



DUCTLESS SPLIT-TYPE AIR CONDITIONERS

No. SP-004

SERVICE & PARTS MANUAL

Series PL Ceiling Cassettes

Models **PL18FK2/PU18EK, PU18EK-1**
PL24FK2/PU24EK, PU24EK-1
PL30FK2/PU30EK, PU30EK-1
PL36FK2/PU36EK, PU36EK-1
PL42FK2/PU42EK2, PU42EK2-1

Series PLL Ceiling Cassettes

PLL12FK/PUL12EK, PUL12EK-1
PLL18FK/PUL18EK, PUL18EK-1
PLL24FK/PUL24EK, PUL24EK-1

Series PC Ceiling Suspended

PC24EK/PU24EK, PU24EK-1
PC30EK/PU30EK, PU30EK-1
PC36EK/PU36EK, PU36EK-1
PC42EK/PU42EK2, PU42EK2-1

Series PCL Ceiling Suspended

PCL24EK/PUL24EK, PUL24EK-1

Series PK Wall Mounted

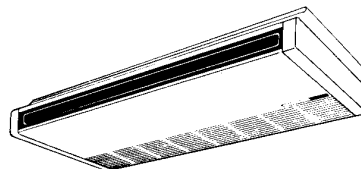
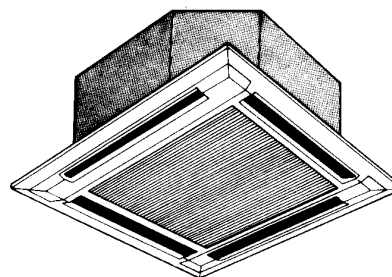
PK18EK/PU18EK, PU18EK-1
PK24EK/PU24EK, PU24EK-1
PK30EK/PU30EK, PU30EK-1

Series PKL Wall Mounted

PKL12EK/PUL12EK, PUL12EK-1
PKL18EK/PUL18EK, PUL18EK-1
PKL24EK/PUL24EK, PUL24EK-1

Change points of models with sub number "-1"

1. Outdoor controller board changed to the same type as that of heat pump unit.
2. Transformer changed.
3. Contactor changed from VC-20F to S-12. (for PU18EK-1 and PUL18EK-1)
4. Series PLL become PL.
5. Series PKL become PK.
6. Series PCL become PC.



The Slim Line.
From Mitsubishi Electric.



Mr. SLIM™

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1

CHANGE POINTS

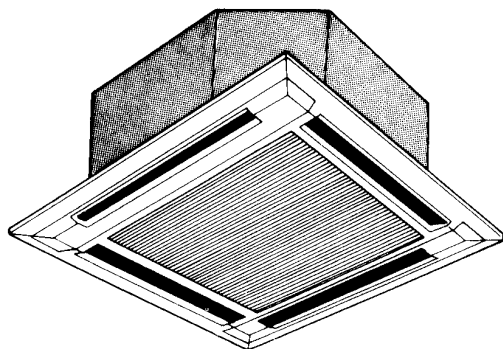
PU18EK→ PU18EK-1
PU24EK→ PU24EK-1
PU30EK→ PU30EK-1
PU36EK→ PU36EK-1
PU42EK2→ PU42EK2-1
PUL12EK→ PUL12EK-1
PUL18EK→ PUL18EK-1
PUL24EK→ PUL24EK-1

1. Outdoor controller board changed to the same type as that of heat pump unit.
2. With the change of outdoor controller board, transformer changed.
3. Contactor changed from VC-20F to S-U12. (for PU18EK-1 and PUL18EK-1)
4. Model name of “PLL” has changed to “PL”, specifications are identical.
5. Model name of “PCL” has changed to “PC”, specifications are identical.
6. Model name of “PKL” has changed to “PK”, specifications are identical.

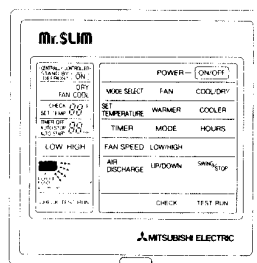
2

FEATURES

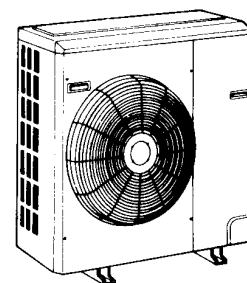
Series PL Ceiling Cassettes



Indoor unit
PL18FK2



Remote controller



Outdoor unit
PU18EK, PU18EK-1

<MODEL>	<COOLING CAPACITY>	<SEER>
PL18FK2	18,400 Btu/h	10.2
PL24FK2	23,600 Btu/h	10.0
PL30FK2	31,000 Btu/h	10.4
PL36FK2	36,100 Btu/h	10.0
PL42FK2	42,500 Btu/h	10.0

1. SPACE-SAVING CENTRALLY LOCATED CEILING RECESSED INSTALLATION

2. 4-WAY AIR FLOW SYSTEM

This series allows you to select from 2, 3, and 4 way air flow directions according to your requirement. As a result, you get superb flexibility in choosing a configuration that gives you maximum cooling efficiency in a neat and unobstructive installation.

3. REDI-CHARGED REFRIGERANT SYSTEM

When refrigerant tubing is 100ft or less, it is unnecessary to charge additional refrigerant. This can contribute to enhance installation quality and reduce installation time.

4. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 0°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

The microprocessor automatically adjusts fan speed in accordance with outdoor temperature to maintain the coolant at an even condensing temperature. The result is smooth, efficient cooling even when temperatures outdoors drop as low as 0°F. This makes the unit ideal for a wide range of specialized cooling needs, such as rooms with many office machines or computers and areas subject to strong sunlight. Optional wind baffle must be installed.

5. ADVANCED MICROPROCESSOR CONTROL

(1) Easy to use Microprocessor

1) Ultra-Thin Remote Controller

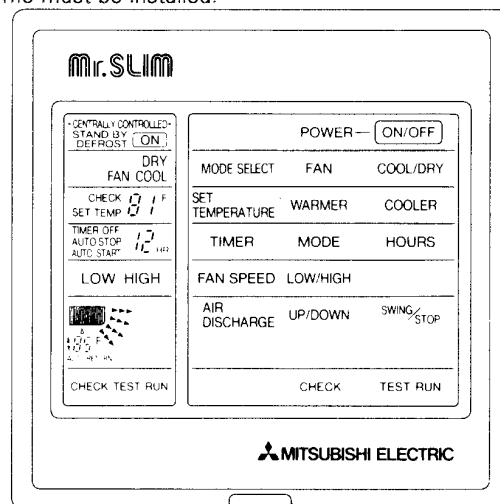
The streamlined, square controller is designed to blend with any kind of interior and the adoption of a sophisticated microprocessor allows you to easily carry out a wide range of operations.

2) Attractive Liquid Crystal Display (LCD)

Unit operation mode, set temperature, room temperature, timer setting, fan speed, and air flow direction are displayed of the remote controller by the easily understood visual Liquid Crystal Display (LCD).

3) Convenient 24-Hour ON-OFF Timer

The timer allows Mr. SLIM to be switched on or off automatically at the time you set. Once the timer is set, the remaining time is shown by the LCD.



4) Self-Diagnostic Feature Indicates Faults Instantly

In the rare case when a problem occurs, the unit stops operating and the set temperature indicator changes to the self-diagnostic indicator, indicating the location of the fault.

If the check switch is pressed twice, the unit stops operating and the check mode is initiated. The cause of the most recent problem stored in the memory is displayed on the LCD. This is extremely useful for maintenance purposes.

5) Useful Memory Feature for Storing Instructions

The previous set value is memorized so that constant temperature control can be obtained. This is convenient when, for example, a power failure occurs.

(2) Non-polar Two-Wire Remote Controller Cables

The non-polar, two-wire type remote controller cable is slim, installation is simple and troublefree. Remote controller wire can be extended up to 550 yards.

6. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS

The most significant feature of the series PL is the advanced microprocessor system control. Behind the development of this system is the recent world-wide trend in the air conditioning of larger buildings, away from centralized duct systems in favor of a large number of individual split type units. There are a number of reasons for this: first, costly troublesome duct installation is eliminated; second, the overall air conditioning balance is excellent; and third, operation cost is low, since flexible control of each unit is possible. This system control was developed exclusively by Mitsubishi in the light of this demand. Microprocessor control makes possible individual control, group control, control using two remote controllers, remote on/off control and individual control without troublesome modifications to the equipment.

1) Individual Control by Gathering Remote Controllers

A Series PL unit is installed in each room, and the remote controllers are gathered together in a separate location, where each unit is controlled individually.

Each remote controller is connected to its indoor unit by non-polar 2-wire cable to eliminate the possibility of miswiring. Separation can be as much as 550 yards, making this type of control extremely easy to implement.

Thermistors in the indoor unit maintain each room at its own individually set temperature.

This control system is excellent for schools or kindergartens, where controls should be kept out of the reach of the pupils.

2) Group Control by a Single Remote Controller

In an application requiring a number of air conditioner units in a large area on a single floor, up to 50 Series PL units can be centrally controlled using a single remote controller. The remote controller controls Power ON-OFF, set temperature, fan speed, ON-OFF timer, and auto vane position of all units of the group. Obviously, if all the units started simultaneously, the surge current would be unacceptably high. Therefore the microprocessor board of each indoor unit has a 8-toggle DIP switch that can be programmed to give sequential starting with up to 50 seconds delay. When the switch of the remote controller is pressed, master unit comes on immediately, followed by the other units in the programmed order. Thereafter the thermistor in each indoor unit controls compressor operation to keep the room at the set temperature.

The remote controller is connected to indoor units by non-polar 2-wire cable. Total cable length can be as much as 550 yards. This system can be applied to the air conditioning of large offices or conference rooms, supermarkets, etc.

3) Control Using Two Remote Controllers

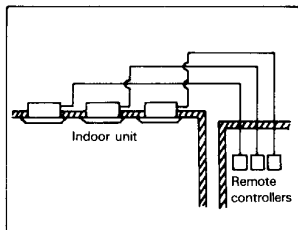
Two remote controllers can be used to control either one unit or several units in group control. This makes it possible to control units with ease either from a distance or at close range. Units operate according to the last command from either remote controller.

4) Both Remote ON/OFF Control and Individual Control

All units can be turned on and off simultaneously using the remote ON/OFF switch, and also individual units can be controlled from the remote controllers.

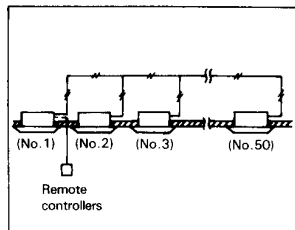
This system is well suited to buildings having a large number of rooms. In offices, for example, all units can be started together to cool the premises before workers arrive, operated as necessary by individual remote controllers during the day, and stopped together at the end of business.

① Individual Control by Gathering Remote Controllers.



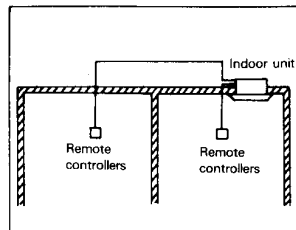
A built-in thermistor in each indoor unit controls its cooling operation to maintain desired room temperature. Non-polar, two wire connection cables can be extended up to 550 yards.

② Group Control by a Single Remote Controller.



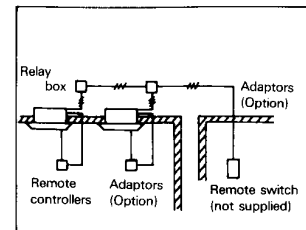
Each unit starts in sequence at one second intervals, and a built-in thermistor in each indoor unit controls its cooling operation to maintain desired room temperature.

③ Control Using Two Remote Controllers.



Two remote controllers can be used to control either one unit or several units in group control. This makes it possible to control unit with ease either from a distance or at close range. Units operate according to the latest commands from either remote controller.

④ Both Remote ON/OFF Control and Individual Control.



Relays and remote ON-OFF switch are not supplied. Timer Control is also available.

7. DRAIN PUMP FOR EASY PIPE CONNECTION

This mechanism, with its capacity to raise drain water about 20" above the ceiling line, is convenient for removing water and avoiding piping contact with beams, etc.

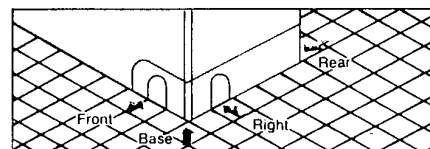
8. FRESH AIR INTAKE AND BRANCH DUCTING ARE AVAILABLE (on-site work)

9. HIGH RELIABILITY AND EASY SERVICING

In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism (cooling), an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

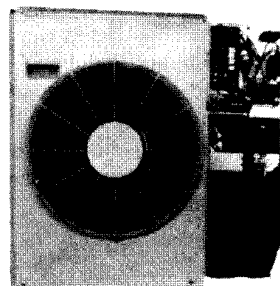
10. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

Piping on the outdoor unit may be connected from either of four directions: front, rear, side or beneath the base. This easy-access design makes it possible to install a number of units in a compact arrangement at a single site. The outdoor unit allows for unheard-of flexibility in determining a piping layout, thus greatly simplifying installation.



11. FRONT-ACCESS FACILITATES MAINTENANCE

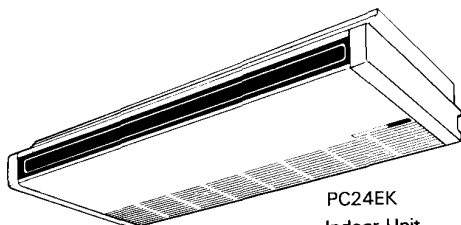
The outdoor unit has been designed with a front-access service panel that allows easy access to all maintenance points, regardless of the installation layout. What's more, this front panel may be removed by loosening only two screws. It all adds up to greatly simplified maintenance work.



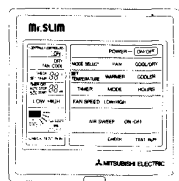
12. NITROGEN GAS IS CHARGED TO INDOOR UNIT

The indoor units of this series are charged with nitrogen gas (N_2) instead of R-22 before shipment from the factory.

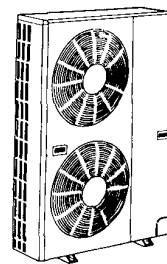
Series PC Ceiling Suspended



PC24EK
Indoor Unit



Microprocessor
Remote controller



PU24EK, PU24EK-1
Outdoor Unit

<MODEL>	<Cooling Capacity>	<SEER>
PC24EK	24,000 Btu/h	10.3
PC30EK	31,000 Btu/h	10.4
PC36EK	36,500 Btu/h	10.2
PC42EK	42,500 Btu/h	10.0

1. ADVANCED MICROPROCESSOR CONTROL (Please refer to page 2-3 for the detail.)

- (1) Easy to use Microprocessor remote controller
 - 1) Ultra-Thin Remote Controller
 - 2) Attractive Liquid Crystal Display (LCD)
 - 3) Convenient 24-Hour ON-OFF Timer
 - 4) Self-Diagnostic Feature Indicates Faults Instantly
 - 5) Useful Memory Feature for Storing Instructions
- (2) Non-polar Two-Wire Remote Controller Cables

2. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS (Please refer to page 3 for the detail.)

- 1) Group Control by a Single Remote Controller
- 2) Control Using Two Remote Controllers
- 3) Both Remote ON/OFF Control and Individual Control
- 4) Individual Control by Gathering Remote Controllers

3. REDI-CHARGED REFRIGERANT SYSTEM

When refrigerant tubing is 100ft or less, it is unnecessary to charge additional refrigerant. This can contribute to enhance installation quality and reduce installation time.

4. MAXIMUM COMFORT AIR CONDITIONING

- (1) Indoor Unit Changeable Air Outlet
PC-EK series have changeable air outlet.
Downward air flow can be obtained at an angle up to 30°. Upward air flow at angle of 10° is able to stretch cool air in a room. This function enables comfortable air distribution.

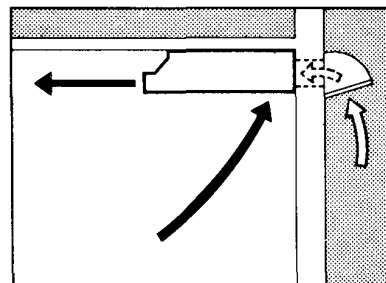
- (2) Swing Flow Louvers

The Swing Flow Louvers automatically change the air flow direction for desirable air distribution.



(3) Fresh-Air Intake

The PC-EK series also has fresh air intake, providing more comfortable, healthful air conditioning through better ventilation. The rear panel has a knock-out for the intake of fresh air.



5. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 0°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

(Please refer to page 2 for the detail.)

6. DRAIN PUMP FOR EASY PIPE CONNECTION (Option)

This mechanism, with its capacity to raise drainwater 20" above the ceiling line, is convenient for removing water and avoiding piping contact with beams, etc.

Note : This can not be mounted in the unit.

7. SLIM, COMPACT AND SPACE SAVING

(1) Space Saving Design

Because the PC-EK series indoor units are designed to be suspended from the ceiling, valuable floor space and wall surfaces are not used. The unit is only 7-11/16" high and 50-7/16" wide (PC24EK).

The outdoor units are also slim line, with a depth dimension of only 11-5/8" (PU24EK).

(2) Flush-To-The-Wall Installation

Since the units in the PC-EK series are installed flush against the back wall, connection pipes are hidden. This gives the room a touch of sleek sophistication.

8. EASY INSTALLATION

Installation is simple, thanks to the easy-connection refrigerant lines. As all outdoor units are charged for 100' of line set and tested at the factory, there's no need for special on-site work.

The indoor unit is easy to mount and requires only a minimum of wiring, saving your time, labor, and money.

9. HIGH RELIABILITY AND EASY SERVICING

In addition to the self-diagnostic function, units are also equipped with a 3-minute tie delay mechanism, an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

10. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

(Please refer to page 4 for the detail.)

11. FRONT-ACCESS FACILITATES MAINTENANCE

(Please refer to page 4 for the detail.)

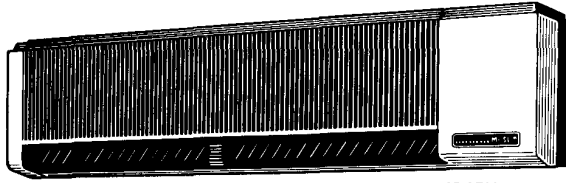
12. ECONOMICAL AND EFFICIENT OPERATION

- Mitsubishi exclusive LCD indicators show the temperature selected and the current room temperature. This system ensures full protection against overcooling.
- The Mitsubishi Electric split-type air-to-air PC models feature highly precise compressors with large-capacity heat exchangers for efficient operation.

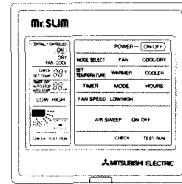
13. NITROGEN GAS IS CHARGED TO INDOOR UNIT

Indoor units of this series are charged with nitrogen gas (N₂) instead of R-22 before shipment from the factory.

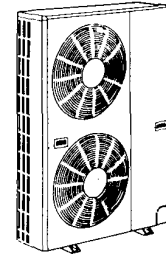
Series PK Wall Mounted



PK24EK
Indoor unit



Microprocessor
remote controller



PU24EK, PU24EK-1
Outdoor unit

Models	Cooling capacity	SEER
PK18EK	18,000 Btu/h	11.0
PK24EK	24,000 Btu/h	10.3
PK30EK	28,800 Btu/h	10.0

1. ADVANCED MICROPROCESSOR CONTROL (Please refer to page 2~3 for detail.)

- (1) Ultra-Thin, Multifunction LCD Remote Controller
- (2) Non-polar Two-Wire Remote Controller Cables

2. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSORS (Please refer to page 3 for the detail.)

- (1) Group control by a Single Remote Controller
- (2) Control Using Two Remote Controllers
- (3) Both Remote ON-OFF Control and Individual Control
- (4) Individual Control by Gathering Remote Controllers

3. REDI-CHARGED REFRIGERANT SYSTEM

When refrigerant tubing is 100ft or less, it is unnecessary to charge additional refrigerant. This can contribute to enhance installation quality and reduce installation time.

4. MAXIMUM COMFORT AIR CONDITIONING

1) Swing Flow Louvers

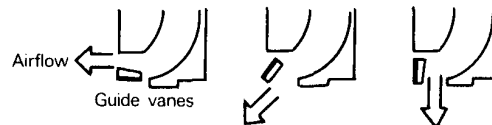
Swing Flow Louvers automatically change the airflow direction for uniform air distribution.

Swing flow louvers.



2) Guide Vanes

Guide Vanes also change the airflow direction vertically.



(During Cooling)

5. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 0°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

(Please refer to page 2 for the detail.)

6. INSIDE-THE-UNIT PIPE CONNECTION

Pipe connections for the indoor unit can be done inside the unit itself in order to make the connection work easier and give a beautiful finish of the installation.

7. SLIM, COMPACT AND SPACE SAVING

1) Space Saving Design

Only 8-11/16 inches deep and 14-3/16 inches high, the indoor unit is styled long and thin for mounting just below the ceiling. No valuable floor space is required for installation.

The outdoor units are also slim line with a depth dimension of only 11-5/8 inches (PU24EK).

8. EASY INSTALLATION

Installation is simple, thanks to the easy-connection refrigerant lines. As all units are charged for 100' of line set and tested at the factory, there's no need for special on-site work.

9. HIGH RELIABILITY AND EASY SERVICING

In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism, an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

10.FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

(Please refer to page 4 for the detail.)

11.FRONT-ACCESS FACILITATES MAINTENANCE

(Please refer to page 4 for the detail.)

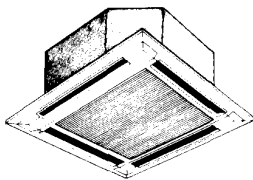
12.ECONOMICAL AND EFFICIENT OPERATION

- Mitsubishi exclusive LCD indicators show the temperature selected and the current room temperature. This system ensures full protection against overcooling.
- The Mitsubishi Electric split-type air-to-air PK models feature highly precise compressors with large-capacity heat exchangers for efficient operation.

13.NITROGEN GAS IS CHARGED TO INDOOR UNIT

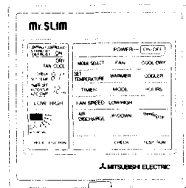
Indoor units of this series are charged with nitrogen gas (N₂) instead of R-22 before shipment from the factory.

Series PLL Ceiling Cassettes

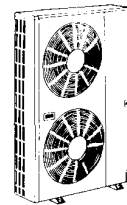


PLL24FK
Indoor Unit

<MODELS>	<COOLING CAPACITY>	<SEER>
PLL12FK	12,300 Btu/h	10.4
PLL18FK	18,400 Btu/h	10.2
PLL24FK	23,600 Btu/h	10.0



Microprocessor
Remote controller



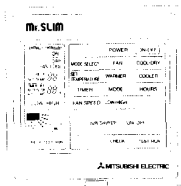
PUL24EK, PUL24EK-1
Outdoor Unit

Series PCL Ceiling Suspended

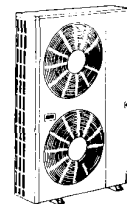


PCL24EK
Indoor Unit

<MODEL>	<COOLING CAPACITY>	<SEER>
PCL24EK	24,000 Btu/h	10.3



Microprocessor
Remote controller



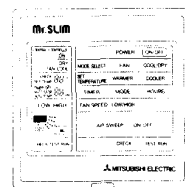
PUL24EK, PUL24EK-1
Outdoor Unit

Series PKL Wall Mounted

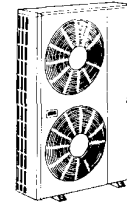


PKL24EK
Indoor Unit

<MODELS>	<COOLING CAPACITY>	<SEER>
PKL12EK	12,000 Btu/h	10.7
PKL18EK	18,000 Btu/h	11.0
PKL24EK	24,000 Btu/h	10.3



Microprocessor
Remote controller



PUL24EK, PUL24EK-1
Outdoor Unit

1. COOLING OPERATION UNDER OUTDOOR TEMPERATURES AS LOW AS 0°F

With conventional air conditioners in cooling mode, the condensing pressure enough to stop the unit when the outdoor air temp. is very low. However, in PLL, PCL, and PKL series, controlling speed of the outdoor fan makes it possible to keep the condensing pressure at the proper level. This results the cooling operation under extremely low outdoor temp. as 0°F.

2. ADVANCED MICROPROCESSOR CONTROL (Please refer to page 2~3 for the detail.)

3. INNOVATIVE SYSTEM CONTROL BY MICROPROCESSOR (Please refer to page 3 for the detail.)

4. REDI-CHARGED REFRIGERANT SYSTEM (Please refer to page 2.)

5. MAXIMUM COMFORT AIR CONDITIONING (PCL/PKL series) (Please refer to page 5 ~ 6.)

6. DRAIN PUMP FOR EASY PIPE CONNECTION (Please refer to page 4.)

It is equipped for PLL only, and option for PCL.

7. EASY INSTALLATION (PCL/PKL series) (Please refer to page 6.)

8. HIGH RELIABILITY AND EASY SERVICING (Please refer to page 6.)

9. ECONOMICAL AND EFFICIENT OPERATION (PCL/PKL series) (Please refer to page 6.)

10. NITROGEN GAS IS CHARGED TO INDOOR UNIT (PCL/PKL) (Please refer to page 4.)

3

SPECIFICATIONS

MODELS : PL18/24FK, PLL12/18/24FK

Model			PLL12FK	PL18FK PLL18FK	PL24FK PLL24FK
Capacity	* 1	Btu/h	12,300	18,400	23,600
Power consumption	* 1	kW	1.23	1.88	2.48
EER	* 1		10.0	9.8	9.5
SEER			10.4	10.2	10.0
INDOOR UNIT MODEL			PLL12FK	PL18FK2, PLL18FK	PL24FK2, PLL24FK
External finish			Galvanized sheets with gray heat insulaiton		
Power supply	V, phase, Hz		115, 1, 60		
Max. fuse size (time delay)	A		15	15	15
Min. ampacity	A		2.0	2.0	2.0
Fan motor	F.L.A.		0.75	0.85	1.1
Airflow Hi-Lo	Dry	CFM	570-540	680-460	750-550
	Wet	CFM	420-400	650-440	660-480
Moisture removal	Pints/h		3.8	5.3	6.8
Sound level Hi-Lo	dB(A)		43-35	45-38	47-39
Cond. drain connection OD	in.		1-1/4	1-1/4	1-1/4
Dimensions	W	in.	32-1/4		
	D	in.	32-1/4		
	H	in.	10-1/8		
Weight	lb.		60	64	64
INDOOR GRILLE	External finish		Munsell 0.70Y 8.59/0.97		
	Dimensions	W	in.	36-5/8	
		D	in.	36-5/8	
		H	in.	2-3/8	
	Weight		22		
OUTDOOR UNIT MODEL			PUL12EK, PUL12EK-1	PU18EK, PU18EK-1 PUL18EK, PUL18EK-1	PU24EK, PU24EK-1 PUL24EK, PUL24EK-1
External finish			Munsell 5Y 7/1		
Sound level	dB(A)		50	53	55
Power supply	V, phase, Hz		208-230, 1, 60		
Max. fuse size (time delay)	A		15	20	20
Min. ampacity	A		11	16	16
Fan motor	F.L.A.		0.65	0.75	0.65 + 0.65
Compressor	Model (type)		RH167NAB	RH247NAB	NH33NBD
		R.L.A.	8.9	12	11.5
		L.R.A.	29	37	54
Crankcase heater	A(W)		0.11/0.12(23/28)	0.11/0.12 (23/28)	0.16/0.17 (33/39)
Refrigerant control			Capillary tube		
Dimensions	W	in.	34-1/4		
	D	in.	11-5/8		
	H	in.	25-5/8	33-1/2	49-9/16
Weight	lb.		105	154	207
REMOTE CONTROLLER			With indoor unit		
Control voltage (by built-in transformer)			Indoor unit - remote controller : DC12V, Indoor unit - outdoor unit : DC12V		
REFRIGERANT PIPING			Not supplied (optional parts)		
Pipe size	Liquid	in.	3/8	3/8	3/8
	Gas	in.	5/8	5/8	5/8
Connection method	Indoors		Flared		
	Outdoors		Flared		
Between the indoor & outdoor units	Height difference	ft	130	130	164
	Piping length	ft	130	130	164

NOTE : * 1. Rating conditions — indoor : 80°FDB, 67°FWB outdoor : 95°FDB, 75°FWB

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	*PL: 0°FDB *PLL: 0°FDB

*WITH WIND BAFFLE INSTALLED

MODELS : PL30/36/42FK(2)

Item			Model	PL30FK	PL36FK	PL42FK2
Capacity		* 1	Btu/h	31,000	36,100	42,500
Power consumption		* 1	kW	3.10	3.76	4.40
EER		* 1		10.0	9.6	9.7
SEER				10.4	10.0	10.0
INDOOR UNIT MODELS				PL30FK2	PL36FK2	PL42FK2
External finish				Galvanized sheets with gray heat insulation		
Power supply		V, phase, Hz		115, 1, 60		
Max. fuse size (time delay)		A		15	15	15
Min. ampacity		A		2.0	2.0	3.0
Fan motor		F.L.A.		1.0 + 1.0	1.0 + 1.0	1.2 + 1.2
Airflow Hi-Lo	Dry	CFM		1,170-850	1,170-850	1,270-920
	Wet	CFM		1,090-790	1,090-790	1,200-870
Moisture removal		(Pints/h)		9.6	10.9	12.6
Sound level Hi-Lo		dB(A)		49-41	49-41	49-42
Cond. drain connection OD		in.		1-1/4	1-1/4	1-1/4
Dimensions	W	in.		52-3/4		
	D	in.		32-1/4		
	H	in.		10-1/8		
Weight		lb.		99	99	101
INDOOR GRILLE	External finish			Munsell 0.70Y 8.59/0.97		
	Dimensions	W	in.	57-1/8		
		D	in.	36-5/8		
		H	in.	2-3/8		
Weight				35		
OUTDOOR UNIT MODEL				PU30EK, PU30EK-1	PU36EK, PU36EK-1	PU42EK2, PU42EK2-1
External finish				Munsell 5Y 7/1		
Sound level		dB(A)		55	55	56
Power supply		V, phase, Hz		208-230, 1, 60		
Max. fuse size (time delay)		A		30	30	40
Min. ampacity		A		20	22	27
Fan motor		F.L.A.		0.65 + 0.65	0.75 + 0.75	0.8 + 0.8
Compressor	Model(type)			NH41NAD	NH47NAD	NH569NXA
	R.L.A.			14.0	17.5	20
	L.R.A.			73	87	105
Crankcase heater		A(W)		0.16/0.17 (33/39)	0.16/0.17 (33/39)	0.16/0.17 (33/39)
Refrigerant control				Capillary tube		
Dimensions	W	in.		34-1/4	38-3/16	38-3/16
	D	in.		11-5/8	13-9/16	13-9/16
	H	in.		49-9/16		
Weight		lb.		208	220	260
REMOTE CONTROLLER				With indoor unit		
Control voltage (by built-in transformer)				Indoor unit - remote controller : DC12V, Indoor unit - outdoor unit : DC12V		
REFRIGERANT PIPING				Not supplied (optional parts)		
Pipe size	Liquid	in.		1/2	1/2	1/2
	Gas	in.		3/4	3/4	3/4
Connection method	Indoors			Flared		
	Outdoors			Flared		
Between the indoor & outdoor units	Height difference	ft		164	164	164
	Piping length	ft		164	164	164

NOTES : * 1. Rating conditions — indoor : 80°FDB, 67°FWB outdoor : 95°FDB, 75°FWB

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95°FDB, 71°FWB	115°FDB
	Minimum	67°FDB, 57°FWB	*PL: 0°FDB

*WITH WIND BAFFLE INSTALLED

MODELS : PC24/30/36/42EK,PCL24EK

Item			Model	PC24EK PCL24EK	PC30EK	PC36EK	PC42EK
Capacity	* 1	Btu/h		24,000	31,000	36,500	42,500
Power consumption	* 1	kW		2.43	3.10	3.80	4.40
EER	* 1			9.9	10.0	9.6	9.7
SEER				10.3	10.4	10.2	10.0
INDOOR UNIT MODEL				PC24EK PCL24EK	PC30EK	PC36EK	PC42EK
External finish				Munsell 2.5Y 8/0.3 & N2			
Power supply		V,Phase,HZ		115,1,60			
Max. fuse size (time delay)		A		15	15	15	15
Min ampacity		A		3.0	3.0	3.0	3.0
Fan motor		F.L.A.		1.8	1.8	2.1	2.4
Airflow Hi-Lo	Dry	CFM		1,050-850	1,050-850	1,270-990	1,270-990
	Wet	CFM		900-730	900-730	1,100-860	1,100-860
Moisture removal		Pints/h		7.2	9.6	11.1	12.6
Sound level Hi-Lo		dB(A)		50-43	50-43	52-44	52-44
Cond. drain connection OD		in.		1	1	1	1
Dimensions	W	in.		50-7/16		62-1/4	
	D	in.		26-13/16		26-13/16	
	H	in.		10-1/8		10-1/8	
Weight		lb.		93		115	
OUTDOOR UNIT MODEL				PU24EK, PU24EK-1 PUL24EK, PUL24EK-1	PU30EK, PU30EK-1	PU36EK, PU36EK-1	PU42EK2, PU42EK2-1
External finish				Munsell 5Y7/1			
Power supply		V,phase,HZ		208/230,1,60			
Max. fuse size (time delay)		A		20	30	30	40
Min. ampacity		A		16	20	22	27
Fan motor		F.L.A.		0.65+0.65	0.65+0.65	0.75+0.75	0.8+0.8
Compressor	Model			NH33NBD	NH41NAD	NH47NAD	NH569NXA
		R.L.A.		11.5	14.0	17.5	20
		L.R.A.		54	73	87	105
Crankcase heater		A(W)		0.16/0.17 (33/39)	0.16/0.17 (33/39)	0.16/0.17 (33/39)	0.16/0.17 (33/39)
Refrigerant control				Capillary tube			
Sound level		dB(A)		55	55	55	56
Dimensions	W	in.		33-1/4		38-3/16	
	D	in.		11-5/8		13-9/16	
	H	in.		49-9/16		49-9/16	
Weight		lb.		207	208	220	260
REMOTE CONTROLLER				With indoor unit			
Control volage (by built-in transformer)				Indoor unit - remote controler : DC12V, Indoor unit - outdoor unit : DC12V			
REFRIGERANT PIPING				Not supplied (optional parts)			
Pipe size	Liquid	in.		3/8	1/2		
	Gas	in.		5/8	3/4		
Connection method	Indoors			Flared			
	Outdoors			Flared			
Between the indoor & outdoor units	Height	ft		164			
	Piping length	ft.		164			

NOTE : * 1. Rating conditions — indoor : 80 FDB, 67 FWB outdoor : 95 FDB, 75 FWB

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95 FDB, 71 FWB	115 FDB
	Minimum	67 FDB, 57 FWB	*PC: 0°FDB *PCL: 0°FDB

*WITH WIND BAFFLE INSTALLED

MODELS : PK18/24/30EK, PKL18/24EK

Item			Model	PKL12EK	PK18EK PKL18EK	PK24EK PKL24EK	PK30EK
Capacity		* 1	Btu/h	12,000	18,000	24,000	28,800
Power consumption		* 1	kW	1.17	1.70	2.37	2.94
EER		* 1		10.3	10.6	10.1	9.8
SEER				10.7	11.0	10.3	10.0
INDOOR UNIT MODEL				PKL12EK	PK18EK PKL18EK	PK24EK PKL24EK	PK30EK
External finish			Munsell 2.5Y 8/0.3				
Power supply		V,Phase,Hz		115,1,60			
Max. fuse size (time delay)		A		15	15	15	15
Min ampacity		A		1.0	1.0	2.0	2.0
Fan motor		F.L.A.		0.5	0.9	0.9	0.9
Airflow Hi-Lo	Dry	CFM		480-390	660-500	660-500	660-500
	Wet	CFM		460-370	600-460	600-460	600-460
Moisture removal		Pints/h		3.8	5.3	7.2	8.6
Sound level Hi-Lo		dB(A)		49-43	49-43	49-43	50-44
Cond. drain connection OD		in.		1	1	1	1
Dimensions	W	in.		48-1/16	60-1/4		
	D	in.		8-11/16	8-11/16		
	H	in.		14-3/16	14-3/16		
Weight		lb.		55	68	69	
OUTDOOR UNIT MODEL				PUL12EK, PUL12EK-1	PU18EK, PU18EK-1 PUL18EK, PUL18EK-1	PU24EK, PU24EK-1 PUL24EK, PUL24EK-1	PU30EK, PU30EK-1
External finish			Munsell 5Y7/1				
Power supply		V,phase,Hz		208/230,1,60			
Max. fuse size (time delay)		A		15	20	20	30
Min. ampacity		A		11	16	16	20
Fan motor		F.L.A.		0.65	0.65	0.65+0.65	0.65+0.65
Compressor	Model			RH167NAB	RH247NAB	NH33NBD	NH41NAD
		R.L.A.		8.9	12.0	11.5	14.0
		L.R.A.		29	37	54	73
Crankcase heater		A(W)		0.11/0.12 (23/28)	0.11/0.12 (23/28)	0.16/0.17 (33/39)	0.16/0.17 (33/39)
Refrigerant control			Capillary tube				
Sound level		dB(A)		50	53	55	55
Dimensions	W	in.		34-1/4			
	D	in.		11-5/8			
	H	in.		25-9/16	33-1/2	49-9/16	
Weight		lb.		105	154	207	208
REMOTE CONTROLLER			With indoor unit				
Control volage (by built-in transformer)			Indoor unit - remote controller : DC12V, Indoor unit - outdoor unit : DC12V				
REFRIGERANT PIPING			Not supplied (optional parts)				
Pipe size	Liquid	in.		3/8			1/2
	Gas	in.		5/8			3/4
Connection method	Indoors	Flared					
	Outdoors	Flared					
Between the indoor & outdoor units	Height	ft		130			164
	Piping length	ft		130			164

NOTE : * 1. Rating conditions — indoor : 80 FDB, 67 FWB outdoor : 95 FDB, 75 FWB

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95 FDB, 71 FWB	115 FDB
	Minimum	67 FDB, 57 FWB	*PK: 0°FDB *PKL: 0°FDB

*WITH WIND BAFFLE INSTALLED

4

DATA

MODELS : PL18/24/30/36/42FK2, PLL12/18/24FK

1. PERFORMANCE DATA

1) COOLING CAPACITY

Models	Outdoor air		Outdoor intake air DB temperature (°F)														
	Airflow (CFM) B.F	IWB(°F)	75			85			95			105			115		
			TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PLL12FK	420 0.27	71	14.3	7.1	1.06	13.8	6.9	1.16	13.2	6.8	1.27	12.6	6.6	1.38	11.9	6.4	1.50
		67	13.2	8.4	1.03	12.8	8.2	1.12	12.3	8.0	1.23	11.8	7.8	1.34	11.2	7.6	1.46
		63	12.1	9.3	0.99	11.8	9.1	1.08	11.4	9.0	1.18	11.1	8.8	1.29	10.4	8.4	1.40
PL18FK2 PLL18FK	650 0.17	71	21.2	14.6	1.64	20.6	13.6	1.77	19.6	12.5	1.93	18.7	11.6	2.10	17.9	10.6	2.23
		67	19.8	16.0	1.60	19.1	15.1	1.73	18.4	14.0	1.88	17.5	12.8	2.03	16.5	11.7	2.17
		63	18.5	17.2	1.56	17.9	16.1	1.70	17.1	15.0	1.83	16.3	13.9	1.98	15.3	12.7	2.12
PL24FK2 PLL24FK	660 0.13	71	27.4	17.8	2.15	26.5	16.7	2.36	25.3	15.2	2.57	24.0	13.8	2.77	22.8	12.5	3.00
		67	25.6	19.5	2.10	24.7	18.0	2.30	23.6	16.8	2.48	22.6	15.4	2.69	21.4	13.9	2.90
		63	23.8	20.5	2.05	22.9	19.0	2.24	22.1	18.1	2.43	21.0	16.6	2.62	20.0	15.2	2.81
PL30FK2	1090 0.15	71	35.8	19.4	2.65	34.5	19.1	2.88	33.5	18.8	3.17	31.4	18.5	3.44	29.6	18.0	3.76
		67	33.2	22.6	2.59	31.9	22.1	2.81	31.0	21.6	3.10	28.8	20.9	3.35	27.4	20.4	3.63
		63	30.9	25.1	2.53	29.8	24.6	2.75	29.0	23.9	3.02	26.9	23.1	3.28	25.6	22.5	3.55
PL36FK2	1090 0.15	71	41.7	27.1	3.22	40.3	25.4	3.52	38.6	23.5	3.85	36.8	22.1	4.22	34.9	20.2	4.56
		67	38.9	29.6	3.15	37.5	28.1	3.44	36.1	26.4	3.76	34.5	24.5	4.10	32.5	22.4	4.42
		63	36.4	32.0	3.08	35.1	30.2	3.36	33.5	28.1	3.67	31.9	26.2	4.00	30.2	24.2	4.30
PL42FK2	1200 0.14	71	49.6	32.3	3.95	47.8	30.0	4.25	45.8	28.0	4.60	43.5	25.7	4.85	41.2	23.1	5.20
		67	46.1	35.0	3.88	44.3	32.8	4.10	42.5	30.6	4.40	40.2	28.2	4.65	37.7	25.3	4.95
		63	42.8	37.2	3.80	41.1	34.9	4.00	39.3	32.6	4.28	37.1	29.7	4.45	34.8	27.1	4.75

Notes 1. B.F : Bypass Factor, IWB : Intake air wet-bulb temperature.

TC : Total Capacity ($\times 10^3$ Btu/h), SHC : Sensible Heat Capacity ($\times 10^3$ Btu/h)

TPC : Total Power Consumption (kW).

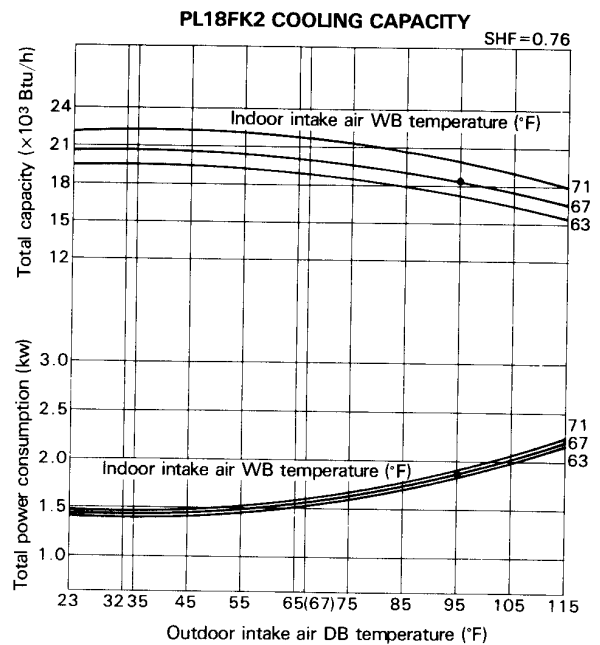
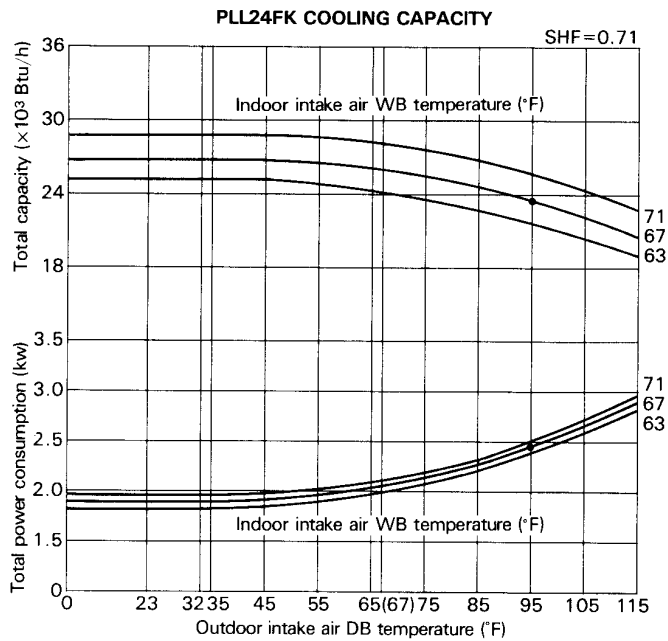
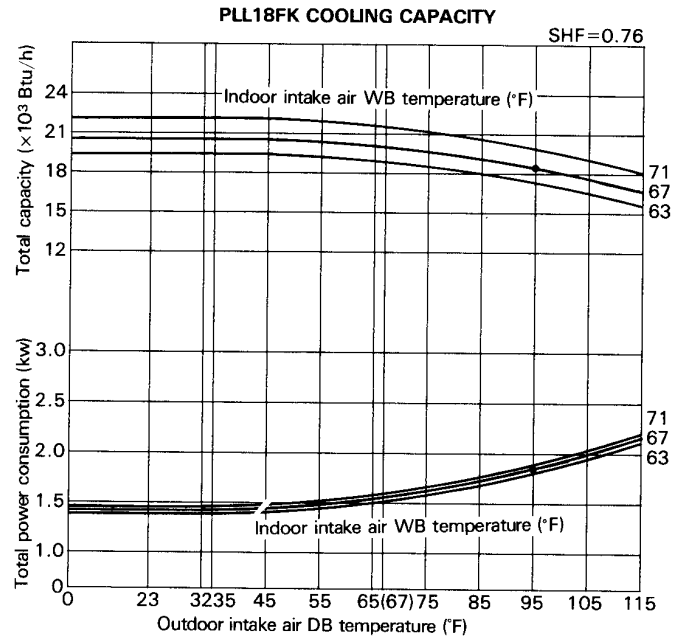
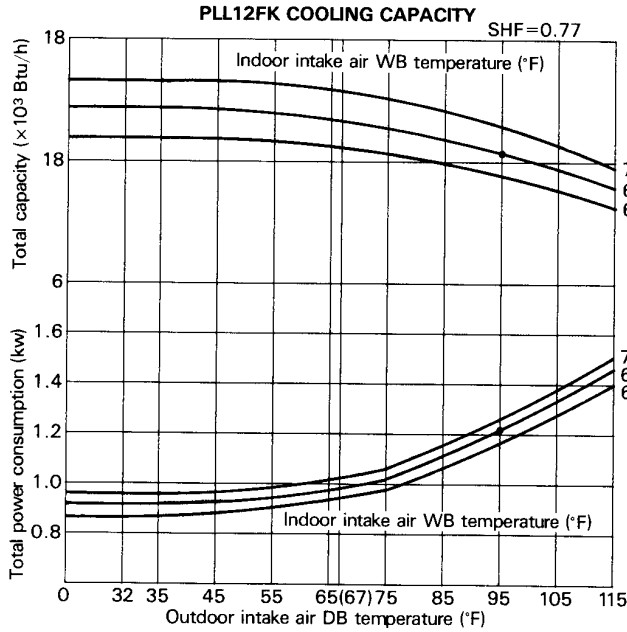
2. SHC is based on 80°F of indoor intake air DB temperature.

