Changes for the Better

MITSUBISHI ELECTRIC

Air-Conditioners For Building Application

2005

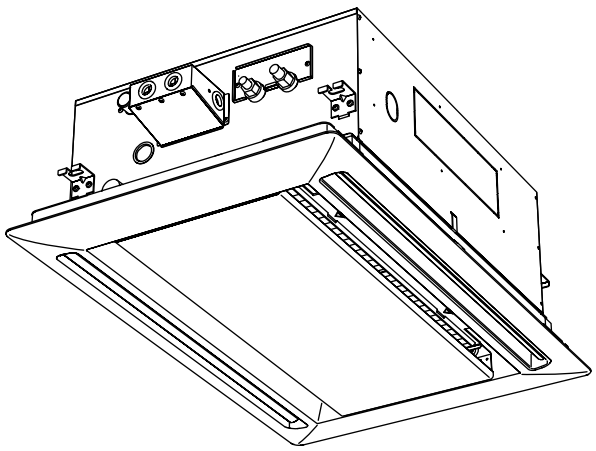
TECHNICAL & SERVICE MANUAL

Series PLFY Ceiling Cassettes

<Indoor unit>

Models

PLFY-P06NLMU-E
PLFY-P08NLMU-E
PLFY-P12NLMU-E
PLFY-P15NLMU-E
PLFY-P18NLMU-E



INDOOR UNIT

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CITY MULTI

For use with the R410A & R22

SAFETY PRECAUTIONS

1. Before installation and electric work

- **Before installing the unit, make sure you read all the "Safety precautions".**
- **The "Safety precautions" provide very important points regarding safety. Make sure you follow them.**
- **This equipment may cause the adverse effect on the same supply system.**
- **Please report to or take consent by the supply authority before connection to the system.**

Symbols used in the text

⚠Warning:
Describes precautions that should be observed to prevent danger of injury or death to the user.

⚠Caution:
Describes precautions that should be observed to prevent damage to the unit.

Symbols used in the illustrations

: Indicates an action that must be avoided.

: Indicates that important instructions must be followed.

: Indicates a part which must be grounded.

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

: Beware of electric shock (This symbol is displayed on the main unit label.) <Color: Yellow>

⚠Warning:
Carefully read the labels affixed to the main unit.

⚠Warning:

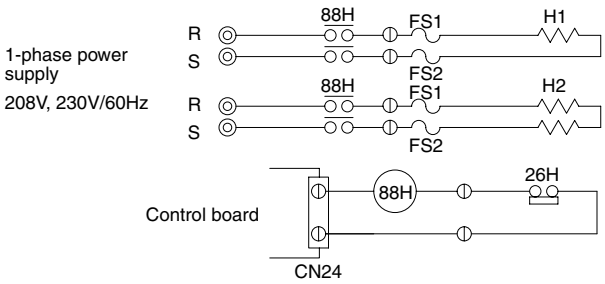
- **Ask the dealer or an authorized technician to install the air conditioner.**
  - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the air unit at a place that can withstand its weight.**
  - Inadequate strength may cause the unit to fall down, resulting in injuries.
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
  - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for typhoons and other strong winds and earthquakes and install the unit at the specified place.**
  - Improper installation may cause the unit to topple and result in injury.
- **Always use an air cleaner, humidifier, electric heater, and other accessories specified by Mitsubishi Electric.**
  - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
  - If the unit is repaired improperly, water leakage, electric shock, or fire may result.
- **Do not touch the heat exchanger fins.**
  - Improper handling may result in injury.
- **If refrigerant gas leaks during installation work, ventilate the room.**
  - If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- **Install the air conditioner according to this Installation Manual.**
  - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations"and the instructions given in this manual and always use a special circuit.**
  - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Keep the electric parts away from water (washing water etc.).**
  - It might result in electric shock, catching fire or smoke.
- **Securely install the cover of control box and the panel.**
  - If the cover and panel are not installed properly,dust or water may enter the outdoor unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge the it with a refrigerant different from the refrigerant specified on the unit.**
  - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
  - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
  - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.
- **After completing installation work, make sure that refrigerant gas is not leaking.**
  - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.
- **Do not reconstruct or change the settings of the protection devices.**
  - If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.
- **To dispose of this product, consult your dealer.**
- **Do not use a leak detection additive.**

⚠ Warning:

- **Note the following when building a heater in the air conditioning system.**
  - Leave enough space between units for proper ventilation so that the indoor unit temperature does not exceed 40˚C when windless.
  - Keep the heater clean, and take appropriate measures so that the indoor unit does not suck in the dust particles that accumulate on the heater.
  - Use the optional heater cable (PAC-YU24HT) to perform an interlocked operation with indoor units.
  - Do not build a heater inside the indoor unit.

Recommended circuit

Wiring diagram



FS1, 2 ----- Thermal fuse

H1, H2 ----- Heater

26H --------- Overheat protection thermostat

88H --------- Electromagnetic contactor

2. Precautions for devices that use R410A refrigerant

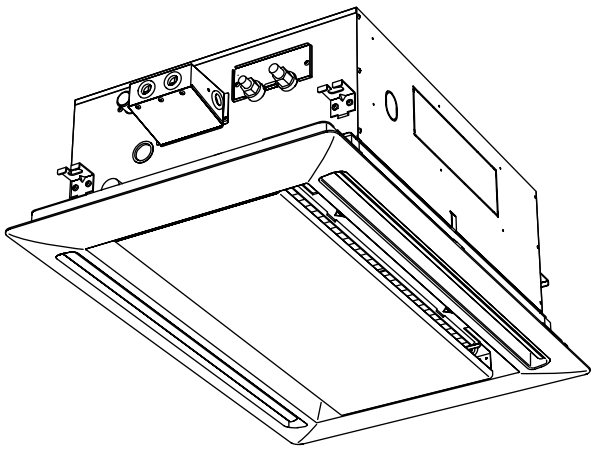
⚠ Caution:

- **Do not use the existing refrigerant piping.**
  - The old refrigerant and refrigerator oil in the existing piping contains a large amount of chlorine which may cause the refrigerator oil of the new unit to deteriorate.
- **Use refrigerant piping made of C1220 (Cu-DHP) phosphorus deoxidized copper as specified in the *JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
  - Contaminants on the inside of the refrigerant piping may cause the refrigerant residual oil to deteriorate.

  *JIS: Japanese Industrial Standard
- **Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)**
  - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor trouble may result.
- **Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections.**
  - The refrigerator oil will degrade if it is mixed with a large amount of mineral oil.
- **Use liquid refrigerant to fill the system.**
  - If gas refrigerant is used to seal the system, the composition of the refrigerant in the cylinder will change and performance may drop.
- **Do not use a refrigerant other than R410A.**
  - If another refrigerant (R22, etc.) is used, the chlorine in the refrigerant may cause the refrigerator oil to deteriorate.
- **Use a vacuum pump with a reverse flow check valve.**
  - The vacuum pump oil may flow back into the refrigerant cycle and cause the refrigerator oil to deteriorate.
- **Do not use the following tools that are used with conventional refrigerants.**
  (Gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, refrigerant recovery equipment)
  - If the conventional refrigerant and refrigerator oil are mixed in the R410A, the refrigerant may deteriorated.
  - If water is mixed in the R410A, the refrigerator oil may deteriorate.
  - Since R410A does not contain any chlorine, gas leak detectors for conventional refrigerants will not react to it.
- **Do not use a charging cylinder.**
  - Using a charging cylinder may cause the refrigerant to deteriorate.
- **Be especially careful when managing the tools.**
  - If dust, dirt, or water gets in the refrigerant cycle, the refrigerant may deteriorate.

1 FEATURES

Series PLFY Ceiling Cassettes

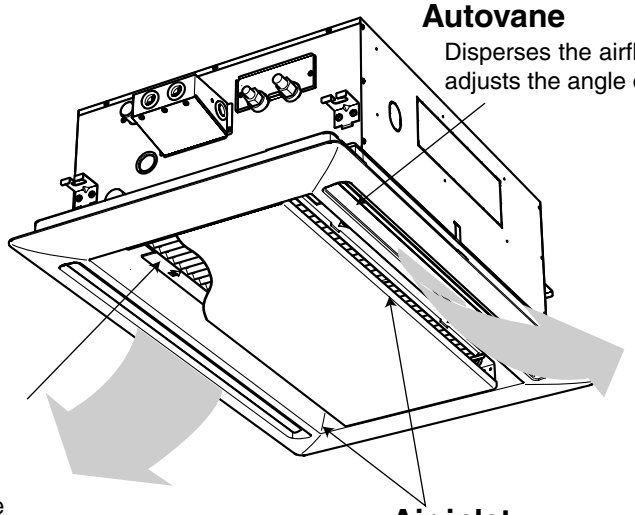


Indoor unit

Models	Cooling capacity/Heating capacity	
	kW	BTU / h
PLFY-P06NLMU-E	1.8 / 2.0	6000 / 6700
PLFY-P08NLMU-E	2.3 / 2.6	8000 / 9000
PLFY-P12NLMU-E	3.5 / 4.0	12000 / 13500
PLFY-P15NLMU-E	4.4 / 5.0	15000 / 17000
PLFY-P18NLMU-E	5.3 / 5.9	18000 / 20000

2 PART NAMES AND FUNCTIONS

● **Indoor (Main) Unit**



Autovane

Disperses the airflow up and down and adjusts the angle of the airflow.

