

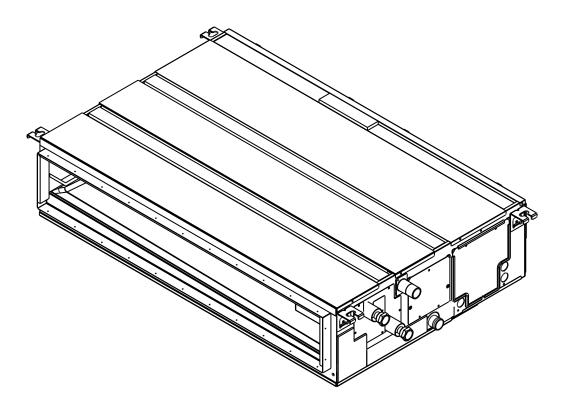
Changes for the Better

2012

TECHNICAL & SERVICE MANUAL

Model name

PEFY-WP20VMA-E PEFY-WP25VMA-E PEFY-WP32VMA-E PEFY-WP40VMA-E PEFY-WP50VMA-E



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

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

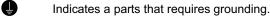
This symbol indicates that failure to follow the instructions exactly as stated poses the risk of serious injury or damage to the unit.



Indicates an action that must be avoided.



Indicates important instructions.



- A 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>

Carefully read the labels affixed to the main unit.

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.

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.

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 water 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. 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 water leakage.

ITo avoid water damage to the furnishings, check for water leak at the completion of all work.

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 may result in smoke, fire, or explosion.

Consult your dealer for proper disposal method.

Precautions for handling units for use with water

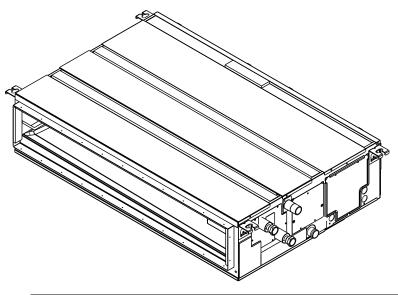
Do not use the existing water piping.

Store the piping materials indoors, and keep both ends of the pipes sealed until immediately before installation. Keep the joints wrapped in plastic bags. If dust or dirt enters the water circuit, it may damage the heat exchanger and cause water leakage. Only use water.

Only use clean water as a refrigerant. The use of water outside the specification may damage the refrigerant circuit.

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[1] Features

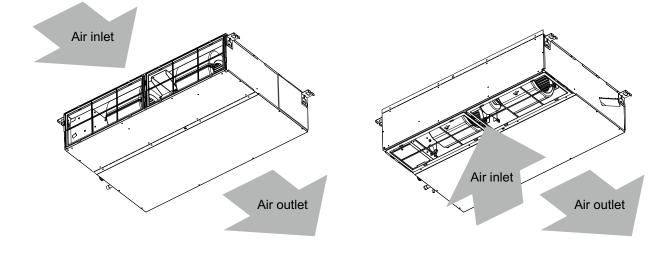


Model	Cooling capacity/Heating capacity
	kW
PEFY-WP20VMA-E	2.2/2.5
PEFY-WP25VMA-E	2.8/3.2
PEFY-WP32VMA-E	3.6/4.0
PEFY-WP40VMA-E	4.5/5.0
PEFY-WP50VMA-E	5.6/6.3

[1] Components and Functions

- 1. Indoor (Main) Unit
 - (1) In case of rear inlet

(2) In case of bottom inlet

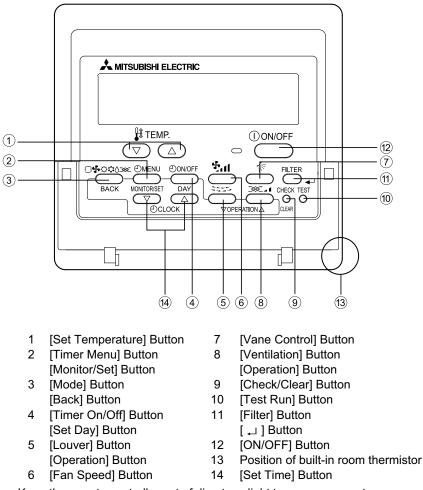


2. Remote Controller

[PAR-21MAA]

