MITSUBISHI ELECTRIC

SPLIT-TYPE,HEAT PUMP AIR CONDITIONERS

2001

No. OC248
REVISED EDITION-A

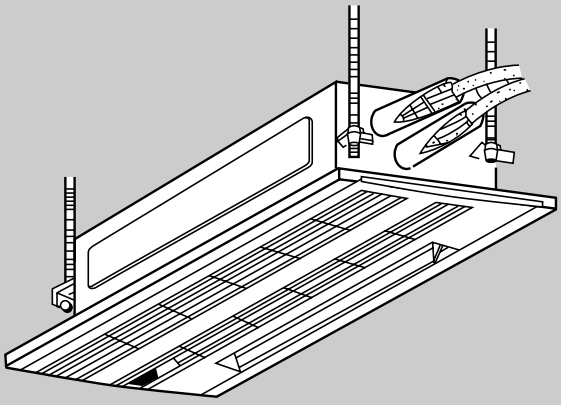
TECHNICAL & SERVICE MANUAL

Series PMFY Ceiling Cassettes R407C / R22

Indoor unit
[Model names] **[Service Ref.]**

[Model names]	[Service Ref.]
PMFY-P20VBM-A	PMFY-P20VBM-A
	PMFY-P20VBM-A1
PMFY-P25VBM-A	PMFY-P25VBM-A
	PMFY-P25VBM-A1
PMFY-P32VBM-A	PMFY-P32VBM-A
	PMFY-P32VBM-A1
PMFY-P40VBM-A	PMFY-P40VBM-A
	PMFY-P40VBM-A1

- PMFY-P20VBM-A1, PMFY-P25VBM-A1, PMFY-P32VBM-A1, PMFY-P40VBM-A1 are added in Revised Edition-A.
- Please destroy OC248.



INDOOR UNIT

CONTENTS

1 TECHNICAL CHANGES

PMFY-P20VBM-A → PMFY-P20VBM-A$_1$
PMFY-P25VBM-A → PMFY-P25VBM-A$_1$
PMFY-P32VBM-A → PMFY-P32VBM-A$_1$
PMFY-P40VBM-A → PMFY-P40VBM-A$_1$

- INDOOR CONTROLLER BOARD(I.B) has changed.
- DRAIN PAN has changed.

2 SAFETY PRECAUTION

Cautions for using with the outdoor unit which adopts R407C refrigerant.

· **Do not use the existing refrigerant piping.**
-The old refrigerant and lubricant in the existing piping contains a large amount of chlorine which may cause the lubricant deterioration of the new unit.

· **Use "low residual oil piping".**
-If there is a large amount of residual oil (hydraulic oil, etc.) inside the piping and joints, deterioration of the lubricant will result.

· **Store the piping to be used during installation indoors with keep both ends 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 ESTR , ETHER or HAB as the lubricant to coat flares and flange connection parts.**

Use liquid refrigerant to seal 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 R407C.**
-If another refrigerant (R22, etc.) is used, the chlorine in the refrigerant may cause the lubricant deterioration.

· **Use a vacuum pump with a reverse flow check valve.**
-The vacuum pump oil may flow back into the refrigerant cycle and cause the lubricant deterioration.

[1] Service tools

Use the below service tools as exclusive tools for R407C refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	·Only for R407C.
		·Use the existing fitting SPECIFICATIONS. (UNF7/16)
		·Use high-tension side pressure of 3.43MPa·G or over.
②	Charge hose	·Only for R407C.
		·Use pressure performance of 5.10MPa·G or over.
③	Electronic scale	
④	Gas leak detector	·Use the detector for R134a or R407C.
⑤	Adapter for reverse flow check.	·Attach on vacuum pump.
⑥	Refrigerant charge base.	
⑦	Refrigerant cylinder.	·For R407C ·Top of cylinder (Brown) ·Cylinder with syphon
⑧	Refrigerant recovery equipment.	

[2] Notice on repair service

·After recovering the all refrigerant in the unit, proceed to working.
·Do not release refrigerant in the air.
·After completing the repair service, recharge the cycle with the specified amount of liquid refrigerant.

[3] Refrigerant recharging

(1) Refrigerant recharging process

①Direct charging from the cylinder.
·R407C cylinder are available on the market has a syphon pipe.
·Leave the syphon pipe cylinder standing and recharge by liquid refrigerant

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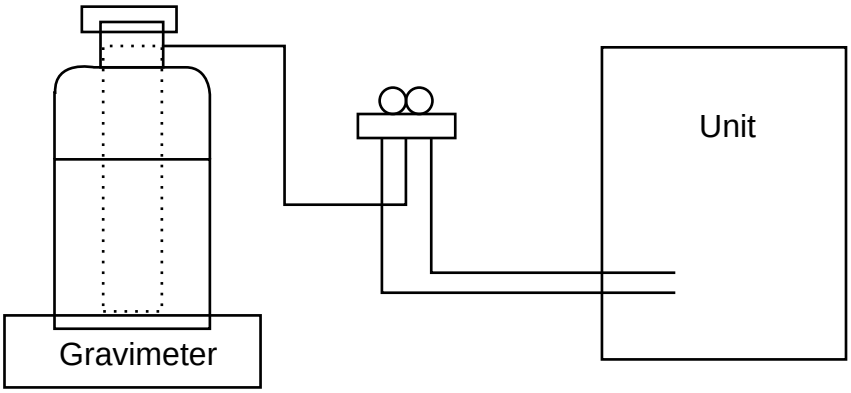
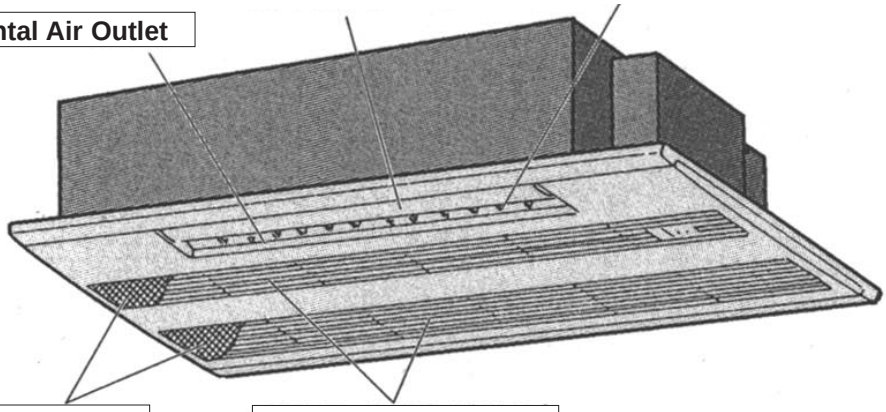


(2) Recharge in refrigerant leakage case

·After recovering the all refrigerant in the unit, proceed to working.
·Do not release the refrigerant in the air.
·After completing the repair service, recharge the cycle with the specified amount of liquid refrigerant.

3 PART NAMES AND FUNCTIONS

● **Indoor (Main) Unit**



Auto Air Swing Vane
Disperses airflow up and down and adjusts the angle of airflow direction.

Guide vane
Air flow can be changed to horizontally by moving the Guide vane to the left or right.

Horizontal Air Outlet

Filters
Remove dust and pollutants from return air.

Air intake
Returns air from room.

● **Remote controller** **[PAR-20MAA]**

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

● **Operation buttons**

TEMP. ADJUSTMENT button
This sets the room temperature. The temperature setting can be performed in 1℃ units
Setting range
Cooler 19℃ to 30℃
Heater 17℃ to 28℃

TIME SETTING button
This sets the current time, start time and stop time.

AIR SPEED button
This sets the ventilation fan speed.

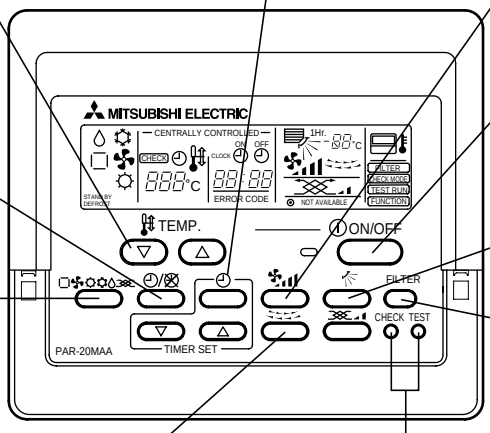
ON/OFF button
This switches between the operation and stop modes each time it is pressed. The lamp on this button lights during operation.

TIMER button
This switches between continuous operation and the timer operation.

AIR DIRECTION button
This adjusts the vertical angle of the ventilation.

OPERATION SWITCH button
Press this button to switch the cooler, electronic dry (dehumidify), automatic and heater modes.

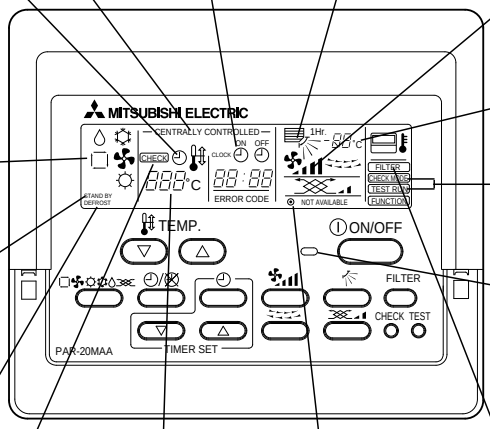
FILTER button
This resets the filter service indication display



LOUVER button
This switch the horizontal fan motion ON and OFF.
(Not available for this model.)