Long-life filter

Removes the sucked-in dust and dirt. Since the long-life filter is used as an air filter, it should be cleaned at the beginning of air-cooling and heating seasons. (During seasons with large amounts of dust and dirt, more frequent cleaning are recommended.)

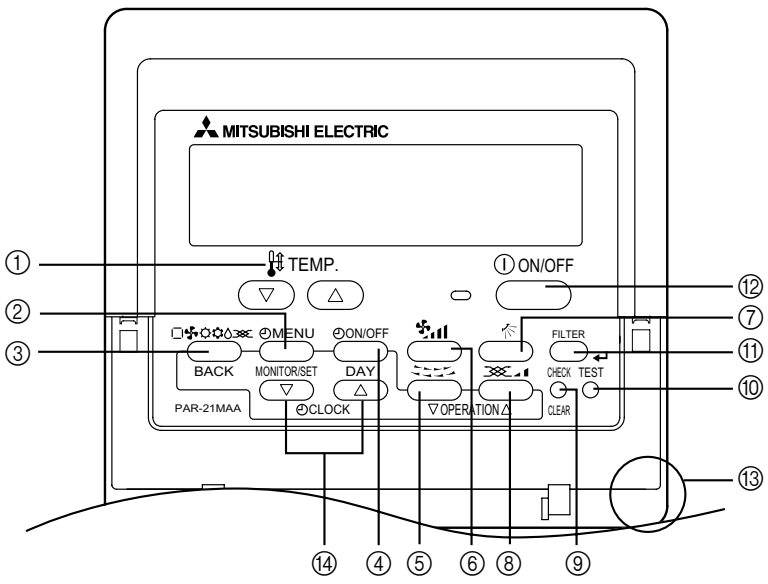
Air inlet

Sucks the ambient air in.

● **Remote controller** **[PAR-21MAA]**

● Once the controls are set, the same operation mode can be repeated by simply pressing the ON/OFF button.

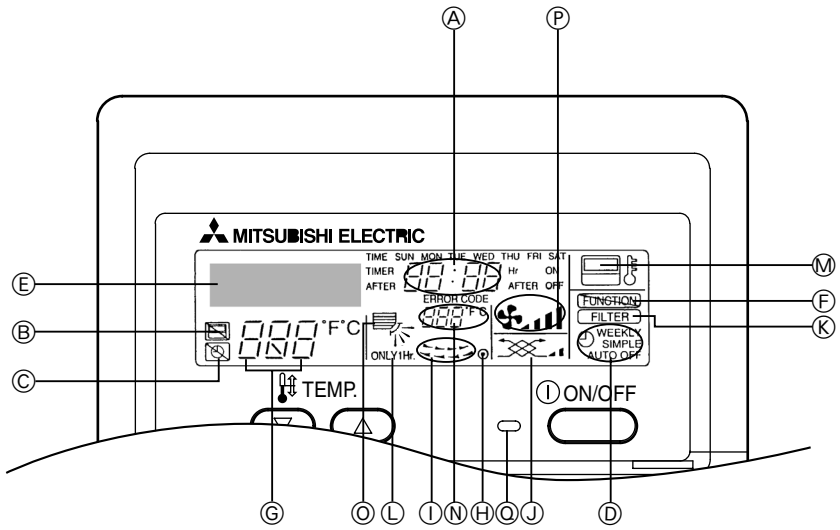
[Operation buttons]



① [Set Temperature] Button
② [Timer Menu] Button
[Monitor/Set] Button
③ [Mode] Button
[Return] Button
④ [Timer On/Off] Button
[Set Day] Button
⑤ [Louver] Button
[Operation] Button
⑥ [Fan Speed] Button
⑦ [Airflow Up/Down] Button
⑧ [Ventilation] Button
[Operation] Button
⑨ [Check/Clear] Button
⑩ [Test run] Button
⑪ [Filter] Button
[↵] Button
⑫ [ON/OFF] Button
⑬ Position of built-in room temperature
⑭ [Set Time] Button

- Never expose the remote controller to direct sunlight. Doing so can result in the erroneous measurement of room temperature.
- Never place any obstacle around the lower right-hand section of the remote controller. Doing so can result in the erroneous measurement of room temperature.

[Display]



Ⓐ Current time/Timer
Ⓑ Centralized control
Ⓒ Timer OFF
Ⓓ Timer indicator
Ⓔ Operation mode: ☼COOL, ♢DRY, ⎕AUTO, FAN, ☼HEAT
Ⓕ “Locked” indicator
Ⓖ Set temperature
Ⓗ Power ON
Ⓘ Louver
Ⓙ Ventilation
Ⓚ Filter sign
Ⓛ Set effective for 1 hr.
Ⓜ Sensor position
Ⓝ Room temperature
Ⓞ Airflow
Ⓟ Fan speed

3 SPECIFICATION

3-1. Specification

PLFY-P-NMLU-E

Item \ Model				PLFY-P06NLMU-E	PLFY-P08NLMU-E	PLFY-P12NLMU-E	PLFY-P15NLMU-E	PLFY-P18NLMU-E
Power sourse				208/230V, 60Hz				
Capacity *1	Cooling	kW		1.8	2.3	3.5	4.4	5.3
		BTU/h		6000	8000	12000	15000	18000
	Heating	kW		2.0	2.6	4.0	5.0	5.9
		BTU/h		6700	9000	13500	17000	20000
Dimension *4	Height	mm		290 (20)				
		in		11-7/16 (13/16)				
	Width	mm		776 (1080)				946 (1250)
		in		30-9/16 (42-17/32)				37-1/4 (49-7/32)
	Depth	mm		634 (710)				
		in		24-31/32 (27-31/32)				
Net weight		kg		23 (6.5)		24 (6.5)		27 (7.5)
		lb		51 (15)		53 (15)		60 (17)
FAN	Airflow rate (Low-Middle-High)		m^3/min	6.5-8.0-9.5	6.5-8.0-9.5	6.5-8.0-9.5	7.0-8.5-10.5	9.0-11.0-12.5
			cfm	230-282-335	230-282-335	230-282-335	247-300-371	318-388-441
	External static pressure	Pa	208V	-	-	-	-	-
			230V	-	-	-	-	-
Noise level (Low-Middle-High) *2		dB(A)	208V	27-30-33	27-30-33	27-30-33	29-33-36	31-34-37
			230V	28-31-34	28-31-34	28-31-34	30-34-37	32-35-38
Filter				Standard filter				

Notes: *1 Cooling/Heating capacity indicates the maximum value at operation under the following condition.
Cooling: Indoor: 26.7 ˚C [80 ˚F] DB/19.4 ˚C [67 ˚F] WB Outdoor: 35 ˚C [95 ˚F] DB
Heating: Indoor: 21.1 ˚C [70 ˚F] DB Outdoor: 8.3 ˚C [47 ˚F] DB/6.1˚C [43 ˚F] WB
*2 The operating noise is the data that was obtained in an anechoic room.
*4 The figure in ( ) indicates Panel's.

