Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS
SPLIT-TYPE, AIR CONDITIONERS

May 2005
No.OC331

SERVICE MANUAL

Series PKA Wall Mounted R407C/R410A

Indoor unit [Model names]

PKA-RP60FAL

PKA-RP71FAL

PKA-RP100FAL

[Service Ref.]

PKA-RP60FAL
PKA-RP71FAL
PKA-RP100FAL

• This manual describes only service data of the indoor units.

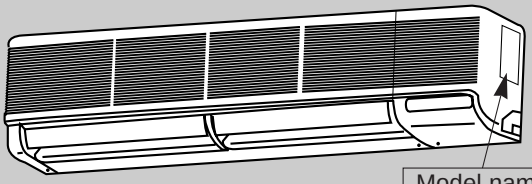
Series PKH R407C

PKH-P60FALH

PKH-P71FALH

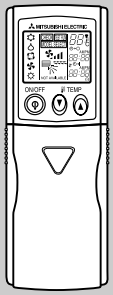
PKH-P100FALH

PKH-P60FALH
PKH-P71FALH
PKH-P100FALH



Indoor unit

Model name indication



Remote controller

CONTENTS

Mr.SLIM™

1 REFERENCE MANUAL

1-1. OUTDOOR UNIT'S SERVICE MANUAL

Service Ref.	Service Manual No.
PUHZ-RP35/50/60/71/100/125/140VHA PUHZ-RP100/125/140YHA	OC334
PUHZ-RP71/100/125/140VHA-A	OC337
PUHZ-RP200/250YHA	OC338
PUHZ-RP200/250YHA-A	OC339
PU(H)-P·VGAA.UK PU(H)-P·YGAA.UK	OC336

1-2. TECHNICAL DATA BOOK

Series (Outdoor unit)	Manual No.
PUHZ-RP·VHA(-A) PUHZ-RP·YHA(-A)	OCS01
PU(H)-P·VGAA.UK PU(H)-P·YGAA.UK	OCS02

2 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 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.

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.

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.

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 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 ESTER , 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.

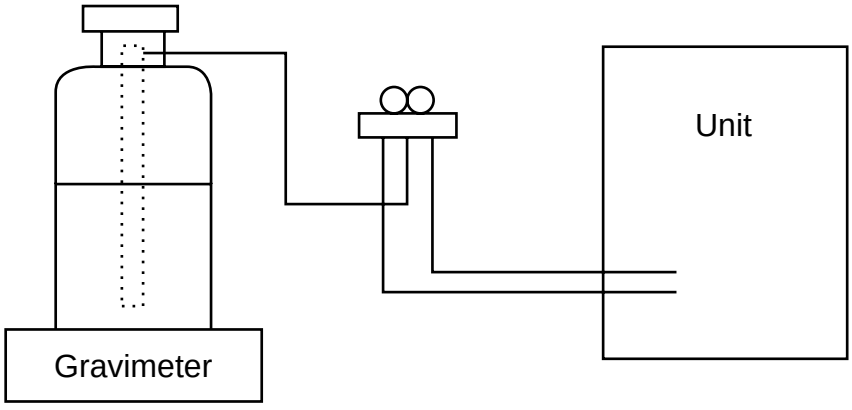
[1] Cautions for service

·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 liquid 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 RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

In case of using the existing pipes for R22, be careful with the followings.
· For RP100 be sure to perform replacement operation before test run.
· Change flare nut to the one provided with this product. Use a newly flared pipe.
· Avoid using thin pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contamination such as sulfur hazardous for use, oxides, dirt, shaving particles, etc.
In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Leave elbow joints, etc. in their packaging.)

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

Use ester oil, ether oil or alkylbenzene oil (small amount) as the refrigerant oil applied to flares and flange connections.

If large amount of mineral oil enter, 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

Keep the 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.

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

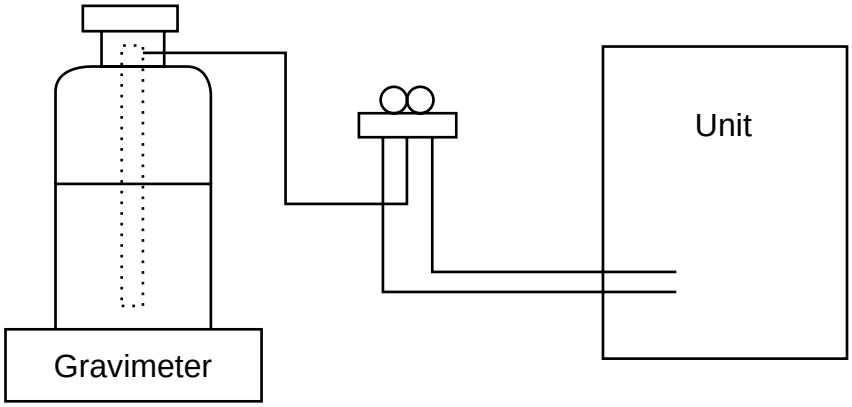
[1] Cautions for service

(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.)



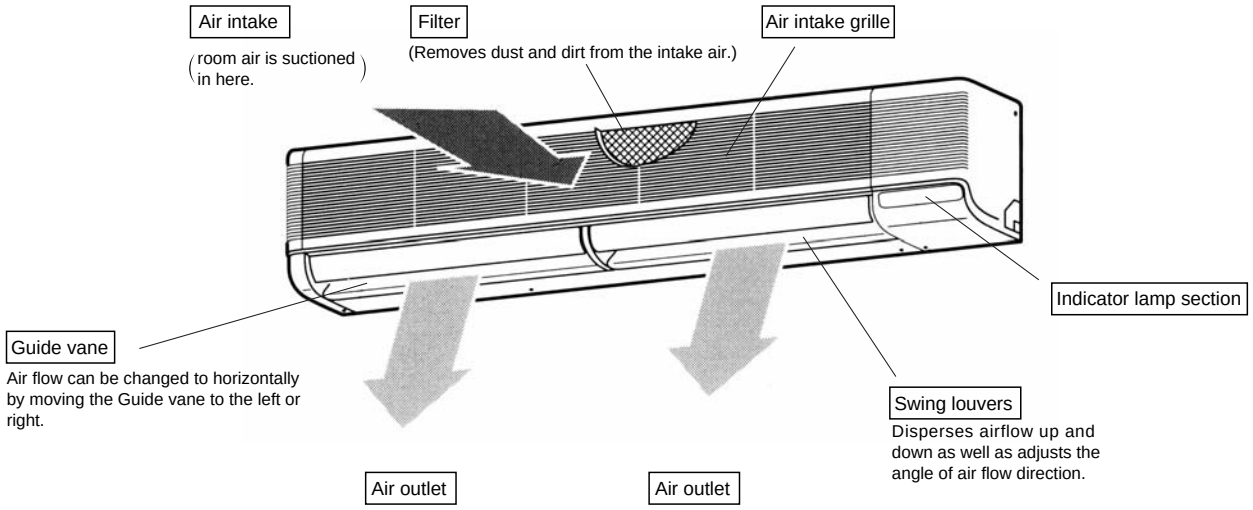
[3] Service tools

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	——

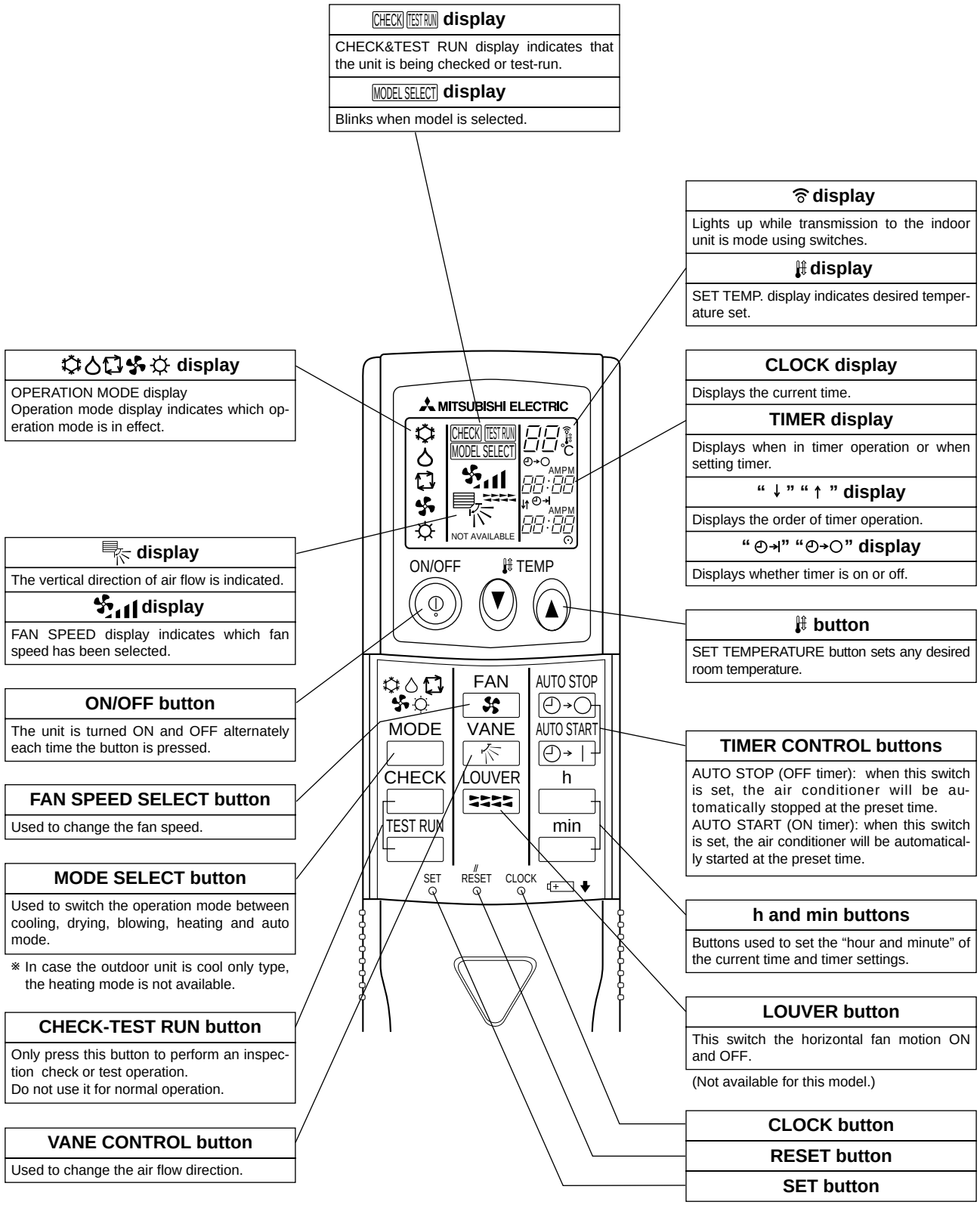
3 PART NAMES AND FUNCTIONS

● **Indoor Unit**



●Wireless remote controller

● When cover is open.



4 SPECIFICATIONS

INDOOR UNIT	**Service Ref.**			**PKA-RP60FAL**		
	Mode			Cooling	Heating	
	Power supply(phase, cycle, voltage)			Single phase, 50Hz, 230V		
		Input	kW	0.09	0.09	
		Running current	A	0.43	0.43	
		Starting current	A	0.80	0.80	
	External finish			Munsell 3.4Y 7.7/0.8		
	Heat exchanger			Plate fin coil		
	Fan	Fan(drive) x No.		Line flow (direct) x 2		
		Fan motor output	kW	0.040		
		Airflow(Low-High)	m³/min(CFM)	15-20(530-705)		
		External static pressure	Pa(mmAq)	0(direct blow)		
	Operation control & Thermostat			Wireless remote controller & built-in		
	Noise level(Low-High)		dB	39-45		
	Unit drain pipe O.D.		mm(in.)	20(13/16)		
	Dimensions	W	mm(in.)	1,400(55-1/8)		
		D	mm(in.)	235(9-1/4)		
		H	mm(in.)	340(13-3/8)		
	Weight		kg(lbs)	24(53)		

INDOOR UNIT	**Service Ref.**			**PKA-RP71FAL**		
	Mode			Cooling	Heating	
	Power supply(phase, cycle, voltage)			Single phase, 50Hz, 230V		
		Input	kW	0.09	0.09	
		Running current	A	0.43	0.43	
		Starting current	A	0.80	0.80	
	External finish			Munsell 3.4Y 7.7/0.8		
	Heat exchanger			Plate fin coil		
	Fan	Fan(drive) x No.		Line flow (direct) x 2		
		Fan motor output	kW	0.040		
		Airflow(Low-High)	m³/min(CFM)	15-20(530-706)		
		External static pressure	Pa(mmAq)	0(direct blow)		
	Operation control & Thermostat			Wireless remote controller & built-in		
	Noise level(Low-High)		dB	39-45		
	Unit drain pipe O.D.		mm(in.)	20(13/16)		
	Dimensions	W	mm(in.)	1,400(55-1/8)		
		D	mm(in.)	235(9-1/4)		
		H	mm(in.)	340(13-3/8)		
	Weight		kg(lbs)	24(53)		

INDOOR UNIT	**Service Ref.**			**PKA-RP100FAL**		
	Mode			Cooling	Heating	
	Power supply(phase, cycle, voltage)			Single phase, 50Hz, 230V		
		Input	kW	0.11	0.11	
		Running current	A	0.52	0.52	
		Starting current	A	0.90	0.90	
	External finish			Munsell 3.4Y 7.7/0.8		
	Heat exchanger			Plate fin coil		
	Fan	Fan(drive) x No.		Line flow (direct) x 2		
		Fan motor output	kW	0.070		
		Airflow(Low-High)	m³/min(CFM)	22-28(780-990)		
		External static pressure	Pa(mmAq)	0(direct blow)		
	Operation control & Thermostat			Wireless remote controller & built-in		
	Noise level(Low-High)		dB	41-46		
	Unit drain pipe O.D.		mm(in.)	26(1)		
	Dimensions	W	mm(in.)	1,680(66-1/8)		
		D	mm(in.)	235(9-1/4)		
		H	mm(in.)	340(13-3/8)		
	Weight		kg(lbs)	28(62)		

INDOOR UNIT	**Service Ref.**				**PKH-P60FALH**	
	Mode				Cooling	Heating
	Power supply(phase, cycle,voltage)				Single phase, 50Hz, 230V	
		Input	※1	kW	0.09	0.09<1.93>
		Running current	※1	A	0.43	0.43<8.39>
		Starting current	※1	A	0.80	0.80<8.39>
	External finish				Munsell 3.4Y 7.7/0.8	
	Heat exchanger				Plate fin coil	
	Fan	Fan(drive) x No.			Line flow (direct) x 2	
		Fan motor output		kW	0.040	
		Airflow(Low-High)		m³/min(CFM)	15-20 (530-706)	
		External static pressure		Pa(mmAq)	0(direct blow)	
	Booster heater		※1	kW	<1.93>	
	Operation control & Thermostat				Wireless remote controller & built-in	
	Noise level(Low-High)			dB	39-45	
	Unit drain pipe O.D.			mm(in.)	20(13/16)	
	Dimensions		W	mm(in.)	1,400(13/16)	
			D	mm(in.)	235(9-1/4)	
			H	mm(in.)	340(13-3/8)	
	Weight			kg(lbs)	26(57)	