CHECK-TEST RUN button
Only press this button to perform an inspection check or test operation. Do not use it for normal operation.

● Display



CENTRALLY CONTROLLED display

This indicates when the unit is controlled by optional features such as central control type remote controller.

CLOCK display

The current time , start time and stop time can be displayed in ten second intervals by pressing the time switch button. The start time or stop time is always displayed during the timer operation.

In this display example on the bottom left, a condition where all display lamps light is shown for explanation purposes although this differs from actual operation.

AIR DIRECTION display

This displays the air direction.

TIMER display

This indicates when the continuous operation and time operation modes are set.
It also display the time for the timer operation at the same time as when it is set.

AIR SPEED display

The selected fan speed is displayed.

ROOM TEMPERATURE display

The temperature of the suction air is displayed during operation. The display range is 8°C to 39°C. The display flashes 8°C when the actual temperature is less than 8°C and flashes 39°C when the actual temperature is greater than 39°C.

OPERATION MODE display

This indicates the operation mode.

STANDBY display

The [STANDBY] symbol is only displayed from the time the heating operation starts unit the heated air begins to blow.

Operation lamp

This lamp lights during operation, goes off when the unit stops and flashes when a malfunction occurs.

CHECK MODE / TEST RUN display

This display lights in the check mode or when a test operation is performed.

DEFROST display

This indicates when the defrost operation is performed.

FILTER display

This lamp lights when the filter need to be cleaned.

CHECK display

This indicates when a malfunction has occurred in the unit which should be checked.

SET TEMPERATURE display

This displays the selected setting temperature.

POWER display

This lamp lights when electricity is supplied to the unit.

Caution

- Only the Power display lights when the unit is stopped and power supplied to the unit.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button, operation switch button and TEMP. adjustment button do not operate.
- “NOT AVAILABLE” is displayed when the Air speed button are pressed.This indicates that this room unit is not equipped with the fan direction adjustment function and the louver function.
- When power is turned ON for the first time, it is normal that “H0” is displayed on the room temperature indication (For max. 2minutes). Please wait until this “H0” indication disappear then start the operation.

4 SPECIFICATION

4-1. Specification

Item				PMFY-P20VBM-A PMFY-P20VBM-A1	PMFY-P25VBM-A PMFY-P25VBM-A1	PMFY-P32VBM-A PMFY-P32VBM-A1	PMFY-P40VBM-A PMFY-P40VBM-A1
Power			V･Hz	Single phase 220V-230V-240V 50Hz / 220V 60Hz			
Cooling capacity			kW	2.2	2.8	3.6	4.5
Heating capacity			kW	2.5	3.2	4.0	5.0
Electric characteristic	Input	Cooling	kW	0.042	0.044	0.044	0.054
		Heating	kW	0.042	0.044	0.044	0.054
	Current	Cooling	A	0.20	0.21	0.21	0.26
		Heating	A	0.20	0.21	0.21	0.26
Exterior (munsell symbol)			—	Unit : Galvanized sheets · Standard grills : ABS resin acrylic coating Munsell<0.98Y 8.99/0.63>			
Dimensions		Height	mm	230<30>			
		Width	mm	812<1,000>			
		Depth	mm	395<470>			
Heat exchanger			—	Cross fin			
Fan	Fan × No		—	Line flow fan × 1			
	Air flow ※3		m^3/min	8.7-8.0-7.2-6.5	9.3-8.6-8.0-7.3		10.7-9.7-8.7-7.7
	External static pressure		Pa	0			
	Fan motor output		kW	0.028			
Insulator			—	Polyethylene sheet			
Air filter			—	PP honey comb fabric			
Pipe dimensions		Gas side	ϕmm(in.)	12.7(1/2")			
		Liquid side	ϕmm(in.)	6.35(1/4")			
Unit drain pipe size			ϕmm	I.D.26 (PVC pipe VP-20 connectable)			
Noise level ※3			dB	35-33-30-27	37-36-34-32		39-37-35-33
Product weight			kg	14<3.0>			

Note 1. Rating conditions
Cooling: Indoor: D.B. 27°C W.B. 19.0°C
outdoor: D.B. 35°C
Heating: Indoor: D.B. 20°C
outdoor: D.B. 7°C W.B. 6°C

Note 2. The number indicated in < > is just for the grille.

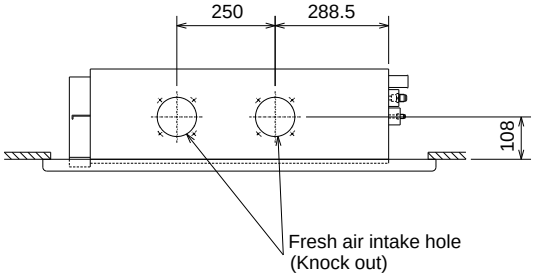
※ 3. Air flow and the noise level are indicated as High-Middium 1-Middium 2-Low.

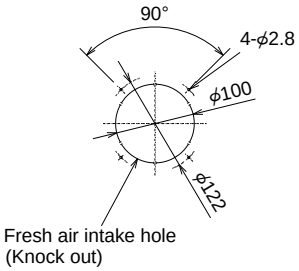
4-2. Electrical parts specifications

Model / Parts name	Symbol	PMFY-P20VBM-A PMFY-P20VBM-A1	PMFY-P25VBM-A PMFY-P25VBM-A1	PMFY-P32VBM-A PMFY-P32VBM-A1	PMFY-P40VBM-A PMFY-P40VBM-A1
Room temperature thermistor	TH21	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.2kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Liquid pipe thermistor	TH22	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.2kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Gas pipe thermistor	TH23	Resistance 0℃/15kΩ, 10℃/9.6kΩ, 20℃/6.3kΩ, 25℃/5.2kΩ, 30℃/4.3kΩ, 40℃/3.0kΩ			
Fuse (Indoor controller board)	FUSE	250V 6.3A			
Fan motor	MF	DC Brushless Motor 8-pole OUTPUT 28W PN0H28-MA			
Vane motor	MV	MSFJC 20M23 12V/380Ω			
Drain-up mechanism	DP	PJV-1046 220-240V 50/60Hz			
Drain sensor	DS	Thermistor resistance 0℃/6kΩ, 10℃/3.9kΩ, 20℃/2.6kΩ, 25℃/2.2kΩ, 30℃/1.8kΩ, 40℃/1.3kΩ			
Linear expansion valve	LEV	DC12V Stepping motor drive port (0~2000pulse) EDM-402ME			
Power supply terminal block	TB2	(L, N, ⏚) 330V 30A			
Transmission terminal block	TB5	(M1, M2, S) 250V 20A			
MA-remote controller terminal block	TB15	(1,2) 250V 10A			

4-3. Air capacity taken from outside

PMFY-P·VBM-A series are possible to be taken air from outside.
When taking air from the outside, the duct fan can be used to.
The air capacity should be 20% or less of the air flow SPEC(Hi).





Service Ref.	Air flow (Hi)	Air capacity taken outside
PMFY-P20VBM-A PMFY-P20VBM-A1	8.7m^3/min	Max 1.74m^3/min
PMFY-P25VBM-A PMFY-P25VBM-A1	9.3m^3/min	Max 1.86m^3/min
PMFY-P32VBM-A PMFY-P32VBM-A1	9.3m^3/min	Max 1.86m^3/min
PMFY-P40VBM-A PMFY-P40VBM-A1	10.7m^3/min	Max 2.14m^3/min

Interlocking operation method with duct fan (Booster fan)

●Whenever the indoor unit is operating, the duct fun also operates.

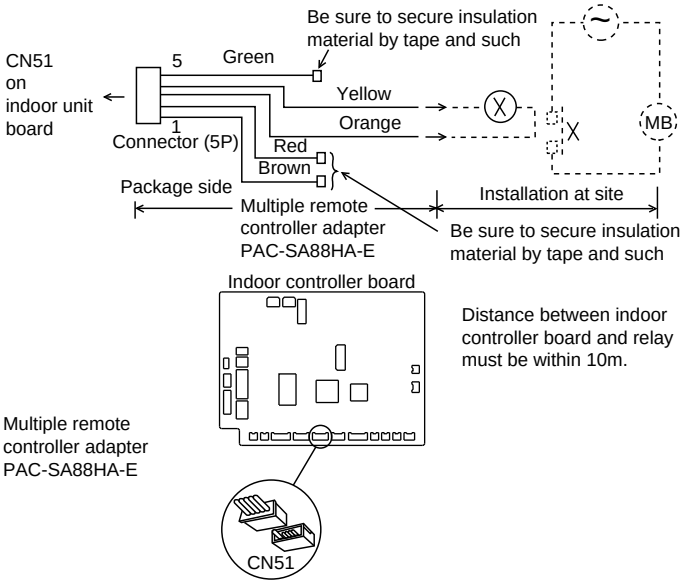
(1)Connect the optional multiple remote controller adapter(PAC-SA88HA-E)to the connector CN51 on the indoor controller board.

(2)Drive the relay after connecting the 12V DC relay between the Yellow and Orange connector lines.

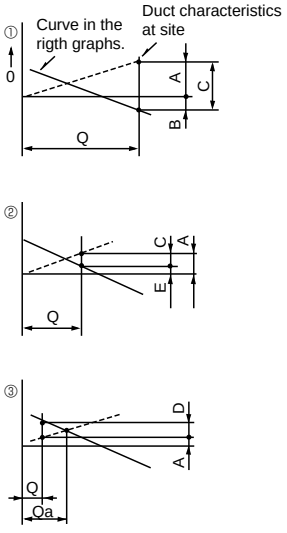
(※)Use a relay under 1W.

