Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

March 2013

No. OC310
REVISED EDITION-B

TECHNICAL & SERVICE MANUAL

Series PKFY Wall Mounted R410A / R407C / R22

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

PKFY-P32VGM-E **PKFY-P32VGM-E**

PKFY-P40VGM-E **PKFY-P40VGM-E**

PKFY-P50VGM-E **PKFY-P50VGM-E**

Revision:
- The indicated No. of CORNER COVER (page 23) have been corrected in REVISED EDITION-B.
- Some descriptions have been modified.

- Please void OC310 REVISED EDITION-A.

Note:
- This manual describes only service data of the indoor units.
- RoHS compliant products have <G> mark on the spec name plate.
- For servicing of RoHS compliant products, refer to the RoHS Parts List.

Indoor unit

CONTENTS

1 SAFETY PRECAUTION

CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R407C

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 indoors, and both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Use ESTR , ETHER or HAB as the lubricant to coat flares and flange connection parts.

If large amount of mineral oil enter, that can cause deterioration of refrigerant oil etc.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

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.

Use the specified refrigerant only.

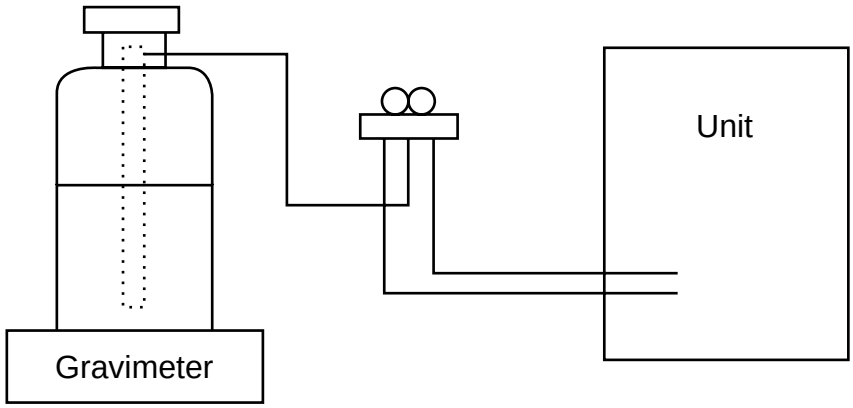
Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

[1] Cautions for 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 iquid refrigerant.

[2] 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 it.
(By liquid refrigerant)



(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] 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.	———

Cautions for units utilizing refrigerant R410A

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 indoors, and both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a small amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Do not use refrigerant other than R410A.

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enter into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

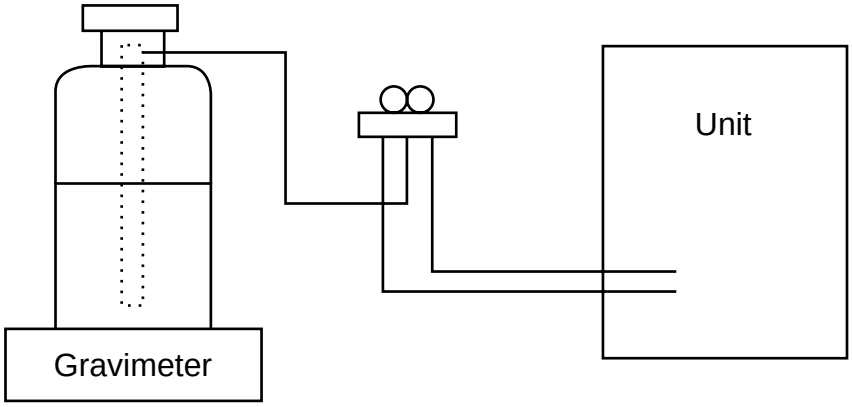
[1] Cautions for service

(1) Perform service after collecting the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

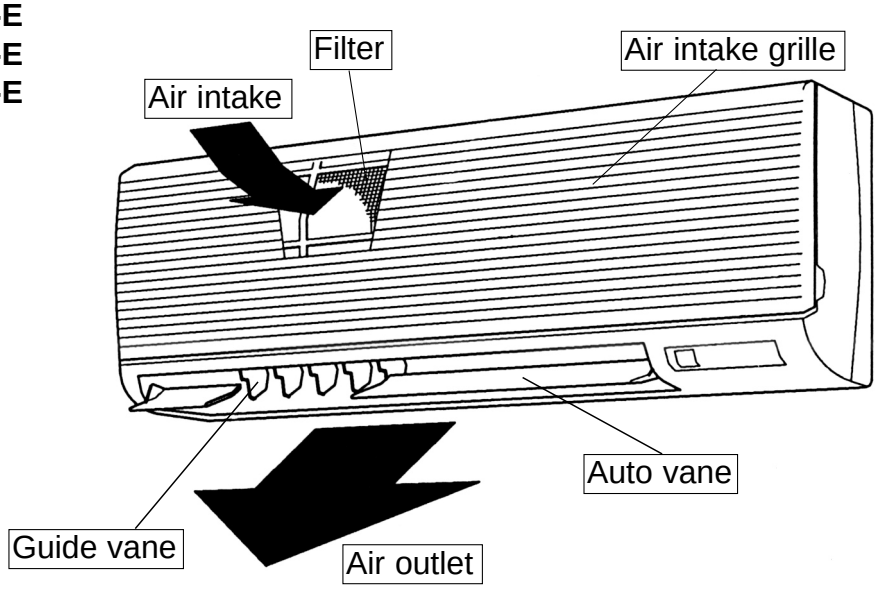
Use the below service tools as exclusive tools for R410A refrigerant.

No.		Specifications
①	Gauge manifold	·Only for R410A
		·Use the existing fitting specifications. (UNF1/2)
		·Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	·Only for R410A
		·Use pressure performance of 5.09MPa·G or over.
③	Electronic scale	——
④	Gas leak detector	·Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	·Attach on vacuum pump.
⑥	Refrigerant charge base	——
⑦	Refrigerant cylinder	·Only for R410A Top of cylinder (Pink) Cylinder with syphon
⑧	Refrigerant recovery equipment	——

2 PART NAMES AND FUNCTIONS

● Indoor Unit

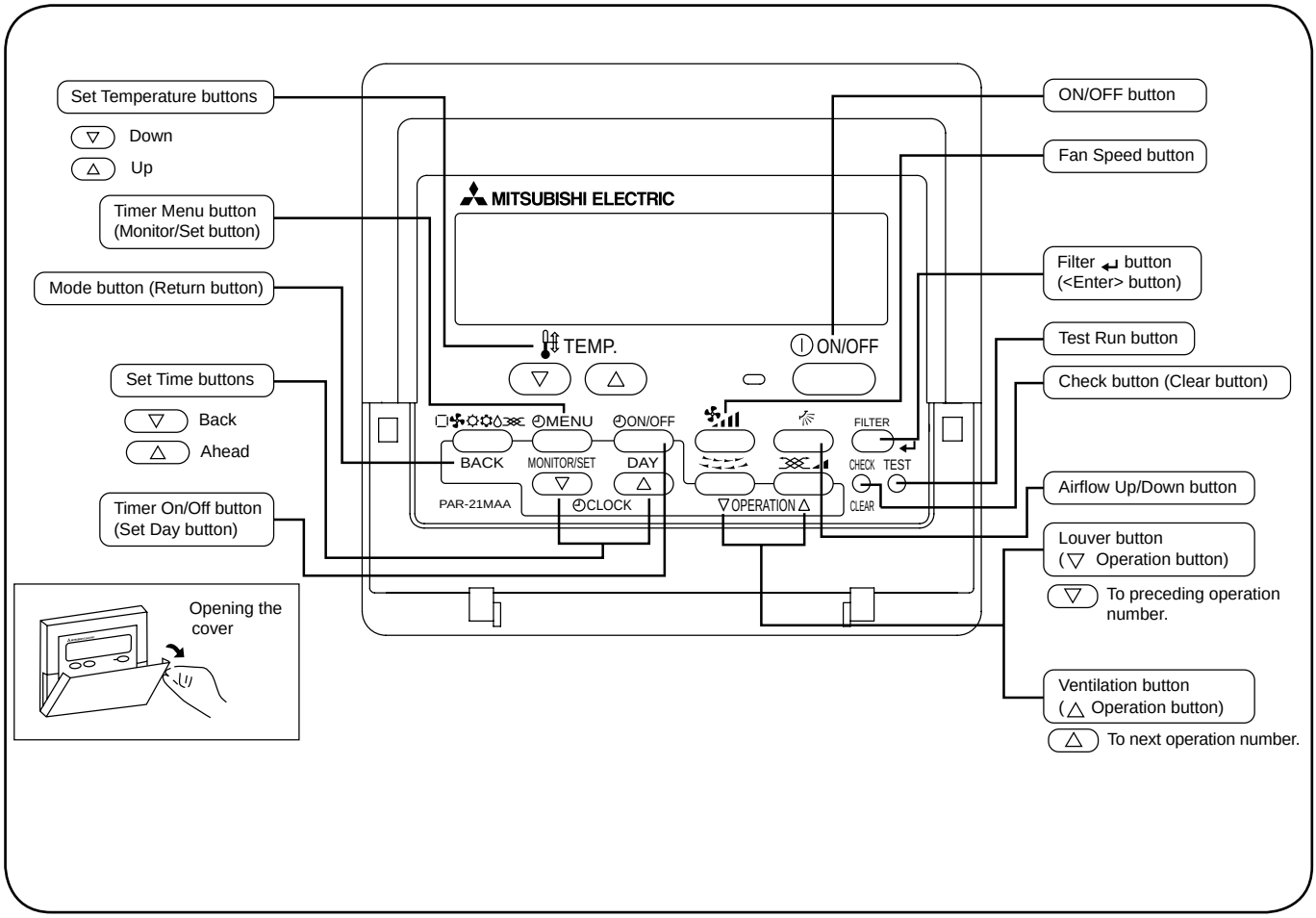
PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E



