TB15	(1, 2) 250V 15A, (M1, M2, S) 250V 20A		
Drain float switch	FS	Open/short detection Initial contact resistance 500 mΩ or less		
Drain pump	DP	PMD INPUT 3W (13 VDC) 24L/Hr		

# [1] Outlines and Dimensions

## 1. PEFY-P06, 08, 12, 15, 18, 24, 27, 30, 36, 48, 54NMAU-E4

Unit : mm(in.)

- Note**
1. Use an M10 screw for the suspension bolt (field supply).
  2. Keep the service space for maintenance at the bottom.
  3. This drawing is for PEFY-P24-27-30NMAU-E4 models, which have 2 fans. PEFY-P06-08-12NMAU-E4 models have 1 fan. PEFY-P15-18NMAU-E4 models have 2 fans. PEFY-P36-48-54NMAU-E4 models have 3 fans.
  4. If the inlet duct is used, remove the air filter (supplied with the unit), then install the filter (field supply) at the suction side.
  5. Heat air to 0°C (32°F) or higher when taking fresh air with a fresh air intake.





[Maintenance access space]

Secure enough access space to allow for the maintenance, inspection, and replacement of the motor, fan, drain pump, heat exchanger, and control box in one of the following ways.

Select an installation site for the indoor unit so that its maintenance access space will not be obstructed by beams or other objects.

- (1) When a space of 300mm or more is available below the unit between the unit and the ceiling. (Fig.1)
  - Create access door 1 and 2 (450x450mm each) as shown in Fig.2.
  - (Access door 2 is not required if enough space is available below the unit for a maintenance worker to work in.)
- (2) When a space of less than 300mm is available below the unit between the unit and the ceiling. (At least 20mm of space should be left below the unit as shown in Fig.3.)
  - Create access door 1 diagonally below the control box and access door 3 below the unit as shown in Fig.4.
  - or
  - Create access door 4 below the control box and the unit as shown in Fig.5.

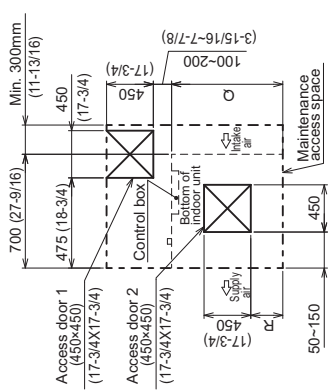
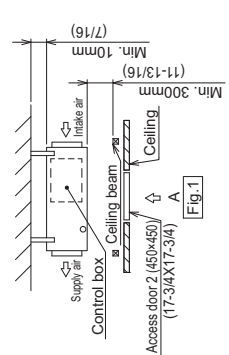
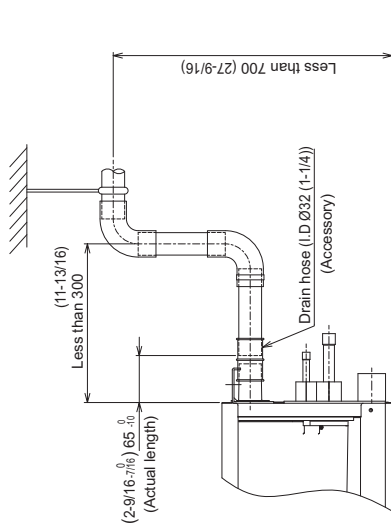


Fig.2 (Viewed from the direction of the arrow A)

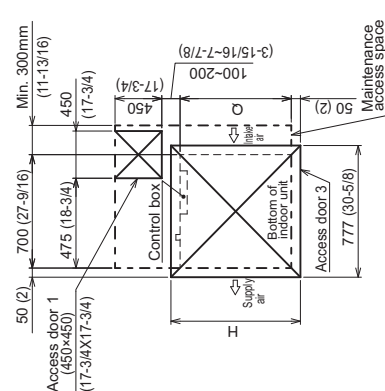
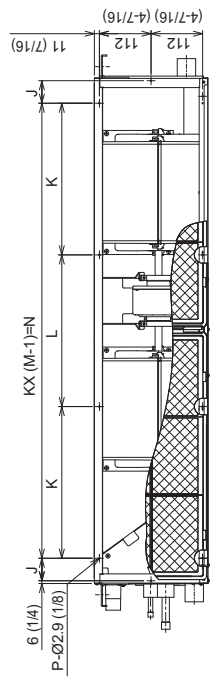


Fig.4 (Viewed from the direction of the arrow B)

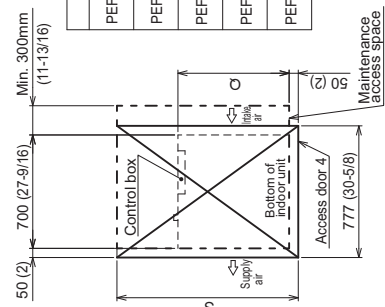


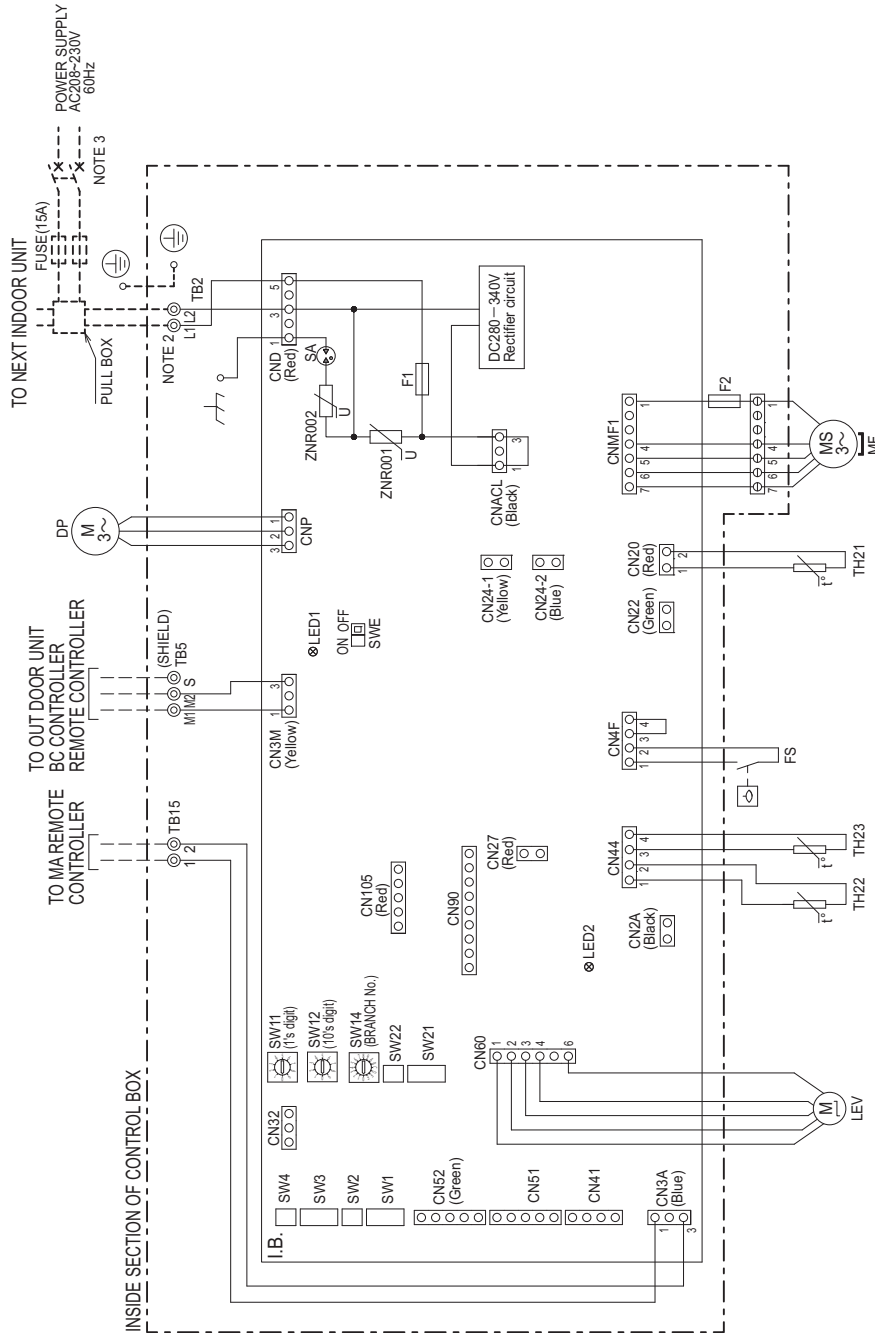
Fig.5 (Viewed from the direction of the arrow B)

Model	H	J	K	L	M	N	P	Q	R	S	Unit:mm(in.)
PEFY-P06,08,12NMAU-E4	800 (31-1/2)	44 (1-3/4)	150 (5-15/16)	300 (11-9/16)			10 (27-9/16)	700 (27-9/16)	50-150 (2)-5-15/16)	1300 (51-3/16)	
PEFY-P15,18NMAU-E4	1000 (39-3/8)	54 (2-3/16)	260 (10-1/4)	4	4	780 (30-3/4)	10 (35-7/16)	900 (35-7/16)	150-250 (5-15/16)-(9-7/8)	1500 (59-1/16)	
PEFY-P24,27,30NMAU-E4	1200 (47-1/4)	49 (1-15/16)	330 (13)			990 (39)	10 (43-5/16)	1100 (43-5/16)	250-350 (9-7/8)-(13-13/16)	1700 (66-15/16)	
PEFY-P36,48NMAU-E4	1500 (59-1/16)	54 (2-3/16)	320 (12.5/8)	5	5	1280 (50-7/16)	12 (55-1/8)	1400 (55-1/8)	400-500 (15-3/4)-(19-11/16)	2000 (78-3/4)	
PEFY-P54NMAU-E4	1700 (66-15/16)	54 (2-3/16)	370 (14-5/8)	5	5	1480 (58-5/16)	12 (63)	1600 (63)	500-600 (19-11/16)-(23-5/8)	2200 (86-5/8)	

Unit : mm(in.)