2) COOLING CAPACITY CORRECTIONS

MODELS	Refrigerant piping length (one way)									
	25ft(std)	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PL18FK2 PLL12FK PLL18FK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PL24FK2 PLL24FK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL30FK2	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL36FK2	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PL42FK2	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

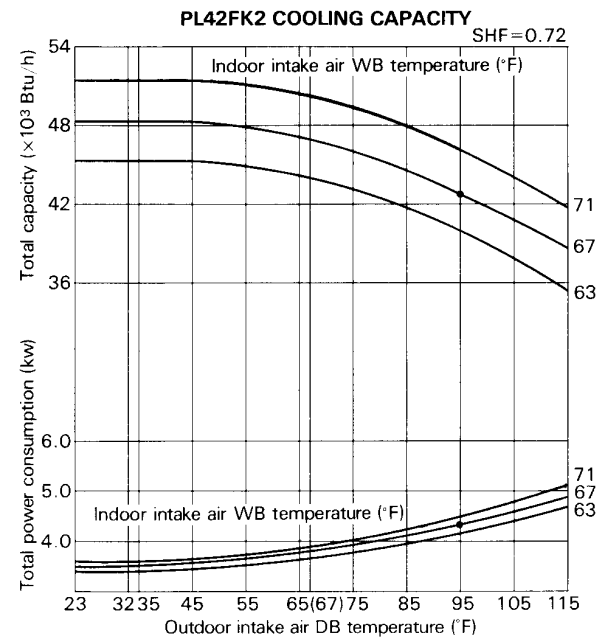
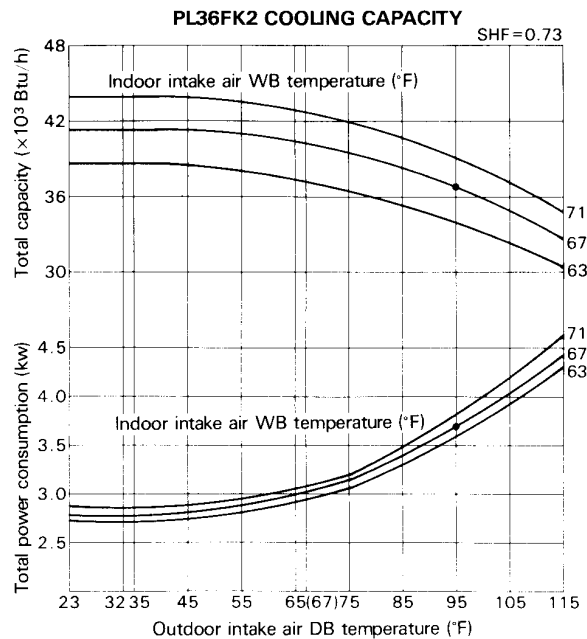
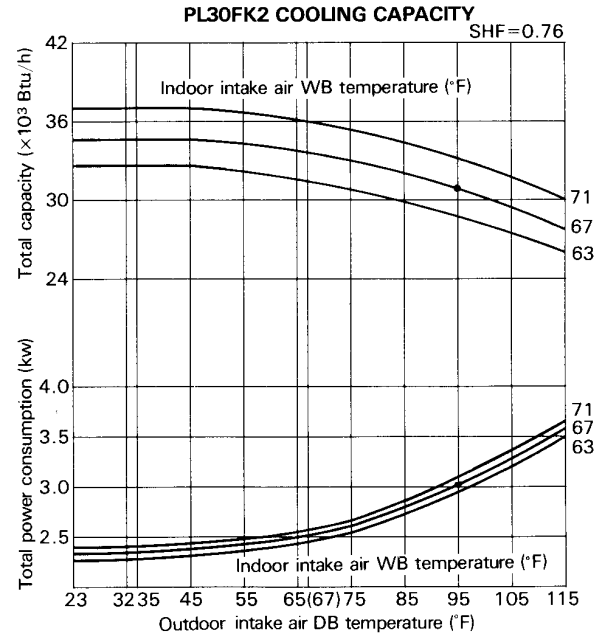
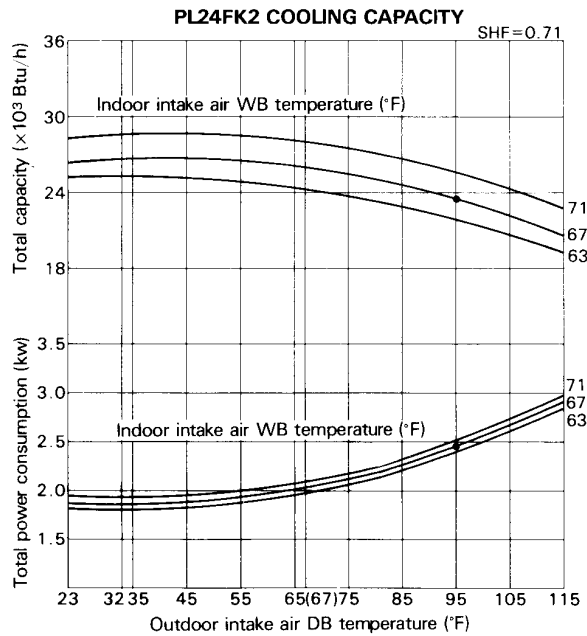
2. PERFORMANCE CURVE

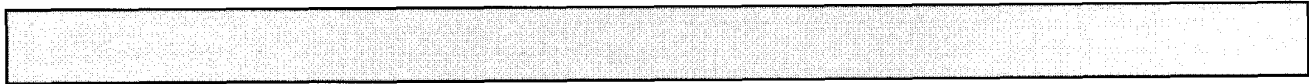
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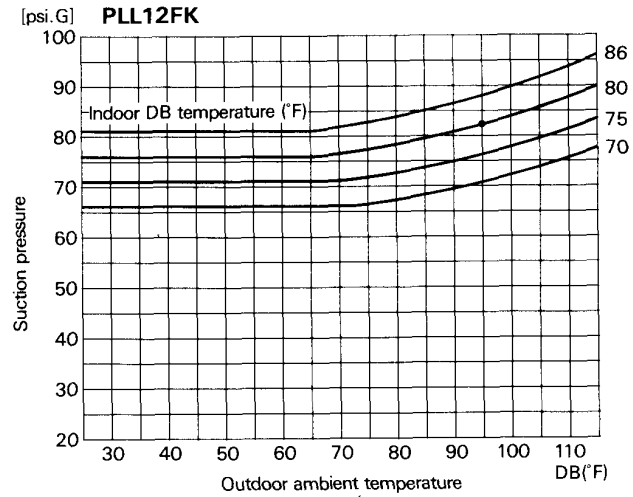
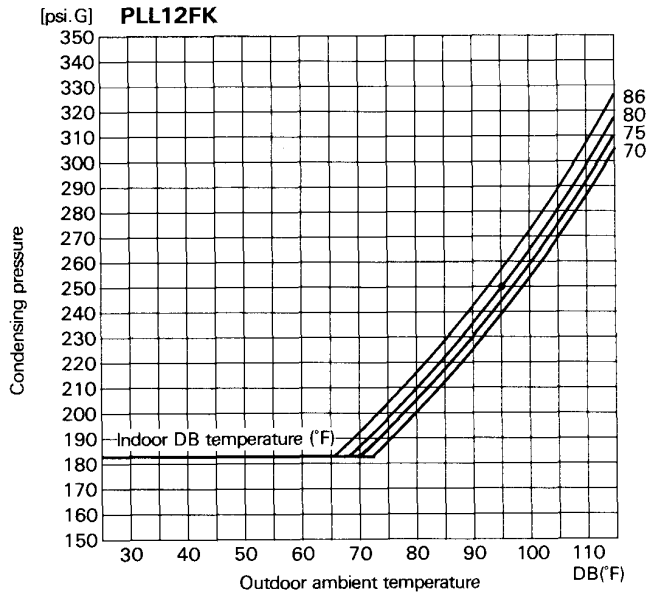
NOTE: A point on the curve shows the reference point.



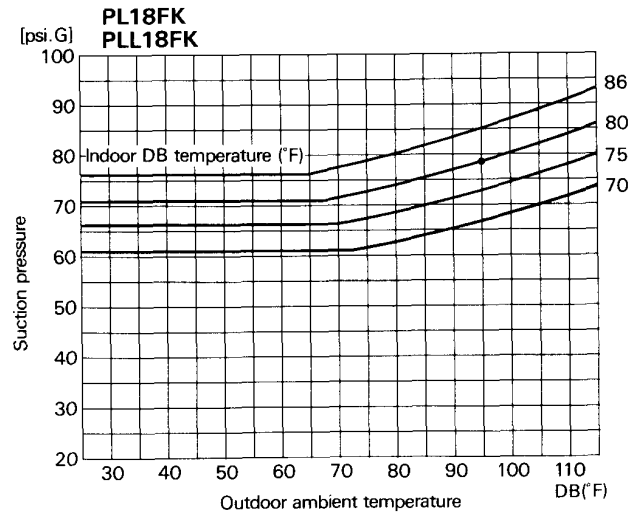
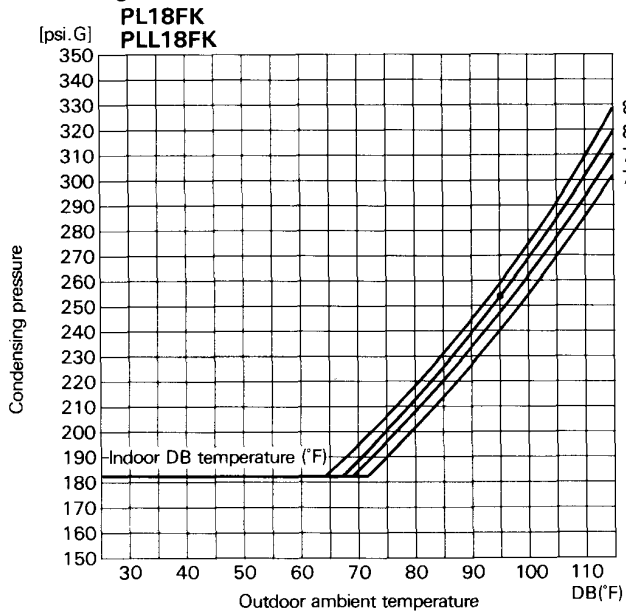


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

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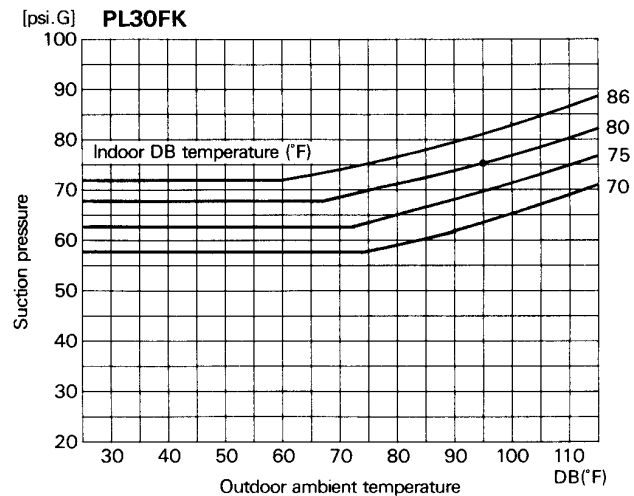
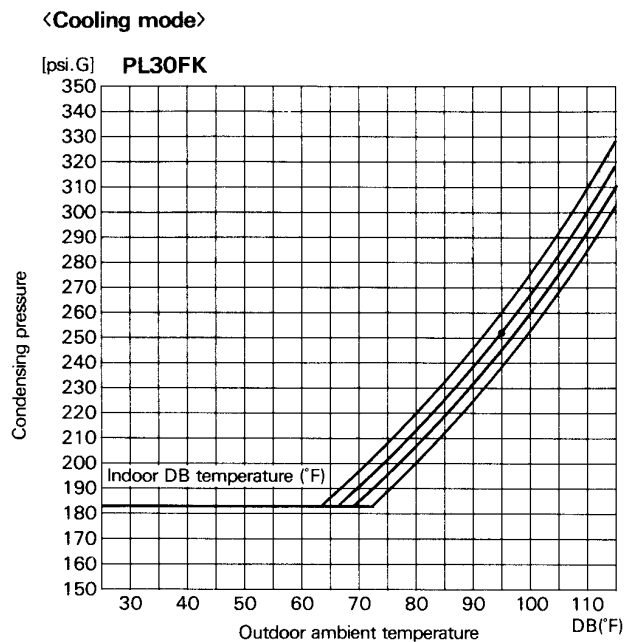
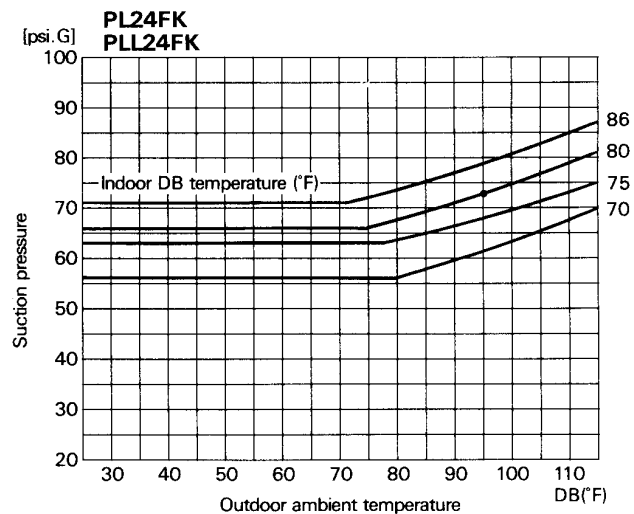
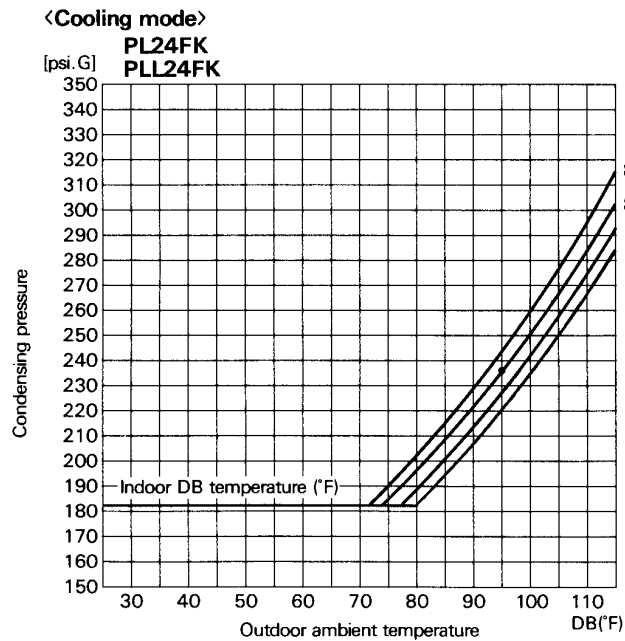


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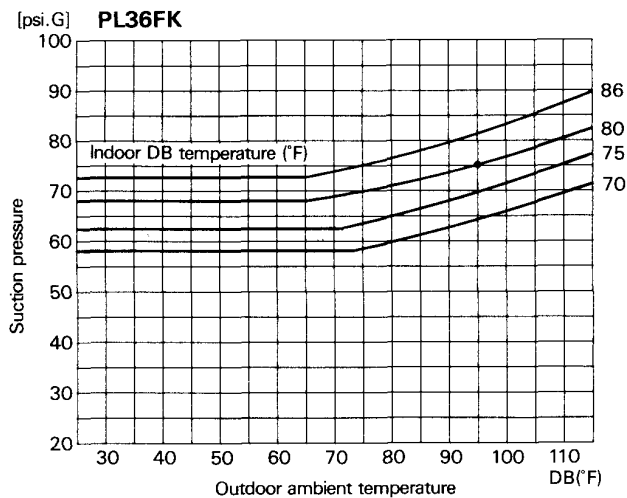
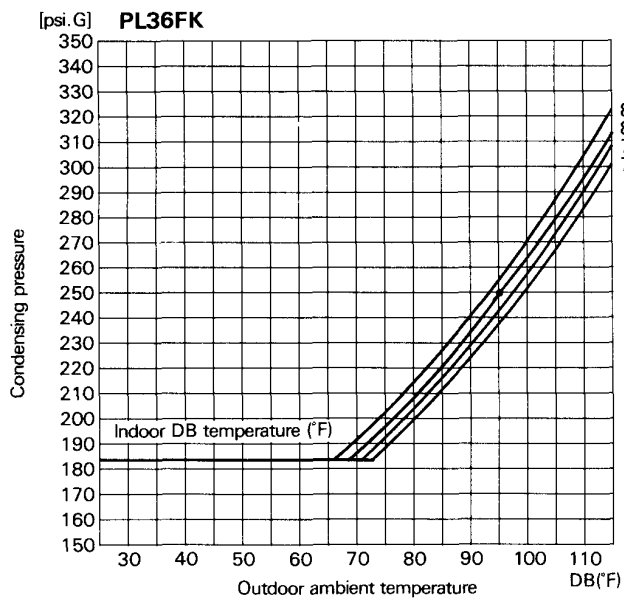


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

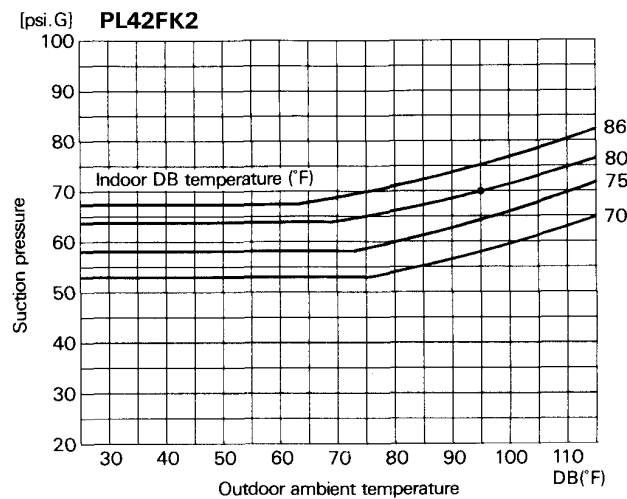
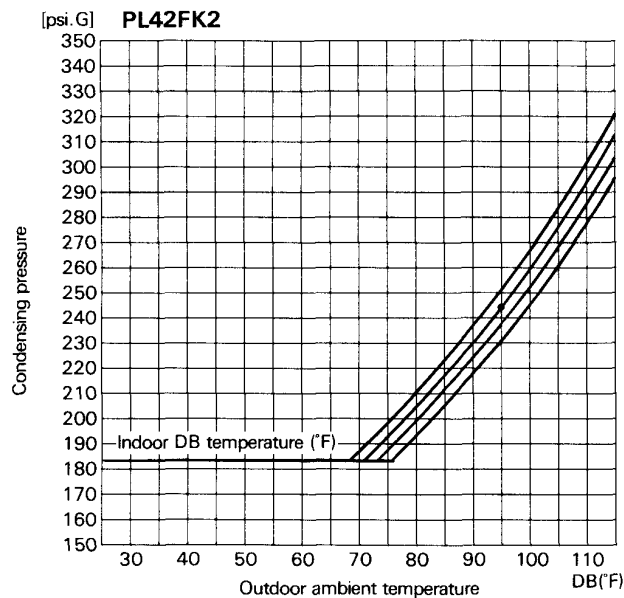


Data is based on the condition of indoor humidity 50%.
 Air flow should be set at H1.
 A point on the curve shows the reference point.

<Cooling mode>



<Cooling mode>



3. STANDARD OPERATION DATA

Models			PLL12FK	PL18FK PLL18FK	PL24FK	
Item		Unit	Cooling	Cooling	Cooling	
Total	Capacity	Btu/h	12,300	18,400	23,600	
	SHF	—	0.77	0.76	0.71	
	Input	kW	1.23	1.88	2.48	
Electrical circuit	INDOOR UNIT MODEL		PLL12FK	PL18FK2 PLL18FK	PL24FK2 PLL24FK	
	Power supply (V,phase,Hz)		115,1,60	115,1,60	115,1,60	
	Input	kW	0.10	0.10	0.12	
	Fan current	A	0.75	0.85	1.06	
	OUTDOOR UNIT MODEL		PUL12EK, PUL12EK-1	PU18EK, PU18EK-1 PUL18EK, PUL18EK-1	PU24EK, PU24EK-1 PUL24EK, PUL24EK-1	
	Power supply (V,phase,Hz)		208/230,1,60	208/230,1,60	208/230,1,60	
	Input	kW	1.13	1.78	2.36	
	Comp. current	A	8.9	12.0	11.5	
	Fan current	A	0.75	0.75	0.65 + 0.65	
Refrigerant circuit	Condensing pressure	psi•G	246	252	236	
	Suction pressure	psi•G	82	79	74	
	Discharge temperature	°F	154	161	162	
	Condensing temperature	°F	116	117	113	
	Suction temperature	°F	50	51	45	
	Ref. pipe length	ft	25	25	25	
	Refrigerant charge	—	4 lbs 14 oz	5 lbs 8 oz	9 lbs 15 oz	
Indoor side	Intake air temperature	DB	°F	80	80	80
		WB	°F	67	67	67
	Discharge air temperature	DB	°F	64	60	57
		WB	°F	60	58	56
	Fan speed (High)	rpm	590	680	710	
	Air flow (High)	CFM	420	650	660	
Outdoor side	Intake air temperature	DB	°F	95	95	95
		WB	°F	—	—	—
	Fan speed upper/lower	rpm	790	790	750	750
	Air flow	CFM	1,590	1,590	3,170	



Models				PL30FK		PL36FK		PL42FK2	
Item			Unit	Cooling		Cooling		Cooling	
Total	Capacity		Btu/h	31,000		36,100		42,500	
	SHF		—	0.76		0.73		0.72	
	Input		kW	3.1		3.76		4.40	
Electrical circuit	INDOOR UNIT MODEL			PL30FK2		PL36FK2		PL42FK2	
	Power supply (V,phase,Hz)			115,1,60		115,1,60		115,1,60	
	Input		kW	0.1 + 0.1		0.1 + 0.1		0.13 + 0.13	
	Fan current		A	0.9 + 0.9		0.9 + 0.9		1.15 + 1.15	
	OUTDOOR UNIT MODEL			PU30EK, PU30EK-1		PU36EK, PU36EK-1		PU42EK2, PU42EK2-1	
	Power supply (V,phase,Hz)			208/230,1,60		208/230,1,60		208/230,1,60	
	Input		kW	2.90		3.56		4.14	
	Comp. current		A	14.0		15.9		20.0	
	Fan current		A	0.65 + 0.65		0.75 + 0.75		0.8 + 0.8	
Refrigerant circuit	Condensing pressure		psi•G	237		249		236	
	Suction pressure		psi•G	76		75		70	
	Discharge temperature		°F	165		164		166	
	Condensing temperature		°F	113		115		113	
	Suction temperature		°F	47		46		44	
	Ref. pipe length		ft	25		25		25	
	Refrigerant charge		—	10 lbs 2 oz		10 lbs 9 oz		12 lbs 9 oz	
Indoor side	Intake air temperature	DB	°F	80		80		80	
		WB	°F	67		67		67	
	Discharge air temperature	DB	°F	59		59		58	
		WB	°F	58		57		56	
	Fan speed (High)		rpm	660		660		710	
	Air flow (High)		CFM	1,090		1,090		1,200	
Outdoor side	Intake air temperature	DB	°F	95		95		95	
		WB	°F	—		—		—	
	Fan speed upper/lower		rpm	750	750	760	760	840	840
Air flow		CFM	3,170		3,350		3,530		

4. OPERATING RANGE

1) POWER SUPPLY

	Rating	Allowable voltage
Indoor unit	115V 1 phase 60Hz	Min. 103V — Max. 127V
Outdoor unit	208/230V 1 phase 60Hz	Min. 198V — Max. 253V

2) OPERATION

Function	Intake air temperature	Indoor		Outdoor	
	Condition	DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	75
	Minimum temperature	67	57	*0	—
	Maximum humidity	80	75	80	75

5. OUTLET AIR SPEED AND COVERAGE RANGE

*WITH WIND BAFFLE INSTALLED

		PLL12FK	PL18FK2 PLL18FK	PL24FK2 PLL24FK	PL30FK2	PL36FK2	PL42FK2
Standard height (8.2ft)	Air flow (CFM)	570	680	750	1,170	1,170	1,270
	Air speed (ft/sec.)	9.5	11.3	12.5	10.5	10.5	11.4
	Coverage range (ft)	18	21	23	27	27	29
High ceiling (9.8ft)	Air flow (CFM)	570	680	750	1,170	1,170	1,270
	Air speed (ft/sec.)	13.4	16.0	17.7	15.8	15.8	17.1
	Coverage range (ft)	20	24	26	32	32	34
	Total width discharge outlets (ft)	2.62	2.62	2.62	4.59	4.59	4.59

● The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High fan setting.

The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

6. ADDITIONAL REFRIGERANT CHARGE (R-22 (OZ))

Models	Outdoor unit precharged (up to 100 ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PLL12FK	4lbs 14oz	0	0	0	0	0	0	2	4	—	—
PL18FK PLL18FK	5lbs 8oz	0	0	0	0	0	0	2	4	—	—
PL24FK PLL24FK	9lbs 15oz	0	0	0	0	0	0	2	4	7	9
PL30FK	10lbs 2oz	0	0	0	0	0	0	5	10	16	20
PL36FK	10lbs 9oz	0	0	0	0	0	0	5	10	16	20
PL42FK2	12lbs 9oz	0	0	0	0	0	0	5	10	16	20

MODELS : PC24/30/36/42EK,PCL24EK

1. PERFORMANCE DATA

1) COOLING CAPACITY

Models	Indoor air		Outdoor intake air DB temperature (°F)														
	Airflow (CFM) B.F.	IWB (°F)	75			85			95			105			115		
			TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PC24EK PCL24EK	900 0.14	71	27.8	15.6	2.10	27.0	15.4	2.30	25.8	15.1	2.49	24.8	14.9	2.70	23.6	14.6	2.90
		67	26.2	18.3	2.05	25.2	17.9	2.24	24.0	17.5	2.43	23.2	17.2	2.62	22.2	16.8	2.82
		63	24.5	20.4	2.00	23.6	19.9	2.19	22.8	19.5	2.37	21.8	19.0	2.56	20.8	18.5	2.75
PC30EK	900 0.15	71	35.9	17.7	2.67	34.5	17.3	2.90	33.1	16.9	3.18	31.7	16.6	3.45	30.2	16.1	3.73
		67	33.3	21.1	2.60	32.3	20.6	2.82	31.0	20.1	3.10	29.6	19.5	3.35	28.2	19.0	3.62
		63	31.2	23.8	2.55	30.2	23.2	2.78	29.0	22.6	3.02	27.6	21.8	3.28	26.2	21.1	3.55
PC36EK	1,100 0.12	71	42.3	21.6	3.23	40.9	21.2	3.53	39.3	20.7	3.88	37.5	20.3	4.25	35.7	19.8	4.62
		67	39.3	25.5	3.18	37.9	24.9	3.46	36.5	24.3	3.80	34.9	23.7	4.13	33.3	23.1	4.49
		63	36.7	28.6	3.12	35.5	28.0	3.38	33.9	27.1	3.70	32.5	26.4	4.03	31.0	25.5	4.38
PC42EK	1,100 0.12	71	50.2	23.8	4.00	48.2	23.2	4.25	45.8	22.6	4.55	43.5	21.9	4.85	41.1	21.2	5.25
		67	46.4	28.5	3.90	44.6	27.7	4.15	42.5	26.8	4.40	40.3	25.9	4.70	38.1	25.0	5.00
		63	43.3	32.2	3.80	41.5	31.2	4.00	39.5	30.1	4.25	37.3	28.9	4.50	35.1	27.6	4.75

Notes 1. B.F : Bypass Factor, IWB : Intake air WB temperature
TC : Total Capacity ($\times 10^3$ Btu/h), SHC : Sensible Heat Capacity ($\times 10^3$ Btu/h)
TPC : Total Power Consumption (kW)
2. SHC is based on 80°F of indoor intake air DB temperature.

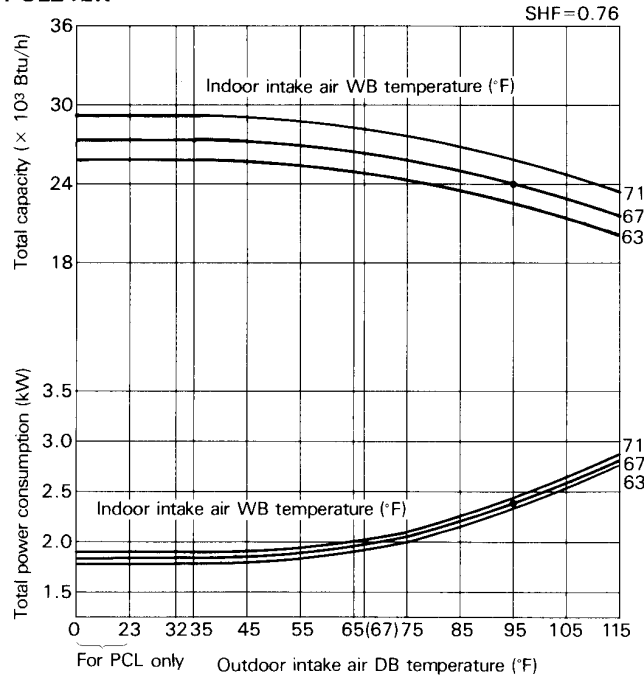
2) COOLING CAPACITY CORRECTIONS

MODEL	Refrigerant piping length (one way)									
	25ft (std)	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PC24EK PCL24EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PC30EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PC36EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PC42EK	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

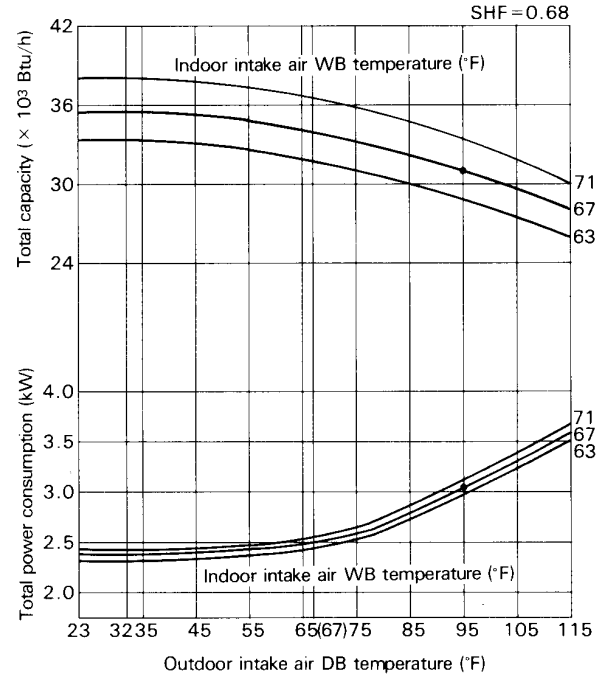
2. PERFORMANCE CURVE

NOTE: A point on the curve shows the reference point.

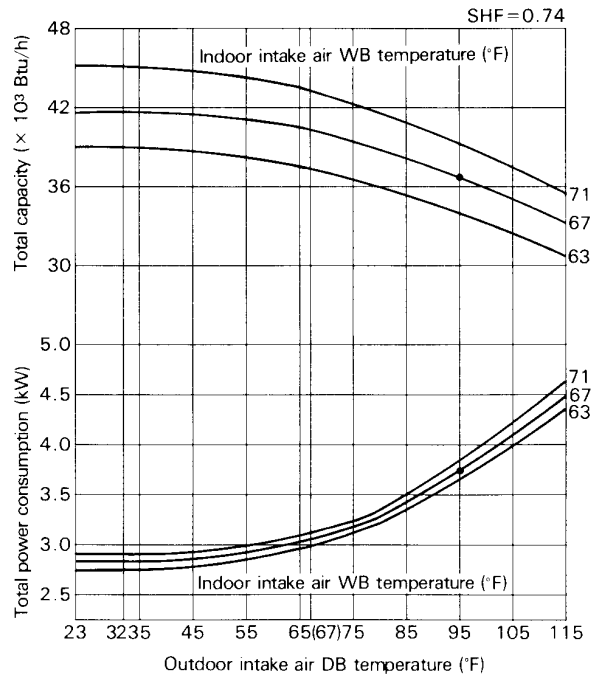
**PC24EK
PCL24EK COOLING CAPACITY**



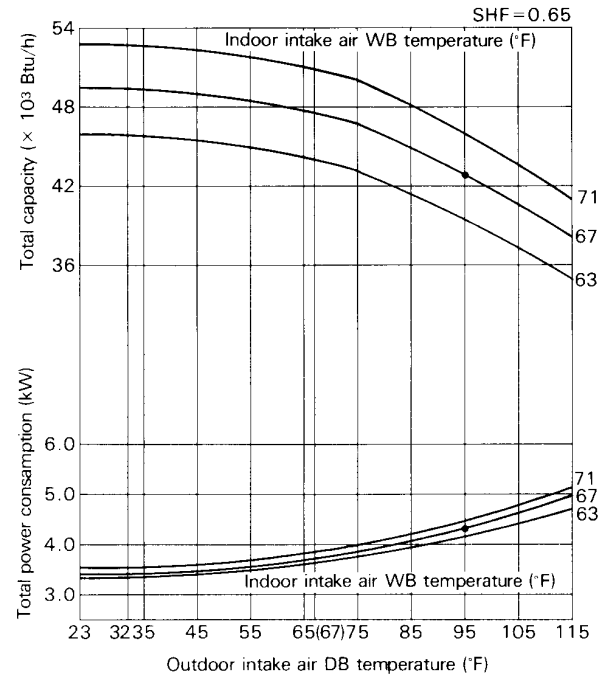
PC30EK COOLING CAPACITY



PC36EK COOLING CAPACITY



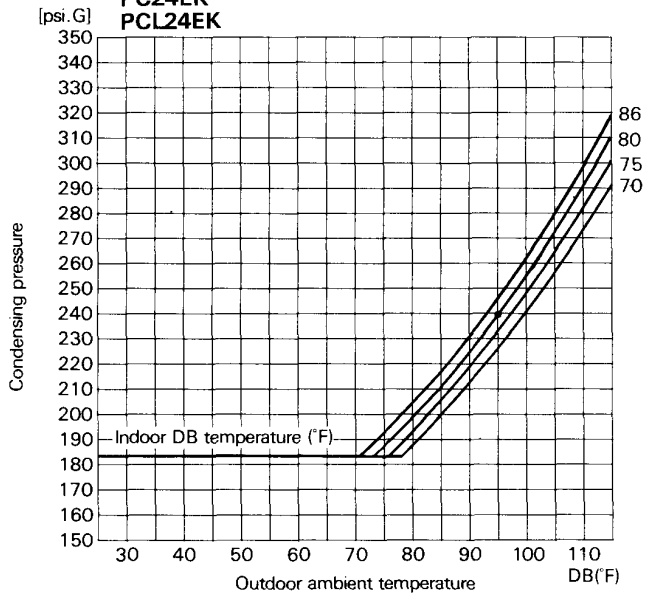
PC42EK COOLING CAPACITY



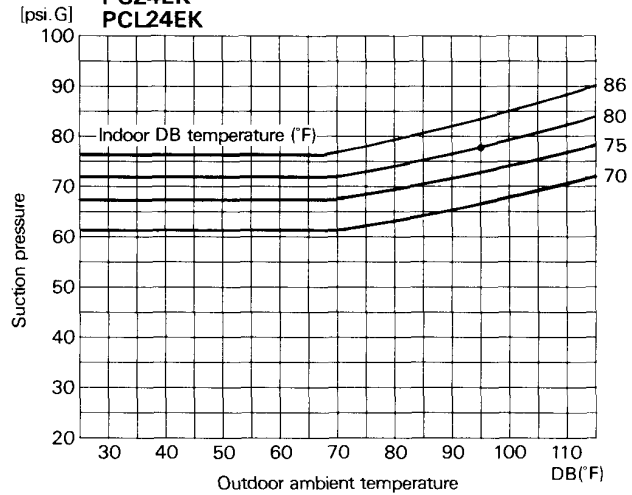
Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>

**PC24EK
PCL24EK**

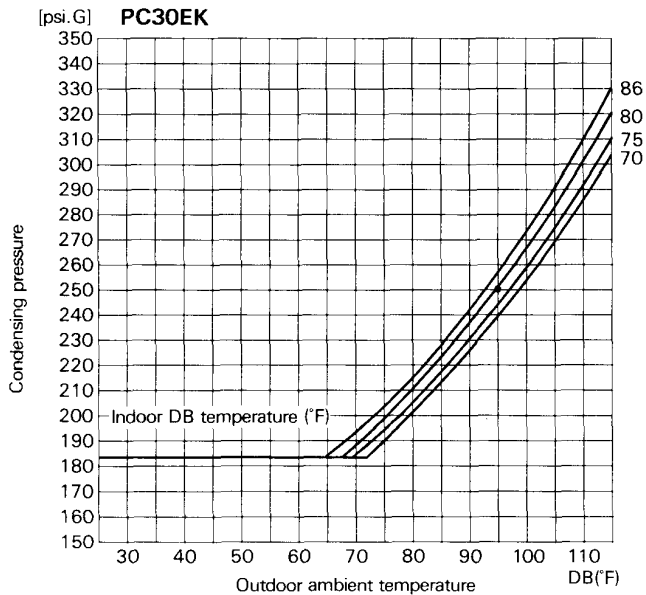


**PC24EK
PCL24EK**

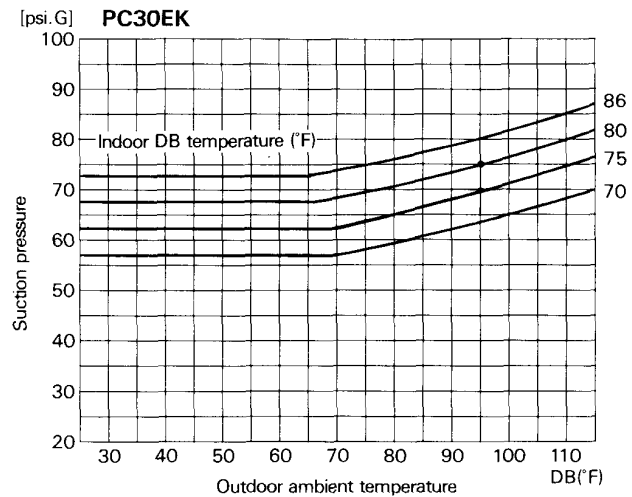


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PC30EK

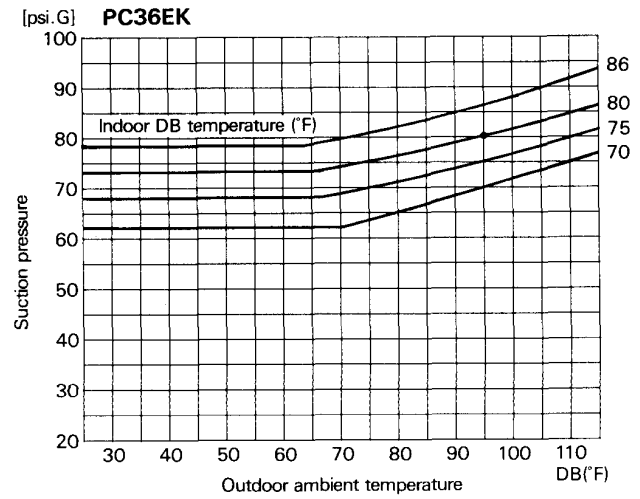
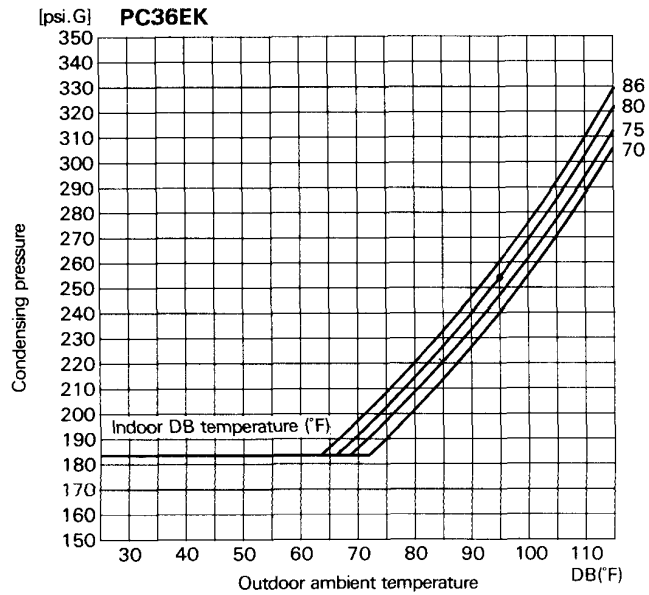


PC30EK

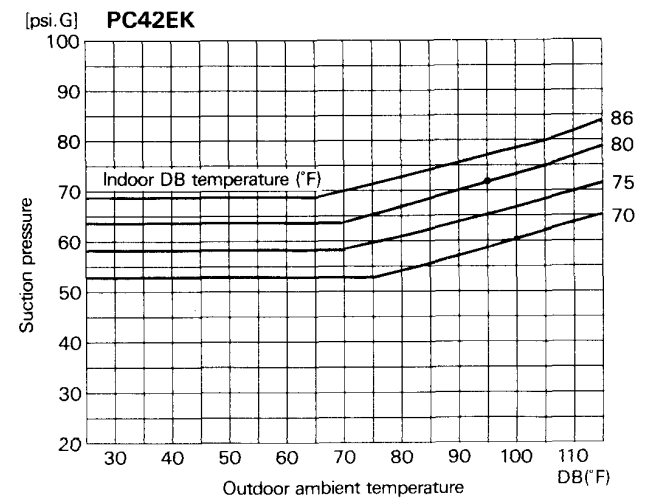
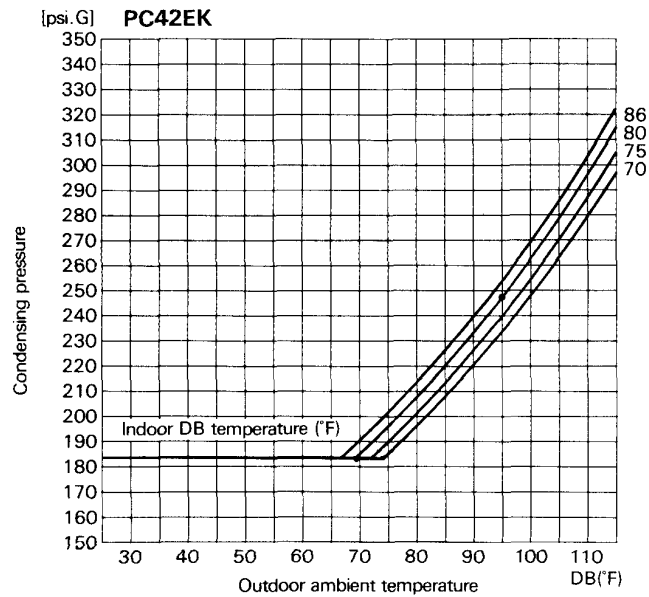


Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.

<Cooling mode>



<Cooling mode>



3. STANDARD OPERATION DATA

Model			PC24EK PCL24EK		PC30EK		PC36EK		PC42EK	
Item		Unit	Cooling		Cooling		Cooling		Cooling	
Total	Capacity	Btu/h	24,000		31,000		36,500		42,500	
	SHF	—	0.76		0.68		0.74		0.65	
	Input	kW	2.43		3.1		3.8		4.4	
Electrical circuit	INDOOR UNIT MODEL		PC24EK PCL24EK		PC30EK		PC36EK		PC42EK	
	Power supply (V,phase,HZ)		115,1,60		115,1,60		115,1,60		115,1,60	
	Input	kW	0.2		0.2		0.22		0.26	
	Fan current	A	1.8		1.8		2.1		2.4	
	OUTDOOR UNIT MODEL		PU24EK, PU24EK-1 PUL24EK, PUL24EK-1		PU30EK, PU30EK-1		PU36EK, PU36EK-1		PU42EK2, PU42EK2-1	
	Power supply (V,phase,HZ)		208/230,1,60		208/230,1,60		208/230,1,60		208/230,1,60	
	Input	kW	2.23		2.9		3.58		4.14	
	Comp. current	A	11.5		14.0		17.5		20.0	
	Fan current	A	0.65+0.65		0.65+0.65		0.75+0.75		0.8+0.8	
Refrigerant circuit	Condensing pressure	psi·G	237		236		250		237	
	Suction pressure	psi·G	78		75		81		71	
	Discharge temperature	°F	158		167		165		168	
	Condensing temperature	°F	113		113		117		113	
	Suction temperature	°F	49		46		50		46	
	Ref. pipe length	ft	25		25		25		25	
	Refrigerant charge	—	9 lbs 15 oz		10 lbs 2 oz		10 lbs 9 oz		12 lbs 9 oz	
Indoor side	Intake air temperature	DB	°F	80	80	80	80	80	80	80
		WB	°F	67	67	67	67	67	67	67
	Discharge air temperature	DB	°F	60	57	59	56	56	56	56
		WB	°F	58	55	57	55	55	55	55
	Fan speed (High)	rpm	1,410		1,410		1,490		1,490	
Outdoor side	Airflow (High)	CFM	900		900		1,100		1,100	
	Intake air temperature	DB	°F	95	95	95	95	95	95	95
		WB	°F	—	—	—	—	—	—	—
	Fan speed upper/lower	rpm	750	750	750	750	760	760	840	840
Outdoor side	Airflow	CFM	3,170		3,170		3,350		3,350	

4. OPERATING RANGE

1) POWER SUPPLY

	Rating	Allowable voltage
Indoor unit	115V 1 phase 60Hz	Min. 103V — Max. 127V
Outdoor unit	208/230V 1 phase 60Hz	Min. 198V — Max. 253V

2) OPERATION

Function	Intake air temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	75
	Minimum temperature	67	57	*0	—
	Maximum humidity	80	75	80	75

*WITH WIND BAFFLE INSTALLED

5. OUTLET AIR SPEED AND COVERAGE RANGE

		PC24EK PCL24EK	PC30EK	PC36EK	PC42EK
Standard height (8.2ft)	Airflow (CFM)	1,050		1,270	
	Air speed (ft/sec.)	17.0		16.5	
	Coverage range (ft)	43		48	

- The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High fan setting.

The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

6. ADDITIONAL REFRIGERANT CHARGE (R-22 (OZ))

Model	Outdoor unit precharged (up to 100ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PC24EK PCL24EK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PC30EK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20
PC36EK	10 lbs 9 oz	0	0	0	0	0	0	5	10	16	20
PC42EK	12 lbs 9 oz	0	0	0	0	0	0	5	10	16	20

MODELS : PK18/24/30EK, PKL12/18/24EK

1. PERFORMANCE DATA

1) COOLING CAPACITY

Models	Indoor air		Outdoor intake air DB temperature (°F)														
	Airflow (CFM) B.F.	IWB (°F)	75			85			95			105			115		
			TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PKL12EK	460 0.17	71	14.1	7.8	1.01	13.5	7.6	1.10	12.9	7.5	1.21	12.1	7.3	1.32	11.3	7.2	1.43
		67	13.2	9.1	0.98	12.7	8.9	1.07	12.0	8.7	1.17	11.3	8.4	1.28	10.6	8.1	1.39
		63	12.3	10.1	0.95	11.8	9.9	1.04	11.2	9.5	1.14	10.5	9.2	1.24	9.8	8.8	1.34
PK18EK PKL18EK	600 0.19	71	21.0	10.8	1.47	20.2	10.5	1.59	19.4	10.3	1.74	18.5	10.0	1.90	17.7	9.8	2.05
		67	19.6	12.8	1.42	19.1	12.5	1.56	18.0	12.2	1.70	17.5	11.9	1.84	16.7	11.6	2.00
		63	18.5	14.4	1.39	17.9	14.1	1.52	17.1	13.7	1.66	16.3	13.2	1.79	15.3	12.6	1.95
PK24EK PKL24EK	600 0.17	71	28.0	12.9	2.05	27.0	12.6	2.25	25.8	12.2	2.45	24.6	11.8	2.63	23.6	11.6	2.83
		67	26.2	15.7	2.00	25.2	15.3	2.20	24.0	14.8	2.37	23.2	14.4	2.55	22.0	13.9	2.75
		63	24.6	18.0	1.95	23.7	17.5	2.14	22.8	17.0	2.32	21.7	16.3	2.50	20.6	15.7	2.68
PK30EK	600 0.13	71	33.7	15.0	2.46	32.5	14.6	2.76	31.2	14.1	3.01	29.8	13.7	3.30	28.3	13.2	3.58
		67	31.6	18.4	2.42	30.4	17.8	2.68	28.8	17.2	2.94	27.8	16.6	3.21	26.4	16.0	3.48
		63	29.4	21.0	2.39	28.3	20.3	2.61	27.1	19.6	2.83	25.9	18.9	3.12	24.6	18.1	3.41

Notes 1. B.F. : Bypass Factor, IWB : Intake air wet-bulb temperature.