MB: Electromagnetic switch power relay for duct fan.

X: Auxiliary relay (12V DC LY-1F)



How to read curves



Q…Planned amount of fresh air intake <m^3/min>

A…Static pressure loss of fresh air intake duct system with air flow amount Q <Pa>

B…Forced static pressure at air conditioner inlet with air flow amount Q <Pa>

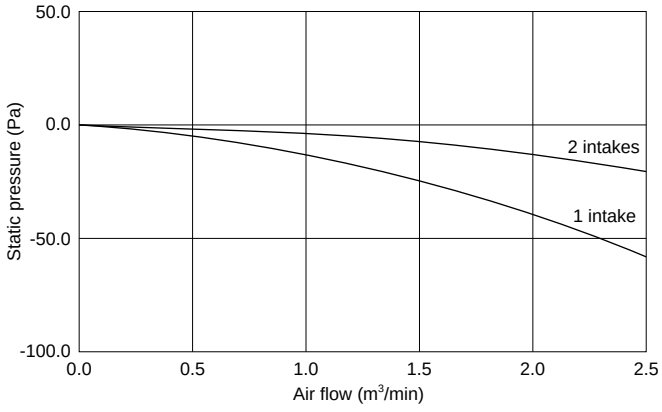
C…Static pressure of booster fan with air flow amount Q <Pa>

D…Static pressure loss increase amount of fresh air intake dust system for air flow amount Q <Pa>

E…Static pressure of indoor unit with air flow amount Q <Pa>

Qa…Estimated amount of fresh air intake with out D <m^3/min>

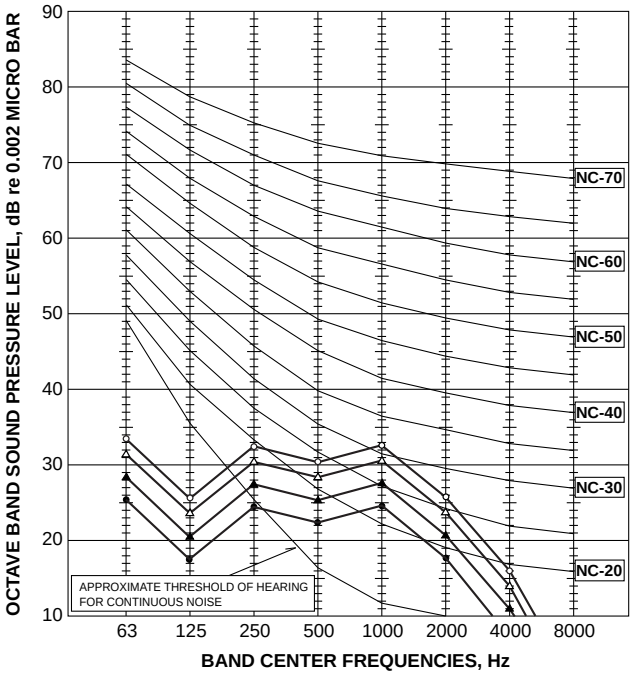
Characteristic diagram of air capacity taken from outside of PMFY-P·VBM



4-4. NOISE CRITERION CURVES

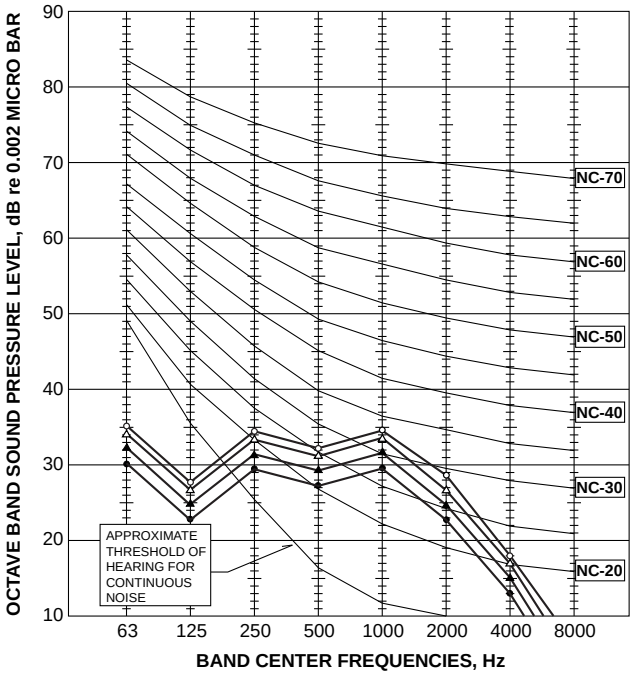
PMFY-P20VBM-A
PMFY-P20VBM-A$_1$

NOTCH	SPL(dB)	LINE
Hi	35	
Mi1	33	
Mi2	30	
Lo	27	



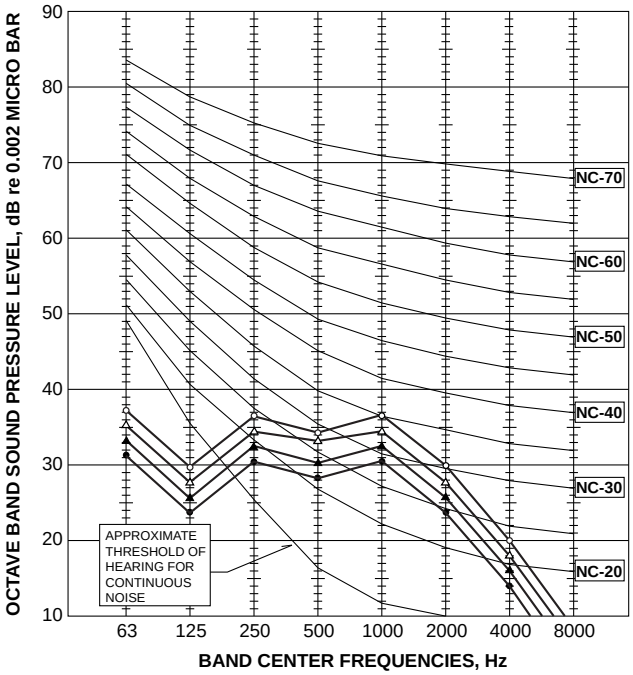
PMFY-P25VBM-A
PMFY-P25VBM-A$_1$
PMFY-P32VBM-A
PMFY-P32VBM-A$_1$

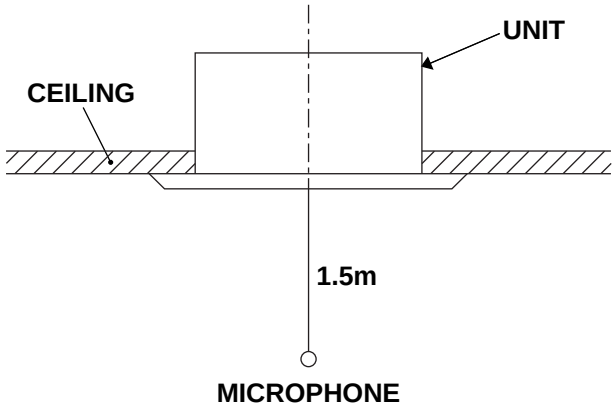
NOTCH	SPL(dB)	LINE
Hi	37	
Mi1	36	
Mi2	34	
Lo	32	