# [1] Wiring Diagram

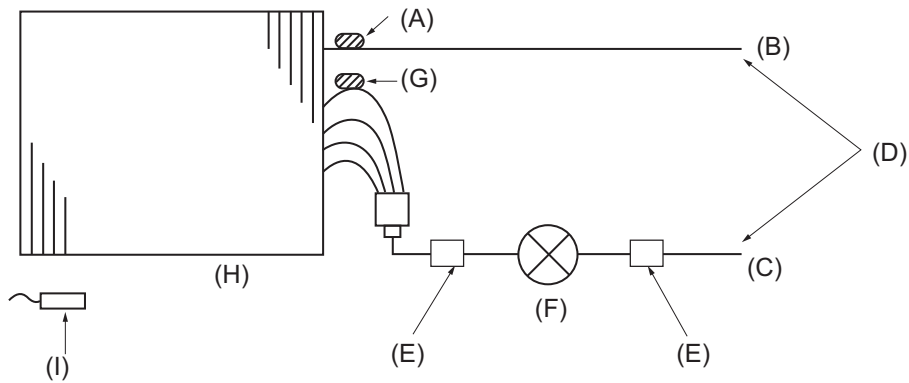
1. PEFY-P06, 08, 12, 15, 18, 24, 27, 30, 36, 48, 54NMAU-E4



- NOTES: 1. Symbols used in wiring diagram are  
 ○ ○ ○ ○ : Connector, ⊙ : Terminal  
 ----- (Heavy dotted line): Field wiring.  
 2. Use copper supply wires.  
 3. A disconnect should be required by local code.  
 Se procurer un sectionneur conforme aux réglementations Locales.

SYMBOL	EXPLANATION	SYMBOL	NAME	SYMBOL	NAME
DP	Drain Pump	I.B.	Indoor controller board	I.B.	Indoor controller board
F2	Fuse DC400V 3A SHV11	SA	Arrester	SW1	Switch (for mode selection)
FS	Float switch	F1	Fuse AC250V 6.3A (TP) M-BL8A04	SW2	Switch (for capacity code)
MF	Fan Motor	ZNR001,002	Varistor	SW3	Switch (for mode selection)
LEV	Linear expansion valve	CN2A	Connector (0-10V Analog input)	SW4	Switch (for mode selection)
TB2	Power source terminal block	CN22	Connector (Fan control)	SW11	Switch (1's digit address set)
TB5	Transmission terminal block	CN24-1	Connector (Heater control 1st)	SW12	Switch (10's digit address set)
TB15	Transmission terminal block	CN24-2	Connector (Heater control 2nd)	SW14	Switch (BRANCH No.)
TH21	Thermistor (inlet air temp. detection)	CN27	Connector (Damper)	SW21	Switch (for static pressure selection)
TH22	Thermistor (piping temp. detection/liquid)	CN32	Connector (Remote switch)	SW22	Switch (Wireless pair No.)
TH23	Thermistor (piping temp. detection/gas)	CN41	Connector (HA terminal-A)	SWE	Connector (emergency operation)
		CN51	Connector (Centrally control)	LED1	LED (Power supply)
		CN52	Connector (Remote indication)	LED2	LED (Remote controller supply)
		CN90	Connector (Wireless)		
		CN105	Connector (IT terminal)		

**[1] Refrigerant system diagram**

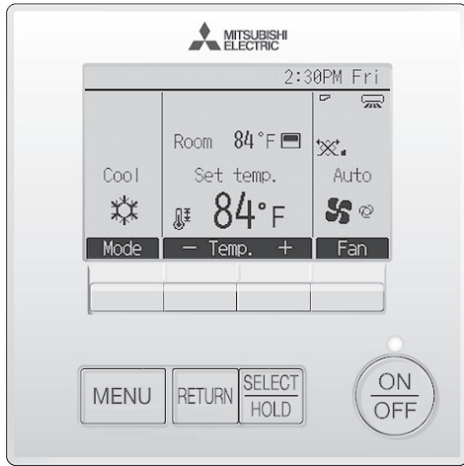


- (A) Gas pipe thermistor TH23
- (B) Gas pipe
- (C) Liquid pipe
- (D) Brazed connections
- (E) Strainer (#100 mesh)
- (F) Linear expansion valve
- (G) Liquid pipe thermistor TH22
- (H) Heat exchanger
- (I) Room temperature thermistor TH21

Capacity	PEFY-P06, 08, 12, 15, 18NMAU-E4	PEFY-P24, 27, 30, 36, 48, 54NMAU-E4
Gas pipe	ø12.7 [1/2]	ø15.88 [5/8]
Liquid pipe	ø6.35 [1/4]	ø9.52 [3/8]

**[1] Microprocessor Control**

**1. Cool operation**



**<How to operate>**

1. Press POWER [ON/OFF] button.
2. Press the [F1] button to display Cool.
3. Press the [F2] or [F3] button to set the desired temperature.

**Note**

The set temperature changes 2°F when the [F2] or [F3] button is pressed one time. Cooling 67 to 87°F

**1. Thermoregulating function**

**(1) Thermoregulating function (Function to prevent restarting for 3 minutes)**

- ♦Room temperature  $\geq$  desired temperature + 2°F ...Thermo ON
- ♦Room temperature  $\leq$  desired temperature ...Thermo OFF

**(2) Anti-freezing control (Frost Prevention control of indoor unit)**

♦Detected condition:

When BOTH conditions 1 and 2 have been meet, the indoor LEV will close to minimum Thermo OFF\* position until released.

- 1) Indoor unit has been Thermo ON\* in Cool/Dry mode for at least 16 min.
- 2) When the liquid pipe temp (TH22) or gas pipe temp (TH23) is 33.8°F or less, continuously for 3 min.

♦Released condition:

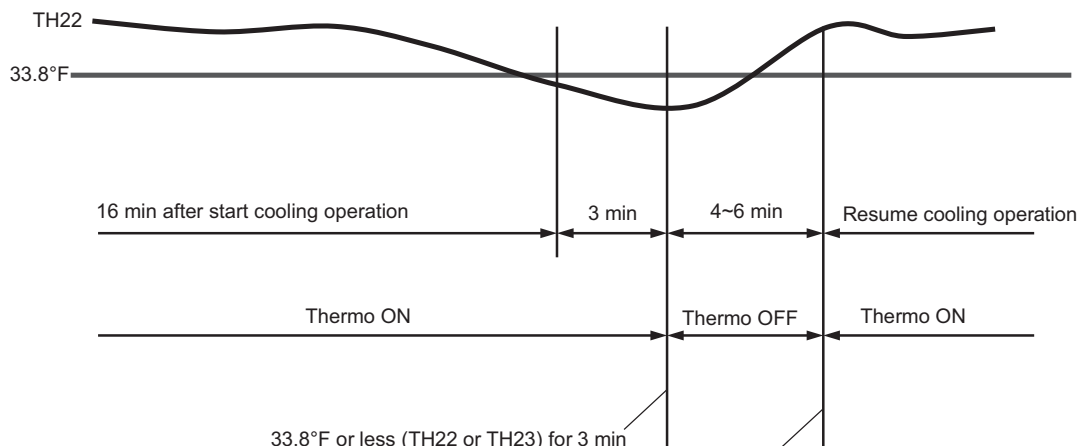
Anti-freezing control is cancelled when ANY one of the following conditions is satisfied, and an additional 3 minutes have passed.

- 1) Liquid pipe temp (TH22) and gas pipe temp (TH23) are 50°F or above continuously for 1 min.
- 2) The condition of the Thermo OFF\* has become complete by thermal-regulating (unit satisfies by set point).
- 3) The operation mode becomes a mode other than COOL or Dry.
- 4) The operation is stopped (unit is turned off).
- 5) Three min have passed from start of anti-freezing control.

\*Thermo OFF = The IC coil is not actively cooling or heating.

\*Thermo ON = The IC coil is actively cooling or heating.

Example:



- [50°F or above (TH22 and TH23) for 1 min] and 3 min passed or
- 6 min passed

2. Fan

(1) By the remote controller setting (switch of 3 speeds+Auto)

Type	Fan speed notch
3 speeds + Auto type	[Low], [Mid], [High], [Auto]

•When [Auto] is set, fan speed is changed depending on the value of: Room temperature - Desired temperature

3. Drain pump

(1) Drain pump control

•Always drain pump ON during the Cool and Drying mode operation. (Regardless of the thermo ON/ OFF)

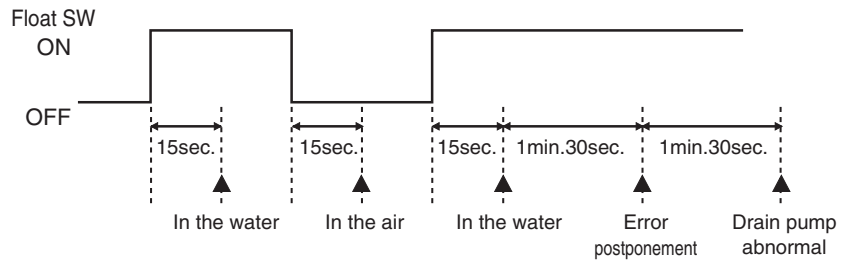
•When the operation mode has changed from the Cool or Drying to the others (including Stop), OFF the control after the drain pump ON for 3 minutes.

(2) Float switch control

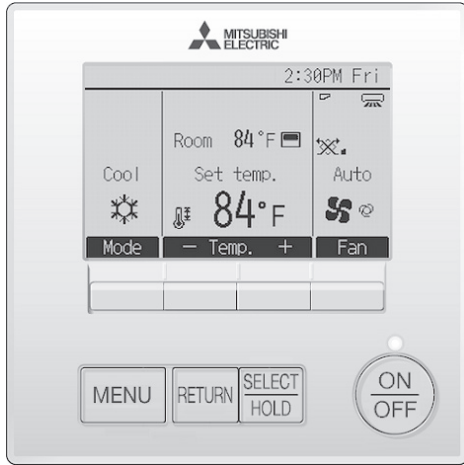
•Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF.

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.



## 2. Drying operation



### <How to operate>

1. Press POWER [ON/OFF] button.
2. Press the [F1] button to display Drying.
3. Press the [F2] or [F3] button to set the desired temperature.

### Note

The set temperature changes 2°F when the [F2] or [F3] button is pressed one time. Drying 67 to 87°F

### 1. Thermoregulating function

#### (1) Thermo regulating function (Function to prevent restarting for 3 minutes)

♦Setting the Dry thermo by the thermo regulating signal and the room temperature (TH21).

Dry thermo ON Room temperature  $\geq$  desired temperature + 2°F

Dry thermo OFF Room temperature  $\leq$  desired temperature

Room temperature	3 min. passed since starting operation		Dry thermo ON time (min)	Dry thermo OFF time (min)
	Thermo regulating 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			

#### (2) Frozen prevention control

♦No control function

### 2. Fan

#### (1) Indoor fan operation controlled depends on the compressor conditions.

Dry thermo	Fan speed notch	
ON	[Low]	
OFF	Excluding the following	Stop
	Room temp. < 64°F	[Low]

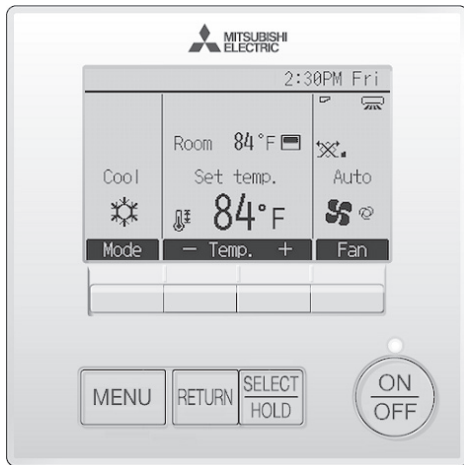
### Note

Remote controller setting is not acceptable.