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

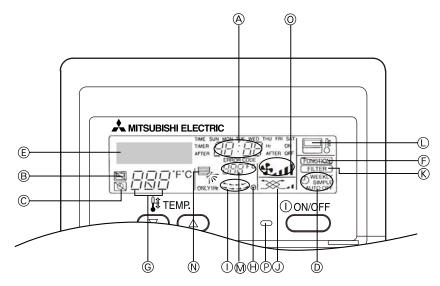
(1) Remote Controller Buttons



•Keep the remote controller out of direct sunlight to ensure accurate measurement of room temperature.

•The thermistor at the lower right-hand section of the remote controller must be free from obstructions to ensure accurate measurement of room temperature.

(2) Remote Controller Display



- A Current time/Timer time
- B Centralized control indicator
- C Timer OFF indicator
- D Timer mode indicator
- F Function mode indicator
- G Preset temperature
- H Power indicator

- I Louver swing
- J Ventilation
- K Filter sign
- L Sensor position
- M Room temperature
- N Vane setting
- O Fan speed
- P Operation lamp

[1] Specifications

1. Specifications

Model			PEFY-WP20VMA-E	PEFY-WP25VMA-E
Power supply	Voltage	V	1-phase 220-230-240	
	Frequency	Hz	50/60	
Cooling capacity ^{*1}		kW	2.2	2.8
Heating capacity ^{*1}		kW	2.5	3.2
Power consumption	Cooling	kW	0.07	0.09
	Heating	kW	0.05	0.07
Current consumption	Cooling	kW	0.55	0.64
	Heating	kW	0.44	0.53
External finish	·	•	Galva	nized
Dimensions	Height	mm	25	50
	Width	mm	700	900
	Depth	mm	73	32
Net weight	4	kg	21	26
Heat exchanger			Cross fin(Aluminium fin and copper tube)	
Fan	Туре		Sirocco fan x 1	
	Airflow rate (Low-Mid-High)	m ³ /min	7.5-9.0-10.5	10.0-12.0-14.0
	External static pressure	Pa	35/50/70/100/150	
Motor	Output	kW	0.0	085
Air filter	ŀ	•	PP Honeycomb fabric (washable)	
Diameter of water pipe	Inlet	in	Rc3/4 screw	
water pipe	Outlet	in	Rc3/4	screw
Drain pipe dimensions	ŀ	mm[in.]	O.D. 32[1-1/4]	
Operating noise(Low-Mid-High)	35Pa	dB (A)	23-25-28	23-26-29
	50Pa	1	23-26-29	23-27-30
Aux. duct	70Pa	1	24-27-30	24-28-31
	100Pa		25-28-32	26-29-33
Measurement location 1	150Pa		28-32-36	29-33-37
* Measured in anechoic room.				
Any duct	35Pa	1	28-30-34	28-30-34
Aux. duct	50Pa	1	28-30-34	28-30-34
	70Pa	1	29-32-36	29-32-36
1.5m	100Pa	1	29-33-37	29-33-37
Measurement location 2 * Measured in anechoic room.	150Pa	1	31-35-40	32-36-40

*1 <Cooling> Indoor temperature: 27°CDB/19°CWB (81°FDB/66°FWB) Outdoor temperature: 35°CDB (95°FDB) <Heating> Indoor temperature: 20°CDB (68°FWB) Outdoor temperature: 7°CDB/6°CWB (45°FDB/43°FWB)