TC : Total Capacity ($\times 10^3$ Btu/h), SHC : Sensible Heat Capacity ($\times 10^3$ Btu/h)

TPC : Total Power Consumption (kW)

2. SHC is based on 80°F of indoor intake air DB temperature.

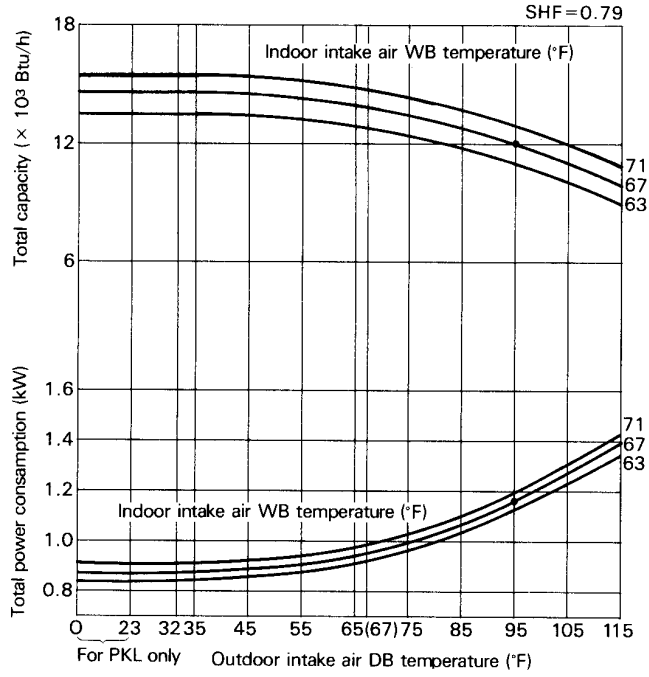
2) COOLING CAPACITY CORRECTIONS

MODEL	Refrigerant piping length (one way)									
	25ft (std)	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKL12EK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PK18EK PKL18EK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PK24EK PKL24EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PK30EK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874

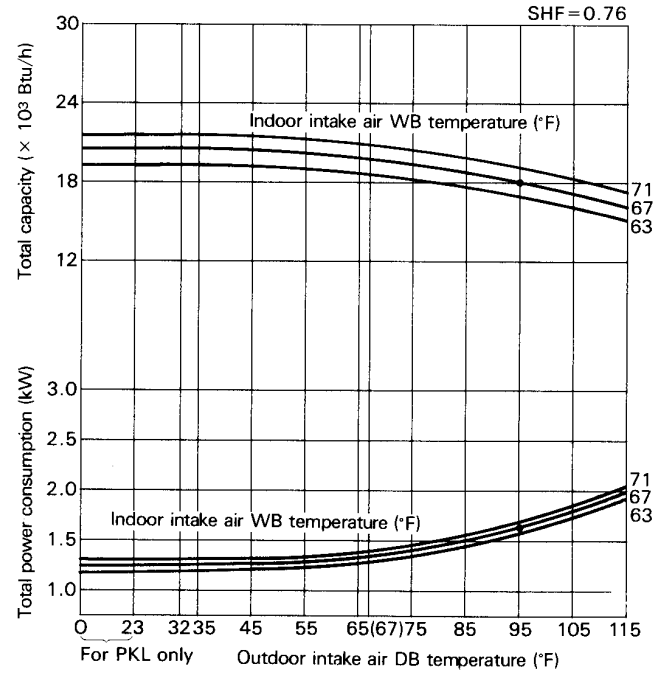
2. PERFORMANCE CURVE

NOTE: A point on the curve shows the reference point.

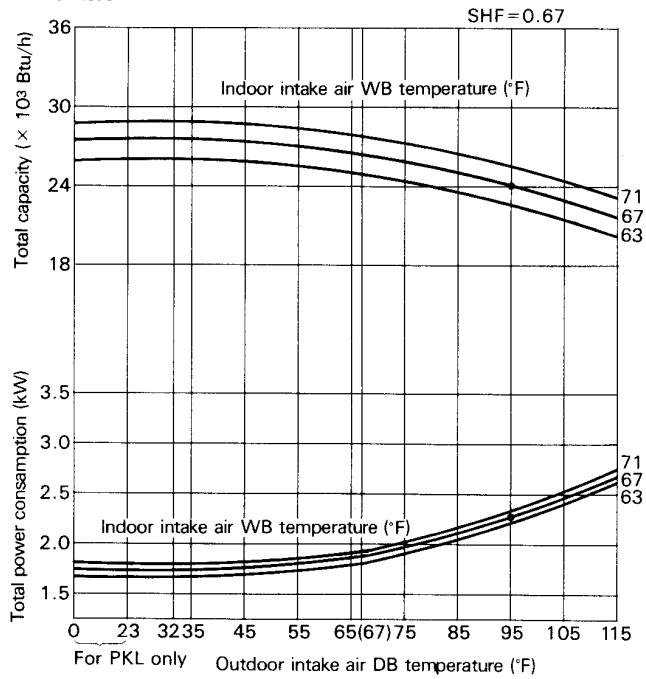
PKL12EK COOLING CAPACITY



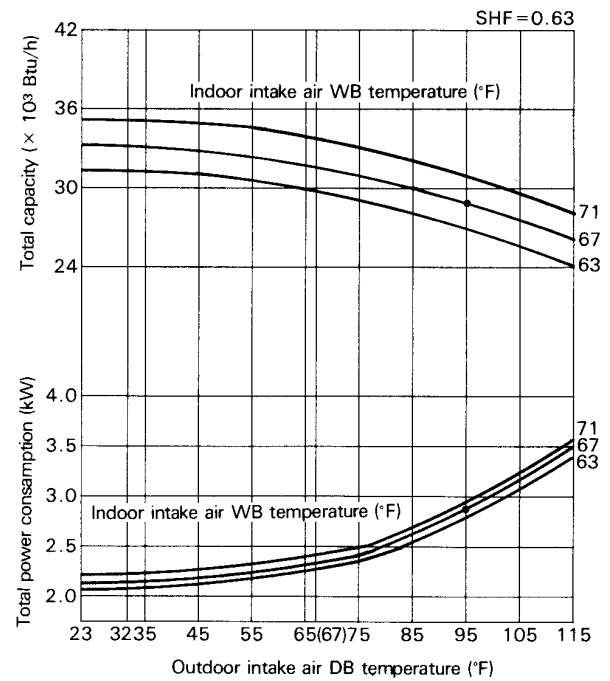
PK18EK PKL18EK COOLING CAPACITY



PK24EK PKL24EK COOLING CAPACITY



PK30EK COOLING CAPACITY

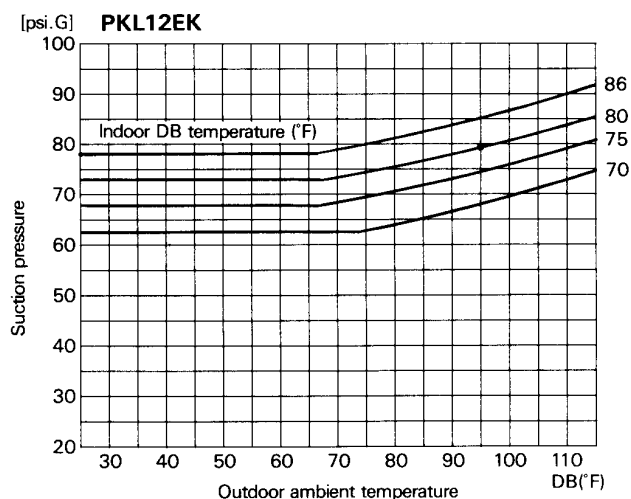
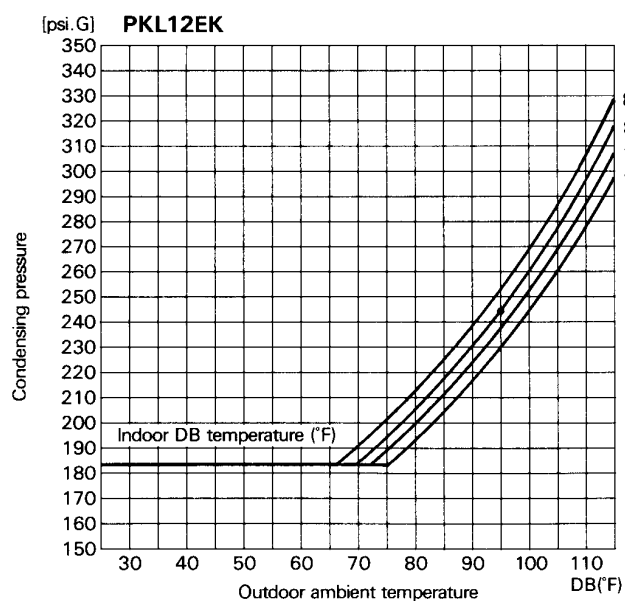


Data is based on the condition of indoor humidity 50%.

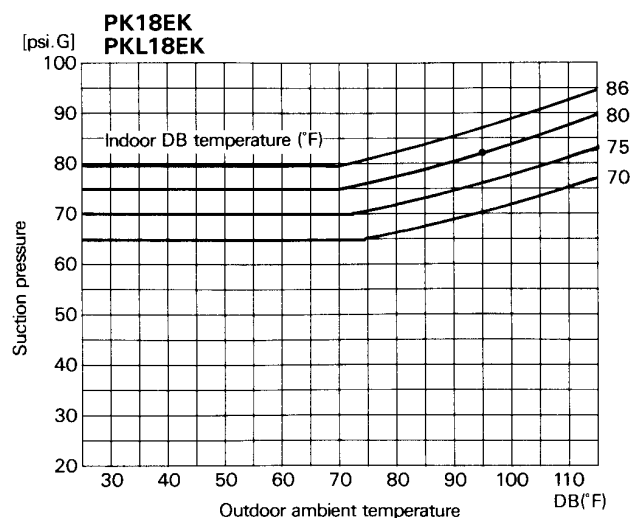
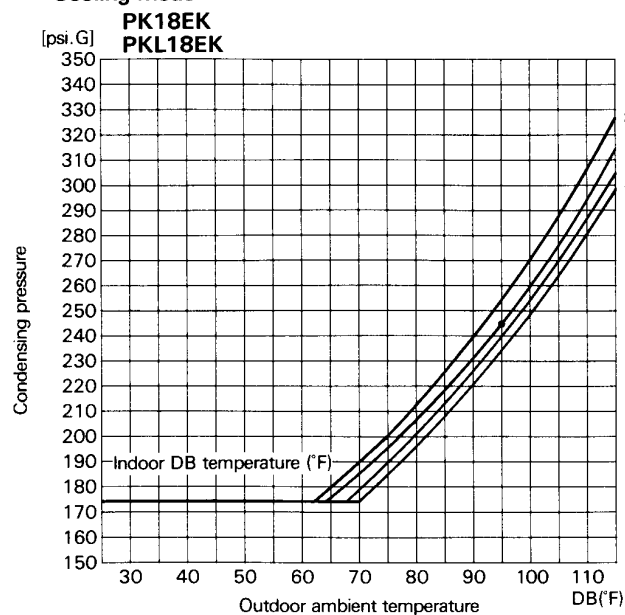
Air flow should be set at HI.

A point on the curve shows the reference point.

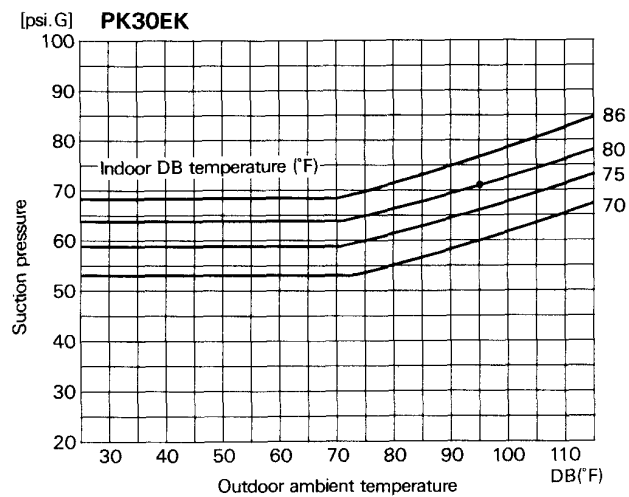
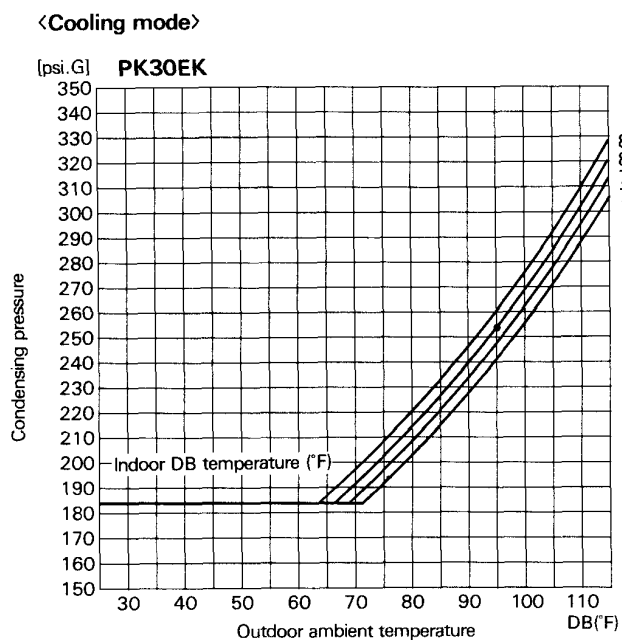
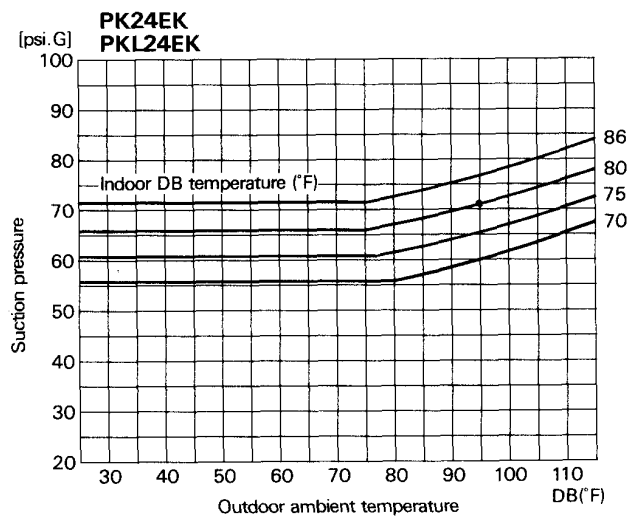
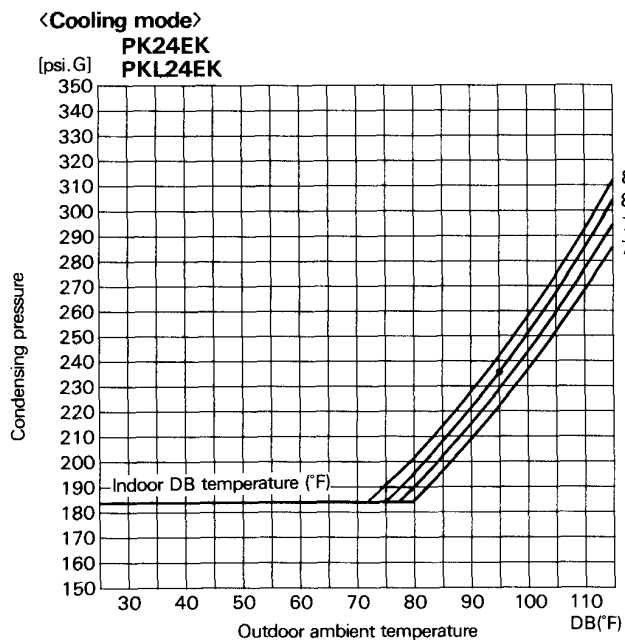
<Cooling mode>



<Cooling mode>



Data is based on the condition of indoor humidity 50%.
 Air flow should be set at HI.
 A point on the curve shows the reference point.



3. STANDARD OPERATION DATA

Model			PKL12EK	PK18EK PKL18EK	PK24EK PKL24EK	PK30EK
Item		Unit	Cooling	Cooling	Cooling	Cooling
Total	Capacity	Btu/h	12,000	18,000	24,000	28,800
	SHF	—	0.79	0.76	0.67	0.63
	Input	kW	1.17	1.70	2.37	2.94
Electrical circuit	INDOOR UNIT MODEL		PKL12EK	PK18EK PKL18EK	PK24EK PKL24EK	PK30EK
	Power supply (V, phase, Hz)		115, 1, 60	115, 1, 60	115, 1, 60	115, 1, 60
	Input	kW	0.06	0.10	0.10	0.10
	Fan current	A	0.5	0.9	0.9	0.9
	OUTDOOR UNIT MODEL		PUL12EK, PUL12EK-1	PU18EK, PU18EK-1 PUL18EK, PUL18EK-1	PU24EK, PU24EK-1 PUL24EK, PUL24EK-1	PU30EK, PU30EK-1
	Power supply (V, phase, Hz)		208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60
	Input	kW	1.11	1.60	2.27	2.84
	Comp. current	A	8.9	12.0	11.5	14.0
	Fan current	A	0.65	0.75	0.65+0.65	0.65+0.65
Refrigerant circuit	Condensing pressure	psi·G	243	245	233	235
	Suction pressure	psi·G	80	81	71	70
	Discharge temp.	°F	155	165	158	166
	Condensing temp.	°F	115	116	112	113
	Suction temp.	°F	49	49	43	43
	Ref. pipe length	ft	25	25	25	25
	Refrigerant charge	—	4 lbs 14 oz	5 lbs 8 oz	9 lbs 15 oz	10 lbs 2 oz
Indoor side	Intake air temperature	DB	°F	80	80	80
		WB	°F	67	67	67
	Discharge air temperature	DB	°F	61	58	53
		WB	°F	59	55	51
	Fan speed (High)	rpm	1,350	1,390	1,410	1,440
	Airflow (High)	CFM	460	600	600	600
Outdoor side	Intake air temperature	DB	°F	95	95	95
		WB	°F	—	—	—
	Fan speed upper/lower	rpm	720	790	750 750	750 750
	Airflow	CFM	1,590	1,590	3,170	3,170

4. OPERATING RANGE

1) POWER SUPPLY

	Rating	Allowable voltage
Indoor unit	115V 1 phase 60Hz	Min. 103V — Max. 127V
Outdoor unit	208/230V 1 phase 60Hz	Min. 198V — Max. 253V

2) OPERATION

Function	Intake air temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	75
	Minimum temperature	67	57	*0	—
	Maximum humidity	80	75	80	75

*WITH WIND BAFFLE INSTALLED

5. OUTLET AIR SPEED AND COVERAGE RANGE

		PKL12EK	PK18EK PKL18EK	PK24EK PKL24EK	PK30EK
Standard height (8.2ft)	Airflow (CFM)	480	660		
	Air speed (ft/sec.)	13.8	14.1		
	Coverage range (ft)	31	36		

- The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High fan setting.

The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

6. ADDITIONAL REFRIGERANT CHARGE (R-22 (OZ))

Model	Outdoor unit precharged (up to 100ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKL12EK	4 lbs 14 oz	0	0	0	0	0	0	2	4	—	—
PK18EK PKL18EK	5 lbs 8 oz	0	0	0	0	0	0	2	4	—	—
PK24EK PKL24EK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PK30EK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20

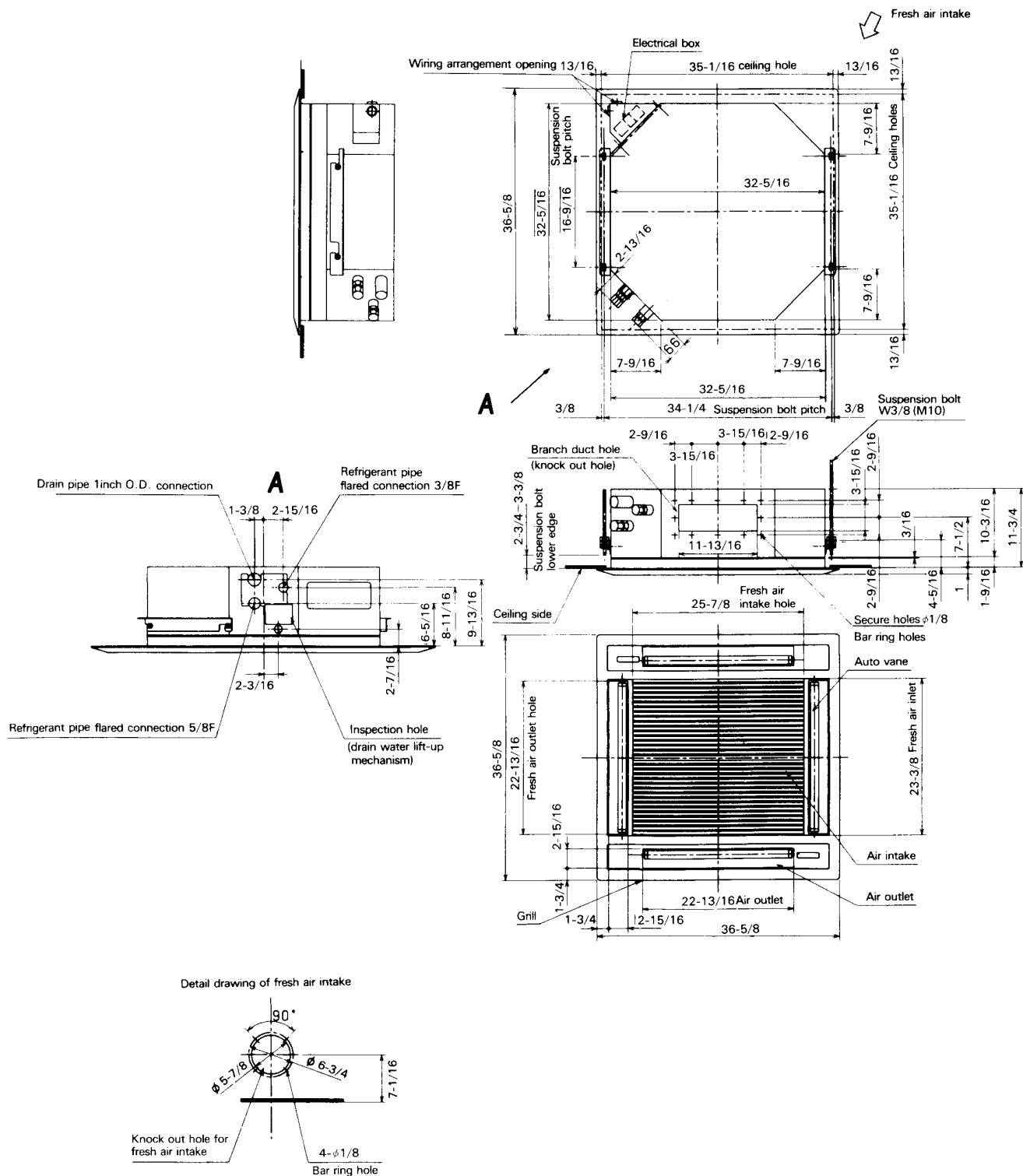
5

5.1 Indoor unit PL18/24FK2, PLL12/18/24FK

Unit : inch

Note

1. For drainage piping use PVC pipe 1 inch O.D.
2. For suspension bolts use W3/8 or M10 screws. (Actual arrangement)
3. Figure 35-1/16 * 35-1/16 ceiling holes are standard but the ceiling holes for 33-7/8 33-7/8 can also be installed. In this case, the installation and service are a little more difficult.



Unit : inch

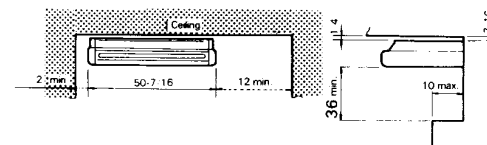
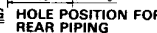
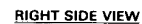
1. For drainage piping use PVC pipe 1 inch O.D.
2. For suspension bolts use W3/8 or M10 screws. (Actual arrangement)
3. Figure 35-1/16 * 55-1/2 ceiling holes are standard but the ceiling holes for 33-7/8 * 54-5/16 can also be installed. In this case, the installation and service are slightly more difficult.



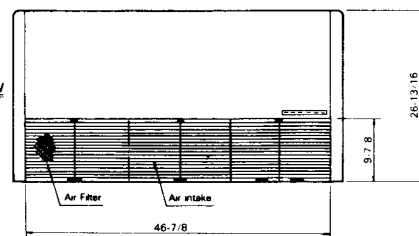
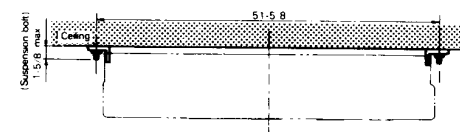
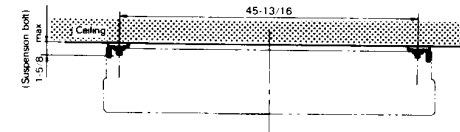
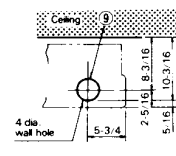
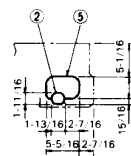
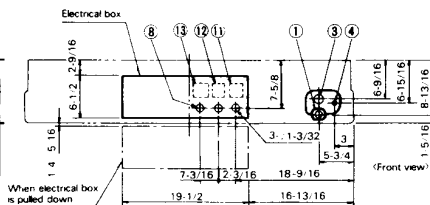
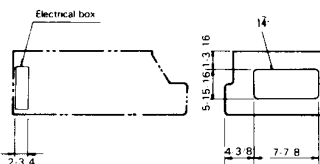
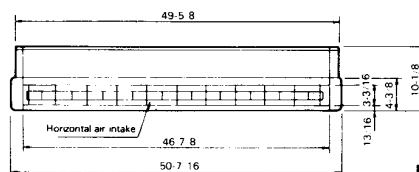
UNIT: inch

1. Allow dimensions for protruded architectural members on ceiling.
2. For drainage piping use VP20 (OD1") PVC pipes.
3. For anchor bolts use W3/8 screws.

TOP VIEW

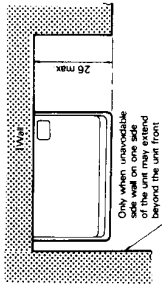


For workability and safety of suspension work, leave as much space as possible between one side of the unit and wall. Space required for bottom and right hand side for piping and wiring maintenance are shown above.

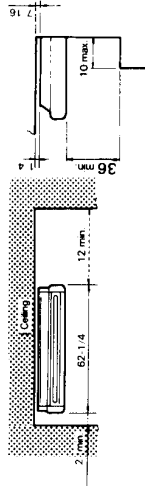


- ① Drainage pipe connection (1inch dia. I.D.)
- ② Knock out hole for rear drainage piping arrangement
- ③ Refrigerant-pipe flared connection 5/8F(PC24EK, PCL24EK), 3/4F(PC30EK)
- ④ Refrigerant-pipe flared connection 3/8F(PC24EK, PCL24EK), 1/2F(PC30EK)
- ⑤ Knock out hole for rear refrigerant-piping arrangement
- ⑥ Knock out hole for upper refrigerant-piping arrangement
- ⑦ Knock out hole for night piping (refrigerant, drainage and wiring)
- ⑧ Knock out hole for wiring arrangement
- ⑨ Wall hole for piping arrangement
- ⑩ Ceiling hole for piping arrangement
- ⑪ Terminal bed for power line
- ⑫ Terminal bed for indoor and outdoor units connection
- ⑬ Terminal bed for Remote controller
- ⑭ Knock out hole for fresh air intake

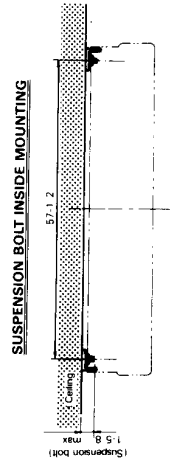
SERVICE SPACE REQUIRED AROUND INDOOR UNIT



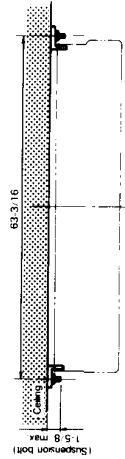
Only when unavoidable side wall on one side of the unit may extend beyond the unit front



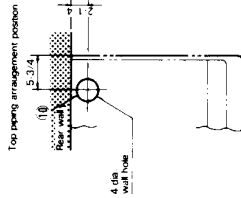
For workability and safety of suspension work, leave as much space as possible between one side of the unit and wall. Space required for bottom and right hand side for piping and wiring maintenance are shown above.



SUSPENSION BOLT OUTSIDE MOUNTING

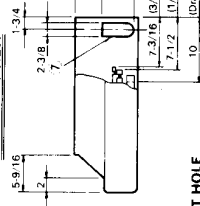


UPPER PIPING ARRANGEMENT POSITION



Top piping arrangement position

RIGHT SIDE VIEW

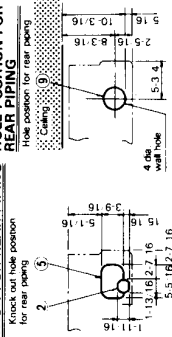


KNOCK OUT HOLE POSITION FOR REAR PIPING

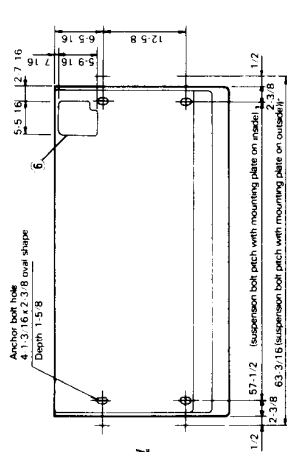
Knock out hole position

10 (Drainage)

HOLE POSITION FOR REAR PIPING

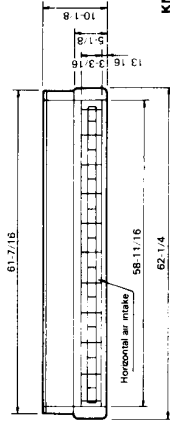


Knock out hole position



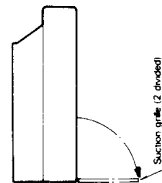
TOP VIEW

Unit: inch

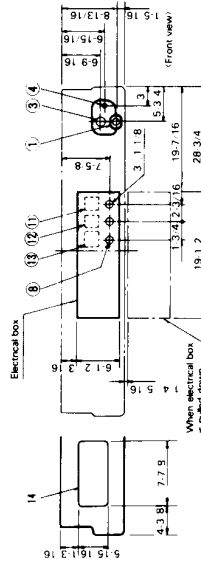


FRONT VIEW

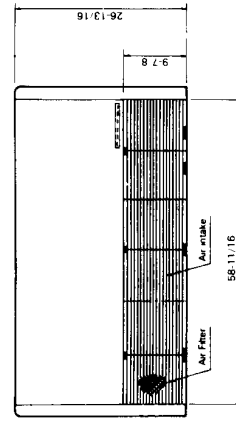
LEFT SIDE VIEW



1



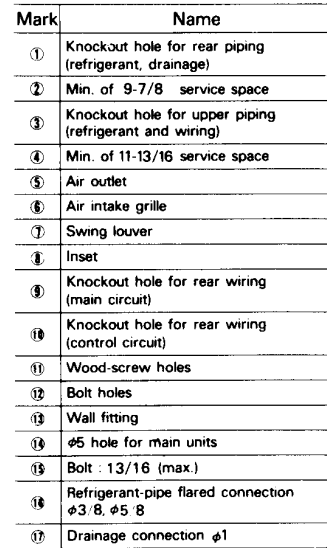
When electrical



BOTTOM VIEW

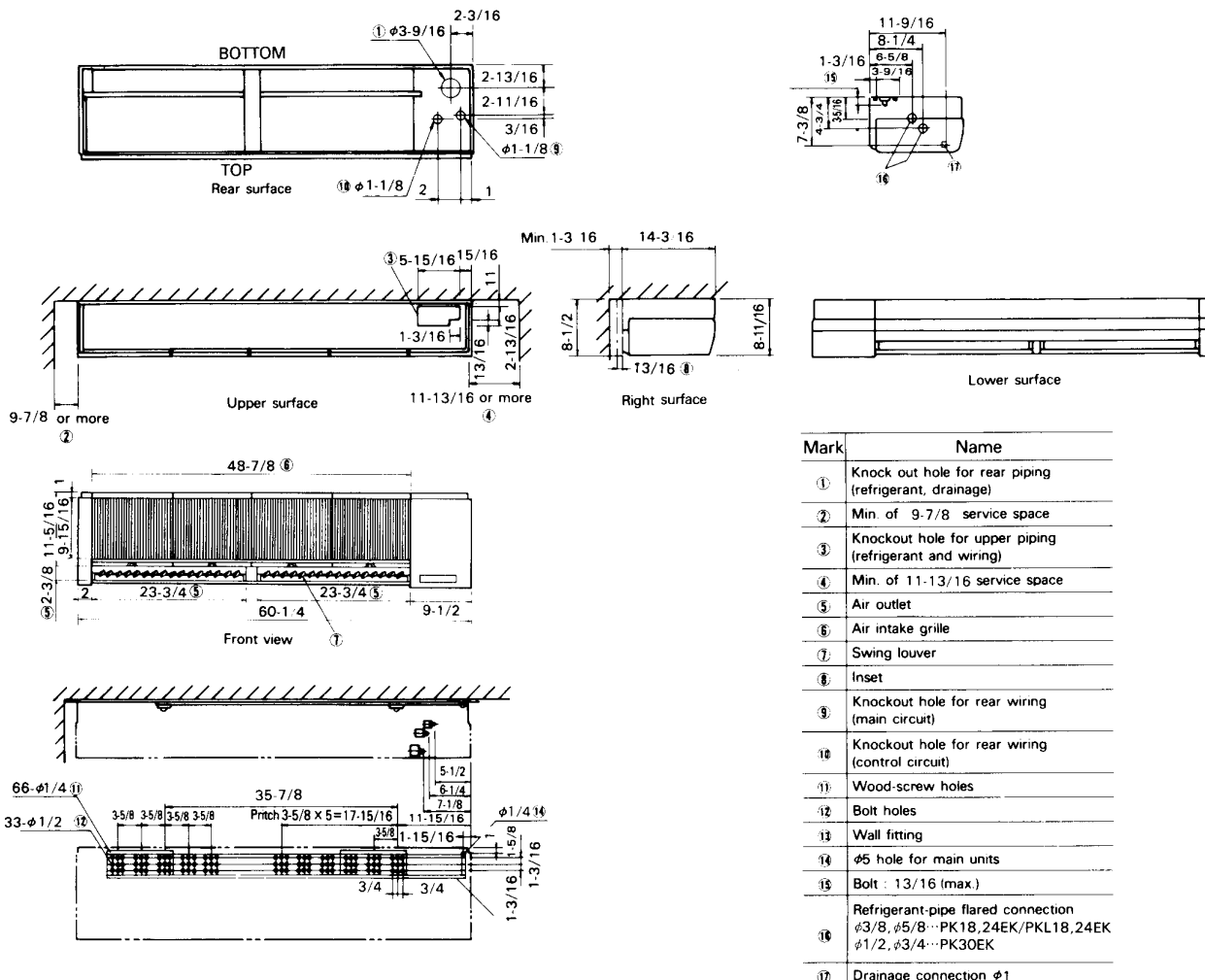
- ① Drainage pipe connection (1 inch dia. I.D.)
- ② Knock out hole for rear drainage piping arrangement
- ③ Refrigerant-pipe flared connection 3/4F
- ④ Refrigerant-pipe flared connection 1/2F
- ⑤ Knock out hole for rear refrigerant-piping arrangement
- ⑥ Knock out hole for upper refrigerant-piping arrangement
- ⑦ Knock out hole for right piping (refrigerant, drainage and wiring)
- ⑧ Knock out hole for wiring arrangement
- ⑨ Wall hole for piping arrangement
- ⑩ Ceiling hole for piping arrangement
- ⑪ Terminal bed for power line
- ⑫ Terminal bed for indoor and outdoor units connection
- ⑬ Terminal bed for Remote controller
- ⑭ Knock out hole for fresh air intake

Unit : inch



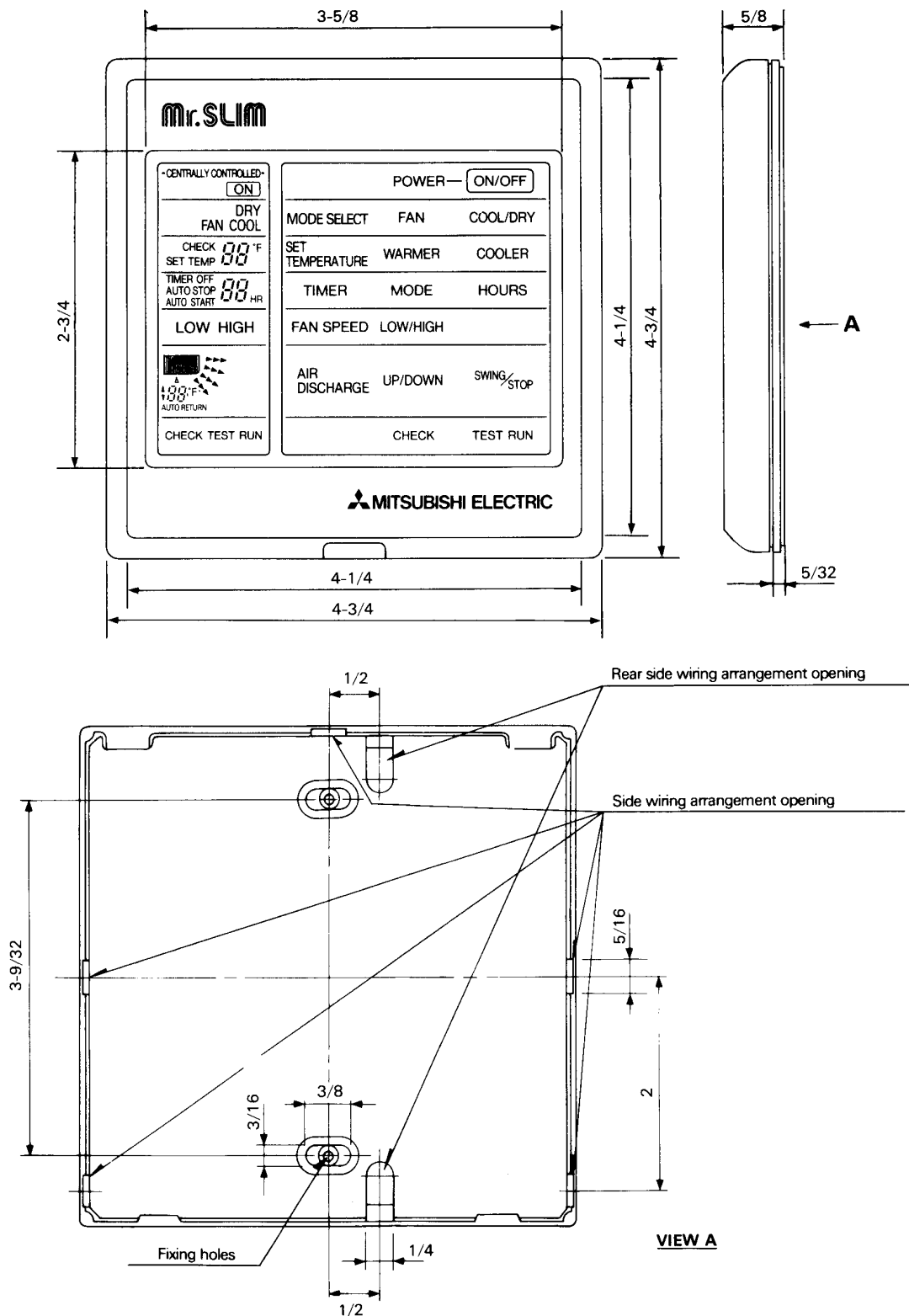
Indoor unit
PK18/24/30EK, PKL18/24EK

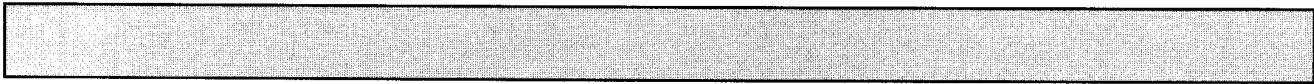
Unit: inch



1. The first step in the process of identifying a problem is to define the problem. This involves identifying the symptoms of the problem and determining the scope of the problem. Once the problem has been defined, the next step is to identify the causes of the problem. This involves identifying the factors that are contributing to the problem and determining the underlying causes. Once the causes have been identified, the next step is to develop a plan to address the problem. This involves identifying the actions that need to be taken to address the problem and determining the resources that will be needed to implement the plan. Finally, the last step in the process is to implement the plan and monitor the results. This involves putting the plan into action and tracking the progress of the plan to ensure that the problem is being addressed effectively.

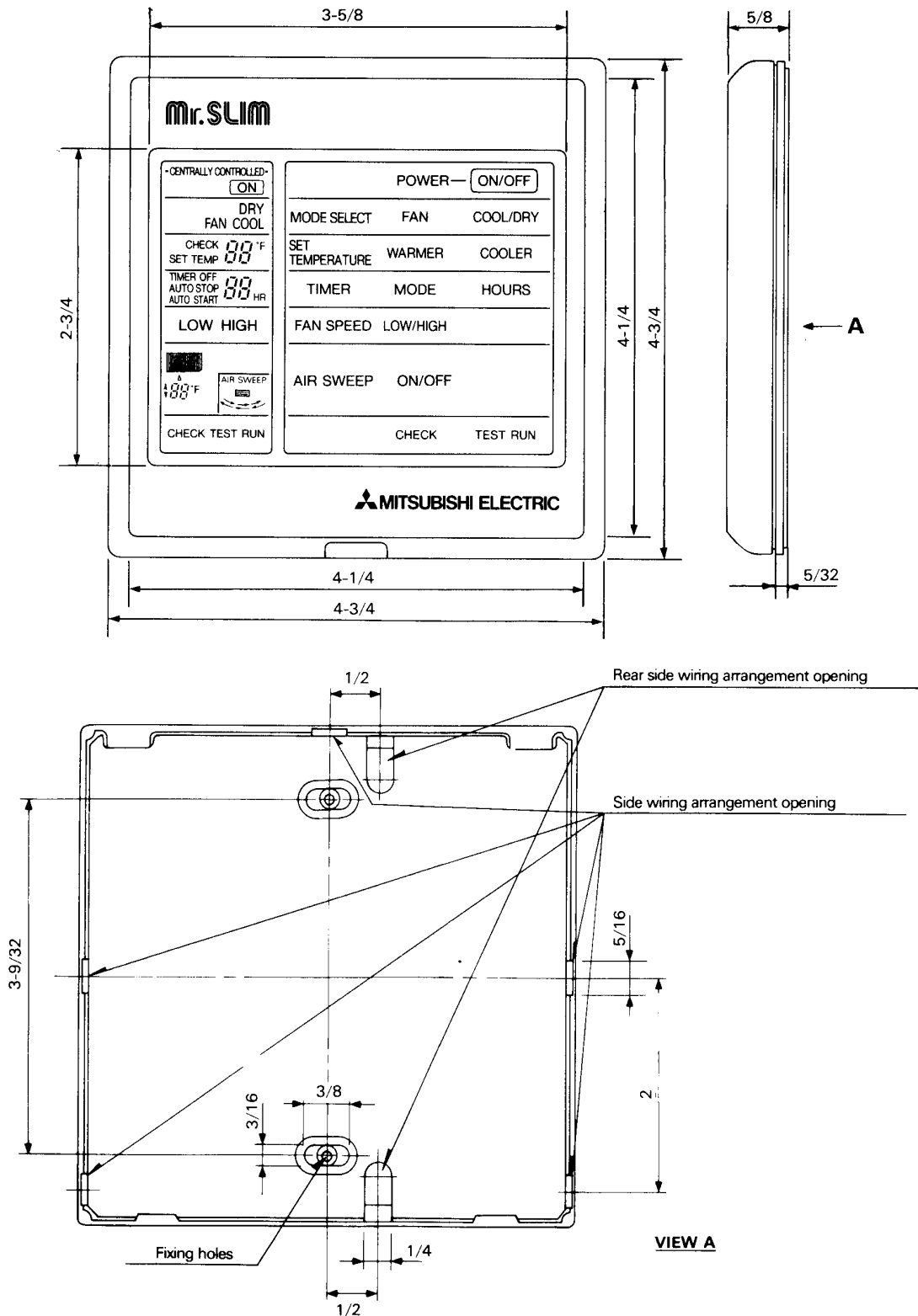
Unit : inch



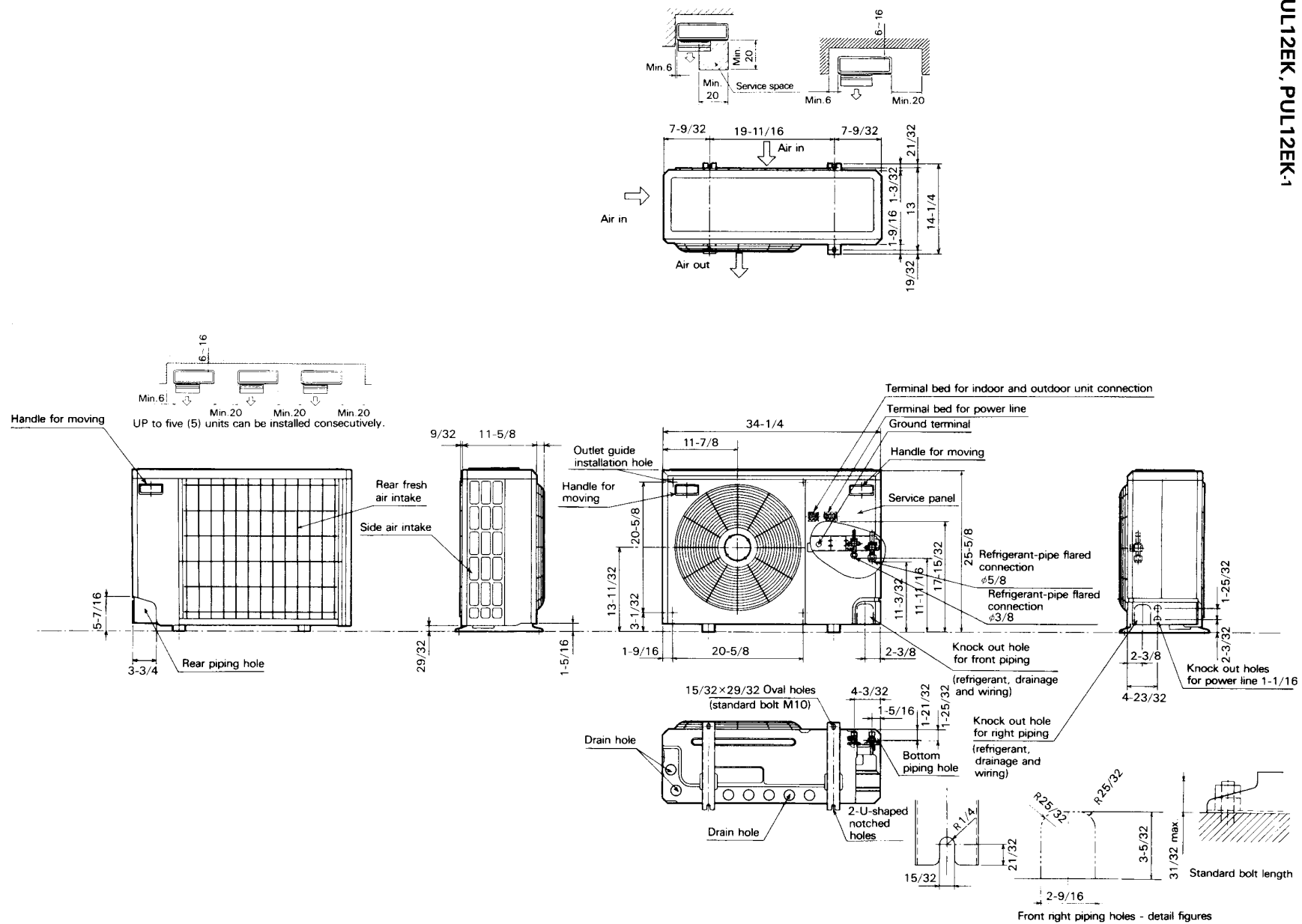


Remote controller (PC/PCL/PK/PKL series)