### 3. Drain pump

#### (1) Same control as Cool operation

### 3. Fan operation



**<How to operate>**

1. Press POWER [ON/OFF] button.
2. Press the [F4] button to display Fan.

1. Fan
  - (1) Set by remote controller.

Type	Fan speed notch
3 speeds + Auto type	[Low], [Mid], [High], [Auto]

♦When [Auto] is set, fan speed becomes [Low].

2. Drain pump
  - (1) Drain pump control

♦The drain pump turns ON for the specified amount of time when any of the following conditions is met:

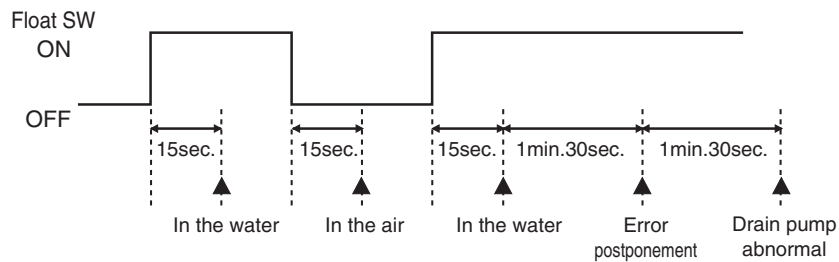
- 1) ON for 3 minutes after the operation mode is switched from Cool or Drying to another operation mode (Fan).
- 2) ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water.

- (2) Float switch control

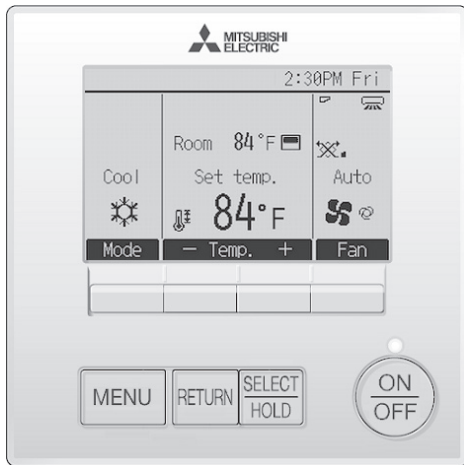
♦Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF.

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.



## 4. Heat operation



### <How to operate>

1. Press POWER [ON/OFF] button.
2. Press the [F1] button to display Heat.
3. Press the [F2] or [F3] button to set the desired temperature.

### Note

The set temperature changes 2°F when the [F2] or [F3] 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]

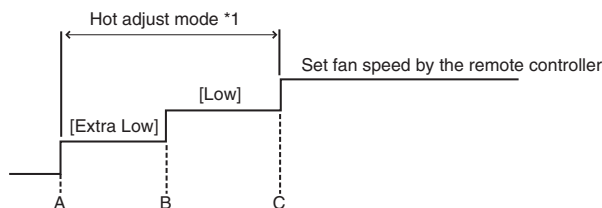
The [STANDBY] symbol is only displayed during the hot adjust mode.

1. Thermoregulating function
  - (1) Thermoregulating function (Function to prevent restarting for 3 minutes)
    - ♦Room temperature  $\leq$  desired temperature -2°F ...Thermo ON
    - ♦Room temperature  $\geq$  desired temperature ...Thermo OFF
2. Fan
  - (1) By the remote controller setting (switch of 3 speeds+Auto)

Type	Fan speed notch
3 speeds + Auto type	[Low], [Mid], [High], [Auto]

♦When [Auto] is set, fan speed is changed depending on the value of:  
Desired temperature - Room temperature  
Give priority to under-mentioned controlled mode

- 1) Hot adjust mode
  - 2) Preheating exclusion mode
  - 3) Thermo OFF mode (When the compressor off by the thermoregulating)
  - 4) Cool air prevention mode (Defrosting mode)
  - 5) Capacity increasing mode
- (2) Hot adjust mode
    - ♦The fan controller becomes the hot adjuster mode for the following conditions.
      - 1) When starting the Heat operation
      - 2) When the thermoregulating function changes from OFF to ON.
      - 3) When release the Heat defrosting operation



A: Hot adjust mode starts.

B: 5 minutes have passed since the condition A or the indoor liquid pipe temperature turned 95°F or more.

C: 2 minutes have passed since the condition A. (Terminating the hot adjust mode)

### Note

\*1 "STAND BY" will be displayed during the hot adjust mode.

- (3) Preheating exclusion mode

♦When the condition changes the auxiliary heater ON to OFF (thermoregulating or operation stop, etc.), the indoor fan operates in [Low] mode for 1 minute.



**Note**

This control is same for the model without auxiliary heater.

(4) Thermo OFF mode

♦When the thermoregulating function changes to OFF, the indoor fan operates in [Extra low].

(5) Heat defrosting mode

♦The indoor fan stops.

3. Drain pump

(1) Drain pump control

♦The drain pump turns ON for the specified amount of time when any of the following conditions is met:

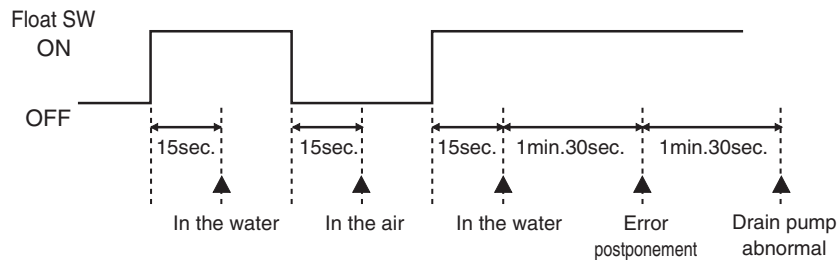
- 1) ON for 3 minutes after the operation mode is switched from Cool or Drying to another operation mode (Fan).
- 2) ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water.

(2) Float switch control

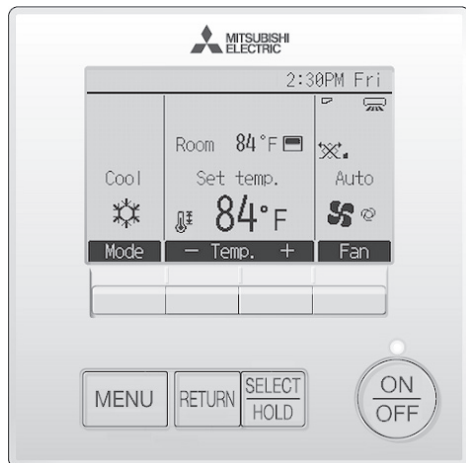
♦Float switch control judges whether the sensor is in the air or in the water by turning the float switch ON/OFF.

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.



**5. Auto operation [Automatic Cool / Heat change over operation]**



**<How to operate>**

1. Press POWER [ON/OFF] button.
2. Press the [F1] button to display Auto.
3. Press the [F2] or [F3] button to set the desired temperature.

**Note**

The set temperature changes 2°F when the [F2] or [F3] button is pressed one time. Automatic 67 to 83°F

1. Initial value of operation mode

- (1) Heat mode for room temperature < Desired temperature
- (2) 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

- (1) Same control as Cool operation

4. Heat mode

(1) Same control as heat operation

The value "3°F" is modifiable from 1.8°F to 9°F by maintenance tool.

**6. When unit is stopped control mode**

1. Drain pump

(1) Drain pump control

♦The drain pump turns ON for the specified amount of time when any of the following conditions is met:

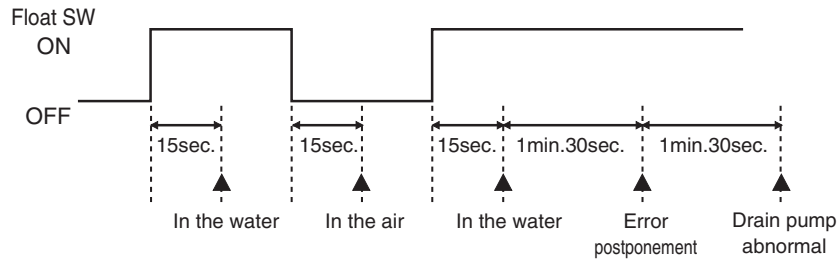
- 1) ON for 3 minutes after the operation mode is switched from Cool or Drying to another operation mode (Fan).
- 2) ON for 6 minutes after the float switch is submerged in the water when the float switch control judges the sensor is in the water.

(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.



**7. Heater control**

1. Control specifications and DIP S/W setting

♦Table 1 shows the function settings the field-installed heater. Select the desired pattern in the table below, and set the DIP SW on the outdoor and indoor units as shown in Table 1.

Table.1

Outdoor unit setting	Condition of outdoor unit	PEFY-P-NMAU-E4					
		DIP S/W (Indoor unit)*1		Heater control			
		SW3-2	SW3-4	Pattern	Defrost	Error	
DIP S/W OFF *3	N / A	OFF	-	Heater not Available			
		ON	OFF	Heater Available	OFF	OFF	
		ON	ON	Heater Available	ON	ON*2	
DIP S/W ON *3	<p>Condition of O/U</p> <p>Normal drive</p> <p>Defrost drive</p> <p>H/P drive</p> <p>H/P stop</p> <p>a b c d Outdoor temp.</p> <p>Parameters a/b/c/d are set by maintenance tool.</p>	Normal drive	OFF	-	Heater not Available		
			ON	OFF	Heater Available	OFF	OFF
			ON	ON	Heater Available	ON	ON*2
		Defrost drive H/P drive H/P stop	OFF	-	Heater not Available		
			ON	OFF	Heater Available	OFF	OFF
			ON	ON	Heater Available	ON	ON*2

\*1 Default settings: SW3-2 OFF, SW3-4 OFF

\*2 Heater will not operate during all error modes.

\*3 Please set function codes that are shown on outdoor unit service manuals (DIP S/W Functions).

\*4 Heater On signal can not be output in the following cases for safety reasons.

- Return air temperature sensor fault (Error code: 5101)
- Indoor unit fan operation error (Error code: 4109)
- Indoor unit fan motor error (Error code: 4114)
- Transmission error (Error code: 6\*\*\*, 7\*\*\*)
- When heating mode is prohibited
- When demand control or capacity save is set to 0%
- During refrigerant recovery mode on PUMY system
- For a few minutes when change from thermo OFF to ON or ON to OFF in R2/WR2 system

♦Table 2 shows how the field-installed heater is controlled.