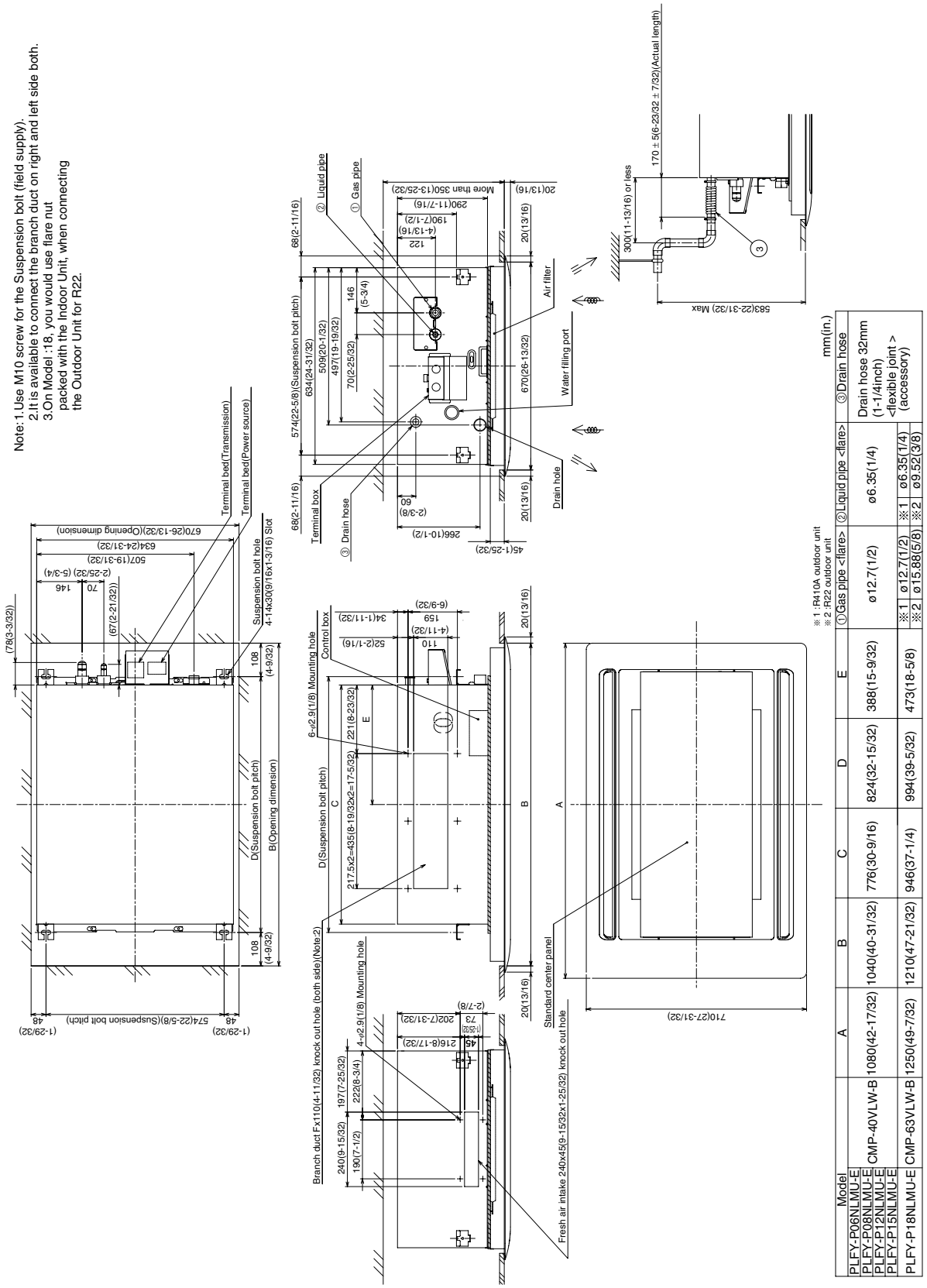
3-2. Electrical parts specifications

Parts name \ Model	Symbol	PLFY-P06NLMU-E	PLFY-P08NLMU-E	PLFY-P12NLMU-E	PLFY-P15NLMU-E	PLFY-P18NLMU-E
Tranrsformer	T	(Primary) 220-240V 50Hz, 220-230V 60Hz (Secondry) 23.2V 1.1A				
Room temperature thermistor	TH21	Resistance 0°C[32°F]/15kΩ, 10°C[50°F]/9.6kΩ, 20°C[68°F]/6.3kΩ,25°C[77°F]/5.4kΩ, 30°C[86°F]/4.3kΩ, 40°C[104°F]/3.0kΩ				
Liquid pipe thermistor	TH22	Resistance 0°C[32°F]/15kΩ, 10°C[50°F]/9.6kΩ, 20°C[68°F]/6.3kΩ,25°C[77°F]/5.4kΩ, 30°C[86°F]/4.3kΩ, 40°C[104°F]/3.0kΩ				
Gas pipe thermistor	TH23	Resistance 0°C[32°F]/15kΩ, 10°C[50°F]/9.6kΩ, 20°C[68°F]/6.3kΩ,25°C[77°F]/5.4kΩ, 30°C[86°F]/4.3kΩ, 40°C[104°F]/3.0kΩ				
Fuse (Indoor controller board)	F901	250V 6.3A				
Fan motor (with Inner-thermostat)	MF1	6-pole OUTPUT 15W UEM6Q-11SA3P				6-pole OUTPUT 20W UEM6Q-21SA3P
Inner-thermostat (Fan motor)	-	OFF 145±8°C[293±46°F] ON 88±15°C[190±59°F]				
Fan motor capacitor	C1	1.3μF x 440V			1.5μF x 440V	1.7μF x 440V
Vane motor	MV	DC12V Stepping motor				
Drain-up mechanism	DP	INPUT 6.4/5.5W 400cm^3/min				
Drain sensor	DS	Resistance 0°C[32°F]/6.0kΩ, 10°C[50°F]/3.9kΩ, 20°C[68°F]/2.6kΩ,25°C[77°F]/2.2kΩ, 30°C[86°F]/1.8kΩ, 40°C[104°F]/1.3kΩ				
Linear expansion valve	LEV	DC12V Stepping motor drive port dimension ø 3.2 (0~2000pulse) (0~1800pulse <at R410A outdoor unit> 0~2000pulse <at the other outdoor unit>)				
Power supply terminal bed	TB2	(L1,L2,G) 330V 30A				
Transmission terminal bed	TB5 TB15	(M1,M2,S),(1,2) 300V 10A				

4 OUTLINES AND DIMENSIONS

PLFY-P06·08·12·15·18NLMU-E

Unit :mm(in.)



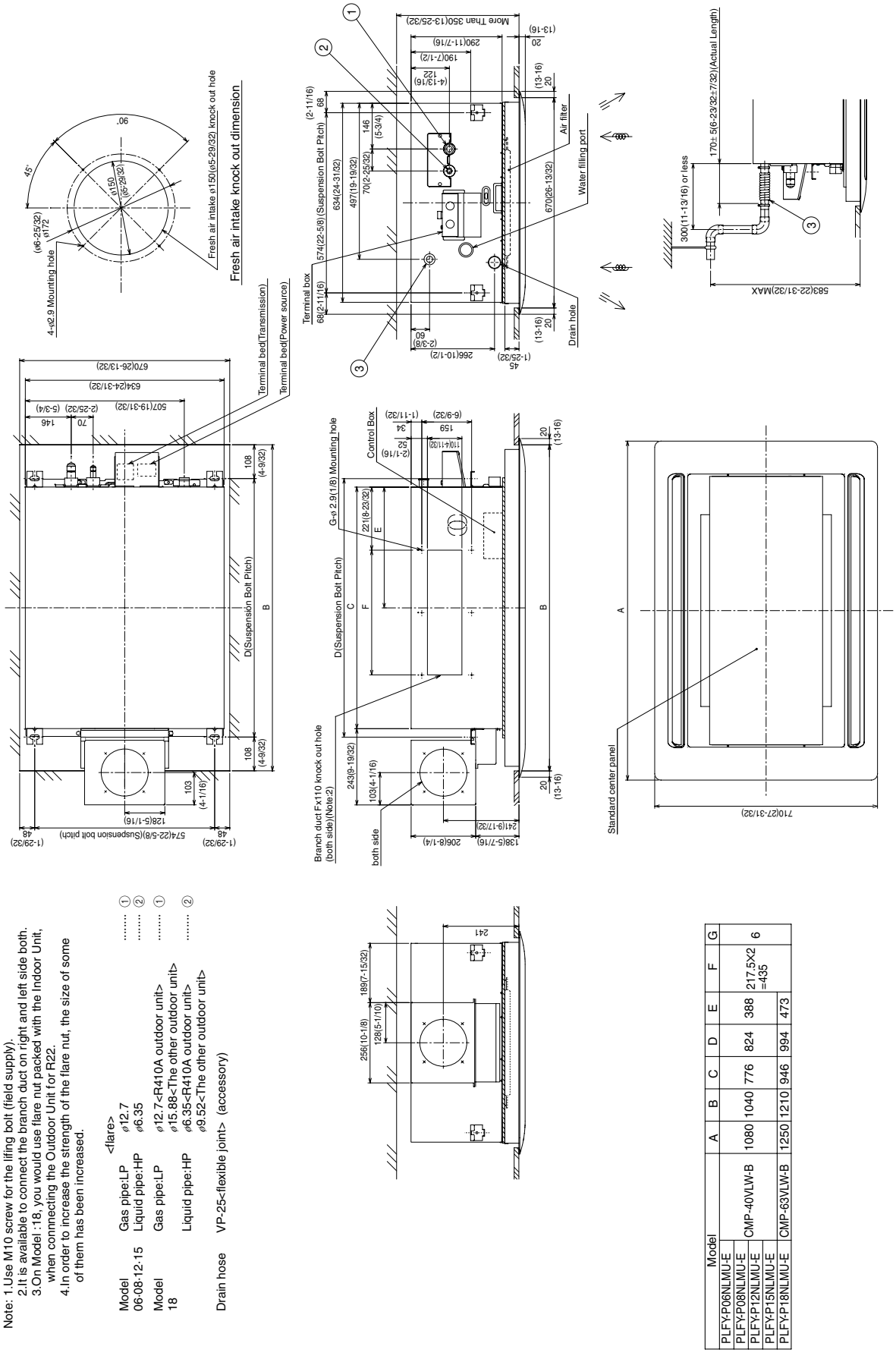
※1 : R410A outdoor unit
※2 : R22 outdoor unit

mm(in.)