INDOOR UNIT	**Service Ref.**				**PKH-P71FALH**	
	Mode				Cooling	Heating
	Power supply(phase, cycle,voltage)				Single phase, 50Hz, 230V	
		Input	※1	kW	0.09	0.09<1.93>
		Running current	※1	A	0.43	0.43<8.39>
		Starting current	※1	A	0.80	0.80<8.39>
	External finish				Munsell 3.4Y 7.7/0.8	
	Heat exchanger				Plate fin coil	
	Fan	Fan(drive) x No.			Line flow (direct) x 2	
		Fan motor output		kW	0.040	
		Airflow(Low-High)		m³/min(CFM)	15-20 (530-706)	
		External static pressure		Pa(mmAq)	0(direct blow)	
	Booster heater		※1	kW	<1.93>	
	Operation control & Thermostat				Wireless remote controller & built-in	
	Noise level(Low-High)			dB	39-45	
	Unit drain pipe O.D.			mm(in.)	20(13/16)	
	Dimensions		W	mm(in.)	1,400(13/16)	
			D	mm(in.)	235(9-1/4)	
			H	mm(in.)	340(13-3/8)	
	Weight			kg(lbs)	26(57)	

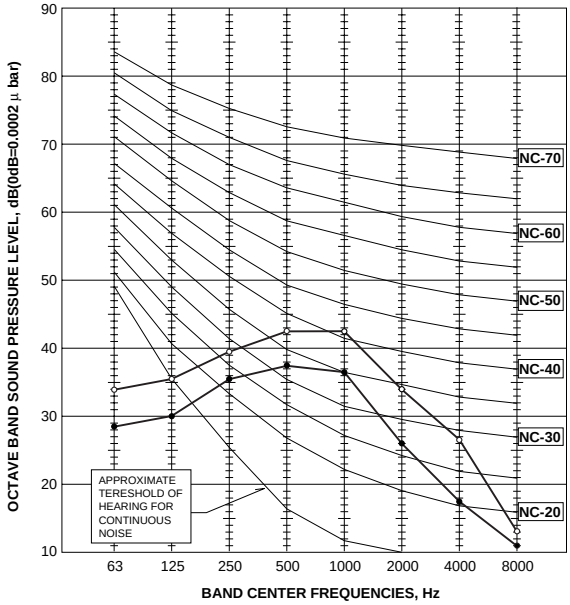
INDOOR UNIT	**Service Ref.**				**PKH-P100FALH**	
	Mode				Cooling	Heating
	Power supply(phase, cycle,voltage)				Single phase, 50Hz, 230V	
		Input	※1	kW	0.11	0.11<2.20>
		Running current	※1	A	0.52	0.52<9.57>
		Starting current	※1	A	0.90	0.90<9.57>
	External finish				Munsell 3.4Y 7.7/0.8	
	Heat exchanger				Plate fin coil	
	Fan	Fan(drive) x No.			Line flow (direct) x 2	
		Fan motor output		kW	0.070	
		Airflow(Low-High)		m³/min(CFM)	22-28(777-988)	
		External static pressure		Pa(mmAq)	0(direct blow)	
	Booster heater		※1	kW	<2.20>	
	Operation control & Thermostat				Wireless remote controller & built-in	
	Noise level(Low-High)			dB	41-46	
	Unit drain pipe O.D.			mm(in.)	20(13/16)	
	Dimensions		W	mm(in.)	1,680(66-1/8)	
			D	mm(in.)	235(9-1/4)	
			H	mm(in.)	340(13-3/8)	
	Weight			kg(lbs)	30(66)	

※1 : < > Shows the only booster heater rating.

5 NOISE CRITERION CURVES

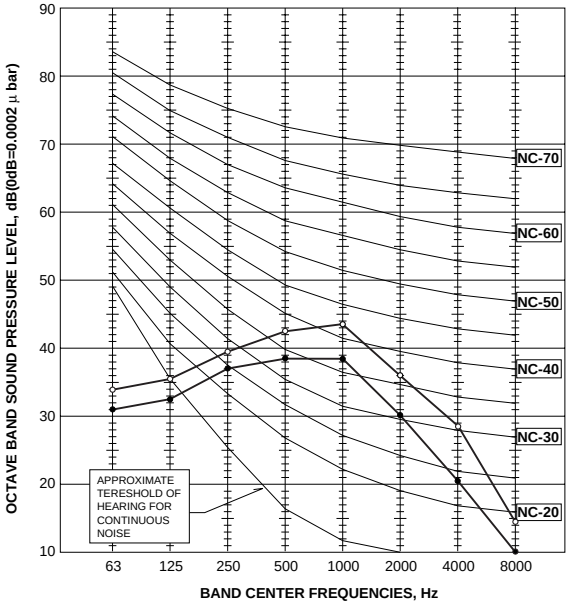
PKA-RP60FAL
PKA-RP71FAL
PKH-P60FALH
PKH-P71FALH

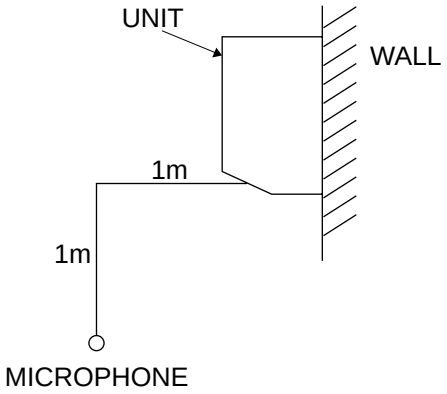
NOTCH	SPL(dB)	LINE
High	45	○—○
Low	39	●—●



PKA-RP100FAL
PKH-P100FALH

NOTCH	SPL(dB)	LINE
High	46	○—○
Low	41	●—●

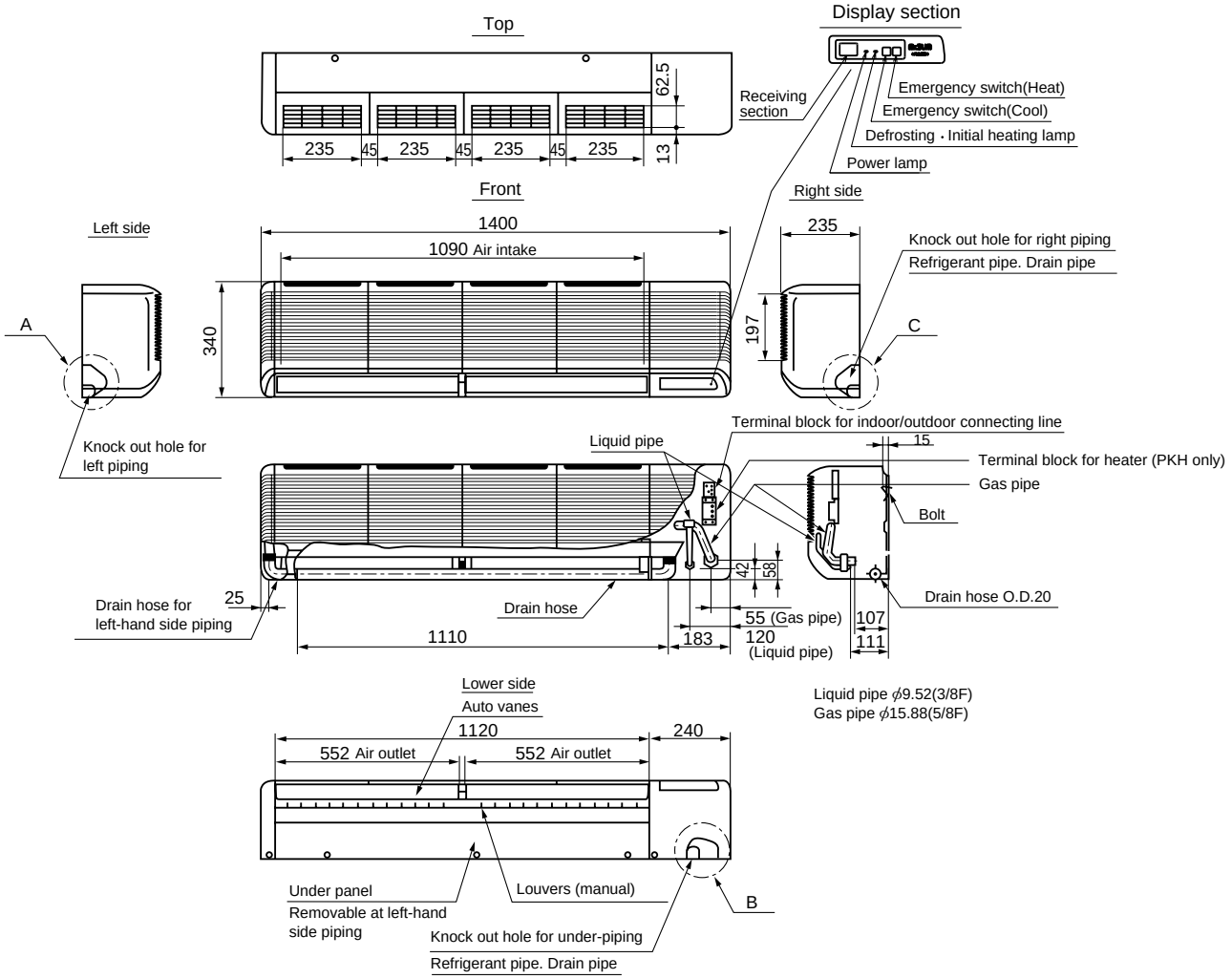


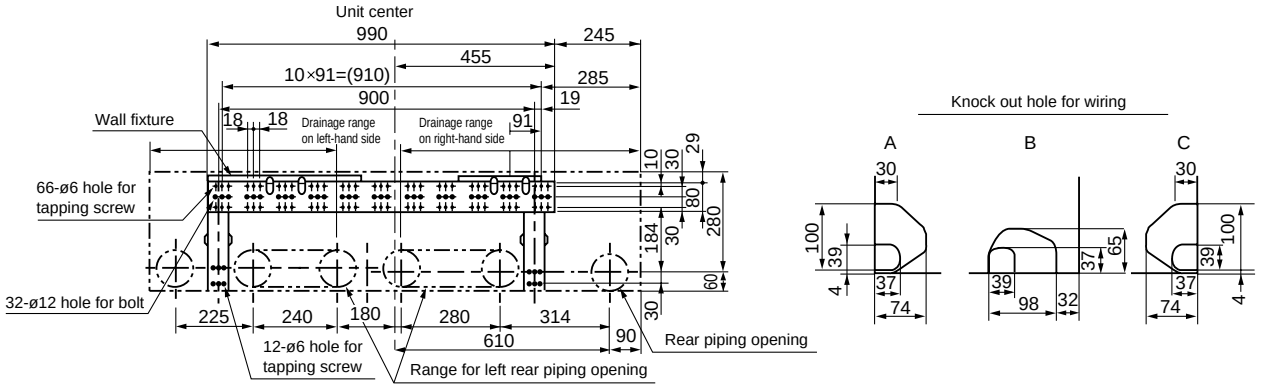


6 OUTLINES AND DIMENSIONS

PKH-P60FALH, PKA-RP60FAL
PKH-P71FALH, PKA-RP71FAL

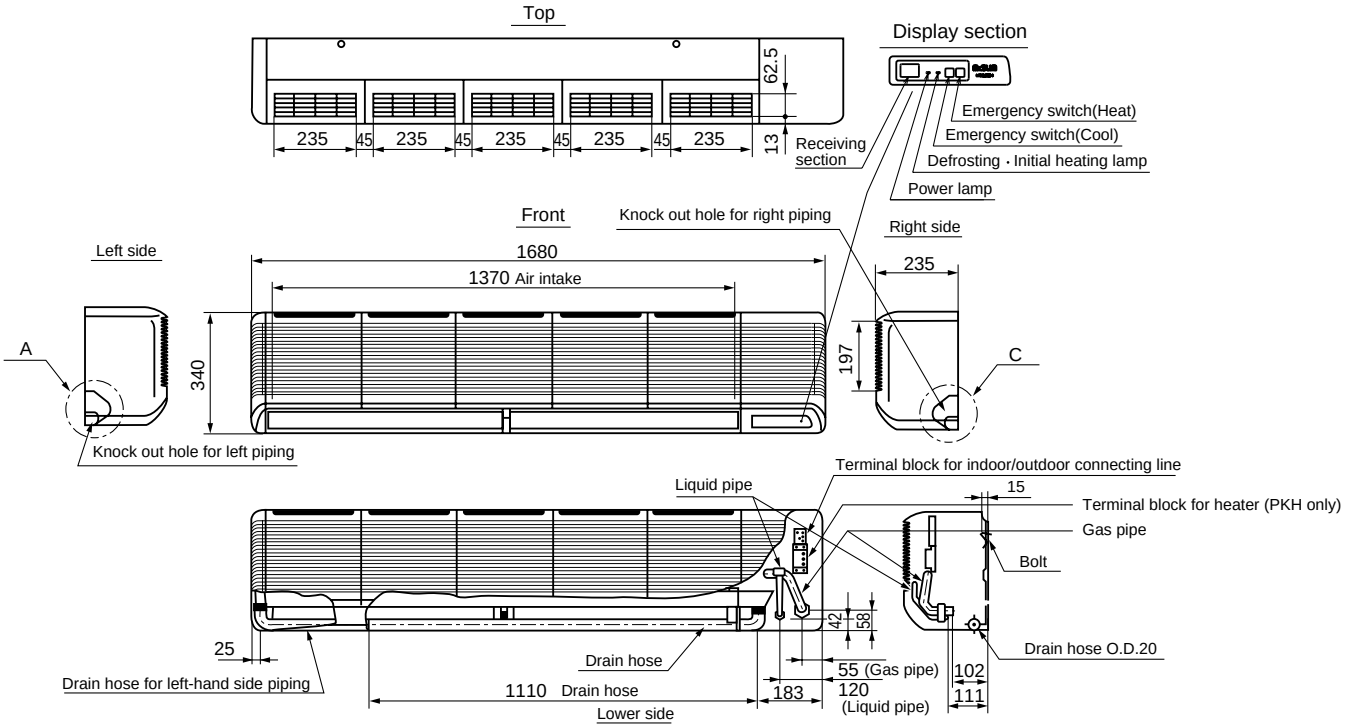
Unit : mm





PKH-P100FALH, PKA-RP100FAL

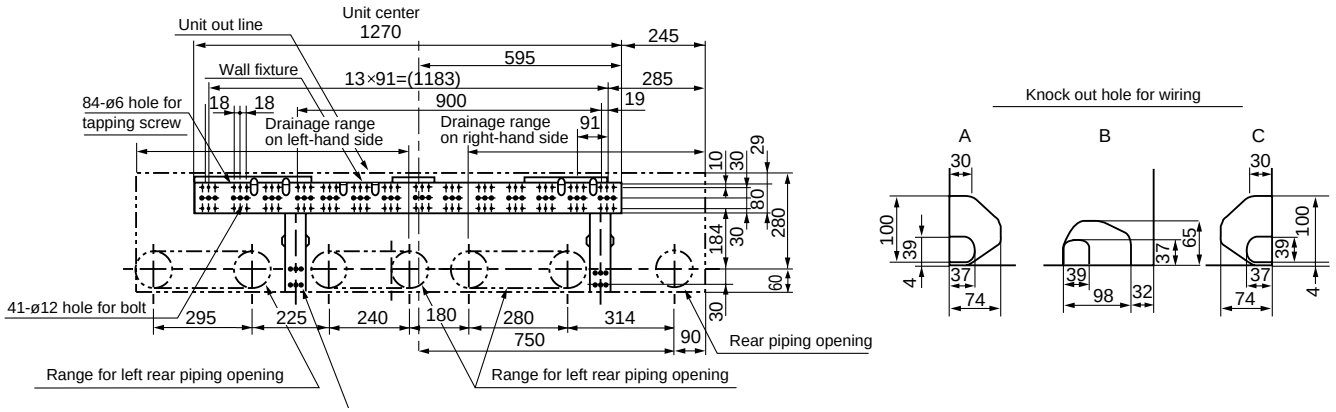
Unit : mm



Available pipe size

	RP100	P100
LIQUID SIDE	ϕ9.52 ○	ϕ9.52 ○
GAS SIDE	ϕ15.88 ○	—
	ϕ19.05	ϕ19.05 ○

○ : Factory flare nut attachment to the heat-exchanger.