Unit : inch



5.3 Outdoor unit PUL12EK, PUL12EK-1

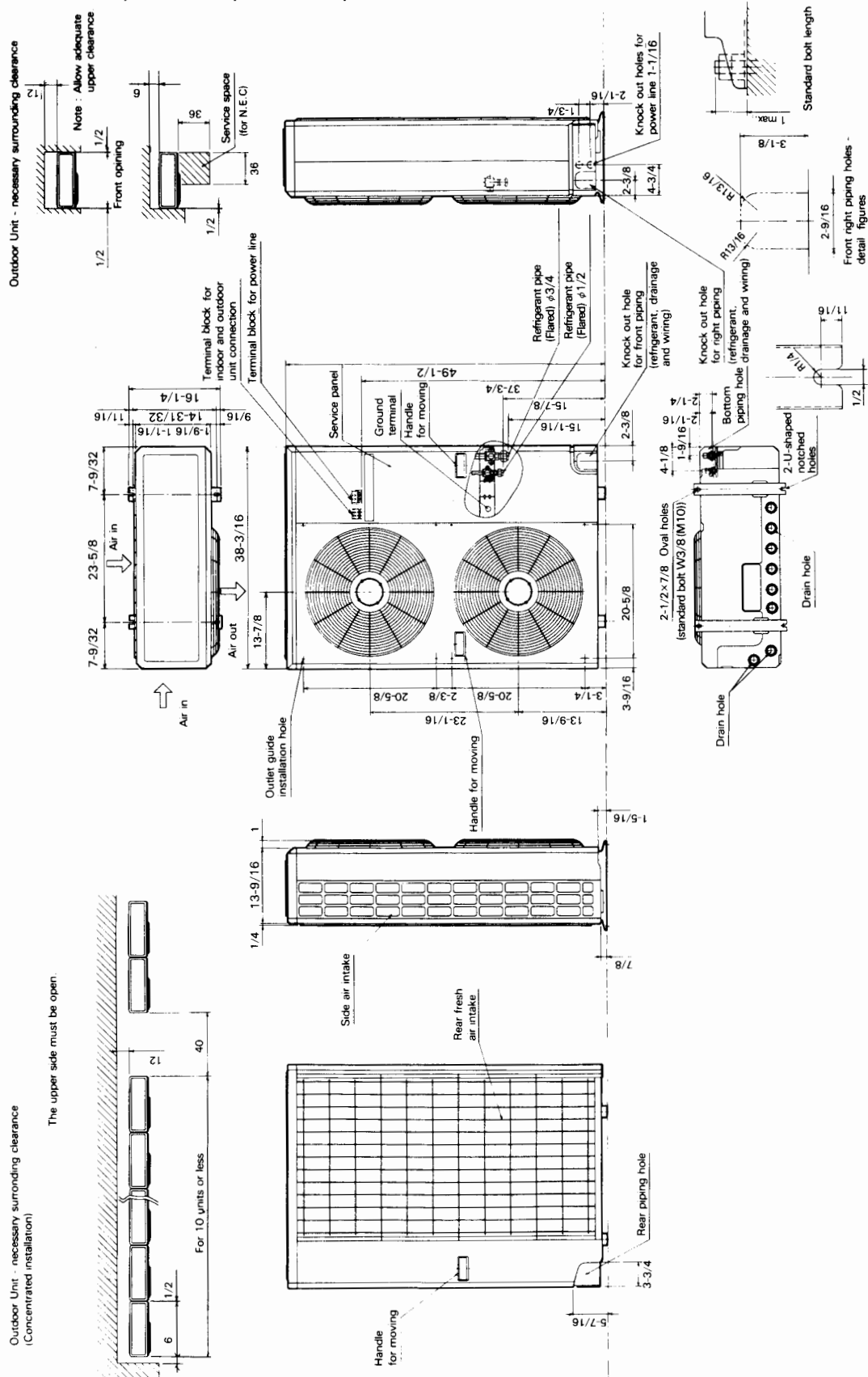


Unit : inch

Unit : inch



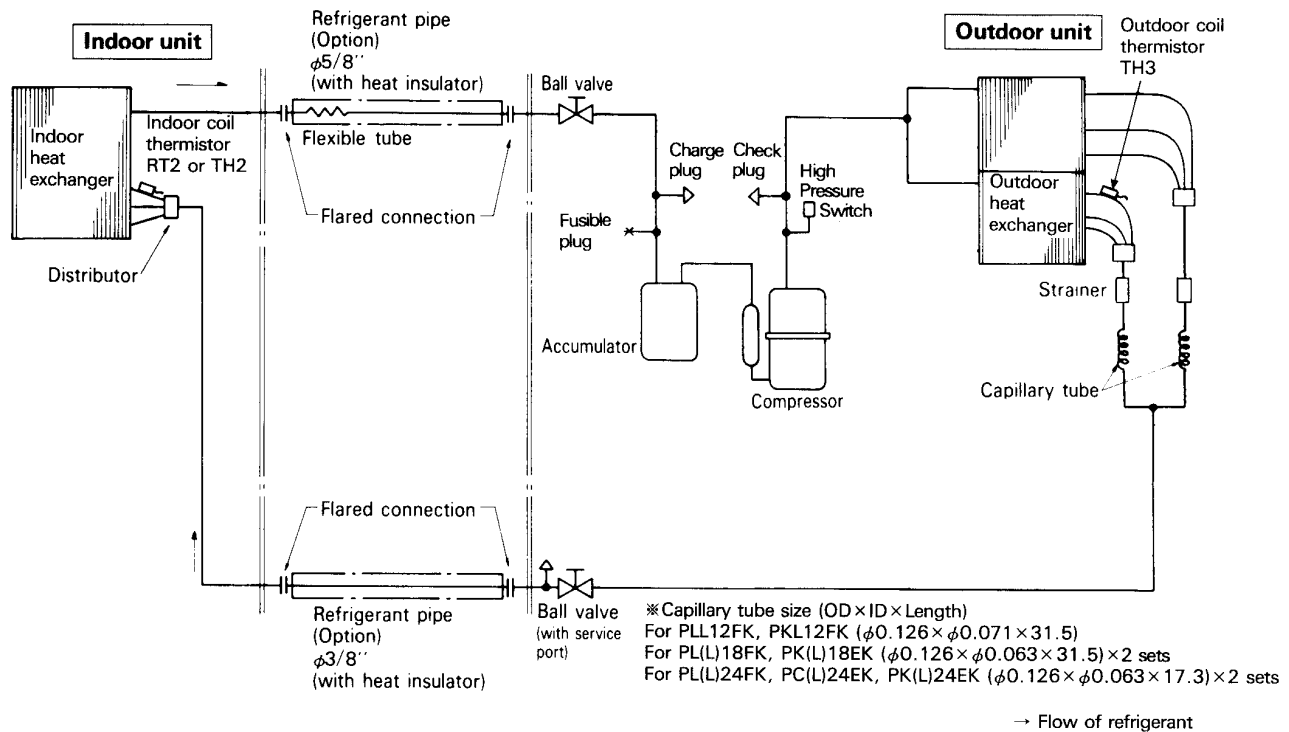
Unit : inch



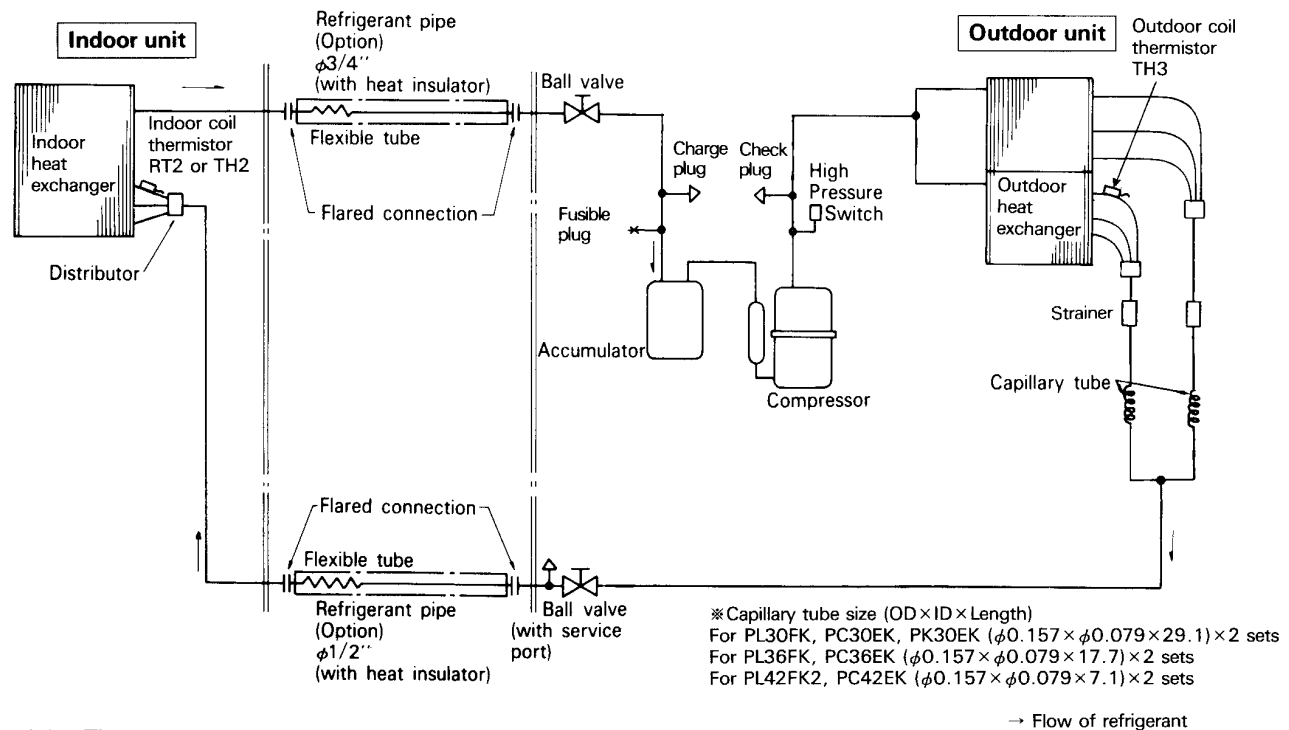
6

REFRIGERANT SYSTEM DIAGRAM

PL18/24FK, PLL12/18/24FK, PC24EK, PCL24EK, PK18/24EK, PKL12/18/24EK



PL30/36FK, PL42FK2, PC30/36/42EK, PK30EK

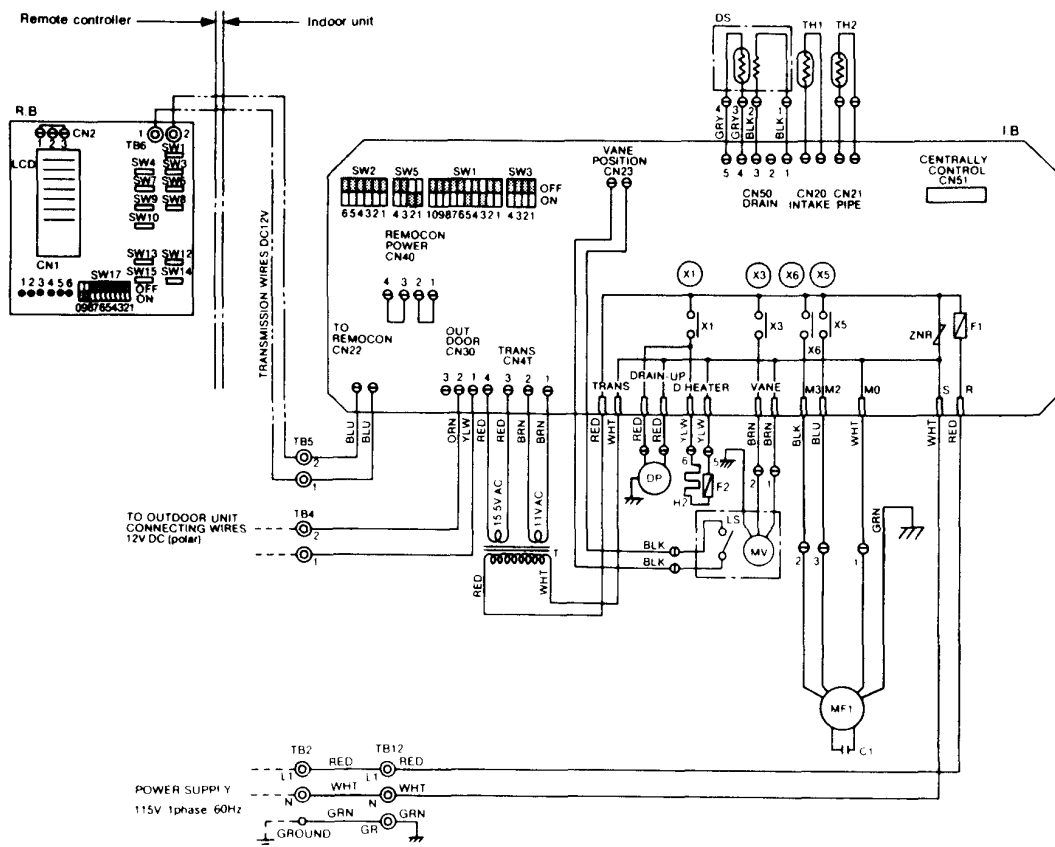


NOTE: The symbol ϕ indicates the diameter.

WIRING DIAGRAM

MODELS: PL18/24FK2, PLL12/18/24FK WIRING DIAGRAM

C1	FAN MOTOR CAPACITOR	SW5 <I.B>	MODEL SELECTOR	T	TRANSFORMER
CN1 <R.B>	PROGRAM TIMER CONNECTOR	SW1 <R.B>	ON/OFF SWITCH	TB2, 12	TERMINAL BLOCK <POWER>
CN2 <R.B>	REMOTE SWITCH CONNECTOR	SW3 <R.B>	COOLING/DRY OPERATION MODE SWITCH	TB4	TERMINAL BLOCK <INDOOR/OUT-DOOR CONNECTING LINE>
CN51 <I.B>	CENTRALLY CONTROL CONNECTOR	SW4 <R.B>	FAN MODE SWITCH	TB5, 6	TERMINAL BLOCK <REMOTE CONTROLLER TRANSMISSION LINE>
DP	DRAIN PUMP	SW6 <R.B>	SET TEMPERATURE UP SWITCH		
DS	DRAIN SENSOR	SW7 <R.B>	SET TEMPERATURE DOWN SWITCH	TH1	ROOM TEMPERATURE THERMISTOR <32°F/15kΩ, 77°F/5.4kΩ>
F1 <I.B>	FUSE <6A>	SW8 <R.B>	TIMER TIME SWITCH		
F2	FUSE <0.5A>	SW9 <R.B>	TIMER, CONTINUOUS AND ON/OFF SWITCH	TH2	INDOOR COIL THERMISTOR <32°F/15kΩ, 77°F/5.4kΩ>
H2	DEW PREVENTION HEATER <GRILLE>			X1 <I.B>	CONDENSATE PUMP AND DEW PREVENTION HEATER DELAY
I.B	INDOOR CONTROLLER BOARD	SW10 <R.B>	FAN SPEED HIGH/LOW SELECTOR		
LCD	LIQUID CRYSTAL DISPLAY	SW12 <R.B>	LOUVER SWING/STOP SELECTOR		
LS	LIMIT SWITCH <VANE MOTOR>	SW13 <R.B>	AIR FLOW UP/DOWN DIRECTION SELECTOR	X3 <I.B>	VANE RELAY
MF1	FAN MOTOR <INNER THERMOSTAT>			X5 <I.B>	FAN RELAY
MV	VANE MOTOR <WITH LIMIT SWITCH>	SW14 <R.B>	TEST RUN SWITCH	X6 <I.B>	FAN RELAY
R.B	REMOTE CONTROLLER BOARD	SW15 <R.B>	INSPECTION SWITCH	ZNR	VARISTOR
SW1 <I.B>	MODE SELECTOR	SW17 <R.B>	ADDRESS SELECTOR		
SW2 <I.B>	ADDRESS SELECTOR				
SW3 <I.B>	EMERGENCY OPERATION SWITCH				



Notes :

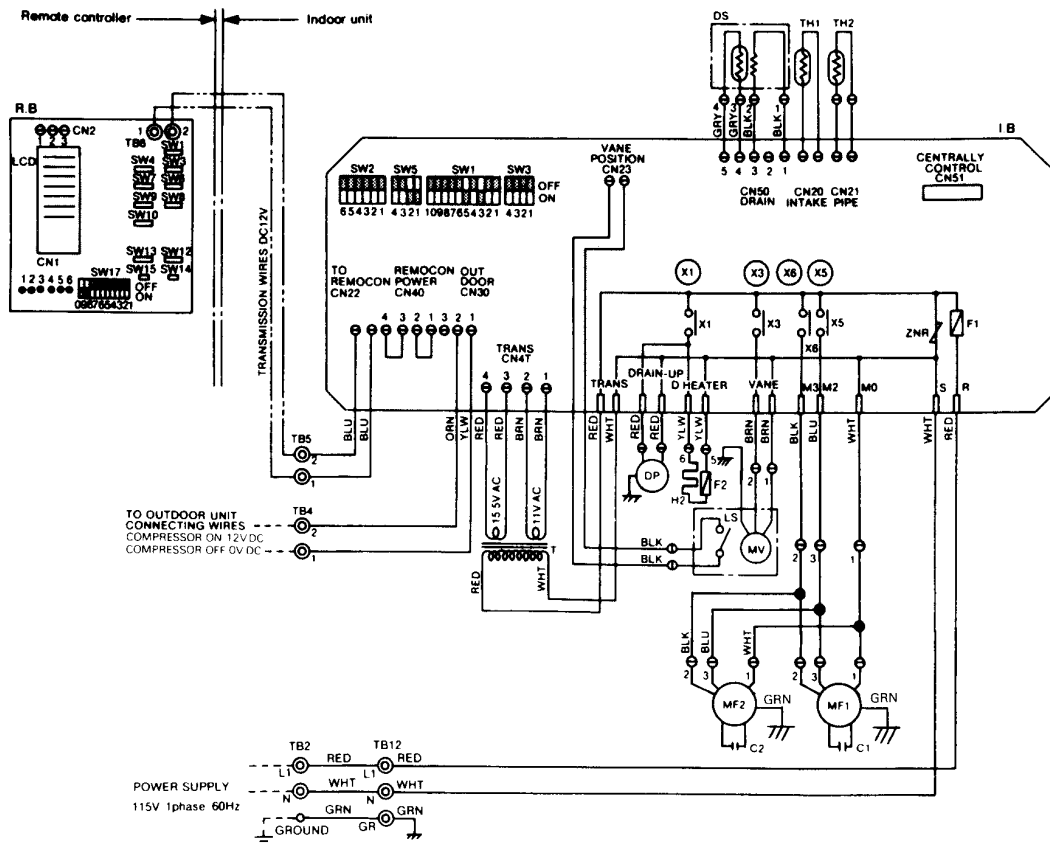
1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Indoor and outdoor connecting wires are made with polarities, make wiring to matching terminals.
3. Symbols used in wiring diagram above are,
 : Terminal block, : connector, : PC board insertion tab.

MODELS:PL30/36/42FK2 WIRING DIAGRAM

C1,2 FAN CAPACITOR
 CN1 <R.B> PROGRAM TIMER CONNECTOR
 CN2 <R.B> REMOTE SWITCH CONNECTOR
 CN51 <I.B> CENTRALLY CONTROL CONNECTOR
 DP DRAIN PUMP
 DS DRAIN SENSOR
 F1 <I.B> FUSE <6A>
 F2 FUSE <0.8A>
 H2 DEW PREVENTION HEATER <GRILLE>
 I.B INDOOR CONTROLLER BOARD
 LCD LIQUID CRYSTAL DISPLAY
 LS LIMIT SWITCH <VANE MOTOR>
 MF1,2 FAN MOTOR <INNER THERMOSTAT>
 MV VANE MOTOR <WITH LIMIT SWITCH>
 R.B REMOTE CONTROLLER BOARD
 SW1 <I.B> MODE SELECTOR
 SW2 <I.B> ADDRESS SELECTOR
 SW3 <I.B> EMERGENCY OPERATION SWITCH

SW5 <I.B> MODEL SELECTOR
 SW1 <R.B> ON/OFF SWITCH
 SW3 <R.B> COOLING/DRY OPERATION MODE SWITCH
 SW4 <R.B> FAN MODE SWITCH
 SW6 <R.B> SET TEMPERATURE UP SWITCH
 SW7 <R.B> SET TEMPERATURE DOWN SWITCH
 SW8 <R.B> TIMER TIME SWITCH
 SW9 <R.B> TIMER, CONTINUOUS AND ON/OFF SWITCH
 SW10 <R.B> FAN SPEED HIGH/LOW SELECTOR
 SW12 <R.B> LOUVER SWING/STOP SELECTOR
 SW13 <R.B> AIR FLOW UP/DOWN DIRECTION SELECTOR
 SW14 <R.B> TEST RUN SWITCH
 SW15 <R.B> INSPECTION SWITCH
 SW17 <R.B> ADDRESS SELECTOR

T TRANSFORMER
 TB2,12 TERMINAL BLOCK <POWER>
 TB4 TERMINAL BLOCK <INDOOR/OUT-DOOR CONNECTING LINE>
 TB5,6 TERMINAL BLOCK <REMOTE CONTROLLER TRANSMISSION LINE>
 TH1 ROOM TEMPERATURE THERMISTOR <32°F/15kΩ, 77°F/5.4kΩ>
 TH2 INDOOR COIL THERMISTOR <32°F/15kΩ, 77°F/5.4kΩ>
 X1 <I.B> CONDENSATE PUMP AND DEW PREVENTION HEATER DELAY
 X3 <I.B> VANE RELAY
 X5 <I.B> FAN RELAY
 X6 <I.B> FAN RELAY
 ZNR VARISTOR

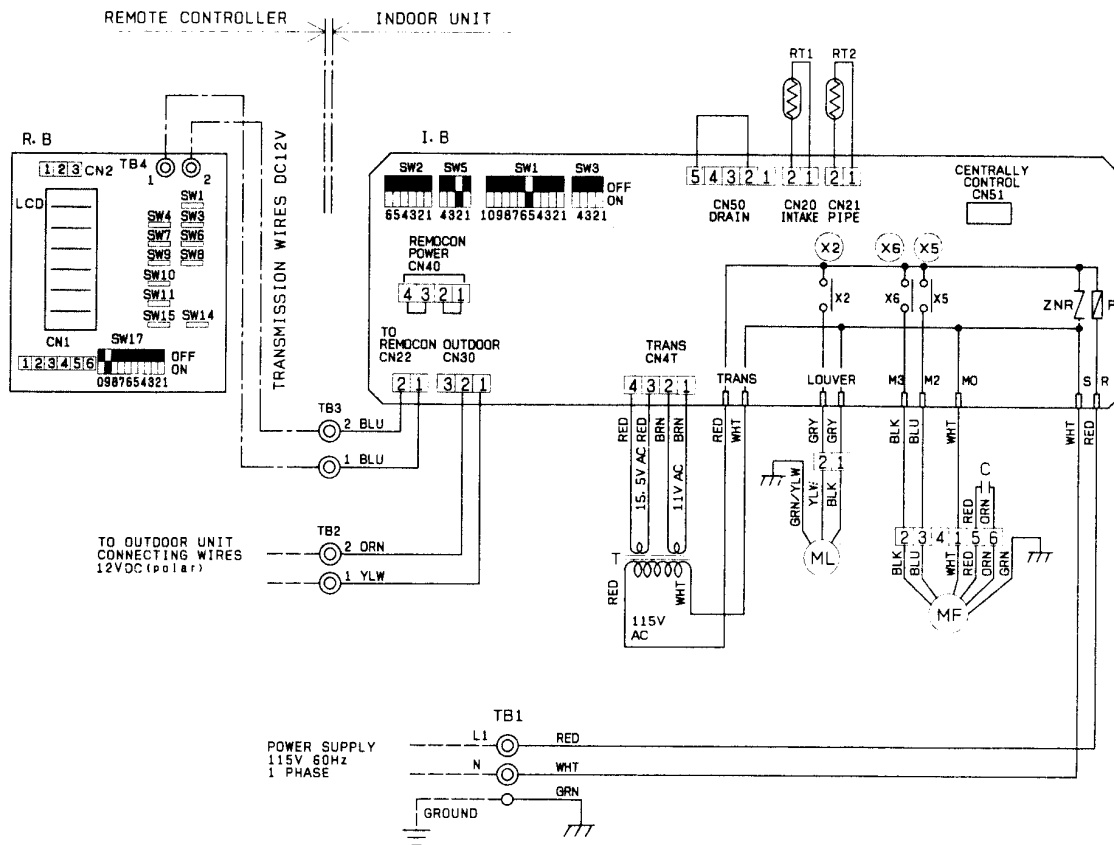


Notes :

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 to matching terminals.
3. Symbols used in wiring diagram above are,
 : Terminal block, : connector, : PC board insertion tab.

MODELS: PC24/30/36/42EK, PCL24EK WIRING DIAGRAM

C	FAN CAPACITOR	SW1 (I.B)	MODE SELECTOR	SW11 (R.B)	LOUVER ON/OFF SWITCH
CN1 (R.B)	PROGRAM TIMER CONNECTOR	SW2 (I.B)	ADDRESS SELECTOR	SW14 (R.B)	TEST RUN SWITCH
CN2 (R.B)	REMOTE SWITCH CONNECTOR	SW3 (I.B)	EMERGENCY SWITCH	SW15 (R.B)	INSPECTION SWITCH
CN51 (I.B)	CENTRALLY CONTROL CONNECTOR	SW5 (I.B)	MODEL SELECTOR	SW17 (R.B)	ADDRESS SELECTOR
F (I.B)	FUSE (6A)	SW1 (R.B)	ON/OFF SWITCH	T	TRANSFORMER
I.B	INDOOR CONTROLLER BOARD	SW3 (R.B)	COOLING/DRY OPERATION MODE SWITCH	TB1~4	TERMINAL BLOCK
LCD	LIQUID CRYSTAL DISPLAY	SW4 (R.B)	FAN OPERATION MODE SWITCH	X2 (I.B)	LOUVER RELAY
MF	FAN MOTOR (INNER THERMOSTAT)	SW6 (R.B)	SET TEMPERATURE UP SWITCH	X5 (I.B)	FAN RELAY
ML	LOUVER MOTOR	SW7 (R.B)	SET TEMPERATURE DOWN SWITCH	X6 (I.B)	FAN RELAY
R.B	REMOTE CONTROLLER BOARD	SW8 (R.B)	TIMER TIME SWITCH	ZNR	VARIATOR
RT1	ROOM TEMPERATURE THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ)	SW9 (R.B)	TIMER CONTINUOUS AND ON/OFF SWITCH		
RT2	INDOOR COIL THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ)	SW10 (R.B)	FAN SPEED HIGH/LOW SELECTOR		



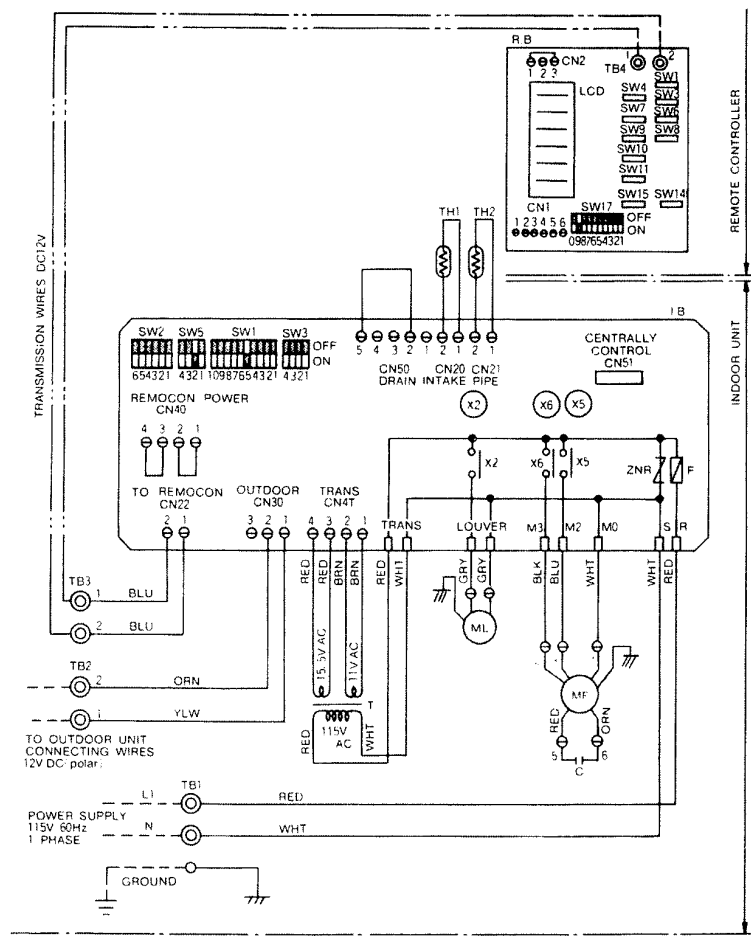
NOTES :

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 to matching terminals.
3. Symbols used in wiring diagram above are,

○ : Terminal block, □ : connector, □ : PC board insertion tab.

MODELS: PK18/24/30EK, PKL12/18EK WIRING DIAGRAM

C	FAN MOTOR CAPACITOR	SW3 (I.B)	EMERGENCY OPERATION SWITCH	SW15 (R.B)	INSPECTION SWITCH
CN1 (R.B)	PROGRAM TIMER CONNECTOR	SW5 (I.B)	MODE SELECTOR SWITCH	SW17 (R.B)	ADDRESS SELECTOR SWITCH
CN2 (R.B)	REMOTE SWITCH CONNECTOR	SW1 (R.B)	ON/OFF SWITCH	T	TRANSFORMER
CN51 (I.B)	CENTRALLY CONTROL CONNECTOR	SW3 (R.B)	COOLING/DRY OPERATION MODE SWITCH	TB1~4	TERMINAL BLOCK
F (I.B)	FUSE (6A)	SW4 (R.B)	FAN OPERATION MODE SWITCH	TH1	ROOM TEMP. THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ)
I.B	INDOOR CONTROLLER BOARD	SW6 (R.B)	SET TEMPERATURE UP SWITCH	TH2	INDOOR COIL THERMISTOR (32°F/15kΩ, 77°F/5.4kΩ)
LCD	LIQUID CRYSTAL DISPLAY	SW7 (R.B)	SET TEMPERATURE DOWN SWITCH	X2 (I.B)	LOUVER MOTOR RELAY
MF	FAN MOTOR (INNER THERMOSTAT)	SW8 (R.B)	TIMER TIME SWITCH	X5 (I.B)	FAN MOTOR RELAY
ML	LOUVER MOTOR	SW9 (R.B)	TIMER, CONTINUOUS AND ON/OFF SWITCH	X6 (I.B)	FAN MOTOR RELAY
R.B	REMOTE CONTROLLER BOARD	SW10 (R.B)	FAN SPEED HIGH/LOW SELECTOR SWITCH	ZNR	VARISTOR
SW1 (I.B)	MODE SELECTOR SWITCH	SW11 (R.B)	LOUVER ON/OFF SWITCH		
SW2 (I.B)	ADDRESS SELECTOR SWITCH	SW14 (R.B)	TEST RUN SWITCH		

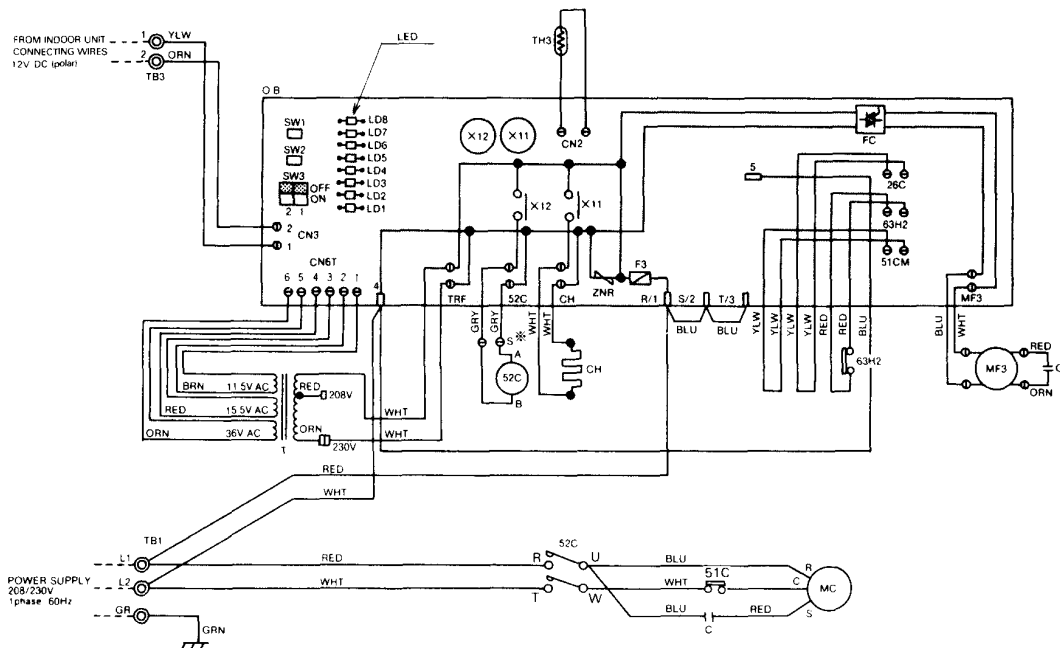


NOTES :

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 to matching terminals.
3. Symbols used in wiring diagram above are,
 ○ : Terminal block, ⊕ : connector, □ : PC board insertion tab.

MODELS:PUL12EK WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	LD1~LD8	LED <CHECK, SERVICE>	TH3	OUTDOOR COIL THERMISTOR
C3	FAN CAPACITOR	MC	COMPRESSOR	X11 <O.B>	CRANKCASE HEATER RELAY
CH	CRANKCASE HEATER	MF3	OUTDOOR FAN MOTOR (INNER THERMOSTAT)	X12 <O.B>	COMPRESSOR RELAY
CN3 <O.B>	CONNECTOR <CONNECTING WIRES INDOOR/OUTDOOR>	O.B	OUTDOOR CONTROLLER BOARD	ZNR	VARIATOR
CN6T <O.B>	CONNECTOR <TRANSFORMER>	SW1,2,3 <O.B>	SELECT SWITCH <CHECK, SERVICE>	52C	CONTACTOR
		T	TRANSFORMER	63H2	HIGH PRESSURE SWITCH <PROTECT>
		FC <O.B>	FAN CONTROLLER	TB1	TERMINAL BLOCK <POWER, SUPPLY>
		F3 <O.B>	FUSE <6A>	TB3	TERMINAL BLOCK <CONNECTING WIRES INDOOR/OUTDOOR>
				51C	OVERCURRENT RELAY



Main functions of LED (when both Nos.1 and 2 of [SW3] are "OFF")

LED NO.	Output display (steady light)	Check display (flashing)
LD1	Compressor indoor command	---
LD2	---	---
LD3	---	Pipe temp. sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	---	---
LD7	---	TH3 overheat protection
LD8	Crankcase heater ON	Defective input

NOTE : If the operation stops to function of the protection device, the check display flashes.

How to use SW1 and 2

- Pressing [SW1] erases the past check contents loaded on the micro-computer.
- The output display (light) remains during operation but pressing [SW2] displays the past check contents in flashing mode. Pressing the switch again returns to output display (light).

CAUTION FOR SERVICING

- The connector marked  is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

* White connector



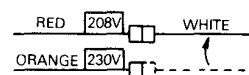
CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- * Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

CAUTIONS FOR INDOOR AND OUTDOOR CONNECTING WIRES

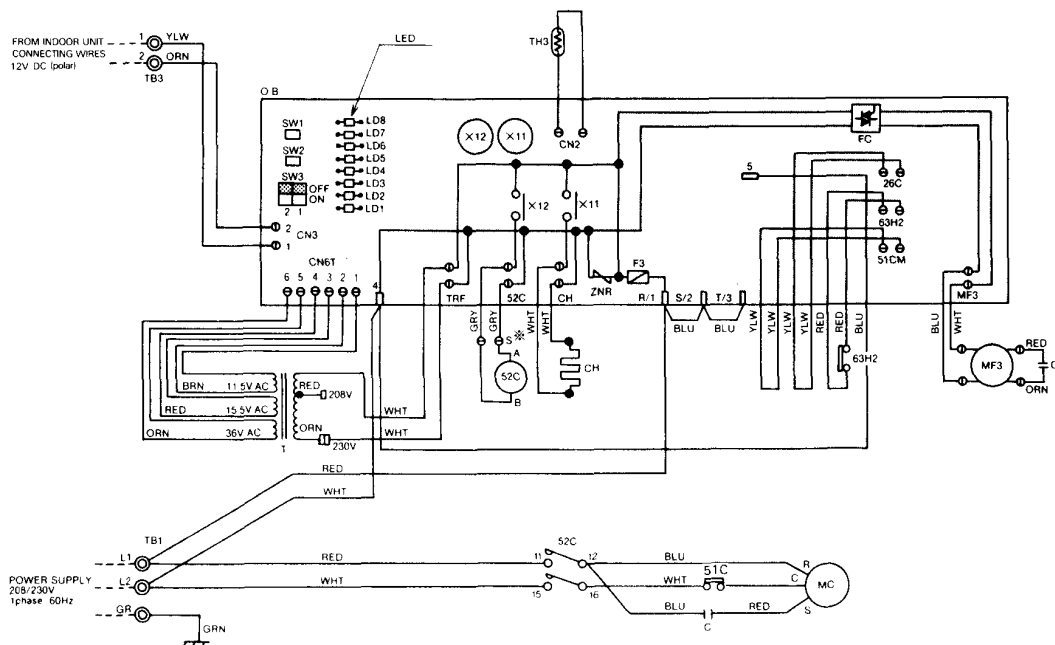
- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1, 2) for indoor and outdoor units.

* When power Supply is 208V



MODELS: PU18EK, PUL18EK WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	LD1~LD8	LED <CHECK, SERVICE>	TH3	OUTDOOR COIL THERMISTOR
C3	FAN CAPACITOR	MC	COMPRESSOR	X11 <O.B>	CRANKCASE HEATER RELAY
CH	CRANKCASE HEATER	MF3	OUTDOOR FAN MOTOR (INNER THERMOSTAT)	X12 <O.B>	COMPRESSOR RELAY
CN3 <O.B>	CONNECTOR <CONNECTING WIRES INDOOR/OUTDOOR>	O.B	OUTDOOR CONTROLLER BOARD	ZNR	VARIATOR
CN6T <O.B>	CONNECTOR <TRANSFORMER>	SW1,2,3 <O.B>	SELECT SWITCH <CHECK, SERVICE>	52C	CONTACTOR
		T	TRANSFORMER	63H2	HIGH PRESSURE SWITCH <PROTECT>
		FC <O.B>	FAN CONTROLLER	TB1	TERMINAL BLOCK <POWER, SUPPLY>
		F3 <O.B>	FUSE <6A>	TB3	TERMINAL BLOCK <CONNECTING WIRES INDOOR/OUTDOOR>
				51C	OVERCURRENT RELAY



Main functions of LED (when both Nos.1 and 2 of [SW3] are "OFF")

LED NO.	Output display (steady light)	Check display (flashing)
LD1	Compressor indoor command	---
LD2	---	---
LD3	---	Pipe temp. sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	---	---
LD7	---	TH3 overheat protection
LD8	Crankcase heater ON	Defective input

NOTE : If the operation stops to function of the protection device, the check display flashes.

How to use SW1 and 2

- Pressing [SW1] erases the past check contents loaded on the micro-computer.
- The output display (light) remains during operation but pressing [SW2] displays the past check contents in flashing mode. Pressing the switch again returns to output display (light).

CAUTION FOR SERVICING

- The connector marked  is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

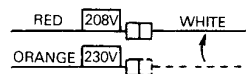
CAUTIONS FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1, 2) for indoor and outdoor units.

* White connector



* When power Supply is 208V

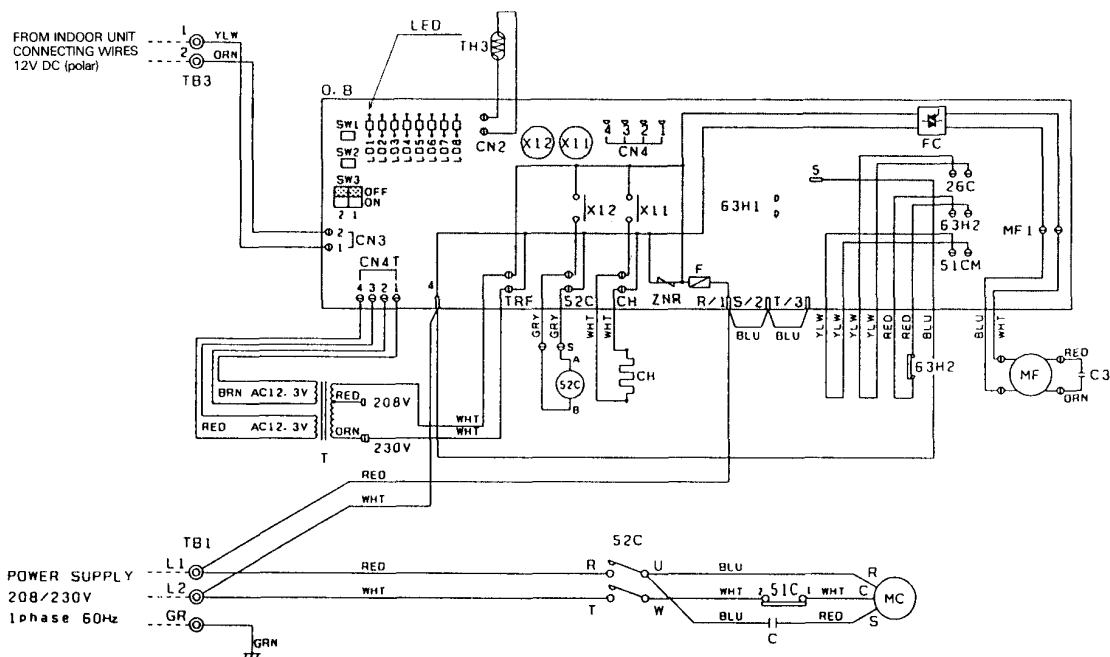


MODELS: PU12/18EK-1 PUL12/18EK-1 WIRING DIAGRAM

C COMPRESSOR CAPACITOR
C3 FAN CAPACITOR
CH CRANKCASE HEATER
CN3 <O.B> CONNECTOR <CONNECTING WIRES
INDOOR/OUTDOOR>
CN4T <O.B> CONNECTOR <TRANSFORMER>

LD1~LD8 LED <CHECK, SERVICE>
MC COMPRESSOR
MF OUTDOOR FAN MOTOR (INNER THERMOSTAT)
O.B OUTDOOR CONTROLLER BOARD
SW1,2,3<O.B> SELECT SWITCH <CHECK, SERVICE>
T TRANSFORMER
FC <O.B> FAN CONTROLLER
F <O.B> FUSE <6A>

TH3 OUTDOOR COIL THERMISTOR
X11 <O.B> CRANKCASE HEATER RELAY
X12 <O.B> COMPRESSOR RELAY
ZNR <O.B> VARISTOR
52C CONTACTOR
63H2 HIGH PRESSURE SWITCH <PROTECT>
TB1 TERMINAL BLOCK <POWER, SUPPLY>
TB3 TERMINAL BLOCK <CONNECTING
WIRES INDOOR/OUTDOOR>
51C OVERCURRENT RELAY



Main functions of LED (when both Nos.1 and 2 of [SW3] are "OFF")

LED NO.	Output display (steady light)	Check display (flashing)
LD1	Compressor indoor command	—
LD2	—	—
LD3	—	TH3 short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	—
LD6	—	—
LD7	—	TH3 overheat protection
LD8	Crankcase heater ON	Defective input

NOTE : If the operation stops to function of the protection device, the check display flashes.

How to use SW1 and 2

- Pressing [SW1] erases the past check contents loaded on the micro-computer.
- The output display (light) remains during operation but pressing [SW2] displays the past check contents in flashing mode. Pressing the switch again returns to output display (light).

CAUTION FOR SERVICING

- The connector marked  is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- * Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

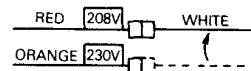
CAUTIONS FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1, 2) for indoor and outdoor units.

* White connector

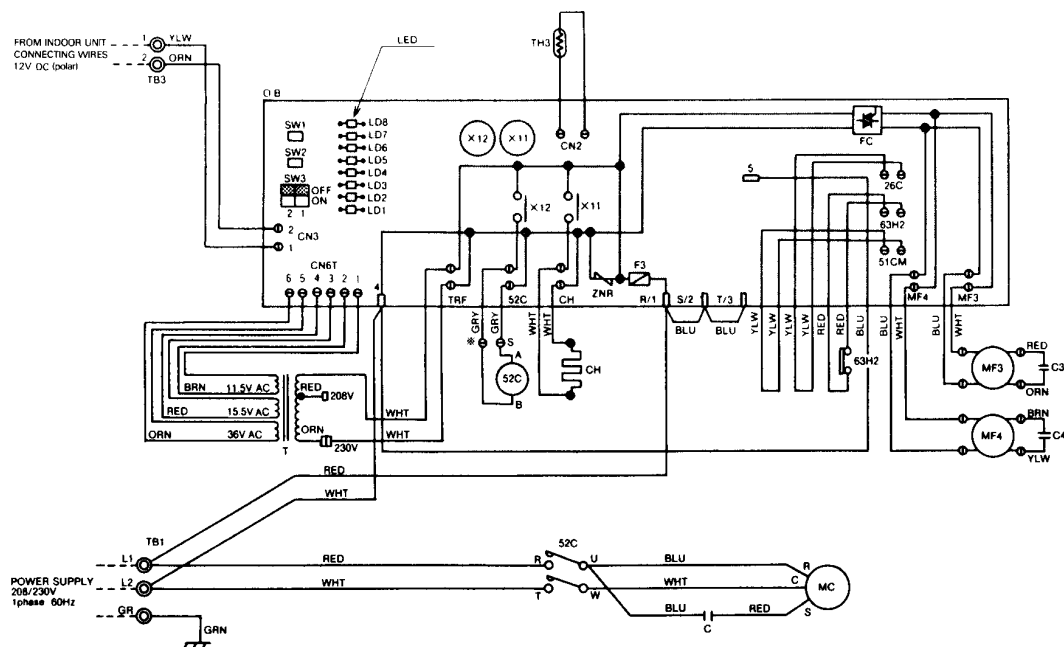


* When power Supply is 208V



MODELS: PU24/30/36EK, PU42EK2, PUL24EK WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	LD1~LD8	LED <CHECK, SERVICE>	TH3	OUTDOOR COIL THERMISTOR
C3,4	FAN CAPACITOR	MC	COMPRESSOR (INNER THERMOSTAT)	X11 <O.B>	CRANK CASE HEATER RELAY
CH	CRANKCASE HEATER	MF3,4	OUTDOOR FAN MOTOR (INNER THERMOSTAT)	X12 <O.B>	COMPRESSOR RELAY
CN3 <O.B>	CONNECTOR <CONNECTING WIRES	O.B	OUTDOOR CONTROLLER BOARD	ZNR	VARIATOR
	INDOOR/OUTDOOR>	SW1,2,3<O.B>	SELECT SWITCH <CHECK, SERVICE>	52C	CONTACTOR
CN6T <O.B>	CONNECTOR <TRANSFORMER>	T	TRANSFORMER	63H2	HIGH PRESSURE SWITCH <PROTECT>
FC <O.B>	FAN CONTROLLER	TB1	TERMINAL BLOCK <POWER SUPPLY>	R	RESISTOR <PU42EK2>
F3 <O.B>	FUSE <6A>	TB3	TERMINAL BLOCK <CONNECTING WIRES INDOOR/OUTDOOR>	C5	COMPRESSOR START CAPACITOR <PU42EK2>
				19	COMPRESSOR START RELAY <PU42EK2>



Main functions of LED (when both Nos.1 and 2 of [SW3] are "OFF")

LED NO.	Output display (steady light)	Check display (flashing)
LD1	Compressor indoor command	---
LD2	---	---
LD3	---	Pipe temp. sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	---
LD6	---	---
LD7	---	TH3 overheat protection
LD8	Crankcase heater ON	Defective input

NOTE : If the operation stops to function of the protection device, the check display flashes.