Table.2 [Heater Control Table]

Mode Change	Condition				
EH1 ON	$(T_o - T_{RA}) > 2.7 \text{ }^\circ\text{F [1.5 }^\circ\text{C]}$	AND	$T_{RA}$ has not increased by $0.9 \text{ }^\circ\text{F [0.5}^\circ\text{C]}$ in $X$ min		
EH2 ON	EH1 ON for $> 5$ min	AND	$(T_o - T_{RA}) > 2.7 \text{ }^\circ\text{F [1.5 }^\circ\text{C]}$	AND	$T_{RA}$ has not increased by $0.9 \text{ }^\circ\text{F [0.5}^\circ\text{C]}$ in 5 min
EH1 OFF	$(T_o - T_{RA}) \leq 0.9 \text{ }^\circ\text{F [0.5 }^\circ\text{C]}$				
EH2 OFF					
KEY • EH1: Electric Heater 1 • EH2: Electric Heater 2 • To: Set point temperature • $T_{RA}$ : Return Air temperature • X: Time delay (Selectable. Default is 20 min. Selectable to 10, 15, or 25 min)					

♦Table 3 shows how the time delay is selected.

Table.3 [Time Delay Selection Table]

Function Setting *1	Action *3
108-1	Set Time Delay to <u>10</u> minutes
108-2	Set Time Delay to <u>15</u> minutes
108-3	Set Time Delay to <u>20</u> minutes *2
108-4	Set Time Delay to <u>25</u> minutes

\*1 Time delay can only be selected with MA controller. If use of a non-MA controller is desired, the time delay must first be selected with the MA controller. Then the non-MA controller can be attached and used.

\*2 The default time delay setting is 20 minutes.

\*3 Time delays are approximate.

•Chart 1 and Table 4 show an example of heater operation.

Chart 1 [Heater Operation Example]

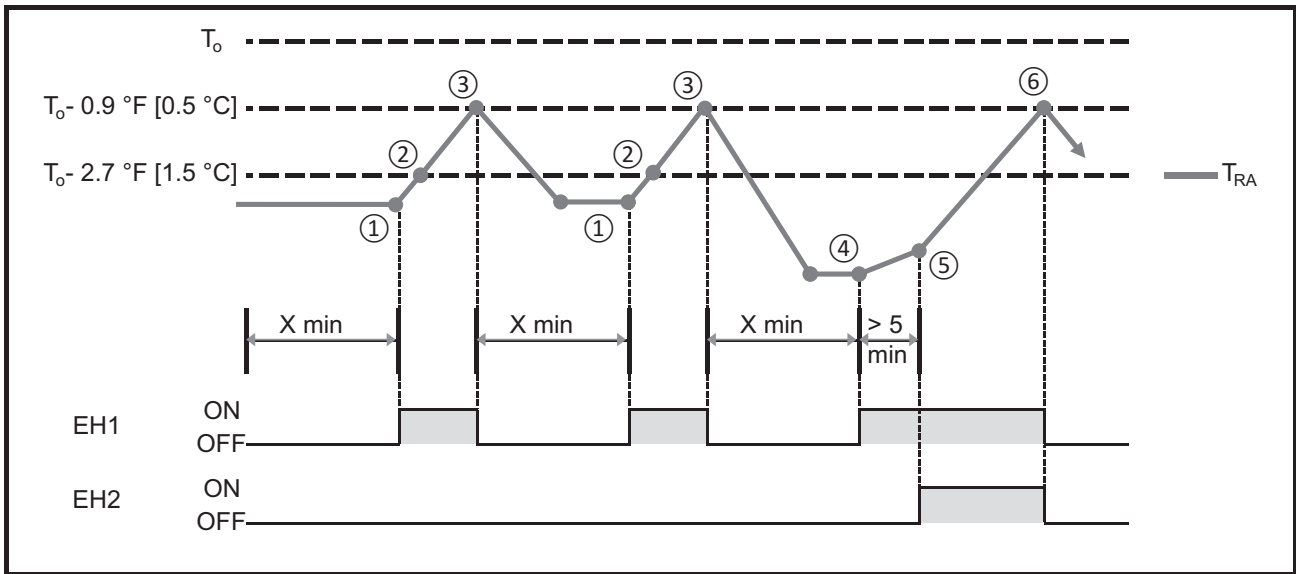
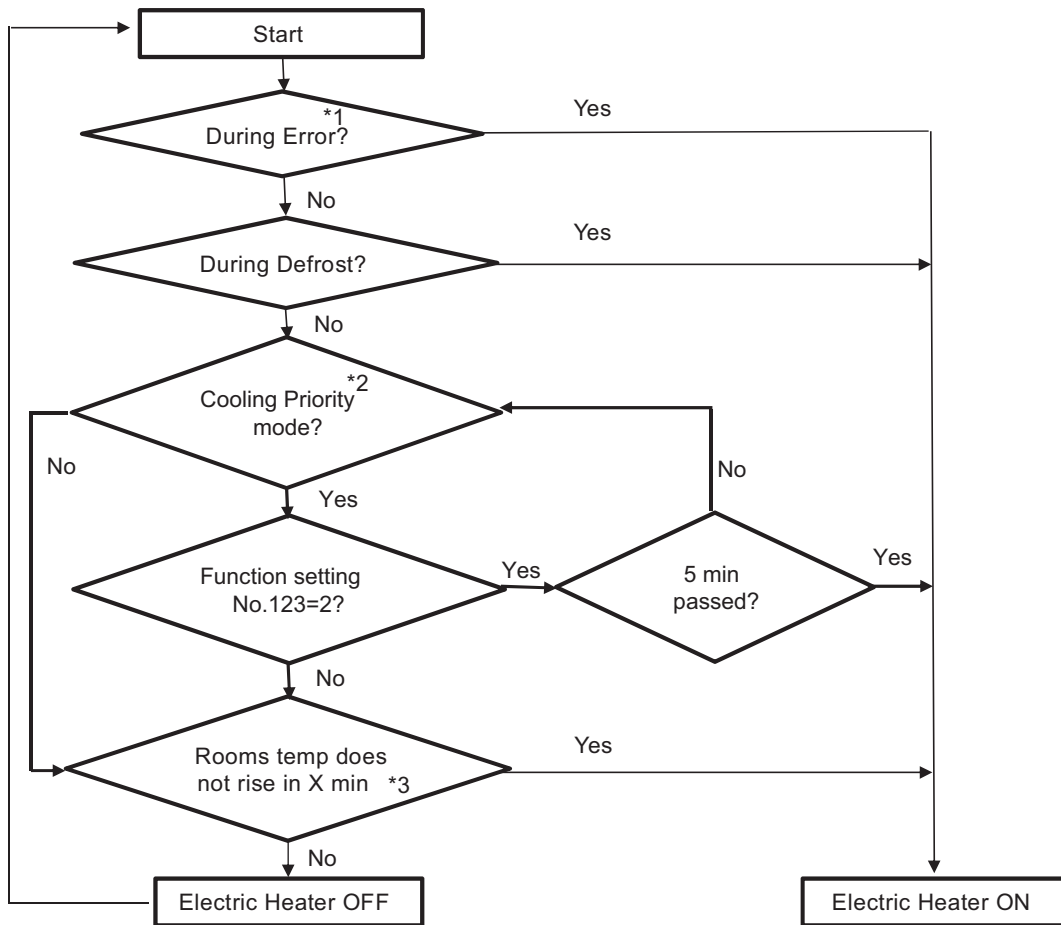


Table.4 [Heater Operation Example]

Step	Condition		Result
①	$(T_0 - T_{RA}) > 2.7 \text{ }^\circ\text{F} [1.5 \text{ }^\circ\text{C}]$	AND $T_{RA}$ has not increased by $0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$ in $\underline{X}$ min	EH1 ON
②	$(T_0 - T_{RA}) \leq 2.7 \text{ }^\circ\text{F} [1.5 \text{ }^\circ\text{C}]$	AND $T_{RA}$ increasing faster than $0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$ in 5 min	EH2 not ON
③	$(T_0 - T_{RA}) \leq 0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$		EH1 OFF
④	$(T_0 - T_{RA}) > 2.7 \text{ }^\circ\text{F} [1.5 \text{ }^\circ\text{C}]$	AND $T_{RA}$ has not increased by $0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$ in $\underline{X}$ min	EH1 ON
⑤	$(T_0 - T_{RA}) > 2.7 \text{ }^\circ\text{F} [1.5 \text{ }^\circ\text{C}]$	AND $T_{RA}$ not increasing faster than $0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$ in 5 min	EH2 ON
⑥	$(T_0 - T_{RA}) \leq 0.9 \text{ }^\circ\text{F} [0.5 \text{ }^\circ\text{C}]$		EH1 OFF EH2 OFF

•Chart 2 show how heater is on.

The software has the function to turn on electric heater 5 minutes after turning on remote controller in case that outdoor unit cannot operate in heating mode because the system is in cooling priority mode. This function is available when function setting No.123 is set to "2".



\*1. The heater will not turn on in the error of TH1 thermistor or fan motor.

\*2. See WT06231 for the details of this function.

\*3. X (time delay) default is 20 min and changeable by function setting, see Table 3.

**Note**

(1) Turning on the heater with the fan setting set to OFF requires that the DIP S/W and connectors on the indoor units are set on site.

Fan control

Pattern	CN22 for FAN control (PAC-YU25HT)	DIP SW3-2 (Indoor unit)	DIP SW3-4 (Indoor unit)	in error *1 *5		in defrost		All modes other than defrost and error	
				Fan	Heater	Fan	Heater	Fan	Heater
1	Disabled	ON	OFF	FAN ON *2	OFF	Stop	OFF	High *3	ON
2			ON	High (DIP SW1-7: ON and SW1-8: OFF) or (DIP SW1-7: OFF and SW1-8: ON)	ON	High (DIP SW1-7: ON and SW1-8: OFF) or (DIP SW1-7: OFF and SW1-8: ON)	ON	In heating Thermo-Off	
				<table border="1"> <thead> <tr> <th>Fan</th> <th>Heater</th> </tr> </thead> <tbody> <tr> <td>High (DIP SW1-7: ON and SW1-8: OFF) or (DIP SW1-7: OFF and SW1-8: ON)</td> <td>ON</td> </tr> <tr> <td>Very low (DIP SW1-7: OFF and SW1-8: OFF) STOP (DIP SW1-7: ON and SW1-8: ON)</td> <td>OFF</td> </tr> </tbody> </table>		Fan	Heater	High (DIP SW1-7: ON and SW1-8: OFF) or (DIP SW1-7: OFF and SW1-8: ON)	ON
Fan			Heater						
High (DIP SW1-7: ON and SW1-8: OFF) or (DIP SW1-7: OFF and SW1-8: ON)	ON								
Very low (DIP SW1-7: OFF and SW1-8: OFF) STOP (DIP SW1-7: ON and SW1-8: ON)	OFF								
3	Enabled	OFF	FAN ON *2	OFF	Stop	OFF	*4	ON	
4		ON	FAN ON *2	ON	Stop	ON			

\*1 Heater will not operate during all error modes.