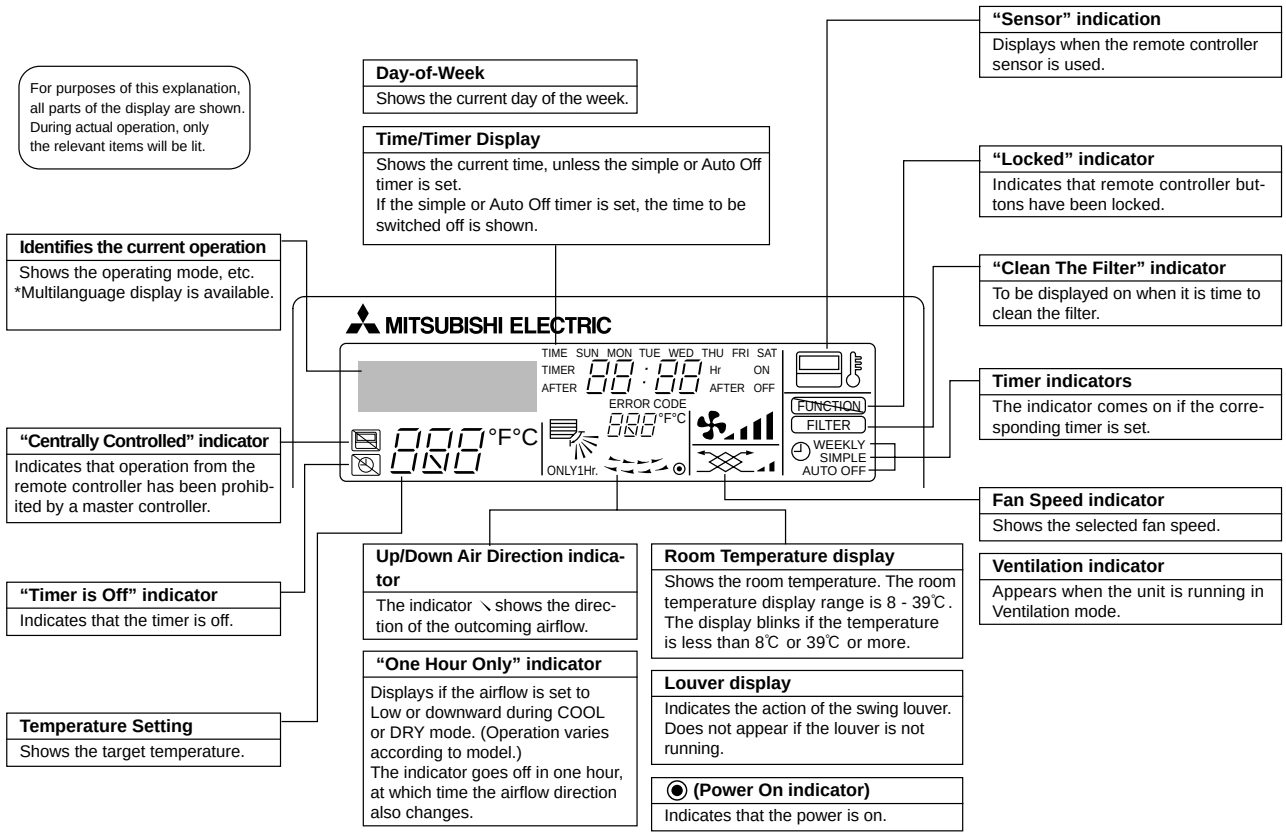
● Wired remote controller

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

● Operation buttons



● Display



Caution

- Only the Power on indicator lights when the unit is stopped and power supplied to the unit.
- If you press a button for a feature that is not installed at the indoor unit, the remote controller will display the "Not Available" message.
  If you are using the remote controller to drive multiple indoor units, this message will appear only if he feature is not present at the parent unit.
- When power is turned ON for the first time, it is normal that "PLEASE WAIT" is displayed on the room temperature indication (For max. 2minutes). Please wait until this "PLEASE WAIT" indication disappear then start the operation.

3 SPECIFICATIONS

3-1. SPECIFICATION

Item				PKFY-P32VGM-E	PKFY-P40VGM-E	PKFY-P50VGM-E
Power			V•Hz	Single phase 220V-230V-240V · 50Hz / 220V · 60Hz		
Cooling capacity			kW	3.6	4.5	5.6
Heating capacity			kW	4.0	5.0	6.3
Electric characteristic	Input	Cooling	kW	0.07		
		Heating	kW	0.07		
	Current	Cooling	A	0.32		
		Heating	A	0.32		
Exterior (munsell symbol)			—	Plastic , white : <0.70Y 8.59/0.97>		
Dimensions		Height	mm	340		
		Width	mm	990		
		Depth	mm	235		
Heat exchanger			—	Cross fin (Aluminum plate fin and copper tube)		
Fan	Fan 5 No		—	Linflow fan × 1		
	Air flow *2		m²/min	11.5-10.5-9.5-8		12-11-10-9
	External static pressure		Pa	0		
	Fan motor output		kW	0.03		
Insulator			—	Polyethylene sheet		
Air filter			—	PP honey comb		
Pipe dimensions		Gas side	ϕmm(in.)	12.7(1/2")		12.7(1/2") / 15.88(5/8")
		Liquid side	ϕmm(in.)	6.35(1/4")		6.35(1/4") / 9.52(3/8")
Unit drain pipe size			ϕmm	O.D.20 (PVC pipe VP-20 connectable)		
Noise level *2			dB	41-38-36-33		43-40-37-34
Product weight			kg	16		

Note 1. Rating conditions (JIS B 8615-1)
Cooling : Indoor D.B. 27°C W.B. 19°C
Outdoor D.B. 35°C
Heating : Indoor D.B. 20°C
Outdoor D.B. 7°C W.B. 6°C

*2. Air flow and the noise level are indicated as High – Medium1 – Medium2 – Low .