7 WIRING DIAGRAM

PKA-RP60FAL PKA-RP71FAL PKA-RP100FAL
PKH-P60FALH PKH-P71FALH PKH-P100FALH

SYMBOL		NAME	SYMBOL	NAME	SYMBOL		NAME
P.B		INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)	W.B		WIRELESS REMOTE CONTROLLER BOARD
I.B		INDOOR CONTROLLER BOARD	MF	FAN MOTOR		RU	RECEIVING UNIT
	FUSE	FUSE(T6.3AL250V)	MV	VANE MOTOR		BZ	BUZZER
	ZNR	VARISTOR	TB2	TERMINAL BLOCK (HEATER) ※PKH-P.FALH models only or option for PKA-RP.FAL models.		LED1	LED(RUN INDICATOR)
	CN2L	CONNECTOR(LOSSNAY)				LED2	LED(HOT ADJUST)
	CN32	CONNECTOR(REMOTE SWITCH)	TB4	TERMINAL BLOCK(INDOOR/OUTDOOR CONNECTING LINE)		SW1	SWITCH(HEATING ON/OFF)
	CN41	CONNECTOR(HA TERMINAL-A)				SW2	SWITCH(COOLING ON/OFF)
	CN51	CONNECTOR(CENTRALLY CONTROL)	TB5	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)(OPTION)	R.B		WIREDREMOTE CONTROLLER BOARD(OPTION)
	SW1	SWITCH (MODEL SELECTION) ※See Table 1.				TB6	TERMINAL BLOCK(REMOTE CONTROLLER TRANSMISSION LINE)
	SW2	SWITCH (CAPACITY CODE) ※See Table 2.	TH1	ROOM TEMP.THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT)	HEATER		
	SWE	SWITCH(EMERGENCY OPERATION)				FS1,2	THERMAL FUSE(117℃ 10A:60,71FALH/ 117℃ 16A:100FALH)
	X4	RELAY(FAN MOTOR)	TH2	PIPE TEMP.THERMISTOR/LIQUID (0℃/15kΩ, 25℃/5.4kΩ DETECT)			
	BCR	FAN CONTROL ELEMENT				H1	HEATER
	LED1	POWER SUPPLY(I.B)	TH5	COND./EVA.TEMP.THERMISTOR (0℃/15kΩ, 25℃/5.4kΩ DETECT)		26H	HEATER THERMAL SWITCH
	LED2	POWER SUPPLY(R.B)				88H	HEATER CONTACTOR
	LED3	TRANSMISSION(INDOOR-OUTDOOR)					

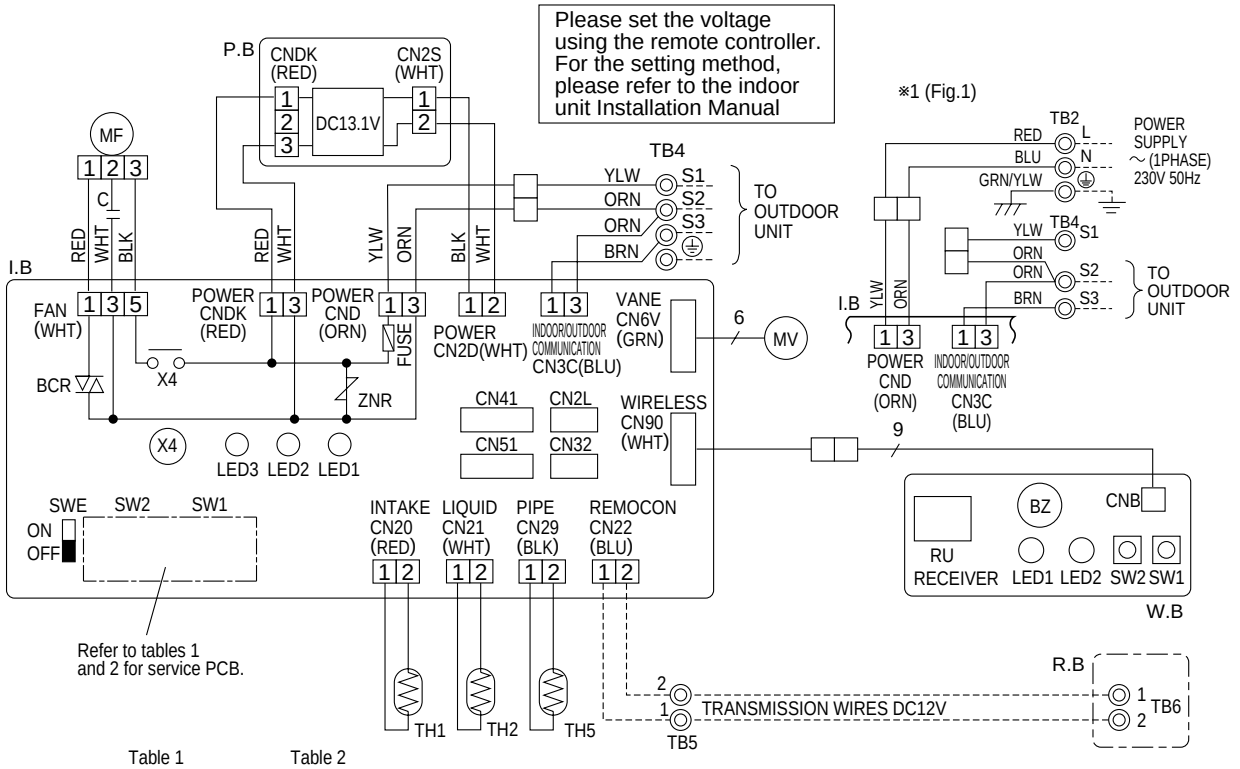


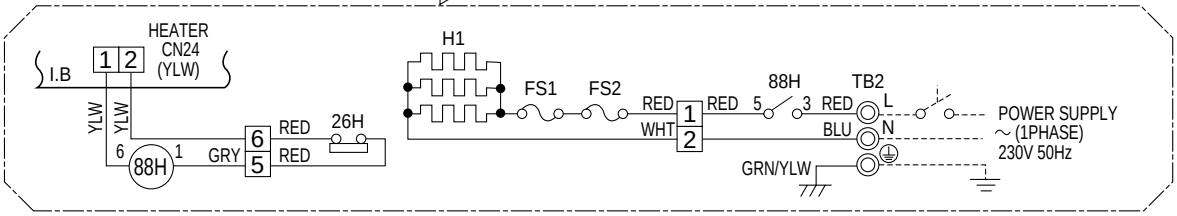
Table 1

SW1
Service board
1 2 3 4 5 ON OFF

Table 2

SW2					
MODELS	Service board	MODELS	Service board	MODELS	Service board
PKA-RP60FAL PKH-P60FALH	1 2 3 4 5 ON OFF	PKA-RP71FAL PKH-P71FALH	1 2 3 4 5 ON OFF	PKA-RP100FAL PKH-P100FALH	1 2 3 4 5 ON OFF

PKH-P60～P100FALH models only



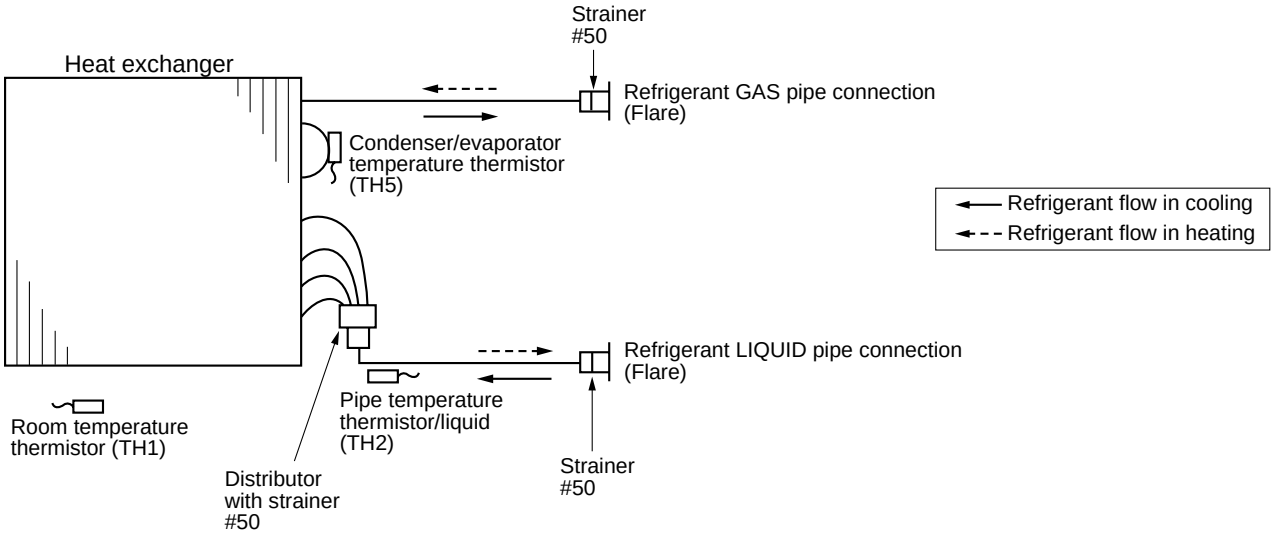
NOTES:
1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers (S1, S2, S3).
3. Make sure that the main power supply of the booster heater is independent.
4. Symbols used in wiring diagram above are, □□□: Connector, ◎: Terminal (block).

※1. When work to supply power separately to Indoor and Outdoor unit was applied, refer to Fig 1.
※2. For power supply system of this unit, refer to the caution label located near this diagram.

8 REFRIGERANT SYSTEM DIAGRAM

PKA-RP60FAL **PKH-P60FALH**
PKA-RP71FAL **PKH-P71FALH**
PKA-RP100FAL **PKH-P100FALH**

Unit : mm



9 TROUBLESHOOTING

9-1. TROUBLESHOOTING

<Error code display by self-diagnosis and actions to be taken for service (summary)>

Present and past error codes are logged and displayed on the wired remote controller or controller board of outdoor unit. Actions to be taken for service and the inferior phenomenon reoccurrence at field are summarized in the table below. Check the contents below before investigating details.

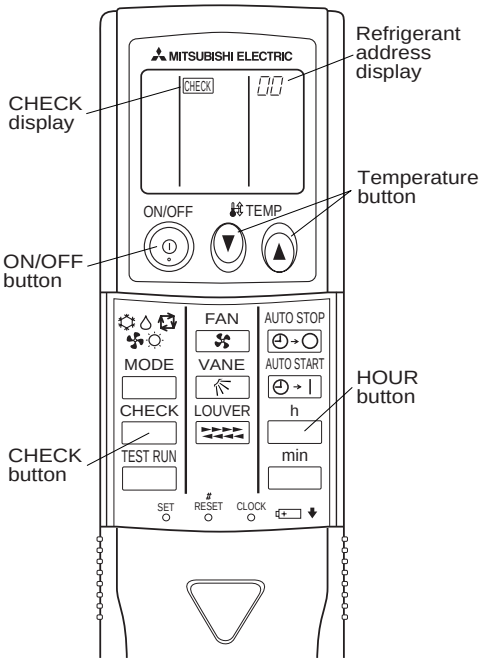
Unit conditions at service	Error code	Actions to be taken for service (summary)
The inferior phenomenon is reoccurring.	Displayed	Judge what is wrong and take a corrective action according to “SELF-DIAGNOSIS ACTION TABLE” (9-3).
	Not displayed	Identify the cause of the inferior phenomenon and take a corrective action according to “TROUBLESHOOTING BY INFERIOR PHENOMENA ” (9-4).
The inferior phenomenon is not reoccurring.	Logged	①Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise and etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the inferior phenomenon occurred, and wiring related. ②Reset error code logs and restart the unit after finishing service. ③There is no abnormality in electrical components, controller boards, and remote controller.
	Not logged	①Recheck the abnormal symptom. ②Identify the cause of the inferior phenomenon and take a corrective action according to “TROUBLESHOOTING BY INFERIOR PHENOMENA ” (9-4). ③Continue to operate unit for the time being if the cause is not ascertained. ④There is no abnormality in electrical components, controller boards, remote controller etc.

9-2. MALFUNCTION-DIAGNOSIS METHOD BY REMOTE CONTROLLER

<In case of trouble during operation>

When a malfunction occurs to air conditioner, both indoor unit and outdoor unit will stop and operation lamp blinks to inform unusual stop.

<Malfunction-diagnosis method at maintenance service>



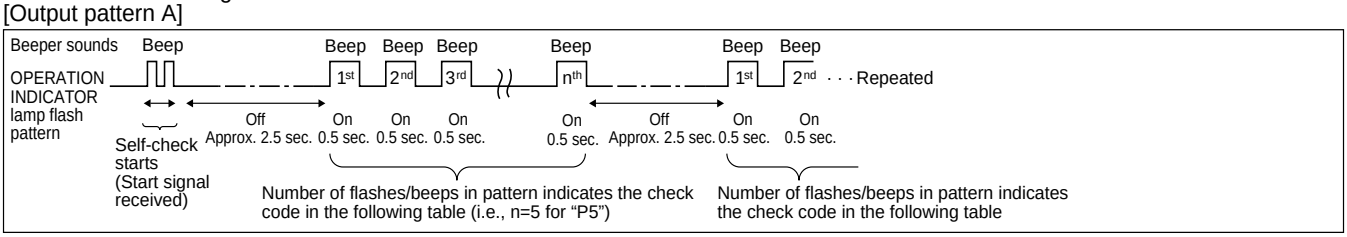
[Procedure]

1. Press the CHECK button twice.	• "CHECK" lights, and refrigerant address "00" flashes. • Check that the remote controller's display has stopped before continuing.
2. Press the temperature buttons.	• Select the refrigerant address of the indoor unit for the self-diagnosis. Note: Set refrigerant address using the outdoor unit's DIP switch (SW1). (For more information, see the outdoor unit installation manual.)
3. Point the remote controller at the sensor on the indoor unit and press the HOUR button.	• If an air conditioner error occurs, the indoor unit's sensor emits an intermittent buzzer sound, the operation light flashes, and the error code is output. (It takes 3 seconds at most for error code to appear.)
4. Point the remote controller at the sensor on the indoor unit and press the ON/OFF button.	• The check mode is cancelled.