\*2 The fan speed in the Heating Thermo-OFF mode depends on the settings of DIP-SW 1-7 and 1-8. Refer to VIII-[1]-5-1 Function setting.

\*3 While the heater is on, the fan will operate at high speed regardless of the fan setting on the remote controller.

\*4 The fan speed depends on the settings of the remote controller. The heater turns on regardless of the fan speed.

\*5 The fan stops and the heater turns off, depending on the type of error.



**\* If a heater is installed in the duct, do not use CN22. By doing so, the fan will turn off when the heater is on, which may result in fire.**

(2) Back-up heating will not be performed when the heater turns on while demand control is performed (not a request item).

(3) This is applicable only to the R410 series. Make the settings for the following dip switches on the outdoor unit control board before switching on the power.

2. PAC-YU25HT (Optional Parts) installation

The following section describes installation of the External Heater Adapter that connects to CITY MULTI air conditioner R410A series indoor unit. This products is the special wiring parts to drive an electric heater with the air conditioner.

(1) Parts list

•Check that the following parts are included in the package.

- 1) External output cable.....2 in total  
Two types of cables with different connectors are included.
- 2) Panel heater connector.....3 in total  
White: 1  
Green: 2 (2 types)

(2) Connection to the indoor unit

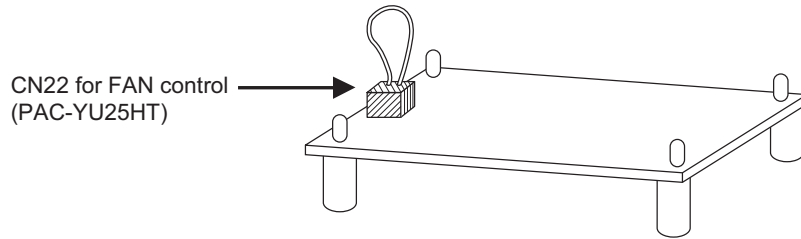
•Use the cables that fit the connectors on the indoor unit control board.

1) External output cable (with a yellow connector)

This cable is used to connect a relay circuit for an interlocked operation with either an electric or a panel heater. Select the heater output pattern (1st =CN24-1 or 2nd = CN24-2) to use, and connect the cable to the connector on the indoor unit control board that corresponds to the selection.

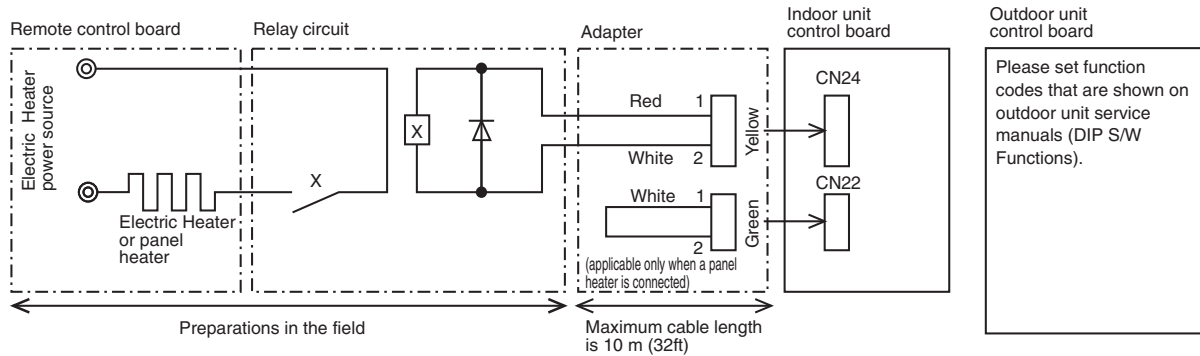
2) Panel heater connector (with a green connector)

This connector is used to perform an interlocked operation with a panel heater. Depending on the indoor unit control board specification, connect the cable to CN22 as appropriate.



(3) Wiring

•A basic connection method is shown below.



•For relay X, use the specifications given below.

Operation coil

Rated voltage: 12VDC

Power consumption: 0.9W or less

\* Use the diode that is recommended by the relay manufacturer at both ends of the relay coil.

•The length of the electrical wiring for the PAC-YU25HT is 2 meters (6-1/2 ft.)

•To extend this length, use sheathed 2-core cable.

Control cable type: CVV, CVS, CPEV or equivalent.

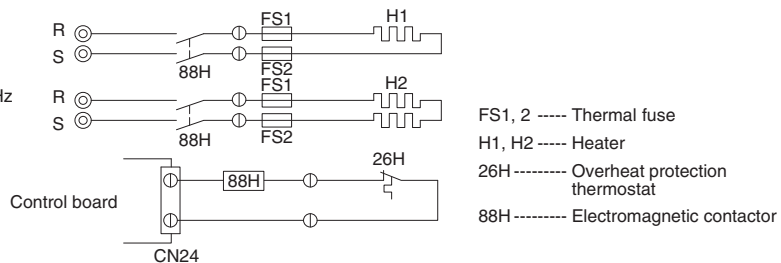
Cable size: 0.5 mm<sup>2</sup> ~ 1.25 mm<sup>2</sup> (16 to 22 AWG)

Don't extend the cable more than 10 meters (32ft)

Recommended circuit

1-phase power supply  
208V, 230V/60Hz

Wiring diagram



(4) Wiring restrictions

•Keep the length of the cable connecting to the circuit board of the indoor unit shorter than 10 meters (32ft).

•Longer than 10 meters (32ft) could cause improper operation.

•Use a transit relay when extending wiring such as remote wiring.

**[1] Troubleshooting**

**1. Check methods**

1. Component and check points

(1) Thermistor

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

Disconnect the connector and measure the resistance between terminals with a tester.  
(Ambient temperature 10°C - 30°C[50°F-86°F])

Normal	Abnormal
4.3kΩ - 9.6kΩ	Open or short

(Refer to the thermistor characteristic graph below.)

1) Thermistor characteristic graph

**Low-temperature thermistor**

- Room temperature thermistor (TH21)
- Liquid pipe thermistor (TH22)
- Gas pipe thermistor (TH23)
- Drain sensor (DS)

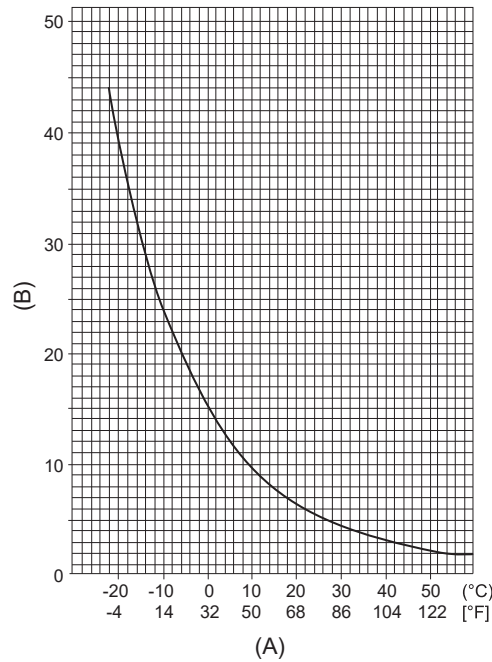
- Thermistor R<sub>0</sub> = 15 kΩ±3%
- Multiplier of B = 3480 kΩ±2%

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

0°C	32°F	15kΩ
10°C	50°F	9.6kΩ
20°C	68°F	6.3kΩ
25°C	77°F	5.2kΩ
30°C	86°F	4.3kΩ
40°C	104°F	3.0kΩ

(A) Temperature (°C)[°F]

(B) Resistance (kΩ)



(2) Fan motor (CNMF)

Refer to the page on "DC fan motor (fan motor/indoor control board)."

(3) Linear expansion valve

Disconnect the connector, and measure the resistance between terminals with a tester.  
Refer to the next page for details.

	Normal				Abnormal
	1-6 White-Red	2-6 Yellow-Red	3-6 Orange-Red	4-6 Blue-Red	
	(150Ω) ±10%				Open or short

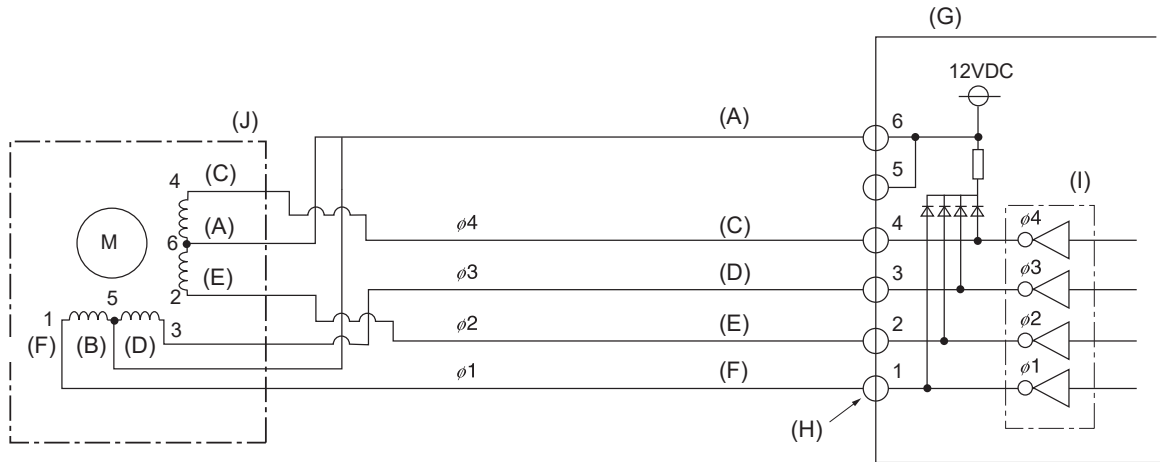
- (A) Red
- (B) Blue
- (C) Orange
- (D) Yellow
- (E) White
- (F) White



1) Summary of linear expansion valve (LEV) operation

- The LEV is operated by a stepping motor, which operates by receiving a pulse signal from the indoor control board.
- The LEV position changes in response to the pulse signal.

