

TECHNICAL & SERVICE MANUAL

Series PLH Ceiling Cassettes

**Indoor unit
[Model names]**

PLH-3AK

PLH-3AKH

PLH-4AKS

PLH-4AKHS

PLH-5AKS

PLH-5AKHS

PLH-6AKS

PLH-6AKHS

[Service Ref.]

PLH-3AK.UK
PLH-3AK₁.UK
PLH-3AKH.UK
PLH-3AKH₁.UK
PLH-4AKS.UK
PLH-4AKS₁.UK
PLH-4AKHS.UK
PLH-4AKHS₁.UK
PLH-5AKS.UK
PLH-5AKS₁.UK
PLH-5AKHS.UK
PLH-5AKHS₁.UK
PLH-6AKS.UK
PLH-6AKS₁.UK
PLH-6AKHS.UK
PLH-6AKHS₁.UK

Revision:

- PLH-3AK₁.UK, PLH-3AKH₁.UK, PLH-4AKS₁.UK, PLH-4AKHS₁.UK, PLH-5AKS₁.UK, PLH-5AKHS₁.UK, PLH-6AKS₁.UK and PLH-6AKHS₁.UK are added in REVISED EDITION-A.
- "14. PARTS LIST" has been modified.

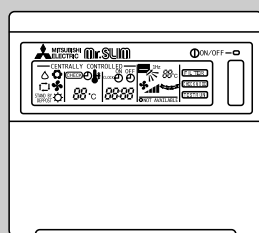
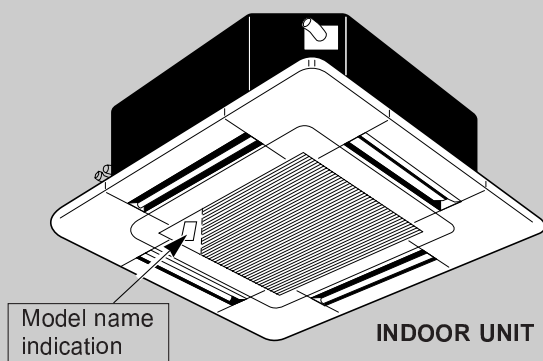
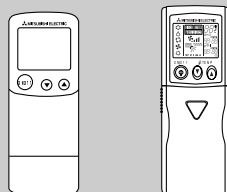
Note:

- This manual does not cover the following outdoor units. When servicing them, please refer to the following service manual and this manual in a set.

[Service Ref.]

(OC150 REVISED EDITION-A)
 PUH-3VKA₂.UK PUH-3YKA₂.UK
 PUH-4YKSA₂.UK
 PUH-5YKSA₂.UK
 PUH-6YKSA₂.UK
 (OC184)
 PUH-4VKSA.UK

- Please void OC211.


**WIRED REMOTE
CONTROLLER**


PLH-•AK.UK PLH-•AK₁.UK
 PLH-•AKH.UK PLH-•AKH₁.UK
 PLH-•AKS.UK PLH-•AKS₁.UK
 PLH-•AKHS.UK PLH-•AKHS₁.UK
**WIRELESS REMOTE
CONTROLLER**

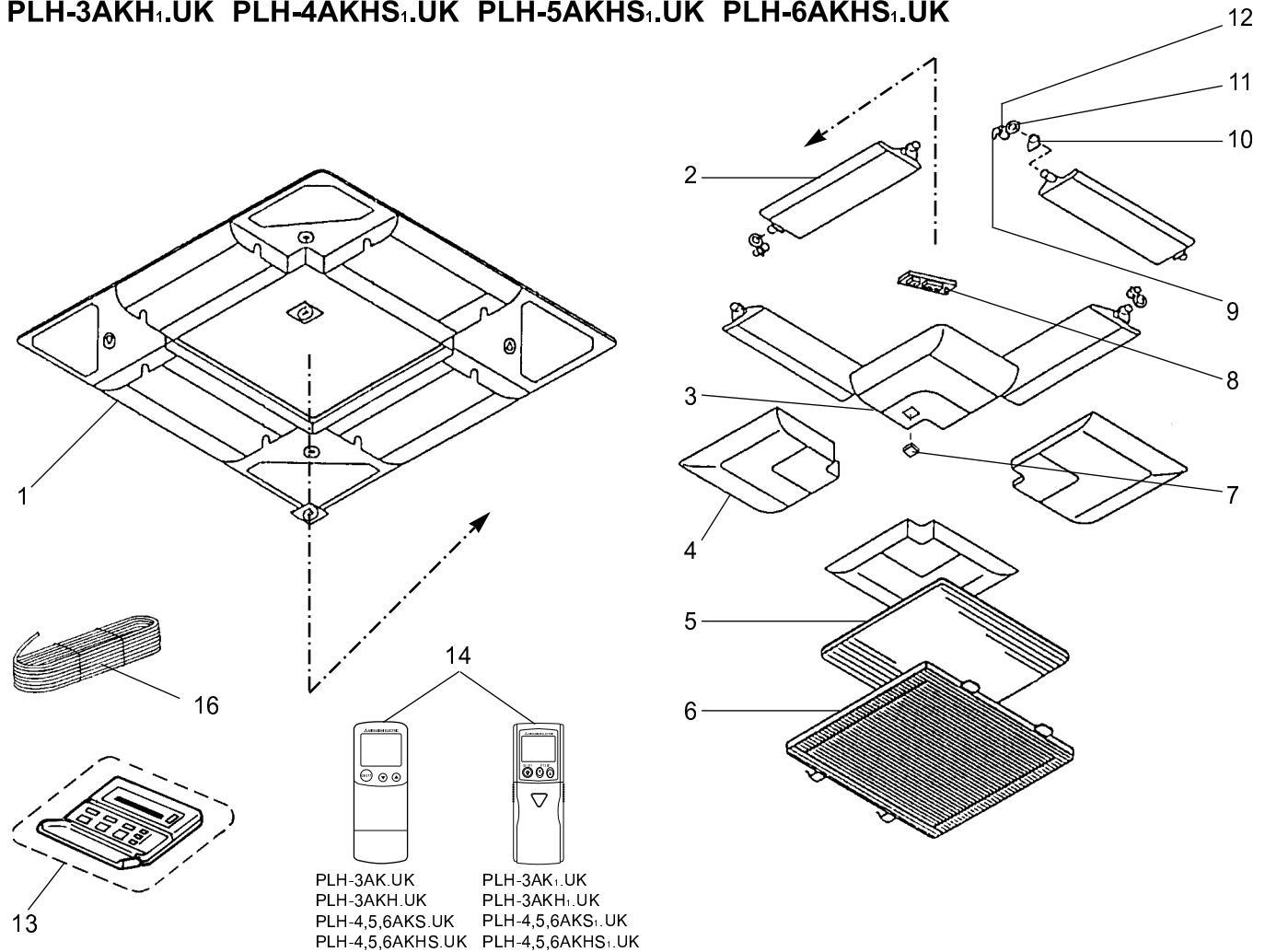
CONTENTS

1. TECHNICAL CHANGES.....	2
2. PART NAMES AND FUNCTIONS	3
3. SPECIFICATIONS.....	7
4. DATA	11
5. OUTLINES AND DIMENSIONS.....	24
6. WIRING DIAGRAM.....	26
7. REFRIGERANT SYSTEM DIAGRAM	27
8. OPERATION FLOW-CHART	28
9. MICROPROCESSOR CONTROL	32
10. TROUBLESHOOTING	54
11. 4-WAY AIR FLOW SYSTEM	66
12. SYSTEM CONTROL	72
13. DISASSEMBLY PROCEDURE	77
14. PARTS LIST	80
15. OPTIONAL PARTS	85