PMFY-P40VBM-A
PMFY-P40VBM-A$_1$

NOTCH	SPL(dB)	LINE
Hi	39	
Mi1	37	
Mi2	35	
Lo	33	





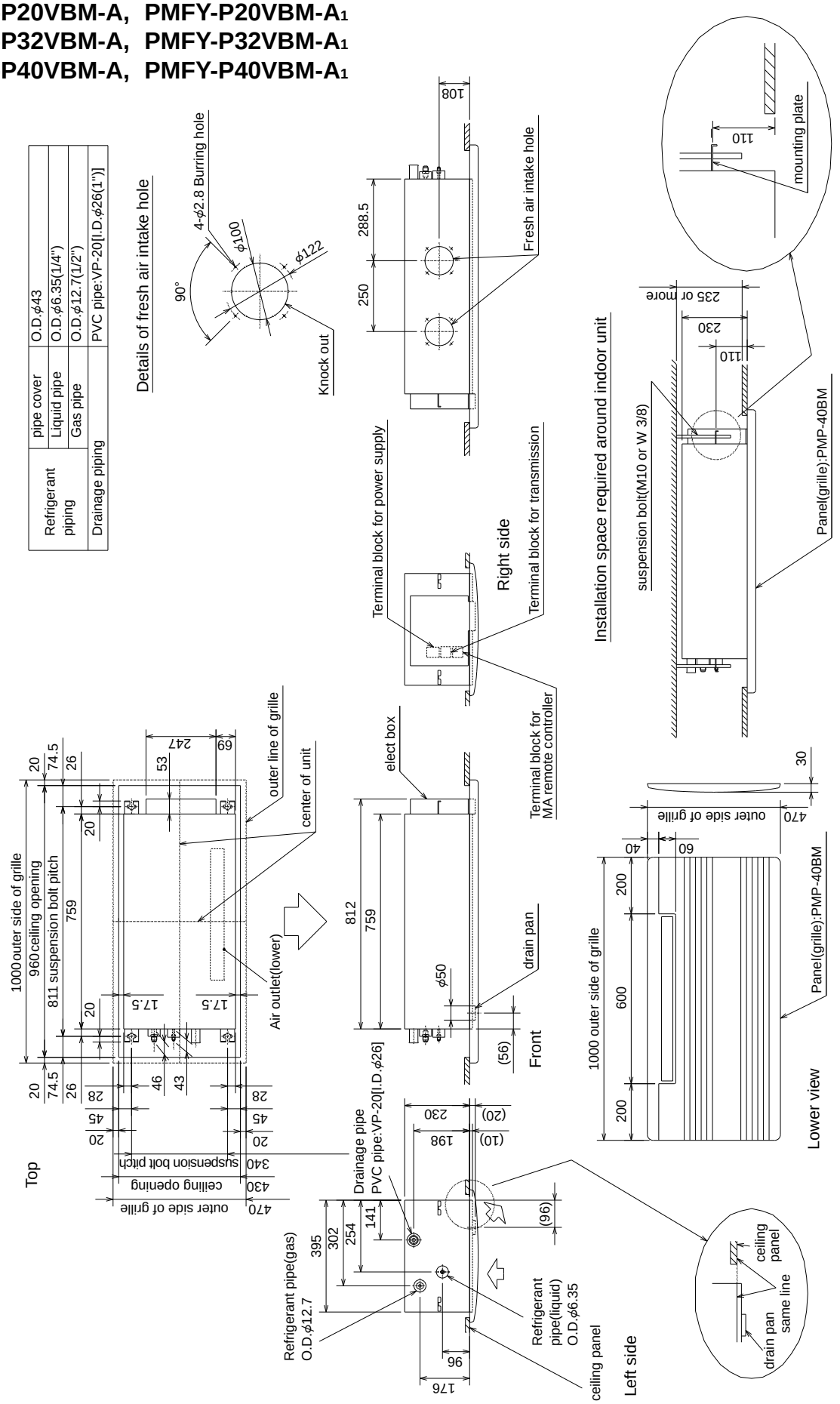
Ambient temperature 27℃

Test conditions are based on JIS Z8731

5 OUTLINES AND DIMENSIONS

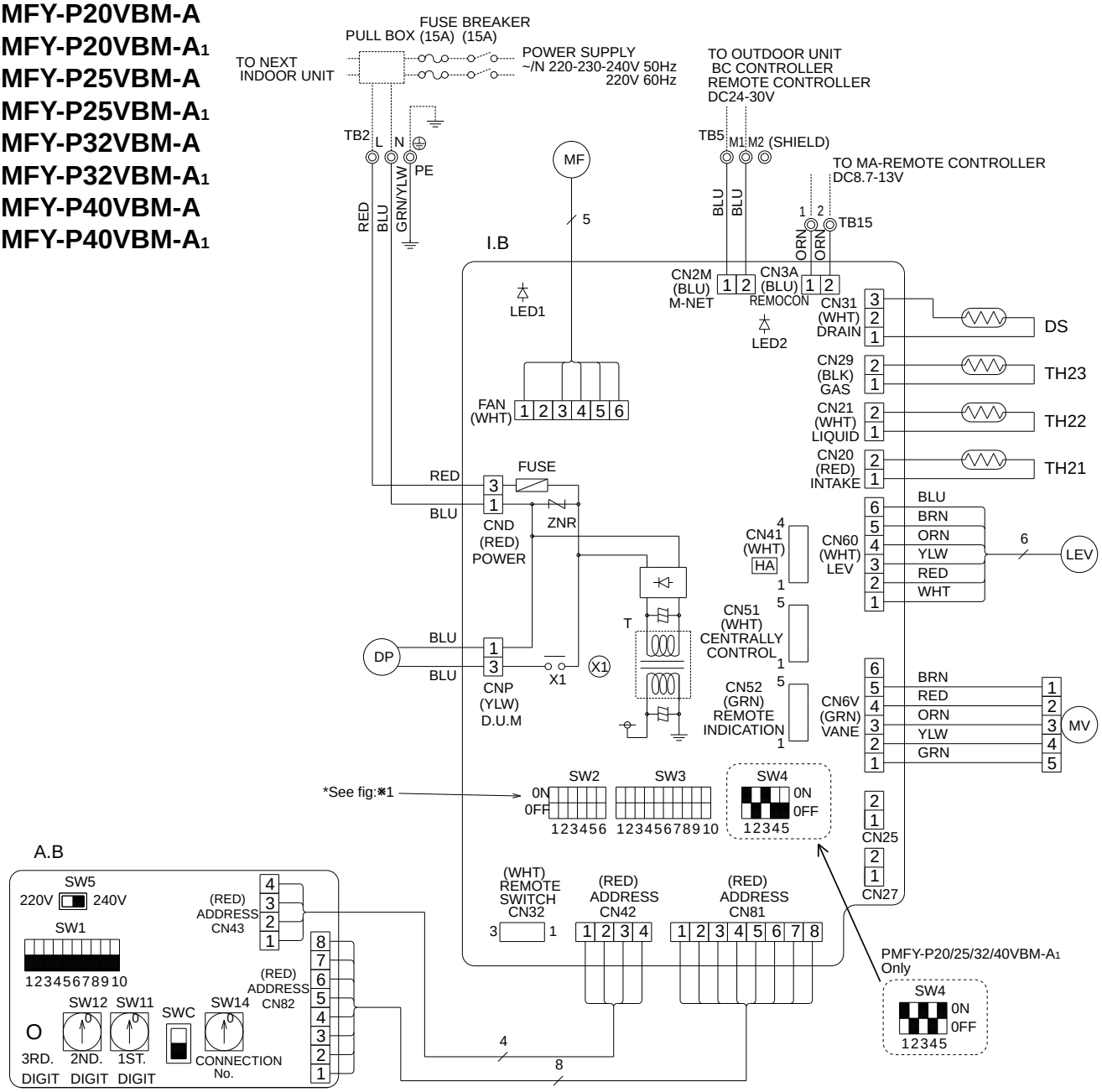
PMFY-P20VBM-A, PMFY-P20VBM-A1
PMFY-P20VBM-A, PMFY-P20VBM-A1
PMFY-P32VBM-A, PMFY-P32VBM-A1
PMFY-P40VBM-A, PMFY-P40VBM-A1

Unit : mm



6 WIRING DIAGRAM

PMFY-P20VBM-A
PMFY-P20VBM-A1
PMFY-P25VBM-A
PMFY-P25VBM-A1
PMFY-P32VBM-A
PMFY-P32VBM-A1
PMFY-P40VBM-A
PMFY-P40VBM-A1



[LEGEND]

SYMBOL	NAME		SYMBOL	NAME	
I.B	INDOOR CONTROLLER BOARD		MF	FAN MOTOR	
CN25	CONNECTOR	HUMIDIFIER	MV	VANE MOTOR	
CN27		DAMPER	DP	DRAIN WATER LIFTING-UP MACH.	
CN32		REMOTE SWITCH	DS	DRAIN SENSOR	
CN41		HA TERMINAL-A	TB2	TERMINAL BLOCK	POWER SUPPLY
CN51		CENTRALLY CONTROL	TB5		TRANSMISSION
CN52		REMOTE INDICATION	TB15		MA-REMOTE CONTROLLER
SW2	SWITCH	CAPACITY CODE	TH21	THERMISTOR	ROOM TEMPERATURE DETECTION (0℃/15kΩ, 25℃/5.4kΩ)
SW3		MODE SELECTION	TH22		PIPE TEMPERATURE DETECTION/LIQUID (0℃/15kΩ, 25℃/5.4kΩ)
SW4		MODEL SELECTION	TH23		PIPE TEMPERATURE DETECTION/GAS (0℃/15kΩ, 25℃/5.4kΩ)
ZNR	VARISTOR		LEV	LINEAR EXPANSION VALVE	
FUSE	FUSE(6.3A/250V)				
X1	AUX.RELAY	DRAIN PUMP			
T	TRANSFORMER				
LED1	POWER SUPPLY(I.B)				
LED2	POWER SUPPLY(I.B)				
A.B	CIRCUIT BOARD				
SW1	SWITCH	MODE SELECTION			
SW5		VOLTAGE SELECTION			
SW11		ADDRESS SETTING 1ST DIGIT			
SW12		ADDRESS SETTING 2ND DIGIT			
SW14		CONNECTION NO.			