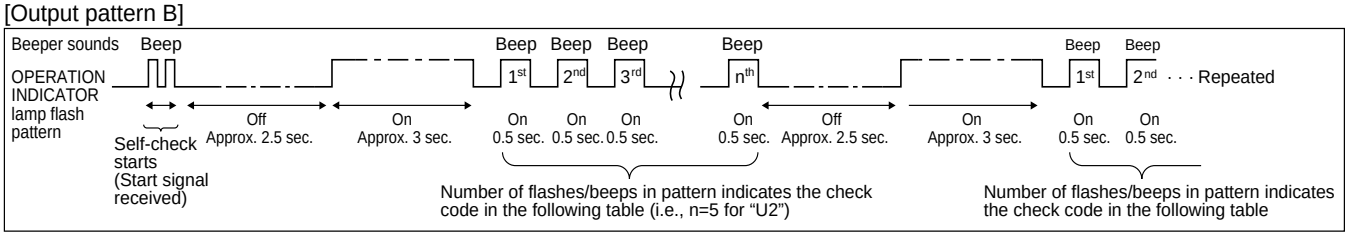
To be continued to the next page.

• Refer to the following tables for details on the check codes.

[Output pattern A]



[Output pattern B]



[Output pattern A] Errors detected by indoor unit

Wireless remote controller	Wired remote controller	Symptom	Remark
Beeper sounds/OPERATION INDICATOR lamp flashes (Number of times)	① Check code		
1	P1	Intake sensor error	
2	P2	Pipe (TH2) sensor error	
	P9	Pipe (TH5) sensor error	
3	E6,E7	Indoor/outdoor unit communication error	
4	P4	Drain sensor error	
5	P5	Drain pump error	
6	P6	Freeing/Overheating safeguard operation	
7	EE	Communication error between indoor and outdoor units	
8	P8	Pipe temperature error	
9	E4, E5	Remote controller signal receiving error	
10	–	–	
11	–	–	
12	Fb	Indoor unit control system error (memory error, etc.)	
–	E0, E3	Remote controller transmission error	
–	E1, E2	Remote controller control board error	

[Output pattern B] Errors detected by unit other than indoor unit (outdoor unit, etc.)

Wireless remote controller	Wired remote controller	Symptom	Remark
Beeper sounds/OPERATION INDICATOR lamp flashes (Number of times)	① Check code		
1	E9	Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)	For details, check the LED display of the outdoor controller board. As for outdoor unit, refer to outdoor unit's service manual.
2	UP	Compressor overcurrent interruption	
3	U3,U4	Open/short of outdoor unit thermistors	
4	UF	Compressor overcurrent interruption (When compressor locked)	
5	U2	Abnormal high discharging temperature/49C worked/ insufficient refrigerant	
6	U1,Ud	Abnormal high pressure (63H worked)/Overheating safeguard operation	
7	U5	Abnormal temperature of heat sink	
8	U8	Outdoor unit fan safeguard stop	
9	U6	Compressor overcurrent interruption/Abnormal of power module	
10	U7	Abnormality of super heat due to low discharge temperature	
11	U9,UH	Abnormality such as overvoltage or voltage shortage and abnormal synchronous signal to main circuit/Current sensor error	
12	–	–	
13	–	–	
14	Others	Other errors (Refer to the technical manual for the outdoor unit.)	

*1 If the beeper does not sound again after the initial two beeps to confirm the self-check start signal was received and the OPERATION INDICATOR lamp does not come on, there are no error records.

*2 If the beeper sounds three times continuously "beep, beep, beep (0.4 + 0.4 + 0.4 sec.)" after the initial two beeps to confirm the self-check start signal was received, the specified refrigerant address is incorrect.

• On wireless remote controller
②The continuous buzzer sounds from receiving section of indoor unit.
③Blink of operation lamp
• On wired remote controller
①Check code displayed in the LCD.

• If the unit cannot be operated properly after the above test run has been performed, refer to the following table to remove the cause.

Symptom			Cause
Wired remote controller		LED 1, 2 (PCB in outdoor unit)	
PLEASE WAIT	For about 2 minutes following power-on	After LED 1, 2 are lighted, LED 2 is turned off, then only LED 1 is lighted. (Correct operation)	•For about 2 minutes following power-on,operation of the remote controller is not possible due to system start-up. (Correct operation)
PLEASE WAIT → Error code	After about 2 minutes has expired following power-on	Only LED 1 is lighted. → LED 1, 2 blink.	•Connector for the outdoor unit's protection device is not con-nected. •Reverse or open phase wiring for the outdoor unit's power terminal block (L1, L2, L3)
Display messages do not appear even when operation switch is turned ON (operation lamp does not light up).		Only LED 1 is lighted. → LED 1 blinks twice, LED 2 blinks once.	•Incorrect wiring between indoor and outdoor units (incorrect polarity of S1, S2, S3) •Remote controller wire short

On the wireless remote controller with condition above, following phenomena takes place.
• No signals from the remote controller are accepted.
• OPE lamp is blinking.
• The buzzer makes a short piping sound.

Note:
Operation is not possible for about 30 seconds after cancellation of function selection. (Correct operation)

For description of each LED (LED1, 2, 3) provided on the indoor controller, refer to the following table.

LED1 (power for microcomputer)	Indicates whether control power is supplied. Make sure that this LED is always lit.
LED2 (power for remote controller)	Indicates whether power is supplied to the remote controller. This LED lights only in the case of the indoor unit which is connected to the outdoor unit refrigerant address "0".
LED3 (communication between indoor and outdoor units)	Indicates state of communication between the indoor and outdoor units. Make sure that this LED is always blinking.

9-3. SELF-DIAGNOSIS ACTION TABLE

Note: Refer to the manual of outdoor unit for the details of display such as F, U, and other E.

Error Code	Meaning of error code and detection method	Cause	Countermeasure
P1	**Abnormality of room temperature thermistor (TH1)** ① The unit is in three-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after three minutes. (The unit returns to normal operation, if it has normally reset.) ② Constantly detected during cooling, drying, and heating operation. Short: 90℃ or more Open: -40℃ or less	① Defective thermistor characteristics. ② Contact failure of connector (CN20) on the indoor controller board. (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring. ④ Defective indoor controller board.	①–③ Check resistance value of thermistor. 0℃ ·····15.0kΩ 10℃ ····9.6kΩ 20℃ ····6.3kΩ 30℃ ····4.3kΩ 40℃ ····3.0kΩ If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor breaking of wire or contact failure can be detected. ② Check contact failure of connector (CN20) on the indoor controller board. Refer to 9-7. Turn the power on again and check restart after inserting connector again. ④ Check room temperature display on remote controller. Replace indoor controller board if there is abnormal difference with actual room temperature. Turn the power off, and on again to operate after check.
P2	**Abnormality of pipe temperature thermistor/Liquid (TH2)** ① The unit is in three-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after three minutes. (The unit returns to normal operation, if it has normally reset.) ② Constantly detected during cooling, drying, and heating (except defrosting) operation. Short: 90℃ or more Open: -40℃ or less	① Defective thermistor characteristics. ② Contact failure of connector (CN21) on the indoor controller board. (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring. ④ Defective refrigerant circuit is causing thermistor temperature of 90℃ or more or -40℃ or less. ⑤ Defective indoor controller board.	①–③ Check resistance value of thermistor. For characteristics, refer to (P1) above. ② Check contact failure of connector (CN21) on the indoor controller board. Refer to 9-7. Turn the power on and check restart after inserting connector again. ④ Check pipe <liquid> temperature with remote controller in test run mode. If pipe <liquid> temperature is exclusively low (in cooling mode) or high (in heating mode), refrigerant circuit may have defective. ⑤ Check pipe <liquid> temperature with remote controller in test run mode. If there is exclusive difference with actual pipe <liquid> temperature, replace indoor controller board. Turn the power off, and on again to operate after check.
P4	**Abnormality of drain sensor (DS)** ① Suspensive abnormality, if short/open of thermistor is detected for 30 seconds continuously. Turn off compressor and indoor fan. ② Short/open is detected for 30 seconds continuously during suspensive abnormality. (The unit returns to normal operation, if it has normally reset.) ③ Detect the following condition. • During cooling and drying operation. • In case that pipe <liquid> temperature - room temperature <-10deg (Except defrosting) • When pipe <liquid> temperature or room temperature is short/open temperature. • During drain pomp operation.	① Defective thermistor characteristics ② Contact failure of connector (CN31) on the indoor controller board. (Insert failure). ③ Breaking of wire or contact failure of drain sensor wiring. ④ Defective indoor controller board.	①–③ Check resistance value of thermistor. 0℃ ·····6.0kΩ 10℃ ····3.9kΩ 20℃ ····2.6kΩ 30℃ ····1.8kΩ 40℃ ····1.3kΩ ② Check contact failure of connector (CN31) on the indoor controller board. Refer to 9-7. Turn the power on again and check restart after inserting connector again. ④ Replace indoor controller board if drain pump operates with the line of drain sensor connector CN31-① and ② is short-circuited, and abnormality reappears. Turn the power off, and on again to operate after check.
P5	**Malfunction of drain pump (DP)** ① Suspensive abnormality, if thermistor of drain sensor is let heat itself and temperature rises slightly. Turn off compressor and indoor fan. ② Drain pomp is abnormal if the condition above is detected during suspensive abnormality. ③ Constantly detected during drain pomp operation.	① Malfunction of drain pump ② Defective drain Clogged drain pump Clogged drain pipe ③ Attached drop of water at the drain sensor • Drops of drain trickles from lead wire. • Clogged filter is causing wave of drain. ④ Defective indoor controller board.	① Check if drain-up machine works. ② Check drain function. ③ Check the setting of lead wire of drain sensor and check clogs of the filter. ④ Replace indoor controller board if drain pump operates with the line of drain sensor connector CN31-① and ② is short-circuited and abnormality reappears. Refer to 9-7. Turn the power off, and on again to operate after check.

Error Code	Meaning of error code and detection method	Cause	Countermeasure
P6	**Freezing/overheating protection is working** ① Freezing protection (Cooling mode) The unit is in six-minute resume prevention mode if pipe <liquid or condenser/evaporator> temperature stays under -15℃ for three minutes, three minutes after the compressor started. Abnormal if it stays under -15℃ for three minutes again within 16 minutes after six-minute resume prevention mode. <Frost prevention mode> If pipe <liquid or condenser-evaporator> temperature is 2℃ or below when 16 minutes has passed after compressor starts operating, unit will start operating in frost prevention mode which stops compressor operation. After that, when pipe <liquid or condenser/evaporator> temperature stays 10℃ or more for 3 minutes, frost prevention mode will be released and compressor will restart its operation. ② Overheating protection (Heating mode) The units is in six-minute resume prevention mode if pipe <condenser / evaporator> temperature is detected as over 70℃ after the compressor started. Abnormal if the temperature of over 70℃ is detected again within 10 minutes after six-minute resume prevention mode.	(Cooling or drying mode) ① Clogged filter (reduced airflow) ② Short cycle of air path ③ Low-load (low temperature) operation beyond the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective. ⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (clogs) (Heating mode) ① Clogged filter (reduced airflow) ② Short cycle of air path ③ Over-load (high temperature) operation beyond the tolerance range ④ Defective indoor fan motor • Fan motor is defective. • Indoor controller board is defective. ⑤ Defective outdoor fan control ⑥ Overcharge of refrigerant ⑦ Defective refrigerant circuit (clogs) ⑧ Bypass circuit of outdoor unit is defective.	(Cooling or drying mode) ① Check clogs of the filter. ② Remove shields. ④ Measure the resistance of fan motor's winding. Measure the output voltage of fan's connector (FAN) on the indoor controller board. ※The indoor controller board should be normal when voltage of AC 220~240V is detected while fan motor is connected. Refer to 9-7. ⑤ Check outdoor fan motor. ⑥⑦ Check operating condition of refrigerant circuit. (Heating mode) ① Check clogs of the filter. ② Remove shields. ④ Measure the resistance of fan motor's winding. Measure the output voltage of fan's connector (FAN) on the indoor controller board. ※The indoor controller board should be normal when voltage of AC 220~240V is detected while fan motor is connected. Refer to 9-7. ⑤ Check outdoor fan motor. ⑥~⑧Check operating condition of refrigerant circuit.
P8	**Abnormality of pipe temperature** <Cooling mode> Detected as abnormal when the pipe temperature is not in the cooling range 3 minutes later of compressor start and 6 minutes later of the liquid or condenser/evaporator pipe is out of cooling range. Note 1) It takes at least 9 min. to detect. Note 2) Abnormality P8 is not detected in drying mode. Cooling range : -3 deg ≧ (TH-TH1) TH: Lower temperature between: liquid pipe temperature (TH2) and condenser/evaporator temperature (TH5) TH1: Intake temperature <Heating mode> When 10 seconds have passed after the compressor starts operation and the hot adjustment mode has finished, the unit is detected as abnormal when condenser/evaporator pipe temperature is not in heating range within 20 minutes. Note 3) It takes at least 27 minutes to detect abnormality. Note 4) It excludes the period of defrosting (Detection restarts when defrosting mode is over) Heating range : 3 deg ≦ (TH5-TH1)	① Slight temperature difference between indoor room temperature and pipe <liquid or condenser / evaporator> temperature thermistor • Shortage of refrigerant • Disconnected holder of pipe <liquid or condenser / evaporator> thermistor • Defective refrigerant circuit ② Converse connection of extension pipe (on plural units connection) ③ Converse wiring of indoor/ outdoor unit connecting wire (on plural units connection) ④ Defective detection of indoor room temperature and pipe <condenser / evaporator> temperature thermistor ⑤ Stop valve is not opened completely.	①~④ Check pipe <liquid or condenser / evaporator> temperature with room temperature display on remote controller and outdoor controller circuit board. Pipe <liquid or condenser / evaporator> temperature display is indicated by setting SW2 of outdoor controller circuit board as follows. (Conduct temperature check with outdoor controller circuit board after connecting 'A-Control Service Tool(PAC-SK52ST)'.) ②③Check converse connection of extension pipe or converse wiring of indoor/outdoor unit connecting wire.