PANEL PARTS

PLH-3AK.UK PLH-4AKS.UK PLH-5AKS.UK PLH-6AKS.UK
 PLH-3AK₁.UK PLH-4AKS₁.UK PLH-5AKS₁.UK PLH-6AKS₁.UK
 PLH-3AKH.UK PLH-4AKHS.UK PLH-5AKHS.UK PLH-6AKHS.UK
 PLH-3AKH₁.UK PLH-4AKHS₁.UK PLH-5AKHS₁.UK PLH-6AKHS₁.UK



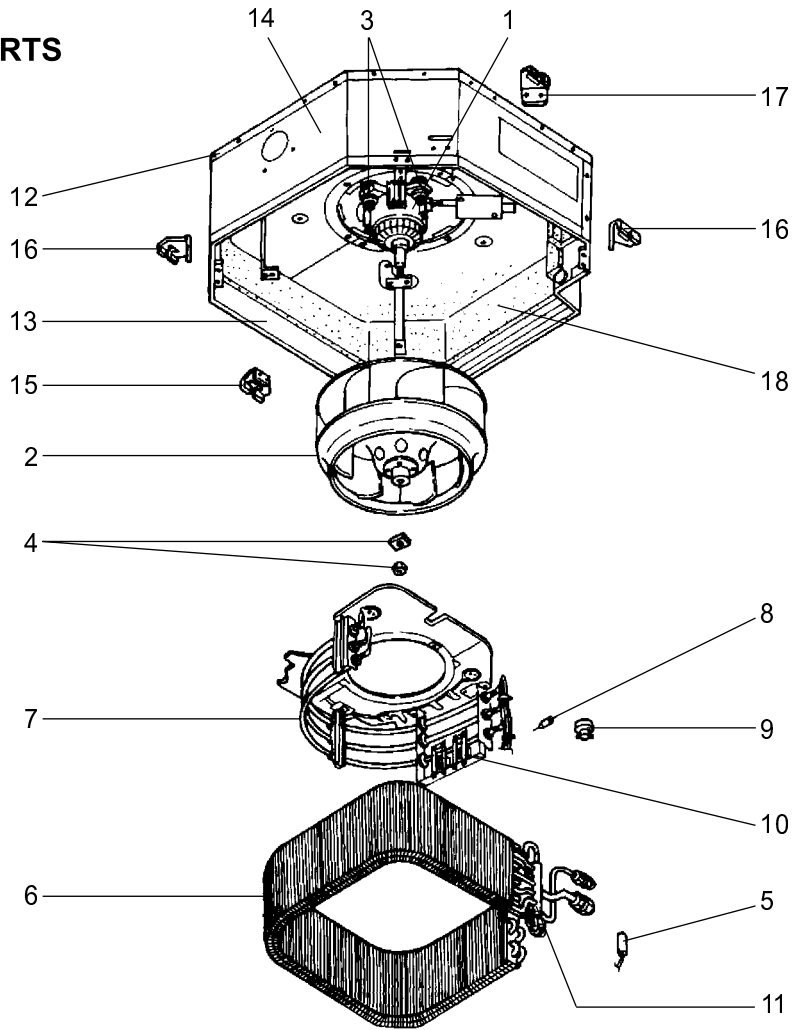
Part number that is circled is not shown in the figure.

No.	Parts No.	Parts Name	Specification	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recom-mended Q'ty	Price	
				PLH-3AK.UK PLH-3AKH.UK PLH-4,5,6AKS.UK PLH-4,5,6AKHS.UK		PLH-3AK ₁ .UK PLH-3AKH ₁ .UK PLH-4,5,6AKS ₁ .UK PLH-4,5,6AKHS ₁ .UK					Unit	Amount
				WIRED	WIRELESS	WIRED	WIRELESS					
1	S70 E10 003	AIR OUTLET GRILLE		1	1	1	1					
2	S70 E00 002	VANE ASSY		4	4	4	4					
3	S70 E01 638	CORNER PANEL		1	2	1	2					
4	S70 E00 638	CORNER PANEL		3	2	3	2					
5	S70 E00 500	L.L FILTER		1	1	1	1					
6	S70 E00 691	GRILLE ASSY		1	1	1	1					
7	S70 24K 658	RECEIVER			1		1					
8	S70 E00 317	WIRELESS ADAPTER			1		1	W.B				
9	S70 E00 223	STEPPING MOTOR		4	4	4	4	MV				
10	S70 E00 063	VANE BUSH		8	8	8	8					
11	S70 E00 040	GEAR (VANE)		4	4	4	4					
12	S70 E01 040	GEAR		4	4	4	4					
13	S70 E02 713	REMOTE CONTROLLER BOARD		1		1		R.B				
14	S70 E04 714	WIRELESS REMOTE CONTROLLER			1							
	S70 E03 713	WIRELESS REMOTE CONTROLLER					1					
15	S70 E00 673	SCREW ASSY		1	1	1	1					
16	S70 E01 305	CABLE ASSY		1		1						