Model			PEFY- WP32VMA-E	PEFY- WP40VMA-E	PEFY- WP50VMA-E
Power supply	Voltage	V	1-phase 220-230-240		
	Frequency	Hz		50/60	
Cooling capacity ^{*1}		kW	3.6	4.5	5.6
Heating capacity *1		kW	4.0	5.0	6.3
Power consumption	Cooling	kW	0.11	0.14	0.14
	Heating	kW	0.09	0.12	0.12
Current consumption	Cooling	kW	0.74	1.15	1.15
	Heating	kW	0.63	1.04	1.04
External finish				Galvanized	
Dimensions	Height	mm		250	
	Width	mm	900	11	00
	Depth	mm		732	
Net weight		kg	26	3	1
Heat exchanger			Cross fin(Aluminium fin and copper tube)		
Fan	Туре		Sirocco fan x 1 Sirocco fan x 2		fan x 2
	Airflow rate (Low-Mid-High)	m ³ /min	12.0-14.5-17.0	14.5-18.0-21.0	14.5-18.0-21.0
	External static pressure	Ра	35/50/70/100/150		
Motor	Output	kW	0.085 0.121		21
Air filter			PP Ho	oneycomb fabric (was	nable)
Diameter of	Inlet	in	Rc3/4 screw		
water pipe	Outlet	in		Rc3/4 screw	
Drain pipe dimensions	1	mm[in.]	O.D. 32[1-1/4]		
Operating noise(Low-Mid-High)	35Pa	dB (A)	24-28-31	26-29-33	26-29-33
Aux. duct	50Pa		25-29-32	26-29-34	26-29-34
	70Pa		26-30-33	26-30-35	26-30-35
	100Pa		27-31-34	29-33-37	29-33-37
Measurement location 1	150Pa	-	29-34-38	32-37-41	32-37-41
* Measured in anechoic room.					
[]	35Pa	-	28-31-35	30-33-37	30-33-37
Aux. duct	50Pa	1	28-32-35	30-34-38	30-34-38
	70Pa	1	29-33-37	31-36-39	31-36-39
	100Pa	-	30-34-38	33-37-41	33-37-41
Measurement location 2	150Pa	-	32-37-41	36-41-44	36-41-44

*1 <Cooling> Indoor temperature: 27°CDB/19°CWB (81°FDB/66°FWB) Outdoor temperature: 35°CDB (95°FDB) <Heating> Indoor temperature: 20°CDB (68°FWB) Outdoor temperature: 7°CDB/6°CWB (45°FDB/43°FWB)

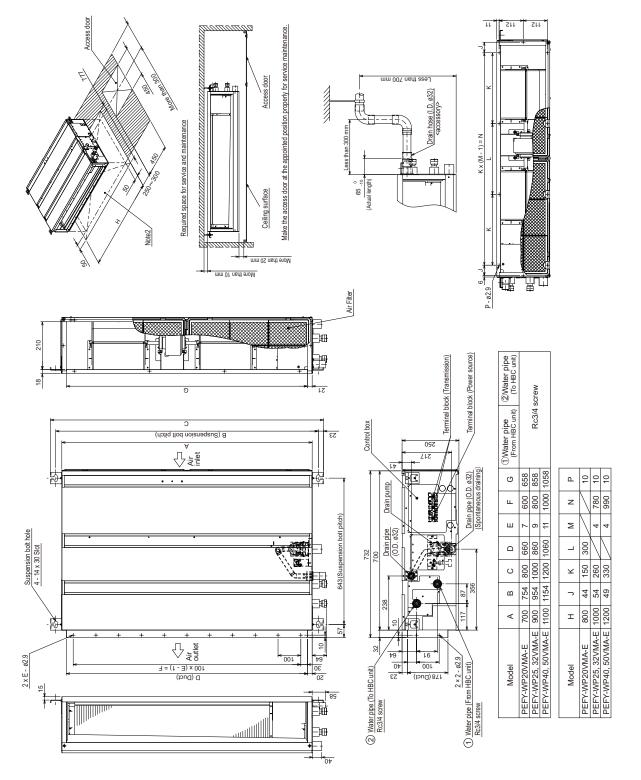
2. Electrical component specifications

Component	Sym- bol	PEFY-WP20VMA-E
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
Water inlet 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
Water outlet 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	FUSE	250V 6.3A
Fan motor		8-pole, Output 85W SIC-70CW-D885-1
Power supply terminal block	TB2	(L, N, 🕀) 250V 20A
Transmission terminal block	TB5 TB15	(1, 2) 250V 15A, (M1, M2, S) 250V 20A
Drain float switch	DS	Open/short detection Initial contact resistance 500 m Ω or less