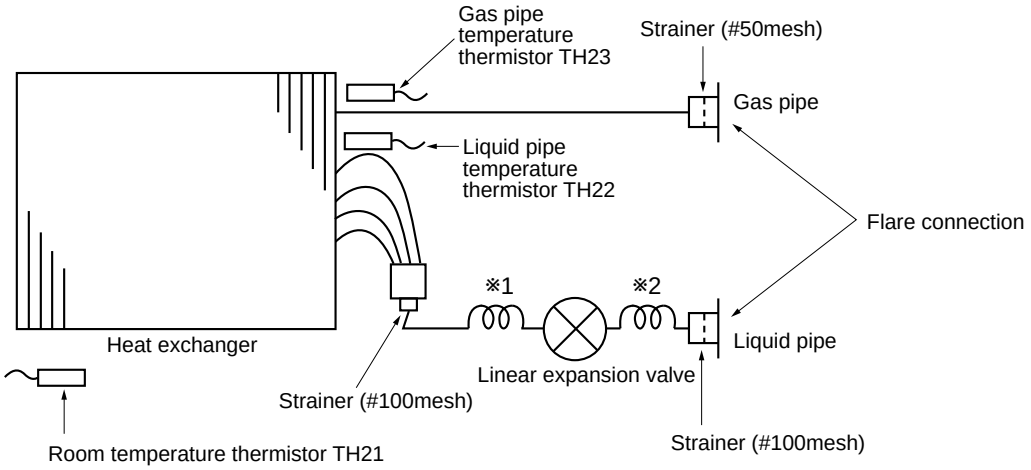
<※1>

MODELS	SW2	SW3
P20VBM	0N 0FF 123456	0N 0FF 12345678910
P25VBM	0N 0FF 123456	0N 0FF 12345678910
P32VBM	0N 0FF 123456	0N 0FF 12345678910
P40VBM	0N 0FF 123456	0N 0FF 12345678910

NOTES:
1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. Symbol [S] of TB5 is the shield wire connection.
3. Symbols used in wiring diagram above are, ◎:terminal block, □□□:connector.
4. The setting of the SW2 dip switches differs in the capacity for the detail, see the table <※1>.
5. Please set the switch SW5 according to the power supply voltage. Set SW5 to 240V side when the power supply is 230 and 240 volts. When the power supply is 220 volts, set SW5 to 220V side.

7 REFRIGERANT SYSTEM DIAGRAM

PMFY-P20VBM-A PMFY-P25VBM-A PMFY-P32VBM-A PMFY-P40VBM-A
PMFY-P20VBM-A$_1$ PMFY-P25VBM-A$_1$ PMFY-P32VBM-A$_1$ PMFY-P40VBM-A$_1$

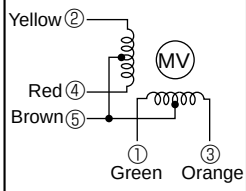
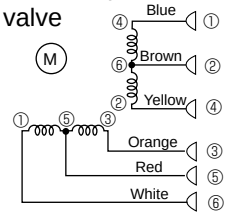
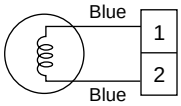
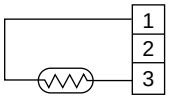


Service Ref. / Item	PMFY-P20, P25, P32, P40VBM-A PMFY-P20, P25, P32, P40VBM-A$_1$
Gas pipe	ϕ12.7(1/2")
Liquid pipe	ϕ6.35(1/4")

	PMFY-P20, P25VBM-A PMFY-P20, P25VBM-A$_1$	PMFY-P32, P25VBM-A PMFY-P40, P25VBM-A$_1$
Capillary tube ※1	O.D.ϕ4.6 × I.D.ϕ3.4 × ℓ 200	O.D.ϕ3.6 × I.D.ϕ2.4 × ℓ 200
Capillary tube ※2	O.D.ϕ3.6 × I.D.ϕ2.4 × ℓ 80	

8 TROUBLE SHOOTING

8-1. How to check the parts PMFY-P20/25/32/40VBM-A PMFY-P20/25/32/40VBM-A1

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)</td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 10℃~30℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to the next page for a detail.)</td></tr>
<tr><td>Vane motor
 
</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃~30℃)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Brown — Yellow</td><td rowspan="4">380Ω ±7%</td><td rowspan="4">Open or short</td></tr><tr><td>Brown — Red</td></tr><tr><td>Brown — Orange</td></tr><tr><td>Brown — Green</td></tr></table></td></tr>
<tr><td>Linear expansion valve
 
</td><td>Disconnect the connector then measure the resistance valve using a tester.
Refer to the next page for a detail.
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>(1)-(5)
White-Red</td><td>(2)-(6)
Yellow-Blown</td><td>(3)-(5)
Orange-Red</td><td>(4)-(6)
Blue-Brown</td><td rowspan="2">Open or short</td></tr><tr><td colspan="4">150kΩ ±10%</td></tr></table>(Refer to the next page for a detail.)</td></tr>
<tr><td>Drain-up mechanism
 
</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 20℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>400Ω~480Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Drain sensor
 
</td><td>Measure the resistance after 3 minutes have passed since the power supply was intercepted.
(Surrounding temperature 0℃~60℃)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>0.6kΩ~6.0kΩ</td><td>Open or short</td></tr></table>(Refer to the next page for a detail.)</td></tr>
</table>

<Thermistor Characteristic graph>

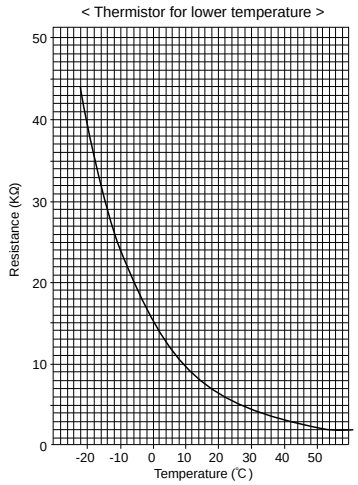
Thermistor for lower temperature

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

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

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

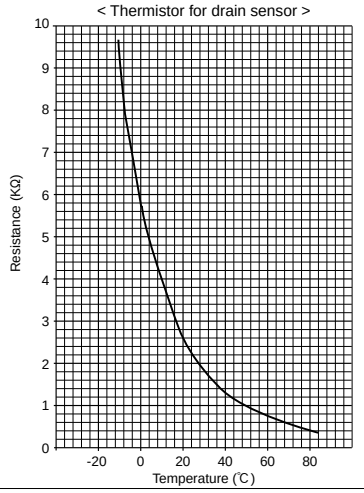
0℃ : 15kΩ
10℃ : 9.6kΩ
20℃ : 6.3kΩ
25℃ : 5.2kΩ
30℃ : 4.3kΩ
40℃ : 3.0kΩ



Thermistor R_0=6.0kΩ ± 3%
Fixed number of B=3390kΩ ± 2%

$$Rt=6\exp\{3390(\frac{1}{273+t}-\frac{1}{273})\}$$

0℃ : 6 kΩ
10℃ : 3.9kΩ
20℃ : 2.6kΩ
25℃ : 2.2kΩ
30℃ : 1.8kΩ
40℃ : 1.3kΩ

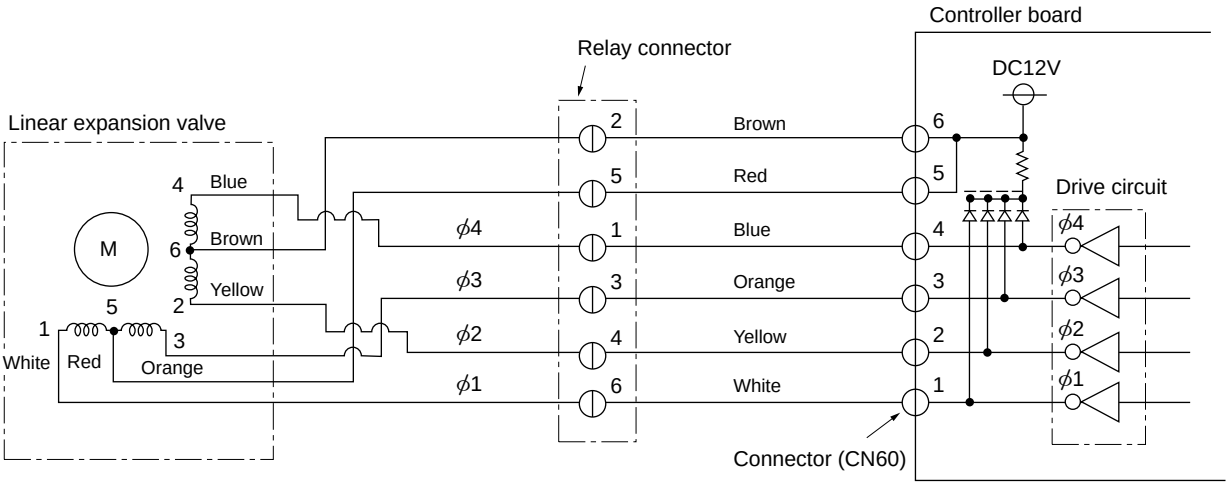


Linear expansion valve

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 expansion valve>



Note : Since the number of the connector at the controller board side and the relay connector are different, follow the color of the lead wire.

<Output pulse signal and the valve operation>

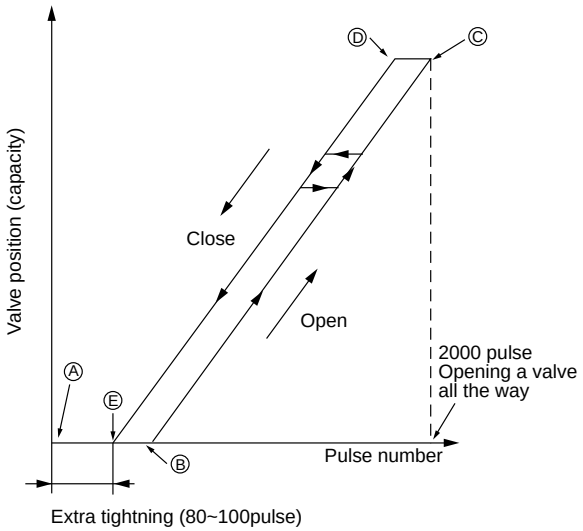
Output (Phase)	Output			
	1	2	3	4
ϕ1	ON	OFF	OFF	ON
ϕ2	ON	ON	OFF	OFF
ϕ3	OFF	ON	ON	OFF
ϕ4	OFF	OFF	ON	ON

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

The output pulse shifts in above order.