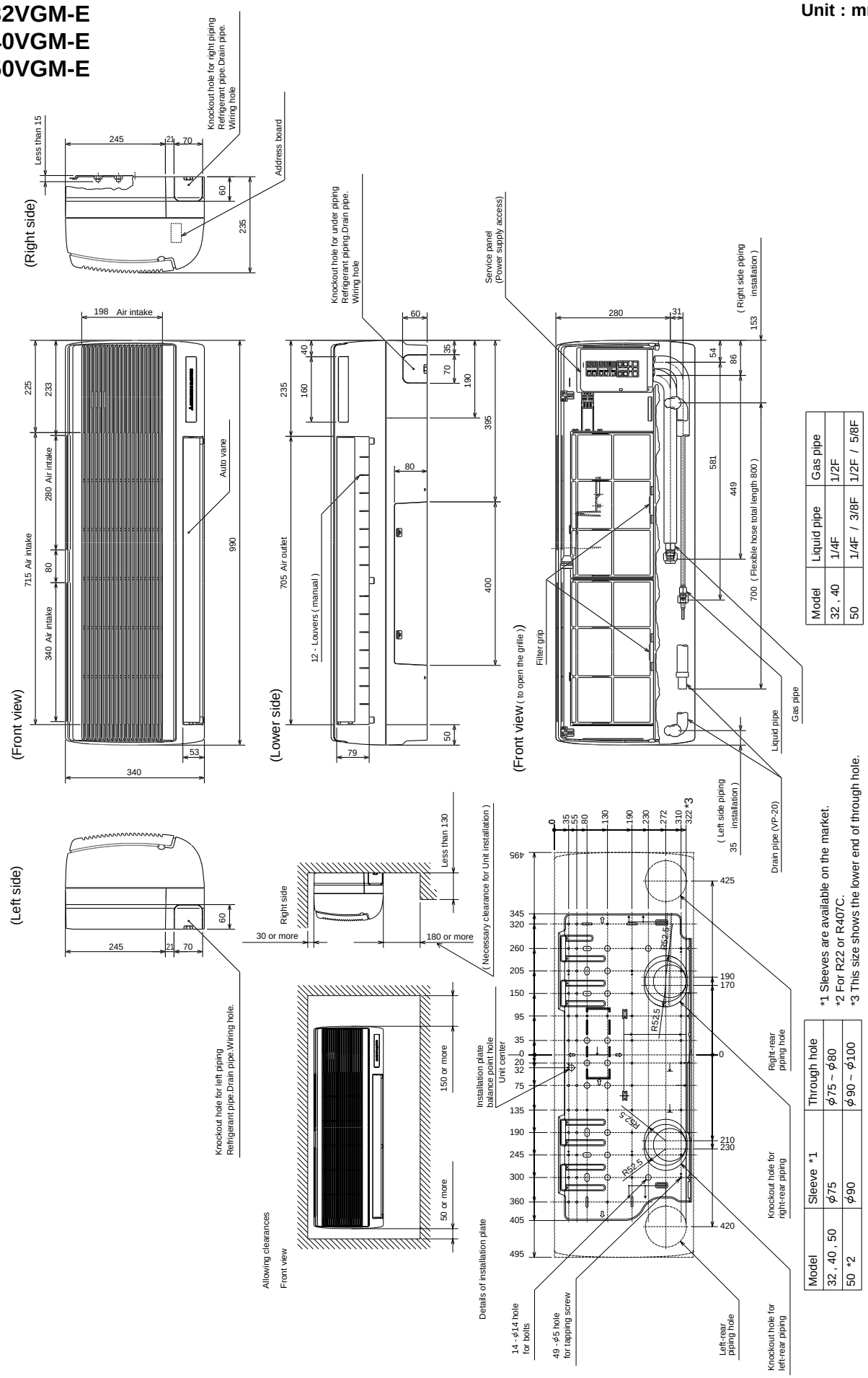
3-2. ELECTRICAL PARTS SPECIFICATIONS

Parts name \ Model	Symbol	PKFY-P32VGM-E	PKFY-P40VGM-E	PKFY-P50VGM-E
Room temperature thermistor	TH21	Resistance 0ºC/15kΩ, 10ºC/9.6kΩ, 20ºC/6.3kΩ, 25ºC/5.4kΩ, 30ºC/4.3kΩ, 40ºC/3.0kΩ		
Liquid pipe temperature thermistor	TH22	Resistance 0ºC/15kΩ, 10ºC/9.6kΩ, 20ºC/6.3kΩ, 25ºC/5.4kΩ, 30ºC/4.3kΩ, 40ºC/3.0kΩ		
Gas pipe temperature thermistor	TH23	Resistance 0ºC/15kΩ, 10ºC/9.6kΩ, 20ºC/6.3kΩ, 25ºC/5.4kΩ, 30ºC/4.3kΩ, 40ºC/3.0kΩ		
Fuse (Indoor controller board)	FUSE	250V 6.3A		
Fan motor (with inner-thermostat)	MF	PM4V30-K 220-240V/220V , 50/60Hz 4 pole Output 30W		
		Inner-thermostat: OFF 125±5ºC		
Fan motor capacitor	C1	2.0μF 440V		
Vane motor	MV	MP 35 EA DC12V		
Linear expansion valve	LEV	DC12V Stepping motor drive Port dimension ⌀3.2 (0 ~ 2000pulse)		
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 OUTLINES AND DIMENSIONS

PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E

Unit : mm



Model	Liquid pipe	Gas pipe
32 , 40	1/4F	1/2F
50	1/4F / 3/8F	1/2F / 5/8F

Model	Sleeve *1	Through hole
32 , 40 , 50	φ75	φ75 ~ φ80
50 *2	φ90	φ90 ~ φ100

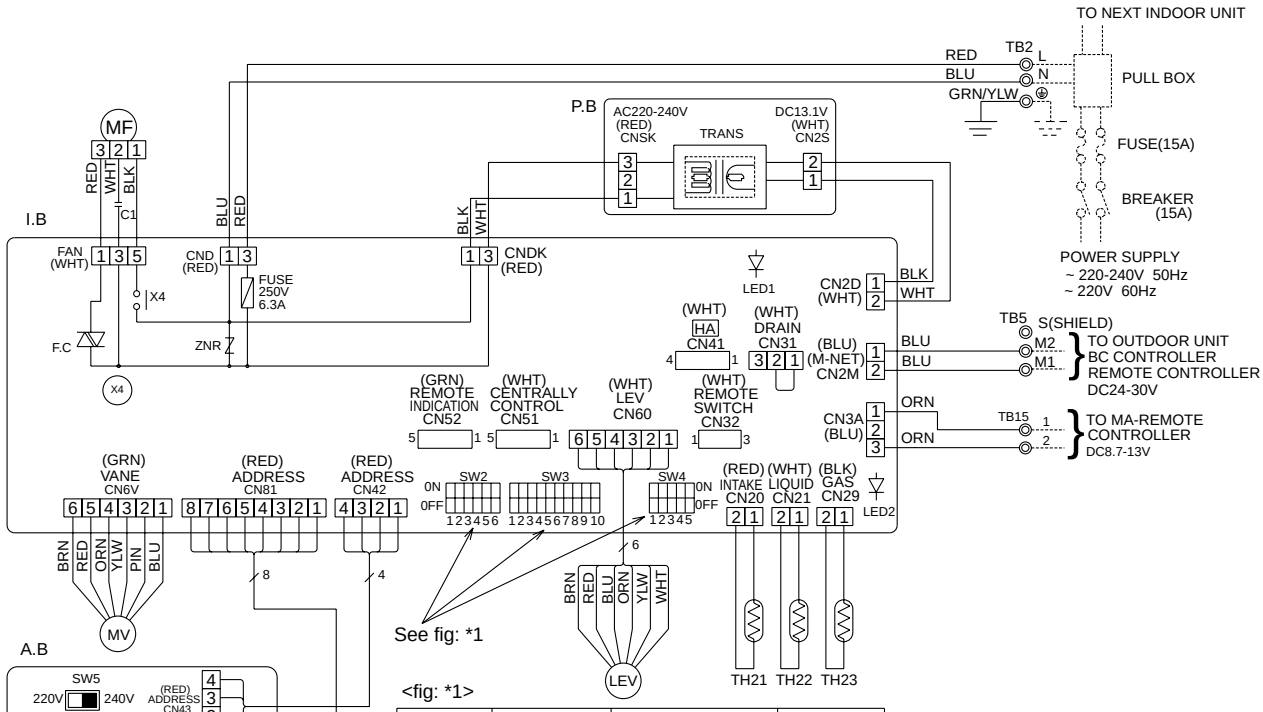
*1 Sleeves are available on the market.
*2 For R22 or R407C.
*3 This size shows the lower end of through hole.

5 WIRING DIAGRAM

PKFY-P32VGM-E PKFY-P40VGM-E PKFY-P50VGM-E

Legend

Symbol	Name		Symbol	Name		Symbol	Name	
I.B	Indoor controller board		C1	Capacitor (fan motor)		TH23	Thermistor	Pipe temperature detection/Gas (0ºC/15kΩ , 25ºC/5.4kΩ)
CN32	Connector	Remote switch	LEV	Linear expansion valve				
CN41		HA terminal-A	MF	Fan motor (with inner thermo)		A.B	Circuit board	
CN51		Centrally control	MV	Vane motor		SW1	Switch	Mode selection
CN52		Remote indication	P.B	Indoor power board		SW5		Voltage selection
F.C	Fan phase control		TB2	Terminal block	Power supply	SW11		Address setting 1st digit
FUSE	Fuse (6.3A)		TB5		Transmission	SW12		Address setting 2nd digit
SW2	Switch	Capacity code	TB15		MA-Remote Controller	SW14		Connection No.
SW3		Mode selection	TH21	Thermistor	Room temperature detection (0ºC/15kΩ , 25ºC/5.4kΩ)	SWC		Option selector
SW4		Model selection						
X4	Aux.Relay (Fan motor)		TH22		Pipe temperature detection/Liquid (0ºC/15kΩ , 25ºC/5.4kΩ)			
ZNR	Varistor							



<fig: *1>

Models	SW2	SW3	SW4
P32	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5
P40	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5
P50	ON OFF 1 2 3 4 5 6	ON OFF 1 2 3 4 5 6 7 8 9 10	ON OFF 1 2 3 4 5

The black square (■) indicates a switch position.