Component	Sym- bol	PEFY- WP25VMA-E	PEFY- WP32VMA-E	PEFY- WP40VMA-E	PEFY- WP50VMA-E	
Room temperature thermistor	TH21	Resistance 0°C/15kΩ	, 10°C/9.6kΩ, 20°C/6.3	3kΩ, 25°C/5.4kΩ, 30°C	/4.3kΩ, 40°C/3.0kΩ	
Water inlet pipe thermistor	TH22	Resistance 0°C/15kΩ	Resistance 0°C/15kΩ, 10°C/9.6kΩ, 20°C/6.3kΩ, 25°C/5.4kΩ, 30°C/4.3kΩ, 40°C/3.0kΩ			
Water outlet pipe thermistor	TH23	Resistance 0°C/15kΩ	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	FUSE	250V 6.3A				
Fan motor			utput 85W N-D885-2	8-pole, Ou SIC-70CV	tput 121W V-D8121-1	
Power supply terminal block	TB2	(L, N, 🕀) 250V 20A				
Transmission terminal block	TB5 TB15	(1, 2) 250V 15A, (M1, M2, S) 250V 20A				
Drain float switch	DS	Open/short detection Initial contact resistance 500 m Ω or less				

[1] Outlines and Dimensions

1. PEFY-WP20, 25, 32, 40, 50VMA-E



- (A) Space required for service and maintenance.
- (B) Provide an access door for maintenance at the bottom.

Note 1 Use M10 suspension bolts. (not supplied)

- 2 Provide an access door for maintenance at the bottom.
- 3 The dimensions in the table are those of the PEFY-WP40, 50VMA-E models, which have 2 fans. The PEFY-WP20, 25, 32VMA-E model have 1 fans.
- 4 To connect an intake duct, uninstall the air filter on the unit, and install a locally procured air filter on the intake duct on the intake side.