Model	A	B	C	D	E	①Gas pipe <flare>	②Liquid pipe <flare>	③Drain hose
PLFY-P06NLMU-E PLFY-P08NLMU-E PLFY-P12NLMU-E PLFY-P15NLMU-E	CMP-40VLW-B	1080(42-17/32)	1040(40-31/32)	776(30-9/16)	824(32-15/32)	388(15-9/32)	ø12.7(1/2)	ø6.35(1/4)	Drain hose 32mm (1-1/4inch) <flexible joint > (accessory)
PLFY-P18NLMU-E	CMP-63VLW-B	1250(49-7/32)	1210(47-21/32)	946(37-1/4)	994(39-5/32)	473(18-5/8)	※1 ø12.7(1/2) ※2 ø15.88(5/8)	※1 ø6.35(1/4) ※2 ø9.52(3/8)	

PLFY-P06·08·12·15·18NLMU-E with OA duct flange

Unit :mm(in.)



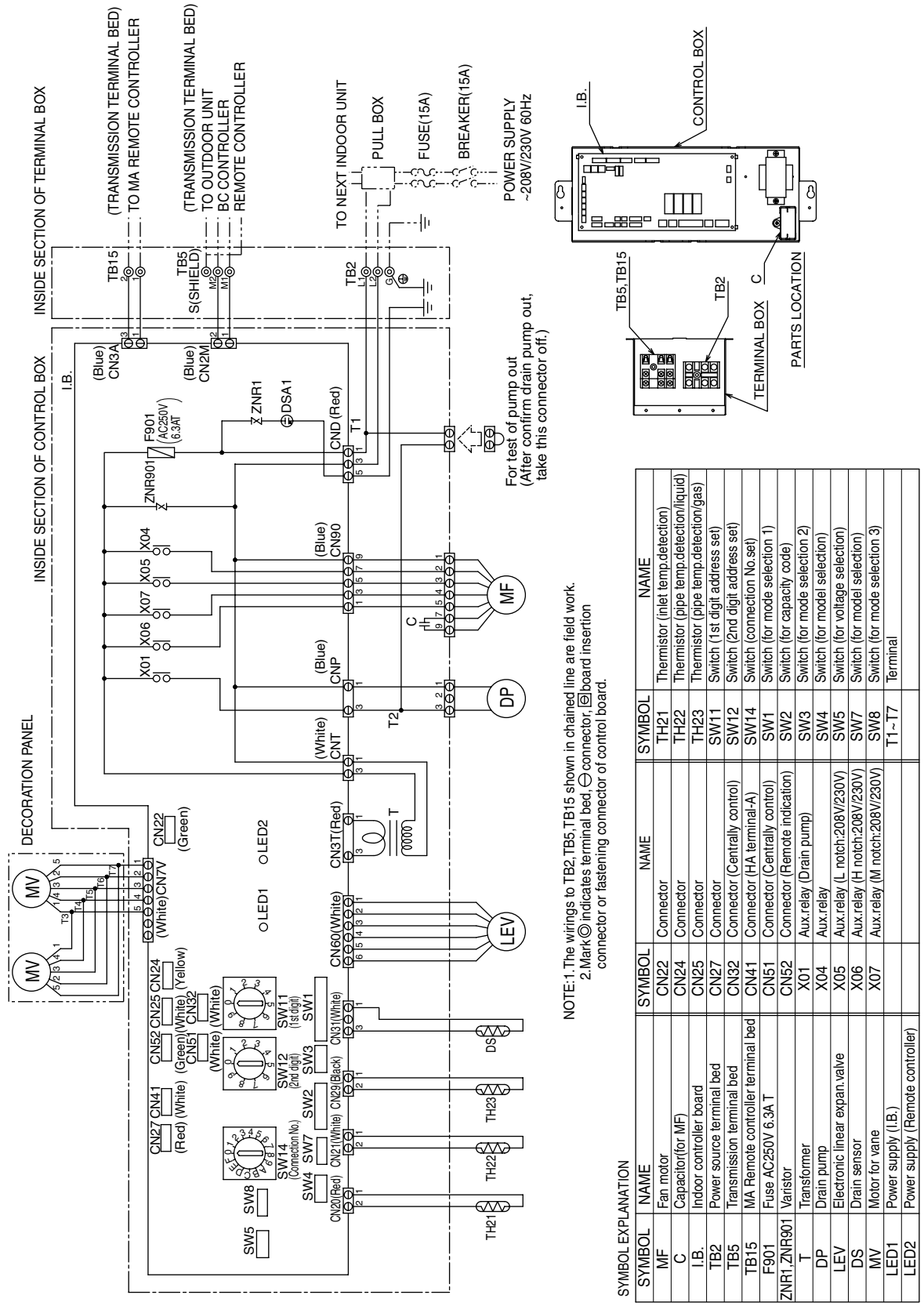
Note: 1.Use M10 screw for the lifting bolt (field supply).
2.It is available to connect the branch duct on right and left side both.
3.On Model :18, you would use flare nut packed with the Indoor Unit, when connecting the Outdoor Unit for R22.
4.In order to increase the strength of the flare nut, the size of some of them has been increased.

		<flare>	
Model 06·08·12·15	Gas pipe:LP	ø12.7	..... ①
	Liquid pipe:HP	ø6.35	..... ②
Model 18	Gas pipe:LP	ø12.7<R410A outdoor unit>	..... ①
		ø15.88<The other outdoor unit>	
	Liquid pipe:HP	ø6.35<R410A outdoor unit>	..... ②
		ø9.52<The other outdoor unit>	
Drain hose	VP-25<flexible joint> (accessory)		

Model	A	B	C	D	E	F	G
PLFY-P06NLMU-E	1080	1040	776	824	388	217.5×2 =435	6
PLFY-P08NLMU-E							
PLFY-P12NLMU-E							
PLFY-P15NLMU-E							
PLFY-P18NLMU-E	1250	1210	946	994	473		

5 WIRING DIAGRAM

PLFY-P06·08·12·15·18NLMU-E



NOTE:1.The wirings to TB2,TB5,TB15 shown in chained line are field work.
2.Mark◎indicates terminal bed,⊖connector,▣board insertion connector or fastening connector of control board.

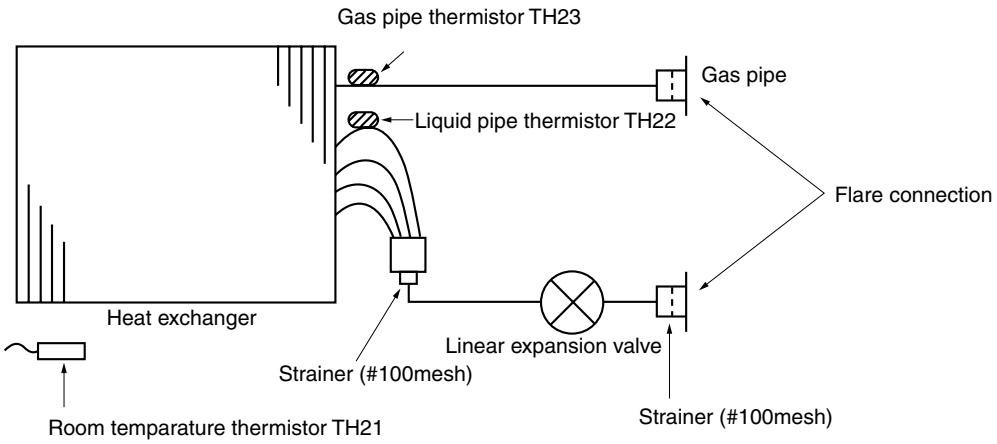
SYMBOL EXPLANATION

SYMBOL	NAME
MF	Fan motor
C	Capacitor(for MF)
I.B.	Indoor controller board
TB2	Power source terminal bed
TB5	Transmission terminal bed
TB15	MA Remote controller terminal bed
F901	Fuse AC250V 6.3A T
ZNR1,ZNR901	Varistor
T	Transformer
DP	Drain pump
LEV	Electronic linear expan.valve
DS	Drain sensor
MV	Motor for vane
LED1	Power supply (I.B.)
LED2	Power supply (Remote controller)

SYMBOL	NAME
CN22	Connector
CN24	Connector
CN25	Connector
CN27	Connector
CN32	Connector (Centrally control)
CN41	Connector (HA terminal-A)
CN51	Connector (Centrally control)
CN52	Connector (Remote indication)
X01	Aux.relay (Drain pump)
X04	Aux.relay
X05	Aux.relay (L notch:208V/230V)
X06	Aux.relay (H notch:208V/230V)
X07	Aux.relay (M notch:208V/230V)

SYMBOL	NAME
TH21	Thermistor (inlet temp.detection)
TH22	Thermistor (pipe temp.detection/liquid)
TH23	Thermistor (pipe temp.detection/gas)
SW11	Switch (1st digit address set)
SW12	Switch (2nd digit address set)
SW14	Switch (connection No.set)
SW1	Switch (for mode selection 1)
SW2	Switch (for capacity code)
SW3	Switch (for mode selection 2)
SW4	Switch (for model selection)
SW5	Switch (for voltage selection)
SW7	Switch (for model selection)
SW8	Switch (for mode selection 3)
T1~T7	Terminal