How to use SW1 and 2

- Pressing [SW1] erases the past check contents loaded on the micro-computer.
- The output display (light) remains during operation but pressing [SW2] displays the past check contents in flashing mode. Pressing the switch again returns to output display (light).

CAUTION FOR SERVICING

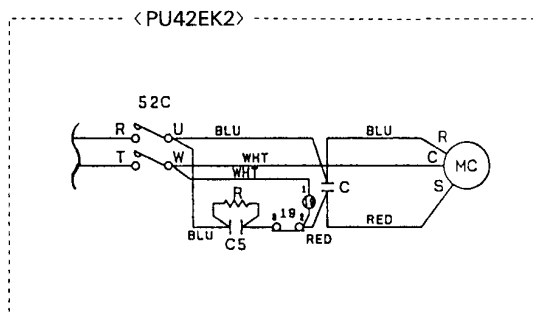
- The connector marked ① is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

CAUTIONS FOR INDOOR AND OUTDOOR CONNECTING WIRES

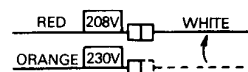
- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1, 2) for indoor and outdoor units.



* White connector

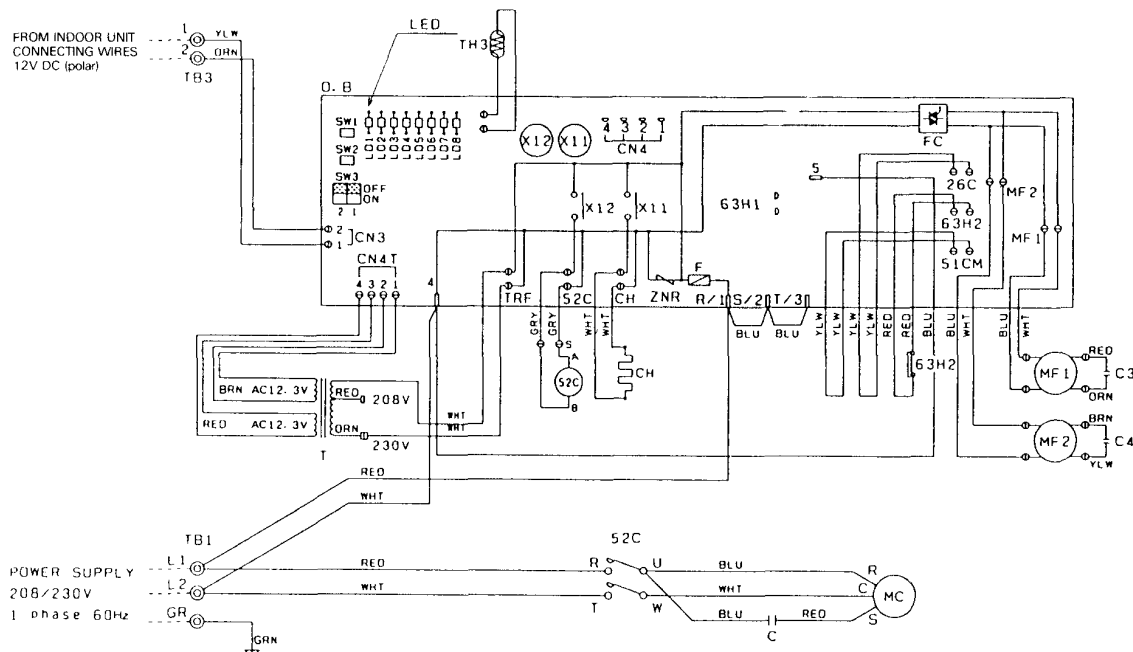


* When power Supply is 208V



MODELS:PU24/30/36EK-1, PU42EK2-1, PUL24EK-1 WIRING DIAGRAM

C	COMPRESSOR CAPACITOR	LD1~LD8	LED <CHECK, SERVICE>	TH3	OUTDOOR COIL THERMISTOR
C3.4	FAN CAPACITOR	MC	COMPRESSOR (INNER THERMOSTAT)	X11 <O.B>	CRANK CASE HEATER RELAY
CH	CRANKCASE HEATER	MF1,2	OUTDOOR FAN MOTOR (INNER THERMOSTAT)	X12 <O.B>	COMPRESSOR RELAY
CN3 <O.B>	CONNECTOR <CONNECTING WIRES INDOOR/OUTDOOR>	O.B	OUTDOOR CONTROLLER BOARD	ZNR	VARISTOR
CN4T <O.B>	CONNECTOR <TRANSFORMER>	SW1,2,3<O.B>	SELECT SWITCH <CHECK, SERVICE>	52C	CONTACTOR
FC <O.B>	FAN CONTROLLER	T	TRANSFORMER	63H2	HIGH PRESSURE SWITCH <PROTECT>
F <O.B>	FUSE <6A>	TB1	TERMINAL BLOCK <POWER SUPPLY>	R	RESISTOR <PU42EK2-1>
		TB3	TERMINAL BLOCK <CONNECTING WIRES INDOOR/OUTDOOR>	C5	COMPRESSOR START CAPACITOR <PU42EK2-1>
				19	COMPRESSOR START RELAY <PU42EK2-1>



Main functions of LED (when both Nos.1 and 2 of [SW3] are "OFF")

LED NO.	Output display (steady light)	Check display (flashing)
LD1	Compressor indoor command	
LD2		
LD3		TH3 short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	
LD6		
LD7		TH3 overheat protection
LD8	Crankcase heater ON	Defective input

NOTE : If the operation stops to function of the protection device, the check display flashes.

How to use SW1 and 2

- Pressing [SW1] erases the past check contents loaded on the micro-computer.
- The output display (light) remains during operation but pressing [SW2] displays the past check contents in flashing mode. Pressing the switch again returns to output display (light).

CAUTION FOR SERVICING

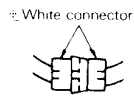
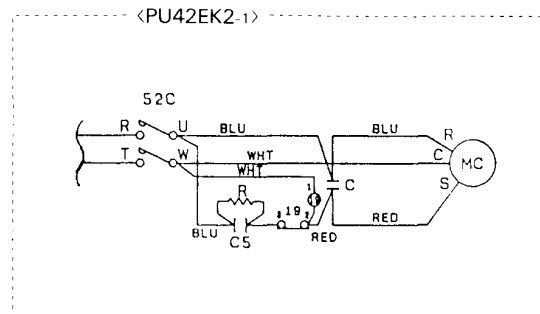
- The connector marked  is to turn the compressor ON-OFF during servicing. The compressor stops by disconnecting the white connector as shown at the right.

CAUTIONS FOR POWER SUPPLY WIRING

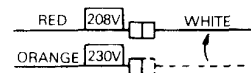
- Since LD8 lights when normal power is turned "ON", check the power supply with the "ON" or "OFF" LD8.
- Since the indoor transformer (T) is connected with 230V power, if 208V power is used, change the wiring connection in the following Procedure.

CAUTIONS FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires has polarity, make sure to connect the same terminal numbers (1, 2) for indoor and outdoor units.



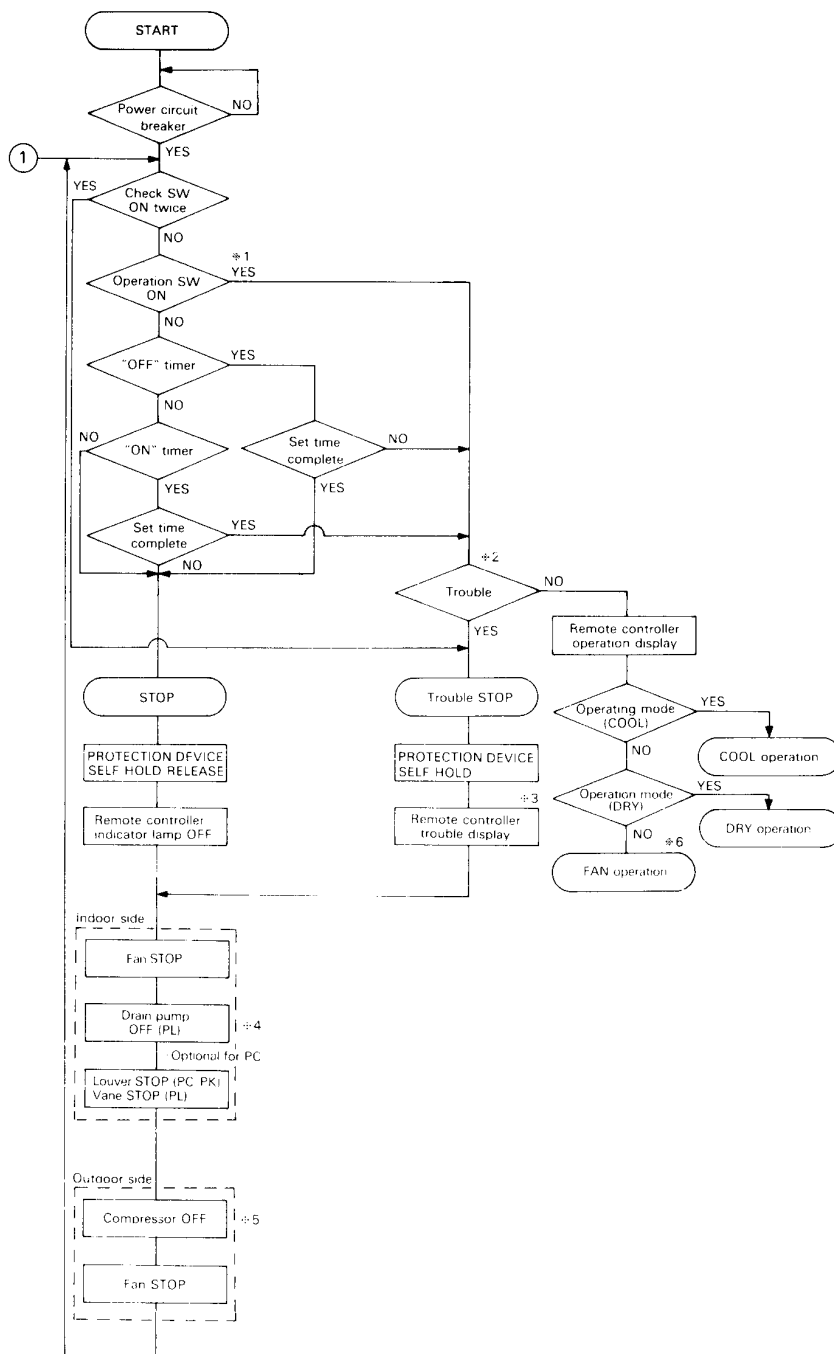
+ When power Supply is 208V



8

OPERATION FLOW-CHART

MAIN OPERATION



*1 In addition to remote controller, centralized control and remote ON-OFF control are available.

*2 Causes for entering check mode are listed below :

- E0 — Signal transmitting/receiving error
- P1 — Abnormality of room temperature thermistor
- P2 — Abnormality of indoor coil thermistor
- P3 — Signal transmitting/receiving error
- P4 — Abnormality of drain sensor
- P5 — Abnormality of drain pump
- P6 — Coil frost protection
- P7 — System error
- P8 — Outdoor unit trouble

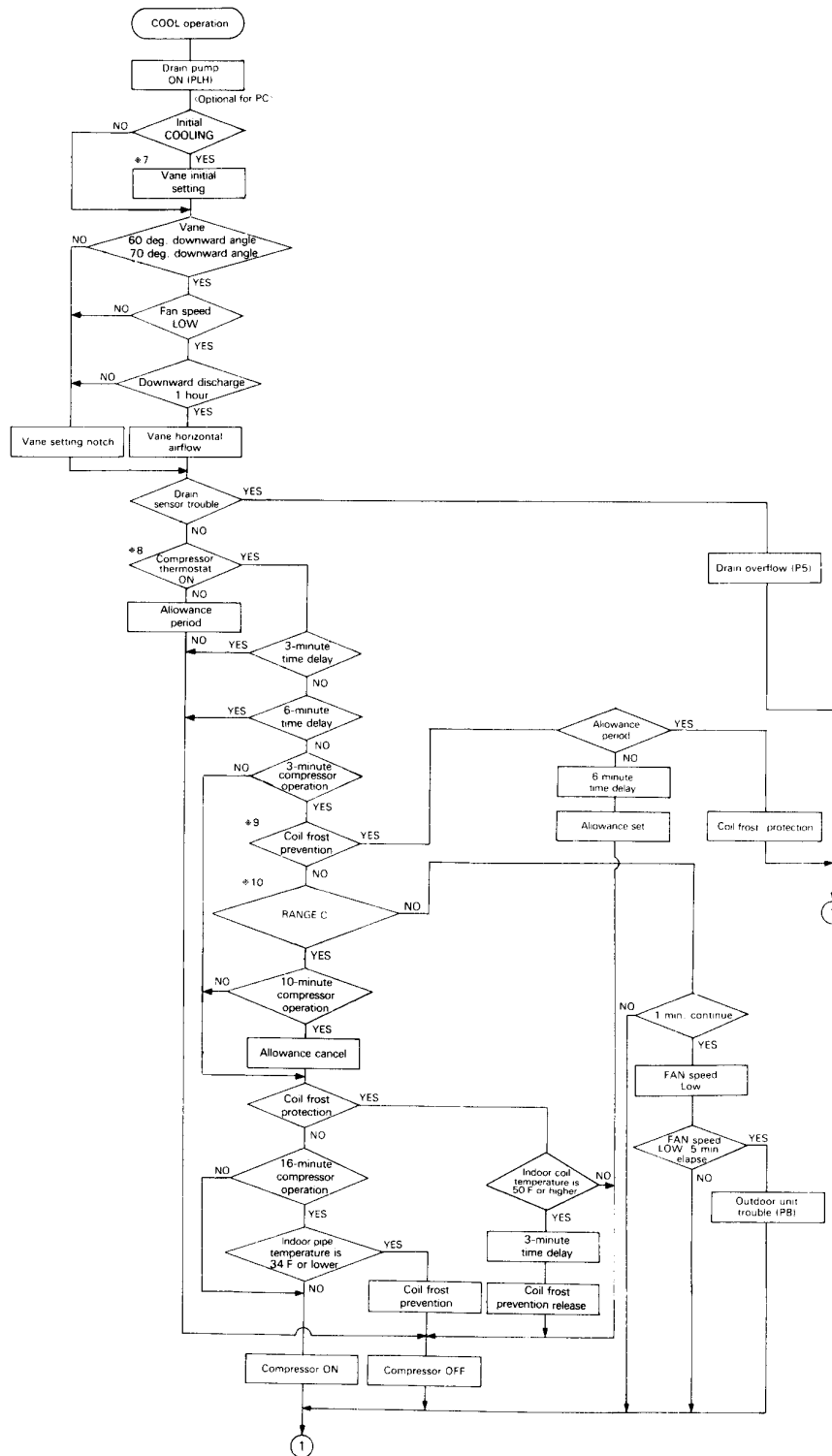
*3 If check mode is set by check SW check point for error occurred in the past will be displayed.

*4 When the unit is stopped after COOL mode or DRY mode the drain pump continues to work for 3 minutes.

*5 The 3 minutes time-delay mechanism functions after compressor stops.

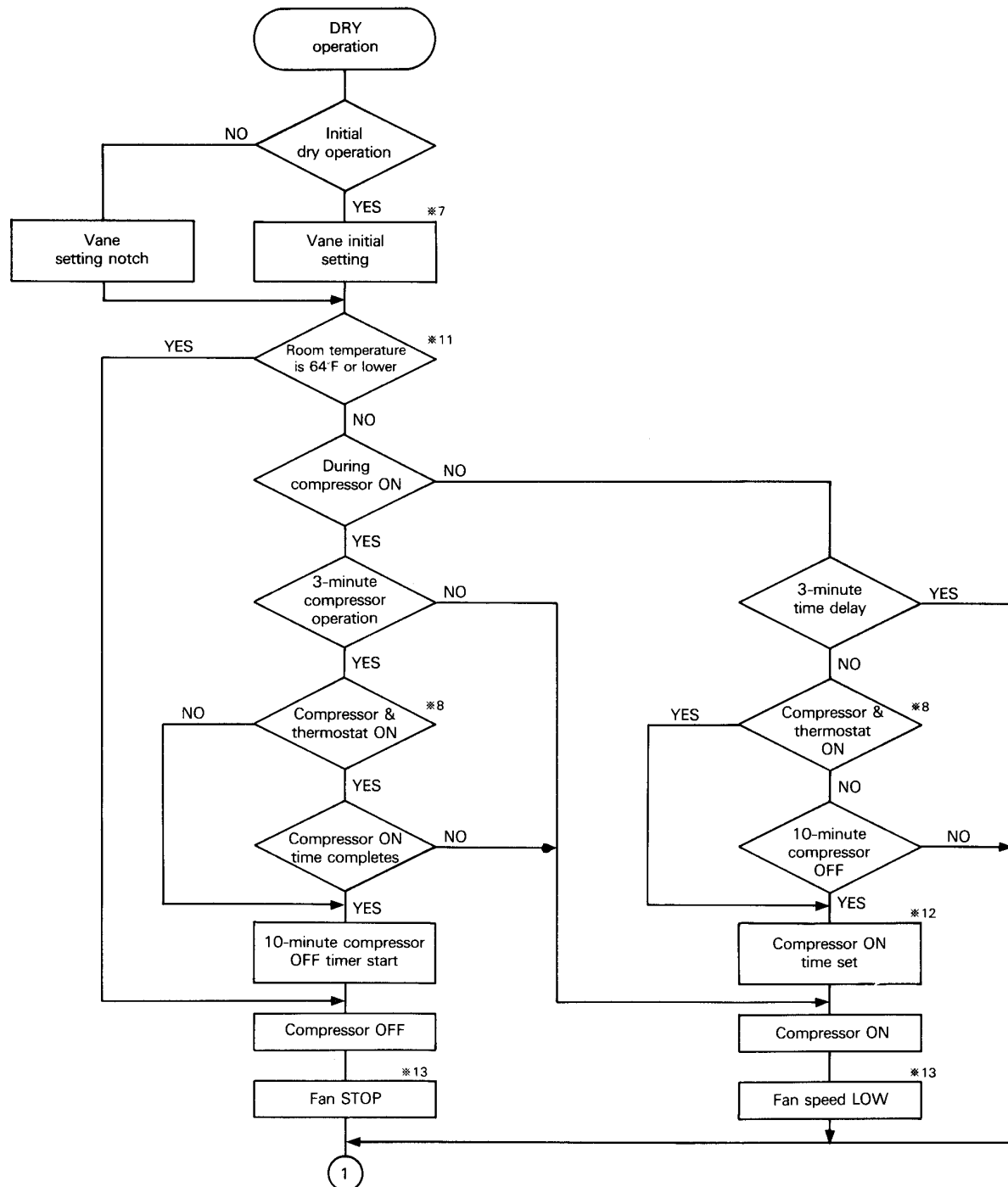
*6 Fan speed and air flow direction are set by remotecontroller. Compressor is continuously ON.

COOLING OPERATION



- *7 When operation stops or changes to cooling or dry mode, the auto vane turns to horizontal angle. If operation changes during auto vane SWING, the auto vane continues to swing.
- *8 For TEST RUN the thermostat function will be ignored resulting in continuous thermostat ON.
- *9 After 3 minute compressor operation, if the indoor coil temperature reads 5 F or below for 3 minutes, the compressor stops for 6 minutes.
- *10 RANGE C : Room temperature minus indoor coil temperature is more than 9 deg.

DRY OPERATION



*7~8 Refer to page 58.

*11 When room temperature is 64 F or below, the compressor cannot operate.

When room temperature rises over 64 F, the compressor starts after 3-minute time delay.

*12 Compressor ON time is decided by room temperature. Refer to page 62.

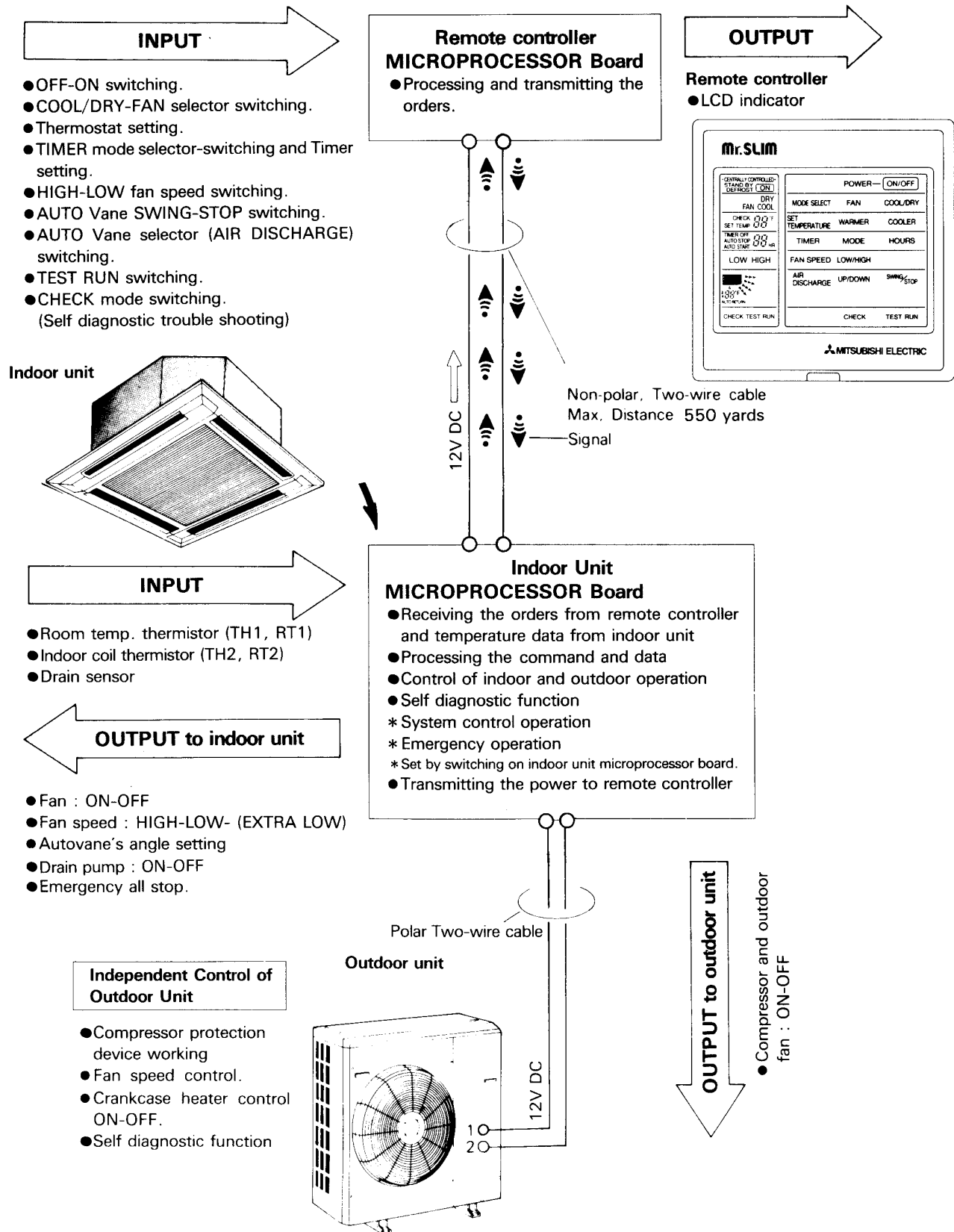
*13 In dry operation, compressor ON makes the fan speed LOW and compressor OFF stops the fan.

Fan speed setting by remote controller is not available.

9

MICROPROCESSOR CONTROL

1. OUTLINE OF MICROPROCESSOR CONTROL



2. COOLING OPERATION

(1) Thermostat function

During cooling operation, desired temperature can be set in the range from 66°F to 86°F. When room temperature falls to the set temperature, the thermostat turns to OFF. After that, when the room temperature rises 2 deg. higher than the set temperature, the thermostat turns ON.

(2) Coil frost prevention

After 16-minute compressor continuous operation, if the indoor coil thermistor (RT2 or TH2) reads 34°F or below, the compressor stops to prevent coil frosting. When the indoor coil temperature rises to 50°F, the coil frost prevention stops and the compressor restarts after 3-minute time delay function. ※1

※1 After stop, the compressor does not restart for 3 minutes to prevent short cycle.

(3) Coil frost protection

① After compressor continuous operation of at least 3 minutes, if the indoor coil temperature has been 5°F or below for 3 minutes, the coil frost protection mode starts.

② The compressor stops, and restarts 6 minutes later. (6-minute time delay)

③ The first 10 minutes after the compressor restart is an allowance period.

- If the same conditions as ① is satisfied in the allowance period, both indoor and outdoor units stop and check code "P6" appears on the liquid crystal display (LCD) of the remote controller.

- If the same conditions as ① is satisfied after the allowance period, 6-minute time delay functions and the allowance period starts again.

④ If the cooling mode stops or changes to other mode during 6-minute time delay or the allowance period, the coil frost protection mode is canceled.

(4) Outdoor unit abnormality detection

After 3-minute compressor continuous operation, if room temperature minus indoor coil temperature is less than 9 degrees for 1 minute, the fan speed turns to LOW. Five minutes later, if the difference is still less than 9 degrees, the outdoor unit is regarded as abnormal. Then the compressor stops and the check code "P8" appears on LCD of the remote controller.

(5) Dew prevention heater

To prevent dew on the grill, the dew prevention heater is continuously ON during cooling operation, independent of the thermostat ON or OFF.

(6) Drain pump

Drain pump is ON during cooling operation. When cooling operation stops or changes to other mode, the pump continues to operate for 3 minutes.

① Drain pump abnormality

The drain pump is regarded as abnormal if the drain sensor is under water.

Whether the drain sensor is under water or not is judged by the temperature the drain sensor reads.

- The drain sensor is judged as out of water when :

The drain sensor has sensed more than 40 degrees of temperature rise after the drain sensor heater ON, or the drain sensor has read 145°F or above.

- The drain sensor is judged as under water when :

Though more than 40 seconds have passed since the drain sensor heater turns to ON, the drain sensor has sensed less than 40 degrees of temperature rise, or the drain sensor has read below 145°F.

In this case, the condensate pump is regarded as abnormal. The operation stops, and the check code "P5" appears on the LCD of the remote controller.

② Drain sensor heater ON/OFF

- The drain sensor heater turns to ON when either of the conditions below is satisfied.

- a) The drain sensor has read higher than the room temperature and the temperature difference is less than 9 degrees.

- b) About 3 minutes have passed since the drain sensor heater turned to OFF.

However, the drain sensor heater does not turn to ON, if the drain sensor reads 145°F or above.

- The drain sensor heater turns to OFF when either of the conditions below is satisfied.

- a) The drain sensor has read more than 40 degrees of temperature rise after the drain sensor heater turned to ON.

- b) The drain sensor has read 145°F or above.

- c) Forty seconds have passed since the drain sensor heater turned to ON.

3. DRY OPERATION

(1) Thermostat function and compressor control contents

Thermostat condition		Compressor control	
Thermostat	Room temperature after 3-minute compressor operation	* ON time	OFF time
Thermostat ON	82°F or above	9 (min)	3
	79°F to 82°F	7	3
	75°F to 79°F	5	3
	Below 75°F	3	3
Thermostat OFF	Above 64°F	3	10

* Compressor ON time depends on the room temperature after 3-minute compressor operation. For example, after 3-minute compressor operation, if the room temperature is 85°F, the compressor operates 6 minutes more. (9-3=6)

(a) Three minutes after the compressor starts :

- If the thermostat is ON, the compressor continues to run according to the above table.
- If the thermostat is OFF, the compressor stops for next 10 minutes.

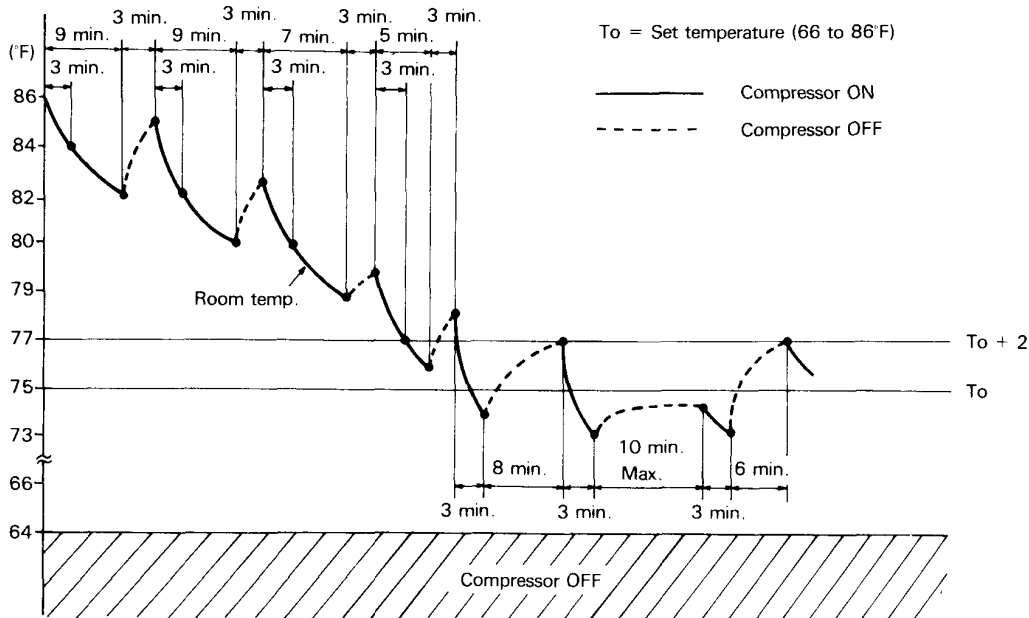
(b) Three minutes after the compressor stops :

- If the thermostat is ON, the compressor starts.
- If the thermostat is OFF, the compressor remains OFF. However, if the thermostat has been OFF for 10 minutes, the compressor operates for 3 minutes.

(c) If the room temperature is 64°F or below, the compressor does not work.

When the room temperature rises above 64°F :

- If the thermostat is ON, the 3-minute time delay works.
- If the thermostat is OFF, the 10-minute time delay works.



(2) Fan control

While the compressor operates, the fan speed is LOW. While the compressor stops, the fan stops. Fan speed setting by the remote controller is not available.

(3) Protection function

Coil frost protection is the same as that in cooling mode. But coil frost prevention and outdoor unit abnormality detection do not work.

(4) Dew prevention heater

Remains continuously ON while in dry mode.

4. AUTO VANE CONTROL (For series PL/PLL)

(1) Frequency judgement

When the unit operates for the first time after the circuit breaker turned to ON, the frequency, 50Hz or 60Hz, is judged by the horizontality sensing switch. If the frequency cannot be judged immediately for some reason, the sensing operation continues for 10 minutes with the vane motor at ON.

If the frequency cannot be judged yet after 10-minute sensing, the vane motor turns to OFF. But the AIR DISCHARGE DIRECTION display continues to be indicated.

(2) During cooling operation

When the cooling operation starts, the horizontal discharge is automatically set. However, the desired discharge among four modes below-listed can be selected with the AIR DISCHARGE UP/DOWN button on the remote controller.

- ① 20 deg. discharge
 - ② 45 deg. downward discharge (only with the fan speed at HIGH)
 - ③ 60 deg. downward discharge
 - ④ 70 deg. downward discharge
- } See Fig. 1.

When discharge ③ or ④ continues for 1 hour with the fan speed at LOW, the discharge direction turns to the horizontal discharge automatically.

NOTE 1: After that, the discharge ③ or ④ is available by setting with the remote controller, and it continues for 1 hour.

NOTE 2: If the discharge direction changes from ③ to ④, the direction returns to the horizontal discharge when 1 hour has passed since the discharge ③ started.

NOTE 3: If the discharge direction changes from ③ (or ④) to the 20 deg. discharge, the 1-hour timer to return the 20 deg. discharge is canceled at that time.

(3) During the operation OFF, the auto vane is in the horizontal position.

(4) Automatic swing mechanism

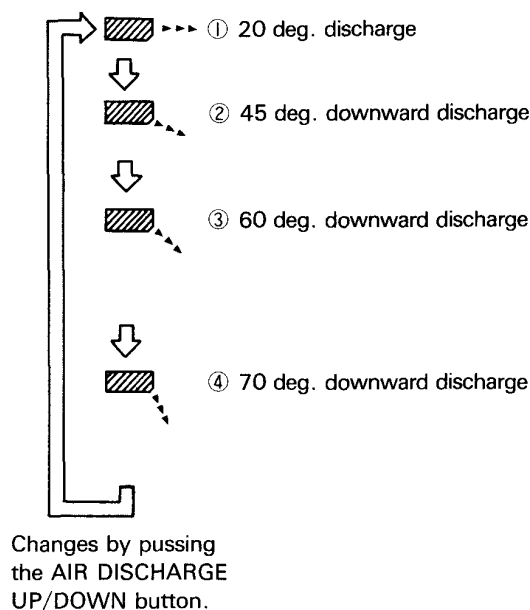
To enable the automatic swing mechanism, turn ON SW17-10 of the remote controller and SW5-1 of the indoor controller board.

Swinging air-flow or fixed air-flow can be selected by the AIR DISCHARGE SWING/STOP button on the remote controller.

- Swinging air-flow : The air flow swings between the horizontal discharge and the downward discharge.
- Fixed air-flow : The air flow is fixed at the set discharge direction.

(5) When the vane motor is out of order or the connector is badly connected, the air discharge display of the remote controller continues.

Fig. 1. <Remote controller display>



5. REMOTE CONTROL DISPLAY

All LCD are indicated for your reference.

PL/PLL series

ON

Displayed during operation (ON).

FAN, COOL/DRY

Operation mode is displayed.

SET TEMP./CHECK

SET TEMP :
The desired temperature setting is displayed.

CHECK :
When unit malfunctioning occurs, this display is activated. At this time, "Unit address" and "check-code" are alternately displayed, indicating the malfunctioning unit and the cause.

TIMER OFF, AUTO STOP, AUTO START (TIMER MODE)

TIMER OFF (continuous operation), **AUTO STOP**, **AUTO START** mode are displayed. In **AUTO STOP/AUTO START** mode, the set timer is also displayed. Time setting is in 1 hour units for up to 24 hours.

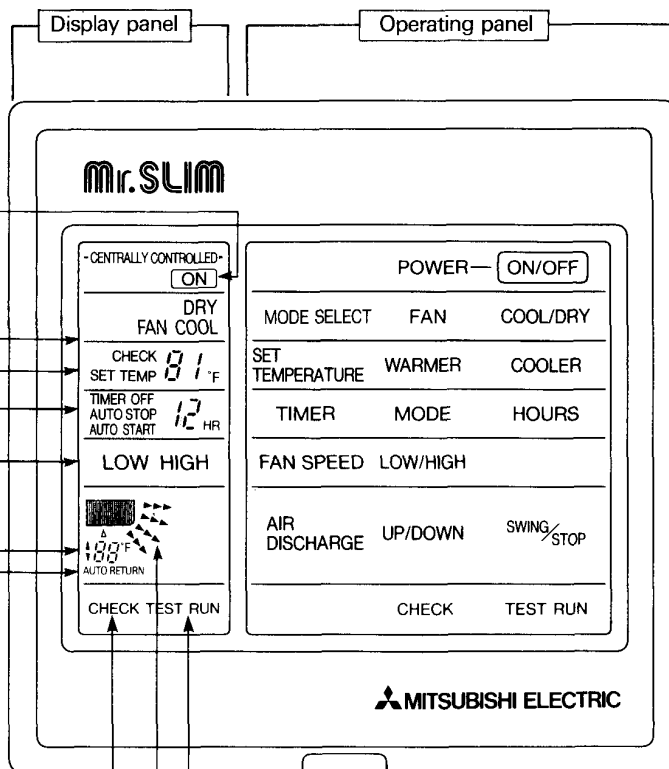
Fan speed (LOW, HIGH)

The fan speed (Low/High) is displayed.

AUTO RETURN

(1 hour air discharge timer)

The display appears when the unit is set for cooling or dry mode with low fan speed and downward airflow. 1 hour later it disappears.

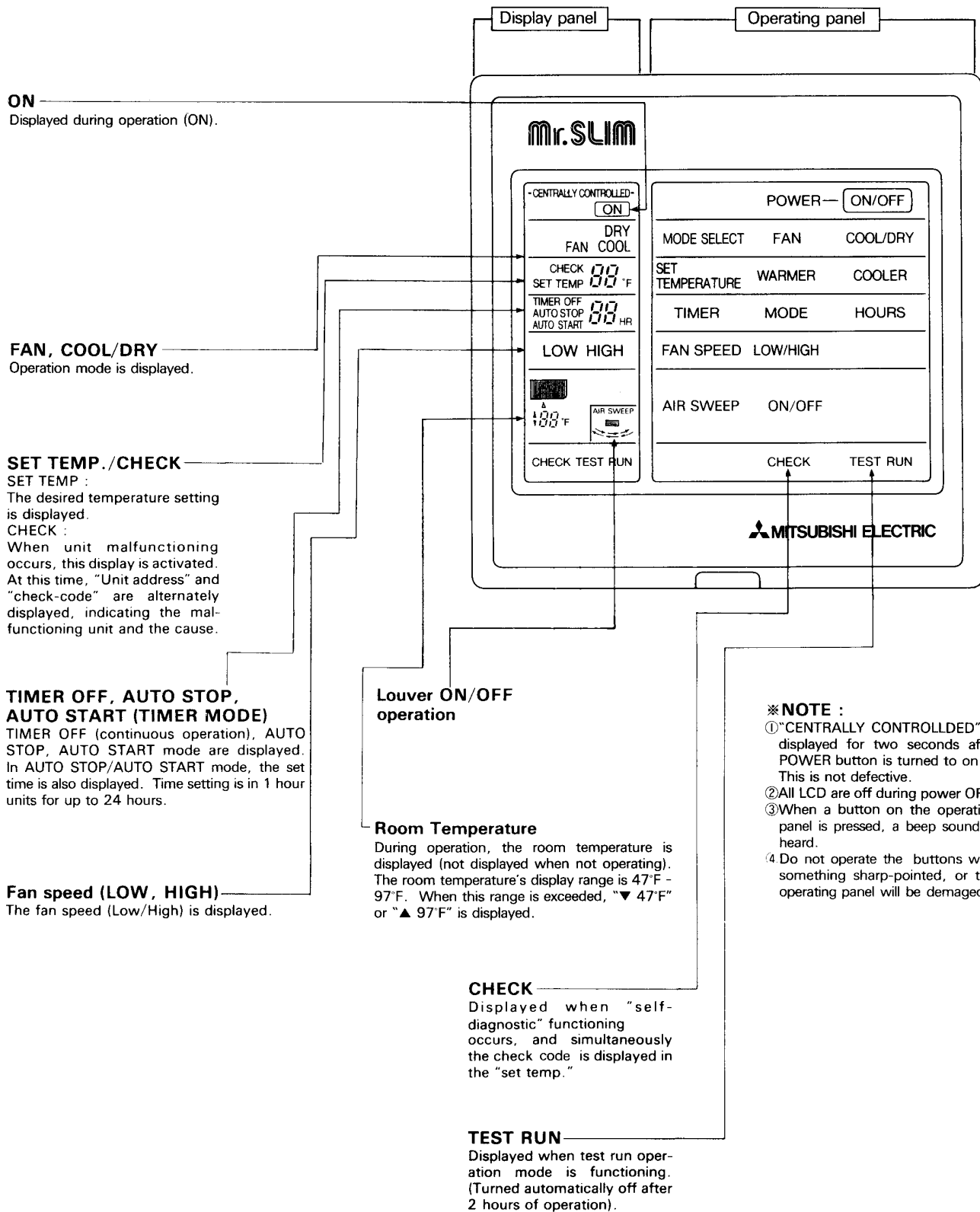


※NOTE :

- ① "CENTRALLY CONTROLLED" is displayed for two seconds after POWER button is turned to on. This is not defective.
- ② All LCD are off during power OFF.
- ③ When a button on the operating panel is pressed, a beep sound is heard.
- ④ Do not operate the buttons with something sharp-pointed, or the operating panel will be damaged.

PC/PCL/PK/PKL series

All LCD are indicated for your reference.



Remote control operation and Liquid Crystal Display

1) ON/OFF

Press the **ON/OFF** button to operate the unit.

2) Operating mode selection

Select the desired operating mode with these buttons: **COOL/DRY** or **FAN**

3) Room temperature setting

Each time the **WARMER** button is pressed, the set temperature rises by 2 deg.

Each time the **COOLER** button is pressed, the set temperature falls by 2 deg.

If the **WARMER** or **COOLER** button is continually pressed, the set temperature rises or falls by 2 deg. per 0.5 sec.

4) Timer operation

① If the **MODE** button is pressed, the modes change in the following order :

(AUTO STOP) → (AUTO START) → (TIMER OFF), and the respective modes are displayed on the liquid crystal display panel.

② Time setting

Timer time can be set by the **HOURS** button. Each time the **HOURS** button is pressed, the time increases by 1 hour. If the **HOURS** button is continually pressed, the time increases by 1 hour pr. 0.5 sec. Time setting is in 1 hour units for up to 24 hours.

In this example, the AUTO STOP is selected and 8 hours later the air conditioner will be turned to off. The time display will change in 1 hour units, showing the remaining time.



● The timer mode automatically memorizes the previous time setting. When the timer mode is repeatedly used, the previous time setting is set automatically. (Use the **HOURS** button to change the time setting)

③ Timer cancel device

To cancel the timer setting, push the POWER **ON/OFF** button.

5) Fan speed

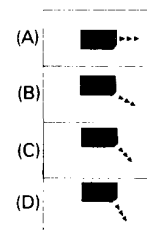
Press the **LOW/HIGH** button to change between low and high speed, "LOW" or "HIGH" is displayed according to the mode.

6) Air discharge selection (the angle of auto vane) (For PL/PLL series)

Press the **UP/DOWN** button to select the air discharge direction among the following air discharge setting.

Air discharge display

- (A) 20 deg. discharge
- (B) 45 deg. downward discharge
- (C) 60 deg. downward discharge
- (D) 70 deg. downward discharge



○ In cooling mode, the 45 deg. downward discharge is available only while the fan speed is HIGH.

7) Louver operation (AIR SWEEP (For PC/PCL/PK/PKL series))

Press the AIR SWEEP **ON/OFF** button to turn the louver operation (air sweep) ON or OFF.

During "AIR SWEEP" ON, the display alternates every second :



8) "Self-diagnostic" function (**CHECK**)

Press the **CHECK** button twice to start the "self-diagnostic" function. "Unit address" and "check code" are alternately displayed in the set temperature display.

9) "TEST RUN" mode

Press the **TEST RUN** button twice to start the test run mode. The TEST RUN is easily available, regardless of season.

5. TEST RUN FUNCTION

5-1 BEFORE TEST RUN

After finishing the outdoor and indoor installation, piping, and wiring, check for refrigerant leaks and looseness of power supply cord and control wire.

And then, use the test run function. The test run operates independently of the thermostat function and the room temperature. In case of the models with drain pump, it works during the test run.

5-2 HOW TO WORK TEST RUN OPERATION

(1) Turn the main breakers ON.

(2) Press the **TEST RUN** button twice, and "TEST RUN" appears on LCD of the remote controller.

NOTE1: During the remote ON-OFF control or the centrally control, **TEST RUN** button is not available.

NOTE2: After pressing **TEST RUN** button once, if a different button is pressed by mistake, the first pressing is cancelled.

(3) Press **FAN** button and check if the air is discharged.

(4) Press **COOL** button and check if the cool air is discharged.

(5) Check for the louver and the auto vane with **AIR DISCHARGE UP/DOWN** and **AIR SWEEP** buttons.

(6) During the test run operation, the indoor coil temperature code is displayed at the room temperature display part on the remote controller.

NOTE : The indoor coil temperature code is displayed in the range form 1 to 15, showing the temperature from -40°F to 194°F . See the below table.

To check the compressor operation, refer to this code. In normal cooling operation, the code should be fall as time passes.

Code	1	2	3	4	5	6	7	8
Indoor coil temperature	$-40\sim 34^{\circ}\text{F}$	$\sim 50^{\circ}\text{F}$	$\sim 59^{\circ}\text{F}$	$\sim 68^{\circ}\text{F}$	$\sim 77^{\circ}\text{F}$	$\sim 86^{\circ}\text{F}$	$\sim 95^{\circ}\text{F}$	$\sim 104^{\circ}\text{F}$
Code	9	10	11	12	13	14	15	
Indoor coil temperature	$\sim 113^{\circ}\text{F}$	$\sim 122^{\circ}\text{F}$	$\sim 131^{\circ}\text{F}$	$\sim 140^{\circ}\text{F}$	$\sim 158^{\circ}\text{F}$	$\sim 194^{\circ}\text{F}$	Thermistor abnormality	

(7) Check if the outdoor fan operates normally.

(8) As the test run operation has the 2-hour AUTO STOP timer, it stops 2 hours later automatically. To interrupt the test run operation, press power **ON/OFF** button or timer **MODE** button.

CAUTION: If the unit is out of order during TEST RUN OPERATION, check the malfunction with SELF-DIAGNOSTIC FUNCTION. (See page 73 to 78.)

If an emergency cooling is necessary for the customer, use the EMERGENCY OPERATION. (See the next page.)

6. EMERGENCY OPERATION

When the remote controller or microprocessor is out of order, and all other parts are normal, setting the dipswitch SW3 on the indoor controller board enables the EMERGENCY OPERATION.

6-1 BEFORE EMERGENCY OPERATION

(1) Make sure that the compressor and the indoor fan are operating normally.

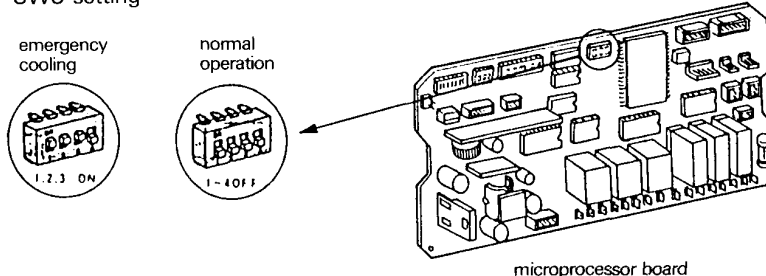
(2) Check for malfunctioning point with the SELF-DIAGNOSTIC FUNCTION. If the protection function, such as coil frost protection, is found to be working, remove the sources to release the protection function before starting the EMERGENCY OPERATION.

CAUTION : If the SELF-DIAGNOSTIC FUNCTION indicates "drain pump malfunction" (P5) in the cooling mode, DO NOT use the EMERGENCY OPERATION. Otherwise drain overflow may occur.

6-2 HOW TO WORK EMERGENCY OPERATION

(1) For emergency cooling, turn the SW3 levers 1, 2, and 3 ON; and 4 OFF.

SW3 setting



- (2) Turn the outdoor unit breaker ON, and then turn the indoor unit breaker ON.
Now, the EMERGENCY OPERATION starts.
- (3) During EMERGENCY OPERATION, the indoor fan operates at high speed, but the swing louvers and the auto vane do not work.
- (4) To stop the EMERGENCY OPERATION, turn the indoor unit breaker OFF.
- NOTE: The remote controller POWER ON/OFF button is not available to start/stop the EMERGENCY OPERATION.
- CAUTION: Do not use the emergency cooling for more than 10 hours, or the indoor coil may frost.