[1] Wiring Diagram

1. PEFY-WP20, 25, 32, 40, 50VMA-E

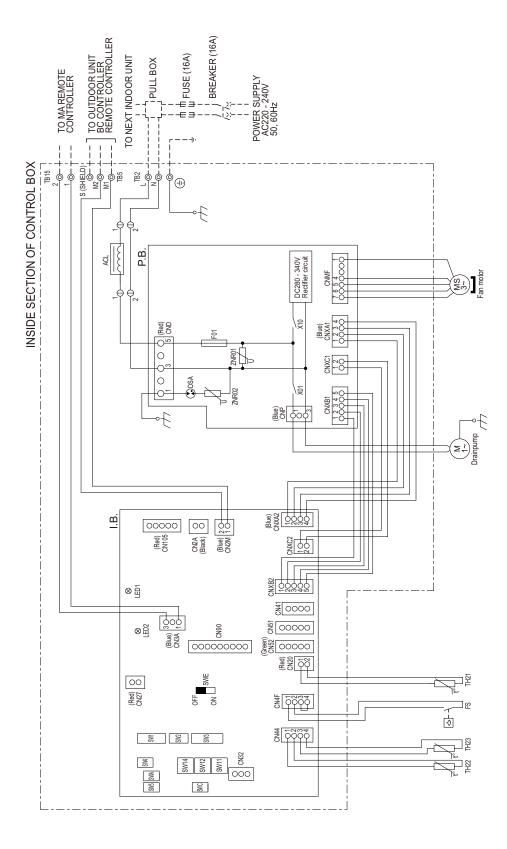


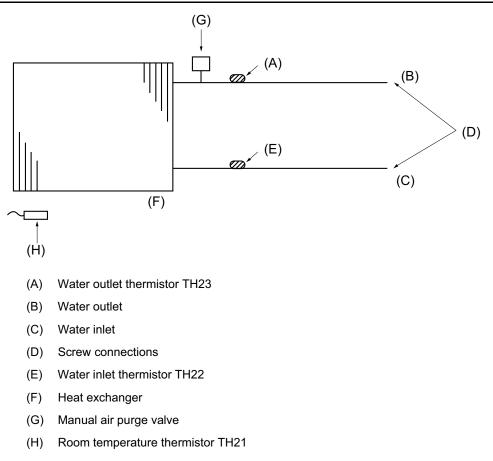
Table.1 SYMBOL EXPLANATION

SYM- BOL	NAME	SYM- BOL	NAME	SYM- BOL	NAME
I.B.	Indoor controller board	CN32	Connector (Remote switch)	SW2 (I.B.)	Switch (for capacity code)
P.B.	Power supply board	CN41	Connector (HA terminal-A)	SW3 (I.B.)	Switch (for mode selection)
TB2	Power source terminal block	CN51	Connector (Centrally control)	SW4 (I.B.)	Switch (for model selection)
TB5	Transmission terminal block	CN52	Connector (Remote indica- tion)	SW5 (I.B.)	Switch (for mode selection)
TB15	Transmission terminal block	CN90	Connector (Wireless)	SWE (I.B.)	Connector (emergency opera- tion)
F01	Fuse AC 250V 6.3A	CN105	Connector (IT terminal)	SW11 (I.B.)	Switch (1s digit address set)
ZNR01, 02	Varistor	CN2A	Connector (0-10V Analog in- put)	SW12 (I.B.)	Switch (10ths digit address set)
DSA	Arrester	FS	Float switch	SW14 (I.B.)	Switch (BRANCH No.)
X01	Aux. relay	TH21	Thermistor (inlet air temp.de- tection)	SWA (I.B.)	Switch (for static pressure se- lection)
X10	Aux. relay	TH22	Thermistor (piping temp.de- tection / water inlet)	SWC (I.B.)	Switch (for static pressure se- lection)
ACL	AC reactor (Power factor improvement)	TH23	Thermistor (piping temp. de- tection / water outlet)		
CN27	Connector (Damper)	SW1 (I.B.)	Switch (for mode selection)		

Note 1 Wiring to TB2, TB5, and TB15 indicated by the double-dashed lines is on-site work.

2 \bigcirc terminal block, \ominus connector.

[1] Refrigerant system diagram



Capacity	PEFY-WP20, 25, 32, 40, 50VMA-E
Water outlet	Rc3/4 screw
Water inlet	Rc3/4 screw

[1] Troubleshooting

1. Check methods

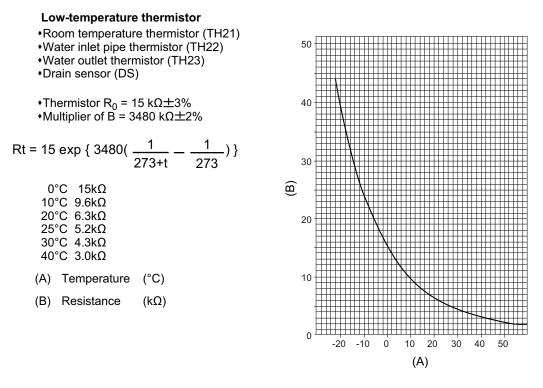
- 1. Component and check points
- (1) Thermistor
 - •Room temperature thermistor (TH21)
 - •Water inlet thermistor (TH22)
 - •Water outlet thermistor (TH23)

Disconnect the connector and measure the resistance between terminals with a volt meter. (Ambient temperature $10^{\circ}C - 30^{\circ}C$)

Normal	Abnormal
4.3kΩ - 9.6kΩ	Open or short

(Refer to the thermistor characteristic graph below.)