6 REFRIGERANT SYSTEM DIAGRAM



mm <in.>

Item \ Capacity		PLFY-P06,08,12,15NLMU-E	PLFY-P18NLMU-E
Gas pipe	R410A	ø 12.7 (1/2)	
	R22	ø 12.7 (1/2)	ø 15.88 (5/8)
Liquid pipe	R410A	ø 6.35 (1/4)	
	R22	ø 6.35 (1/4)	ø 9.52 (3/8)

7 TROUBLE SHOOTING

7-1. Simple check of main components

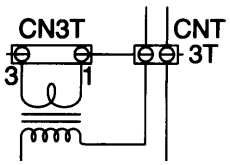
Room temperature thermistor (TH21) / Liquid pipe thermistor (TH22) / Gas pipe thermistor (TH23)

Disconnect the connector, then measure the resistance using a tester.
(Surrounding temperature 10°C to 30°C[50°F to 86°F])

Normal	Abnormal
4.3kΩ~9.6kΩ	Open or short

(Refer to the thermistor)

Power transformer



Disconnect the connector and measure the resistance using a tester. (Surrounding temperature: 25°C[77°F])

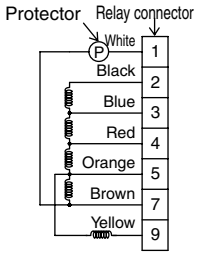
	Normal	Abnormal
CNT(1)~(3)	App.112.5Ω (Model:06~18)	Open or short
CN3T(1)~(3)	App.1.2Ω (Model:06~18)	

Vane motor

Measure the resistance between the terminals using a tester. (Surrounding temperature: 20°C to 30°C[68°F to 86°F])

		Normal	Abnormal
Model:06~18	1-2 1-3 1-4 1-5	App.300Ω	Open or short

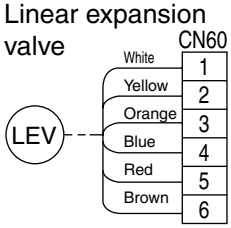
Fan motor



Measure the resistance between the terminals using a tester. (Surrounding temperature: 20°C[68°F])

	06 to 15	18
(1)-(2) White-Black	517.6Ω	369.6Ω
(1)-(3) White-Blue	420.6Ω	310.1Ω
(1)-(4) White-Red	352.2Ω	268.9Ω
(1)-(5) White-Orange	304Ω	229Ω
(1)-(9) White-Yellow	547Ω	431Ω

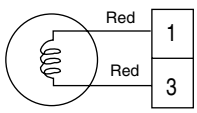
Linear expansion valve



Disconnect the connector then measure the resistance valve using a tester.
(Surrounding temperature: 20°C[68°F])

Normal				Abnormal
(1)-(5) White-Red	(2)-(6) Yellow-Blown	(3)-(5) Orange-Red	(4)-(6) Blue-Brown	Open or short
150Ω±10%				

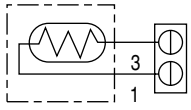
Drain-pump



Measure the resistance between the terminals using a tester.(Surrounding temperature: 20°C to 30°C[68°F to 86°F])

Normal	Abnormal
572Ω (Model:06~18)	Open or short

Drain sensor



Measure the resistance between the terminals using a tester.

0˚C[32˚F]/6.0kΩ,10˚C[50˚F]/3.9kΩ
20˚C[68˚F]/2.6kΩ,25˚C[77˚F]/2.2kΩ
30˚C[86˚F]/1.8kΩ,40˚C[104˚F]/1.3kΩ

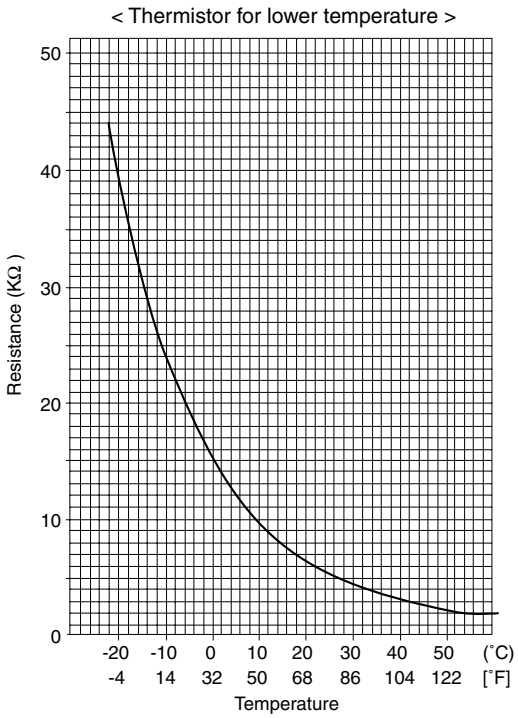
<Table of thermistor characteristics>
Thermistor (piping temperature detection, room temperature detection)

● Table of thermistor resistance
Thermistor Ro = 15kΩ±3%
B constant = 3480kΩ±2%

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

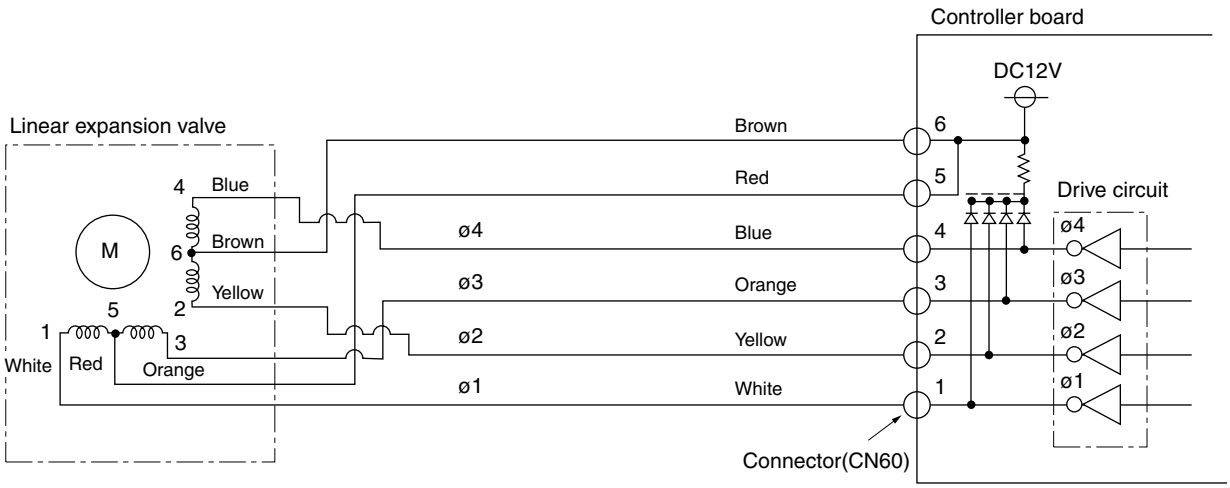
$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

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



Linear expansion valve

① **Operation summary of the linear expansion valve.**
• Linear expansion valve open/close through stepping motor after receiving the pulse signal from the indoor controller board.
• Valve position can be changed in proportion to the number of pulse signal.
<Connection between the indoor controller board and the linear expasion valve>



<Output pulse signal and the valve operation>

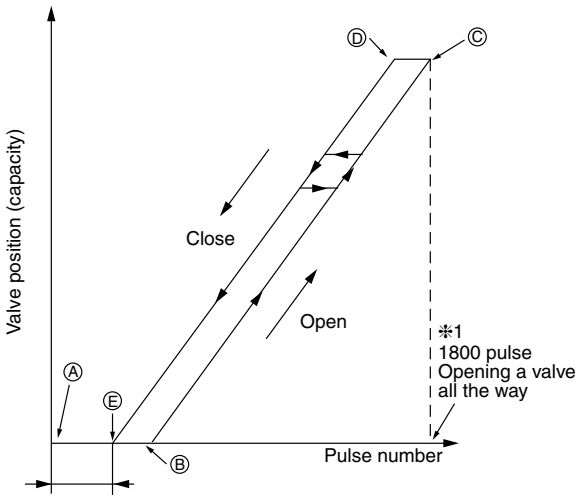
Output (Phase)	Output			
	1	2	3	4
ø1	ON	OFF	OFF	ON
ø2	ON	ON	OFF	OFF
ø3	OFF	ON	ON	OFF
ø4	OFF	OFF	ON	ON

Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

The output pulse shifts in above order.

✻ 1. When linear expansion valve operation stops, all output phase become OFF.
2. At phase interruption or when phase does not shift in order, motor does not rotate smoothly and motor will locks and vibrates.

② Linear expansion valve operation



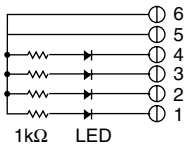
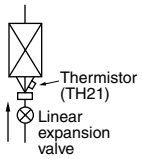
✻ When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

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

✻ Noise can be detected by placing the ear against the screw driver handle while putting the screw driver to the linear expansion valve.

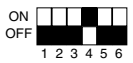
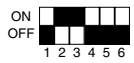
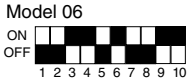
✻1:1800pulse at R410A outdoor unit.
2000pulse at the other outdoor unit.