**Indoor control board and LEV connection**



- |            |                            |
|------------|----------------------------|
| (A) Red    | (G) Control board          |
| (C) Blue   | (H) Connection (CN60)      |
| (D) Orange | (I) Drive circuit          |
| (E) Yellow | (J) Linear expansion valve |
| (F) White  |                            |

**Pulse signal output and valve operation**

Phase number	Output pulse			
	1	2	3	4
ø1	ON	OFF	OFF	ON
ø2	ON	ON	OFF	OFF
ø3	OFF	ON	ON	OFF
ø4	OFF	OFF	ON	ON

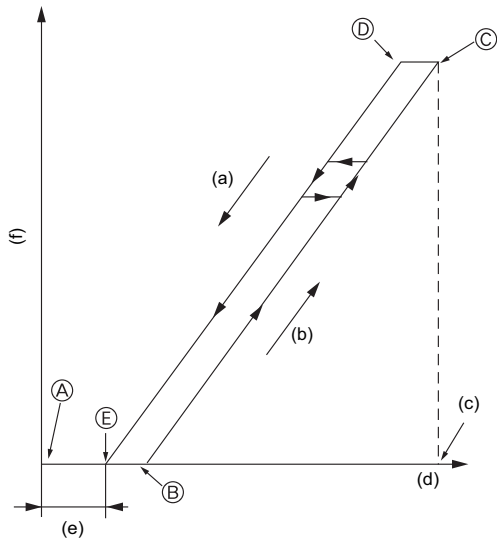
The output pulse changes in the following order:

When the valve closes 1 -> 2 -> 3 -> 4 -> 1

When the valve opens 4 -> 3 -> 2 -> 1 -> 4

- When the valve position remains the same, all output signals will be OFF.
- If any output signal is missing or if the signal remains ON, the motor vibrates and makes clicking noise.

2) LEV operation



- (a) Close
- (b) Open
- (c) Fully open valve (2000 pulses)
- (d) No. of pulses
- (e) Extra tightening (41 pulses)
- (f) Valve opening degree

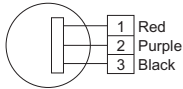
- When the power is turned on, a pulse signal of fully open pulse + 10% pulse is output (valve closure signal), to bring the valve to position A.
- When the valve is operating normally, it is free of vibration noise. If the valve locks or when it goes from point E to A in the figure, it makes louder noise than would be heard when there is an open phase.
- Check for abnormal sound/vibration by placing the metal tip of a screwdriver against the valve and the handle side against your ear.

3) Troubleshooting

Symptom	Checking Criteria	Remedy
Circuit failure on the microcomputer	<p>Disconnect the connectors on the control board, and connect LEDs to test the circuit as shown below.</p> <p>Pulse signals are output for 10 seconds when the main power is turned on. If there are LEDs that do not light up at all or remain lit after the pulses are turned off, there is a problem with the driving circuit.</p>	Replace the indoor control board if driving circuit failure is detected.
Locked LEV	The motor will idle and make small clicking noise if it is run while the LEV is locked. If this clicking noise is heard both when the valve is fully closed and while it is being opened, it indicates a problem.	Replace the LEV.
Disconnected or shorted LEV motor coils	Measure the resistance between the coils with a tester (red-white, red-orange, Red-yellow, Red-blue). The normal range of resistance is $150\Omega \pm 10\%$	Replace the LEV.

Symptom	Checking Criteria	Remedy
Valve closure failure (leaky valve)	<p>To check the LEV on the indoor unit, check the indoor unit liquid pipe temperature that appears on the operation monitor on the outdoor unit's multi control board while operating the indoor unit in question in the FAN mode and the other indoor units in the cooling mode.</p> <p>(A) Termistor (TH22)</p> <p>Normally, the LEV is fully closed while the unit is in the FAN mode. If the valve is leaky, liquid pipe thermistor reading will be lower than normal. If it is significantly lower than the inlet temperature on the remote controller, valve closure failure is suspected. If the amount of leakage is insignificant, replacement of LEV is unnecessary unless it is causing a problem.</p>	Replace the LEV if the amount of leakage is great.
Misconnections of connectors or contact failure	<p>Perform a visual check for disconnected connectors.</p> <p>Perform a visual check of lead wire color.</p>	Disconnect the connectors on the control board and perform a continuity test.

(4) Drain pump



1. Check if the drain float switch works properly.
2. Check if the drain pump works and drains water properly in cooling operation.
3. If no water drains, confirm that the check code 2502 will not be displayed 10 minutes after the operation starts.

Note: The drain pump for this model is driven by the internal DC motor of controller board, so it is not possible to measure the resistance between the terminals.

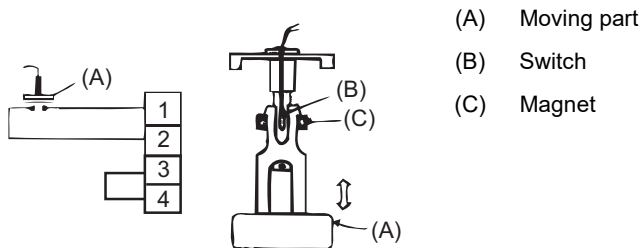
Normal

Red-Black: Input 13V DC → The fan starts to rotate.

Purple-Black: Abnormal (check code 2502) if it outputs 0-13 V square wave (5 pulses/rotation), and the number of rotation is not normal.

(5) Drain float switch (CN4F)

Disconnect the connector, and measure the resistance between terminals with a tester.



Position of the moving part	Normal	Abnormal
Up	Short	(any position but short)
Down	Open	(any position but open)

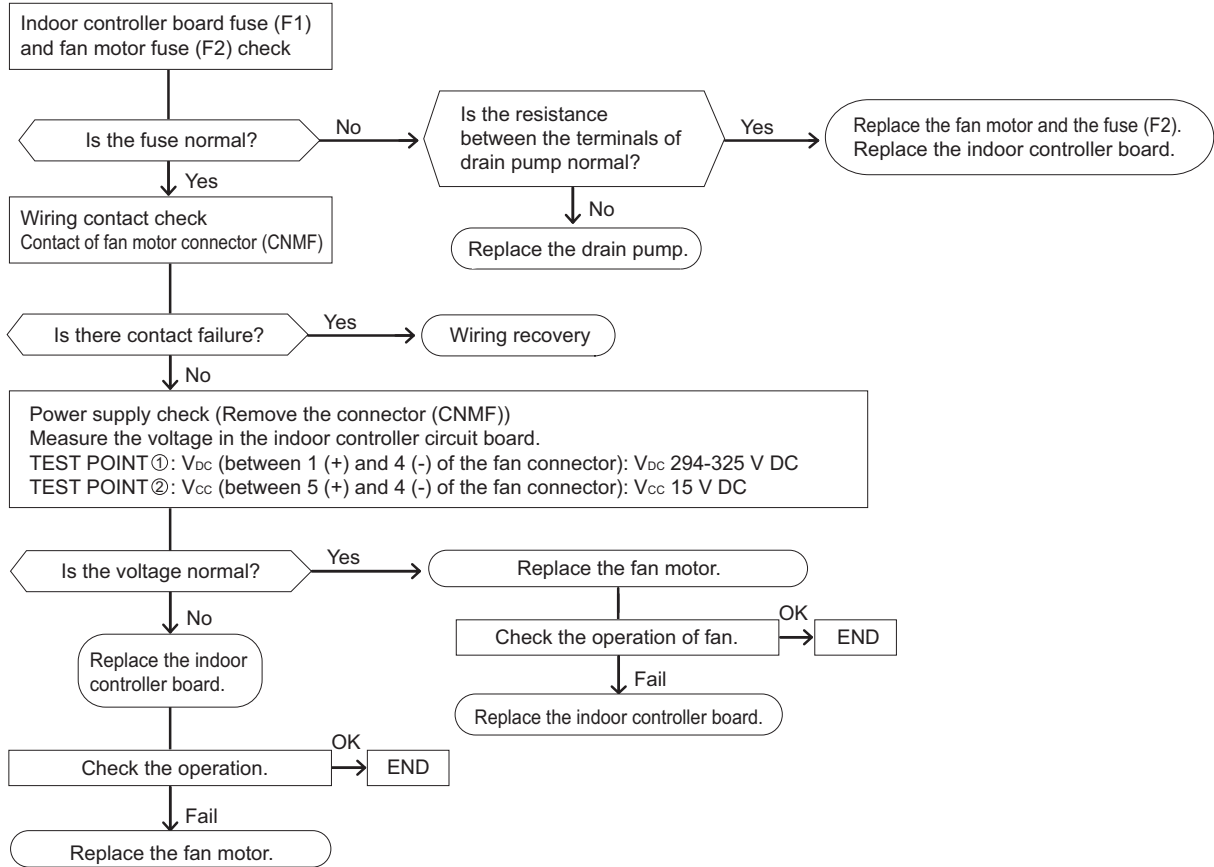
## 2. DC fan motor (fan motor/indoor control board)

### 1. CAUTION

- A high voltage is applied to the connector for connection to the fan motor (CNMF).
- Do not unplug the connector CNMF with the unit energized to avoid damage to the indoor control board and fan motor.

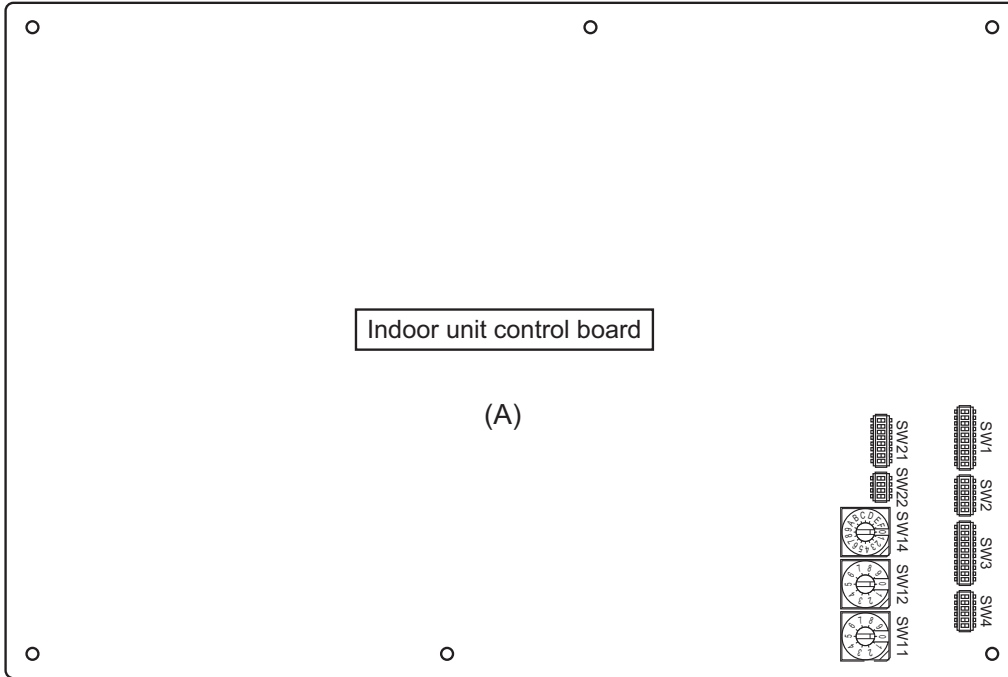
### 2. Troubleshooting

- Symptom: Indoor unit fan does not run.



### 3. Address switch setting

Make sure that power to the unit is turned off.