❋ 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

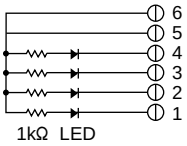
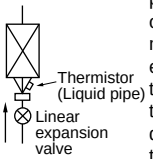


❋ When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

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.

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 150Ω ± 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 thermistor 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.

8-2. TROUBLE SHOOTING

Check method of indoor fan motor (fan motor / control p.c.board)

① Notes

· High voltage is applied to the connecter (FAN) for the fan motor. Give attention to the service.

· Do not pull out the connector (Fan) for the motor with the power supply on.
(It causes trouble of the control p.c.board)

② Self check

Conditions : The indoor fan cannot turn around.

Wiring contact check
Contact of fan motor connector (FAN)
Contact of power supply cable.

↓

Was contact caused good? → N0 → Wiring recovery

↓Yes

Fan motor check
Measure the resistance between the fan motor connecter ①(+) and ③(–).
(With the connecter is pulled out from the p.c.board)

↓

Is the resistance 1MΩ or more? → N0 → Trouble of the fan motor Replacement of the motor

↓Yes

Power supply check
Check the voltage in the indoor control p.c.board
Approx. 310~340V between the connecter (FAN) ①(+) and ③(–).
Approx. 1~3V between the connecter (FAN) ⑤(+) and ③(–).
(The voltage between the ⑤ and ③ is a value during the fan motor operation.
In the case that the fan motor off, the voltage is 0V.)

↓

Is the voltage normal? → N0→ Trouble of the indoor p.c.board
Replacement of the indoor control p.c.board

↓Yes

Fan motor position sensor signal check
Turn around the fan motor more than one revolution slowly, and check the voltage between the connecter (FAN) ⑥(+) and ③(–).

↓

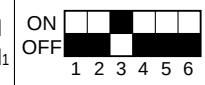
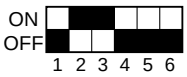
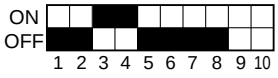
Dose the voltage repeat DC0V and DC15V? → N0 → Trouble of the fan motor
Replacement of the motor

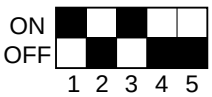
↓Yes

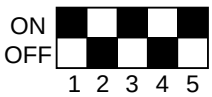
Replacement of the indoor control p.c.board

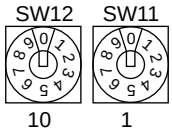
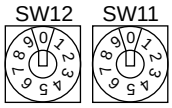
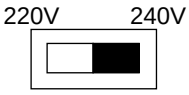
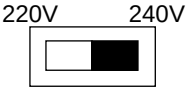
8-3. FUNCTION OF DIP SWITCH

<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>Bult-in remote controller</td><td>Indoor unit</td><td rowspan="10">Address board
<At delivery>
 

(※1) Fan operation at Heating mode.
(※2) Heater thermo ON is operating.
(※3) SW 1-7=OFF, SW 1-8=ON → Setting air flow.
SW 1-7=OFF, SW 1-8=ON → Indoor fan stop.</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 cleaning sign</td><td>2,500hr</td><td>100hr</td></tr>
<tr><td>4</td><td>Fresh 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 in ON ※1</td><td>Operated depends on the condition ※2</td></tr>
<tr><td>7</td><td rowspan="2">Air flow at</td><td>Low ※3</td><td>Extra low ※3</td></tr>
<tr><td>8</td><td>Setting air flow</td><td>Depends on SW1-7</td></tr>
<tr><td>9</td><td>Auto restart function</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>10</td><td>Power source 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>SW 2</th><th>MODELS</th><th>SW 2</th></tr><tr><td>PMFY-P20VBM
PMFY-P20VBM1</td><td> 
</td><td>PMFY-P32VBM
PMFY-P32VBM1</td><td> 
</td></tr><tr><td>PMFY-P25VBM
PMFY-P25VBM1</td><td> 
</td><td>PMFY-P40VBM
PMFY-P40VBM1</td><td> 
</td></tr></table></td><td>Indoor controller board
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 / Cool only</td><td>Cooling only</td><td>Heat pump</td><td rowspan="10">Indoor controller board
Set while the unit is off.
<At delivery>
 

(※4) At cooling mode, each angle can be used only 1 hour.
(※5) SW 3-9 setting
PMFY-P20, P25VBM(1)=ON
PMFY-P32, P40VBM(1)=OFF
SW 3-10 setting
PMFY-P20, P25VBM(1)=ON
PMFY-P32, P40VBM(1)=OFF
(※6) The numerical valve in the parentheses shows the case which the R22 outdoor unit is connected.</td></tr>
<tr><td>2</td><td>Louver</td><td>Available</td><td>Not available</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>Vane horizontal angle</td><td>Second setting</td><td>First setting</td></tr>
<tr><td>6</td><td>Vane cooling limit angle setting ※4</td><td>Horizontal angle</td><td>Down B, C</td></tr>
<tr><td>7</td><td>Indoor linear expansion valve opening change</td><td>Effective</td><td>Not effective</td></tr>
<tr><td>8</td><td>Heating 4deg. up</td><td>Not effective</td><td>Effective</td></tr>
<tr><td>9</td><td>Target superheat setting ※5</td><td>9deg. (5deg.) ※6</td><td>6deg. (2deg.) ※6</td></tr>
<tr><td>10</td><td>Target sub cool setting ※5</td><td>15deg.</td><td>10deg.</td></tr>
<tr><td>SW4
Unit
Selection</td><td>1~5</td><td colspan="3">PMFY-P20/25/32/40VBM
 

PMFY-P20/25/32/40VBM1
 
</td><td>Indoor controller board
Set while the unit is off.
PMFY-P20/25/32/40VBM PMFY-P20/25/32/40VBM1
 
</td></tr>
</table>

Switch	Pole	Operation by switch	Remarks
SW11 1st digit address setting SW12 2nd digit address setting	Rotary switch	 Address setting should be done when M-NET remote controller is being used.	Address board Address can be set while the unit is stopped. <At delivery> 
SW14 Connection No. setting	Rotary switch	 This is the switch to be used when the indoor unit is operated with R2 series outdoor unit as a set.	Address board <At delivery> 
SW5 Voltage Selection	2	 If the unit is used at the 230V or 240V area, set the voltage to 240V. If the unit is used at the 220V, set the voltage to 220V.	Address board <At delivery> 

9 DISASSEMBLY PROCEDURE

Be careful on removing heavy parts.

PMFY-P32VBM-A$_1$

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS

1. Removing the intake grille

Opening the air intake grille

(1) Press the PUSH of the air intake grille.(See figure 1)
(2) Put your figure on the both end of nut of the air intake grille and put it down after the grille clicked.

Removing the air intake grille

(1) Press the PUSH of air intake grille, and pull down the both end of nut with your fingers after the grille clicked. (See figure 1)
(2) Pull out the handle of air intake grille strong toward you. (See figure 2)
(3) Draw the string of air intake grille to prevent the grille from dropping.(see figure 3)

Photo 1

Figure 1

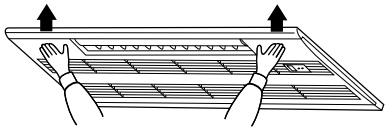


Figure 2

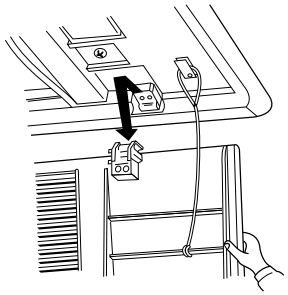
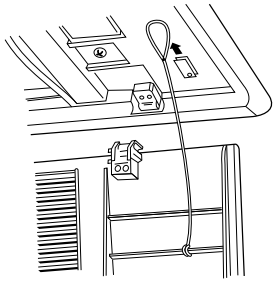
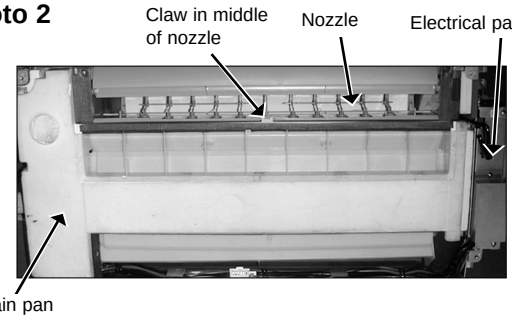
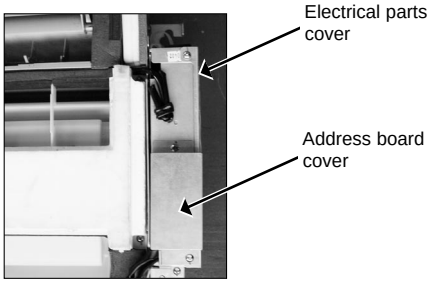
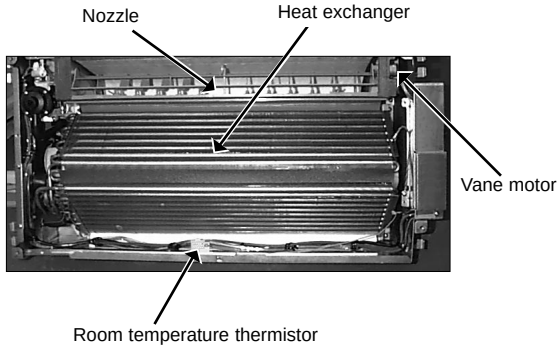
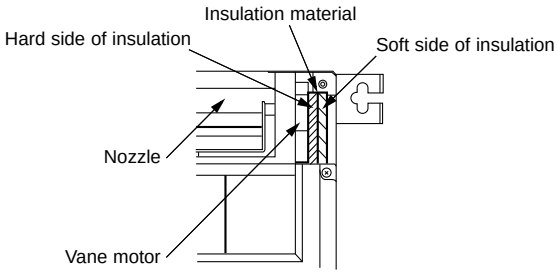
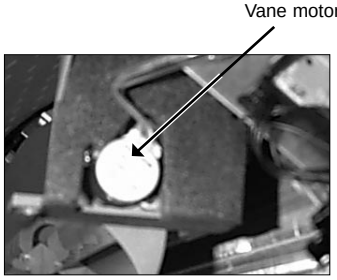
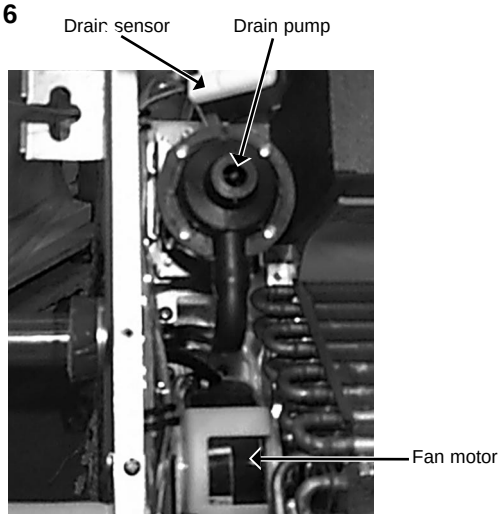
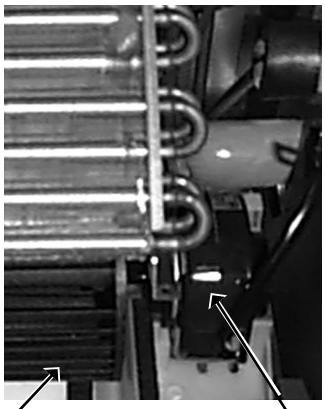