③ Trouble shooting

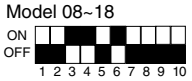
Symptom	Check points	Countermeasures
Operation circuit failure of the micro processor.	Disconnect the connector on the controller board, then connect LED for checking.  Pulse signal will be sent out for 10 seconds as soon as the main switch is turn on. If there is LED with lights on or lights off, it means the operation circuit is abnormal.	Exchange the indoor controller board at drive circuit failure.
Linear expansion valve mechanism is locked.	Motor will idle and make ticking noise when motor is operated while the linear expansion valve is locked. This ticking sound is the sign of the abnormality.	Exchange the linear expansion vale.
Short or breakage of the motor coil of the linear expansion valve.	Measure the resistance between the each coil (red-white, red-orange, brown-yellow, brown-blue) using a tester. It is normal if the resistance is in the range of $150\Omega \pm 10\%$.	Exchange the linear expansion valve.
Valve doesn´t close completely (thermistor leaking).	To check the linear expansion valve, operate the indoor unit in fan mode and at the same time operate other indoor units in cooling mode, then check the pipe temperature <liquid pipe temperature> of the indoor unit by the outdoor multi controller board operation monitor. During fan operation, linear expansion valve is closed completely and if there are some leaking, detecting temperature of the thermistor will go lower. If the detected temperature is much lower than the temperature indicated in the remote controller, it means the valve is not closed all the way. It is not necessary to exchange the linear expansion valve, if the leakage is small and not making any trouble.  	If large amount of refrigeration is leaked, exchange the linear expansion valve.
Wrong connection of the connector or contact failure.	Check the color of lead wire and missing terminal of the connector.	Disconnect the connector at the controller board, then check the continuity.

7-2. FUNCTION OF DIP-SWITCH

<table>
<tr><th rowspan="2">Switch</th><th rowspan="2">Pole</th><th rowspan="2">Function</th><th colspan="2">Operation by switch</th><th rowspan="2">Remarks</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td rowspan="10">SW1
Mode
Selection</td><td>1</td><td>Thermistor<Intake temperature detection>position</td><td>Built-in remote controller</td><td>Indoor unit</td><td rowspan="10"><At delivery>

</td></tr>
<tr><td>2</td><td>Filter crogging detection</td><td>Provided</td><td>Not provided</td></tr>
<tr><td>3</td><td>Filter life</td><td>2,500hr</td><td>100hr</td></tr>
<tr><td>4</td><td>Air intake</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>5</td><td>Remote indication switching</td><td>Thermostat ON signal indication</td><td>Fan output indication</td></tr>
<tr><td>6</td><td>Humidifier control</td><td>Always operated while the heat is ON</td><td>Operated depends on the condition</td></tr>
<tr><td>7</td><td>Air flow st</td><td>Low</td><td>Extra low</td></tr>
<tr><td>8</td><td>Heat thermostat OFF</td><td>Setting air flow</td><td>Reset to SW1-7</td></tr>
<tr><td>9</td><td>Auto reset function</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>10</td><td>Power ON/OFF</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>SW2
Capacity
code
setting</td><td>1~6</td><td colspan="3"><table><tr><th>MODELS</th><th>SW2</th><th>MODELS</th><th>SW2</th></tr><tr><td>PLFY-P06NLMU-E</td><td>
</td><td>PLFY-P15NLMU-E</td><td>
</td></tr><tr><td>PLFY-P08NLMU-E</td><td>
</td><td>PLFY-P18NLMU-E</td><td>
</td></tr><tr><td>PLFY-P12NLMU-E</td><td>
</td><td></td><td></td></tr></table></td><td>Set while the unit is off.
<At delivery>
Set for each capacity.</td></tr>
<tr><td rowspan="10">SW3
Function
Selection</td><td>1</td><td>Heat pump/Cooling only</td><td>Cooling only</td><td>Heat pump</td><td rowspan="10">Set while the unit is off.
<At delivery>
Model 06


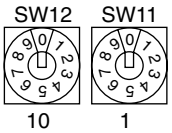
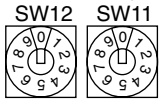
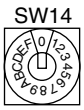
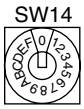
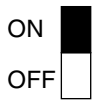
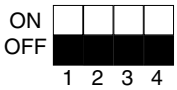
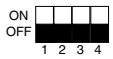
Model 12


Model 08~18

</td></tr>
<tr><td>2</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>3</td><td>Vane</td><td>Available</td><td>Not available</td></tr>
<tr><td>4</td><td>Vane swing function</td><td>Available</td><td>Not available</td></tr>
<tr><td>5</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>6</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>7</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>8</td><td>Heating 4K up</td><td>Not effective</td><td>Effective</td></tr>
<tr><td>9</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>10</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td rowspan="4">SW4
Unit
Selection</td><td>1</td><td>—</td><td>—</td><td>—</td><td rowspan="4">Set while the unit is off.
<At delivery>
Model 06~18

</td></tr>
<tr><td>2</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>3</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>4</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td rowspan="3">SW8
Function
Selection</td><td>1</td><td>Demand</td><td>Not effective</td><td>Effective</td><td rowspan="3">Set while the unit is off.
<At delivery>
Model 06~18

</td></tr>
<tr><td>2</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>3</td><td>—</td><td>—</td><td>—</td></tr>
</table>

Note :The DipSW setting is effective during unit stopping (remote controller OFF) for SW1,2 and 3 commonly and the power souce is not required to reset.

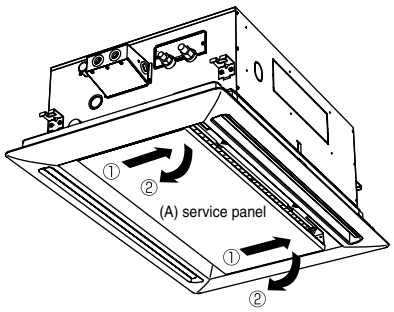
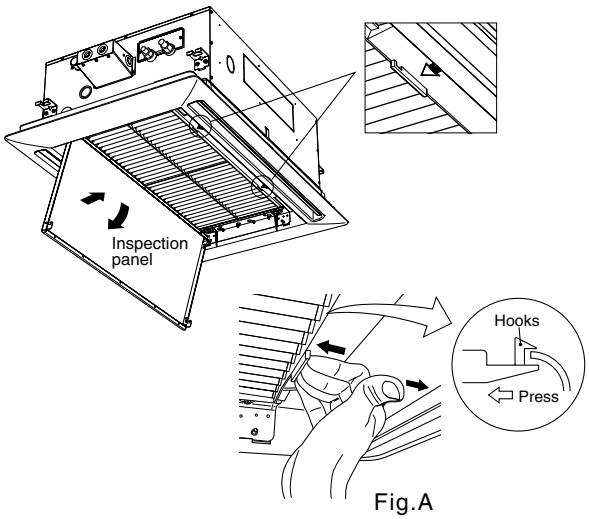
Switch	Pole	Operation by switch	Remarks
SW11 1st digit address setting SW12 2nd degit address setting Note:1	Rotary switch	 Address setting should be done when network remote controller (PAR-F25MA) is being used.	Address can be set while the unit is stopped. <At delivery> 
SW14 Connection No. setting Note:1	Rotary switch	 This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.	<At delivery> 
SW5 Voltage Selection Note:1	2	 ON : 208V OFF : 230V If the unit is used at the 208V area, set the switch as ON. If the unit is used at the 208V area, set the switch as OFF.	<At delivery> 
SW7	1~4		Set while the unit is off. <At delivery> 

Note 1 : The DipSW setting is effective during unit stopping (remote controller OFF) for SW11,12,14 and 5.

8 DISASSEMBLY PROCEDURE

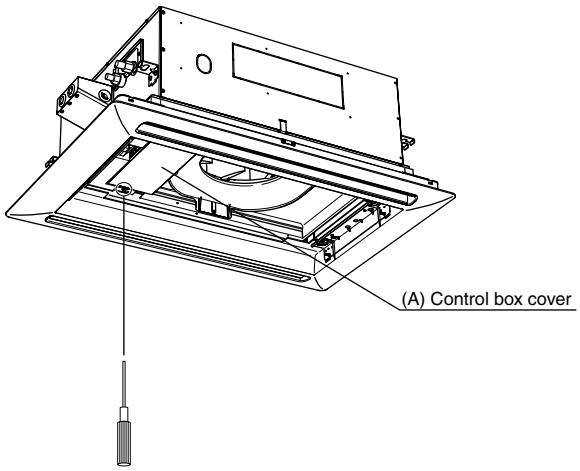
8-1.SERVICE PANEL and FILTER

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Removing the service panel (A) (Fig.1-1) (1) Slide the service panel (A) in the direction of the arrow ① while lifting it. (depending on the local installation,the slide direction is reverse) (2) After sliding, if it is opened in direction ②, the service panel (A) drops down as shown in Fig.1-2. (3) Remove the service panel (A) from the two pins. (Be care-ful not to allow it to drop). **2. Removing the filter (Fig.1-2)** (1) Place fingers on the projection near the PUSH mark on the filter, as shown in Fig. A. Remove panel frame with thumb, and press projections with other fingers to remove the hooks.	(Fig.1-1)  (Fig.1-2)  Fig.A