FUNCTIONAL PARTS

PLH-3AK.UK
 PLH-3AK₁.UK
 PLH-3AKH.UK
 PLH-3AKH₁.UK

PLH-4AKS.UK
 PLH-4AKS₁.UK
 PLH-4AKHS.UK
 PLH-4AKHS₁.UK

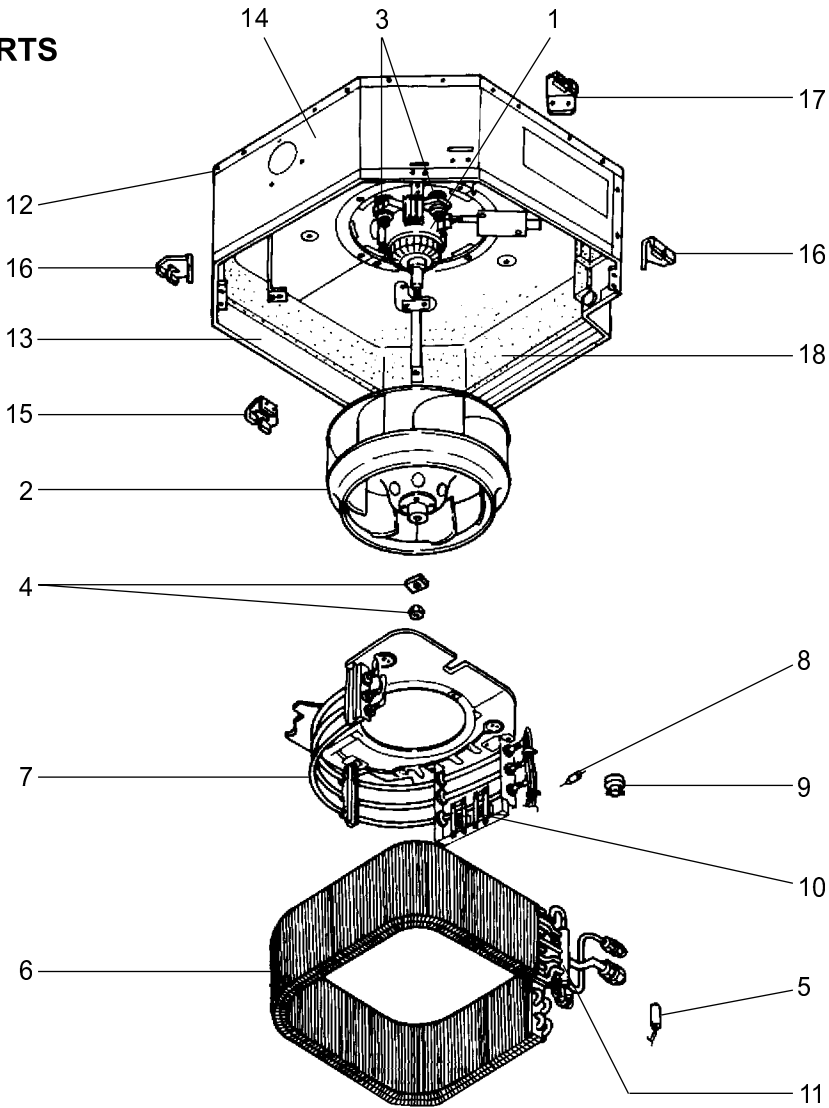


No.	Parts No.	Parts Name	Specification	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				PLH-3		PLH-4					Unit	Amount
				AK AK ₁	AKH AKH ₁	AKS AKS ₁	AKHS AKHS ₁					
1	S70 E06 762	FAN MOTOR	D17B6P70MS	1	1							
	S70 E07 762	FAN MOTOR	D176P120MS			1	1					
2	S70 E00 114	TURBO FAN		1	1							
	S70 E01 114	TURBO FAN				1	1					
3	S70 A41 105	RUBBER MOUNT		4	4	4	4					
	S70 08K 097	SPLIT WASHER		1	1	1	1					
5	S70 17J 202	PIPE TEMPERATURE THERMISTOR		1	1	1	1		RT2			
	S70 E06 480	HEAT EXCHANGER		1	1							
6	S70 E07 480	HEAT EXCHANGER				1	1					
	S70 E07 300	HEATER ELEMENT 700W			3				H1			
7	S70 E06 300	HEATER ELEMENT 867W				3			H1			
	S70 E02 706	THERMAL FUSE	104°C, 16A		1	1			FS2			
9	S70 46K 700	THERMOSTAT	50°C OFF		1	1			26H			
10	S70 20J 303	INSULATOR			1	1						
11	S70 E00 418	RESTRICTOR VALVE		1	1	1	1					
12	S70 E03 687	BASE		1	1	1	1					
	S70 005 688	DRUM 1 ASSY		1	1							
13	S70 007 688	DRUM 1 ASSY				1	1					
	S70 006 688	DRUM 2 ASSY		1	1							
14	S70 008 688	DRUM 2 ASSY				1	1					
	S70 E00 130	LEG		1	1	1	1					
16	S70 E01 130	LEG		2	2	2	2					
17	S70 E02 130	LEG		1	1	1	1					
18	S70 E00 659	INNER COVER ASSY		1								
	S70 E01 659	INNER COVER ASSY			1							
	S70 E02 659	INNER COVER ASSY				1						
	S70 E03 659	INNER COVER ASSY					1					