1) Thermistor characteristic graph



(2) Fan motor (CNMF)

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

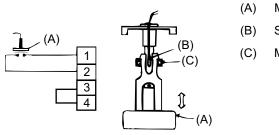
(3) Drain-up mechanism

Measure the resistance between the terminals with a tester. (coil temperature $20^{\circ}\mbox{C})$

Normal	Abnormal
340 Ω	Open or short

(4) Drain float switch (CN4F)

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



(A) Moving part(B) Switch(C) Magnet

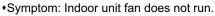
Position of the moving part	Normal	Abnormal
Up	Short	(any position but short)
Down	Open	(any position but open)

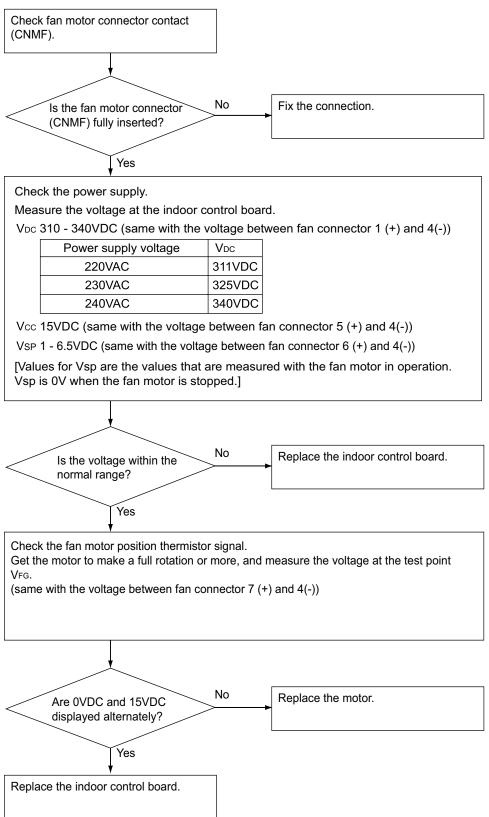
2. DC fan motor (fan motor/indoor control board)

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.

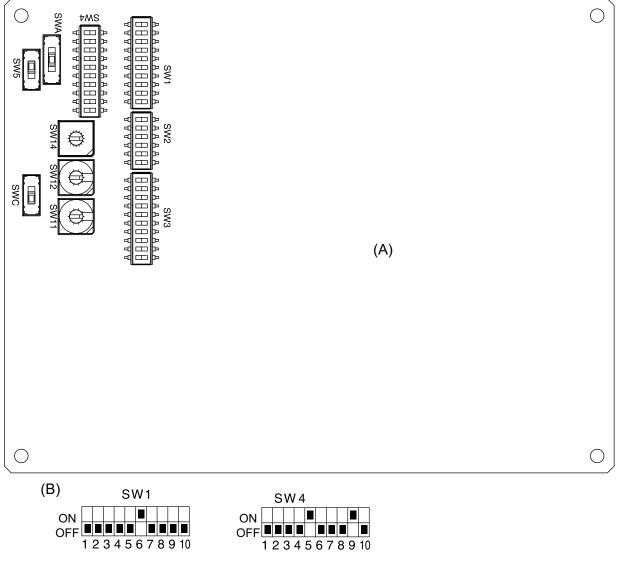
2. Troubleshooting





3. Address switch setting

Make sure that power to the unit is turned off.



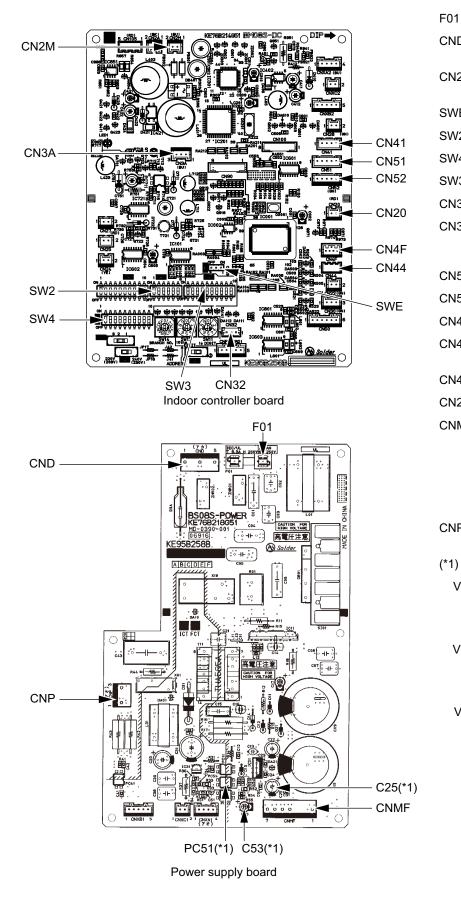
(A) Indoor unit control board

(B) Factory setting (all models)