8-2.CONTROL BOX

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Remove the service panel and filter with the procedure explained in section 8-1.	(Fig.2-1) 
2. Removing the control box cover (Fig.2-1). • Remove the fixing screws (one) of the control box cover (A), and remove the cover. * At this stage, the following servicing is possible. ① Operation and check of the switches (listed below) which are on the address board. • Rotary switches SW11, 12 Address setting • Rotary switch SW14 Branch port setting • Dip switch SW1 Function change 1 • Dip switch SW2 Capacity setting • Dip switch SW3 Function change 2 • Dip switch SW4 Model setting • Dip switch SW5 Option setting • Dip switch SW6 Model change • Dip switch SW7 Function change 3 ② Connection check and local connection of lead wires (listed below) which are connected to the control box (B). • Power supply lead wire (Connected at the factory) • Drain pump lead wire (Connected at the factory) • LEV lead wire (Connected at the factory) • Panel vane motor lead wire (Connected locally) • Panel limit switch lead wire (Connected locally) • Drain pump trial operation connector (Connected locally) • M-NET transmission lead wire (Connected at the factory) • MA remote controller transmission wire (Connected at the factory) • Fan motor lead wire (Connected at the factory) • Intake air sensor lead wire (Connected at the factory) • Fluid piping sensor lead wire (Connected at the factory) • Gas piping sensor lead wire (Connected at the factory) (• Humidifier lead wire) ◯ (• Auxiliary electric heater lead wire) ③ Control board exchange ④ Condenser exchange ⑤ Power supply transformer exchange 6 Intake air sensor exchange Note: The control PCB, capacitor and power transformer could fall off when removed.	(Photo.2-1) 

8-3.Fan and fan motor

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS

1. Remove the service panel and filter with the procedure explained in section 8-1.

2. Remove the two screws fixing the bell-mouth (A), and remove the bell-mouth A. (Fig. 3-1)

3. Remove the turbo fan mounting screw (one M8 nut), and pull the turbo fan off the fan motor shaft. (Photograph 3-1)

Note: The turbo fan will come off the motor shaft when the mounting screw is removed, so take care not to let turbo fan fall off when removing it.

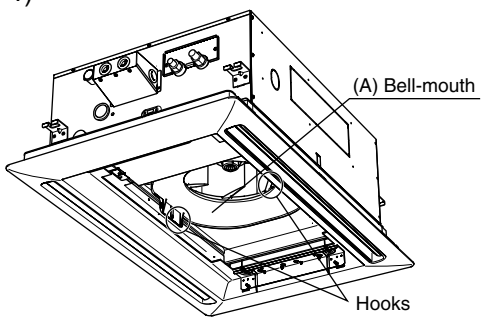
4. Remove the lead wire retainer. (Two screws) (Photograph 3-3)

5. Disconnect the motor lead wire connector in the control box.
- Motor on the control box side
  Remove the connector cover, and remove the motor lead wire connector.
- Motor on the opposite control box side
  (Photograph 3-1)
  (1) Remove the protection cover on the control box side.
  (2) Remove the lead wire, pick the tab of the connector, and push it into the motor side.

6. Remove the mounting nuts (four M5 nuts) fixing the motor fixing leg and main body, and remove the fan motor together with the leg. (Photograph 3-3)

Note: The fan motor will come off the main body when the mounting screw is removed. It could fall off, so when removing, securely hold the fan motor and remove the mounting screws.

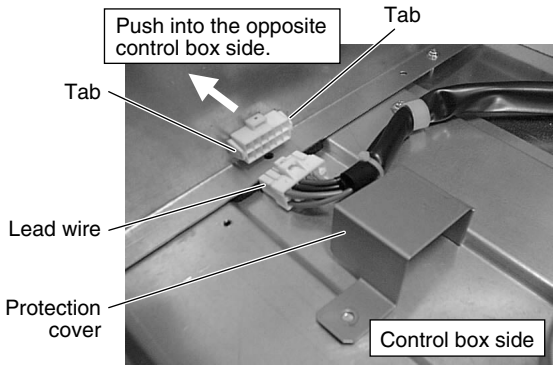
(Fig.3-1)



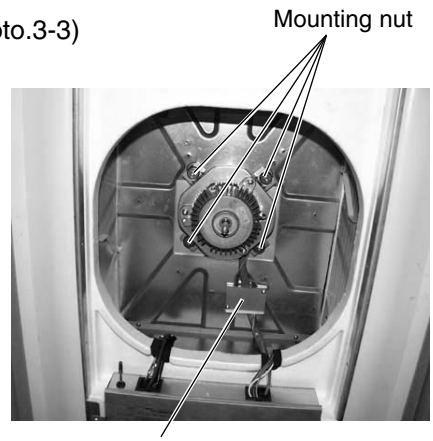
(Photo.3-1)



(Photo.3-2)



(Photo.3-3)



8-4. Thermistor <fluid piping temperature detection, gas piping temperature detection>

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS

1. Remove the service panel and filter with the procedure explained in section 8-1.

2. Remove the decorative panel frame.

(1) Loosen the four stepped screws fixing the panel, and suspend the panel frame. (Fig. 4-1)

(2) When the panel frame is pressed (or pulled) in the longitudinal direction, the stepped screws will come out of the key holes provided on the panel frame, and the panel frame will come off.

3. Remove the bell-mouth with the procedure explained in section 8-3 .

4. Remove the control box.

(1) Remove the control box cover with the procedure explained in section 8-2.

(2) Disconnect the following lead wire connectors from the control box. (Photograph 4-1)

- Power supply lead wire (CND, 5P: red)
- Drain pump lead wire (CNP, 3P: blue)
- Drain sensor lead wire (CN31, 3P: white)
- LEV lead wire (CN60, 6P: white)
- Vane motor lead wire for panel (CN7V, 7P: white)
- M-NET transmission lead wire (CN2M, 2P: blue)
- MA remote controller transmission lead wire (CN3A, 3P: blue)
- Fan motor lead wire (CN90, 9P: blue)
- Fluid piping temperature sensor lead wire (CN21, 2P: white)
- Gas piping temperature sensor lead wire (CN29, 2P, black)

(3) Loosen the two screw fixing the control box, and remove the control box.

5. Remove the drain pan. (Photograph 4-2)

(1) Remove the two drain pan fixing plates B. (One screw/plate)

(2) Remove the two drain pan fixing plates C. (Three screws/plate)

(3) Remove the side frame reinforcement plate. (One screw)

(4) Loosen the rubber plug on the drain pan's drainage socket, and drain out all water from the drain pan.

Note: Before removing the rubber plug, prepare a bucket, etc., so that the drainage will be caught. The desk or floor should be covered with a sheet, etc., so that water will not get on it inadvertently.

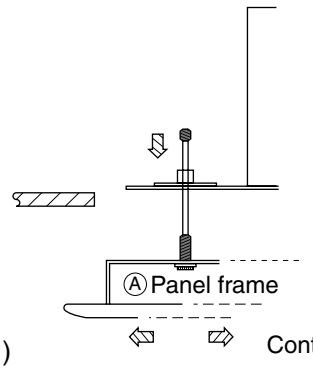
(5) Pull down the drain pan.

Note: Pull the drain pan out gradually by shifting the front and back to the left and right. The drain pan is made of styrofoam, so take care not to break it.

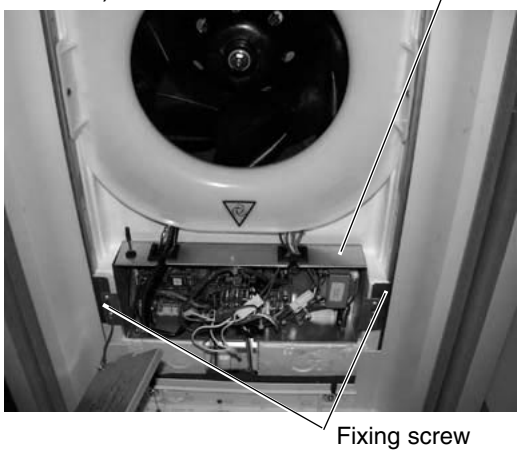
6. Remove the thermistor from the thermistor holder on the copper piping (fluid piping ... thin piping, gas piping ... thick piping). (Photograph 4-3)

Note: Each thermistor has a notch on the tube to drain out any water condensed in the piping tube. That section comes to the very bottom. A trap is provided so that the water will drip into the drain pan. Thus, when replacing the thermistor, always set the trap at the original position.