FUNCTIONAL PARTS

PLH-5AKS.UK
 PLH-5AKS₁.UK
 PLH-5AKHS.UK
 PLH-5AKHS₁.UK

PLH-6AKS.UK
 PLH-6AKS₁.UK
 PLH-6AKHS.UK
 PLH-6AKHS₁.UK

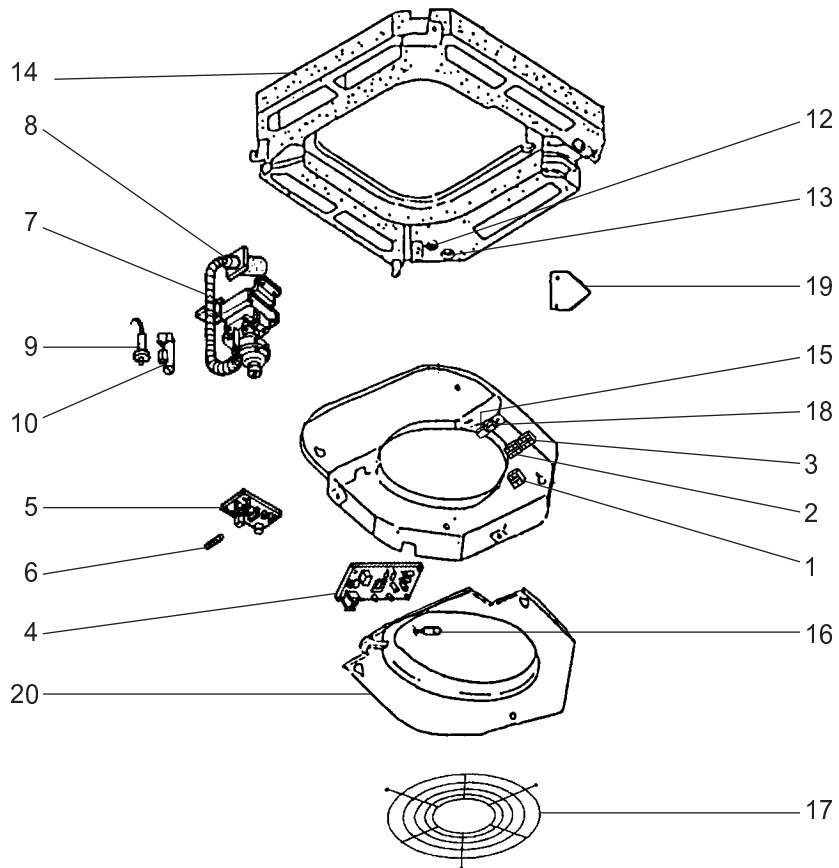


No.	Parts No.	Parts Name	Specification	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				PLH-5		PLH-6					Unit	Amount
				AKS AKS ₁	AKHS AKHS ₁	AKS AKS ₁	AKHS AKHS ₁					
				.UK								
1	S70 E07 762	FAN MOTOR	D176P120MS	1	1	1	1		MF			
2	S70 E01 114	TURBO FAN		1	1	1	1					
3	S70 A41 105	RUBBER MOUNT		4	4	4	4					
4	S70 08K 097	SPLIT WASHER		1	1	1	1					
5	S70 17J 202	PIPE TEMPERATURE THERMISTOR		1	1	1	1		RT2			
6	S70 E08 480	HEAT EXCHANGER		1	1							
	S70 E09 480	HEAT EXCHANGER				1	1					
7	S70 E05 300	HEATER ELEMENT 1000W			3		3		H1			
8	S70 E02 706	THERMAL FUSE	104°C, 16A		1		1		FS2			
9	S70 46K 700	THERMOSTAT	50°C OFF		1		1		26H			
10	S70 20J 303	INSULATOR			1		1					
11	S70 E00 418	RESTRICTOR VALVE		1	1	1	1					
12	S70 003 687	BASE		1	1	1	1					
13	S70 007 688	DRUM 1 ASSY		1	1	1	1					
14	S70 008 688	DRUM 2 ASSY		1	1	1	1					
15	S70 E00 130	LEG		1	1	1	1					
16	S70 E01 130	LEG		2	2	2	2					
17	S70 E02 130	LEG		1	1	1	1					
18	S70 E02 659	INNER COVER ASSY		1		1						
	S70 E03 659	INNER COVER ASSY			1		1					

FUNCTIONAL PARTS

PLH-3AK.UK
 PLH-3AK₁.UK
 PLH-3AKH.UK
 PLH-3AKH₁.UK

PLH-4AKS.UK
 PLH-4AKS₁.UK
 PLH-4AKHS.UK
 PLH-4AKHS₁.UK



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

No.	Parts No.	Parts Name	Specification	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				PLH-3		PLH-4					Unit	Amount
				AK AK ₁	AKH AKH ₁	AKS AKS ₁	AKHS AKHS ₁					
				.UK								
1	S70 512 716	TERMINAL BLOCK	2P (1, 2)	1	1	1	1		TB5			
2	S70 517 716	TERMINAL BLOCK	3P (1, 2, 3)	1	1	1	1		TB4			
3	S70 521 716	TERMINAL BLOCK	3P (L, N, ⊕)	1	1	1	1		TB2			
4	S70 E01 310*	CONTROLLER BOARD		1	1	1	1		I.B ※			
5	S70 E02 313	POWER BOARD		1	1	1	1		P.B			
6	S70 520 239	FUSE 250V 6.3A	250V 6.3A	2	2	2	2	PART OF PCB	F1, F2			
7	S70 E02 355	DRAIN PUMP		1	1	1	1		D.P			
8	S70 A41 523	DRAIN SOCKET		1	1	1	1	PART OF DRAIN PAN ASSY				
9	S70 E00 266	DRAIN SENSOR		1	1	1	1		D.S			
10	S70 31K 241	DRAIN SENSOR HOLDER		1	1	1	1					
⑪	S70 W28 527	DRAIN HOSE		1	1	1	1					
12	S70 A48 524	DRAIN PLUG		1	1	1	1					
13	S70 A41 524	DRAIN PLUG		1	1	1	1					
14	S70 E02 529	DRAIN PAN		1	1							
	S70 E00 529	DRAIN PAN				1	1					
15	S70 17T 255	CAPACITOR	3.5μF 440V	1	1				C			
	S70 E02 255	CAPACITOR	7.0μF 440V			1	1		C			
16	S70 E00 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1		RT1			
17	S70 E10 675	FAN GUARD		1	1	1	1					
18	S70 71G 215	HEATER CONTACTOR			1		1		88H			
19	S70 001 663	CORNER COVER ASSY		1	1	1	1					
20	S70 003 503	CONTROL COVER ASSY		1	1	1	1					

※ The part name of symbol "I.B" is "SPCB".