Figure 3

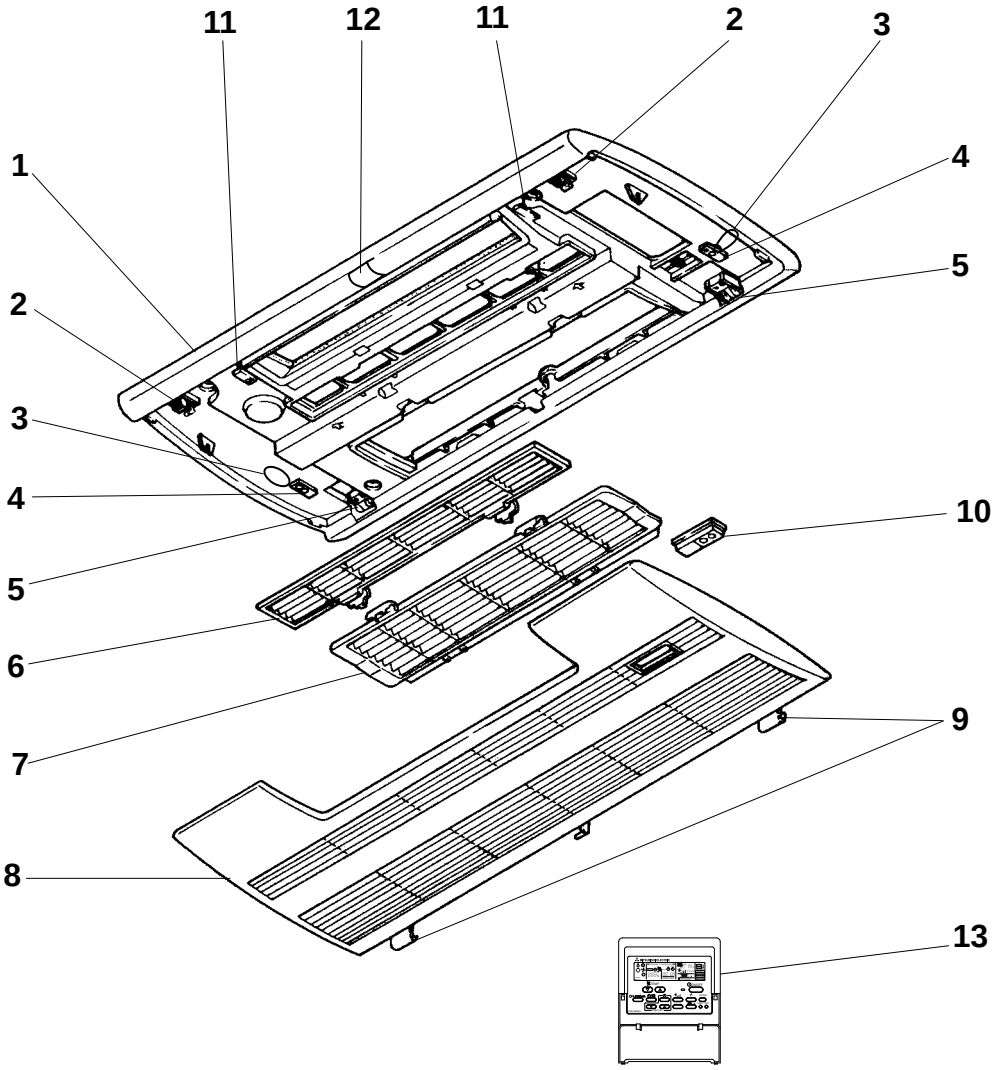


OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
2. Removing the electrical parts box (1) Remove the panel. (2) Remove the address board cover. (3) Remove the electrical parts cover. (4) Disconnect the connectors of fan motor, vane motor, drain pump, room temperature thermistor, pipe temperature thermistor, condenser/evaporator temperature thermistor, and drain sensor on the electrical controller board. (5) Disconnect the lead wire and earth wire from terminal block. (6)Remove the electrical parts box.	**Photo 2**  **Photo 3** 
3. Removing the nozzle **Note when the nozzle is removed** **·The insulation material (white) which prevents water drop is mounted to the side of vane motor, remove the insulation material before removing nozzle. (See figure 4)** **·After completing the service, re-mount the insulation material as before as shown in right figure.** **·After service, mount the double layer insulation without fail. The hard material side should be faced to the nozzle. (See figure 4)** (1) Remove the panel. (2) Remove the room temperature thermistor. (3) Unhook the claw in the middle of nozzle and remove the drain pan. (5 screws) (See photo 2) (4) Remove the nozzle side of the heat exchanger.(2 screws) (5) Remove the address board cover. (6) Remove the electrical parts cover. (7) Disconnect the connector of vane motor. (8) Remove the insulation material (white) on the right side of nozzle. (9)Remove the nozzle. (6 screws)	**Photo 4**  **Figure 4** 
4. Removing the vane motor (1) Remove the nozzle. Refer to above-mentioned (3) Removing the nozzle. (2) Remove the vane motor.	**Photo 5** 

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
5. Removing the drain pump (1) Remove the panel. (2) Unhook the claw in the middle of nozzle and remove the drain pan. (3) Remove the address board cover. (4) Remove the electrical parts cover. (5) Disconnect the connector of drain pump. (6) Remove the drain hose. (7) Remove the drain pump.(2 screws)	**Photo 6** 
6. Removing the fan motor and line flow fan (1) Remove the panel. (2) Unhook the claw in the middle of nozzle and remove the drain pan. (3) Unscrew 2 screws at the nozzle side of the heat exchanger. (4) Remove the address board cover. (5) Remove the electrical parts cover. (6) Disconnect the connector of vane motor,fan motor and drain pump. (7) Remove the nozzle side of the heat exchanger.(2 screws) (8) Remove the nozzle. (9) Remove the drain pump. (10) Unscrew 2 screws in the motor support. (11) Remove the fan motor and line flow fan (The fan motor and line flow fan can be removed without removing the heat exchanger.)	**Photo 7** 
7. Removing the thermistor<Intake temperature detector> (1) Remove the panel. (2) Remove the address board cover. (3) Remove the electrical parts cover. (4) Remove the thermistor <intake temperature detector> (5) Disconnect the lead wire from the cord clamp (5 points) (6) Disconnect the connector (CN20) on the indoor controller board.	
8. Removing the thermistor<Liquid pipe temperature detector> <Gas pipe temperature detector> (1) Remove the panel. (2) Remove the address board cover. (3) Remove the electrical parts cover. (4) Remove the drain pan. (5) Remove the thermistor <Gas pipe temperature detector> /<Liquid pipe temperature detector>. (6) Disconnect the lead wire from the cord clamp (7) Disconnect the connector (CN21)/(CN29) on the indoor controller board.	