Error Code	Meaning of error code and detection method	Cause	Countermeasure
P9	**Abnormality of pipe temperature thermistor / Condenser-Evaporator (TH5)** ① The unit is in three-minute resume protection mode if short/open of thermistor is detected. Abnormal if the unit does not get back to normal within three minutes. (The unit returns to normal operation, if it has normally reset.) ② Constantly detected during cooling, drying, and heating operation (except defrosting) Short: 90℃ or more Open: -40℃ or less	① Defective thermistor characteristics ② Contact failure of connector (CN29) on the indoor controller board. (Insert failure) ③ Breaking of wire or contact failure of thermistor wiring. ④ Temperature of thermistor is 90℃ or more or -40℃ or less caused by defective refrigerant circuit. ⑤ Defective indoor controller board.	①–③ Check resistance value of thermistor. For characteristics, refer to (P1) above. ② Check contact failure of connector (CN29) on the indoor controller board. Refer to 9-7. Turn the power on and check restart after inserting connector again. ④ Operate in test run mode and check pipe <condenser / evaporator> temperature with outdoor controller circuit board. If pipe <condenser / evaporator> temperature is exclusively low (in cooling mode) or high (in heating mode), refrigerant circuit may have defective. ⑤ Operate in test run mode and check pipe <condenser / evaporator> temperature with outdoor control circuit board. If there is exclusive difference with actual pipe <condenser / evaporator> temperature replace indoor controller board. There is no abnormality if none of above comes within the unit. Turn the power off and on again to operate. (In case of checking pipe temperature with outdoor controller circuit board, be sure to connect A-control service tool (PAC-SK52ST).)
E0 or E4	**Remote controller transmission error(E0)/signal receiving error(E4)** ① Abnormal if main or sub remote controller can not receive normally any transmission from indoor unit of refrigerant address “0” for three minutes. (Error code : E0) ② Abnormal if sub remote controller could not receive for any signal for two minutes. (Error code: E0) ① Abnormal if indoor controller board can not receive normally any data from remote controller board or from other indoor controller board for three minutes. (Error code: E4) ② Indoor controller board cannot receive any signal from remote controller for two minutes. (Error code: E4)	① Contact failure at transmission wire of remote controller ② All remote controllers are set as “sub” remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board. ③ Mis-wiring of remote controller. ④ Defective transmitting receiving circuit of remote controller ⑤ Defective transmitting receiving circuit of indoor controller board of refrigerant address “0”. ⑥ Noise has entered into the transmission wire of remote controller.	① Check disconnection or looseness of indoor unit or transmission wire of remote controller. ② Set one of the remote controllers “main”. If there is no problem with the action above. ③ Check wiring of remote controller. • Total wiring length: max.500m (Do not use cablex 3 or more) • The number of connecting indoor units: max.16units • The number of connecting remote controller: max.2units When it is not the above-mentioned problem of ①~③ ④ Diagnose remote controllers. a) When “RC OK” is displayed, Remote controllers have no problem. Put the power off, and on again to check. If abnormality generates again, replace indoor controller board. b) When “RC NG” is displayed, Replace remote controller. c) When “RC E3” is displayed, d) When “ERC 00-06” is displayed, [c),d)➜Noise may be causing abnormality.] ✻ If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address “0” may be abnormal.
E3 or E5	**Remote controller transmission error(E3)/signal receiving error(E5)** ① Abnormal if remote controller could not find blank of transmission path for six seconds and could not transmit. (Error code: E3) ② Remote controller receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Error code: E3) ① Abnormal if indoor controller board could not find blank of transmission path. (Error code: E5) ② Indoor controller board receives transmitted data at the same time, compares the data,and when detecting it, judges different data to be abnormal 30 continuous times. (Error code: E5)	① Two remote controller are set as “main.” (In case of 2 remote controllers) ② Remote controller is connected with two indoor units or more. ③ Repetition of refrigerant address. ④ Defective transmitting receiving circuit of remote controller. ⑤ Defective transmitting receiving circuit of indoor controller board. ⑥ Noise has entered into transmission wire of remote controller.	① Set a remote controller to main, and the other to sub. ② Remote controller is connected with only one indoor unit. ③ The address changes to a separate setting. ④~⑥ Diagnose remote controller. a) When “RC OK”is displayed, remote controllers have no problem. Put the power off,and on again to check. When becoming abnormal again, replace indoor controller board. b)When “RC NG”is displayed, replace remote controller. c)When “RC E3”or “ERC 00-66”is displayed, noise may be causing abnormality.

Error Code	Meaning of error code and detection method	Cause	Countermeasure
E6	**Indoor/outdoor unit communication error (Signal receiving error)** ① Abnormal if indoor controller board cannot receive any signal normally for six minutes after putting the power on. ② Abnormal if indoor controller board cannot receive any signal normally for three minutes. ③ Consider the unit abnormal under the following condition: When two or more indoor units are connected to one outdoor unit, indoor controller board cannot receive a signal for three minutes from outdoor controller circuit board, a signal which allows outdoor controller circuit board to transmit signals.	① Contact failure, short circuit or, mis-wiring (converse wiring) of indoor/outdoor unit connecting wire ② Defective transmitting receiving circuit of indoor controller board ③ Defective transmitting receiving circuit of indoor controller board ④ Noise has entered into indoor/ outdoor unit connecting wire.	✻ Check LED display on the outdoor control circuit board. (Connect A-control service tool, PAC-SK52ST.) Refer to EA-EC item if LED displays EA-EC. ① Check disconnection or looseness of indoor/ outdoor unit connecting wire of indoor unit or outdoor unit. Check all the units in case of twin triple indoor unit system. ②-④ Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board or outdoor controller circuit board. ✻ Other indoor controller board may have defective in case of twin triple indoor unit system.
E7	**Indoor/outdoor unit communication error (Transmitting error)** Abnormal if "1" receiving is detected 30 times continuously though indoor controller board has transmitted "0".	① Defective transmitting receiving circuit of indoor controller board ② Noise has entered into power supply. ③ Noise has entered into outdoor control wire.	①-③ Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board.
Fb	**Abnormality of indoor controller board** Abnormal if data cannot be normally read from the nonvolatile memory of the indoor controller board.	① Defective indoor controller board.	① Replace indoor controller board.
E1 or E2	**Abnormality of remote controller control board** ① Abnormal if data cannot be normally read from the nonvolatile memory of the remote controller control board. (Error code: E1) ② Abnormal if the clock function of remote controller cannot be normally operated. (Error code: E2)	① Defective remote controller.	① Replace remote controller.

9-4. TROUBLESHOOTING BY INFERIOR PHENOMENA

Note: Refer to the manual of outdoor unit for the detail of remote controller.

Phenomena	Cause	Countermeasure
(1)LED2 on indoor controller board is off.	• When LED1 on indoor controller board is also off.	
	① Power supply of rated voltage is not supplied to outdoor unit.	① Check the voltage of outdoor power supply terminal block (L, N) or (L_3, N). • When AC 220~240V is not detected. Check the power wiring to outdoor unit and the breaker. • When AC 220~240V is detected. —Check ② (below).
	② Defective outdoor controller circuit board.	② Check the voltage between outdoor terminal block S1 and S2. • When AC 220~240V is not detected. Check the fuse on outdoor controller circuit board. Check the wiring connection. • When AC 220~240V is detected. —Check ③ (below).
	③ Power supply of 220~240V is not supplied to indoor unit.	③ Check the voltage between indoor terminal block S1 and S2. • When AC 220~240V is not detected. Check indoor/outdoor unit connecting wire for mis-wiring. • When AC 220~240V is detected. —Check ④ (below).
	④ Defective indoor power board.	④ Check voltage output from CN2S on indoor power board (DC13.1V). Refer to 9-7-2. • When no voltage is output. Check the wiring connection. • When output voltage is between DC12.5V and DC13.7V. —Check ⑤ (below).
	⑤ Defective indoor controller board.	⑤ Check the wiring connection between indoor controller board and indoor power board. Check the fuse on indoor controller board. If no problems are found, indoor controller board is defective.
	(For the separate indoor/outdoor unit power supply system)	
	① Power supply of 220~240V AC is not supplied to indoor unit.	① Check the voltage of indoor power supply terminal block (L,N). • When AC220~240V is not detected. Check the power supply wiring. • When AC220~240V is detected. -Check ② (below).
	② The connectors of the optional replacement kit are not used.	② Check that there is no problem in the method of connecting the connectors. • When there are problems in the method of connecting the connectors. Connect the connector correctly referring to installation manual of an optional kit. • When there is no problem in the method of connecting the connectors. -Check ③ (below).
	③ Defective indoor controller board.	③ Check voltage output from CNDK on indoor controller board. • When AC220~240V is not detected. Check the fuse on indoor controller board. Check the wiring connection between indoor power supply terminal block and CND on indoor controller board. • When AC220~240V is detected. -Check ④ (below).
	④ Defective indoor power board.	④ Check voltage output from CN2S on indoor power board. • When no voltage output. Check the wiring connection between CNDK on indoor controller board and CNSK on indoor power board. If no problem are found,indoor power board is defective. • When DC12.5~13.7V is detected. Check the wiring connection between CN2S on indoor power board and CN2D on indoor power board. If no problem are found,indoor controller board is defective.
	• When LED1 on indoor controller board is lit. ① Mis-setting of refrigerant address for outdoor unit (There is no unit corresponding to refrigerant address “0”.)	① Reconfirm the setting of refrigerant address for outdoor unit Set the refrigerant address to “0”. (For grouping control system under which 2 or more outdoor units are connected, set one of the units to “0”.) Set refrigerant address using SW1 (3-6) on outdoor controller circuit board.

Note: Refer to the manual of outdoor unit for the detail of remote controller.

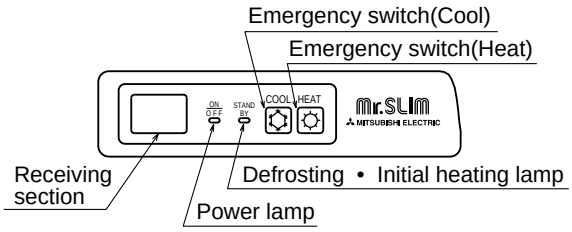
Phenomena	Cause	Countermeasure
(2)LED2 on indoor controller board is blinking.	• When LED1 on indoor controller board is also blinking. Connection failure of indoor/outdoor unit connecting wire	Check indoor/outdoor unit connecting wire for connection failure.
	• When LED1 is lit. ① Mis-wiring of remote controller wires Under twin triple indoor unit system, 2 or more indoor units are wired together. ② Refrigerant address for outdoor unit is wrong or not set. Under grouping control system, there are some units whose refrigerant address is 0. ③ Short-cut of remote controller wires ④ Defective remote controller	① Check the connection of remote controller wires in case of twin triple indoor unit system. When 2 or more indoor units are wired in one refrigerant system, connect remote controller wires to one of those units. ② Check the setting of refrigerant address in case of grouping control system. If there are some units whose refrigerant addresses are 0 in one group, set one of the units to 0 using SW1 (3-6) on outdoor controller circuit board. ③④ Remove remote controller wires and check LED2 on indoor controller board. • When LED2 is blinking, check the short-cut of remote controller wires. • When LED2 is lit, connect remote controller wires again and: if LED2 is blinking, remote controller is defective; if LED2 is lit, connection failure of remote controller terminal block etc. has returned to normal.
(3)Upward/downward vane performance failure	① The vane is not downward during defrosting and heat preparation and when the thermostat is OFF in HEAT mode. (Working of COOL protection function) ② Vane motor does not rotate. • Defective vane motor • Breaking of wire or connection failure of connector • Up/down vane setting is “No vanes”. ③ Upward/downward vane does not work. • The vane is set to fixed position.	① Normal operation (The vane is set to horizontal regardless of remote control.) ② Check ② (left). • Check the vane motor. (Refer to “How to check the parts”.) • Check for breaking of wire or connection failure of connector. • Check “Up/down vane setting”. (Unit function selection by remote controller). ③ Normal operation (Each connector on vane motor side is disconnected.)
(4)Receiver for wireless remote controller	① Weak batteries of wireless remote controller. ② Contact failure of connector (CNB) on wireless remote controller board. (Insert failure) ③ Contact failure of connector (CN90) on indoor controller board.(Insert failure) ④ Contact failure of connector between wireless remote controller board and indoor controller board.	① Replace batteries of wireless remote controller. ②~④ Check contact failure of each connector. If no problems are found of connector, replace indoor controller board. When the same trouble occurs even if indoor controller board is replaced, replace wireless remote controller board.

9-5. EMERGENCY OPERATION

9-5-1. When wireless remote controller troubles or its battery is exhausted

1. Emergency operation is available in such a case using emergency operation switch equipped next to the receiver of indoor unit.
2. To start operation
   • Cooling Operation·····Press (Cooling) switch.
   • Heating Operation·····Press (Heating) switch.

※When the unit starts operating, the power lamp is lit.



※Emergency operation will be performed as follows.

Mode	Cooling	Heating
Set temperature	24℃	24℃
Fan speed	High	High
Airflow direction	Horizontal (30deg)	Downward (70deg)

3. To stop operation
   • Press either emergency operation switch (cooling/heating).

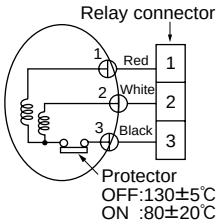
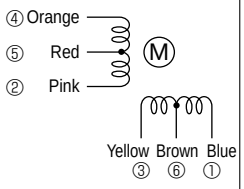
9-5-2. When wired remote controller or indoor unit micro computer troubles

1. If there is not any other wrong when trouble occures, emergency operation starts as the indoor controller board switch (SWE) is set to ON.
   During the emergency operation the indoor unit is as follows;
   (1) Indoor fan high speed operation (2) Drain-up machine operation

2. When emergency operating for COOL or HEAT, setting of the switch (SWE) in the indoor controller board and outdoor unit emergency operation are necessary.

3. Check items and notices as the emergency operation
   (1) Emergency operation cannot be used as follows;
      • When the outdoor unit is something wrong.
      • When the indoor fan is something wrong.
      • When drain over flow protected operation is detected during self-diagnosis. (Error code : P5)
   (2) Emergency operation will be serial operation by the power supply ON/OFF.
      ON/OFF or temperature, etc. adjustment is not operated by the remote controller.
   (3) Do not operate for a long time as cold air is blown when the outdoor unit starts defrosting operation during heat emergency operation.
   (4) Cool emergency operation must be within 10 hours at most. It may cause heat exchanger frosting in the indoor unit.
   (5) After completing the emergency operation, return the switch setting, etc. in former state.
   (6) Since vane does not work at emergency operation, position the vane manually and slowly.

9-6. HOW TO CHECK THE PARTS
PKH-P60FALH, PKH-P71FALH, PKH-P100FALH
PKA-RP60FAL, PKA-RP71FAL, PKA-RP100FAL

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (TH1)
Pipe temperature thermistor (TH2)
Condenser/evaporator temperature thermistor (TH5)</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></td></tr>
<tr><td>Fan motor
 
</td><td>Measure the resistance between the terminals using a tester.
(Winding temperature 20℃)
<table><tr><th rowspan="2">Motor terminal
or
Relay connector</th><th colspan="2">Normal</th><th rowspan="2">Abnormal</th></tr><tr><th>60, 71</th><th>100</th></tr><tr><td>Red–Black</td><td>99.5Ω</td><td>62.6Ω</td><td rowspan="2">Open or short</td></tr><tr><td>White–Black</td><td>103.9Ω</td><td>74.0Ω</td></tr></table></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">186~214Ω</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>Heater
(Only PKH)</td><td>Measure the resistance of each heater element by using a tester.
<table><tr><th colspan="2">Normal</th><th>Abnormal</th></tr><tr><td>60, 71</td><td>100</td><td rowspan="3">Open or short</td></tr><tr><td>18.9Ω</td><td>16.5Ω</td></tr><tr><td>700W 240V</td><td>800W 240V</td></tr></table></td></tr>
<tr><td>Contactor
(for heater)
(Only PKH)</td><td>Measure the resistance between the terminals using a tester.
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>6 — 88H — 1
160Ω</td><td>Open or short</td></tr></table></td></tr>
</table>

<Thermistor Characteristic graph>

Thermistor for lower temperature

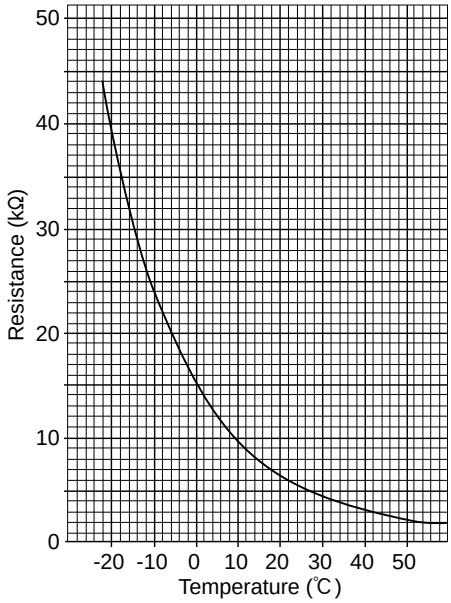
Room temperature thermistor(TH1)
Pipe temperature thermistor(TH2)
Condenser/evaporator temperature thermistor(TH5)