FUNCTIONAL PARTS

PLH-5AKS.UK

PLH-5AKS₁.UK

PLH-5AKHS.UK

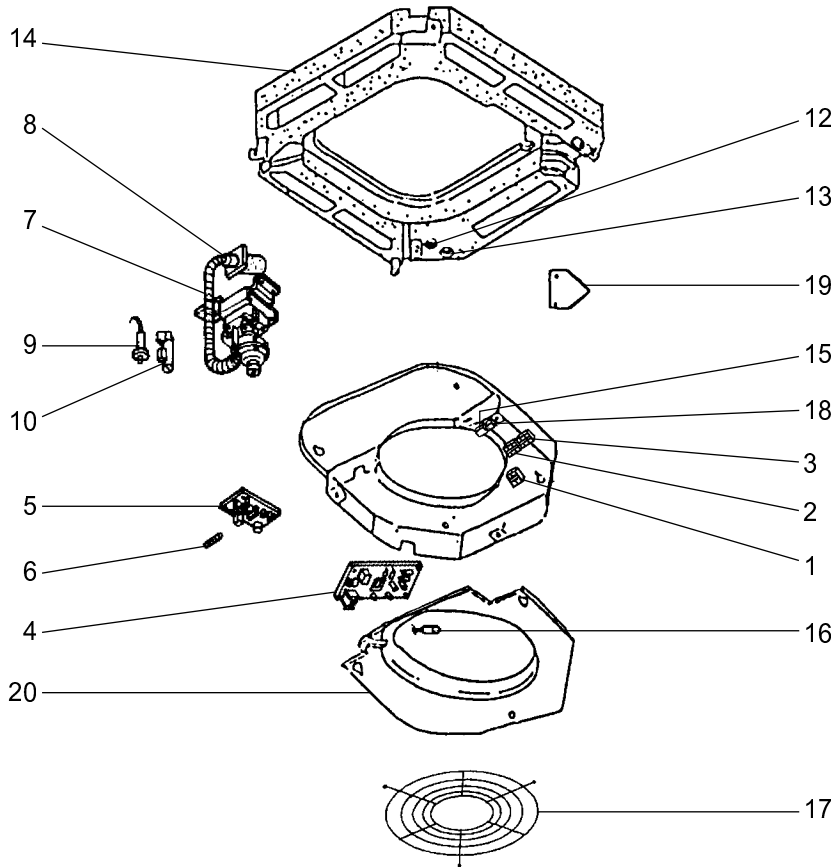
PLH-5AKHS₁.UK

PLH-6AKS.UK

PLH-6AKS₁.UK

PLH-6AKHS.UK

PLH-6AKHS₁.UK



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

No.	Parts No.	Parts Name	Specification	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol	Recom- mended Q'ty	Price	
				PLH-5		PLH-6					Unit	Amount
				AKS AKS ₁	AKHS AKHS ₁	AKS AKS ₁	AKHS AKHS ₁					
				.UK								
1	S70 512 716	TERMINAL BLOCK	2P (1, 2)	1	1	1	1		TB5			
2	S70 517 716	TERMINAL BLOCK	3P (1, 2, 3)	1	1	1	1		TB4			
3	S70 521 716	TERMINAL BLOCK	3P (L, N, ⊕)	1	1	1	1		TB2			
4	S70 E01 310*	CONTROLLER BOARD		1	1	1	1		I.B ※			
5	S70 E02 313	POWER BOARD		1	1	1	1		P.B			
6	S70 520 239	FUSE 250V 6.3A	250V 6.3A	2	2	2	2	PART OF PCB	F1, F2			
7	S70 E02 355	DRAIN PUMP		1	1	1	1		D.P			
8	S70 A41 523	DRAIN SOCKET		1	1	1	1	PART OF DRAIN PAN ASSY				
9	S70 E00 266	DRAIN SENSOR		1	1	1	1		D.S			
10	S70 31K 241	DRAIN SENSOR HOLDER		1	1	1	1					
⑪	S70 W28 527	DRAIN HOSE		1	1	1	1					
12	S70 A48 524	DRAIN PLUG		1	1	1	1					
13	S70 W28 524	DRAIN PLUG		1	1	1	1					
14	S70 E00 529	DRAIN PAN		1	1							
	S70 E01 529	DRAIN PAN				1	1					
15	S70 E02 255	CAPACITOR	7.0μF 440V	1	1	1	1		C			
16	S70 E00 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1		RT1			
17	S70 E10 675	FAN GUARD		1	1	1	1					
18	S70 71G 215	HEATER CONTACTOR			1	1	1		88H			
19	S70 001 663	CORNER COVER ASSY		1	1	1	1					
20	S70 003 503	CONTROL COVER ASSY		1	1	1	1					

※ The part name of symbol "I.B" is "SPCB".

1. REFRIGERANT PIPES

Service Ref. : PLH-3AK.UK PLH-3AK_i.UK
 PLH-3AKH.UK PLH-3AKH_i.UK

Part No.	PAC-05FFS-E	PAC-07FFS-E	PAC-10FFS-E	PAC-15FFS-E
Pipe length	5m	7m	10m	15m
Pipe size O.D.	Liquid: ϕ 9.52		Gas: ϕ 15.88	
Connection method	Indoor unit: Flared		Outdoor unit: Flared	

Service Ref. : PLH-4AKS.UK, PLH-5AKS.UK, PLH-6AKS.UK PLH-4AKS_i.UK, PLH-5AKS_i.UK, PLH-6AKS_i.UK
 PLH-4AKHS.UK, PLH-5AKHS.UK, PLH-6AKHS.UK PLH-4AKHS_i.UK, PLH-5AKHS_i.UK, PLH-6AKHS_i.UK

Part No.	PAC-PC51PI-E	PAC-SC52PI-E	PAC-SC53PI-E	PAC-SC54PI-E
Pipe length	5m	7m	10m	15m
Pipe size O.D.	Liquid: ϕ 9.52		Gas: ϕ 19.05	
Connection method	Indoor unit: Flared		Outdoor unit: Flared	

Note 1. How to connect refrigerant pipes.

Factory supplied optional refrigerant pipings contain refrigerant at the above atmospheric pressures. As long as the connection takes no more than 5 minutes, no air will enter, and there will be no need for air purging.

Remove the blind caps and make the connections within 5 minutes. After the connections for the indoor and outdoor units are made, open the stop valve on the outdoor unit to allow refrigerant gas to flow.

Note 2. The following main parts are contained in the optional refrigerant piping kit.

Heat insulating cover, vinyl tapes, nipples, sleeve and flange (for wall hole).

2. TIMER

When using a program timer, a program timer adapter (PAC-825AD) is also needed.

Part No.	PAC-SC32PTA (with set back function)
Model Name	Program timer

2-1 Program timer specifications

Parts name	Program timer
Parts No.	PAC-SC32PTA
Exterior dimensions (inch)	5-4/32x4-23/32x23/32 (130x120x18mm)
Installation	Wall mount
Type of clock	Quartz
Clock accuracy	\pm 50 second / month at 25°C
Display-Time	Liquid crystal display
-Week	Liquid crystal display
-Timer setting unit	Liquid crystal display
Program cycle	24 hours
Timer setting unit	30 minutes
No. of set points	48 / day
Power rating	5V DC \pm 5% (Supplied by Remote Controller)

2-2 Feature of program timer

(1) Daily timer function

Daily timer can be set in 30 minutes units for up to 24 hours.

Each unit can be set for unit ON, unit OFF, or setback operation.

(2) Setback operation (PAC-SC32PT)

Set back operation is useful for reducing running costs

e.g. At a hotel with a 24-hour system

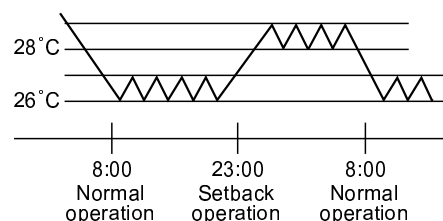
8:00~23:00 Cooling operation with set temperature at 26°C

23:00~8:00 Setback operation with 2 degrees of setback

As shown in the chart on the night, the set temperature rises 2 degrees automatically during the setback operation. When the setback operation ends, normal operation will begin.

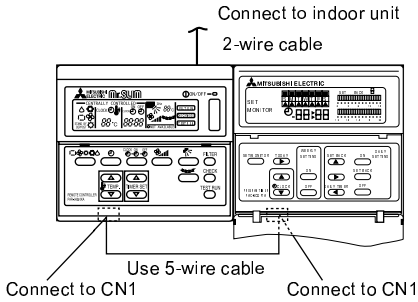
(3) Weekly timer function

Daily timer function can apply to each day of the week.