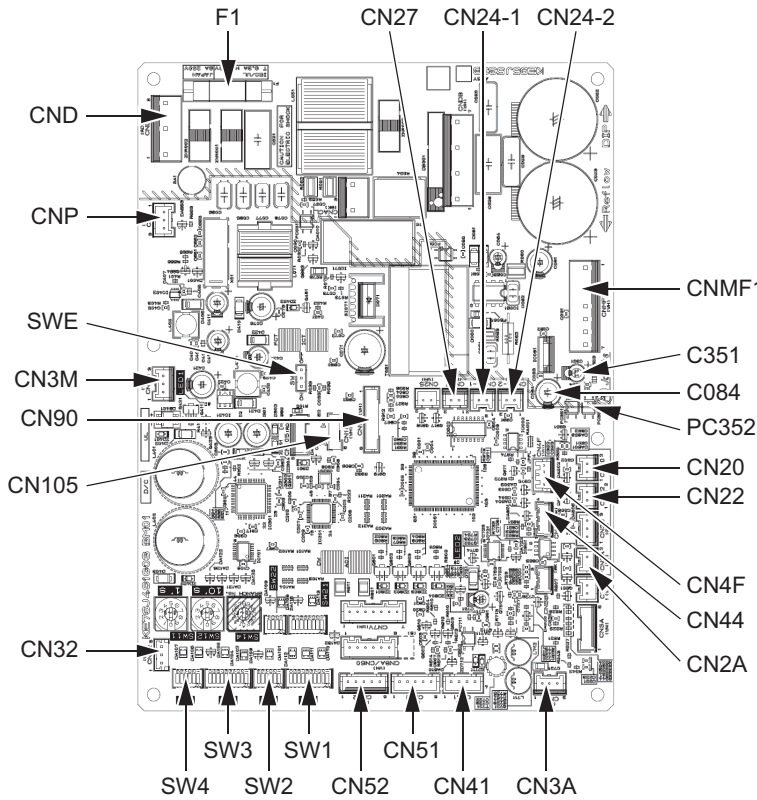


(A) Indoor unit control board

1. When using an ME remote controller, set the address with the rotary switches (SW11, SW12).  
♦Address setting is not required when the unit remote controller is used.  
**On-site address setting is required for the indoor units to run.**
2. Address settings vary in different systems.  
Refer to the section on address setting in the outdoor unit installation manual.
3. Address is set with a combination of SW12 (10's digit) and SW11 (1's digit).  
To set the address to "3," set SW12 to "0" and SW11 to "3."  
To set the address to "25," set SW 12 to "2" and SW 11 to "5."

#### 4. Voltage test points on the control board

1. PEFY-P06, 08, 12, 15, 18, 24, 27, 30, 36, 48, 54NMAU-E4



- F1 Fuse (AC 250V 6.3A)
- CND Power supply voltage (208 - 230V)
- CN3M For M-NET transmission cable connection (24 - 30VDC (Between 1 and 3.))
- SWE Emergency operation
- SW1 Function setting
- SW2 Capacity setting
- SW4 Function setting
- SW3 Function setting
- SW11 1's digit address set
- SW12 10's digit address set
- SW14 Branch No.
- SW21 For static pressure selection
- SW22 Wireless pair No.
- CN32 Remote start/stop adapter
- CN3A For MA remote controller cable connection (10 - 13 VDC (Between 1 and 3.))
- CN52 Remote display
- CN51 Centralized control
- CN41 JAMA standard HA terminal A
- CN44 Thermistor (liquid/gas temperature)
- CN4F Float thermistor
- CN22 For fan control
- CN20 Thermistor (Inlet temperature)
- CN27 Damper
- CN24-1 Heater control 1st
- CN24-2 Heater control 2nd
- CN2A 0-10V Analog input
- CN90 Wireless
- CN105 IT terminal
- CNMF Fan motor output  
1 - 4: 294 - 325 VDC  
5 - 4: 15 VDC  
6 - 4: 0 - 6.5 VDC  
7 - 4: Stop 0 or 15 VDC  
Run 7.5 VDC  
(0 - 15 pulse)
- CNP Drain-up mechanism output (13 VDC (Between 1 and 3.))
- (\*1)
- V<sub>FG</sub> Voltage on the (-) side of PC352 and C084 (Same with the voltage between 7 (+) and 4 (-) of CNMF)
- V<sub>CC</sub> Voltage between the C084 pins 15 VDC (Same with the voltage between 5 (+) and 4 (-) of CNMF)
- V<sub>sp</sub> Voltage between the C351 pins 0 VDC (with the fan stopped) 1 - 6.5 VDC (with the fan in operation) (Same with the voltage between 6 (+) and 4 (-) of CNMF)

## 5. Dipswitch setting (Factory setting)

### 1. Function setting

#### (1) SW1

Switch position	Function	Switch setting		
		ON	OFF	
1	Active Thermistor (Intake air thermistor)	Built-in thermistor on the remote controller	Indoor unit	
2	Filter clogging detection	Available	Unavailable	
3	Filter life	2500 hr	100 hr	
4	Outdoor air intake	Enabled	Disabled	
5	Remote display	Thermo-ON signal	Fan output	
6	Humidifier operation	During heating mode	During heating operation	
7	Fan speed at heating Thermo-OFF	7	8	Fan speed notch in heating thermo off
8		OFF	OFF	Very low
		ON	OFF	Low
		OFF	ON	Preset fan speed
		ON	ON	Stop
9	Auto restart after power failure	Enabled	Disabled	
10	Power start/stop	Enabled	Disabled	

#### 1) Adress board

Factory setting



#### (2) SW3

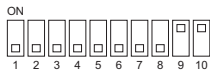
Switch position	Function	Switch setting	
		ON	OFF
1	Unit type	Cooling only	Heat pump
2	Heater available	Heater available	Heater not available
3	-	-	-
4	Heater Control	Heater ON during defrost and error	Heater OFF during defrost and error
5	-	-	-
6	-	-	-
7	-	-	-
8	Heating 4-deg up	Disabled	Enabled
9	-	-	-
10	-	-	-

#### 1) Indoor control board

Dipswitch settings must be made while the unit is stopped.

Factory setting

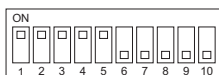
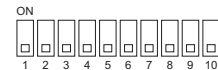
PEFY-P06, 24NMAU-E4



PEFY-P08, 15, 18, 27, 30, 36, 48, 54NMAU-E4



PEFY-P12NMAU-E4



The figure at left shows that the switches 1 through 5 are set to ON and 6 through 10 are set to OFF.

2. Capacity code setting

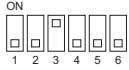
(1) SW2

Dipswitch settings must be made while the unit is stopped.

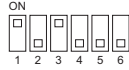
Factory setting

The switches are set to correspond to the unit capacity.

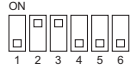
PEFY-P06NMAU-E4



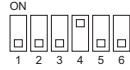
PEFY-P08NMAU-E4



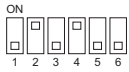
PEFY-P12NMAU-E4



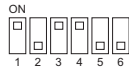
PEFY-P15NMAU-E4



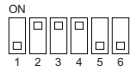
PEFY-P18NMAU-E4



PEFY-P24NMAU-E4



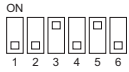
PEFY-P27NMAU-E4



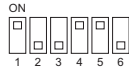
PEFY-P30NMAU-E4



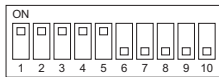
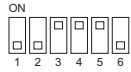
PEFY-P36NMAU-E4



PEFY-P48NMAU-E4



PEFY-P54NMAU-E4



The figure at left shows that the switches 1 through 5 are set to ON and 6 through 10 are set to OFF.

3. Model setting

(1) SW4

Dipswitch settings must be made while the unit is stopped.

Factory setting

Please see the WIRING LABEL on the control box.

Note:

Changes made to the dipswitches SW1, SW2, and SW3 will become effective when the unit comes to a stop (remote controller off). There is no need to power cycle the unit.

4. Power voltage setting

(1) SW21-6

Dipswitch settings must be operated with the main power turned OFF.

Factory setting

Please see the WIRING LABEL on the control box.

Set SW21-6 to OFF side when the power supply is 230 volts.

When the power supply is 208 volts, set SW21-6 to ON side.

5. External static pressure

Five levels of external static pressure are available for selection.

Set the setting either by using the switches on the control board (SW21-1, SW21-2, and SW21-5) or from the function selection screen on the remote controller.

Note:

◆When the static pressure setting was set from the remote controller, the actual setting and the switch setting on the control board may not match because the latest setting from the remote controller overrides the previous setting.

To check the latest static pressure setting, check it on the remote controller, not on the switch.

◆If the static pressure setting for the duct is lower than that for the unit, the fan of the unit may repeat start/stop, and the outdoor unit may remain in a stopped state. Match the static pressure settings for the unit to that for the duct.



**To set the external static pressure with the switches on the control board**

External static pressure	SW21-1	SW21-2	SW21-5	Initial setting
35 Pa	OFF	OFF	OFF	
50 Pa	ON	OFF	OFF	○
70 Pa	OFF	ON	ON	
100 Pa	OFF	OFF	ON	
150 Pa	ON	OFF	ON	

**To set the external static pressure from the function selection screen on the remote controller (PAR-40MAAU)**

Follow the instructions below and the instructions detailed in the remote controller manual for how to set the switches.

1. Set the function setting No. 32 (Switch setting/Function selection) to "2".
2. Set the function setting No. 8 and No. 10 to appropriate values, according to the external static pressure.

Selection	Function setting No.	Initial setting	Current setting
	No. 32		
Switch setting	1	○	
Function selection	2		

External static pressure	Function setting No.		Initial setting	Current setting
	No. 8	No. 10		
35 Pa	2	1		
50 Pa	3	1	○	
70 Pa	1	2		
100 Pa	2	2		
150 Pa	3	2		

**[Important]**  
Be sure to write down the settings for all functions in the "Current setting" row if any of the initial settings has been changed.

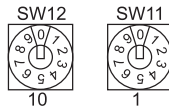
6. 1s and 10ths digits

- (1) SW11, SW12 (Rotary switch)

The use of an ME remote controller requires address setting.

Address settings must be made while the unit is stopped.

Factory setting



7. Connection No. setting

- (1) SW14 (Rotary switch)

This switch is used when the unit connected to an R2 series of outdoor unit.

Factory setting



Note:

Changes to the dipswitches SW11, SW12, SW14, and SW15 must be made while the unit is stopped and the remote controller is OFF.

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## [1] Disassembly Procedure

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### 1. Control box

Exercise caution when removing heavy parts.

1. Removing the control box cover
  - (1) Remove the three fixing screws on the cover (A) to remove it.
    - ♦Tighten screws to a torque of  $2.0\pm 0.2$  N·m.