7. DIP SWITCH FUNCTIONS

Each figure shows the initial setting by factory.

1 On remote controller board

(1) SW17 (Address selector)

	1	2	3	4	5	6	7	8	9	0
ON	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒
OFF	☒	☒	☒	☒	☒	☒	☒	☒	☒	☐

	1	2	3	4	5	6	7	8	9	0
ON	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐
OFF	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒

SW17-1~6) For address setting

SW17-7) When two remote controllers are used, this switch sets the controller function.

OFF: The remote controller is set as a main controller.

ON: The remote controller is set as a sub controller.

SW17-8) Back-up switch

This switch is not available for series PL/PLL/PC/PCL/PK/PKL.

SW17-9) Switch for temperature unit

OFF: °C(Celsius)

ON: °F(Fahrenheit)

SW17-0) Switch for louvers

OFF: Unit with louvers (For PC/PCL/PK/PKL)

ON: Unit without louvers (For PL/PLL)

2 On indoor controller board

(1) SW1 (Mode selector)

	1	2	3	4	5	6	7	8	9	10
ON	☐	☒	☒	☒	☒	☒	☒	☒	☒	☒
OFF	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐

	1	2	3	4	5	6	7	8	9	10
ON	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐
OFF	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒

SW1-1) Switch to change over between FAN mode and AUTOMATIC COOLING-HEATING CHANGE OVER mode

OFF: Fan mode for cooling-only models including series PL/PLL/PC/PCL/PK/PKL.

ON: AUTOMATIC COOLING-HEATING CHANGE OVER mode for heat pump models

SW1-2) Switch to change over louver display

OFF: Swing

ON: Rotary

SW1-3) Switch for auto vane

OFF: Unit without auto vane (For PC/PCL/PK/PKL)

ON: Unit with auto vane (For PL/PLL)

SW1-4) Switch for drain pump (Drain lift-up mechanism)

OFF: The drain pump works in only cooling mode.

ON: The drain pump works in both cooling and heating mode. (For heat pump models)

SW1-5) Switch to change the temperature to start coil frost prevention

OFF: 36°F (For previous special models)

ON: 34°F (For all current models)

SW1-6) Switch for set temperature adjustment in heating mode

This is not available for series PL/PLL/PC/PCL/PK/PKL.

SW1-7) Switch for fan speed during thermostat OFF in heating mode

This is not available for series PL/PLL/PC/PCL/PK/PKL.

SW1-8) Switch for fan motor operation in heating mode

This is not available for series PL/PLL/PC/PCL/PK/PKL.

SW1-9) Switch for outdoor unit abnormality detection

OFF: When abnormality occurs, it is detected.

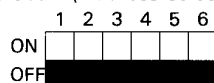
ON: Even if abnormality occurs, it is not detected.

SW1-10) Switch for AUTO RESTART FUNCTION

OFF: This function does not work.

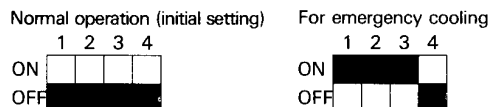
ON: This function works.

(2) SW2 (Address selector)



Use SW2 to set unit- address for group control.
For further information, refer to page 78.

(3) SW3 (Emergency operation switch)



(4) SW5 (Model selector)



- SW5-1) OFF: For models without automatic swing mechanism (For PC/PCL/PK/PKL)
ON: For models with automatic swing mechanism (For PL/PLL)
- SW5-2) OFF: For models with heating mode and cooling mode
ON: For models with only cooling mode including PL/PLL/PC/PCL/PK/PKL
- SW5-3) OFF: For normal models
ON: For twin control models
- SW5-4) OFF: For No.1 unit of twin control
ON: For No.2 unit of twin control

8. OUTDOOR MICROPROCESSOR CONTROL

8-1 Protection function

- (1) As soon as a reversed phase, an open phase, or a P.C. board trouble is sensed, the operation stops and the check code is displayed by LED on the outdoor controller board.
- (2) When a protection function such as high pressure switch and overcurrent relay works for the first time, the operation stops and restarts after 3-minute time delay mode. When the second protection function works, the operation stops and the check code is displayed by LED. This condition continues until the outdoor unit receives OFF command from the indoor controller board. Check code indication continues until the outdoor unit receives the ON command from the indoor controller board.
- (3) The second protection function is not necessary to be the same as the first one. The content of the second protection function is loaded in the memory, which is cleared when SW1 turns to ON or the next check mode starts.

8-2 Control by outdoor coil thermistor

- (1) Unit control
Outdoor coil temperature range for control is from -40 to 194°F . When reading 194°F or above, the outdoor coil thermistor is regarded as short-circuited. When reading -40°F or below, the outdoor coil thermistor is regarded as open-circuited. An open circuit is not sensed for the first 7 min. after the compressor start up, but is sensed during defrosting operation or for the first 10 seconds after the compressor start-up.
- (2) Target temperature of outdoor coil temperature
Fan rotational frequency is controlled so that the outdoor coil temperature keeps $95^{\circ}\text{F} \pm 4^{\circ}\text{F}$.

8-3 Unit operation control

The compressor receives signal from the indoor unit and make the outdoor unit start or stop.

8-4 Fan control

Fan rotational frequency is phase-controlled so that the outdoor coil temperature reaches the target temperature. This control enables cooling operation even if the outdoor temperature is low. Fan rotational frequency is adjusted by fan output. Fan output is divided into 256 steps from 0 to 255 and is controlled every 30seconds.

(1) Initial setting

A. When power is turned to on, or when the compressor restarts after interval of 30 minutes or more:

- If the outdoor coil thermistor reads 46°F or above, the fan output step becomes 100.
- If the outdoor coil thermistor reads below 46°F, the fan output step becomes 200.

B. When the compressor restarts within 30 minutes after stop, the fan output step is the same as the fan output before the compressor stops.

C. When the operation mode is changed within 30 minutes after the compressor stops, the fan output step becomes 100.

D. When the operation mode is changed after the compressor interval of more than 30 minutes, the fan output step is the same as described in A.

(2) For the first 2 minutes after the compressor start-up, the fan operates at the initial setting output, and then every other 30 seconds, the fan output is adjusted depending on the difference between the outdoor coil temperature and the target temperature. But as soon as the outdoor coil temperature becomes 122°F or above, the fan output step becomes 255.

(3) When the outdoor coil thermistor reads 122°F or above, the fan output step becomes 255.

(4) When the high pressure switch (63H1) functions, the fan output step becomes 255. After that, when the switch returns, the fan control returns to the normal control.

8-5 Crankcase heater control

(1) With jumper wire J3

The crankcase heater is ON from the power is turned to on till the compressor starts, and turns to ON 1 hour after the compressor stop.

(2) Without jumper wire J3

The crankcase heater is ON from the power is turned to on till the compressor starts, and repeats ON/OFF on a 1-hour schedule.

8-6 Fixed fan-output

While the compressor is operating and the fan output step is indicated by LED, pushing SW2 fixes the fan output of that time. The fixed fan-output can be released when either of the following conditions is satisfied.

- ① SW2 is pushed again.
- ② SW3 setting is changed.
- ③ The compressor stops.
- ④ Defrosting operation starts. (for heat pump unit)

8-7 Function of switches on the outdoor controller board

SW1: Clears the check code memory (push-button switch)

SW2: Switches the output state indication and the check code display (push-button switch)

SW3-1,2: Switches the output state indication items (dip switch)

For further information, please refer to page 76.

8-8 Operation during the power-on-reset state

- (1) When the circuit breaker is turned to ON, the microprocessor enters the power-on-reset state, which continues until the direct current for the microprocessor control reaches 12V.

Then the microprocessor starts operation in the following order.

① Each I/O port clearance

② Function input

Function depends on jumper wires set beforehand in the factory.

Jumper wire	Function	With jumper wire	Without jumper wire
J1	Reversed phase sensing	Sensed	Not sensed
J2	Not applied for series PL/PLL/PC/PCL/PK/PKL.		
J3	Crankcase heater control	Refer to 8-5 (1) on page 70.	Refer to 8-5 (2) on page 70.
J4	Target temperature of outdoor coil temperture	86°F For heat pump units	95°F For cooling units

③ Check for a reversed phase

④ Check for an open phase (with J1)

⑤ 50/60Hz judgement

⑥ EARAM data loading (check mode, and total time of compressor operation)

⑦ Coil temperature initial input

- (2) If an open phase or a reversed phase is sensed, LED blinks every other second.

NOTE

* If power is not supplied to the transformer and the microprocessor, the microprocessor does not work and can sense neither a reversed phase nor an open phase.

* If a contact point of protective device such as the high pressure switch has already been opened in the power-on-reset state, it is regarded as an open phase.

In this case, all LED are OFF.

* As for three-phase model, if phase R or T opens, microprocessor does not work due to abnormal voltage. In this case, LED are all ON or all OFF.

8-9 100% fan output

Fan output is fixed to 255 (100%) by shorting CN22. However, the fan stops during compressor OFF or defrosting operation.

Open circuit of CN22 enables the fan control to start.

8-10 Time shortening

Short circuit of CN21 shortens the time listed below.

1) Fan control period : 30 sec. → 3 sec.

2) Three-minute time delay function : 3 min. → 3 sec.

3) Compressor ON/OFF time for bypass valve ON/OFF : 30 min. → 3 sec.

4) Compressor ON time to start other functions : x min. → x sec.

10

TROUBLE SHOOTING

1. REMOTE CONTROLLER DISPLAY ABNORMALITY

Display abnormality	Cause	Check points																				
The display "centrally controlled" on remote controller does not disappear.	1) Wrong address setting of remote controller/indoor controller board. 2) Time adapter is connected to the remote controller. 3) Signal transmission error between indoor unit and remote controller.	1) Check the address setting of remote controller and indoor controller. 2) Check if the timer adapter is used correctly. 3) ① Turn another remote controller's DIP SW17-7 ON to make it sub controller. ② Connect the sub controller to the unit, and turn circuit breaker ON. • If the display "centrally controlled" disappear, replace the former remote controller. • If the display remains the same, replace the indoor controller board.																				
When remote controller POWER switch is turned to ON, the check code "EO" appears.	1) Signal transmission error between indoor unit and remote controller.	1) ①Connect a sub remote controller. ②Turn circuit breaker ON. If the display "centrally controlled" remains, replace the indoor controller board. ③If the display disappears, turn the remote controller POWER switch ON and check as follows. <table><tr><th></th><th>Remote controller</th><th>Sub remote controller</th><th>Malfunction</th></tr><tr><td>1</td><td>Operating Display</td><td>EO Display</td><td>Malfunction of Indoor Unit</td></tr><tr><td>2</td><td>Operating Display</td><td>Operating Display</td><td>Malfunction of Remote Controller</td></tr><tr><td>3</td><td>No Display</td><td>EO Display</td><td>Malfunction of Indoor Unit and Remote Controller</td></tr><tr><td>4</td><td>No Display</td><td>Operating Display</td><td>Malfunction of Remote Controller</td></tr></table>		Remote controller	Sub remote controller	Malfunction	1	Operating Display	EO Display	Malfunction of Indoor Unit	2	Operating Display	Operating Display	Malfunction of Remote Controller	3	No Display	EO Display	Malfunction of Indoor Unit and Remote Controller	4	No Display	Operating Display	Malfunction of Remote Controller
	Remote controller	Sub remote controller	Malfunction																			
1	Operating Display	EO Display	Malfunction of Indoor Unit																			
2	Operating Display	Operating Display	Malfunction of Remote Controller																			
3	No Display	EO Display	Malfunction of Indoor Unit and Remote Controller																			
4	No Display	Operating Display	Malfunction of Remote Controller																			
When remote controller POWER switch is turned to ON, operating display appears, but disappears soon.	1) Short circuit of indoor/outdoor connecting wire 2) Short circuit of transmission wire 3) Short circuit of drain sensor heater circuit 4) Wrong operation of remote controller due to infrared signal from other appliances.	1), 2) Check the wire. 3) Measure the resistance of the drain sensor connector CN50 ① - ③. If normal, the value should be 82Ω. 4) Turn the circuit breaker OFF, and then turn ON. If the remote controller remains abnormal, despite the above measures, replace the indoor controller board.																				
Despite turning POWER switch ON, the remote controller display does not appear.	1) Damaged remote controller 2) Short circuit of transmission wire 3) Bad contact of indoor CN40 4) CN40 is attached to a sub unit. 5) Damaged transformer 6) Bad contact of CN4T 7) Broken fuse 8) Circuit breaker OFF	1) Measure the voltage between terminals of remote controller. If no voltage, remove the terminals and measure the voltage between wires. If the voltage is between 6VDC and 12V, replace the remote controller. 2) ~ 8) Check each point. If normal, replace the indoor controller board.																				

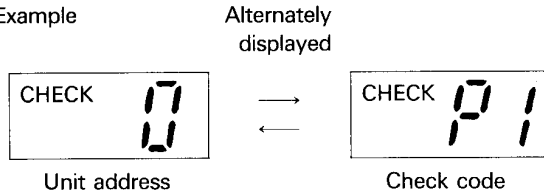
2. SELF DIAGNOSTIC FUNCTION WITH REMOTE CONTROLLER

2-1 When malfunction occurs during operation

When malfunction occurs, the indoor and outdoor units stop and the malfunction is displayed on LCD of the remote controller.

- (A) At the set temperature display part, "CHECK" appears, and the unit address and the check code are alternately at one-second intervals. (Check mode)

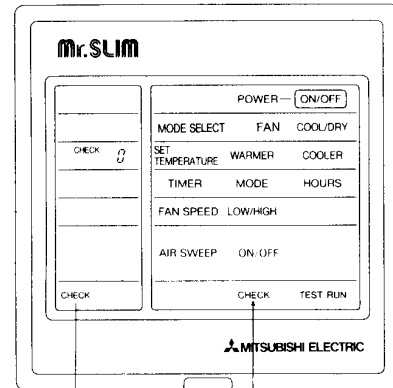
Example



- (B) When using one remote controller to control several units in the group control, the LCD shows the unit address and the check code of the first malfunctioning unit.
- (C) To cancel the check mode, press the POWER **ON/OFF** button. However, during the remote ON/OFF control or the centralized control, press the remote ON/OFF switch or turn the centralized controller power button OFF.

NOTE: The latest check code is memorized, even if the check code was cancelled by ways above-mentioned. It takes up to 60 seconds to display the memorized check code.

CHECK mode



Displayed when
CHECK button pressed twice

CHECK button

2-2 How to use the self diagnostic function in service

A. For normal control with one unit and one remote controller

- (1) Pressing the **CHECK** button on the remote controller twice starts the self diagnostic function.
- (2) During the self diagnostic function, "CHECK" appears at two positions on the remote controller display. Then, at least 10 seconds later, the unit address and the check code are alternately displayed at one second intervals.
- (3) Check and repair the unit according to the check code. (Refer to the next page.)

2-3 For group control using one remote controller

- (1) Press the **WARMER** or **COOLER** button of the remote controller to advance or go back the unit address. Each time **WARMER** button is pressed, the unit address advances by one. Each time **COOLER** button is pressed, the unit address goes back by one.
The check code of the unit address appears after the unit address, and they alternate.
- (2) The check code "U8" means there has been no malfunction since installation.
The check code "E0" means the following conditions:
 - The unit address displayed on the remote controller does not apply to any unit.
 - Power is not supplied to the unit.
 - Signal transmitting/receiving circuit is abnormal.
- (3) Check and repair the unit according to the check code. (Refer to the next page.)



Check code	Diagnosis of malfunction	Cause	Check points
E0	Signal transmitting/receiving error Indoor controller does not respond to remote controller signal.	During individual unit control 1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal.	1) Check the transmission wire. 2) Check with another remote controller. If "E0" is still indicated, replace the indoor controller board. If other check code appears, replace the former remote controller.
P1	Abnormality of room temperature thermistor (TH1 or RT1)	1) Bad contact of thermistor 2) Damaged thermistor	1) Check the thermistor. 2) Measure the resistance of the thermistor. If normal, it should be as follows. 32°F...15kΩ 50°F...9.6kΩ 68°F...6.3kΩ 86°F...4.3kΩ 104°F...3.0kΩ If normal, replace the indoor controller board.
P2	Abnormality of pipe temperature thermistor (TH2 or RT2)		
P3	Signal transmission error (Remote controller does not respond to indoor controller signal.)	1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal. 3) Wrong operation due to infrared signal from other appliances	1) Check the transmission wire. 2) Check with another remote controller. If "P3" is still indicated, replace the indoor board. If other check code appears, replace the former remote controller. 3) Short-circuit between ① and ② of CN40 and attach CN40 to the following units ● Second unit in twin control ● Second and third units in triple control ● Sub units in group control
P4	Abnormality of drain sensor	1) Bad contact of transmission wire 2) Damaged thermistor	1) Check the connector. 2) Measure the resistance of the thermistor ④ - ⑤. As for the normal resistance, refer to the case P1. If normal, replace the indoor controller board.

Check code	Diagnosis of malfunction	Cause	Check points
P5	Malfunction of drain pump	1) Malfunction of drain pump 2) Damaged drain sensor	1) Check the drain pump. 2) ● Check the drain sensor. ● Check the drain sensor heater. If normal, its resistance should be 82 Ω. If normal, replace the indoor controller board.
P6	Coil frost protection has worked.	1) Short cycle of air cycle 2) Dirty air filter 3) Damaged fan 4) Abnormal refrigerant	1) Clear the obstruction from the air cycle 2) Clean the air filter. 3) Check the fan. 4) Check the refrigerant temperature
P7	System error	1) Wrong address-setting 2) Signal transmitting/receiving circuit of remote controller is abnormal. 3) Wrong SW6-setting	1) Check the address-setting. 2) Check with another remote controller. If check code other than "P7" appears, replace the former remote controller. 3) Check SW6 setting
	Signal transmission error In twin/triple control, the first unit has not received signal from the second unit or the third unit for 5 minutes.	1) Bad contact of transmission wire 2) Wrong operation due to infrared signal from other appliances	1) Check the transmission wire 2) Short-circuit between ① and ② of CN40 and attach CN40 to the following unit. ● Second unit in twin control ● Second and third units in triple control ● Sub units in group control
P8	Abnormality of outdoor unit ● Indoor board does not see drop in indoor coil temperature during call for compressor operation	If outdoor unit does not function: 1) Wrong wiring of indoor/outdoor connecting wire 2) Reversed control wires. 3) Protection device has worked If outdoor unit functions properly: 1) Damaged indoor pipe thermistor	1) Check the indoor/outdoor connecting wire. 2) Check the protection devices. 3) Measure the resistance of the indoor pipe temperature thermistor. 4) Check for 12VDC between control wires 1 & 2 at the outdoor unit during a call for cooling (P8 code must be reset). ● If 12VDC is present check the wiring inside the outdoor unit, transformer secondaries and control fuse, if all OK, change outdoor board. ● If 12VDC is not present check same wires at indoor unit. - If 12VDC is present at the indoor, locate and repair the broken control wire.

3. SELF-DIAGNOSTIC FUNCTION WITH LED ON OUTDOOR CONTROLLER BOARD

Setting dip switches SW2 and SW3 on the outdoor controller board enables LED to show the output state and check code. Output state is shown by LED lighting, and check code by blinking.

SW1 : Turning SW1 ON clears the check code. If SW1 is turned to ON during check code blinking, the indication changes to output state indication.

NOTE : SW1 is usually available independent of SW3 setting. As an exception, when the check code shows a reversed phase or an open phase during the power-on-reset state, SW1 is not available.

SW2 : SW2 is turned to ON by pushing, and OFF by releasing.

When SW3-1 and SW3-2 are OFF, pushing SW2 changes indication between output state and check code alternately.

SW3 : Output state indication items depend on combination of SW3-1 ON/OFF and SW3-2 ON/OFF.

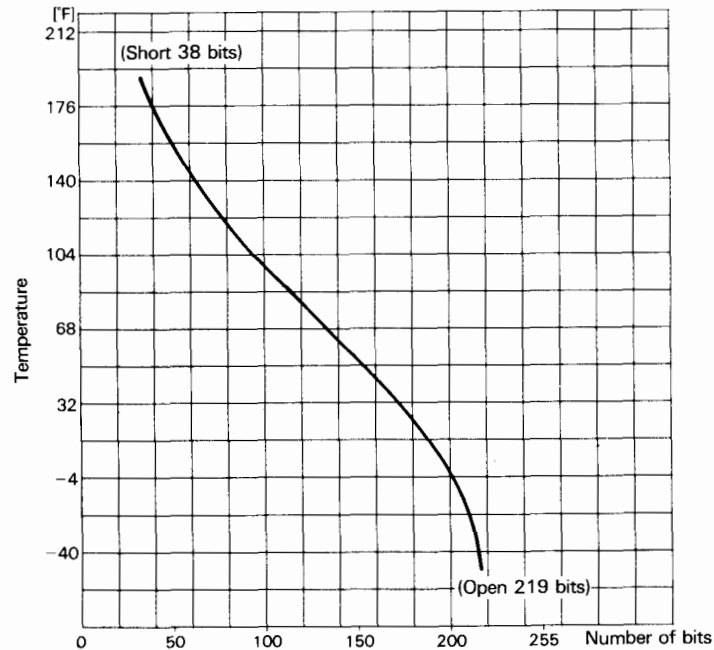
Changed alternately by pushing SW2.

	Check code	Output state	Outdoor coil temperature (bit)	Fan output step (bit)	Total time of compressor operation (Hr)
SW3-1	OFF	OFF	OFF	ON	ON
SW3-2	OFF	OFF	ON	OFF	ON
LED	blinking	lighting			
LD1	Reversed phase has been sensed.	Comp. ON command from indoor controller	1	1	256
LD2	Open phase has been sensed.	Heating operation command from indoor controller ※	2	2	512
LD3	Outdoor coil thermistor is abnormal.	During 63H1 function ※	4	4	1024
LD4	63H2 has worked.	Compressor ON	8	8	2048
LD5	51CM has worked.	Outdoor fan ON	16	16	4096
LD6	26C has worked.	Reversing valve ON ※	32	32	8192
LD7	Overheat protection has worked.	Bypass valve ON ※	64	64	16384
LD8	Input circuit on controller board is abnormal.	Crankcase heater ON	128	128	32768

※ Not applied to series PL/PLL/PC/PCL/PK/PKL.

3-1 Outdoor coil temperature

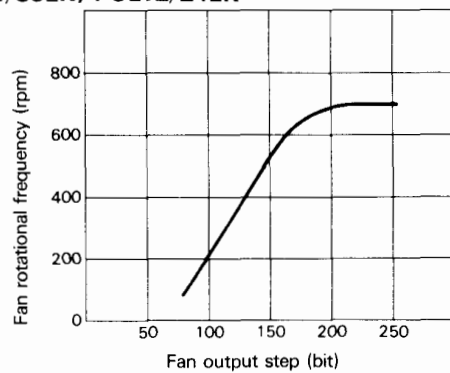
To obtain data of outdoor coil temperature, add the number of bits of lighting LEDs, and see the graph below. Then you can get the temperature.



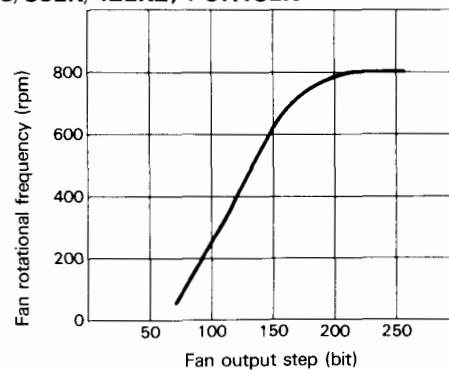
3-2 Fan output step

To obtain data of fan output step, add the number of bits of lighting LEDs. By seeing the graph below, you can get fan rotational frequency corresponding to the fan output step.

① PU24/30EK, PUL12/24EK



② PU18/36EK/42EK2, PUH18EK



3-3 Total time of compressor operation

Compressor operation time is indicated in 256 hours units. To obtain the compressor operation time, add the hours of lighting LEDs. During the compressor operation time indication, SW2 is not available.

3-4 Check code indication

- The latest check code is indicated.
- If the outdoor controller board receives the compressor ON command from the indoor controller board during check code indication, the indication changes to output state indication.
- When the check code is indicated by pushing SW2 during normal operation, operation continues.
- When a protection function works for the first time during operation, the operation stops and restarts after the 3-minute time delay mode. When the second protection function works, the operation stops and the check code is indicated. However, unless both SW3-1 and SW3-2 are OFF, the check code is not indicated.

4. TROUBLESHOOTING ACCORDING TO CHECK CODE

Blinking LED	Diagnosis of malfunction	Cause	Check points
LD1	Reversed phase has been sensed.	Phases R, S, and T are connected improperly.	Check the power supply connection.
LD2	Open phase has been sensed.	● Phase S has opened. ● Contact of protector such as thermal switch has opened when power turns on.	● Check the power supply. ● Check each protector. Take care of some protectors that need long time to return.
LD3	Outdoor coil thermistor is abnormal. (Open circuit or short circuit has been sensed.)	● Pipe temperature thermistor has broken. ● Thermistor is badly connected.	● Measure the resistance of the thermistor. ● Check the thermistor. If normal, replace the outdoor controller board.
LD4	High pressure switch (63H2) has opened.	● 63H2 is badly connected. ● 63H2 has worked.	● Check 63H2 and the outdoor fan motor. ● Check if refrigerant is short. ● Check if air cycle is short-cycled.
LD5	Overcurrent relay (51CM) opened.	● 51CM is badly connected. ● 51CM has worked.	● Check 51CM, the compressor, and power supply.
LD6	Thermal switch (26C) has opened. ※	● 26C is badly connected. ● 26C has worked.	● Check 26C. ● Check if refrigerant is short. ● Check if the capillary tube is clogged.
LD7	Over heat protection has worked.	● The thermistor has broken. ● Pipe temperature has exceeded 152°F.	● Measure the resistance of the thermistor. ● Check the outdoor fan motor. ● Check if air cycle is short-cycled.
LD8	Input circuit of outdoor controller board is abnormal.	● Pulse input has been abnormal.	● Replace the outdoor controller board.

※Not applied to PL/PLL/PC/PCL/PK/PKL.

5. WHEN OUTDOOR UNIT DOES NOT WORK

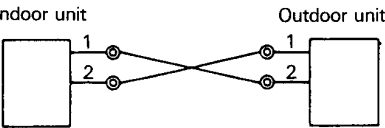
Cause	Check points
1) Indoor/outdoor connecting wires are badly connected. (Refer to next page.) 2) Power supply is badly connected. 3) Connector or transformer has broken. 4) Fuse (6A) in the outdoor controller board has blown.	1) Check the connecting wires. 2) Check the power supply. 3) Check connectors and transformers. 4) Check the fuse.

6. WRONG WIRING ON SITE

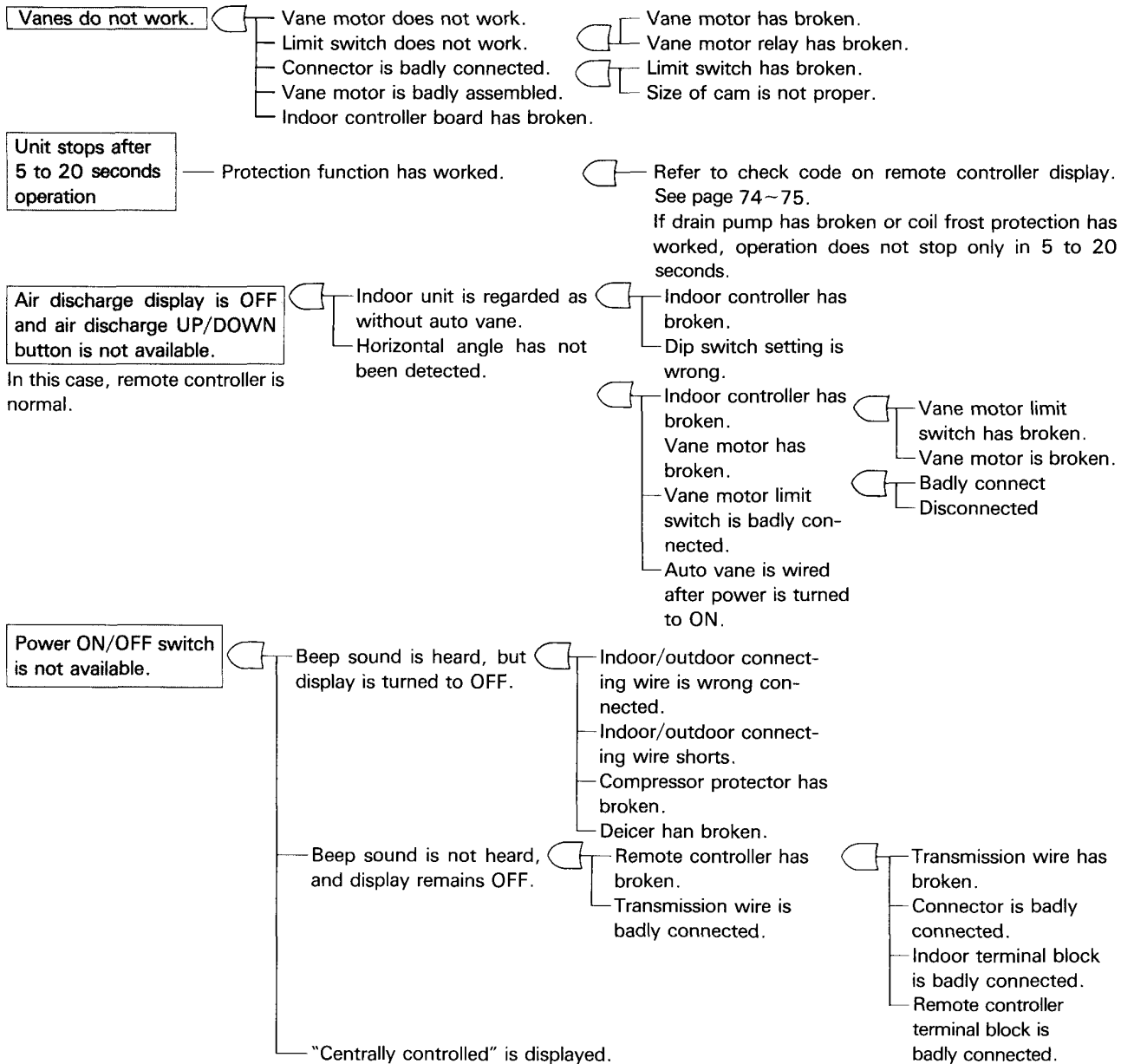
6-1 Between remote controller and indoor unit

If wire is disconnected between the remote controller and the indoor unit, the POWER ON display does not appear despite turning the power switch ON. The beep sound is not heard, either.

6-2 Phenomena due to wrong wiring between indoor and outdoor units

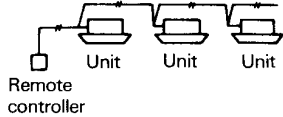
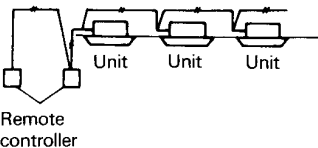
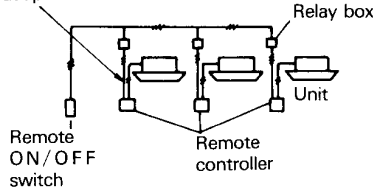
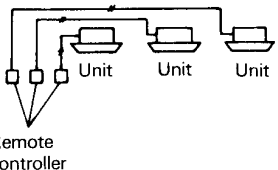
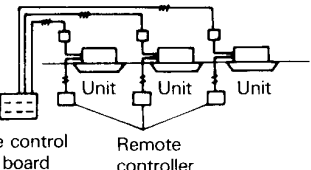
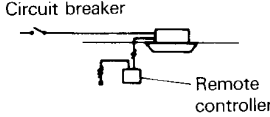
Wrong wiring	Thermostat	Phenomena
	OFF	The outdoor unit stops.
	ON	Operation stops. 9 minutes later, the check code "P8" appears on the remote controller display.
Disconnect between 1 and 1 or 2 and 2.	OFF	Operation stops.
	ON	9 minutes later, the check code "P8" appears on the remote controller display.

7. OTHER TROUBLES AND CAUSES



11 SYSTEM CONTROL

1. VARIETY OF SYSTEM CONTROL FUNCTIONS

1 Group control by a single remote controller. (See page 82.)	 Remote controller	A number of units, installed at different locations can be started and controlled with a single remote controller. The remote controller can be mounted in a remote location using a non-polar two-wire cable, which can be extended up to 550 yards. A maximum of 50 units are controllable by a single remote controller. All units operate in the same mode.
2 Control using two remote controllers (See page 83.)	 Remote controller	Two remote controllers can be used to control either one unit or several units in group control. This enables to control units with ease either from a distance or at close range. Units operate according to the latest command from either remote controller.
3 Both remote ON/OFF and individual controls (See page 83.)	 Optional adapter Remote ON/OFF switch Remote controller Relay box	All units can be turned on or off simultaneously using the remote ON-OFF switch. Besides each unit can be controlled individually by each remote controller. During remote ON-OFF control, a message of "CENTRALLY CONTROLLED" is displayed on the LCD of the remote controller. This method is available for both one unit control and several units control.
4 Individual control by gathering remote controllers (See page 84.)	 Remote controller	By gathering remote controllers to one place, several units installed at different locations can be controlled individually, and operation conditions of all units are visible without a special control board. Control method is the same as that of the single unit with a single remote controller.
5 Multiple remote control display (See page 85.)	 Remote control display board Remote controller	Several units can be controlled by remote control display board. Operation conditions of all units are visible with the remote control display board. Individual control by each remote controller is also available.
6 AUTO RESTART FUNCTION (See page 85.)	 Circuit breaker Remote controller	Units can be started or stopped by circuit breaker on or off. Remote controller is also available. By this function, when the power is restored after power failure, the unit restarts automatically.

2. GROUP CONTROL BY A SINGLE REMOTE CONTROLLER

A maximum of 50 units can be started in order according to the dip switch setting.

2-1 How to wire

- (1) Connect the remote controller to the double terminal block on the indoor controller board of the master unit, that is, No.0 unit. (See Figure 1.)
- (2) Connect the double terminal block of the master unit to the double terminal block of No.1 unit.
- (3) Connect the double terminal block of No.1 unit and the double terminal block of No.2 unit.
- (4) Continue the process until all the units are connected with two-wire cables. (See Figure 2.)
- (5) Remove the connector CN40 from the indoor controller board of each unit except the master unit. (See Figure 3.)
- (6) Set the unit-address of each unit with SW2 on the indoor controller board following the instruction below.

Figure 1

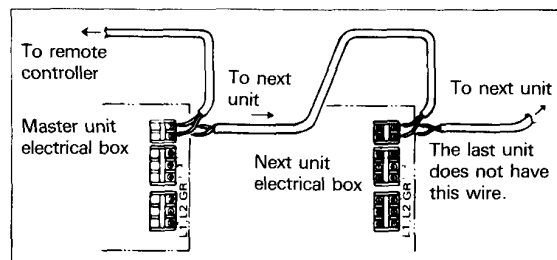


Figure 2

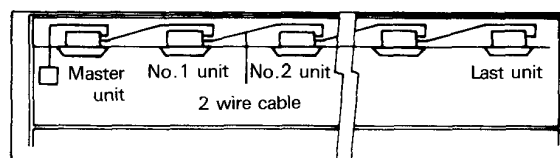
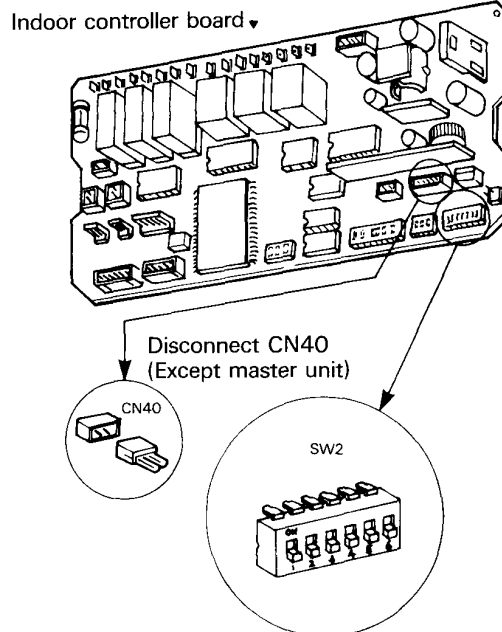


Figure 3

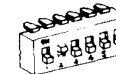
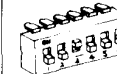
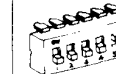
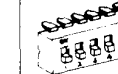


2-2 How to set unit-address

The unit-address also serves as a successive-start timer which start each unit at intervals of 1 second. If two or more units have the same unit-address in the group control, operation stops due to system error. Be sure to set SW2 correctly following the instructions below.

- (1) Each lever of SW2 shows the number as follows.
 SW2-1 : 1 SW2-4 : 8
 SW2-2 : 2 SW2-5 : 16
 SW2-3 : 4 SW2-6 : 32
- (2) Total number of levers turned to ON shows the address of the unit.
 If you turn ON SW2-1 and SW2-2, the unit-address is set as No.3.
- (3) In this way, set from the master unit to the last unit.
 Do not forget to set the master (No.0) unit.

Setting examples

	Master (No.0) unit	No.1 unit	No.2 unit	No.4 unit	No.8 unit	No.16 unit	No.32 unit
SW2	ALL OFF 	1 ON 	2 ON 	3 ON 	4 ON 	5 ON 	6 ON 
Unit address & start delay in seconds.	0	1	2	4	8	16	32

2-3 Unit control

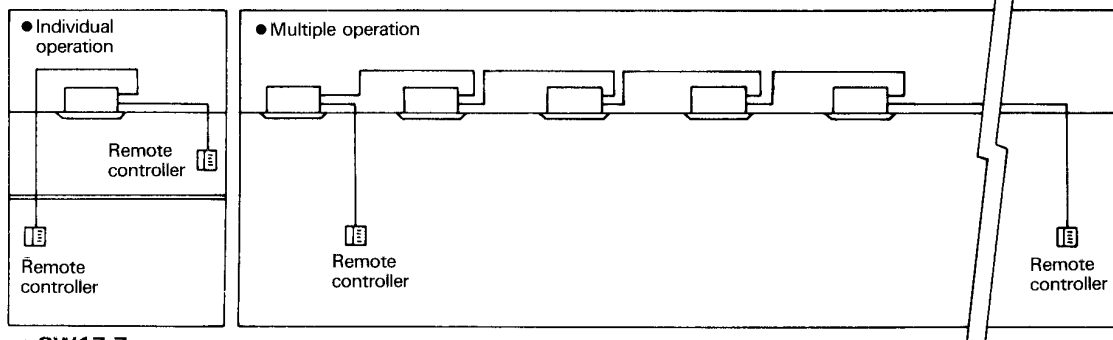
The remote controller can control all unit ON/OFF, temperature, air flow, and swing louver. However, the thermostat in each unit turns to ON or OFF individually to adjust the room temperature.

3. CONTROL USING TWO REMOTE CONTROLLERS

Two remote controllers are available for control of either one unit or a group of units. Units operate according to the latest command from either of the two remote controllers.

However, before operation, be sure to set one remote controller for "main controller" and the other for "sub controller", using dipswitch SW17-7 of the remote controller.

Figure4



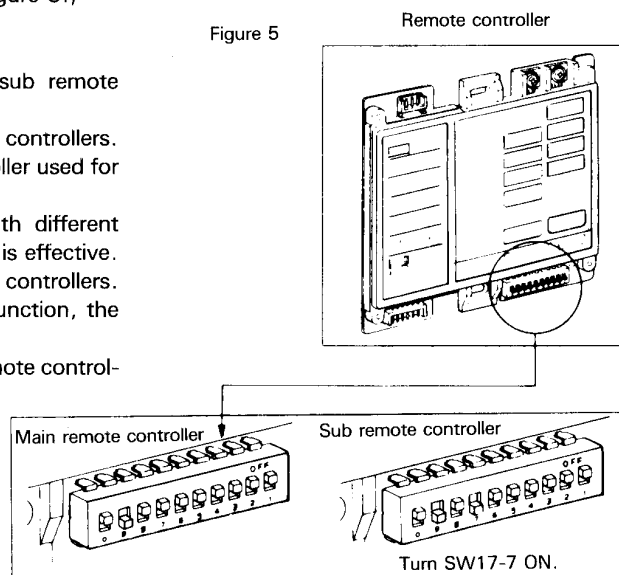
3-1 How to set SW17-7

- (1) For the main remote controller, turn SW17-7 OFF. (See Figure 5.)
- (2) For the sub remote controller, turn SW17-7 ON.

3-2 Remote controller LCD indication

- (1) The same indication always appears on both main and sub remote controllers, excepting in the timer operation.
- (2) Timer operation can be set with either of the two remote controllers. However, LCD indication appears only on the remote controller used for timer setting.
- (3) If both remote controllers are set for timer operation with different time-settings, the timer operation of shorter remaining-time is effective.
- (4) Self-diagnostic function is available with either of two remote controllers. If one of the remote controllers is used for self-diagnostic function, the other remote controllers displays the self-diagnostic mode. If the self-diagnostic function is reset by either of the two remote controllers, both remote controllers are reset.

Figure 5



4. REMOTE ON-OFF AND INDIVIDUAL REMOTE CONTROLS

This method is available to control one unit or any number of units.

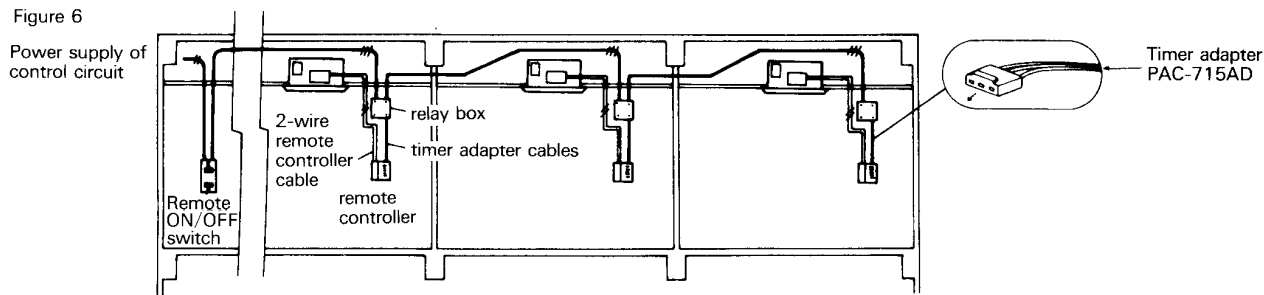
The following operations are available by connecting a relay, timer adapter, and remote ON/OFF switch to the system. Timer adapter, PAC-715AD, is an optional part. Other parts are on the market.

- (A) To start all units in order by remote ON-OFF switch
- (B) To stop all units simultaneously by remote ON-OFF switch
- (C) To switch from the remote ON-OFF control to the individual remote control

4-1 System

Figure 6 shows the case of three units as an example. The same is the case with any number of units.

Figure 6



NOTE1: Install the relay box where you can service easily.

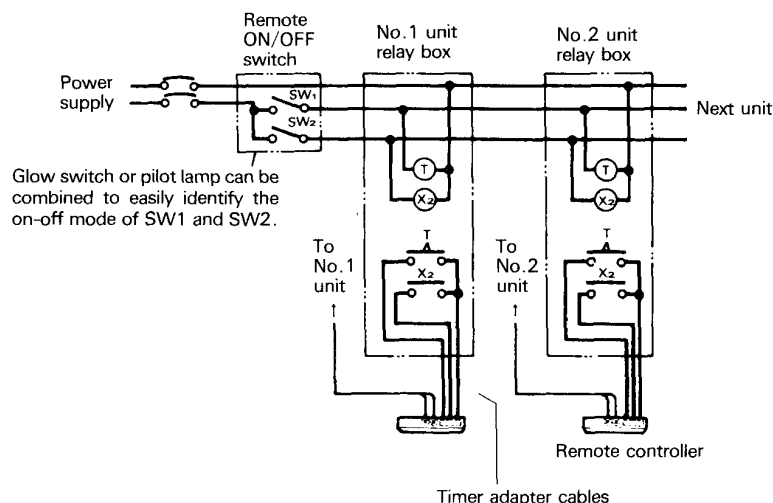
NOTE2: For control circuit wiring, use a wire of No.14 AWG or a control cable according to the power supply of control circuit.

NOTE3: When the power supply of control circuit is 115/230V AC,

- Do not connect the control circuit wire to the remote controller cable directly.
- Do not place the control circuit wire and the remote controller cable into the same conduit tube.

4-2 Basic wiring

Caution: Before starting all units simultaneously by the remote ON-OFF switch, be sure to connect a sequence-start timer into the remote ON-OFF circuit. Otherwise, rush of starting current exert a bad influence upon the power supply.



4-3 Switch function of remote ON-OFF switch

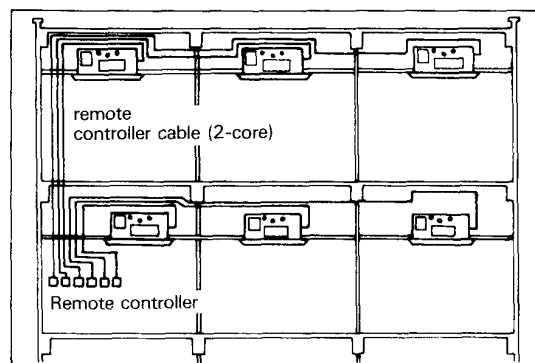
		SW2 (Switches between remote ON-OFF and individual control)	
		ON (Remote ON-OFF control)	OFF (Individual control)
SW1 (Switches between remote ON and OFF.)	ON (Start)	All units start together. * 1 Individual control is not available.	Each unit can be controlled by each remote controller. Remote ON-OFF switch is not available.
	OFF (Stop)	All units stop together. * 2 Individual control is not available.	

* 1 After all units start together, if SW2 is turned to OFF, each unit can be individually stopped by each remote controller.

* 2 After all units stop together, if SW2 is turned to ON, each unit can be individually started by each remote controller.

5. INDIVIDUAL CONTROL BY GATHERING REMOTE CONTROLLERS.

- Gathering remote controllers allows controlling individually units installed at different places and to monitor the operations without a special control board.
- Remote control cable is extendable up to 550 yards. When the cable length exceeds 39 ft, use the double-insulated two-core cable such as Belden 9407, and the cable thickness must be No.22 AWG or above.
- When gathering the power ON/OFF switches of air conditioners near the remote controllers, you should also install the power ON/OFF switch near each unit to prevent electric trouble in servicing.



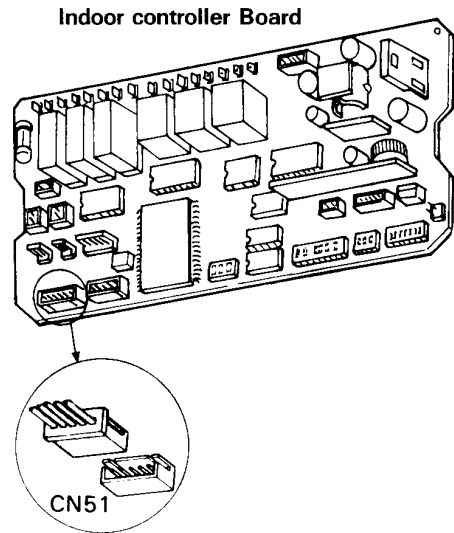
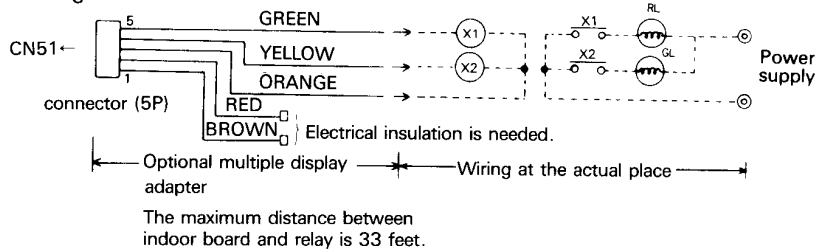
6. MULTIPLE REMOTE CONTROL DISPLAY

You can control several units by multiple remote control display, if you wire an optional multiple display adapter (PAC-725AD) with relays and lamps on the market.