2-3 How to connect program timer

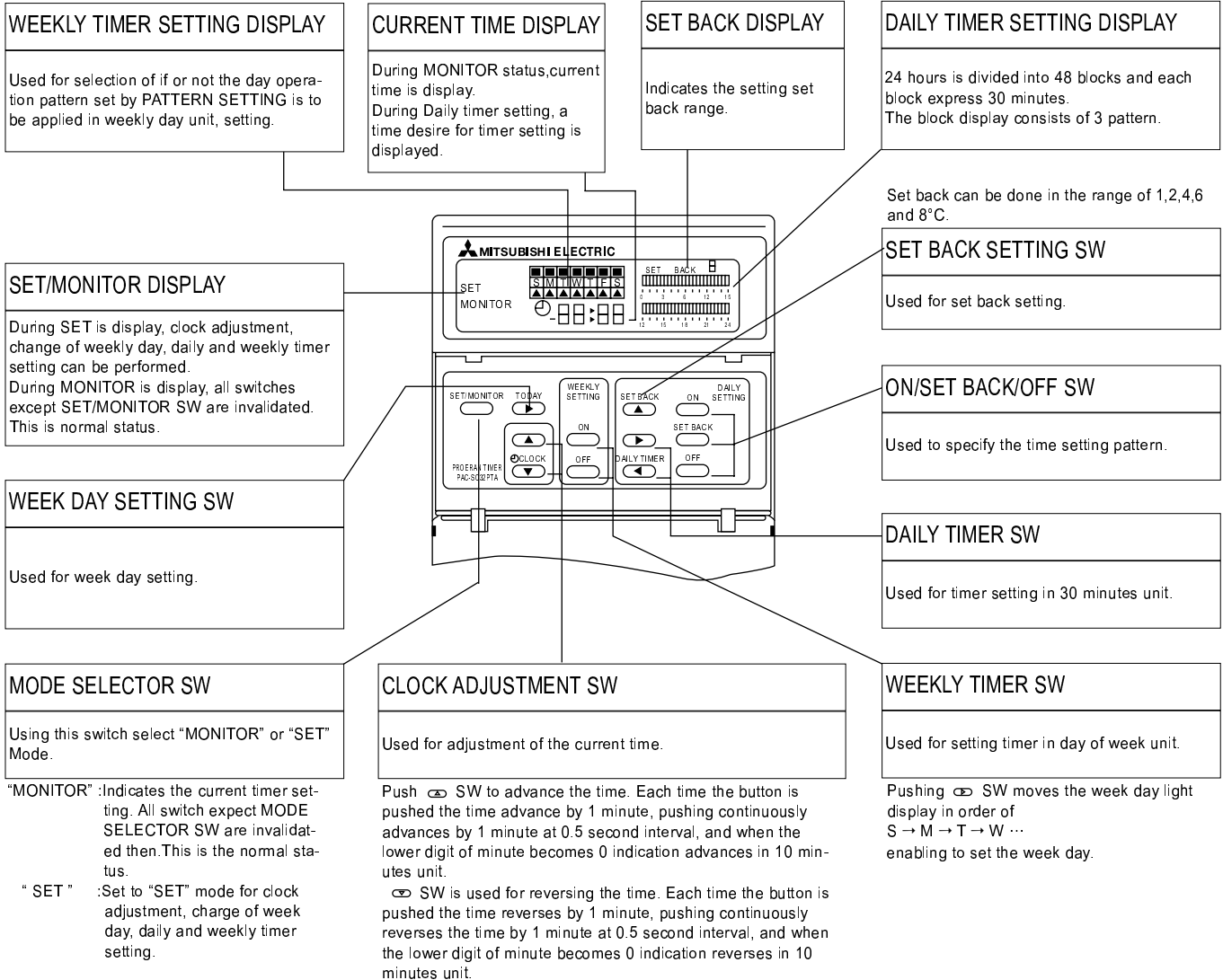
- (1) Install the program timer next to the remote controller the same way as the remote controller is installed.
- (2) Connect the program timer and the remote controller with a 5-wire cable as shown in the figure below



NOTE: While the program timer is connected to the remote controller, the 24hour ON/OFF timer on the remote controller will not operate.

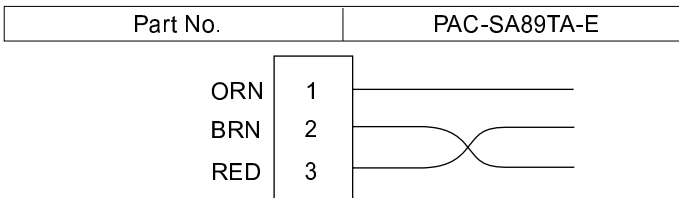
2-4 Names and functions

<PAC-SC32PTA>



3. TIMER ADAPTER

This adapter is needed for system control and for operation via external contacts. Adapter connection is described on page 70.



4. MULTIPLE REMOTE CONTROLLER ADAPTER

This adapter is needed for remote indication (operation/check). Adapter connection is described on page 72.

Part No.	PAC-SA88HA-E
<input type="checkbox"/> 1	BRN
<input type="checkbox"/> 2	RED
<input type="checkbox"/> 3	ORN
<input type="checkbox"/> 4	YLW
<input type="checkbox"/> 5	GRN

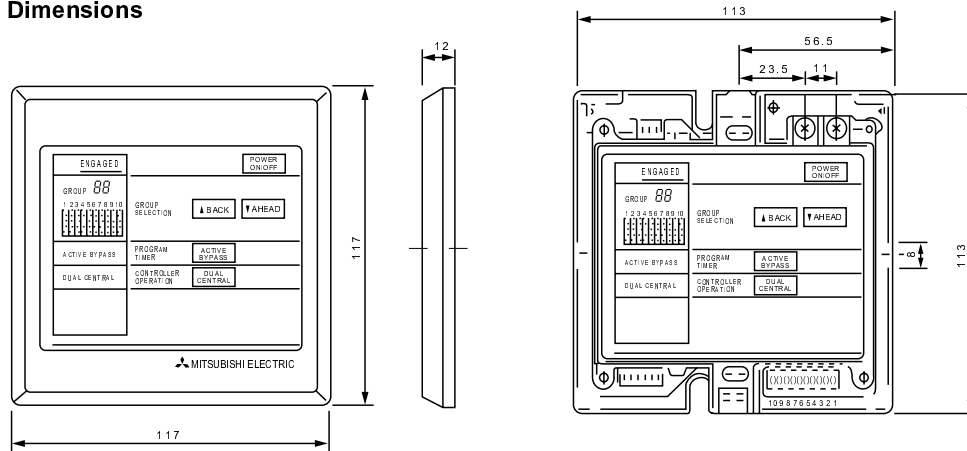
5. CENTRALIZED REMOTE CONTROLLER

Allows individual or combined control of up to 16 units. When using the PAC-805RC, the program timer adapter (PAC-825AD) is also needed.