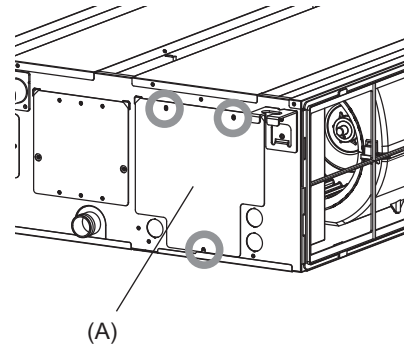


Fig.1

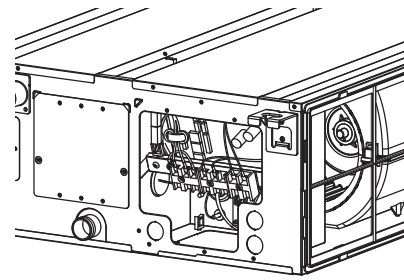


Fig.2

## 2. Thermistor (Intake air)

**Exercise caution when removing heavy parts.**

1. Remove the control box cover according to the procedure in section 1.
2. Remove the thermistor.
  - (1) Pull out the thermistor holder (B) and thermistor (C) on the control box.

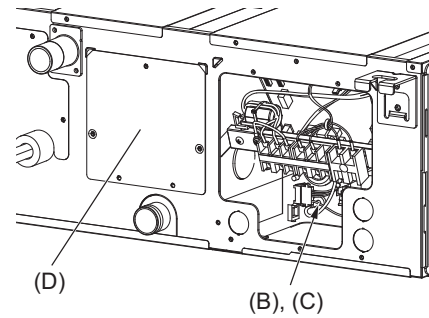


Fig.3

## 3. Drain pump

**Exercise caution when removing heavy parts.**

1. Remove the control box cover according to the procedure in section 1.
2. Remove the drain pump.
  - (1) Remove the drain pump from connector (E) in control box.
  - (2) Remove the cover (D) and the drain pump.

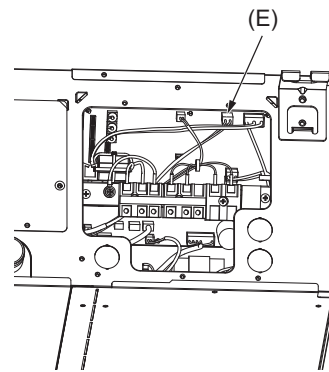


Fig.4

## 4. Drain pan

**Exercise caution when removing heavy parts.**

1. Removing the filter and the bottom plate
  - (1) Push down the tab on the filter, and pull out the filter in the direction of the arrow 1.
  - (2) Remove the fixing screws on the bottom plate (F), (G) to remove it.
    - Tighten screws to a torque of  $1.4\pm 0.2$  N·m.

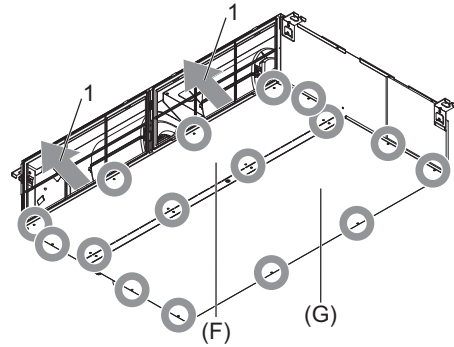


Fig.5

2. Removing the drain pan
  - (1) Pull out the drain pan in the direction of the arrow 2.

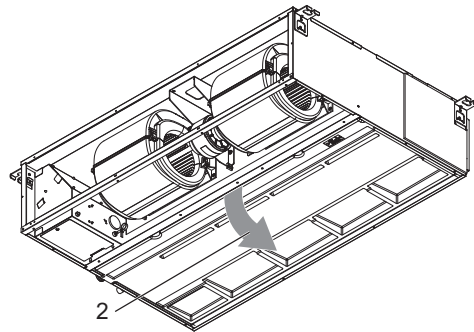


Fig.6

**Note**

- Drain the water out of the drain pan before removing it.

## 5. Thermistor (Gas pipe) (Liquid pipe)

Exercise caution when removing heavy parts.

1. Remove the drain pan according to the procedure in section 4.
2. Removing the Heat exchanger cover
  - (1) Remove the three fixing screws on the heat exchanger cover (H) to remove it.
    - Tighten screws to a torque of  $1.4 \pm 0.2$  N·m.

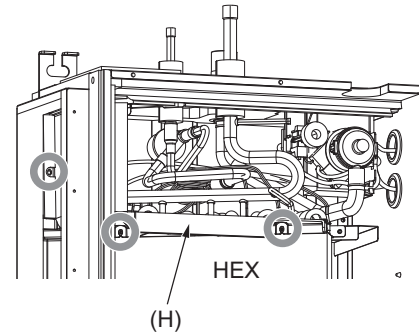


Fig.7

3. Removing the thermistor
  - (1) Remove the thermistor (J) from the thermistor holder (K) on the copper tube.

Thermistor size  
Liquid pipe:  $\varnothing 8$ mm  
Gas pipe:  $\varnothing 6$ mm

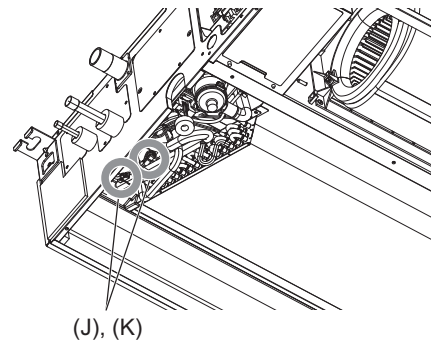


Fig.8

## 6. Fan and fan motor

**Exercise caution when removing heavy parts.**

### 1. Removing the filter and the bottom plate

- (1) Push down the tab on the filter, and pull out the filter in the direction of the arrow 1.
- (2) Remove the fixing screws on the bottom plate (M) to remove it.
  - Tighten screws to a torque of  $1.4 \pm 0.2 \text{ N}\cdot\text{m}$ .

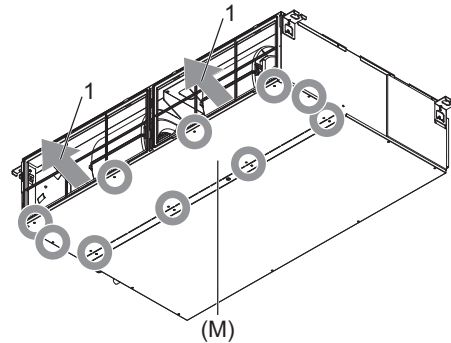


Fig.9

### 2. Removing the fan casing (bottom half)

- (1) Squeeze the tabs on the fan casing to remove it in the direction of arrow 2.

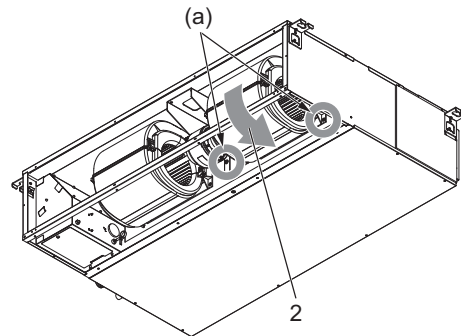


Fig.10

(a) Tab

### 3. Removing the motor cable

- (1) Remove the motor cable through the rubber bush.

### 4. Removing the fan motor and the Sirocco fan

- (1) Loosen either of the two rubber joint (N) fixing screws.
- (2) To remove the Sirocco fans (b) and (c) of PEFY-P36, 48, 54NMAU-E4, loosen only the screw (d) on the bearing support (P), and remove the other screws on it.

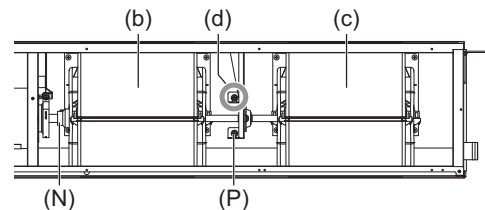


Fig.11

- (3) Remove the two motor fixing screws to remove the motor and the Sirocco fan in the direction of arrow 3.

•Tighten screws to a torque of  $3.5 \pm 0.2 \text{ N}\cdot\text{m}$ .

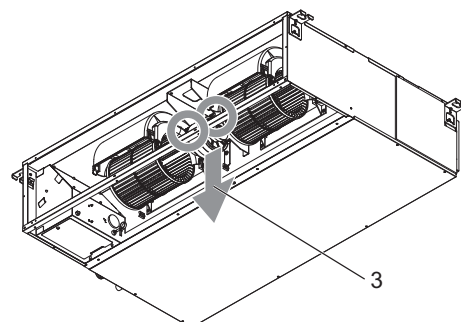


Fig.12

- (4) Remove the four fan case fixing screws to take the top half of the fan casing off.
  - Tighten screws to a torque of  $1.4 \pm 0.2$  N·m.

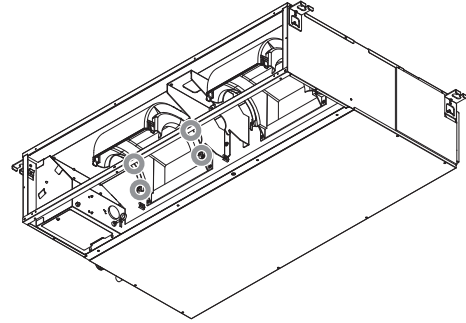


Fig.13

## 7. Heat exchanger

**Exercise caution when removing heavy parts.**

1. Remove the drain pan according to the procedure in section 4.
2. Remove the heat exchanger cover according to the procedure in section 5-2.
3. Removing the cover
  - (1) Remove the five fixing screws on the cover (Q) to remove it.
    - Tighten screws to a torque of  $2.0 \pm 0.2$  N·m.

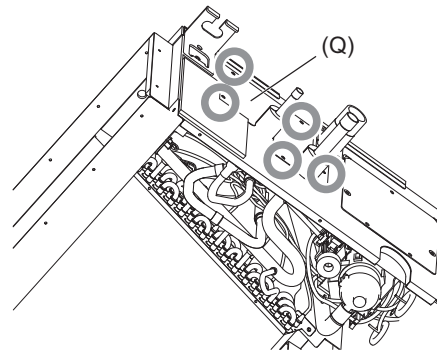


Fig.14

4. Removing the Heat exchanger
  - (1) Remove the fixing screws on the heat exchanger (R) to remove it.
    - Tighten screws to a torque of  $1.4 \pm 0.2$  N·m.

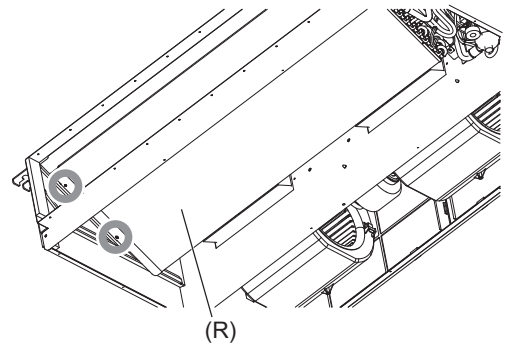


Fig.15

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