Note

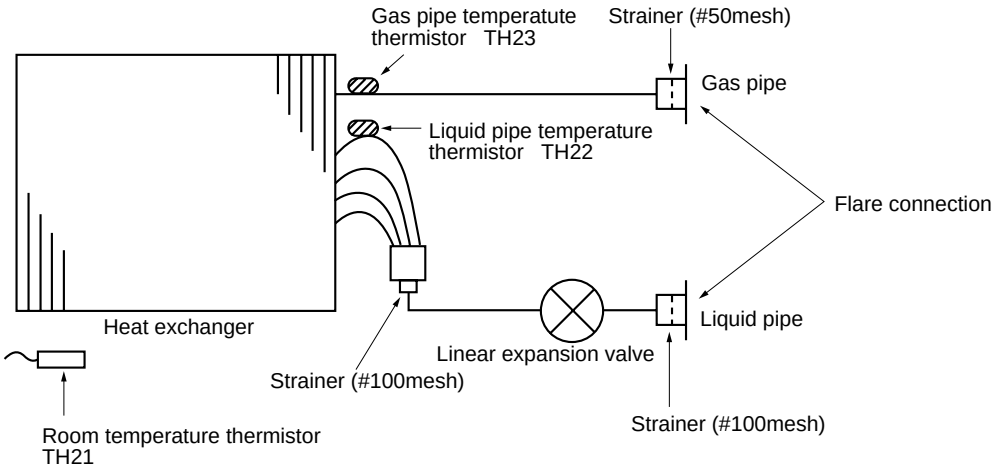
1.At servicing for outdoor unit,always follow the wiring diagram of outdoor unit.
2.In the case of using MA-Remote controller, please connect to TB15.
(Remote controller wire is non-polar.)
3.In the case of using M-NET, please connect to TB5.
(Transmisson line is non-polar.)
4.Symbol[S] of TB5 is the shield wire connection.
5.Symbols used in wiring diagram above are, ◎:terminal block, □□□:connecter.
6.The setting of the SW2 dip switches differs in the capacity for the detail,refer to the fig: *1.
7.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.

LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main power supply(Indoor unit:220-240V) power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

6 REFRIGERANT SYSTEM DIAGRAM

PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E



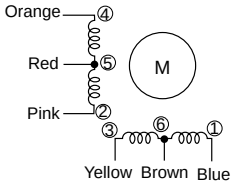
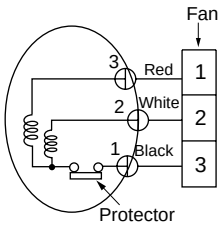
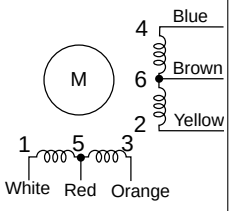
Item \ Capacity	PKFY-P32VGM-E PKFY-P40VGM-E	PKFY-P50VGM-E
Gas pipe	ϕ12.7 (1/2”)	ϕ12.7 (1/2”) or ϕ15.88(5/8”)
Liquid pipe	ϕ 6.35 (1/4”)	ϕ 6.35 (1/4”) or ϕ9.52(3/8”)

7 TROUBLE SHOOTING

7-1. HOW TO CHECK THE PARTS
PKFY-P32VGM-E PKFY-P40VGM-E PKFY-P50VGM-E

<table>
<tr><th>Parts name</th><th>Check method</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 with a tester.
(Surrounding temperature 10°C~30°C)
<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 the details.</td></tr>
<tr><td>Vane motor
 
</td><td>Measure the resistance between the terminals with a tester.
(Surrounding temperature 20°C~30°C)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Brown - Yellow</td><td rowspan="4">186Ω ~ 214Ω</td><td rowspan="4">Open or short</td></tr><tr><td>Brown - Blue</td></tr><tr><td>Red - Orange</td></tr><tr><td>Red - Pink</td></tr></table></td></tr>
<tr><td>Fan motor
 
</td><td>Measure the resistance between the terminals with a tester.
(Surrounding temperature 20°C)
<table><tr><th>Motor terminal or relay connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red - Black</td><td>141.2Ω</td><td rowspan="2">Open or short</td></tr><tr><td>White - Black</td><td>131.5Ω</td></tr></table></td></tr>
<tr><td>Linear expansion valve
 
</td><td>Disconnect the connector then measure the resistance with a tester.
(Surrounding temperature 20°C)
<table><tr><th colspan="4">Normal</th><th>Abnormal</th></tr><tr><td>(1)-(5)
White-Red</td><td>(2)-(6)
Yellow-Brown</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">150Ω ±10%</td></tr></table>Refer to the next page for the details.</td></tr>
</table>

<Thermistor Characteristic graph>

Thermistor for lower temperature

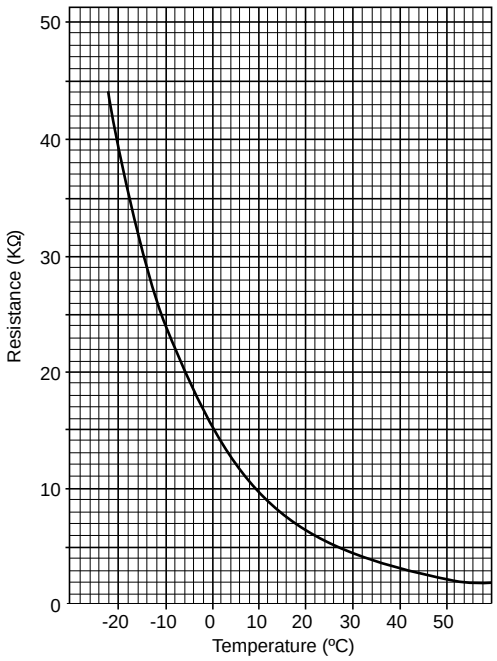
Room temperature thermistor(TH21)
Liquid pipe temperature thermistor (TH22)
Gas pipe temperature thermistor (TH23)

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

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

0ºC	15kΩ
10ºC	9.6kΩ
20ºC	6.3kΩ
25ºC	5.4kΩ
30ºC	4.3kΩ
40ºC	3.0kΩ

< Thermistor for lower temperature >

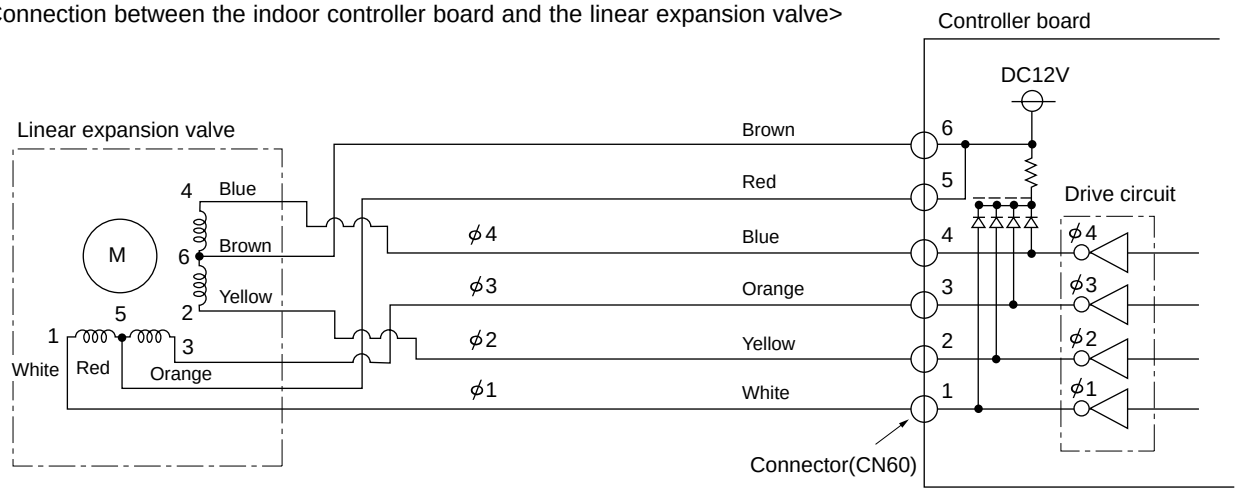


Linear expansion valve

①Operation 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>



<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

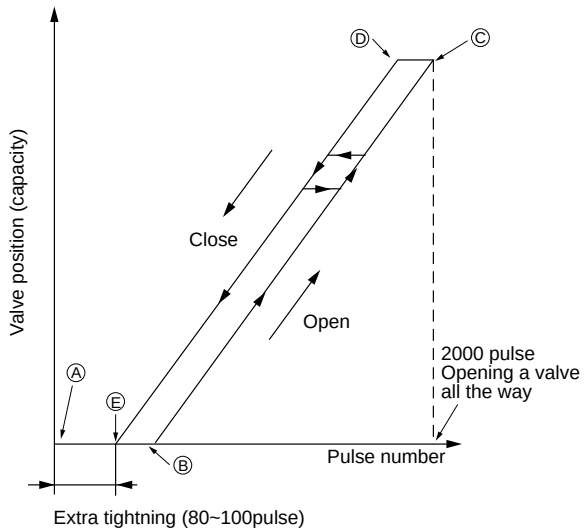
Closing a valve : 1 → 2 → 3 → 4 → 1
Opening a valve : 4 → 3 → 2 → 1 → 4

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 locks and vibrates.