- 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.
- Address settings vary in different systems.
 Refer to the section on address setting in the outdoor unit installation manual.
- 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-WP20, 25, 32, 40, 50VMA-E



01	Fuse(AC 250V 6.3A)
ND	Power supply voltage (220 - 240VAC)
N2M	For M-NET transmission cable connection (24 - 30VDC)
WE	Emergency operation
W2	Capacity setting
W4	Function setting
W3	Function setting
N32	Remote start/stop adapter
N3A	For MA remote controller cable connection (10 - 13 VDC (Between 1 and 3.))
N52	Remote display
N51	Centralized control
N41	JAMA standard HA terminal A
N44	Thermistor (water inlet / water outlet temperature)
N4F	Float thermistor
N20	Thermistor (Inlet temperature)
NMF	Fan motor output 1 - 4: 310 - 340 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)
NP	Drain-up mechanism output (200VAC)
1)	
V _{FG}	Voltage on the (-) side of PC51 and C25 (Same with the voltage between 7 (+) and 4 (-) of CNMF)
V _{CC}	Voltage between the C25 pins 15 VDC (Same with the voltage between 5 (+) and 4 (-) of CNMF)
Vsp	Voltage between the C53 pins 0VDC (with the fan stopped) 1 - 6.5VDC (with the fan in opera- tion) (Same with the voltage between 6

(+) and 4 (-) of CNMF)

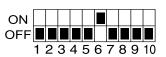
5. Dipswitch setting (Factory setting)

- 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	Low	Very low
8	Fan speed at heating Thermo-OFF	Preset fan speed	Follows the setting of SW1-7
9	Auto restart after power failure	Enabled	Disabled
10	Power start/stop	Enabled	Disabled

1) Adress board





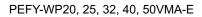
(2) SW3

Switch position	Function		Switch setting		
		ON	OFF		
1	Unit type	Cooling only	Heat pump		
2	-	-	-		
3	-	-	-		
4	-	-	-		
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



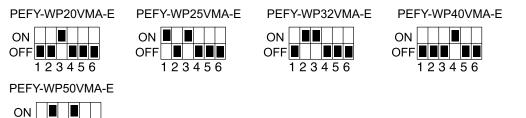


2. Capacity code setting

- (1) SW2
- 1) Indoor control board

Dipswitch settings must be made while the unit is stopped. Factory setting

The switches are set to correspond to the unit capacity.



3. Model setting

OFF **1** 2 3 4 5 6

- (1) SW4
- 1) Indoor control board

Dipswitch settings must be made while the unit is stopped.

Factory setting



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) SW5
- 1) Indoor control board

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

Factory setting

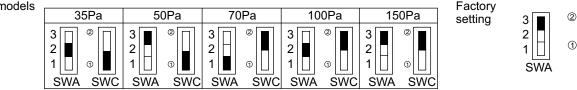


Set SW5 to 240V side when the power supply is 240 volts. When the power supply is 220 and 230 volts, set SW5 to 220V side.

5. External static pressure

- (1) SWA, SWC
- 1) Indoor control board

All models



Note:

Changes that are made to the dipswitches SWA and SWC immediately become effective regardless of the unit's operation status (RUN/STOP) or the remote controller status (ON/OFF).

6. 1s and 10ths digits

Factory setting

(1) SW11, SW12 (Rotary switch)

The use of a network remote controller (PAR-F27MEA) requires address setting.

Indoor control board 1)

Address settings must be made while the unit is stopped.