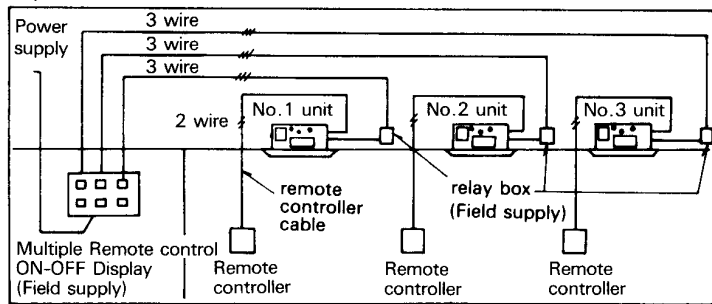
6-1 How to wire

- (1) Connect the multiple display adapter to the connector CN51 on the indoor controller board.
- (2) Wire three of the five wires from the multiple display adapter as shown in the below figure.

<Wiring>



<System>



(Operation check)

[Notes on Signs]

X1: Relay (for check lamp)

X2: Relay (for operation lamp)

RL: Check Lamp

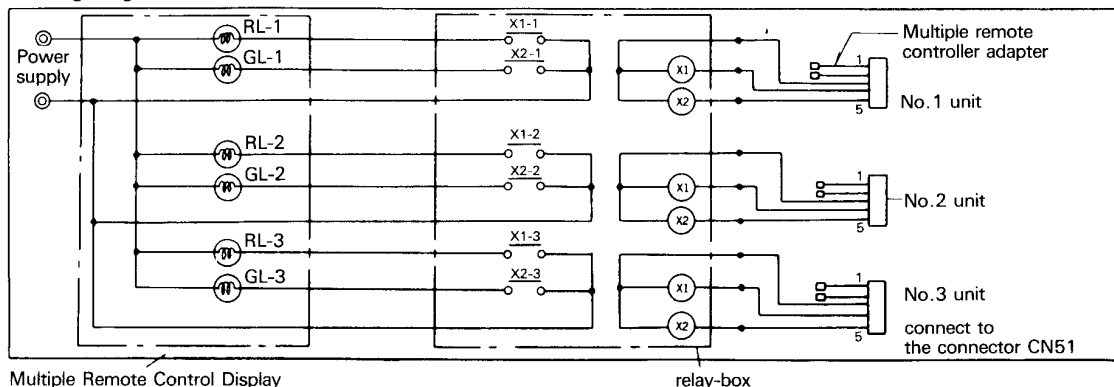
GL: Operation Lamp

[Field supplied parts]

Relays: DC 12V with rated coil power consumption below 0.9W.

Lamps: Matching to power supply voltage

<Wiring diagram>



Multiple Remote Control Display

relay-box

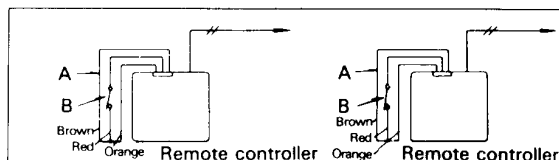
7. AUTO RESTART FUNCTION

Unit can be started or stopped by power supply ON or OFF.

Therefore, after power failure, when the power is restored, the unit restarts automatically.

To enable this function, turn ON the dipswitch SW1-10 on the indoor controller board.

<Wiring>



A : an optional timer adapter

B : a single-throw switch

For remote control, connect the optional timer adapter (PAC-715AD.)

12

TIMER OPERATION WITH OPTIONAL PARTS

- The remote controller is equipped with 24-hour ON/OFF timer as standard. (See page 86.)
- Optional program timer (PAC-SK65PT) can be connected to the remote controller.
- Timer on the market is available. In this case, optional timer adapter (PAC-715AD) is necessary.

1. PROGRAM TIMER

1-1 Feature of program timer

(1) Daily timer function

Twenty-four hours of a day are equally divided into 48 time-periods, that is, a time-period is 30 minutes. Each time-period can be set for unit ON, unit OFF, or setback operation.

(2) Setback operation

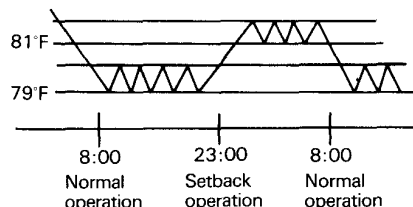
Set back operation is useful to reduce running cost.

e.g. At a hotel of the 24-hour system

8:00~23:00 Cooling operation with set temperature at 79°F

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

As shown in the right chart, the set temperature rises 2 degrees automatically during the setback operation. When the setback operation ends, normal operation starts.

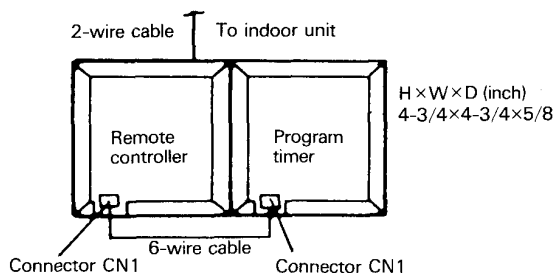


(3) Weekly timer function

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

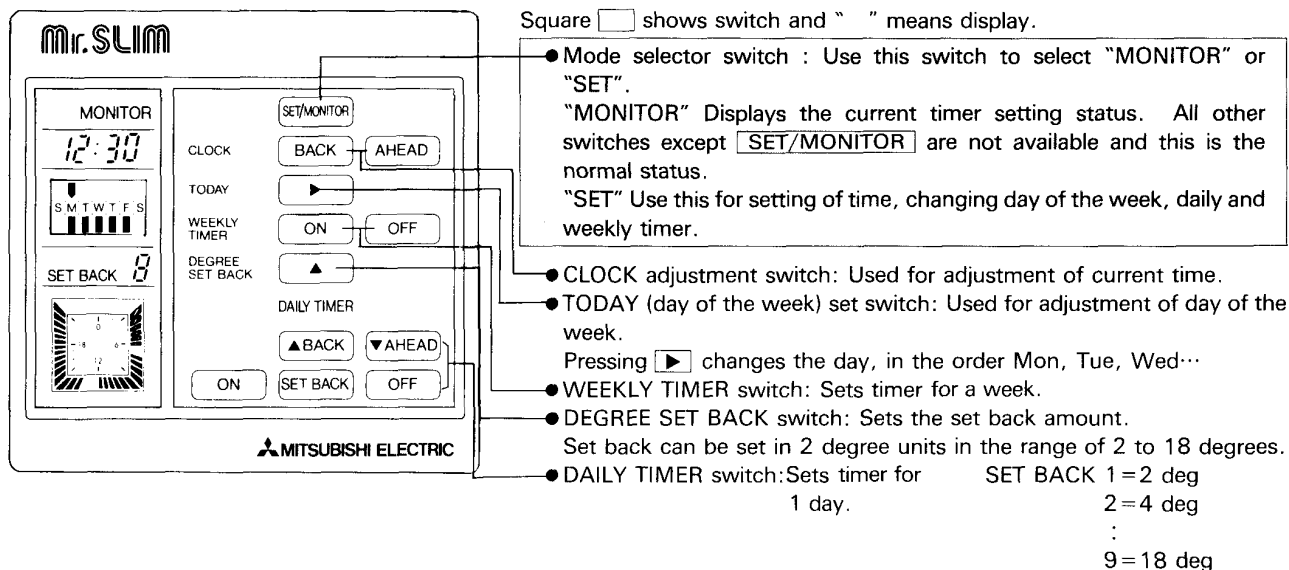
1-2 How to connect program timer

- (1) Install the program timer next to the remote controller in the same way the remote controller is installed. The program timer has the same dimensions as that of the remote controllers.
- (2) Connect the program timer and the remote controller with 6-wire cable as shown in the below figure.

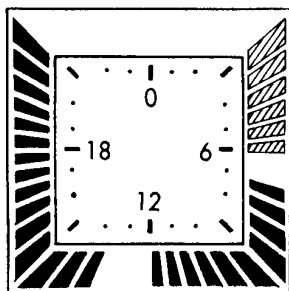


NOTE: While the program timer is connected to the remote controller, the 24-hour ON/OFF timer of the remote controller is not available.

1-3 How to use program timer



(1) Daily timer setting procedure



i) Daily timer display

Each block shows timer setting of the time-period by three patterns of LED.

Lighting Normal operation

Blinking Setback operation

OFF No operation

As an example, the left figure shows:

7:00 to 12:00, 13:30 to 21:00 lighting → Normal operation

3:00 to 6:00 (hatched section) blinking → Setback operation

21:00 to 3:00, 6:00 to 7:00, 12:00 to 13:30 OFF → No operation

ii) DAILY TIMER setting procedure

(1) Press **SET/MONITOR** and switchover to "set" mode.

(2) One block blinks to show the current time. Move the blinking block by **▲BACK** or **▲AHEAD** switch to the time to set. (If there are blocks already set for "set back operation", the blocks are blinking more slowly than the current time block.)

(3) Set the timer for each block as follows :

[For operation ON] →press **ON**→the block lights→the next block blinks.

[For SET BACK operation]→press **SET BACK**→the block blinks→the next block blinks.

[For operation OFF] →press **OFF**→the block turns OFF→the next block blinks.

Continuous pattern setting can be done by pressing the switch continuously.

(2) WEEKLY TIMER setting procedure

i) Weekly timer display

Upper row ... A lighting LED shows "today".

Lower row ... Each LED displays if the daily timer is ON or OFF.

ii) Weekly timer setting procedure

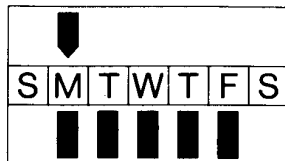
(1) Press **SET/MONITOR** and switch over to "SET" mode.

(2) Today's LED blinks in the lower row. To apply the daily timer, press the WEEKLY TIMER **ON** switch. Not to apply the daily timer, press the WEEKLY TIMER **OFF** switch.

(3) Then the next LED blinks. Set in the same way as (2).

(4) Repeat procedure as described in (2) and (3) until all of 7 days are set.

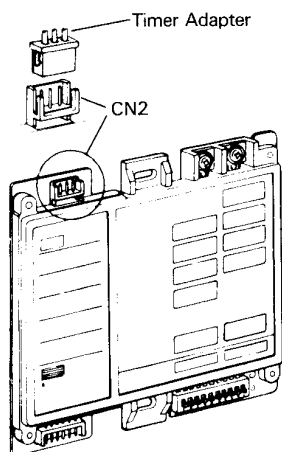
(5) When setting is completed, press **SET/MONITOR** switch to return to "MONITOR" mode.



2. TIMER ADAPTER

With the optional timer adapter (PAC-715AD), a timer on the market can be connected. Connect the timer adapter to the remote controller and wire as shown in the below figure. If more than 33 feet of wiring is needed to connect the remote controller and the timer, use a relay.

NOTE: Be sure to use a non-voltage contact output timer with load and timer power supply having different circuits.



<Wiring> T...Timer Contact
SW...Switch

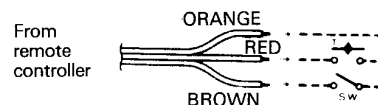
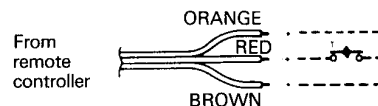
1. Independent Timer Operation

Remote controller operation switch becomes idle.

2. Combined Use of Timer and Remote Controls

SW ON Timer control

SW OFF Remote Control Operation



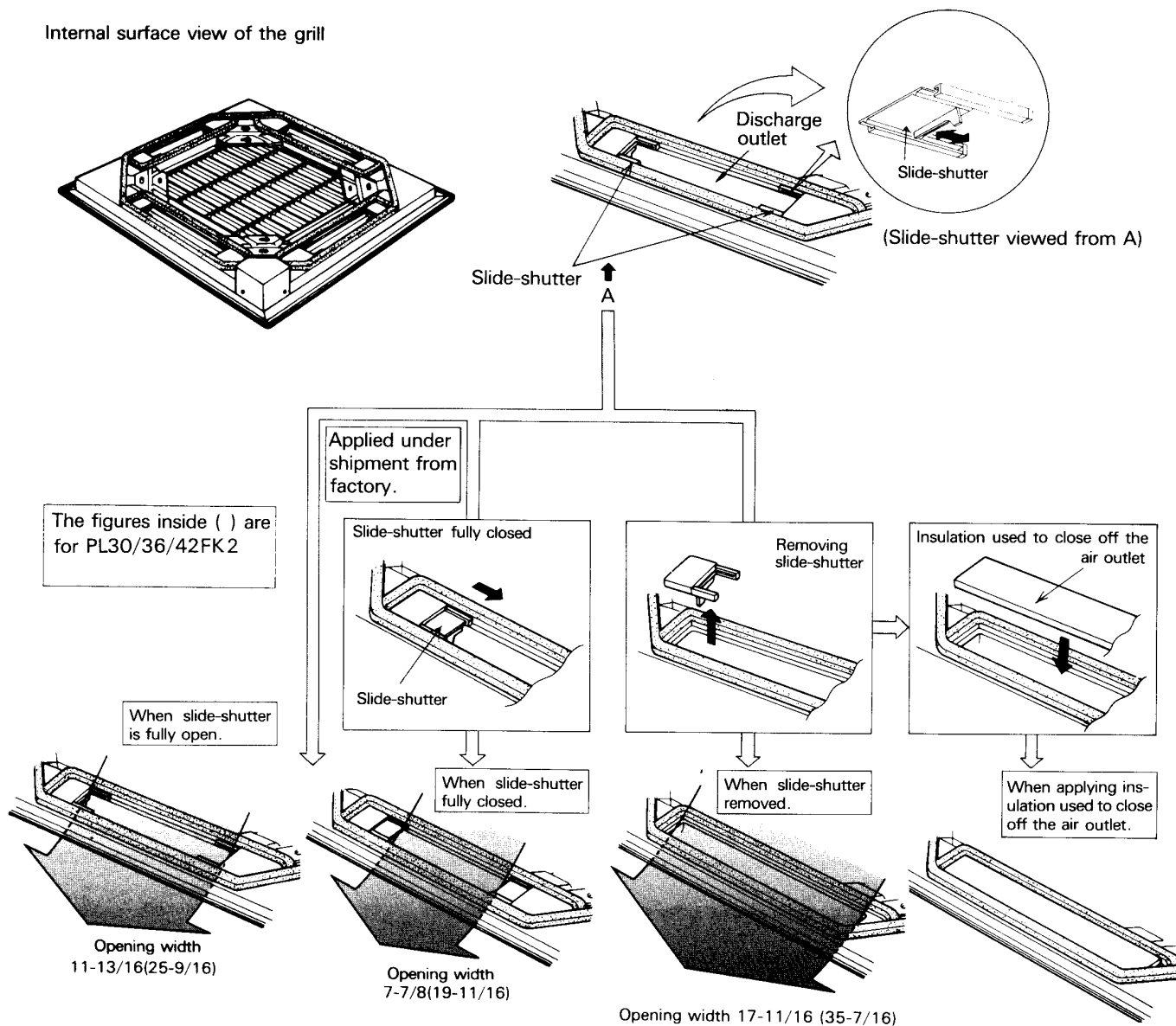
13

4-WAY AIR FLOW SYSTEM (SERIES PL/PLL)

Using this grill enables to select the air discharge direction. The air flow can also be regulated by adjusting the widths of each discharge outlet. Choose the adequate method according to the conditions in the room where the panel is to be installed.

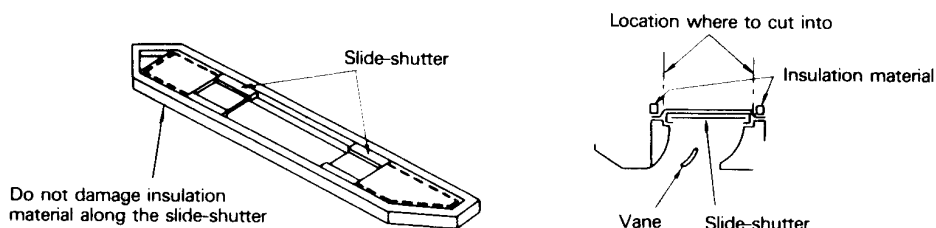
* For 2-direction discharge, the widths of the outlets must be under a fully opened condition.

Internal surface view of the grill



Adjusting the discharge outlets (Only when discharge outlets are fully opened or closed).

- Remove slide-shutter by cutting into the broken-lines using a cutter. When doing so pay attention not to damage the insulation around the slide-shutter.



Opening measurements for PL30/36/42FK2 are within ().

Unit: inch

■ Adjustment examples of discharge direction & air flow

● Regular ceiling height

When ceiling is of regular height (For example 8.2ft) set each outlet at a standard width (11-13/16).

● Relatively high ceiling

Set the outlets during installation.

The outlet width can be adjusted in the range of 7-7/8 to 11-13/16 using the slide knob.

● High ceiling

Adjust each outlet width to 7-7/8 to enable air to reach maximum distance. Applicable for rooms with ceiling height of 9.8ft.

● 4-direction air discharge

Remove slide-shutter at installation and adjust the outlet width to 17-11/16. Close remaining outlets to selected width.

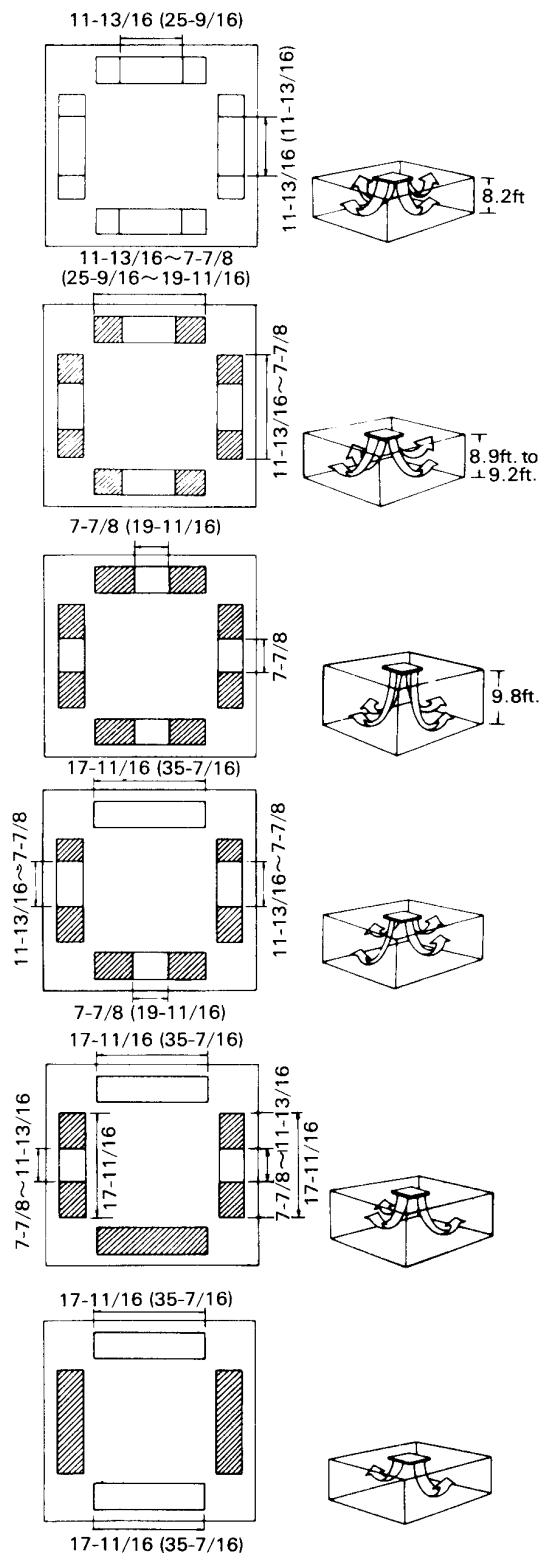
● 3-direction air discharge

During installation close one outlet and shield it with the insulation panel. Adjust widths of remaining 3 outlets to match the room space.

● 2-direction air discharge

During installation close two outlets and fully open (17-11/16 width) the remaining 2.

* For 30/36/42FK2, open the longer outlets and close the shorter outlets.



Selecting arrangement of discharge outlet and adjusting the width for PL18/24FK2, PLL12/18/24FK.

Constrained Conditions When Selecting Discharge Outlet Width.
(PL18/24FK2, PLL12/18/24FK).

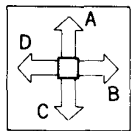
Total width of four outlets must exceeds 31-1/2.

Unit: inch

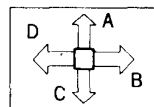
Room pattern (ratio of room length and width)		Discharge outlet * Ceiling height	A	B	C	D	Examples of application Precautions
1 (1 : 1)	①	7.9	11-13/16	11-13/16	11-13/16	11-13/16	(1)When the outlet A is close to a window, widen A and narrow C to raise the cooling power of A. e.g. ①-A : 11-13/16 → 17-11/16 ①-C : 11-13/16 → 7-7/8 (2)When ceiling height exceeds 9.5ft adjust 4 outlets to 7-7/8 each or 2 outlets to 17-11/16 each.
	②	8.9	9-13/16	9-13/16	9-13/16	9-13/16	
2 (1 : 1.5)	①	7.9	9-13/16	11-13/16	9-13/16	11-13/16	
	②	8.9	7-7/8	11-13/16	7-7/8	9-13/16	
3 (1 : 2)	①	7.9	7-7/8	17-11/16	7-7/8	17-11/16	When the outlet B is close to a window, narrow D to 11-13/16. However, is case of ②, do not narrow D.
	②	8.9	0	17-11/16	0	17-11/16	
4 (1 : 1)	①	7.9	0	7-7/8	17-11/16	7-7/8	Total width of all outlets must exceed 31-1/2. The width of B and D is to be 9-13/16 when the ceiling height is 8.9ft.
	②	8.9	0	9-13/16	11-13/16	11-13/16	
5 (1 : 1)	①	—	17-11/16	17-11/16	0	0	In this case, other widths are not available.

When ceiling height is 7.9 feet.

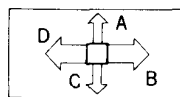
1-①



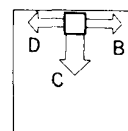
2-①



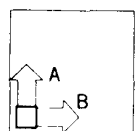
3-①



4-①

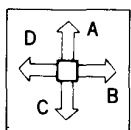


5-①

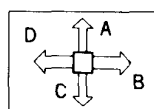


When ceiling height is 8 to 8.9 feet.

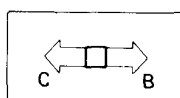
1-②



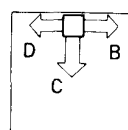
2-②



3-②



4-②



Selecting arrangement of discharge outlet and adjusting the width for PL30/36/42FK(2).

Constrained conditions when selecting discharge outlet Width.
(PL30/36/42FK(2))

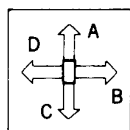
Total width of four outlets must exceed 55-1/8.

Unit: inch

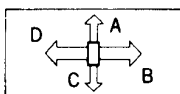
Room pattern (ratio of room length and width)	Discharge outlet		A	B	C	D	Examples of application Precautions
	* Ceiling height						
6 (1 : 1)	①	7.9	17-11/16	25-9/16	17-11/16	25-9/16	When the unit is installed near a window, the longer outlet (B or D) must be in direction of the window.
	②	8.9	11-13/16	19-11/16	11-13/16	19-11/16	
7 (1 : 2)	①	7.9	11-13/16	25-9/16	11-13/16	25-9/16	When the ceiling height exceeds 9.8ft, adjust the longer outlets to 35-7/16 each. Or adjust the longer outlets to 19-11/16 each and the shorter outlets to 7-7/8 each.
	②	8.9	9-13/16	19-11/16	9-13/16	19-11/16	
8 (1 : 3)	①	7.9	11-13/16	35-7/16	11-13/16	35-7/16	
	②	8.9	0	35-7/16	0	35-7/16	
9 (1 : 2)	①	7.9	0	17-11/16	35-7/16	17-11/16	
	②	8.9	0	17-11/16	25-9/16	17-11/16	
10 (1 : 2)	①	—	9-13/16	35-7/16	9-13/16	0	7-7/8 is not available, as the total width of opened outlets must exceed 55-1/8.

When ceiling height is 7.9 feet.

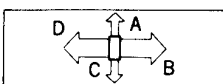
6-①



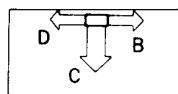
7-①



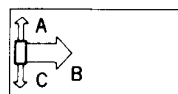
8-①



9-①

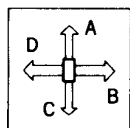


10-①

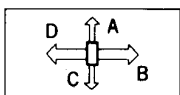


When ceiling height is 8 to 8.9 feet.

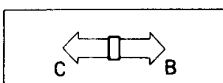
6-②



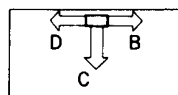
7-②



8-②



9-②

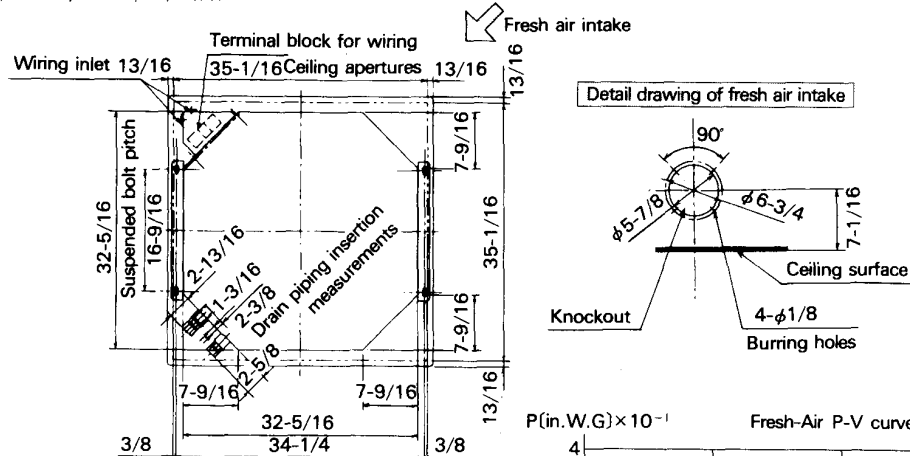


FRESH AIR INTAKE (Installation at site)

1. Location for installing fresh air intake

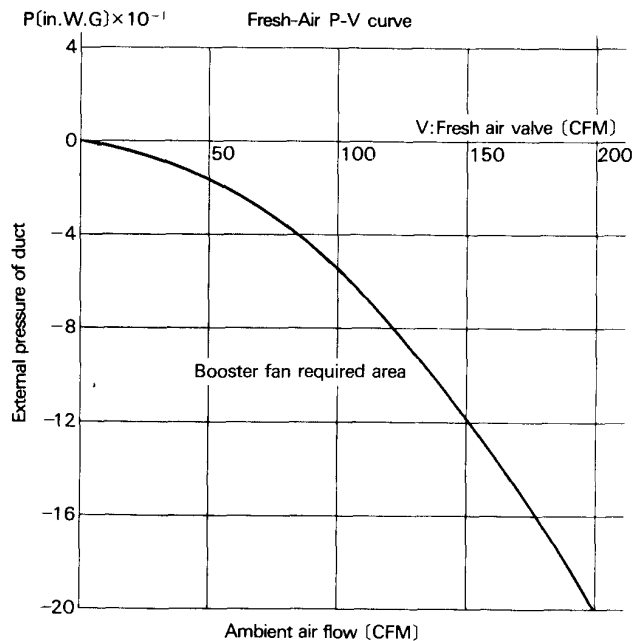
- The fresh air intake duct can be connected by removing the knockout holes on the casing of the indoor unit and attaching the fresh air intake flange and duct. When applying fresh air intake, confirm that the mixed air is within applicable conditions as the intake air mixes with the ambient air.

Figure is for PL18/24FK2, PLL12/18/24FK.



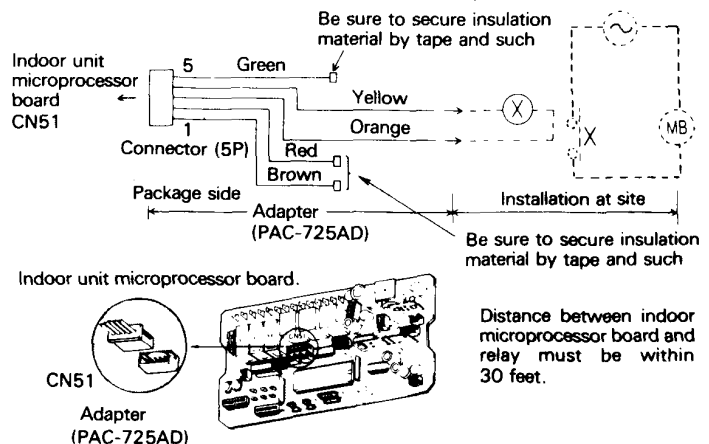
2. Air flow & static pressure conditions for fresh air intake

Be sure to use a duct fan (booster fan) when applying fresh air intake. As for sequential operation with the duct fan, see Item 3.



3. Sequential operation method with duct fan. (Booster fan)

- Have the duct fan 'ON' whenever indoor is in operation mode (air-conditioning and fan).
- (1) Connect optional multiple remote controller adapter (PAC-725AD) to indoor microprocessor board CN51.
- (2) Drive the relay after connecting the DC12V relay between the Yellow and Orange connector lines.
- (*) Use a relay under 1W.
- MB: Electromagnetic open/close power relay for duct fan.
- X: Auxiliary relay (DC12V LY-1F).



BRANCH DUCT (Installation at site)

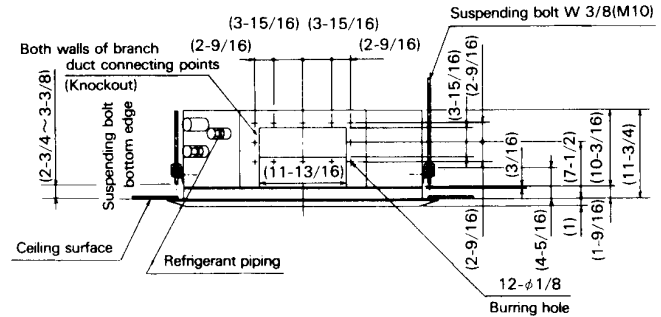
To discharge air from a branch duct, install it during the initial installation.

1. Branch Duct Installation Procedure

Install branch duct at site by following procedure

- (1) Remove insulation along the broken-lines on unit surface at the back-side of the indoor unit. Knock out the branch duct connecting point.
- (2) Secure flange, procured locally, by twelve ST screws (4.0 dia).
- (3) Connect flange to duct.
- (4) Tear off the insulation material on the surface of the main body of the unit, push in the insulation and secure it air tightly.

2. Branch Duct Installation

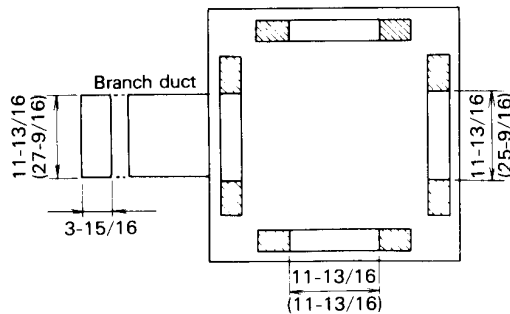


3. Air Flow & Static Pressure Characteristics of Branch Duct

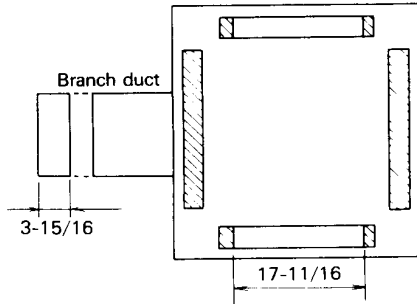
- The air flow and static pressure characteristics of the branch duct when installing a standard panel (4 direction discharge) or when applying a 2-direction discharge is as follows.

Opening measurements for PL30/36/42FK(2) are within ().

Standard: 4 direction discharge



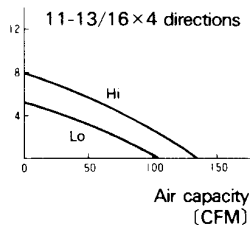
2 direction discharge



4 direction discharge (11-13/16 × 4 directions).

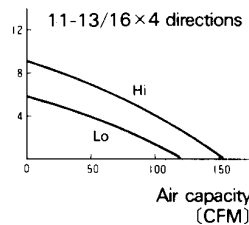
● PL18FK2

Static pressure
(in. W. G × 10⁻²)



● PL24FK2

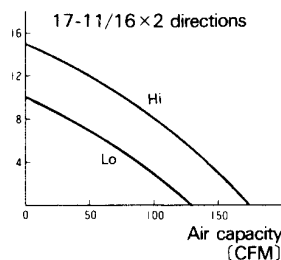
Static pressure
(in. W. G × 10⁻²)



2 direction discharge (17-11/16 × 2 directions).

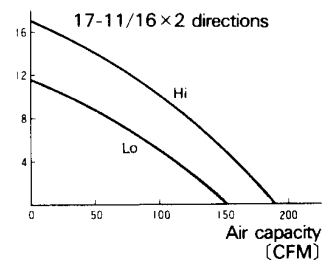
● PL18FK2

Static pressure
(in. W. G × 10⁻²)

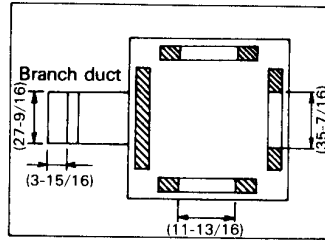


● PL24FK2

Static pressure
(in. W. G × 10⁻²)



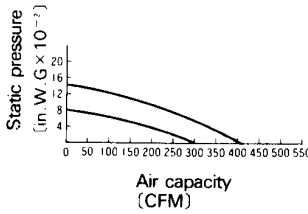
3 direction discharge



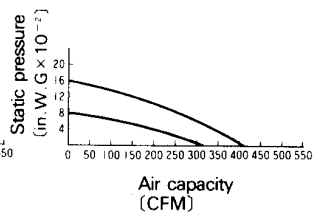
4-direction discharge ($25-9/16 \times 2$ directions)
($11-13/16 \times 2$ directions)

3-direction discharge ($35-7/16 \times 1$ directions)
($11-13/16 \times 2$ directions)

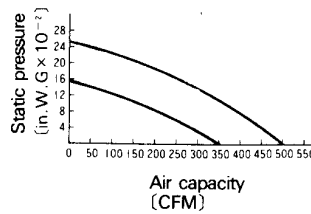
● PL30/36FK2



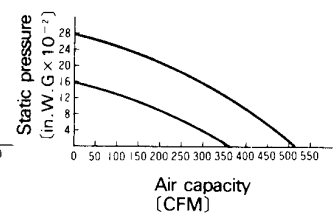
● PL42FK2



● PL30/36FK2



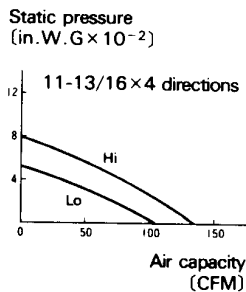
● PL42FK2



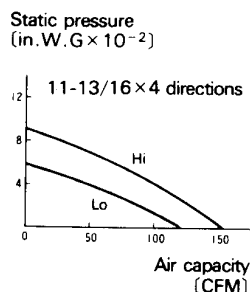
4-direction discharge ($11-13/16 \times 4$ directions).

2-direction discharge ($17-11/16 \times 2$ directions).

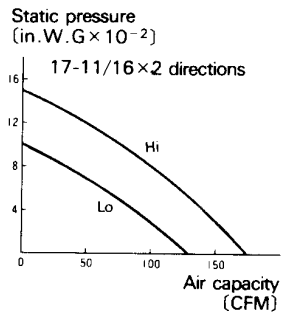
● PLL18FK



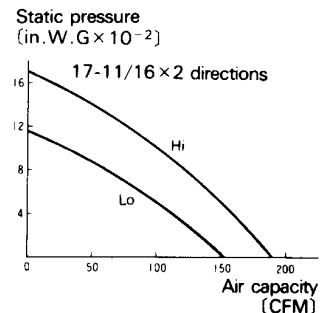
● PLL24FK



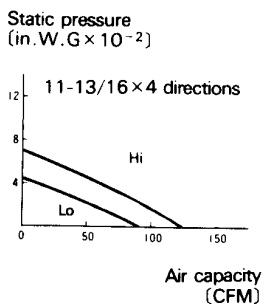
● PLL18FK



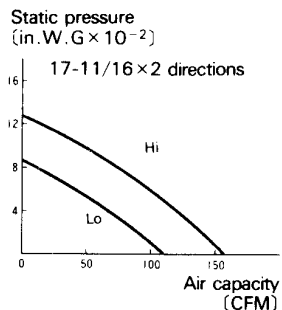
● PLL24FK



● PLL12FK

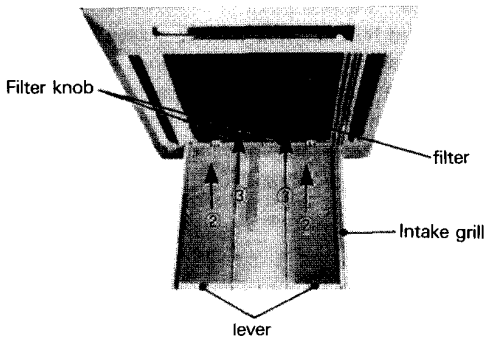
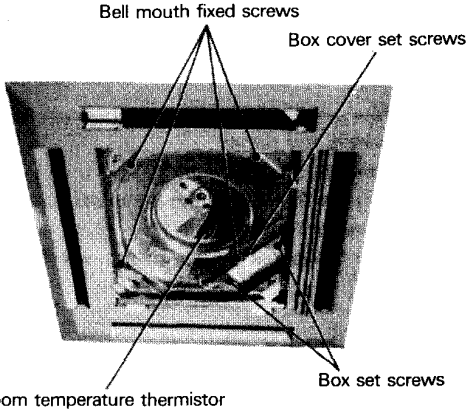
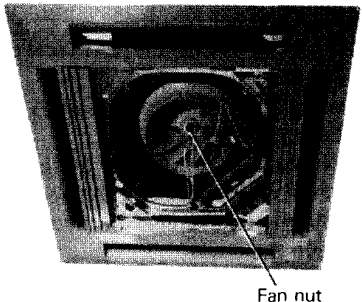
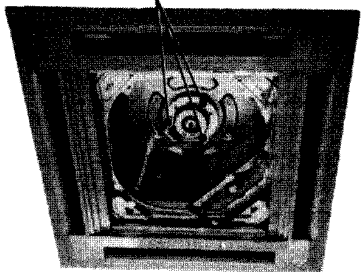


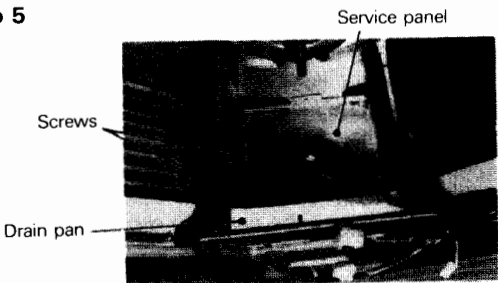
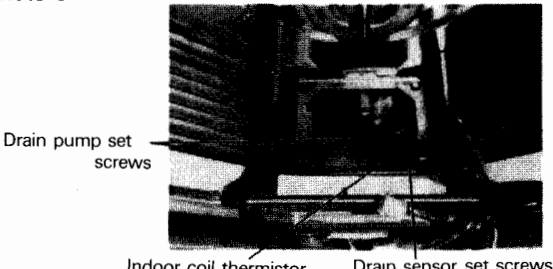
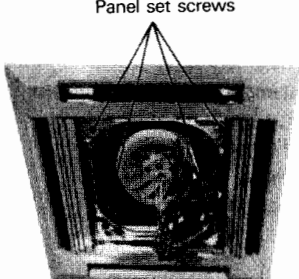
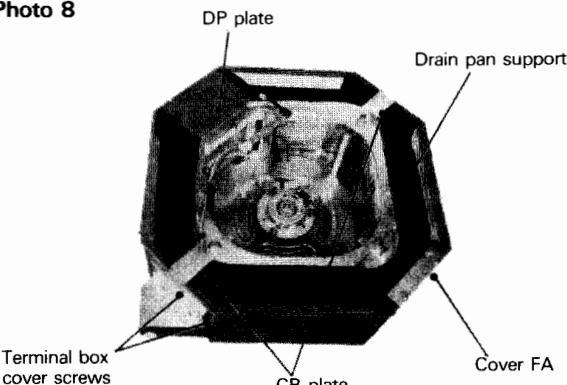
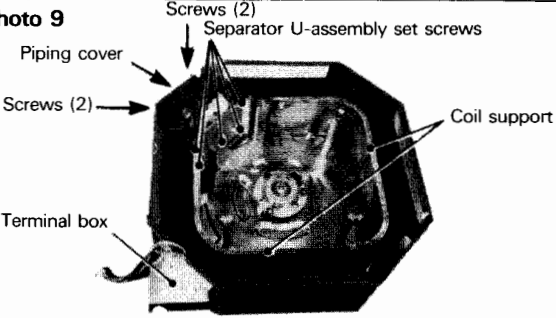
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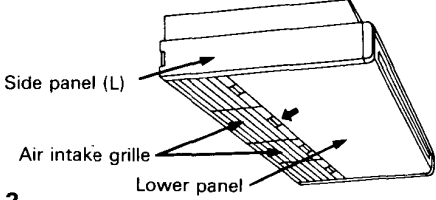
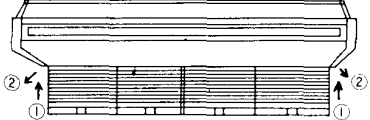
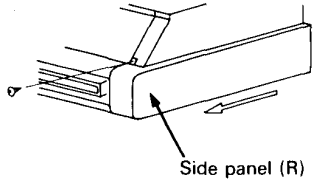
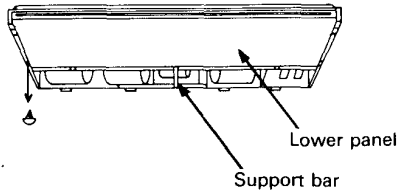
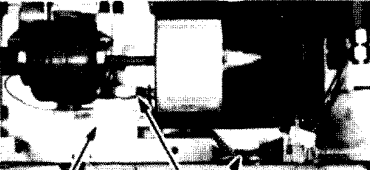
14 DISASSEMBLY PROCEDURE

14-1 Indoor unit (PL24FK2, PLL24FK)

OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
1. Removing the air intake grill (1) Slide the lever in the direction of the arrow ①. (2) Open it 90 deg. (3) Slide the intake grill in the direction of the arrow ② and remove it. (4) Slide the two knobs on the left and right in the direction of the arrow ③ and remove the filter.	Photo 1 
2. Removing the electrical box (1) Pull the knob to remove the room temperature thermistor. (2) Remove the screw from the box cover. (3) Grasp the lead lines and pull them out. (4) Remove the 2 mounting screws from the box. (5) Remove the connectors from the box. (6) Pull out the box. Electrical parts inside the box - Controller board - Transformer - Relay - Terminal block	Photo 2 
3. Removing the fan motor (1) Loosen two screws to remove the bell mouth. (2) Remove the clamp screws (2) from the fan motor lead. (3) Remove the capacitor wires. (4) Remove the fan motor setting screws (3).	Photo 3  Photo 4 

OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
4. Removing the drain pump, drain sensor, and indoor coil thermistor (1) Remove the fan (nut). (2) Remove the electrical box (3 screws). (3) Remove the service panel screws (2 pcs). (4) Hold the knob and remove the service panel. (5) Remove the drain pump set screws (2 pcs). (6) Remove the screw from the drain sensor assembly. (7) The indoor coil thermistor is inserted in the holder.	Photo 5  Photo 6 
5. Removing the panel (1) Remove the connectors. (2) Remove the two of the panel set screws and loosen the other two screws. (3) Slide the panel slightly to remove it.	Photo 7 
6. Removing the drain pan and terminal box (1) Remove the panel. (2) Remove the electrical box. (3) Remove the bell mouth. (4) Remove the DP and CB plates and cover FA screws (2 screw each). (5) Remove the drain pan support (5 C-screws). (6) Pull out the drain pan. * Pull the left and right of the pan gradually. Be careful not to crack or damage the pan. (7) Loosen the two screws on the terminal box cover. (8) Remove the cover.	Photo 8 
7. Removing the heat exchanger (1) Remove the panel. (2) Remove the panel mouth. (3) Remove the turbo fan. (4) Remove the electrical box. (5) Remove the drain pan. (6) Remove the coil support. (2 pcs.) (7) Remove the separator U-assembly (5 screws). (8) Remove the external piping cover (2 pcs.).	Photo 9 

14-2 Indoor unit (PC24EK)

OPERATING PROCEDURE	PHOTOS & ILLUSTRATIONS
1. Removing the air intake grille (1) Unhook the clasps at the edge of the grille and open the grill. (2) Lift up the grill in direction of arrow ① in Fig.2. (3) Pull the grill toward you to remove. (In direction of arrow ②)	Fig. 1  Side panel (L) Air intake grille Lower panel Fig. 2 
2. Removing the side panels (1) Remove a white screw of the side panel (RIGHT). (2) Pull out the panel toward you to remove. (3) Remove a white screw of the side panel (LEFT). (4) Pull out the panel toward you to remove.	Fig. 3  Side panel (R)
3. Removing the lower panel (1) Remove the lower panel set screws. 2 pcs on each side and 3 pcs at the rear. (total 7 pcs) * PC42EK has 4 pcs at the rear and 2 pcs on each side. (total 8 pcs)	Fig. 4  Lower panel Support bar
4. Removing the electrical box (1) Remove the air intake grille. (Refer to 1.) (2) Remove the support bar set screw and remove the bar. (See fig. 4) (3) Loose the lead clamps (2 pcs) for the sirocco fan and the louver motor. (See photo 1)	Photo 1  Electrical box Clamps for fan lead



OPERATING PROCEDURE

- (4) Remove the electrical box set screws. (2 pcs) Pull down the electrical box and hang it from the rear panel using the S hooks located on the both sides of the box.
- (5) The electrical box has two covers. (R and L) Remove the 2 screws on the cover (R), and remove the screw on the cover (L). Then remove the box covers.
- (6) Now you can check the inside of the electrical box. (See fig. 6)

PHOTOS & ILLUSTRATIONS

Fig. 5

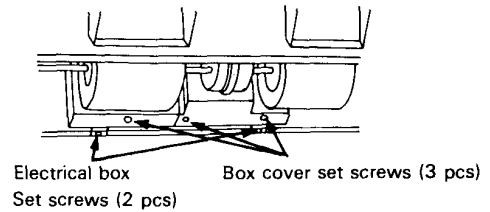
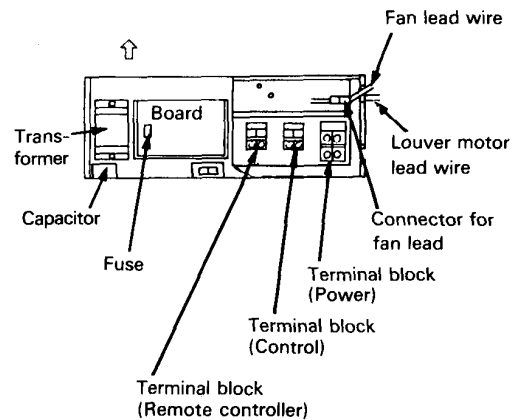
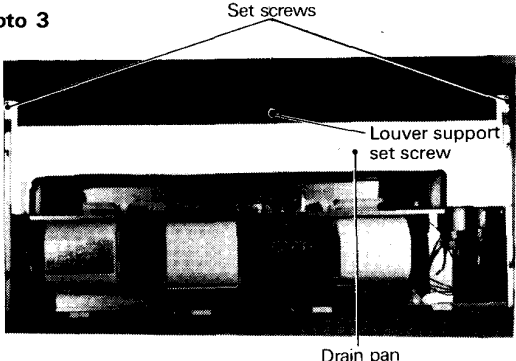
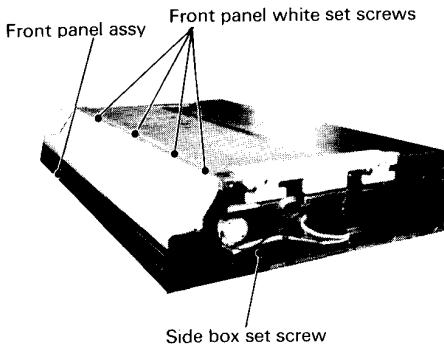
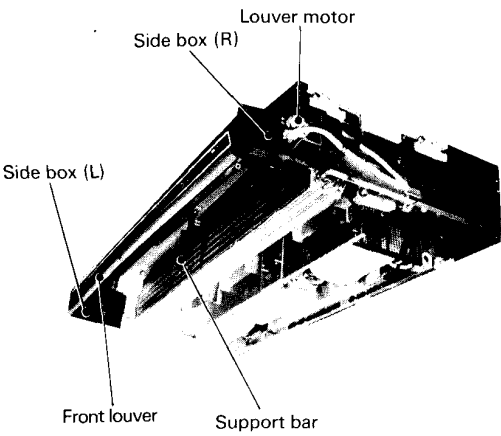
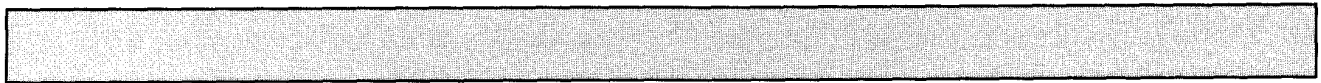


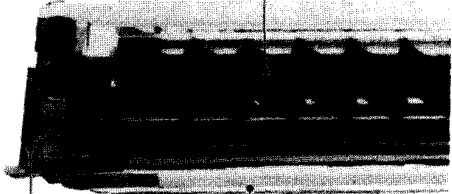
Fig. 6





OPERATING PROCEDURE	PHOTOS
5. Removing the drain pan After removing the lower panel: (1) Remove the drain pan support set screws (2 pcs) (2) Remove the louver support set screw. (See photo 3) (3) Remove the drain pan.	Photo 3 
6. Removing the front panel assembly After removing the drain pan: (1) Pull the lower louver toward you and unhook the clasps. (2 points at the center) (2) Remove the front panel white set screws. (4 pcs) (3) Remove the side box set screws on the both sides. (4 screws on the side and front, 1 screw at the bottom, on each side.) (4) The panel assembly will be removed. (See photo 5)	Photo 4 
7. Removing the louver motor Remove only the right side panel to remove this motors. (1) Remove setting screws of motor. (2 pcs) (See photo 6) 8. Removing of the swing louver (1) Remove the swing louver from the joint on the right side. (2) Slide the louver out to the left side.	Photo 5 



OPERATING PROCEDURE	PHOTOS
9. Removing the front louver (1) Pull and unhook the louver toward you. (Clasps are 5 pcs)	Photo 6 Thermistor check plate Louver motor set screw Set screw  Front panel lower Side box Right Thermistor Side plate (S) Photo 7 Swing louver  Side box left Front panel lower

OPERATING PROCEDURE

10. Removing the fan motor

After removing the electrical box covers:

- (1) Disconnect the lead connector for fan.
- (2) Pull out the room temp. thermistor from the casing (A). (See photo 9)
- (3) Loose the shaft joint set screws (2 pcs) with a hexagonal wrench. (Size 3mm)
- (4) Unhook the casing (A) by pushing. (2 points for each side)
- (5) Open about half of the casing (A) and take it out.
- (6) Loose the fixing band set screws. (1 pcs on the both sides of the fan motor.)
- (7) Remove the fixing bands.
- (8) Take out the fan motor.