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

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

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

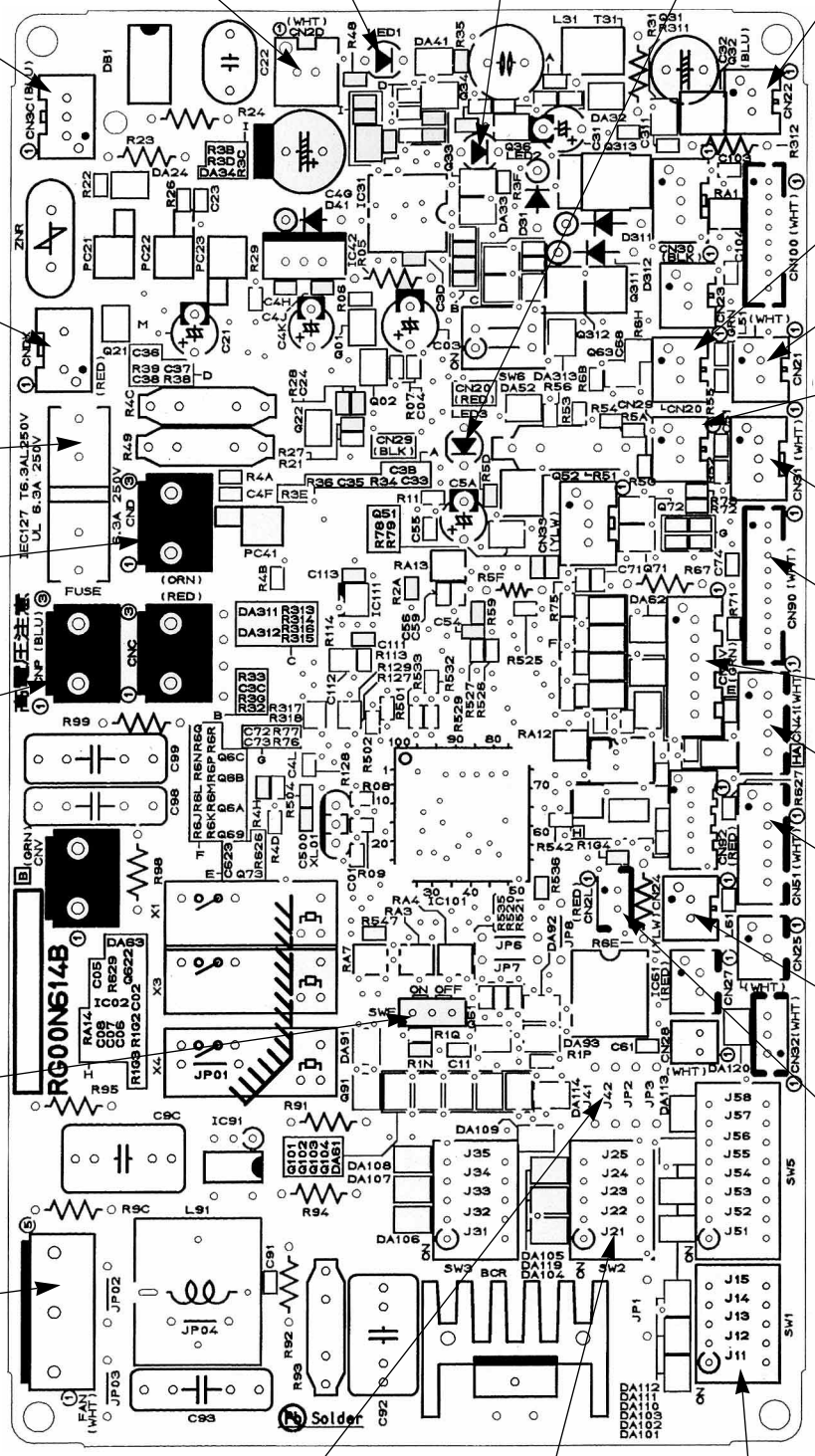
< Thermistor for lower temperature >



9-7. TEST POINT DIAGRAM

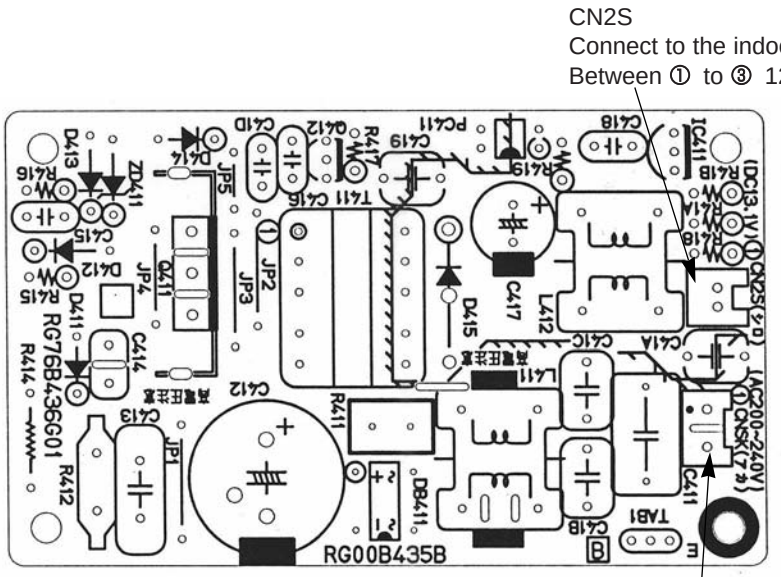
9-7-1. Indoor controller board

PKA-RP60FAL PKH-P60FALH
PKA-RP71FAL PKH-P71FALH
PKA-RP100FAL PKH-P100FALH



9-7-2. Indoor power board

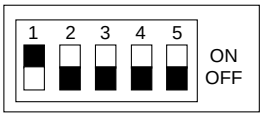
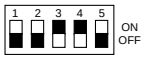
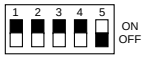
PKA-RP60FAL PKH-P60FALH
PKA-RP71FAL PKH-P71FALH
PKA-RP100FAL PKH-P100FALH



9-8. FUNCTIONS OF DIP SWITCH AND JUMPER WIRE

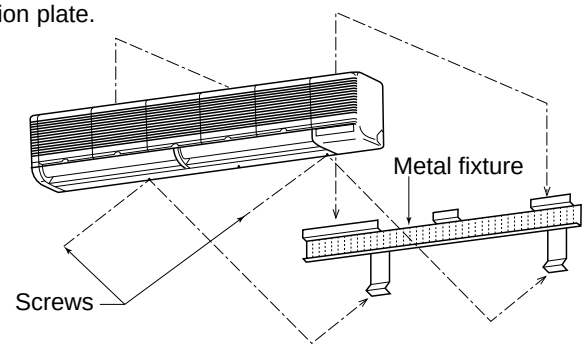
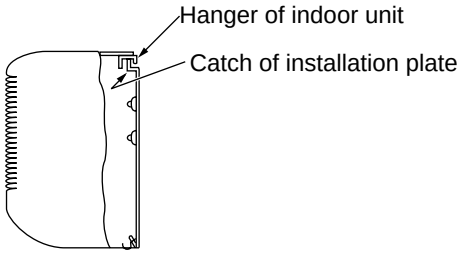
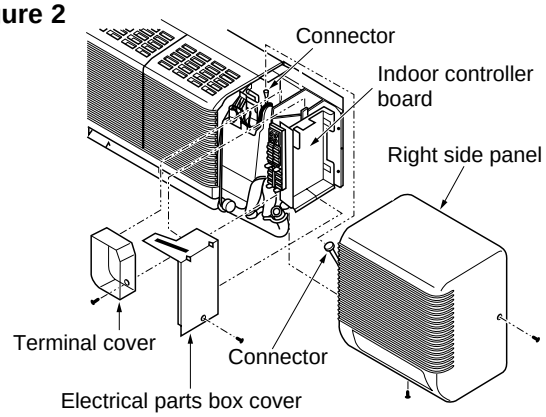
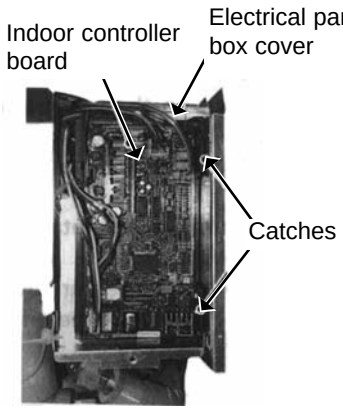
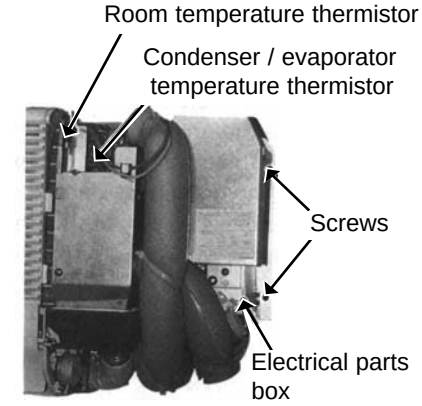
Each function is controlled by the dip switch and the jumper wire on control p.c. board.
SW1 and SW2 are equipped only for service parts.
Model setting and capacity setting are memorized in the nonvolatile memory of the control p.c. board of the unit.

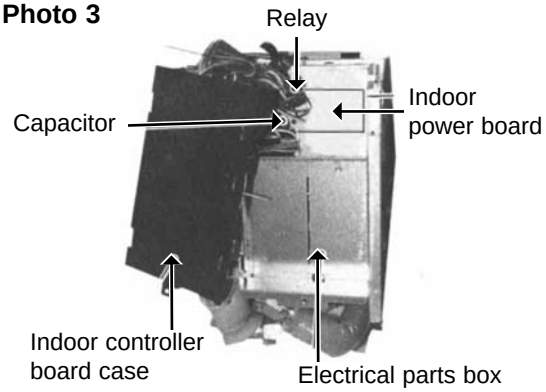
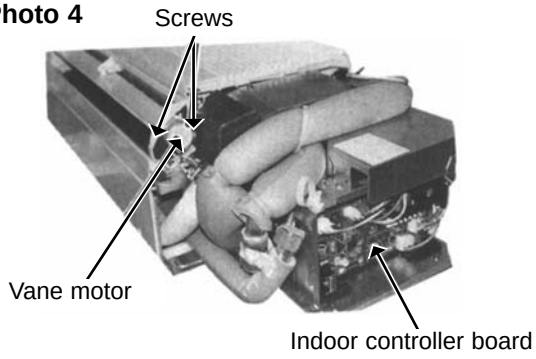
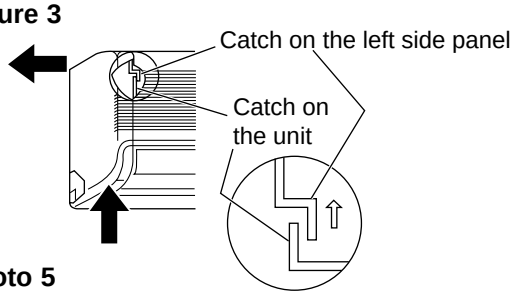
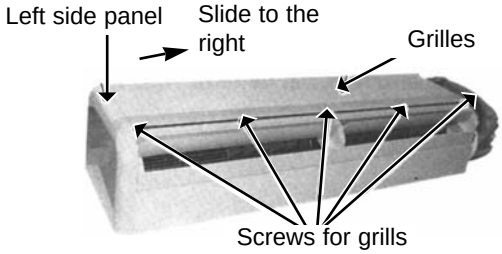
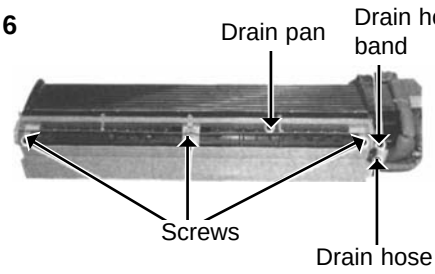
(Marks in the table below) Jumper wire (○ : Short × : Open)

<table>
<tr><th>Jumper wire</th><th>Functions</th><th>Setting by the dip switch and jumper wire</th><th>Remarks</th></tr>
<tr><td>SW1</td><td>Model settings</td><td>For service board
 
</td><td></td></tr>
<tr><td>SW2</td><td>Capacity settings</td><td>
<table>
<tr><th>Models</th><th>Service board</th></tr>
<tr><td>PKA-RP60FAL
PKH-P60FALH</td><td> 
</td></tr>
<tr><td>PKA-RP71FAL
PKH-P71FALH</td><td> 
</td></tr>
<tr><td>PKA-RP100FAL
PKH-P100FALH</td><td> 
</td></tr>
</table>
</td><td></td></tr>
<tr><td>J41
J42</td><td>Pair number setting with wireless remote controller</td><td>
<table>
<tr><th rowspan="2">Wireless remote controller setting</th><th colspan="2">Control PCB setting</th></tr>
<tr><th>J41</th><th>J42</th></tr>
<tr><td>0</td><td>○</td><td>○</td></tr>
<tr><td>1</td><td>×</td><td>○</td></tr>
<tr><td>2</td><td>○</td><td>×</td></tr>
<tr><td>3 ~ 9</td><td>×</td><td>×</td></tr>
</table>
</td><td><Settings at time of factory shipment>
Wireless remote controller: 0
Control PCB: ○ (for both J41 and J42)
Four pair number settings are supported.
The pair number settings of the wireless remote controller and indoor control PCB (J41/J42) are given in the table on the left.
('×' in the table indicates the jumper line is disconnected.)</td></tr>
<tr><td>JP1</td><td>Unit type setting</td><td>
<table>
<tr><th>Model</th><th>JP1</th></tr>
<tr><td>Without TH5</td><td>○</td></tr>
<tr><td>With TH5</td><td>×</td></tr>
</table>
</td><td>There is no jumper (JP1) because these models have the cond./eva. temperature thermistor (TH5).</td></tr>
<tr><td>JP3</td><td>Indoor controller board type setting</td><td>
<table>
<tr><th>Indoor controller board type</th><th>JP3</th></tr>
<tr><td>Factory shipment</td><td>×</td></tr>
<tr><td>Service parts</td><td>○</td></tr>
</table>
</td><td></td></tr>
</table>

10 DISASSEMBLY PROCEDURE

PKH-P60FALH, PKA-RP60FAL
PKH-P71FALH, PKA-RP71FAL

OPERATING PROCEDURE	PHOTOS&ILLUSTRATION
1. Removing the lower side of the indoor unit from the installation plate (1) Remove the 2 screws. Hang the indoor unit hangers to the catches on the installation plate. 	**Figure 1** 
2. Removing the right side panel (1) Remove the 2 screws of the right side panel:one on the bottom and the other on the upper right-hand side. (2) Disconnect the connector from the adapter case. (3) Sliding the right side panel to the right, pull it out toward you.	**Figure 2** 
3. Removing the indoor controller board (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Disconnect the connectors on the indoor controller board. (4) To unhook the catches on the right-hand side of the indoor controller board, pull the left-hand side toward you and lift up the cover to the right. Then the indoor controller board can be removed.	**Photo 1** 
4. Removing the electrical parts box (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Remove the room temperature thermistor and the condenser / evaporator temperature thermistor. (4) Disconnect the vane motor connector on the indoor controller board. (5) Remove the 2 screws of the electrical parts box. (6) Disconnect the connector of the heater lead wire connector. (7) Disconnect the connector of the fan motor lead wire. (8) Remove the electrical parts box.	**Photo 2** 