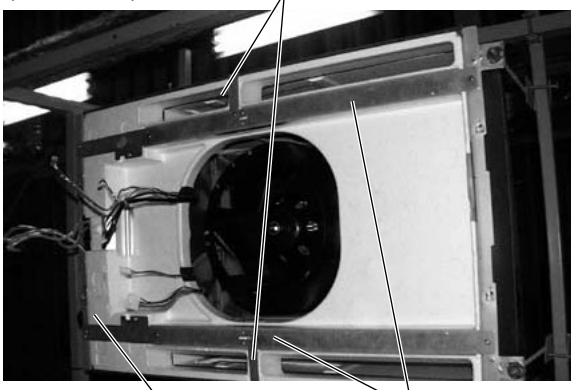
(Fig.4-1)



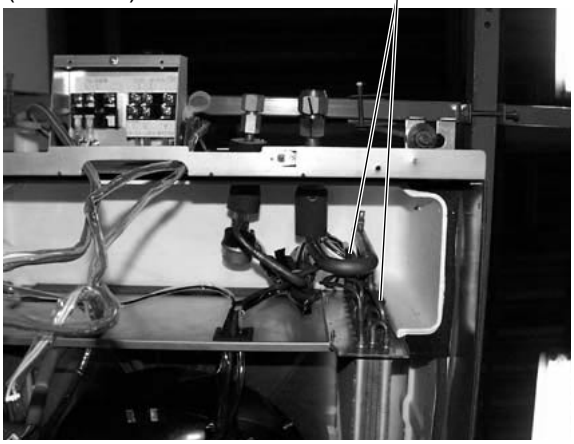
(Photo.4-1)



(Photo.4-2)

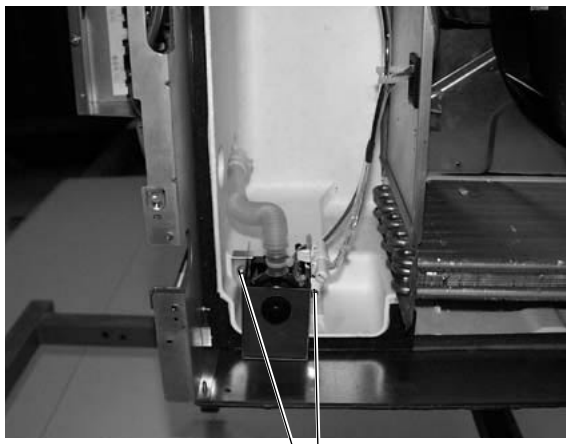


(Photo.4.3)



8-5.DRAIN PUMP and DRAIN SENSOR

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Remove the service panel and filter with the procedure explained in section 8-1. **2. Remove the decorative panel frame with the procedure explained in section 8-4.** **3. Remove the bell-mouth with the procedure explained in section 8-3.** **4. Remove the control box with the procedure explained in section 8-4.** **5. Remove the drain pan with the procedure explained in section 8-4.** **6. Remove the binding band on the drain hose connected to the drain pump.** **7. The drain pump and drain sensor, fixed to the cover, are fixed to the main unit. Remove the two fixing screws and remove. (Photograph 6-1)**	(Photo.6-1)  Fixing screw

8-6.LEV and HEAT EXCHANGER

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS

1. Remove the service panel and filter with the procedure explained in section 8-1.

2. Remove the decorative panel frame with the procedure explained in section 8-4.

3. Remove the bell-mouth with the procedure explained in section 8-3.

4. Remove the control box with the procedure explained in section 8-4.

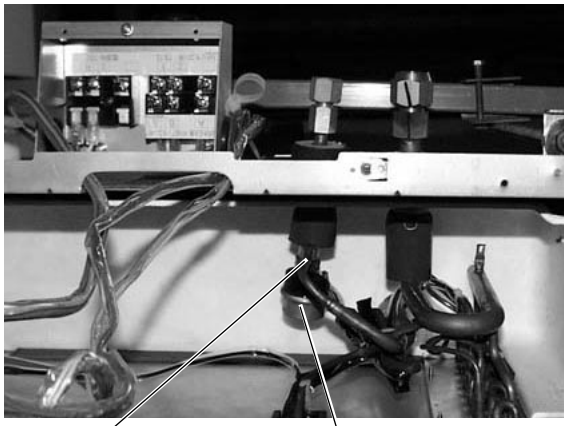
5. Remove the drain pan with the procedure explained in section 8-4.

6. Remove the LEV drive motor with a double spanner. (Photograph 7-1)

7. Remove the fluid piping connection flare, gas piping connection flare, and then lower the unit body to remove the heat exchanger.
(Photographs 7-2, 7-3)
(1) Remove the two heat exchanger support plates A. (One screw/plate)
(2) Remove the heat exchanger support plate B. (Two screws)
(3) Remove the piping fixing plate C. (Two screws)
(4) Slide the heat exchanger in the direction opposite the piping, and remove it.

Note 1: Cover the control box, motor, drain pump and LEV with cloth, etc., to protect them in case water should come in contact when washing the drain pan and heat exchanger.
2: Do not drain the water used to clean the drain pan and heat exchanger with the rain pump. Drain it separately.

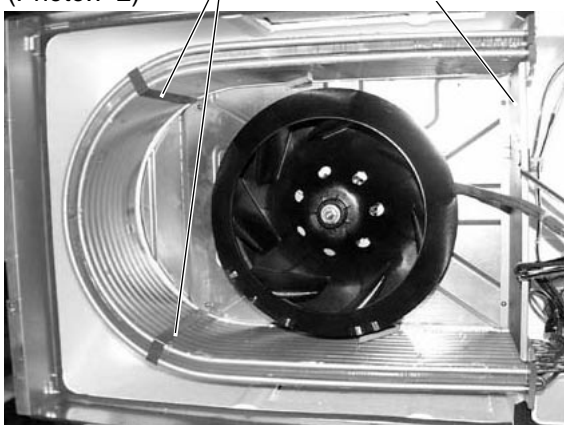
(Photo.7-1)



Heat exchanger support plate A

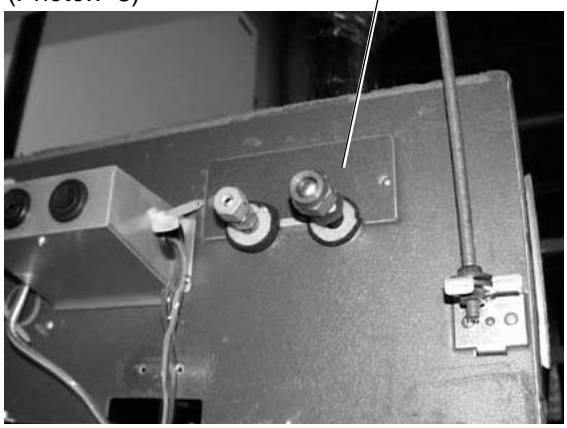
(Photo.7-2)

Heat exchanger support plate B



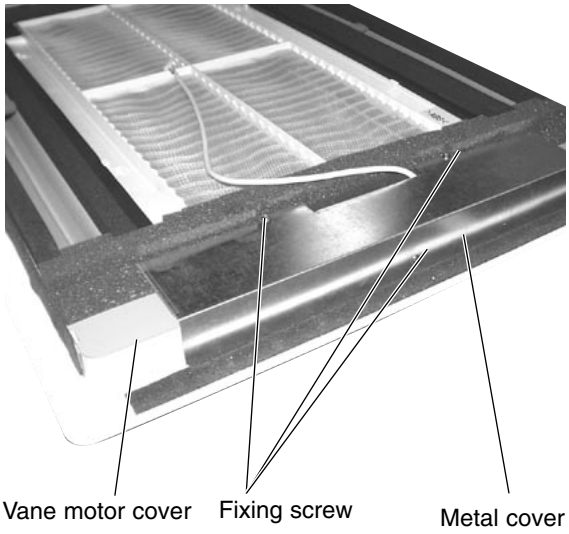
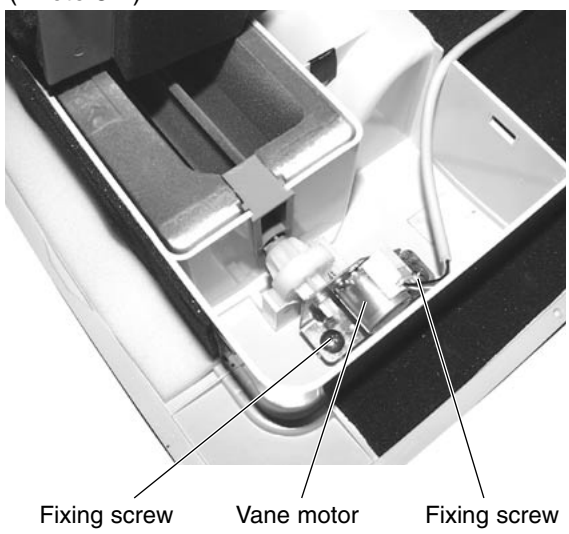
Piping fixing plate C

(Photo.7-3)



8-7.Vane motor

Be careful removing heavy parts.

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Remove the metal cover. (Three screws) (Photograph 8-1) **2. Remove the vane motor cover. The vane motor cover can be removed by pushing it up with fingers.** **3. Remove the two motor mounting screws. (Photograph 8-2)**	(Photo.8-1)  (Photo.8-2) 

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HVAC Advanced Products Division

3400 Lawrenceville Suwanee Road • Suwanee, Georgia 30024
Toll Free: 800-433-4822 • Toll Free Fax: 800-889-9904
www.mrslim.com

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