②Linear expansion valve operation

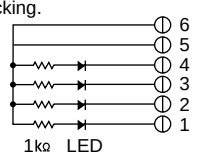
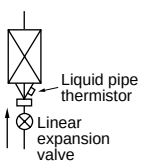


* When the switch is turned on, 2200 pulse closing valve signal will be send till it goes to Ⓐ point in order to define the valve position.

  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.

③Troubleshooting

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 turned 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 does not 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.

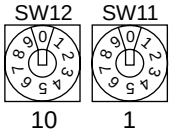
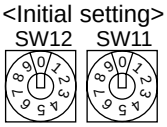
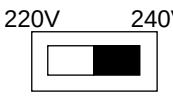
7-2. FUNCTION OF DIPSWITCH

PKFY-P32VGM-E PKFY-P40VGM-E PKFY-P50VGM-E

The black square (■) indicates a switch position.

Switch	Pole	Function	Operation by switch		Remarks
			ON	OFF	
SW1 Mode Selection	1	Thermistor<Intake temperature detection>position	Built-in remote controller	Indoor unit	Address board <Initial setting> ON OFF 1 2 3 4 5 6 7 8 9 10 NOTE: *1 At Heating mode, fan operating. *2 At Heating mode, operating heat thermostat ON. *3 SW1-7=OFF, SW1-8=ON →Setting air flow. SW1-7=ON, SW1-8=ON →Indoor fan stop.
	2	Filter clogging detection	Provided	Not provided	
	3	Filter cleaning sign	2500hr	100hr	
	4	Air intake	Effective	Not effective	
	5	Remote indication switching	Thermostat ON signal indication	Fan output indication	
	6	Humidifier control	Always operated while the heating mode *1	Operated depends on the condition *2	
	7	Air flow set in case of	Fix to LOW *3	Fix to EXTRA LOW *3	
	8	Heat thermostat OFF	Depends on setting Remote controller *3	Depends on SW1-7	
	9	Auto restart	Effective	Not effective	
	10	Power source ON/OFF	Effective	Not effective	
SW2 Capacity code setting	1~6	Capacity / SW2: P32 (ON OFF 1 2 3 4 5 6), P40 (ON OFF 1 2 3 4 5 6), P50 (ON OFF 1 2 3 4 5 6)			Indoor controller board Set while the unit is off. <Initial setting> Set for each capacity.
SW3 Function Selection	1	Heat pump/Cooling only	Cooling only models	Heat pump models	Indoor controller board Set while the unit is off. <Initial setting> ON OFF 1 2 3 4 5 6 7 8 9 10 NOTE: *4 At cooling mode, each angle can be used only 1 hour. *5 SW3-9 setting P32 = OFF P40 = ON P50 = OFF
	2	Louver	Available	Not available	
	3	Vane	Available	Not available	
	4	Vane swing function	Available	Not available	
	5	Vane horizontal angle	Second setting	First setting	
	6	Vane cooling limit angle setting *4	Horizontal angle	Down B,C	
	7	Indoor linear expansion valve opening	Effective	Not effective	
	8	Heater 4deg up	Not effective	Effective	
	9	Target Superheat setting *5	9 degrees	6 degrees	
	10	Target Sub cool setting	15 degrees	10 degrees	
SW4 Unit Selection	1~5	ON OFF 1 2 3 4 5			Indoor controller board Set while the unit is off. <Initial setting> ON OFF 1 2 3 4 5

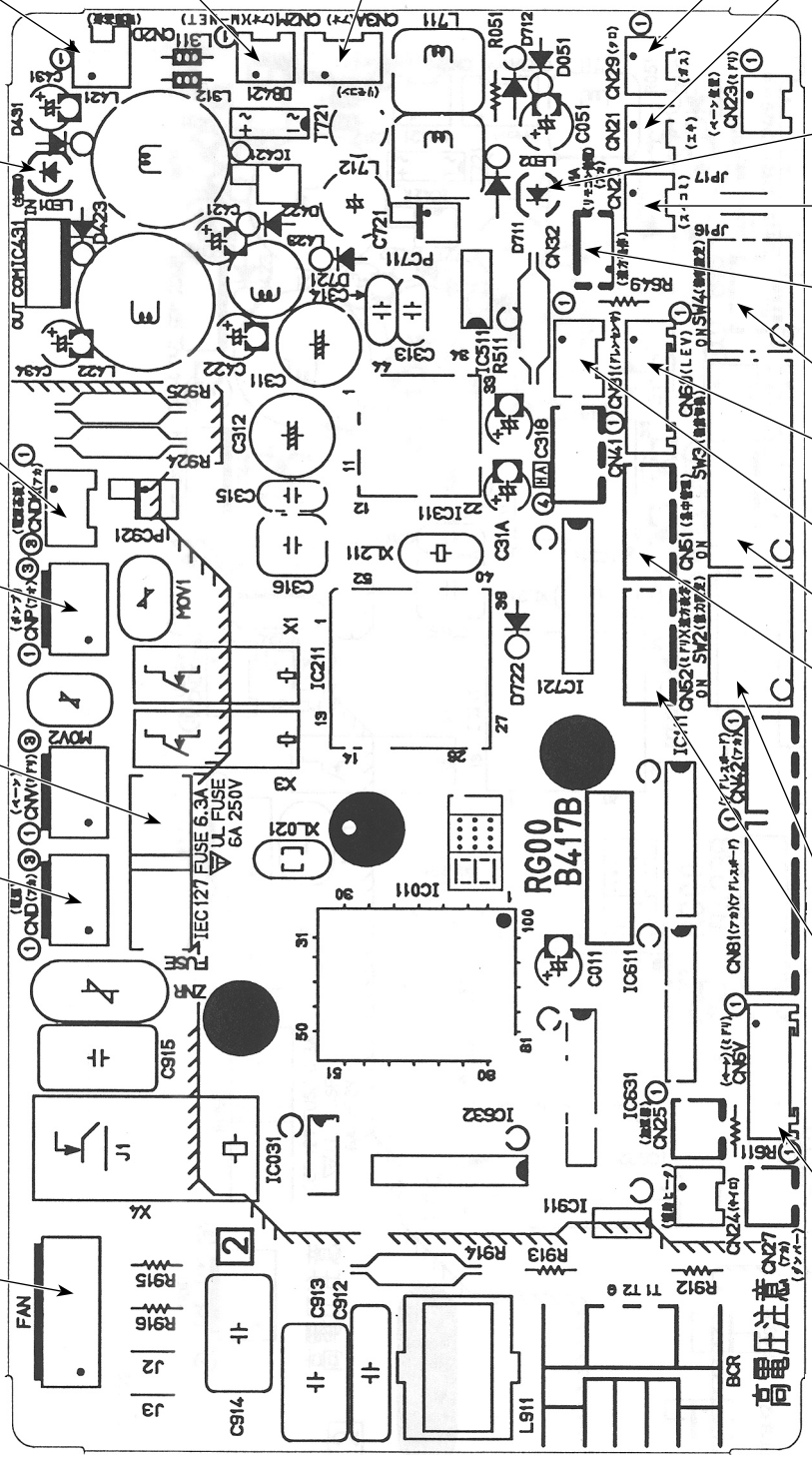
The black square (■) indicates a switch position.