PHOTOS

Photo 9

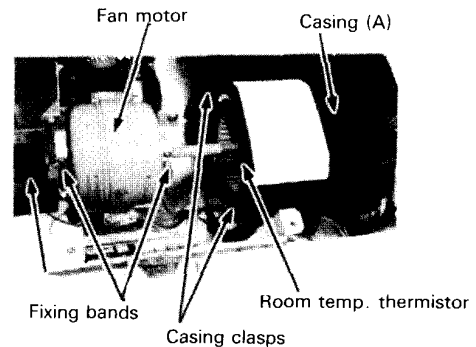
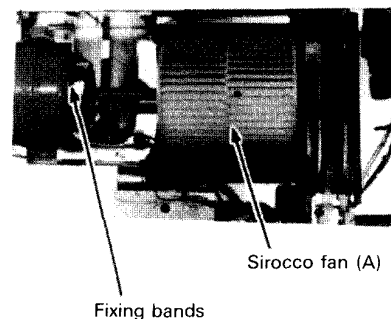


Photo 10



11. Removing the room temperature thermistor

After removing the electrical box covers:

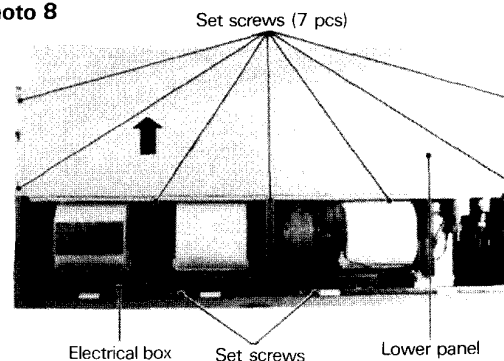
- (1) Pull out the room temperature thermistor from the casing (A).
- (2) Disconnect the connector (CN-20) from the controller board in the electrical box.
- (3) Take out the thermistor.

12. Removing the indoor coil thermistor

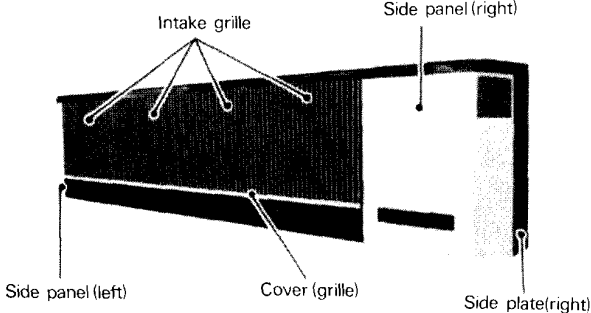
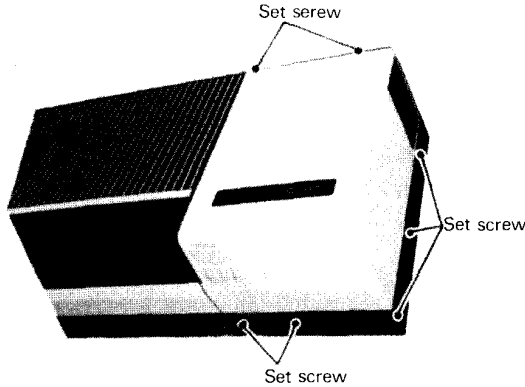
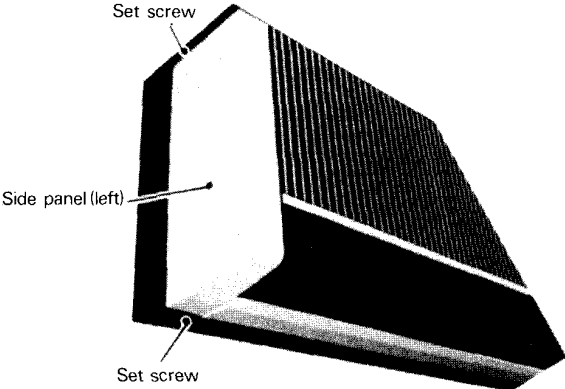
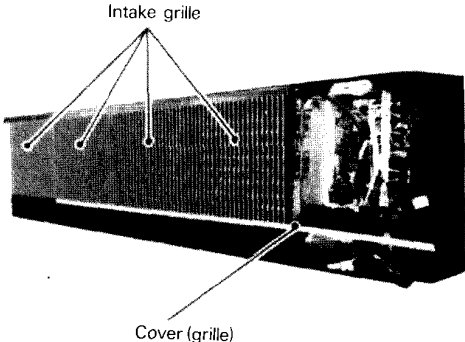
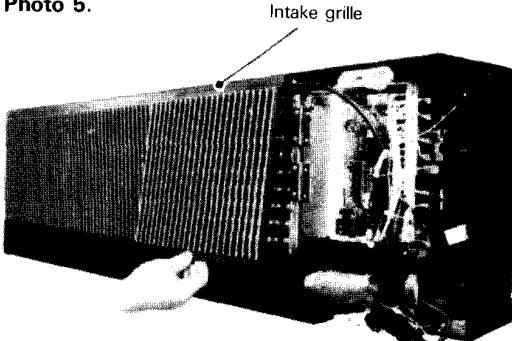
After removing the electrical box covers:

- (1) Remove the right side panel.
- (2) Remove the set screw of the thermistor check plate and the set screws of the side plate. (3 pcs) (See photo 6)
- (3) Remove the indoor coil thermistor from the heat exchanger.
- (4) Disconnect the connector (CN-21) from the controller board in the electrical box.
- (5) Take out the thermistor.

Photo 8



14-3 Indoor unit (PK24EK)

OPERATING PROCEDURE	PHOTOS
1. Removing the side panel (right) (1) Unscrew seven set screws to remove the panel. (See photo 2.) Photo 1. 	Photo 2. 
2. Removing the side panel(left) (1) Remove two screws. (See photo 3.) (2) Pull out the panel downward. Photo 3. 	Photo 4. 
3. Removing the intake grilles (1) Remove the three(four) air filters. (2) Remove the side panels (right and left). (Refer to items 1 and 2.) (3) Pull out the cover (grille) to either side of right or left. (See photo 4.) (4) Put your finger tips into underside centre of the intake grille and unfasten the insertings at lower right and left, then pull out the grille toward your side lowering it a little. Same in procedure for all three (four) grilles. (See photo 5.)	Photo 5. 

OPERATING PROCEDURE

4. Removing the side plate(right)

- (1) Remove the side panel(right). (Refer to item 1.)
- (2) Remove two set screws and pull out the plate downward.(See photo 6.)

5. Removing drain cover

- (1) Remove the side panel(right). (Refer to item 1.)
- (2) Take off the drain cover with the set screw loosening. (See photo 6.)

6. Removing the electrical parts

- (1) Remove the side plate(right). (Refer to item 4.)
- (2) Disconnect the leads and remove the connector for the fan motor with the louver motor. (See photo 7.)
- (3) Electrical parts (See photo 7.)
 - Contactor fan motor (52F)
 - Indoor controller board
 - TB. (Terminal block)
- (4) Electrical parts (See photo 8)

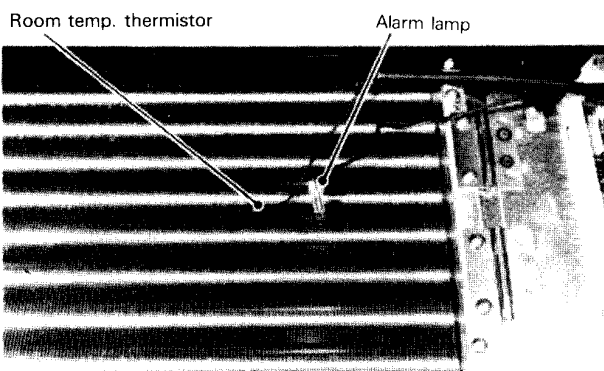
Remove electrical parts box set screws and set electrical parts box upright. (See photo 8.)

 - Transformer
 - Run capacitor
 - Thermistor
- (5) Electrical parts (See photo 9.)

Remove cover(grille), then remove intake grille(right). (Refer to item 3 (3) (4))

 - Room temp. thermistor

Photo 9.



PHOTOS

Photo 6.

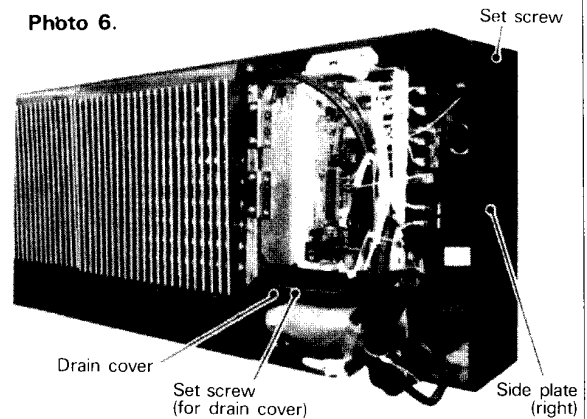


Photo 7.

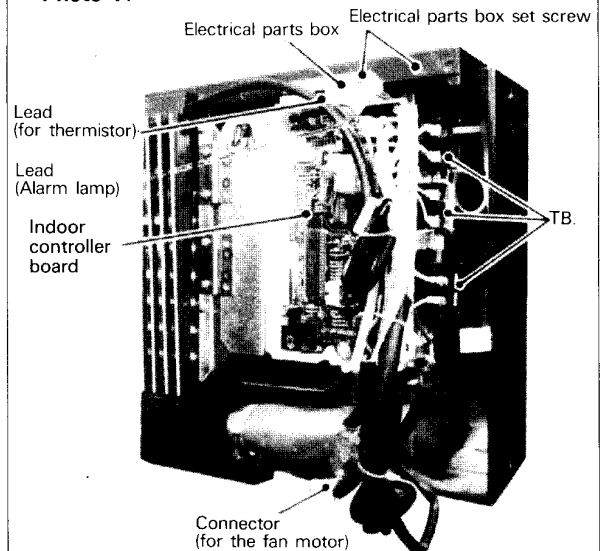
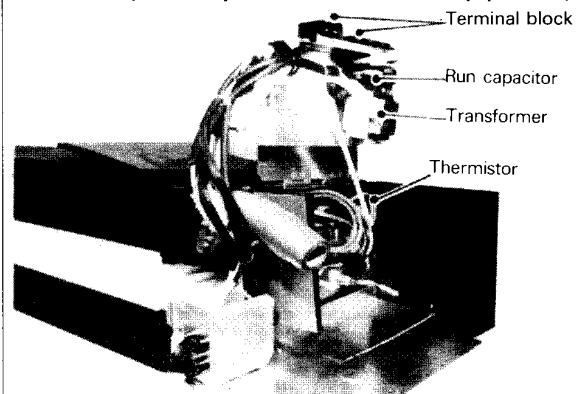


Photo 8. (Electrical parts box in set in set up position)



OPERATING PROCEDURE

7. Removing the fan assembly

- (1) Remove the side panels (right and left).
(Refer to items 1 and 2.)
- (2) Remove the three(four) intake grilles.
(Refer to items 3-(3), and (5).)
- (3) Remove the side plate(right). (Refer to item 4-(2).)
- (4) Take off the drain cover. (Refer to item 5-(2).)
- (5) Remove one set screw on the back plate and remove the back plate. (See photo 11.)
- (6) Unscrew four set screws to remove the lower panel (rear). (See photo 11.)
- (7) Unscrew four set screws to remove the lower panel (front). (See photo 12.)
- (8) Disconnect the leads and remove the connector for the fan motor with the louver motor. (See photo 12.)
- (9) Remove the set screw of the support. (See photo 13.)
- (10) Remove two right and two left set screws of the fan assembly. (See photos 14 and 15.)
- (11) Remove set screws on the line flow fan, then remove the stopper plate. (See photo 16.)
- (12) Remove the motor shaft set screw, then remove the fan. (See photo 16.)
- (13) Remove set screw on the motor fixing plate(left and right), then remove the motor. (See photo 16.)

Photo 14.

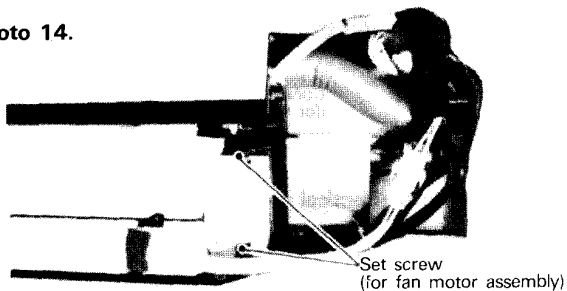
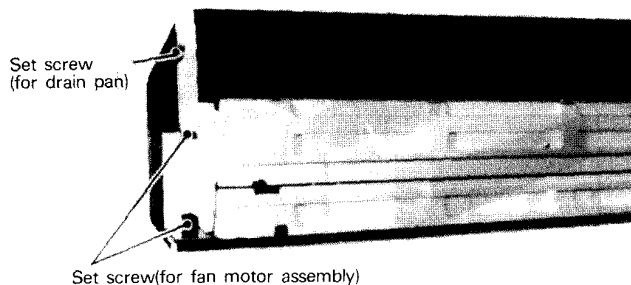


Photo 15.



PHOTOS

Photo 10.

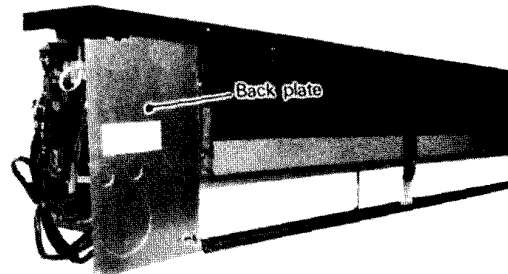


Photo 11.

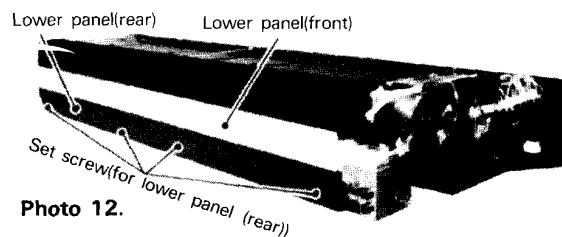


Photo 12.

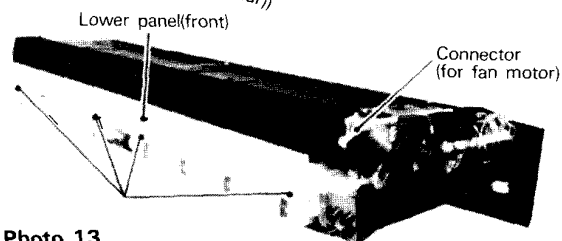


Photo 13.

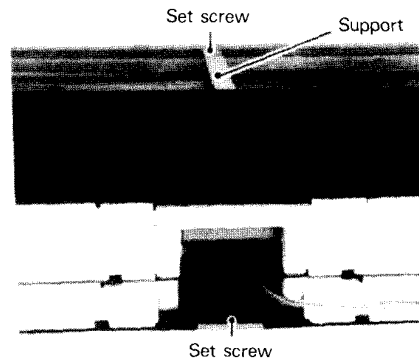
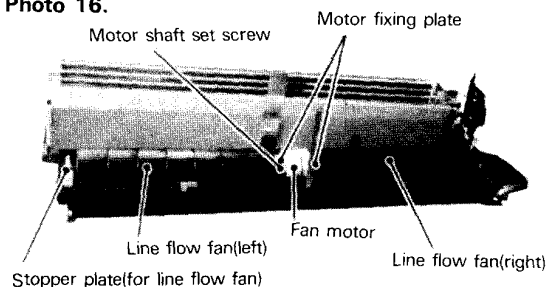
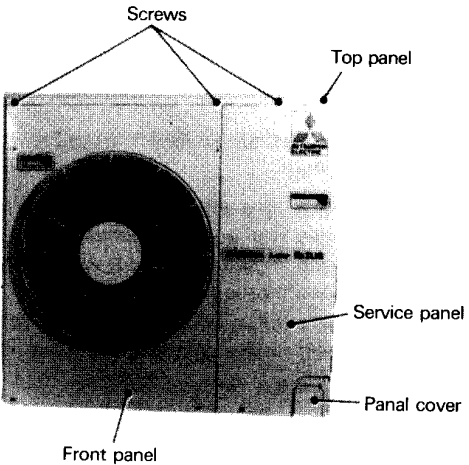
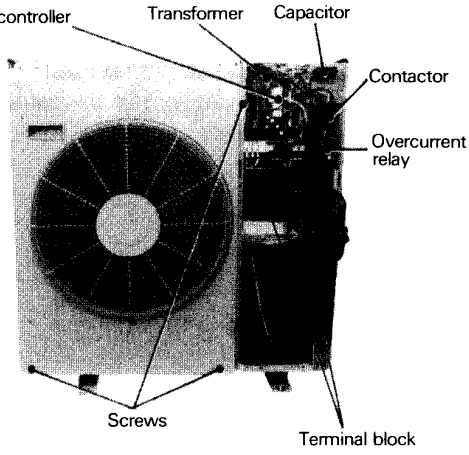
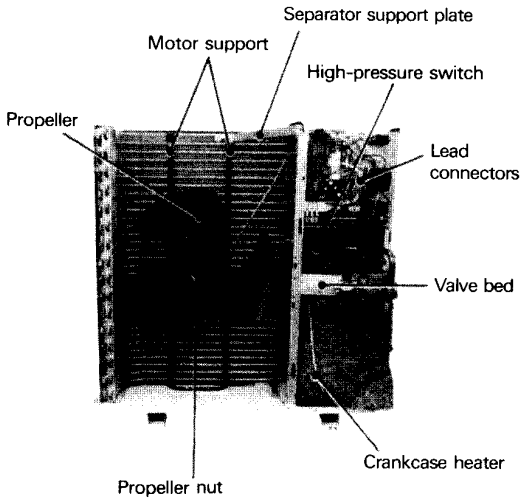


Photo 16.



14-4 Outdoor unit (PU18EK)

OPERATING PROCEDURE	PHOTOS
1. Electrical parts (1) Remove top panel (3 screws in front, 2 screws in rear) (2) Remove cover panel (1 screw). The panel is anchored by clicks to the side panel. Remove by pulling towards you. (3) Remove service panel (1 screw). The panel is anchored by clicks on the right and left sides. After removing the screw, pull the panel down and remove it by pulling towards you.	Photo 1  Photo 2 
2. Blower motor (1) Remove front panel (3 screws). Open the panel to a 45 degree angle and lift to remove. The panel is clasped at three points on the left side. (2) Remove propeller fan (1 set nut). (3) Remove fan motor (3 screws). Remove lead connectors.	Photo 3 

OPERATING PROCEDURE

3. Heat Exchanger, Compressor

- (1) Remove the rear panel (2 screws in front, 1 screw on the side, 3 screws in the rear). Remove the valve bed, and open the rear panel to the rear to remove.

NOTE :

All panels are clasped, and must be removed by shifting up and down.

- (2) Remove right side panel (4 screws).
- (3) Remove rear guard (3 screws).
- (4) Remove separator support plate (4 screws).
- (5) Remove motor support (2 screws).
- (6) Remove valve bed (5 screws). The valve bed is clasped on the right and left sides. Lift to remove.
- (7) Remove the electrical parts box .
Remove the respective connectors from high-pressure switch, crank case heater, shell thermo, and fan motor lead.
- (8) Remove separator (2 screws).
- (9) Remove heat exchanger (2 screws).
Disconnect the welded section of pipe.
- (10) Remove compressor (3 set nuts).

Remove the weldment of the compressor suction pipe and discharge pipe.

PHOTOS

Photo 4

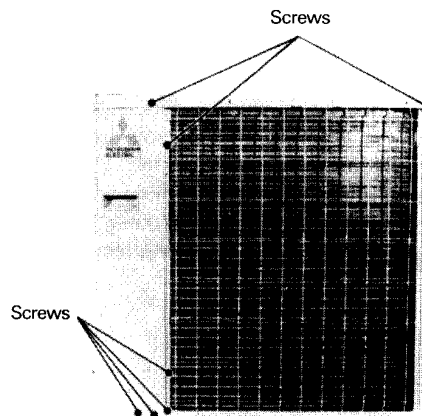


Photo 5

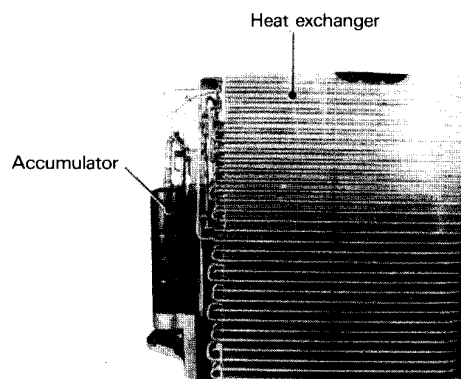
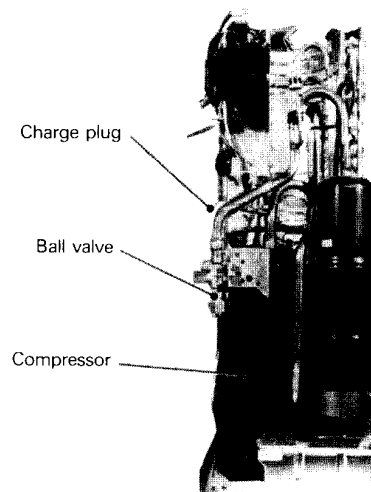
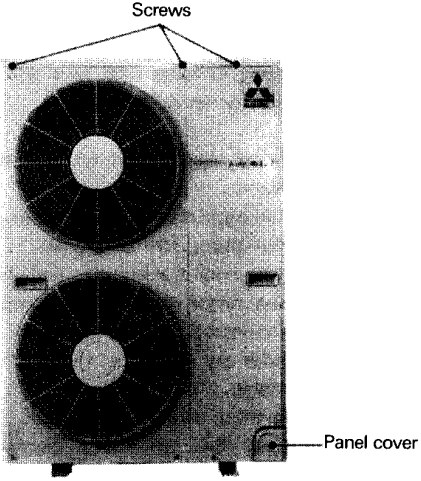
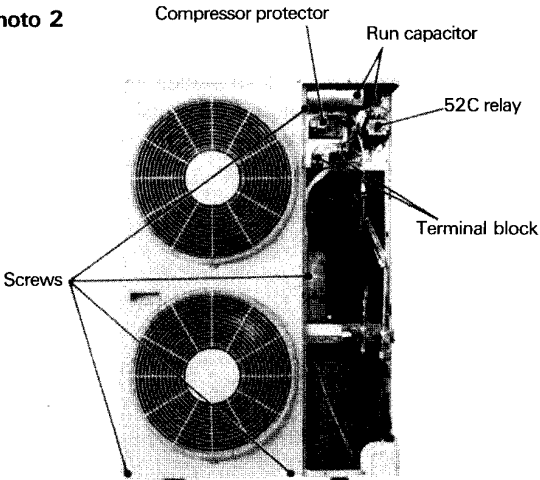
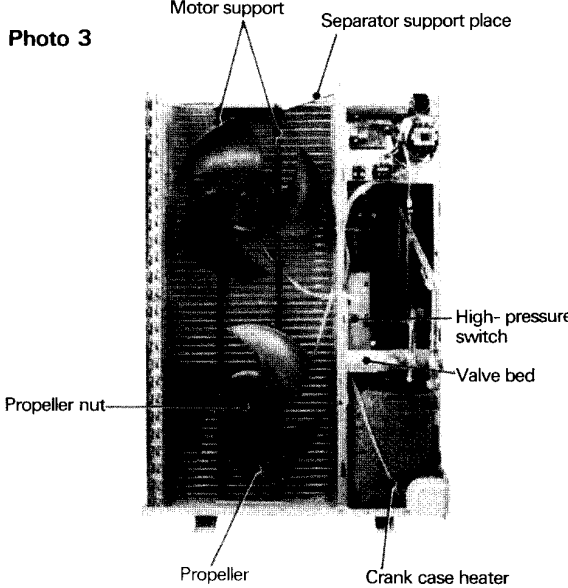


Photo 6



14-5 Outdoor unit (PU24EK)

OPERATING PROCEDURE	PNOTOS
1. Electrical parts (1) Remove top panel (3 screws in front, 2 screws in rear) (2) Remove panel cover (1 screw). The panel is clasped to the side panel. Remove by pulling towards you. (3) Remove service panel (1 screw). The panel is clasped on the right and left sides. After removing the screw, pull the panel down and remove it by pulling towards you.	Photo 1  Photo 2 
2. Blower motor (1) Remove front panel (3 screws). Open the panel to a 45 degree angle and lift to remove. The panel is clasped at three points on the left side. (2) Remove propeller fan (1 set nut). (3) Remove fan motor (3 screws). Remove lead connectors.	Photo 3 

OPERATING PROCEDURE

3. Heat Exchanger, Compressor

- (1) Remove the rear panel (2 screws in front, 1 screw on the side, 3 screws in the rear).

Remove the valve bed, and open the rear panel to the rear to remove.

NOTE :

All panels are clasped and must be removed by shifting up and down.

- (2) Remove right side panel (4 screws).
- (3) Remove rear guard (3 screws).
- (4) Remove separator support plate (4 screws).
- (5) Remove motor support (2 screws).
- (6) Remove valve bed (5 screws). The valve bed is anchored by clicks on the right and left sides. Lift to remove.
- (7) Remove the electrical parts box.
Remove the respective connectors from high-pressure switch, Low-pressure switch, crank case heater, shell thermo, and fan motor lead.
- (8) Remove separator (2 screws).
- (9) Remove heat exchanger (2 screws).
Disconnect the welded section of pipe.
- (10) Remove compressor (3 set nuts).
Remove the weldment of the compressor suction pipe and discharge pipe.

PHOTOS

Photo 4

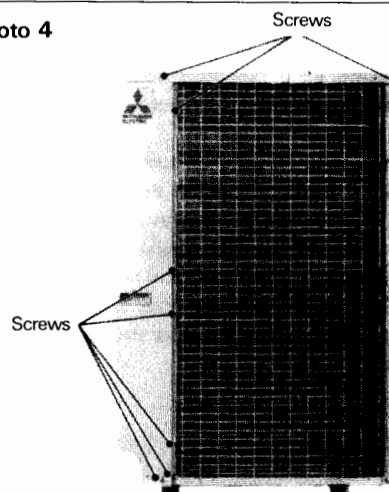


Photo 5

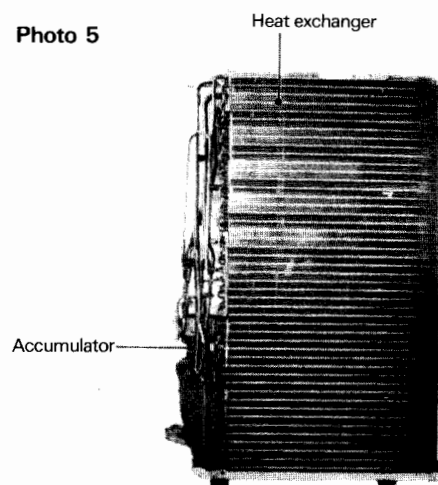
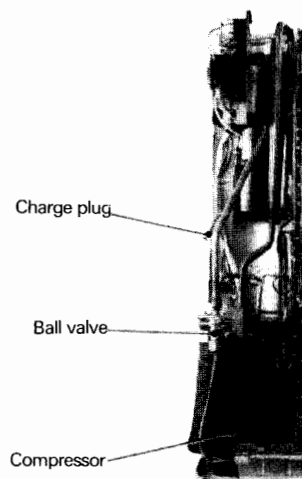


Photo 6



1. REFRIGERANT PIPES

For model : PL18/24FK, PLL12/18/24FK, PC24EK, PCL24EK, PK18/24EK, PKL12/18/24EK

Parts No.	PACSK05FS	PACSK07FS	PACSK10FS	PACSK15FS
Pipe length (ft.)	16	23	33	49
Pipe size OD (in.)	Liquid $\phi 3/8$		Gas $\phi 5/8$	
Connection method	Indoor unit : Flared		Outdoor unit : Flared	

For model : PL30/36/42FK, PC30/36/42EK, PK30EK

Parts No.	PACSK05FF	PACSK07FF	PACSK10FF	PACSK15FF
Pipe length (ft.)	16	23	33	49
Pipe size OD (in.)	Liquid $\phi 1/2$		Gas $\phi 3/4$	
Connection method	Indoor unit : Flared		Outdoor unit : Flared	

Note 1. The refrigerant pipes and the indoor unit contain a nitrogen holding charge which must be removed by evacuation. (PL/PC/PCL/PK/PKL)

<Piping connection procedures>

See that ball valve on outdoor unit is fully shut (unit is shipped with valve shut). Remove caps from piping and unit and make flare connection promptly. Repeat for each connection, one at a time.

After all piping connections between indoor and outdoor unit have been completed, vacuum-purge air from system through the service port of the ball valve on the outdoor unit.

Note 2. The following parts are contained in optional refrigerant pipint kit.

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

2. TIMER

Part No.	PAC-SK65PT
Model Name	Program timer

3. TIMER ADAPTER

Depending on the microprocessor type, this adapter is required for system control and for operation via external contacts.

Part No.	PAC-715AD
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4. MULTIPLE REMOTE CONTROLLER ADAPTER.

Required for remote indication (operation/check).

Part No.	PAC-725AD
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5. DRAIN PUMP (PC/PCL series)

Part No.	PAC-280DM
Applied	PC24/30/36/42EK, PCL24EK

6. FINISH COVER

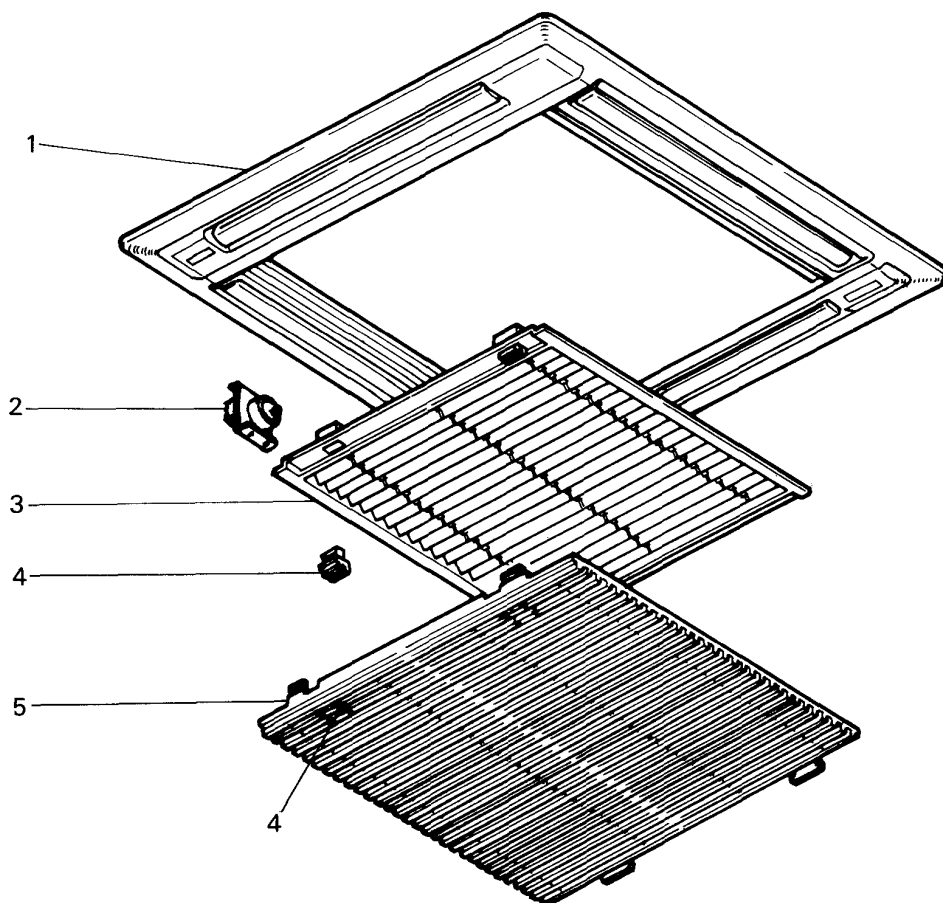
Part No.	PAC-988KC-E	PAC-989KC-E
Applied	PC24/30EK, PCL24EK	PC36/42EK

7. WIND BAFFLE

Part No.	WB-PEK	WB-PEK2
Applied	PU12/18EK, PU12/18EK-1	PU24/30/36/42EK

16 PARTS LIST

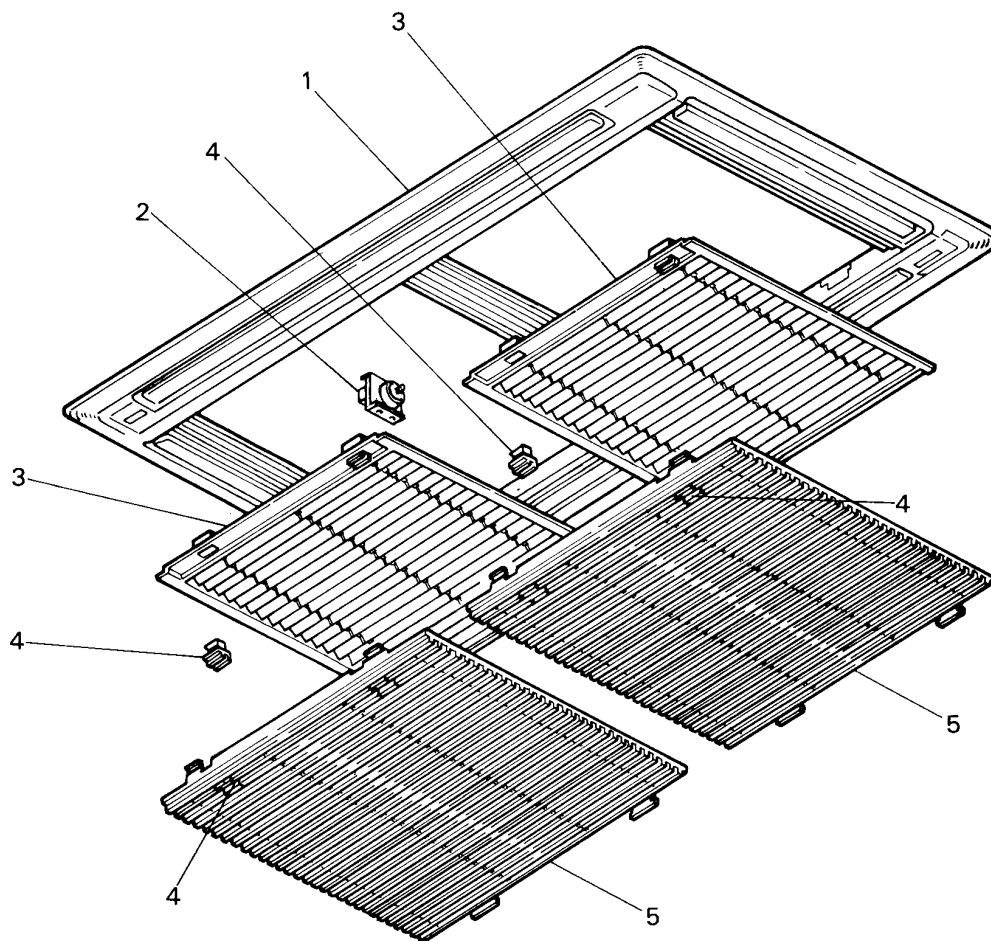
PL18/24FK2, PLL12/18/24FK PANEL PARTS



No.	Parts No.	Parts Name	Specifications Drawing No.	Q'ty/set			Remarks	Circuit Diagram Symbol	Recom- mended Q'ty	Price	
				PLL12FK	PL18FK2 PLL18FK	PL24FK2 PLL24FK				Unit	Amount
1	T7W 410 003	AIR OUTLET GRILL	MARBLE WHITE	1	1	1	PL18/24FK				
2	T7W 410 223	VANE MOTOR		1	1	1	PL-FK PL-FK2 PLL-FK	MV			
3	R01 K01 500	AIR FILTER		1	1	1	PL-FK PL-FK2 PLL-FK				
4	R01 K01 054	CATCH		4	4	4	PL-FK PL-FK2 PLL-FK				
5	R01 K01 691	INTAKE GRILL		1	1	1	PL18/24FK				
* 6	T7W 411 239	FUSE	250V 0.5A	1	1	1		F2			

*This part is not shown in the illustration.

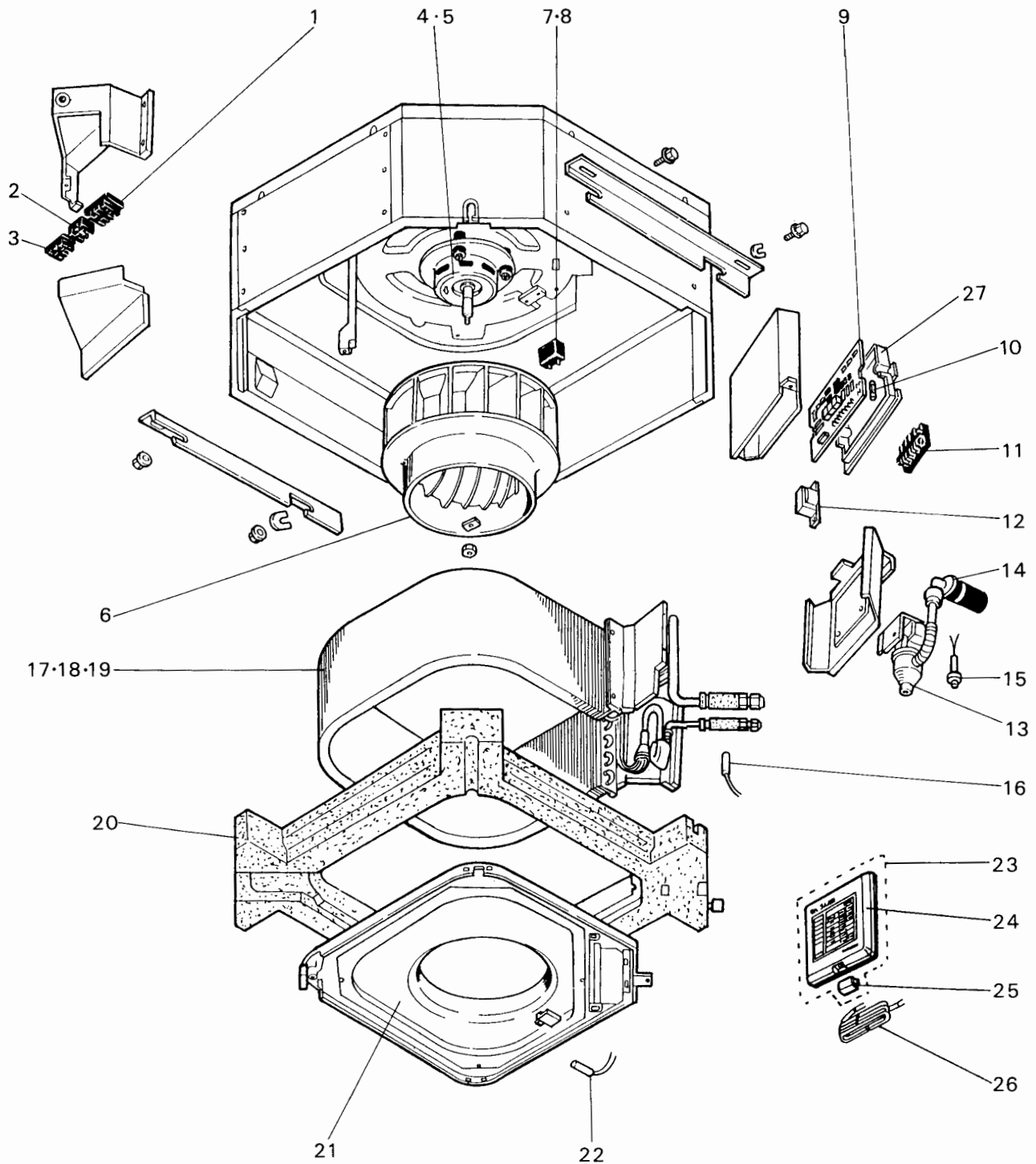
PL30/36/42FK2 PANEL PARTS



No.	Parts No.	Parts Name	Specifications Drawing No.	Q'ty/set			Remarks	Circuit Diagram Symbol	Recom- mended Q'ty	Price	
				PL30FK2	PL36FK2	PL42FK2				Unit	Amount
1	T7W 413 003	AIR OUTLET GRILL	MARBLE WHITE	1	1	1	PL36/42FK				
2	T7W 410 223	VANE MOTOR		1	1	1	PL-FK PL-FK2	MV			
3	R01 K01 500	AIR FILTER		2	2	2	PL-FK PL-FK2				
4	R01 K01 054	CATCH		8	8	8	PL-FK PL-FK2				
5	R01 K21 691	INTAKE GRILL		2	2	2	PL36/42FK				
*6	T7W 413 239	FUSE	250V 0.8A	1	1	1		F2			

※This part is not shown in the illustration.

PL18/24FK2, PLL12/18/24FK FUNCTIONAL PARTS



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No.	Parts No.	Parts Name	Specifications Drawing No.	Q'ty/set			Remarks	Circuit Diagram Symbol	Recom- mended Q'ty	Price	
				PLL12FK	PL18FK2 PLL18FK	PL24FK2 PLL24FK				Unit	Amount
1	T7W 420 716	TERMINAL BLOCK	3P(L1,N,GR)	1	1	1	PL-FK2	TB2			
2	R01 556 246	TERMINAL BLOCK	2P(1,2)	1	1	1	PL-FK PL-FK2	TB5			
3	R01 556 246	TERMINAL BLOCK	2P(1,2)	1	1	1	PL-FK PL-FK2	TB4			
4	T7W 410 762	FAN MOTOR	SGR-25 DTC	1	1		PL18/24FK	MF1			
5	T7W 411 762	FAN MOTOR	SGR-37 DTC			1	PL18/24FK	MF1			
6	R01 K01 114	TURBO FAN		1	1	1	PL-FK PL-FK2				
7	T7W 410 255	FAN CAPACITOR	12 μ F 220V		1	1	PL-FK PL-FK2	C1			
8	T7W 409 255	FAN CAPACITOR	8.5 μ F 220V	1				C1			
9	T7W 410 310	INDOOR CONTROLLER BOARD		1	1	1	PL-FK PL-FK2	I.B			
10	T7W 410 239	FUSE	250V 6A	1	1	1	PL-FK PL-FK2	F1			
11	T7W 411 716	TERMINAL BLOCK	3P(L1,N,GR)	1	1	1	PL-FK PL-FK2	TB12			
12	T7W A01 799	TRANSFORMER	RED:15.5VAC, 0.3A BRN:11.0VAC, 0.6A	1	1	1	PL-FK PL-FK2	T			
13	T7W 410 355	DRAIN PUMP		1	1	1	PL-FK PL-FK2	DP			
14	R01 K01 523	DRAIN SOCKET		1	1	1	PL-FK PL-FK2				
15	R01 K01 266	DRAIN SENSOR		1	1	1	PL-FK PL-FK2	DS			
16	R01 K01 202	INDOOR COIL THERMISTOR		1	1	1	PL-FK PL-FK2	TH2			
17	T7W 410 480	HEAT EXCHANGER			1		PL18FK				
18	T7W 411 480	HEAT EXCHANGER				1	PL24FK				
19	R01 K42 480	HEAT EXCHANGER		1							
20	T7W 410 529	DRAIN PAN		1	1	1	PL-FK				
21	R01 K01 119	BELL MOUTH		1	1	1	PL-FK PL-FK2				
22	R01 J01 202	ROOM TEMPERATURE THERMISTOR		1	1	1	PL-FK PL-FK2	TH1			
23	T7W 410 200	REMOTE CONTROLLER		1	1	1	PL-FK PL-FK2	R.B			
24	T7W 351 077	REMOTE CONTROLLER COVER		1	1	1	PL-FK PL-FK2				
25	R01 L72 095	SCREW CAP		1	1	1	PL-FK PL-FK2				
26	T7W 556 305	REMOTE CONTROLLER CABLE	39ft	1	1	1	PL-FK PL-FK2				
27	T7W 829 070	CONTROLLER CASE		1	1	1	PL-FK PL-FK2				