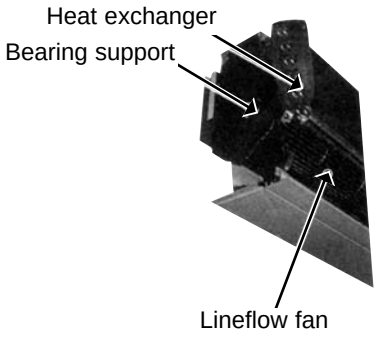
OPERATING PROCEDURE	PHOTOS&ILLUSTRATION
(9) Remove the screws of the indoor controller board case, and pull out the indoor controller board case. Then the indoor power board, the fan motor capacitor and the heater relay can be serviced.	**Photo 3** 
5. Removing the vane motor (1) Remove the right side panel. (2) Remove the screw of the electrical parts box cover, and remove the cover. (3) Remove the 2 screws of the vane motor, and remove the motor from the shaft. (4) Disconnect the vane motor connector on the indoor controller board.	**Photo 4** 
6. Removing the intake grilles (1) Remove the right side panel. (2) To remove the left side panel, remove the screw on the bottom and the screw on the upper left-hand side. (See Figure 3.) 1. Press up this side of the left side panel to unhook the catch on the panel from the catch on the unit. 2. Slide the left side panel to the left to remove the panel. Note: Fix the unit to the metal fixture securely (3) Remove the air filters. (4) Hold and press the centre cover to remove. (5) Remove the screws of the grilles. (6) Pull the lower side of the grille toward you and slide the upper to the right to remove the grilles.	**Figure 3**  **Photo 5** 
7. Removing the drain pan (1) Remove the left and right side panels. (2) Remove the grilles. (3) Remove the electrical parts box cover. (4) Loosen the drain hose band to remove. (5) Remove the 3 screws of the drain pan, and slide the drain pan toward you to remove.	**Photo 6** 

OPERATING PROCEDURE

8. Removing the line flow fan and the fan motor

(1) Remove the left and right side panels.
(2) Remove the grilles.
(3) Remove the electrical parts box.
(4) Remove the drain pan.
(5) Loosen the screw that fixes the line flow fan to the fan motor. (See Photo 7.)
(6) Remove the 4 screws of the motor fixture, and remove the fan motor and the motor fixture at a time (See Photo 8.)
(7) Remove the screws of the left and right motor supports, and remove the motor supports and the fan motor. (See Photo 9.)
(8) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
(9) Remove the screw of the centre support, and remove the support. (See Photo 10.)
(10) Pull the left-hand side of the heat exchanger toward you, and remove the line flow fan.

Photo 11



9. Removing the electrical heater. (PKH only)

(1) Remove the left and right side panels.
(2) Remove the grills.
(3) Remove the drain pan.
(4) Loosen the screw that fixes the line flow fan to the fan motor.(See Photo 7.)
(5) Remove the screw of the centre support, and remove the support. (See Photo 10.)
(6) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
(7) Pull the left-hard side of the heat exchanger toward you, and remove the line flow fan.
(8) Remove the heater fixing screws (1 screw each on right and left sides), and slide the heater element to the left to remove the heater.

PHOTOS

Photo 7

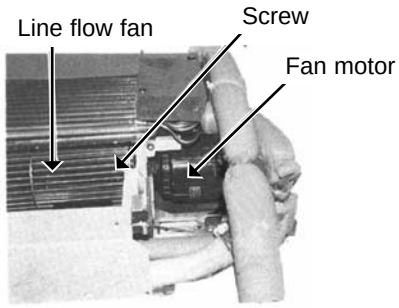


Photo 8

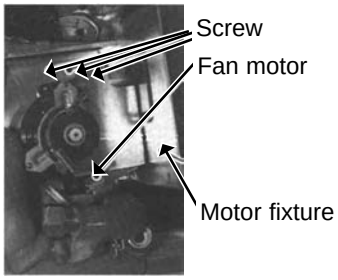


Photo 9

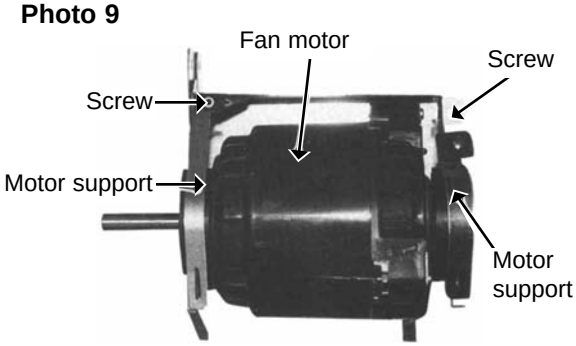


Photo 10

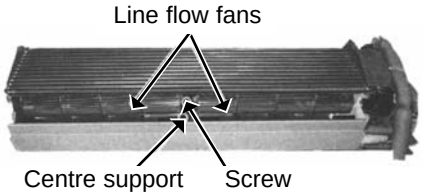
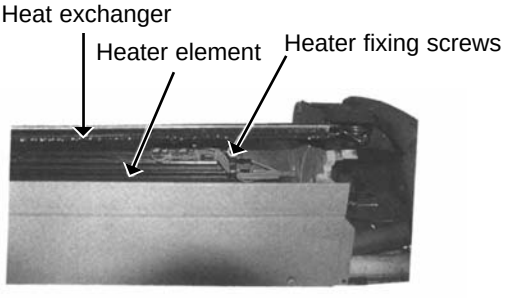
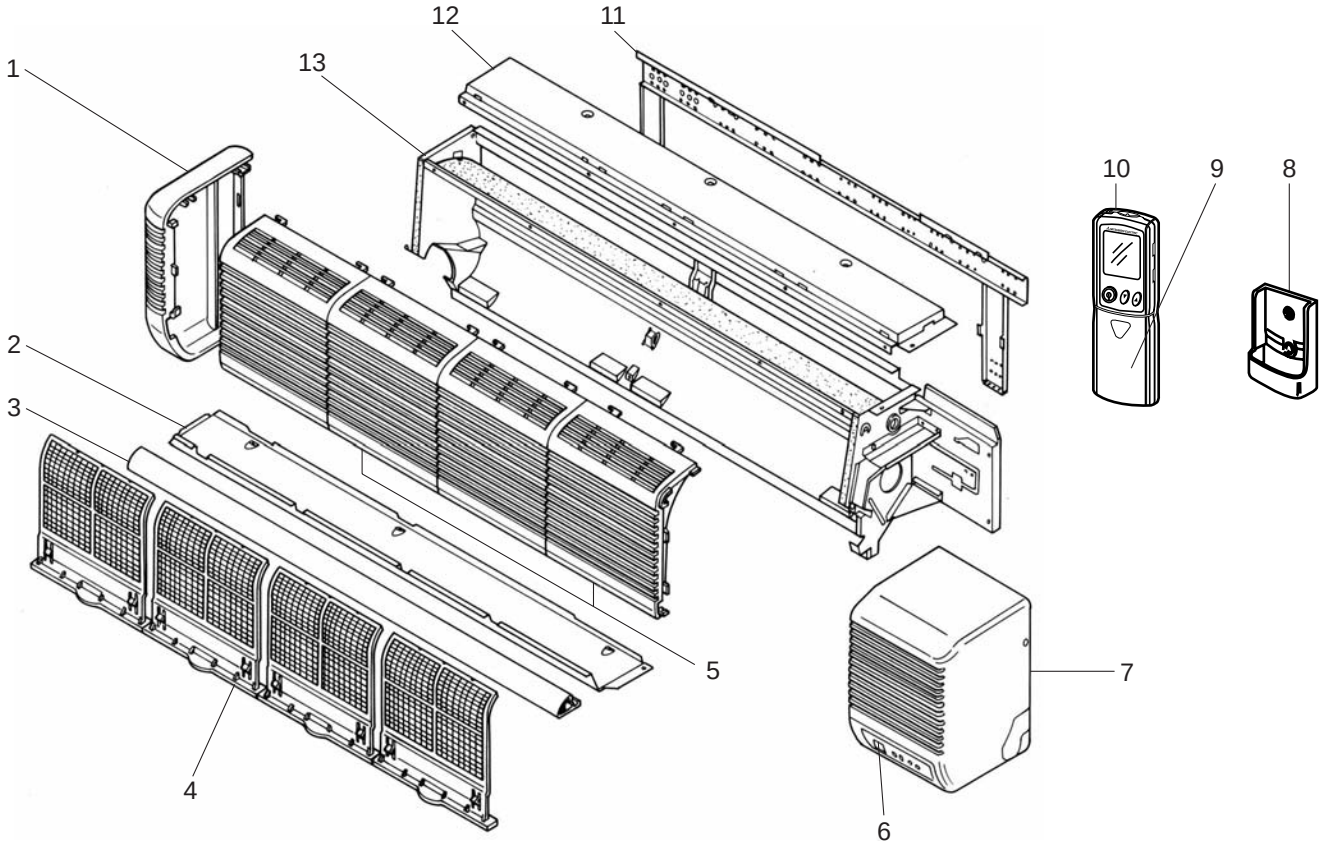


Photo 12



11 PARTS LIST

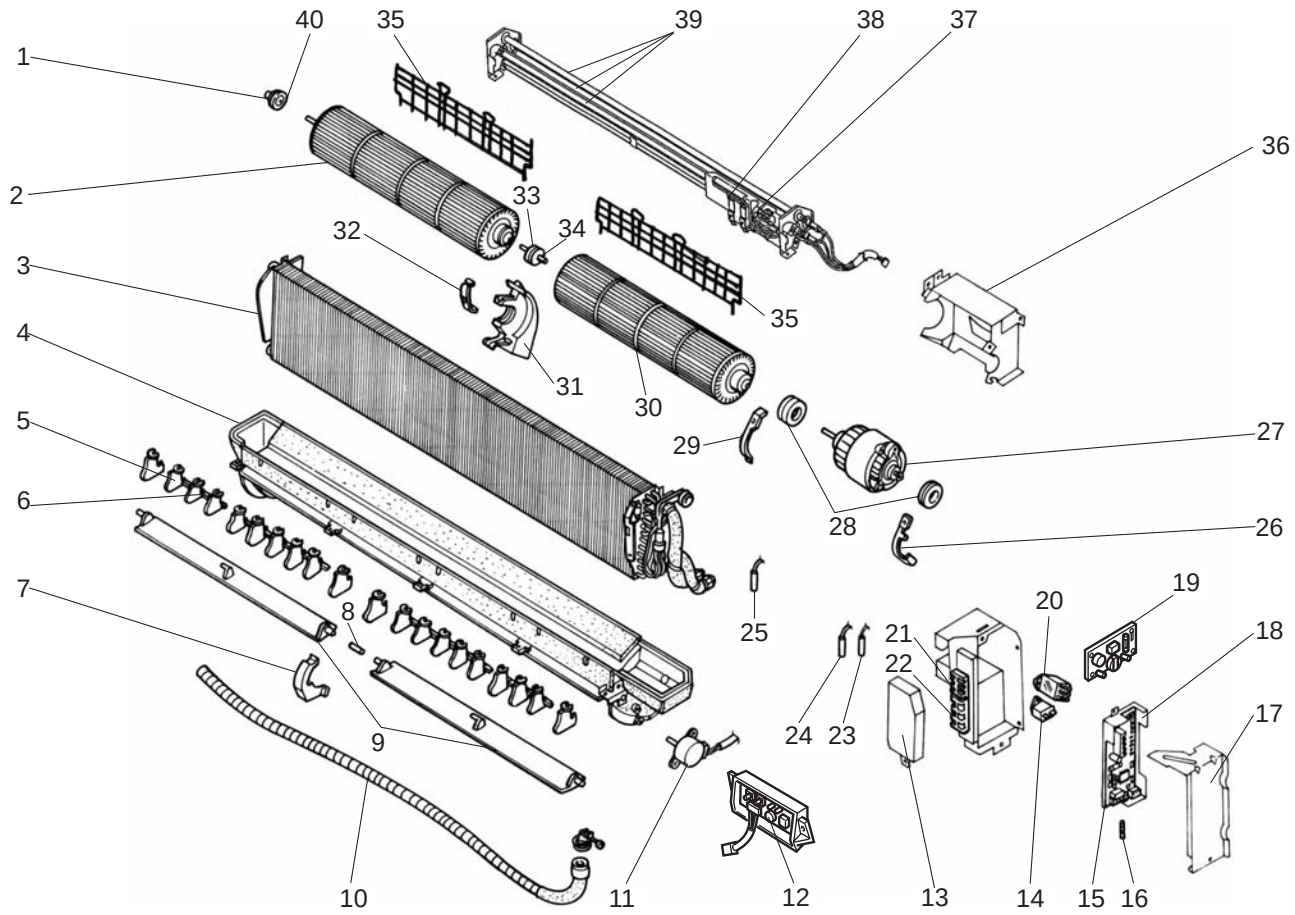
STRUCTURAL PARTS
PKA-RP60FAL PKH-P60FALH
PKA-RP71FAL PKH-P71FALH



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

No.	Part No.	Part Name	Specifications	Q'ty/set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKA- RP60FAL RP71FAL	PKH- P60FALH P71FALH				Unit	Amount
1	R01 12G 662	LEFT SIDE PANEL		1	1					
2	R01 E01 812	UNDER PLATE		1	1					
3	R01 E00 811	NOSE		1	1					
4	R01 A17 500	AIR FILTER		4	4					
5	R01 12G 691	INTAKE GRILLE		2	2					
6	R01 24K 658	RECEIVER		1	1		RU			
7	T7W E05 661	RIGHT SIDE PANEL		1	1					
8	R01 E00 075	WIRELESS REMOTE CONTROLLER HOLDER		1	1					
9	R01 E01 049	WIRELESS REMOTE CONTROLLER DOOR		1	1					
10	T7W E06 714	WIRELESS REMOTE CONTROLLER		1	1					
11	R01 12G 808	BACK PLATE		1	1					
12	R01 E01 641	TOP PLATE		1	1					
13	—	BOX ASSEMBLY		1		(RG00A734GG9)				
	—	BOX ASSEMBLY			1	(RG00A734GH1)				
⑭	R01 12G 523	DRAIN SOKET		1	1					

PKH-P60FALH, PKA-RP60FAL ELECTRICAL PARTS
PKH-P71FALH, PKA-RP71FAL



No.	Part No.	Part Name	Specification	Q'ty/set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKH-P		PKA- RP					Unit	Amount
				60FALH	71FALH	60FAL	71FAL					
1	R01 Z61 102	BEARING MOUNT		1	1	1	1					
2	R01 12G 114	LEFT LINEFLOW FAN		1	1							
	R01 13G 114	LEFT LINEFLOW FAN				1	1					
3	T7W E57 480	HEAT EXCHANGER				1						
	R01 E61 480	HEAT EXCHANGER		1								
	R01 E62 480	HEAT EXCHANGER			1		1					
4	T7W E13 529	DRAIN PAN		1	1	1	1					
5	—	GUIDE VANE		20	20	20	20	(BG25J821H02)				
6	—	ARM		3	3	3	3	(BG25H301H02)				
7	R01 12G 621	CENTER COVER		1	1	1	1					
8	R01 12G 063	JOINT SHAFT		1	1	1	1					
9	R01 12G 002	AUTO VANE		2	2	2	2					
10	R01 KV5 527	DRAIN HOSE		1	1	1	1					
11	R01 E05 223	VANE MOTOR		1	1	1	1		MV			
12	R01 E03 317	WIRELESS ADAPTER CONTROLLER BOARD		1	1	1	1		W.B			
13	—	TERMINAL COVER		1	1	1	1	(BG02J608H07)				
14	R01 588 255	CAPACITOR	2.0μF 440V	1	1	1	1		C			
15	T7W E40 310	INDOOR CONTROLLER BOARD		1	1	1	1		I.B			