10 PARTS LIST

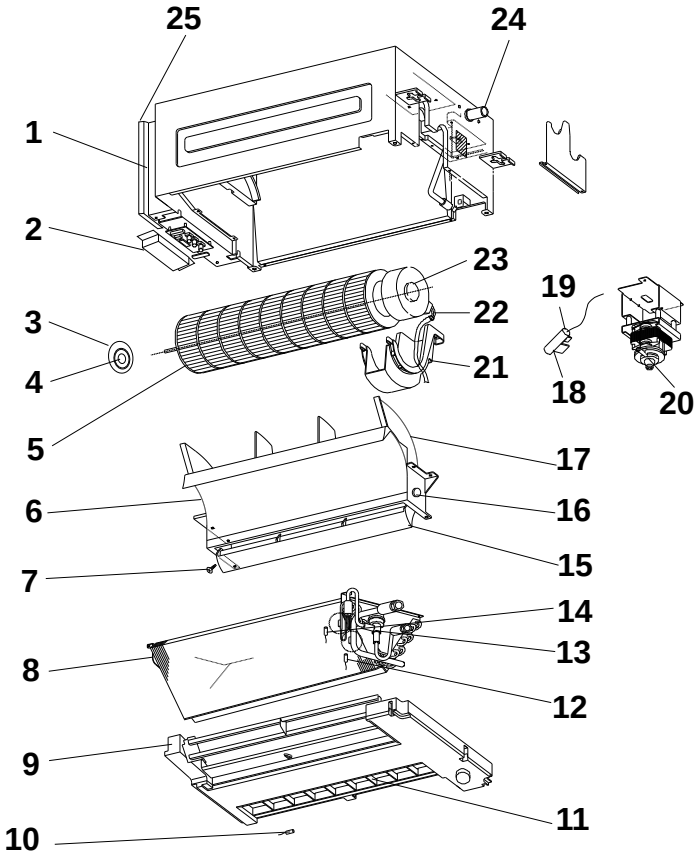
PANEL PARTS
PMFY-P20VBM-A
PMFY-P20VBM-A$_1$
PMFY-P25VBM-A
PMFY-P25VBM-A$_1$
PMFY-P32VBM-A
PMFY-P32VBM-A$_1$
PMFY-P40VBM-A
PMFY-P40VBM-A$_1$



No.	Part No.	Part Name	Specification	Q'ty/set PMFY-P20/P25 P32/P40 VBM-A VBM-A$_1$	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price Unit	Price Amount
1	T7W E11 003	AIR OUTLET GRILLE		1					
2	R01 E00 055	LATCH		2					
3	—	HANGER		2	(DT88D360H03)				
4	R01 E00 099	PANEL HOOK		2					
5	RO1 E01 054	GRILLE CATCH		2					
6	RO1 E01 500	L.L.FILTER		1					
7	R01 E02 500	L.L.FILTER		1					
8	TW7 E01 691	INTAKE GRILLE		1					
9	R01 E00 054	GRILLE CATCH		2					
10	R01 E00 648	RECEIVER COVER		1					
11	R01 E00 044	MAGNET		2					
12	R01 E00 096	SCREW CAP		1					
13	—	REMOTE CONTROLLER	PAR-20MAA	1		R.B			

FUNCTIONAL PARTS

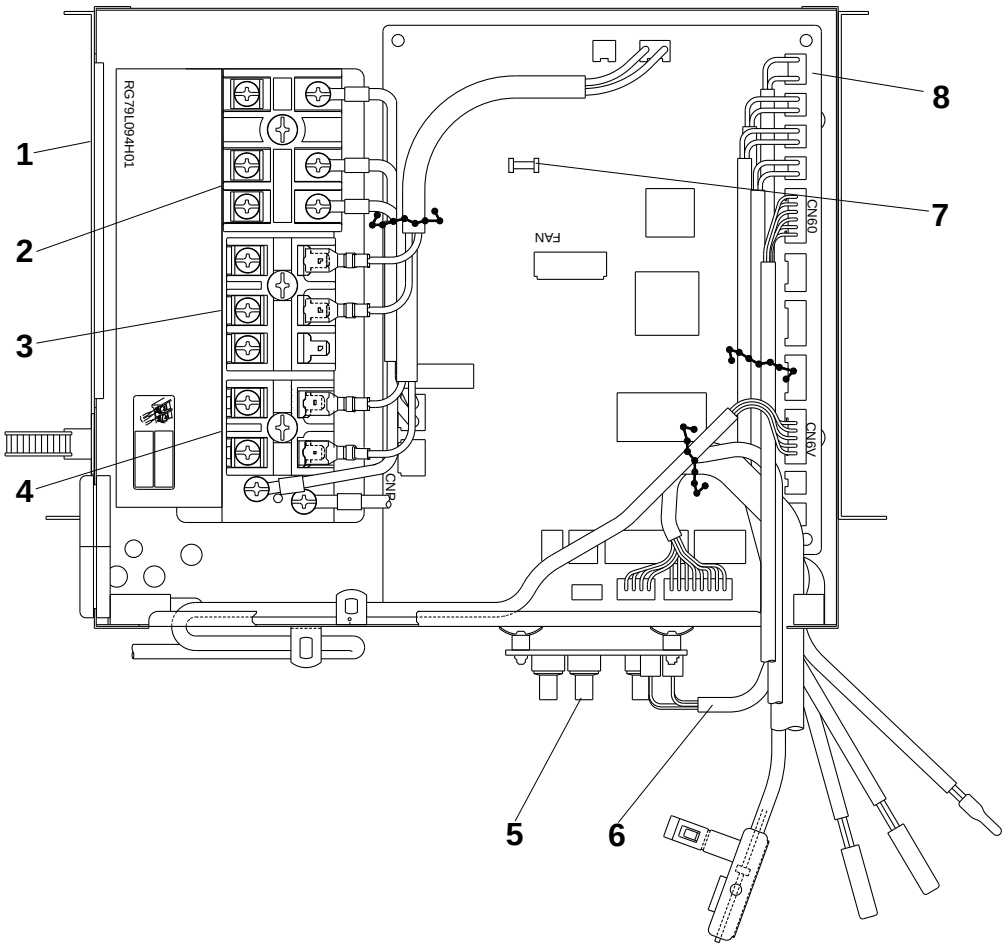
PMFY-P20VBM-A
PMFY-P20VBM-A1
PMFY-P25VBM-A
PMFY-P25VBM-A1
PMFY-P32VBM-A
PMFY-P32VBM-A1
PMFY-P40VBM-A
PMFY-P40VBM-A1



Part number that is circled is not shown in the figure.

No.	Part No.	Part Name	Specification	Q'ty/set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PMFY-P · VBM-A		PMFY-P · VBM-A1					Unit	Amount
				20/25	32/40	20/25	32/40					
1	—	CABINET		1	1	1	1	(DT00A478G64)				
2	—	ADDRESS BOARD COVER		1	1	1	1	(RG02L277H02)				
3	R01 22A 102	BEARING MOUNT		1	1	1	1					
4	R01 005 103	SLEEVE BEARING		1	1	1	1					
5	R01 E02 114	LINE FLOW FAN		1	1	1	1					
6	R01 E00 079	STABILIZER ASSY		1	1	1	1					
7	R01 E00 092	VANE SLEEVE		1	1	1	1					
8	T7W E39 480	HEAT EXCHANGER		1		1						
	T7W E40 480	HEAT EXCHANGER			1		1					
9	R01 E04 529	DRAIN PAN		1	1							
	R01 E10 529	DRAIN PAN				1	1					
10	R01 E00 202	THERMISTOR	ROOM	1	1	1	1		TH21			
11	R01 E00 038	GUIDE VANE		1	1	1	1					
12	R01 E01 202	THERMISTOR	LIQUID	1	1	1	1		TH22			
13	R01 E00 401	LINEAR EXPANSION VALVE		1	1	1	1		LEV			
14	R01 E03 202	THERMISTOR	GAS	1	1	1	1		TH23			
15	R01 E01 002	VANE		1	1	1	1					
16	R01 E01 223	VANE MOTOR		1	1	1	1		MV			
17	R01 E00 110	CASING		1	1	1	1					
18	R01 31K 241	SENSOR HOLDER		1	1	1	1					
19	R01 E01 266	DRAIN SENSOR		1	1	1	1		DS			
20	T7W E02 355	DRAIN PUMP		1	1	1	1		DP			
21	R01 E00 130	MOTOR SUPPORT		1	1	1	1					
22	R01 E03 220	FAN MOTOR		1	1	1	1		MF			
23	R01 E01 105	MOTOR MOUNT		1	1	1	1					
24	R01 E00 527	DRAIN PIPE		1	1	1	1					
25	—	CONTROL BOX COVER		1	1	1	1	(RG00L311G07)				
(26)	R01 E01 673	SCREW ASSY		1	1	1	1					

ELECTRICAL PARTS
PMFY-P20VBM-A
PMFY-P20VBM-A$_1$
PMFY-P25VBM-A
PMFY-P25VBM-A$_1$
PMFY-P32VBM-A
PMFY-P32VBM-A$_1$
PMFY-P40VBM-A
PMFY-P40VBM-A$_1$



No.	Part No.	Part Name	Specification	Q'ty/set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PMFY-P20/P25 P32/P40					Unit	Amount
				VBM-A	VBM-A$_1$					
1	—	CONTROL BOX		1	1	(RG02B337G10)				
2	T7W A14 716	TERMINAL BLOCK	3P (L,N,⏚)	1	1		TB2			
3	T7W E00 716	TERMINAL BLOCK	3P (M1,M2,S)	1	1		TB5			
4	T7W 515 716	TERMINAL BLOCK	2P(1,2)	1	1		TB15			
5	T7W B01 294	ADDRESS BOARD		1	1		A.B			
6	R01 E00 304	CABLE ASSY		1	1					
7	T7W 520 239	FUSE	250V 6.3A	1	1		FUSE			
8	T7W E11 310	INDOOR CONTROLLER BOARD	with POWER BOARD	1			I.B			
	T7W E16 310	INDOOR CONTROLLER BOARD	with POWER BOARD		1		I.B			

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