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. <Initial setting> 
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 <Initial setting> 
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 <Initial setting> 

7-3. TEST POINT DIAGRAM

7-3-1. Indoor controller board

PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E



CN2D
Connect to the indoor power board (CN2S)
12.5-13.7V DC (Pin① (+))

CN2M
Connect to the terminal block (TB5)
(M-NET transmission connecting wire)
24-30V DC (non-polar)

CN3A
Connect to the terminal block (TB15)
(MA-Remote controller connecting wire)
Between ① to ③ 8.7-13V DC (Pin① (+))

CN29
Pipe temperature thermistor/Gas (TH23)

CN21
Pipe temperature thermistor/Liquid (TH22)

LED1
Main power supply
(Indoor unit : 220-240V)

LED2
Power supply for MA-Remote controller

CN20
Room temperature thermistor (TH21)

CN32
Connector
(Remote switch)

CND
Power supply for indoor controller board
Between ① to ③ 220-240V AC

SW4
Model selection

CN60
Linear expansion valve output (LEV)

CNP
Drain pump output (DP)
Between ① to ③ 220-240V AC

CN31
Drain sensor (DS)

SW3
Mode selection

CN51
Centrally control
①-② : Control signal
12VDC pulse input (① : +)
③-④ : Operation indicator
12VDC (③ : +)
③-⑤ : Malfunction indicator
12VDC (③ : +)

FUSE
6.3A 250V

SW2
Capacity setting

CNDK
Connect to the indoor power board (CNSK)
Between ① to ③ 220-240V AC

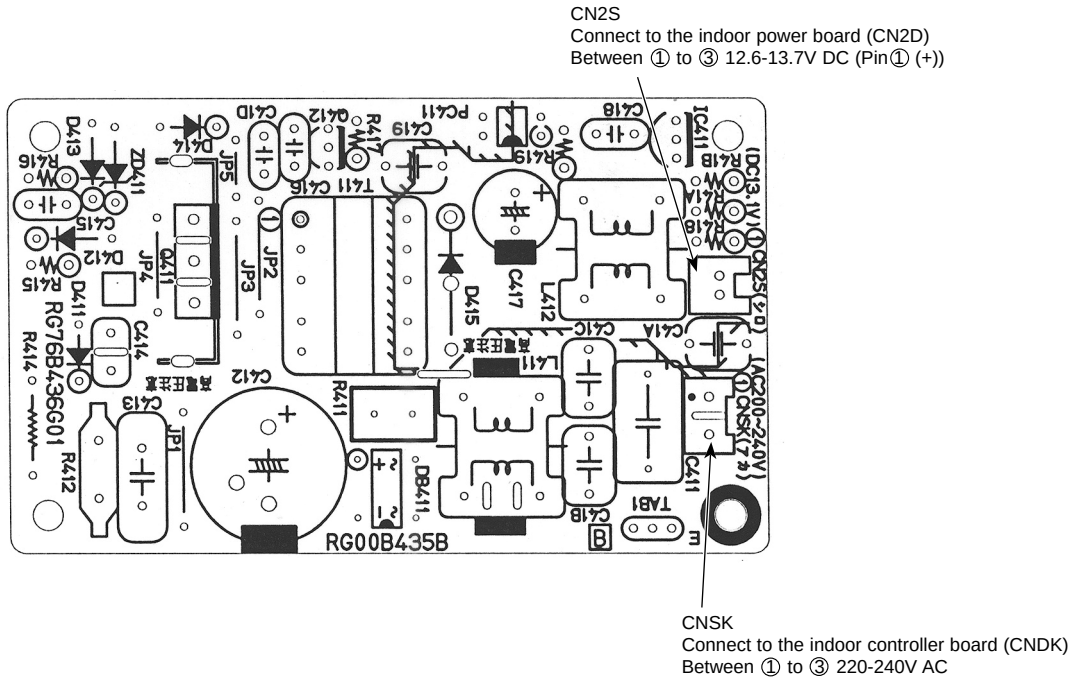
CN52
Remote indicator
①-②: Status lamp 12VDC (① : +)
Fan motor output
(SW1-5 OFF)
Thermostat ON (SW1-5 ON)
①-③: Cooling/Dry status lamp
12VDC (① : +)
①-④: Heating status lamp
12VDC (① : +)

CN6V
Vane moter output (MV)

FAN
Fan motor output (MF)

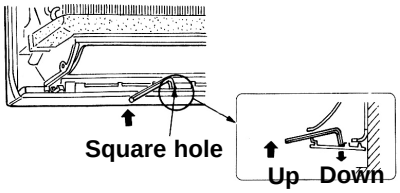
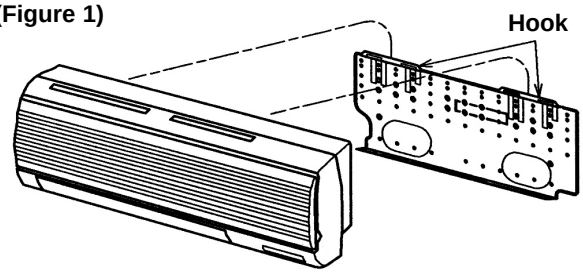
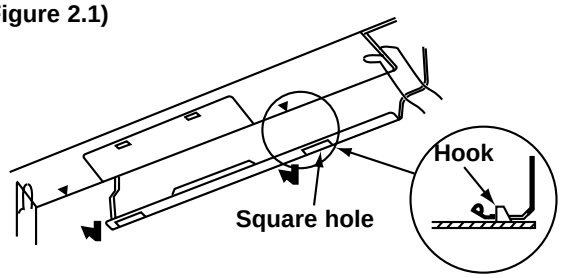
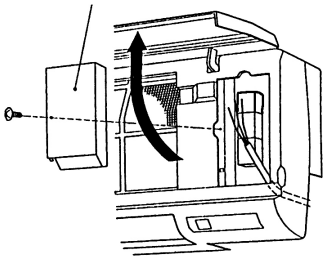
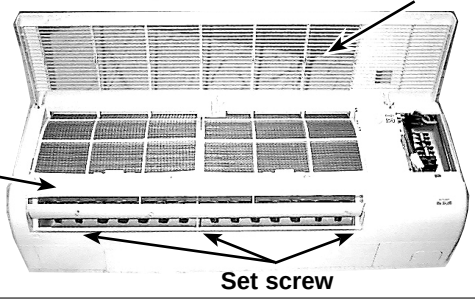
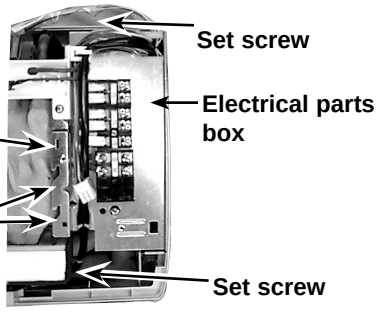
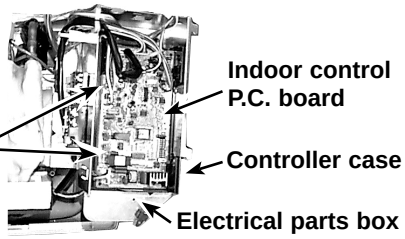
* The voltage range of DC12V in this page is between DC11.5 V to DC 13.7 V.

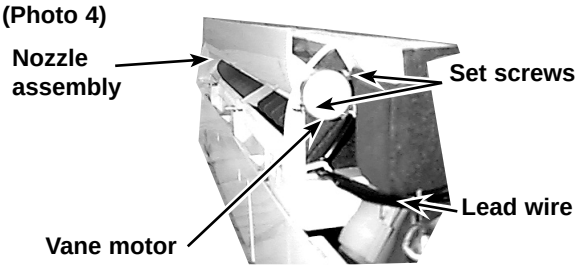
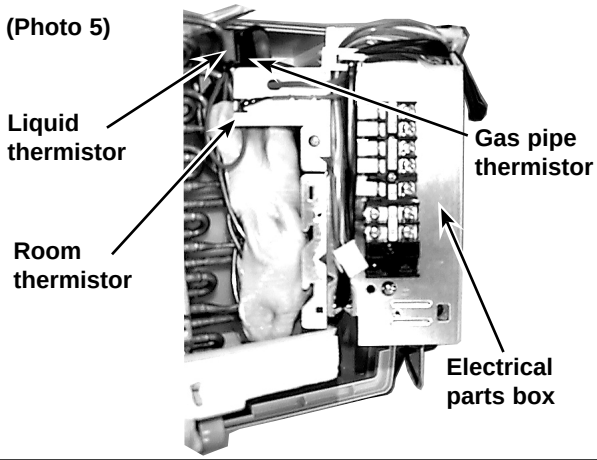
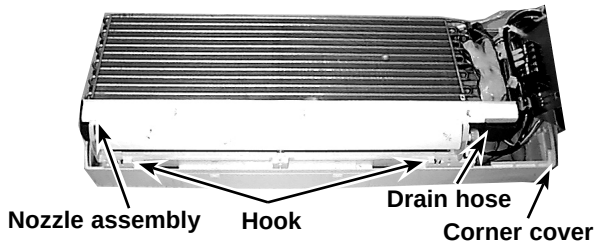
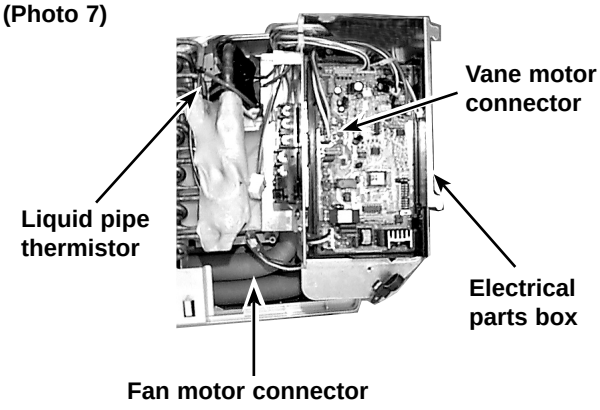
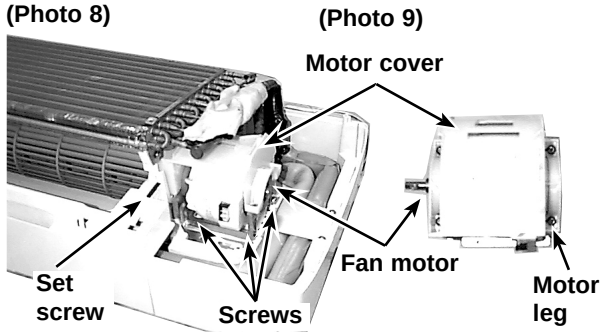
7-3-2. Indoor power board
PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E