- 7. Connection No. setting
- (1) SW14 (Rotary switch)

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

Indoor control board 1)

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.

SWC

[1] Disassembly Procedure

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.

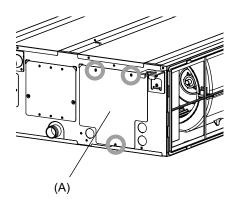


Fig.1

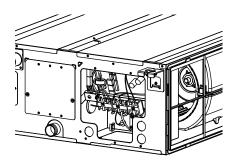


Fig.2

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.

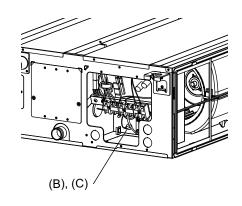


Fig.3

3. Drainpan

Exercise caution when removing heavy parts.

2. Removing the drainpan

- 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 (D), (E) to remove it.

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

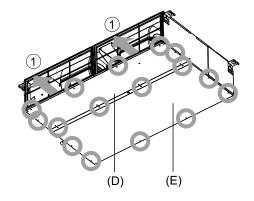


Fig.4

Fig.5

Note •Drain the water out of the drain pan before removing it.

4. Thermistor (Water outlet) (Water inlet)

Exercise caution when removing heavy parts.

- 1. Remove the drain pan according to the procedure in **section 3**.
- 2. Removing the Heat exchanger cover
- (1) Remove the four fixing screws on the heat exchanger cover (F) to remove it.

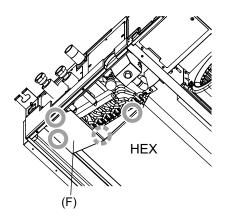


Fig.6

- 3. Removing the thermistor
- (1) Remove the thermistor (G) from the thermistor holder (H) on the copper tube.

Thermistor size Water inlet: ø8mm Water outlet: ø6mm

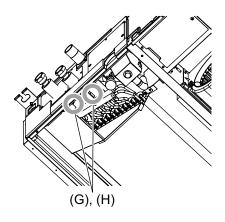


Fig.7

5. 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 (J) to remove it.

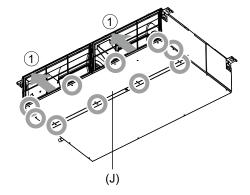


Fig.8



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

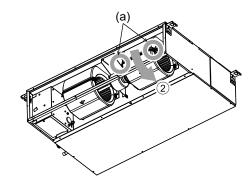


Fig.9

- 3. Removing the motor cable
- (1) Remove the motor cable threw the rubber bush.
- 4. Removing the fan motor and the Sirocco fan
- (1) Remove the two motor fixing screws to remove the motor and the Sirocco fan in the direction of arrow 3.

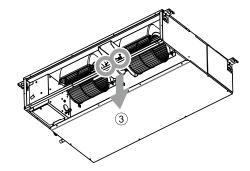
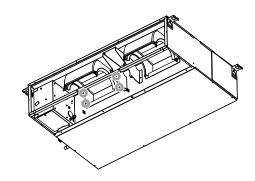


Fig.10

(2) Remove the four fan case fixing screws to take the top half of the fan casing off.

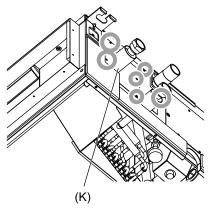




6. Heat exchanger

Exercise caution when removing heavy parts.

- Remove the drain pan according to the procedure in section 3.
- 2. Remove the heat exchanger cover according to the procedure in **section 4.** 2.
- 3. Removing the cover
- (1) Remove the five fixing screws on the cover (K) to remove it.





(K) Pipe support plate

- 4. Removing the Heat exchanger
- (1) Remove the fixing screws on the heat exchanger (M) to remove it.

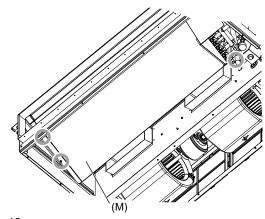


Fig.13

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