Part No.	PAC-805RC
----------	-----------

Unit:mm

5-1 Dimensions



5-2 Functions

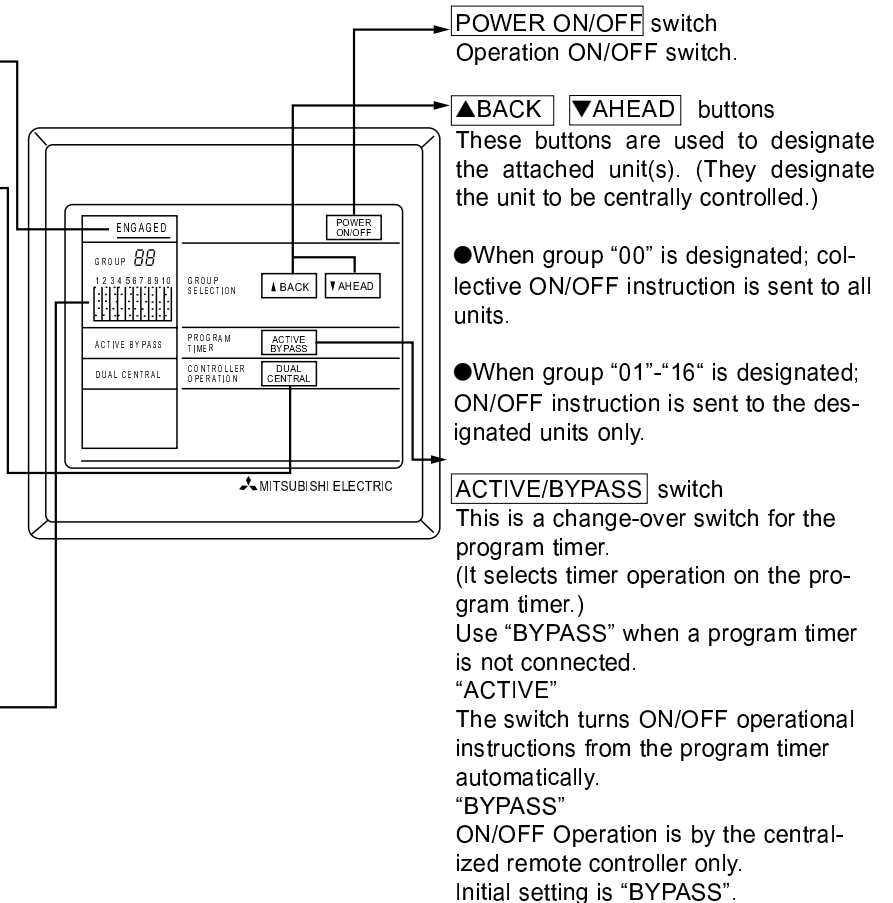
"ENGAGED" indicator
When this indicator is lit, transmission is in progress and all switches are inoperative.

DUAL/CENTRAL switch
This change-over switch governing the operation of the accessory remote controller.

"DUAL"
Instructions from both the accessory remote controller and the centralized remote controller are valid. (Priority given to the last instruction received.)

"CENTRAL"
ON/OFF switching by the accessory remote controller is invalidated. Control is by the centralized remote controller only. Initial setting is "DUAL".

LCD Matrix Display
This display indicates the operational status of all connected units either by steady lighting or by flashing.



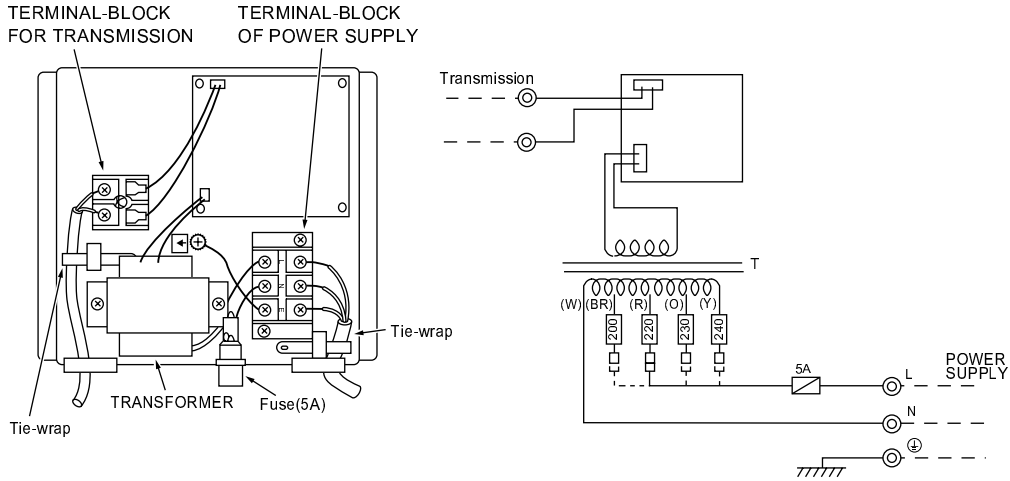
Independent "DUAL / CENTRAL" and "ACTIVE / BYPASS" setting of all the groups is possible. When the power supply to the centralized remote controller is cut due to power failure, all settings will return to original "DUAL" and "BYPASS".

5-3 Connection method

(1) Connections in the power supply cord.

1. Connect the power supply cord to the power supply terminal-block and fix it in-place with a tie-wrap. Connect a single phase 200V AC (220, 230, 240V) to L (N). As (E) is the GND terminal, be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap. Use a $\Omega 1.6$ (AWG 14) or above two-wire cable for the transmission line.

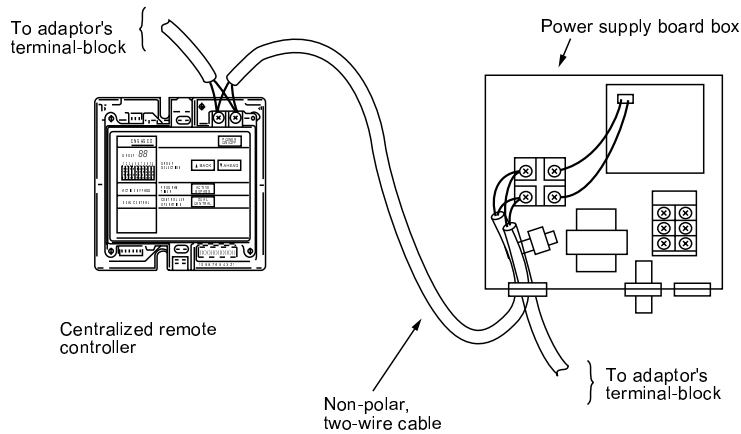
CAUTION : Never connect the power supply cord to the transmission terminal-block.



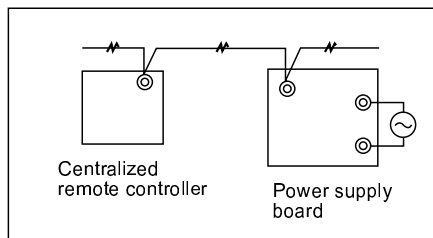
Wiring has to be changed when a 200,230 or 240V power is used.

(2) Connection method of centralized remote controller and power supply board.

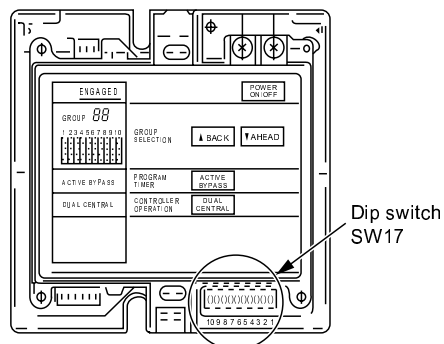
1. Connect the centralized remote controller and power supply board with a non-polar, two-wire cable.