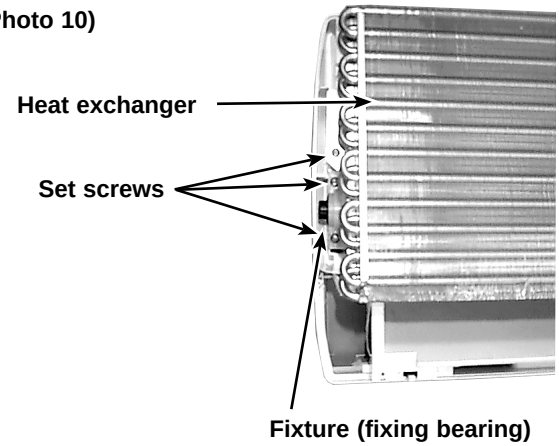
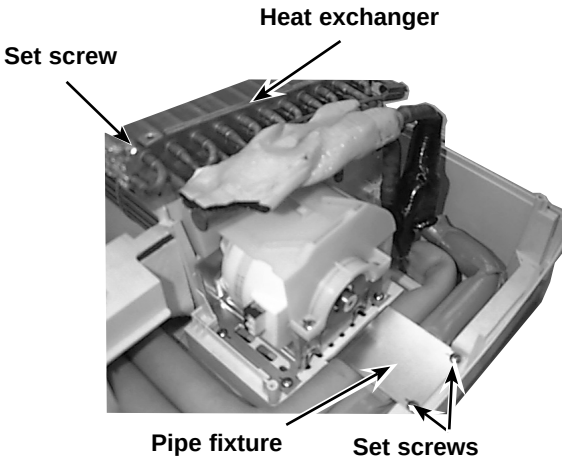


8 DISASSEMBLY PROCEDURE

PKFY-P32VGM-E PKFY-P40VGM-E PKFY-P50VGM-E

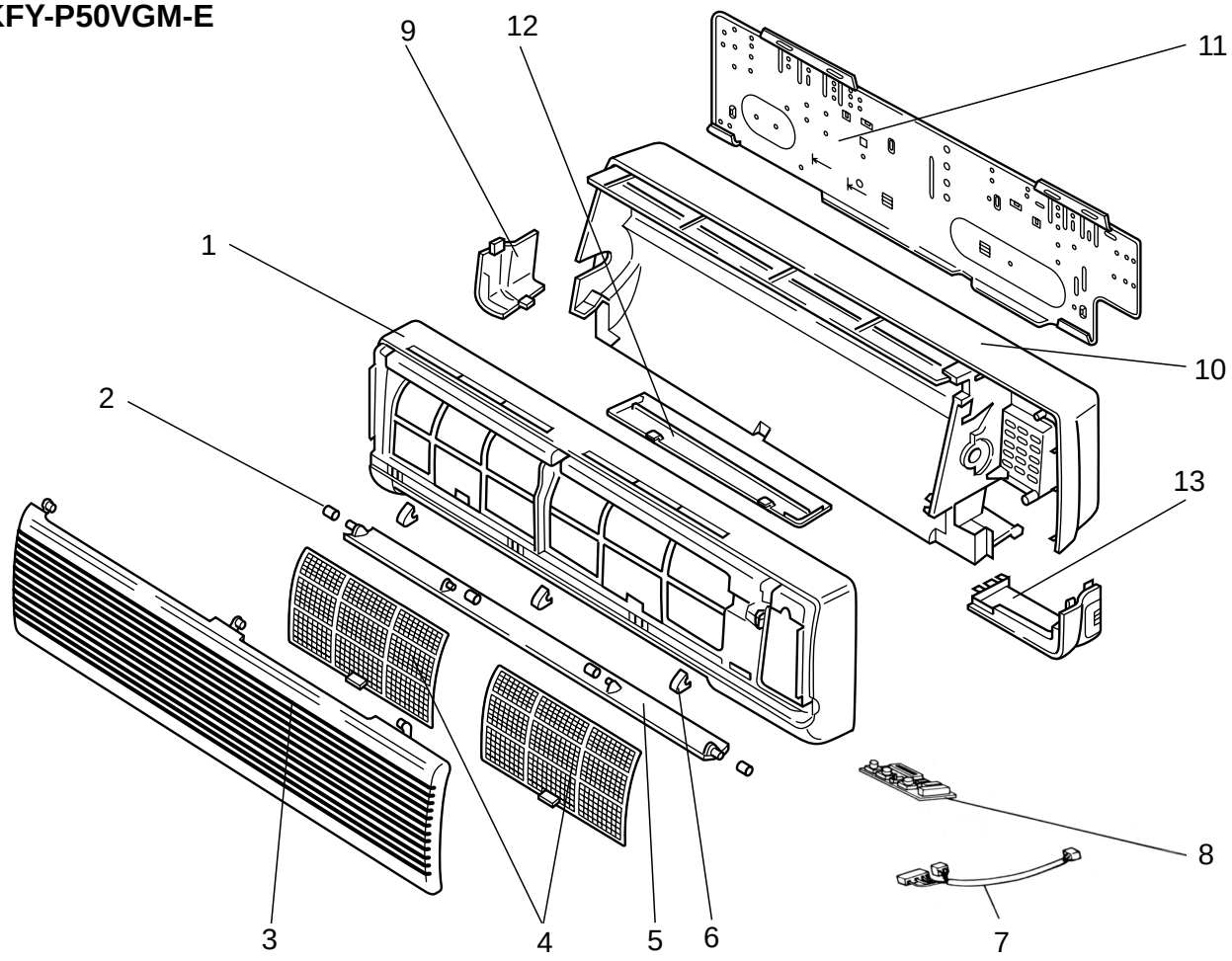
OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
1. REMOVE THE LOWER SIDE OF THE INDOOR UNIT FROM THE INSTALLATION PLATE (1) Remove the left / right corner box of the indoor unit. (2) Hold and pull down the lower and both ends of the indoor unit, and remove the ▼ section from the square hole. (Refer to the figure 2.1) Or remove the front panel and push the ▼ section down by using alankey ,etc. from the front side. (Refer to the figure 2.2). (3) Unhook the top of the indoor unit from the back plate catch. **(Figure 2.2)** 	**(Figure 1)**  **(Figure 2.1)** 
2. REMOVING THE FRONT PANEL (1) Open the front grille. (2) Remove the terminal block cover with a screw. (3) Remove the screw 3 caps then remove the set 3 screws. (4) After removing the lower side of the front panel a little, remove it as pulling toward upper.	**(Figure 3)**  **(Photo 1)** 
3. REMOVING THE INDOOR CONTROLLER BOARD (1) Remove the terminal block cover. (2) Remove the front panel. (See the photo 1) (3) Remove the electrical parts box (2 screws). (4) Remove the electrical parts box cover (1 screw). (5) Disconnect the connector on the indoor controller board and remove the controller board by Pulling up the hook of the controller case. * To work smoothly, hang the side hooks of the electrical parts box on the hook of the motor cover. (See the photo 3)	**(Photo 2)**  **(Photo 3)** 

OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
4. REMOVING THE VANE MOTOR (1) Disconnect the connector CN6V on the indoor controller board. (2) Remove the 2 screws of the vane motor, disconnect the lead wire and remove the vane motor from the shaft.	**(Photo 4)** 
5. REMOVING THE THERMISTOR (1) Removing the room thermistor TH21. ①Disconnect the connector CN20 <red> on the indoor controller board. ②Remove the room thermistor from the holder. (2) Removing the liquid pipe thermistor TH22. ①Disconnect the connector CN21 <white> on indoor controller board. ②Remove the liquid pipe thermistor with set to the pipe. (3) Removing the gas pipe thermistor TH23. ①Disconnect the connector CN29 <black> on indoor controller board. ②Remove the gas pipe thermistor with set to the pipe.	**(Photo 5)** 
6. REMOVING THE NOZZLE ASSEMBLY (1) Disconnect the connector CN6V on the indoor controller board. (2) Disconnect the lead wire of the vane motor. (3) Remove the corner cover. (4) Pull the drain hose out from the nozzle assembly. (5) Unhook the hook of the lower nozzle assembly and pull the nozzle assembly toward you, then remove the nozzle assembly by sliding it down.	**(Photo 6)** 
7. REMOVING THE ELECTRICAL PARTS BOX (1) Remove the terminal block cover. (2) Remove the front panel. (See the photo 1) (3) Disconnect the vane motor connector. (4) Disconnect the fan motor connector from the fan motor. (5) Remove the liquid / gas pipe thermistor. (See the photo 5) (6) Remove the electrical parts box (2 screws).	**(Photo 7)** 
8. REMOVING THE FAN MOTOR (1) Remove the terminal block cover. (2) Remove the front panel. (See the photo 1) (3) Remove the electrical parts box. (See the photo 7) (4) Remove the nozzle assembly. (See the photo 6) (5) Remove the fan motor leg fixing 3 screws. (6) Unscrew the set screws using by alankey and remove it by sliding the fan motor to right. (7) Remove the 4 screws and remove the motor cover from the fan motor leg.	**(Photo 8)** **(Photo 9)** 

OPERATION PROCEDURE	PHOTOS & ILLUSTRATION
9. REMOVING THE LINE FLOW FAN (1) Remove the terminal block cover. (2) Remove the front panel. (See the photo 1) (3) Remove the electrical parts box. (See the photo 7) (4) Remove the nozzle assembly. (See the photo 6) (5) Remove the fan motor. (See the photo 8) (6) Remove the pipe fixture with 2 screws. (See the photo 11) (7) Remove the left / right screws of the heat exchanger and pull the left-hand side up. (8) Remove the 2 screws by sliding it toward you remove the fixture (fixing bearing). * When reattaching the fan to the fan motor, locate and fix the shaft after installing the fan.	**(Photo 10)** 
10. REMOVING THE HEAT EXCHANGER (1) Remove the terminal block cover. (2) Remove the front panel. (See the photo 1) (3) Remove the electrical parts box. (See the photo 7) (4) Remove the corner box. (5) Remove the nozzle assembly. (See the photo 6) (6) Remove the 2 screws and the pipe fixture. (7) Remove the 2 screws and heat exchanger.	**(Photo 11)** 

9 RoHS PARTS LIST

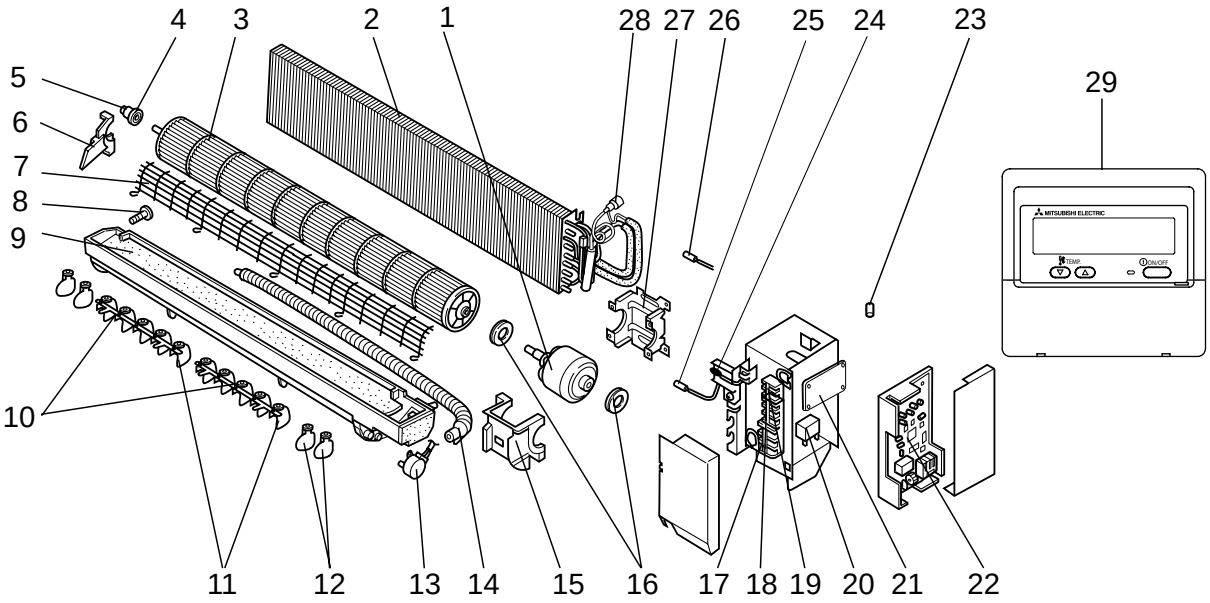
STRUCTURAL PARTS
PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E



No.	RoHS	Parts No.	Parts Name	Specifications	PKFY-P32,P40,P50VGM-E	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty
1	G	R01 E05 651	FRONT PANEL		1			
2	G	R01 08Y 092	VANE SLEEVE		1			
3	G	R01 08Y 691	FRONT GRILLE		1			
4	G	R01 A32 500	AIR FILTER		2			
5	G	R01 08Y 002	AUTO VANE		1			
6	G	R01 08Y 096	SCREW CAP		3			
7	G	R01 A00 304	ADDRESS CABLE		1			
8	G	T7W E01 294	ADDRESS BOARD		1		A.B	
9	G	R01 08Y 658	CORNER COVER-L		1			
10	G	R01 08Y 635	BOX ASSEMBLY		1			
11	G	R01 08Y 808	BACK PLATE		1			
12	G	R01 08Y 623	UNDER COVER		1			
13	G	R01 10Y 658	CORNER COVER-R		1			

RoHS PARTS LIST

ELECTRICAL PARTS
PKFY-P32VGM-E
PKFY-P40VGM-E
PKFY-P50VGM-E



No.	RoHS	Parts No.	Parts Name	Specifications	PKFY-P·VGM-E			Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty
					32	40	50			
1	G	T7W A02 762	FAN MOTOR		1	1	1		MF	
2	G	R01 J34 480	HEAT EXCHANGER		1					
	G	R01 J35 480	HEAT EXCHANGER			1				
	G	R01 J36 480	HEAT EXCHANGER				1			
3	G	R01 E22 114	LINE FLOW FAN		1	1	1			
4	G	R01 E04 103	SLEEVE BEARING		1	1	1			
5	G	R01 08Y 102	BEARING MOUNT		1	1	1			
6	G	R01 08Y 106	BEARING SUPPORT		1	1	1			
7	G	T7W A01 675	FAN GUARD		1	1	1			
8	G	R01 08Y 524	DRAIN PLUG		1	1	1			
9	G	R01 08Y 530	NOZZLE ASSY		1	1	1			
10	G	R01 08Y 059	ARM		2	2	2			
11	G	R01 08Y 038	GUIDE VANE		10	10	10			
12	G	R01 10Y 038	GUIDE VANE		4	4	4			
13	G	R01 E14 223	VANE MOTOR		1	1	1		MV	
14	G	R01 08Y 527	DRAIN HOSE		1	1	1			
15	G	R01 08Y 135	MOTOR COVER		1	1	1			
16	G	R01 08Y 105	RUBBER MOUNT		2	2	2			
17	G	T7W E33 716	TERMINAL BLOCK	2P(1,2)	1	1	1		TB15	
18	G	R01 E27 246	TERMINAL BLOCK	3P(M1,M2,S)	1	1	1		TB5	
19	G	T7W E32 716	TERMINAL BLOCK	3P(L,N,⏚)	1	1	1		TB2	
20	G	R01 E13 255	RUN CAPACITOR	2.0μF 440V	1	1	1		C1	
21	G	R01 E38 313	POWER BOARD		1	1	1		P.B	
22	G	T7W E53 310	CONTROLLER BOARD		1	1	1		I.B	
23	G	R01 E06 239	FUSE	250V 6.3A	1	1	1		FUSE	
24	G	R01 H08 202	ROOM THERMISTOR		1	1	1		TH21	
25	G	R01 H07 202	LIQUID PIPE THERMISTOR		1	1	1		TH22	
26	G	R01 H13 202	GAS PIPE THERMISTOR		1	1	1		TH23	
27	G	R01 08Y 130	MOTOR SUPPORT		1	1	1			
28	G	R01 H05 401	LINEAR EXPANSION VALVE		1	1	1		LEV	
29	G	—	REMOTE CONTROLLER	PAR-21MAA	1	1	1			

CITY MULTI

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