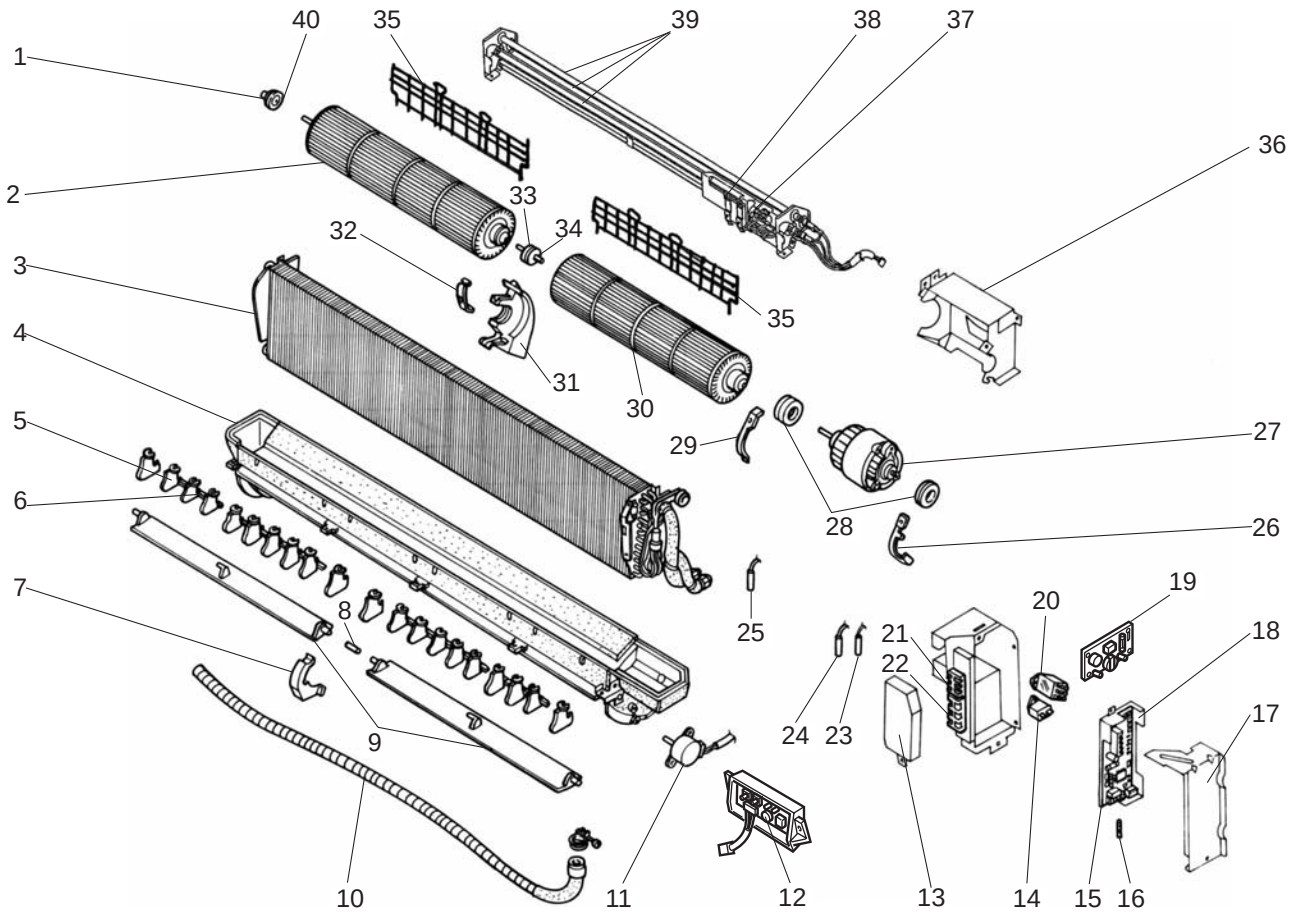
Continued to the next page.

From the previous page.

Part numbers 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	
				PKH-P		PKA-RP					Unit	Amount
				60FALH	71FALH	60FAL	71FAL					
16	R01 E02 239	FUSE	250V 6.3A	1	1	1	1		FUSE			
17	—	CONTROLLER COVER		1	1	1	1	(BG02A648G03)				
18	—	CONTROLLER CASE		1	1	1	1	(BG25J080H02)				
19	R01 E02 313	INDOOR POWER BOARD		1	1	1	1		P.B			
20	R01 71G 215	HEATER CONTACTOR	JC-1A DC12V	1	1				88H			
21	T7W E23 716	TERMINAL BLOCK	3P(S1, S2, S3)	1	1	1	1		TB4			
22	T7W A14 716	TERMINAL BLOCK	3P(L,N,⏚)	1	1				TB2			
23	T7W E12 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1		TH1			
24	R01 E34 202	CONDENSER / EVAPORATOR TEMPERATURE THERMISTOR		1	1	1	1		TH5			
25	R01 E02 202	PIPE TEMPERATURE THERMISTOR		1	1	1	1		TH2			
26	—	MOTOR BAND		1	1	1	1	(BG02H065H01)				
27	R01 12G 220	FAN MOTOR	PN4S40-K	1	1	1	1		MF			
28	R01 12G 105	RUBBER MOUNT		2	2	2	2					
29	—	MOTOR BAND		1	1	1	1	(BG02H178H01)				
30	R01 12G 115	RIGHT LINEFLOW FAN		1	1							
	R01 13G 115	RIGHT LINEFLOW FAN				1	1					
31	—	CENTER SUPPORT		1	1	1	1	(BG00R259G07)				
32	—	BEARING BAND		1	1	1	1	(BG02L462H02)				
33	R01 KV5 102	BEARING MOUNT		1	1	1	1					
34	R01 12G 103	SLEEVE BEARING		1	1	1	1					
35	T7W B02 675	FAN GUARD		2	2	2	2					
36	—	MOTOR LEG		1	1	1	1	(BG02A534H16)				
37	R01 230 700	HEATER THERMAL SWITCH	70°C OFF 50°C ON	1	1				26H			
38	R01 12G 706	THERMAL FUSE	117°C 10A 250V	1	1				FS1,2			
39	T7W 587 300	HEATER	240V 700W	3	3				H1			
40	R01 005 103	SLEEVE BEARING		1	1	1	1					
㊶	R01 20J 303	INSULATOR		1	1							

PKH-P100FALH, PKA-RP100FAL ELECTRICAL PARTS



No.	Part No.	Part Name	Specification	Q'ty/set		Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PKH-P	PKA- RP				Unit	Amount
				100FALH	100FAL					
1	R01 Z61 102	BEARING MOUNT		1	1					
2	R01 16G 114	LEFT LINEFLOW FAN		1						
	R01 17G 114	LEFT LINEFLOW FAN			1					
3	T7W E22 480	HEAT EXCHANGER		1						
	T7W E58 480	HEAT EXCHANGER			1					
4	T7W E14 529	DRAIN PAN		1	1					
5	—	GUIDE VANE		26	26	(BG25J821H02)				
6	—	ARM		4	4	(BG25H301H02)				
7	R01 12G 621	CENTER COVER		1	1					
8	R01 12G 063	JOINT SHAFT		1	1					
9	R01 16G 002	AUTO VANE		2	2					
10	R01 KV5 527	DRAIN HOSE		1	1					
11	R01 E05 223	VANE MOTOR		1	1		MV			
12	R01 E03 317	WIRELESS ADAPTER CONTROLLER BOARD		1	1		W.B			
13	—	TERMINAL COVER		1	1	(BG02J608H07)				
14	R01 576 255	CAPACITOR	3.0μF 440V	1	1		C			
15	T7W E40 310	INDOOR CONTROLLER BOARD		1	1		I.B			

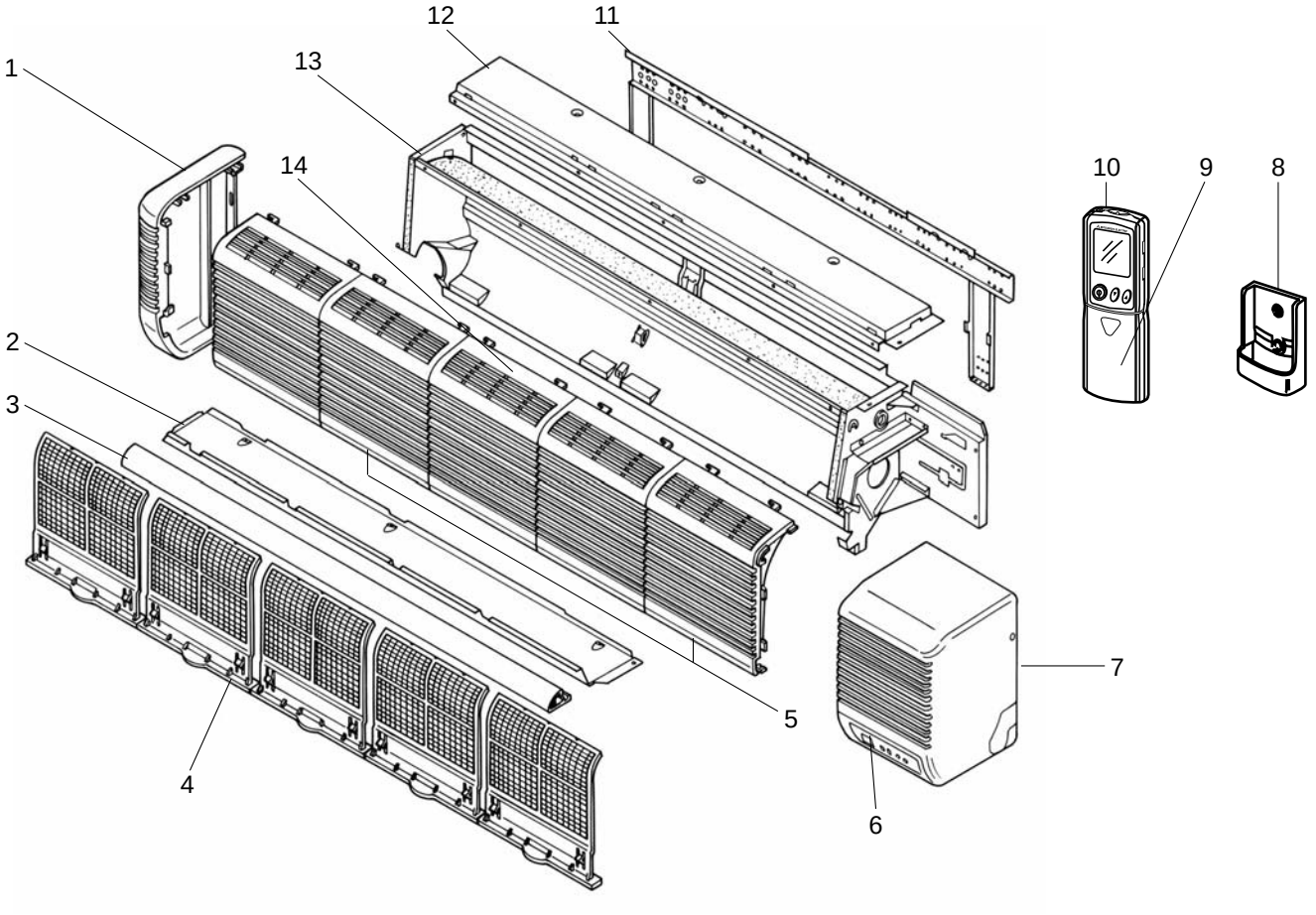
Continued to the next page.

From the previous page.

Part numbers 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	
				PKH-P	PKA-RP				Unit	Amount
				100FALH	100FAL					
16	R01 E02 239	FUSE	250V 6.3A	1	1		FUSE			
17	—	CONTROLLER COVER		1	1	(BG02A648G03)				
18	—	CONTROLLER CASE		1	1	(BG25J080H02)				
19	R01 E02 313	INDOOR POWER BOARD		1	1		P.B			
20	R01 71G 215	HEATER CONTACTOR	JC-1A DC12V	1			88H			
21	T7W E23 716	TERMINAL BLOCK	3P(S1, S2, S3)	1	1		TB4			
22	T7W A14 716	TERMINAL BLOCK	3P(L,N,⏚)	1			TB2			
23	T7W E12 202	ROOM TEMPERATURE THERMISTOR		1	1		TH1			
24	R01 E34 202	CONDENSER / EVAPORATOR TEMPERATURE THERMISTOR		1	1		TH5			
25	R01 E02 202	PIPE TEMPERATURE THERMISTOR		1	1		TH2			
26	—	MOTOR BAND		1	1	(BG02H065H01)				
27	T7W 571 762	FAN MOTOR	PN4S70-K	1	1		MF			
28	R01 16G 105	RUBBER MOUNT		2	2					
29	—	MOTOR BAND		1	1	(BG02H178H01)				
30	R01 16G 115	RIGHT LINEFLOW FAN		1						
	R01 17G 115	RIGHT LINEFLOW FAN			1					
31	—	CENTER SUPPORT		1	1	(BG00R259G07)				
32	—	BEARING BAND		1	1	(BG02L462H02)				
33	R01 KV5 102	BEARING MOUNT		1	1					
34	R01 12G 103	SLEEVE BEARING		1	1					
35	T7W B03 675	FAN GUARD		2	2					
36	—	MOTOR LEG		1	1	(BG02A534H17)				
37	R01 230 700	HEATER THERMAL SWITCH	70℃ OFF 50℃ ON	1			26H			
38	T7W 589 706	THERMAL FUSE	117℃ 16A 250V	1			FS1,2			
39	T7W 589 300	HEATER	240V 800W	3			H1			
40	R01 005 103	SLEEVE BEARING		1	1					
㊶	R01 20J 303	INSULATOR		1						

STRUCTURAL PARTS
PKA-RP100FAL
PKH-P100FALH



Part numbers 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	
				PKA-	PKH-				Unit	Amount
				RP100FAL	P100FALH					
1	R01 12G 662	LEFT SIDE PANEL		1	1					
2	R01 E00 812	UNDER PLATE		1	1					
3	R01 E01 811	NOSE		1	1					
4	R01 A17 500	AIR FILTER		5	5					
5	R01 12G 691	INTAKE GRILLE		2	2					
6	R01 24K 658	RECEIVER		1	1		RU			
7	T7W E05 661	RIGHT SIDE PANEL		1	1					
8	R01 E00 075	WIRELESS REMOTE CONTROLLER HOLDER		1	1					
9	R01 E01 049	WIRELESS REMOTE CONTROLLER DOOR		1	1					
10	T7W E06 714	WIRELESS REMOTE CONTROLLER		1	1					
11	R01 16G 808	BACK PLATE		1	1					
12	R01 E00 641	TOP PLATE		1	1					
13	—	BOX ASSEMBLY		1		(RG00A734GH0)				
	—	BOX ASSEMBLY			1	(RG00A734GH2)				
14	R01 16G 692	INTAKE GRILLE		1	1					
(15)	R01 12G 523	DRAIN SOKET		1	1					

Mr.SLIM™

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE : MITSUBISHI DENKI BLDG., 2-2-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

Distributed in May 2005 No.OC331 PDF 9
Made in Japan.

New publication, effective May 2005.
Specifications subject to change without notice.