2. Wiring diagram



3. Be sure to set the maximum address number with the dip switch SW17 on the centralized remote controller.

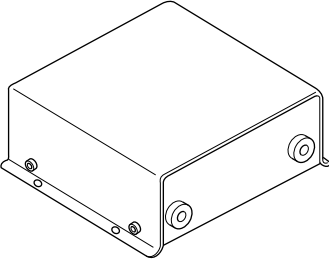
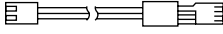
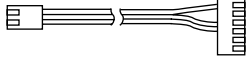
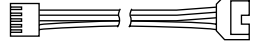
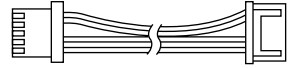


6. PROGRAM TIMER ADAPTER

This adapter is needed when a program timer(PAC-SC32PTA)or a centralized remote controller(PAC-805RC)is used.

Part No.	PAC-825AD
----------	-----------

6-1 Parts included

① ADAPTER1P	② 3-core cable1P	③ 3-core cable1P
	 Length : 2m (6' 7")	 Length : 2m (6' 7")
	④ 4-core cable1P	⑤ 5-core cable1P
	 Length : 2m (6' 7")	 Length : 2m (6' 7")

6-2 Connection method

Connection and wiring methods differ with the type of the indoor unit used. Confirm the type before carrying out the work.

(1) Connections in the adapter box

1. Connect the power supply cord to the terminal-block and fix it in-place with a tie-wrap.
Connect a single phase 200V AC (220, 230, 240V) to Ⓛ (Ⓝ).
As Ⓧ is the GND terminal, be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap (when a centralized remote controller is being used).
CAUTION : Never connect the power supply cord to the transmission terminal-block

Fig.1

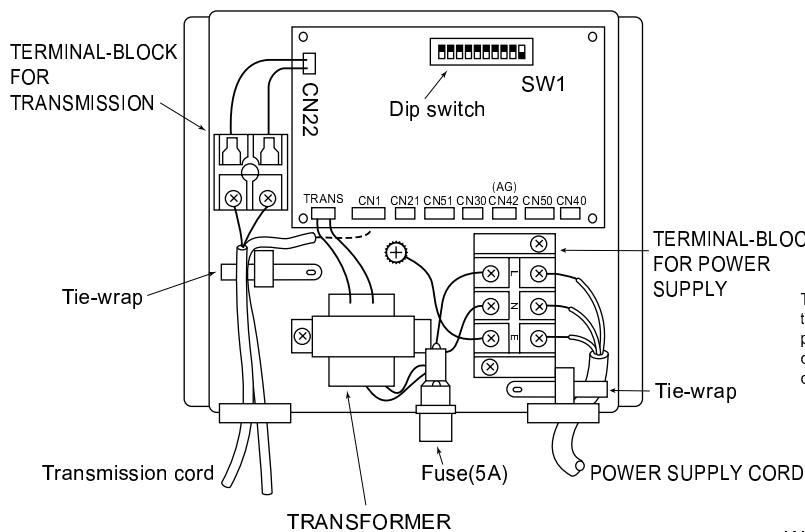
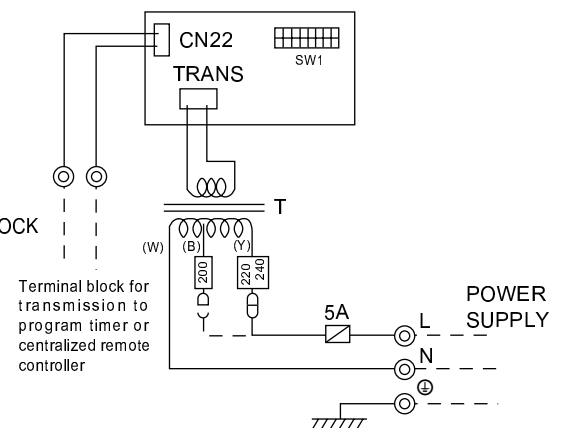


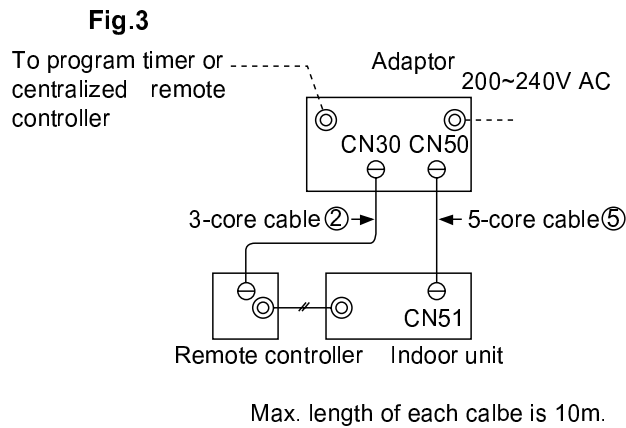
Fig.2



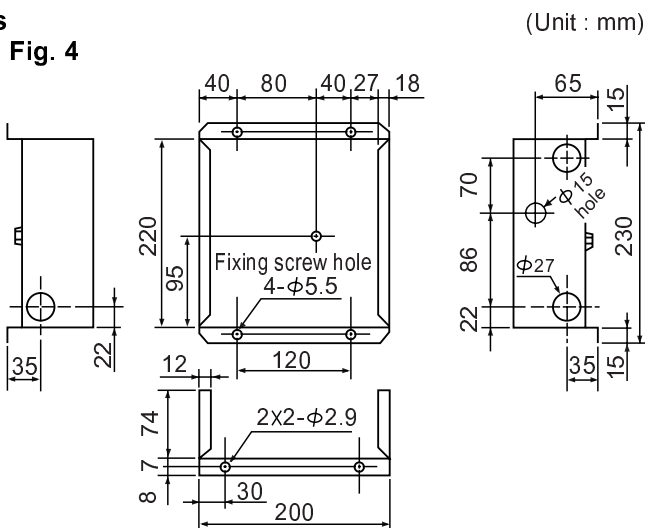
Wiring has to be changed when 200V power supply is used.

- (2) When the centralized remote controller is used, set the address number with the dip switch SW1 of the program timer adapter.

(3) Connections from adaptor



6-3 Dimensions



7. MULTI FUNCTION CASEMENT (For HIGH EFFICIENCY FILTER AND FRESH AIR INTAKE)

Part No.	PAC-SG03TM-E
Applicable Service Ref.	PLH-3/4/5/6AK(H)(S).UK PLH-3/4/5/6AK(H)(S).UK

8. HIGH EFFICIENCY FILTER ELEMENT

Part No.	PAC-SG01KF
Applicable Service Ref.	PLH-3/4/5/6AK(H)(S).UK PLH-3/4/5/6AK(H)(S).UK

9. AIR OUTLET SHUTTER PLATE (20sets, 2pcs / 1set)

Part No.	PAC-SG06SP-E
Applicable Service Ref.	PLH-3/4/5/6AK(H)(S).UK PLH-3/4/5/6AK(H)(S).UK



HEAD OFFICE : MITSUBISHI DENKI BLDG., 2-2-3, MARUNOUCHI, CHIYODA-KU, TOKYO100-8310, JAPAN